

**GENERAL NOTES**

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY AND/OR MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE, UNLESS ALTERNATIVE COMPLIANCE REQUIREMENTS HAVE BEEN APPROVED.
- THE CONTRACTOR IS TO NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE DAYS BEFORE STARTING WORK ON THESE DRAWINGS: MISS UTILITY 1-800-257-7777; VERIDON TELEPHONE COMPANY; HOWARD COUNTY BUREAU OF UTILITIES; AT&T CABLE LOCATION DIVISION; B.G.&E. CO. CONTRACTOR SERVICES; B.G.&E. CO. UNDERGROUND DAMAGE CONTROL; STATE HIGHWAY ADMINISTRATION; THE CONTRACTOR SHALL NOTIFY MISS UTILITY AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO START OF WORK.
- THE SUBJECT PROPERTY IS ZONED "CE-F" PER ZONING BOARD DECISION AND ORDER FOR CASE ZB1105-M, APPROVED ON NOVEMBER 6, 2017 AND IS SUBJECT TO THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER CONN. BILL 75-2003.
- HOWARD COUNTY ZONING BOARD CASE ZB-1105-M, APPROVED ON NOVEMBER 6, 2017, CONTAINED THE FOLLOWING CONDITION OF APPROVAL: THE PETITIONER SHALL MAKE ANY NECESSARY REVISIONS TO THE PARKING AND TABULATION AT THE SITE DEVELOPMENT PLAN STATE: THE EXISTING TOPOGRAPHY SHOWN HEREON WAS OBTAINED FROM AERIAL PHOTOGRAMMETRY COMPILED BY POTOMAC AERIAL SURVEYS, INC. DECEMBER 21, 2017 AND SUPPLEMENTED BY VOGL ENGINEERING+TIMMONS GROUP DATED MARCH 2013.
- FEB/MARCH 2014 AND FEB/MARCH 2018.
- 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 16E1 AND 16H3 WERE USED FOR THIS PROJECT.
- SOIL TYPES SHOWN HEREON ARE IN ACCORDANCE WITH THE WEI SOIL SURVEY, HOWARD COUNTY, MARYLAND.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES LOCATED ON THE SUBJECT PROPERTY OR THE COUNTY'S CEMETERY SITE MAP.
- THE SITE IS NOT LOCATED IN THE HISTORIC DISTRICT OR LISTED ON THE HISTORIC SITES INVENTORY. NO STRUCTURES CURRENTLY EXISTING ON THE SUBJECT PROPERTY ARE OVER 50 YEARS OLD. PLEASE REFER TO SDP-88-037.
- THE PRE-SUBMISSION MEETING WAS HELD FOR THIS PROJECT ON JULY 25, 2018 AT 6 PM AT THE CHAPEL GATE PRESBYTERIAN CHURCH.
- THIS PROJECT, CHAPEL GATE CEF # 14-09, HAS BEEN REVIEWED BY THE HOWARD COUNTY DESIGN ADVISORY BOARD (DAP) ON APRIL 9, 2014.
- THE ENVIRONMENTAL CONCEPT PLAN (ECP-18-062) WAS APPROVED PER LETTER DATED FEBRUARY 21, 2019.
- THE SKETCH PLAN (S-19-001) WAS APPROVED PER LETTER DATED APRIL 16, 2019.
- THE PRELIMINARY PLAN (P-20-002) WAS APPROVED PER LETTER DATED FEBRUARY 6, 2020.
- MARRIOTTVILLE ROAD IS CLASSIFIED AS A PUBLIC INTERMEDIATE ARTERIAL.
- IMPROVEMENTS TO MARRIOTTVILLE ROAD SHALL BE AS DETAIL HEREON WITH COORDINATION WITH CAPITAL PROJECT J-4205 (WHEN FUNDED).
- US ROUTE 40 IS CLASSIFIED AS A PUBLIC INTERMEDIATE ARTERIAL. (NO IMPROVEMENTS PROPOSED).
- ALBETH ROAD IS CLASSIFIED AS A PUBLIC LOCAL ROAD.
- ROAD FRONTAGE IMPROVEMENTS SHALL BE PROVIDED ALONG ALBETH ROAD IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL AND THE ZONING BOARD DECISION AND ORDER ZB-1105-M.
- PROPOSED ROADWAYS: STARLIGHT PLACE - PUBLIC ACCESS STREET; KIRKLEIGH DRIVE - PUBLIC ACCESS STREET / PRIVATE EXTENSION; CROSSPOINT WAY - PUBLIC ACCESS PLACE; EDEN COURT - PRIVATE ALLEY FROM PRIVATE EXTENSION OF KIRKLEIGH DRIVE; KEYSTONE LANE - PRIVATE ALLEY FROM KIRKLEIGH DRIVE; SUMMER WOODS PLACE - PRIVATE ALLEY FROM CROSSPOINT WAY; WELCOME WAY - PRIVATE ALLEY FROM STARLIGHT WAY.
- IN ACCORDANCE WITH WP-19-056, PRIVATE ROADS MUST BE DESIGNED AND CONSTRUCTED TO PUBLIC ROAD STANDARDS.
- GATED FIRE DEPARTMENT ACCESS ROAD CONNECTION TO MARRIOTTVILLE ROAD - THE HOMEOWNER ASSOCIATION (HOA) IS RESPONSIBLE TO MAINTAIN THE FIRE LANE (SECONDARY/EMERGENCY ACCESS) AND ENSURE THE REMOVAL OF SNOW IN A TIMELY MANNER.
- ANY DAMAGE TO PUBLIC RIGHT-OF-WAY, PAVING, OR EXISTING UTILITIES WILL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
- DRIVEWAY(S) SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS: A) WIDTH - 12 FEET (16 FEET SERVING MORE THAN ONE RESIDENCE); B) SURFACE - 6 INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-1/2" MIN.); C) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% CHANGE AND MINIMUM 45-FOOT DEPTH TURNING RADIUS; D) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H2S LOADING); E) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100-YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY SURFACE; F) STRUCTURE CLEARANCES - MINIMUM 12 FEET; G) MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE.
- PUBLIC TRASH AND RECYCLING COLLECTION WILL BE PROVIDED ALONG THE PUBLIC AND PRIVATE ROADS WITHIN 5' OF THE EDGE OF THE ROADWAY. AS COLLECTION WILL OCCUR ALONG PRIVATE ROADWAYS, A DAMAGE WAIVER (WORDING AND PROCEDURES AS REQUIRED BY THE CHIEF OF THE DPW ENVIRONMENTAL SERVICES COLLECTIONS DIVISION) MUST BE PROVIDED WITH THE FINAL PLAN AND INCLUDED IN THE HOA AGREEMENT WITH HOWARD COUNTY. COUNTY SERVICES WILL NOT BEGIN ON THE ROADS UNTIL CONSTRUCTION HAS CLEARED SUFFICIENTLY FOR THE TRUCKS TO GO THROUGH UN-HINDERED.
- THE MAINTENANCE OF THE TRASH PAD AND ITS LANDSCAPING IS THE RESPONSIBILITY OF THE HOA.
- EXISTING UTILITIES LOCATED FROM UTILITIES, TOPOGRAPHIC SURVEY, PUBLIC WATER AND AND SEWER EXTENSION PLANS, AND AS-BUILT DRAWINGS. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE.
- ANY DAMAGE INCURRED TO THE EXISTING UTILITIES, DUE TO CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- A TRAFFIC STUDY WAS PREPARED BY TRAFFIC GROUP, ENTITLED "TRAFFIC IMPACT ANALYSIS" WAS APPROVED UNDER S-19-001, MARCH 26, 2019.
- THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
- WATER FOR THIS PROJECT IS TO BE PUBLIC EXTENSION OF CONTRACT NO. 44-3486.
- SEWER FOR THIS PROJECT IS TO BE PUBLIC EXTENSION OF CONTRACT NO. 24-3447.

- REFER TO:
- FINAL WATER & SEWER PLAN PHASE 1 24-5123-D
  - FINAL WATER & SEWER PLAN PHASE 2 24-5169-D
- FLOODPLAINS ARE LOCATED ON-SITE.
  - THE FLOODPLAIN STUDY FOR THIS PROJECT, PREPARED BY VOGL ENGINEERING+TIMMONS GROUP, DATED SEPTEMBER 2019 (AS REVISED) WAS FINALIZED AND APPROVED, JUNE 7, 2021.
  - THE ON-SITE FLOODPLAIN BOUNDARIES WERE DELINEATED BASED ON A THE ABOVE REPORT.
  - THE DESIGN OF THE STARLIGHT PLACE ROAD CROSSING CULVERT INCORPORATED THE LATEST DESIGN OF THE MARRIOTTVILLE ROAD CULVERT PREPARED BY JOHNSON, MIRMAN & THOMPSON, INC. (JMT) AS PART OF THE CAPITAL PROJECT J-4205 PLAN.
  - IN ACCORDANCE WITH WP-19-056, ENCROACHMENTS INTO THE STEEP SLOPES AND STREAM BUFFERS ARE LIMITED TO THE PURPOSE OF INSTALLING THE TRAIL PATH IN ACCORDANCE WITH THE D&O AND EXHIBITS ASSOCIATED WITH ZB-1105-M.
  - WETLANDS AND STREAMS SHOWN ON-SITE ARE BASED ON THE DELINEATION PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES. IN A REPORT TITLED "WETLAND, FOREST STAND DELINEATION & PRELIMINARY FOREST CONSERVATION PLAN REPORT" DATED JULY 24, 2018 AND UPDATED MARCH 14, 2019. THE WETLANDS REPORT WAS APPROVED ON APRIL 10, 2019, UNDER ECP-18-062.
  - REFERENCE NO. TRACKING NUMBER: 21-NT-3067 (4/16/247)
  - NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAMS OR THEIR BUFFERS OR FLOODPLAIN EASEMENT AREAS AND 100-YEAR FLOODPLAIN EXCEPT AS APPROVED THROUGH AN ESSENTIAL DISTURBANCE DETERMINATION OR ALTERNATIVE COMPLIANCE.
  - A FOREST STAND DELINEATION PLAN & REPORT TITLED "WETLAND, FOREST STAND DELINEATION & PRELIMINARY FOREST CONSERVATION PLAN REPORT" DATED JULY 24, 2018 WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. C/O MR. JOHN CANOLES.
  - 53 SPECIMEN TREES WERE IDENTIFIED.
- PER SDP07-133:
- FOREST CONSERVATION OBLIGATIONS IN ACCORDANCE WITH SECTION 16-1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION MANUAL HAVE BEEN PREVIOUSLY ADDRESSED BY THE PLACEMENT OF 12.80 ACRES OF EXISTING FOREST INTO RETENTION EASEMENTS AND THE POSTING OF SURETY UNDER SDP-03-122(FC)/FOREST CONSERVATION PLAN OF EASEMENT (RECORDING REFERENCE NOS. 15923 TO 15925). THESE PREVIOUSLY SECURED EASEMENTS WERE RECONFIGURED AND NEW EASEMENT AREAS ADDED UNDER THE SDP-07-133 PLAN.

- THE REVISED FOREST CONSERVATION PLAN, SDP 07-133(FC)/ PLAN FOR GRANT OF FOREST CONSERVATION EASEMENTS (RECORDING REFERENCE NOS. 20074 TO 20076), PLACED 12.80 ACRES OF EXISTING FOREST INTO RETENTION EASEMENTS WHICH MET THE OBLIGATION OF REQUIRED RETENTION.
- NO NEW FOREST CONSERVATION OBLIGATION IS REQUIRED BASED ON THE CHANGES PER THIS F-21-011 PLAN**
- F-21-011 FOREST CONSERVATION EASEMENTS HAVE BEEN RECONFIGURED AS PART OF F-21-011 AND THIS PLAN PROPOSAL TO FULFILL THE REQUIREMENTS OF SECTION 16-1200 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY FOREST CONSERVATION MANUAL. PORTIONS OF PREVIOUSLY PLATTED FOREST CONSERVATION EASEMENT HAVE BEEN REMOVED AND/OR RECONFIGURED. F-21-011 AND THIS PLAN F-21-011 IDENTIFY NON-CREDITED AREAS OF RETENTION (<35' WIDE) AND THE NEW AREAS OF RETENTION EASEMENT.
- THE RESULT IS 12.81 ACRES OF ON-SITE RETENTION.
- TOTAL FOREST CONSERVATION OBLIGATION REMAINS PROVIDED ON-SITE VIA RETENTION EASEMENT (NO SURETY REQUIRED).
- NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT, HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

- A NOISE STUDY FOR THIS PROJECT WAS PREPARED BY VOGL ENGINEERING+TIMMONS GROUP, DATED JULY 2020 AND APPROVED, APRIL 19, 2021. THE 65 DBA NOISE CONTOUR LINE DRAWN ON THIS SUBDIVISION PLAN IS ADVISORY AS REQUIRED BY THE HOWARD COUNTY DESIGN MANUAL, CHAPTER 5, REVISED FEBRUARY 1992, AND CANNOT BE CONSIDERED TO EXACTLY LOCATE THE 65 DBA NOISE LINE. THE 65 DBA NOISE LINE HAS BEEN ESTABLISHED BY HOWARD COUNTY TO ALERT DEVELOPERS, BUILDERS AND FUTURE RESIDENTS THAT AREAS BEYOND THIS THRESHOLD MAY EXCEED GENERALLY ACCEPTED NOISE LEVELS ESTABLISHED BY THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.
- THE GEOTECHNICAL REPORT FOR THIS PROJECT WAS PREPARED BY HILLIS CARNES ENGINEERING ASSOCIATES, INC., DATED SEPTEMBER 9, 2019, AND APPROVED JANUARY 28, 2020 UNDER P-20-002.
- STORM WATER MANAGEMENT PRACTICES ARE REQUIRED IN ACCORDANCE WITH THE DESIGN MANUALS, PRIOR TO SIGNATURE APPROVAL OF THE FINAL PLAN, THE DEVELOPER WILL BE REQUIRED TO EXECUTE THE DECLARATION OF COVENANT AND/OR A DEVELOPER'S AGREEMENT FOR THE CONSTRUCTION OF THE STORM WATER MANAGEMENT PRACTICES AND A MAINTENANCE AGREEMENT.
- STORMWATER MANAGEMENT FOR THE PROJECT IS PROVIDED BY THE USE OF BIOTRETION, NON-STRUCTURAL, ALTERNATIVE SURFACE AND MICRO-SCALE PRACTICES IN ACCORDANCE WITH THE MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II, ENVIRONMENTAL, ALTERNATIVE SITE DESIGN AND CRITERIA OUTLINED IN CHAPTER 5 OF HOWARD COUNTY DESIGN MANUAL - VOLUME I DESIGN.
- A. STORMWATER FILTERING SYSTEMS INCLUDE: BIOTRETION (F-6). THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
- B. NON-STRUCTURAL PRACTICES: DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2). THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
- C. ALTERNATIVE SURFACES INCLUDE: PERMEABLE SURFACES (A-2) ON LOT DRIVEWAYS & OFF LOT PARKING AREAS. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNER AND THE HOMEOWNERS ASSOCIATION.
- D. MICRO-SCALE PRACTICES INCLUDE: PRIVATE OFF-LOT (OPEN SPACE) FACILITIES: MICRO-BIOTRETION (M-6), A GRAVEL WETLAND (M-2) AND A FILTERIA INLET. THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
- E. PRIVATE ON-LOT RAIN BARREL (M-1). THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNER.
- F. BIOTRETION: BIO-CLEAN STRUCTURES (SHEET 100). THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
- ALL SIDEWALKS PROVIDING ACCESS TO STORMWATER MANAGEMENT EASEMENTS / AREAS SHALL BE TRAFFIC BEARING FOR THE LIMITS OF THE ACCESS POINTS / EASEMENTS. REINFORCEMENT SHALL BE IN ACCORDANCE WITH HOWARD COUNTY DETAIL R-6.03.
- IN ACCORDANCE WITH ZONING BOARD DECISION AND ORDER FOR CASE ZB-1105-M, THE OPEN SPACE REQUIREMENTS FOR THIS CEF-M PROJECT IS 25% OF GROSS AREA (19.86 AC. GROSS AREA X 25% = 4.97 AC.).
- REFER TO OPEN SPACE TABULATION HEREON.
- OPEN SPACE LOTS 135-137 SHALL BE OWNED AND MAINTAINED BY THE HOA.
- IN ACCORDANCE WITH ZONING BOARD DECISION AND ORDER FOR CASE ZB1105-M, THE RECREATION OPEN SPACE REQUIREMENTS FOR THIS CEF-M PROJECT IS 1,000 SF/UNIT. SOME RECREATIONAL AREAS OF THE RESIDENTIAL DEVELOPMENT WILL BE SHARED WITH AND WILL REMAIN PART OF CHAPEL GATE PRESBYTERIAN CHURCH PROPERTY.
- REFER TO SHEET 38 & 39.
- 134 UNITS x 1,000 SF = 134,000 SF OR 3.07 ACRES.
- THE OVERALL REQUIREMENT HAS BE MET AS ALLOWED BY THE JUNE 2012 POLICY AND THE CEF-M REGULATIONS HERON.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS

REFER TO SHEET 2 FOR CONTINUATION OF GENERAL NOTES

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12/27/21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 12/31/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT

**PARKING TABULATION:**

TOTAL NUMBER OF DWELLING UNITS PROPOSED: 134  
 SINGLE FAMILY ATTACHED (SFA) = 134 LOTS

1. OFF-STREET PARKING SPACES REQUIRED: 2 SPACES PER UNIT  
 134 X 2 = 268 SPACES REQUIRED

PARKING SPACES PROVIDED:  
 SFA = 1 GARAGE / 1 DRIVEWAY  
 1 SPACE IN GARAGE = 72 SPACES (FOR 72 UNITS)  
 1 SPACES ON DRIVEWAY = 124 SPACES (FOR 124 UNITS)

SFA = 2 GARAGE / 2 DRIVEWAY  
 2 SPACES ON DRIVEWAY = 124 SPACES (FOR 62 UNITS)  
 2 SPACES ON DRIVEWAY = 124 SPACES (FOR 62 UNITS)

TOTAL OFF STREET PARKING SPACES PROVIDED: 268 SPACES PROVIDED  
 OFF-STREET PARKING SPACES PROVIDED: 124 PARKING SPACE EXCESS

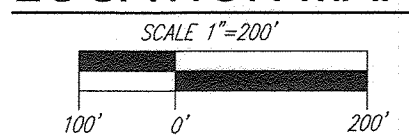
THE HOA SHALL BE RESPONSIBLE FOR ENFORCING THE PARKING REQUIREMENTS ON EACH RESIDENTIAL LOT. GARAGE SPACES SHALL REMAIN OPEN FOR VEHICLE PARKING USE. THE GARAGE SPACE MAY NOT BE CONVERTED TO LIVING SPACE AND SHALL ONLY BE UTILIZED AS A VEHICULAR PARKING SPACE.

VISITOR PARKING REQUIRED:  
 SFA - 134 UNITS @ 0.5 SPACES PER UNIT  
 134 x 0.5 = 67 SPACES REQUIRED

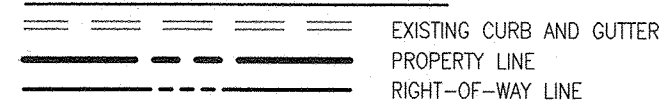
80 ON-STREET INDENTED SPACES PROVIDED  
 REFER TO 124 PARKING SPACE EXCESS

REFER TO GENERAL NOTE 38, SHEET 2  
 ON-STREET PARKING SHALL BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION

**LOCATION MAP**



**LEGEND**



**FINAL ROAD CONSTRUCTION PLANS**  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF NON BUILDABLE BULK PARCEL B  
 PLAT 25442-25954  
 MARRIOTTVILLE, MD 21104

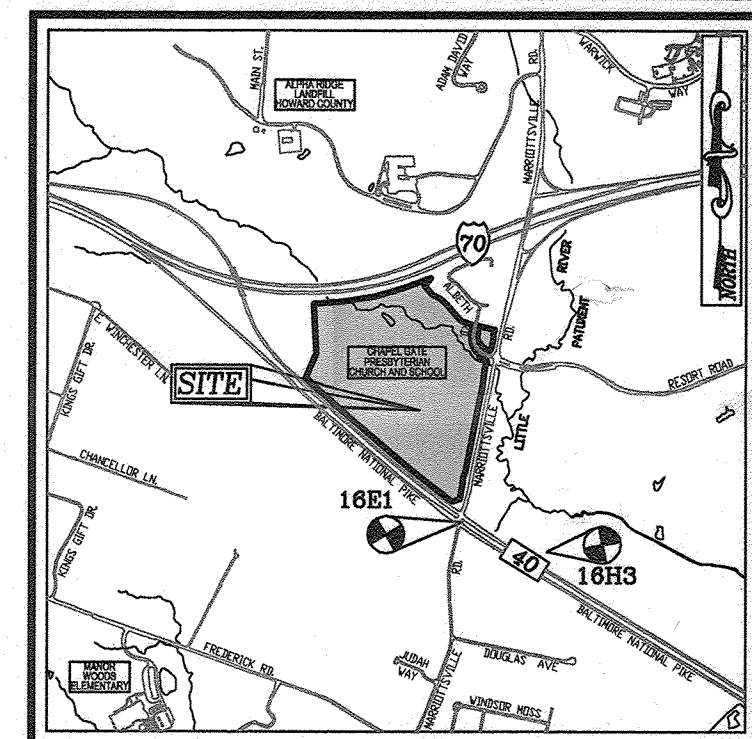
**COORDINATE TABLE**

#	NORTH	EAST	#	NORTH	EAST
16H3	592408.074	1341924.016	42	594766.029	1340413.392
16E1	593250.989	1340192.746	43	594666.874	1340398.921
21	594754.365	1338558.609	45	593784.060	1340223.814
22	595002.814	1338661.049	46	593713.404	1340194.514
23	59512.538	1338633.641	47	593637.895	1340189.739
25	59572.179	1338631.756	48	593460.758	1340160.571
26	59573.980	1338658.808	49	593467.465	1340233.399
27	595701.467	1339792.382	50	594139.889	1339250.400
28	595608.999	1339879.686	51	594387.083	1338972.106
29	595567.368	1339958.609	52	595285.953	1340348.751
34	595212.667	1340015.691	53	595248.929	1340521.105
31	595338.484	1340172.128	54	595206.959	1340510.638
32	595296.324	1340299.859	55	595155.984	1340510.454
33	595248.744	1340284.625	56	595058.425	1340488.473
34	595217.388	1340277.954	57	595029.816	1340478.958
35	594983.300	1340317.540	58	595041.244	1340444.816
36	594948.584	1340360.664	59	595055.974	1340416.280
37	594937.416	1340380.324	60	595072.984	1340391.366
38	594972.376	1340289.166	61	595093.240	1340373.716
39	594955.211	1340428.141	62	595119.593	1340366.662
40	594914.520	1340441.247	63	595149.854	1340346.227
41	594865.589	1340424.961	64	595182.169	1340343.265
			65	595235.786	1340348.156

**BENCHMARKS**

HOWARD COUNTY BENCHMARK 16E1 (CONC. MON.)  
 N 593250.98 E 1340192.70 ELEV. 463.89  
 LOCATION: ISLE AT CORNER RT-40 & MARRIOTTVILLE ROAD

HOWARD COUNTY BENCHMARK 16H3 (CONC. MON.)  
 N 592408.04 E 1341523.97 ELEV. 469.71  
 LOCATION: RT-40, 0.45 MILES WEST OF TURF VALLEY ROAD



**VICINITY MAP**  
 SCALE: 1"=2000'  
 ADC MAP: PAGE: 19 BLOCK: B3, B4, C3 & C4

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**MODERATE INCOME HOUSING UNITS (MIHU) ALLOCATION EXEMPTIONS TRACKING**

Total Number of Lots/Units Proposed	134
Number of MIHU Required	21 UNITS - ZB-1105-M*
Number of MIHU Provided Onsite (net of APFO allocations)	21
Number of APFO Allocations Required (remaining lots/units)	134
MIHU Fee-in-Lieu (indicate lot/unit numbers)	N/A

\* CEF-REGULATION REQUIRES 14 UNITS.  
 21 UNITS PROVIDED PER ZB-1105-M

**OWNER DEVELOPER**

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH  
 2600 MARRIOTTVILLE RD, MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

**SITE DATA**

DEED REFERENCE: PARCEL 110: L 1389 / F 339  
 PARCEL 421: L 4163 / F 424

ELECTION DISTRICT: 3RD  
 LOCATION: MARRIOTTVILLE ROAD / U.S. RT 40 / ALBETH ROAD

EXISTING ZONING: CEF-M

GROSS AREA: 60.74 AC +/-  
 -PARCEL A - CHURCH / SCHOOL AREA: 40.40 AC +/-  
 -NON-BUILDABLE PARCEL B: 19.86 AC +/-  
 -CEP PROJECT AREA: 1.65 AC +/-  
 -NON-BUILDABLE PARCEL C: 0.09 AC +/-  
 -NON-BUILDABLE PARCEL D: 0.67 AC +/-

AREA OF 100 YEAR FLOODPLAIN: 0.51 AC +/-  
 AREA OF STEEP SLOPES (>6% OR GREATER): 1.63 AC  
 AREA OF WETLAND & WETLAND BUFFER AREA: 0.39 AC  
 AREA OF STREAM & STREAM BUFFER AREA: 9.04 AC  
 NET AREA (GROSS-STEEP SLOPES & FLOODPLAIN): 58.6 ACRES ±  
 BASE DENSITY: 1.34 LOTS (ZB-1105-M)  
 NUMBER OF PROPOSED RESIDENTIAL LOTS: 134 LOTS  
 AREA OF PROPOSED RESIDENTIAL LOTS: 5.89 AC  
 AREA OF ROAD RIGHT OF WAY (ON-SITE): 2.83 AC  
 OPEN SPACE REQUIRED: SEE TABULATION  
 OPEN SPACE PROVIDED: SEE TABULATION  
 REC OPEN SPACE: SEE SHEETS 38 & 39  
 LIMIT OF DISTURBANCE: SEE SHEET 20  
 EXISTING USE OF SITE: VACANT  
 PROPOSED USE OF SITE: RESIDENTIAL - SFA  
 PROPOSED WATER SYSTEM: PUBLIC  
 PROPOSED SEWER SYSTEM: PUBLIC

DPZ REFERENCES: CHAPEL GATE: 6-09E, SDP-88-037, BA CASE 93-07E, SDP-93-128, PLAT 13157, PLAT 15336, T0-01-01, BA CASE 01-23E, WP-03-94, SDP-02-133F, PLAT 15923-25, SDP-03-122, T0-01-01, SDP-07-133, WP-08-034, PLAT 20074-76, PLAT 25442-254

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SETB. 6-28-22	
	DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	

**FINAL ROAD CONSTRUCTION PLAN**  
 COVER SHEET, NOTES AND CEF-M REGULATIONS

**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF CHAPEL GATE WOODS, NON-BUILDABLE BULK PARCEL B  
 PLAT 25442-25954

PARCELS: 110 & 421  
 TAX MAP: 16 GRD: 10  
 3RD ELECTION DISTRICT

ZONED: CEF-M

**VOGEL ENGINEERING**  
 PROFESSIONAL ENGINEER

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

DESIGN BY: ES, RHV  
 DRAWN BY: VE+JTC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.D. NO.: 13-36 / 40220

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

1 SHEET OF 101

**OPEN SPACE TABULATION:**

IN ACCORDANCE WITH THE ZONING BOARD DECISION AND ORDER FOR CASE ZB-1105-M, THE OPEN SPACE REQUIREMENTS FOR THIS CEF-M PROJECT IS 25% OF GROSS AREA.

(1



**GENERAL NOTES CONTINUED**

36. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. A FINANCIAL SURETY IN THE AMOUNT OF \$ 88,800 SHALL BE POSTED AS PART OF THE DEVELOPER'S AGREEMENT:  
 - PERIMETER PLANTINGS IN THE AMOUNT OF \$30,000 FOR THE REQUIRED 55 SHADE TREES AND 90 EVERGREEN TREES.  
 - SPECIMEN TREE REPLACEMENT IN THE AMOUNT OF \$16,200 FOR THE REQUIRED 54 SHADE TREES.  
 - INTERNAL SFA PLANTINGS IN THE AMOUNT OF \$40,200 FOR THE REQUIRED 134 SHADE TREES.  
 - PARKING ISLAND PLANTINGS IN THE AMOUNT OF \$2,400 FOR THE REQUIRED 8 SHADE TREES.  
 37. - PUBLIC STREET TREES ARE PROVIDED FOR THIS PROJECT IN ACCORDANCE WITH SECTION 16.124(a)(1) OF THE SUBDIVISION REGULATIONS AND THE LANDSCAPE MANUAL.  
 FINANCIAL SURETY (\$ 88,800) SHALL BE POSTED AS PART OF THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS COST ESTIMATE FOR THE REQUIRED 131 STREET TREES.  
 38. - IN ACCORDANCE WITH DESIGN MANUAL - VOLUME 3, CHAPTER 2 - SECTION 2.9.B. PARKING IS REQUIRED AT TWO (2) SPACES PER UNIT OFF STREET PARKING TO INCLUDE GARAGE SPACE, DRIVEWAY, PARKING PAD AND COURTS. GARAGES COUNT AS A FULL SPACE(S). REFER TO TABULATION ON SHEET 1.  
 NOTE: THE GARAGE SPACES MAY NOT BE CONVERTED TO LIVING SPACE AND SHALL ONLY BE UTILIZED FOR VEHICULAR PARKING SPACE.

39. IN ACCORDANCE WITH ZONING BOARD DECISION AND ORDER FOR CASE ZB-1105-M, THIS SUBDIVISION IS REQUIRED TO PROVIDE MODERN INCOME HOUSING UNITS. A MHU AGREEMENT AND MHU COVENANTS WILL BE REQUIRED IN ACCORDANCE WITH SECTION 13.402 OF THE HOWARD COUNTY CODE.  
 - THE MHU REQUIREMENT FOR THIS SUBDIVISION (ZB1105-M) IS 14 UNITS.  
 - 21 UNITS SHALL BE PROVIDED AS PERMITTED IN THE D60 FOR ZB1105-M.  
 - REFER TO TRACKING CHART, SHEET 1.  
 A MHU AGREEMENT WILL BE RECORDED SIMULTANEOUSLY WITH THE RECORDING OF THE FINAL PLAT.  
 40. THIS PROJECT IS SUBJECT TO THE PROVISIONS OF SECTION 2.015. THE PLANNING DIRECTOR APPROVED THE REQUEST FOR ALTERNATIVE COMPLIANCE TO THE FOLLOWING SECTIONS:

SECTION 16.120(a)(7) REMOVAL OF SPECIMEN TREES 30" IN DIAMETER OR GREATER. THIS REQUEST IS FOR THE REMOVAL OF 27 SPECIMEN TREES (26 TULIP POPLAR AND 1 MAPLE).  
 SECTION 16.120(c)(4) SINGLE FAMILY ATTACHED LOTS MAY BE APPROVED WITHOUT PUBLIC ROAD FRONTAGE, PROVIDED THEY FRONT ON A COMMONLY OWNED AREA CONTAINING A PARKING AREA OR PRIVATE ROAD NOT EXCEEDING A LENGTH OF 200 FEET MEASURED FROM THE EDGE OF THE PUBLIC RIGHT-OF-WAY ALONG THE CENTERLINE OF THE PRIVATE ROAD. THE REQUEST IS TO EXCEED THE 200' LENGTH FROM A PUBLIC ROAD FOR 5-19-001 LOTS 14, 15, 46-54, 74-79, AND 82-89. NEW LOT NUMBERS LOTS 16, 17, 48-56, 75-80, AND 83-91.

SECTION 16.116 PROTECTION OF WETLANDS, STREAMS, AND STEEP SLOPES - THE REQUEST IS FOR THE DISTURBANCE TO THE 100' STREAM BUFFER AND 25% STEEP SLOPES TO ACCOMMODATE INSTALLATION OF THE PROPOSED PATHWAY SYSTEM APPROVED AS PART OF THE COMMUNITY ENHANCEMENT REQUIREMENTS PER 2B CASE NO. 1105M.

APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:  
 1. IDENTIFIED SPECIMEN TREES MAY BE REMOVED PROVIDED THEY ARE REPLACED AT A 2:1 RATIO WITH 3" CALIPER NATIVE TREES FOR A TOTAL OF 54 REPLACEMENT TREES. A MINIMUM VARIETY OF THREE NATIVE LARGE SHADE TREE SPECIES SHOULD BE USED TO FULFILL THIS REQUIREMENT. THE MITIGATION TREES SHALL BE SHOWN ON FUTURE SUBDIVISION AND DEVELOPMENT LANDSCAPE PLANS AND BONDED AS LANDSCAPE TREES.  
 2. PROVIDE A CHART ON ALL SUBJECT PLANS IDENTIFYING THE SPECIMEN TREES PERMITTED TO BE REMOVED AS IDENTIFIED IN THE ALTERNATIVE COMPLIANCE PETITION EXHIBIT MAY BE REMOVED.  
 3. PRIVATE ROADS MUST BE DESIGNED AND CONSTRUCTED TO PUBLIC ROAD STANDARDS.  
 4. ADDRESS SIGNAGE MAY BE REQUIRED AT THE END OF ALLEYS, AS TO BE DETERMINED BY DEPARTMENT OF FIRE AND RESCUE SERVICES IN FUTURE SUBDIVISION PLAN SUBMISSIONS.  
 5. ANY TRENCHING OR EXCAVATION OF PRIVATE ALLEYS MUST BE DESIGNED AND SCREENED IN ACCORDANCE WITH THE D&O CONDITIONS OF APPROVED LISTED IN ZB-1105M.  
 6. ADD A GENERAL NOTE THAT LOTS 14-15, LOTS 46-54, LOTS 74-79, AND LOTS 82-89 (NEW LOT NUMBERS LOTS 16, 17, 48-56, 75-80, AND 83-91) ARE PERMITTED WITHOUT PUBLIC ROAD FRONTAGE AND TO BE LOCATED ON A PRIVATE ROAD MORE THAN 200' FROM THE PUBLIC ROAD TERMINUS.  
 7. ENCROACHMENTS INTO THE STEEP SLOPES AND STREAM BUFFERS ARE LIMITED TO THE PURPOSE OF INSTALLING THE TRAIL PATH IN ACCORDANCE WITH SECTION 16.1105M.  
 8. LOD FOR PATHWAY CONSTRUCTION WILL BE LIMITED TO THE MINIMUM REQUIRED TO COMPLETE THE WORK.  
 9. GRADING DETAILS WILL BE PROVIDED TO LIMIT DISTURBANCE TO CRITICAL ROOT ZONES, AND TO KEEP THE WORK AREA TO AN AREA OF MINIMUM DISTURBANCE BY CAREFULLY SELECTING BEST MANAGEMENT CONSTRUCTION METHODS AND EQUIPMENT.  
 10. EXERCISE EQUIPMENT AND THE REFLECTION/SITTING AREA WILL BE PLACED OUTSIDE STREAM BUFFERS TO THE EXTENT POSSIBLE.  
 41. ON MARCH 13, 2019 THE PLANNING DIRECTOR APPROVED THE REQUESTS TO ALLOW THE AREA #1 STREAM CROSSING FOR PROPOSED DISTURBANCE TO THE 25' WETLANDS BUFFER, 100' STREAM BUFFER AND 100-YEAR FLOODPLAIN, AREA #2 FOR REMOVAL OF EXISTING DRIVEWAY PAVEMENT WITHIN THE 100' STREAM BUFFER, A PORTION OF A PROPOSED PAVED ALLEY WITH A PUBLIC WATER LINE BENEATH THE ALLEY TO SERVE UNITS 1 THRU 19 (NEW LOT NUMBERS LOTS 1-9 AND 16-21), A STORM DRAIN AND THE EXISTING WETLANDS BUFFER, 100' STREAM BUFFER AND 100-YEAR FLOODPLAIN, AREA #3 FOR REMOVAL OF RIP-RAP WITHIN THE 25' WETLAND BUFFERS AND AREA #3 FOR REMOVAL OF EXISTING 27" CMP CULVERT, INLET AND END SECTIONS UNDER THE EXISTING CHURCH DRIVEWAY AT MARRIOTTSVILLE ROAD ESSENTIAL OR NECESSARY DISTURBANCES IN ACCORDANCE WITH SECTION 16.116(c) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE DECISION WAS MADE BASED ON THE FOLLOWING:

1. THE DETAILED JUSTIFICATIONS PROVIDED BY VOGEL ENGINEERING+TIMMONS GROUP IN A LETTER DATED MARCH 6, 2019.  
 2. THE DISTURBANCES ARE NECESSARY TO PROVIDE ESSENTIAL PUBLIC WATER AND SEWER UTILITIES, AND PUBLIC ROAD ACCESS TO SERVE THE PROPOSED DEVELOPMENT.  
 3. THE PROPOSED DESIGN MINIMIZES DISTURBANCES TO THE STREAM AND WETLANDS BUFFERS AND 100-YEAR FLOODPLAIN INCLUDING THE INSTALLATION OF RETAINMENT WALLS, A BOTTOMLESS ARCH CULVERT OR A BRIDGE SYSTEM TO MINIMIZE DISTURBANCE TO THE STREAM.  
 4. THE PROPOSAL WILL REMOVE AND REDUCE EXISTING DRIVEWAY PAVEMENT FROM THE STREAM BUFFER BY APPROXIMATELY 3,175 SF.  
 5. THE STREAM BUFFER AREAS DISTURBED WILL BE RE-VEGETATED AND PLANTED.  
 6. THERE ARE NO OTHER REASONABLE ALTERNATIVES FOR EXTENSION AND CONNECTION OF THE PUBLIC WATER AND SEWER SERVICE.  
 7. FOR THE REMOVAL OF THE EXISTING DRIVEWAY PAVEMENT AND CULVERT PIPE, FOR THE STORM DRAIN OUTFALL AND RIP-RAP, AND FOR THE PUBLIC ROAD ACCESS ENTRANCE TO THIS DEVELOPMENT AND THE EXISTING CHURCH DRIVEWAY BECAUSE OF THE EXISTING LIMITED SITE ACCESS ALONG MARRIOTTSVILLE ROAD.

APPROVAL OF THE ABOVE DESCRIBED ESSENTIAL OR NECESSARY DISTURBANCES ARE SUBJECT TO THE FOLLOWING:  
 1. INSTALLATION OF A BOTTOMLESS ARCH CULVERT OR BRIDGE SYSTEM FOR THE PUBLIC ROAD "A" STREAM CROSSING;  
 2. THE PLANTING OF VEGETATION (TREES, SHRUBS, AND GROUNDCOVER ETC) WITHIN THE STREAM BUFFER AREA TO MITIGATE THE PROPOSED STREAM AND WETLANDS BUFFER AND FLOODPLAIN DISTURBANCES;  
 3. THE BOTTOMLESS ARCH CULVERT OR BRIDGE SYSTEM AND STREAM BUFFER MITIGATION STRATEGY SHALL BE PROVIDED AS PART OF THE SUBMITTAL;  
 4. THE APPLICANT SHALL OBTAIN AUTHORIZATION FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT AND U.S. ARMY CORPS OF ENGINEERS FOR ACTIVITIES IN REGULATED WETLAND AND STREAM AREAS PRIOR TO SUBMISSION OF GRADING ESSENTIAL PUBLIC WATER AND SEWER UTILITIES. REFERENCE THE APPLICABLE MDE OR USACE PERMITS OR TRACKING NUMBERS ON ANY ASSOCIATED SUBDIVISION AND SITE DEVELOPMENT PLANS, AND BUILDING OR GRADING PERMITS.

REFER TO DETAILS HEREIN FOR THE STARLIGHT PLACE CULVERT / STREAM CROSSING  
 IN A LETTER DATED JULY 23, 2021, THE DEPARTMENT OF PLANNING & ZONING IN CONSULTATION WITH THE DIRECTOR OF PLANNING, DIRECTOR OF PUBLIC WORKS, AND ADMINISTRATOR OF THE OFFICE OF COMMUNITY SUSTAINABILITY APPROVED THE REQUEST TO ALLOW THE CHAPEL GATE PROPERTY AND CHAPEL GATE WOODS PROJECT TO EXCEED THE MINIMUM NECESSARY TO PROVIDE ACCESS TO THE PROPERTY, AND TO FACILITATE NON-EROSIVE DISCHARGE FROM A CHAPEL WETLAND AND STORM DRAIN.  
 - THE PROPOSED STREAM CROSSING HAS BEEN LOCATED TO SIMULTANEOUSLY PROVIDE THE BEST INTERSECTION DISTANCE BETWEEN THE PROPOSED NEW ROAD AND THE INTERSECTION OF ALBETH ROAD AND MARRIOTTSVILLE ROAD.  
 - THE GEOMETRY OF THE STREAM CROSSING IS BASED ON COORDINATION WITH THE DEPARTMENT OF PUBLIC WORKS AND DEPARTMENT OF PLANNING AND ZONING TO ENSURE TRAFFIC SAFETY AND LIMIT ENVIRONMENTAL DISTURBANCES TO THE EXTENT POSSIBLE.  
 - A BOTTOMLESS ARCH CULVERT WILL BE USED FOR THE STREAM CROSSING TO LIMIT IMPACTS TO STREAM FLOW AND WILDLIFE.  
 - THERE ARE NO OTHER REASONABLE ALTERNATIVES TO PROVIDE ACCESS TO THE PROPERTY THAT MEET THE REQUIREMENTS MULTIPLE DESIGN REQUIREMENTS AND DESIGN CONSTRAINTS FOR THIS SITE.

APPROVAL OF THE ABOVE DESCRIBED ESSENTIAL OR NECESSARY DISTURBANCES ARE SUBJECT TO THE FOLLOWING MITIGATION METHODS:  
 - FOR THE STREAM CROSSING, A BOTTOMLESS ARCH CULVERT WILL BE INSTALLED.  
 - THE OUTFALLS ARE DESIGNED TO ACCOMMODATE DRAINAGE AND PROVIDE NON-EROSIVE DRAINAGE.  
 - ANY AREAS OF VEGETATION NOT PERMANENTLY IMPROVED WITH A STRUCTURE SHALL BE REVEGETATED AS PART OF THE FOREST CONSERVATION PLAN OR LANDSCAPE PLAN ASSOCIATED WITH F-21-011.  
 42. TRAFFIC CONTROL DEVICES:  
 A. THE R1-1(STOP) SIGNS AND STREET NAME SIGN (SNS) ASSEMBLIES FOR THIS DEVELOPMENT MUST BE INSTALLED BEFORE BASE PAVING IS COMPLETE.  
 B. THE TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2430) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES.  
 C. ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MDMUTCD).  
 D. ALL SIGN POST USED FOR TRAFFIC CONTROL SIGNS INSTALLED ON THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, "CORKY PUNCH" SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE - 3" LONG). THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "CORKY" INCHES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON THE TOP OF EACH POST.  
 43. THIS PROJECT WILL REQUIRE STREET LIGHTING IN ACCORDANCE WITH SECTION 16.135 OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE HOWARD COUNTY DESIGN MANUAL, STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURES AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III, SECTION 5.5.A. A MINIMUM OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 1/13/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

44. PRIVATE RANGE OF ADDRESS SIGN ASSEMBLIES FOR LOTS 1-7, 13-17, 44-54, 55-67 and 70-77 SHALL BE FABRICATED AND INSTALLED BY HOWARD COUNTY - BUREAU OF HIGHWAYS AT THE DEVELOPERS/OWNERS EXPENSE. CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-2430 FOR DETAILS AND COST ESTIMATES.  
 -LOTS 1-7, 13-17, 44-54, 55-69 and 70-77 SHALL UTILIZE A PRIVATE ALLEY.  
 45. - USE THE MAINTENANCE AGREEMENT FOR THE SHARED ALLEYS SHOWN ON ATTACHED SIMULTANEOUSLY WITH THE FINAL PLAT.  
 46. ON THE APPROACH SIDE OF A STOP SIGN AND ALL OTHER TRAFFIC CONTROL SIGNS NOT ACCORD TO A STREET LIGHT POLE, NO STREET TREE CAN BE PLANTED WITHIN 30' OF THE SIGN.  
 47. THE FOLLOWING STANDARDS (CONSTRUCTION AND TEMPORARY TRAFFIC CONTROL) ARE REQUIRED FOR THIS PROJECT:  
 ALBETH ROAD  
 A. MD-104.02-02 - SHOULDER WORK/2 LANE, 2 WAY - EQL/LESS THAN 40 MPH  
 B. MD-104.02-10 - RIGHT LANE CLOSURE/2 LANE, 2 WAY - EQL/LESS THAN 40 MPH  
 MARRIOTTSVILLE ROAD  
 A. MD-104.02-01 - SHOULDER WORK/2 LANE, 2 WAY - GREATER THAN 40 MPH  
 B. MD-104.02-09 - RIGHT LANE CLOSURE/2 LANE, 2 WAY - GREATER THAN 40 MPH  
 -FOR ALL STANDARDS REFERRED TO ON THIS PLAN THE CONTRACTOR MUST GO TO THE BOOK OF STANDARDS WHICH WILL HAVE THE MOST CURRENT VERSION. THE BOOK OF STANDARDS CAN BE ACCESSSED AT: [HTTP://APPS.ROADS.MARYLAND.GOV/BUSINESSWITHSA/BIZ25TOSPFCSD/DESMANUALSTPUB/UPUBLICATIONSONLINE/OHD/BOOKSTD/](http://apps.roads.maryland.gov/businesswithhsa/biz25tospfcs/desmanualstpub/upublicationsonline/ohd/bookstd/)  
 -ALL ITEMS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT VERSION OF THE REFERENCED STANDARD AT THE TIME OF CONSTRUCTION.  
 48. IN ACCORDANCE WITH WP-19-056, SKETCH PLAN LOTS 14-15, LOTS 46-54, LOTS 74-79 AND LOTS 82-89, (NOW LOTS 13-14, LOTS 45-53, LOTS 72-77 AND LOTS 80-87) ARE PERMITTED WITHOUT PUBLIC ROAD FRONTAGE AND TO BE LOCATED ON A PRIVATE ROAD MORE THAN 200' FROM THE PUBLIC ROAD TERMINUS.  
 49. -CONCEPTUAL LOCATIONS OF THE ALBETH HEIGHTS RESIDENTS ENTRY PILLARS ALONG ALBETH ROAD ARE SHOWN HEREON.  
 -THE DEVELOPER IS RESPONSIBLE FOR THE INSTALLATION OF THE ALBETH HEIGHTS ENTRY PILLARS. THE FINAL LOCATION OF THE PILLARS SHALL BE AS DIRECTED BY HOWARD COUNTY-DEPARTMENT OF PUBLIC WORKS DURING THE FUTURE FINAL ROAD CONSTRUCTION PLAN REVIEW AND APPROVAL.  
 -THE DEVELOPER SHALL WORK WITH THE ALBETH HEIGHTS RESIDENTS AND HOWARD COUNTY REGARDING THE DESIGN TO ENSURE THEY MEET THE INTENTION OF ZB-1105-M.  
 -ENTRY PILLAR DESIGN WILL BE COMPLETED BY OTHERS.  
 50. THIS PROJECT IS SUBJECT TO A DESIGN MANUAL WANNER REQUEST DATED MARCH 12, 2019, REGARDING A WANNER FROM DESIGN MANUAL VOLUME III, SECTION 5.0.1.A, APPENDIX A SPECIFYING MINIMUM RADIUS REQUIREMENTS FOR ACCESS PLACE ROADWAYS. THE REQUEST IS FOR ROAD "A" A 350' MINIMUM RADIUS TO ALLOW A 210' RADIUS AND FOR ROAD "B" A 350' RADIUS TO ALLOW 250', AND FROM SECTION 2.5.1 TABLE 2.07 REGARDING MINIMUM INTERSECTION SPACING ALONG ROAD "A" BETWEEN ALBETH ROAD AND THE CHURCH DRIVEWAY/ALLEY TO ALLOW 216' AND ALONG ROAD "B" BETWEEN ROAD "A" AND ROAD "C" TO ALLOW 239'. IN THE LETTER DATED APRIL 1, 2019, THE CHIEF OF THE DEVELOPMENT ENGINEERING DIVISION STATED, AFTER CONSULTATION WITH THE DEPARTMENT OF PLANNING AND ZONING/DIVISION OF LAND DEVELOPMENT AND THE DEPARTMENT OF PUBLIC WORKS, AND BASED ON THE JUSTIFICATION PROVIDED IN THE REQUEST, THIS DIVISION HAS DECIDED THE FOLLOWING:  
 1. REGARDING SECTION 2.3.A.1.A, APPENDIX A, FOR ROAD "B" (ST A 4+96 - ST A 8+48) FROM THE REQUIRED 350' TO THE PROPOSED 250', WE HAVE NO OBJECTION TO THE GRANTING OF THE REQUESTED WANNER SUBJECT TO PROVIDING PARKING RESTRICTIONS AT BOTH SIDES OF ROAD "B" THROUGHOUT THE CURVE TO ENSURE ADEQUATE SIGHT DISTANCE AND TURNING PATH WIDTH IS MAINTAINED.  
 2. REGARDING SECTION 2.3.A.1.A, APPENDIX A, FOR ROAD "A" (STA 3+99 - STA 5+70 AND STA 5+70 - STA 7+50) FROM THE REQUIRED 350' TO THE PROPOSED 210' WE HAVE NO OBJECTION TO THE GRANTING OF THE REQUESTED WANNER SUBJECT TO PROVIDING PARKING RESTRICTIONS AT BOTH SIDES OF ROAD "A" THROUGHOUT THE CURVE AND ELIMINATING THE PROPOSED B HEAD-IN, OFF-STREET PARKING SPACES IN ORDER TO ENSURE ADEQUATE SIGHT DISTANCE FROM ROAD "B". IF OFF-STREET PARKING IS STILL NEEDED TRAFFIC DIVISION'S SUGGESTION WOULD BE TO PROVIDE SEVERAL PARALLEL SPACES ACROSS THE STREET THEREBY AVOIDING POTENTIAL CONFLICTS AS DRIVERS BACK IN/OUT ALONG THE MAIN ROAD.  
 3. REGARDING SECTION 2.5.B.1, TABLE 2.07 TO REDUCE THE REQUIRED INTERSECTION SPACING AT "A" BETWEEN ALBETH ROAD AND CHURCH DRIVEWAY AND AT ROAD "B" BETWEEN ROAD "A" AND ROAD "C", WE HAVE NO OBJECTION TO THE GRANTING OF THE REQUESTED WANNER.  
 51. THIS PROJECT IS SUBJECT TO A DESIGN MANUAL WANNER REQUEST REQUESTING SEVERAL WANNERS FROM DESIGN MANUAL VOLUME III. AFTER CONSULTATION WITH THE DEPARTMENT OF PLANNING AND ZONING/DIVISION OF LAND DEVELOPMENT AND THE DEPARTMENT OF PUBLIC WORKS, THE CHIEF OF THE DEVELOPMENT ENGINEERING DIVISION IN A LETTER DATED APRIL 16, 2021 APPROVED THE REQUESTS BASED ON THE JUSTIFICATION PRESENTED. APPROVAL IS SUBJECT TO THE FOLLOWING FROM DPW:  
 1. REGARDING SECTION 2.5, TABLE 2.07, FROM DESIGN MANUAL VOLUME II TO REDUCE A MINIMUM INTERSECTION SPACING ALONG STARLIGHT PLACE FROM WELCOME WAY/CHURCH DRIVEWAY TO ALBETH ROAD FROM THE REQUIRED 250' TO 217'. DPW HAS REVIEWED THE SUBMITTAL AND HAS NO OBJECTION TO THE GRANTING OF THE REQUESTED WANNER BASED ON THE FOLLOWING:  
 STARLIGHT PLACE'S REVISED ALIGNMENT MAXIMIZES THE INTERSECTION SPACING ALONG ALBETH ROAD, INCREASES THE "VEHICLE STACKING" DISTANCE FROM MARRIOTTSVILLE ROAD (TRAFFIC SIGNAL), ENHANCES ROADWAY GEOMETRY ALBETH ROAD AND STARLIGHT PLACE, INTERSECT AT 90 DEGREES, ENHANCES STOPPING AND INTERSECTION SIGHT DISTANCE ALONG ALBETH ROAD (ST A 0+00 - STA 1+00, PROVIDES A UNIFORM HORIZONTAL CURVE), AND CLOSELY FOLLOWS THE PREVIOUSLY APPROVED SKETCH PLAN (5-19-001).  
 2. REGARDING CONSTRUCTION DETAILS R-1.02 FROM THE DESIGN MANUAL, VOLUME IV TO MODIFY AN ACCESS PLACE SPECIAL SECTION AS SHOWN IN EXHIBIT WITH THEIR SUBMISSION, WE OFFER THE FOLLOWING GIVEN THE DESIRE TO MINIMIZE ENVIRONMENTAL IMPACTS, DPW HAS NO OBJECTION TO SIDEWALK BEING LIMITED TO ONE-SIDE (STARLIGHT PLACE - CULVERT CROSSING); STA 0+00 - STA 2+00 (LT) AS SHOWN, HOWEVER, BECAUSE THE PROPOSED RETAINING WALL DIRECTLY ADJUTS THE SIDEWALK, THE WIDTH SHOULD BE INCREASED TO 6 FT INSURING AN ADEQUATE "CLEAR ZONE" IS PROVIDED AND WALKERS APPROACHING ONE ANOTHER HAVE SUFFICIENT ROOM TO PASS. WE HAVE NO OBJECTION TO THE PAVEMENT WIDTH BEING REDUCED BY ONE FOOT TO MAKE UP THE ADDITIONAL WIDTH OF THE SIDEWALK.  
 3. THE RIGHT OF WAY AT HEADWALL #1 AND #2 DOES NOT ENCOMPASS THE WING WALLS AT BOTH ENDS. THEREFORE, A PUBLIC RETAINING WALL EASEMENT IS REQUIRED TO ENLARGE THESE PORTIONS OF THE WALL.  
 4. GRADING ON BOTH SIDES OF THESE WALL IS EXTENSIVE, WITH THE CONTINUED REVIEW OF FINAL PLAN, DEMONSTRATE HOW ACCESS TO THE LOW SIDE OF THE WALL IS ACCOMPLISHED, VERIFY AND SHOW ON THE FINAL PLAN AND PLAT AN ACCEPTABLE EASEMENT FOR THIS ACCESS BASED ON THE FINAL OWNERSHIP OF THE PROPERTY ON EACH SIDE OF THE WALLS.

52. THE FUTURE CHURCH WALL AREA IS LOCATED WITHIN AN ENVIRONMENTAL AREA, ANY CONSTRUCTION WITHIN THIS AREA WILL REQUIRE PRIOR PERMISSION FROM DPZ.

**ADDRESS & ON-LOT STORMWATER MANAGEMENT PRACTICE CHART**

ON-LOT STORMWATER PRACTICE CHART					
LOT # / STREET ADDRESS	FACILITY TYPE	LOT # / STREET ADDRESS	FACILITY TYPE	LOT # / STREET ADDRESS	FACILITY TYPE
13403 STARLIGHT PLACE	RAIN BARREL (M-3)	13404 STARLIGHT PLACE	RAINFALL (M-1)	13405 STARLIGHT PLACE	RAINFALL (M-1)
13406 STARLIGHT PLACE	RAINFALL (M-1)	13407 STARLIGHT PLACE	RAINFALL (M-1)	13408 STARLIGHT PLACE	RAINFALL (M-1)
13409 STARLIGHT PLACE	RAINFALL (M-1)	13410 STARLIGHT PLACE	RAINFALL (M-1)	13411 STARLIGHT PLACE	RAINFALL (M-1)
13412 STARLIGHT PLACE	RAINFALL (M-1)	13413 STARLIGHT PLACE	RAINFALL (M-1)	13414 STARLIGHT PLACE	RAINFALL (M-1)
13415 STARLIGHT PLACE	RAINFALL (M-1)	13416 STARLIGHT PLACE	RAINFALL (M-1)	13417 STARLIGHT PLACE	RAINFALL (M-1)
13418 STARLIGHT PLACE	RAINFALL (M-1)	13419 STARLIGHT PLACE	RAINFALL (M-1)	13420 STARLIGHT PLACE	RAINFALL (M-1)
13421 STARLIGHT PLACE	RAINFALL (M-1)	13422 STARLIGHT PLACE	RAINFALL (M-1)	13423 STARLIGHT PLACE	RAINFALL (M-1)
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13427 STARLIGHT PLACE	RAINFALL (M-1)	13428 STARLIGHT PLACE	RAINFALL (M-1)	13429 STARLIGHT PLACE	RAINFALL (M-1)
13430 STARLIGHT PLACE	RAINFALL (M-1)	13431 STARLIGHT PLACE	RAINFALL (M-1)	13432 STARLIGHT PLACE	RAINFALL (M-1)
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13436 STARLIGHT PLACE	RAINFALL (M-1)	13437 STARLIGHT PLACE	RAINFALL (M-1)	13438 STARLIGHT PLACE	RAINFALL (M-1)
13439 STARLIGHT PLACE	RAINFALL (M-1)	13440 STARLIGHT PLACE	RAINFALL (M-1)	13441 STARLIGHT PLACE	RAINFALL (M-1)
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13445 STARLIGHT PLACE	RAINFALL (M-1)	13446 STARLIGHT PLACE	RAINFALL (M-1)	13447 STARLIGHT PLACE	RAINFALL (M-1)
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13451 STARLIGHT PLACE	RAINFALL (M-1)	13452 STARLIGHT PLACE	RAINFALL (M-1)	13453 STARLIGHT PLACE	RAINFALL (M-1)
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13460 STARLIGHT PLACE	RAINFALL (M-1)	13461 STARLIGHT PLACE	RAINFALL (M-1)	13462 STARLIGHT PLACE	RAINFALL (M-1)
13463 STARLIGHT PLACE	RAINFALL (M-1)	13464 STARLIGHT PLACE	RAINFALL (M-1)	13465 STARLIGHT PLACE	RAINFALL (M-1)
13466 STARLIGHT PLACE	RAINFALL (M-1)	13467 STARLIGHT PLACE	RAINFALL (M-1)	13468 STARLIGHT PLACE	RAINFALL (M-1)
13469 STARLIGHT PLACE	RAINFALL (M-1)	13470 STARLIGHT PLACE	RAINFALL (M-1)	13471 STARLIGHT PLACE	RAINFALL (M-1)
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13490 STARLIGHT PLACE	RAINFALL (M-1)	13491 STARLIGHT PLACE	RAINFALL (M-1)	13492 STARLIGHT PLACE	RAINFALL (M-1)
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13547 STARLIGHT PLACE	RAINFALL (M-1)	13548 STARLIGHT PLACE	RAINFALL (M-1)	13549 STARLIGHT PLACE	RAINFALL (M-1)
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13553 STARLIGHT PLACE	RAINFALL (M-1)	13554 STARLIGHT PLACE	RAINFALL (M-1)	13555 STARLIGHT PLACE	RAINFALL (M-1)
13556 STARLIGHT PLACE	RAINFALL (M-1)	13557 STARLIGHT PLACE	RAINFALL (M-1)	13558 STARLIGHT PLACE	RAINFALL (M-1)
13559 STARLIGHT PLACE	RAINFALL (M-1)	13560 STARLIGHT PLACE	RAINFALL (M-1)	13561 STARLIGHT PLACE	RAINFALL (M-1)
13562 STARLIGHT PLACE	RAINFALL (M-1)	13563 STARLIGHT PLACE	RAINFALL (M-1)	13564 STARLIGHT PLACE	RAINFALL (M-1)
13565 STARLIGHT PLACE	RAINFALL (M-1)	13566 STARLIGHT PLACE	RAINFALL (M-1)	13567 STARLIGHT PLACE	RAINFALL (M-1)
13568 STARLIGHT PLACE	RAINFALL (M-1)	13569 STARLIGHT PLACE	RAINFALL (M-1)	13570 STARLIGHT PLACE	RAINFALL (M-1)
13571 STARLIGHT PLACE	RAINFALL (M-1)	13572 STARLIGHT PLACE	RAINFALL (M-1)	13573 STARLIGHT PLACE	RAINFALL (M-1)
13574 STARLIGHT PLACE	RAINFALL (M-1)	13575 STARLIGHT PLACE	RAINFALL (M-1)	13576 STARLIGHT PLACE	RAINFALL (M-1)
13577 STARLIGHT PLACE	RAINFALL (M-1)	13578 STARLIGHT PLACE	RAINFALL (M-1)	13579 STARLIGHT PLACE	RAINFALL (M-1)
13580 STARLIGHT PLACE	RAINFALL (M-1)	13581 STARLIGHT PLACE	RAINFALL (M-1)	13582 STARLIGHT PLACE	RAINFALL (M-1)
13583 STARLIGHT PLACE	RAINFALL (M-1)	13584 STARLIGHT PLACE	RAINFALL (M-1)	13585 STARLIGHT PLACE	RAINFALL (M-1)
13586 STARLIGHT PLACE	RAINFALL (M-1)	13587 STARLIGHT PLACE	RAINFALL (M-1)	13588 STARLIGHT PLACE	RAINFALL (M-1)
13589 STARLIGHT PLACE	RAINFALL (M-1)	13590 STARLIGHT PLACE	RAINFALL (M-1)	13591 STARLIGHT PLACE	RAINFALL (M-1)
13592 STARLIGHT PLACE	RAINFALL (M-1)	13593 STARLIGHT PLACE	RAINFALL (M-1)	13594 STARLIGHT PLACE	RAINFALL (M-1)
13595 STARLIGHT PLACE	RAINFALL (M-1)	13596 STARLIGHT PLACE	RAINFALL (M-1)	13597 STAR	



ROAD NAME	STATION	OFFSET	FEATURE/POLE TYPE	SYMBOL
STARLIGHT PLACE	0+14.30	30.5 RT	LED-250 WATT	
STARLIGHT PLACE	1+90	18 RT		
STARLIGHT PLACE	2+54.33	16.0 LT		
STARLIGHT PLACE	3+69.42	16.3 RT	LED-150 WATT PRISMER COLUMN FITURE MOUNTED ON A 14" BLACK FIBERGLASS POLE	
STARLIGHT PLACE	5+84.27	17.9 RT		
STARLIGHT PLACE	7+18	17 RT	LED-100 WATT PRISMER COLUMN FITURE MOUNTED ON A 14" BLACK FIBERGLASS POLE	
STARLIGHT PLACE	8+19.83	16.4 LT		
STARLIGHT PLACE	9+35	16 RT		
STARLIGHT PLACE	10+48.22	16.4 LT		

ROAD NAME	STATIONS	PAVEMENT TYPE	CLASSIFICATION	DESIGN SPEED (MPH)
STARLIGHT PLACE	0+00-11+72.73	P-3	PUBLIC ACCESS STREET	SPEED LIMIT "30"

ROAD NAME	STATION	OFFSET	TYPE
STARLIGHT PLACE	0+39.68	17.4 LT	R1-1 STOP SIGN & STREET NAME SIGN
STARLIGHT PLACE	0+99.44	14.7 RT	R2-1 SPEED LIMIT "25 MPH"
STARLIGHT PLACE	2+45.25	16.80 RT	R1-1 STOP SIGN & STREET NAME SIGN
STARLIGHT PLACE	2+95.19	16.6 LT	W3-1 STOP AHEAD SIGN
STARLIGHT PLACE	4+43.74	15.8 LT	W1-1R CURVE WARNING SIGN
STARLIGHT PLACE	9+21.96	15.4 RT	W3-1 STOP AHEAD SIGN
STARLIGHT PLACE	10+28.18	16.2 LT	R2-1 SPEED LIMIT "25 MPH"
STARLIGHT PLACE	11+38.84	17.2 RT	R1-1 STOP SIGN & STREET NAME SIGN

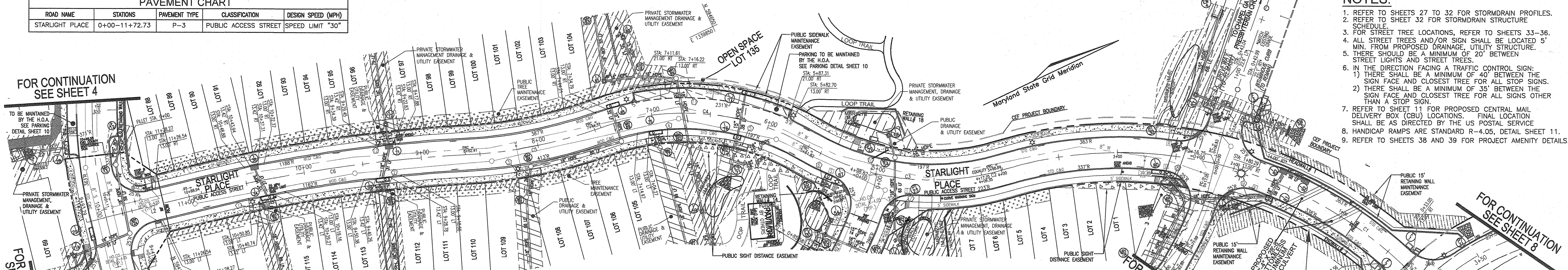
NOTE: ALL SIGN LOCATIONS ARE APPROXIMATE. HOWARD COUNTY TRAFFIC SHALL FIELD APPROVE OR MARK ALL SIGN LOCATIONS PRIOR TO ANY SIGNS BEING INSTALLED. CALL 410-313-5752.

FOR CONTINUATION SEE SHEET 4

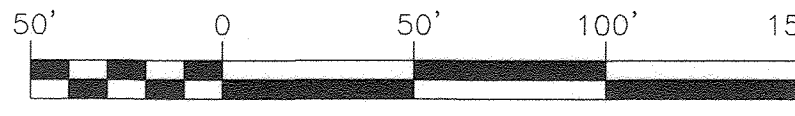
FOR CONTINUATION SEE SHEET 6

FOR CONTINUATION SEE SHEET 4

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008



PLAN VIEW  
STARLIGHT PLACE  
PUBLIC ACCESS STREET  
SCALE: 1"=50'

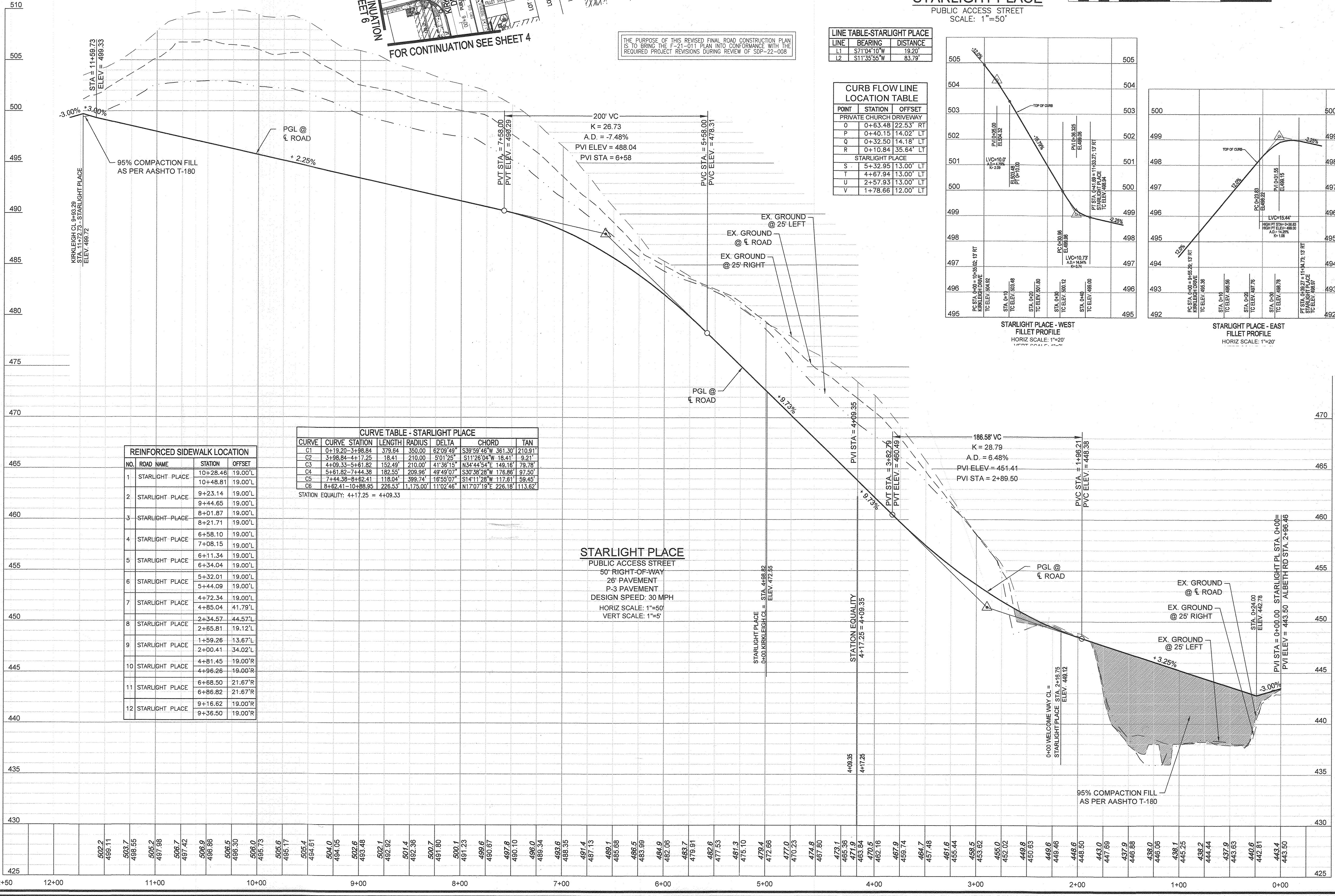


- NOTES:
- REFER TO SHEETS 27 TO 32 FOR STORMDRAIN PROFILES.
  - REFER TO SHEET 32 FOR STORMDRAIN STRUCTURE SCHEDULE.
  - FOR STREET TREE LOCATIONS, REFER TO SHEETS 33-36.
  - ALL STREET TREES AND/OR SIGNS SHALL BE LOCATED 5' MIN. FROM PROPOSED DRAINAGE UTILITY STRUCTURE.
  - THERE SHOULD BE A MINIMUM OF 20' BETWEEN STREET LIGHTS AND STREET TREES.
  - IN THE DIRECTION FACING A TRAFFIC CONTROL SIGN:
    - THERE SHALL BE A MINIMUM OF 40' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL STOP SIGNS.
    - THERE SHALL BE A MINIMUM OF 35' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL SIGNS OTHER THAN A STOP SIGN.
  - REFER TO SHEET 11 FOR PROPOSED CENTRAL MAIL DELIVERY BOX (CBU) LOCATIONS. FINAL LOCATION SHALL BE AS DIRECTED BY THE US POSTAL SERVICE.
  - HANDICAP RAMPS ARE STANDARD R-4.05, DETAIL SHEET 11.
  - REFER TO SHEETS 38 AND 39 FOR PROJECT AMENITY DETAILS.

AREA 1  
NECESSARY DISTURBANCE  
SEE GENERAL NOTE 41,  
SHEET 2

LEGEND:

- EXISTING CURB AND GUTTER
- CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- STORM DRAIN
- STORM DRAIN INLET
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- 5' SIDEWALK
- STREET LIGHT
- STREET SIGN
- EXISTING 10' TREE MAINTENANCE EASEMENT
- CENTRAL MAIL DELIVERY BOX (CBU)
- PRIVATE STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
- PUBLIC STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
- PRIVATE STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
- PUBLIC STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT



NO.	ROAD NAME	STATION	OFFSET
1	STARLIGHT PLACE	10+28.46	19.00'L
2	STARLIGHT PLACE	9+23.14	19.00'L
3	STARLIGHT PLACE	8+01.87	19.00'L
4	STARLIGHT PLACE	6+58.10	19.00'L
5	STARLIGHT PLACE	6+34.04	19.00'L
6	STARLIGHT PLACE	5+32.01	19.00'L
7	STARLIGHT PLACE	4+72.34	19.00'L
8	STARLIGHT PLACE	2+34.57	44.57'L
9	STARLIGHT PLACE	2+00.41	34.02'L
10	STARLIGHT PLACE	4+81.45	19.00'R
11	STARLIGHT PLACE	6+88.50	21.67'R
12	STARLIGHT PLACE	9+16.62	19.00'R

CURVE	CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
C1	0+13.20-3+89.84	376.64	350.00	67.09 49'	S32°59'45"W 361.30	210.91'
C2	3+98.84-4+17.20	18.41	210.00	5.01 25'	S11°39'04"W 18.41	9.21'
C3	4+09.33-5+61.82	152.49	210.00	41.36 15'	N34°44'54"E 149.16	78.78'
C4	5+61.82-7+44.38	182.55	209.96	49.49 07'	S30°38'28"W 176.86	97.50'
C5	7+44.38-8+42.41	118.04	399.74	18.53 07'	S14°11'28"W 117.81	59.43'
C6	8+62.41-10+88.95	226.53	1,175.00	11.02 46'	N17°07'19"E 226.19	113.62'

STARLIGHT PLACE  
PUBLIC ACCESS STREET  
50' RIGHT-OF-WAY  
26' PAVEMENT  
P-3 PAVEMENT  
DESIGN SPEED: 30 MPH  
HORIZ SCALE: 1"=50'  
VERT SCALE: 1"=5'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Jane*  
 CHIEF, BUREAU OF HIGHWAYS  
 09/14/2022  
 MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*W. P. ...*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 9/21/22  
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*...*  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 9/21/22  
 DATE

OWNER  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2800 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE
2	REVISE THE PLAN TO ADD UTILITY ALBETH ROAD CURB LINE GRAB AND TO ADD 'P.A.'	4/12/23
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 STARLIGHT PLACE PLAN VIEW AND PROFILE  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 2594Z - 2595A  
 PARCELS: 110 & 421 L 1389/F, 339 (P. 110)  
 TAX MAP: 18 GRID: 10 L 4153/F, 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

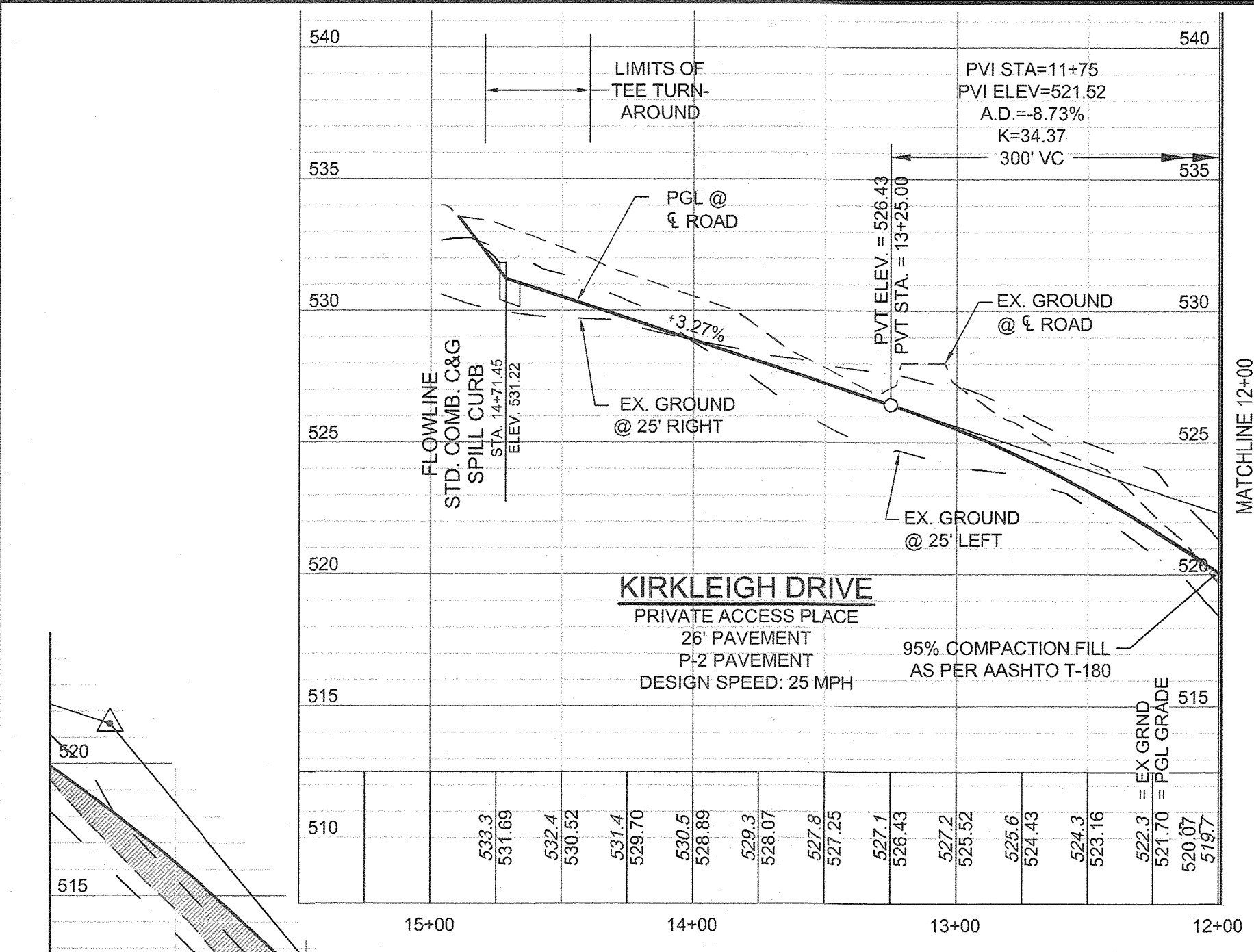
**VOGEL ENGINEERING**  
 +  
**TIMMONS GROUP**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 P: 410.461.7666 F: 410.461.8961 www.timmons.com

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE JOBS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-17-2022

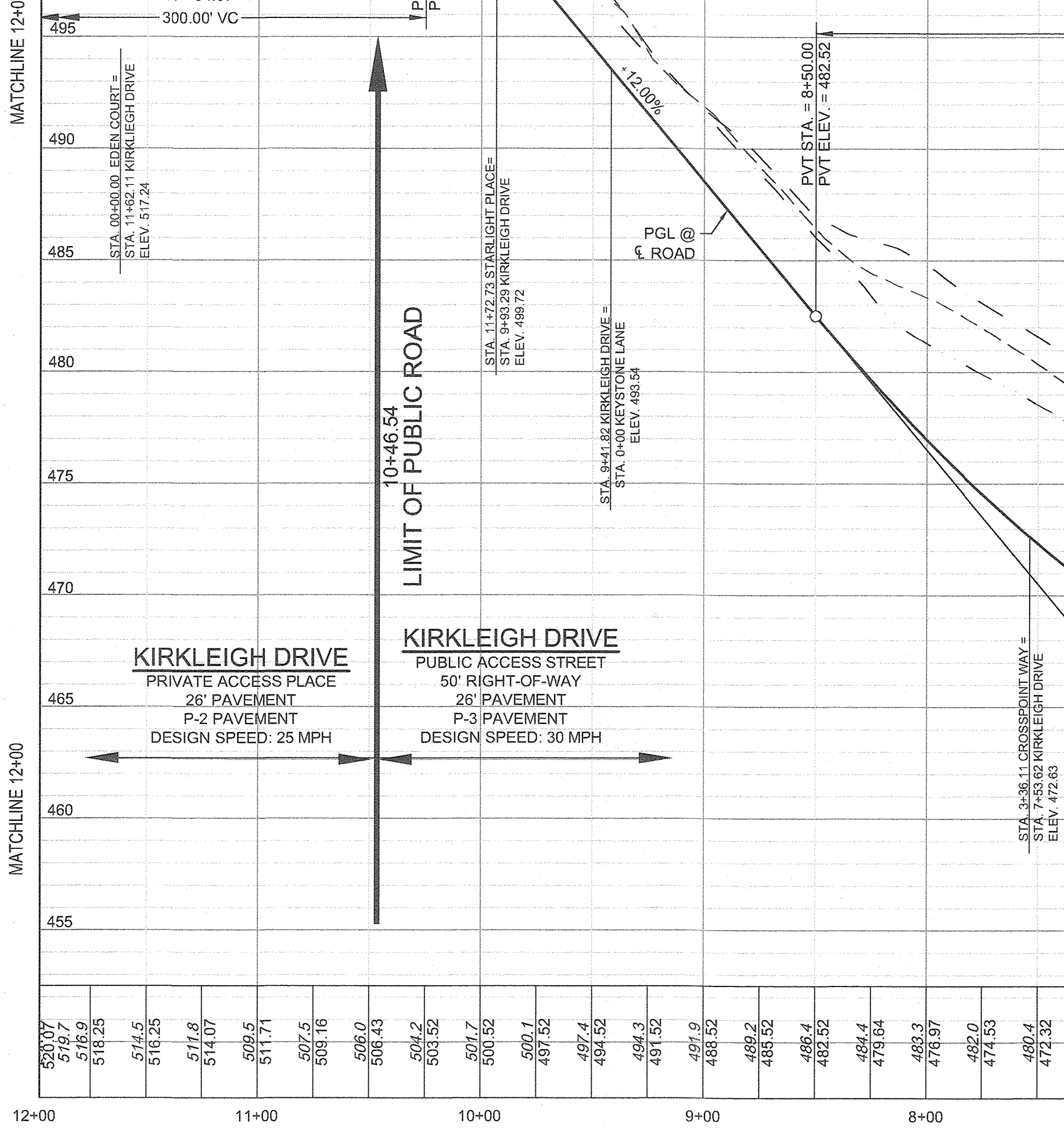
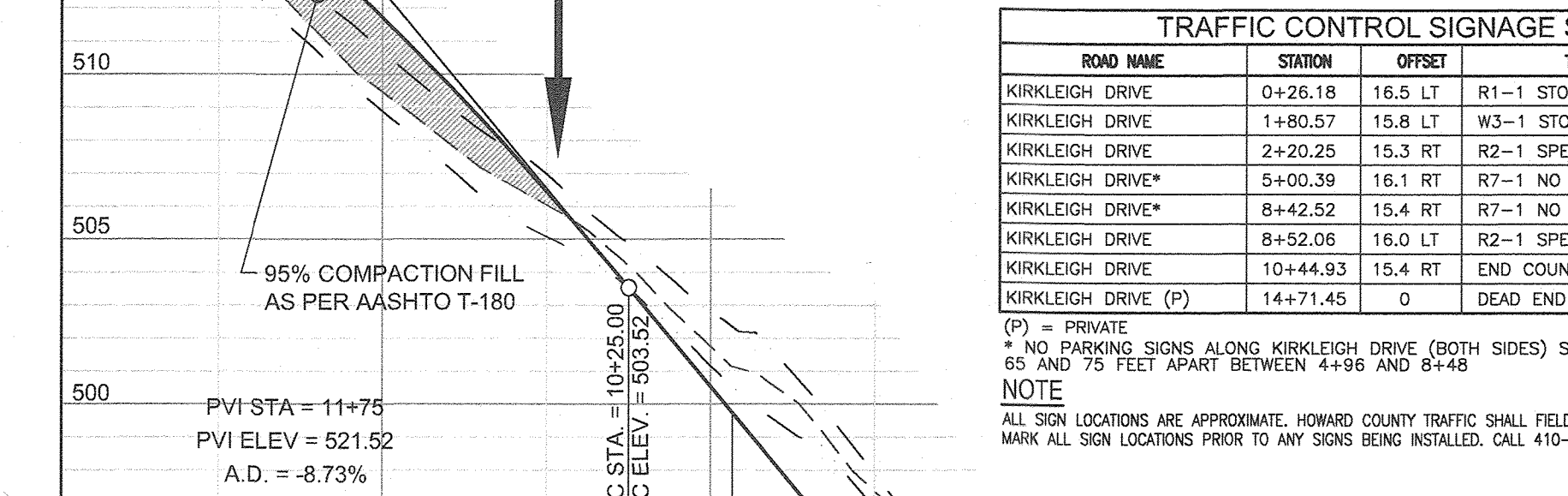
DESIGN BY: ES, RHY  
 DRAWN BY: VE+TC  
 CHECKED BY: RHY  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

3 SHEET OF 101





POINT	STATION	OFFSET
A	0+39.94	13.00' RT
B	0+78.81	13.00' RT
C	1+33.84	31.00' RT
D	2+03.20	13.00' RT
E	10+35.52	13.00' RT
F	10+46.78	13.00' RT
G	10+62.05	21.00' RT
H	11+23.70	13.00' LT
J	11+19.71	13.00' LT
K	10+49.90	21.00' LT
L	10+49.90	17.97' LT
M	10+45.73	13.00' LT
N	0+31.45	13.00' LT
LOTS 33-37		
R-6.01 DRIVEWAY APRON		
A2	5+59.69	13.00' LT
B2	5+67.22	13.00' LT
C2	5+77.20	13.00' LT
D2	5+84.73	13.00' LT
E2	6+02.20	13.00' LT
F2	6+09.74	13.00' LT
G2	6+26.62	13.00' LT
H2	6+34.15	13.00' LT
J2	6+44.11	13.00' LT
K2	6+51.64	13.00' LT



ROAD NAME	STATION	OFFSET	TYPE
KIRKLEIGH DRIVE	0+26.18	16.5 LT	R1-1 STOP SIGN & STREET NAME SIGN
KIRKLEIGH DRIVE	1+80.57	15.8 LT	W3-1 STOP AHEAD SIGN
KIRKLEIGH DRIVE	2+20.25	15.3 RT	R2-1 SPEED LIMIT "25"
KIRKLEIGH DRIVE*	5+00.39	16.1 RT	R7-1 NO PARKING ANY TIME SIGN
KIRKLEIGH DRIVE*	8+42.52	15.4 RT	R7-1 NO PARKING ANY TIME SIGN
KIRKLEIGH DRIVE	8+52.06	16.0 LT	R2-1 SPEED LIMIT "25"
KIRKLEIGH DRIVE	10+44.93	15.4 RT	END COUNTY MAINTENANCE SIGN
KIRKLEIGH DRIVE (P)	14+71.45	0	DEAD END SIGN & R7-1 "NO PARKING" SIGN

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/19/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9/20/22

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/20/22

ROAD NAME	STATIONS	PAVEMENT TYPE	CLASSIFICATION	DESIGN SPEED
KIRKLEIGH DRIVE	0+00-10+46.55	P-3	PUBLIC ACCESS STREET	SPEED LIMIT "30"
KIRKLEIGH DRIVE	10+46.55-14+71.45	P-2	PRIVATE ACCESS PLACE	SPEED LIMIT "25"

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+00.00 - 0+85.38	85.38	275.00	17°49'53"	54.92031'E 85.24	43.14
1+33.84 - 2+95.13	161.29	350.00	26°24'12"	S21°13'29"E 159.87	82.10
2+95.13 - 4+74.44	181.32	754.55	13°46'05"	S01°08'20"E 180.88	91.10
4+98.88 - 8+47.89	351.52	210.00	85°51'14"	S53°40'19"W 311.78	232.83
10+01.11 - 10+46.54	45.43	350.00	1°02'23"15"	N74°42'57"W 45.40	22.75

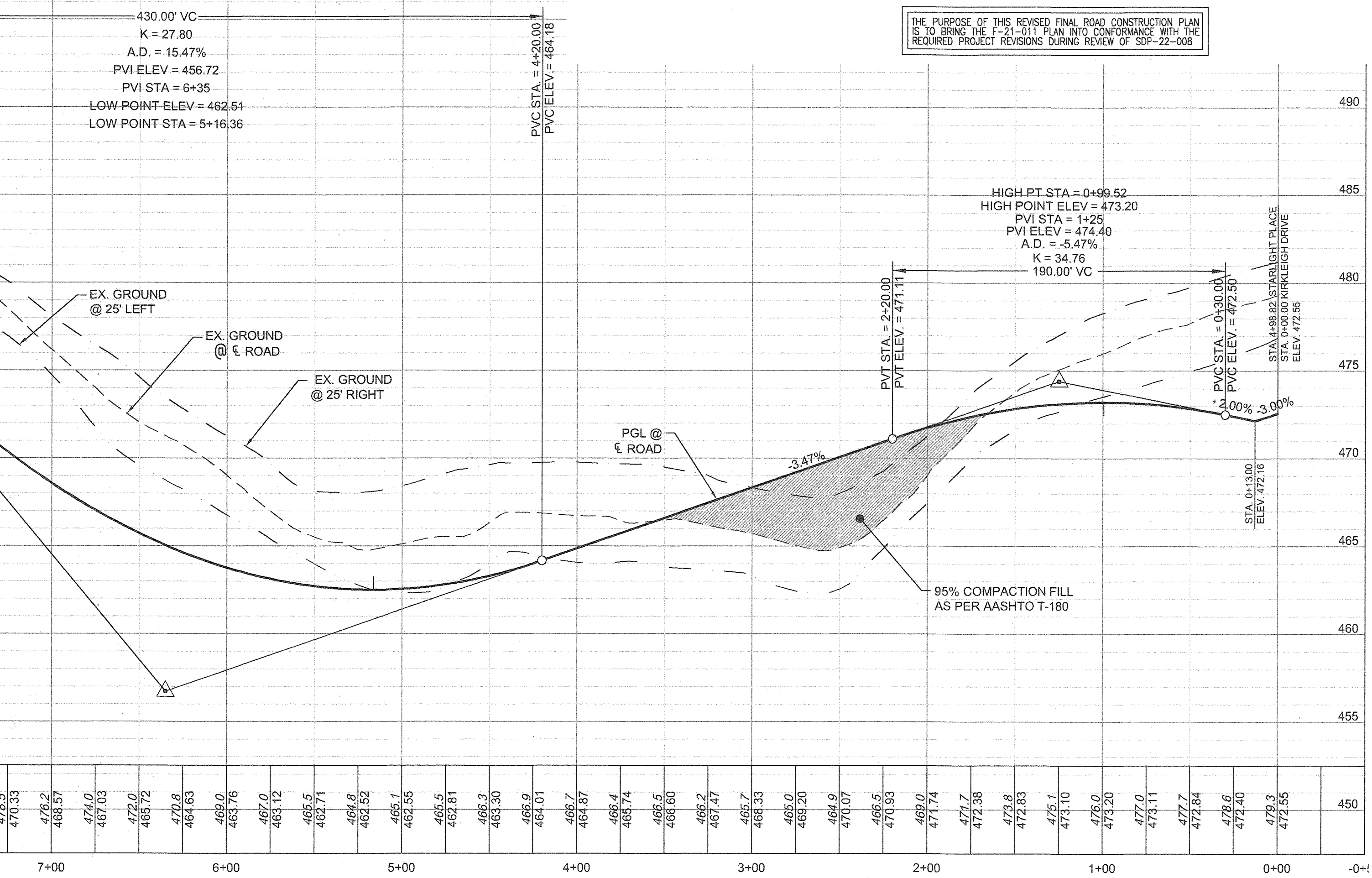
ROAD NAME	STATION	OFFSET	FEATURE/POLE TYPE	SYMBOL
KIRKLEIGH DRIVE	2+13.64	16.5 RT	LED-100 WATT PRIMER COLUMNAL FIXTURE MOUNTED ON 14' BLACK FIBERGLASS POLE	☀
KIRKLEIGH DRIVE	3+57.58	26.8 RT		☀
KIRKLEIGH DRIVE	5+30.06	16.9 LT		☀
KIRKLEIGH DRIVE	6+63	17 RT		☀
KIRKLEIGH DRIVE	8+60	17 RT		☀
KIRKLEIGH DRIVE	9+15.42	17.3 LT		☀
KIRKLEIGH DRIVE	10+26.55	17.9 RT		☀
KIRKLEIGH DRIVE (P)	11+34.72	18.8' LT		☀
KIRKLEIGH DRIVE (P)	14+77.24	0		☀

NOTES:  
 1. REFER TO SHEETS 27 TO 32 FOR STORMDRAIN PROFILES.  
 2. REFER TO SHEET 32 FOR STORMDRAIN STRUCTURE SCHEDULE.  
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 11. REFER TO SHEET 11 FOR T-TURNAROUND DETAIL R-5.05.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/19/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9/20/22

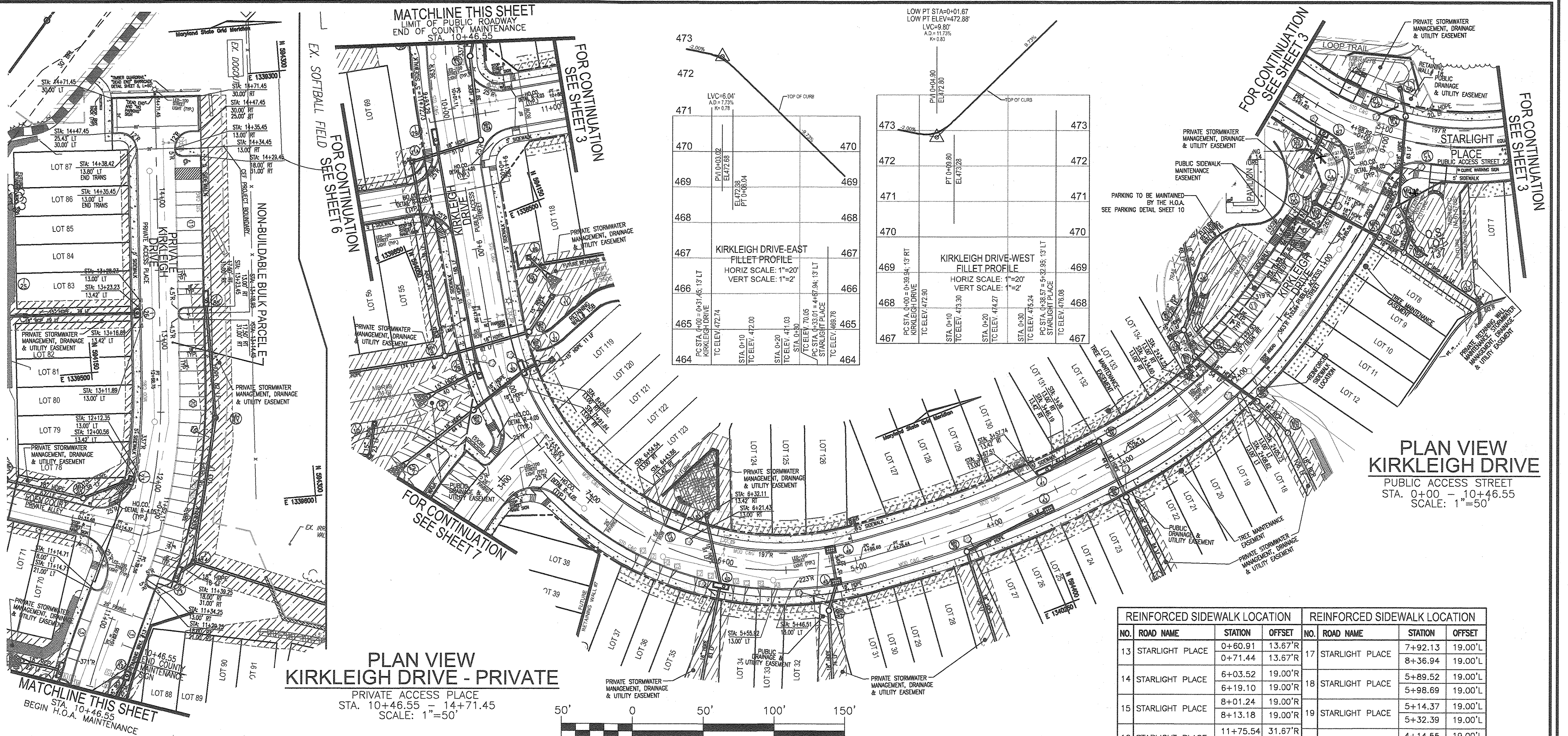
CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/20/22



CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
10+46.54 - 10+82.25	35.50	350.00	0°48'43"	N88°03'38"W 35.49	17.77
11+39.56 - 12+68.78	129.19	350.00	21°08'57"	N75°43'34"W 128.46	65.34

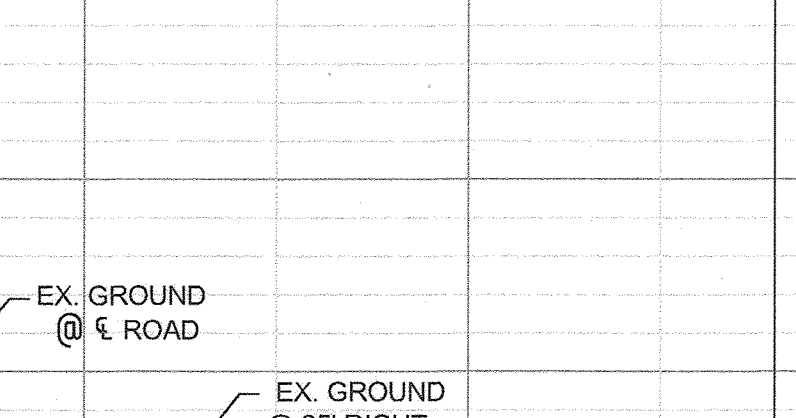
ROAD NAME	STATION	OFFSET	FEATURE/POLE TYPE	SYMBOL
KIRKLEIGH DRIVE	2+13.64	16.5 RT	LED-100 WATT PRIMER COLUMNAL FIXTURE MOUNTED ON 14' BLACK FIBERGLASS POLE	☀
KIRKLEIGH DRIVE	3+57.58	26.8 RT		☀
KIRKLEIGH DRIVE	5+30.06	16.9 LT		☀
KIRKLEIGH DRIVE	6+63	17 RT		☀
KIRKLEIGH DRIVE	8+60	17 RT		☀
KIRKLEIGH DRIVE	9+15.42	17.3 LT		☀
KIRKLEIGH DRIVE	10+26.55	17.9 RT		☀
KIRKLEIGH DRIVE (P)	11+34.72	18.8' LT		☀
KIRKLEIGH DRIVE (P)	14+77.24	0		☀

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POINT	STATION	OFFSET
A	0+39.94	13.00' RT
B	0+78.81	13.00' RT
C	1+33.84	31.00' RT
D	2+03.20	13.00' RT
E	10+35.52	13.00' RT
F	10+46.78	13.00' RT
G	10+62.05	21.00' RT
H	11+23.70	13.00' LT
J	11+19.71	13.00' LT
K	10+49.90	21.00' LT
L	10+49.90	17.97' LT
M	10+45.73	13.00' LT
N	0+31.45	13.00' LT
LOTS 33-37		
R-6.01 DRIVEWAY APRON		
A2	5+59.69	13.00' LT
B2	5+67.22	13.00' LT
C2	5+77.20	13.00' LT
D2	5+84.73	13.00' LT
E2	6+02.20	13.00' LT
F2	6+09.74	13.00' LT
G2	6+26.62	13.00' LT
H2	6+34.15	13.00' LT
J2	6+44.11	13.00' LT
K2	6+51.64	13.00' LT

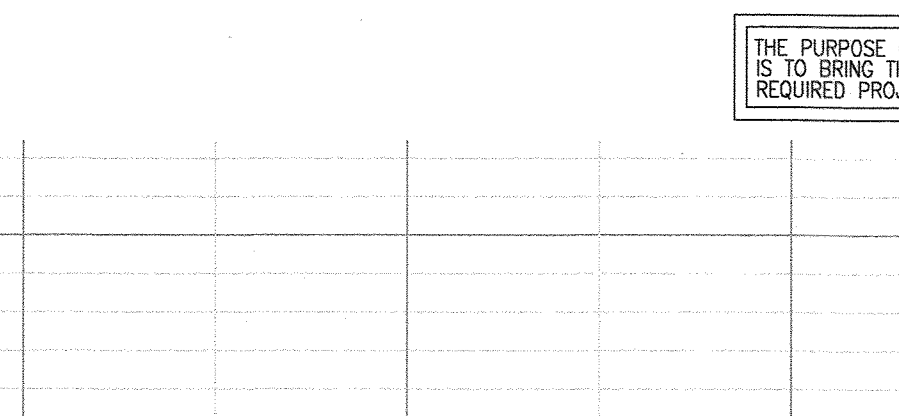
ROAD NAME	STATION	OFFSET	TYPE
KIRKLEIGH DRIVE	0+26.18	16.5 LT	R1-1 STOP SIGN & STREET NAME SIGN
KIRKLEIGH DRIVE	1+80.57	15.8 LT	W3-1 STOP AHEAD SIGN
KIRKLEIGH DRIVE	2+20.25	15.3 RT	R2-1 SPEED LIMIT "25"
KIRKLEIGH DRIVE*	5+00.39	16.1 RT	R7-1 NO PARKING ANY TIME SIGN
KIRKLEIGH DRIVE*	8+42.52	15.4 RT	R7-1 NO PARKING ANY TIME SIGN
KIRKLEIGH DRIVE	8+52.06	16.0 LT	R2-1 SPEED LIMIT "25"
KIRKLEIGH DRIVE	10+44.93	15.4 RT	END COUNTY MAINTENANCE SIGN
KIRKLEIGH DRIVE (P)	14+71.45	0	DEAD END SIGN & R7-1 "NO PARKING" SIGN



CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
10+46.54 - 10+82.25	35.50	350.00	0°48'43"	N88°03'38"W 35.49	17.77
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ROAD NAME	STATION	OFFSET	FEATURE/POLE TYPE	SYMBOL
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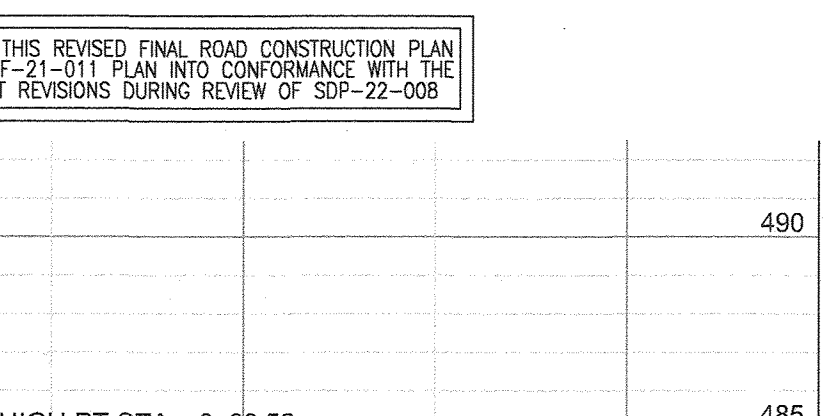
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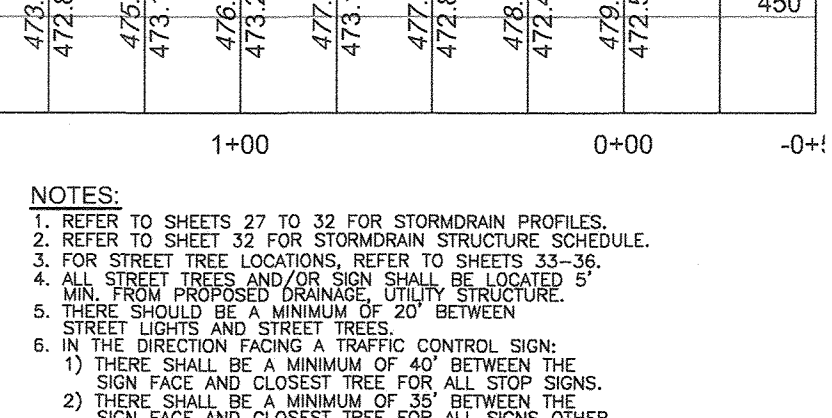
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**LEGEND:**

- EXISTING CURB AND GUTTER
- CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- STORM DRAIN
- STORM DRAIN INLET
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- 8' SIDEWALK
- STREET LIGHT
- STREET SIGN
- PUBLIC 10' TREE MAINTENANCE EASEMENT
- CENTRAL MAIL DELIVERY BOX (CMB)
- PUBLIC STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
- PRIVATE STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
- PUBLIC UTILITY EASEMENT
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- PUBLIC UTILITY EASEMENT
- PRIVATE UTILITY EASEMENT

**CURB FLOW LINE LOCATION TABLE**

POINT	STATION	OFFSET	ELEVATION
W	0+45.15	10.00' RT	
X	1+31.19	10.00' RT	
Y	1+37.56	10.00' RT	
Z	4+01.09	10.00' LT	462.70
A1	3+71.09	30.00' LT	462.20
B1	3+71.09	50.00' LT	461.40
C1	3+45.09	50.00' LT	462.60
D1	3+45.09	30.00' LT	462.60
E1	3+25.09	10.00' LT	464.34
F1	2+97.54	10.00' LT	
G1	2+85.04	10.00' LT	
H1	1+57.47	10.00' LT	

**REINFORCED SIDEWALK LOCATION**

NO.	ROAD NAME	STATION	OFFSET
23	WELCOME WAY	1+17.68	10.67'L
		1+35.24	10.67'L

**CURVE TABLE - WELCOME WAY**

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+71.09 - 0+71.09	54.00	200.00	15.29°	54.31452	23.18
0+92.00 - 1+39.47	46.87	50.00	53.29°	30.91011	25.19
2+52.06 - 2+97.54	45.48	50.00	52.06°	30.82208	24.45

**TRAFFIC CONTROL SIGNAGE SCHEDULE**

ROAD NAME	STATION	OFFSET	TYPE
WELCOME WAY (PRIVATE)	0+27.09	14.7 LT	R1-1 STOP SIGN & STREET NAME SIGN
WELCOME WAY (PRIVATE)	3+59.16	52.1 LT	DEAD END SIGN & R7-1 "NO PARKING" SIGN (C)
WELCOME WAY (PRIVATE)	4+03.8	0	DEAD END SIGN & R7-1 "NO PARKING" SIGN (C)
WELCOME WAY (PRIVATE)	0+75.66	17.2 RT	"NO PARKING" SIGN (A)
WELCOME WAY (PRIVATE)	3+31.55	14.9 LT	"NO PARKING" SIGN (A)
WELCOME WAY (PRIVATE)	3+98.13	14.1 RT	"NO PARKING" SIGN (B)

**NOTE**  
ALL SIGN LOCATIONS ARE APPROXIMATE. HOWARD COUNTY TRAFFIC SHALL FIELD APPROVE OR MARK ALL SIGN LOCATIONS PRIOR TO ANY SIGNS BEING INSTALLED. CALL 410-313-5752.

**WELCOME WAY - STREET LIGHT LOCATIONS**

ROAD NAME	STATION	OFFSET	FIXTURE	POLE TYPE	SYMBOL
WELCOME WAY (PRIVATE)	4+10.44		LED-100 WATT	PREMIER COLONIAL FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE	

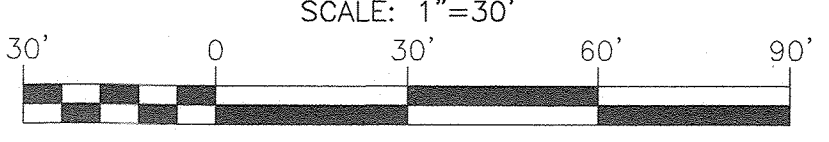
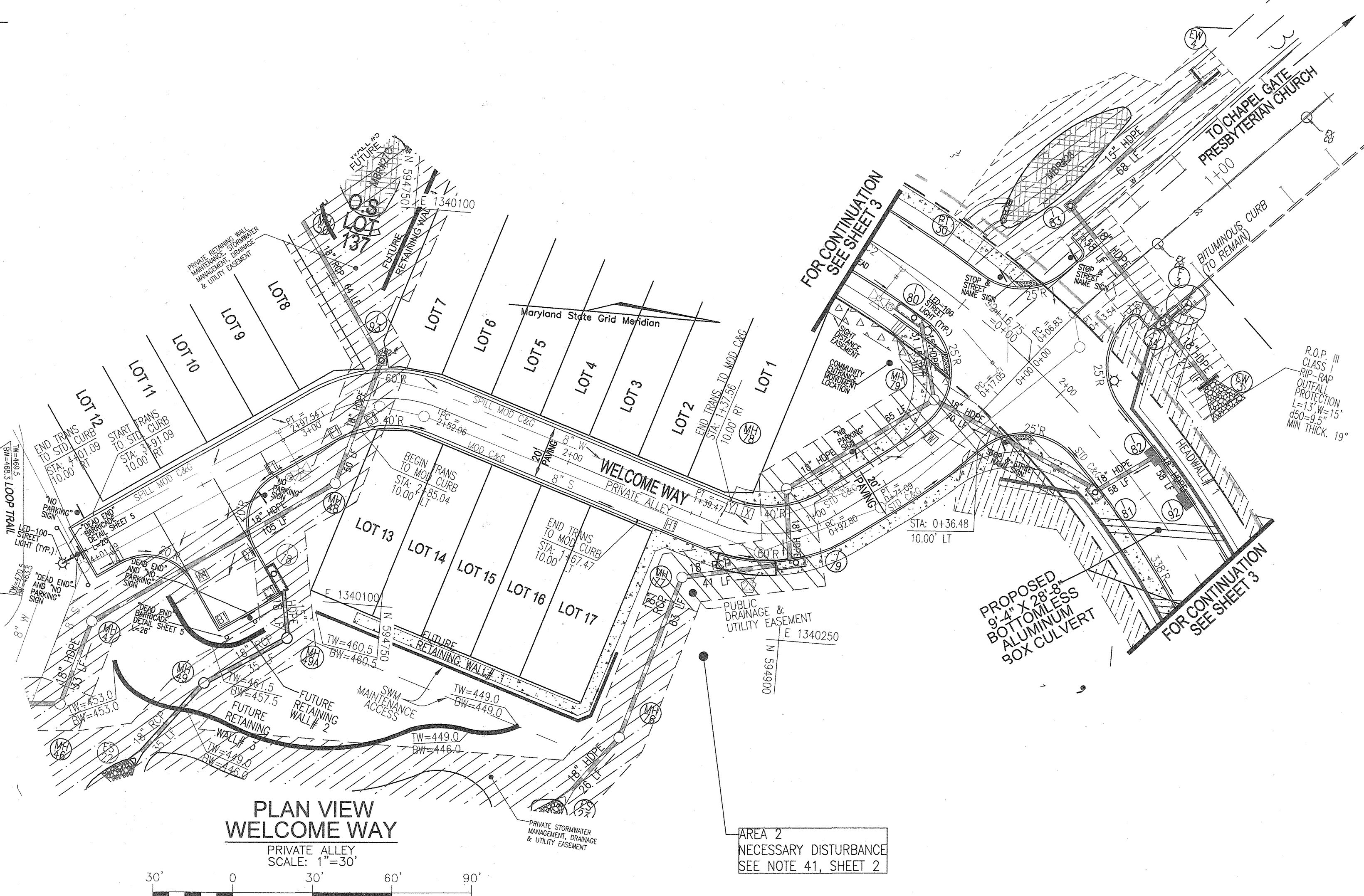
\* STATIONING EXTENDED BEYOND TEE

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  - HANDICAP RAMPS ARE STANDARD R-4.05, DETAIL SHEET 11.

APPROVED: *James*  
CHIEF, BUREAU OF HIGHWAYS MK  
DATE: 09/19/2022

APPROVED: *[Signature]*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 9/21/22

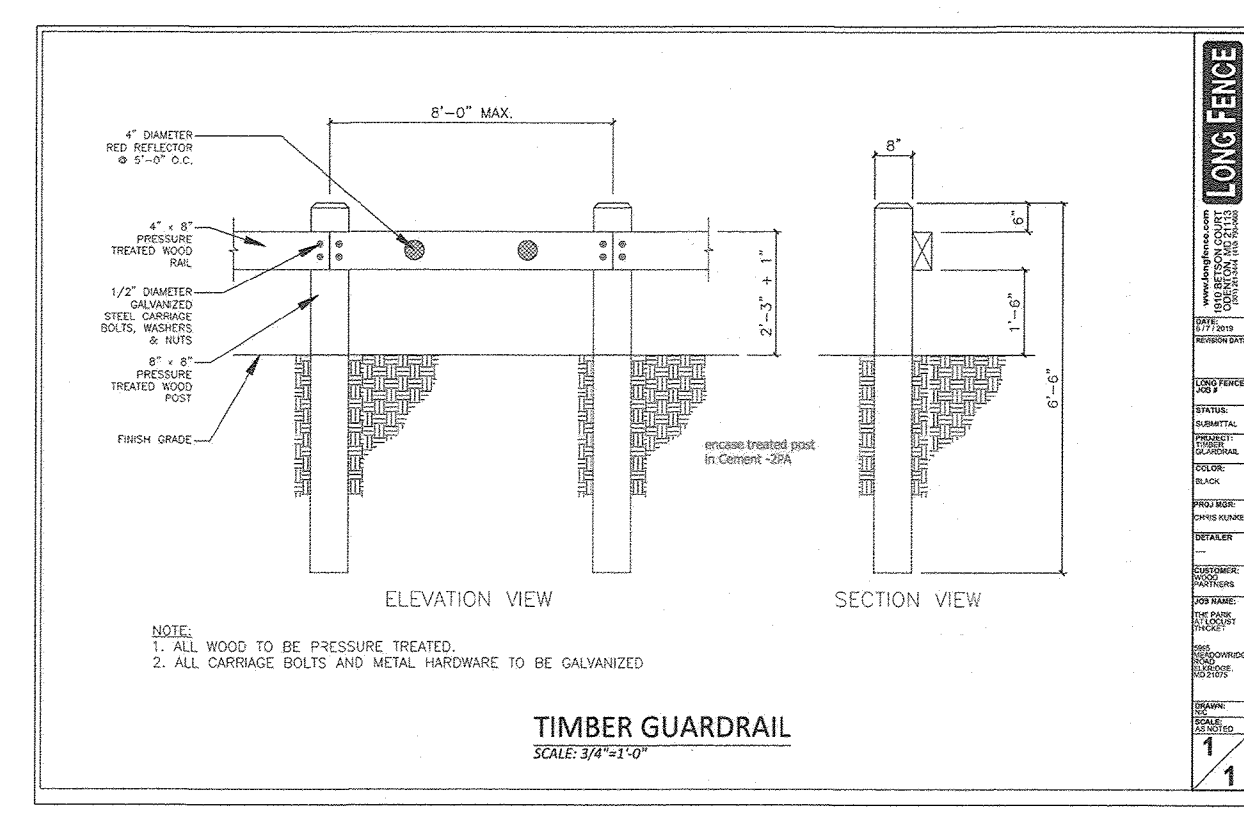
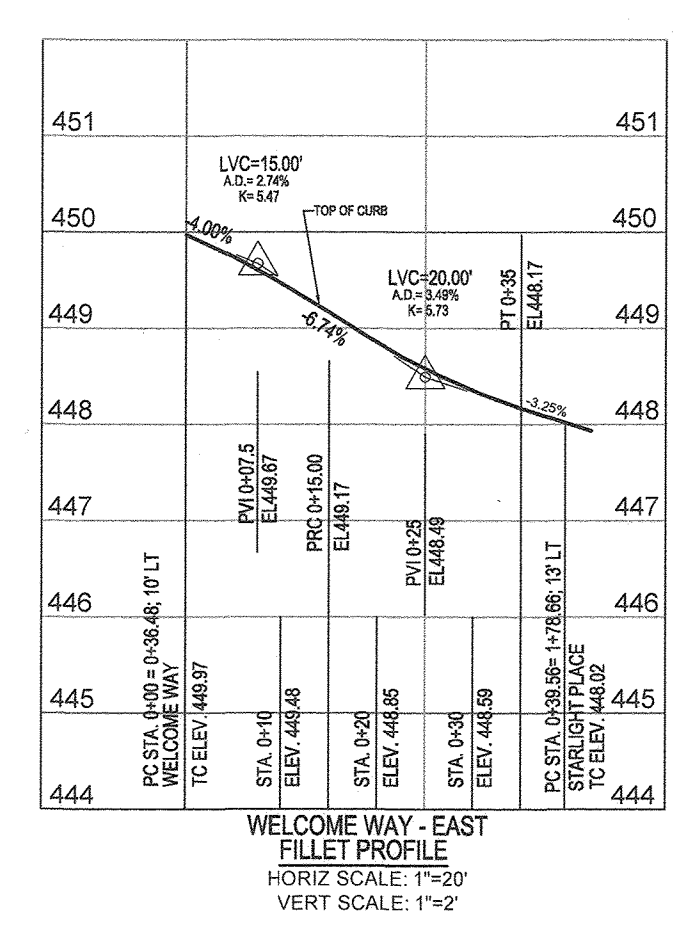
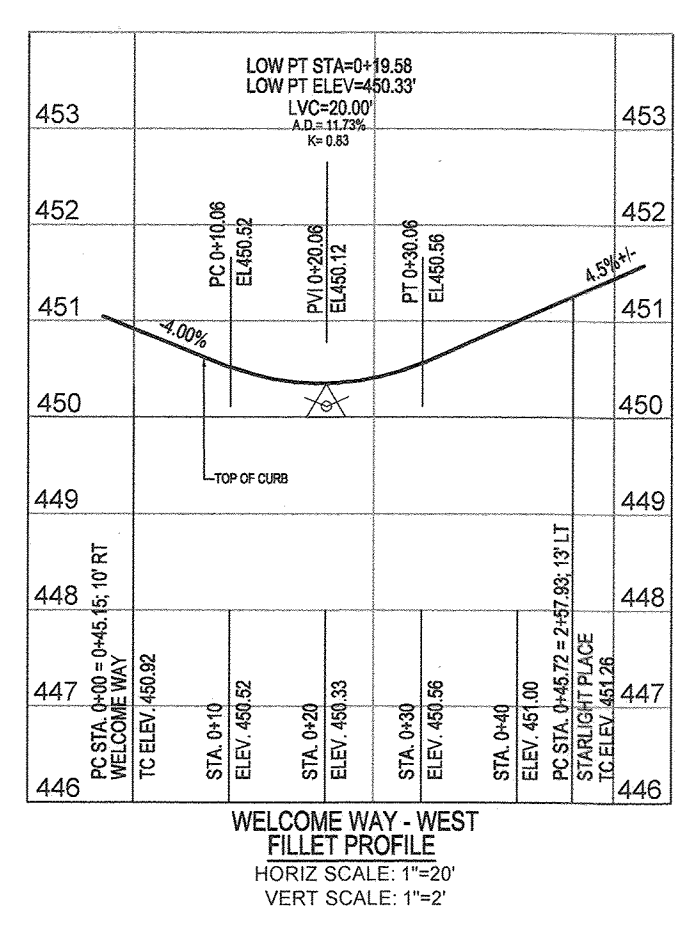
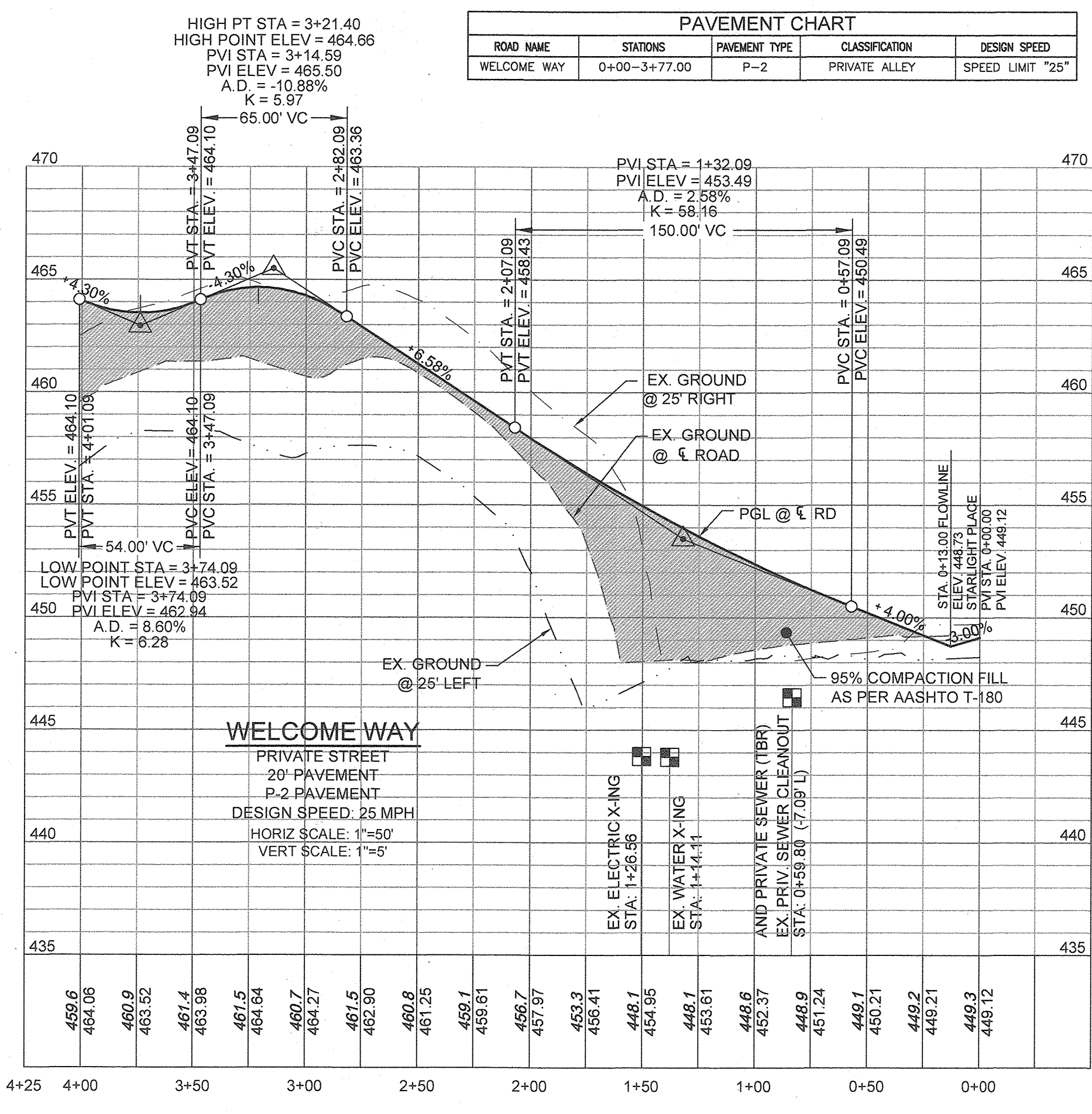
APPROVED: *[Signature]*  
CHIEF, DIVISION OF LAND DEVELOPMENT  
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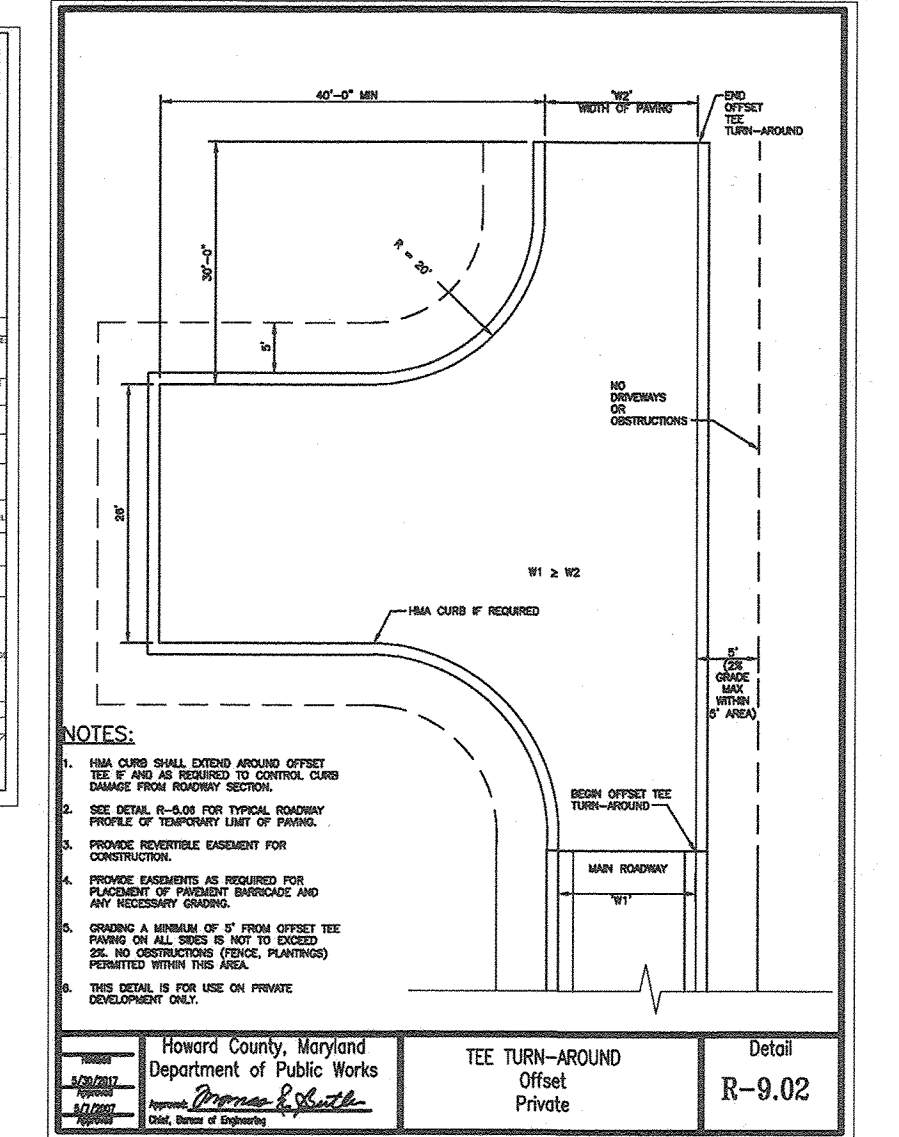
**FIRE RESCUE NOTE:**  
ALL CURBING ALONG WELCOME WAY 0+52.4 THRU 3+77 SHALL BE PAINTED TO RESTRICT PARKING

**PAVEMENT CHART**

ROAD NAME	STATIONS	PAVEMENT TYPE	CLASSIFICATION	DESIGN SPEED
WELCOME WAY	0+00-3+77.00	P-2	PRIVATE ALLEY	SPEED LIMIT "25"



**TYPICAL "DEAD END" BARRICADE**



**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDERS SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
WELCOME WAY PLAN VIEW AND PROFILE

**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 23942 & 25954  
L 1389/F 339 (P. 110)  
L 1463/F 424 (P. 421)  
3RD ELECTION DISTRICT  
ZONED: CEF-M  
HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
TIMMONS GROUP

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

DESIGN BY: ES, RHV  
DRAWN BY: VE+TG  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022.

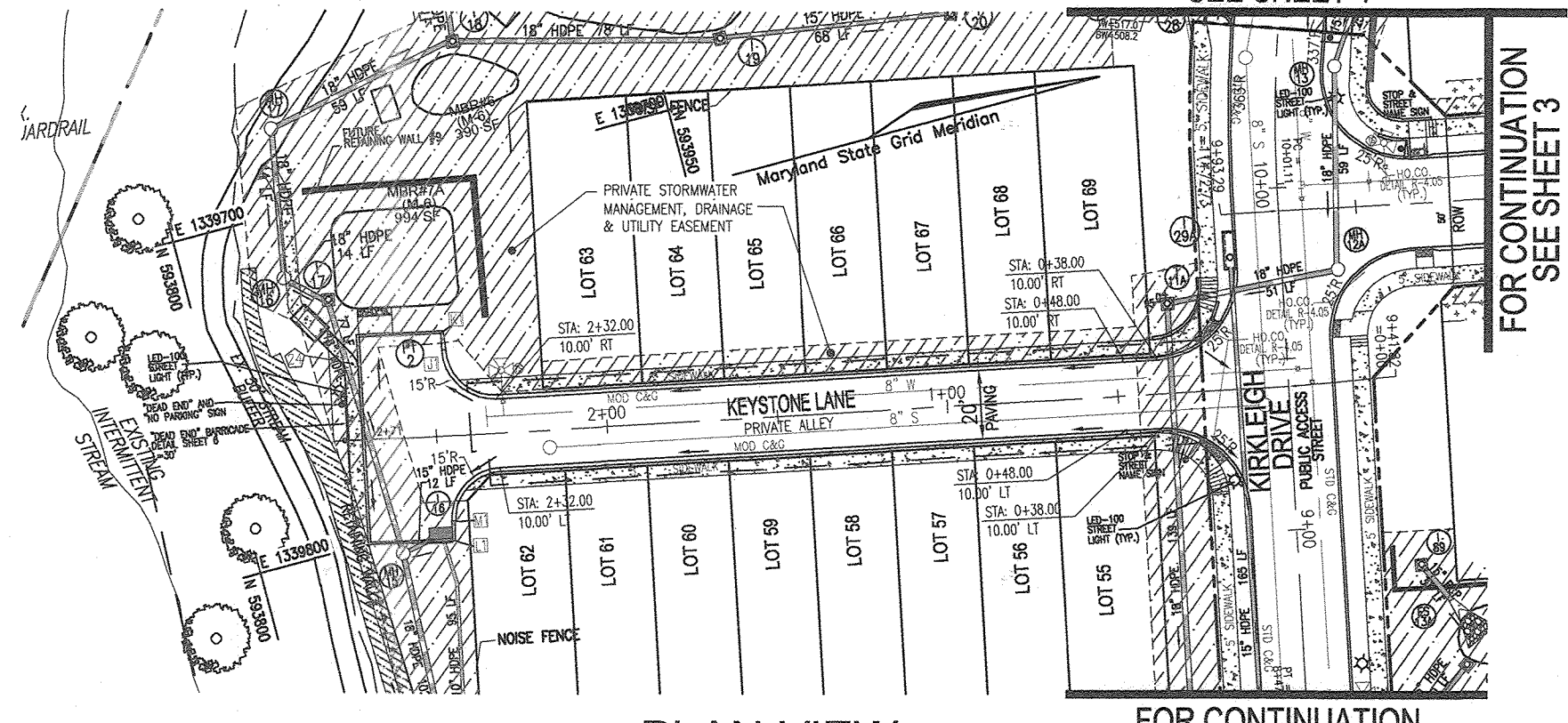
ROBERT H. VOGEL, PE No. 16193

5 SHEET OF 101

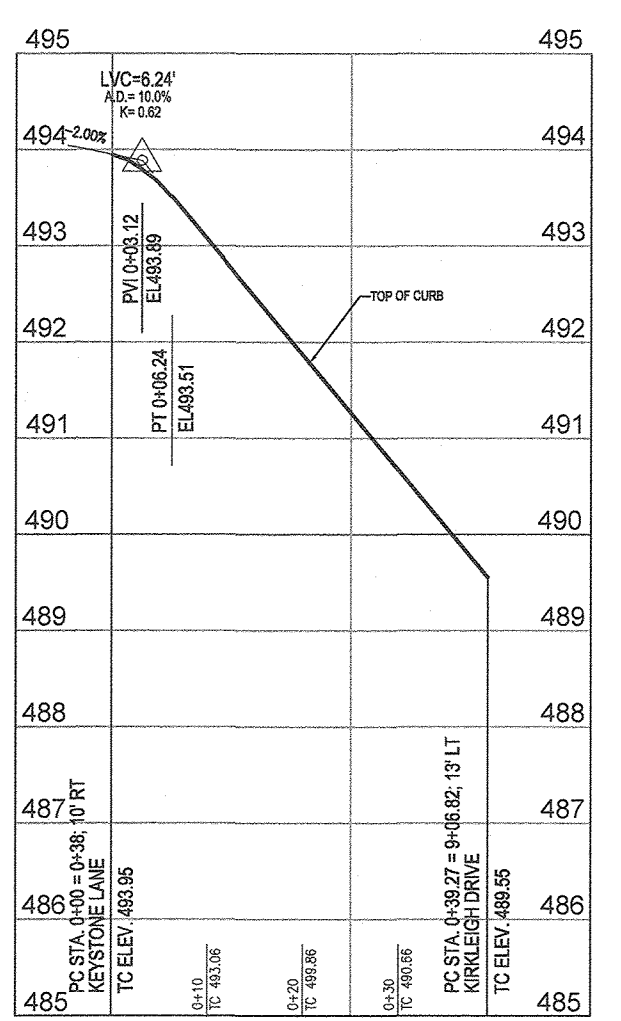
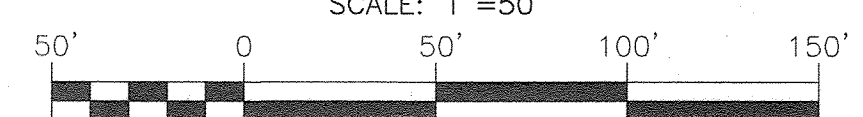


FOR CONTINUATION  
SEE SHEET 4

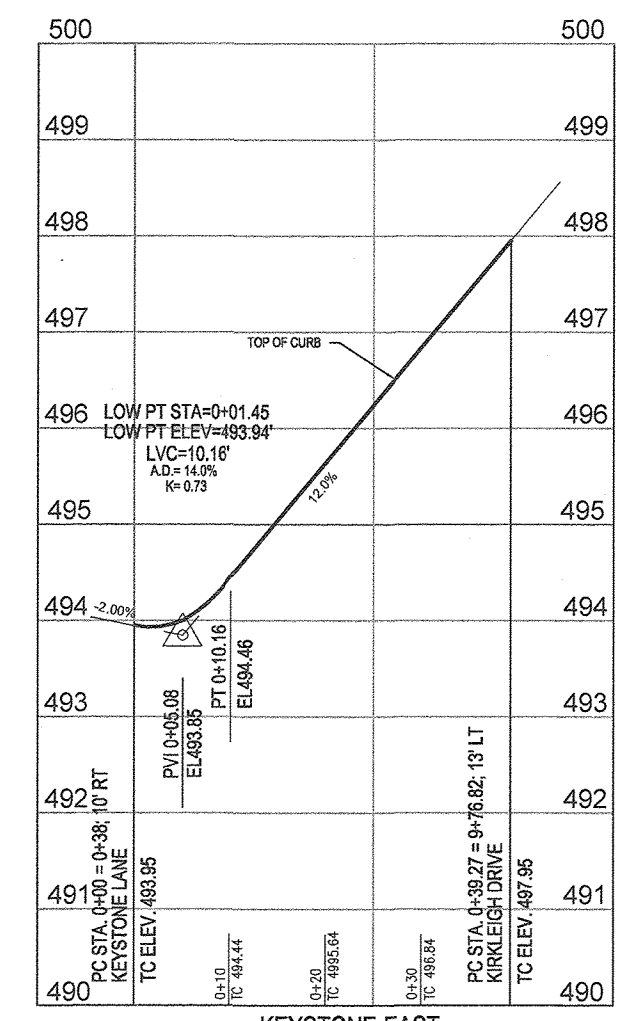
FOR CONTINUATION  
SEE SHEET 3



PLAN VIEW  
KEYSTONE LANE  
PRIVATE ALLEY  
SCALE: 1"=50'



KEYSTONE WEST  
FILLET PROFILE  
HORIZ SCALE: 1"=20'  
VERT SCALE: 1"=2'



KEYSTONE EAST  
FILLET PROFILE  
HORIZ SCALE: 1"=20'  
VERT SCALE: 1"=2'

POINT	STATION	OFFSET	DESCRIPTION
KEYSTONE LANE			
J1	2+47.00	25.00' RT	BEGIN TRANS TO STD C&G
K1	2+47.00	30.00' RT	END TRANS TO STD C&G
LT	2+47.00	30.00' LT	BEGIN TRANS TO MOD C&G
M1	2+47.00	25.00' LT	END TRANS TO MOD C&G

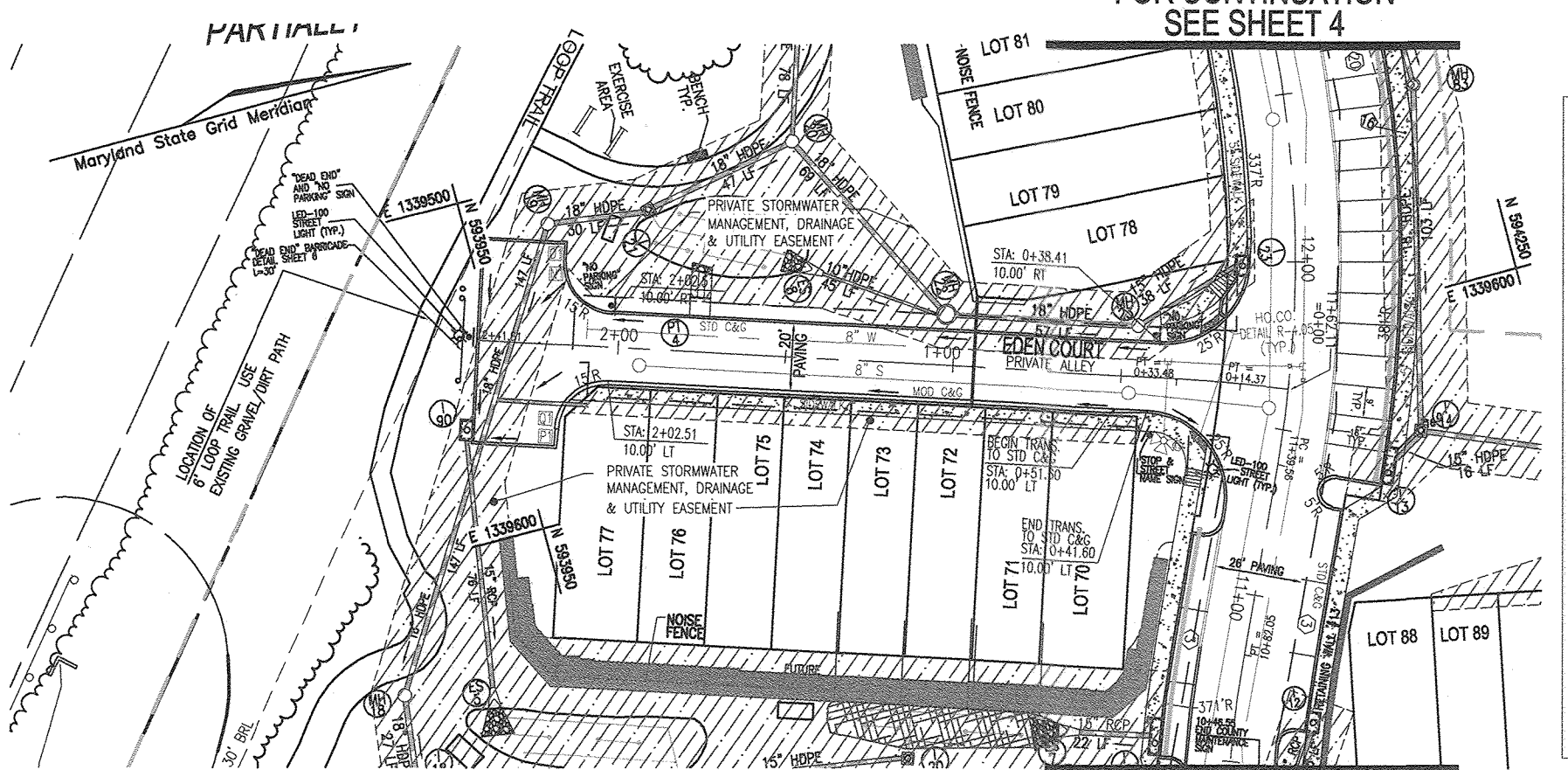
ROAD NAME	STATIONS	PAVEMENT TYPE	CLASSIFICATION	DESIGN SPEED
KEYSTONE LANE	0+00-2+71.00	P-2	PRIVATE ALLEY	SPEED LIMIT "25"
EDEN COURT	0+00-2+41.51	P-2	PRIVATE ALLEY	SPEED LIMIT "25"

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS MK 09/14/2022 DATE

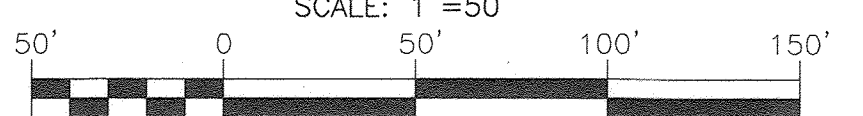
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 9/21/22 DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT 9/26/22 DATE

FOR CONTINUATION  
SEE SHEET 4

FOR CONTINUATION  
SEE SHEET 4



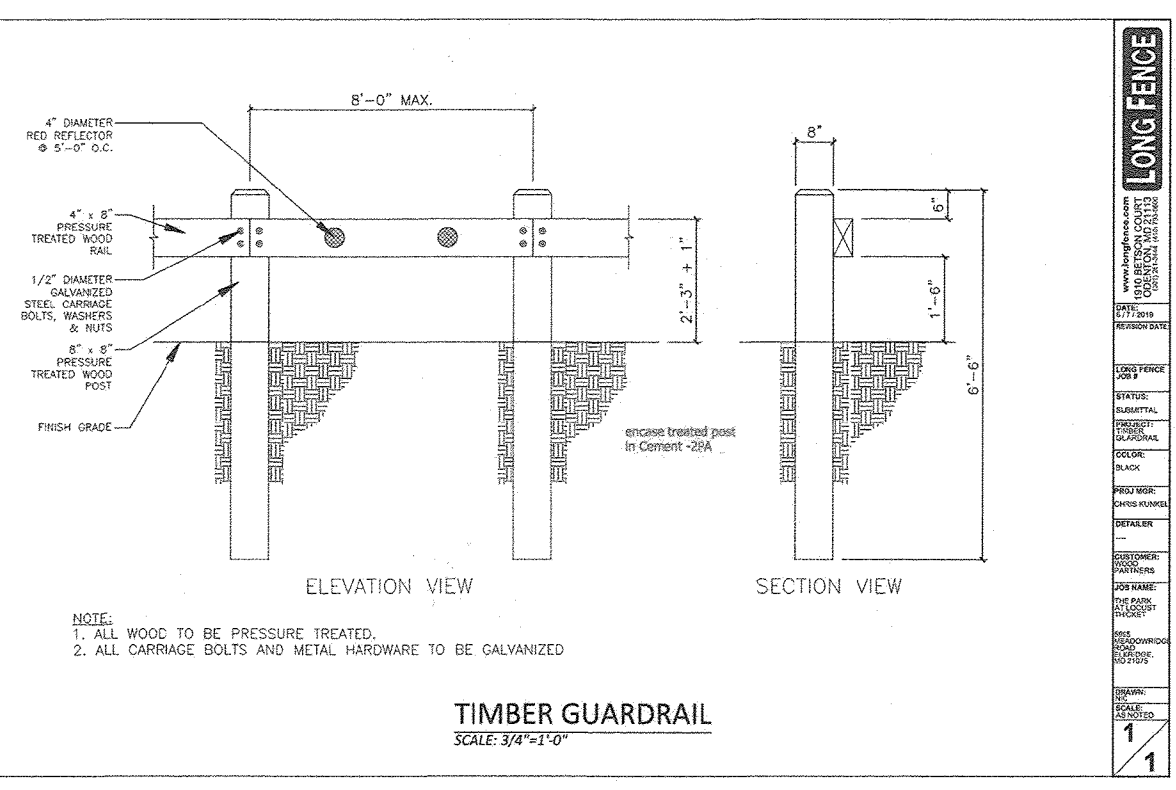
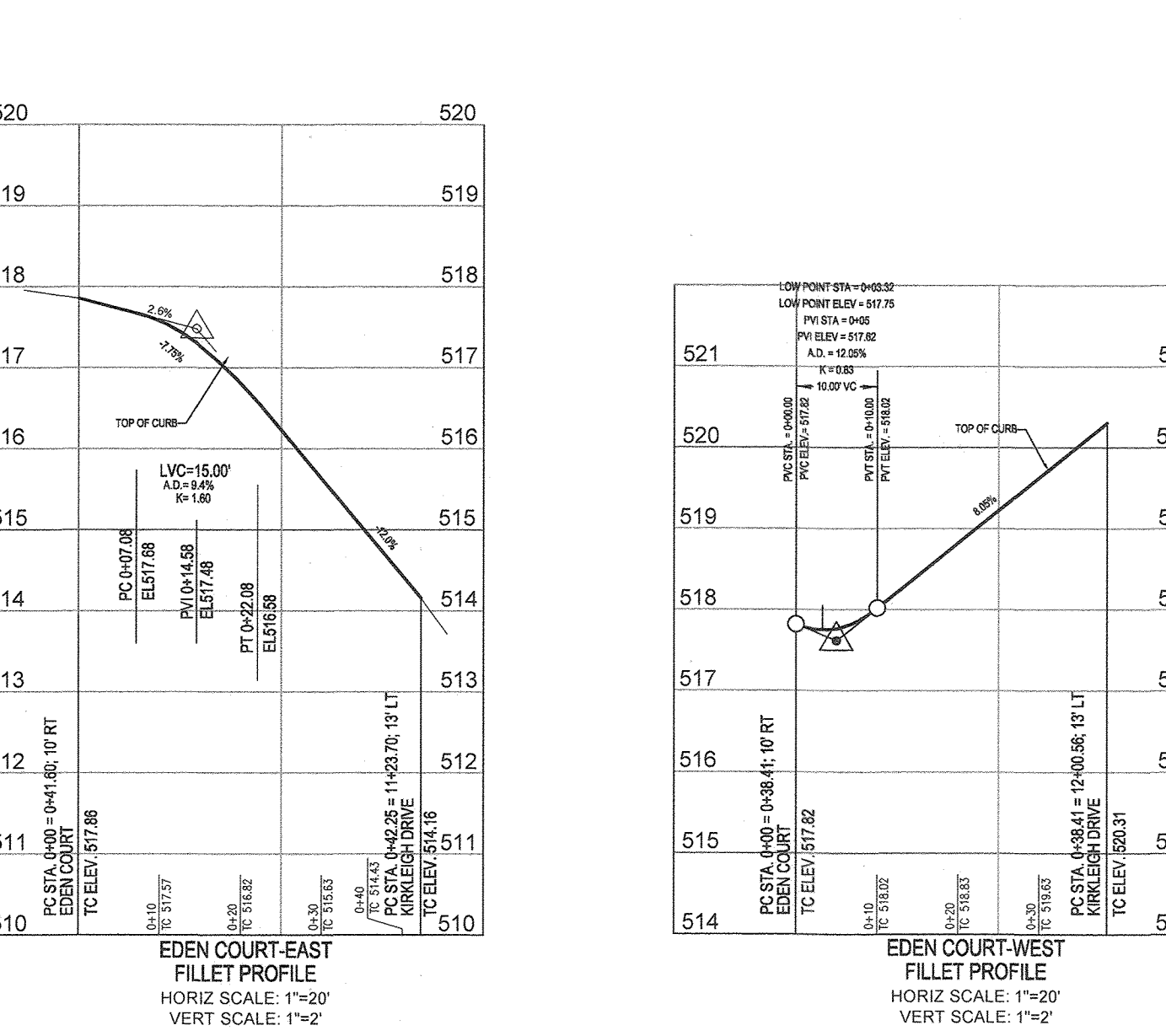
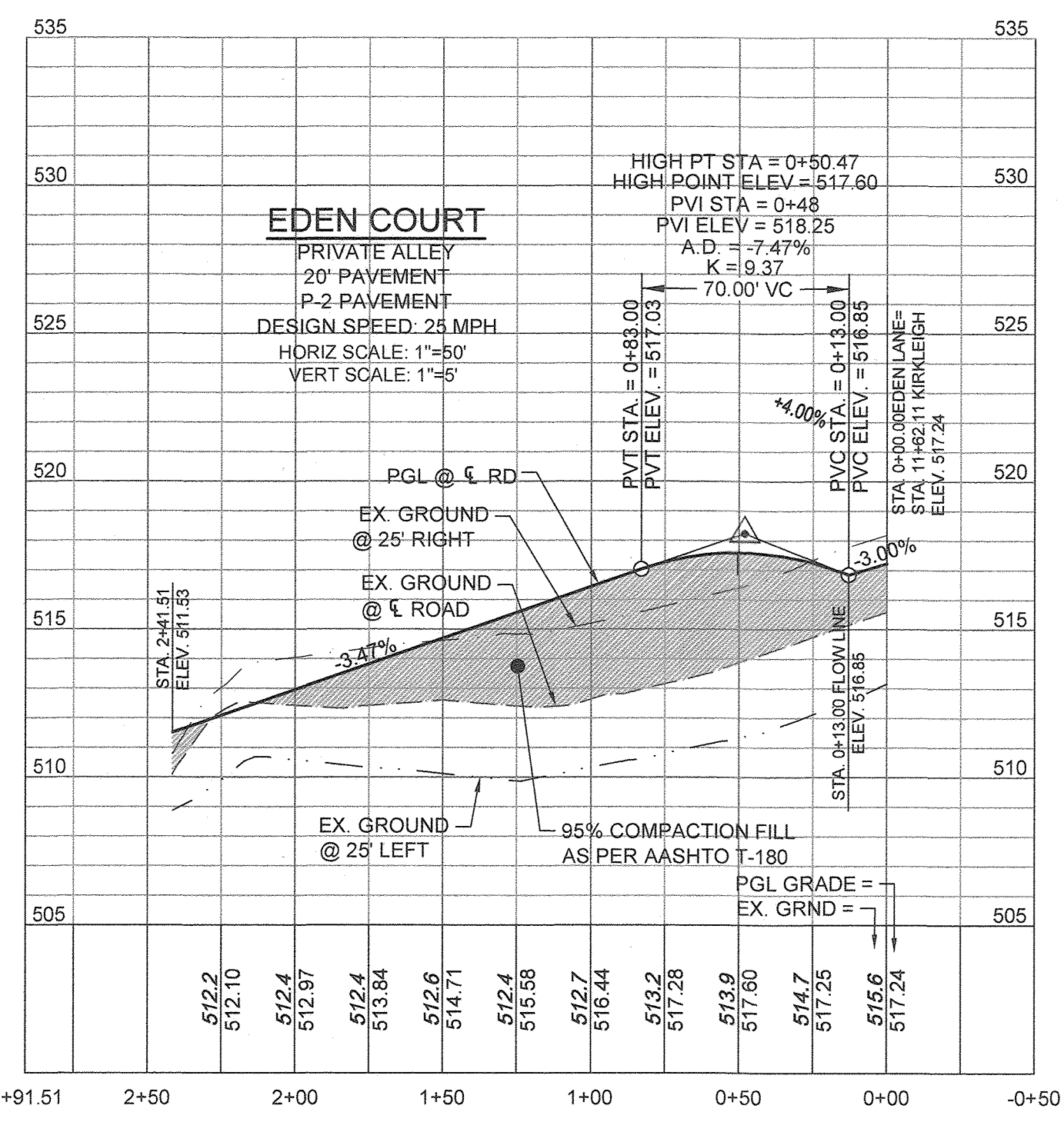
PLAN VIEW  
EDEN COURT  
PRIVATE ALLEY  
SCALE: 1"=50'



FIRE & RESCUE SERVICES NOTE:  
 ALL CURBING ALONG KEYSTONE LANE (0+38± THRU 2+71) AND EDEN COURT (0+38± THRU 2+41) SHALL BE PAINTED TO RESTRICT PARKING

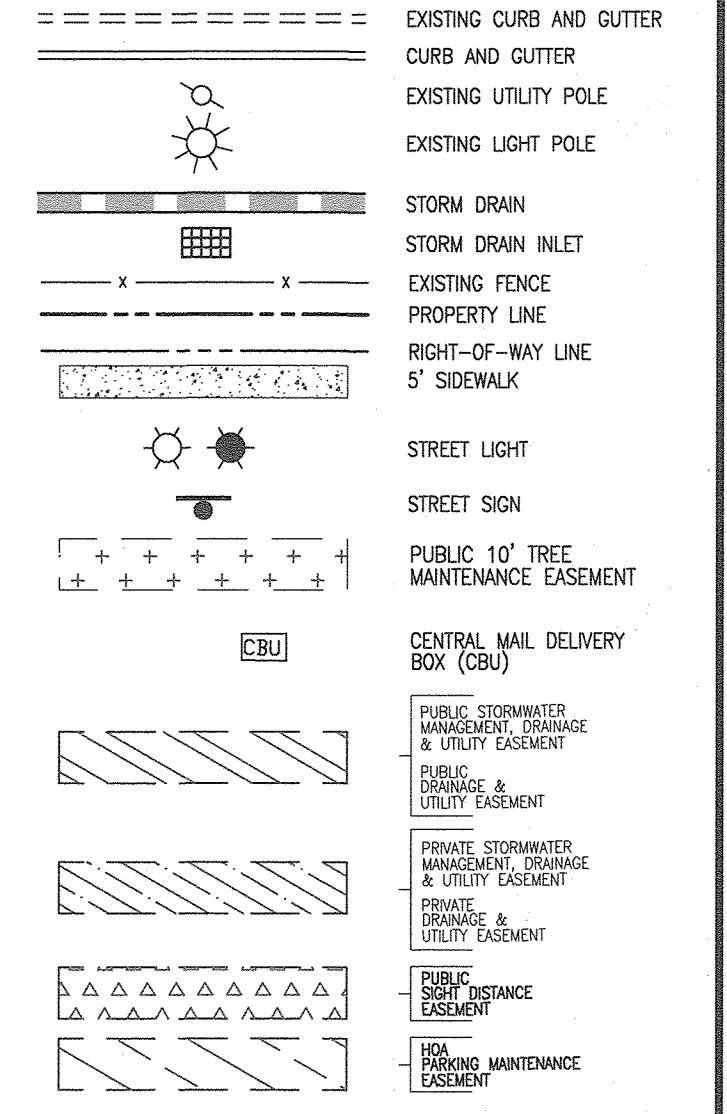
CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+14.37 - 0+33.48	19.11	350.00	03°07'44"	519.3531'W 19.11	25.53

POINT	STATION	OFFSET	DESCRIPTION
EDEN COURT			
N1	2+17.51	25.00' RT	PT RADIUS
O1	2+17.51	30.00' RT	
P1	2+17.51	30.00' LT	BEGIN TRANS TO MOD C&G
Q1	2+17.51	25.00' LT	END TRANS TO MOD C&G



TIMBER GUARDRAIL  
SCALE: 3/8"=1'-0"

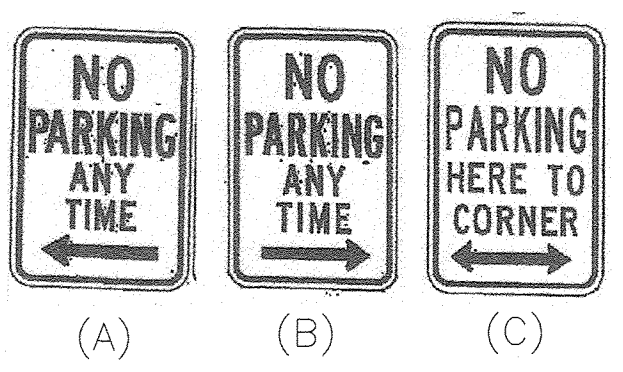
LEGEND:



- NOTES:
- REFER TO SHEETS 27 TO 32 FOR STORMDRAIN PROFILES.
  - REFER TO SHEET 32 FOR STORMDRAIN STRUCTURE SCHEDULE.
  - FOR STREET TREE LOCATIONS, REFER TO SHEETS 33-36.
  - ALL STREET TREES AND/OR SIGN SHALL BE LOCATED 5' MIN. FROM PROPOSED DRAINAGE, UTILITY STRUCTURE.
  - THERE SHOULD BE A MINIMUM OF 20' BETWEEN STREET LIGHTS AND STREET TREES.
  - IN THE DIRECTION FACING A TRAFFIC CONTROL SIGN:
    - THERE SHALL BE A MINIMUM OF 40' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL STOP SIGNS.
    - THERE SHALL BE A MINIMUM OF 35' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL SIGNS OTHER THAN A STOP SIGN.
  - REFER TO SHEET 11 FOR PROPOSED CENTRAL MAIL DELIVERY BOX (CMB) LOCATIONS. FINAL LOCATION SHALL BE AS DIRECTED BY THE US POSTAL SERVICE.
  - HANDICAP RAMPS ARE STANDARD R-4.05, DETAIL SHEET 11.
  - REFER TO SHEETS 38 & 39 FOR PROJECT AMENITY DETAILS.
  - REFER TO SHEET 11 FOR T-TURNAROUND DETAIL R-5.05.

ROAD NAME	STATION	OFFSET	FIXTURE/POLE TYPE	SYMBOL
KEYSTONE LANE (P)	2+77.5*	14.5' RT	LED-100 WATT PRIMER COLUMNAL FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE	
EDEN COURT (P)	2+47.6*	1.0' RT		

ROAD NAME	STATION	OFFSET	TYPE
KEYSTONE LANE	0+31.37	19.6' LT	R1-1 STOP SIGN & STREET NAME SIGN
KEYSTONE LANE (PRIVATE)	2+77*	10.5 RT	DEAD END SIGN & R7-1 "NO PARKING" SIGN (C)
EDEN COURT (PRIVATE)	0+40.8	17.3' LT	R1-1 STOP SIGN & STREET NAME SIGN
EDEN COURT (PRIVATE)	2+44.57*	1.0' RT	DEAD END SIGN & R7-1 "NO PARKING" SIGN (C)
EDEN COURT (PRIVATE)	0+40.4	12.4' RT	"NO PARKING" SIGN (A)
EDEN COURT (PRIVATE)	2+02.78	12.3' RT	"NO PARKING" SIGN (B)



THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SUP-22-008

NO.	ROAD NAME	STATION	OFFSET
24*	STARLIGHT PLACE	2+71.67	0
		2+80.12	23.73'R

OWNER: CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTVILLE RD. MARRIOTTVILLE, MD 21104 (410) 442-5888

DEVELOPER: SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLICOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM

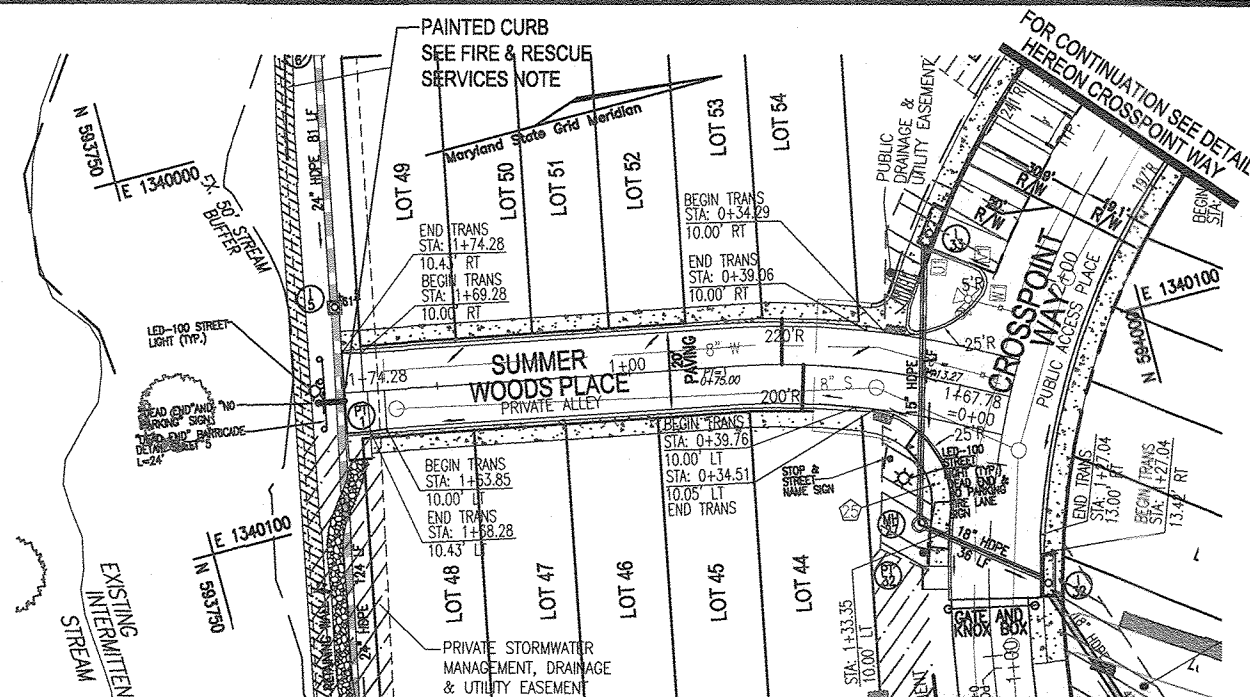
REVISED FINAL ROAD CONSTRUCTION PLAN  
 EDEN COURT PLAN VIEW AND PROFILE  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E

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

DESIGN BY: ES, RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

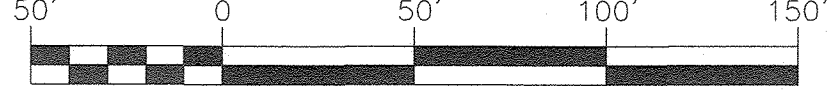
6 SHEET OF 101





**PLAN VIEW  
SUMMER WOODS PLACE**

PRIVATE ALLEY  
SCALE: 1"=50'



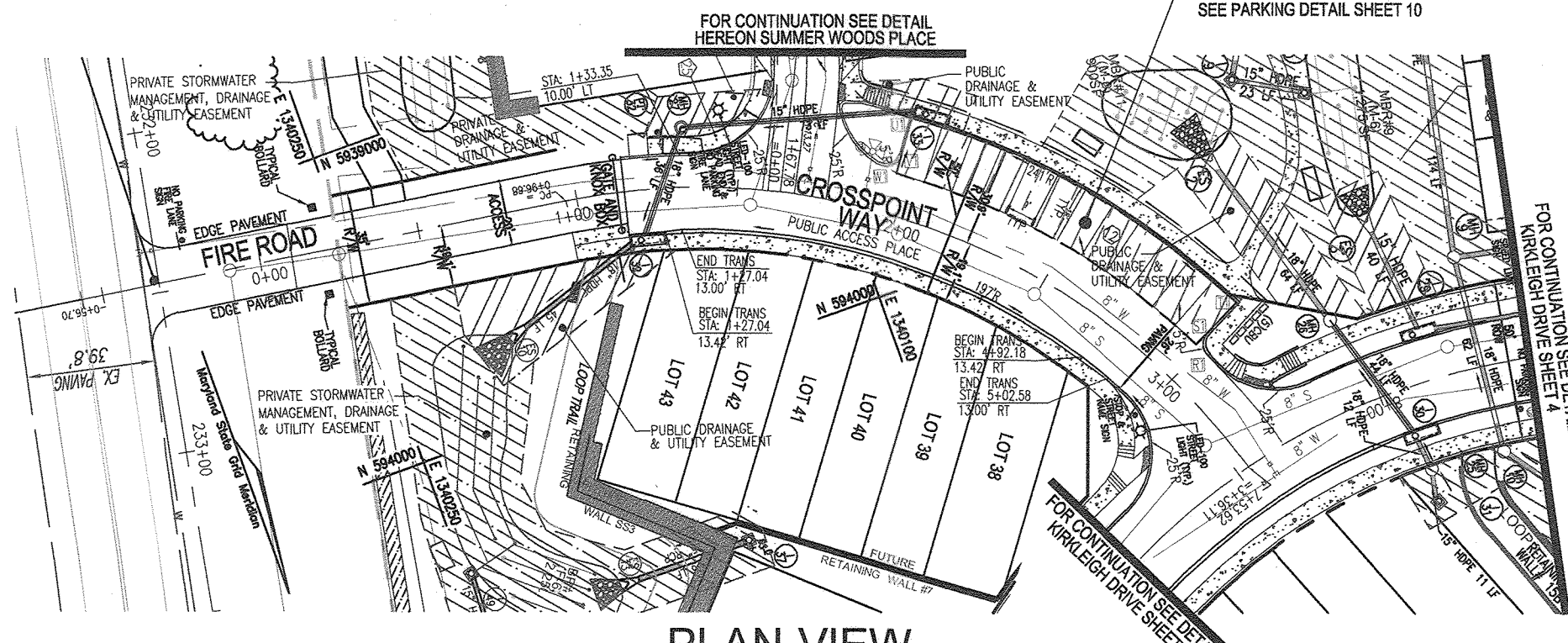
FIRE & RESCUE SERVICES NOTE:  
ALL CURBING ALONG SUMMER WOODS PLACE (0+364 THRU 1+73.59) SHALL BE PAINTED TO RESTRICT PARKING

**CURVE TABLE - SUMMER WOODS PLACE (PRIVATE)**

CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+13.27 - 0+73.00	61.73	210.00	18.50 33'	176.43 51 7"	61.51
					31.08

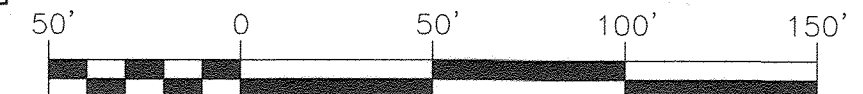
**LEGEND:**

- EXISTING CURB AND GUTTER
- CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- STORM DRAIN
- STORM DRAIN INLET
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- 5' SIDEWALK
- STREET LIGHT
- STREET SIGN
- PUBLIC 10' TREE MAINTENANCE EASEMENT
- CENTRAL MAIL DELIVERY BOX (CBU)
- PUBLIC STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
- PRIVATE STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
- BLIND SIGN DISTANCE EASEMENT
- NON-PARKING MAINTENANCE EASEMENT



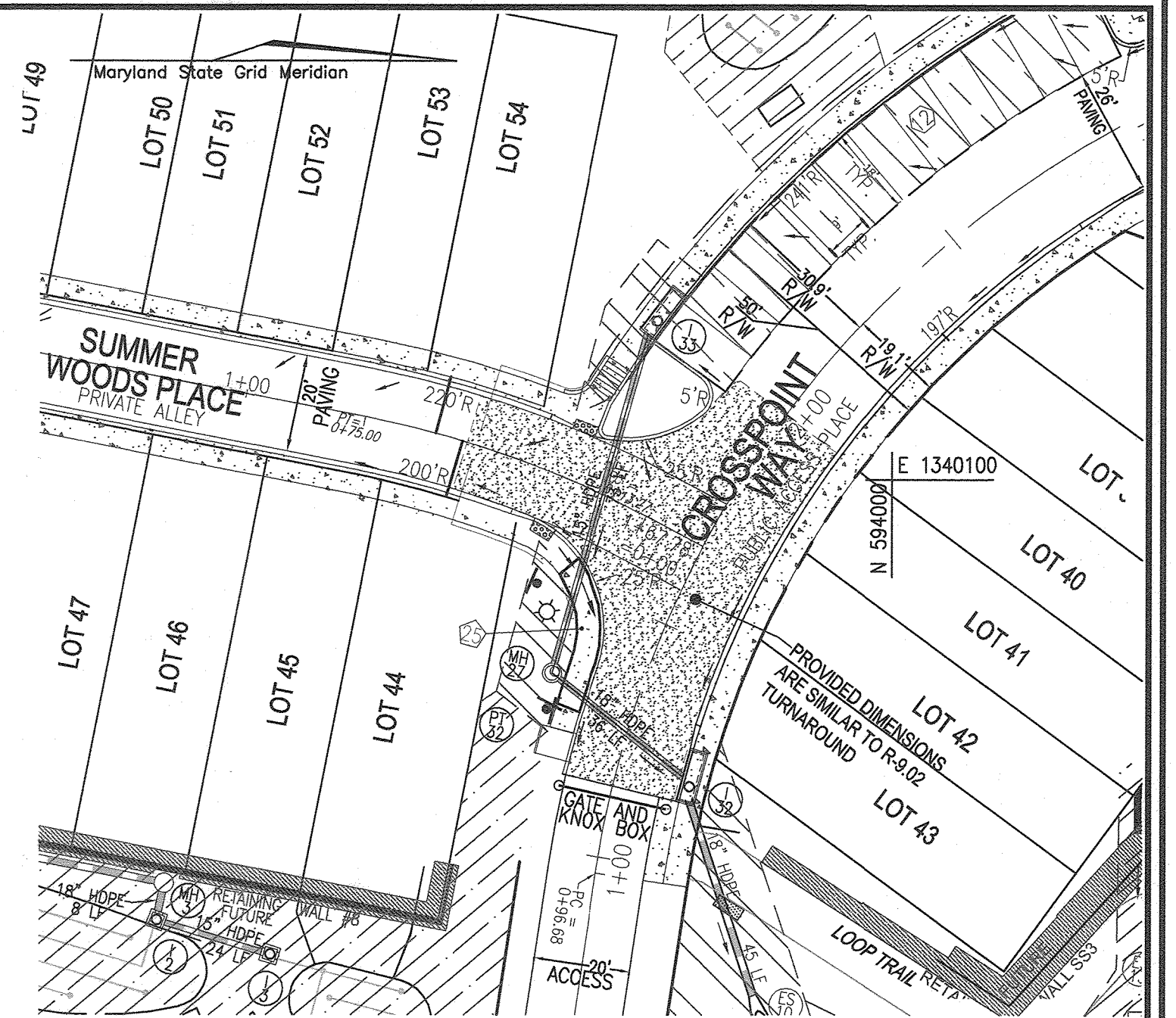
**PLAN VIEW  
CROSSPOINT WAY**

PUBLIC ACCESS PLACE  
SCALE: 1"=50'



**CURVE TABLE - CROSSPOINT WAY**

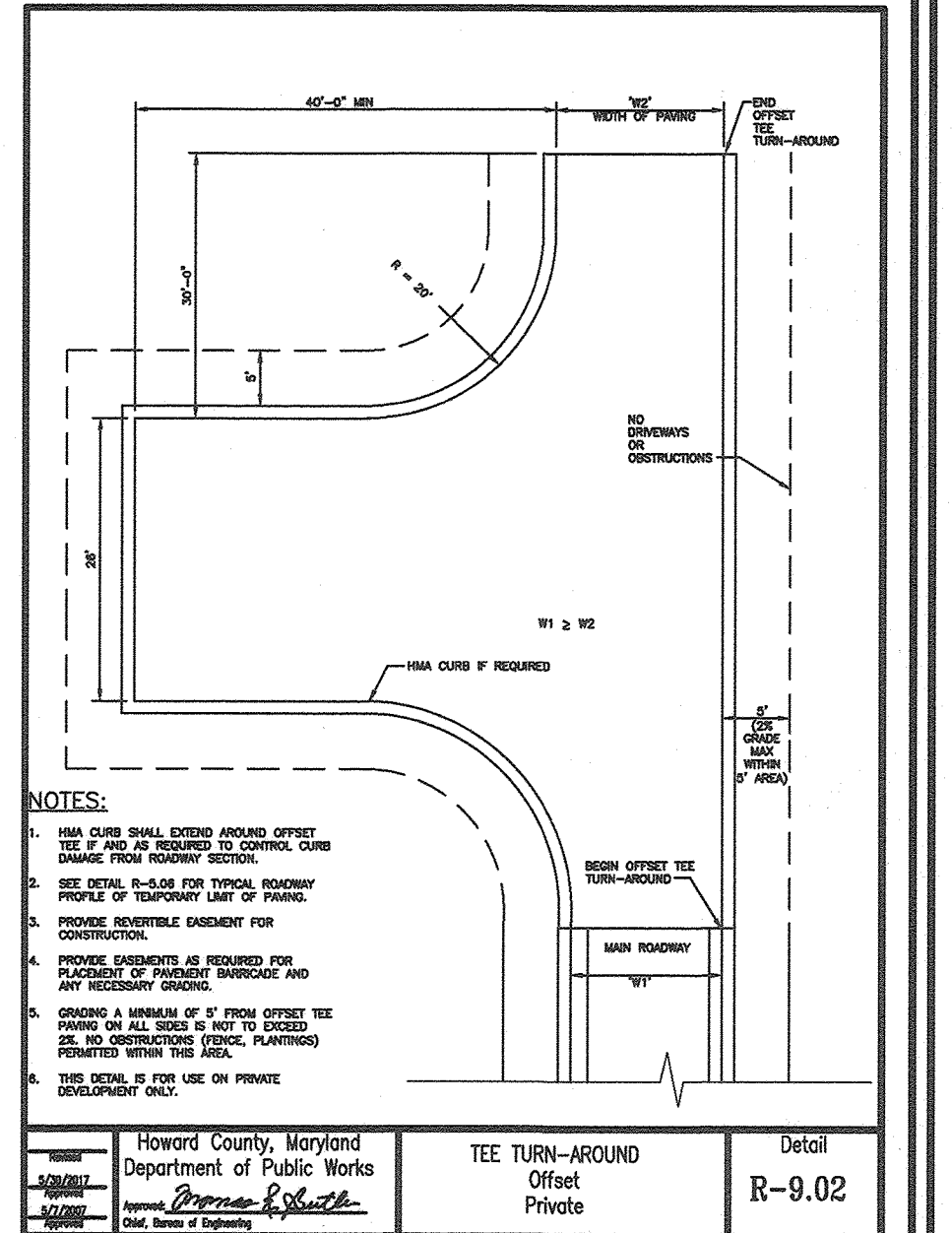
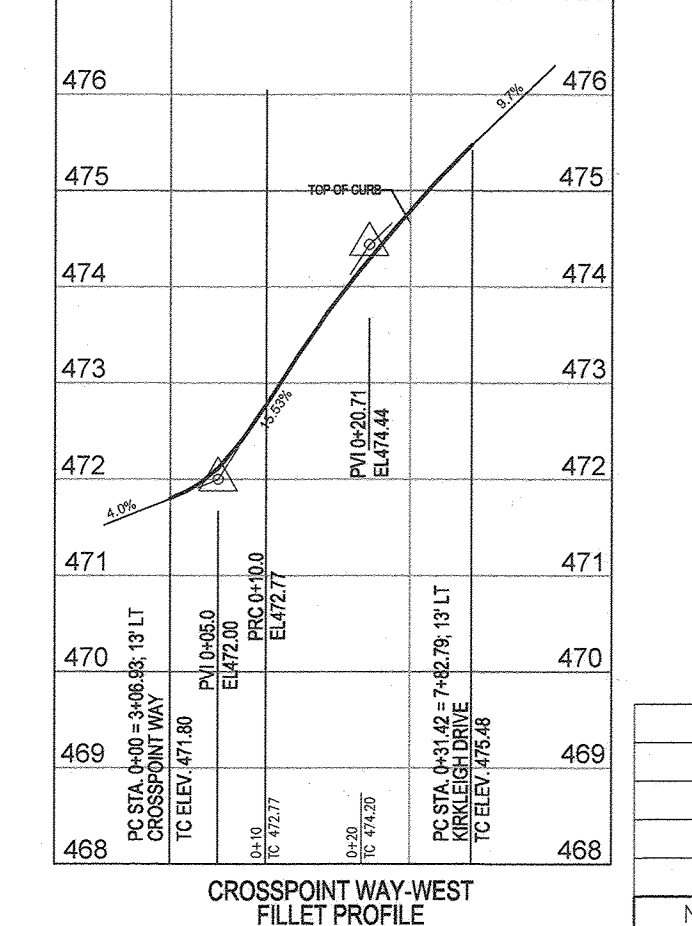
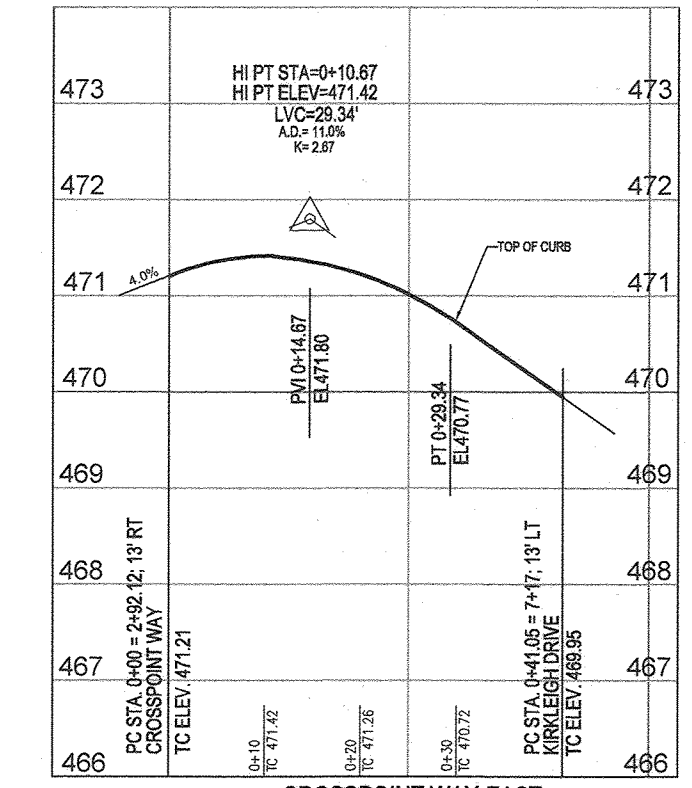
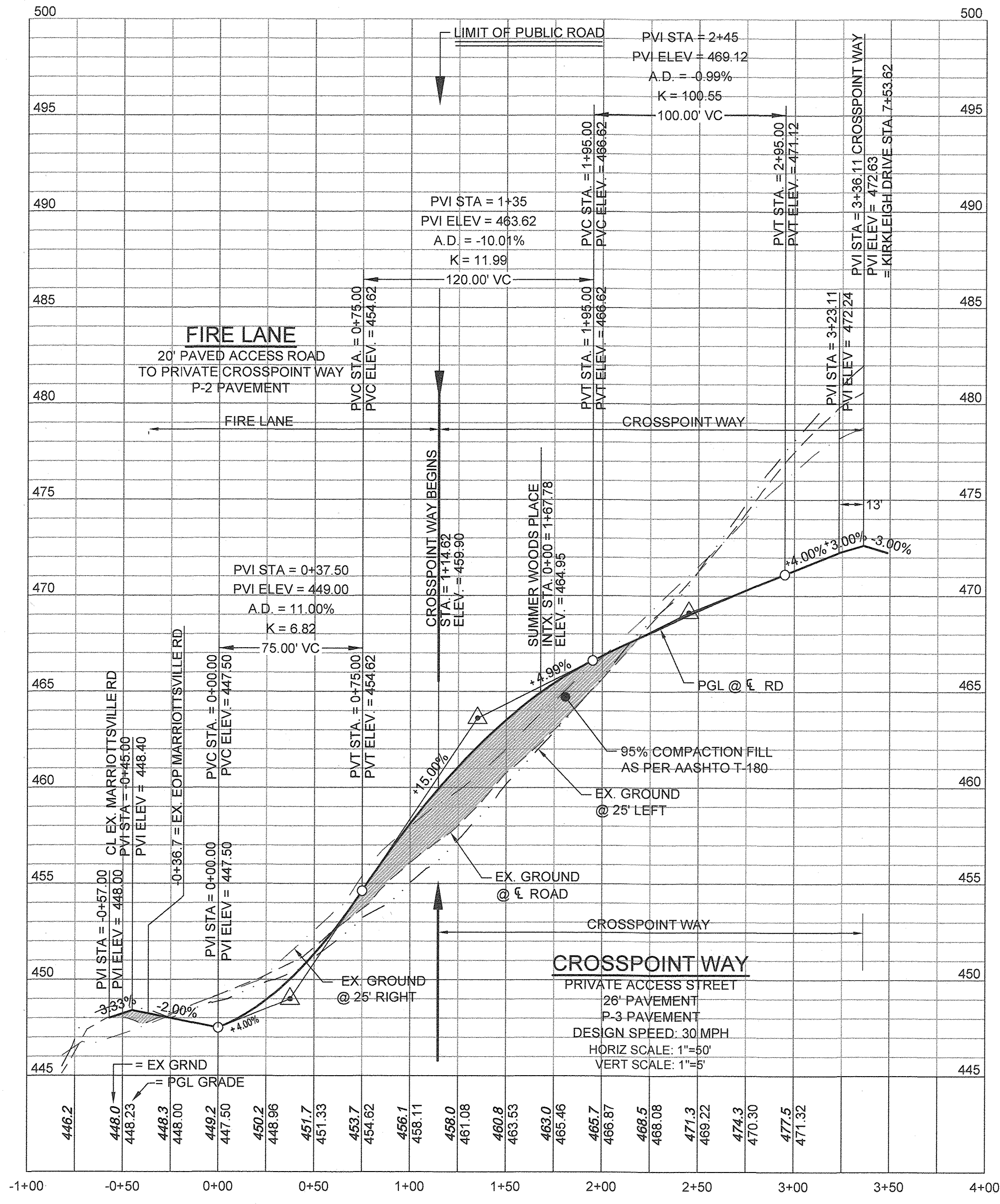
CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
0+98.68 - 3+36.11	237.43	210.00	85 19 33'	145 52 46 7"	226.67
					134.63



MODIFIED R-9.02 "T" TURN-AROUND DETAIL

**NOTES:**

- REFER TO SHEETS 27 TO 32 FOR STORMDRAIN PROFILES.
- REFER TO SHEET 32 FOR STORMDRAIN STRUCTURE SCHEDULE.
- FOR STREET TREE LOCATIONS, REFER TO SHEETS 33-36.
- ALL STREET TREES AND/OR SIGN SHALL BE LOCATED 5' MIN. FROM PROPOSED DRAINAGE, UTILITY STRUCTURE.
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- IN THE DIRECTION FACING A TRAFFIC CONTROL SIGN:
  - THERE SHALL BE A MINIMUM OF 40' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL STOP SIGNS.
  - THERE SHALL BE A MINIMUM OF 35' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL SIGNS OTHER THAN A STOP SIGN.
- REFER TO SHEET 11 FOR PROPOSED CENTRAL MAIL DELIVERY BOX (CBU) LOCATIONS. FINAL LOCATION SHALL BE AS DIRECTED BY THE US POSTAL SERVICE.
- HANDICAP RAMP ARE STANDARD R-4.05, DETAIL SHEET 11.
- REFER TO SHEET 38 AND 39 FOR PROJECT AMENITY DETAILS.

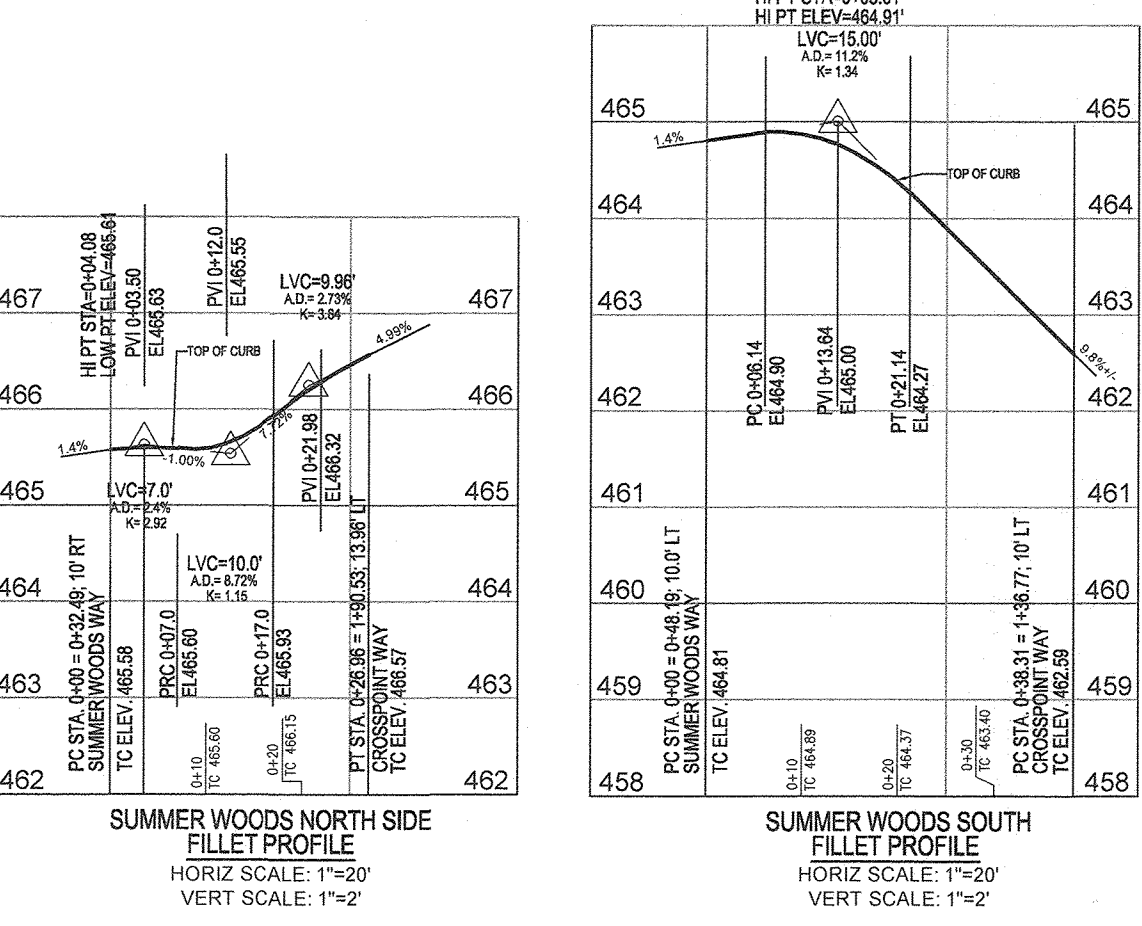
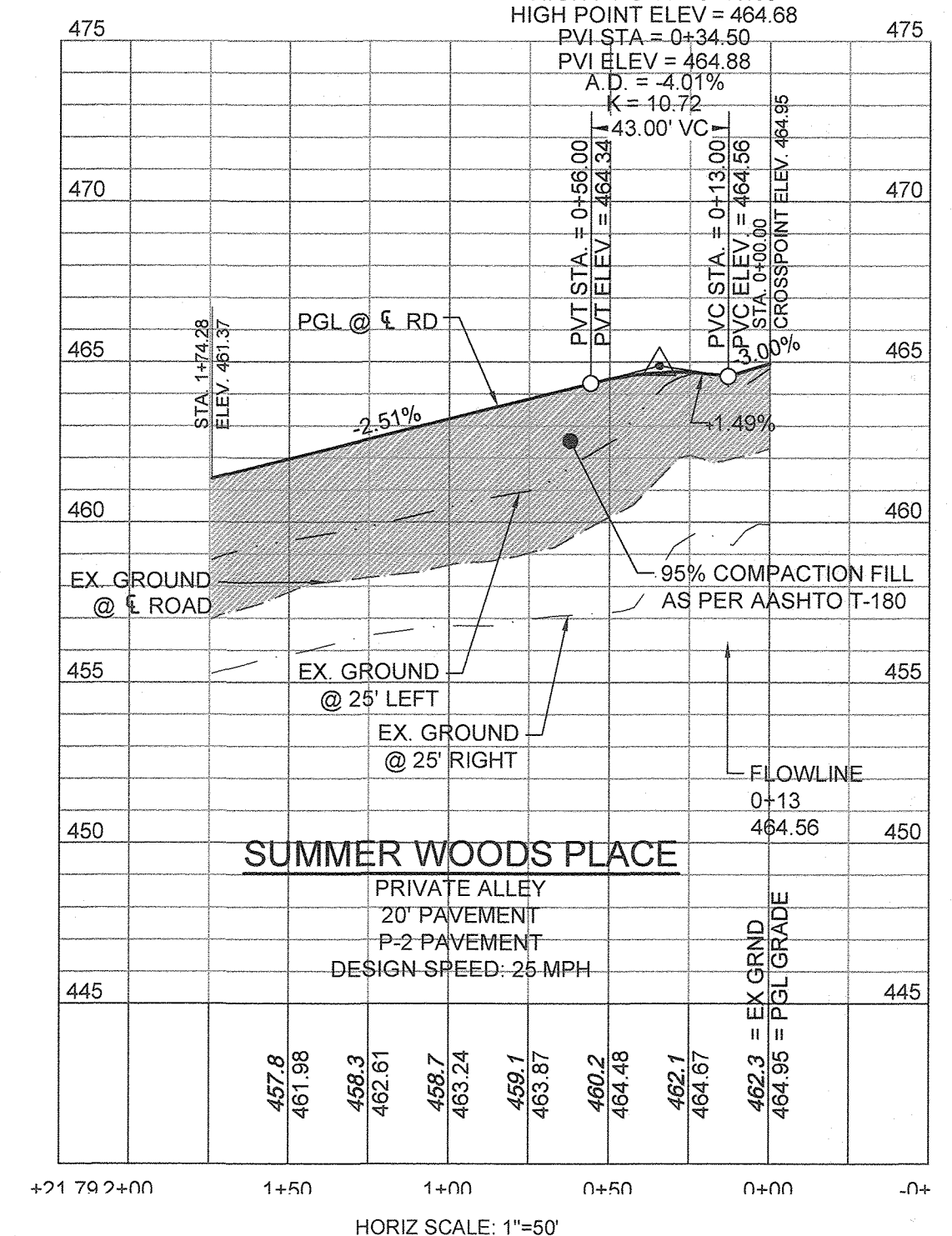


**OWNER:** CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
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(410) 442-5888

**DEVELOPER:** SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-485-4244  
SDCPROPERTIES.COM

**REVISIONS:**

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTSVILLE ROAD IMPROVEMENTS PLANS	6-28-22



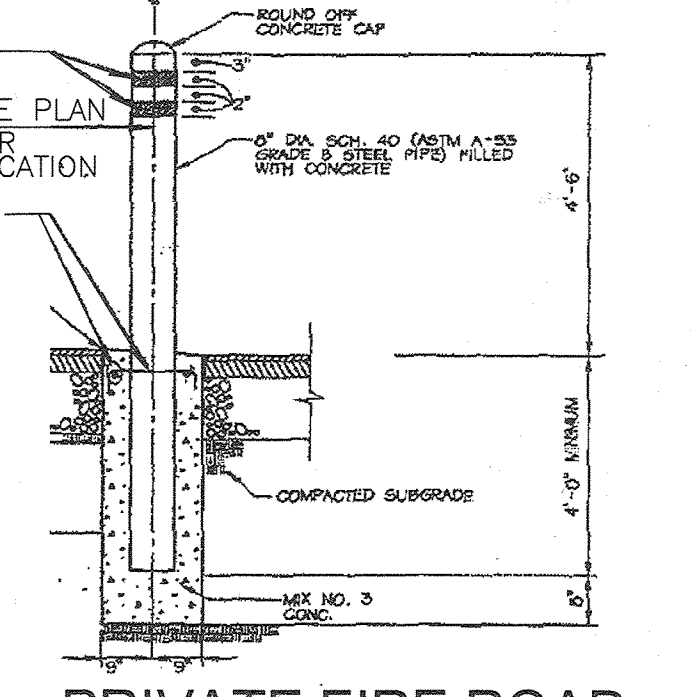
**PAVEMENT CHART**

ROAD NAME	STATIONS	PAVEMENT TYPE	CLASSIFICATION	DESIGN SPEED
CROSSPOINT WAY	0+00-1+14.62	P-2	N/A FIRE ACCESS	N/A
CROSSPOINT WAY	1+14.62-3+36.11	P-3	PUBLIC ACCESS PLACE	SPEED LIMIT "30"
SUMMER WOODS PLACE	0+00-1+73.59	P-2	PRIVATE ALLEY	SPEED LIMIT "25"

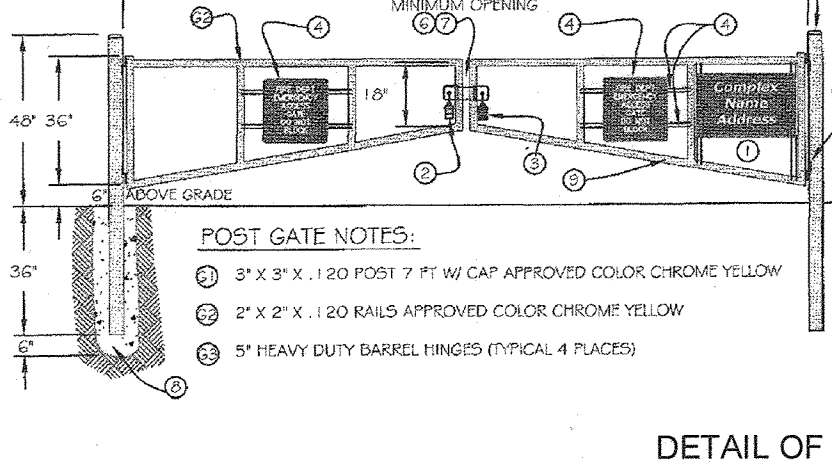
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS MK  
DATE: 09/10/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 9/21/22

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 9/21/22



PRIVATE FIRE ROAD  
TYPICAL BOLLARD  
OR APPROVED EQUAL  
SCALE: NTS



DETAIL OF  
"FIRE ROAD ENTRANCE GATE" W/ KNOX BOX OR EQUIVALENT  
NOT TO SCALE

- GENERAL NOTES:**
- APPROVED SIGN, OF LETTERS HELVETICA MEDIUM, 36" X 24", RED BACKGROUND WITH WHITE REFLECTIVE LETTERING, TO IDENTIFY THE NAME OF THE COVERED AREA AND LOCATION (ADDRESS). 1/2" X 1/2" MOUNTING STRIPS.
  - PROPERTY OWNERS/MANAGEMENT PADLOCK.
  - KNOX PADLOCK SHALL BE ACCESSIBLE FROM BOTH SIDES OF GATE.
  - KNOX PADLOCKS CAN BE PLACED AS AT WWW.HOWARD.CO.MD.
  - IF NUMERICAL ACCESS DO NOT BLOCK TO OR SIGN OF LETTERS. 2 1/2" X 2 1/2" KEYS BACKGROUND WITH WHITE REFLECTIVE LETTERS, PLACED BACK TO BACK AND FASTENED ON ALL 4 CORNERS. 3/4" X 1/2" MOUNTING STRIPS.
  - THE MINIMUM OVERALL WIDTH OF THE GATE OPENING SHALL BE 20 FT.
  - WELD MODIFIED L-BRACKET TO GATE FRAME OR POST. ROUND ALL EDGES. (TYPICAL) 2 PLACES.
  - LOCKING BAR LENGTH IS DETERMINED BY THE FRAME WIDTH AND THE GAP WIDTH BETWEEN THE 2 GATES. REMOVE ALL STRAP EDGES/ROUND ALL CORNERS.
  - 2 1/2" DIAMETER CONCRETE POST FOOTINGS. (TYPICAL)
  - POSTS AND GATES SHALL BE PAINTED CHROME YELLOW.
  - POSTS & BARRIERS SHALL BE SET OFF THE ROADWAY FIFTY-FIVE (55) TO ALLOW SAFE DISTANCE TO PULL OFF THE ROADWAY.

**CURB FLOW LINE LOCATION TABLE**

POINT	STATION	OFFSET
R1	3+02.76	13.00' LT
S1	2+98.15	17.95' LT
T1	2+98.15	31.00' LT
U1	1+96.45	31.00' LT
V1	1+96.45	18.00' LT
WT	1+91.47	13.07' LT

**TRAFFIC CONTROL SIGNAGE SCHEDULE**

ROAD NAME	STATION	OFFSET	TYPE
SUMMER WOODS PLACE	0+27.20	17.9' LT	R1-1 STOP SIGN & STREET NAME SIGN
SUMMER WOODS PLACE (PRIVATE)	1+80.6'	2.2' LT	DEAD END SIGN & R7-1 'NO PARKING' SIGN (C)
CROSSPOINT WAY	2+99.41	15.9' RT	R1-1 STOP SIGN & STREET NAME SIGN
CROSSPOINT WAY	1+26.22	17.3' LT	RB-31 NO PARKING FIRE LANE SIGN & DEAD END SIGN
CROSSPOINT WAY	-0+22.4'	11.6' LT	RB-31 NO PARKING FIRE LANE SIGN

**NOTE:**  
ALL SIGN LOCATIONS ARE APPROXIMATE. HOWARD COUNTY TRAFFIC SHALL FIELD APPROVE OR MARK ALL SIGN LOCATIONS PRIOR TO ANY SIGNS BEING INSTALLED. CALL 410-313-5752.

**STREET LIGHT LOCATIONS**

ROAD NAME	STATION	OFFSET	FIXTURE/POLE TYPE	SYMBOL
SUMMER WOODS PLACE (P)	1+81.25*	0	LED-100 WATT PRIMER COLUMN FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE	(Symbol)
CROSSPOINT WAY	1+43.53	23.8' LT		(Symbol)
CROSSPOINT WAY	3+04.46	18.3' RT		(Symbol)

(P) = PRIVATE  
\* STATIONING EXTENDED BEYOND TEE



**REVISED FINAL ROAD CONSTRUCTION PLAN  
CROSSPOINT WAY AND  
SUMMER WOODS PLACE PLAN VIEW AND PROFILE**

**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 25942 - 25954  
PARCELS: 110 & 421 L 1389/F: 339 (P. 110)  
TAX MAP: 16 GRD 10 L 4183/F: 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

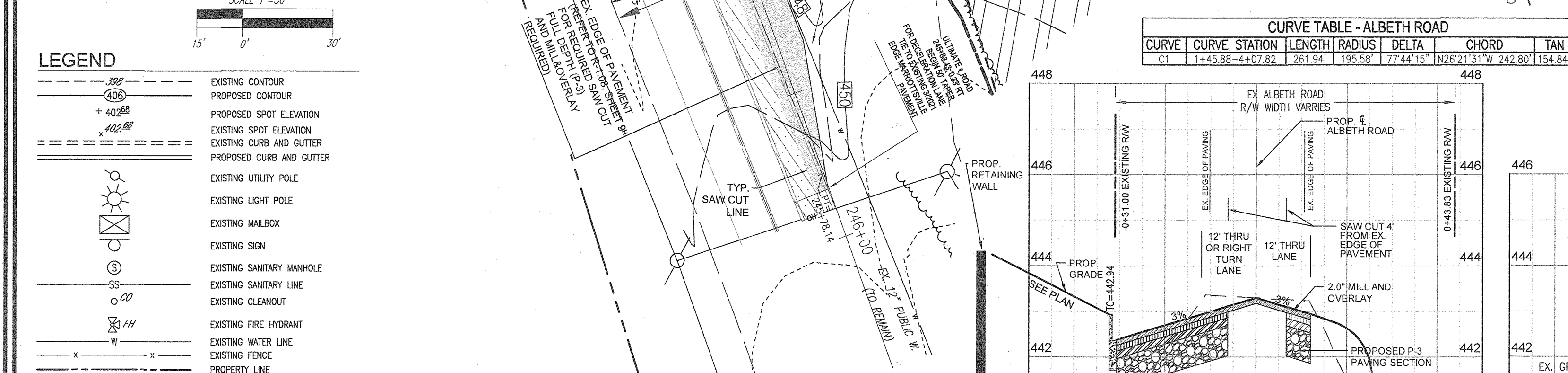
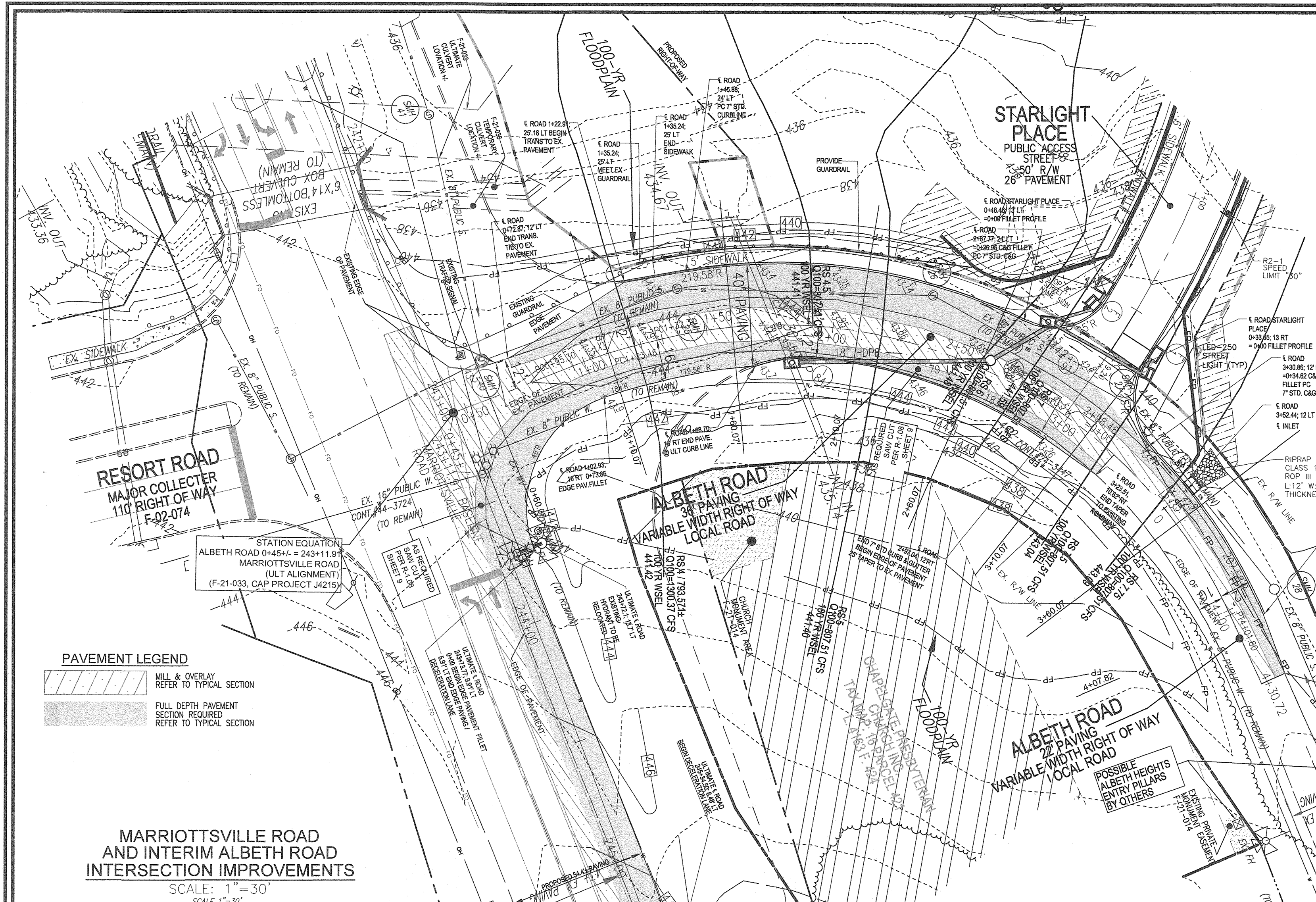
**VOGEL ENGINEERING**  
**TIMMONS GROUP**  
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
P: 410.461.7666 F: 410.461.8961 www.timmons.com

**PROFESSIONAL CERTIFICATE**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022.

DESIGN BY: ES, RHV  
DRAWN BY: VE+TG  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-38 / 40220

7 SHEET 101





**PAVEMENT LEGEND**

- MILL & OVERLAY REFER TO TYPICAL SECTION
- FULL DEPTH PAVEMENT SECTION REQUIRED REFER TO TYPICAL SECTION

**MARRIOTTVILLE ROAD AND INTERIM ALBETH ROAD INTERSECTION IMPROVEMENTS**  
SCALE: 1"=30'  
SCALE: 1"=30'

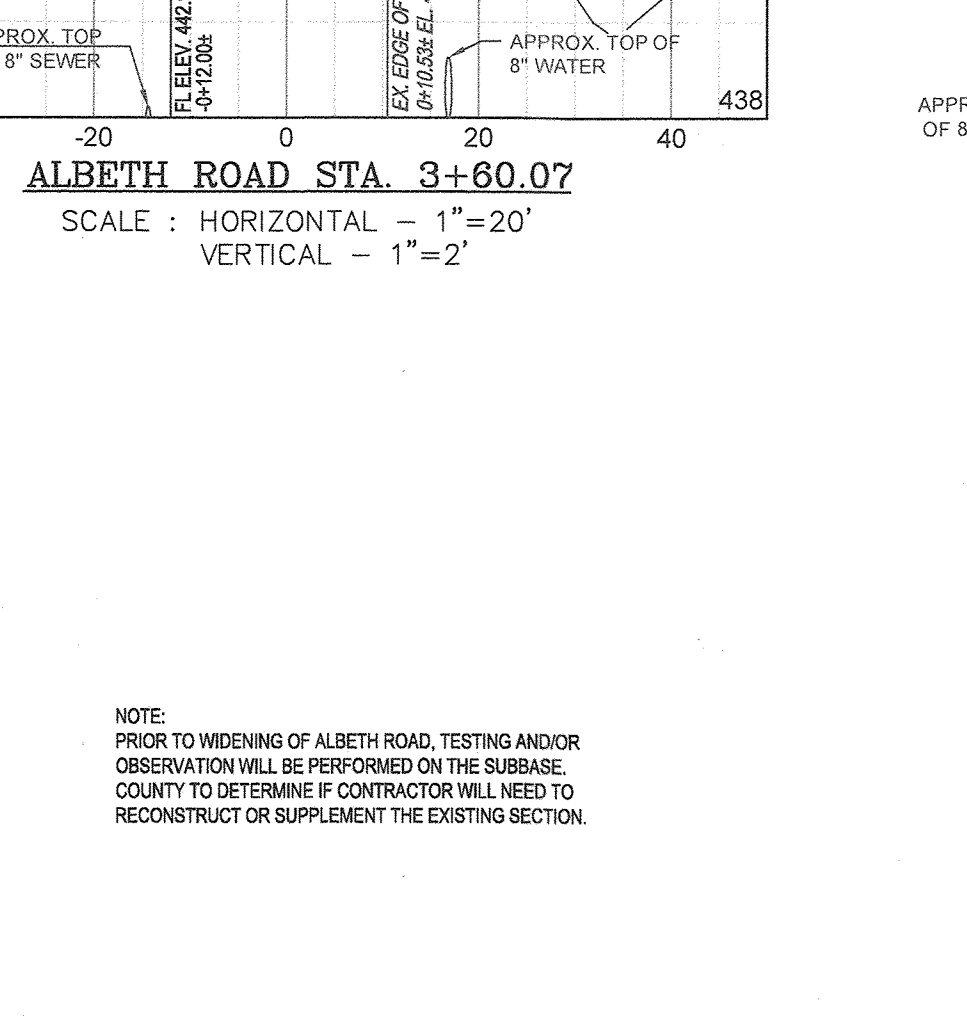
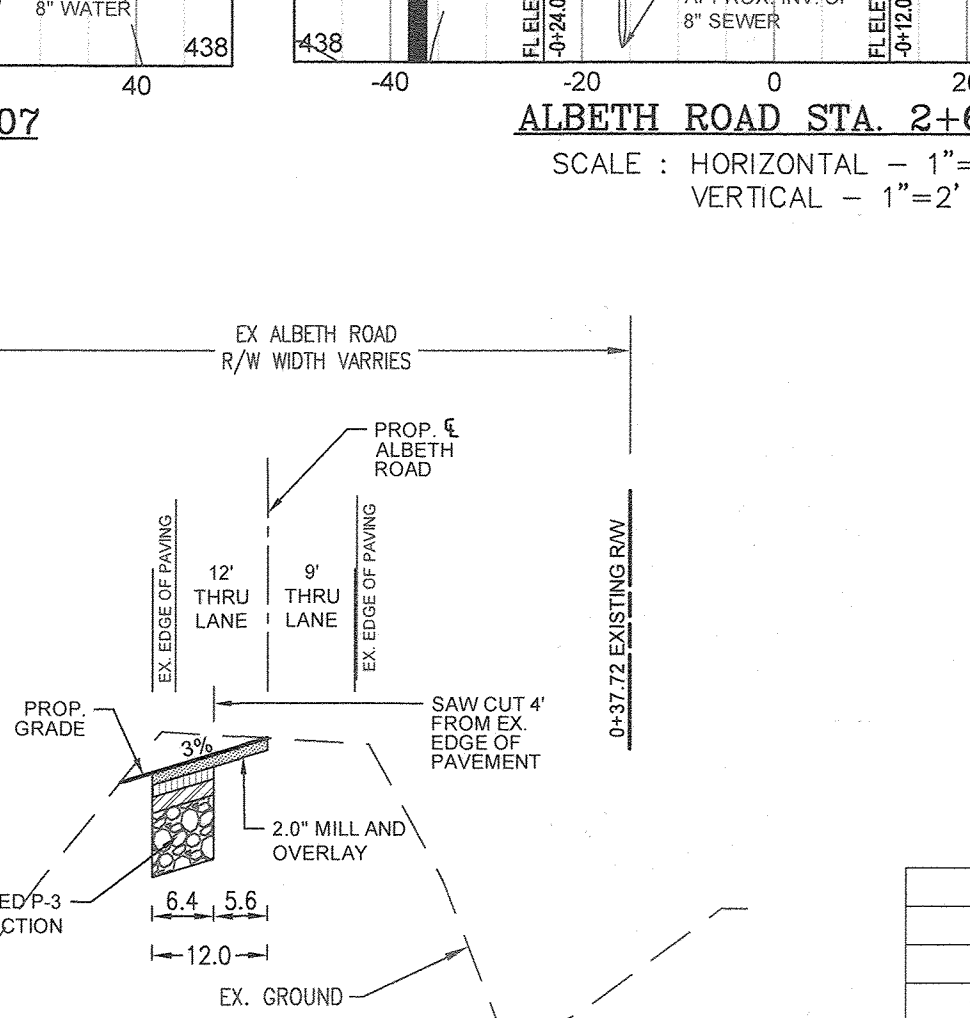
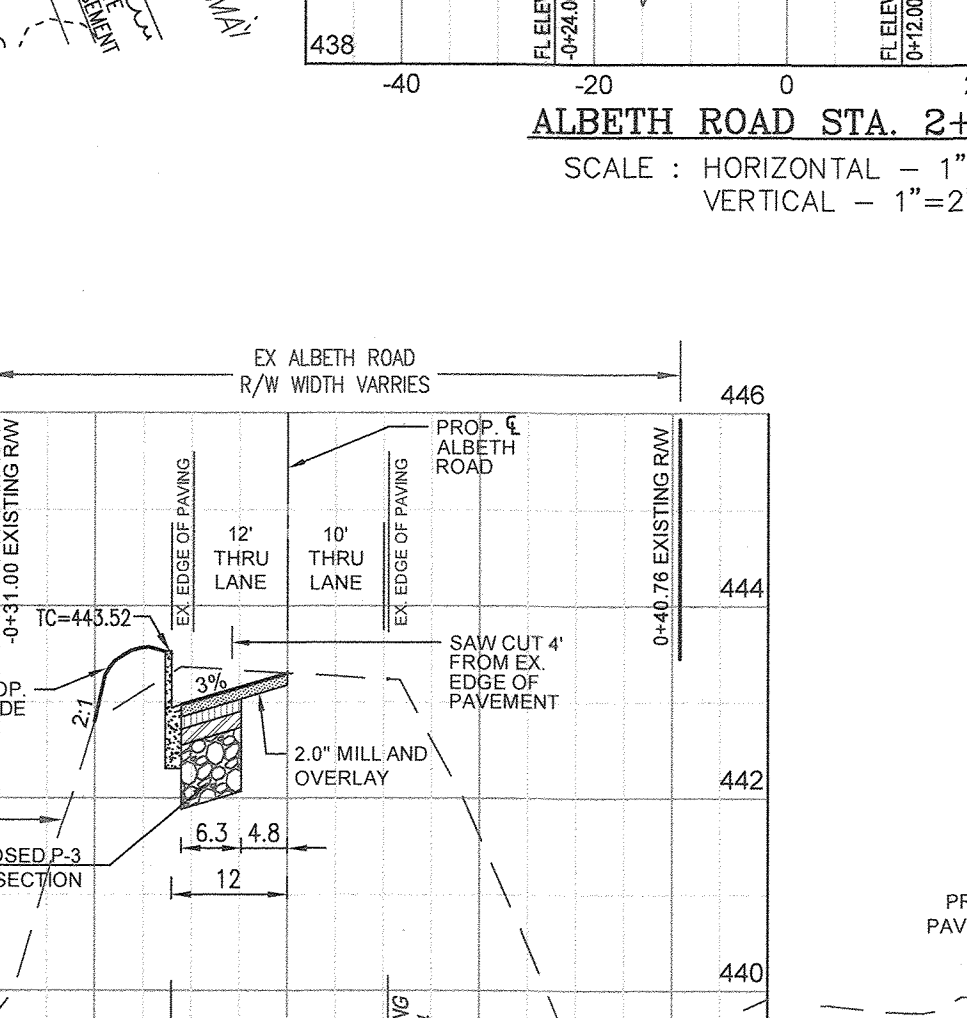
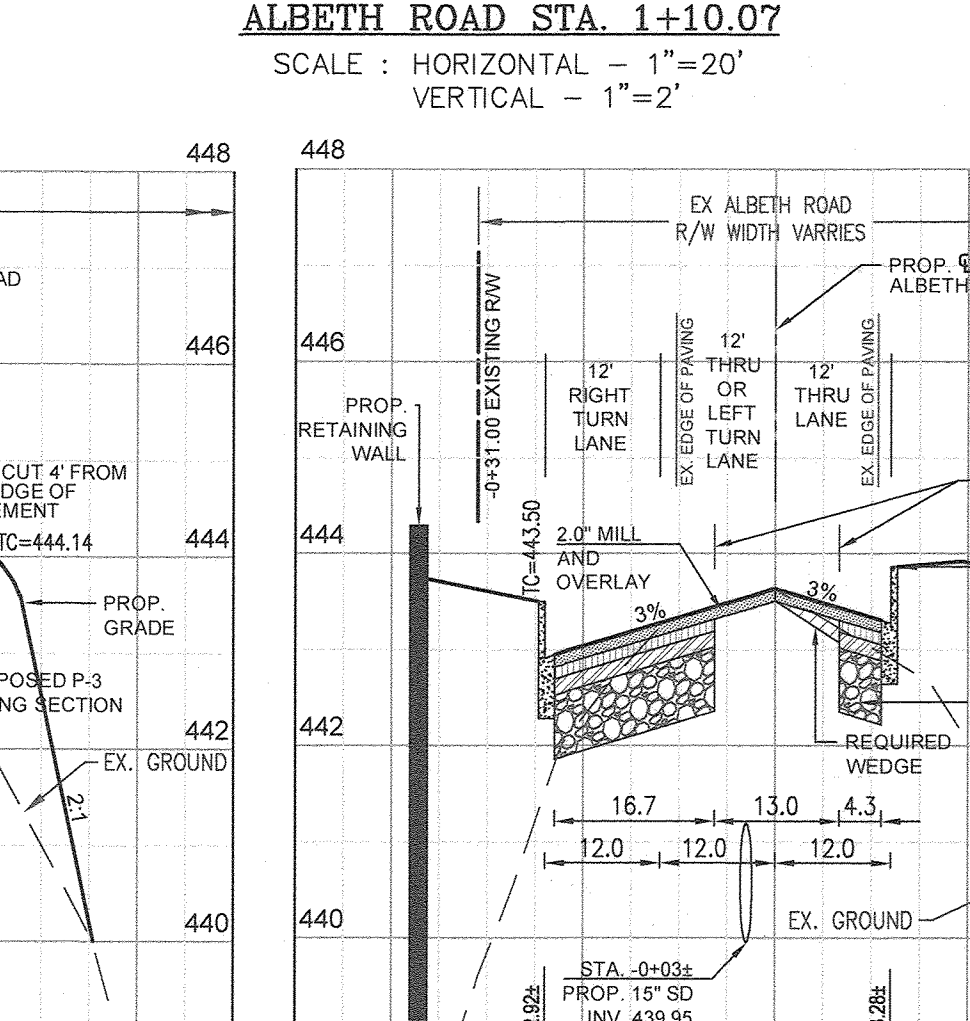
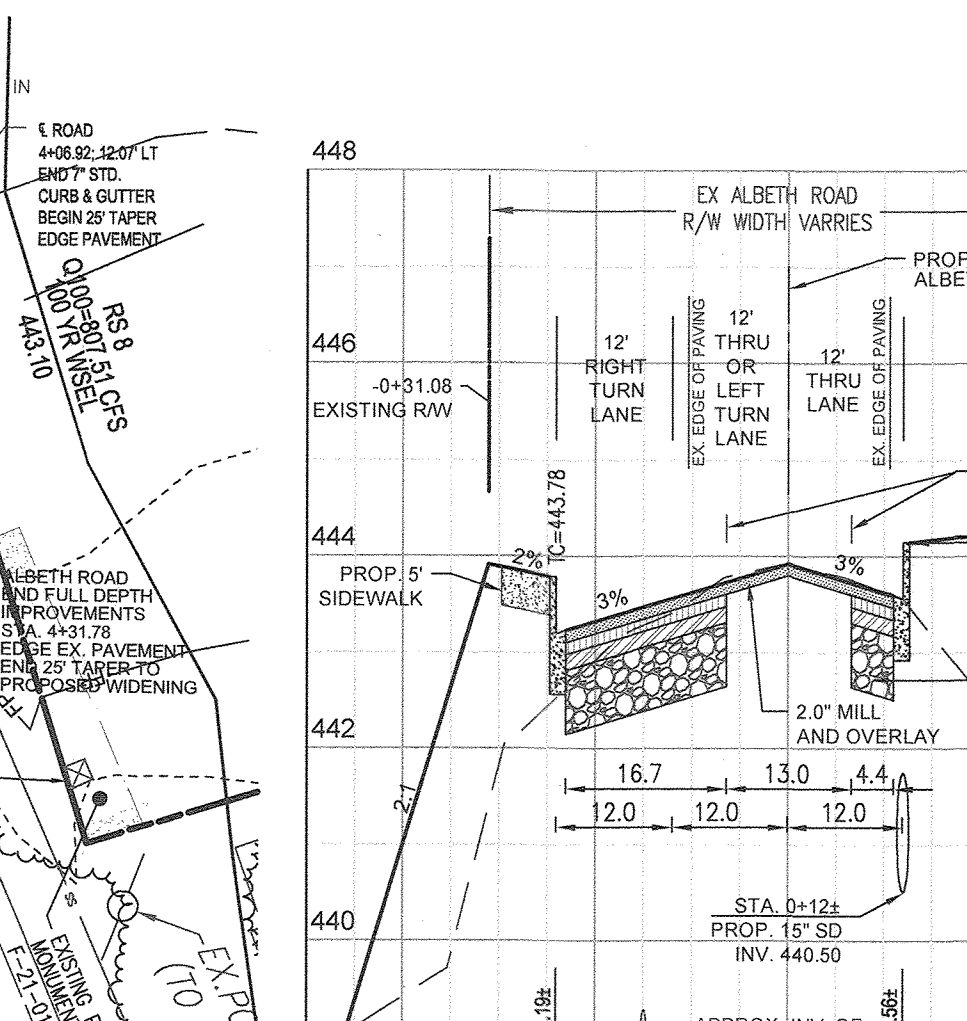
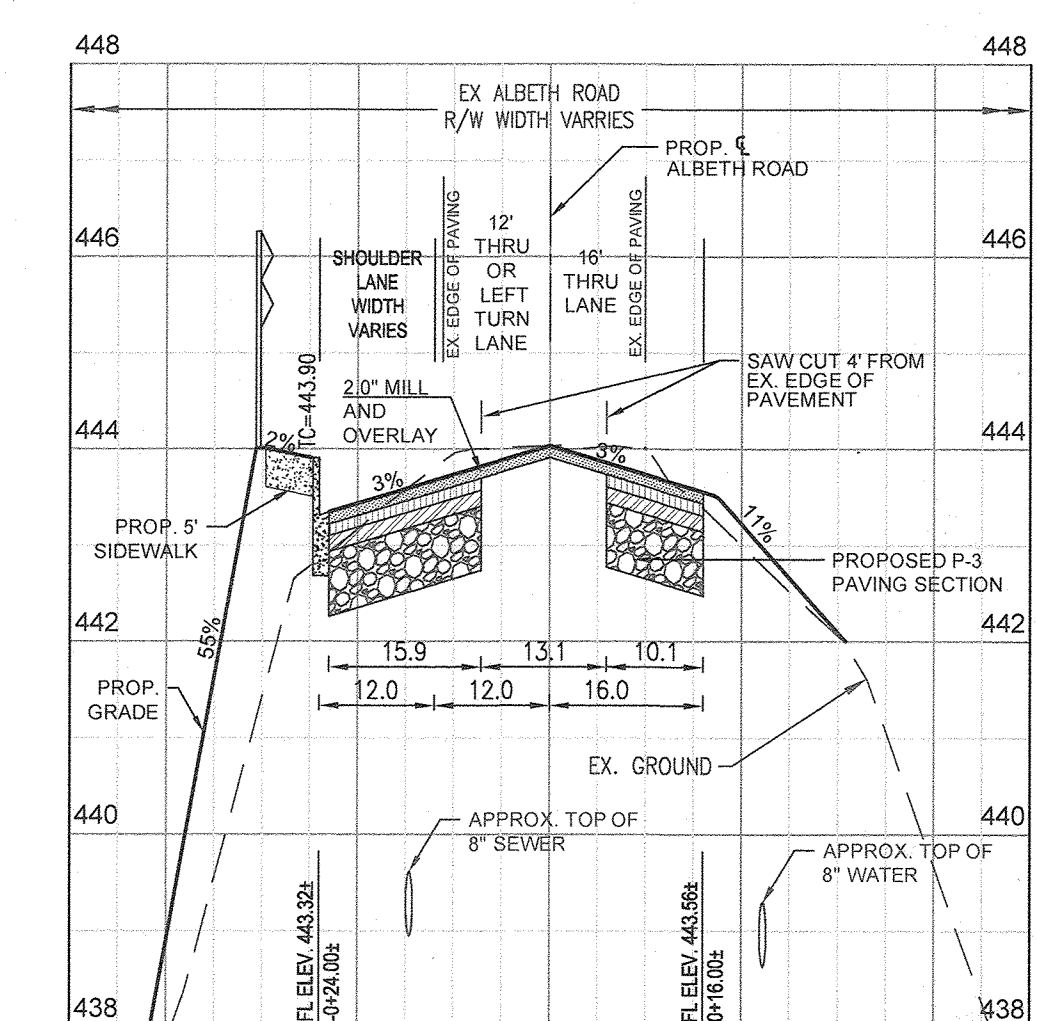
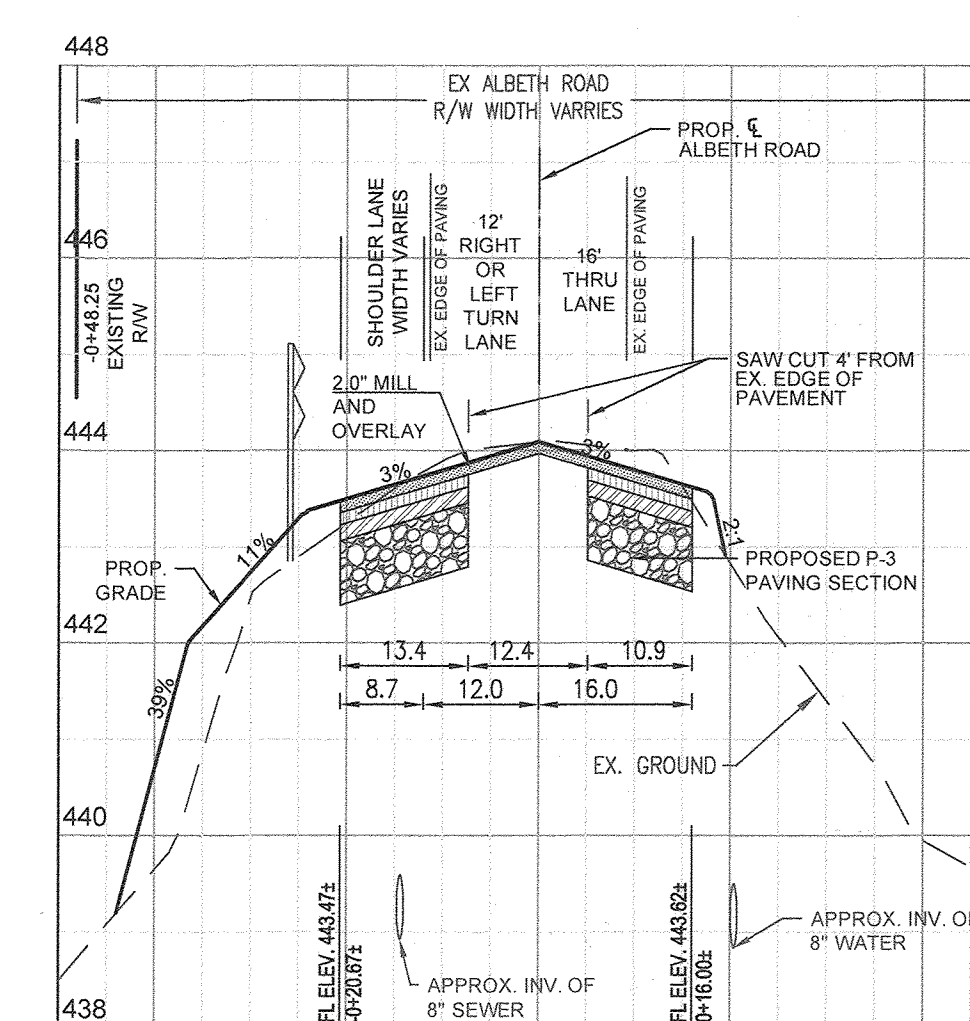
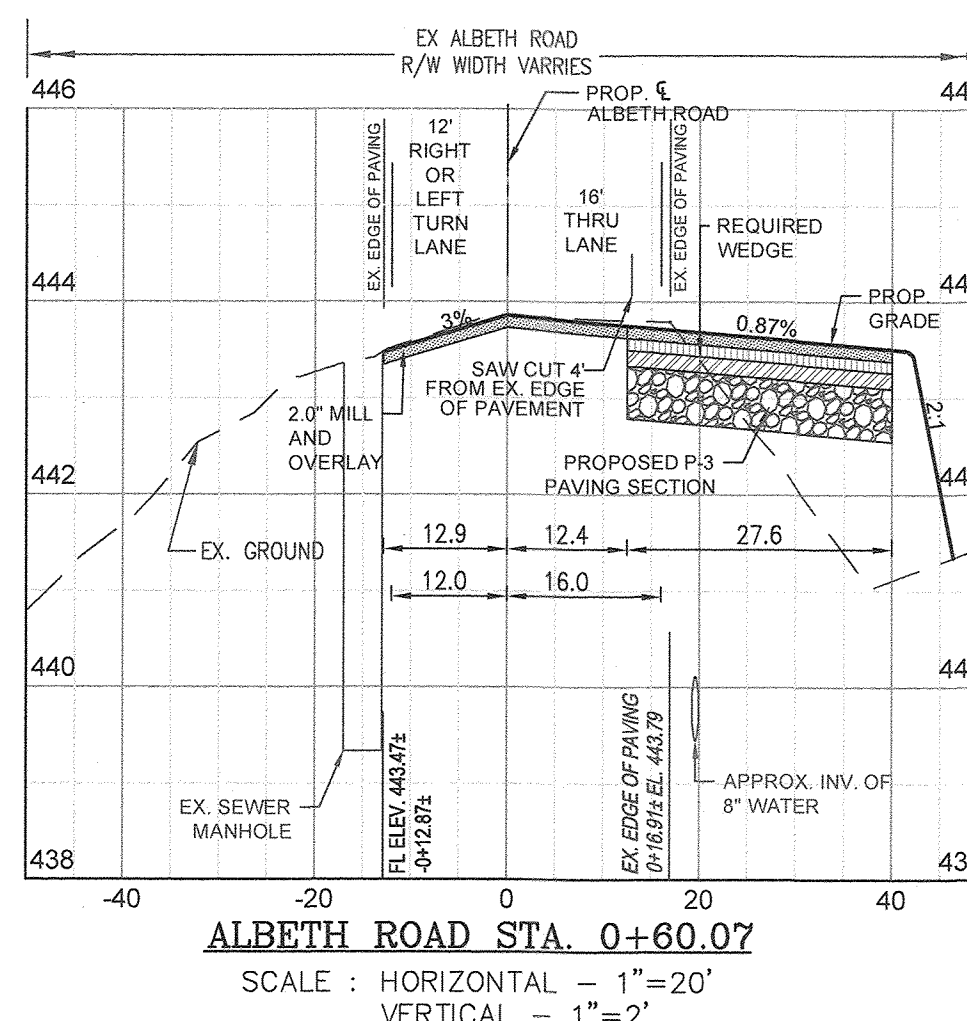
**LEGEND**

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE

**MARRIOTTVILLE ROAD AND INTERIM ALBETH ROAD INTERSECTION IMPROVEMENTS**  
SCALE: 1"=30'  
SCALE: 1"=30'

**CURVE TABLE - ALBETH ROAD**

CURVE	CURVE STATION	LENGTH	RADIUS	DELTA	CHORD	TAN
C1	1+45.88-4+07.82	261.94'	195.58'	77°44'15"	N26°21'31"W 242.80'	154.84'



THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	5-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
INTERIM ALBETH ROAD - CROSS SECTIONS AND  
MARRIOTTVILLE ROAD & INTERIM ALBETH ROAD  
INTERSECTION & ROAD IMPROVEMENTS  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL E  
PLATS 25942 & 25954 L 1389/F 339 (P. 110)  
L 4163/F 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

DESIGN BY: ES, RHV  
DRAWN BY: VE-TC  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

8 SHEET OF 101

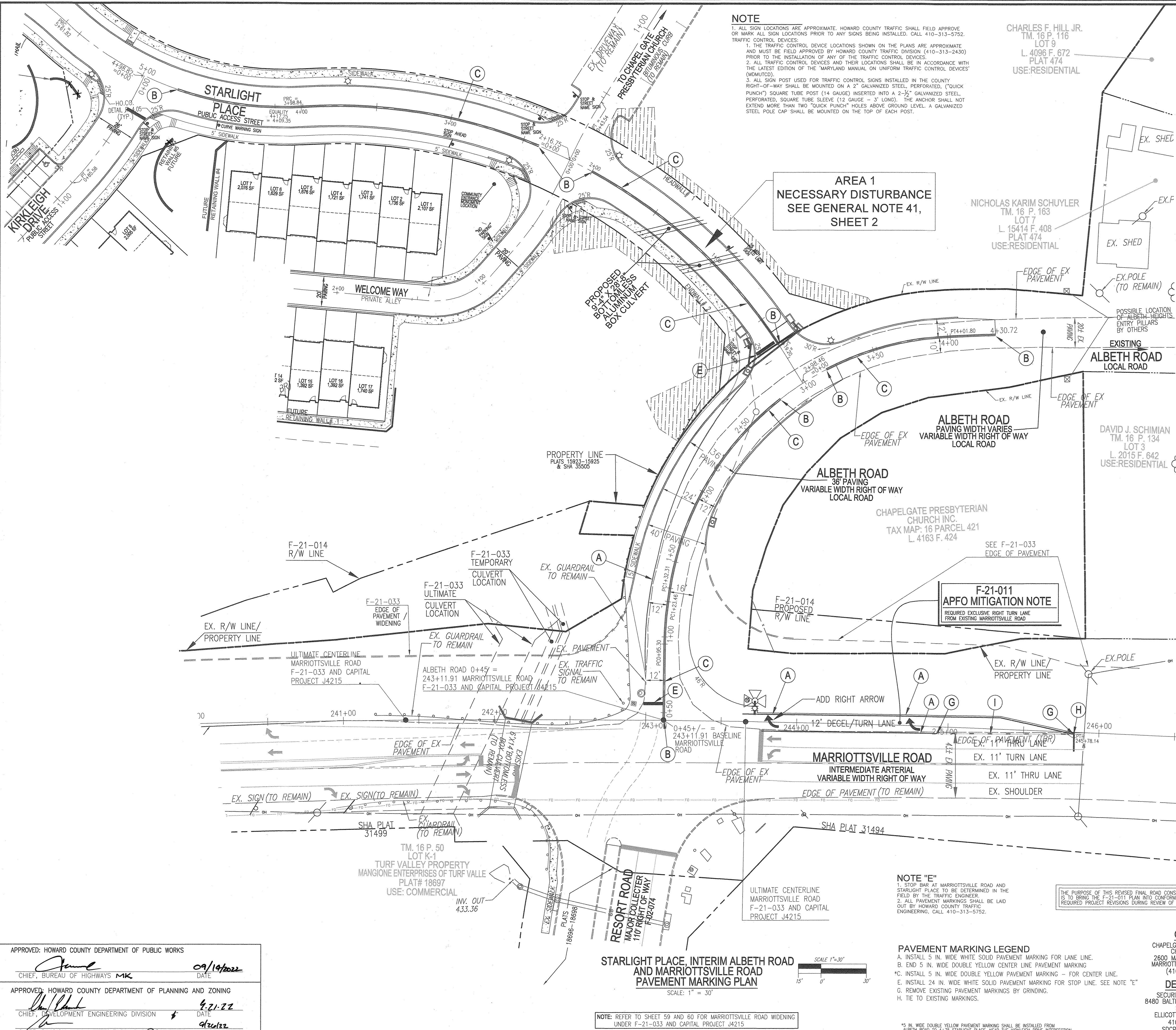
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS MK 09/14/2022 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION 9/21/22 DATE  
CHIEF, DIVISION OF LAND DEVELOPMENT 9/16/22 DATE

NOTE  
PRIOR TO WIDENING OF ALBETH ROAD, TESTING AND/OR OBSERVATION WILL BE PERFORMED ON THE SUBBASE. COUNTY TO DETERMINE IF CONTRACTOR WILL NEED TO RECONSTRUCT OR SUPPLEMENT THE EXISTING SECTION.

NOTES:  
1. ADA RAMPS TO BE CONSTRUCTED TO HOWARD COUNTY STANDARDS AS SPECIFIED HEREON.  
2. THE DECELERATION LANE SHALL BE 12' TO THE FLOWLINE OF THE GUTTER FROM EDGE OF PAVEMENT. SEE TYPICAL SECTION, SHEET 11.  
3. UNDERGROUND UTILITIES WITHIN THE LIMITS OF ROAD IMPROVEMENTS SHALL BE RELOCATED AT THE DISCRETION AND DIRECTION OF THE UTILITY OWNER.  
4. REFER TO SHEET 9 FOR ALBETH ROAD STRIPING DETAILS.  
5. REFER TO SHEET 9 FOR ALBETH ROAD AND STARLIGHT PLACE FILLET PROFILES.  
6. MARRIOTTVILLE ROAD CENTERLINE ALIGNMENT AND STATIONING PER CAPITAL PROJECT J4215 AND MARRIOTTVILLE ROAD WIDENING F-21-033.





**NOTE**  
 1. ALL SIGN LOCATIONS ARE APPROXIMATE. HOWARD COUNTY TRAFFIC SHALL FIELD APPROVE OR MARK ALL SIGN LOCATIONS PRIOR TO ANY SIGNS BEING INSTALLED. CALL 410-313-5752.  
 TRAFFIC CONTROL DEVICES:  
 1. THE TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2430) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES.  
 2. ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE 'MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES' (MUTCD).  
 3. ALL SIGN POST USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, ("QUICK PUNCH") SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED SQUARE TUBE SLEEVE (12 GAUGE - 3' LONG). THE ANCHOR SHALL NOT EXTEND MORE THAN TWO ("QUICK PUNCH") HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON THE TOP OF EACH POST.

CHARLES F. HILL JR.  
 TM. 16 P. 116  
 LOT 9  
 L. 4096 F. 672  
 PLAT 474  
 USE: RESIDENTIAL

NICHOLAS KARIM SCHUYLER  
 TM. 16 P. 163  
 LOT 7  
 L. 15414 F. 408  
 PLAT 474  
 USE: RESIDENTIAL

DAVID J. SCHIMIAN  
 TM. 16 P. 134  
 LOT 3  
 L. 2015 F. 642  
 USE: RESIDENTIAL

AREA 1  
 NECESSARY DISTURBANCE  
 SEE GENERAL NOTE 41,  
 SHEET 2

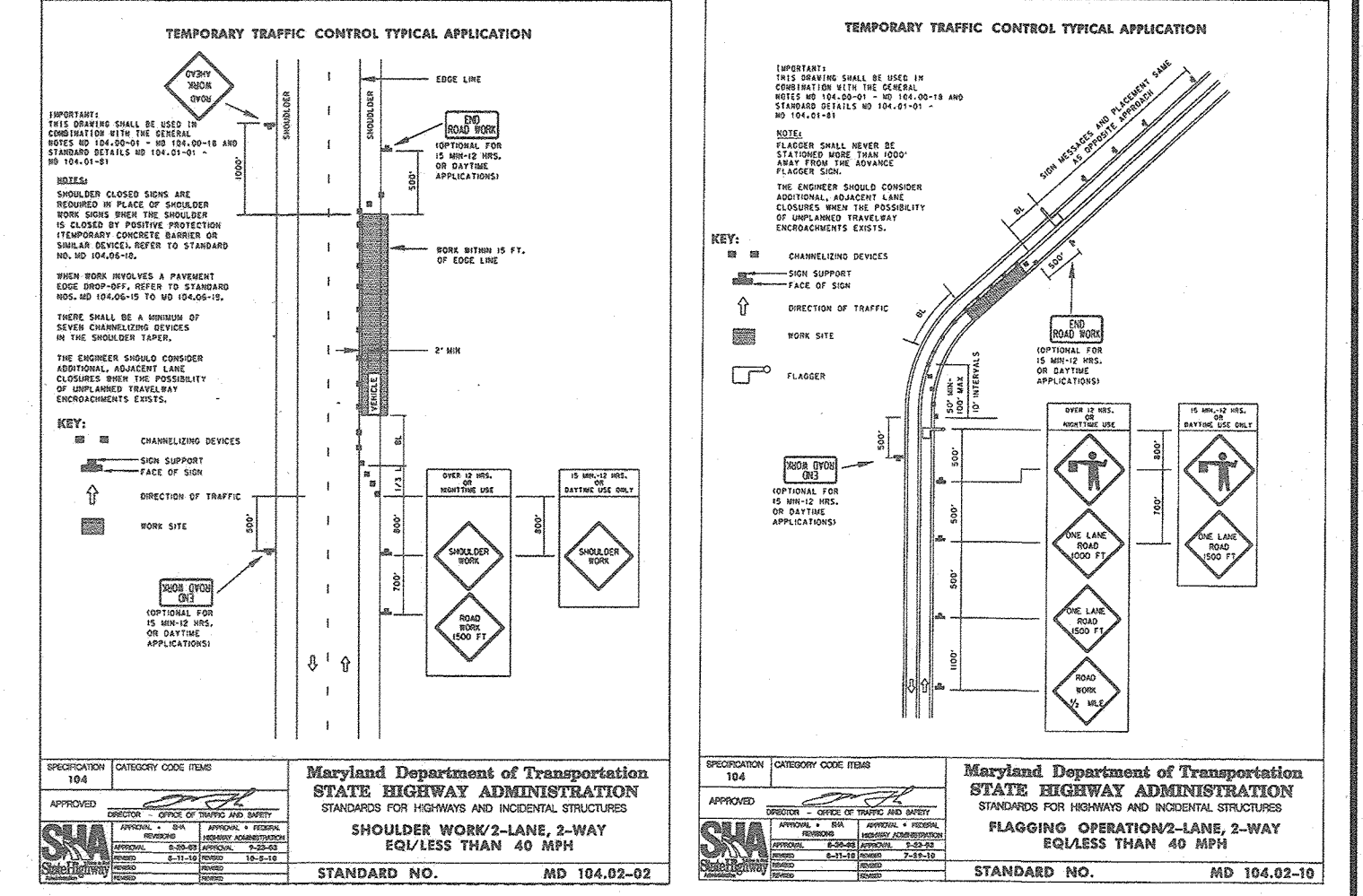
F-21-011  
 APFO MITIGATION NOTE  
 REQUIRED EXCLUSIVE RIGHT TURN LANE  
 FROM EXISTING MARRIOTTVILLE ROAD

**NOTE "E"**  
 1. STOP BAR AT MARRIOTTVILLE ROAD AND STARLIGHT PLACE TO BE DETERMINED IN THE FIELD BY THE TRAFFIC ENGINEER.  
 2. ALL PAVEMENT MARKINGS SHALL BE LAID OUT BY HOWARD COUNTY TRAFFIC ENGINEERING. CALL 410-313-5752.

**PAVEMENT MARKING LEGEND**  
 A. INSTALL 5 IN. WIDE WHITE SOLID PAVEMENT MARKING FOR LANE LINE.  
 B. END 5 IN. WIDE DOUBLE YELLOW CENTER LINE PAVEMENT MARKING.  
 C. INSTALL 5 IN. WIDE DOUBLE YELLOW PAVEMENT MARKING - FOR CENTER LINE.  
 D. INSTALL 24 IN. WIDE WHITE SOLID PAVEMENT MARKING FOR STOP LINE. SEE NOTE "E".  
 E. REMOVE EXISTING PAVEMENT MARKINGS BY GRINDING.  
 H. TIE TO EXISTING MARKINGS.

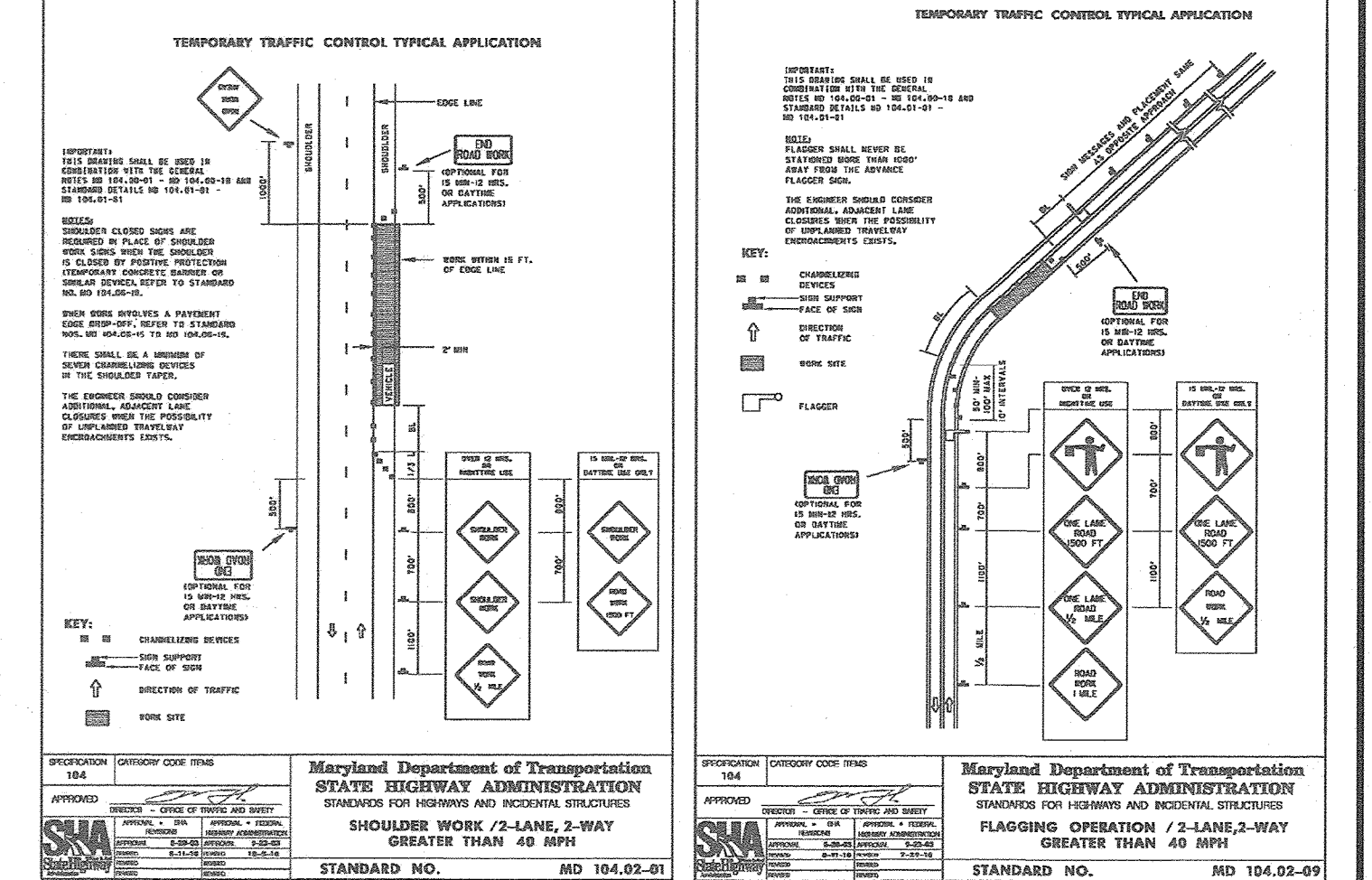
STARLIGHT PLACE, INTERIM ALBETH ROAD  
 AND MARRIOTTVILLE ROAD  
 PAVEMENT MARKING PLAN  
 SCALE: 1" = 30'

NOTE: REFER TO SHEET 59 AND 60 FOR MARRIOTTVILLE ROAD WIDENING UNDER F-21-033 AND CAPITAL PROJECT J4215



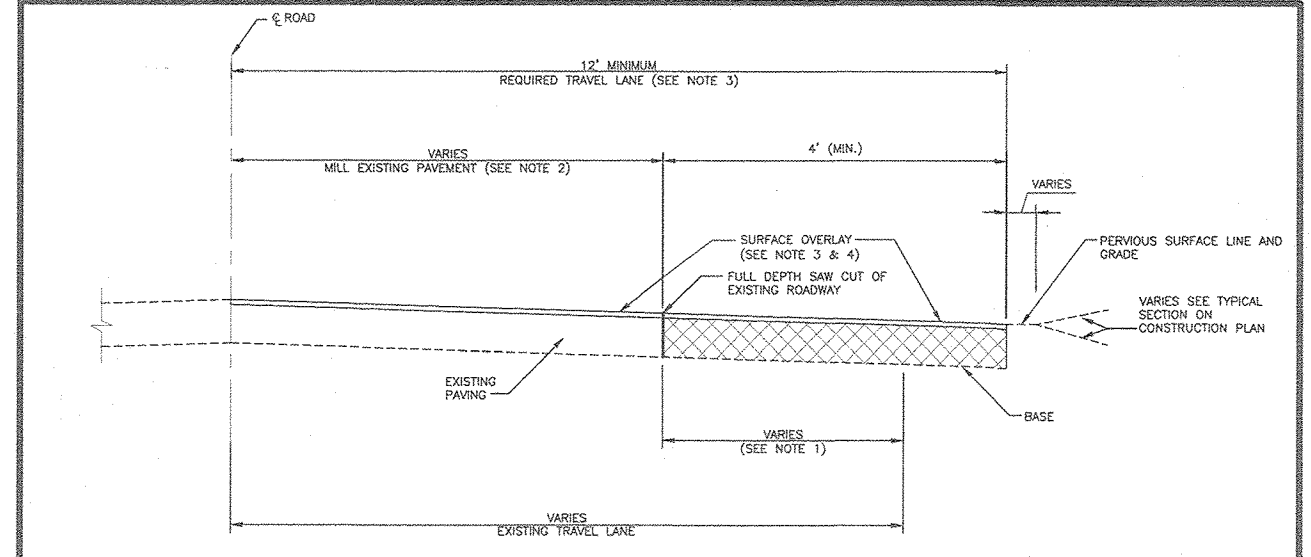
**ALBETH ROAD**  
 TYPICAL WORK ZONE  
 TRAFFIC CONTROL DETAILS

ALL WORK WITHIN THE ALBETH ROAD PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE STANDARD MARYLAND STATE HIGHWAY ADMINISTRATION DETAILS: MD 104.02-10 OR AS DIRECTED BY THE HOWARD COUNTY - TRAFFIC ENGINEERING DIVISION.



**MARRIOTTVILLE ROAD**  
 TYPICAL WORK ZONE  
 TRAFFIC CONTROL DETAILS

ALL WORK WITHIN THE MARRIOTTVILLE ROAD PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE STANDARD MARYLAND STATE HIGHWAY ADMINISTRATION DETAILS: MD 104.02-01 AND MD 104.02-02 AS DIRECTED BY THE HOWARD COUNTY - TRAFFIC ENGINEERING DIVISION.



**NOTES:**  
 1. WHEN EXISTING TRAVEL LANE IS LESS THAN THE REQUIRED 11' TURN LANE, CONTRACTOR SHALL REDUCE A MINIMUM OF 1" FULL DEPTH OF THE EXISTING ROADWAY IF CURB AND GUTTER IS PROVIDED, PROVIDE A MINIMUM OF 4" OF RESURFACING FROM FACE OF EXISTING ROAD.  
 2. THE EXISTING PAVEMENT TO BE RESURFACED SHALL BE MILLED AT DEPTH OF 1.127" (MINIMUM).  
 3. THE RESURFACING SHALL BE PLACED TO THE CENTERLINE OF THE ROADWAY.  
 4. RESURFACING COURSE TO BE EQUAL TO THE SURFACE COURSE OF THE ROADWAY, PRESENT SECTION.

Howard County, Maryland  
 Department of Public Works  
 Name: *Proprietary & Confidential*  
 Date: 09/14/2022

Existing Roadway Widening Strip  
 Detail R-1.08

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 STARLIGHT PLACE, INTERIM ALBETH ROAD &  
 MARRIOTTVILLE ROAD PAVEMENT MARKING PLAN  
 AND MAINTENANCE OF TRAFFIC DETAILS  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF CHAPEL GATE WOODS, NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRID: 10 L. 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
 +  
**TIMMONS GROUP**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 P: 410.461.7656 F: 410.461.8961 www.timmons.com

DESIGN BY: ES, RHY  
 DRAWN BY: VE+TG  
 CHECKED BY: RHY  
 DATE: SEPTEMBER 2022  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 49220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16183, EXPIRATION DATE: 09-27-2022

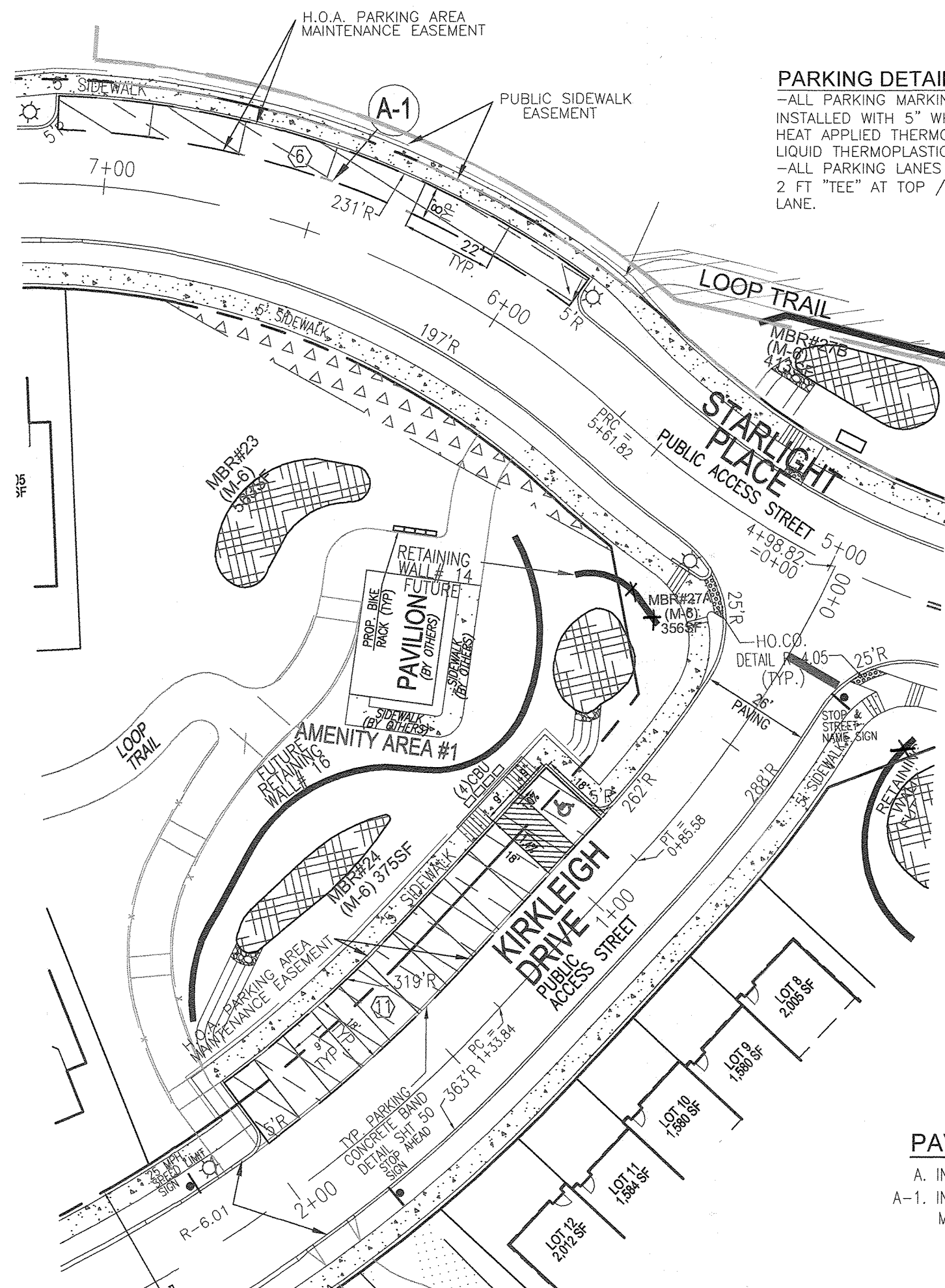
9 SHEET 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*James*  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/14/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Shelley*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9/21/22

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Shelley*  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/21/22

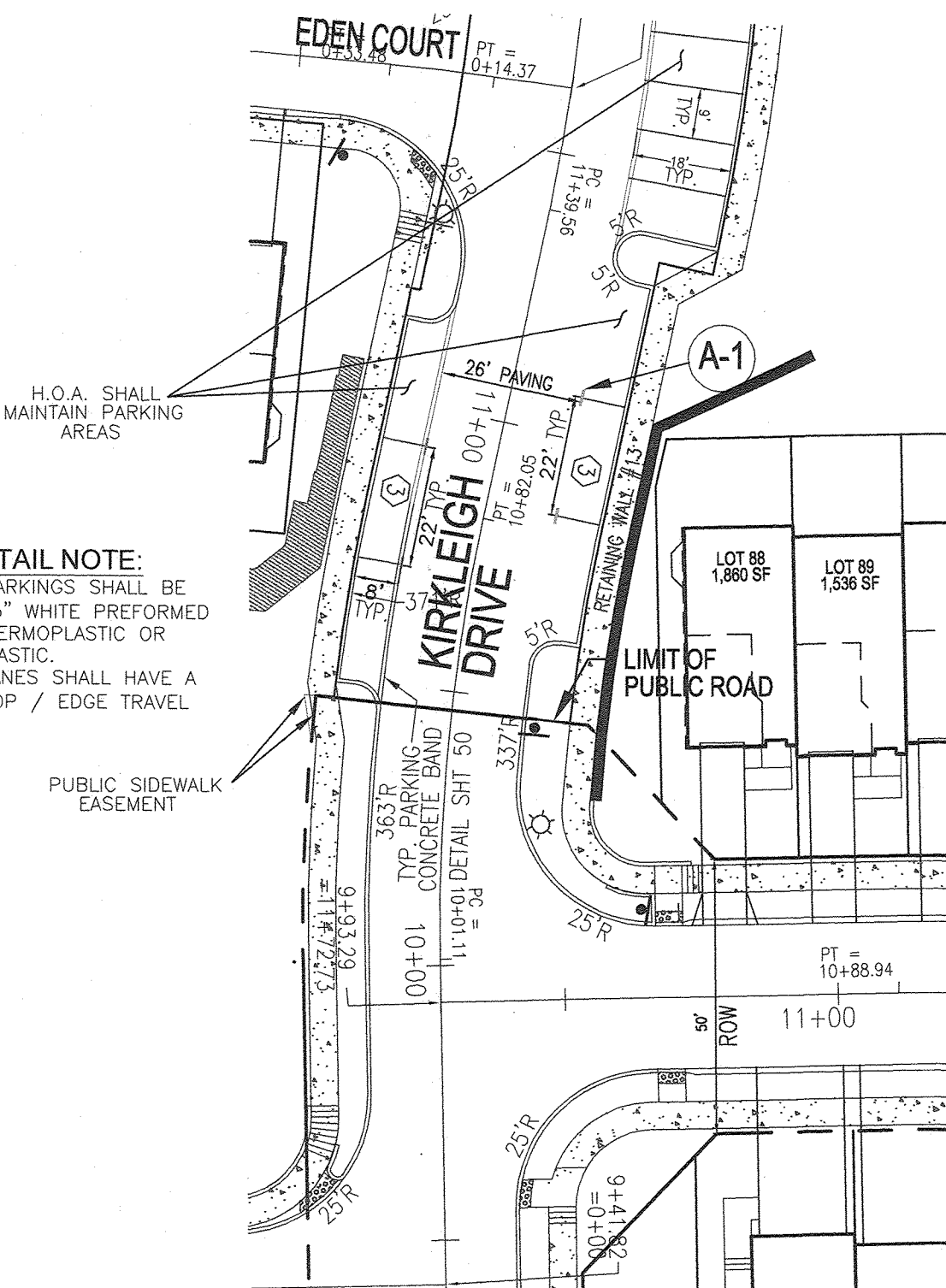




KIRKLEIGH DR. / STARLIGHT PL. HEAD-IN & PARALLEL PARKING DETAIL  
SCALE 1"=30'

**PARKING DETAIL NOTE:**  
-ALL PARKING MARKINGS SHALL BE INSTALLED WITH 5" WHITE PREFORMED HEAT APPLIED THERMOPLASTIC OR LIQUID THERMOPLASTIC.  
-ALL PARKING LANES SHALL HAVE A 2 FT "TEE" AT TOP / EDGE TRAVEL LANE.

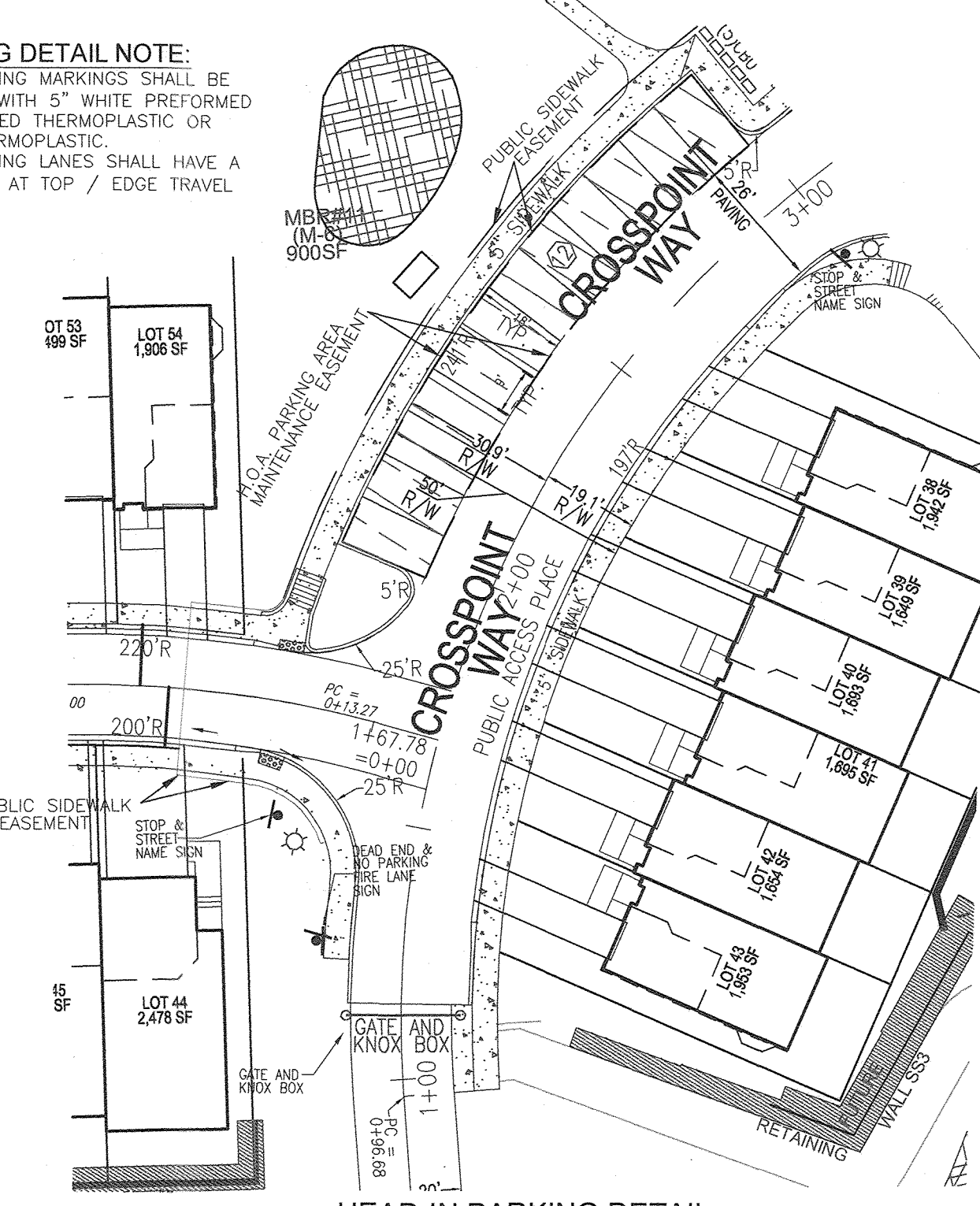
**PAVEMENT MARKING LEGEND**  
A. INSTALL 5 IN. WIDE WHITE SOLID PAVEMENT MARKING FOR SPACE LINE.  
A-1. INSTALL 5 IN. WIDE WHITE SOLID PAVEMENT MARKING FOR PARALLEL PARKING SPACES (3FT IN LENGTH)



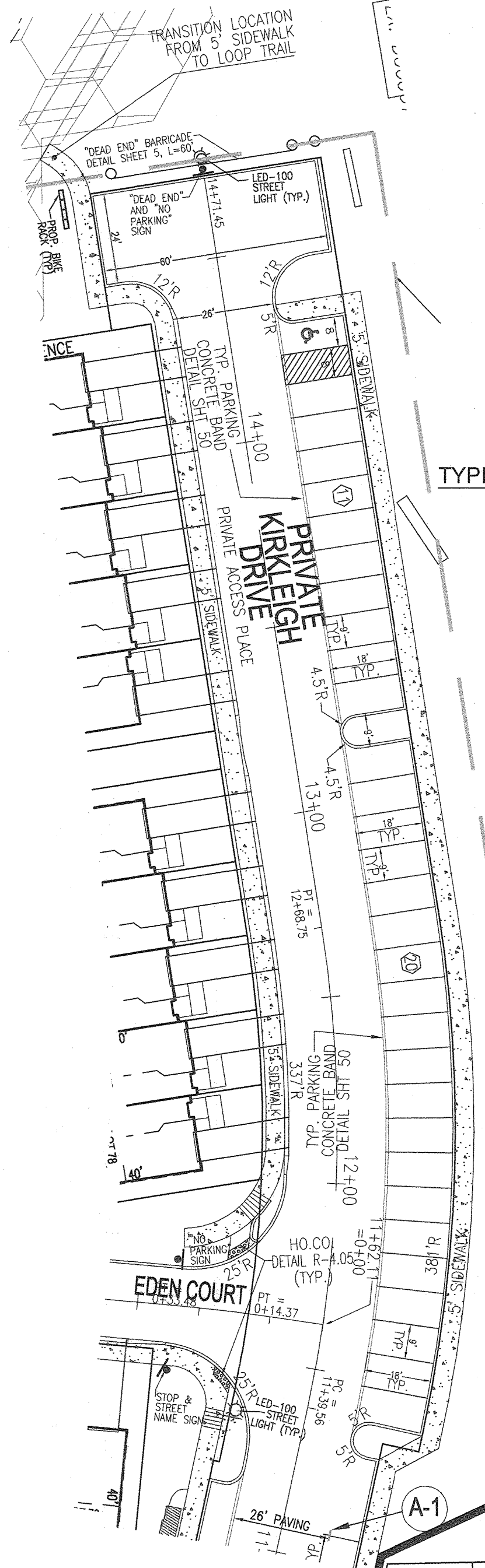
KIRKLEIGH DR. / EDEN COURT TYPICAL PARALLEL PARKING DETAIL  
SCALE 1"=30'

**PARKING DETAIL NOTE:**  
-ALL PARKING MARKINGS SHALL BE INSTALLED WITH 5" WHITE PREFORMED HEAT APPLIED THERMOPLASTIC OR LIQUID THERMOPLASTIC.  
-ALL PARKING LANES SHALL HAVE A 2 FT "TEE" AT TOP / EDGE TRAVEL LANE.

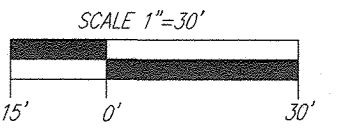
**PARKING DETAIL NOTE:**  
-ALL PARKING MARKINGS SHALL BE INSTALLED WITH 5" WHITE PREFORMED HEAT APPLIED THERMOPLASTIC OR LIQUID THERMOPLASTIC.  
-ALL PARKING LANES SHALL HAVE A 2 FT "TEE" AT TOP / EDGE TRAVEL LANE.



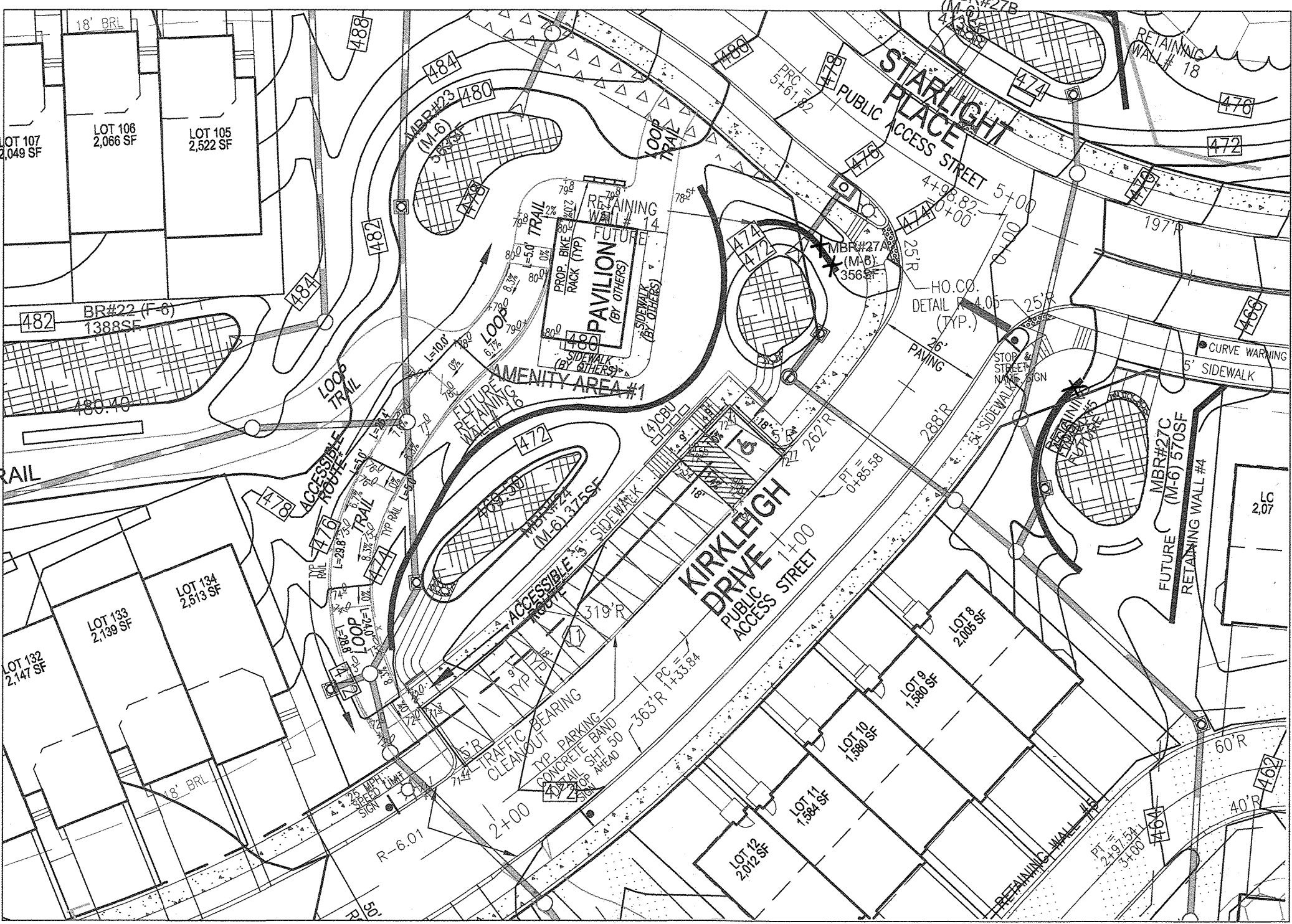
HEAD-IN PARKING DETAIL  
SCALE 1"=30'



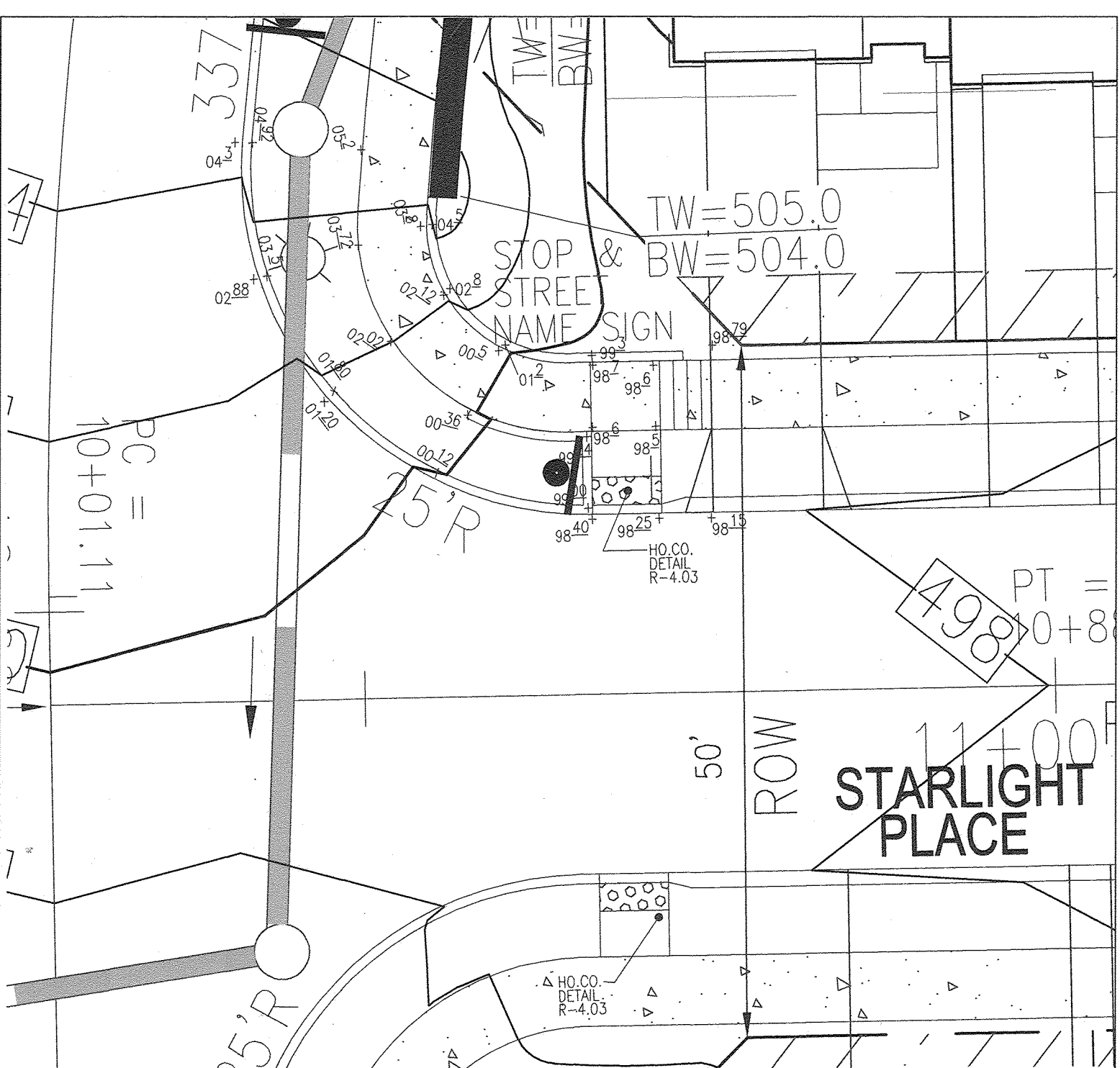
KIRKLEIGH DRIVE TYPICAL HEAD-IN PARKING DETAIL  
SCALE 1"=30'



**PARKING DETAIL NOTE:**  
-ALL PARKING MARKINGS SHALL BE INSTALLED WITH 5" WHITE PREFORMED HEAT APPLIED THERMOPLASTIC OR LIQUID THERMOPLASTIC.  
-ALL PARKING LANES SHALL HAVE A 2 FT "TEE" AT TOP / EDGE TRAVEL LANE.

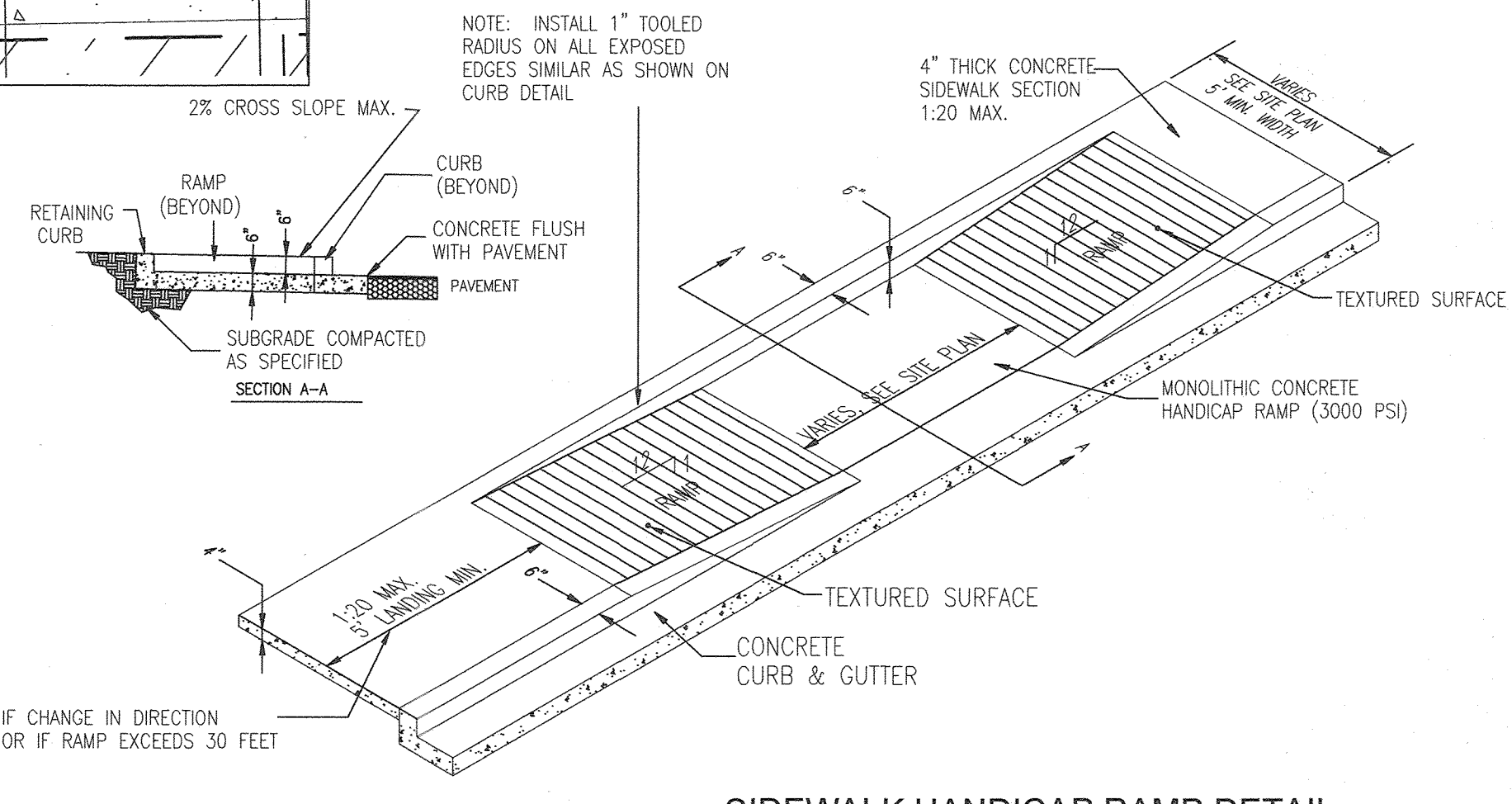


PAVILION ACCESSIBLE ROUTE PLAN  
SCALE 1"=30'

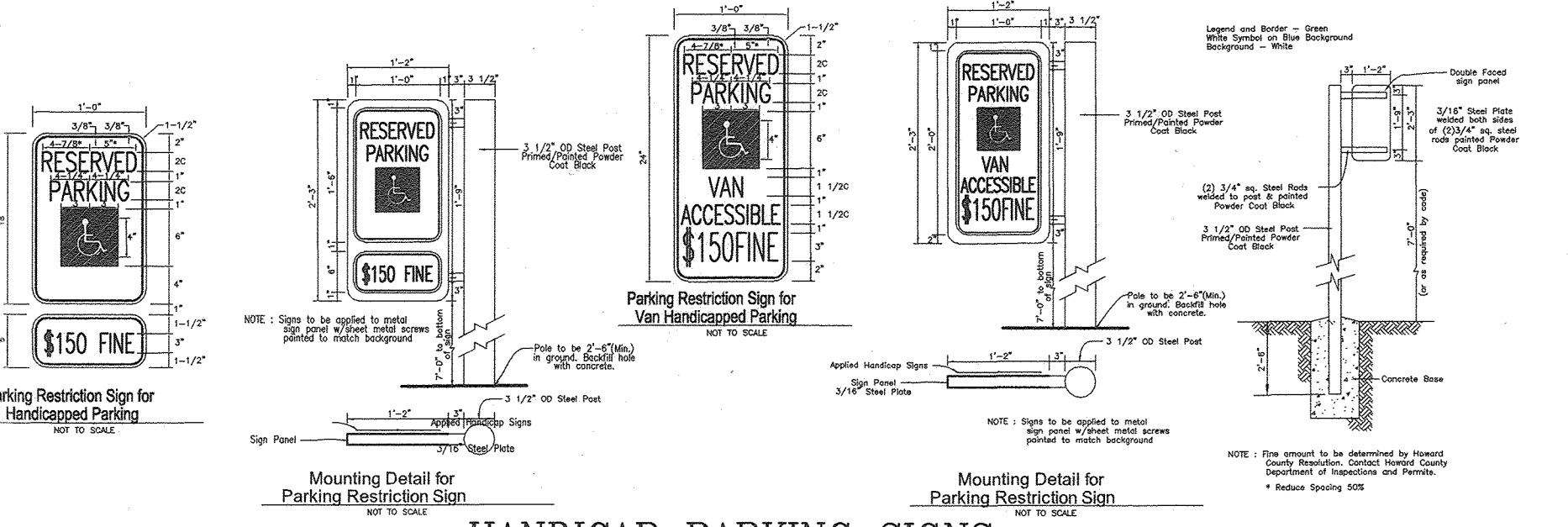


TYPE B RAMP - STARLIGHT @ KIRKLEIGH  
SCALE 1"=10'

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008



SIDEWALK HANDICAP RAMP DETAIL  
NOT TO SCALE



HANDICAP PARKING SIGNS  
(NOT TO SCALE)

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 09/14/2022  
 CHIEF, BUREAU OF HIGHWAYS MK  
 APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 9/21/22  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 APPROVED: [Signature] 9/26/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT

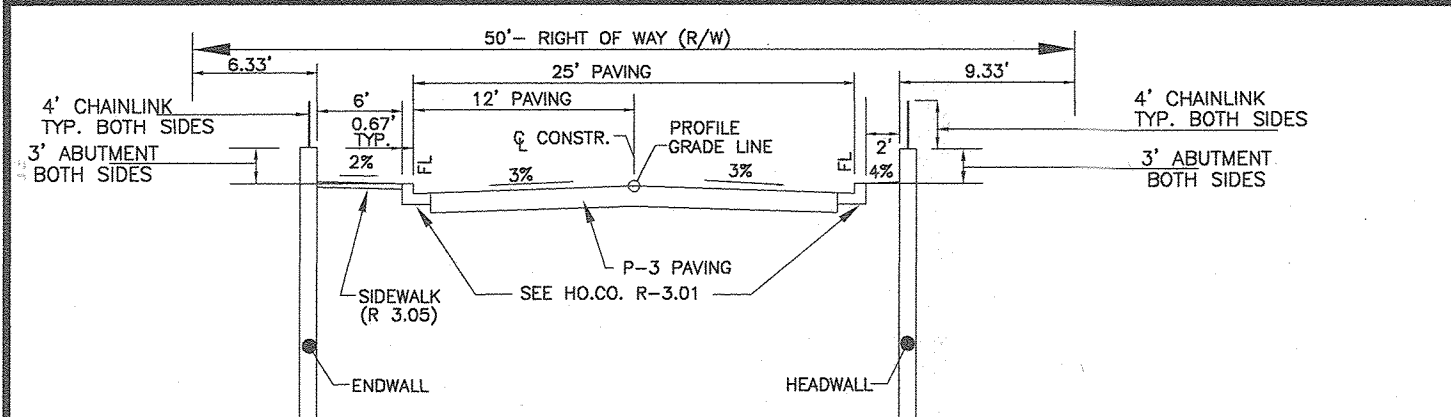
NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDERS SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	8-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 PARKING AREA DETAILING AND PAVILION ACCESSIBLE ROUTE  
**CHAPELGATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 PLATS: 23942 & 23954 L 1389/F 339 (P. 110)  
 T&M MAP: 18 GRID: 10 L 4163/F 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

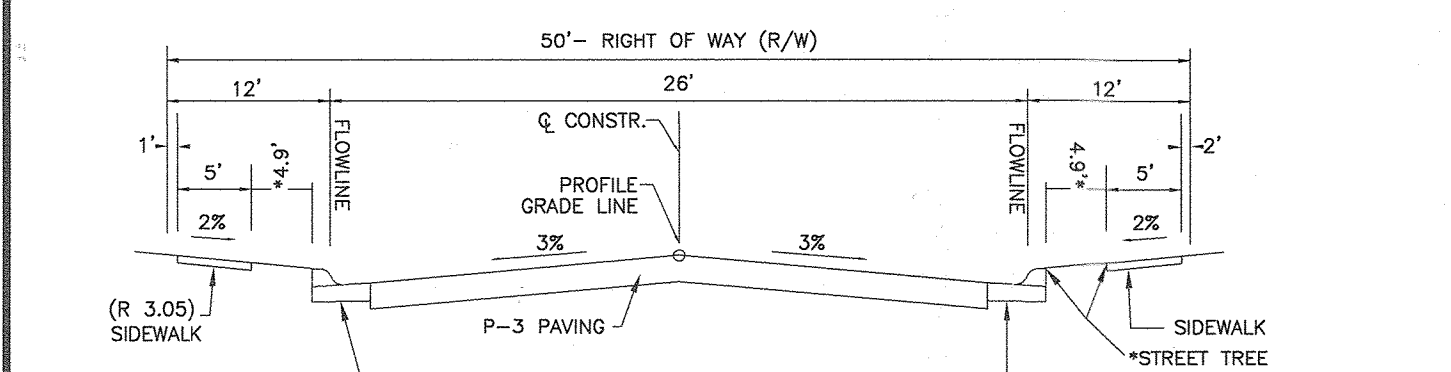
PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022.  
 DESIGN BY: ES, RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220  
 10 SHEET OF 101





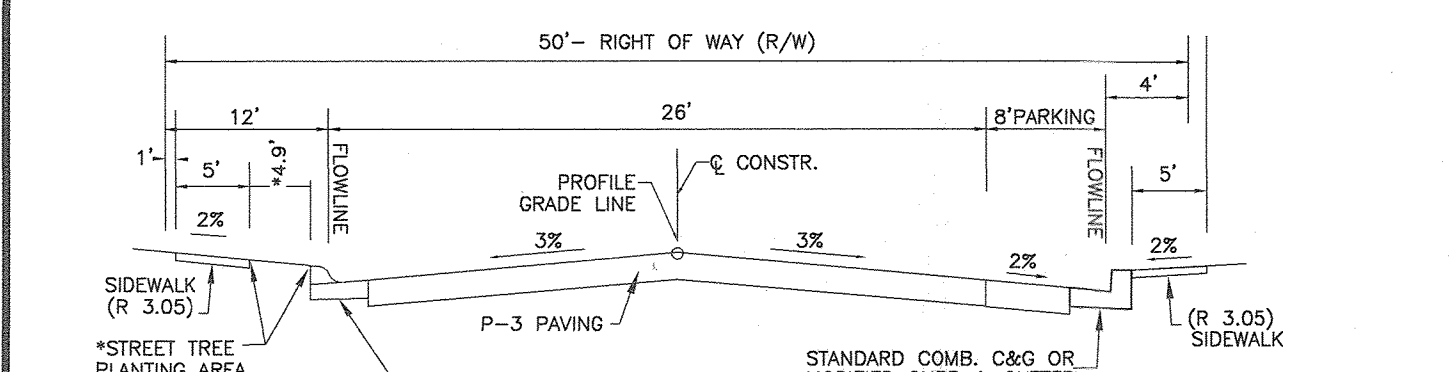
STARLIGHT PLACE  
NON-TYPICAL ROADWAY SECTION  
CLASSIFICATION: PUBLIC ACCESS STREET  
SECTION NOT TO SCALE  
14+00.0 - 24+00.0

REFER TO SHEET 2, GENERAL NOTE 51, REGARDING THE APPROVED DESIGN MANUAL WAIVER



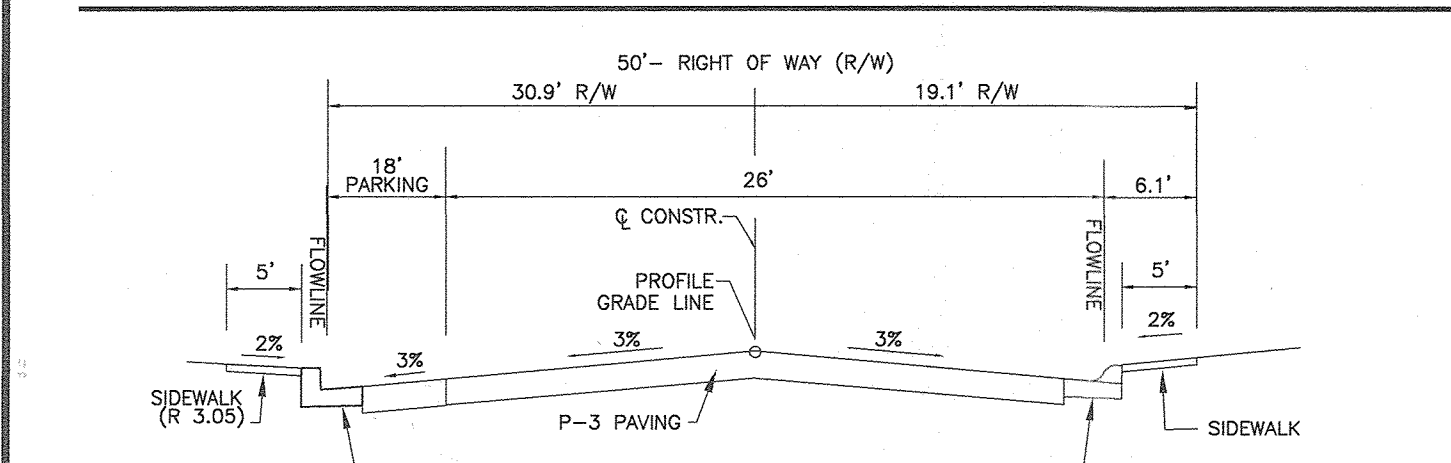
STARLIGHT PLACE  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PUBLIC ACCESS STREET  
SECTION NOT TO SCALE  
24+00.0 - 54+85.2  
74+00.0 - 74+14.8

\* REFER TO THE STREET TREE NOTES ON SHEET 37.



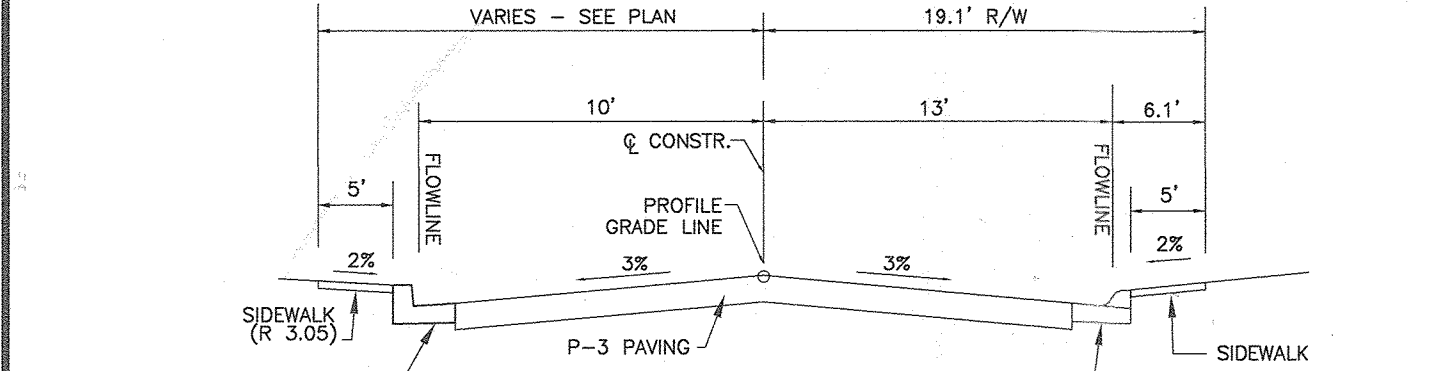
STARLIGHT PLACE  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PUBLIC ACCESS STREET  
SECTION NOT TO SCALE  
54+85.2 - 74+14.8

\* REFER TO THE STREET TREE NOTES ON SHEET 37.



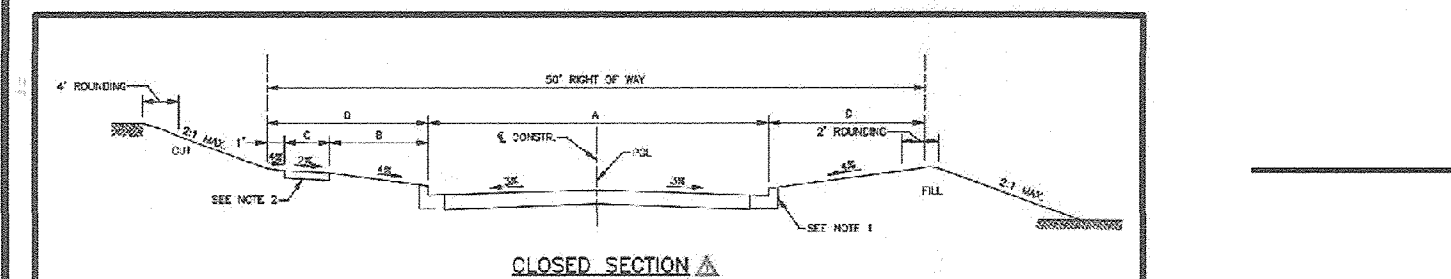
CROSSPOINT WAY  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PRIVATE ACCESS PLACE  
SECTION NOT TO SCALE  
2+00.0 - 34+00.0

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



CROSSPOINT WAY  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PRIVATE ACCESS PLACE  
SECTION NOT TO SCALE  
11+15.0 - 14+63.468

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



CLOSED SECTION A

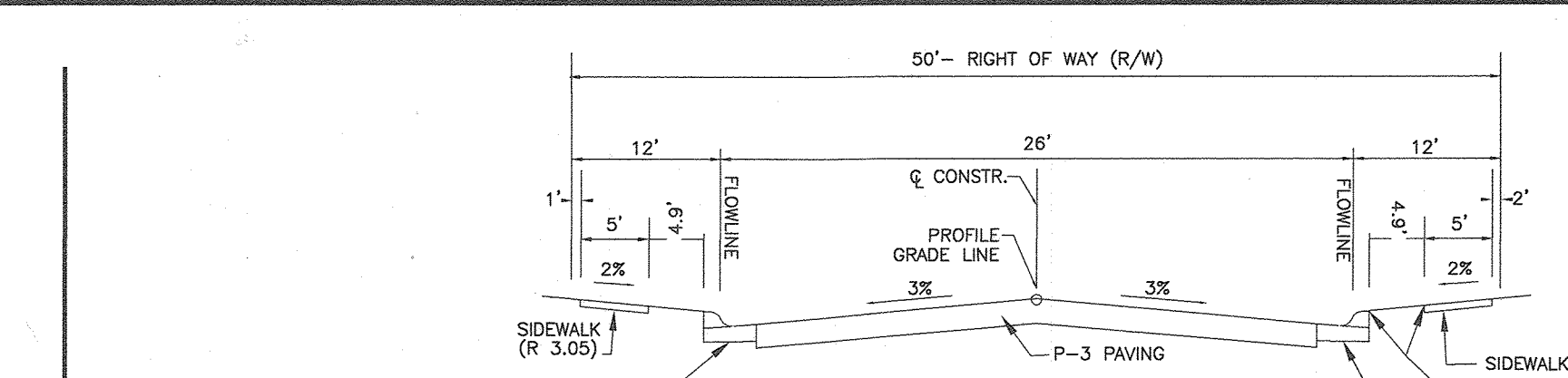
SECTION	ROAD AND STREET CLASSIFICATION	SECTION NOT TO SCALE	DATE
P-1	RESIDENTIAL DRIVEWAY ENTRANCE	7' COMBINATION CURB AND GUTTER	12/07/2021
P-2	RESIDENTIAL DRIVEWAY ENTRANCE	7' COMBINATION CURB AND GUTTER	12/07/2021
P-3	RESIDENTIAL DRIVEWAY ENTRANCE	7' COMBINATION CURB AND GUTTER	12/07/2021
P-4	RESIDENTIAL DRIVEWAY ENTRANCE	7' COMBINATION CURB AND GUTTER	12/07/2021

TYPICAL SECTIONS - RESIDENTIAL STREETS  
Access Place, Access Streets, Minor Collector (Closed Section)

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
DATE: 12/07/2021

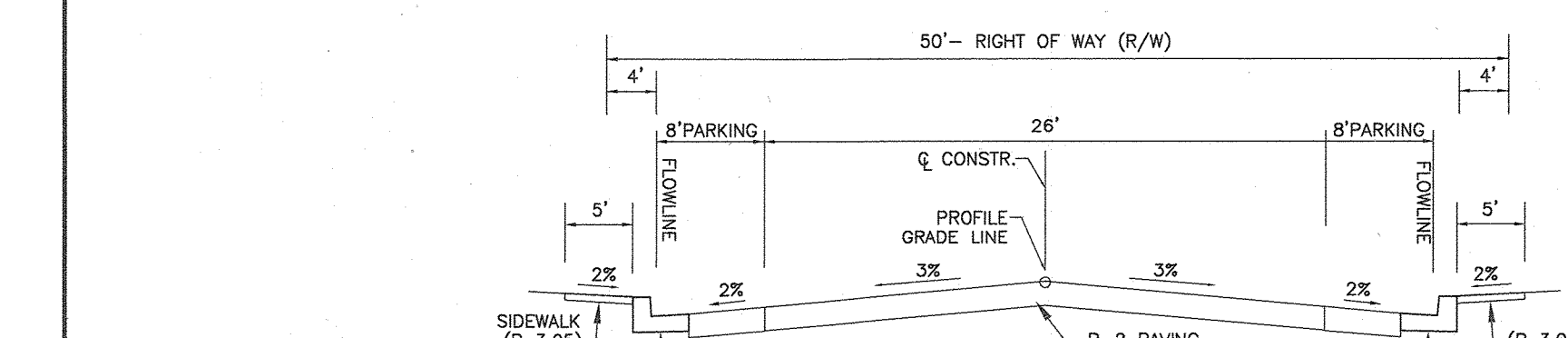
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
DATE: 12/28/21

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
DATE: 1/31/22



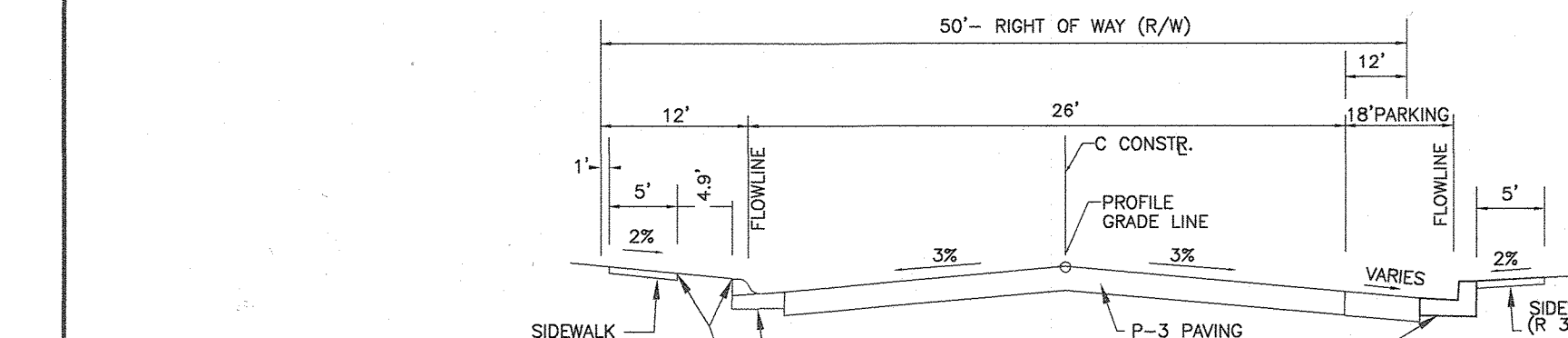
KIRKLEIGH DRIVE  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PUBLIC ACCESS STREET  
SECTION NOT TO SCALE  
24+00.0 - 104+00.0

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



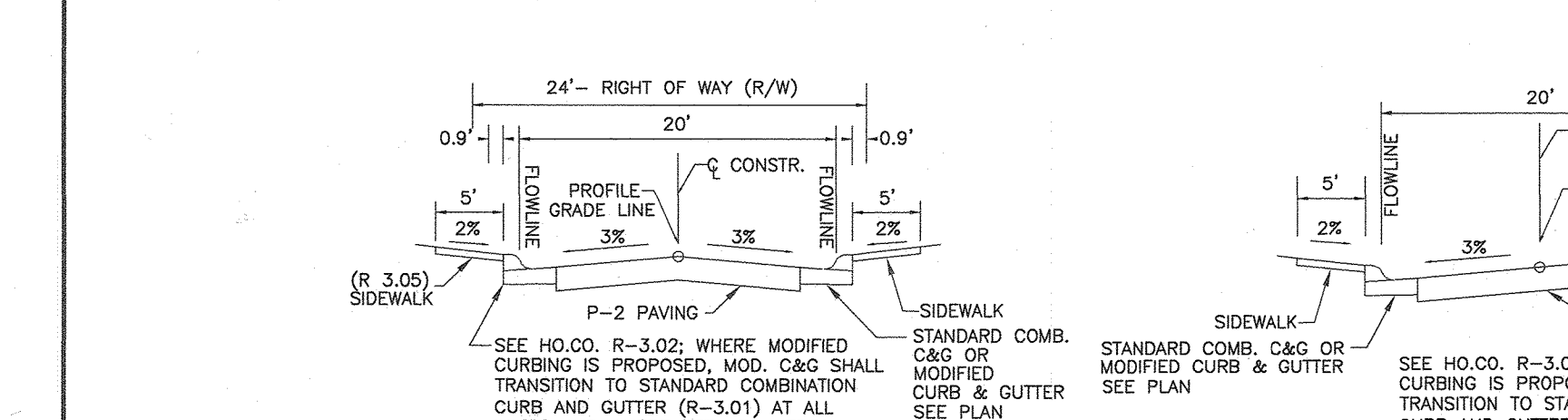
KIRKLEIGH DRIVE  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PRIVATE ACCESS STREET  
SECTION NOT TO SCALE  
104+00.0 - 111+30.0

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



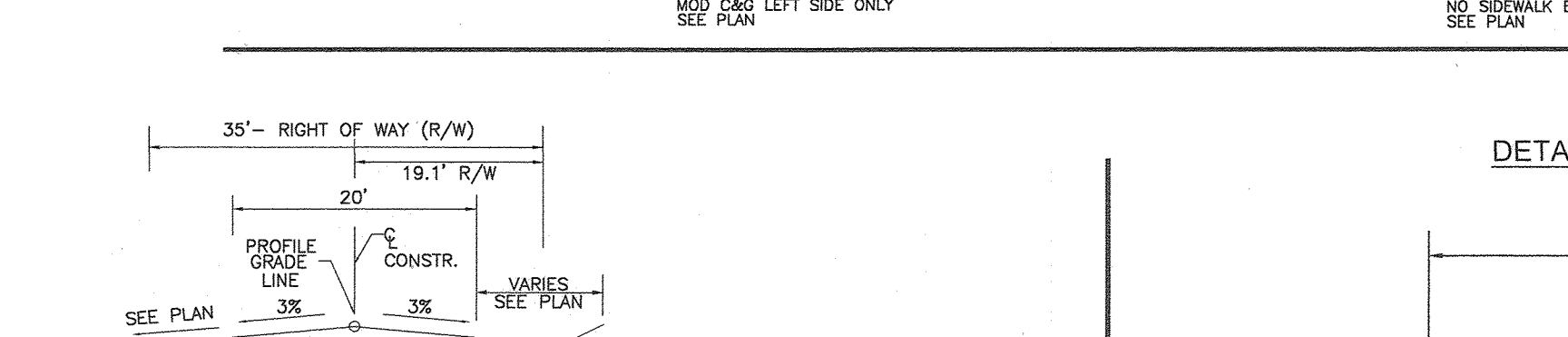
KIRKLEIGH DRIVE  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PRIVATE ACCESS STREET  
SECTION NOT TO SCALE  
111+30.0 - 144+71.458

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



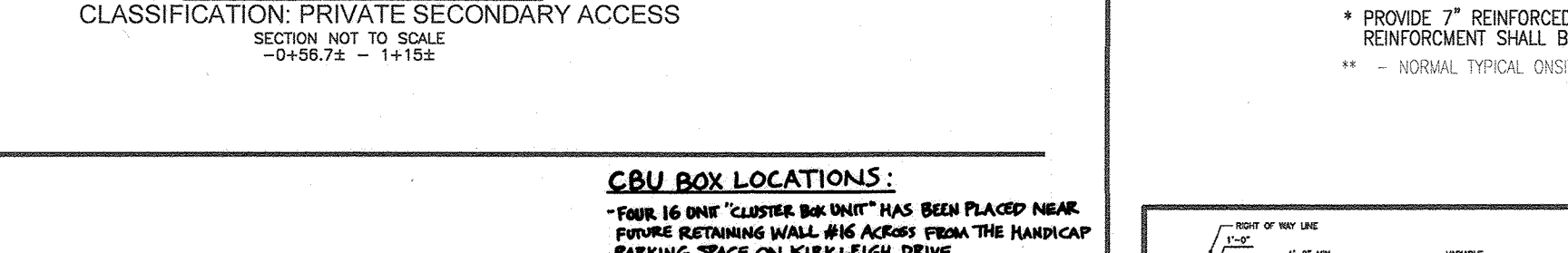
PRIVATE ALLEY  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PRIVATE ALLEY  
SECTION NOT TO SCALE  
KEYSTONE LANE: 0+00.0 - 2+71  
SUMMER WOODS PLACE: 0+00.0 - 1+73.50  
WELCOME WAY: 0+00.0 - 1+30.0  
NO SIDEWALK BEYOND 1+30.0  
SEE PLAN

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON

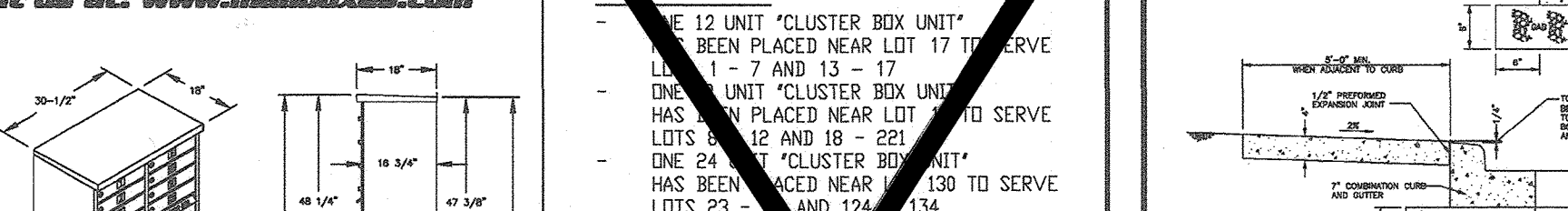


PRIVATE FIRE ROAD  
TYPICAL ROADWAY SECTION  
CLASSIFICATION: PRIVATE SECONDARY ACCESS  
SECTION NOT TO SCALE  
0+58.74 - 1+15.0

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON

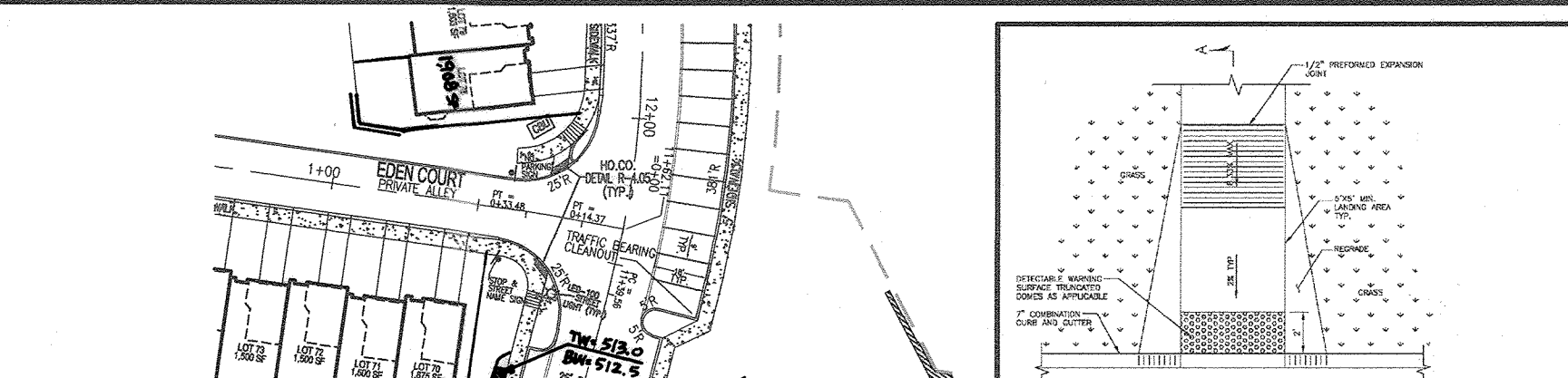


TYPICAL CENTRAL MAIL DELIVERY BOX (CBU) OR APPROVED EQUAL



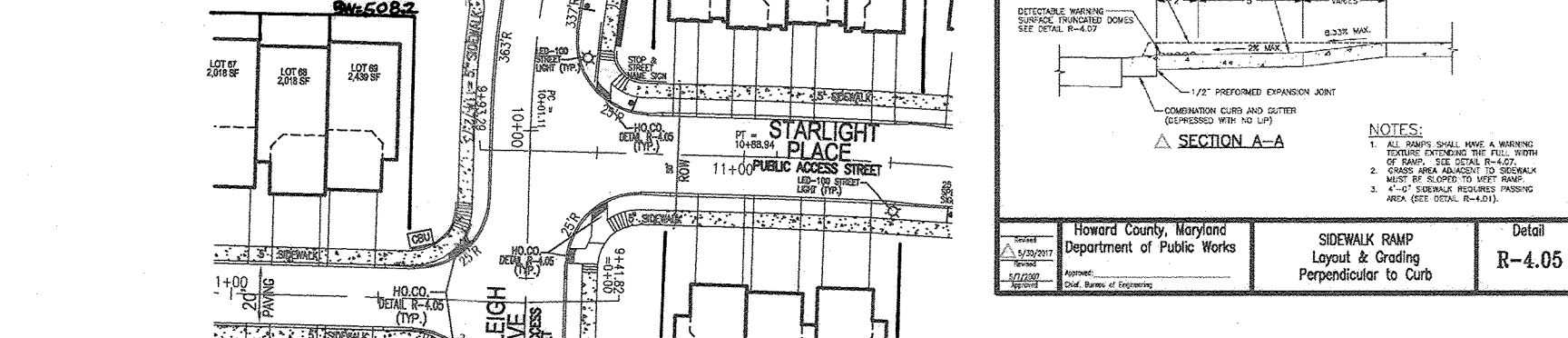
Visit us at: www.mailboxes.com

SALSBUURY INDUSTRIES MANUFACTURES CBU'S THAT ARE OFFICIALLY LICENSED BY THE U.S.P.S. SALSBUURY 3300 SERIES CLUSTER BOX UNITS ARE MANUFACTURED TO U.S.P.S. "T" SPECIFICATIONS. THEY ARE AN OFFICIALLY LICENSED PRODUCT OF THE U.S. POSTAL SERVICE FOR CENTRALIZED MAIL DELIVERY. LICENSE NUMBER 1CD5E0-08-B-0026



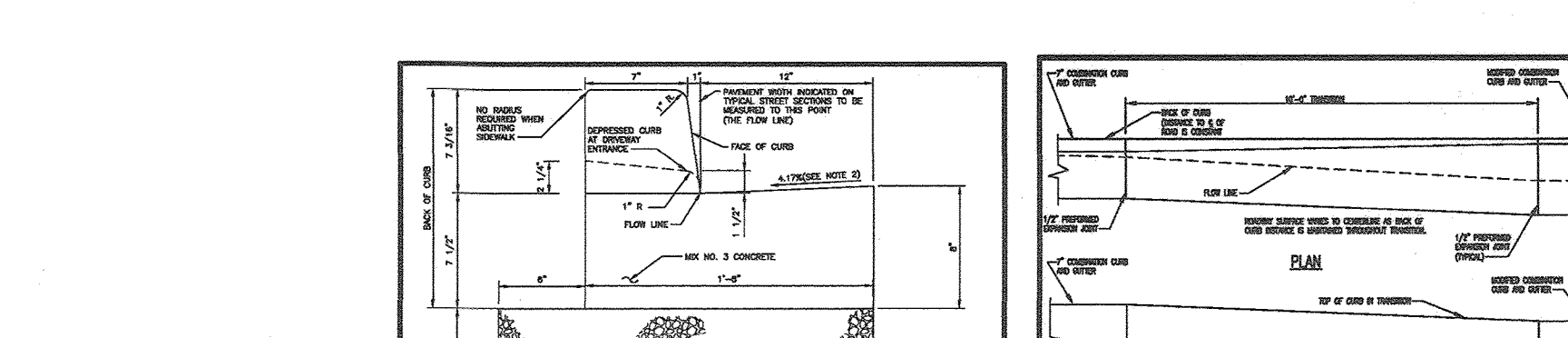
TYPICAL SIDEWALK RAMP DETAIL  
SCALE 1" = 60"

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



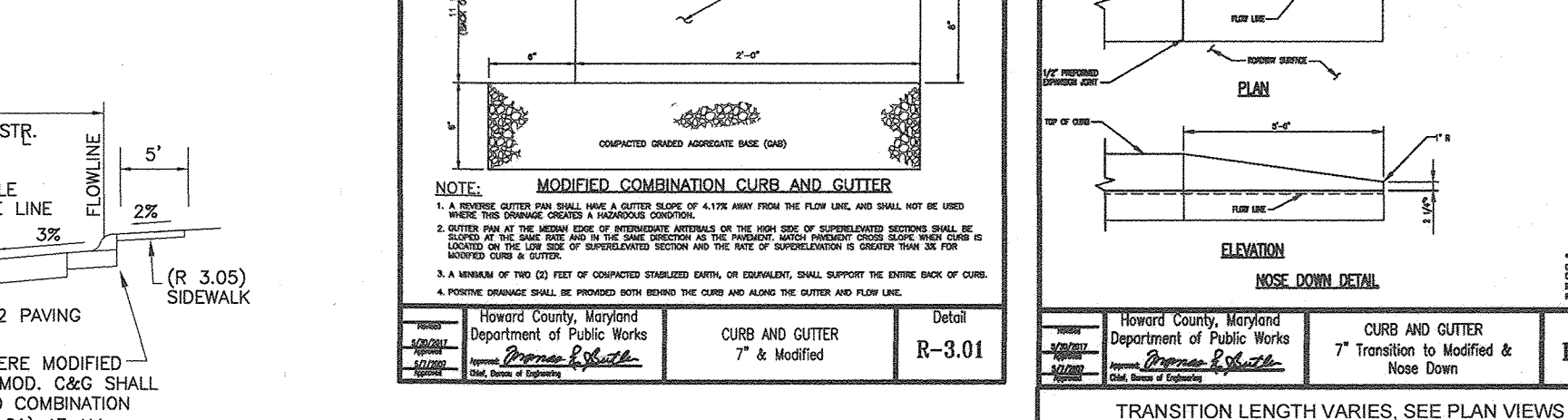
TYPICAL SIDEWALK RAMP DETAIL  
SCALE 1" = 60"

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



7' COMBINATION CURB AND GUTTER  
SECTION NOT TO SCALE

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



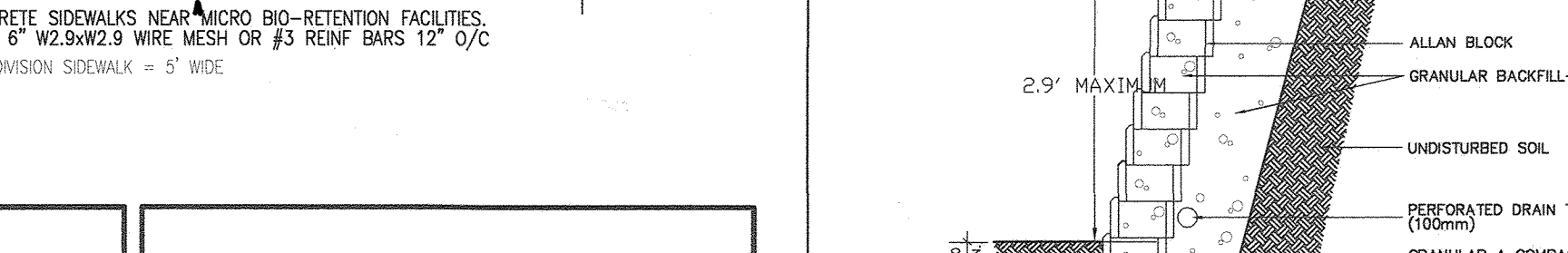
7' MODIFIED COMBINATION CURB AND GUTTER  
SECTION NOT TO SCALE

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON

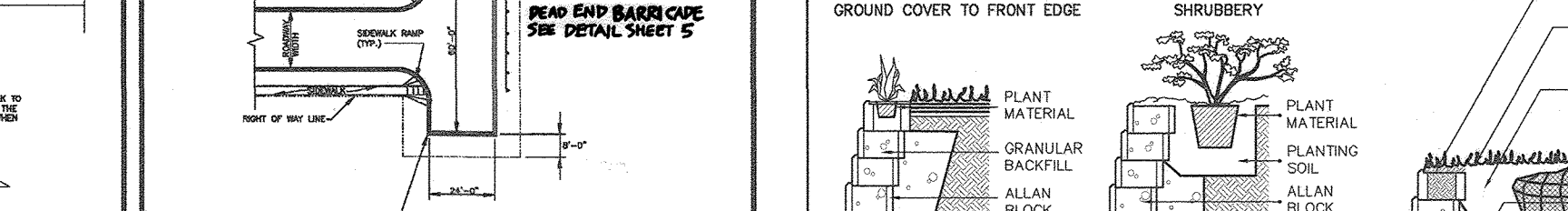


DETAIL - REINFORCED CONCRETE SIDEWALK  
NOT TO SCALE

SEE HO.CO. R-3.02; WHERE MODIFIED CURBING IS PROPOSED, MOD. C&G SHALL TRANSITION TO STANDARD COMBINATION CURB AND GUTTER (R-3.01) AT ALL INLETS AND WHERE DETAILED HEREON



DETAIL - REINFORCED CONCRETE SIDEWALK  
NOT TO SCALE



TYPICAL LANDSCAPE (<2.9') OR GRAVITY WALL OR EQUAL

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
DATE: 1/31/22

SECTION	ROAD AND STREET CLASSIFICATION	SECTION NOT TO SCALE	DATE
P-1	RESIDENTIAL DRIVEWAY ENTRANCE	7' COMBINATION CURB AND GUTTER	12/07/2021
P-2	RESIDENTIAL DRIVEWAY ENTRANCE	7' COMBINATION CURB AND GUTTER	12/07/2021
P-3	RESIDENTIAL DRIVEWAY ENTRANCE	7' COMBINATION CURB AND GUTTER	12/07/2021
P-4	RESIDENTIAL DRIVEWAY ENTRANCE	7' COMBINATION CURB AND GUTTER	12/07/2021

TYPICAL SECTIONS - RESIDENTIAL STREETS  
Access Place, Access Streets, Minor Collector (Closed Section)

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
DATE: 12/28/21

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
DATE: 1/31/22

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
DATE: 1/31/22

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DATE: 1/31/22

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
DATE: 1/31/22

REVISION: 1. REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDERS G-28-22. SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS

NO. REVISION DATE

FINAL ROAD CONSTRUCTION PLAN

DETAIL SHEET  
CHAPEL GATE WOODS  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E

RESUBDIVISION OF CHAPEL GATE WOODS BULK PARCEL E  
L. 1389/ F. 339 (P. 110)  
L. 4163/ F. 424 (P. 421)  
DATE: 2/24/21

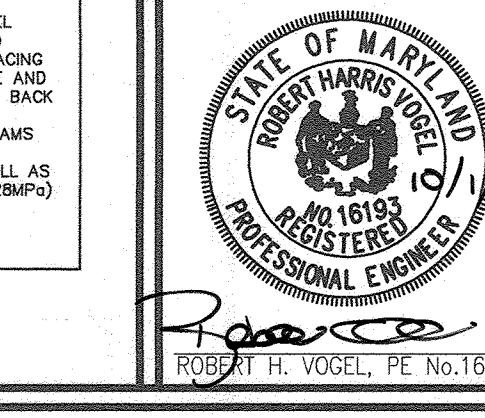
PARCELS: 110 & 421  
TAX MAP: 16 GRD: 10  
3RD ELECTION DISTRICT

ZONED: CEF-M  
HOWARD COUNTY, MARYLAND

VOGEL ENGINEERING  
TIMMONS GROUP

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

DESIGN BY: ES, RHY  
DRAWN BY: VE4-TQ  
CHECKED BY: RHY  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 49220



PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022



- LEGEND:**
- EXISTING CURB AND GUTTER
  - PROPOSED CURB AND GUTTER
  - EXISTING UTILITY POLE
  - EXISTING LIGHT POLE
  - EXISTING MAILBOX
  - EXISTING SIGN
  - EXISTING SANITARY MANHOLE
  - EXISTING SANITARY LINE
  - EXISTING CLEANOUT
  - EXISTING FIRE HYDRANT
  - EXISTING WATER LINE
  - PROPOSED STORM DRAIN
  - PROPOSED STORM DRAIN INLET
  - EXISTING TREELINE (FIELD LOCATED)
  - EXISTING VEGETATION
  - EXISTING FENCE
  - PROPERTY LINE
  - RIGHT-OF-WAY LINE
  - PROPOSED SIDEWALK
  - PUBLIC 100 YR FLOODPLAIN
  - EX. WETLAND
  - EX. WETLAND BUFFER
  - EX. STREAM
  - EX. STREAM BUFFER
  - LOOP TRAIL
  - VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
  - LIMIT OF DISTURBANCE
  - SOILS BOUNDARY
  - MODERATE SLOPES (15% - 24.99%)
  - STEEP SLOPE (>25%)
  - EXISTING FOREST CONSERVATION EASEMENT F-21-014
  - EXISTING PUBLIC 12' TRAIL EASEMENT F-21-014
  - EX. SPECIMEN TREE W/ CRITICAL ROOT ZONE
  - EX. SPECIMEN TREE TO BE REMOVED

**NOTE:**  
SILT FENCE IS TO BE REPLACED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.  
SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 25' APART.  
DOUBLE ROWS OF SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

**NOTE:**  
STABILIZATION IS TO BE DONE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS REQUIRED BY THE 2011 STDS. & SPECS, WHICHEVER IS MORE RESTRICTIVE.

MATCHLINE - SHEET 14  
MATCHLINE - SHEET 13

E 1339750  
N 594800

EARTH DIKE  
SILT FENCE  
SUPER SILT FENCE

CLEANWATER DIKE  
SEDIMENT CONTROL DRAINAGE DRAIN  
TIME OF CONCENTRATION PATH  
BAFFLEBOARD  
RP-RAP INFLOW PROTECTION  
RPS REMOVABLE PUMPING STATION

MARYLAND STATE GRID MERIDIAN

MARYLAND STATE GRID MERIDIAN

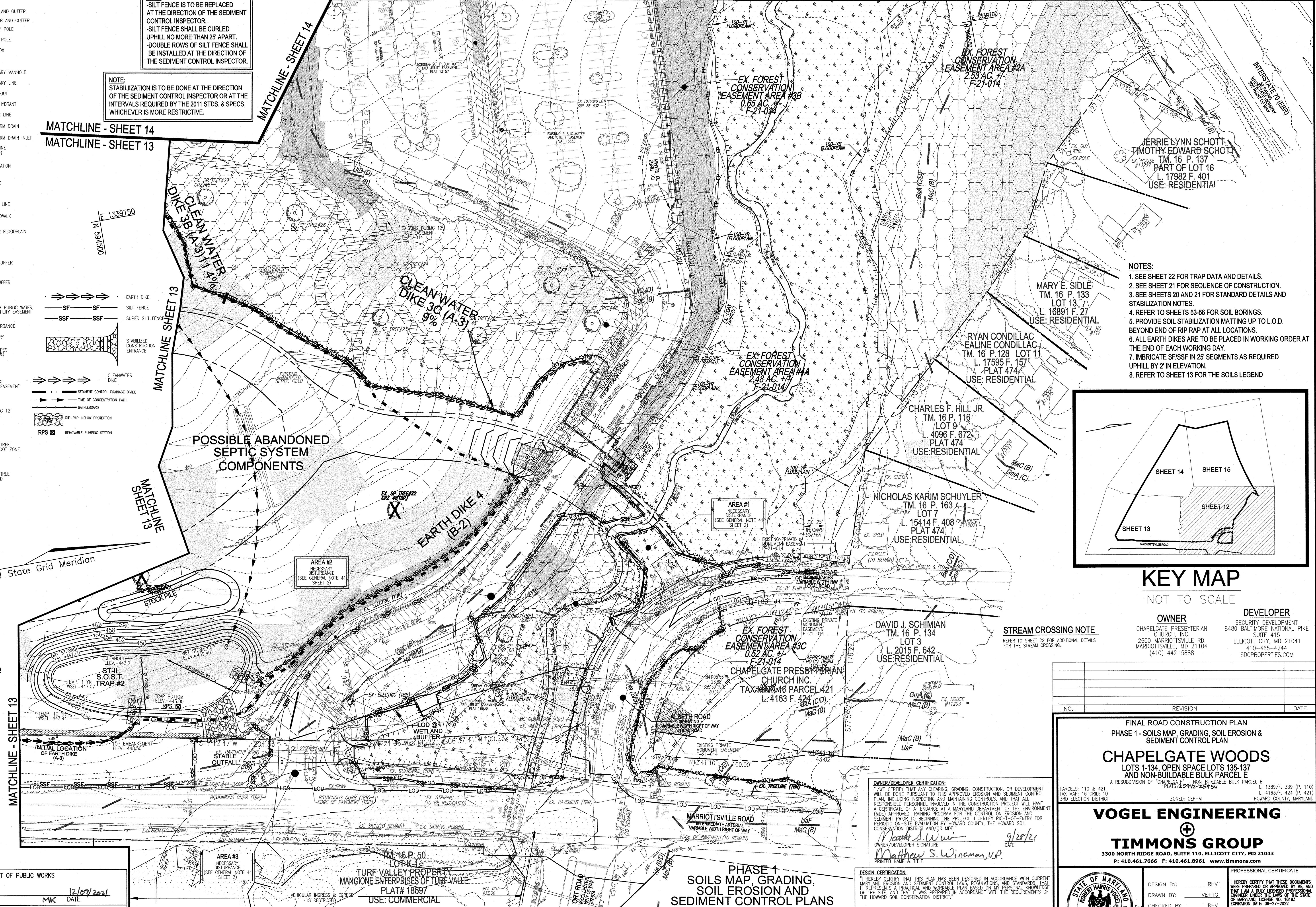
N 1340250  
N 594250

MATCHLINE - SHEET 13

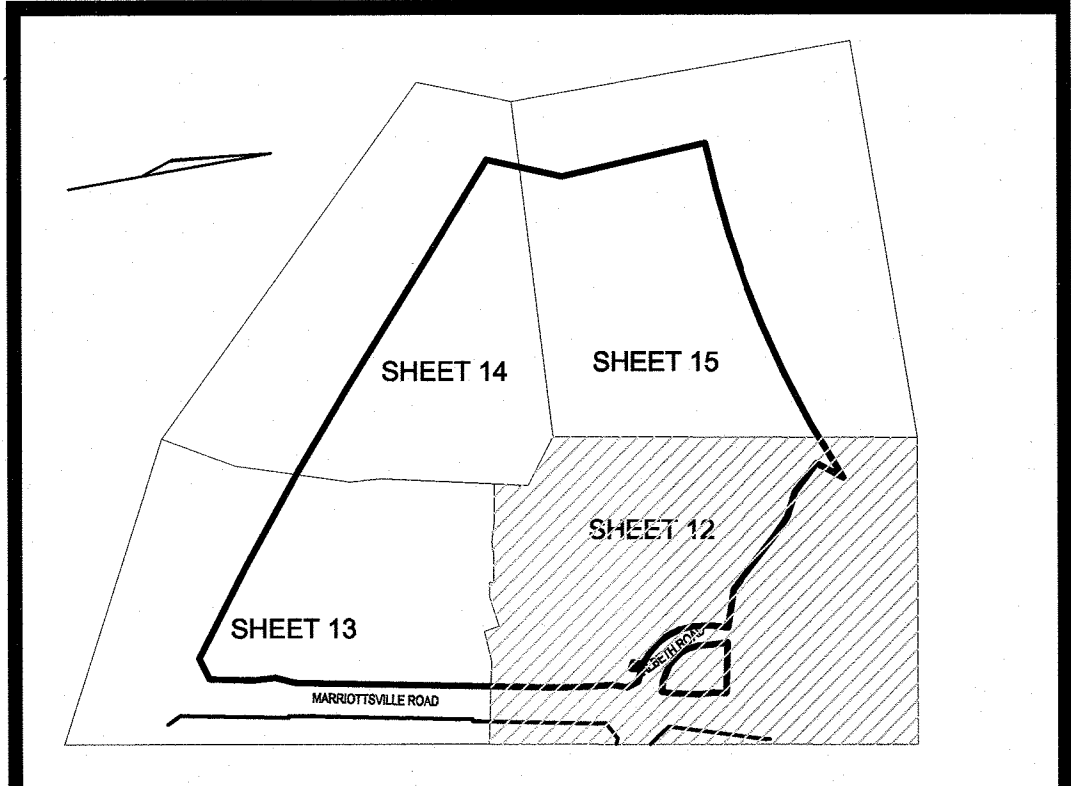
MATCHLINE - SHEET 13

MATCHLINE - SHEET 15

MATCHLINE - SHEET 15



- NOTES:**
- SEE SHEET 22 FOR TRAP DATA AND DETAILS.
  - SEE SHEET 21 FOR SEQUENCE OF CONSTRUCTION.
  - SEE SHEETS 20 AND 21 FOR STANDARD DETAILS AND STABILIZATION NOTES.
  - REFER TO SHEETS 53-56 FOR SOIL BORINGS.
  - PROVIDE SOIL STABILIZATION MATTING UP TO L.O.D. BEYOND END OF RIP RAP AT ALL LOCATIONS.
  - ALL EARTH DIKES ARE TO BE PLACED IN WORKING ORDER AT THE END OF EACH WORKING DAY.
  - IMBRICATE SF/SSF IN 25' SEGMENTS AS REQUIRED UPHILL BY 2' IN ELEVATION.
  - REFER TO SHEET 13 FOR THE SOILS LEGEND



**KEY MAP**  
NOT TO SCALE

**OWNER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

**STREAM CROSSING NOTE**  
REFER TO SHEET 22 FOR ADDITIONAL DETAILS FOR THE STREAM CROSSING.

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

*Matthew S. Wineman, V.P.* 9/28/21  
OWNER/DEVELOPER SIGNATURE DATE  
PRINTED NAME & TITLE

**DESIGNER CERTIFICATION:**  
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

*Robert H. Vogel* 9/28/21  
DESIGNER SIGNATURE DATE  
PRINTED NAME

MD REGISTRATION NO. 16193  
(R.L.S., OR R.L.A. (circle one))

NO.	REVISION	DATE

**FINAL ROAD CONSTRUCTION PLAN**  
PHASE 1 - SOILS MAP, GRADING, SOIL EROSION & SEDIMENT CONTROL PLAN

**CHAPELGATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF CHAPELGATE WOODS NON-BUILDABLE BULK PARCEL B PLATS 25942-25954

PARCELS: 110 & 421  
TAX MAP: 16 GRD: 10  
3RD ELECTION DISTRICT

ZONED: CEF-M

PLAT 1389/F. 339 (P. 110)  
L. 4163/F. 424 (P. 421)  
HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**

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

PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A duly LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022

DESIGN BY: RHV  
DRAWN BY: VE+TG  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

12 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*James* 12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*John* 12-23-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION & DATE  
*RAM* 1/31/22  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

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

*Allyson D. Brothie* 09/27/21  
HOWARD S.C.D. DATE

**CHURCH ENTRANCE NOTE**

1. UPON COMPLETION OF NEW CHURCH ACCESS, THE EXISTING CHURCH ACCESS TO MARRIOTTVILLE ROAD (PAVEMENT, STORM DRAINAGE, SIGNAGE, ETC.) SHALL BE REMOVED. SWALES GROVED AND STORM DRAINS INSTALLED PROVIDING POSITIVE DRAINAGE TO THE MARRIOTTVILLE ROAD CULVERT.  
- ALL DISTURBANCES SHALL BE IMMEDIATELY STABILIZED.  
- REFER TO SHEET 16 FOR POST-EXISTING ENTRANCE REMOVAL CONDITIONS.

**NOTE:**  
THIS SITE SHALL ONLY BE ACCESSED VIA THE SHOWN STABILIZED CONSTRUCTION ENTRANCES. SEE SHEET 13 AND THE LOCATIONS HEREON.

**PHASE 1 SOILS MAP, GRADING, SOIL EROSION AND SEDIMENT CONTROL PLANS**

SCALE: 1"=50'

SCALE 1"=30'



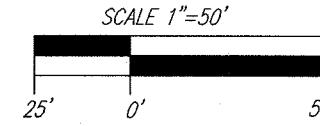
SOILS LEGEND			
SYMBOL NAME/DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BsA BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GgG GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GgB GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GhB GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hs HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MdD MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
Uaf UDOTHERENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
UdD URBAN LAND-UDOTHERENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 HOWARD COUNTY SOILS MAP NUMBER 12 - SWEETVILLE SE  
 \*K VALUES PER <http://www.howardsoil.org/documents> - \*K FACTORS (USE KW)  
 NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

- NOTES:
- SEE SHEET 22 FOR TRAP DATA AND DETAILS.
  - SEE SHEET 21 FOR SEQUENCE OF CONSTRUCTION.
  - SEE SHEETS 20 AND 21 FOR STANDARD DETAILS AND STABILIZATION NOTES.
  - REFER TO SHEETS 53-56 FOR SOIL BORINGS.
  - PROVIDE SOIL STABILIZATION MATTING UP TO L.O.D. BEYOND END OF RIP RAP AT ALL LOCATIONS.
  - ALL EARTH DIKES ARE TO BE PLACED IN WORKING ORDER AT THE END OF EACH WORKING DAY.
  - IMBRICATE SF/SSF IN 2' SEGMENTS AS REQUIRED UPHILL BY 2' IN ELEVATION.

PHASE 1 - SOILS MAP, GRADING,  
 SOIL EROSION AND SEDIMENT CONTROL PLANS

SCALE: 1"=50'



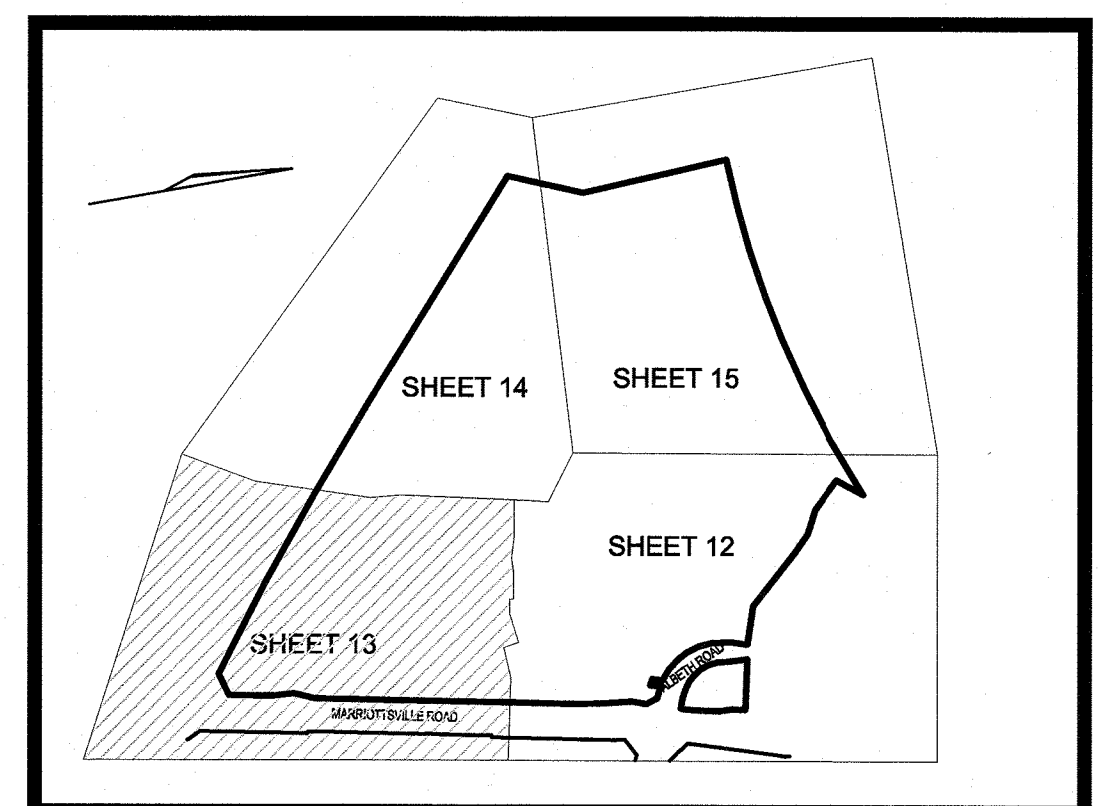
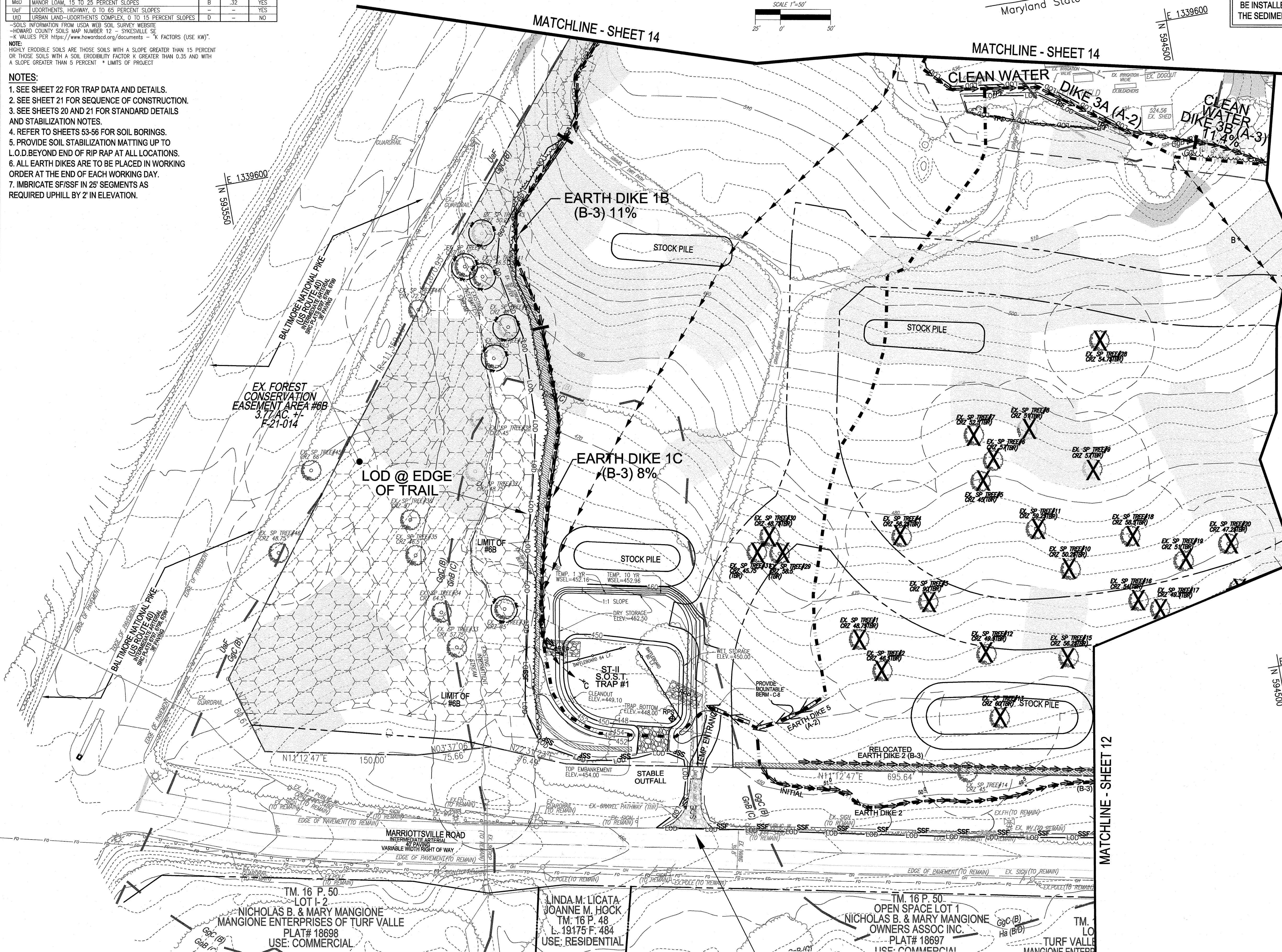
Maryland State Grid Meridian

E 1339600

NOTE:  
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 -SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 25' APART.  
 -DOUBLE ROWS OF SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

LEGEND:

- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MANHOLE
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING TREELINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
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- RIGHT-OF-WAY LINE
- VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
- EXISTING FOREST CONSERVATION EASEMENT F-21-014
- LIMIT OF DISTURBANCE
- SOILS BOUNDARY
- MODERATE SLOPES (15% - 24.99%)
- STEEP SLOPE (>25%)
- EARTH DIKE
- SILT FENCE
- SUPER SILT FENCE



KEY MAP  
 NOT TO SCALE

OWNER  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
 PHASE 1 - SOILS MAP, GRADING, SOIL EROSION & SEDIMENT CONTROL PLAN  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25-912-2-9954  
 PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
 16 GRID 10 L 4183/F. 424 (P. 421)  
 3RD ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 ZONED: CEF-M

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

DESIGN BY: RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2025

13 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
 [Signature] 1/13/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

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

[Signature] 9/28/21  
 OWNER/DEVELOPER SIGNATURE DATE  
 Matthew S. Wineman, V.P.  
 PRINTED NAME & TITLE

DESIGN CERTIFICATION:  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 9/24/21  
 DESIGNER'S SIGNATURE DATE  
 ROBERT H. VOGEL  
 PRINTED NAME  
 MD REGISTRATION NO. 16193  
 (P.E.) R.L.S. OR R.L.A. (circle one)

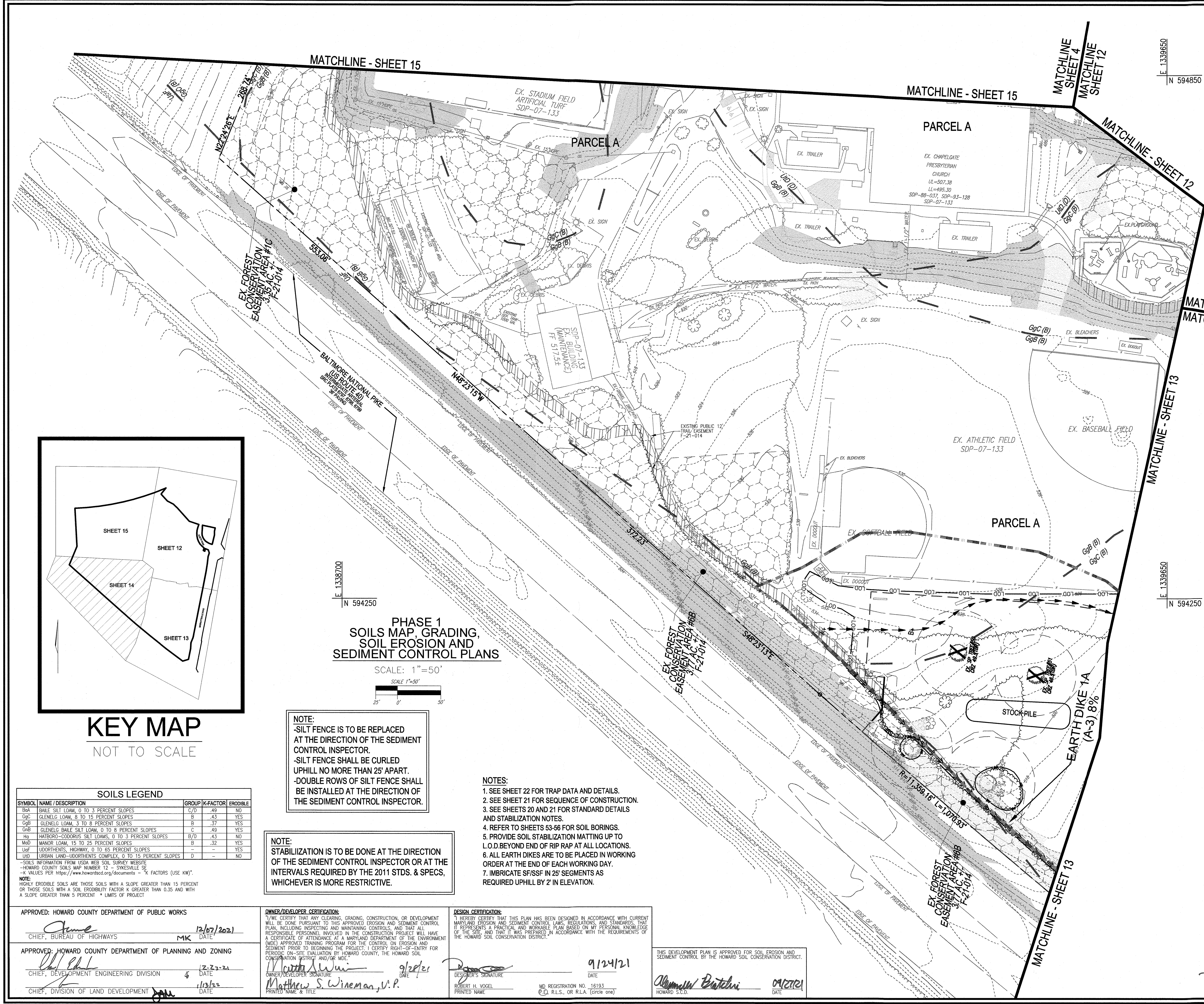
NOTE:  
 THIS SITE SHALL ONLY BE ACCESSED VIA THE SHOWN STABILIZED CONSTRUCTION ENTRANCES. SEE SHEET 12 AND THE LOCATION HEREON.

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

[Signature] 09/20/21  
 HOWARD S.C.D. DATE

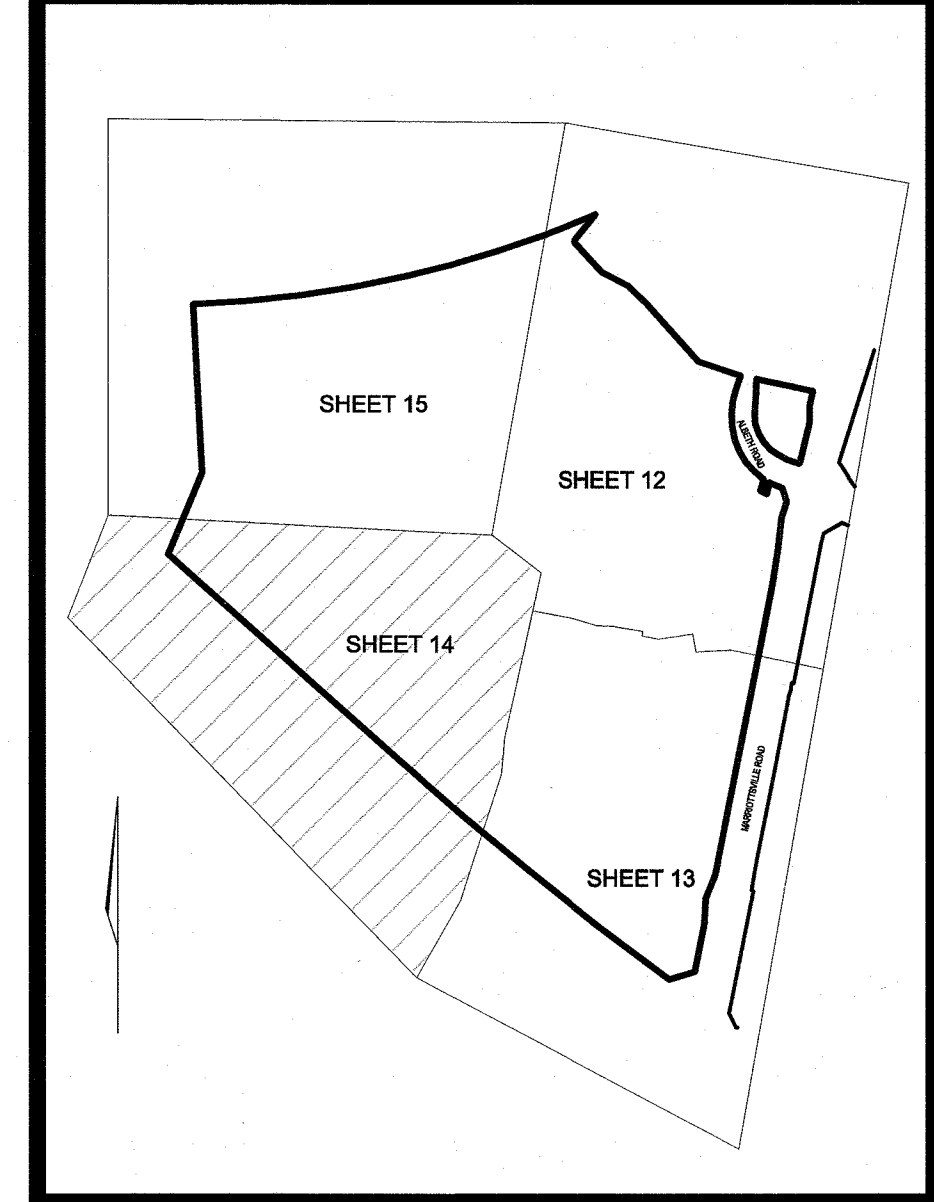
NOTE:  
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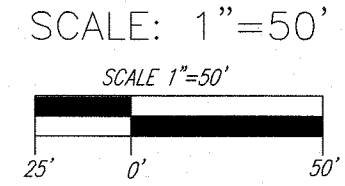


**LEGEND:**

	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
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	EX. SPECIMEN TREE W/ CRITICAL ROOT ZONE
	EX. SPECIMEN TREE TO BE REMOVED
	LOD - LIMIT OF DISTURBANCE
	M1B2 - SOILS BOUNDARY
	M1D3 - SOILS BOUNDARY
	MODERATE SLOPES (15% - 24.99%)
	STEEP SLOPE (>25%)
	EXISTING FOREST CONSERVATION EASEMENT F-21-014
	EXISTING PUBLIC 12' TRAIL EASEMENT F-21-014
	EARTH DIKE
	SILT FENCE
	SUPER SILT FENCE
	SEDIMENT CONTROL DRAINAGE DIVIDE
	TIME OF CONCENTRATION PATH



**PHASE 1  
SOILS MAP, GRADING,  
SOIL EROSION AND  
SEDIMENT CONTROL PLANS**



**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
G2A	FAIR SILET LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
G2C	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
G2B	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
G2B	GLENELG BAILE SILET LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
M2	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
M2D	MAJOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
L2F	UDORTHENTIS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
U2D	URBAN LAND-UDORTHENTIS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

**NOTE:**  
-SILT FENCE IS TO BE REPLACED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.  
-SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 25' APART.  
-DOUBLE ROWS OF SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

**NOTE:**  
STABILIZATION IS TO BE DONE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS REQUIRED BY THE 2011 STDS. & SPECS, WHICHEVER IS MORE RESTRICTIVE.

- NOTES:**
1. SEE SHEET 22 FOR TRAP DATA AND DETAILS.
  2. SEE SHEET 21 FOR SEQUENCE OF CONSTRUCTION.
  3. SEE SHEETS 20 AND 21 FOR STANDARD DETAILS AND STABILIZATION NOTES.
  4. REFER TO SHEETS 53-56 FOR SOIL BORINGS.
  5. PROVIDE SOIL STABILIZATION MATTING UP TO L.O.D. BEYOND END OF RIP RAP AT ALL LOCATIONS.
  6. ALL EARTH DIKES ARE TO BE PLACED IN WORKING ORDER AT THE END OF EACH WORKING DAY.
  7. IMBRICATE SF/SSF IN 25' SEGMENTS AS REQUIRED UPHILL BY 2' IN ELEVATION.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 12-21-21

CHIEF, DIVISION OF LAND DEVELOPMENT  
  
 DATE: 11/3/22

**OWNER/DEVELOPER CERTIFICATION:**  
 I/WE CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE.  
 Matthew W. P. DATE: 9/22/21  
 PRINTED NAME & TITLE: Matthew S. Wineman, V.P.

**DESIGN CERTIFICATION:**  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
 Robert H. Vogel DATE: 9/24/21  
 PRINTED NAME: ROBERT H. VOGEL  
 MD REGISTRATION NO. 16193  
 EA R.L.S., OR R.L.A. (Circle one)

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
  
 DATE: 09/27/21  
 HOWARD S.C.D.

**OWNER**  
 CHAPELGATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
 PHASE 1 - SOILS MAP, GRADING, SOIL EROSION & SEDIMENT CONTROL PLAN  
**CHAPELGATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPELGATE PRESBYTERIAN CHURCH, INC. NON-BUILDABLE BULK PARCEL B" PLATS 25-9102-25-9104  
 PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRD-10 L 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

**PROFESSIONAL CERTIFICATE**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

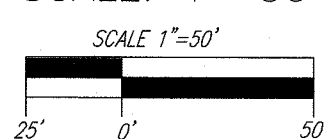
DESIGN BY: RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

14 SHEET OF 101



PHASE 1 - SOILS MAP, GRADING,  
SOIL EROSION AND SEDIMENT CONTROL PLANS

SCALE: 1"=50'

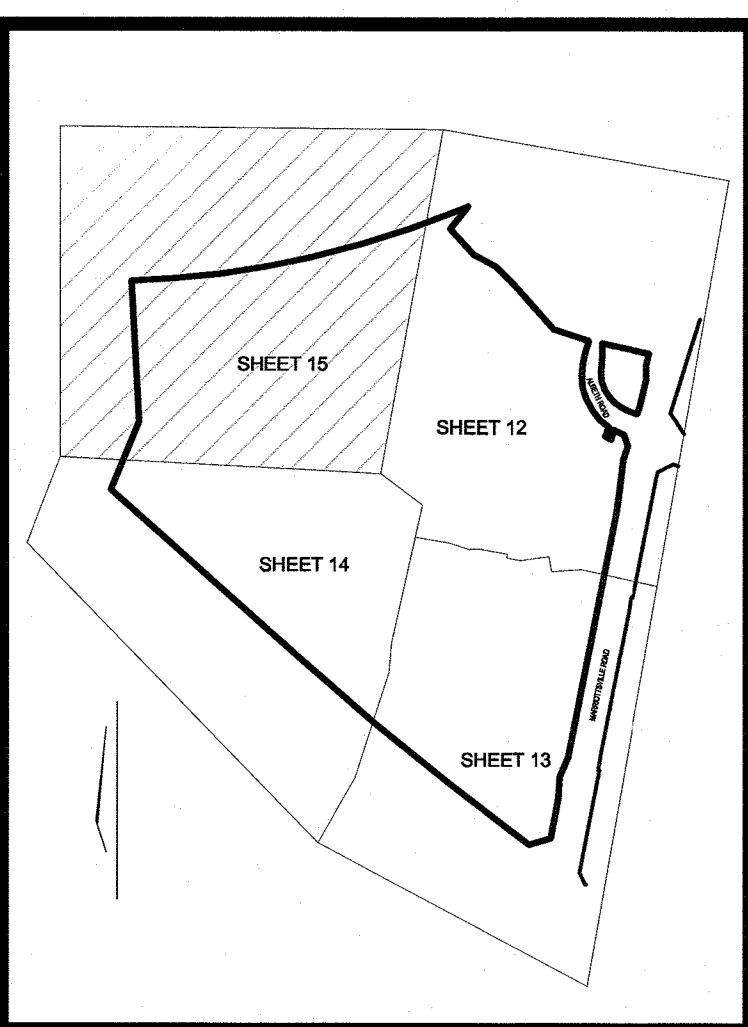


- NOTES:
- SEE SHEET 22 FOR TRAP DATA AND DETAILS.
  - SEE SHEET 21 FOR SEQUENCE OF CONSTRUCTION.
  - SEE SHEETS 20 AND 21 FOR STANDARD DETAILS AND STABILIZATION NOTES.
  - REFER TO SHEETS 53-56 FOR SOIL BORINGS.
  - PROVIDE SOIL STABILIZATION MATTING UP TO O.D. BEYOND END OF RIP RAP AT ALL LOCATIONS.
  - ALL EARTH DIKES ARE TO BE PLACED IN WORKING ORDER AT THE END OF EACH WORKING DAY.
  - IMBRICATE SF/SSF IN 25' SEGMENTS AS REQUIRED UPHILL BY 2' IN ELEVATION.

E 1338550  
N 595750

E 1339750  
N 595750

- LEGEND:
- EXISTING CURB AND GUTTER
  - EXISTING UTILITY POLE
  - EXISTING LIGHT POLE
  - EXISTING MAILBOX
  - EXISTING SIGN
  - EXISTING SANITARY MANHOLE
  - EXISTING SANITARY LINE
  - EXISTING CLEANOUT
  - EXISTING FIRE HYDRANT
  - EXISTING WATER LINE
  - EXISTING TREELINE (FIELD LOCATED)
  - EXISTING VEGETATION
  - EXISTING FENCE
  - PROPERTY LINE
  - RIGHT-OF-WAY LINE
  - PUBLIC 100 YR FLOODPLAIN
  - EX. STREAM
  - EX. STREAM BUFFER
  - LIMIT OF DISTURBANCE
  - SOILS BOUNDARY
  - M1B2
  - M1D3
  - MODERATE SLOPES (15% - 24.99%)
  - STEEP SLOPE (>25%)
  - EXISTING FOREST CONSERVATION EASEMENT F-21-014
  - EXISTING PUBLIC 12' TRAIL EASEMENT F-21-014



KEY MAP  
NOT TO SCALE

- NOTE:
- SILT FENCE IS TO BE REPLACED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
  - SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 25' APART.
  - DOUBLE ROWS OF SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

- NOTE:
- STABILIZATION IS TO BE DONE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS REQUIRED BY THE 2011 STDS. & SPECS, WHICHEVER IS MORE RESTRICTIVE.

SOILS LEGEND

SYMBOL NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GgC GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GgB GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GgE GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hs HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MdD MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UaF URBORNTHS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
LUD URBAN LAND-URBORNTHS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

NOTE:  
HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT. \* LIMITS OF PROJECT

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
 [Signature] 11/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

OWNER/DEVELOPER CERTIFICATION:  
 I HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL ON EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE.  
 [Signature] 9/28/21  
 OWNER/DEVELOPER SIGNATURE DATE  
 Matthew S. Wiseman, V.P.  
 PRINTED NAME & TITLE

DESIGN CERTIFICATION:  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
 [Signature] 9/27/21  
 DESIGNER'S SIGNATURE DATE  
 ROBERT H. VOGEL  
 PRINTED NAME  
 MD REGISTRATION NO. 16193  
 (P.E.) R.L.S., OR R.L.A. (Circle one)

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
 [Signature] 09/27/21  
 Alexander Butcher  
 HOWARD S.C.D. DATE

NOTE:  
NO DISTURBANCE TO THIS AREA IS PROPOSED UNDER PHASE 1 FOR PROJECT LOOP TRAIL AND ASSOCIATED AMENITIES SEE SHEET 19

OWNER  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

FINAL ROAD CONSTRUCTION PLAN  
 PHASE 1 - SOILS MAP, GRADING, SOIL EROSION & SEDIMENT CONTROL PLAN  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
 EX. MAP: 16 GORD: 10 SUITE 415 L 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT F. 25972-25984 HOWARD COUNTY, MARYLAND  
 ZONED: CEF-M

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

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A QUALIFIED PROFESSIONAL ENGINEER UNDER THE JURISDICTION OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

DESIGN BY: RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 49220

15 SHEET OF 101







SOILS LEGEND				
SYMBOL	NAME/DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
CgC	GLENGLE LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
CgB	GLENGLE LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GbB	GLENGLE BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Ha	HARBOR-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MaD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UdF	UDORTMENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
UdD	URBAN LAND-UDORTMENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 HOWARD COUNTY SOILS MAP NUMBER 12 - SYKESVILLE SE  
 \*K VALUES PER <https://www.howardcd.org/documents> - K FACTORS (USE KW)  
 NOTE:  
 HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SOLOPS GREATER THAN 15 PERCENT  
 OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH  
 A SOLOPS GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

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

SCALE: 1" = 50'  
 SCALE 1" = 50'

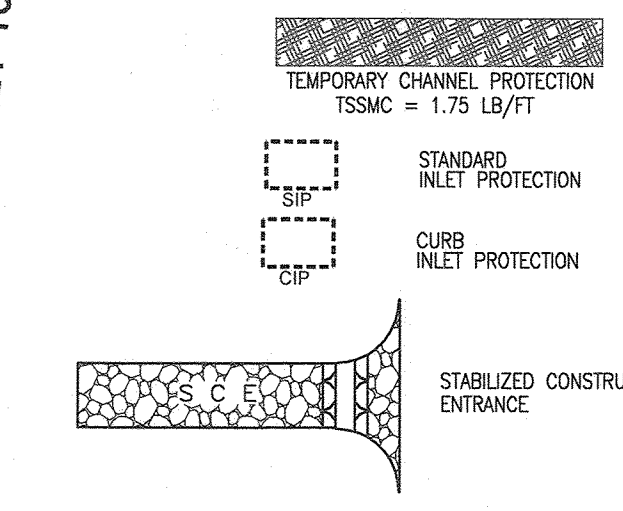
SWALE 3 TO I-14  
 BOTTOM = 3.0'  
 SIDE SLOPES = 4:1  
 SLOPE = 6.4%  
 Q10=0.70 CFS\*  
 V10=0.80 FPS  
 d10=0.23"  
 PROVIDE TSSMC 1.75 LB/FT2  
 IN SWALE AND STABILIZE  
 WITH PERMANENT SEED MIX

Maryland State Grid Meridian  
 N 1339600  
 N 993500

LEGEND:	
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING TREE LINE (FIELD LOCATED)
	EXISTING VEGETATION
	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	PROPOSED SIDEWALK
	LOOP TRAIL
	VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
	EX. SPECIMEN TREE W/ CRITICAL ROOT ZONE
	LIMIT OF DISTURBANCE
	SOILS BOUNDARY
	MODERATE SLOPES (15% - 24.99%)
	STEEP SLOPE (>25%)
	EXISTING FOREST CONSERVATION EASEMENT F-21-014
	DIVERSION DIKE
	EARTH DIKE
	SILT FENCE
	SUPER SILT FENCE

NOTE:  
 STABILIZATION IS TO BE DONE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS REQUIRED BY THE 2011 STDS. & SPECS. WHICHEVER IS MORE RESTRICTIVE.

NOTE:  
 - SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.  
 - SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 25 FEET APART  
 - DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.



- NOTES
1. ALL EARTH DIKES ARE TO BE PLACED IN WORKING ORDER AT THE END OF EACH WORKING DAY.
  2. IMBRICATE SF/SF IN 25' SEGMENTS AS REQUIRED UPHILL BY 2" IN ELEVATION.
  3. PROVIDE SOIL STABILIZATION MATTING UP TO L.O.D. BEYOND END OF RIPRAP AT ALL OUTFALL LOCATIONS.

- NOTES
1. REFER TO SHEET 21 FOR SEQUENCE OF CONSTRUCTION.
  2. REFER TO SHEET 22 FOR TRAP DETAILS.
  3. REFER TO SHEETS 20 FOR STANDARD DETAILS AND STABILIZATION NOTES.
  4. REFER TO SHEET 52-55 FOR SOIL BORINGS.

OWNER  
 CHAPELATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 PHASE 2 - SOILS MAP, GRADING, SOIL EROSION & SEDIMENT CONTROL PLAN

**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25942 & 25954 L. 1389/F. 339 (P. 110)  
 L. 4163/F. 424 (P. 421)  
 PARCELS: 110 & 421  
 TAX MAP: 16 GRD. 10  
 3RD ELECTION DISTRICT

ZONED: CEF-M

**VOGEL ENGINEERING**  
 REGISTERED PROFESSIONAL ENGINEER

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

DESIGN BY: ES, RHW  
 DRAWN BY: VE+HTG  
 CHECKED BY: RHW  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

17 SHEET 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 09/14/2022  
 CHIEF, BUREAU OF HIGHWAYS MK

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 9-21-22  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature] 9/21/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT

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

[Signature] 7-27-22  
 Matthew S. Williams, U.P.

DESIGN CERTIFICATION:  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS AND STANDARDS; THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 8/17/22  
 Alexander Botchko  
 HOWARD S.C.D.

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

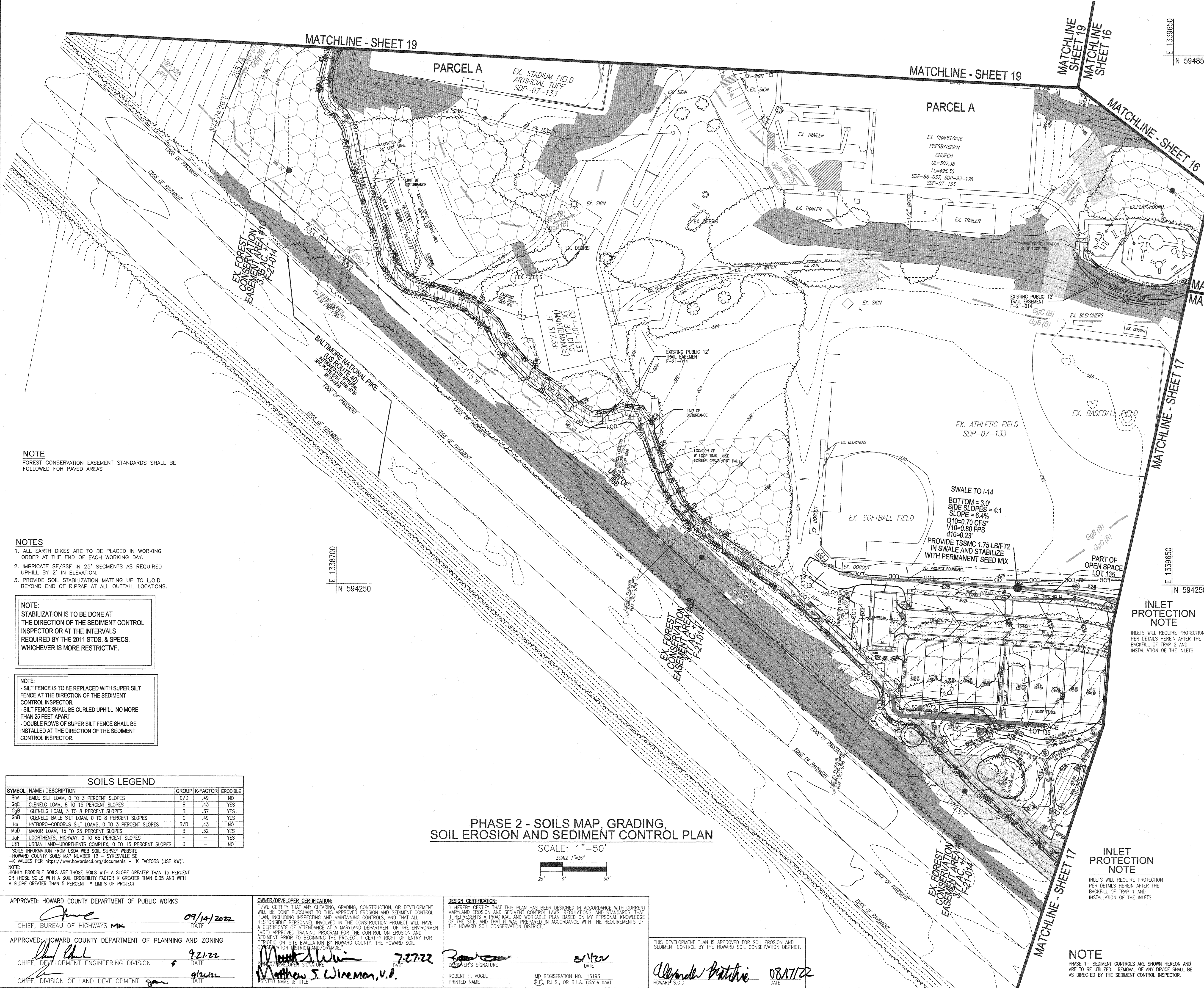
[Signature] 08/17/22  
 HOWARD S.C.D.

NOTE  
 PHASE 1 - SEDIMENT CONTROLS ARE SHOWN HEREIN AND ARE TO BE UTILIZED. REMOVAL OF ANY DEVICE SHALL BE AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008







**LEGEND:**

	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING TREE LINE (FIELD LOCATED)
	EXISTING VEGETATION
	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	PROPOSED SIDEWALK
	LOOP TRAIL
	VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
	EX. SPECIMEN TREE W/ CRITICAL ROOT ZONE
	LIMIT OF DISTURBANCE
	SOILS BOUNDARY
	MODERATE SLOPES (15% - 24.99%)
	STEEP SLOPE (>25%)
	EXISTING FOREST CONSERVATION EASEMENT F-21-014
	EXISTING PUBLIC 12' TRAIL EASEMENT F-21-014
	DIVERSION DIKE
	EARTH DIKE
	SILT FENCE
	SUPER SILT FENCE

PART OF EX. FOREST CONSERVATION EASEMENT AREA #4A 2.48 AC. +/- F-21-014

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-014 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008.

- NOTES**
- REFER TO SHEET 21 FOR SEQUENCE OF CONSTRUCTION.
  - REFER TO SHEET 22 FOR TRAP DETAILS.
  - REFER TO SHEETS 20 FOR STANDARD DETAILS AND STABILIZATION NOTES.
  - REFER TO SHEET 52-55 FOR SOIL BORINGS.

**OWNER**  
 CHAPELGATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD., MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 PHASE 2 - SOILS MAP, GRADING, SOIL EROSION & SEDIMENT CONTROL PLAN

**CHAPELGATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25942 - 25954 L 1389/F. 339 (P. 110)  
 3RD ELECTION DISTRICT ZONED: CEF-M L 4163/F. 424 (P. 421)  
 HOWARD COUNTY, MARYLAND

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

**PROFESSIONAL CERTIFICATE**

DESIGN BY: ES, RHY  
 DRAWN BY: VE+TC  
 CHECKED BY: RHY  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

18 SHEET OF 101

**NOTE**  
 FOREST CONSERVATION EASEMENT STANDARDS SHALL BE FOLLOWED FOR PAVED AREAS

- NOTES**
- ALL EARTH DIKES ARE TO BE PLACED IN WORKING ORDER AT THE END OF EACH WORKING DAY.
  - IMBRICATE SF/SSF IN 25' SEGMENTS AS REQUIRED UPHILL BY 2' IN ELEVATION.
  - PROVIDE SOIL STABILIZATION MATTING UP TO L.O.D. BEYOND END OF RIPRAP AT ALL OUTFALL LOCATIONS.

**NOTE:**  
 STABILIZATION IS TO BE DONE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS REQUIRED BY THE 2011 STDS. & SPECS. WHICHEVER IS MORE RESTRICTIVE.

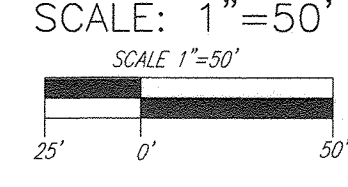
**NOTE:**  
 - SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.  
 - SILT FENCE SHALL BE CURLED UPHILL NO MORE THAN 25 FEET APART.  
 - DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

**SOILS LEGEND**

SYMBOL	NAME/DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
Bsk	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GcC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GcB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GcB	GLENELG BALE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hg	HATHORNG-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
Mq2	MAJOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
Uaf	UDORTHERTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
Urd	URBAN LAND-UDORTHERTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

-SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 -HOWARD COUNTY SOILS MAP NUMBER 12 - SYKESVILLE SE  
 -K VALUES PER <http://www.howarddot.org/documents> - "K" FACTORS (USE KW)  
 NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

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



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 09/14/2022  
 CHIEF, BUREAU OF HIGHWAYS MK

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 9/21/22  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

APPROVED: [Signature] 9/21/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT

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

[Signature] 7-27-22  
 Matthew S. Wiseman, V.P.  
 PRINTED NAME & TITLE

**DESIGN CERTIFICATION:**  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 8/1/22  
 ROBERT H. VOGEL  
 PRINTED NAME  
 MD REGISTRATION NO. 16193  
 (P.E., R.L.S., OR R.L.A. (circle one))

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

[Signature] 08/17/22  
 HOWARD S.C.D.

**INLET PROTECTION NOTE**  
 INLETS WILL REQUIRE PROTECTION PER DETAILS HEREIN AFTER THE BACKFILL OF TRAP 2 AND INSTALLATION OF THE INLETS

**NOTE**  
 PHASE 1 - SEDIMENT CONTROLS ARE SHOWN HEREON AND ARE TO BE UTILIZED. REMOVAL OF ANY DEVICE SHALL BE AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.



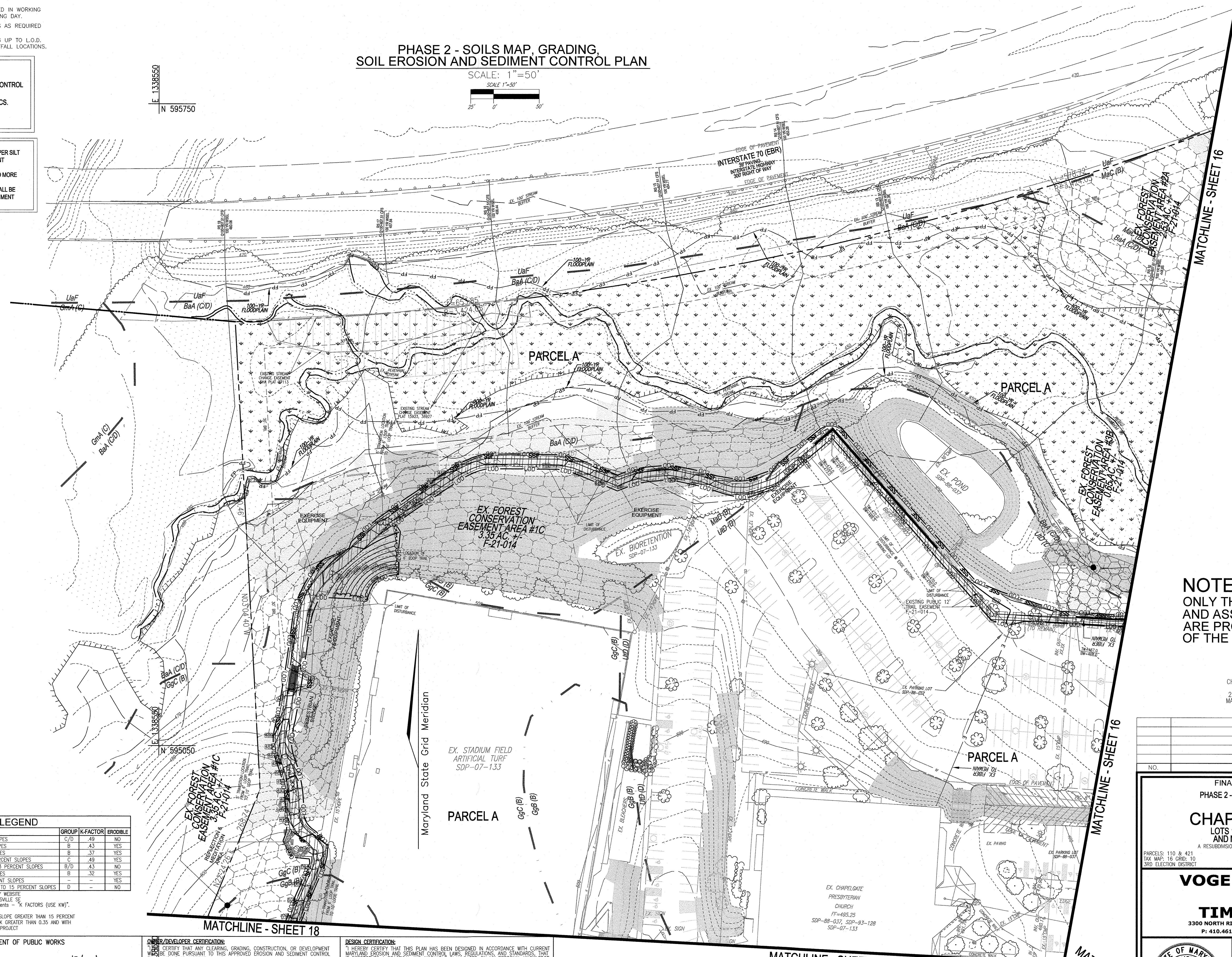
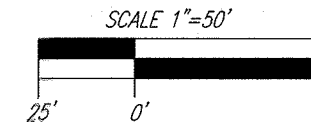
- NOTES**
1. ALL EARTH DIKES ARE TO BE PLACED IN WORKING ORDER AT THE END OF EACH WORKING DAY.
  2. IMBRICATE SF/SSF IN 25' SEGMENTS AS REQUIRED UPHILL BY 2' IN ELEVATION.
  3. PROVIDE SOIL STABILIZATION MATTING UP TO L.O.D. BEYOND END OF RIPRAP AT ALL OUTFALL LOCATIONS.

**NOTE:**  
STABILIZATION IS TO BE DONE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS REQUIRED BY THE 2011 STDS. & SPECS. WHICHEVER IS MORE RESTRICTIVE.

**NOTE:**  
- SILT FENCE IS TO BE REPLACED WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.  
- SILT FENCE SHALL BE CURLED UPHILL. NO MORE THAN 25 FEET APART.  
- DOUBLE ROWS OF SUPER SILT FENCE SHALL BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

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

SCALE: 1"=50'



**LEGEND:**

	EXISTING CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	EXISTING TREE LINE (FIELD LOCATED)
	EXISTING VEGETATION
	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	LOOP TRAIL
	PUBLIC 100 YR FLOODPLAIN
	EX. STREAM
	EX. STREAM BUFFER
	LIMIT OF DISTURBANCE
	SOILS BOUNDARY
	MODERATE SLOPES (15% - 24.9%)
	STEEP SLOPE (>25%)
	EXISTING FOREST CONSERVATION EASEMENT
	EXISTING PUBLIC 12' TRAIL EASEMENT
	LIMIT OF DISTURBANCE
	SILT FENCE
	SUPER SILT FENCE

**NOTE:**  
ONLY THE PROJECT LOOP TRAIL AND ASSOCIATED AMENITIES ARE PROPOSED ON THIS PORTION OF THE SITE

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	49	NO
GgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	43	YES
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	37	YES
GgD	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	49	YES
Ho	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	43	NO
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	32	YES
UgF	UDORHTHENS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
UdD	URBAN LAND-UDORHTHENS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS  
 MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12/23/21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE

[Signature] 11/3/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE

**OWNER/DEVELOPER CERTIFICATION:**  
 I HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WORK IS BEING PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT AND GENERAL SERVICES TRAINING PROGRAM FOR THE CONTROL ON EROSION AND SEDIMENTATION BEGINS THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD COUNTY CONSERVATION DISTRICT AND/OR M.D.

[Signature] 9/20/21  
 OWNER/DEVELOPER SIGNATURE  
 Matthew S. Winegar, P.E.  
 PRINTED NAME & TITLE

**DESIGN CERTIFICATION:**  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS; THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 9/24/21  
 DESIGNER'S SIGNATURE  
 ROBERT H. VOGEL  
 PRINTED NAME

MD REGISTRATION NO. 16193  
 R.L.S. OR R.L.A. (circle one)

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

[Signature] 09/27/21  
 HOWARD S.C.D.  
 DATE

- NOTES**
1. REFER TO SHEET 21 FOR SEQUENCE OF CONSTRUCTION.
  2. REFER TO SHEET 22 FOR TRAP DETAILS.
  3. REFER TO SHEETS 20 FOR STANDARD DETAILS AND STABILIZATION NOTES.
  4. REFER TO SHEET 52-55 FOR SOIL BORINGS.

FINAL ROAD CONSTRUCTION PLAN  
 PHASE 2 - SOILS MAP, GRADING, SOIL EROSION & SEDIMENT CONTROL PLAN

**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF CHAPEL GATE WOODS, NON-BUILDABLE BULK PARCEL E  
 PLATS 255-102-25-954  
 PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRID: 10 L 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

DESIGN BY: RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

19 SHEET OF 101



**HOWARD SOIL CONSERVATION DISTRICT  
STANDARD SEDIMENT CONTROL NOTES**

- A PRE-CONSTRUCTION MEETING MUST OCCUR WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION DIVISION (CD), 410-313-1855 AFTER THE FUTURE LOTS AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELDS. A MINIMUM OF 48 HOURS NOTICE TO THE CD MUST BE GIVEN AT THE FOLLOWING STAGES:
  - PROXIMITY TO THE START OF EARTH DISTURBANCE.
  - UPON COMPLETION OF THE INSTALLATION OF PERMANENT EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING.
  - PROXIMITY TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT.
  - PROXIMITY TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES.

OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE. OTHER RELATED STATE AND FEDERAL PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS PLAN.

- 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 THEREOF.
- 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 CONTROL DICES, SWALES, STOPS, 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.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE. THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR TOPSOIL (SEC. B-4-4-C), PERMANENT SEEDING (SEC. B-4-4-D), TEMPORARY SEEDING (SEC. B-4-4-E) AND MULCHING (SEC. B-4-4-F). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES IF THE GROUND IS PROTECTED FROM THE EFFECTS OF SEEDING (SEC. B-4-4-G). SPECIFICATIONS SHALL BE ENFORCED IN AREAS WITH 21% OF CUT AND FILL PLUS 1% OF EXCESS (20 FT. DI. MUST BE ENFORCED WITH STABLE OUTLET). UNCONCENTRATED FLOW, SLOPES, AND HIGHLY ERODIBLE AREAS SHALL RECEIVE SOIL STABILIZATION MATINGS (SEC. B-4-4-H). ADDITIONAL CONTROL STRUCTURES ARE TO BE INSTALLED AS NECESSARY TO MAINTAIN STABILIZATION OPERATIVE UNTIL PERMANENT STRUCTURES ARE OBTAINED FROM THE CD.

6. SITE ANALYSIS:

TOTAL AREA OF SITE:	20.26	ACRES
AREA DISTURBED:	19.3	ACRES*
AREA TO BE ROOF OR PAVED:	8.0	ACRES
AREA TO BE VEGETATIVELY STABILIZED:	11.3	ACRES
TOTAL CUT:	77.57	CU. YDS. TOTAL
TOTAL FILL:	86.67	CU. YDS. TOTAL
OFFSITE WASTE/BORROW AREA LOCATION:	F21-011	

(1) REFER TO ITEM 11 BELOW

- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE CD, 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 TIME (ROUTINE, PRE-STORM EVENT, DURING RAIN EVENT).
  - NAME AND TITLE OF INSPECTOR.
  - WEATHER INFORMATION (CURRENT CONDITIONS AS WELL AS TIME AND AMOUNT OF LAST RECORDED PRECIPITATION).
  - BRIEF DESCRIPTION OF PROJECT'S STATUS (E.G., PERCENT COMPLETE).
  - CHOICE OF CURRENT MATERIALS TO BE USED AND UNACCEPTABLE MATERIALS.
  - EVIDENCE OF SEDIMENT DISCHARGES.
  - IDENTIFICATION OF PLAN DEFICIENCIES.
  - IDENTIFICATION OF SEDIMENT CONTROL STRUCTURES THAT REQUIRE MAINTENANCE.
  - IDENTIFICATION OF MISSING OR IMPROPERLY INSTALLED SEDIMENT CONTROLS.
  - IDENTIFICATION OF STATUS REGARDING THE SEQUENCE OF CONSTRUCTION AND STABILIZATION REQUIREMENTS.
  - PHOTOGRAPHS.
  - IDENTIFICATION OF SAMPLING.
  - MAINTENANCE AND/OR CORRECTIVE ACTION PERFORMED.
  - OTHER INSPECTION ITEMS AS REQUIRED BY THE GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES (NPDES, MD).

NOTES:  
 SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND" CHOICE OF CURRENT MATERIALS TO BE USED IS THE BEST GUARANTEE OF CULTURE 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.

- IDEAL TIMES OF SEEDING FOR TURF GRASS CULTIVARS
  - WESTERN MD: MARCH 15 TO JUNE 1, AUGUST 10 TO OCTOBER 1 (HARDNESS ZONES: 5B, 6A)
  - CENTRAL MD: MARCH 15 TO OCTOBER 15 (HARDNESS ZONE: 6B)
  - SOUTHERN MD, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDNESS ZONES: 7A, 7B)

- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE FEET (NPDES, MD) OR THAT WHICH CAN AND SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.
- ANY MAJOR CHANGES OR REVISIONS TO THE PLAN OR SEQUENCE OF CONSTRUCTION ARE TO BE REVIEWED AND APPROVED BY THE CD PRIOR TO PROCEEDING WITH CONSTRUCTION. MINOR REVISIONS MAY BE ALLOWED BY THE CD PER THE LIST OF CHANGES PROVIDED IN THE CD PERMITS.

- 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 WIDTH OF 20 AC. PER GRADING UNIT) AND PROCEED TO THE NEXT GRADING UNIT. SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE CD. UNLESS OTHERWISE APPROVED BY THE CD, A GRADING UNIT MAY NOT BE MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

- WATER WASH FROM ANY EQUIPMENT, VEHICLES, WHEELS, PAVEMENT, AND OTHER SOURCES MUST BE TREATED BY A SEDIMENT BASIN OR APPROVED WASHOUT STRUCTURE.
- CONSTRUCTION SHALL BE STOCKPILED AND PRESERVED ON-SITE FOR REDISTRIBUTION ONTO FINAL GRADE.

- ALL SILT FENCE AND SUPER SILT FENCE SHALL BE PLACED ON THE CONTOUR, AND B. SOIL MUST NOT BE HARVESTED OR TRANSPORTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY AFFECT ITS SURVIVAL.
- B. SOIL MUST NOT BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS.

2. STREAM CHANNELS MUST NOT BE DISTURBED DURING THE FOLLOWING RESTRICTED TIME PERIODS (UNLESS OTHERWISE APPROVED BY THE CD):
  - USE I AND I.P. MARCH 1 - JUNE 15
  - USE II AND IIP OCTOBER 1 - APRIL 30
  - USE IV MARCH 1 - MAY 31

3. 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.

- ITEM 11, REGARDING POOL DISTURBANCE IS NO LONGER A REQUIREMENT OF THE STATE OF MARYLAND, HOWEVER REMAINS A REQUIREMENT OF HOWARD COUNTY.

THIS PLAN IS APPROVED FOR SMALL POND CONSTRUCTION, AND SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT:

*Allyson Beattie* 09/27/2021  
 HOWARD S.C.D. DATE

OWNER/DEVELOPER CERTIFICATION:  
 I HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING RECEIVING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I SHALL ENGAGE A MARYLAND REGISTERED PROFESSIONAL ENGINEER TO SUPERSEDE POND CONSTRUCTION, AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR FOR.

*Matthew S. Wineman, V.P.* 9/20/21  
 OWNER/DEVELOPER SIGNATURE  
 PRINTED NAME & TITLE

DESIGN CERTIFICATION:  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN, AND THAT I AM A MARYLAND REGISTERED PROFESSIONAL ENGINEER. I WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERSEDE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

*Robert H. Vogel* 9/24/21  
 DESIGNER SIGNATURE  
 PRINTED NAME & TITLE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 DATE: 12/01/2021  
 MK

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 DATE: 1/13/22

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 DATE: 1/13/22

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 DATE: 1/13/22

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 DATE: 1/13/22

**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 THE DISTURBED SOILS.

**CONDITIONS WHERE PRACTICE APPLIES**  
 EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

**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 HIPPIES 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 SOLES 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 MEANS.

2. PERMANENT STABILIZATION
  - A. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBED AREA OVER 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
    - SOIL PH BETWEEN 6.0 AND 7.0.
    - SOIL NUTRIENT LEVELS: 100 POUNDS PER MILLION (PPM) OF NITROGEN, 100 PPM OF PHOSPHORUS, AND 100 PPM OF POTASSIUM.
    - SOIL CONTAINS LESS THAN 40 PERCENT FINE (POSSIBLY FINE GRANULATED MATERIAL, GREATER THAN 300 MESH SIFT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD WATER.
    - A MODERATE AMOUNT OF MOISTURE AN EXCEPTION.
    - PLACED AT A HIGH SPOT.
    - LOCATE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
  - B. PLANT ORNAMENTAL PLANTS TO A DEPTH OF 3 TO 5 INCHES IN SIZE OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP WITHIN 10 FEET OF THE SLOPE.
  - C. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT, ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAR SURFACE, WOODEN BERM, AND SLOPE PROTECTION AS NECESSARY. MAINTAIN ENTRANCE OPEN TO ALLOW FOR TRACKING OF ADJACENT ROADWAY BY VEHICLES, SURFING, AND/OR SNEAKING. WASHING TRUCKS AND TRAILERS MUST BE TRACKED ONTO PAVEMENT IS NOT APPLICABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

3. SEEDING AND MULCHING
  - 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 BE USED UNDER TEMPERATURE CONTROL. SEEDS MUST BE STORED IN A DRY, COOL PLACE. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY THE TYPE OF SEED AND SEEDING RATE.
  - B. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE SOIL IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND IS THAW.
  - C. INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SOIL MUST MEET THE 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 HYDRATED. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED.
  - D. SOIL OR SEED MAY BE TREATED WITH AN INSECTICIDE TO PREVENT BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
  - E. MULCH ALONE MAY BE APPLIED TO 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.

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    - WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
    - WCFM IS TO BE DRIED AND FERTILIZER ON THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORM SPREAD SURFACE.
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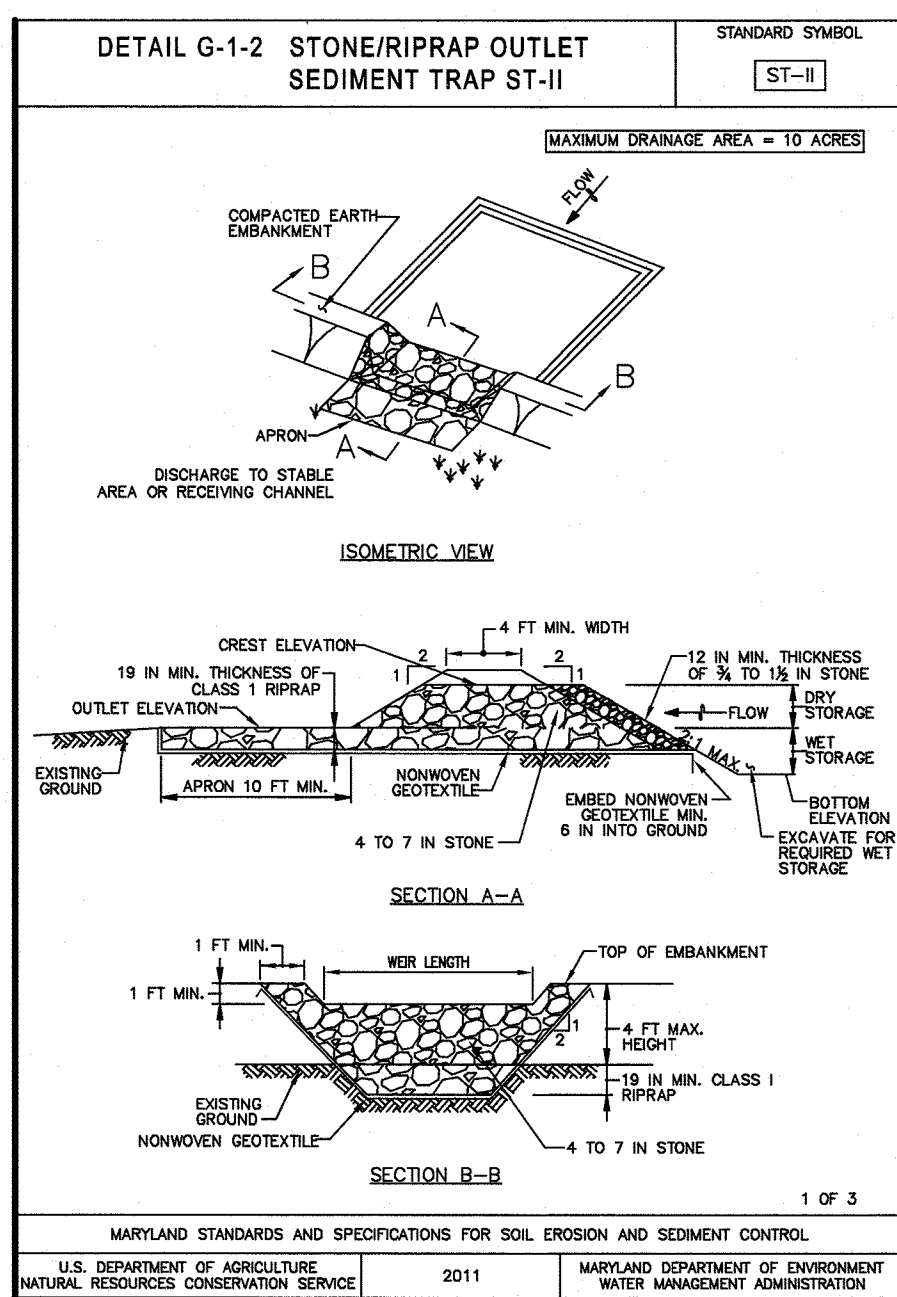
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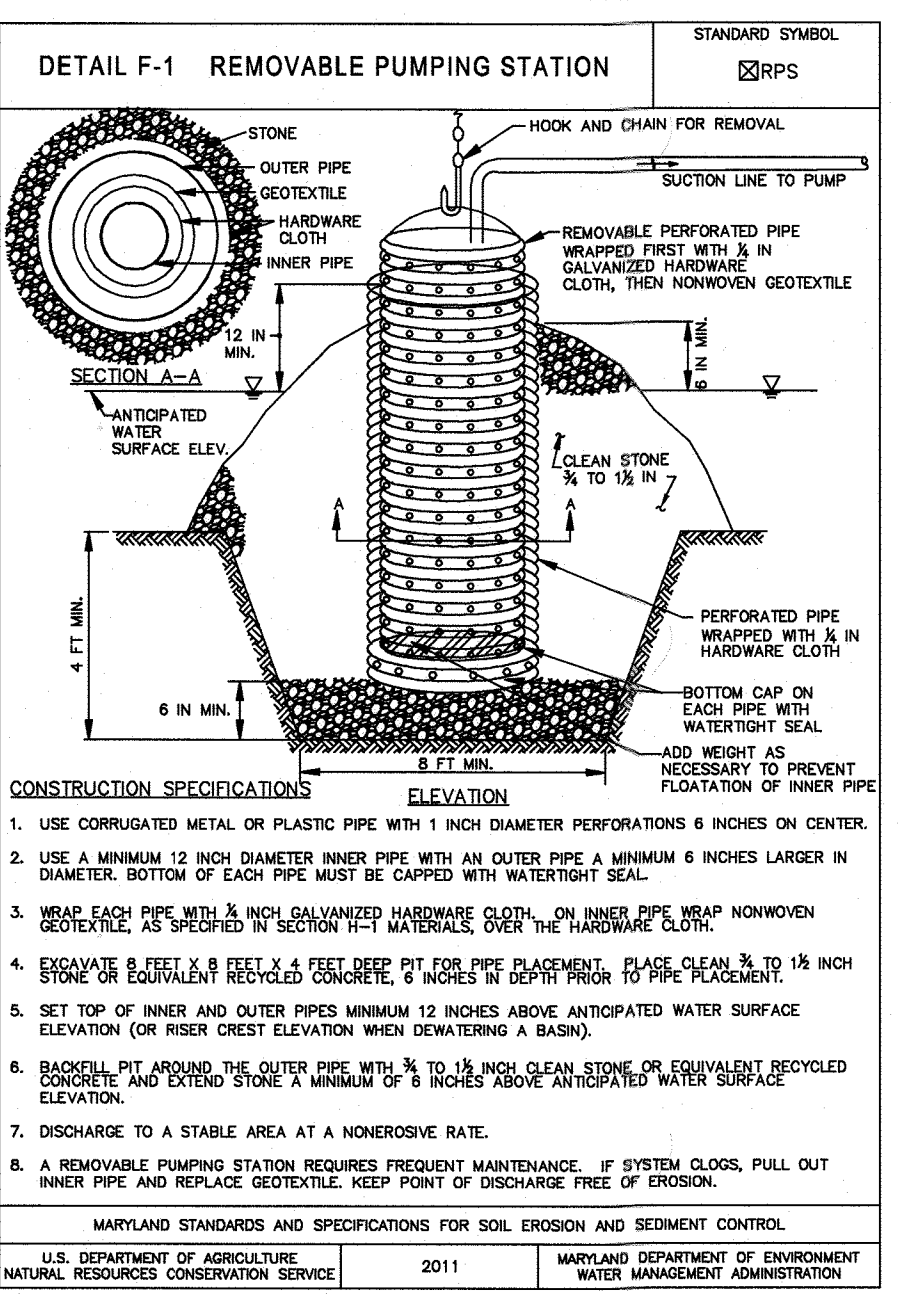




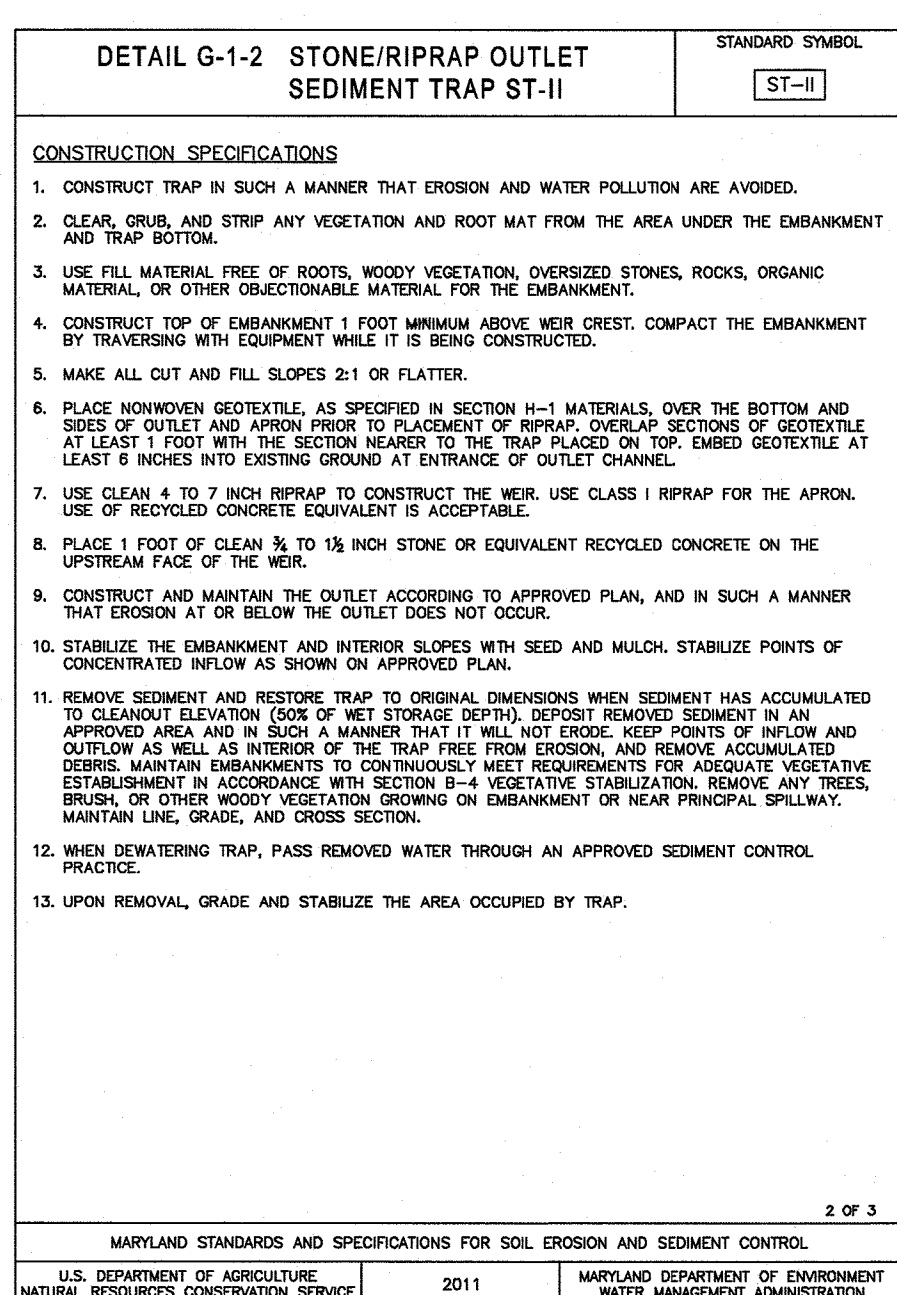




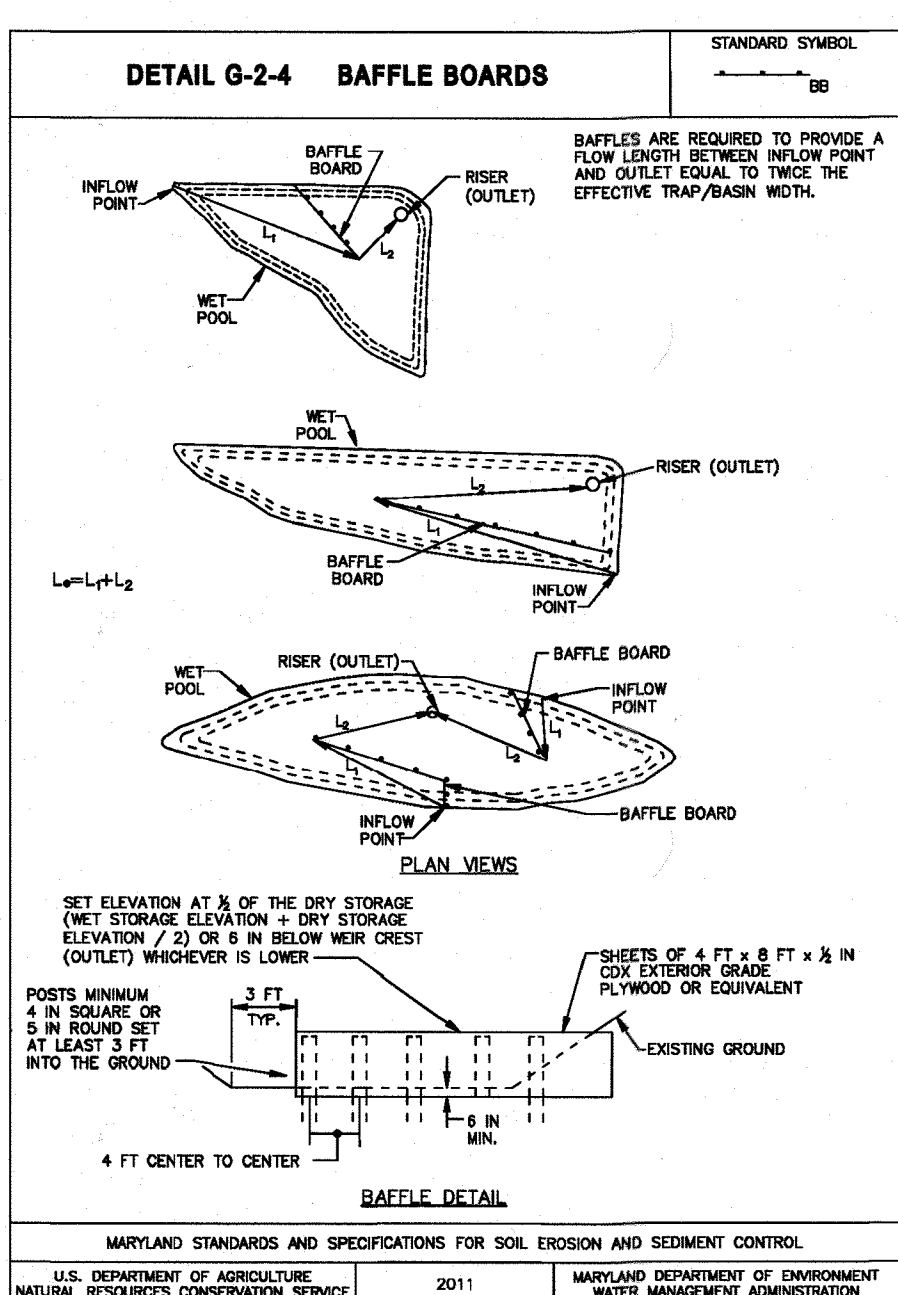
STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II, TRAP NO. # 1		
DRAINAGE AREA - INITIAL	2.25	ACRES
DRAINAGE AREA - INTERIM	7.13	ACRES
DRAINAGE AREA - FINAL	7.06	ACRES
TOTAL STORAGE REQUIRED	25,668	CF
WET STORAGE PROVIDED	48,435	CF
WET STORAGE REQUIRED	12,834	CF
DRY STORAGE PROVIDED	17,743	CF
DRY STORAGE REQUIRED	12,834	CF
EXISTING GROUND ELEVATION AT OUTLET (WET STORAGE ELEVATION)	450.00	FT
TRAP BOTTOM ELEVATION	448.00	FT
TRAP BOTTOM DIMENSIONS	15' x 15'	FT x FT
WEIR LENGTH - 7.13 AC x 4 = 28.52' USE 30'	30	FT
WEIR CREST (DRY STORAGE) ELEVATION	452.50	FT
CLEANOUT ELEVATION	449.10	FT
TOP OF EMBANKMENT ELEVATION	454.00	FT
EMBANKMENT TOP WIDTH	2:1	H:V RATIO
OUTLET PROTECTION - LENGTH	10	FT (MIN)
OUTLET PROTECTION - DEPTH	10"	IN



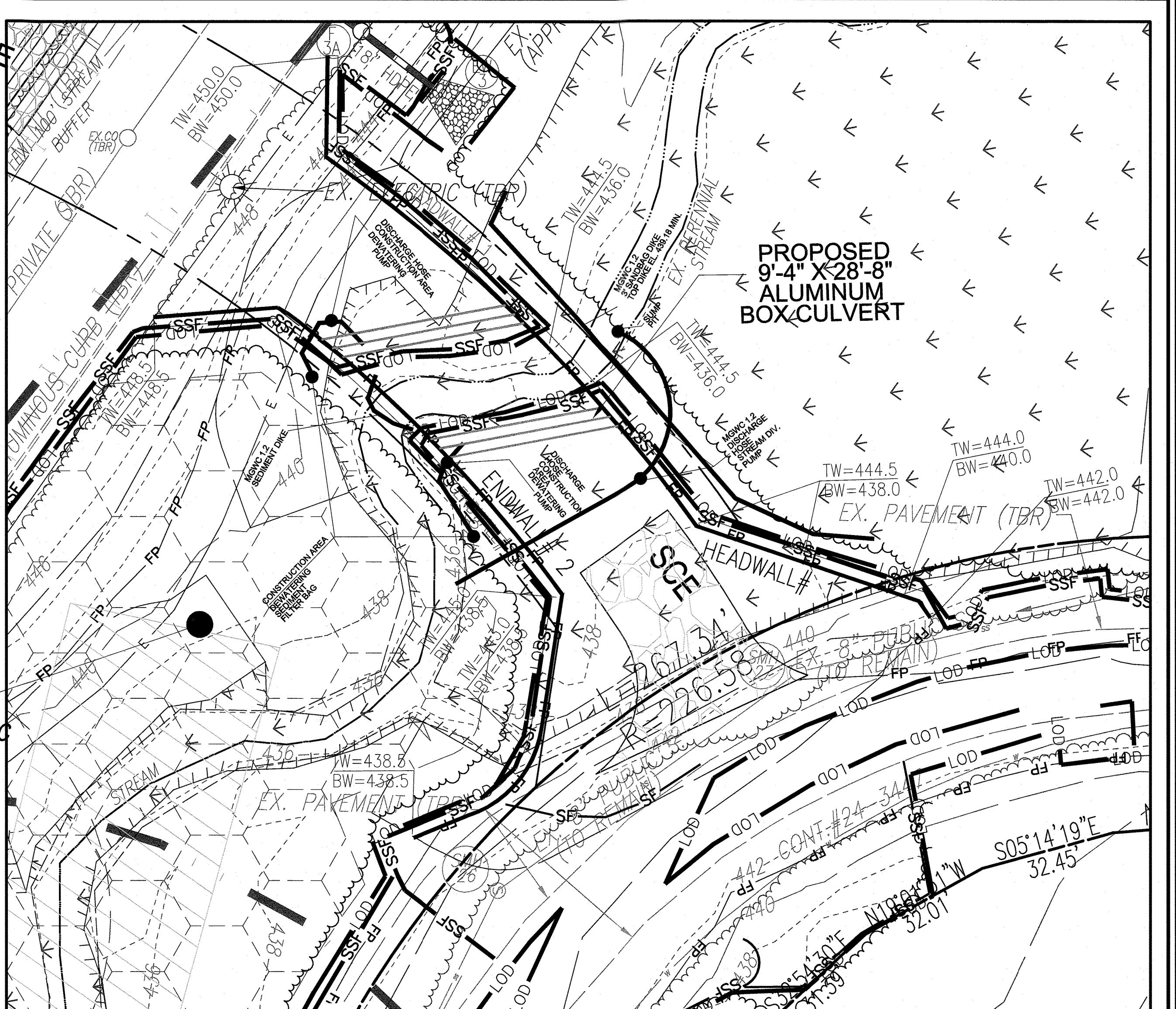
- BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS
- NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
  - PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
  - DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELTERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELTERIOUS SUBSTANCE.
  - PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
  - REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
  - RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
  - ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (Avena SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDING AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
  - AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
  - TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM.
    - USE I WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
    - USE II WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THROUGH APRIL 30, INCLUSIVE, DURING ANY YEAR.
    - USE IV WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.
  - STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
  - CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.



STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II, TRAP NO. # 2		
DRAINAGE AREA - INITIAL	3.46	ACRES
DRAINAGE AREA - INTERIM	8.90	ACRES
DRAINAGE AREA - FINAL	8.97	ACRES
TOTAL STORAGE REQUIRED	32,292	CF
WET STORAGE PROVIDED	67,561	CF
WET STORAGE REQUIRED	16,146	CF
DRY STORAGE PROVIDED	19,965	CF
DRY STORAGE REQUIRED	16,146	CF
EXISTING GROUND ELEVATION AT OUTLET (WET STORAGE ELEVATION)	444.50	FT
TRAP BOTTOM ELEVATION	443.00	FT
TRAP BOTTOM DIMENSIONS	22' x 23'	FT x FT
WEIR LENGTH - 8.97 AC x 4 = 35.88' USE 36'	36	FT
WEIR CREST (DRY STORAGE) ELEVATION	447.50	FT
CLEANOUT ELEVATION	443.7	FT
TOP OF EMBANKMENT ELEVATION	448.50	FT
EMBANKMENT TOP WIDTH	2:1	H:V RATIO
OUTLET PROTECTION - LENGTH	4	FT
OUTLET PROTECTION - DEPTH	10	FT (MIN)
OUTLET PROTECTION - DEPTH	10"	IN



- BAFFLE DESIGN TRAP # 1
- AREA WET STORAGE EL. = 9,285 SF  
 $W_e = (A/2) \cdot 0.5$   
 $W_e = 66'$   
 $MIN L_e = W_e \times 2 = 132'$
- INFLOW SOUTH  
 $L_1 = 60'$   
 $L_2 = 80'$   
 PROVIDED  $L_e = 140'$
- INFLOW NORTH  
 $L_1 = 64'$   
 $L_2 = 76'$   
 PROVIDED  $L_e = 140'$
- BAFFLE DESIGN TRAP # 2
- AREA WET STORAGE EL. = 14,107 SF  
 $W_e = (A/2) \cdot 0.5$   
 $W_e = 83.99'$   
 $MIN L_e = W_e \times 2 = 168'$
- INFLOW SOUTH  
 $L_1 = 50'$   
 $L_2 = 113'$   
 PROVIDED  $L_e = 165'$
- INFLOW NORTH  
 $L_1 = 76'$   
 $L_2 = 92'$   
 PROVIDED  $L_e = 168'$

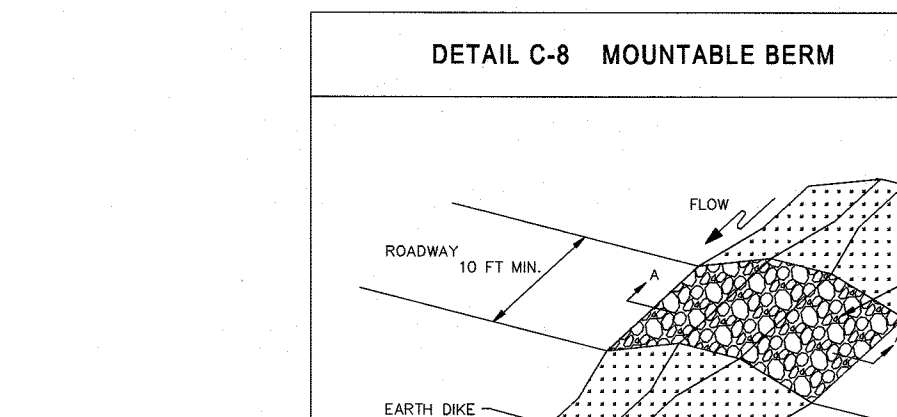
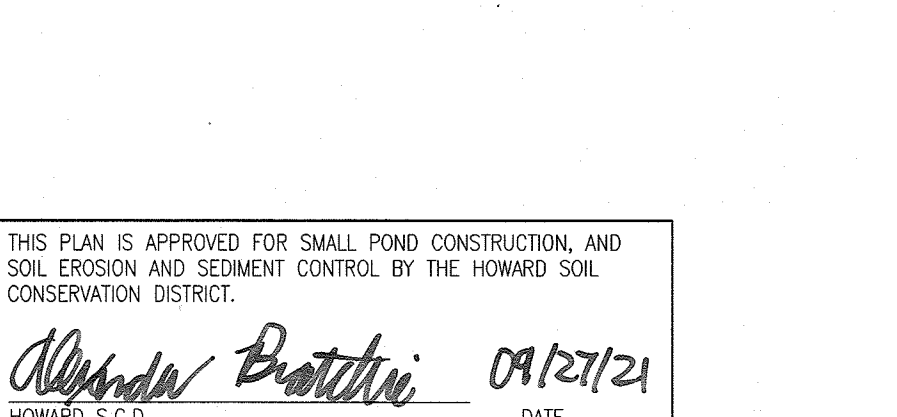


**NOTE**  
 FOR HEADWALL #1, ENDWALL #2 AND ALUMINUM BOX CULVERT CONSTRUCTION DETAILS, REFER TO DETAILS HEREIN

**SCALE 1"=20'**

**NOTE**  
 THE DEVELOPER WILL OBTAIN ALL NECESSARY STATE PERMITS FOR THE PROPOSED ENVIRONMENTAL IMPACTS.  
 -MDE FILE NO. MPRCN05V  
 -MDE TRACKING NUMBER IS: 21-NI-3067 (A#167647)  
 -HW 21-NI-3067  
 -DEPT. OF ARMY NO.  
 -CEMB-OPR-N (SECURITY DEVELOPMENT/RO XING, CULVERT, & OUTFALL) 2021-60578-M44

ALL WORK IN THE NONTIDAL WETLANDS, WETLAND BUFFERS SHALL BE COMPLETED PER THE BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS.



THIS PLAN IS APPROVED FOR SMALL POND CONSTRUCTION, AND SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

*Howard S.C.D.* 09/27/21 DATE

**OWNER/DEVELOPER CERTIFICATION:**  
 I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I SHALL ENGAGE A MARYLAND REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION, AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I CERTIFY NOT-TO-DRY FOR PERIODS ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE.

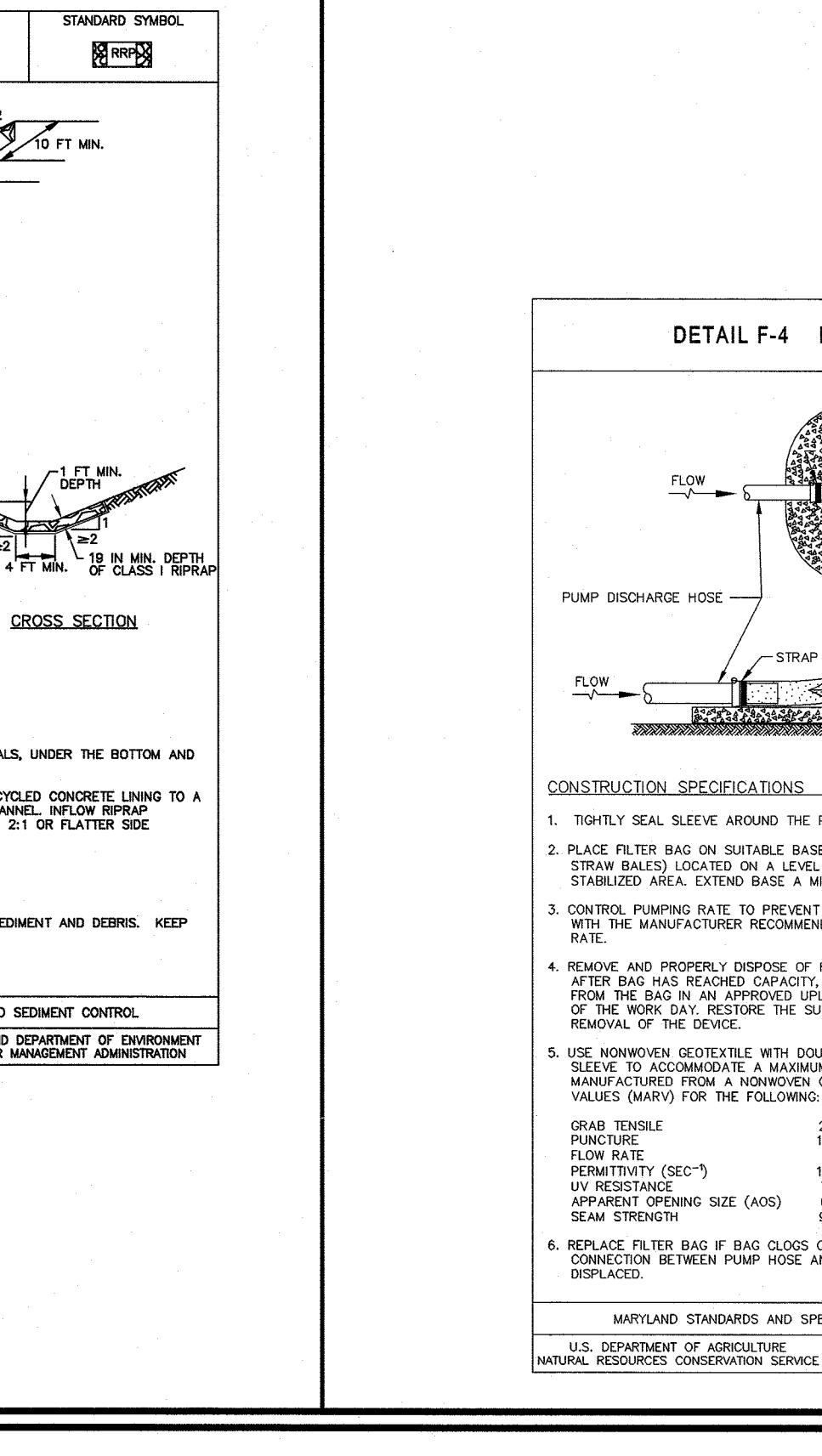
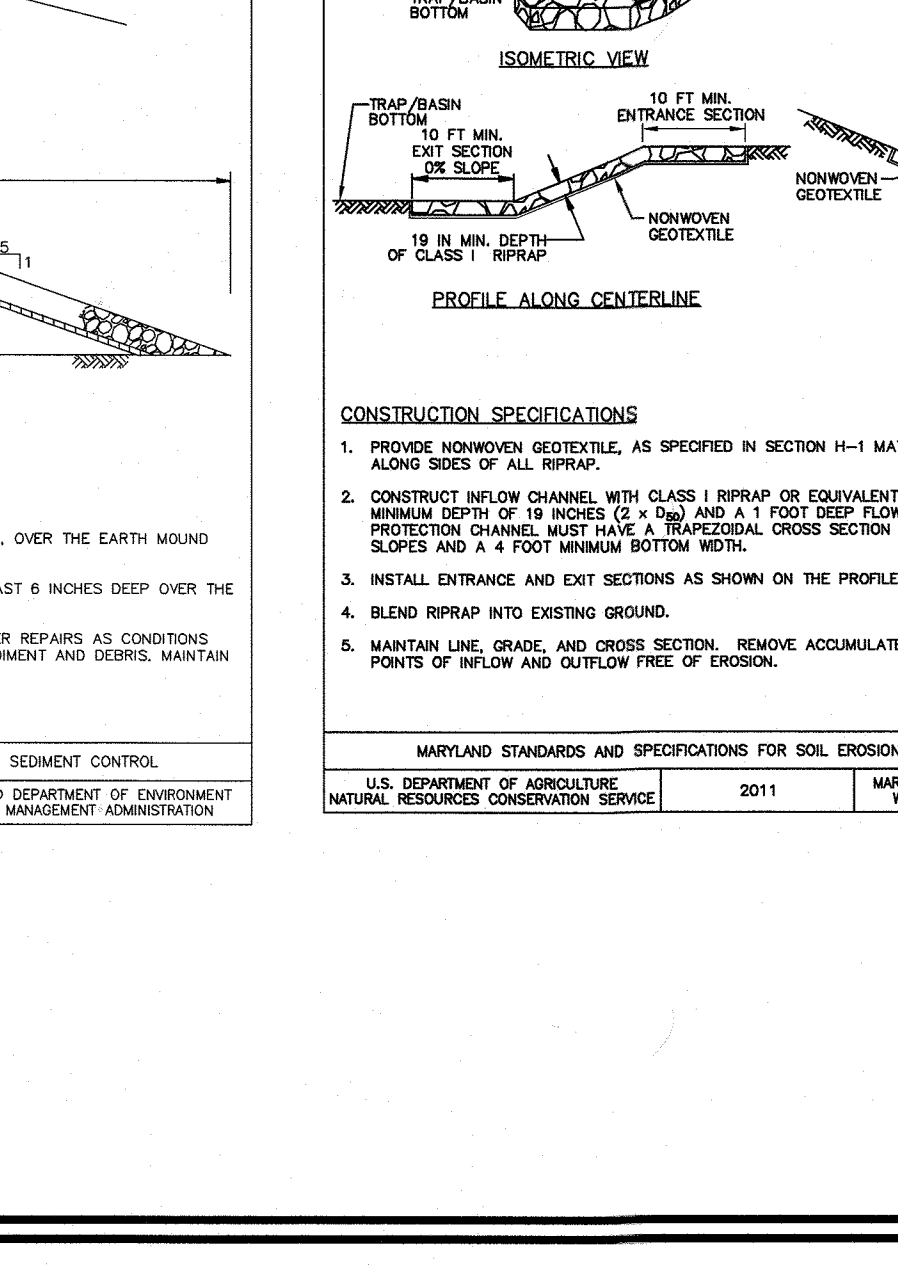
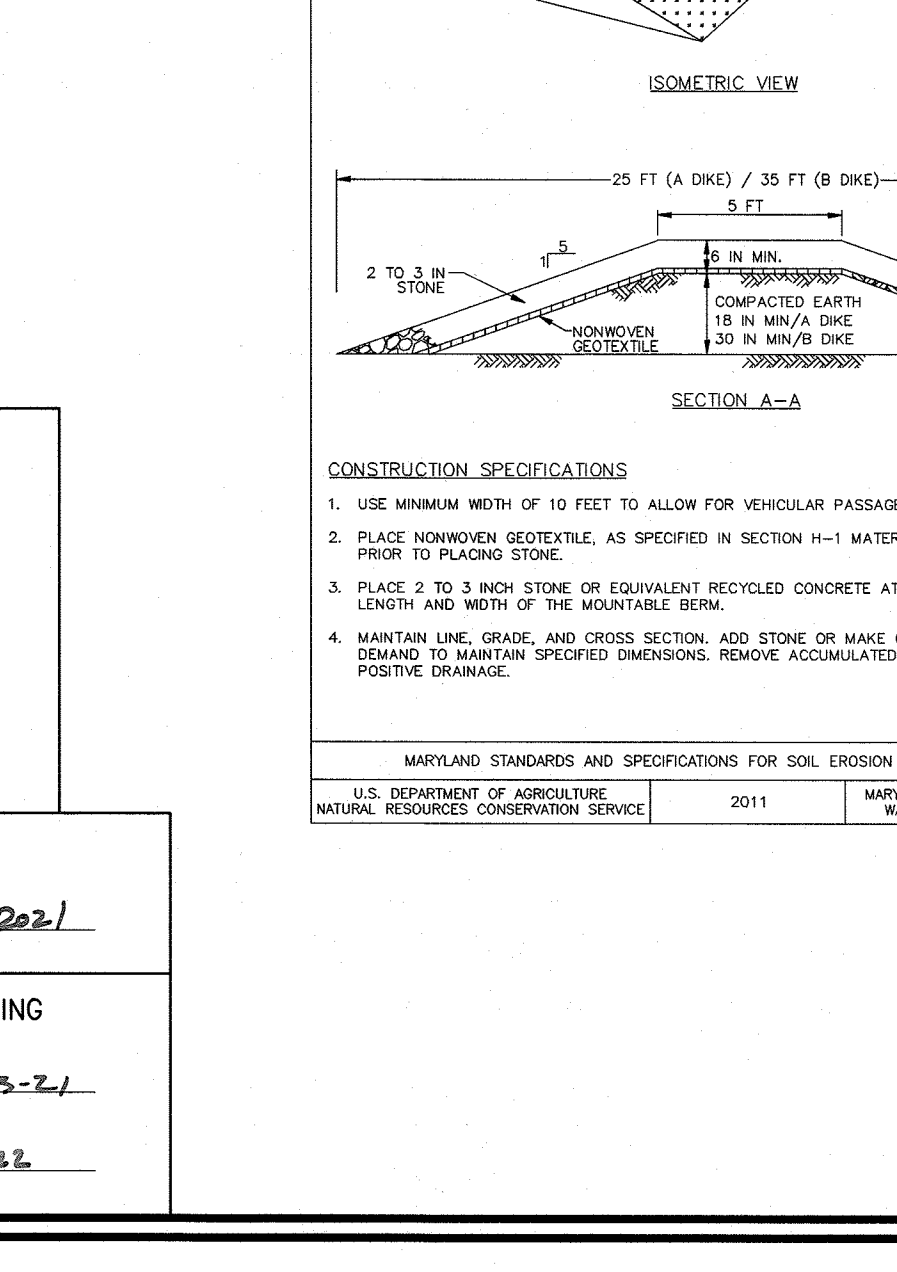
*Matthew S. Wiseman, P.E.* 9/28/21 OWNER/DEVELOPER SIGNATURE  
 Matthew S. Wiseman, P.E. PRINTED NAME & TITLE

**DESIGN CERTIFICATION:**  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, AND THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTICED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

*Robert H. Vogel* 9/24/21 DESIGNER'S SIGNATURE  
 ROBERT H. VOGEL M.D. REGISTRATION NO. 16193 PRINTED NAME  
 (P), R.L.S., OR R.L.A. (CIRCLE ONE)

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*James* 12/07/2021 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*John* 12-23-21 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
*John* 1/3/22 CHIEF, DIVISION OF LAND DEVELOPMENT DATE



- CONSTRUCTION SPECIFICATIONS**
- TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
  - PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALE) UNDER A LEVEL, OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
  - CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
  - REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY. WHENEVER OCCURS SPREAD THE DRAINERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESURFACE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
  - USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MANY) FOR THE FOLLOWING:
 

GRAB TENSILE	250 LB	ASTM D-4632
PUNCHING	150 LB	ASTM D-4633
FLOW RATE	70 GAL/MIN/FT <sup>2</sup>	ASTM D-4491
PERMEABILITY (SEC <sup>-2</sup> )	1.2 SEC <sup>-2</sup>	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4550
APPROXIMATE OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH		ASTM D-4632
  - REPLACE FILTER BAG IF BAG CLOSURE HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

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

**PLAN VIEW**

**SECTION A-A**

**NOTE**  
 pumps should discharge onto a stable velocity dissipator made of rip rap or sandbags

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT NATIONAL PIKE SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

**FINAL ROAD CONSTRUCTION PLAN**  
**SOIL EROSION AND SEDIMENT CONTROL PLAN**  
**NOTES AND DETAILS**

**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 LOTS: 257, 258, 259  
 3RD ELECTION DISTRICT ZONED: CEF-M

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

**PROFESSIONAL CERTIFICATE**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

DESIGN BY: RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

22 SHEET OF 101



**LEGEND:**

- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- EXISTING TREE LINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- PROPOSED SIDEWALK
- PUBLIC 100 YR FLOODPLAIN
- EX. WETLAND
- EX. WETLAND BUFFER
- EX. STREAM
- EX. STREAM BUFFER
- LOOP TRAIL
- EX. SPECIMEN TREE W/ CRITICAL ROOT ZONE
- RUB (C) SOILS BOUNDARY
- Cbc (B) SOILS BOUNDARY
- STREET LIGHT
- 100 YR FLOODPLAIN CROSS SECTION/ WSEL
- EXISTING FOREST CONSERVATION EASEMENT F-21-014
- EXISTING PUBLIC 12' TRAIL EASEMENT F-21-014
- DRAINAGE AREA INLET ZONING C FACTOR # % IMPERVIOUS
- DRAINAGE AREA DIVIDE

Maryland State Grid Meridian

MATCHLINE - SHEET 25  
MATCHLINE - SHEET 24

MATCHLINE - SHEET 26

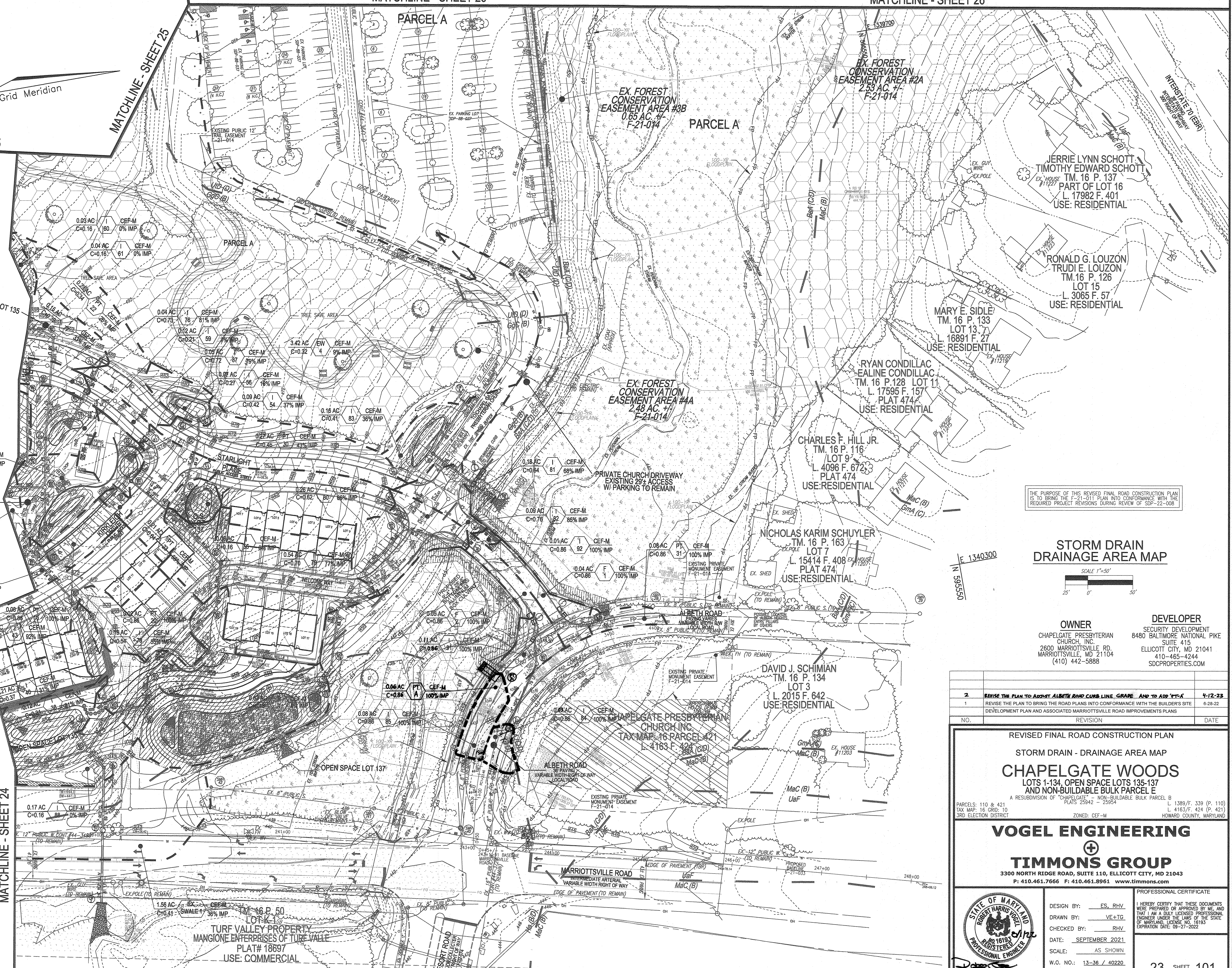
MATCHLINE - SHEET 26

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E 1339750

N 595550  
E 1340300

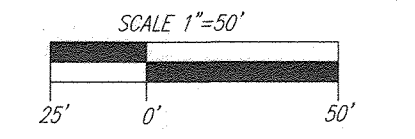
MATCHLINE SHEET 24

MATCHLINE - SHEET 24



THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SUP-22-008

**STORM DRAIN DRAINAGE AREA MAP**



**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

2	REVISE THE PLAN TO ADJUST ALBETH ROAD CURB LINE, GRADE AND TO ADD 'C'-'A'	4-12-23
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

NO.	REVISION	DATE
-----	----------	------

REVISED FINAL ROAD CONSTRUCTION PLAN  
STORM DRAIN - DRAINAGE AREA MAP  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 2594Z - 2595A  
PARCELS: 110 & 421 L. 1389 F. 339 (P. 110)  
TAX MAP: 16 GRD: 10 L. 4163 F. 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

**PROFESSIONAL CERTIFICATE**

DESIGN BY: ES, RHV  
DRAWN BY: VE+TC  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE JURE OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

ROBERT H. VOGEL, PE No.16193

**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
CgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GpB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GpB	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hs	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UaF	UDORNTENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
UdD	URBAN LAND-UDORNTENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

NOTE:  
-SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
-HOWARD COUNTY SOILS MAP NUMBERS 12 - SYKESVILLE SE  
-K VALUES PER https://www.howardsoil.org/documents - "K" FACTORS (USE KW)  
NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 3 PERCENT \* LIMITS OF PROJECT

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS MK 09/19/2022 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION 9-21-22 DATE  
CHIEF, DIVISION OF LAND DEVELOPMENT 9/21/22 DATE

TURF VALLEY PROPERTY  
MANGIONE ENTERPRISES OF TURF VALLEY  
PLAT# 18697  
USE: COMMERCIAL



SOILS LEGEND				
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
Bk	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
Bc	BALE SILT LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GcB	GLENNELG LOAM, 8 TO 15 PERCENT SLOPES	B	.37	YES
GnB	GLENNELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hb	HATBORO-ODORIUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
Md	MAJOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
Luf	UDORHENTIS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
Lud	UDORHENTIS, HIGHWAY, 0 TO 15 PERCENT SLOPES	D	-	NO

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 HOWARD COUNTY SOILS MAP NUMBER 12 - SYKESVILLE SE  
 \* K-VALUES PER MTRZ/WWW.HOWARDSD.org/documents -- \* FACTORS (USE KW)  
 NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

LEGEND:	
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING TREE LINE (FIELD LOCATED)
	EXISTING VEGETATION
	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	PROPOSED SIDEWALK
	PUBLIC 100 YR FLOODPLAIN
	EX. WETLAND
	EX. WETLAND BUFFER
	EX. STREAM
	EX. STREAM BUFFER
	LOOP TRAIL
	EX. SPECIMEN TREE W/ CRITICAL ROOT ZONE
	SOILS BOUNDARY
	STREET LIGHT
	100 YR FLOODPLAIN CROSS SECTION/ WSEL
	EXISTING FOREST CONSERVATION EASEMENT F-21-014
	Drainage Area Inlet Zoning C Factor # % IMPERVIOUS
	DRAINAGE AREA DIVIDE



THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

<b>OWNER</b> CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTVILLE RD. MARRIOTTVILLE, MD 21104 (410) 442-5888	<b>DEVELOPER</b> SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLCOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM
--	--

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	9-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 STORM DRAIN - DRAINAGE AREA MAP  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25942 & 25954  
 PARCELS: 110 & 421 L 1389/F 339 (P. 110)  
 TAX MAP: 16 ORD-10 L 4163/F 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

DESIGN BY: ES, RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

24 SHEET OF 101

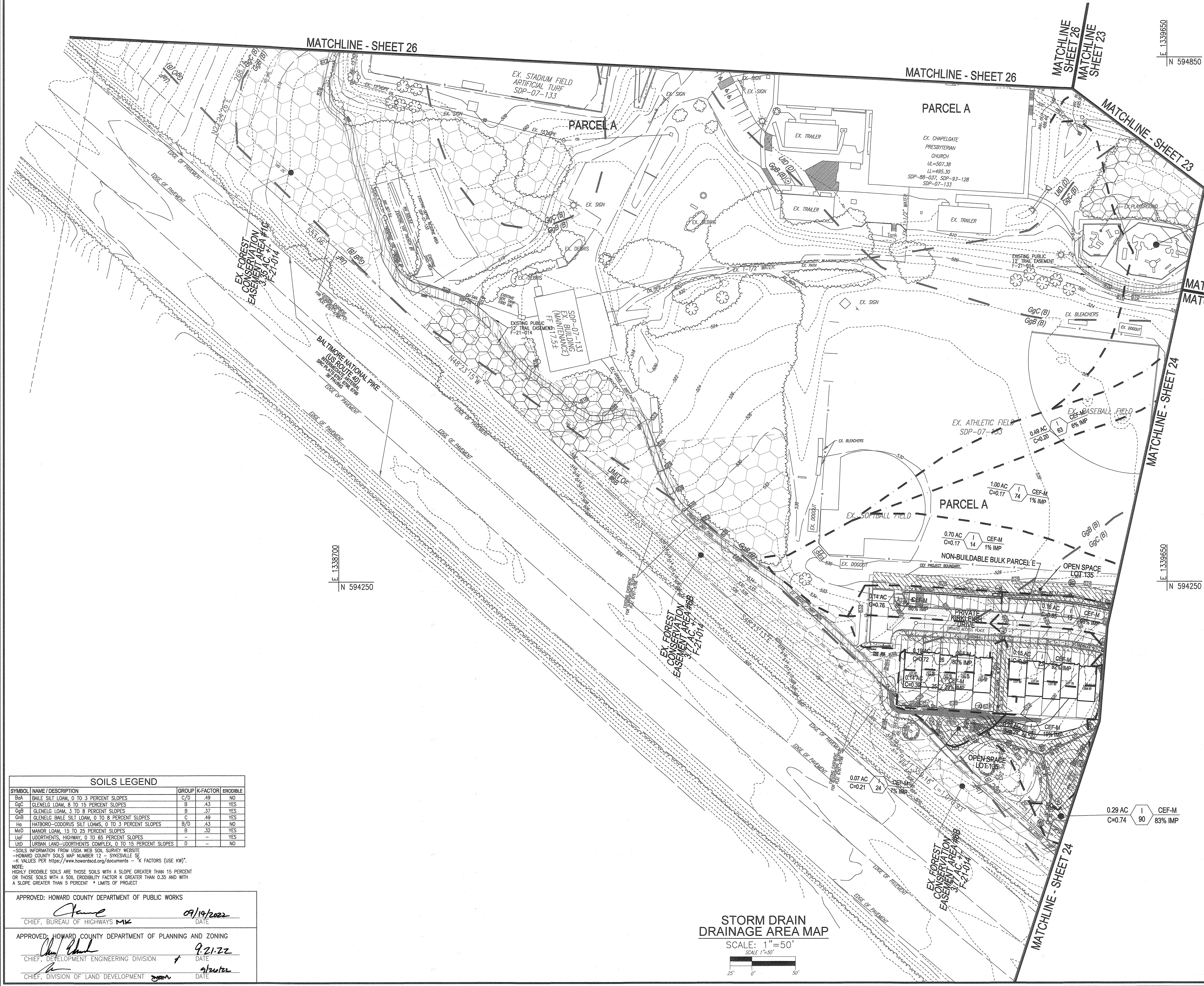
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS MKC  
 DATE: 09/19/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9-21-22

APPROVED: DIVISION OF LAND DEVELOPMENT  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/26/22

STORM DRAIN DRAINAGE AREA MAP  
 SCALE: 1"=50'





- LEGEND:**
- EXISTING CURB AND GUTTER
  - PROPOSED CURB AND GUTTER
  - EXISTING UTILITY POLE
  - EXISTING LIGHT POLE
  - EXISTING MAILBOX
  - EXISTING SIGN
  - EXISTING SANITARY MANHOLE
  - EXISTING SANITARY LINE
  - EXISTING CLEANOUT
  - EXISTING FIRE HYDRANT
  - EXISTING WATER LINE
  - PROPOSED STORM DRAIN
  - PROPOSED STORM DRAIN INLET
  - EXISTING TREELINE (FIELD LOCATED)
  - EXISTING VEGETATION
  - EXISTING FENCE
  - PROPERTY LINE
  - RIGHT-OF-WAY LINE
  - PROPOSED SIDEWALK
  - PUBLIC 100 YR FLOODPLAIN
  - EX. WETLAND
  - EX. WETLAND BUFFER
  - EX. STREAM
  - EX. STREAM BUFFER
  - LOOP TRAIL
  - EX. SPECIMEN TREE W/ CRITICAL ROOT ZONE
  - SOILS BOUNDARY
  - STREET LIGHT
  - 100 YR FLOODPLAIN CROSS SECTION/ WSEL
  - EXISTING FOREST CONSERVATION EASEMENT
  - EXISTING PUBLIC 12' TRAIL EASEMENT
- DRAINAGE AREA ZONING**
- C FACTOR # % IMPERVIOUS
- DRAINAGE AREA DIVIDE

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 SUITE 415  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 STORM DRAIN - DRAINAGE AREA MAP  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25042 - 25054 L. 1389/F. 339 (P. 110)  
 L. 4163/F. 424 (P. 421)  
 TAX MAP: 16 GRD: 10 L. 16183  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

DESIGN BY: ES, RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16183 EXPIRATION DATE: 09-27-2022

**25** SHEET **101**  
 OF

**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GgD	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hs	HATBORO-CODDORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UdF	UDOROTHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
UdD	URBAN LAND-UDOROTHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 -HOWARD COUNTY SOILS MAP NUMBER 12 - SYKESVILLE SE  
 -K VALUES PER https://www.howardocd.org/documents - "K" FACTORS (USE KW)  
 NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

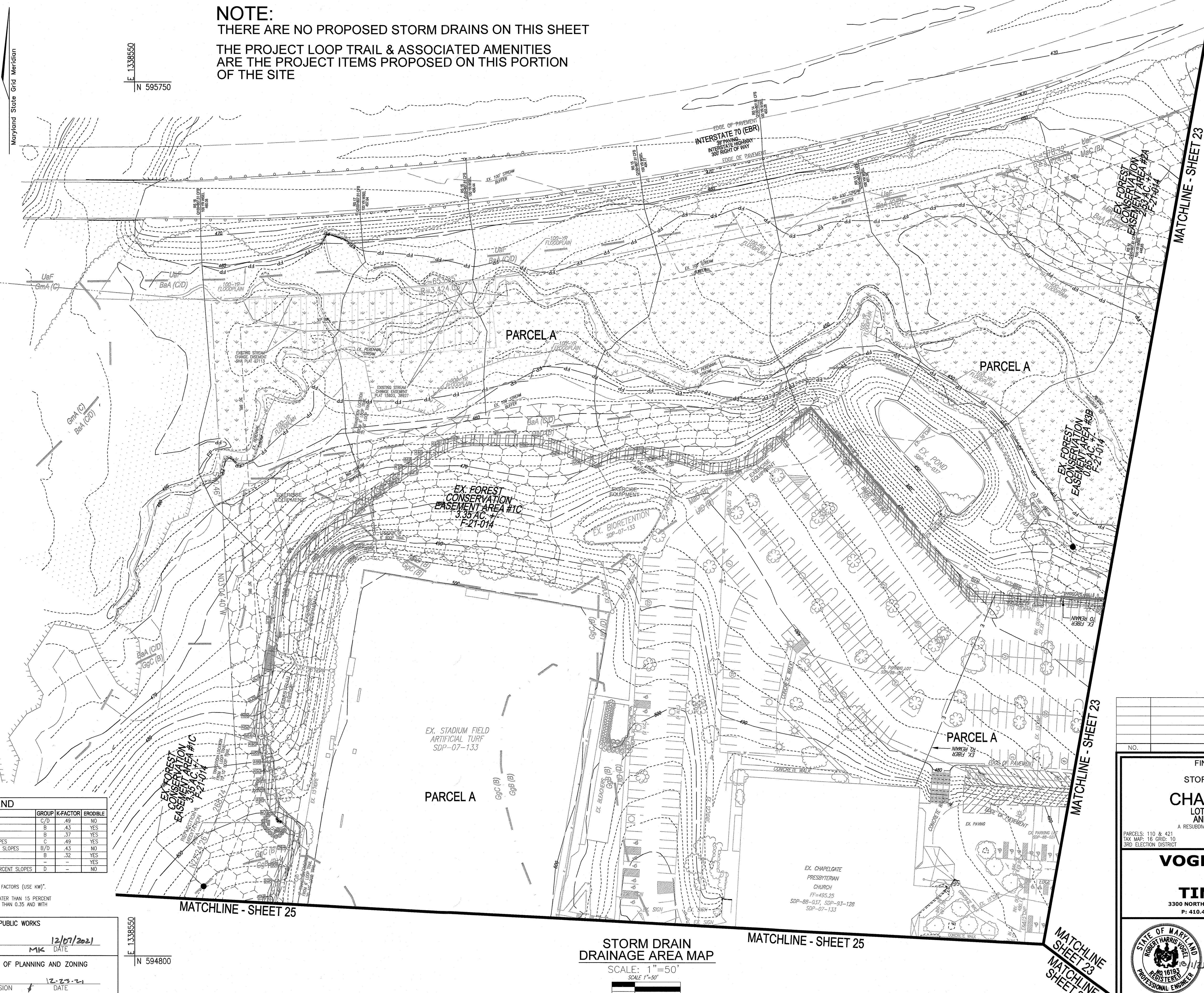
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS MKK 09/19/2022 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 9.21.22 DATE  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT 9/21/22 DATE

**STORM DRAIN DRAINAGE AREA MAP**  
 SCALE: 1"=50'  
 SCALE: 1"=50'



**NOTE:**  
THERE ARE NO PROPOSED STORM DRAINS ON THIS SHEET  
THE PROJECT LOOP TRAIL & ASSOCIATED AMENITIES  
ARE THE PROJECT ITEMS PROPOSED ON THIS PORTION  
OF THE SITE



**LEGEND:**

	EXISTING CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	EXISTING TREE LINE (FIELD LOCATED)
	EXISTING VEGETATION
	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	LOOP TRAIL
	PUBLIC 100 YR FLOODPLAIN
	EX. STREAM
	EX. STREAM BUFFER
	SOILS BOUNDARY
	STREET LIGHT
	100 YR FLOODPLAIN CROSS SECTION / WSEL
	EXISTING FOREST CONSERVATION EASEMENT
	EXISTING PUBLIC 12' TRAIL EASEMENT
	DRAINAGE AREA
	INLET
	ZONING
	C FACTOR
	% IMPERVIOUS
	DRAINAGE AREA DIVIDE

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDC PROPERTIES.COM

**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA	BALILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GhB	GLENELG BALE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Ha	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MaD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UaF	UDOROTHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
UaD	URBAN LAND-UDOROTHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

NOTE:  
HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 12-23-21

APPROVED: HOWARD COUNTY DEPARTMENT OF LAND DEVELOPMENT  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 1/10/22

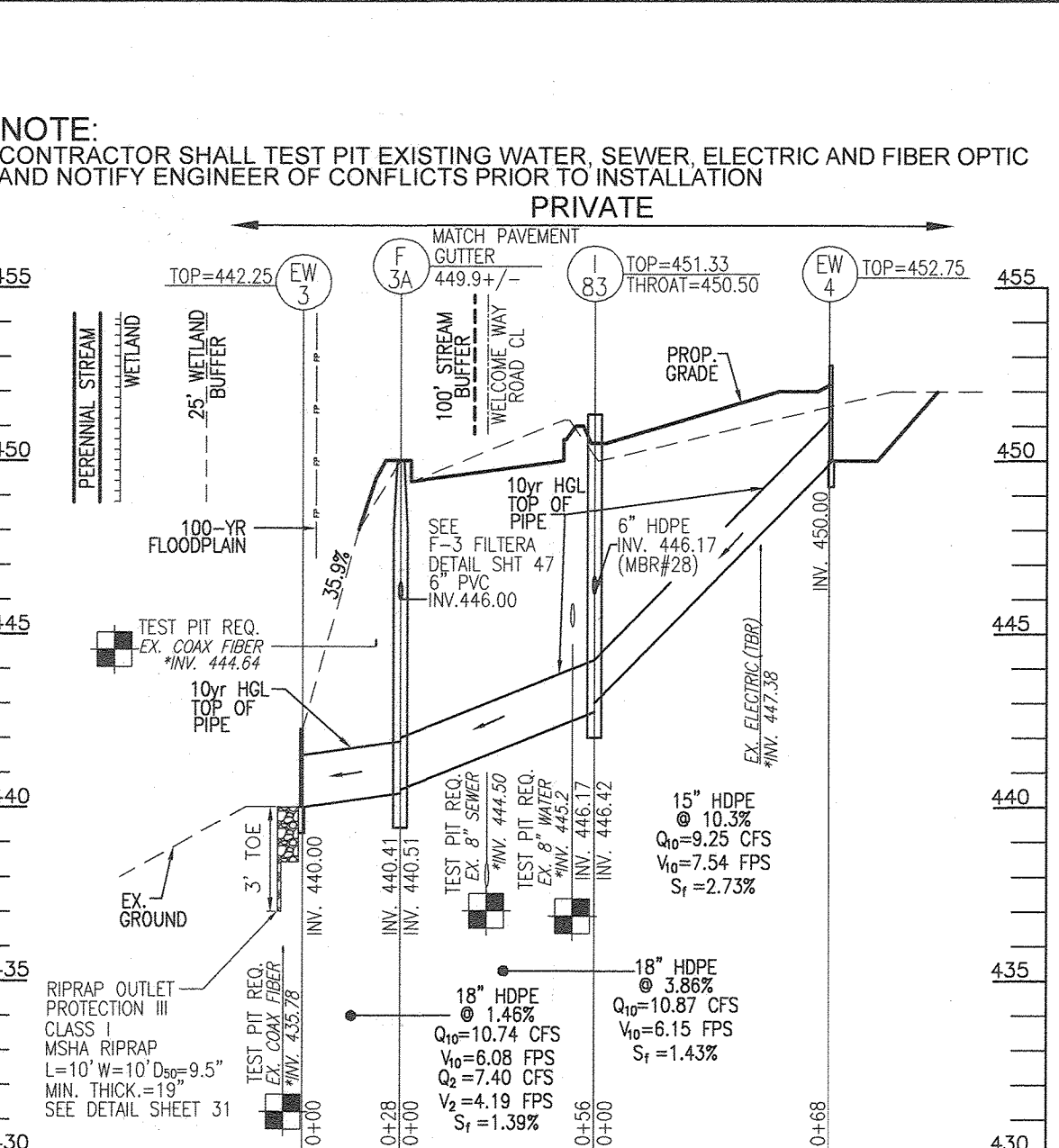
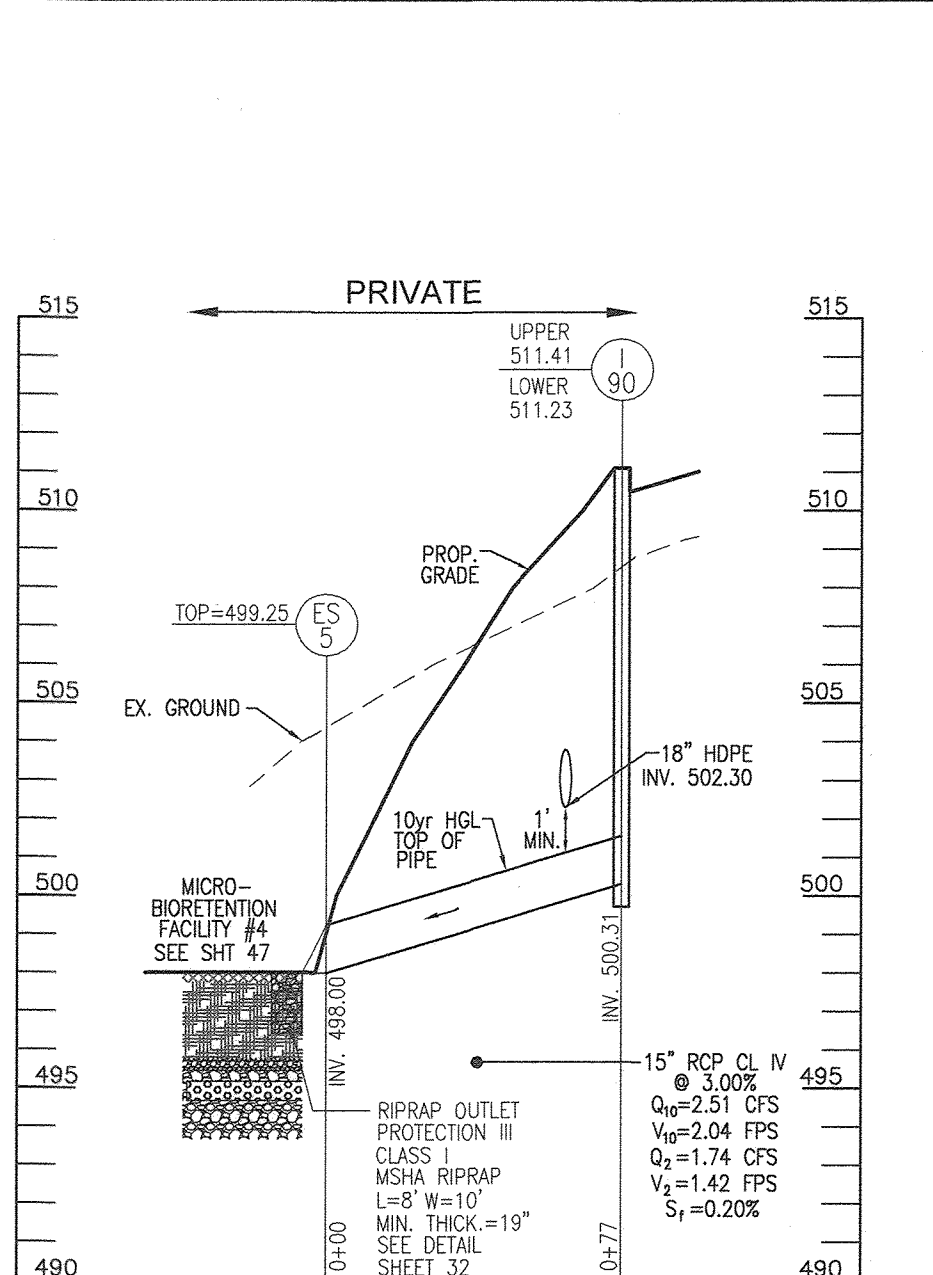
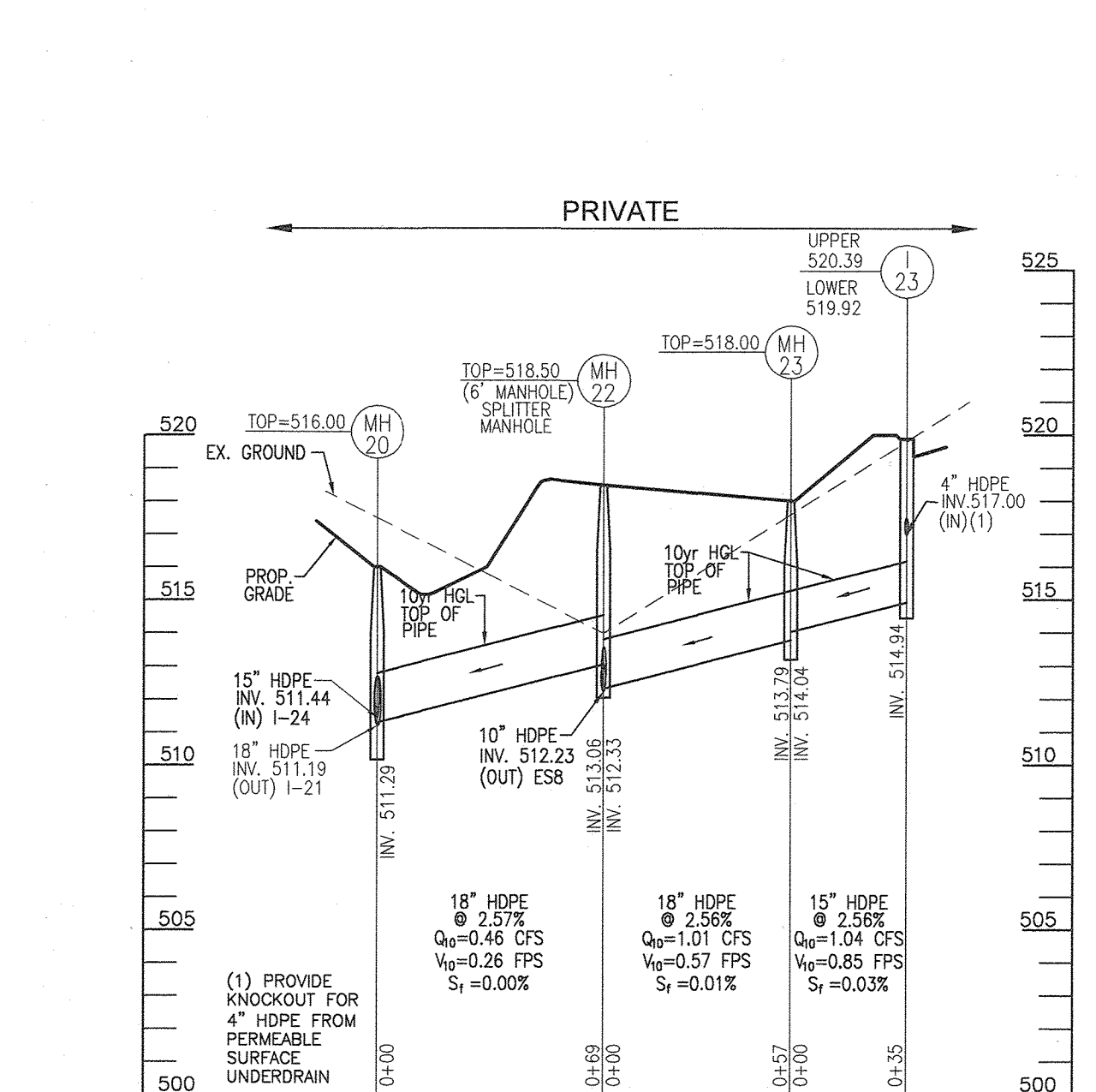
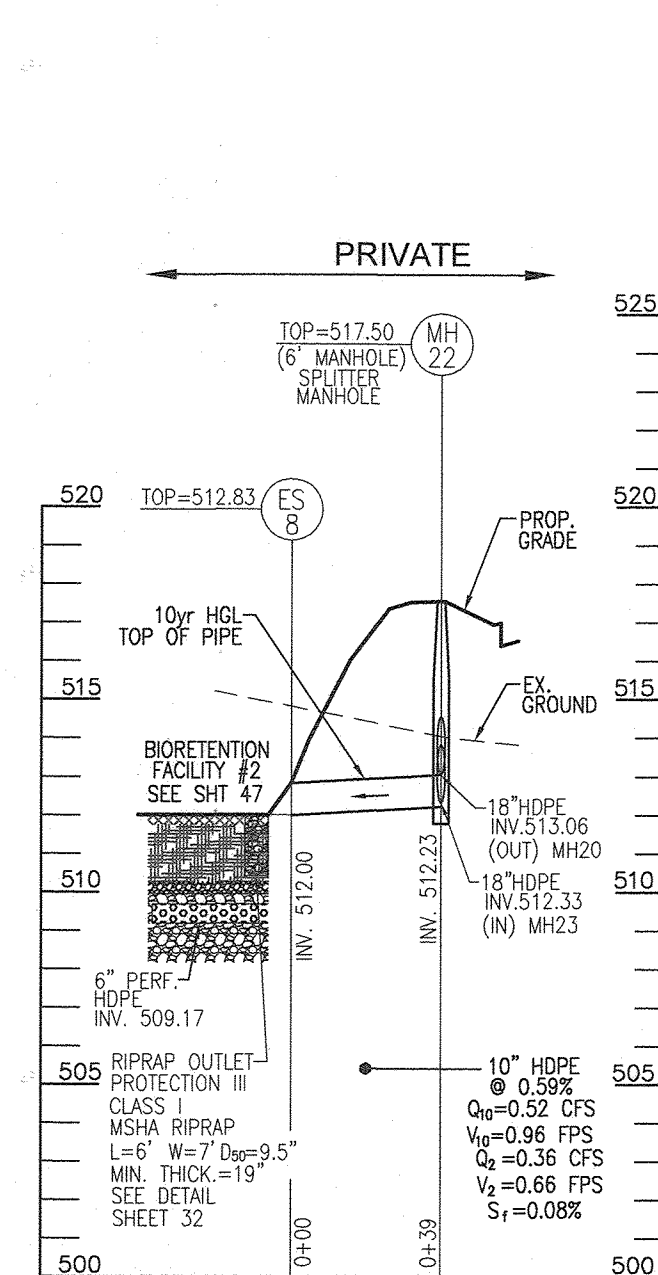
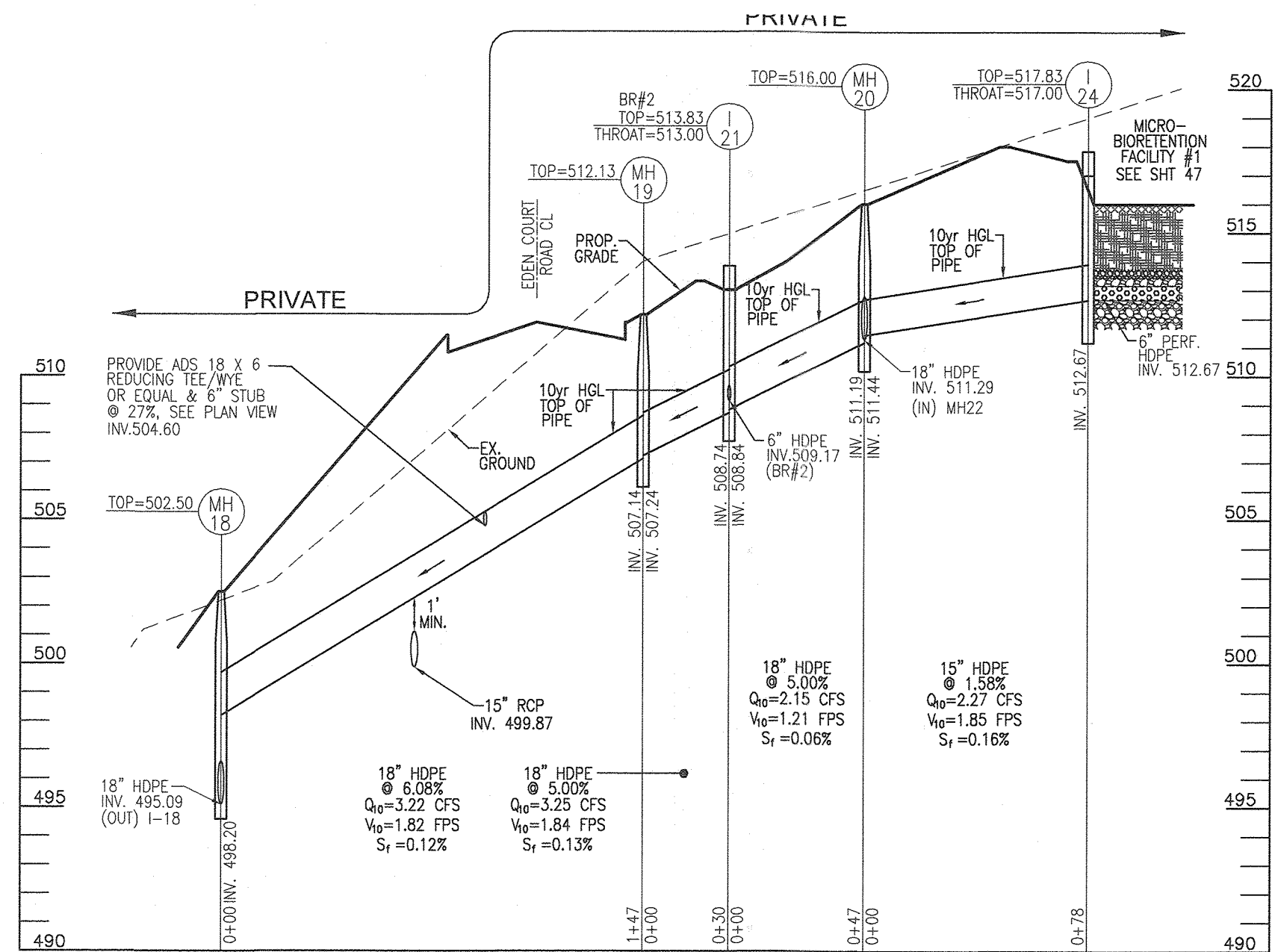
**STORM DRAIN DRAINAGE AREA MAP**  
 SCALE: 1" = 50'

NO.	REVISION	DATE
<b>FINAL ROAD CONSTRUCTION PLAN</b> <b>STORM DRAIN - DRAINAGE AREA MAP</b> <b>CHAPEL GATE WOODS</b> <b>LOTS 1-134, OPEN SPACE LOTS 135-137</b> <b>AND NON-BUILDABLE BULK PARCEL E</b> <small>A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B        PLATS 25972-25974        L 1389/F 339 (P. 110)        L 4163/F 424 (P. 421)        HOWARD COUNTY, MARYLAND</small>		
<b>VOGEL ENGINEERING</b>  <b>TIMMONS GROUP</b> <small>3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043        P: 410.461.7666 F: 410.461.8961 www.timmons.com</small>		
DESIGN BY: RHV	PROFESSIONAL CERTIFICATE	
DRAWN BY: VE+TG	I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022	
CHECKED BY: RHV		
DATE: SEPTEMBER 2021		
SCALE: AS SHOWN		
W.O. NO.: 13-36 / 40220		
 ROBERT H. VOGEL, PE No. 16193		26 SHEET OF 101

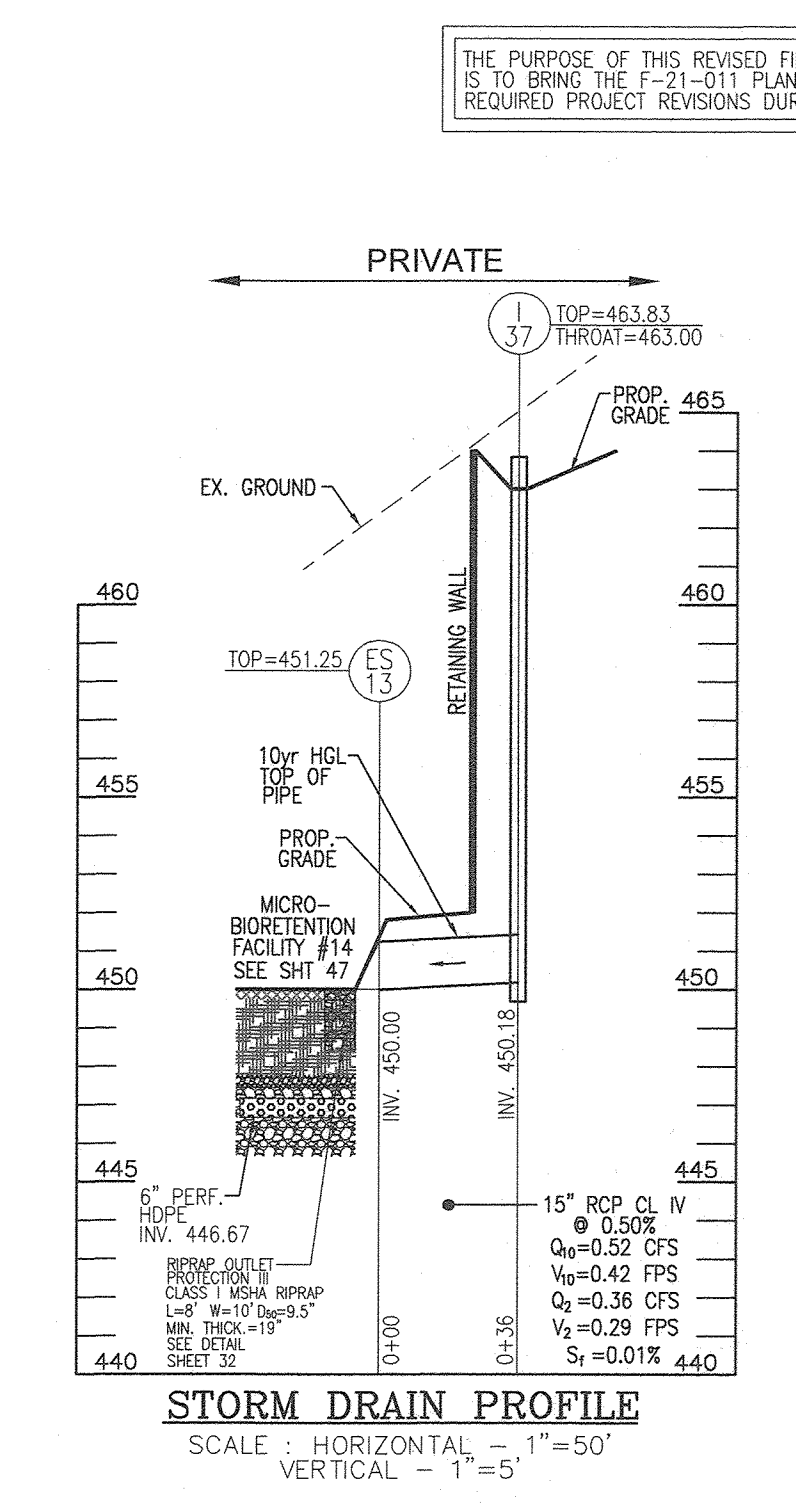
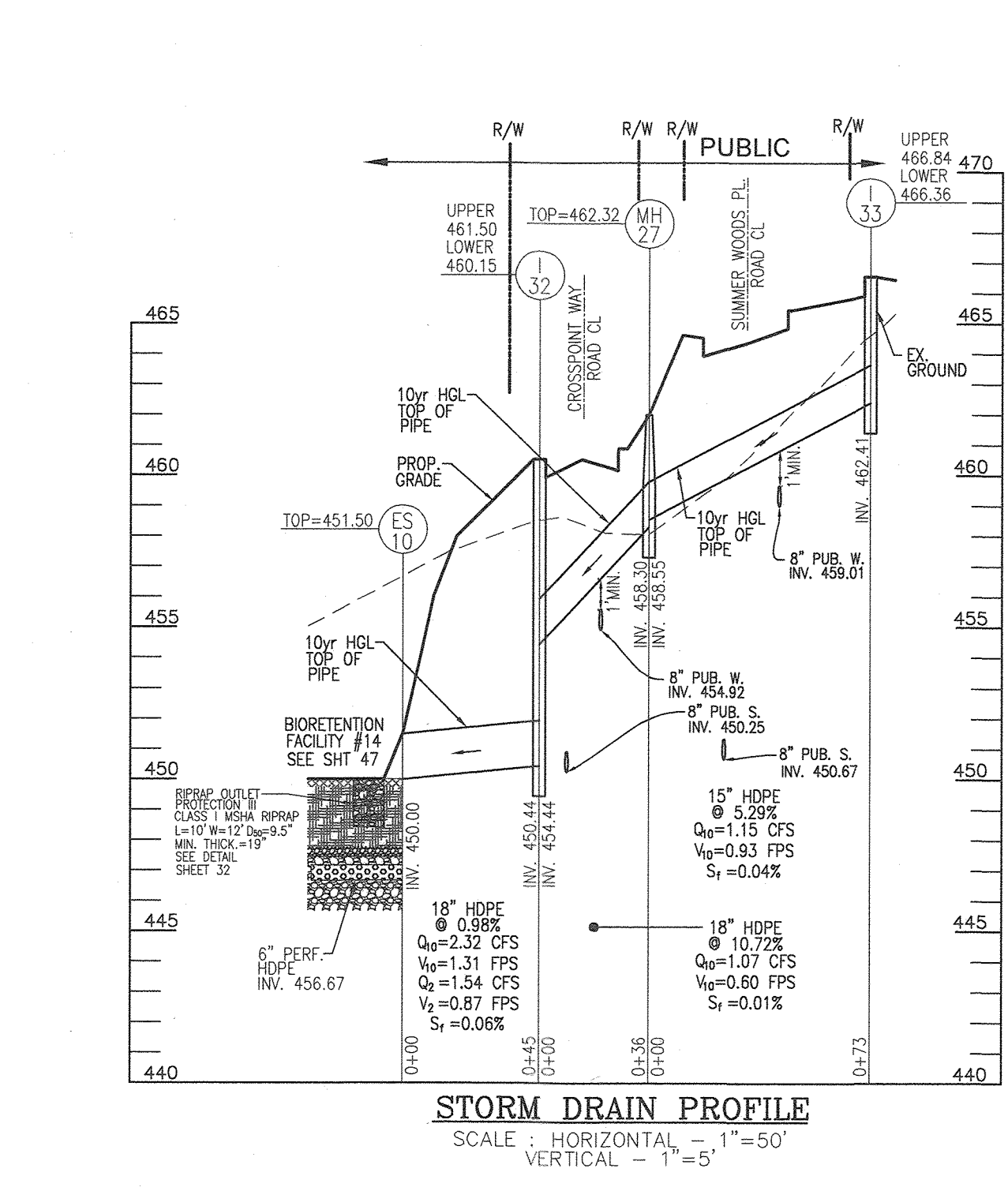
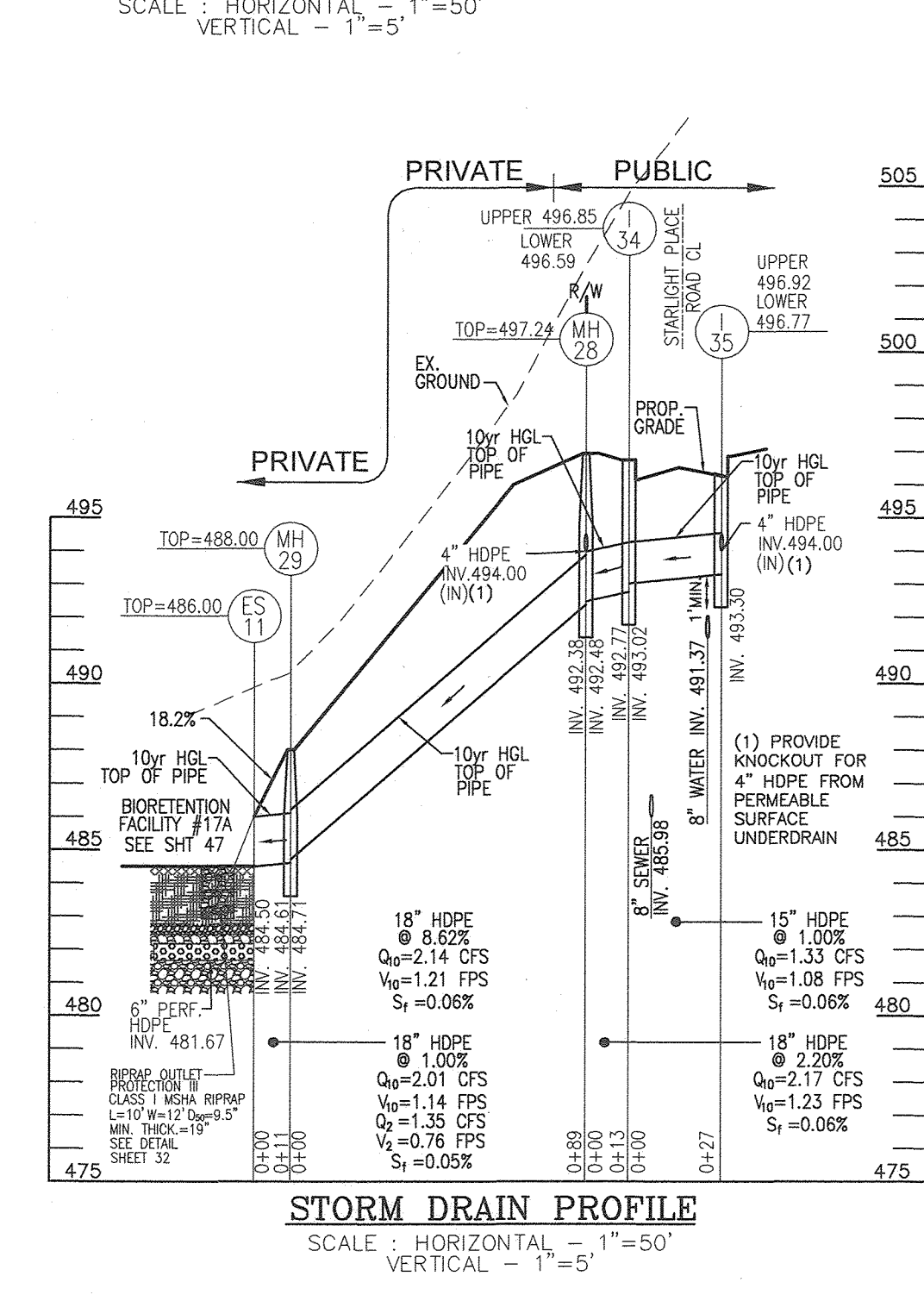
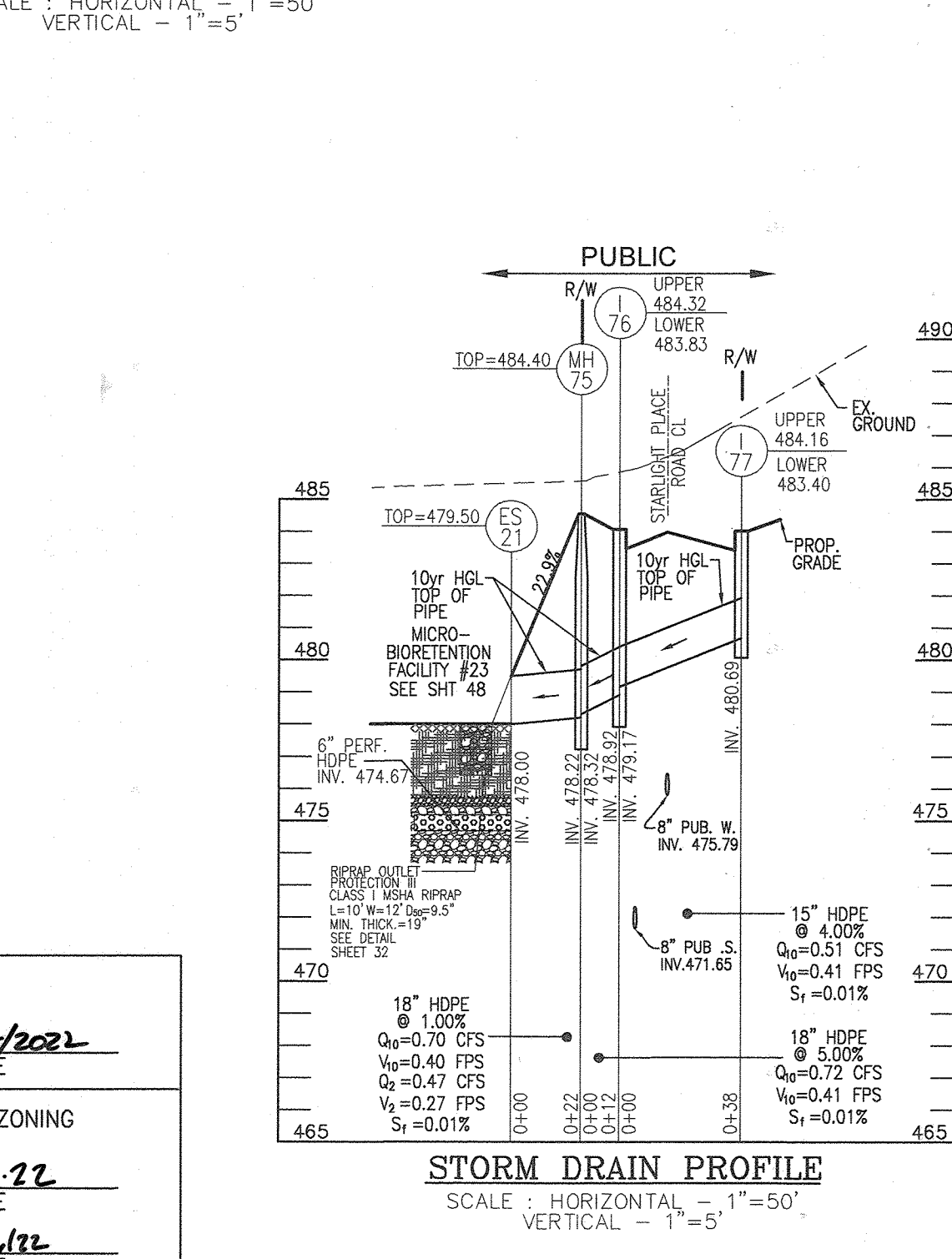
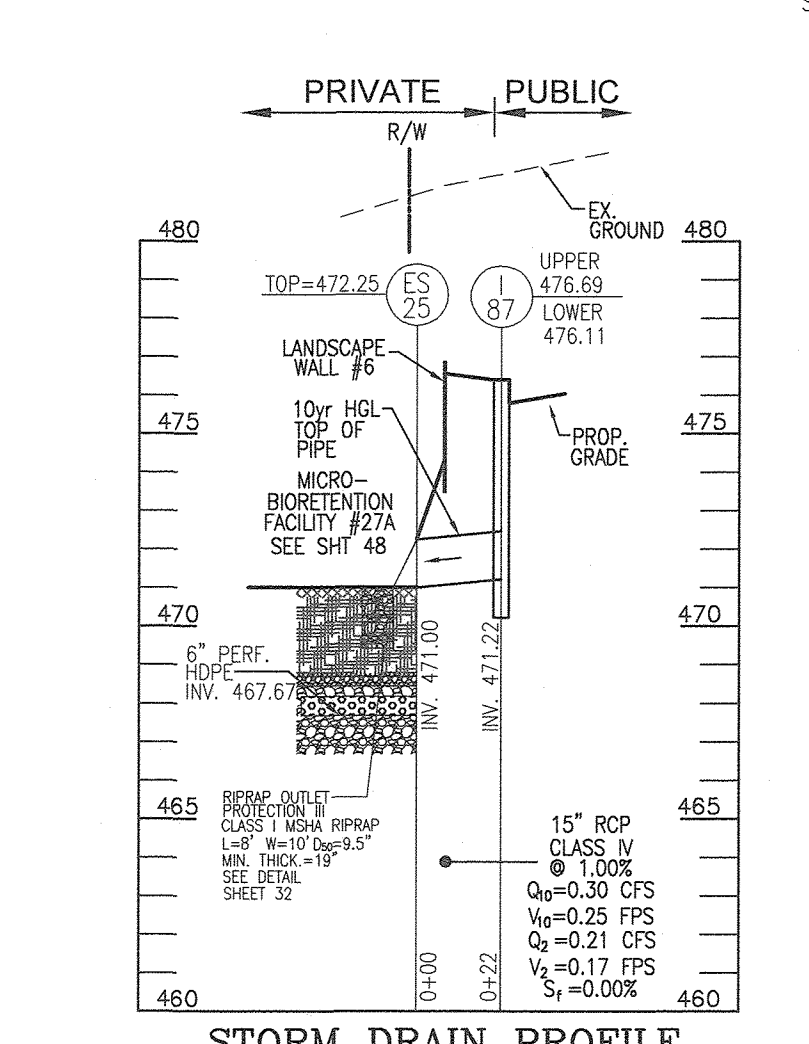
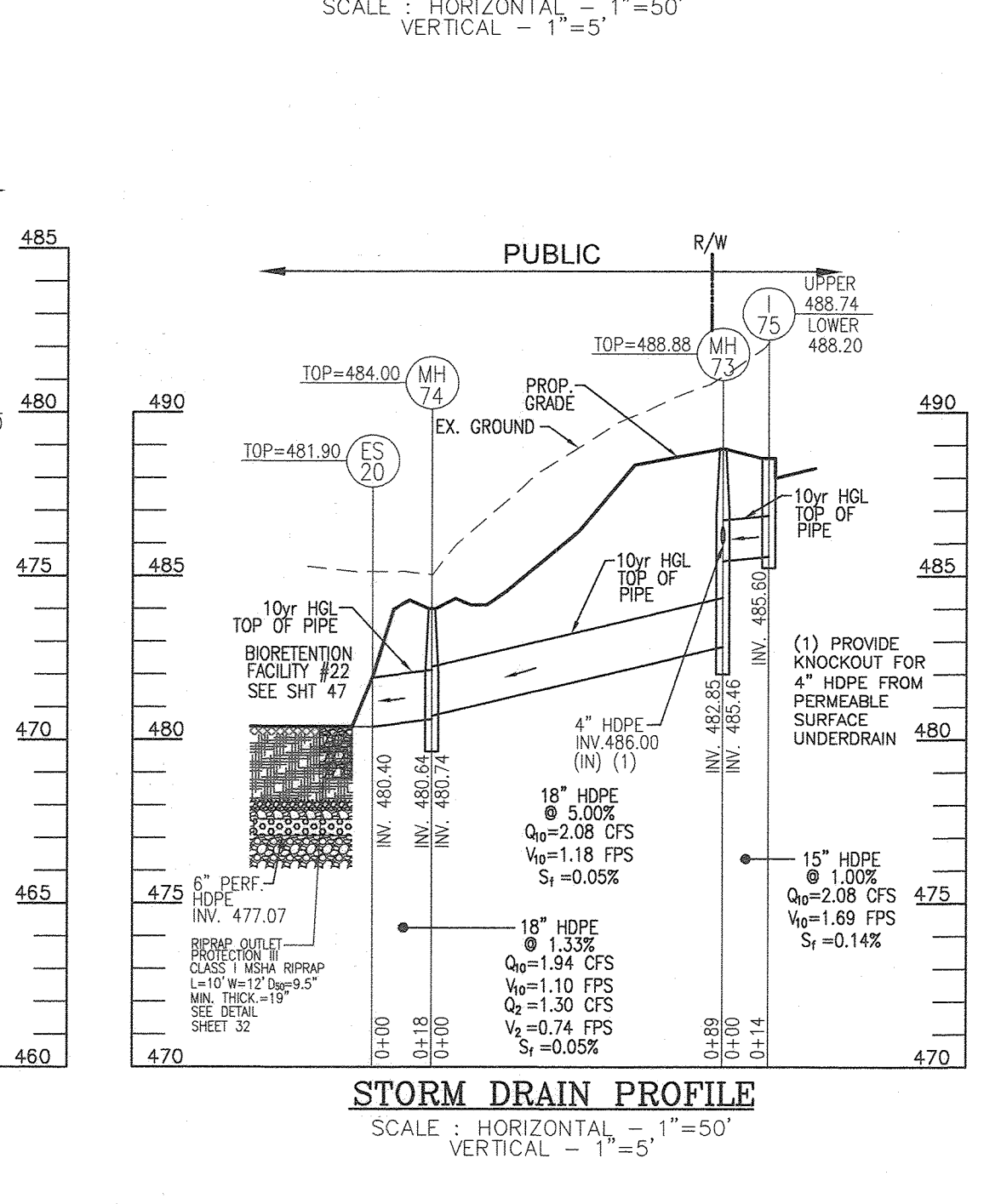
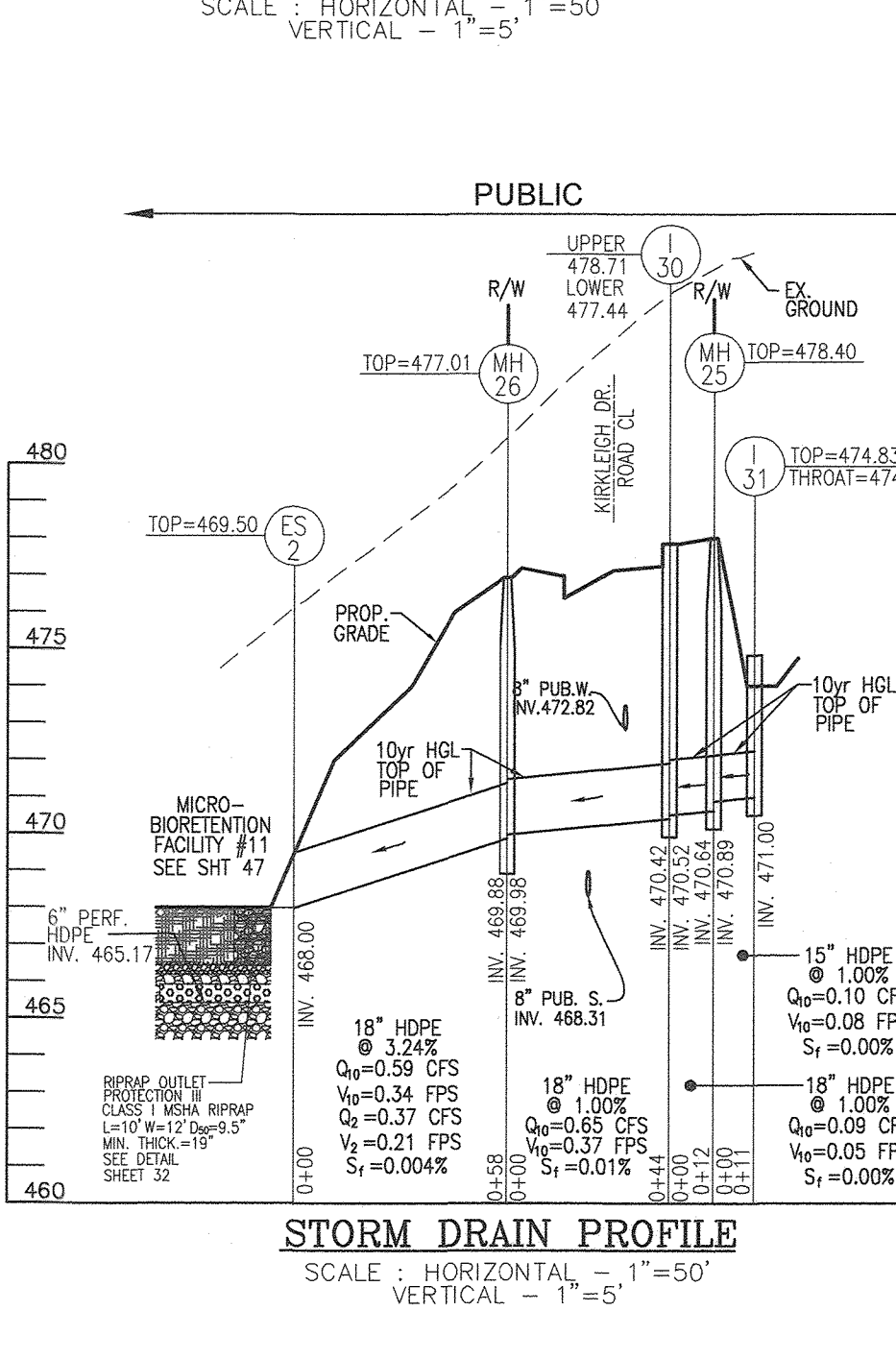
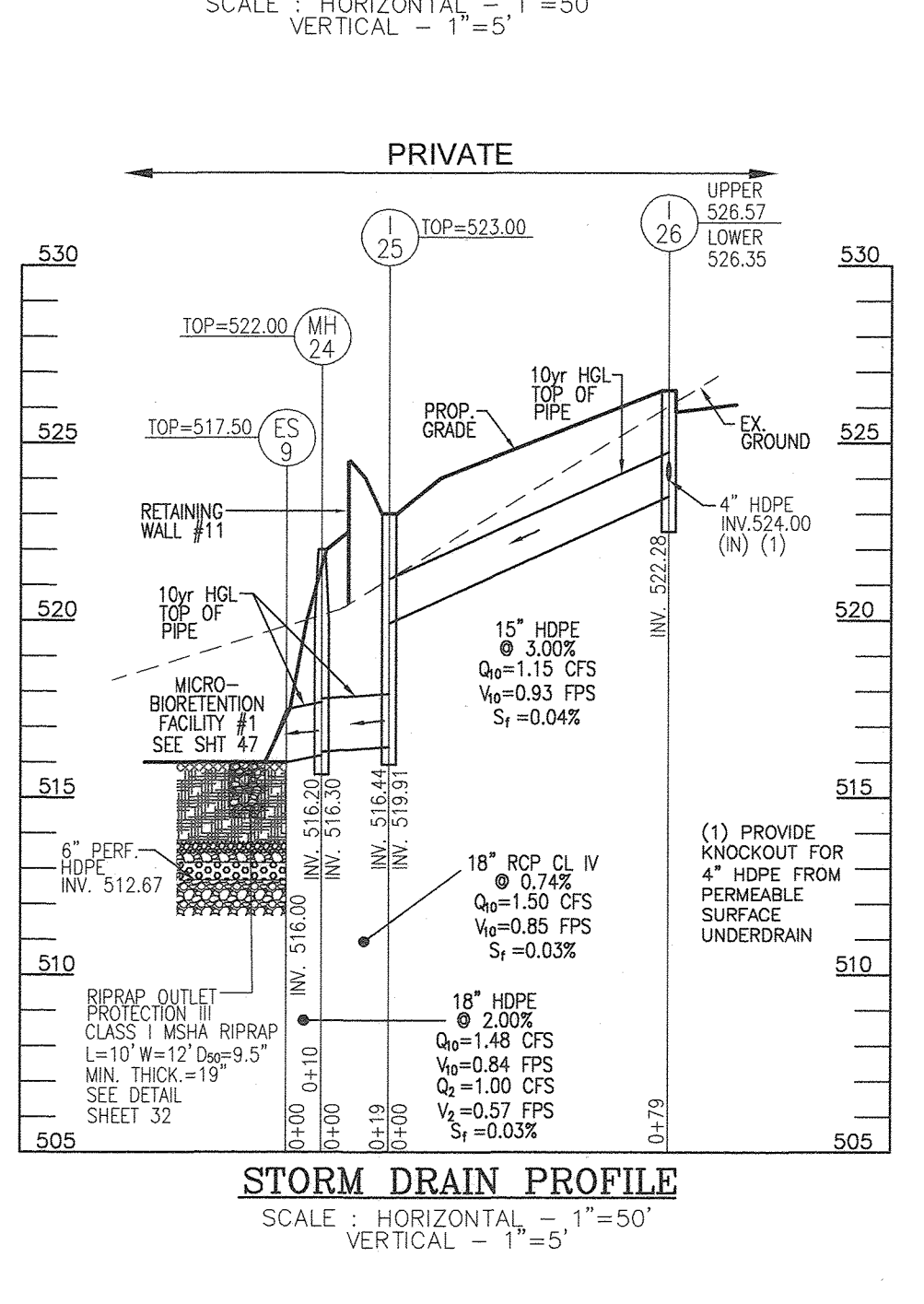
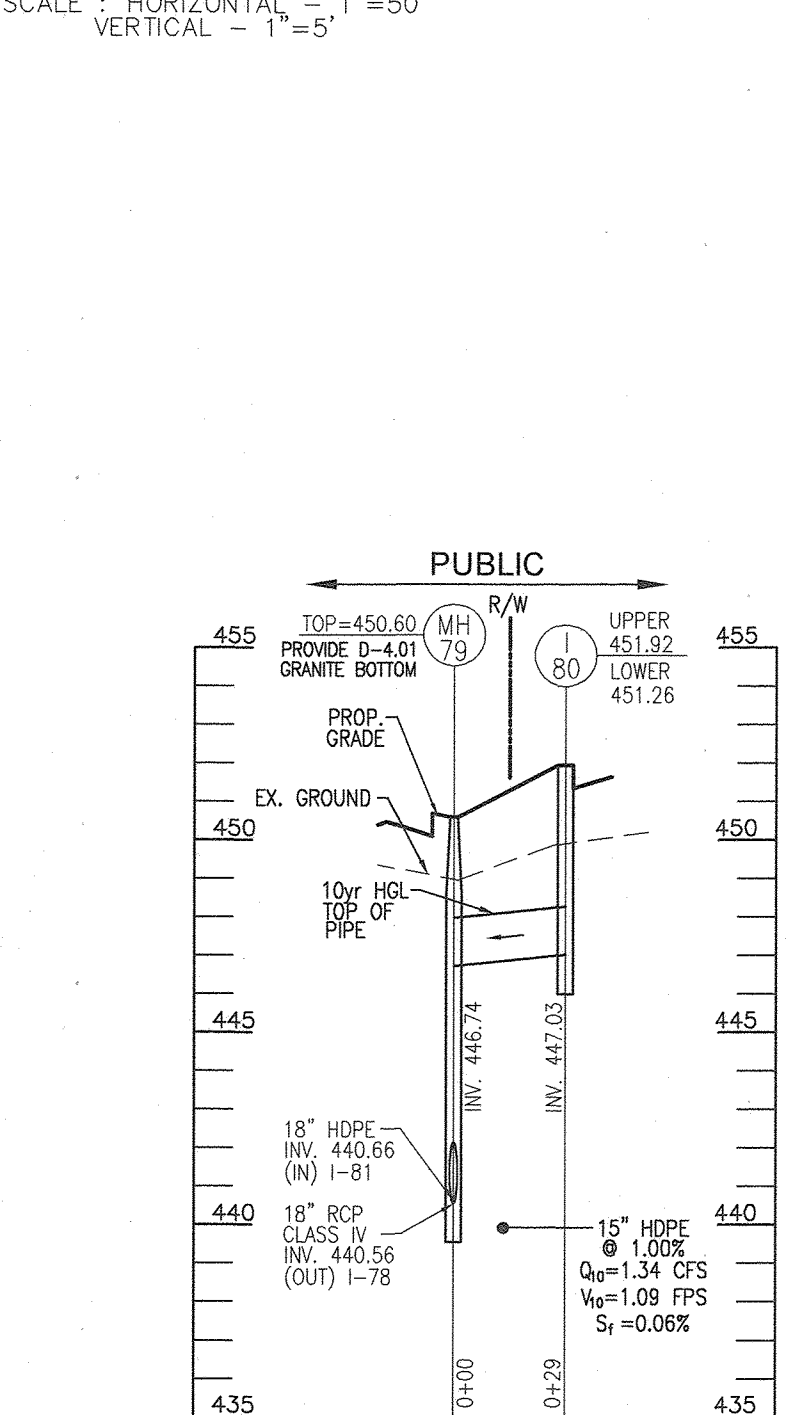
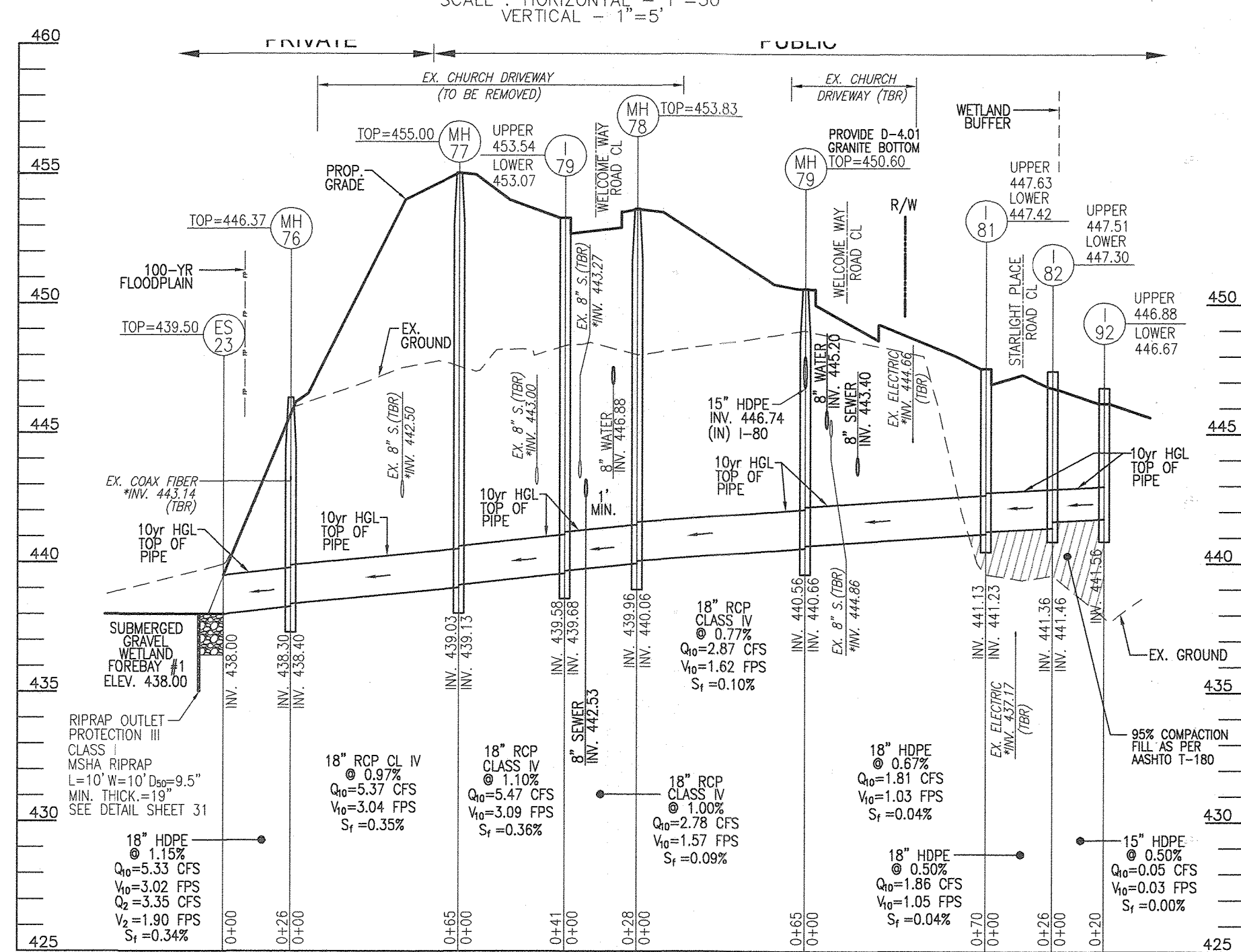








NOTE: CONTRACTOR SHALL TEST PIT EXISTING WATER, SEWER, ELECTRIC AND FIBER OPTIC AND NOTIFY ENGINEER OF CONFLICTS PRIOR TO INSTALLATION



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 09/16/2022  
 CHIEF, BUREAU OF HIGHWAYS MIZ  
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 9-21-22  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE

APPROVED: [Signature] 9/20/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-111 PLAN INTO CONFORMANCE WITH THE DEVELOPER'S AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

OWNER  
 CHAPELATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER  
 SECURITY SYSTEMS  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-29-22

REVISED FINAL ROAD CONSTRUCTION PLAN

STORM DRAIN PROFILES  
 CHAPELATE WOODS  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF PLATS 25942 - 25954

PARCELS: 110 & 421  
 TAX MAP: 16 GRID: 10  
 3RD ELECTION DISTRICT

ZONED: CEF-M  
 L 1389/F, 339 (P. 110)  
 L 4163/F, 424 (P. 421)  
 HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
 REGISTERED PROFESSIONAL ENGINEER

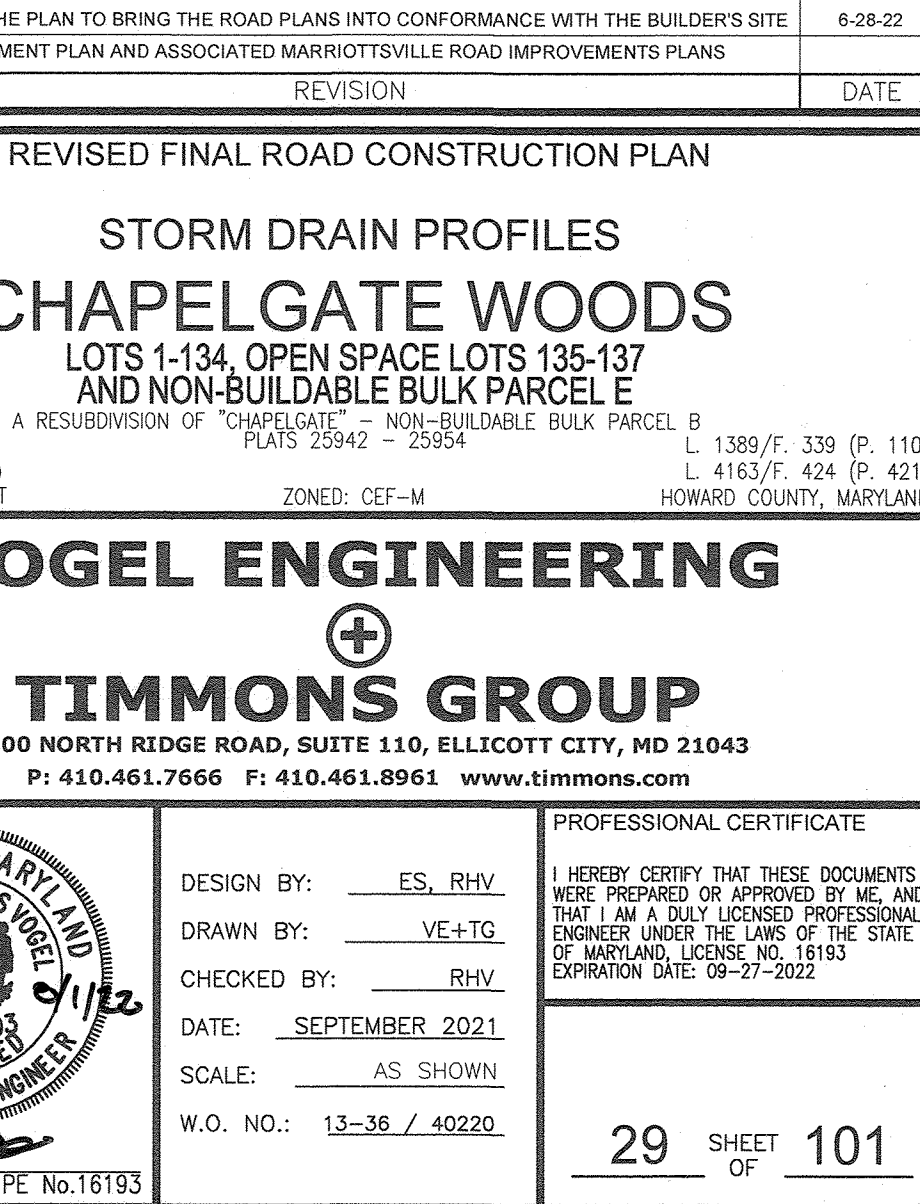
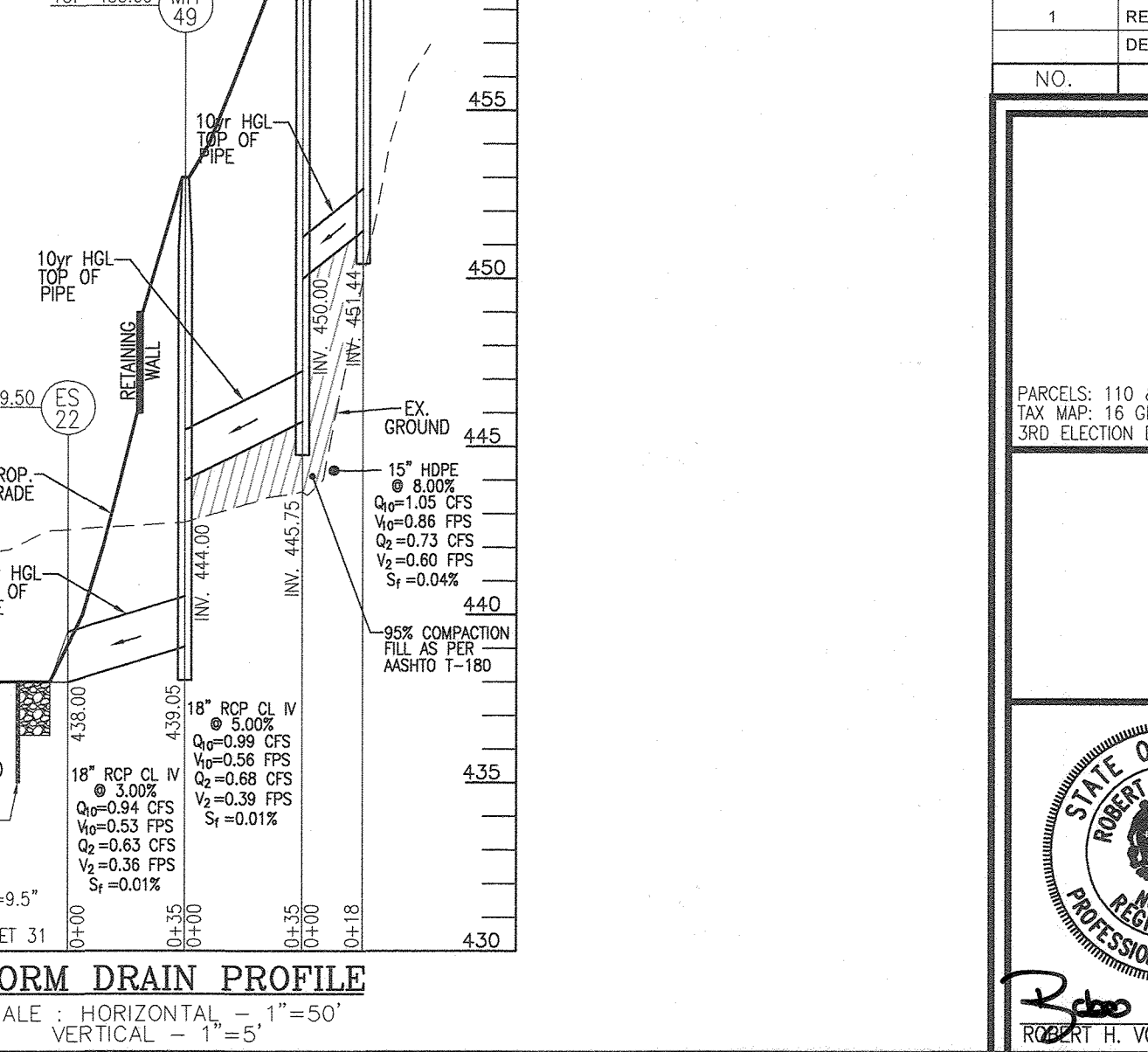
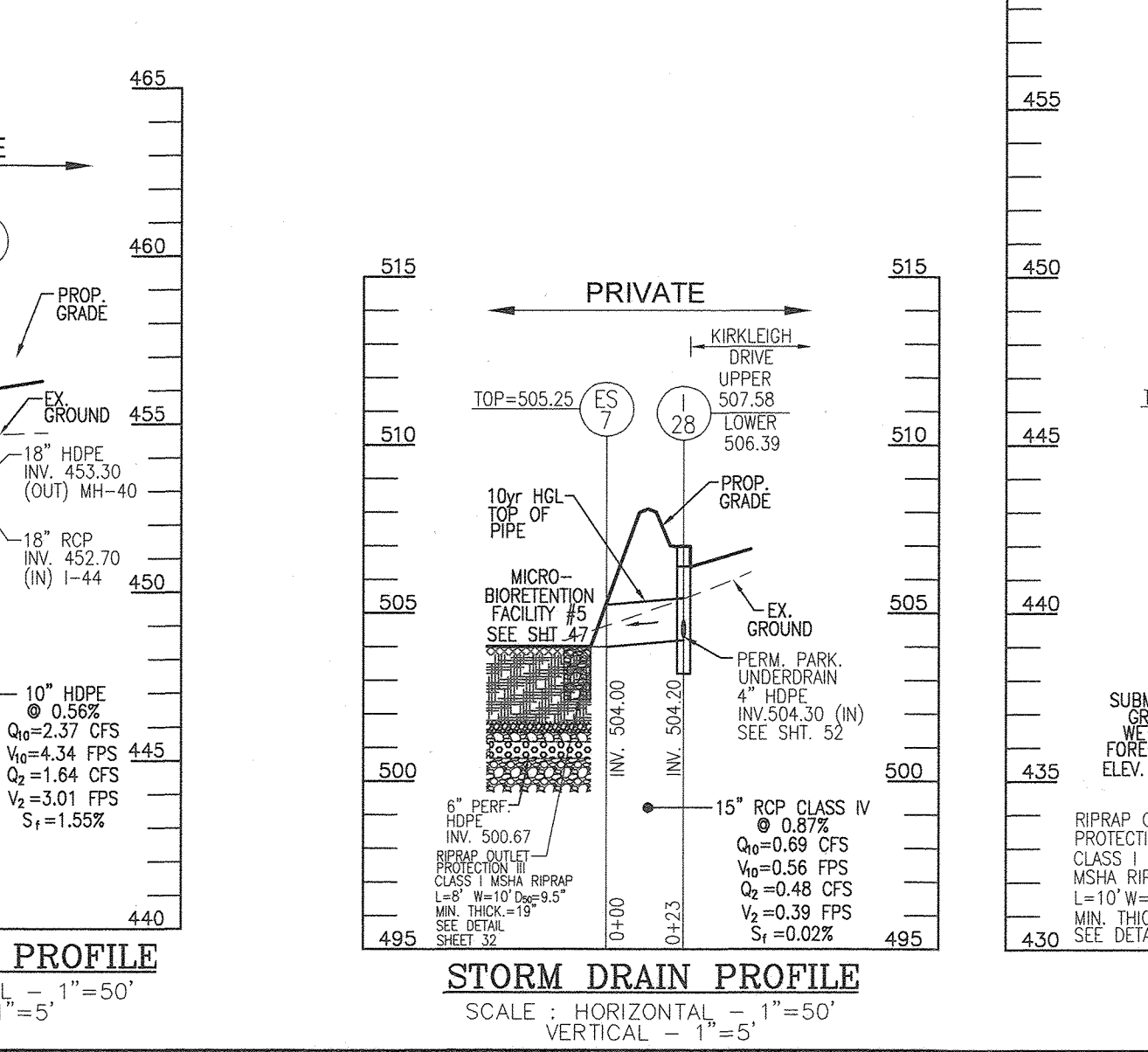
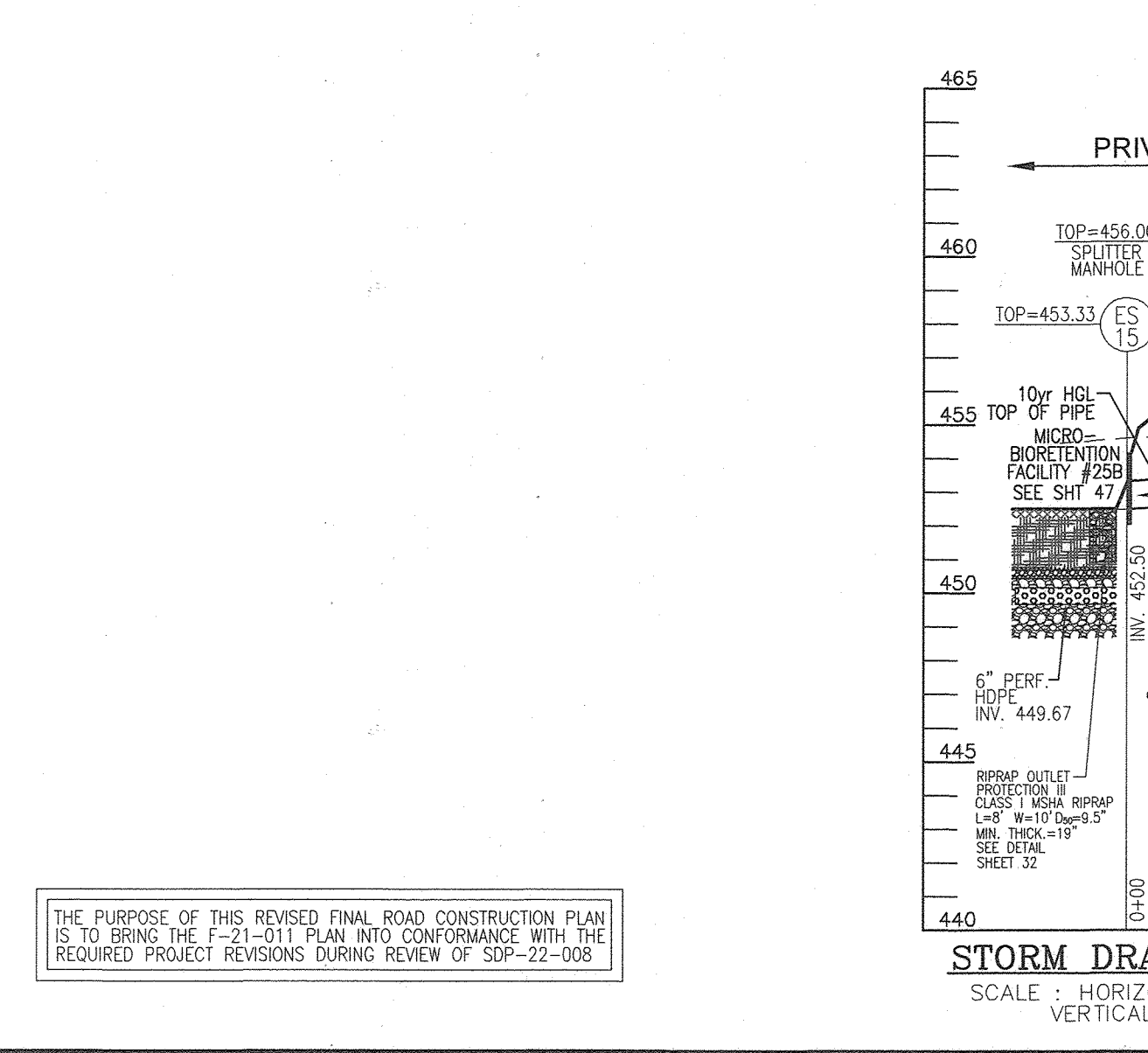
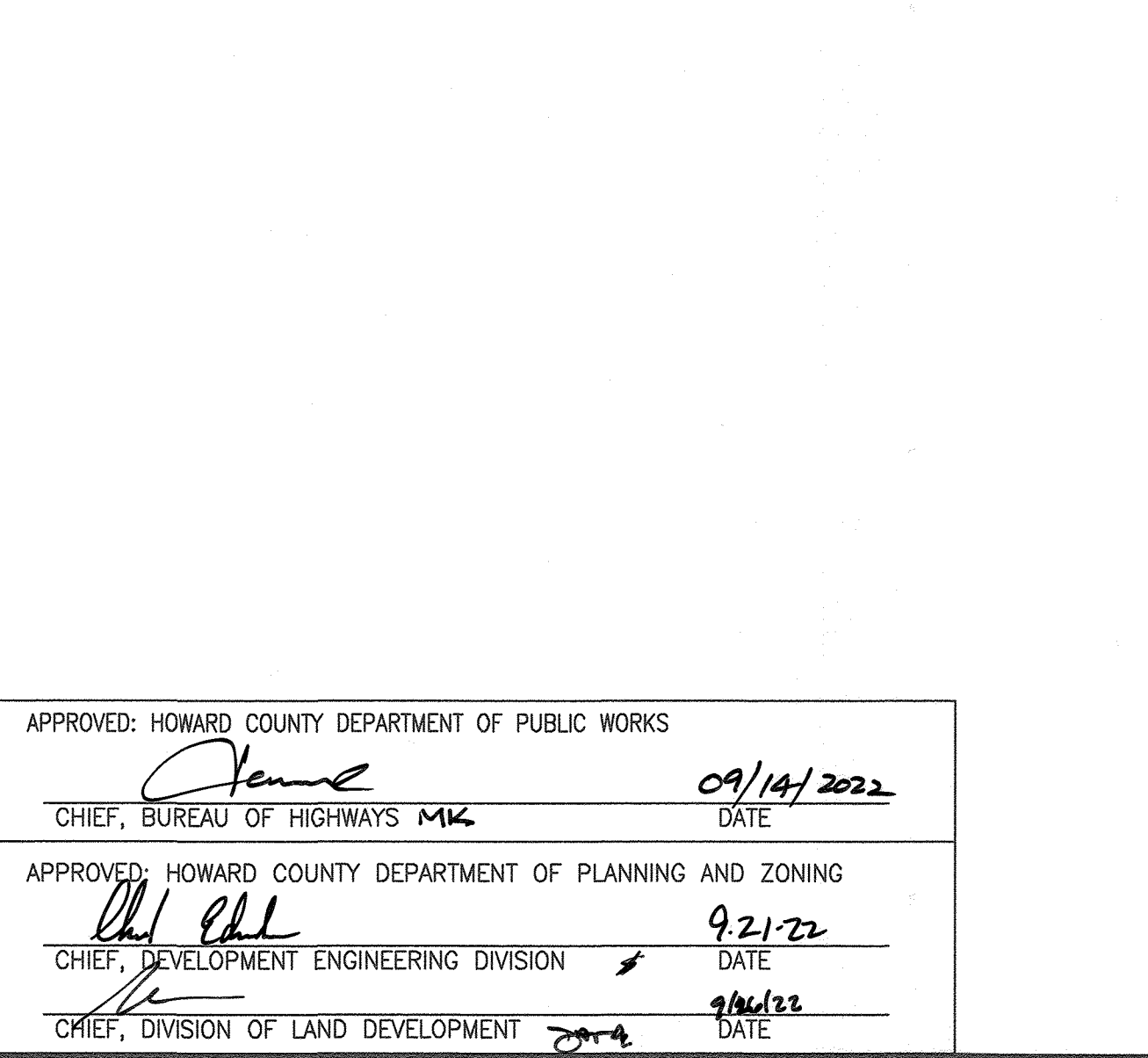
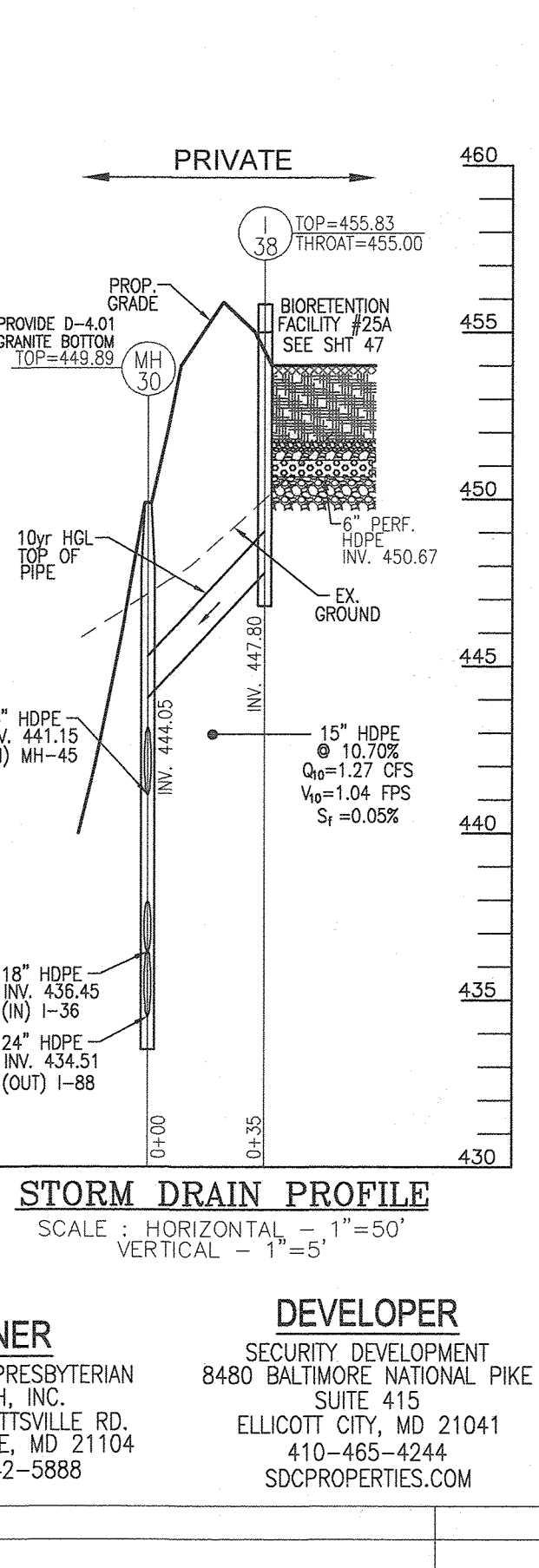
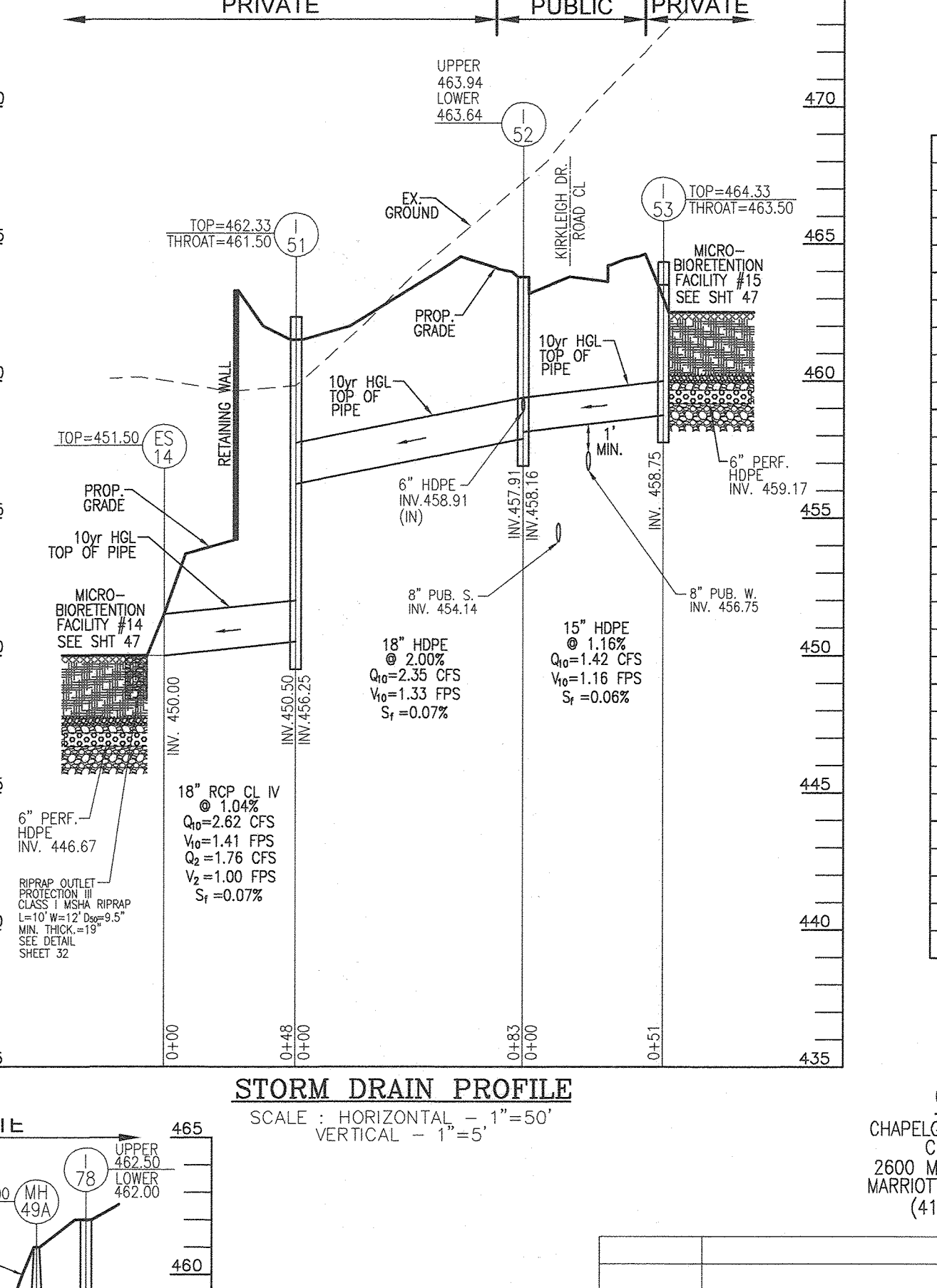
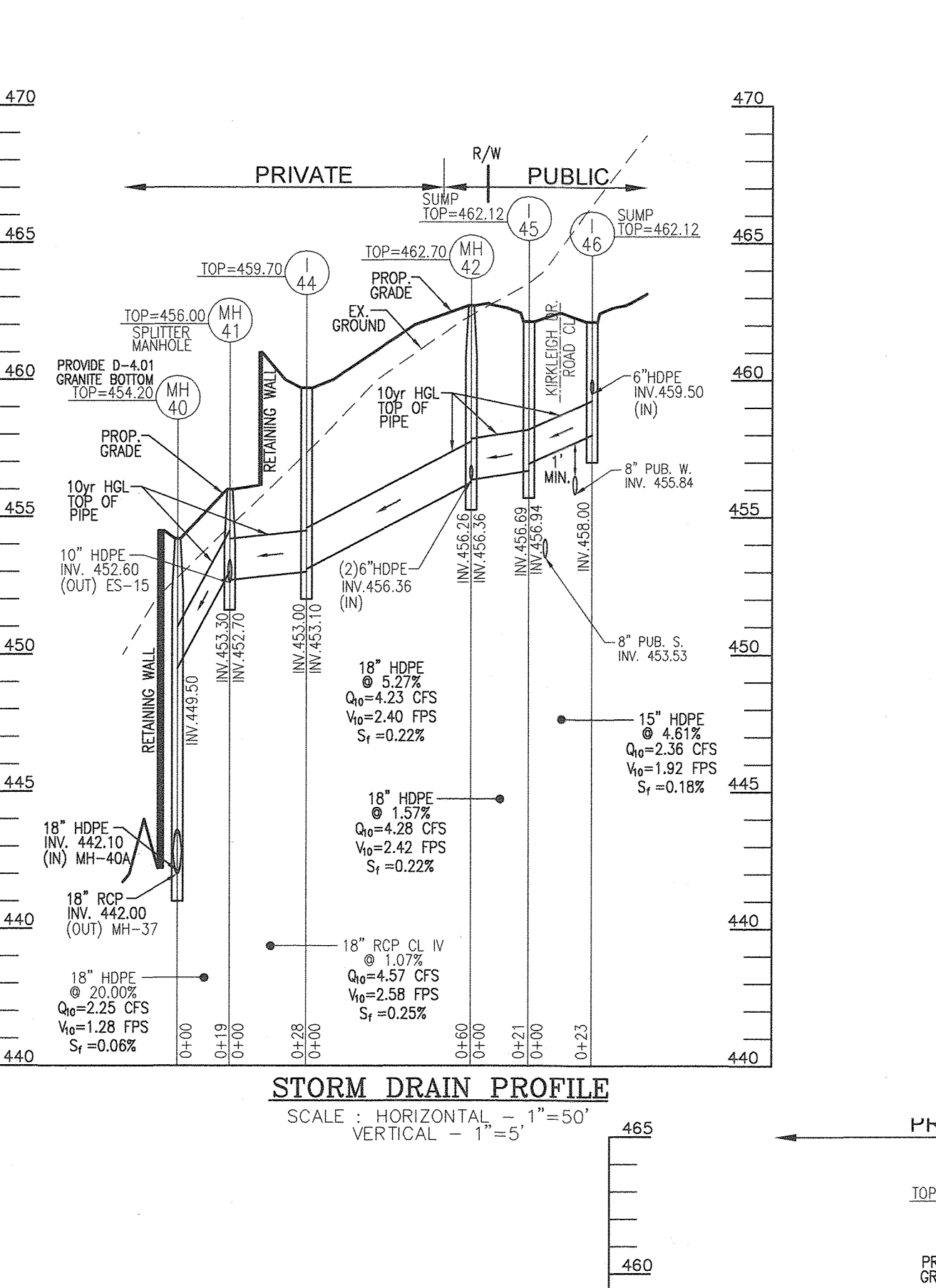
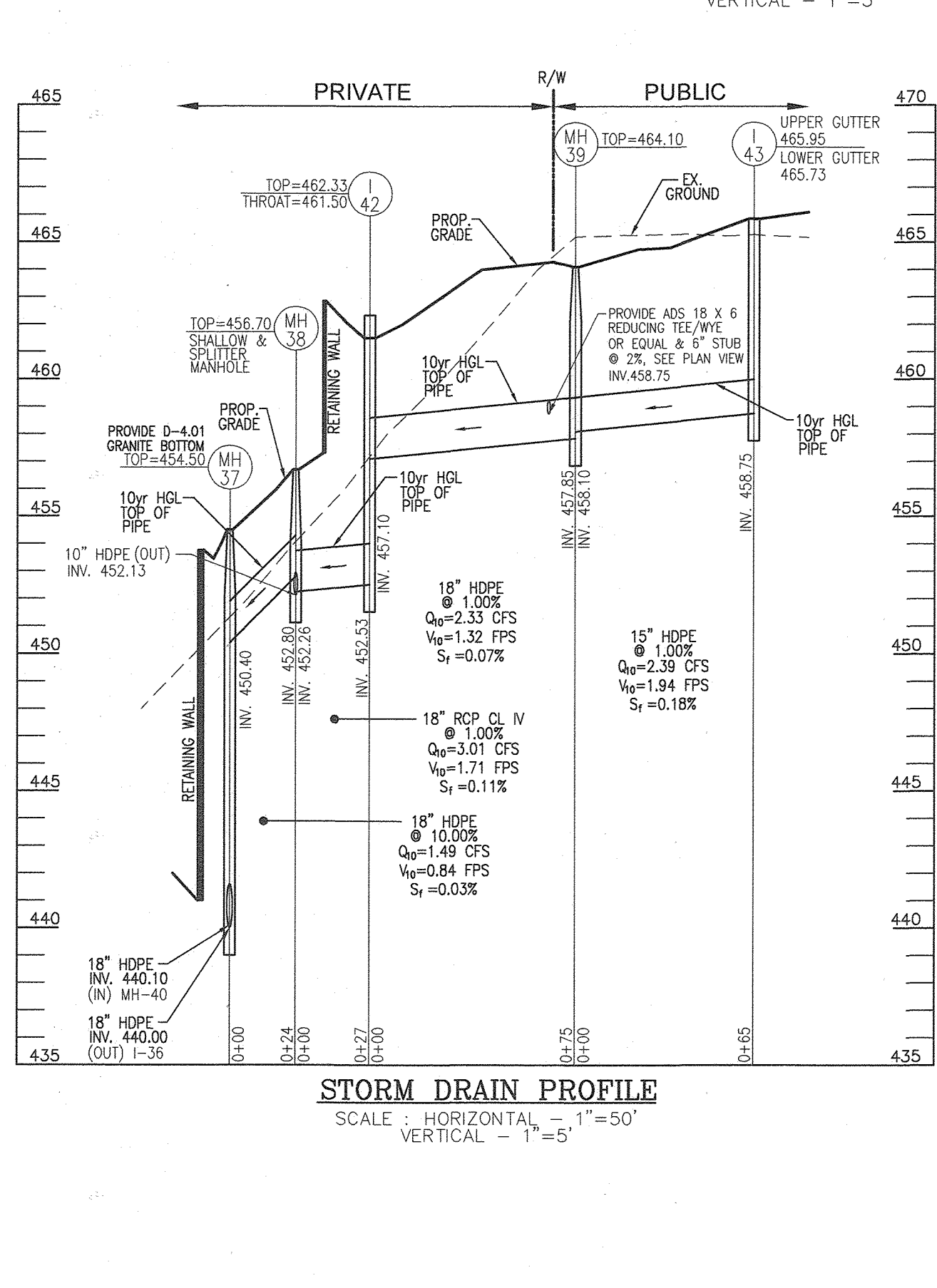
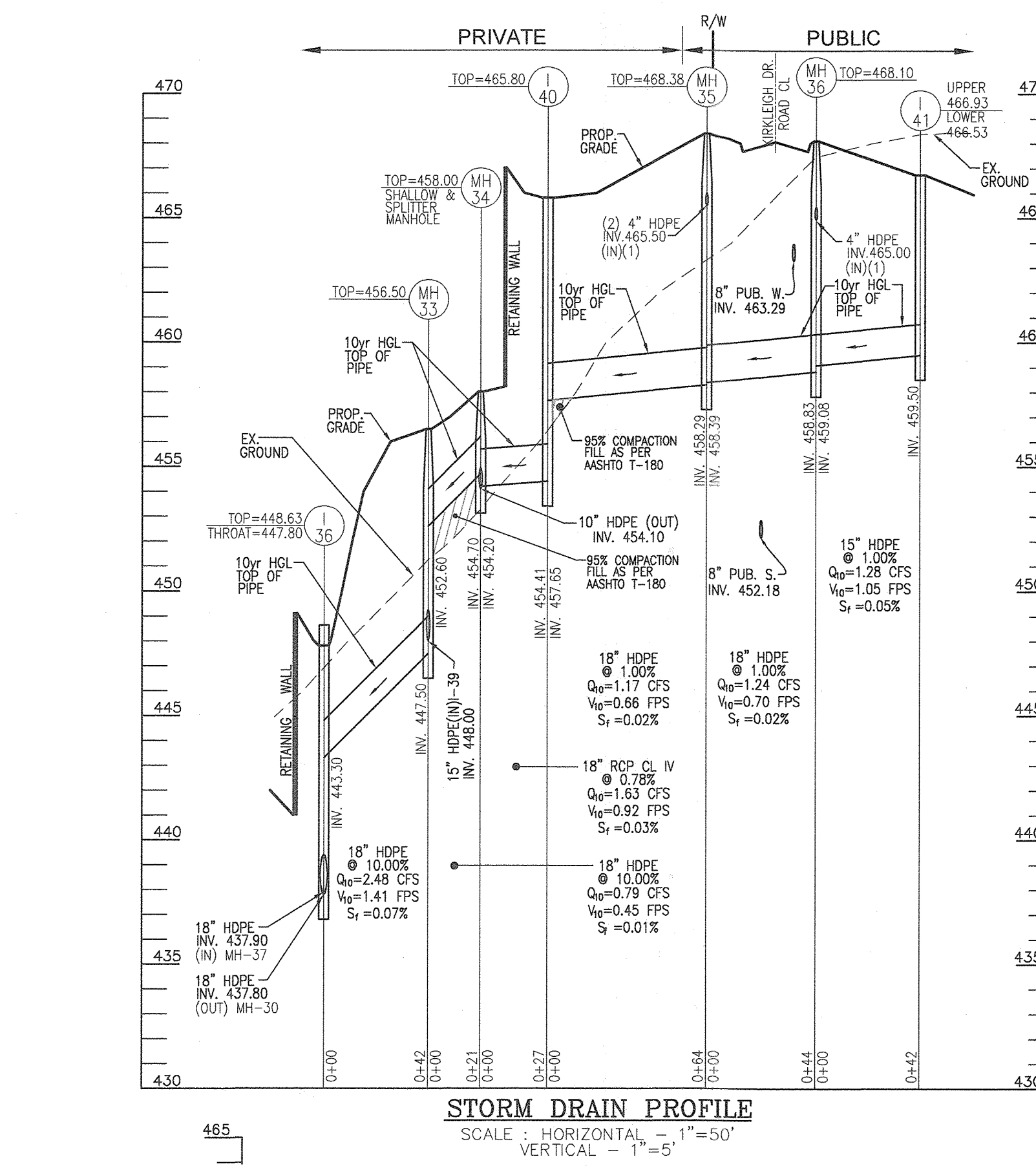
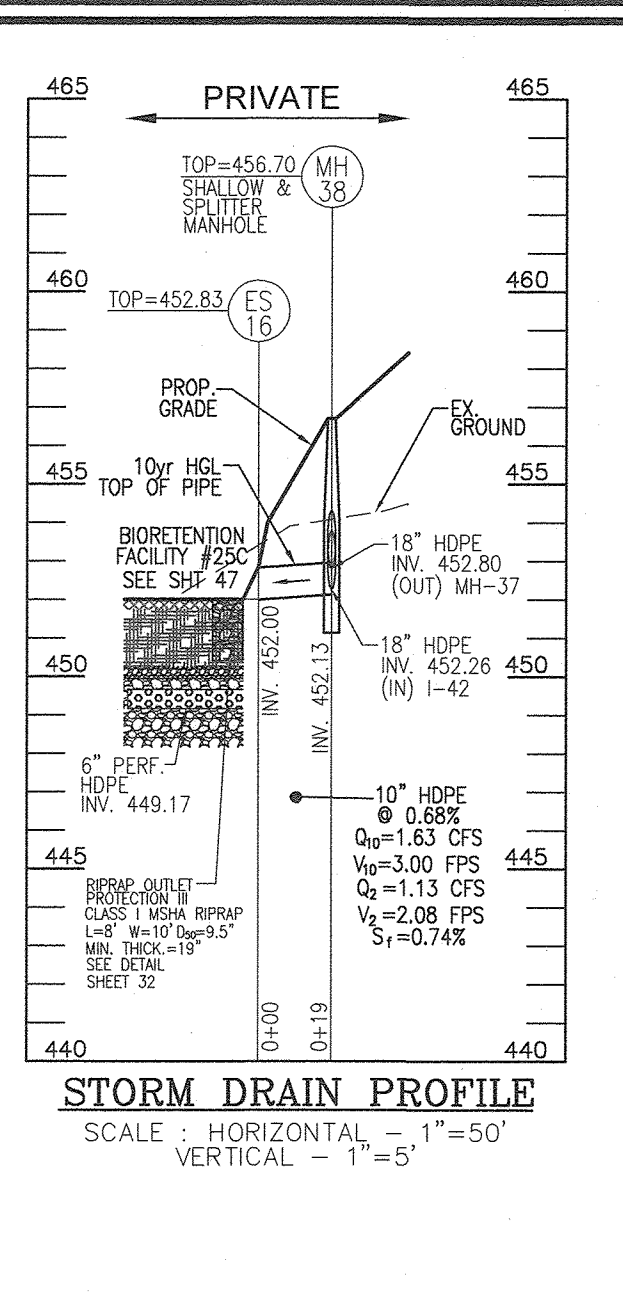
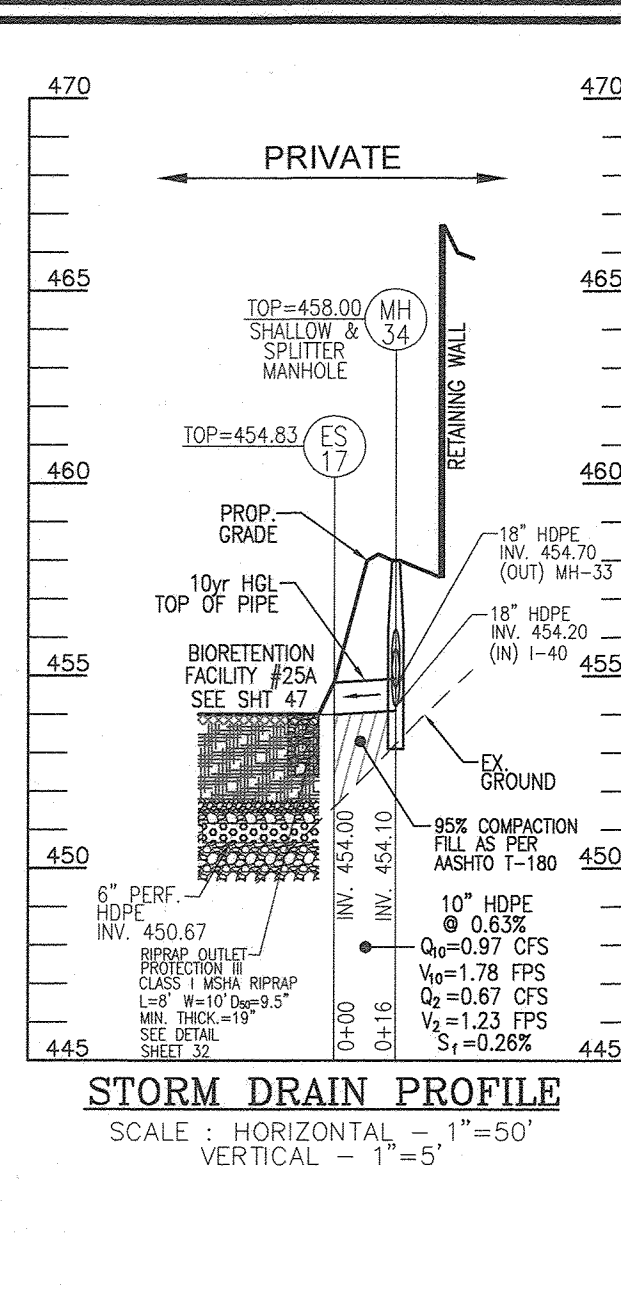
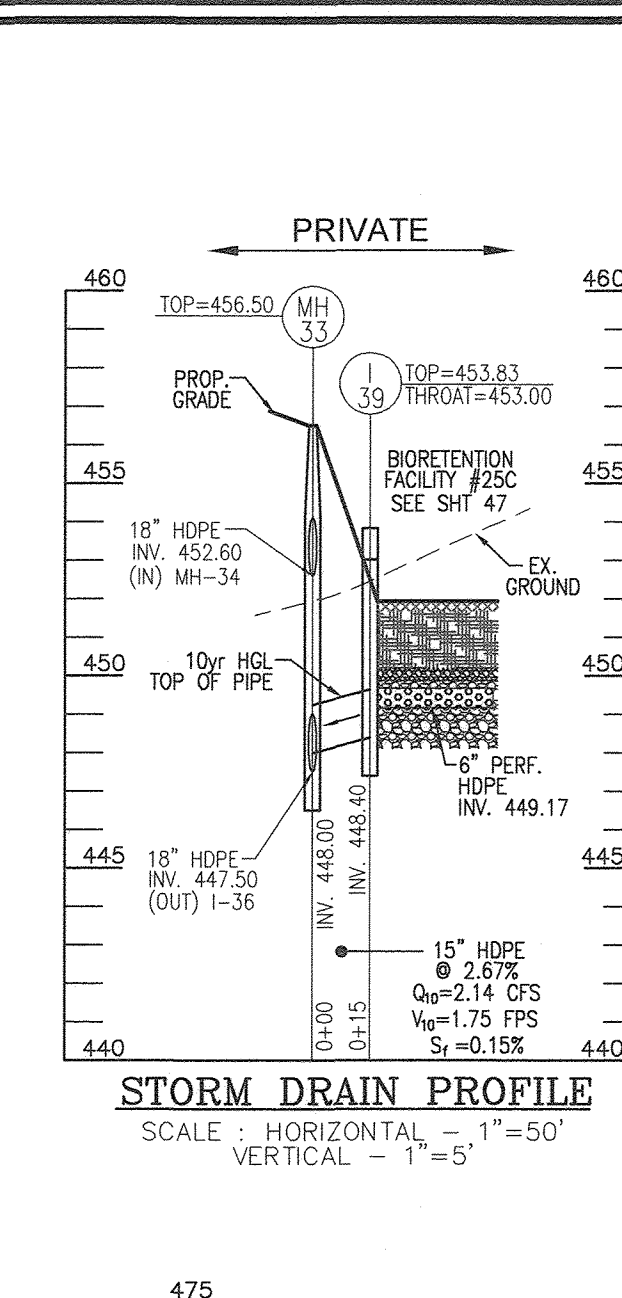
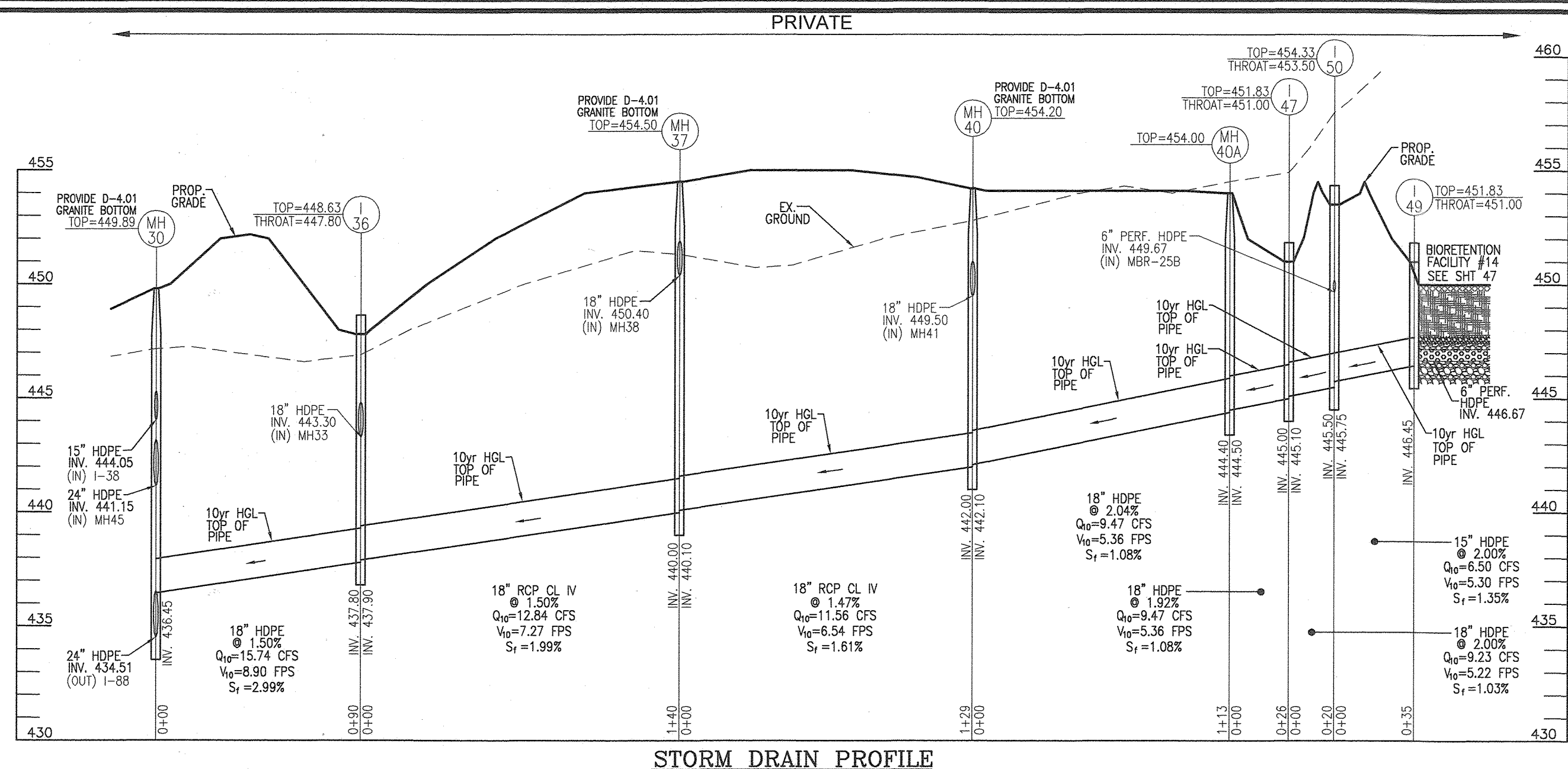
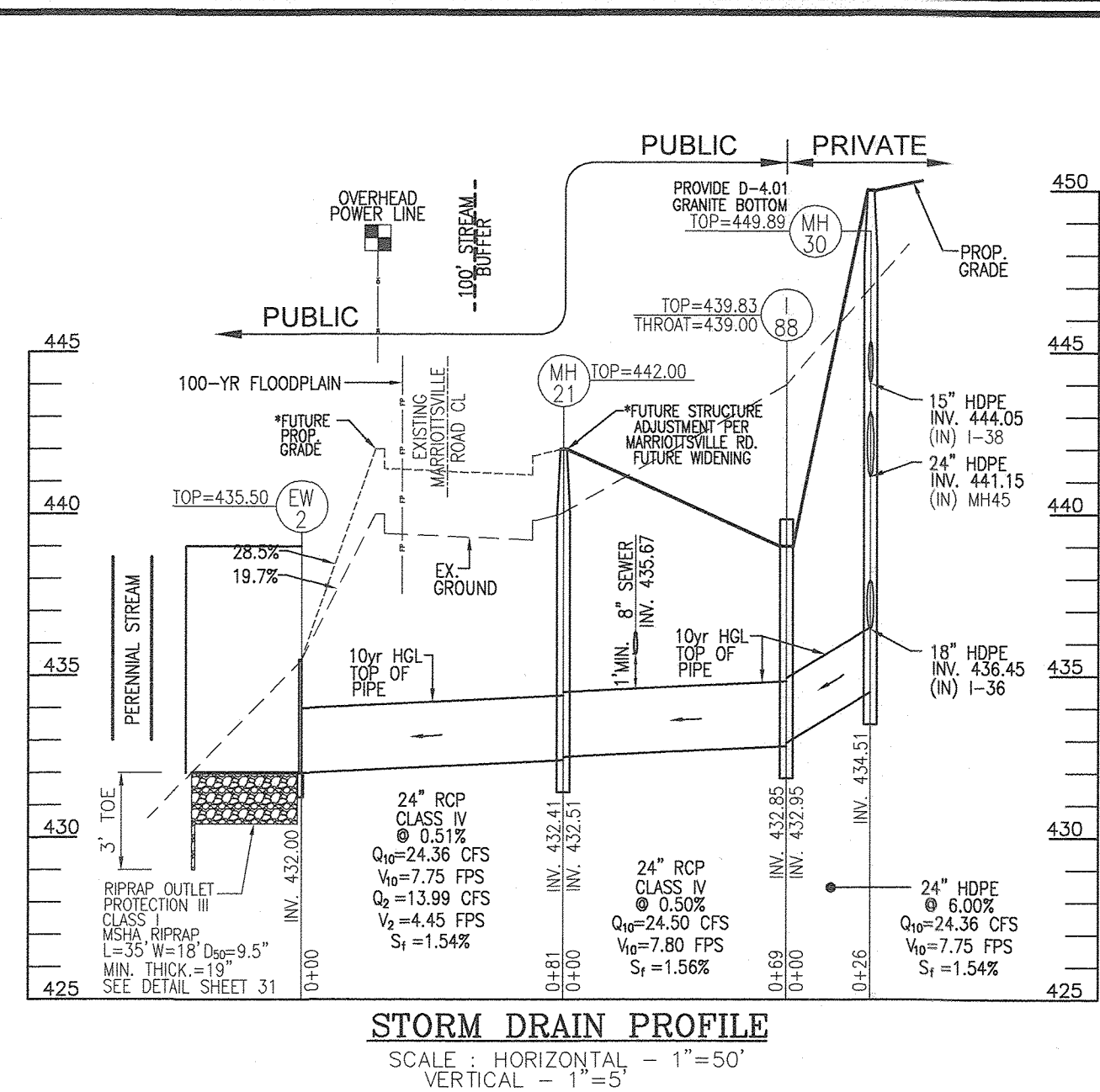
**TIMMONS GROUP**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 P: 410.461.7666 F: 410.461.8961 www.timmons.com

DESIGN BY: ES, RHV  
 DRAWN BY: VE+HTV  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE 09-27-2022

28 SHEET 101  
 OF





APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS MKK  
 DATE: 09/14/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9/21/22

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/26/22

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDERS SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
**STORM DRAIN PROFILES**  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF CHAPEL GATE - NON-BUILDABLE BULK PARCEL B  
 PLATS 25942 - 25954  
 PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRD: 10 L 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 ZONED: CEF-M

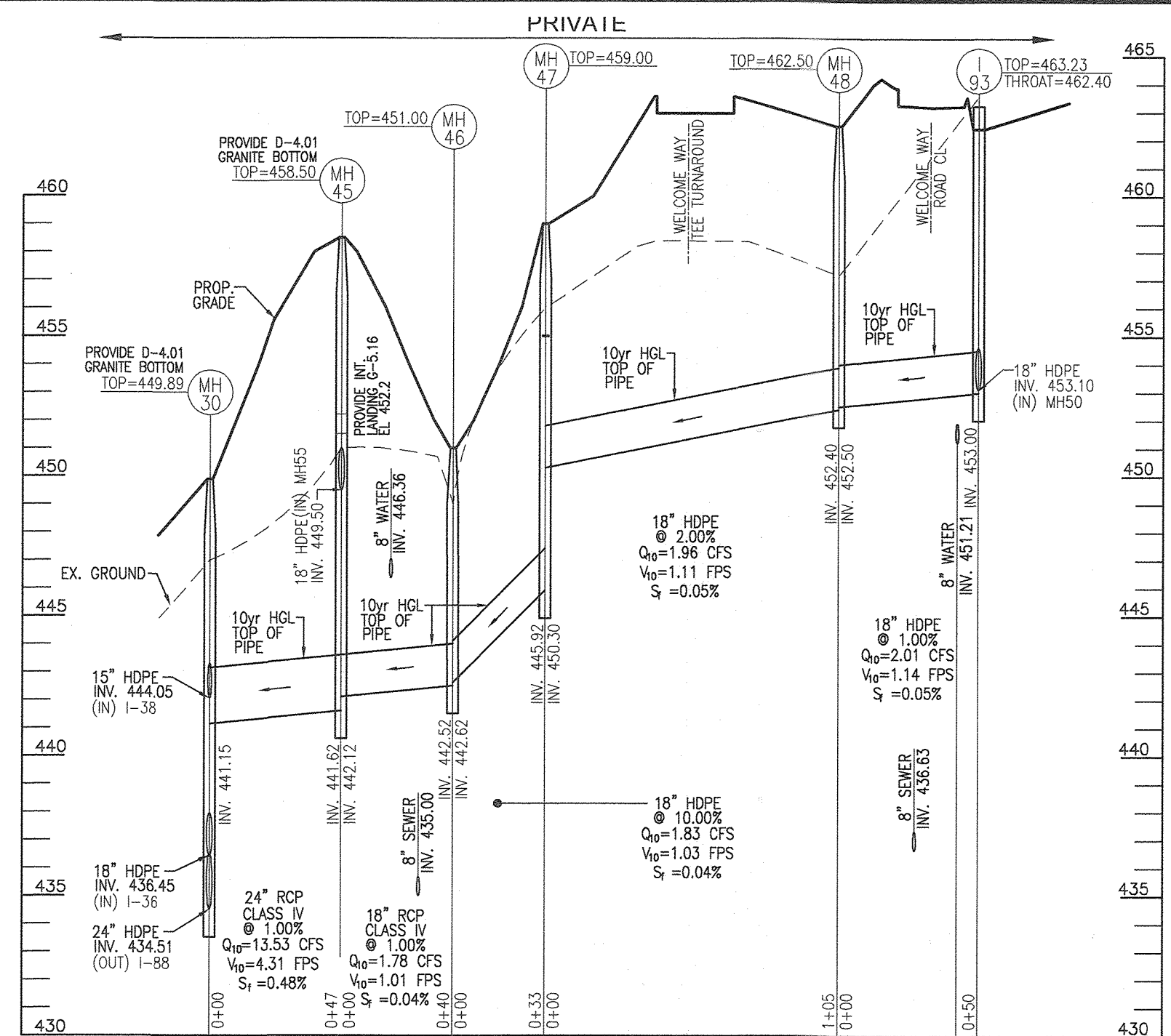
**VOGEL ENGINEERING**  
**TIMMONS GROUP**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 P: 410.461.7666 F: 410.461.8961 www.timmons.com

PROFESSIONAL CERTIFICATE  
 DESIGN BY: ES, R/V  
 DRAWN BY: VE-T/H  
 CHECKED BY: R/VH  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 49220

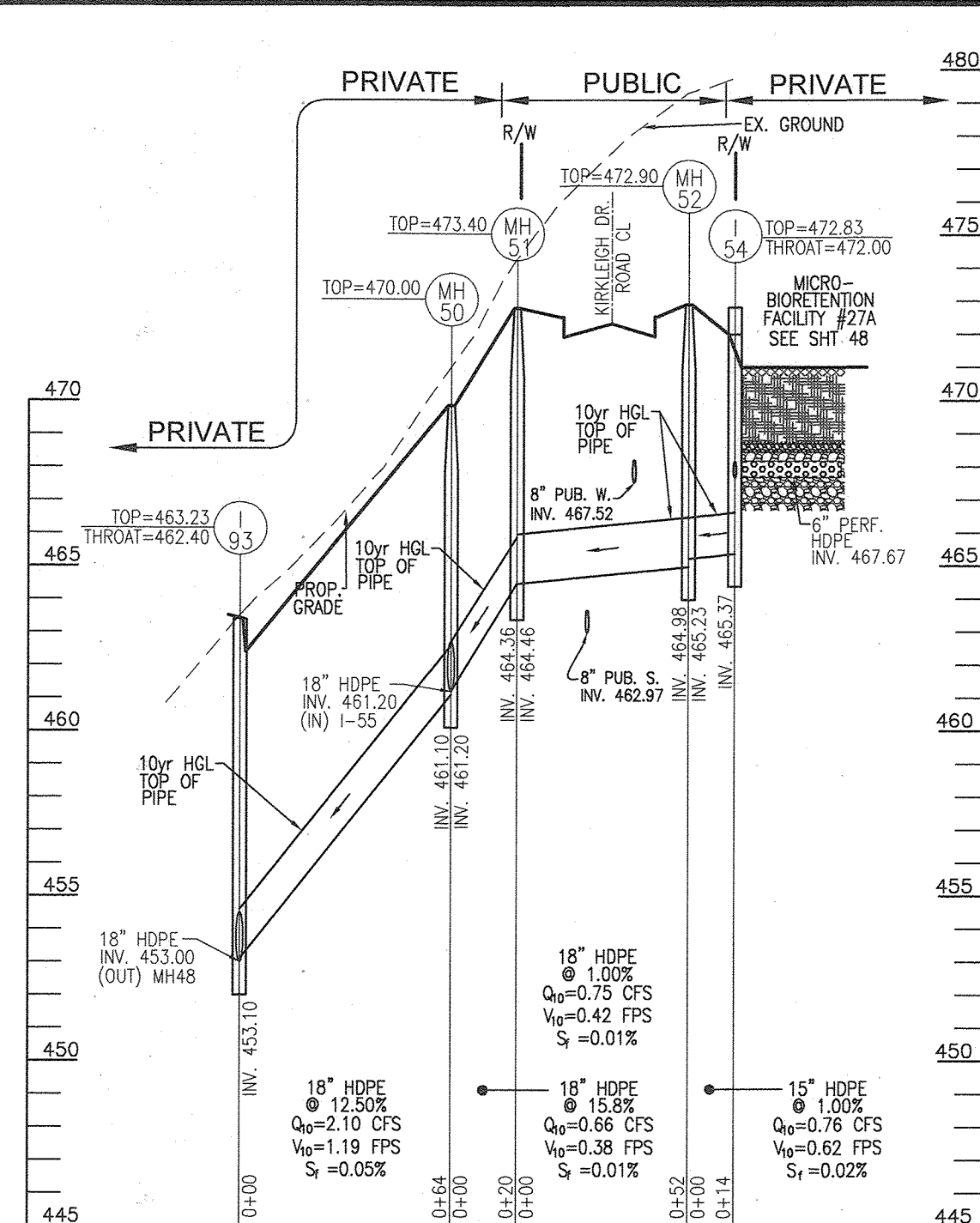
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE 09-27-2022

29 SHEET 101

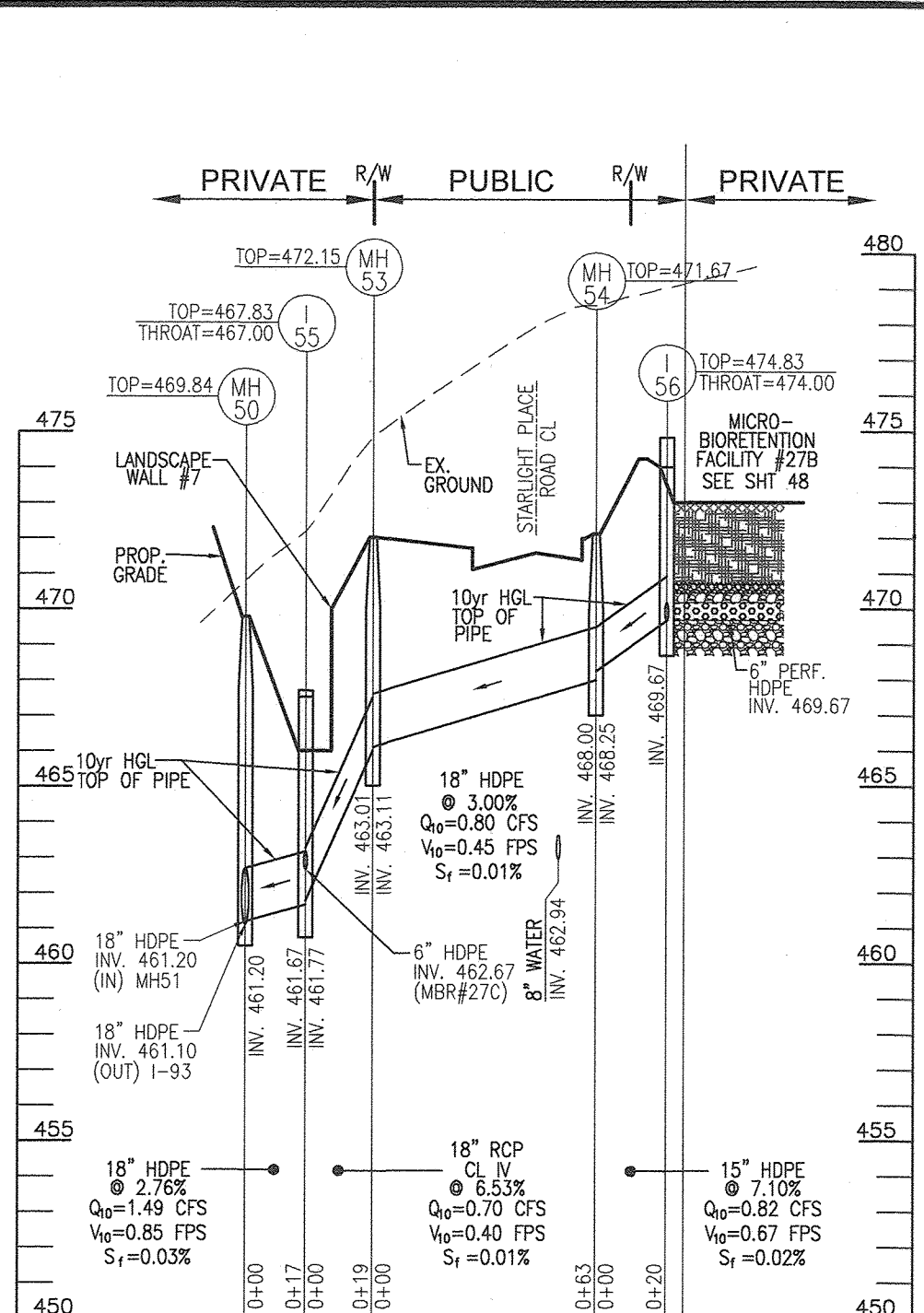




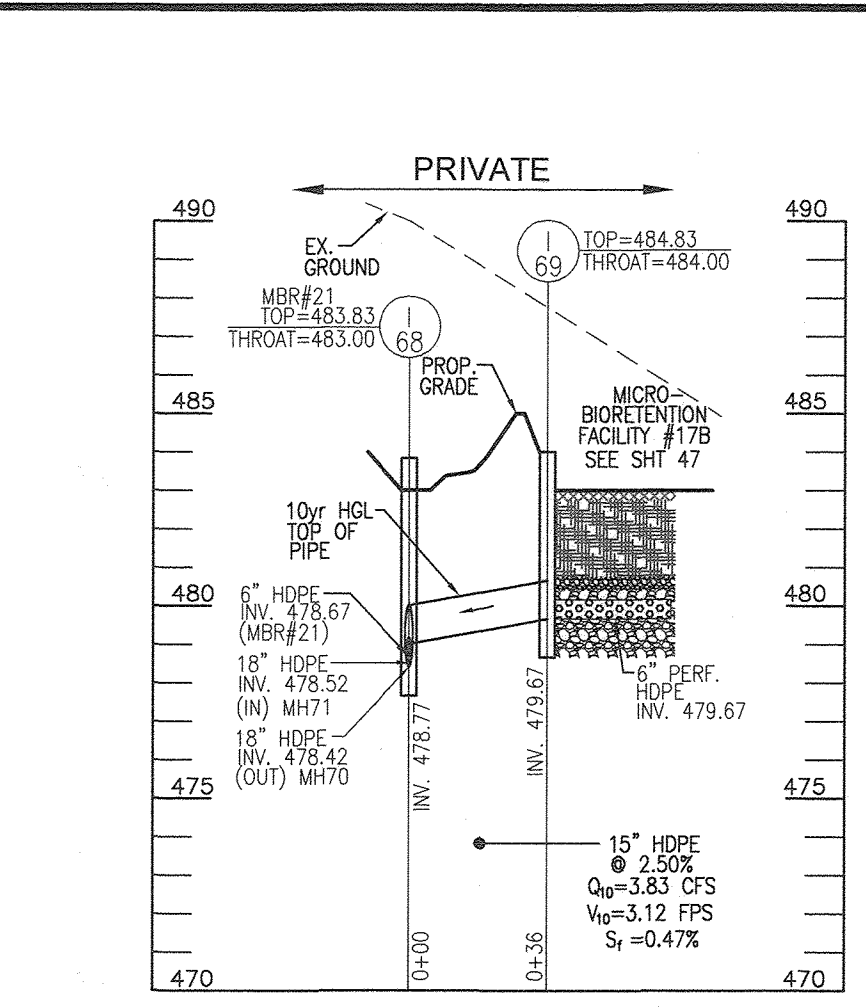
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



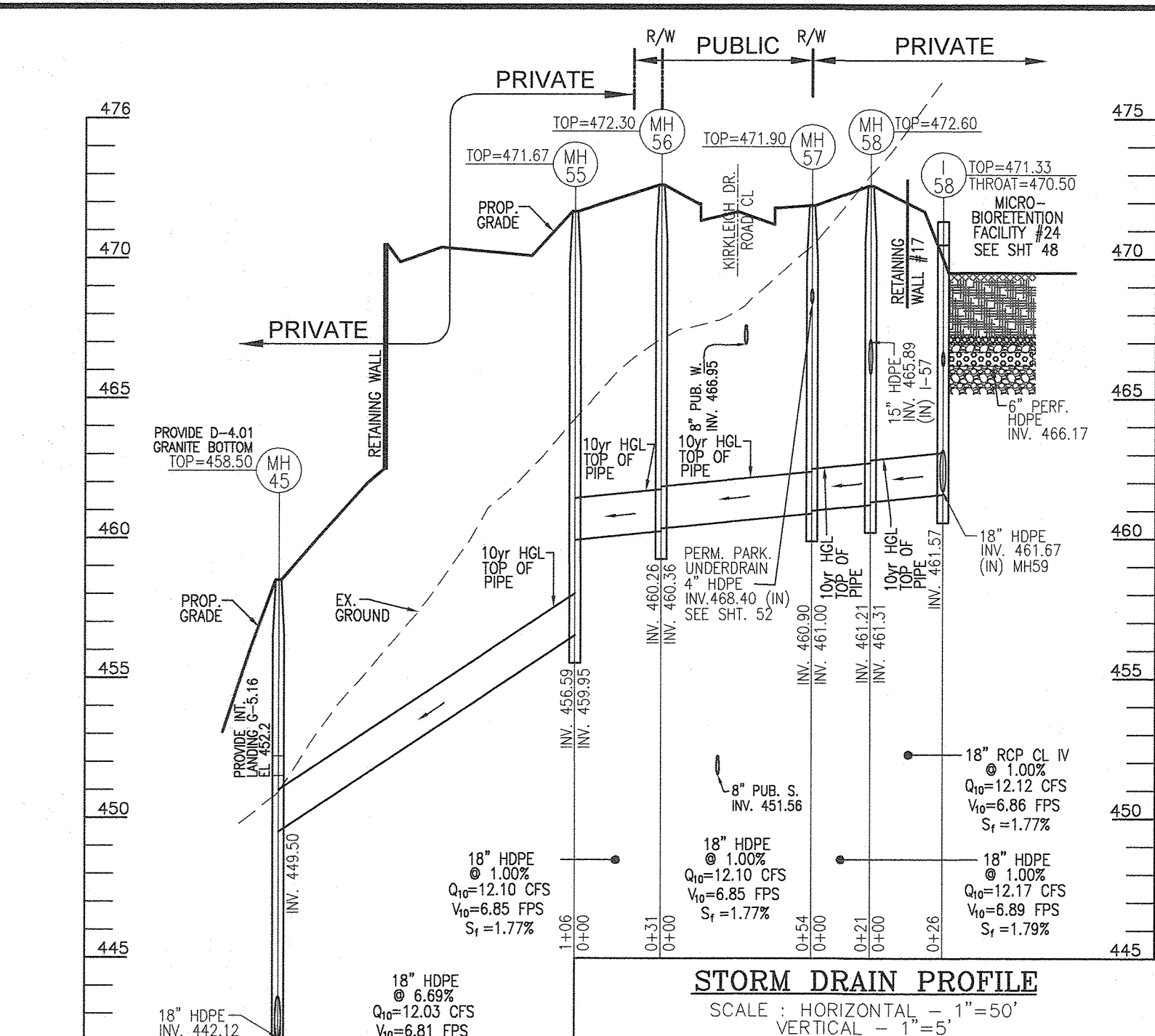
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



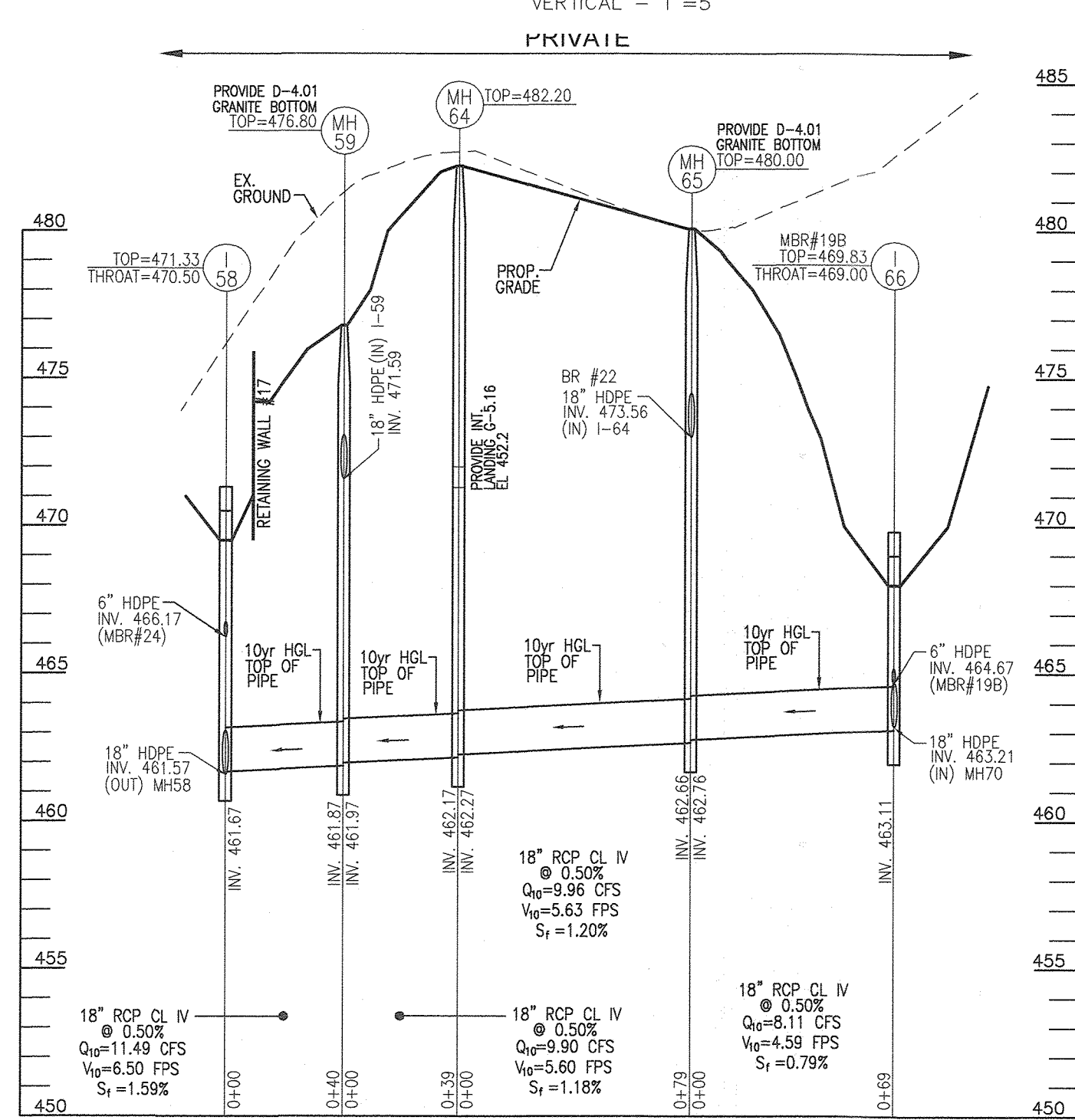
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



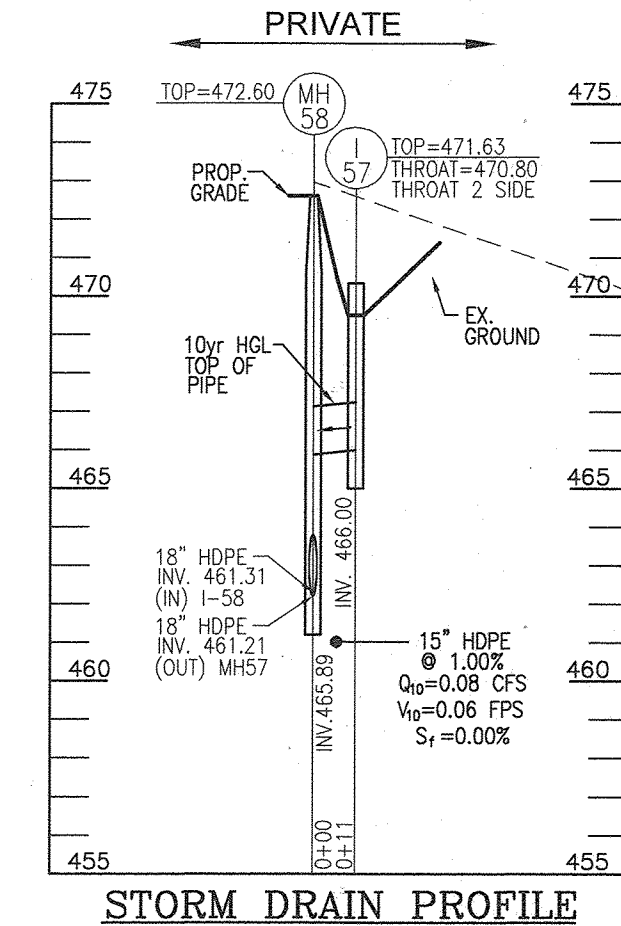
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



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



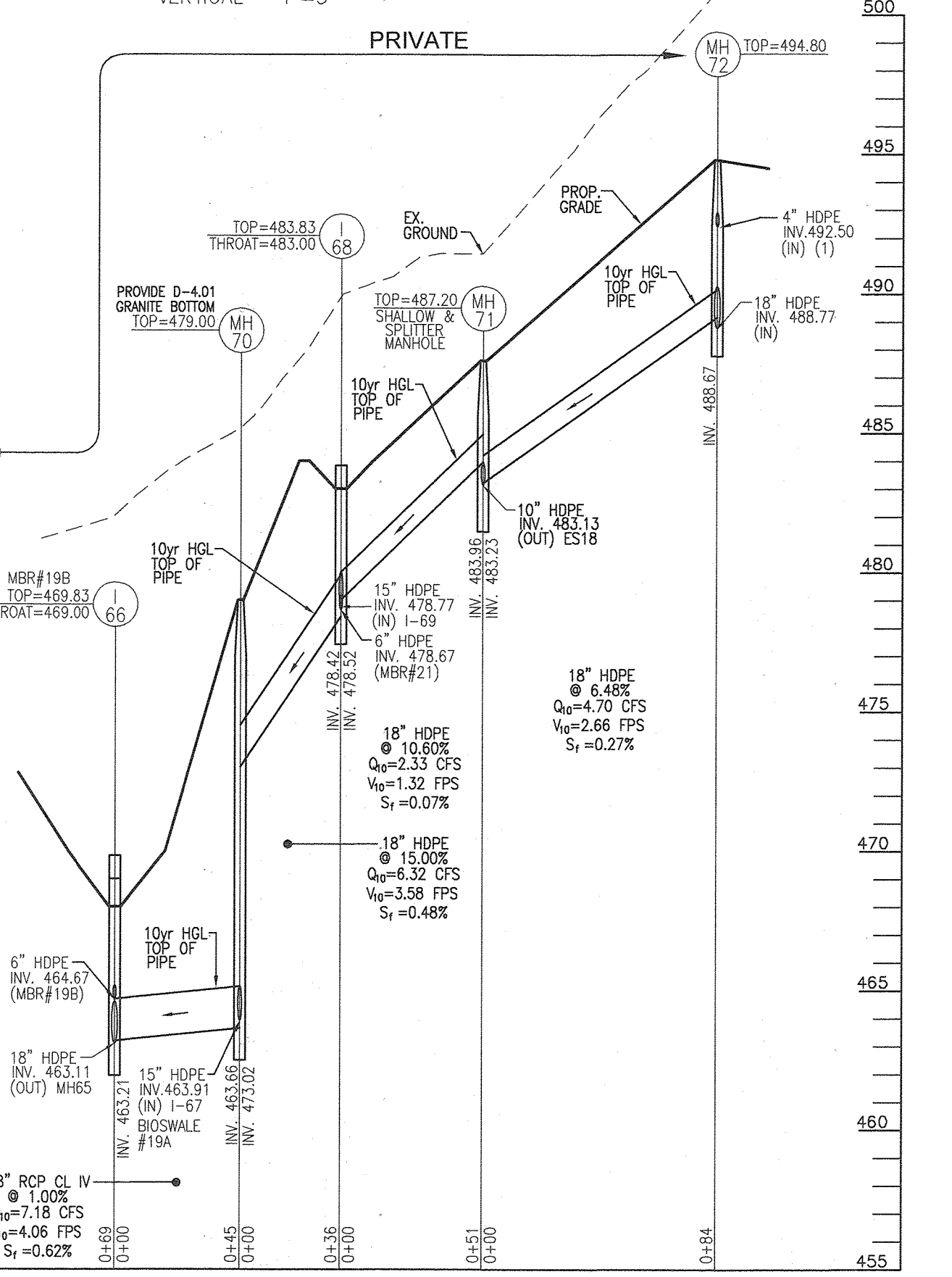
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



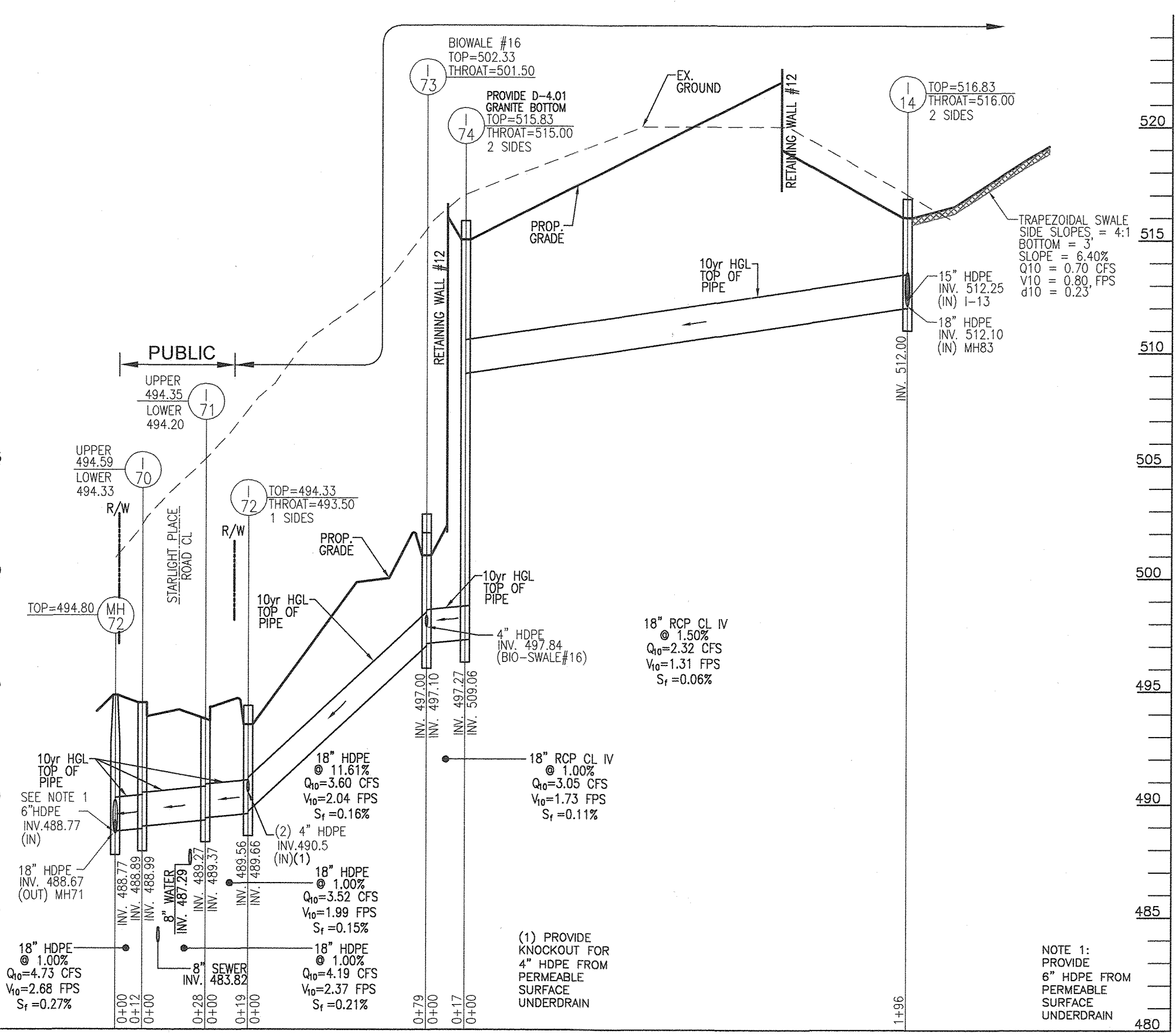
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



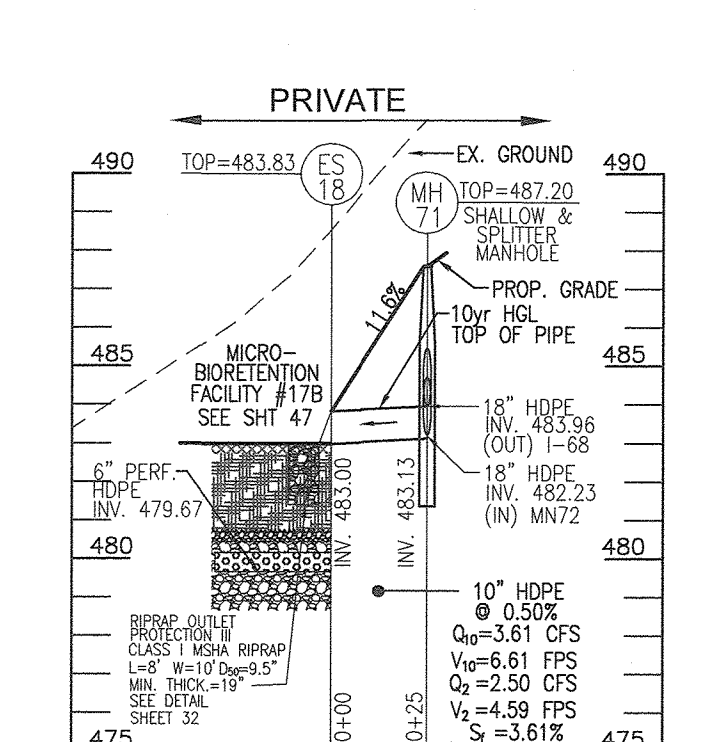
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



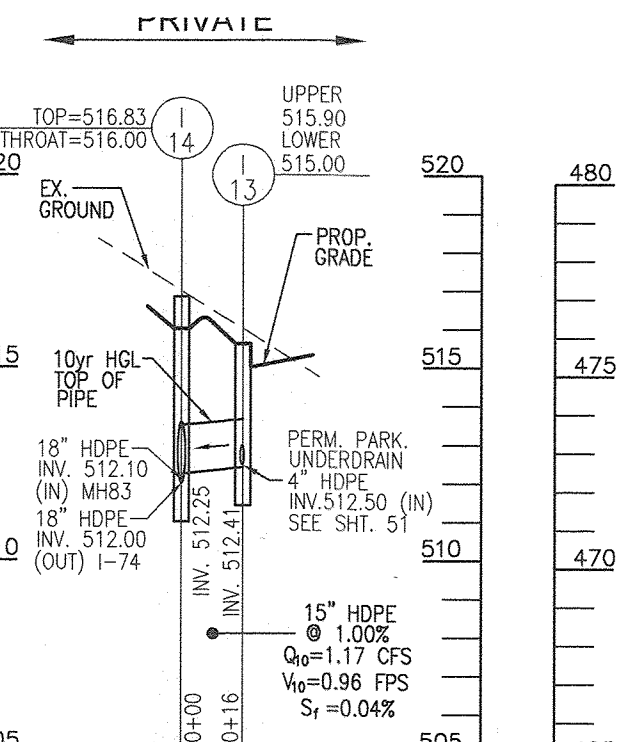
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



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



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



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

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/10/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9-21-22

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/21/22

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-511 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN

**STORM DRAIN PROFILES**

**CHAPEL GATE WOODS**

LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF CHAPEL GATE - NON-BUILDABLE BULK PARCEL B

PARCELS: 110 & 421 L 1389/F, 339 (P. 110)  
 TAX MAP: 16 GRD: 10 L 4163/F, 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**

**TIMMONS GROUP**

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

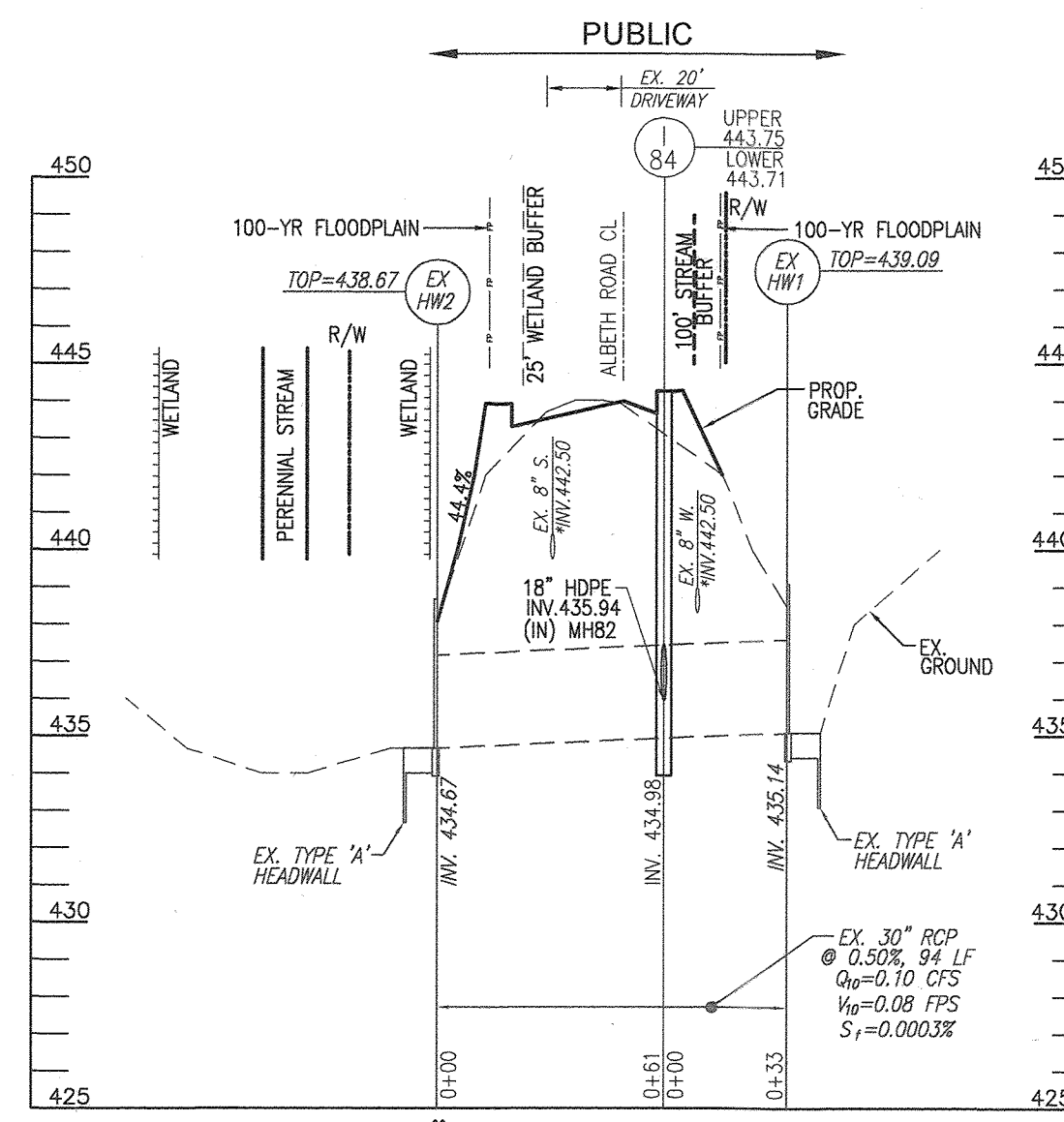
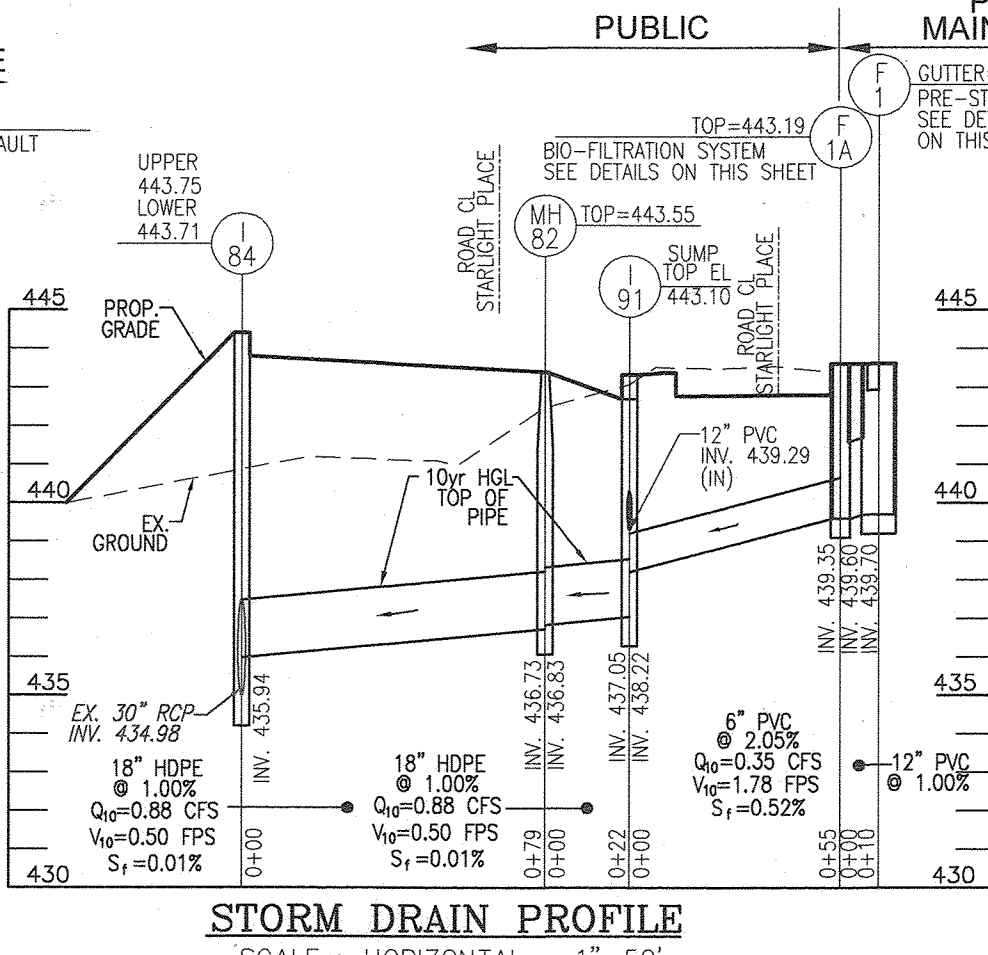
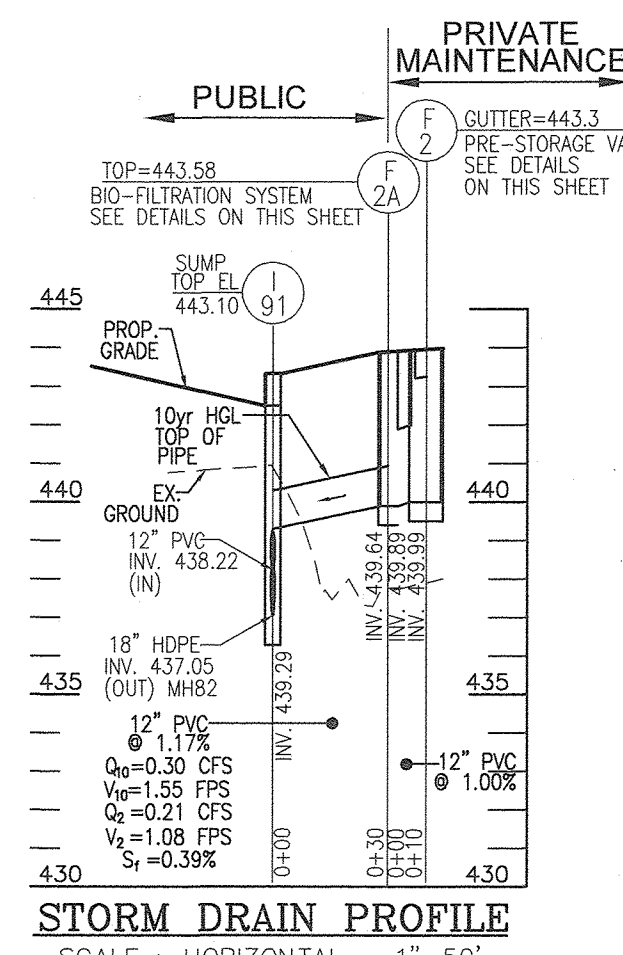
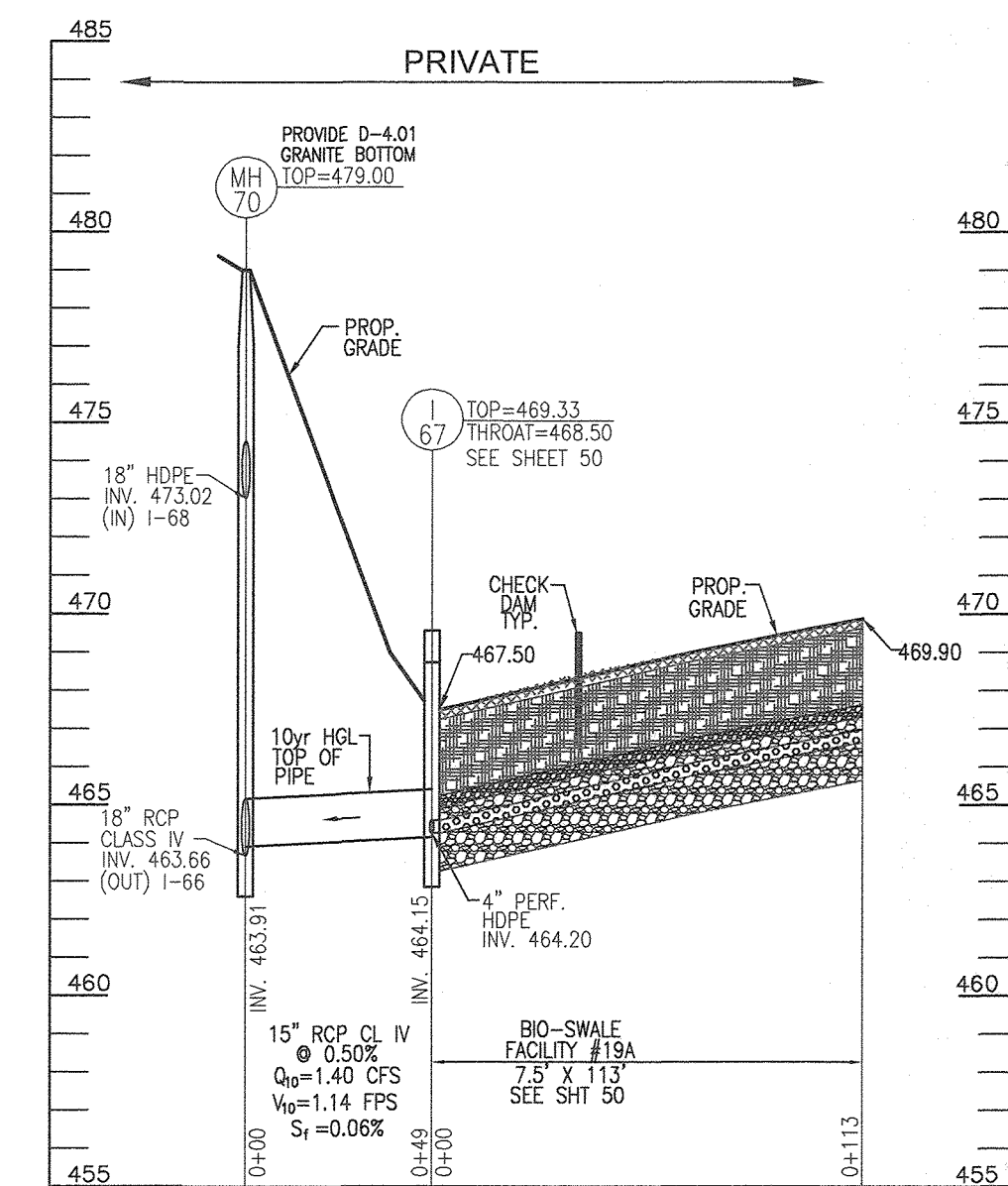
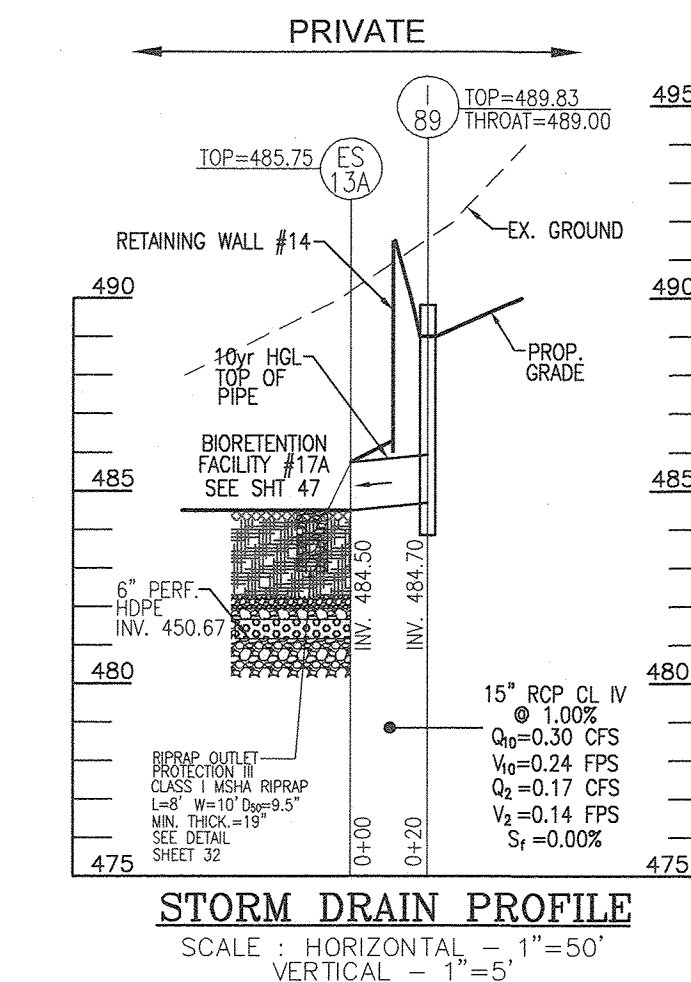
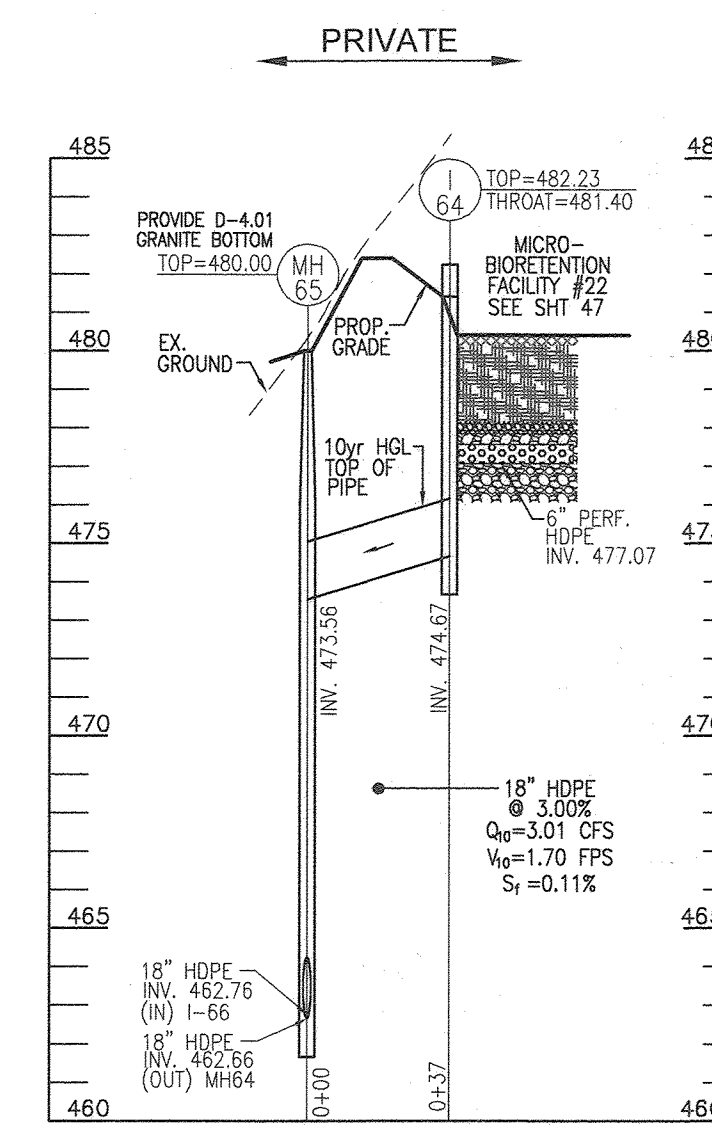
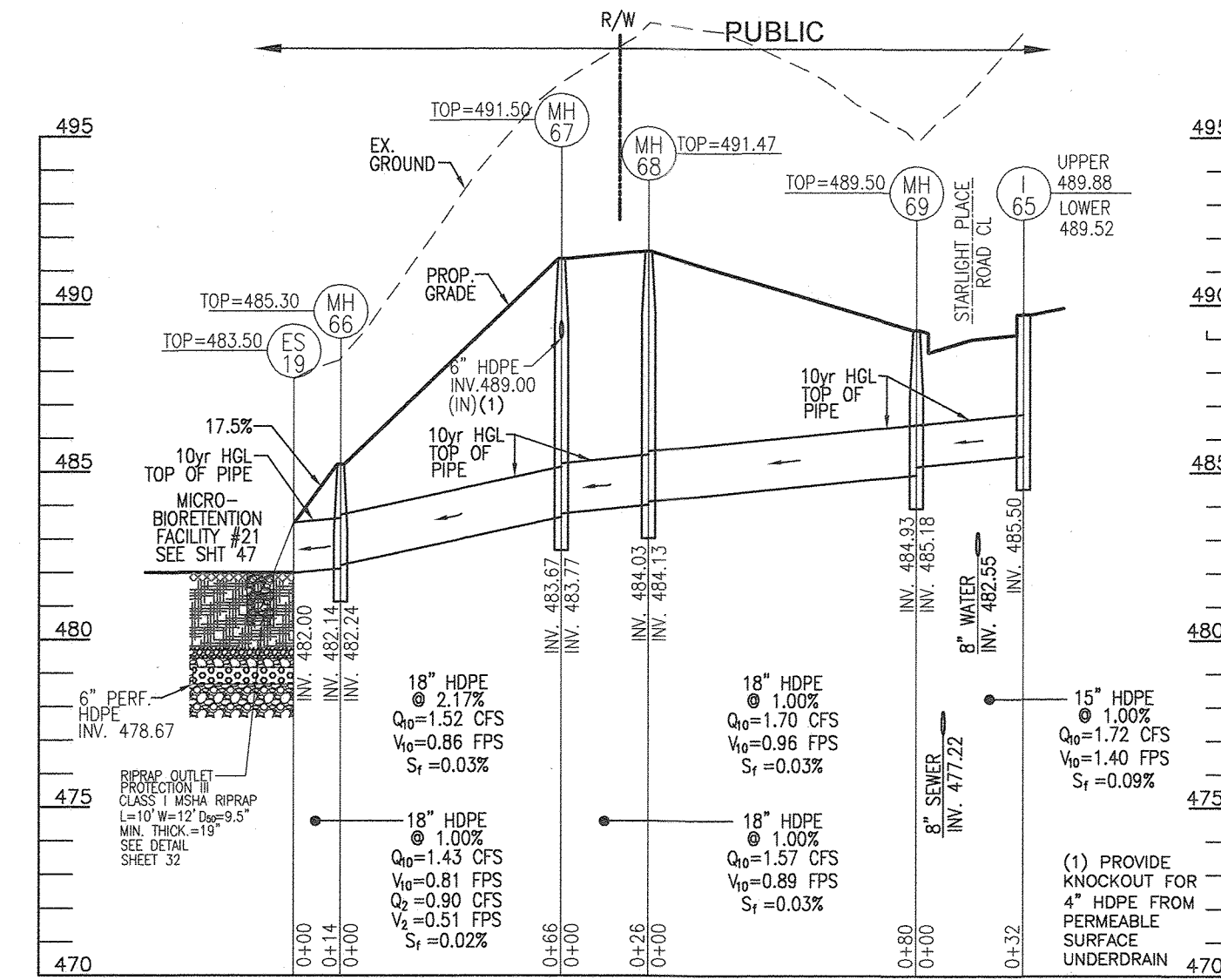
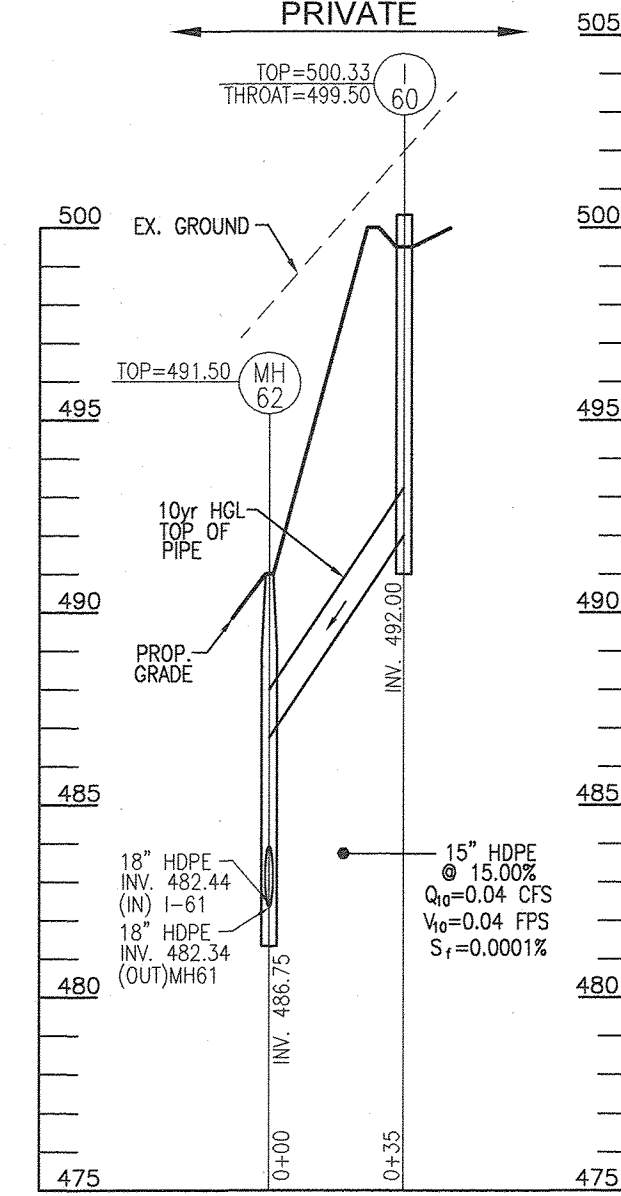
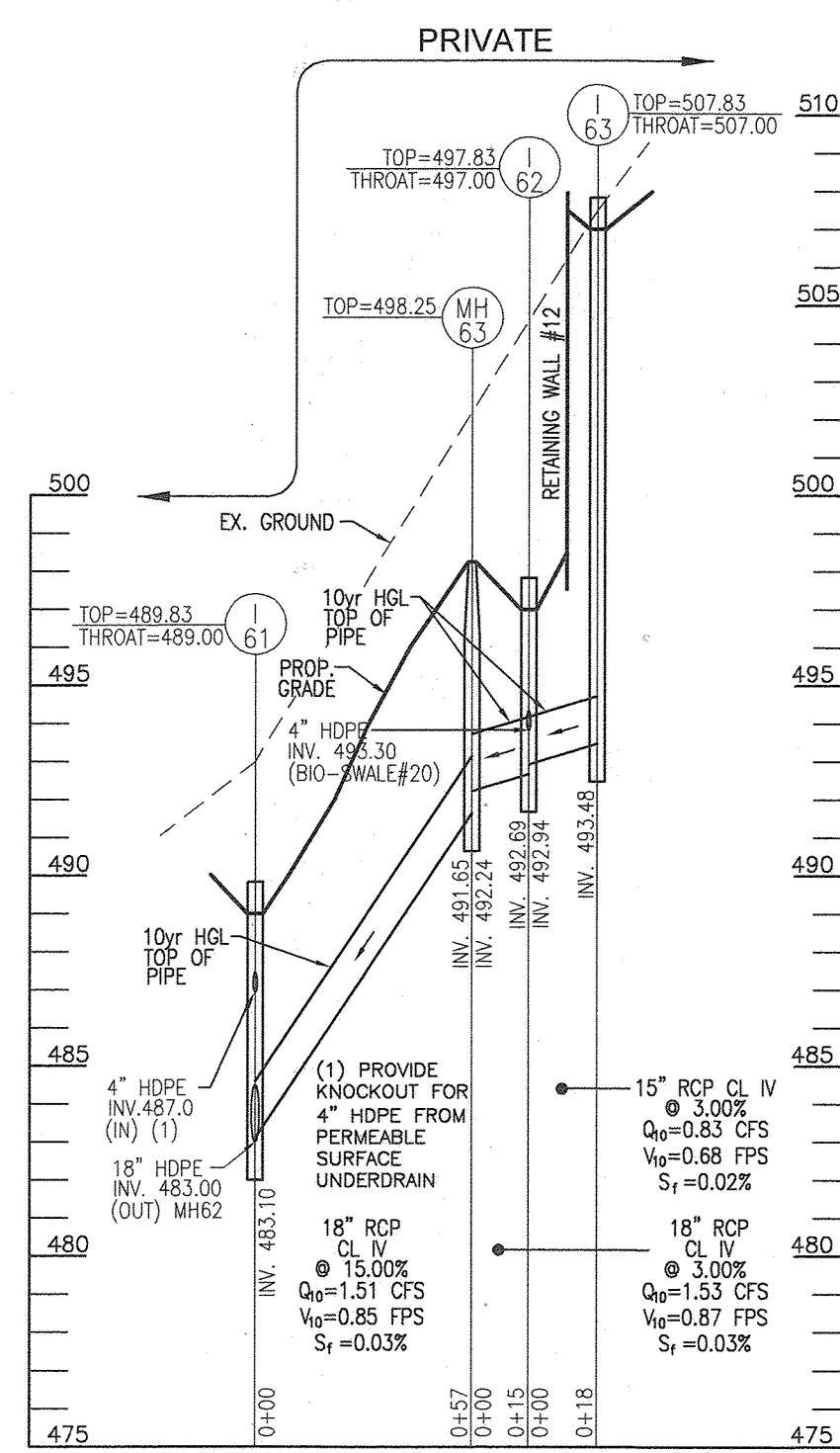
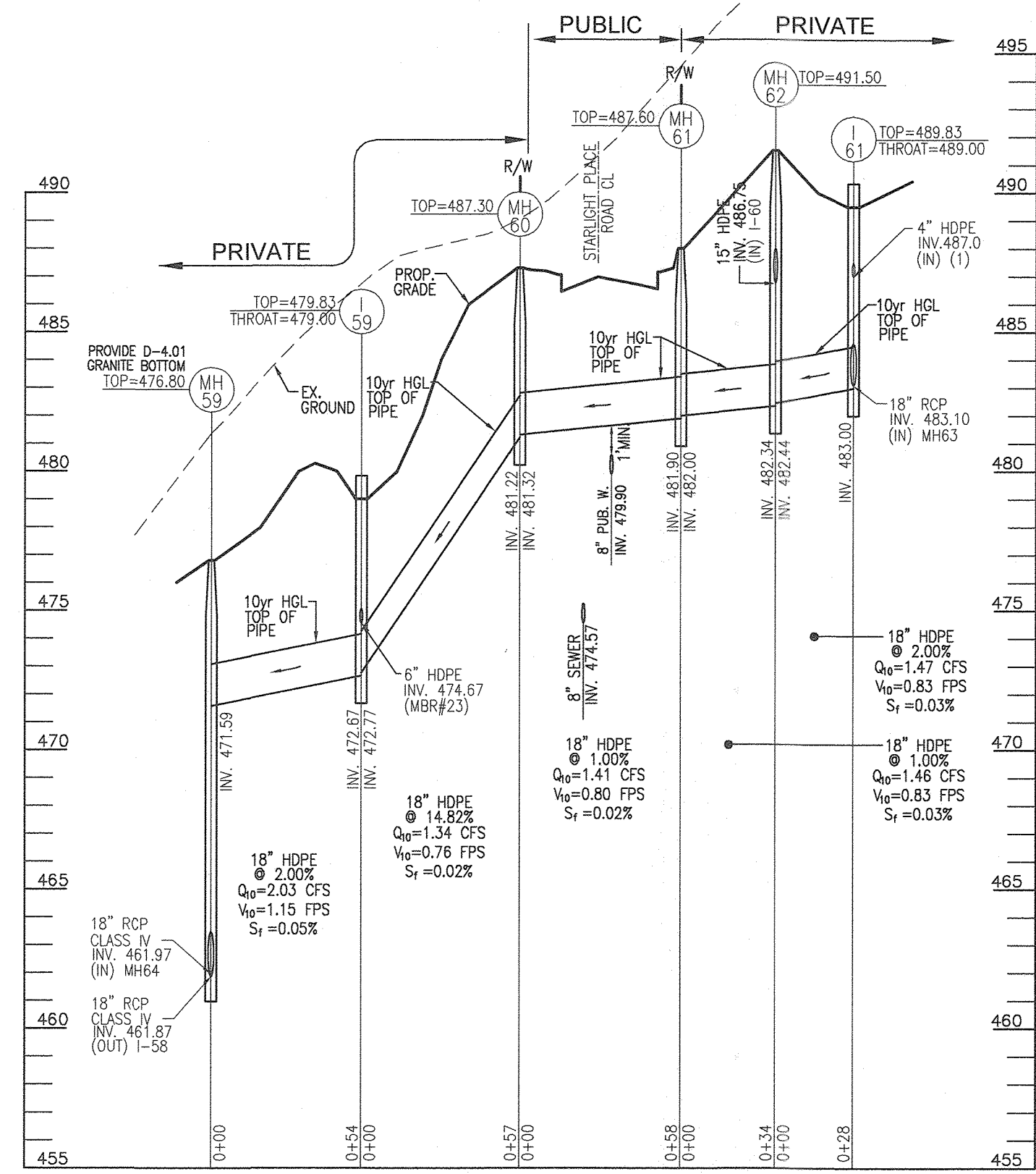
PROFESSIONAL CERTIFICATE

DESIGN BY: ES, RHY  
 DRAWN BY: VE+TG  
 CHECKED BY: RHY  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-21-2022

30 SHEET OF 101





THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

- NOTES:**
- INLET 84 LOCATION SET BY ROAD IMPROVEMENTS.
  - CONTRACTOR SHALL TEST PIT PIPE FOR HORIZONTAL ULTIMATE HORIZONTAL LOCATION ALONG CURB LINE.
  - INVERT OF INLET STRUCTURES SHALL UTILIZE THE METHODOLOGIES OUTLINED WITH THE STANDARD SHA JUNCTION BOX DETAIL (MD 386.11). INVERT OF STRUCTURES SHALL BE CAST IN PLACE. "DOGHOUSE" STYLE, AROUND THE EX. 30" CULVERT.
  - AFTER CAST IN PLACE STRUCTURES ARE IN PLACE, EXISTING PIPE SHALL BE TRIMMED TO INSIDE UPSTREAM AND DOWNSTREAM FACES, PER STANDARD PRACTICES.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 09/14/2022  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 9-22-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 9/26/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

REVISED FINAL ROAD CONSTRUCTION PLAN

**STORM DRAIN PROFILES**  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF CHAPEL GATE - NON-BUILDABLE BULK PARCEL B  
 PLATS 25942 & 25954  
 PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRID: 10 L. 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE

DESIGN BY: ES, RHV  
 DRAWN BY: VE+TO  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022.

31 SHEET 101

REPLACEMENT MYLAR F-21-011



**STRUCTURE SCHEDULE**

STR #	TYPE	INV. IN	INV. OUT	TOP ELEV	DETAIL	LOCATION	REMARKS	PRIVATE/PUBLIC
MH-1	48" MANHOLE	446.67/446.27	446.17	452.77	G 5.12	E=1340167.83 N=593771.60	(1)	PRIVATE
MH-3	48" MANHOLE	447.17	447.07	454.00	G 5.12	E=1340183.09 N=593850.00	(1)	PRIVATE
MH-6	48" MANHOLE	468.32/463.25	463.15	474.00	G 5.12	E=1339940.53 N=593883.14	(1)	PRIVATE
MH-7	48" MANHOLE	464.58	464.48	477.00	G 5.12	E=1339957.62 N=593944.01	(1)	PRIVATE
MH-8	48" MANHOLE	474.46	474.36	482.00	G 5.12	E=1339904.88 N=593937.48	(1)	PRIVATE
MH-9	48" MANHOLE	475.70/475.70	475.60	481.58	G 5.12	E=1339928.23 N=594048.94	(1)	PRIVATE
MH-10	48" MANHOLE	476.42	476.32	481.50	G 5.12	E=1339934.03 N=594110.54	(1)	PRIVATE
MH-12A	48" MANHOLE	492.62	492.52	497.11	G 5.12	E=1339795.41 N=594127.63	(1)	PUBLIC
MH-13	48" MANHOLE	493.81	493.71	504.91	G 5.12	E=1339737.76 N=594147.93	(1)	PUBLIC
MH-14	48" MANHOLE	472.53/472.38	472.28	478.30	G 5.12	E=1339907.44 N=593887.22	(1)	PRIVATE
MH-15	48" MANHOLE	483.90/484.15	483.80	490.16	G 5.12	E=1338905.11 N=593841.83	(1)	PRIVATE
MH-16	48" MANHOLE	485.01	484.91	489.50	G 5.12	E=1339718.73 N=593826.71	(1)	PRIVATE
MH-17	48" MANHOLE	487.60	487.50	492.00	G 5.12	E=1339675.65 N=593836.31	(1)	PRIVATE
MH-18	48" MANHOLE	498.20	498.10	502.50	G 5.12	E=1339637.42 N=593897.28	(1)	PRIVATE
MH-19	48" MANHOLE	507.24	507.14	512.13	G 5.12	E=1339612.86 N=593974.54	(1)	PRIVATE
MH-20	48" MANHOLE	511.29/511.44	511.19	516.00	G 5.12	E=1339508.13 N=594051.09	(1)	PRIVATE
MH-21	48" MANHOLE	432.51	432.41	442.00	G 5.12	E=1340425.22 N=594562.60	(1)	PUBLIC
MH-22	72" MANHOLE	512.33	513.06/512.23	517.50	G 5.13	E=1339568.23 N=594062.32	(1)(5)	PRIVATE
MH-23	48" MANHOLE	514.04	513.79	518.00	G 5.12	E=1339567.39 N=594136.57	(1)	PRIVATE
MH-24	48" MANHOLE	516.30	516.20	522.00	G 5.12	E=1339454.76 N=594087.45	(1)(3)	PRIVATE
MH-25	48" MANHOLE	470.89	470.64	478.40	G 5.12	E=1339910.12 N=594138.85	(1)	PRIVATE
MH-26	48" MANHOLE	469.98	469.88	477.01	G 5.12	E=1339970.96 N=594054.20	(1)	PUBLIC
MH-27	48" MANHOLE	458.55	458.30	462.32	G 5.12	E=1340139.83 N=593929.85	(1)	PUBLIC
MH-28	48" MANHOLE	492.48/494.00*	492.38	497.24	G 5.12	E=1339829.16 N=594202.16	(1)	PUBLIC
MH-29	48" MANHOLE	484.71	484.61	488.00	G 5.12	E=1339915.95 N=594202.16	(1)(4)	PRIVATE
MH-30	60" MANHOLE	444.05/441.15/436.45	434.51	449.89	G 5.13	E=1340335.22 N=594562.25	(1)	PRIVATE
MH-33	48" MANHOLE	448.00/452.60	447.50	456.50	G 5.12	E=1340302.84 N=594464.58	(1)	PRIVATE
MH-34	48" MANHOLE	454.20	454.70/454.10	458.00	G 5.12	E=1340284.24 N=594474.71	(1)(4)(5)	PRIVATE
MH-35	48" MANHOLE	458.39/465.50/465.50*	458.29	468.38	G 5.12	E=1340195.21 N=594461.12	(1), "2" KO	PRIVATE
MH-36	48" MANHOLE	459.08/465.00*	458.83	468.10	G 5.12	E=1340151.63 N=594457.42	(1)	PUBLIC
MH-37	48" MANHOLE	450.40/440.10	440.00	450.50	G 5.12	E=1340316.48 N=594335.66	(1)	PRIVATE
MH-38	48" MANHOLE	452.26	452.80/452.13	456.70	G 5.12	E=1340232.78 N=594339.71	(1)	PUBLIC
MH-39	48" MANHOLE	458.10	457.85	464.10	G 5.12	E=1340196.08 N=594342.56	(1)(4)(5)	PRIVATE
MH-40	48" MANHOLE	449.50/442.10	442.00	454.20	G 5.12	E=1340295.81 N=594208.72	(1)	PRIVATE
MH-40A	48" MANHOLE	444.50	444.40	454.00	G 5.12	E=1340268.50 N=594098.67	(1)	PRIVATE
MH-41	48" MANHOLE	452.70	453.30/452.60	456.00	G 5.12	E=1340277.06 N=594211.77	(1)(5)	PRIVATE
MH-42	48" MANHOLE	456.36/456.36/456.36*	456.26	462.70	G 5.12	E=1340319.27 N=594236.70	(1)	PRIVATE
MH-45	48" MANHOLE	449.50/442.12	441.62	458.50	G 5.12	E=1340299.96 N=594592.87	(1)	PRIVATE
MH-46	48" MANHOLE	442.62	442.52	451.00	G 5.12	E=1340296.77 N=594632.82	(1)	PRIVATE
MH-47	48" MANHOLE	450.30	449.92	459.00	G 5.12	E=1340264.85 N=594642.03	(1)	PRIVATE
MH-48	48" MANHOLE	452.50	452.40	462.50	G 5.12	E=1340205.41 N=594728.76	(1)	PRIVATE
MH-49	48" MANHOLE	444.00	439.05	453.00	G 5.12	E=1340284.24 N=594686.01	(1)	PRIVATE
MH-49A	48" MANHOLE	450.00	451.00	461.00	G 5.12	E=1340219.77 N=594775.64	(1)	PRIVATE
MH-50	48" MANHOLE	461.20/461.20	461.10	470.00	G 5.12	E=1340105.59 N=594705.32	(1)	PRIVATE
MH-51	48" MANHOLE	464.46	464.36	473.40	G 5.12	E=1340089.64 N=594694.07	(1)	PUBLIC
MH-52	48" MANHOLE	465.23	464.98	472.90	G 5.12	E=1340050.232 N=594660.19	(1)	PUBLIC
MH-53	48" MANHOLE	463.11	463.01	472.15	G 5.12	E=1340073.33 N=594714.65	(1)	PUBLIC
MH-54	48" MANHOLE	468.25	468.00	471.67	G 5.12	E=1340016.62 N=594742.04	(1)	PUBLIC
MH-55	48" MANHOLE	459.95	459.59	471.67	G 5.12	E=1340194.31 N=594583.89	(1)	PRIVATE
MH-56	48" MANHOLE	460.36	460.26	472.30	G 5.12	E=1340165.73 N=594571.60	(1)	PUBLIC
MH-57	48" MANHOLE	461.00/468.40*	460.90	471.90	G 5.12	E=1340120.47 N=594542.06	(1)	PUBLIC
MH-58	48" MANHOLE	469.89/461.31	461.21	472.60	G 5.12	E=1340099.95 N=594541.25	(1)	PRIVATE
MH-59	48" MANHOLE	471.59/461.97	461.87	476.80	G 5.12	E=1340040.46 N=594684.29	(1)	PRIVATE
MH-60	48" MANHOLE	481.32	481.20	487.30	G 5.12	E=1339972.74 N=594586.62	(1)	PRIVATE
MH-61	48" MANHOLE	482.00	481.90	488.00	G 5.12	E=1339960.74 N=594593.00	(1)(3)	PRIVATE
MH-62	48" MANHOLE	482.44/486.75	482.34	491.50	G 5.12	E=1339880.37 N=594573.46	(1)	PRIVATE
MH-63	48" MANHOLE	482.24	481.65	498.25	G 5.12	E=1339797.81 N=594563.34	(1)(3)	PRIVATE
MH-64	48" MANHOLE	462.27	462.17	482.20	G 5.12	E=1340033.41 N=594526.07	(1)	PRIVATE
MH-65	48" MANHOLE	473.58/462.76	462.66	480.00	G 5.12	E=1340037.02 N=594447.21	(1)	PRIVATE
MH-66	48" MANHOLE	482.24	482.14	485.30	G 5.12	E=1339974.41 N=594420.42	(1)	PRIVATE
MH-67	48" MANHOLE	483.77/483.00*	483.67	491.50	G 5.12	E=1339912.87 N=594444.90	(1)	PUBLIC
MH-68	48" MANHOLE	484.13	484.03	491.47	G 5.12	E=1339891.01 N=594459.54	(1)	PUBLIC
MH-69	48" MANHOLE	485.18	484.93	489.50	G 5.12	E=1339904.82 N=594538.14	(1)	PRIVATE
MH-70	48" MANHOLE	463.91/473.02	463.66	479.00	G 5.12	E=1340012.35 N=594341.67	(1)	PRIVATE
MH-71	48" MANHOLE	483.23	483.13/483.96	487.20	G 5.12	E=1339938.02 N=594309.95	(1)(4)(5)	PRIVATE
MH-72	48" MANHOLE	489.77/482.52	489.67	494.80	G 5.12	E=1339898.13 N=594309.95	(1)	PRIVATE
MH-73	48" MANHOLE	485.48/486.00*	485.38	488.88	G 5.12	E=1339923.83 N=594565.40	(1)	PUBLIC
MH-74	48" MANHOLE	480.74	480.64	484.00	G 5.12	E=1340011.64 N=594549.63	(1)	PUBLIC
MH-75	48" MANHOLE	478.32	478.22	484.40	G 5.12	E=1340395.64 N=594621.51	(1)	PUBLIC
MH-76	48" MANHOLE	438.40	438.30	446.37	G 5.12	E=1340291.46 N=594843.34	(1)	PRIVATE
MH-77	48" MANHOLE	439.13	439.03	455.00	G 5.12	E=1340229.46 N=594861.79	(1)	PUBLIC
MH-78	48" MANHOLE	440.06	439.96	453.83	G 5.12	E=1340193.13 N=594898.02	(1)	PUBLIC
MH-79	48" MANHOLE	446.74/440.66	440.56	450.60	G 5.12	E=1340155.29 N=594950.50	(1)	PUBLIC
MH-82	48" MANHOLE	436.83	436.73	443.20	G 5.12	E=1340327.44 N=595068.99	(1)	PRIVATE
MH-83	48" MANHOLE	517.91	517.66	522.70	G 5.12	E=1339539.29 N=594234.21	(1)	PRIVATE

STR #	TYPE	INVERT	TOP ELEV	DETAIL	LOCATION	REMARKS	PRIVATE/PUBLIC
ES-2	18" END SEC.	468.00	469.50	HDPE	E=1339987.88 N=593998.22	(2) MBR#11	PUBLIC
ES-3	18" END SEC.	474.00	475.50	HDPE	E=1339948.61 N=594033.00	(2) MBR#9	PUBLIC
ES-4	10" END SEC.	476.00	476.83	HDPE	E=1339887.30 N=593947.72	(2) MBR#7B	PRIVATE
ES-5	15" END SEC.	498.00	499.25	RCP	E=1339641.83 N=593923.19	(2) MBR#4	PRIVATE
ES-7	15" END SEC.	504.00	505.25	RCP	E=1339699.42 N=594088.74	(2) MBR#5	PRIVATE
ES-8	10" END SEC.	512.00	512.83	HDPE	E=1339546.44 N=594051.07	(2) BR#2	PRIVATE
ES-9	18" END SEC.	516.00	517.50	HDPE	E=1339444.45 N=594088.79	(2) MBR#1	PRIVATE
ES-10	18" END SEC.	450.00	451.50	HDPE	E=1340193.76 N=593970.10	(2) BR#14	PUBLIC
ES-11	18" END SEC.	484.50	486.00	HDPE	E=1339915.95 N=594222.16	(2) BR#17A	PRIVATE
ES-13	15" END SEC.	450.00	451.25	RCP	E=1340199.56 N=594056.72	(2) BR#14	PRIVATE
ES-13A	15" END SEC.	484.50	485.75	RCP	E=1339897.12 N=594134.99	(2) BR#17A	PRIVATE
ES-14	18" END SEC.	450.00	451.50	RCP	E=1340220.20 N=594070.70	(2) BR#14	PRIVATE
ES-15	10" END SEC.	452.00	452.83	HDPE	E=1340278.30 N=594193.70	(2) BR#14	PRIVATE
ES-16	10" END SEC.	452.00	452.83	HDPE	E=1340302.56 N=594354.60	(2) BR#25C	PRIVATE
ES-17	10" END SEC.	454.00	454.83	HDPE	E=1340294.43 N=594486.46	(2) BR#25A	PRIVATE
ES-18	10" END SEC.	483.00	483.83	HDPE	E=1339946.01 N=594293.24	(2) MBR#17B	PRIVATE
ES-19	18" END SEC.	482.00	483.50	HDPE	E=1339979.10 N=594414.51	(2) BR#21	PRIVATE
ES-20	18" END SEC.	480.40	481.90	HDPE	E=1340011.60 N=594531.67	(2) BR#22	PUBLIC
ES-21	18" END SEC.	478.00	479.50	HDPE	E=1339968.48 N=594611.40	(2) MBR#23	PUBLIC
ES-22	18" END SEC.	438.00	439.50	RCP	E=1340311.95 N=594664.86	(2) GW	PRIVATE
ES-23	18" END SEC.	438.00	439.50	HDPE	E=1340312.54 N=594827.26	(2) GW	PRIVATE
ES-25	18" END SEC.	471.00	472.25	HDPE	E=1340017.63 N=594672.00	(2) MBR#27A	PUBLIC
EW-1	24" "A" ENDWALL	448.00	449.50	D-5.21	E=1340200.20 N=594376.06	(2)	PRIVATE
EW-2	24" "C" ENDWALL	432.00	435.50	D-5.21	E=1340505.17 N=594547.11	(2)	PRIVATE
EW-3	18" "C" ENDWALL	440.00	442.25	D-5.21	E=1340140.13 N=595052.71	(2)	PRIVATE
EW-4	15" "S" "C" ENDWALL	450.00	452.75	MD-356.01	E=1340028.03 N=595041.08	(2)	PRIVATE

Notes: (1) Coordinate for Proposed Structure = Centerline of Structure  
 Manhole size subject to change per precaster recommendation  
 (2) Coordinate for End Section/Endwall/Headwall = Centerline of Pipe @ Downstream Face  
 (3) Offset top section rotate lid UP/HILL  
 (4) Shallow Manhole  
 (5) Splitter Manhole (6) MATCH EX GRADE AT END RIP RAP  
 \* = Invert from Perf. HDPE pervious pavement outlet



**LEGEND:**

- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- EXISTING PRELINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- PROPOSED SIDEWALK
- PUBLIC 100 YR FLOODPLAIN
- EX. WETLAND
- EX. WETLAND BUFFER
- EX. STREAM
- EX. STREAM BUFFER
- LOOP TRAIL
- VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
- EX. SPECIMEN TREE W/ CRITICAL ROOT ZONE
- AMENITY AREA #1
- AMENITY AREA BOUNDARY & DESIGNATION
- INTERNAL LANDSCAPING - SHADE
- INTERNAL LANDSCAPING - ORNAMENTAL
- PARKING LOT INTERNAL LANDSCAPING
- SPECIMEN TREE REPLACEMENT LANDSCAPING
- PERIMETER LANDSCAPING
- PROPOSED STREET TREES
- BC&E 40' GREEN ZONE DOES NOT AFFECT PROJECT
- BC&E 25' YELLOW ZONE DOES NOT AFFECT PROJECT
- EX. SPECIMEN TREE TO BE REMOVED
- 10' TREE MAINTENANCE EASEMENT
- RS7 100 YR WSEL 42.25
- 100 YEAR FLOODPLAIN CROSS SECTION WSEL
- EXISTING PUBLIC 12' TRAIL EASEMENT F-21-014

**FOREST CONSERVATION LEGEND:**

- EXISTING FOREST CONSERVATION EASEMENT F-21-014 PLAT 25942-25954

**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
B5A	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GcC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GcB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GcB	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hs	HATBORO-ODOROUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/O	.43	NO
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UcF	UDORHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	D	---	YES
UcD	URBAN LAND-UDORHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	---	NO

NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

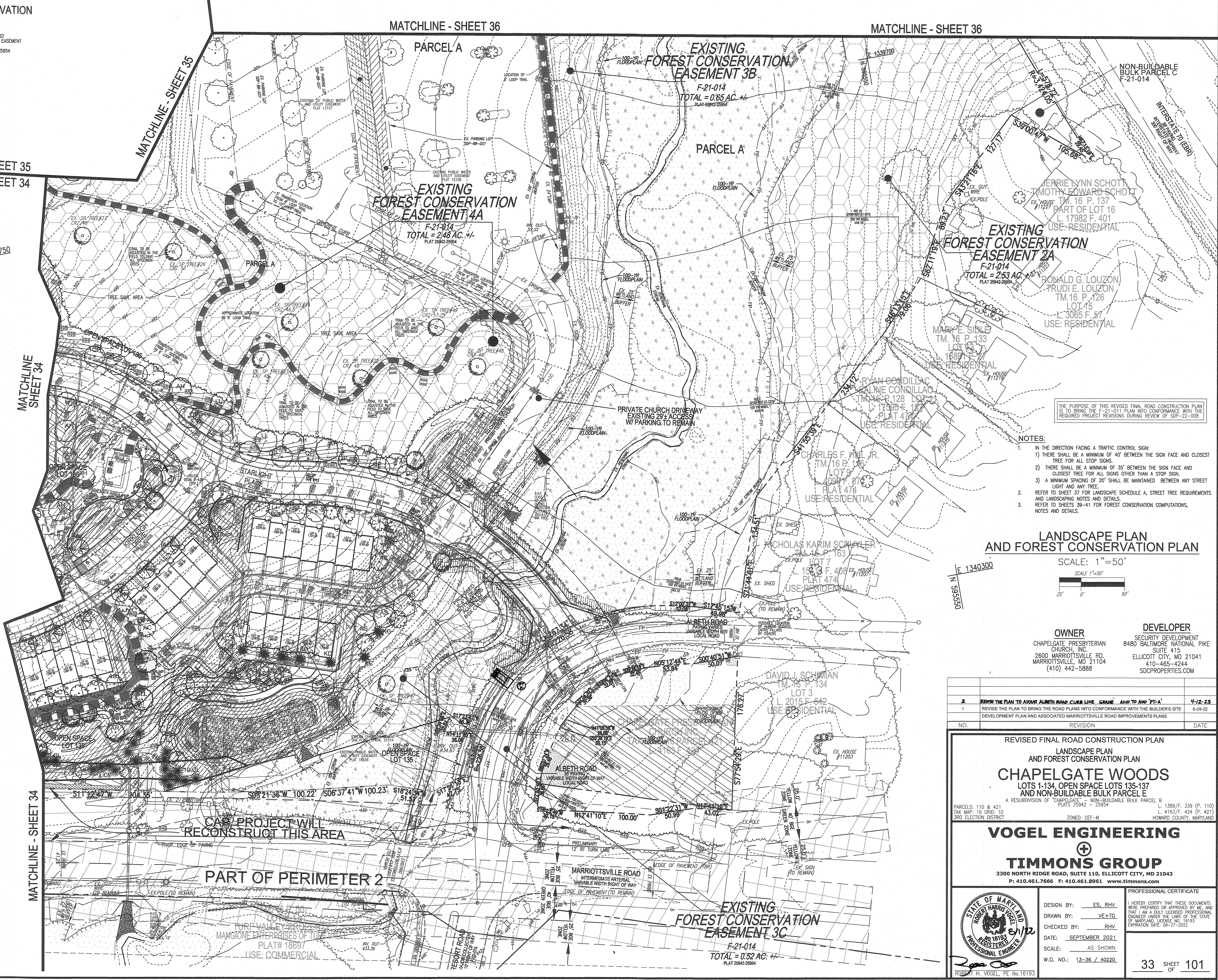
**DEVELOPER'S/BUILDER'S CERTIFICATE**

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 18.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

Signature: *Mark S. W...* DATE: 7-27-22

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 Chief, Bureau of Highways: *MK* DATE: 09/14/2022

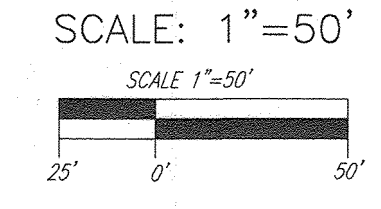
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 Chief, Development Engineering Division: *...* DATE: 9-22-21  
 Chief, Division of Land Development: *...* DATE: 9/26/22



THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

- NOTES:**
- IN THE DIRECTION FACING A TRAFFIC CONTROL SIGN:
    - THERE SHALL BE A MINIMUM OF 40' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL STOP SIGNS.
    - THERE SHALL BE A MINIMUM OF 35' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL SIGNS OTHER THAN A STOP SIGN.
    - A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
  - REFER TO SHEET 37 FOR LANDSCAPE SCHEDULE A, STREET TREE REQUIREMENTS AND LANDSCAPING NOTES AND DETAILS.
  - REFER TO SHEETS 39-41 FOR FOREST CONSERVATION COMPUTATIONS, NOTES AND DETAILS.

**LANDSCAPE PLAN AND FOREST CONSERVATION PLAN**



**OWNER:** CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTVILLE RD. MARRIOTTVILLE, MD 21104 (410) 442-5888

**DEVELOPER:** SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLICOTT CITY, MD 21041 (410)-465-4244 SDCPROPERTIES.COM

NO.	REVISION	DATE
2	REVISE THE PLAN TO ADD ALBETH ROAD CURB LINE, GRADE AND TO ADD 'P.C.A'	4-12-23
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 LANDSCAPE PLAN AND FOREST CONSERVATION PLAN  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 L 1389/F. 339 P. (110)  
 TAX MAP: 16 GRD. 10 L 4163/F. 424 P. (421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

DESIGN BY: ES, RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.C. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

33 SHEET OF 101



SOILS LEGEND				
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
B6A	BALTIMORE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
G6C	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
G6B	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
G6D	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
H6	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
M6D	MAJOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
U6F	UDORHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
U6D	URBAN LAND-UDORHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 HOWARD COUNTY SOILS MAP NUMBER 12 - STOKESVILLE  
 \* K VALUES PER <http://www.howard.org/documents> - \* K FACTORS (USE K10)  
 NOTE:  
 HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

FOREST CONSERVATION LEGEND:	
	EXISTING FOREST CONSERVATION EASEMENT F-21-014 PLAT 25942-25954



LEGEND:	
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING FENCE
	AMENITY AREA BOUNDARY & DESIGNATION
	INTERNAL LANDSCAPING - SHADE
	INTERNAL LANDSCAPING - SHRUB
	INTERNAL LANDSCAPING - ORNAMENTAL
	PARKING LOT INTERNAL LANDSCAPING
	EXISTING TREE (FIELD LOCATED)
	EXISTING VEGETATION
	EX SPECIMEN TREE W/ CRITICAL ROOT ZONE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	PROPOSED SIDEWALK
	LOOP TRAIL
	VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
	B&E 40' GREEN ZONE DOES NOT AFFECT PROJECT
	B&E 25' YELLOW ZONE DOES NOT AFFECT PROJECT
	10' TREE MAINTENANCE EASEMENT
	SPECIMEN TREE REPLACEMENT LANDSCAPING
	PERIMETER LANDSCAPING
	PROPOSED STREET TREES

**EXISTING FOREST CONSERVATION EASEMENT 6B**  
 F-21-014  
 TOTAL = 3.77 AC. +/-  
 PLAT 25942-25954

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

- NOTES:**
- IN THE DIRECTION FACING A TRAFFIC CONTROL SIGN:
    - THERE SHALL BE A MINIMUM OF 40' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL STOP SIGNS.
    - THERE SHALL BE A MINIMUM OF 35' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL SIGNS OTHER THAN A STOP SIGN.
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  - REFER TO SHEET 37 FOR LANDSCAPE SCHEDULE A, STREET TREE REQUIREMENTS AND LANDSCAPING NOTES AND DETAILS.
  - REFER TO SHEETS 39-41 FOR FOREST CONSERVATION COMPUTATIONS, NOTES AND DETAILS.

<b>OWNER</b> CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTVILLE RD. MARRIOTTVILLE, MD 21104 (410) 442-5888	<b>DEVELOPER</b> SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLCOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM
--	--

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	9-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 LANDSCAPE PLAN  
 AND FOREST CONSERVATION PLAN  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 L 1389/F 339 (P. 110)  
 TAX MAP: 18 GRD. 10 L 4163/F 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/14/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9-22-21

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/20/22

**DEVELOPER'S/BUILDER'S CERTIFICATE**

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

SIGNATURE OF DEVELOPER  
 DATE: 7.27.22

**LANDSCAPE PLAN AND FOREST CONSERVATION PLAN**  
 SCALE: 1" = 50'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/14/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9-22-21

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/20/22

**PROFESSIONAL CERTIFICATE**

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022.

DESIGN BY: ES, RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

ROBERT H. VOGEL, PE No. 16193

34 SHEET 101  
 OF



MATCHLINE - SHEET 36

MATCHLINE - SHEET 36

MATCHLINE SHEET 36  
MATCHLINE SHEET 33

E 1339650  
N 594850

MATCHLINE - SHEET 33

MATCHLINE - SHEET 33  
MATCHLINE - SHEET 34

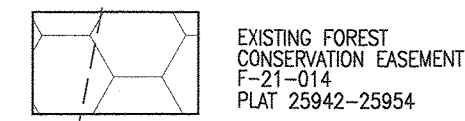
MATCHLINE - SHEET 34

E 1339650  
N 594250

LEGEND:

- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- EXISTING TIE LINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- PROPOSED SIDEWALK
- LOOP TRAIL
- VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
- EX. SPECIMEN TREE
- CRITICAL AREA ZONE
- AMENITY AREA #1
- AMENITY AREA BOUNDARY & DESIGNATION
- INTERNAL LANDSCAPING - SHADE
- INTERNAL LANDSCAPING - ORNAMENTAL
- PARKING LOT INTERNAL LANDSCAPING
- SPECIMEN TREE REPLACEMENT LANDSCAPING
- PERIMETER LANDSCAPING
- PROPOSED STREET TREES

FOREST CONSERVATION LEGEND:



EXISTING FOREST CONSERVATION EASEMENT F-21-014 PLAT 25942-25954

EXISTING FOREST CONSERVATION EASEMENT 1C  
F-21-014  
TOTAL = 3.35 AC. +/-  
PLAT 25942-25954

EXISTING FOREST CONSERVATION EASEMENT 6B  
F-21-014  
TOTAL = 3.77 AC. +/-  
PLAT 25942-25954

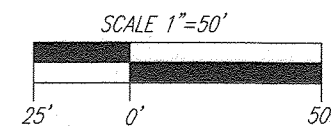
SOILS LEGEND

SYMBOL	NAME/DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BsA	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
GcC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
GcB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
GcB	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
HsB	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
MdD	MAJOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
UdF	UDOROTHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
UdD	URBAN LAND-UDOROTHENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

LANDSCAPE PLAN AND FOREST CONSERVATION PLAN

SCALE: 1"=50'



DEVELOPER'S/BUILDER'S CERTIFICATE

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

*Monty W. Wini* 7-27-22  
SIGNATURE OF DEVELOPER DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

*James* 09/19/2022  
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Cheryl* 9-22-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Cheryl* 9/26/22  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

NOTES:

- IN THE DIRECTION FACING A TRAFFIC CONTROL SIGN:  
1) THERE SHALL BE A MINIMUM OF 40' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL STOP SIGNS.  
2) THERE SHALL BE A MINIMUM OF 35' BETWEEN THE SIGN FACE AND CLOSEST TREE FOR ALL SIGNS OTHER THAN A STOP SIGN.  
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- REFER TO SHEET 37 FOR LANDSCAPE SCHEDULE A, STREET TREE REQUIREMENTS AND LANDSCAPING NOTES AND DETAILS.
- REFER TO SHEETS 39-41 FOR FOREST CONSERVATION COMPUTATIONS, NOTES AND DETAILS.

CHAPEL GATE EXISTING AMENITIES NOTE

PER THE ZB-1105-M DECISION AND ORDER, THE EXISTING CHAPEL GATE BALL FIELDS, PLAYGROUNDS AND TOT LOTS AS WELL AS THE NEWLY PROPOSED CHAPEL GATE AMENITIES SHALL BE SHARED WITH THE COMMUNITY.

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

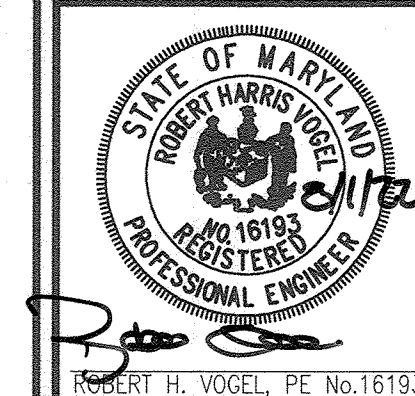
**DEVELOPER**  
SECURITY DEVELOPMENT  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
LANDSCAPE PLAN AND FOREST CONSERVATION PLAN  
CHAPEL GATE WOODS  
LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
PLATS 25942 - 25954 L 4163/F. 424 (P. 421)  
TAX MAP: 16 GRID: 10 HOWARD COUNTY, MARYLAND  
3RD ELECTION DISTRICT ZONED: CEF-M

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



DESIGN BY: ES, RHV  
DRAWN BY: VE+TC  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022.



SYMBOL	NAME/DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
B5A	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	49	NO
G5C	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	43	YES
G5B	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	37	YES
G5D	GLENELG BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	49	YES
H5	HANFORD-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	43	NO
M5D	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	32	YES
U5F	UDORTHERTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	-	YES
U5D	URBAN LAND-UDORTHERTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE  
 HOWARD COUNTY SOILS MAP NUMBER 12 - SPYCKVILLE SE  
 K VALUES PER https://www.howardcountymd.gov/documents - "K" FACTORS (USE KW)  
 NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

E 1338550  
 N 595750

**FOREST CONSERVATION EASEMENT LEGEND:**

- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING TREE LINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- LOOP TRAIL
- PUBLIC 100 YR FLOODPLAIN
- EX. STREAM
- EX. STREAM BUFFER
- 100 YEAR FLOODPLAIN CROSS-SECTION / NOEL
- EXISTING PUBLIC 12' TRAIL EASEMENT

**LEGEND:**

- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING TREE LINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- LOOP TRAIL
- PUBLIC 100 YR FLOODPLAIN
- EX. STREAM
- EX. STREAM BUFFER
- 100 YEAR FLOODPLAIN CROSS-SECTION / NOEL
- EXISTING PUBLIC 12' TRAIL EASEMENT

**EXISTING FOREST CONSERVATION EASEMENT 3B**  
 F-21-014  
 TOTAL = 0.65 AC. +/-  
 Plat # 25942 - 25954

**NOTE:**  
 ONLY THE PROJECT LOOP TRAIL AND ASSOCIATED AMENITIES ARE PROPOSED ON THIS PORTION OF THE SITE  
 NO LANDSCAPING IS REQUIRED ON THIS SHEET

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT CHURCH, INC.  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE

**FINAL ROAD CONSTRUCTION PLAN AND FOREST CONSERVATION PLAN**  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRID: 10 SUITE: 415  
 3RD ELECTION DISTRICT PLATS: 25942, 424 (P. 421)  
 ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

**PROFESSIONAL CERTIFICATE**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A BULK LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

DESIGN BY: RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

36 SHEET OF 101

**NOTE:**  
 1. REFER TO SHEET 40-42 FOR FOREST CONSERVATION COMPUTATIONS, NOTES AND DETAILS.

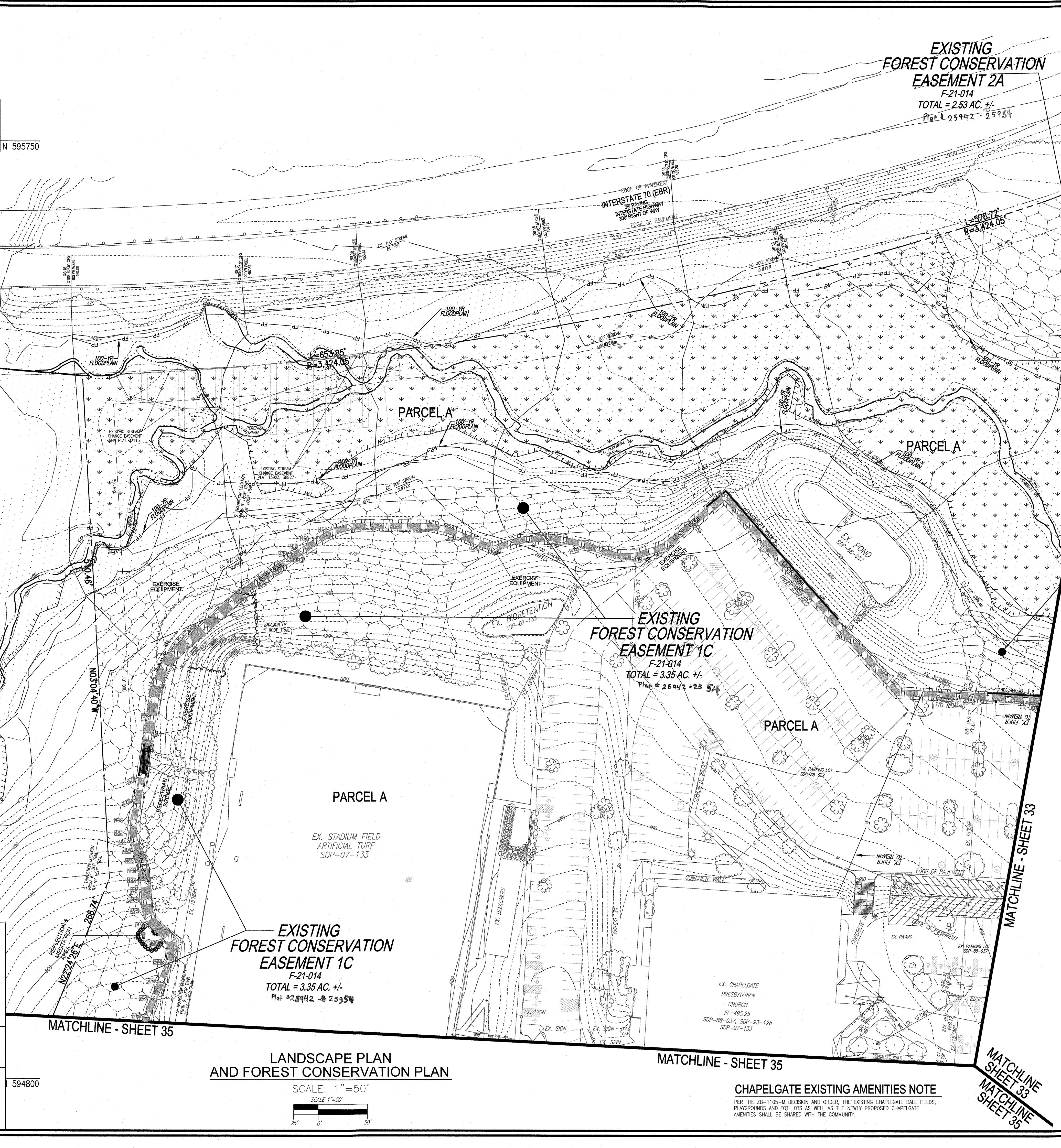
**DEVELOPER'S/BUILDER'S CERTIFICATE**

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

*Mark Whitt*  
 SIGNATURE OF DEVELOPER  
 11/9/21  
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*James*  
 CHIEF, BUREAU OF HIGHWAYS  
 12/07/2021  
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*John*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 12/23/21  
 DATE  
*Jan*  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 11/3/22  
 DATE



**LANDSCAPE PLAN AND FOREST CONSERVATION PLAN**

SCALE: 1"=50'  
 SCALE 1"=50'

**CHAPEL GATE EXISTING AMENITIES NOTE**  
 FOR THE 2B-1105-A DECISION AND ORDER, THE EXISTING CHAPEL GATE BALL FIELDS, PLAYGROUNDS AND TOT LOTS AS WELL AS THE NEWLY PROPOSED CHAPEL GATE AMENITIES SHALL BE SHARED WITH THE COMMUNITY.

594800



**LANDSCAPING NOTES**

- AT THE TIME OF PLANT INSTALLATION, ALL SHRUBS AND TREES LISTED AND APPROVED ON THE LANDSCAPE PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATIONS OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING, ANY DENIAL FROM THE APPROVED LANDSCAPE PLAN MAY RESULT IN DELAY OR IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO THE APPLICABLE PLANS.
- THE OWNER, TENANT AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND 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. SHOULD ANY TREE DESIGNATED FOR PRESERVATION FOR WHICH LANDSCAPING CREDIT IS GIVEN, DIE PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD, AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE HOWARD COUNTY LANDSCAPE MANUAL.
- PLANTINGS SHOWN HEREON ARE THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL DURING THE CONSTRUCTION OF THE FINAL PLAN.
- SURETY FOR THE PROPOSED LANDSCAPING SHALL BE BASED ON THE NUMBER OF PLANTINGS REQUIRED.

PUBLIC STREET TREES ARE PROVIDED FOR THIS PROJECT IN ACCORDANCE WITH SECTION 16.124(a)(1) OF THE SUBDIVISION REGULATIONS AND THE LANDSCAPE FINANCIAL SURETY (§ 39-300) SHALL BE POSTED AS PART OF THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS COST ESTIMATE.

THE REMOVAL OF TREES 30" OR GREATER DBH IS PROHIBITED WITHOUT COUNTY APPROVAL.

THIS PROJECT IS SUBJECT TO WP-19-056, ON MARCH 26, 2019; THE PLANNING DIRECTOR APPROVED THE REQUEST FOR ALTERNATIVE COMPLIANCE TO SECTION 16.1205(A)(7) REMOVAL OF SPECIMEN TREES 30" IN DIAMETER OR GREATER. WP-19-056 APPROVED THE REMOVAL OF 27 SPECIMEN TREES (26 TULIP POPLAR AND 1 MAPLE). SEE TABLE, SHEET 42.

SCHEDULE 'A' - PERIMETER LANDSCAPE EDGE										
CATEGORY	ADJACENT TO ROADWAYS AND PERIMETER PROPERTIES									
	1	2	3	4	5A	5B	5C	5D	5E	5F
PERIMETER FRONTAGE DESIGNATION	C	C	C	C	A	B	B	B	A	A
LANDSCAPE TYPE	C	C	C	C	A	B	B	B	A	A
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	328	1,497	803	279	87	407	454	123	357	195
CREDIT FOR EXISTING VEGETATION (YES, NO LINEAR FEET DESCRIBE BELOW IF NEEDED)	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
CREDIT FOR WALL, FENCE OR BERM (YES, NO LINEAR FEET DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
LENGTH OF PERIMETER REMAINING	0	1,198	53	209	37	407	337	0	62	0
NUMBER OF PLANTS REQUIRED										
SHADE TREES	140	0	140	28	140	2	140	6	180	1
EVERGREEN TREES	120	0	120	56	120	3	120	11	140	11
SHRUBS	0	0	0	0	0	0	0	0	0	0
NUMBER OF PLANTS PROVIDED										
SHADE TREES	0	24	2	6	1	9	7	0	1	1
EVERGREEN TREES	0	64	3	11	-	11	9	0	-	-
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	-	-	-	-	-	-	-
SHRUBS (10:1 SUBSTITUTION)	-	-	-	-	-	-	-	-	-	-
EX. SPECIMEN TREES TO REMAIN	-	-	-	-	-	-	-	-	-	-
DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED										

PERIMETER LANDSCAPE EDGE LANDSCAPE SCHEDULE					
KEY	QUAN	SYMB	BOTANICAL NAME	SIZE	REM
SHADE # 61					
QR	25	+	QUERCUS RUBRA NORTHERN RED OAK	2 1/2" - 3" CAL.	B & B
AR	26	+	ACER RUBRUM 'OCTOBER GLORY' / ACER GLORY RED MAPLE	2 1/2" - 3" CAL.	B & B
EVERGREEN # 90					
CL	90	+	CUPRESSOCYPARIS LEYLANDII LEYLAND CYPRESS	8"-10" HT.	B & B
PA	8	+	THUJA OCCIDENTALIS 'PYRAMIDAL' EMERALD GREEN PYRAMIDAL ARBORVITAE	6'-8" HT.	B & B

NOTE: WITH PERMISSION FROM HOWARD COUNTY, PLANTINGS SPECIFIED HEREON MAY BE SUBSTITUTED WITH APPROVED SPECIES LISTED IN APPENDIX B & C OF THE HOWARD COUNTY LANDSCAPE MANUAL.

REPLACEMENT SPECIMEN TREES (WP-19-056) PLANTING SCHEDULE					
KEY	SYMB	QUAN	BOTANICAL NAME	SIZE	REM
LL	+	18	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LITTLELEAF LINDEN	3" CAL.	B & B
AS	+	18	PLATANUS OCCIDENTALIS AMERICAN SYCAMORE	3" CAL.	B & B
AH	+	18	CARPINUS CAROLINIANA AMERICAN HORNBAM	3" CAL.	B & B

NOTE: WITH PERMISSION FROM HOWARD COUNTY, PLANTINGS SPECIFIED HEREON MAY BE SUBSTITUTED WITH APPROVED SPECIES LISTED IN APPENDIX B & C OF THE HOWARD COUNTY LANDSCAPE MANUAL.

NOTES:  
- REFER TO WP-19-056 DECISION, SHEET 42  
- REFER TO SHEETS 12-14 & 41 FOR LOCATION OF SPECIMEN TREES TO BE REMOVED

SCHEDULE 'B' PARKING LOT INTERNAL LANDSCAPING					
KEY	SYMB	QUAN	BOTANICAL NAME	SIZE	REM
NUMBER OF PARKING SPACES					77
NUMBER OF TREES REQUIRED					8
NUMBER OF TREES PROVIDED					8
SHADE TREES					-
OTHER TREES (2:1 SUBSTITUTION)					-

PARKING LOT INTERNAL LANDSCAPING - PLANTING SCHEDULE					
KEY	SYMB	QUAN	BOTANICAL NAME	SIZE	REM
ZS	+	8	ZELKOVA SERRATA 'VILLAGE GREEN' VILLAGE GREEN JAPANESE ZELKOVA	2 1/2"-3" CAL.	B & B

NOTE: WITH PERMISSION FROM HOWARD COUNTY, PLANTINGS SPECIFIED HEREON MAY BE SUBSTITUTED WITH APPROVED SPECIES LISTED IN APPENDIX B & C OF THE HOWARD COUNTY LANDSCAPE MANUAL.

STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
STARLIGHT PLACE (STA. 2450-11+72.73)	* 1846/40	46	46
KIRKLEIGH DRIVE (STA. 0400-14+71.45)	* 2943/40	74	74
CROSSPOINT WAY (STA. 1451.63-3+72.81)	* 442/40	11	11
*INCLUDES BOTH SIDES OF ROAD	TOTAL	131	131

PUBLIC STREET TREES ARE PROVIDED FOR THIS PROJECT IN ACCORDANCE WITH SECTION 16.124(a)(1) OF THE SUBDIVISION REGULATIONS AND THE LANDSCAPE FINANCIAL SURETY (§ 39-300) SHALL BE POSTED AS PART OF THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS COST ESTIMATE.

**STREET TREE NOTES:**

- WHEN THE DISTANCE BETWEEN THE CURB AND SIDEWALK IS 6 FEET OR GREATER, TREES SHALL BE LOCATED WITHIN THE RIGHT OF WAY AND SHALL BE CENTERED BETWEEN THE CURB AND THE SIDEWALK.
- WHEN THE DISTANCE BETWEEN THE CURB AND THE SIDEWALK IS LESS THAN 6 FEET, AND WHERE TREES ARE PLANTED CLOSER THAN 3 FEET TO THE SIDEWALK, A BIOLOGIC ROOT INHIBITOR BARRIER OR PHYSICAL CONTAINER BARRIER SHALL BE REQUIRED.
- WHEN THE DISTANCE BETWEEN THE CURB AND THE 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.
- TREES SHALL BE PLACED A MINIMUM OF 30 FEET FROM ALL SIGNS AND INTERSECTIONS WHEN PLANTED BETWEEN SIDEWALK AND CURB, AND BE LOCATED WITH CONSIDERATION OF UNDERGROUND UTILITIES AND STRUCTURES. STREET TREES MAY NOT BE PLANTED WITHIN 5 FEET OF A DRAIN INLET STRUCTURE, 5 FEET OF AN OPEN SPACE ACCESS STRIP, OR 10 FEET OF A DRIVEWAY.

STREET TREE - PLANTING SCHEDULE					
KEY	QUAN	SYMB	BOTANICAL NAME	SIZE	REM
QP	46	+	QUERCUS ROBUR 'FASTIGIATA' COLUMNAR ENGLISH OAK	2 1/2"-3" CAL.	B & B
GT	11	+	GLEDITSIA TRACANTHOS INERMIS 'IMPERIAL' / IMPERIAL THORNLESS HONEY LOCUST	2 1/2"-3" CAL.	B & B
AG	74	+	ACER RUBRUM 'AUTUMN FLAME' AUTUMN FLAME RED MAPLE	2 1/2"-3" CAL.	B & B

NOTE: WITH PERMISSION FROM HOWARD COUNTY, PLANTINGS SPECIFIED HEREON MAY BE SUBSTITUTED WITH APPROVED SPECIES LISTED IN APPENDIX B & C OF THE HOWARD COUNTY LANDSCAPE MANUAL.

**LANDSCAPE SCHEDULE NOTES:**

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

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

RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING PLANTING SCHEDULE					
KEY	SYMB	QUAN	BOTANICAL NAME	SIZE	REM
KC	+	12	PRUNUS SERRULATA 'KWANZAN' KWANZAN CHERRY	1 1/2"-2" CAL.	
ER	+	13	CERCIS CANADENSIS EASTERN REDBUD	1 1/2"-2" CAL.	
KD	+	18	CORNUS KOUSA KOUSA DOGWOOD	8' - 10' HGT	
JY	+	20	TAXUS CUSPIDATA 'NANA' DWARF JAPANESE YEW	18"-24" SPREAD	

NOTE: WITH PERMISSION FROM HOWARD COUNTY, PLANTINGS SPECIFIED HEREON MAY BE SUBSTITUTED WITH APPROVED SPECIES LISTED IN APPENDIX B & C OF THE HOWARD COUNTY LANDSCAPE MANUAL.

SCHEDULE 'C' RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING				
NUMBER OF DWELLING UNITS	134 - SFA			
NUMBER OF TREES REQUIRED (1:DU SFA)	134			
NUMBER OF TREES PROVIDED				
SHADE TREES	111			
ORNAMENTAL (2:1 SUBSTITUTION)	43			
SHRUB (10:1 SUBSTITUTION)	20			

RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING PLANTING SCHEDULE					
KEY	SYMB	QUAN	BOTANICAL NAME	SIZE	REM
AC	+	111	ACER RUBRUM 'ARMSTRONG' ARMSTRONG COLUMNAR RED MAPLE	2 1/2"-3" CAL.	B & B

NOTE: WITH PERMISSION FROM HOWARD COUNTY, PLANTINGS SPECIFIED HEREON MAY BE SUBSTITUTED WITH APPROVED SPECIES LISTED IN APPENDIX B & C OF THE HOWARD COUNTY LANDSCAPE MANUAL.

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE LANDSCAPE MANUAL. A FINANCIAL SURETY SHALL BE POSTED AS PART OF THE DEVELOPER'S AGREEMENT FOR THE REQUIRED LANDSCAPING IN THE AMOUNT OF \$88,800.  
\$75,300 FOR 108 SHADE TREES (55 + 54 WP-19-056 + 134 INTERNAL + 8 PARKING)  
\$13,500 FOR 90 EVERGREEN TREES (\$13,500)

**DEVELOPER'S/BUILDER'S CERTIFICATE**

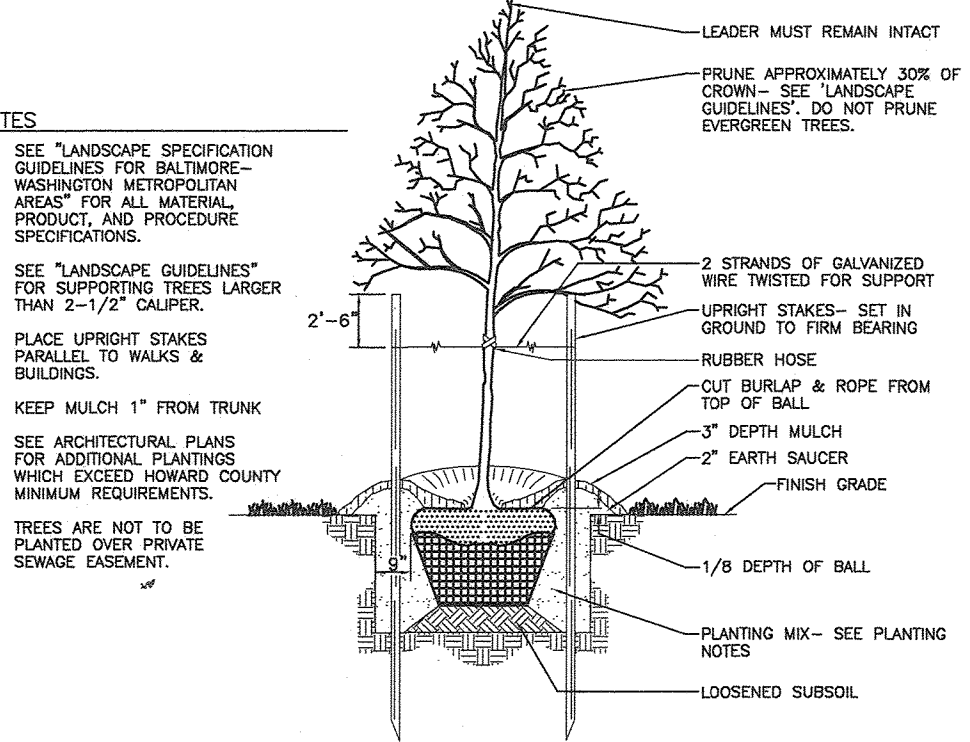
I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE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

*Matthew A. Wain* 7-27-22  
SIGNATURE OF DEVELOPER DATE

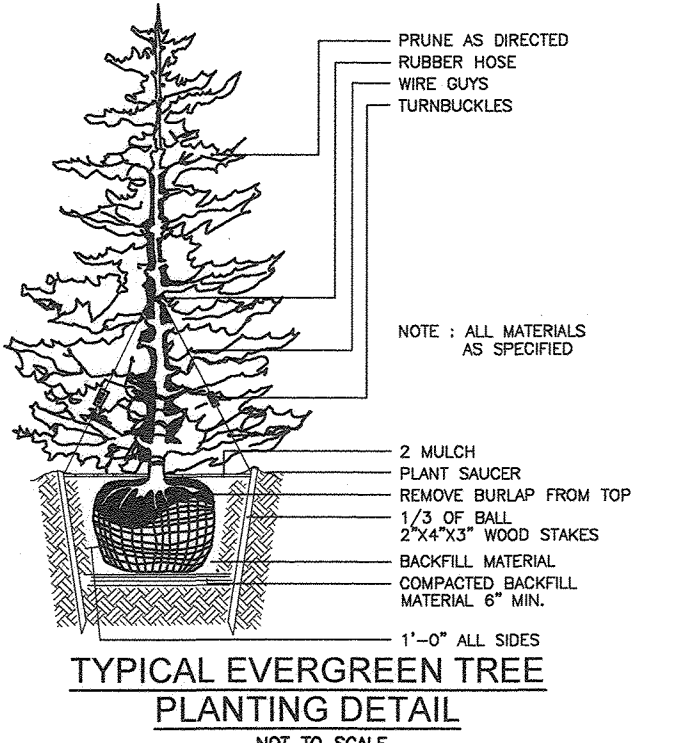
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Mike* 09/14/2022  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*John* 9-22-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*John* 9/22/21  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE



**TREE PLANTING AND STAKING**  
DECIDUOUS TREES UP TO 2-1/2" CALIPER NOT TO SCALE



**TYPICAL EVERGREEN TREE PLANTING DETAIL**  
NOT TO SCALE

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
LANDSCAPE PLAN - NOTES & DETAILS

**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 25942 - 25954 L 1389/F. 339 (P. 110)  
L 4163/F. 424 (P. 421)  
TAX MAP: 16 GRD: 10 L 4163/F. 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

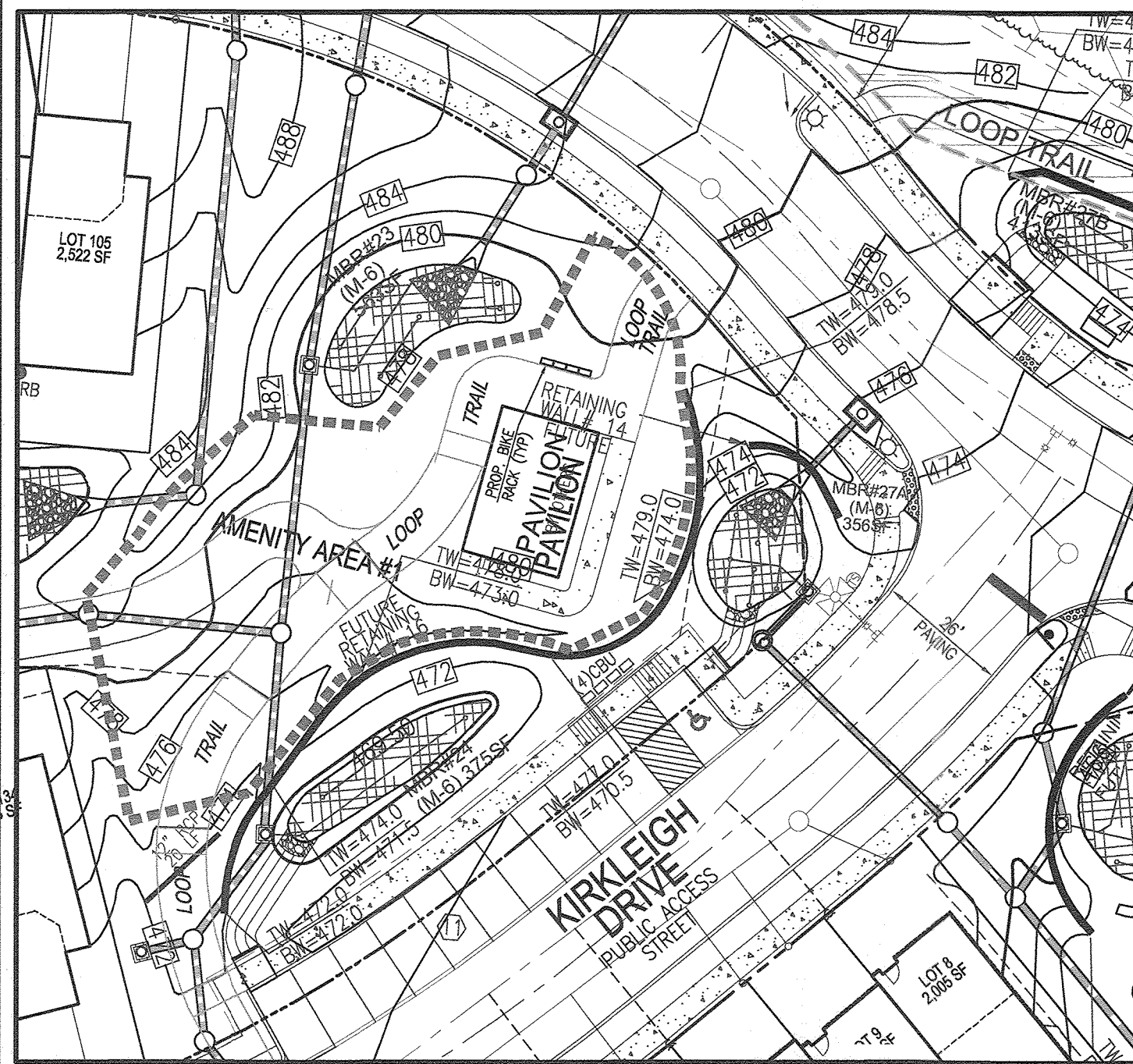
**VOGEL ENGINEERING**  
TIMMONS GROUP  
3300 NORTH RIDGE ROAD, SUITE 110, ELLCOTT CITY, MD 21043  
P: 410.461.7666 F: 410.461.8961 www.timmons.com

DESIGN BY: ES, RHW  
DRAWN BY: VE+TG  
CHECKED BY: RHW  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-38 / 40220

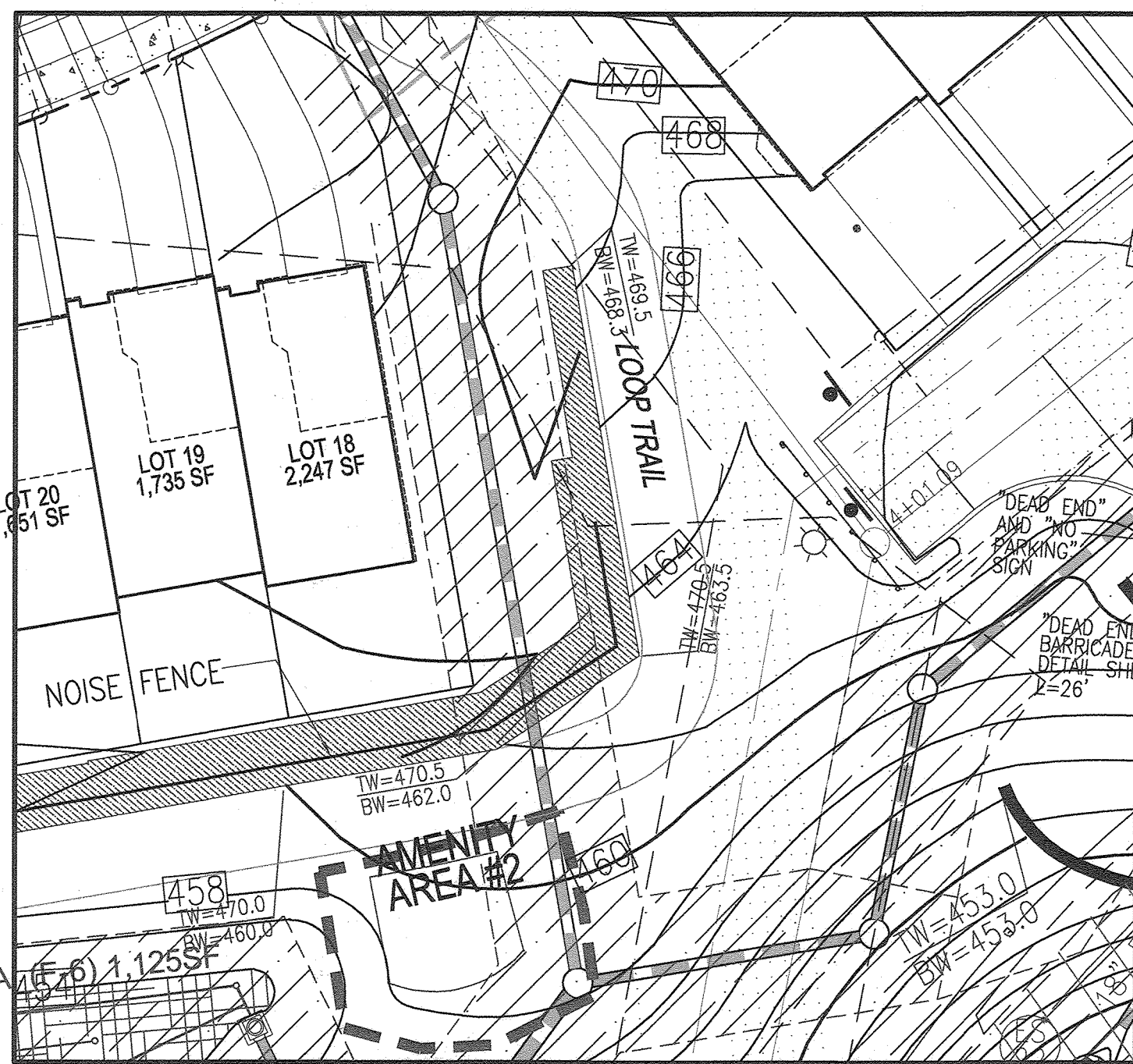
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37 SHEET 101

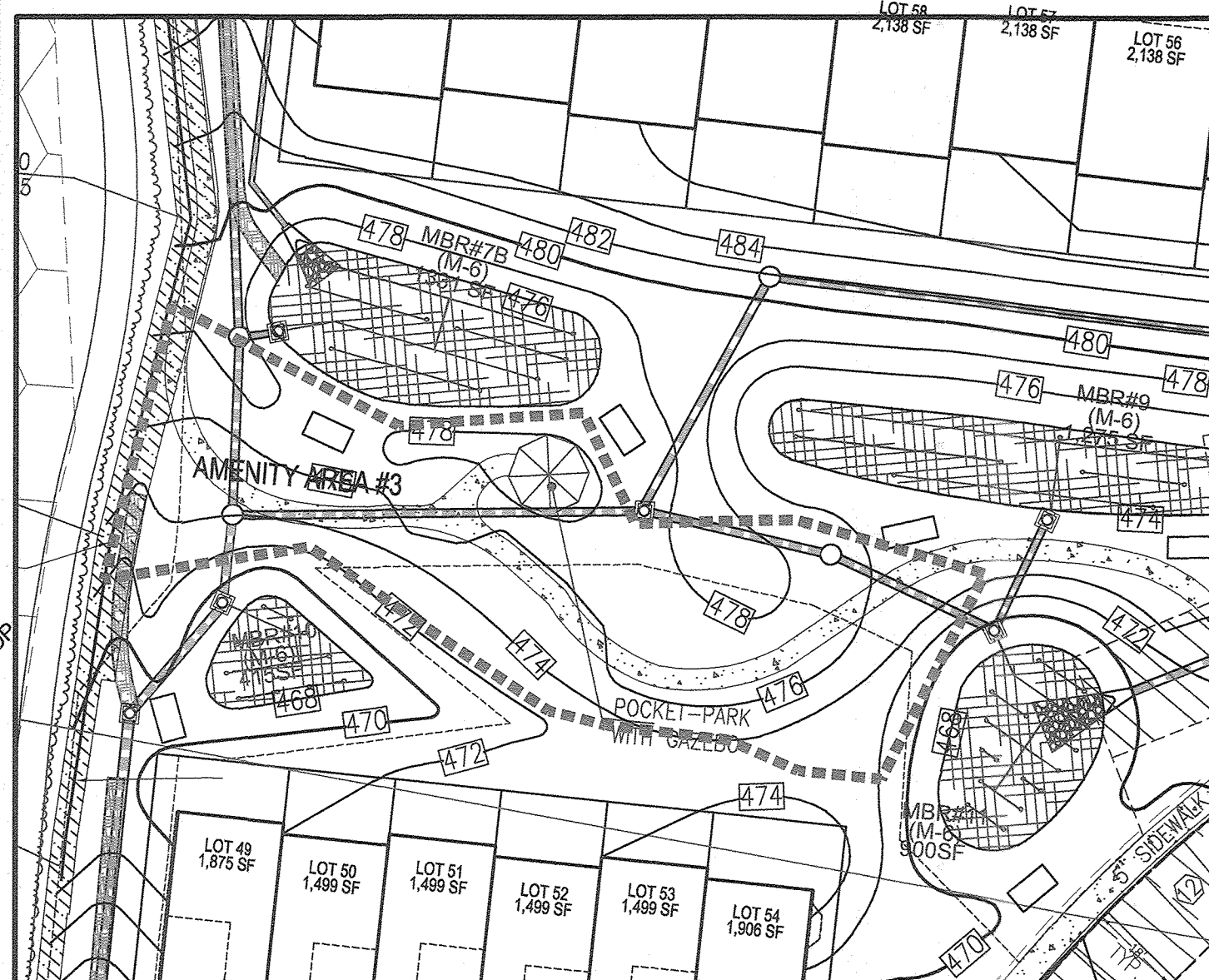
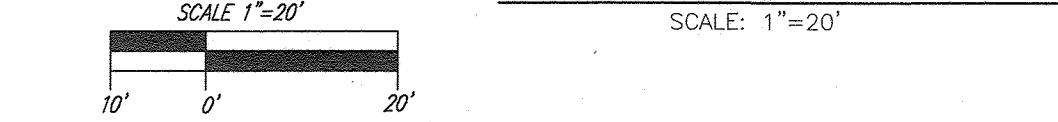




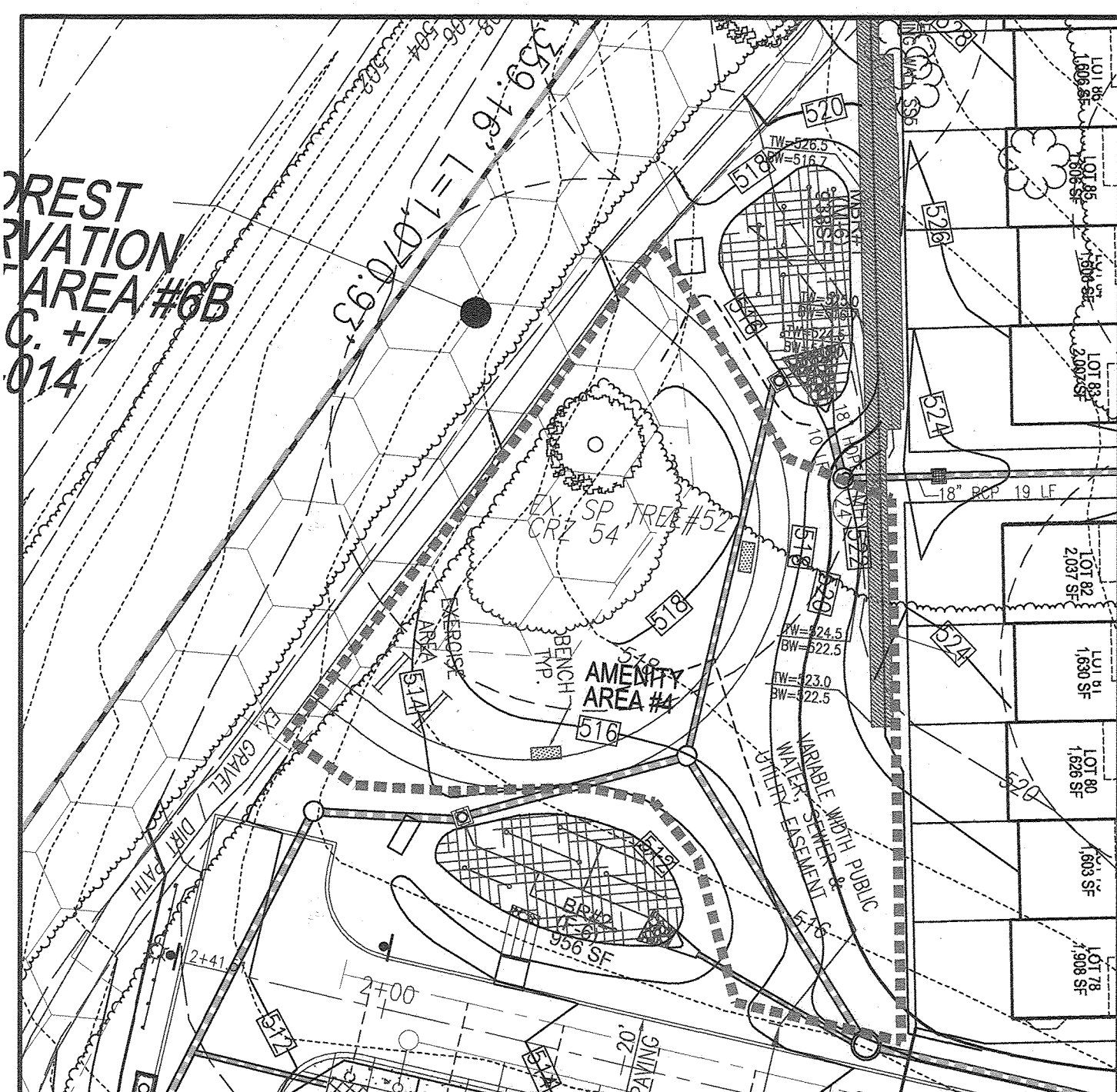
AMENITY AREA #1 - DETAIL



AMENITY AREA #2 - DETAIL



AMENITY AREA #3 - DETAIL



AMENITY AREA #4 - DETAIL



RECREATION OPEN SPACE TABULATION:

RECREATION OPEN SPACE REQUIRED = 1,000 SF/UNIT X 134 UNITS = 134,000 SF REQUIRED

TOTAL RECREATION OPEN SPACE TO BE PROVIDED FOR CHAPEL GATE

P/O OPEN SPACE 135  
 - AMENITY AREA 2 = 770 SF  
 2 BENCHES = 400 SF CREDIT  
 - AMENITY AREA 3 = 6,415 SF  
 GAZEBO = 2,000 SF CREDIT  
 - AMENITY AREA 4 = 10,015 SF  
 2 BENCHES = 400 SF CREDIT  
 FITNESS STATION  
 - PATHWAY (SEE BELOW)

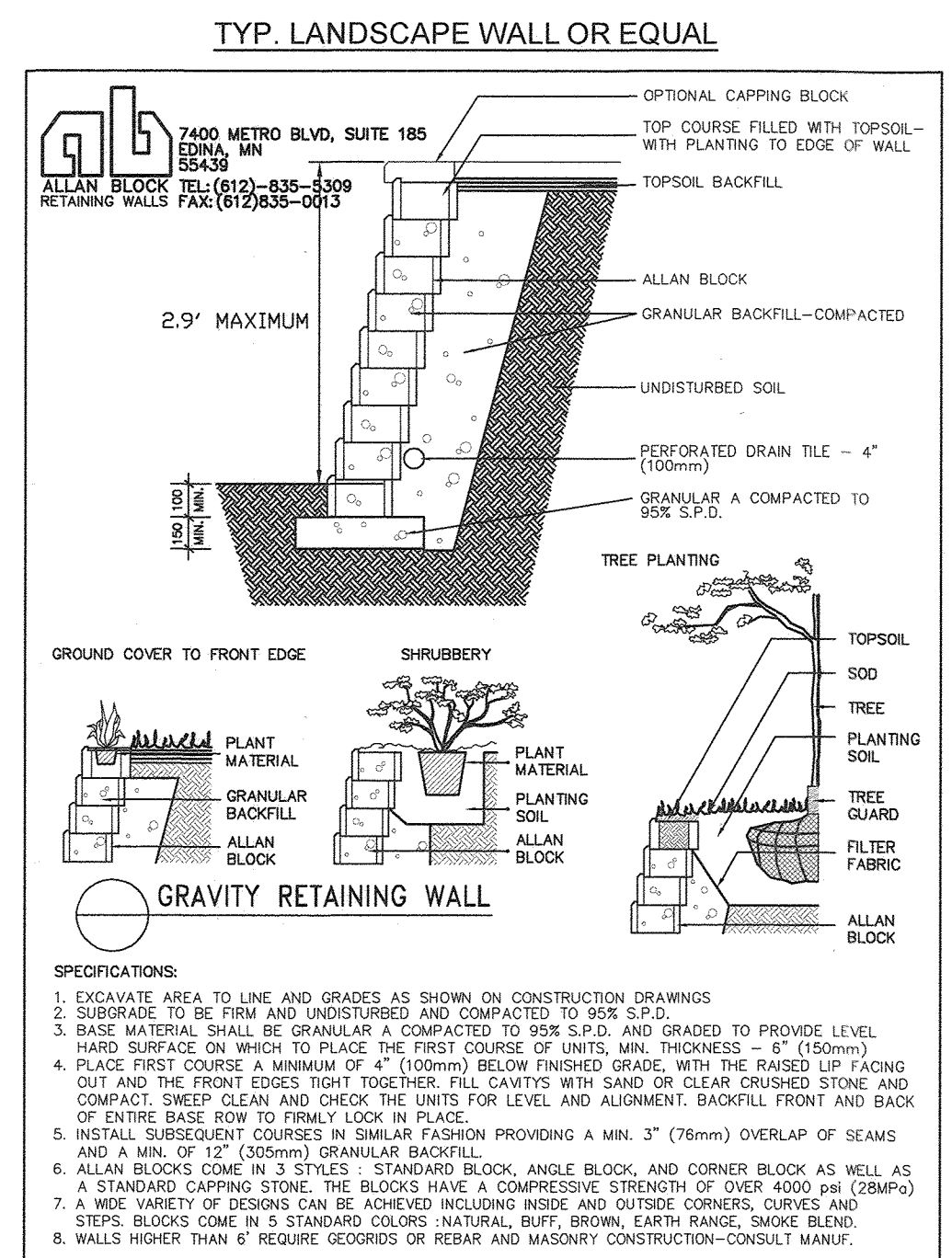
P/O OPEN SPACE 136  
 - AMENITY AREA 1 = 7,090 SF  
 PLUS AMENITIES:  
 - PAWELON  
 (PERMIT BY OTHERS)  
 - PATHWAY (SEE BELOW)

PATHWAY AMENITY:  
 - LOOP TRAIL 10'x6' PERMEABLE ASPHALT TRAIL = 3,265 LF @ 10' WIDE = 3,265 LF @ 8' WIDE = 3,265 SF @ 35% OF CREDIT = 1,142 SF  
 - FITNESS EQUIPMENT / STATION = 10 BENCHES = 2,000 SF

TOTAL LAND AREA & AMENITY CREDIT = 185,170 SF +/- PLUS NUMEROUS PIECES OF FITNESS EQUIPMENT AND PAWELON

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS MKC 09/14/2022 DATE

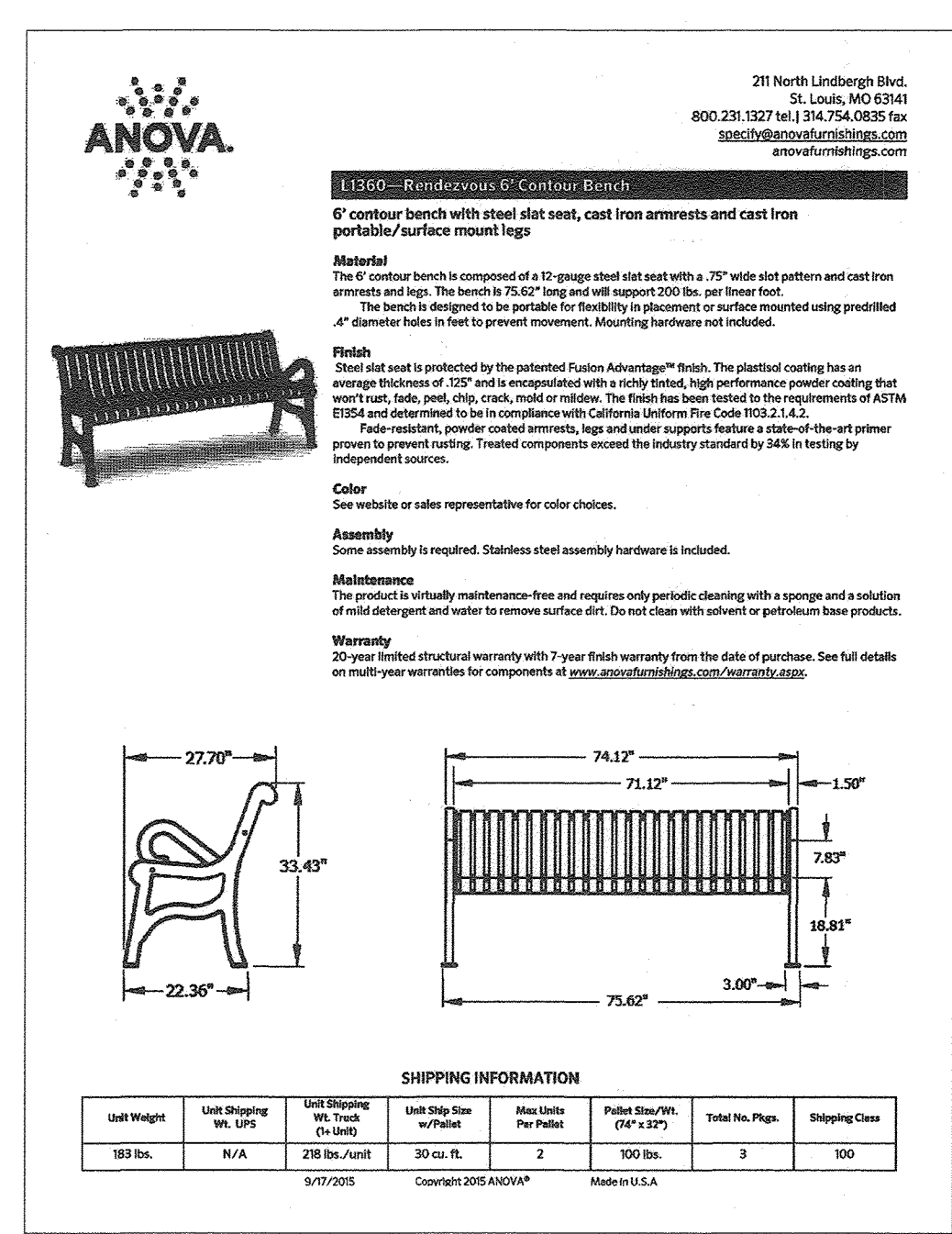
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 9-22-21 DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT 9/20/22 DATE



TYP. LANDSCAPE WALL OR EQUAL

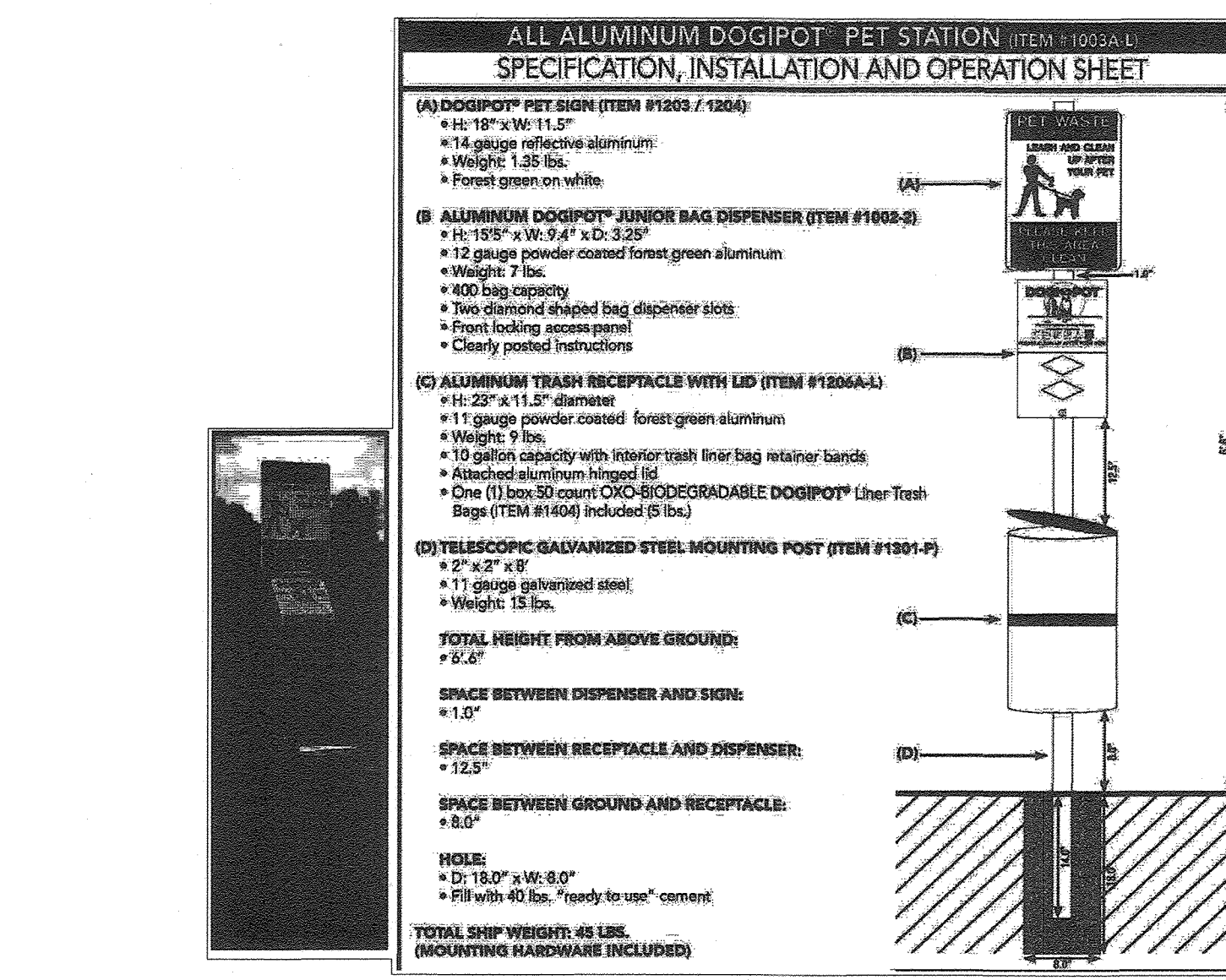
SPECIFICATIONS:  
 1. EXCAVATE AREA TO LINE AND GRADES AS SHOWN ON CONSTRUCTION DRAWINGS  
 2. SUBGRADE TO BE FIRM AND UNDISTURBED AND COMPACTED TO 95% S.P.D.  
 3. BASE MATERIAL SHALL BE GRANULAR A COMPACTED TO 95% S.P.D. AND GRADED TO PROVIDE LEVEL HARD SURFACE ON WHICH TO PLACE THE FIRST COURSE UNITS WITH THICKNESS = 4" (100mm)  
 4. PLACE FIRST COURSE A MINIMUM OF 4" (100mm) BELOW FINISHED GRADE WITH THE RAISED LIP FACING OUT AND THE FRONT EDGES RIGHT TOGETHER. FILL GAVOTS WITH SAND OR CLEAN CRUSHED STONE AND COMPACT. SWEEP CLEAN AND CHECK THE UNITS FOR LEVEL AND ALIGNMENT. BACKFILL FRONT AND BACK OF ENTIRE BASE ROW TO FIRM 1' LICK IN PLACE.  
 5. INSTALL SUBSEQUENT COURSES IN SIMILAR FASHION PROVIDING A MIN. 3" (76mm) OVERLAP OF SEAMS AND A MIN. OF 1/2" (13mm) GRANULAR BACKFILL.  
 6. ALLAN BLOCKS COME IN 3 STYLES - STANDARD BLOCK, ANGLE BLOCK, AND CORNER BLOCK AS WELL AS A STANDARD CAPPING BLOCK. THE BLOCKS HAVE A COMPRESSIVE STRENGTH OF OVER 4000 PSI (28MPa)  
 7. A WIDE VARIETY OF COLORS CAN BE ACHIEVED INCLUDING INSIDE AND OUTSIDE CORNERS, CURVES AND STEPS. BLOCKS COME IN 5 STANDARD COLORS: NATURAL, BUFF, BROWN, EARTH TANCE, SANDY BLEND  
 8. WALLS HIGHER THAN 6' REQUIRE GEOTECH OR REBAR AND MASONRY CONSTRUCTION - CONSULT MANUF.

RECREATION OPEN SPACE - AMENITY DETAILS OR EQUAL

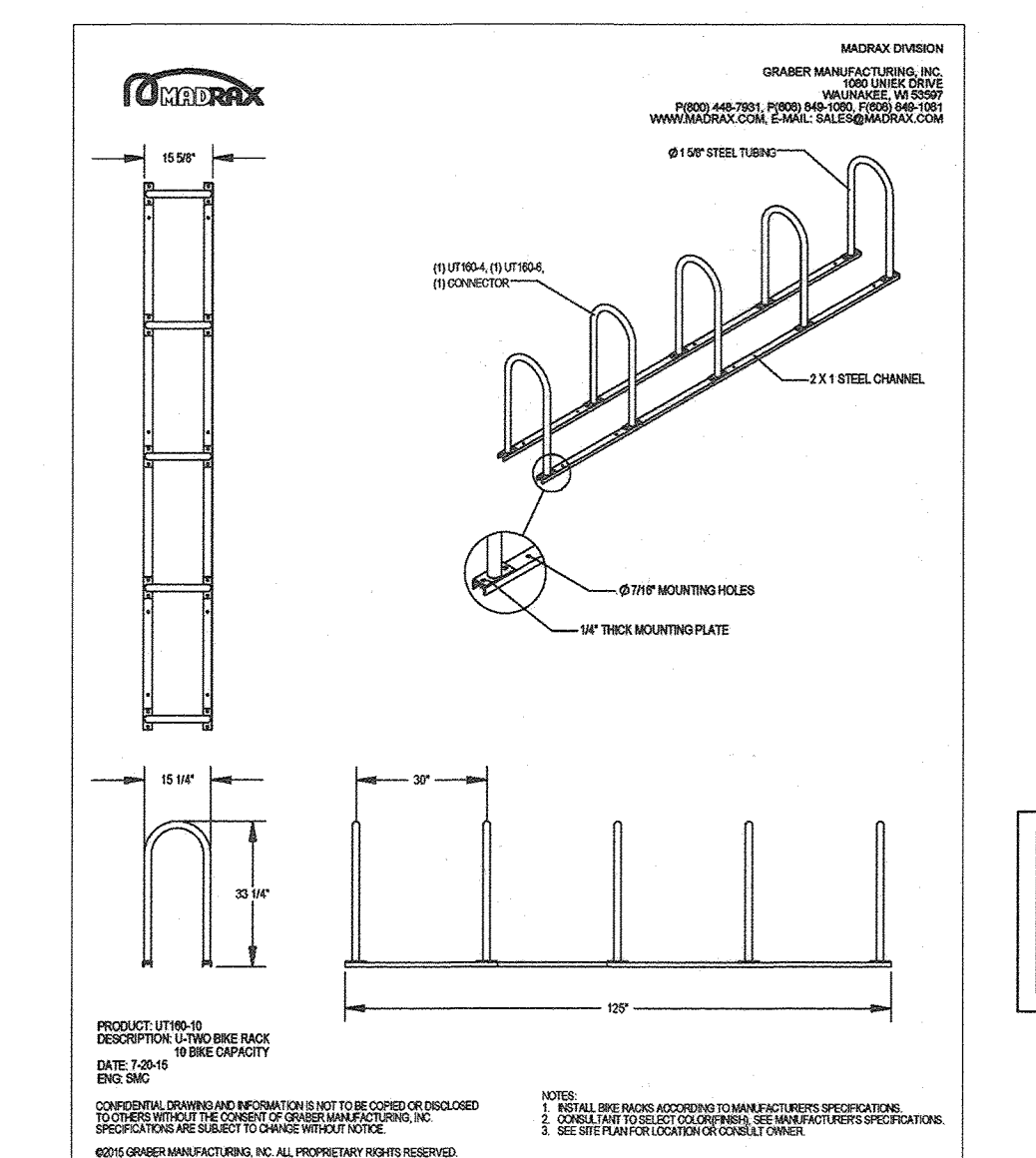


TYPICAL BENCH OR EQUAL  
 SCALE: N.T.S.

TYPICAL GAZEBO DETAILS OR EQUAL  
 NOT TO SCALE



TYPICAL PET STATION OR EQUAL  
 SCALE: N.T.S.



TYPICAL BIKE RACK OR EQUAL  
 SCALE: N.T.S.

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-11 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SPP-22-008

CHAPEL GATE EXISTING AMENITIES NOTE

OWNER: CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARIOTTVILLE RD. MARIOTTVILLE, MD 21104 (410) 442-5888

DEVELOPER: SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLICOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 RECREATION OPEN SPACE  
 AMENITY DETAILS AND AMENITY AREA DETAILING  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25942 - 25954  
 PARCELS: 110 & 421 L 1389/F 339 (P. 110)  
 SIX MAPS: 15 GRID: 10 L 4163/F 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

DESIGN BY: ES, RHY  
 DRAWN BY: VE+TG  
 CHECKED BY: RHY  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

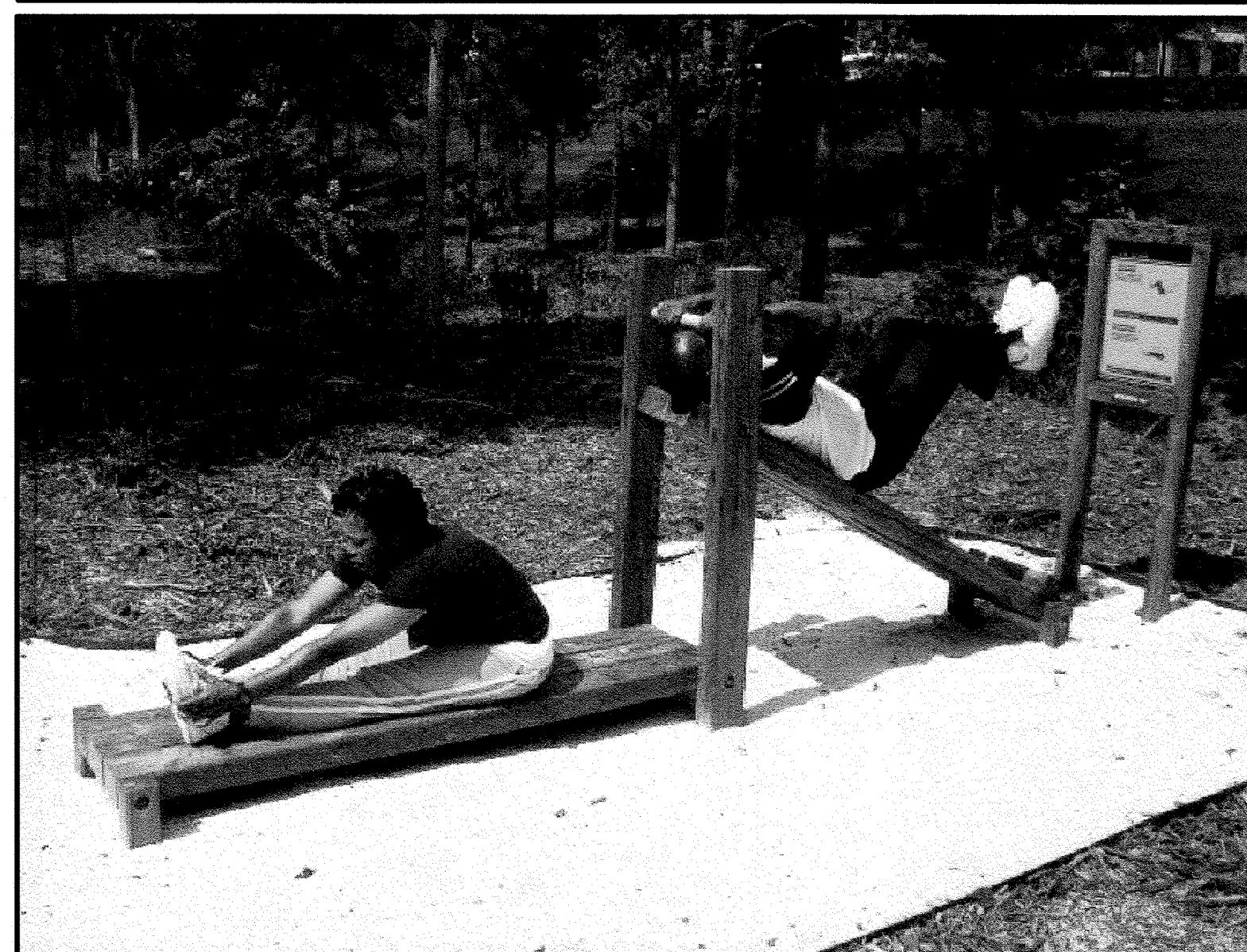
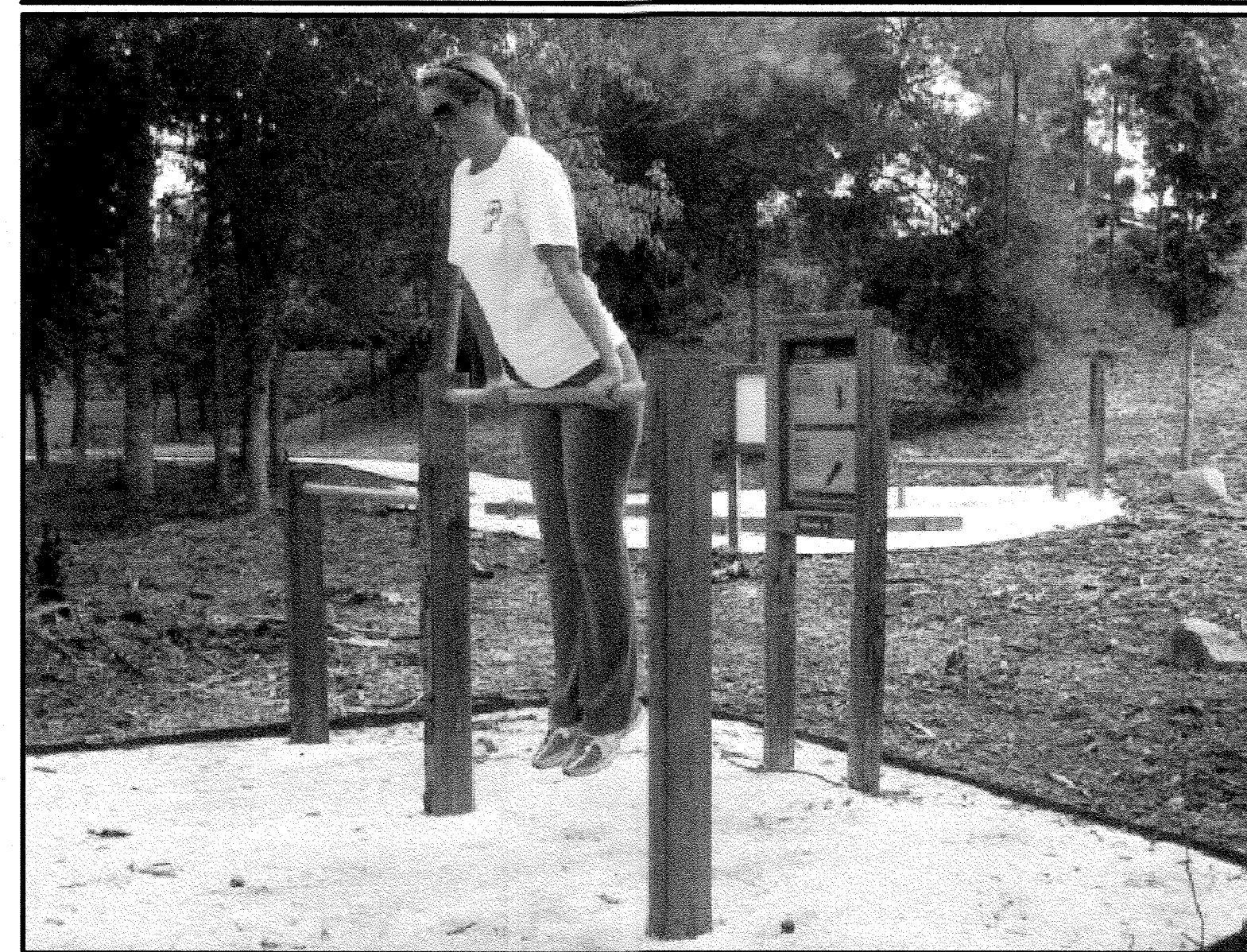
PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

38 SHEET OF 101



TYPICAL LOOP TRAIL - OUTDOOR FITNESS EQUIPMENT STATIONS OR EQUAL

REFER TO :https://www.fittrail.com/

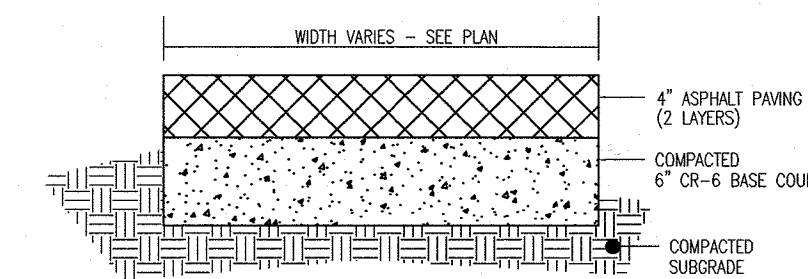
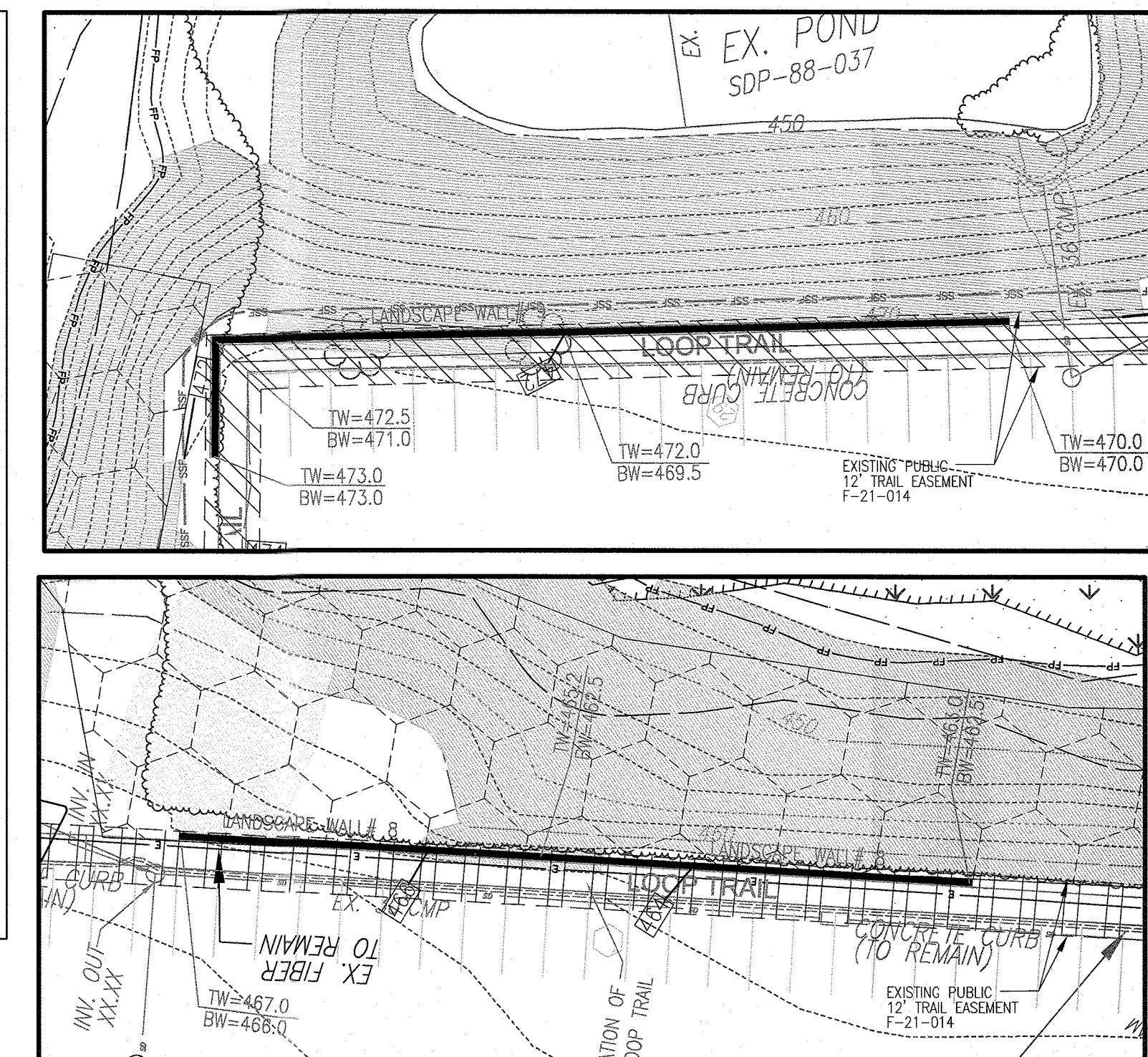
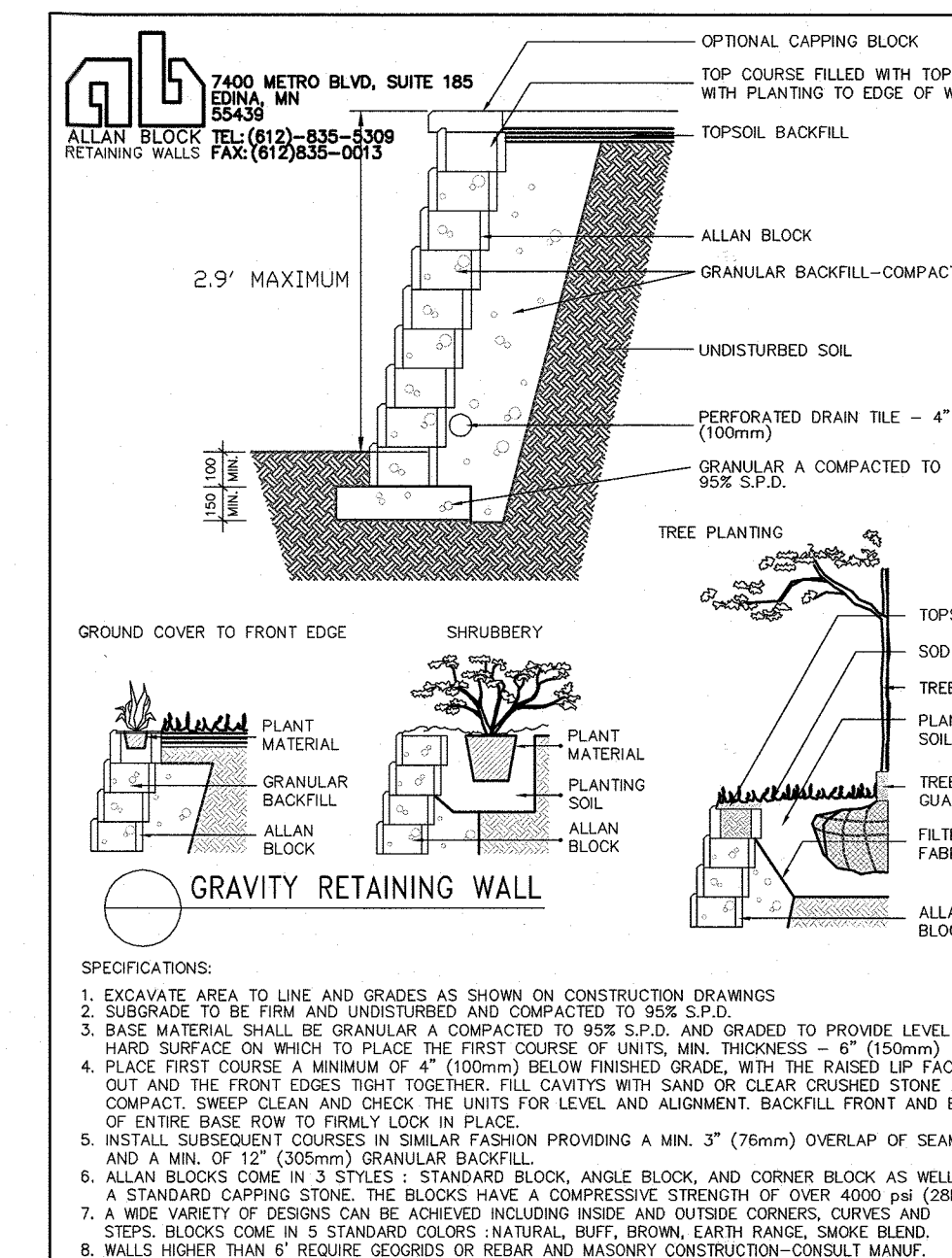


APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MJK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION & DATE

CHIEF, DIVISION OF LAND DEVELOPMENT [Signature] 1/3/22 DATE

TYP. LANDSCAPE WALL OR EQUAL



NOTE

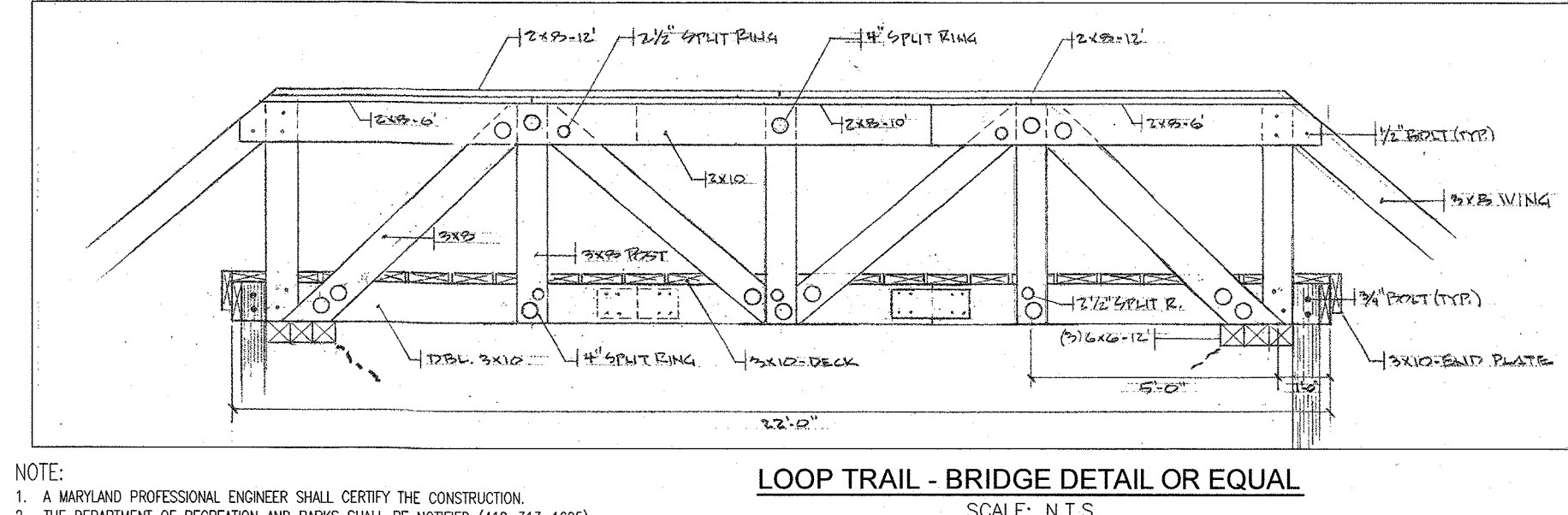
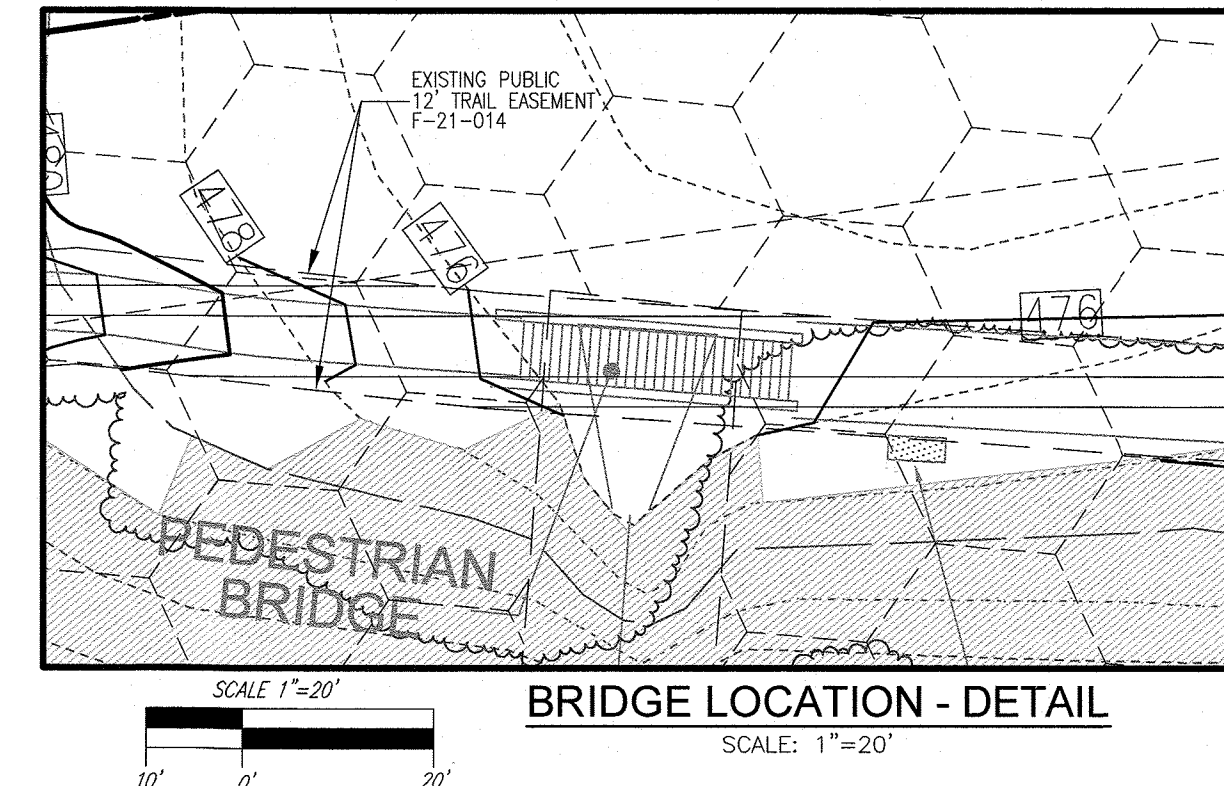
REFER TO SHEETS 16-19 FOR THE LOCATION AND VERTICAL GRADES ASSOCIATED WITH THE CONSTRUCTION OF THE LOOP TRAIL.

- MAXIMUM CROSS-SLOPE SHALL NOT EXCEED 2%.
- TRAIL SHALL BE ADJUSTED TO MINIMIZE IMPACTS TO SPECIMEN TREES

LOOP TRAIL NOTE

THE PROJECT'S LOOP TRAIL THROUGH ANY CREDITED FOREST CONSERVATION AREA SHALL BE:

- 6 FEET WIDE.
- LIMITED TO THE ALIGNMENT AND GRADE SHOWN TO LIMIT DISTURBANCE AND ENSURE CANOPY IS MAINTAINED.
- BE ADJUSTED TO MINIMIZE IMPACTS TO SPECIMEN TREES



NOTE:

- A MARYLAND PROFESSIONAL ENGINEER SHALL CERTIFY THE CONSTRUCTION.
- THE DEPARTMENT OF RECREATION AND PARKS SHALL BE NOTIFIED (410-313-1695) OF THE CONSTRUCTION SCHEDULE OF THE PEDESTRIAN LOOP TRAIL AND BRIDGE.

CHAPELGATE EXISTING AMENITIES NOTE

PER THE ZB-1105-M DECISION AND ORDER, THE EXISTING CHAPELGATE BALL FIELDS, PLAYGROUNDS AND TOT LOTS AS WELL AS THE NEWLY PROPOSED CHAPELGATE AMENITIES SHALL BE SHARED WITH THE COMMUNITY.

OWNER  
 CHAPELGATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER  
 SECURITY DEVELOPMENT SUITE 415  
 8480 BALTIMORE NATIONAL PIKE  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
 LOOP TRAIL DETAILS AND  
 OUTDOOR FITNESS EQUIPMENT STATION DETAILING  
**CHAPELGATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B PLATS 25942-25954  
 PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRD. 10 L 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE

DESIGN BY: RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

39 SHEET OF 101







CHAPELGATE PRESBYTERIAN CHURCH INC.  
FOREST CONSERVATION EASEMENTS

FCE#	SDP-02-133 PLATS 15923-25	SDP-07-133 PLATS 20074-76	F-21-014
#1	6.2811 AC		
#1A		1.40 AC	
#1B		1.38 AC	
#1C			3.35 AC
#2	2.5797 AC	2.58 AC	2.53 AC
#2A			
#3	0.3735 AC		
#3A		0.86 AC	
#3B			0.65 AC
#3C			0.52 AC
NON CREDITED			-0.42 AC
#4	0.4309 AC	0.43 AC	
#4A			2.48 AC
#5	1.0790 AC	1.08 AC	0 AC
#6	2.0558 AC	3.44 AC	3.77 AC
#6A			-0.059 AC
NON CREDITED			
#7		1.63 AC	0 AC
TOTALS	12.80 AC	12.80 AC	12.81 AC

SDP-02-133 - ORIGINAL EASEMENTS  
SDP-07-133 - AMENDED EASEMENTS  
PLANS (F-21-011 & F-21-014):  
- RELOCATES PART OF CURRENT FCE#2, #3A, #4, #6A  
- RELOCATES ALL OF FCE#5 AND FCE#7

FOREST CONSERVATION LEGEND:

- EXISTING FOREST RETENTION EASEMENT F-21-14
- FOREST CONSERVATION EASEMENT SIGN
- EX. SPECIMEN TREE

- LEGEND
- EXISTING CURB AND GUTTER
  - EXISTING CONTOUR
  - EXISTING SANITARY MANHOLE
  - EXISTING SANITARY LINE
  - EXISTING CLEANOUT
  - EXISTING FIRE HYDRANT
  - EXISTING WATER LINE
  - EXISTING UTILITY POLE
  - EXISTING MAILBOX
  - EXISTING SIGN
  - PROPERTY LINE
  - RIGHT-OF-WAY LINE
  - EXISTING WETLAND
  - EXISTING WETLAND BUFFER
  - EX. 100 YEAR FLOODPLAIN
  - EXISTING STREAM
  - EXISTING STREAM BUFFER
  - EXISTING VEGETATION
  - MIB2
  - MID3
  - EXISTING SIDEWALK
  - EXISTING FENCE

Eco-Science Professionals, Inc.  
Consulting Ecologists  
P.O. Box 5006 Glen Arden, Maryland 21057  
Telephone (410) 833-2488 Fax (410) 833-2488

MD DNR Qualified Professional  
USACE Wetland Delimitator  
Certification # WDCP00MD061004412  
John P. Condon

EX. FOREST CONSERVATION EASEMENT AREA #6B  
3.77 AC +/-  
F-21-014  
PLAT 25942-25954

EX. FOREST CONSERVATION EASEMENT AREA #1C  
3.35 AC +/-  
F-21-014  
PLAT 25942-25954

EX. FOREST CONSERVATION EASEMENT AREA #1C  
3.35 AC +/-  
F-21-014  
PLAT 25942-25954

EX. FOREST CONSERVATION EASEMENT AREA #3B  
0.65 AC +/-  
F-21-014  
PLAT 25942-25954

EX. FOREST CONSERVATION EASEMENT AREA #2A  
2.53 AC +/-  
F-21-014  
PLAT 25942-25954

EX. FOREST CONSERVATION EASEMENT AREA #4A  
2.48 AC +/-  
F-21-014  
PLAT 25942-25954

EX. FOREST CONSERVATION EASEMENT AREA #6B  
3.77 AC +/-  
F-21-014  
PLAT 25942-25954

EX. FOREST CONSERVATION EASEMENT AREA #3C  
0.52 AC +/-  
F-21-014  
PLAT 25942-25954

LOOP TRAIL NOTE  
THE PROJECT'S LOOP TRAIL THROUGH ANY CREDITED FOREST CONSERVATION AREA SHALL BE:  
1. 6 FEET WIDE  
2. LIMITED TO THE ALIGNMENT AND GRADE SHOWN TO LIMIT DISTURBANCE AND ENSURE CANOPY IS MAINTAINED.  
3. BE ADJUSTED TO MINIMIZE IMPACTS TO SPECIMEN TREES  
REFER TO SHEETS 16-19 OF THE PLAN SET FOR THE PROJECT'S LOOP TRAIL LIMIT OF DISTURBANCE

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

OWNER: CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

DEVELOPER: SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
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SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
FOREST CONSERVATION PLAN  
CHAPELGATE - F-21-014

**CHAPELGATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCELS

A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
PARCELS: 110 & 421  
16A MAR 16 GRID 10  
3RD ELECTION DISTRICT

PLATS 25942 - 25954  
L 1389/F 339 (P. 110)  
L 4163/F 424 (P. 421)  
HOWARD COUNTY, MARYLAND  
ZONED: CEF-M

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

DESIGN BY: ES, RHY  
DRAWN BY: VE+TO  
CHECKED BY: RHY  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

41 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS MK  
DATE: 09/14/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 9/23/22

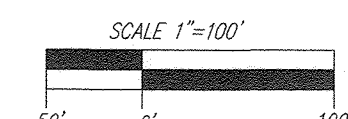
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 9/26/22

SUBDIVISION: CHAPELGATE PRESBYTERIAN CHURCH INC.  
PLAT 18897  
USE: COMMERCIAL

PLAT 18897  
USE: COMMERCIAL

PLAT 18897  
USE: COMMERCIAL

FOREST CONSERVATION PLAN  
SCALE: 1"=100'





**SDP-07-133 - HOWARD COUNTY FOREST CONSERVATION WORKSHEET**

ZONED CEF  
NET TRACT AREA: 46.6 AC.  
A. TOTAL TRACT AREA: 46.6 AC.  
B. AREA WITHIN 100 YEAR FLOODPLAIN: 8.3 AC.  
C. AREA TO REMAIN IN AG. PRODUCTION: 0.0 AC.  
D. NET TRACT AREA: 38.3 AC  
LAND USE CATEGORY

INPUT THE NUMBER "1" UNDER THE APPROPRIATE LAND USE ZONING, AND LIMIT TO ONLY ONE ENTRY. ZONED R-ED-MKD-3

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

E. AFFOREST THRESHOLD: 15% X D = 5.7 AC  
F. CONSERVATION THRESHOLD: 20% X D = 7.7 AC

EXISTING FOREST COVER:  
G. EXISTING FOREST COVER: = 33.5 AC  
H. AREA OF FOREST ABOVE AFFORESTATION THRESHOLD: = 27.8 AC  
I. AREA OF FOREST ABOVE CONSERVATION THRESHOLD: = 25.9 AC  
BREAK EVEN POINT:  
(2 X I) + F = BREAK EVEN POINT (0 AC)

J. BREAK EVEN POINT / FOREST RET. ABOVE THRESHOLD W/ NO MIT. = 12.8 AC  
K. FOREST CLEARING PERMITTED WITHOUT MITIGATION: = 20.7 AC

PROPOSED FOREST CLEARING:  
L. TOTAL AREA OF FOREST TO BE CLEARED: = 20.7 AC  
M. TOTAL AREA OF FOREST TO BE RETAINED: = 12.8 AC (N FCE)  
(IN ADDITION TO 8.3 ACRES FORESTED FLOODPLAIN)

PLANTING REQUIREMENTS:  
N. REFORESTATION FOR CLEARING ABOVE CONSERVATION THRESHOLD (L X 25) = 5.2 AC  
O. REFORESTATION FOR CLEARING BELOW CONSERVATION THRESHOLD = 0.0 AC  
P. CREDIT FOR RETENTION ABOVE CONSERVATION THRESHOLD (M-F) = 5.2 AC  
R. TOTAL REFORESTATION REQUIRED (N+P-O) = 0.0 AC  
S. TOTAL AFFORESTATION REQUIRED = 0.0 AC  
T. TOTAL PLANTING REQUIREMENT (REFORESTATION) = 0.0 AC

**SDP-03-133 - NOTE**  
FOREST CONSERVATION SURETY IS ASSOCIATED WITH SDP-03-133 (PLATS 15923-15925).  
NO NEW EASEMENTS ARE REQUIRED FOR F-21-011. ONLY THE REMOVAL OF CERTAIN RECORDED EASEMENTS AND THE REDEFINING OF THE EXISTING EASEMENTS PREVIOUSLY RECORDED UNDER PLATS 20074-20076.

PER SDP07-133:  
FOREST CONSERVATION OBLIGATIONS IN ACCORDANCE WITH SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION MANUAL HAVE BEEN PREVIOUSLY ADDRESSED BY THE PLACEMENT OF 12.80 ACRES OF EXISTING FOREST INTO RETENTION EASEMENTS AND THE POSTING OF SURETY UNDER SDP-03-133(F)/FOREST CONSERVATION PLAT OF EASEMENT (RECORDING REFERENCE NOS. 15923 TO 15925). THESE PREVIOUSLY RECORDED EASEMENTS WERE RECONFIGURED AND NEW EASEMENT AREAS ADDED UNDER THE SDP-07-133 PLAN.

THE REVISED FOREST CONSERVATION PLAT, SDP 07-133(F.C.)/ PLAT FOR GRANT OF FOREST CONSERVATION EASEMENTS (RECORDING REFERENCE NOS. 20074 TO 20076), PLACED 12.80 ACRES OF EXISTING FOREST INTO RETENTION EASEMENTS WHICH MET THE OBLIGATION OF REQUIRED RETENTION.

UNDER F-21-014  
FOREST CONSERVATION EASEMENTS HAVE BEEN RECONFIGURED AS PART OF F-21-014 AND THIS PLAN PROPOSAL TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY FOREST CONSERVATION MANUAL. PORTIONS OF PREVIOUSLY PLATED FOREST CONSERVATION EASEMENT HAVE BEEN REMOVED AND/OR RECONFIGURED. F-21-014 AND THIS PLAN F-21-011 IDENTIFIES NON-CREDITED AREAS OF RETENTION (<35' WIDE) AND THE NEW AREAS OF RETENTION EASEMENT.

-THE RESULT IS 12.81 ACRES OF ON-SITE RETENTION.  
-TOTAL FOREST CONSERVATION OBLIGATION REMAINS PROVIDED ON-SITE VIA RETENTION EASEMENT (NO SURETY REQUIRED).

NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT. HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

**SDP-07-133 - NOTE**  
PER SDP-07-133  
THE PREVIOUSLY RECORDED FOREST RETENTION AREAS WERE BASED ON THE PROPOSED ULTIMATE DEVELOPMENT AS ANTICIPATED.  
(REFER TO SDP-07-133, SHEET 28)

THE OWNER RESERVES THE RIGHT TO ADJUST THE LIMITS OF THE FOREST RETENTION AREAS ON-SITE, AND TO PAY-IN-LIEU, IF RETENTION REQUIREMENTS CANNOT ULTIMATELY BE MET ON-SITE.

THE OWNER SHALL RECORD AN AMENDED PLAN IF FOREST CONSERVATION AREAS CHANGE DURING THE FUTURE PHASES OF DEVELOPMENT, WITH NO FINANCIAL PENALTY FOR CHANGES OR REDUCTION IN THE LIMITS OF RETENTION.

STANDARD FEES WILL BE CHARGED AS SURETY FOR RETENTION OR FOR FEE-IN-LIEU.

PER SDP07-133:  
FOREST CONSERVATION OBLIGATIONS IN ACCORDANCE WITH SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION MANUAL HAVE BEEN PREVIOUSLY ADDRESSED BY THE PLACEMENT OF 12.80 ACRES OF EXISTING FOREST INTO RETENTION EASEMENTS AND THE POSTING OF SURETY UNDER SDP-03-133(F)/FOREST CONSERVATION PLAT OF EASEMENT (RECORDING REFERENCE NOS. 15923 TO 15925). THESE PREVIOUSLY RECORDED EASEMENTS WERE RECONFIGURED AND NEW EASEMENT AREAS ADDED UNDER THE SDP-07-133 PLAN.

THE REVISED FOREST CONSERVATION PLAT, SDP 07-133(F.C.)/ PLAT FOR GRANT OF FOREST CONSERVATION EASEMENTS (RECORDING REFERENCE NOS. 20074 TO 20076), PLACED 12.80 ACRES OF EXISTING FOREST INTO RETENTION EASEMENTS WHICH MET THE OBLIGATION OF REQUIRED RETENTION.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
09/14/2022  
DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
9-2-22  
DATE

CHIEF, BUREAU OF HIGHWAYS MK  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT

**CHAPEL GATE PRESBYTERIAN CHURCH INC. FOREST CONSERVATION EASEMENTS**

FCE#	SDP-02-133	SDP-07-133	F-21-014
	PLATS 15923-25	PLATS 20074-76	
#1	6.2811 AC		
#1A		1.40 AC	
#1B		1.38 AC	
#1C			3.35 AC
#2	2.5797 AC	2.58 AC	
#2A			2.53 AC
#3	0.3735 AC		
#3A		0.86 AC	
#3B			0.65 AC
#3C			0.52 AC
NON CREDITED			-0.42 AC
#4	0.4309 AC	0.43 AC	
#4A			2.48 AC
#5	1.0790 AC	1.08 AC	0 AC
#6	2.0558 AC		
#6A		3.44 AC	
#6B			3.77 AC
NON CREDITED			-0.059 AC
#7		1.63 AC	0 AC
TOTALS	12.80 AC	12.80 AC	12.81 AC

**SDP-02-133 - ORIGINAL EASEMENTS**  
**SDP-07-133 - AMENDED EASEMENTS**  
**PLANS (F-21-011 & F-21-014):**  
-RELOCATES PART OF CURRENT FCE#2, #3A, #4, #6A  
-RELOCATES ALL OF FCE#5 AND FCE#7

**Specimen Tree Chart**

Key (DBH)	Species	Size (inches)	CRZ (feet radius)	Comments
1	Tulip poplar	32.5	48.75	TO BE REMOVED
2	Tulip poplar	31.5	46.5	TO BE REMOVED
3	Tulip poplar	30*	50	poor major trunk rot to be removed
4	Tulip poplar	37.6	56.28	TO BE REMOVED
5	Tulip poplar	30	45	TO BE REMOVED
6	Tulip poplar	38	57	TO BE REMOVED
7	Tulip poplar	35	52.5	TO BE REMOVED
8	Tulip poplar	34	51	TO BE REMOVED
9	Tulip poplar	38	57	TO BE REMOVED
10	Tulip poplar	33.5	50.25	TO BE REMOVED
11	Tulip poplar	39.5	59.25	TO BE REMOVED
12	Tulip poplar	33	49.5	fair condition, some dieback to be removed
13	Tulip poplar	40	60	TO BE REMOVED
14	Tulip poplar	30	45	TO REMAIN
15	Tulip poplar	37.5	56.25	TO BE REMOVED
16	Tulip poplar	36	54	TO BE REMOVED
17	Tulip poplar	33	49.5	TO BE REMOVED
18	Tulip poplar	39	58.5	TO BE REMOVED
19	Tulip poplar	34	51	TO BE REMOVED
20	Tulip poplar	31.5	47.25	TO BE REMOVED
21	Tulip poplar	32	48	TO BE REMOVED
22	Tulip poplar	32	48	TO BE REMOVED
23	Tulip poplar	30	45	TO REMAIN
24	Tulip poplar	31	46.5	TO REMAIN
25	Tulip poplar	30	45	TO REMAIN
26	Tulip poplar	34	51	TO REMAIN
27	Tulip poplar	32	48	TO REMAIN
28	Tulip poplar	36.5	54.75	TO BE REMOVED
29	Tulip poplar	39	58.5	TO BE REMOVED
30	Tulip poplar	32.5	48.75	TO BE REMOVED
31	Tulip poplar	36.8	55.2	TO BE REMOVED
32	Tulip poplar	30	45	TO REMAIN
33	Red oak	38.5	57.75	TO REMAIN
34	Red oak	43	64.5	TO REMAIN
35	Tulip poplar	31	46.5	TO REMAIN
36	White oak	38	57	TO REMAIN
37	Black oak	32.5	48.75	TO REMAIN
38	Red maple	30	45	TO REMAIN
39	Tulip poplar	33	49.5	TO REMAIN
40	Tulip poplar	32	48	fair condition, some dieback to REMAIN
41	Tulip poplar	31	46.5	TO REMAIN
42	Tulip poplar	33	49.5	TO REMAIN
43	Tulip poplar	33.5	50.25	TO REMAIN
44	Red oak	48.5	72.75	TO REMAIN
45	Tulip poplar	44	66	TO REMAIN
46	Red oak	32.5	48.75	TO REMAIN
47	Quercus sp	40.5	60.75	fair condition, dieback noted to REMAIN
48	Tulip poplar	32	48	TO REMAIN
49	Tulip poplar	34.5	51.75	TO REMAIN
50	Tulip poplar	33	49.5	TO BE REMOVED
51	Red maple	31	46.5	poor, severe rot to be REMOVED
52	Sour cherry	36	54	fair, heavy vine and trunk rot to REMAIN
53	Tulip poplar	31	46.5	TO REMAIN

**SEQUENCE OF CONSTRUCTION-FOREST CONSERVATION**

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

**FOREST RETENTION AREAS AND NOTES**

1. THE WETLANDS AND WETLAND BUFFERS ARE LOCATED ON AN OPEN SPACE LOT 135.
2. NO RARE, THREATENED OR ENDANGERED SPECIES WERE OBSERVED ON THIS SITE.
3. FORESTED AREAS ADJACENT TO FLOODPLAINS AND STREAM BUFFERS ARE SUBSTANTIALLY RETAINED IN OPEN SPACE LOTS.
4. CHANGES IN GRADING AND RUNOFF WITHIN CONSTRUCTION/INSTALLATION AREAS WILL NOT ADVERSELY AFFECT THE SOILS WITHIN THE FOREST RETENTION AREA. SEDIMENT CONTROL MEASURES WILL REDUCE CONCENTRATED FLOW RUNOFF TO STORMWATER MANAGEMENT FACILITIES, RETAIN SEDIMENT WITHIN THE CONSTRUCTION SITE, AND/OR REDIRECT CLEAN WATER AWAY FROM CONSTRUCTION AREAS.
5. THE FOREST CONSERVATION EASEMENT HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT. HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

**CONSTRUCTION PERIOD PROTECTION AND MANAGEMENT NOTES FOR FOREST CONSERVATION**

**PRE-CONSTRUCTION PHASE**

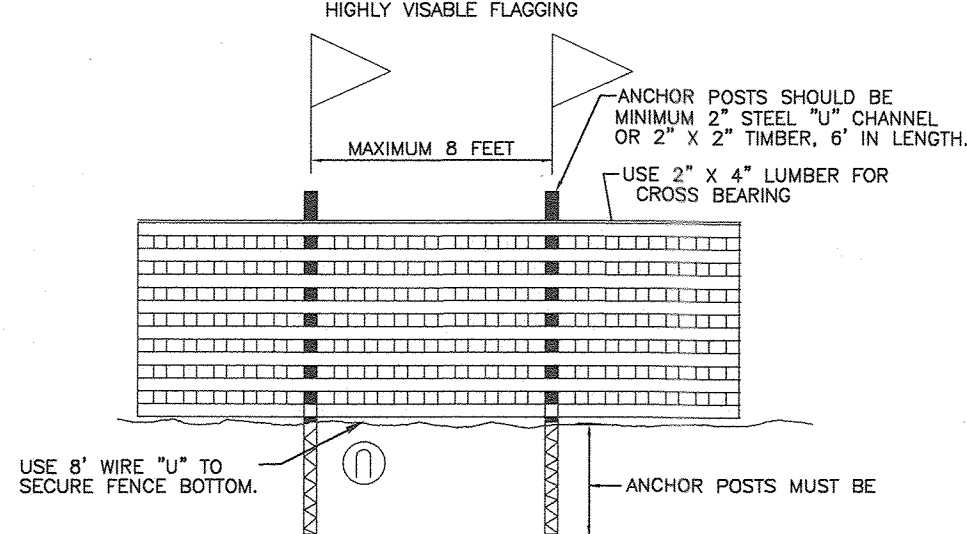
1. FOR RETENTION AREAS, INSTALL BLAZE ORANGE FENCE AND RETENTION SIGNS BEFORE CONSTRUCTION BEGINS.
2. FENCING SHALL BE MAINTAINED IN GOOD CONDITION AND PROMPTLY REPAIRED.
3. A QUALIFIED TREE CARE EXPERT SHALL DETERMINE IF ROOT PRUNING IS REQUIRED ALONG THE LIMIT OF DISTURBANCE. ROOT PRUNING SHALL BE LIMITED TO STORMWATER MANAGEMENT FACILITIES, RETAIN SEDIMENT WITHIN THE CONSTRUCTION SITE, AND/OR REDIRECT CLEAN WATER AWAY FROM CONSTRUCTION AREAS.

**CONSTRUCTION PHASE**

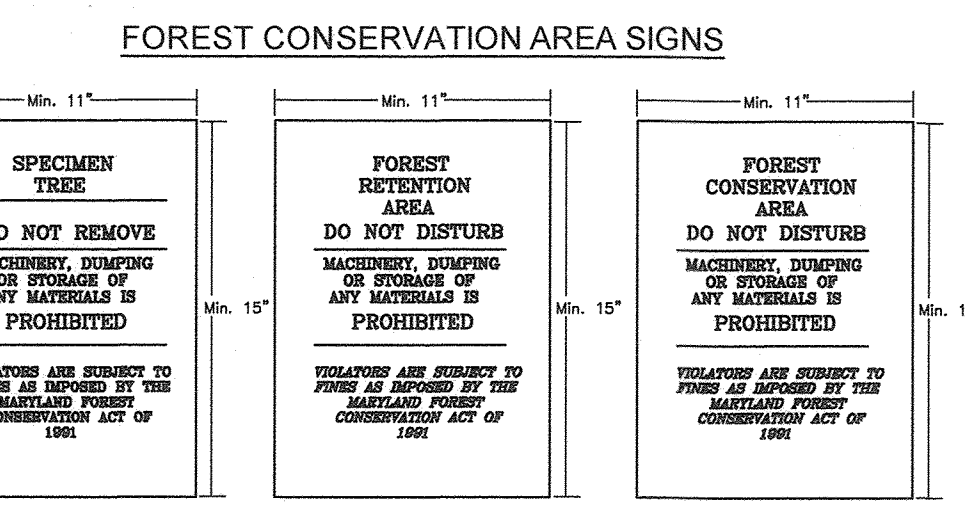
1. NO DISTURBANCE OR DUMPING IS ALLOWED INSIDE THE TREE RETENTION AREA.
2. NO EQUIPMENT SHALL BE OPERATED INSIDE THE TREE RETENTION AREA.
3. IN THE EVENT OF DROUGHT, THE PROTECTED TREES SHALL BE MONITORED FOR SIGNS OF STRESS AND WATERED AS NEEDED.

**POST-CONSTRUCTION PHASE**

1. AT THE DISCRETION OF A QUALIFIED TREE CARE EXPERT, DAMAGES TO RETAINED TREES SHALL BE REPAIRED BY THE CONTRACTOR.
2. FENCE REMOVAL AND STABILIZATION SHALL BE AS PER THE SEDIMENT AND EROSION CONTROL PLAN.
3. DO NOT REMOVE SIGNS.



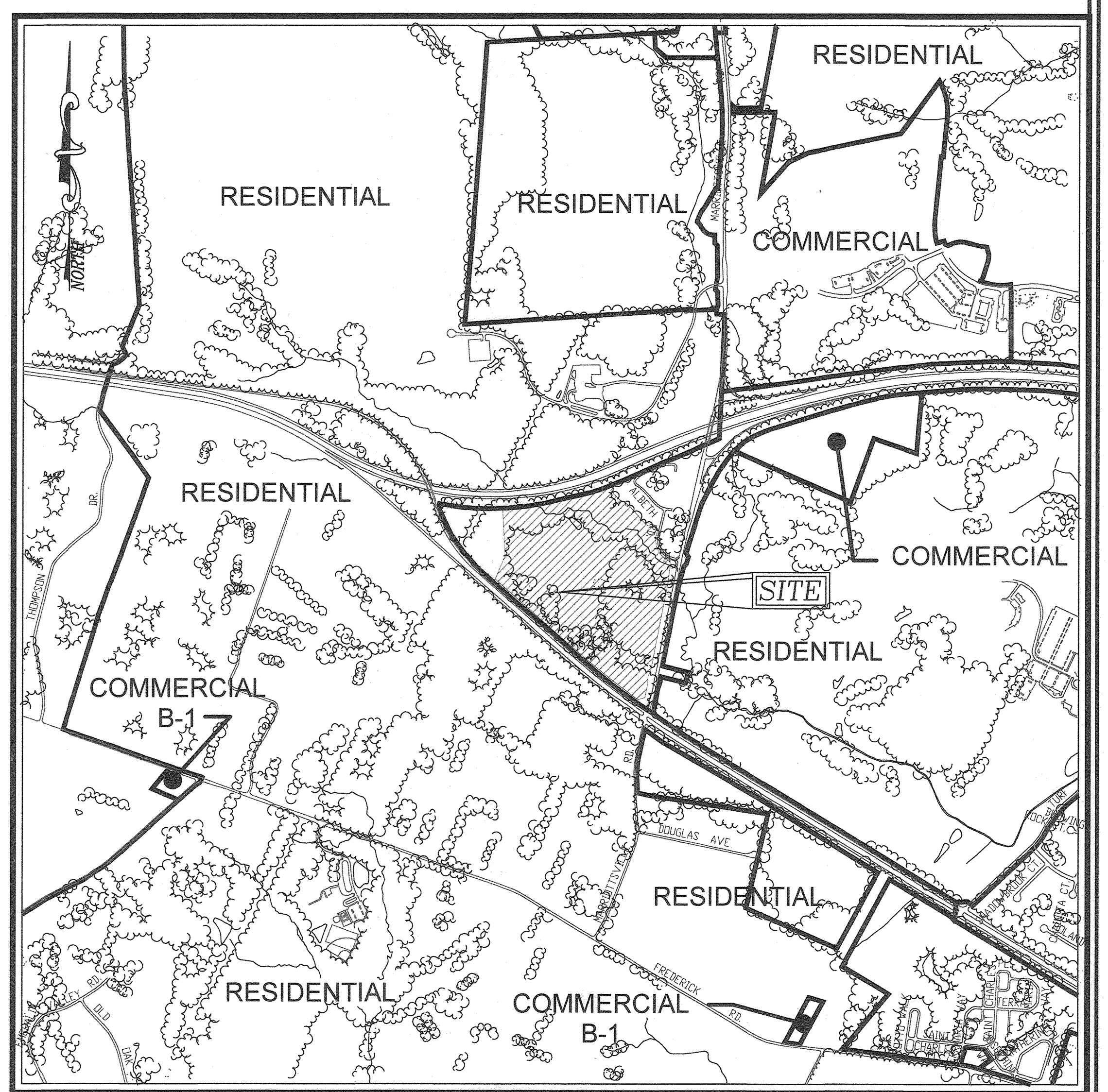
**BLAZE ORANGE PLASTIC MESH**  
**TYPICAL TREE PROTECTION FENCE DETAIL**



**FOREST CONSERVATION AREA SIGNS**

**NOTE:**

1. BOTTOM OF SIGNS TO BE HIGHER THAN TOP OF TREE PROTECTION FENCE.
2. SIGNS TO BE PLACED APPROXIMATELY 50-100' FEET APART. CONDITIONS ON SITE AFFECTING VISIBILITY MAY WARRANT PLACING SIGNS CLOSER OR FARTHER APART. WHERE SIGNS ARE TO BE PLACED AT THE REAR OF PROPOSED LOTS.
3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.
4. ALL FOREST CONSERVATION SIGNAGE SHALL BE IN PLACE FOR PERPETUITY.
5. SIGN LOCATION SYMBOL = ●
6. SDP-07-133 FOREST CONSERVATION EASEMENTS SIGN PLACEMENT SHALL BE REVISITED TO CONFORM TO THE REDEFINED EASEMENTS AS SHOWN HEREON.



**VICINITY MAP**  
SCALE: 1"=1,000'  
ADC MAP: PAGE: 19 BLOCK: B3, B4, C3 & C4

**BENCHMARKS**  
HOWARD COUNTY BENCHMARK 16E1 (CONC. MON.)  
N 593250.96 E 1340192.70 ELEV. 463.89  
LOCATION: ISLE AT CORNER RT-40 & MARRIOTTVILLE ROAD  
HOWARD COUNTY BENCHMARK 16H3 (CONC. MON.)  
N 592408.04 E 1341523.97 ELEV. 469.71  
LOCATION: RT-40, 0.45 MILES WEST OF TURF VALLEY ROAD

**GENERAL NOTES**

WATERSHED NAME: PATUXENT RIVER WATERSHED  
WATERSHED NUMBER: 2131105

A. GROSS SITE AREA: 60.74 AC.  
NET SITE AREA: (60.74-4.86-8.46\*) 47.42 AC.  
B. AREA OF 100-YEAR FLOODPLAIN: 8.46 AC. \*\*  
C. AREA OF WETLANDS AND BUFFERS(ONSITE): 0.74 AC.±\*  
AREA OF STREAM AND BUFFERS (ONSITE): 2.31 AC.±\*  
D. AREA OF > 25% STEEP SLOPES: 4.86 AC.  
E. EXISTING FOREST (FSD): 27.80 AC.  
F. ZONED: R-20 (CHURCH) & CEF-M (PROJECT)  
G. EXISTING USE: CHURCH FACILITY  
H. PROPOSED USE: RESIDENTIAL (SFA)

\* AREAS OVERLAP  
\*\* TO BE FINALIZED WITH APPROVAL OF FLOODPLAIN STUDY IN CONJUNCTION WITH CAPITAL PROJECT J-4205

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDERS SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

**REVISED FINAL ROAD CONSTRUCTION PLAN**  
**FOREST CONSERVATION PLAN NOTES AND DETAILS**  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL E  
PLATS 25942 - 25954  
PARCELS: 110 & 421  
PLOT 10  
3RD ELECTION DISTRICT  
ZONED: CEF-M  
L 1399/F 339 (P 110)  
L 4153/F 424 (P 421)  
HOWARD COUNTY, MARYLAND

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

DESIGN BY: ES, RHV  
DRAWN BY: VE+TC  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 49220

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

42 SHEET OF 101

THIS PROJECT IS SUBJECT TO WP-19-056, ON MARCH 26, 2019; THE PLANNING DIRECTOR APPROVED THE REQUEST FOR ALTERNATIVE COMPLIANCE TO THE FOLLOWING SECTIONS

SECTION 16.1205(A)(7) REMOVAL OF SPECIMEN TREES 30" IN DIAMETER OR GREATER. THIS REQUEST IS FOR THE REMOVAL OF 27 SPECIMEN TREES (26 TULIP POPULAR AND 1 MAPLE).

SECTION 16.1200(C)(4) SINGLE FAMILY ATTACHED LOTS MAY BE APPROVED WITHOUT PUBLIC ROAD FRONTAGE PROVIDED THEY FRONT ON A COMMONLY OWNED AREA CONTAINING A PARKING AREA OR PRIVATE ROAD NOT EXCEEDING A LENGTH OF 200 FEET MEASURED FROM THE EDGE OF THE PUBLIC RIGHT-OF-WAY ALONG THE CENTERLINE OF THE PRIVATE ROAD.  
THE REQUEST IS TO EXCEED THE 200' LENGTH FROM A PUBLIC ROAD FOR LOTS 14, 15, 46-54, 74-79 AND 82-89.

SECTION 16.116 PROTECTION OF WETLANDS, STREAMS, AND STEEP SLOPES - THE REQUEST IS FOR THE DISTURBANCE TO THE 100' STREAM BUFFER AND 25% STEEP SLOPES TO ACCOMMODATE INSTALLATION OF THE PROPOSED PATHWAY SYSTEM APPROVED AS PART OF THE COMMUNITY ENHANCEMENT REQUIREMENTS PER ZB CASE NO. 1105M.

APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. THE IDENTIFIED SPECIMEN TREES MAY BE REMOVED PROVIDED THEY ARE REPLACED AT A 2:1 RATIO WITH 3" CALIBER NATIVE TREES FOR A TOTAL OF 54 REPLACEMENT TREES. A MINIMUM VARIETY OF THREE NATIVE LARGE SHADE TREE SPECIES SHOULD BE USED TO FULFILL THIS REQUIREMENT. THE MITIGATION TREES SHALL BE SHOWN ON FUTURE SUBDIVISION AND DEVELOPMENT LANDSCAPE PLANS AND BONDED AS LANDSCAPE TREES.
2. PROVIDE A CHART ON ALL SUBJECT PLANS TO IDENTIFY THE SPECIMEN TREES PERMITTED TO BE REMOVED AS IDENTIFIED IN THE ALTERNATIVE COMPLIANCE PETITION EXHIBIT ON ALL SUBDIVISION PLAN SUBMISSIONS. ONLY THE SPECIMEN TREES IDENTIFIED IN THE ALTERNATIVE COMPLIANCE PETITION EXHIBIT MAY BE REMOVED.
3. PRIVATE ROADS MUST BE DESIGNED AND CONSTRUCTED TO PUBLIC ROAD STANDARDS.
4. ADDRESS SIGNAGE MAY BE REQUIRED AT THE END OF ALLEYS, AS TO BE DETERMINED BY DEPARTMENT OF FIRE AND RESCUE SERVICES IN FUTURE SUBDIVISION PLAN SUBMISSIONS.
5. ANY TRASH PAD AREAS REQUIRED AT THE END OF PRIVATE ALLEYS MUST BE DESIGNED AND SCREENED IN ACCORDANCE WITH THE D&O CONDITIONS OF APPROVED LISTED IN ZB-1105M.
6. ADD A GENERAL NOTE THAT LOTS 14-15, LOTS 46-54, LOTS 74-79 AND LOTS 82-89 ARE PERMITTED WITHOUT PUBLIC ROAD FRONTAGE AND TO BE LOCATED ON A PRIVATE ROAD MORE THAN 200' FROM THE PUBLIC ROAD TERMINUS.
7. ENCRoACHMENTS INTO THE STEEP SLOPES AND STREAM BUFFERS ARE LIMITED TO THE PURPOSE OF INSTALLING THE TRAIL PATH IN ACCORDANCE WITH THE D&O AND EXHIBITS ASSOCIATED WITH ZB-1105M.
8. LOD FOR PATHWAY CONSTRUCTION WILL BE LIMITED TO THE MINIMUM REQUIRED TO COMPLETE THE WORK.
9. GRADING DETAILS WILL BE PROVIDED TO LIMIT DISTURBANCE TO CRITICAL ROOT ZONES, AND TO KEEP THE WORK AREA TO AN AREA OF MINIMUM DISTURBANCE BY CAREFULLY SELECTING BEST MANAGEMENT CONSTRUCTION METHODS AND EQUIPMENT.
10. EXERCISE EQUIPMENT AND THE REFLECTION/SITTING AREA WILL BE PLACED OUTSIDE STREAM BUFFERS TO THE EXTENT POSSIBLE.

**SPECIMEN TREE - REPLACEMENT CALCULATIONS**

NO. TO BE REMOVED	NO. REPLACEMENT REQUIRED	NO. PROVIDED
27	54	54
SEE TABLE		3" CAL.

**NOTES:**  
-REPLACEMENT TREES REQUIRED PER THE APPROVED REMOVAL OF 27 SPECIMEN TREES. REFER TO WP-19-056 DECISION ABOVE  
-3" CALIBER NATIVE SHADE TREES REQUIRED  
-A MINIMUM VARIETY OF THREE NATIVE LARGE SHADE TREE SPECIES SHOULD BE USED TO FULFILL THIS REQUIREMENT.  
-REFER TO SHEETS 12-14 & 41 FOR LOCATION OF SPECIMEN TREES TO BE REMOVED

REFER TO SHEETS 12-16 FOR THE LOCATIONS OF SPECIMEN TREES APPROVED FOR REMOVAL.

**Eco-Science Professionals, Inc.**  
Consulting Ecologists  
P.O. Box 5904 Glen Arm, Maryland 21057  
Telephone (410) 832-3489 Fax (410) 832-3488

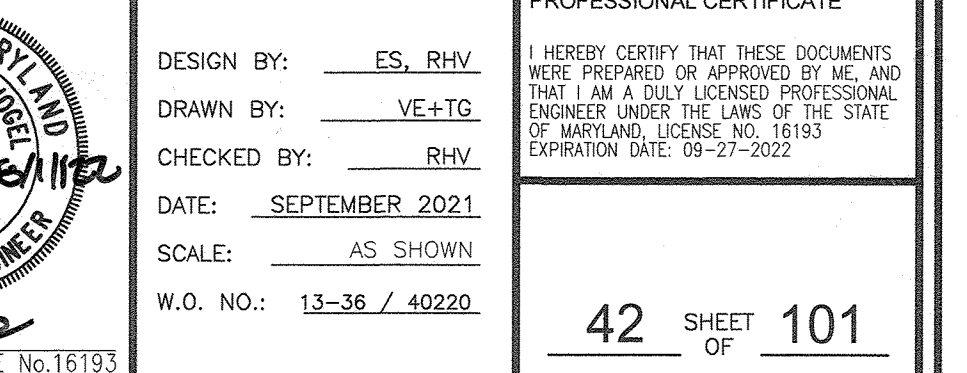
**MD DNR Qualified Professional**  
USACOE Wetland Delineator  
Certification # WDC090000061004482  
John P. Canoles

**FSD NOTES:**

1. No rare, threatened or endangered species or their habitats were observed on the property.
2. No cemeteries or historic properties are known to occur on the property.
3. Surrounding land use is primarily medium/high density residential development.
4. Approximately 0.4 acres of forest is present within 100 feet of the subject property.
5. All of the wetlands and streams are part of the Little Patuxent River watershed (02-13-51). These streams are classified as Use IV-P waters.
6. Approximately 8.5 acres of 100 year floodplain is present on the property.
7. Steep slopes are present on the property.
8. Specimen trees are present on the property.

**Forest Stand Data**

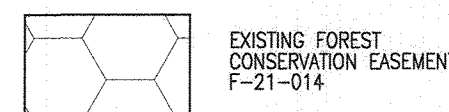
Key	Community Type	Area (Ac)	Dominant Vegetation	Overall Condition	Priority
F1	Oak-Flg	2.2	Liquidambar styraciflua, Quercus sp.	Good	8.5 acres 100-year
F2	Paper Birch	0.1	Liquidambar styraciflua, Prunus serotina, Acer rubrum, Betula papyrifera	Fair	2.8 to 3.0 acres
F3	Maple	0.7	Acer rubrum, Fraxinus americana, Liquidambar styraciflua, Prunus serotina	Good	1.7 to 2.0 acres





**LEGEND:**

- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- EXISTING TREELINE (FIELD LOCATED)
- EXISTING VEGETATION
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- PROPOSED SIDEWALK
- PROPOSED 100 YR FLOODPLAIN
- EX. WETLAND
- EX. WETLAND BUFFER
- EX. STREAM
- EX. STREAM BUFFER
- LOOP TRAIL
- VARIABLE WIDTH PUBLIC WATER, SEWER, AND UTILITY EASEMENT
- EX. SP. TREE#7 CRZ 48.75'
- 100 YR FLOODPLAIN CROSS SECTION/ WSEL



MATCHLINE - SHEET 45  
MATCHLINE - SHEET 44

Maryland State Grid Meridian  
N 1339750  
E 595550

MATCHLINE SHEET 44

MATCHLINE SHEET 44

MATCHLINE - SHEET 44

MATCHLINE - SHEET 46

MATCHLINE - SHEET 46



**SUMMARY**

ESD Requirements:  
 Site Area = 20.0 Acres (Site - CEF Area)  
 Site Impervious Area = 8.56 Acres  
 Site Percent Impervious = 42.8%  
 Site Rv = 0.432  
 Site RCN = 56.9

Required Pe = 1.80"  
 Required ESDv = 56,872 cuft  
 Required Rev = 7,685 cuft

ESD Provided:  
 ESD Facilities Drainage Area = 19.14 Acres  
 Impervious Area Treated = 8.54 Acres  
 Percent Impervious = 44.6%  
 Rv = 0.4123  
 Provided Pe = 1.87 +/-  
 ESDv Provided = 56,921 cuft +/-

Rev Provided from Bioretention (F-6), Micro-Bioretention (M-6), and Bio-Swales (M-8) facilities:  
 MBR/BR/BS Facility Areas = 30,170 sf  
 Depth = 0.83  
 Porosity = 0.40  
 Provided Rev = 10,016 cuft +/-

Required Cpv = Cpv Requirement met by successful use of ESD Practices  
 Op 10 = N/A  
 Op 100 = N/A

**ESD LEGEND:**

- P-10 TEST PIT
- B-1 SOIL BORING
- DA-7 ESD DRAINAGE AREA DIVIDE
- ESD DRAINAGE AREA DESIGNATION
- ALTERNATIVE SURFACE PERMEABLE SURFACE (A-2)
- MBR26 (M-6)
- PROPOSED F-6, M-6 OVER/UNDERDRAIN
- 50 GAL RAIN BARREL (M-1)
- N-2 DISCONNECTION OF NON ROOFTOP RUNOFF
- N-2 SLOPE AREA
- BR26 (F-6)
- FILTERING PRACTICE BIORETENTION (F-6)

**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
Ba	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49	NO
Gc	GLENNEL LOAM, 8 TO 15 PERCENT SLOPES	B	.43	YES
Gp	GLENNEL LOAM, 3 TO 8 PERCENT SLOPES	B	.37	YES
Gb	GLENNEL BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49	YES
Hg	HATHORO-ODOROUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43	NO
Md	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32	YES
Lg	LODINGTONS, HIGHWAY, 0 TO 65 PERCENT SLOPES	D	-	YES
Ld	URBAN LAND-URDINGTONS COMPLEX, 0 TO 15 PERCENT SLOPES	D	-	NO

NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT \* LIMITS OF PROJECT

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 09/14/2022  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 9/21/22  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

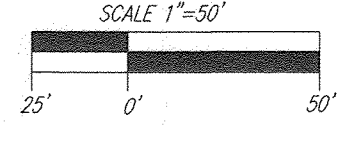
APPROVED: [Signature] 9/21/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT

**CHAPEL GATE WOODS - MEASURED SUBAREA - ESDV COMPUTATIONS**

NO.	DESCRIPTION	AREA (AC)	PERCENT IMPERVIOUS	ESDv (CUFT)	REV. (CUFT)	NET ESDv (CUFT)	REMARKS
1	LOT 136	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 23
2	LOT 137	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 24
3	LOT 138	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 25
4	LOT 139	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 26
5	LOT 140	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 27
6	LOT 141	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 28
7	LOT 142	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 29
8	LOT 143	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 30
9	LOT 144	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 31
10	LOT 145	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 32
11	LOT 146	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 33
12	LOT 147	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 34
13	LOT 148	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 35
14	LOT 149	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 36
15	LOT 150	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 37
16	LOT 151	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 38
17	LOT 152	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 39
18	LOT 153	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 40
19	LOT 154	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 41
20	LOT 155	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 42
21	LOT 156	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 43
22	LOT 157	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 44
23	LOT 158	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 45
24	LOT 159	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 46
25	LOT 160	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 47
26	LOT 161	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 48
27	LOT 162	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 49
28	LOT 163	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 50
29	LOT 164	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 51
30	LOT 165	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 52
31	LOT 166	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 53
32	LOT 167	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 54
33	LOT 168	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 55
34	LOT 169	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 56
35	LOT 170	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 57
36	LOT 171	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 58
37	LOT 172	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 59
38	LOT 173	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 60
39	LOT 174	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 61
40	LOT 175	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 62
41	LOT 176	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 63
42	LOT 177	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 64
43	LOT 178	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 65
44	LOT 179	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 66
45	LOT 180	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 67
46	LOT 181	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 68
47	LOT 182	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 69
48	LOT 183	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 70
49	LOT 184	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 71
50	LOT 185	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 72
51	LOT 186	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 73
52	LOT 187	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 74
53	LOT 188	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 75
54	LOT 189	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 76
55	LOT 190	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 77
56	LOT 191	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 78
57	LOT 192	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 79
58	LOT 193	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 80
59	LOT 194	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 81
60	LOT 195	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 82
61	LOT 196	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 83
62	LOT 197	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 84
63	LOT 198	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 85
64	LOT 199	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 86
65	LOT 200	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 87
66	LOT 201	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 88
67	LOT 202	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 89
68	LOT 203	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 90
69	LOT 204	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 91
70	LOT 205	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 92
71	LOT 206	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 93
72	LOT 207	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 94
73	LOT 208	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 95
74	LOT 209	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 96
75	LOT 210	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 97
76	LOT 211	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 98
77	LOT 212	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 99
78	LOT 213	0.00	0.00	0.00	0.00	0.00	MACROSCALE 14 MARRIOTT RD RETENTION 100

**ENVIRONMENTAL SITE DESIGN (ESD)  
STORMWATER MANAGEMENT  
DRAINAGE AREA MAP**

SCALE: 1"=50'



THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21044  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE
2	REVISE THE PLAN TO ADJUST ALBETH ROAD CURB LINE GRADE AND TO ADD PTA	4/12/23
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDERS SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 ENVIRONMENTAL SITE DESIGN (ESD)  
 STORMWATER MANAGEMENT - DRAINAGE AREA MAP  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF 'CHAPEL GATE



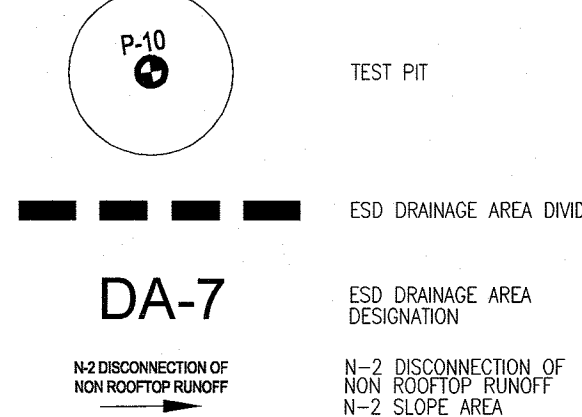








**ESD LEGEND:**



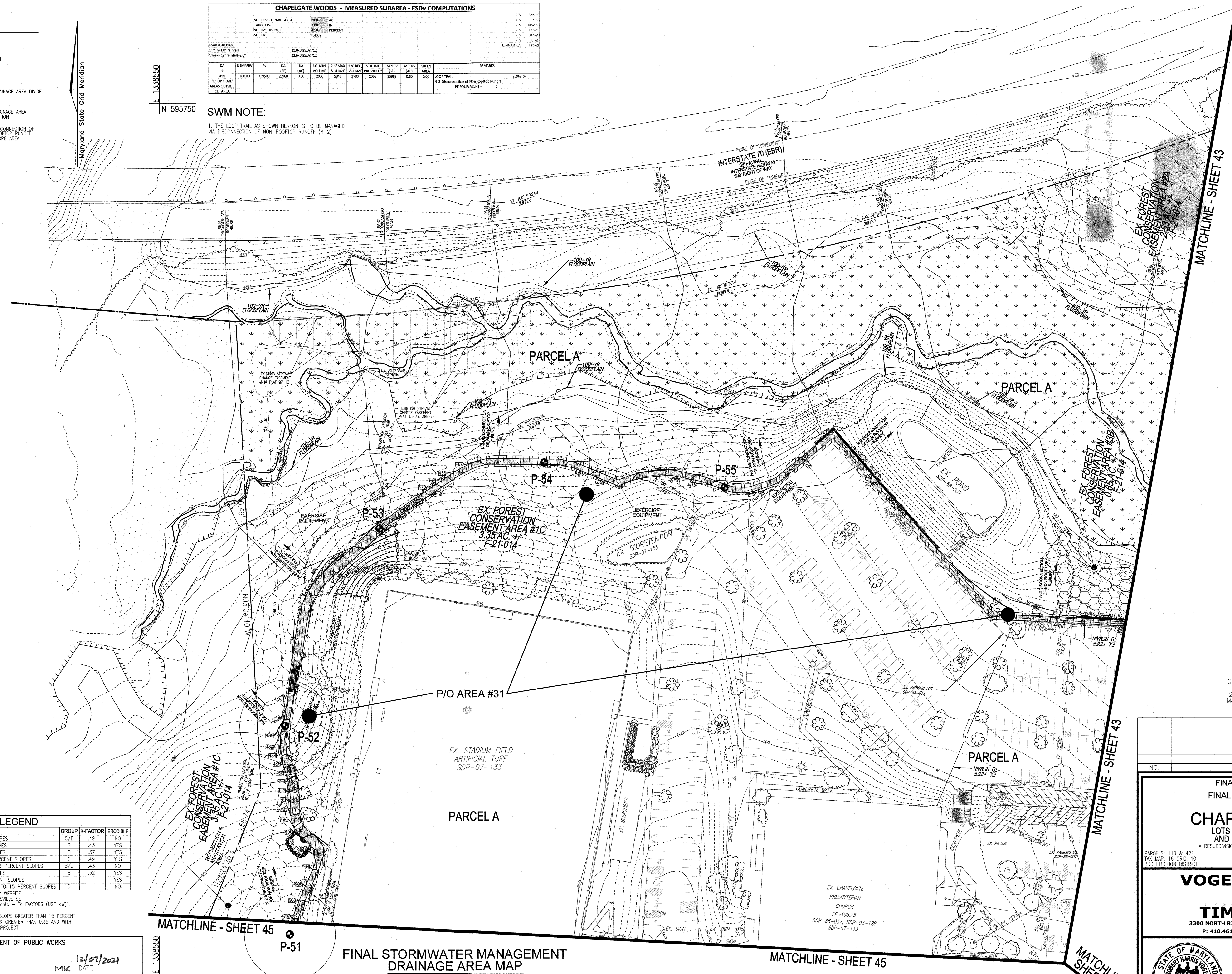
CHapelgate Woods - Measured Subarea - ESDv Computations											
Site Development Area:	30.00	AC	REV	Sep-20							
Target Area:	3.00	AC	REV	Jan-21							
Site Impervious:	62.8	PERCENT	REV	Feb-21							
Site No:	0-432		REV	Jan-22							
			REV	Jul-22							
			UNNAN REV	Feb-23							

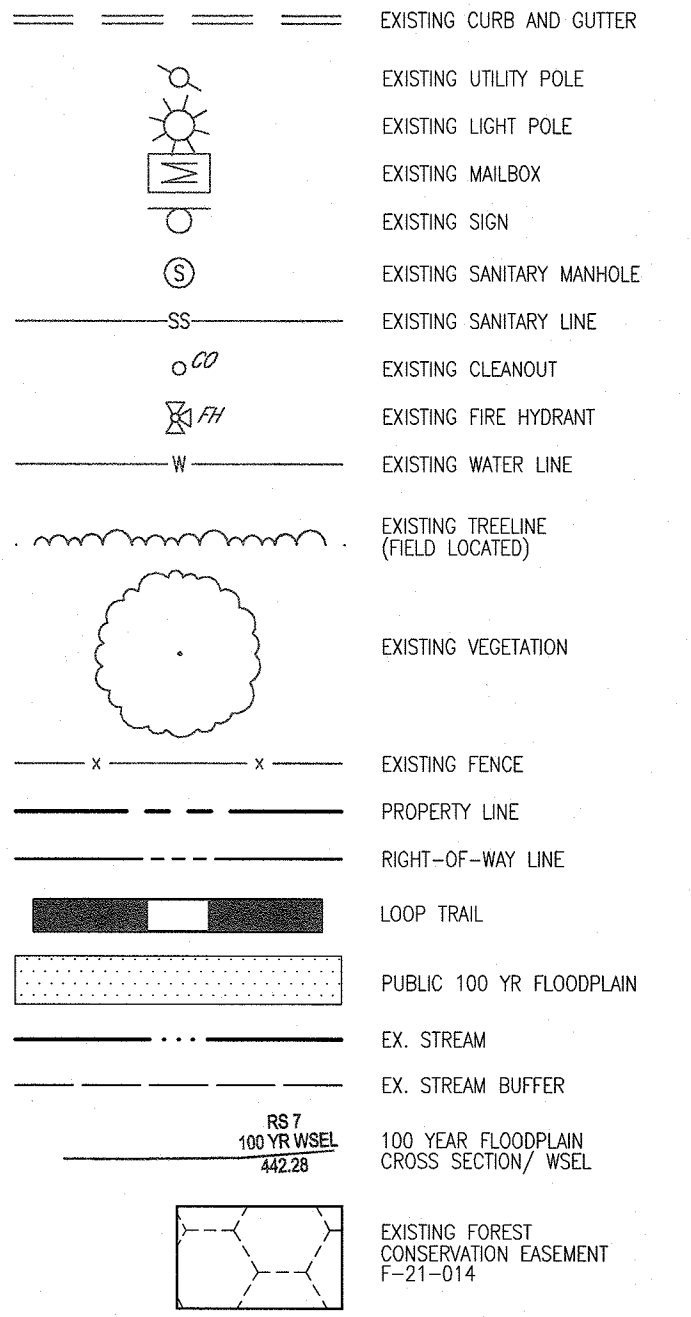
DA	% IMPERV	Rv	DA	DA	1.0 P. MAX	2.0 P. MAX	1.0 P. REQ.	VOLUME	IMPERV	IMPERV	GREEN	REMARKS
#			(SF)	(AC)	(VOLUME)	(VOLUME)	(VOLUME)	(CU FT)	(CU FT)	(CU FT)	(CU FT)	
1	100.00	0.000	2968	0.00	3066	3465	3700	2098	630	0.00	0.00	LOOP TRAIL
2												N-2 Disconnection of Non Rooftop Runoff
												FE EQUVALENT = 1

**SWM NOTE:**

1. THE LOOP TRAIL AS SHOWN HEREON IS TO BE MANAGED VIA DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2)



**LEGEND:**



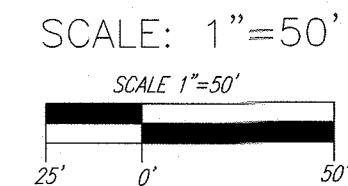
SOILS LEGEND			
SYMBOL	NAME/DESCRIPTION	GROUP	K-FACTOR/ERODIBLE
BsA	BALILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.49 NO
GpC	GLENELO LOAM, 8 TO 15 PERCENT SLOPES	B	.43 YES
GpB	GLENELO LOAM, 3 TO 8 PERCENT SLOPES	B	.37 YES
GpB	GLENELO BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES	C	.49 YES
Hs	HATBORO-CODORIUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.43 NO
MdD	MANOR LOAM, 15 TO 25 PERCENT SLOPES	B	.32 YES
LgF	UDORMENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES	-	- YES
UdD	URBAN LAND-BOOTHMENTS COMPLEX, 0 TO 15 PERCENT SLOPES	D	- NO

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 12-23-21

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 11/21/22

**FINAL STORMWATER MANAGEMENT DRAINAGE AREA MAP**



**NOTE:**  
 ONLY THE PROJECT LOOP TRAIL & ASSOCIATED AMENITIES ARE PROPOSED ON THIS PORTION OF THE SITE

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO. \_\_\_\_\_ REVISION \_\_\_\_\_ DATE \_\_\_\_\_

**FINAL ROAD CONSTRUCTION PLAN**  
**FINAL STORMWATER MANAGEMENT DRAINAGE AREA MAP**  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE WOODS" NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 L 1389/F 339 (P. 110)  
 TAX MAP: 16 GRID: 10 L 4163/F 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M PLATS: 25412-25494  
 HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
 TIMMONS GROUP  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 P: 410-461.7666 F: 410-461.8961 www.timmons.com

DESIGN BY: RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

46 SHEET OF 101



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

**1. MATERIAL SPECIFICATIONS**

- THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.
- 2. FILTERING MEDIA OR PLANTING SOIL**  
THE SOIL SHALL BE A UNIFORM MIX 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 HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMISSA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMPOST 15.000.000. THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:  
• SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURE CLASSIFICATION).  
• ORGANIC CONTENT - MINIMUM 10% (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).  
• CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.  
• PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.

**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 LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MASH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRE TRUCKS. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE. COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE THE SOIL PROFILE THROUGH THE 12" HIGH 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 MESH 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 SUBSURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. FINES 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 1/3RD 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 STAKE 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, DEFOLIANTS, OR AT A MINIMUM, IMPROVES 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.

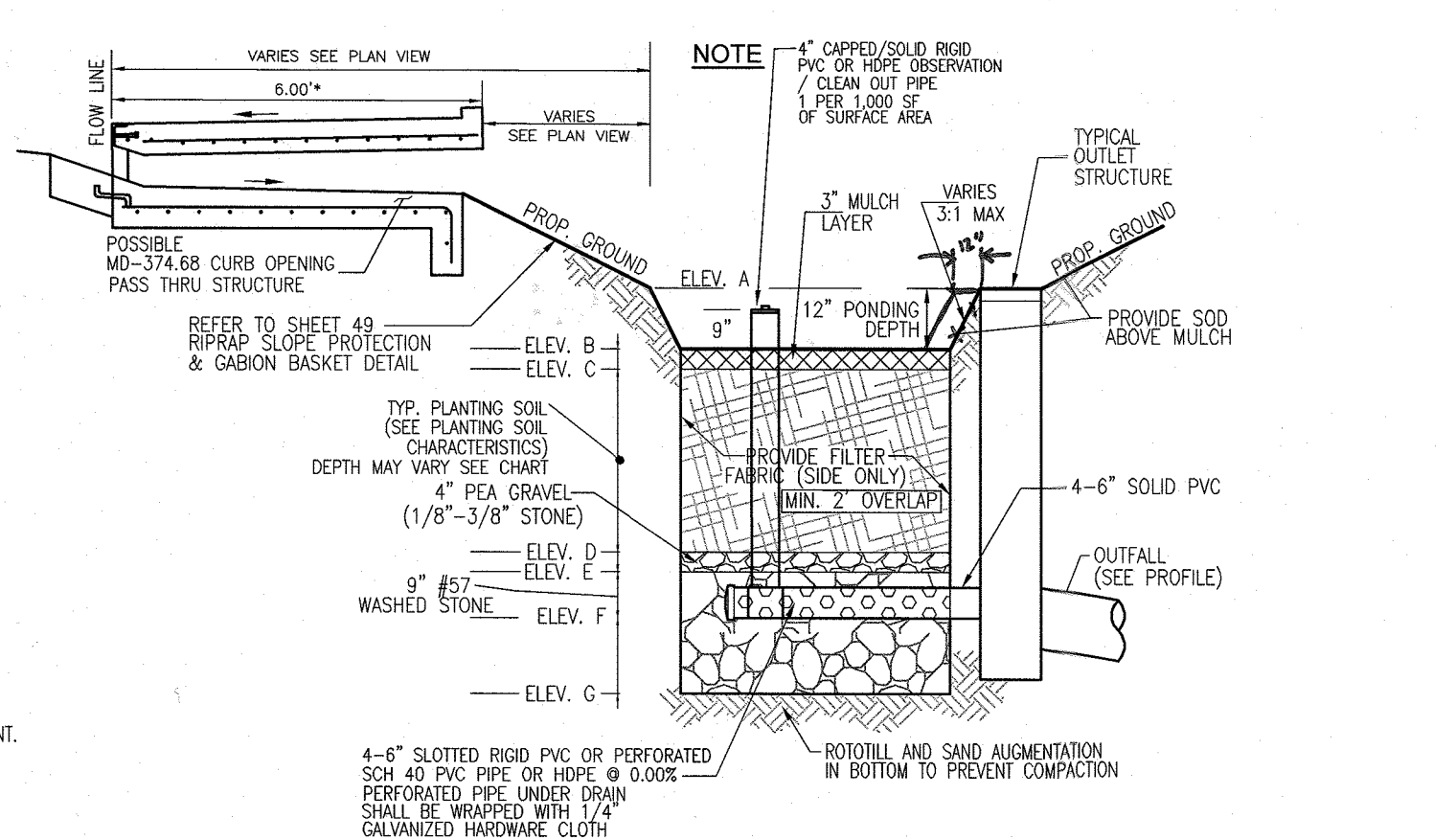
**6. UNDERDRAINS**

UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:  
• PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).  
• PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH 1/4" (MIN.) GALVANIZED HARDWARE CLOTH.  
• GRAVEL - THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.  
• A 4" RIGID PERFORATED PIPE SHALL BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.  
• A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

**7. MISCELLANEOUS**

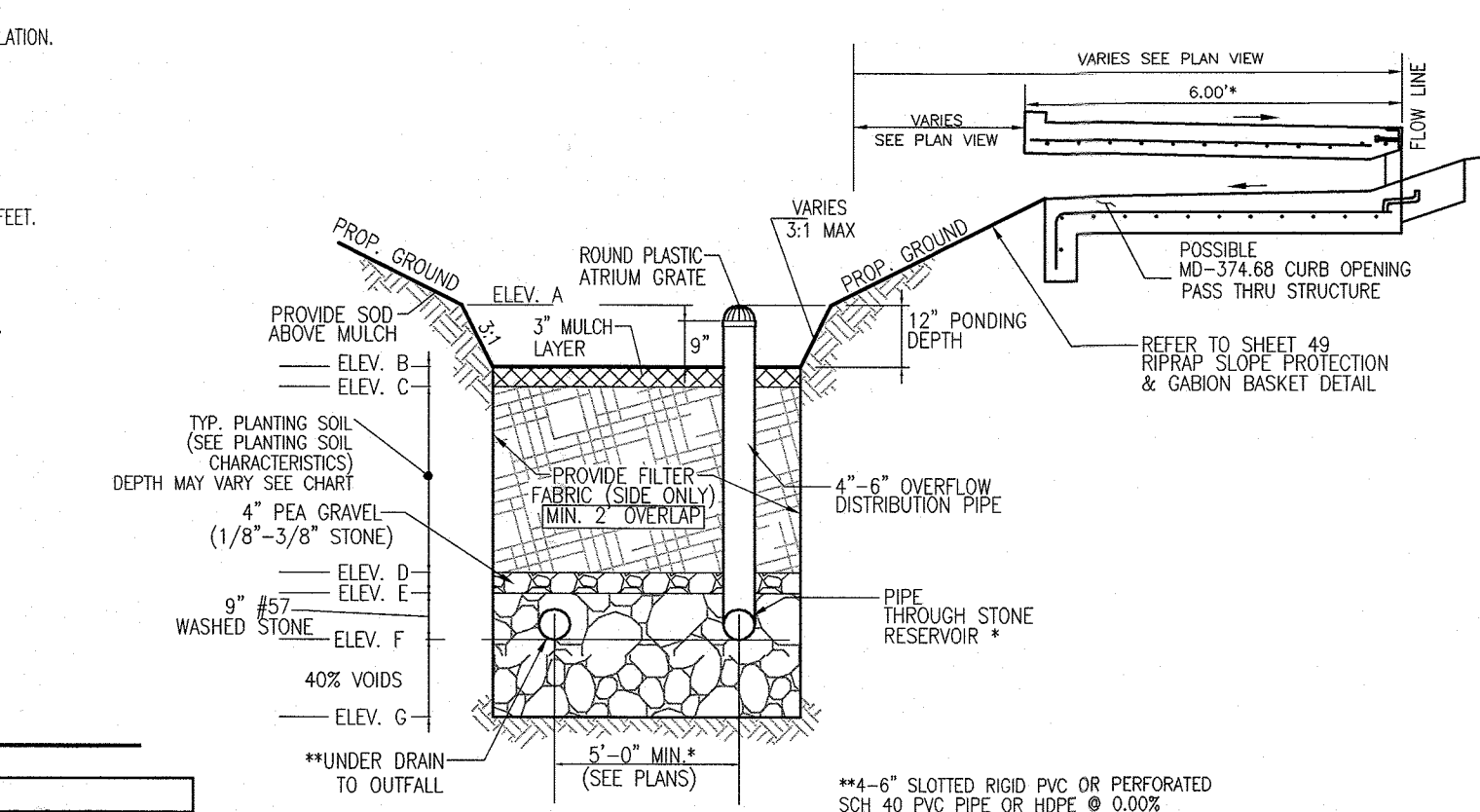
THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.



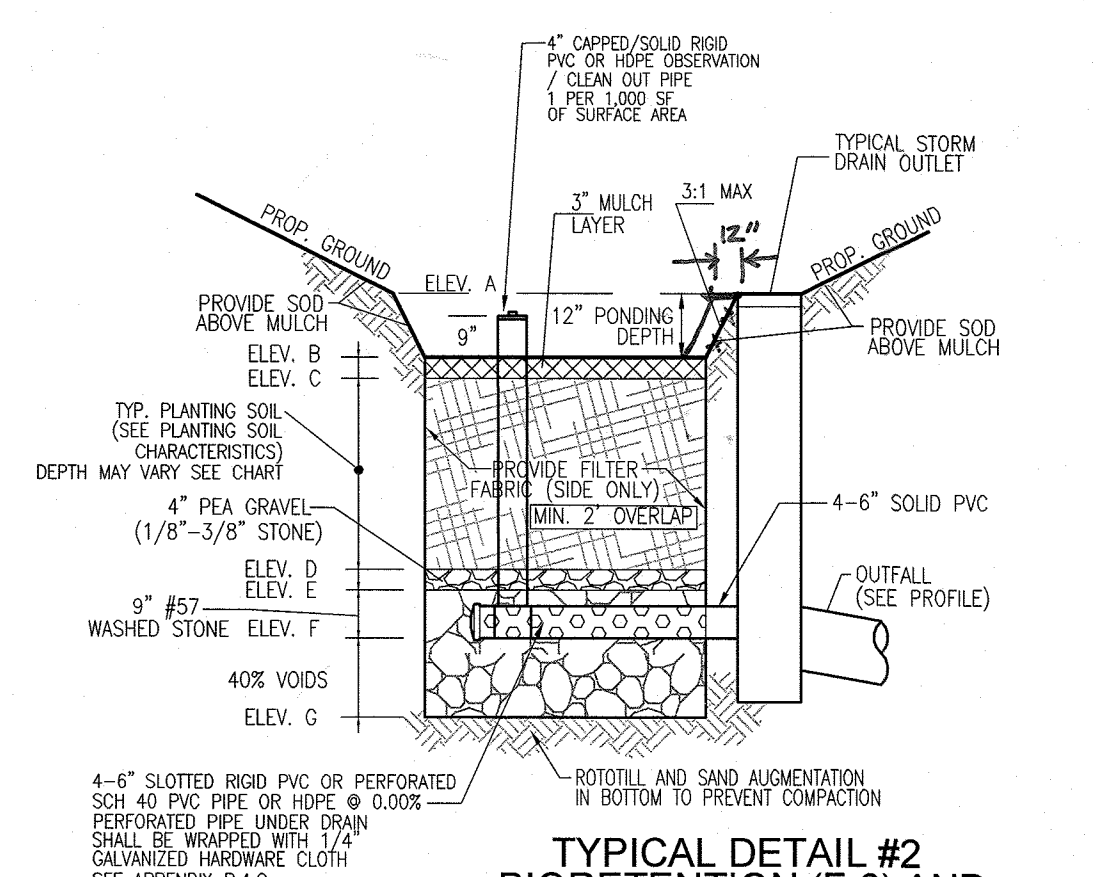
**TYPICAL DETAIL #1 MICRO-BIORETENTION (UNDERDRAIN)**  
NOT TO SCALE

**MICROBIORETENTION NOTES:**

- ONLY THE SIDES OF MICRO-BIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICRO-BIORETENTION WILL CAUSE THE MDR TO FAIL AND THEREFORE SHALL NOT BE INSTALLED.
- WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH. SEE APPENDIX B.4.C.6.
- PROVIDE 5" MINIMUM SPACING BETWEEN UNDER DRAIN AND PERFORATED PIPE THROUGH STONE RESERVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL BIOD.



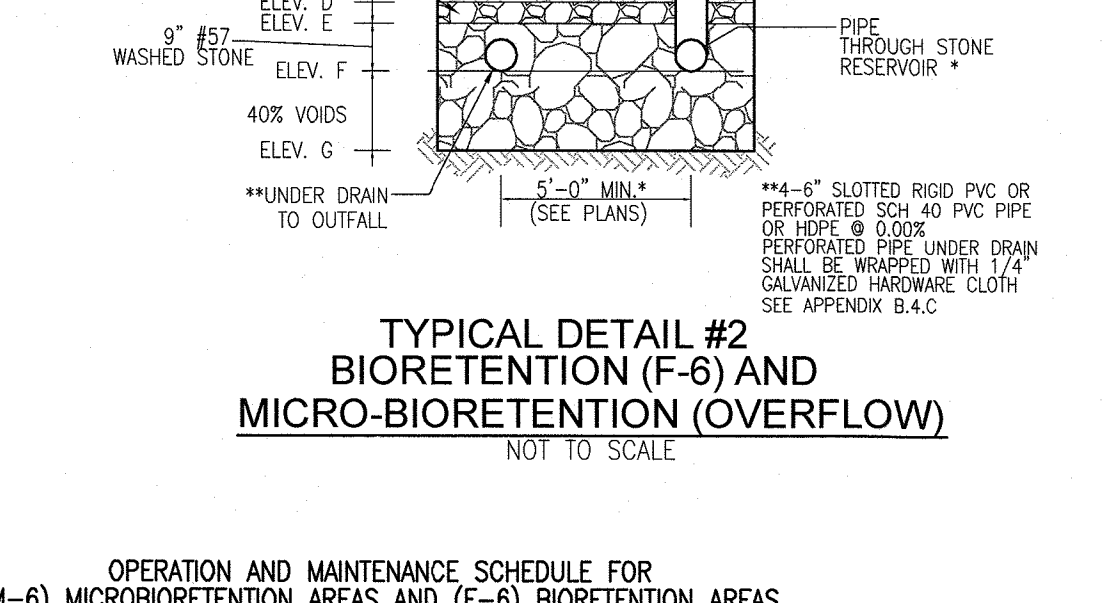
**TYPICAL DETAIL #1 MICRO-BIORETENTION (OVERFLOW)**  
NOT TO SCALE



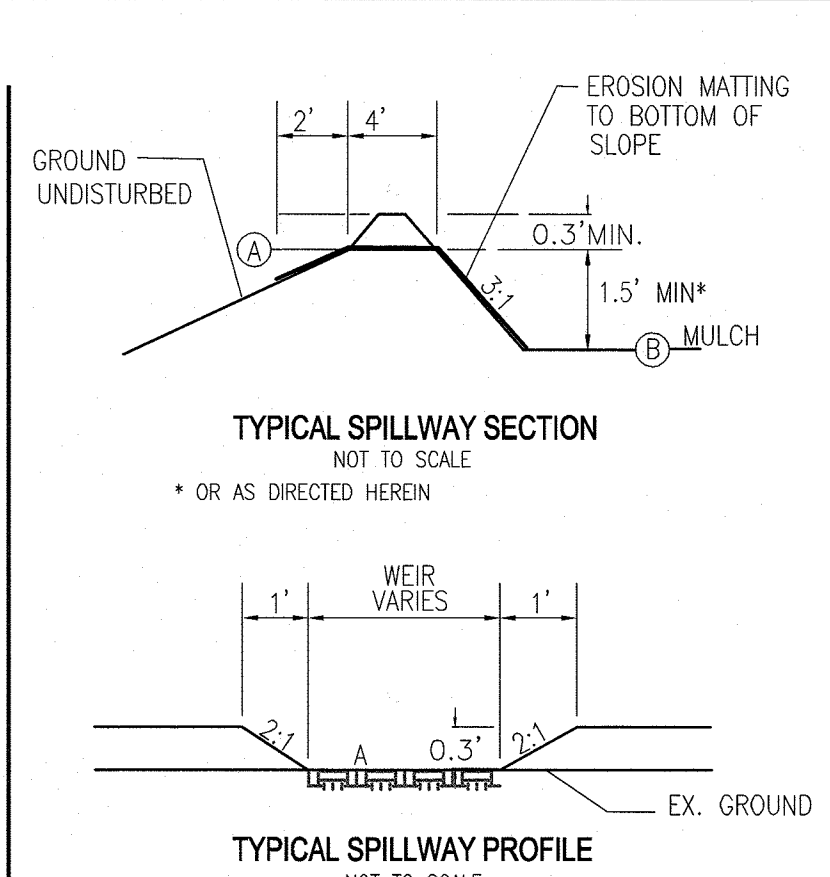
**TYPICAL DETAIL #2 BIORETENTION (F-6) AND MICRO-BIORETENTION (UNDERDRAIN)**  
NOT TO SCALE

**OPERATION AND MAINTENANCE SCHEDULE FOR (M-6) MICROBIORETENTION AREAS AND (F-6) BIORETENTION AREAS**

- ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.1.1 AND 2.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED WYRE TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.
- MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
- SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.



**TYPICAL DETAIL #2 BIORETENTION (F-6) AND MICRO-BIORETENTION (OVERFLOW)**  
NOT TO SCALE



**DETAILS OF WEIR OUTLET MICRO-BIORETENTION**  
NOT TO SCALE

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED RAINWATER HARVESTING (M-1)**

- THE OWNER SHALL EMPTY BARRELS ON A MONTHLY BASIS AND CLEAN BARRELS WITH A HOSE.
- THE OWNER SHALL VERIFY INTEGRITY OF LEAF SCREENS, GUTTERS, DOWNSPUTS, SPOUTS, AND MISCOUTS SCREENS, AND CLEAN AND REMOVE ANY DEBRIS.
- THE OWNER SHALL REPLACE DAMAGED COMPONENTS AS NEEDED.
- THE OWNER SHALL ALLOW THE BARREL TO DRAIN BY BOTTOM SPOUT DURING THE WINTER SEASON.

**N-1. DISCONNECTION OF ROOFTOP RUNOFF**

**CONSTRUCTION CRITERIA:**

- THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING THE CONSTRUCTION OF PROJECTS WITH PERMITTED ROOFTOP DISCONNECTIONS:
  - EROSION AND SEDIMENT CONTROL: EROSION AND SEDIMENT CONTROL PRACTICES (E.G., SEDIMENT TRAPS) SHALL NOT BE LOCATED IN VEGETATED AREAS RECEIVING DISCONNECTED RUNOFF.
  - SITE DISTURBANCE: CONSTRUCTION VEHICLES AND EQUIPMENT SHOULD AVOID AREAS RECEIVING DISCONNECTED RUNOFF TO MINIMIZE DISTURBANCE AND COMPACTION. SHOULD AREAS RECEIVING DISCONNECTED RUNOFF BECOME COMPACTED, SCARIFYING THE SURFACE OR ROTOTILLING THE SOIL TO A DEPTH OF FOUR TO SIX INCHES SHALL BE PERFORMED TO ENSURE PERMEABILITY. ADDITIONALLY, AMENDMENTS MAY BE NEEDED FOR TIGHT, CLAYEY SOILS.

**INSPECTION:**

A FINAL INSPECTION SHALL BE CONDUCTED BEFORE USE AND OCCUPANCY APPROVAL TO ENSURE THAT SIZING FOR TREATMENT AREAS HAVE BEEN MET AND PERMANENT STABILIZATION HAS BEEN ESTABLISHED.

**MAINTENANCE CRITERIA:**

MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE AREAS RECEIVING RUNOFF SHOULD BE PROTECTED FROM FUTURE COMPACTION (E.G., BY PLANTING TREES OR SHRUBS ALONG THE PERIMETER). IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

**HOWARD COUNTY - OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DISCONNECTION OF ROOFTOP RUNOFF (N-1), DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2)**

- MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF ARE PROTECTED FROM FUTURE COMPACTION OR DEVELOPMENT OF IMPERVIOUS AREA. IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

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

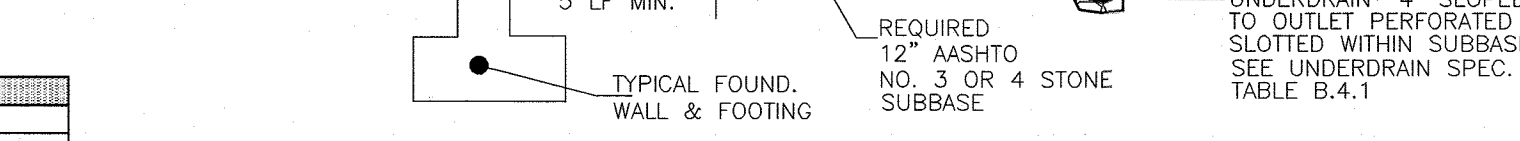
**Table B.4.1 Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration**

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil	loamy sand (60-65%) and compost (35-40%) or sandy loam (30%), coarse sand (30%) and compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
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	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 pipe; not necessary underdrain pipes. Perforated pipe shall be wrapped with 1/4 inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3, F <sub>c</sub> = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-A615-60	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.8/9; 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 carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

**Table B.3.2 Materials Specifications for Bioretention**

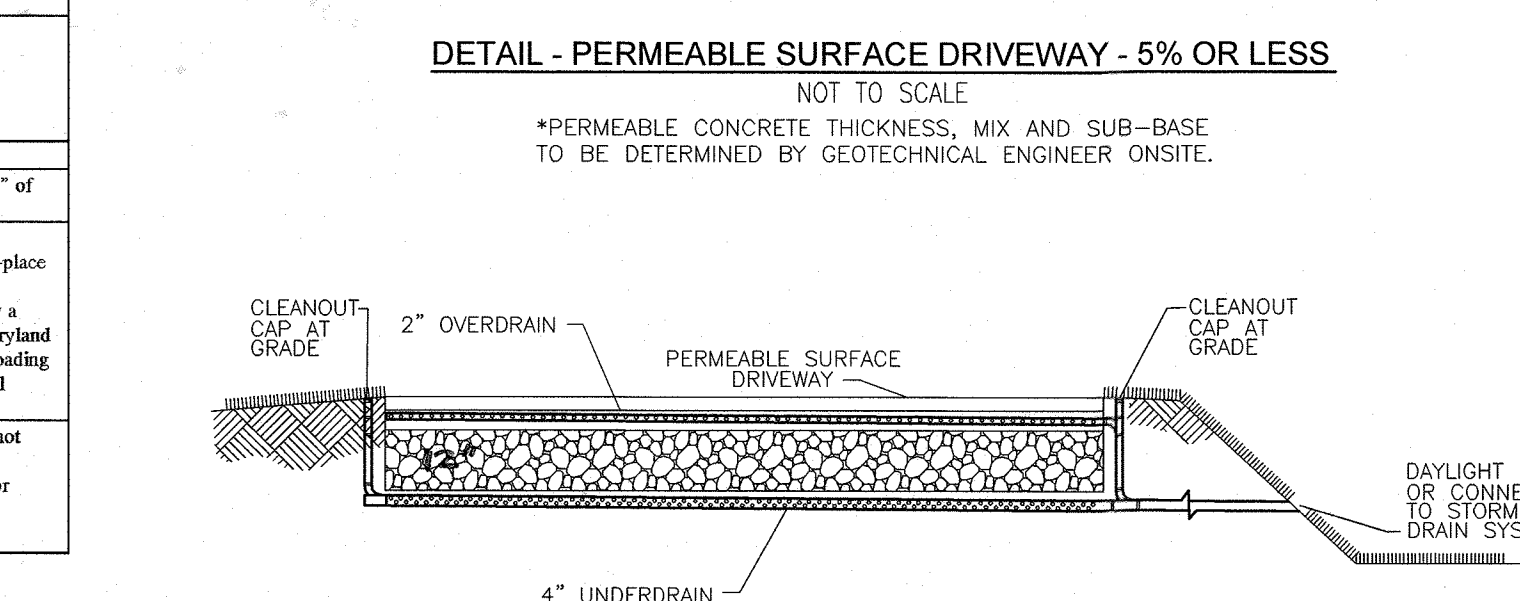
Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil	see Appendix A, Table A.4	n/a	USDA soil types loamy sand, sandy loam or loam
Mulch	shredded hardwood	aged 6 months, minimum	
Pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448	pea gravel: No. 6 stone: 2" to 5"	
Geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
Underdrain gravel	AASHTO M-43	0.375" to 0.75"	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipe; not necessary underdrain pipes
Poured in place concrete (if required)	MSHA Mix No. 3, F <sub>c</sub> = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-A615-60	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.8/9; 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 #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS  
 APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 APPROVED: [Signature] 1/13/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT



**DETAIL - PERMEABLE SURFACE DRIVEWAY - 5% OR LESS**  
NOT TO SCALE

- NOTES:  
 1. PAVEMENT CROSS SECTION/THICKNESS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER  
 2. UNDERDRAIN SHALL BE LOCATED SUCH THAT IT CAN DAYLIGHT OR CONNECT TO STORM DRAIN SYSTEM  
 3. OVERDRAIN SHALL COMBINE WITH UNDERDRAIN  
 4. AN UNDERDRAIN CLEANOUT SHALL BE PROVIDED ON THE HIGH AND LOW SIDE OF THE DRIVEWAY

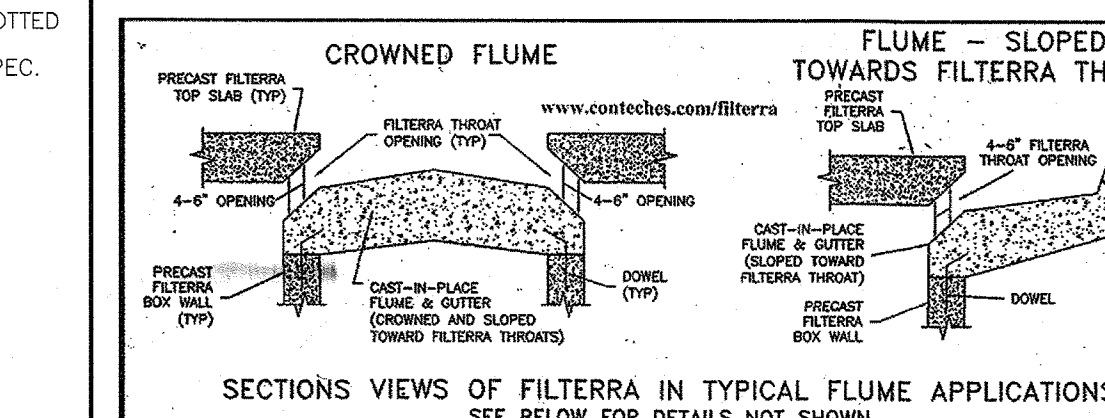


**TYPICAL PERMEABLE SURFACE DRIVEWAY UNDERDRAIN / OVERDRAIN OUTLET DETAIL**  
NOT TO SCALE

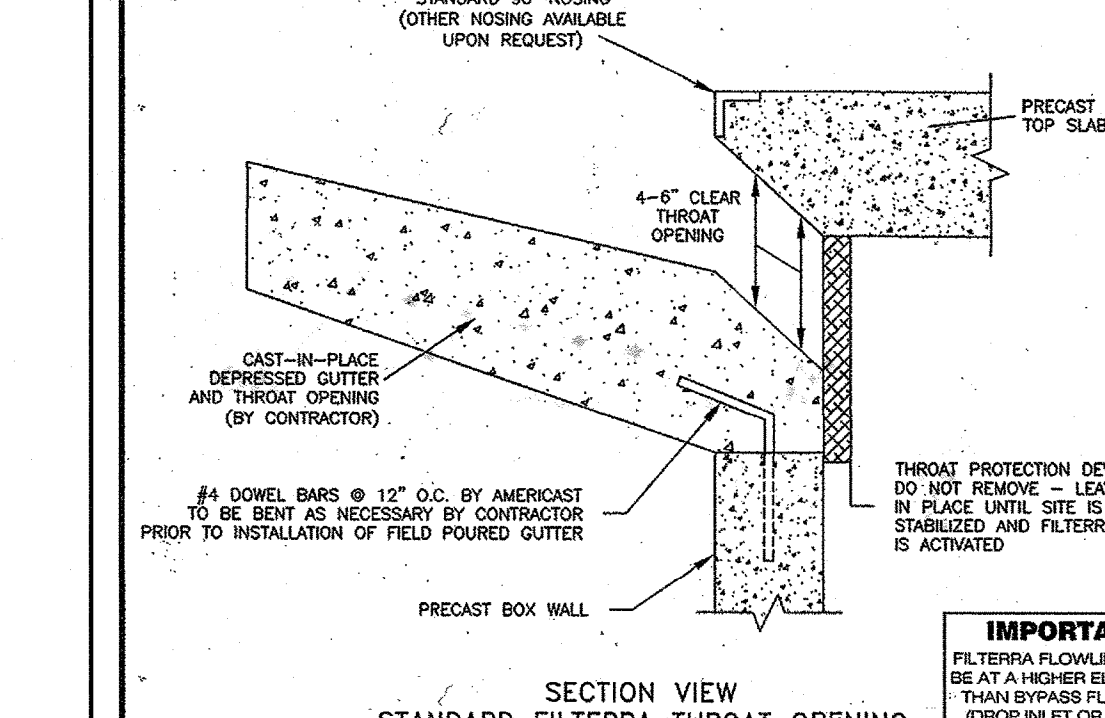
NOTE:  
 -DETAIL SHOWN FOR INFORMATION ONLY. DRIVEWAY DETAILING (TYPE, PLAN VIEW & PROFILE) WILL BE PART OF THE BUILDER'S FUTURE SITE DEVELOPMENT PLAN.  
 -REFER TO SHEET 51 FOR THE SPECIFICATIONS FOR PERMEABLE PAVEMENTS

**CHAPEL GATE CHURCH DRIVEWAY**  
NOT TO SCALE

FILTERRA CHART						
FACILITY	FACILITY NUMBER	UNIT DESIGNATION	TREATMENT AREA	OUTSIDE DIM	WQV CREDIT (cf)	
FILTERRA	F-1	CONTECH FILTERRA (FTSC 6'x4')	6' x 4'	13' x 5'	339	



**SECTIONS VIEWS OF FILTERRA IN TYPICAL FLUME APPLICATIONS**  
SEE BELOW FOR DETAILS NOT SHOWN



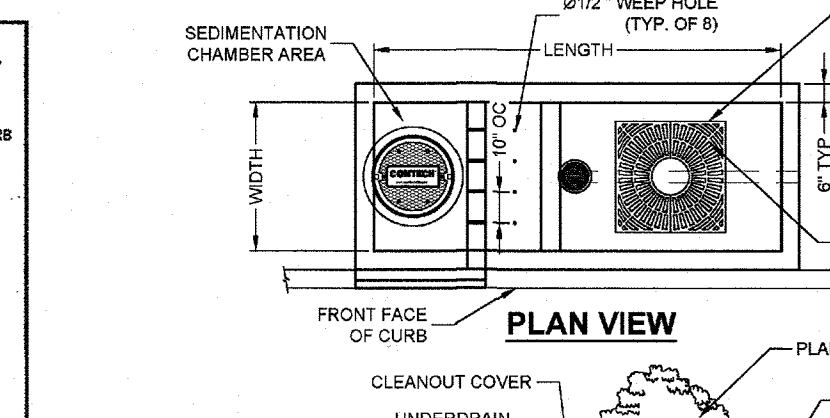
**STANDARD FILTERRA THROAT OPENING**

IMPORTANT: FILTERRA FLOWLINE MUST BE AT A HIGHER ELEVATION THAN BYPASS FLOWLINE (DRAIN INLET OR OTHER).  
 MODIFICATIONS OF DRAWINGS ARE ONLY PERMITTED BY WRITTEN AUTHORIZATION FROM FILTERRA.  
 DRAWING AVAILABLE IN TFF FILE FORMAT.  
 DATE: 02-26-09 DWG: COT-5  
 AMERICAST  
 FILTERRA THROAT OPENING AND GUTTER OR FLUME DETAIL  
 FILTERRA

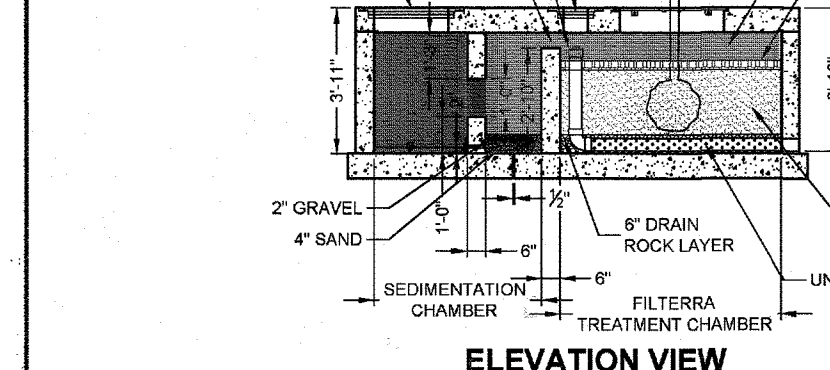
**FILTERRA OUTFLOW / INVERT CHART**

FROM	TO	TOP OF STRUCTURE	INV.	DIA (IN.)	LENGTH (FT)	INV. IN	AT INLET
F-3	OUTLET	450.8/450.7	446.77	6"	6'	446	

NOTE: INVERT OUT IS 0.2' FROM TOP OF STRUCTURE.  
 \*TOP STRUCTURE TO MONITOR EXISTING PAVEMENT GUTTER ELEVATION



**PLAN VIEW**



**ELEVATION VIEW**

UNIT DESIGNATION	INSIDE WALL DIMENSIONS	FILTERRA TREATMENT AREA	MAXIMUM DRAINAGE AREA (TREATED) SQ. FT.	STORAGE CAPACITY OF FILTERRA PRIOR TO TREATMENT (CF)	WQV TREATMENT EQUIVALENT (CF)
FTSC 6' x 4'	12' x 4'	6' x 4'	4,396	117	307
FTSC 6' x 6'	16' x 6'	6' x 6'	6,534	128	511
FTSC 6' x 8'	16' x 8'	6' x 8'	9,039	176	702
FTSC 10' x 6'	16' x 6'	10' x 6'	10,454	204	816
FTSC 10' x 8'	20' x 8'	10' x 8'	15,340	286	1,194
FTSC 10' x 12'	22' x 8'	12' x 8'	16,930	330	1,307

NOTE:  
 1. TREATMENT AREA IS THE GROSS LENGTH MINUS 4" OF EACH OF THE TREATMENT AREA.  
 2. MAXIMUM DRAINAGE AREA IS BASED ON 100% OF THE TREATMENT AREA.  
 3. STORAGE CAPACITY IS BASED ON 100% OF THE TREATMENT AREA.  
 4. ALL INFORMATION IS BASED ON STANDARD 48 IN. TO 60 IN. TO 60 IN. CONTACT YOUR LOCAL REPRESENTATIVE FOR CUSTOM SIZES IF THE STANDARD UNITS DO NOT MEET SITE REQUIREMENTS.  
 PLEASE CONTACT YOUR LOCAL REPRESENTATIVE FOR CUSTOM SIZES IF THE STANDARD UNITS DO NOT MEET SITE REQUIREMENTS.  
 CONTECH ENGINEERING SOLUTIONS  
 603 Stroud Way, Suite 113, Littleton, CO 80120  
 303.777.2724  
 800.759.8174

**DETAIL OF BUSHMAN RAIN HARVESTING SYSTEM OR EQUIVALENT 200 GALLON RAIN BARREL**  
NOT TO SCALE

**BUSHMAN**  
 8000 York Road, Suite 100  
 Columbia, MD 21046  
 410-461-2222  
 www.bushman.com

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED RAINWATER HARVESTING (M-1)**

- THE OWNER SHALL EMPTY BARRELS ON A MONTHLY BASIS AND CLEAN BARRELS WITH A HOSE.
- THE OWNER SHALL VERIFY INTEGRITY OF LEAF SCREENS, GUTTERS, DOWNSPUTS, SPOUTS, AND MISCOUTS SCREENS, AND CLEAN AND REMOVE ANY DEBRIS.
- THE OWNER SHALL REPLACE DAMAGED COMPONENTS AS NEEDED.
- THE OWNER SHALL ALLOW THE BARREL TO DRAIN BY BOTTOM SPOUT DURING THE WINTER SEASON.

**N-1. DISCONNECTION OF ROOFTOP RUNOFF**

**CONSTRUCTION CRITERIA:**

- THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING THE CONSTRUCTION OF PROJECTS WITH PERMITTED ROOFTOP DISCONNECTIONS:
  - EROSION AND SEDIMENT CONTROL: EROSION AND SEDIMENT CONTROL PRACTICES (E.G., SEDIMENT TRAPS) SHALL NOT BE LOCATED IN VEGETATED AREAS RECEIVING DISCONNECTED RUNOFF.
  - SITE DISTURBANCE: CONSTRUCTION VEHICLES AND EQUIPMENT SHOULD AVOID AREAS RECEIVING DISCONNECTED RUNOFF TO MINIMIZE DISTURBANCE AND COMPACTION. SHOULD AREAS RECEIVING DISCONNECTED RUNOFF BECOME COMPACTED, SCARIFYING THE SURFACE OR ROTOTILLING THE SOIL TO A DEPTH OF FOUR TO SIX INCHES SHALL BE PERFORMED TO ENSURE PERMEABILITY. ADDITIONALLY, AMENDMENTS MAY BE NEEDED FOR TIGHT, CLAYEY SOILS.

**INSPECTION:**

A FINAL INSPECTION SHALL BE CONDUCTED BEFORE USE AND OCCUPANCY APPROVAL TO ENSURE THAT SIZING FOR TREATMENT AREAS HAVE BEEN MET AND PERMANENT STABILIZATION HAS BEEN ESTABLISHED.

**MAINTENANCE CRITERIA:**

MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE AREAS RECEIVING RUNOFF SHOULD BE PROTECTED FROM FUTURE COMPACTION (E.G., BY PLANTING TREES OR SHRUBS ALONG THE PERIMETER). IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

**HOWARD COUNTY - OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DISCONNECTION OF ROOFTOP RUNOFF (N-1), DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2)**

- MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF ARE PROTECTED FROM FUTURE COMPACTION OR DEVELOPMENT OF IMPERVIOUS AREA. IN COMMERCIAL AREAS, FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

**CHAPEL GATE CHURCH DRIVEWAY**  
NOT TO SCALE

**FILTERRA CHART**

FACILITY	FACILITY NUMBER	UNIT DESIGNATION	TREATMENT AREA	OUTSIDE DIM	WQV CREDIT (cf)
FILTERRA	F-1	CONTECH FILTERRA (FTSC 6'x4')	6' x 4'	13' x 5'	339

**CHAPEL GATE CHURCH DRIVEWAY**  
NOT TO SCALE

**FILTERRA OUTFLOW / INVERT CHART**

FROM	TO	TOP OF STRUCTURE	INV.	DIA (IN.)	LENGTH (FT)	INV. IN	AT INLET
F-3	OUTLET	450.8/450.7	446.77	6"	6'	446	

NOTE: INVERT OUT IS 0.2' FROM TOP OF STRUCTURE.  
 \*TOP STRUCTURE TO MONITOR EXISTING PAVEMENT GUTTER ELEVATION

**CHAPEL GATE CHURCH DRIVEWAY**  
NOT TO SCALE

**SECTIONS VIEWS OF FILTERRA IN TYPICAL FLUME APPLICATIONS**  
SEE BELOW FOR DETAILS NOT SHOWN

**CHAPEL GATE CHURCH DRIVEWAY**  
NOT TO SCALE

**STANDARD FILTERRA THROAT OPENING**

**CHAPEL GATE CHURCH DRIVEWAY**  
NOT TO SCALE

**DETAIL - PERMEABLE SURFACE DRIVEWAY - 5% OR LESS**  
NOT TO SCALE

**CHAPEL GATE CHURCH DRIVEWAY**  
NOT TO SCALE

**TYPICAL PERMEABLE SURFACE DRIVEWAY UNDERDRAIN / OVERDRAIN OUTLET DETAIL**  
NOT TO SCALE

**FINAL ROAD CONSTRUCTION PLAN**  
STORMWATER MANAGEMENT NOTES & DETAILS

**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL B

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421  
 TAX MAP: 16 GRD 10  
 3RD ELECTION DISTRICT

OWNER: CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD., MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER: SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE, SUITE 415, ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

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

DESIGN BY: RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

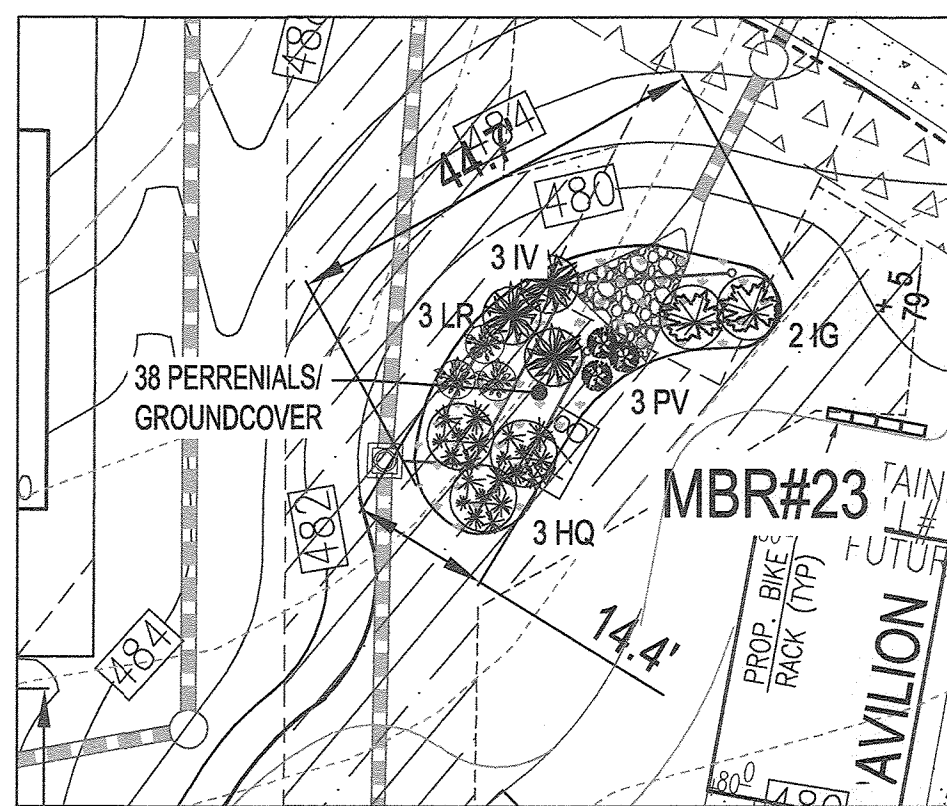
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193  
 EXPIRATION DATE: 09-27-2022

47 SHEET OF 101

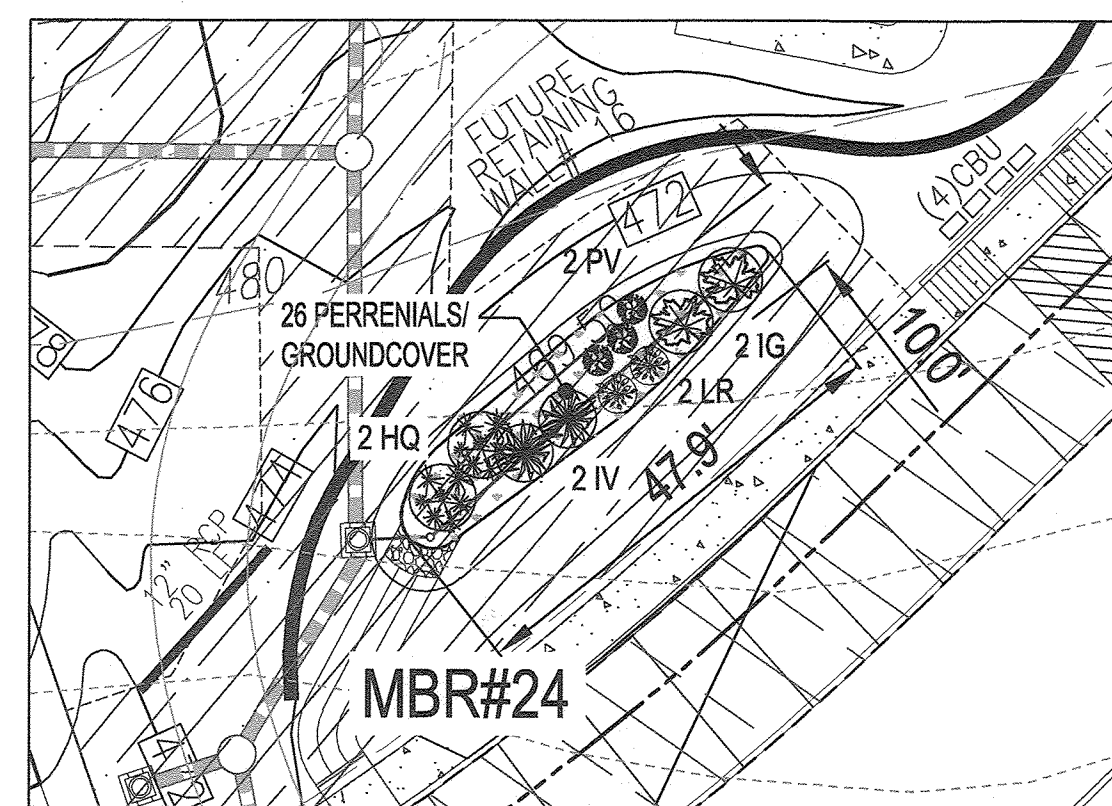




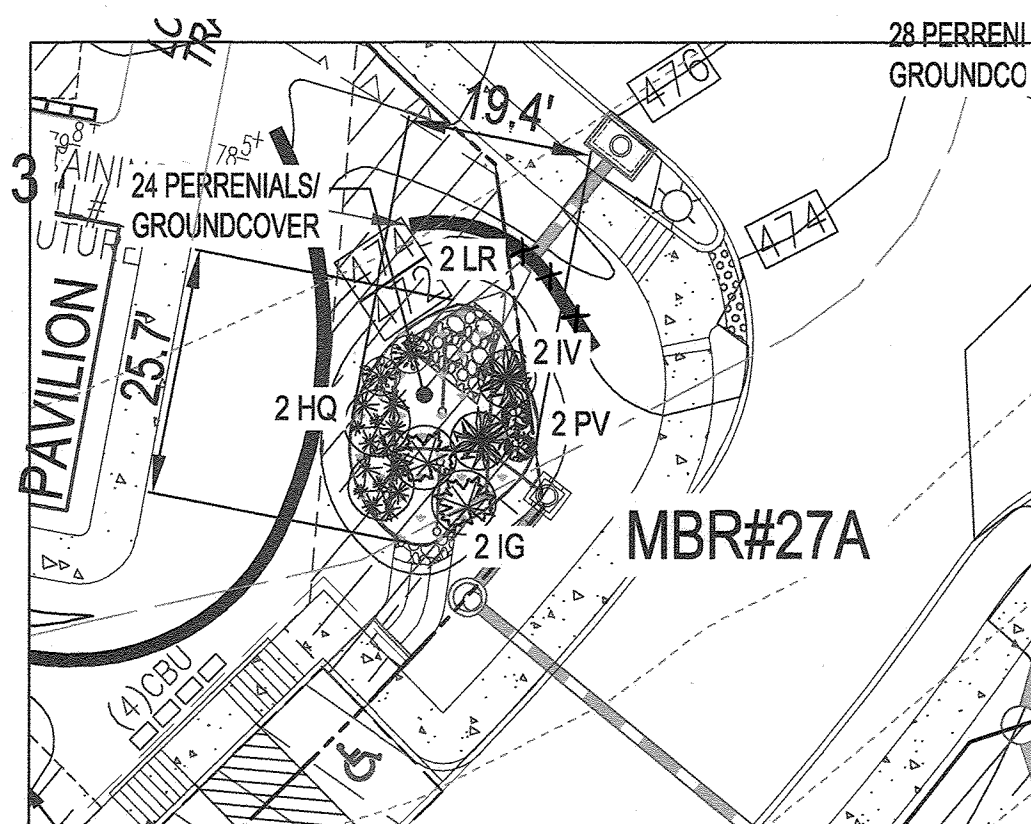




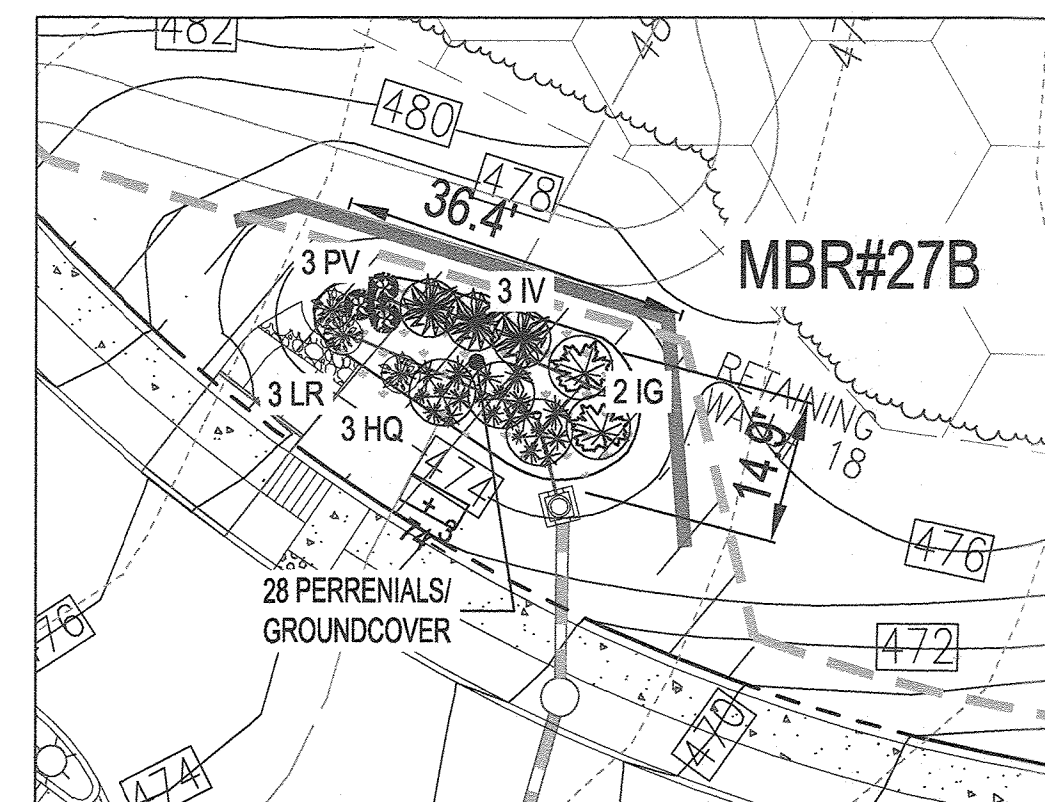
MBR# 23 PLANTING  
SCALE: 1" = 20'



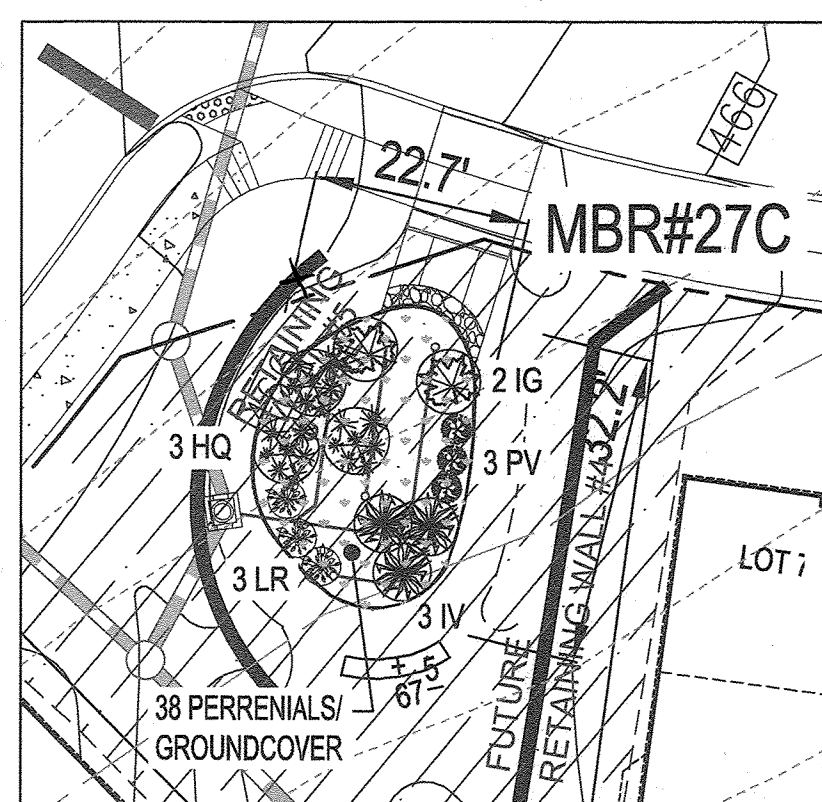
MBR# 24 PLANTING  
SCALE: 1" = 20'



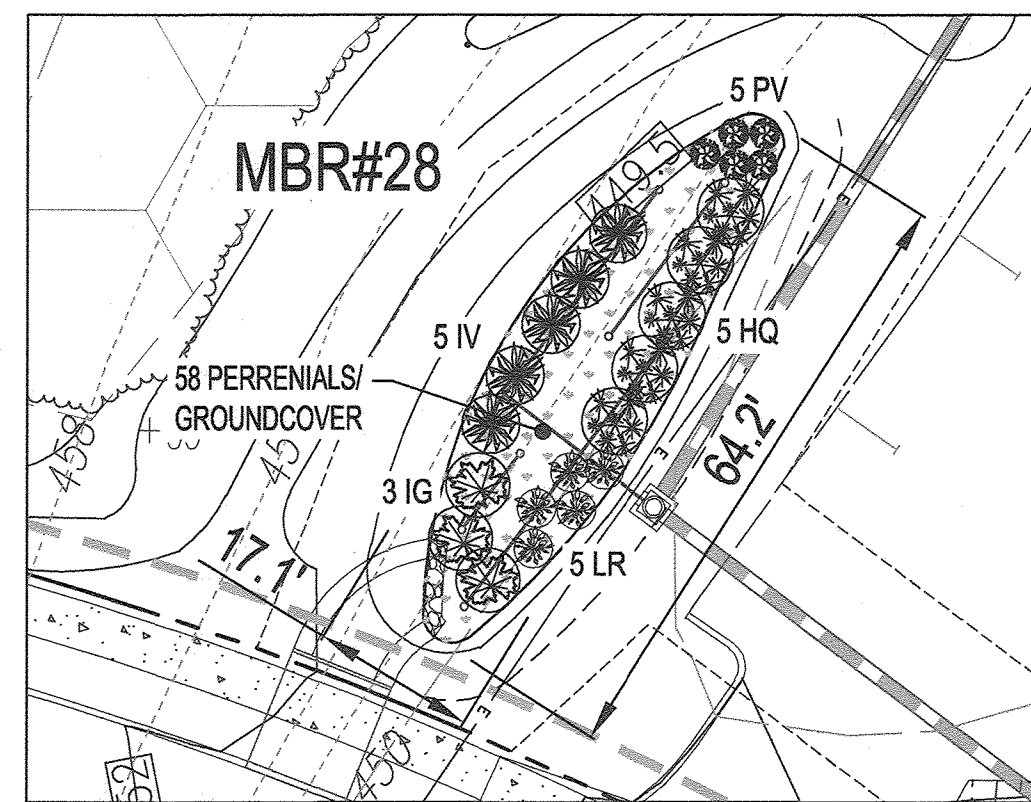
MBR# 27A PLANTING  
SCALE: 1" = 20'



MBR# 27B PLANTING  
SCALE: 1" = 20'



MBR# 27C PLANTING  
SCALE: 1" = 20'



MBR# 28 PLANTING  
SCALE: 1" = 20'

PERENNIALS/GROUND COVER PLANTING SCHEDULE				
LEGEND	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
571		BAPTISIA AUSTRALIS FALSE INDIGO	4" POT	12"-18" O.C. FOR SIDES AND BOTTOM OF MBR. MIX ALL VARIETIES IN A NATURALIZED RANDOM PATTERN THROUGHOUT. PLANT IN GROUPS OF NO LESS THAN 9 PLANTS PER CLUMP.
571		ACORUS GRAMINEUS 'OGON' GOLDEN VARIATED SWEET FLAG	1 QT.	

BIORETENTION PLANTING SCHEDULE (SHRUB/ORNAMENTAL GRASSES)				
LEGEND/KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
IG	58	ILEX GLABRA 'SHAMROCK' HKBERRY HOLLEY	1 GALLON	18" O.C.
IV	91	ITEA VIRGINICA 'HENRY'S GARNETT' VIRGINIA SWEETSPICE	1 GALLON	18" O.C.
HQ	88	HYDRANGEA QUERCIFOLIA OAKLEAF HYDRANGEA	1 GALLON	30" O.C.
LR	91	LEUCOTHEDE RACEMOSA FETTERBUSH	1 GAL.	30" O.C.
PV	91	PANICUM VIRGATUM SWITCHGRASS	1 GAL.	36" O.C.

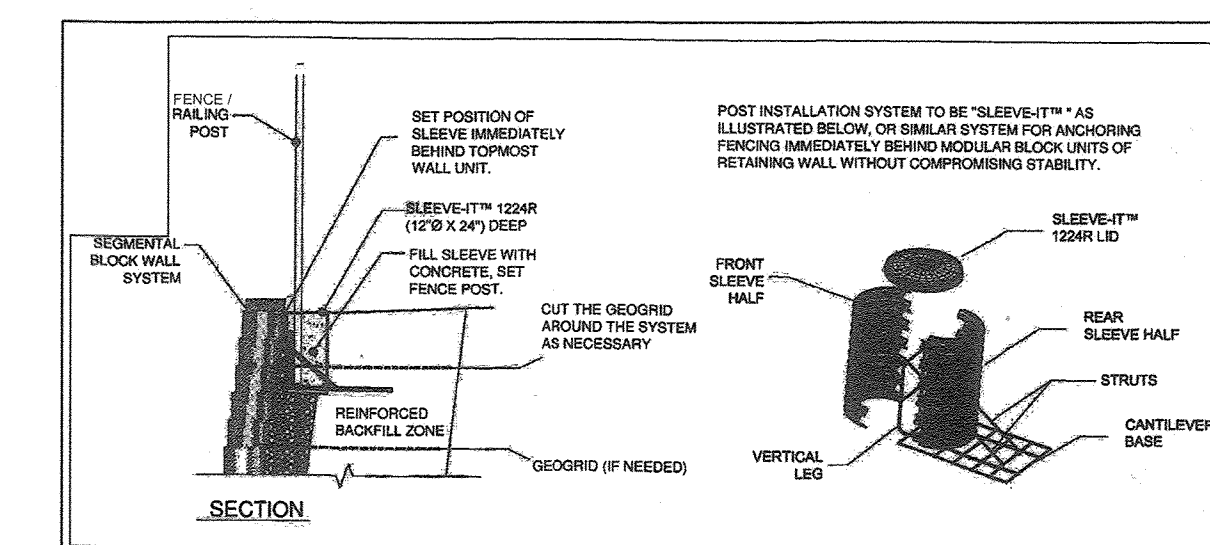
NOTE: WITH PERMISSION FROM HOWARD COUNTY, PLANTING SPECIFIED HEREON MAY BE SUBSTITUTED WITH APPROVED SPECIES LISTED IN TABLE A.4 - 4.0 SHOW HEREON.

**MIcro-BIoretention PLANTING SCHEDULE NOTES**

- ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AND SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HOWARD COUNTY PLANTING SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
- FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
- CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.
- MIcro-BIoretention AREAS ARE TO BE PLANTED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (0.0229 STEMS PER SQUARE FOOT), ABOVE PLANTING RATIOS ARE TO BE APPLIED TO THE AREAS PROVIDED IN THE ESDV SUMMARY. FILTER AREA SHALL BE 50% COVERED BY PLANTINGS AT FULL GROWTH.

MIcro-BIoretention PLANTING REQUIREMENTS				PLANTINGS PROVIDED						PERENNIALS/GROUND COVER PROVIDED		
MBR #	LF	AREA	STEMS REQUIRED (0.0229)	STEMS PROVIDED	IG	IV	HQ	LR	PV	BA	AG	TOTAL
MBR-1	122	936	22	21	3	5	3	5	5	32	32	64
BR-2	124	955	22	23	3	5	5	5	5	33	33	66
MBR-4	160	1073	25	28	4	6	6	6	6	26	26	52
MBR-5	129	750	18	19	3	4	4	4	4	26	26	52
MBR-6	78	402	10	12	2	2	2	3	3	14	14	28
MBR-7A	119	984	23	23	3	5	5	5	5	34	34	68
MBR-7B	152	1338	31	33	5	7	7	7	7	46	46	92
MBR-9	201	1270	30	32	4	7	7	7	7	44	44	88
MBR-10	82	415	10	14	2	3	3	3	3	14	14	28
MBR-11	110	890	21	23	3	5	5	5	5	31	31	62
BR-12	186	1625	38	41	5	9	9	9	9	56	56	112
MBR-13	76	403	10	11	2	3	2	2	2	14	14	28
BR-14	278	2250	52	55	7	12	12	12	12	78	78	156
MBR-15A	111	841	20	23	3	5	5	5	5	29	29	58
MBR-17A	235	1350	31	33	5	7	7	7	7	47	47	94
MBR-17B	139	1034	24	28	4	6	6	6	6	36	36	72
MBR-19B	110	705	17	18	3	4	3	4	4	24	24	48
MBR-21	189	1450	34	37	5	8	8	8	8	50	50	100
BR-22	184	1390	32	33	5	7	7	7	7	48	48	96
MBR-23	106	562	13	14	2	3	3	3	3	19	19	38
MBR-24	102	378	9	10	2	2	2	2	2	13	13	26
BR-25A	166	1125	26	28	4	6	6	6	6	39	39	78
MBR-25B	223	2175	50	51	7	11	11	11	11	76	76	152
BR-25C	193	1650	38	41	5	9	9	9	9	57	57	114
MBR-27A	68	352	9	10	2	2	2	2	2	12	12	24
MBR-27B	82	407	10	14	2	3	3	3	3	14	14	28
MBR-27C	87	561	13	14	2	3	3	3	3	19	19	38
MBR-28	139	850	20	23	3	5	5	5	5	29	29	58
<b>TOTALS</b>	<b>2302</b>	<b>16516</b>	<b>97</b>	<b>103</b>	<b>58</b>	<b>91</b>	<b>88</b>	<b>91</b>	<b>91</b>	<b>571</b>	<b>571</b>	<b>1142</b>

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



FENCE POST AT MICRO-BIoretention W/ GRAVITY WALL - INSTALLATION DETAIL OR EQUAL NOT TO SCALE

FENCE NOTES:  
- FENCING IS REQUIRED FOR ALL WALLS WHERE THE WALL HEIGHT IS GREATER THAN 30" (2.5')  
- FENCE DESIGN BY OTHERS

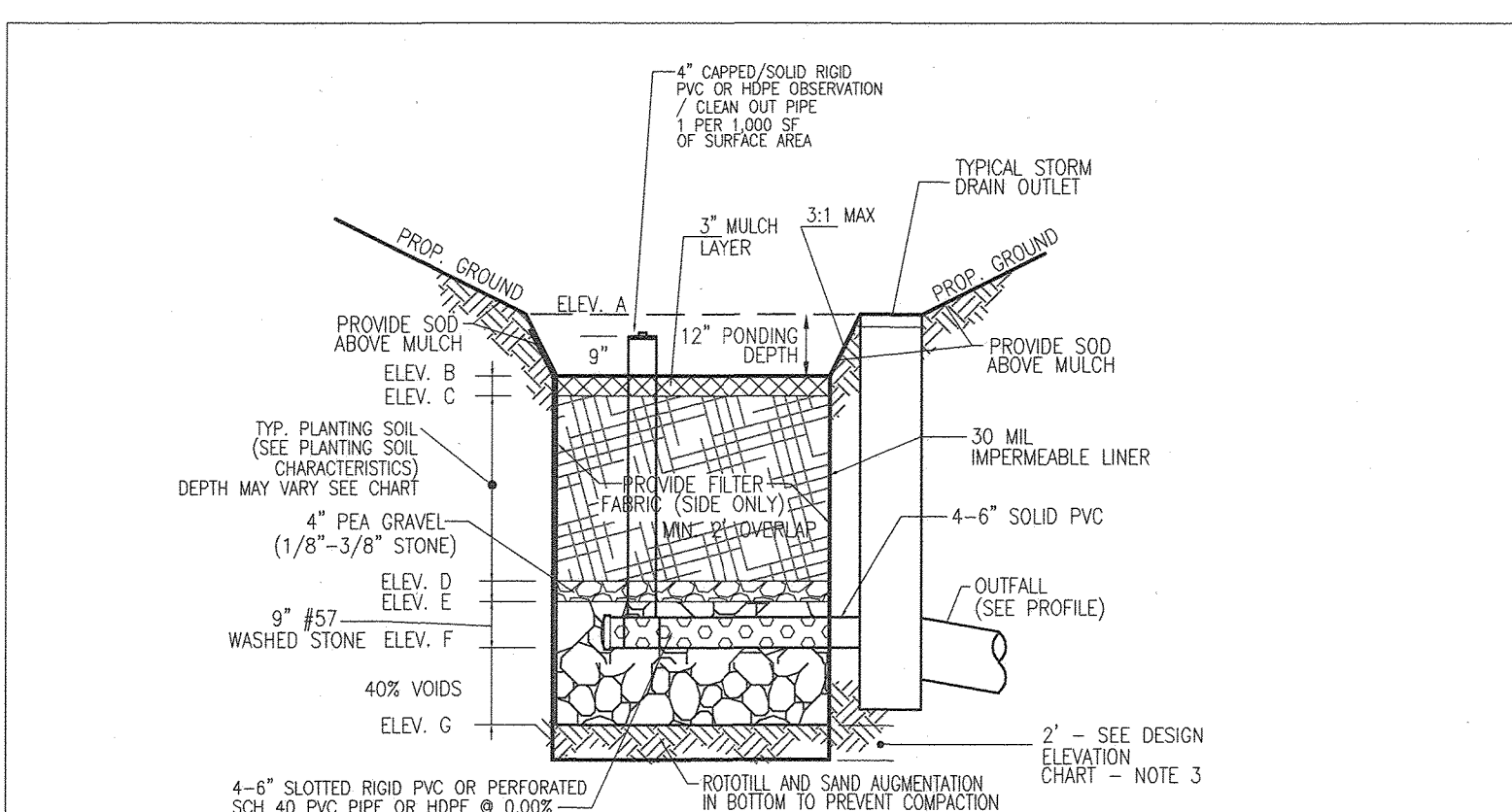
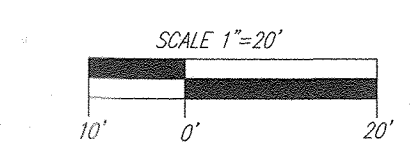
BIoretention / MIcro-BIoretention FACILITY - DESIGN ELEVATION CHART														
FACILITY #	FACILITY TYPE	ESD WSEL A	TOP MULCH B	TOP PLANT SOIL C	BOTTOM PLANT SOIL D	BOTTOM PEA GRAVEL E	INV PIPE (1) F	INV STONE G	SURFACE AREA	APPROX DIM (2)	OWNER	MAINTENANCE PRIVATE/PUBLIC	INLET #	LINER (3)
1	M-6	517.00	516.00	515.75	513.75	513.42	512.67	511.67	938	SEE PLAN	PRIVATE	PRIVATE HOA	24	YES
2	F-6	513.00	512.00	511.75	510.25	509.92	509.17	508.17	956	SEE PLAN	PRIVATE	PRIVATE HOA	24	-
4	M-6	499.00	498.00	497.75	495.75	495.42	494.67	493.67	1073	SEE PLAN	PRIVATE	PRIVATE HOA	19	-
5	M-6	505.00	504.00	503.75	501.75	501.42	500.67	499.67	750	SEE PLAN	PRIVATE	PRIVATE HOA	20	YES
6	M-6	497.00	496.00	495.75	493.75	493.42	492.67	491.67	994	SEE PLAN	PRIVATE	PRIVATE HOA	18	-
7A	M-6	489.00	488.00	487.75	485.75	485.42	484.67	483.67	394	SEE PLAN	PRIVATE	PRIVATE HOA	17	YES
7B	M-6	477.00	476.00	475.75	473.75	473.42	472.67	471.67	1331	SEE PLAN	PRIVATE	PRIVATE HOA	15	-
9	F-6	475.00	474.00	473.75	471.75	471.42	470.67	469.67	1275	SEE PLAN	PRIVATE	PRIVATE HOA	10	-
10	M-6	469.00	468.00	467.75	465.75	465.42	464.67	463.67	415	SEE PLAN	PRIVATE	PRIVATE HOA	7	-
11	M-6	469.00	468.00	467.75	466.25	465.92	465.17	464.17	900	SEE PLAN	PRIVATE	PRIVATE HOA	9	-
12	F-6	451.50	450.50	450.25	448.75	448.42	447.67	446.67	1613	SEE PLAN	PRIVATE	PRIVATE HOA	2	YES
13	M-6	451.50	450.50	450.25	448.75	448.42	447.67	446.67	405	SEE PLAN	PRIVATE	PRIVATE HOA	3	YES
14	F-6	451.00	450.00	449.75	447.75	447.42	446.67	445.67	2250	SEE PLAN	PRIVATE	PRIVATE HOA	49	-
15	M-6	463.50	462.50	462.25	460.25	459.92	459.17	458.17	848	SEE PLAN	PRIVATE	PRIVATE HOA	53	YES
17A	F-6	485.50	484.50	484.25	482.75	482.42	481.67	480.67	1350	SEE PLAN	PRIVATE	PRIVATE HOA	11	YES
17B	M-6	484.00	483.00	482.75	480.75	480.42	479.67	478.67	1050	SEE PLAN	PRIVATE	PRIVATE HOA	69	-
19B	M-6	469.00	468.00	467.75	465.75	465.42	464.67	463.67	713	SEE PLAN	PRIVATE	PRIVATE HOA	66	-
21	M-6	483.00	482.00	481.75	479.75	479.42	478.67	477.67	1470	SEE PLAN	PRIVATE	PRIVATE HOA	68	YES
22	F-6	481.40	480.40	480.15	478.15	477.82	477.07	476.07	1388	SEE PLAN	PRIVATE	PRIVATE HOA	64	-
23	M-6	479.00	478.00	477.75	475.75	475.42	474.67	473.67	563	SEE PLAN	PRIVATE	PRIVATE HOA	59	-
24	M-6	470.50	469.50	469.25	467.25	466.92	466.17	465.17	375	SEE PLAN	PRIVATE	PRIVATE HOA	58	-
25A	F-6	455.00	454.00	453.75	451.75	451.42	450.67	449.67	1125	SEE PLAN	PRIVATE	PRIVATE HOA	38	-
25B	F-6	453.50	452.50	452.25	450.25	450.42	449.67	448.67	2175	SEE PLAN	PRIVATE	PRIVATE HOA	50	YES
25C	F-6	453.00	452.00	451.75	450.25	449.92	449.17	448.17	1650	SEE PLAN	PRIVATE	PRIVATE HOA	39	YES
27A	M-6	472.00	471.00	470.75	468.75	468.42	467.67	466.67	356	SEE PLAN	PRIVATE	PRIVATE HOA	54	-
27B	M-6	474.00	473.00	472.75	470.75	470.42	469.67	468.67	413	SEE PLAN	PRIVATE	PRIVATE HOA	56	-
27C	M-6	467.00	466.00	465.75	463.75	463.42	462.67	461.67	570	SEE PLAN	PRIVATE	PRIVATE HOA	55	YES
28	M-6	450.50	449.50	449.25	447.25	446.92	446.17	445.17	850	SEE PLAN	PRIVATE	PRIVATE HOA	83	-

(1) UNDERDRAIN PIPE AND OVERFLOW DISTRIBUTION PIPE  
(2) REFER TO SHEET X & THIS SHEET  
(3) PROVIDE 30-MIL PVC IMPERMEABLE LINER ALONG RETAINING WALL SIDE(S) OF FACILITY EXCAVATION PRIOR TO PLACEMENT OF TYPICAL SECTION LINER SHALL EXTEND FROM TABLE ELEVATION A TO 2 FEET BELOW TABLE ELEVATION G

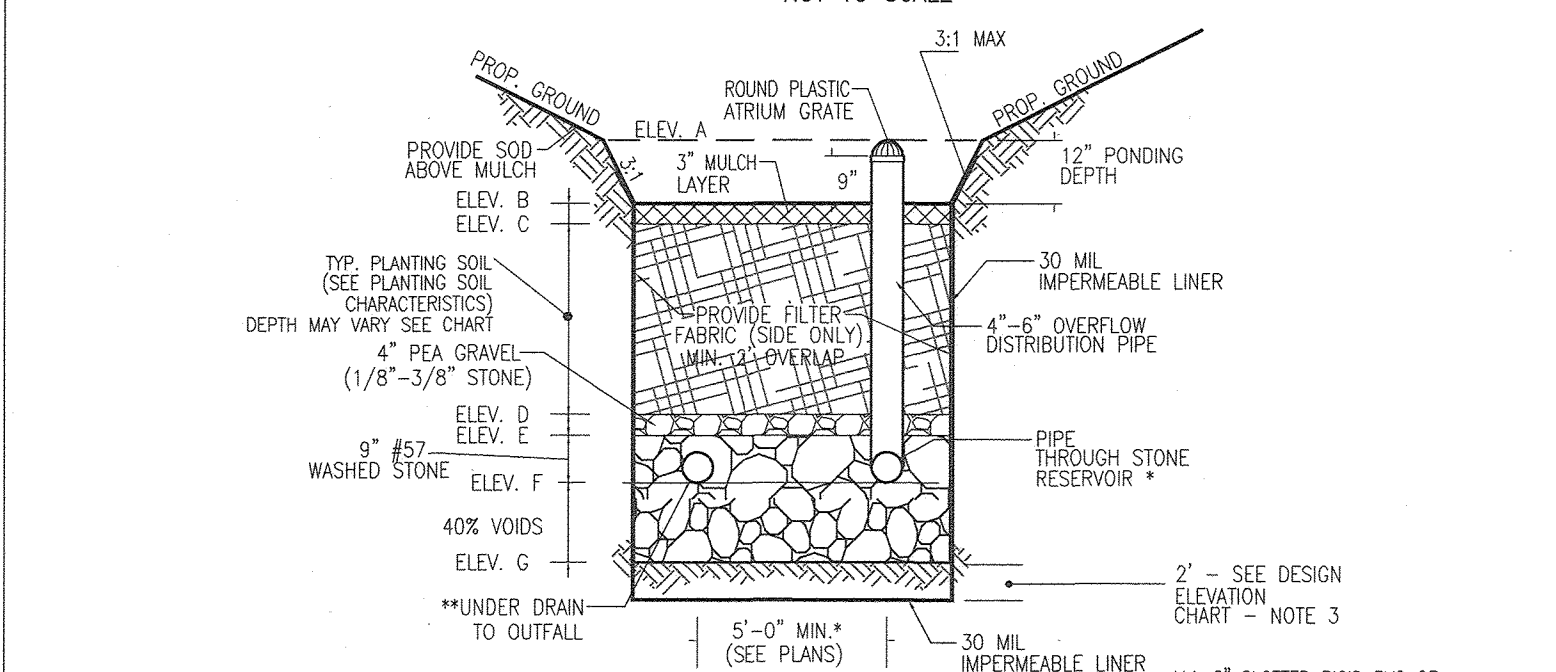
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 09/14/2022  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 9.21.22  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

CHIEF, DIVISION OF LAND DEVELOPMENT [Signature] 9/26/22 DATE



TYPICAL DETAIL #3 BIoretention (F-6) AND MIcro-BIoretention (UNDERDRAIN) NOT TO SCALE

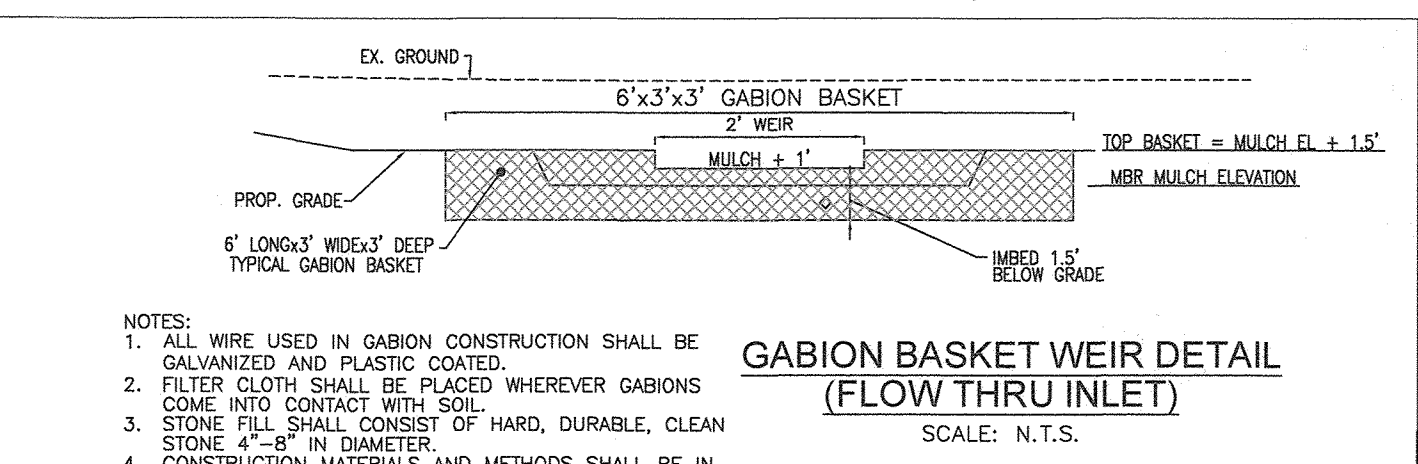


TYPICAL DETAIL #3 BIoretention (F-6) AND MIcro-BIoretention (OVERFLOW) NOT TO SCALE

Material	Specification/Test Method	Size	Notes
Impermeable liner (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tensile strength 1,100 lb., elongation 200%) ASTM-D-624 (Tear resistance - 150 lb./in) ASTM-D-471 (water adsorption: +8 to -2% mass)	30 mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.

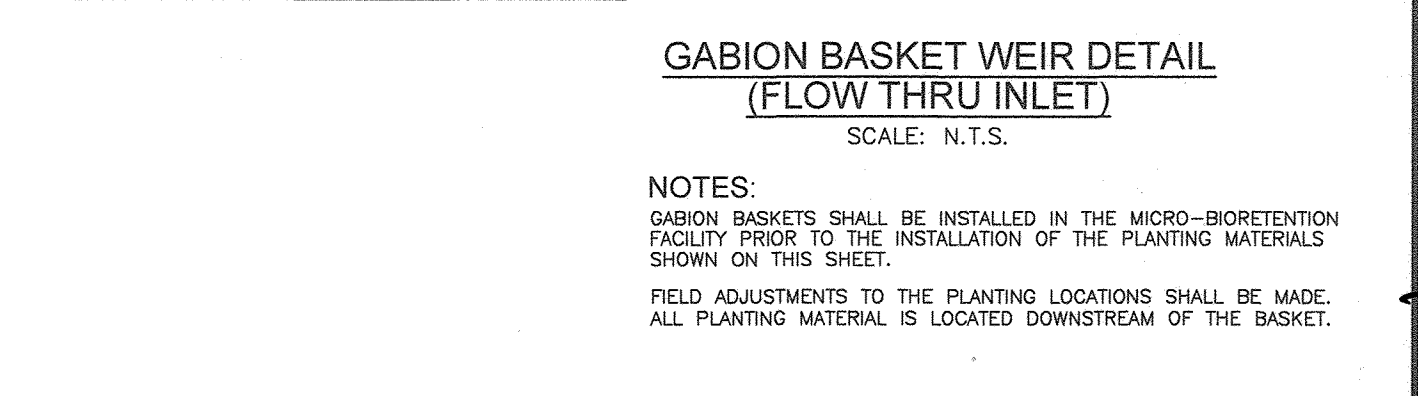
IMPERMEABLE LINER TO BE INSTALLED IN THE FOLLOWING MIcro-BIoretention/BIoretention FACILITIES:  
 MIcro-BIoretention 1, MIcro-BIoretention 5, MIcro-BIoretention 7A, BIoretention 12, MIcro-BIoretention 13, MIcro-BIoretention 15, BIoretention 17A, MIcro-BIoretention 21, MIcro-BIoretention 25B, BIoretention 25C, MIcro-BIoretention 27C

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008



GABION BASKET WEIR DETAIL (FLOW THRU INLET) SCALE: N.T.S.

STR#	Q10 FLOW
PT-1	2.98
PT-2	0.77
PT-3	0.72
PT-4	2.28
PT-5	0.89
PT-6	0.65
PT-7	0.44
PT-8	0.78
PT-9	1.09
PT-10	1.34
PT-11	2.65



GABION BASKET WEIR DETAIL (FLOW THRU INLET) SCALE: N.T.S.

NOTES:  
 1. ALL WIRE USED IN GABION CONSTRUCTION SHALL BE GALVANIZED AND PLASTIC COATED.  
 2. FILTER CLOTH SHALL BE PLACED WHEREVER GABIONS COME INTO CONTACT WITH SOIL.  
 3. STONE FILL SHALL CONSIST OF HARD, DURABLE, CLEAN STONE 4"-8" IN DIAMETER.  
 4. CONSTRUCTION MATERIALS AND METHODS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

FIELD ADJUSTMENTS TO THE PLANTING LOCATIONS SHALL BE MADE. ALL PLANTING MATERIAL IS LOCATED DOWNSTREAM OF THE BASKET.

Appendix A. Landscaping Guidelines for Stormwater BMPs - Specific Landscaping Criteria

Table A.4 Commonly Used Species for Bioretention Areas

Tree	Shrub	Herbaceous/Grass
Acer rubrum	Asarula purpurifera	Andropogon virginicus
Betula nigra	Baccharis distachya	Bromus
Thuja occidentalis	Cephalanthus occidentalis	Dioscorea oppositifolia
Juniperus virginiana	Hamamelis virginiana	Scirpus pungens
Eastern Red Cedar	Witch Hazel	Three Square Bulrush
Chionodoxa virginiana	Vaccinium corymbosum	Iris versicolor
Fringetree	Highbush Blueberry	Blue Flag
Nyssa sylvatica	Ilex glabra	Lobelia cardinalis
Black Gum	Ilex	Cardinal Flower
Dioscorea virginiana	Ilex verticillata	Panicum virgatum
Pennisetum	Winterberry	Switchgrass
Platanus occidentalis	Viburnum dentatum	Dichanthium scoparium
Sycamore	Astragalus	Broom Panic Grass
Quercus palustris	Lindera benzoin	Rudbeckia laciniata
Pine Oak	Spiraea	Tall Coneflower
Quercus phellos	Myrica pensylvanica	Scirpus cyperinus
Solidago	Bayberry	Woolgrass
Black willow		Vernonia noveboracensis
		New York Ironweed

Note 1: For more options on plant selection for bioretention, consult Bioretention Manual (EPA, 1998) or the Design of Stormwater Filtering Systems (Caylor and Schuler, 1997).

- TABLE A.4 IS TAKEN FROM THE "2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II - APPENDIX A."
- CONTRACTOR SHALL BE FAMILIAR WITH APPENDIX B.4.C. CONSTRUCTION SPECIFICATIONS AND TABLE B.4.1 MATERIAL SPECIFICATIONS. IN ADDITION THE "2000 MARYLAND STORMWATER DESIGN MANUAL - VOLUME II - APPENDIX A OFFERS ADDITIONAL HELPFUL INFORMATION."
- NO TREES SHALL BE PLANTED WITHIN A MIcro-BIoretention FACILITY. USE ONLY SHRUB OR HERBACEOUS SPECIES.
- ABOVE TABLE A.4 IS FOR INFORMATIONAL PURPOSES ONLY. LANDSCAPE CONTRACTOR SHALL INSTALL PLANTINGS SPECIFIED OR USE APPROVED EQUAL SPECIES WHICH ARE TOLERANT TO FLUCTUATING WATER LEVELS.
- PLANTINGS SHOWN HEREON ARE THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL DURING THE CONSTRUCTION OF THIS FINAL PLAN.

OWNER: CHAPEL GATE PRESBYTERIAN CHURCH







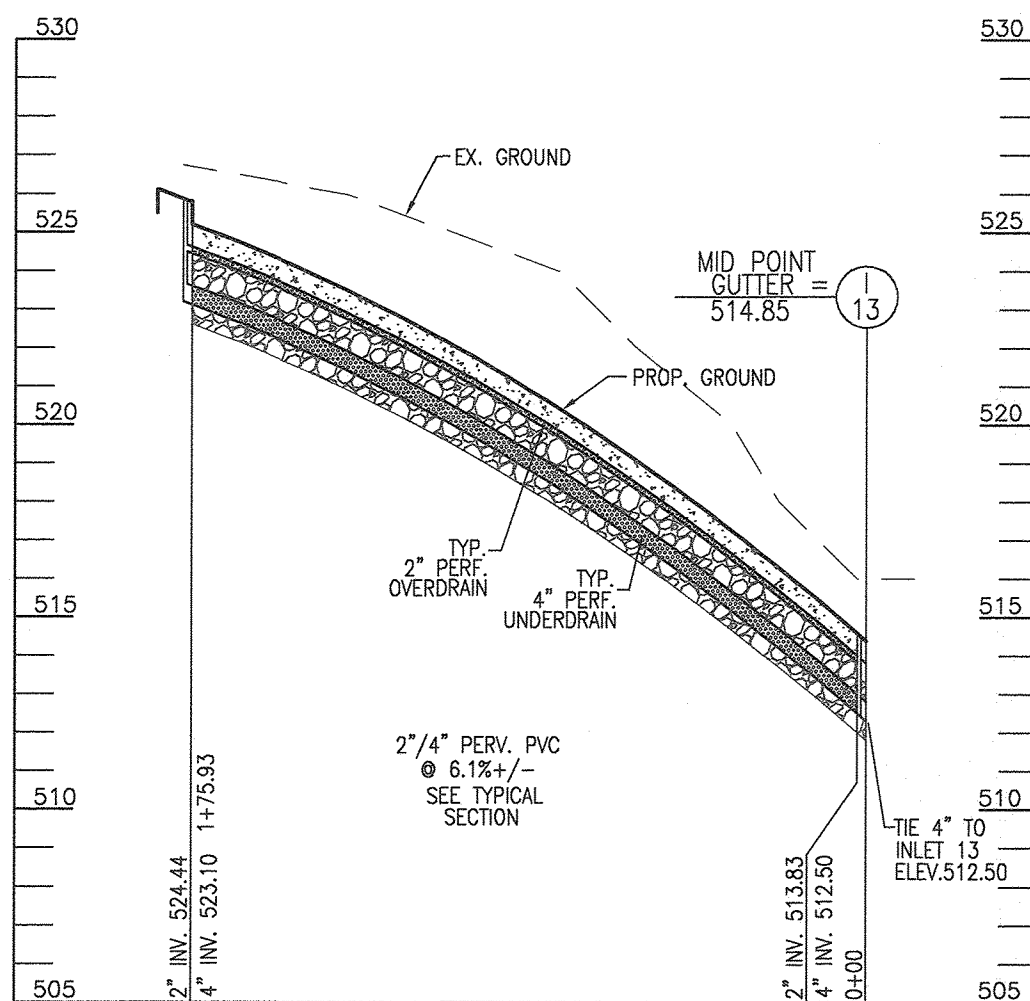
**B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TURF**

THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS AND ARE NOT EXCLUSIVE OR LIMITING. THE DESIGNER IS RESPONSIBLE FOR DEVELOPING SPECIFICATIONS FOR INDIVIDUAL PROJECTS AND SPECIFIC CONDITIONS.

- PERVIOUS CONCRETE SPECIFICATIONS**  
DESIGN THICKNESS - PERVIOUS CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING EITHER STANDARD PAVEMENT PROCEDURES (E.G., AASHTO, ACI 325.9R, ACI 309R) OR LONG STRUCTURAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.  
MIX & INSTALLATION - TRADITIONAL PORTLAND CEMENTS (ASTM C 150, C 1157) MAY BE USED IN PERVIOUS CONCRETE APPLICATIONS. PHOSPHORUS ADMIXTURES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TRIAL BATCHING) PRIOR TO CONSTRUCTION SO THAT CRITICAL PROPERTIES (E.G., SETTING TIME, RATE OF STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.  
AGGREGATE - PERVIOUS CONCRETE CONTAINS A LIMITED FINE AGGREGATE CONTENT. COMMONLY USED GRADATIONS INCLUDE ASTM C 33 NO. 67 (3/4 IN. TO NO. 4), NO. 8 (3/8 IN. TO NO. 16) AND NO. 89 (3/8 IN. TO NO.50) SIZES. SINGLE-SIZED AGGREGATE (UP TO 1 INCH) MAY ALSO BE USED.  
WATER CONTENT - WATER-TO-CEMENT RATIOS BETWEEN 0.27 AND 0.30 ARE USED ROUTINELY WITH PROPER INCLUSION OF CHEMICAL ADMIXTURES. WATER QUALITY SHOULD MEET A.S.I. 308. AS A GENERAL RULE, POTABLE WATER SHOULD BE USED ALTHOUGH RECYCLED CONCRETE PRODUCTION WATER MEETING ASTM C 94 OR AASHTO M 157 MAY ALSO BE USED.  
ADMIXTURES - CHEMICAL ADMIXTURES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPEC. PROPERTIES IN PERVIOUS CONCRETE. USE OF ADMIXTURES SHOULD MEET ASTM C 494 (CHEMICAL ADMIXTURES) AND ASTM C 220 (AIR ENTRAINING ADMIXTURES) AND CLOSELY FOLLOW MANUFACTURER'S RECOMMENDATIONS.  
BASE COURSE - THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).
- PERMEABLE INTERLOCKING CONCRETE PAVEMENTS (PICP)**  
PAVER BLOCKS - BLOCKS SHOULD BE EITHER 3" OR 4" IN. THICK, AND MEET ASTM C 936 OR CSA A231.2 REQUIREMENTS. APPLICATIONS SHOULD HAVE 20% OR MORE (NOT PREVIOUS) OF THE SURFACE AREA OPEN. INSTALLATION SHOULD FOLLOW MANUFACTURER'S INSTRUCTIONS, EXCEPT THAT INFILL AND BASE COURSE MATERIALS AND DIMENSIONS SPECIFIED IN THIS APPENDIX SHALL BE FOLLOWED.  
INFILL MATERIALS AND LEVELING COURSE - OPENINGS SHALL BE FILLED WITH ASTM C-33 GRADED SAND OR SANDY LOAM. PICP BLOCKS SHALL BE PLACED ON A ONE-INCH THICK LEVELING COURSE OF ASTM C-33 SAND.  
BASE COURSE - THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).
- POROUS BITUMINOUS ASPHALT**
- REINFORCED TURF**  
REINFORCED GRASS PAVEMENT (RGP) - WHETHER USED WITH GRASS OR GRAVEL, THE RGP THICKNESS SHALL BE AT LEAST 1-3/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED PERMEABLE PAVEMENT (A-2)**

- PAVEMENT SURFACES SHOULD BE SWEEPED AND VACUUMED (IF POROUS CONCRETE) TO REDUCE SEDIMENT ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT, WASHING OR COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
- DRAINAGE PIPES, INLETS, STONE EDGE DRAINS AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SUBBASE SHOULD BE CLEANED OUT AT REGULAR INTERVALS.
- DECICERS SHOULD BE USED IN MODERATION. DECICERS SHOULD BE NON-TOXIC AND BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR AS PRETREATED SALT. SNOW PLOWING SHOULD BE DONE CAREFULLY WITH BLADES SET ONE-INCH ABOVE THE SURFACE. PLOWED SNOW PILES AND SNOWMELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.



**PERMEABLE PAVEMENT UNDERDRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'

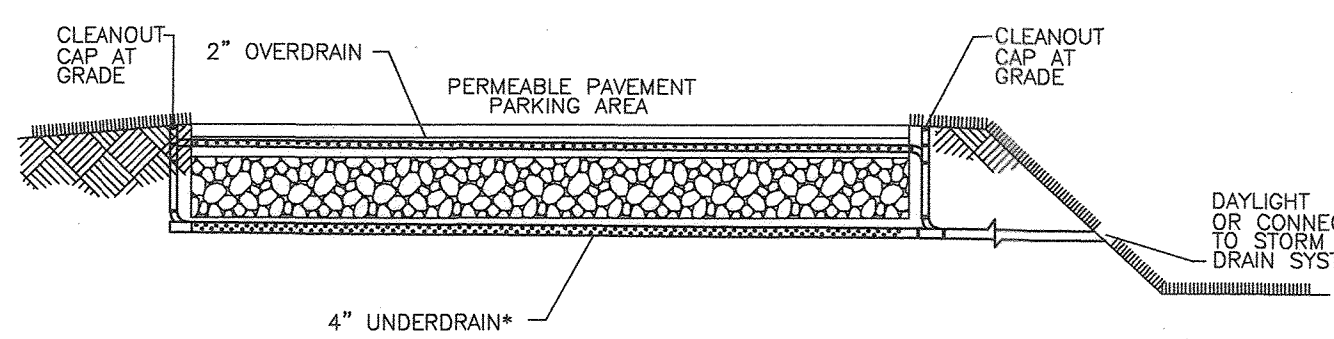
**A-2. PERMEABLE PAVEMENTS**

**CONSTRUCTION CRITERIA:**

- THE FOLLOWING ITEMS SHOULD BE ADDRESSED DURING CONSTRUCTION OF PROJECTS WITH PERMEABLE PAVEMENT:
  - EROSION AND SEDIMENT CONTROL: FINAL GRADING FOR INSTALLATION SHOULD NOT TAKE PLACE UNTIL THE SURROUNDING SITE IS STABILIZED. IF THIS CANNOT BE ACCOMPLISHED, RUNOFF FROM DISTURBED AREAS SHALL BE DIVERTED AROUND PROPOSED PAVEMENT LOCATIONS.
  - SOIL COMPACTION: SUB SOILS SHALL NOT BE COMPACTED. CONSTRUCTION SHOULD BE PERFORMED WITH LIGHTWEIGHT, WIDE TRACKED EQUIPMENT TO MINIMIZE COMPACTION. EXCAVATED MATERIALS SHOULD BE PLACED IN A CONTAINED AREA.
  - DISTRIBUTION SYSTEMS: OVERDRAIN, UNDERDRAIN, AND DISTRIBUTION PIPES SHALL BE CHECKED TO ENSURE THAT BOTH THE MATERIAL AND PERFORATIONS MEET SPECIFICATIONS (SEE APPENDIX B.4). THE UPSTREAM ENDS OF PIPES SHOULD BE CAPPED PRIOR TO INSTALLATION. ALL UNDERDRAIN OR DISTRIBUTION PIPES USED SHOULD BE INSTALLED FLAT ALONG THE BED BOTTOM.
  - SUBBASE INSTALLATION: SUBBASE AGGREGATE SHALL BE CLEAN AND FREE OF FINES. THE SUBBASE SHALL BE PLACED IN LIFTS AND LIGHTLY ROLLED ACCORDING TO THE SPECIFICATIONS (SEE APPENDIX B.4).
- INSPECTION:**  
REGULAR INSPECTIONS SHALL BE MADE DURING THE FOLLOWING STAGES OF CONSTRUCTION:
  - DURING EXCAVATION TO SUB GRADE.
  - DURING PLACEMENT AND BACKFILL OF ANY DRAINAGE OR DISTRIBUTION SYSTEM(S).
  - DURING PLACEMENT OF THE CRUSHED STONE SUBBASE MATERIAL.
  - DURING PLACEMENT OF THE SURFACE MATERIAL.
  - UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

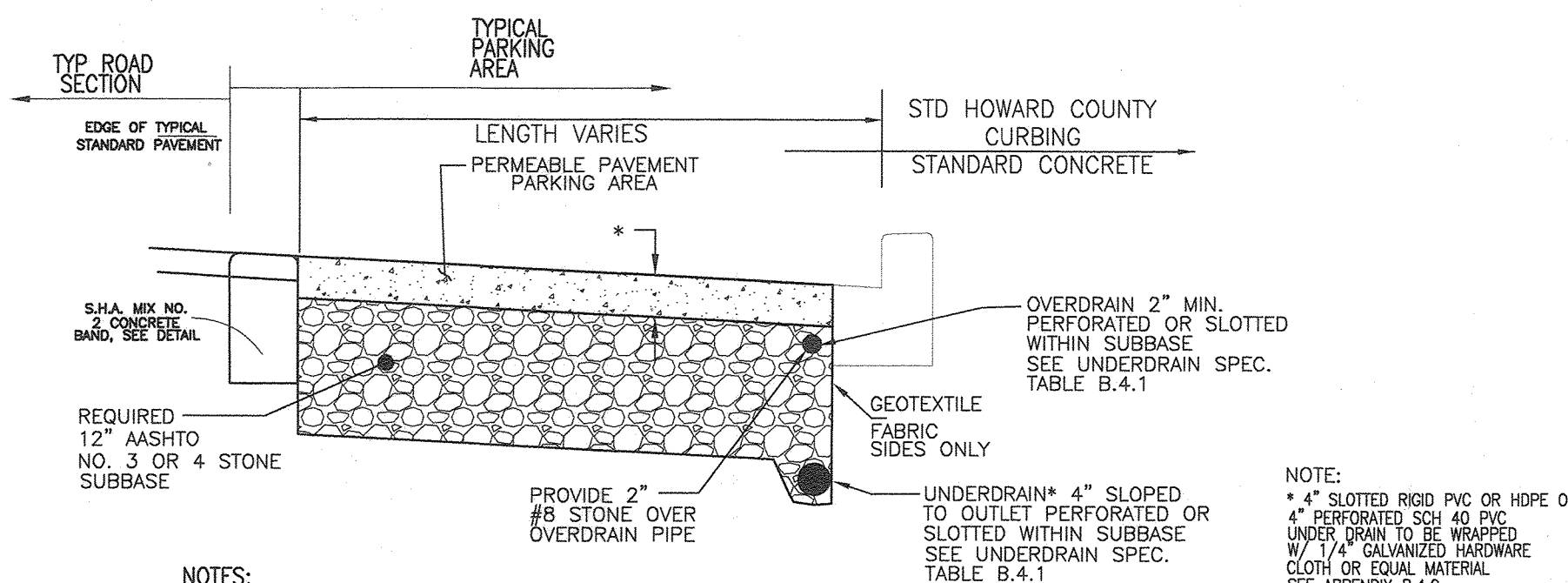
**MAINTENANCE CRITERIA:**

- THE FOLLOWING PROCEDURES SHOULD BE CONSIDERED ESSENTIAL FOR MAINTAINING PERMEABLE PAVEMENT SYSTEMS:
  - PAVEMENTS SHOULD BE USED ONLY WHERE REGULAR MAINTENANCE CAN BE PERFORMED. MAINTENANCE AGREEMENTS SHOULD CLEARLY SPECIFY HOW TO CONDUCT ROUTINE TASKS TO ENSURE LONG-TERM PERFORMANCE.
  - PAVEMENT SURFACES SHOULD BE SWEEPED AND VACUUMED TO REDUCE SEDIMENT ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. WASHING OR COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
  - DRAINAGE PIPES, INLETS, STONE EDGE DRAINS, AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SUBBASE SHOULD BE CLEANED OUT AT REGULAR INTERVALS.
  - TRUCKS AND OTHER HEAVY VEHICLES CAN GRIND DIRT AND GRIT INTO THE POROUS SURFACES, LEADING TO CLOGGING AND PREMATURE FAILURE. THESE VEHICLES SHOULD BE PREVENTED FROM TRACKING AND SPILLING MATERIAL ONTO THE PAVEMENT.
  - DECICERS SHOULD BE USED IN MODERATION. WHEN USED, DECICERS SHOULD BE NON-TOXIC AND ORGANIC AND CAN BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR AS PRETREATED SALT. SNOW PLOWING SHOULD BE DONE CAREFULLY WITH BLADES SET ONE-INCH HIGHER THAN NORMAL. PLOWED SNOW PILES AND SNOW MELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.



**TYPICAL PERMEABLE PAVEMENT UNDERDRAIN / OVERDRAIN OUTLET DETAIL**  
NOT TO SCALE

**NOTE:**  
\* 4" SLOTTED RIGID PVC OR HDPE OR 4" PERFORATED SCH 40 PVC UNDERDRAIN TO BE WRAPPED BY 1/4" GALVANIZED HARDWARE CLOTH OR EQUAL MATERIAL. SEE APPENDIX B.4.C.  
DAYLIGHT OR TIE TO STORM DRAIN STRUCTURE AS SHOWN IN PLAN VIEW



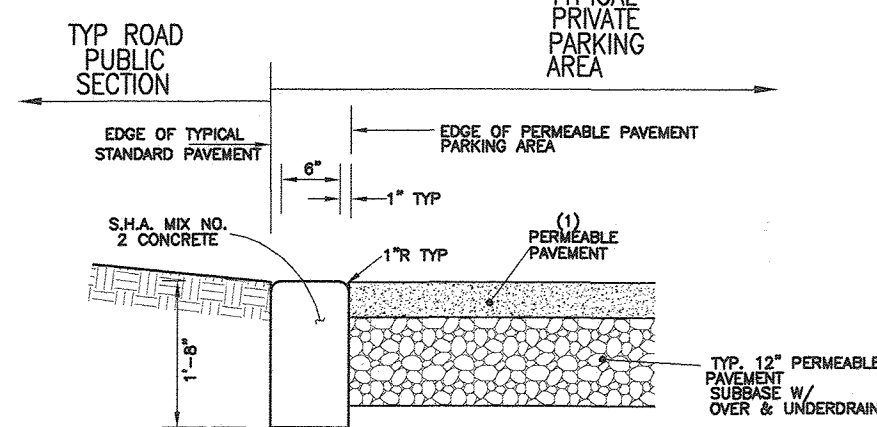
**NOTES:**

- PAVEMENT CROSS SECTION/THICKNESS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER
- UNDERDRAIN SHALL BE LOCATED SUCH THAT IT CAN DAYLIGHT OR CONNECT TO STORM DRAIN SYSTEM
- OVERDRAIN SHALL COMBINE WITH UNDERDRAIN
- AN UNDERDRAIN CLEANOUT SHALL BE PROVIDED ON THE HIGH AND LOW SIDE OF THE FACILITY

**DETAIL - PERMEABLE PAVEMENT - PARKING AREA**

NOT TO SCALE

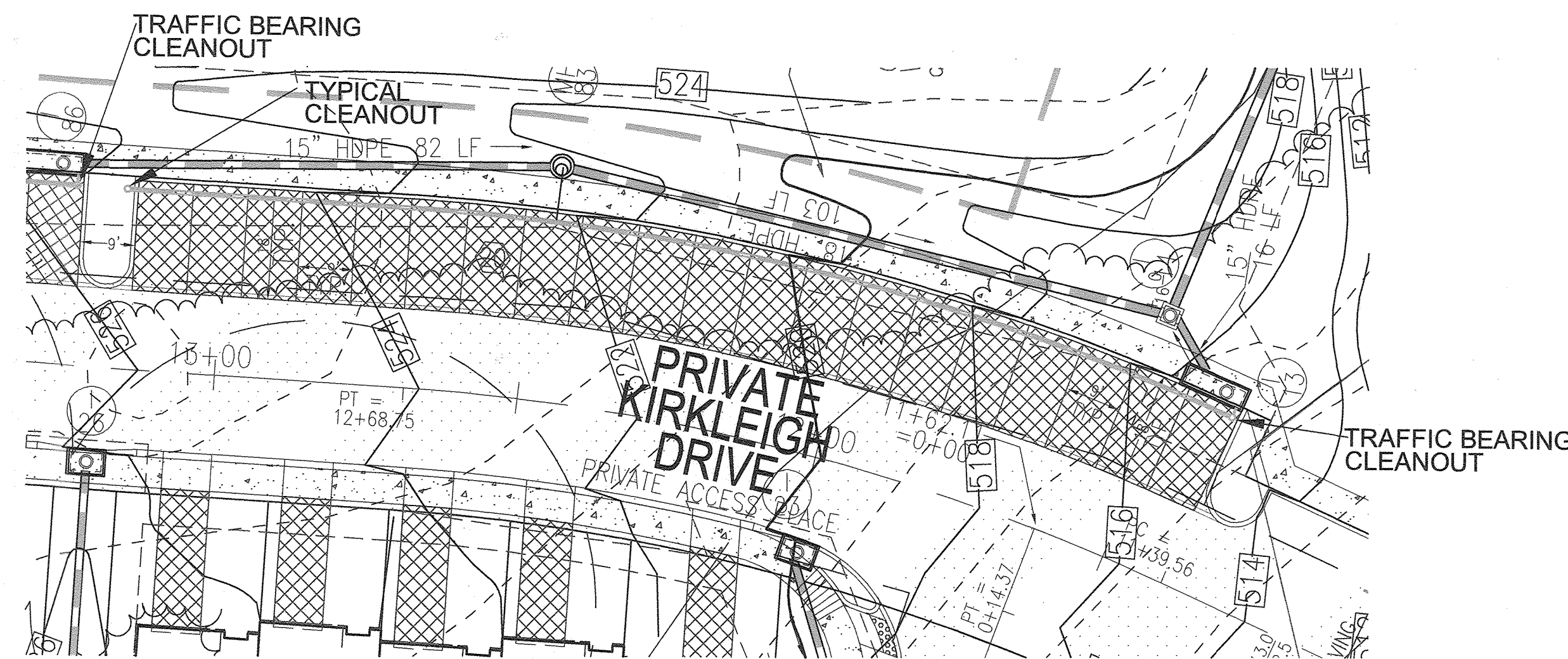
\*ALL PERMEABLE PAVEMENT THICKNESS, MIX AND SUB-BASE TO BE DETERMINED BY GEOTECHNICAL ENGINEER ONSITE.



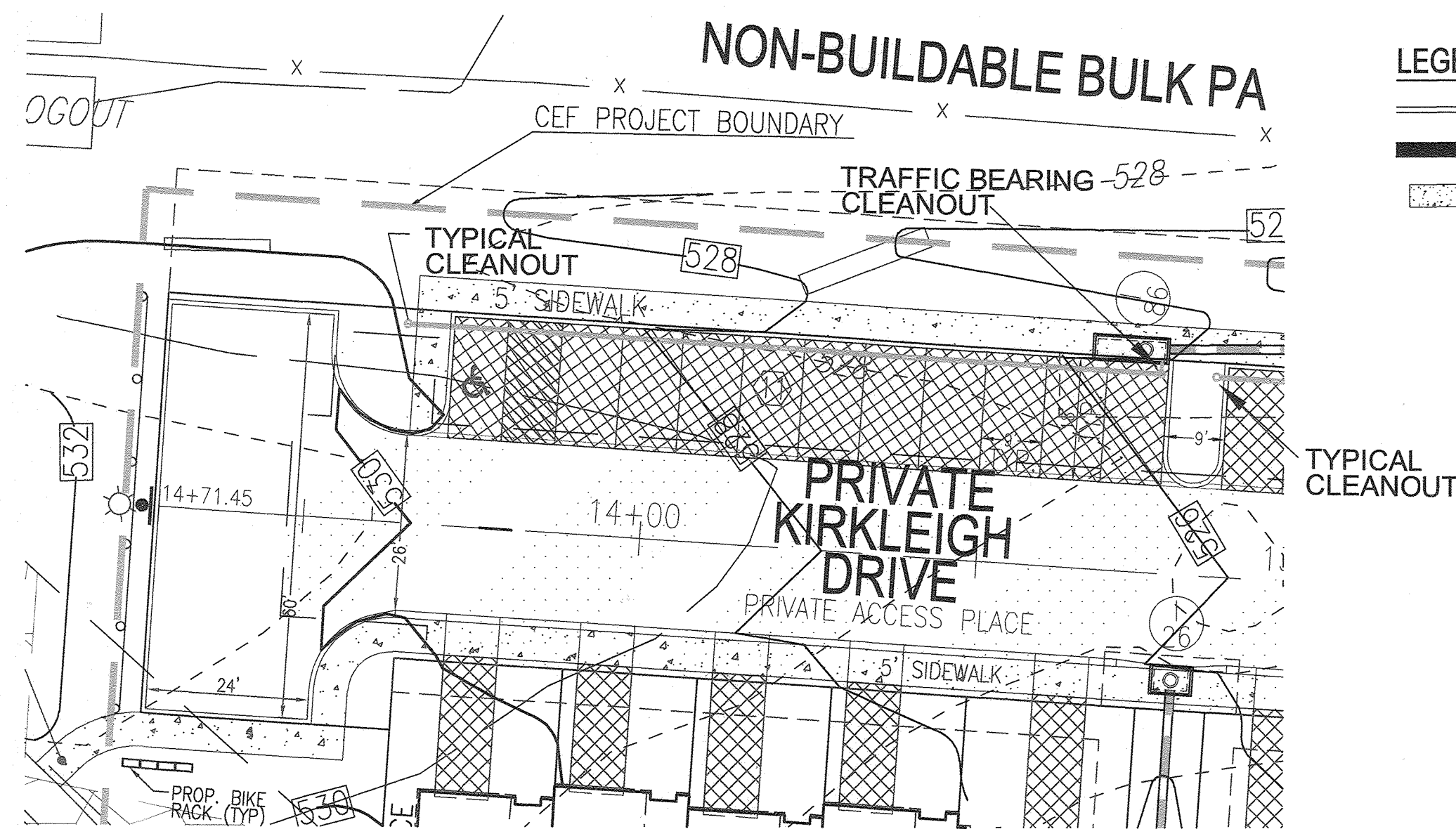
**NOTES:**

- PAVEMENT CROSS SECTION/THICKNESS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER
- REFER TO "DETAIL - PERMEABLE PAVEMENT - PARKING AREA" DETAIL FOR TYPICAL SECTION, UNDER AND OVERDRAIN REQUIREMENTS

**PERMEABLE PAVEMENT - PARKING CONCRETE BAND**  
(NOT TO SCALE)



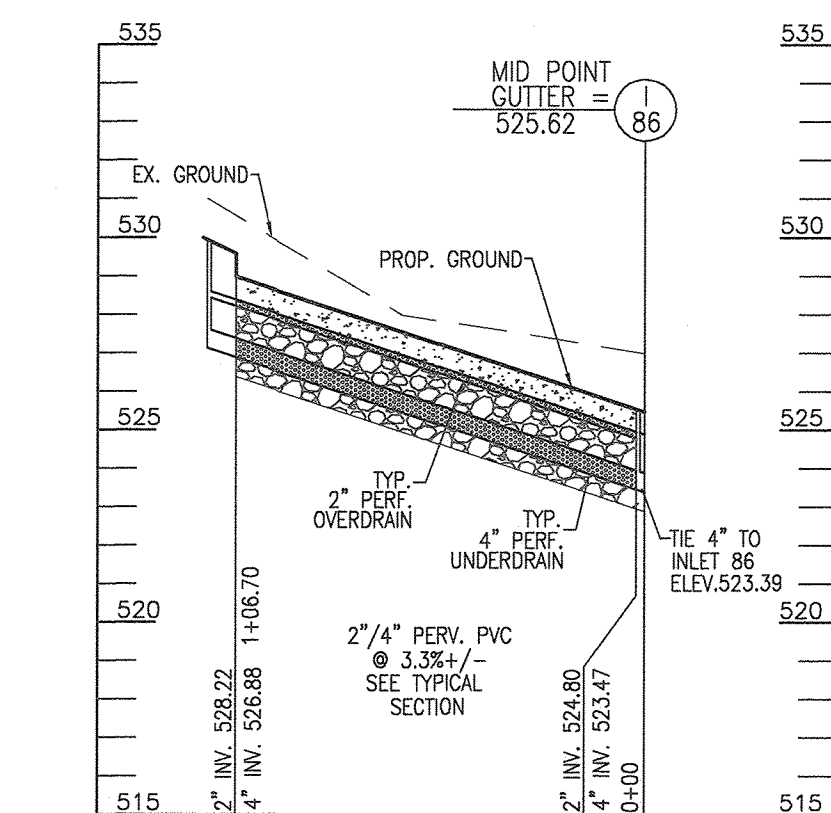
**PERMEABLE PAVEMENT - PARKING AREA TO I-13**  
SCALE: 1"=20'



**PERMEABLE PAVEMENT - PARKING AREA TO I-86**  
SCALE: 1"=20'

**LEGEND:**

- PROPOSED CURB AND GUTTER
- PROPOSED STORM DRAIN
- PROPOSED SIDEWALK
- ALTERNATIVE SURFACE PERMEABLE PAVEMENT (A-2)



**PERMEABLE PAVEMENT UNDERDRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MK 09/14/2022 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION 9/21/22 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT 9/20/22 DATE

PERMEABLE PAVEMENT UNDERDRAIN OUTFALL		
SWM DA #	UNDERDRAIN MIN. INVERT	OUTFALL LOCATION
DA 1	523.39	UNDERDRAIN TO OUTFALL TO I-86
DA 3	512.50	UNDERDRAIN TO OUTFALL TO I-13

**OWNER:**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER:**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
PERMEABLE PAVEMENT PARKING AREA - NOTES & DETAILS  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PARCELS: 110 & 421 L 1389/F 339 (P. 110)  
TAX MAP: 16 GRD: 10 L 4163/YE: 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M L 4163/YE: 424 (P. 421)  
HOWARD COUNTY, MARYLAND

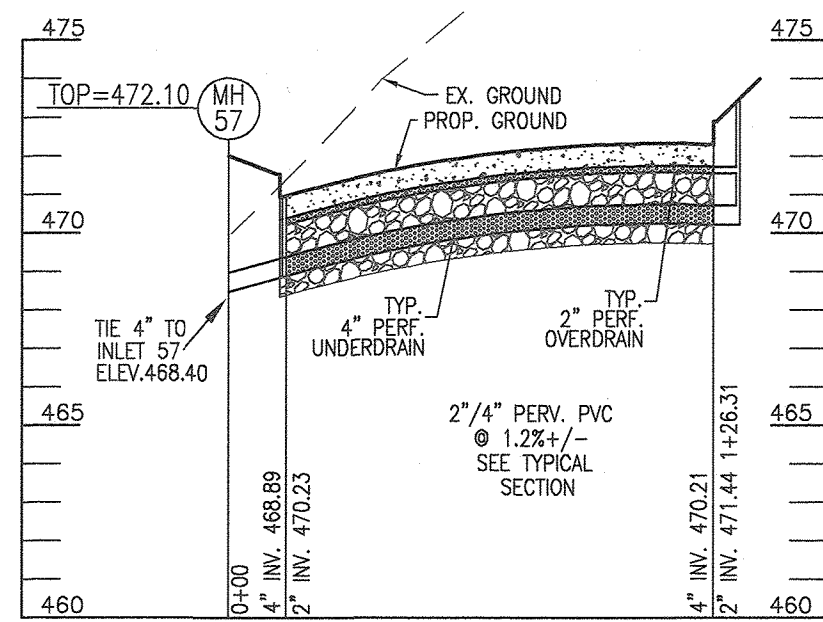
**VOGEL ENGINEERING**  
**TIMMONS GROUP**  
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
P: 410.461.7666 F: 410.461.8961 www.timmons.com

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16183 EXPIRATION DATE: 09-27-2022

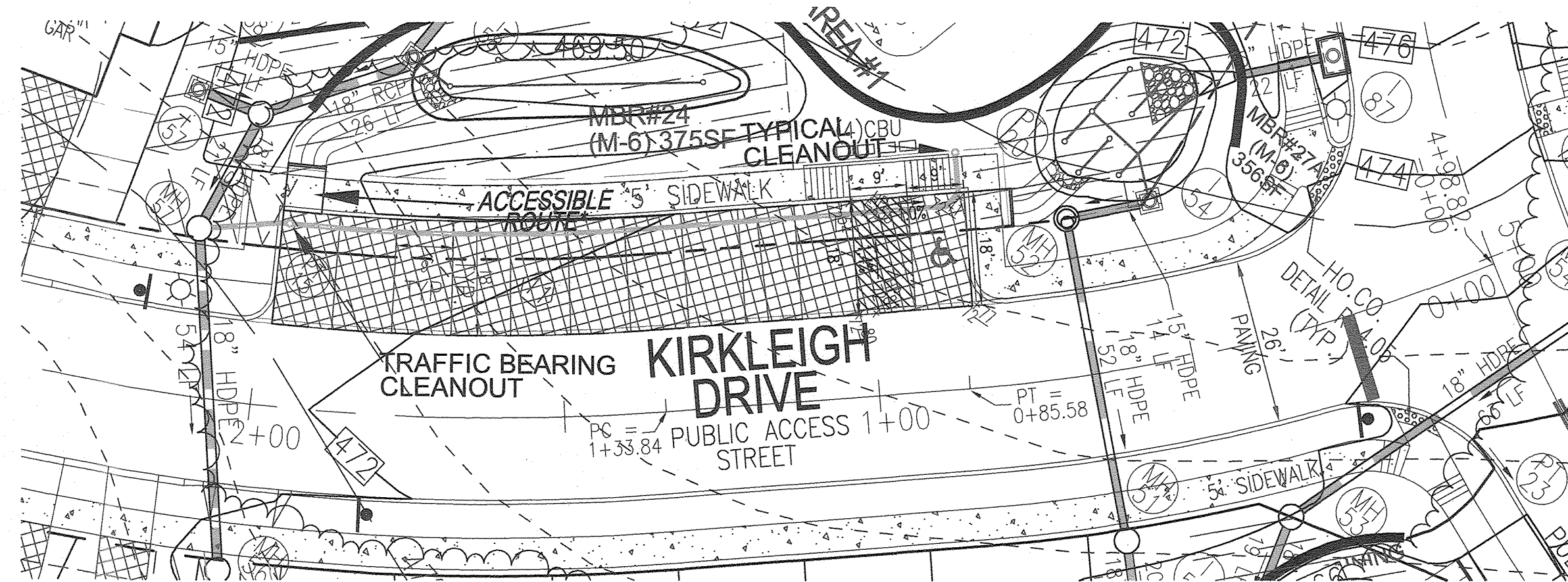
DESIGN BY: ES, RHV  
DRAWN BY: VE+TG  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-36 / 40220

51 SHEET OF 101





PERMEABLE PAVEMENT UNDERDRAIN PROFILE  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'

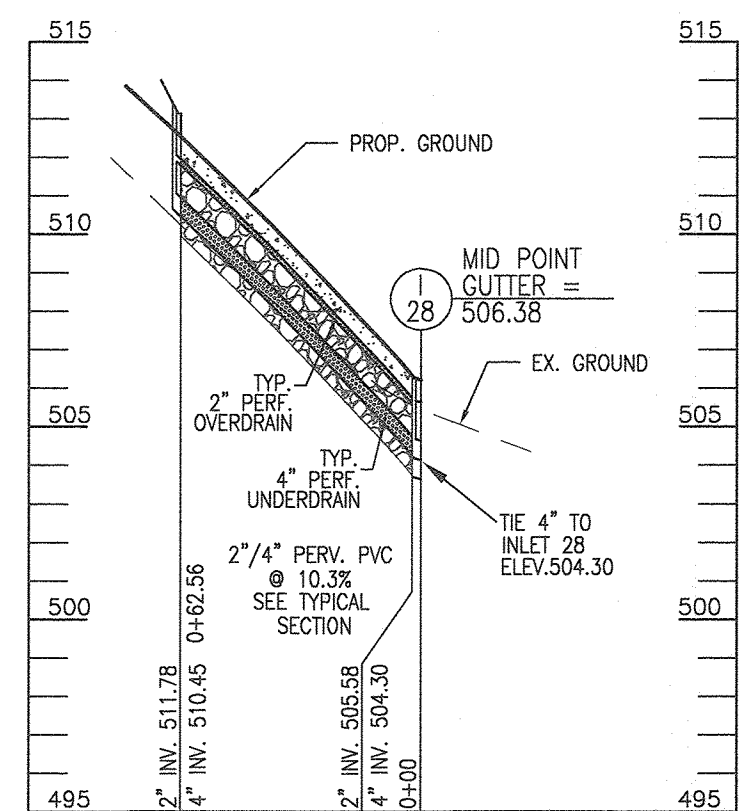


PERMEABLE PAVEMENT - PARKING AREA TO MH-57  
SCALE: 1"=20'

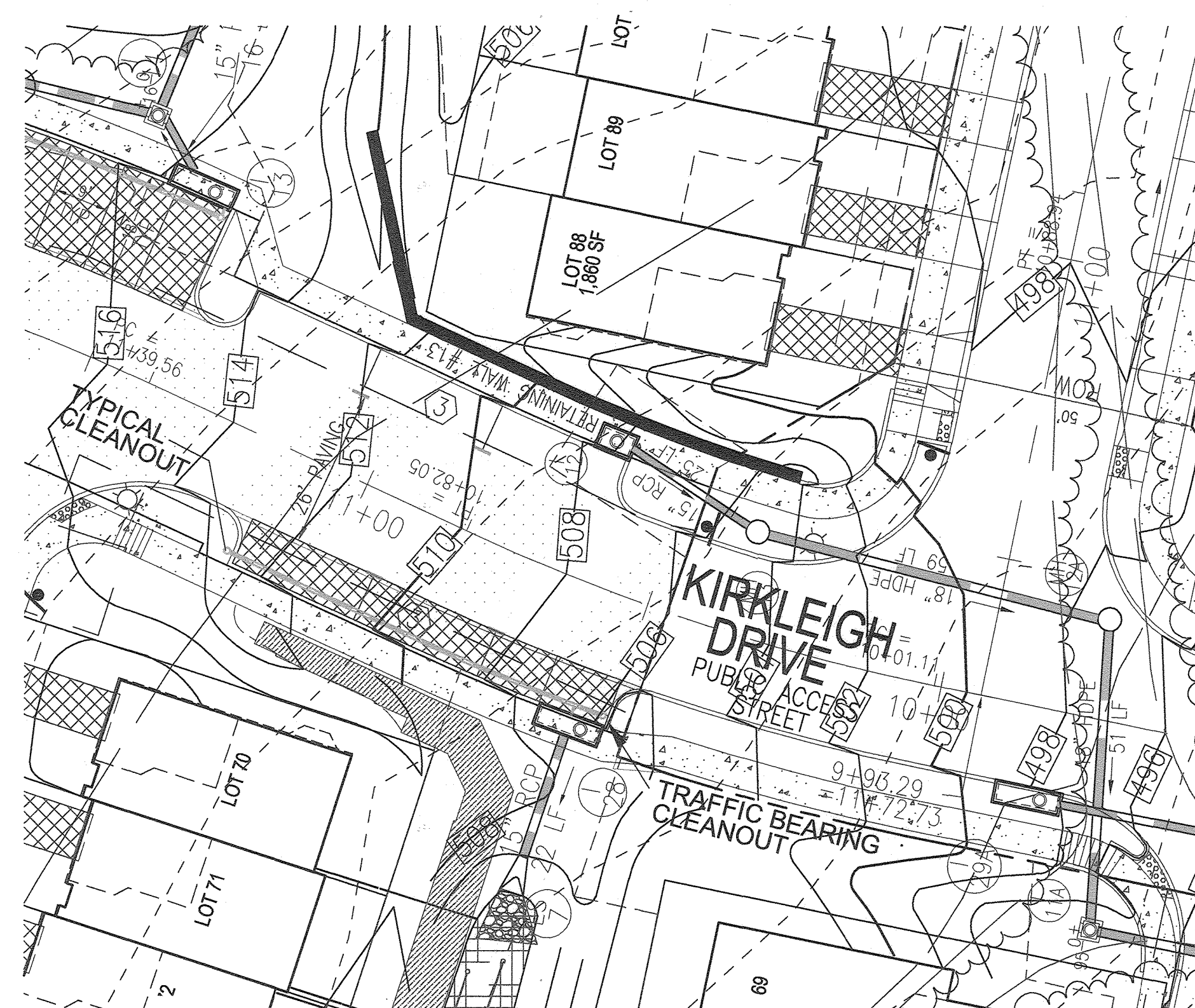
PERMEABLE PAVEMENT UNDERDRAIN OUTFALL		
SWM DA #	UNDERDRAIN MIN. INVERT	OUTFALL LOCATION
DA 5	504.30	UNDERDRAIN TO OUTFALL TO I-28
LOOP TRAIL DA 24 & 27A	468.40	UNDERDRAIN TO OUTFALL TO MH-57

LEGEND:

- PROPOSED CURB AND GUTTER
- PROPOSED STORM DRAIN
- PROPOSED SIDEWALK
- ALTERNATIVE SURFACE PERMEABLE PAVEMENT (A-2)



PERMEABLE PAVEMENT UNDERDRAIN PROFILE  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



PERMEABLE PAVEMENT - PARKING AREA TO I-28  
SCALE: 1"=20'

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

NOTE: DRIVEWAY DETAILING (PLAN & PROFILE) WILL BE PART OF THE BUILDER'S FUTURE SITE DEVELOPMENT PLAN.

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
PERMEABLE PAVEMENT  
PARKING AREA DETAILS  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
TAX MAP: 16 GRID 10 L 4183/F. 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS MK 09/14/2022 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 9.21.22 DATE

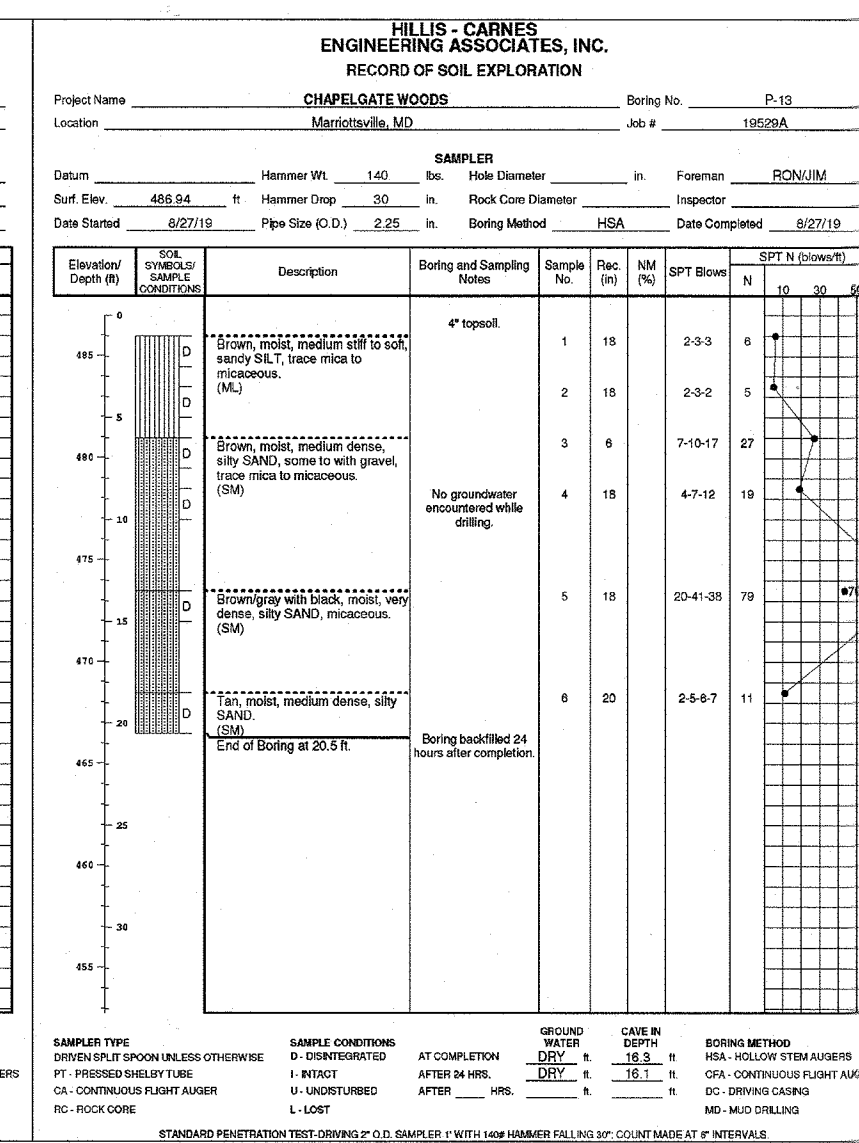
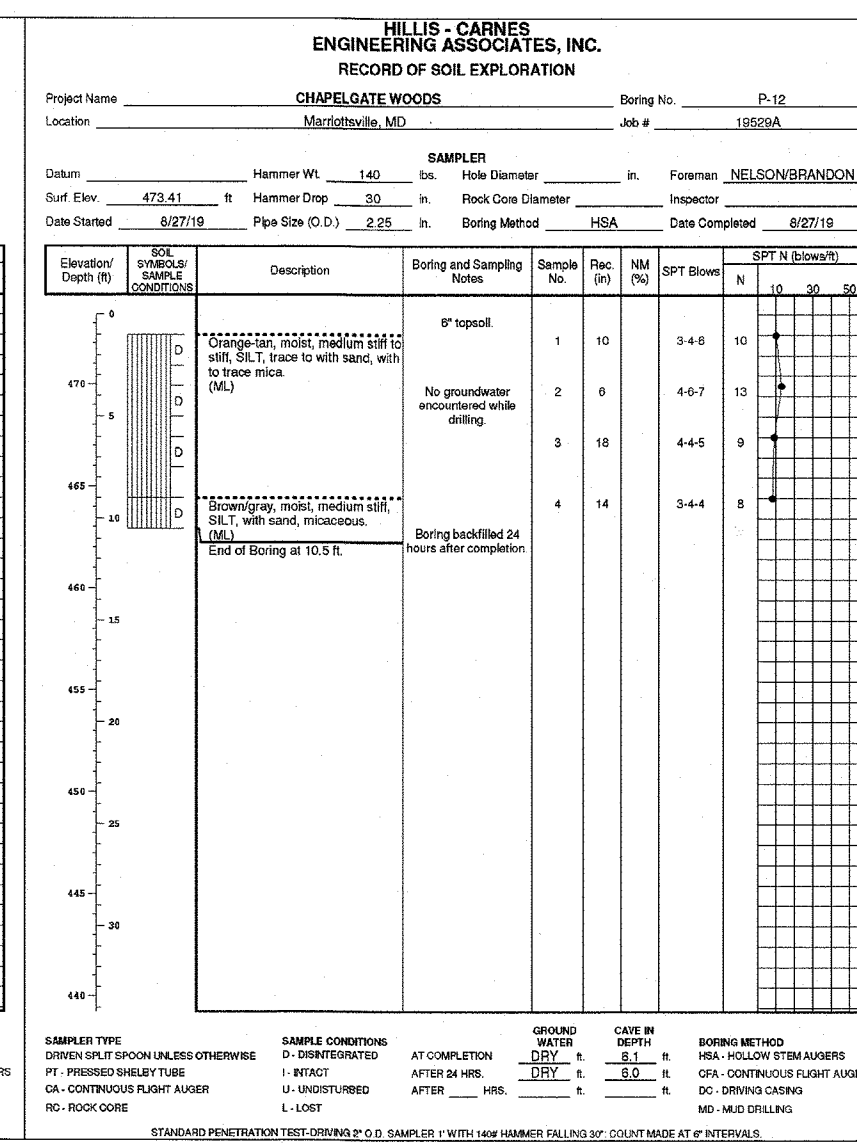
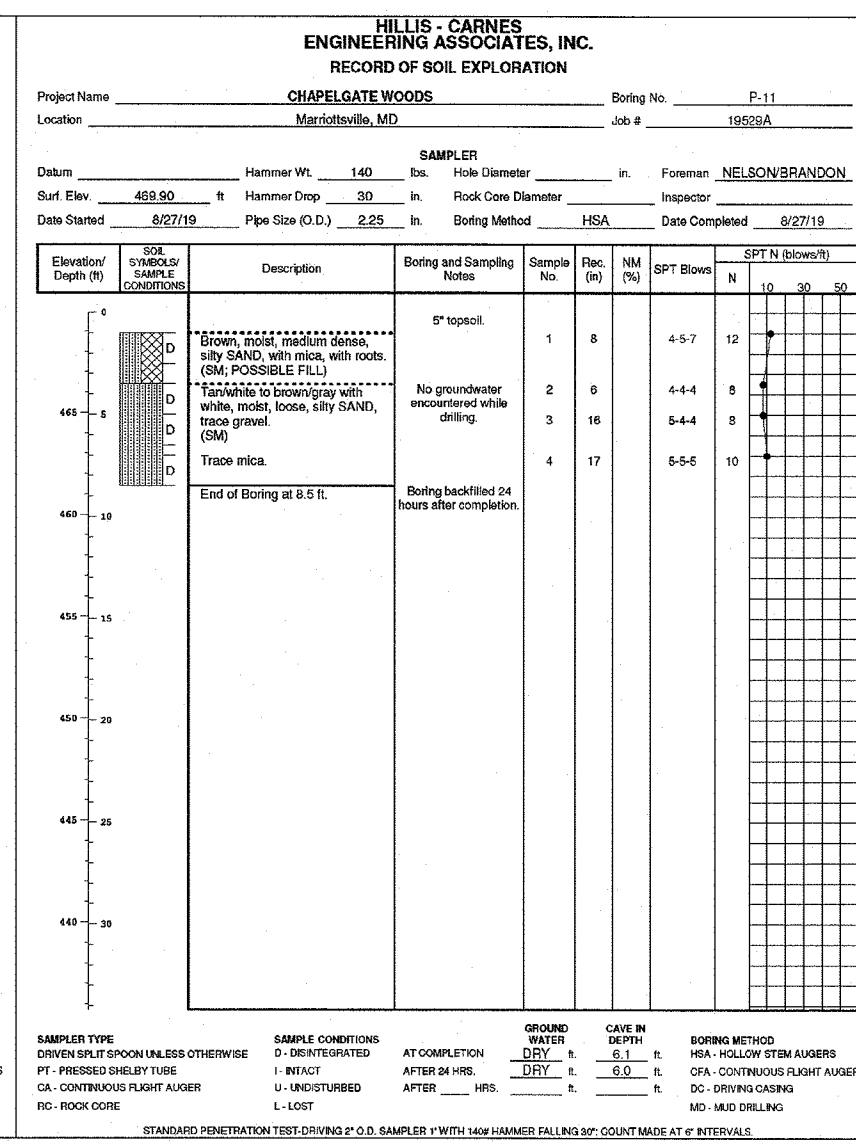
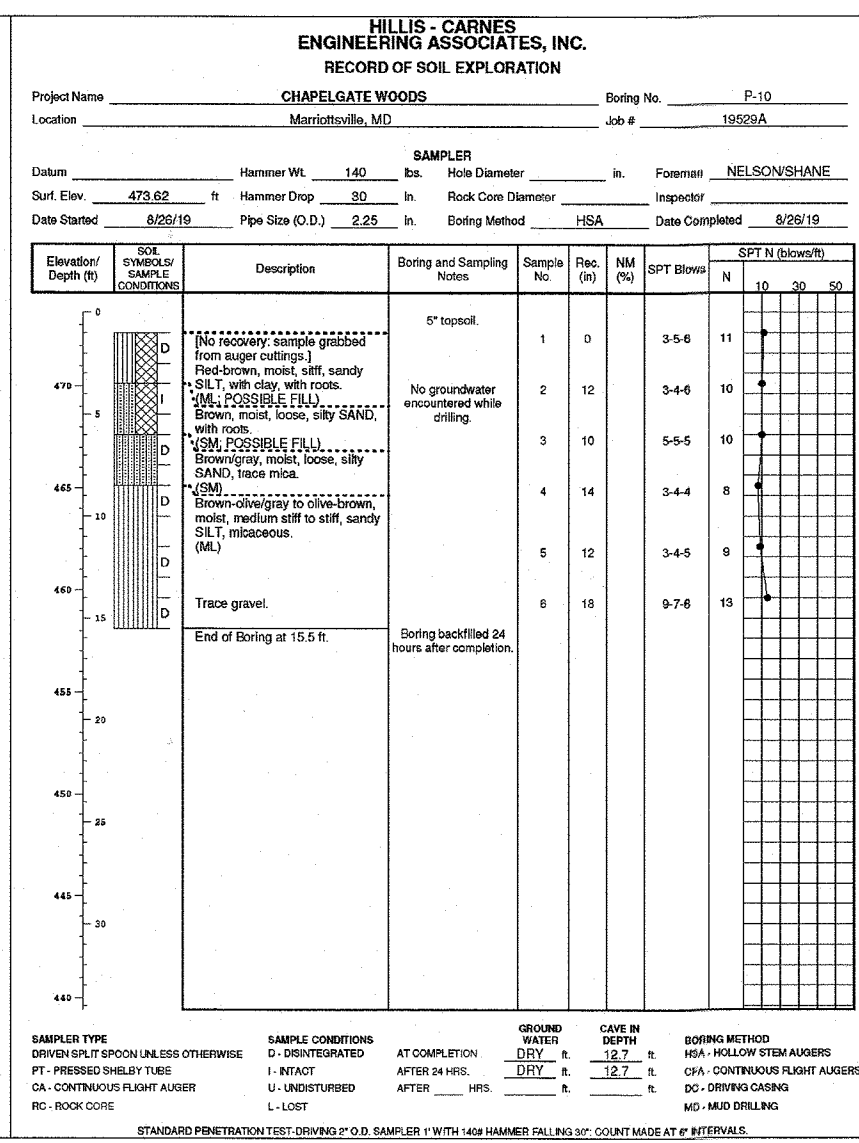
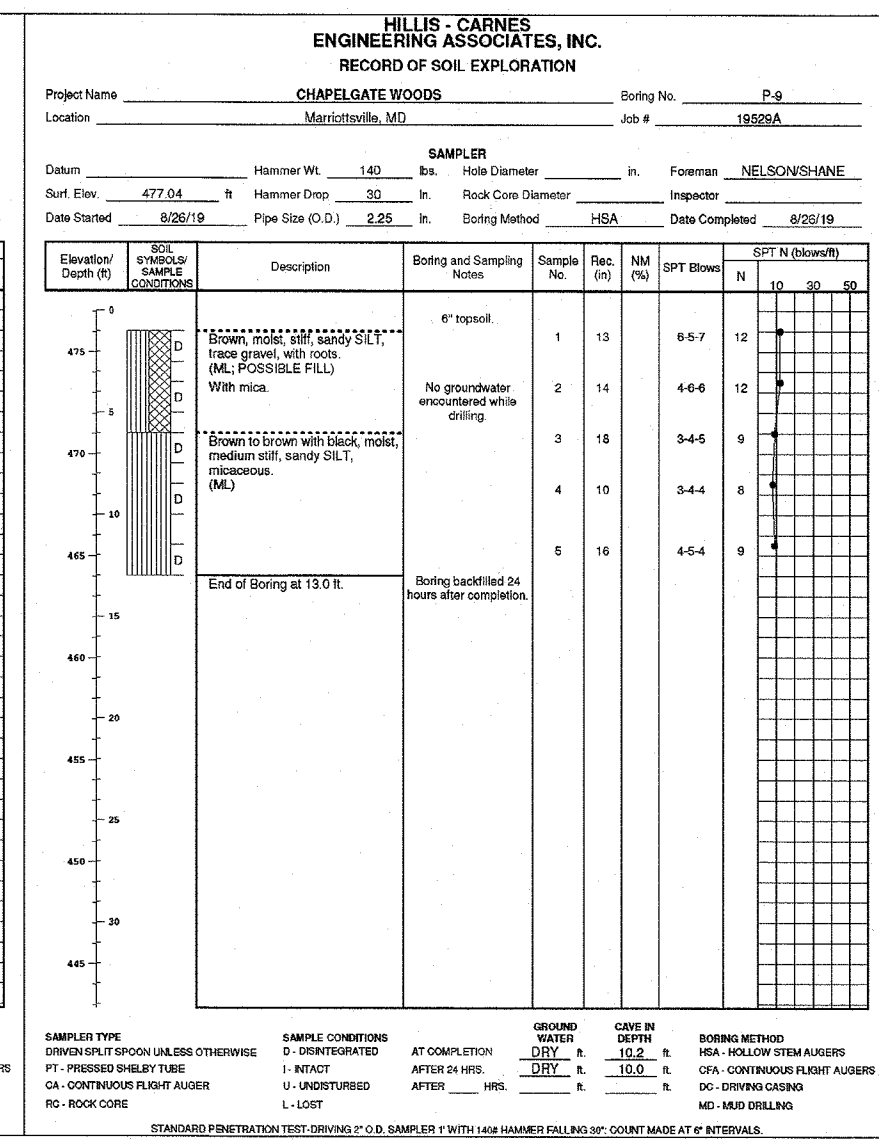
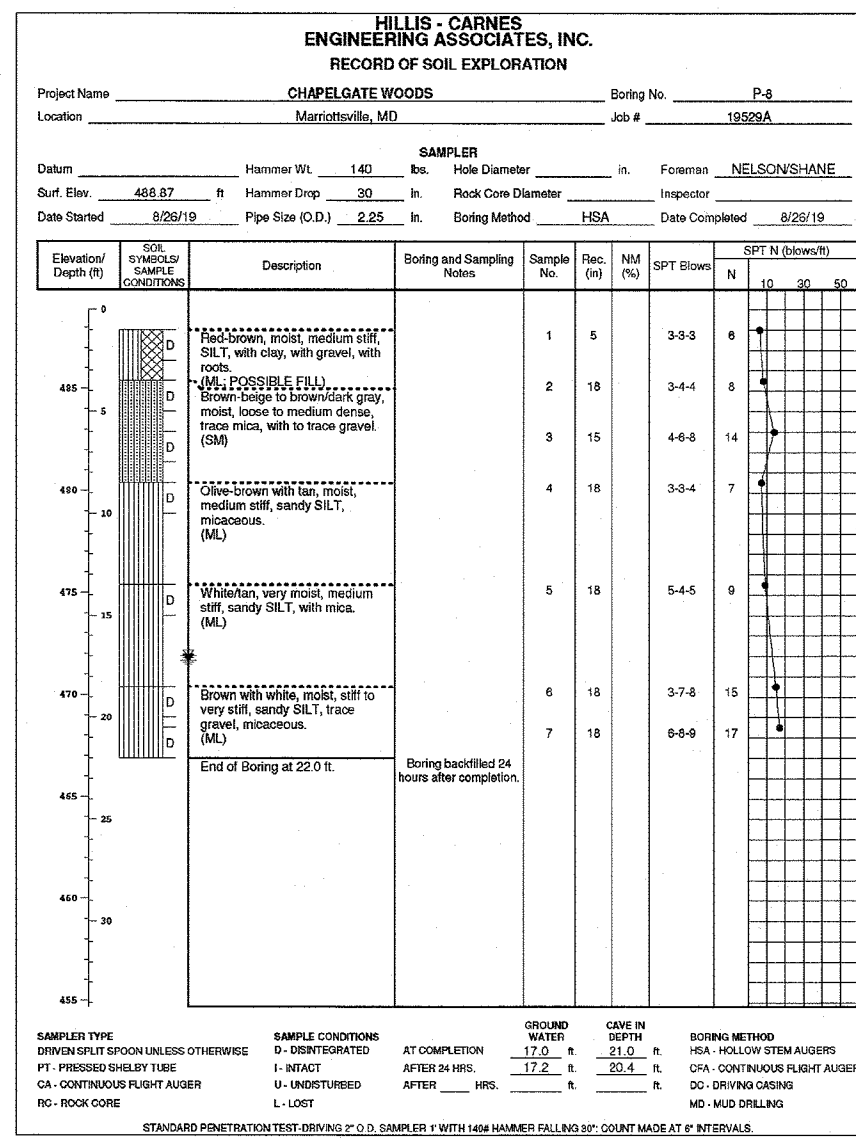
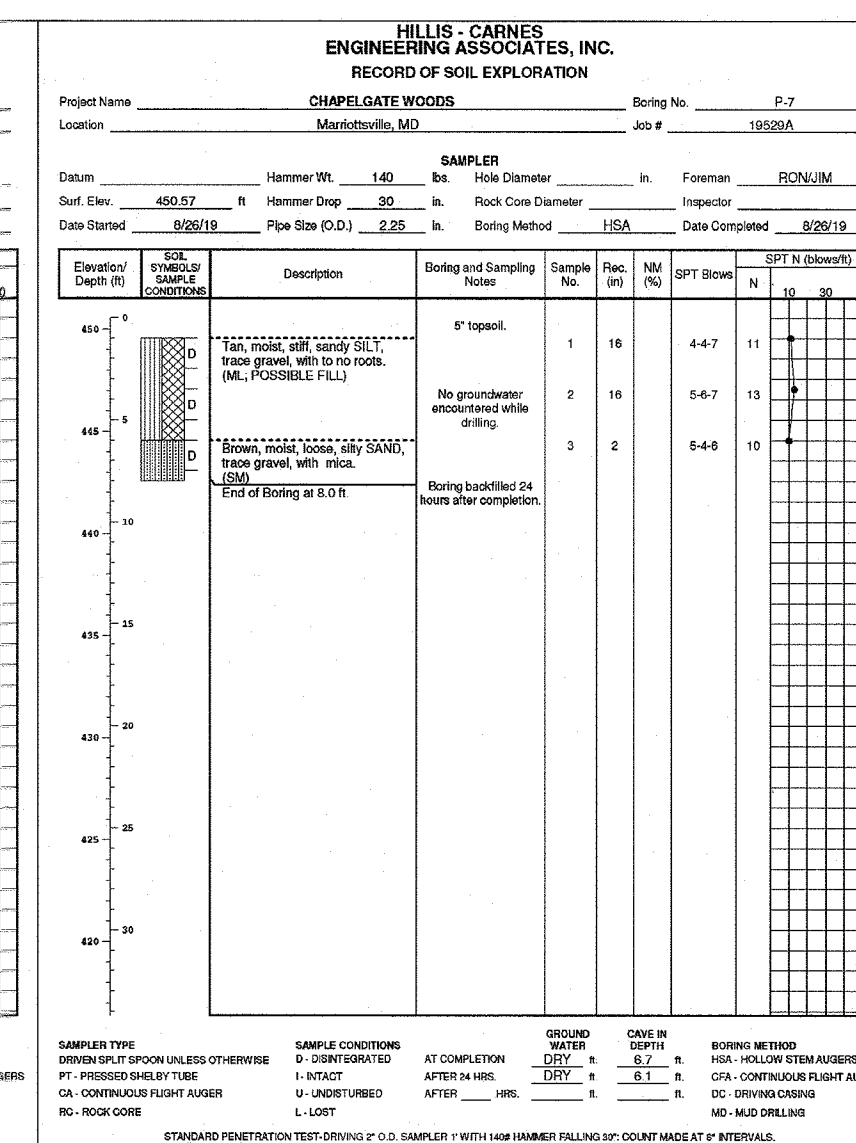
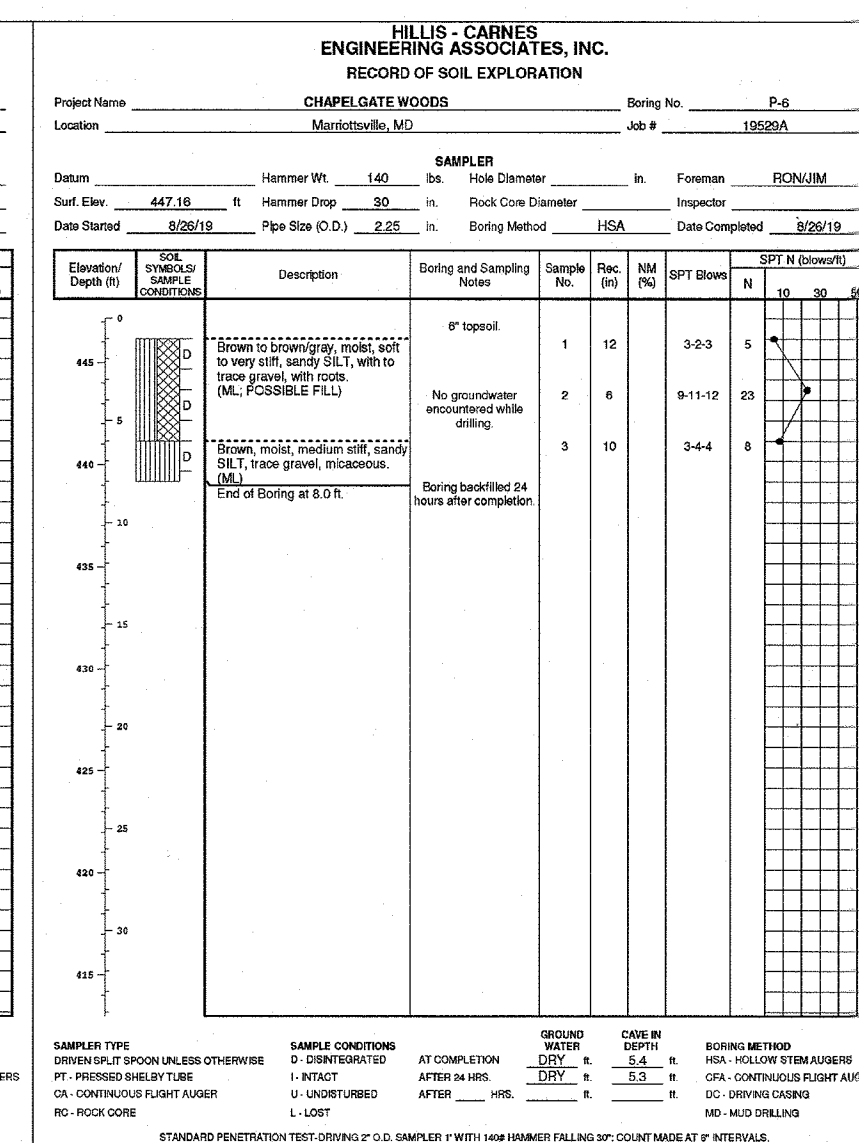
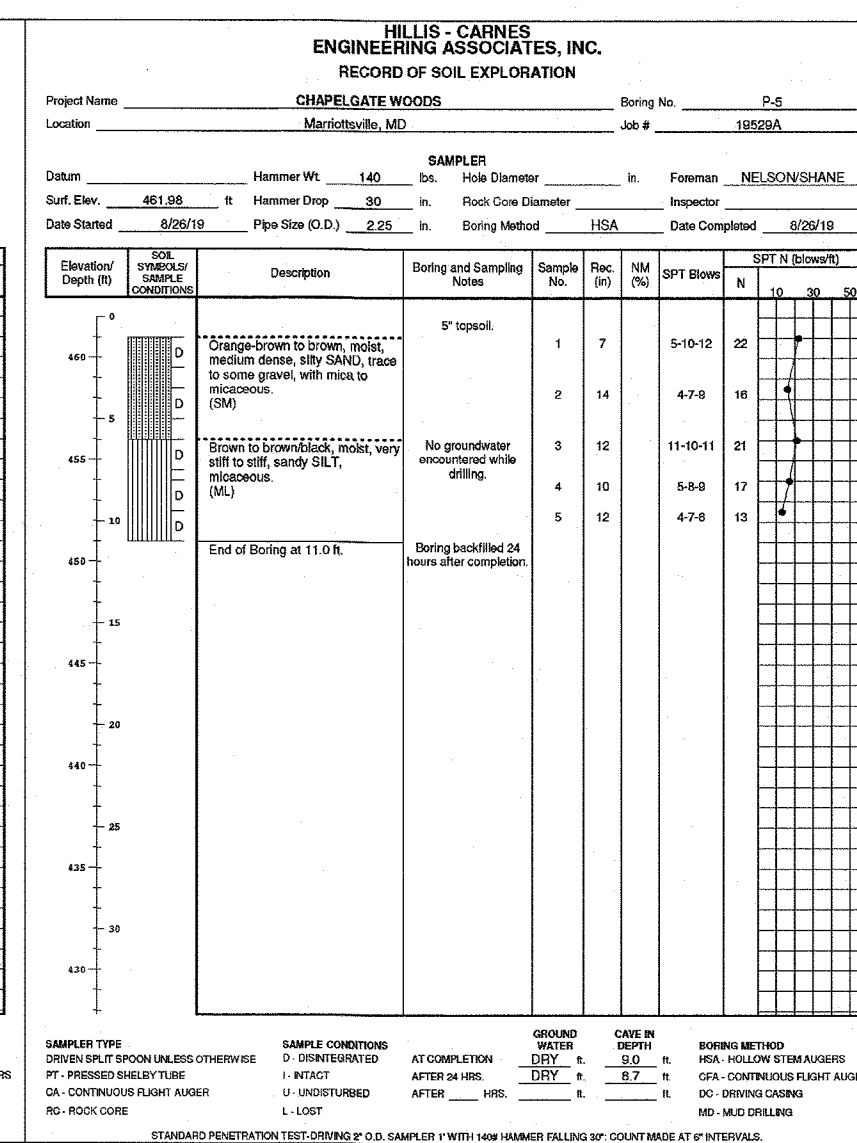
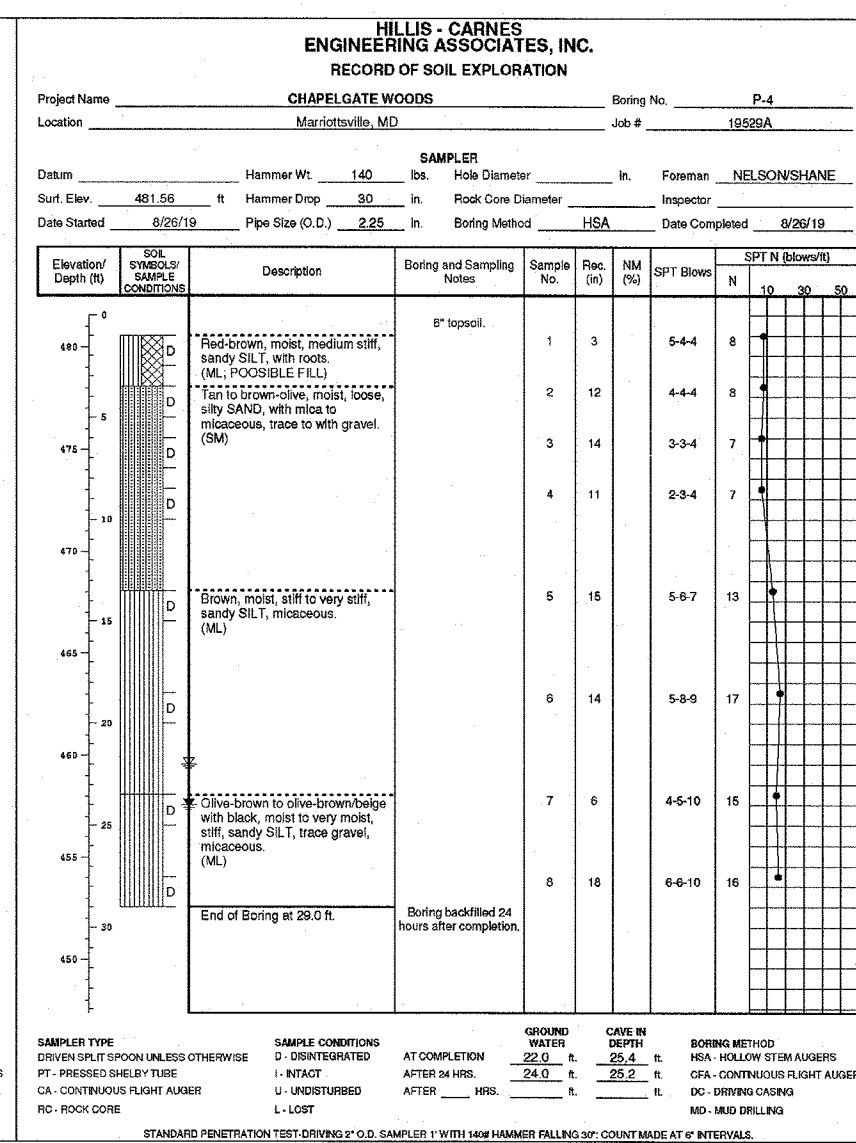
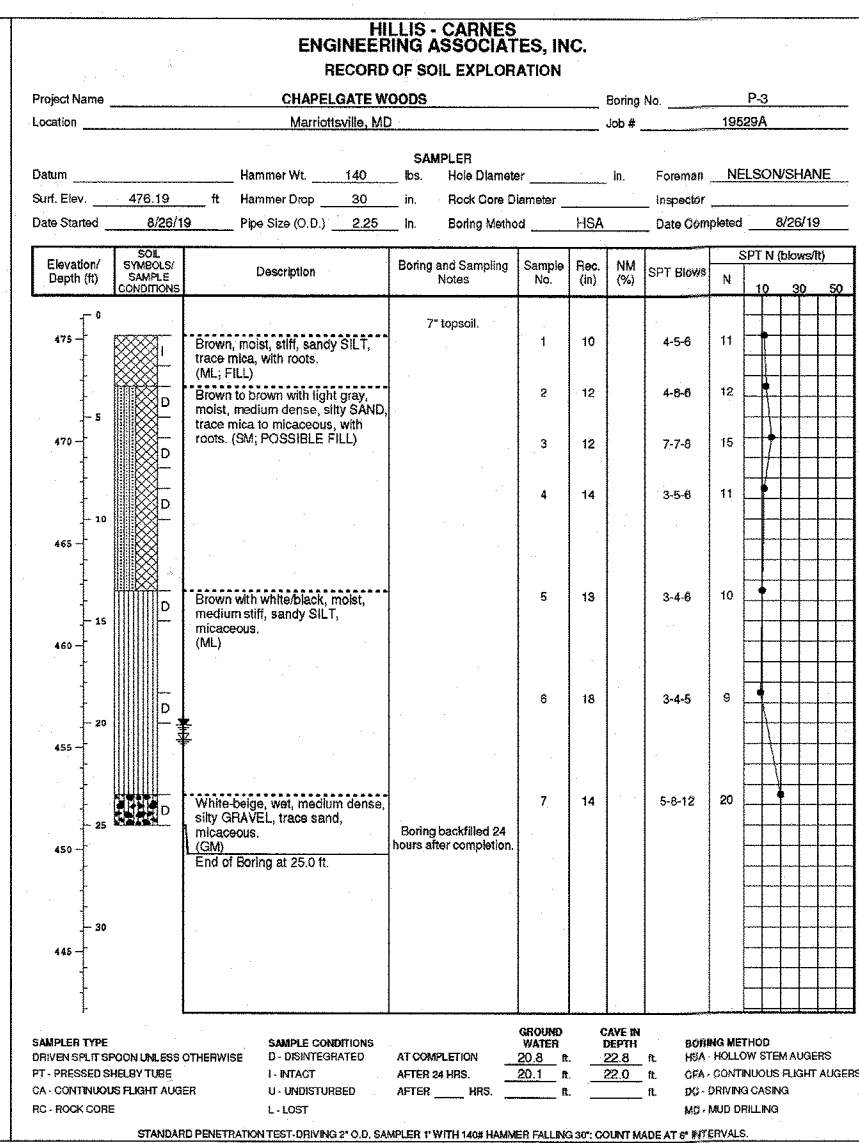
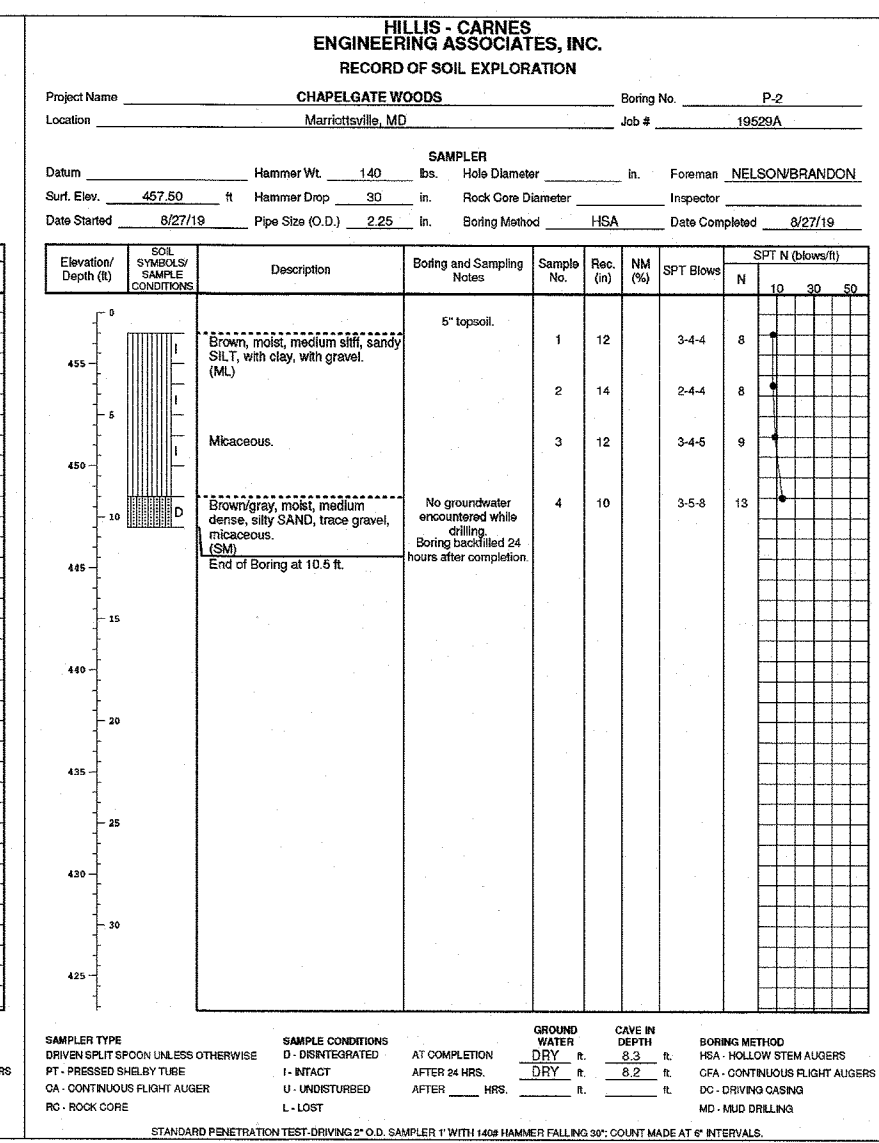
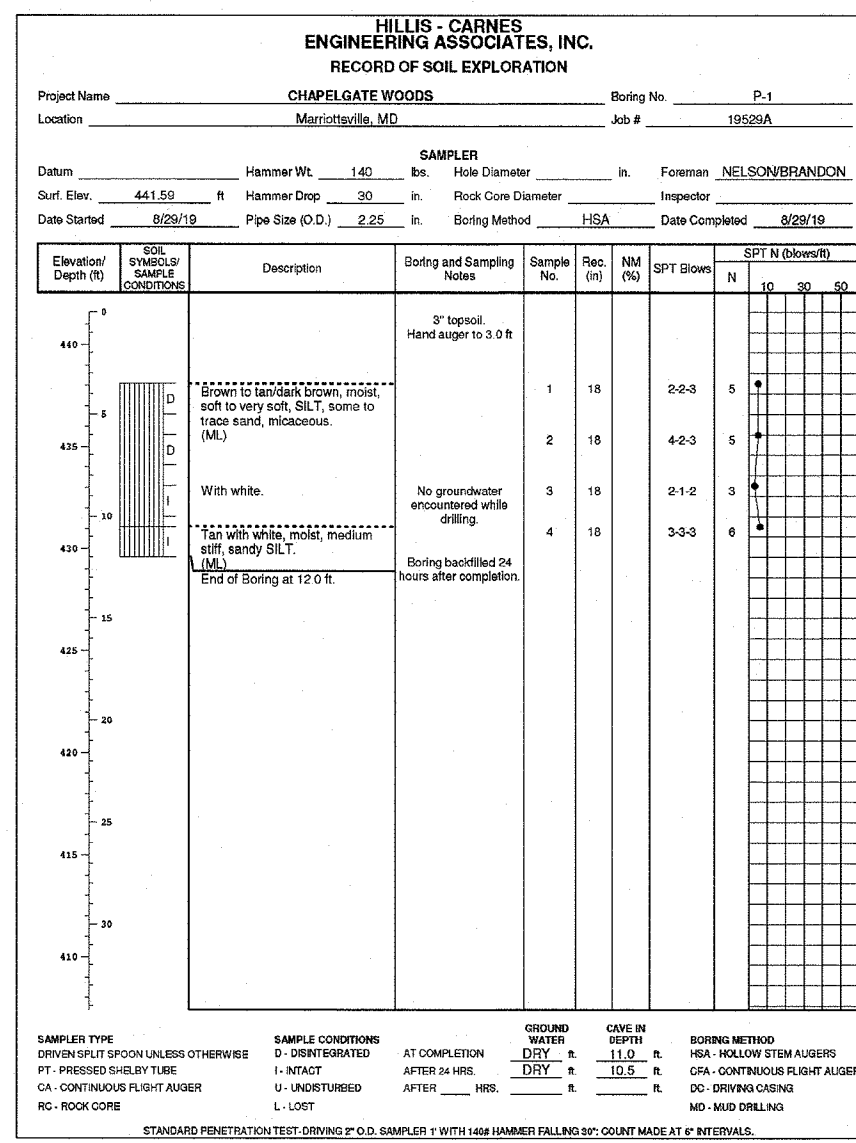
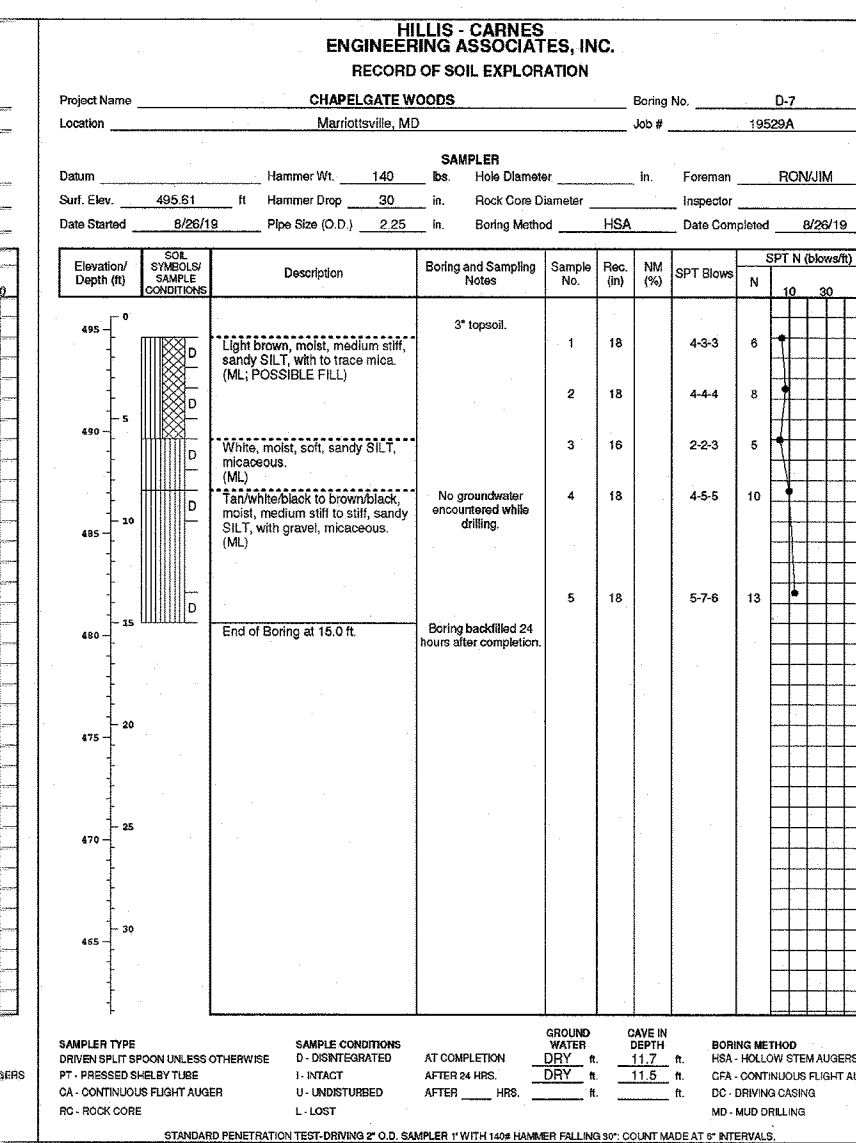
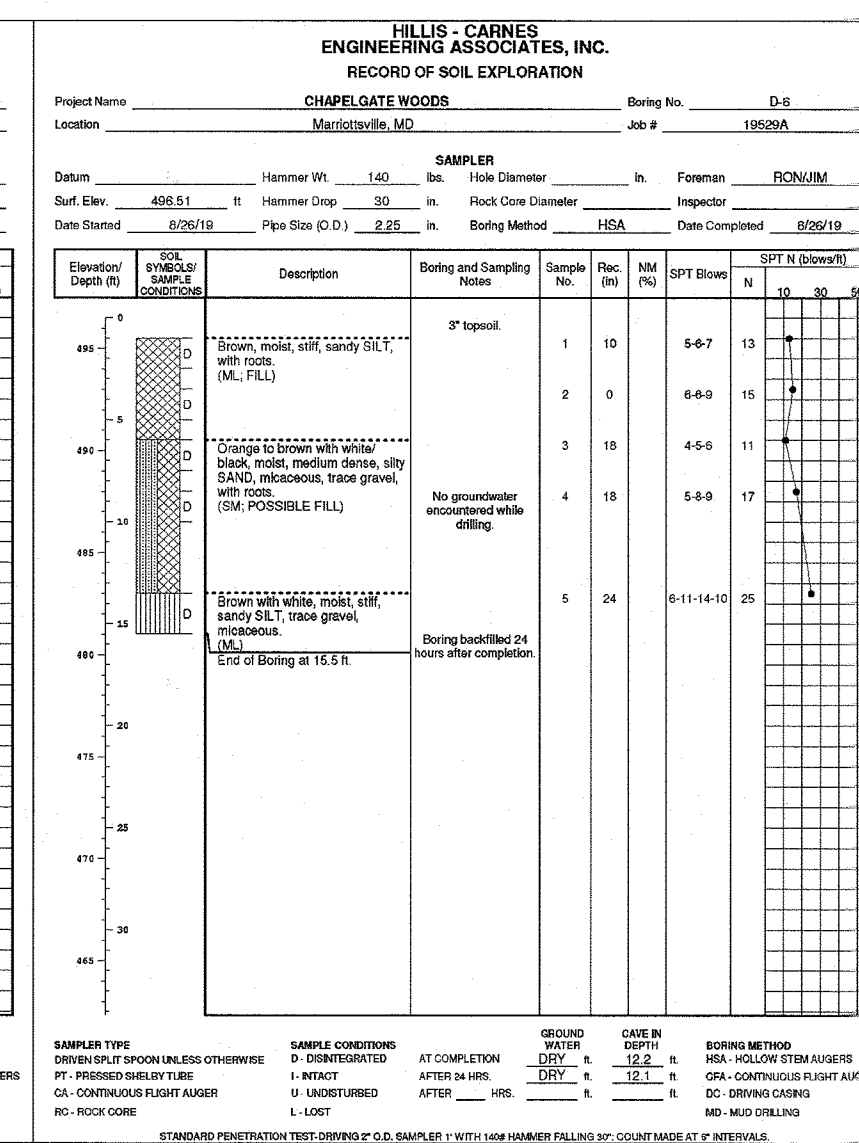
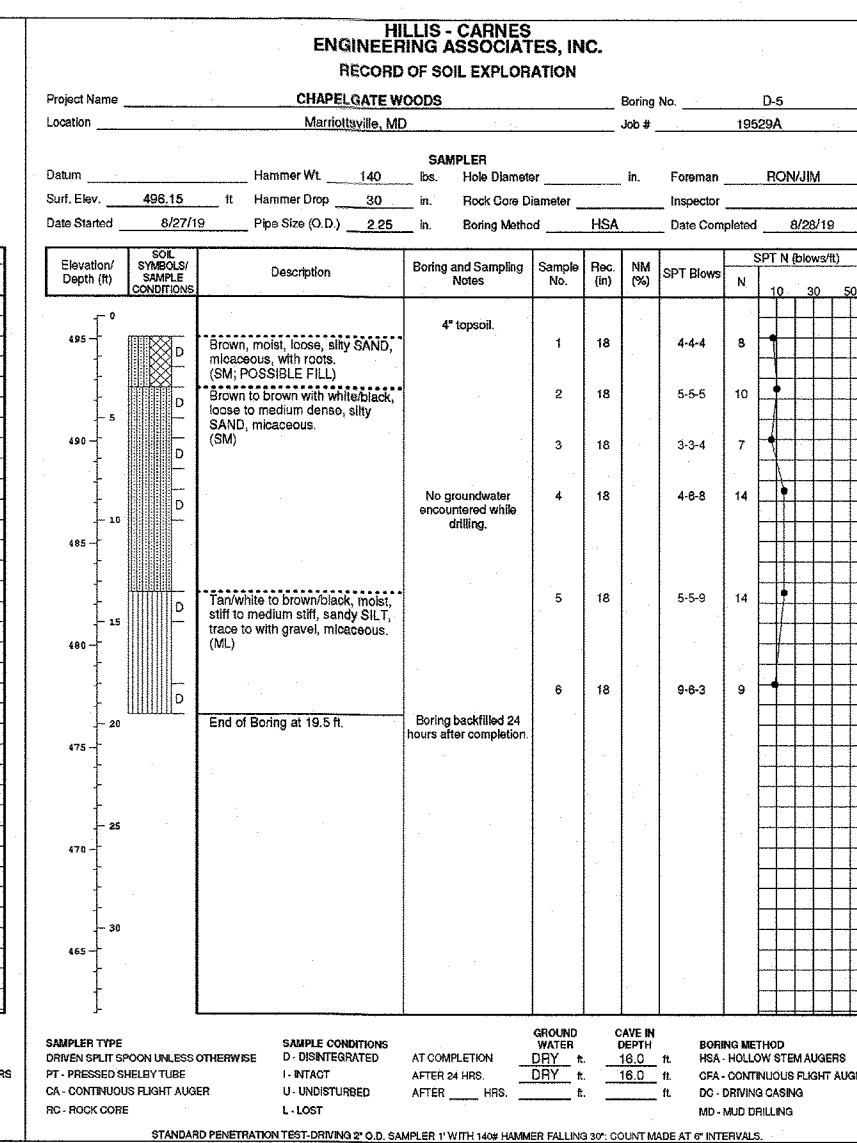
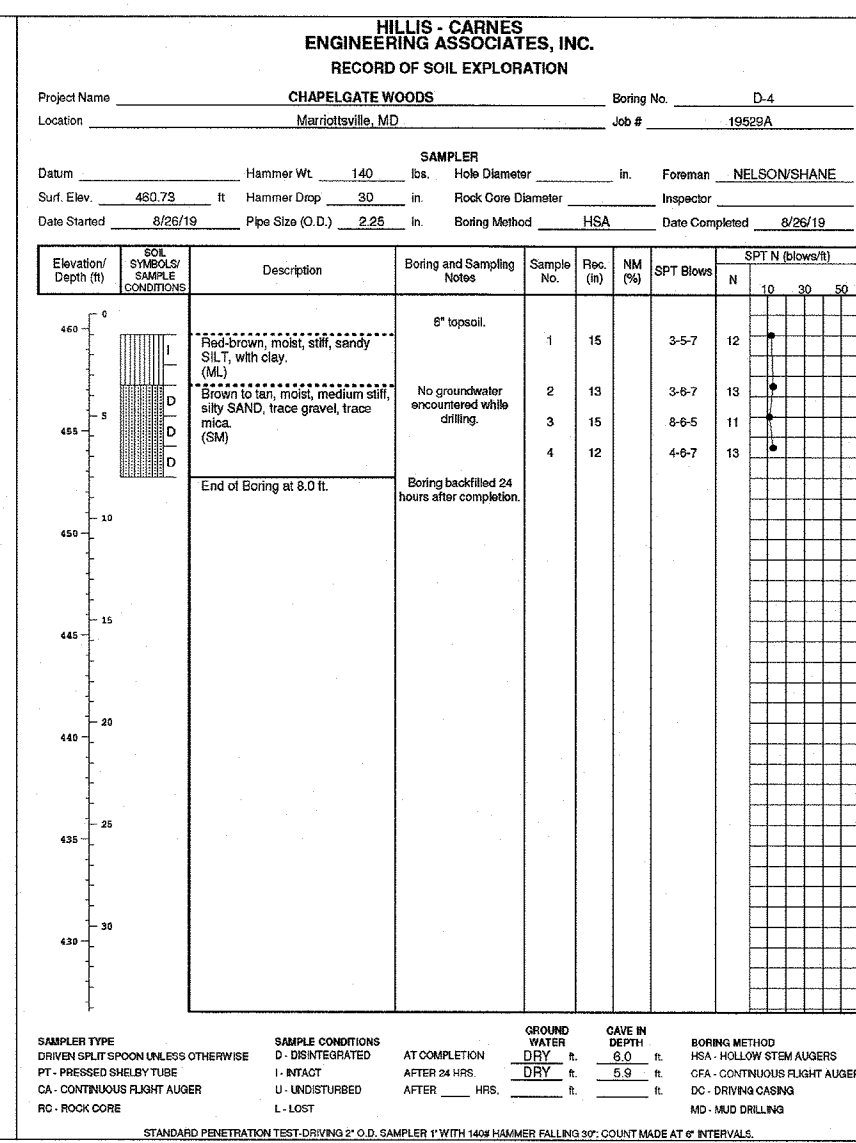
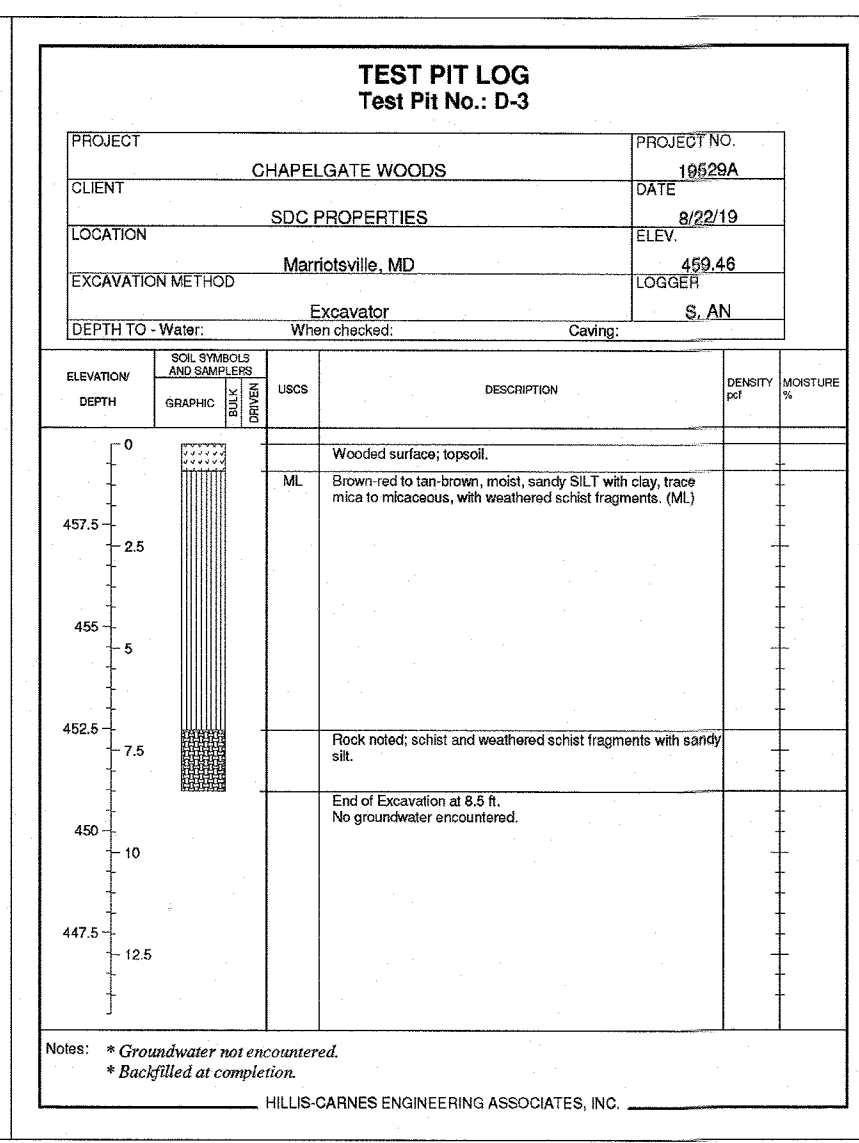
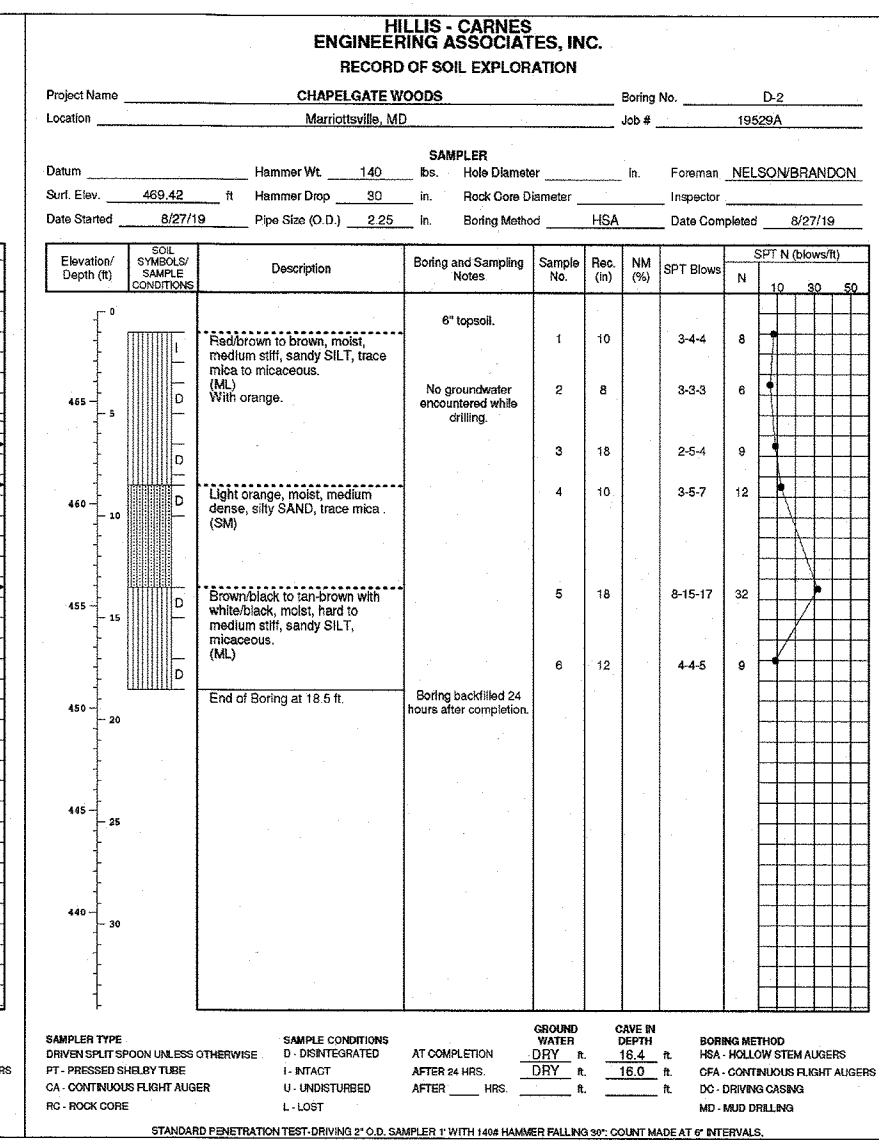
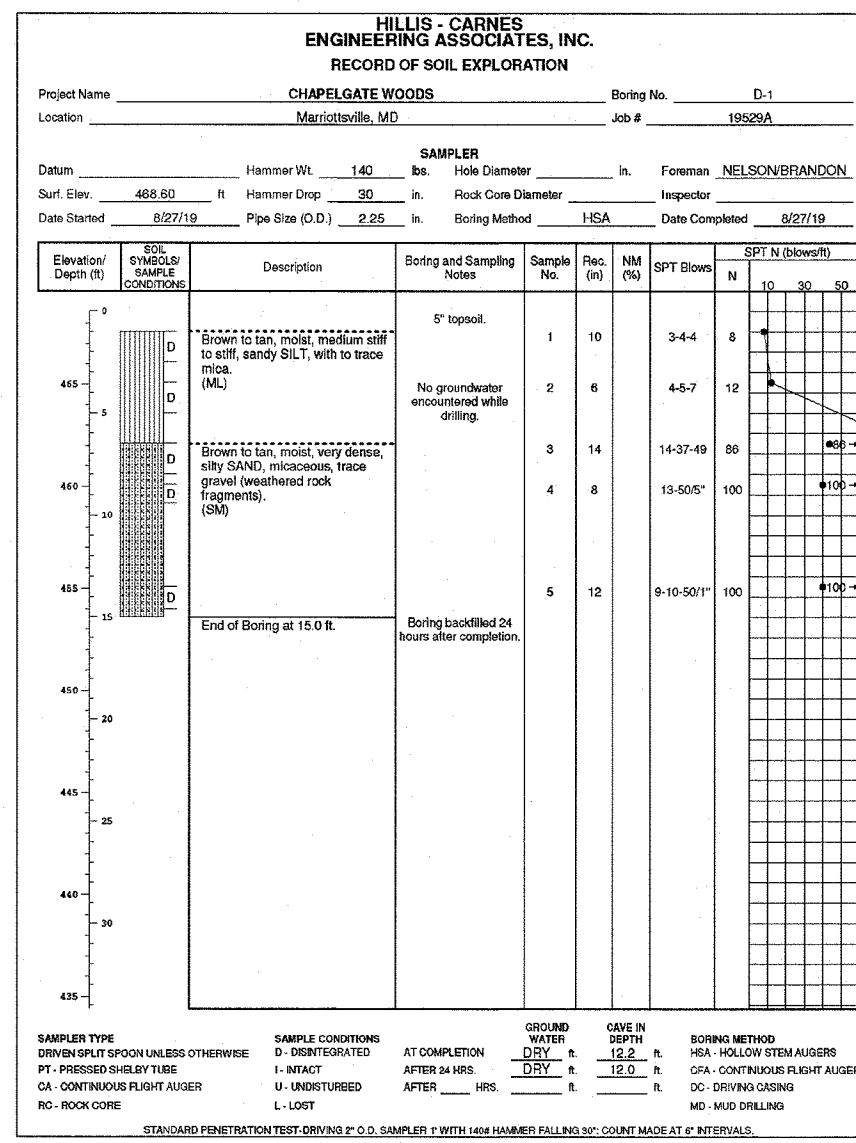
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT 9/22/22 DATE

DESIGN BY: ES, RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022.

52 SHEET OF 101





APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12/23/21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT [Signature] 1/13/22  
 DATE

OWNER  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD., MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
 ESD STORMWATER MANAGEMENT TEST PIT LOGS  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL E  
 PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
 TAX MAP: 16 GR 10D L. 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M

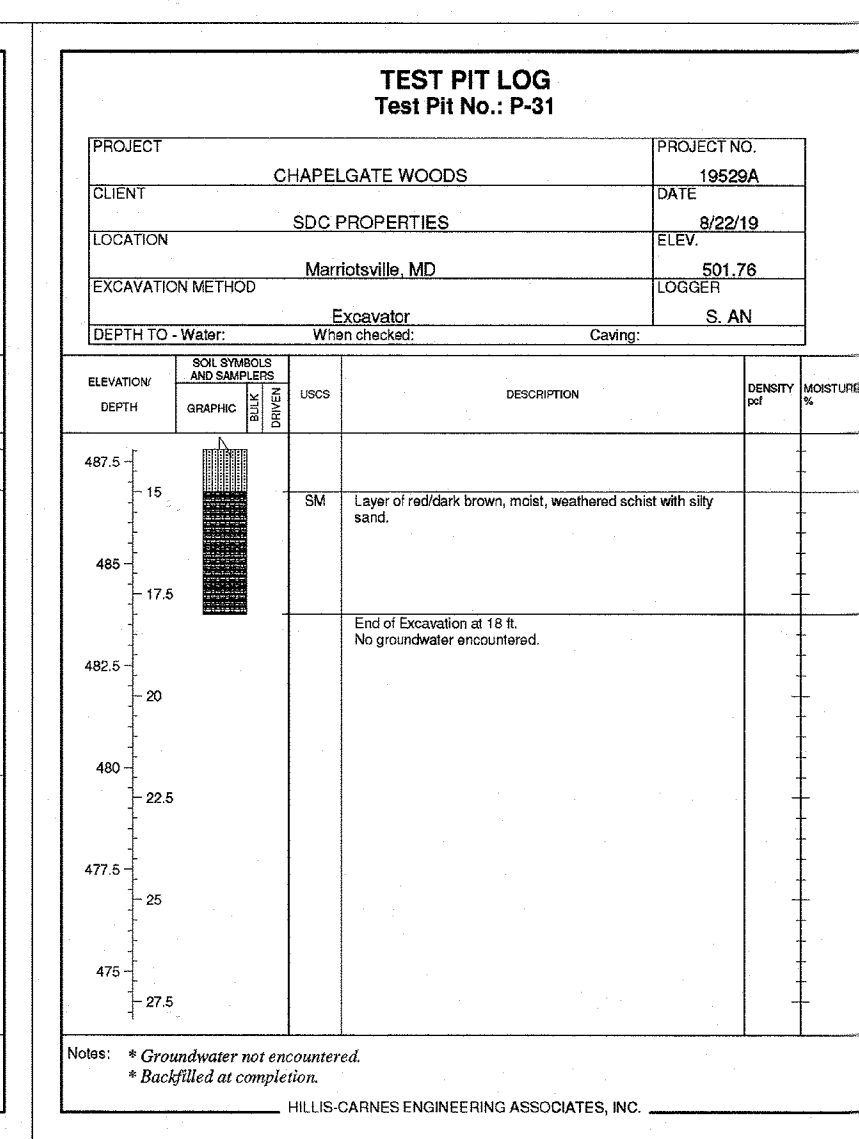
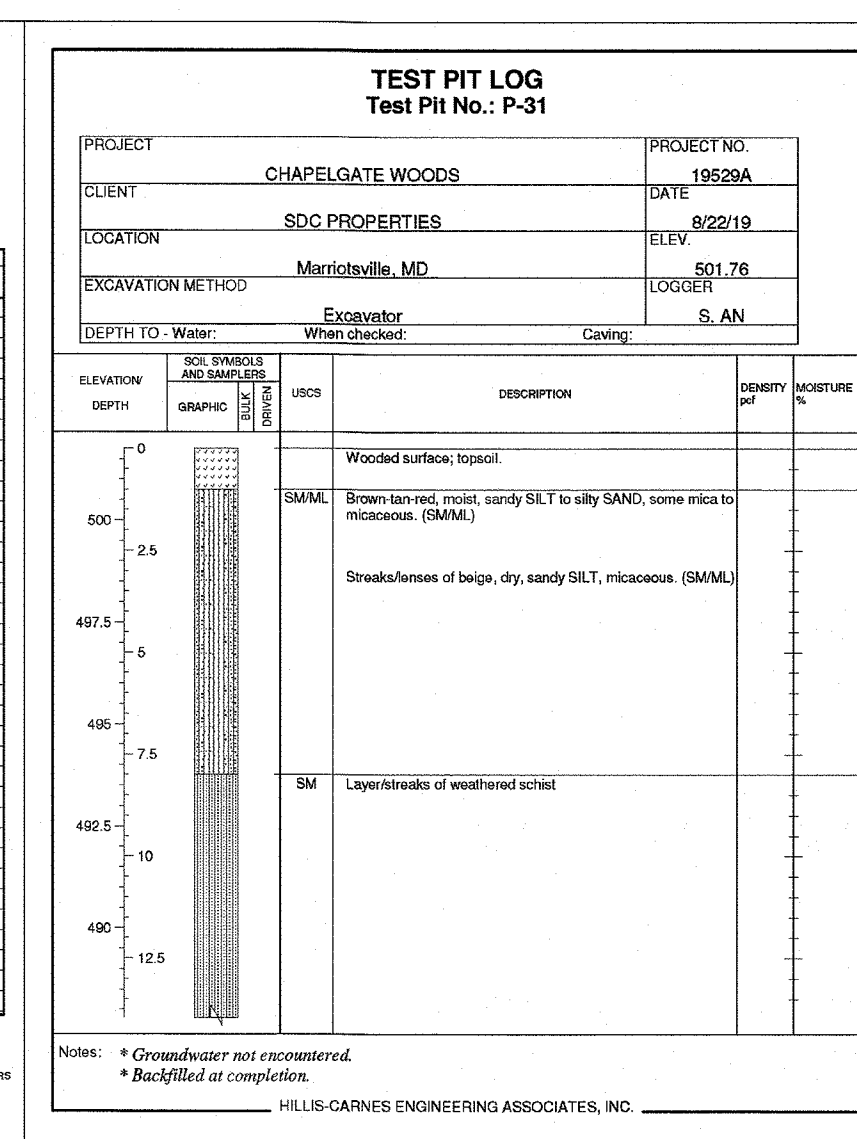
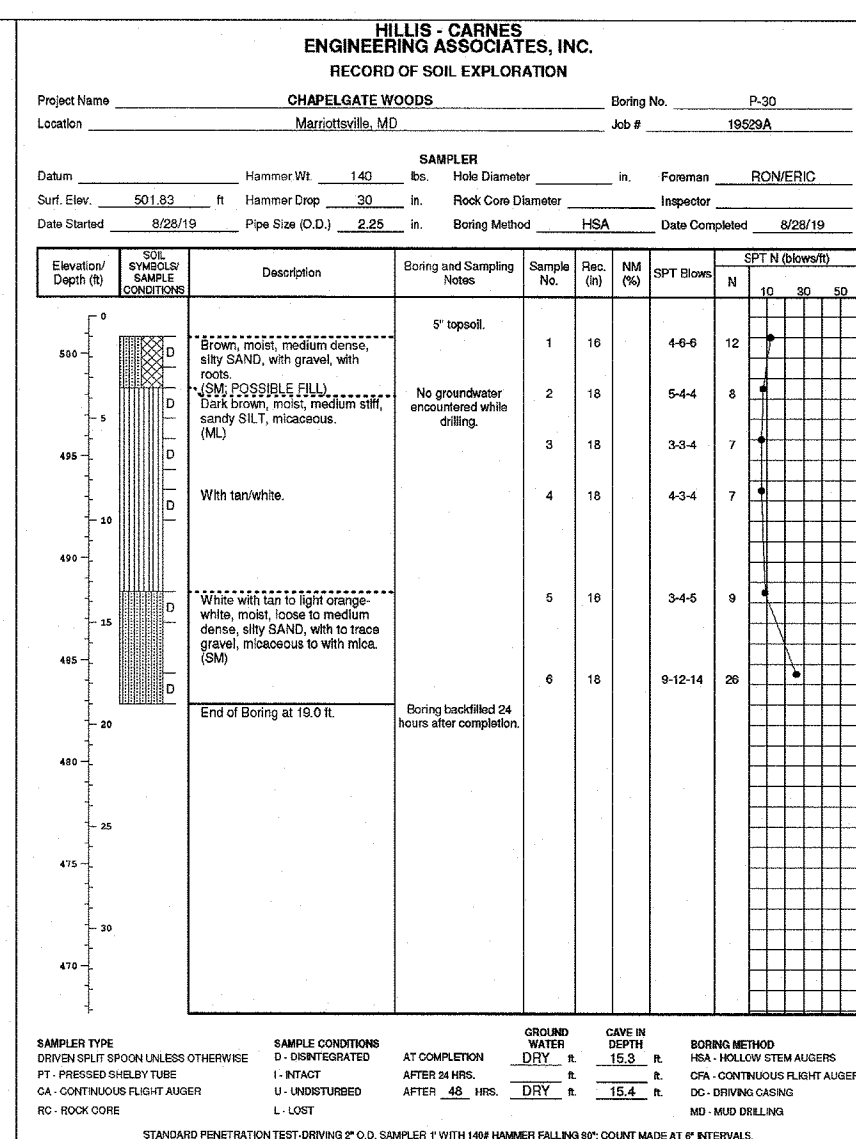
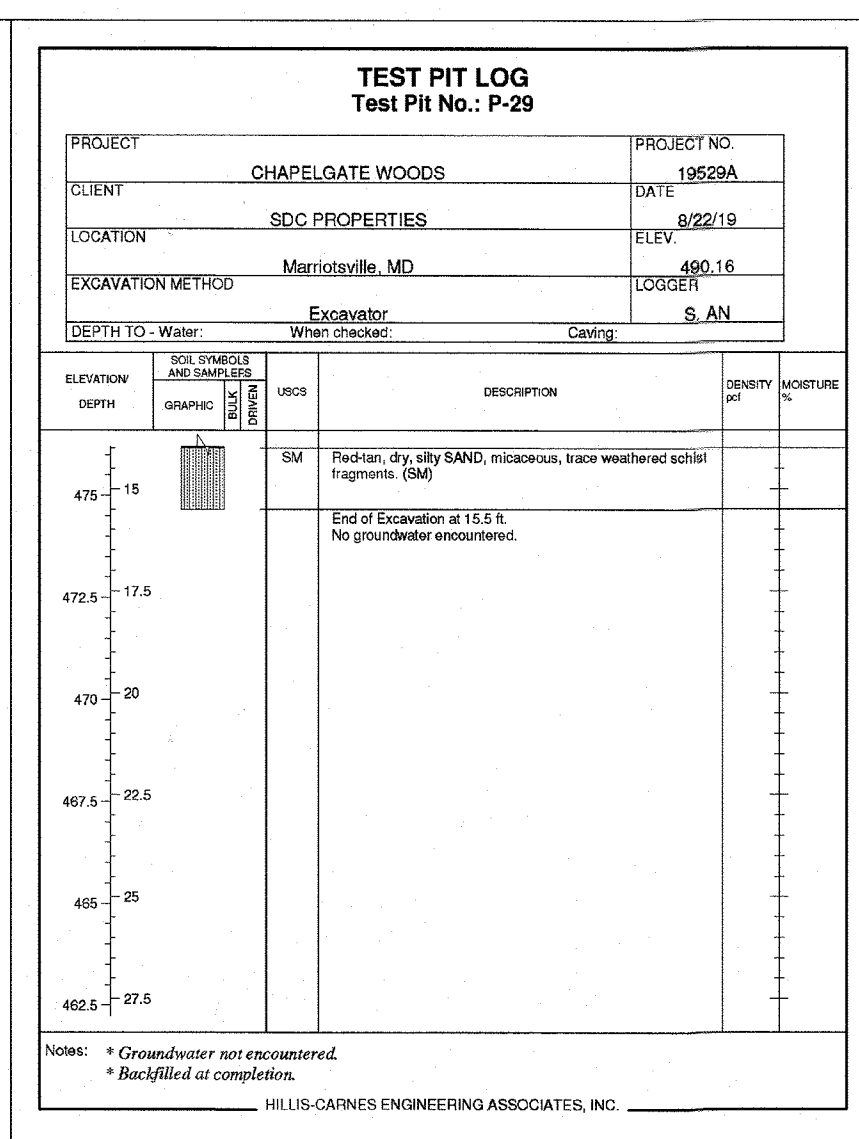
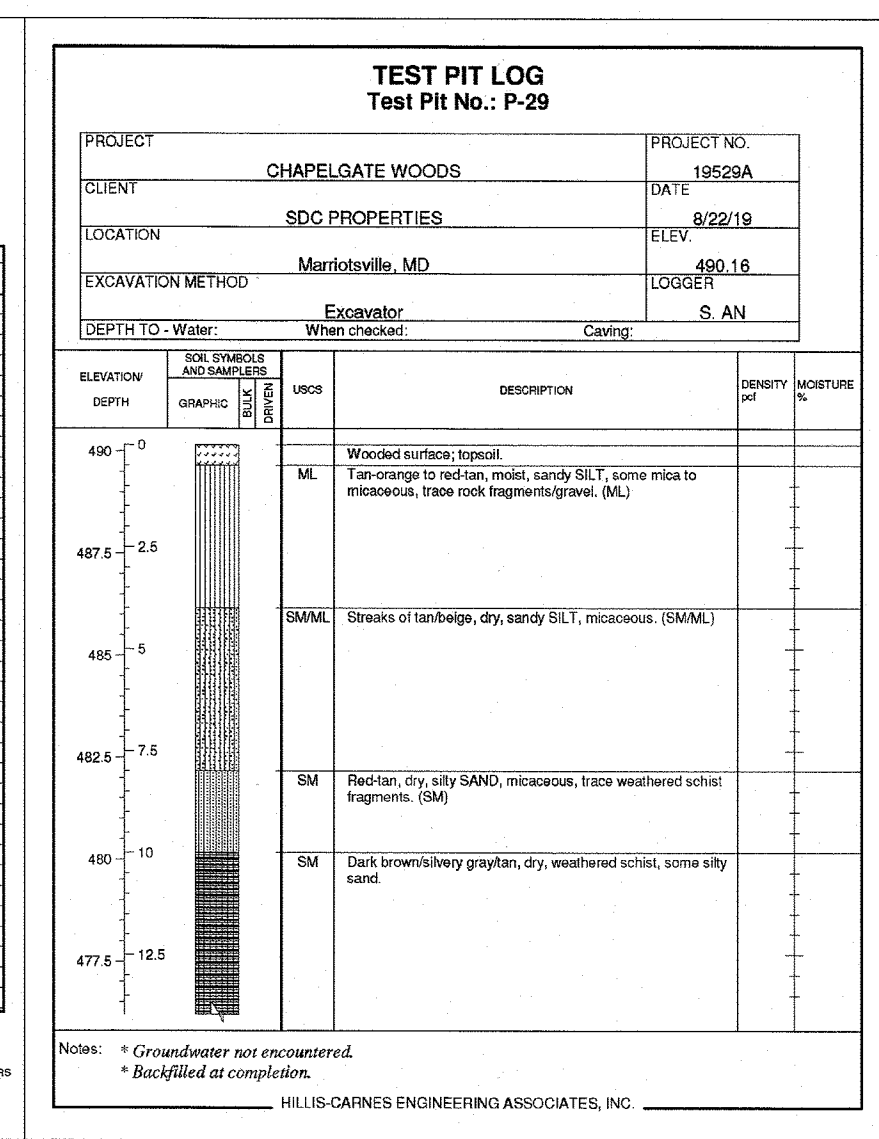
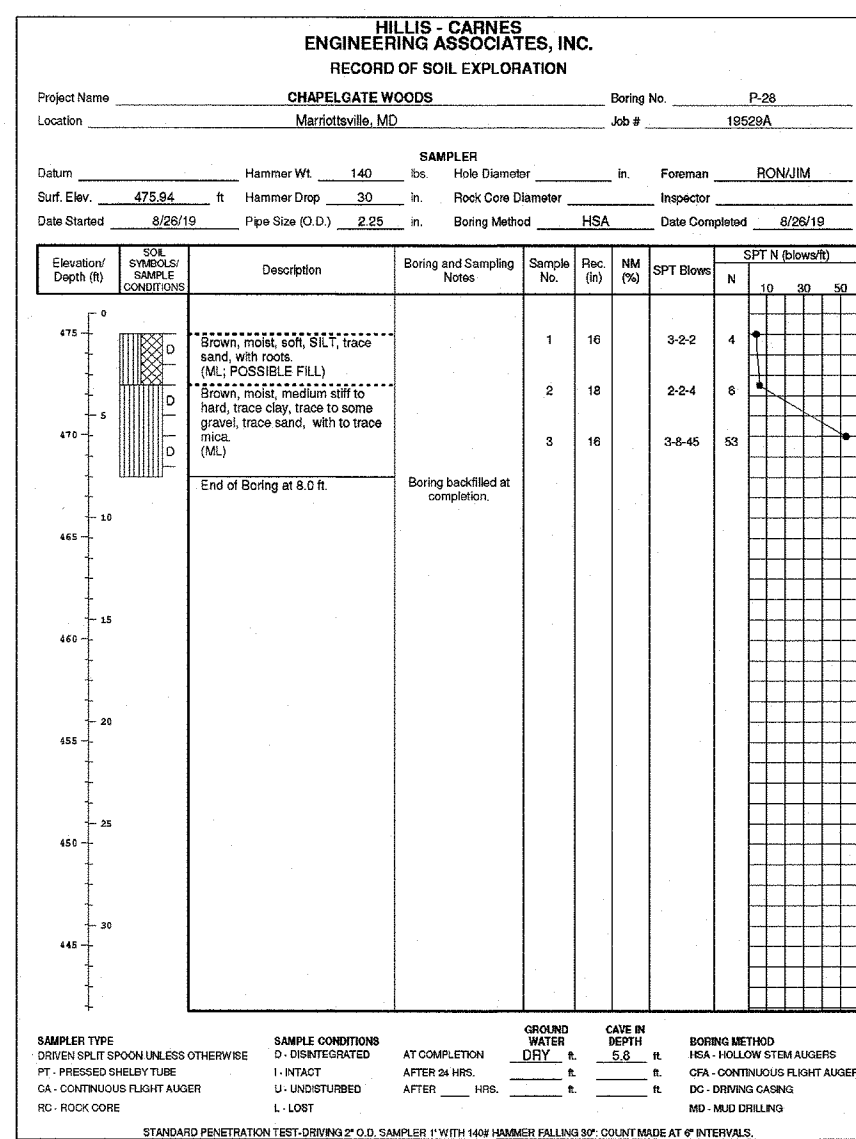
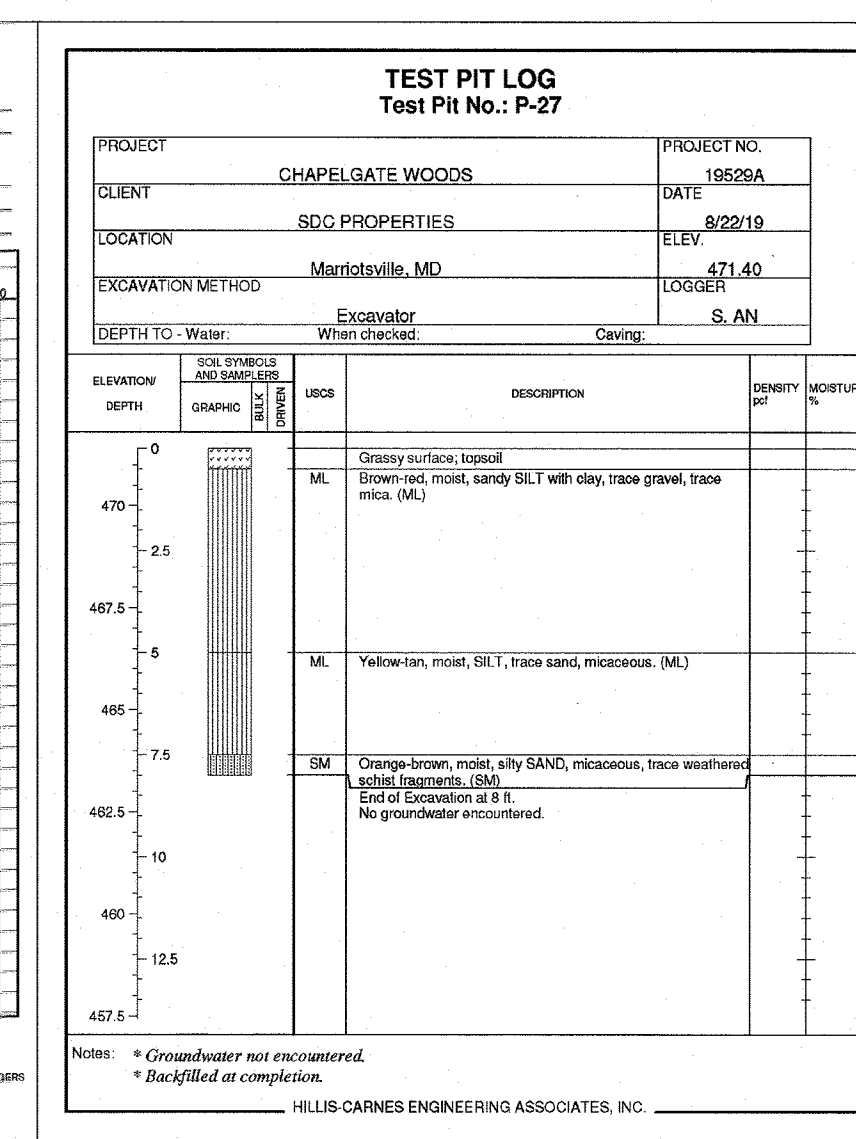
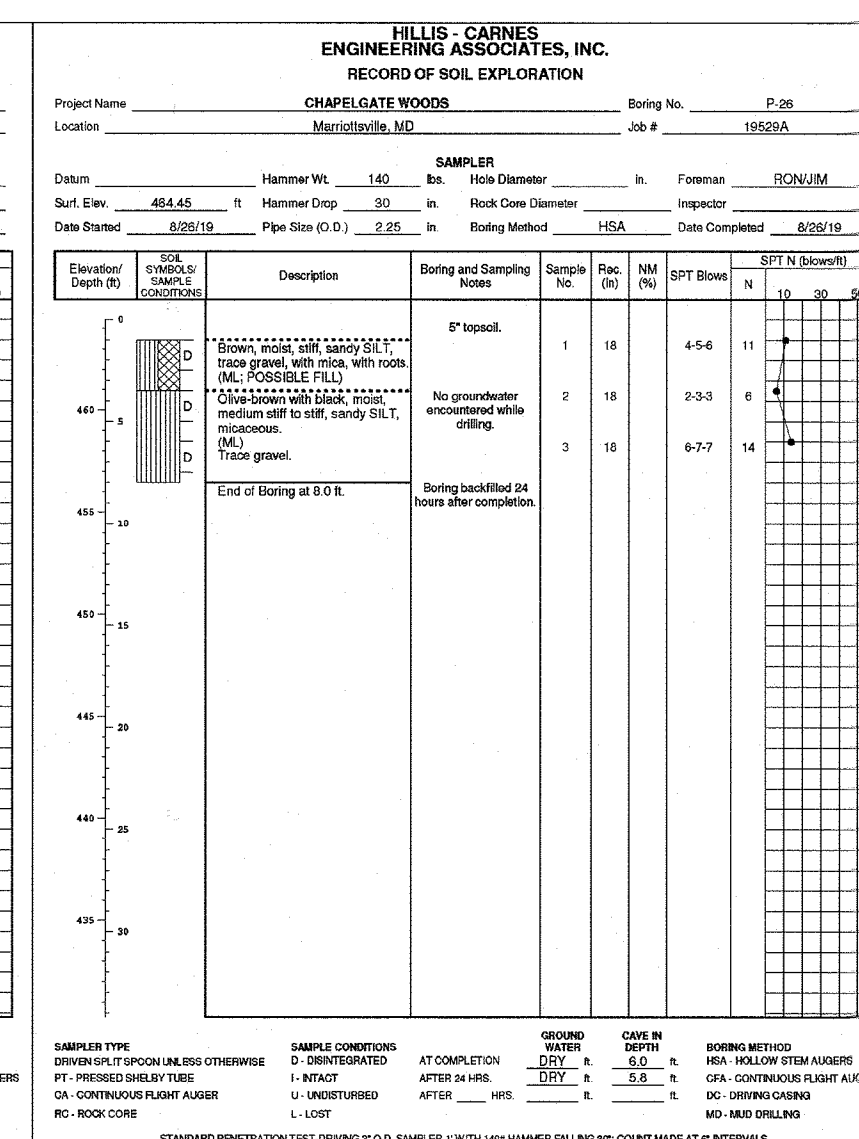
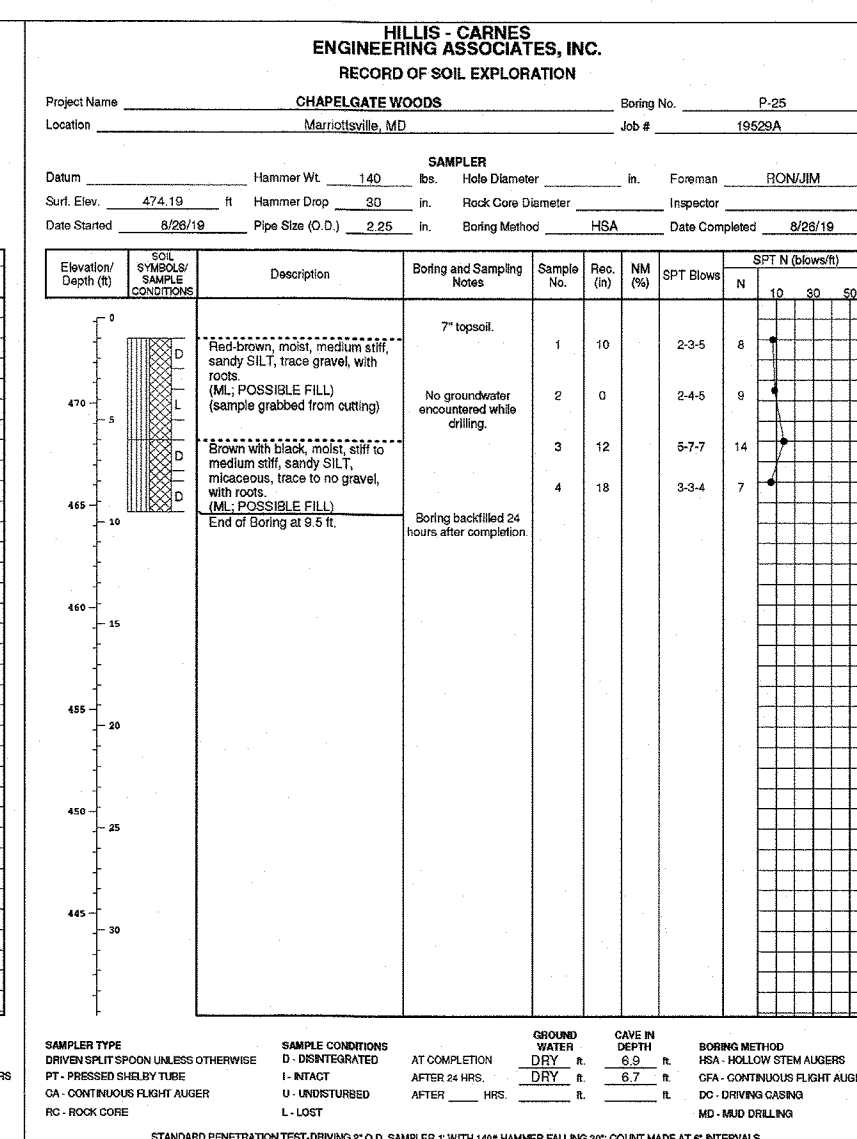
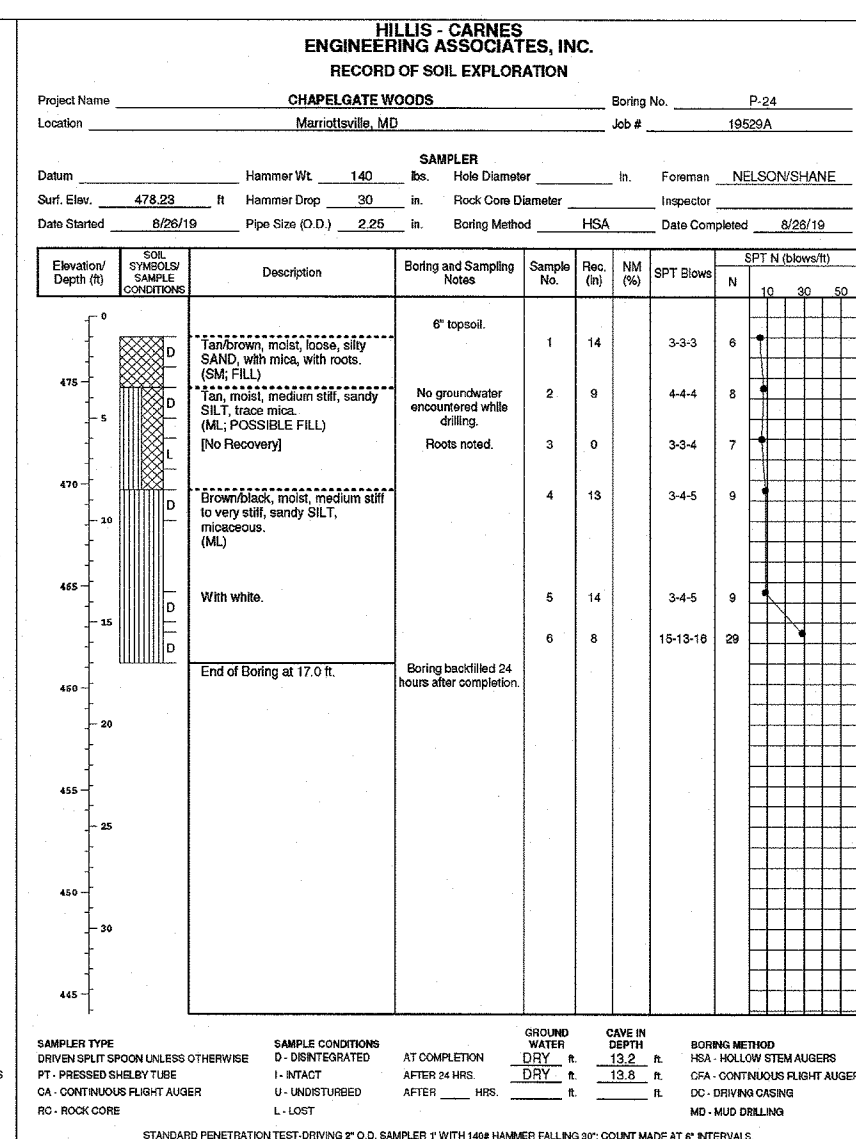
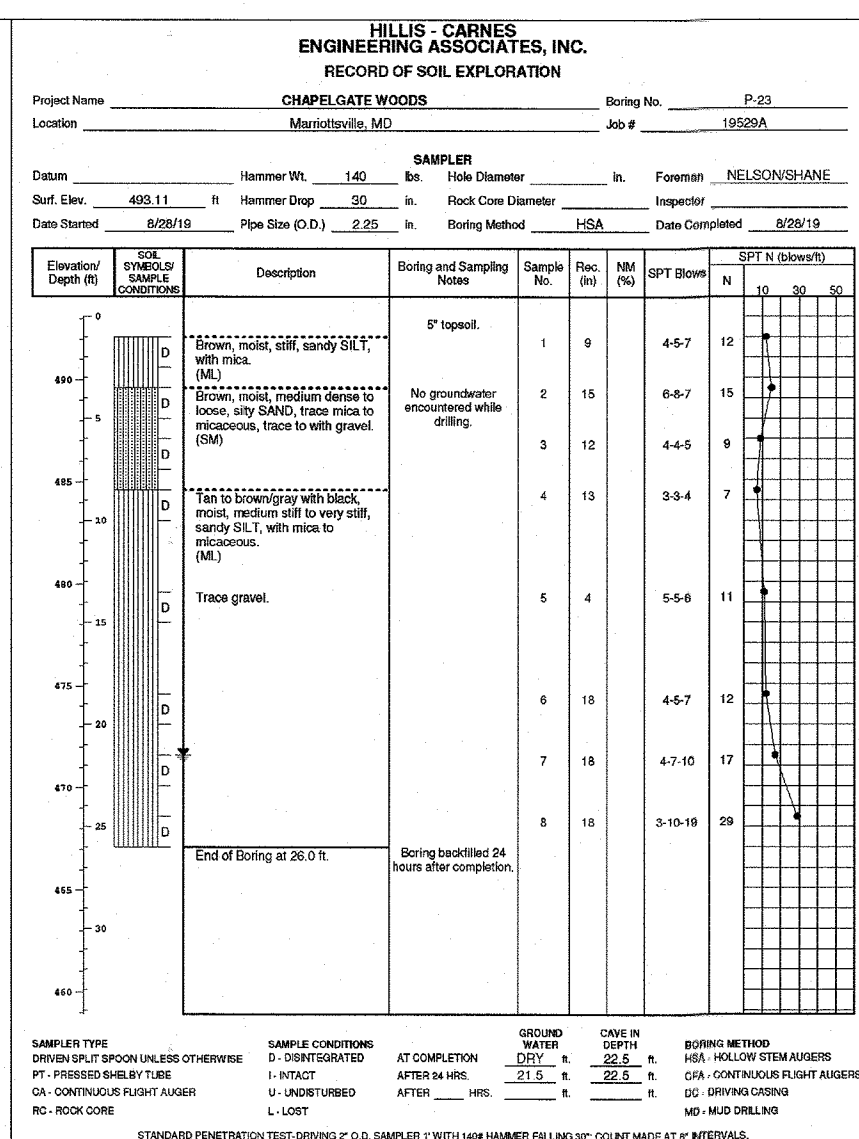
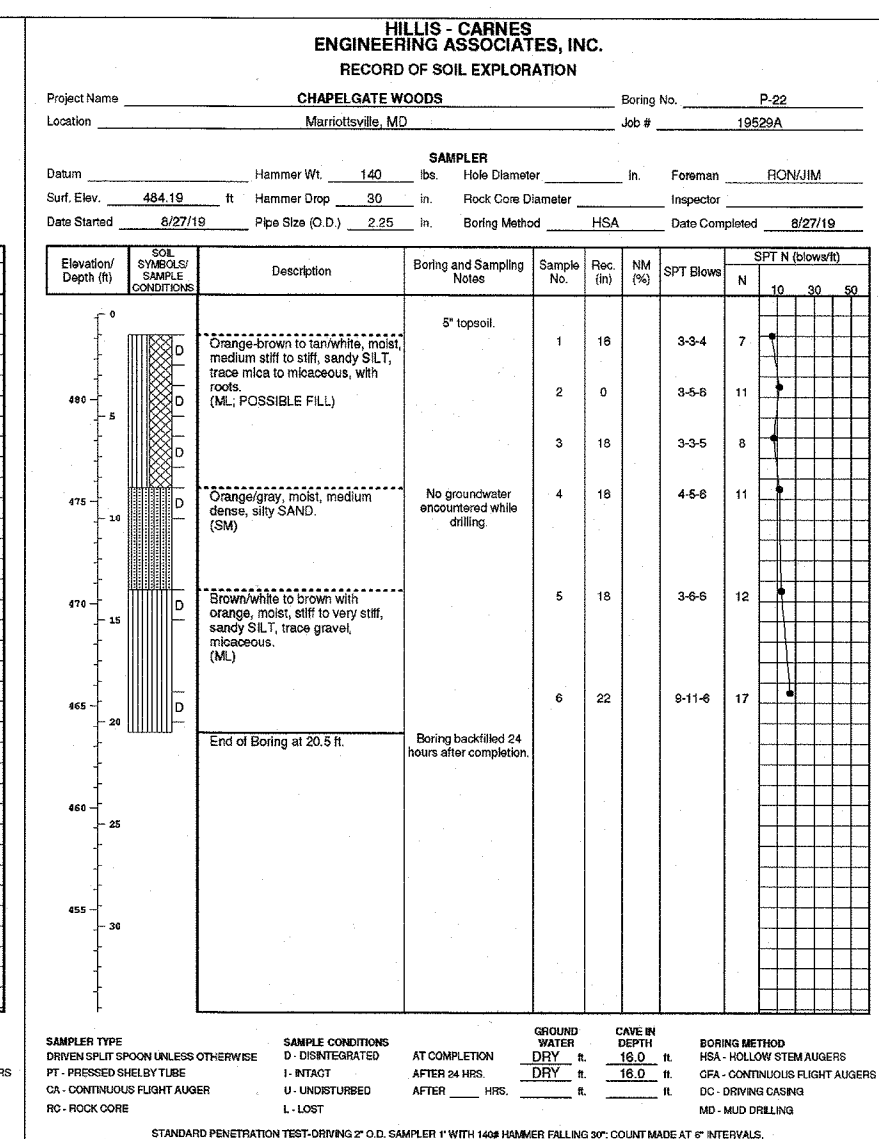
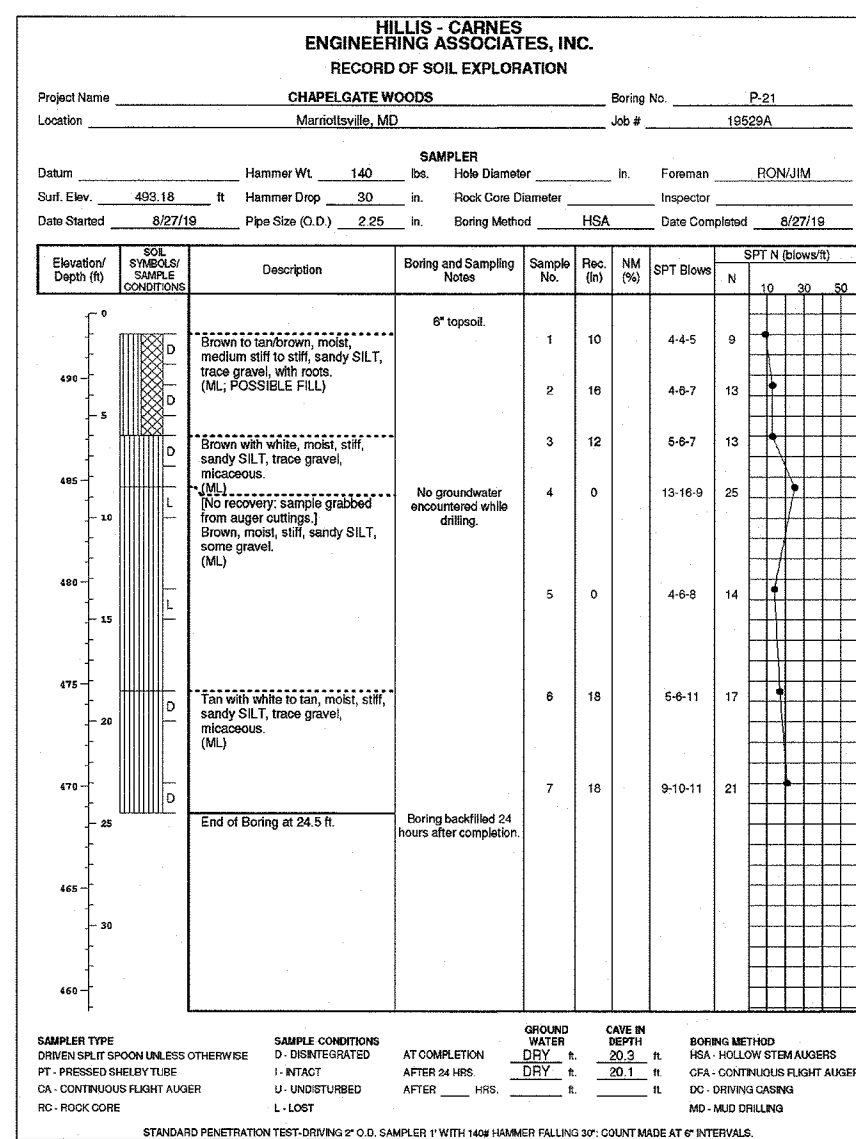
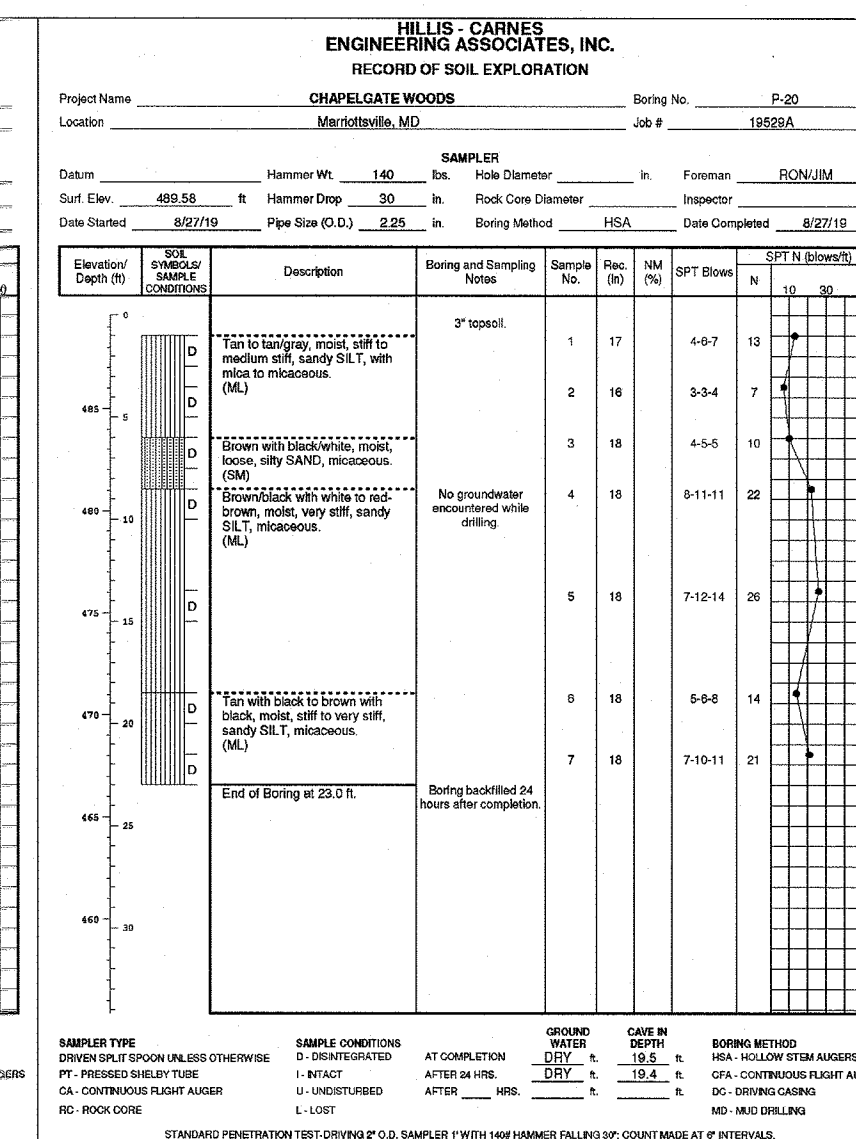
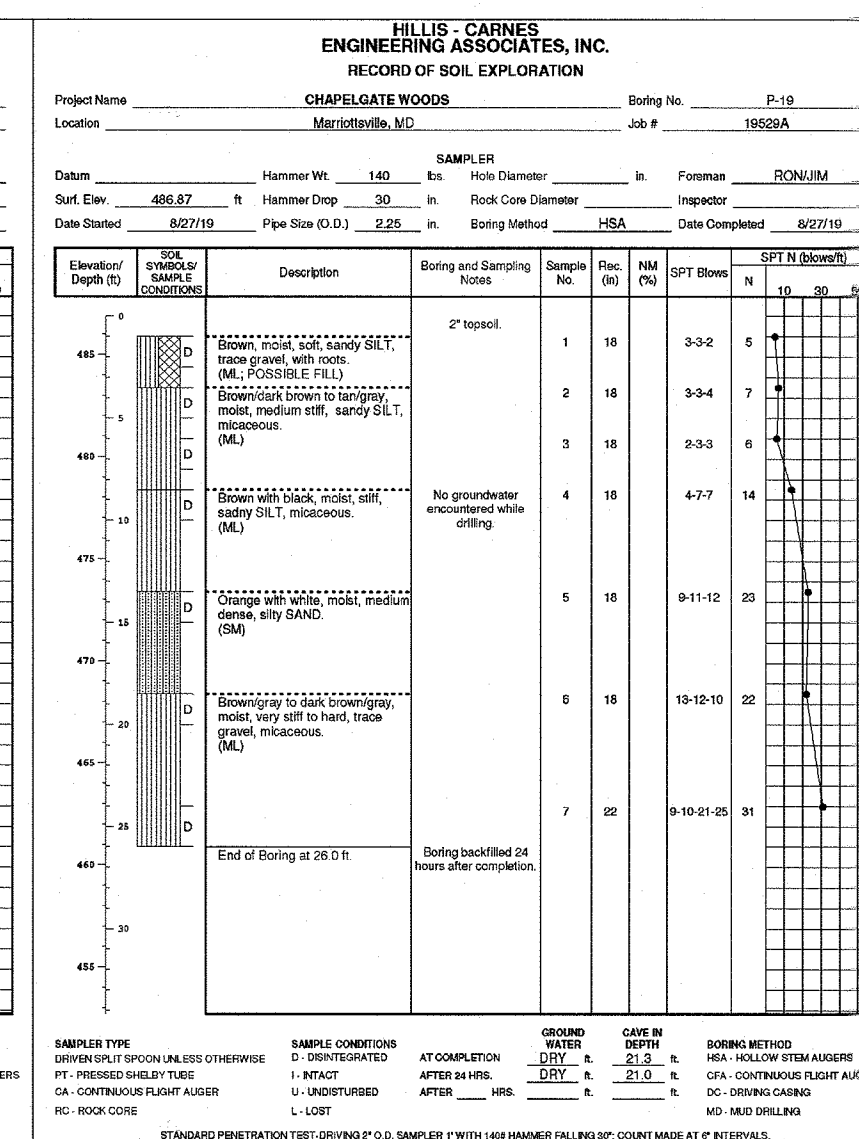
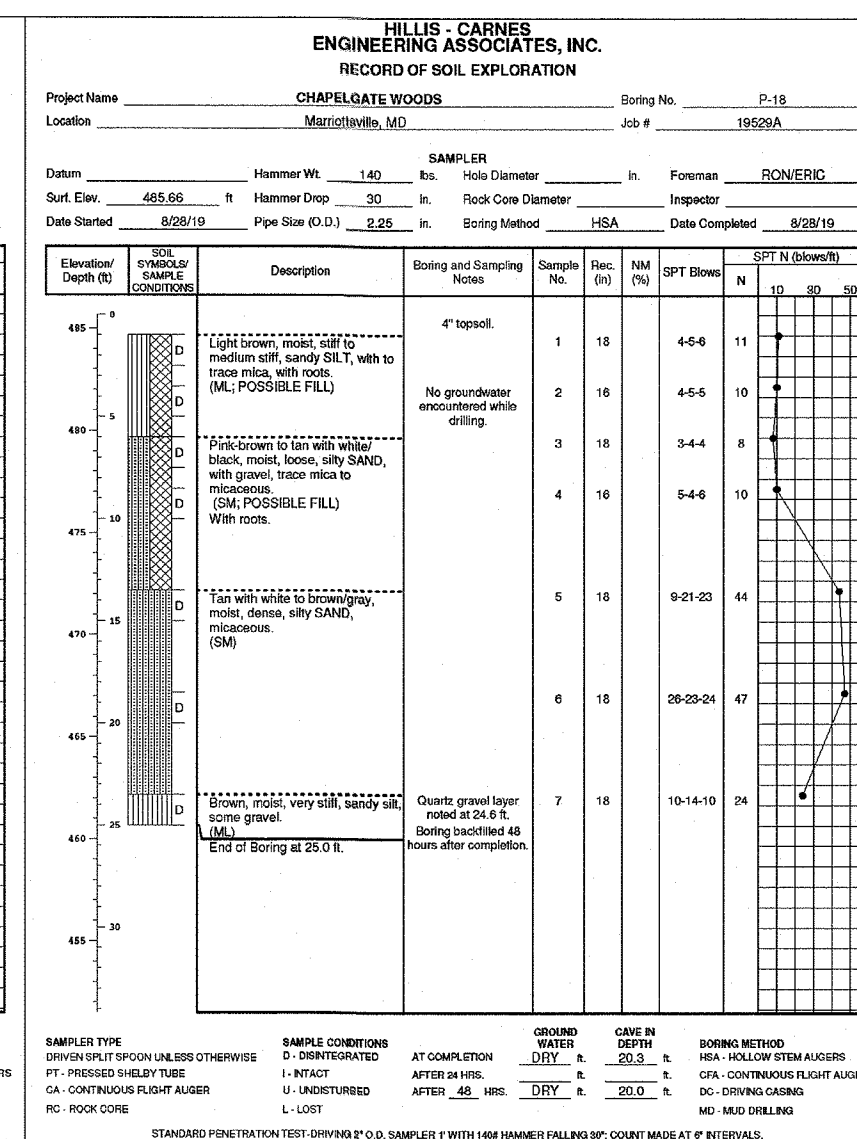
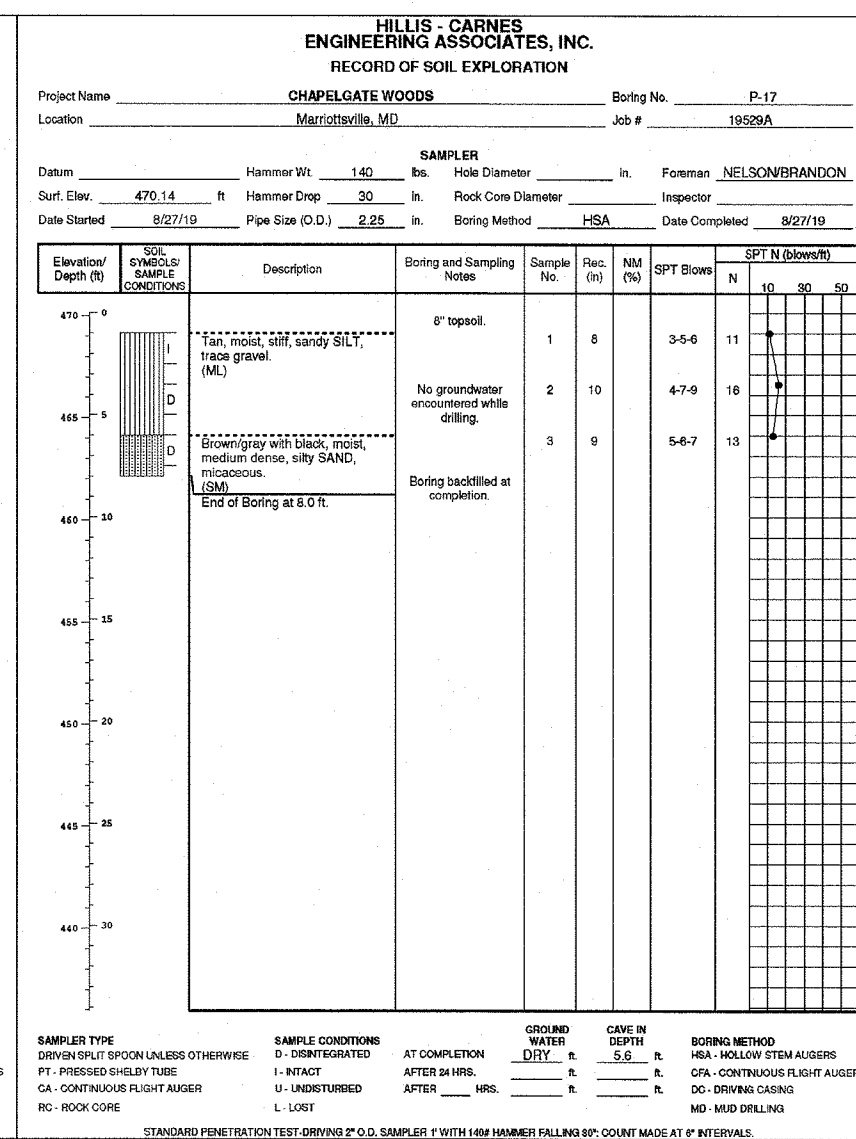
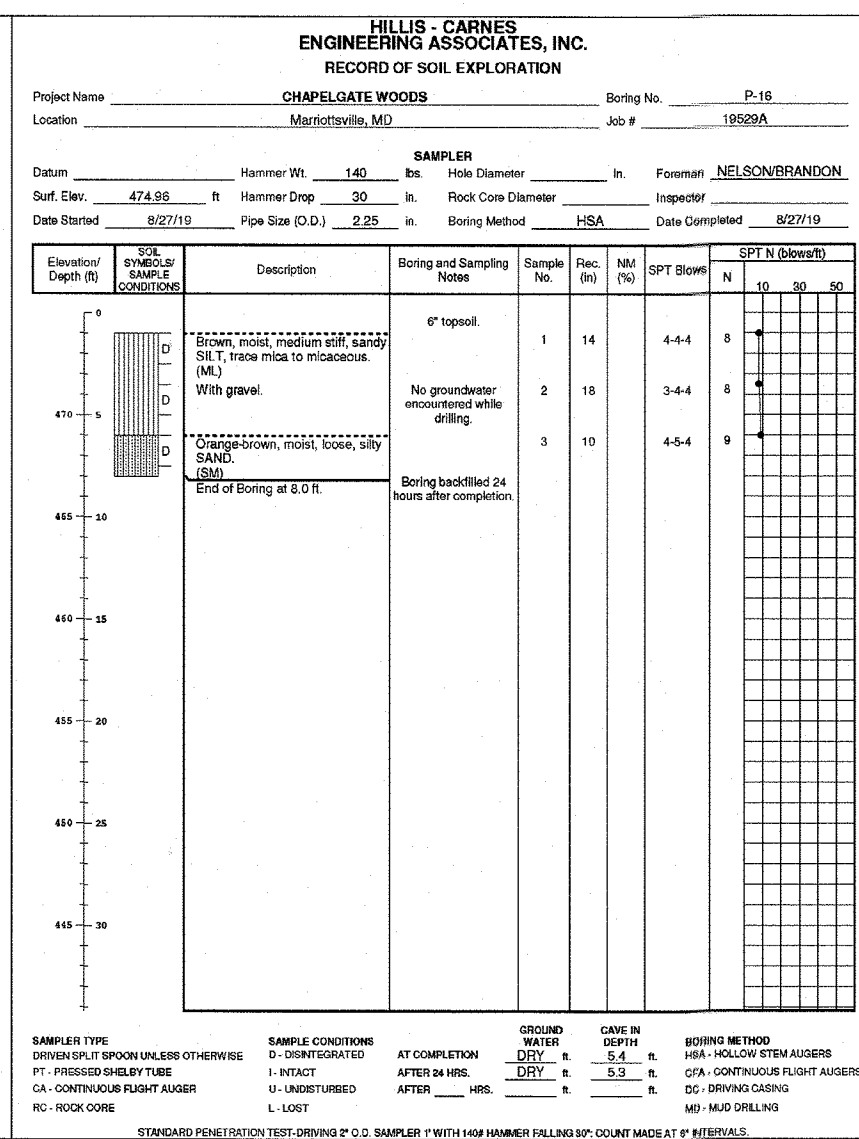
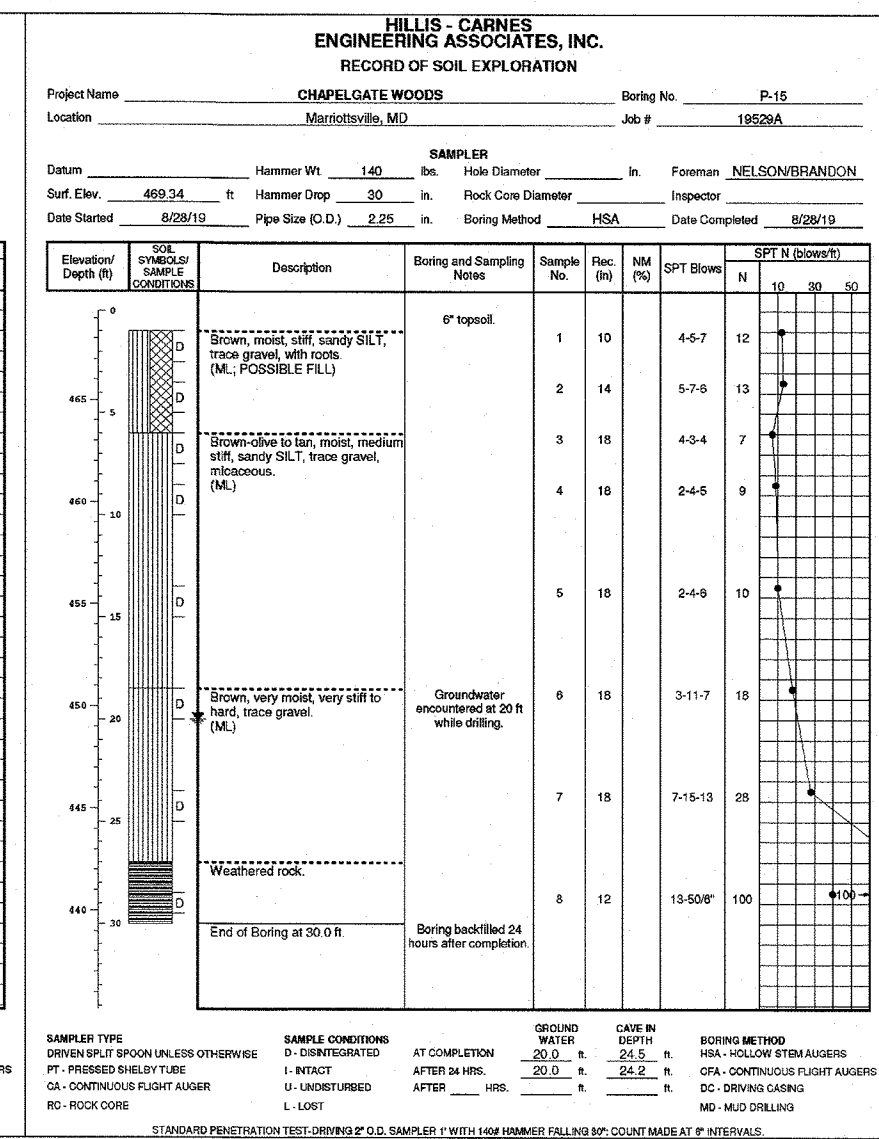
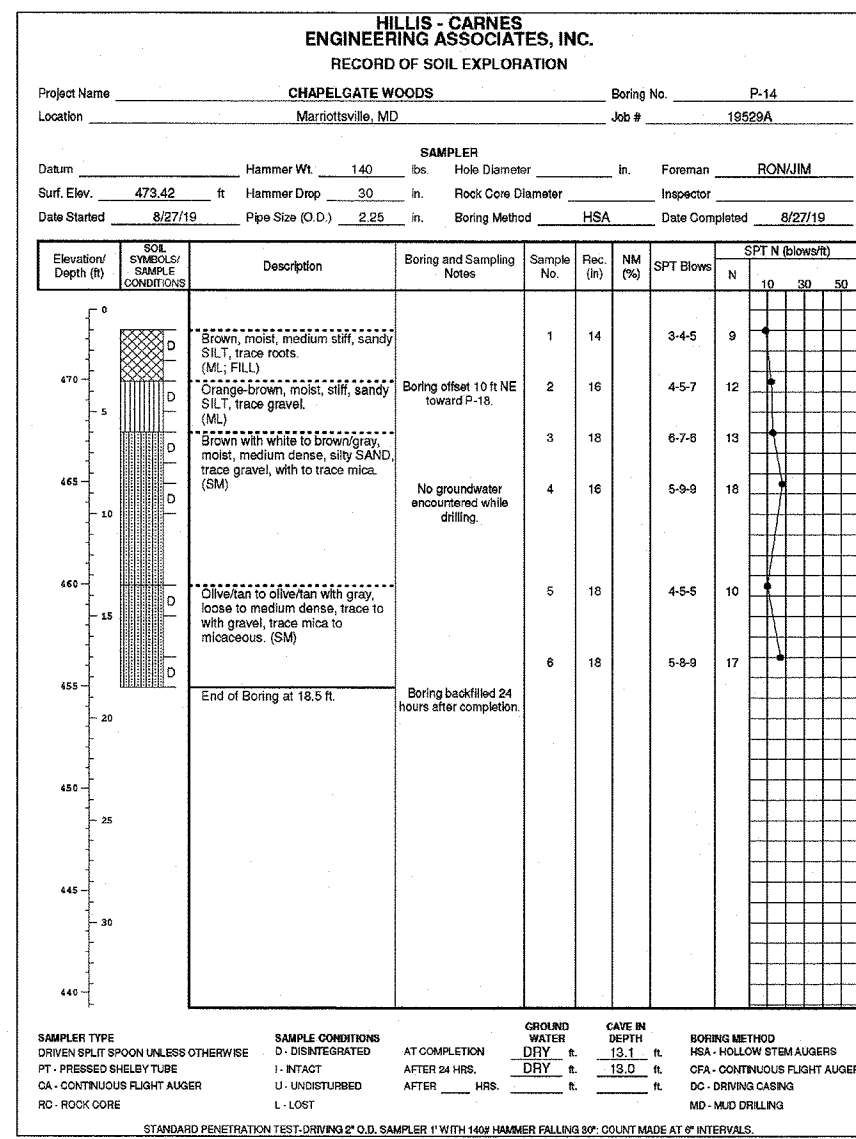
**VOGEL ENGINEERING**  
 +  
**TIMMONS GROUP**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 P: 410.461.7666 F: 410.461.8961 www.timmons.com

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

DESIGN BY: RHV  
 DRAWN BY: VE-TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

53 SHEET OF 101





APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS  
 MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12/23/21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE

[Signature] 11/3/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE

OWNER: CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD., MARRIOTTVILLE, MD 21104  
 (410) 442-5888

DEVELOPER: SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
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FINAL ROAD CONSTRUCTION PLAN  
 ESD STORMWATER MANAGEMENT TEST PIT LOGS  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25912-25954  
 PARCELS: 110 & 421 L 1389/F, 339 (P. 110)  
 TAX MAP: 18 GRD: 10 L 4163/F, 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
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 DATE: SEPTEMBER 2021  
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 W.D. NO.: 13-36 / 40220

54 SHEET OF 101











**WETLAND SOIL SPECIFICATIONS**

THE SURFACE INFILTRATION RATES OF THE GRAVEL WETLAND SOIL SHOULD BE SIMILAR TO A LOW HYDRAULIC CONDUCTIVITY WETLAND SOIL (0.1-0.01 FT/DAY = 3.5 X 10<sup>-5</sup> CM/SEC TO 3.5 X 10<sup>-6</sup> CM/SEC). THIS SOIL CAN BE MANUFACTURED USING COMPOST, SAND, AND SOME FINE SOILS TO BLEND TO A HIGH % ORGANIC MATTER CONTENT SOIL (>15% ORGANIC MATTER).

AVOID USING CLAY CONTENTS IN EXCESS OF 15% BECAUSE OF POTENTIAL MIGRATION OF FINES INTO SUBSURFACE GRAVEL LAYER.

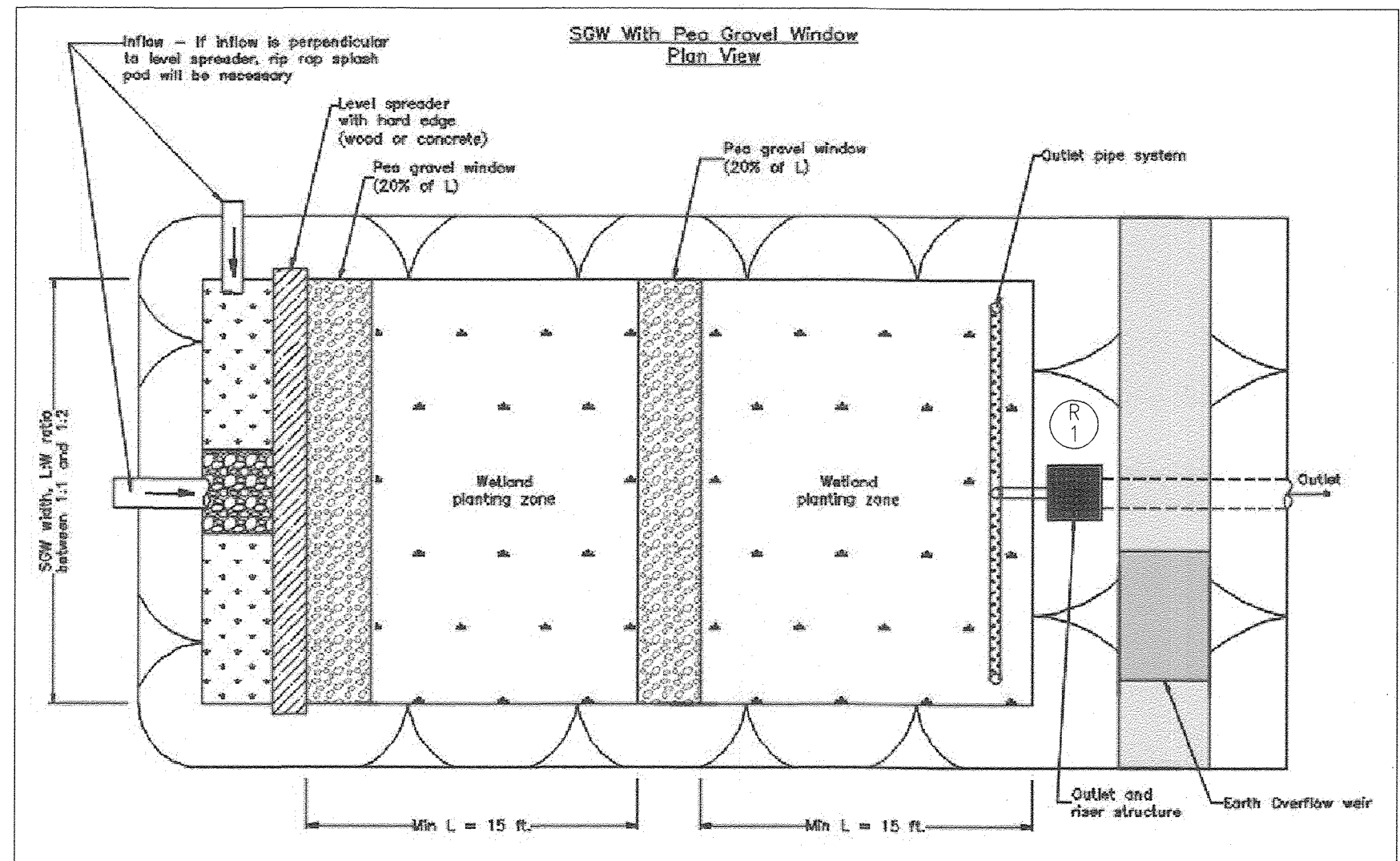
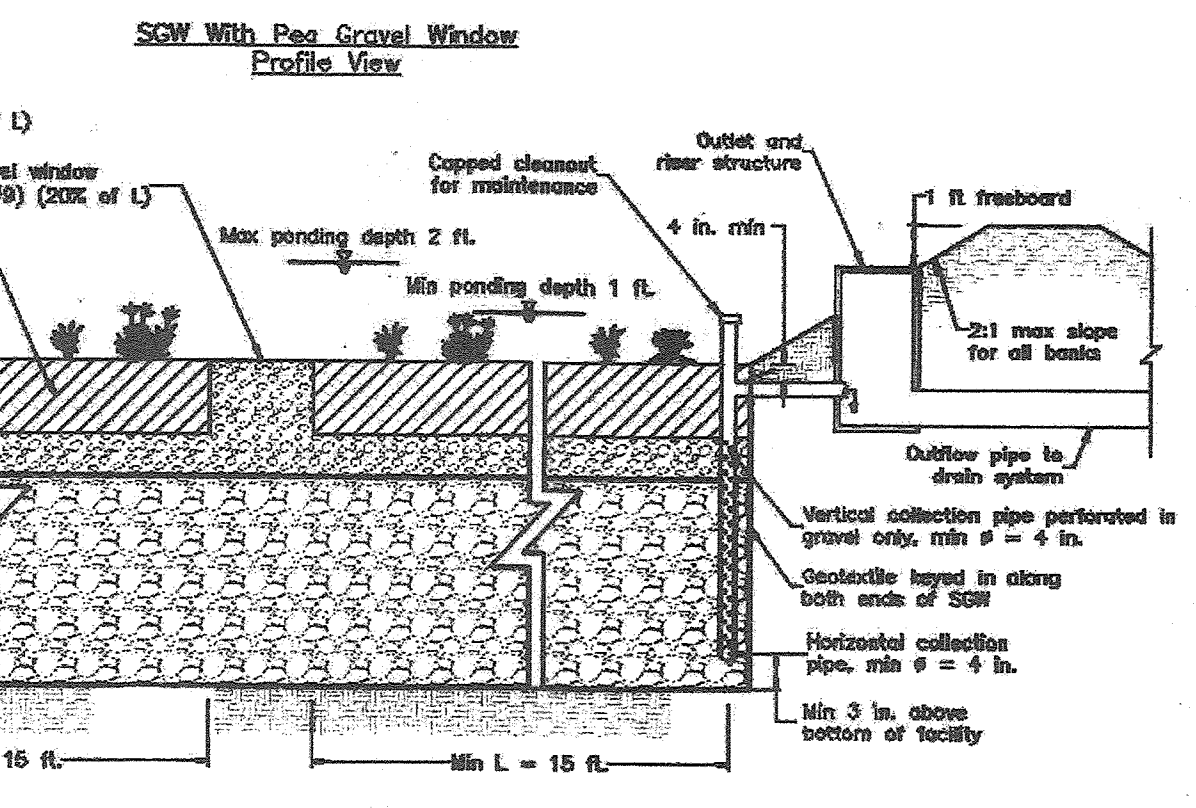
DO NOT USE GEOTEXTILES BETWEEN THE HORIZONTAL LAYERS OF THIS SYSTEM AS THEY WILL CLOG DUE TO FINES AND MAY RESTRICT ROOT GROWTH.

WETLAND MULCH CAN BE SUBSTITUTED FOR WETLAND SOIL.

**IMPERVIOUS LINER:**

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

**TYPICAL M-2 SUBMERGED GRAVEL WETLAND DETAILS**  
SCALE: N.T.S.



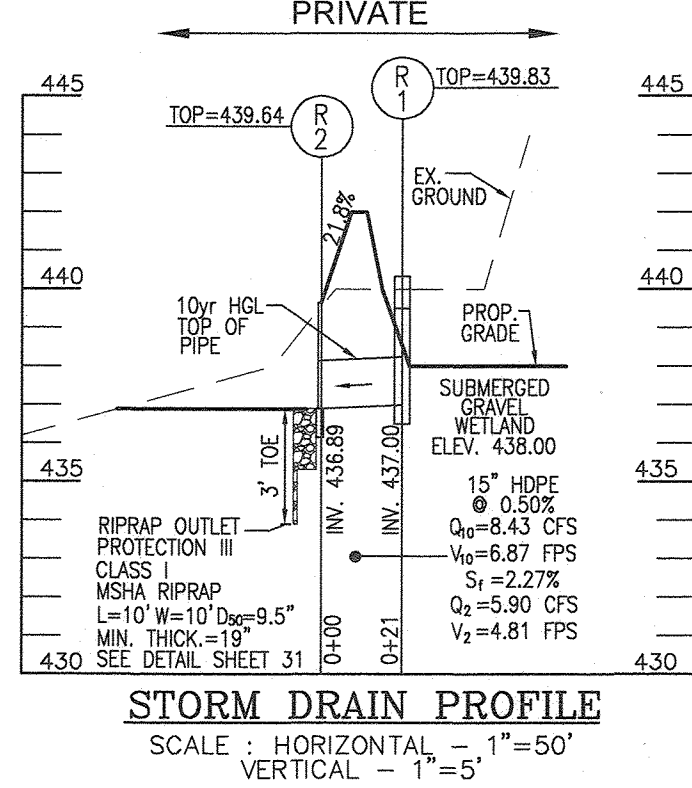
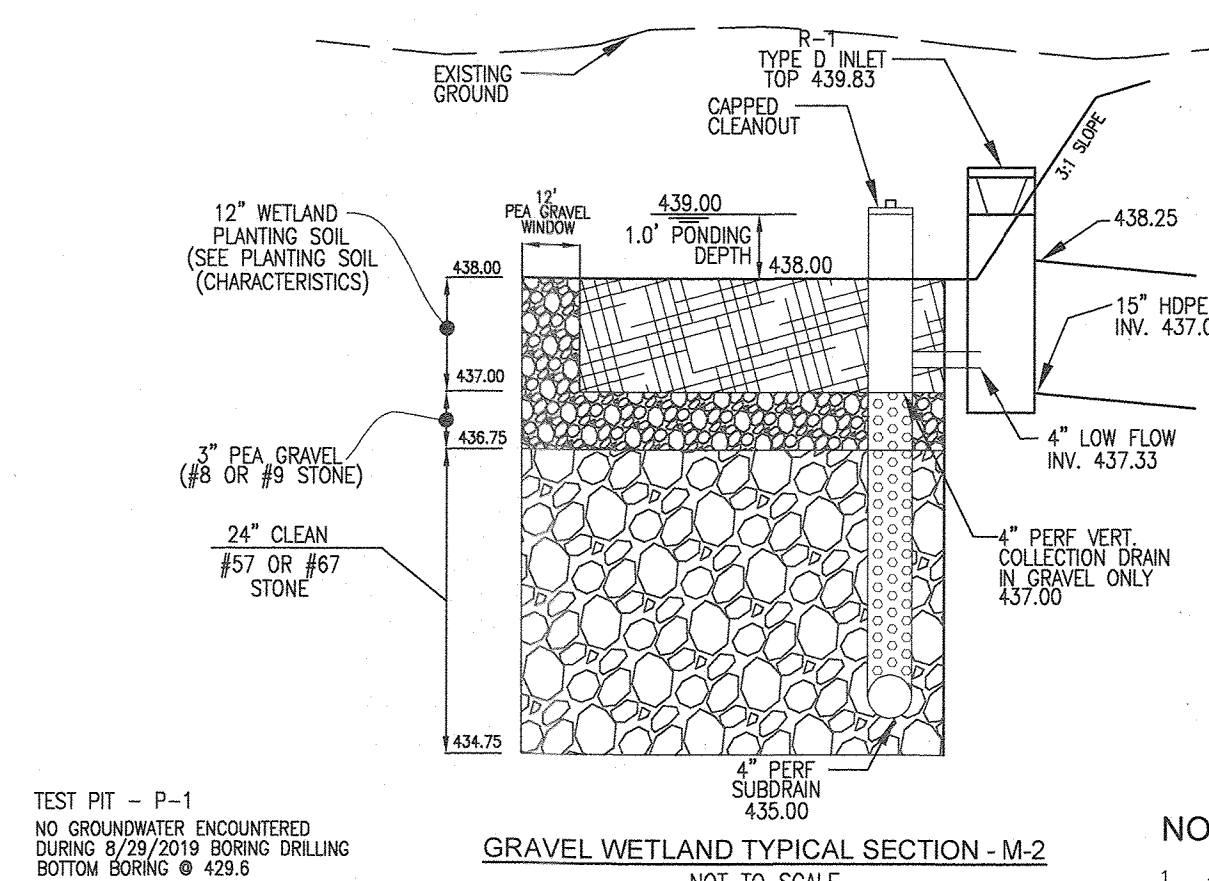
L=136 FT, W=50 FT  
PEAT GRAVEL WINDOW = 5 FT

MBR FACILITY #	ESD	TOP PLANT SOIL	BOTTOM PLANT SOIL	BOTTOM PEAT GRAVEL	INV PIPE	INV STONE	SURFACE AREA SF	APPROX DIM
1	A	439.00	438.00	437.00	436.75	435.00	5205	SEE PLAN

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 09/19/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9-21-22

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/21/22



- NOTES**
- 4" SUBIRIP PIPE PERFORATE HORIZONTAL SECTIONS OF PIPE ONLY. SEE DETAIL FOR REQUIRED PERFORATED SECTION IN VERTICAL PIPE.
  - RISER SOLID PIPES SHALL BE CAPPED AT ELEV 439.00
  - REFER TO TABLE B.4.1. FOR PIPE SPECIFICATIONS.
  - WETLAND SOIL: THE SURFACE INFILTRATION RATES OF THE GRAVEL WETLAND SOIL SHOULD BE SIMILAR TO A LOW HYDRAULIC CONDUCTIVITY WETLAND SOIL (0.1-0.01 FT/DAY = 3.5 X 10<sup>-5</sup> CM/SEC TO 3.5 X 10<sup>-6</sup> CM/SEC). THIS SOIL CAN BE MANUFACTURED USING COMPOST, SAND, AND SOME FINE SOILS TO BLEND TO A HIGH % ORGANIC MATTER CONTENT SOIL (>15% ORGANIC MATTER).
  - AVOID USING CLAY CONTENTS IN EXCESS OF 15% BECAUSE OF POTENTIAL MIGRATION OF FINES INTO SUBSURFACE GRAVEL LAYER. DO NOT USE GEOTEXTILES BETWEEN THE HORIZONTAL LAYERS OF THIS SYSTEM AS THEY WILL CLOG DUE TO FINES AND MAY RESTRICT ROOT GROWTH.
  - WETLAND MULCH CAN BE SUBSTITUTED FOR WETLAND SOIL.
  - PLANTINGS MAY BE SUBSTITUTED WITH NATIVE WETLAND PLANT STOCK OBTAINED FROM A LOCAL AQUATIC PLANT NURSERY.

- CONTRACTOR SHALL BE FAMILIAR WITH APPENDIX B.4.C. CONSTRUCTION SPECIFICATIONS AND TABLE B.4.1 MATERIAL SPECIFICATIONS. IN ADDITION THE "2000 MARYLAND STORMWATER DESIGN MANUAL - VOLUME II - APPENDIX A OFFERS ADDITIONAL HELPFUL INFORMATION.
- NO TREES SHALL BE PLANTED WITHIN A THE GRAVEL WETLAND. USE ONLY SHRUB OR HERBACEOUS SPECIES.
- REFER TO ABOVE TABLE A.4.1 FOR ADDITIONAL PLANTING SUBSTITUTIONS. LANDSCAPE CONTRACTOR SHALL INSTALL PLANTINGS SPECIFIED OR USE APPROVED EQUAL SPECIES WHICH ARE TOLERANT TO FLUCTUATING WATER LEVELS.
- PLANTINGS SHOWN HEREON ARE THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL DURING THE CONSTRUCTION OF THIS FINAL PLAN.

LEGEND/KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
TS	23	SCIRPUS PUNGENS COMMON THREE-SQUARE	PLANT STOCK	CONT
DP	23	SAGITTARIA LATIFOLIA ARROWHEAD/DUCK POTATO	PLANT STOCK	9-12" SPACE
AA	23	FELDNDIA VIRGINICA ARROW ARUM	PLANT STOCK	9-12" SPACE
PV	50	PANICUM VIRGATUM SWITCHGRASS	1 GAL.	-

LEGEND	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
	182	BAPTISIA ALUSTRALIS FALSE INDIGO	4" POT	12"-15" O.C. FOR SIDES AND BOTTOM OF MBR. MIX ALL VARIETIES IN A NATURALIZED RANDOM PATTERN THROUGHOUT. PLANT IN GROUPS OF NO LESS THAN 9 PLANTS PER CLUMP
	182	ACORUS GRAMINEUS 'OGON' GOLDEN VARIEGATED SWEET FLAG	1 QT.	-

MBR #	AREA	STEMS REQUIRED (0.0227)		PLANTINGS PROVIDED					PERENNIALS/GROUND COVER	
		TS	DP	AA	PV	BA	AG	TOTAL		
GW	5205	119	119	23	23	23	50	182	182	364
<b>TOTALS</b>	<b>5205</b>	<b>119</b>	<b>119</b>	<b>23</b>	<b>23</b>	<b>23</b>	<b>50</b>	<b>182</b>	<b>182</b>	<b>364</b>

AREAS ARE TO BE PLANTED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (0.0227 STEMS PER SQUARE FOOT).

**"GRAVEL WETLAND" PLANTING SCHEDULE NOTES:**

- ALL PLANT MATERIALS SHALL BE FULLING AND HEALTHY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT ANN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HOWARD COUNTY PLANTING SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
- FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES. CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLANT DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.
- PLANTINGS MAY BE SUBSTITUTED WITH NATIVE WETLAND PLANT STOCK OBTAINED FROM A LOCAL AQUATIC PLANT NURSERY.
- GRAVEL WETLAND AREAS ARE TO BE PLANTED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (0.0227 STEMS PER SQUARE FOOT). ABOVE PLANTING RATIOS ARE TO BE APPLIED TO THE AREAS PROVIDED IN THE ESD. SUMMARY.
- FILTER AREA SHALL BE 50% COVERED BY PLANTINGS AT FULL GROWTH

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SUBMERGED GRAVEL WETLANDS (M-2)**

- During the first year of operation, the Owner shall inspect the facility after every heavy storm and replace vegetation as needed.
- The Owner shall remove sediment accumulated in the pretreatment areas as necessary.
- Signs of uneven flow within the wetland may mean that the gravel or underdrain is clogged. The gravel or underdrain shall be removed, cleaned, and replaced, as needed.
- The Owner shall ensure a dense stand of wetland vegetation is maintained through the life of the facility and replace vegetation as needed.
- The Owner shall ensure the inlets and outlets to each gravel wetland cell are free from debris.
- The Owner shall repair erosion at inflow points and ensure flow splitters are functional to prevent storm water from bypassing the facility.

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDR-22-008

**SUBMERGED GRAVEL WETLAND**

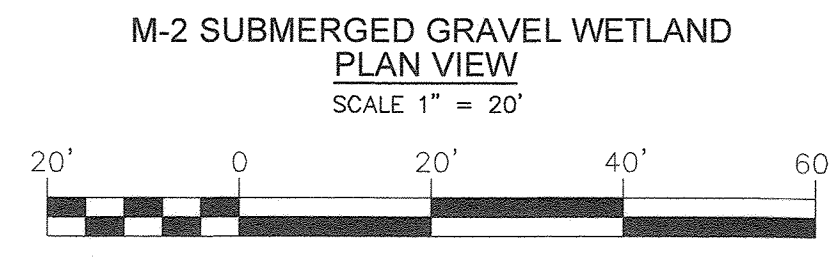
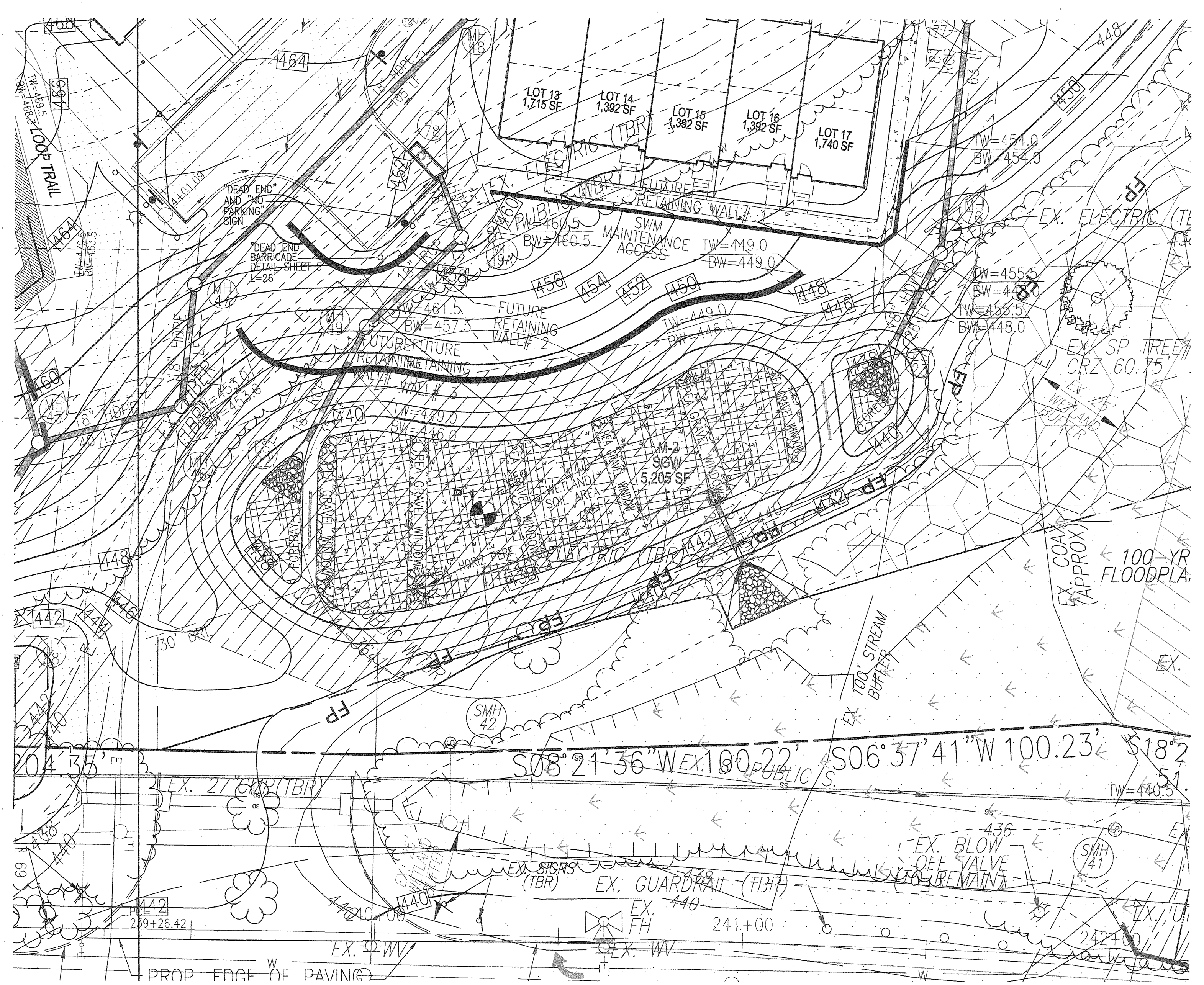
TYPE: NON-MD 378  
 HAZARD CLASS: A  
 PROP. DRAINAGE AREA: 1.87 AC.  
 BOTTOM ELEV.: 438.0 - SURFACE ELEVATION  
 GRAVEL WETLAND: 434.75 - 438 (SURFACE)  
 TOP: 442.2  
 EMERGENCY SPILLWAY: N/A

Q1 (DEV.): 3.6 CFS  
 Q10 (DEV.): 9.5 CFS  
 Q100 (DEV.): 18.3 CFS

Q1 (SWM): 2.2 CFS  
 1 YR SWM WSEL = 439.22  
 Q10 (SWM): 6.3 CFS  
 10 YR SWM WSEL = 439.58  
 Q100 (SWM): 13.6 CFS  
 100 YR SWM WSEL = 439.99

**OWNER**  
 CHAPELGATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM



NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 GRAVEL WETLAND NOTES AND DETAILS

**CHAPELGATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL

A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25942 - 25954  
 PARCELS: 110 & 421 L: 1389/F: 339 (P: 110)  
 MAP: 16 GRD: 10 L: 4163/F: 424 (P: 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

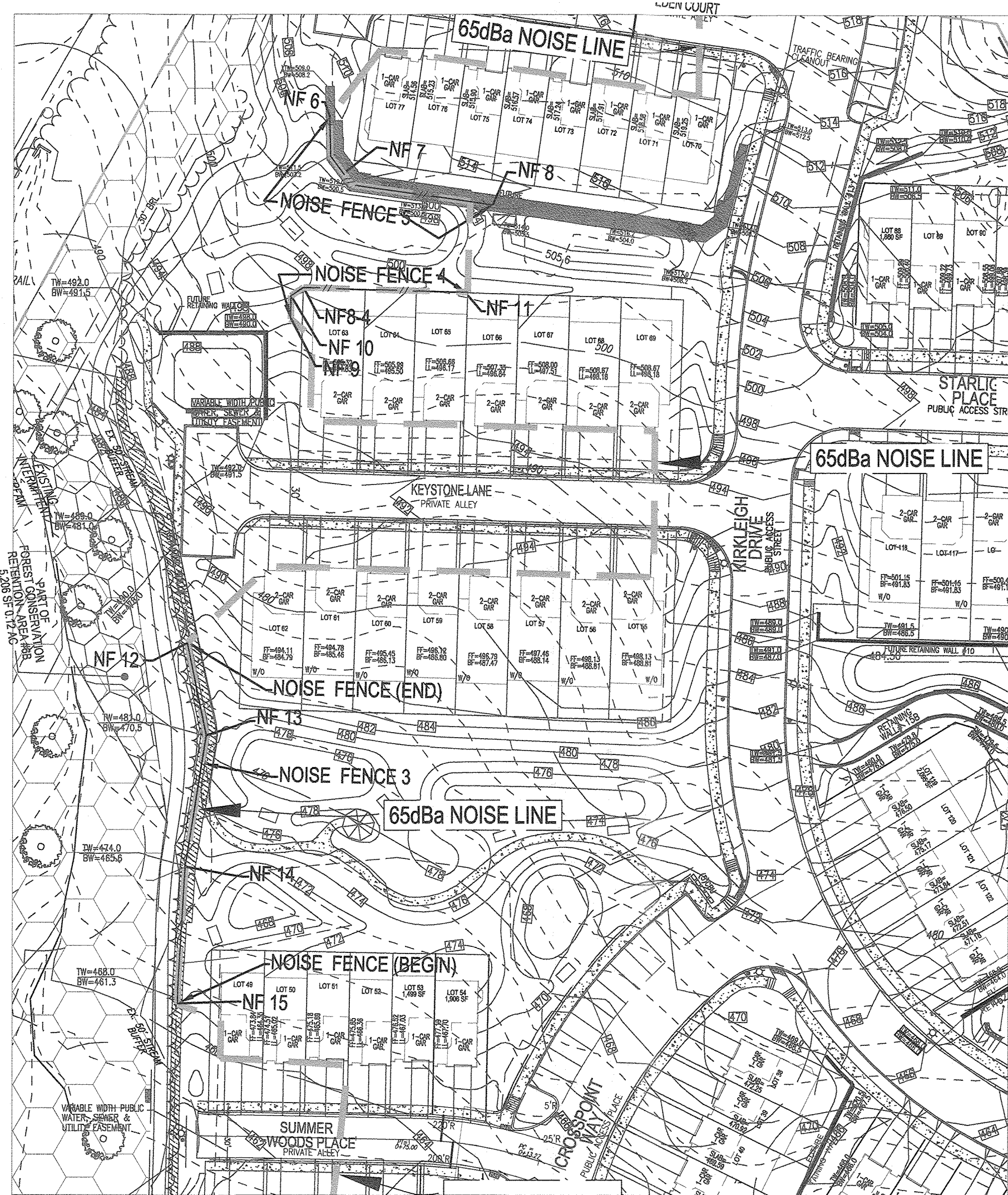
**PROFESSIONAL CERTIFICATE**

DESIGN BY: ES, RHY  
 DRAWN BY: VE+TC  
 CHECKED BY: RHY  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

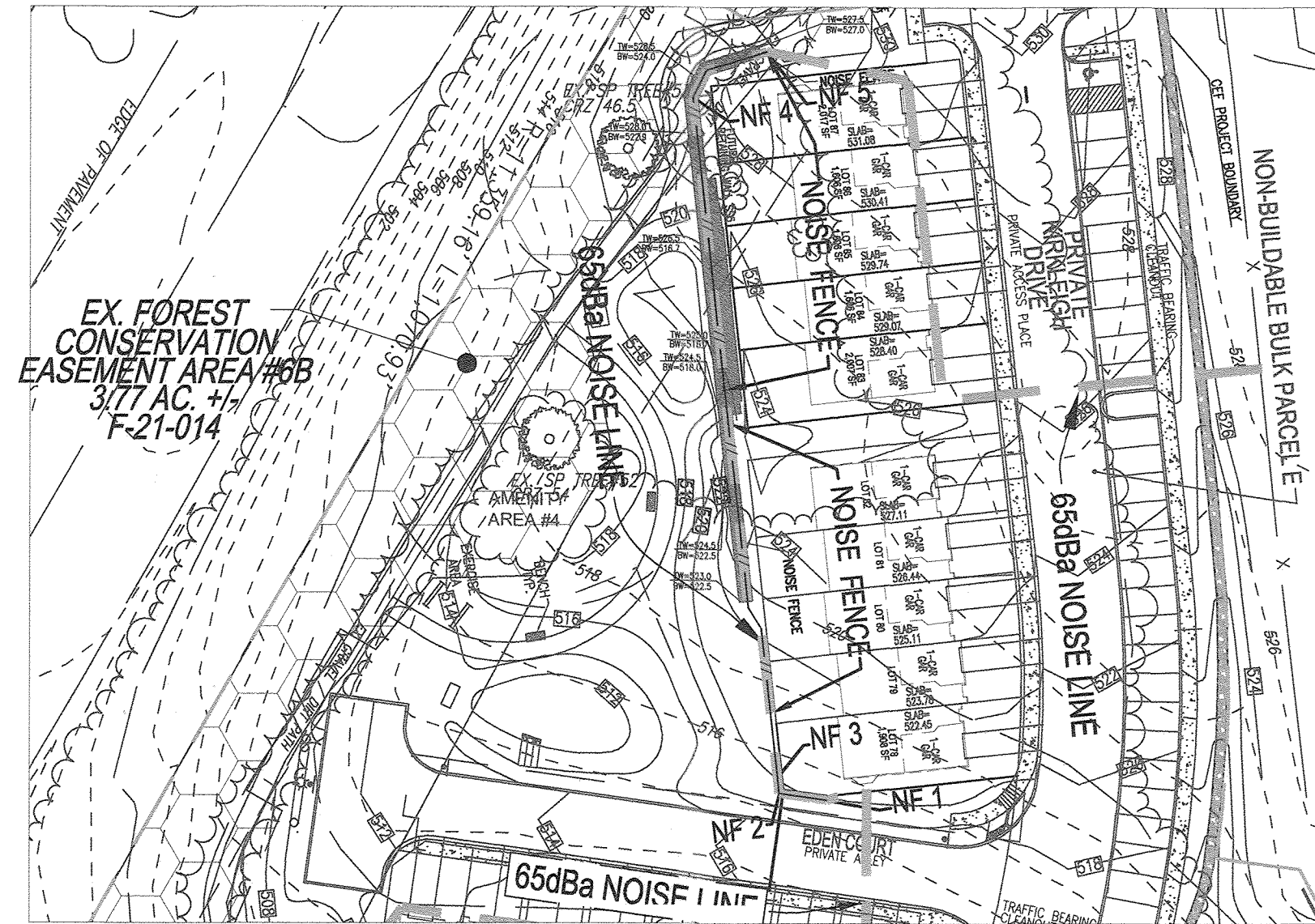
57 SHEET OF 101





NOISE FENCE 3, 4 & 5 LOCATIONS - LOTS 49 - 77, 88 - 90 & 116 - 118  
SCALE: 1" = 50'

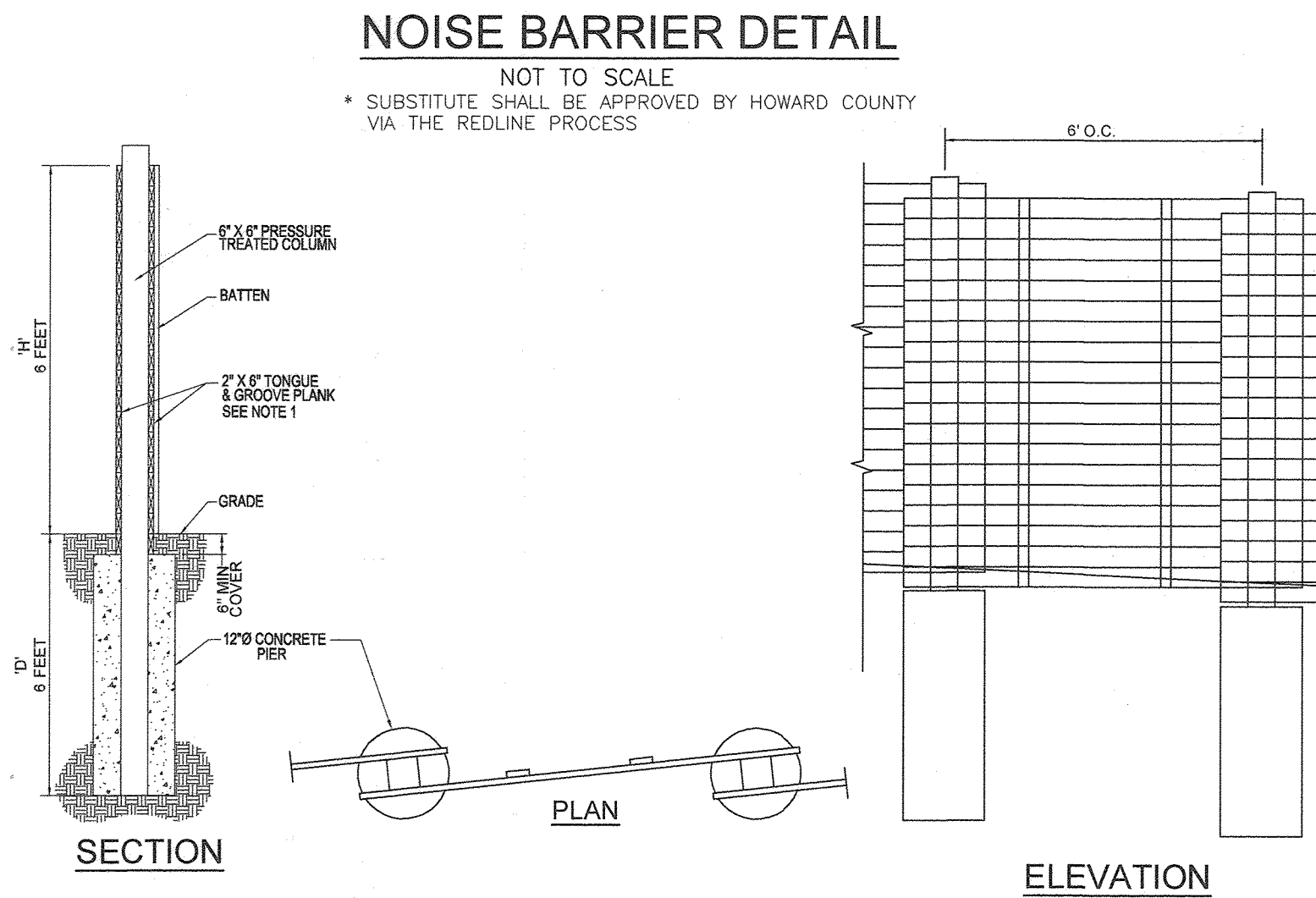
NOISE FENCE LOCATION CHART					
POINT	NORTHING	EASTING	GROUND	TOP FENCE	WALL HEIGHT
<b>NOISE FENCE 5</b>					
NF6	593937	1339610	510	516	6 FEET TALL
NF7	593939	1339637	512	518	6 FEET TALL
NF8	594004	1339658	514	520	6 FEET TALL
<b>NOISE FENCE 4</b>					
NF8-4	593910	1339687	498	504	6 FEET TALL
NF9	593902	1339700	499	505	6 FEET TALL
NF10	593904	1339690	498	504	6 FEET TALL
NF11	593986	1339703	501	507	6 FEET TALL
<b>NOISE FENCE 3</b>					
NF12	593829	1339841	485.3	491.3	6 FEET TALL
NF13	593830	1339885	480.5	486.5	6 FEET TALL
NF14	593810	1339943	473	479	6 FEET TALL
NF15	593795	1340006	468	474	6 FEET TALL



NOISE FENCE 6 LOCATION - LOTS 78 - 87  
SCALE: 1" = 50'

NOISE FENCE 6 LOCATION CHART					
POINT	NORTHING	EASTING	GROUND	TOP FENCE	WALL HEIGHT
NF1	594105	1339573	520	526	6 FEET TALL
NF2	594091	1339568	519	525	6 FEET TALL
NF3	594091	1339563	520	526	6 FEET TALL
NF4	594102	1339343	527.5	533.5	6 FEET TALL
NF5	594128	1339333	527.5	533.5	6 FEET TALL

A NOISE STUDY FOR THIS PROJECT WAS PREPARED BY VOGEL ENGINEERING+TIMMONS GROUP, DATED JULY 2020 AND APPROVED APRIL 19, 2021.  
-THE 65 DBA NOISE CONTOUR LINE DRAWN ON THIS SUBDIVISION PLAN IS ADVISORY AS REQUIRED BY THE HOWARD COUNTY DESIGN MANUAL, CHAPTER 5, REVISED FEBRUARY 1992, AND CANNOT BE CONSIDERED TO EXACTLY LOCATE THE 65 DBA NOISE EXPOSURE. THE 65 DBA NOISE LINE WAS ESTABLISHED BY HOWARD COUNTY TO ALERT DEVELOPERS, BUILDERS AND FUTURE RESIDENTS THAT AREAS BEYOND THIS THRESHOLD MAY EXCEED GENERALLY ACCEPTED NOISE LEVELS ESTABLISHED BY THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.

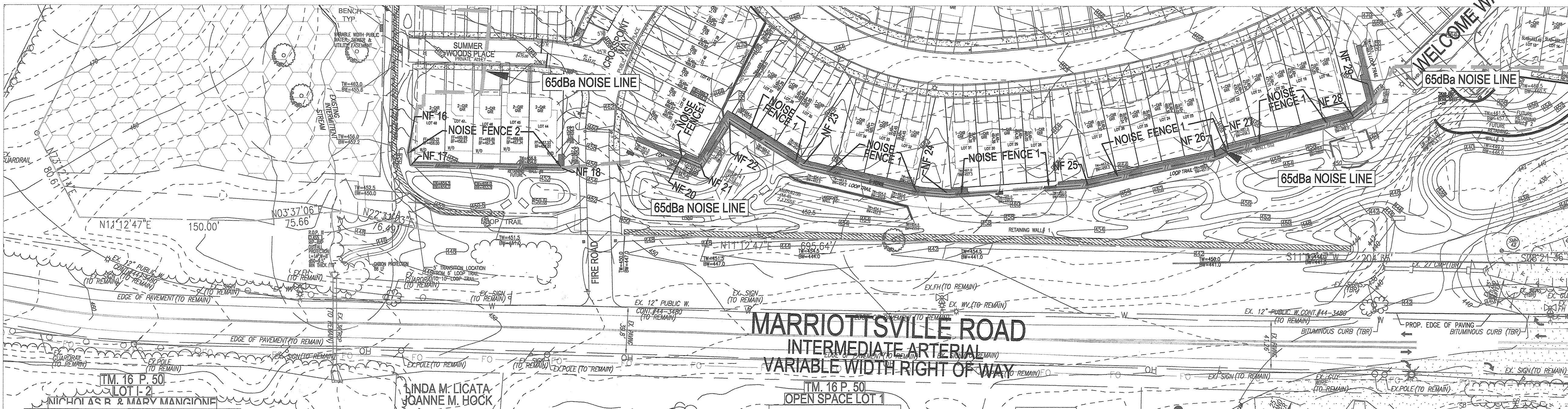


NOTE: REFER TO HOWARD COUNTY DETAIL B-16 FOR MATERIAL SPECIFICATIONS AND TREATMENT (PRESERVATIVE, PAINT OR STAIN)

**NOTES:**

- A. NOISE BARRIER SHALL BE 6 FEET TALL.
- B. NOISE BARRIER SHALL BE 6 FEET TALL.
- C. NOISE BARRIER SHALL BE 6 FEET TALL.
- D. NOISE BARRIER SHALL BE 6 FEET TALL.
- E. NOISE BARRIER SHALL BE 6 FEET TALL.
- F. NOISE BARRIER SHALL BE 6 FEET TALL.
- G. NOISE BARRIER SHALL BE 6 FEET TALL.
- H. NOISE BARRIER SHALL BE 6 FEET TALL.
- I. NOISE BARRIER SHALL BE 6 FEET TALL.
- J. NOISE BARRIER SHALL BE 6 FEET TALL.
- K. NOISE BARRIER SHALL BE 6 FEET TALL.
- L. NOISE BARRIER SHALL BE 6 FEET TALL.
- M. NOISE BARRIER SHALL BE 6 FEET TALL.
- N. NOISE BARRIER SHALL BE 6 FEET TALL.
- O. NOISE BARRIER SHALL BE 6 FEET TALL.
- P. NOISE BARRIER SHALL BE 6 FEET TALL.
- Q. NOISE BARRIER SHALL BE 6 FEET TALL.
- R. NOISE BARRIER SHALL BE 6 FEET TALL.
- S. NOISE BARRIER SHALL BE 6 FEET TALL.
- T. NOISE BARRIER SHALL BE 6 FEET TALL.
- U. NOISE BARRIER SHALL BE 6 FEET TALL.
- V. NOISE BARRIER SHALL BE 6 FEET TALL.
- W. NOISE BARRIER SHALL BE 6 FEET TALL.
- X. NOISE BARRIER SHALL BE 6 FEET TALL.
- Y. NOISE BARRIER SHALL BE 6 FEET TALL.
- Z. NOISE BARRIER SHALL BE 6 FEET TALL.

Howard County, Maryland  
Department of Public Works  
Noise Wall Notes  
Private  
B-9.06




NOISE FENCE 1 & 2 LOCATIONS  
SCALE: 1" = 50'

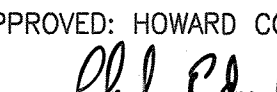
NOISE FENCE 2 LOCATION CHART					
POINT	NORTHING	EASTING	GROUND	TOP FENCE	WALL HEIGHT
NF16	593778	1340154	455	461	6 FEET TALL
NF17	593779	1340166	454	460	6 FEET TALL
NF18	593907	1340191	457.4	463.4	6 FEET TALL


NOISE FENCE 1 LOCATION CHART					
POINT	NORTHING	EASTING	GROUND	TOP FENCE	WALL HEIGHT
NF20	594009	1340199	463	469	6 FEET TALL
NF21	594024	1340208	463	469	6 FEET TALL
NF22	594055	1340174	464	470	6 FEET TALL
NF23	594110	1340224	463	469	6 FEET TALL
NF24	594230	1340270	461	467	6 FEET TALL
NF25	594349	1340283	463.5	469.5	6 FEET TALL
NF26	594460	1340278	466.5	472.5	6 FEET TALL
NF27	594473	1340275	467	473	6 FEET TALL
NF28	594584	1340265	470.5	476.5	6 FEET TALL
NF29	594600	1340238	470	476	6 FEET TALL

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDF-22-008

A NOISE STUDY FOR THIS PROJECT WAS PREPARED BY VOGEL ENGINEERING+TIMMONS GROUP, DATED JULY 2020 AND APPROVED APRIL 19, 2021.  
-THE 65 DBA NOISE CONTOUR LINE DRAWN ON THIS SUBDIVISION PLAN IS ADVISORY AS REQUIRED BY THE HOWARD COUNTY DESIGN MANUAL, CHAPTER 5, REVISED FEBRUARY 1992, AND CANNOT BE CONSIDERED TO EXACTLY LOCATE THE 65 DBA NOISE EXPOSURE. THE 65 DBA NOISE LINE WAS ESTABLISHED BY HOWARD COUNTY TO ALERT DEVELOPERS, BUILDERS AND FUTURE RESIDENTS THAT AREAS BEYOND THIS THRESHOLD MAY EXCEED GENERALLY ACCEPTED NOISE LEVELS ESTABLISHED BY THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.


APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/14/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9/21/22

APPROVED: DIVISION OF LAND DEVELOPMENT  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/20/22

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTSVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
 NOISE WALL DETAILING  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF 'CHAPEL GATE', NON-BUILDABLE BULK PARCEL B  
 PLATS 25942 & 25954  
 PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRD: 10 L 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

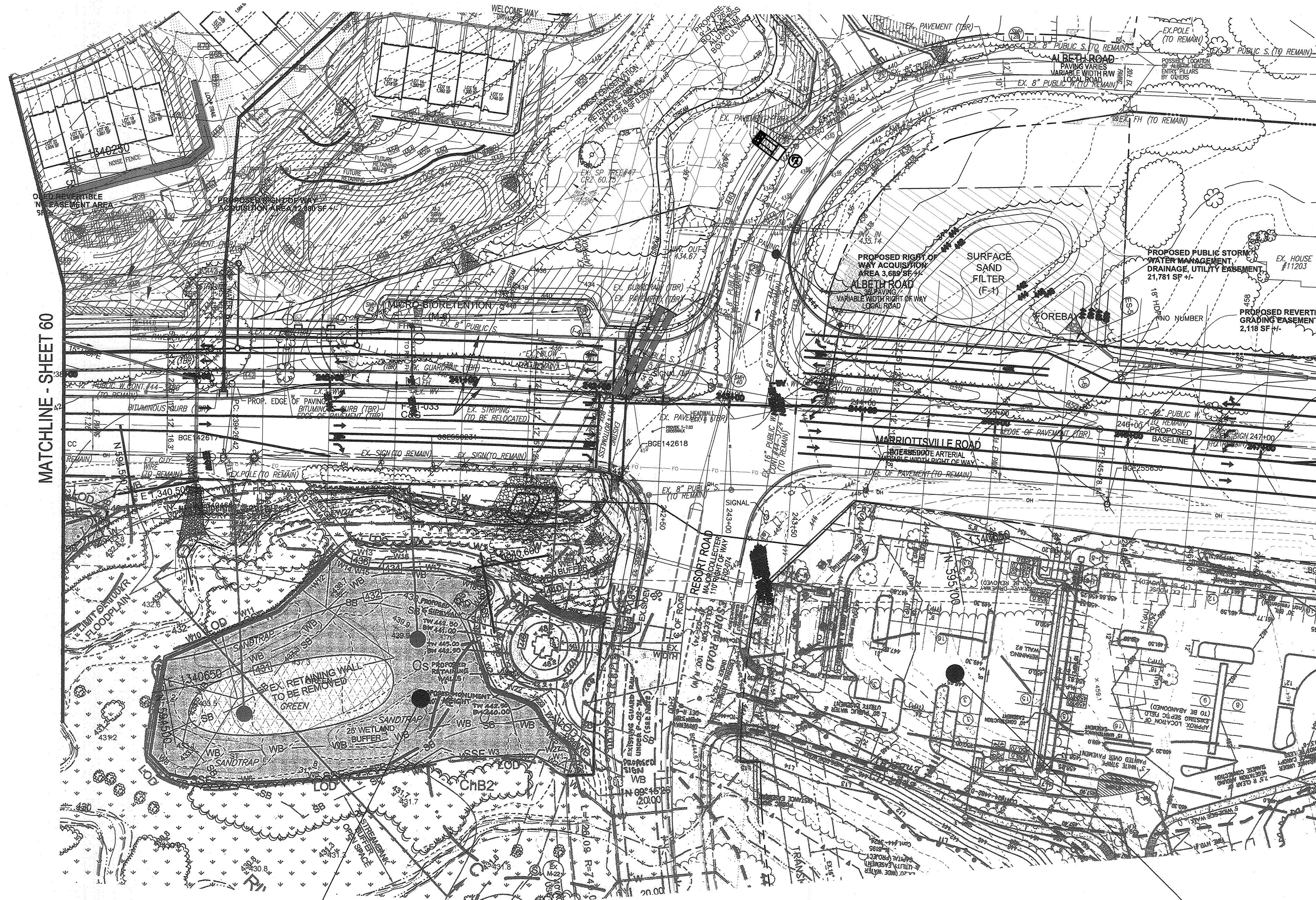
DESIGN BY: ES, RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2022

58 SHEET OF 101



Maryland State Grid Meridian



MATCHLINE - SHEET 60

**NOTE:**  
REFER TO CAPITAL PROJECT J-4205 PLANS FOR IMPROVEMENTS BEYOND THIS POINT

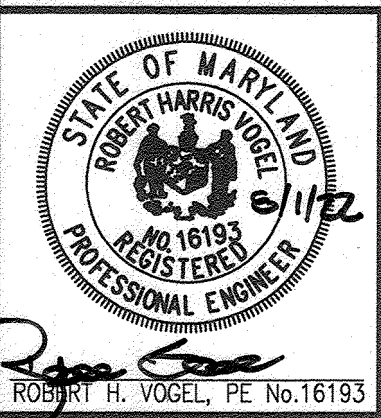
THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-011 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-009

<b>OWNER</b>	<b>DEVELOPER</b>
CHAPELGATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTVILLE RD. MARRIOTTVILLE, MD 21104 (410) 442-5888	SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLCOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM

NO.	REVISION	DATE
2	REVISE THE PLAN TO ADJUST ALBETH ROAD CURB LINE GRADE AND TO ADD 'PT-A'	4-12-23
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDERS SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-29-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
F-21-033 / PHASE 1 CAPITAL PROJECT J-4205  
AND CHAPELGATE WOODS PROJECT MERGE  
**CHAPELGATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
PARCELS: 110 & 421 L: 1389/F: 339 (P. 110)  
TAX MAP: 16 GRID TO L: 4163/F: 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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



PROFESSIONAL CERTIFICATE  
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DESIGN BY: ES, RHV  
DRAWN BY: VE-TG  
CHECKED BY: RHV  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-38 / 40220

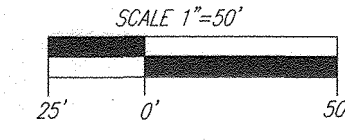
59 SHEET OF 101

REFER TO SDP-10-056

REFER TO SDP-07-084

**F-21-033 / PHASE 1 CAPITAL PROJECT J-4205 AND CHAPELGATE WOODS PROJECT MERGE**

SCALE: 1"=50'



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/14/2022

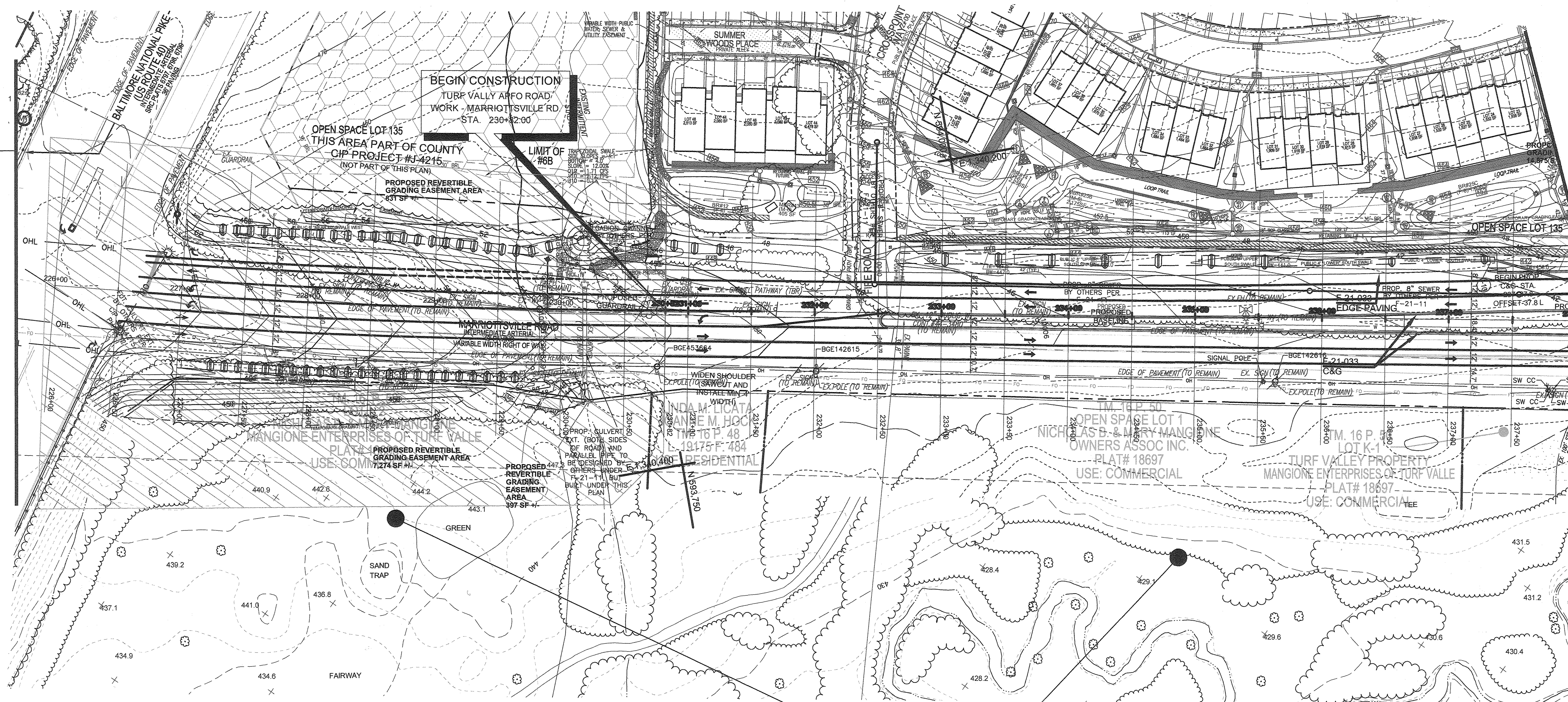
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9-21-22

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/26/22

**NOTE:**  
MARRIOTTVILLE ROAD - F-21-033 / PHASE 1 CAPITAL PROJECT J-4205 PLAN INFORMATION SHOWN HEREON WAS TAKEN FROM THE LATEST INFORMATION MADE AVAILABLE TO VOGEL ENGINEERING+TIMMONS GROUP 1/2021



NOTE:  
REFER TO CAPITAL PROJECT J-4205 PLANS  
FOR IMPROVEMENTS BEYOND THIS POINT



MATCHLINE - SHEET 59

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-033 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SDP-22-008

**OWNER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

REFER TO  
SDP-10-056

Maryland State Grid Meridian

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDERS SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

REVISED FINAL ROAD CONSTRUCTION PLAN  
F-21-033 / PHASE 1 CAPITAL PROJECT J-4205  
AND CHAPELGATE WOODS PROJECT MERGE  
**CHAPELGATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
PARCELS: 110 & 421 L 1389/F 339 (P 110)  
TAX MAP: 16 GRD 10 L 4163/F 424 (P 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
⊕  
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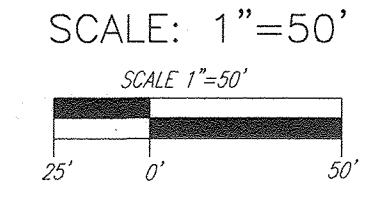
	DESIGN BY: ES, RHV	I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022
	DRAWN BY: VE+TC	
	CHECKED BY: RHV	
	DATE: SEPTEMBER 2021	
SCALE: AS SHOWN	W.O. NO.: 13-36 / 49220	60 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS MK  
 DATE: 09/14/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION JZ  
 DATE: 9-21-22

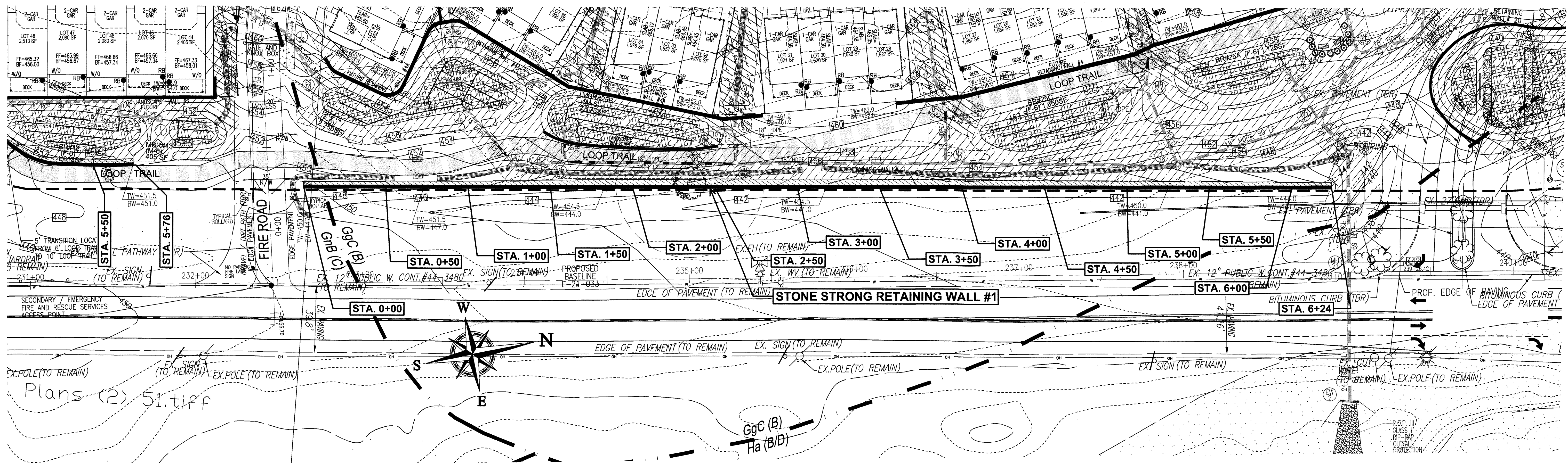
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT JAM  
 DATE: 9/22/22

F-21-033 / PHASE 1 CAPITAL PROJECT J-4205  
AND CHAPELGATE WOODS PROJECT MERGE

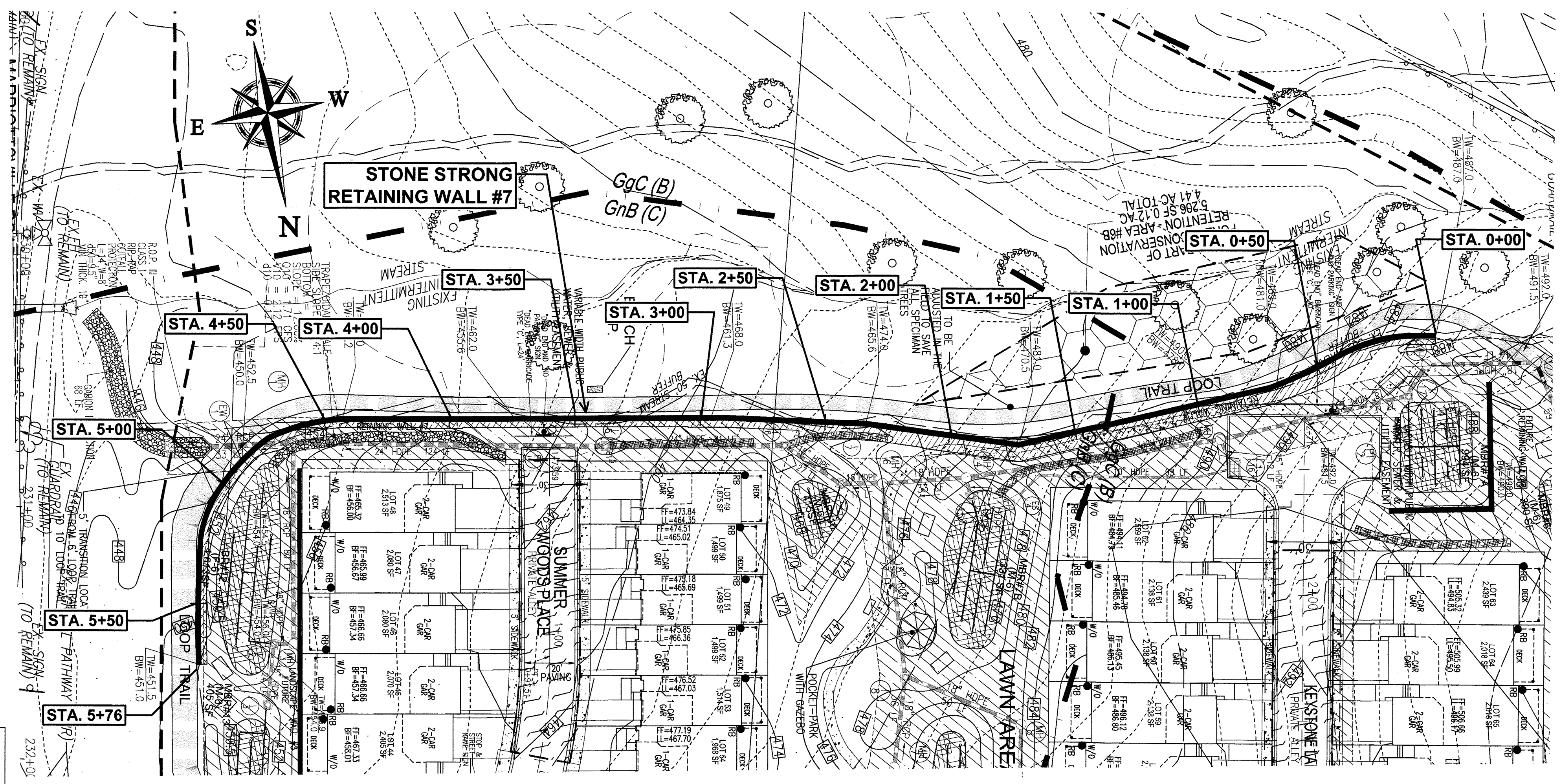


NOTE:  
MARRIOTTVILLE ROAD - F-21-033 / PHASE 1  
CAPITAL PROJECT J-4205 PLAN INFORMATION SHOWN  
HEREON WAS TAKEN FROM THE LATEST INFORMATION  
MADE AVAILABLE TO VOGEL ENGINEERING+TIMMONS  
GROUP 1/2021





**STONE STRONG RETAINING WALL #1 LOCATION PLAN**  
1" = 30'





**STONE STRONG RETAINING WALL #7 LOCATION PLAN**  
1" = 30'

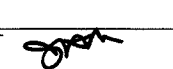
NOTE:  
RETAINING WALLS TO BE  
MAINTAINED BY H.O.A.

**OWNER**  
CHAPELGATE PRESBYTERIAN  
CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLCOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS  
 12/07/2021  
 MK DATE

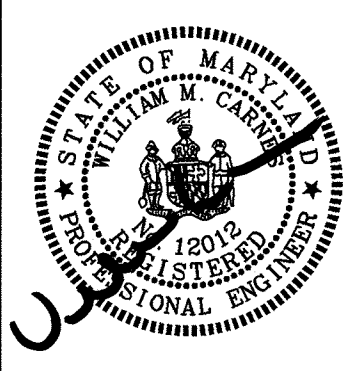
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 12-23-21  
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 1/13/22  
 DATE

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
**STONE STRONG RETAINING WALLS #1 & #7**  
 LOCATION PLAN  
**CHAPELGATE WOODS**  
 LOTS 1-134 OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 L 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRID: 10 L 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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



PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS  
 WERE PREPARED OR APPROVED BY ME, AND  
 THAT I AM A DULY LICENSED PROFESSIONAL  
 ENGINEER UNDER THE LAWS OF THE STATE  
 OF MARYLAND, LICENSE NO. 12012  
 EXPIRATION DATE: 06/16/22.

DESIGN BY: HM+AM  
 DRAWN BY: HM+AM  
 CHECKED BY: HM  
 DATE: SEPT 2021  
 SCALE: AS SHOWN  
 HCEA NO.: 20441A

**61** SHEET **101**  
OF



**STONE STRONG SYSTEMS SPECIFICATIONS FOR PRECAST MODULAR BLOCK RETAINING WALL SYSTEM**

**PART 1: GENERAL**

**1.01 DESCRIPTION**

- A. WORK INCLUDES FURNISHING AND INSTALLING PRECAST MODULAR BLOCKS (PMB) TO THE LINES AND GRADES SHOWN ON THE PLANS AND AS SPECIFIED HEREIN. ALSO INCLUDED IS FURNISHING AND INSTALLING APPURTENANT MATERIALS REQUIRED FOR CONSTRUCTION OF THE COMPLETE SYSTEM.
- B. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SAFETY. THE ENGINEER AND OWNER SHALL NOT BE RESPONSIBLE FOR MEANS OR METHODS OF CONSTRUCTION OR FOR SAFETY OF WORKERS OR THE PUBLIC.

**1.02 DELIVERY, STORAGE, AND HANDLING**

- A. CONTRACTOR SHALL CHECK THE MATERIALS UPON DELIVERY TO ASSURE THAT PROPER MATERIALS HAVE BEEN RECEIVED.
- B. CONTRACTOR SHALL PROTECT THE MATERIALS FROM DAMAGE. DAMAGED MATERIAL SHALL NOT BE INCORPORATED INTO THE WALL OR THE REINFORCED SOIL EMBANKMENTS.
- C. CONTRACTOR SHALL PREVENT EXCESSIVE MUD, CONCRETE, ADHESIVES AND OTHER SUBSTANCES THAT MAY ADHERE FROM COMING IN CONTACT WITH THE MATERIALS.
- D. EXPOSED FACES OF PRECAST MODULAR BLOCK UNITS SHALL BE REASONABLY FREE OF CHIPS, CRACKS, OR STAINS WHEN VIEWED FROM A DISTANCE OF 10 FEET.

**PART 2: MATERIALS**

**2.01 WALL UNITS**

- A. PRECAST MODULAR BLOCKS SHALL BE STONE STRONG UNITS MANUFACTURED UNDER LICENSE FROM STONE STRONG LLC.
- B. WALL UNITS SHALL CONFORM TO ASTM C1776.
- C. DIMENSION TOLERANCES FOR PRECAST MODULAR BLOCKS SHALL BE +/- 1/8 INCH FOR HEIGHT, +/- 1/8 INCH FOR LENGTH (ALONG FACE), AND +1/2 TO -1/4 INCH FOR WIDTH (FACE TO TAIL).
- D. CONCRETE FOR PRECAST MODULAR BLOCKS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. ENTRAINED AIR CONTENT SHALL BE BETWEEN 5 AND 7%.
- E. INTERNAL UNIT REINFORCEMENT OR UNREINFORCED UNITS SHALL BE PROVIDED ACCORDING TO PUBLISHED STONE STRONG ENGINEERING GUIDANCE. REINFORCED UNITS SHALL BE MARKED WITH THE TYPE OF REINFORCEMENT.
- F. THE FACE PATTERN SHALL BE SELECTED FROM THE MANUFACTURER'S STANDARD MOLDS. THE COLOR OF THE UNITS SHALL BE NATURAL GRAY. A CONCRETE STAIN MAY BE FIELD APPLIED TO COLOR THE UNITS IF SPECIFIED BY THE ENGINEER OR OWNER.

**2.03 WALL BASE**

- A. THE WALL BASE SHALL CONSIST OF DENSE GRADED CRUSHED AGGREGATE. A MINIMUM OF 75% OF COARSE MATERIAL SHALL HAVE 2 OR MORE FRACTURED FACES. WALL BASE MATERIAL SHALL MEET THE FOLLOWING GRADATION:  

US STANDARD SIEVE SIZE	PERCENT PASSING
1-1/2"	80-100%
3/4"	50-90%
#4	0-40%
#200	0-10%
- B. THE CONTRACTOR MAY SUBSTITUTE CONCRETE WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI FOR THE GRANULAR BASE MATERIAL. CONCRETE MAY BE PLACED FULL THICKNESS OR AS A TOPPING OVER A COMPACTED GRANULAR THE BASE. IF USED AS A TOPPING, THE CONCRETE SHALL HAVE A MINIMUM THICKNESS OF 3 INCHES.

**2.04 UNIT FILL**

- A. UNIT FILL SHALL CONSIST OF A SCREENED CRUSHED AGGREGATE. A MINIMUM OF 75% OF COARSE MATERIAL SHALL HAVE 2 OR MORE FRACTURED FACES. UNIT FILL MATERIAL SHALL MEET THE FOLLOWING GRADATION:

US STANDARD SIEVE SIZE	PERCENT PASSING
1-1/2"	100%
3/4"	50-90%
#4	0-10%
#8	0-5%

**2.05 BACKFILL**

- A. IF A SELECT GRANULAR REINFORCED ZONE IS INDICATED, IT SHALL CONSIST OF FILL SAND OR OTHER CLEAN AGGREGATE MEETING THE FOLLOWING GRADATION:

US STANDARD SIEVE SIZE	PERCENT PASSING
3/4"	100%
#200	0-5%

- B. ALL OTHER BACKFILL BEHIND AND IN FRONT OF THE WALL SHALL CONSIST OF SUITABLE ON-SITE SOIL OR IMPORTED BORROW AND SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER. BACKFILL SHALL GENERALLY CONSIST OF SANDS, SILTS, OR LEAN CLAYS WITH A LIQUID LIMIT LESS THAN 45 AND A PLASTICITY INDEX LESS THAN 20. FAT CLAY SOILS, COBBLES, AND LARGE ROCK SHOULD GENERALLY BE AVOIDED UNLESS APPROVED BY THE GEOTECHNICAL ENGINEER BASED ON LOCAL PRACTICES. FROZEN SOILS, EXCESSIVELY WET OR DRY SOILS, DEBRIS, AND DELETERIOUS MATERIALS SHOULD NOT BE USED.

**2.06 DRAIN TILE**

- A. DRAIN TILE SHALL BE A PERFORATED OR SLOTTED PVC OR CORRUGATED HDPE PIPE. THE DRAIN TILE SHOULD BE CONNECTED TO STORM DRAINS OR DAYLIGHTED AT LOW POINTS AND/OR PERIODICALLY ALONG THE WALL ALIGNMENT AS SHOWN ON THE PLANS.

**2.07 GEOTEXTILE FABRIC**

- A. PROVIDE A GEOTEXTILE FILTER FOR SEPARATION FROM BACKFILL AT THE TAILS OF THE BLOCKS. THE GEOTEXTILE SHALL BE A NEEDLE PUNCHED NON-WOVEN FABRIC WITH A MINIMUM GRAB TENSILE STRENGTH OF 120 POUNDS. THE GEOTEXTILE MAY COVER THE ENTIRE BACK FACE OF THE BLOCKS OR MAY BE CUT IN STRIPS TO COVER THE GAPS BETWEEN TAIL UNITS WITH A MINIMUM OF 6 INCHES OF OVERLAP OVER THE CONCRETE TAIL ON BOTH SIDES.

**2.08 CONCRETE FOR TAIL EXTENSIONS**

**PART 3: EXECUTION**

**3.01 EXCAVATION**

- A. EXCAVATE AS REQUIRED FOR INSTALLATION OF THE RETAINING WALL SYSTEM. EXCAVATE TO THE BASE LEVEL FOR A SUFFICIENT DISTANCE BEHIND THE FACE TO PERMIT INSTALLATION OF THE BASE.
- B. SLOPE OR SHORE EXCAVATION AS NECESSARY FOR SAFETY AND FOR CONFORMANCE WITH APPLICABLE OSHA REQUIREMENTS.

**3.02 WALL BASE**

- A. FOUNDATION SOILS SHALL BE EXCAVATED TO THE DIMENSIONS SHOWN ON THE PLANS. FOUNDATION SOIL SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO CONFIRM THAT THE BEARING SOILS ARE SIMILAR TO THE DESIGN CONDITIONS OR ASSUMPTIONS.
- B. CONSTRUCT THE WALL BASE TO THE LINES AND GRADES SHOWN ON THE PLANS. PLACE AND CONSOLIDATE CONCRETE, STRIKE, AND FINISH PLANE AND LEVEL. OVEREXCAVATED AREAS SHALL BE FILLED WITH ADDITIONAL CONCRETE OR GRANULAR BASE MATERIAL. COMPACT GRANULAR BASE MATERIAL TO PROVIDE A HARD AND LEVEL SURFACE TO SUPPORT THE

WALL UNITS. BASE MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY (ASTM D698, STANDARD PROCTOR). FINAL BASE ELEVATION SHALL BE WITHIN 0.1 FEET OF PLAN ELEVATION.

- C. PREPARE AND SMOOTH THE GRANULAR MATERIAL TO ENSURE COMPLETE CONTACT OF THE FIRST COURSE WITH THE BASE. THE BASE MAY BE DRESSED WITH FINE AGGREGATE TO AID LEVELING.

**3.03 UNIT INSTALLATION**

- A. PLACE THE FIRST COURSE OF UNITS DIRECTLY ON THE WALL BASE. CHECK UNITS FOR LEVEL AND ALIGNMENT. UNITS SHALL BE WITHIN 1/8 INCH OF LEVEL FROM END TO END AND FROM FRONT TO BACK. ADJACENT UNITS SHOULD BE IN CONTACT. IF POSSIBLE, BEGIN PLACING UNITS AT THE LOWEST SECTION OF THE WALL.
- B. FILL ALL VOIDS BETWEEN AND WITHIN THE BLOCKS WITH GRANULAR UNIT FILL. ADDITIONAL UNIT FILL IS NOT REQUIRED BEHIND THE UNITS, BUT MAY BE PLACED FOR THE CONVENIENCE OF THE CONTRACTOR.
- C. PLACE BACKFILL BEHIND THE UNITS IN MAXIMUM LOOSE LIFTS OF 8 INCHES AND COMPACT. COMPACT ALL BACKFILL TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY (ASTM D698, STANDARD PROCTOR). FOR COHESIVE SOILS, THE MOISTURE CONTENT AT THE TIME OF COMPACTION SHOULD BE ADJUSTED TO WITHIN -2 AND +3 PERCENT OF OPTIMUM. PLACE BACKFILL IN SUCCESSIVE LIFTS UNTIL LEVEL WITH THE TOP OF THE FACING UNIT.
- D. REMOVE ALL EXCESS AGGREGATE AND OTHER MATERIALS FROM THE TOP OF THE UNITS BEFORE LAYING UP THE NEXT COURSE.
- E. PLACE THE NEXT COURSE OF PRECAST MODULAR BLOCK UNITS IN RUNNING BOND WITH THE PREVIOUS COURSE. PLACE THE WEB RECESS OVER THE ALIGNMENT HOOP PROTRUDING FROM THE UNIT BELOW, AND PULL THE UNIT FORWARD TO CONTACT THE HOOP. BATTER SHOULD BE WITHIN 1/4 INCH TOLERANCE (4 INCHES FROM 24 SF UNIT BELOW, 2 INCHES FROM 6 SF UNIT BELOW).
- F. CONTINUE PLACING SUCCESSIVE COURSES TO THE ELEVATIONS SHOWN ON THE PLANS. CONSTRUCT WALL IN LEVEL STAGES, PLACING THE UNITS AT EACH COURSE FOR THE ENTIRE LENGTH OF THE WALL, IF POSSIBLE. UNIT FILL AND BACKFILL SHOULD BE PLACED TO THE LEVEL OF THE TOP OF THE FACING UNIT BEFORE PLACING THE NEXT COURSE.
- G. PROVIDE TEMPORARY SWALES TO DIVERT RUNOFF AWAY FROM WALL EXCAVATION AND AWAY FROM FACE.
- H. FINAL GRADE ABOVE AND BELOW THE RETAINING WALL SHALL PROVIDE FOR POSITIVE DRAINAGE AND PREVENT PONDING. PROTECT COMPLETED WALL FROM OTHER CONSTRUCTION. DO NOT OPERATE LARGE EQUIPMENT OR STORE MATERIALS ABOVE THE WALL THAT EXCEED THE DESIGN SURCHARGE LOADS.

**PART 4: CONSTRUCTION QUALITY CONTROL AND ASSURANCE**

**4.01 CONSTRUCTION QUALITY CONTROL**

- A. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT ALL INSTALLATION AND MATERIALS MEET THE QUALITY SPECIFIED IN THE CONSTRUCTION DRAWINGS.
- B. THE CONTRACTOR SHALL VERIFY THAT INSTALLATION IS IN ACCORDANCE WITH THE SPECIFICATIONS AND CONSTRUCTION DRAWINGS.

**4.02 QUALITY ASSURANCE**

- A. THE OWNER IS RESPONSIBLE TO ENGAGE TESTING AND INSPECTION SERVICES TO PROVIDE INDEPENDENT QUALITY CONSTRUCTION ASSURANCE.
- B. COMPACTION TESTING SHALL BE DONE A MINIMUM OF EVERY 1 FOOT OF VERTICAL FILL AND EVERY 100 LINEAL FEET ALONG THE WALL.
- C. TESTING SHALL BE DONE AT A VARIETY OF LOCATIONS TO COVER THE ENTIRE BACKFILL ZONE.
- D. THE INDEPENDENT INSPECTION PROFESSIONAL SHOULD PERFORM SUFFICIENT TESTING AND OBSERVATION TO VERIFY THAT WALL INSTALLATION SUBSTANTIALLY CONFORMS TO THE DESIGN DRAWINGS AND SPECIFICATIONS.

**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.

<p><b>OWNER</b> CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTSVILLE RD. MARRIOTTSVILLE, MD 21104 (410) 442-5888</p>	<p><b>DEVELOPER</b> SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLICOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM</p>
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NO.	REVISION	DATE

**FINAL ROAD CONSTRUCTION PLAN**  
**STONE STRONG RETAINING WALL**  
**SPECIFICATIONS AND NOTES**  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 25942 - 25954  
PARCELS: 110 & 421 L: 1389/F: 339 (P. 110)  
TAX MAP: 18 GRD-10 L: 4183/F: 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
**ENGINEERING ASSOCIATES**  
10975 Guilford Road, Suite A Annapolis Junction, Maryland  
Phone: (410) 890-4788 www.hcea.com Fax: (410) 890-4098



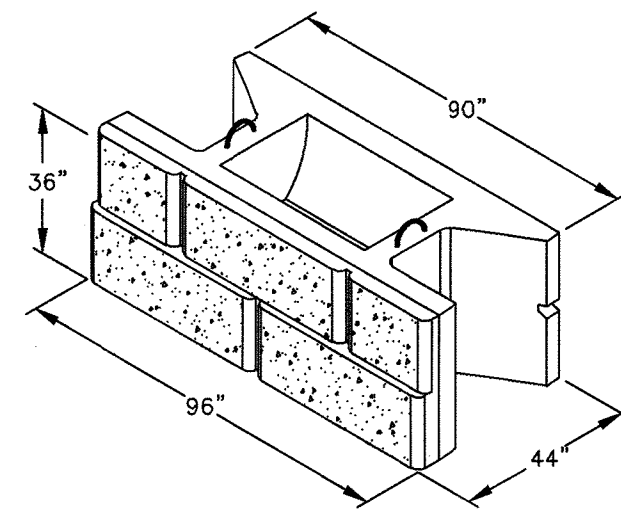
**PROFESSIONAL CERTIFICATE**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12012, EXPIRATION DATE: 06/30/22.  
DESIGN BY: HM+AM  
DRAWN BY: HM+AM  
CHECKED BY: HM  
DATE: SEPT 2021  
SCALE: AS SHOWN  
HCEA NO.: 20441A  
**62** SHEET **101** OF

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[Signature] 12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

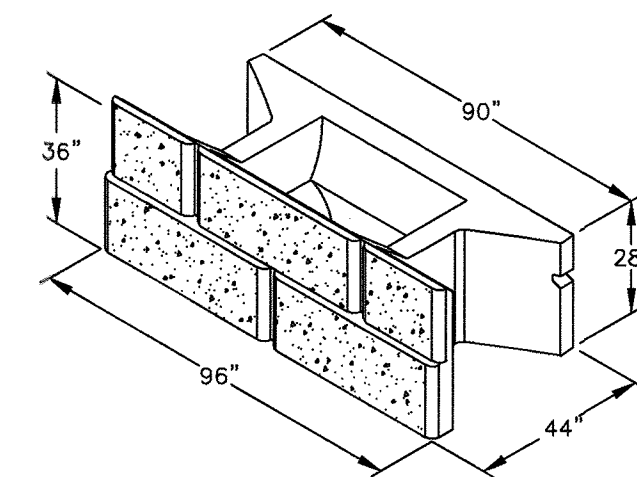
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CHIEF, DEVELOPMENT ENGINEERING DIVISION # DATE

[Signature] 1/10/22  
CHIEF, DIVISION OF LAND DEVELOPMENT gm DATE

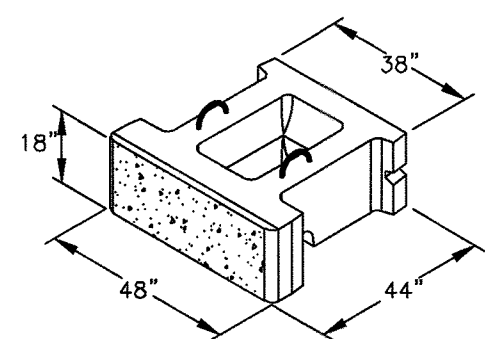




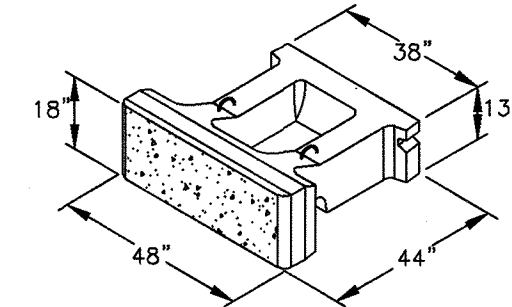
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BATTERED FACE  
NOT TO SCALE



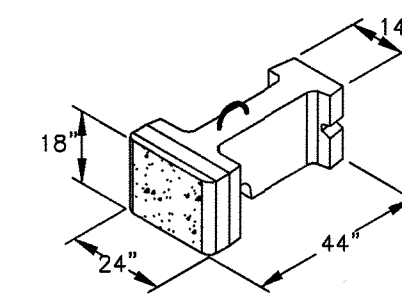
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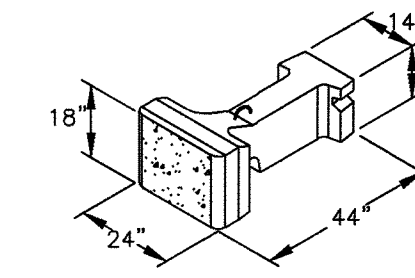
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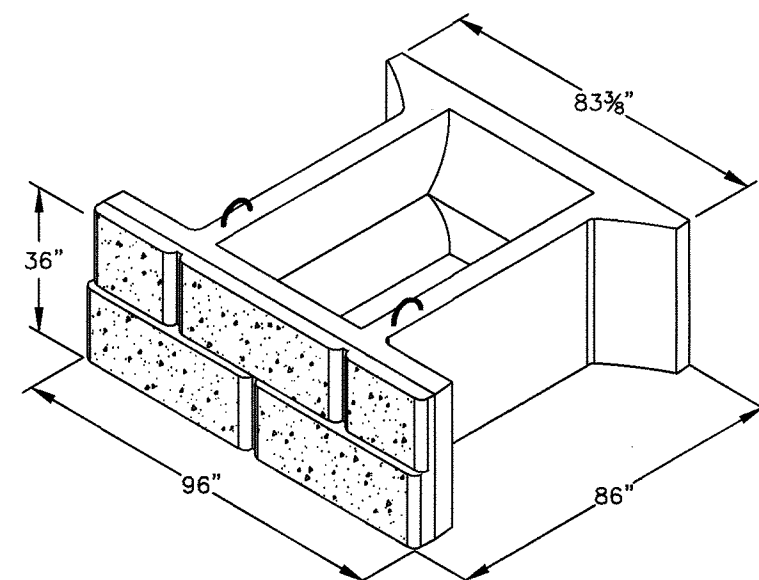
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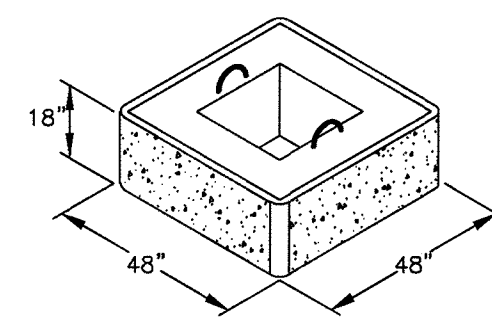
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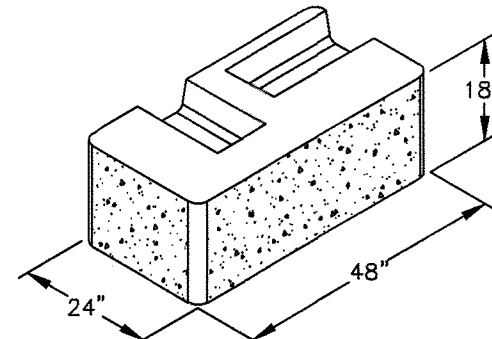
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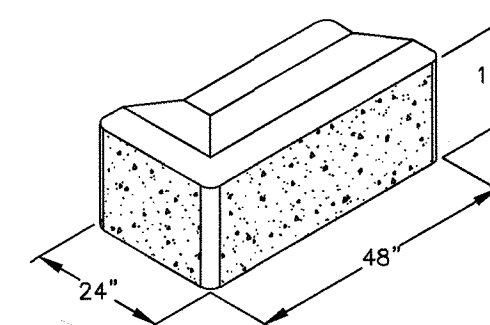
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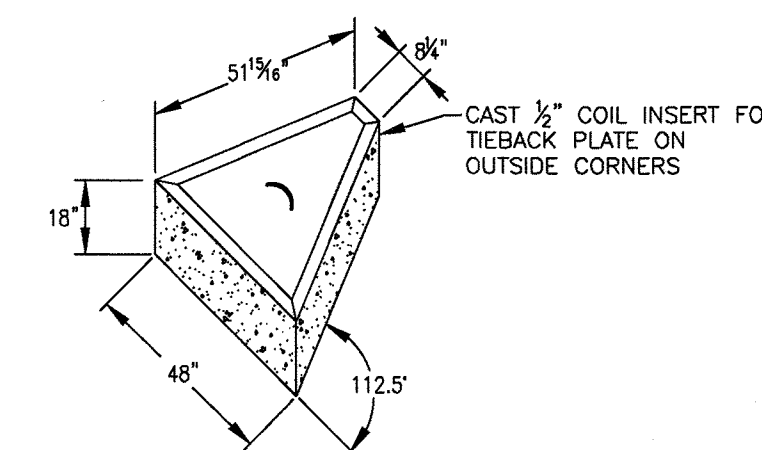
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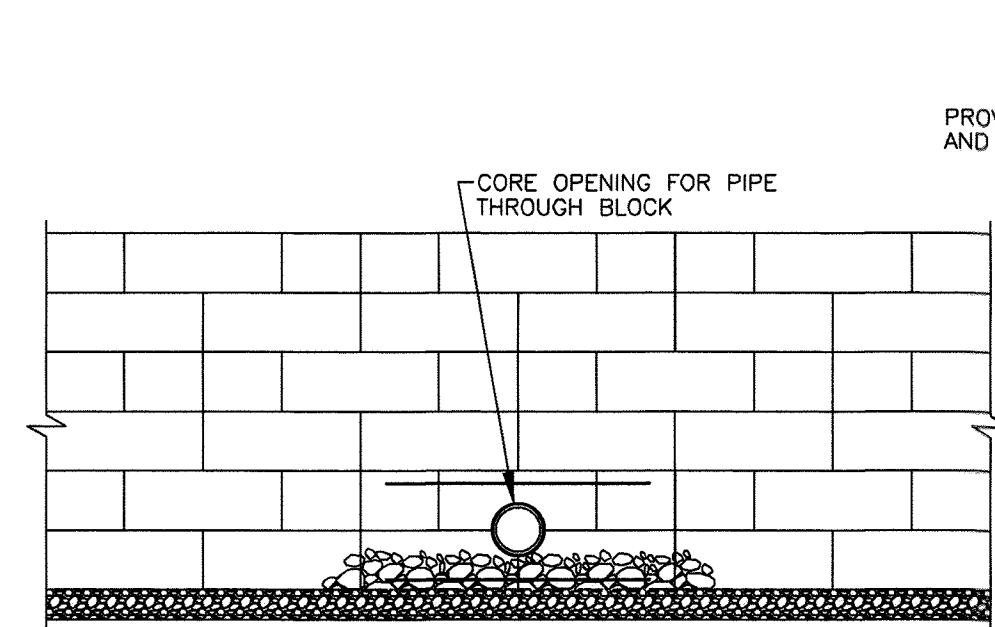
STONE STRONG CORNER UNIT  
NOT TO SCALE



STONE STRONG END UNIT  
NOT TO SCALE

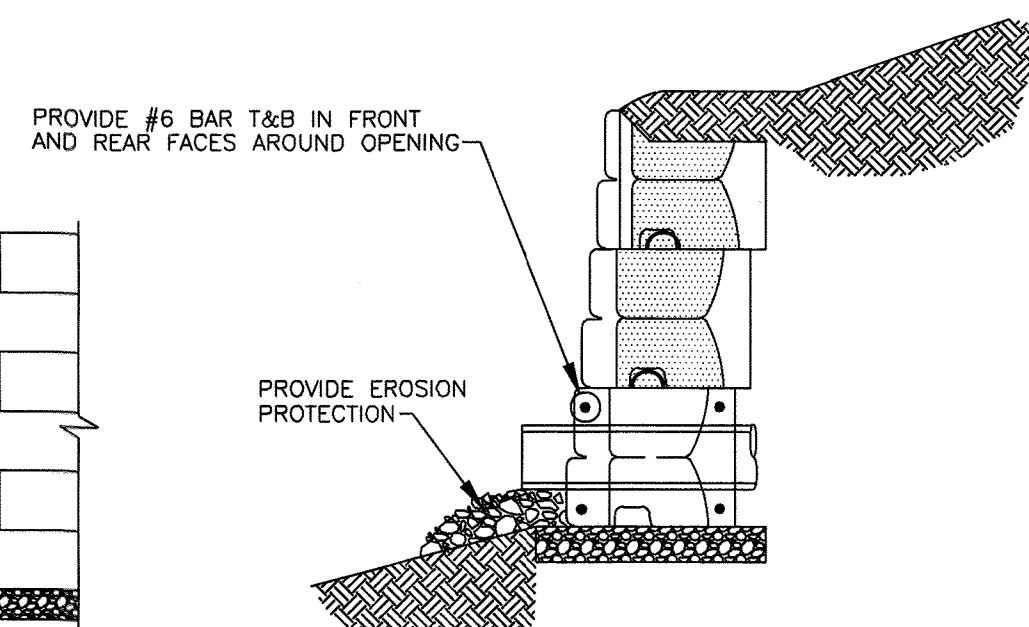


STONE STRONG 45° CORNER UNIT  
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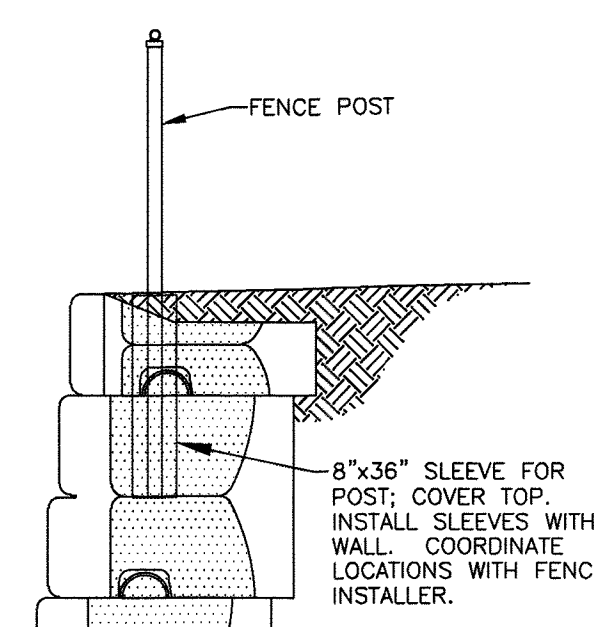


FACE ELEVATION

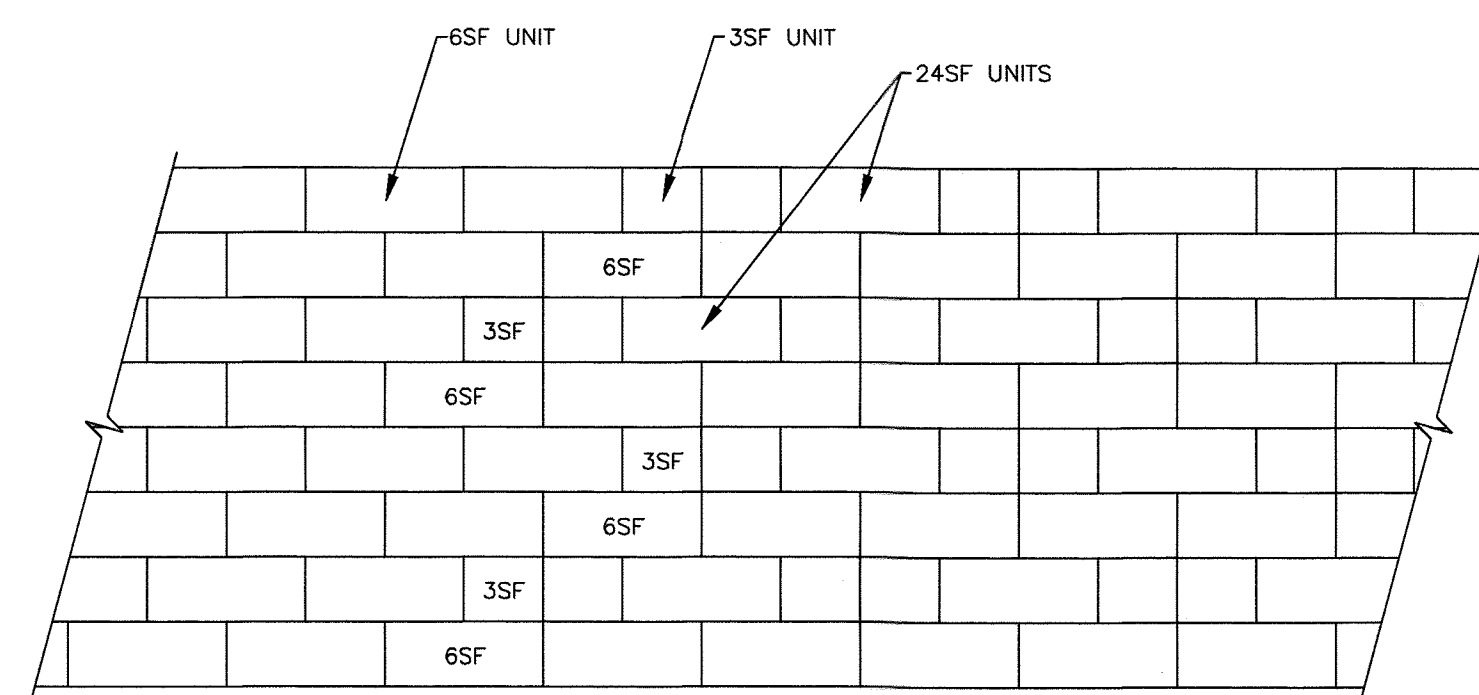
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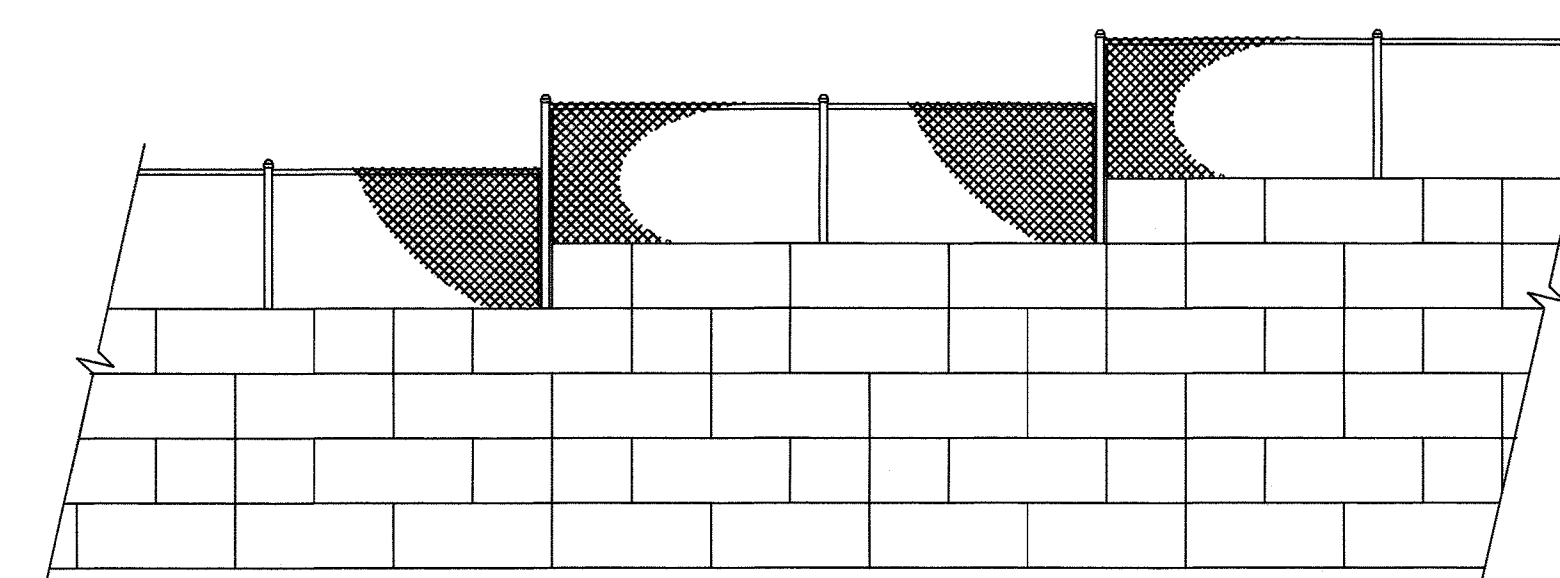
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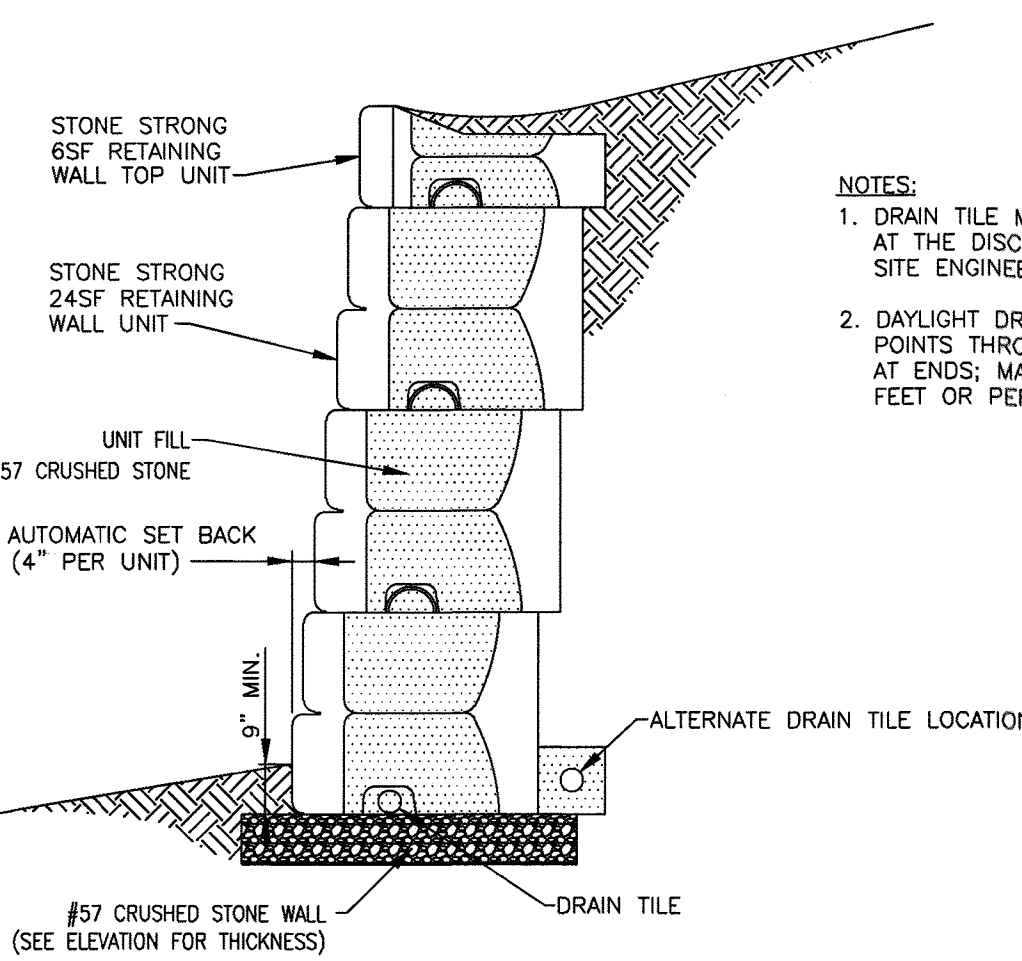
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TRANSITION 24SF TO 6SF  
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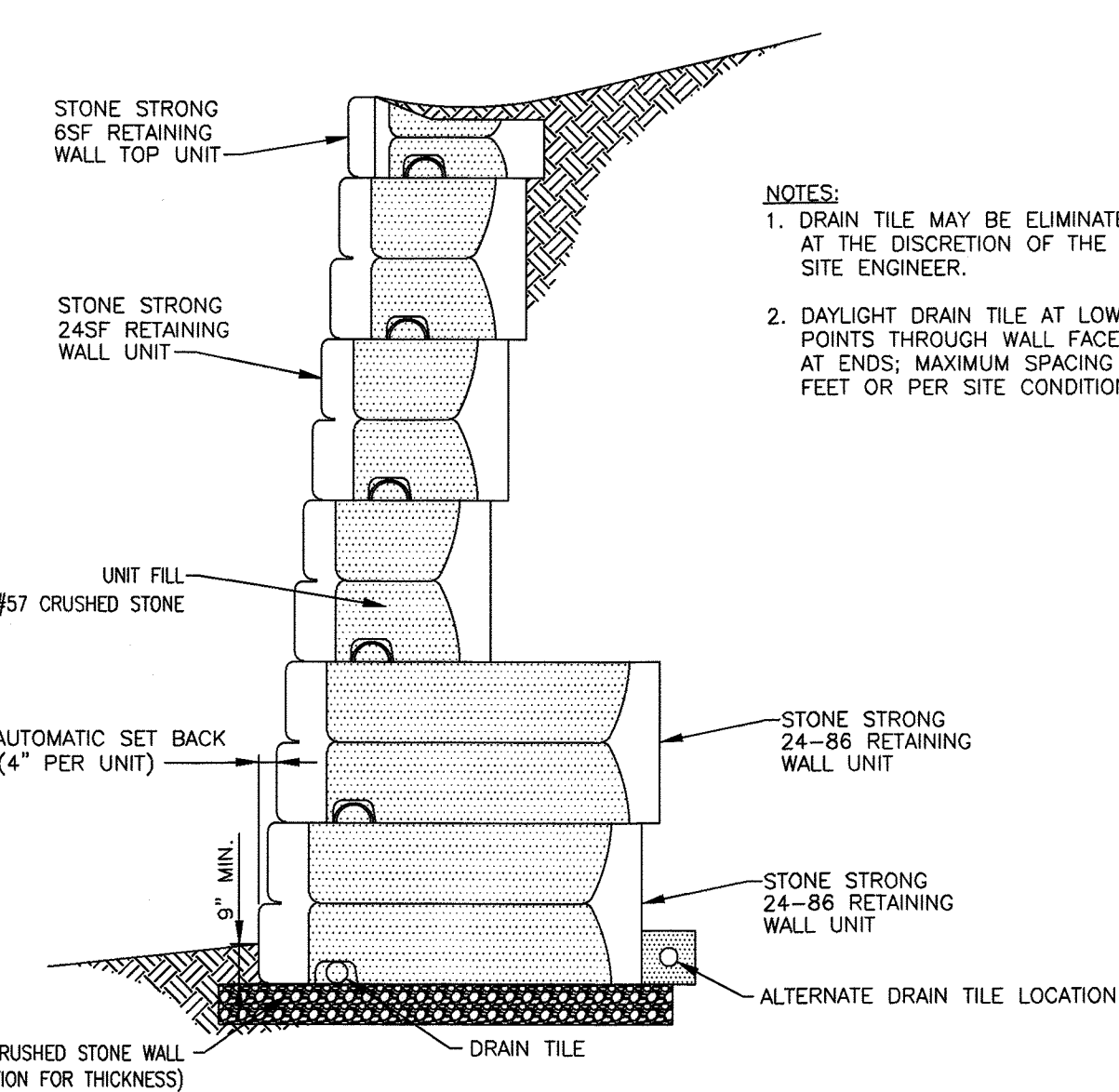


TYPICAL FENCE CONFIGURATION  
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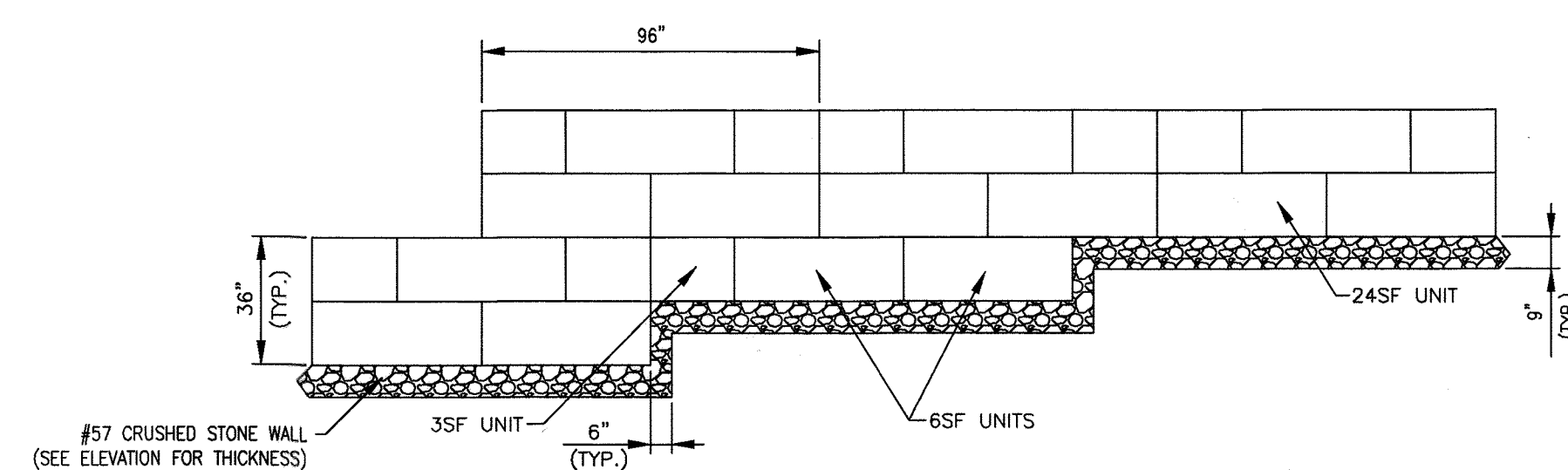
GRAVITY WALL CROSS SECTION  
NOT TO SCALE

- NOTES:
1. DRAIN TILE MAY BE ELIMINATED AT THE DISCRETION OF THE SITE ENGINEER.
  2. DAYLIGHT DRAIN TILE AT LOW POINTS THROUGH WALL FACE OR AT ENDS; MAXIMUM SPACING 100 FEET OR PER SITE CONDITIONS.



GRAVITY WALL CROSS SECTION w/EXTENDED BASE UNITS  
NOT TO SCALE

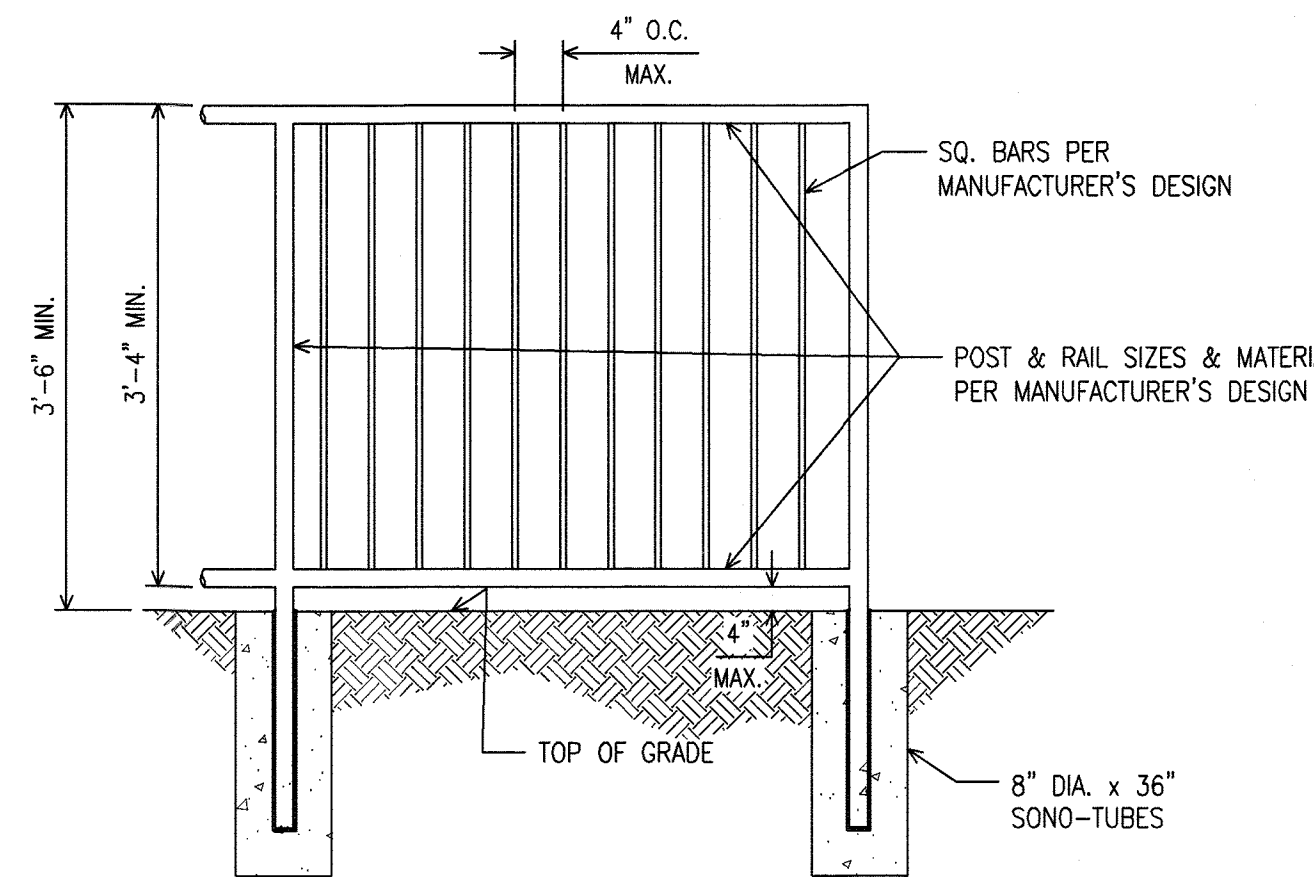
- NOTES:
1. DRAIN TILE MAY BE ELIMINATED AT THE DISCRETION OF THE SITE ENGINEER.
  2. DAYLIGHT DRAIN TILE AT LOW POINTS THROUGH WALL FACE OR AT ENDS; MAXIMUM SPACING 100 FEET OR PER SITE CONDITIONS.



WALL BASE STEP  
NOT TO SCALE

NOTE:

1. FENCE SHALL BE A MIN. 42" ABOVE TOP GRADE AND SHALL NOT ALLOW PASSAGE OF A 4" DIA. SPHERE.
2. THE FENCE SHALL NOT HAVE AN ORNAMENTAL PATTERN THAT WOULD PROVIDE A LADDER EFFECT.
3. TYPICAL FENCE DETAIL PROVIDED. EQUIVALENT DETAIL MAY BE USED AT THE DISCRETION OF THE CONTRACTOR.



TYPICAL FENCE DETAIL  
NOT TO SCALE

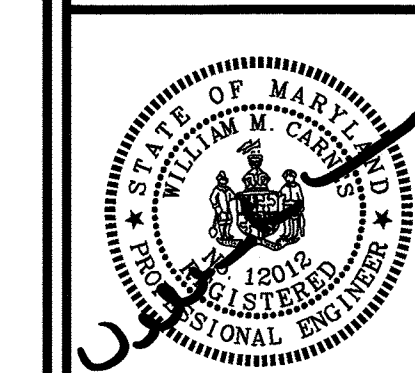
OWNER: CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTVILLE RD. MARRIOTTVILLE, MD 21104 (410) 442-5888

DEVELOPER: SECURITY DEVELOPMENT SUITE 415 ELLICOTT CITY, MD 21041 (410) 465-4244 SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
STONE STRONG RETAINING WALL  
CONSTRUCTION DETAILS  
CHAPEL GATE WOODS  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF CHAPEL GATE WOODS, NON-BUILDABLE BULK PARCEL B  
PLATS 25712-25751  
PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
TAX MAP: 18 GRID: 10 L. 4163/F. 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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



PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 20192 EXPIRATION DATE: 06/16/22

DESIGN BY: HM+AM  
DRAWN BY: HM+AM  
CHECKED BY: HM  
DATE: SEPT. 2021  
SCALE: AS SHOWN  
HCEA NO.: 20441A

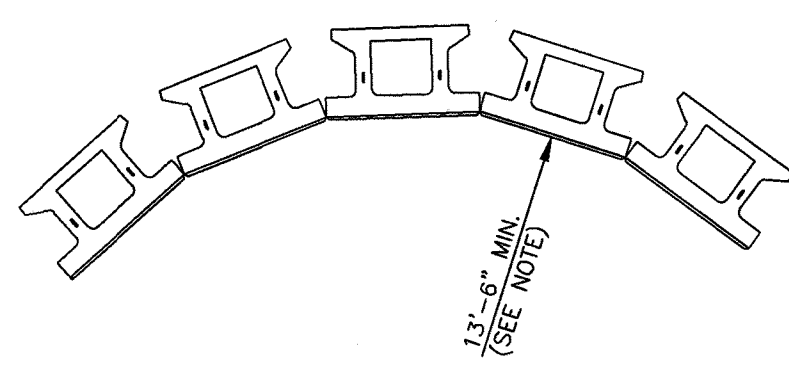
63 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS  
12/07/2021  
MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
12-23-21  
DATE

CHIEF, DIVISION OF LAND DEVELOPMENT  
1/13/22  
DATE

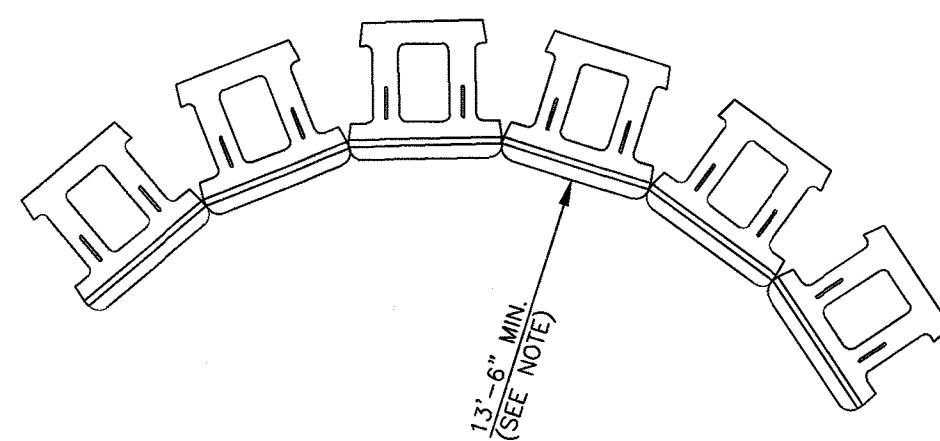




Minimum Concave Radius		
Wall Height (ft)	Total # of Courses	Reqd. Radius at Top Course
3	2	13' 8"
4 1/2	3	13' 10"
6	4	14' 0"
7 1/2	5	14' 2"
9	6	14' 4"
10 1/2	7	14' 6"
12	8	14' 8"

NOTE:  
MINIMUM RADIUS OCCURS AT LOWEST COURSE.  
RADIUS INCREASES 2" PER COURSE ABOVE, AS SHOWN ON TABLE.

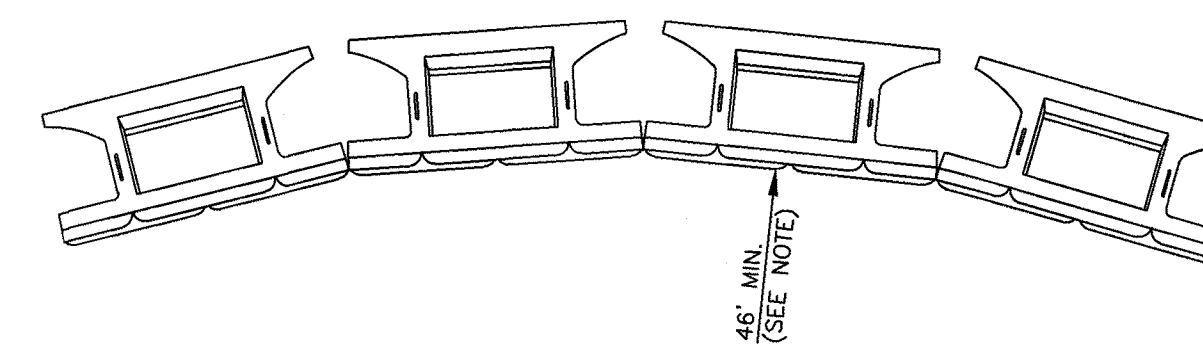
MINIMUM CONCAVE RADIUS-6-28 UNITS  
NOT TO SCALE



Minimum Concave Radius		
Wall Height (ft)	Total # of Courses	Reqd. Radius at Top Course
3	2	13' 8"
4 1/2	3	13' 10"
6	4	14' 0"
7 1/2	5	14' 2"
9	6	14' 4"
10 1/2	7	14' 6"
12	8	14' 8"

NOTE:  
MINIMUM RADIUS OCCURS AT LOWEST COURSE.  
RADIUS INCREASES 2" PER COURSE ABOVE, AS SHOWN ON TABLE.

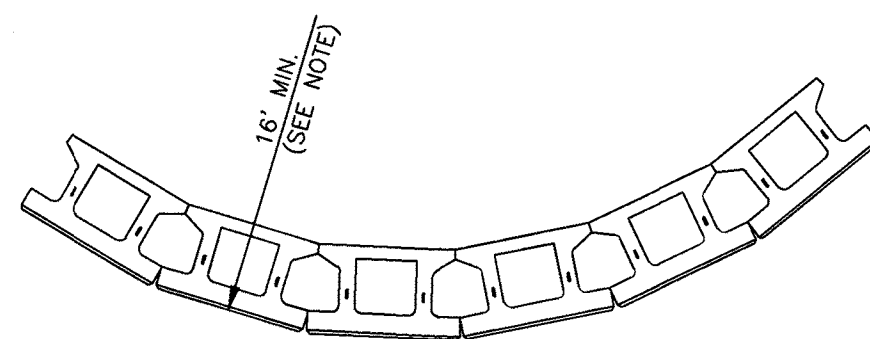
MINIMUM CONCAVE RADIUS-6SF UNITS  
NOT TO SCALE



Minimum Concave Radius		
Wall Height (ft)	Total # of Courses	Reqd. Radius at Top Course
6	2	46' 4"
9	3	46' 8"
12	4	47' 0"
15	5	47' 4"
18	6	47' 8"
21	7	48' 0"
24	8	48' 4"

NOTE:  
MINIMUM RADIUS OCCURS AT LOWEST COURSE.  
RADIUS INCREASES 4" PER COURSE ABOVE, AS SHOWN ON TABLE.

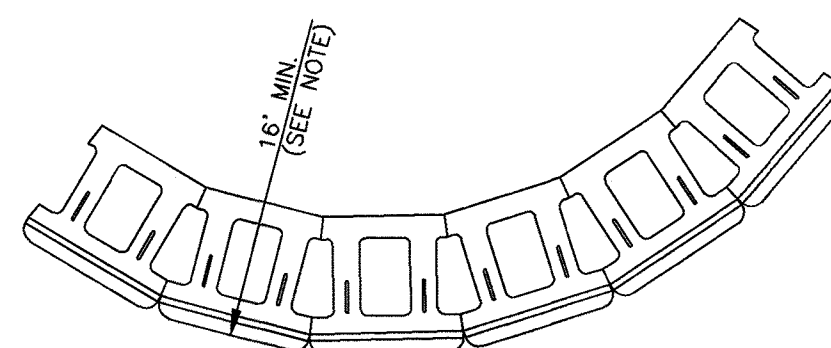
MINIMUM CONCAVE RADIUS-24SF UNITS  
NOT TO SCALE



Minimum Convex Radius		
Wall Height (ft)	Total # of Courses	Reqd. Radius at First Course
3	2	16' 2"
4 1/2	3	16' 4"
6	4	16' 6"
7 1/2	5	16' 8"
9	6	16' 10"
10 1/2	7	17' 0"
12	8	17' 2"

NOTE:  
NOTE: MINIMUM RADIUS OCCURS AT TOP COURSE.  
REQUIRED RADIUS INCREASES 2" PER COURSE BELOW, AS SHOWN ON TABLE.

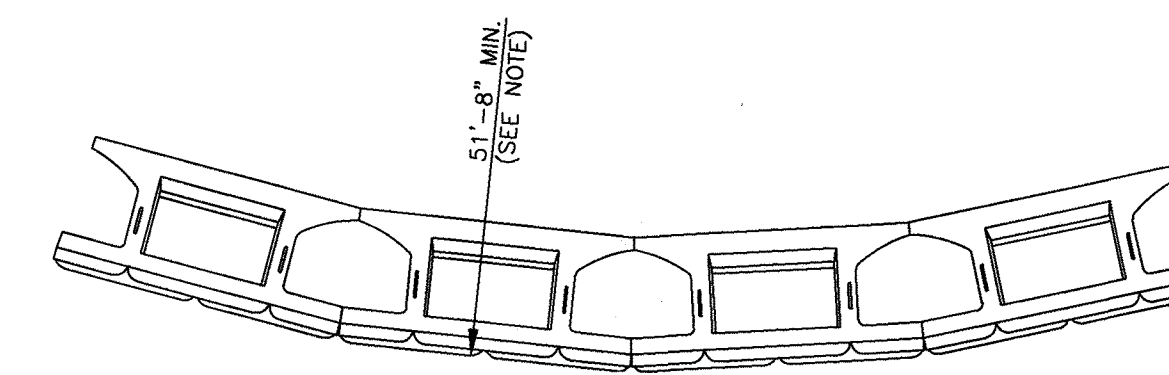
MINIMUM CONVEX RADIUS-6-28 UNITS  
NOT TO SCALE



Minimum Convex Radius		
Wall Height (ft)	Total # of Courses	Reqd. Radius at First Course
3	2	16' 2"
4 1/2	3	16' 4"
6	4	16' 6"
7 1/2	5	16' 8"
9	6	16' 10"
10 1/2	7	17' 0"
12	8	17' 2"

NOTE:  
NOTE: MINIMUM RADIUS OCCURS AT TOP COURSE.  
REQUIRED RADIUS INCREASES 2" PER COURSE BELOW, AS SHOWN ON TABLE.

MINIMUM CONVEX RADIUS-6SF UNITS  
NOT TO SCALE



Minimum Convex Radius		
Wall Height (ft)	Total # of Courses	Reqd. Radius at First Course
6	2	52' 0"
9	3	52' 4"
12	4	52' 8"
15	5	53' 0"
18	6	53' 4"
21	7	53' 8"
24	8	54' 0"

NOTE:  
MINIMUM RADIUS OCCURS AT TOP COURSE.  
REQUIRED RADIUS INCREASES 4" PER COURSE BELOW, AS SHOWN ON TABLE.

MINIMUM CONVEX RADIUS-24SF UNITS  
NOT TO SCALE

**OWNER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
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**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
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NO.	REVISION	DATE

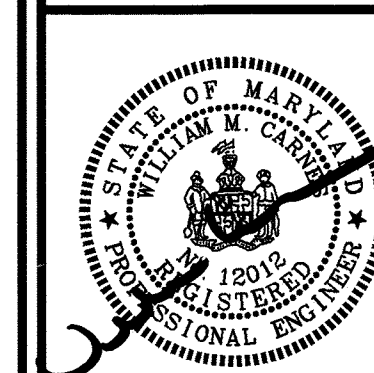
FINAL ROAD CONSTRUCTION PLAN  
STONE STRONG RETAINING WALL  
CONSTRUCTION DETAILS  
CHAPELGATE WOODS

LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPELGATE" NON-BUILDABLE BULK PARCEL B  
PLATS 25992 - 25954  
PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
TAX MAP: 16 GRID: 10 SUITE 415 L. 4163/F. 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
ENGINEERING ASSOCIATES

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



PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12012, EXPIRATION DATE: 06/16/22.

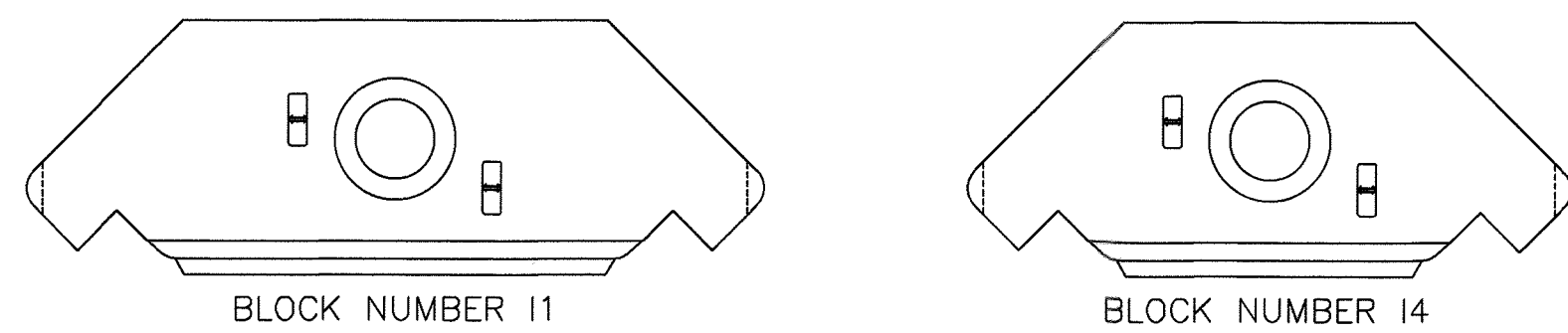
DESIGN BY: HM+AM  
DRAWN BY: HM+AM  
CHECKED BY: HM  
DATE: SEPT. 2021  
SCALE: AS SHOWN  
HCEA NO.: 20441A

64 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

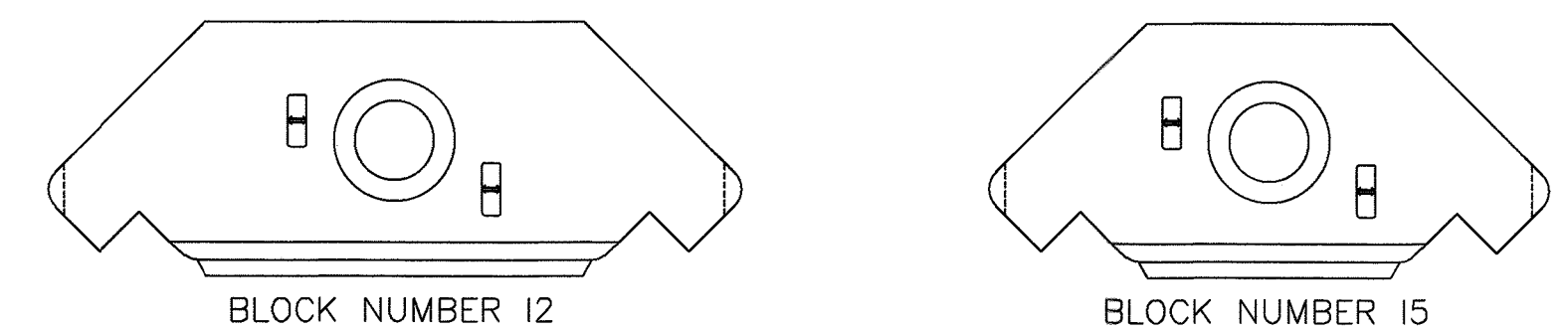
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12-23-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
1/13/22  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE





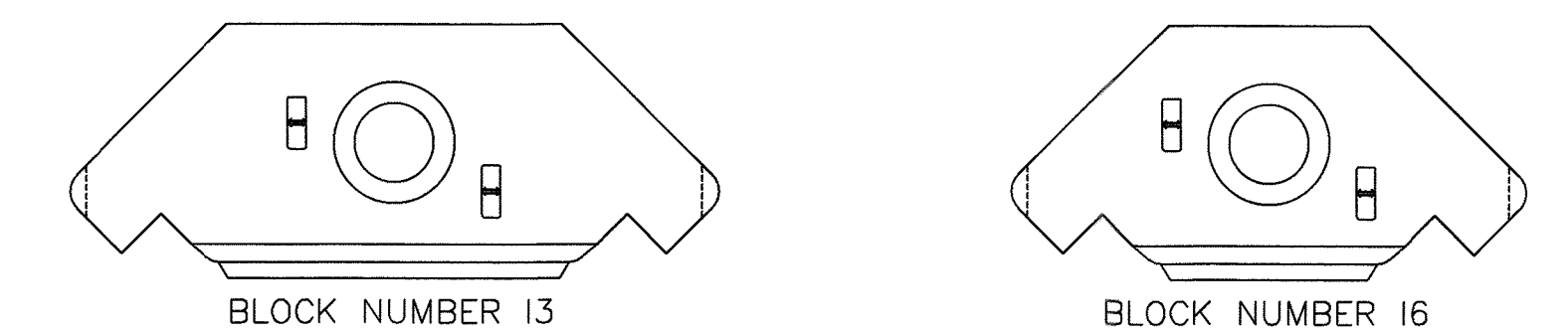
BLOCK NUMBER 11

BLOCK NUMBER 14



BLOCK NUMBER 12

BLOCK NUMBER 15

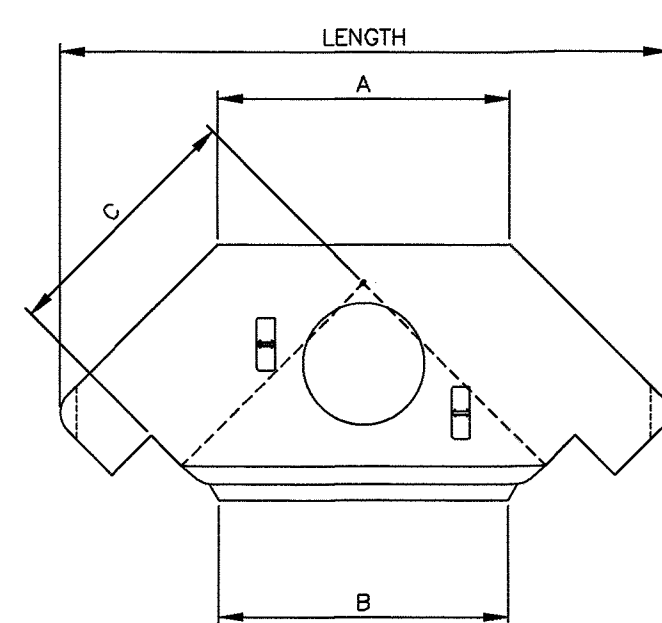


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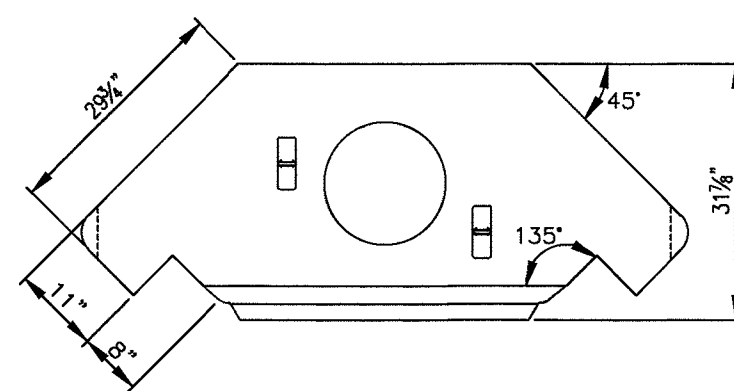
BLOCK NUMBER 16

STONE STRONG INSIDE CORNER UNITS  
NOT TO SCALE

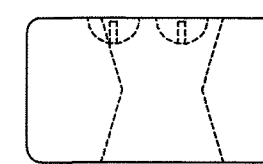
Block #	Length	A	B	C	Block Weight
11	65 in 1666 mm	25 in 641 mm	25 in 633 mm	19 in 485 mm	2070 lbs 940 kg
12	70 in 1790 mm	31 in 784 mm	31 in 777 mm	23 in 593 mm	2350 lbs 1065 kg
13	76 in 1934 mm	37 in 928 mm	36 in 921 mm	27 in 694 mm	2630 lbs 1195 kg
14	82 in 2077 mm	42 in 1072 mm	42 in 1064 mm	31 in 796 mm	2900 lbs 1315 kg
15	87 in 2221 mm	48 in 1215 mm	48 in 1208 mm	35 in 896 mm	3180 lbs 1445 kg
16	93 in 2365 mm	54 in 1359 mm	53 in 1352 mm	39 in 997 mm	3460 lbs 1570 kg



PLAN VIEW  
VARIABLE DIMENSIONS

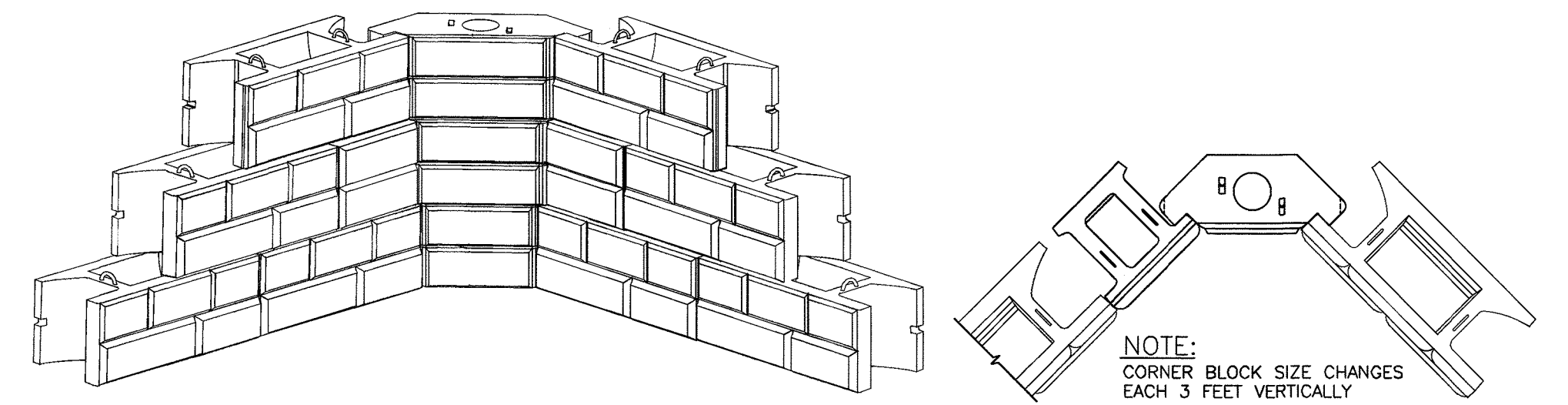


PLAN VIEW  
FIXED DIMENSIONS



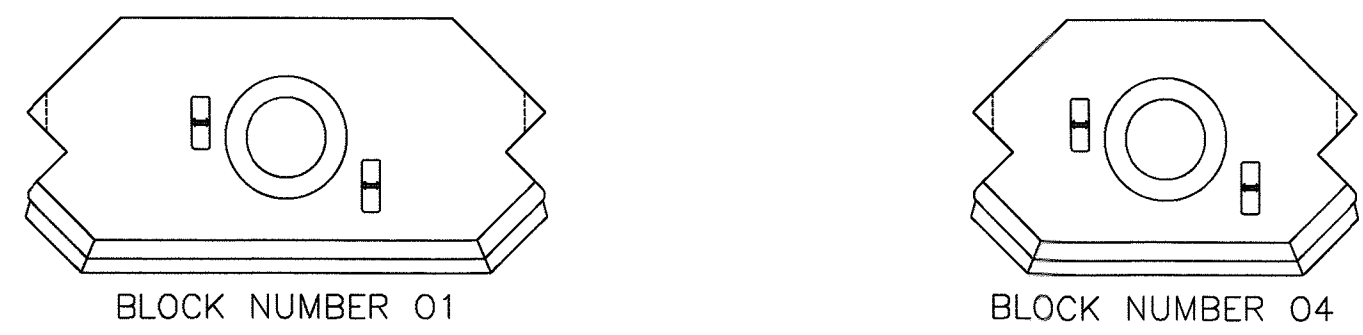
END VIEW

STONE STRONG INSIDE CORNER UNIT  
NOT TO SCALE



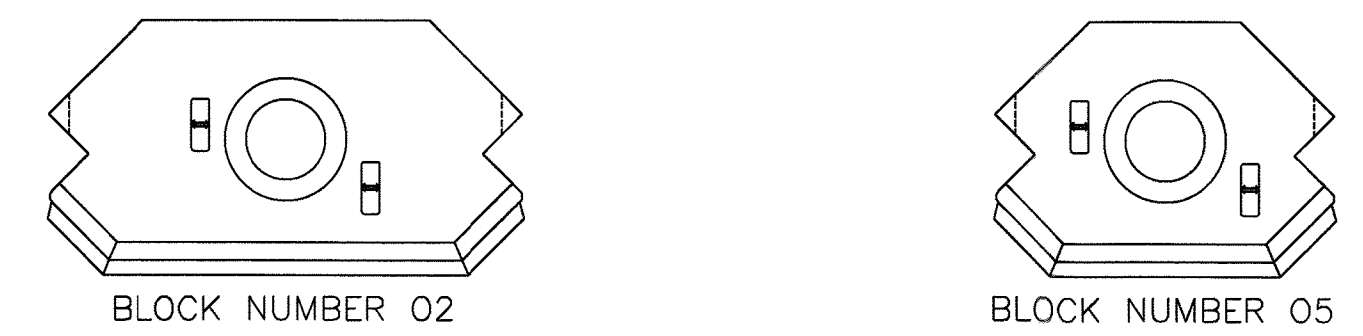
STONE STRONG INSIDE CORNER BLOCK ASSEMBLY  
NOT TO SCALE

NOTE:  
CORNER BLOCK SIZE CHANGES  
EACH 3 FEET VERTICALLY



BLOCK NUMBER 01

BLOCK NUMBER 04



BLOCK NUMBER 02

BLOCK NUMBER 05

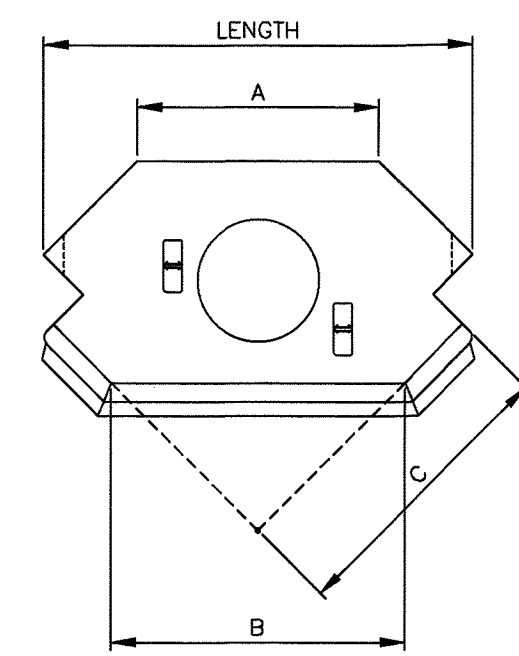


BLOCK NUMBER 03

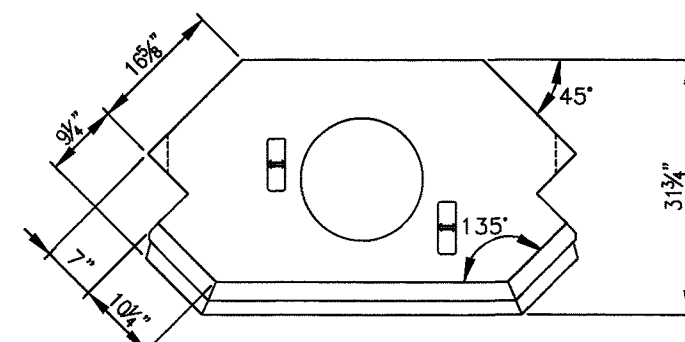
BLOCK NUMBER 06

STONE STRONG OUTSIDE CORNER UNITS  
NOT TO SCALE

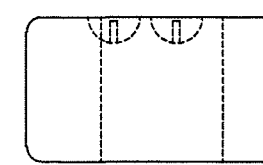
Block #	Length	A	B	C	Block Weight
01	65 in 1652 mm	42 in 1054 mm	53 in 1347 mm	50 in 1276 mm	2835 lbs 1286 kg
02	59 in 1508 mm	36 in 910 mm	47 in 1203 mm	46 in 1175 mm	2550 lbs 1155 kg
03	56 in 1415 mm	30 in 767 mm	42 in 1060 mm	42 in 1073 mm	2255 lbs 1025 kg
04	48 in 1221 mm	23 in 623 mm	36 in 916 mm	38 in 972 mm	1955 lbs 885 kg
05	42 in 1077 mm	19 in 479 mm	30 in 772 mm	34 in 870 mm	1670 lbs 760 kg
06	37 in 933 mm	13 in 336 mm	25 in 629 mm	30 in 768 mm	1370 lbs 620 kg



PLAN VIEW  
VARIABLE DIMENSIONS

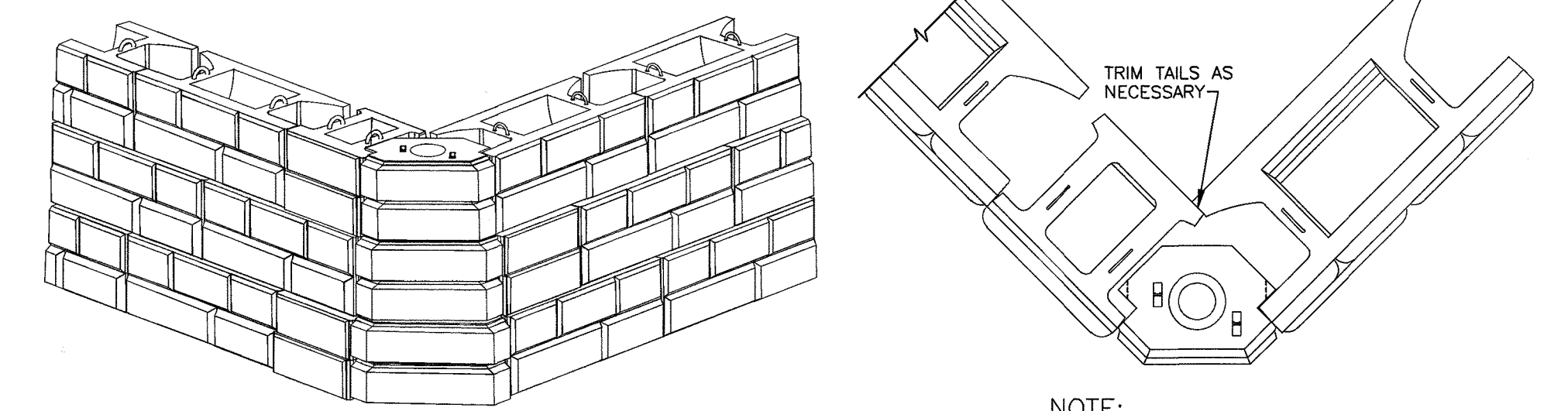


PLAN VIEW  
FIXED DIMENSIONS



END VIEW


STONE STRONG OUTSIDE CORNER UNIT  
NOT TO SCALE





STONE STRONG OUTSIDE CORNER BLOCK ASSEMBLY  
NOT TO SCALE

NOTE:  
CORNER BLOCK SIZE CHANGES  
EACH 3 FEET VERTICALLY

TRIM TAILS AS  
NECESSARY

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

CHIEF, DIVISION OF LAND DEVELOPMENT  1/3/22 DATE

OWNER: CHAPEL GATE PRESBYTERIAN CHURCH, INC., 2600 MARRIOTTVILLE RD., MARRIOTTVILLE, MD 21104, (410) 442-5888

DEVELOPER: SECURITY DEVELOPMENT, 8480 BALTIMORE NATIONAL PIKE, SUITE 415, ELLICOTT CITY, MD 21041, 410-465-4244, SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
 STONE STRONG RETAINING WALL  
 CONSTRUCTION DETAILS  
 CHAPEL GATE WOODS  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF CHAPEL GATE - NON-BUILDABLE BULK PARCEL B  
 PLATS 25912-25954  
 PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
 TAX MAP: 16 GRID: 10 L. 4163/F. 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

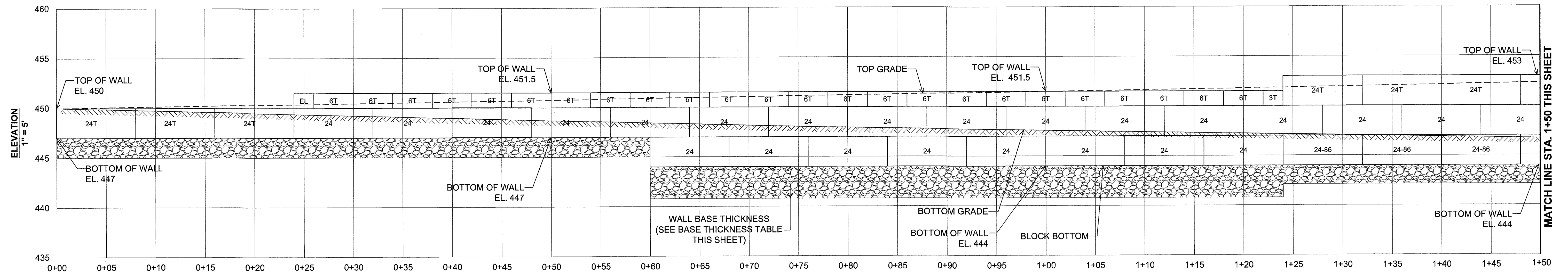
**HILLIS-CARNES**  
 ENGINEERING ASSOCIATES  
 10975 Guilford Road, Suite A Annapolis Junction, Maryland  
 Phone: (410) 880-4788 www.hcea.com Fax: (410) 880-4098

DESIGN BY: HM+AM  
 DRAWN BY: HM+AM  
 CHECKED BY: HM  
 DATE: SEPT 2021  
 SCALE: AS SHOWN  
 HCEA NO.: 20441A

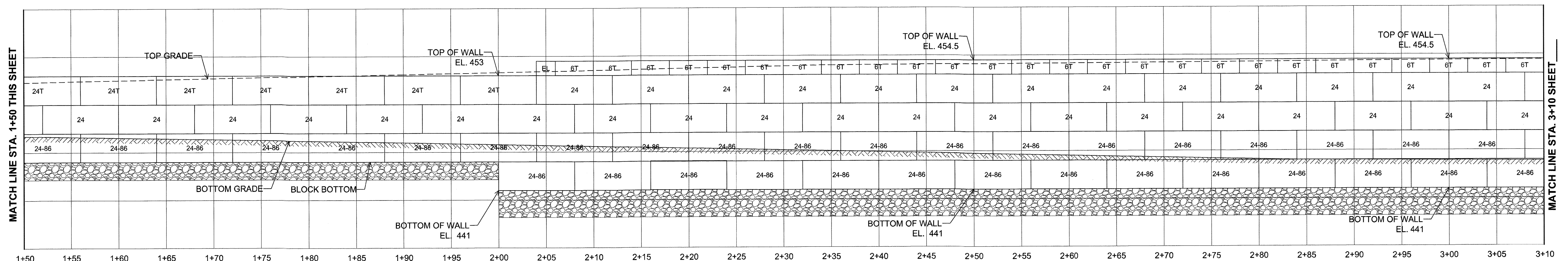
PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A duly LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12012, EXPIRATION DATE: 06/16/22.

65 SHEET OF 101





WALL #1 STATION  
1" = 5'  
**STONE STRONG WALL #1 ELEVATION**  
STA 0+00 TO 1+50



WALL #1 STATION  
1" = 5'  
**STONE STRONG WALL #1 ELEVATION**  
STA 1+50 TO 3+10

**WALL #1 BASE THICKNESS AS FOLLOWS:**

STA 0+00 to STA 0+60 = 24"
STA 0+60 to STA 1+24 = 38.5"
STA 1+24 to STA 2+00 = 22.5"
STA 2+00 to STA 4+12 = 34"
STA 4+12 to STA 4+76 = 29"
STA 4+76 to STA 5+12 = 20.5"
STA 5+12 to STA 5+53 = 22.5"
STA 5+53 to STA 5+96 = 38.5"
STA 5+96 to STA 6+24 = 24"

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
**STONE STRONG RETAINING WALL #1**  
ELEVATION STA. 0+00 TO 3+10  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PARTS 2942 - 25954  
PARCELS: 110 & 421 L 1389/F, 339 (P. 110)  
TAX MAP: 16 GRID: 10 L 4163/F, 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
James 12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
12-23-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

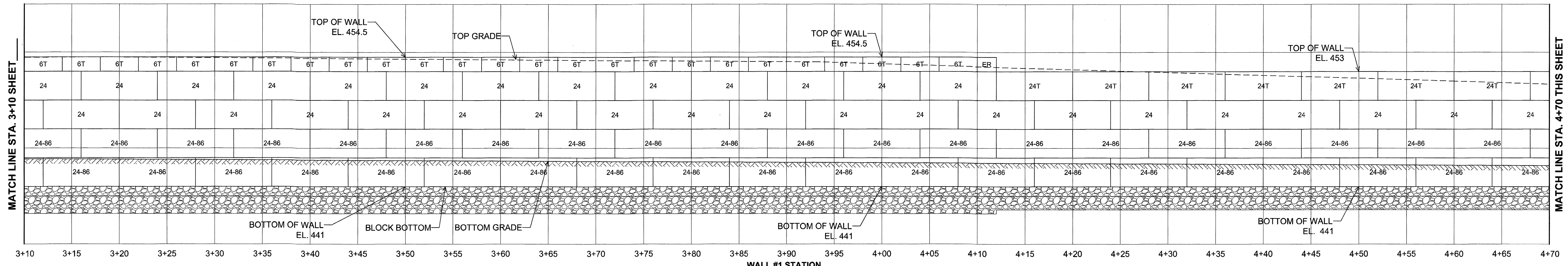
1/3/22  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 12072 EXPIRATION DATE: 06/16/22.

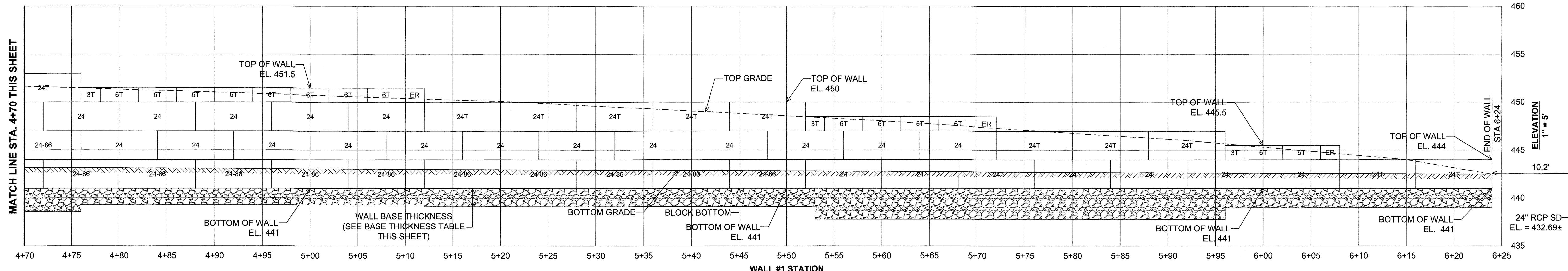
DESIGN BY: HM+AM  
DRAWN BY: HM+AM  
CHECKED BY: HM  
DATE: SEPT 2021  
SCALE: AS SHOWN  
HCEA NO.: 20441A

66 SHEET OF 101





WALL #1 STATION  
1" = 5'  
**STONE STRONG WALL #1 ELEVATION**  
STA 3+10 TO 4+10



WALL #1 STATION  
1" = 5'  
**STONE STRONG WALL #1 ELEVATION**  
STA 4+10 TO 6+24

**WALL #1 BASE THICKNESS AS FOLLOWS:**

STA 0+00 to STA 0+60 = 24"
STA 0+60 to STA 1+24 = 38.5"
STA 1+24 to STA 2+00 = 22.5"
STA 2+00 to STA 4+12 = 34"
STA 4+12 to STA 4+76 = 29"
STA 4+76 to STA 5+12 = 20.5"
STA 5+12 to STA 5+53 = 22.5"
STA 5+53 to STA 5+96 = 38.5"
STA 5+96 to STA 6+24 = 24"

**OWNER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21041  
410-465-4244  
SDC PROPERTIES.COM

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 12-23-21

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 1/13/22

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
**STONE STRONG RETAINING WALL #1**  
 ELEVATION STA. 3+10 TO 6+24  
 CHAPELGATE WOODS  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF CHAPELGATE WOODS - NON-BUILDABLE BULK PARCEL E  
 PLATS 25942-25954 L 1389/F. 339 (P. 110)  
 L 4183/F. 424 (P. 421)  
 PARCELS: 110 & 421 TAX MAP: 16 GRID: 10 ZONED: OEF-M HOWARD COUNTY, MARYLAND  
 3RD ELECTION DISTRICT

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

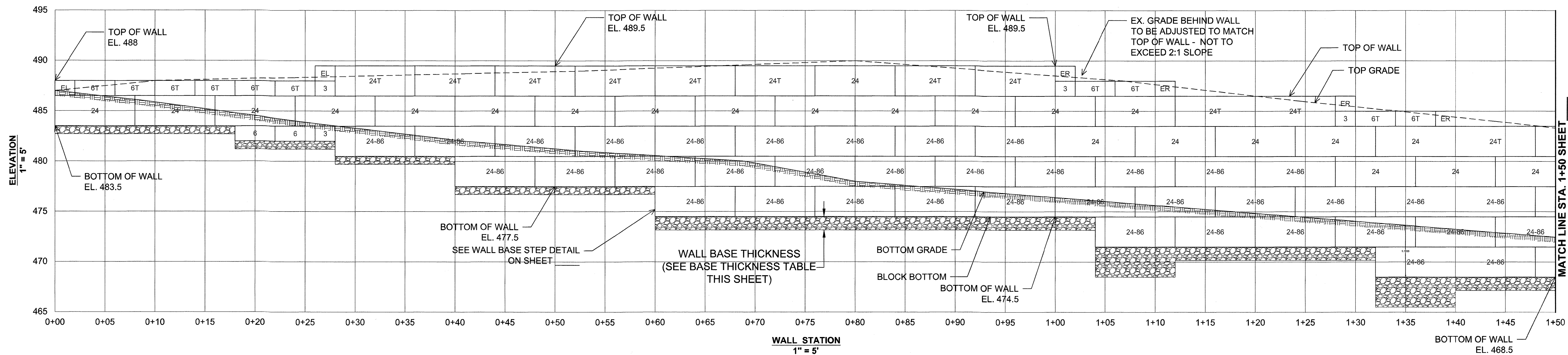
PROFESSIONAL CERTIFICATE  
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DESIGN BY: HM+AM  
 DRAWN BY: HM+AM  
 CHECKED BY: HM  
 DATE: SEPT. 2021  
 SCALE: AS SHOWN  
 HCEA NO.: 20441A

67 SHEET OF 101



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



**STONE STRONG WALL #7 ELEVATION  
STA. 0+00 TO 1+50**

**OWNER**  
CHAPEL GATE PRESBYTERIAN  
CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

**WALL #7 BASE THICKNESS  
AS FOLLOWS:**

STA 0+00 to STA 0+60 = 9"
STA 0+60 to STA 1+04 = 16"
STA 1+04 to STA 1+12 = 36"
STA 1+12 to STA 1+32 = 16"
STA 1+32 to STA 1+40 = 36"
STA 1+40 to STA 1+60 = 16"
STA 1+60 to STA 1+76 = 36"
STA 1+76 to STA 2+24 = 16"
STA 2+24 TO STA 5+76 = 9"

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*James* 12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Chief* 12/23/21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

CHIEF, DIVISION OF LAND DEVELOPMENT *gan* 1/13/22  
DATE

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
**STONE STRONG RETAINING WALL #7**  
ELEVATION STA. 0+00 TO 1+50  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 25942-25954  
PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
TAX MAP: 16 ORD: 10 L. 4163/F. 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

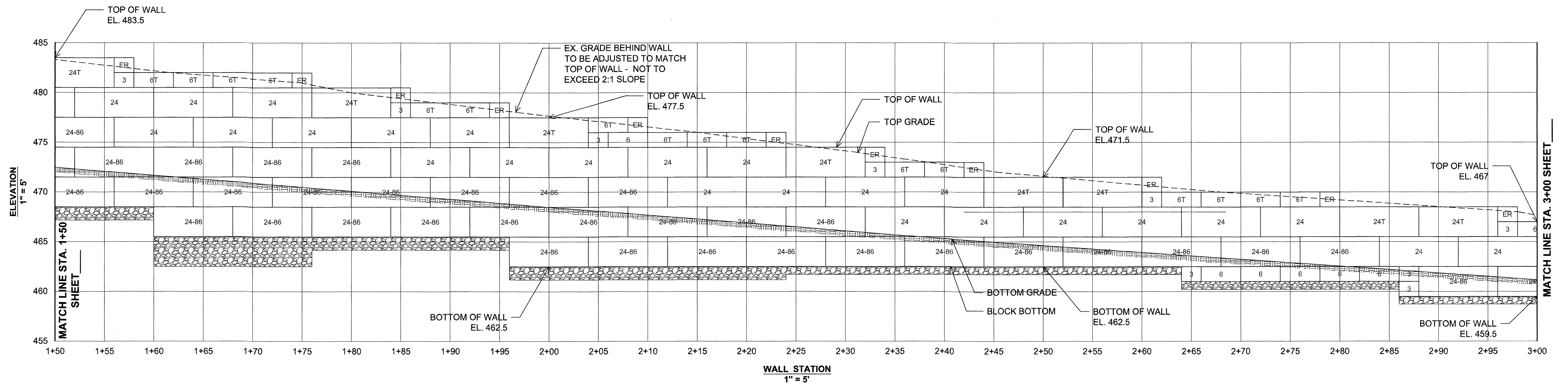
**HILLIS-CARNES**  
**ENGINEERING ASSOCIATES**  
10975 Guilford Road, Suite A Annapolis Junction, Maryland  
Phone: (410) 880-4788 www.hcea.com Fax: (410) 880-4098

DESIGN BY: HM+AM  
DRAWN BY: HM+AM  
CHECKED BY: HM  
DATE: SEPT 2021  
SCALE: AS SHOWN  
HCEA NO.: 20441A

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THAT I AM A DULY LICENSED PROFESSIONAL  
ENGINEER UNDER THE LAWS OF THE STATE  
OF MARYLAND, LICENSE NO. 12012  
EXPIRATION DATE: 06/16/22

68 SHEET OF 107





**STONE STRONG WALL #7 ELEVATION  
STA. 1+50 TO 3+00**

<b>OWNER</b> CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTVILLE RD. MARRIOTTVILLE, MD 21104 (410) 442-5888	<b>DEVELOPER</b> SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLCOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM
--	--

**WALL #7 BASE THICKNESS  
AS FOLLOWS:**  
 STA 0+00 TO STA 0+60 = 9"  
 STA 0+60 TO STA 1+04 = 16"  
 STA 1+04 TO STA 1+12 = 36"  
 STA 1+12 TO STA 1+32 = 16"  
 STA 1+32 TO STA 1+40 = 36"  
 STA 1+40 TO STA 1+60 = 16"  
 STA 1+60 TO STA 1+76 = 36"  
 STA 1+76 TO STA 2+24 = 16"  
 STA 2+24 TO STA 5+76 = 9"

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*James* (12/07/2021)  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*John* (12-23-21)  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION f DATE

*Sam* (1/3/22)  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

NO.	REVISION	DATE

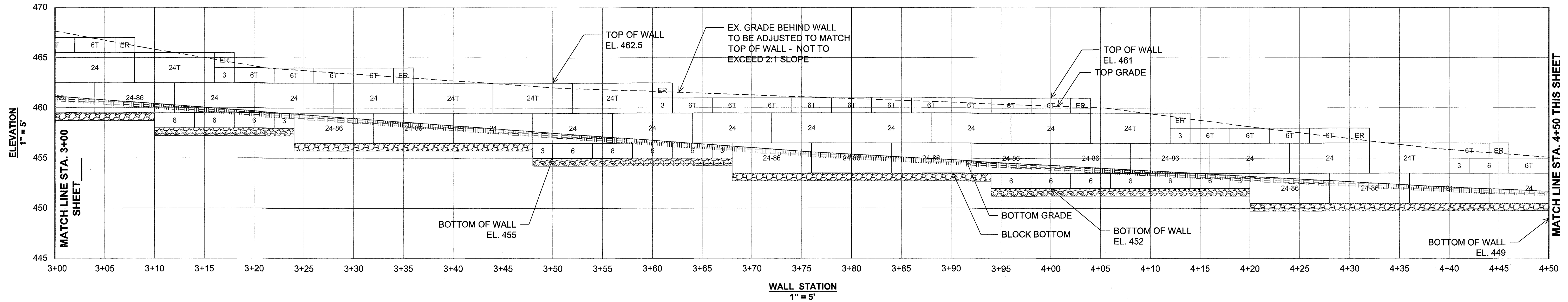
FINAL ROAD CONSTRUCTION PLAN  
**STONE STRONG RETAINING WALL #7**  
 ELEVATION STA. 1+50 TO 3+00  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 L 1389/F, 339 (P. 110)  
 TAX MAP: 16 (RD. 10) L 4163/F, 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND  
 PLATS: 25912-29954

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

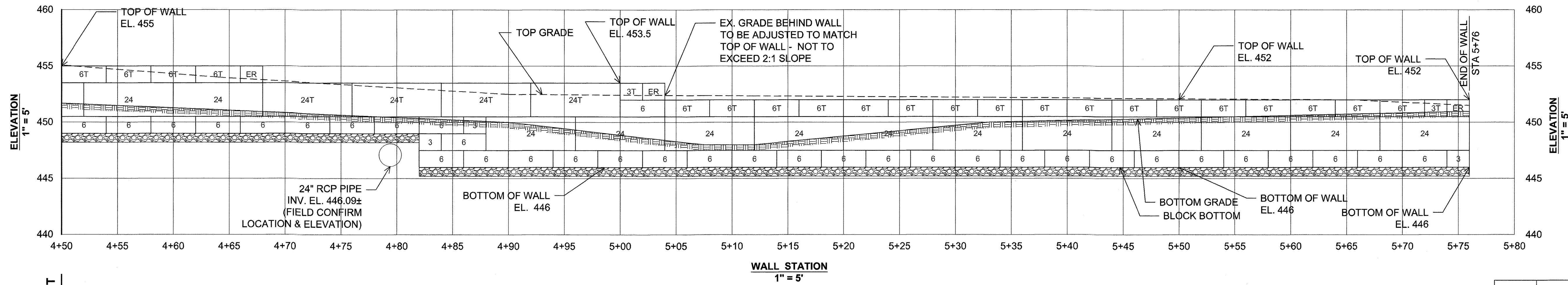
	DESIGN BY: <u>HM+AM</u>	I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12010, EXPIRATION DATE: 06/16/22.
	DRAWN BY: <u>HM+AM</u>	
	CHECKED BY: <u>HM</u>	
	DATE: <u>SEPT 2021</u>	
SCALE: <u>AS SHOWN</u>	HCEA NO.: <u>20441A</u>	69 SHEET OF 101



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



**STONE STRONG WALL #7 ELEVATION  
STA. 3+00 TO 4+50**



**STONE STRONG WALL #7 ELEVATION  
STA. 4+50 TO 5+76**

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO. REVISION DATE

FINAL ROAD CONSTRUCTION PLAN  
**STONE STRONG RETAINING WALL #7**  
ELEVATION STA. 3+00 TO 5+80  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF CHAPEL GATE - NON-BUILDABLE BULK PARCEL B  
PLAT 25912 - 25951

PARCELS: 110 & 421 L 1389/F/ 339 (P. 110)  
TAX MAP: 16 GRD: 10 L 4163/F/ 424 (P. 421)  
3RD ELECTION DISTRICT ZONED: CEF-W HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
**ENGINEERING ASSOCIATES**  
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DESIGN BY: HM+AM  
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70 SHEET OF 101

WALL #7 BASE THICKNESS  
AS FOLLOWS:  
STA 2+24 TO STA 5+76 = 9"

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*[Signature]* 12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*[Signature]* 12-23-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

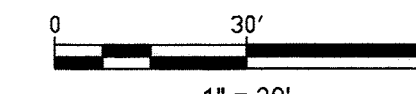
CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 1/9/22 DATE





**MSE RETAINING WALL #12, #13, #15A, #15B & #18 PLAN**  
 1" = 30'

NOTE:  
 RETAINING WALLS TO BE  
 MAINTAINED BY H.O.A.



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

*[Signature]*  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 12-23-21

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 1/3/22

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-485-4244  
 SDCPROPERTIES.COM

NO. REVISION DATE

RETAINING WALLS #12, #13, #15A, #15B & #18 PLAN

**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421  
 TAX MAP: 18 GRD-10  
 3RD ELECTION DISTRICT  
 PLATS: 25942-25954  
 L. 1389/E. 339 (P. 110)  
 L. 6183/F. 424 (P. 421)  
 HOWARD COUNTY, MARYLAND

**HILLIS-CARNE'S**  
**ENGINEERING ASSOCIATES**  
 10975 Guilford Road, Suite A Annapolis Junction, Maryland  
 Phone: (410) 880-4788 www.hcaeb.com Fax: (410) 880-4098

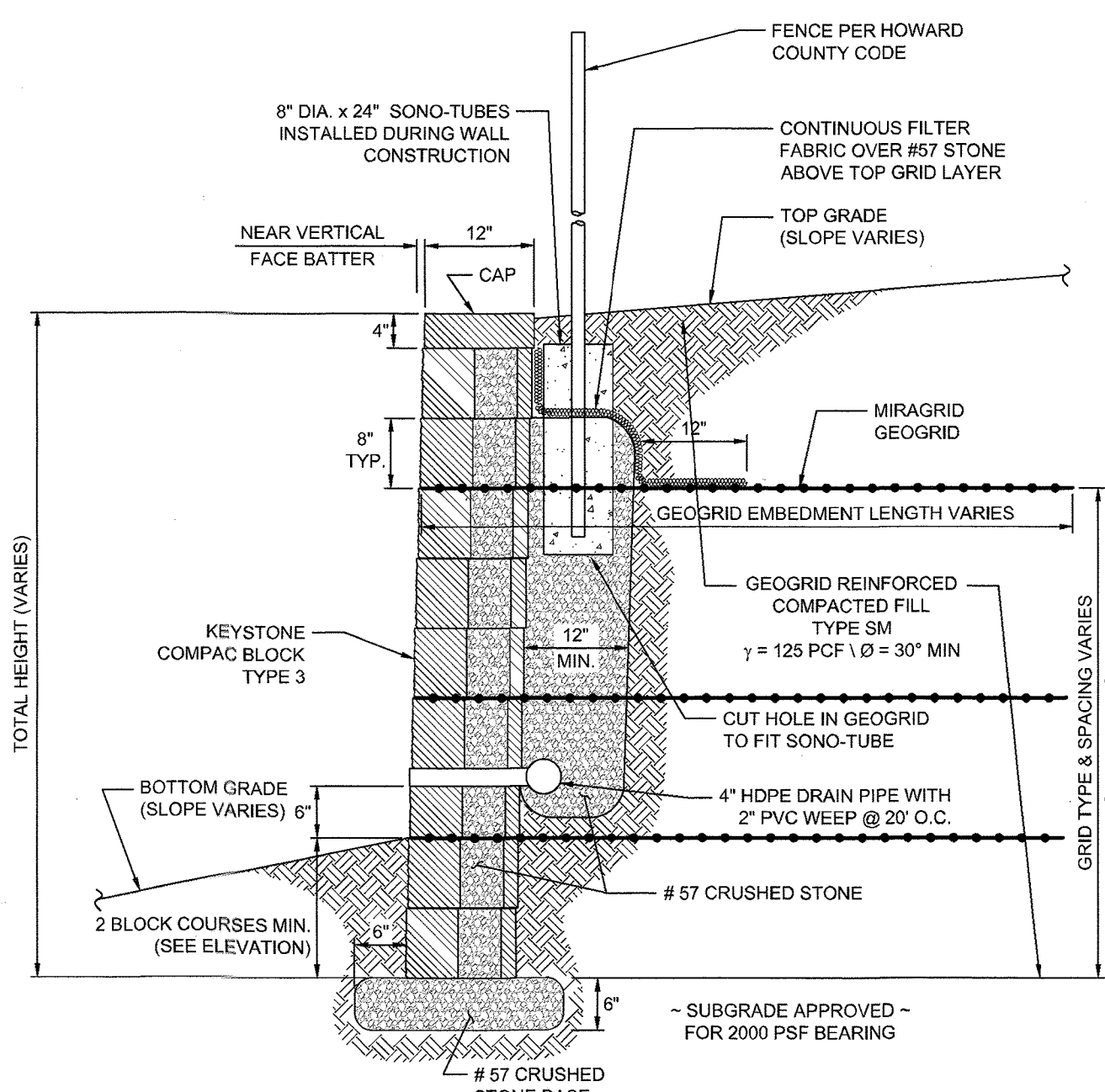
PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12012 EXPIRATION DATE: 06/19/2022.

DESIGN BY: AM+JRE  
 DRAWN BY: AM+JRE  
 CHECKED BY: HM  
 DATE: SEPT 2021  
 SCALE: AS SHOWN  
 HCEA NO.: 20441A

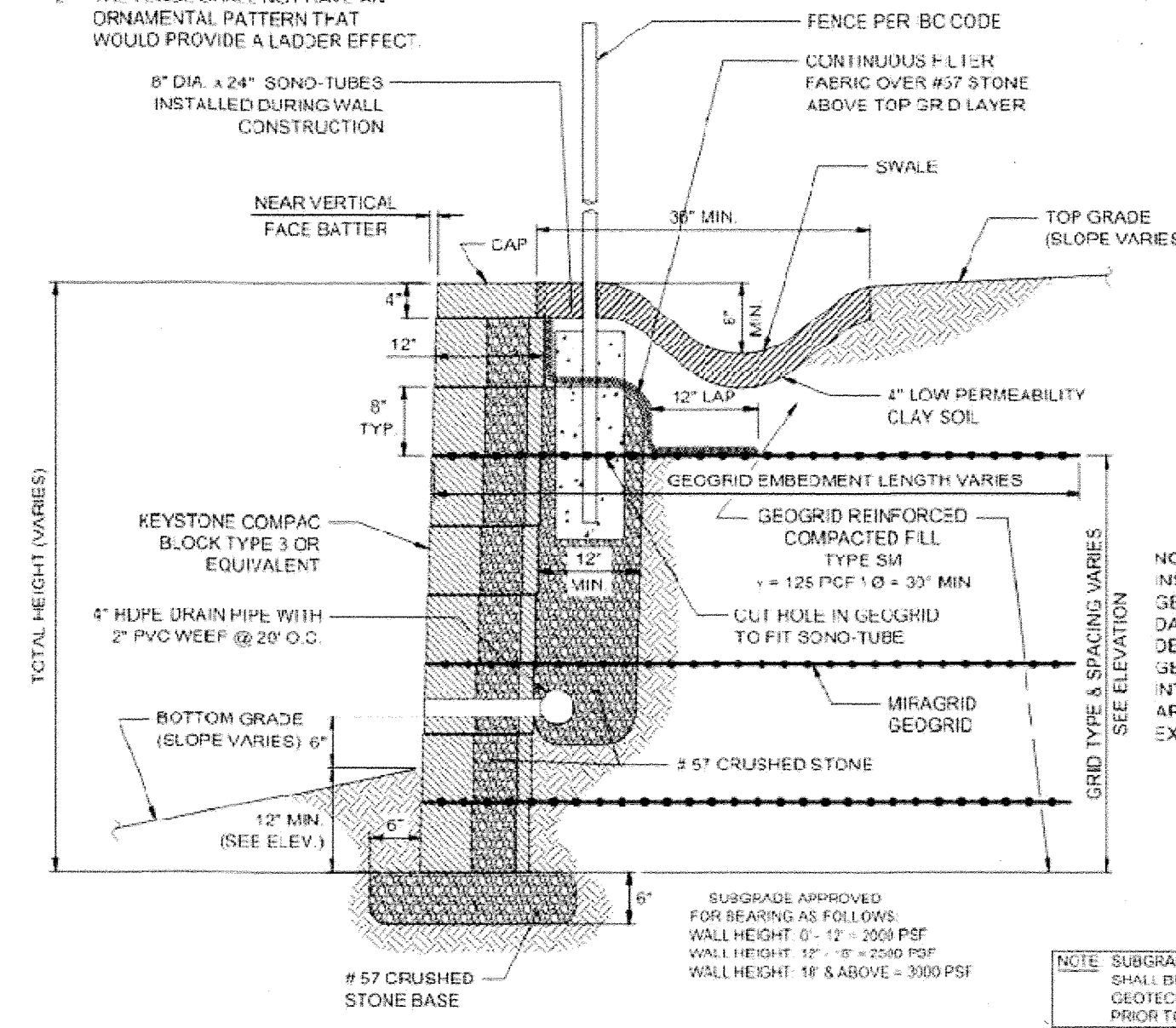
71 SHEET OF 101





TYPICAL WALL SECTION  
N.T.S.

NOTE:  
1. FENCE SHALL BE A MIN. 42" ABOVE TOP GRADE AND SHALL NOT ALLOW PASSAGE OF 4" DIA. SPHERE.  
2. THE FENCE SHALL NOT HAVE AN ORNAMENTAL PATTERN THAT WOULD PROVIDE A LADDER EFFECT.



WALL #12 TYPICAL SECTION  
N.T.S.

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.

NOTE: SUBGRADE BEARING CAPACITY SHALL BE VERIFIED BY A GEOTECHNICAL ENGINEER PRIOR TO WALL CONSTRUCTION.

**SPECIFICATIONS**  
**SEGMENTAL CONCRETE BLOCK RETAINING WALL**

**PART 1: GENERAL**  
**1.01 DESCRIPTION**  
A. WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTION OF A SEGMENTAL 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 SEGMENTAL CONCRETE RETAINING WALL UNITS**  
A. SEGMENTAL CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING ARCHITECTURAL REQUIREMENTS:  
FACE FINISH - 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 NORMALLY 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. SEGMENTAL CONCRETE UNITS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C1372 - STANDARD SPECIFICATIONS FOR SEGMENTAL RETAINING WALL UNITS.  
C. SEGMENTAL 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 16" (W) X 12" (D) MINIMUM FOR COMPACT III UNITS; UNIT SIZE - 8" (H) X 16" (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. SEGMENTAL CONCRETE UNITS SHALL CONFORM TO THE

FOLLOWING CONSTRUCTABILITY REQUIREMENTS:  
VERTICAL SETBACK = 1/8" PER COURSE (NEAR VERTICAL) OR 1 1/4" 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" DIA. THERMOSET EPOXY/ALYL 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; 8,400 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 ON 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.  

SEIVE 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 HOPE 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.

B. RETAINING WALL EXCAVATIONS SHALL BE PERFORMED IN COMPLIANCE WITH MOSH AND OSHA REQUIREMENTS. CARE SHALL BE EXERCISED TO PROPERLY SHORE OR SLOPE BACK EXCAVATIONS TO MAINTAIN STABILITY. IF SLOPE FLATTENING IS NOT ACHIEVABLE, TEMPORARY SUPPORT OF EXCAVATION FOR THE RETAINING WALL CONSTRUCTION SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR AND PERFORMED IN ACCORDANCE WITH ANY JURISDICTIONAL SAFETY STANDARDS.

**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 SEGMENTAL 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 SEGMENTAL 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 SHEARCONNECTING 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 SEGMENTAL WALL UNIT PINS AND WITHIN 1 INCH OF THE FACE OF THE UNITS. PLACE THE NEXT COURSE OF SEGMENTAL 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 LATERALLY A MINIMUM OF 6" IN FRONT AND BEHIND THE SEGMENTAL WALL UNIT.  
D. ONLY LIGHTWEIGHT HAND-OPERATED COMPACTION EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET FROM THE BACK OF THE SEGMENTAL 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 SEGMENTAL 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 GULLED 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.

**HOWARD COUNTY NOTES:**

- NO TREES SHALL BE PLANTED WITHIN 10 FEET OF THE TOP OF THE RETAINING WALL.
- RETAINING WALLS SHALL ONLY BE CONSTRUCTED UNDER THE OBSERVATION OF A REGISTERED PROFESSIONAL ENGINEER AND A (NICET, WAGEL, OR EQUIVALENT) CERTIFIED SOILS TECHNICIAN.
- 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.
- 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-388.
- THE SUITABILITY OF FILL MATERIAL SHALL BE CONFIRMED BY THE ON-SITE SOILS TECHNICIAN. EACH 8" LIFT MUST BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY AND THE TESTING REPORT SHALL BE MADE AVAILABLE TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.
- WALLS SHALL NOT BE CONSTRUCTED ON UNCERTIFIED FILL MATERIALS.
- WALLS SHALL NOT BE CONSTRUCTED WITHIN A HOWARD COUNTY RIGHT-OF-WAY OR EASEMENT.

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21104  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE

MSE RETAINING WALL CONSTRUCTION DETAILS

**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF CHAPEL GATE - NON-BUILDABLE BULK PARCEL E  
PARCELS: 110 & 421  
TAX MAP: 16 GRD: 10  
3RD ELECTION DISTRICT

L 1389/7: 339 (P. 110)  
L 4163/F: 424 (P. 421)  
ZONED: CEF-M  
HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A duly licensed PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12072, EXPIRATION DATE: 06/16/2022.

DESIGN BY: HM  
DRAWN BY: HM+AM  
CHECKED BY: HM  
DATE: SEPT 2021  
SCALE: AS SHOWN  
HCEA NO.: 20441A

72 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS  
DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 12/23/21

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 1/12/22



**"NO-FINES" CONCRETE SPECIFICATION**

"NO-FINES" CONCRETE IS A PERMEABLE CONCRETE MASS THAT IS MADE BY ELIMINATING THE FINE AGGREGATE COMPONENT IN CONCRETE WHICH CREATES A SIGNIFICANT VOID STRUCTURE WITHIN THE CONCRETE. THE MATERIAL IS PLACED IN A SEMI-LIQUID STATE AND ALLOWED TO HARDEN IN PLACE WITH MINIMAL COMPACTION AND PLACEMENT WORK AS REQUIRED TO LEVEL MATERIAL AND FILL ALL VOIDS.

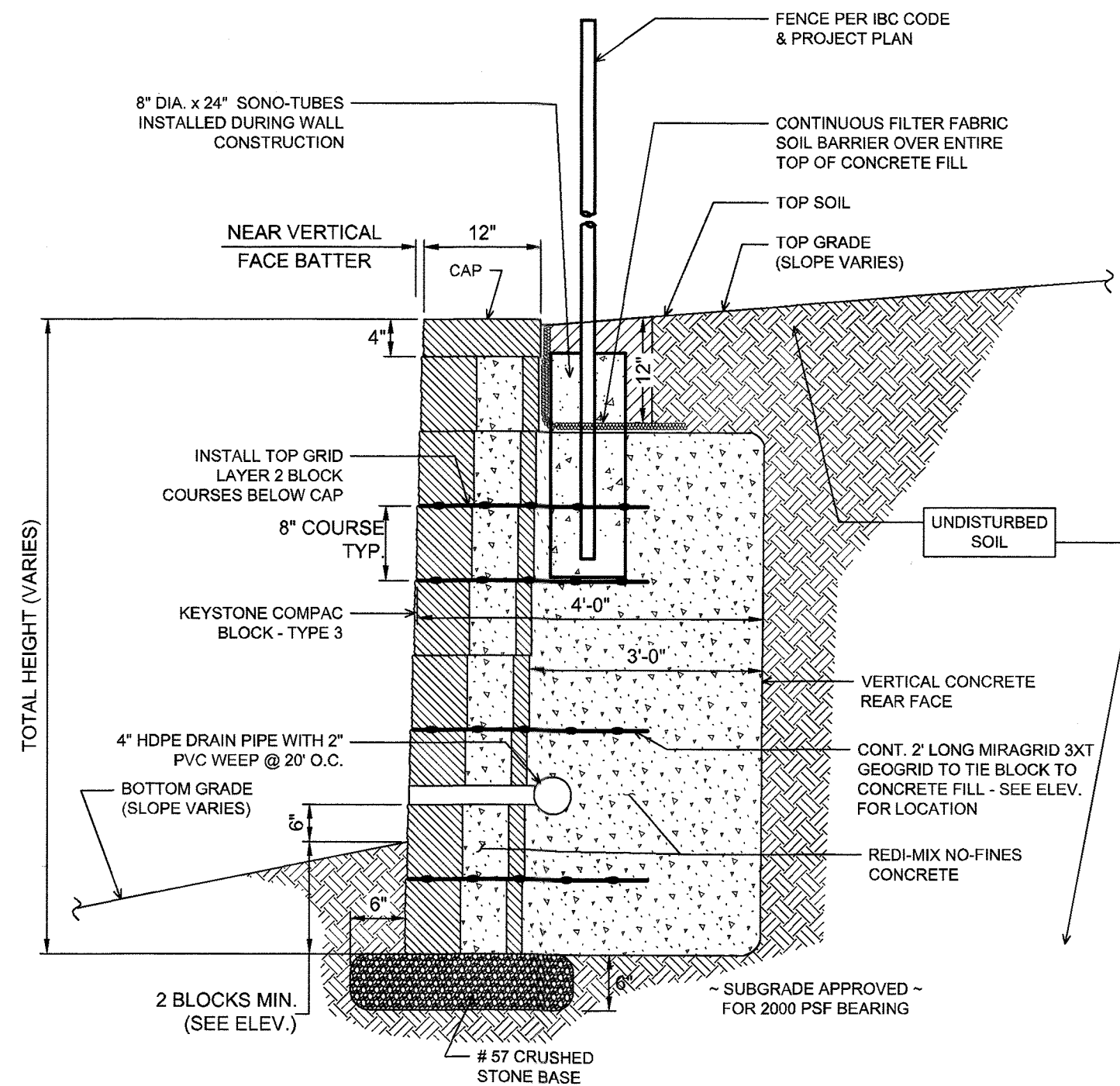
"NO-FINES" CONCRETE SHALL CONSIST OF PORTLAND CEMENT, WATER AND 1/2" - 3/4" COARSE AGGREGATE. FLY ASH MAY ALSO BE USED AS PART OF THE MIX DESIGN AS REQUIRED. THE CONCRETE SHALL BE MIXED BY MACHINE AND THE QUANTITY OF WATER USED SHALL NOT EXCEED THAT REQUIRED TO COMPLETELY COAT ALL THE AGGREGATE PARTICLE WITHOUT FORMING EXCESSIVE GROUT.

**TYPICAL MIX DESIGN**

- CEMENT - PORTLAND CEMENT, TYPE 1 OR II, ASTM C150
- AGGREGATE - NO. 57 OR NO. 6 STONE OR EQUIVALENT, ASTM C33
- AGGREGATE/CEMENT RATIO - APPROX 6:1 BY WEIGHT
- WATER/CEMENT RATIO - 0.35 TO 0.45 BY WEIGHT
- IN-PLACE VOID RATIO - 20% - 30%
- IN-PLACE UNIT WEIGHT = 110 TO 130 LBS/CF
- COMPRESSIVE STRENGTH - 2,000 PSI NOMINALLY @ 28 DAYS

**"NO-FINES" CONCRETE INSTALLATION STEPS**

1. SUBGRADE SHALL BE CLEAN AND FIRM BEFORE PLACING CONCRETE.
2. PLACE CONCRETE IN 16" (2 BLOCK COURSE) LIFTS, FILLING ALL VOIDS IN BLOCK - ROD CONCRETE AS NEEDED TO CONSOLIDATE.
3. PLACE GEOGRID TIES WHERE SHOWN ON ELEVATION.
4. WAIT SEVERAL HOURS BETWEEN CONCRETE LIFTS TO ALLOW CONCRETE TO SUFFICIENTLY HARDEN.



**TYPICAL WALL #15A "NO-FINES" SECTION FROM STA. 0+30 TO STA. 1+10 N.T.S.**

**"NO-FINES" RETAINING WALL CONSTRUCTION DETAILS**

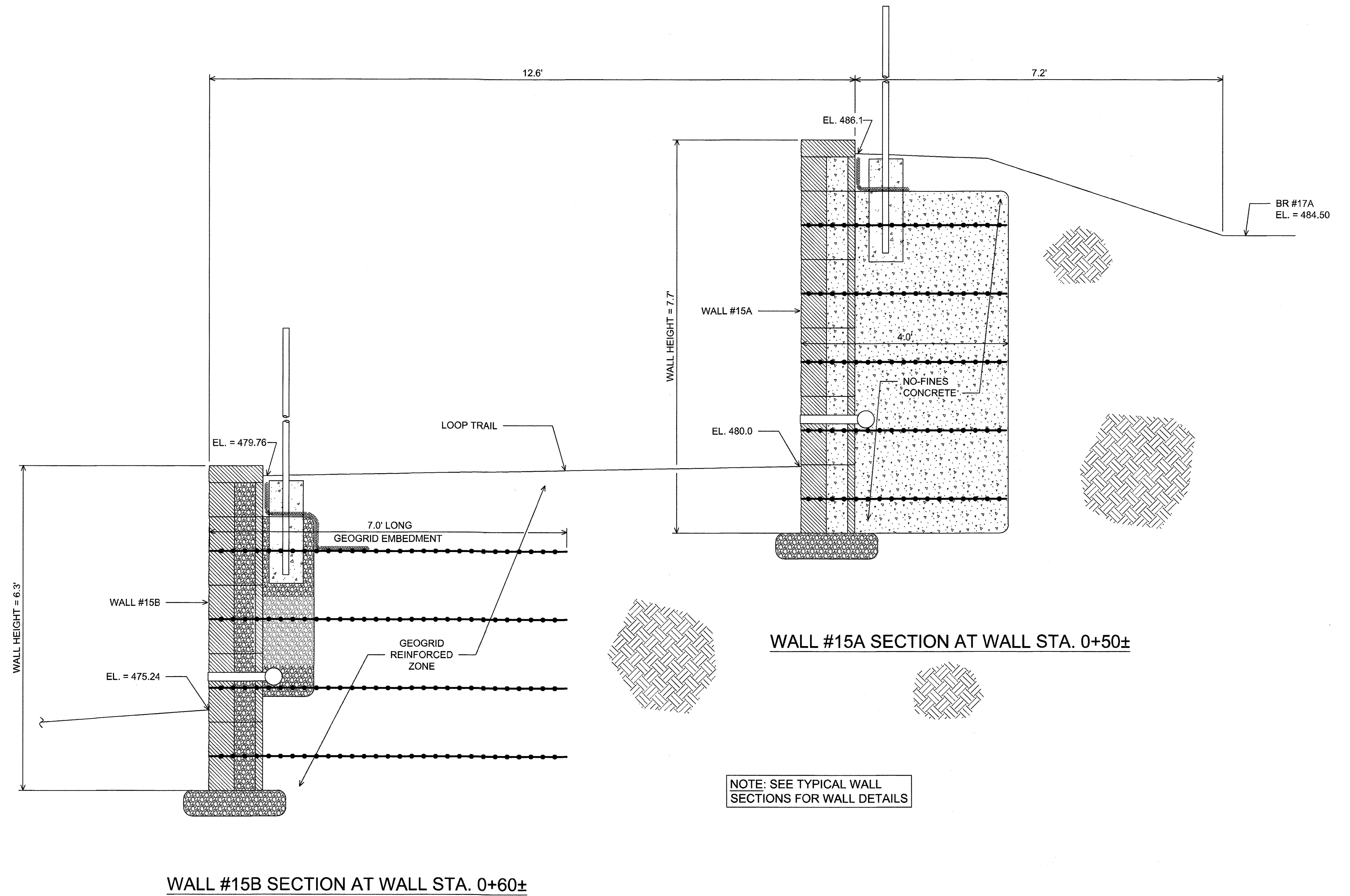
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*[Signature]* 12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 12-23-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 1/13/22  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE



**WALL #15B SECTION AT WALL STA. 0+60±**

**SECTION A-A AT LOOP TRAIL SCALE: 3/4" = 1'-0"**

**OWNER**  
CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
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**DEVELOPER**  
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8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE

**"NO-FINES" RETAINING WALL CONSTRUCTION DETAILS AND SECTION A-A AT LOOP TRAIL**

**CHAPEL GATE WOODS**

LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 25942-25954 L 1389/F 339 (P. 110)  
L 4163/F 424 (P. 421)  
PARCELS: 110 & 421 TAX MAP: 16 GRID: 10 ZONED: CEF-M HOWARD COUNTY, MARYLAND  
3RD ELECTION DISTRICT

**HILLIS-CARNES ENGINEERING ASSOCIATES**

10875 Guilford Road, Suite A Annapolis Junction, Maryland  
Phone: (410) 880-4788 www.hcea.com Fax: (410) 880-4088

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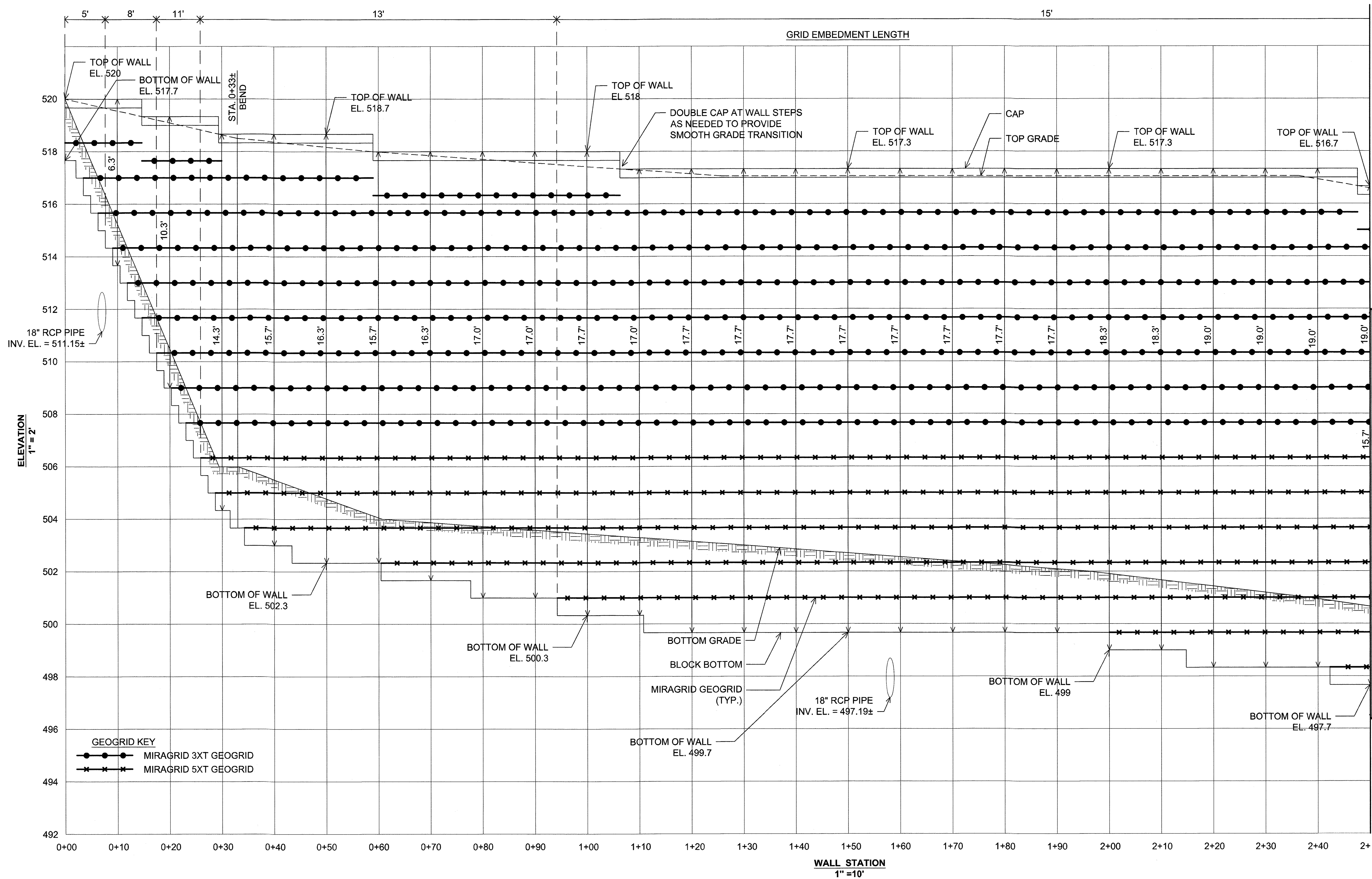
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**13** SHEET OF **101**









**WALL #12 ELEVATION**

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARROTTSVILLE RD.  
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NO.	REVISION	DATE
3	00	

**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421  
 TAX MAP: 18 GRID: 10  
 3RD ELECTION DISTRICT

PLATS: 25992-25954  
 L: 1389/F: 339 (P: 110)  
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APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS  
 MKC DATE

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 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT  
 [Signature] 1/13/22  
 DATE

PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12012, EXPIRATION DATE: 06/16/2022.

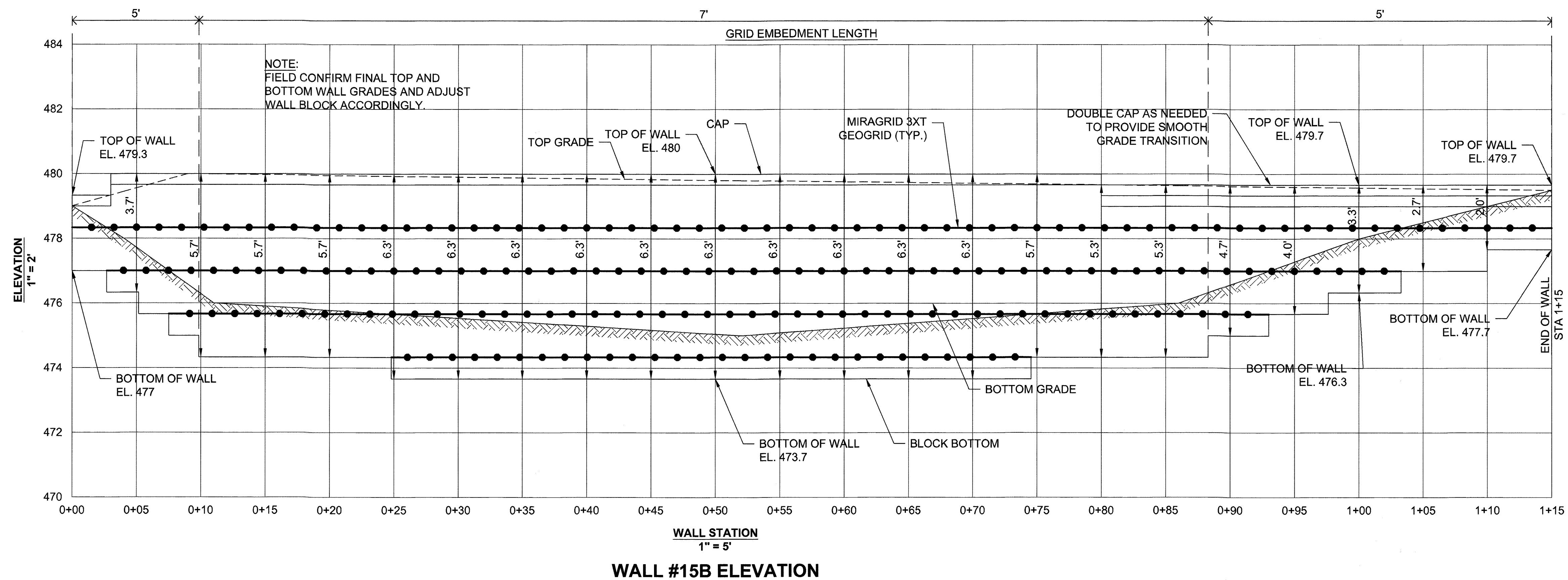
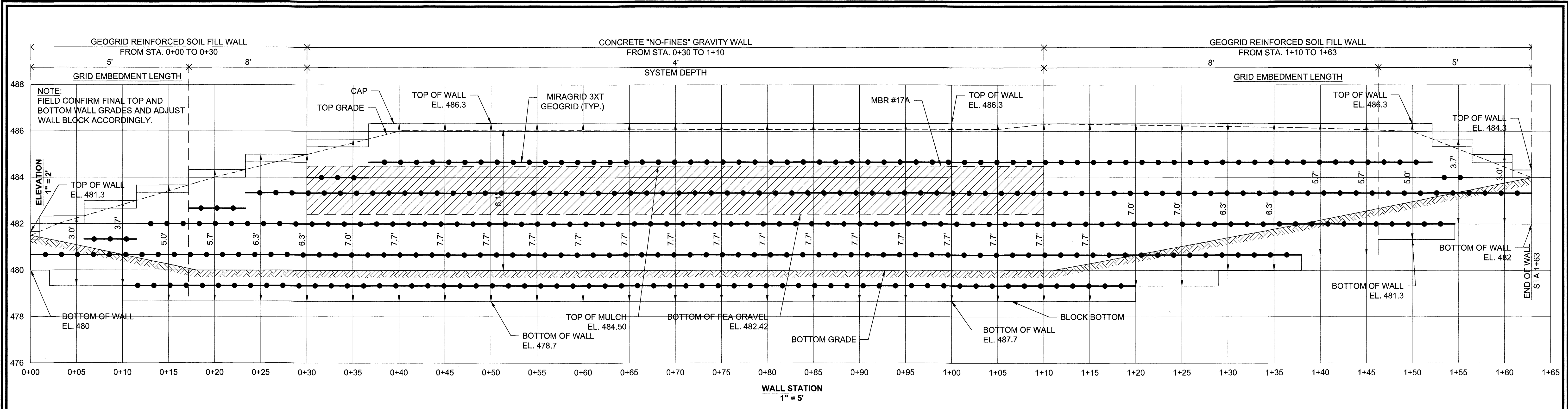
DESIGN BY: HM  
 DRAWN BY: HM+AM  
 CHECKED BY: HM  
 DATE: SEPT 2021  
 SCALE: AS SHOWN  
 HCEA NO.: 20441A

**75** SHEET OF **101**









**OWNER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
8480 BALTIMORE NATIONAL PIKE  
SUITE 415  
ELLICOTT CITY, MD 21104  
410-465-4244  
SDCPROPERTIES.COM

NO.	REVISION	DATE

RETAINING WALL #15A & #15B ELEVATIONS

**CHAPELGATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 25992-25954  
PARCELS: 110 & 421  
TAX MAP: 16 GRID: 1D  
3RD ELECTION DISTRICT

L 1389/F: 339 (P. 110)  
L 4163/F: 424 (P. 421)  
ZONED: CEF-M  
HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
ENGINEERING ASSOCIATES  
10975 Guilford Road, Suite A Annapolis Junction, Maryland  
Phone: (410) 860-4798 www.hceae.com Fax: (410) 860-4698

DESIGN BY: HM  
DRAWN BY: HM+AM  
CHECKED BY: HM  
DATE: SEPT 2021  
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77 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
[Signature] 12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
[Signature] 12-23-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 1/13/22  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

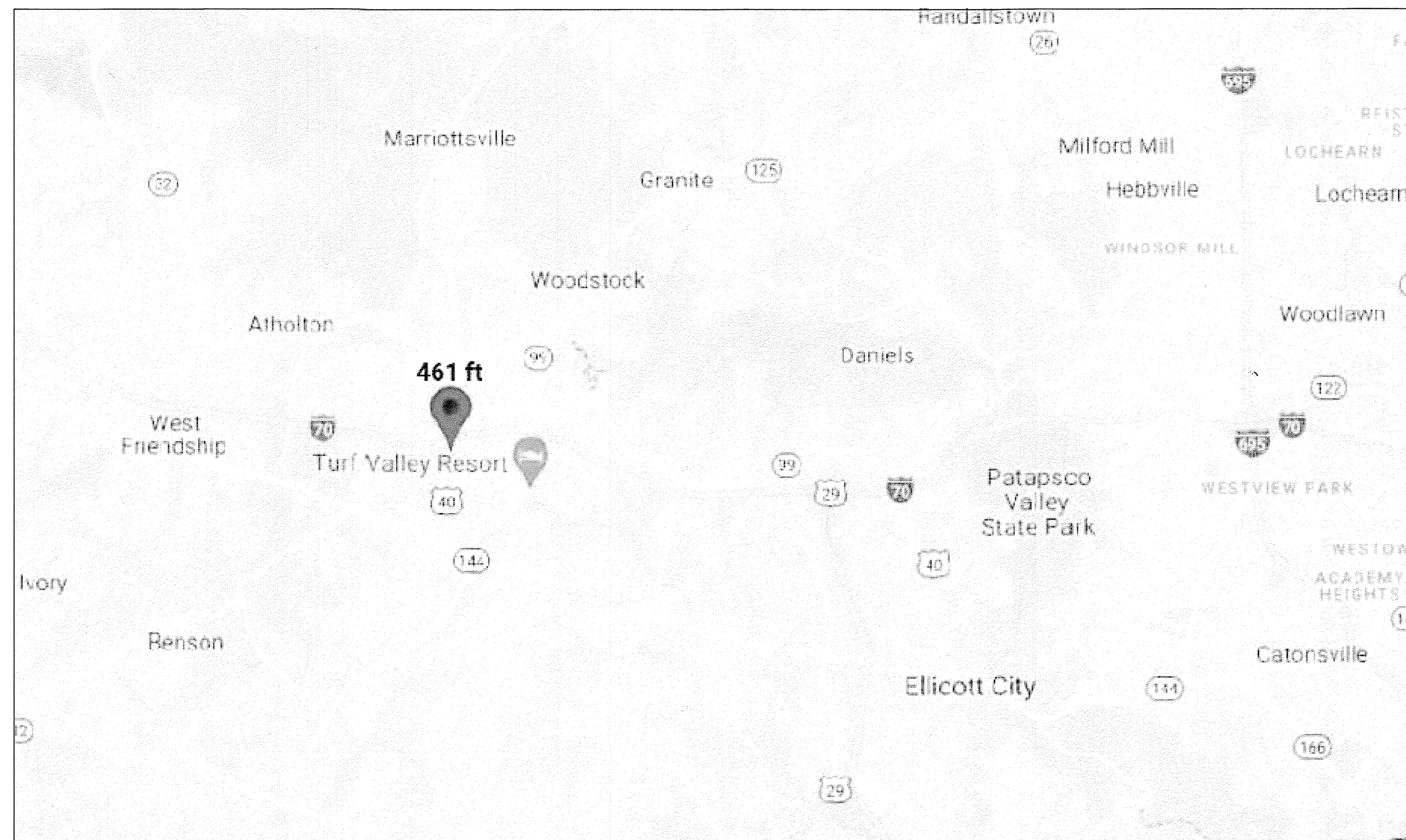






# CONSTRUCTION DRAWINGS FOR CAST-IN-PLACE CONCRETE RETAINING WALL HEADWALL #1 AND ENDWALL #2 CHAPELGATE WOODS HOWARD COUNTY, MARYLAND

JULY 2021



PROJECT LOCATION MAP

### SHEET INDEX

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- 80 WALL LOCATION PLAN
- 81 GENERAL NOTES AND TYPICAL DETAILS
- 82 CONCRETE RETAINING WALL DETAILS
- 83 CONCRETE RETAINING WALL ELEVATION - HEADWALL #1
- 84 CONCRETE RETAINING WALL ELEVATION - ENDWALL #2
- 85 CULVERT SCOUR PROTECTION DETAIL

<p><b>OWNER</b> CHAPELGATE PRESBYTERIAN CHURCH, INC. 2600 MARRIOTTVILLE RD. MARRIOTTVILLE, MD 21104 (410) 442-5888</p>	<p><b>DEVELOPER</b> SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLCOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM</p>
--	---

NO.	REVISION	DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MKK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 1/13/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

FINAL ROAD CONSTRUCTION PLAN

## CHAPELGATE WOODS

LOTS 1-134, OPEN SPACE LOTS 135-137  
AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL B  
PLATS 25942 - 25954

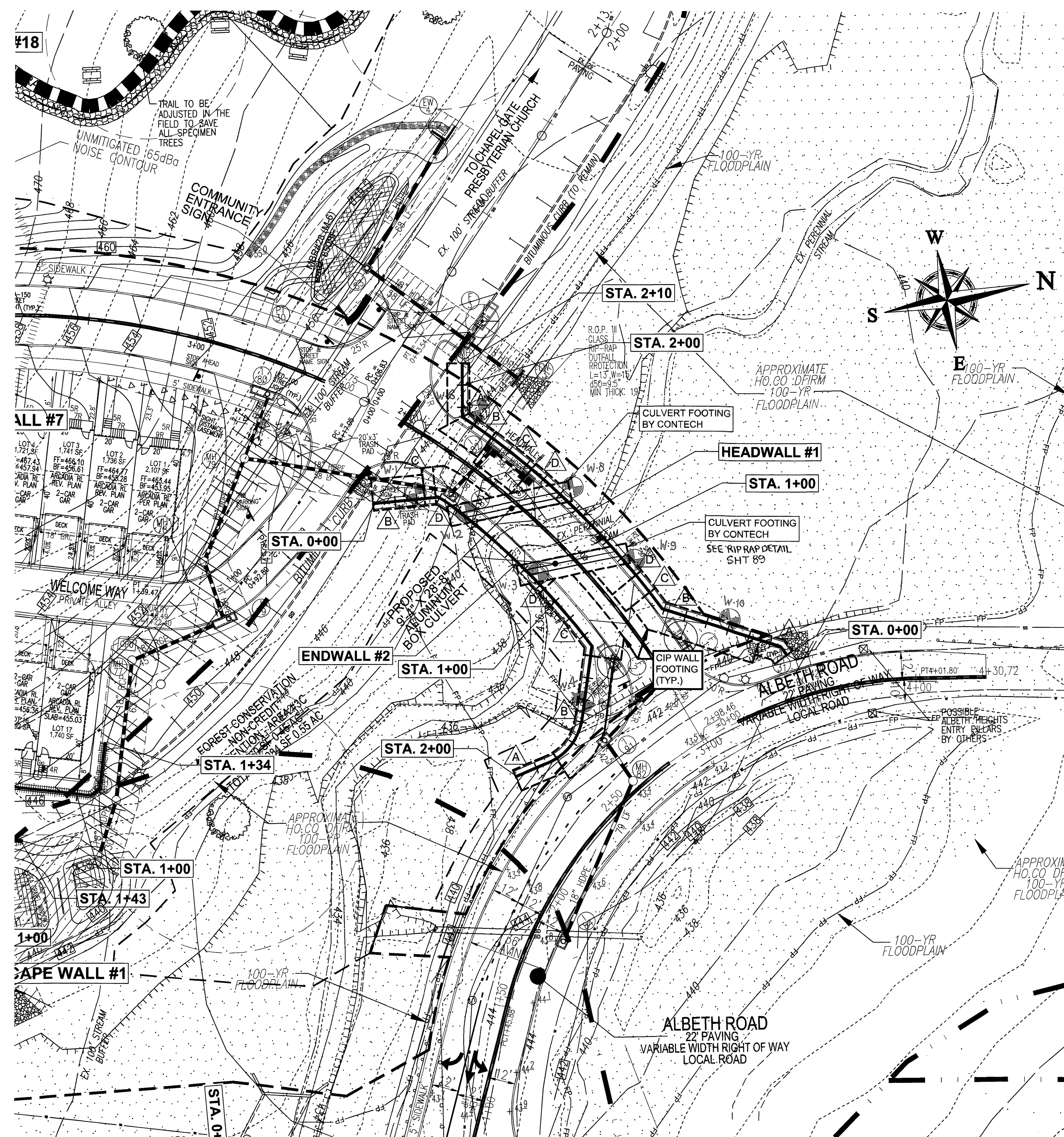
PARCELS: 110 & 421 L 1389/F, 339 (P. 110)  
 TAX MAP: 16 GRID: 10 L 4163/F, 424 (P. 421)  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

### HILLIS-CARNES ENGINEERING ASSOCIATES

10975 Guilford Road, Suite A Annapolis Junction, Maryland  
Phone: (410) 860-4788 www.hcaea.com Fax: (410) 860-4088

DESIGN BY: CRS.	PROFESSIONAL CERTIFICATE
DRAWN BY: CRS.	I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 12012 EXPIRATION DATE: 06-16-2022.
CHECKED BY: JRE.	
DATE: SEPT 2021	
SCALE: AS SHOWN	
HCEA NO.: 20441A	79 SHEET OF 101





**WALL LOCATION PLAN**  
1" = 30'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Jane* 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*John* 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 6 DATE

*Tom* 1/13/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTSVILLE RD.  
 MARRIOTTSVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
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 PARCELS: 110 & 421 L. 1389/F. 339 (P. 110)  
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 3RD ELECTION DISTRICT PLATS: 25942-25954 410-465-4244  
 ZONED: CEF-M HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
**ENGINEERING ASSOCIATES**  
 18975 Guilford Road, Suite A Annapolis Junction, Maryland  
 Phone: (410) 880-4788 www.hca.com Fax: (410) 880-4088

	DESIGN BY: _____ CRS	<b>PROFESSIONAL CERTIFICATE</b> 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. 12012, EXPIRATION DATE: 06-15-2022.
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	SCALE: _____ AS SHOWN	
HCEA NO.: _____ 20441A	<b>80</b> SHEET OF <b>101</b>	



GENERAL NOTES

**CONTRACTOR RESPONSIBILITIES:** THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETED. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCE, AND TO ENSURE THE STABILITY OF THE BUILDING AND ITS COMPONENT PARTS, AND THE ADEQUACY OF TEMPORARY OR INCOMPLETE CONNECTIONS, DURING ERECTING. THIS INCLUDES THE ADDITION OF ANY SHORING, SHEETING, TEMPORARY GUYS, BRACING OR TIEDOWNS THAT MIGHT BE NECESSARY. SUCH MATERIAL IS NOT SHOWN ON THE DRAWINGS. IF APPLIED, THEY SHALL BE REMOVED AS CONDITIONS PERMIT AND SHALL REMAIN THE CONTRACTOR'S PROPERTY. THE ENGINEER HAS NO EXPERTISE IN, AND TAKES NO RESPONSIBILITY FOR, CONSTRUCTION MEANS AND METHODS OR JOBSITE SAFETY DURING CONSTRUCTION. PROCESSING AND/OR APPROVED SUBMITTALS MADE BY THE CONTRACTOR WHICH MAY CONTAIN INFORMATION RELATED TO CONSTRUCTION METHODS OF SAFETY ISSUES, OR PARTICIPATION IN MEETINGS WHERE SUCH ISSUES MIGHT BE DISCUSSED, SHALL NOT BE CONSTRUED AS VOLUNTARY ASSUMPTION BY THE ENGINEER OF ANY RESPONSIBILITY OF EACH CONTRACTOR TO FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE ENGINEER IS NOT ENGAGED IN, AND DOES NOT SUPERVISE CONSTRUCTION.

**CONTROLLED FILL AND BACKFILL:** SAMPLES OF ALL MATERIALS THAT THE CONTRACTOR PROPOSES TO USE FOR COMPACTED FILL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER. COMPACTED FILL SHALL CONSIST OF LOCAL MATERIAL FREE OF DELETERIOUS MATTER AND CLASSIFIED SP, SW, SM, SC, GP, GW, GM, OR GC PER ASTM D-2487. THE CONTROL OF THE MOISTURE FOR PLACING THE FILL WILL BE BASED ON THE RESULTS OF COMPACTION TESTS PER ASTM D-1557. ALL COMPACTED FILL SHALL HAVE A DENSITY OF AT LEAST 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557. PRIOR TO PLACEMENT OF ANY FILLS, THE SITE SHALL BE STRIPPED OF ALL TOPSOIL, VEGETATION, ROCKS, AND ORGANIC MATERIALS AND THE EXPOSED SUBGRADE SHALL BE COMPACTED IN PLACE TO A CONFIRMED DENSITY OF 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY. FILL MATERIAL SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING 8" IN THICKNESS AND SHALL BE MIXED, SPREAD AND PLACED IN SUCH A WAY AS TO PRODUCE A UNIFORM THICKNESS OF MATERIAL AFTER PLACING. EACH LAYER OF FILL SHALL BE COMPACTED WITH A MINIMUM OF 6 COMPLETE PASSES ON ALL PORTIONS OF THE SURFACE OF EACH LIFT OF FILL BY RUBBER-TIRED ROLLERS, SHEEPS-FOOT ROLLERS OR OTHER MECHANICAL EQUIPMENT APPROVED BY THE GEOTECHNICAL ENGINEER. COMPACTED FILL PLACED WITHIN 4 FEET OF STRUCTURES AND PIPES SHOULD BE PLACED IN HORIZONTAL LIFTS NOT TO EXCEED 4 INCHES THICKNESS AND COMPACTED WITH HAND TAMPERS OR LIGHT COMPACTION EQUIPMENT TO THE SAME STANDARD. HEAVY COMPACTION EQUIPMENT SHOULD NOT BE ALLOWED WITHIN 4 FEET OF STRUCTURES UNLESS A MINIMUM 2 FEET DEPTH OF FILL COVERS THE STRUCTURES. WHENEVER IN PLACE DENSITIES ARE FOUND BELOW ACCEPTABLE LIMITS, ADDITIONAL ROLLING TO PRODUCE THE SPECIFIED DENSITIES SHALL BE REQUIRED. THE CONTRACTOR SHALL TAKE ALL MEASURES REQUIRED TO PROVIDE FOR FREE DRAINAGE OF THE SITE AND TO PREVENT PONDING OF WATER. SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES. PLACING OF FILL CONTAINING ORGANIC MATTER; PLACING OF FILL WITH MOISTURE CONTENT TOO HIGH OR TOO LOW FOR PROPER COMPACTION; PLACING OF FILL WHEN FREE WATER IS STANDING ON THE EXISTING FILL SURFACE; PLACING OF FILL IN A FROZEN CONDITION OR ON TOP OF FROZEN MATTER WILL NOT BE PERMITTED. THE SOILS ENGINEER SHALL SUPERVISE THE PLACING OF THE COMPACTED FILL AND ALL THE MATERIAL AND EQUIPMENT USED FOR THIS PURPOSE AND SHALL MAKE SUCH SOILS TESTS AS MAY BE REQUIRED FOR THE COMPLETION OF THE WORK PERFORMING AT LEAST 6 IN PLACE DENSITY TESTS DURING EACH EIGHT HOUR SHIFT.

**FOUNDATIONS-SPREAD FOOTINGS:** BOTTOM OF ALL FOOTINGS SHALL BE A MINIMUM OF 2'-0" BELOW ORIGINAL GRADE OR PLACED IN APPROVED COMPACTED FILL. BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE A MINIMUM OF 3'-0" BELOW FINISHED GRADE. A SOIL BEARING CAPACITY OF 3000 PSF WAS USED IN THE FOUNDATION DESIGN, AND MUST BE FIELD VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER. IF SOIL OF THIS BEARING CAPACITY IS NOT ENCOUNTERED AT THE ELEVATIONS INDICATED ON THE CONTRACT DRAWINGS, FOOTINGS SHALL BE LOWERED OR INCREASED IN SIZE AS DIRECTED BY THE STRUCTURAL ENGINEER. ELEVATIONS SHOWN ON PLAN ARE TO THE BOTTOM OF THE FOOTINGS.

**CONCRETE:** ALL CONCRETE WORK SHALL CONFORM TO ALL THE PROVISIONS OF THE "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301) AND TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318). ALL STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4500 PSI UNLESS NOTED OTHERWISE. ADDITIONALLY, THE CONCRETE SHALL CONFORM TO ALL THE PROVISIONS OF "RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING" (ACI 305) AND "RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING" (ACI 306). ALL FORMWORK SHALL BE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE "FORMWORK FOR CONCRETE" SPECIAL PUBLICATION NO. 4 AND ACI'S "STANDARD RECOMMENDED PRACTICE FOR CONCRETE FORMWORK" (ACI-347). ALL CONCRETE EXPOSED TO THE WEATHER SHALL HAVE AN AIR ENTRAINMENT OF 6% +/- 1%. THE MAXIMUM WATER CEMENT RATIO W/C SHALL NOT EXCEED 0.56 FOR ALL CONCRETE EXCEPT CONCRETE EXPOSED TO WEATHER WHICH SHALL NOT EXCEED 0.45. NO ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL BE PERMITTED. THE MAXIMUM SLUMP OF ALL CONCRETE SHALL BE 4". ALL CONCRETE SHALL BE CURED WITH LIQUID SEALING COMPOUND CONFORMING TO ASTM C-309, TYPE I AND FEDERAL SPECIFICATION TT-C-00800 OR OTHER APPROVED METHOD WHICH IS COMPATIBLE WITH FLOORING ADHESIVES AND OTHER SURFACE TREATMENTS. ALL CONCRETE LEFT EXPOSED AT THE COMPLETION OF THE PROJECT SHALL BE TREATED WITH A CLEAR, PENETRATING ACRYLIC BASE POLYMER CAPABLE OF PREVENTING INFILTRATION OF WATER BORNE CHLORIDES SUCH AS "CONSPEC CURE & SEAL WB" BY DAYTON SUPERIOR CORPORATION OR APPROVED EQUAL. LOADS GREATER THAN THE DESIGN LIVE LOADS SHALL NOT BE PLACED ON THE STRUCTURE. A CONCRETE STRUCTURE MAY NOT SUPPORT ITS DESIGN LIVE LOAD FOR 28 DAYS. CONTRACTOR SHALL SUPPORT ADJACENT STRUCTURES, UTILITIES, AND EXCAVATIONS AS REQUIRED FOR COMPLETION OF WORK. ONE SET OF COMPRESSIVE TEST CYLINDERS FOR EACH 100 CUBIC YARDS POURED, BUT NOT LESS THAN ONE SET FOR EACH DAY'S POUR AND EACH CLASS OF CONCRETE, ALONG WITH SLUMP TESTS SHALL BE PERFORMED BY A TESTING LABORATORY APPROVED BY THE STRUCTURAL ENGINEER. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL TEMPORARY FORMWORK INCLUDING STRIPPING PROCEDURES FOR CONCRETE FLAT SLABS, SHEETING, SHORING, UNDERPINNING, ETC. SEALED BY A REGISTERED PROFESSIONAL ENGINEER AS PART OF THE CONTRACTOR'S WORK.

GENERAL NOTES

**REINFORCING STEEL:** REINFORCING STEEL SHALL BE DEFORMED BARS IN ACCORDANCE WITH ASTM A-615, GRADE 60. BENDS ARE TO BE FABRICATED AS PER DETAILS. PLACE MAIN REINFORCING STEEL SO AS TO PROVIDE 3" MINIMUM COVER FOR FOUNDATIONS POURED ON EARTH, 2" MINIMUM COVER FOR BEAMS AND COLUMNS, 3/4" MINIMUM COVER FOR SLABS AND 1 1/2" FOR ALL REBAR IN EXPOSED CONCRETE (EXCEPT AS OTHERWISE DETAILED). WHERE EPOXY-COATED REINFORCING IS INDICATED ON THE CONTRACT DOCUMENTS, THE REINFORCING SHALL BE EPOXY-COATED CONFORMING TO ASTM A-775 FOR BARS, WHERE REQUIRED, DAMAGED AND CUT EPOXY-COATING SHALL BE REPAIRED WITH PATCHING MATERIAL CONFORMING TO ASTM A-775. EPOXY-COATED REINFORCING BARS SHALL BE FASTENED WITH NYLON-, EPOXY-, OR PLASTIC-COATED TIE WIRE.

**INSPECTION:** ALL WORK SPECIFIED HEREIN SHALL BE INSPECTED IN ACCORDANCE WITH THE BUILDING CODE AND ALL LOCAL ORDINANCES. THE OWNER OR CONTRACTOR SHALL HIRE AN EXPERIENCED QUALIFIED INSPECTOR TO PERFORM ALL REQUIRED INSPECTION WORK. INSPECTION SHALL CONSIST OF VISUAL OBSERVATIONS OF MATERIALS, EQUIPMENT OR CONSTRUCTION WORK FOR THE PURPOSE OF ASCERTAINING THAT THE WORK IS IN SUBSTANTIAL CONFORMANCE WITH THE CONTRACT DOCUMENTS AND WITH THE DESIGN INTENT. THE ENGINEER WILL NOT PERFORM THE REQUIRED INSPECTION AS PART OF THIS PRESENT CONTRACT WITH THE ARCHITECT/OWNER. UNDER THIS PRESENT CONTRACT, THE ENGINEER MAY VISIT THE SITE TO ASCERTAIN GENERAL CONFORMANCE TO THE CONTRACT DOCUMENTS. HOWEVER, SUCH VISITS SHALL NOT BE RELIED UPON BY OTHERS AS ACCEPTANCE OF THE WORK, NOR SHOULD IT BE CONSTRUED TO RELIEVE THE CONTRACTOR IN ANY WAY FROM HIS OBLIGATIONS AND RESPONSIBILITIES UNDER THE CONSTRUCTION CONTRACT. HOWEVER, IF DESIRED, HILLIS-CARNES ENGINEERING ASSOCIATES MAY BE HIRED UNDER A SEPARATE CONTRACT TO PERFORM THIS INSPECTION WORK.

**DESIGN WITHOUT CONSTRUCTION REVIEW:** IT IS AGREED THAT IF HILLIS-CARNES ENGINEERING ASSOCIATES' PROFESSIONAL SERVICES DO NOT EXTEND TO OR INCLUDE THE REVIEW OR SITE OBSERVATION OF THE CONTRACTOR'S WORK OR PERFORMANCE, THEN THE OWNER WILL DEFEND, INDEMNIFY AND HOLD HARMLESS HILLIS-CARNES ENGINEERING ASSOCIATES, FROM ANY CLAIM OR SUIT WHATSOEVER, INCLUDING BUT NOT LIMITED TO ALL PAYMENTS, EXPENSES OR COSTS INVOLVED, ARISING FROM OR ALLEGED TO HAVE ARISEN FROM THE CONTRACTOR'S PERFORMANCE OR THE FAILURE OF THE CONTRACTOR'S WORK TO CONFORM TO THE DESIGN INTENT AND THE CONTRACT DOCUMENTS. HILLIS-CARNES ENGINEERING ASSOCIATES, AGREES TO BE RESPONSIBLE FOR ITS OWN OR ITS EMPLOYEES' NEGLIGENT ACTS, ERRORS OR OMISSIONS.

**OWNERSHIP OF DOCUMENTS:** THE CONTRACTOR ACKNOWLEDGES THESE PLANS AND SPECIFICATIONS PREPARED BY HILLIS-CARNES ENGINEERING ASSOCIATES, AS INSTRUMENTS OF PROFESSIONAL SERVICE. NEVERTHELESS, THE PLANS AND SPECIFICATIONS PREPARED UNDER THIS AGREEMENT SHALL REMAIN THE PROPERTY OF HILLIS-CARNES ENGINEERING ASSOCIATES UPON COMPLETION OF THE WORK. THE CONTRACTOR AGREES TO HOLD HARMLESS AND INDEMNIFY HILLIS-CARNES ENGINEERING ASSOCIATES, AGAINST ALL DAMAGES, CLAIMS, AND LOSSES, INCLUDING DEFENSE COSTS, ARISING OUT OF ANY REUSE OF THE PLANS AND SPECIFICATIONS WITHOUT THE WRITTEN AUTHORIZATION OF HILLIS-CARNES ENGINEERING ASSOCIATES

**DESIGN DATA:**  
 fc = 4500 PSI (WALL FOUNDATIONS)  
 fc = 4500 PSI (RETAINING WALL)  
 fy = 60000 PSI

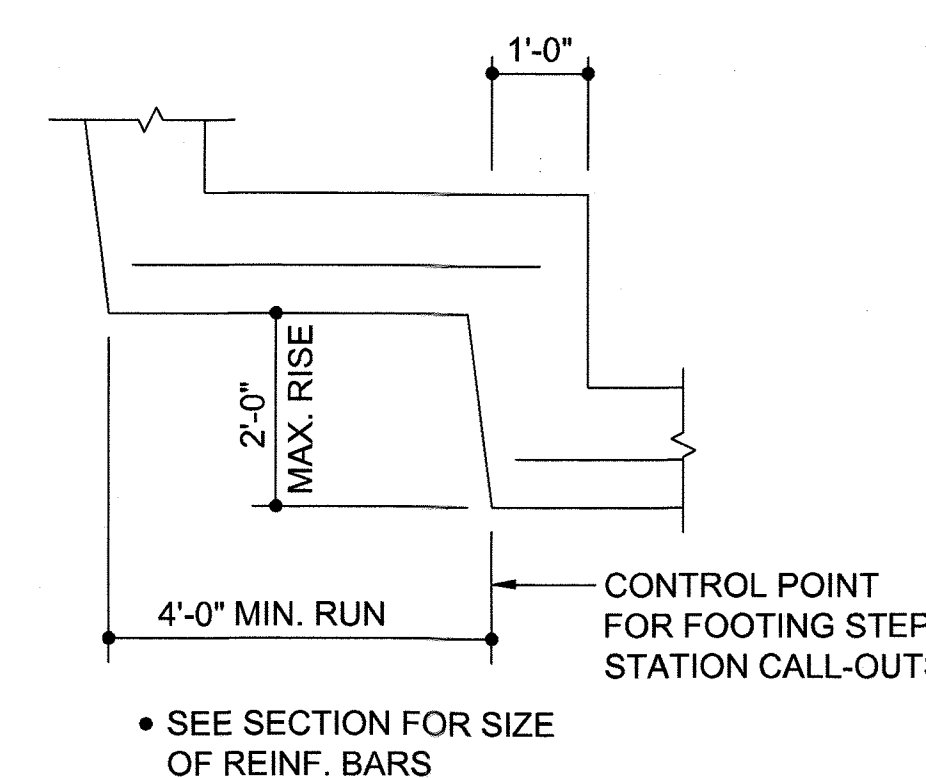
**DESIGN EARTH PRESSURES:**  
 ACTIVE PRESSURE = 44 PSF  
 PASSIVE PRESSURE = 250 PSF  
 FRICTION COEFFICIENT = 0.35  
 PERCENT OF FRICTION USED FOR SLIDING = 100%  
 PERCENT OF PASSIVE USED FOR SLIDING = 50%

**MINIMUM FACTORS OF SAFETY:**  
 OVERTURNING = 2.0  
 SLIDING = 1.5

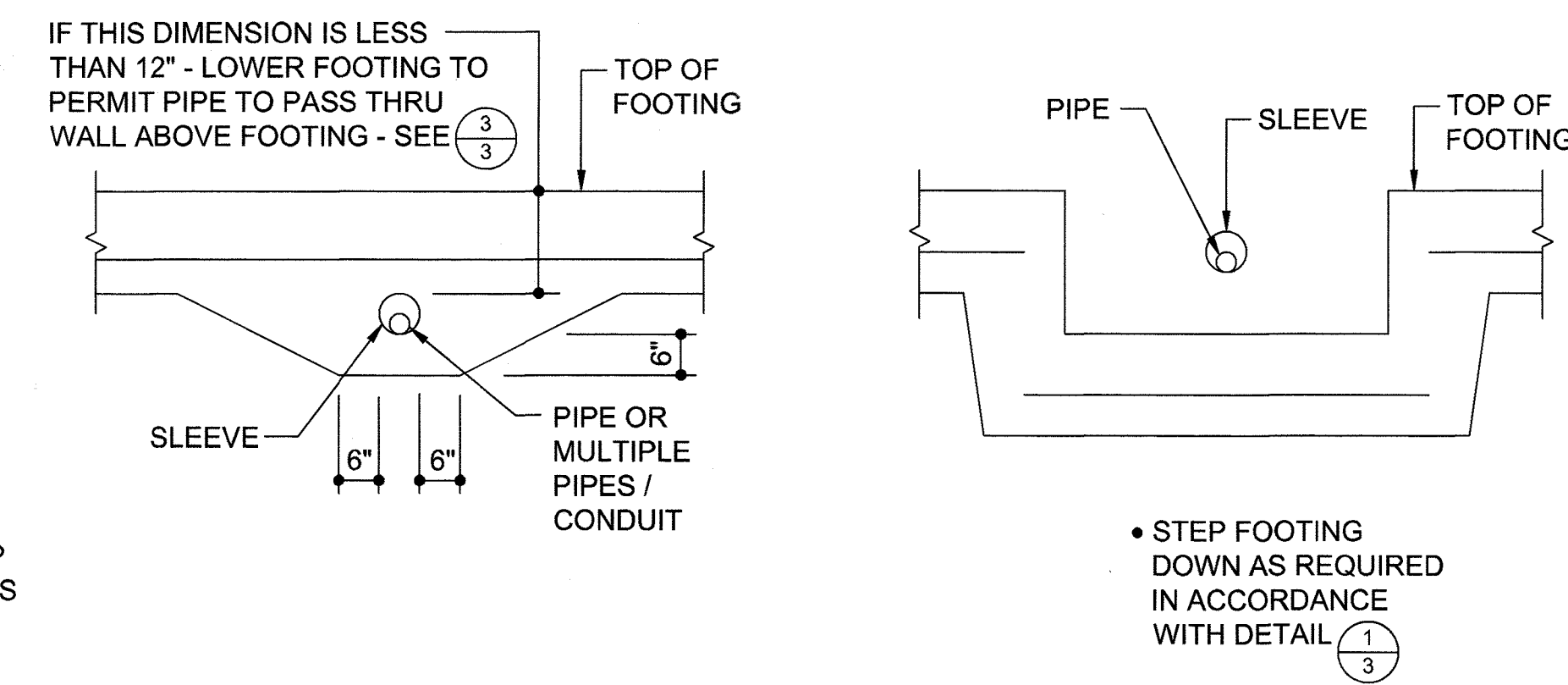
**SNOW LOAD:**  
 GROUND SNOW LOAD Pg = 25 PSF  
 SNOW LOAD IMPORTANCE FACTOR I = 1.0  
 SNOW EXPOSURE FACTOR Ce = 1.0  
 THERMAL FACTOR Ct = 1.2  
 FLAT ROOF SNOW LOAD Pf = 21 PSF

**WIND LOAD:**  
 BASIC WIND SPEED 115 MPH  
 BUILDING CATEGORY II  
 WIND EXPOSURE B

**EARTHQUAKE LOAD:**  
 RISK CATEGORY II  
 IMPORTANCE FACTOR 1.00  
 SITE CLASS D  
 Ss 0.138g  
 S1 0.043g  
 SDS 0.148g  
 SD1 0.069g  
 SEISMIC DESIGN CATEGORY B  
 SEISMIC FORCE RESISTING SYSTEM:  
 ORDINARY REINFORCED CONCRETE SHEAR WALLS  
 Cs (=SDS/(R\*1)) 0.037  
 RESPONSE MODIFICATION FACTOR (R) 4.0  
 EQUIVALENT LATERAL FORCE DESIGN METHOD

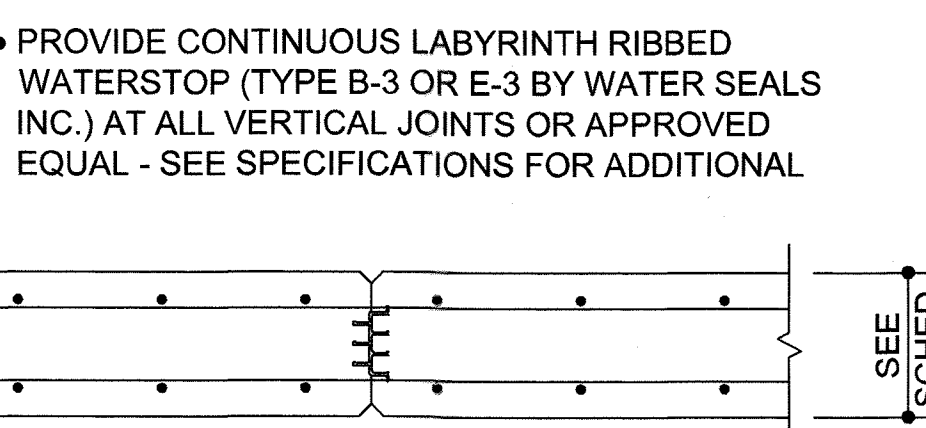


1 TYP. STEPPED FOOTING



2 TYPICAL PIPE THRU FOOTING

3 FOOTING STEPPED DOWN AT PIPE

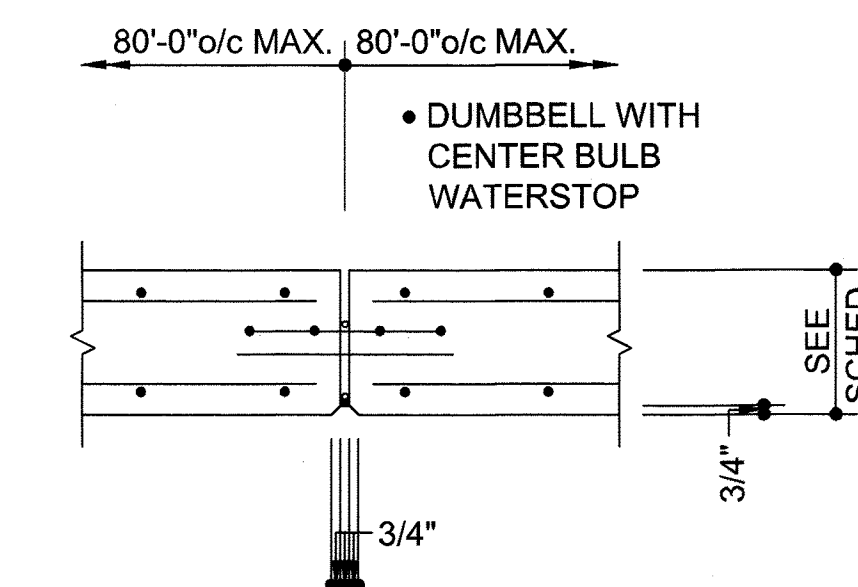


4 CONSTRUCTION JOINT IN CONCRETE WALLS

• PROVIDE CONTINUOUS LABYRINTH RIBBED WATERSTOP (TYPE B-3 OR E-3 BY WATER SEALS INC.) AT ALL VERTICAL JOINTS OR APPROVED EQUAL - SEE SPECIFICATIONS FOR ADDITIONAL

• 1"Ø x 1'-6" SMOOTH DOWEL AT 12"Ø GREASED AND WRAPPED FOR 60% OF ITS LENGTH

• SEE ARCHITECTURAL DRAWINGS FOR LOCATION AND EXTENT OF REVEALS

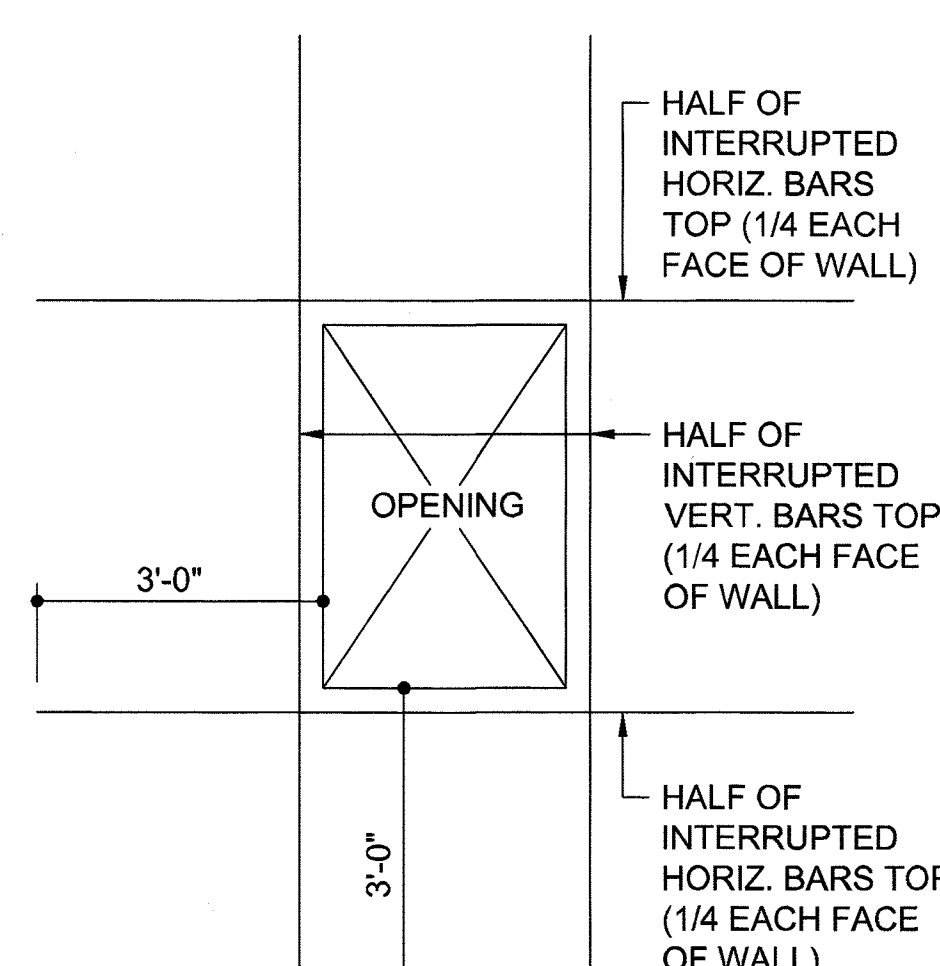


• PROVIDE 2" CLEAR TO VERTICAL REINFORCING (TYPICAL EACH FACE)

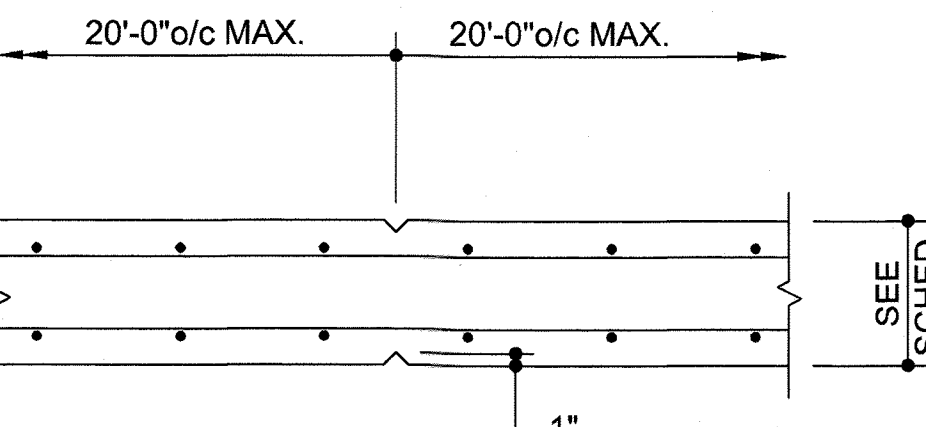
• CLOSED CELL BACKER ROD WITH 3/8" DEEP URETHANE SEALANT

• PROVIDE LABYRINTH WATERSTOP AT BACK OF WALL

• PROVIDE EXPANSION JOINT IN SITE WALLS ONLY - SEE CIVIL DRAWINGS FOR LOCATION OF WALLS

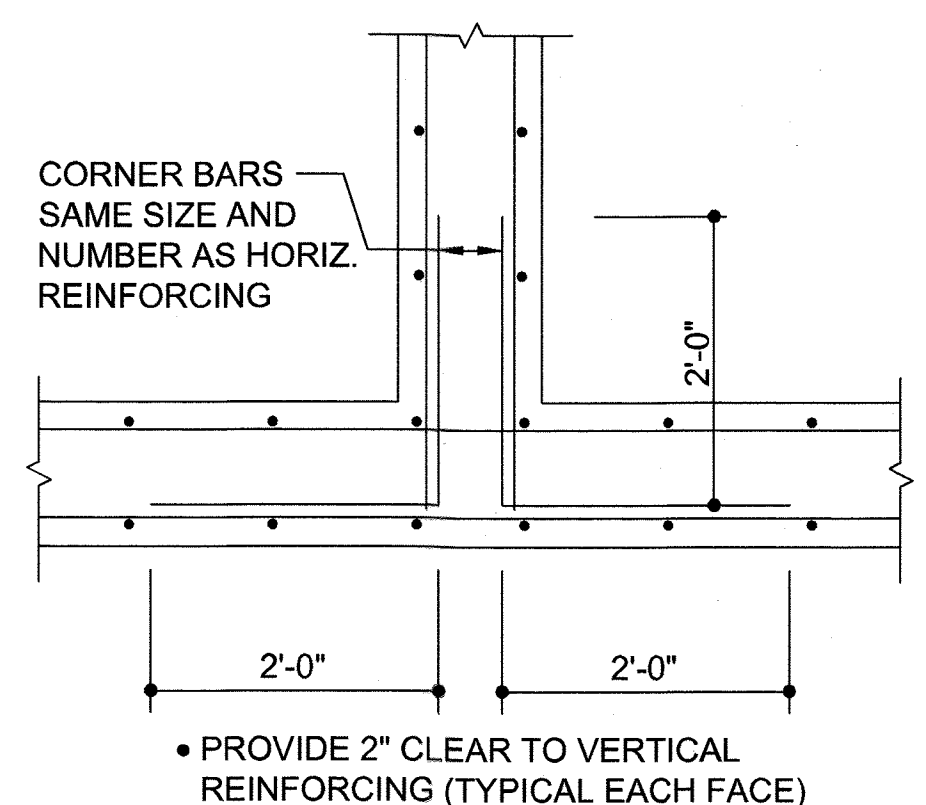


7 TYPICAL OPENING IN CONCRETE WALL



5 CONTROL JOINT IN CONCRETE WALLS

6 VERTICAL EXPANSION JOINT IN CONCRETE WALL



8 TYPICAL CORNER BARS

**OWNER**  
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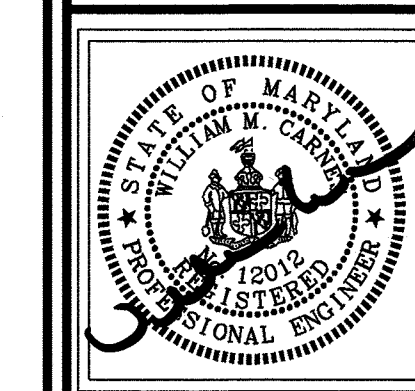
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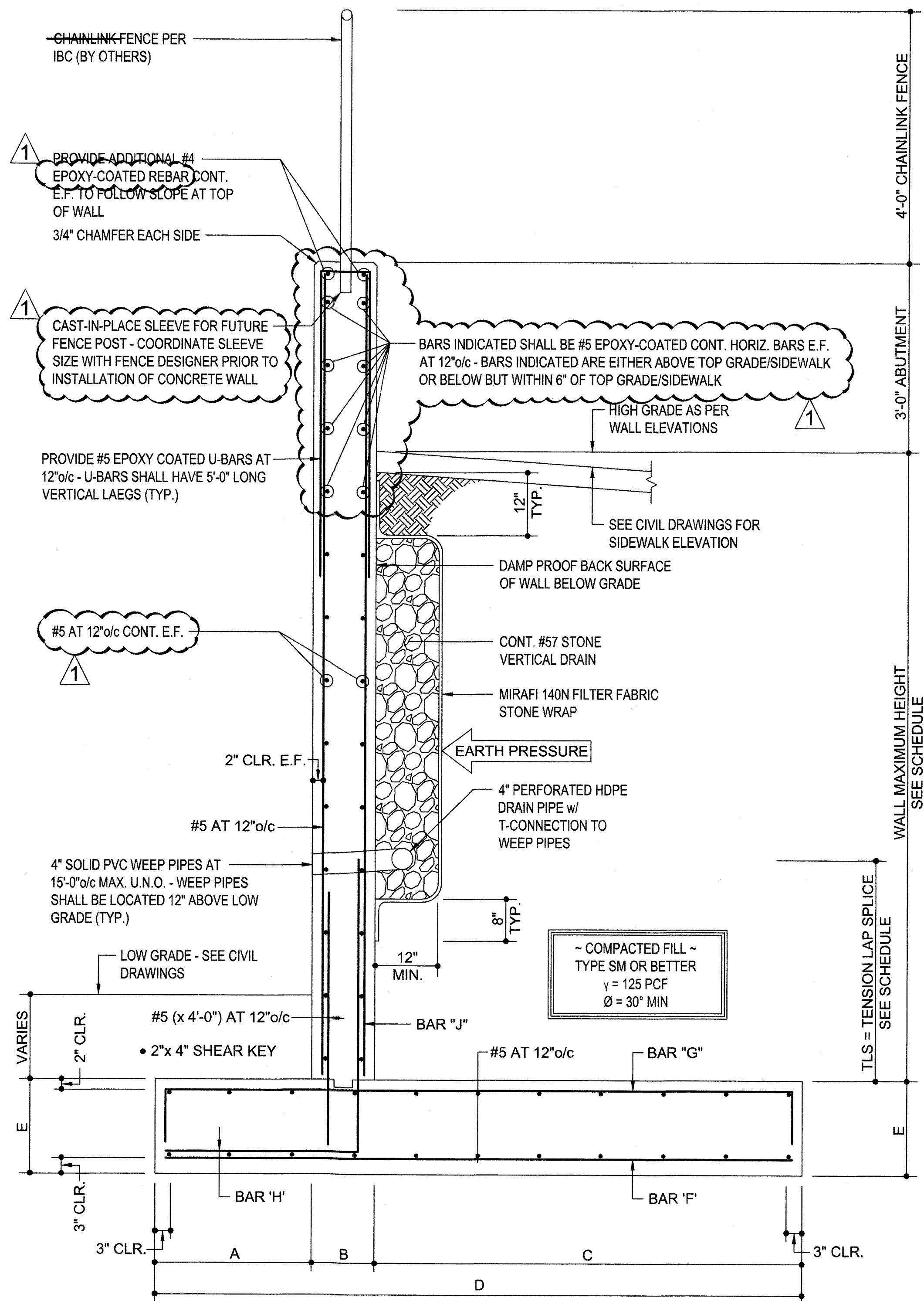
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[Signature] 1/13/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE





- NOTES:**
- ALL CONCRETE FOR RETAINING WALL FOOTINGS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,500 PSI
  - ALL CONCRETE FOR RETAINING WALLS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,500 PSI
  - 3,000 PSF BEARING CAPACITY OF SOIL TO BE CONFIRMED BY GEOTECHNICAL ENGINEER - PLACE FOOTING AGAINST UNDISTURBED GROUND
  - WALL SHALL NOT BE BACKFILLED UNTIL CONCRETE HAS ATTAINED FINAL DESIGN STRENGTH
  - WALL SHALL NOT BE BACKFILLED UNTIL LOW GRADE HAS BEEN COMPLETED AS PER CIVIL ENGINEER'S GRADING PLAN

1 TYPICAL CONCRETE RETAINING WALL

CONCRETE WALL SCHEDULE

WALL TYPE	MAXIMUM WALL HEIGHT	WALL STEM & FOOTING DIMENSION					FOOTING REINFORCING		STEM REINFORCING		
		TOE 'A'	STEM 'B'	HEEL 'C'	WIDTH 'D'	THICK 'E'	BAR 'F'	BAR 'G'	BAR 'H'	TLS	BAR 'J'
A	6'-0"	2'-9"	1'-0"	6'-3"	10'-0"	1'-2"	#5 AT 12"o/c	#5 AT 12"o/c	#5 AT 12"o/c	3'-0"	#5 AT 12"o/c
B	9'-0"	2'-9"	1'-0"	10'-3"	14'-0"	1'-4"	#5 AT 12"o/c	#5 AT 12"o/c	#6 AT 12"o/c	3'-6"	#6 AT 12"o/c
C	12'-0"	2'-9"	1'-0"	13'-3"	17'-0"	1'-8"	#7 AT 12"o/c	#7 AT 12"o/c	#8 AT 10"o/c	4'-6"	#6 AT 10"o/c
D	14'-0"	2'-9"	1'-0"	13'-3"	17'-0"	1'-8"	#7 AT 10"o/c	#7 AT 10"o/c	#8 AT 6"o/c	4'-6"	#6 AT 6"o/c

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/13/2021  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 1/13/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTSVILLE RD.  
 MARRIOTTSVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

1	COUNTY COMMENTS	12/10/21
NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN

**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E

PARCELS: 110 & 421  
 TAX MAP: 16 GRID: 10  
 3RD ELECTION DISTRICT

PLANS: 25742-25754  
 ZONED: CEF-M

L 1389/F. 339 (P. 110)  
 L 4163/F. 424 (P. 421)  
 HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
 ENGINEERING ASSOCIATES

10975 Guilford Road, Suite A Annapolis Junction, Maryland  
 Phone: (410) 880-4788 www.hca.com Fax: (410) 880-4098



DESIGN BY: CRS  
 DRAWN BY: CRS  
 CHECKED BY: JRE  
 DATE: SEPT 2021  
 SCALE: AS SHOWN  
 HCEA NO.: 20441A

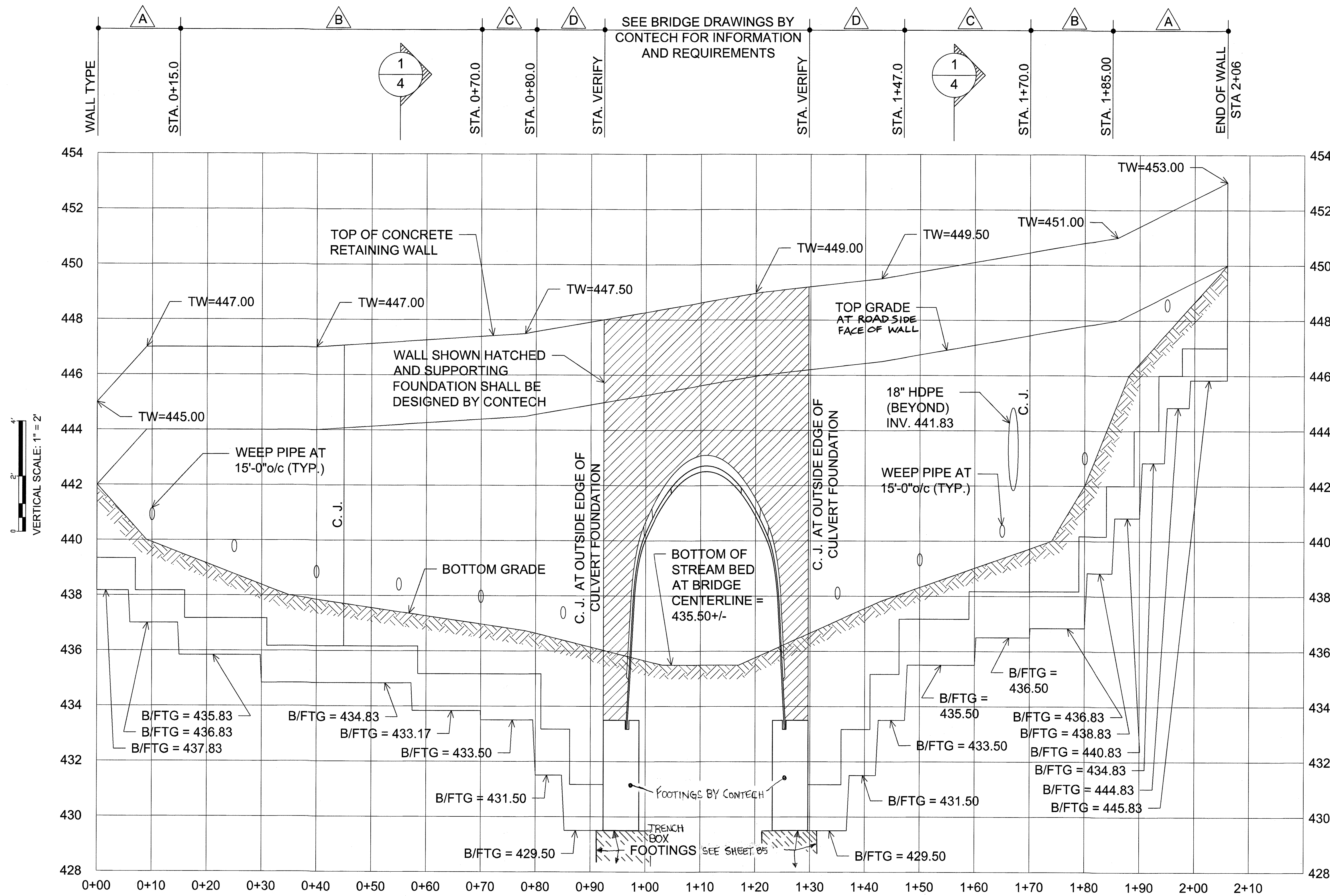
PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 10112, EXPIRATION DATE: 06-16-2022

82 SHEET OF 101

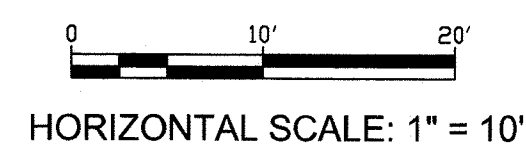


**CULVERT PROTECTION SCOUR NOTES:**

- HILLIS-CARNES ENGINEERING ASSOCIATES, INC. PERFORMED FOUR (4) SOIL BORINGS ON APRIL 27, 2021 AT THE CORNERS OF THE CULVERT FOOTINGS
- SCOUR ANALYSIS PERFORMED BY VOGEL ENGINEERING + TIMMONS GROUP DATED MAY 2021 WAS BASED ON THESE SOIL BORINGS
- THE UPSTREAM BORINGS AT HEADWALL #1 INDICATED REFUSAL AT LESS THAN 10' BORING DEPTH; ONE DOWNSTREAM (ENDWALL #2) BORING INDICATED REFUSAL AT 17.5'; ONE DOWNSTREAM (ENDWALL #2) BORING SHOWED NO REFUSAL TO A TERMINATED DEPTH OF 25'
- BASED ON THESE BORINGS, VOGEL ENGINEERING + TIMMONS GROUP REQUIRED THAT THE FOUNDATIONS EXTEND DOWN TO A DEPTH OF 17' OR TO A DEPTH WHERE ROCK IS ENCOUNTERED
- THE ACTUAL ROCK ELEVATIONS ALONG THE CULVERT FOOTINGS VARIES ALONG THE CULVERT FOOTING LENGTHS AND IS UNKNOWN
- ACCORDINGLY, REFER TO SCOUR PROTECTION DETAIL ON SHEET 7 FOR INFORMATION AND REQUIREMENTS
- AT LOCATIONS WHERE ROCK IS NOT PRESENT TO A DEPTH OF 17':
  - PROVIDE 10' MINIMUM WIDTH TRENCH BOX WITH BOTTOM ELEVATION BELOW SCOUR DEPTH AND FILLED COMPLETELY SOLID WITH UNREINFORCED LEAN CONCRETE ( $f_c = 3,000$  PSI MINIMUM) ALONG ENTIRE LENGTH OF CULVERT FOOTING
- AT LOCATIONS WHERE ROCK IS DISCOVERED WITHIN 17' OF STREAM BED MINIMUM ELEVATION:
  - REMOVE ROCK AS REQUIRED TO PROVIDE A LEVEL BEARING SURFACE FOR A 10' MINIMUM WIDTH TRENCH BOX WITH BOTTOM ELEVATION RESTING ON SOLID BEDROCK AND FILL COMPLETELY SOLID WITH UNREINFORCED LEAN CONCRETE ( $f_c = 3,000$  PSI MINIMUM) ALONG ENTIRE LENGTH OF CULVERT FOOTING
- REFER TO WALL ELEVATIONS ON SHEETS 5 AND 6 FOR CULVERT FOOTING BEARING ELEVATIONS
- COORDINATE CULVERT FOUNDATION, UPSTREAM AND DOWNSTREAM HEADWALLS, AND ALL CULVERT REINFORCING WITH CBC ENGINEERS DRAWINGS DATED 5/7/21



**WALL STATION**  
1" = 10'  
**HEADWALL #1 ELEVATION**



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 1/13/22  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SOCOPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN

**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PARCELS: 110 & 421 PLATS: 25942-25954  
 TAX MAP: 16 GRID: 10 L. 1389/F. 339 (P. 110)  
 3RD ELECTION DISTRICT ZONED: CEF-M L. 4163/F. 424 (P. 421)  
 HOWARD COUNTY, MARYLAND

**HILLIS-CARNES ENGINEERING ASSOCIATES**  
 10875 Guilford Road, Suite A Annapolis Junction, Maryland  
 Phone: (410) 880-4788 www.hcea.com Fax: (410) 880-4088

DESIGN BY: CRS  
 DRAWN BY: CRS  
 CHECKED BY: JRE  
 DATE: SEPT 2021  
 SCALE: AS SHOWN  
 HCEA NO.: 20441A

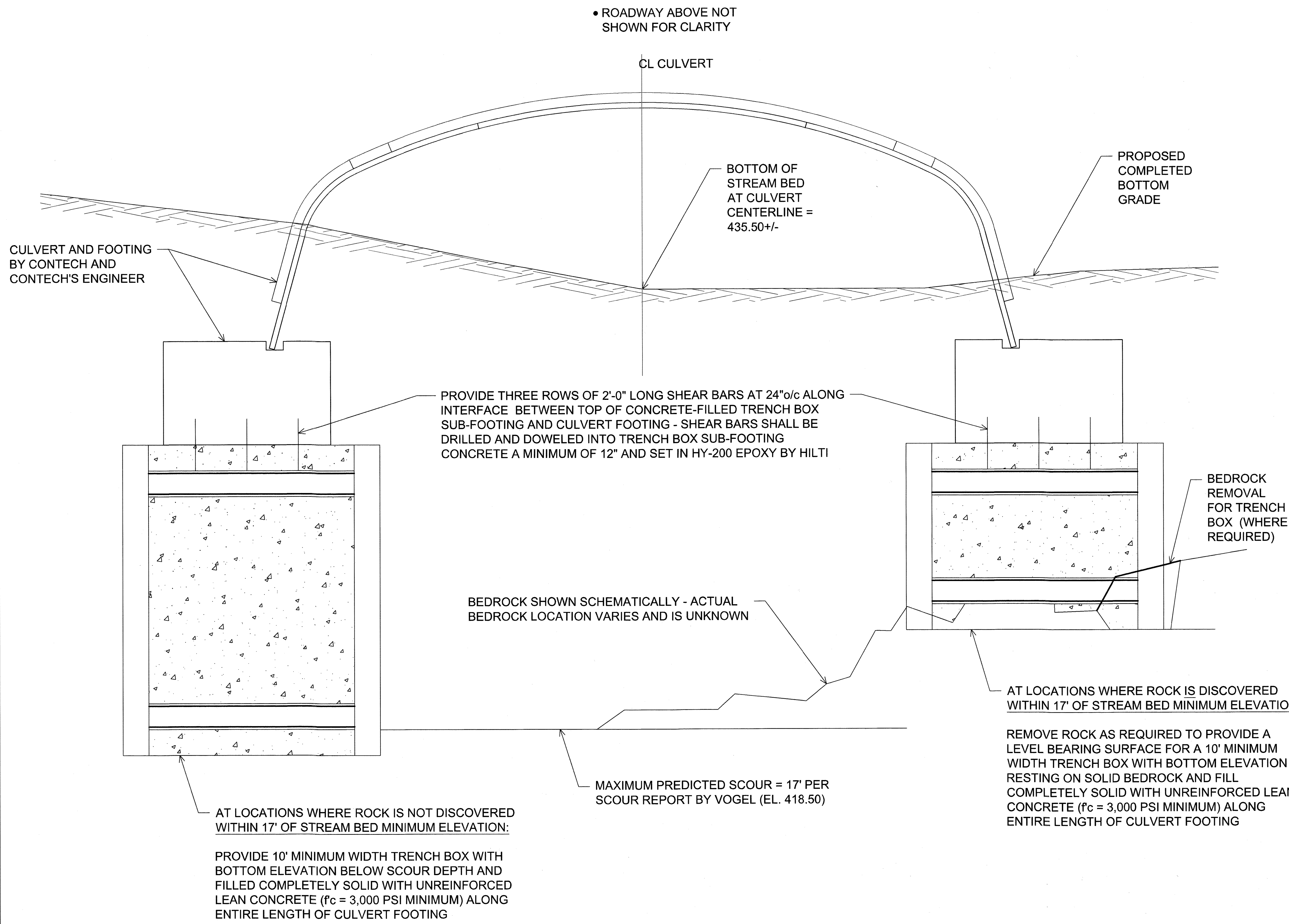
PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12012 EXPIRATION DATE: 06-18-2022

**83** SHEET OF **101**









- CULVERT PROTECTION SCOUR NOTES:**
- HILLIS-CARNES ENGINEERING ASSOCIATES, INC. PERFORMED FOUR (4) SOIL BORINGS ON APRIL 27, 2021 AT THE CORNERS OF THE CULVERT FOOTINGS
  - SCOUR ANALYSIS PERFORMED BY VOGEL ENGINEERING + TIMMONS GROUP DATED MAY 2021 WAS BASED ON THESE SOIL BORINGS
  - THE UPSTREAM BORINGS AT HEADWALL #1 INDICATED REFUSAL AT LESS THAN 10' BORING DEPTH; ONE DOWNSTREAM (ENDWALL #2) BORING INDICATED REFUSAL AT 17.5'; ONE DOWNSTREAM (ENDWALL #2) BORING SHOWED NO REFUSAL TO A TERMINATED DEPTH OF 25'
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  - REFER TO WALL ELEVATIONS ON SHEETS 5 AND 6 FOR CULVERT FOOTING BEARING ELEVATIONS
  - COORDINATE CULVERT FOUNDATION, UPSTREAM AND DOWNSTREAM HEADWALLS, AND ALL CULVERT REINFORCING WITH CBC ENGINEERS DRAWINGS DATED 5/7/21

**OWNER**  
 CHAPELGATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN

**CHAPELGATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E

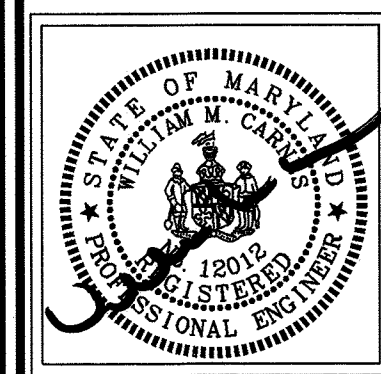
A RESUBDIVISION OF "CHAPELGATE" - NON-BUILDABLE BULK PARCEL E  
 PLATS 25992-25994

PARCELS: 110 & 421  
 TAX MAP: 16 GRID: 10  
 3RD ELECTION DISTRICT

L: 1389/F: 339 (P. 110)  
 L: 4163/F: 424 (P. 421)  
 HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
 ENGINEERING ASSOCIATES

10975 Guilford Road, Suite A Annapolis Junction, Maryland  
 Phone: (410) 880-4788 www.hilliscarnes.com Fax: (410) 880-4088



PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 12017, EXPIRATION DATE: 06-16-2022.

DESIGN BY: CRS  
 DRAWN BY: CRS  
 CHECKED BY: JRE  
 DATE: SEPT 2021  
 SCALE: AS SHOWN  
 HCEA NO.: 20441A

85 SHEET OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

*[Signature]*  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 12/07/2021

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 12-23-21

*[Signature]*  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 1/13/22



**IMPORTANT:**  
ASSEMBLY INSTRUCTIONS WILL BE SHIPPED WITH THE STRUCTURE. THEY ARE LOCATED IN THE BRIGHTLY COLORED BOLT KEG.

**NOTES:**

- INVERT END OF HAUNCH PLATES PAINTED RED.
- WHEN A FULL CORRUGATED INVERT IS USED, SCALLOPED CLOSURE PLATES ARE TO BE CLIPPED TO THE OUTSIDE OF THE RECEIVING CHANNEL TO MINIMIZE BACKFILL INFILTRATION IN THE VALLEYS OF THE CORRUGATED INVERT PLATE BELOW THE RECEIVING CHANNEL.  
NOTE: THIS DOES NOT MAKE A JOINT TIGHT ENOUGH TO PREVENT INFILTRATION OF FINE SILTS OR SANDS. THE USE OF A GEOTEXTILE PREVENTS THE INFILTRATION OF THE BACKFILL THROUGH THE UNFILLED BOLT HOLES AND THE SPACE BETWEEN THE INVERT PLATE AND THE SCALLOP PLATE. A ROLL OF GEOTEXTILE IS PROVIDED FOR THIS PURPOSE. WHEN SHORT FOOTING PADS ARE USED, THE SCALLOPED CLOSURE PLATES ARE NOT PROVIDED UNLESS ORDERED AS AN EXTRA, SINCE IT IS ANTICIPATED THESE FOOTING PLATES WILL BE BURIED.
- INVERT END OF HAUNCH RIBS PAINTED RED.

**GENERAL NOTES:**

- CONFIRMATION OF COVER - THIS STRUCTURE IS WITHIN THE MINIMUM AND MAXIMUM ALLOWABLE HEIGHT OF COVER, FOR THE DESIGNATED LOADING, AS FOLLOWS:

LOADING: HL-93  
MINIMUM COVER (FT): 2.00  
MAXIMUM COVER (FT): 3.75

- FOR PROPER BOLT SIZE USAGE, REFER TO THE FOLLOWING:

**PLATE ONLY**

	1 PLATE	2 PLATE	3 PLATE
0.100" - 0.125" THK. PLATE		1 1/4"	1 1/4"
0.150" - 0.175" THK. PLATE		1 1/4"	1 1/2"
0.200" - 0.250" THK. PLATE		1 1/2"	2"

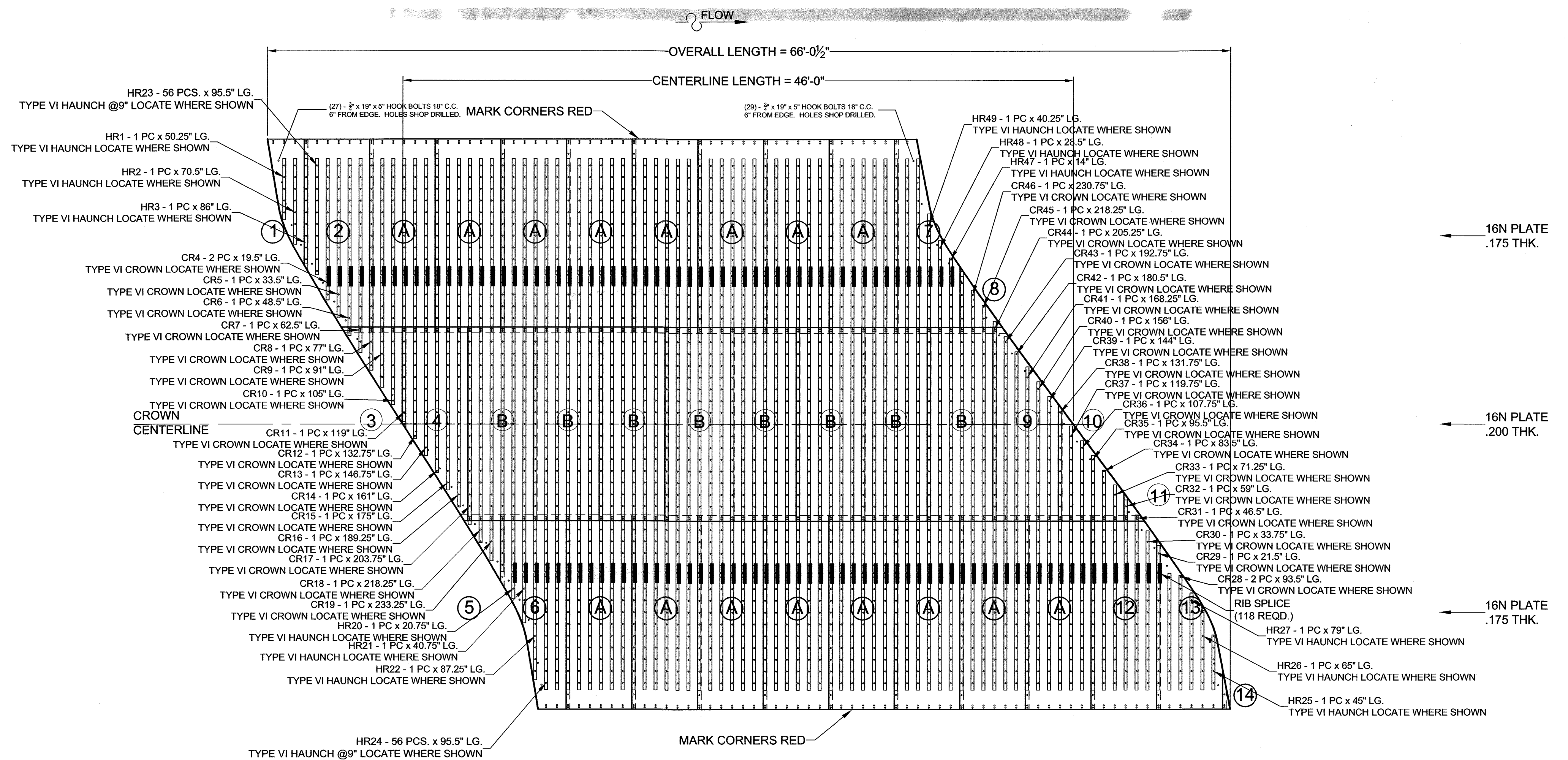
**PLATE W/ T2 OR T4 REINFORCING RIB OR RECEIVING CHANNEL**

	1 PLATE	2 PLATE	3 PLATE
0.100" - 0.125" THK. PLATE	1 1/4"	1 1/2"	1 1/2"
0.150" - 0.175" THK. PLATE	1 1/4"	1-1/2"	2"
0.200" - 0.225" THK. PLATE	1 1/2"	2"	2"
0.250" THK. PLATE	1 1/2"	2"	2"

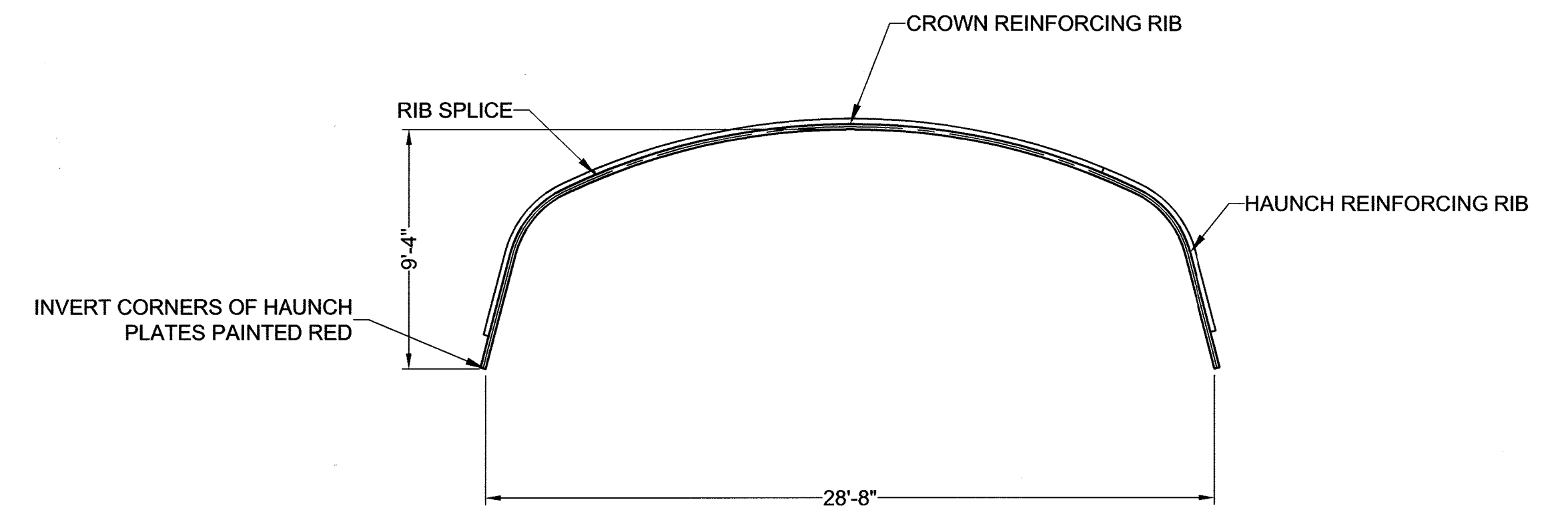
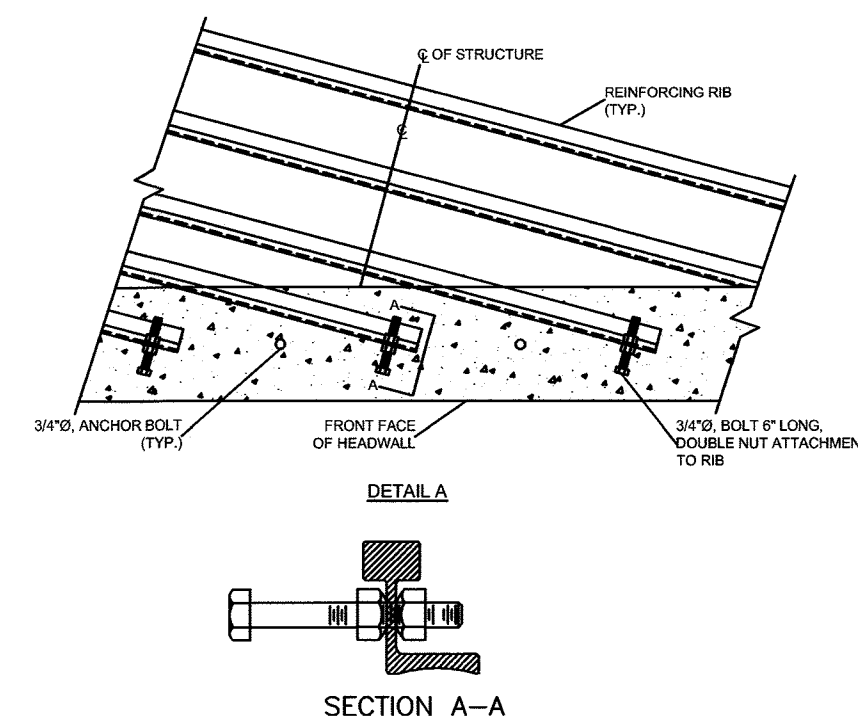
**PLATE W/ T6 REINFORCING RIB**

	1 PLATE	2 PLATE	3 PLATE
0.100" - 0.125" THK. PLATE	1 1/2"	2"	2"
0.150" - 0.175" THK. PLATE	2"	2"	2"
0.200" - 0.225" THK. PLATE	2"	2"	2 1/2"
0.250" THK. PLATE	2"	2"	2 1/2"

- NUTS MAY BE LOCATED ON STRUCTURE'S INTERIOR OR EXTERIOR TO ALLOW CONVENTIONAL ACCESS DURING ASSEMBLY AND TORQUING. ONLY ONE SIDE OF NUT HAS A CURVED SURFACE AND IT SHOULD BE IN DIRECT CONTACT WITH PLATE VALLEY.
- ALL PLATE LAPS AND REINFORCING RIBS MUST BE PROPERLY MATED IN A TANGENT FASHION USING PROPER ALIGNMENT TECHNIQUES AND HELD IN ALIGNMENT BY FASTENERS (FINGER TIGHTENED ONLY). BEFORE BACKFILLING COMMENCES, ALL FASTENERS MUST BE TORQUED FOR ADEQUATE COMPONENT CONTACT. GOOD COMPONENT FIT IS BETTER THAN HIGH TORQUE.
- FASTENER TORQUE REQUIREMENTS: TORQUE AT 100-150 FOOT-POUNDS. TORQUE LEVELS ARE FOR INSTALLATION, NOT RESIDUAL, IN-SERVICE REQUIREMENTS. SINCE TORQUEING MAY LOOSEN PREVIOUSLY TIGHTENED FASTENERS, MULTIPLE PASSES MAY BE NECESSARY. WHEN SEAM SEALANT TAPE IS USED, FASTENERS SHOULD BE TORQUED AGAIN AFTER 24 HOURS.
- ALL ALUMINUM STRUCTURAL PLATE MATERIAL IS MANUFACTURED IN ACCORDANCE WITH AASHTO M219, ASTM B746 AND ASTM B864 SPECIFICATIONS. SEE ASSEMBLY INSTRUCTIONS SHIPPED WITH MATERIAL IN FASTENER CONTAINER. ALSO REFER TO SPECIFIC PRODUCT CATALOG FOR ADDITIONAL PRODUCT INFORMATION.
- THE ASSEMBLY BOLTS AND NUTS ARE SPECIALLY DESIGNED WITH ROUNDED OR SPHERICAL THROATS FOR FITTING EITHER THE CREST OR VALLEY OF THE CORRUGATIONS, PROVIDING MAXIMUM BEARING CONTACT AREA WITH THE PLATES WITHOUT THE USE OF WASHERS. NOTE THAT THE BOLTS AND NUTS SHOULD BE INSTALLED SUCH THAT THE ROUNDED PORTION IS IN CONTACT WITH THE PLATES.



**ALBC - DEVELOPED PLAN (OUTSIDE VIEW)**  
**28'-8" SPAN x 9'-4" RISE**



**ALBC - END VIEW**

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION f DATE

CHIEF, DIVISION OF LAND DEVELOPMENT [Signature] 1/3/22 DATE

PROFESSIONAL CERTIFICATION:  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 40240, EXPIRATION DATE: 5/13/23

[Signature] Mitchell Hahst

Rev.	Date	By	Description
1	7/1/21	JBE	REV. 1
2	9/13/21	JBE	REV. 2

Approved By: MTH Date: SEPT., 2021  
 Project No.: CBC-24067 Rev.: 2

**CBC Engineers**

1 5/6/2021 CHANGED TO A 93R3 BOX. BTS  
 REVISION DESCRIPTION BY

**CONTECH**  
 ENGINEERED SOLUTIONS LLC  
 www.ContechES.com  
 700 Tech Drive, Winchester, KY 40391  
 859-744-3339 859-744-9665 FAX

FOR APPROVAL  
**CONTECH**  
 STRUCTURAL PLATE  
 CONTECH CONTRACT DRAWING

CHAPELGATE WOODS  
 PLAT 25942-25954  
 HOWARD COUNTY, MARYLAND

TYPE: BOX	INLET	OUTLET
SIZE: 93R3	32.8	36.7
SPAN: 28'-8"	0	0
RISE: 9'-4"		
LENGTH @ 4'-0"		

PLATE THICKNESS: .175(H)/.200(C)  
 REINFORCING RIB SPACING: AS SHOWN  
 REINFORCING RIB TYPE: AS SHOWN  
 NUMBER OF STRUCTURES: 1

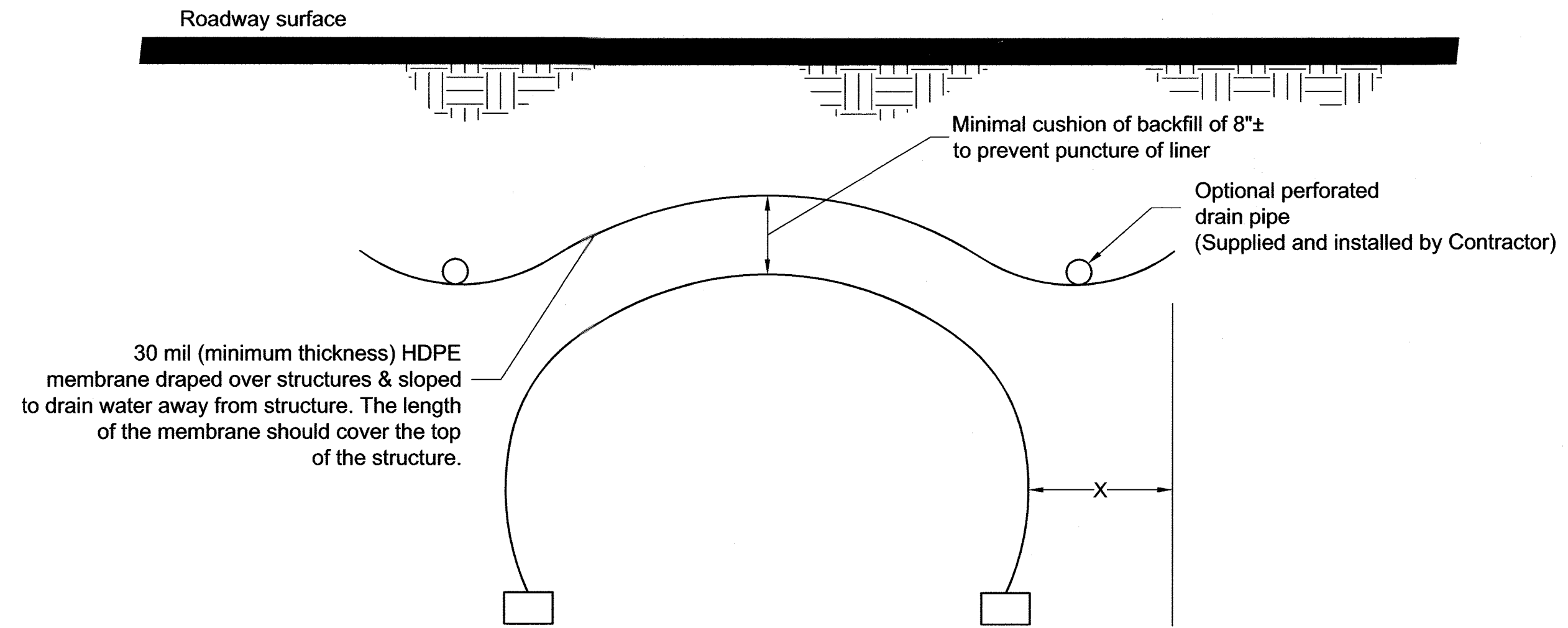
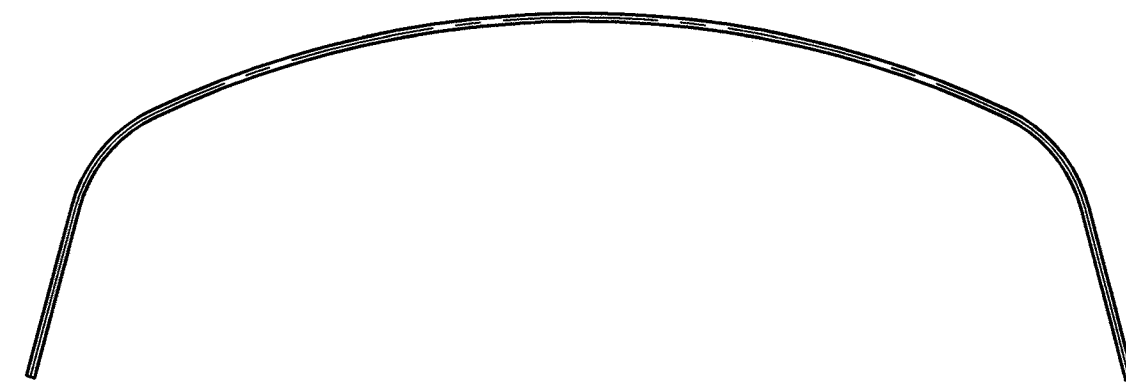
**OWNER**  
 CHAPELGATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

PROJECT NO.	SEQ. NO.	DATE
627869	010	SEPT., 2021
DESIGNED:	DRAWN:	
CHECKED:	APPROVED:	
SHEET NO.:	86 of 101	

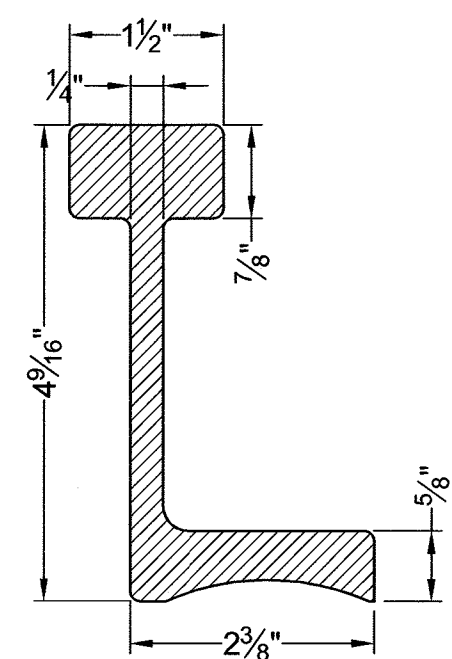


**ALBC - INLET AND OUTLET EXPANDED END VIEW**

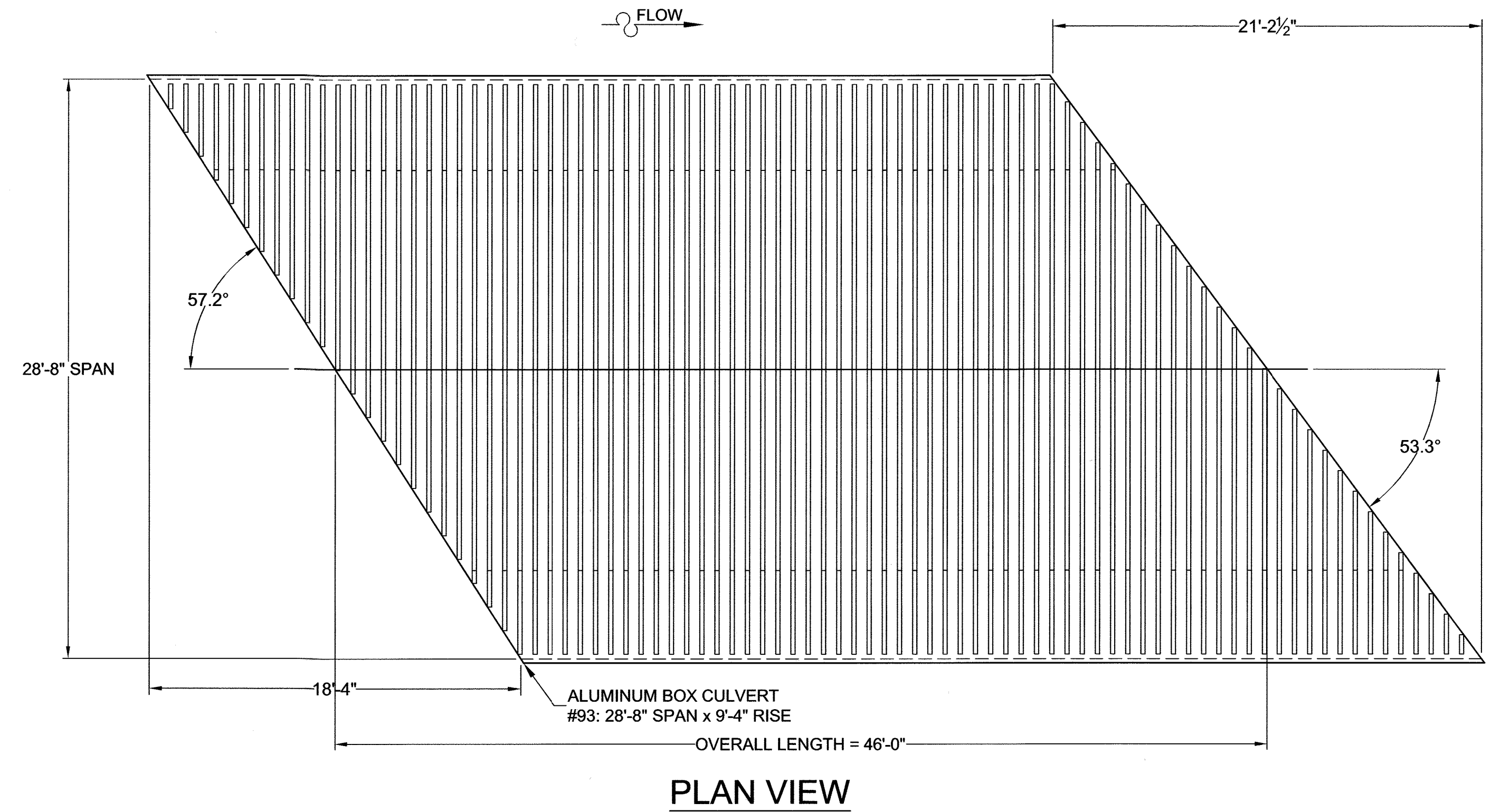


**HDPE Membrane Protection from De-Icing Salts**

X = The extents of the HDPE Membrane is the select backfill width plus 2 feet on each side.



TYPE VI RIB (CONTECH) TYPE 3 RIB (ASTM)  
 ALLOY 6061-T6  
 YIELD STRENGTH 35 KSI [241.3 MPa]  
 TENSILE STRENGTH 38 KSI [262.0 MPa]  
 AREA 3.62 IN.<sup>2</sup> [2335 mm<sup>2</sup>]  
 CENTER OF MASS Y Yc = 2.27 IN. [57.6mm]  
 SECTION MODULUS 4.38 IN.<sup>3</sup> [71.775mm<sup>3</sup>]  
 PLASTIC MODULUS 5.66 IN.<sup>3</sup> [92.750mm<sup>3</sup>]  
 PLASTIC MOMENT Mp = 16.52 [22.41 KN-M]



**PLAN VIEW**

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MKC DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION & DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT [Signature] 1/13/22 DATE

PROFESSIONAL CERTIFICATION:  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 40240, EXPIRATION DATE: 5/13/23.



Approved By	Date	Rev.	Date	By	Description
MTH	SEPT., 2021	1	7/1/21	JBE	REV. 1
		2	9/13/21	JBE	REV. 2

MARK	DATE	REVISION DESCRIPTION	BY
1	5/6/2021	CHANGED TO A 93R3 BOX.	BTS

**CONTECH**  
 ENGINEERED SOLUTIONS LLC  
 www.ContechES.com  
 700 Tech Drive, Winchester, KY 40391  
 859-744-3339 859-744-9665 FAX

FOR APPROVAL  
**CONTECH**  
 STRUCTURAL PLATE  
 CONTECH CONTRACT DRAWING

CHAPEL GATE WOODS  
 PLAT 25942-25954  
 HOWARD COUNTY, MARYLAND

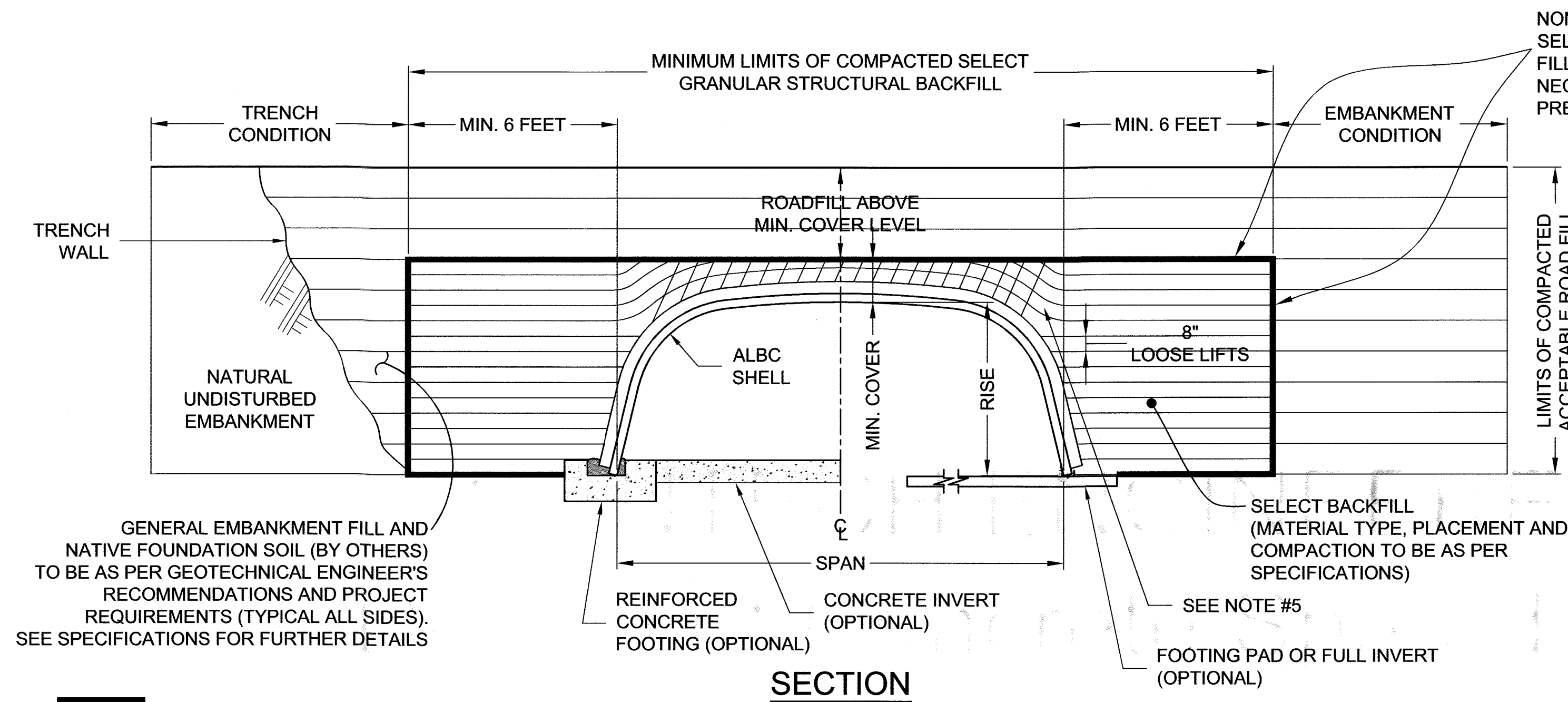
TYPE: BOX	INLET	OUTLET	PLATE THICKNESS: .175(H)/.200(C)
SIZE: 93R3			REINFORCING RIB SPACING: AS SHOWN
SPAN: 28'-8"	SKEW 32.8	36.7	REINFORCING RIB TYPE: AS SHOWN
RISE: 9'-4"	BEVEL 0	0	NUMBER OF STRUCTURES: 1
LENGTH @ t: 46'-0"			

**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
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 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

PROJECT NO.	SEC. NO.	DATE
627860	010	SEPT., 2021
DESIGNED:	DRAWN:	
BTS	BTS	
CHECKED:	APPROVED:	
SHEET NO.:	87 OF 101	





GENERAL EMBANKMENT FILL AND NATIVE FOUNDATION SOIL (BY OTHERS) TO BE AS PER GEOTECHNICAL ENGINEER'S RECOMMENDATIONS AND PROJECT REQUIREMENTS (TYPICAL ALL SIDES). SEE SPECIFICATIONS FOR FURTHER DETAILS

- SELECT GRANULAR STRUCTURAL BACKFILL LIMITS.
- INITIAL LIFTS OVER THE CROWN OF STRUCTURE AS INDICATED BY SHADED AREA TO BE COMPACTED TO REQUIRED DENSITY WITH HAND OPERATED EQUIPMENT OR WITH LIGHTWEIGHT (D-4 OR LIGHTER) EQUIPMENT.

**NOTES:**

- ALL SELECT GRANULAR BACKFILL TO BE PLACED IN A BALANCED FASHION IN THIN LIFTS (8" LOOSE TYPICALLY) AND COMPACTED TO 95% PERCENT DENSITY PER AASHTO T-180.
- COMPLETE AND REGULAR MONITORING OF THE ALUMINUM BOX CULVERT SHAPE IS NECESSARY DURING ALL BACKFILLING OF THE STRUCTURE.
- PREVENT DISTORTION OF SHAPE AS NECESSARY BY VARYING COMPACTION METHODS AND EQUIPMENT.
- TRENCH WIDTH OTHER THAN 6 FEET SHALL BE BY DIRECTION OF THE ENGINEER OF RECORD.
- SWITCH TO PLACING SELECT GRANULAR BACKFILL IN RADIAL LIFTS NEAR THE MIDDLE OF THE HAUNCH CURVE.

**SECTION**

**ADDITIONAL SELECT GRANULAR STRUCTURAL BACKFILL NOTES:**

SATISFACTORY BACKFILL MATERIAL, PROPER PLACEMENT, AND COMPACTION ARE KEY FACTORS IN OBTAINING MAXIMUM STRENGTH AND STABILITY.

THE BACKFILL MATERIAL SHOULD BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATERIAL THAT COULD CAUSE HARD SPOTS OR DECOMPOSE TO CREATE VOIDS. BACKFILL MATERIAL SHOULD BE WELL GRADED GRANULAR MATERIAL THAT MEETS THE REQUIREMENTS OF AASHTO M-145 FOR SOIL CLASSIFICATIONS A-1, A-2-4 OR A-2-5. SEE THE STRUCTURAL PLATE BACKFILL GROUP CLASSIFICATION TABLE ON THIS SHEET. BACKFILL MUST BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN 8" LOOSE LIFTS. EACH LIFT IS TO BE COMPACTED TO A MINIMUM OF 95% DENSITY PER AASHTO T-180.

A HIGH PERCENTAGE OF SILT OR FINE SAND IN THE NATIVE SOILS SUGGESTS THE NEED FOR A WELL GRADED GRANULAR BACKFILL MATERIAL TO PREVENT SOIL MIGRATION. IF THE PROPOSED BACKFILL IS NOT A WELL GRADED GRANULAR MATERIAL, A NON-WOVEN GEOTEXTILE FILTER FABRIC SHALL BE PLACED BETWEEN THE SELECT BACKFILL AND THE IN SITU SOIL.

DURING BACKFILL, ONLY LIGHTWEIGHT TRACKED VEHICLES (D-4 OR LIGHTER) SHOULD BE NEAR THE STRUCTURE AS FILL PROGRESSES ABOVE THE CROWN AND TO THE FINISHED GRADE. THE ENGINEER AND CONTRACTOR ARE CAUTIONED THAT THE MINIMUM COVER MAY NEED TO BE INCREASED TO HANDLE TEMPORARY CONSTRUCTION VEHICLE LOADS (HEAVIER THAN D-4).

STRUCTURAL PLATE BACKFILL GROUP CLASSIFICATION, REFERENCE AASHTO M-145				
GROUP CLASSIFICATION	A-1-a	A-1-b	A-2-4	A-2-5
Sieve Analysis Percent Passing				
No. 10 (2,000 mm)	50 max.	---	---	---
No. 40 (0.425 mm)	30 max.	50 max.	---	---
No. 200 (0.075 mm)	15 max.	25 max.	35 max.	35 max.
Atterberg Limits for Fraction Passing No. 40 (0.425 mm)				
Liquid Limits	---	---	40 max.	41 min.
Plasticity Index	6 max.	6 max.	10 max.	10 max.
Usual Materials	Stone Fragment, Gravel and Sand		Silty or Clayey Gravel and Sand	

Reference the most current version of ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), for comparable soil groups.

NON-WOVEN FILTER FABRIC TO BE PLACED BETWEEN THE SELECT BACKFILL AND ADJACENT EMBANKMENT FILL/NATIVE FOUNDATION SOIL AS DETERMINED NECESSARY BY PROJECT GEOTECHNICAL ENGINEER TO PREVENT SOIL MIGRATION (TYPICAL ALL SIDES).

**1.0 STANDARDS AND DEFINITIONS**

- STANDARDS - All standards refer to the current ASTM / AASHTO edition unless otherwise noted.
  - ASTM B-864 "Standard Specification for Corrugated Aluminum Box Culverts" (AASHTO Designation M-219).
  - AASHTO Standard Specification for Highway Bridges - Section 12 Division I - Design, AASHTO LRFD Bridge Design Specifications Section 12.
  - AASHTO Standard Specification for Highway Bridges - Section 26 Division II - Construction, AASHTO LRFD Bridge Construction Specifications - Section 26. ASTM B789, Standard Practice for Installing Corrugated Aluminum Structural Plate Pipe.
- DEFINITIONS
  - Engineer - In these specifications the word "Engineer" shall mean the Engineer of Record or Owner's designated engineering representative.
  - Manufacturer - In these specifications the word "Manufacturer" shall mean CONTECH ENGINEERED SOLUTIONS.
  - Contractor - In these specifications the word "Contractor" shall mean the firm or corporation undertaking the execution of any installation work under the terms of these specifications.

**2.0 GENERAL CONDITIONS**

- Any installation guidance provided herein shall be endorsed by the engineer, discrepancies herein are governed by the Engineer's plans and specifications.
- The Contractor shall furnish all labor, material and equipment and perform all work and services except those set out and furnished by the Owner, necessary to complete in a satisfactory manner the site preparation, excavation, filling, compaction, grading as shown on the plans and as described therein. This work shall consist of all mobilization clearing and grading, grubbing, stripping, removal of existing material unless otherwise stated, preparation of the land to be filled, filling of the land, spreading and compaction of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades, slopes, and specifications. This work is to be accomplished under the observation of the Owner or his designated representative.
- Prior to bidding the work, the Contractor shall examine, investigate and inspect the construction site as to the nature and location of the work, and the general and local conditions at the construction site, including without limitation, the character of surface or subsurface conditions and obstacles to be encountered on and around the construction site and shall make such additional investigation as he may deem necessary for the planning and proper execution of the work.
- If conditions other than those indicated are discovered by the Contractor, the Owner shall be notified immediately. The material which the Contractor believes to be a changed condition shall not be disturbed so that the owner can investigate the condition.
- The construction shall be performed under the direction of the Engineer.
- All aspects of the structure design and site layout including foundations, backfill, and treatments and necessary scour consideration shall be performed by the Engineer.

**3.0 ASSEMBLY AND INSTALLATION**

- Bolts and nuts shall conform to the requirements of ASTM A-307 and/or ASTM A-449. The box culvert shall be assembled in accordance with the plate layout drawings provided by the manufacturer and per the manufacturer's recommendations.
 

Bolts shall be tightened using an applied torque of between 100 and 150 ft.-lbs.
- The box culvert shall be installed in accordance with the plans and specifications, the manufacturer's recommendations, and AASHTO Standard Specification for Highway Bridges - Section 26 Division II - Construction/AASHTO LRFD Bridge Construction Specifications - Section 26.
- Trench excavation shall be made in embankment material that is structurally adequate. The trench width shall be shown on the plans. Poor quality in situ embankment material must be removed and replaced with suitable backfill as directed by the Engineer.

- Aluminum Box Culvert designs require a minimum allowable soil-bearing pressure of 4,000 psf. Lower bearing capacities may be accommodated with a site specific design for an aluminum foundation or a concrete footing.
 

If the engineer determines the natural foundation is inadequate to support the structure's backfill, the poor material shall be excavated, removed and replaced to a suitable depth with competent material. The specific depth of excavation required may be reduced by utilizing a geosynthetic reinforced foundation as designed by a qualified geotechnical engineer. For additional information contact your local Contech representative.
- When a metal foundation is used, the soil bedding requires a minimum of 6 inches of loose granular material with a maximum particle size of one half the corrugation depth. The proper width of the bedding material required shall conform to the project plans and specifications.
 

Bedding preparation is critical to both structure performance and service life. The bedding should be constructed to uniform line and grade to avoid distortions that may create undesirable stresses in the structure and/or rapid deterioration of the roadway. The bed should be free of rock formations, protruding stones, frozen lumps, roots, and other foreign matter that may cause unequal settlement.
- The structure shall be assembled in accordance with the Manufacturer's instructions. All plates shall be unloaded and handled with reasonable care. Plates shall not be rolled or dragged over gravel rock and shall be prevented from striking rock or other hard objects during placement in trench or on bedding.
 

When installed on a full invert or on flexible footing pads, assembly of the invert or footing pads shall start at the downstream end. Circumferential seam laps shall single over the top of the downstream plates as assembly progresses upstream. Whether the box culvert is installed on a concrete footing, full metal invert, or flexible footing pad, assembly of the structure shell shall start at the upstream end. Downstream rings of plates shall be assembled outside of the upstream rings (Circumferential seams are shingled downstream when viewed from the inside of the shell).
- The structure shall be backfilled using clean well graded granular material that meets the requirements for soil classifications A-1, A-2-4 or A-2-5 per AASHTO M-145. See the structural plate backfill group classification table on this sheet.
 

Backfill must be placed symmetrically on each side of the structure in 8 inch loose lifts. Each lift shall be compacted to a minimum of 95 percent density per AASHTO T-180.
- Standard highway loads that meet the permissible design load limits for an Aluminum Box Culvert are not allowed on the structure until it is backfilled completely and pavement is in place.
 

The addition of temporary soil for heavy construction loads is not feasible or permissible for Aluminum Box Culverts. By design, these structures are limited in the range of permissible fill heights and live loads.

Heavy construction loads that exceed that of the particular highway live load design limits are not allowed on Aluminum Box Culverts without approval from the Engineer.
- If an aluminum headwall and/or wingwall system is specified, the select granular structural backfill shall extend limits past the dead man anchor system. Contact the Engineer if stiff material or rock is encountered where the wingwalls and deadmen are to be installed.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12/22/2021  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 4 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT [Signature] 11/3/22 DATE

PROFESSIONAL CERTIFICATION:  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 40240, EXPIRATION DATE: 5/13/23

[Signature] [Professional Engineer Seal]

Approved By: MTH Date: SEPT., 2021  
 Project No: CBC-24067 Rev: 2

**CBC Engineers**

1 5/6/2021 CHANGED TO A 93R3 BOX. BTS

2 9/13/21 JBE REV. 2

**CONTECH ENGINEERED SOLUTIONS LLC**  
 www.ContechES.com  
 700 Tech Drive, Winchester, KY 40391  
 859-744-3339 859-744-9665 FAX

FOR APPROVAL

**CONTECH STRUCTURAL PLATE**

CONTECH CONTRACT DRAWING

CHAPELGATE WOODS  
 PLAT 25942-25954  
 HOWARD COUNTY, MARYLAND

**OWNER**  
 CHAPELGATE PRESBYTERIAN CHURCH, INC.  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

TYPE: BOX	INLET	OUTLET	PLATE THICKNESS: 175(H)/200(C)
SIZE: 93R3	32.8	36.7	REINFORCING RIB SPACING: AS SHOWN
SPAN: 28'-8"	BEVEL	0	REINFORCING RIB TYPE: AS SHOWN
RISE: 9'-4"			
LENGTH @ 4: 46'-0"			NUMBER OF STRUCTURES: 1

PROJECT NO: 627860	SEQ. NO: 010	DATE: SEPT., 2021
DESIGNED: [Signature]	DRAWN: BTS	
CHECKED: [Signature]	APPROVED: [Signature]	
SHEET NO: 88	OF 101	







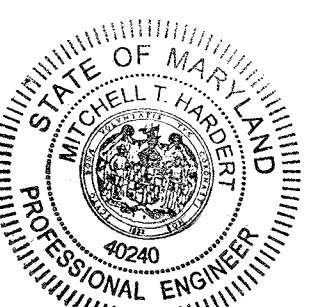
# CONTECH ENGINEERED SOLUTIONS, LLC

## Design of Concrete Spread Footings and Concrete Headwalls for a Skewed ALBC #93 (627860); Chapelgate Woods, Howard County, Maryland

INDEX	
90.	TITLE SHEET / INDEX
91.	PLAN, PROFILE, & SECTION VIEWS
92.	END ELEVATION VIEWS
93.	UPSTREAM HEADWALL DETAILS
94.	DOWNSTREAM HEADWALL DETAILS
95.	SPECIFICATIONS

PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE  
DOCUMENTS WERE PREPARED BY ME, AND  
I AM A DULY LICENSED PROFESSIONAL  
ENGINEER UNDER THE LAWS OF THE STATE  
OF MARYLAND, LICENSE NO. 40240,  
EXPIRATION DATE: 5/13/23

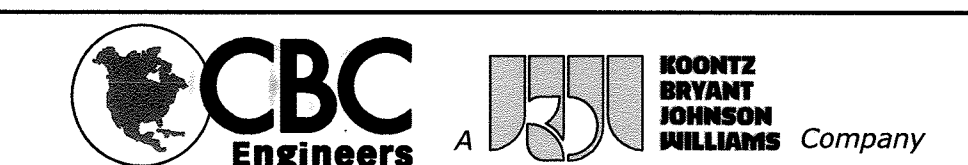
*Mitchell H. Holt*



**OWNER**  
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2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
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ELLICOTT CITY, MD 21041  
410-465-4244  
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Rev.	Date	By	Description
2	9/13/21	DJH	REV. 2
1	7/1/21	JBE	REV. 1

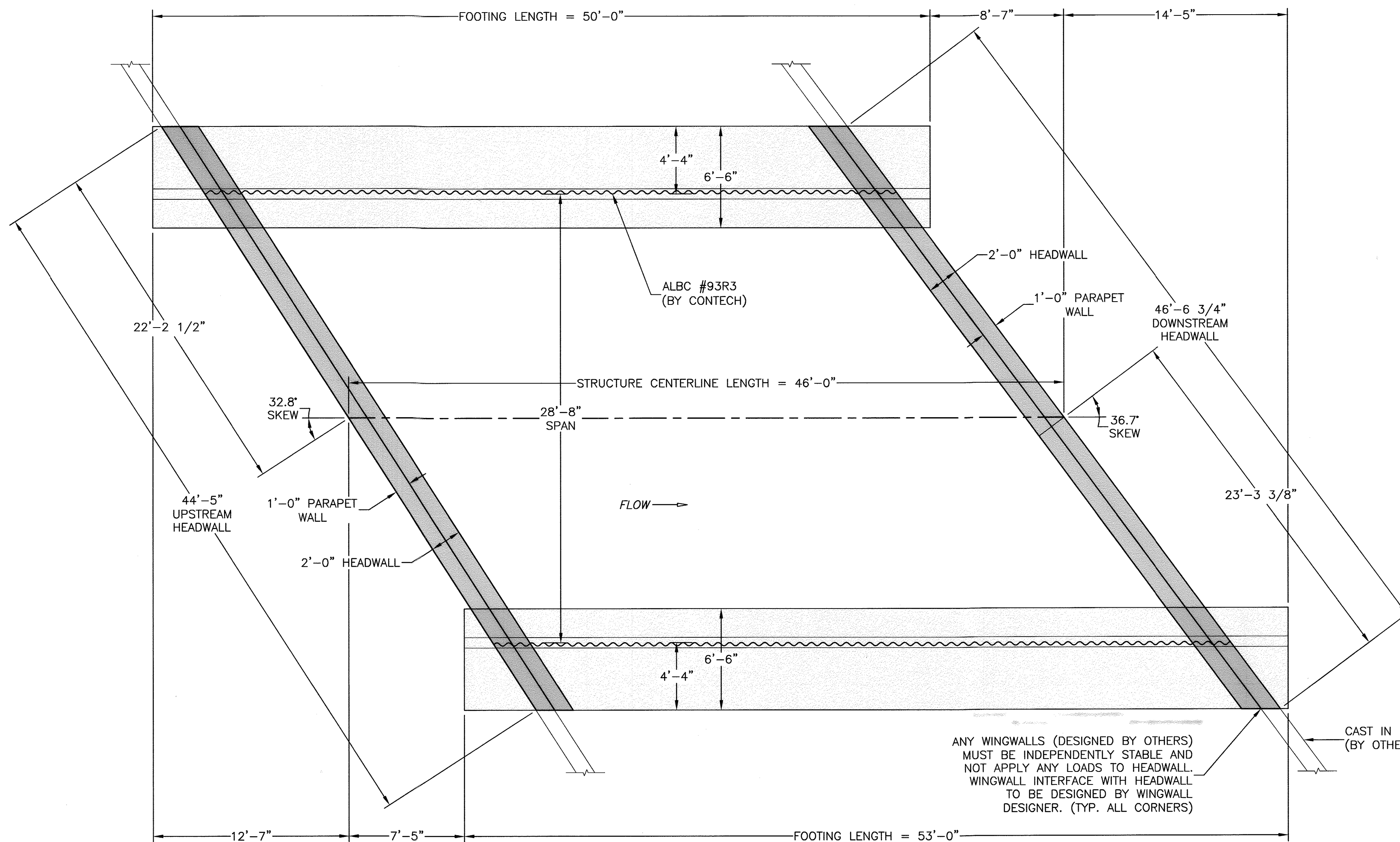


### TITLE SHEET / INDEX

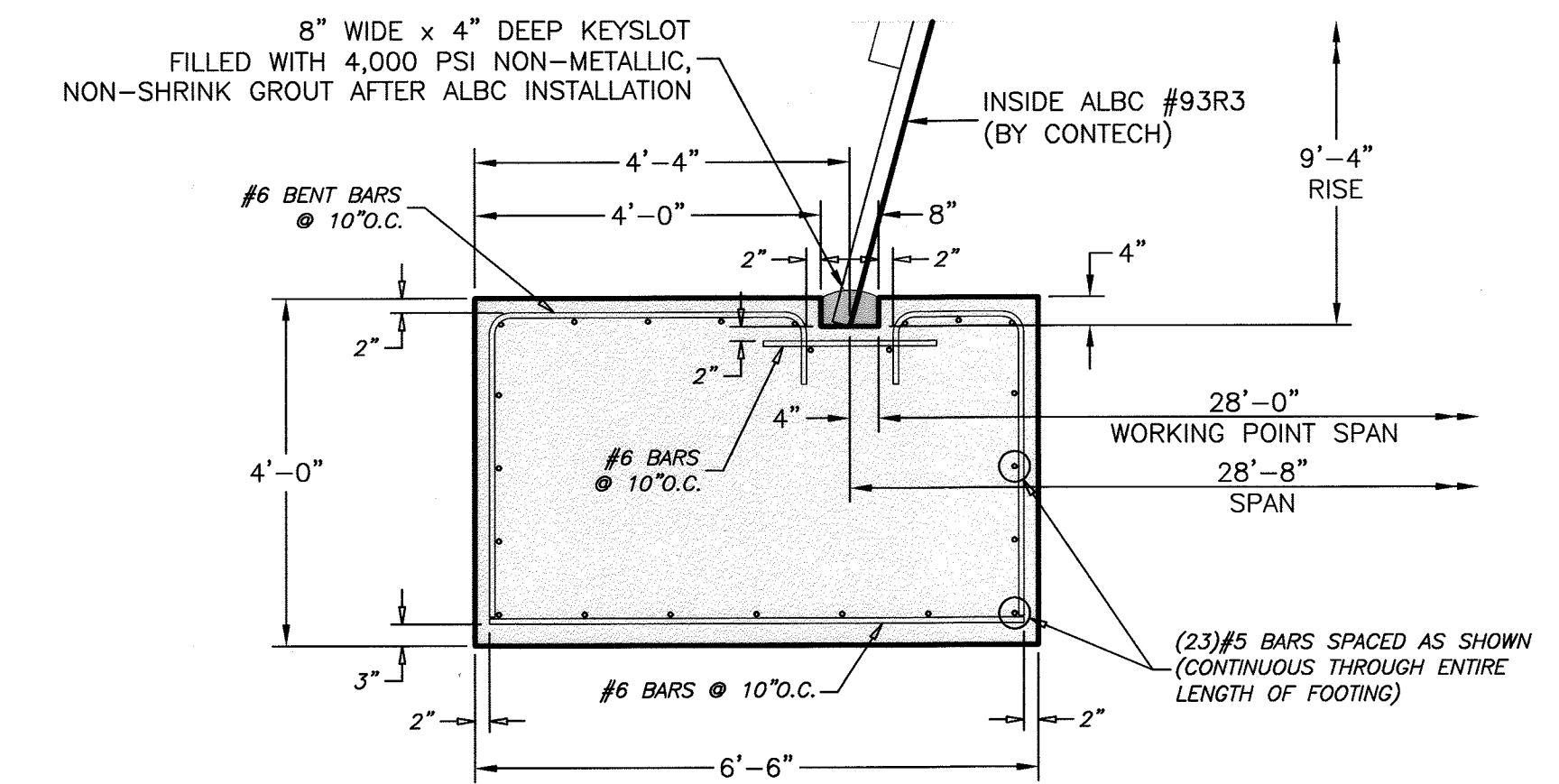
Drawn By DJH	Date SEPT., 2021	CONTECH ENGINEERED SOLUTIONS, LLC Design of Concrete Spread Footings and Coricrete Headwalls for a Skewed ALBC #93 (627860); Chapelgate Woods, Howard County, Maryland <b>PLAT 25942-25954</b>	
Approved By	Date		
Scale GRAPHIC	Project No. CBC-24067	Rev. 2	Sheet 90 OF 101

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS	
<i>[Signature]</i> CHIEF, BUREAU OF HIGHWAYS	12/07/2021 DATE
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
<i>[Signature]</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	12-23-21 DATE
<i>[Signature]</i> CHIEF, DIVISION OF LAND DEVELOPMENT	1/13/22 DATE





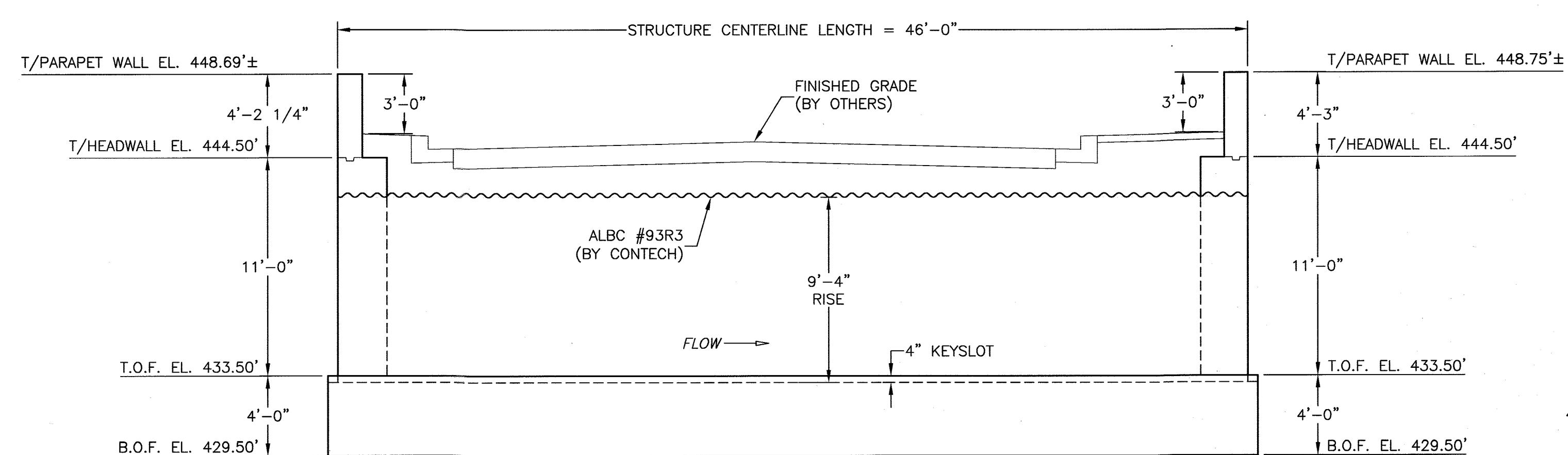
PLAN VIEW



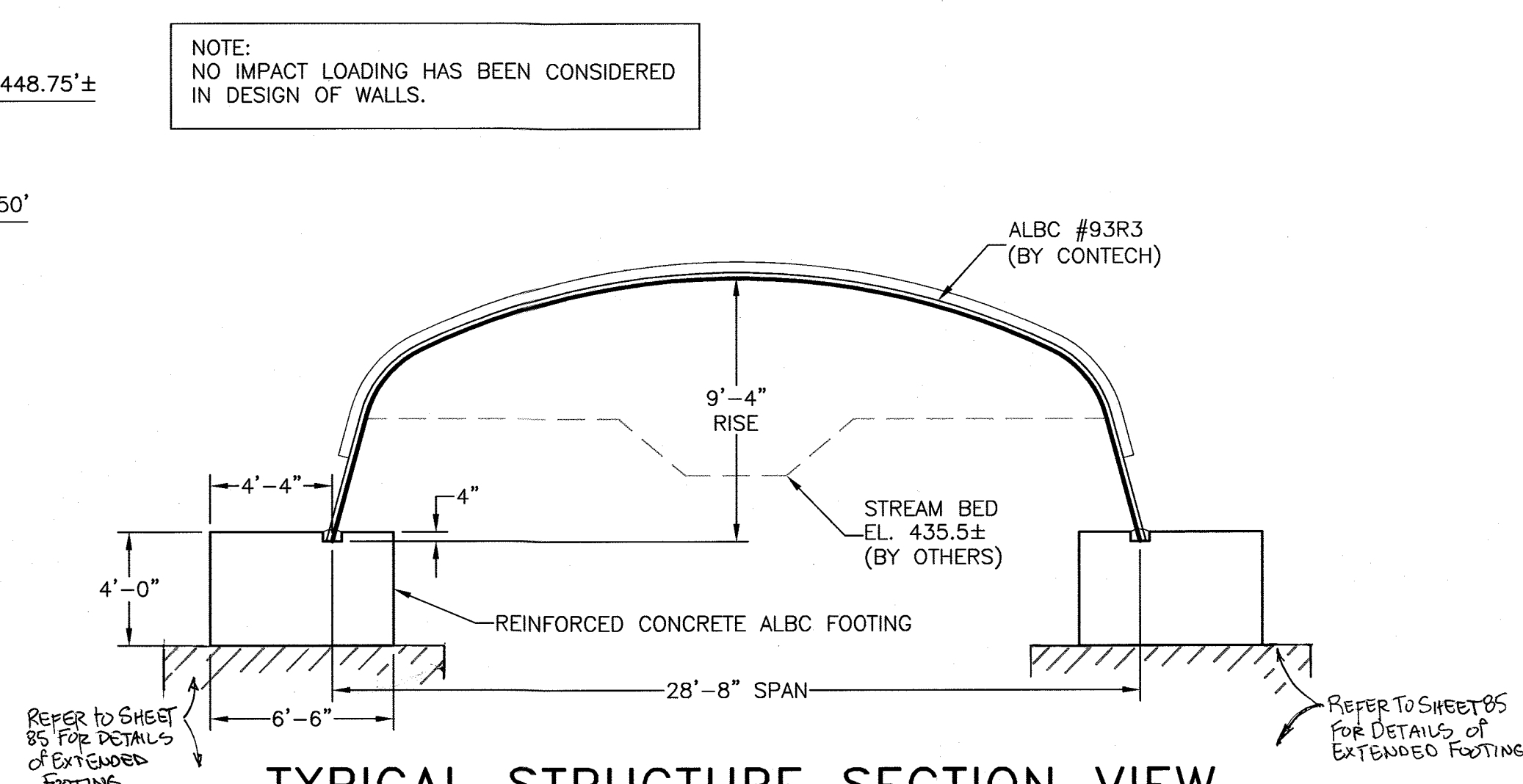
TYPICAL ALBC FOOTING SECTION



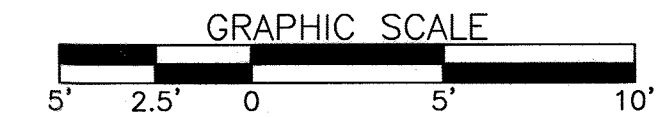
- NOTES:
- 1.) CONCRETE SHALL BE  $f'_c = 4,500$  psi.
  - 2.) ALL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60.
  - 3.) FOOTING IS DESIGNED FOR A 3,000 psf ALLOWABLE BEARING CAPACITY WITH A FRICTION FACTOR OF 0.35. THESE VALUES MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  - 4.) SCOUR IS NOT ADDRESSED HEREIN AND IS THE RESPONSIBILITY OF OTHERS THAN CBC ENGINEERS.



PROFILE THROUGH CENTERLINE OF STRUCTURE

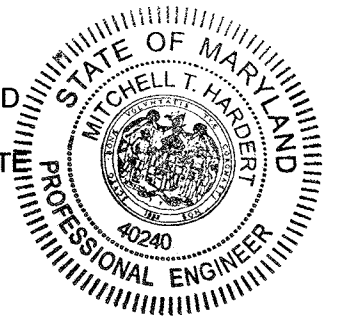


TYPICAL STRUCTURE SECTION VIEW



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I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 40240, EXPIRATION DATE: 5/13/23.

*Michael Holt*



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CHAPELGATE PRESBYTERIAN CHURCH, INC.  
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**DEVELOPER**  
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1	7/1/21	JBE	REV. 1

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CHIEF, BUREAU OF HIGHWAYS MK DATE

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*[Signature]* 12-23-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION 5 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 1/13/22 DATE

**CBC Engineers** A **KOONTZ BRYANT JOHNSON WILLIAMS Company**

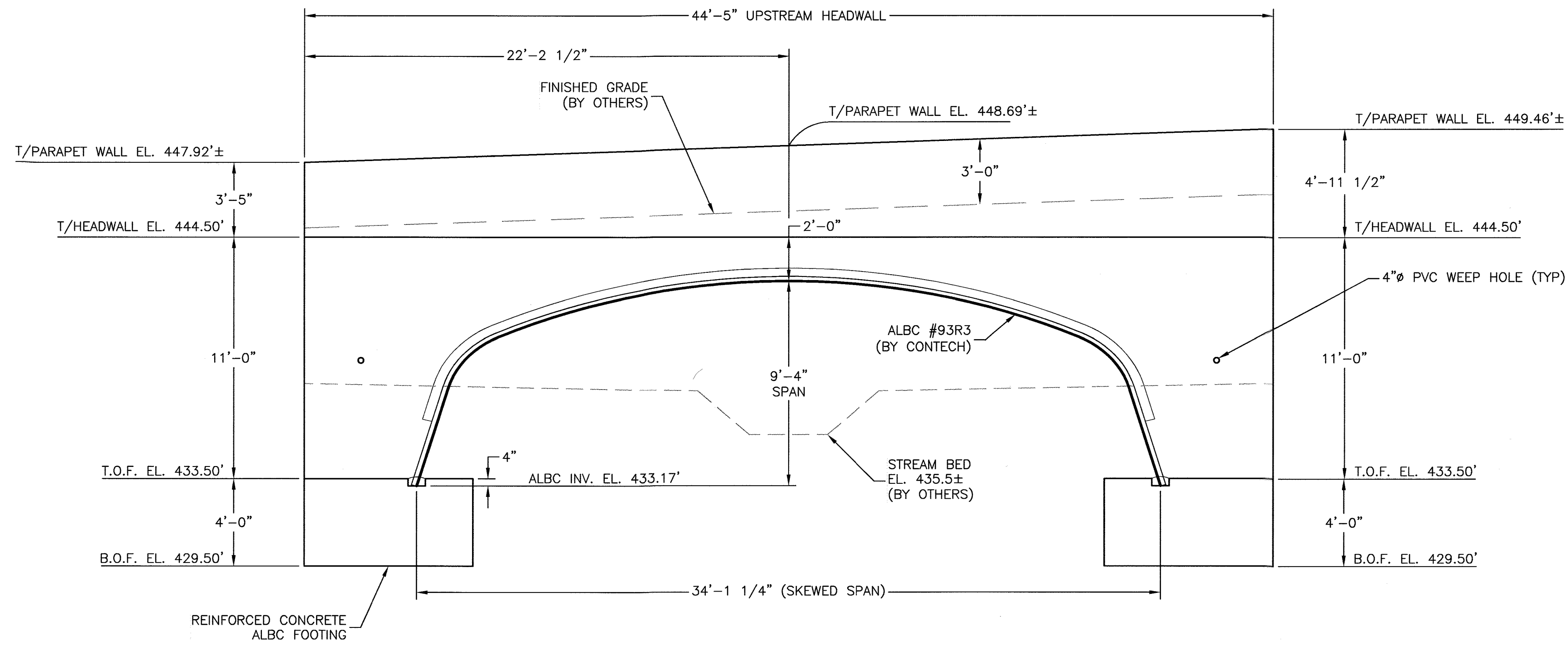
**PLAN, PROFILE & SECTION VIEWS**

Drawn By: DJH Date: SEPT., 2021  
Approved By: Date: 12-23-21

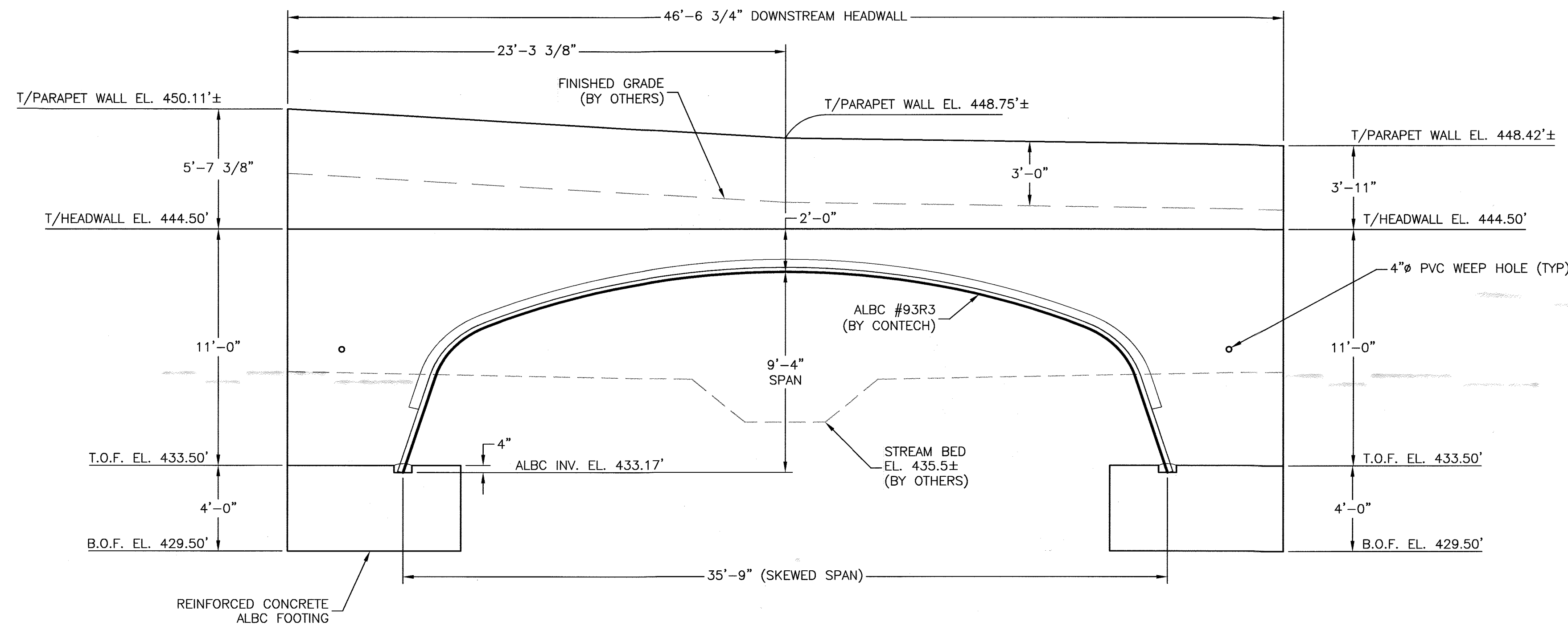
CONTECH ENGINEERED SOLUTIONS, LLC  
Design of Concrete Spread Footings and Concrete Headwalls for a Skewed ALBC #93 (627860);  
Chapelgate Woods, Howard County, Maryland  
PLAT 25942-25954

Scale: GRAPHIC Project No.: CBC-24067 Rev.: 2 Sheet: 91 OF 101

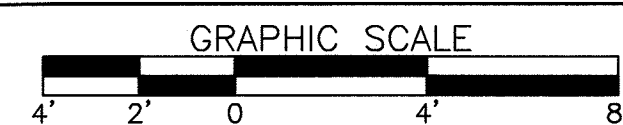




UPSTREAM END ELEVATION VIEW



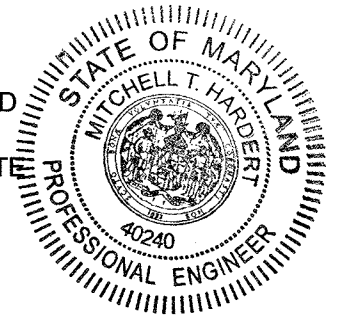
DOWNSTREAM END ELEVATION VIEW



- NOTES:
- 1.) CONCRETE SHALL BE  $f'_c = 4,500$  psi.
  - 2.) ALL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60.
  - 3.) FOOTING IS DESIGNED FOR A 3,000 psf ALLOWABLE BEARING CAPACITY WITH A FRICTION FACTOR OF 0.35, THESE VALUES MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  - 4.) SCOUR IS NOT ADDRESSED HEREIN AND IS THE RESPONSIBILITY OF OTHERS THAN CBC ENGINEERS.

PROFESSIONAL CERTIFICATION:  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 40240, EXPIRATION DATE: 5/13/23

*Michael Holt*



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 SDCPROPERTIES.COM

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 CHIEF, BUREAU OF HIGHWAYS MK DATE

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*[Signature]* 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION f DATE

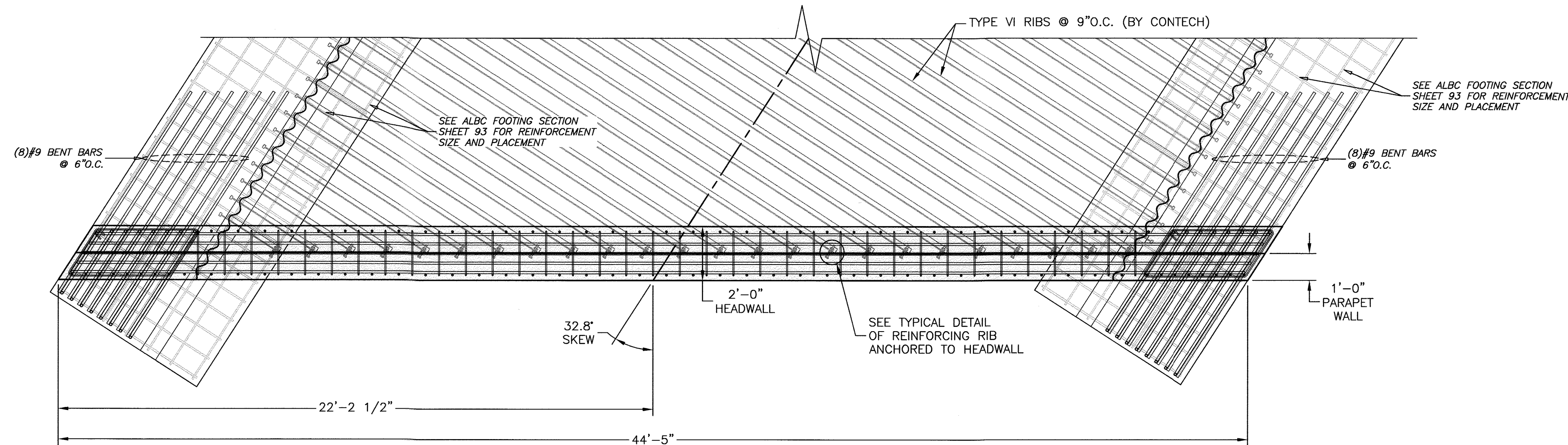
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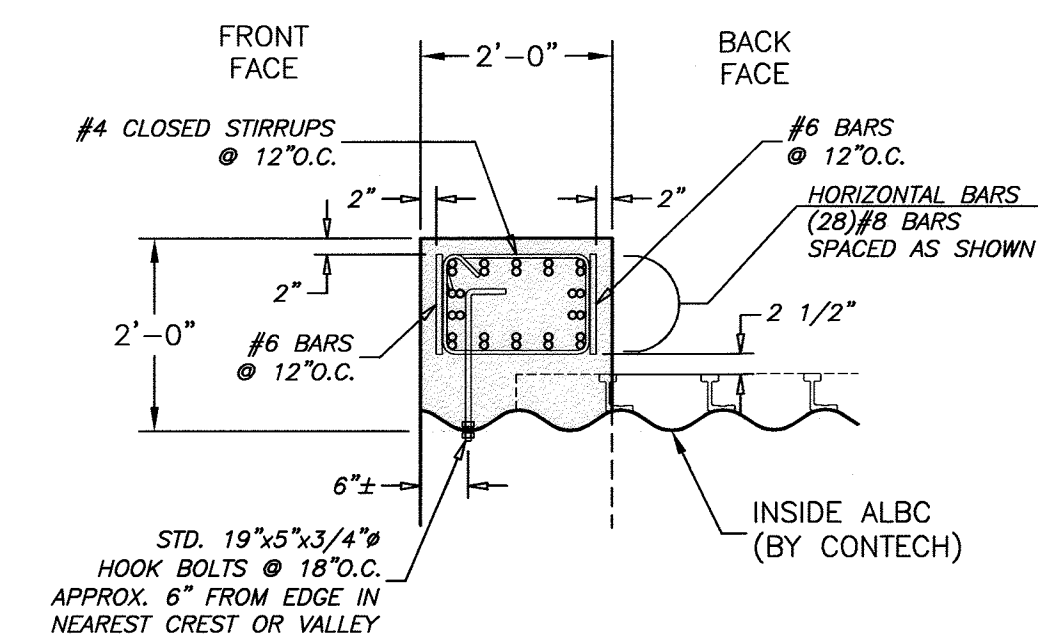
  

<b>CBC Engineers</b>		<b>HOONTZ BRYANT JOHNSON WILLIAMS Company</b>	
<b>END ELEVATION VIEWS</b>			
Drawn By DJH	Date SEPT., 2021	CONTECH ENGINEERED SOLUTIONS, LLC Design of Concrete Spread Footings and Concrete Headwalls for a Skewed ALBC #93 (627860); Chapelgate Woods, Howard County, Maryland PLAT 25492-25954	
Approved By	Date	Project No. CBC-24067	Rev. Sheet 2 92 OF 101
Scale GRAPHIC			



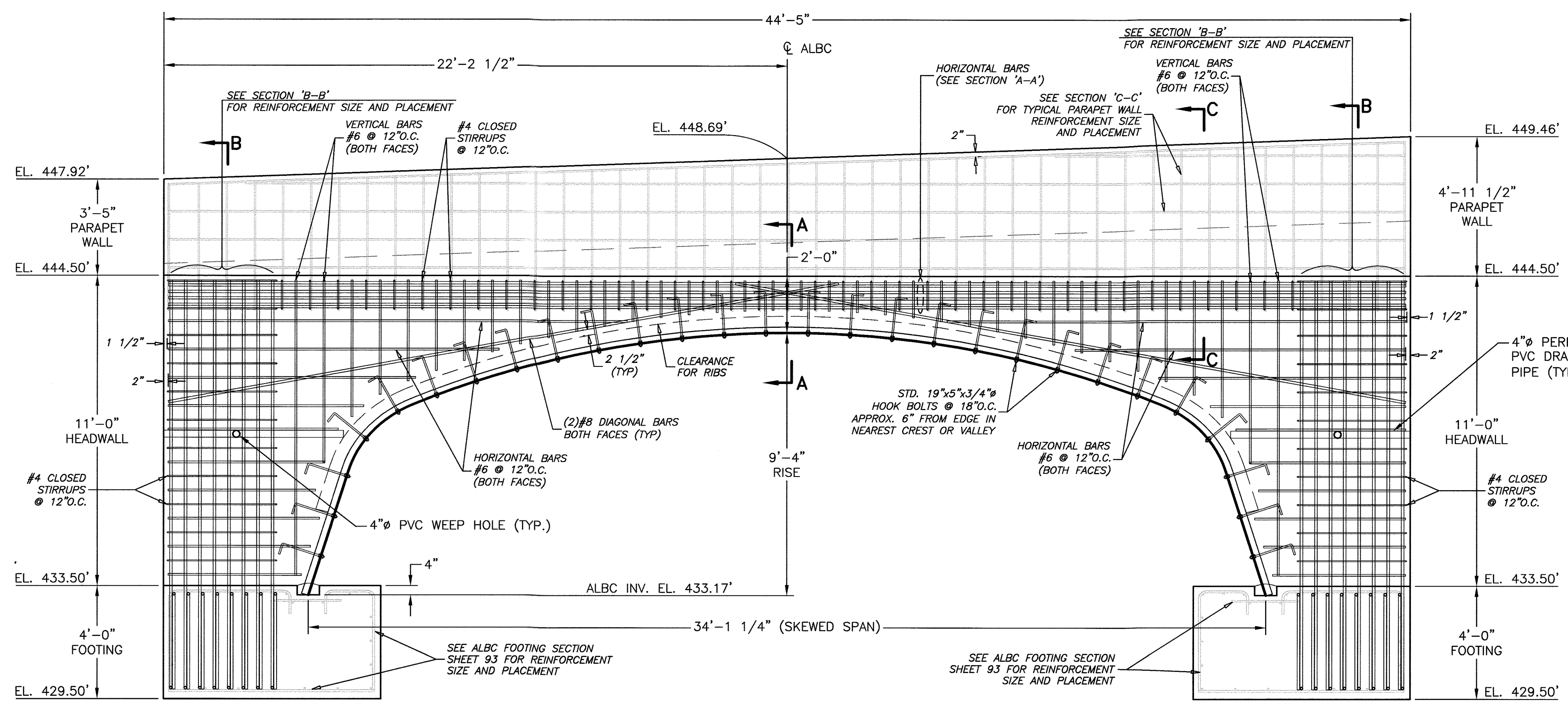


PLAN VIEW



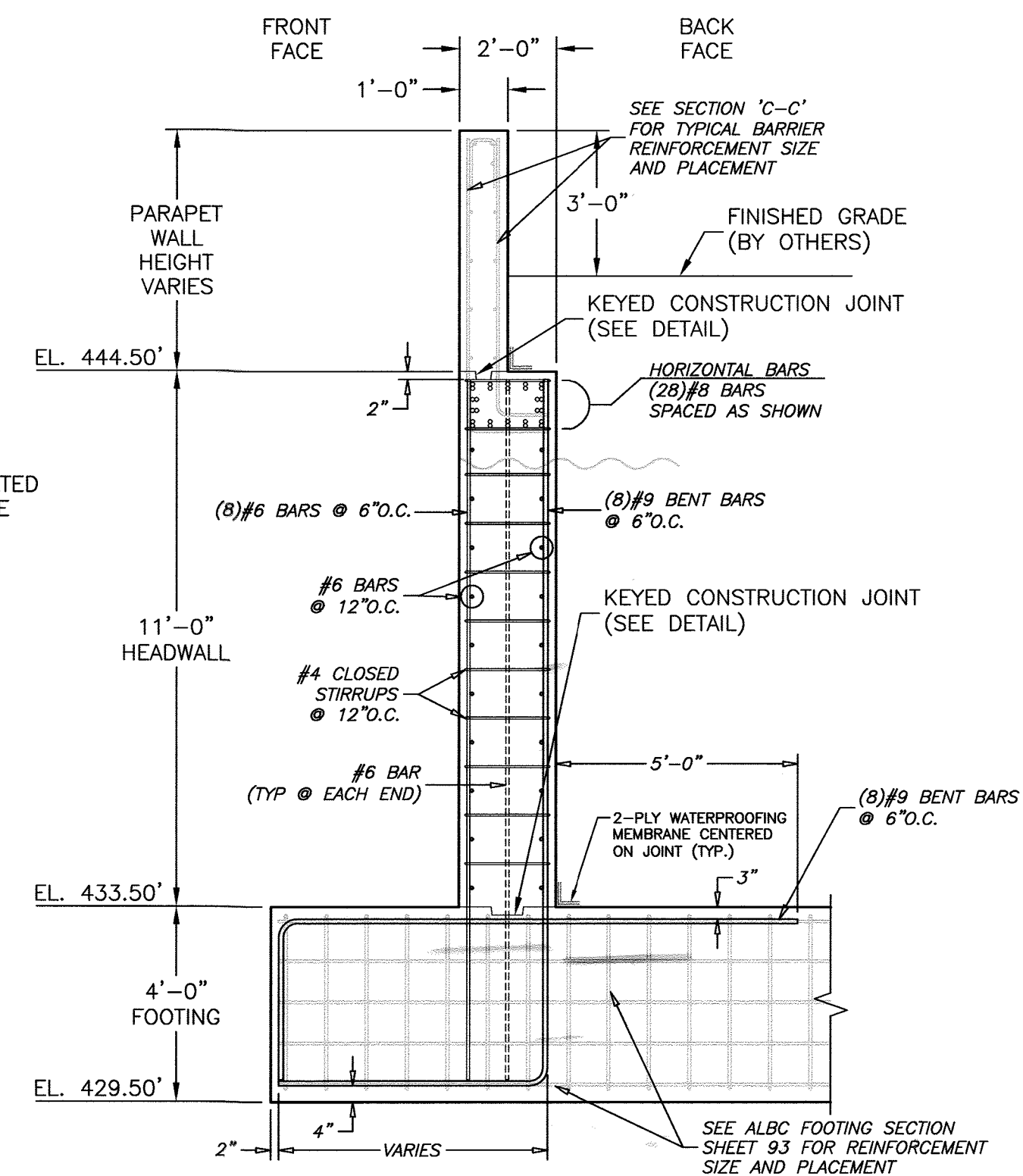
SECTION 'A-A'

GRAPHIC SCALE



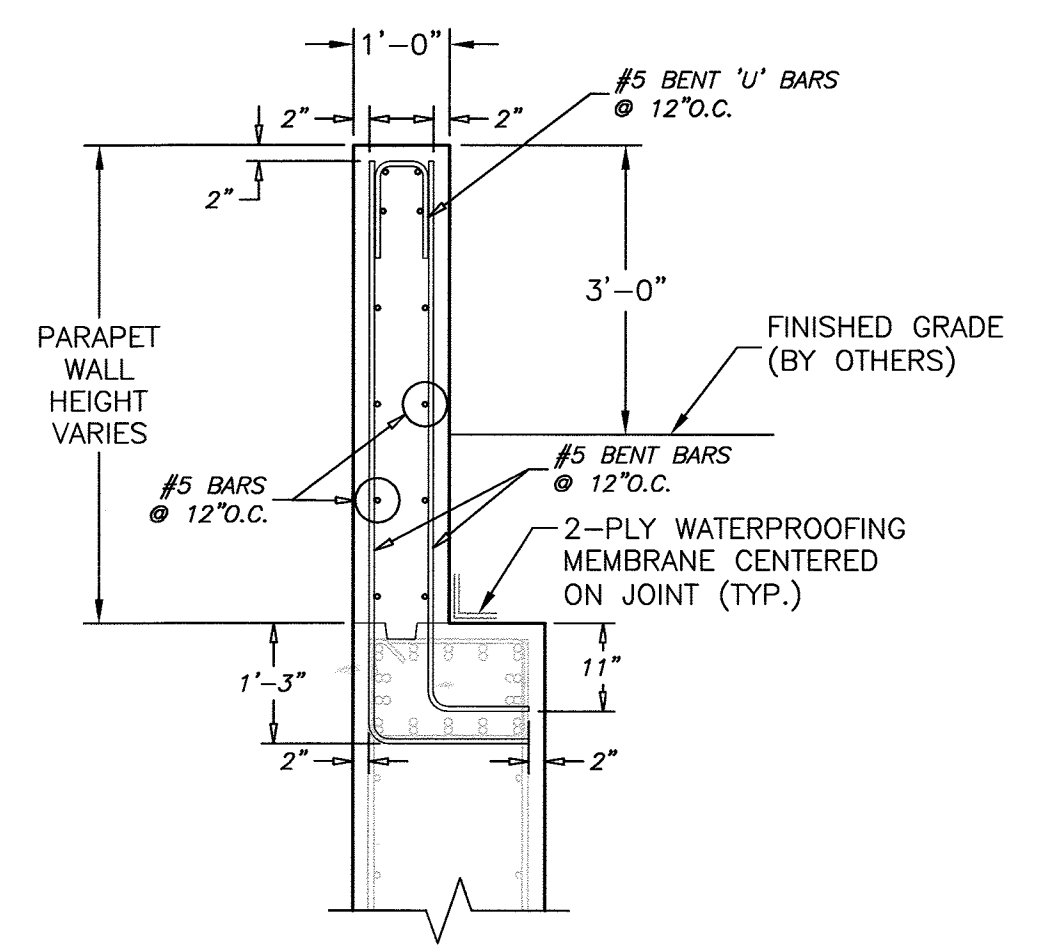
ELEVATION VIEW  
UPSTREAM HEADWALL DETAILS

GRAPHIC SCALE



SECTION 'B-B'

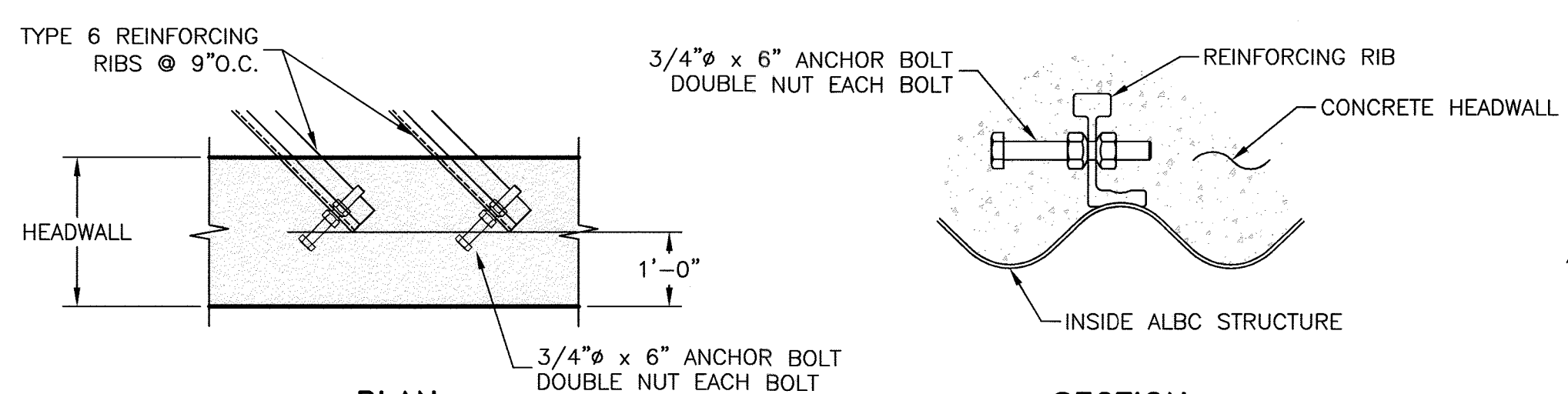
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SECTION 'C-C'  
(TYPICAL PARAPET WALL DETAIL)

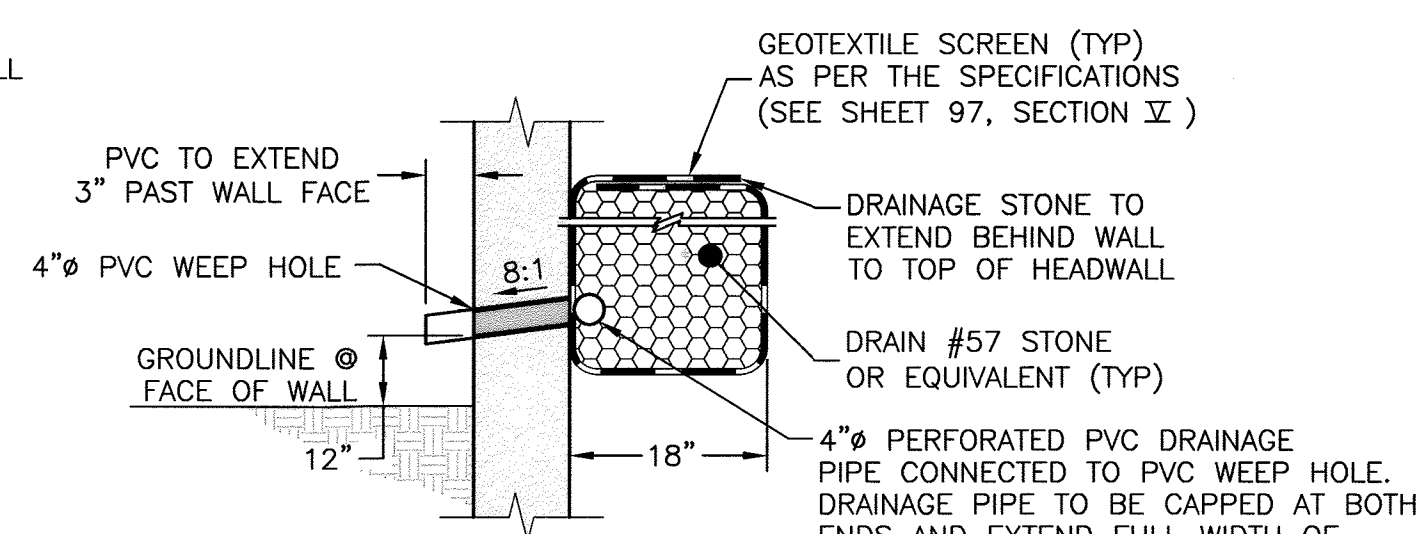
GRAPHIC SCALE

NOTE: ALL REINFORCING STEEL IN PARAPET WALL TO BE EPOXY COATED.



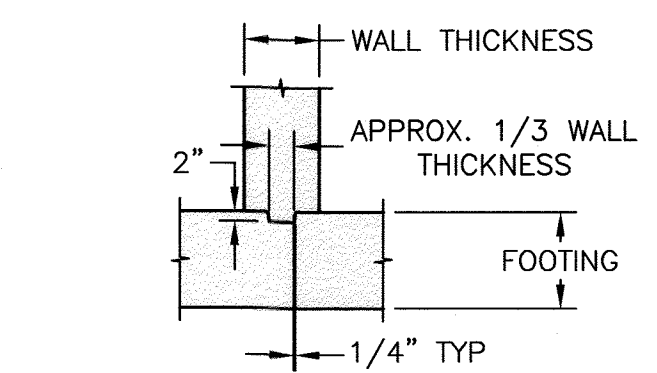
PLAN  
TYPICAL DETAIL OF REINFORCING RIB  
ANCHORED INTO SKEWED HEADWALL

NOT TO SCALE



WEEP HOLE DETAIL

NOT TO SCALE



KEYED JOINT DETAIL

NOT TO SCALE

- NOTES:
- 1.) CONCRETE SHALL BE  $f'c = 4,500$  psi.
  - 2.) ALL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60.
  - 3.) FOOTING IS DESIGNED FOR A 3,000 psf ALLOWABLE BEARING CAPACITY WITH A FRICTION FACTOR OF 0.35. THESE VALUES MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  - 4.) SCOUR IS NOT ADDRESSED HEREIN AND IS THE RESPONSIBILITY OF OTHERS THAN CBC ENGINEERS.

PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 40240, EXPIRATION DATE: 9/13/23.

*Michael Hahl*

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CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

**DEVELOPER**  
SECURITY DEVELOPMENT  
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ELLCOTT CITY, MD 21041  
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**UPSTREAM HEADWALL DETAILS**

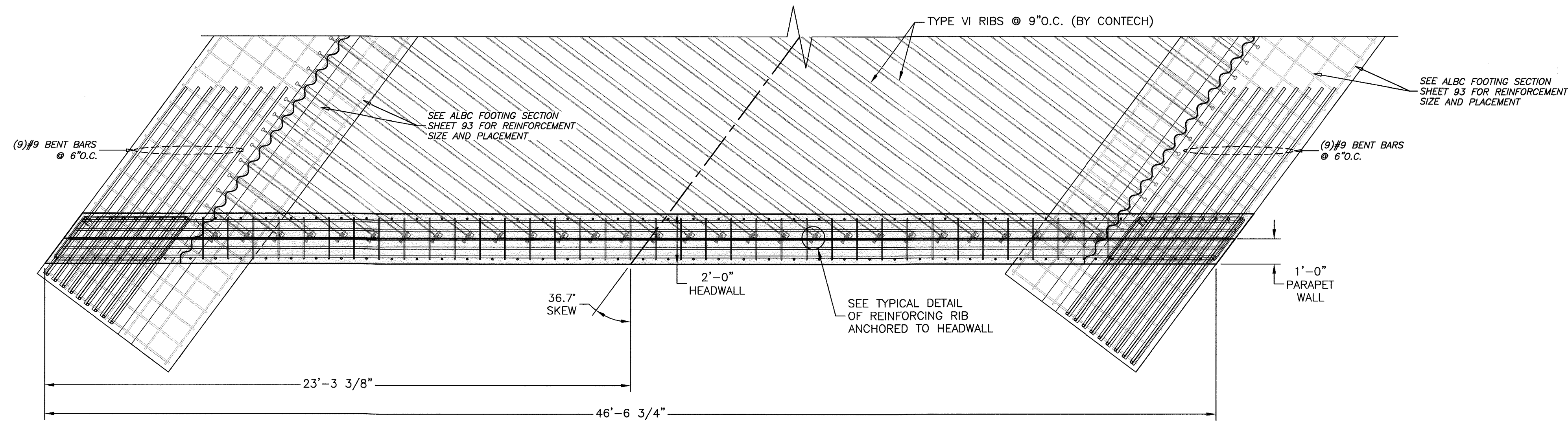
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 Approved By: Date: \_\_\_\_\_  
 Project No. Rev. Sheet  
 GRAPHIC CBC-24067 2 93 OF 101

CONTECH ENGINEERED SOLUTIONS, LLC  
 Design of Concrete Spread Footings and Concrete Headwalls for a Skewed ALBC #93 (627860).  
 Chapelgate Woods, Howard County, Maryland  
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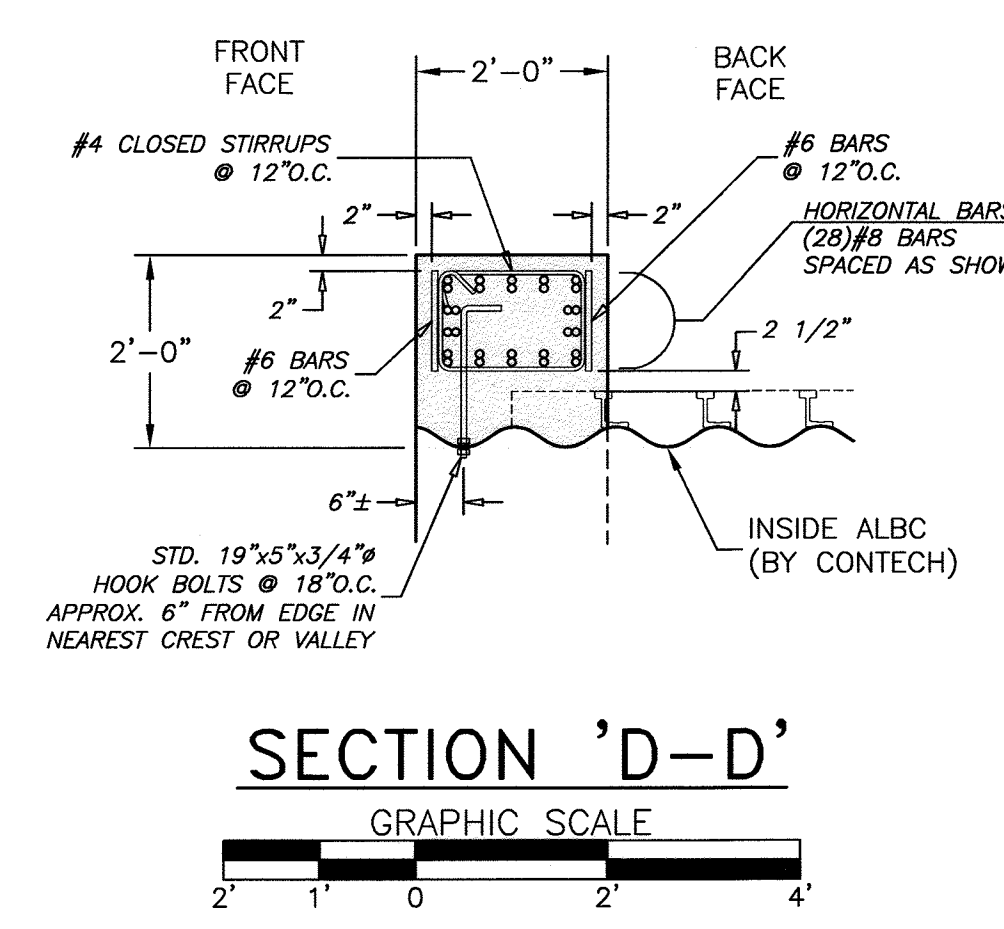
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*[Signature]* 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*[Signature]* 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 1/19/22 DATE

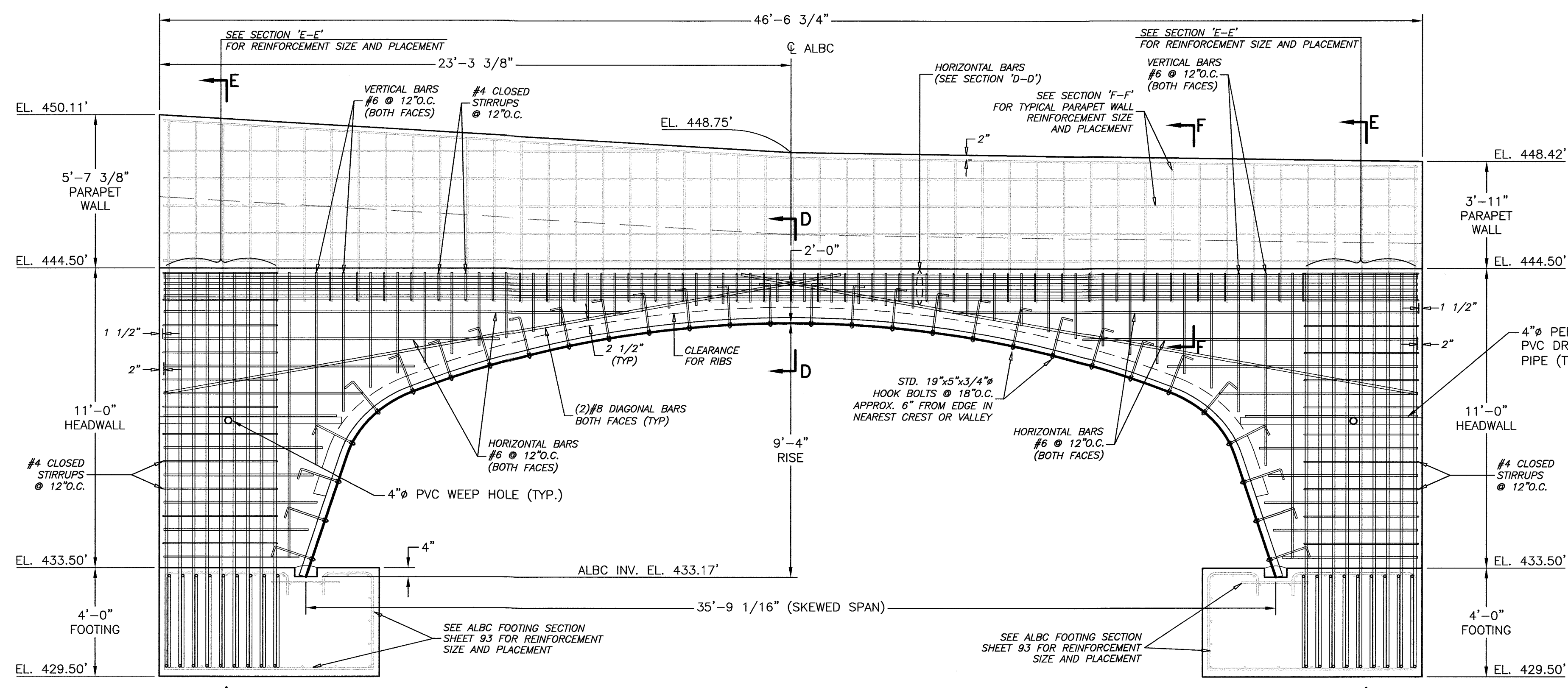




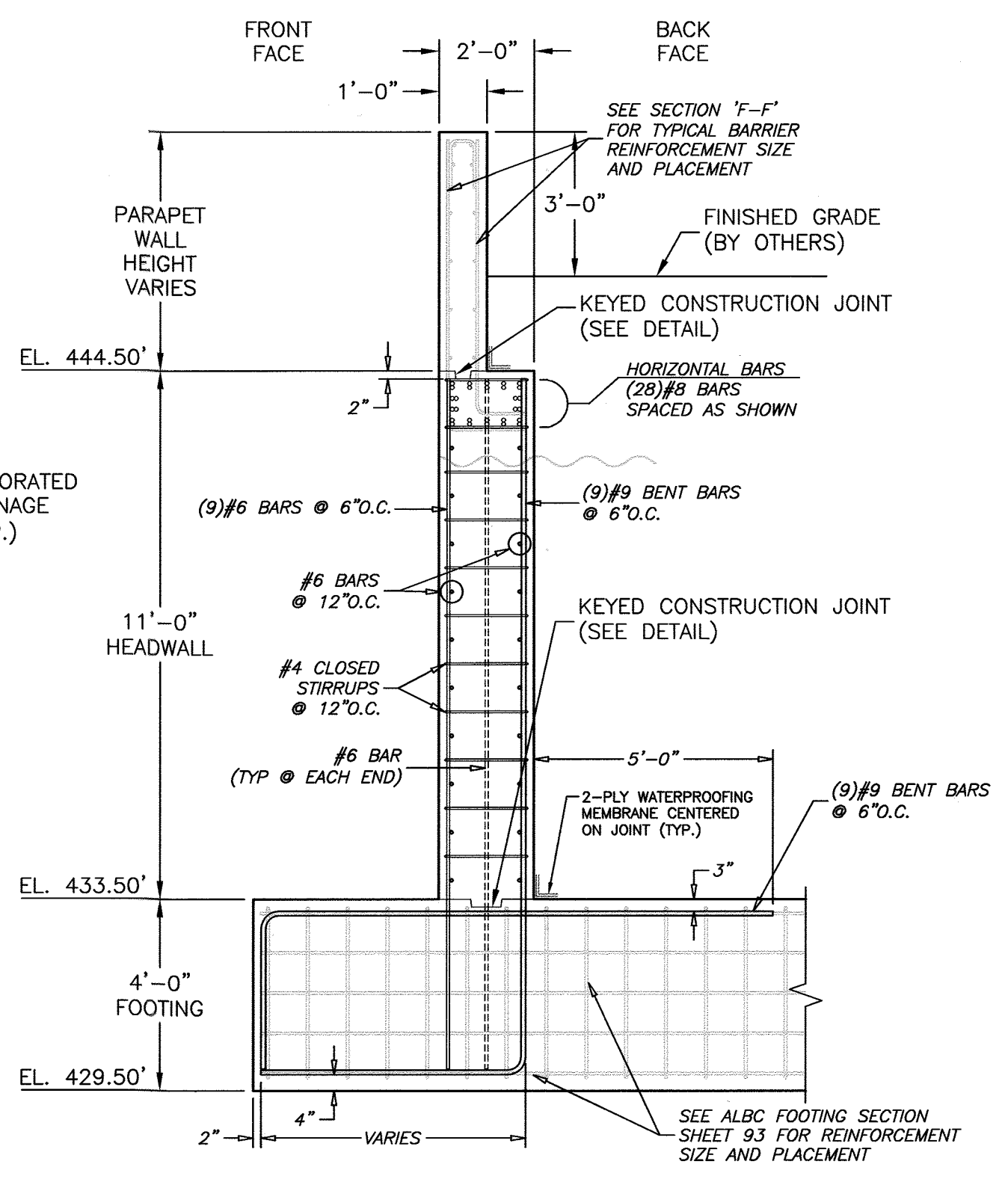
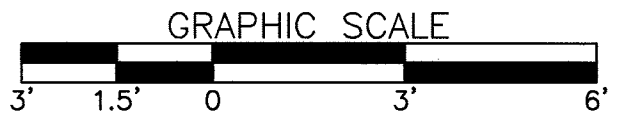
PLAN VIEW



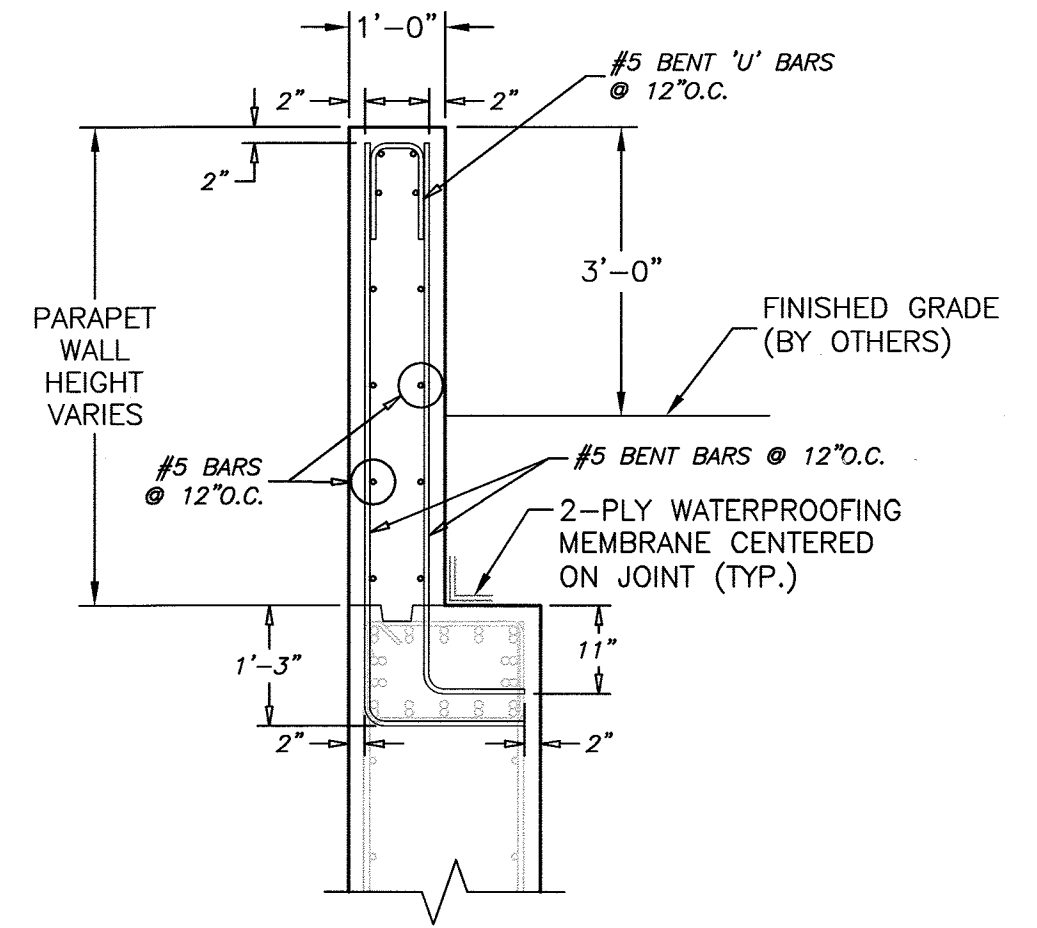
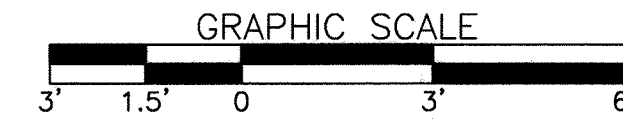
SECTION 'D-D'



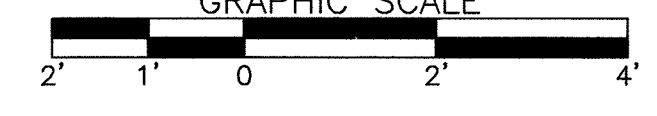
ELEVATION VIEW  
DOWNSTREAM HEADWALL DETAILS



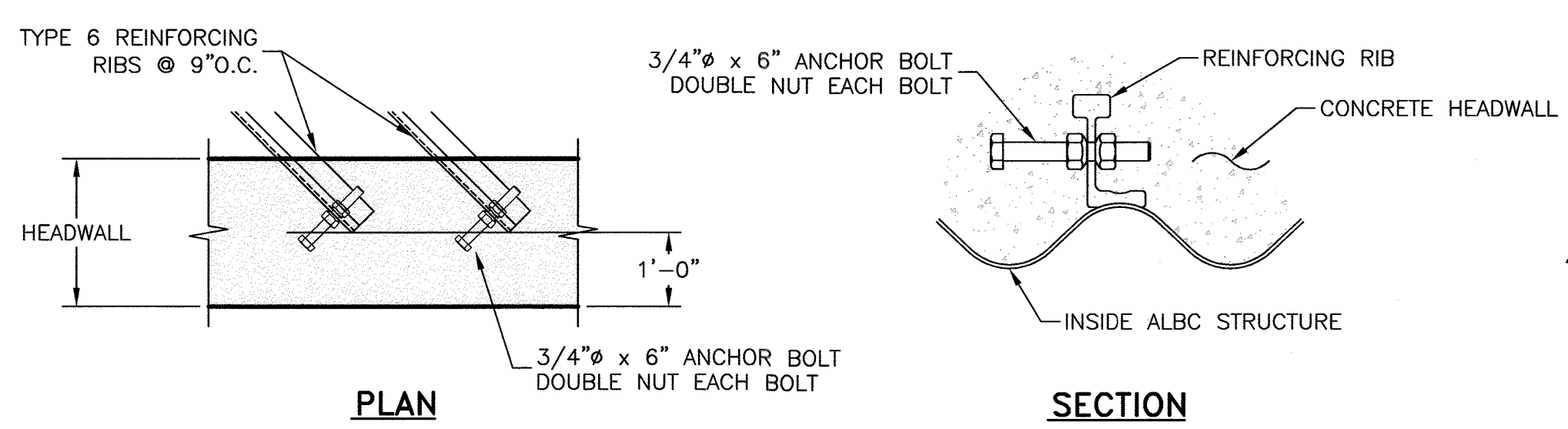
SECTION 'E-E'



SECTION 'F-F'  
(TYPICAL PARAPET WALL DETAIL)

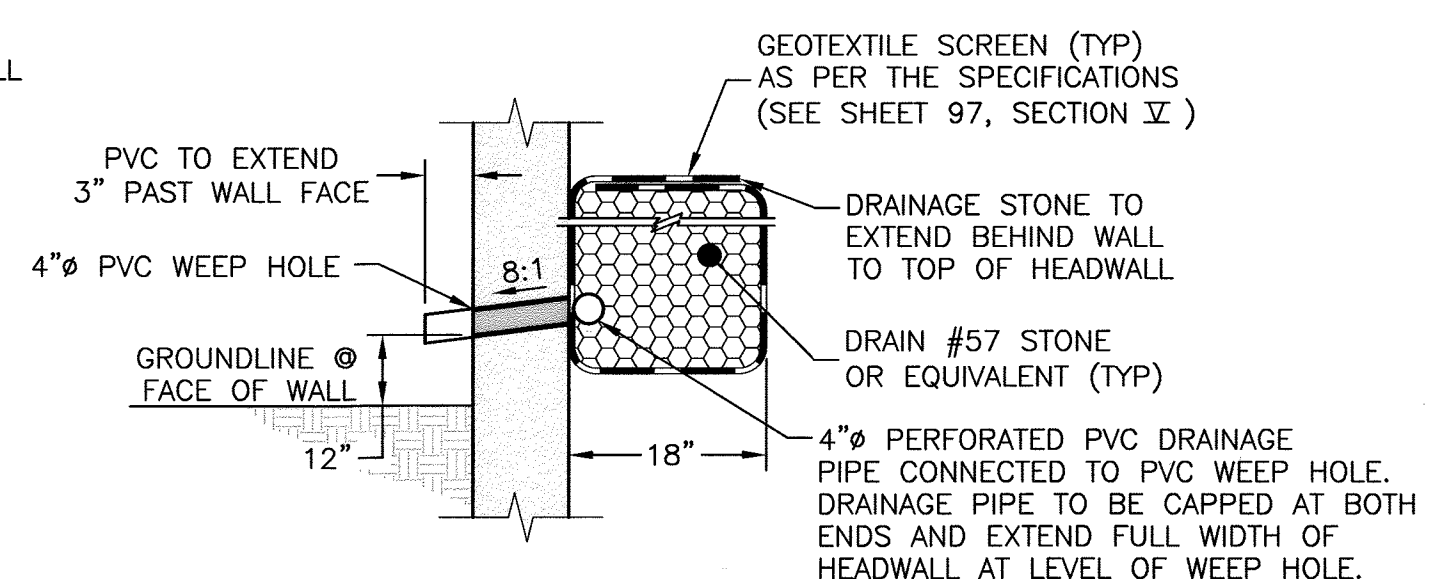


NOTE: ALL REINFORCING STEEL IN PARAPET WALL TO BE EPOXY COATED.



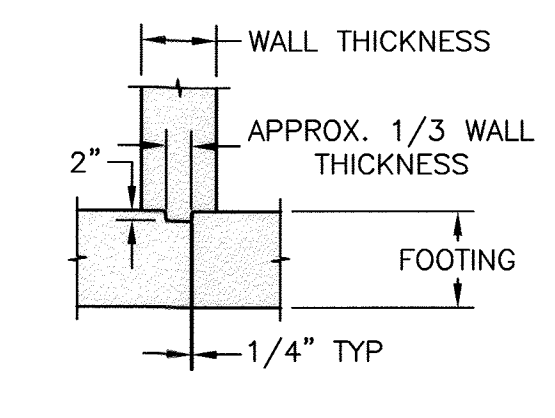
TYPICAL DETAIL OF REINFORCING RIB ANCHORED INTO SKEWED HEADWALL

NOT TO SCALE



WEEP HOLE DETAIL

NOT TO SCALE



KEYED CONSTRUCTION JOINT DETAIL

NOT TO SCALE

- NOTES:
- 1.) CONCRETE SHALL BE  $f'_c = 4,500$  psi.
  - 2.) ALL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60.
  - 3.) FOOTING IS DESIGNED FOR A 3,000 psf ALLOWABLE BEARING CAPACITY WITH A FRICTION FACTOR OF 0.35. THESE VALUES MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  - 4.) SCOUR IS NOT ADDRESSED HEREIN AND IS THE RESPONSIBILITY OF OTHERS THAN CBC ENGINEERS.

PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 40240, EXPIRATION DATE: 9/13/23

*Michael Holt*



**OWNER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTSVILLE RD.  
MARRIOTTSVILLE, MD 21104  
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**DEVELOPER**  
SECURITY DEVELOPMENT  
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410-465-4244  
SDCPROPERTIES.COM

2	9/13/21	DJH	REV. 2
1	7/1/21	JBE	REV. 1

**CBC Engineers** A **HOONTZ BRYANT JOHNSON WILLIAMS Company**

**DOWNSTREAM HEADWALL DETAILS**

Drawn By: DJH Date: SEPT., 2021  
Approved By: Date: \_\_\_\_\_  
Scale: GRAPHIC Project No: CBC-24067 Rev: 2 Sheet: 94 OF 101

CONTECH ENGINEERED SOLUTIONS, LLC  
Design of Concrete Spread Footings and Concrete Headwalls for a Skewed ALBC #93 (627860).  
Chapelgate Woods, Howard County, Maryland  
PLAT 25942-25944

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*[Signature]* 12/07/2021  
CHIEF, BUREAU OF HIGHWAYS MK DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*[Signature]* 12-27-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 1/13/22 DATE



I - GENERAL

1.0 STANDARDS AND DEFINITIONS

- 1.1 STANDARDS - All standards refer to latest edition unless otherwise noted.
  - 1.1.1 ASTM D-698-70 (Method C) "Standard Test Methods for Moisture, Density Relations of Soils and Soil Aggregate Mixtures Using 5.5-lb (2.5 kg.) Rammer and 12-inch (305-mm) Drop".
  - 1.1.2 ASTM D-2922 "Standard Test Method for Density of Soil and Soil Aggregate in Place by Nuclear methods (Shallow Depth)".
  - 1.1.3 ASTM D-1556 "Standard Test Method for Density of Soil in place by the Sand-Cone Method".
  - 1.1.4 ASTM D-1557 "Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort."
  - 1.1.5 All construction and materials shall be in accordance with the latest AASHTO standards.
- 1.2 DEFINITIONS
  - 1.2.1 Owner - In these specifications the word "Owner" shall mean SDC Group.
  - 1.2.2 Engineer - In these specifications the word "Engineer" shall mean the Owner designated engineer.
  - 1.2.3 Design Engineer - In these specifications the words "Design Engineer" shall mean CBC Engineers and Associates, Ltd.
  - 1.2.4 Contractor - In these specifications the word "Contractor" shall mean the firm or corporation undertaking the execution of any work under the terms of these specifications.
  - 1.2.5 Approved - In these specifications the word "approved" shall refer to the approval of the Engineer or his designated representative.
  - 1.2.6 As Directed - In these specifications the words "as directed" shall refer to the directions to the Contractor from the Owner or his designated representative.

2.0 GENERAL CONDITIONS

- 2.1 The Contractor shall furnish all labor, material and equipment and perform all work and services except those set out and furnished by the Owner, necessary to complete in a satisfactory manner the site preparation, excavation, filling, compaction, grading as shown on the plans and as described therein. This work shall consist of all mobilization clearing and grading, grubbing, stripping, removal of existing material unless otherwise stated, preparation of the land to be filled, filling of the land, spreading and compaction of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades, slopes, and specifications.
 

This work is to be accomplished under the observation of the Owner or his designated representative.
- 2.2 Prior to bidding the work, the Contractor shall examine, investigate and inspect the construction site as to the nature and location of the work, and the general and local conditions at the construction site, including, without limitation, the character of surface or subsurface conditions and obstacles to be encountered on and around the construction site; and shall make such additional investigation as he may deem necessary for the planning and proper execution of the work.
 

If conditions other than those indicated are discovered by the Contractor, the Owner should be notified immediately. The material which the Contractor believes to be a changed condition should not be disturbed so that the owner can investigate the condition.
- 2.3 The construction shall be performed under the direction of an experienced engineer who is familiar with the design plan.

II - FOOTINGS

1.0 EXCAVATION FOR FOOTINGS

- 1.1 Footing excavation shall consist of the removal of all material, of whatever nature, necessary for the construction of foundations.
- 1.2 It shall be the responsibility of the Contractor to identify and relocate all existing utilities which conflict with the proposed footing locations shown on the plan. The Contractor must call the appropriate utility company at least 48 hours before any excavation to request exact field location of utilities, and coordinate removal and installation of all utilities with the respective utility company.
- 1.3 The side of all excavations shall be cut to prevent sliding or caving of the material above the footings.
- 1.4 Excavated material shall be disposed in accordance with the plan established by the Engineer.
- 1.5 The structure footings have been designed for a net allowable bearing capacity of 3,000 psf as per the requirements of the project geotechnical engineer. A friction factor of 0.35 has been utilized. These values shall be verified in the field before construction. The evaluation and design of any required foundation improvement to achieve the design allowable bearing capacity and friction factor, and to protect against frost, scour and settlement is the responsibility of others than CBC. All recommendations in the project geotechnical report shall be followed during construction.

2.0 CONCRETE FOOTING DIMENSIONS

The footings shall be reinforced in accordance with the construction drawings.

III - HEADWALLS

- 1.0 The headwalls shall consist of reinforced concrete conforming to Chapter IV of these specifications and to Division II, Section 8, of the AASHTO Standard Specifications for Highway Bridges having a minimum compression strength of 4,500 psi.
- 2.0 Reinforcing steel shall conform to ASTM A-615, Grade 60, having a minimum yield strength of 60,000 psi.
- 3.0 The headwalls shall be anchored to the ALBC in the manner shown on the plans and shall be formed and poured in accordance with the plan dimensions.
- 4.0 Round weep holes spaced not over 5 feet on center shall be placed in the walls above finished grade as shown on the construction drawings. A granular envelope, consisting of #57 stone (clean 3/4" aggregate) or equivalent, shall be placed behind each weep hole for a distance of approximately 1 foot from all edges of the weep hole. A free-draining geotextile screen shall be placed between the weep hole and the stone to prevent erosion of the stone.
- 5.0 The select backfill behind the headwalls must be a well-graded, angular, durable material conforming to the select backfill specifications for the ALBC and be compacted to at least 90% of the modified Proctor dry unit weight to achieve a minimum internal friction angle of 36 degrees. The material must be placed in strict conformance with the project specifications, the manufacturer's requirements, and industry standards.
- 6.0 All Federal, State, and Local regulations shall be strictly adhered to relative to excavation side-slope geometry and any required excavation shoring.
- 7.0 It must be emphasized that temporary bracing of the ends of the structure will be required during the pipe backfilling and headwall construction. Any required temporary bracing should remain in place until the headwalls and backfilling have been fully completed, and until the concrete in the headwalls has reached its design strength. The design of the temporary bracing is beyond the scope of this project. Others are responsible for the design of the temporary bracing. Unless the temporary bracing is adequate and supports the structure during construction and filling, the structure could deform and collapse.

IV - CONCRETE

1.0 CODES AND STANDARDS

- 1.1 Reinforced concrete shall conform to the requirements of AASHTO Standard Specifications for Highway Bridges, Division II - Construction, Section 8, "Concrete Structures", for Class A concrete, having a minimum compressive strength of 4,500 psi.

2.0 STANDARDS FOR MATERIALS

- 2.1 Portland Cement - Conforming to ASTM Specification C-150, Type I or II.
- 2.2 Water - The water shall be drinkable, clean free from injurious amounts of oils, acids, alkalis, organic materials, or deleterious substances.
- 2.3 Aggregates - Fine and coarse aggregates shall conform to current ASTM Specification C-33 "Specification for Concrete Aggregates" except that local aggregates which have been shown by tests and by actual service to produce satisfactory qualities may be used when approved by the Engineer.
- 2.4 Submittals - Test data and/or certifications to the Owner shall be furnished upon request.

3.0 PROPORTIONING OF CONCRETE

- 3.1 COMPOSITION
  - 3.1.1 The concrete shall be composed of cement, fine aggregate, coarse aggregate and water.
  - 3.1.2 The concrete shall be homogeneous, readily placeable and uniformly workable and shall be proportioned in accordance with ACI-211.1.
  - 3.1.3 Proportions shall be established on the basis of field experience with the materials to be employed. The amount of water used shall not exceed the maximum 0.45 water/cement ratio, and shall be reduced as necessary to produce concrete of the specified consistency at the time of placement.
  - 3.1.4 An air-entraining admixture, conforming to the requirements of ASTM C260, shall be used in all concrete furnished under this contract. The quantity of admixture shall be such as to produce an air content in the freshly mixed concrete of 6 percent plus or minus 1 percent as determined in accordance with ASTM C231 or C173.
- 3.2 Qualities Required - As indicated in the table below:

TABLE IV-1 QUALITIES REQUIRED	
ITEM	QUALITY REQUIRED
AASHTO Class	A
Type of Cement	I or II
Compressive Strength $f_c$ @ 28 days	4,500 psi
Slump, inches	2 - 4 in.

- 3.3 Maximum Size of Coarse Aggregates - Maximum size of coarse aggregates shall not be larger than 19 mm (3/4 inches).
- 3.4 Rate of Hardening of Concrete - Concrete mix shall be adjusted to produce the required rate of hardening for varied climatic conditions:
 

Under 40°F Ambient Temperature - All work to be in accordance with the recommendations of ACI-306R "Cold Weather Concreting."

4.0 MIXING AND PLACING

- 4.1 Equipment - Ready Mix Concrete shall be used and shall conform to the "Specifications for Ready-Mix Concrete," ASTM C-94. Approval is required prior to using job mixed concrete.
- 4.2 Preparation - All work shall be in accordance with ACI-304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete." All construction debris and extraneous matter shall be removed from within the forms. Concrete shall be placed on clean surfaces, free from water. Concrete that has to be dropped four (4) feet or more shall be placed through a tremie.

- 4.3 All concrete shall be consolidated by internal mechanical vibration immediately after placement. Vibrators shall be of a size appropriate for the work, capable of transmitting vibration to concrete at frequencies of not less than 4,500 impulses per minute.

5.0 FORM WORK

- 5.1 Forms shall be of wood, steel or other approved material and shall be set and held true to the dimensions, lines and grades of the structure prior to and during the placement of concrete.
- 5.2 Forms shall not be removed until the concrete has sufficient strength to prevent concrete damage and/or drainage.

6.0 CURING

- 6.1 Fresh concrete shall be protected from rains, flowing water and mechanical injury for a period of at least four (4) days. No loads shall be applied to the concrete until it has reached its design strength.

7.0 REINFORCING STEEL

- 7.1 MATERIAL
  - 7.1.1 All reinforcing bars shall be deformed bars (ASTM-A615) Grade 60.
- 7.2 BENDING AND SPLICING
  - 7.2.1 Bar reinforcement shall be cut and bent to the shapes shown on the plans. Fabrication tolerances shall be in accordance with ACI 315. All bars shall be bent cold, unless otherwise permitted.
  - 7.2.2 All reinforcement shall be furnished in the full lengths indicated on the plans unless otherwise permitted. Except for splices shown on the plans and splices for No. 5 or smaller bars, splicing of bars will not be permitted without written approval. Splices shall be staggered as far as possible.
  - 7.2.3 In lapped splices, the bars shall be placed and wired in such a manner as to maintain the minimum distance to the surface of the concrete shown on the plans.
  - 7.2.4 Substitution of different size bars will be permitted only when authorized by the engineer. The substituted bars shall have an area equivalent to the design area, or larger.
- 7.3 PLACING AND FASTENING
  - 7.3.1 Steel reinforcement shall be accurately placed as shown on the plans and firmly held in position during the placing and setting of concrete. Bars shall be tied at all intersections around the perimeter of each mat and at not less than 2 foot centers or at every intersection, whichever is greater, elsewhere. Welding of cross bars (tack welding) will not be permitted for assembly of reinforcement.
  - 7.3.2 Reinforcing steel shall be supported in its proper position by use of mortar blocks, wire bar supports, supplementary bars or other approved devices. Such devices shall be of such height and placed at sufficiently frequent intervals so as to maintain the distance between the reinforcing and the formed surface or the top surface within 1/4 inch of that indicated on the plans.

V - FILTER FABRIC (GEOTEXTILE SCREEN)

- 1.0 Geotextile (filter fabric) shall be placed over the #57 drainage stone at all weepholes. The filter fabric shall be placed between weepholes, #57 drainage stone and the granular backfill material. Filter fabric shall be placed at all locations shown on the construction drawings and as necessary to maintain a soil-tight system.
- 2.0 Filter fabric cloth shall conform to Contech specification for C60-NW or equivalent and shall meet the following ASTM tests:
  - 2.1 ASTM D4751 - Apparent opening size equal to #70 U.S. Standard Sieve Size.
  - 2.2 ASTM D4632 (Grab Tensile Test) - Minimum Strength = 160 pounds.
  - 2.3 ASTM D4632 (Grab Elongation) - 30-70%.
  - 2.4 ASTM D4533 (Trapezoidal Tear) - Minimum Strength = 60 pounds.
  - 2.5 ASTM D4355 (Stabilized for Heat and Ultra-Violet Degradation) - 70% strength retained.
- 3.0 The minimum fabric coefficient of permeability (ASTM D4491) shall be 0.24 cm/sec.
- 4.0 The fabric shall be non-woven with a minimum thickness (ASTM D5199) of 60 mils.
- 5.0 Fabric shall not be placed over sharp or angular rocks that could tear or puncture it.
- 6.0 Care should be exercised to prevent any puncturing or rupture of the filter fabric. Should such rupture occur the damaged area should be covered with a patch of filter fabric using an overlap minimum of one (1) foot.

PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 40240, EXPIRATION DATE: 6/13/23



*Michael Holt*

**OWNER**  
CHAPELGATE PRESBYTERIAN CHURCH, INC.  
2600 MARRIOTTVILLE RD.  
MARRIOTTVILLE, MD 21104  
(410) 442-5888

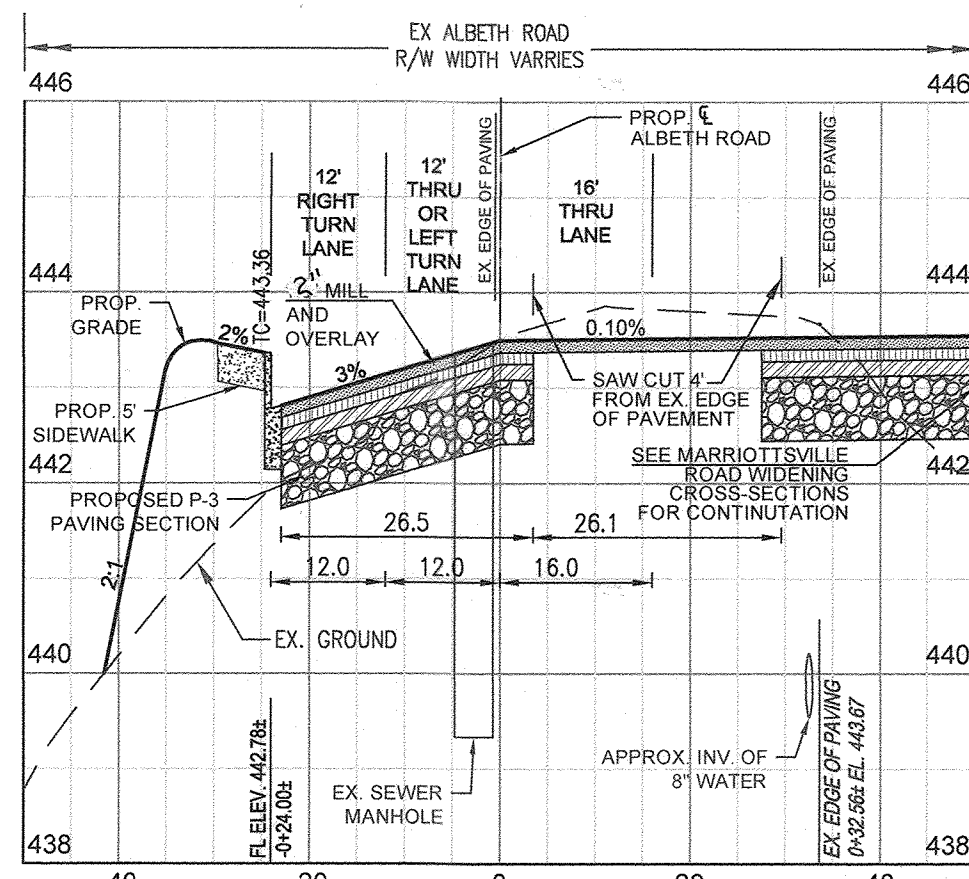
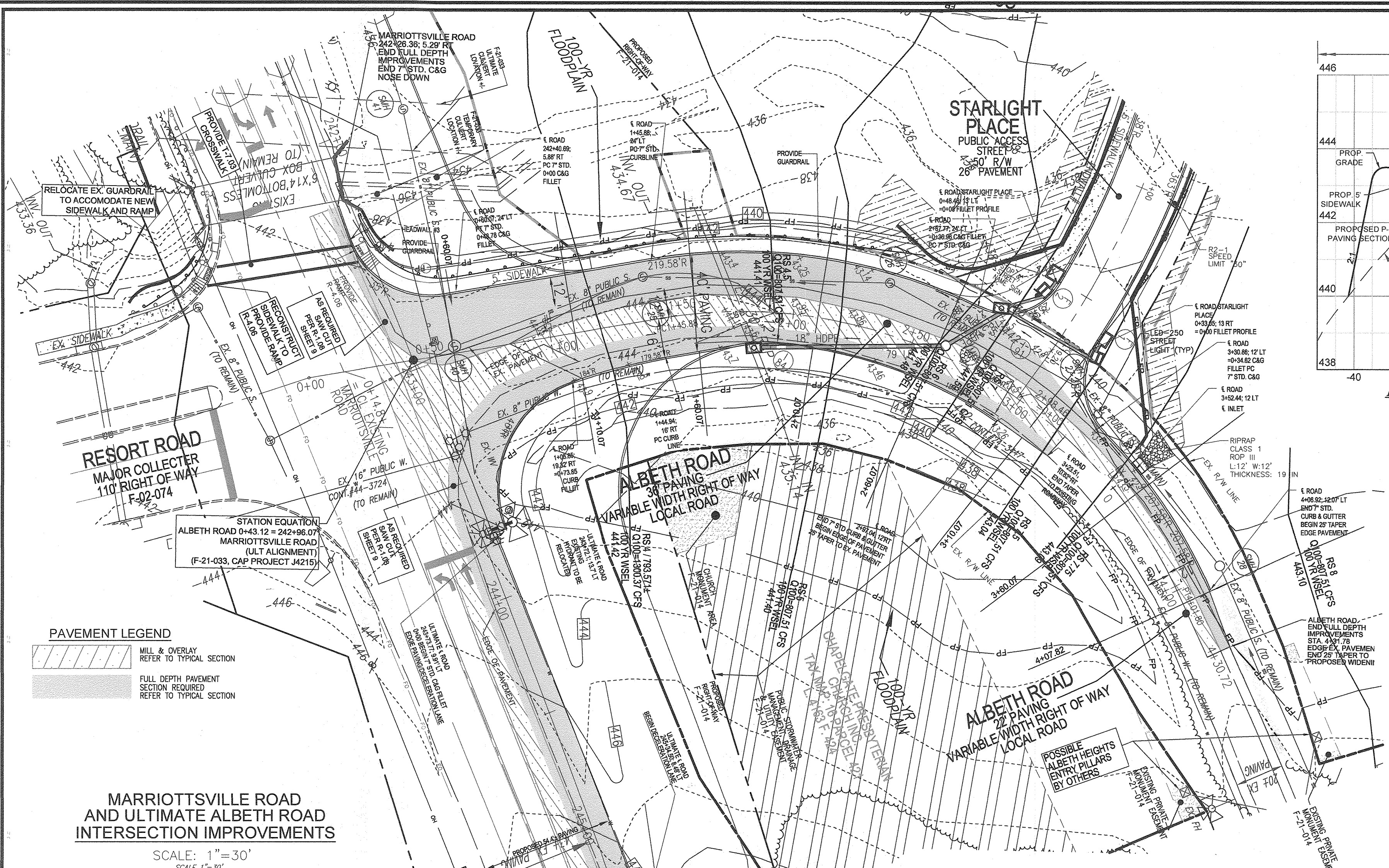
**DEVELOPER**  
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8480 BALTIMORE NATIONAL PIKE  
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410-465-4244  
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2	9/13/21	DJH	REV. 2
1	7/1/21	JBE	REV. 1

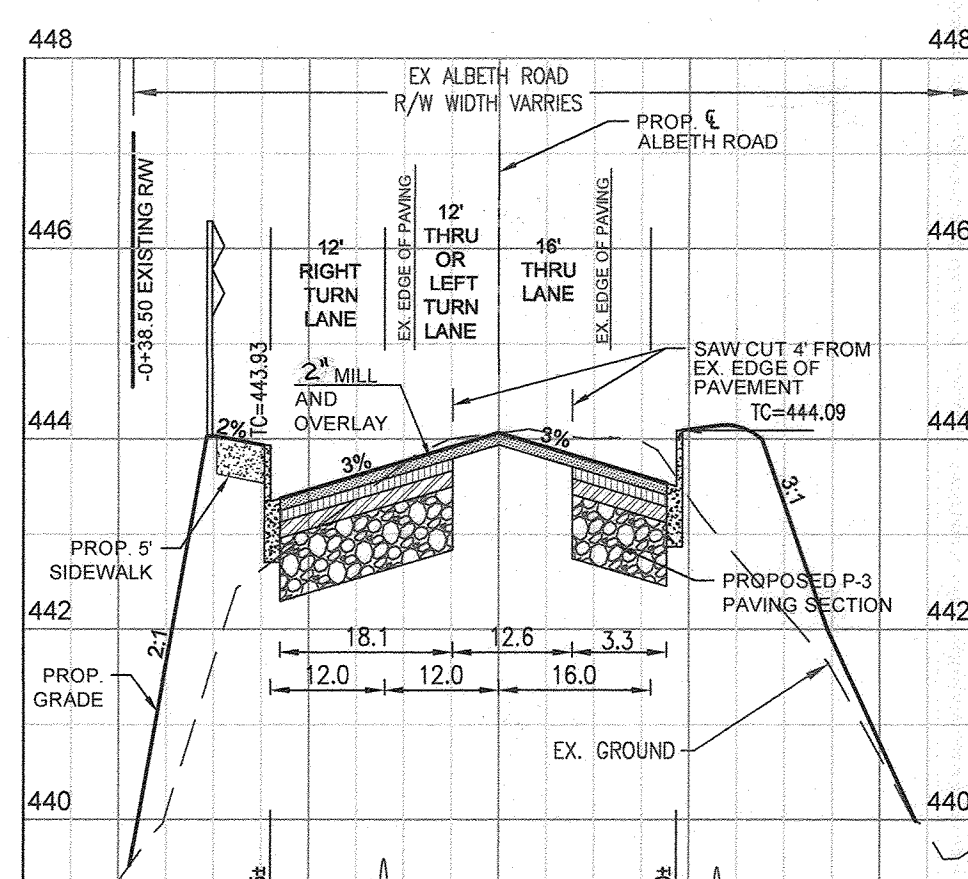
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Approved By	Date	Project No.	Rev. Sheet
DJH	SEPT., 2021	CBC-24067	2 95 OF 101
Scale	GRAPHIC	Rev.	Sheet

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS	
	12/07/2021 MK DATE
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
	12-23-21 DATE
	11/21/22 DATE

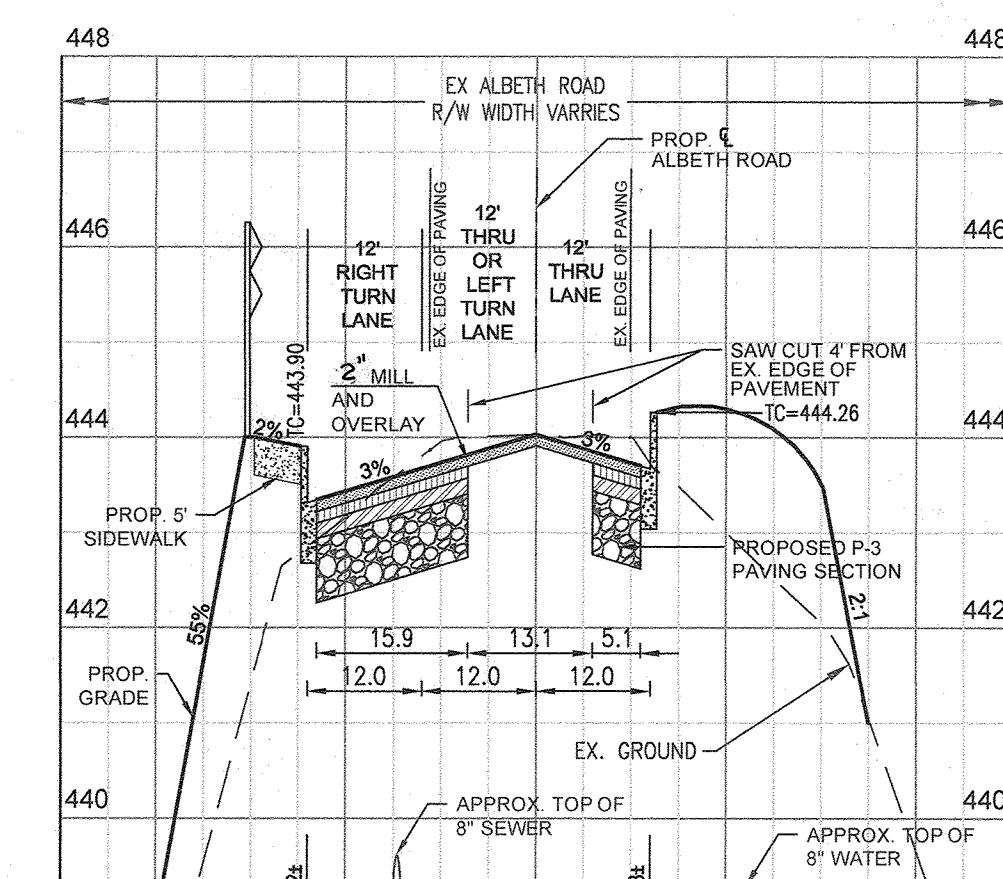




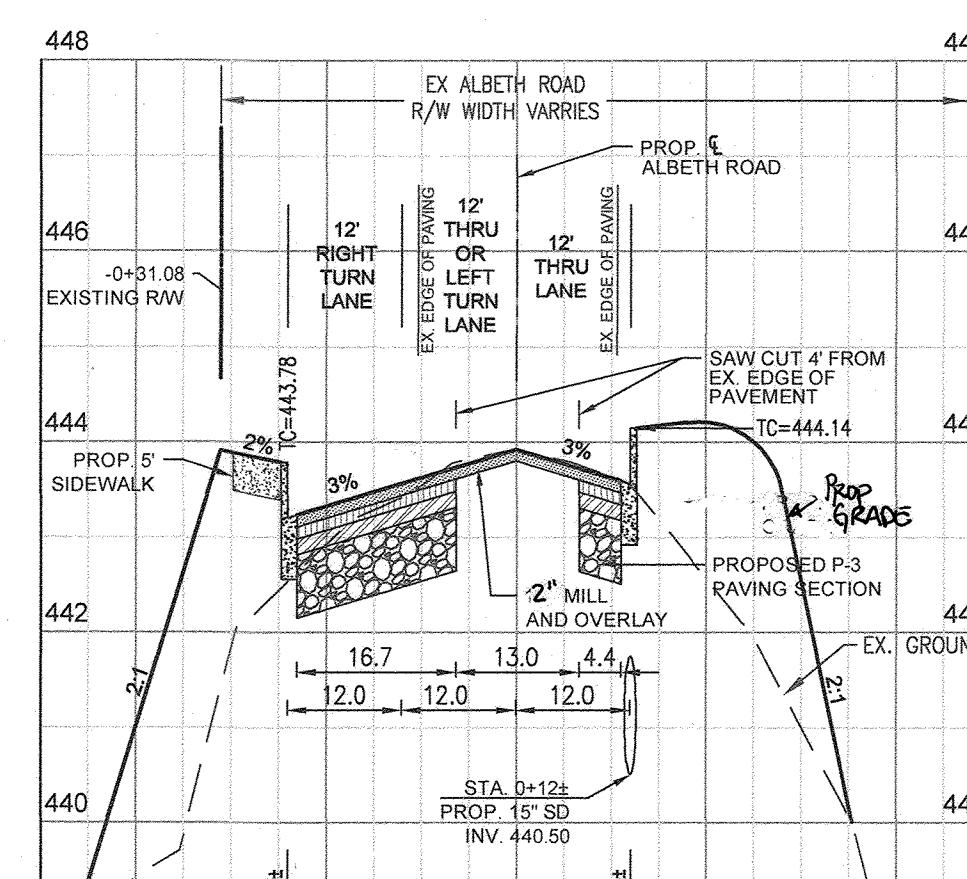
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VERTICAL - 1"=2'



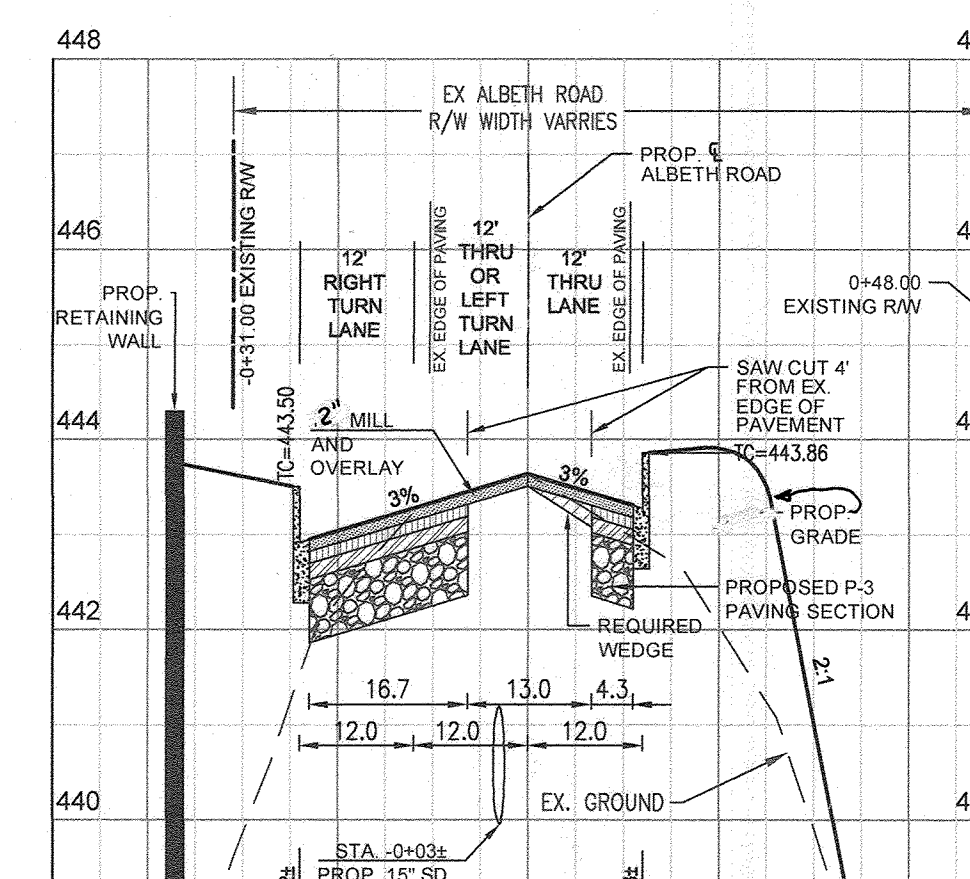
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ALBETH ROAD STA. 1+60.07  
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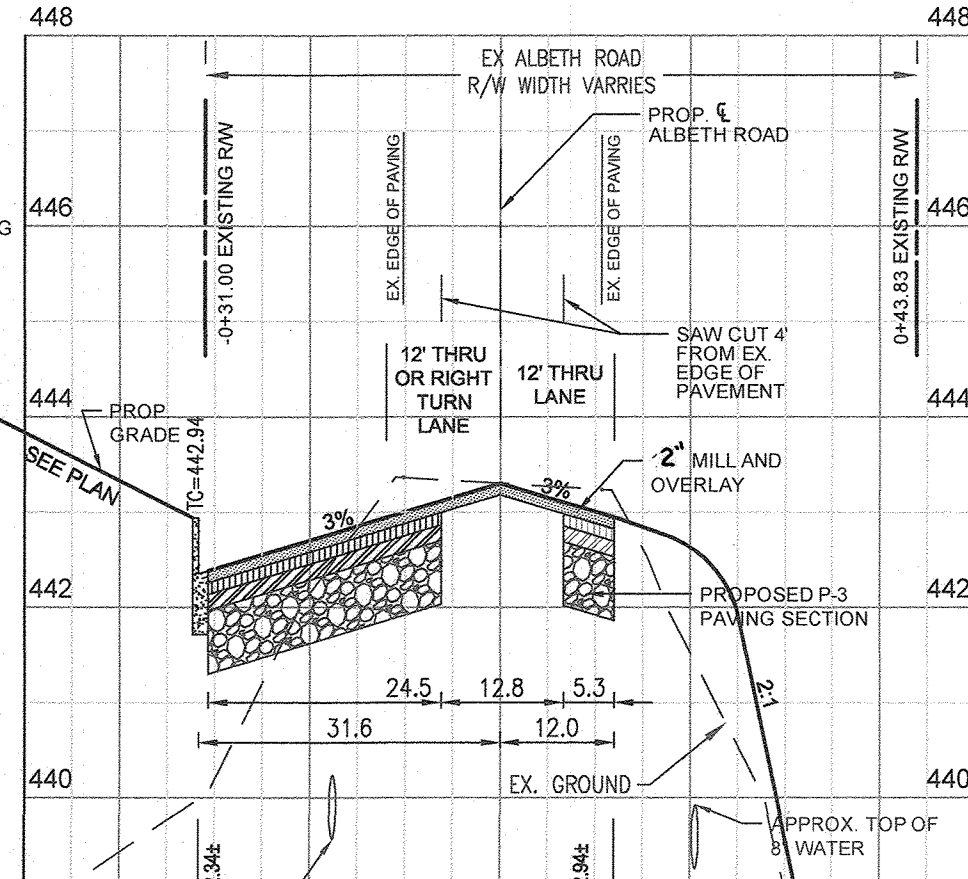


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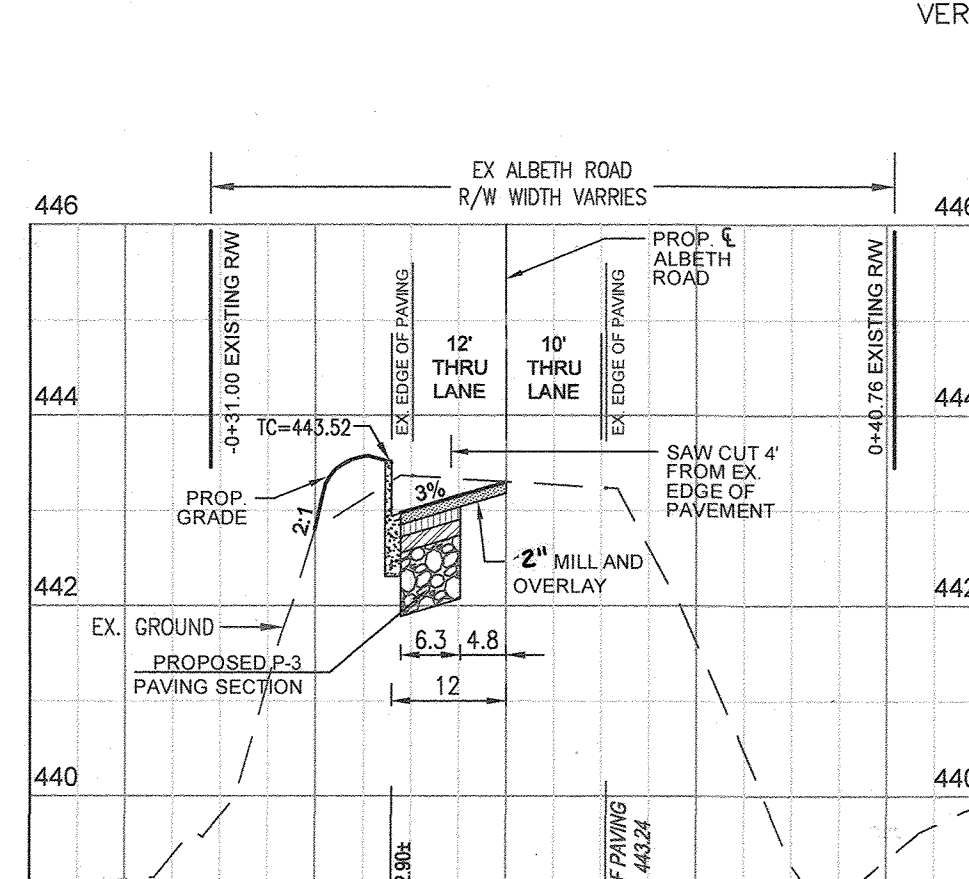


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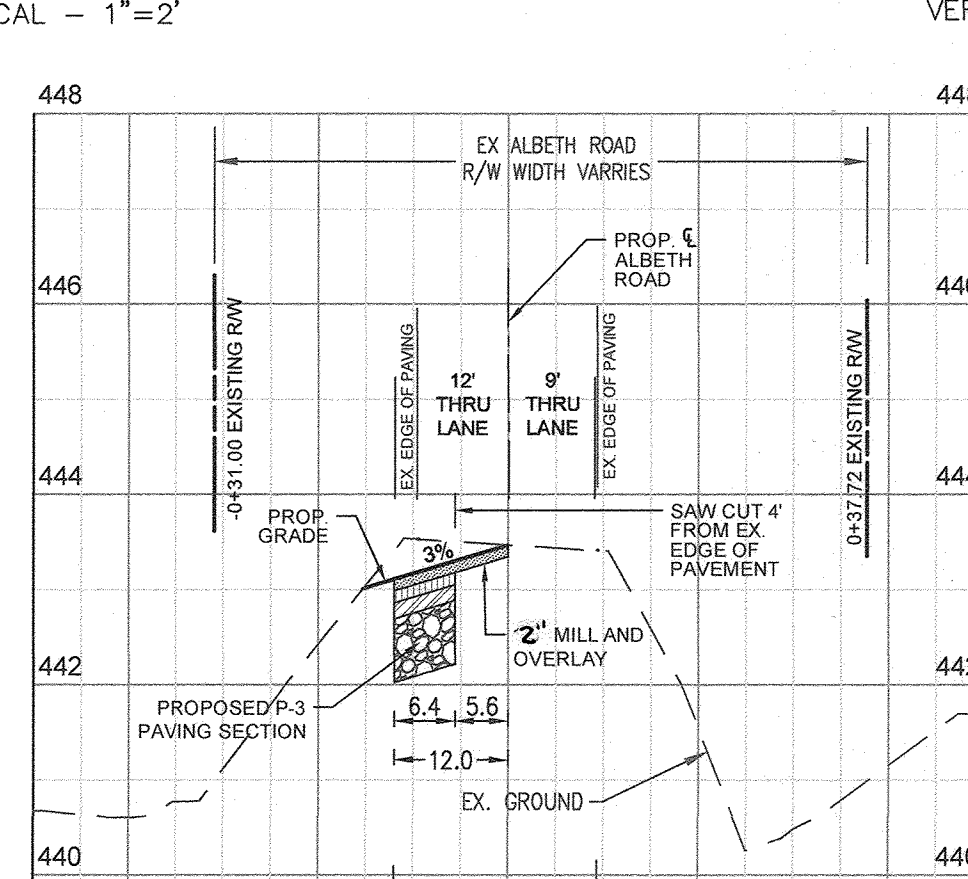
CURVE TABLE - ALBETH ROAD						
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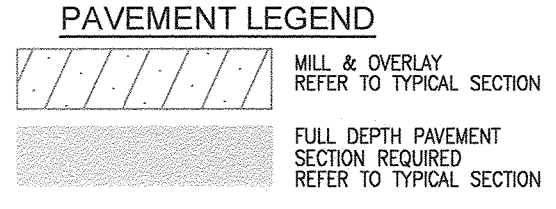
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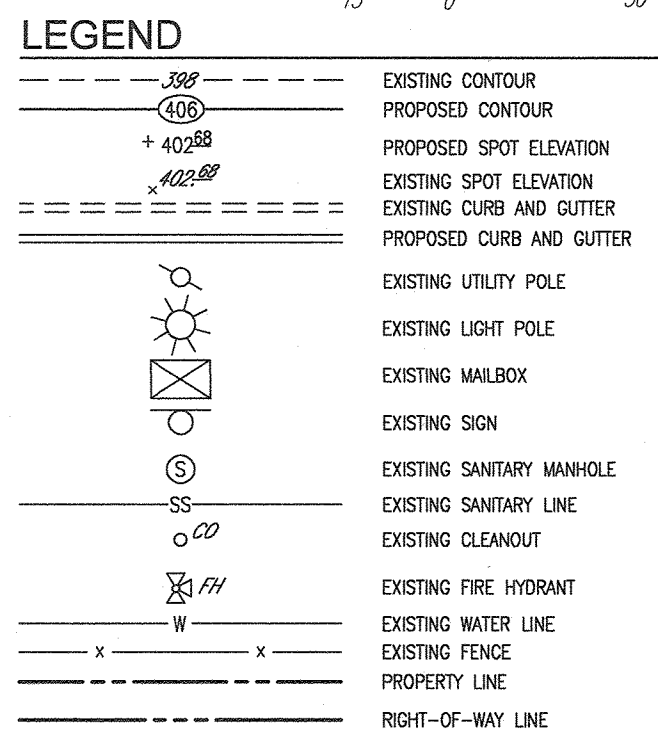


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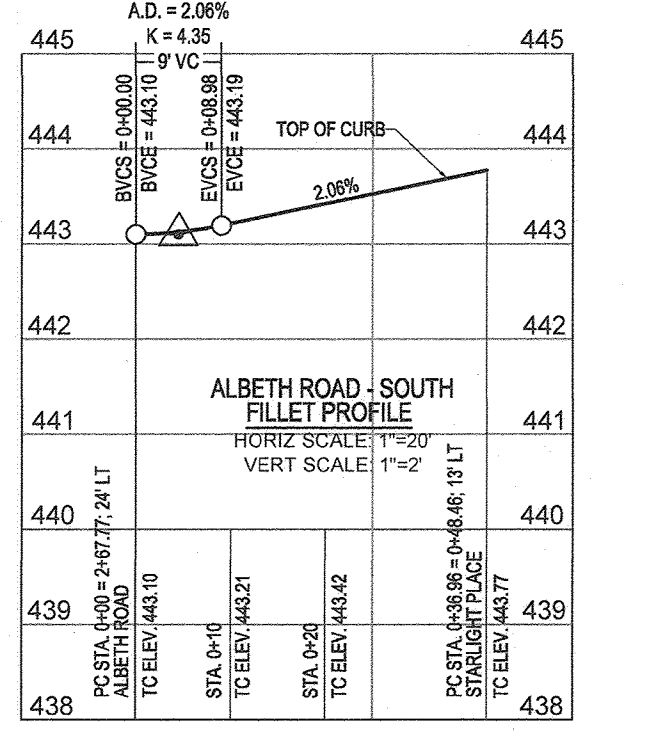
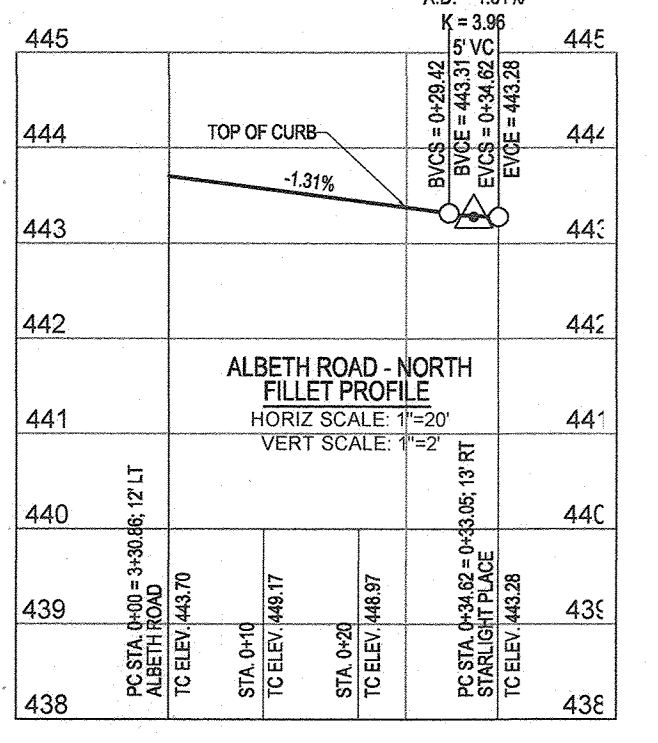


MARRIOTTVILLE ROAD AND ULTIMATE ALBETH ROAD INTERSECTION IMPROVEMENTS

SCALE: 1"=30'



SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA STANDARD SPECIFICATIONS (2009)	MIN. SURFACE COURSE	MIN. SUBGRADE	MIN. FINISH	MIN. TOTAL THICKNESS
P-1	RESURFACING AND NON-RESURFACING, WITH OR WITHOUT CURB AND GUTTER	SECTION 600	1.5	1.5	1.5	4.5
P-2	RESURFACING AND NON-RESURFACING, WITH OR WITHOUT CURB AND GUTTER	SECTION 600	1.5	1.5	1.5	4.5
P-3	RESURFACING AND NON-RESURFACING, WITH OR WITHOUT CURB AND GUTTER	SECTION 600	1.5	1.5	1.5	4.5
P-4	RESURFACING AND NON-RESURFACING, WITH OR WITHOUT CURB AND GUTTER	SECTION 600	1.5	1.5	1.5	4.5



**NOTE**  
AT THE TIME CHAPEL GATE WOODS (F-21-011) IS READY FOR DEDICATION WITH HOWARD COUNTY, IF CONSTRUCTION OF THE MARRIOTTVILLE ROAD IMPROVEMENTS PER THAT SHOWN ON F-21-033 IS NOT UNDERWAY, THE IMPROVEMENTS SHOWN ON SHEETS 98-99 WILL BE REQUIRED.

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ELLICOTT CITY, MD 21041  
410-465-4244  
SDCPROPERTIES.COM

REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE G-28-22.  
DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS

**FINAL ROAD CONSTRUCTION PLAN**  
**ULTIMATE ALBETH ROAD - CROSS SECTIONS AND MARRIOTTVILLE ROAD & ULTIMATE ALBETH ROAD INTERSECTION & ROAD IMPROVEMENTS**  
**CHAPEL GATE WOODS**  
LOTS 1-134, OPEN SPACE LOTS 135-137 AND NON-BUILDABLE BULK PARCEL E  
A RESUBDIVISION OF "CHAPEL GATE" NON-BUILDABLE BULK PARCEL B  
PLATS 25942, 25954  
PARCELS 110 & 421 TAX MAP: 10 GRD: 10 3RD ELECTION DISTRICT  
L 1389/F 339 (P. 110) L 4163/F 424 (P. 421)  
HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
**TIMMONS GROUP**  
3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
P: 410.461.7656 F: 410.461.8961 www.timmons.com

DESIGN BY: ES, RHY  
DRAWN BY: VE+TG  
CHECKED BY: RHY  
DATE: SEPTEMBER 2021  
SCALE: AS SHOWN  
W.O. NO.: 13-38 / 40220

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193  
EXPIRATION DATE: 09-27-2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
12/07/2021  
CHIEF, BUREAU OF HIGHWAYS  
DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
12-23-21  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE

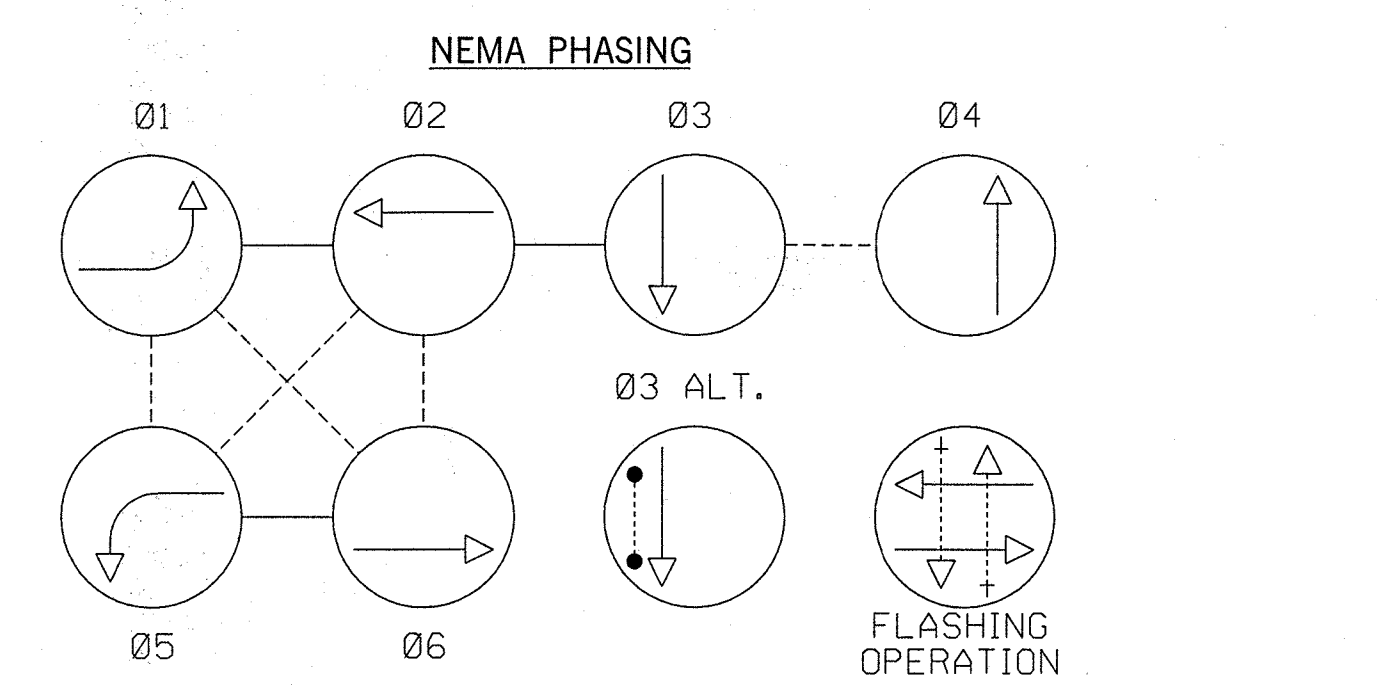
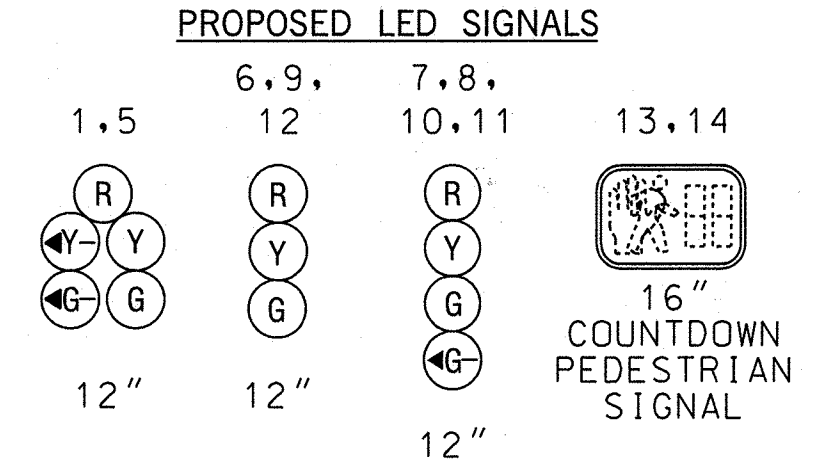
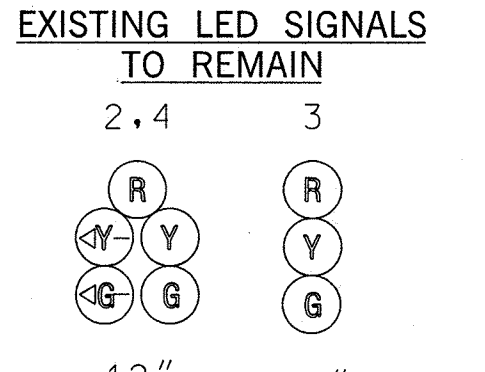
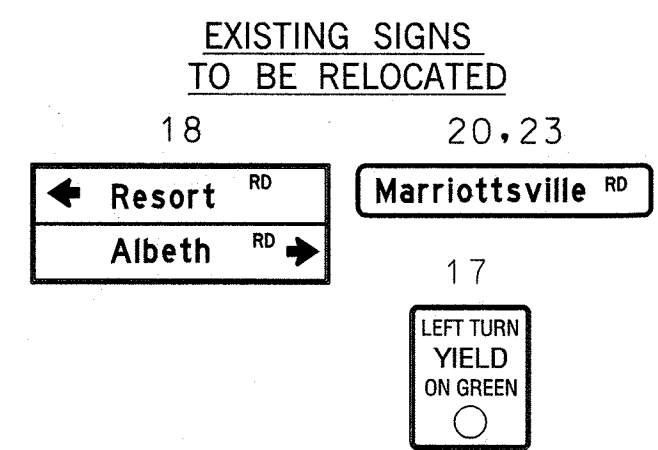
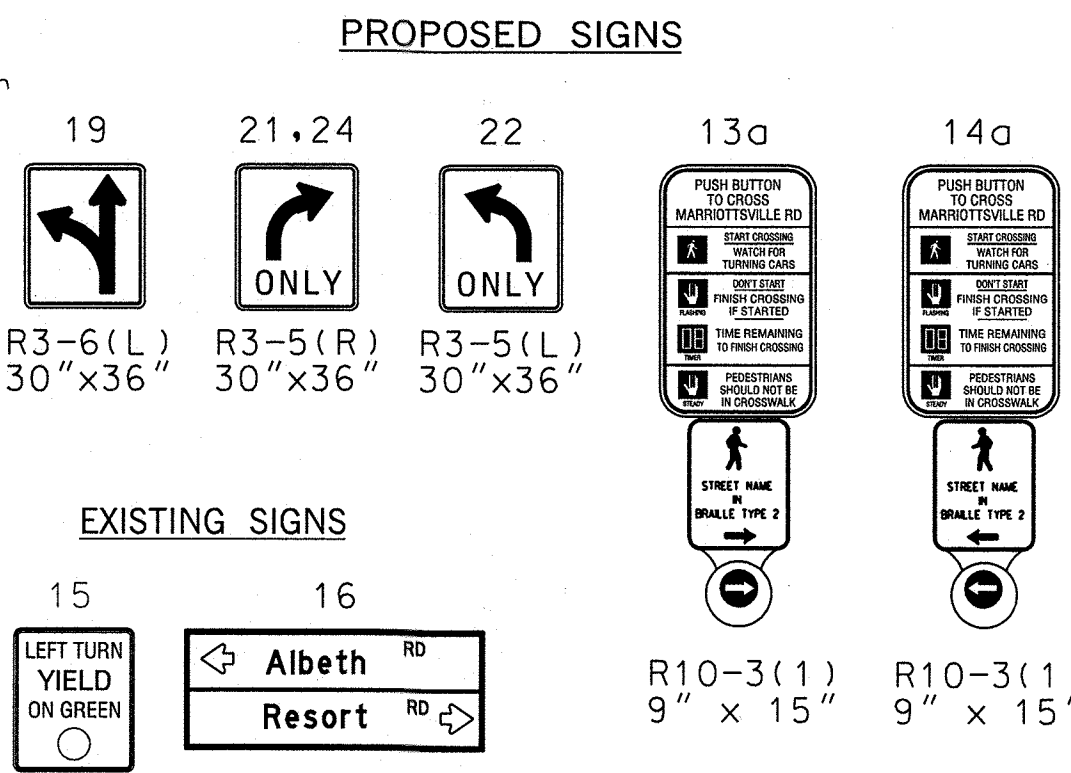
11/2/22  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE



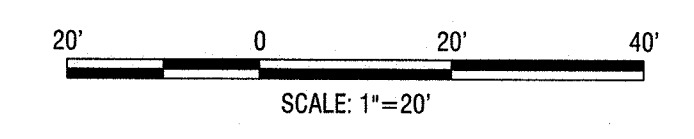
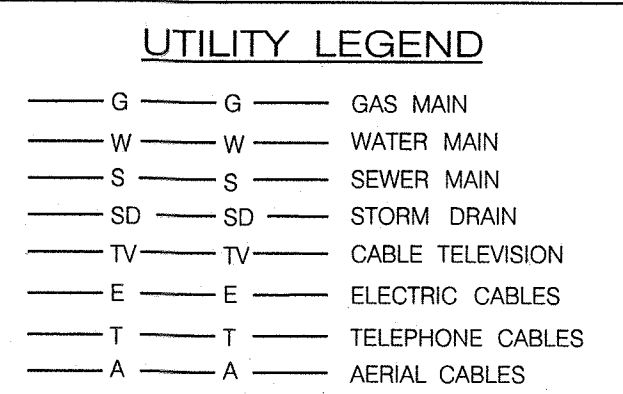
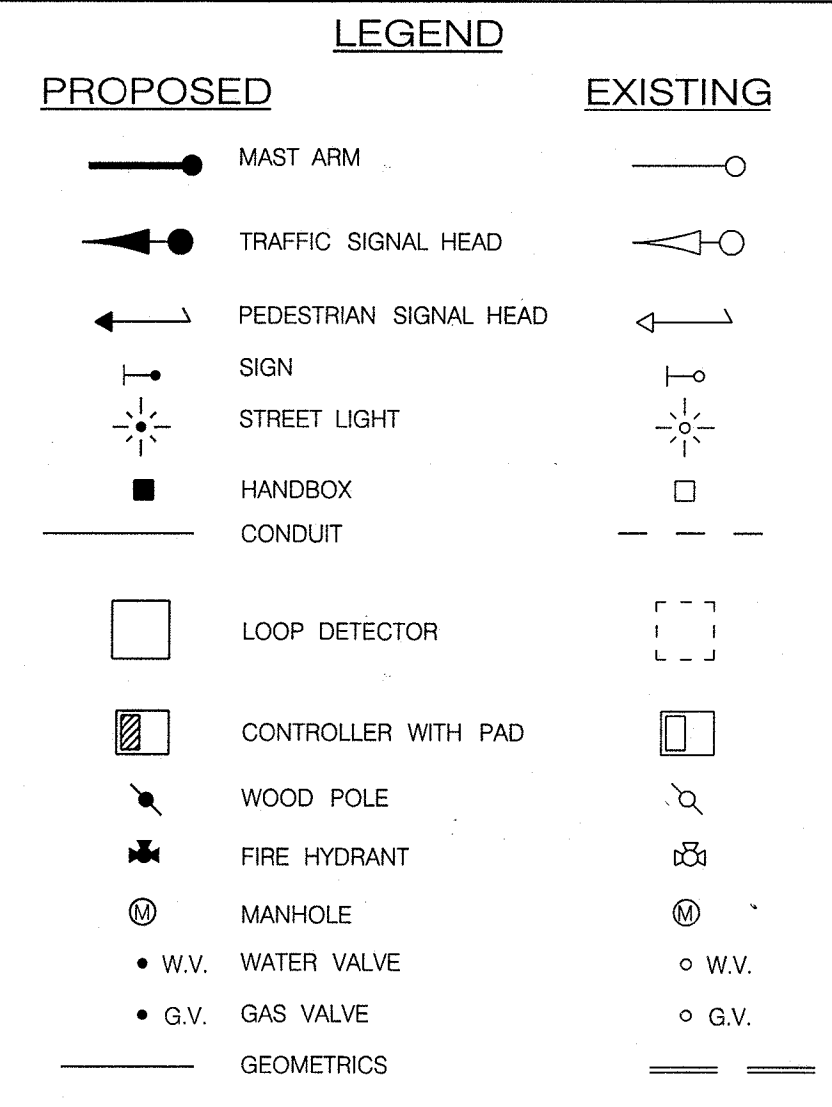
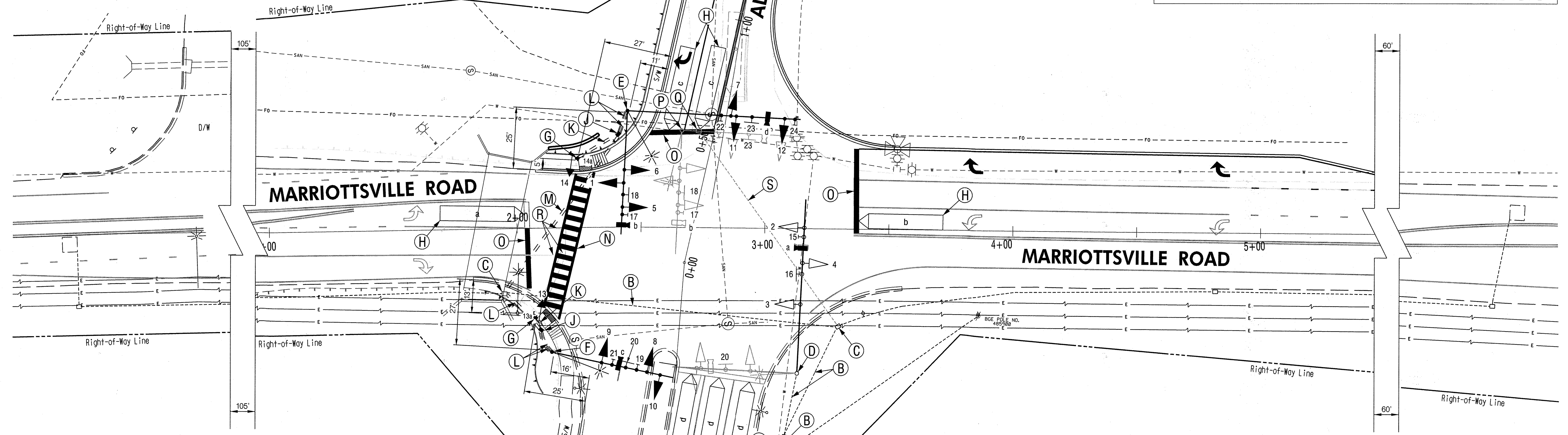




Mariottsville Road is considered to run in a North/South direction.



NOTE: PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY.



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.: 31757, EXPIRATION DATE: 6-28-23

**CONSTRUCTION DETAILS**

- A. USE EXISTING BASE MOUNTED CABINET/CONTROLLER. INSTALL UPDATE VIDEO DETECTION EQUIPMENT.
- B. USE EXISTING CONDUIT.
- C. USE EXISTING HANDBOX.
- D. USE EXISTING SIGNAL POLE, NORTHBOUND MAST ARM AND SIGNAL HEADS. RELOCATE EXISTING SIGNS AND LUMINAIRE AS SHOWN. REPLACE EXISTING VIDEO DETECTION CAMERA, REMOVE EXISTING EASTBOUND MAST ARM AND ALL ATTACHED EQUIPMENT.
- E. INSTALL 27 FT. STEEL TWIN MAST ARM POLE WITH 50 FT. AND 70 FT. MAST ARMS, SIGNAL HEADS, SIGNS, VIDEO DETECTION CAMERAS, 20 FT. LUMINAIRE ARM, AND LED LUMINAIRE. INSTALL RELOCATED STREET NAME SIGNS. (NOTE: TWO-3 IN. PVC SCHEDULE 80 CONDUIT BEND).
- F. INSTALL 27 FT. STEEL MAST ARM POLE WITH 50 FT. MAST ARM, SIGNAL HEADS, SIGNS, VIDEO DETECTION CAMERA, AND RELOCATED 20 FT. LUMINAIRE ARM AND LED LUMINAIRE. INSTALL RELOCATED STREET SIGN. (NOTE: TWO-3 IN. PVC SCHEDULE 80 CONDUIT BEND).
- G. INSTALL 10 FT. STEEL PEDESTAL POLE WITH MODIFIED FOUNDATION WITH BREAKAWAY COUPLINGS, COUNTDOWN PEDESTRIAN SIGNAL HEAD, AUDIBLE PEDESTRIAN PUSHBUTTON AND PEDESTRIAN INSTRUCTIONAL SIGN. (NOTE: ONE-2 IN. PVC SCHEDULE 80 CONDUIT BEND).
- H. PROPOSED VIDEO DETECTION ZONE.
- J. INSTALL HANDBOX.
- K. INSTALL 2 IN. PVC SCHEDULE 80 ELECTRICAL CONDUIT - TRENCHED.
- L. INSTALL 3 IN. PVC SCHEDULE 80 ELECTRICAL CONDUIT - TRENCHED.
- M. INSTALL 4 IN. PVC SCHEDULE 80 ELECTRICAL CONDUIT - BORED.
- N. INSTALL 12 IN. HEAT APPLIED, WHITE PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKING FOR CROSSWALK.
- O. INSTALL 24 IN. HEAT APPLIED, WHITE PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKING FOR STOP LINE/CROSSWALK.
- P. REMOVE EXISTING STEEL POLE AND ALL ATTACHED EQUIPMENT, REMOVE FOUNDATION 12 IN. BELOW GRADE. EXISTING STREET SIGNS TO BE RELOCATED TO NEW SIGNAL POLE.
- Q. REMOVE EXISTING HANDBOX.
- R. REMOVE EXISTING PAVEMENT MARKING.
- S. CAP AND ABANDON EXISTING CONDUIT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 12/23/21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS

The Traffic Group  
 Suite 11  
 9900 Franklin Square Dr.  
 Beltsville, Maryland  
 410-931-6900  
 1-800-585-8411  
 Fax: 410-931-6901



DES:	JAD
DRN:	JAD
CHK:	JJD
DATE:	09/2021
BY:	NO.
REVISION:	
DATE:	

CAPITAL PROJECT NO.  
 T-7104

TRAFFIC SIGNAL PLAN  
 Mariottsville Road  
 at  
 Albeth Road/Resort Road

SCALE:  
 1"=20'  
 SHEET  
 18 OF 40



**PROJECT DESCRIPTION**  
GENERAL

THIS PROJECT INVOLVES THE PARTIAL RECONSTRUCTION OF THE TRAFFIC CONTROL SIGNAL AT THE INTERSECTION OF MARRIOTTSTVILLE ROAD AT RESORT ROAD/ALBETH ROAD IN HOWARD COUNTY, MARYLAND. MARRIOTTSTVILLE ROAD IS CONSIDERED TO RUN IN A NORTH/SOUTH DIRECTION.

**INTERSECTION OPERATION**

EXISTING CONTROLLER HOUSED IN A BASE MOUNTED CABINET SHALL BE UTILIZED. THE INTERSECTION WILL OPERATE IN A 6 NEMA PHASE FULLY ACTUATED MODE. THERE IS EXCLUSIVE LEFT TURN PHASES FOR BOTH THE NORTH AND SOUTHBOUND MOVEMENTS OF MARRIOTTSTVILLE ROAD. THE RESORT ROAD/ALBETH ROAD THROUGH MOVEMENTS WILL OPERATE IN A SPLIT PHASE OPERATION WITH AN ACTUATED PEDESTRIAN MOVEMENT ACROSS THE SOUTH LEG OF THE INTERSECTION.

**EQUIPMENT LIST**

A. EQUIPMENT TO BE FURNISHED BY THE COUNTY AND INSTALLED BY THE TRAFFIC SIGNAL CONTRACTOR.

QUANTITY	UNITS	DESCRIPTION
3	EA	12 IN., ONE-WAY, THREE SECTION L.E.D. (R,Y,G) ADJUSTABLE YELLOW FACED TRAFFIC SIGNAL HEAD WITH MAST ARM MOUNTING HARDWARE AND TUNNEL VISORS
4	EA	12 IN., ONE-WAY, FOUR SECTION L.E.D. (R,Y,G,GA) ADJUSTABLE YELLOW FACED TRAFFIC SIGNAL HEAD WITH MAST ARM MOUNTING HARDWARE AND TUNNEL VISORS
2	EA	12 IN., ONE-WAY, FIVE SECTION L.E.D. (R,Y,G,YA,GA) ADJUSTABLE YELLOW FACED TRAFFIC SIGNAL HEAD WITH MAST ARM MOUNTING HARDWARE AND TUNNEL VISORS
2	EA	16 IN., ONE-WAY, ONE SECTION L.E.D. (COUNTDOWN INDICATIONS) ADJUSTABLE PEDESTRIAN SIGNAL HEAD WITH POST TOP MOUNTING HARDWARE AND CUT-AWAY VISORS
1,320	LF	VIDEO DETECTION CABLE
2	EA	AUDIBLE PEDESTRIAN PUSHBUTTON ASSEMBLY WITH PUSHBUTTON SIGN
1	EA	APS 2-WIRE CENTRAL CONTROL UNIT
1	EA	L.E.D. LAMP
1	EA	30 IN. x 36 IN. R3-5(L) SIGN WITH MAST ARM MOUNTING HARDWARE
2	EA	30 IN. x 36 IN. R3-5(R) SIGN WITH MAST ARM MOUNTING HARDWARE
1	EA	30 IN. x 36 IN. R10-12 SIGN WITH MAST ARM MOUNTING HARDWARE
1	EA	CAMERA DETECTION RETRO-FIT KIT FOR EXISTING CABINET
4	EA	HD IP-BASED VIDEO DETECTION CAMERA

**EQUIPMENT LIST CONT.**

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE TRAFFIC SIGNAL CONTRACTOR.

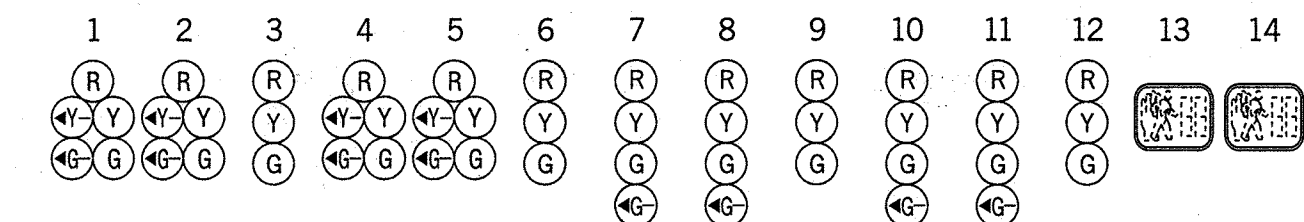
QUANTITY	UNITS	DESCRIPTION
LUMP SUM	LS	MOT - HWY
1.5	CY	TEST PIT EXCAVATION
12	CY	CONCRETE FOUNDATION
25	LF	2 IN. CONDUIT PVC SCHED 80 - TRENCHED
70	LF	3 IN. CONDUIT PVC SCHED 80 - TRENCHED
90	LF	4 IN. CONDUIT PVC SCHED 80 - BORED/PUSHED
2	EA	GROUND ROD WITH CLAMP
620	LF	2- COND. No. 14 AWG IMSA 19-1
710	LF	3- COND. No. 14 AWG IMSA 19-1
1,760	LF	5- COND. No. 14 AWG IMSA 19-1
1,240	LF	7- COND. No. 14 AWG IMSA 19-1
310	LF	1- COND. No. 6 AWG - SOLID BARE COPPER
397	LF	3- COND. No. 12 AWG COPPER TYPE TC
195	LF	24 IN. WHITE THERMOPLASTIC PAVEMENT MARKING - STOP LINE/CROSSWALK
140	LF	12 IN. WHITE THERMOPLASTIC PAVEMENT MARKING - CROSSWALK
1	EA	27 FT. STEEL TWIN MAST ARM POLE WITH 50 FT. AND 70 FT. MAST ARMS
2	EA	10 FT. STEEL PEDESTAL POLE WITH BREAKAWAY COUPLING BASE
1	EA	20 FT. LUMINAIRE ARM
2	EA	TRAFFIC SIGNAL HANDBOX
9	EA	INSTALL SIGNAL HEAD
2	EA	INSTALL PEDESTRIAN SIGNAL HEAD
2	EA	INSTALL PEDESTRIAN PUSHBUTTON & SIGN
4	EA	INSTALL SIGN - MAST ARM
4	EA	RELOCATE EXISTING MAST ARM SIGN
1	EA	RELOCATE EXISTING LUMINAIRE ARM AND LUMINAIRE
4	EA	INSTALL VIDEO CAMERA DETECTOR WITH COUNTY SUPPLIED CLAMP
LUMP SUM	LS	REMOVE SALVAGE EXISTING SIGNAL EQUIPMENT

**GENERAL NOTES**

- VIDEO CAMERA LOCATION/ALIGNING SHALL BE COORDINATED WITH THE COUNTY ENGINEER.
- THE CONTRACTOR SHALL VERIFY ALL PROPOSED POLE AND CABINET LOCATIONS WITH THE COUNTY ENGINEER PRIOR TO INSTALLATION. CONTACTS WITH COUNTY ENGINEER AT (410) 313-5753.
- ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH COUNTY STANDARDS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR TERMINATING ALL SIGNAL CABLE TO THE APPROPRIATE TERMINALS AND PROPERLY LABEL EACH CABLE.
- THE CONTRACTOR SHALL VERIFY ALL UNDERGROUND UTILITIES PRIOR TO INSTALLING PROPOSED SIGNAL EQUIPMENT. IF ANY UTILITY CONFLICTS SHOULD ARISE THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER.
- ALL TRAFFIC SIGNAL FOUNDATIONS SHALL BE INSTALLED AT THE FINAL SIDEWALK OR CURB GRADE FOR CLOSED SECTIONS. HIGHEST ROADWAY PROFILE GRADE FOR OPEN SECTIONS. TO MEET CLEARANCES AS SPECIFIED IN MD 816.03, MD 818.04. THE CONTRACTOR SHALL VERIFY ULTIMATE GRADES PRIOR TO THE INSTALLATION OF ALL SIGNAL EQUIPMENT.
- PUSHBUTTONS ARE TO BE LOCATED SO THAT THEY CAN BE ACTIVATED BY A PERSON IN A WHEELCHAIR REACHING LESS THAN 18 IN. FROM A 60 IN. x 60 IN. LEVEL LANDING AREA WITH A CROSS SLOPE OF LESS THAN OR EQUAL TO 2%.
- THE 10 FT. SEPARATION BETWEEN PUSHBUTTONS IS TO BE MEASURED FROM FACE OF PUSHBUTTON TO FACE OF PUSHBUTTON, NOT CENTER TO CENTER OF POLE.
- PUSHBUTTON ARROWS ARE TO BE PARALLEL TO THE CROSSING FOR WHICH THEY ARE INTENDED.
- THE LOCATION OF ACCESSIBLE PEDESTRIAN SIGNAL PUSHBUTTONS MUST MEET LOCATION REQUIREMENTS OF MUTCD SEC. 4E.08; 4E.10; FIG 4E-3; FIG 4E-4 AND THE NCHRP PUBLICATION, "ACCESSIBLE PEDESTRIAN SIGNALS: GUIDE TO BEST PRACTICE". IF NOT MET, THE CONTRACTOR IS TO STOP WORK ON PUSHBUTTON LOCATIONS UNTIL A DESIGN WAIVER IS OBTAINED, APPROVED BY THE COUNTY.
- THE CONTRACTOR SHALL COORDINATE WITH THE COUNTY ENGINEER 48 HOURS PRIOR TO INSTALLING FOUNDATIONS.
- CONTRACTOR SHALL CONTACT HOWARD COUNTY'S UNDERGROUND UTILITY PERMIT DIVISION AT 410-313-4207 AT LEAST FIVE BUSINESS DAY PRIOR TO STARTING ANY WORK WITHIN THE PUBLIC RIGHT-OF-WAY.

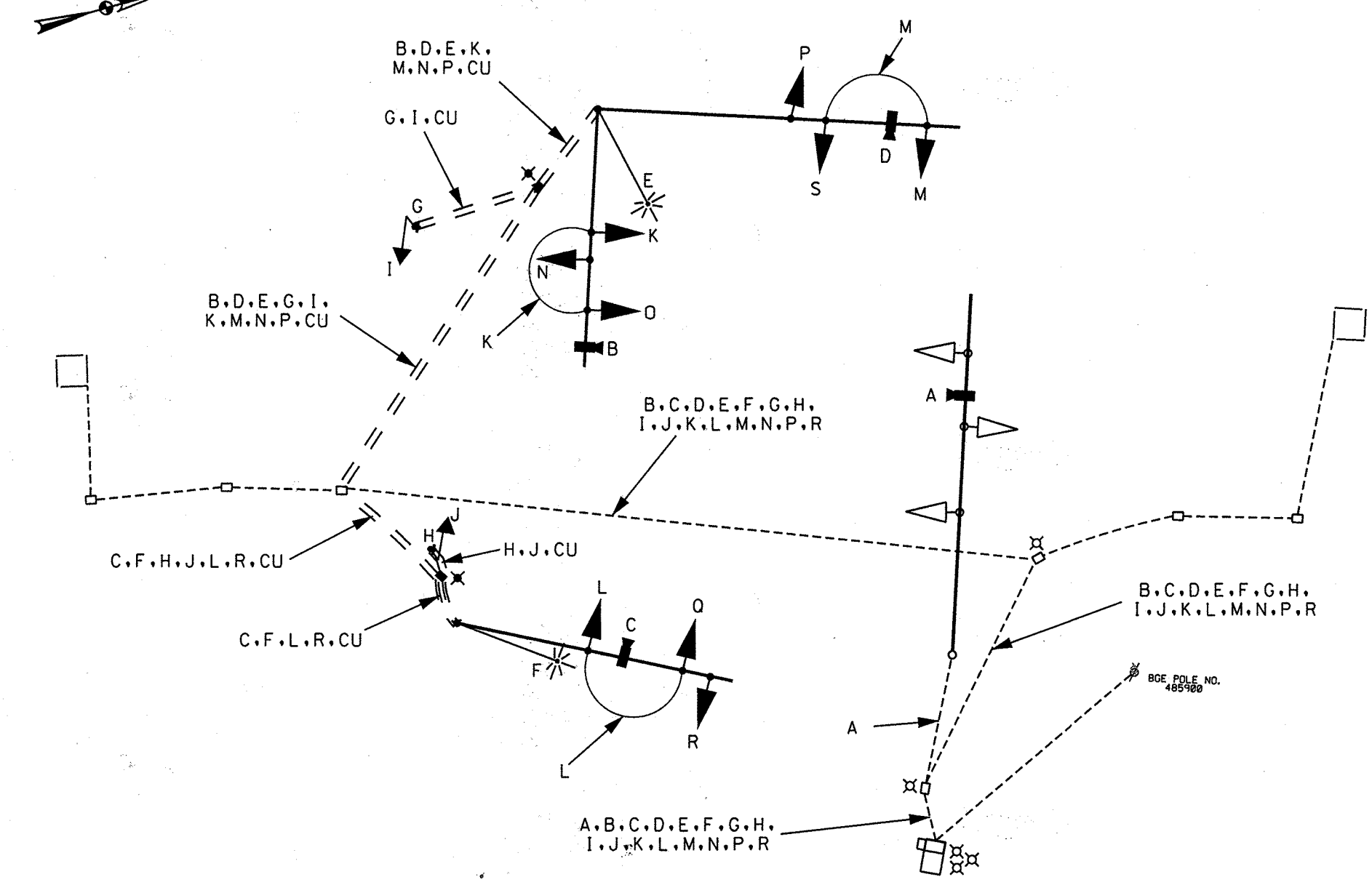
APS WILL FUNCTION AS FOLLOWS:  
FOR MARRIOTTSTVILLE ROAD AT RESORT ROAD/ALBETH ROAD  
A. WHEN PEDESTRIAN LOCATES AND PRESSES PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON MESSAGE WILL BE "WAIT TO CROSS MARRIOTTSTVILLE AT RESORT AND ALBETH. WAIT."  
B. WHEN WALK PHASE BEGINS, THE AUDIBLE SOUND WILL BE A RAPID TICK, WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE.

**PHASE CHART**



PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
PHASE 1 AND 5	+GR	+GR	R	+GR	+GR	R	R	R	R	R	R	R	DW	DW
1 AND 5 CHANGE TO 1 AND 6, 2 AND 5, OR 2 AND 6														
PHASE 1 AND 6	+GG	+GG	G	R	R	R	R	R	R	R	R	R	DW	DW
1 CHANGE	+YG	+YG	G	R	R	R	R	R	R	R	R	R	DW	DW
PHASE 2 AND 5	R	R	R	+GG	+GG	G	R	R	R	R	R	R	DW	DW
5 CHANGE	R	R	R	+YG	+YG	G	R	R	R	R	R	R	DW	DW
PHASE 2 AND 6	G	G	G	G	G	G	R	R	R	R	R	R	DW	DW
2 AND 6 CHANGE	Y	Y	Y	Y	Y	Y	R	R	R	R	R	R	DW	DW
PHASE 3	R	R	R	R	R	R	+GG	+GG	G	R	R	R	DW	DW
3 CHANGE	R	R	R	R	R	R	Y	Y	Y	R	R	R	DW	DW
PHASE ALT 3	R	R	R	R	R	R	+GG	+GG	G	R	R	R	WK	WK
PED CLEARANCE	R	R	R	R	R	R	+GG	+GG	G	R	R	R	FLDW	FLDW
ALT 3 CHANGE	R	R	R	R	R	R	Y	Y	Y	R	R	R	DW	DW
PHASE 4	R	R	R	R	R	R	R	R	R	+GG	+GG	G	DW	DW
4 CHANGE	R	R	R	R	R	R	R	R	R	Y	Y	Y	DW	DW
FLASHING OPERATION	FLY	FLY	FLY	FLY	FLY	FLY	FLR	FLR	FLR	FLR	FLR	FLR	DARK	DARK

**WIRING DIAGRAM**



**KEY**

A	VIDEO DETECTOR CABLE	L	5-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
B		M	
C	3-CONDUCTOR TRAY CABLE (NO. 12 A.W.G.)	N	7-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
D		O	
E	2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)	P	THIN GREEN COPPER GROUND WIRE (NO. 6 A.W.G.)
F		S	
G	2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)	CU	THIN GREEN COPPER GROUND WIRE (NO. 6 A.W.G.)
H		X	

X - PROPOSED GROUND ROD

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.: 31757 EXPIRATION DATE: 6-28-23

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
12/22/21  
12/22/21  
12/07/2021

The Traffic Group  
Suite H  
9900 Franklin Square Dr.  
Baltimore, Maryland  
410-931-6600  
1-800-583-8411  
Fax: 410-931-6601



DES: JAD	
DRN: JAD	
CHK: JJD	
DATE: 09/2021	
BY: NO	REVISION

CAPITAL PROJECT NO.  
T-7104  
600 SCALE MAP NO. DATE:

GENERAL INFORMATION SHEET  
Marriottsville Road  
at  
Albeth Road/Resort Road

SCALE:  
N.T.S.  
SHEET  
99 OF 101



SITE SPECIFIC DATA	
PROJECT NUMBER	13665
PROJECT NAME	CHAPEL GATE WOODS
PROJECT LOCATION	MARROTSVILLE, MD
STRUCTURE ID	F-1
TREATMENT REQUIRED	
VOLUME BASED (CF) ESQ	FLOW BASED (CFS)
110	N/A
TREATMENT HGL AVAILABLE (FT)	3.24
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	N/A
PIPE DATA	I.E. MATERIAL DIAMETER
INLET PIPE 1	439.89 PVC 12"
INLET PIPE 2	N/A N/A N/A
OUTLET PIPE	439.35 PVC 12"
PRETREATMENT	BIOFILTRATION DISCHARGE
RM ELEVATION	443.60 443.60 443.60
SURFACE LOAD	PEDESTRIAN N/A PEDESTRIAN
FRAME & COVER	24" X 42" OPEN PLANTER N/A
METALANMEDIA VOLUME (CY)	0.86
ORIFICE SIZE (DIA. INCHES)	#1.03"

NOTES: PRELIMINARY NOT FOR CONSTRUCTION. 8.44 50 FT OF METALAN MEDIA PROVIDED. MINIMUM 110 CF STORED PRIOR TO TREATMENT.

INSTALLATION NOTES:  
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND ACCESSORIES REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPEARANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.  
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.  
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTERSECT BEYOND FLOORS). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER-TIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.  
4. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GRIND ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.  
5. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.  
6. CONTRACTOR RESPONSIBLE FOR CONTRACTING BIO-CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO-CLEAN REPRESENTATIVE.

GENERAL NOTES:  
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.  
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS REGARDING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO-CLEAN.

PLAN VIEW LEFT END VIEW

ELEVATION VIEW RIGHT END VIEW

MWS-L-4-4'-2" V STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

SITE SPECIFIC DATA	
PROJECT NUMBER	13665
PROJECT NAME	CHAPEL GATE WOODS
PROJECT LOCATION	MARROTSVILLE, MD
STRUCTURE ID	F-1
TREATMENT REQUIRED	
VOLUME BASED (CF) ESQ	FLOW BASED (CFS)
110	N/A
TREATMENT HGL AVAILABLE (FT)	3.24
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	N/A
PIPE DATA	I.E. MATERIAL DIAMETER
INLET PIPE 1	439.89 PVC 12"
INLET PIPE 2	N/A N/A N/A
OUTLET PIPE	439.35 PVC 12"
PRETREATMENT	BIOFILTRATION DISCHARGE
RM ELEVATION	443.60 443.60 443.60
SURFACE LOAD	PEDESTRIAN N/A PEDESTRIAN
FRAME & COVER	24" X 42" OPEN PLANTER N/A
METALANMEDIA VOLUME (CY)	0.86
ORIFICE SIZE (DIA. INCHES)	#1.03"

NOTES: PRELIMINARY NOT FOR CONSTRUCTION. 8.44 50 FT OF METALAN MEDIA PROVIDED. MINIMUM 110 CF STORED PRIOR TO TREATMENT.

INSTALLATION NOTES:  
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND ACCESSORIES REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPEARANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.  
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.  
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTERSECT BEYOND FLOORS). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER-TIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.  
4. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GRIND ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.  
5. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.  
6. CONTRACTOR RESPONSIBLE FOR CONTRACTING BIO-CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO-CLEAN REPRESENTATIVE.

GENERAL NOTES:  
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.  
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS REGARDING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO-CLEAN.

PLAN VIEW ELEVATION VIEW

MWS-L-4-4'-2" V STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

SITE SPECIFIC DATA	
PROJECT NUMBER	13665
PROJECT NAME	CHAPEL GATE WOODS
PROJECT LOCATION	MARROTSVILLE, MD
STRUCTURE ID	F-2
TREATMENT REQUIRED	
VOLUME BASED (CF) ESQ	FLOW BASED (CFS)
143	N/A
TREATMENT HGL AVAILABLE (FT)	3.24
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	N/A
PIPE DATA	I.E. MATERIAL DIAMETER
INLET PIPE 1	439.89 PVC 12"
INLET PIPE 2	N/A N/A N/A
OUTLET PIPE	439.64 PVC 12"
PRETREATMENT	BIOFILTRATION DISCHARGE
RM ELEVATION	443.91 443.91 443.91
SURFACE LOAD	PEDESTRIAN N/A PEDESTRIAN
FRAME & COVER	24" X 42" OPEN PLANTER N/A
METALANMEDIA VOLUME (CY)	0.86
ORIFICE SIZE (DIA. INCHES)	#1.03"

NOTES: PRELIMINARY NOT FOR CONSTRUCTION. 8.44 50 FT OF METALAN MEDIA PROVIDED. MINIMUM 123 CF STORED PRIOR TO TREATMENT.

INSTALLATION NOTES:  
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND ACCESSORIES REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPEARANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.  
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.  
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTERSECT BEYOND FLOORS). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER-TIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.  
4. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GRIND ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.  
5. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.  
6. CONTRACTOR RESPONSIBLE FOR CONTRACTING BIO-CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO-CLEAN REPRESENTATIVE.

GENERAL NOTES:  
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.  
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS REGARDING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO-CLEAN.

PLAN VIEW LEFT END VIEW

ELEVATION VIEW RIGHT END VIEW

MWS-L-4-4'-2.2" V STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

SITE SPECIFIC DATA	
PROJECT NUMBER	13665
PROJECT NAME	CHAPEL GATE WOODS
PROJECT LOCATION	MARROTSVILLE, MD
STRUCTURE ID	F-2
TREATMENT REQUIRED	
VOLUME BASED (CF) ESQ	FLOW BASED (CFS)
143	N/A
TREATMENT HGL AVAILABLE (FT)	3.24
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE	N/A
PIPE DATA	I.E. MATERIAL DIAMETER
INLET PIPE 1	439.89 PVC 12"
INLET PIPE 2	N/A N/A N/A
OUTLET PIPE	439.64 PVC 12"
PRETREATMENT	BIOFILTRATION DISCHARGE
RM ELEVATION	443.91 443.91 443.91
SURFACE LOAD	PEDESTRIAN N/A PEDESTRIAN
FRAME & COVER	24" X 42" OPEN PLANTER N/A
METALANMEDIA VOLUME (CY)	0.86
ORIFICE SIZE (DIA. INCHES)	#1.03"

NOTES: PRELIMINARY NOT FOR CONSTRUCTION. 8.44 50 FT OF METALAN MEDIA PROVIDED. MINIMUM 123 CF STORED PRIOR TO TREATMENT.

INSTALLATION NOTES:  
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND ACCESSORIES REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPEARANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.  
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.  
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTERSECT BEYOND FLOORS). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER-TIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.  
4. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GRIND ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.  
5. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.  
6. CONTRACTOR RESPONSIBLE FOR CONTRACTING BIO-CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO-CLEAN REPRESENTATIVE.

GENERAL NOTES:  
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.  
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS REGARDING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO-CLEAN.

PLAN VIEW ELEVATION VIEW

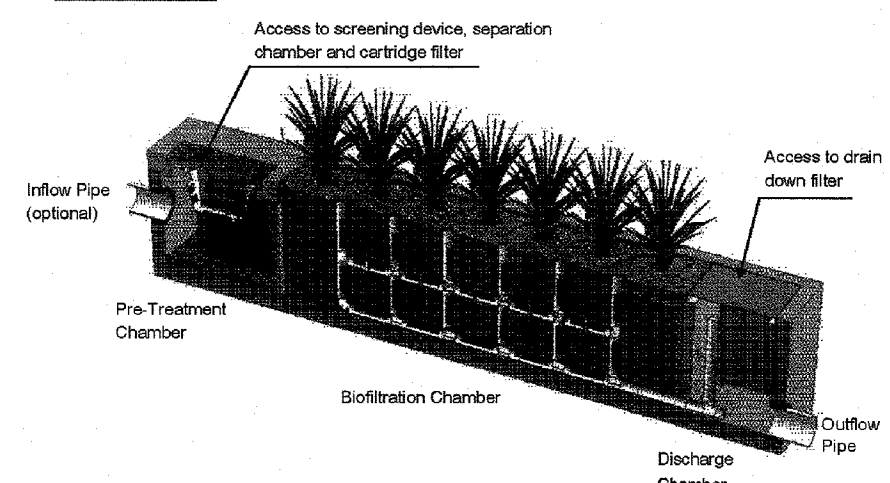
MWS-L-4-4'-2.2" V STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device - average maintenance interval is 6 to 12 months.
  - (5 minute average service time)
- Remove Sediment from Separation Chamber - average maintenance interval is 12 to 24 months.
  - (10 minute average service time)
- Replace Cartridge Filter Media - average maintenance interval 12 to 24 months.
  - (10-15 minute per cartridge average service time)
- Replace Drain Down Filter Media - average maintenance interval is 12 to 24 months.
  - (5 minute average service time)
- Trim Vegetation - average maintenance interval is 6 to 12 months.
  - (Service time varies)

System Diagram



www.BioCleanEnvironmental.com

OPERATION AND MAINTAINANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED UNDERGROUND FACILITIES

- THE UNDERGROUND STORMWATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN ITS OPERATION AND FUNCTION.
- THE UNDERGROUND STORMWATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVENTS.
- WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHALL BE CLEANED.
- THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEANUP OPERATION.
- THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORMWATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
- THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX (6) MONTHS. IF OBSTRUCTIONS ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 12/07/2021  
 CHIEF, BUREAU OF HIGHWAYS M.K. DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 12-23-21  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

Maintenance Procedures

- Screening Device**
- Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
  - Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
  - Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.
- Separation Chamber**
- Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
  - With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
  - Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.
- Cartridge Filters**
- Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
  - Enter separation chamber.
  - Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
  - Remove each of 4 to 8 media cages holding the media in place.
  - Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
  - Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.
- Drain Down Filter**
- Remove hatch or manhole cover over discharge chamber and enter chamber.
  - Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
  - Exit chamber and replace hatch or manhole cover.

Maintenance Notes

- BIO-CLEAN DEVICE SHALL BE MAINTAINED BY THE H.O.A.
- Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.
  - The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.
  - Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
  - Entry into chambers may require confined space training based on state and local regulations.
  - No fertilizer shall be used in the Biofiltration Chamber.

OWNER: CHAPEL GATE PRESBYTERIAN CHURCH, INC. 2600 MARROTSVILLE RD. MARROTSVILLE, MD 21104 (410) 442-2888

DEVELOPER: SECURITY DEVELOPMENT 8480 BALTIMORE NATIONAL PIKE SUITE 415 ELLICOTT CITY, MD 21041 410-465-4244 SDCPROPERTIES.COM

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLAN  
 BIO-CLEAN BIOFILTRATION SYSTEM  
 NOTES & DETAILS  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E  
 A RESUBDIVISION OF "CHAPEL GATE" - NON-BUILDABLE BULK PARCEL B  
 PLATS 25942-25954  
 PARCELS: 110 & 421 L 1389/F, 339 (P. 110)  
 TAX MAP: 16 GRID: 10 SUITE 415  
 3RD ELECTION DISTRICT ZONED: CEF-M HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
 REGISTERED PROFESSIONAL ENGINEER

**TIMMONS GROUP**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
 P: 410-461.7666 F: 410-461.8961 www.timmons.com

DESIGN BY: RHV  
 DRAWN BY: VE+TG  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

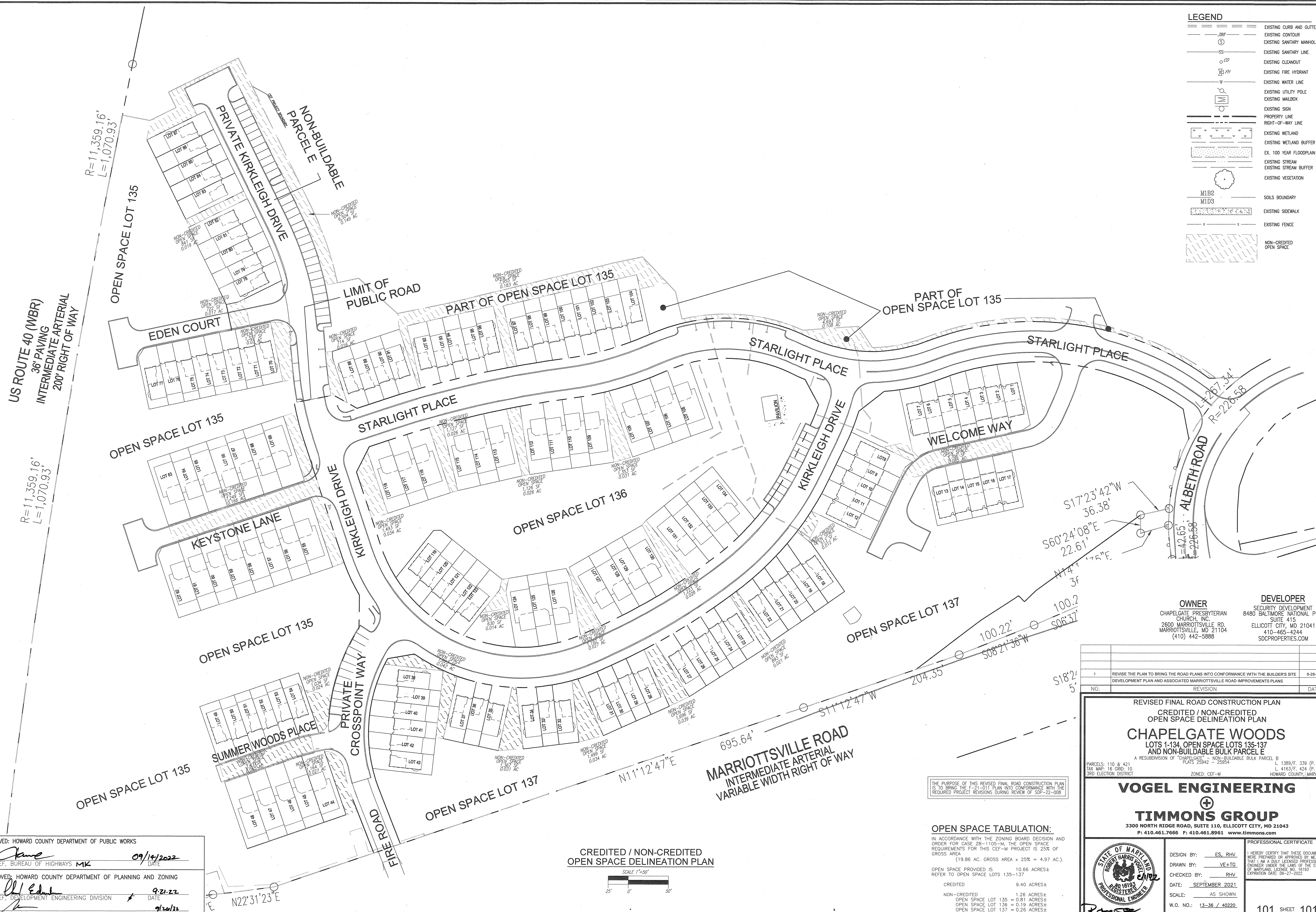
PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

100 SHEET OF 101



**LEGEND**

	EXISTING CURB AND GUTTER
	EXISTING CONTOUR
	EXISTING SANITARY MANHOLE
	EXISTING SANITARY LINE
	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	EXISTING UTILITY POLE
	EXISTING MAILBOX
	EXISTING SIGN
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	EXISTING WETLAND
	EXISTING WETLAND BUFFER
	EX. 100 YEAR FLOODPLAIN
	EXISTING STREAM
	EXISTING STREAM BUFFER
	EXISTING VEGETATION
	M1B2 SOILS BOUNDARY
	M1D3 SOILS BOUNDARY
	EXISTING SIDEWALK
	EXISTING FENCE
	NON-CREDITED OPEN SPACE



**OWNER**  
 CHAPEL GATE PRESBYTERIAN CHURCH, INC.  
 SUITE 415  
 2600 MARRIOTTVILLE RD.  
 MARRIOTTVILLE, MD 21104  
 (410) 442-5888

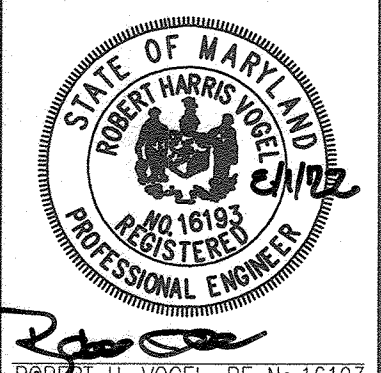
**DEVELOPER**  
 SECURITY DEVELOPMENT  
 8480 BALTIMORE NATIONAL PIKE  
 SUITE 415  
 ELLICOTT CITY, MD 21041  
 410-465-4244  
 SDCPROPERTIES.COM

NO.	REVISION	DATE
1	REVISE THE PLAN TO BRING THE ROAD PLANS INTO CONFORMANCE WITH THE BUILDER'S SITE DEVELOPMENT PLAN AND ASSOCIATED MARRIOTTVILLE ROAD IMPROVEMENTS PLANS	6-28-22

**REVISED FINAL ROAD CONSTRUCTION PLAN**  
 CREDITED / NON-CREDITED  
 OPEN SPACE DELINEATION PLAN  
**CHAPEL GATE WOODS**  
 LOTS 1-134, OPEN SPACE LOTS 135-137  
 AND NON-BUILDABLE BULK PARCEL E

A RESUBDIVISION OF 'CHAPEL GATE' - NON-BUILDABLE BULK PARCEL B  
 PLANS 25242 & 25254  
 L 1389/F. 339 (P. 110)  
 L 4163/F. 424 (P. 421)  
 PARCELS: 110 & 421  
 TAX MAP: 16 GRID: 10  
 3RD ELECTION DISTRICT  
 ZONED: CEF-M  
 HOWARD COUNTY, MARYLAND

**VOGEL ENGINEERING**  
 +  
**TIMMONS GROUP**  
 3300 NORTH RIDGE ROAD, SUITE 110, ELLICOTT CITY, MD 21043  
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**PROFESSIONAL CERTIFICATE**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 16193 EXPIRATION DATE: 09-27-2022

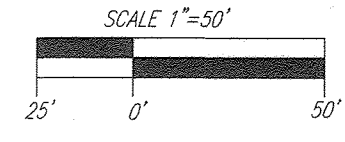
DESIGN BY: ES, RHV  
 DRAWN BY: VE+TC  
 CHECKED BY: RHV  
 DATE: SEPTEMBER 2021  
 SCALE: AS SHOWN  
 W.O. NO.: 13-36 / 40220

THE PURPOSE OF THIS REVISED FINAL ROAD CONSTRUCTION PLAN IS TO BRING THE F-21-DT1 PLAN INTO CONFORMANCE WITH THE REQUIRED PROJECT REVISIONS DURING REVIEW OF SSP-22-008

**OPEN SPACE TABULATION:**  
 IN ACCORDANCE WITH THE ZONING BOARD DECISION AND ORDER FOR CASE ZB-1105-M, THE OPEN SPACE REQUIREMENTS FOR THIS CEF-M PROJECT IS 25% OF GROSS AREA.  
 (19.86 AC. GROSS AREA x 25% = 4.97 AC.)

OPEN SPACE PROVIDED IS	10.66 ACRES±
REFER TO OPEN SPACE LOTS 135-137	
CREDITED	9.40 ACRES±
NON-CREDITED	1.26 ACRES±
OPEN SPACE LOT 135	= 0.81 ACRES±
OPEN SPACE LOT 136	= 0.19 ACRES±
OPEN SPACE LOT 137	= 0.26 ACRES±

**CREDITED / NON-CREDITED  
 OPEN SPACE DELINEATION PLAN**



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] MK  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 09/14/2022

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] J. Edman  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 9-21-22

APPROVED: [Signature] gpm  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 9/20/22