

GENERAL NOTES

- 1) THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
- 2) BOUNDARY IS BASED ON A FIELD RUN MONUMENTED SUBURBAN BOUNDARY SURVEY PERFORMED BY JOHN A. MILDBERG IN MARCH, 2006.
- 3) THE EXISTING TOPOGRAPHY SHOWN ON-SITE IS BASED ON AN AERIAL TOPOGRAPHIC SURVEY PERFORMED BY WINGS AERIAL MAPPING CO. INC. FROM 01 OF ABOUT JANUARY, 2006.
- 4) THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM, HOWARD COUNTY MONUMENT NOS. 16E1 AND 0012 WERE USED FOR THIS PROJECT.
- 5) WATER IS PUBLIC, THE CONTRACT NUMBER IS 24-4549-D. THE DRAINAGE AREA IS LITTLE PATUXENT.
- 6) SEWER IS PUBLIC, THE CONTRACT NUMBER IS 24-4549-D. THE DRAINAGE AREA IS LITTLE PATUXENT.
- 7) STORMWATER MANAGEMENT QUALITY AND QUANTITY CONTROL IS PROVIDED WITHIN SWMF #3 & #4 (P-1 MICROPORE ED POND), THE OFFLINE RECHARGE CHAMBER AT SWMF#4, SWMF#5 (P-5 POCKET POND), SWMF#6 (F-1 SURFACE SAND FILTER WITH DRY DETENTION POND) AND SHEETFLOW TO BUFFER CREEKS. SWMF# 3, #4 & #5 SHALL BE PRIVATELY OWNED AND JOINTLY MAINTAINED. THE RECHARGE CHAMBER AT SWMF #4 SHALL BE PRIVATELY OWNED AND PRIVATELY MAINTAINED. FOR SWMF #6, THE SURFACE SAND FILTER SHALL BE PRIVATELY OWNED AND PRIVATELY MAINTAINED WHILE THE DRY DETENTION POND SHALL BE PRIVATELY OWNED AND JOINTLY MAINTAINED.
- 8) EXISTING UTILITIES SHOWN ARE BASED ON CONTRACT DRAWINGS, AERIAL AND FIELD SURVEYED LOCATIONS.
- 9) 100-YEAR FLOODPLAIN STUDY AND REPORT WAS PREPARED BY BENCHMARK ENGINEERING, INC. IN MAY, 2008 FOR THE FLOODPLAIN LOCATED WITHIN OPEN SPACE LOT 204 AND GOLF SPACE LOTS 77 & 209. THE FLOODPLAIN LOCATED ON PARCEL "B" IS BASED ON THE STUDY PERFORMED BY BERNARD JOHNSON IN MAY, 1986.
- 10) WETLANDS LOCATIONS SHOWN ARE BASED ON APPROVED STUDIES AS SHOWN ON COMPREHENSIVE SKETCH PLAN OF TURF VALLEY. WETLANDS ARE BASED ON A STUDY CONDUCTED BY EXPLORATION RESEARCH FOR S-86-13 AND VERIFIED BY ECO-SYSTEM PROFESSIONALS, INC. IN JUNE 2002 AND APRIL 2004 (FOR DEVELOPMENT IN AND AROUND PODS I, K, L, M, N, O, P, Q, & S).
- 11) NOISE STUDY WAS PREPARED BY POLYSONICS DATED NOVEMBER, 2007 AND REVISED IN MAY, 2008. 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 WITHIN THAT THRESHOLD MAY EXCEED GENERALLY ACCEPTED NOISE LEVELS ESTABLISHED BY THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.
- 12) THE GEOTECHNICAL REPORT WAS PREPARED BY HILLIS CARNES ENGINEERING ASSOCIATES, INC. IN MARCH, 2008 AND SUPPLEMENTED IN AUGUST, 2007.
- 13) THE SUBJECT PROPERTY IS ZONED PGCC PER THE 2-2-2004 COMPREHENSIVE ZONING PLAN AND THE "COMPT LITE" ZONING AMENDMENTS EFFECTIVE 7-28-2006.
- 14) TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO BURIAL GROUNDS, CEMETERIES OR HISTORIC STRUCTURES LOCATED ON THIS SITE.
- 15) NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, OR THEIR REQUIRED BUFFERS, 100-YEAR FLOODPLAIN OR 20% OR GREATER STEEP SLOPES THAT ARE AT LEAST 20,000 S.F. OF CONTIGUOUS AREA EXCEPT FOR THE DISTURBANCES SHOWN ASSOCIATED WITH THE 3 STREAM CROSSINGS (STATIONS 55+50, 78+50 AND 82+00) ALONG RESORT ROAD. MDE PERMIT #02-NI-0009 / 200261454 EFFECTIVE MAY 16, 2006 WITH AN EXPIRATION OF DECEMBER 31, 2011. THE DISTURBANCE OF NON-TIDAL WETLANDS ALLOWED IN THIS PERMIT IS APPROXIMATELY 73,745 S.F. OF WETLAND MITIGATION WHICH SHALL OCCUR ON-SITE (WITHIN TURF VALLEY). NONE OF THAT MITIGATION IS PROPOSED WITHIN THE LIMITS OF THE VILLAGES AT TURF VALLEY.
- 16) THIS PROJECT IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
- 17) THE LOTS SHOWN HEREON COMPLY WITH THE MINIMUM OWNERSHIP WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT.
- 18) DRIVEWAYS SHALL BE PROVIDED PRIOR TO ISSUANCE OF A USE AND OCCUPANCY PERMIT FOR ANY NEW DWELLINGS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING/MINIMUM REQUIREMENTS:
 - A) WIDTH - 12' (6" SERVING MORE THAN ONE RESIDENCE).
 - B) SURFACE - 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING (1.5" MIN).
 - C) GEOMETRY - MAX. 15% GRADE, MAX. 10% GRADE CHANGE & MIN. 45' TURNING RADIUS.
 - D) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOAD)
 - E) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOODPLAIN WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY
 - F) STRUCTURE CLEARANCES - MINIMUM 12 FEET.
 - G) MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.
- 19) LANDSCAPING FOR THIS SUBDIVISION IS PROVIDED IN ACCORDANCE WITH A CERTIFIED LANDSCAPE PLAN INCLUDED WITH THIS ROAD CONSTRUCTION PLAN SET IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$18,450.00 (\$11,400.00 FOR 38 SHADE TREES, \$7,050.00 FOR 47 EVERGREENS).
20. VILLAGES AT TURF VALLEY, PHASE 2:

PARCEL 401: THE TOTAL FOREST CONSERVATION OBLIGATION AMOUNT OF 4.48 ACRES SHALL BE MET BY THE RETENTION OF 2.03 AC. OF NET TRACT AREA FOREST WITHIN A FOREST CONSERVATION EASEMENT (#8-8) ON PARCEL 401 AND BY THE OFFSITE RETENTION OF 4.50 AC. OF FOREST WITHIN FOREST CONSERVATION EASEMENTS (#9-13) OF WHICH ONLY 2.45 AC. IS CREDITED (SINCE THIS RETENTION IS OFFSITE IT IS CREDITED AT A 2:1 RATIO). FINANCIAL SURETY FOR THE REQUIRED FOREST CONSERVATION HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$42,699.00 (\$30.20 PER SQUARE FOOT).

PARCEL B & 394: THIS PORTION OF THE PROJECT IS EXEMPT FROM HOWARD COUNTY FOREST CONSERVATION UNDER SECTION 16.1202(b) OF THE COUNTY CODE SINCE IT IS A PLANNED UNIT DEVELOPMENT UNDER S-86-13.

FAIRWAYS AT TURF VALLEY, PHASE 2 AND 3:

THE TOTAL FOREST CONSERVATION OBLIGATION OF 1.12 ACRES (PHASE 2, F-10-084 AND 0.22 ACRES PHASE 3, F-10-086) HAS BEEN MET BY THE OFFSITE RETENTION OF 1.08 ACRES OF FOREST WITHIN FOREST CONSERVATION EASEMENT #14 OF WHICH ONLY 0.54 ACRES IS CREDITED (SINCE THIS RETENTION IS OFFSITE IT IS CREDITED AT A 2:1 RATIO) AND BY THE PLANTING OF 60 ACRES OF FOREST WITHIN FOREST CONSERVATION EASEMENT #14. FINANCIAL SURETY FOR THE REQUIRED FOREST CONSERVATION HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$22,608.00 FOR PHASE 2, F-10-084 AND \$3,833.00 FOR PHASE 3, F-10-086. THE FOREST CONSERVATION EASEMENTS FOR FAIRWAYS AT TURF VALLEY, PHASES 2 AND 3 AND SHOWN ON THESE PLANS. FINANCIAL SURETY FOR THE REQUIRED FOREST CONSERVATION HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$22,608.00 FOR PHASE 2, F-10-084 AND \$3,833.00 FOR PHASE 3, F-10-086. THE FOREST CONSERVATION EASEMENTS ARE SUBJECT TO CHANGE BASED ON DEVELOPMENT OF THE FINAL FOREST CONSERVATION PLANS FOR FAIRWAYS AT TURF VALLEY, PHASES 2 AND 3 DURING THEIR FINAL SUBDIVISION PLAN STAGE.

THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENTS; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
- 21) RESERVATION OF PUBLIC UTILITY AND FOREST CONSERVATION EASEMENTS

DEVELOPER RESERVES UNTO ITSELF, ITS SUCCESSORS AND ASSIGNS, ALL EASEMENTS SHOWN ON THIS PLAN FOR WATER, SEWER, STORM DRAINAGE, OTHER PUBLIC UTILITIES, LOCATED IN, ON, OVER AND THROUGH LOT 203, OPEN SPACE LOTS 204-207, GOLF SPACE LOTS 77, 78, 206 & 209, PARCELS "A" AND PARCELS "B". ANY CONVEYANCES OF THE AFORESAID LOTS/PARCELS SHALL BE SUBJECT TO THE EASEMENTS HERIN RESERVED, WHETHER OR NOT EXPRESSLY STATED IN THE DEED(S) CONVEYING SAID LOT(S)/PARCELS. DEVELOPER SHALL EXECUTE AND DELIVER DEEDS FOR THE EASEMENTS HERIN RESERVED TO HOWARD COUNTY WITH A METES AND BOUNDS DESCRIPTION OF THE FOREST CONSERVATION AREA, UPON COMPLETION OF THE PUBLIC UTILITIES AND THEIR ACCEPTANCE BY HOWARD COUNTY, AND IN THE CASE OF THE FOREST CONSERVATION EASEMENT(S), UPON COMPLETION OF THE DEVELOPER'S OBLIGATION UNDER THE FOREST CONSERVATION INSTALLATION AND MAINTENANCE AGREEMENT EXECUTED BY THE DEVELOPER AND THE COUNTY, AND THE RELEASE OF DEVELOPER'S SURETY POSTED WITH SAID AGREEMENT, THE COUNTY SHALL ACCEPT THE EASEMENTS AND RECORD THE DEED(S) OF EASEMENT IN THE LAND RECORDS OF HOWARD COUNTY.
- 22) THIS SUBDIVISION IS SUBJECT TO SECTION 18.122B OF THE HOWARD COUNTY CODE, PUBLIC WATER AND/OR SEWER SERVICE HAS BEEN GRANTED UNDER THE TERMS AND PROVISIONS, THEREOF, EFFECTIVE 1.8.00, ON WHICH DATE DEVELOPER AGREEMENT #24-4549-D WAS FILED AND ACCEPTED.
- 23) THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- 24) THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- 25) STREET LIGHT PLACEMENT AND TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)". A MINIMUM SPACING OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREETLIGHT AND ANY TREE.
- 26) TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO PLACEMENT OF ANY ASPHALT.
- 27) ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED SQUARE TUBE POST (1/4 GAUGE) INSERTED INTO A 2-3/4" GALVANIZED STEEL, PERFORATED SQUARE TUBE SLEEVE (1/2 GAUGE)-3" LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- 28) THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE APRIL 13, 2004. PER SECTION 126(H)(1), PLANNING BOARD APPROVAL IS REQUIRED FOR THE SITE DEVELOPMENT PLAN FOR THIS PROJECT.

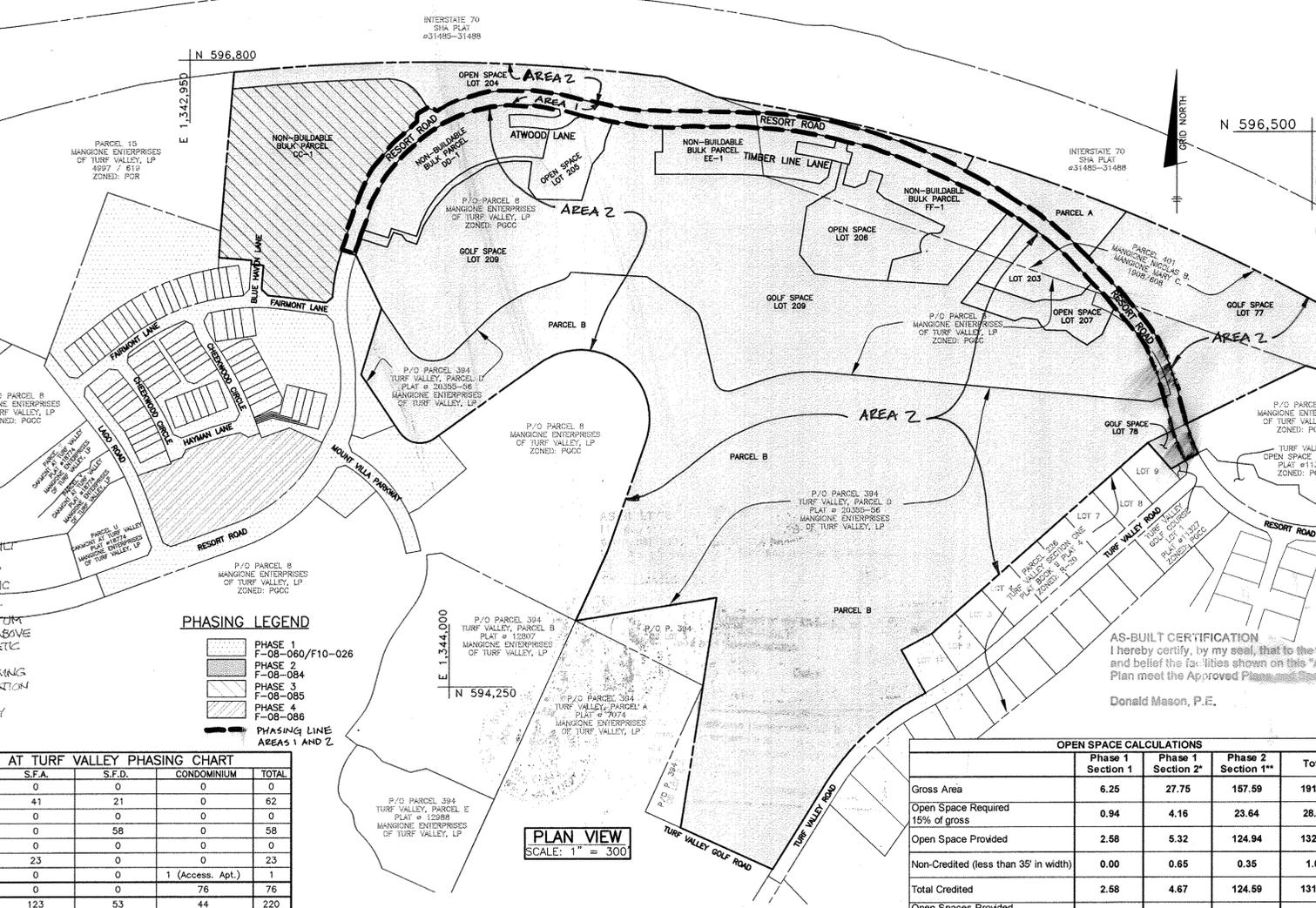
RIGHT OF WAY ELEVATION CHART NAD 83

R/W FT NO	DESCRIPTION	ELEVATION
110	REBAR @ CAP	459.00'
308	REBAR @ CAP	458.88'
300	REBAR @ CAP	458.00'
310	REBAR @ CAP	458.20'
318	REBAR @ CAP	458.31'
310	REBAR @ CAP	458.34'
320	REBAR @ CAP	458.48'
321	REBAR @ CAP	458.85'
322	REBAR @ CAP	458.00'
400	REBAR @ CAP	500.10'
401	REBAR @ CAP	500.07'
402	REBAR @ CAP	480.78'
412	CONC. MOI	475.96'
413	REBAR @ CAP	474.02'
414	REBAR @ CAP	467.84'
415	REBAR @ CAP	465.02'
428	REBAR @ CAP	482.01'
420	REBAR @ CAP	485.10'
430	REBAR @ CAP	465.02'
431	GRD RAIL POST	488.44'
432	REBAR @ CAP	483.02'
453	REBAR @ CAP	482.01'
454	REBAR @ CAP	465.14'
455	REBAR @ CAP	461.80'
456	REBAR @ CAP	474.20'
457	REBAR @ CAP	482.01'
458	REBAR @ CAP	504.01'
450	REBAR @ CAP	503.04'
460	REBAR @ CAP	503.02'
461	CONC. MOI	506.80'
462	REBAR @ CAP	503.05'
416	CONC. MOI	483.42'
417	REBAR @ CAP	463.82'
418	REBAR @ CAP	463.75'
419	REBAR @ CAP	464.13'
403	REBAR @ CAP	470.02'

VILLAGES AT TURF VALLEY

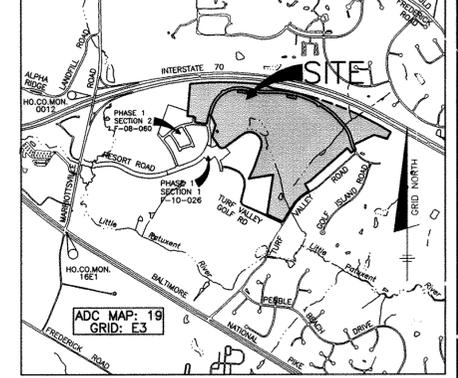
PHASE 2, SECTION 1

ROADS, STORMWATER MANAGEMENT AND STORM DRAIN CONSTRUCTION PLANS



BENCHMARK NAD'83 HORIZONTAL

HO. CO. #16E1 (AKA: 3438001)	STAMPED BRASS DISK SET ON TOP OF A 3" DEEP COLUMN OF CONCRETE.
N 593250.960'	E 1340192.70'
ELEVATION: 463.981'	
HO. CO. #0012 (AKA: 3439001)	STAMPED BRASS DISK SET ON TOP OF A 3" DEEP COLUMN OF CONCRETE.
N 596502.760'	E 1340864.37'
ELEVATION: 486.298'	



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. 22391, Expiration Date: 6-30-15



FOR REVIEW #5 ONLY

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

License No. 21443, Expiration Date: 12-21-13

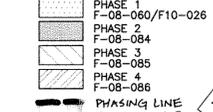


* SEE SHEET NO. 5 FOR RECOVERY SKETCHES.

AS-BUILT NOTES:

- 1) HORIZONTAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM 16E1 AND ADJ 07 AS PROJECTED FROM HO. CO. GEODETIC CONTROL STATIONS 16E1 AND ADJ 07.
- 2) THE INSTRUMENTS USED IN PERFORMING THE AS-BUILT WERE A 5" TOTAL STATION AND PRISM AND RIK GPS.
- 3) THIS AS-BUILT WAS PERFORMED BY BENCHMARK ENGINEERING, INC.

PHASING LEGEND



VILLAGES AT TURF VALLEY PHASING CHART

PHASE	S.F.A.	S.F.D.	CONDOMINIUM	TOTAL
1 (F10-026)	0	0	0	0
1 (F-08-060)	41	21	0	62
2 (F-08-084)	0	0	0	0
2 (F-10-078)	0	58	0	58
3 (F-08-085)	0	0	0	0
4 (F-08-086)	23	0	0	23
MAINT SHOP (SDP-08-096)	0	0	1 (Access. Apt.)	1
FUTURE CONDO BLDGS	0	0	76	76
TOTAL	123	53	44	220

OPEN SPACE CALCULATIONS

	Phase 1 Section 1	Phase 1 Section 2	Phase 2 Section 1*	Total
Gross Area	6.25	27.75	157.59	191.59
Open Space Required 15% of gross	0.94	4.16	23.64	28.74
Open Space Provided	2.58	5.32	124.94	132.84
Non-Credited (less than 35' in width)	0.00	0.65	0.35	1.00
Total Credited	2.58	4.67	124.59	131.84
Open Spaces Provided Above Requirement	1.64	0.51	100.95	103.10

* This includes area for Phase 4 (Non-Buillable Bulk Parcel BB)
 * This includes area for Phase 2, Section 2 (Non-Buillable Bulk Parcels DD, EE & FF) and area for Phase 3 (Non-Buillable Bulk Parcel CC)

BULK REGULATIONS :

PERMITTED USES : ALL USES AS PER TURF VALLEY PGCC DISTRICT, MULTI-USE SUBDISTRICT FINAL DEVELOPMENT PLAN, SECOND AMENDMENT, PLATS 1957B-1958B (48 USES OUTLINED FROM RESIDENTIAL USES TO SPECIALTY STORES)

PERMITTED HEIGHT : SINGLE-FAMILY DETACHED AND ATTACHED - 34 FEET APARTMENT BUILDINGS - 80 FEET ACCESSORY STRUCTURES - 15 FEET

MAXIMUM DENSITY FOR TOTAL PGCC DISTRICT IS 2 DWELLING UNITS PER ACRE.

MAXIMUM UNITS PER STRUCTURE:

1. SINGLE FAMILY ATTACHED - 8 UNITS PER STRUCTURE
2. APARTMENTS LESS THAN 40 FEET IN HEIGHT - 24 UNITS PER STRUCTURE
3. APARTMENTS 40 FEET OR GREATER IN HEIGHT - 120 UNITS PER STRUCTURE

MINIMUM LOT SIZE REQUIREMENTS :

- SINGLE FAMILY DETACHED - 6,000 SQ.FT.
- EXCEPT ZERO LOT LINE DWELLINGS - 4,000 SQ.FT.
- SINGLE FAMILY SEMI-DETACHED - 4,000 SQ.FT.

MAXIMUM BUILDING LENGTH FOR A RESIDENTIAL STRUCTURE = 120 FEET, UNLESS APPROVED BY PLANNING BOARD TO A MAXIMUM OF 300 FEET.

PERMITTED SETBACKS:

FROM ARTERIAL:

- RESIDENTIAL STRUCTURES - 50 FEET
- ACCESSORY USES - 30 FEET
- PARKING - 25 FEET

FROM COLLECTORS AND LOCAL STREETS:

- RESIDENTIAL AND NON-RESIDENTIAL STRUCTURES - 30 FEET FROM A 60 FT. ROW 20 FEET FROM A 50 FT. ROW
- 10 FEET

ACCESSORY USES:

- FROM NON-PGCC ADJACENT PROPERTIES - 25 FEET
- FROM RESIDENTIAL DISTRICTS - 25 FEET
- FROM ALL OTHER DISTRICTS - 30 FEET

FROM LOT LINES WITHIN PGCC MULTI-USE SUBDISTRICT:

- ZERO LOT LINE AND ALL OTHER USES - SIDE - 0 FEET
- MINIMUM OF 10 FEET MUST BE PROVIDED BETWEEN STRUCTURES
- RESIDENTIAL - REAR - 5 FEET
- SINGLE-FAMILY DETACHED - SIDE - 7.5 FEET

BETWEEN ATTACHED DWELLING UNITS AND APARTMENT BUILDINGS :

- FACE TO FACE - 30 FEET
- FACE TO SIDE/REAR TO SIDE - 30 FEET
- SIDE TO SIDE - 15 FEET
- REAR TO REAR - 60 FEET
- REAR TO FACE - 100 FEET

THERE IS A 60% MINIMUM LOT COVERAGE REQUIREMENT FOR SFA LOTS AND NO SPECIFIED COVERAGE REQUIREMENT FOR APARTMENTS.

SHEET INDEX

NO.	TITLE
1	TITLE SHEET
2-4	ROAD PLAN AND PROFILE RESORT ROAD
5	ROAD PLAN AND PROFILE ATWOOD LANE
6	ROAD PLAN AND PROFILE TIMBER LINE LANE & WICKWOOD COURT
7	CURB RETURN FILLET PROFILES AND ROAD DETAILS
8	STORM DRAIN PROFILES
9-10	STREET LIGHT, STREET SIGN AND STREET STRIPING PLAN
11-14	GRADING, SEDIMENT AND EROSION CONTROL PLAN
15-16A	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
16	STREAM CROSSING DETAILS
17	STORM DRAIN DRAINAGE AREA MAP
18	STORM DRAIN DRAINAGE AREA MAP FOR CULVERTS
19-20	STORM DRAIN PROFILES & DETAILS
21	SWM DETAILS - FACILITY #3
22	SWM DETAILS - FACILITY #4
23	SWM DETAILS - FACILITY #5
24	SWM DETAILS - FACILITY #6
25	SWM DETAILS, NOTES AND MAINTENANCE SCHEDULES
26	SWM SOILS BORING LOGS
27-29	PERIMETER LANDSCAPE AND STREET TREE PLAN
30	INTERNAL SWM LANDSCAPING PLAN
31	FOREST CONSERVATION NOTES AND DETAILS
32-34	FOREST CONSERVATION PLAN
35-43	CON/SPAN BRIDGE INSTALL DRAWINGS
44-50	NOISE WALL PLAN AND PROFILES
51-53	RETAINING WALL #1 & #2 DETAILS AND PROFILES
54-55	RETAINING WALL #3 DETAILS AND PROFILES
56	RETAINING WALL #4 & #5 DETAILS AND PROFILES

APPROVED: DEPARTMENT OF PUBLIC WORKS

Michelle Z... 1-9-14
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Keith... 1/23/14
CHIEF, DIVISION OF LAND DEVELOPMENT

Chad... 1-15-14
CHIEF, DEVELOPMENT ENGINEERING DIVISION

BENCHMARK ENGINEERING, INC.
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-8644
 WWW.BE-ENLNGINEERING.COM

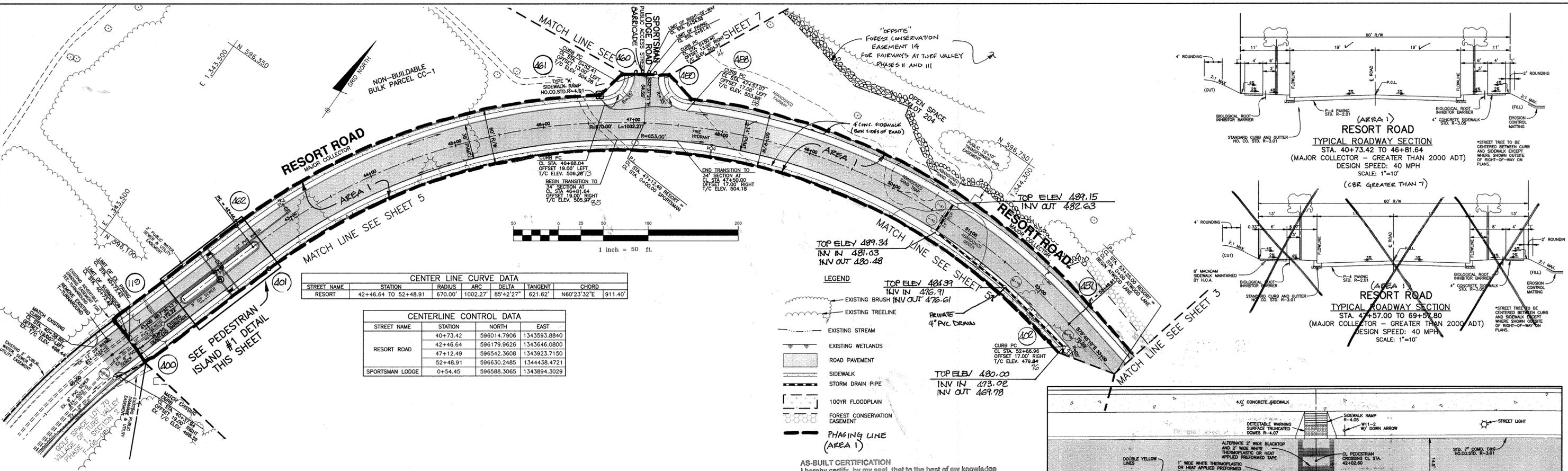
VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B, NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1

TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P10 394, GRID: 17
 TAX MAP: 16, PARCEL: P10 & GRID: 17

ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED PGCC

TITLE SHEET

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 1 OF 56

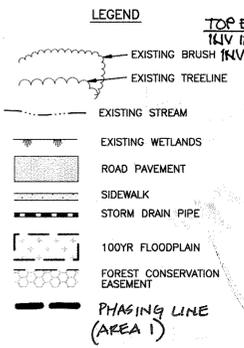


CENTER LINE CURVE DATA

STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
RESORT	42+46.64 TO 52+48.91	670.00'	1002.27'	85°42'27"	621.62'	N60°23'32"E 911.40'

CENTERLINE CONTROL DATA

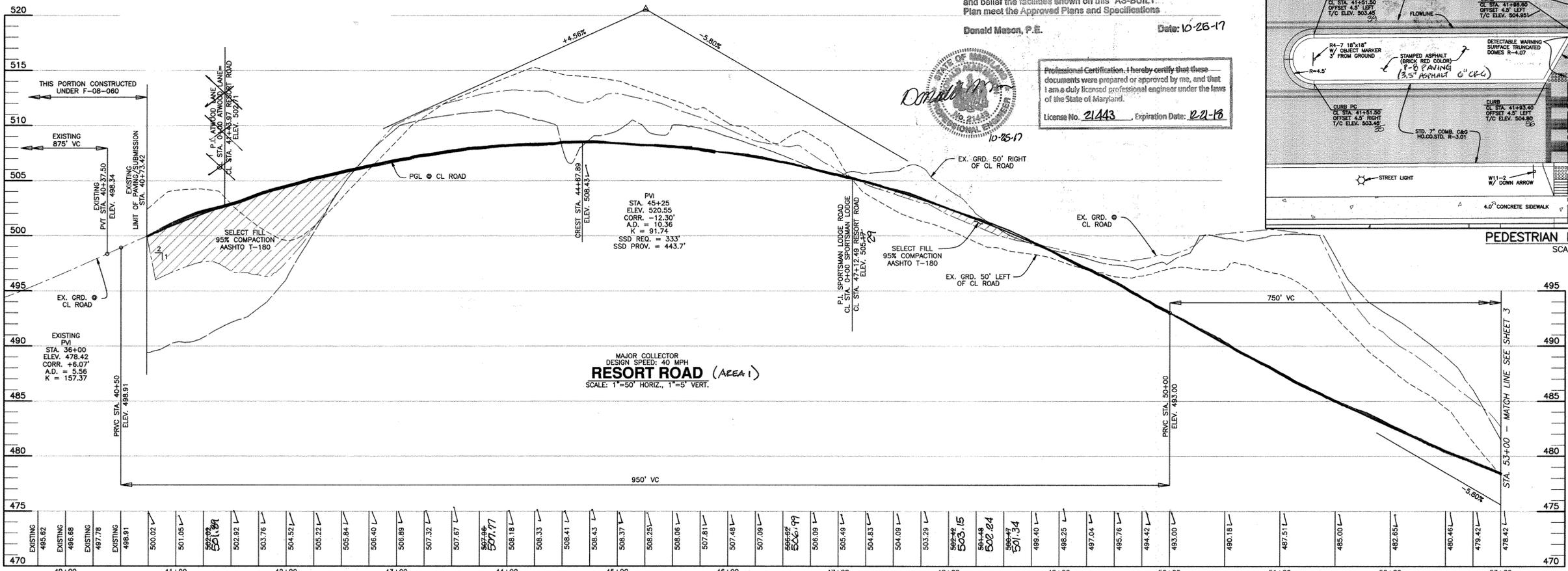
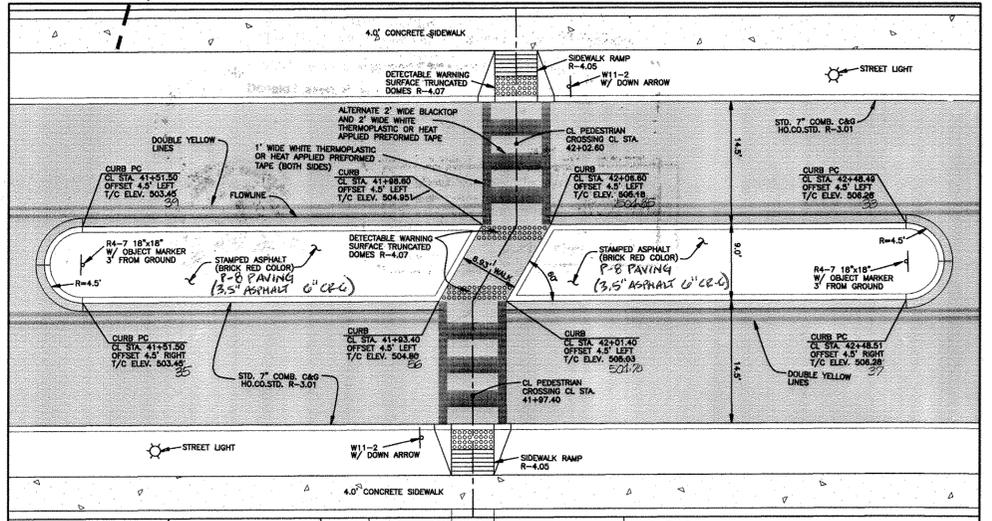
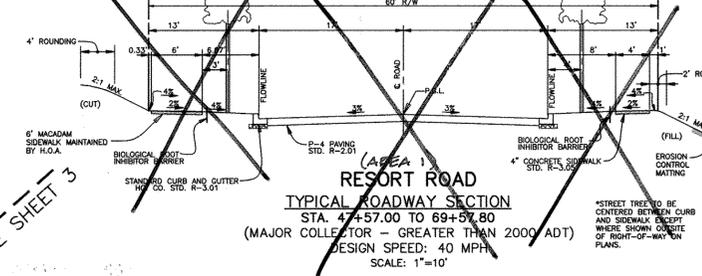
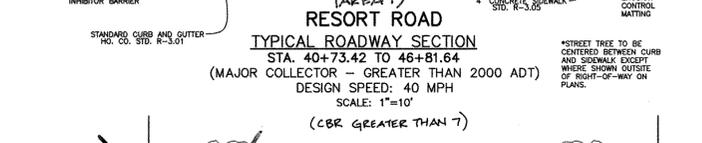
STREET NAME	STATION	NORTH	EAST
RESORT ROAD	40+73.42	596014.7906	1343593.8840
	42+46.64	596179.9626	1343646.0800
	47+12.49	596542.3608	1343923.7150
	52+48.91	596630.2485	1344438.4721
SPORTSMAN LODGE	0+54.45	596588.3065	1343894.3029



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

Donald Mason, P.E. Date: 10-26-17

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-31-18



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22390, Expiration Date: 6-30-15
 For REVISION # 4, #5, #6

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 1-9-14
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 1/23/14
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 1/15/14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1

TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P10 394, GRID: 17
 TAX MAP: 16, PARCEL: P10 8, GRID: 17

ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

REVISED ROAD PLAN AND PROFILE
 RESORT ROAD

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 2 OF 56

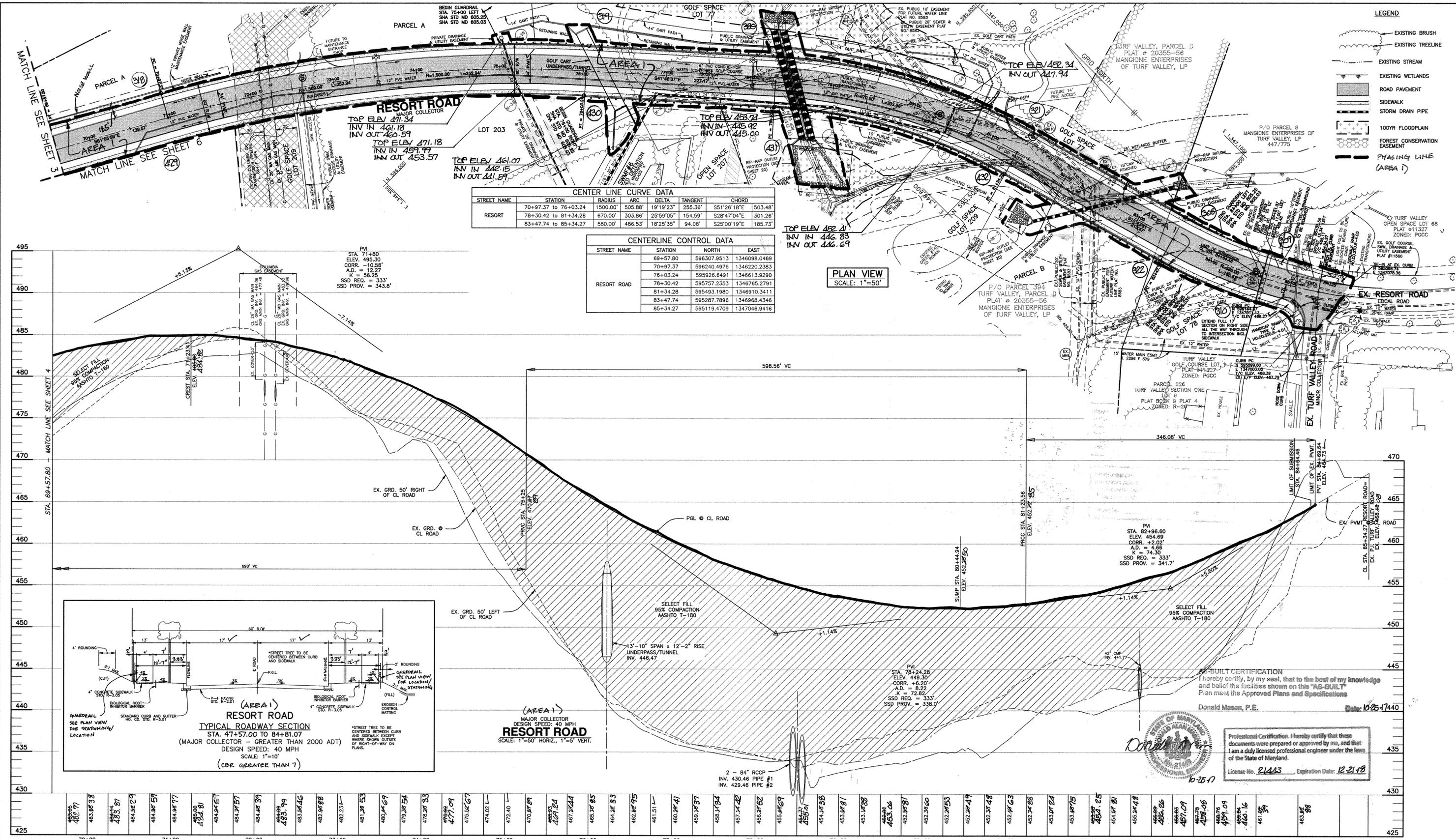
REVISION

NO.	DATE	REVISION
7	6-14-14	AS-BUILT (4" PK DRAIN)
6	7-19-2017	ADD PAVEMENT TYPE FOR PEDESTRIAN ISLANDS
5	12-4-2014	REVISE 6" ASPHALT SIDEWALK BACK TO 4" CONCRETE. DELETE THE SEC. STATIONS 4157 TO 4167 AND CBE VALUE TO THE SEC.
4	7-8-2014	ADD PHASING LINE (AREA I)
3	3-31-2014	REVISE FCE # 14 LIMITS
2	12-4-2013	revise Atwood Lane, revise water, sewer and storm drain layout, delete noise wall, correct typical section, revise lot numbers in Title Block, add 6" asphalt sdwk on northside of Resort.
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK ENGINEERING, INC.
 8480 BALTIMORE NATIONAL PIKE SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BE-ONLINEENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 28559, Expiration Date: 7-22-2015

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



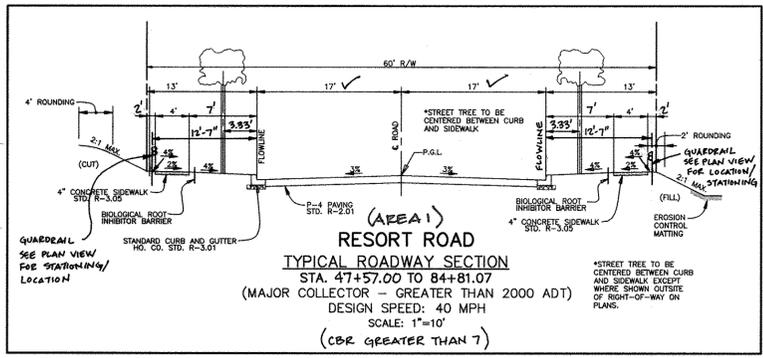
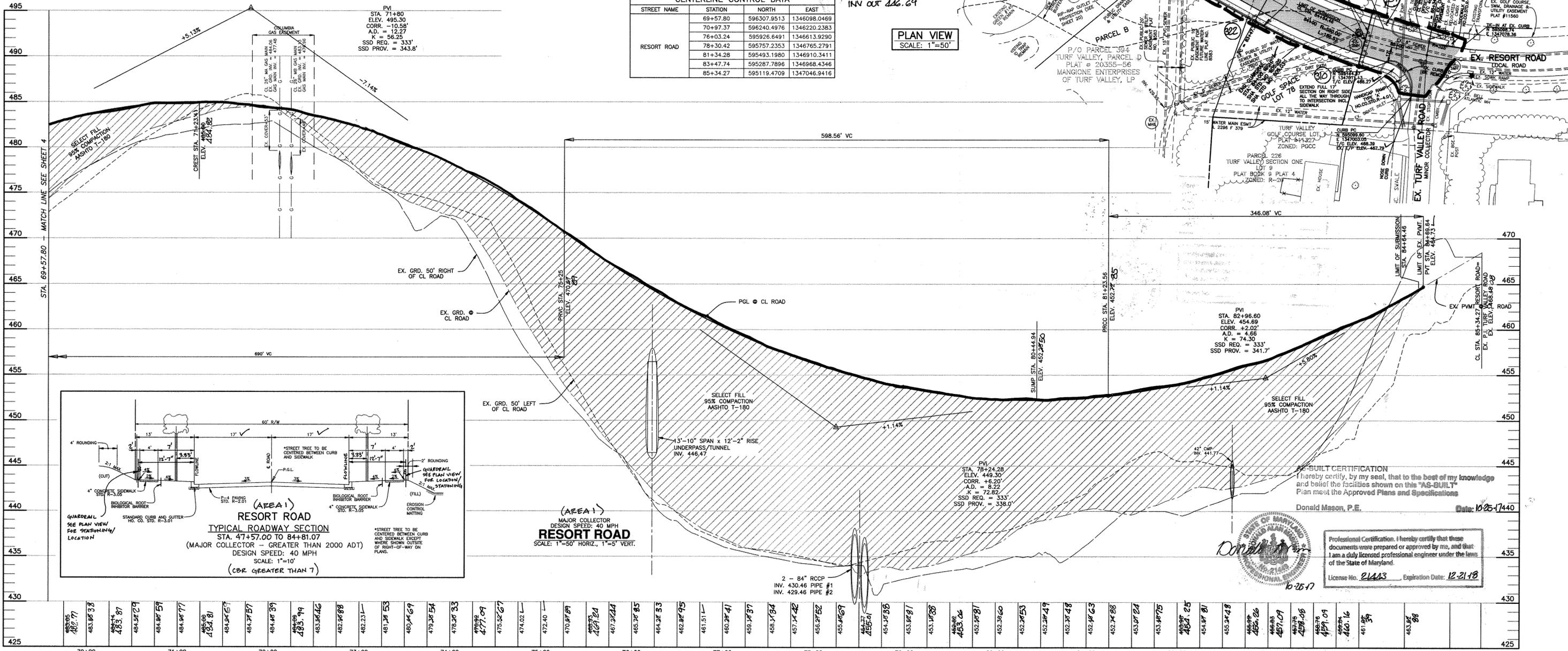
CENTER LINE CURVE DATA

STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
RESORT	70+97.37 to 76+03.24	1500.00'	505.88'	19°19'23"	255.36'	S51°26'18"E 503.48'
	78+30.42 to 81+34.28	670.00'	303.86'	25°59'05"	154.59'	S28°47'04"E 301.26'
	83+47.74 to 85+34.27	580.00'	486.53'	18°25'35"	94.08'	S25°00'19"E 185.73'

CENTERLINE CONTROL DATA

STREET NAME	STATION	NORTH	EAST
RESORT ROAD	69+57.80	596307.9513	1346098.0469
	70+97.37	596240.4976	1346220.2383
	76+03.24	595926.6491	1346613.9290
	78+30.42	595757.2353	1346765.2791
	81+34.28	595493.1980	1346910.3411
	83+47.74	595287.7896	1346968.4346
85+34.27	595119.4709	1347046.9418	

PLAN VIEW
SCALE: 1"=50'



(AREA 1) MAJOR COLLECTOR DESIGN SPEED: 40 MPH RESORT ROAD
SCALE: 1"=50' HORIZ., 1"=5' VERT.

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications.
Donald Mason, P.E. Date: 10-25-1440

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-31-18

APPROVED: DEPARTMENT OF PUBLIC WORKS
1-9-14
APPROVED: DEPARTMENT OF PLANNING AND ZONING
1/23/14
1-15-14

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22390 Expiration Date: 6-30-15
FOR REVISION #4 ONLY

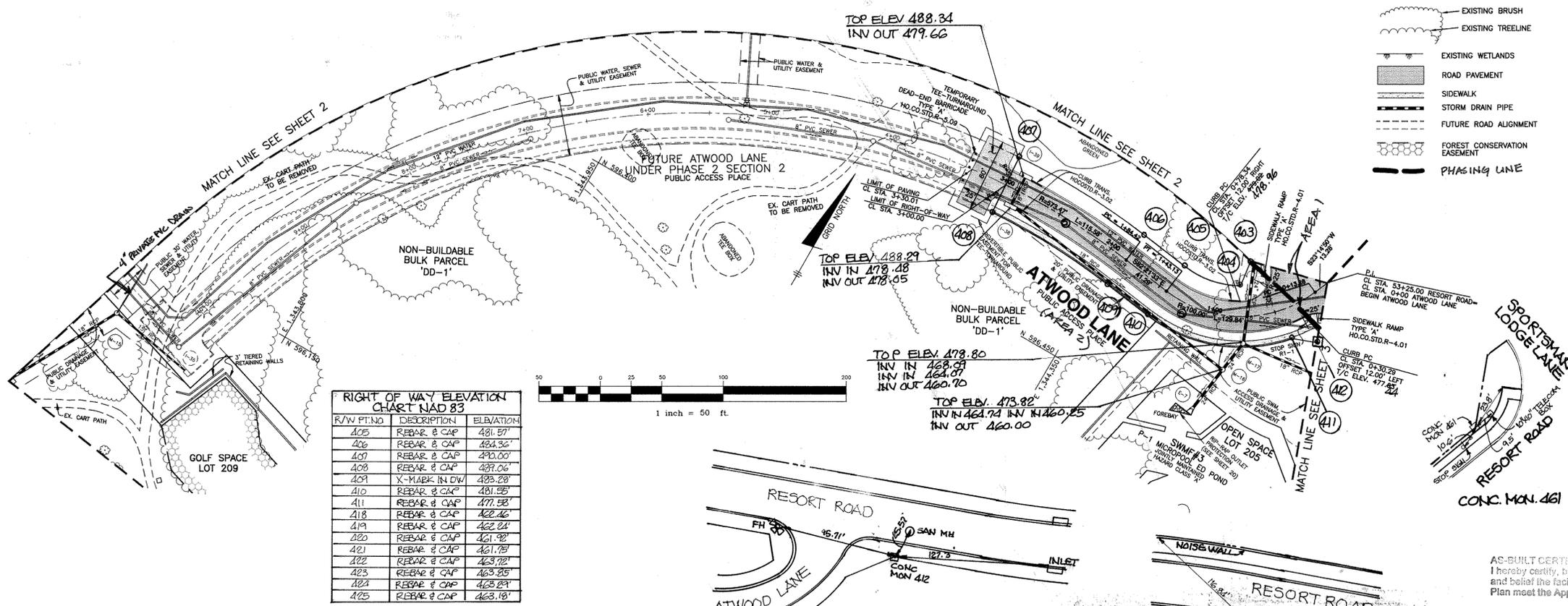
NO.	DATE	REVISION
5	12-4-2014	REVISE TYPICAL SECTION TO INDICATE GUARDRAILS AND REVISED SIDEWALK LOCATIONS.
4	7-9-2014	ADD PHASING LINE (AREA 1)
3	3-21-2014	REVISE NOISE WALL LOCATION
2	12-4-2013	delete intersection with Wickwood Court, add guardrails, fix typical section, revise lot numbers in title block
1	4-20-2012	add tunnel, retaining wall and cart path, revise SWM #6 location, revise storm drain, add 6" pvc conduit

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE & SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
WWW.BE-CHALLENGING.COM

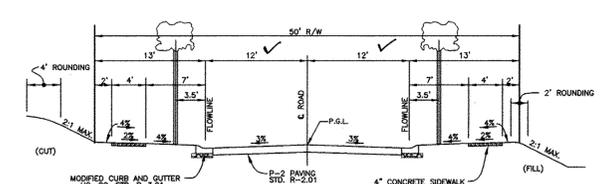
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 24339 Expiration Date: 7-22-2015

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

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
LOT 203; OPEN SPACE LOTS 204-207;
GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B;
NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P/O 394, GRID: 17
TAX MAP: 16, PARCEL: P/O 3, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC
REVISED ROAD PLAN AND PROFILE
RESORT ROAD
DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 4 OF 56



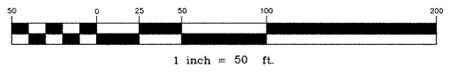
- LEGEND**
- EXISTING BRUSH
 - EXISTING TREELINE
 - EXISTING WETLANDS
 - ROAD PAVEMENT
 - SIDEWALK
 - STORM DRAIN PIPE
 - FUTURE ROAD ALIGNMENT
 - FOREST CONSERVATION EASEMENT
 - PHASING LINE



(AREA 2)
ATWOOD LANE
 TYPICAL ROADWAY SECTION
 (PUBLIC ACCESS PLACE - LESS THAN 200 ADT)
 DESIGN SPEED: 25 MPH
 SCALE: 1"=10'
 (COR GREATER THAN 7')

RIGHT OF WAY ELEVATION CHART NAD 83

R/W PT. NO.	DESCRIPTION	ELEVATION
405	REBAR & CAP	481.57'
406	REBAR & CAP	482.36'
407	REBAR & CAP	493.00'
408	REBAR & CAP	497.06'
409	X-MARK IN DW	493.28'
410	REBAR & CAP	481.55'
411	REBAR & CAP	477.58'
412	REBAR & CAP	482.42'
413	REBAR & CAP	481.78'
414	REBAR & CAP	483.72'
415	REBAR & CAP	483.25'
416	REBAR & CAP	483.24'
417	REBAR & CAP	481.92'
418	REBAR & CAP	481.78'
419	REBAR & CAP	483.72'
420	REBAR & CAP	483.25'
421	REBAR & CAP	483.24'
422	REBAR & CAP	483.24'
423	REBAR & CAP	483.24'
424	REBAR & CAP	483.24'
425	REBAR & CAP	483.16'



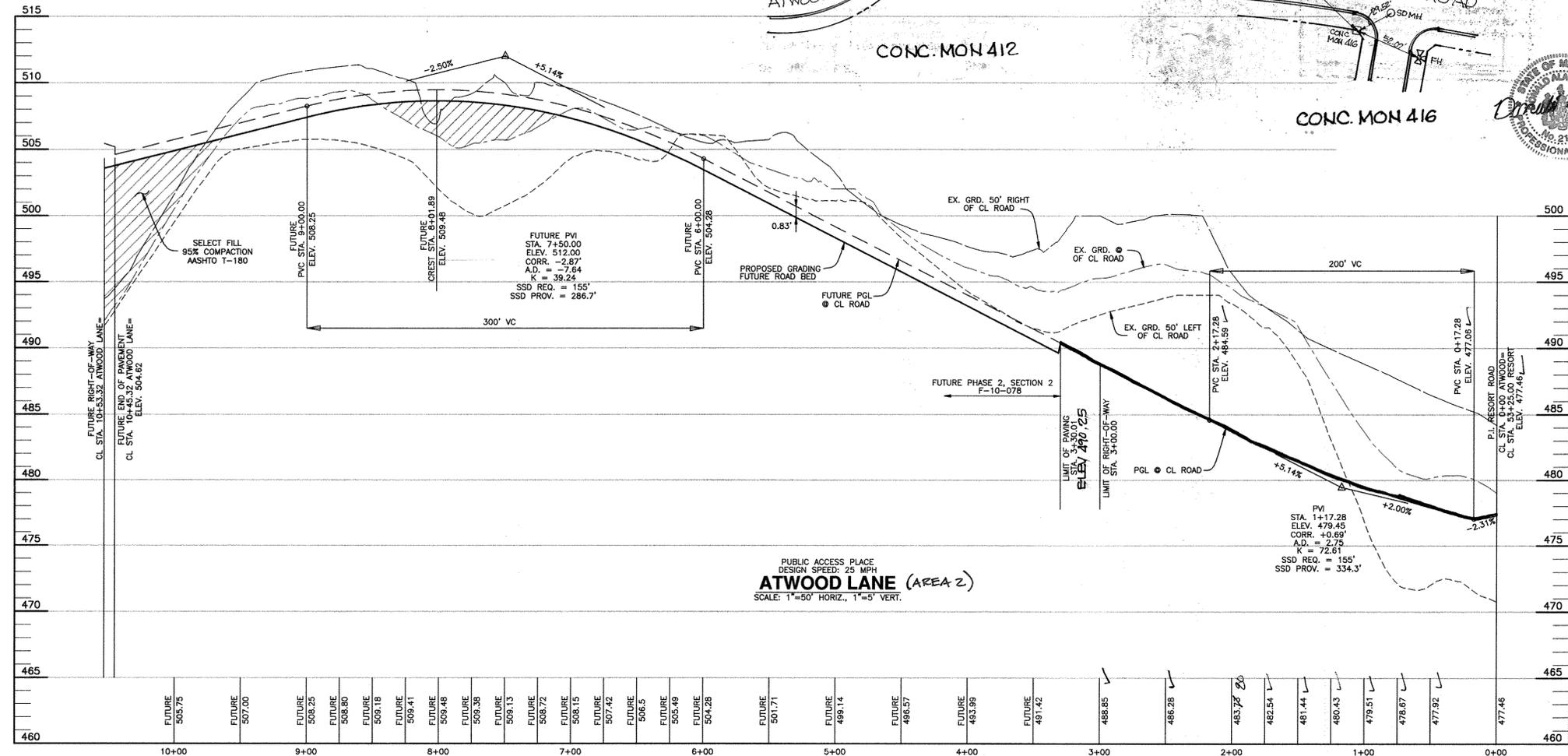
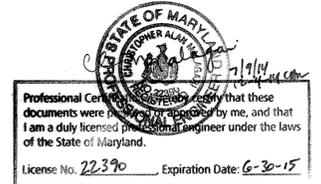
CENTER LINE CURVE DATA

STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
ATWOOD LANE	0+13.28 TO 1+43.13	100.00'	129.84'	74°23'37"	75.90'	S60°26'38"W 120.91'
	1+84.42 TO 3+00.00	573.47'	115.58'	11°23'52"	57.99'	N88°07'59"W 115.39'

CENTERLINE CONTROL DATA

STREET NAME	STATION	NORTH	EAST
ATWOOD LANE	0+00	596612.8120	1344512.5386
	0+13.28	596600.6066	1344507.2954
	1+43.13	596540.9644	1344402.1180
	1+84.42	596546.4549	1344361.1907
	3+00.00	596550.2142	1344245.8669

AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
 Donald Mason, P.E. Date: 10-25-17



APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 1-9-14 DATE
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 1/23/14 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 1-15-14 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

NO.	DATE	REVISION
5	6-18-15	AS-BUILT (9" PVC DRAIN)
4	12-4-2014	ADD CBR VALUE TO TYPICAL SECTION
3	7-8-2014	ADD PHASING LINE
2	12-4-2013	revise Atwood Lane alignment and profile. revise water, sewer and storm drain layout. revise lot numbers
1	4-20-2012	REVISE SHEET NUMBER

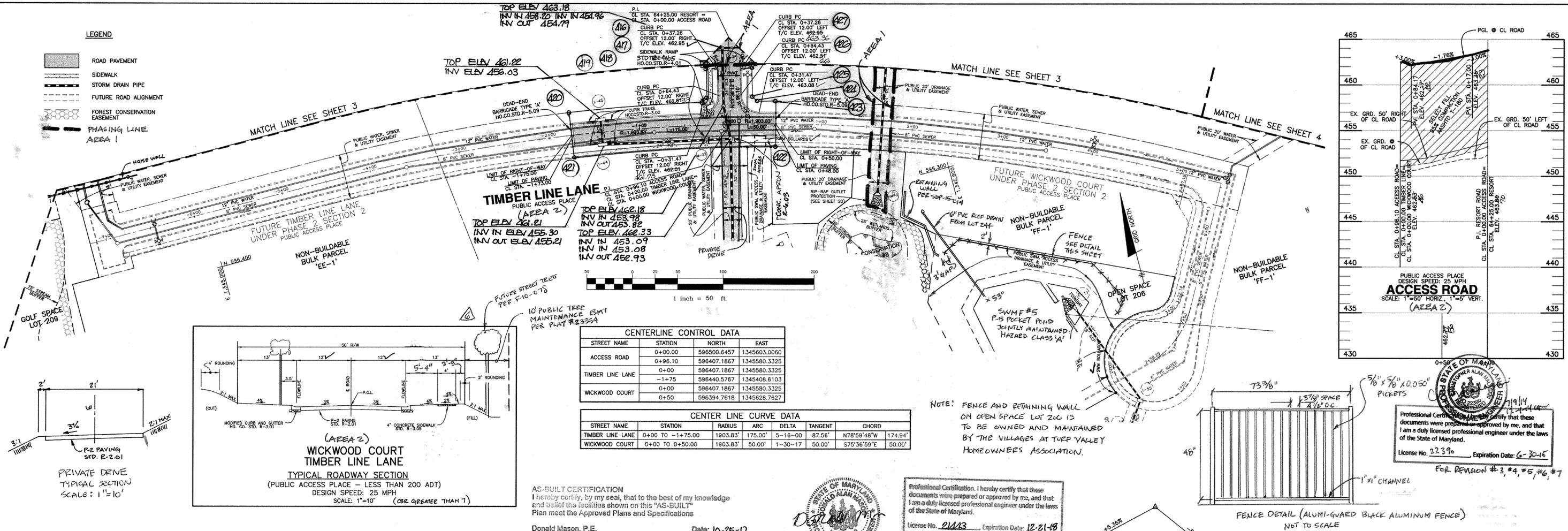
BENCHMARK ENGINEERING, INC.
 ENGINEERS • LAND SURVEYORS • PLANNERS
 8400 BALTIMORE NATIONAL PIKE & SUITE 418
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-485-8105 FAX: 410-485-8644
 WWW.BE-CMENGINEERING.COM

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P/0 394, GRID: 17
 TAX MAP: 16, PARCEL: P/0 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

REVISED ROAD PLAN AND PROFILE ATWOOD LANE
 DATE: SEPTEMBER, 2013 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 5 OF 56

LEGEND

- ROAD PAVEMENT
- SIDEWALK
- STORM DRAIN PIPE
- FUTURE ROAD ALIGNMENT
- FOREST CONSERVATION EASEMENT
- PHASING LINE
- AREA 1

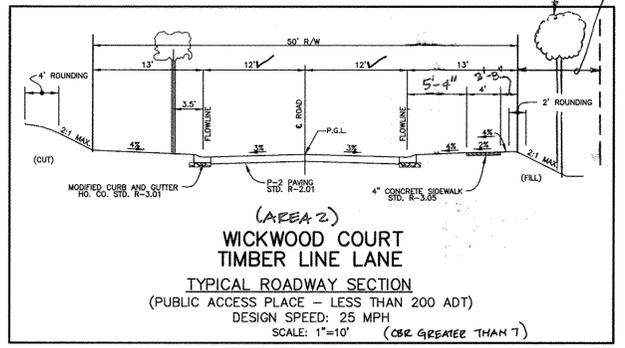


CENTERLINE CONTROL DATA

STREET NAME	STATION	NORTH	EAST
ACCESS ROAD	0+00.00	596500.6457	1345603.0080
ACCESS ROAD	0+96.10	596407.1867	1345580.3325
TIMBER LINE LANE	0+00	596407.1867	1345580.3325
TIMBER LINE LANE	-1+75	596440.5767	1345408.6103
WICKWOOD COURT	0+00	596407.1867	1345580.3325
WICKWOOD COURT	0+50	596394.7618	1345628.7627

CENTER LINE CURVE DATA

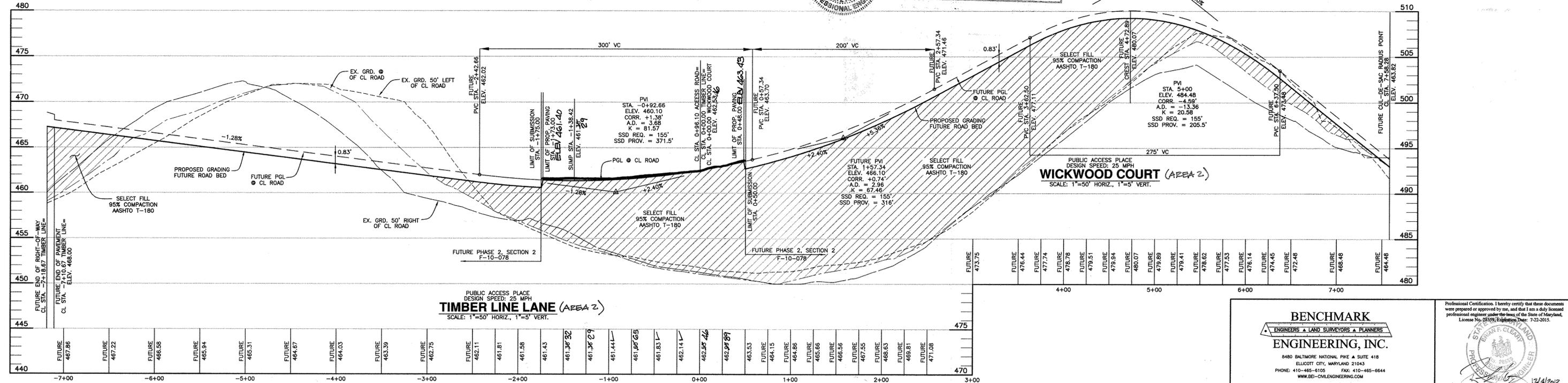
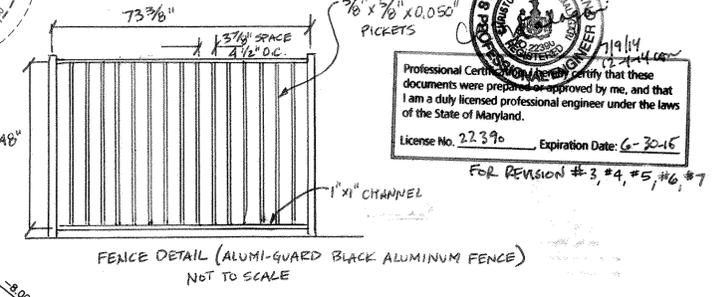
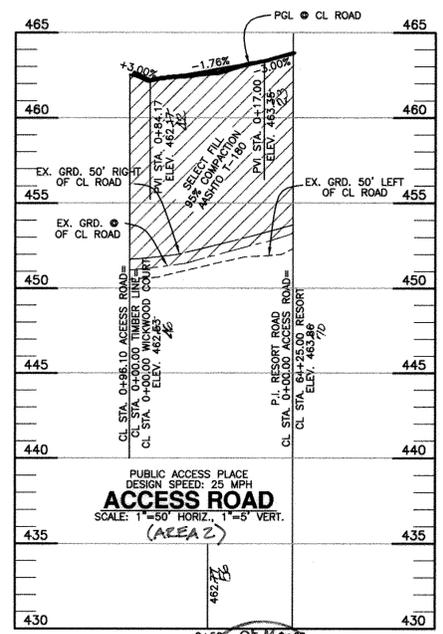
STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
TIMBER LINE LANE	0+00 TO -1+75.00	1903.83'	175.00'	5-16-00	87.56'	N78°59'48"W 174.94'
WICKWOOD COURT	0+00 TO 0+50.00	1903.83'	50.00'	1-30-17	50.00'	S75°36'59"E 50.00'



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E. Date: 10-25-17



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-18



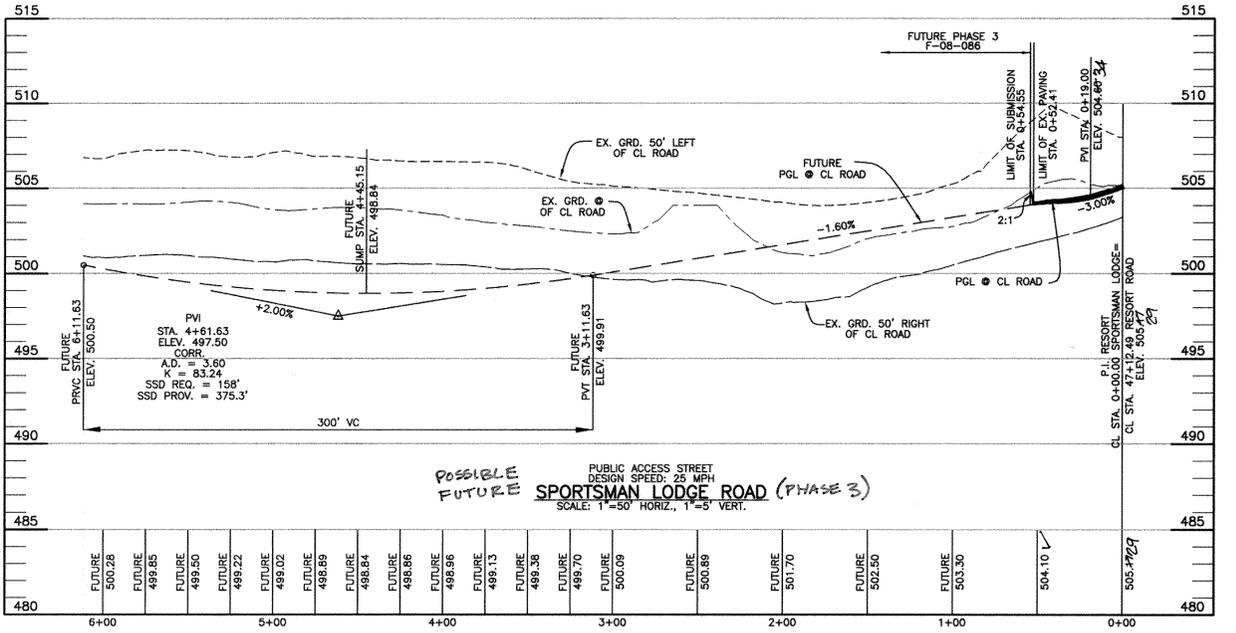
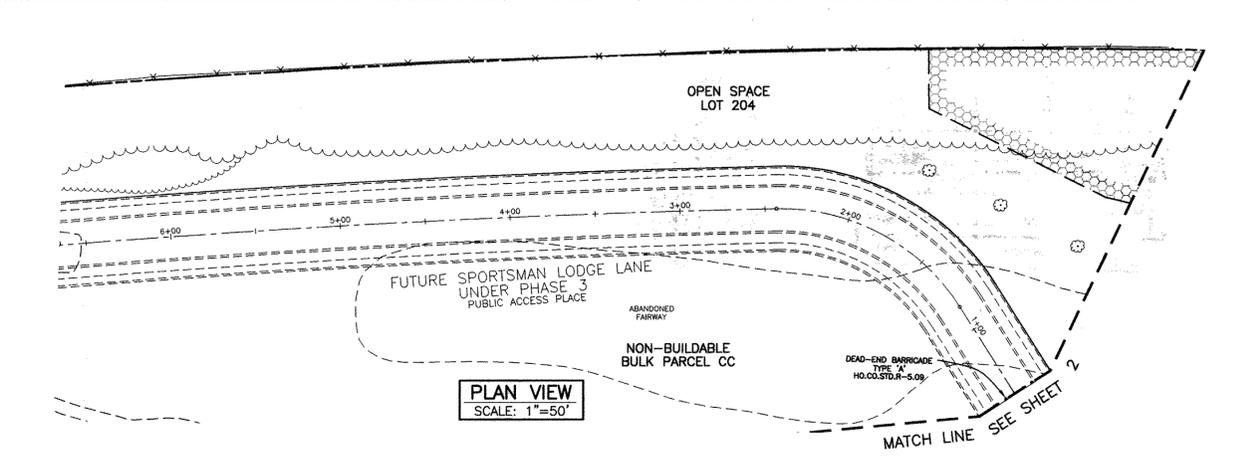
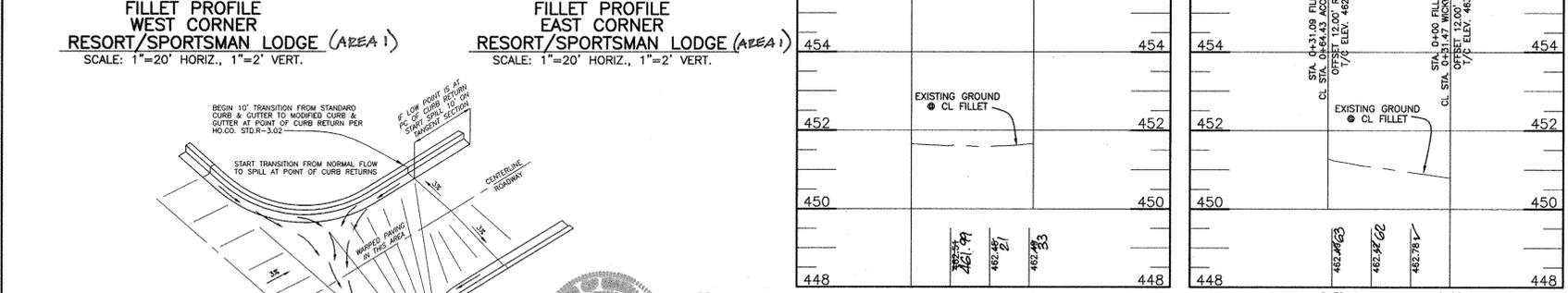
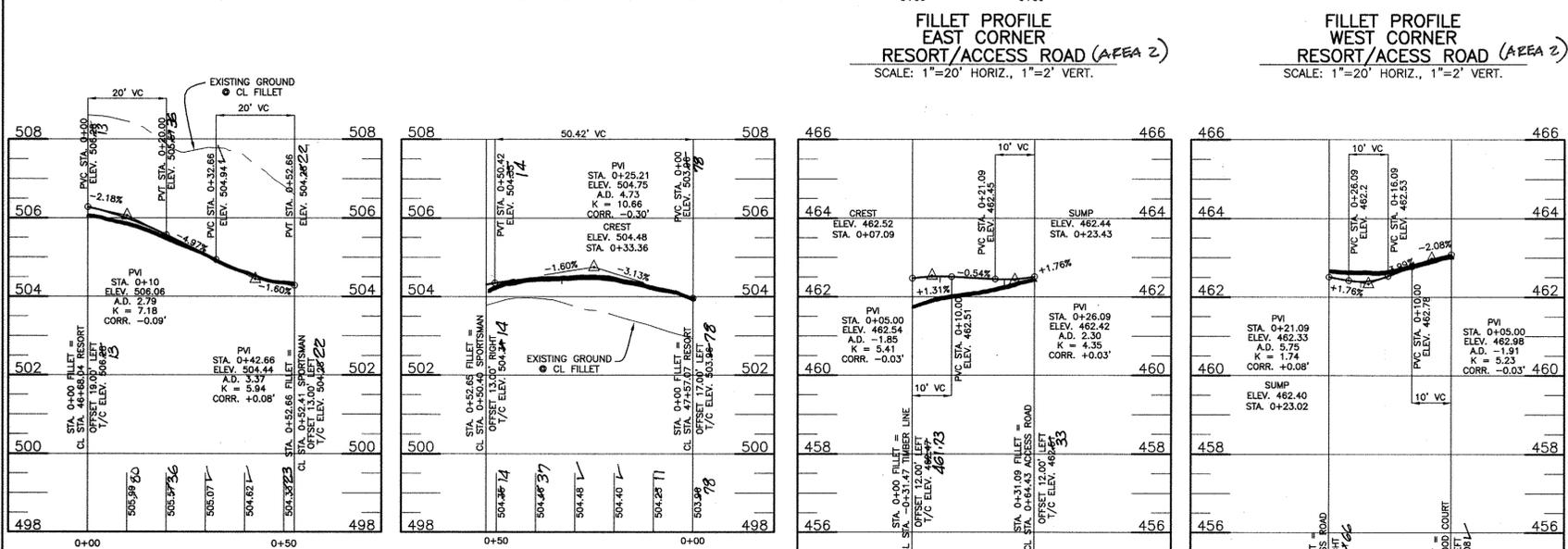
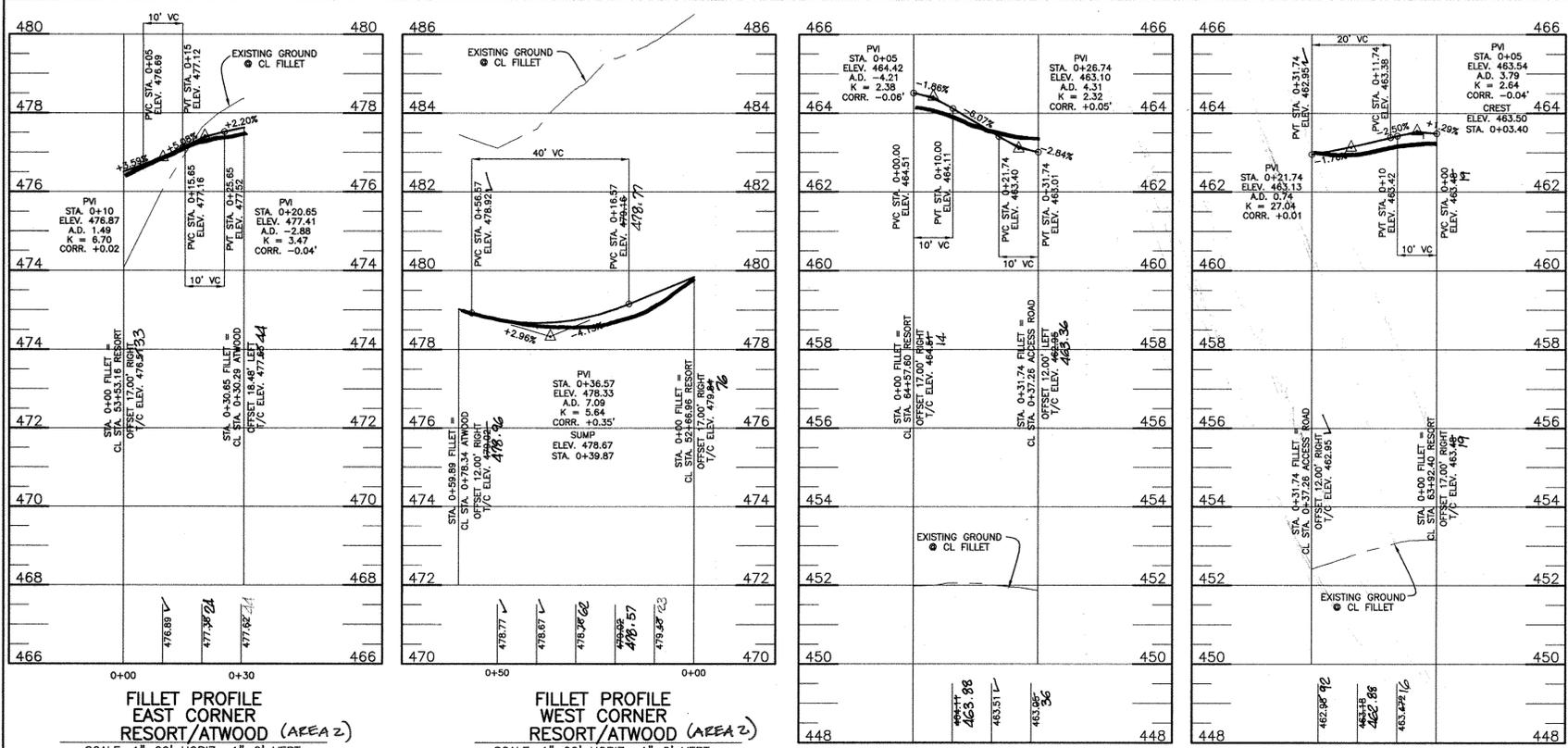
APPROVED: DEPARTMENT OF PUBLIC WORKS
1-9-14 DATE
APPROVED: DEPARTMENT OF PLANNING AND ZONING
1/23/14 DATE
1-15-14 DATE

NO.	DATE	REVISION
7	7-19-2017	ADD FENCE & FENCE DETAIL ON OPEN SPACE LOT 206, ADD ROOF DRAIN FROM LOT 244
6	5-16-2017	REVISE TYPICAL SECTION TO REVISE DISTANCE FROM CURB TO SIDEWALK, ADD FENCE DETAIL
5	2-9-2016	SHOW PRIVATE DRIVE, REVISE SIDEWALK AND RAMP'S ORIENTATION, ADD PRIVATE DRIVE TYPICAL SECTION
4	12-4-2014	ADD CBR VALUE TO TYPICAL SECTION
3	7-8-2014	ADD PHASING LINE (AREA 1 & AREA 2), ADD NOISE WALL AT END OF TIMBER LINE.
2	12-4-2013	REVISE Timber Line Lane and Wickwood Court alignment and profile, revise water, sewer and storm drain layout, revise lot numbers
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK ENGINEERING, INC.
8400 BALTIMORE NATIONAL PIKE & SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-485-8100 FAX: 410-485-8644
WWW.BE-CVLENGINEERING.COM

**VILLAGES AT TURF VALLEY
PHASE 2, SECTION 1**
LOT 203; OPEN SPACE LOTS 204-207;
GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B;
NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P0 394, GRID: 17
TAX MAP: 16, PARCEL: P0 8, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

**REVISED ROAD PLAN AND PROFILE
TIMBER LINE LANE & WICKWOOD COURT**
DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 6 OF 56



SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)															
		PAVEMENT MATERIAL (INCHES)				MIN HMA WITH GAB				HMA WITH CONSTANT GAB							
P-4	MINOR COLLECTORS: NON-RESIDENTIAL MAJOR COLLECTORS:	HMA SUPERPAVE FINAL SURFACE		2.0	2.0	2.0	2.0	2.0	2.0	HMA SUPERPAVE INTERMEDIATE SURFACE		2.0	2.0	2.0	2.0		
		HMA SUPERPAVE INTERMEDIATE SURFACE		2.0	2.0	2.0	2.0	2.0	2.0	HMA SUPERPAVE BASE		2.0	2.0	2.0	2.0		
		HMA SUPERPAVE BASE		4.0	4.0	3.0	6.0	5.0	3.0	GRADED AGGREGATE BASE (GAB)		13.0	7.0	4.0	6.0	6.0	6.0
		GRADED AGGREGATE BASE (GAB)		13.0	7.0	4.0	6.0	6.0	6.0								

P-4 PAVING DETAIL

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)															
		PAVEMENT MATERIAL (INCHES)				MIN HMA WITH GAB				HMA WITH CONSTANT GAB							
P-2	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SAC: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE		1.5	1.5	1.5	1.5	1.5	1.5	HMA SUPERPAVE INTERMEDIATE SURFACE		1.0	1.0	1.0	1.0		
		HMA SUPERPAVE INTERMEDIATE SURFACE		1.0	1.0	1.0	1.0	1.0	1.0	HMA SUPERPAVE BASE		2.0	2.0	2.0	2.0		
		HMA SUPERPAVE BASE		2.0	2.0	2.0	3.5	2.0	2.0	GRADED AGGREGATE BASE (GAB)		8.0	4.0	3.0	4.0	4.0	4.0
		GRADED AGGREGATE BASE (GAB)		8.0	4.0	3.0	4.0	4.0	4.0								

P-2 PAVING DETAIL

ROAD CHART					
AREA	NAME	CLASSIFICATION	DESIGN SPEED	PAVING TYPE	STATION LIMITS
AREA 1	RESORT ROAD	MAJOR COLLECTOR	40 MPH	P-4	40+73.42 TO 85+34.27
AREA 2	ATWOOD LANE	PUBLIC ACCESS PLACE	25 MPH	P-2	0+00 TO 3+00.00
AREA 3	TIMBER LINE LANE	PUBLIC ACCESS PLACE	25 MPH	P-2	0+00 TO -1+75.00
AREA 3	SPORTSMAN LODGE ROAD	PUBLIC ACCESS STREET	30 MPH	P-2	0+00 TO 0+54.55
AREA 2	WICKWOOD COURT	PUBLIC ACCESS PLACE	25 MPH	P-2	0+00 TO 0+50.00

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter J. Mason 1-9-14
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kevin P. Reardon 1/23/14
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Donald Mason 1/15/14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22390 Expiration Date: 6-20-15
 FOR REMON # 3 ONLY

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P10, GRID: 17
 TAX MAP: 16, PARCEL: P10, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PCCC

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 6480 BALTIMORE NATIONAL PkE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BEN-ENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 28359; Expiration Date: 7-22-2015.

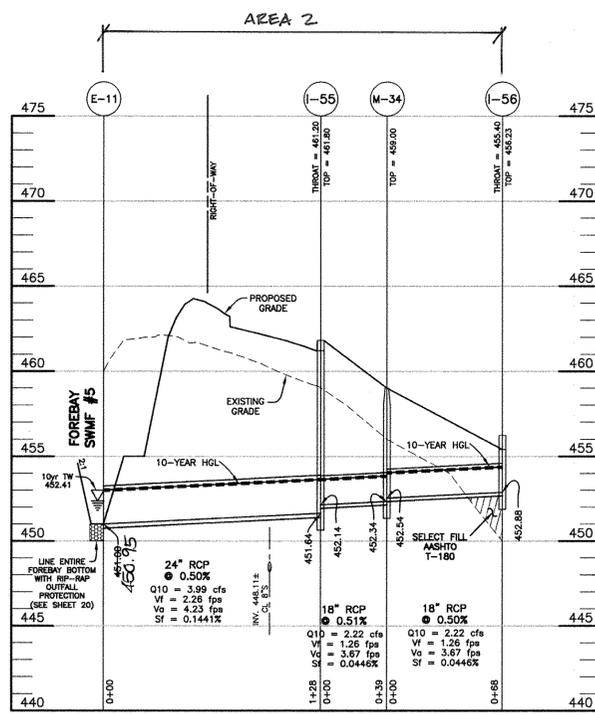
OWNER/DEVELOPER:
 MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21083
 +10-825-8400

REVISED ROAD PLAN AND PROFILE SPORTSMAN LODGE ROAD CURB & FILLETS AND DETAILS
 DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 7 OF 56



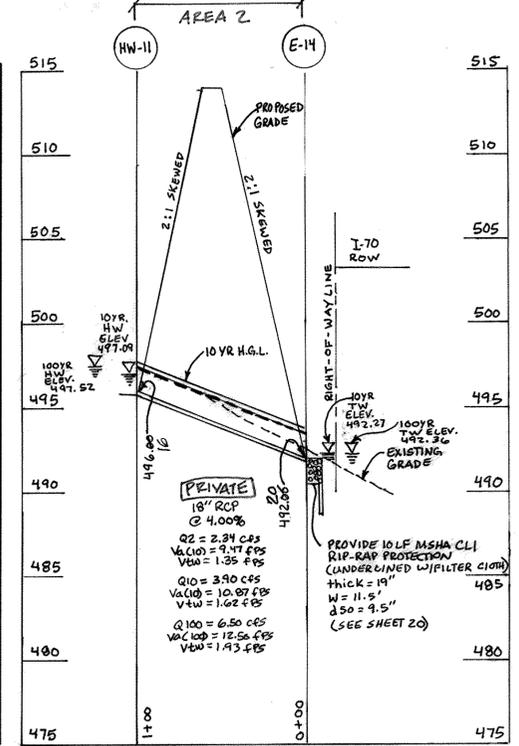
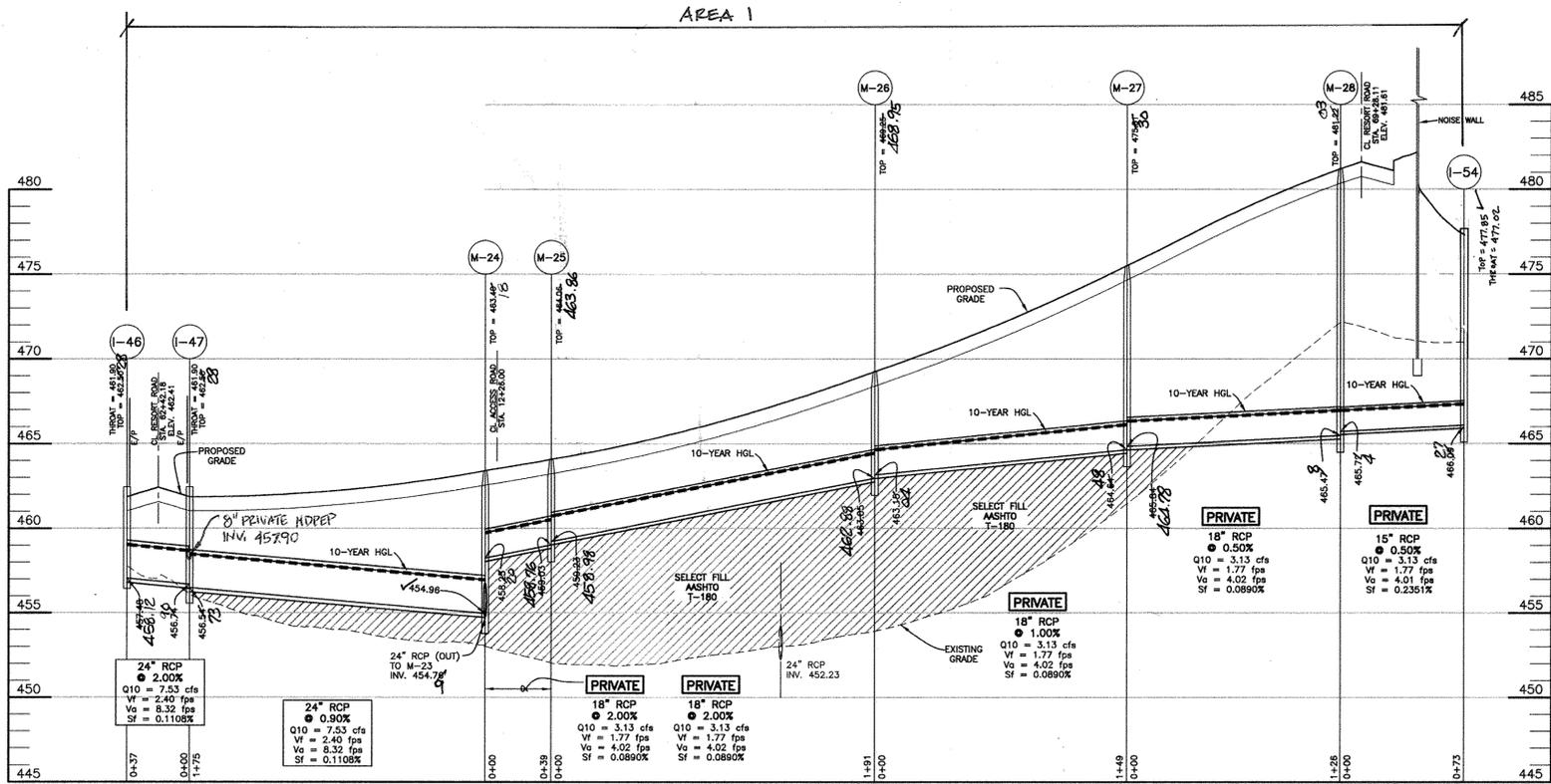
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-15

NOTE: BEAM AND COLVERT SHALL BE PRIVATELY OWNED AND MAINTAINED.



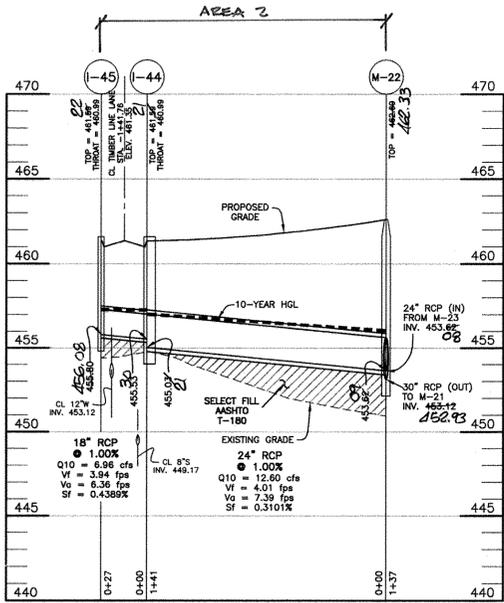
STORM DRAIN PROFILE E-11 TO I-56

TO BE CONSTRUCTED UNDER PHASE 2 SECTION 2, F-10-078
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



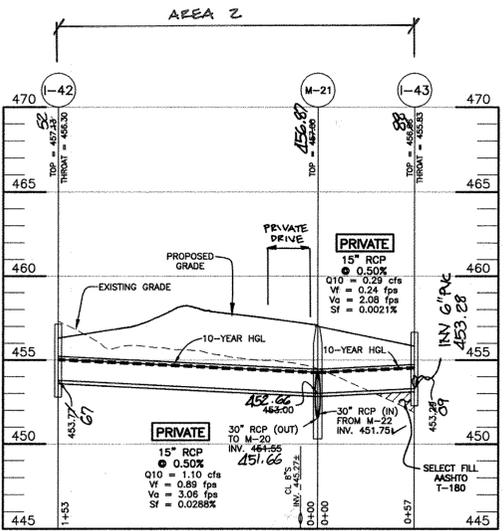
CULVERT PROFILE HW-11 TO E-14

SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



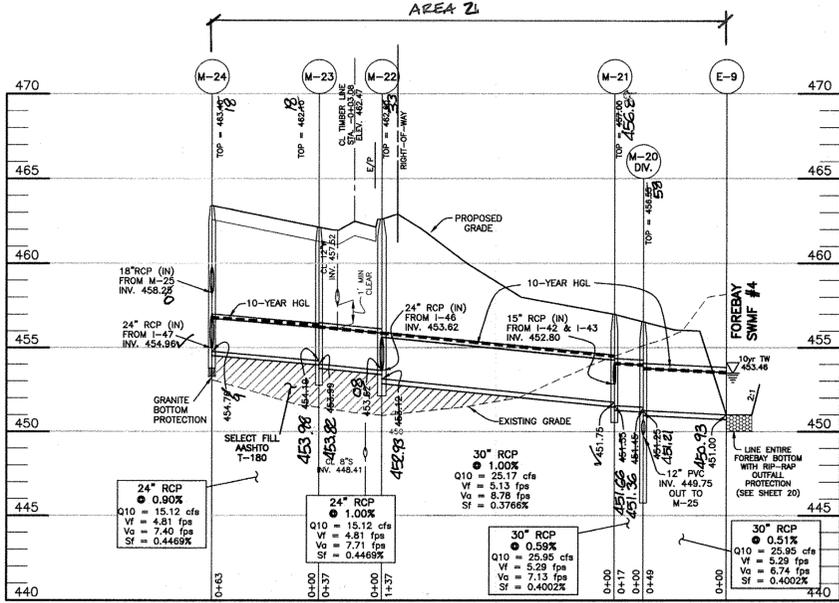
STORM DRAIN PROFILE I-45 TO M-22

SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



STORM DRAIN PROFILE I-42 TO I-43

SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



STORM DRAIN PROFILE M-24 TO E-9

SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'

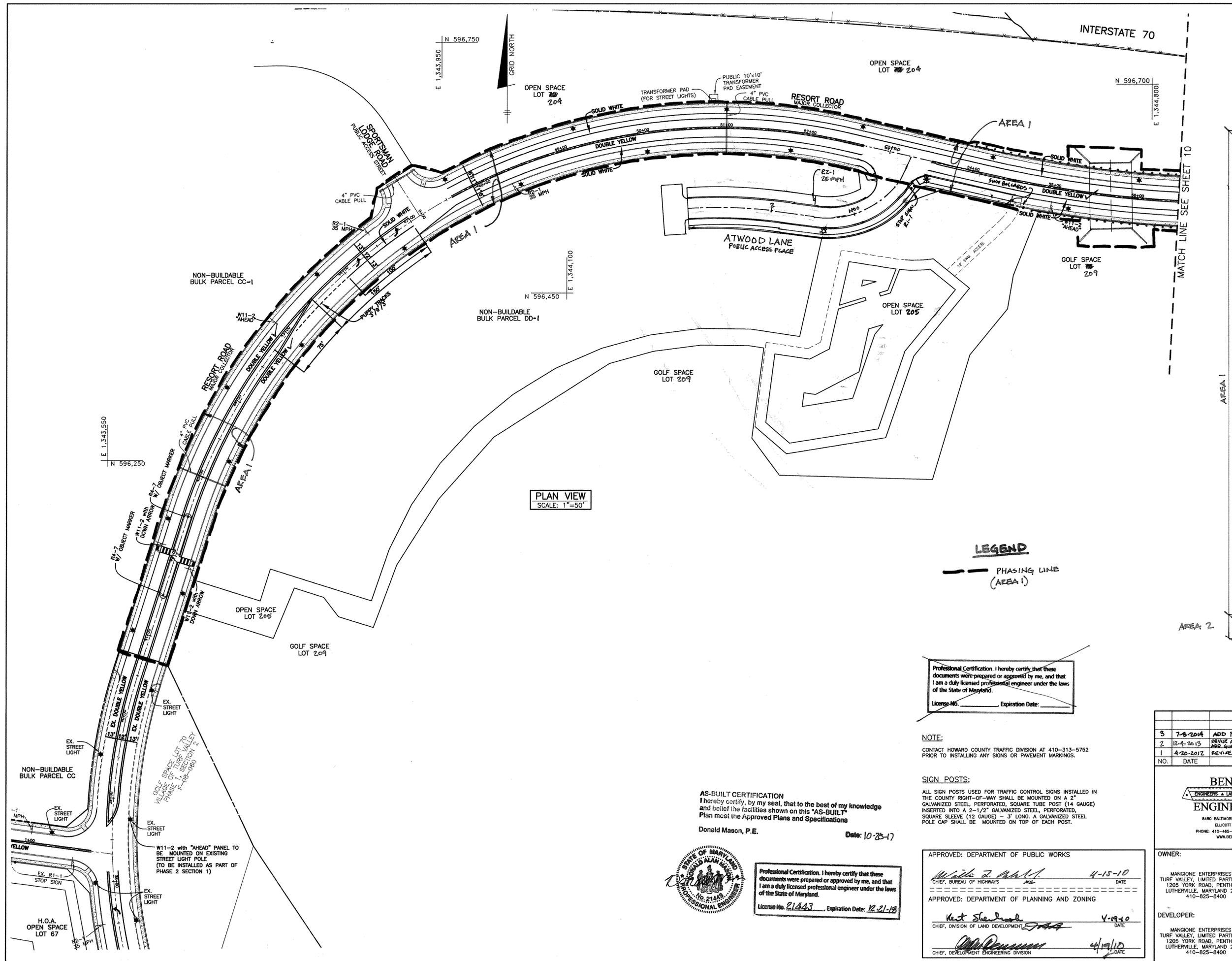
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22330 Expiration Date: 6-30-15
FOR REVISION #4, #5, #6, #7

APPROVED: DEPARTMENT OF PUBLIC WORKS
1-9-14 DATE
APPROVED: DEPARTMENT OF PLANNING AND ZONING
1/23/14 DATE
1/5/14 DATE

NO.	DATE	REVISION
5	12-4-2014	REVISE I-54 TOP AND THREAT ELEVATIONS
4	7-8-2014	ADD PHASING DESIGNATIONS (AREA 1 AND AREA 2)
3	3-31-2014	ADD PROFILE FROM HW 11 TO E14
2	12-4-2013	delete fillet profiles and add revised storm drain profiles.
1	4-20-2012	add profile through underpass/tunnel

NO.	DATE	REVISION
7	5-23-2017	ADD 3" PRIVATE HDPEP @ I-47
6	2-9-2016	REVISE PROP. GRADE BETWEEN M-21 AND I-42.

OWNER:	MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400
DEVELOPER:	MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400
REVISION	REVISED STORM DRAIN PROFILES
DATE:	FEBRUARY, 2010
SCALE:	1" = 50'
SHEET	8 OF 56



PLAN VIEW
SCALE: 1"=50'

LEGEND
 --- PHASING LINE (AREA 1)

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. _____ Expiration Date: _____

NOTE:
 CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-5752 PRIOR TO INSTALLING ANY SIGNS OR PAVEMENT MARKINGS.

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

AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
 Donald Mason, P.E. Date: 10-25-17



Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12-21-18

APPROVED: DEPARTMENT OF PUBLIC WORKS
 Wade Z. Hall, 4-15-10, DATE
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Vest Steinhilber, 4-19-10, DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT
 APPROVED: DEPARTMENT OF TRANSPORTATION
 [Signature], 4/19/10, DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	DESCRIPTION
	RESORT ROAD CL STA. 41+00	LEFT
	RESORT ROAD CL STA. 41+60	RIGHT
	RESORT ROAD CL STA. 42+40	LEFT
	RESORT ROAD CL STA. 43+30	RIGHT
	RESORT ROAD CL STA. 44+07	LEFT
	RESORT ROAD CL STA. 45+00	RIGHT
	RESORT ROAD CL STA. 45+75	LEFT
	RESORT ROAD CL STA. 46+75	RIGHT
	RESORT ROAD CL STA. 47+60	LEFT
	RESORT ROAD CL STA. 48+40	RIGHT
	RESORT ROAD CL STA. 49+20	LEFT
	RESORT ROAD CL STA. 50+00	RIGHT
	RESORT ROAD CL STA. 51+00	LEFT
	RESORT ROAD CL STA. 51+80	RIGHT
	RESORT ROAD CL STA. 52+60	LEFT
	RESORT ROAD CL STA. 53+50	RIGHT
	RESORT ROAD CL STA. 54+20	LEFT
	RESORT ROAD CL STA. 55+20	RIGHT
	RESORT ROAD CL STA. 56+00	LEFT
	RESORT ROAD CL STA. 56+80	RIGHT
	RESORT ROAD CL STA. 57+60	LEFT
	RESORT ROAD CL STA. 58+40	RIGHT
	RESORT ROAD CL STA. 59+20	LEFT
	RESORT ROAD CL STA. 60+00	RIGHT
*	RESORT ROAD CL STA. 60+80	LEFT
	RESORT ROAD CL STA. 61+60	RIGHT
	RESORT ROAD CL STA. 62+60	LEFT
	RESORT ROAD CL STA. 63+40	RIGHT
	RESORT ROAD CL STA. 64+20	LEFT
	RESORT ROAD CL STA. 65+00	RIGHT
	RESORT ROAD CL STA. 65+80	LEFT
	RESORT ROAD CL STA. 66+60	RIGHT
	RESORT ROAD CL STA. 67+40	LEFT
	RESORT ROAD CL STA. 68+20	RIGHT
	RESORT ROAD CL STA. 69+00	LEFT
	RESORT ROAD CL STA. 69+80	RIGHT
	RESORT ROAD CL STA. 70+60	LEFT
	RESORT ROAD CL STA. 71+40	RIGHT
	RESORT ROAD CL STA. 72+40	LEFT
	RESORT ROAD CL STA. 73+40	RIGHT
	RESORT ROAD CL STA. 74+20	LEFT
	RESORT ROAD CL STA. 75+00	RIGHT
	RESORT ROAD CL STA. 75+80	LEFT
	RESORT ROAD CL STA. 76+60	RIGHT
	RESORT ROAD CL STA. 77+40	LEFT
	RESORT ROAD CL STA. 78+20	RIGHT
	RESORT ROAD CL STA. 79+00	LEFT
	RESORT ROAD CL STA. 79+80	RIGHT
	RESORT ROAD CL STA. 80+60	LEFT
	RESORT ROAD CL STA. 81+40	RIGHT
	RESORT ROAD CL STA. 82+20	LEFT
	RESORT ROAD CL STA. 83+00	RIGHT
	RESORT ROAD CL STA. 83+80	LEFT
	RESORT ROAD CL STA. 84+60	RIGHT
	RESORT ROAD CL STA. 85+85	RIGHT
	EX. TURF VALLEY ROAD N595112.31 E1347008.11	
	TIMBER LINE LANE (ACCESS) CL STA. 0+40	RIGHT
*	ATWOOD LANE CL STA. 2+40	LEFT
*	ACCESS ROAD CL STA. 0+40	LEFT
	TIMBER LINE LANE CL STA. 0+45	RIGHT

150 WATT HPS VAPOR PREMIER POST-TOP FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE

100 WATT HPS VAPOR PREMIER POST-TOP FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE

3	7-8-2014	ADD PHASING LINE	
2	12-4-2013	REVISE ATWOOD LANE ALIGNMENT ADJUST STRIPING SIGNAGE LIGHT POLE AND SIGNAGE. REVISE LOT 209 SHOWN AS 10' TYPED BULK	
1	4-20-2012	REVISE SHEET NUMBER	

NO. DATE REVISION

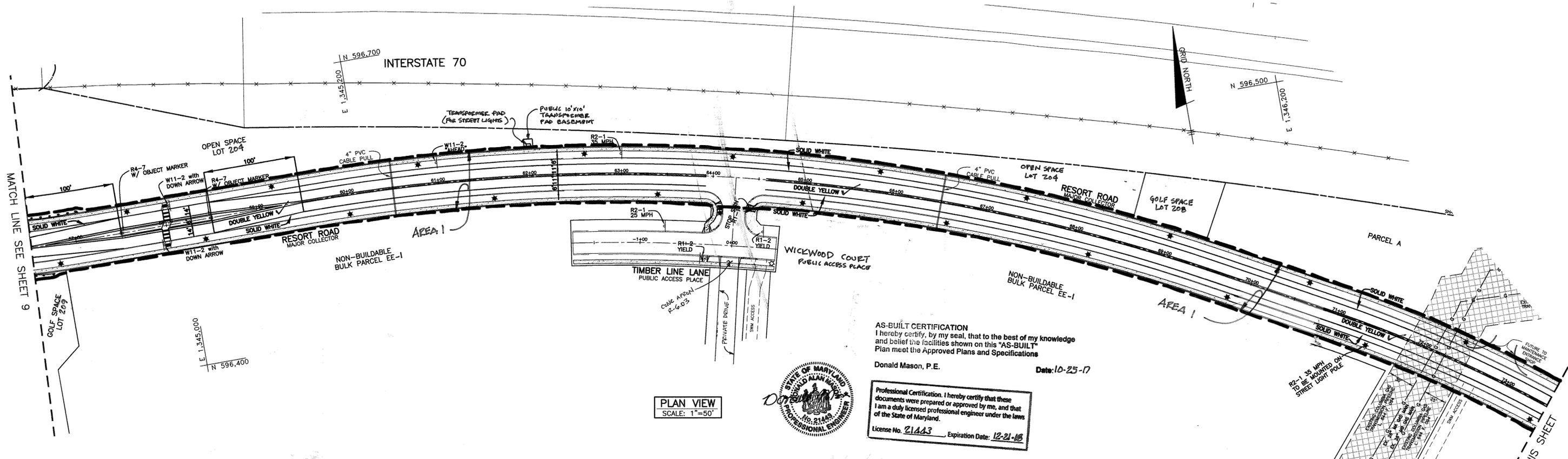
BENCHMARK ENGINEERING, INC.
 8480 BALTIMORE NATIONAL PIKE A SUITE 418
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BE-CVLENGINEERING.COM

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 21443, Expiration Date: 12-21-2018.

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 205, OPEN SPACE LOTS 204-207, GOLF SPACE LOTS 208, 209, PARCELS A & B, NON-BUILDABLE BULK PARCELS CC-1 DD-1 DE-1 FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P/D 394, GRID: 17
 TAX MAP: 16, PARCEL: P/O 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

STREET LIGHT, STREET SIGN AND STREET STRIPING PLAN
 DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 9 OF 56

P:\1915\dwg\Phase 2 Section 1\17002-1_64_409-10.dwg, 2/8/2010 10:30:35 AM



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

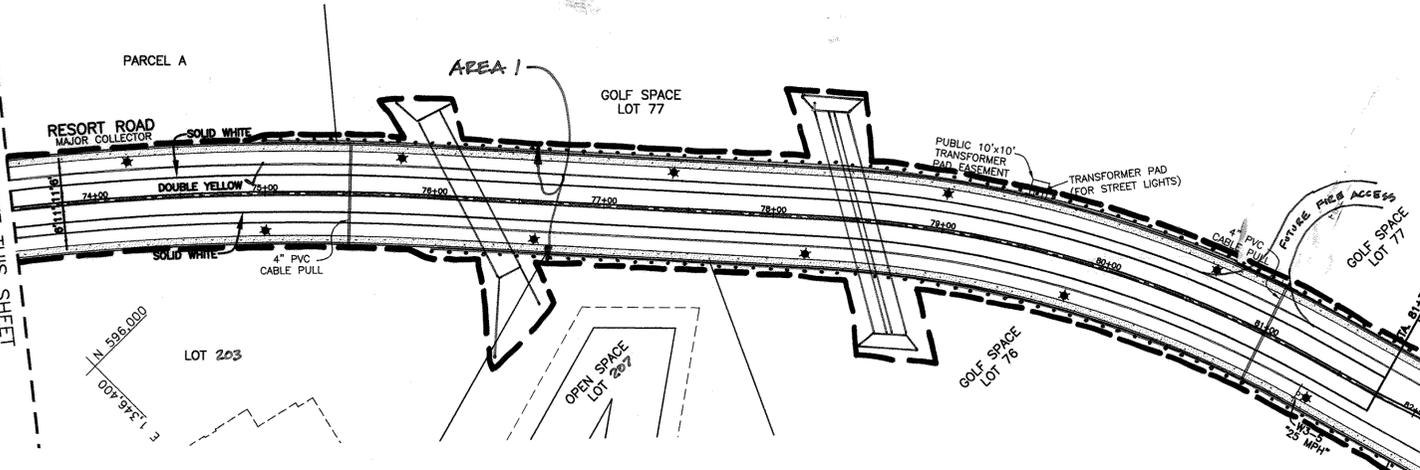
Donald Mason, P.E. Date: 10-25-17



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

License No. 21443 Expiration Date: 12-21-18

LEGEND
 PHASING LINE AREA 1



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. 27390 Expiration Date: 12-1-14

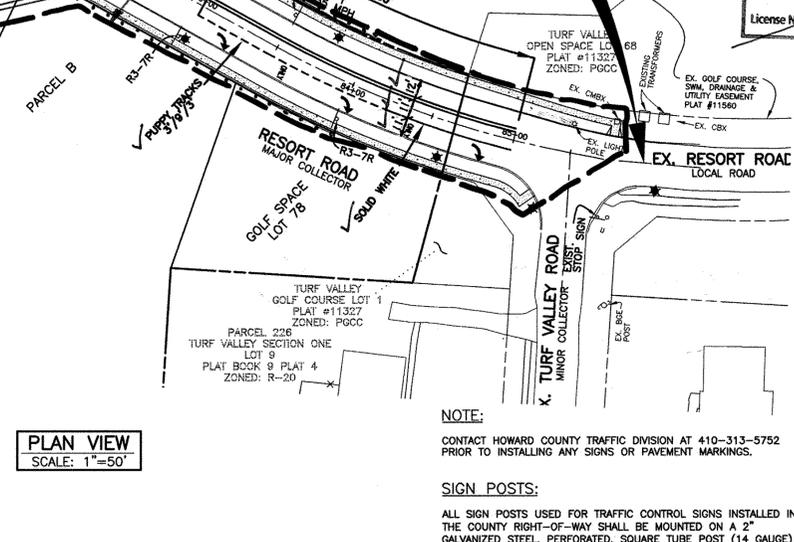
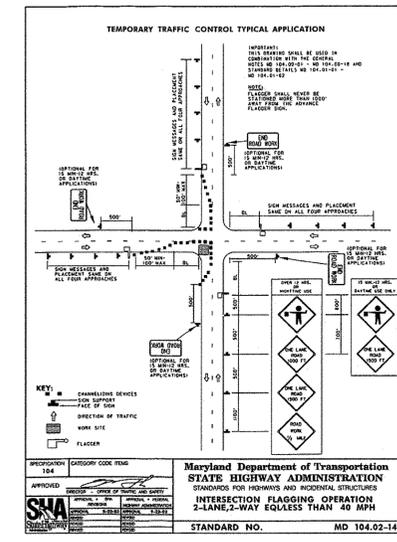
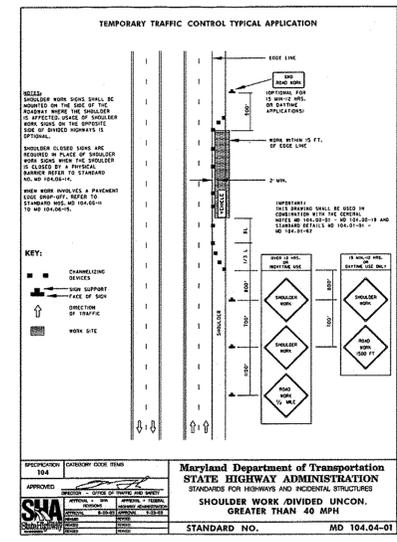
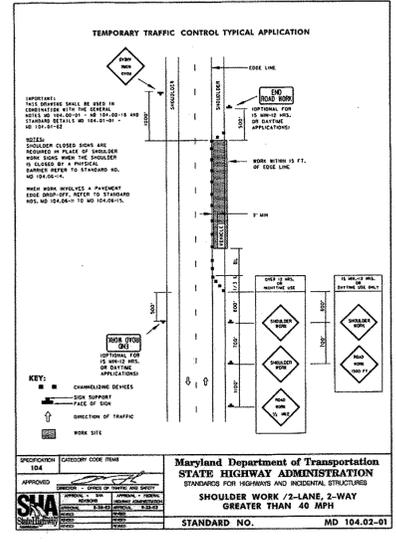
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. Expiration Date:

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4-15-10 DATE
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-19-10 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4/15/10 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION



NOTE:
 CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-5752 PRIOR TO INSTALLING ANY SIGNS OR PAVEMENT MARKINGS.

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NO.	DATE	REVISION
5	2-9-2016	SHOW PRIVATE DRIVE AND REVISE SIDEWALK? RAMP ORIENTATION
4	12-4-2014	REVISE LANE STRIPING DIMENSION SIGNS AT STA. 84+40 RESORT ROAD
3	7-8-2014	ADD PHASING LINE
2	12-4-2013	DELTA'S UNCLE SAM INTERSECTION WITH RESORT ROAD. ADD GROUND SIGNS. REVISE LOT 1 SHEET
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS

8480 BALTIMORE NATIONAL PIKE A SUITE 418
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-465-8108 FAX: 410-465-8644
 WWW.BE-ENGINEERING.COM

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

[Signature] 2/23/10

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

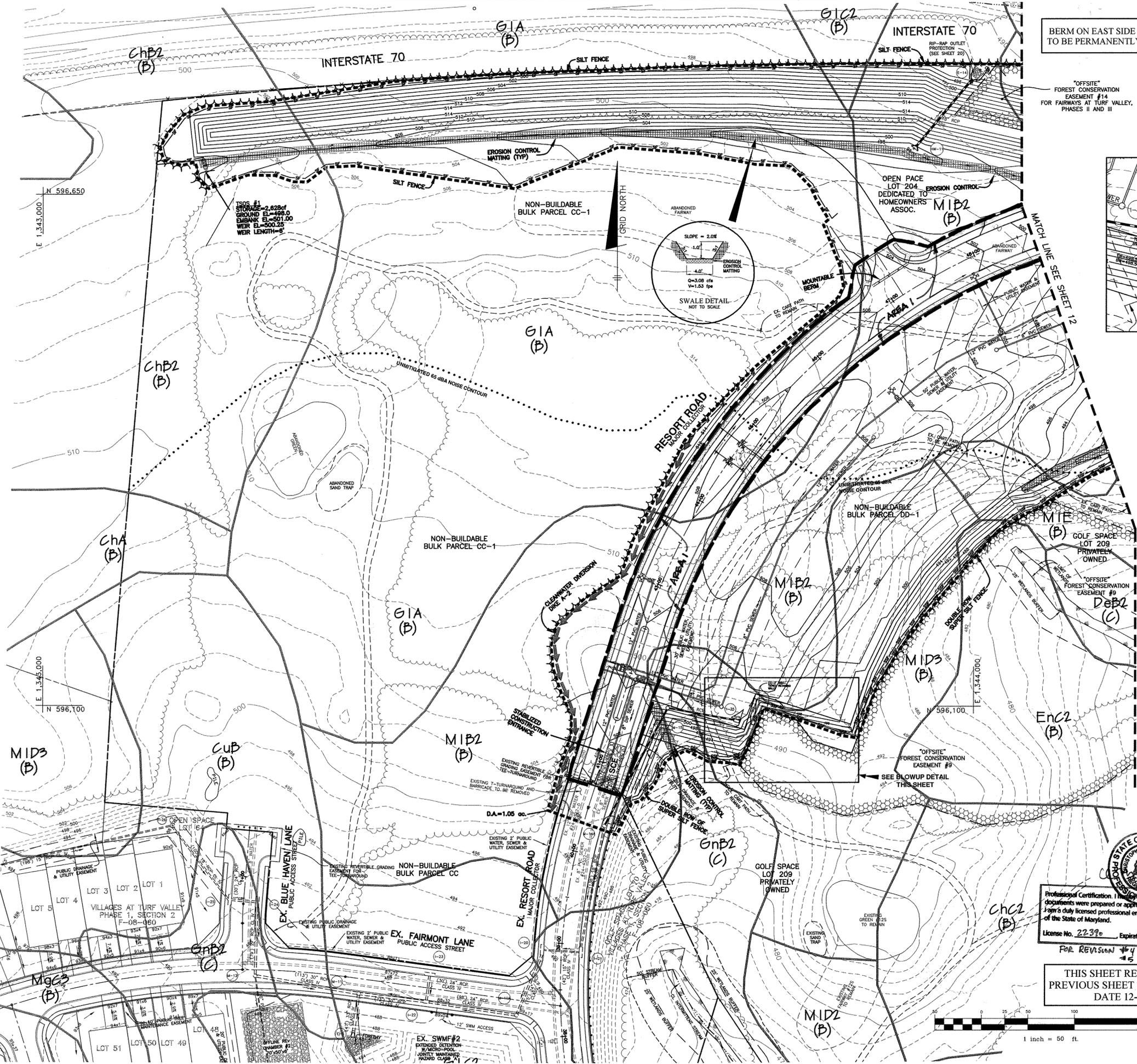
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
 410-825-8400

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 205; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 76, 208, 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS, CO-1 DP-1 EE-1 PE-1

TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P10 394, GRID: 17
 TAX MAP: 16, PARCEL: P10 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

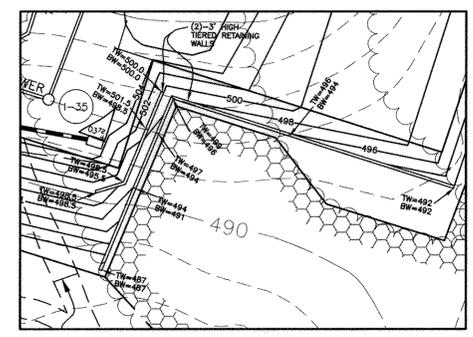
STREET LIGHT, STREET SIGN AND STREET STRIPING PLAN

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 10 OF 56



BERM ON EAST SIDE OF CULVERT TO BE PERMANENTLY STABILIZED

"OFFSITE" FOREST CONSERVATION EASEMENT #14 FOR FAIRWAYS AT TURF VALLEY, PHASES II AND III



RETAINING WALL BLOWUP
SCALE: 1"=30'

- LEGEND**
- EXISTING CONTOURS AERIAL JAN. 2008
 - EXISTING BRUSH
 - EXISTING TREELINE
 - PROPOSED TREELINE
 - EXISTING STREAM
 - EXISTING WETLANDS
 - UNMITIGATED 65 dBA NOISE LINE
 - FOREST CONSERVATION EASEMENT
 - EARTH DIKE
 - SUPER SILT FENCE
 - LIMIT OF DISTURBANCE
 - EROSION CONTROL MATTING
 - STABILIZED CONSTRUCTION ENTRANCE
 - SOILS DELINEATION LINE
 - SOILS TYPE AND CLASS
 - PHASING LINE (AREA 1)

GENERAL STORAGE REQUIREMENT SUMMARY TABLE

DRAINAGE AREA 3	WQV AREA = 0.35 AC. CPV AREA = 0.35 AC.	NOTES
(WQV)	0.0054 ac-ft	SMALL AMOUNT OF IMPERVIOUS TO BE TREATED UPON EXTENSION OF ROAD
(REV)	0.01 ac-ft	SMALL AMOUNT OF IMPERVIOUS TO BE TREATED UPON EXTENSION OF ROAD
(CPV)	0.0000 ac-ft	NOT REQUIRED FOR THIS AREA 1-TYR POST < 2.0 dts

1-YEAR DISCHARGE COMPARISON TABLE

EXISTING	PROPOSED	NOTES
0.18 CFS	0.18 CFS	1-TYR POST-DEVELOPED DISCHARGE AMOUNT IS LESS THAN 1-TYR PRE-DEVELOPED DISCHARGE AMOUNT

- NOTES:**
- TEMPORARY OR PERMANENT STABILIZATION IS TO BE PERFORMED AT THE DISCRETION OF THE SEDIMENT CONTROL INSPECTOR REGARDLESS OF ANY OTHER STANDARD STABILIZATION NOTES WITH THE STANDARD NOTES BEING THE MINIMUM.
 - SILT AND SUPER SILT FENCING TO BE CURLED UPHILL AT 2 VERTICAL FOOT INTERVALS WHERE FENCING RUNS DOWNHILL.

NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-19

5 12-4-2014 REVISE 0' MANGIOME SLOPE TO 4' CONC. SLOPE

NO.	DATE	REVISION
4	7-8-2014	ADD PHASING LINE
3	3-28-2014	extend the berm along I-70, add storm drain from HW11 to E14, revise FCE 14 limits, add missing proposed treeline
2	12-4-2013	revise berm size, delete noise wall, revise storm drain, water & sewer alignments, revise grading south of Resort Road. Revise lot numbers.
1	4-20-2012	revise sheet number

BENCHMARK ENGINEERING, INC.
8400 BALTIMORE NATIONAL PIKE & SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-8105 FAX: 410-465-8644
WWW.BE-CIVILENGINEERING.COM

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

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

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
LOT 203; OPEN SPACE LOTS 204-207;
GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B;
NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: PO 394, GRID: 17
TAX MAP: 16, PARCEL: PO 8, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

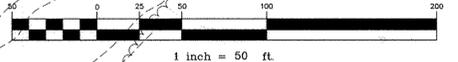
REVISED GRADING, SEDIMENT AND EROSION CONTROL PLAN

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
SCALE: 1" = 50' SHEET 11 OF 56

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

FOR REVISION #4 ONLY

THIS SHEET REPLACES THE PREVIOUS SHEET WITH REVISION DATE 12-4-2013.

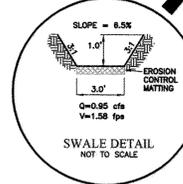
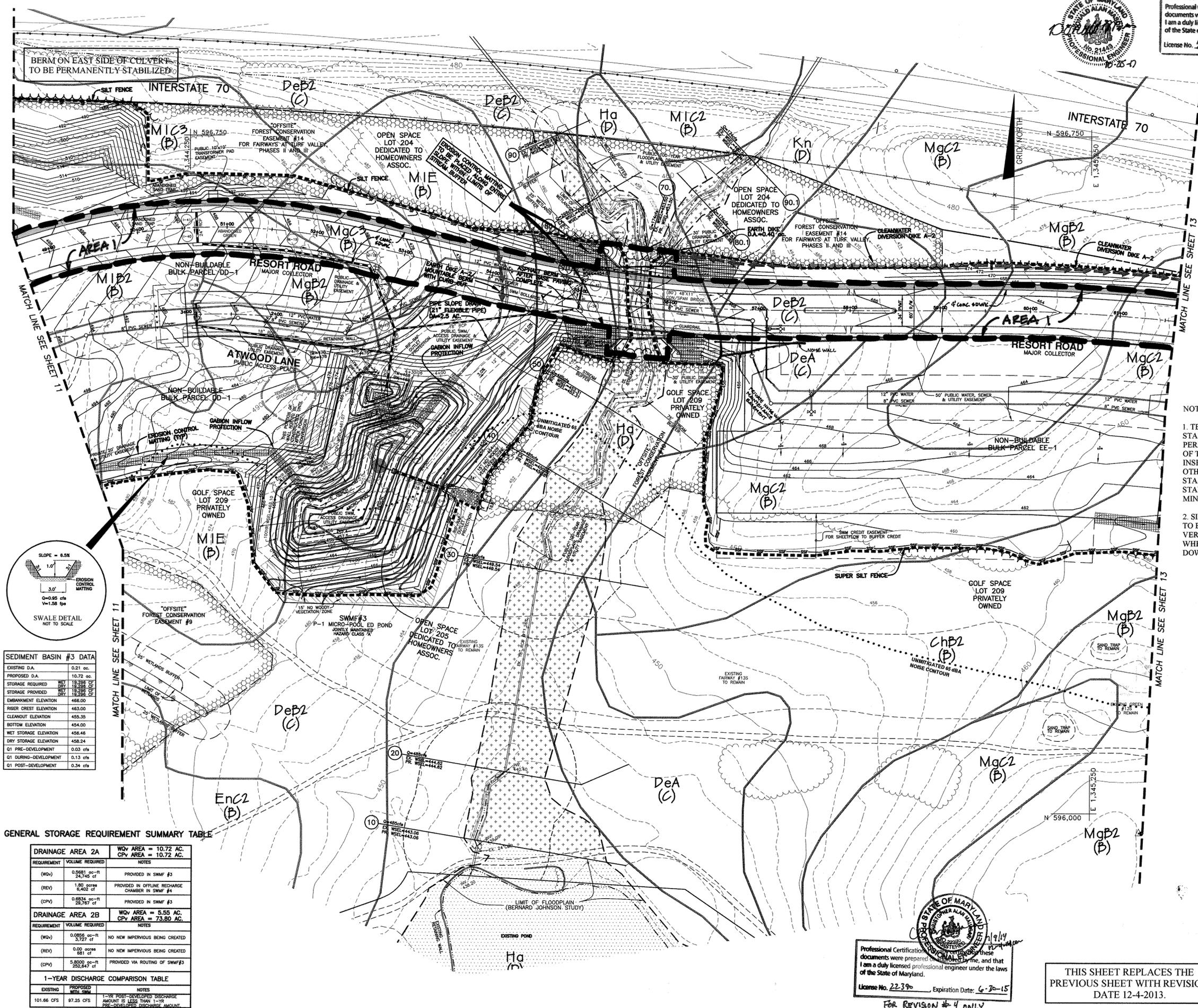




Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-31-16

LEGEND

- EXISTING CONTOURS AERIAL JAN. 2006
- EXISTING BRUSH
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING STREAM
- EXISTING WETLANDS
- UNMITIGATED 65 dBA NOISE LINE
- FOREST CONSERVATION EASEMENT
- EARTH DIKE
- SUPER SILT FENCE
- LIMIT OF DISTURBANCE
- EROSION CONTROL MATTING
- SOILS DELINEATION LINE
- SOILS TYPE AND CLASS
- GIA (B)
- PHASING LINE (AREA 1)



SEDIMENT BASIN #3 DATA

EXISTING D.A.	0.21 ac.
PROPOSED D.A.	10.72 ac.
STORAGE REQUIRED	19,296 CF
STORAGE PROVIDED	19,296 CF
EMBANKMENT ELEVATION	466.00
RISER CHEST ELEVATION	463.00
CLEANOUT ELEVATION	459.30
BOTTOM ELEVATION	454.00
WET STORAGE ELEVATION	456.48
DRY STORAGE ELEVATION	458.24
Q1 PRE-DEVELOPMENT	0.03 cfs
Q1 DURING-DEVELOPMENT	0.13 cfs
Q1 POST-DEVELOPMENT	0.34 cfs

GENERAL STORAGE REQUIREMENT SUMMARY TABLE

DRAINAGE AREA 2A	WQV AREA = 10.72 AC. CPV AREA = 10.72 AC.	REQUIREMENT	VOLUME REQUIRED	NOTES
(WQV)		0.5891 ac-ft	24,746 cf	PROVIDED IN SWMF #3
(REV)		1.80 ac-ft	6,402 cf	PROVIDED IN OFFLINE RECHARGE CHAMBER IN SWMF #4
(CPV)		0.6834 ac-ft	29,767 cf	PROVIDED IN SWMF #3
DRAINAGE AREA 2B	WQV AREA = 5.55 AC. CPV AREA = 73.80 AC.	REQUIREMENT	VOLUME REQUIRED	NOTES
(WQV)		0.0856 ac-ft	3,727 cf	NO NEW IMPERVIOUS BEING CREATED
(REV)		0.00 ac-ft	0 cf	NO NEW IMPERVIOUS BEING CREATED
(CPV)		5.8000 ac-ft	252,847 cf	PROVIDED VIA ROUTING OF SWMF #3
1-YEAR DISCHARGE COMPARISON TABLE				
EXISTING	PROPOSED WITH SWM	NOTES		
101.86 CFS	97.25 CFS	-1% PRE-DEVELOPED DISCHARGE AMOUNT IS LESS THAN 1-YEAR PRE-DEVELOPED DISCHARGE AMOUNT.		

NOTES:

- TEMPORARY OR PERMANENT STABILIZATION IS TO BE PERFORMED AT THE DISCRETION OF THE SEDIMENT CONTROL INSPECTOR REGARDLESS OF ANY OTHER STANDARD STABILIZATION NOTES WITH THE STANDARD NOTES BEING THE MINIMUM.
- SILT AND SUPER SILT FENCING TO BE CURLED UPHILL AT 2 VERTICAL FOOT INTERVALS WHERE FENCING RUNS DOWNHILL.

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

Donald M. Man, License No. 21443, Date: 10-25-17

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFICATION DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

BY THE DEVELOPER:
 [Signature] 3/20/14 DATE

BY THE ENGINEER:
 [Signature] 3/20/2014 DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4/16/14 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4/20/14 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4/28/14 DATE

NO.	DATE	REVISION
4	7-9-2014	ADD NOISE WALL AT STATIONS 50+50 TO 51+00 ALONG EBERT ROAD. BREAK OUT EBERT ROAD RIGHT-OF-WAY AND CALL IT AREA 1.
3	3-28-2014	extend berm along I-70, revise FGE 14 limits.
2	12-4-2013	revise Atwood Lane, water, sewer storm drain layout, delete noise wall, add retaining walls by SWMF #3, revise grading, revise lot numbers.
1	4-20-2012	revise sheet number

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE A SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-485-8105 FAX: 410-485-8644
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OWNER:
 MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
 410-825-8400

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

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P10, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

GRADING, SEDIMENT AND EROSION CONTROL PLAN

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: 1" = 50' SHEET 12 OF 56

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22390, Expiration Date: 6-30-15
 FOR REVISION #4 ONLY

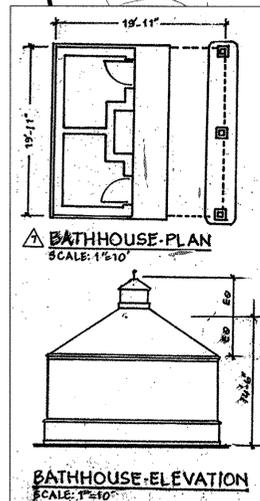
THIS SHEET REPLACES THE PREVIOUS SHEET WITH REVISION DATE 12-4-2013.

SEDIMENT BASIN #4 DATA	
EXISTING D.A.	0.88 ac.
PROPOSED D.A.	8.68 ac.
STORAGE REQUIRED	18,824 cu ft
STORAGE PROVIDED	18,824 cu ft
EMBANKMENT ELEVATION	456.00
RISER CREST ELEVATION	453.50
CLEANOUT ELEVATION	447.05
BOTTOM ELEVATION	446.00
WET STORAGE ELEVATION	447.97
DRY STORAGE ELEVATION	449.53
Q1 PRE-DEVELOPMENT	0.17 cfs
Q1 DURING-DEVELOPMENT	0.16 cfs

SEDIMENT BASIN #5 DATA	
EXISTING D.A.	0.06 ac.
PROPOSED D.A.	3.19 ac.
STORAGE REQUIRED	5,970 cu ft
STORAGE PROVIDED	5,970 cu ft
EMBANKMENT ELEVATION	452.00
RISER CREST ELEVATION	452.40
CLEANOUT ELEVATION	447.95
BOTTOM ELEVATION	447.00
WET STORAGE ELEVATION	448.73
DRY STORAGE ELEVATION	450.03
Q1 PRE-DEVELOPMENT	0.01 cfs
Q1 DURING-DEVELOPMENT	0.10 cfs
Q1 POST-DEVELOPMENT	0.06 cfs

GENERAL STORAGE REQUIREMENT SUMMARY TABLE

DRAINAGE AREA	WQV AREA	CPV AREA	NOTES
4A	8.80 AC.	9.05 AC.	
REQUIREMENT	VOLUME REQUIRED		
(NOV)	0.4247 ac-ft 18,392 cf		PROVIDED IN SWMF #4
(REV)	1.27 conc 4,544 cf		PROVIDED IN THE OFFLINE RECHARGE CHAMBER
(CPV)	0.8237 ac-ft 22,811 cf		PROVIDED IN SWMF #4
4B	3.15 AC.	3.15 AC.	
REQUIREMENT	VOLUME REQUIRED		
(NOV)	0.1105 ac-ft 4,812 cf		PROVIDED IN SWMF #5
(REV)	0.33 conc 1,213 cf		PROVIDED IN THE OFFLINE RECHARGE CHAMBER IN SWMF #4
(CPV)	0.1324 ac-ft 5,767 cf		PROVIDED IN SWMF #5
4C	3.65 AC.	3.65 AC.	
REQUIREMENT	VOLUME REQUIRED		
(NOV)	0.0543 ac-ft 2,451 cf		NO NEW IMPERVIOUS BEING CREATED
(REV)	0.01 conc 44 cf		NO NEW IMPERVIOUS BEING CREATED
(CPV)	0.0000 ac-ft 0 cf		NOT REQUIRED FOR THIS AREA
1-YEAR DISCHARGE COMPARISON TABLE			
EXISTING	PROPOSED	NOTES	
0.80 CFS	1.09 CFS	1-YR POST-DEVELOPER DISCHARGE AMOUNT IS GREATER THAN 1-YR PRE-DEVELOPER DISCHARGE AMOUNT.	



9	10-18-2017	ADD TEMP. FENCE ON OS LOT 206/207 OF SWMF #4 AND GOLF SPACE LOT 209
8	2-9-2016	show revised private drive and bathhouse location, revise grades along private drive and on west side of SWMF #4, add 30'x30' turnaround areas, revise sidewalk and ramp locations
7	8-20-2015	add bathhouse, WHC and SHC
6	12-4-2014	revise 6' asphalt sidewalk to a 4' conc. sidewalk, revise grades in area of 1-54 per field conditions.

THIS SHEET REPLACES THE PREVIOUS ORIGINAL SIGNED ON JANUARY 23, 2014

NOTE: SWMF #4 & #5 TO BE MAINTAINED AS SEDIMENT TRAPS UNTIL COMPLETION OF PHASE 2, SECTION 2.

LEGEND

- EXISTING CONTOURS AERIAL JAN. 2006
- EXISTING BRUSH
- EXISTING TRELISE
- PROPOSED TRELISE
- EXISTING STREAM
- EXISTING WETLANDS UNMITIGATED 65 dBA NOISE LINE
- FOREST CONSERVATION EASEMENT
- EARTH DIKE
- SUPER SILT FENCE
- LIMIT OF DISTURBANCE
- EROSION CONTROL MATTING
- SOILS DELINEATION LINE
- SOILS TYPE AND CLASS
- PHASING LINE AREA 1

NO.	DATE	REVISION
5	7-8-2014	add phasing line
4	3-31-2014	revise dimension of noise wall to curb to be 20 feet.
3	12-4-2013	shift Timber Line Lane, delete intersection of Wickwood Court and Resort Road, revise mass grading, revise lot numbers, revise storm drain, water & sewer alignments, delete noise wall.
2	8-22-2013	add retaining wall #3.
1	4-20-2012	revise match line location with sheet 14, revise sheet number

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6165 FAX: 410-465-6644
 WWW.BE-CVLENGINEERING.COM

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

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

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 15, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P/O 394, GRID: 17
 TAX MAP: 16, PARCEL: P/O 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

REVISIONS:
 GRADING, SEDIMENT AND EROSION CONTROL PLAN
 DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: 1" = 50' SHEET 13 OF 56

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-21-18



AS-BUILT CERTIFICATION
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

Donald M. Malagan, PE No. 21443, Engineer, Date: 10-25-17

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

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

Chris Malagan, 2/9/16, Developer

BY THE ENGINEER:
 I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED 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.

Chris Malagan, 2-9-16, Engineer - Chris Malagan, P.E. # 22390

John R. Johnston, 2/19/16, HOWARD SOIL CONSERVATION DISTRICT

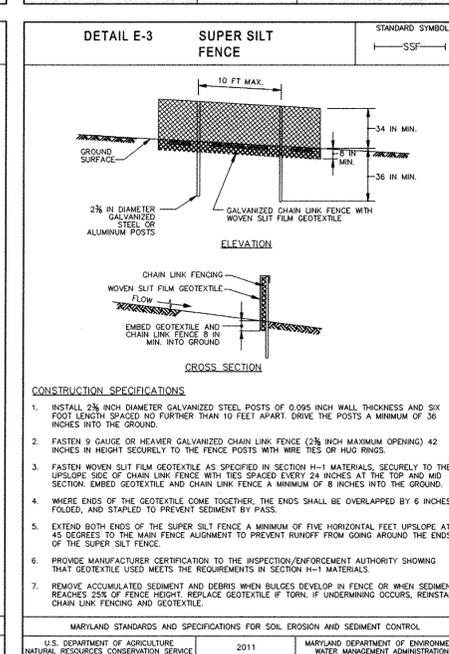
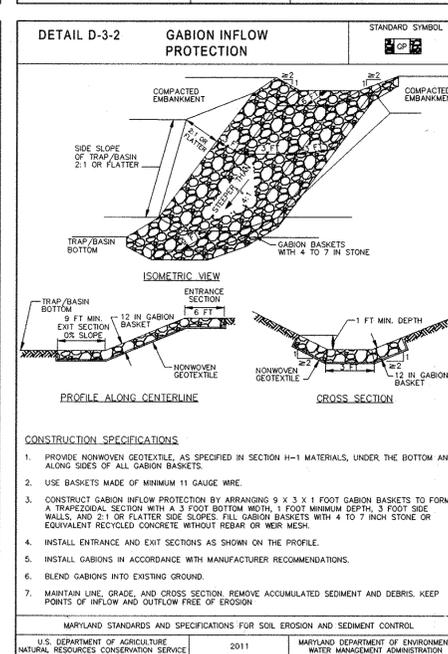
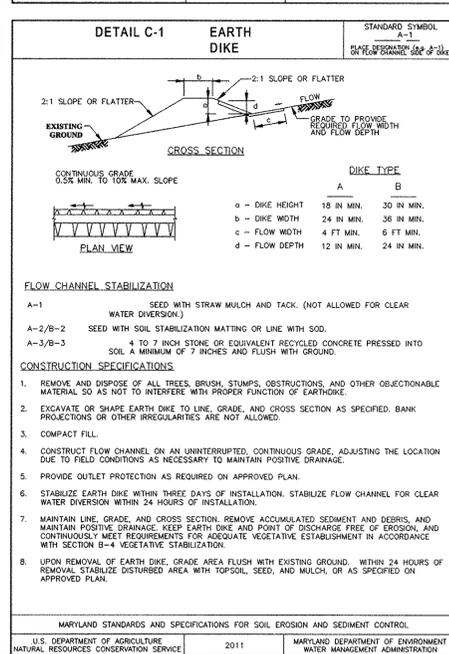
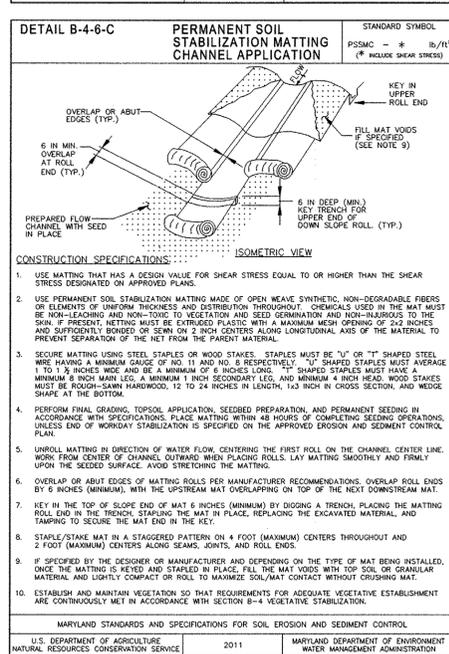
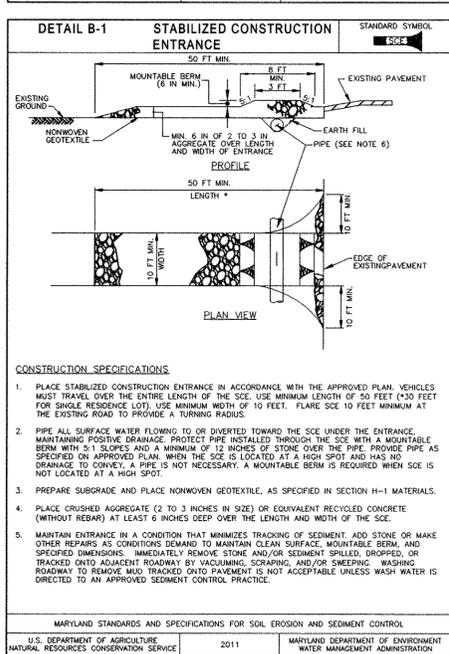
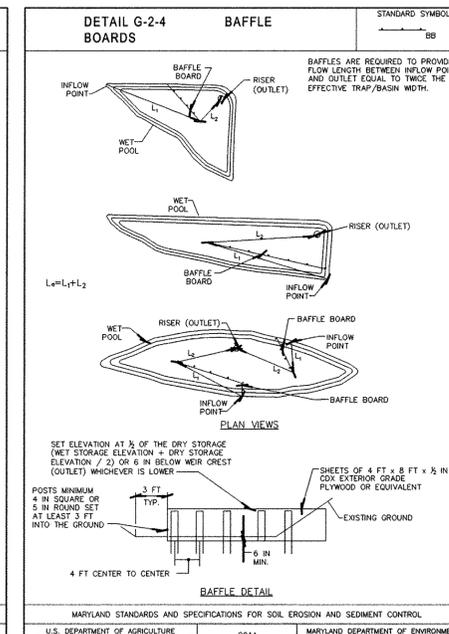
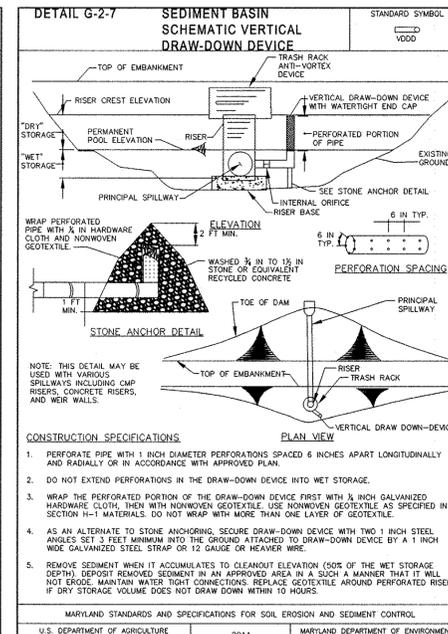
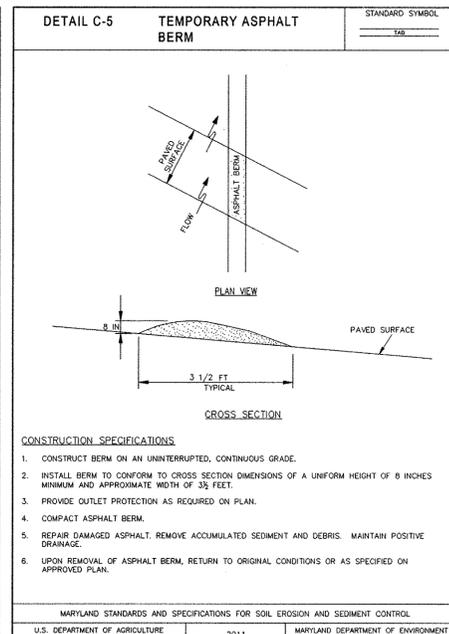
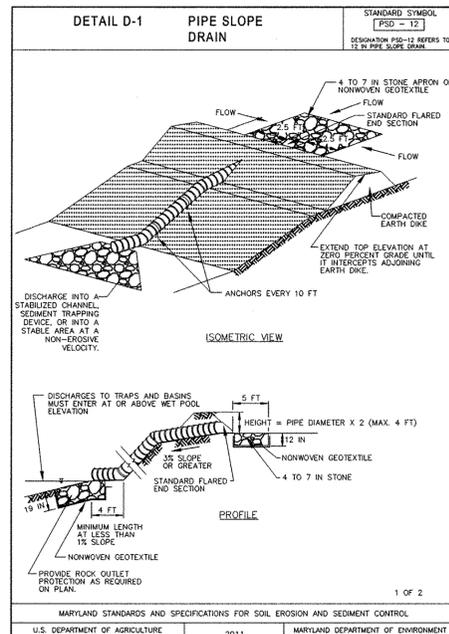
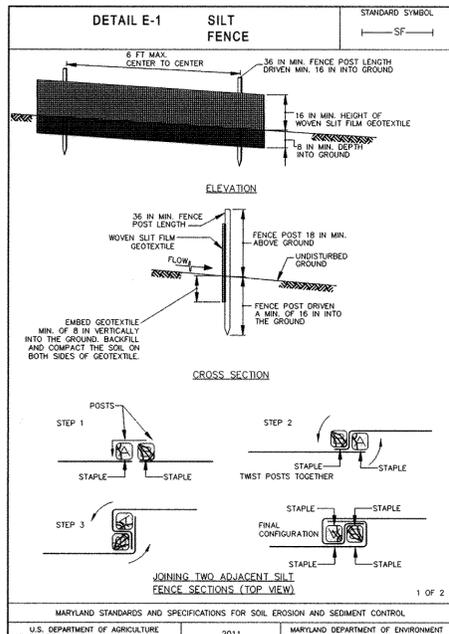
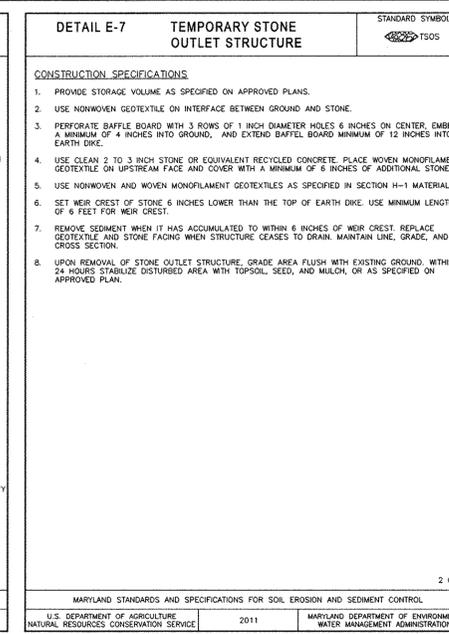
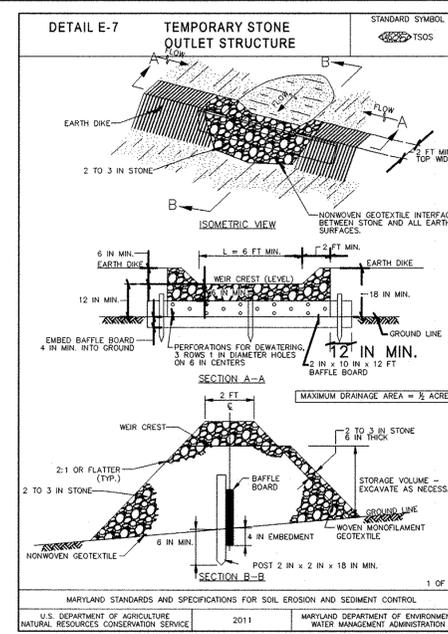
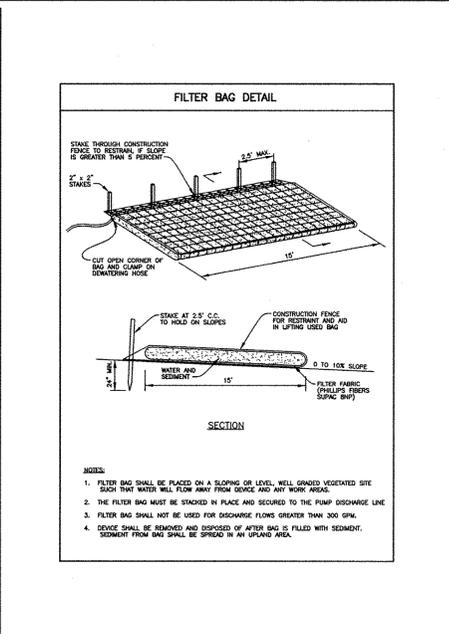
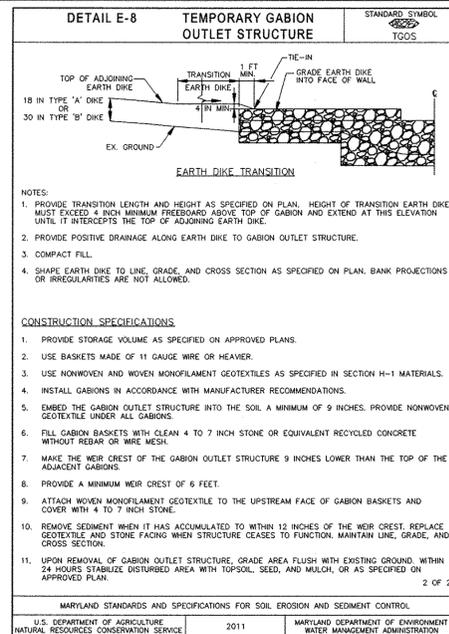
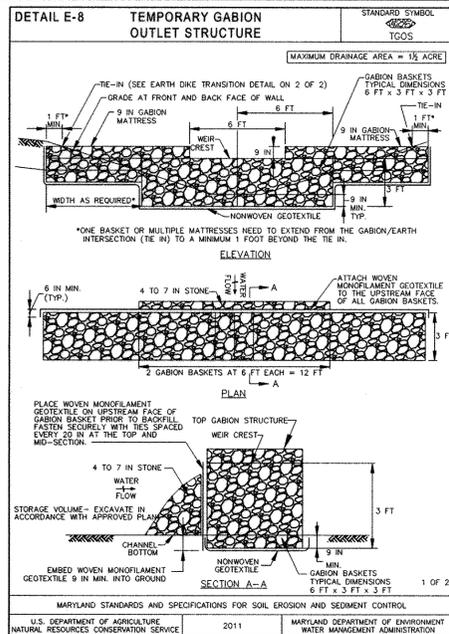
APPROVED: DEPARTMENT OF PUBLIC WORKS
 Meunier, 2/24/2016, CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Vasthion, 3-7-16, CHIEF, DIVISION OF LAND DEVELOPMENT

U. J. G. 2-29-16, CHIEF, DEVELOPMENT ENGINEERING DIVISION

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





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. 21463 Expiration Date: 12-21-18

BY THE DEVELOPER:
 [Signature] 12/5/13 DATE

BY THE ENGINEER:
 [Signature] 12/9/2013 DATE
 [Signature] 12/2/13 DATE
 [Signature] 1-9-14 DATE
 [Signature] 1/23/14 DATE
 [Signature] 1/5/14 DATE

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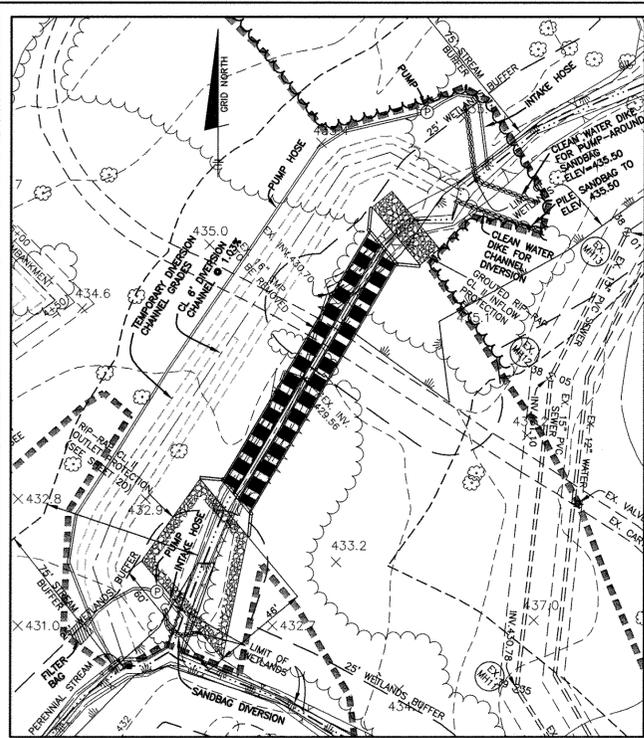
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OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
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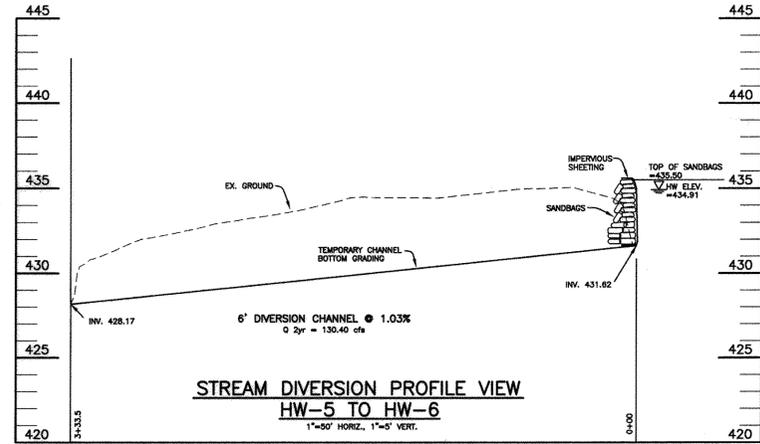
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
 410-825-8400

REVISIONS:
 2 12-4-2013 revise lots in title block, update details to 2011 Stds & Specs.
 1 4-20-2012 revise S.O.C. to include wall & tunnel installation, revise sheet number

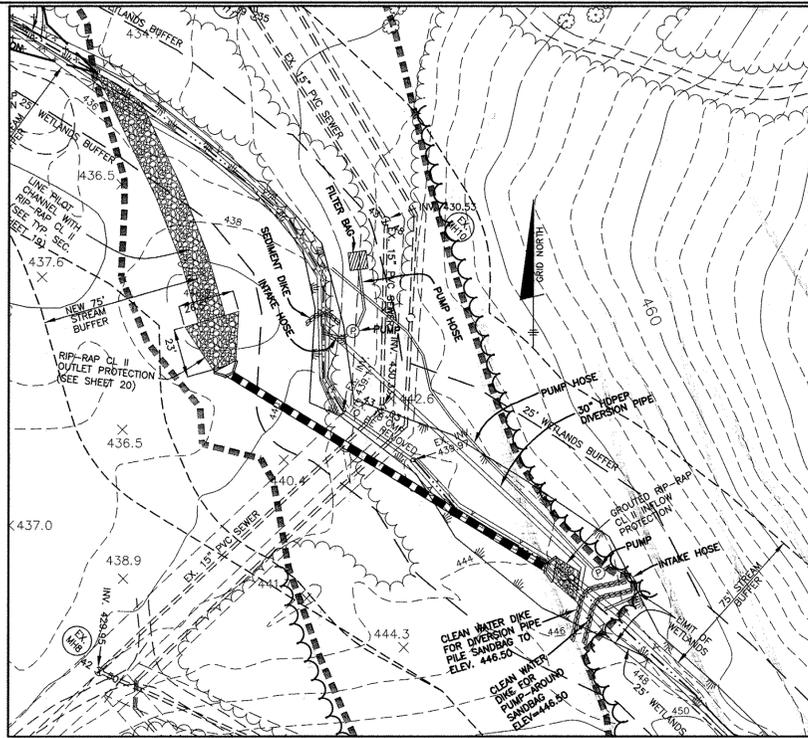
DATE: FEBRUARY, 2010 SHEET: 15A OF 56
 SCALE: AS SHOWN



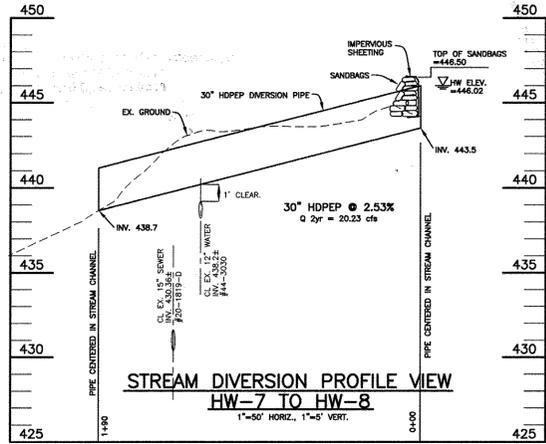
STREAM DIVERSION PLAN VIEW
HW-5 TO HW-6
SCALE: 1" = 40'



STREAM DIVERSION PROFILE VIEW
HW-5 TO HW-6
1"=50' HORIZ., 1"=5' VERT.



STREAM DIVERSION PLAN VIEW
HW-7 TO HW-8
SCALE: 1" = 40'



STREAM DIVERSION PROFILE VIEW
HW-7 TO HW-8
1"=50' HORIZ., 1"=5' VERT.

MGWC 1.6: FABRIC-BASED CHANNEL DIVERSION

MGWC 1.6: FABRIC-BASED CHANNEL DIVERSION

DESCRIPTION
The work should consist of installing fabric-based diversion channels for the purpose of erosion control when construction activities occur within the stream channel.

EFFECTIVE USES & LIMITATIONS
Diversion channels are used to divert flow during construction of in-stream projects. Diversion channels which have an insufficient flow capacity can fail and adversely affect the downstream channel section under construction. Therefore, in-channel construction activities should occur only during periods of low flow.

MATERIAL SPECIFICATIONS
Materials for fabric-based channel diversions should meet the following requirements:
• Rip-rap: Class 1 rip-rap should be used with fabric-based channel diversions.
• Filter Cloth: Filter cloth should be a woven or non-woven fabric consisting of only continuous chain polymeric filaments or yarns of polypropylene. The fabric should be inert to commonly encountered chemicals, hydrocarbons, and acids and should be resistant to ultraviolet radiation.
• Anchor Pins: 1/4" diameter pins should have a minimum length of 18 inches (0.45 meters), and accompanying washers should have a minimum diameter of 1 inch (25 millimeters).
• Sandbags: Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
• Sheeting: Sheeting should consist of polyethylene or other material which is impervious and resistant to puncture and tearing.

INSTALLATION GUIDELINES
All erosion and sediment control devices, including mandatory dewatering basins, should be installed as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during periods of low flow.

Channel Excavation
1. All disturbances resulting from construction of the diversion should be contained by appropriate sediment control measures.
2. Excavation of the channel should begin at the downstream end and proceed upstream. The channel should be excavated to a minimum depth sufficient to carry the stream's base flow for projects with duration of 2 weeks or less. For projects of longer duration, channels should have a minimum capacity sufficient to carry bankfull flow. All excavated materials should be stockpiled outside of the 100-year flood plain and temporarily stabilized to prevent re-entrance into the stream channel and all activities contributing flow to the work area (refer to Detail 1.6).

DESCRIPTION
The process of excavation and stabilization with fabric should be a continuous and uninterrupted operation. All materials should be in place prior to channel construction.

EFFECTIVE USES & LIMITATIONS
The downstream and upstream connections to the natural channel should be constructed under dry conditions. The stream should be covered by sandbags along the opposing bank during the process of cutting the diversion channel into the natural stream channel. Excavation and stabilization should be a continuous and uninterrupted operation.

MATERIAL SPECIFICATIONS
All debris such as rocks, sticks, etc. should be removed and the channel surfaces made smooth so that the fabric will rest flush with the channel at all sides and bottom.

INSTALLATION GUIDELINES
1. The fabric should have a minimum width such that it is keyed in end and anchored at the top of stream bank.
2. Fabric should be placed so that it rests flush with the channel at all points of contact.
3. Fabric should be placed such that one piece will line the entire channel. If this is not possible, fabric should be placed in sections with a maximum overlap of 12 inches (30 centimeters).
4. The fabric should be keyed into a 2" x 2" (50.8 mm x 50.8 mm) trench located at the upstream edge and at 50-foot (15.24-meter) intervals with the overlap placed seaward to catch 50-foot (15.24-meter) trench. The key-in should be from top of channel to top of channel. Class 1 rip-rap should be carefully placed into the trench with zero drop height.
5. The fabric sections should be secured with hold-down pins and washers. Overlaps should be pinned along transverse and longitudinal areas with spacing equal to 3 feet (0.9 meters) maximum.
6. Sediment from surrounding areas of disturbance should not be allowed to enter the diversion channel.

Alternative Methods of Placing the Fabric
1. The above design may be modified to allow sewing of the geotextile fabric. Sewing of the geotextile fabric, other than overlapping, should eliminate the requirement for transverse placement of the fabric. Either transverse or longitudinal placements should work equally well.
2. The spacing of the pins should be either larger or smaller depending on the anticipated velocities and thickness and type of geotextile fabric.
3. The entire bottom of the channel could be riprapped if high velocities are anticipated. When the area is riprapped, it is not required that the geotextile fabric underlie the rip-rap.

Removal of Diversion
1. Water should not be allowed through the natural stream until all construction is completed.
2. After redirecting the flow through the natural channel, all fabric should be removed from the temporary diversion. The diversion should then be backfilled and stabilized. Points of tie-in to the natural channel should be protected with rip-rap according to the rip-rap schedule.

Removal of Diversion
1. All disturbances resulting from construction of the diversion should be contained by appropriate sediment control measures.
2. Excavation of the channel should begin at the downstream end and proceed upstream. The channel should be excavated to a minimum depth sufficient to carry the stream's base flow for projects with duration of 2 weeks or less. For projects of longer duration, channels should have a minimum capacity sufficient to carry bankfull flow. All excavated materials should be stockpiled outside of the 100-year flood plain and temporarily stabilized to prevent re-entrance into the stream channel and all activities contributing flow to the work area (refer to Detail 1.6).

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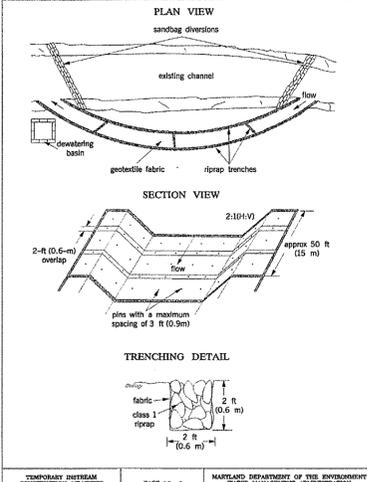
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2. Excavation of the channel should begin at the downstream end and proceed upstream. The channel should be excavated to a minimum depth sufficient to carry the stream's base flow for projects with duration of 2 weeks or less. For projects of longer duration, channels should have a minimum capacity sufficient to carry bankfull flow. All excavated materials should be stockpiled outside of the 100-year flood plain and temporarily stabilized to prevent re-entrance into the stream channel and all activities contributing flow to the work area (refer to Detail 1.6).

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Maryland's Guidelines To Waterway Construction
DETAIL 1.6: FABRIC-BASED DIVERSION



TEMPORARY INSTREAM CONSTRUCTION MEASURES
MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2009
PAGE 1.6-1

MGWC 1.4: DIVERSION PIPE

DESCRIPTION
The work should consist of installing flow diversion pipes in combination with sandbags or stone diversions when construction activities occur within the stream channel.

EFFECTIVE USES & LIMITATIONS
Diversion pipes with an insufficient flow capacity can cause the channel diversion to fail thereby resulting in severe erosion of the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low flow.

MATERIAL SPECIFICATIONS
Materials for stream diversions should meet the following requirements:
• Rip-rap: Stone should be washed and have a minimum diameter of 3 inches (75 millimeters).
• Sandbags: Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
• Sheeting: Sheeting should consist of polyethylene or other material which is impervious and resistant to puncture and tearing.

INSTALLATION GUIDELINES
All erosion and sediment control devices including mandatory dewatering basins should be installed as the first order of business according to a plan approved by the WMA or local authority. Construction in the tributary, including pump-around practices, should proceed from upstream to downstream during low flow conditions. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Diversion pipes with sandbags or stone barriers should be installed as follows (refer to Detail 1.4):
1. Sandbags/stone barriers should be placed and installed as detailed in MGWC 1.3: Sandbag/Stone Diversion. The materials should be used to withstand baseflow velocities.
2. All excavated material should be stockpiled and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
3. Sediment-beds water from the construction area should be pumped to a dewatering basin.
4. The diversion pipe should have a minimum capacity sufficient to carry the 2-year flow for projects with a duration of two weeks or greater. For projects of shorter duration, the capacity of the pipe can be reduced accordingly.
5. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.
6. Sediment control devices are to remain in place until all disturbed areas are stabilized and the impacting authority approves their removal.

Diversion pipes with sandbags or stone barriers should be installed as follows (refer to Detail 1.4):
1. Sandbags/stone barriers should be placed and installed as detailed in MGWC 1.3: Sandbag/Stone Diversion. The materials should be used to withstand baseflow velocities.
2. All excavated material should be stockpiled and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
3. Sediment-beds water from the construction area should be pumped to a dewatering basin.
4. The diversion pipe should have a minimum capacity sufficient to carry the 2-year flow for projects with a duration of two weeks or greater. For projects of shorter duration, the capacity of the pipe can be reduced accordingly.
5. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.
6. Sediment control devices are to remain in place until all disturbed areas are stabilized and the impacting authority approves their removal.

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1. Sandbags/stone barriers should be placed and installed as detailed in MGWC 1.3: Sandbag/Stone Diversion. The materials should be used to withstand baseflow velocities.
2. All excavated material should be stockpiled and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
3. Sediment-beds water from the construction area should be pumped to a dewatering basin.
4. The diversion pipe should have a minimum capacity sufficient to carry the 2-year flow for projects with a duration of two weeks or greater. For projects of shorter duration, the capacity of the pipe can be reduced accordingly.
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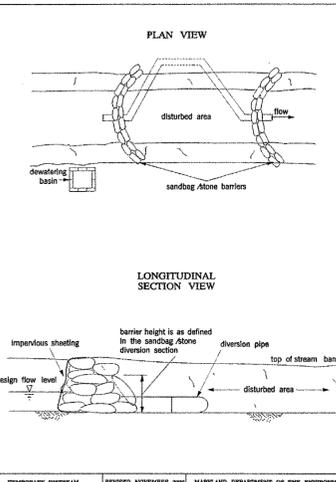
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TEMPORARY INSTREAM CONSTRUCTION MEASURES
MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2009
PAGE 1.4-1

Maryland's Guidelines To Waterway Construction
DETAIL 1.4: DIVERSION PIPE



TEMPORARY INSTREAM CONSTRUCTION MEASURES
MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
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MGWC 4.8: TEMPORARY ACCESS BRIDGE

DESCRIPTION
A temporary access bridge is a stream crossing made of wood, steel, or other materials designed to limit the amount of disturbance to the stream banks and bed.

EFFECTIVE USES & LIMITATIONS
Temporary access bridges are the preferred method of waterway crossing since they typically cause the least disturbance to the waterway and banks, pose the least chance for interference with fish migration, and can be quickly removed and reset.

MATERIAL SPECIFICATIONS
• Stringers: Stringers should either be logs, sawn timber, prestressed concrete beams, metal beams, or other approved materials.
• Deck Material: Deck materials should be of sufficient strength to support the anticipated load.

CONSTRUCTION SEQUENCE
All erosion and sediment control devices, including stream diversions, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Dewatering basins should be built as needed and erosion control devices should be used to prevent surface drainage from entering the stream during bridge crossing. (See the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control.) The proposed construction, maintenance, and removal sequence is as follows:

1. Abutments should be placed parallel to, and on, stable banks such that the structure is at or above bankfull depth to prevent the components of floating materials and debris.
2. Temporary access bridges should be constructed to span the entire channel. If the bankfull channel exceeds 8 feet (2.5 meters), then a floating pier, or other bridge support may be constructed within the waterway. No support will be permitted within the channel for waterways less than 4 feet wide. One additional bridge support will be permitted for each additional 8-foot width of the channel.
3. All decking materials should be placed perpendicular to the stringers, lapped tightly, and securely fastened to the stringers. Decking materials must be lapped tightly to prevent any void material washed onto the bridge from falling into the waterway.
4. Although run racks are optional, they may be necessary to properly discharge loads. One run plank should be provided for each inch of the equipment wheels and should be securely fastened to the length of the span. Cuts or breaks may be installed along the outer sides of the deck to provide additional safety.
5. Bridges should be securely anchored at one end using steel cables or chains to prevent the bridge from floating upstream and possibly causing obstruction to the flow. Anchoring at only one end will prevent channel obstruction in the event that flood waters float the bridge. Anchorages should be large trees, boulders, or the steel anchors.
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IMPLEMENTATION SEQUENCE
Sediment control measures, pump-around practice, and associated channel and bank construction should be completed for the following activities (refer to Detail 1.2):

1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-way have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the owner's or utility company's satisfaction.
2. The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
3. The contractor should conduct a pre-construction meeting on-site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should make on all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all areas within the limit of disturbance which will be removed for construction access. Stages should not be removed within the limit of disturbance without approval from the WMA or local authority.
4. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump-around removed from the channel. Work should not be conducted in the channel during rain events.
6. Sandbags/dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of rip-rap or sandbags.
7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel before the downstream sandbag/dike.
8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction.)
9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or soil and mulch as specified on the plans.
10. After an area is completed and stabilized, the clean water dikes should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
11. A pump-around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by installing a sandbag/dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump-around.
12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump-around practices, should proceed from upstream to downstream during low flow conditions. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.
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14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

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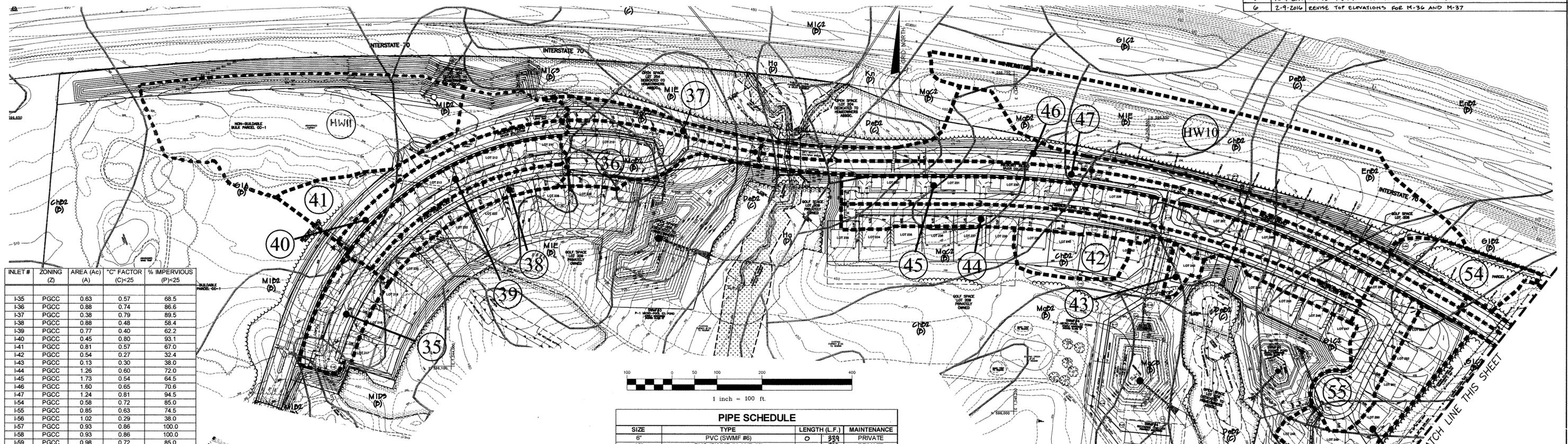
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5 12-4-2014 REVISE I-5A AND HW-10 IN STRUCTURE SCHEDULE
 6 2-9-2016 REVISE TOP ELEVATIONS FOR M-36 AND M-37

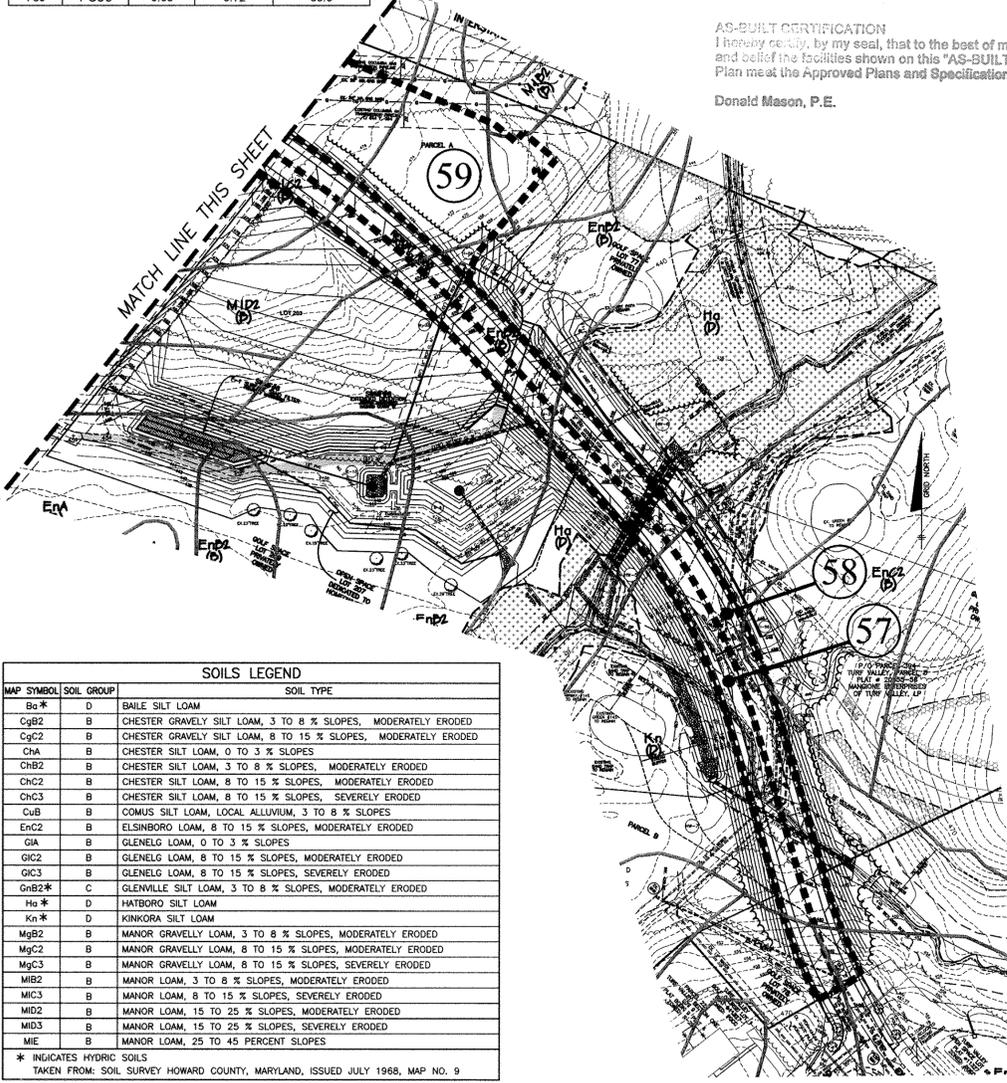


AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications.
 Donald Mason, P.E. Date: 10-25-17

PIPE SCHEDULE

SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
6"	PVC (SWMF #6)	0	334 PRIVATE
12"	PVC (SWMF #4 AND #6)	0	638 PRIVATE
15"	RCP CLASS IV	73	176 PUBLIC
18"	RCP CLASS IV	567	180 PUBLIC
15"	RCP CLASS IV	0	75 PUBLIC
18"	RCP CLASS IV	75	1047 PUBLIC
24"	RCP CLASS IV	1011	681 PUBLIC
30"	RCP CLASS IV	0	330 PUBLIC
42"	RCP CLASS IV	176	0 PUBLIC
84"	RCP CLASS IV	274	0 PUBLIC
30"	ASTM C-361	0	120 PUBLIC
36"	ASTM C-361	0	125 PUBLIC

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12-21-18
 10-25-17



STRUCTURE TABLE

AREA	STRUCTURE	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	THROAT ELEV.	STD. DETAIL	INLET NOTES	MAINTENANCE
INLETS										
2	I-35	A-5	CL STA. 10+45.32 ATWOOD OFFSET 27.17' LEFT			900.00	504.32	503.72	HO.CO.STD. D-4.01	3.5' WIDTH PUBLIC
1	I-36	A-10	CL STA. 55+00.00 RESORT ROAD OFFSET 17.00' RIGHT	467.90	467.28	471.92	471.32	471.32	HO.CO.STD. D-4.03	3.5' WIDTH PUBLIC
1	I-37	A-10	CL STA. 55+00.00 RESORT ROAD OFFSET 17.00' LEFT	468.20	471.92	471.92	471.32	471.32	HO.CO.STD. D-4.03	3.5' WIDTH PUBLIC
2	I-38	A-10	CL STA. 2+88.59 ATWOOD LANE OFFSET 12.00' LEFT	479.20	488.89	488.89	487.90	487.90	HO.CO.STD. D-4.03	3.5' WIDTH PUBLIC
1	I-39	A-10	CL STA. 2+88.59 ATWOOD LANE OFFSET 12.00' RIGHT	480.00	488.50	488.50	487.90	487.90	HO.CO.STD. D-4.03	3.0' WIDTH PUBLIC
1	I-40	A-10	CL STA. 50+66.53 RESORT ROAD OFFSET 17.00' RIGHT	481.24	489.37	489.37	488.77	488.77	HO.CO.STD. D-4.03	4.0' WIDTH PUBLIC
1	I-41	A-10	CL STA. 50+66.53 RESORT ROAD OFFSET 17.00' LEFT	482.74	489.37	489.37	488.77	488.77	HO.CO.STD. D-4.03	3.0' WIDTH PUBLIC
2	I-42	D	N 596303.048 E 134597.996	453.28	457.33	457.33	456.30	456.30	HO.CO.STD. D-4.10	OPENS ON EAST AND WEST FACE PRIVATE
2	I-43	D	N 596265.5514 E 1345600.7802	453.28	456.88	456.88	455.83	455.83	HO.CO.STD. D-4.10	OPENS ON EAST AND WEST FACE PRIVATE
2	I-44	A-10	CL STA. +141.76 TIMBER LINE LANE OFFSET 12.00' LEFT	455.58	455.03	455.03	454.99	454.99	HO.CO.STD. D-4.03	4.0' WIDTH PUBLIC
2	I-45	A-10	CL STA. +141.76 TIMBER LINE LANE OFFSET 12.00' RIGHT	455.58	456.80	456.80	456.99	456.99	HO.CO.STD. D-4.03	3.0' WIDTH PUBLIC
1	I-46	A-10	CL STA. 62+42.17 RESORT ROAD OFFSET 17.00' LEFT	457.48	457.48	462.90	461.90	461.90	HO.CO.STD. D-4.03	4.0' WIDTH PUBLIC
1	I-47	A-10	CL STA. 62+42.17 RESORT ROAD OFFSET 17.00' RIGHT	458.28	458.28	462.90	461.90	461.90	HO.CO.STD. D-4.03	3.0' WIDTH PUBLIC
1	I-54	D	N 596373.0138 E 1348105.0391	456.09	477.95	477.95	477.02	477.02	HO.CO.STD. D-4.10	OPENS ON NORTH AND EAST FACE PRIVATE
NA	I-55 (FUTURE)	A-5	CL STA. +52.15 WICKWOOD COURT LINEAR PROFILE	452.14	451.64	461.20	461.80	461.80	HO.CO.STD. D-4.01	3.0' WIDTH PUBLIC
NA	I-56 (FUTURE)	D	N 595888.2096 E 1345911.3908	452.88	456.23	455.40	455.40	455.40	HO.CO.STD. D-4.10	OPENS ON NORTH AND EAST FACE PRIVATE
1	I-57	A-10	CL STA. 80+43.83 RESORT ROAD OFFSET 17.00' RIGHT	447.31	445.92	446.81	452.34	451.74	HO.CO.STD. D-4.03	4.0' WIDTH PUBLIC
1	I-58	A-10	CL STA. 80+43.83 RESORT ROAD OFFSET 17.00' LEFT	448.00	448.00	452.34	451.74	451.74	HO.CO.STD. D-4.03	3.0' WIDTH PUBLIC
1	I-59	D	CL STA. 76+02.14 RESORT ROAD OFFSET 37.13' LEFT	466.00	461.18	460.82	460.82	460.82	HO.CO.STD. D-4.10	NO OPENINGS NEEDED PRIVATE
MANHOLES										
2	M-15	4" DIA	N 596098.4406 E 1343871.6182	498.50	494.00	505.00	505.00	505.00	HO.CO.STD. G-5.12	PUBLIC
2	M-16	4" DIA	N 596508.3778 E 1344473.7548	24' 460.00	460.00	460.00	474.00	474.00	HO.CO.STD. G-5.12	PUBLIC
2	M-17	4" DIA	N 596535.1987 E 1344477.4604	24' 468.20	468.20	468.20	478.90	478.90	HO.CO.STD. G-5.12	PUBLIC
1	M-18	4" DIA	CL STA. 52+64.89 RESORT ROAD OFFSET 21.67' RIGHT	473.35	476.00	480.00	480.00	480.00	HO.CO.STD. G-5.12	PUBLIC
1	M-19	4" DIA	CL STA. 52+64.89 RESORT ROAD OFFSET 21.67' RIGHT	473.35	476.00	480.00	480.00	480.00	HO.CO.STD. G-5.12	PUBLIC
2	M-20	5" DIA	N 596242.3004 E 1345540.2397	451.48	451.28	459.50	459.50	459.50	HO.CO.STD. G-5.13	PUBLIC
2	M-21	5" DIA	N 596288.7459 E 1345544.2375	30' 451.75	452.80	457.00	457.00	457.00	HO.CO.STD. G-5.13	PUBLIC
2	M-22	5" DIA	CL STA. 0+00.00 TIMBER LINE LANE OFFSET 15.83' LEFT	24' 453.28	453.28	462.80	462.80	462.80	HO.CO.STD. G-5.13	PUBLIC
2	M-23	4" DIA	CL STA. 0+75.69 ACCESS ROAD OFFSET 7.00' RIGHT	464.19	463.88	464.99	462.10	462.10	HO.CO.STD. G-5.12	PUBLIC
1	M-24	4" DIA	CL STA. 54+17.36 RESORT ROAD OFFSET 12.25' RIGHT	24' 454.36	458.28	463.40	463.40	463.40	HO.CO.STD. G-5.12	PUBLIC
1	M-25	4" DIA	CL STA. 54+57.60 RESORT ROAD OFFSET 12.00' RIGHT	466.23	466.23	464.00	464.00	464.00	HO.CO.STD. G-5.12	PRIVATE
1	M-26	4" DIA	CL STA. 66+50.00 RESORT ROAD OFFSET 12.00' RIGHT	463.15	463.15	468.00	468.00	468.00	HO.CO.STD. G-5.12	PRIVATE
1	M-27	4" DIA	CL STA. 68+00.00 RESORT ROAD OFFSET 12.00' RIGHT	465.84	465.84	475.50	475.50	475.50	HO.CO.STD. G-5.12	PRIVATE
1	M-28	4" DIA	CL STA. 69+27.06 RESORT ROAD OFFSET 12.00' RIGHT	465.28	465.28	481.20	481.20	481.20	HO.CO.STD. G-5.12	PRIVATE
1	M-29	4" DIA	CL STA. 69+27.06 RESORT ROAD OFFSET 12.00' RIGHT	465.28	465.28	481.20	481.20	481.20	HO.CO.STD. G-5.12	PRIVATE
1	M-29A	4" DIA	CL STA. 65+74.77 RESORT ROAD OFFSET 11.13' LEFT	452.94	452.94	466.80	466.80	466.80	HO.CO.STD. G-5.12	PUBLIC
2	M-30	5" DIA	N 595800.47 E 1346484.18	30' 440.60	441.11	445.00	445.00	445.00	HO.CO.STD. G-5.13	PUBLIC
1	M-31	5" DIA	CL STA. 76+88.99 RESORT ROAD OFFSET 22.82' RIGHT	444.86	442.15	441.60	441.60	441.60	HO.CO.STD. G-5.13	PUBLIC
1	M-32	4" DIA	CL STA. 79+04.97 RESORT ROAD OFFSET 22.50' RIGHT	446.73	445.87	453.78	453.78	453.78	HO.CO.STD. G-5.12	PUBLIC
1	M-33	4" DIA	CL STA. 75+21.26 RESORT ROAD OFFSET 21.00' RIGHT	446.00	444.99	447.10	447.10	447.10	HO.CO.STD. G-5.12	PUBLIC
NA	M-34 (FUTURE)	4" DIA	N 595985.7623 E 1345915.5554	452.54	452.34	458.00	458.00	458.00	HO.CO.STD. G-5.12	PRIVATE
2	M-35	4" DIA	N 595955.4954 E 1345488.6617	446.10	446.00	461.00	461.00	461.00	HO.CO.STD. G-5.12	PRIVATE
2	M-36	4" DIA	N 596009.7812 E 1345437.3558	446.59	446.59	462.00	462.00	462.00	HO.CO.STD. G-5.12	PRIVATE
2	M-37	4" DIA	N 596196.4542 E 1345464.8449	446.31	446.21	459.00	459.00	459.00	HO.CO.STD. G-5.12	PRIVATE
2	E-14	18" CONC.	N 59 6 77 6 46 124 399 9 7 6	419.20	419.20	420.11	420.11	420.11	D-5.51	PRIVATE
2	E-5	36" CONC.	N 596355.96 E 1344540.84	458.00	458.00	458.00	458.00	458.00	D-5.51	PUBLIC
2	E-7	30" CONC.	N 596464.73 E 1344461.92	458.00	458.00	458.00	458.00	458.00	D-5.51	PUBLIC
2	E-8	36" CONC.	N 596012.55 E 1345595.63	458.00	458.00	458.00	458.00	458.00	D-5.51	PUBLIC
2	E-9	30" CONC.	N 596193.43 E 1345536.14	458.00	458.00	458.00	458.00	458.00	D-5.51	PUBLIC
2	E-10	30" CONC.	N 596032.72 E 1345786.82	446.00	446.00	446.00	446.00	446.00	D-5.51	PUBLIC
NA	E-11 (FUTURE)	18" CONC.	N 596115.76 E 1345892.57	452.00	452.00	452.00	452.00	452.00	D-5.51	PUBLIC
2	E-12	30" CONC.	N 596373.75 E 1345696.46	432.00	432.00	432.00	432.00	432.00	D-5.51	PUBLIC
2	E-13	30" CONC.	N 595782.01 E 1346471.18	440.00	440.00	440.00	440.00	440.00	D-5.51	PUBLIC
2	HW-11	10" CONC.	N 59 6 6 9 9 7 4 E 134 3 9 3 5 8 0	419.20	419.20	420.11	420.11	420.11	D-5.51	PRIVATE
1	HW-5	MOD. TYPE A	N 595676.87 E 1346736.94	428.80	428.80	433.00	433.00	433.00	SEE SHEET 20	PUBLIC
1	HW-6	MOD. TYPE A	N 596004.04 E 1346817.97	431.00	431.00	432.00	432.00	432.00	SEE SHEET 20	PUBLIC
1	HW-7	42" TYPE A	N 596426.37 E 1346881.70	438.00	438.00	442.00	442.00	442.00	PUBLIC	PUBLIC
1	HW-8	42" TYPE A	N 596328.00 E 1347017.31	442.00	442.00	442.00	442.00	442.00	PUBLIC	PUBLIC
1	HW-9	24" TYPE A	N 596292.43 E 1345710.63	440.00	440.00	440.00	440.00	440.00	PUBLIC	PUBLIC
1	HW-10	NA	N 596488.62 E 1345759.92	453.34	453.34	453.34	453.34	453.34	NA	PUBLIC

STRUCTURES IDENTIFIED AS "FUTURE" ARE TO BE CONSTRUCTED UNDER VILLAGES, PHASE 2, SECTION 2, F-10-078
 STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE RIM.
 STRUCTURE LOCATION FOR INLETS IS AT THE CENTER OF THE INLET FACE FOR A-5 AND A-10 INLETS AND AT THE TOP CENTER OF D-INLETS.
 STRUCTURE LOCATION FOR THE END-SECTIONS IS AT THE MIDPOINT OF THE END OF THE STRUCTURE.
 PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22390 Expiration Date: 6-30-15
 For Revisions #4 ONLY, #5, #6

APPROVED: DEPARTMENT OF PUBLIC WORKS
 Chief, Bureau of Highways
 DATE: 1-9-14

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Division of Land Development
 DATE: 1/23/14

APPROVED: PROFESSIONAL ENGINEERING DIVISION
 DATE: 1-15-14

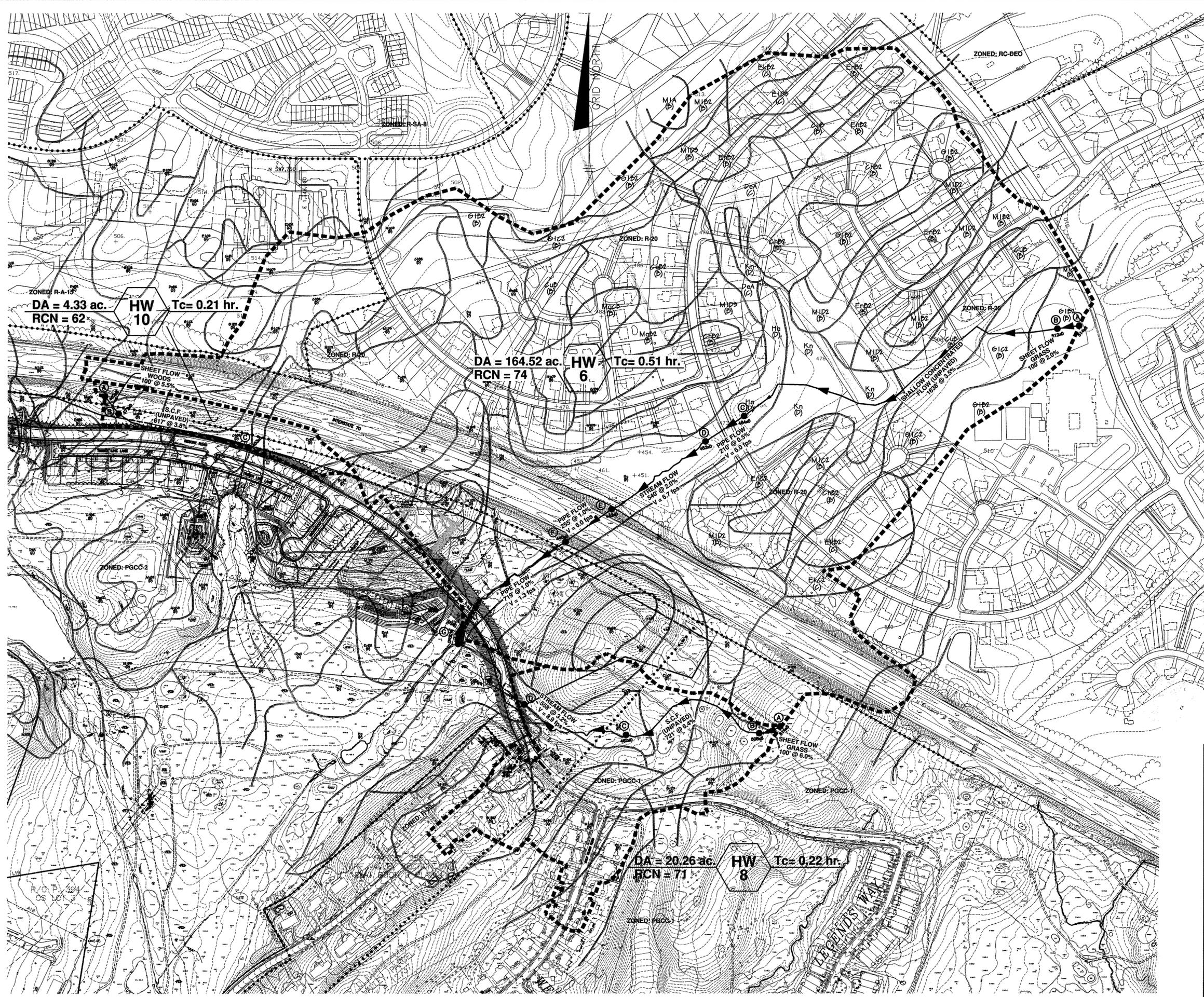
BENCHMARK ENGINEERING, INC.
 8400 BALTIMORE NATIONAL PIKE & SUITE 111
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-465-9105 FAX: 410-465-6644
 WWW.BE-ENGINEERING.COM

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 303, OPEN SPACE LOTS 204-207, GOLF SPACE LOTS 77, 78, 208 & 209, PARCELS A & B; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P03 394, GRID: 17
 TAX MAP: 16, PARCEL: P03 395, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

REVISED STORM DRAIN DRAINAGE AREA MAP
 DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: 1" = 50' SHEET 17 OF 56

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

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



SOILS LEGEND		
MAP SYMBOL	SOIL GROUP	SOIL TYPE
Ba*	D	BAILE SILT LOAM
CgB2	B	CHESTER GRAVELLY SILT LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
CgC2	B	CHESTER GRAVELLY SILT LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
CHA	B	CHESTER SILT LOAM, 0 TO 3 % SLOPES
CHB2	B	CHESTER SILT LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
CHC2	B	CHESTER SILT LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
CHC3	B	CHESTER SILT LOAM, 8 TO 15 % SLOPES, SEVERELY ERODED
CuB	B	COMUS SILT LOAM, LOCAL ALLUVIUM, 3 TO 8 % SLOPES
Enc2	B	ELLSBORO LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
GIA	B	GLENELG LOAM, 0 TO 3 % SLOPES
GIC2	B	GLENELG LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
GIC3	B	GLENELG LOAM, 8 TO 15 % SLOPES, SEVERELY ERODED
GmB2*	C	GLENVILLE SILT LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
Hu*	D	HATBORO SILT LOAM
Kr*	D	KINKORA SILT LOAM
MgB2	B	MANOR GRAVELLY LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
MgC2	B	MANOR GRAVELLY LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
MgC3	B	MANOR GRAVELLY LOAM, 8 TO 15 % SLOPES, SEVERELY ERODED
MIB2	B	MANOR LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
MIC3	B	MANOR LOAM, 8 TO 15 % SLOPES, SEVERELY ERODED
MID2	B	MANOR LOAM, 15 TO 25 % SLOPES, MODERATELY ERODED
MID3	B	MANOR LOAM, 15 TO 25 % SLOPES, SEVERELY ERODED
MIE	B	MANOR LOAM, 25 TO 45 PERCENT SLOPES

* INDICATES HYDRIC SOILS
 TAKEN FROM: SOIL SURVEY HOWARD COUNTY, MARYLAND, ISSUED JULY 1968, MAP NO. 9

- LEGEND
- EXISTING CONTOURS AERIAL, JAN. 2008
 - EXISTING BRUSH
 - EXISTING TREELINE
 - EXISTING STREAM
 - DRAINAGE DIVIDE
 - TO TRAVEL PATH
 - ZONING LINE
 - SOILS LINE
 - SOILS TYPE

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



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21463 Expiration Date: 12/31/16

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter J. Wall 4-15-10
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Walter J. Wall 4-15-10
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

David Alan Wainwright 4/17/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO.	DATE	REVISION
2	12-4-2012	REVISE LOT SHEET NUMBERS IN THIS BLOCK
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK
 ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-8100 FAX: 410-465-8644
 WWW.BEI-CVLENGINEERING.COM



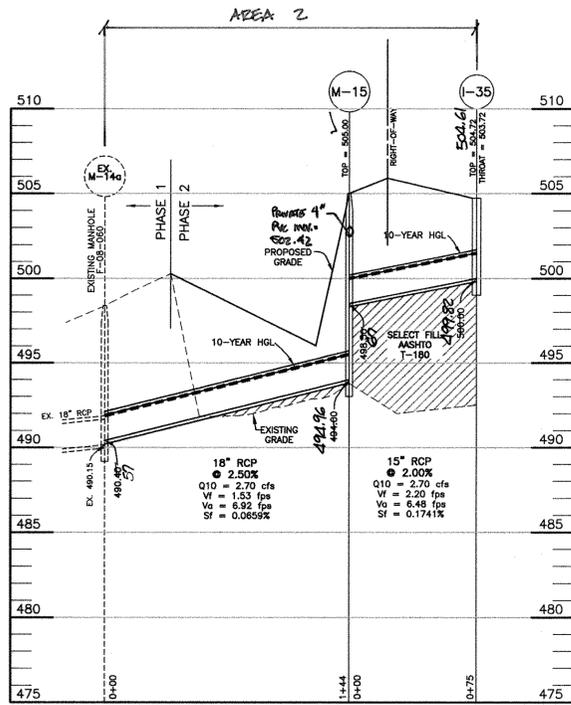
OWNER:
 MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
 410-825-8400

DEVELOPER:
 MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
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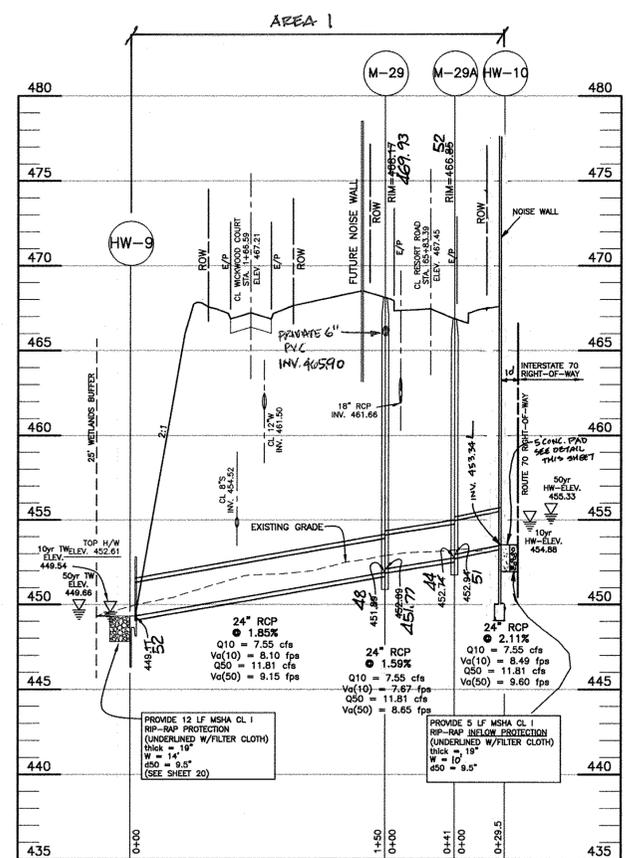
VILLAGES AT TURF VALLEY
PHASE 2, SECTION 1
 LOT 202, OPEN SPACE LOTS 204-207
 GOLF COURSE LOTS 77, 78, 208, 209 PARCELS A & B;
 NON-BUILDABLE BRICK PARCELS C2-1, C2-1-BE-1 FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P10 39, GRID: 17
 TAX MAP: 16, PARCEL: P10 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

STORM DRAIN DRAINAGE AREA MAP FOR CULVERTS

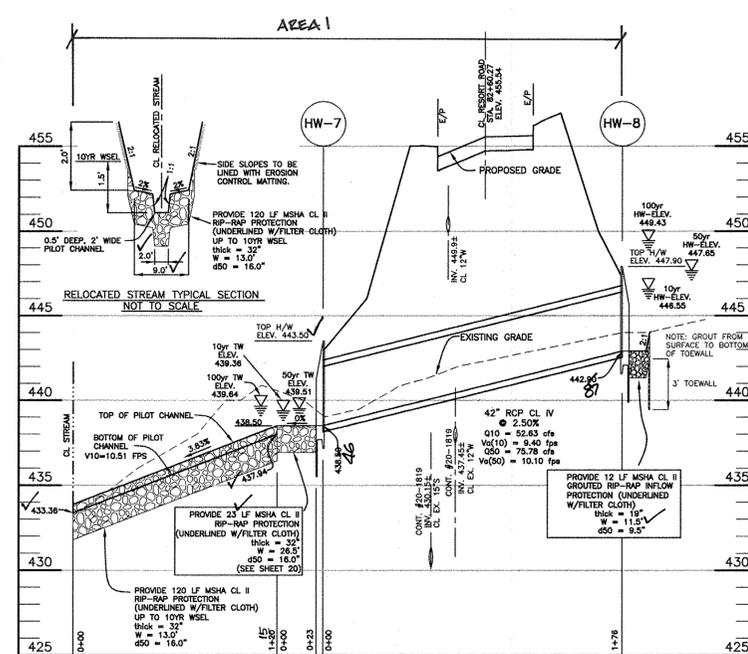
DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 18 OF 56



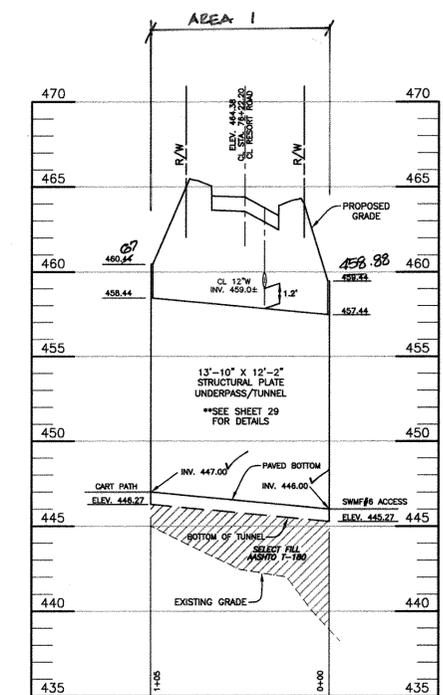
STORM DRAIN PROFILE I-35 TO EX. M-14A
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



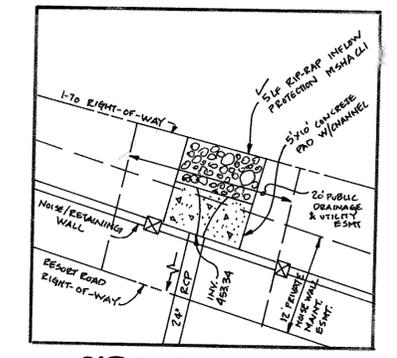
CULVERT PROFILE HW-10 TO HW-9
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



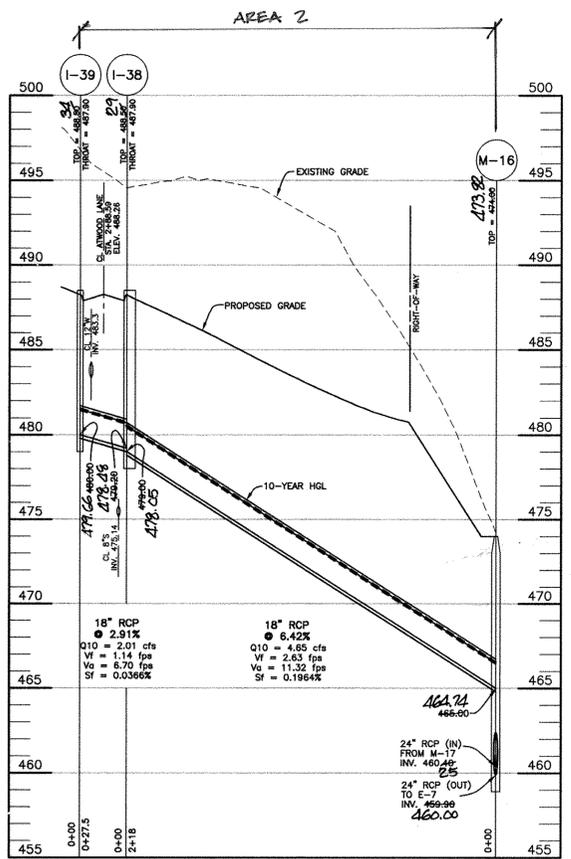
CULVERT PROFILE HW-8 TO HW-7
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



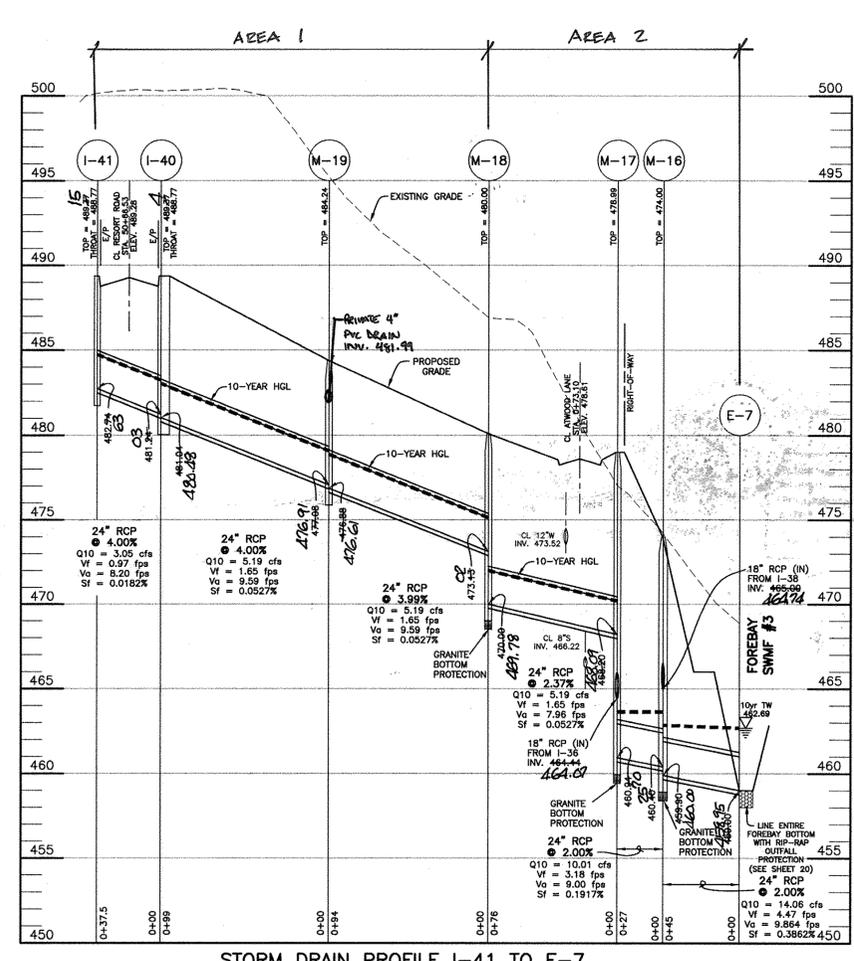
PROFILE THROUGH UNDERPASS/TUNNEL
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



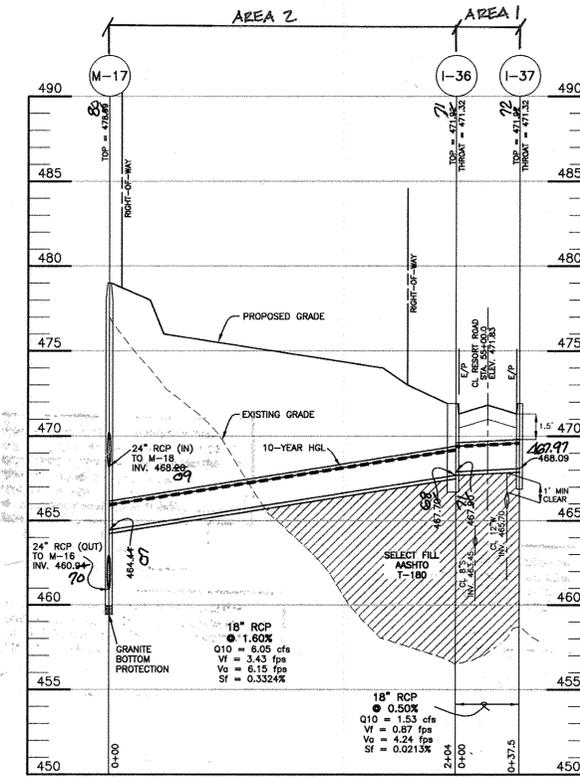
PAD DETAIL AT HW-10
SCALE: 1"=10'



STORM DRAIN PROFILE I-39 TO M-16
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



STORM DRAIN PROFILE I-41 TO E-7
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



STORM DRAIN PROFILE I-37 TO M-17
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E. Date: 10-25-17

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-18

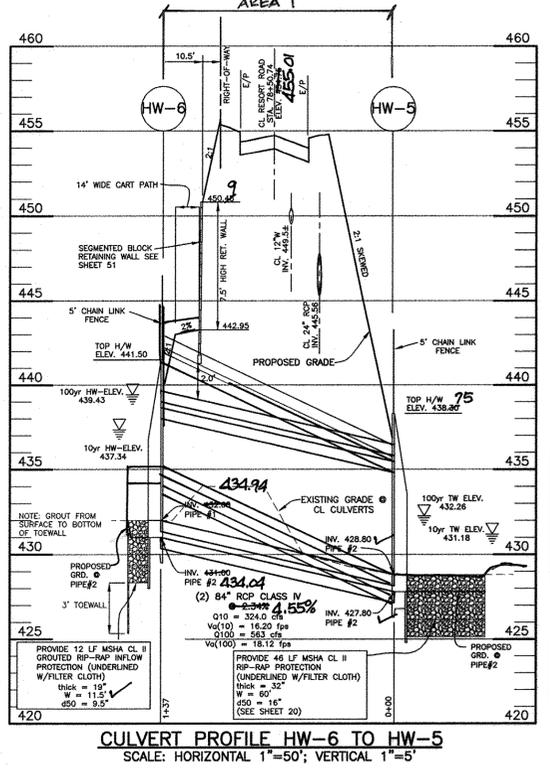
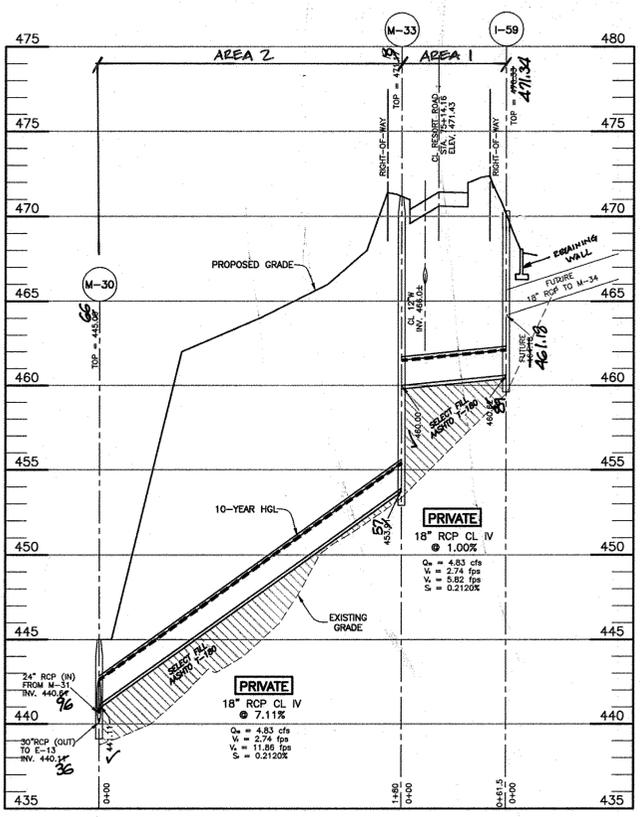
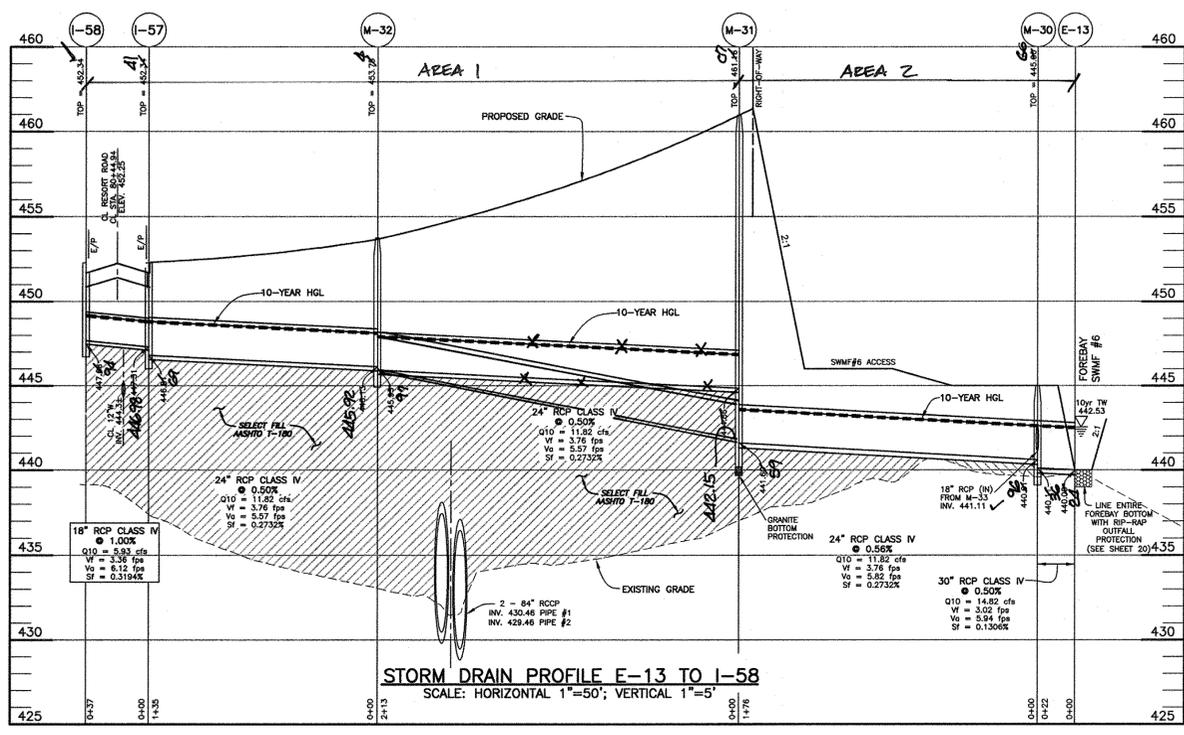
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22390 Expiration Date: 6-30-15

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS DATE: 1-9-14
APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT DATE: 1/23/14
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 1/15-14

NO.	DATE	REVISION
4	7-8-2014	ADD PHASING (AREA 1 AND AREA 2)
3	12-4-2013	REVISE ALL STORM DRAIN PROFILES BASED ON REVISED LAYOUT, EXCEPT FOR PROFILES FOR HW-8 TO HW-7 AND UNDERPASS/TUNNEL.
2	8-22-2013	ADD RETAINING WALL #3 TO PROFILE AT HW-10.
1	4-20-2012	ADD PROFILE THROUGH UNDERPASS/TUNNEL

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 418 ELICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6644 WWW.BE-CIVILENGINEERING.COM	Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 22390 Expiration Date: 6-30-15
OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400	DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400
VILLAGES AT TURF VALLEY PHASE 2, SECTION I LOT 203, OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1 TAX MAP: 16, PARCEL: P10 394, GRID: 10 TAX MAP: 16, PARCEL: P10 394, GRID: 17 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC	
REVISED STORM DRAIN PROFILES	
DATE: FEBRUARY, 2010	BEI PROJECT NO. 1915
SCALE: 1" = 50'	SHEET 19 OF 56

7	6-19-14	AS-BUILT (4" PVC DRAIN)
6	5-23-2017	ADD PRIVATE 4" PVC DRAIN
5	12-4-2014	REVISE HW-10 SO THAT THE RETAINING WALL ACTS AS HEADWALL. ADD CONC. PAD BEHIND HEADWALL. ADD DETAIL.

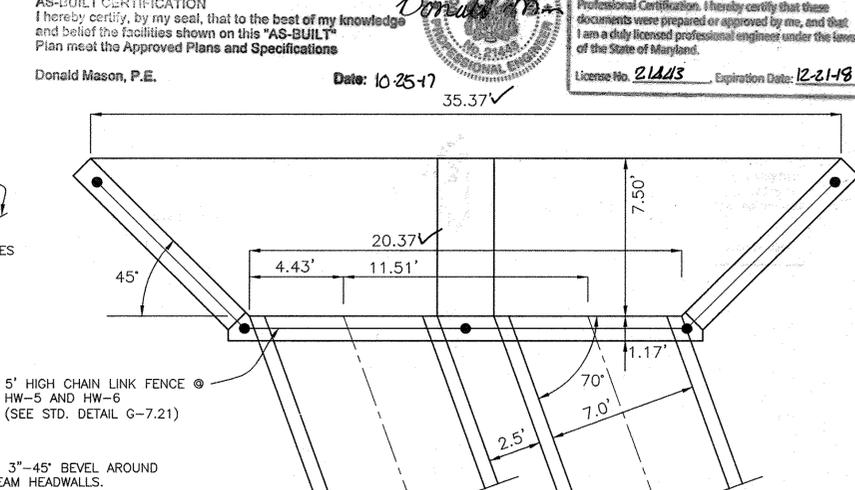
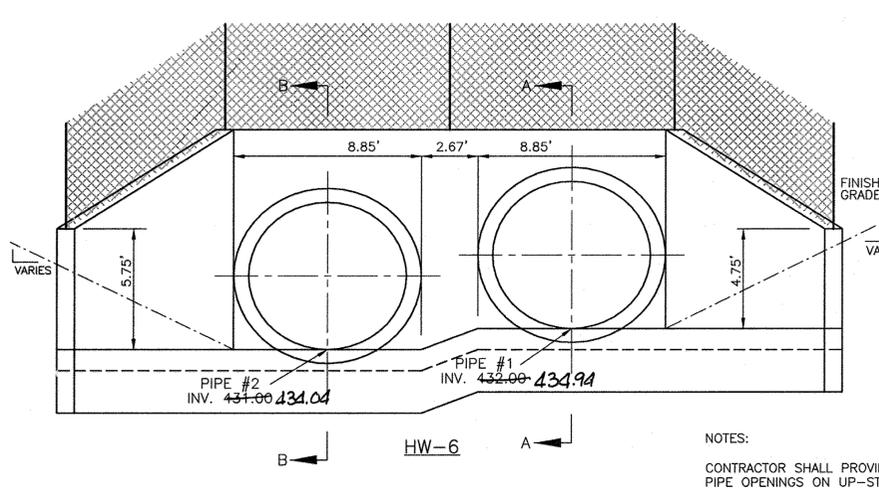
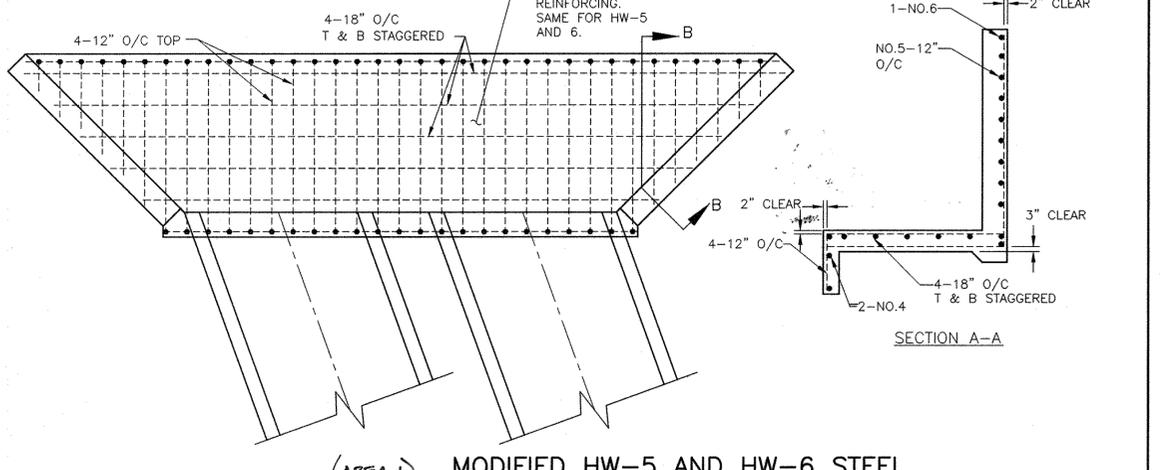
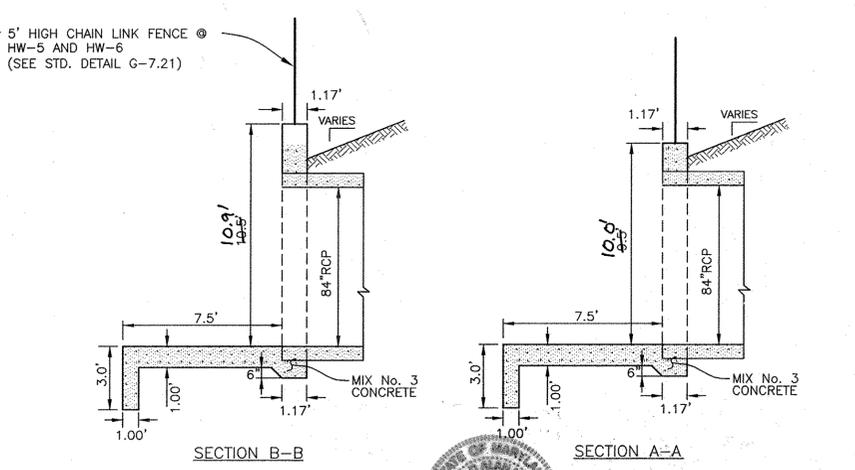
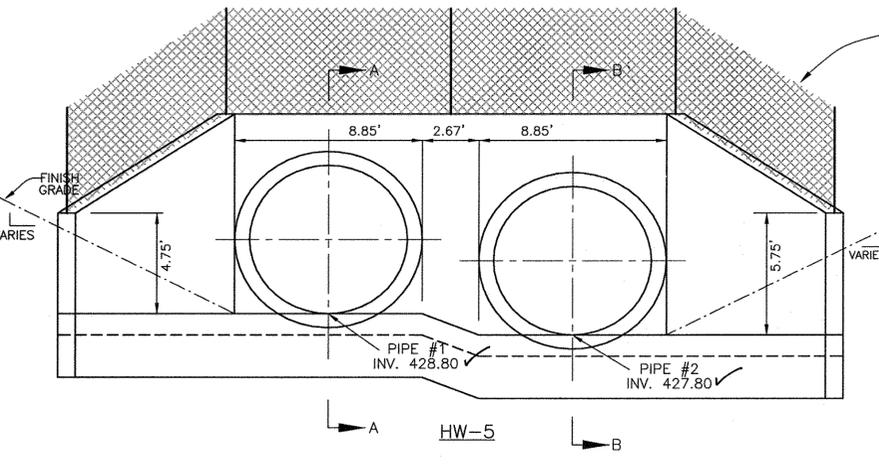


CONSTRUCTION SPECIFICATIONS

- THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
- THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
- GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
- STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
- THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

OUTLET PROTECTION DETAIL
NOT TO SCALE

STRUCTURE	V10	d10	d50	LENGTH(L)	WIDTH(W)	THICK(T)	SHA CLASS	AREA
E-6	11.09	1.22'	9.5"	✓34' @ 0%	✓13.6'	19"	I	2
E-7	10.09	1.41'	9.5"	✓FOREBAY	✓FOREBAY	19"	I	2
E-8	8.36	1.37'	9.5"	✓20' @ 0%	✓11'	19"	I	2
E-9	6.29	2.16'	9.5"	✓FOREBAY	✓FOREBAY	19"	I	2
E-10	7.09	0.54'	9.5"	✓10' @ 0%	✓12.5'	19"	I	2
E-11	4.87	1.08'	9.5"	✓FOREBAY	✓FOREBAY	19"	NA	2
E-12	9.31	1.09'	9.5"	✓24' @ 0%	✓21.7'	19"	I	2
E-13	8.47	1.56'	9.5"	✓FOREBAY	✓FOREBAY	19"	I	2
HW-5	16.29	2.38'	16"	✓46'	✓60.0'	32"	II	1
HW-7	9.29	0.86'	16"	✓23'	✓26.5'	32"	II	1
HW-9	9.00	0.55'	9.5"	✓12'	✓14.0'	19"	I	1
E-14	10.87	0.27'	9.5"	✓10'	✓11.5'	19"	I	2



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E.
Date: 10-25-17
35.37 ✓

Professional Certification
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-19

Professional Certification
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22390, Expiration Date: 12-4-14

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. _____, Expiration Date: _____

SCALE: 1" = 4'

NO.	DATE	REVISION
5	12-4-2014	REVISE GRADING AT I-59 IN PROFILE.
4	7-8-2014	ADD PHASING LINE (AREA 1 AND AREA 2)
3	3-31-2014	ADD E-14 TO OUTLET PROTECTION DETAIL
2	12-4-2013	REVISE LOT SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	revise storm drain profile from I-59 to E-13 and from M-30 to I-60. revise profile through 84" culverts to show retaining wall and cart path

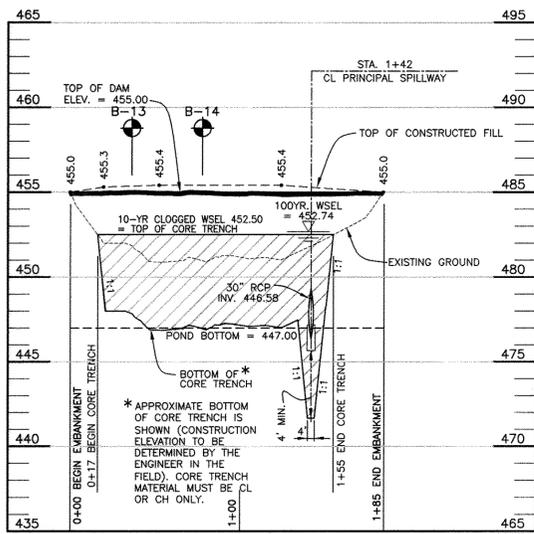
BENCHMARK ENGINEERING, INC.
ENGINEERS • LAND SURVEYORS • PLANNERS
8480 BALTIMORE NATIONAL PIKE & SUITE 418
ELICOTT CITY, MARYLAND 21043
PHONE: 410-465-8105 FAX: 410-465-8644
WWW.BE-CIVILENGINEERING.COM

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
LOT 203, OPEN SPACE LOTS 204-207;
GOLF SPACE LOT 17, 78, 208, 209; PARCELS A & B;
NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1
TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P10 & GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: POCC

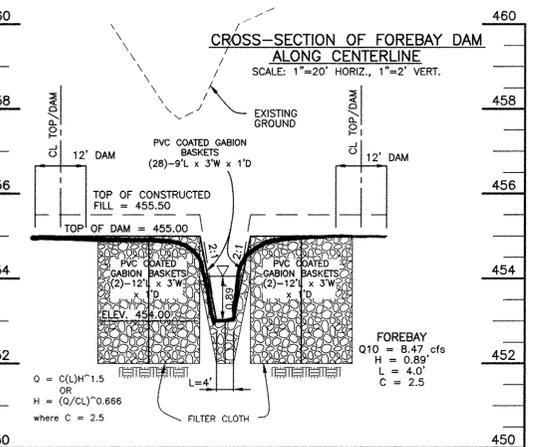
REVISOR
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
410-825-8400

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

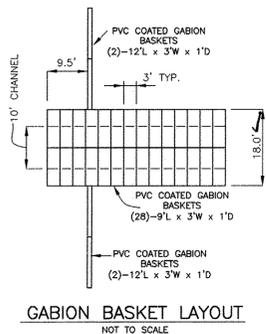
DATE: FEBRUARY, 2010 **BEI PROJECT NO.:** 1915
SCALE: AS SHOWN **SHEET:** 20 OF 56



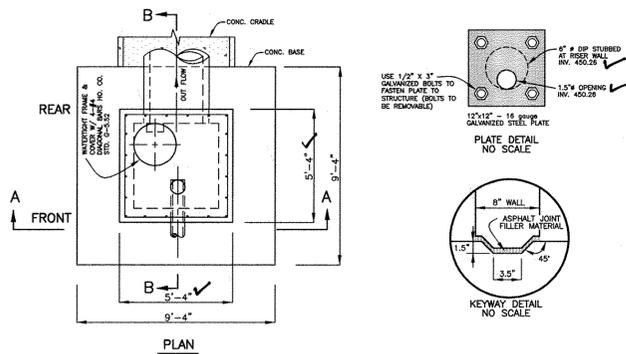
CROSS-SECTION OF DAM ALONG CENTERLINE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



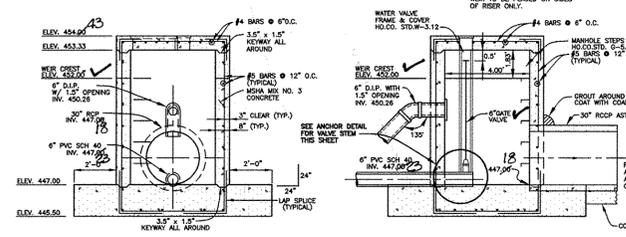
CROSS-SECTION OF FOREBAY DAM ALONG CENTERLINE
SCALE: 1"=20' HORIZ., 1"=2' VERT.



GABION BASKET LAYOUT
NOT TO SCALE



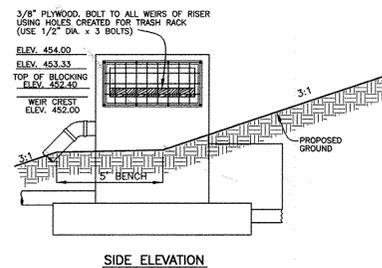
PLAN



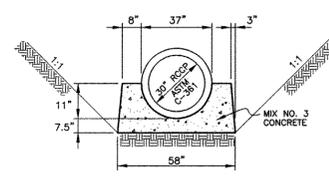
SECTION A-A
FRONT VIEW

SECTION B-B
SIDE VIEW

RISER STRUCTURE (S-5)
SCALE: 1" = 4'

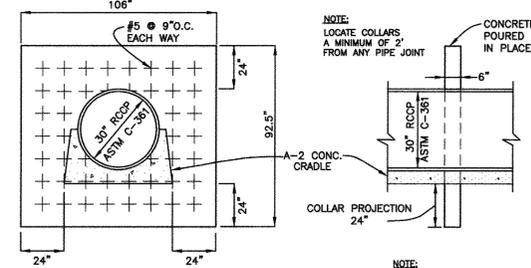


BASIN #5
TEMPORARY BLOCKING DETAIL
SCALE: 1" = 4'



SCS TR-46 TYPE A-2
CONCRETE CRADLE

- TRASH RACK SHALL BE PAINTED BATTLESHIP GRAY.
- TRASH RACK TO BE INSTALLED UPON CONVERSION TO SWM POND.

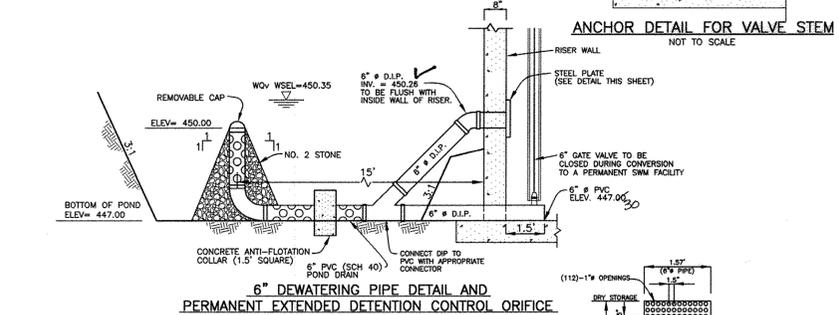


COLLAR SIZE: 106" X 92.5"
ANTI-SEEP COLLAR
NOT TO SCALE

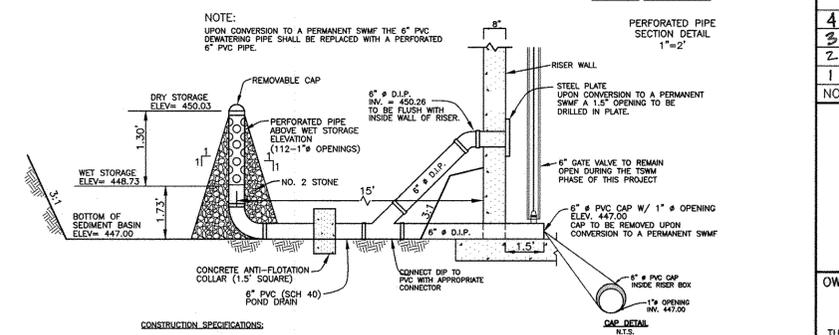
ALL ITEMS ON THIS SHEET
ARE WITHIN AREA 2

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

License No. 21443, Expiration Date: 12-21-19



6" DEWATERING PIPE DETAIL AND
PERMANENT EXTENDED DETENTION CONTROL ORIFICE
NOT TO SCALE



BASIN #5
TEMPORARY SWM
VERTICAL DRAW-DOWN DEVICE
NOT TO SCALE

- CONSTRUCTION SPECIFICATIONS:
- PERFORATIONS IN THE DRAW-DOWN DEVICE MAY NOT EXTEND INTO THE WET STORAGE.
 - THE TOTAL AREA OF THE PERFORATIONS MUST BE GREATER THAN 2 TIMES THE AREA OF THE INTERNAL ORIFICE.
 - THE PERFORATED PORTION OF THE DRAW-DOWN DEVICE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH AND GEOTEXTILE FABRIC. THE GEOTEXTILE FABRIC SHALL MEET THE SPECIFICATIONS FOR GEOTEXTILE CLASS E.
 - PROVIDE SUPPORT OF DRAW-DOWN DEVICE TO PREVENT SAGGING AND FLOTTATION AN ACCEPTABLE PREVENTATIVE MEASURE IS TO STAKE BOTH SIDE OF DRAW-DOWN DEVICE WITH 1" STEEL ANGLE OR 1 1/4" SQUARE OR 2" ROUND WOODEN POSTS SET 3" MINIMUM INTO THE GROUND THEN JOINING THEM TO THE DEVICE BY WRAPPING WITH 12 GAUGE MINIMUM WIRE.

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

Donald M. Mason, PE No. 21443
ENGINEER DATE 10-25-17

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

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

Developer: [Signature] DATE 3/2/10

BY THE ENGINEER:
I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED 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.

Donald M. Mason, PE No. 21443
ENGINEER DATE 2/22/10

HOWARD SOIL CONSERVATION DISTRICT
[Signature] DATE 3/23/10

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature] DATE 4-15-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[Signature] DATE 4-19-10

[Signature] DATE 4/15/10

NO.	DATE	REVISION
4	3-30-2017	DELETE CLAY LINE NOTE AND ADD SOILS NOTE.
3	7-8-2014	ADD NOTE ABOUT 'AREA 2'
2	12-4-2013	REVISE LOT & SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER

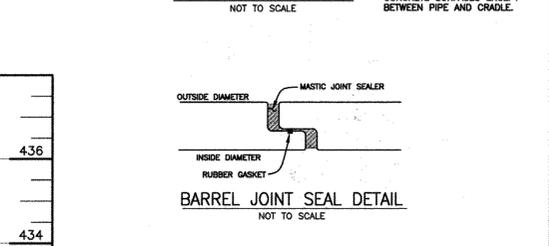
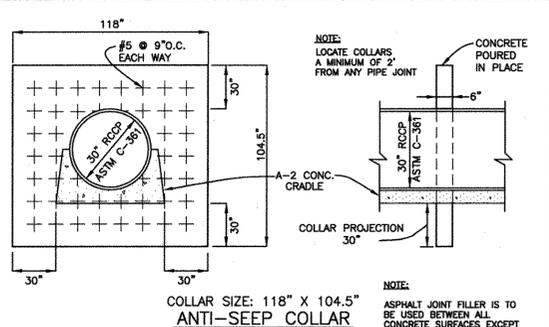
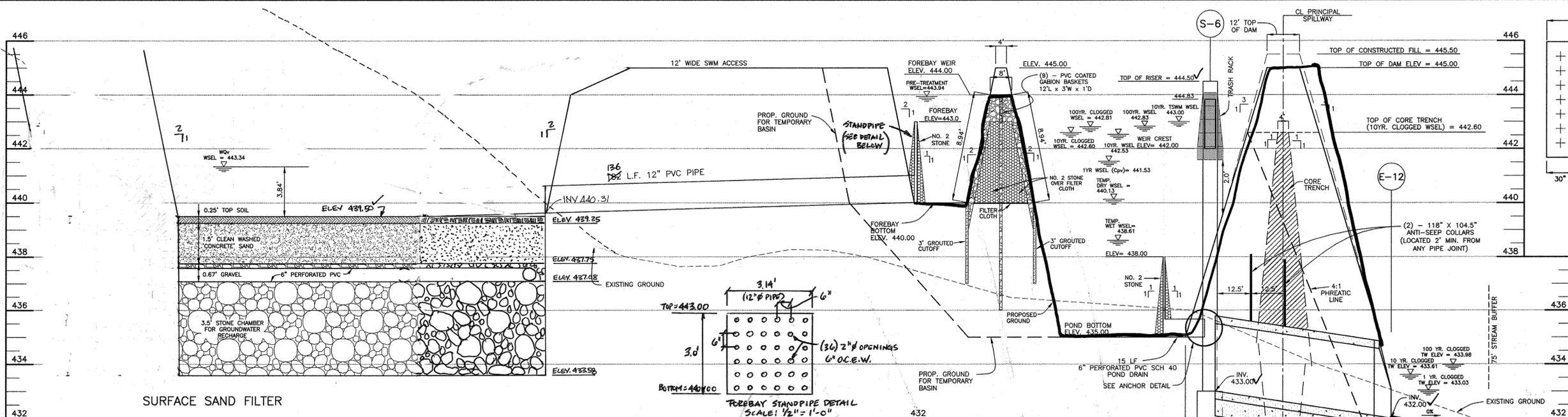
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE A SUITE 418
ELICOTT CITY, MARYLAND 21043
PHONE: 410-465-8100 FAX: 410-465-8644
WWW.BC-ENGINEERING.COM

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

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

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
LOT 202, OPEN SPACE LOTS 204-207; GOLF SHAPE LOTS 77, 78, 208, 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS CO-1 DD-1 BE-1 PP-1
TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P/0 394, GRID: 17
TAX MAP: 17, PARCEL: P/0 5, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

STORMWATER MANAGEMENT DETAILS FACILITY #5
DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 23 OF 56



AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

ENGINEER: *Donald M. Mason* P.E. # 21443 DATE: 10-25-17

CERTIFY MEANS TO STATE AND ASSURE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION, THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS REASONABLY EXPECTED AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

BY THE DEVELOPER:

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

DEVELOPER: *Jeffrey W. Schramm* DATE: 4-10-12

BY THE ENGINEER:

I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE 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.

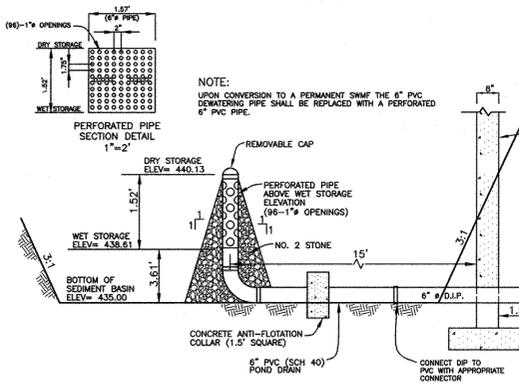
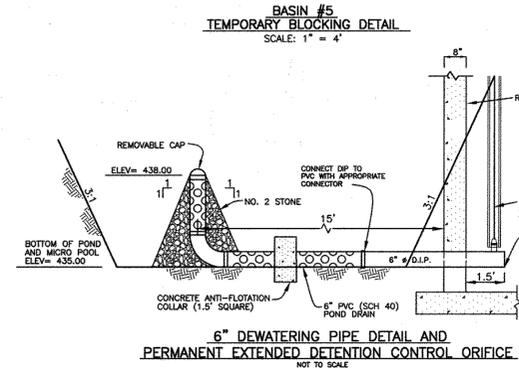
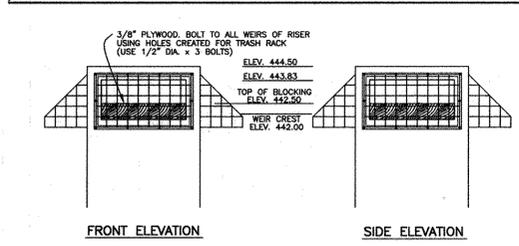
ENGINEER - DONALD A. MASON, P.E. # 21443 DATE: 4-19-12

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Jeffrey W. Schramm DATE: 4-24-12
HOWARD SOIL CONSERVATION DISTRICT

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter J. Smith DATE: 5-10-12
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Veronica DATE: 5-15-12
CHIEF, DIVISION OF LAND DEVELOPMENT
Donald M. Mason DATE: 5-15-12
CHIEF, DEVELOPMENT ENGINEERING DIVISION

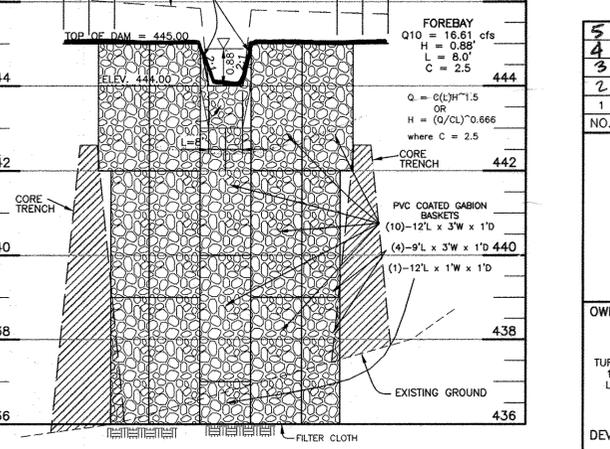
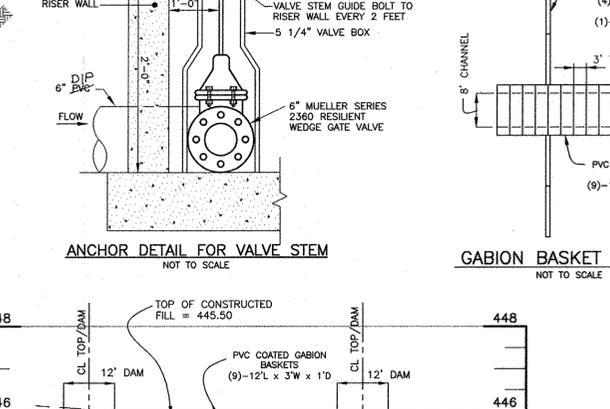
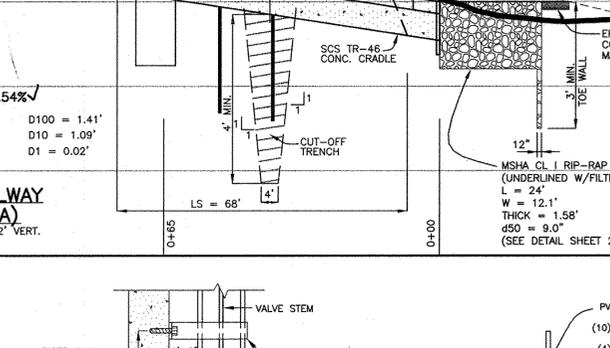
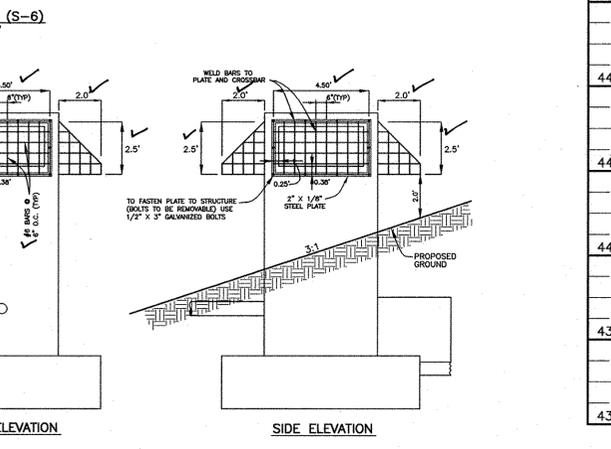
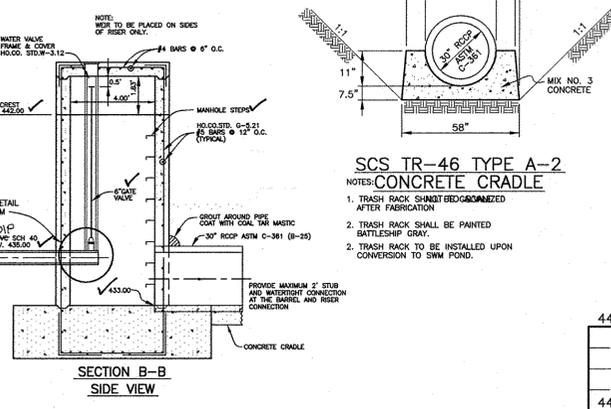
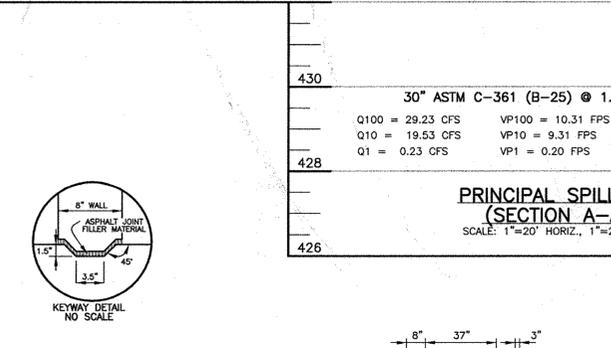
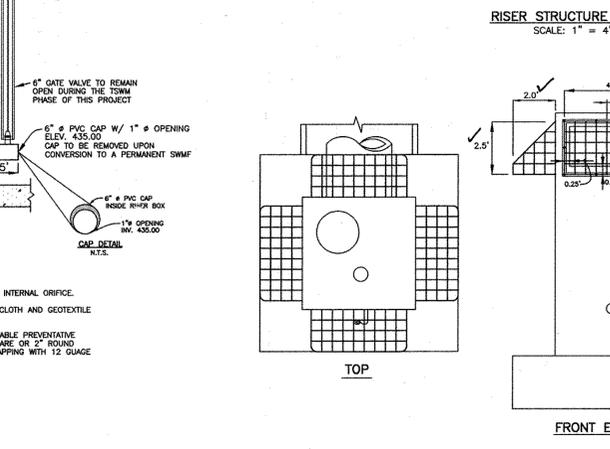
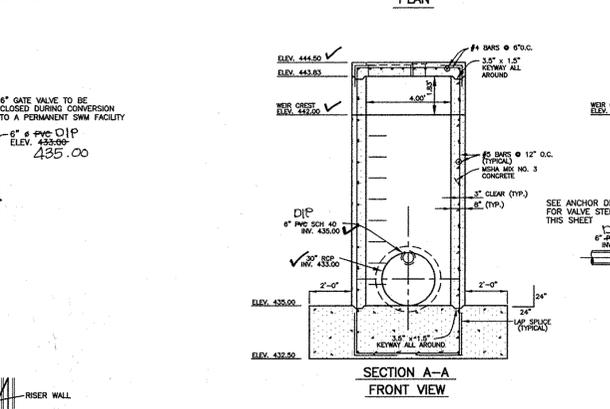
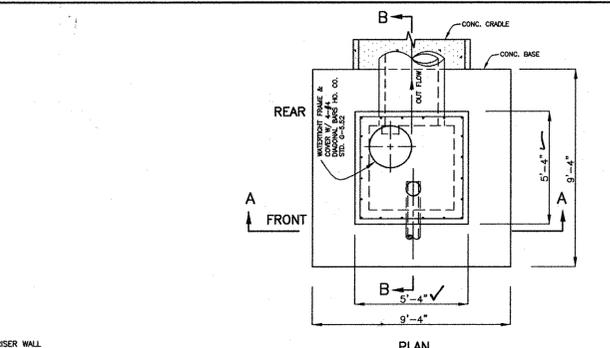


CONSTRUCTION SPECIFICATIONS:

- PERFORATIONS IN THE DRAW-DOWN DEVICE MAY NOT EXTEND INTO THE WET STORAGE.
- THE TOTAL AREA OF THE PERFORATIONS MUST BE GREATER THAN 2 TIMES THE AREA OF THE INTERNAL ORIFICE.
- THE PERFORATED PORTION OF THE DRAW-DOWN DEVICE SHALL BE WRAPPED WITH #16 HARDWARE CLOTH AND GEOTEXTILE FABRIC. THE GEOTEXTILE FABRIC SHALL MEET THE SPECIFICATIONS FOR GEOTEXTILE CLASS E.
- PROVIDE SUPPORT OF DRAW-DOWN DEVICE TO PREVENT SAGGING AND FLOATION. AN ACCEPTABLE PREVENTATIVE MEASURE IS TO STAKE BOTH SIDE OF DRAW-DOWN DEVICE WITH 1\"/>

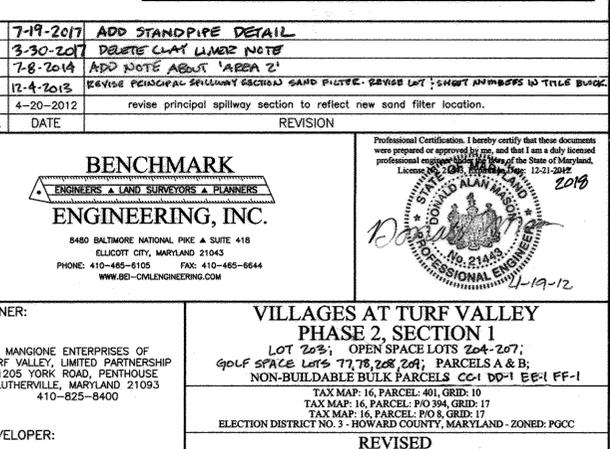
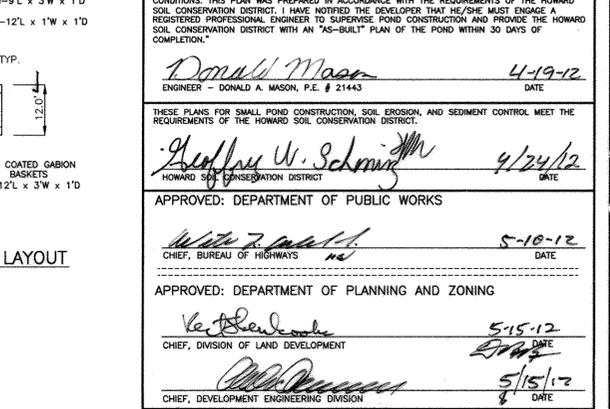
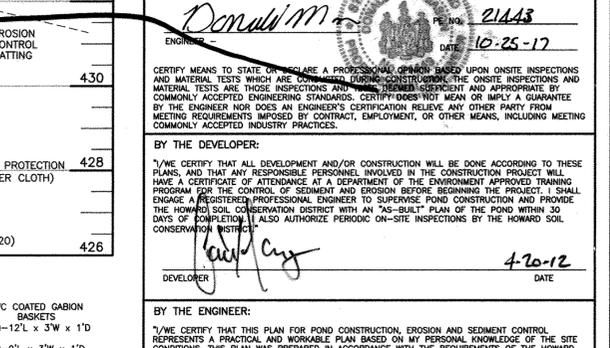
SEE SHEET 15 FOR MDE STANDARD DETAIL.

BASIN #6
6\"/>



PRINCIPAL SPILLWAY (SECTION A-A)
SCALE: 1\"/>

Q100 = 29.23 CFS	VP100 = 10.31 FPS	D100 = 1.41'
Q10 = 19.53 CFS	VP10 = 9.31 FPS	D10 = 1.09'
Q1 = 0.23 CFS	VP1 = 0.20 FPS	D1 = 0.02'



CROSS-SECTION OF FOREBAY DAM ALONG CENTERLINE
SCALE: 1\"/>

FOREBAY
Q10 = 16.61 cfs
H = 0.98'
L = 8.0'
C = 2.5

Q = C(L/H)^{1.5}
H = (Q/CL)^{0.666}
where C = 2.5

ALL ITEMS ON THIS SHEET ARE WITHIN 'AREA 2'

CONSTRUCTION SPECIFICATIONS

These specifications are appropriate to all ponds within the scope of the Standard for practice MD-378. All references to ASTM and AASHTO specifications apply to the most recent version.

Site Preparation

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped to topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and shore breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

Fill

Material - The fill material shall be taken from approved designated borrow areas. If shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable material. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification CC, SC, CH, or CL and must have at least 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer.

Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment.

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than maximum dry density with a moisture content within ± 2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Cut Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment. Dimple bands are not considered to be watertight.

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi; 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that a minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over, and on the side of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill material outside the structure backfill (flowable fill) zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

Pipe Conduits

All pipes shall be circular in cross section

Corrugated Metal Pipe - all of the following criteria shall apply for corrugated metal pipe:

1. Materials - (Polymer Coated steel pipe) - Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.

Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-198 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

2. Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness.

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.

All connection shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, prepared to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard log type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 1/2-inch thick closed cell circular neoprene gasket shall be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable.

Helicly corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

5. Backfilling shall conform to "Structure Backfill".

6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe to least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Grovel bedding is not permitted.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to "Structure Backfill".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Plastic Pipe - The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" - 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

3. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

4. Backfilling shall conform to "Structure Backfill".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

Concrete

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 311.

Geotextile shall be placed under all riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

Care of Water during Construction

All work on permanent structures shall be carried out in areas free from water. The contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level of the location being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water pumps from which the water shall be pumped.

Stabilization

All borrow areas shall be graded to provide proper drainage and left in a slightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

Erosion and Sediment Control

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

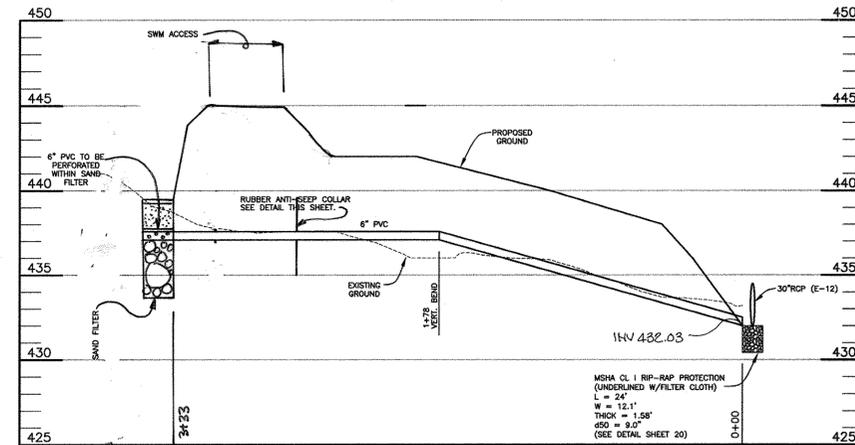
GEOTECHNICAL ENGINEER RECOMMENDATIONS:

EMBANKMENT AND CUT-OFF TRENCH CONSTRUCTION

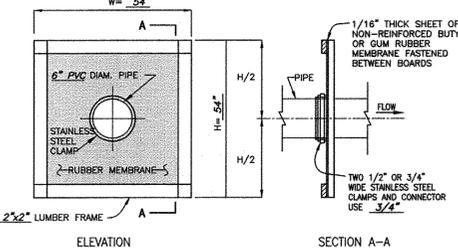
THE AREAS OF THE PROPOSED SWM FACILITIES SHOULD BE STRIPPED OF TOPSOIL AND ANY OTHER UNSUITABLE MATERIALS FROM THE EMBANKMENT OR STRUCTURE AREAS IN ACCORDANCE WITH SOIL CONSERVATION DISTRICT AFTER STRIPPING OPERATIONS HAVE BEEN COMPLETED. THE EXPOSED SUBGRADE MATERIALS SHOULD BE PROTECTED WITH A LOADED EROSION CONTROL MAT OR EQUIPMENT IN THE PRESENCE OF A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE. FOR AREAS THAT ARE NOT ACCESSIBLE TO A DUMP TRUCK, THE EXPOSED SUBGRADE MATERIALS SHOULD BE PROTECTED BY A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE UTILIZING A DYNAMIC CONCENTRIC PENETRATOR. ANY EXCESSIVELY SOFT OR LOOSE MATERIALS IDENTIFIED BY PENETRATOR OR PENETROMETER TESTING SHOULD BE EXCAVATED TO SUITABLE FIRM SOIL AND THEN GRADED. RE-ESTABLISHED BY BACKFILLING WITH SUITABLE SOIL.

A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER SHOULD BE PRESENT TO MONITOR PLACEMENT AND COMPACTION OF FILL FOR THE EMBANKMENT AND CUT-OFF TRENCH. IN ACCORDANCE WITH NRCS-MD CODE NO. 378 POND STANDARDS/SPECIFICATIONS, SOILS CONFORMING TO THE CENTER OF EMBANKMENT AND CUTOFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION CC, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASSING THE #200 SIEVE.

IT IS OUR PROFESSIONAL OPINION THAT IN ADDITION TO THE SOIL MATERIALS DESCRIBED ABOVE, A FINE-GRAINED SOIL, INCLUDING SILT(SL) WITH A PLASTICITY INDEX OF 10 OR MORE, SHOULD BE PLACED AND COMPACTED IN ACCORDANCE WITH NRCS-MD CODE NO. 378 SPECIFICATIONS.

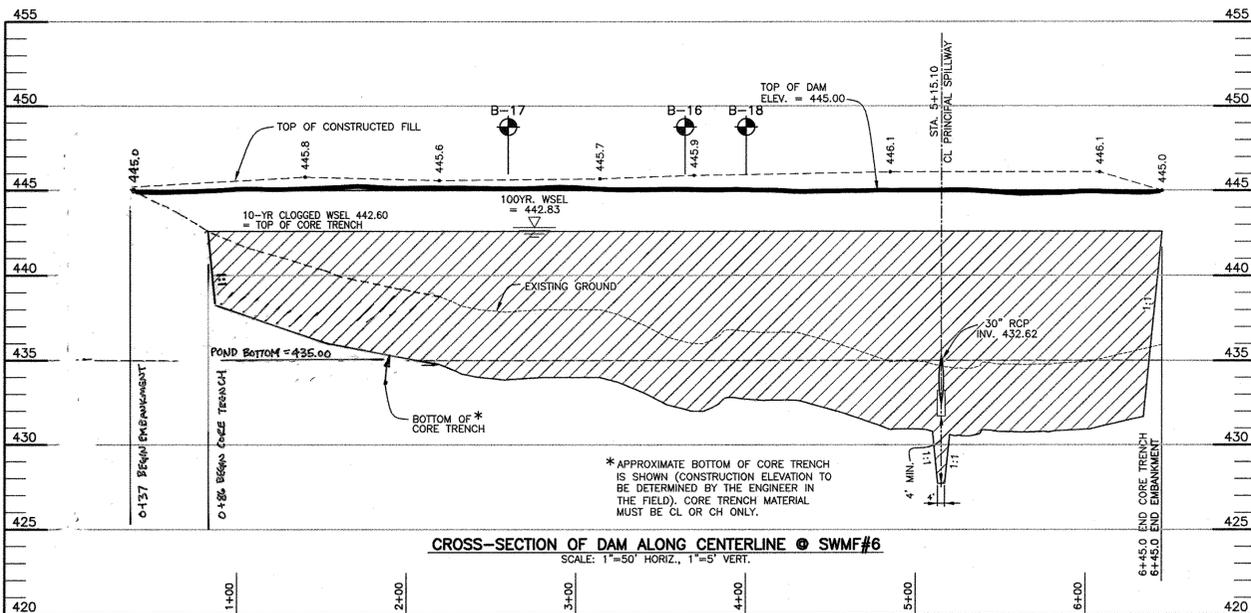


PROFILE OF 6" PVC FOR SAND FILTER & SWMF#6
SCALE: 1"=50' HORIZ., 1"=5' VERT.

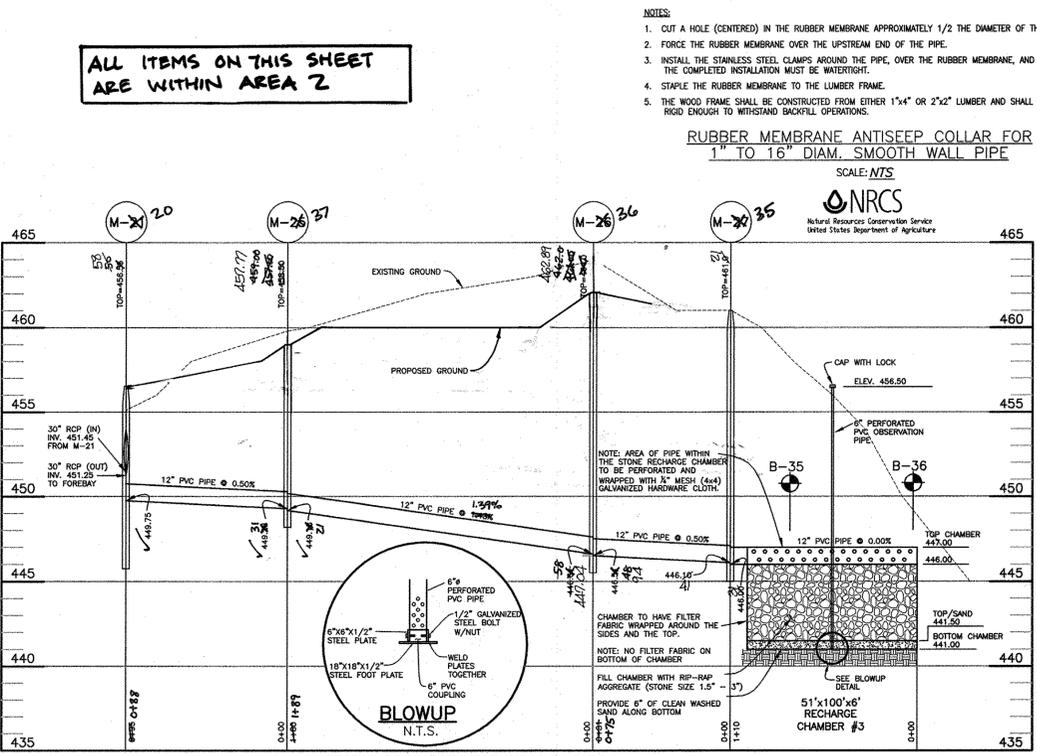


- NOTES:**
- CUT A HOLE (CENTERED) IN THE RUBBER MEMBRANE APPROXIMATELY 1/2 THE DIAMETER OF THE PIPE.
 - FORCE THE RUBBER MEMBRANE OVER THE UPSTREAM END OF THE PIPE.
 - INSTALL THE STAINLESS STEEL CLAMPS AROUND THE PIPE, OVER THE RUBBER MEMBRANE, AND TIGHTEN. THE COMPLETED INSTALLATION MUST BE WATER-TIGHT.
 - STAPLE THE RUBBER MEMBRANE TO THE LUMBER FRAME.
 - THE WOOD FRAME SHALL BE CONSTRUCTED FROM EITHER 1"x4" OR 2"x2" LUMBER AND SHALL BE RIGID ENOUGH TO WITHSTAND BACKFILL OPERATIONS.

RUBBER MEMBRANE ANTISEEP COLLAR FOR 1" TO 16" DIAM. SMOOTH WALL PIPE
SCALE: N.T.S.



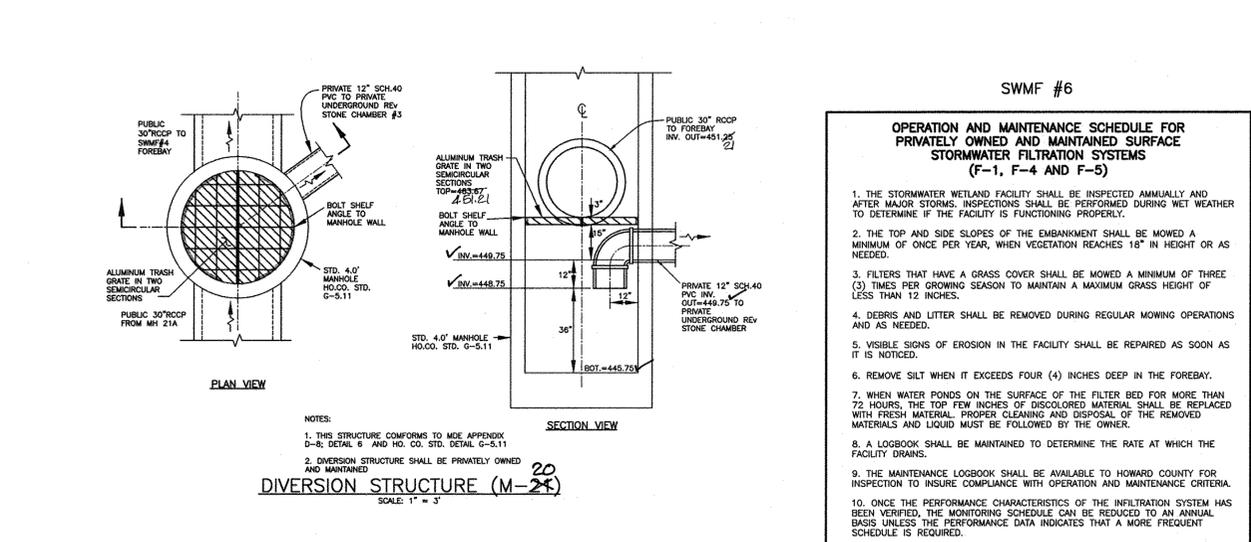
CROSS-SECTION OF DAM ALONG CENTERLINE @ SWMF#6
SCALE: 1"=50' HORIZ., 1"=5' VERT.



STORM DRAIN PROFILE TO RECHARGE CHAMBER #3 @ SWMF#4
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'

SWMF #3, #4, #5 AND P/O #6

RECHARGE CHAMBER #3



DIVERSION STRUCTURE (M-24)
SCALE: 1"=3'

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE STORMWATER FILTRATION SYSTEMS (F-1, F-4 AND F-5)

- THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
- THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE PER YEAR, WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.
- FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF THREE (3) TIMES PER GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 12 INCHES.
- DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
- VISIBLE SIGNS OF EROSION IN THE FACILITY SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
- REMOVE SILT WHEN IT EXCEEDS FOUR (4) INCHES DEEP IN THE FOREBAY.
- WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISPOSED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.
- A LOGBOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAS BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND JOINTLY MAINTAINED STORMWATER PONDS (P-1 THROUGH P-5)

- ROUTINE MAINTENANCE (BY H.O.A.):**
- FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER IF THE POND IS FUNCTIONING PROPERLY.
 - TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES PER YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED.
 - DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
 - VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS THE RIP-RAP OR GRASS ON OUTLET AREA SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
- NON-ROUTINE MAINTENANCE (BY HOWARD COUNTY):**
- STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
 - SEDIMENTS SHALL BE REMOVED FROM THE POND, AND FOREBAY, NO LATER THAN WHEN THE CAPACITY OF THE POND, OR FOREBAY, IS HALF FULL OF SEDIMENT, OR, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, UPON APPROVAL FROM THE DEPARTMENT OF PUBLIC WORKS.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED STORMWATER RECHARGE TRENCHES

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

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

Donald M. Mason
ENGINEER - DONALD M. MASON, P.E. # 21443

4-20-12

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ONSITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS, CODES, RULES OF PRACTICE OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION BELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

BY THE DEVELOPER:

4-20-12

BY THE ENGINEER:

4-19-12

APPROVED: DEPARTMENT OF PUBLIC WORKS

5-10-12

APPROVED: DEPARTMENT OF PLANNING AND ZONING

5-15-12

NO.	DATE	REVISION
1	4-20-2012	revise profile of 6" PVC for sand filter for SWMF 6 and Cross Section of Dam @ SWMF 6.
2	12-4-2013	REVISE PROFILE OF 6" PVC FOR SAND FILTER AND CROSS SECTION OF DAM @ SWMF#6 BOARD NO. 12-4-2013. REVISE PROFILE OF 6" PVC FOR SAND FILTER AND CROSS SECTION OF DAM @ SWMF#6 BOARD NO. 12-4-2013. REVISE LOT 1 SHEET NUMBERS IN TITLE BLOCK.
3	7-8-2014	ADD NOTE ABOUT 'AREA Z'
4	2-9-2016	REVISE PERM. GRADE AND RIM ELEVATIONS FROM M-35 TO M-20

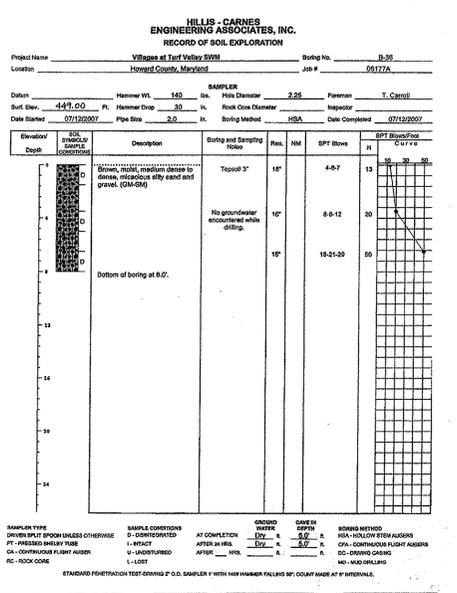
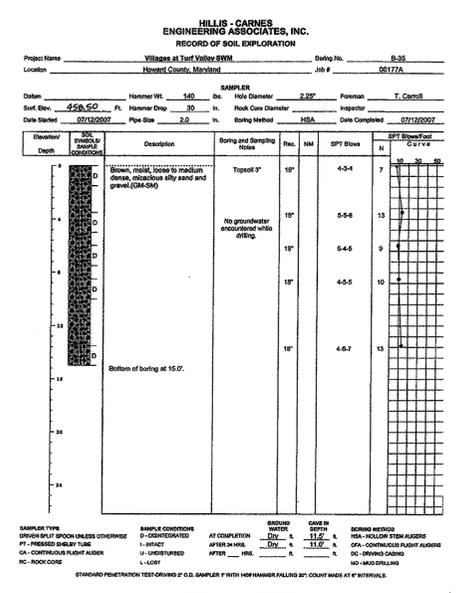
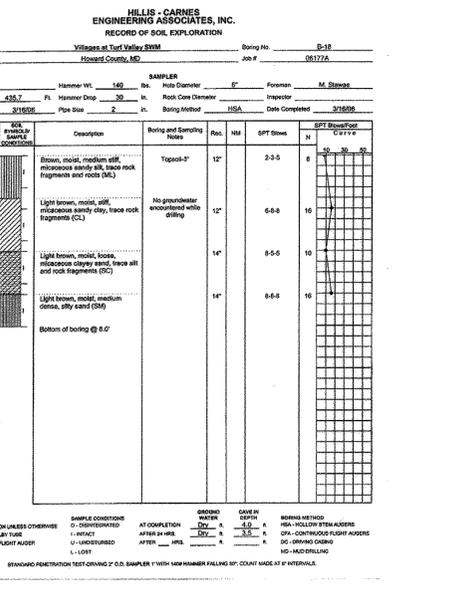
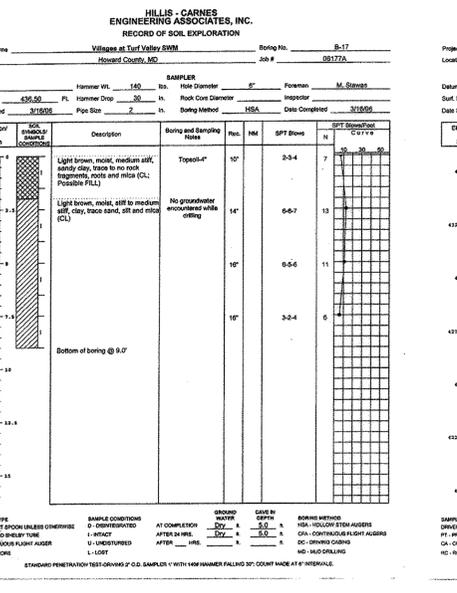
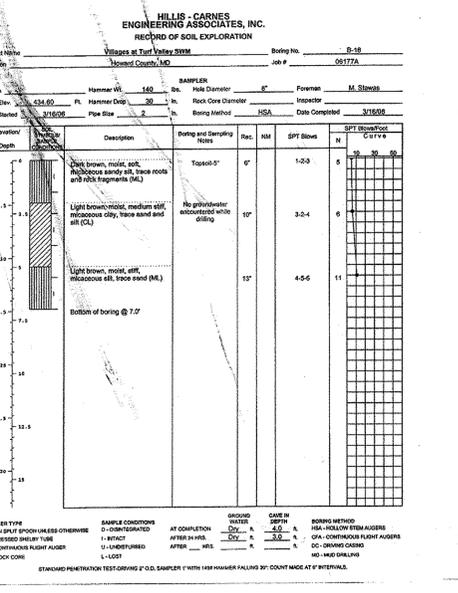
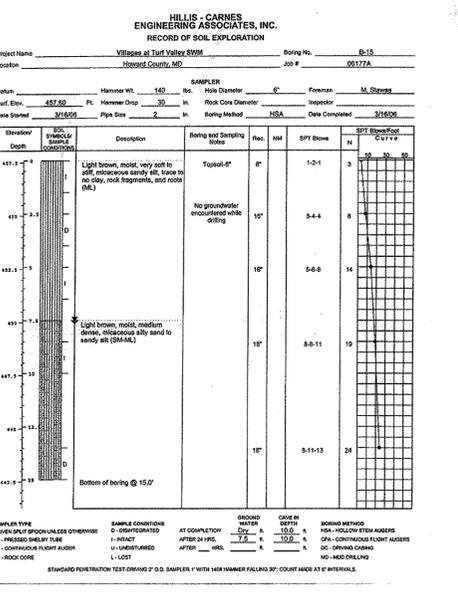
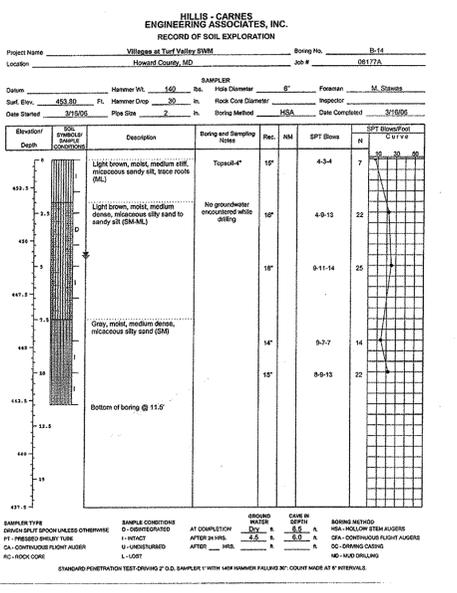
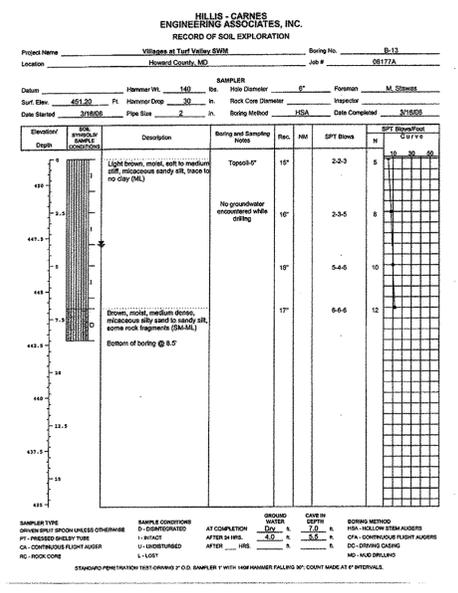
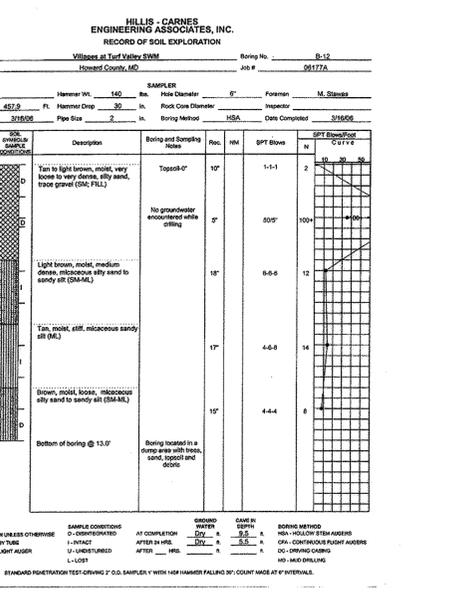
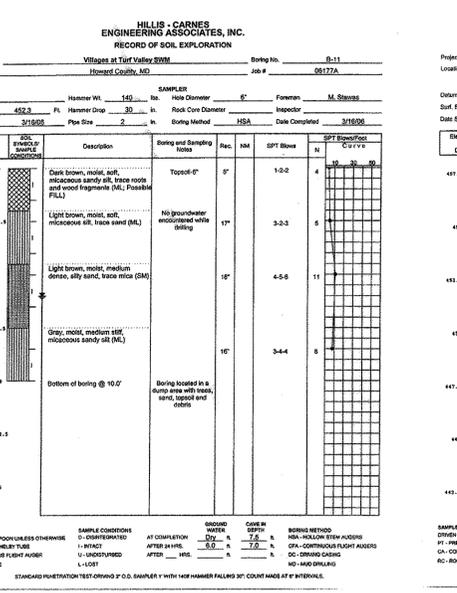
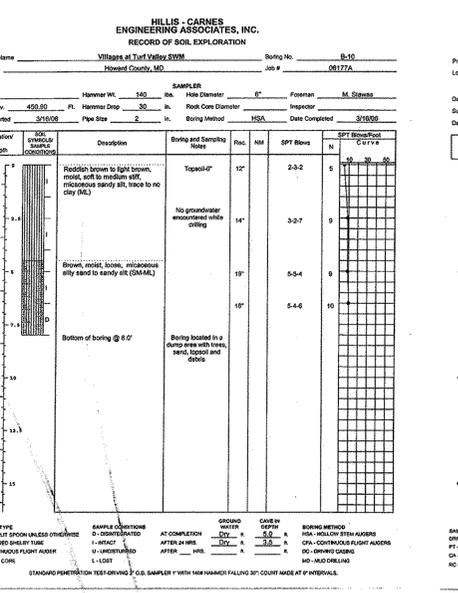
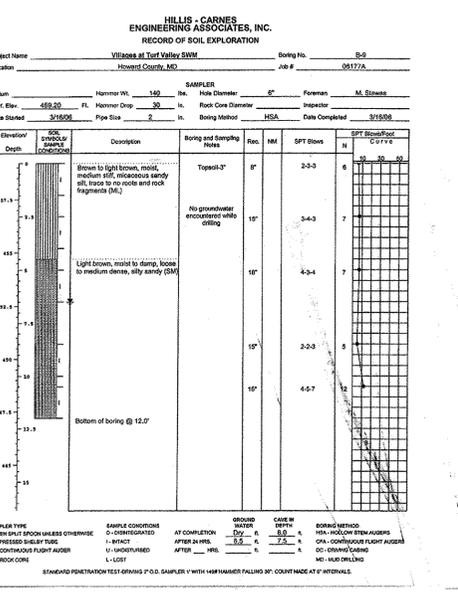
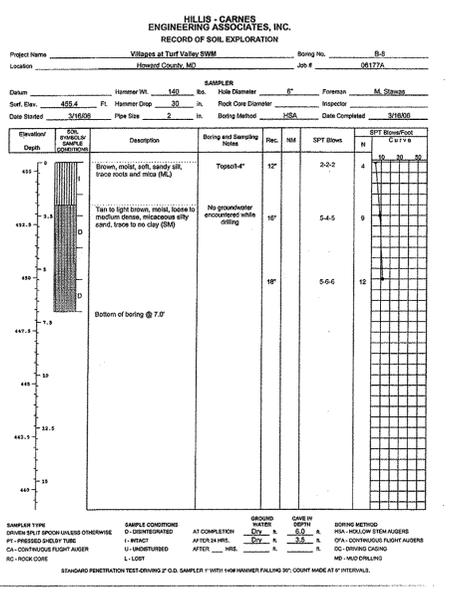
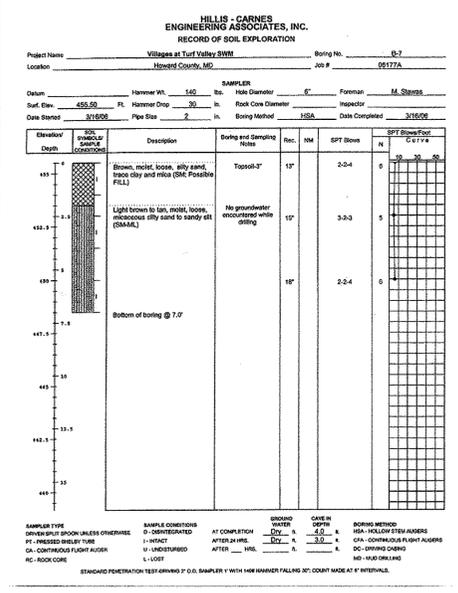
BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE & SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
WWW.BE-CVLENGINEERING.COM

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
LOT 204; OPEN SPACE LOTS 204-207;
GOLF SPACE LOTS 17, 18, 208, 209; PARCELS A & B;
NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1
TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: PH304, GRID: 17
TAX MAP: 16, PARCEL: PH308, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED POCC

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

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

DATE: FEBRUARY, 2010 **BEI PROJECT NO. 1915**
SCALE: AS SHOWN **SHEET 25 OF 56**



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



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-31-18

APPROVED: DEPARTMENT OF PUBLIC WORKS
W. J. White, 4-15-10, DATE
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
K. J. St. Louis, 4-19-10, DATE
CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: DEVELOPMENT ENGINEERING DIVISION
M. J. [Signature], 4/10/10, DATE

NO.	DATE	REVISION
2	12-9-2010	REVISE LOT 1 SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER.

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

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

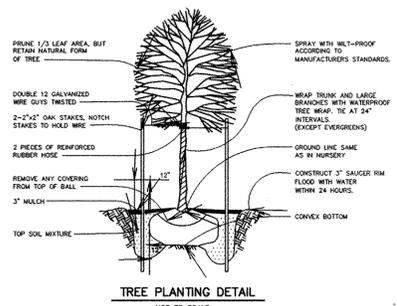
VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
LOT 2081, OPEN SPACE LOTS 204-207;
GOLF SPACES LOTS 77 TO 208; PARCELS A & B
NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1
TAX MAP: 16, PARCEL: P/O 394, GRID: 17
TAX MAP: 16, PARCEL: P/O 8, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: POCC

SOIL BORING LOGS FOR STORMWATER MANAGEMENT

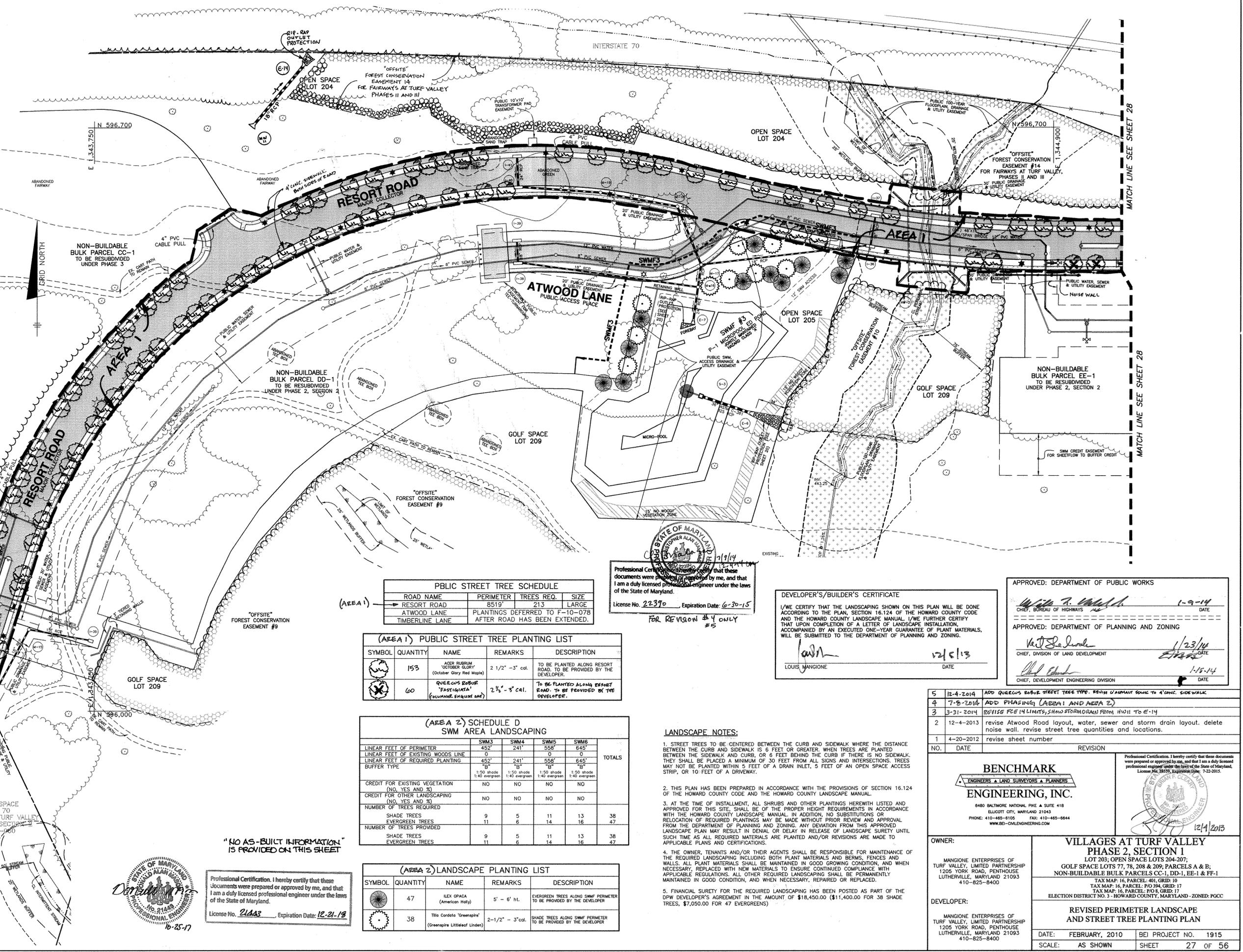
DATE: FEBRUARY, 2010
SCALE: AS SHOWN

BEI PROJECT NO. 1915
SHEET 26 OF 56

AS-BUILT F-08-084



- LEGEND**
- EXISTING BRUSH
 - EXISTING TREELINE
 - PROPOSED TREELINE
 - EXISTING STREAM
 - EXISTING WETLANDS
 - PROPOSED STORM DRAIN PIPE
 - PROPOSED SIDEWALK
 - PROPOSED ROAD PAVING
 - 100YR FLOODPLAIN
 - FOREST CONSERVATION EASEMENT
 - STREET LIGHT
 - FIRE HYDRANT
 - PHASING LINE AREA 1



PUBLIC STREET TREE SCHEDULE

ROAD NAME	PERIMETER	TREES REQ.	SIZE
RESORT ROAD	8519'	213	LARGE
ATWOOD LANE			PLANTINGS DEFERRED TO F-10-078
TIMBERLINE LANE			AFTER ROAD HAS BEEN EXTENDED.

(AREA 1) PUBLIC STREET TREE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	153	ACER RUBRUM (OCTOBER GLORY) (October Glory Red Maple)	2 1/2" - 3" cal.	TO BE PLANTED ALONG RESORT ROAD. TO BE PROVIDED BY THE DEVELOPER.
	60	QUERCUS ROBUR ("FASTIGIATA") (COLUMNAR SHAGBARK OAK)	2 1/2" - 3" cal.	TO BE PLANTED ALONG RESORT ROAD. TO BE PROVIDED BY THE DEVELOPER.

(AREA 2) SCHEDULE D SWM AREA LANDSCAPING

	SWM3	SWM4	SWM5	SWM6	TOTALS
LINEAR FEET OF PERIMETER	452'	241'	558'	645'	
LINEAR FEET OF EXISTING WOODS LINE	0	0	0	0	
LINEAR FEET OF REQUIRED PLANTING	452'	241'	558'	645'	
BUFFER TYPE	1:50 shade 1:40 evergreen	1:50 shade 1:40 evergreen	1:50 shade 1:40 evergreen	1:50 shade 1:40 evergreen	
CREDIT FOR EXISTING VEGETATION (NO, YES AND %)	NO	NO	NO	NO	
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	NO	NO	NO	NO	
NUMBER OF TREES REQUIRED					
SHADE TREES	9	5	11	13	38
EVERGREEN TREES	11	6	14	16	47
NUMBER OF TREES PROVIDED					
SHADE TREES	9	5	11	13	38
EVERGREEN TREES	11	6	14	16	47

(AREA 2) LANDSCAPE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	47	ILEX OPACA (American Holly)	5' - 6' ht.	EVERGREEN TREES ALONG SWM PERIMETER TO BE PROVIDED BY THE DEVELOPER
	38	Tilia Cordata "Greenspire" (Greenspire Littleleaf Linden)	2-1/2" - 3" cal.	SHADE TREES ALONG SWM PERIMETER TO BE PROVIDED BY THE DEVELOPER

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. 22370 Expiration Date: 6-30-15
 FOR REVISION #4 ONLY

DEVELOPER'S/BUILDER'S CERTIFICATE
 I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION OF A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE-YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.
 Louis Mangione DATE 1/23/13

APPROVED: DEPARTMENT OF PUBLIC WORKS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
 APPROVED: CHIEF, DEVELOPMENT ENGINEERING DIVISION

- LANDSCAPE NOTES:**
- STREET TREES TO BE CENTERED BETWEEN THE CURB AND SIDEWALK WHERE THE DISTANCE BETWEEN THE CURB AND SIDEWALK IS 6 FEET OR GREATER. WHEN TREES ARE PLANTED BETWEEN THE SIDEWALK AND CURB, OR 6 FEET BEHIND THE CURB IF THERE IS NO SIDEWALK, THEY SHALL BE PLACED A MINIMUM OF 30 FEET FROM ALL SIGNS AND INTERSECTIONS. TREES MAY NOT BE PLANTED WITHIN 5 FEET OF A DRAIN INLET, 5 FEET OF AN OPEN SPACE ACCESS STRIP, OR 10 FEET OF A DRIVEWAY.
 - THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.
 - AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWIT LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.
 - THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
 - FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$118,450.00 (\$11,400.00 FOR 38 SHADE TREES, \$7,050.00 FOR 47 EVERGREENS)

NO.	DATE	REVISION
5	12-4-2014	ADD QUERCUS ROBUR STREET TREE TYPE. REVISE CURB/PAVEMENT SPACING TO A CONC. SIDEWALK
4	7-9-2014	ADD PHASING (AREA 1 AND AREA 2)
3	3-31-2014	REVISE FCE 14 LIMITS, SHOW STORM DRAIN FROM HWY 11 TO E-14
2	12-4-2013	revise Atwood Road layout, water, sewer and storm drain layout. delete noise wall. revise street tree quantities and locations.
1	4-20-2012	revise sheet number

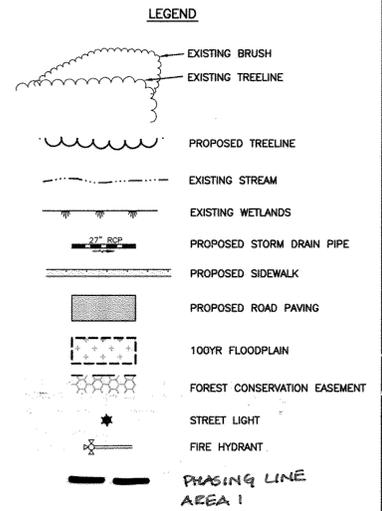
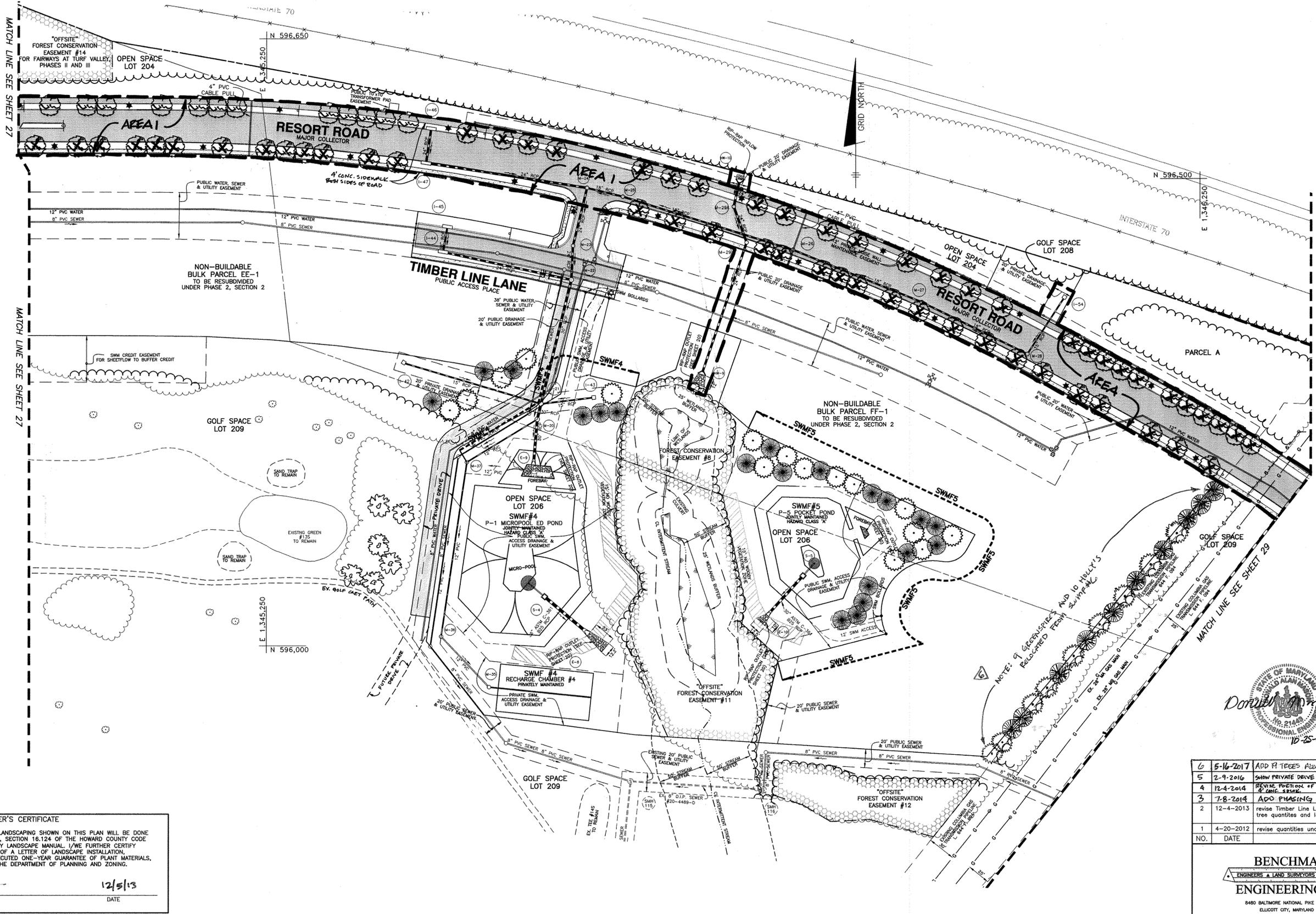
BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 118
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-465-8105 FAX: 410-465-8444
 WWW.BE-CIVILENGINEERING.COM

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

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

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P0394, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

REVISED PERIMETER LANDSCAPE AND STREET TREE PLANTING PLAN
 DATE: FEBRUARY, 2010 SHEET PROJECT NO. 1915
 SCALE: AS SHOWN BEI 27 OF 56



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



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21423 Expiration Date: 12-21-13

NO.	DATE	REVISION
6	5-16-2017	ADD 11 TREES ALONG WESTERN EDGE OF GAS EASEMENT ON GOLF SPACE LOT 209
5	2-9-2016	SHOW PRIVATE DRIVE. FIN SIDEWALK & RAMPS ORIENTATION
4	12-4-2014	REVISE PORTION OF STREET TREES TO BE QUEBEC'S BOBIF. DESIGN NORMAL SWALK TO BE 4' CONC. SIDEWALK
3	7-8-2014	ADD PHASING LINE (AREA 1)
2	12-4-2013	REVISE Timber Line Lane layout, water, sewer and storm drain layout, delete noise wall, revise tree quantities and locations, move all landscaping charts to sheet 27.
1	4-20-2012	REVISE QUANTITIES UNDER SWMF6 IN Schedule 'D'

DEVELOPER'S/BUILDER'S CERTIFICATE

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

Louis Mangione 12/5/13
 LOUIS MANGIONE DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
 1-9-14
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 1/23/14
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

1-15-14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22390 Expiration Date: 6-30-15
 FOR REVISION #3, #4, #5, #6

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-485-6105 FAX: 410-485-6644
 WWW.BD-CIVILENGINEERING.COM

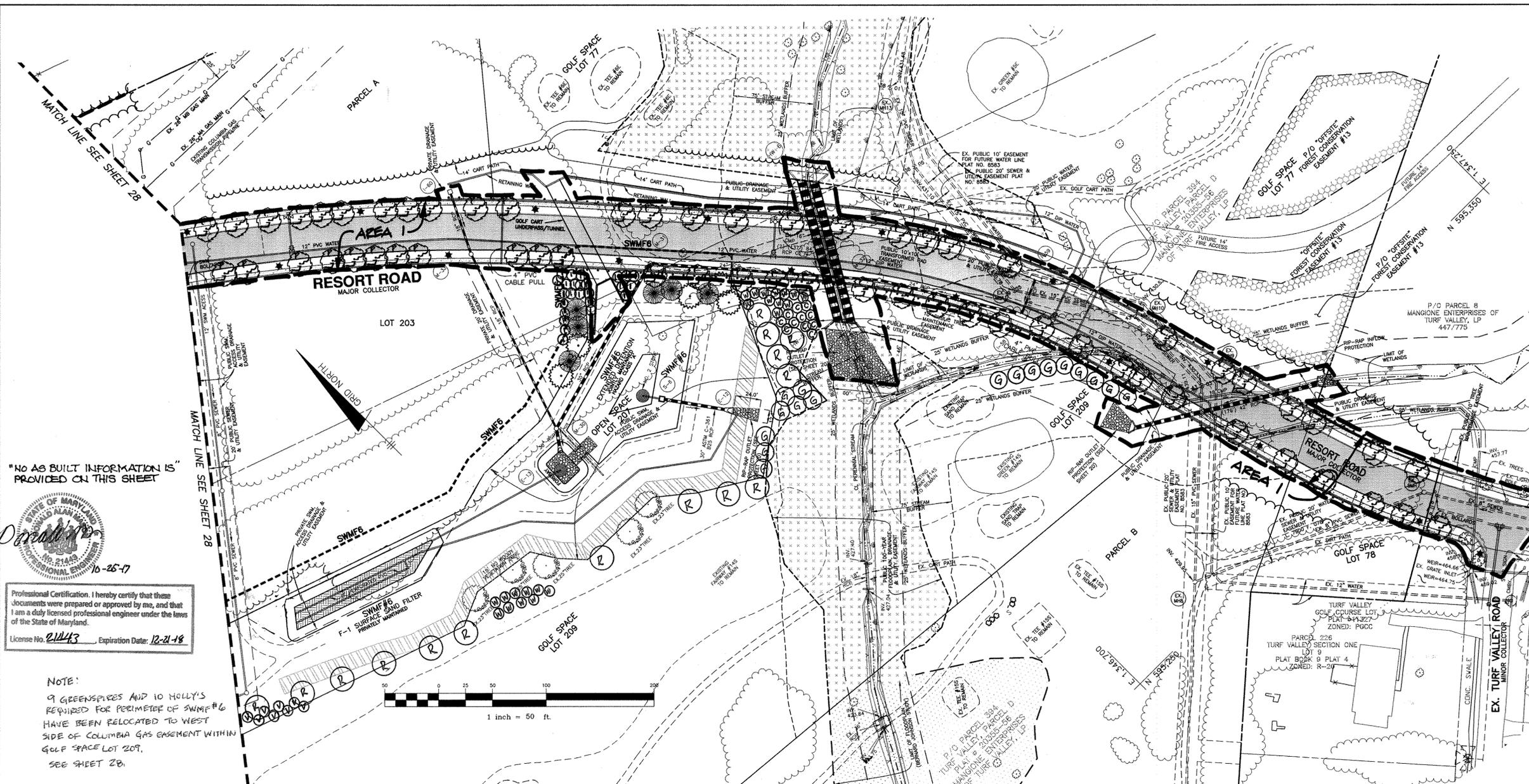
VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1

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

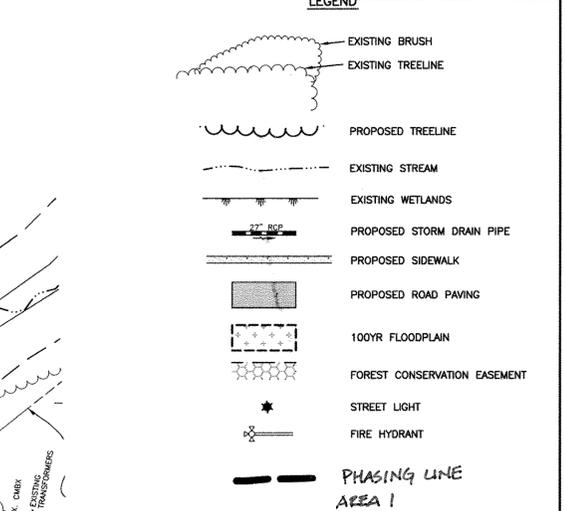
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

REVISED PERIMETER LANDSCAPE AND STREET TREE PLANTING PLAN

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 28 OF 56



SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
(R)	15	RIVER-BIRCH	10'-12' HGT.	SHADE TREES TO BE PLANTED AROUND SWMF#6 PROVIDED BY DEVELOPER. RELOCATED FROM SDP-08-076
(G)	17	GREEN GIANT	5'-6' HGT	EVER GREEN TREES TO BE PLANTED AROUND SWMF#6 BY DEVELOPER. RELOCATED FROM SDP-08-076
(V)	8	VIBURNUM	2.5'-3' HGT	SHUBS TO BE PLANTED AROUND SWMF#6 BY DEVELOPER. RELOCATED FROM SDP-08-076
(I)	25	ITEA	3'-4' HGT.	
(W)	22	WINTERBERRY	3'-4' HGT.	
(C)	11	CHOKEBERRY	3'-4' HGT.	



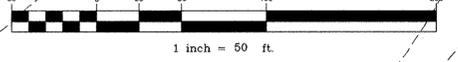
"NO AS BUILT INFORMATION IS PROVIDED ON THIS SHEET"



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

License No. 21443 Expiration Date: 12-21-18

NOTE:
9 GREENSPACES AND 10 HOLLYS REQUIRED FOR PERIMETER OF SWMF#6 HAVE BEEN RELOCATED TO WEST SIDE OF COLUMBIA GAS EASEMENT WITHIN GOLF SPACE LOT 209. SEE SHEET 28.



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

License No. 22390 Expiration Date: 6-30-15

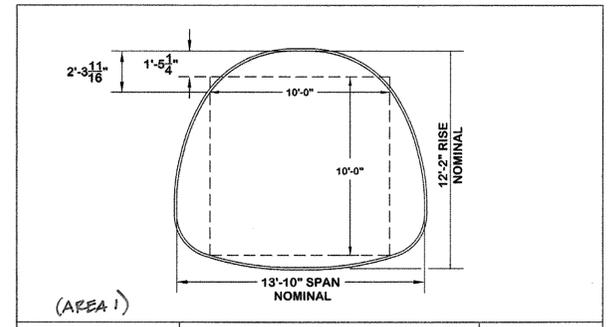
DEVELOPER'S/BUILDER'S CERTIFICATE
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Louis Mangione 12/5/13
LOUIS MANGIONE DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
William R. Wall 1-9-14
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kevin P. Dool 1/23/14
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

1/15/14
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



LANE METAL PRODUCTS DIVISION
OF LANE ENTERPRISES, INC.
PULASKI, PA.

DRAWN BY: "BBK"
APPROVED BY:
DATE: 4-30-09
SCALE: NONE

NOTES:
1. SEE SHEET 19 FOR PROFILE THROUGH UNDERPASS/TUNNEL
2. UNDERPASS/TUNNEL TO BE MANUFACTURED BY LANE OR EQUIVALENT.

UNDERPASS

Underpasses are intended for use where a greater vertical clearance is required and the bottom needs to be relatively flat. Especially useful for auto, truck, railroad, golf cart, pedestrian and animal traffic. Also useful for utility tunnels between buildings. Like the pipe arch, the underpass requires good soil bearing pressures in the corners if it is to function as designed.

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STRUCTURAL PLATE UNDERPASS

NOMINAL SIZE (IN)	NOMINAL SIZE (MM)	MINIMUM CLEARANCE (IN)	MINIMUM CLEARANCE (MM)								
24	610	1750	4425	24	610	1750	4425	24	610	1750	4425
28	710	1750	4425	28	710	1750	4425	28	710	1750	4425
32	810	1750	4425	32	810	1750	4425	32	810	1750	4425
36	910	1750	4425	36	910	1750	4425	36	910	1750	4425
40	1010	1750	4425	40	1010	1750	4425	40	1010	1750	4425
44	1110	1750	4425	44	1110	1750	4425	44	1110	1750	4425
48	1210	1750	4425	48	1210	1750	4425	48	1210	1750	4425
52	1310	1750	4425	52	1310	1750	4425	52	1310	1750	4425
56	1410	1750	4425	56	1410	1750	4425	56	1410	1750	4425
60	1510	1750	4425	60	1510	1750	4425	60	1510	1750	4425
64	1610	1750	4425	64	1610	1750	4425	64	1610	1750	4425
68	1710	1750	4425	68	1710	1750	4425	68	1710	1750	4425
72	1810	1750	4425	72	1810	1750	4425	72	1810	1750	4425
76	1910	1750	4425	76	1910	1750	4425	76	1910	1750	4425
80	2010	1750	4425	80	2010	1750	4425	80	2010	1750	4425
84	2110	1750	4425	84	2110	1750	4425	84	2110	1750	4425
88	2210	1750	4425	88	2210	1750	4425	88	2210	1750	4425
92	2310	1750	4425	92	2310	1750	4425	92	2310	1750	4425
96	2410	1750	4425	96	2410	1750	4425	96	2410	1750	4425
100	2510	1750	4425	100	2510	1750	4425	100	2510	1750	4425
104	2610	1750	4425	104	2610	1750	4425	104	2610	1750	4425
108	2710	1750	4425	108	2710	1750	4425	108	2710	1750	4425
112	2810	1750	4425	112	2810	1750	4425	112	2810	1750	4425
116	2910	1750	4425	116	2910	1750	4425	116	2910	1750	4425
120	3010	1750	4425	120	3010	1750	4425	120	3010	1750	4425
124	3110	1750	4425	124	3110	1750	4425	124	3110	1750	4425
128	3210	1750	4425	128	3210	1750	4425	128	3210	1750	4425
132	3310	1750	4425	132	3310	1750	4425	132	3310	1750	4425
136	3410	1750	4425	136	3410	1750	4425	136	3410	1750	4425
140	3510	1750	4425	140	3510	1750	4425	140	3510	1750	4425
144	3610	1750	4425	144	3610	1750	4425	144	3610	1750	4425
148	3710	1750	4425	148	3710	1750	4425	148	3710	1750	4425
152	3810	1750	4425	152	3810	1750	4425	152	3810	1750	4425
156	3910	1750	4425	156	3910	1750	4425	156	3910	1750	4425
160	4010	1750	4425	160	4010	1750	4425	160	4010	1750	4425
164	4110	1750	4425	164	4110	1750	4425	164	4110	1750	4425
168	4210	1750	4425	168	4210	1750	4425	168	4210	1750	4425
172	4310	1750	4425	172	4310	1750	4425	172	4310	1750	4425
176	4410	1750	4425	176	4410	1750	4425	176	4410	1750	4425
180	4510	1750	4425	180	4510	1750	4425	180	4510	1750	4425
184	4610	1750	4425	184	4610	1750	4425	184	4610	1750	4425
188	4710	1750	4425	188	4710	1750	4425	188	4710	1750	4425
192	4810	1750	4425	192	4810	1750	4425	192	4810	1750	4425
196	4910	1750	4425	196	4910	1750	4425	196	4910	1750	4425
200	5010	1750	4425	200	5010	1750	4425	200	5010	1750	4425

Notes:
1. Minimum covers are based on AASHTO H20, H20 and H20S loading. Minimum covers are measured from top of pipe to bottom of finished pavement or top of rigid pavement. Minimum cover must be maintained in proposed traffic areas.
2. Consult manufacturer for design involving railroad, airport or heavy construction equipment loads.
3. For product weights, consult Tables 11a and 11b on page 20 and 21.

DURABILITY
Structural plate has been used to assemble structures for nearly 70 years and has a proven performance record. Structural plate offers a long service life because of the thickness of the plates used in the structure and the zinc-zinc silico-phosphated coating applied after plate fabrication. Structural plate structures offer the advantage of being able to have heavier plates in the center than in the remainder of the plate ring. Durability requirements are established by sampling the soil and water at a site, testing for the values of pH and resistivity, and estimating potential abrasive forces. If the site is extremely severe, the invert may be paved with concrete or bituminous for increased corrosion and abrasion resistance.

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LANE ENTERPRISES, INC.

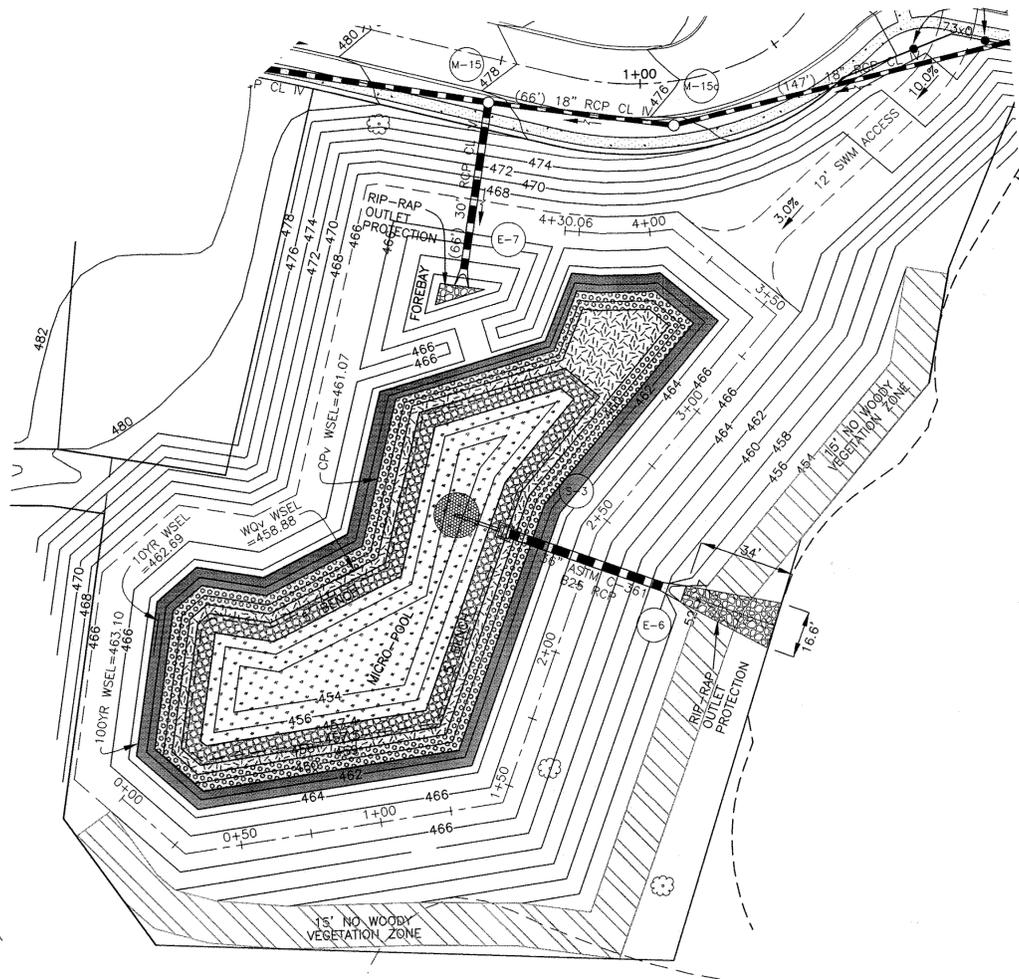
GEOMETRIC PROPERTIES OF PLATE

SIZE (IN)	WEIGHT (LBS)	AREA (SQ IN)	MOMENT OF INERTIA (IN ⁴)	SECTION MODULUS (IN ³)	RADIUS OF GYRATION (IN)	DEVELOPER
12	1.10	1.10	0.15	0.15	0.15	LANE
14	1.54	1.54	0.25	0.25	0.25	LANE
16	2.00	2.00	0.40	0.40	0.40	LANE
18	2.50	2.50	0.60	0.60	0.60	LANE
20	3.00	3.00	0.80	0.80	0.80	LANE
22	3.50	3.50	1.10	1.10	1.10	LANE
24	4.00	4.00	1.40	1.40	1.40	LANE
26	4.50	4.50	1.80	1.80	1.80	LANE
28	5.00	5.00	2.20	2.20	2.20	LANE
30	5.50	5.50	2.60	2.60	2.60	LANE
32	6.00	6.00	3.10	3.10	3.10	LANE
34	6.50	6.50	3.60	3.60	3.60	LANE
36	7.00	7.00	4.10	4.10	4.10	LANE
38	7.50	7.50	4.70	4.70	4.70	LANE
40	8.00	8.00	5.30	5.30	5.30	LANE
42	8.50	8.50	5.90	5.90	5.90	LANE
44	9.00	9.00	6.50	6.50	6.50	LANE
46	9.50	9.50	7.10	7.10	7.10	LANE
48	10.00	10.00	7.70	7.70	7.70	LANE
50	10.50	10.50	8.30	8.30	8.30	LANE
52	11.00	11.00	8.90	8.90	8.90	LANE
54	11.50	11.50	9.50	9.50	9.50	LANE
56	12.00	12.00	10.10	10.10	10.10	LANE
58	12.50	12.50	10.70	10.70	10.70	LANE
60	13.00	13.00	11.30	11.30	11.30	LANE
62	13.50	13.50	11.90	11.90	11.90	LANE
64	14.00	14.00	12.50	12.50	12.50	LANE
66	14.50	14.50	13.10	13.10	13.10	LANE
68	15.00	15.00	13.70	13.70	13.70	LANE
70	15.50	15.50	14.30	14.30	14.30	LANE
72	16.00	16.00	14.90	14.90	14.90	LANE
74	16.50	16.50	15.50	15.50	15.50	LANE
76	17.00	17.00	16.10	16.10	16.10	LANE
78	17.50	17.50	16.70	16.70	16.70	LANE
80	18.00	18.00	17.30	17.30	17.30	LANE
82	18.50	18.50	17.90	17.90	17.90	LANE
84	19.00	19.00	18.50	18.50	18.50	LANE
86	19.50	19.50	19.10	19.10	19.10	LANE
88	20.00	20.00	19.70	19.70	19.70	LANE
90	20.50	20.50	20.30	20.30	20.30	LANE
92	21.00	21.00	20.90	20.90	20.90	LANE
94	21.50	21.50	21.50	21.50	21.50	LANE
96	22.00	22.00	22.10	22.10	22.10	LANE
98	22.50	22.50	22.70	22.70	22.70	LANE
100	23.00	23.00	23.30	23.30	23.30	LANE

Notes:
1. Values for "X", "Y", "Z" and "W" are one side of horizontal projection.

DETAILS OF UNCURVED PLATE SECTIONS

NET WIDTH (IN)	DEPTH (IN)	AREA (SQ IN)	MOMENT OF INERTIA (IN ⁴)	SECTION MODULUS (IN ³)	RADIUS OF GYRATION (IN)	DEVELOPER
12	12	144	1728	144	12	LANE
14	14	196	3528	196	14	LANE
16	16	256	6528	256	16	LANE
18	18	324	10512	324	18	LANE
20	20	400	15440	400	20	LANE
22	22	484	21352	484	22	LANE
24	24	576	28224	576	24	LANE
26	26	676	36056	676	26	LANE
28	28	784	44848	784	28	LANE
30	30	900	54590	900	30	LANE
32	32	1024	65280	1024	32	LANE
34	34	1156	76916	1156	34	LANE
36	36	1296	89500	1296	36	LANE
38	38	1444	103032	1444	38	LANE
40	40	1600	117512	1600	40	LANE
42	42	1764	132950	1764	42	LANE
44	44	1936	149348	1936	44	LANE
46	46	2116	166706	2116	46	LANE
48	48	2304	185024	2304	48	LANE
50	50	2500	204300	2500	50	LANE
52	52	2704	224536	2704	52	LANE
54	54	2916	245732	2916	54	LANE
56	56	3136	267888	3136	56	LANE
58	58	3364	290904	3364	58	LANE
60	60	3600	314780	3600	60	LANE
62	62	3844	339516	3844	62	LANE
64	64	4096	365112	4096	64	LANE
66	66	43				

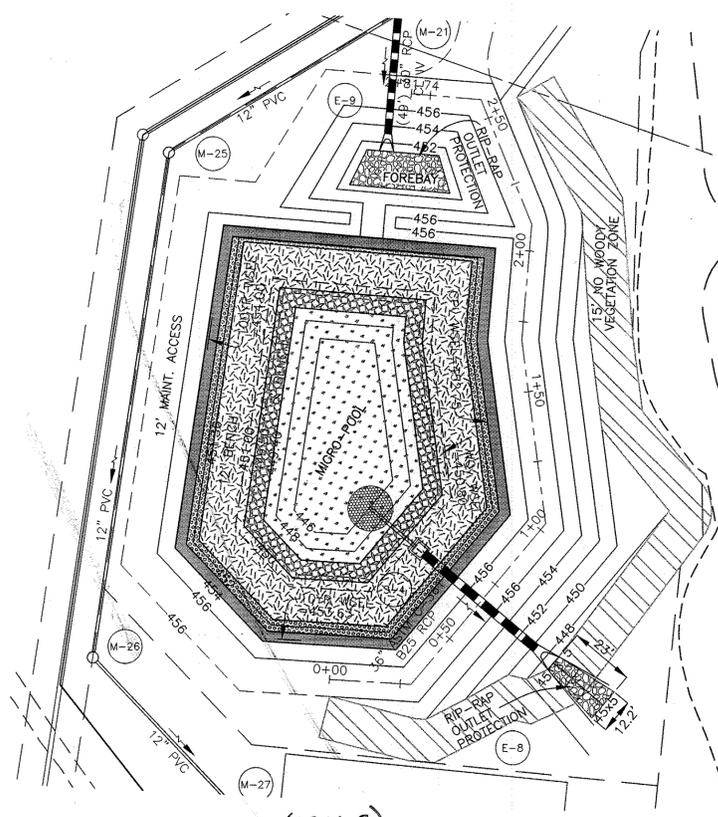


(AREA 1)
INTERNAL LANDSCAPING FOR
SWMF #3
P-1 MICRO-POOL ED POND
SCALE: 1" = 30'

ZONE	AREA (SF)	ELEVATION RANGE	PLANT MIX	QUANTITIES
1	5,433	454.00 - 457.40	100% WATER LILLY	604
2	2,891	457.40 - 458.00	50% BROAD WATER WEED 25% DUCK POTATO 25% ARROW ARUM	161 80 81
3	2,123	458.00 - 459.00	50% CUTGRASS, RICE 50% SWITCHGRASS	118 118
4	3,340	459.00 - 461.07	(CP-) 50% LOVEGRASS-MEADOW 25% VIOLETS, COMMON BLUE 25% CONEFLOWER, CUT-LEAF	186 93 93
5	3,574	(CP-) (100YR) 461.07 - 463.10	75% WITCHGRASS, NEEDLE-LEAF 25% CONEFLOWER, SWEET	298 99
6	0	N/A	N/A	0

ALL PLANTINGS TO BE QUART BULBS AND SPACED AT 3' O.C.

NOTE:
SWMF #3 TO BE MAINTAINED AS
A SEDIMENT TRAP UNTIL
COMPLETION OF PHASE 3.

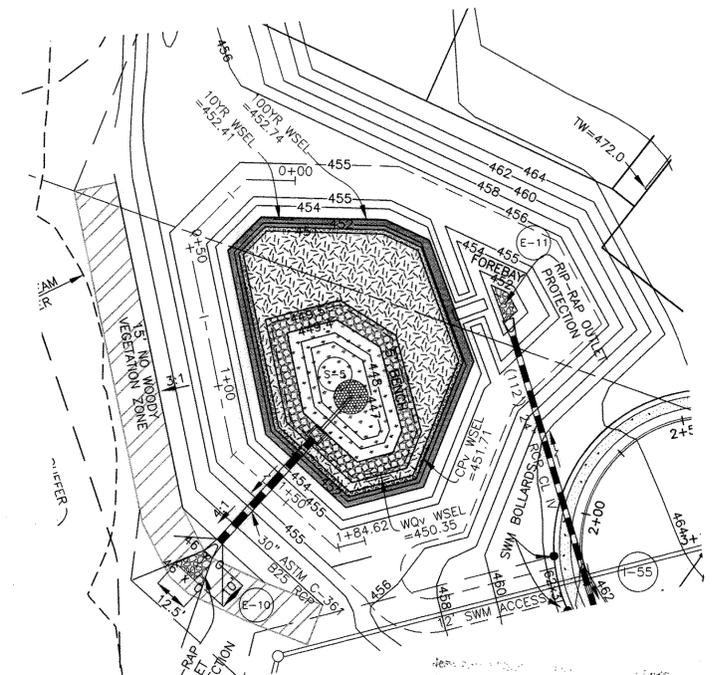


(AREA 2)
INTERNAL LANDSCAPING FOR
SWMF #4
P-1 MICRO-POOL ED POND
SCALE: 1" = 30'

ZONE	AREA (SF)	ELEVATION RANGE	PLANT MIX	QUANTITIES
1	3,946	446.00 - 449.40	100% WATER LILLY	438
2	1,790	449.40 - 450.00	50% BROAD WATER WEED 25% DUCK POTATO 25% ARROW ARUM	99 49 50
3	5,309	450.00 - 451.36	50% CUTGRASS, RICE 50% SWITCHGRASS	293 295
4	1,657	451.36 - 452.75	(CP-) 50% LOVEGRASS-MEADOW 25% VIOLETS, COMMON BLUE 25% CONEFLOWER, CUT-LEAF	92 46 46
5	1,680	(CP-) (100YR) 452.75 - 454.00	75% WITCHGRASS, NEEDLE-LEAF 25% CONEFLOWER, SWEET	140 47
6	0	N/A	N/A	0

ALL PLANTINGS TO BE QUART BULBS AND SPACED AT 3' O.C.

NOTE:
SWMF #4 & #5 TO BE MAINTAINED AS
SEDIMENT TRAPS UNTIL COMPLETION OF
PHASE 2, SECTION 2.



(AREA 2)
INTERNAL LANDSCAPING FOR
SWMF #5
P-5 POCKET POND
SCALE: 1" = 30'

ZONE	AREA (SF)	ELEVATION RANGE	PLANT MIX	QUANTITIES
1	1,347	447.00 - 449.40	100% WATER LILLY	150
2	1,076	449.40 - 450.00	50% BROAD WATER WEED 25% DUCK POTATO 25% ARROW ARUM	60 30 30
3	2,670	450.00 - 451.00	50% CUTGRASS, RICE 50% SWITCHGRASS	148 148
4	415	(CP-) 451.00 - 451.50	50% LOVEGRASS-MEADOW 25% VIOLETS, COMMON BLUE 25% CONEFLOWER, CUT-LEAF	23 12 12
5	1,027	(CP-) (100YR) 451.50 - 452.67	75% WITCHGRASS, NEEDLE-LEAF 25% CONEFLOWER, SWEET	85 29
6	0	N/A	N/A	0

ALL PLANTINGS TO BE QUART BULBS AND SPACED AT 3' O.C.

LEGEND

- ZONE 1
- ZONE 2
- ZONE 3
- ZONE 4
- ZONE 5

- NOTES:
1. LOOSEN SOIL IN PLANTING ZONES TO A DEPTH OF THREE TO FIVE INCHES BEFORE PLANTING.
 2. PLANTING HOLES TO HAVE A DIAMETER 6" GREATER THAN THE ROOT BALL BEING PLANTED IN THEM.
 3. NO WOODY VEGETATION IS PERMITTED WITHIN 15' OF THE TOE OF SLOPE OR 25' OF THE SPILLWAY.

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-31-18



APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter Z. Smith 4-15-10
CHIEF, BUREAU OF HIGHWAYS
APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kurt Sheldahl 4-19-10
CHIEF, DIVISION OF LAND DEVELOPMENT
John J. ... 4/16/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION

3	7-8-2014	ADD 'AREA 2' LABEL TO PLAN VIEWS
2	12-4-2013	REVISE LOT & SHORT NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER

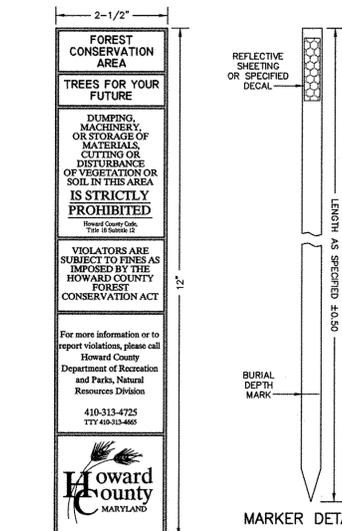
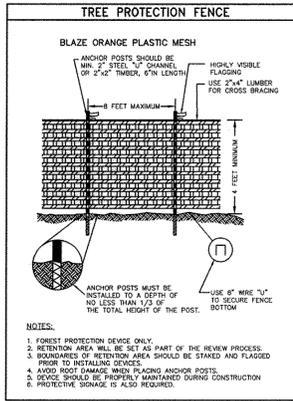
NO. DATE REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
840 BALTIMORE NATIONAL PIKE & SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-665-8105 FAX: 410-665-8644
WWW.BE-ENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 21443, Expiration Date: 12-31-2010.

VILLAGES AT TURF VALLEY
PHASE 2, SECTION 1
LOT 203; OPEN SPACE LOTS 204-207
GOLF SPACE LOTS 217, 228, 208; PARCELS A & B;
NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1
TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P/O 394, GRID: 17
TAX MAP: 16, PARCEL: P/O 8, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

INTERNAL SWM LANDSCAPING PLAN
OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
DATE: FEBRUARY, 2010
SCALE: AS SHOWN
SHEET 30 OF 56
BEI PROJECT NO. 1915



DECAL SPECIFICATIONS

Materials:
Number 3690 Scotchcal
non-reflective substrate.

Color:
Dark green text and border
on beige background.

FCR CARBONITE MARKER
NOT TO SCALE

SOILS LEGEND		
MAP SYMBOL	SOIL GROUP	SOIL TYPE
Ba*	D	BAILE SILT LOAM
CyB2	B	CHESTER GRAVELLY SILT LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
CyC2	B	CHESTER GRAVELLY SILT LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
ChA	B	CHESTER SILT LOAM, 0 TO 3 % SLOPES
ChB2	B	CHESTER SILT LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
ChC2	B	CHESTER SILT LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
ChC3	B	CHESTER SILT LOAM, 8 TO 15 % SLOPES, SEVERELY ERODED
CuB	B	COMUS SILT LOAM, LOCAL ALLUVIUM, 3 TO 8 % SLOPES
EnC2	B	ELSNBORO LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
GIA	B	GLENELG LOAM, 0 TO 3 % SLOPES
GIC2	B	GLENELG LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
GIC3	B	GLENELG LOAM, 8 TO 15 % SLOPES, SEVERELY ERODED
GhB2*	C	GLENVILLE SILT LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
Ha*	D	HATBORO SILT LOAM
Kn*	D	KINKORA SILT LOAM
MgB2	B	MANOR GRAVELLY LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
MgC2	B	MANOR GRAVELLY LOAM, 8 TO 15 % SLOPES, MODERATELY ERODED
MgC3	B	MANOR GRAVELLY LOAM, 8 TO 15 % SLOPES, SEVERELY ERODED
MIB2	B	MANOR LOAM, 3 TO 8 % SLOPES, MODERATELY ERODED
MIC3	B	MANOR LOAM, 8 TO 15 % SLOPES, SEVERELY ERODED
MID2	B	MANOR LOAM, 15 TO 25 % SLOPES, MODERATELY ERODED
MID3	B	MANOR LOAM, 15 TO 25 % SLOPES, SEVERELY ERODED
ME	B	MANOR LOAM, 25 TO 45 PERCENT SLOPES

* INDICATES HYDRIC SOILS
TAKEN FROM: SOIL SURVEY HOWARD COUNTY, MARYLAND, ISSUED JULY 1968, MAP NO. 9

PLANTING NOTES:

- MULTIFLORA ROSE CONTROL MAY BE REQUIRED AS PART OF THIS PLANTING PLAN.
- BAREROOT PLANT MATERIAL MAY BE USED TO OFFSET THE COST OF MULTIFLORA ROSE REMOVAL AND MAINTENANCE. IF BAREROOT MATERIAL IS USED IT MUST BE PLANTED IN MARCH - APRIL AND AN ANTI-DESICCANT GEL SHOULD BE UTILIZED TO PROTECT ROOT SYSTEMS. CONTAINER GROWN STOCK IS RECOMMENDED.
- PLANTS SHOULD BE FLAGGED TO AID ON LOCATION DURING MAINTENANCE. PLANTINGS SHOULD ALSO BE PLANTED IN A GRID PATTERN TO FACILITATE MAINTENANCE AND REMOVAL OF INVASIVE AND EXOTIC SPECIES.

MULTIFLORA ROSE CONTROL NOTE

MULTIFLORA ROSE IS PREVALENT IN CERTAIN AREAS TO BE AFFORESTED. PRIOR TO PLANTING ALL MULTIFLORA ROSE SHOULD BE REMOVED. REMOVAL OF THE ROSE MAY BE PERFORMED WITH MOWING AND HERBICIDE TREATMENTS. PHYSICAL REMOVAL OF ALL TOP GROWTH FOLLOWED BY A PERIODIC HERBICIDE TREATMENT OF STUMP SPROUTS IS RECOMMENDED. NATIVE TREE AND SHRUB SPECIES OCCURRING WITHIN THE ROSE THICKETS SHOULD BE RETAINED WHEREVER POSSIBLE. HERBICIDE TREATMENTS SHALL OCCUR ON 2 MONTH INTERVALS DURING THE FIRST GROWING SEASON AND ONCE EACH IN THE SPRING AND FALL FOR SUBSEQUENT YEARS. HERBICIDE USED SHALL BE MADE SPECIFICALLY TO ADDRESS WOOLLY PLANT MATERIAL AND SHALL BE APPLIED AS PER MANUFACTURERS SPECIFICATIONS. CARE SHOULD BE TAKEN NOT TO SPRAY PLANTED TREES OR NATURALLY OCCURRING NATIVE TREE/SHRUB SEEDLINGS. IT IS RECOMMENDED THAT INITIATION OF ROSE REMOVAL BEGIN AT LEAST SIX MONTHS PRIOR TO PLANTING.

PLANTING/SOIL SPECIFICATIONS

- PLANTING OF NURSERY STOCK SHALL TAKE PLACE BETWEEN MARCH 15TH AND APRIL 30TH. CONTAINER STOCK MAY BE PLANTED BETWEEN SEPTEMBER 1ST AND OCTOBER 30TH.
- A THREE (3) INCH LAYER OF TOPSOIL SHALL BE SPREAD OVER ALL REFORESTATION AREAS IMPACTED BY SITE GRADING TO ASSURE A SUITABLE PLANTING AREA. DISTURBED AREAS SHALL BE SEEDED AND STABILIZED AS PER GENERAL CONSTRUCTION PLAN FOR PROJECT.
- PLANTING STOCK SHALL HAVE THEIR ROOT SYSTEMS PROTECTED BY AN ANTI-DESICCANT GEL.
- PLANTS SHALL BE INSTALLED SO THAT THE TOP OF ROOT MASS IS LEVEL WITH THE TOP OF EXISTING GRADE. BAREROOT PLANTING SHALL CONSIST OF 3 PARTS EXISTING SOIL TO 1 PART FINE FINES OR EQUIVALENT.
- PERFORATOR SHALL BE EQUIPPED WITH A 22-3/8" OR EQUIVALENT, APPLIED AS PER MANUFACTURERS SPECIFICATIONS.
- A TWO (2) INCH LAYER OF HARDWOOD MULCH SHALL BE PLACED OVER THE ROOT AREA OF ALL PLANTINGS.
- PLANT MATERIAL SHALL BE TRANSPORTED TO THE SITE IN A TARRED OR COVERED TRUCK. PLANTS SHALL BE KEPT MOIST PRIOR TO PLANTING.
- ALL ROOT-SOUNDING EMBERS ASSOCIATED WITH THE PLANTING OPERATION SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

SEQUENCE OF CONSTRUCTION

- PLANTS SHALL BE INSTALLED AS PER PLANT SCHEDULE AND PLANTING/SOIL SPECIFICATIONS FOR THE PROJECT.
- UPON COMPLETION OF THE PLANTING, SIGNAGE SHALL BE INSTALLED AS PER THE FOREST RETENTION AREA PROTECTION DEVICES SHOWN ON THE FOREST CONSERVATION PLAN.
- PLANTINGS SHALL BE MAINTAINED AND GUARANTEED IN ACCORDANCE WITH THE MAINTENANCE AND GUARANTEE REQUIREMENTS FOR PROJECT.

MAINTENANCE OF PLANTINGS

- MAINTENANCE OF ALL PLANTINGS SHALL LAST FOR A PERIOD OF 24 MONTHS.
- ALL PLANT MATERIAL SHALL BE WATERED TWICE A MONTH DURING THE 1ST GROWING SEASON. WATERING MAY BE MORE OR LESS FREQUENT DEPENDING ON WEATHER CONDITIONS DURING SECOND GROWING SEASON. ONCE A MONTH DURING MAY-SEPTEMBER IF NEEDED.
- WINDMILL COCKS AND WINDMILL WEEDS WILL BE REMOVED FROM REFORESTATION AREAS. OLD FIELD SUCCESSIONAL SPECIES WILL BE RETAINED.
- PLANTS WILL BE EXAMINED A MINIMUM OF TWO TIMES DURING THE GROWING SEASON FOR SERIOUS PLANT PESTS AND DISEASES. SERIOUS PROBLEMS WILL BE TREATED WITH THE APPROPRIATE ADJUT.
- DEAD BRANCHES WILL BE PRUNED FROM PLANTINGS.

GUARANTEE REQUIREMENTS

- AFTER ONE GROWING SEASON, PLANT MATERIAL SHALL BE MAINTAINED AT 80% SURVIVAL THRESHOLD. A 75% SURVIVAL RATE OF FORESTATION PLANTINGS WILL BE REQUIRED AT THE END OF THE 24 MONTH MAINTENANCE PERIOD. ALL PLANT MATERIALS FROM THE FOREST PLANTING WILL BE REPLACED AT THE BEGINNING OF THE NEXT GROWING SEASON.
- THE CONTRACTOR WILL NOT BE LIABLE FOR PLANT LOSS DUE TO THEFT OR VANDALISM. HOWEVER, DEVELOPER SHALL BE RESPONSIBLE UNTIL RELEASE FROM THE FOREST SURETY OBLIGATION.

SURETY FOR REFORESTATION

- THE DEVELOPER SHALL POST A SURETY (BOND LETTER OF CREDIT) TO ENSURE THAT REFORESTATION PLANTINGS ARE COMPLETED. UPON ACCEPTANCE OF THE PLANTINGS BY THE COUNTY, THE BOND SHALL BE RELEASED.

2" CALIPER TREES = 7 PLANTING UNITS
1" CALIPER TREES = 3.5 PLANTING UNITS
WHIPS W/SHOULDERS = 2 PLANTING UNITS
SEEDLINGS = 1 PLANTING UNIT

PLANTING SHALL BE INSTALLED IN A CURVILINEAR FASHION ALONG A CONTOUR TO AVOID A GRID APPEARANCE BUT SHOULD BE SPACED TO FACILITATE MAINTENANCE. LARGER STOCK TREES (1" AND 2" CALIPER) SHOULD BE STAGGERED ALONG THE OUTER PERIMETER OF THE PLANTING AREAS TO SERVE AS A DEMARCATION OF THE FCE.

FCE #14 RETENTION CREDIT TABLE (AREA 2)		
	NET RETENTION AREA	RETENTION CREDITED TOWARD OBLIGATION
TOTAL FCE #14	1.32 AC	0.66 AC
CREDITED TO FAIRWAYS 2	0.64 AC	0.32 AC
CREDITED TO FAIRWAYS 3	0.44 AC	0.22 AC
CREDITED TO VILLAGES 2	0.24 AC	0.12 AC

FOREST CONSERVATION NOTES: (AREA 2)

- VILLAGES AT TURF VALLEY, PHASE 2:

PARCEL 401: THE TOTAL FOREST CONSERVATION OBLIGATION AMOUNT OF 4.48 ACRES SHALL BE MET BY THE RETENTION OF 2.03 AC. OF NET TRACT AREA FOREST WITHIN A FOREST CONSERVATION EASEMENT (#6-8) ON PARCEL 401 AND BY THE OFFSITE RETENTION OF 4.90 AC. OF FOREST WITHIN FOREST CONSERVATION EASEMENTS (#9-14) OF WHICH ONLY 2.45 AC. IS CREDITED (SINCE THIS RETENTION IS OFFSITE IT IS CREDITED AT A 2:1 RATIO). FINANCIAL SURETY FOR THE REQUIRED FOREST CONSERVATION HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF \$42,889.00 (\$0.20 PER SQUARE FOOT ROUNDED UP TO NEAREST DOLLAR).

PARCEL 8 & 394: THIS PORTION OF THE PROJECT IS EXEMPT FROM HOWARD COUNTY FOREST CONSERVATION REQUIREMENTS UNDER SECTION 16.1200(b) OF THE COUNTY CODE SINCE IT IS A PLANNED UNIT DEVELOPMENT UNDER S-86-13.

FAIRWAYS AT TURF VALLEY, PHASE 2 AND 3:

THE TOTAL FOREST CONSERVATION OBLIGATION OF 1.12 ACRES (PHASE 2, F-10-084) AND 0.22 ACRES (PHASE 3, F-10-086) HAS BEEN MET BY THE OFFSITE RETENTION OF 0.98 ACRES OF FOREST WITHIN FOREST CONSERVATION EASEMENT #14 OF WHICH ONLY 0.24 ACRES IS CREDITED (SINCE THIS RETENTION IS OFFSITE IT IS CREDITED AT A 2:1 RATIO) AND BY THE PLANTING OF 0.98 ACRES OF FOREST WITHIN FOREST CONSERVATION EASEMENT #14. FINANCIAL SURETY FOR THE REQUIRED FOREST CONSERVATION HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF \$22,000.00 FOR PHASE 2, F-10-084 AND \$2,000.00 FOR PHASE 3, F-10-086.

THE FOREST CONSERVATION EASEMENTS FOR FAIRWAYS AT TURF VALLEY, PHASES 2 AND 3 AND SHOWN ON THESE PLANS SATISFY FOREST CONSERVATION OBLIGATIONS BASED ON PRELIMINARY FOREST CONSERVATION PLANS FOR THOSE SUBDIVISIONS. THE EASEMENTS ARE SUBJECT TO CHANGE BASED ON DEVELOPMENT OF THE FINAL FOREST CONSERVATION PLANS FOR FAIRWAYS AT TURF VALLEY, PHASES 2 AND 3 DURING THEIR FINAL SUBDIVISION PLAN STAGE.

2. ANY FOREST CONSERVATION EASEMENT (FCE) AREA SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF HOWARD COUNTY WHICH RESTRICT THE DISTURBANCE AND USE OF THESE AREAS.

3. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENTS; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

4. LIMITS OF DISTURBANCE SHALL BE RESTRICTED TO AREAS OUTSIDE THE LIMIT OF TEMPORARY FENCING OR THE FCE BOUNDARY, WHICHEVER IS GREATER.

5. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST CONSERVATION EASEMENT, EXCEPT AS PERMITTED BY HOWARD COUNTY DPZ.

6. NO STOCKPILES, PARKING AREAS, EQUIPMENT CLEANING AREAS, ETC. SHALL OCCUR WITHIN AREAS DESIGNATED AS FOREST CONSERVATION EASEMENTS.

7. TEMPORARY FENCING SHALL BE USED TO PROTECT FOREST RESOURCES DURING CONSTRUCTION. THE FENCING SHALL BE PLACED ALONG ALL FCE RETENTION BOUNDARIES WHICH OCCUR WITHIN 15 FEET OF THE PROPOSED LIMITS OF DISTURBANCE.

8. PERMANENT SIGNAGE SHALL BE PLACED 50-100' APART ALONG THE BOUNDARIES OF ALL AREAS INCLUDED IN FOREST CONSERVATION EASEMENTS.

9. PORTIONS OF THE SITE OCCURRING WITHIN THE 100-YEAR FLOODPLAIN ARE NOT INCLUDED AS PART OF THE NET TRACT AREA OF THE SITE. AREAS OF FLOODPLAIN FOREST OCCURRING WITHIN THE LIMITS OF A FOREST CONSERVATION EASEMENT WILL BE PROTECTED BY THE EASEMENT RESTRICTIONS BUT HAVE NOT BEEN CREDITED TOWARD THE PROJECTS FCA OBLIGATIONS.

10. THE FOREST CONSERVATION WATERSHED FOR THIS PROJECT IS THE LITTLE PATUXENT RIVER (UPPER) #2131105A.

11. THERE ARE NO BARE, THREATENED OR ENDANGERED SPECIES LOCATED ON THIS SITE. THERE ARE NO SPECIMEN OR CHARMS TREES LOCATED ON THIS SITE. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO HISTORIC STRUCTURES LOCATED ON THIS SITE.

12. THE PROTECTIVE SIGNAGE SHALL STAY ON-SITE IN PERPETUITY.

Forest Conservation Summary Table (AREA 2)						
Parcel 401, Villages at Turf Valley, Phase 2						
Easement #	Retention	Retention credited toward obligation	Non-credited retention	Planting	Priority Areas	Total Easement Area
6	0.23	0.23	0	0	0.10	0.23
7	1.54	1.54	0.08	0	0	1.62
8	0.26	0.26	0	0	0.24	0.26
9	2.52	1.26	0	0	0.42	2.52
10	0.56	0.28	0.26	0	0.76	0.82
11	0.80	0.40	0	0	0.71	0.80
12	0.23	0.115	0	0	0	0.23
13	0.55	0.275	0	0	0.12	0.55
14	0.24	0.12	0	0	0	0.24
TOTALS	6.93	4.48	0.34	0	2.35	7.27

*All areas are in acres

Forest Conservation Summary Table						
Fairways at Turf Valley, Phases 2 and 3						
Easement #	Retention	Retention credited toward obligation	Non-credited retention	Planting	Priority Areas	Total Easement Area
14	2.1	1.08	0.54	0.21	0.84	2.09**

*All areas are in acres

** TOTAL EASEMENT AREA EQUALS 2.35 ACRES
2.09 AC. FOR FAIRWAYS, PHASES 2 AND 3
0.24 AC. FOR VILLAGES, PHASE 2

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS

MD DNR Qualified Professional
USACO E Wetland Delineator
Certification # WPC-17-06610044B2
John P. Chiles
2/28/10

P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-31-18



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

FOR BEARINGS AND DISTANCES OF THE FOREST CONSERVATION EASEMENTS SEE RECORDED PLAN.

APPROVED: DEPARTMENT OF PUBLIC WORKS
4-15-10
APPROVED: DEPARTMENT OF PLANNING AND ZONING
4-19-10
4/19/10

NO.	DATE	REVISION
5	7-8-2014	ADD AREA 2 LABELS
4	3-31-2014	REVISE NOTE #1, FOREST CONSERVATION SUMMARY TABLE (FCE #14 CREDIT TABLE BASED ON NEW FCE #14 LIMITS)
3	12-4-2013	REVISE LOT 1 SHEET NUMBERS IN TITLE BLOCK
2	11-21-2012	REVISE SUMMARY TABLE. ADD FCE #14 RETENTION CREDIT TABLE. REVISE NOTE #1.
1	4-20-2012	REVISE SHEET NUMBER.

BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE A SUITE 418
ELICOTT CITY, MARYLAND 21043
PHONE: 410-465-4105 FAX: 410-465-6644
WWW.BE-ENGINEERING.COM

OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1200 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

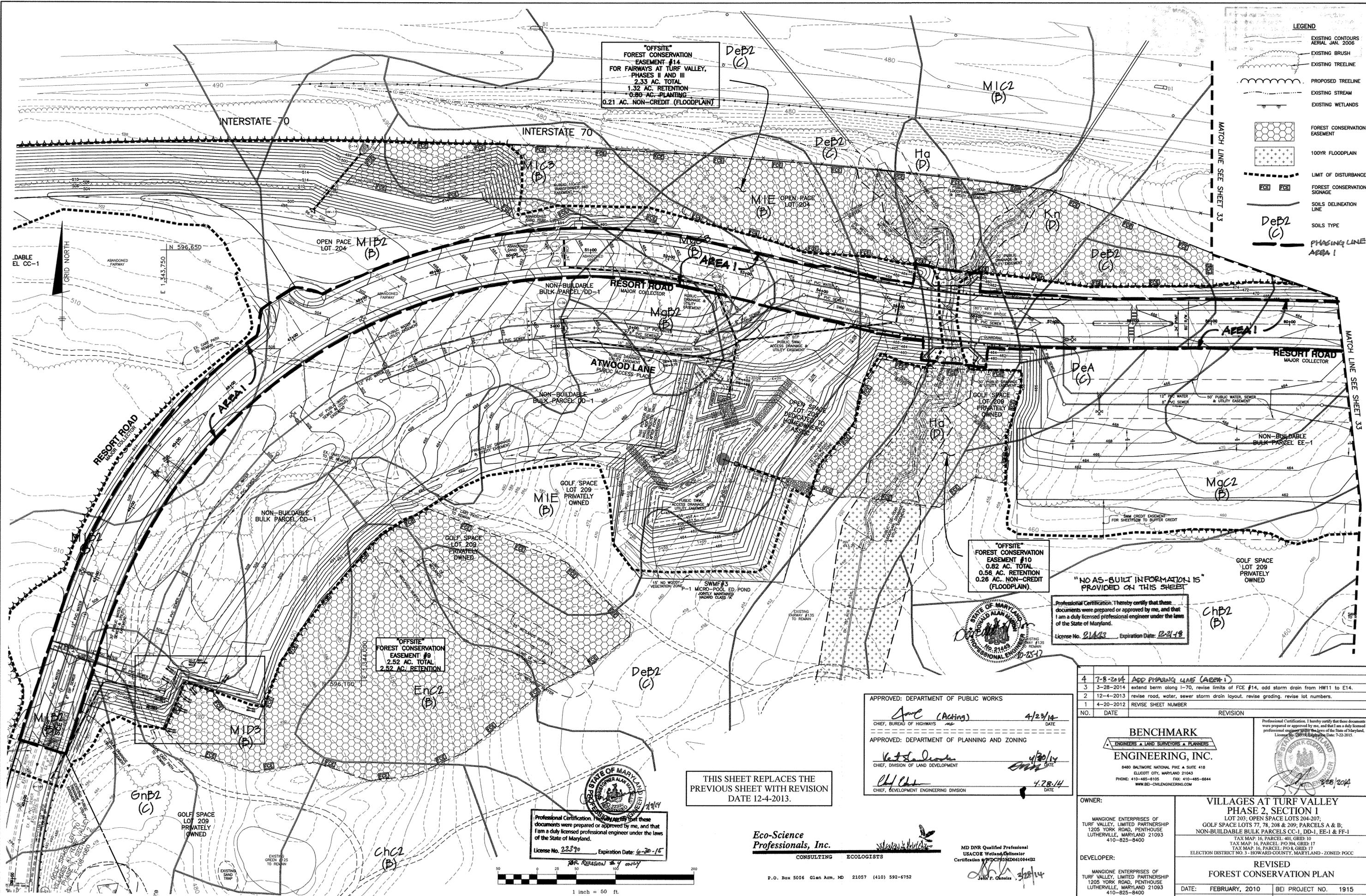
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1200 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
LOT 203; OPEN SPACE LOTS 204-207;
GOLF SHALES LOTS 71, 78, 208, 209; PARCELS A & B;
NON-BUILDABLE BULK PARCELS C01-D01-BE4-FF-1

TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P10, GRID: 17
TAX MAP: 16, PARCEL: P08, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

FOREST CONSERVATION NOTES AND DETAILS

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 31 OF 56



"OFFSITE" FOREST CONSERVATION EASEMENT #14 FOR FAIRWAYS AT TURF VALLEY, PHASES II AND III
 2.33 AC. TOTAL
 1.32 AC. RETENTION
 0.80 AC. PLANTING
 0.21 AC. NON-CREDIT (FLOODPLAIN)

"OFFSITE" FOREST CONSERVATION EASEMENT #10
 0.82 AC. TOTAL
 0.58 AC. RETENTION
 0.26 AC. NON-CREDIT (FLOODPLAIN)

"OFFSITE" FOREST CONSERVATION EASEMENT #9
 2.52 AC. TOTAL
 2.52 AC. RETENTION

- LEGEND**
- EXISTING CONTOURS AERIAL JAN. 2006
 - EXISTING BRUSH
 - EXISTING TREELINE
 - PROPOSED TREELINE
 - EXISTING STREAM
 - EXISTING WETLANDS
 - FOREST CONSERVATION EASEMENT
 - 100YR FLOODPLAIN
 - LIMIT OF DISTURBANCE
 - FOREST CONSERVATION SIGNAGE
 - SOILS DELINEATION LINE
 - SOILS TYPE
 - PHASING LINE AREA 1

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. 21433 Expiration Date: 2-2-18



NO.	DATE	REVISION
4	7-8-2014	ADD PHASING LINE (AREA 1)
3	3-28-2014	extend berm along I-70, revise limits of FCE #14, add storm drain from HW11 to E14.
2	12-4-2013	revise road, water, sewer storm drain layout, revise grading, revise lot numbers.
1	4-20-2012	REVISE SHEET NUMBER

APPROVED: DEPARTMENT OF PUBLIC WORKS
April (Acting) 4/23/14
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kathleen 4/30/14
 CHIEF, DIVISION OF LAND DEVELOPMENT

Phil 7-28-14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

THIS SHEET REPLACES THE PREVIOUS SHEET WITH REVISION DATE 12-4-2013.

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. 22379 Expiration Date: 6-20-15



BENCHMARK ENGINEERING, INC.
 ENGINEERS • LAND SURVEYORS • PLANNERS
 8480 BALTIMORE NATIONAL PIKE • SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6844
 WWW.BE-ONLINEENGINEERING.COM



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

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

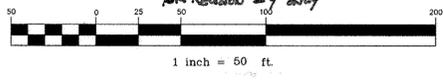
VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: PO 394, GRID: 17
 TAX MAP: 16, PARCEL: PO 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

REVISED FOREST CONSERVATION PLAN

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 32 OF 56

Eco-Science Professionals, Inc.
 CONSULTING ECOLOGISTS
 P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

MD DNR Qualified Professional
 USACE Wetland Delimitator
 Certification # WDC150300061004432
John P. Caneles 3/28/14





Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12-21-16

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



- LEGEND**
- - - - - EXISTING CONTOURS AERIAL JAN. 2006
 - ~ ~ ~ ~ ~ EXISTING BRUSH
 - ~ ~ ~ ~ ~ EXISTING TREELINE
 - ~ ~ ~ ~ ~ PROPOSED TREELINE
 - - - - - EXISTING STREAM
 - - - - - EXISTING WETLANDS
 - [Pattern] FOREST CONSERVATION EASEMENT
 - [Pattern] 100YR FLOODPLAIN
 - - - - - LIMIT OF DISTURBANCE
 - [Pattern] FOREST CONSERVATION SIGNAGE
 - - - - - SOILS DELINEATION LINE
 - DeB2 (C) SOILS TYPE
 - - - - - PHASING LINE AREA 1

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22390 Expiration Date: 6-30-15
 For REVISION #3 ONLY

FOR BEARINGS AND DISTANCES OF THE FOREST CONSERVATION EASEMENTS SEE RECORDED PLAT.

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 1-9-14
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 1/23/14
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

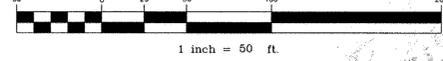
[Signature] 1/15/14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO.	DATE	REVISION
3	7-8-2014	ADD PHASING LINE (AREA 1)
2	12-4-2013	revise road, water, sewer storm drain layout, revise grading, revise lot numbers.
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK ENGINEERING, INC.
 ENGINEERS • LAND SURVEYORS • PLANNERS
 8480 BALTIMORE NATIONAL PIKE • SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-485-6105 FAX: 410-485-6644
 WWW.BE-ENGINEERING.COM

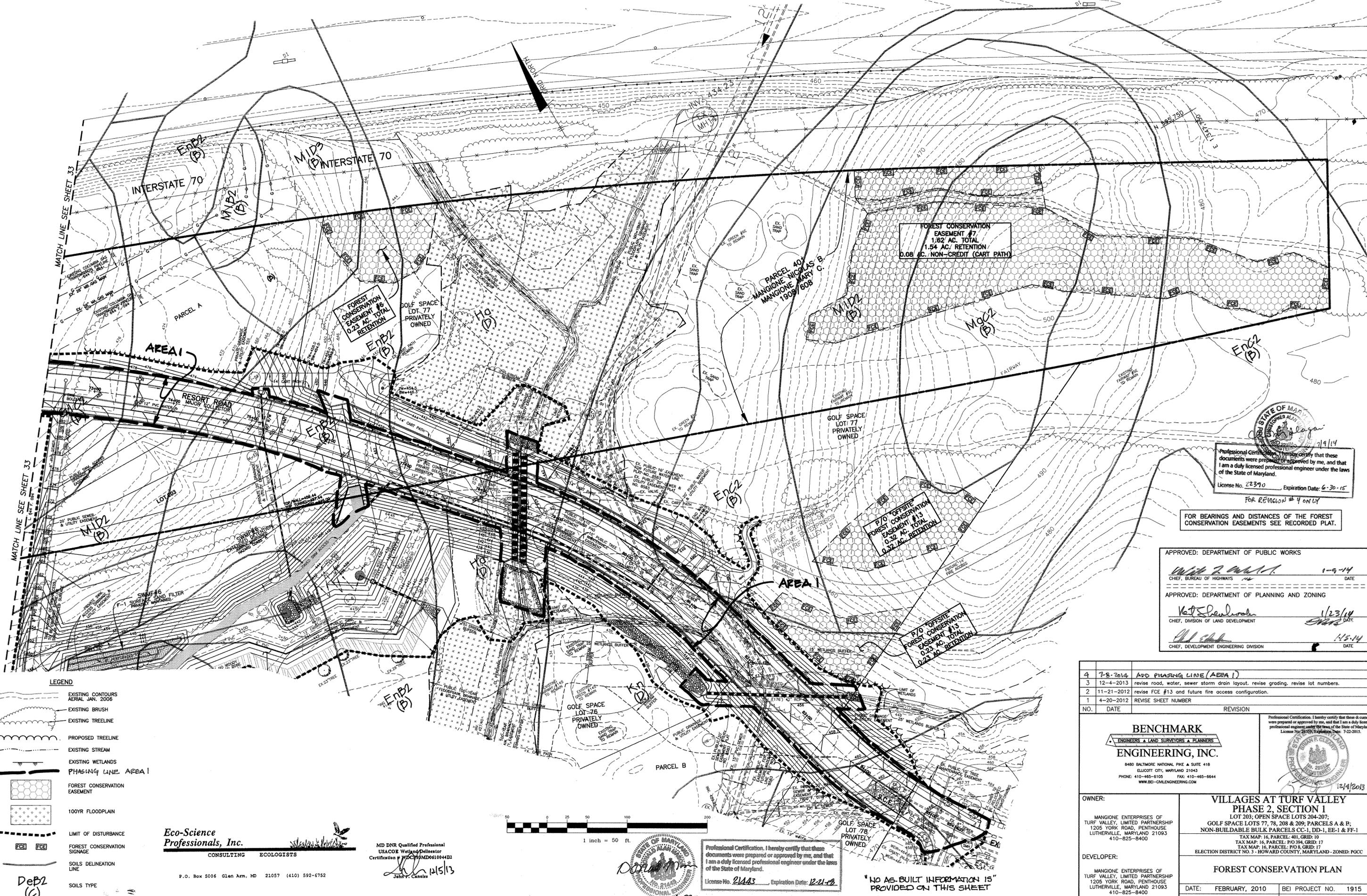
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22355, Expiration Date: 7-22-2015

OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400	VILLAGES AT TURF VALLEY PHASE 2, SECTION 1 LOT 203; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1	
	TAX MAP: 16, PARCEL: 401, GRID: 10 TAX MAP: 16, PARCEL: P0394, GRID: 17 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC	
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400	FOREST CONSERVATION PLAN	
	DATE: FEBRUARY, 2010	BEI PROJECT NO. 1915
SCALE: AS SHOWN	SHEET 33 OF 56	



Eco-Science Professionals, Inc.
 CONSULTING ECOLOGISTS
 P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

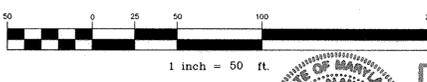
MD DNR Qualified Professional
 USACOK Wetland Delimitator
 Certification # WTD061004432
 [Signature] 1/15/14



- LEGEND**
- EXISTING CONTOURS AERIAL JAN. 2006
 - EXISTING BRUSH
 - EXISTING TREELINE
 - PROPOSED TREELINE
 - EXISTING STREAM
 - EXISTING WETLANDS
 - PHASING LINE AREA I
 - FOREST CONSERVATION EASEMENT
 - 100YR FLOODPLAIN
 - LIMIT OF DISTURBANCE
 - FOREST CONSERVATION SIGNAGE
 - SOILS DELINEATION LINE
 - SOILS TYPE

Eco-Science Professionals, Inc.
 CONSULTING ECOLOGISTS
 P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

MD DNR Qualified Professional
 USACE Wetland Designer
 Certification # JYDC93MD0610041B3
 John F. Casale



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-21-18

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22370, Expiration Date: 6-30-15
 FOR REVISION #4 ONLY

FOR BEARINGS AND DISTANCES OF THE FOREST CONSERVATION EASEMENTS SEE RECORDED PLAT.

APPROVED: DEPARTMENT OF PUBLIC WORKS
 Chief, Bureau of Highways 1-9-14 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Division of Land Development 1/23/14 DATE

Chief, Development Engineering Division 1/5/14 DATE

4	7-8-2014	ADD PHASING LINE (AREA I)
3	12-4-2013	revise road, water, sewer storm drain layout. revise grading. revise lot numbers.
2	11-21-2012	revise FCE #13 and future fire access configuration.
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK ENGINEERING, INC.
 ENGINEERS • LAND SURVEYORS • PLANNERS
 8400 BALTIMORE NATIONAL PIKE & SUITE 418
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BE-ENGINEERING.COM

OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400		VILLAGES AT TURF VALLEY PHASE 2, SECTION 1 LOT 203; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & P; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1 TAX MAP: 16, PARCEL: PFO 8, GRID: 17 TAX MAP: 16, PARCEL: PFO 8, GRID: 17 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC	
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400		FOREST CONSERVATION PLAN	
DATE: FEBRUARY, 2010	BEI PROJECT NO. 1915		
SCALE: AS SHOWN	SHEET 34 OF 56		

Installation Drawings Sheet Index	
35	TITLE SHEET, LOCATION PLAN & GENERAL NOTES
36	BRIDGE PLAN & DETAIL
37	FOUNDATION PLAN
38	FOOTING SECTIONS & DETAILS
39	ELEVATIONS
40	SECTION & DETAILS
41	DETAILS
42	SPECIFICATIONS
43	SPECIFICATIONS

NOTES

GENERAL NOTES:

- This bridge has been designed for general site conditions. The project engineer shall be responsible for the structure's suitability to the existing site conditions and for the hydraulic evaluation -- including scour and confirmation of soil conditions.
- Prior to construction, contractor must verify all elevations shown through the engineer.
- Only CONTECH Bridge Solutions Inc. the CON/SPAN® approved precaster in Maryland may provide the structure designed in accordance with these plans.
- The use of another precast structure with the design assumptions used for the CON/SPAN® structure may lead to serious design errors. Use of any other precast structure with this design and drawings voids any certification of this design and warranty. CONTECH Bridge Solutions Inc. assumes no liability for design of any alternate or similar type structures.
- Alternate structures may be considered, provided that signed and sealed design drawings (and calculations) are submitted to the engineer 2 weeks prior to the bid date for review and approval.
- Proposed alternates to a CON/SPAN® Bridge System must submit at least two (2) independently verified full scale load tests that confirm the proposed design methodology of the three sided/arch structure(s). The proposed alternate, upon satisfactory confirmation of design methodology, may be considered an acceptable alternate.

DESIGN DATA

Design Loading:

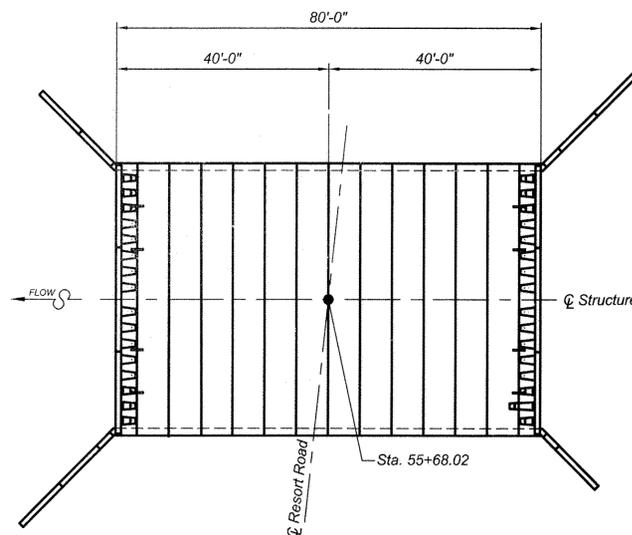
Bridge Units: HS25-44 + Maryland Legal Loads
 Headwalls: Earth Pressure Only
 Wingwalls: Earth Pressure Only
 Design Fill Height: 2'-0" min. to 9'-0" max.
 from top of crown to top of pavement.

Design Method: Load factor per AASHTO Specification
 Assumed Bearing: 4000 PSF *

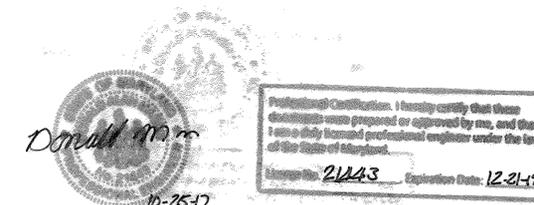
*At the time of design, a geotechnical report for the project site was not available. It is the project engineer's, owner's and/or the contractor's responsibility to verify that the actual site conditions at the time of construction are consistent with the assumed allowable soil bearing pressure with a geotechnical investigation from a qualified geotechnical engineer.

MATERIALS

Precast units shall be constructed and installed in accordance with CON/SPAN® Specifications. Concrete for Footings shall have a minimum compressive strength of 4000 psi. Reinforcing steel for footings shall conform to ASTM A615 or A996-Grade 60.



LOCATION PLAN (AREA 1)
 not to scale



*NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET

NO.	DATE	REVISION
3	7-8-2014	ADD AREA 1 PHASING LABEL
2	12-4-2013	REVISE LOT NUMBERS & SUBSET NUMBER IN TITLE BLOCK.
1	4-20-2012	REVISE SHEET NUMBER



BENCHMARK
 ENGINEERS & LAND SURVEYORS & PLANNERS

8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BEI-CVLENGINEERING.COM

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36225, EXPIRATION DATE: 8/19/2010.

Company:

8210 University Executive Park Drive
 Suite 240
 Charlotte, North Carolina 28262

704-548-8420
 704-548-8586 fax
 800-526-3999

CONTECH PROJECT: 316990

OWNER/DEVELOPER:

VILLAGES AT TURF VALLEY
 PHASE 2, SECTION 1
 LOT 205; OPEN SPACE LOTS 204-207
 GOLF SPACE LOTS 17, 78, 208, 209; PARCELS 'A' & 'B';
 NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1

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

CON/SPAN BRIDGE INSTALL DRAWINGS
 TITLE SHEET, LOCATION PLAN & GENERAL NOTES

DATE: FEBRUARY, 2010 PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 35 OF 56

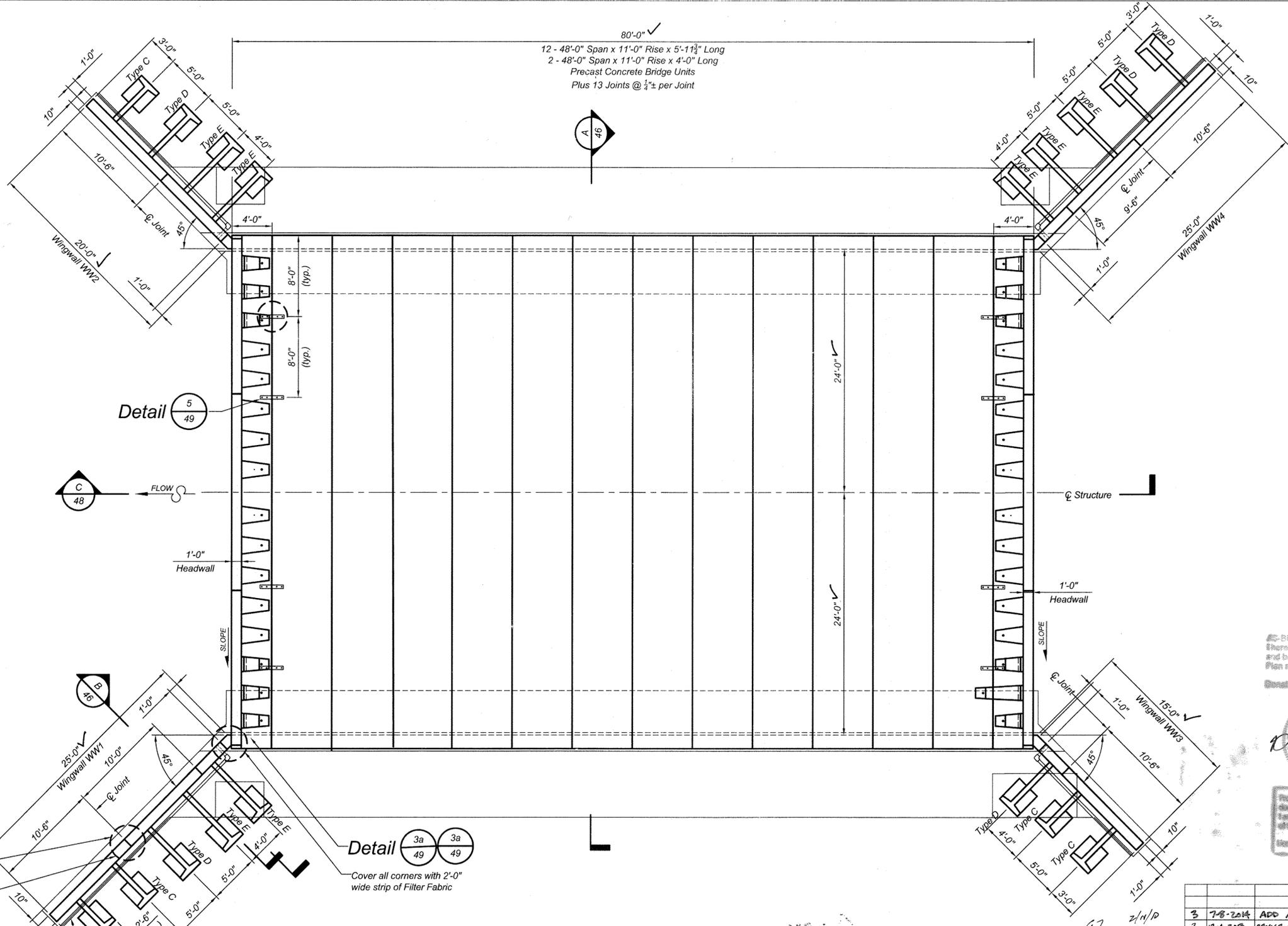
APPROVED: DEPARTMENT OF PUBLIC WORKS

Keith J. McCall 4-15-10
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kurt Sheehy 4-19-10
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

John P. ... 4/19/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



BRIDGE PLAN (AREA 1)



AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications.
 Donald Mason, P.E. Date: 10-25-17



Professional Engineer Seal and Stamp
 License No. 21443 Expiration Date: 12-21-18

NO.	DATE	REVISION
3	7-8-2014	ADD AREA 1 PHASING LABEL
2	12-4-2013	REVISE LOT NUMBERS & SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BEI-CIVILENGINEERING.COM

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36225, EXPIRATION DATE: 8/19/2010.

Company: **CONTECH**
 BRIDGE SOLUTIONS INC.
 8210 University Executive Park Drive
 Suite 240
 Charlotte, North Carolina 28262
 704-548-8420
 704-548-8586 fax
 800-526-3999

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

VILLAGES AT TURF VALLEY
 PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208, 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1
 TAX MAP: 16, PARCEL: 5/0 394, GRID: 17
 TAX MAP: 16, PARCEL: 5/0 B, GRID: 17
 ELECTION DISTRICT NO. 3 ZONED: PDCO HOWARD COUNTY, MARYLAND

CON/SPAN BRIDGE INSTALL DRAWINGS
 BRIDGE PLAN & DETAIL

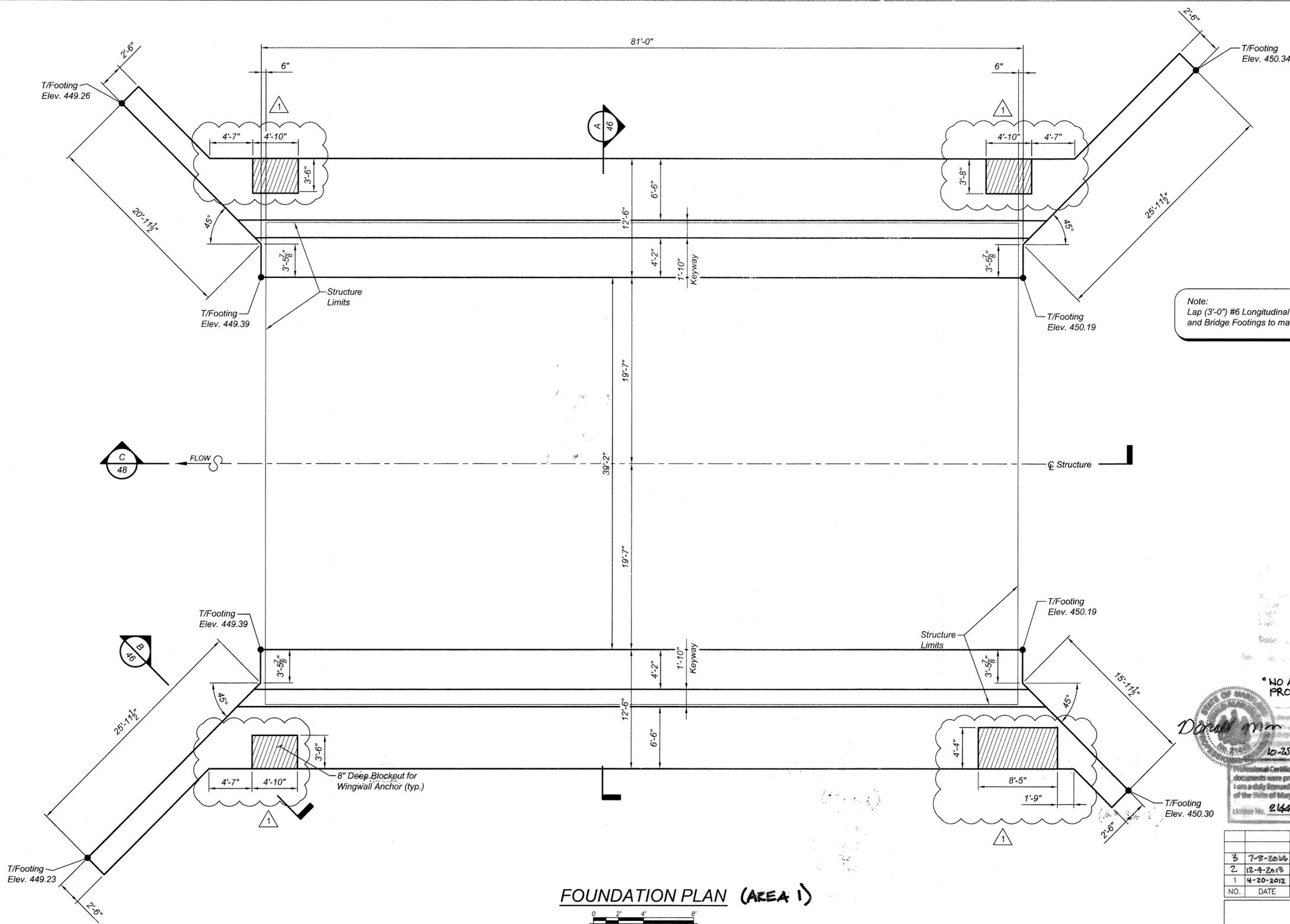
DATE: FEBRUARY, 2010 PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 36 OF 56

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4-15-10
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-15-10
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4/19/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

AS-BUILT



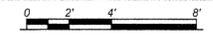
Note:
Lap (3'-0") #6 Longitudinal Bars in Wingwall
and Bridge Footings to make continuous

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

Donald M. ...
10-25-17

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. 2443 Expiration Date: 12-21-18

FOUNDATION PLAN (AREA 1)



NO.	DATE	REVISION
3	7-8-2014	ADD AREA 1 PHASING LABEL
2	12-4-2013	REVISE LOT NUMBERS & SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE & SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36225, EXPIRATION DATE: 8/19/2010

Company:

CONTECH
BRIDGE SOLUTIONS INC.

8210 University Executive Park Drive
Suite 240
Charlotte, North Carolina 28262

704-548-8420
704-548-8586 fax
800-526-3999

OWNER/DEVELOPER:

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

VILLAGES AT TURF VALLEY
PHASE 2 SECTION 1
LOT 203; OPEN SPACE LOTS 204-207;
GOLF SPACE LOTS 7, 7B, 208, 209; PARCELS 'A' & 'B'
NON-BUILDABLE BULK PARCEL CC-1 DD-1 EE-1 FF-1

TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P/O 394, GRID: 17
TAX MAP: 16, PARCEL: P/O B, GRID: 17
ELECTION DISTRICT NO. 3 ZONED: PPLIC HOWARD COUNTY, MARYLAND

CON/SPAN BRIDGE INSTALL DRAWINGS
FOUNDATION PLAN

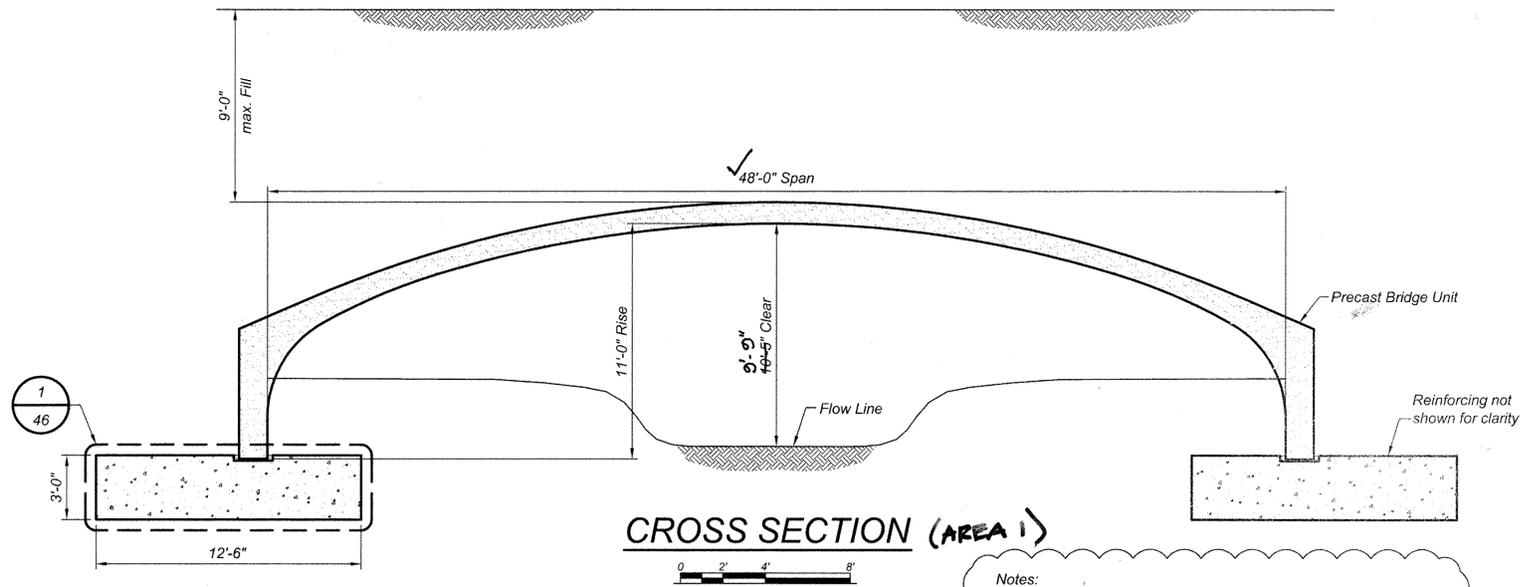
DATE: FEBRUARY, 2010 PROJECT NO. 1915
SCALE: AS SHOWN SHEET 37 OF 56

AS-BUILT

APPROVED: DEPARTMENT OF PUBLIC WORKS
W. Z. Wall 4-15-10
CHIEF, BUREAU OF HIGHWAYS DATE

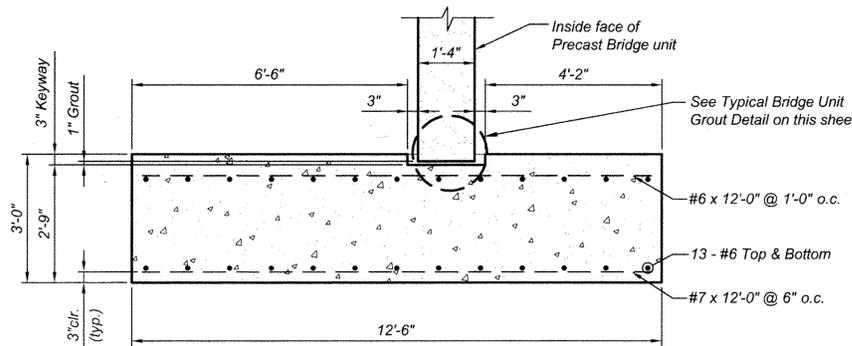
APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kat Shuler 4-19-10
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

John Dennis 4/19/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

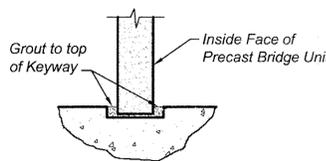


CROSS SECTION (AREA 1)

Notes:
 1. Class 2 riprap shall be provided as a scour countermeasure for the abutments per Appendix D of the "Final Scour Analysis Report" dated January 2010 by Endesco, Inc.
 2. No riprap or other scour countermeasures shall be placed in the stream channel or any wetland area unless all appropriate environmental permits have been obtained predicated on such placement.

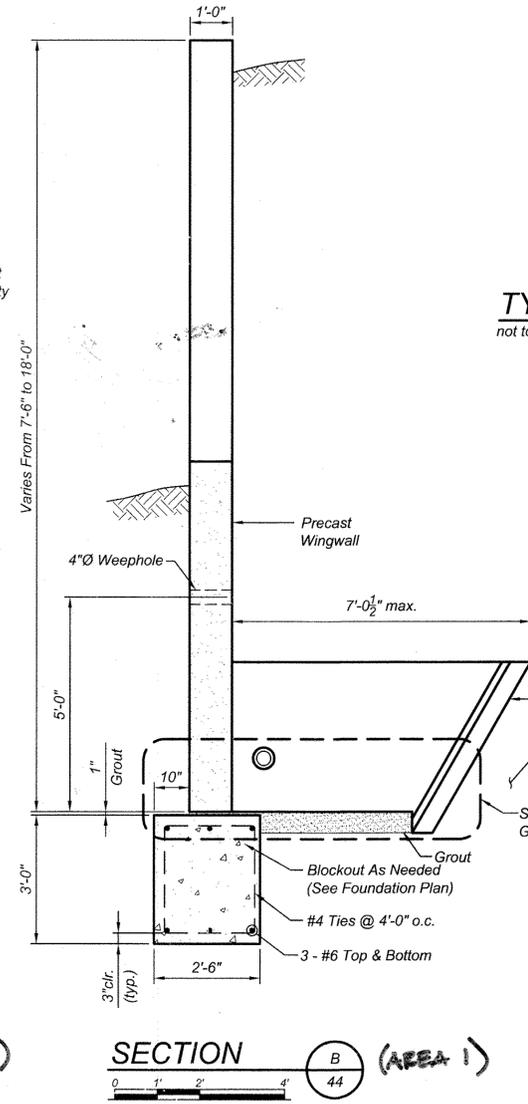


BRIDGE UNIT FOOTING (AREA 1)

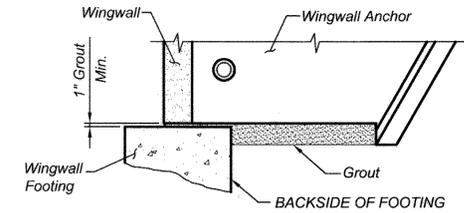


TYPICAL BRIDGE UNIT GROUT DETAIL (AREA 1)

Note:
 Fill entire keyway including nominal 1" void between bottom of keyway and bottom of precast bridge unit leg with grout.



SECTION (AREA 1)

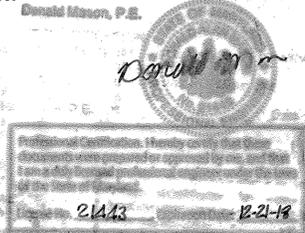


Notes:
 • Minimum 1" Grout under wingwall leg & anchor stem.
 • Area between wingwall footing and wingwall anchor shall be grouted solid before backfill.
 • FORM BACKSIDE OF FOOTING TO DIMENSIONS SHOWN ON FOUNDATION PLAN.

TYPICAL WINGWALL GROUT DETAIL (AREA 1)
 not to scale

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

Donald Mason, P.E. 10-25-17



NO.	DATE	REVISION
3	7-8-2014	ADD AREA 1 PHASING LABELS
2	12-4-2013	REVISE LOT NUMBERS & SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK
 ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BEI-CIVILENGINEERING.COM

OWNER/DEVELOPER:

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

VILLAGES AT TURF VALLEY
 PHASE 2 SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 17, 18, 208, 209; PARCELS 'A' & 'B'
 NON-BUILDABLE BULK PARCELS CCA DD-1 BE-1 FF-1

TAX MAP: 16, PARCEL: 5/0 394, GRID: 17
 TAX MAP: 16, PARCEL: 5/0 8, GRID: 17
 ELECTION DISTRICT NO. 3 ZONED: PDCO
 HOWARD COUNTY, MARYLAND

CON/SPAN BRIDGE INSTALL DRAWINGS
FOOTING SECTIONS AND DETAILS

DATE: FEBRUARY, 2010 PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 38 OF 50

AS-BUILT

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36225, EXPIRATION DATE: 8/19/2010.

Company:

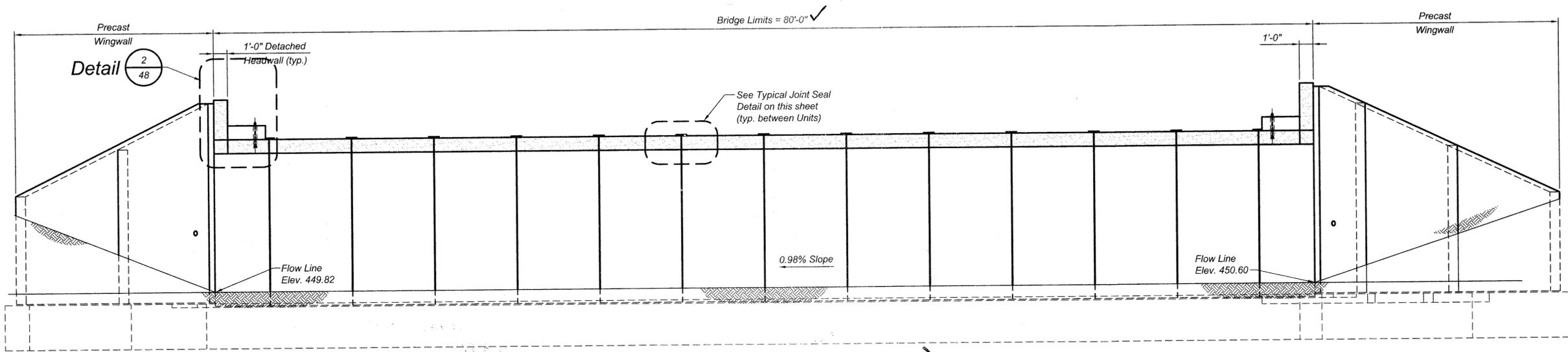
8210 University Executive Park Drive
 Suite 240
 Charlotte, North Carolina 28262

704-548-8420
 704-548-8586 fax
 800-526-3999

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4-15-10
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-19-10
 CHIEF, DIVISION OF LAND DEVELOPMENT

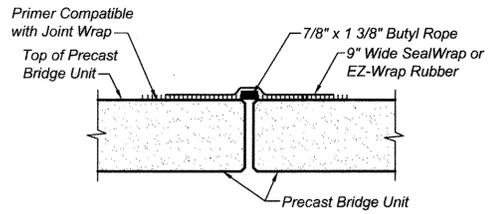
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 CHIEF, DEVELOPMENT ENGINEERING DIVISION



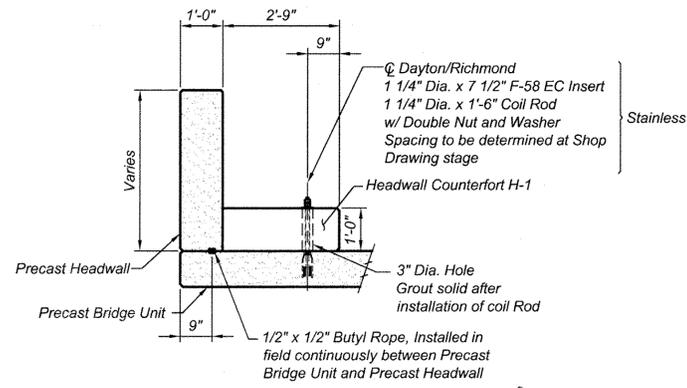
SECTION C (AREA 1)

0 2' 4' 8'

*Note:
Foundation Slope to be continuous through Wingwall Footings

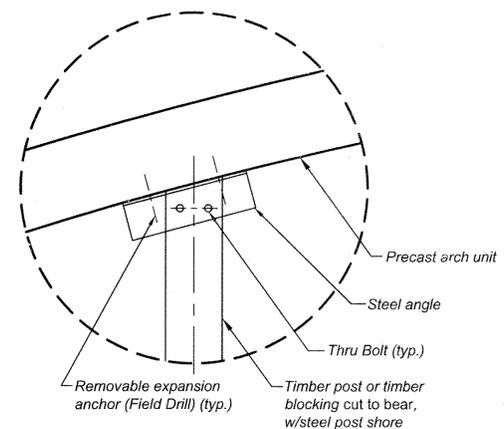


TYPICAL JOINT SEAL DETAIL (AREA 1)
not to scale

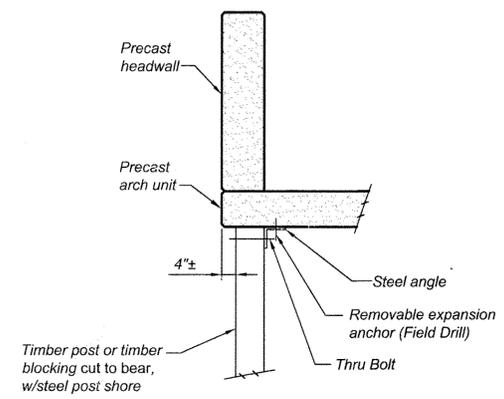


DETAIL 2 (AREA 1)

0 1' 2' 4'



POST CONNECTION DETAIL



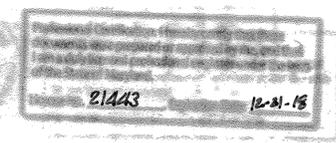
HEADWALL SECTION

TEMPORARY SHORING DETAIL & SECTION (AREA 1)

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

Donald Mason, P.E.

Exp: 10-25-17



NO.	DATE	REVISION
3	7-8-2014	ADD AREA 1 PHASING LABELS
2	12-4-2013	REVISE LOT NUMBERS & SHEET NUMBERS IN TITLE BLOCK.
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE & SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
WWW.BEI-CVLENGINEERING.COM

OWNER/DEVELOPER:

VILLAGES AT TURF VALLEY
PHASE 2 SECTION 1
LOT 208; OPEN SPACE LOTS 204-207;
GOLF SPACE LOTS 77, 78, 208, 209; PARCELS 'A' & 'B'
NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1

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

CON/SPAN BRIDGE INSTALL DRAWINGS
SECTION AND DETAILS

DATE: FEBRUARY, 2010 PROJECT NO. 1915
SCALE: AS SHOWN SHEET 40 OF 56

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. 36225, EXPIRATION DATE: 8/19/2010.

Company:

CONTECH
BRIDGE SOLUTIONS INC.

8210 University Executive Park Drive
Suite 240
Charlotte, North Carolina 28262

704-548-8420
704-548-8586 fax
800-526-3999

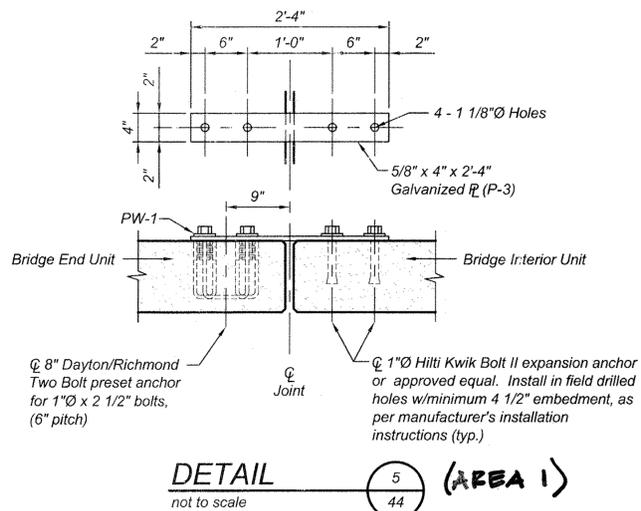
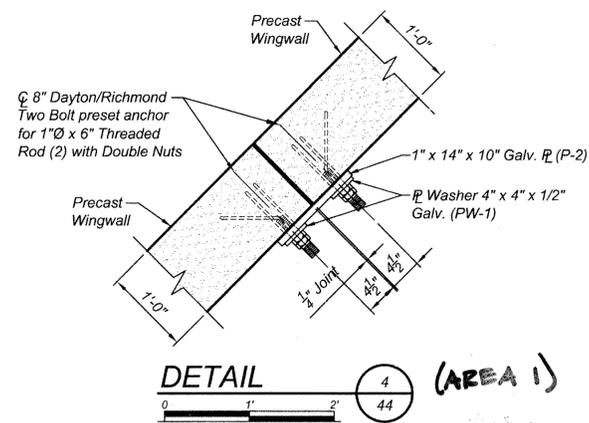
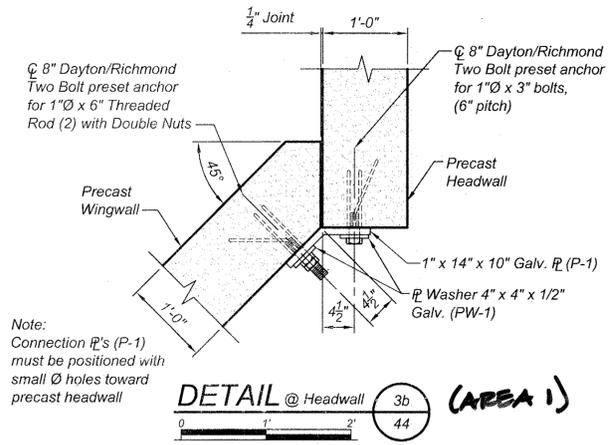
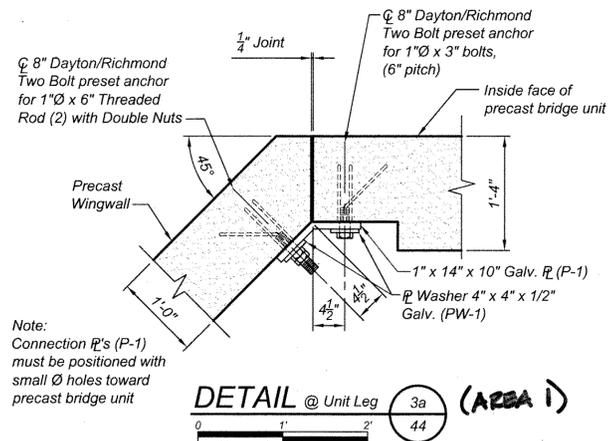
APPROVED: DEPARTMENT OF PUBLIC WORKS

Walter P. White 4-15-10
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Vicki Sheehy 4-19-10
CHIEF, DIVISION OF LAND DEVELOPMENT

Mike Patterson 4/19/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION



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

Professional Certification: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21443, EXPIRATION DATE: 12-21-18

2/11/10

NO.	DATE	REVISION
3	7-8-2014	ADD AREA 1 PHASING LABELS
2	12-4-2013	REVISE LOT NUMBERS & SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BEI-CIVILENGINEERING.COM

OWNER/DEVELOPER: **VILLAGES AT TURF VALLEY**
 PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208, 209; PARCELS 'A' & 'B';
 NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: 5/0 394, GRID: 17
 TAX MAP: 16, PARCEL: P/O 8, GRID: 17
 ELECTION DISTRICT NO. 3 ZONED: P00C HOWARD COUNTY, MARYLAND

CON/SPAN BRIDGE INSTALL DRAWINGS
 DETAILS

DATE: FEBRUARY, 2010 PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 41 OF 56

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. 36225, EXPIRATION DATE: 8/19/2010.

Company: **CONTECH**
 BRIDGE SOLUTIONS INC.
 8210 University Executive Park Drive
 Suite 240
 Charlotte, North Carolina 28262
 704-548-8420
 704-548-8586 fax
 800-526-3999

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4-15-10
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-19-10
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4/19/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

AS-BUILT

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (AREA 1)

1. Description

- 1.1. **Type** This work shall consist of furnishing and constructing a CON/SPAN® bridge system in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or as established by the Engineer. In situations where two or more specifications apply to this work, the most stringent requirements shall govern.
- 1.2. **Designation** Precast reinforced concrete CON/SPAN® bridge units manufactured in accordance with this specification shall be designated by span and rise. Precast reinforced concrete wingwalls and headwalls manufactured in accordance with this specification shall be designated by length, height, and deflection angle.

2. Design

- 2.1. **Specifications** The precast elements are designed in accordance with the "Standard Specifications for Highway Bridges" 17th Edition, adopted by the American Association of State Highway and Transportation Officials, 2002. A minimum of one foot of cover above the crown of the bridge units is required in the installed condition. (Unless noted otherwise on the shop drawings and designed accordingly.)

3. Materials

- 3.1. **Concrete** The concrete for the precast elements shall be air-entrained when installed in areas subject to freeze-thaw conditions, composed of Portland cement, fine and coarse aggregates, admixtures and water. Air-entrained concrete shall contain 6 ± 2 percent air. The air-entraining admixture shall conform to AASHTO M154. The minimum concrete compressive strength shall be as shown on the shop drawings.
- 3.1.1. **Portland Cement** - Shall conform to the requirements of ASTM Specifications C150-Type I, Type II, or Type III cement.
- 3.1.2. **Coarse Aggregate** - Shall consist of stone having a maximum size of 1 inch. Aggregate shall meet requirements for ASTM C33.
- 3.1.3. **Water Reducing Admixture** - The manufacturer may submit, for approval by the Engineer, a water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete.
- 3.1.4. **Calcium Chloride** - The addition to the mix of calcium chloride or admixtures containing calcium chloride will not be permitted.
- 3.1.5. **Mixture** The aggregates, cement and water shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete meeting the strength requirements of this specification. The proportion of Portland cement in the mixture shall not be less than 564 pounds (6 sacks) per cubic yard of concrete.
- 3.2. **Steel Reinforcement**
- 3.2.1. The minimum steel yield strength shall be 60,000 psi, unless otherwise noted on the shop drawings.
- 3.2.2. All reinforcing steel for the precast elements shall be fabricated and placed in accordance with the detailed shop drawings submitted by the manufacturer.
- 3.2.3. Reinforcement shall consist of welded wire fabric conforming to ASTM Specification A 185 or A 497, or deformed billet steel bars conforming to ASTM Specification A 615, Grade 60. Longitudinal distribution reinforcement may consist of welded wire fabric or deformed billet-steel bars.
- 3.3. **Steel Hardware**
- 3.3.1. Bolts and threaded rods for wingwall connections shall conform to ASTM A 307. Nuts shall conform to AASHTO M292 (ASTM A194) Grade 2H. All bolts, threaded rods and nuts used in wingwall connections shall be mechanically zinc coated in accordance with ASTM B695 Class 50.
- 3.3.2. Structural Steel for wingwall connection plates and plate washers shall conform to AASHTO M 270 (ASTM A 709) Grade 36 and shall be hot dip galvanized as per AASHTO M111 (ASTM A123).
- 3.3.3. Inserts for wingwalls shall be 1" diameter Two-Bolt Preset Wingwall Anchors as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700.
- 3.3.4. Ferrule Loop Inserts shall be F-64 Ferrule Loop Inserts as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700.
- 3.3.5. Hook Bolts used in attached headwall connections shall be ASTM A307.
- 3.3.6. Inserts for detached headwall connections shall be AISI Type 304 stainless steel, F-58 Expanded Coil inserts as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700. Coil rods and nuts used in headwall connections shall be AISI Type 304 stainless steel. Washers used in headwall connections shall be either AISI Type 304 stainless steel plate washers or AASHTO M270 (ASTM A709) Grade 36 plate washers hot dip galvanized as per AASHTO M111 (ASTM A123).
- 3.3.7. Reinforcing bar splices shall be made using the Dowel Bar Splicer System as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700, and shall consist of the Dowel Bar Splicer (DB-SAE) and Dowel-In (DI).

4. Manufacture of Precast Elements

- Subject to the provisions of Section 5, below, the precast element dimension and reinforcement details shall be as prescribed in the plan and shop drawings provided by the manufacturer.
- 4.1. **Forms** The forms used in manufacture shall be sufficiently rigid and accurate to maintain the required precast element dimensions within the permissible variations given in Section 5 of these specifications. All casting surfaces shall be of a smooth material.
- 4.2. **Placement of Reinforcement**
- 4.2.1. **Placement of Reinforcement in Precast Bridge Units** - The cover of concrete over the outside circumferential reinforcement shall be 2 inches minimum. The cover of concrete over the inside circumferential reinforcement shall be 1 1/2 inches minimum, unless otherwise noted on the shop drawings. The clear distance of the end circumferential wires shall not be less than one inch nor more than two inches from the ends of each section. Reinforcement shall be assembled utilizing single or multiple layers of welded wire fabric (not to exceed 3 layers), supplemented with a single layer of deformed billet-steel bars, when necessary. Welded wire fabric shall be composed of circumferential and longitudinal wires meeting the spacing requirements of 4.3, below, and shall contain sufficient longitudinal wires extending through the bridge unit to maintain the shape and position of the reinforcement. Longitudinal distribution reinforcement may be welded wire fabric or deformed billet-steel bars and shall meet the spacing requirements of 4.3, below. The ends of the longitudinal distribution reinforcement shall be not more than 3 inches and not less than 1 1/2 inches from the ends of the bridge unit.
- 4.2.2. **Bending of Reinforcement for Precast Bridge Units** - The outside and inside circumferential reinforcing steel for the corners of the bridge shall be bent to such an angle that is approximately equal to the configuration of the bridge's outside corner.
- 4.2.3. **Placement of Reinforcement for Precast Wingwalls and Headwalls** - The cover of concrete over the longitudinal and transverse reinforcement shall be 2 inches minimum. The clear distance from the end of each precast element to the end of reinforcing steel shall not be less than 1/2 inch nor more than 3 inches. Reinforcement shall be assembled utilizing a single layer of welded wire fabric, or a single layer of deformed billet-steel bars. Welded wire fabric shall be composed of transverse and longitudinal wires meeting the spacing requirements of 4.3, below, and shall contain sufficient longitudinal wires extending through the element to maintain the shape and position of the reinforcement. Longitudinal reinforcement may be welded wire fabric or deformed billet-steel bars and shall meet the spacing requirements of 4.3, below.
- 4.3. **Laps, Welds, Spacing**
- 4.3.1. **Laps, Welds, and Spacing for Precast Bridge Units** - Tension splices in the circumferential reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.2 and 8.32.6. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.1 and 8.32.5. The overlap of welded wire fabric shall be measured between the outer-most longitudinal wires of each fabric sheet. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 8.25. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be not less than 2 inches nor more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches.
- 4.3.2. **Laps, Welds, and Spacing for Precast Wingwalls and Headwalls** - Splices in the reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.2 and 8.32.6. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.1 and 8.32.5. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 8.25. The spacing center-to-center of the wires in a wire fabric sheet shall be not less than 2 inches nor more than 8 inches.
- 4.4. **Curing** The precast concrete elements shall be cured for a sufficient length of time so that the concrete will develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof shall be used:
- 4.4.1. **Steam Curing** - The precast elements may be low-pressure steam cured by a system that will maintain a moist atmosphere.
- 4.4.2. **Water Curing** - The precast elements may be water cured by any method that will keep the sections moist.
- 4.4.3. **Membrane Curing** - A sealing membrane conforming to the requirements of ASTM Specification C309 may be applied and shall be left intact until the required concrete compressive strength is attained. The concrete temperature at the time of

strength is attained. The concrete temperature at the time of application shall be within +/- 10 degrees F of the atmospheric temperature. All surfaces shall be kept moist prior to the application of the compounds and shall be damp when the compound is applied.

4.5. Storage, Handling & Delivery

- 4.5.1. **Storage**
Precast concrete bridge elements shall be lifted and stored in "as-cast" position. The precast concrete headwall and wingwall units are cast, stored and shipped in a flat position. The precast elements shall be stored in such a manner to prevent cracking or damage. Store elements using timber supports as appropriate. The units shall not be moved until the concrete compressive strength has reached a minimum of 2500 psi, and they shall not be stored in an upright position.
- 4.5.2. **Handling**
Handling devices shall be permitted in each precast element for the purpose of handling and setting. Spreader beams may be required for the lifting of precast concrete bridge elements to preclude damage from bending or torsion forces.
- 4.4.3. **Delivery**
Precast concrete elements must not be shipped until the concrete has attained the specified design compressive strength, or as directed by the design Engineer. Precast concrete elements may be unloaded and placed on the ground at the site until installed. Store elements using timber supports as appropriate.
- 4.6. **Quality Assurance** The Precaster shall demonstrate adherence to the standards set forth in the NPCA Quality Control Manual. The Precaster shall meet either Section 4.7.1 or 4.7.2
- 4.6.1. **Certification** - The Precaster shall be certified by the Precast/Prestressed Concrete Institute Plant Certification Program or the National Precast Concrete Association's Plant Certification Program prior to and during production of the products covered by this specification.
- 4.6.2. **Qualifications, Testing and Inspection**
- 4.6.2.1. The Precaster shall have been in the business of producing precast concrete products similar to those specified for a minimum of three years. He shall maintain a permanent quality control department or retain an independent testing agency on a continuing basis. The agency shall issue a report, certified by a licensed engineer, detailing the ability of the Precaster to produce quality products consistent with industry standards.
- 4.6.2.2. The Precaster shall show that the following tests are performed in accordance with the ASTM standards indicated. Tests shall be performed as indicated in Section 6 of these specifications.
- 4.6.2.2.1. Air Content: C231 or C173
- 4.6.2.2.2. Compressive Strength: C31, C39, C497
- 4.6.2.3. The Precaster shall provide documentation demonstrating compliance with this section to CONTECH® Bridge Solutions at regular intervals or upon request.
- 4.6.2.4. The Owner may place an inspector in the plant when the products covered by this specification are being manufactured.
- 4.6.3. **Documentation** - The Precaster shall submit Precast Production Reports to CONTECH® Bridge Solutions as required.

5. Permissible Variations

- 5.1. **Bridge Units**
- 5.1.1. **Internal Dimensions** - The internal dimension shall vary not more than 1% from the design dimensions nor more than 1-1/2 inches whichever is less.
- 5.1.2. **Slab and Wall Thickness** - The slab and wall thickness shall not be less than that shown in the design by more than 1/4 inch. A thickness more than that required in the design shall not be cause for rejection.
- 5.1.3. **Length of Opposite Surfaces** - Variations in laying lengths of two opposite surfaces of the bridge unit shall not be more than 1/2 inch in any section, except where beveled ends for laying of curves are specified by the purchaser.
- 5.1.4. **Length of Section** - The underrun in length of a section shall not be more than 1/2 inch in any bridge unit.
- 5.1.5. **Position of Reinforcement** - The maximum variation in position of the reinforcement shall be ± 1/2 inch. In no case shall the cover over the reinforcement be less than 1 1/2 inches for the outside circumferential steel or be less than 1 inch for the inside circumferential steel as measured to the external or internal surface of the bridge. These tolerances or cover requirements do not apply to mating surfaces of the joints.
- 5.1.6. **Area of Reinforcement** - The areas of steel reinforcement shall be the design steel areas as shown in the manufacturer's shop drawings. Steel areas greater than those required shall not be cause for rejection. The permissible variation in diameter of any

reinforcement shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcement.

5.2. Wingwalls & Headwalls

- 5.2.1. **Wall Thickness** - The wall thickness shall not vary from that shown in the design by more than 1/2 inch.
- 5.2.2. **Length/Height of Wall sections** - The length and height of the wall shall not vary from that shown in the design by more than 1/2 inch.
- 5.2.3. **Position of Reinforcement** - The maximum variation in the position of the reinforcement shall be ± 1/2 inch. In no case shall the cover over the reinforcement be less than 1 1/2 inches.
- 5.2.4. **Size of Reinforcement** - The permissible variation in diameter of any reinforcing shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcing. Steel area greater than that required shall not be cause for rejection.

6. Testing/ Inspection

- 6.1. **Testing**
- 6.1.1. **Type of Test Specimen** - Concrete compressive strength shall be determined from compression tests made on cylinders or cores. For cylinder testing, a minimum of 3 cylinders shall be taken for each lot of bridge elements. (A lot is defined as the precast elements made using the same concrete mix during a single day's production.) For core testing, one core shall be cut from each of 3 precast elements selected at random from each group of 15 or fewer elements made using a single concrete mix in the same day's production. Each lot shall be considered separately for the purpose of testing and acceptance.
- 6.1.2. **Compression Testing** - Cylinders shall be made and tested as prescribed by the ASTM C 39 Specification. Cores shall be obtained and tested for compressive strength in accordance with the provisions of the ASTM C42 Specification.
- 6.1.3. **Acceptability of Cylinder Tests** - When the average compressive strength of all cylinders tested is equal to or greater than the design compressive strength, and not more than 10% of the cylinders tested have a compressive strength less than the design concrete strength, and no cylinder tested has a compressive strength less than 80% of the design compressive strength, then the lot shall be accepted. When the compressive strength of the cylinders tested does not conform to these acceptance criteria, the acceptability of the lot may be determined as described in section 6.1.4, below.
- 6.1.4. **Acceptability of Core Tests** - The compressive strength of the concrete in a lot is acceptable when the average core test strength is equal to or greater than the design concrete strength. When the compressive strength of a core tested is less than the design concrete strength, the precast element from which that core was taken may be re-cored. When the compressive strength of the re-core is equal to or greater than the design concrete strength, the compressive strength of the concrete in that lot is acceptable.
- 6.1.4.1. When the compressive strength of any re-core is less than the design concrete strength, the precast element from which that core was taken shall be rejected. Two precast elements from the remainder of the lot shall be selected at random and one core shall be taken from each. If the compressive strength of both cores is equal to or greater than the design concrete strength, the compressive strength of the remainder of that group is acceptable. If the compressive strength of either of the two cores tested is less than the design concrete strength, the remainder of the group shall be rejected or, at the option of the manufacturer, each precast element of the remainder of the group shall be cored and accepted individually, and any of these elements that have cores with less than the design concrete strength shall be rejected. Plugging Core Holes - The core holes shall be plugged and sealed by the manufacturer in a manner such that the elements will meet all of the test requirements of this specification. Precast elements so sealed shall be considered satisfactory for use.
- 6.1.4.2. **Test Equipment** - Every manufacturer furnishing precast elements under this specification shall furnish all facilities and personnel necessary to carry out the test required.
- 6.2. **Inspection** The quality of materials, the process of manufacture, and the finished precast elements shall be subject to inspection by the purchaser.

7. Joints

The bridge units shall be produced with flat butt ends. The ends of the bridge units shall be such that when the sections are laid together they will make a continuous line with a smooth interior free of appreciable irregularities, all compatible with the permissible variations in section 5, above. The joint width between adjacent precast units shall not exceed 3/4 inches.

8. Workmanship/ Finish

The bridge units, wingwalls, and headwalls shall be substantially free of fractures. The ends of the bridge units shall be normal to the walls and centerline of the bridge section, within the limits of the variations given in section 5, above, except where beveled ends are specified. The faces of the wingwalls and headwalls shall be parallel to each other, within the limits of variations given in section 5, above. The surface of the precast elements shall be a smooth steel form or troweled surface. Trapped air pockets causing surface defects shall be considered as part of a smooth, steel form finish.

9. Repairs

Precast elements may be repaired, if necessary, because of imperfections in manufacture or handling damage and will be acceptable if, in the opinion of the purchaser, the repairs are sound, properly finished and cured, and the repaired section conforms to the requirements of this specification.

10. Rejection

The precast elements shall be subject to rejection on account of any of the specification requirements. Individual precast elements may be rejected because of any of the following:

10.1. Fractures or cracks passing through the wall, except for a single end crack that does not exceed one half the thickness of the wall.

10.2. Defects that indicate proportioning, mixing, and molding not in compliance with section 4 of these specifications.

10.3. Honeycombed or open texture.

10.4. Damaged ends, where such damage would prevent making a satisfactory joint.

11. Marking

Each bridge unit shall be clearly marked by waterproof paint. The following shall be shown on the inside of the vertical leg of the bridge section:

Bridge Span X Bridge Rise
Date of Manufacture
Name or trademark of the manufacturer

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



Professional Engineer Seal for Douglas M. ... License No. 21443, Expiration Date 12-31-18



NO.	DATE	REVISION
3	7-8-2014	ADD AREA 1 FINISHING LABEL
2	12-4-2013	REVISE LOT NUMBERS & SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE & SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
WWW.BE-ENGINEERING.COM

OWNER/DEVELOPER:

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

VILLAGES AT TURF VALLEY
PHASE 2 SECTION 1
LOTS 203, OPEN SPACE LOTS 204-207;
GOLF SPACE LOTS 17, 18, 208, 209; PARCELS A & B
NON-BUILDABLE BULK PARCELS CC-1 DD-1 BE-1 FF-1

TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: 670 394, GRID: 17
TAX MAP: 16, PARCEL: 670 8, GRID: 17
ELECTION DISTRICT NO. 3 ZONED: POC
HOWARD COUNTY, MARYLAND

CON/SPAN BRIDGE INSTALL DRAWINGS SPECIFICATIONS

DATE: FEBRUARY, 2010	PROJECT NO. 1915
SCALE: AS SHOWN	SHEET 42 OF 56

AS-BUILT

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Company:

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APPROVED: DEPARTMENT OF PUBLIC WORKS

Walter R. ... 4-15-10
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APPROVED: DEPARTMENT OF PLANNING AND ZONING

Walter R. ... 4-19-10
CHIEF, DIVISION OF LAND DEVELOPMENT

Walter R. ... 4/19/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D) (AREA 1)

12. Installation Preparation

To ensure correct installation of the precast concrete bridge system, care and caution must be exercised in forming the support areas for bridge units, headwall, and wingwall elements. Exercising special care will facilitate the rapid installation of the precast components.

12.1. Footings

Do not over excavate foundations unless directed by site soil engineer to remove unsuitable soil.

The site soils engineer shall certify that the bearing capacity meets or exceeds the footing design requirements, prior to the contractor pouring of the footings. A copy of the report shall be submitted to CONTECH® Bridge Solutions prior to shipment of precast concrete elements.

The bridge units and wingwalls shall be installed on either precast or cast-in-place concrete footings. The size and elevation of the footings shall be as designed by the Engineer. A keyway shall be formed in the top surface of the bridge footing as specified on the plans. No keyway is required in the wingwall footings, unless otherwise specified on the plans.

The footings shall be given a smooth float finish and shall reach a compressive strength of 2,000 psi before placement of the bridge and wingwall elements. Backfilling shall not begin until the footing has reached the full design compressive strength without written approval from CONTECH® Bridge Solutions.

The footing surface shall be constructed in accordance with grades shown on the plans. When tested with a 10-foot straight edge, the surface shall not vary more than 1/4 inch in 10 feet.

If a precast concrete footing is used, the contractor shall prepare a 4-inch thick base layer of compacted granular material the full width of the footing prior to placing the precast footing.

The foundations for precast concrete bridge elements and wingwalls must be connected by reinforcement to form one monolithic body. Expansion joints shall not be used.

The contractor shall be responsible for the construction of the foundations per the plans and specifications.

13. Installation

13.1. General The installation of the precast concrete elements shall be as explained in the publication CON/SPAN Bridge Systems Installation Handbook.

13.1.1. Lifting It is the responsibility of the contractor to ensure that a crane of the correct lifting capacity is available to handle the precast concrete units. This can be accomplished by using the weights given for the precast concrete components and by determining the lifting reach for each crane unit. Site conditions must be checked well in advance of shipping to ensure proper crane location and to avoid any lifting restrictions. The lift anchors or holes provided in each unit are the only means to be used to lift the elements. The precast concrete elements must not be supported or raised by other means than those given in the manuals and drawings without written approval from CONTECH® Bridge Solutions.

13.1.2. Construction equipment weight restrictions: In no case shall equipment operating in excess of the design load (HS20 or HS25) be permitted over the bridge units unless approved by CONTECH® Bridge Solutions.

13.1.2.1 In the immediate area of the bridge units, the following restrictions for the use of heavy construction machinery during backfilling operations apply:

- No construction equipment shall cross the bare precast concrete bridge unit.
- After the compacted fill level has reached a minimum of 4 inches over the crown of the bridge, construction equipment with a weight of less than 10 tons may cross the bridge.
- After the compacted fill level has reached a minimum of 1 foot over the crown of the bridge, construction equipment with a weight of less than 30 tons may cross the bridge.
- After the compacted fill level has reached the design cover, or 2 feet minimum, over the crown of the precast concrete bridge, construction equipment within the design load limits for the road may cross the precast concrete bridge.

13.1. Leveling Pad/ Shims The bridge units and wingwalls shall be set on masonite or steel shims measuring 6" x 6", minimum, unless shown otherwise on the plans. A minimum gap of 1/2 inch shall be provided between the footing and the bottom of the bridge's vertical legs or the bottom of the wingwall.

13.3. Placement of Bridge Units

The bridge units shall be placed as shown on the Engineer's plan drawings. Special care shall be taken in setting the elements to the true line and grade. The joint width between adjacent precast units shall not exceed 3/4 inches.

It is imperative that any lateral spreading of the bridge elements be avoided during and after their placement. Generally, horizontal cable ties are shipped in the larger bridge elements to prevent this spreading. If, due to site restrictions, these ties must be removed prior to placement of the bridge element, the contractor must provide hardwood wedges on site. These hardwood wedges are placed in the keyway outside the legs of the bridge elements, and smaller shims and wedges are added before complete release of the bridge element from the crane. Also, a supply of 1/4 inch and 1/8-inch thick steel or masonite shims for various shimming purposes should be on site, per section 13.2.

13.4. Placement of Wingwalls & Headwalls

The wingwalls and headwalls shall be placed as shown on the plan drawings. Special care shall be taken in setting the elements to the true line and grade.

13.5. Waterproofing/ Joint protection and Subsurface Drainage

13.5.1. External Protection of Joints - The butt joint made by two adjoining bridge units shall be covered with a 7/8" x 1 3/8" preformed bituminous joint sealant and a minimum of a 9-inch wide joint wrap. The surface shall be free of dirt before applying the joint material. A primer compatible with the joint wrap to be used shall be applied for a minimum width of nine inches on each side of the joint. The external wrap shall be either EZ-WRAP RUBBER by PRESS-SEAL GASKET CORPORATION, SEAL WRAP by MAR MAC MANUFACTURING CO. INC. or approved equal. The joint shall be covered continuously from the bottom of one bridge section leg, across the top of the bridge and to the opposite bridge section leg. Any laps that result in the joint wrap shall be a minimum of six inches long with the overlap running downhill.

13.5.2. In addition to the joints between bridge units, the joint between the end bridge unit and the headwall shall also be sealed as described above. If precast wingwalls are used, the joint between the end bridge unit and the wingwall shall be sealed with a 2'-0" strip of filter fabric. Also, if lift holes are formed in the bridge units, they shall be primed and covered with a 9" x 9" square of joint wrap.

13.5.3. During the backfilling operation, care shall be taken to keep the joint wrap in its proper location over the joint.

13.5.4. Subsoil drainage shall be as directed by the engineer.

13.6. Grouting

13.6.1. Grouting shall not be performed when temperatures are expected to go below 35° for a period of 72 hours. Fill the bridge-foundation keyway with cement grout (Portland cement and water or cement mortar composed of Portland cement, sand and water) with a minimum 28-day compressive strength of 3000 psi. Vibrate as required to ensure that the entire key around the bridge element is completely filled. If bridge elements have been set with temporary ties (cables, bars, etc.) grout must attain a minimum compressive strength of 1500 psi before ties may be removed.

13.6.2. All grout shall have a maximum aggregate size of 1/4 inch.

13.6.3. Lifting and erection anchor recesses shall be filled with grout.

13.7. Backfill

13.7.1. Do not perform backfilling during wet or freezing weather.

13.7.2. No backfill shall be placed against any structural elements until they have been approved by the Engineer.

13.7.3. Backfill shall be considered as all replaced excavation and new embankment adjacent to the precast concrete elements. The project construction and material specifications, which include the specifications for excavation for structures and roadway excavation and embankment construction, shall apply except as modified in this section.

13.7.4. Backfill Zones

- In-situ soil
- Zone A: constructed embankment or overfill.
- Zone B: fill that is directly associated with precast concrete bridge installation.
- Zone C: road structure.

13.7.5. Required Backfill Properties

13.7.5.1. In-situ soil

Natural ground is to be sufficiently stable to allow effective support to the precast concrete bridge units. As a guide, the existing natural ground should be of similar quality and density to Zone B material for minimum lateral dimension of one bridge span outside of the bridge footing.

13.7.5.2. Zone A

Zone A requires fill material with specifications and compacting procedures equal to that for normal road embankments.

13.7.5.3. Zone B

Generally, soils shall be reasonably free of organic matter, and, near concrete surfaces, free of stones larger than 3 inches in diameter. See charts for detailed descriptions of acceptable soils.

13.7.5.4. Zone C

Zone C is the road section of gravel, asphalt or concrete built in compliance with local engineering practices.

13.7.6. Placing and Compacting Backfill

Dumping for backfilling is not allowed any nearer than 3 ft from the bridge leg.

The fill must be placed and compacted in layers not exceeding 8 inches. The maximum difference in the surface levels of the fill on opposite sides of the bridge must not exceed 2 feet.

The fill behind wingwalls must be placed at the same time as that of the bridge fill. It must be placed in progressively placed horizontal layers not exceeding 8 inches per layer.

The backfill of Zone B shall be compacted to a minimum density of 95% of the Standard Proctor, as required by AASHTO T-99.

Soil within 1 foot of concrete surfaces should be hand-compacted. Elsewhere, use of rollers is acceptable. If vibrating roller-compactors are used, they should not be started or stopped within Zone B and the vibration frequency should be at least 30 revolutions per second.

The backfill material and compacting behind wingwalls should satisfy the criteria for the bridge backfill, Zone B.

Backfill against a waterproofed surface shall be placed carefully to avoid damage to the waterproofing material.

13.7.7. Bridge Units

For fill heights over 12 feet, no backfilling may begin until a backfill compaction testing plan has been coordinated with and approved by CONTECH® Bridge Solutions. Cost of the backfill compaction testing shall be included in the cost of the precast units. This included cost applies only to projects with fill heights over 12 feet (as measured from top crown of bridge to finished grade).

13.7.8. Wingwalls

Backfill in front of wingwalls shall be carried to ground lines shown in the plans.

13.8. Monitoring

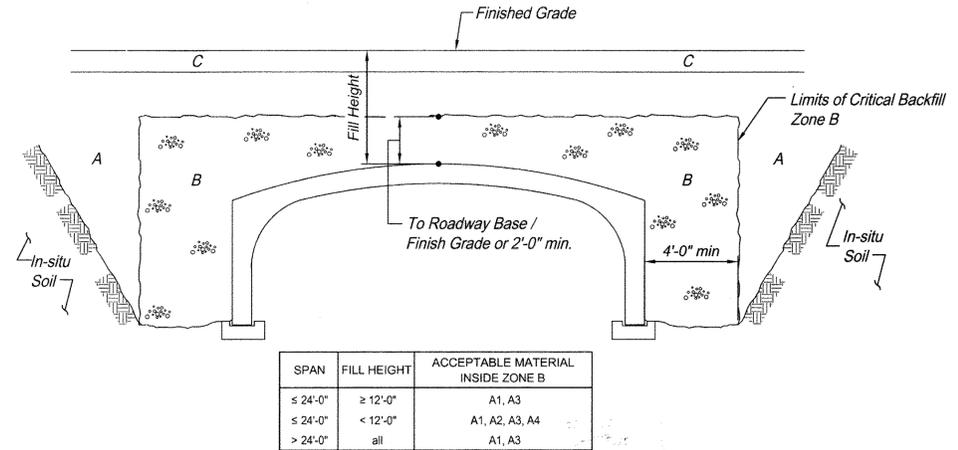
The contractor shall check settlements and horizontal displacement of foundation to ensure that they are within the ultimate limit provided by the engineer. These measurements should give an indication of the settlements and deformations along the length of the foundations.

The first measurement row should take place after the erection of all precast bridge system elements, a second after completion of backfilling, and a third before opening of the bridge to traffic. Further measurements may be made according to local conditions.

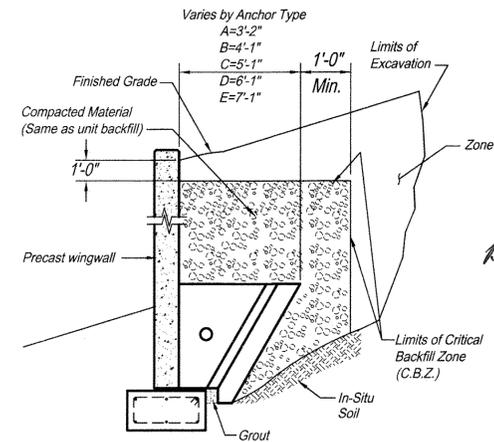
The maximum difference in vertical displacements V should not exceed 1 inch along the length of one foundation.

Acceptable Soils for use in Zone B Backfill

Typical USCS Materials	AASHTO Group	AASHTO SubGroup	Percent passing US Sieve No.			Character of Fraction passing No. 40 Sieve		Soil Description
			#10	#40	#200	Liquid Limit	Plasticity Index	
GW, GP, SP	A1	A-1a	50 max	30 max	15 max	6 max		Largely gravel but can include sand and fines
GM, SW, SP, SM	A1	A-1b		50 max	25 max	6 max		Gravelly sand or graded sand, may include fines
GM, SM, ML, SP, GP	A2	A-2.4			35 max	40 max	10 max	Sands, gravels with low-plasticity silt fines
SC, GC, GM	A2	A-2.5			35 max	41 max	10 max	Sands, gravels with plastic silt fines
SP, SM, SW	A3			51 min	10 max		non-plastic	Fine sands
ML, SM, SC	A4				36 min	40 max	10 max	Low-compressibility silts



BACKFILL REQUIREMENTS (AREA 1)



WALL BACKFILL REQUIREMENTS (AREA 1)

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12-31-18

NO.	DATE	REVISION
3	7-8-2014	ADD ABBA 1 PHASING LABELS
2	12-4-2013	REVISE LOT NUMBERS; SHEET NUMBERS IN TITLE BLOCK
1	4-20-2012	REVISE SHEET NUMBER

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 WWW.BEI-CIVILENGINEERING.COM

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

VILLAGES AT TURF VALLEY PHASE 2 SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 71, 78, 208, 209; PARCELS A1B;
 NON-BUILDABLE BULK PARCELS CCI DD-1 EE-1 FF-1
 TAX MAP: 16, PARCEL: P/O 394, GRID: 17
 TAX MAP: 16, PARCEL: P/O B, GRID: 17
 ZONED: PCCC HOWARD COUNTY, MARYLAND
 ELECTION DISTRICT NO. 3

CON/SPAN BRIDGE INSTALL DRAWINGS SPECIFICATIONS

DATE: FEBRUARY, 2010 PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 43 OF 56

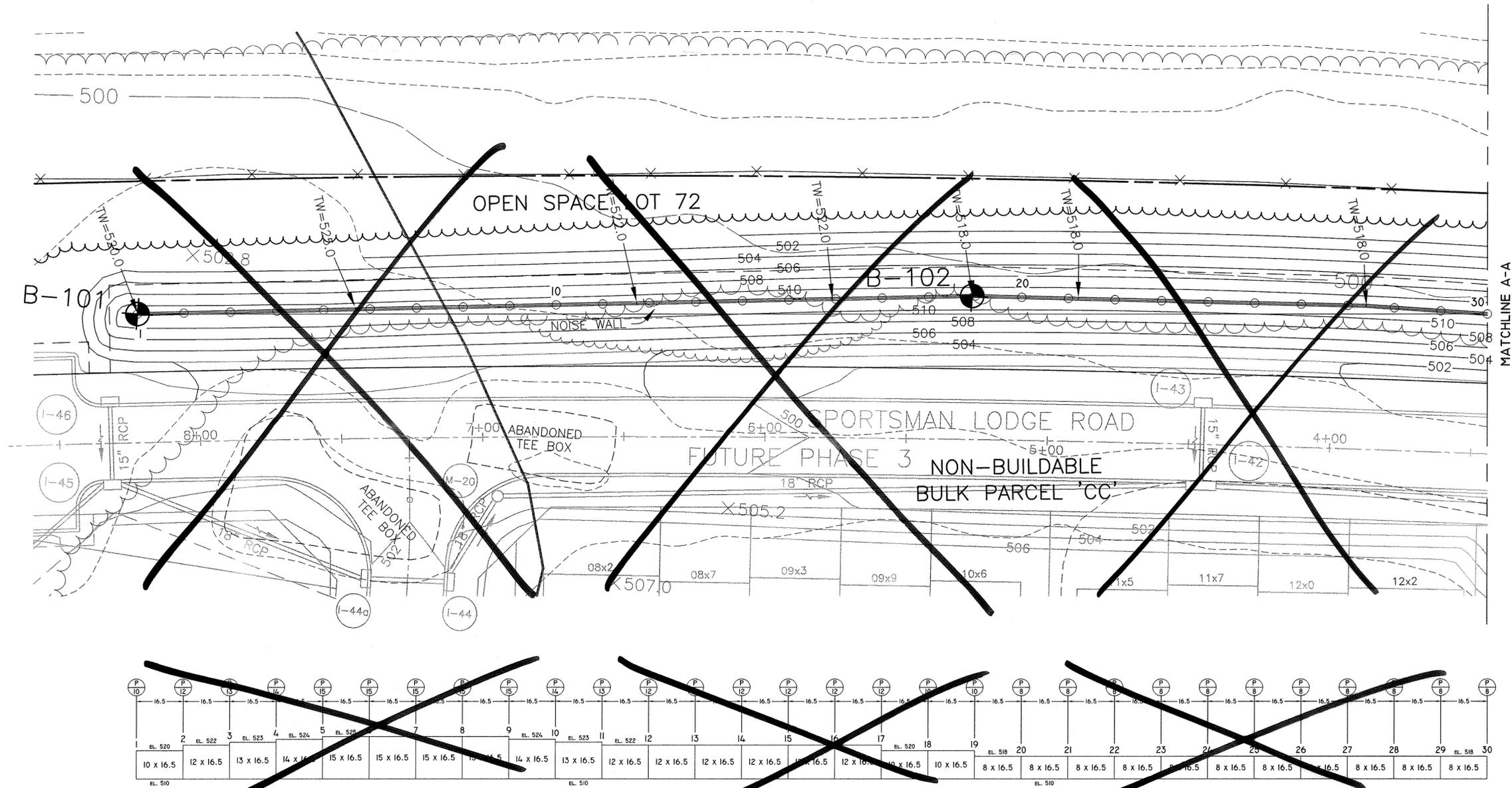
APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4-15-10
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-19-10
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4/19/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

Company:
CONTECH®
 BRIDGE SOLUTIONS INC.
 8210 University Executive Park Drive
 Suite 240
 Charlotte, North Carolina 28262
 704-548-8420
 704-548-8586 fax
 800-526-3999

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. 36225, EXPIRATION DATE: 8/19/2010.



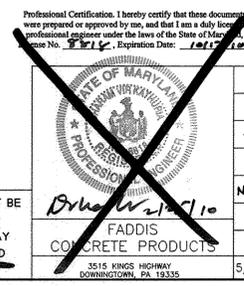
MATCHLINE A-A

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

NOTE:
NOISE WALL PANEL AND FOUNDATION DETAILS SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-31-18



THIS DRAWING AND ALL INFORMATION HEREON MAY NOT BE REPRODUCED OR DISTRIBUTED FOR ANY OTHER PURPOSE EXCEPT FOR THE SPECIFIC PROJECT. THIS DRAWING MAY NOT BE ALTERED IN ANY WAY WITHOUT THE EXPRESSED WRITTEN CONSENT OF FADDIS CONCRETE PRODUCTS.

NO.	BY	DESCRIPTION	DATE
2	BE1	REVISE LOT NUMBERS AND SHEET NUMBER IN TITLE BLOCK. DELETE NOISE WALL	12-4-2013
1	BE1	REVISE SHEET NUMBER	4-20-2012

DATE	SCALE	DR. BY	CHK. BY	DRAWING NO.
5/13/08	---	JML		TV2-01

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

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

VILLAGES AT TURF VALLEY
PHASE 2, SECTION 1
LOT 207; OPEN SPACE LOTS 204-207;
GOLF SPACE LOTS 77, 78, 208, 209 ; PARCELS A & B;
NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1

TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P10 394, GRID: 17
TAX MAP: 16, PARCEL: P10 8, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

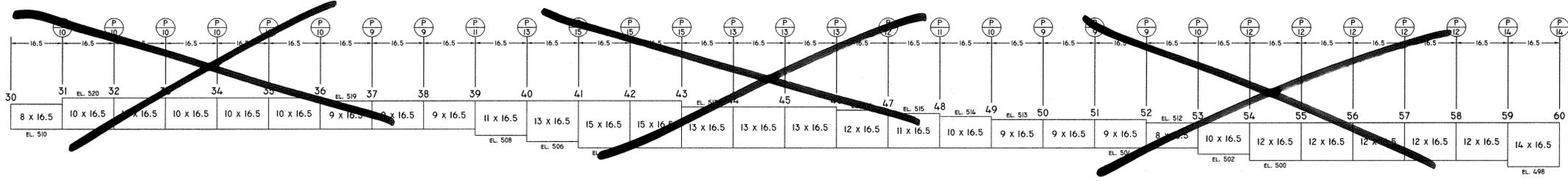
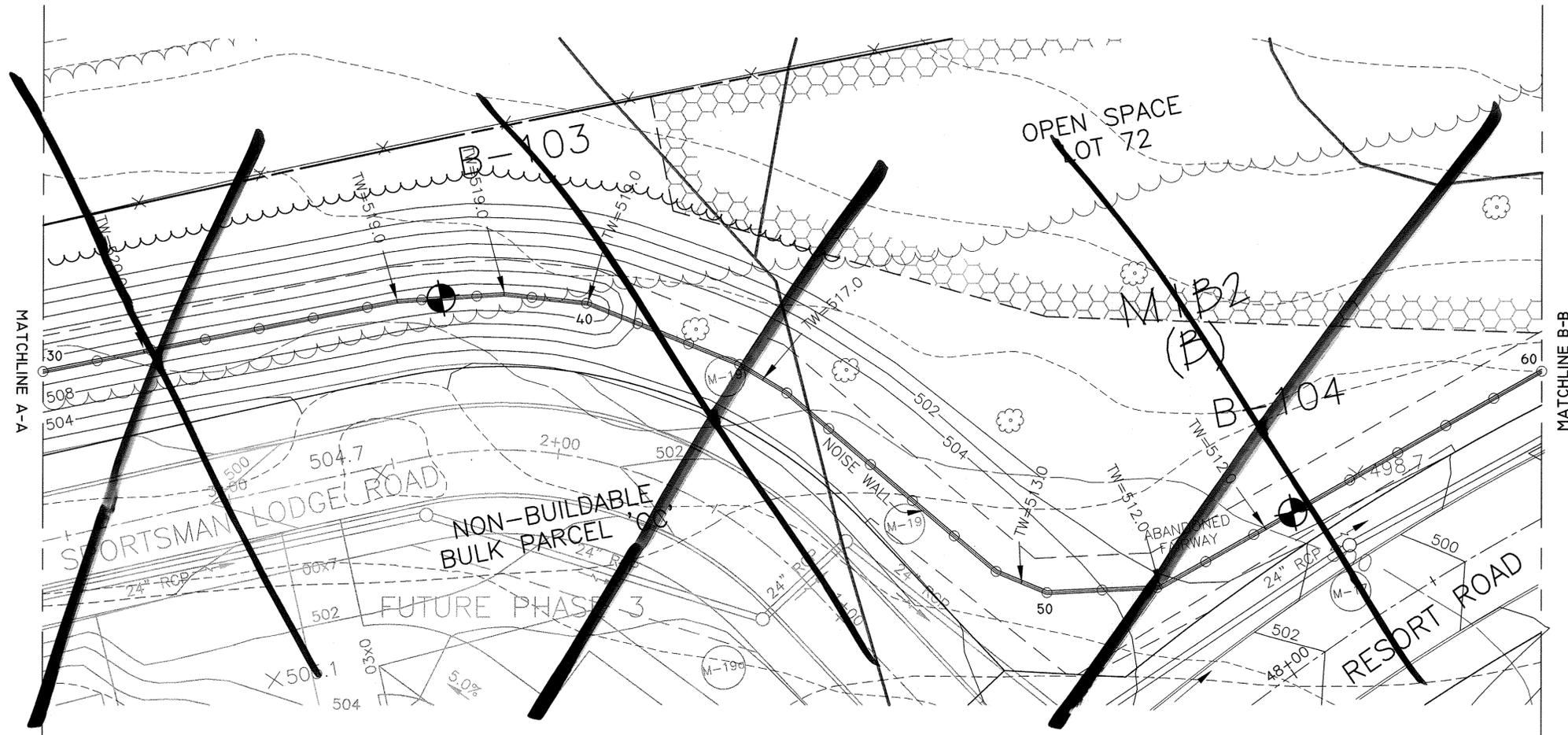
NOISE WALL #2
PLAN AND PROFILE

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 44 OF 56

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter P. Adams 4-15-10
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kat Shubroth 4-19-10
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Michael J. ... 4/19/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date 12-21-19

~~NOTE: NOISE WALL PANEL AND CONNECTION DETAILS SHALL BE SUBMITTED WITH THE SHOP DRAWING.~~

APPROVED: DEPARTMENT OF PUBLIC WORKS
With 2 copies 4-15-10
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Karl Skarlow 4-19-10
 CHIEF, DIVISION OF LAND DEVELOPMENT
W. Dennis 4/19/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

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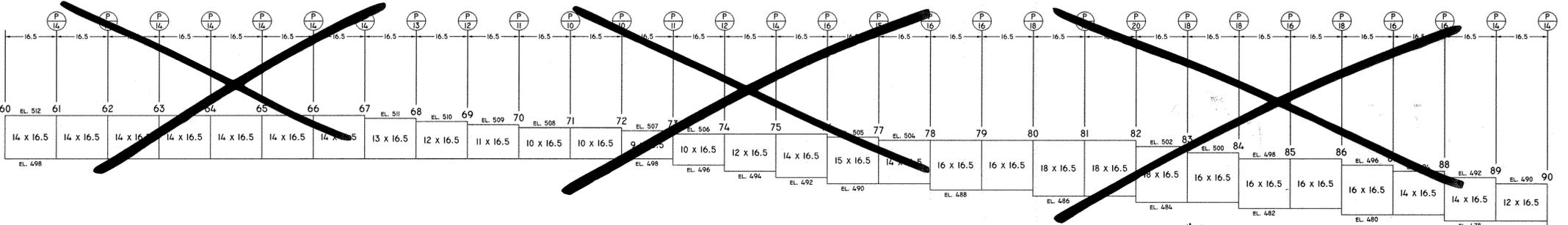
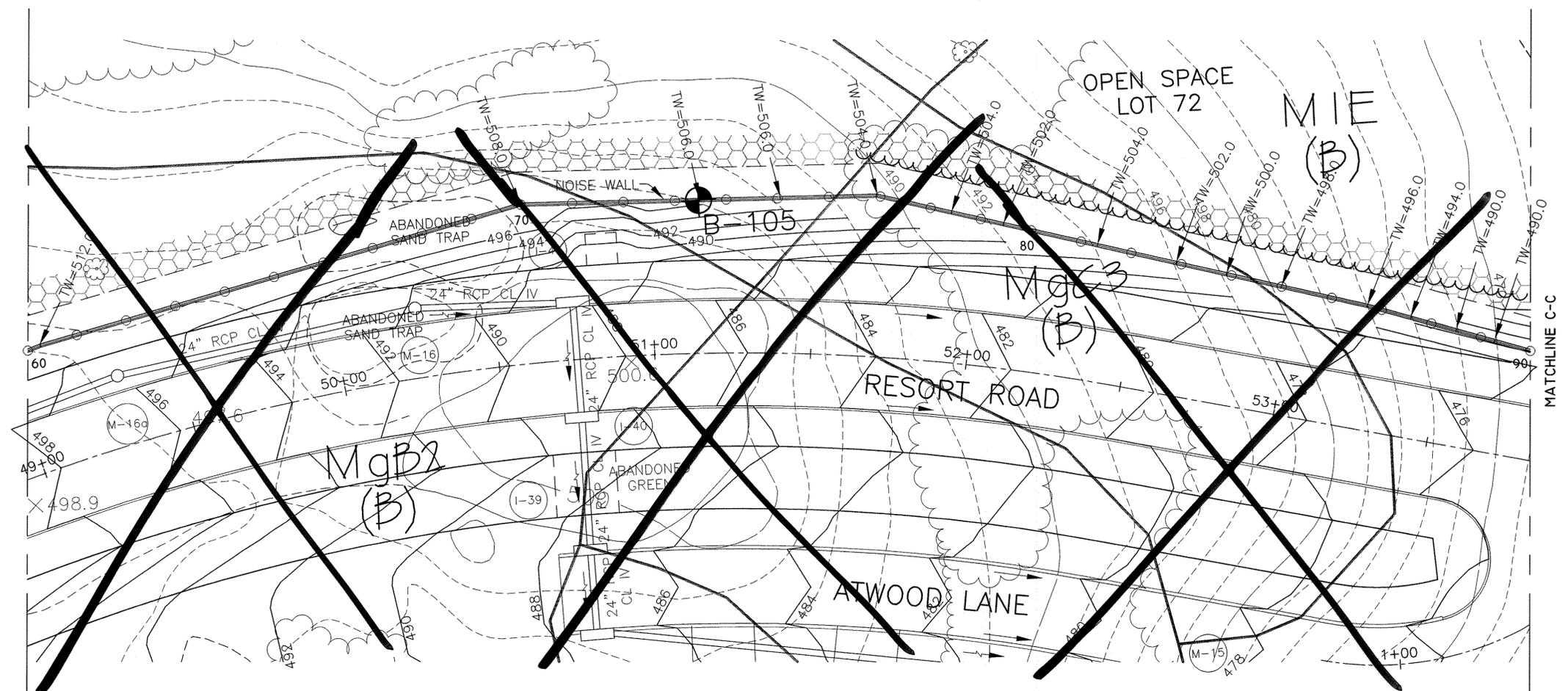
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date 12-21-19

NO.	BY	DESCRIPTION	DATE
2	BE1	DELETE NOISE WALL INFORMATION. REVISE LOT 1 SHEET NUMBERS IN TITLE BLOCK	12-4-2013
1	BE1	REVISE SHEET NUMBER	4-20-2012

DATE	SCALE	DR. BY	CHK. BY	DRAWING NO.
5/13/08	---	JML		TV2-02

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

VILLAGES AT TURF VALLEY
 PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208, 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS C-1, D-1, E-1, FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P/O 394, GRID: 17
 TAX MAP: 16, PARCEL: P/O 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC
 NOISE WALL #2
 PLAN AND PROFILE
 DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 45 OF 56



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. 21123, Expiration Date: 12-31-15

~~NOISE WALL FOUNDATION DETAILS SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.~~

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4-15-10
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4-19-10
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4/19/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

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 License No. 8818, Expiration Date: 11-24-14

2	B51	DELETE NOISE WALL INFORMATION. REVISE LOT & SHEET NUMBERS IN TITLE BLOCK	12-4-2013
1	B51	REVISE SHEET NUMBER	4-20-2012
NO. BY		DESCRIPTION	DATE
DATE		SCALE	DR. BY
5/13/08		---	JML
DRAWING NO.		CHK. BY	DATE
TV2-03			

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

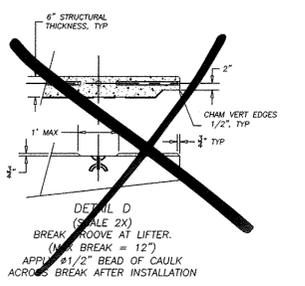
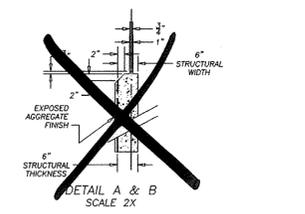
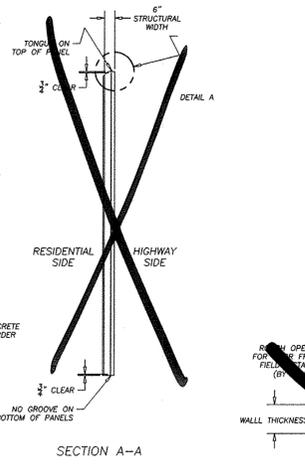
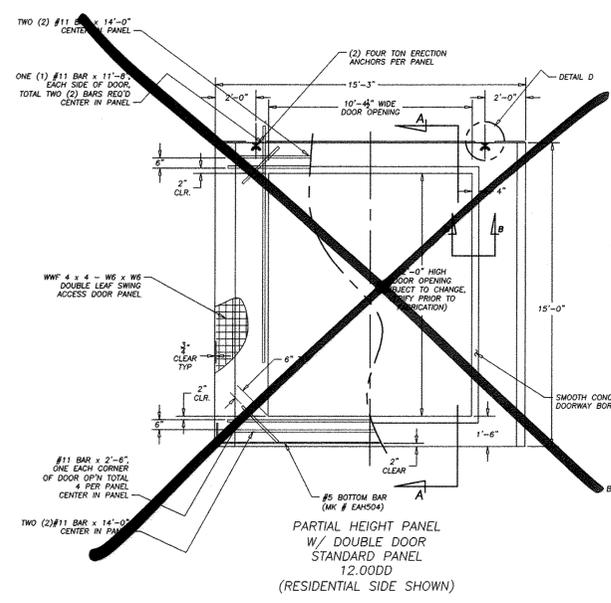
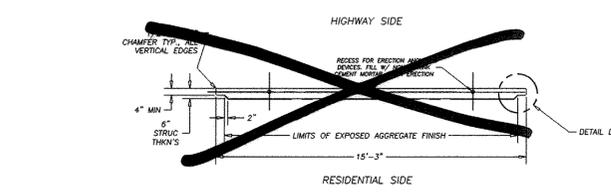
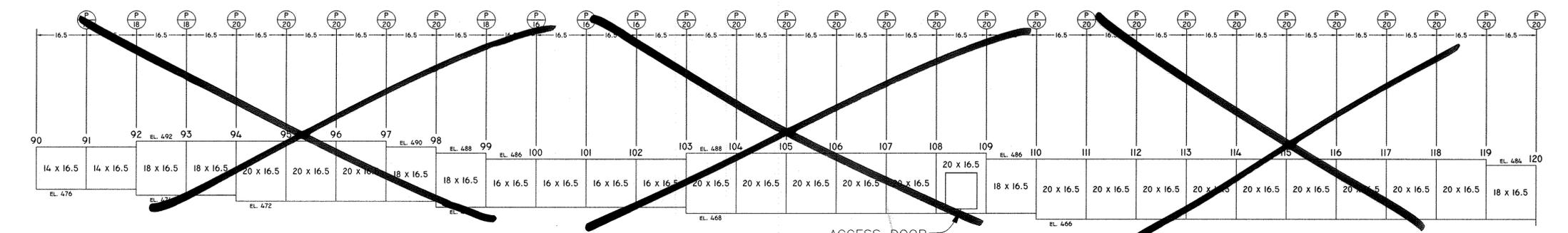
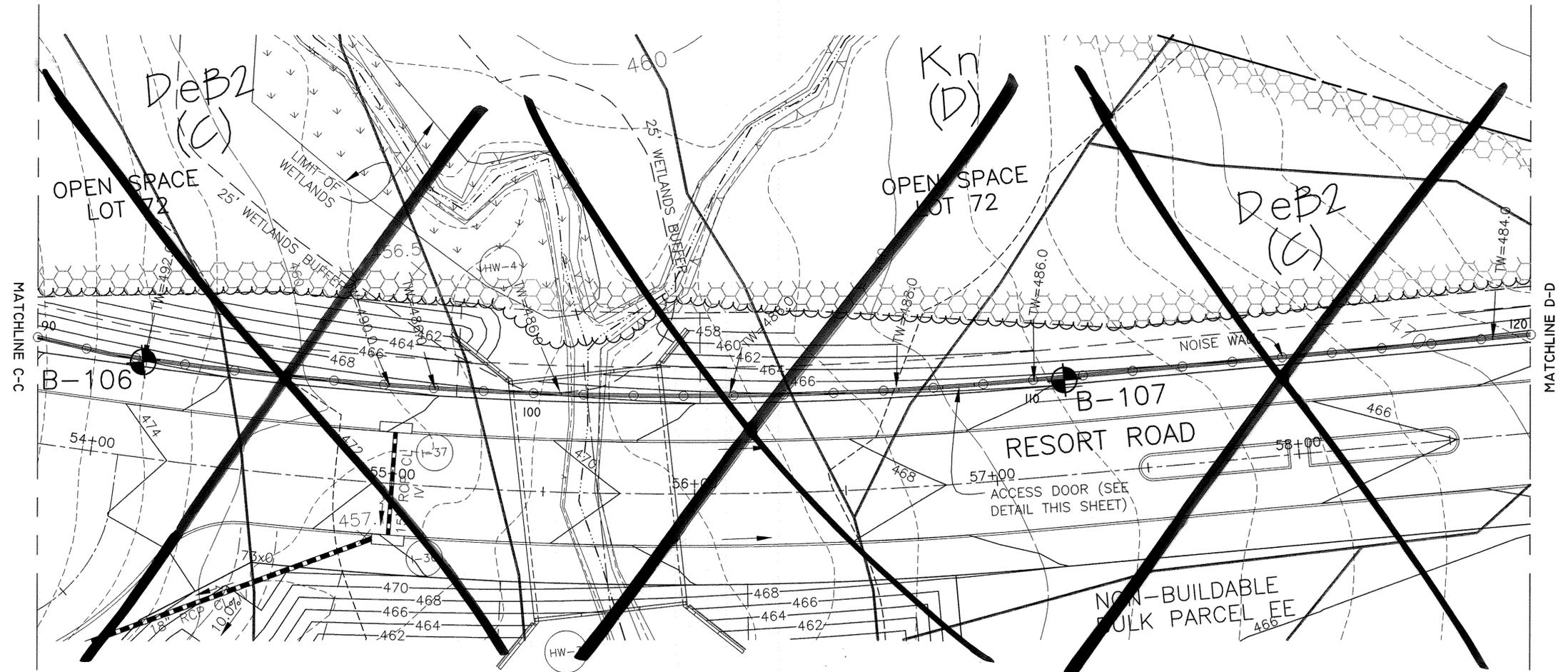
DEVELOPER:
 MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

VILLAGES AT TURF VALLEY
 PHASE 2, SECTION 1
 LOT 203, OPEN SPACE LOTS 204-207,
 GOLF SPACE LOTS 17, 18, 208, 209, PARCELS A & B,
 NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1

TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P/O 394, GRID: 17
 TAX MAP: 16, PARCEL: P/O 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

NOISE WALL #2
 PLAN AND PROFILE

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 46 OF 56



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

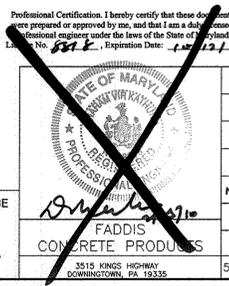
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-21-15

NOTE: NOISE WALL PANEL AND FOUNDATION DETAILS SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.

APPROVED: DEPARTMENT OF PUBLIC WORKS
 Chief, Bureau of Highways
 DATE: 4-15-10

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Division of Land Development
 DATE: 4-19-10

APPROVED: DEVELOPMENT ENGINEERING DIVISION
 Chief, Development Engineering Division
 DATE: 4/19/10



NO.	BY	DESCRIPTION	DATE
2	BEI	DELETE NOISE WALL INFORMATION REVISE LOT & SHEET NUMBERS IN TITLE BLOCK	12-4-2013
1	BEI	REVISE SHEET NUMBER	4-20-2012

DATE	SCALE	DR. BY	CHK. BY	DRAWING NO.
5/13/08	---	JML		TV2-01

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

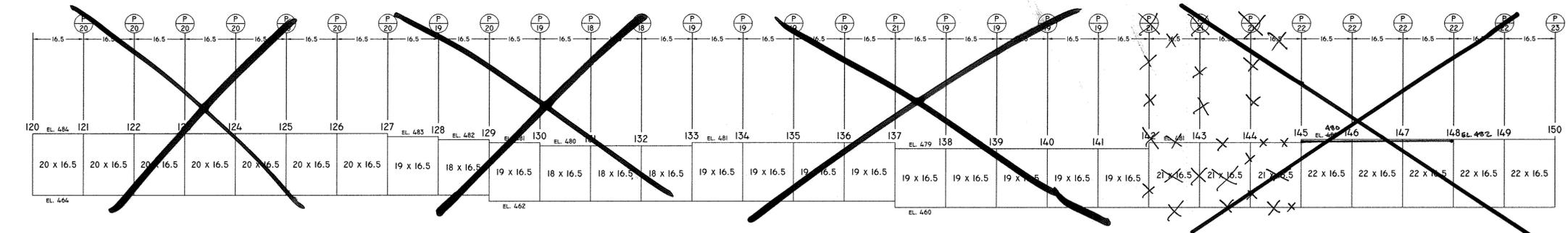
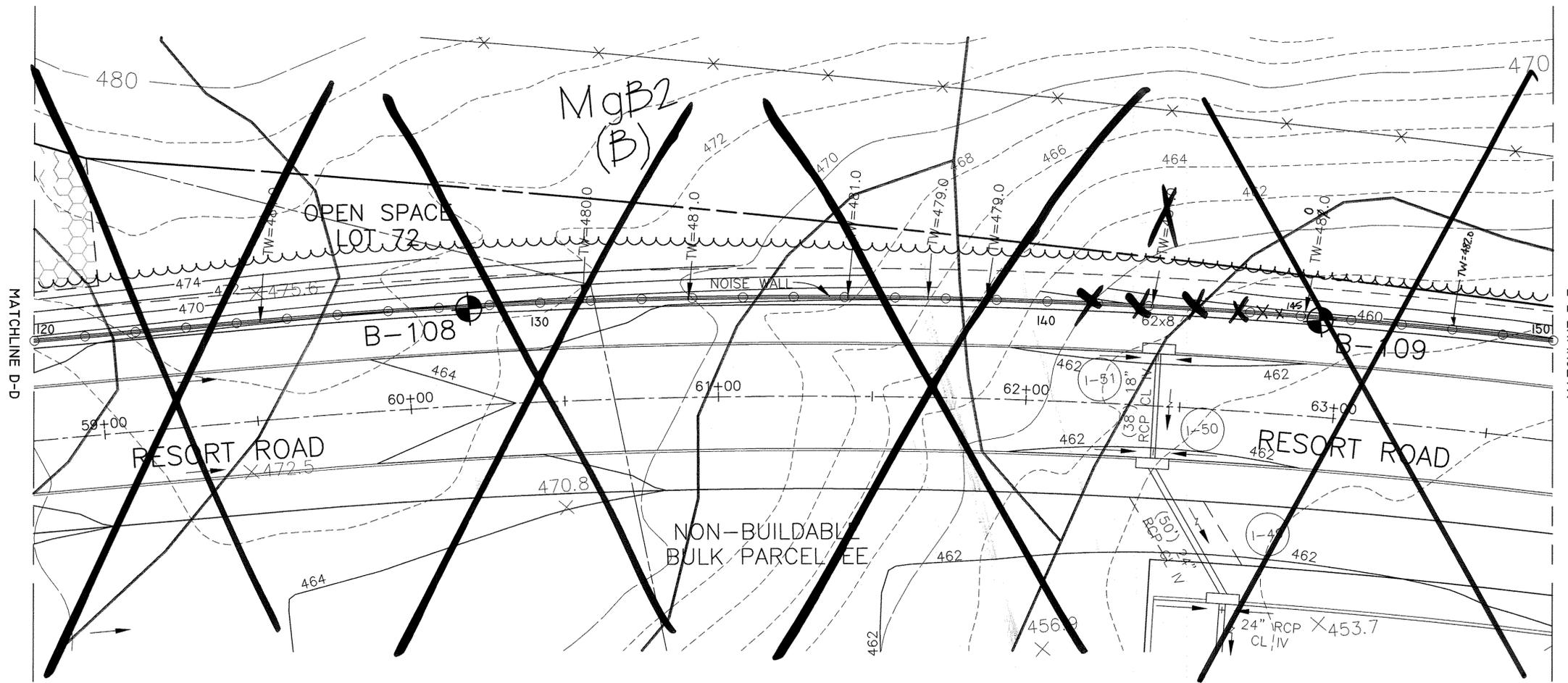
DEVELOPER:
 MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
 410-825-8400

VILLAGES AT TURF VALLEY
 PHASE 2, SECTION 1
 LOT 205, OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208, 209; PARCELS A & B
 NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P/O 394, GRID: 17
 TAX MAP: 16, PARCEL: P/O 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

NOISE WALL #2
 PLAN AND PROFILE

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 47 OF 56

THIS DRAWING AND ALL INFORMATION WITHIN MAY NOT BE REPRODUCED OR DISTRIBUTED FOR ANY OTHER PURPOSE EXCEPT FOR THE PROJECT AND SITE SPECIFIC DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN CONSENT OF FADDIS CONCRETE PRODUCTS.



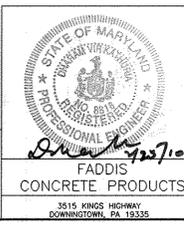
"THERE IS NO AS-BUILT INFORMATION PROVIDED ON THIS SHEET"



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-31-13

NOTE:
 NOISE WALL PANEL AND FOUNDATION DETAILS SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.

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. 8616, Expiration Date: 10-21-11



No.	BY	DESCRIPTION	DATE
3	BEI	DELETE WALL PLAN & PROFILE	3-31-2014
2	BEI	DELETE NOISE WALL WEST OF POST 145	12-4-2013
1	BEI	REVISE SHEET NUMBER	4-20-2012

DATE	SCALE	DR. BY	CHK. BY	DRAWING NO.
5/13/08	---	JML		TV2-05

THIS DRAWING AND ALL INFORMATION WITHIN MAY NOT BE REPRODUCED OR DISTRIBUTED FOR ANY OTHER PURPOSE EXCEPT FOR THE STATED PROJECT. THIS DRAWING MAY NOT BE ALTERED IN ANY WAY WITHOUT THE EXPRESSED WRITTEN CONSENT OF FADDIS CONCRETE PRODUCTS.

APPROVED: DEPARTMENT OF PUBLIC WORKS
William A. White 4-15-10
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kent Sheehy 4-19-10
 CHIEF, DIVISION OF LAND DEVELOPMENT

Mark D. ... 4/19/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

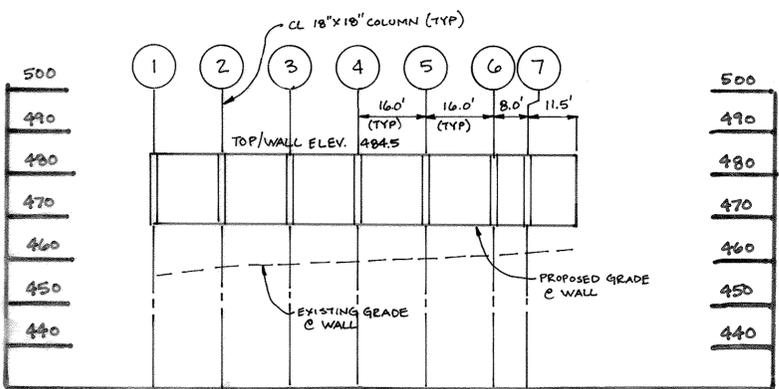
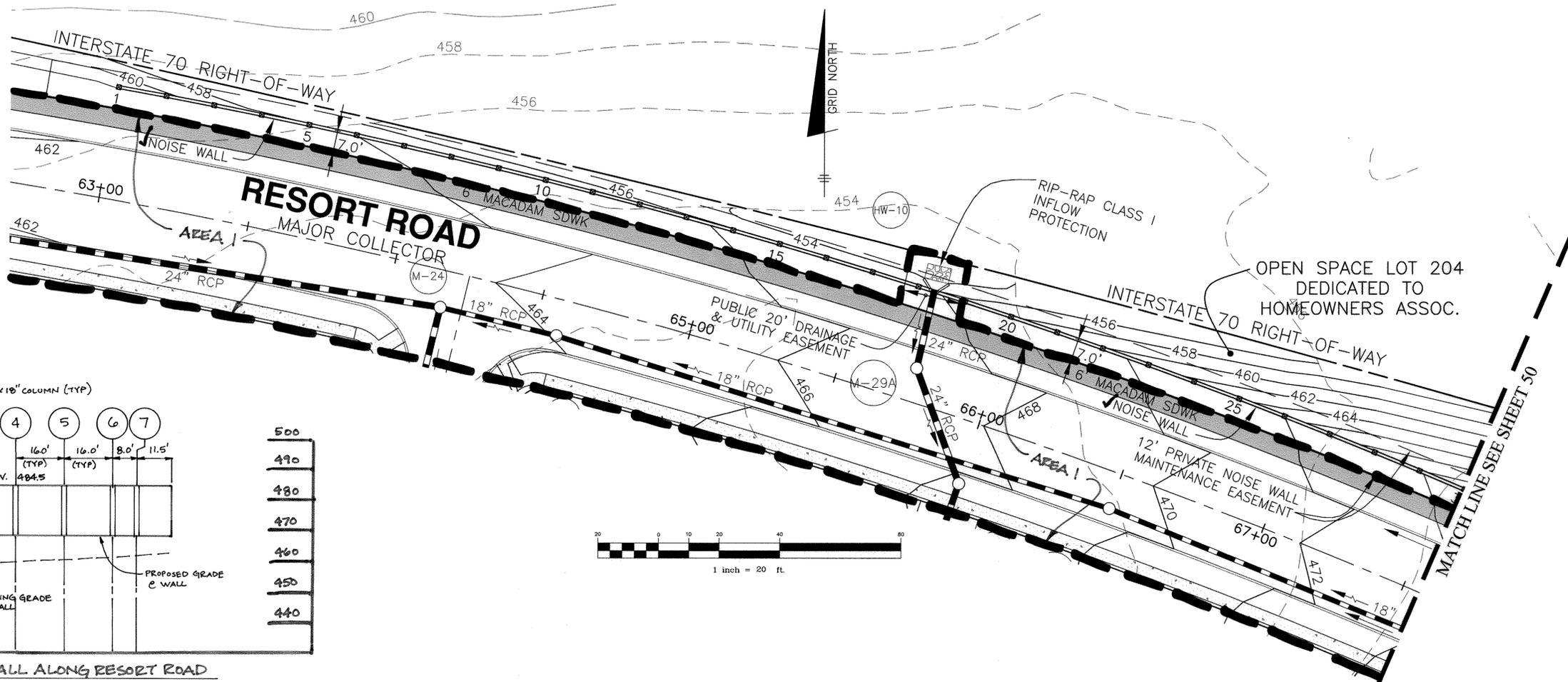
OWNER:
 MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
 410-825-8400

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

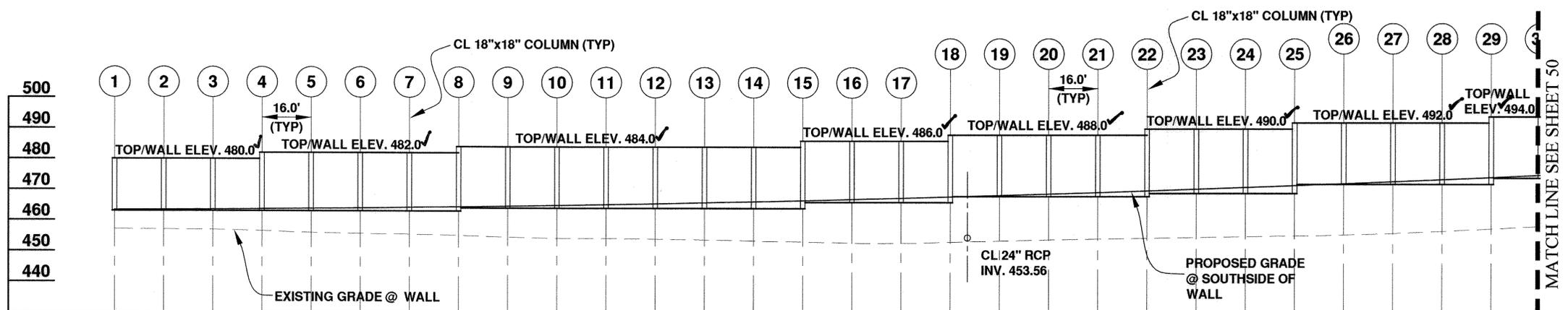
VILLAGES AT TURF VALLEY
 PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207
 GOLF SPACE LOTS 177, 208, 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS C&I DD-1 BE-1 FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P/O 394, GRID: 17
 TAX MAP: 16, PARCEL: P/O 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

NOISE WALL #2
 PLAN AND PROFILE

DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 48 OF 56



PROFILE OF NOISE WALL ALONG RESORT ROAD
 STATION 56+50 TO 57+50
 SCALE: 1"=20' HORIZ., 1"=2' VERT.



PROFILE OF NOISE WALL ALONG RESORT ROAD AREA 2
 STATION 63+00 TO 71+64
 SCALE: 1"=30' HORIZ., 1"=2' VERT.

AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
 Donald Mason, P.E. Date: 10-25-17



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12-31-18

NOTE:
 NOISE WALL PANEL AND FOUNDATION DETAILS SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.

NO.	DATE	REVISION
4	7-8-2014	ADD NOISE WALL PROFILE RESORT ROAD STATION 56+50 TO 57+50. ADD PHASING LINE
3	3-28-2014	revise noise wall plan and profile, shift wall to be 7.0' from cl of wall to right-of-way.
2	12-4-2013	delete noise wall west of post 145
1	4-20-2012	revise sheet number

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. 22370 Expiration Date: 6-30-15
 FOR REVISION #4 ONLY

THIS SHEET REPLACES THE PREVIOUS SHEET WITH REVISION DATE 12-4-2013.

BENCHMARK ENGINEERING, INC.
 ENGINEERS • LAND SURVEYORS • PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-485-8105 FAX: 410-485-8644
 WWW.BE-ENGINEERING.COM

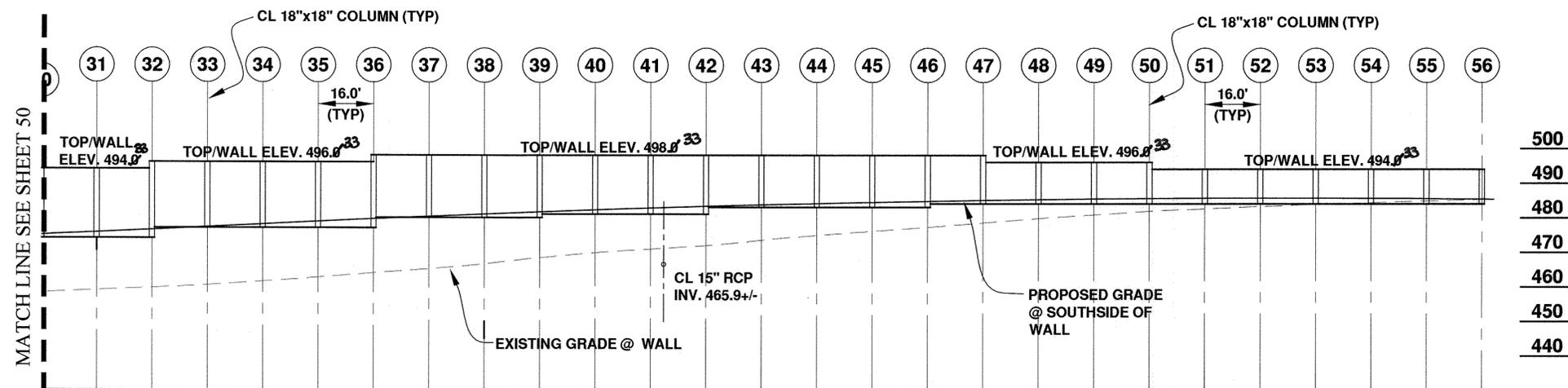
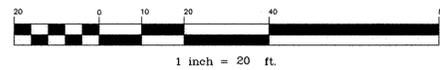
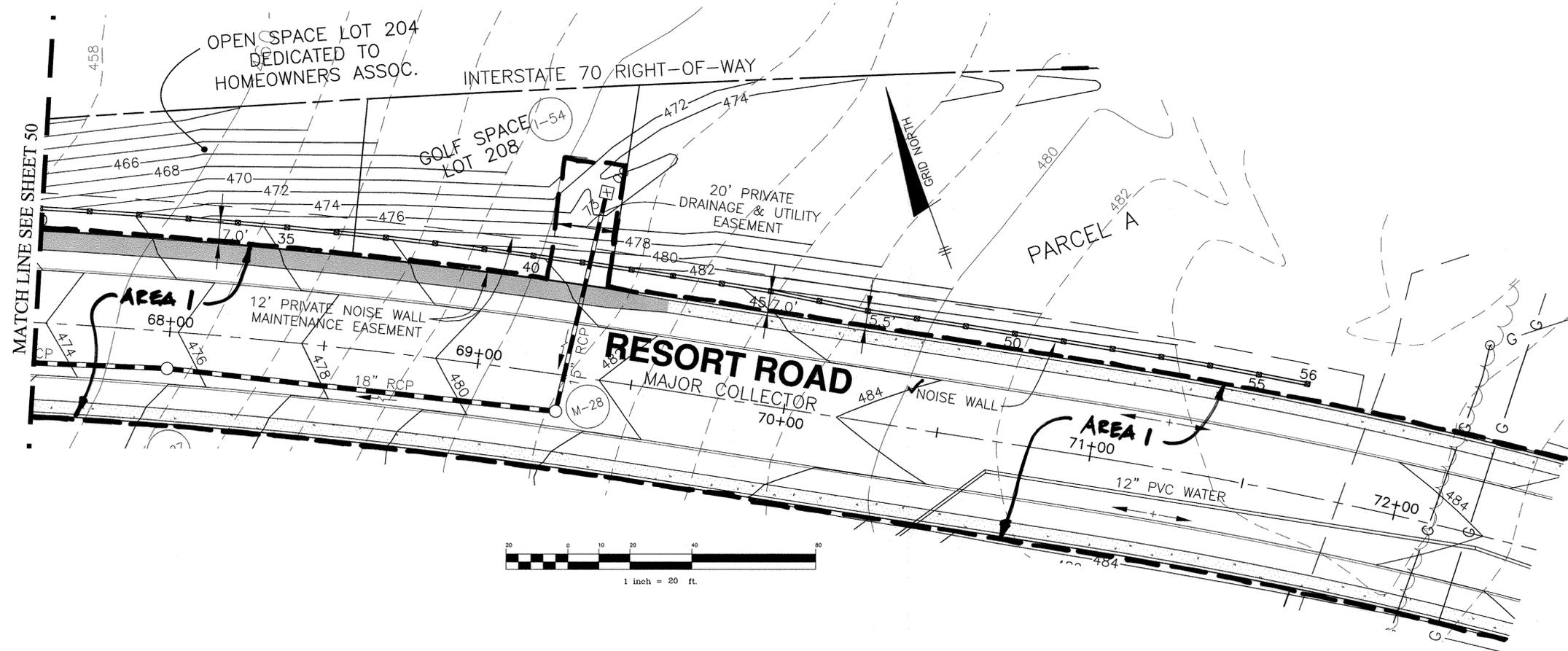
VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: PD 394, GRID: 17
 TAX MAP: 16, PARCEL: PD 39, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

REVISION NOISE WALL #2
 PLAN AND PROFILE
 DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: 1" = 50' SHEET 49 OF 56

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 4/23/14
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4/20/14
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4/20/14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION



PROFILE OF NOISE WALL ALONG RESORT ROAD (AREA 2)
STATION 63+00 TO 71+64
 SCALE: 1" = 36' HORIZ., 1" = 2' VERT.

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

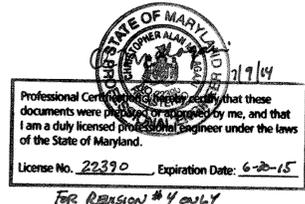
Donald Mason, P.E. Date: 10-25-17



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 10-25-18

NOTE:
 NOISE WALL PANEL AND FOUNDATION DETAILS SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.

NO.	DATE	REVISION
4	7-8-2014	ADD FINISH LINE AND LABELS
3	3-28-2014	revise noise wall plan and profile, shift wall to be 7.0' from cl of wall to right-of-way up to post 45
2	12-4-2013	delete noise wall west of post 145
1	4-20-2012	revise sheet number



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22390, Expiration Date: 6-20-15

THIS SHEET REPLACES THE PREVIOUS SHEET WITH REVISION DATE 12-4-2013.

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] (acting) 4/23/14
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 4/30/14
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 4-28-14
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

BENCHMARK ENGINEERING, INC.
 ENGINEERS • LAND SURVEYORS • PLANNERS
 840 BALTIMORE NATIONAL PIKE A SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-485-6105 FAX: 410-485-6644
 WWW.BE-CVLENGINEERING.COM

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

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

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 77, 78, 208 & 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1 & FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: PO 304, GRID: 17
 TAX MAP: 16, PARCEL: PO 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

REVISED NOISE WALL #2 PLAN AND PROFILE
 DATE: FEBRUARY, 2010 BEI PROJECT NO. 1915
 SCALE: 1" = 50' SHEET 50 OF 56

P:\1915\dwg\Phase 2 Section 1\Major Redline 2\7006_s49-50.dwg, 3/28/2014 10:58:16 AM

SPECIFICATIONS

MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 Description

- Work shall consist of furnishing and construction of a Modular Retaining Wall System in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
- Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.
- 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

- Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.
- Contractor shall protect all materials from damage due to job site conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Modular Concrete Retaining Wall Units

- Modular concrete units shall conform to the following architectural requirements: face color - color may be specified by the Owner.

face finish - sculptured rock face in angular tri-planer or flat configuration. Other face finishes will not be allowed without written approval of Owner.

bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.

- Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.

compressive strength = 3000 psi minimum; absorption = 8% maximum (6% in northern states) for standard weight aggregates;

dimensional tolerances = ±1/8" from nominal unit dimensions not including rough split face, ±1/16"

- Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:

unit height - top and bottom planes; unit size - 8" (H) x 18" (W) x 12" (D) minimum;

unit weight - 75 lbs/unit minimum for standard weight

- aggregates;
inter-unit shear strength - 1000 pif minimum at 2 psi normal pressure; at 2 psi normal force.
geogrid/unit peak connection strength - 1000 pif minimum
- Modular concrete units shall conform to the following constructability requirements: (if applicable)
vertical setback = 1/8"± per course (near vertical) or 1"± per course per the design;
alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;
maximum horizontal gap between erected units shall be - 1/2 inch.

2.02 Shear Connectors (if applicable)

- Shear connectors shall be 1/2 inch diameter thermoset isotropic polyester resin-protuded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to +100 degrees F. 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

- Material shall consist of a compacted #57 crushed stone base as shown on the construction drawings.

2.04 Unit Drainage Fill

- Unit drainage fill shall consist of #57 crushed stone

2.05 Reinforced Backfill

- Reinforced backfill shall type SM, be free of debris and meet the following gradation tested in accordance with ASTM D-422 and meet other properties shown on the plan:

Sieve Size	Percent Passing
2 inch	100-75
3/4 inch	100-75
No. 40	0-60
No. 200	0-40

- Plasticity Index (PI) <10 and Liquid Limit <35 per ASTM D-4318.

- Material can be site excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the reinforced soil mass.

2.06 Geogrid Soil Reinforcement

- Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement

- applications and shall be manufactured from high tenacity polyester yarn.

2.07 Drainage Pipe

- The drainage pipe shall be perforated corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

PART 3 EXECUTION

3.01 Excavation

- Contractor shall excavate to the lines and grades shown on the construction drawings. Owner's representative shall be responsible for inspecting and approving the excavation prior to placement of leveling material or fill soils.

3.02 Base Leveling Pad

- Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6" in front and behind the modular wall unit.
- Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.03 Modular Unit Installation

- 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.
- 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.
- Install shear/connecting devices per manufacturer's recommendations.
- Place and compact drainage fill within and behind wall units. Follow wall erection and drainage fill closely with structure backfill.
- Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed three courses.

3.04 Structural Geogrid Installation

- Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
- Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.
- The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.

- 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 between adjacent pieces of geogrid are not permitted.

3.05 Reinforced Backfill Placement

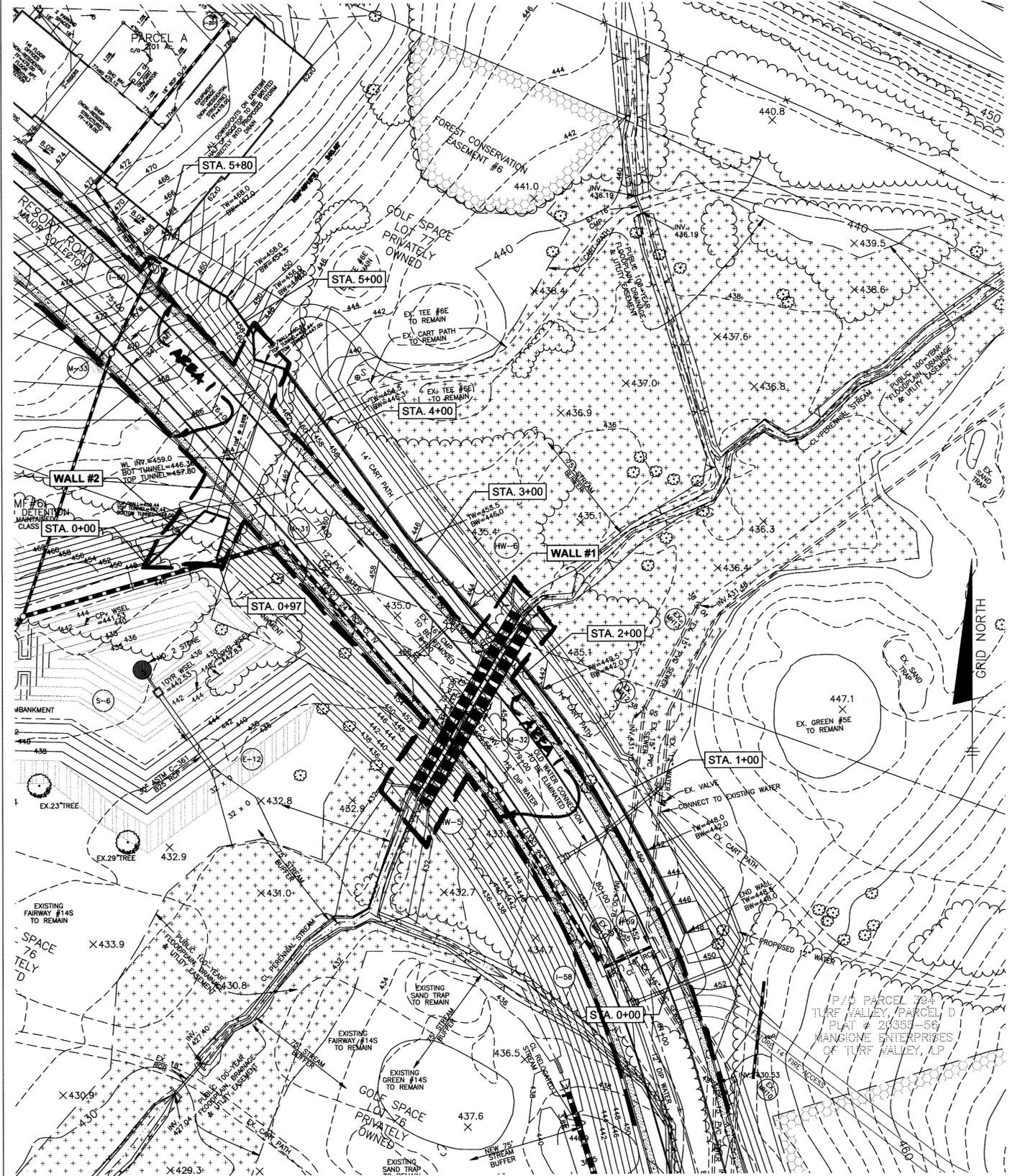
- Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.
- Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 - 10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.
- Reinforced backfill shall be compacted to 95% of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be + 3% to - 3% of optimum.
- Only lightweight hand-operated equipment shall be allowed within 3 feet from the tail of the modular concrete unit.
- 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 the geogrid.
- Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.
- 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

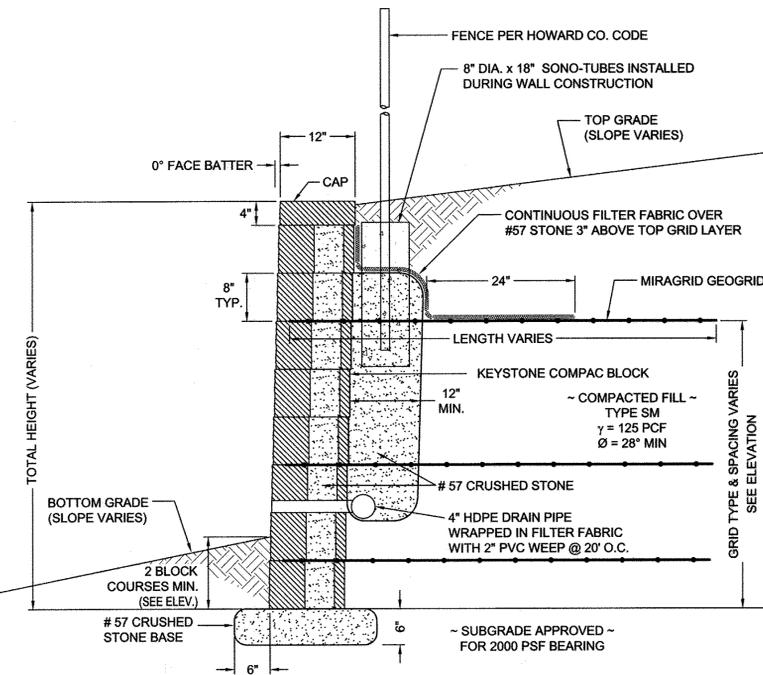
- Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

3.07 Field Quality Control

- The Owner shall engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction.
- As a minimum, quality assurance testing should include foundation soil inspection, soil and backfill testing, verification of design parameters, and observation of construction for general compliance with design drawings and specifications.



WALL LOCATION PLAN
1" = 40'



TYPICAL WALL SECTION (AREA 2)
N.T.S.

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter Wall 5-10-12
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Neil Sedore 5-15-12
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

John O'Connell 5/16/12
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 22390 Expiration Date: 6-30-15
 FOR REVISION #2 ONLY

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443 Expiration Date: 12-21-18

NO.	DATE	REVISION
2	7-8-2014	ADD PHASING LINE AND LABELS
1	12-4-2013	REVISE LOT NUMBERS & SHEET NUMBERS IN TITLE BLOCK

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. 24474 Expiration Date: 05/31/15

HILLIS-CARNES ENGINEERING ASSOCIATES
 10975 Guilford Road, Suite A Annapolis Junction, MD
 (410) 880-4788 Fax: (410) 880-4098

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

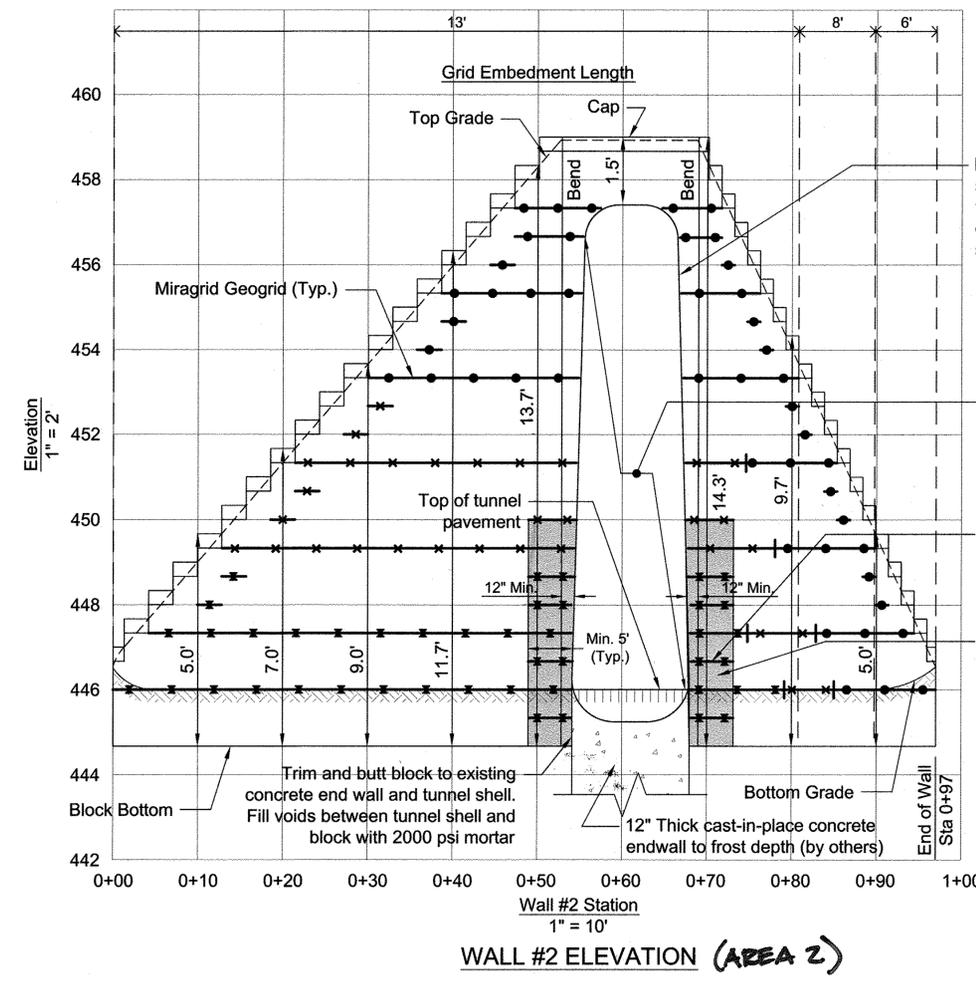
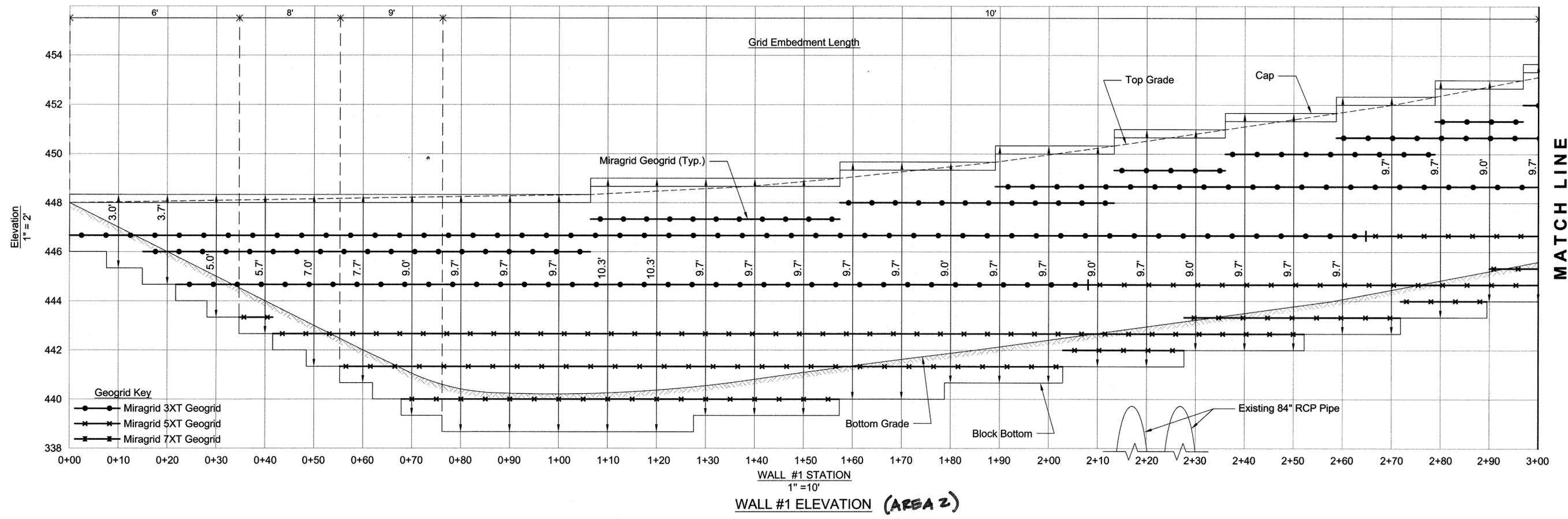
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

VILLAGES AT TURF VALLEY PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 17, 18, 208, 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1

TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P0 394, GRID: 17
 TAX MAP: 16, PARCEL: P10 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

RETAINING WALL PLAN AND DETAILS

DATE: MARCH, 2012 HCEA PROJECT NO. 12048-A
 SCALE: AS SHOWN SHEET 51 OF 56



Manufacturer provided continuous steel angle shall be installed by tunnel contractor along tunnel outside edge perimeter to restrain segmental block

12'-2" rise x 13'-10" span multi-plate steel tunnel (by others)

Additional full length geogrids each side of tunnel where shown

Fill block cells and voids solid with 2000 psi mortar in shaded area shown each side of tunnel

- Geogrid Key**
- Miragrid 3XT Geogrid
 - ✕ Miragrid 5XT Geogrid
 - ✕ Miragrid 7XT Geogrid

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



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-31-19

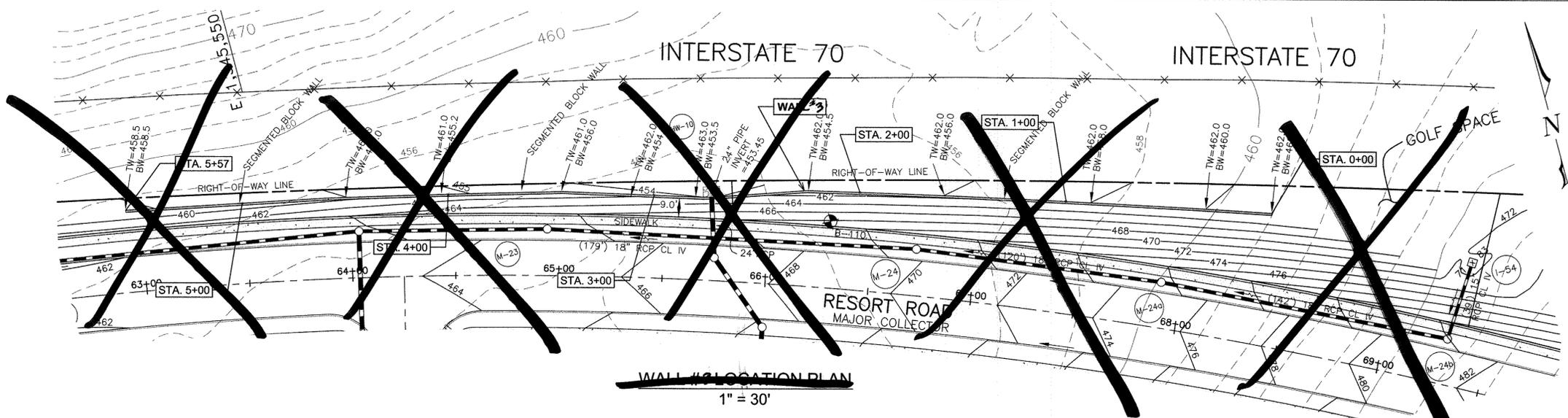
APPROVED: DEPARTMENT OF PUBLIC WORKS
W. J. [Signature] 5-10-12
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[Signature] 5-15-12
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 5/15/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 22390 Expiration Date: 6-20-15
FOR REVISION # 2 ONLY

<p>2 7-8-2014 ADD PHASING LABELS</p> <p>1 12-4-2013 REVISE LOT NUMBER & SHOWN NUMBER IN TITLE BLOCK</p>		
NO.	DATE	REVISION
<p>HILLIS-CARNES ENGINEERING ASSOCIATES 10975 Guilford Road, Suite A Annapolis Junction, MD (410) 880-4788 Fax: (410) 880-4088</p>		
OWNER:	<p>VILLAGES AT TURF VALLEY PHASE 2, SECTION 1 Lot 203, OPEN SPACE LOTS 204-207; GOLF SPACE LOTS 778, 208, 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS Cc1 DD-1 EE-1 FF-1</p>	
DEVELOPER:	<p>MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400</p>	
<p>RETAINING WALL #1 STATION 0+00 TO 3+00 AND WALL #2 ELEVATIONS</p>		
DATE:	MARCH, 2012	HCEA PROJECT NO. 12048-A
SCALE:	AS SHOWN	SHEET 52 OF 56



SPECIFICATIONS
MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 Description

- A. Work shall consist of furnishing and construction of a Modular Retaining Wall System in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
- B. Work includes preparing foundation soil, finishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.
- C. Work includes furnishing and installing geogrid soil reinforcement to the type, size, location, and lengths designated on the construction drawings.

1.02 Delivery, Storage and Handling

- A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.
- B. Contractor shall protect all materials from damage due to job site conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Modular Concrete Retaining Wall Units

- A. Modular concrete units shall conform to the following architectural requirements: face color - color may be specified by the Owner.
- face finish - sculptured rock face in angular tri-planer or flat configuration. Other finishes will not be allowed without written approval of Owner.
- bond configuration - running with bonds nominally located at midpoint 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 10 feet under diffused lighting.
- B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.
- C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:
 - compressive strength = 3000 psi minimum; absorption = 8% maximum (6% in northern states) for standard weight aggregates;
 - dimensional tolerances = ±1/8" from nominal dimensions not including rough split face, ±1/16" unit height - top and bottom planes; unit size - 8' (H) x 8' (W) x 12' (D) minimum;
 - unit weight - 75 lbs/unit minimum for standard weight

aggregates;

- inter-unit shear strength - 1000 pif minimum at 2 psi normal pressure; at 2 psi normal force.
- geogrid unit peak connection strength - 1000 pif minimum.
- D. Modular concrete units shall conform to the following construction requirements: (if applicable)
 - vertical setback = 1/8"± per course (near vertical) or 1"± per course per the design;
 - alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;
 - maximum horizontal gap between erected units shall be - 1/2 inch.

2.02 Shear Connectors (if applicable)

- A. Shear connectors shall be 1/2 inch diameter thermoset isophthalic polyester resin-protuded fiberglass reinforcement rods, equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to + 110 degrees F. 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 as shown on the construction drawings.

2.04 Unit Drainage Fill

- A. Unit drainage fill shall consist of #57 crushed stone

2.05 Geogrid Reinforced Backfill

- A. Reinforced backfill shall type SM, free of debris and meet the following gradation tests in accordance with ASTM D-422 and meet other properties shown on the plan:

Sieve Size	Percent Passing
2 inch	100%
3/4 inch	100%
No. 40	0-60
No. 200	0-35

Plasticity Index (PI) <10 and Liquid Limit <35 per ASTM D 4318.

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 yarn.

2.07 Drainage Pipe

- A. The drainage pipe shall be perforated corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

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 excavation prior to placement of leveling material or fill soils.

3.02 Base Leveling Pad

- A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6" in front and behind the modular wall unit.
- B. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.03 Modular Unit Installation

- A. First course of units shall be placed on the leveling pad at the appropriate line of grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.
- B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.
- C. Install shear/connecting devices per manufacturer's recommendation.
- D. Place and compact drainage fill within and behind wall units. Place compact backfill soil behind drainage fill. Follow wall section and drainage fill closely with structure backfill.
- E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction shall not exceed three 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 design drawings or as directed by the Engineer.
- C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.

- D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or laps 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.
- B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 to 10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.
- C. Reinforced backfill shall be compacted to 95% of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniform distributed throughout each layer and shall be - 3% to - 3% of optimum.
- D. Only lightweight hand-operated equipment shall be allowed within 3 feet from the top of the modular concrete unit.
- E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
- F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp 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.

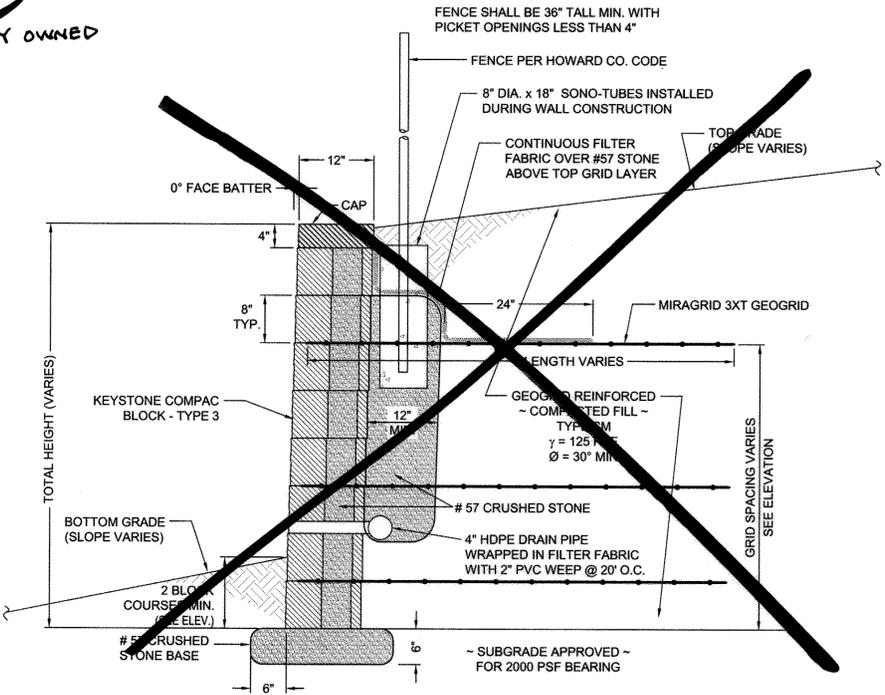
3.06 Cap Installation

- A. Cap units shall be glued to underlying units with an all-weather 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, soil and backfill testing, verification of design parameters, and observation of construction for general compliance with design drawings and specifications.

NOTE:
~~WALL TO BE PRIVATELY OWNED AND MAINTAINED.~~



TYPICAL WALL SECTION
N.T.S.

GENERAL 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, WABCEL, or equiv.) certified soils technician.
3. 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 Penetration test ASTM STP-399.
4. The suitability of fill material shall be confirmed by the on-site soils technician. Each 8 inch 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.
5. Walls shall not be constructed on unconfirmed fill materials.
6. Walls shall not be constructed within a Howard Co. right-of-way.

APPROVED: DEPARTMENT OF PUBLIC WORKS
Mark Z. Wall 9-3-13
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kathleen O'Leary 9-05-13
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

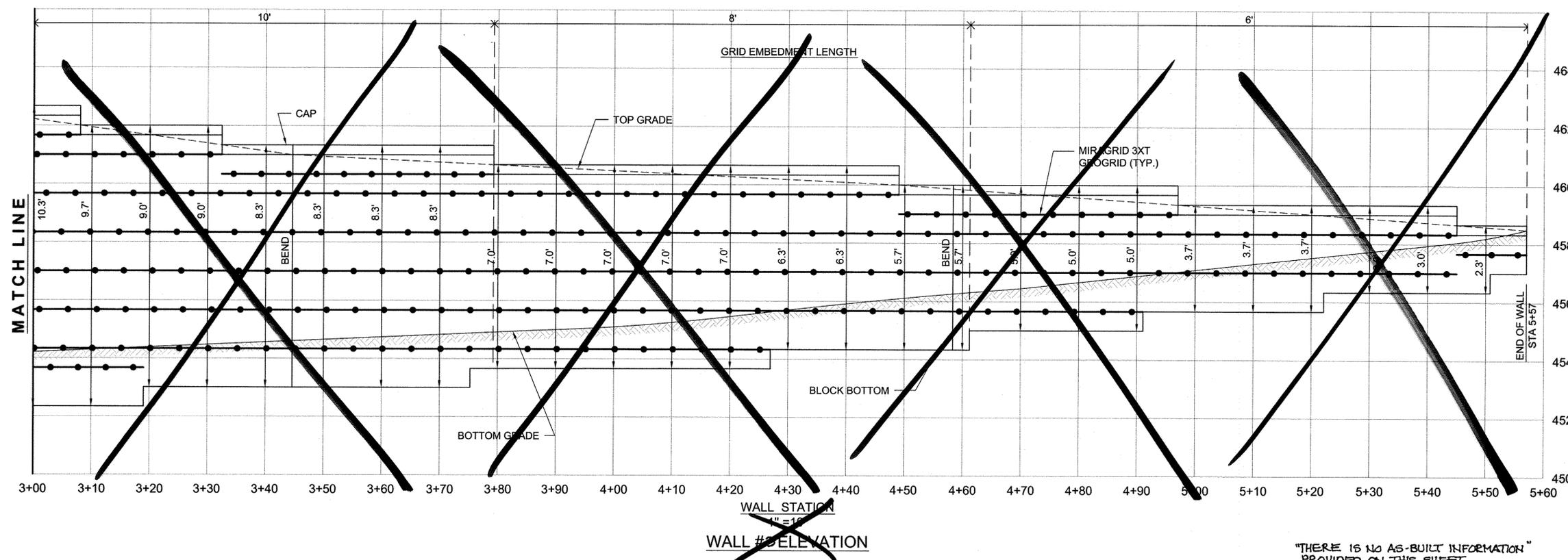
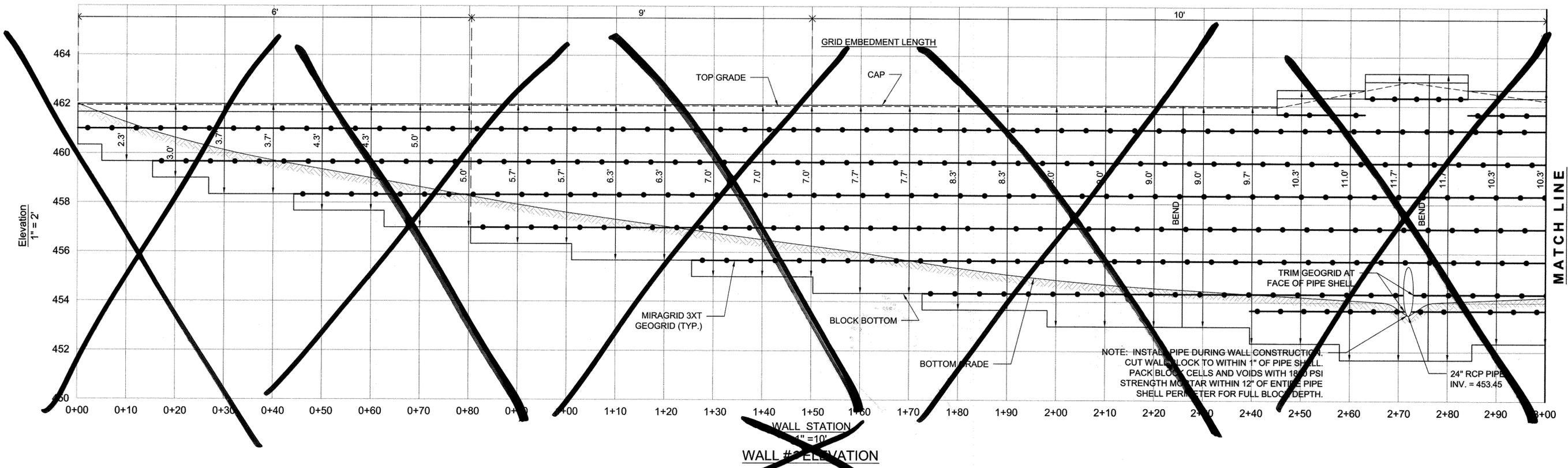
Tom Quinn 9/2/13
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-21-16

2 12-4-2013 DELETE ALL WALL INFO. REVISE LOT & SHEET NUMBERS IN TITLE BLOCK 1 8-27-2013 NEW SHEET ADDED FOR RETAINING WALL		
NO.	DATE	REVISION
HILLIS-CARNES ENGINEERING ASSOCIATES 19975 Guilford Road, Suite A Annapolis Junction, MD (410) 800-4788 Fax: (410) 880-4058		
OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400		VILLAGES AT TURF VALLEY PHASE 2, SECTION 1 LOT 2031 OPEN SPACE LOTS 204-2073 GOLF SPACE LOTS 7778, 208, 209; PARCELS A & B; NON-BUILDABLE BULK PARCELS - CC-1 DO-1 EE-1 FF-1 TAX MAP: 16, PARCEL: 401, GRID: 10 TAX MAP: 16, PARCEL: P10 394, GRID: 17 TAX MAP: 16, PARCEL: P10 8, GRID: 17 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED-PGCC
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400		RETAINING WALL #3 PLAN & DETAILS DATE: AUGUST, 2013 HCEA PROJECT NO. 12048-A SCALE: AS SHOWN SHEET 59 OF 56



APPROVED: DEPARTMENT OF PUBLIC WORKS
Wesley R. Wall 9-3-13
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Ket Stalder 9-05-13
 CHIEF, DIVISION OF LAND DEVELOPMENT
John P. ... 9/13
 CHIEF, DEVELOPMENT ENGINEERING DIVISION



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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-21-18

NO.	DATE	REVISION
2	12-4-2013	DELETE ALL WALL INFO. REVISE LOT & SHEET NUMBERS IN TITLE BLOCK.
1	8-27-2013	NEW SHEET ADDED FOR RETAINING WALL

HILLIS-CARNES
 ENGINEERING ASSOCIATES
 10975 Guilford Road, Suite A Annapolis Junction, MD
 (410) 890-4788 Fax: (410) 890-4098

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. 14346, Expiration Date: 05/13/15



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

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

VILLAGES AT TURF VALLEY
 PHASE 2, SECTION 1
 LOT 203; OPEN SPACE LOTS 204-207;
 GOLF SPACE LOTS 17, 18, 208, 209; PARCELS A & B;
 NON-BUILDABLE BULK PARCELS CC-1 DD-1 EE-1 FF-1
 TAX MAP: 16, PARCEL: 401, GRID: 10
 TAX MAP: 16, PARCEL: P10 394, GRID: 17
 TAX MAP: 16, PARCEL: P10 8, GRID: 17
 ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

RETAINING WALL #3 ELEVATION

DATE: AUGUST, 2013 HCEA PROJECT NO. 12048-A
 SCALE: AS SHOWN SHEET 55 OF 56

SPECIFICATIONS

MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 Description

- A. Work shall consist of furnishing and construction of a Modular Retaining Wall System in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
- B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.
- C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.

1.02 Delivery, Storage and Handling

- A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.
- B. Contractor shall protect all materials from damage due to job site conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Modular Concrete Retaining Wall Units

- A. Modular concrete units shall conform to the following architectural requirements: face color - color may be specified by the Owner.

face finish - sculptured rock face in angular tri-planer or flat configuration. Other face finishes will not be allowed without written approval of Owner.

bond configuration - running with bonds nominally located at midpoint 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 10 feet under diffused lighting.

- B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.

- C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:

compressive strength = 3000 psi minimum; absorption = 8% maximum (8% in northern states) for standard weight aggregates;

dimensional tolerances = ±1/8" from nominal unit dimensions not including rough split face, ±1/16"

unit height - top and bottom planes; unit size - 8" (H) x 18" (W) x 12" (D) minimum;

unit weight - 75 lbs/unit minimum for standard weight aggregates;

inter-unit shear strength - 1000 pif minimum at 2 psi normal pressure; at 2 psi normal force.

geogrid/unit peak connection strength - 1000 pif minimum

- D. Modular concrete units shall conform to the following constructability requirements: (if applicable)

vertical setback = 1/8" ± per course (near vertical) or 1" ± per course per the design;

alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;

maximum horizontal gap between erected units shall be 1/2 inch.

2.02 Shear Connectors (if applicable)

- A. Shear connectors shall be 1/2 inch diameter thermoset isothallic polyester resin-protuded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to +100 degrees F. 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 as shown on the construction drawings.

2.04 Unit Drainage Fill

- A. Unit drainage fill shall consist of #57 crushed stone

2.05 Geogrid Reinforced Backfill

- A. Reinforced backfill shall type SM, be free of debris and meet the following gradation tested in accordance with ASTM D-422 and meet other properties shown on the plan:

Sieve Size	Percent Passing
2 inch	100-75
3/4 inch	100-75
No. 40	0-60
No. 200	0-35

Plasticity Index (PI) <10 and Liquid Limit <35 per ASTM D-4318.

- B. Material can be site excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the reinforced soil mass.

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 yarn.

2.07 Drainage Pipe

- A. The drainage pipe shall be perforated corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

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 excavation prior to placement of leveling material or fill soils.

3.02 Base Leveling Pad

- A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6" in front and behind the modular wall unit.

- B. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

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- A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.

- B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.

- C. Install shear/connecting devices per manufacturer's recommendations.

- D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.

- E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed three 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 design drawings or as directed by the Engineer.

- C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next

course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.

- D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between short pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

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- 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.

- B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8-10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.

- C. Reinforced backfill shall be compacted to 95% of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be +3% to -3% of optimum.

- D. Only lightweight hand-operated equipment shall be allowed within 3 feet from the tail of the modular concrete unit.

- E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.

- F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp 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. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

3.07 Field Quality Control

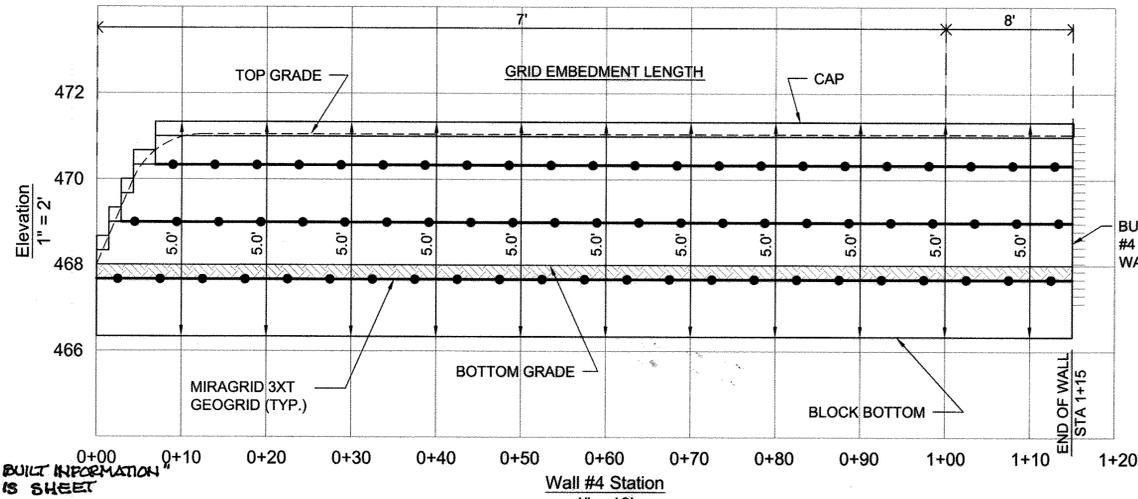
- A. The Owner shall engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction.

- B. As a minimum, quality assurance testing should include foundation soil inspection, soil and backfill testing, verification of design parameters, and observation of construction for general compliance with design drawings and specifications.

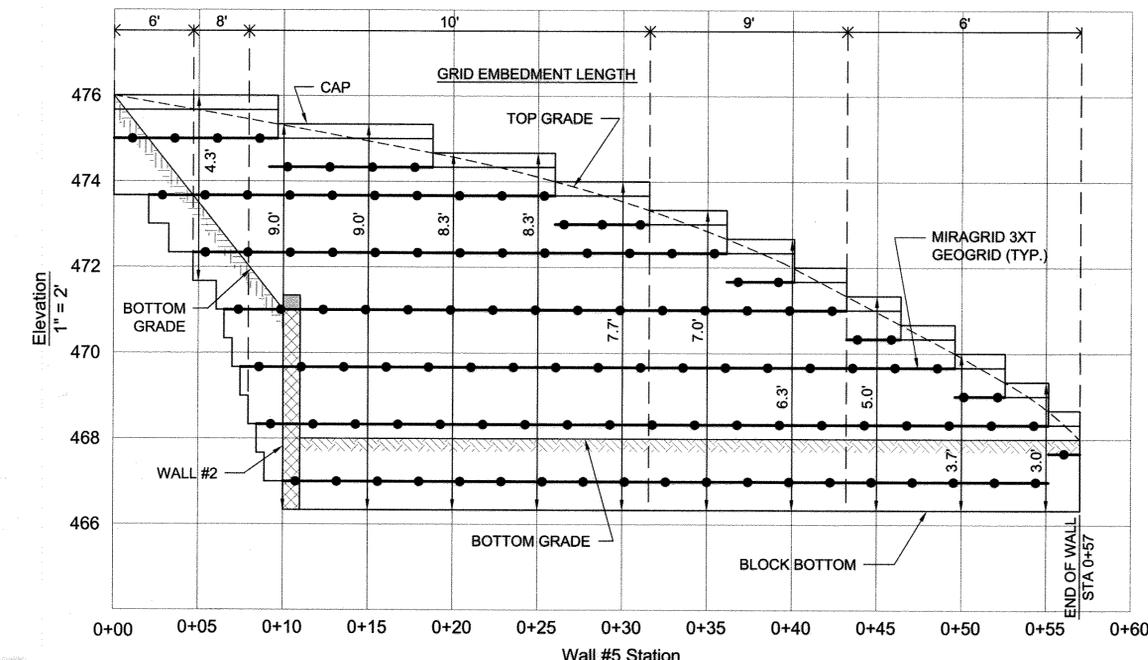
"THERE IS NO AS-BUILT INFORMATION PROVIDE ON THIS SHEET"



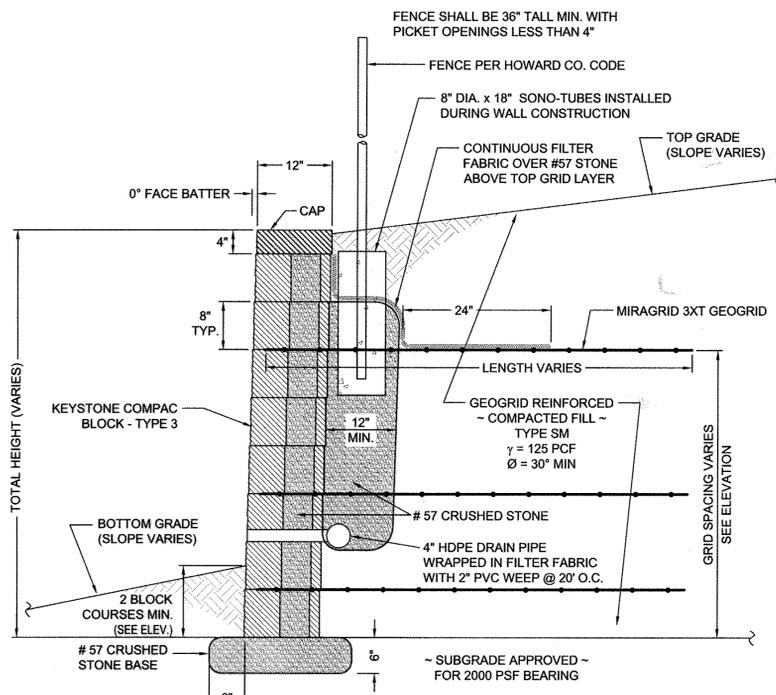
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-31-18



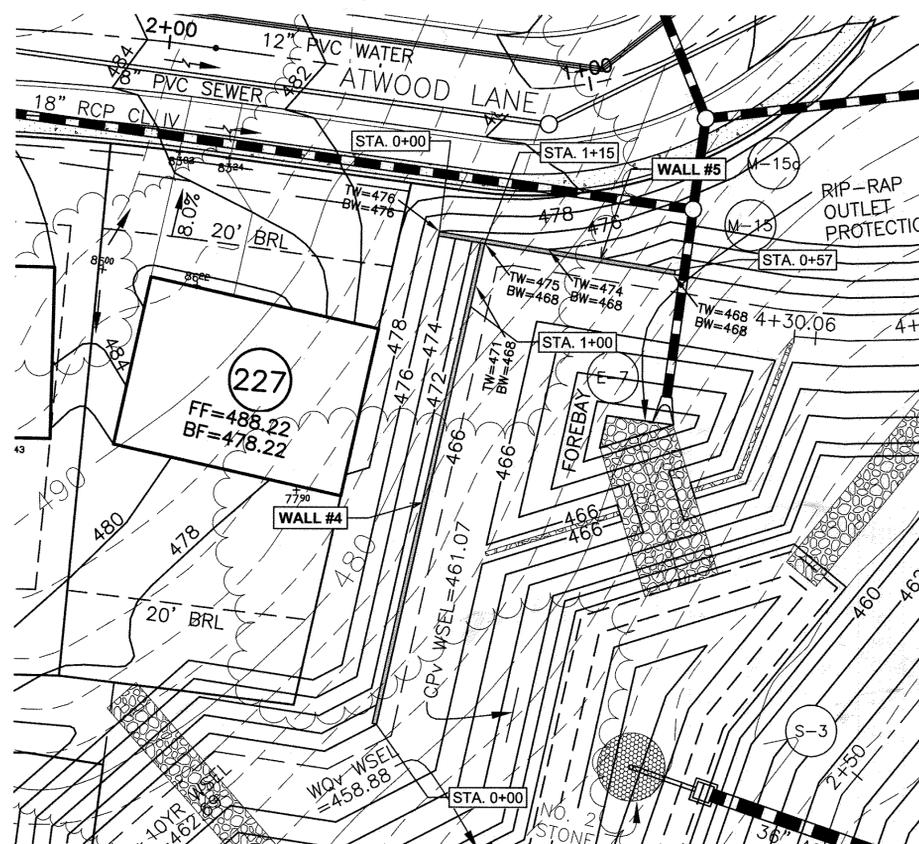
WALL #4 ELEVATION (AREA 2)
1" = 10'



WALL #5 ELEVATION (AREA 2)
1" = 5'



TYPICAL WALL SECTION (AREA 2)
N.T.S.



WALL #4 & #5 LOCATION PLAN (AREA 2)
1" = 20'

GENERAL 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, WACEL, or equiv.) certified soils technician.
- 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.
- 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.
- Walls shall not be constructed on uncertified fill materials.
- Walls shall not be constructed within a Howard Co. right-of-way or easement.

APPROVED: DEPARTMENT OF PUBLIC WORKS
1-9-14
APPROVED: DEPARTMENT OF PLANNING AND ZONING
1/23/14
1-15-14

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. 22320, Expiration Date: 6-30-15
PDE REVISION # 2 ONLY

NO.	DATE	REVISION
2	7-8-2014	ADD PHASING LABEL (AREA 2)
1	12-4-2013	ADDITIONAL SHEET ADDED TO SET

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A Annapolis Junction, MD
(410) 890-4788 Fax: (410) 890-4098

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

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

VILLAGES AT TURF VALLEY
PHASE 2, SECTION 1
LOT 203; OPEN SPACE LOTS 204-07;
GOLF SPACE LOTS 77, 78, 208, 209; PARCELS A & B;
NON-BUILDABLE BULK PARCELS CC-1, DD-1, EE-1, & FF-1
TAX MAP: 16, PARCEL: 401, GRID: 10
TAX MAP: 16, PARCEL: P/O 394, GRID: 17
TAX MAP: 16, PARCEL: P/O 8, GRID: 17
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND - ZONED: PGCC

RETAINING WALL #4 & #5
CONSTRUCTION DETAILS

DATE: DECEMBER, 2013 HCEA PROJECT NO. 12048-A
SCALE: AS SHOWN SHEET 56 OF 56