

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. MULDERBERG IN MARCH, 2006.
- 3.) THE EXISTING TOPOGRAPHY SHOWN ON SITE IS BASED ON AN AERIAL TOPOGRAPHIC SURVEY PERFORMED BY WINGS AERIAL MAPPING CO., INC. FLOWN ON OR 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 24-4522-D. THE DRAINAGE AREA IS LITTLE PATUXENT.
- 6.) SEWER IS PUBLIC. THE CONTRACT NUMBER IS 24-4522-D. THE DRAINAGE AREA IS LITTLE PATUXENT.
- 7.) STORMWATER MANAGEMENT QUALITY AND QUANTITY CONTROL IS PROVIDED WITHIN SWM #1 AND #2 (EXTENDED DETENTION FACILITIES WITH MICROPOOLS) AND THE 2 OFFLINE RECHARGE CHAMBERS. THE PONDS SHALL BE PRIVATELY OWNED AND JOINTLY MAINTAINED. THE RECHARGE CHAMBERS SHALL BE PRIVATELY OWNED AND PRIVATELY MAINTAINED.
- 8.) EXISTING UTILITIES SHOWN ARE BASED ON CONTRACT DRAWINGS, AERIAL AND FIELD SURVEYED LOCATIONS.
- 9.) THERE IS NO 100-YEAR FLOODPLAIN LOCATED WITHIN THE BOUNDARIES OF VILLAGES AT TURF VALLEY, PHASE 1, SECTION 2.
- 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 ESO-SCIENCE PROFESSIONALS, INC. IN JUNE 2002 AND APRIL 2004 (FOR DEVELOPMENT IN AND AROUND POND I, K, L, M, N, O, P, Q, & S).
- 11.) A NOISE STUDY IS NOT REQUIRED FOR VILLAGES AT TURF VALLEY, PHASE 1, SECTION 2.
- 12.) THE GEOTECHNICAL REPORT WAS PREPARED BY HELLIS CARNES ENGINEERING ASSOCIATES, INC. IN MARCH, 2006 AND SUPPLEMENTED IN AUGUST, 2007.
- 13.) THE SUBJECT PROPERTY IS ZONED PGCC PER THE 2-2-2004 COMPREHENSIVE ZONING PLAN AND THE "COMP 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 25% OR GREATER STEEP SLOPES THAT ARE AT LEAST 20,000 S.F. OF CONTIGUOUS AREA EXCEPT FOR THE DISTURBANCES TO THE STREAM BUFFER FOR THE CON/SPAN BRIDGE CROSSING OF RESORT ROAD. MDE PERMIT #20-NT-0009 / 200201454 EFFECTIVE 5-16-2008 WITH EXPIRATION OF DECEMBER 31, 2011.
- 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' (16' SERVING MORE THAN ONE RESIDENCE)
 - b) SURFACE - 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-2" MIN.)
 - c) GEOMETRY - MAX. 15% GRADE, MAX. 10% CHANGE & MIN. 45' TURNING RADIUS
 - d) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (25,000 LB)
 - 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 16.122A OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPV DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$25,300.00 (\$12,200.00 FOR 41/ SHADE TREES, \$13,050.00 FOR 87 EVERGREENS).
- 20.) THIS PROJECT IS EXEMPT FROM HOWARD COUNTY FOREST CONSERVATION REQUIREMENTS UNDER SECTION 16.1202D(1)(v) OF THE COUNTY CODE SINCE IT IS A PLANNED UNIT DEVELOPMENT WHICH HAD A PRELIMINARY DEVELOPMENT PLAN APPROVAL AND 50% OR MORE OF THE LAND WAS RECORDED AND SUBSTANTIALLY DEVELOPED BEFORE DECEMBER 31, 1992.
- 21.) FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT-OF-WAY LINE AND NOT ONTO THE PIPESTEM LOT DRIVEWAY.
- 22.) THERE ARE EXISTING STRUCTURES LOCATED ON NON-BUILDABLE BULK PARCEL BB TO REMAIN. NO NEW BUILDINGS, EXTENSIONS OR ADDITIONS TO THE EXISTING DWELLING ARE TO BE CONSTRUCTED AT A DISTANCE LESS THAN THE ZONING REGULATIONS REQUIREMENTS.
- 23.) RESERVATION OF PUBLIC UTILITY EASEMENTS - 300-365, 304-301 & 312. DEVELOPER RESERVES UNITED HEIREY AND ASSIGNS, ALL EASEMENTS SHOWN ON THIS PLAN FOR WATER, SEWER, STORM DRAINAGE, OTHER PUBLIC UTILITIES, LOCATED IN, ON, OVER AND THROUGH LOTS 1-15, 16, 21, 29, 30, 48-51, 80-83, LAND OPEN SPACES LOTS 64-67. ANY CONVEYANCES OF THE FORESAID LOTS/PARCELS SHALL BE SUBJECT TO THE EASEMENTS HEREON RESERVED, WHETHER OR NOT EXPRESSLY STATED IN THE DEED(S) CONVEYING SAID LOTS/PARCELS. UPON COMPLETION OF THE PUBLIC UTILITIES AND THEIR ACCEPTANCE BY HOWARD COUNTY, THE COUNTY SHALL ACCEPT THE EASEMENTS AND RECORD THE DEED(S) OF ACCEPTANCE IN THE LAND RECORDS OF HOWARD COUNTY.
- 24.) 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 7-27-07. ON WHICH DATE DEVELOPER AGREEMENT #24-4522-D WAS FILED AND ACCEPTED.
- 25.) 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.
- 26.) THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- 27.) 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 19-03)". A MINIMUM SPACING OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
- 28.) 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.
- 29.) ALL SIGN POSTS USED FOR TRAFFIC CONTROL DEVICES 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 SQUARE TUBE SLEEVE (12 GAUGE)-3" LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- 30.) THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE APRIL 13, 2004.
- 31.) ALL PROPOSED ALLEYS (UNITS WITH REAR LOAD GARAGES) ARE PRIVATE. THEY WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
- 32.) WP-05-074 A REQUEST TO WAIVE SECTION 16.116(a)(2)(ii) TO ALLOW GRADING, REMOVAL OF VEGETATIVE COVER AND TREES, PAVING AND NEW STRUCTURES WITHIN 75 FEET STREAM BUFFER FOR THE PURPOSE OF A RETAINING WALL FOR RESORT ROAD AT STATION 39+00 WAS DENIED ON MARCH 10, 2005. THE REMAINING DISTURBANCES IDENTIFIED ON THESE PLANS BY THEIR ENVIRONMENTAL IMPACT ID NUMBER WERE DEEMED AS NECESSARY BY DPZ DURING THE REVIEW OF 5-03-01.
- 33.) THIS PROJECT IS SUBJECT TO THE TRAFFIC STUDY PREPARED BY THE TRAFFIC GROUP, INC. UNDER S-86-13, AND DATED IN MARCH 2004.
- 34.) PARKING REQUIREMENTS AS PER ZONING SECTION 133.0(3):
 - 2 SPACES PER DWELLING UNIT
 - REQUIRED 68 UNITS x 2 = 136
 - PROVIDED: 2 SPACES EACH UNIT FROM GARAGES = 68 x 2 = 136

35) THE VILLAGES AT TURF VALLEY SUBDIVISION (PHASES 1-4) CONSTITUTED 241 TOTAL UNITS WHICH MET THE SKETCH PLAN MILESTONE DATE OF JANUARY 1, 2001 THROUGH JUNE 30, 2002 FOR BOTH PHASE I (A (131 UNITS) & I (B) (110 UNITS) AS ESTABLISHED BY THE REVISED PHASING PLAN DATED IN MARCH 2006. UNDER P-06-013, 42 CONDOMINIUM UNITS THAT WERE APPROVED WERE USED FOR OAKMONT AT TURF VALLEY (P-02-082). THESE 42 CONDOMINIUM UNITS WERE NOT PREVIOUSLY INCLUDED WITH THE OAKMONT AT TURF VALLEY (P-02-082) PLANS. IN ORDER TO RECEIVE BUILDING ALLOCATION THESE 42 CONDOMINIUM UNITS WERE INCLUDED IN THE PRELIMINARY PLAN FOR THE VILLAGES AT TURF VALLEY (P-06-013). THE SECOND AMENDMENT TO THE TURF VALLEY MULTI-USE FINAL DEVELOPMENT PLAN WAS RECORDED ON 30, 2007. THE REVISED PRELIMINARY PLAN FOR THE OAKMONT AT TURF VALLEY AREA FROM 150 TO 200. AS A RESULT, THOSE 42 UNITS ARE NO LONGER A PART OF THE VILLAGES AT TURF VALLEY WHICH LEAVES UNIT TOTAL AT 199. HOWEVER, WITH THE APPROVAL OF WP-06-009 AN ADDITIONAL 21 UNITS WERE ADDED TO THE VILLAGES AT TURF VALLEY. THE FINAL UNIT TOTAL FOR THIS SUBDIVISION COMES TO 220.

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 12-15-09
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 12/24/09
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 12/28/09
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

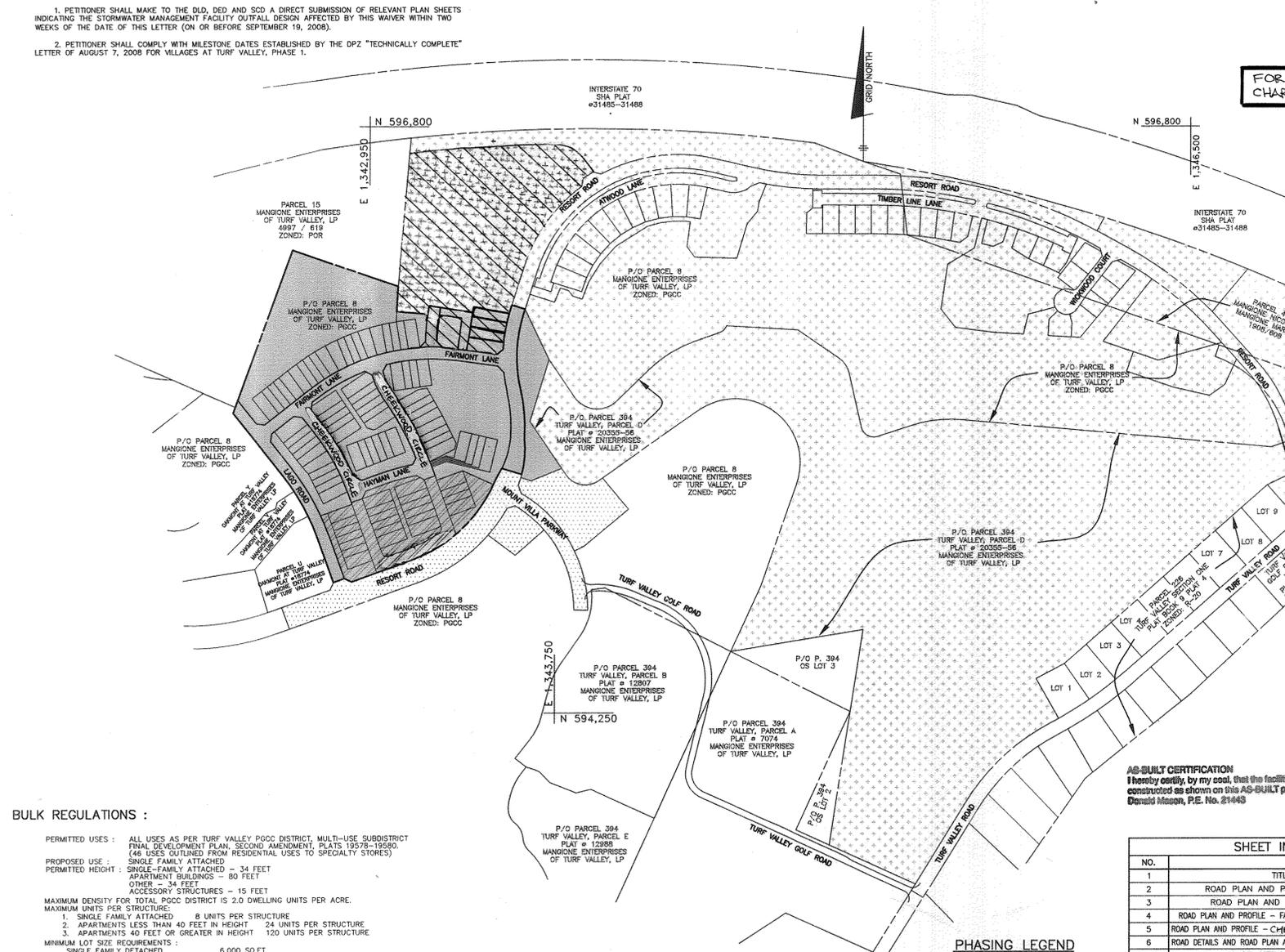
VILLAGES AT TURF VALLEY

PHASE 1 SECTION 2 & SECTION 3

ROADS, STORMWATER MANAGEMENT AND STORM DRAIN CONSTRUCTION PLANS

- 36.) WP-08-009, A WAIVER PETITION TO SECTION 16.143(c) AND 16.146 (c) WHICH REQUIRES A SUBMISSION OF A SKETCH PLAN AND PRELIMINARY PLAN, RESPECTIVELY TO ALLOW THE ADDITION OF 21 UNITS TO VILLAGES AT TURF VALLEY WAS APPROVED ON 12-12-2007 WITH THE FOLLOWING CONDITIONS:
 1. PETITIONER SHALL COMPLY WITH ALL RELEVANT REGULATIONS AT THE TIME OF SITE DEVELOPMENT PLAN SUBMISSION FOR ALL DEVELOPMENT PROPOSED ON LOT 103 OF "VILLAGES AT TURF VALLEY, PHASE 2" (P-08-084).
 2. PETITIONER SHALL COMPLY WITH ALL RELEVANT STORMWATER MANAGEMENT REGULATIONS AT THE TIME OF SITE DEVELOPMENT PLAN SUBMISSION FOR PROPOSED DEVELOPMENT OF LOT 103 OF "VILLAGES AT TURF VALLEY, PHASE 2" (P-08-084).
- 37.) WP-09-004, A WAIVER PETITION TO SECTION 16.116(a)(2)(i) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, WHICH STATES: GRADING, REMOVAL OF VEGETATIVE COVER AND TREES, PAVING AND NEW STRUCTURES SHALL NOT BE PERMITTED WITHIN 50 FEET OF AN INTERMITTENT STREAM BANK WAS APPROVED ON 12-12-2007 WITH THE FOLLOWING CONDITIONS:
 1. PETITIONER SHALL MAKE TO THE BLD, DED AND SCD A DIRECT SUBMISSION OF RELEVANT PLAN SHEETS INDICATING THE STORMWATER MANAGEMENT FACILITY OUTFALL DESIGN AFFECTED BY THIS WAIVER WITHIN TWO WEEKS OF THE DATE OF THIS LETTER (ON OR BEFORE SEPTEMBER 19, 2008).
 2. PETITIONER SHALL COMPLY WITH MILESTONE DATES ESTABLISHED BY THE DPZ "TECHNICALLY COMPLETE" LETTER OF AUGUST 7, 2008 FOR VILLAGES AT TURF VALLEY, PHASE 1.
- 38.) OPEN SPACE DEDICATION FOR LOTS 69, 69, 05, 66, 306 AND 307 AND 312:

THE OPEN SPACE SHOWN HEREON IS HEREBY DEDICATED TO A PROPERTY OWNERS ASSOCIATION FOR THE RESIDENTS OF THIS SUBDIVISION AND RECORDING REFERENCES OF THE ARTICLES OF INCORPORATION AND RESTRICTIONS ARE SHOWN HEREON.
- 39.) PRIOR TO GRADING PERMIT APPLICATION, THE PROJECT SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 16.129 OF THE HOWARD COUNTY CODE.
- 40.) PER HOWARD COUNTY COMMENTS, MOUNT VILLA PARKWAY IS LABELED AS A "PUBLIC ACCESS STREET". HOWEVER, IT HAS BEEN DESIGNATED AS A MAJOR COLLECTOR BASED ON PROJECTED FUTURE ADTs.
- 41.) THE 6 UNITS/LOTS PROPOSED IN P153 (LOTS 300-305) ARE BEING TRANSFERRED FROM THE 59 UNIT/LOTS PREVIOUSLY APPROVED FOR VILLAGES AT TURF VALLEY, PHASE 3, P-08-085.



BULK REGULATIONS:

PERMITTED USES: ALL USES AS PER TURF VALLEY PGCC DISTRICT, MULTI-USE SUBDISTRICT FINAL DEVELOPMENT PLAN, SECOND AMENDMENT, PLATS 19578-19580. (06 USES OUTLINED FROM RESIDENTIAL USES TO SPECIALLY STORED)

PROPOSED USE: SINGLE FAMILY ATTACHED - 34 FEET

PERMITTED HEIGHT: APARTMENT BUILDINGS - 80 FEET
 OTHER - 34 FEET
 ACCESSORY STRUCTURES - 15 FEET

MAXIMUM DENSITY FOR TOTAL PGCC DISTRICT IS 2.0 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 RESIDENTIAL STRUCTURE = 120 FEET, UNLESS APPROVED BY PLANNING BOARD TO A MAXIMUM OF 300 FEET.

PERMITTED SETBACKS:
 FROM ARTERIAL ROADS:
 RESIDENTIAL STRUCTURES - 50 FEET
 ACCESSORY STRUCTURES - 30 FEET
 PARKING - 25 FEET
 FROM LOT LINES WITHIN PGCC MULTI-USE SUBDISTRICT:
 ZERO LOT LINE AND ALL OTHER USES - SIDE - 0 FEET SINGLE FAMILY DETACHED SIDE - 7.5 FEET
 A MINIMUM OF 10 FEET MUST BE PROVIDED BETWEEN STRUCTURES
 RESIDENTIAL - REAR - 20 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
 FROM NON-PGCC ADJACENT PROPERTIES:
 FROM RESIDENTIAL DISTRICTS - 75 FEET
 FROM ALL OTHER DISTRICTS - 30 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% MAXIMUM LOT COVERAGE REQUIREMENT FOR SFA LOTS AND NO SPECIFIED COVERAGE REQUIREMENT FOR APARTMENTS.

PHASING LEGEND:

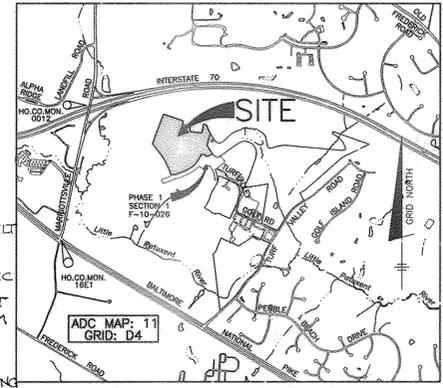
- PHASE 1 SECTION 1 F-10-026
- PHASE 1 SECTION 2 F-08-060
- PHASE 2 F-08-084
- PHASE 3 F-08-084
- PHASE 4 F-08-086

PLAN VIEW SCALE: 1" = 300'

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: 3438001)
 STAMPED BRASS DISK SET ON TOP OF A 3" DEEP COLUMN OF CONCRETE.
 N 596502.760' E 1340864.37'
 ELEVATION: 466.298'



- AS-BUILT NOTES:**
- 1.) HORIZONTAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD 83/ADJ 07 AS PROJECTED FROM HO. CO. GEODETIC CONTROL STATIONS 16E1 AND 0012. VERTICAL DATUM FOR THIS AS-BUILT IS NORTH AMERICAN VERTICAL DATUM NGVD 29 AS PROJECTED FROM THE ABOVE MENTIONED HOWARD COUNTY GEODETIC CONTROL STATIONS.
 - 2.) THE INSTRUMENTS USED IN PERFORMING THIS AS-BUILT WERE A 5" TOTAL STATION AND PRISM AND RTK GPS.
 - 3.) THIS AS-BUILT WAS PERFORMED BY BENCHMARK ENGINEERING, INC.

FOR RIGHT-OF-WAY ELEVATION CHART SEE SHEET NO. 6

VILLAGES AT TURF VALLEY PHASING CHART

PHASE/SECTION	SFA	SFD	CONDOMINIUM	TOTAL
P151 (F-10-026)	0	0	0	0
P152 (F-08-060)	41	21	0	62
P153 (F-10-026)	6	0	0	6
P251 (F-08-084)	0	0	44*	44
P252 (F-10-026)	0	48	0	48
P4 (F-08-086)	15	8	0	23
P8 (F-10-026)	36	0	0	36
MAIN SHOPS (P-08-074)	0	0	1 (ACCESS APN)	1
TOTAL	96	77	44*	220

* FUTURE CONDO BUILDING ON LOT 203

SITE ANALYSIS DATA CHART

GENERAL SITE DATA

- 1.) PRESENT ZONING: PGCC MULTI-USE SUBDISTRICT
- 2.) APPLICABLE DPZ FILE REFERENCES: S-03-01, WP-05-074, WP-08-009, S-86-13, P-06-13, P-24-4605-9, F-10-026, WP-08-084, WP-09-211
- 3.) PROPOSED USE OF SITE: RESIDENTIAL P-15-076
- 4.) PROPOSED WATER AND SEWER SYSTEMS: PUBLIC F-17-013

AREA TABULATION

	P152	P153
1.) GROSS TRACT AREA	27.75 AC±	1136 AC.
2.) AREA WITHIN 100-YEAR FLOODPLAIN	0.00 AC±	0
3.) TOTAL AREA OF 25% OR GREATER STEEP SLOPES	0.44 AC±	0
4.) AREA NOT IN FLOODPLAIN (FOR NTA CALC)	0.44 AC±	0
4.) NET TRACT AREA	27.31 AC±	1136 AC.
5.) TOTAL NUMBER OF LOTS ALLOWED PER ZONING	NA	NA
6.) TOTAL NUMBER OF RESIDENTIAL UNITS/LOTS PROPOSED ON THIS SUBDIVISION	62	6
7.) AREA OF BUILDABLE LOTS	7.992 AC.	10.5 AC.
AREA OF OPEN SPACE LOTS	5.992 AC.	2.14 AC.
AREA OF NON-BUILDABLE BULK PARCELS	9.452 AC.	10.18 AC.
AREA OF PUBLIC RIGHT-OF-WAY	4.922 AC.	0

OPEN SPACE DATA

OPEN SPACE REQUIRED (50% OF PGCC DISTRICT) (15% OF MULTI-USE SUBDISTRICT)

TOTAL AREA OF THIS PHASE (PHASE 1 SECTION 2): 27.752 AC. 11.38 AC.

TOTAL AREA OF OPEN SPACE (REQUIRED): 4.168 AC. NA*

OPEN SPACE PROVIDED (19.2%) 5.582 AC. 0.14 AC.

NON-CREDITED (LESS THAN 35' IN WIDTH) 0.652 AC. 0.14 AC.

CREDITED 4.682 AC. 0.05 AC.

OPEN SPACE FROM PHASE 1 SECTION 1 CREDITED TOWARD THIS PHASE 1.644 AC.

TOTAL CREDITED OPEN SPACE THIS PHASE 6.322 AC.

* OPEN SPACE FOR P153 WAS PROVIDED UNDER PHASE 2 SECTION 1 F-08-084.

AS-BUILT CERTIFICATION
 I, the undersigned, hereby certify that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
 Donald Mason, P.E. No. 21448 Date: 1-4-17

SHEET INDEX

NO.	TITLE
1	TITLE SHEET
2	ROAD PLAN AND PROFILE - RESORT ROAD
3	ROAD PLAN AND PROFILE - LAGO ROAD
4	ROAD PLAN AND PROFILE - FARMONT LANE AND BLUE HAVEN LANE
5	ROAD PLAN AND PROFILE - CHEEKWOOD CIRCLE AND HAYMAN LANE
6	ROAD DETAILS AND ROAD PLAN AND PROFILE - CHEEKWOOD CIRCLE
7	CURB RETURN FILLET PROFILES
8	STREET LIGHT, STREET SIGN AND STREET STRIPING PLAN
9	GRADING, SEDIMENT AND EROSION CONTROL PLAN
10	GRADING, SEDIMENT AND EROSION CONTROL PLAN
11	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
12	STORM DRAIN DRAINAGE AREA MAP
13	STORM DRAIN PROFILES AND DETAILS
14	STORM DRAIN PROFILES AND DETAILS
15	LANDSCAPE AND STREET TREE PLAN
16	LANDSCAPE AND STREET TREE PLAN
17	SWM DETAILS - FACILITY #2
18	SWM DETAILS - FACILITY #2
19	INTERNAL SWM LANDSCAPING PLAN AND SOIL BORING LOGS
20	CON/SPAN - TITLE SHEET, LOCATION PLAN & GENERAL NOTES
21	CON/SPAN - BRIDGE PLAN AND DETAILS
22	CON/SPAN - FOUNDATION PLAN
23	CON/SPAN - FOOTING SECTIONS & DETAILS
24	CON/SPAN - ELEVATIONS, SECTIONS & DETAILS
25	CON/SPAN - SPECIFICATIONS
26	CON/SPAN - SPECIFICATIONS

3 10-20-2010 DELETE BLUE HAVEN LANE. UPDATE NOTES AND SITE ANALYSIS CHART.

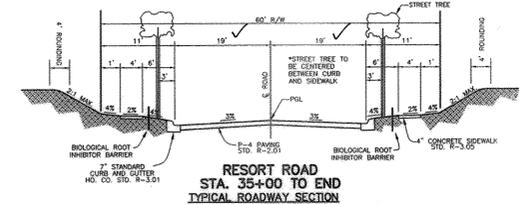
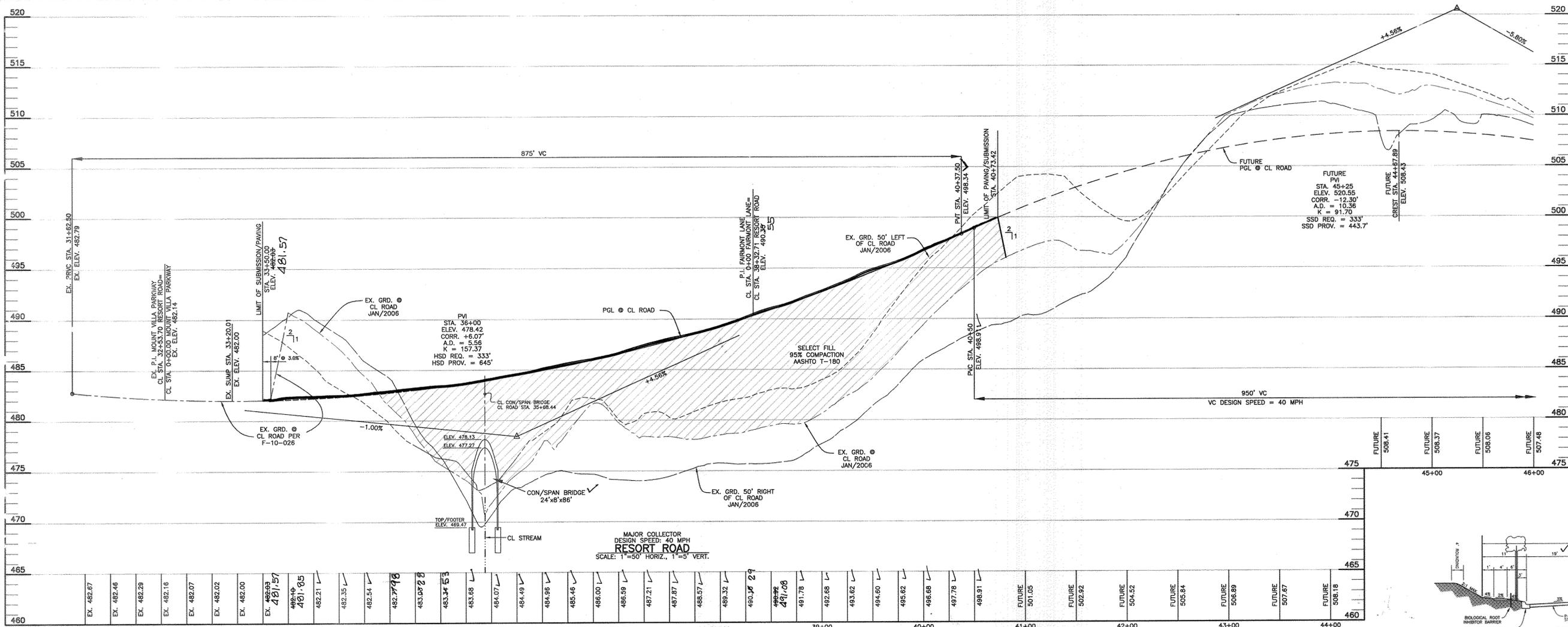
2 4-8-15 REVISE TITLE BLOCK TO ADD P153 LOTS. REVISE PLAN VIEW. UPDATE GEN ARTS 19, 23, 39, 36 AND ADD NOTE 41. UPDATE SITE ANALYSIS CHART

1 5-27-2012 REVISE LOT CONFIGURATION, SITE ANALYSIS CHART, TITLE BLOCK, REVISE BLUE CREST LANE TO CHEEKWOOD CIRCLE, REVISE GEN NOTES 19, 35, 36

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

VILLAGES AT TURF VALLEY
 PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 64, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2.

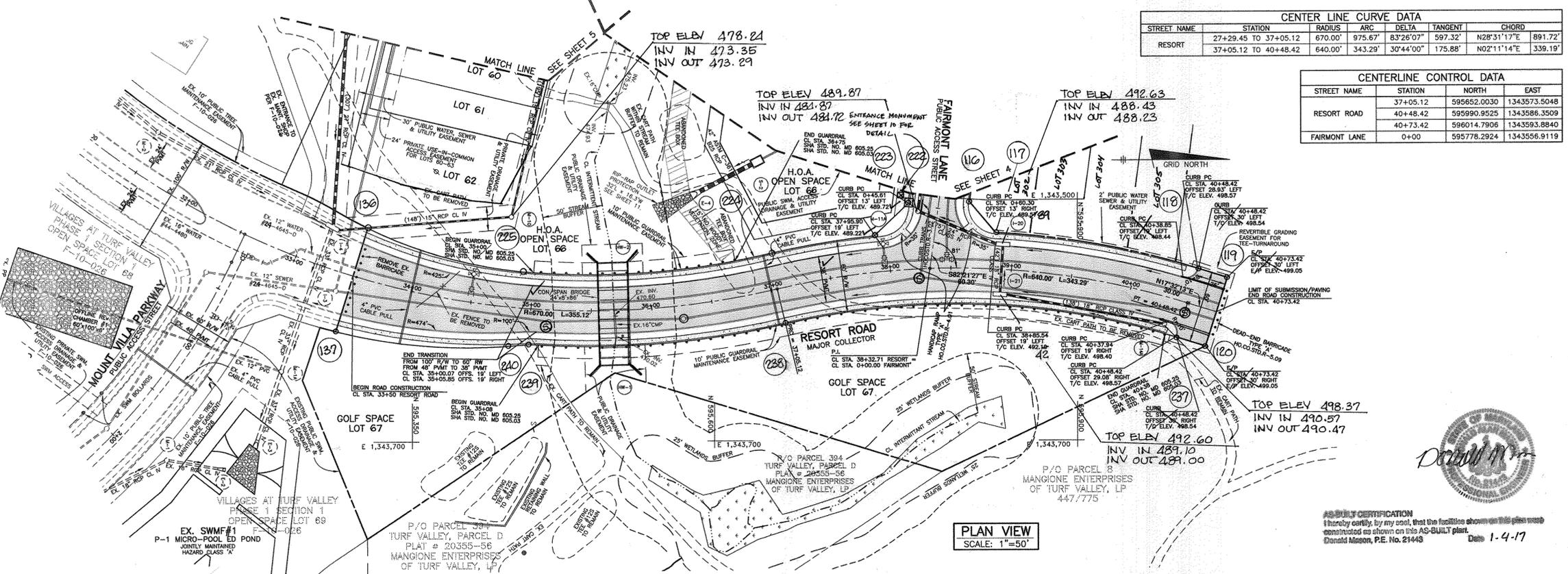
TITLE SHEET
 DATE: OCTOBER 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 1 OF 26



STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
RESORT	27+29.45 TO 37+05.12	670.00'	975.67'	B ³ 26'07"	597.32'	N28°31'17"E 891.72'
RESORT	37+05.12 TO 40+48.42	640.00'	343.29'	30°44'00"	175.88'	N02°11'14"E 339.19'

STREET NAME	STATION	NORTH	EAST
RESORT ROAD	37+05.12	595652.0030	1343573.5048
RESORT ROAD	40+48.42	595990.9525	1343586.3509
RESORT ROAD	40+73.42	596014.7906	1343593.8840
FAIRMONT LANE	0+00	595778.2924	1343556.9119

APPROVED: DEPARTMENT OF PUBLIC WORKS
William J. ... 12-15-09
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Keith ... 12/21/09
 CHIEF, DIVISION OF LAND DEVELOPMENT
... 12/18/09
 CHIEF, DEVELOPMENT ENGINEERING DIVISION



NO.	DATE	REVISION
4	11-3-2016	ADD ENTRANCE MONUMENT
3	4-8-15	ADD P153 LOTS 302-305, UPDATE TITLE BLOCK TO INCLUDE P163 LOTS
2	11-26-12	REVISE SIDE LOT LINE OF LOT 62.
1	5-29-2012	REVISE LOT NUMBERS AND TITLE BLOCK

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

ROAD PLAN AND PROFILE
 RESORT ROAD
 DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 2 OF 26

AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
 Donald Mason, P.E. No. 21448 Date 1-4-17

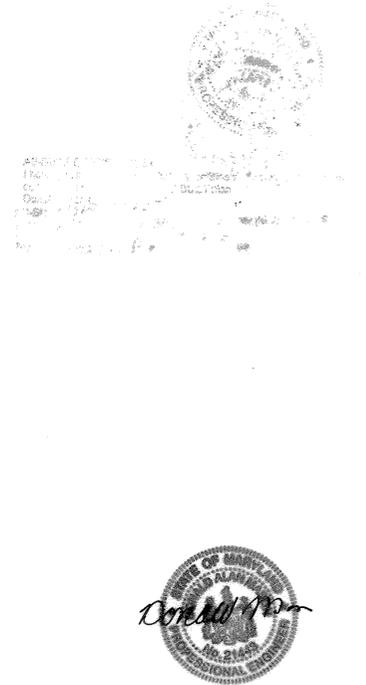
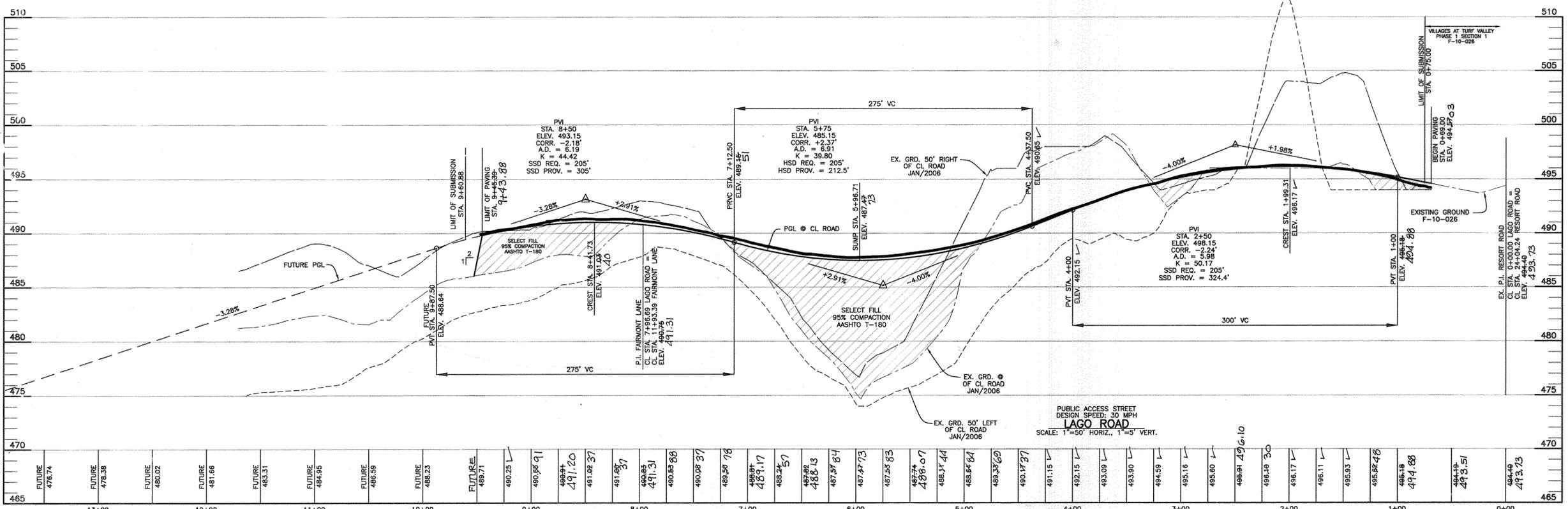
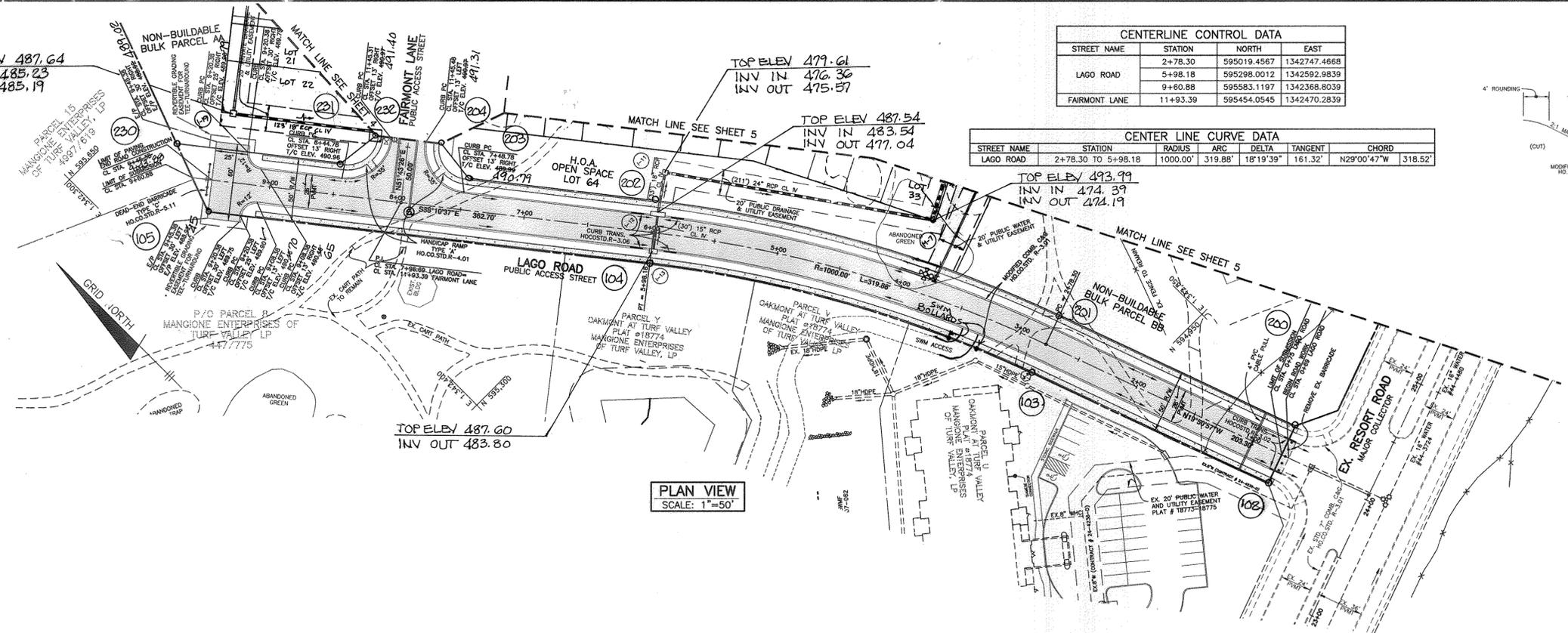
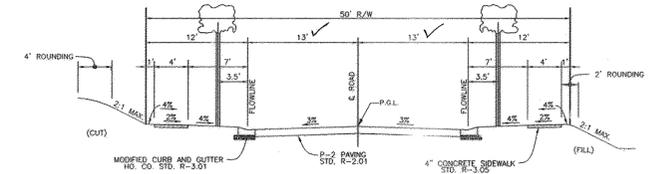
TOP ELEV 487.64
INV IN 485.23
INV OUT 485.19

TOP ELEV 479.61
INV IN 476.36
INV OUT 475.57

TOP ELEV 487.54
INV IN 483.54
INV OUT 477.04

CENTERLINE CONTROL DATA			
STREET NAME	STATION	NORTH	EAST
LAGO ROAD	2+78.30	595019.4567	1342747.4668
LAGO ROAD	5+98.18	595298.0012	1342592.9839
LAGO ROAD	9+60.88	595583.1197	1342368.8039
FAIRMONT LANE	11+93.39	595454.0545	1342470.2839

CENTER LINE CURVE DATA						
STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
LAGO ROAD	2+78.30 TO 5+98.18	1000.00'	319.88'	18°19'39"	161.32'	N29°00'47"W 318.52'



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443
Date: 1-4-17

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter J. Mahan 12-15-09
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Walter J. Mahan 12/15/09
CHIEF, DIVISION OF LAND DEVELOPMENT

Donald M. Mason 12/15/09
CHIEF, DEVELOPMENT ENGINEERING DIVISION

NO.	DATE	REVISION
4	4-8-19	REVISE TITLE BLOCK TO INCLUDE PLS3
3	12-4-2012	RELOCATE SWIM ACCESS TO PARCEL V TO BE OFF LAGO ROAD
2	9-24-2012	REVISE MT LOCATION AND LOT LINES FOR LOTS 29-33
1	5-29-2012	REVISE LOT LINES AND STORM DRAIN BY LOT 23 AND AT M-7. REVISE TITLE BLOCK

3 12-4-2012 RELOCATE SWIM ACCESS TO PARCEL V TO BE OFF LAGO ROAD
2 9-24-2012 REVISE MT LOCATION AND LOT LINES FOR LOTS 29-33
1 5-29-2012 REVISE LOT LINES AND STORM DRAIN BY LOT 23 AND AT M-7. REVISE TITLE BLOCK

NO. DATE REVISION

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.BC-ENR.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: 12-31-2019.

Donald M. Mason 10-23-09
PROFESSIONAL ENGINEER

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

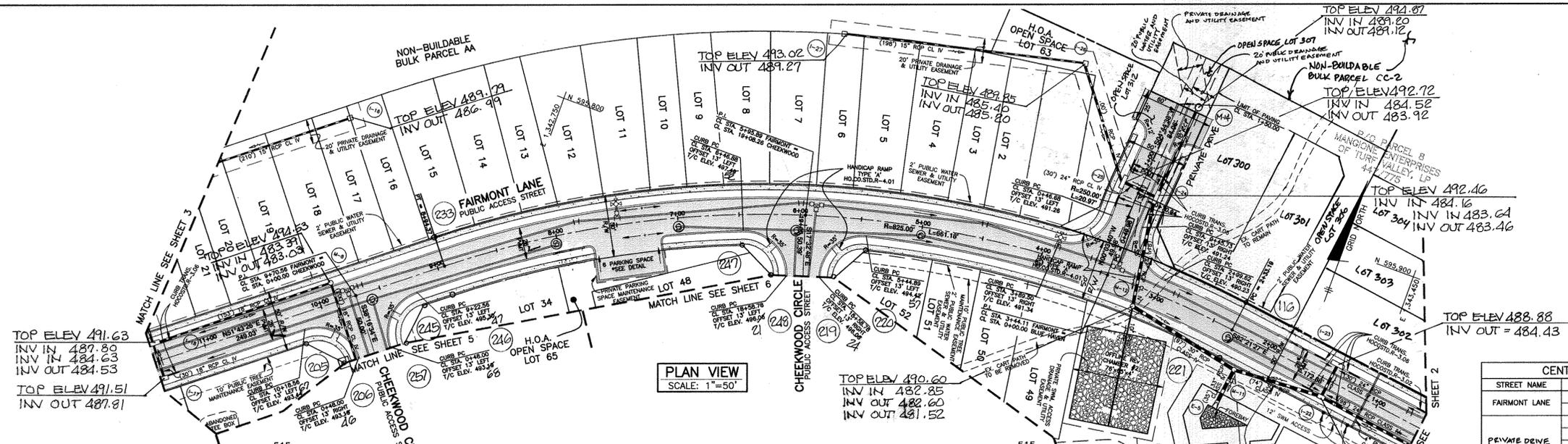
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY
PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA, BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/O 8
ZONED: PGCC
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

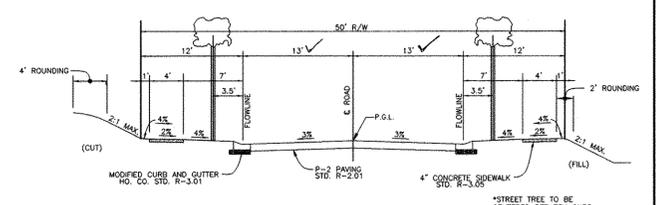
ROAD PLAN AND PROFILE
LAGO ROAD

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 3 OF 26



TOP ELEV 491.63
INV IN 487.80
INV OUT 484.63
TOP ELEV 491.51
INV OUT 487.81

PLAN VIEW
SCALE: 1"=50'



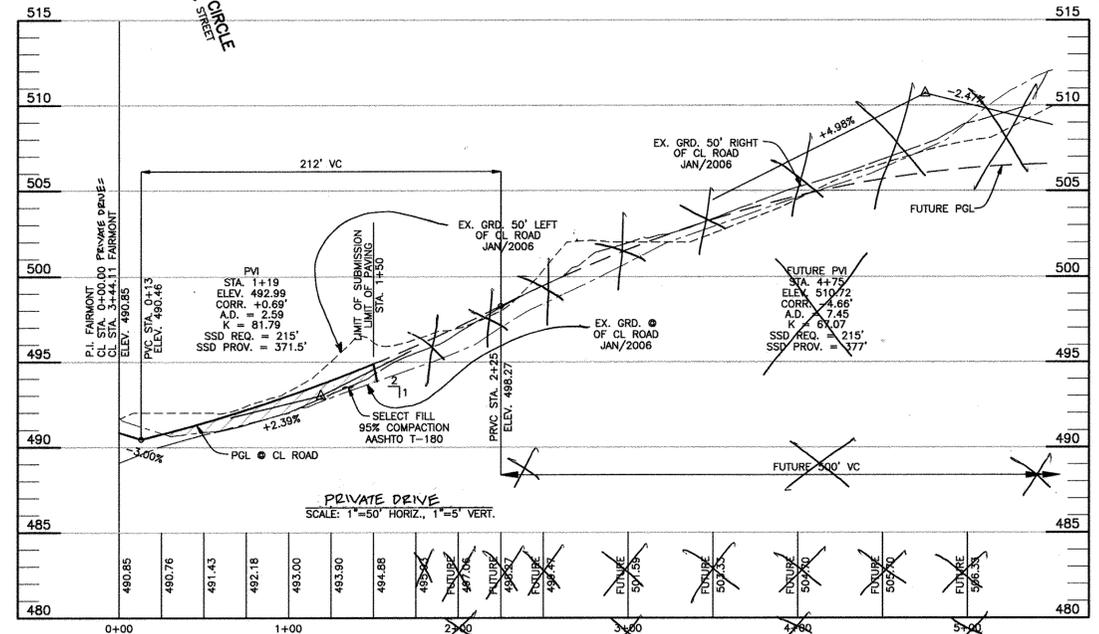
FAIRMONT LANE
TYPICAL ROADWAY SECTION
(PUBLIC ACCESS STREET - LESS THEN 1000 ADT)
DESIGN SPEED: 30 MPH
SCALE: 1"=10'

CENTERLINE CONTROL DATA

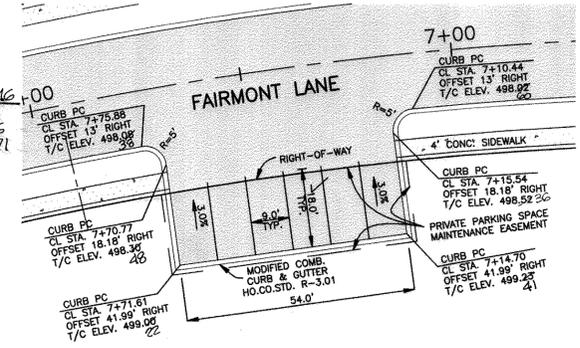
STREET NAME	STATION	NORTH	EAST
FAIRMONT LANE	2+33.19	595809.3045	1343225.7980
	8+94.37	595639.2877	1342705.0319
	0+00.00	595816.6326	1343215.1967
PRIVATE DRIVE	0+49.98	595866.107	1343215.1433
	0+70.94	595887.5530	1343215.9996
	1+50.00	595966.3381	1343222.5375
CHEEKWOOD CIRCLE	19+08.26	595778.2469	1342967.3542
	0+00.00	595592.0901	1342645.2179

CENTER LINE CURVE DATA

STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
FAIRMONT	2+33.19 TO 8+94.37	825.00'	661.18'	45°50'07"	349.50'	S74°41'00"W 643.63'
PRIVATE DRIVE	0+49.98 TO 0+70.94	250.00'	20.97'	04°48'18"	10.49'	N02°20'29"E 20.96'



PRIVATE DRIVE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



PARKING DETAIL
SCALE: 1"=20'

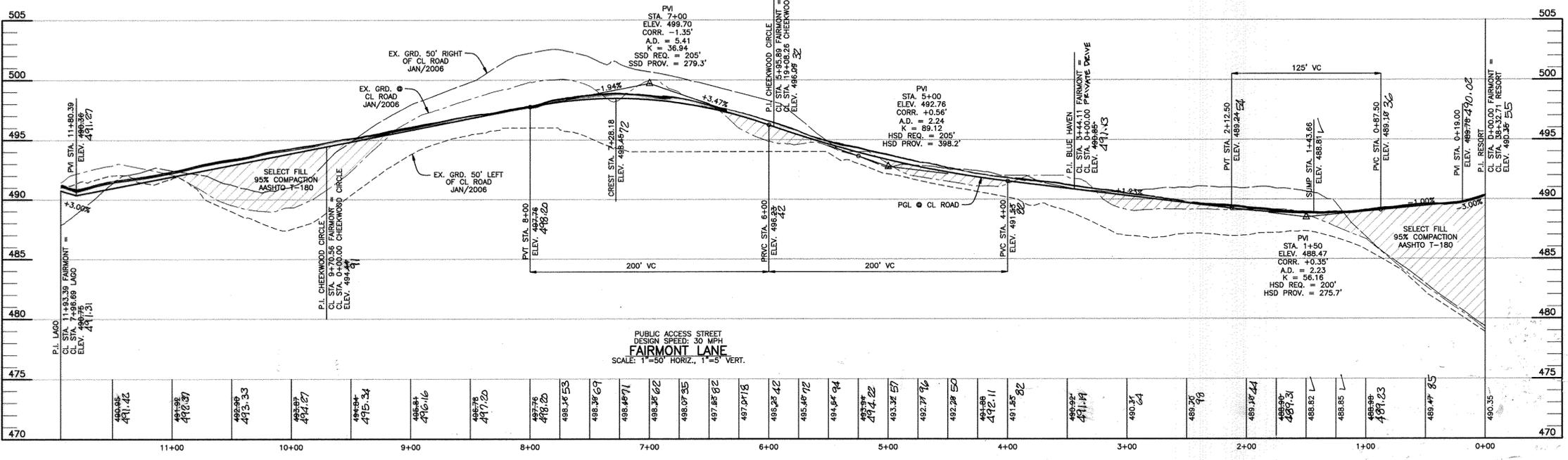


AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 1-4-17

APPROVED: DEPARTMENT OF PUBLIC WORKS
William R. Mault 6-20-12
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Ket Salomon 6-21-12
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Donald Mason 6/21/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE



PUBLIC ACCESS STREET
DESIGN SPEED: 30 MPH
FAIRMONT LANE
SCALE: 1"=50' HORIZ., 1"=5' VERT.

4	10-20-2016	DELETE PUBLIC DRIVE BLUE HAVEN LANE, RE-ASS TO OPEN SPACE LOT 302. ADD UTILITY EASEMENT AND EASEMENT FROM LOT 302 TO LOT 301.
3	4-8-15	ADD P153 LOTS 300-307, N.B. OF CC-2, UPDATE TITLE BLOCK.
2	7-24-2013	DELETE CONC. ASPEN FOR PRIVATE ALLEY AT STA. 7+93.3
1	5-29-2012	REVISE LOT CONFIGURATION, REVISE KLAR CREST LANE TO CHEEKWOOD CIRCLE. REVISE STORM DRAIN BY LOTS 16&17 AND 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 in the State of Maryland, License No. 12-21-007.

BENCHMARK ENGINEERING, INC.
8400 BALTIMORE NATIONAL PIKE A SUITE 418
ELICOTT CITY, MARYLAND 21043
PHONE: 410-465-8108 FAX: 410-465-8644
WWW.BE-CMENGINEERING.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 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 64, GOLF COURSE LOT 65, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-306, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/0 8
ZONED: P0CC
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

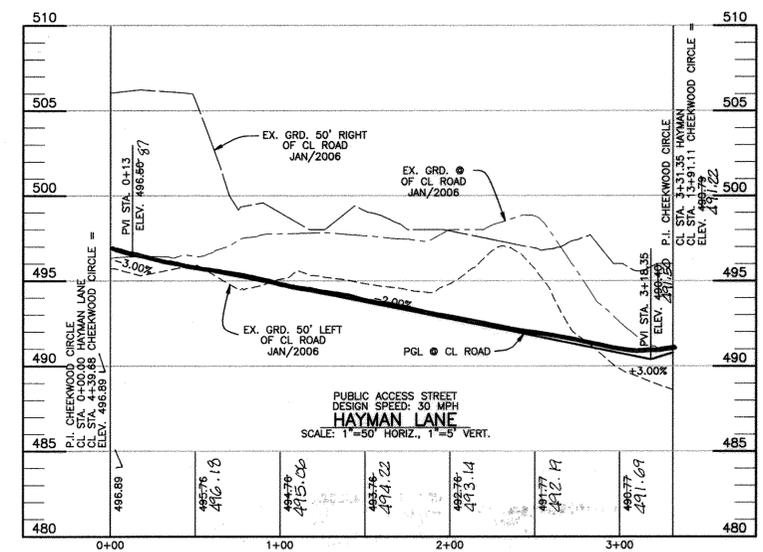
REVISED
ROAD PLAN AND PROFILE
FAIRMONT LANE / BLUE HAVEN LANE
DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 4 OF 26

CENTERLINE CONTROL DATA			
STREET NAME	STATION	NORTH	EAST
CHEEKWOOD CIRCLE	1+33.02 TO 4+44.90	595487.6634	1342727.6181
	4+44.90 TO 4+89.55	595216.3434	1342878.7085
	4+89.55 TO 0+00.00	595174.3733	1342893.9415
HAYMAN LANE	0+00.00 TO 1+25.97	595221.2431	1342876.9153
	1+25.97 TO 3+31.35	595264.8547	1342995.0980
CHEEKWOOD CIRCLE	3+31.35 TO 13+45.45	595315.7405	1343193.6960
	13+45.45 TO 14+05.14	595272.8220	1343209.2733
	14+05.14 TO 14+05.14	595328.9306	1343188.9086

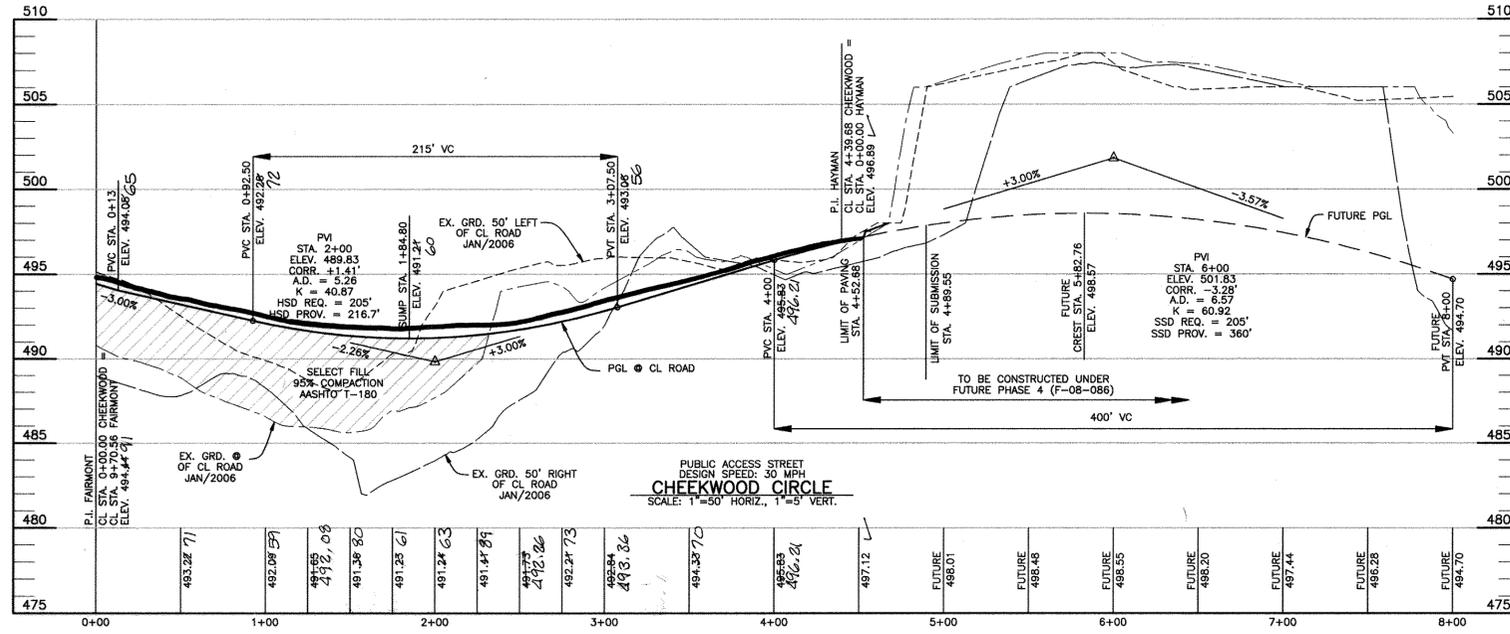
CENTER LINE CURVE DATA						
STREET NAME	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
CHEEKWOOD	1+33.02 TO 4+44.90	975.00'	311.88'	18°19'39"	157.28'	S29°06'44"E 310.55'
	14+05.14 TO 17+57.92	1305.00'	347.83'	15°16'18"	174.95'	N27°35'03"W 346.81'
HAYMAN	1+25.97 TO 3+31.35	1000.00'	205.37'	11°46'01"	103.05'	N75°37'43"E 205.01'



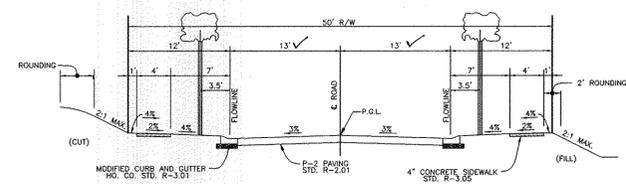
PLAN VIEW
SCALE: 1"=50'



PUBLIC ACCESS STREET
DESIGN SPEED: 30 MPH
HAYMAN LANE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



PUBLIC ACCESS STREET
DESIGN SPEED: 30 MPH
CHEEKWOOD CIRCLE
SCALE: 1"=50' HORIZ., 1"=5' VERT.



HAYMAN LANE
CHEEKWOOD CIRCLE
TYPICAL ROADWAY SECTION
(PUBLIC ACCESS STREET - LESS THAN 1000 ADT)
DESIGN SPEED: 30 MPH
SCALE: 1"=10'

APPROVED: DEPARTMENT OF PUBLIC WORKS
William R. McMillan 6-20-12
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Karl B. ... 6/21/12
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

... 6/10/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO.	DATE	REVISION
5	4-8-15	REVISE TITLE BLOCK TO ADD SIPS
4	7-24-2013	DELETE CONC. APRON FOR PRIVATE ALLEY AT STA. 2+94.10
3	11-26-12	REVISE SIDE LOT LINE OF LOT 5B
2	9-24-2012	REVISE MG OF STORM DRAIN LOCATION OF LOT 27-33 LOT LINE
1	5-29-2012	REVISE LOT CONFIGURATION, REVISE KLEAR CREST LANE TO CHEEKWOOD CIRCLE, REVISE TITLE BLOCK

BENCHMARK ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE A SUITE 418
ELLSWORTH CRT., MARYLAND 21043
PHONE: 410-465-6108 FAX: 410-465-6644
WWW.BD-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

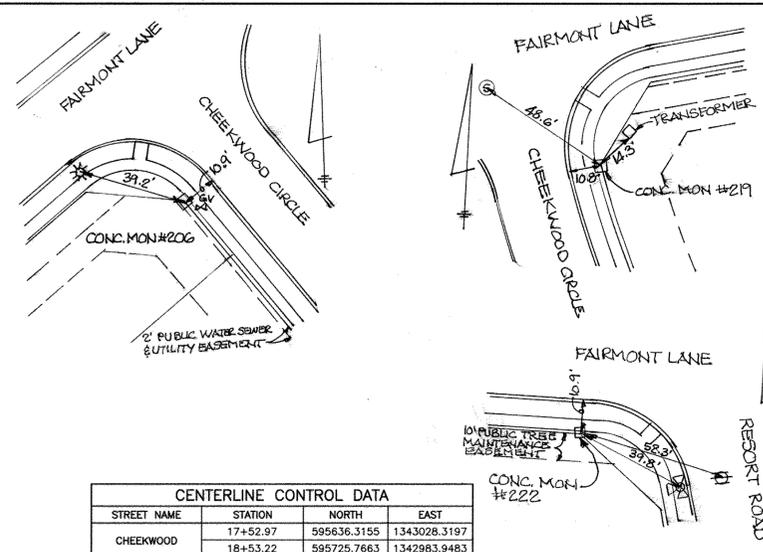
VILLAGES AT TURF VALLEY
PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA # BB AND PHASE SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/O 8
ZONED: PGCC
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

REVISED
ROAD PLAN AND PROFILE
CHEEKWOOD CIRCLE / HAYMAN LANE
DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 5 OF 26

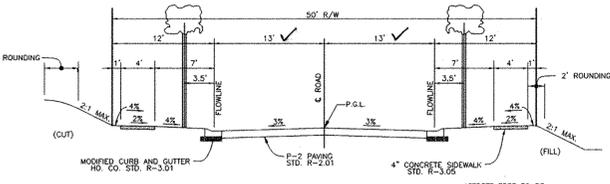


AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 1-4-17

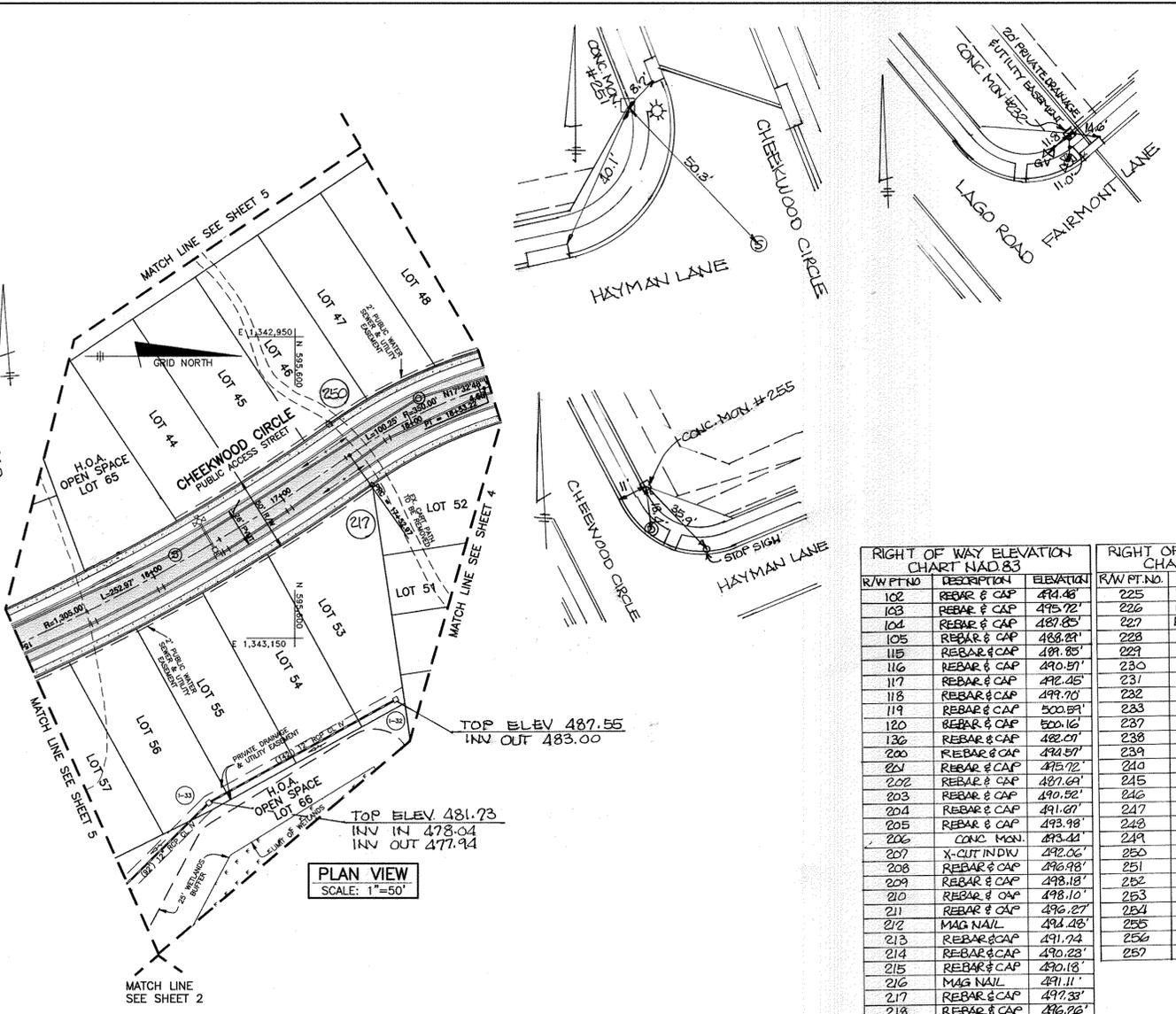


CENTERLINE CONTROL DATA			
STREET NAME	STATION	NORTH	EAST
CHEEKWOOD	17+52.97	595636.3155	1343028.3197
CHEEKWOOD	18+53.22	595725.7663	1342983.9483

CENTER LINE CURVE DATA						
STREET NAME	STATION	RADIUS	ARC	DELTA	CHORD	
HAYMAN	17+52.97 TO 18+53.22	325.00'	100.25'	17°40'24"	50.53'	N26°23'00"W 99.85'



**HAYMAN LANE
CHEEKWOOD CIRCLE
TYPICAL ROADWAY SECTION**
(PUBLIC ACCESS STREET - LESS THAN 1000 ADT)
DESIGN SPEED: 30 MPH
SCALE: 1"=10'



PLAN VIEW
SCALE: 1"=50'

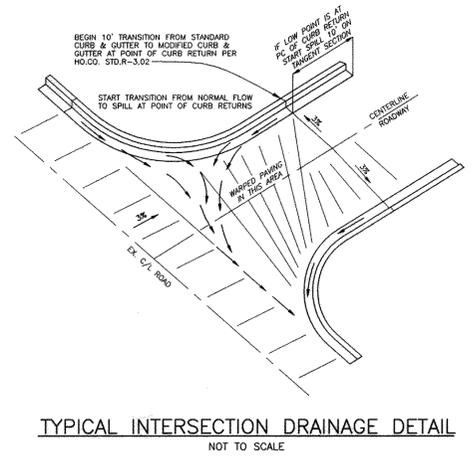
SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 TO <5		5 TO <7		7	
			MIN	HMA WITH GAB	HMA WITH CONSTANT GAB	MIN	HMA WITH GAB	HMA WITH CONSTANT GAB
P-2	PARKING DRIVE ASLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SAC: RESIDENTIAL	PAVEMENT MATERIAL (INCHES) 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL) 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL) HMA SUPERPAVE BASE 19.0 MM PG 64-22, LEVEL 1 (LOW ESAL) GRADED AGGREGATE BASE (GAB)	1.5	1.5	1.5	1.5	1.5	1.5
			1.0	1.0	1.0	1.0	1.0	1.0
			2.0	2.0	2.0	3.5	2.0	2.0
			8.0	4.0	3.0	4.0	4.0	4.0

P-2 PAVING DETAIL

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 TO <5		5 TO <7		7	
			MIN	HMA WITH GAB	HMA WITH CONSTANT GAB	MIN	HMA WITH GAB	HMA WITH CONSTANT GAB
P-4	MINOR COLLECTORS: NON-RESIDENTIAL MAJOR COLLECTORS	PAVEMENT MATERIAL (INCHES) 12.5 MM PG 64-22, LEVEL 2 (LOW ESAL) HMA SUPERPAVE INTERMEDIATE SURFACE 12.5 MM PG 64-22, LEVEL 2 (LOW ESAL) HMA SUPERPAVE BASE 19.0 MM PG 64-22, LEVEL 2 (LOW ESAL) GRADED AGGREGATE BASE (GAB)	2.0	2.0	2.0	2.0	2.0	2.0
			2.0	2.0	2.0	2.0	2.0	2.0
			4.0	4.0	3.0	6.0	5.0	3.0
			13.0	7.0	4.0	6.0	6.0	6.0

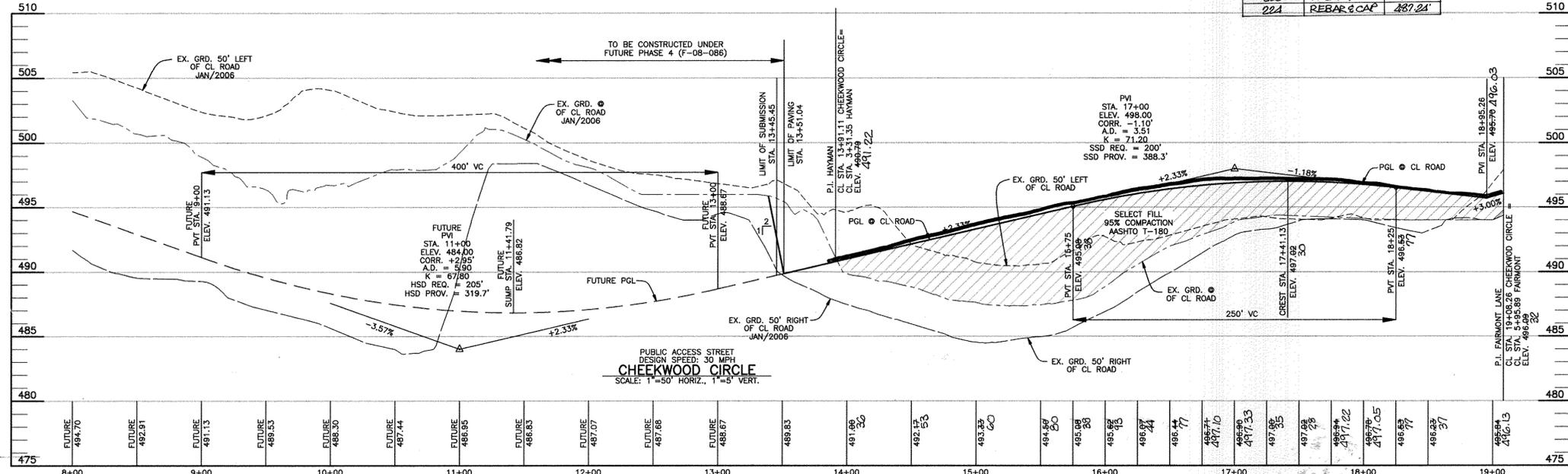
P-4 PAVING DETAIL

RIGHT OF WAY ELEVATION CHART NAD 83			RIGHT OF WAY ELEVATION CHART NAD 83		
R/W PT. NO.	DESCRIPTION	ELEVATION	R/W PT. NO.	DESCRIPTION	ELEVATION
102	REBAR & CAP	484.48'	225	REBAR & CAP	488.51'
103	REBAR & CAP	485.72'	226	REBAR & CAP	481.31'
104	REBAR & CAP	487.85'	227	REBAR & CAP	482.00'
105	REBAR & CAP	488.88'	228	REBAR & CAP	488.65'
106	REBAR & CAP	489.85'	229	REBAR & CAP	493.45'
107	REBAR & CAP	490.87'	230	REBAR & CAP	497.24'
108	REBAR & CAP	491.85'	231	REBAR & CAP	492.00'
109	REBAR & CAP	492.78'	232	CONC. MON.	491.67'
110	REBAR & CAP	493.67'	233	REBAR & CAP	496.32'
111	REBAR & CAP	494.51'	234	REBAR & CAP	498.90'
112	REBAR & CAP	495.31'	235	REBAR & CAP	487.07'
113	REBAR & CAP	496.07'	236	REBAR & CAP	483.89'
114	REBAR & CAP	496.79'	237	REBAR & CAP	483.28'
115	REBAR & CAP	497.47'	238	REBAR & CAP	485.92'
116	REBAR & CAP	498.11'	239	REBAR & CAP	496.69'
117	REBAR & CAP	498.71'	240	REBAR & CAP	497.93'
118	REBAR & CAP	499.28'	241	REBAR & CAP	496.77'
119	REBAR & CAP	499.81'	242	REBAR & CAP	496.84'
120	REBAR & CAP	500.31'	243	REBAR & CAP	497.84'
121	REBAR & CAP	500.78'	244	REBAR & CAP	492.58'
122	REBAR & CAP	501.21'	245	REBAR & CAP	492.53'
123	REBAR & CAP	501.61'	246	REBAR & CAP	494.74'
124	REBAR & CAP	501.98'	247	REBAR & CAP	496.18'
125	REBAR & CAP	502.32'	248	CONC. MON.	496.80'
126	REBAR & CAP	502.63'	249	REBAR & CAP	492.12'
127	REBAR & CAP	502.91'	250	REBAR & CAP	494.19'
128	REBAR & CAP	503.17'			
129	REBAR & CAP	503.41'			
130	REBAR & CAP	503.63'			
131	REBAR & CAP	503.83'			
132	REBAR & CAP	504.01'			
133	REBAR & CAP	504.17'			
134	REBAR & CAP	504.31'			
135	REBAR & CAP	504.43'			
136	REBAR & CAP	504.53'			
137	REBAR & CAP	504.61'			
138	REBAR & CAP	504.67'			
139	REBAR & CAP	504.71'			
140	REBAR & CAP	504.74'			
141	REBAR & CAP	504.75'			
142	REBAR & CAP	504.75'			
143	REBAR & CAP	504.74'			
144	REBAR & CAP	504.71'			
145	REBAR & CAP	504.67'			
146	REBAR & CAP	504.61'			
147	REBAR & CAP	504.53'			
148	REBAR & CAP	504.43'			
149	REBAR & CAP	504.31'			
150	REBAR & CAP	504.17'			
151	REBAR & CAP	504.01'			
152	REBAR & CAP	503.83'			
153	REBAR & CAP	503.63'			
154	REBAR & CAP	503.41'			
155	REBAR & CAP	503.17'			
156	REBAR & CAP	502.91'			
157	REBAR & CAP	502.63'			
158	REBAR & CAP	502.32'			
159	REBAR & CAP	501.98'			
160	REBAR & CAP	501.61'			
161	REBAR & CAP	501.21'			
162	REBAR & CAP	500.78'			
163	REBAR & CAP	500.31'			
164	REBAR & CAP	499.81'			
165	REBAR & CAP	499.28'			
166	REBAR & CAP	498.71'			
167	REBAR & CAP	498.11'			
168	REBAR & CAP	497.47'			
169	REBAR & CAP	496.79'			
170	REBAR & CAP	496.07'			
171	REBAR & CAP	495.31'			
172	REBAR & CAP	494.51'			
173	REBAR & CAP	493.67'			
174	REBAR & CAP	492.78'			
175	REBAR & CAP	491.85'			
176	REBAR & CAP	490.87'			
177	REBAR & CAP	489.85'			
178	REBAR & CAP	488.88'			
179	REBAR & CAP	487.85'			
180	REBAR & CAP	485.72'			
181	REBAR & CAP	484.48'			



TYPICAL INTERSECTION DRAINAGE DETAIL
NOT TO SCALE

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21448 Date: 1-5-17



**PUBLIC ACCESS STREET
DESIGN SPEED: 30 MPH
CHEEKWOOD CIRCLE**
SCALE: 1"=50' HORIZ., 1"=5' VERT.



APPROVED: DEPARTMENT OF PUBLIC WORKS
W. J. ... 6-20-12
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
W. J. ... 6/21/12
CHIEF, DIVISION OF LAND DEVELOPMENT

W. J. ... 6/18/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION

NO.	DATE	REVISION
3	4-8-15	REVISE TITLE BLOCK TO ADD P1 S3
2	7-24-2013	DELETE CONC. ASPEN FOR PRIVATE DRIVE AT STA. 15113.86
1	5-29-2012	REVISE LOT CONFIGURATION. REVISE KLAR CREST LANE TO CHEEKWOOD CIRCLE. REVISE TITLE BLOCK.

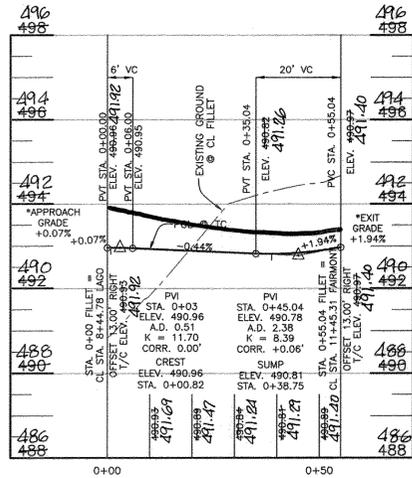
BENCHMARK ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
WWW.BE-CMLENGINEERING.COM

VILLAGES AT TURF VALLEY
PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACES LOTS 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP

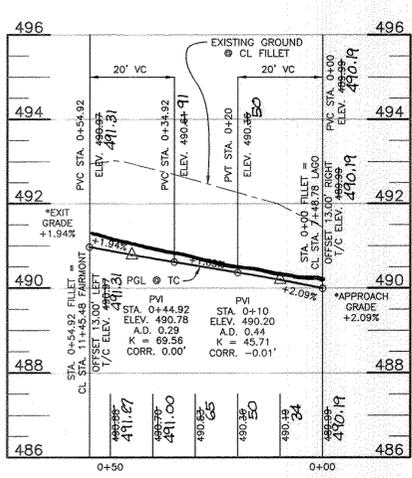
DATE: OCTOBER, 2009
SCALE: AS SHOWN

BEL PROJECT NO. 1915
SHEET 6 OF 26



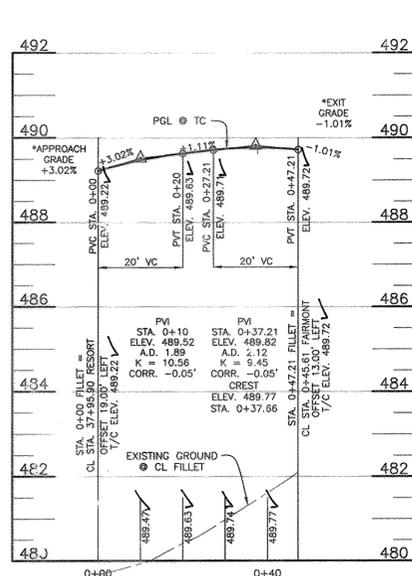
FILLET PROFILE
NORTH CORNER
LAGO/FAIRMONT

SCALE: 1"=20' HORIZ., 1"=2' VERT.



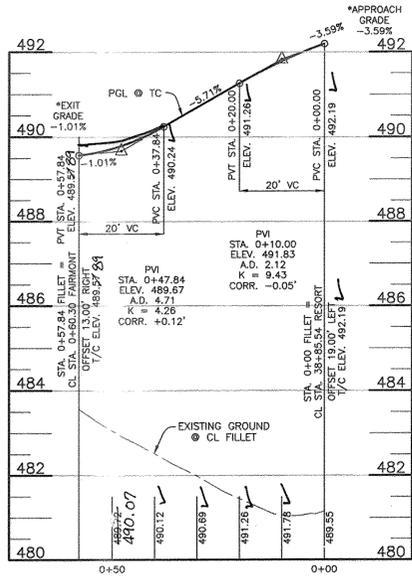
FILLET PROFILE
SOUTH CORNER
LAGO/FAIRMONT

SCALE: 1"=20' HORIZ., 1"=2' VERT.



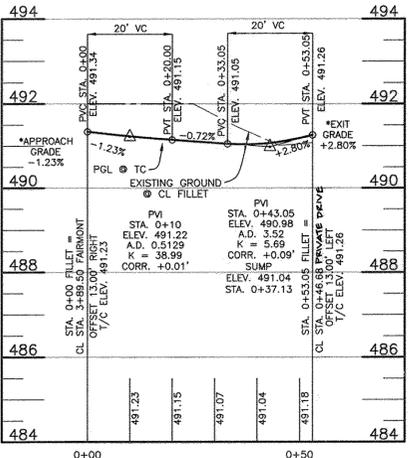
FILLET PROFILE
SOUTH CORNER
RESORT/FAIRMONT

SCALE: 1"=20' HORIZ., 1"=2' VERT.



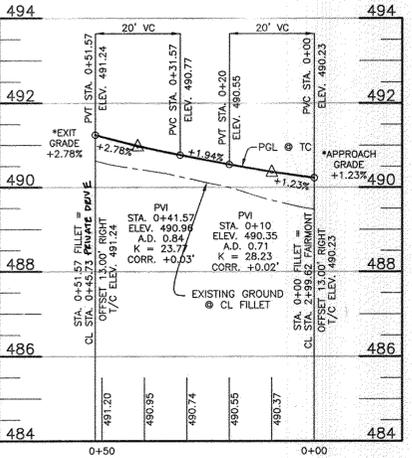
FILLET PROFILE
NORTH CORNER
RESORT/FAIRMONT

SCALE: 1"=20' HORIZ., 1"=2' VERT.



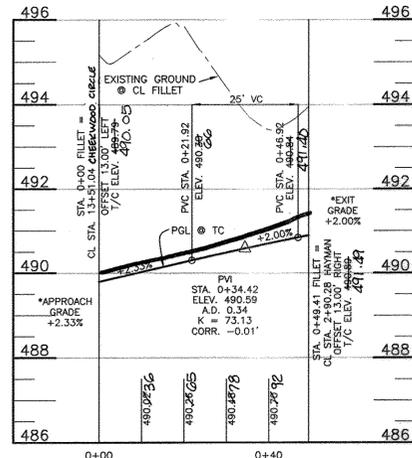
FILLET PROFILE
WEST CORNER
FAIRMONT/Private Drive

SCALE: 1"=20' HORIZ., 1"=2' VERT.



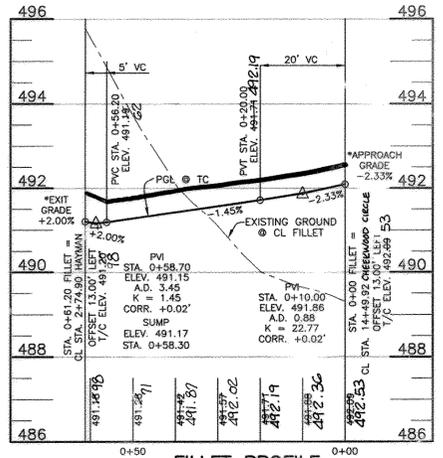
FILLET PROFILE
EAST CORNER
FAIRMONT/Private Drive

SCALE: 1"=20' HORIZ., 1"=2' VERT.



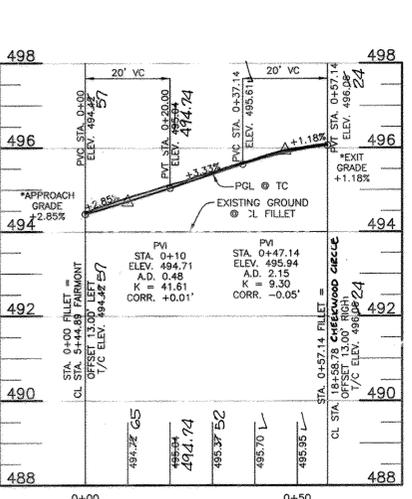
FILLET PROFILE
SOUTH CORNER
CHEEKWOOD Circle/HAYMAN

SCALE: 1"=20' HORIZ., 1"=2' VERT.



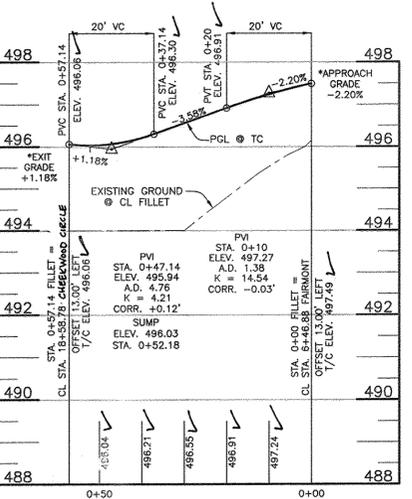
FILLET PROFILE
NORTH CORNER
CHEEKWOOD Circle/HAYMAN

SCALE: 1"=20' HORIZ., 1"=2' VERT.



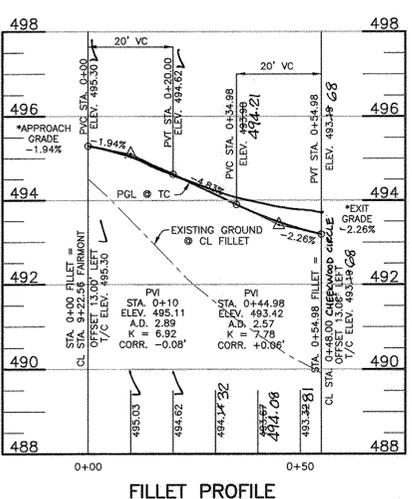
FILLET PROFILE
EAST CORNER
FAIRMONT/CHEEKWOOD Circle

SCALE: 1"=20' HORIZ., 1"=2' VERT.



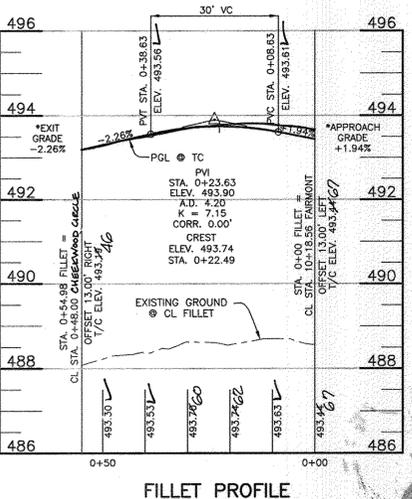
FILLET PROFILE
WEST CORNER
FAIRMONT/CHEEKWOOD Circle

SCALE: 1"=20' HORIZ., 1"=2' VERT.



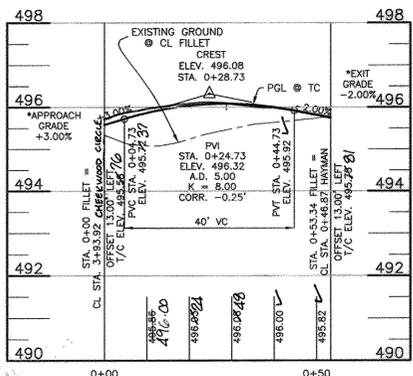
FILLET PROFILE
EAST CORNER
FAIRMONT/CHEEKWOOD Circle

SCALE: 1"=20' HORIZ., 1"=2' VERT.



FILLET PROFILE
WEST CORNER
FAIRMONT/CHEEKWOOD Circle

SCALE: 1"=20' HORIZ., 1"=2' VERT.



FILLET PROFILE
NORTH CORNER
CHEEKWOOD Circle/HAYMAN

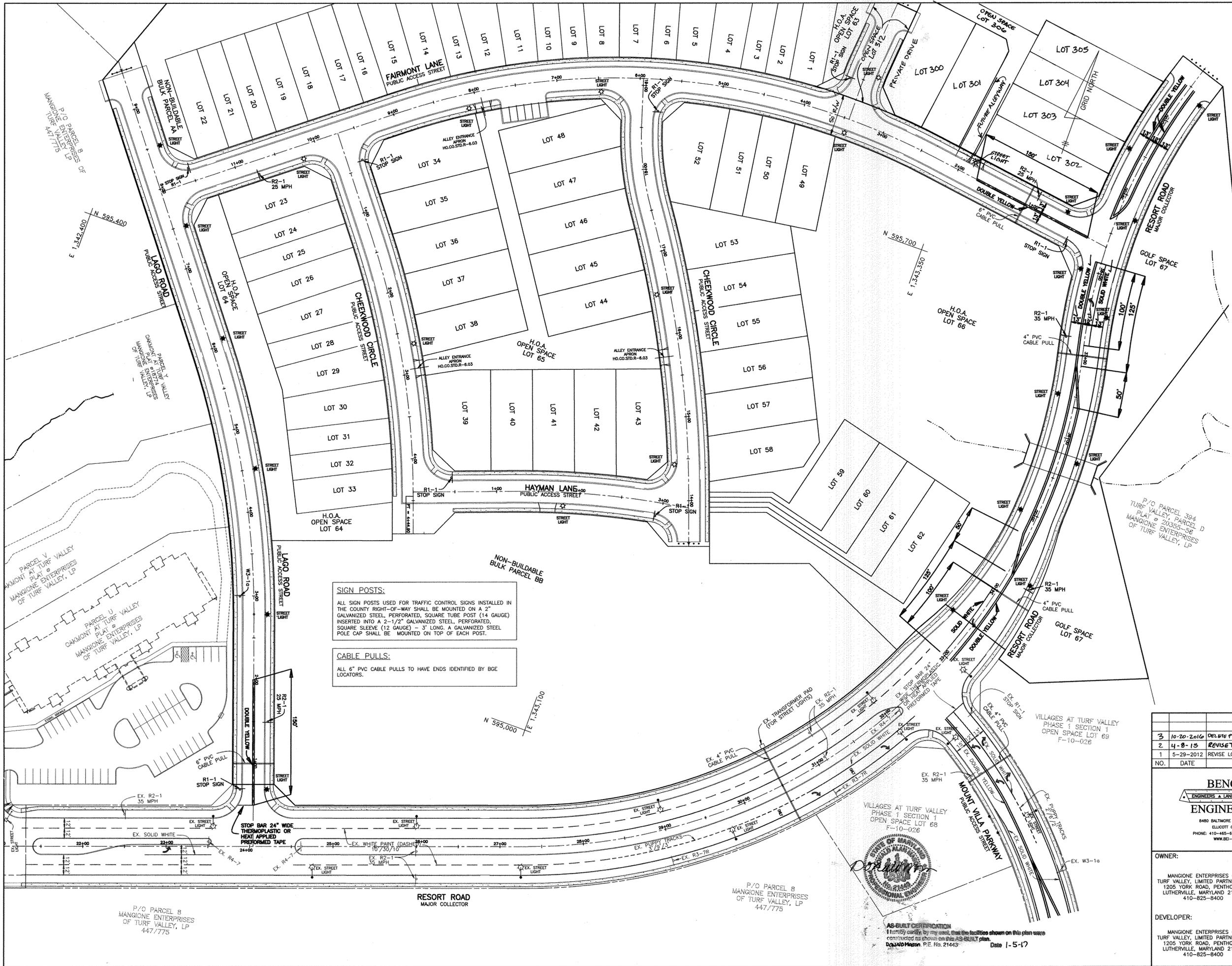
SCALE: 1"=20' HORIZ., 1"=2' VERT.

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter R. Marshall 12-15-09
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
Walter R. Marshall 12/15/09
 CHIEF, DIVISION OF LAND DEVELOPMENT
Walter R. Marshall 12/15/09
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

BENCHMARK ENGINEERING, INC. ENGINEERS & LAND SURVEYORS & PLANNERS 8480 BALTIMORE NATIONAL PIKE A SUITE 418 ELICOTT CITY, MARYLAND 21043 PHONE: 410-485-8105 FAX: 410-485-8644 WWW.BE-ENGINERING.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: 12-31-2018 <i>Donald M. Moore</i> 10-23-09
OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400		VILLAGES AT TURF VALLEY PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2. TAX MAP: 16 GRID: 11 PARCEL: P, J, B ZONED: PCCC ELECTOR DISTRICT NO. 3 HOWARD COUNTY, MARYLAND
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400		CURB RETURN FILLET PROFILES DATE: OCTOBER, 2009 BEI PROJECT NO. 1915 SCALE: AS SHOWN SHEET 7 OF 26



AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
 Donald M. Moore, P.E., No. 21443 1-5-17



STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	DESCRIPTION
★	RESORT ROAD CL STA. 33+50 LEFT	150 WATT HPS VAPOR PREMIER POST-TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE
	RESORT ROAD CL STA. 34+25 RIGHT	
	RESORT ROAD CL STA. 35+00 LEFT	
	RESORT ROAD CL STA. 35+75 RIGHT	
	RESORT ROAD CL STA. 36+50 LEFT	
	RESORT ROAD CL STA. 37+50 RIGHT	
	RESORT ROAD CL STA. 38+00 LEFT	
	RESORT ROAD CL STA. 38+75 RIGHT	
	RESORT ROAD CL STA. 39+50 LEFT	
	RESORT ROAD CL STA. 40+38 RIGHT	
☆	FAIRMONT LANE CL STA. 0+60 RIGHT	100 WATT HPS VAPOR PREMIER POST-TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE
	LAGO ROAD CL STA. 0+89 RIGHT	
	LAGO ROAD CL STA. 2+78 RIGHT	
	LAGO ROAD CL STA. 4+50 RIGHT	
	LAGO ROAD CL STA. 6+08 RIGHT	
	LAGO ROAD CL STA. 7+49 RIGHT	
	LAGO ROAD CL STA. 8+50 RIGHT	
	FAIRMONT LANE CL STA. 1+85 RIGHT	
	FAIRMONT LANE CL STA. 3+44 LEFT	
	FAIRMONT LANE CL STA. 6+47 LEFT	
FAIRMONT LANE CL STA. 8+10 LEFT		
FAIRMONT LANE CL STA. 10+19 LEFT		
PRIVATE DRIVE CL STA. 0+59 RIGHT		
HAYMAN LANE CL STA. 1+80 RIGHT		
CHEEKWOOD CIRCLE CL STA. 2+65 LEFT		
CHEEKWOOD CIRCLE CL STA. 14+44 LEFT		
CHEEKWOOD CIRCLE CL STA. 16+50 LEFT		

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.

CABLE PULLS:
 ALL 6" PVC CABLE PULLS TO HAVE ENDS IDENTIFIED BY BGE LOCATORS.

APPROVED: DEPARTMENT OF PUBLIC WORKS
Will T. ... 6-20-12
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kathleen ... 6/21/12
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Chris ... 6/21/12
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO.	DATE	REVISION
3	10-20-2016	DELETE PUBLIC BLUE HAVEN LAMB. ESTABLISH OPEN SPACE LOT 312. SHOW PRIVATE DRIVE
2	4-8-13	REVISE TITLE BLOCK & ADD P153 LOTS 300-305, RELOCATE STREET LIGHT
1	5-29-2012	REVISE LOT CONFIGURATION, REVISE KLAR CREST LANE TO CHEEKWOOD CIRCLE, TITLE BLOCK.

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

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer in the State of Maryland.
David ... 5-25-12

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 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2.

TAX MAP: 16 GRID: 11 PARCEL: P/O 8
 ZONED: PGCC
 ELECTION DISTRICT NO. 3
 HOWARD COUNTY, MARYLAND

REVISED
STREET LIGHT, STREET SIGN AND STREET STRIPING PLAN

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 8 OF 26



AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
 David ... P.E. No. 21449 Date 1-5-17

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: _____ DATE: _____
 PE NO. _____
 DATE: _____

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 THIS 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 SOIL EROSION AND SEDIMENT 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.

DATE: 11/5/09

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.

DATE: 11/5/09
 DATE: 11/5/09

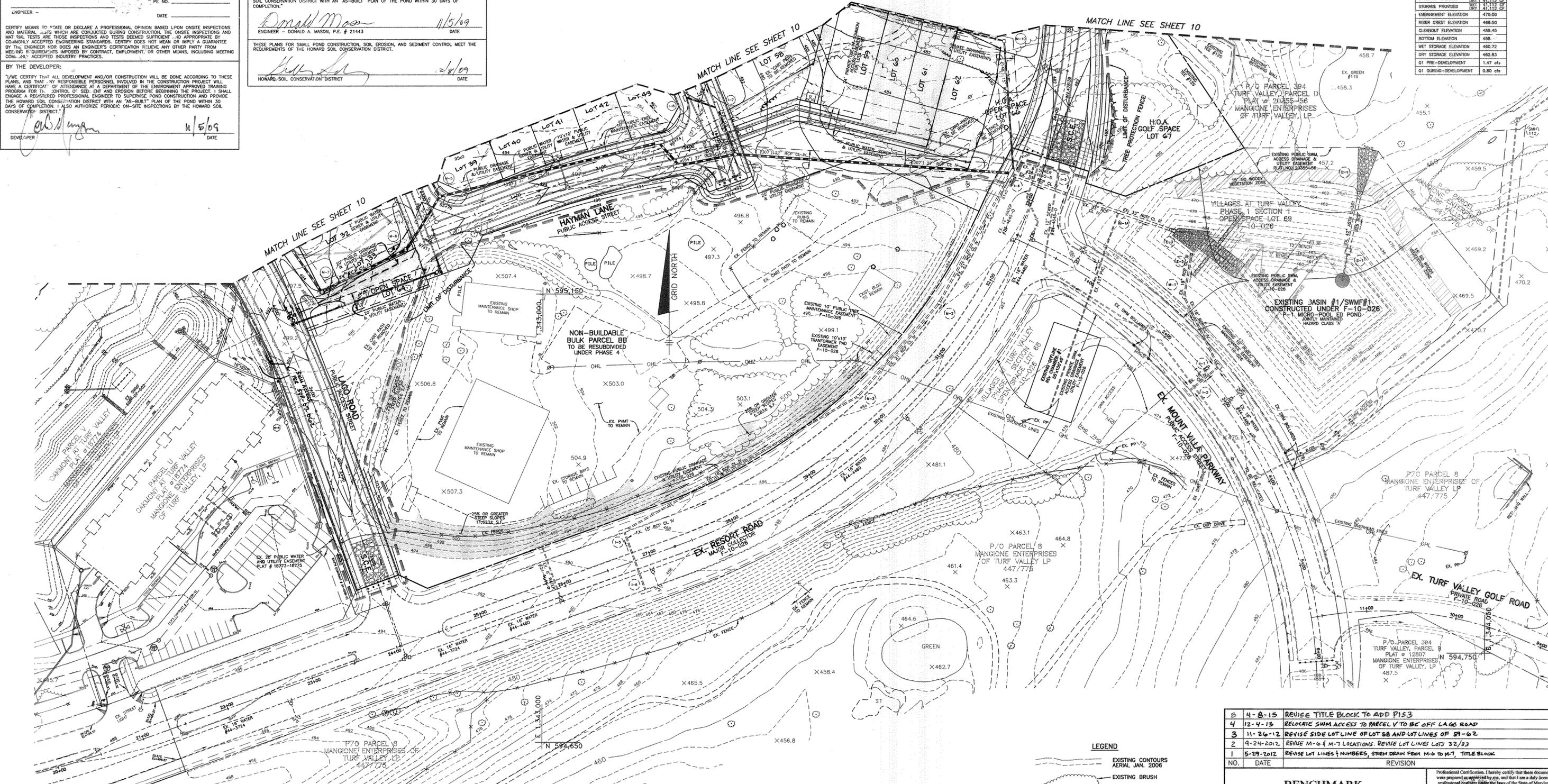
ENGINEER - DONALD A. MASON, P.E. # 21443

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

DATE: 11/5/09

SEDIMENT BASIN #1 DATA

EXISTING D.A.	6.68 ac.
PROPOSED D.A.	22.84 ac.
STORAGE REQUIRED	411,112 CF
STORAGE PROVIDED	411,112 CF
EMBANKMENT ELEVATION	470.00
RISER CREST ELEVATION	466.50
CLEANOUT ELEVATION	459.45
BOTTOM ELEVATION	458
WET STORAGE ELEVATION	460.72
DRY STORAGE ELEVATION	462.83
O1 PRE-DEVELOPMENT	1.47 cfs
O1 DURING-DEVELOPMENT	0.80 cfs



APPROVED: DEPARTMENT OF PUBLIC WORKS

DATE: 12-15-09

APPROVED: DEPARTMENT OF PLANNING AND ZONING

DATE: 12/15/09

DATE: 12/15/09

GENERAL STORAGE REQUIREMENT SUMMARY TABLES
 DRAINAGE AREA 1

REQUIREMENT	TOTAL VOLUME REQUIRED	DA 1A VOLUME REQUIRED	DA 1B VOLUME REQUIRED	DA 1C VOLUME REQUIRED	NOTES
WATER QUALITY VOLUME (WQV)	2,0408 ac-ft 88,896 cf	1,2856 ac-ft 55,131 cf	0,7177 ac-ft 31,281 cf	0,1344 ac-ft 5,856 cf	PROVIDED IN SWMF #1 AND #2 (EXTENDED DETENTION W/ MICRO-POOL)
RECHARGE VOLUME (REV)	5,77 acres 20,668 cf	3,75 acres 13,176 cf	2,22 acres 7,862 cf	0,04 acres 1,047 cf	PROVIDED IN OFFLINE RECHARGE CHAMBERS #1 AND #2
CHANNEL PROTECTION VOL. (CPV)		1,6410 ac-ft 71,463 cf	0,8579 ac-ft 37,369 cf	0,2218 ac-ft 9,654 cf	PROVIDED VIA ROUTING OF SWMF #1 AND #2 (EXTENDED DETENTION W/ MICRO-POOL)

TOTAL VOLUME FOR WQV BASED ON 57.3% IMPERVIOUS WHICH IS ABOVE THE MINIMUM 15.0% REQUIREMENT. VOLUME FOR DA 1A AND 1B BASED ON 73.3% AND 67.1%, RESPECTIVELY. VOLUME FOR DA 1C BASED ON 15.0% (MINIMUM REQUIREMENT) EVEN THOUGH IMPERVIOUS IS ONLY 2.6%. THUS, THE COMBINED WQV ENDS UP BEING MORE THAN OVERALL TOTAL.

* NO NEW IMPERVIOUS AREAS BEING CREATED WITHIN DRAINAGE AREA 1C.

1-YEAR DISCHARGE COMPARISON TABLE

EXISTING	PROPOSED WITH SWM	NOTES
7.99 cfs	4.12 cfs	1-YR POST-DEVELOPED DISCHARGE AMOUNT IS LESS THAN 1-YR PRE-DEVELOPED DISCHARGE AMOUNT.

PLAN VIEW
 SCALE: 1" = 50'

LEGEND

- EXISTING CONTOURS AERIAL JAN. 2006
- EXISTING BRUSH
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING STREAM
- EXISTING WETLANDS
- SIDEWALK
- STORM DRAIN PIPE
- EARTH DIKE
- SUPER SILT FENCE
- TREE PROTECTION FENCE
- LIMIT OF DISTURBANCE
- TEMP SED. TRAP CONTOURS
- EROSION CONTROL MATTING
- STABILIZED CONSTRUCTION ENTRANCE

SCS

REVISIONS

5	4-8-15	REVISE TITLE BLOCK TO ADD P153
4	12-4-13	RELOCATE SWM ACCESS TO PARCEL V TO BE OFF LAGO ROAD
3	11-26-12	REVISE SIDE LOT LINE OF LOT 58 AND LOT LINES OF 59-62
2	9-24-2012	REVISE M-G # M-7 LOCATIONS. REVISE LOT LINES LOTS 32/33
1	5-29-2012	REVISE LOT LINES + NUMBERS, STREAM DRAIN FROM M-6 TO M-7, TITLE BLOCK

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 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELICOTT CITY, MARYLAND 21143
 PHONE: 410-465-6100 FAX: 410-465-8844
 WWW.BE-CIVILENGINEERING.COM

OWNER: VILLAGES AT TURF VALLEY
 PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 64, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA # BB AND PHASE 1 SECTION 3, LOTS 300-305 OPEN SPACE LOTS 306 # 307 AND NON-BUILDABLE BULK PARCEL CC-2

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

GRADING, SEDIMENT AND EROSION CONTROL PLAN

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 9 OF 26

AS-BUILT CERTIFICATION

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

Donald Mason ENGINEER - **21443**
DATE: **1-5-17**

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED THROUGHOUT THE CONSTRUCTION PROJECT AND 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.

W. Wang DEVELOPER DATE: **6/1/12**

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 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. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

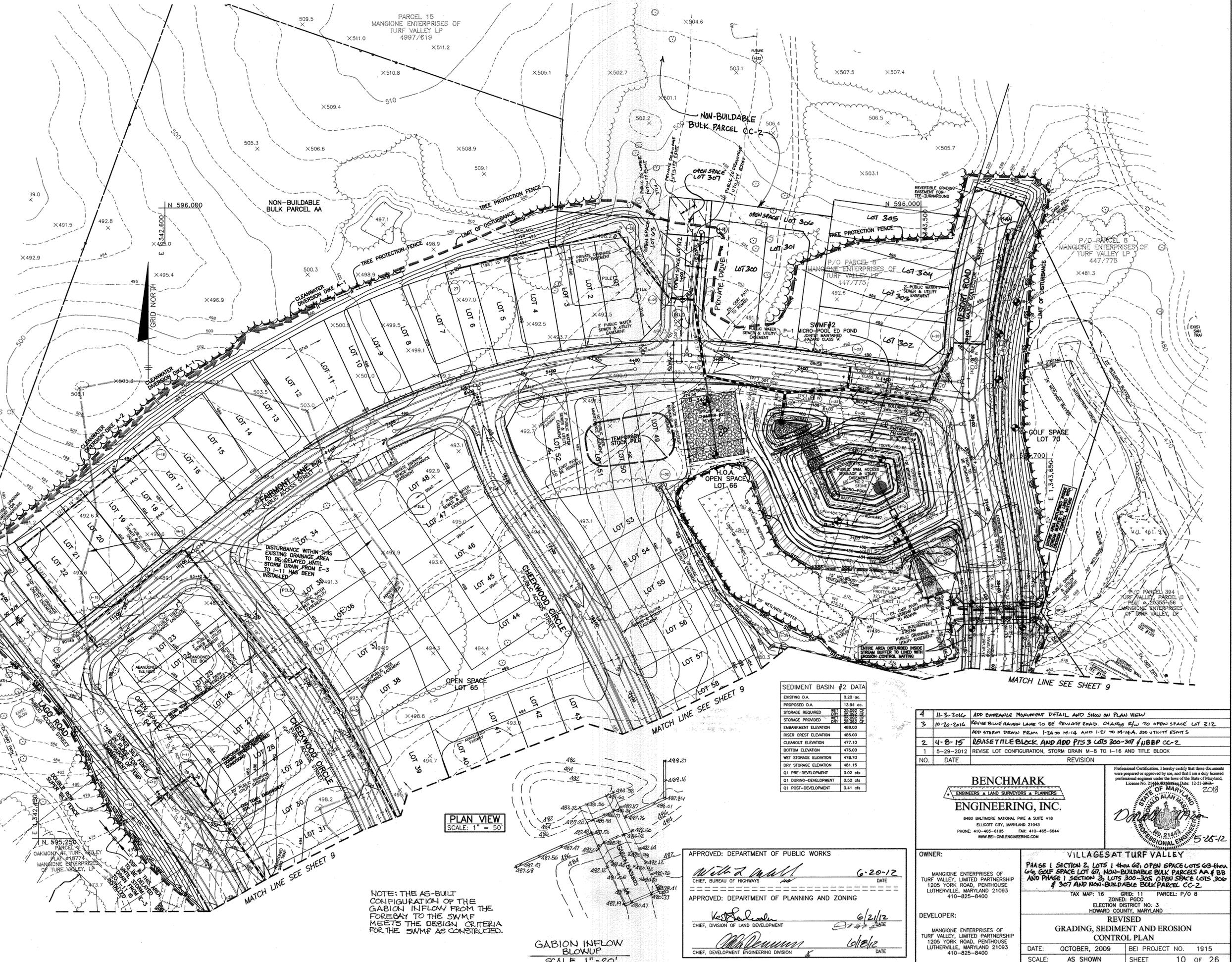
Donald Mason ENGINEER - DONALD A. MASON, P.E. # 21443 DATE: **5-25-12**

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

Jeffrey W. Schomig DATE: **6/14/12**



- LEGEND**
- EXISTING CONTOURS AERIAL JAN. 2006
 - EXISTING BRUSH
 - EXISTING TREELINE
 - PROPOSED TREELINE
 - EXISTING STREAM
 - EXISTING WETLANDS
 - SIDEWALK
 - STORM DRAIN PIPE
 - EARTH DIKE
 - SUPER SILT FENCE
 - TREE PROTECTION FENCE
 - LIMIT OF DISTURBANCE
 - TEMP SED. TRAP CONTOURS
 - EROSION CONTROL MATTING



SEDIMENT BASIN #2 DATA

EXISTING D.A.	0.20 ac.
PROPOSED D.A.	13.94 ac.
STORAGE REQUIRED	25,092 CF
STORAGE PROVIDED	25,092 CF
EMBANKMENT ELEVATION	488.00
RISER CREST ELEVATION	485.00
CLEANOUT ELEVATION	477.10
BOTTOM ELEVATION	475.00
WET STORAGE ELEVATION	478.70
DRY STORAGE ELEVATION	481.15
Q1 PRE-DEVELOPMENT	0.02 cfs
Q1 DURING-DEVELOPMENT	0.50 cfs
Q1 POST-DEVELOPMENT	0.41 cfs

NOTE: THE AS-BUILT CONFIGURATION OF THE GABION INFLOW FROM THE FOREBAY TO THE SWMF MEETS THE DESIGN CRITERIA FOR THE SWMF AS CONSTRUCTED.

GABION INFLOW BLOWUP
SCALE: 1" = 20'

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter A. ... 6-20-12
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kevin ... 6/2/12
CHIEF, DIVISION OF LAND DEVELOPMENT

John ... 6/1/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION

4	11-3-2016	ADD ENTRANCE MONUMENT DETAIL AND SHOW ON PLAN VIEW
3	10-20-2016	REVISE BLUE HAVEN LANE TO BE PRIVATE ROAD. CHANGE E/L TO OPEN SPACE LOT 312. ADD STORM DRAIN FROM I-24 TO M-14 AND I-21 TO M-14. ADD UTILITY ESMTS
2	4-8-15	REVISE TITLE BLOCK AND ADD PFS 3 LOTS 300-307 #UBBP CC-2
1	5-29-2012	REVISE LOT CONFIGURATION, STORM DRAIN M-8 TO I-16 AND TITLE BLOCK

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

VILLAGES AT TURF VALLEY
PHASE I SECTION 2, LOTS 1 thru 68, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE I SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/O B
ZONED: POCO
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

REVISD
GRADING, SEDIMENT AND EROSION CONTROL PLAN

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 10 OF 26

P:\1915\dwg\Phase 1 Section 2\Major Redline\7001_26_s09-11.dwg, 5/25/2012 1:03:23 PM

SEDIMENT CONTROL NOTES

TOPSOIL SPECIFICATIONS

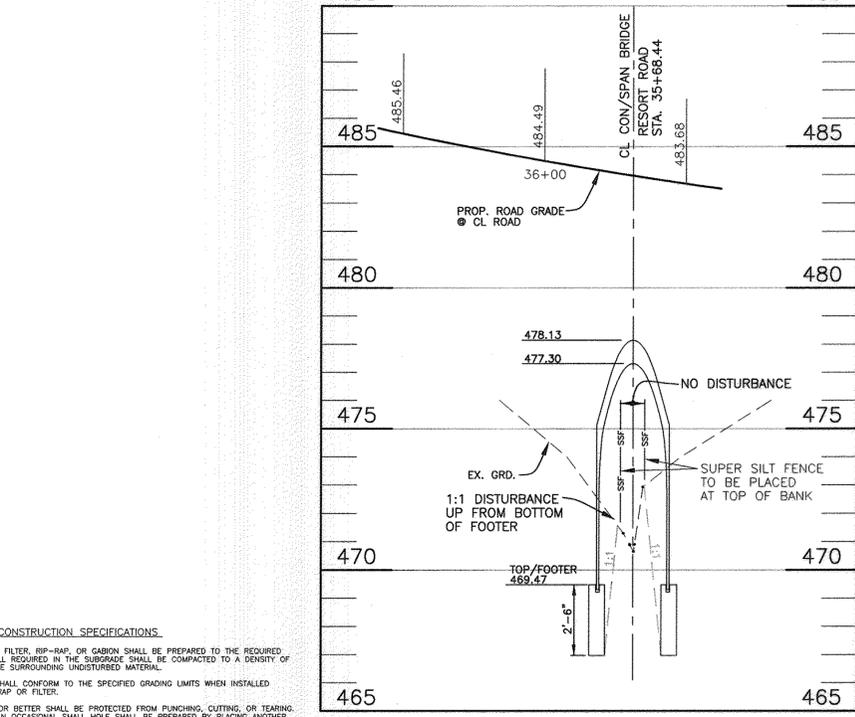
30.0 DUST CONTROL

SEQUENCE OF CONSTRUCTION

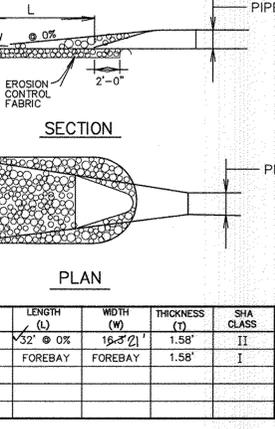
- 1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION... 2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL... 3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERMETER SLOPES AND ALL SLOPES GREATER THAN 3:1 (3) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE... 4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE... 5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SEC. 51) SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52), TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES... 6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR... 7. SITE ANALYSIS: TOTAL AREA OF SITE 27.75 ACRES, AREA DISTURBED 18.54 ACRES, AREA TO BE ROOFED OR PAVED 3.62 ACRES, AREA TO BE VEGETATIVELY STABILIZED 14.92 ACRES, TOTAL CUT 82,585 CY, TOTAL FILL 77,314 CY... 8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE... 9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR... 10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE... 11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

- 1. Topsoil salvaged from the existing site may be used provided that it meets the standards set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by the USDA-SCS in cooperation with Maryland Agricultural Experimental Station... 2. Topsoil Specifications - Soil to be used as topsoil must meet the following: i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate authority. Reproduction of topsoil shall not be a mixture of contrasting texture subsoils and shall contain less than 5% by volume of cinders, stones, silt, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1-1/2" in diameter... ii. Topsoil must be free of plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nutgrass, poison ivy, thistle, or others as specified... iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. LIME shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures... iii. For sites having disturbed areas under 5 acres: 1. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials... 2. For sites having disturbed areas over 5 acres: 1. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following: a. pH for topsoil shall be between 6.0 and 7.5, if the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be added to raise the pH to 6.5 or higher... b. Organic content or topsoil shall be not less than 1.5 percent by weight... c. Topsoil having soluble salt content greater than 500 parts per million shall not be used... d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min) to permit restoration of phyto-toxic materials... Note: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate authority, may be used in lieu of natural topsoil... ii. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials... V. Topsoil Application 1. When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, earth dikes, slope all fence and sediment traps and basins... 2. Grades on the area to be topsoiled, which have been previously established, shall be maintained, about 4" - 8" higher in elevation... 3. Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that seeding or sodding can proceed with a minimum additional seed preparation and slope. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets... 4. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation... VI. Alternative for Permanent Seeding - Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below: 1. Composted Sludge Material for use as a soil conditioner for sites having disturbed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements: a. Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.06.06... b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a pH of 7.0 to 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use... c. Composted sludge shall be applied at a rate of 1 ton/1,000 square feet... iv. Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lb/1,000 square feet, and 1/3 the normal lime application rate... References: Guidelines Specifications, Soil Preparation and Sodding, MD-VA, Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institute, Revised 1973.

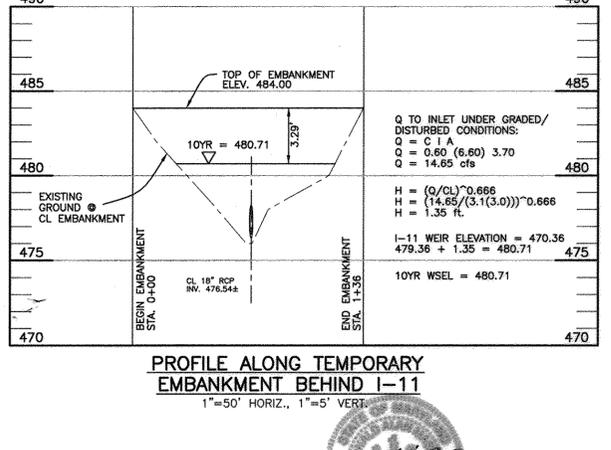
- Definition: Controlling dust blowing and movement on construction sites and roads. Purpose: To prevent blowing and movement of dust from exposed soil surfaces, reduce on and off-site damage, health hazards, and improve traffic safety. Conditions Where Practice Applies: This practice is applicable to areas subject to dust blowing and movement where on and off-site damage is likely without treatment. Specifications: Temporary Methods 1. Mulches - See standards for vegetative stabilization with mulches only. Mulch should be crimped or tracked to prevent blowing. 2. Vegetative Cover - See standards for temporary vegetative cover. 3. Tillage - To roughen surface and bring clods to the surface. This is an emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12' apart, spring-toothed harrows, and similar plows are examples of equipment which may produce the desired effect. 4. Irrigation - This is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. Repeat as needed. At no time should the site be irrigated to the point that runoff begins to flow. 5. Barriers - Solid board fences, snow fences, burlap fences, straw bales, and similar material can be used to control currents and soil blowing. Barriers placed at right angles to prevailing currents at intervals of about 10 times their height are effective in controlling soil blowing. 6. Calcium Chloride - Apply at rates that will keep surface moist. May need retreatment. Permanent Methods 1. Permanent Vegetation - See standards for permanent vegetative cover, and permanent stabilization with sod. Existing trees or large shrubs may afford valuable protection if left in place. 2. Topsoiling - Covering with less erosive soil materials. See standards for topsoiling. 3. Stone - Cover surface with crushed stone or coarse gravel. References: 1. Agriculture Handbook 346. Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss. 2. Agriculture Information Bulletin 354. How to Control Wind Erosion, USDA-ARS.



- CONSTRUCTION SPECIFICATIONS 1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL... 2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER... 3. GEOTEXTILE CLASS G28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT... 4. STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY FREE OF THE SMALLER STONES AND SHALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS... 5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.



OUTLET PROTECTION DETAIL NOT TO SCALE



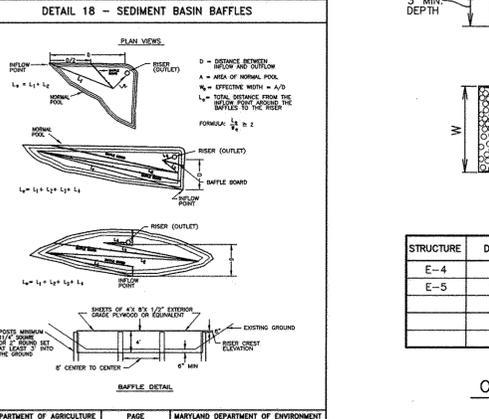
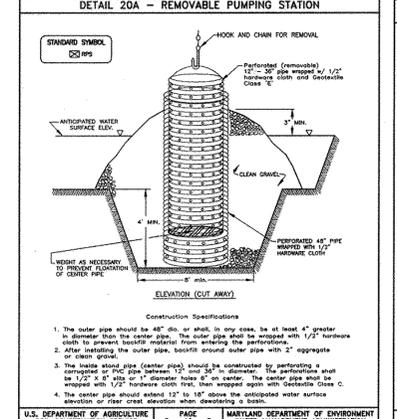
AS-BUILT CERTIFICATION: I-6-17

TEMPORARY SEEDBED PREPARATIONS

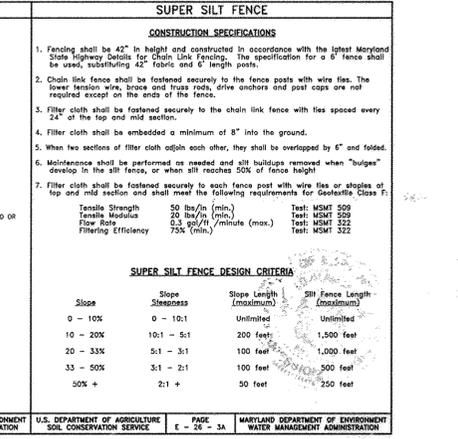
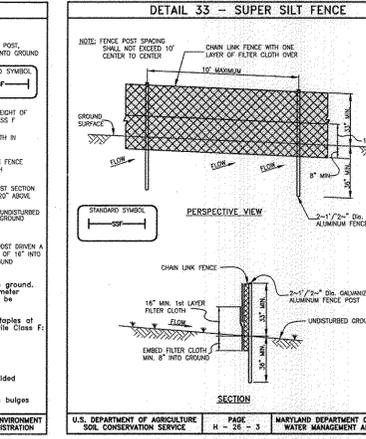
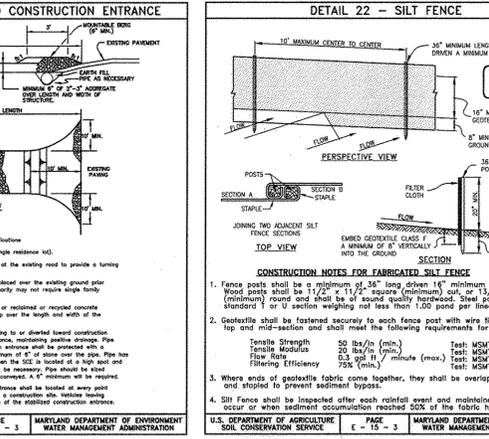
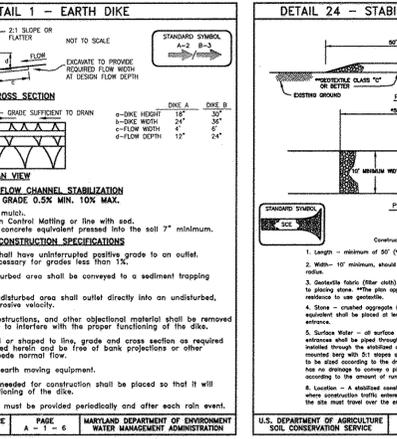
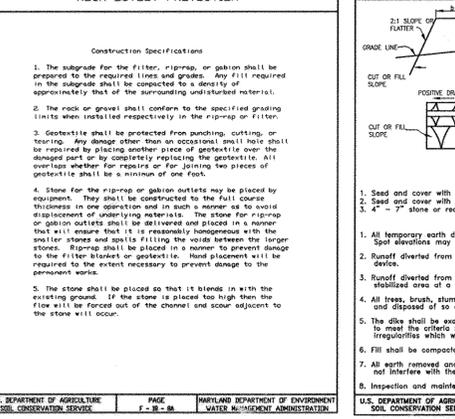
- APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED. SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED. SOIL AMENDMENTS: APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT). SEEDING: FOR PERIOD MARCH 1 THROUGH APRIL 30 AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2-1/2 BUSHELS PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT) FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (0.7 LBS/1000 SQ FT) FOR THE PERIOD NOVEMBER 18 THROUGH FEBRUARY 28. PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD. MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 210 GALLONS PER ACRE (9 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES, 8 FT. OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING. REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

PERMANENT SEEDBED PREPARATIONS

- SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED. SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES: 1. PREFERRED - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0-0 UREAFORM FERTILIZER (9 LBS/1000 SQ FT). 2. ACCEPTABLE - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 1000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. SEEDING: FOR THE PERIODS MARCH 1 THROUGH APRIL 30 AND AUGUST 1 THROUGH OCTOBER 15, SEED WITH 60 LBS PER ACRE (1.4 LBS/1000 SQ FT) OF KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS PER ACRE (0.5 LBS/1000 SQ FT) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 15 THROUGH FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) USE SOD. OPTION (3) SEED WITH 80 LBS PER ACRE OF KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS PER ACRE OF WELL ANCHORED STRAW. MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 210 GALLONS PER ACRE (9 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING. MAINTENANCE: INSPECT ALL SEEDBED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.



ROCK OUTLET PROTECTION



- NOTIFY MDE AND THE SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF CONSTRUCTION. THIS PLAN IS NOT TO PROCEED UNTIL BASIN #1 AND ALL CONTROLS UNDER F-10-026 ARE INSTALLED AND PERMISSION IS GRANTED FROM THE INSPECTOR TO PROCEED. 1. OBTAIN GRADING PERMIT, MDE PERMIT NUMBER 02-NI-0009 / 200261454 EFFECTIVE 5-16-2006. (DAY 1) 2. INSTALL STABILIZED CONSTRUCTION ENTRANCE, TREE PROTECTION FENCES, SUPER SILT FENCES, AND TEMPORARY CLEANNETWORK DIVERSION DIKES EXCEPT SSF AT BOTTOM OF EXISTING SWALE WEST OF I-13. (DAY 2-12) 3. INSTALL SEDIMENT BASIN #2, SEDIMENT BASIN #1 CONSTRUCTED UNDER F-10-026 SHALL REMAIN THROUGHOUT CONSTRUCTION OF THIS PROJECT. (DAY 13-60) 4. INSTALL ANY REMAINING SEDIMENT CONTROL DEVICES. (DAY 61-63) 5. INSTALL CON/SPAN BRIDGE AND STORM DRAIN FROM E-3 TO I-11 (DO NOT PUT LID ON I-11 AT THIS TIME). STREAM CLOSURE MARCH 1st THROUGH JUNE 15th. (DAY 64-74) 6. INSTALL DOUBLE ROW OF SSF AT BOTTOM OF EXISTING CHANNEL WEST OF I-13. (DAY 75) 7. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, BRING ROAD BEDS TO SUBGRADE AND STABILIZE SLOPES IN ACCORDANCE WITH TEMPORARY SEEDBED NOTES. UTILIZE DUST CONTROL METHODS. NO MORE THAN 20 AC. MAY BE UNSTABILIZED AT ANY TIME. ONCE LAO ROAD HAS BEEN BROUGHT UP TO SUBGRADE, TEMPORARY EMBANKMENT FOR I-11 AND SUPER SILT FENCE AT ITS TOE CAN BE REMOVED AND THE LID CAN BE PUT ON I-11. (DAY 76-86) 8. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, INSTALL REMAINING STORM DRAINS, WATER MAINS, SEWER MAINS AND SWALES. (DAY 87-112) 9. PAVE ROADWAYS. (DAY 113-128) 10. COMPLETE MASS GRADING OF SITE AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES. (DAY 129-144) 11. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL DEVICES, AND STABILIZED DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES. (DAY 154-161) 12. CONVERT TEMPORARY BASIN #1 TO ITS FINAL POND DESIGN. ONCE CONVERSION IS COMPLETE, PERFORM AS-BUILT AND SUBMIT APPROVAL TO INSPECTOR. (DAY 162-172) **TEMPORARY BASIN #2 SHALL NOT BE CONVERTED TO FINAL POND DESIGN UNTIL THE PORTION OF VILLAGES AT TURF VALLEY, PHASE 3, F-08-005 THAT DRAINS TO THE BASIN HAS BEEN COMPLETED AND PERMANENTLY STABILIZED. ONCE CONVERSION IS COMPLETE AS-BUILTS SHALL BE PERFORMED AND APPROVAL SUBMITTED TO INSPECTOR.

- ENGINEER'S CERTIFICATE: I HEREBY CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. DONALD MASON, ENGINEER - DONALD A. MASON, P.E. # 21443, DATE 11/5/09. DEVELOPER'S CERTIFICATE: I HAVE CERTIFIED THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT FOR SEDIMENT AND EROSION CONTROL AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT. DONALD MASON, DEVELOPER, DATE 11/5/09. APPROVED: DEPARTMENT OF PUBLIC WORKS, DATE 12/8/09. APPROVED: DEPARTMENT OF PLANNING AND ZONING, DATE 12/15/09.

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS. 8480 BALTIMORE NATIONAL PIKE & SUITE 418, ELICOTT CITY, MARYLAND 21043. PHONE: 410-465-6100, FAX: 410-465-6844, WWW.BE-CV-ENGINEERS.COM. OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP, 1205 YORK ROAD, PENTHUS HOUSE, LUTHERVILLE, MARYLAND 21093, 410-825-8400. DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP, 1205 YORK ROAD, PENTHUS HOUSE, LUTHERVILLE, MARYLAND 21093, 410-825-8400. VILLAGES AT TURF VALLEY, PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA # BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 # 307 AND NON-BUILDABLE BULK PARCELS CC-2. TAX MAP: 16, GRID: 11, PARCEL: P/O B, ZONED: PGCC, ELECTION DISTRICT NO. 3, HOWARD COUNTY, MARYLAND. SEDIMENT AND EROSION CONTROL NOTES AND DETAILS. DATE: OCTOBER, 2009, BEI PROJECT NO. 1915, SCALE: AS SHOWN, SHEET 11 OF 26.



PLAN VIEW
SCALE: 1"=100'

PHASE	INLET #	ZONING (Z)	AREA (Ac) (A)	"C" FACTOR <25 YR (C)	% IMPERVIOUS (P)
I	I-1	PGCC	0.51	0.86	1.00
I	I-2	PGCC	1.03	0.86	1.00
I	I-3	PGCC	0.48	0.86	1.00
I	I-4	PGCC	2.46	0.55	0.81
I	I-5	PGCC	1.20	0.68	0.89
I	I-6	PGCC	0.63	0.86	1.00
I	I-7	PGCC	0.48	0.50	0.77
I	I-8	PGCC	0.52	0.48	0.76
I	I-9	PGCC	0.86	0.45	0.75
I	I-10	PGCC	0.51	0.46	0.75
I	I-11	PGCC	1.43	0.31	0.65
I	I-12	PGCC	0.38	0.86	1.00
I	I-13	PGCC	0.37	0.86	1.00
I	I-14	PGCC	0.97	0.50	0.77
I	I-15	PGCC	2.18	0.40	0.71
I	I-16	PGCC	0.74	0.25	0.41
I	I-17	PGCC	0.09	0.86	1.00
I	I-18	PGCC	0.73	0.51	0.78
I	I-19	PGCC	0.46	0.27	0.48
I	I-20	PGCC	1.58	0.44	0.74
I	I-21	PGCC	0.39	0.86	1.00
I	I-22	PGCC	1.03	0.61	0.84
I	I-23	PGCC	1.83	0.46	0.75
I	I-24	PGCC	1.58	0.49	0.77
I	I-25	PGCC	0.78	0.50	0.78
I	I-26	PGCC	2.49	0.28	0.46
I	I-27	PGCC	1.27	0.20	0.19
IV	I-28	PGCC	0.90	0.57	0.82
IV	I-29	PGCC	1.77	0.47	0.76
III	I-30	PGCC	1.04	0.41	0.72
III	I-31	PGCC	0.41	0.53	0.79
I	I-32	PGCC	0.40	0.31	0.65
I	I-33	PGCC	0.31	0.30	0.65
I	I-34	PGCC	0.40	0.33	0.65
II	I-35	PGCC	0.65	0.60	0.64
I	ROOF*	PGCC	0.08	0.86	1.00

* ROOF - REPRESENTS ROOF AREA OF LOTS 59 thru 62 THAT SHALL TIE INTO STORM DRAIN BETWEEN I-34 AND M-10

APPROVED: DEPARTMENT OF PUBLIC WORKS
W. R. Wall 6-20-12
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
V. S. Schuler 6/21/12
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

M. P. ... 6/21/12
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO.	DATE	REVISION
2	4-8-15	REVISE TITLE BLOCK TO ADD P153
1	5-29-2012	REVISE LOT CONFIGURATION, GRADING, DRAINAGE DIVIDES, STORM DRAIN DATA CHART AND TITLE BLOCK.

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 418
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6844
 WWW.BD-CMENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer in the State of Maryland.
 License No. 12-21-3893
 5-25-12

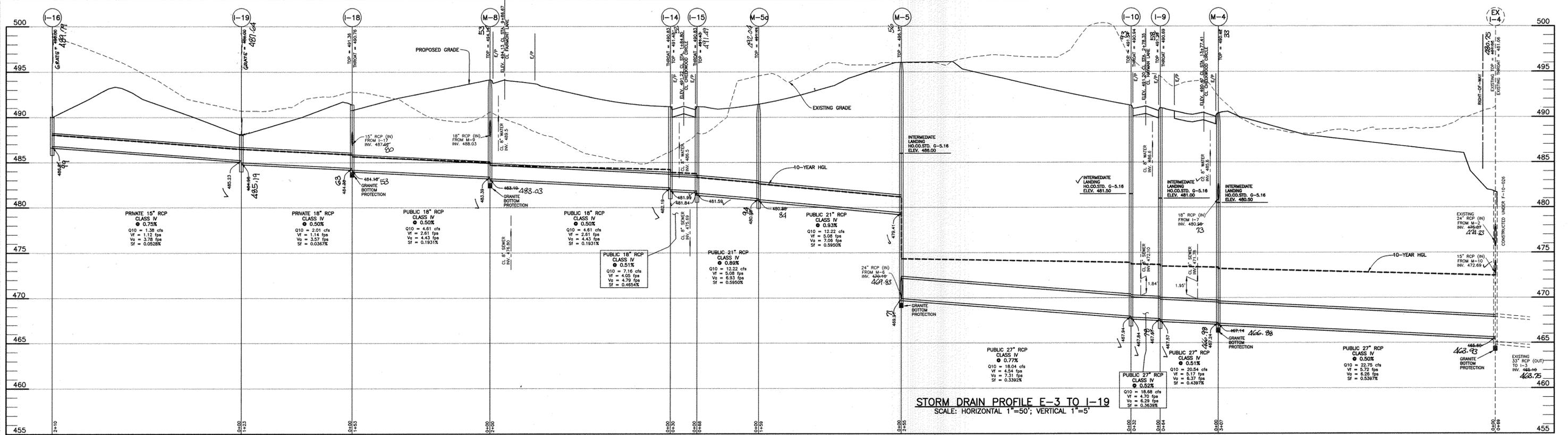
OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
 410-825-8400

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

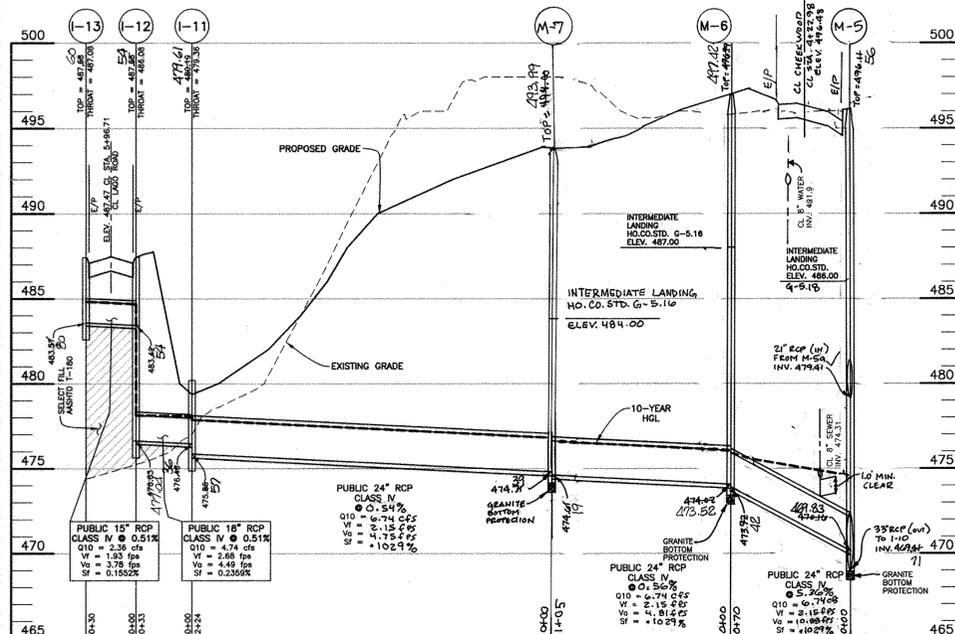
VILLAGES AT TURF VALLEY
 PHASE I SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63-94 AND OPEN SPACE LOT 97, NON-BUILDABLE BULK PARCELS AA, B, B, AND PHASE I SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2
 TAX MAP: 16 GRID: 11 PARCEL: P/O B
 ZONED: PGCC
 ELECTION DISTRICT NO. 3
 HOWARD COUNTY, MARYLAND

REVISED
STORM DRAIN DRAINAGE AREA MAP

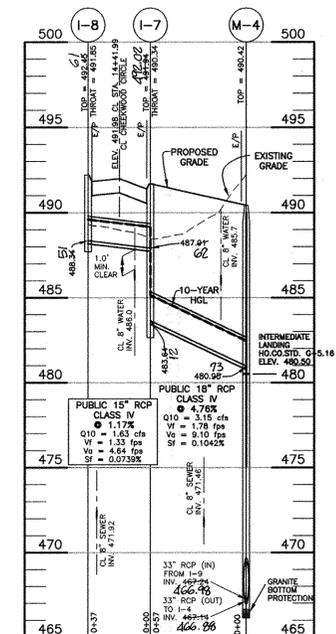
DATE: OCTOBER, 2009 SHEET PROJECT NO. 1915
 SCALE: AS SHOWN BEI PROJECT 12 OF 26



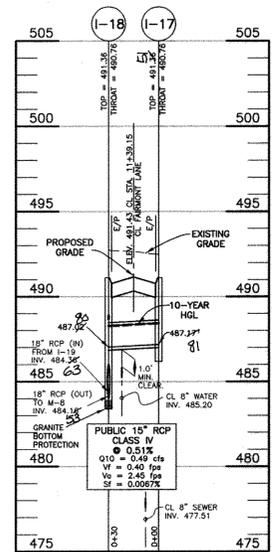
STORM DRAIN PROFILE E-3 TO I-19
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



STORM DRAIN PROFILE M-5 TO I-13
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



STORM DRAIN PROFILE M-4 TO I-8
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'



STORM DRAIN PROFILE I-17 TO I-18
SCALE: HORIZONTAL 1"=50'; VERTICAL 1"=5'

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature] 6-20-12
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
[Signature] 6/21/12
 CHIEF, DIVISION OF LAND DEVELOPMENT
[Signature] 6/18/12
 CHIEF, DEVELOPMENT ENGINEERING DIVISION



AS-BUILT CERTIFICATION
 I hereby certify by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
 Donald Mason, P.E. No. 21443 Date: 1-5-17

NO.	DATE	REVISION
1	4-8-15	REVISE TITLE BLOCK TO ADD P153
2	9-24-12	REVISE PROFILE FROM I-11 TO M-5
3	8-10-12	REVISE INLETS 10 & 19 TO BE TYPE 'S' INLETS, SHOW GRADE ELEVATION
4	5-29-2012	REVISE STORM DRAIN FROM M-8 TO I-16 AND I-11 TO M-5. REVISE ALL COMP DATA. REVISE 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. 21443.

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

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

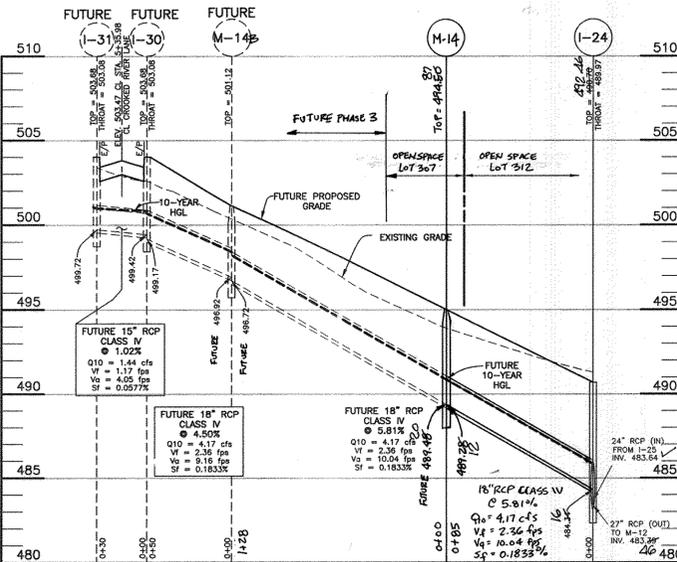
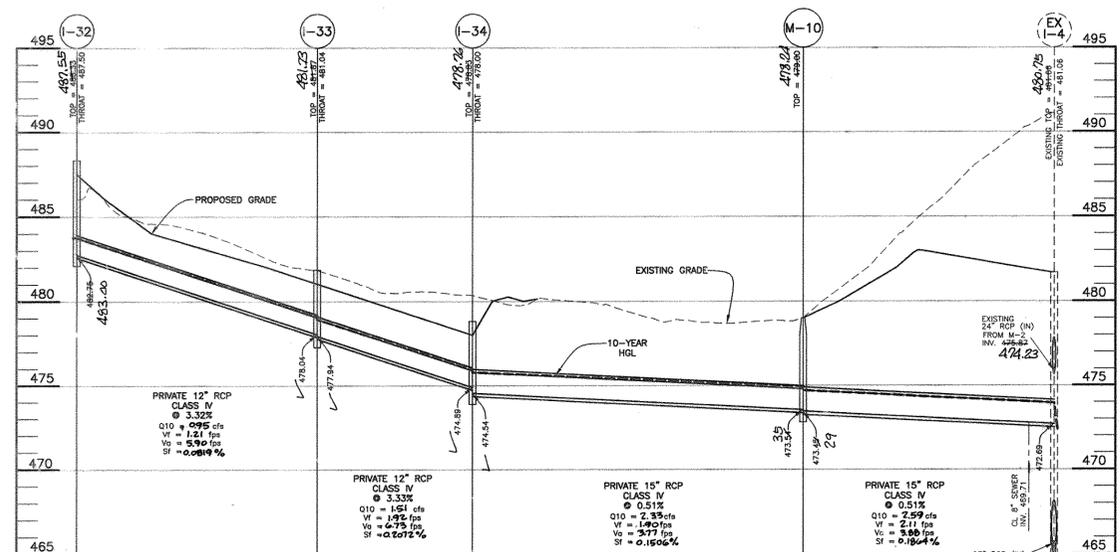
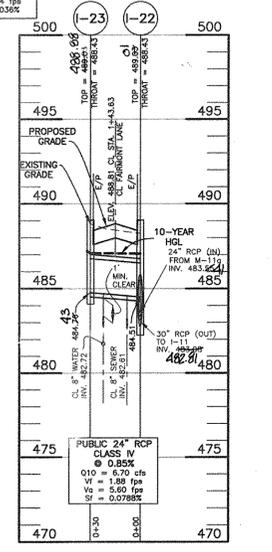
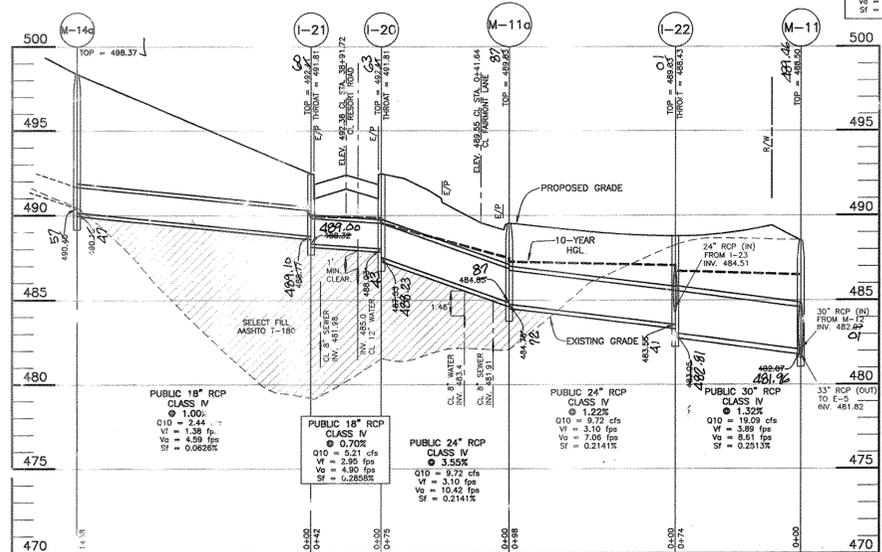
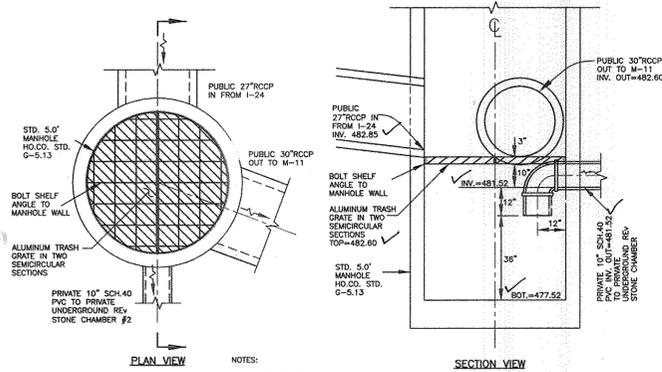
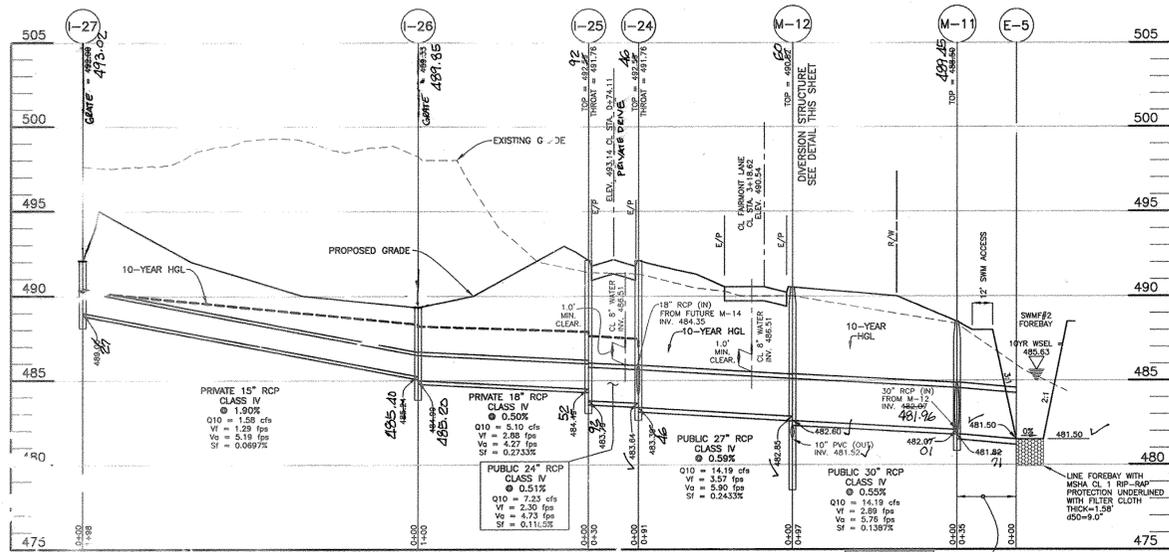
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

VILLAGES AT TURF VALLEY
 PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 106, GOLF SPACE LOT 87, NON-BUILDABLE BULK PARCELS A & B2 AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/0 B
 ZONED: PGCC
 ELECTION DISTRICT NO. 3
 HOWARD COUNTY, MARYLAND

REVISED
STORM DRAIN PROFILES AND DETAILS

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 13 OF 26



STRUCTURE SCHEDULE										
NO.	TYPE	LOCATION	PIPE INV. IN	PIPE INV. OUT	TOP ELEV.	THROAT ELEV.	OWNERSHIP	HO. CO. STD.		
END SECTIONS										
E-4	42" CONC. END SECT.	N 595,580.94, E 1,343,496.23	---	476.00	NA	NA	PUBLIC	D-5.51		
E-5	36" CONC. END SECT.	N 595,744.66, E 1,343,333.83	---	481.50	NA	NA	PUBLIC	D-5.51		
CHECKWOOD COURT INLETS										
I-7	A-10 width=2.5'	CL STA. 14+31.18 OFFSET 13.43' RIGHT	487.91	483.64	491.94	491.34	PUBLIC	D-4.03		
I-8	A-5 width=2.5'	CL STA. 14+53.12 OFFSET 13.43' LEFT	488.34	488.34	492.36	491.85	PUBLIC	D-4.01		
I-9	A-10 width=3.5'	CL STA. 2+85.16 OFFSET 13.43' RIGHT	467.87	467.87	491.28	490.69	PUBLIC	D-4.03		
I-10	A-10 width=3.5'	CL STA. 2+71.72 OFFSET 13.43' LEFT	467.94	467.94	491.54	490.94	PUBLIC	D-4.03		
I-11	D (2-OPENINGS)	CL STA. 5+95.07 OFFSET 47.72' LEFT	476.88	476.88	490.19	479.36	PUBLIC	D-4.10		
I-12	A-10 width=2.5'	CL STA. 5+96.71 OFFSET 13.43' LEFT	483.84	483.84	487.68	487.08	PUBLIC	D-4.03		
I-13	A-5 width=2.5'	CL STA. 5+96.71 OFFSET 13.43' RIGHT	483.87	483.87	487.68	487.08	PUBLIC	D-4.01		
I-14	A-5 width=2.5'	CL STA. 1+84.80 OFFSET 13.43' LEFT	482.19	461.99	491.48	490.83	PUBLIC	D-4.01		
I-15	A-5 width=2.5'	CL STA. 1+84.80 OFFSET 13.43' RIGHT	481.84	481.59	491.48	490.83	PUBLIC	D-4.01		
I-16	S	N 595,725.76, E 1,342,591.06	---	486.99	489.19	490.00	PRIVATE	D-4.22		
I-17	A-5 width=2.5'	CL STA. 11+39.64 OFFSET 13.43' LEFT	487.17	487.17	491.36	490.76	PUBLIC	D-4.01		
I-18	A-10 width=2.5'	CL STA. 11+39.64 OFFSET 13.43' RIGHT	487.92	484.16	491.36	490.76	PUBLIC	D-4.03		
I-19	S	N 595,595.06, E 1,342,427.00	---	485.23	484.98	490.00	PRIVATE	D-4.22		
I-20	A-10 width=3.0'	CL STA. 38+91.72 OFFSET 19.00' LEFT	488.04	487.54	492.46	491.81	PUBLIC	D-4.03		
I-21	A-10 width=2.5'	CL STA. 38+91.72 OFFSET 19.00' RIGHT	488.77	488.77	492.46	491.81	PUBLIC	D-4.03		
I-22	A-5 width=3.5'	CL STA. 1+43.59 OFFSET 13.43' LEFT	483.51	483.51	488.03	488.43	PUBLIC	D-4.01		
I-23	A-10 width=2.5'	CL STA. 1+43.59 OFFSET 13.43' RIGHT	483.51	484.28	488.03	488.43	PUBLIC	D-4.03		
I-24	A-10 width=2.5'	CL STA. 0+74.11 OFFSET 13.43' RIGHT	483.51	483.51	492.58	491.76	PUBLIC	D-4.03		
I-25	A-10 width=2.5'	CL STA. 0+74.11 OFFSET 13.43' LEFT	484.48	483.28	492.58	491.76	PUBLIC	D-4.03		
I-26	S	N 595,971.30, E 1,343,139.96	---	485.24	484.98	489.33	PRIVATE	D-4.22		
I-27	S	N 595,926.75, E 1,342,947.22	---	489.02	493.02	492.00	PRIVATE	D-4.22		
FUTURE										
I-30	A-5 width=2.5'	CL STA. 5+35.08 OFFSET 13.43' LEFT	499.42	499.17	503.68	503.08	PUBLIC	D-4.03		
I-31	A-5 width=2.5'	CL STA. 5+35.08 OFFSET 13.43' RIGHT	499.72	499.72	503.68	503.08	PUBLIC	D-4.01		
I-32	YARD	N 595,667.20, E 1,343,190.47	---	482.75	483.00	487.00	PRIVATE	D-4.14		
I-33	YARD	N 595,542.97, E 1,343,259.01	---	478.04	477.94	481.04	PRIVATE	D-4.14		
I-34	YARD	N 595,477.98, E 1,343,323.52	---	474.89	474.54	478.00	PRIVATE	D-4.14		

CHECKWOOD COURT MANHOLES										
NO.	TYPE	LOCATION	PIPE INV. IN	PIPE INV. OUT	TOP ELEV.	THROAT ELEV.	OWNERSHIP	HO. CO. STD.		
M-4	5'-0" MANHOLE	CL STA. 13+74.99 CHECKWOOD COURT OFFSET 15.87' RIGHT	489.46	489.46	490.42	490.23	PUBLIC	G-5.13		
M-5	5'-0" MANHOLE	CL STA. 4+07.76 CHECKWOOD COURT OFFSET 10.82' LEFT	496.91	496.91	496.35	496.35	PUBLIC	G-5.13		
M-5a	4'-0" MANHOLE	CL STA. 2+51.99 CHECKWOOD COURT OFFSET 17.10' LEFT	480.98	480.98	484.04	484.04	PUBLIC	G-5.11 & G-5.12		
M-6	4'-0" MANHOLE	N 595,191.06, E 1,342,947.78	---	474.27	473.92	477.00	PUBLIC	G-5.11 & G-5.12		
M-7	4'-0" MANHOLE	N 595,151.68, E 1,342,753.61	---	474.27	474.19	474.00	PUBLIC	G-5.11 & G-5.12		
M-8	4'-0" MANHOLE	CL STA. 9+86.67 FAIRMONT LANE OFFSET 16.20' RIGHT	483.99	483.18	484.53	484.53	PUBLIC	G-5.11 & G-5.12		
M-9	4'-0" MANHOLE	CL STA. 9+24.62 FAIRMONT LANE OFFSET 16.20' RIGHT	488.69	488.34	486.36	486.36	PUBLIC	G-5.11 & G-5.12		
M-10	4'-0" MANHOLE	N 595,432.17, E 1,343,513.07	---	473.84	473.82	479.00	PUBLIC	G-5.11 & G-5.12		
M-11	5'-0" MANHOLE	CL STA. 2+16.63 FAIRMONT LANE OFFSET 28.00' LEFT	489.27	481.82	488.50	488.50	PUBLIC	G-5.13		
M-11a	4'-0" MANHOLE	CL STA. 0+45.61 FAIRMONT LANE OFFSET 16.20' LEFT	484.85	484.78	489.53	489.53	PUBLIC	G-5.11 & G-5.12		
M-12	5'-0" MANHOLE	CL STA. 3+15.56 FAIRMONT LANE OFFSET 16.50' LEFT	482.85	481.52	490.52	490.52	PUBLIC	G-5.13		
M-13	4'-0" MANHOLE	CL STA. 2+86.48 FUTURE ROAD OFFSET 16.50' RIGHT	496.92	496.72	501.12	501.12	PUBLIC	G-5.11 & G-5.12		
M-14a	4'-0" MANHOLE	CL STA. 40+34.89 RESORT ROAD OFFSET 22.28' RIGHT	490.40	490.15	498.37	498.37	PUBLIC	G-5.11 & G-5.12		
M-14	4'-0" MANHOLE	N 595,969.29, E 1,343,237.58	---	489.48	489.12	494.50	PUBLIC	G-5.11 & G-5.12		

1) STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE.
 2) STRUCTURE LOCATION FOR INLETS IS AT THE FRONT CENTER OF THE INLET.
 3) STRUCTURE ELEVATION AND LOCATION FOR ENDSECTIONS IS AT THE MIDPOINT OF THE END OF STRUCTURE.
 4) PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.
 5) WIDTH LISTED FOR 'A' TYPE INLETS IS THE INTERIOR WALL WIDTH.

** TO BE INSTALLED UNDER PHASE 3

PIPE SCHEDULE			
PIPE SIZE	LENGTH	TYPE	OWNERSHIP
10"	99'	PVC	PRIVATE
12"	234'	RCP CLASS IV	
15"	751'	RCP CLASS IV	
18"	223'	RCP CLASS IV	
15"	97'	RCP CLASS IV	
18"	736'	RCP CLASS IV	PUBLIC
21"	227'	RCP CLASS IV	
24"	685'	RCP CLASS IV	
27"	749'	RCP CLASS IV	
30"	171'	RCP CLASS IV	
33"	35'	ASTM C-76	
42"	60'	ASTM C-361 (B-25)	

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 12-15-09
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 12/15/09
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 12/15/09
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

5	10-20-2010	ADD M-14. REVISE PROFILE, STRUCTURE SCHED., PIPE SCHED.
4	4-8-10	REVISE TITLE BLOCK TO ADD PLS 3
3	9-24-12	REVISE M-6 & M-7 IN STRUCTURE SCHEDULE
2	8-10-12	REVISE INLETS I-19, I-26 & I-27 TO BE TYPE 'S' INLETS
1	5-29-2012	REVISE STRUCTURE SCHED, PIPE SCHED, STORM DRAIN DATA FROM EX 1-4 TO 1-32
NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
 8480 BALTIMORE NATIONAL PIKE A SUITE 418
 ELICOTT CITY, MARYLAND 21043
 PHONE: 410-465-8105 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, License No. 21443, Expiration 12-31-2018.

Donnell M. Moore
 10-27-09

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
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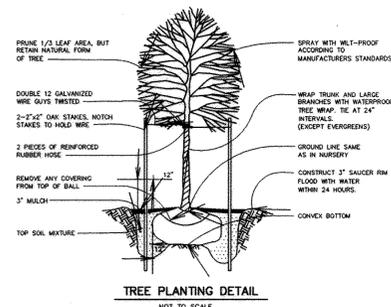
VILLAGES AT TURF VALLEY
 PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACES LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCELS CC-2.

TAX MAP: 16 GRID: 11 PARCEL: P/O 6
 ZONED: PFCO
 ELECTION DISTRICT NO. 3
 HOWARD COUNTY, MARYLAND

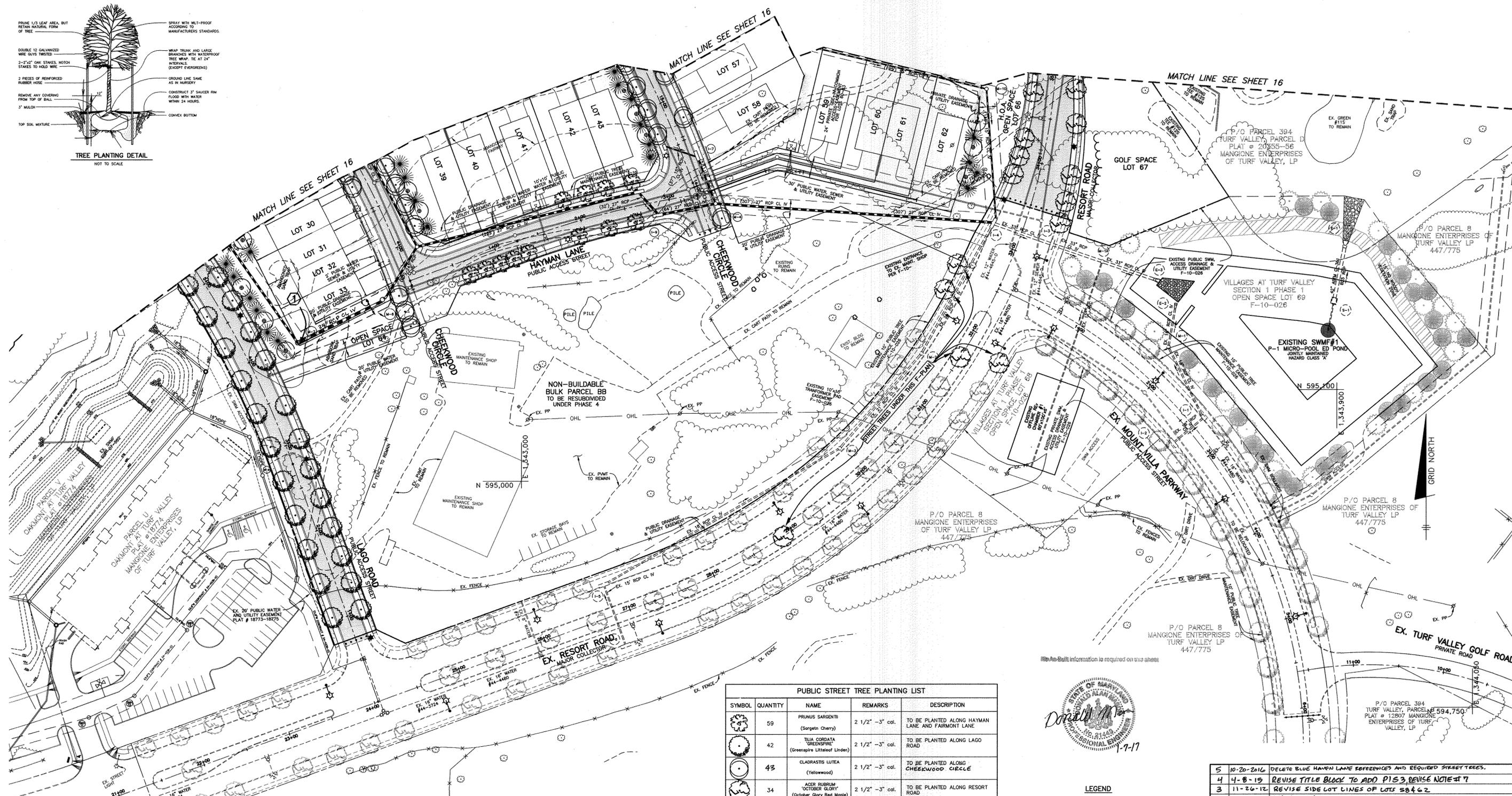
STORM DRAIN PROFILES AND DETAILS

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 14 OF 26

AS-BUILT O8-060



TREE PLANTING DETAIL
NOT TO SCALE

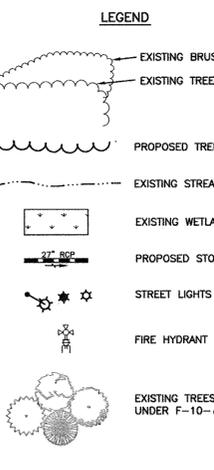


SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	59	PRUNUS SARGENTI (Sargen Cherry)	2 1/2" - 3" cal.	TO BE PLANTED ALONG HAYMAN LANE AND FAIRMONT LANE
	42	TILIA CORDATA (Greenspire Linden)	2 1/2" - 3" cal.	TO BE PLANTED ALONG LAGO ROAD
	43	CLADRASTIS LUTEA (Yellowwood)	2 1/2" - 3" cal.	TO BE PLANTED ALONG CHEEKWOOD CIRCLE
	34	ACER RUBRUM (October Glory)	2 1/2" - 3" cal.	TO BE PLANTED ALONG RESORT ROAD

ROAD NAME	PERIMETER	TREES REQ.	SIZE
RESORT ROAD	1,350'	34	LARGE
HAYMAN LANE	462'	12	MEDIUM
FAIRMONT LANE	1,877'	47	MEDIUM
CHEEKWOOD CIRCLE	924'	23	MEDIUM
CHEEKWOOD CIRCLE	779'	20	MEDIUM
LAGO ROAD	1,672'	42	LARGE

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, 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.
- SEE TREE PLANTING DETAIL - THIS SHEET.
- 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 HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.
- 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 \$25,350.00 (\$12,300.00 FOR 41 SHADE TREES @ \$300.00 FOR 87 EVERGREENS)



APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter J. ... 6-20-12
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Walter J. ... 6/21/12
CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Walter J. ... 6/21/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION

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 6/1/12
LOUIS MANGIONE 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. 12-21-0919 2018

BENCHMARK ENGINEERING, INC.
ENGINEERS • LAND SURVEYORS • PLANNERS
8480 BALTIMORE NATIONAL PIKE & SUITE 418
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DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

VILLAGES AT TURF VALLEY
PHASE 1 SECTION 2, LOTS 1-4 AND 62, OPEN SPACE LOTS 63-64 AND GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-306, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/O 8
ZONED: PGCC
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

REVISED PERIMETER LANDSCAPE AND STREET TREE PLAN

DATE: APRIL, 2012 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 15 OF 26

AS-BUILT F-08-060

SCHEDULE A PERIMETER LANDSCAPE EDGE													
SFA SIDE TO ROAD LOT 300	SFA SIDE TO ROAD LOT 302	CATEGORY	SFA REAR TO ROADWAY LOTS 23-33	SFA SIDE TO ROADWAY LOT 1	SFA SIDE TO ROADWAY LOT 22	SFA SIDE TO ROADWAY LOT 23	SFA SIDE TO ROADWAY LOT 34	SFA SIDE TO ROADWAY LOT 39	SFA SIDE TO ROADWAY LOT 43	SFA SIDE TO ROADWAY LOT 48	SFA SIDE TO ROADWAY LOT 52	SFA SIDE TO ROADWAY LOT 62	TOTALS
120'	132'	LANDSCAPE TYPE	C	C	C	C	B	C	C	B	B	B	
		LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	393'	121'	123'	109'	133'	89'	111'	132'	96'	131'	
NO	NO	CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
NO	NO	CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
3	3	NUMBER OF PLANTS REQUIRED	10	3	3	3	3	2	3	3	2	3	41
6	7	SHADE TREES	20	6	6	5	3	4	6	3	1	4	72
		EVERGREEN TREES	-	-	-	-	-	-	-	-	-	-	-
		OTHER TREES (2:1 SUBSTITUTE) SHRUBS	-	-	-	-	-	-	-	-	-	-	-
3	3	NUMBER OF PLANTS PROVIDED	10	3	3	3	3	2	3	3	2	3	41
6	7	SHADE TREES	20	6	6	5	3	4	6	3	1	4	72
		EVERGREEN TREES	-	-	-	-	-	-	-	-	-	-	-
		OTHER TREES (2:1 SUBSTITUTE) SHRUBS	-	-	-	-	-	-	-	-	-	-	-

SCHEDULE D SWM AREA LANDSCAPING		
LINEAR FEET OF PERIMETER	SWM2	TOTALS
LINEAR FEET OF EXISTING WOODS LINE	853'	
LINEAR FEET OF REQUIRED PLANTING	257'	
BUFFER TYPE	5' B	
	1:50 shade	
	1:40 evergreen	
CREDIT FOR EXISTING VEGETATION (NO, YES AND %)	YES 30%	
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	NO	
NUMBER OF TREES REQUIRED	SHADE TREES 12*	12*
	EVERGREEN TREES 15	15
NUMBER OF TREES PROVIDED	SHADE TREES 0	0
	EVERGREEN TREES 15	15

*12 SHADE TREES TO BE SUBSTITUTED BY INTERNAL LANDSCAPING WITHIN FACILITY AS ALLOWED BY THE LANDSCAPE MANUAL.

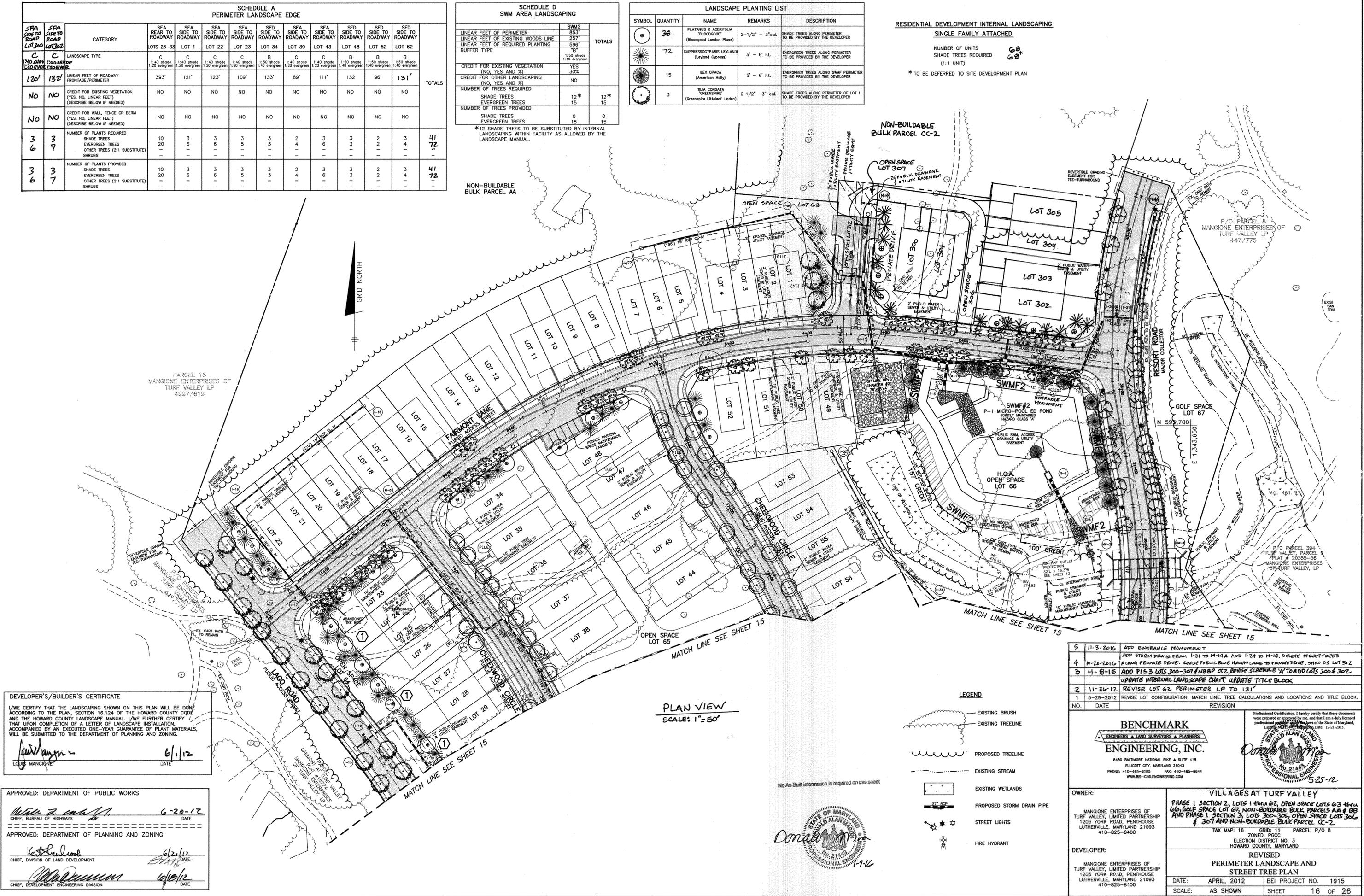
LANDSCAPE PLANTING LIST				
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
⊙	36	PLATANUS X ACERIFOLIA 'BLOODGOOD'	2-1/2" - 3" cal.	SHADE TREES ALONG PERIMETER TO BE PROVIDED BY THE DEVELOPER
☼	72	CUPRESSUS/PARIS LEVLANDE (Leyland Cypress)	5' - 6' ht.	EVERGREEN TREES ALONG PERIMETER TO BE PROVIDED BY THE DEVELOPER
⊙	15	ILEX OPACA (American Holly)	5' - 6' ht.	EVERGREEN TREES ALONG SWM PERIMETER TO BE PROVIDED BY THE DEVELOPER
⊙	3	TILIA CORDATA 'GREENSPIRE' (Greenspire Littleleaf Linden)	2 1/2" - 3" cal.	SHADE TREES ALONG PERIMETER OF LOT 1 TO BE PROVIDED BY THE DEVELOPER

RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING
SINGLE FAMILY ATTACHED

NUMBER OF UNITS
SHADE TREES REQUIRED
(1:1 UNIT) **68**

* TO BE DEFERRED TO SITE DEVELOPMENT PLAN

PARCEL 15
MANGIONE ENTERPRISES OF
TURF VALLEY LP
4997/619



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
LOUIS MANGIONE
6/1/12
DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
W. Z. ...
CHIEF, BUREAU OF HIGHWAYS
6-20-12
DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
...
CHIEF, DIVISION OF LAND DEVELOPMENT
6/2/12
DATE

...
CHIEF, DEVELOPMENT ENGINEERING DIVISION
6/6/12
DATE

PLAN VIEW
SCALE: 1" = 50'

LEGEND

- EXISTING BRUSH
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING STREAM
- EXISTING WETLANDS
- PROPOSED STORM DRAIN PIPE
- STREET LIGHTS
- FIRE HYDRANT

NO.	DATE	REVISION
5	11-3-2016	ADD ENTRANCE MONUMENT AND STORM DRAIN FROM LOT 21 TO M-14A AND 1-24 TO M-14. DELETE STREET TREES ALONG PENNAC DEVE. DENSE PUBLIC EDGE MAINTENANCE TO PENNAC DEVE. SH-10 DS LOT 312
4	10-20-2016	ADD 10' BUFFER TO SWM AREAS TO PENNAC DEVE. SH-10 DS LOT 312
3	4-1-8-15	ADD P153 LOTS 300-307 A HBBP CC2. REVISE SCHEDULE 'A' TO ADD LOTS 306 & 307. UPDATE INTERNAL LANDSCAPE CHART. UPDATE TITLE BLOCK
2	11-26-12	REVISE LOT 62 PERIMETER LP TO 131'
1	5-29-2012	REVISE LOT CONFIGURATION, MATCH LINE, TREE CALCULATIONS AND LOCATIONS AND TITLE BLOCK.

BENCHMARK ENGINEERING, INC.
ENGINEERS • LAND SURVEYORS • PLANNERS
8480 BALTIMORE NATIONAL PIKE A SUITE 418
ELICOTT CITY, MARYLAND 21043
PHONE: 410-665-6100 FAX: 410-665-6644
WWW.BE-ENR.COM

Donal ...
PROFESSIONAL ENGINEER
5-25-12

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

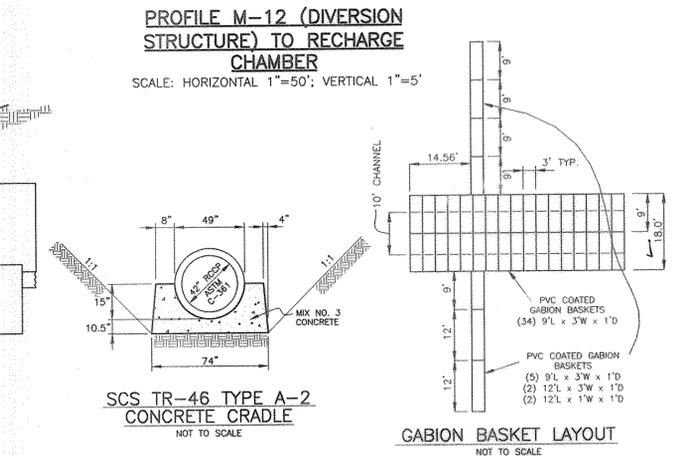
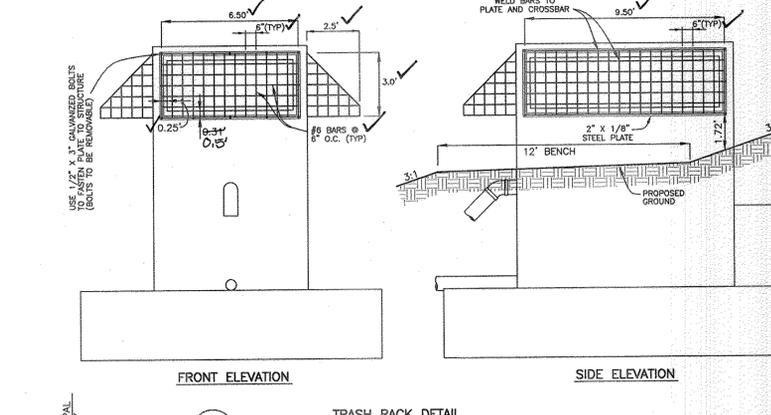
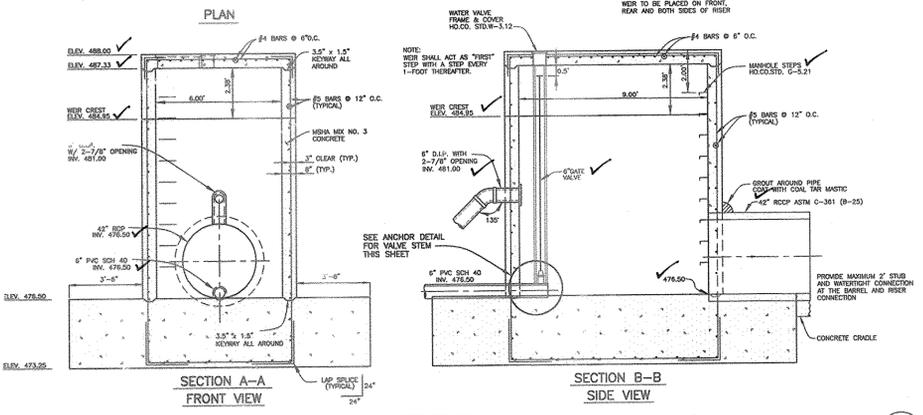
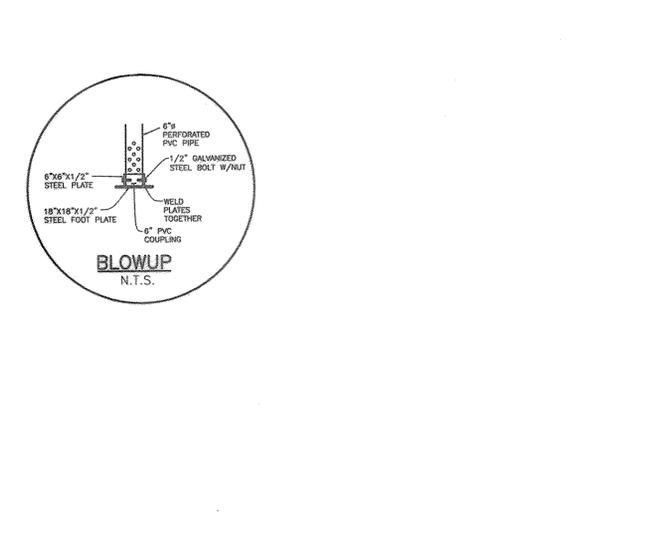
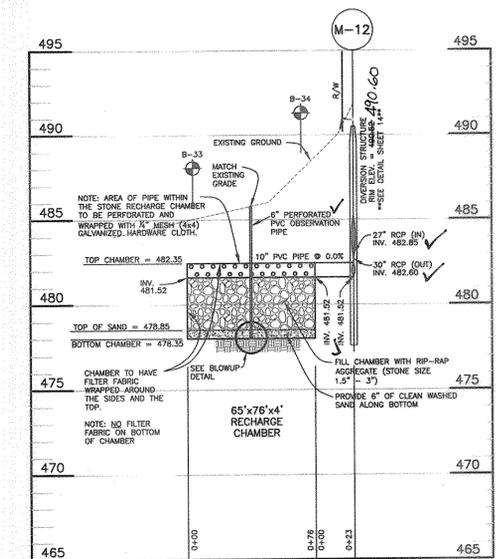
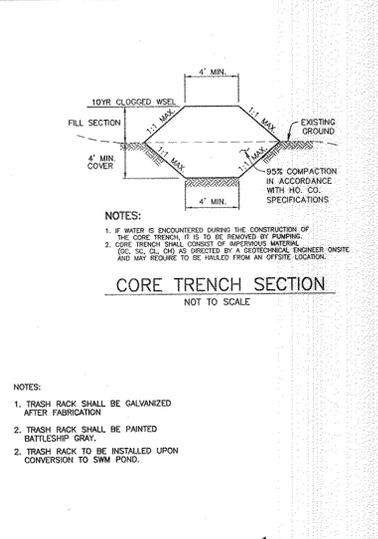
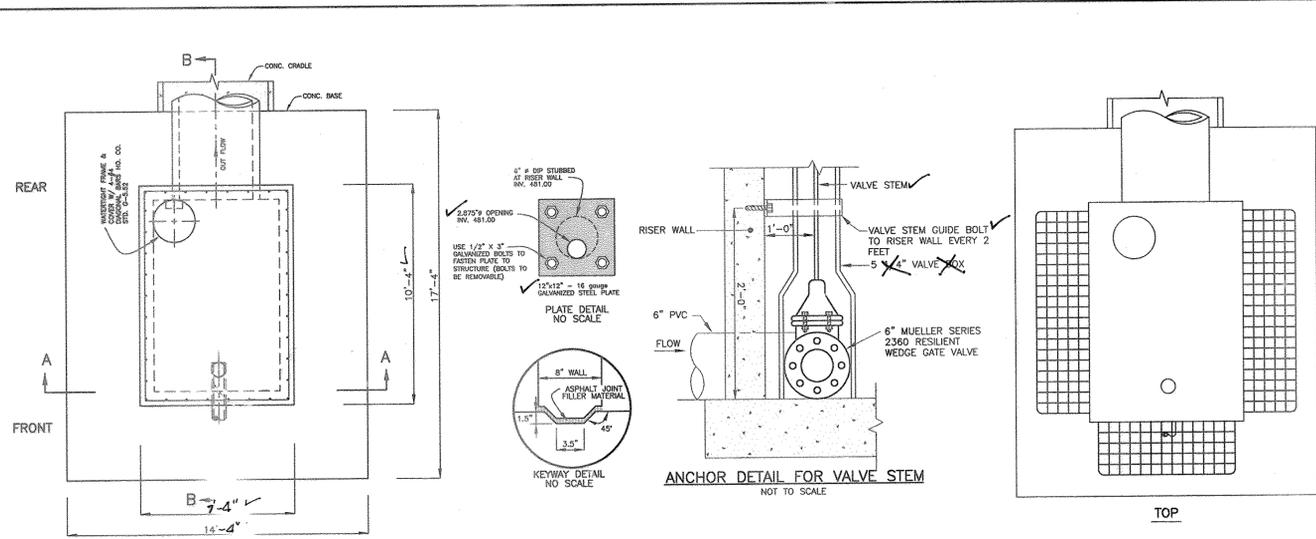
VILLAGES AT TURF VALLEY
PHASE I SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 67, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & AB AND PHASE I SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/O B
ZONED: PGCC
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

REVISED PERIMETER LANDSCAPE AND STREET TREE PLAN

DATE: APRIL, 2012 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 16 OF 26





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 Mason PE No. 21443
ENGINEER - DATE 1-7-12

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/VE 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.

By the Engineer:
I/VE 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.

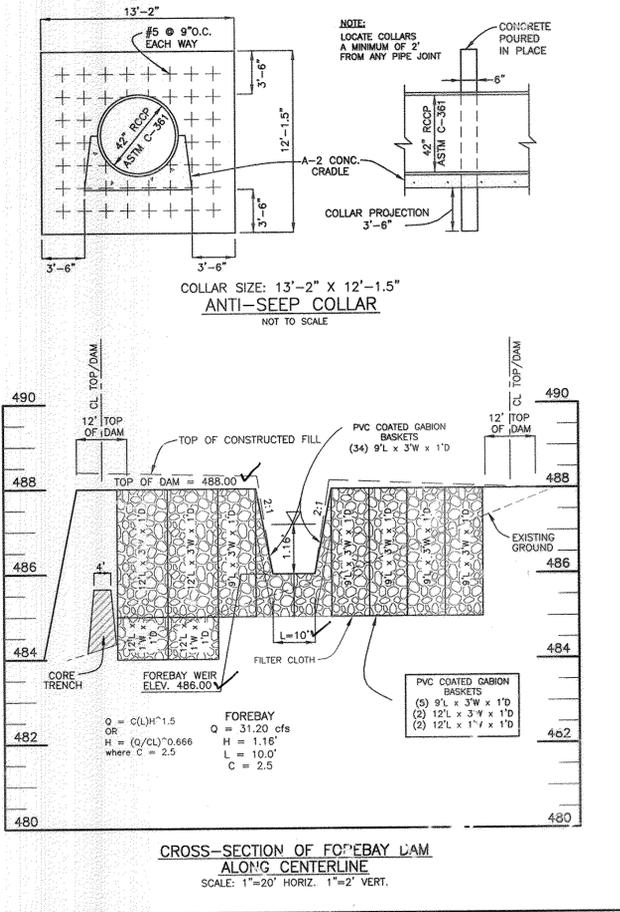
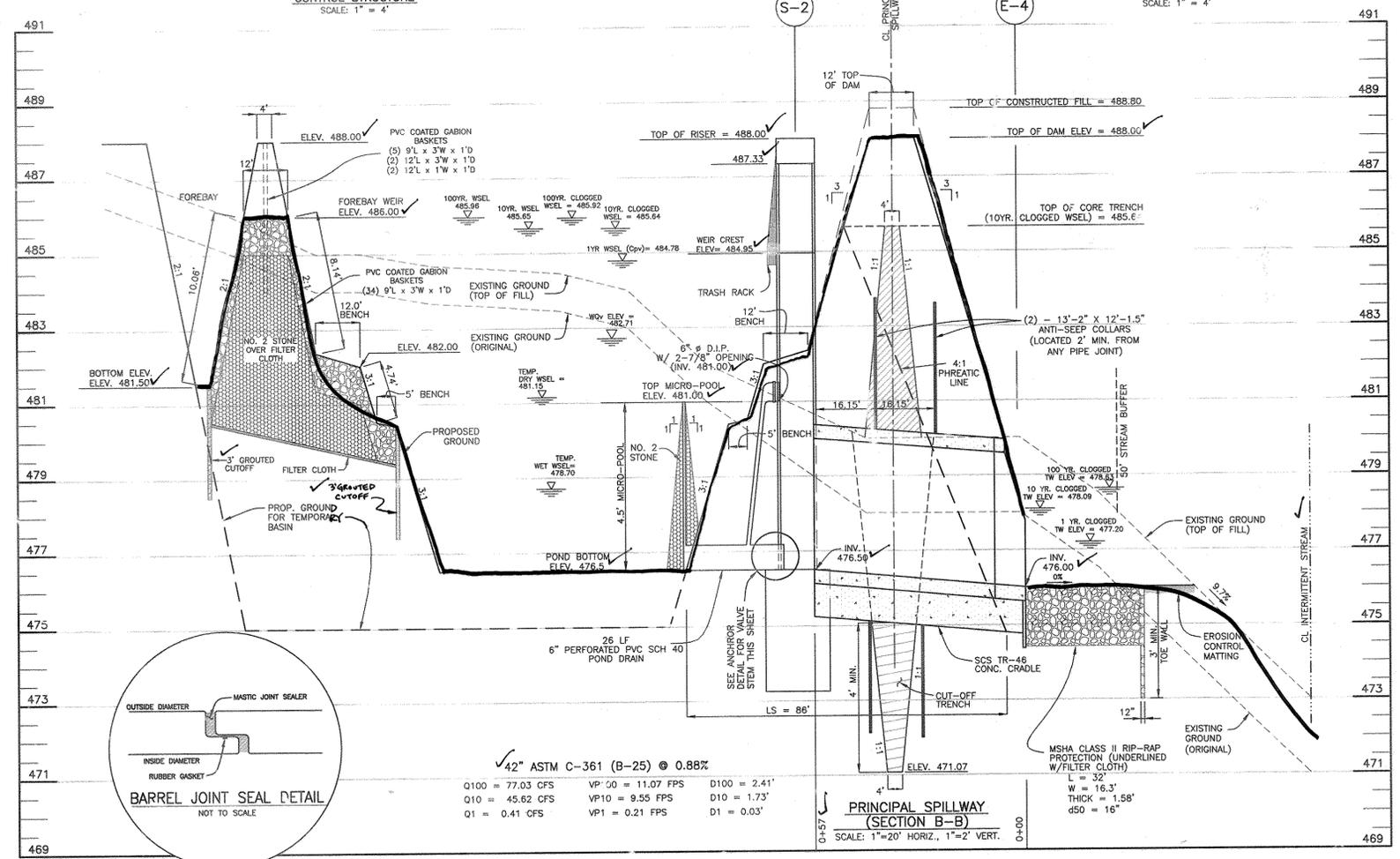
Donald Mason 10-28-09
ENGINEER - DONALD A. MASON, P.E. # 21443 DATE

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
12/8/09
CHIEF, BUREAU OF HIGHWAYS

Approved: DEPARTMENT OF PLANNING AND ZONING
12/15/09
CHIEF, DIVISION OF LAND DEVELOPMENT

Approved: DEPARTMENT OF ENVIRONMENTAL AND PLANNING
12/10/09
CHIEF, DEVELOPMENT ENGINEERING DIVISION



BENCHMARK ENGINEERING, INC.
ENGINEERS & LAND SURVEYORS & PLANNERS
8480 BALTIMORE NATIONAL PIKE A SUITE 418
ELICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
WWW.BEI-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. 21443, Registration Date: 12-31-2016.

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

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

VILLAGES AT TURF VALLEY
PHASE 1 SECTION 2, LOTS 1 thru 67, OPEN SPACE LOTS 63 thru 66 AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

STORMWATER MANAGEMENT DETAILS FACILITY #2

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 17 OF 26

AG-BUILT F-08-060

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 sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe 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.

Earth Fill

Material - The fill material shall be taken from approved designated borrow areas, it 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, Cl, 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 continuous over the entire length of the fill. The most permeable 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 compaction will be obtained with less 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 95% of 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 Trencher).

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 a 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 Care - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the cores 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.

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 drive 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 sides 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 flooding 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 drive 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. Backfill material outside the structural 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 inside and outside surfaces and its appendances 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 appendances 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.

Materials - (Aluminum Pipe) - This pipe and its appendances 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 for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. 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 of 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 or 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, pre-punched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard top 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 3/8-inch thick closed cell circular neoprene gasket will 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.

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

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 at 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. Gravel 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 and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. 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 311, 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 at the location being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps 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.

OPERATION AND MAINTENANCE SCHEDULE FOR JOINTLY MAINTAINED EXTENDED DETENTION POND

ROUTINE MAINTENANCE TO BE PERFORMED BY H.O.A.:

- FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE 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 GABION OUTLET AREA SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

NON-ROUTINE MAINTENANCE TO BE PERFORMED BY HO. CO.:

- 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 MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.

ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION FACILITY HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

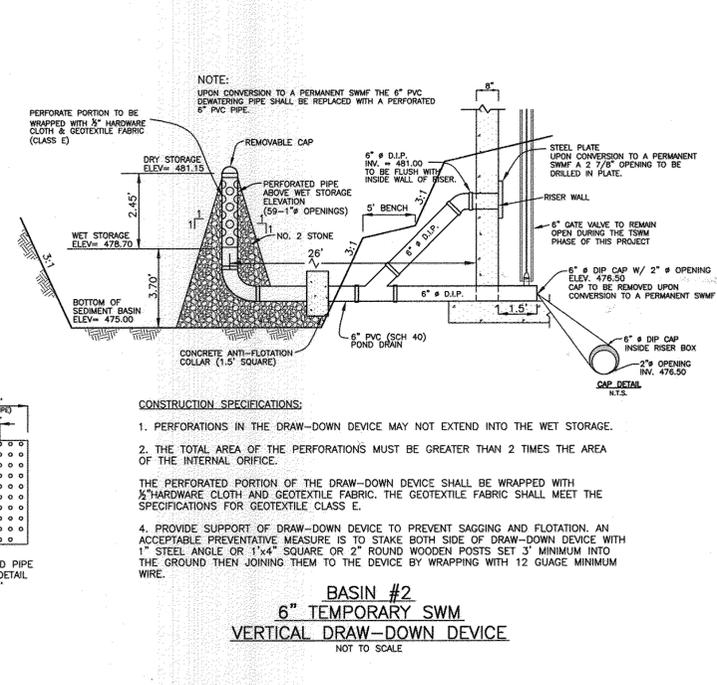
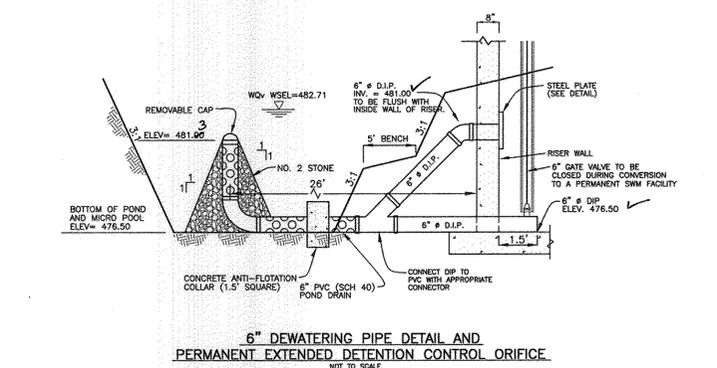
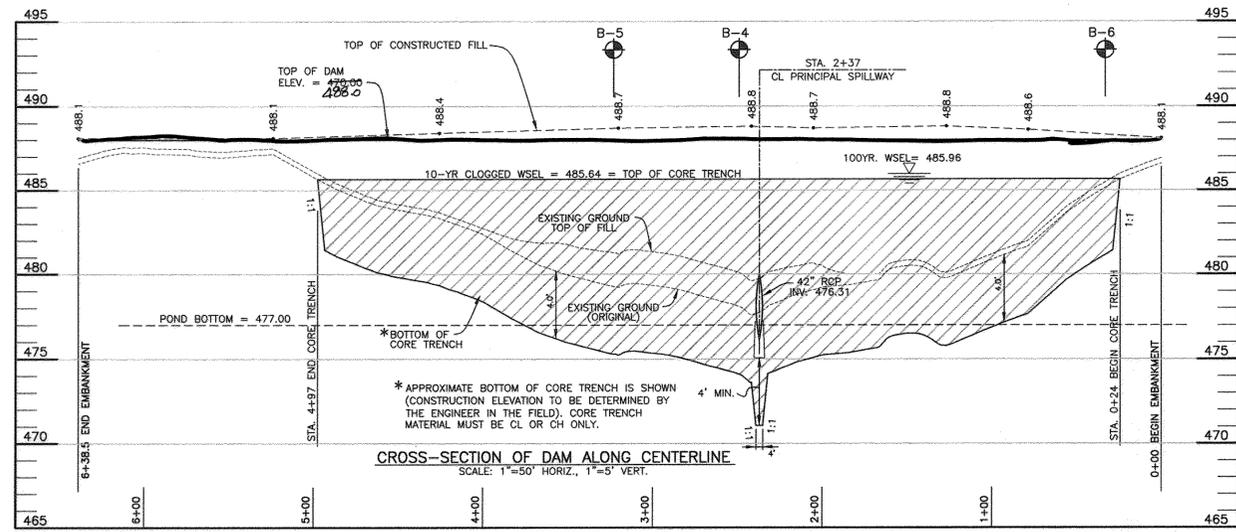
GEOTECHNICAL ENGINEER RECOMMENDATIONS:

EMBANKMENT AND CUT-OFF TRENCH CONSTRUCTION

AREAS SWM POND FACILITIES SHOULD BE STRIPPED OF TOPSOIL AND ANY OTHER UNSUITABLE MATERIALS FROM THE EMBANKMENT OR STRUCTURE AREAS IN ACCORDANCE WITH SOIL CONSERVATION SERVICE STANDARDS. AFTER STRIPPING OPERATIONS HAVE BEEN COMPLETED, THE EXPOSED SURFACE MATERIALS SHOULD BE PROTECTED WITH A LOADED DUMP TRUCK OR SIMILAR EQUIPMENT IN THE PRESENCE OF A REGISTERED PROFESSIONAL ENGINEER OR HIS REPRESENTATIVE. IF THE MATERIALS ARE NOT ACCESSIBLE TO A DUMP TRUCK, THE EXPOSED MATERIALS SHOULD BE OBSERVED AND TESTED BY A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE. UNLESS SO DIRECTED BY THE ENGINEER, AN EXCESSIVE SOFT LOGS MATERIALS IDENTIFIED BY PROFFERLOVE OR PENETROMETER TESTING SHOULD BE EXCAVATED TO SUITABLE FIRM SOIL, AND THEN GRADES 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 INRCS-HD CODE NO. 378 POND STANDARD SPECIFICATIONS. SOILS CONSIDERED SUITABLE FOR THE CENTER OF EMBANKMENT AND CUT-OFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION Cc, Sc, Cl, 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 CAN BE UTILIZED FOR THE CENTER OF THE EMBANKMENT AND CORE TRENCH. ALL FILL MATERIALS MUST BE PLACED AND COMPACTED IN ACCORDANCE WITH INRCS-HD CODE NO. 378 SPECIFICATIONS.



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 STANDARD SPECIFICATIONS.

Donald Mason ENGINEER - 21443 DATE 1-7-17

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED IN ACCORDANCE WITH THE CRITERIA ESTABLISHED IN THE CRITERIA MANUAL 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.

John DEVELOPER DATE 10/21/09

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 Mason ENGINEER - DONALD A. MASON, P.E. # 21443 DATE 10-28-09

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

Paul Salas HOWARD SOIL CONSERVATION DISTRICT DATE 10/8/09

APPROVED: DEPARTMENT OF PUBLIC WORKS

William Z. ... CHIEF, BUREAU OF HIGHWAYS DATE 12-15-09

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kurt Shallock CHIEF, DIVISION OF LAND DEVELOPMENT DATE 12/2/09

Donna CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 12/18/09

NO.	DATE	REVISION
2	4-8-15	REVISE TITLE BLOCK TO ADD P153
1	5-29-2012	REVISE LOT NUMBERS IN TITLE BLOCK

BENCHMARK ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE & SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-485-6105 FAX: 410-485-6644
WWW.BE-ENGINERING.COM

VILLAGES AT TURF VALLEY

PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 64, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA#BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/O B
ZONED: PCCC
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT DETAILS FACILITY #2

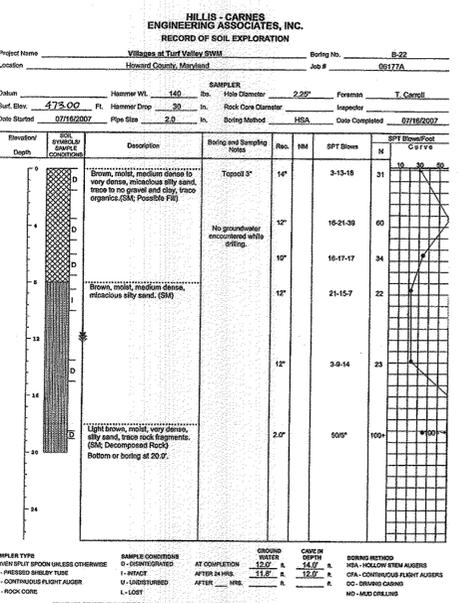
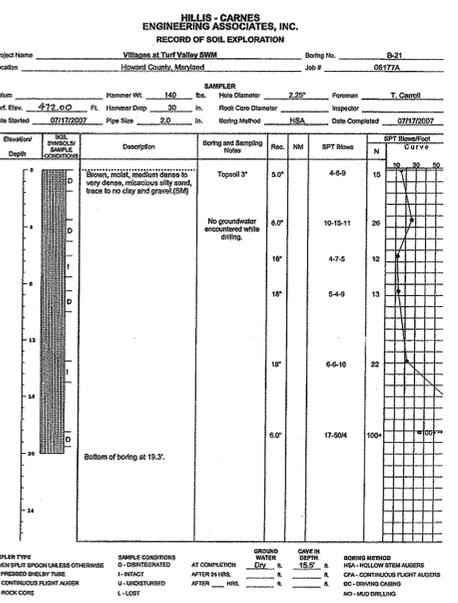
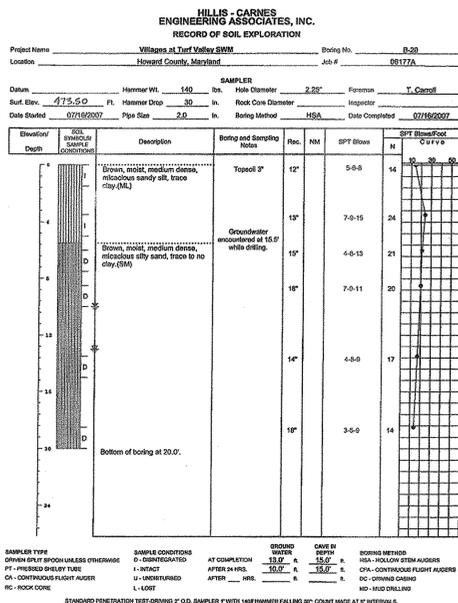
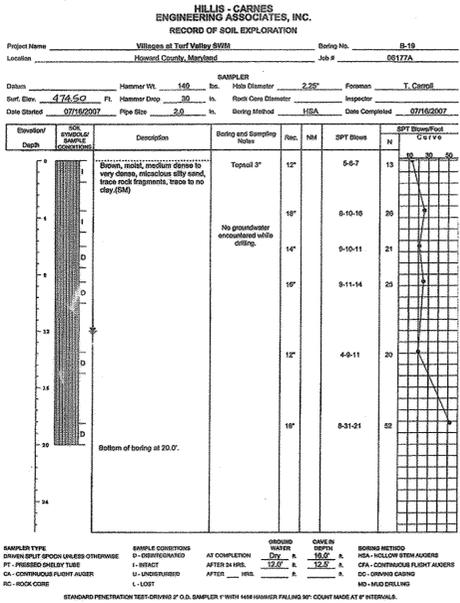
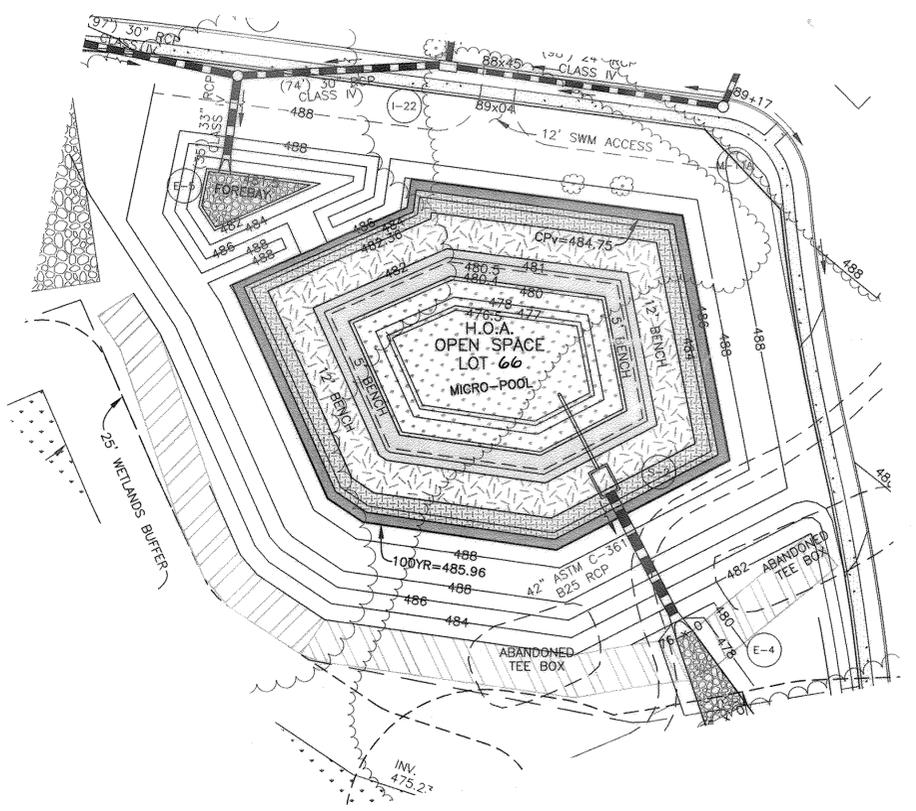
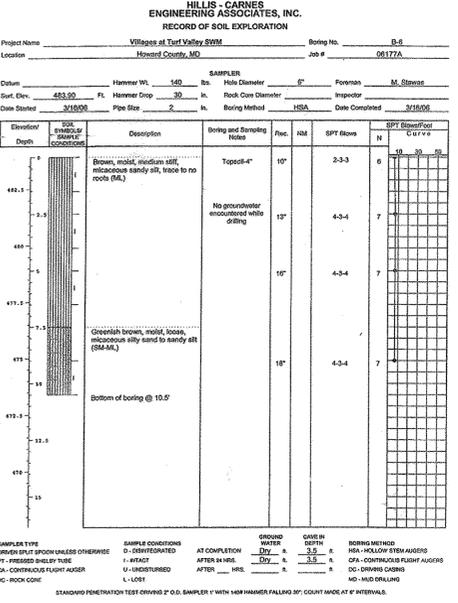
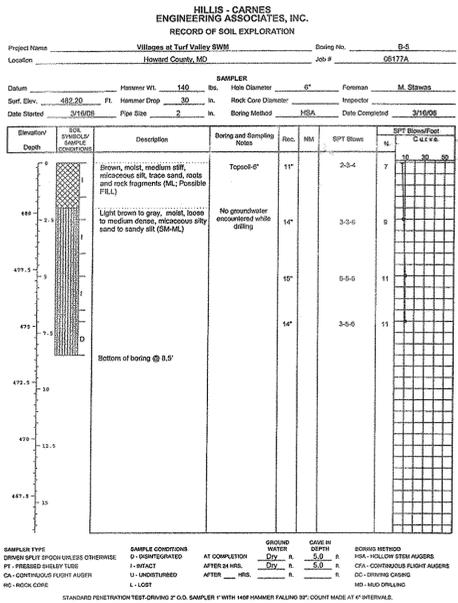
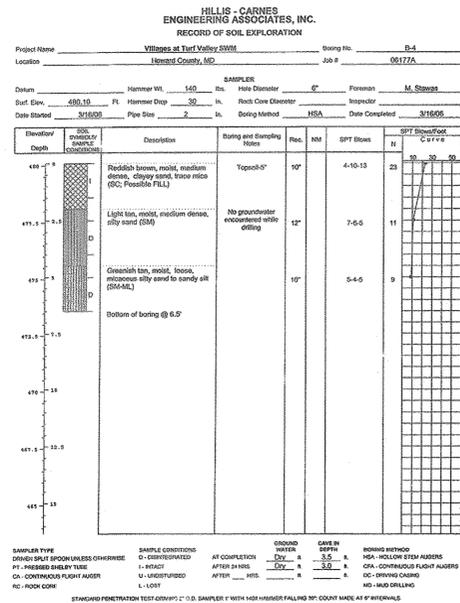
OWNER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

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

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 18 OF 26

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.

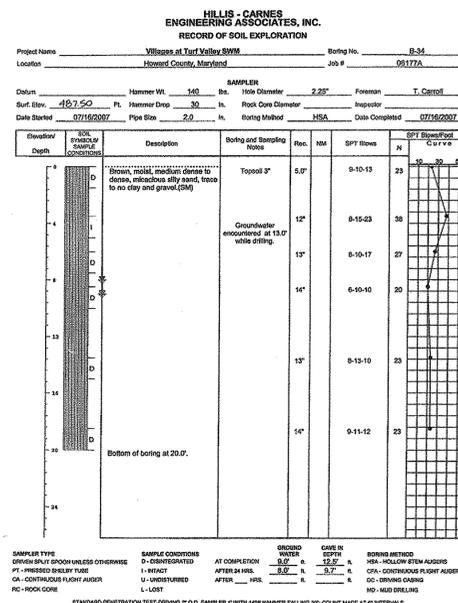
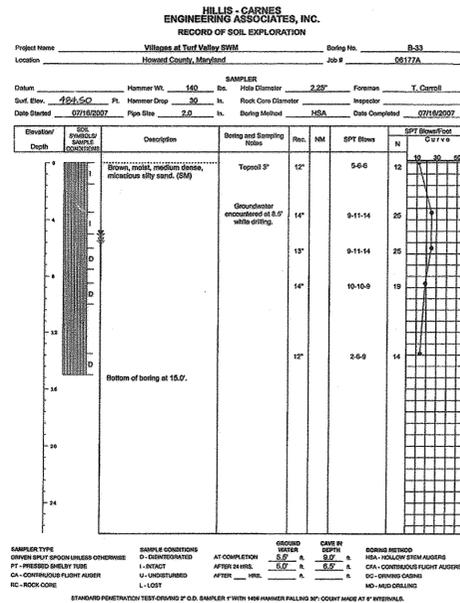
Donald Mason 10-23-09



INTERNAL PLANTING SCHEDULE FOR P-1 MICRO-POOL ED POND #2

ZONE	AREA (SQ)	ELEVATION RANGE	PLANT MIX	QUANTITIES
1	4,635	476.50 - 480.40	100% WATER LILLY 50% BROAD WATER WEED 25% DUCK POTATO 25% ARROW ARUM	515 158 79 79
2	2,837	480.40 - 482.00	50% CUTGRASS, RICE 50% SWITCHGRASS	251 169
3	4,513	482.00 - 483.36	50% CUTGRASS - MEADOW 25% VIOLETS, COMMON BLUE 25% CONEFLOWER, CUT-LEAF	169 85 85
4	3,045	(CPV)	75% WITCHGRASS, NEEDLE-LEAF 25% CONEFLOWER, SWEET	132 44
5	1,587	(CPV) (100YR)	25% CONEFLOWER, SWEET	44
6	0	N/A	N/A	0

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



APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 12-15-09
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 12/24/09
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 12/10/09
 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. 21445, Expiration Date: 12-31-2009

BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE, SUITE 418
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-485-8105 FAX: 410-485-8644
 WWW.BE-CVLENGINEERING.COM

10-28-09

VILLAGES AT TURF VALLEY
 PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA # 88 AND PHASE 1 SECTION 3, LOTS 300-306, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/O 8
 ZONED: PGCC
 ELECTION DISTRICT NO. 3
 HOWARD COUNTY, MARYLAND

INTERNAL SWMF LANDSCAPING PLAN AND SOILS BORING LOGS

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 19 OF 26

Installation Drawings Sheet Index	
20	TITLE SHEET, LOCATION PLAN & GENERAL NOTES
21	BRIDGE PLAN & DETAILS
22	FOUNDATION PLAN
23	FOOTING SECTIONS & DETAILS
24	ELEVATIONS, SECTIONS & DETAILS
25	SPECIFICATIONS
26	SPECIFICATIONS

VILLAGES AT TURF VALLEY, PHASE 1, SECTION 2 AND 3 (RESORT ROAD - STA. 35+68.44)

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 CONSPAN® 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 CONSPAN® 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 CONSPAN® 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.

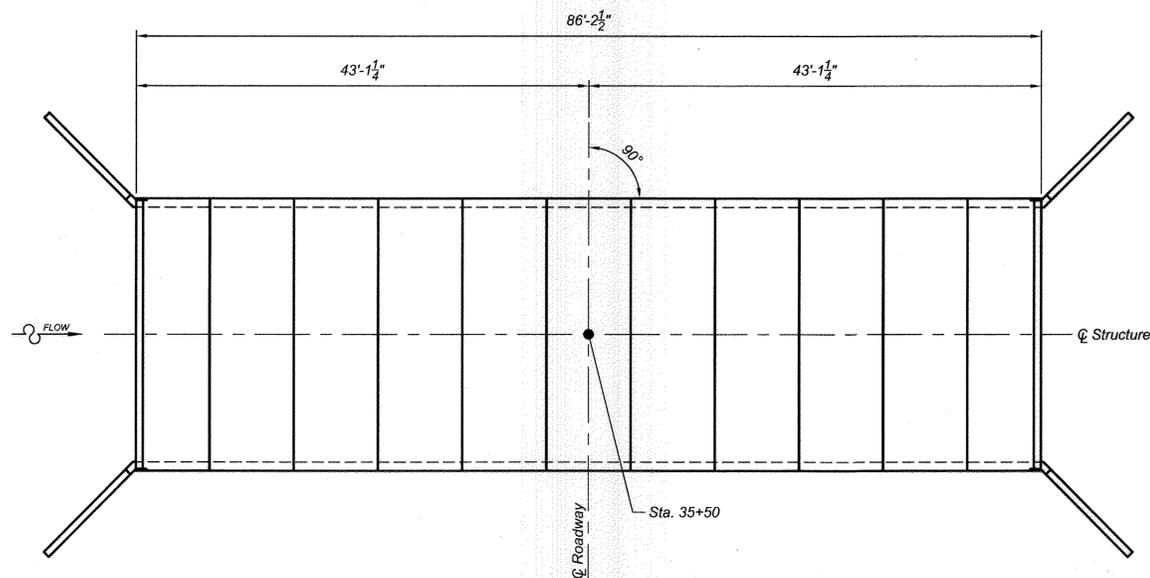
DESIGN DATA

Design Loading:
 Bridge Units: HS27-44 + Maryland Legal Loads Type 3 & Type 3S2
 Headwalls: Earth Pressure Only
 Wingwalls: Earth Pressure Only
 Design Fill Height: 2'-0" min. to 7'-4" max. from top of crown to top of pavement.
 Design Method: Load factor per AASHTO Specification
 Net allowable soil bearing pressure: 4000 PSF *
 Gross allowable soil bearing pressure: 4000 PSF *

*Foundation excavation and subgrade preparation shall be in accordance with the geotechnical report for this project prepared by Hillis-Carnes dated 8/28/2007.

MATERIALS

Precast units shall be constructed and installed in accordance with CONSPAN® 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
not to scale

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

12/21/09

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: 01/19/2010

APPROVED: DEPARTMENT OF PUBLIC WORKS	12-15-09
<i>W. R. Smith</i> CHIEF, BUREAU OF HIGHWAYS	DATE
APPROVED: DEPARTMENT OF PLANNING AND ZONING	12/21/09
<i>Ke. J. Shalender</i> CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
<i>John D. ...</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	12/15/09
	DATE

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	Sheet Title: TITLE SHEET, LOCATION PLAN & GENERAL NOTES CONTECH Bridge Solutions Inc. - System: CONSPAN BRIDGE SYSTEMS
---	--

NO.	DATE	REVISION
2	14-8-15	REVISE TITLE BLOCK TO ADD PIS 3
1	5-29-2012	REVISE LOT NUMBERS IN TITLE BLOCK

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

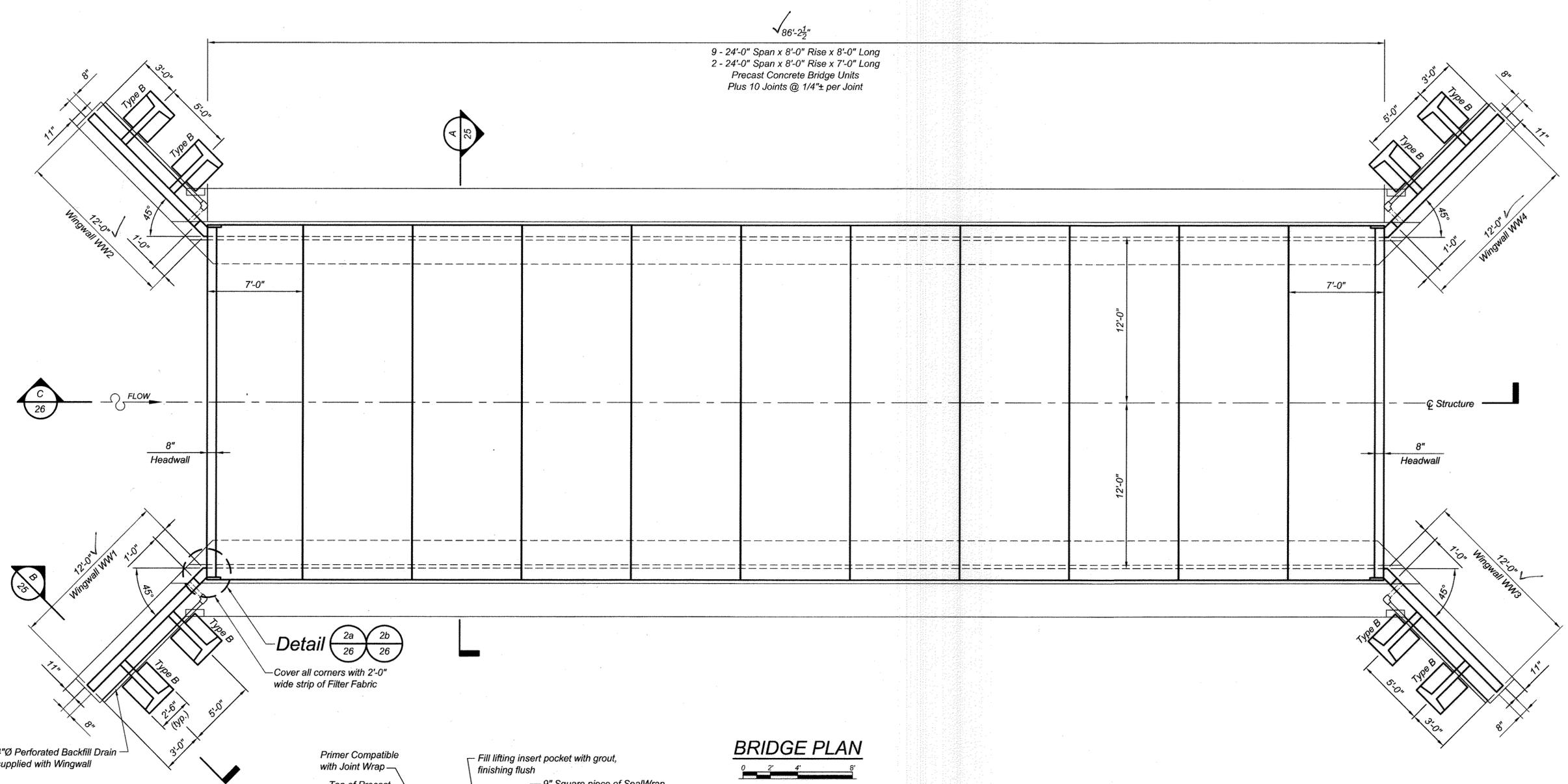
DEVELOPER: MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

VILLAGES AT TURF VALLEY
 PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA# BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2
 TAX MAP: 16 GRID: 11 PARCELS: F/0-8
 ZONED: PGCC
 ELECTION DISTRICT NO. 3
 HOWARD COUNTY, MARYLAND

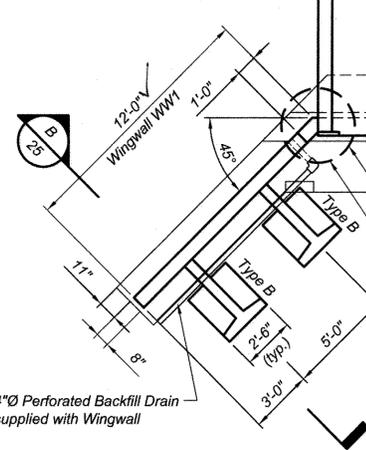
CON/SPAN TITLE SHEET,
LOCATION PLAN & GENERAL NOTES

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 20 OF 26

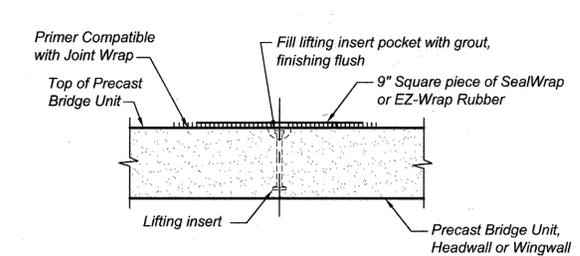
AS-BUILT F-08-060



86'-2 1/2"
 9 - 24'-0" Span x 8'-0" Rise x 8'-0" Long
 2 - 24'-0" Span x 8'-0" Rise x 7'-0" Long
 Precast Concrete Bridge Units
 Plus 10 Joints @ 1/4"± per Joint



Detail 2a 2b
 26 26
 Cover all corners with 2'-0" wide strip of Filter Fabric



TYPICAL LIFT POINT SEALING DETAIL
 not to scale

BRIDGE PLAN
 0 2' 4' 8'

AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
 Donald Mason, P.E. No. 21443 Date 1-7-17



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: 12-31-16



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: 6/1/2016.

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 12-15-09
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 12/21/09
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 12/21/09
 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

Sheet Title:
BRIDGE PLAN & DETAILS
 CONTECH Bridge Solutions Inc. - System:
CONSPAN
 BRIDGE SYSTEMS

NO.	DATE	REVISION
2	4-8-15	REVISE TITLE BLOCK TO ADD PIS 3
1	5-29-2012	REVISE LOT NUMBERS IN TITLE BLOCK

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

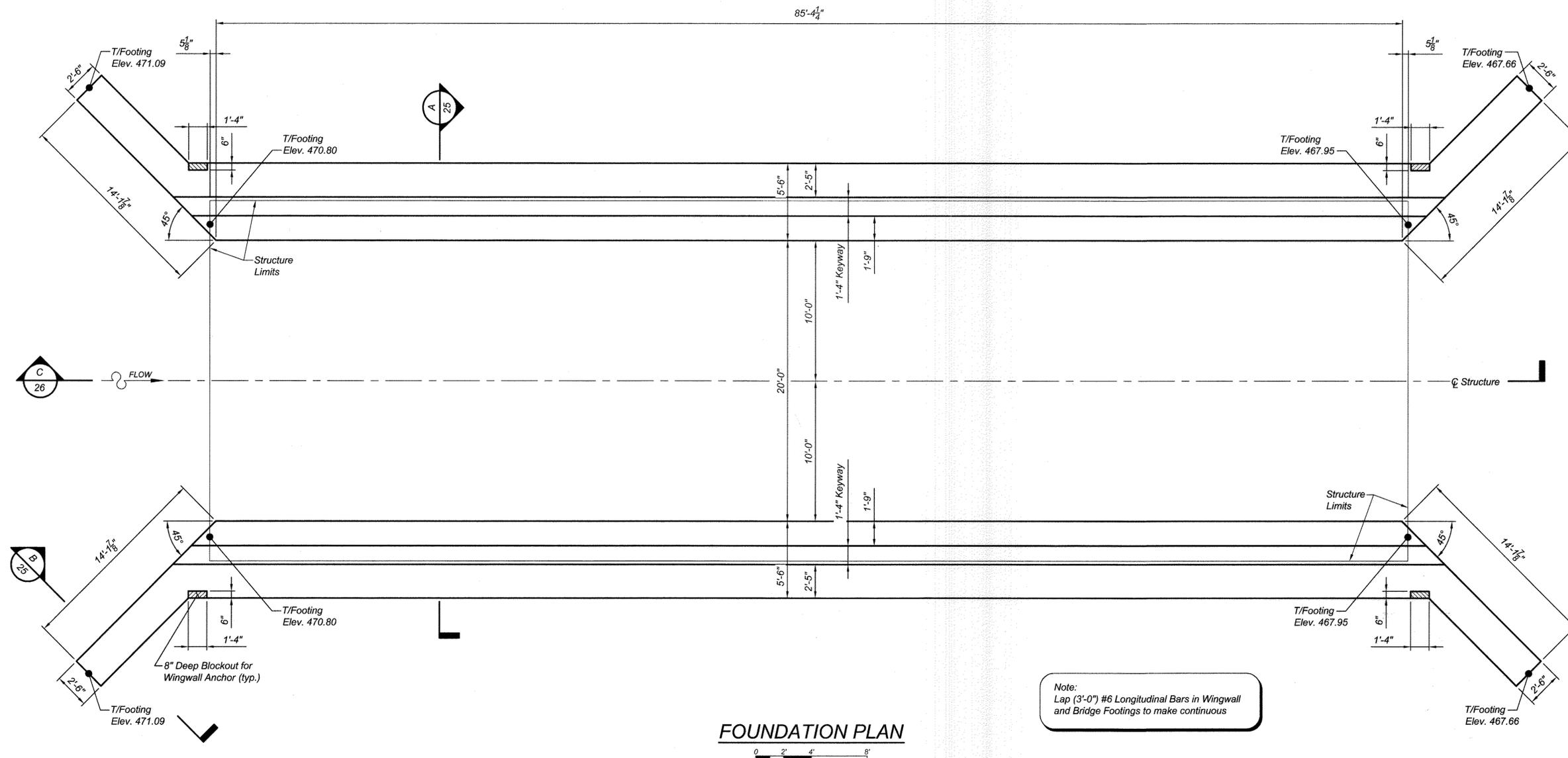
DEVELOPER:
 MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
 1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093
 410-825-8400

VILLAGES AT TURF VALLEY
 PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 64, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2
 TAX MAP: 16 GRID: 11 PARCEL: P/O 8
 ZONED: PCCC
 ELECTION DISTRICT NO. 3
 HOWARD COUNTY, MARYLAND

CON/SPAN
 BRIDGE PLAN & DETAILS

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 21 OF 26

AS-BUILT F-08-060



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

FOUNDATION PLAN
0 2' 4' 8'



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



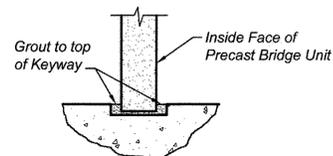
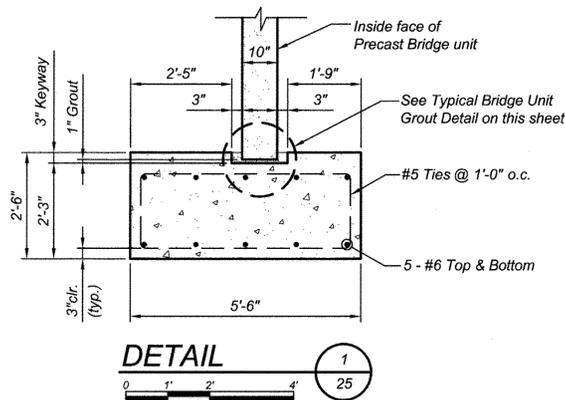
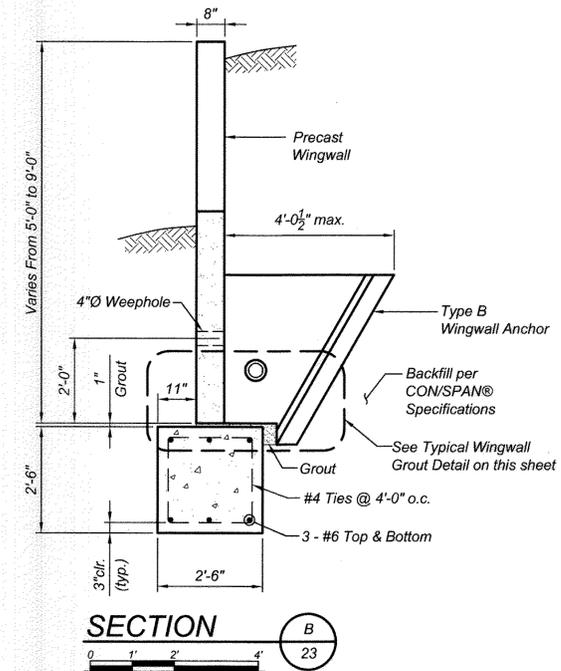
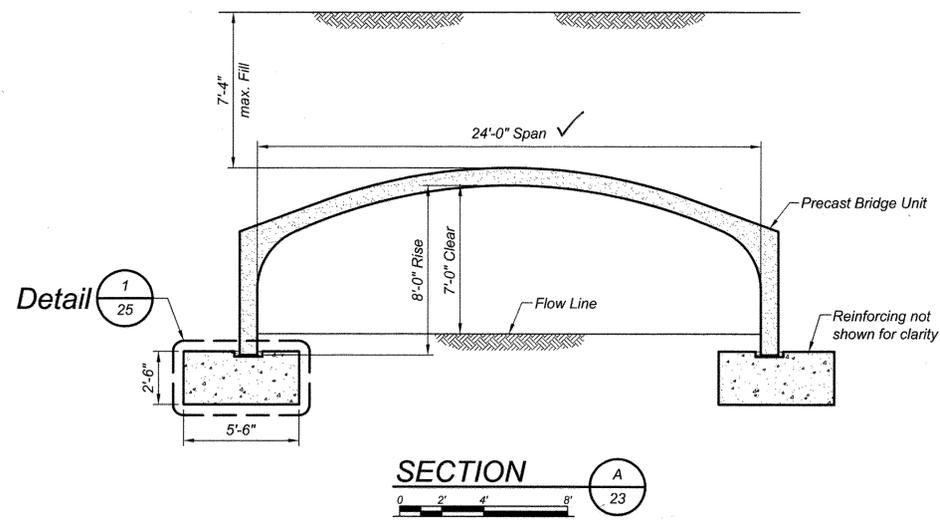
Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 21443, Expiration Date: 12/21/18.

APPROVED: DEPARTMENT OF PUBLIC WORKS
W. J. Smith 12-15-09
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
W. J. Sheehy 12/15/09
 CHIEF, DIVISION OF LAND DEVELOPMENT
W. J. Sheehy 12/15/09
 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

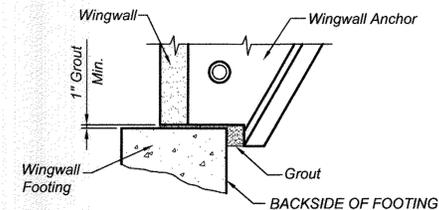
Sheet Title:
FOUNDATION PLAN
 CONTECH Bridge Solutions Inc. - System:
CONSPAN
 BRIDGE SYSTEMS

NO.	DATE	REVISION
2	4-8-15	REVISE TITLE BLOCK TO ADD P153
1	5-29-2012	REVISE LOT NUMBERS IN TITLE BLOCK
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 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA # BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2. TAX MAP: 16 GRID: T1 PARCEL: P/O B ZONED: PCCC ELECTION DISTRICT NO. 3 HOWARD COUNTY, MARYLAND CON/SPAN FOUNDATION PLAN DATE: OCTOBER, 2009 BEI PROJECT NO. 1915 SCALE: AS SHOWN SHEET 22 OF 26		



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

TYPICAL BRIDGE UNIT GROUT DETAIL
not to scale



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
not to scale

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 1-7-17



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: 12-31-19

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. 36225, Expiration Date: 8/1/2010.

APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature] 12-15-09
 CHIEF, BUREAU OF HIGHWAYS
 APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 12/21/09
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 12/21/09
 CHIEF, DEVELOPMENT ENGINEERING DIVISION



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

704-548-8420
704-548-8586 fax
800-526-3989

Sheet Title:

FOOTING SECTIONS & DETAILS

CONTECH Bridge Solutions Inc. - System:



NO.	DATE	REVISION
2	4-8-15	REVISE TITLE BLOCK TO ADD P153
1	5-29-2012	REVISE LOT NUMBERS IN TITLE BLOCK

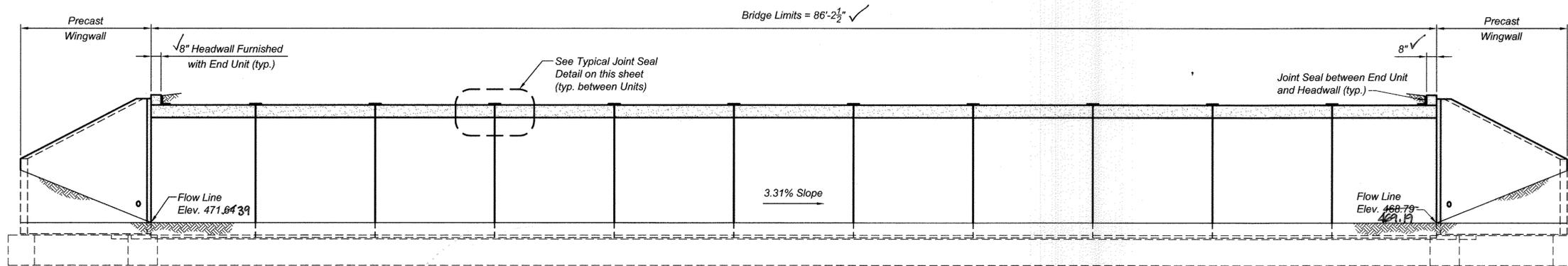
OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE LUTHERVILLE, MARYLAND 21093 410-825-8400

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

VILLAGES AT TURF VALLEY
 PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2
 TAX MAP: 16 GRID: 11 PARCEL: P/O 8
 ZONED: PCCC ELECTION DISTRICT NO. 3 HOWARD COUNTY, MARYLAND

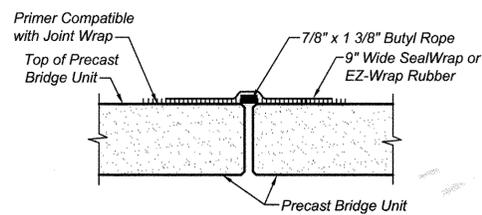
CON/SPAN
FOOTING SECTIONS & DETAILS

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
 SCALE: AS SHOWN SHEET 23 OF 26

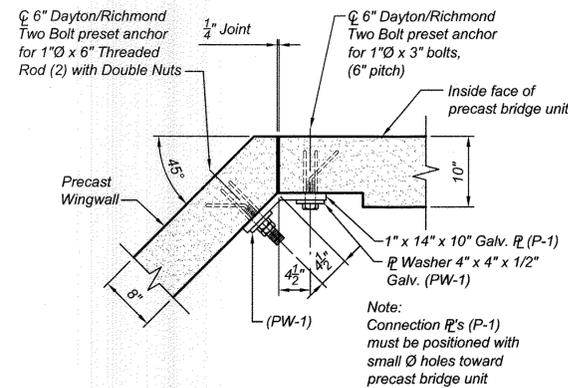


*Note:
Foundation Slope to be continuous
through Wingwall Footings

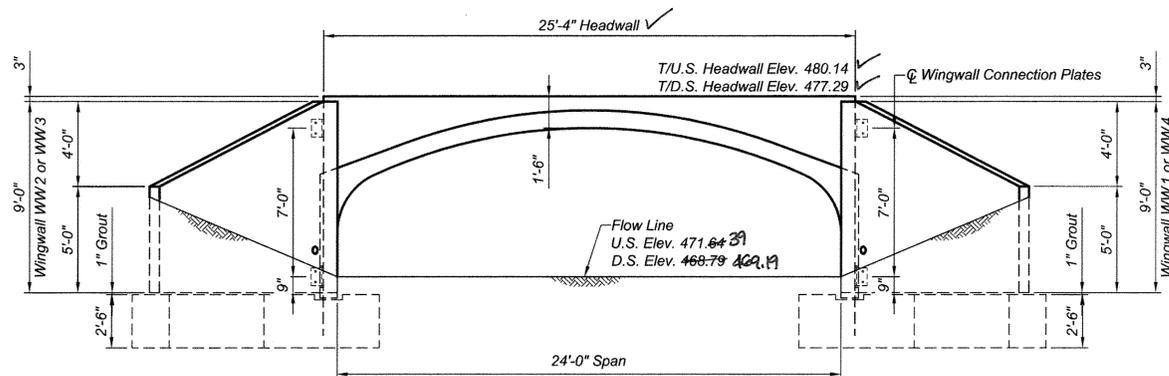
SECTION C
0 2 4 6 8



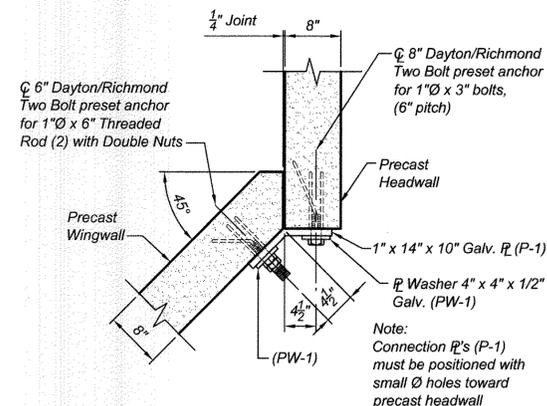
TYPICAL JOINT SEAL DETAIL
not to scale



DETAIL @ Unit Leg 2a
0 1 2 3



TYPICAL END ELEVATION



DETAIL @ Headwall 2b
0 1 2 3

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were
constructed as shown on this AS-BUILT plan.
Donald Meason, P.E. No. 21443 Date 1-7-17



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. 36225 Expiration Date: 8/1/2017

APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter J. ... 12-15-09
CHIEF, BUREAU OF HIGHWAYS
APPROVED: DEPARTMENT OF PLANNING AND ZONING
Karl She ... 12/21/09
CHIEF, DIVISION OF LAND DEVELOPMENT
... 12/15/09
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

Sheet Title:
ELEVATIONS, SECTIONS & DETAILS
CONTECH Bridge Solutions Inc. - System:
CONSPAN
BRIDGE SYSTEMS

NO.	DATE	REVISION
2	4-8-15	REVISE TITLE BLOCK TO ADD P153
1	5-29-2012	REVISE LOT NUMBERS IN TITLE BLOCK
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 I SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 64, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE I SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCELS CC-2.		
TAX MAP: 16 GRID: 11 PARCELS: P/O 8 ZONED: PGCC ELECTION DISTRICT NO. 3 HOWARD COUNTY, MARYLAND		
CON/SPAN ELEVATIONS, SECTIONS & DETAILS		
DATE:	OCTOBER, 2009	BEI PROJECT NO. 1915
SCALE:	AS SHOWN	SHEET 24 OF 26

AS-BUILT

F-08-060

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

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" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1 1/2" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" 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" AND NOT LESS THAN 1 1/2" 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" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1/2" NOR MORE THAN 3". 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 1'-0" 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" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
 - 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" NOR MORE THAN 8".

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 THERE OF 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 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. 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.
- 4.5.3. 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" 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". 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 1/4" 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" IN ANY BRIDGE UNIT.
- 5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± 1/2" IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1 1/2" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" 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".
- 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".
- 5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± 1/2" IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1 1/2".
- 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 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. 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 ELEMENT 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 C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. 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 ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT 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 BRIDGE ELEMENT 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 BRIDGE ELEMENT IS ACCEPTABLE.
 - 6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
 - 6.1.4.2. 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.
 - 6.1.4.3. 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".

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

No As-Built information is required 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

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. 26225, Expiration Date: 04/1/2020.

APPROVED: DEPARTMENT OF PUBLIC WORKS
W. R. ... 12-15-09
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
K. T. ... 12/16/09
CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: DEPARTMENT OF ENGINEERING
M. ... 12/16/09
CHIEF, DEVELOPMENT ENGINEERING DIVISION

Company:

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

704-548-8420
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800-526-3999

Sheet Title:

CONTECH Bridge Solutions Inc. - System:

SPECIFICATIONS

NO.	DATE	REVISION
2	4-8-15	REVISE TITLE BLOCK TO ADD P153
1	5-29-2012	REVISE LOT NUMBERS IN TITLE BLOCK

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 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 64, GOLF SPACE LOT 67, NON-BUILDABLE BULK PARCELS AA # 8B AND PHASE 1 SECTION 3, LOTS 300-305, OPEN SPACE LOTS 306 # 307 AND NON-BUILDABLE BULK PARCEL CC-2

TAX MAP: 16 GRID: 11 PARCEL: P/0 8
ZONED: PGCC
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

CON/SPAN SPECIFICATIONS

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 25 OF 26

AS-BUILT F-08-060

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

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'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN 1/4" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" 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" 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'-0" 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'-0" 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.

13.2. 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" 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".

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 1/2", 3/4" & 1" 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 1/2" x 1 1/2" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" 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 9" 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 6" 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 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".
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" 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'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

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" 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'-0" 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'-0", 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'-0" (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.

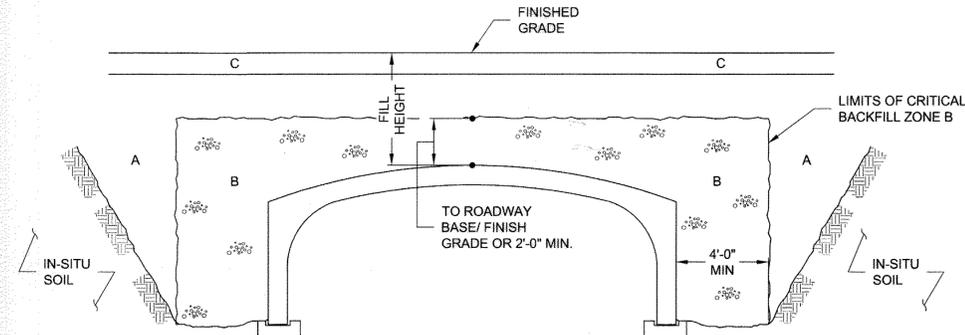
13.7.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

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" ALONG THE LENGTH OF ONE FOUNDATION.

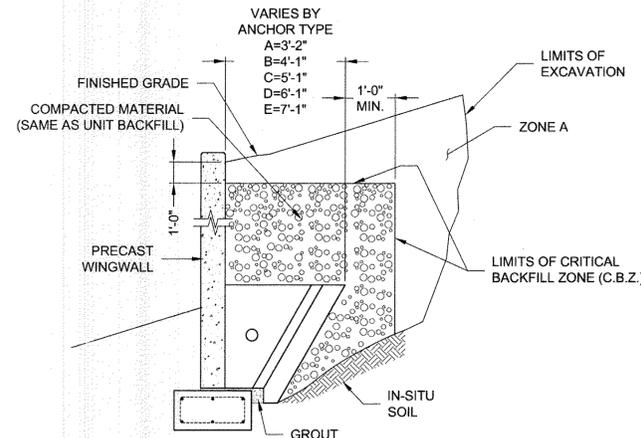
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

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 GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	
GM, SM, ML, SP, GP	A2	A-2.4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES SANDS, GRAVELS WITH PLASTIC SILT FINES
SC, GC, GM		A-2.5			35 MAX	41 MAX	10 MAX	
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



SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS

Additional information is required 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: **10-2-19**

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. **26225**, Expiration Date: **8/14/2010**.

APPROVED: DEPARTMENT OF PUBLIC WORKS
W. J. ... 12-15-09
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING
... 12/24/09
CHIEF, DIVISION OF LAND DEVELOPMENT

... 12/18/09
CHIEF, DEVELOPMENT ENGINEERING DIVISION

Company:
CONTECH®
BRIDGE SOLUTIONS INC.

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Suite 240
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800-526-3999

Sheet Title:
SPECIFICATIONS

CONTECH Bridge Solutions Inc. - System:
CON/SPAN®
BRIDGE SYSTEMS

NO.	DATE	REVISION
2	4-8-15	REVISE TITLE BLOCK TO ADD P15.3
1	5-29-2012	REVISE LOT NUMBERS IN TITLE BLOCK

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

DEVELOPER:
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VILLAGES AT TURF VALLEY

PHASE 1 SECTION 2, LOTS 1 thru 62, OPEN SPACE LOTS 63 thru 66, GOLF SPAC LOT 67, NON-BUILDABLE BULK PARCELS AA & BB AND PHASE 1 SECTION 3, LOTS 300-325, OPEN SPACE LOTS 306 & 307 AND NON-BUILDABLE BULK PARCEL CC-2.

TAX MAP: 16 GRID: 11 PARCEL: P/O 8
ZONED: PGCC
ELECTION DISTRICT NO. 3
HOWARD COUNTY, MARYLAND

CON/SPAN
SPECIFICATIONS

DATE: OCTOBER, 2009 BEI PROJECT NO. 1915
SCALE: AS SHOWN SHEET 26 OF 26