SITE DEVELOPMENT PLAN
BUCH ROAD EXTENSION
PARCELS 126, PARCEL 364, AND PARCEL 505, LOT 496
HOWARD COUNTY, MARYLAND

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY STANDARDS AND SPECIFICATIONS. ALL WORK AND MATERIALS SHALL COMPLY WITH O.S.H.A. STANDARDS.
2. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
3. THE CONTRACTOR IS TO NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE DAYS BEFORE STARTING WORK ON THESE DRAWINGS:

MISS UTILITY:	1-800-257-7777
VERIZON:	1-800-743-0033
BUREAU OF UTILITIES:	410-313-4900
AT&T:	1-800-252-1133
B.G.&E. (CONSTRUCTION SERVICES):	410-637-8713
B.G.&E. (EMERGENCY):	410-685-0123
STATE HIGHWAY ADMINISTRATION:	410-531-5533
COLONIAL PIPELINE CO.:	410-795-1390

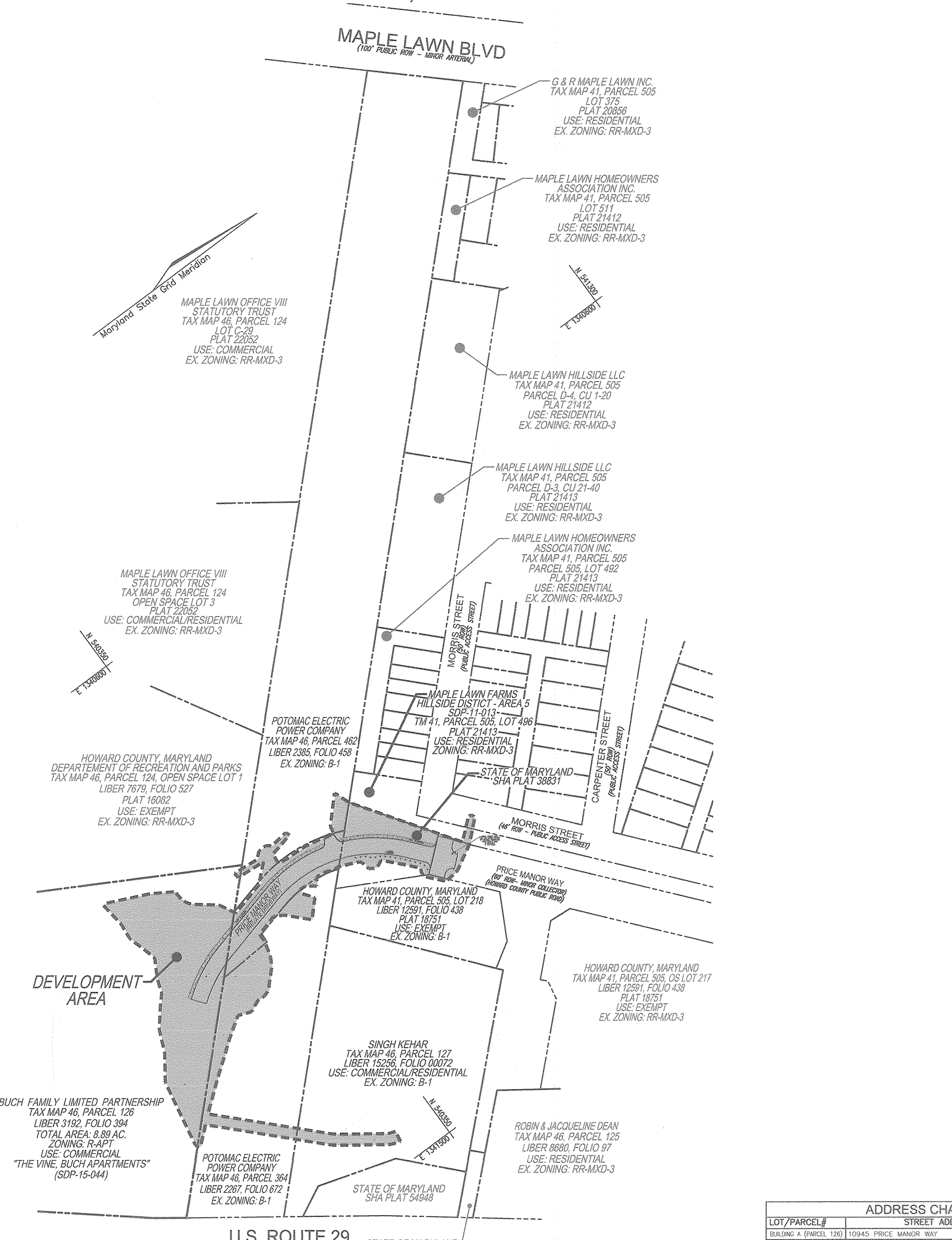
4. SITE ANALYSIS:
   TOTAL PROJECT AREA: 1.85 AC. (INCLUDES TEMP. HAUL ROAD THROUGH PEPCO AND KEHAR PROPERTY)
   PRESENT ZONING: R-APT & B-1
   USE OF STRUCTURES: N/A
   TOTAL BUILDING COVERAGE: 0 SF (0.00 AC. OR 0.00% OF GROSS AREA)
   PAVED DRIVEWAY AREA: 13,801 SF (0.32 AC. OR 17.30% OF GROSS AREA)
   PAVED PARKING LOT/AREA ON SITE: 0 SF
   AREA OF LANDSCAPE ISLAND: 0 SF (0.00 AC. OR 0% OF GROSS AREA)
   LIMIT OF DISTURBED AREA: 1.85 AC (INCLUDES TEMP. HAUL ROAD)
   WETLANDS WITHIN LOD: 0.09 AC.
   WETLAND BUFFERS WITHIN LOD: 0.10 AC.
   STREAMS AND THEIR BUFFERS WITHIN LOD: 0.57 AC
   AREA OF ON-SITE 100 YEAR FLOODPLAIN WITHIN LOD: 0.34 AC
   AREA OF EXISTING FOREST WITHIN LOD: 0.00 AC.
   AREA OF STEEP SLOPES (25% OR GREATER) WITHIN THE LOD: 0.09 AC (0.11 WITHIN PARCEL 126)
   AREA OF ERODIBLE SOILS: 0.00 AC.
   AREA MANAGED BY ESDV (THIS PLAN): 0.21 AC.
   IMPERVIOUS AREA (MANAGED BY ESDv): 0.20 AC.
   GREEN AREA (MANAGED BY ESDv): 0.01 AC.
   CUT: 0 CY FILL: 4,975 CY
5. PROJECT BACKGROUND:
   LOCATION: CLARKSVILLE, MD.; TAX MAP 46, BLOCK 4,
   PARCEL 126
   PARCEL 364 (POTOMAC ELECTRIC POWER COMPANY)
   PARCEL 505, LOT 496 (MAPLE LAWN FARMS SDP-11-013, FOR PUBLIC WATER)
   PARCEL 505, LOT 218 (HOWARD COUNTY, FOR TEE TURN-AROUND)
   PARCEL 127 (SINGH KEHAR, FOR TEMPORARY HAUL ROAD)
   ZONING : R-APT & B-1
   SUBDIVISION : THE VINE
   SECTION/AREA : N/A
   SITE AREA : 1.85 AC.
   DPZ REFERENCES : L.3192/F.394, SDP-91-043, CONT. 20-1739-D, CONT. 24-4686-D, CONT. 24-4916-D, ECP-15-018, ECP-15-047, SDP-15-044, WP-15-154, BA-15-022V, CONT. 24-4916-D, L.16602/F.250, PLAT 23876-23878 (F-16-010), PLAT 23875
6. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/ CONSTRUCTION INSPECTION DIVISION AT(410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO START OF WORK.
7. ANY DAMAGE TO PUBLIC RIGHT-OF-WAY, PAVING, OR EXISTING UTILITIES WILL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
8. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY, PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
9. EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND AND SEWER EXTENSION PLANS AND AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTORS INFORMATION. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
10. ALL REINFORCED CONCRETE FOR STORM DRAIN STRUCTURES SHALL HAVE A MINIMUM OF 28 DAYS STRENGTH OF 3,500 P.S.I.
11. TRAFFIC CONTROL DEVICES:
    A. THE R1-1 SIGN AND THE STREET NAME SIGN (SNS) ASSEMBLY FOR THIS DEVELOPMENT MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETED.
    B. THE TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2430) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES.
    C. ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES"(MdMUTCD).
    D. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT OF WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED IN TO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE)-3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
12. ESTIMATES OF EARTHWORK QUANTITIES ARE PROVIDED SOLELY FOR THE PURPOSE OF CALCULATING FEES.
13. SOIL COMPACTION SPECIFICATIONS, REQUIREMENTS, METHODS AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE PROJECT GEOTECHNICAL ENGINEER. GEOTECHNICAL ENGINEER TO CONFIRM ACCEPTABILITY OF PROPOSED PAVING SECTION, BASED ON SOIL TEST PRIOR TO CONSTRUCTION.
14. COORDINATES AND ELEVATIONS ARE BASED ON MARYLAND COORDINATE SYSTEM - NAD83(1991) AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS 46BE AND 46BF.
15. THE PROPERTY LINES SHOWN HEREON IS BASED ON A FIELD-RUN BOUNDARY SURVEY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC., DATED MAY 11, 2015.
16. THE EXISTING TOPOGRAPHY SHOWN HEREON IS TAKEN FROM A FIELD RUN TOPOGRAPHIC SURVEY SURVEY WITH TWO FOOT CONTOUR INTERVALS WAS PREPARED BY ROBERT H. VOGEL ENGINEERING, INC.; DATED APRIL 5, 2013, JANUARY 8, 2015 AND MARCH 18, 2015. OFFSITE TOPOGRAPHY FROM HOWARD COUNTY GIS.
17. GEOTECHNICAL REPORT PREPARED BY ECS-MIDATLANTIC, LLC; DATED JULY 28, 2014.
18. THE GEOTECHNICAL ENGINEER TO CONFIRM PAVING SECTION PRIOR TO CONSTRUCTION (SEE DETAIL, SHEET 3).
18. ALL CURB AND GUTTER TO BE HOWARD COUNTY STANDARD DETAIL 3.01 UNLESS OTHERWISE NOTED (SEE DETAIL ON SHEET 3).
19. WHERE DRAINAGE FLOWS AWAY FROM CURB, CONTRACTOR TO REVERSE THE GUTTER PAN.
20. ALL ELEVATIONS ARE TO FLOWLINE/BOTTOM OF CURB UNLESS OTHERWISE NOTED.
21. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
22. CONTRACTOR RESPONSIBLE FOR CONSTRUCTING ALL HANDICAP RAMPS AND HANDICAP ACCESS IN ACCORDANCE WITH CURRENT ADA REQUIREMENTS.
23. ALL REINFORCED CONCRETE FOR STORM DRAIN STRUCTURES SHALL HAVE A MINIMUM OF 28 DAYS STRENGTH OF 3500 P.S.I.
24. ALL STORMDRAIN PIPE BEDDING IS TO BE CLASS 'C', AS REQUIRED BY AASHTO-180.
25. PUBLIC WATER IS PROVIDED BY CONTRACT 24-4685-D AND CONTRACT 24-4916-D. PUBLIC SEWER IS PROVIDED BY CONTRACT 20-1739-D AND CONTRACT 24-4916-D.
26. APFO TRAFFIC STUDY PREPARED BY THE TRAFFIC GROUP, DATED AUGUST 6, 2014; APPROVED 08/07/15.
27. THE SUBJECT PROPERTY IS ZONED R-APT AND B-1 IN ACCORDANCE WITH THE 10/06/13 COMPREHENSIVE ZONING PLAN.
28. THIS PROJECT IS SUBJECT TO COMPLIANCE WITH THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. DEVELOPMENT OR CONSTRUCTION ON THIS PROPERTY MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION APPLICATION OR BUILDING/GRADING PERMIT APPLICATIONS.
29. EXISTING PRICE MANOR WAY IS CLASSIFIED AS A MINOR COLLECTOR.
30. SIMPLIFIED FOREST STAND DELINEATION PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. DATED APRIL 14, 2015 AND UPDATED 01/22/16.
31. THIS PROJECT IS EXEMPT FROM THE FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202(b)(i) OF THE HOWARD COUNTY CODE BECAUSE THE NET TRACT AREA FOR THIS THIS PROPERTY IS LESS THAN 40,000 SF IN SIZE.
    THE TOTAL NET AREA FOR THIS PROJECT IS 1.85 ACRES, AND OCCURS SEVERAL DISTINCT PROPERTIES. THE MAJORITY OF THE LOD (0.81 AC.) OCCURS ON THE BUCH PROPERTY, TAX MAP 46 PARCEL 126. ALL FOREST CONSERVATION REQUIRMENTS FOR THIS PROPERTY WILL BE FULFILLED AS PART OF BUCH PROPERTY (SDP-15-044). THE MIDDLE SECTION (LOD OF 0.66 AC) OF THIS PROJECT OCCUR ON TAX MAP 46, PARCEL 364. THIS PROPERTY IS OWNED BY PEPCO AND IS UTILIZED AS A UTILITY LINE RIGHT OF WAY. NO FOREST IS PRESENT IN THIS AREA. DEVELOPMENT WITHIN THIS RIGHT OF WAY IS NOT SUBJECT TO THE FOREST CONSERVATION ACT REQUIREMENTS. A SMALL PORTION OF THE LOD (0.01 AC.) OCCUR ON LOT 496 OF PARCEL 505 ON TAX MAP 46. THIS PROPERTY WAS SUBJECT TO THE FOREST CONSERVATION ACT REQUIREMENTS AS PART OF THE MAPLE LAWN DEVELOPMENT AND THEREFORE IS NOT SUBJECT TO FURTHER OBLIGATIONS SINCE NO FOREST CONSERVATION EASEMENT AREAS WILL BE IMPACTED BY THE PROJECT. THE REMAINING LOD OF 0.37 AC. (LESS THAN 40,000 SF) OCCURS OVER THE EXISTING ACCESS ROAD, ADJACENT LAWN AREAS IS LOCATED WITHIN THE SHA AND HOWARD COUNTY PROPERTIES, AND ALSO INCLUDES 0.06 AC. FOR A TEMPORARY HAUL ROAD FROM THE EXISTING DRIVEWAY OF THE THE KEHAR PROPERTY (TM 46, PARCEL 127). NO FOREST IS PRESENT WITHIN THIS REMAINING PORTION OF THE LOD.
32. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
33. FINANCIAL SURETY IN THE AMOUNT OF $1,200.00 FOR THE 4 REQUIRED PRIVATE STREET TREE PLANTINGS WILL BE INCLUDED AS PART OF THE DED COST ESTIMATE FOR THIS PROJECT.
34. WETLANDS AND STREAMS SHOWN ONSITE ARE BASED ON A FIELD INVESTIGATION AND WETLAND DELINEATION REPORT PERPARED BY BY ECO-SCIENCE PROFESSIONALS, INC. IN AUGUST 21, 2014. THE "BUCH ROAD EXTENSION" WAS FURTHER ADDRESSED UNDER LETTER FROM ECO SCIENCE PROFESSIONALS DATED 04/14/15 AND UPDATED LETTER DATED 01/22/16.
35. THERE ARE WETLANDS, STREAMS, THEIR BUFFERS, STEEP SLOPES, AND 100-YEAR FLOODPLAIN LOCATED WITHIN THE LOD.
36. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAMS OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100 YEAR FLOODPLAIN EXCEPT AS PERMITTED UNDER MDE PERMIT #14-NT-3329/201461731 OR CONFIRMED AS "NECESSARY DISTURBANCE" BY DPZ.
37. FLOODPLAIN STUDY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC.; DATED 10/3/14, REVISED 01/21/15 AND 09/18/15. THE DEVELOPER/ENGINEER WILL COORDINATE WITH FEMA REGARDING THE FLOODPLAIN STUDY AND THE FLOODPLAIN CHANGES/DISTURBANCES.
38. THERE IS 1 SPECIMEN TREES WITHIN THE LOD.
39. ANY EXISTING STREET TREES DAMAGED OR DESTROYED DURING CONSTRUCTION WILL BE REPLACED BY THE CONTRACTOR.
40. THERE ARE NO BURIAL GROUNDS OR CEMETERIES LOCATED ON THIS PROPERTY.
41. A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
42. THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
42. FIRE LANES HAVE BEEN PROVIDED IN THIS SITE TO ALLOW EMERGENCY VEHICLE ACCESS. EITHER FIRE LANE SIGNAGE SHOULD BE INSTALLED, OR THE CURBS SHOULD BE PAINTED IN RED AND STENCILED TO IDENTIFY THE ROAD AS A FIRE LANE.
44. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006), SECTION 5.5.A. A MINIMUM OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
45. ALL EXTERIOR LIGHTING TO COMPLY WITH THE REQUIREMENTS FOUND IN ZONING SECTION 134.0 OF THE HOWARD COUNTY ZONING REGULATIONS. LIGHT TRESPASS ONTO ANY PROPERTY ZONED OR USED FOR RESIDENTIAL PURPOSES SHALL BE LIMITED TO 0.5 FOOT CANDLES. LIGHT TRESPASS ONTO A PROPERTY IN THE RR OR MXD DISTRICTS DESIGNATED FOR DEVELOPMENT OF EQUIVALENT LAND USES AND DENSITIES SHALL BE LIMITED TO 0.1 FOOT CANDLES.
46. STORMWATER MANAGEMENT FOR THIS REDEVELOPMENT PROJECT IS PROVIDED IN ACCORDANCE WITH THE ENVIRONMENTAL SITE DESIGN CRITERIA BY A MICRO-BIORETENTION (M-6). THIS FACILITY SHALL BE PRIVATELY OWNED AND MAINTAINED BY BUCH LLLP.
47. THE COMMUNITY MEETING FOR THIS PROJECT WAS CONDUCTED ON 08/25/14 AT 6PM AT THE NORTH LAUREL COMMUNITY CENTER.
48. THIS PROJECT IS SUBJECT TO WP-15-154; APPROVED 06/25/15; TO WAIVE SECTION 16.1205(A)(7) AND 16.1205(A)(10) WHICH REQUIRES THE RETENTION OF SPECIMEN TREES (30" DBH OR GREATER) THAT ARE NOT CONTAINED WITHIN OTHER PRIORITY FOREST RETENTION AREAS AS OUTLINED IN SECTION 16.1205(A)(1-10), A WAIVER TO SECTION 16.120(C)(1) WHICH REQUIRES THAT ALL COMMERCIAL, INDUSTRIAL OR APARTMENT LOTS TO HAVE A MINIMUM FRONTAGE OF 60 FEET ON AN APPROVED PUBLIC ROAD WHICH PROVIDES ACCESS TO THE PROPERTY, AND A WAIVER TO SECTION 16.116(A)(2)(II) WHICH PROHIBITS DISTURBANCE WITHIN 75' OF A PERENNIAL STREAMBANK FOR USE I STREAMS. APPROVAL SUBJECT TO THE FOLLOWING CONDITIONS:
    A. WAIVER APPROVAL IS LIMITED TO THE REMOVAL OF SPECIMEN TREES #1, #6, #9 AND #10 AS DEPICTED ON THE WAIVER EXHIBIT. ANY PROPOSAL TO REMOVE ADDITIONAL SPECIMEN TREES WILL REQUIRE A NEW WAIVER REQUEST OR AN AMENDMENT TO THIS WAIVE REQUEST.
    B. A MINIMUM OF 8 ADDITIONAL, NATIVE, 2-3" CALIPER TREES SHALL BE PROVIDED ON SITE AS PART OF THE MITIGATION FOR THE SPECIMEN TREE REMOVAL. THIS MITIGATION WILL BE ADDRESSED WITH SDP-15-044 ("THE VINE"-BUCH APARTMENTS) AND WILL BE IN ADDITION TO ANY REQUIRED LANDSCAPE OR FOREST CONSERVATION PLANTINGS. THE MITIGATION WILL BE SHOWN ON THE ASSOCIATED LANDSCAPE PLAN AND SURETY FOR THESE ADDITIONAL TREES WILL BE REQUIRED AS PART OF THE SITE DEVELOPMENT PLAN.
    C. DUE TO THEIR PROXIMITY TO THE LOD. INDIVIDUAL TREE PROTECTIVE DEVICES (TREE FENCING) SHALL BE PLACED COMPLETELY AROUND THE CRITICAL ROOT ZONES OF SPECIMEN TREE #2, SPECIMEN TREE #3, SPECIMEN TREE #4, AND SPECIMEN TREE #7 PRIOR TO THE COMMENCEMENT OF ANY GRADING. THIS SHALL BE OUTLINED IN THE PRE-CONSTRUCTION MANAGEMENT PLAN OF THE FINAL FOREST CONSERVATION PLAN (FCP) AND WITHIN THE SEQUENCE OF CONSTRUCTION PROVIDED ON THE SITE DEVELOPMENT PLAN FOR "THE VINE"-BUCH APARTMENTS".
    D. A PROPERTY MANAGEMENT COMPANY WILL BE CREATED THAT WILL BE THE RESPONSIBLE PARTY FOR THE MAINTENANCE OF THE PRIVATE ROADS AND STORMWATER CONVEYANCE AND MANAGEMENT FACILITIES. WATER AND SEWER SHALL BE PUBLIC AND BE LOCATED WITHIN A RECORDED PUBLIC EASEMENT.
    E. IMPACTS TO STREAMS AND ASSOCIATED BUFFERS AND ALL OTHER ENVIRONMENTAL AREAS SHALL BE THE FEAST NECESSARY AND SHALL BE LIMITED TO THOSE DISTURBANCES SHOWN ON THE WAIVE PETITION AND/OR OUTLINED IN MDE PERMIT 14-NT-3329/201461731.
49. IN ACCORDANCE WITH SECTION 16.116(C) OF THE SUBDIVISION REGULATIONS, NECESSARY DISTURBANCES ARE REQUIRED TO UPGRADE THE EXISTING DRIVEWAY TO CURRENT STANDARDS TO PROVIDE ACCESS TO BUCH PROPERTY (REF. SDP-15-071). THIS UPGRADE ALSO INCORPORATES THE REPLACEMENT OF THE EXISTING CULVERT WITH A BOTTOMLESS BOX CULVERT TO ACCOMMODATE THE INCREASED RUNOFF FROM MAPLE LAWN AND TO PROVIDE A SAFER INGRESS AND EGRESS. THE STREAM, WETLAND AND FLOODPLAIN DISTURBANCES HAVE BEEN PERMITTED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT. THESE ENVIRONMENTAL DISTURBANCES ARE THE MINIMUM REQUIRED AND WOULD BE REQUIRED REGARDLESS OF THE CURRENTLY PROPOSED DEVELOPMENT. WALLS HAVE BEEN UTILIZED ALONG THE DRIVE AND THE LOWER AREAS OF THE SITE TO MINIMIZE AND AVOID ENVIRONMENTAL IMPACTS. THERE IS ALSO A SMALL STREAM BUFFER DISTURBANCE PROPOSED TO ACCOMMODATE STORM DRAIN OUTFALL AND RIPRAP APRON.
50. THIS PLAN IS SUBJECT TO A DESIGN MANUAL WAIVER; APPROVED 07/21/15; TO SEWER SECTION 3.3.B.2.B.1 TO TEMPORARILY ALLOW A DEAD WATER MAIN UNTIL SUCH A TIME AS HOWARD COUNTY COMPLETES THE LOOP; AND TO SECTION 3.3.B.3.A.5 TO REDUCE THE COVER OVER THE PROPOSED PVC C900 WATER MAIN HAS BEEN TO 2.7' FOR A LENGTH OF 20' IN ORDER TO ACCOMMODATE A BOTTOMLESS ARCH BOX CULVERT. APPROVAL SUBJECT TO THE FOLLOWING:
    A. THE WATER MAIN CLEARANCE OVER THE CULVERT CROSSING IS TO BE 12-INCHES INSTEAD OF 9-INCHES.
    B. THE COMPACTION FOR TRENCH BACKFILL MATERIAL PER DETAIL G-2.12 FOR THE PVC WATER MAIN IS TO BE A MINIMUM OF 85% PROCTOR.
    C. THE ROADWAY BACKFILLED MATERIAL OVER THE WATER MAIN CROSSING FROM STA. 3+40 TO STA. 3+65 IS TO BE GRADED AGGREGATE BASE (GAB) INSTEAD OF REGULAR BACKFILL MATERIAL.
    D. THE PVC PIPE RESTRAINT JOINTS ARE TO BE INTERNAL RESTRAINT JOINTS INSTEAD OF EXTERNAL HARNES AS INDICATED ON PROFILE.
51. THIS PLAN IS SUBJECT TO A DESIGN MANUAL WAIVER TO THE FOLLOWING DESIGN MANUALS:
    A. DESIGN MANUAL VOLUME III, SECTION 2.3.A.3.e, WHICH REQUIRES A CUL-DE-SAC OR TEE TURNAROUND AT THE TERMINUS OF A PUCLIC ROAD. APPROVAL GRANTED ON 8/24/15, BASED ON THE RAODWAY BEYOND THE PUBLIC TEE TURNAROUND BEING PRIVATELY OWNED AND MAINTAINED.
    B. DESIGN MANUAL VOLUME III, SECTION 2.6B (TABLE 2.10), WHICH REQUIRES THE CONSTRUCTION OF A PUBLIC ROAD WHERE A SHARED RESIDENTIAL DRIVEWAY CROSSES A 100-YEAR FLOODPLAIN. APPROVAL GRANTED ON 8/24/15, SUBJECT TO THE ROAD BEING BUILT TO A COUNTY ROAD STANDARD AND THE ACCESS BEING PRIVATELY OWNED AND MAINTAINED.
    C. DESIGN MANUAL VOLUME III, SECTION 3.4.A.3.b, WHICH REQUIRES A MINIMUM 10-FOOT RETAINING WALL SETBACK FROM A BOUNDARY LINE. APPROVAL GRANTED ON 8/24/15, BASED ON THE EXPLANATION THAT THE CONSTRUCTINO METHODS FOR THE RETAINING WALLS WILL NOT DISTURB NEIGHBORING PROPERTIES OR ENVIRONMENTAL FEATURES. ALL CONSTRUCTION FOR THE RETAINING WALLS MUST BE LIMITED TO THE SUBJECT SITE.
    D. DESIGN MANUAL VOLUME III, APPENDIX A, WHICH REQUIRES A MINIMUM PAVEMENT WIDTH OF 26-FEET FOR ACCESS TO TOWNHOUSE, APARTMENT, OR CONDOMINIUM DEVELOPMENTS. APPROVAL GRANTED ON 12/22/15, SUBJECT TO THE SECONDARY ACCESS BE DESIGNED AND APPROVED AS PART OF THIS SDP.
    E. DESIGN MANUAL WAIVER TO DESIGN MANUAL VOLUME III, SECTION 2.3.A.3.e; APPROVED 03/24/16; WHICH REQUIRES A SECOND ACCESS WHEN THE TRAFFIC VOLUME IS PROJECTED TO EXCEED 1,000 AVERAGE DAILY TRIPS. THE PROPERTY DOES NOT HAVE ACCESSIBLE FRONTAGE ON A PUBLIC ROAD, AND THEREFORE WILL PROVIDE A SECOND ACCESS WHICH WOULD BE USED FOR "EMERGENCY" ONLY ACCESS.
52. THE CONSTRUCTION SHOWN ON THIS PLAN THROUGH THE POTOMAC ELECTRIC POWER COMPANY PROPERTY (TM 46, PARCEL 364 & 462) IS IN ACCORDANCE WITH THE FEE-SIMPLE AGREEMENT BETWEEN PEPCO AND BUCH LLLP (REF. L.16602/F.250; DATED 11/16/15).
53. THE HAUL ROAD SHOWN ON THESE PLANS IS FOR TEMPORARY USE ONLY, AND WILL ONLY BE UTILITIZED DURING THE CONSTRUCTION OF THE BRIDGE/CULVERT. A PORTION OF THE TEMPORARY HAUL ROAD IS LOCATED ON THE ADJACENT KEHAR SINGH PROPERTY (PARCEL 127). THE AREA OF DISTURBANCE FOR THE HAUL ROAD OF THE KEHAR SINGH PROPERTY IS 0.06 ACRES. THE KEHAR SINGH PROPERTY ALSO BORDERS THE PEPCO PROPERTY AND IS SUBJECT TO A 75' TREE CONFLICT EASEMENT WHICH DOES NOT PERMIT TREES TO BE LOCATED WITHIN. THE AREA WITH THE LOD DOES NOT CONTAIN ANY FOREST, WETLANDS, STREAMS, BUFFERS, SPECIMEN TREES OR FLOODPLAIN. IN ACCORDANCE WITH LETTER DATED 04/28/15 FROM BINDA SIGHN, BUCH LLLP HAS BEEN GRANTED PERMISSION TO ACCESS THIS PROPERTY WITH THE SHOWN TEMPORARY HAUL ROAD.
54. THIS PLAN IS SUBJECT TO WAIVER PETITION WP-16-085; APPROVED 01/21/16; TO WAIVE SECTION 16.1205(a)(7) AND 16.1205(a)(10) WHICH REDUCES THE RETENTION OF SPECIMEN TREES THAT ARE NOT CONTAINED WITHIN OTHER PRIORITY FOREST RETENTION AREAS. APPROVAL SUBJECT TO THE FOLLOWING CONDITIONS:
    1. A REVISED WIAVER EXHIBIT (SERVING AS THE FSD FOR THE IMPACTED AREA OF THE EMERGENCY ACCESS) SHALL BE SUBMITTED WITHIN 2 WEEKS OF WAIVER APPROVAL (ON OR BEFORE 02/04/16) AND WILL ADDRESS ALL COMMENTS.
    2. A REVISED AND COMPLETED FC WORKSHEET INDICATING AMOUNT OF PROPOSED CLEARING AND REFORESTATION/AFFORESTATION OBLIGATIONS SHALL BE SUBMITTED WITHIN 2 WEEKS OF WAIVER APPROVAL (ON OR BEFORE 02/04/16).
    3. WAIVER APPROVAL IS LIMITED TO THE REMOVAL OF SPECIMEN TREES #4, #5, #6 AS DEPICTED ON THE WAIVER EXHIBIT. ANY PROPOSAL TO REMOVE ADDITIONAL SPECIMEN TREES WILL REQUIRE A NEW WAIVER REQUEST OR AN AMENDMENT TO THIS WAIVER REQUEST.
    4. A MINIMUM OF 6 ADDITIONAL, NATIVE, 2-3" CALIPER TREES SHALL BE PROVIDED ON SITE AS PART OF THE MITIGATION FOR THE SPECIMEN TREE REMOVAL. THIS MITIGATION WILL BE ADDRESSED WITH SDP-15-044 ("THE VINE"-BUCH APARTMENTS) AND WILL BE M ADDITION TO ANY REQUIRED LANDSCAPE OR FOREST CONSERVATION PLANTINGS. THE MITIGATION WILL BE SHOWN ON THE ASSOCIATED LANDSCAPE PLAN AND SURETY FOR THESE ADDITIONAL TREES WILL BE REQUIRED AS PART OF THE SITE DEVELOPMENT PLAN.
    5. DUE TO THEIR PROXIMITY TO THE LOD, INDIVIDUAL TREE PROTECTIVE DEVICES (TREE FENCING) SHALL BE PLACED COMPLETELY AROUND THE CRITICAL ROOT ZONES OF SPECIMEN TREE #1, SPECIMEN TREE #2 AND SPECIMEN TREE #3, PRIOR TO THE COMMENCEMENT OF ANY GRADING. THIS SHALL BE OUTLINED IN THE PRE-CONSTMCTION MANAGEMENT PLAN OF THE FINAL FOREST CONSERVATION PLAN (FCP) AND WITHIN THE SEQUENCE OF CONSTRUCTION PROVIDED ON THE SITE DEVELOPMENT PLAN FOR SDP-15-044 ("THE VINE"-BUCH APARTMENTS").
    6. THE PETITIONER SHALL REMOVE THE EXISTING CHAIN LINK SECURITY FENCE (LOCATED INSIDE THE PROPERTY LINE OF PARCEL 288). THIS SECURITY FENCING SHALL BE RELOCATED TO THE PROPERTY LINE (AS SHOWN ON THE WAIVER EXHIBIT) AND SHALL BE OF THE SAME FENCING MATERIAL AS THE EXISTING FENCING LOCATED WITHIN THE POLICE STATION PARKING LOT.
    7. SDP-15-044 ("THE VINE"-BUCH APARTMENTS") SHALL BE AMENDED (VIA DIRECT SUBMISSION) PER THE CONDITIONS SET FORTH ABOVE. A FOREST CONSERVATION FEE-IN-LIEU SHALL BE PROVIDED WITH THE SUBMISSION OF SDP-15-044 MYLARS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 5.12.16
CHIEF, DEVELOPMENT ENGINEERING DIVISION 4w — DATE

[signature] 8.9.16
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 8-11-16
DIRECTOR — DATE

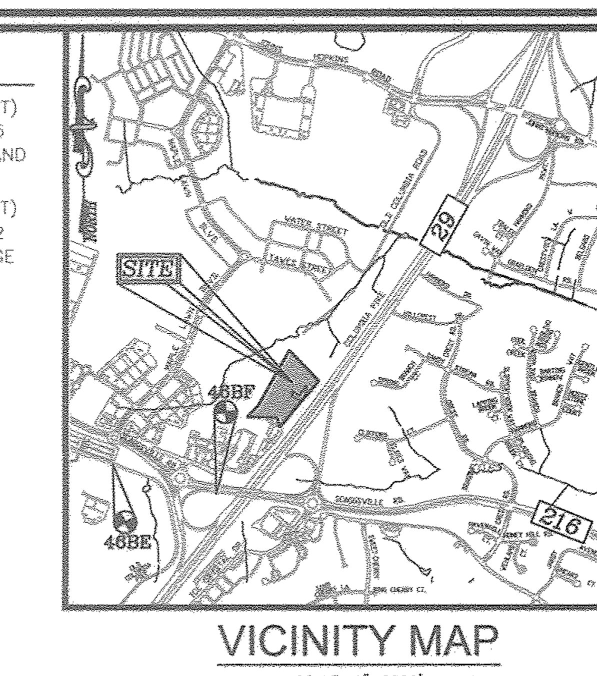


LOCATION MAP
SCALE: 1"=100'

BENCHMARKS

HOWARD COUNTY BENCHMARK - 46BE (CONC. MONUMENT)
N 538853.83 E 1338643.54 ELEV. 443.345
LOCATION: OLD COLUMBIA PIKE AT SCAGGSVILLE PARK AND RIDE

HOWARD COUNTY BENCHMARK - 46BF (CONC. MONUMENT)
N 538448.18 E 1340010.43 ELEV. 446.602
LOCATION: MD-216 AT SCAGGSVILLE NEAR RT-29 BRIDGE



VICINITY MAP
SCALE: 1"=2000'
ADC MAP COORDINATES: 39/C-2

LEGEND:

PROPERTY LINE
RIGHT-OF-WAY LINE
ADJACENT PROPERTY LINE
DEVELOPMENT AREA

SHEET INDEX	
DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 15
SITE LAYOUT AND STREET TREE PLAN	2 OF 15
ROAD PROFILE AND SITE DETAILS	3 OF 15
GRADING, SEDIMENT AND EROSION CONTROL PLAN; SOILS MAP	4 OF 15
SEDIMENT AND EROSION CONTROL NOTES AND DETAILS	5 OF 15
WATERWAY CONSTRUCTION DETAILS	6 OF 15
STORM DRAIN DRAINAGE AREA MAP AND PROFILES	7 OF 15
STORMWATER MANAGEMENT DRAINAGE AREA MAP, NOTES AND DETAILS	8 OF 15
RETAINING WALL PLANS	9-19 OF 19

OWNER/DEVELOPER

BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

ADDRESS CHART	
LOT/PARCEL#	STREET ADDRESS
BUILDING A (PARCEL 126)	10945 PRICE MANOR WAY

PERMIT INFORMATION CHART					
SUBDIVISION NAME	SECTION/ AREA	LOT/ PARCEL			
THE VINE	–	PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496)			
PLAT REF.	BLOCK NO	ZONE	TAX MAP	ELECT DIST.	CENSUS TR.
L.16602/F.250 PLAT 23876-23878	4	R-APT & B-1	46	5TH	605102

SITE DEVELOPMENT PLAN

COVER SHEET

BUCH ROAD EXTENSION
10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET ELLICOTT CITY, MD 21043
TEL: 410.461.7666 FAX: 410.461.8961

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER — 5/2/16

ROBERT H. VOGEL, PE No.16193

DESIGN BY:	RHV/DZE
DRAWN BY:	DZE/KG
CHECKED BY:	RHV
DATE:	APRIL 2016
SCALE:	AS SHOWN
W.O. NO.:	12-50.01

PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2016

SDP-15-071

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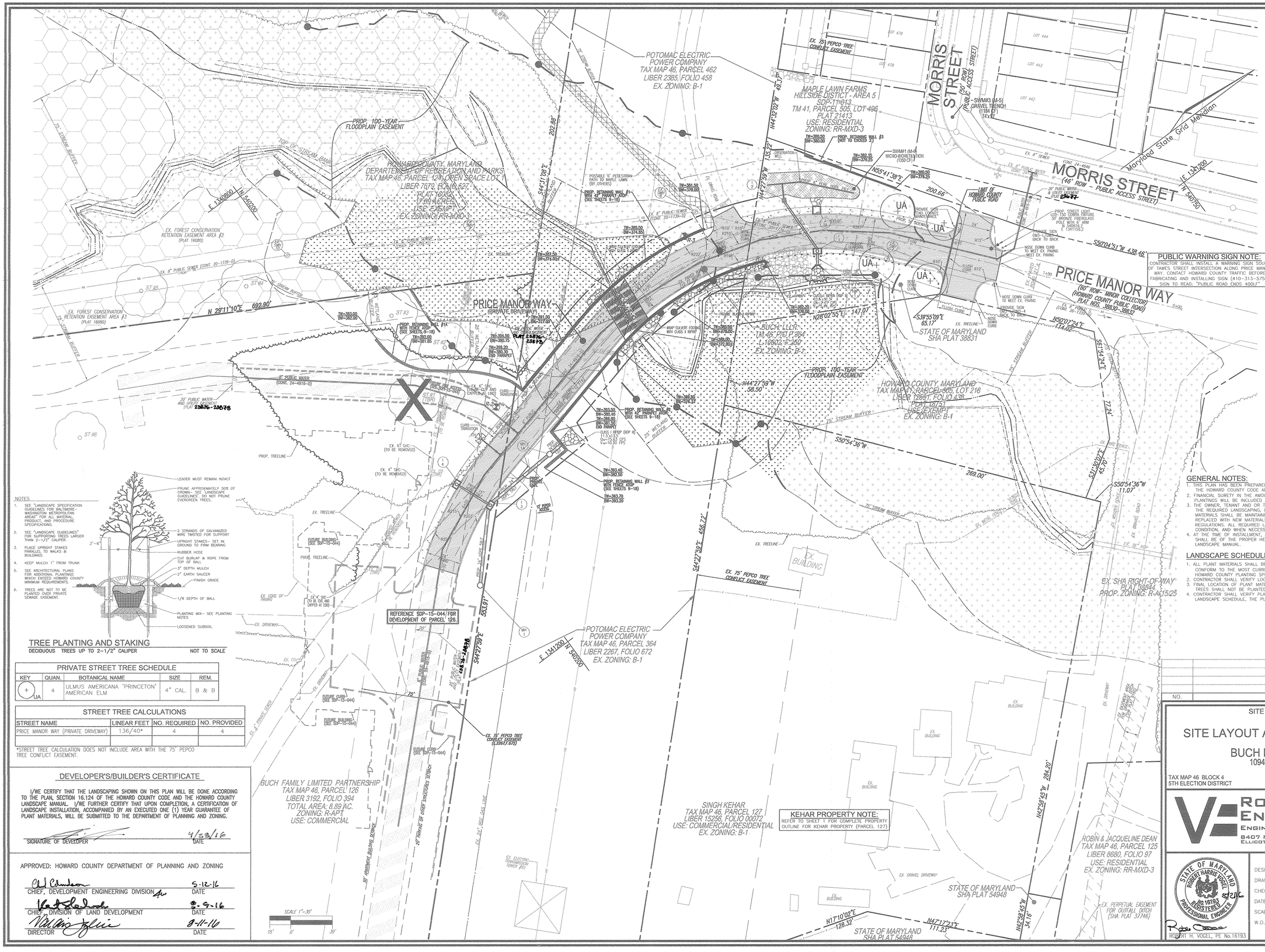

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING LIMIT OF WETLANDS
- EXISTING WETLANDS
- LIMITS OF FLOODPLAIN
- PROPOSED PUBLIC WATER AND UTILITY EASEMENT
- PROPOSED STORMDRAIN
- PROPOSED STORMDRAIN INLET
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED SIDEWALK
- PROPOSED P-3 PAVING SECTION (GEOTECH TO CONFIRM)
- STREET TREES
- MICRO-BIORETENTION (M-6)
- PROP. 100 YEAR FLOODPLAIN EASEMENT
- EX. DFIRM 100 YR FLOODPLAIN EASEMENT
- EX. RIPRAP
- PROP. RIPRAP (REF. PLAN FOR TYPE)

PUBLIC WARNING SIGN NOTE:
CONTRACTOR SHALL INSTALL A WARNING SIGN SOUTH OF TAWES STREET INTERSECTION ALONG PRICE MANOR WAY. CONTACT HOWARD COUNTY TRAFFIC BEFORE FABRICATING AND INSTALLING SIGN (410-313-5752) SIGN TO READ: "PUBLIC ROAD ENDS 400LF"

KEHAR PROPERTY NOTE:
REFER TO SHEET 1 FOR COMPLETE PROPERTY OUTLINE FOR KEHAR PROPERTY (PARCEL 127)

GENERAL NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
2. FINANCIAL SURETY IN THE AMOUNT OF $1,200.00 FOR THE 4 REQUIRED PRIVATE STREET TREE PLANTINGS WILL BE INCLUDED AS PART OF THE DED COST ESTIMATE FOR THIS PROJECT.
3. THE OWNER, TENANT AND OR THEIR AGENCTS SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE REQUIRED LANDSCAPING, PLANT MATERIALS, 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 REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.
4. AT THE TIME OF INSTALLMENT, ALL PLANTINGS LISTED HEREWITHIN AND APPROVED FOR THIS SITE SHALL BE OF THE PROPER HEIGH REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL.

LANDSCAPE SCHEDULE NOTE:

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

OWNER/DEVELOPER

BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

NOTES

1. SEE "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS" FOR ALL MATERIAL, PRODUCT, AND PROCEDURE SPECIFICATIONS.
2. SEE "LANDSCAPE GUIDELINES" FOR SUPPORTING TREES LARGER THAN 2-1/2" CALIPER.
3. PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
4. KEEP MULCH 1" FROM TRUNK
5. SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
6. TREES ARE NOT TO BE PLANTED OVER PRIVATE SEWAGE EASEMENT.

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

PRIVATE STREET TREE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	REM.
UA	4	ULMUS AMERICANA 'PRINCETON' AMERICAN ELM	4" CAL.	B & B

STREET TREE CALCULATIONS

STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
PRICE MANOR WAY (PRIVATE DRIVEWAY)	136/40*	4	4

*STREET TREE CALCULATION DOES NOT INCLUDE AREA WITH THE 75' PEPCO TREE CONFLICT EASEMENT.

DEVELOPER'S/BUILDER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE 4/28/16

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 5-12-16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 5-9-16
DIRECTOR	DATE 5-11-16

SITE DEVELOPMENT PLAN

SITE LAYOUT AND STREET TREE PLAN

BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

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STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER
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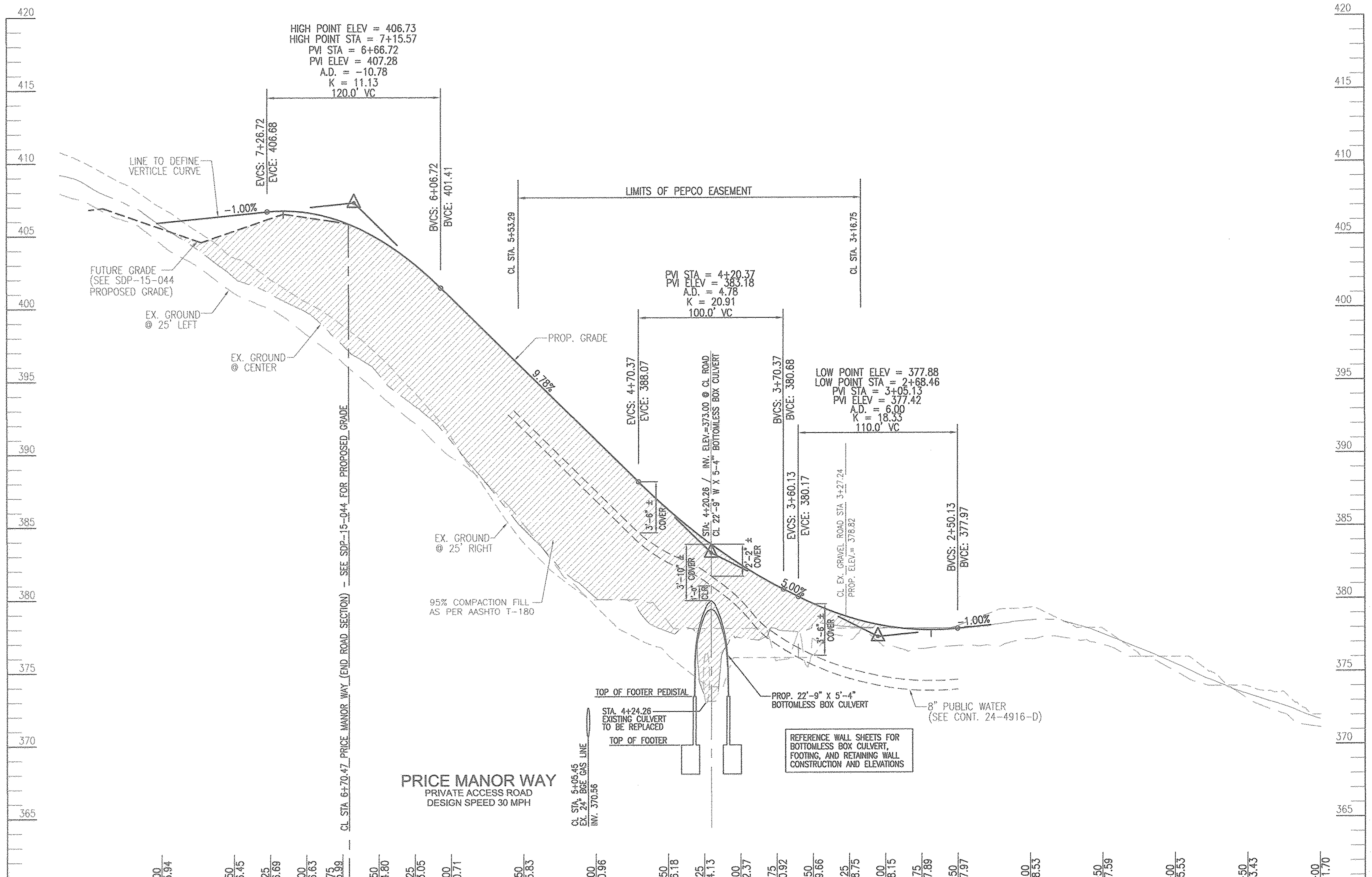
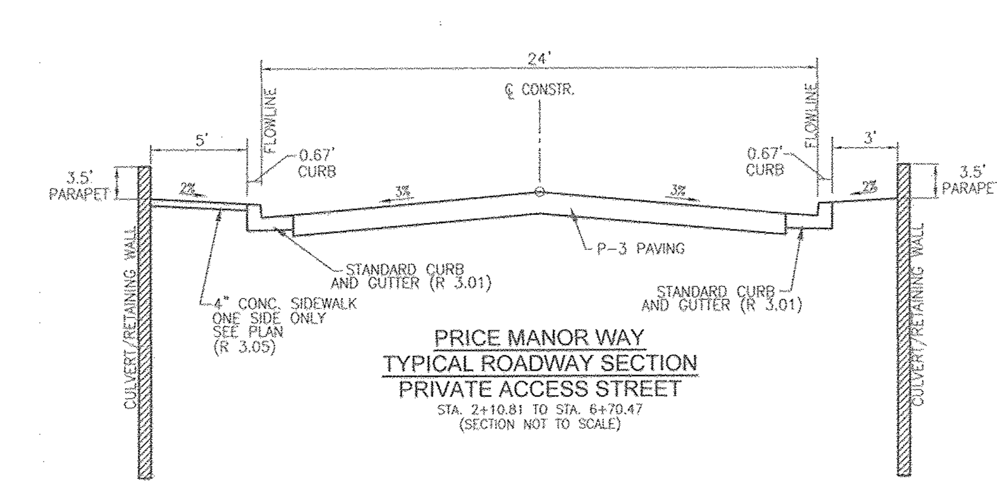
SHEET 2 OF 19

SDP-15-071

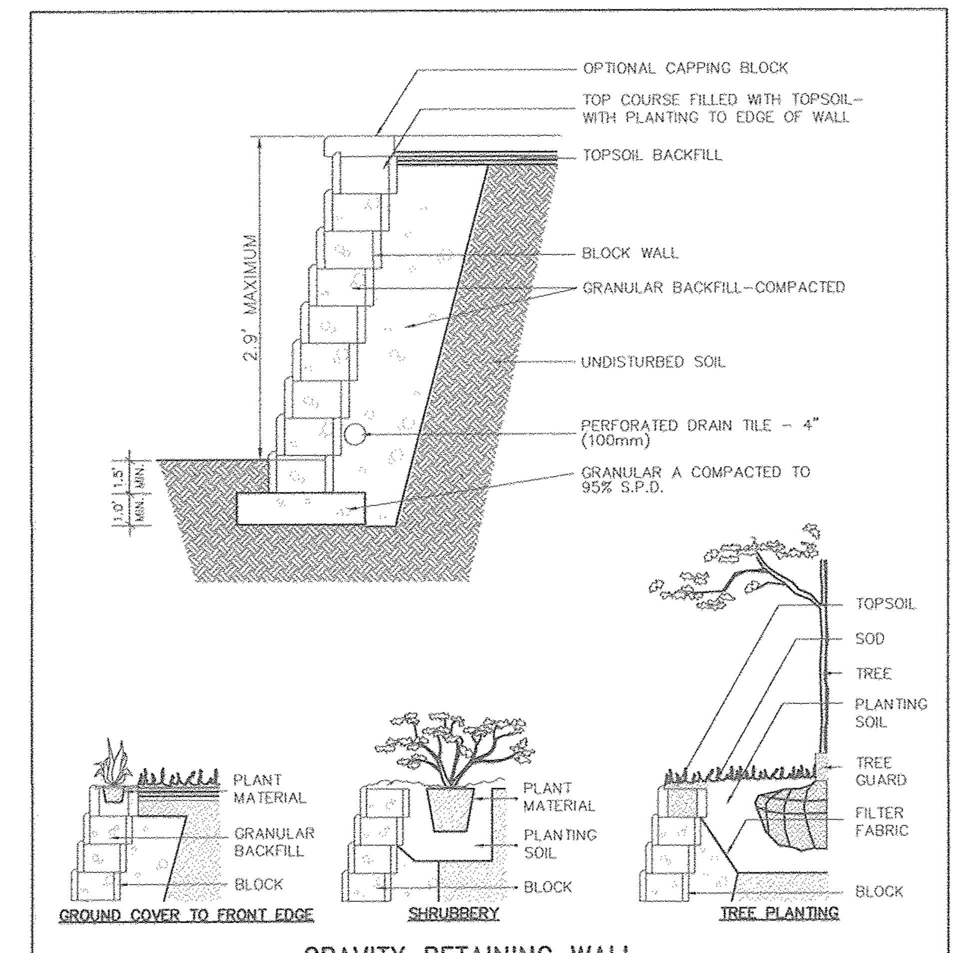


PRICE MANOR WAY - ROAD PROFILE

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



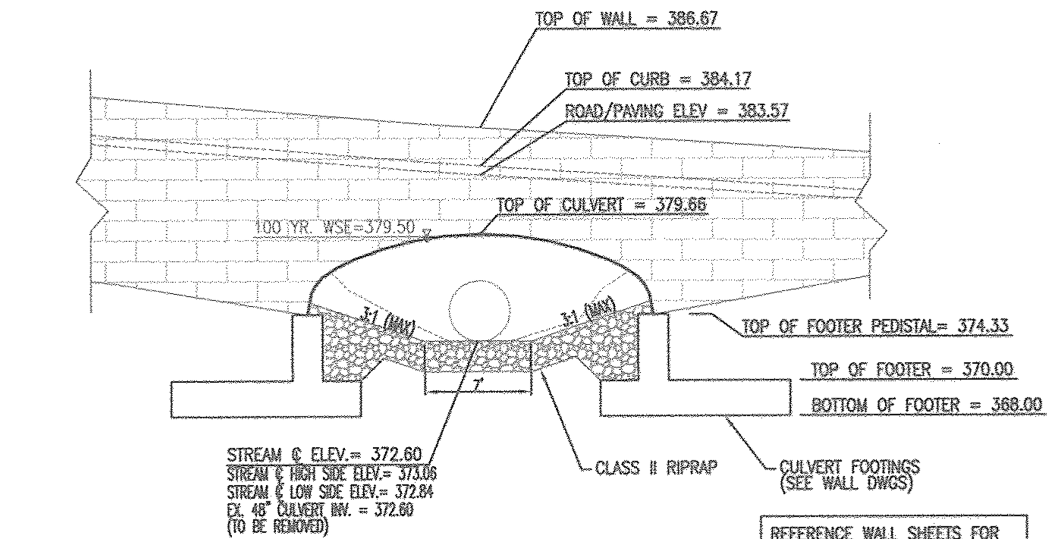
PRICE MANOR WAY
TYPICAL ROADWAY SECTION
PRIVATE ACCESS STREET
STA. 2+10.81 TO STA. 6+70.47
(SECTION NOT TO SCALE)



GRAVITY RETAINING WALL

SPECIFICATIONS:
1. EXCAVATE AREA TO LINE AND GRADES AS SHOWN ON CONSTRUCTION DRAWINGS
2. SUBGRADE TO BE FIRM AND UNDISTURBED AND COMPACTED TO 95% S.P.D.
3. BASE MATERIAL SHALL BE GRANULAR A COMPACTED TO 95% S.P.D. AND GRADED TO PROVIDE LEVEL HARD SURFACE ON WHICH TO PLACE THE FIRST COURSE OF UNITS, MIN. THICKNESS - 6" (150mm)
4. PLACE FIRST COURSE A MINIMUM OF 4" (100mm) BELOW FINISHED GRADE, WITH THE RAISED LIP FACING OUT AND THE FRONT EDGES TIGHT TOGETHER. FILL CAVITYS WITH SAND OR CLEAR CRUSHED STONE AND COMPACT. SWEEP CLEAN AND CHECK THE UNITS FOR LEVEL AND ALIGNMENT. BACKFILL FRONT AND BACK OF ENTIRE BASE ROW TO FIRMLY LOCK IN PLACE.
5. INSTALL SUBSEQUENT COURSES IN SIMILAR FASHION PROVIDING A MIN. 3" (76mm) OVERLAP OF SEAMS AND A MIN. OF 12" (305mm) GRANULAR BACKFILL. 6. WALLS HIGHER THAN 6' REQUIRE GEOGRIDS OR REBAR AND MASONRY CONSTRUCTION; CONSULT MANUFACTURER AND STRUCTURAL ENGINEER. 7. CONSULT WALL/BLOCK MANUFACTURER FOR MORE SPECIFIC INSTALLATION INSTRUCTIONS.

TYP. NON-STRUCTURAL WALL OR EQUAL



REFERENCE WALL SHEETS FOR BOTTOMLESS BOX CULVERT, FOOTING, AND RETAINING WALL CONSTRUCTION AND ELEVATIONS

PROP. CONTECH BOTTOMLESS
ALCMP BOX CULVERT
(22'-9"x5'4")
@ 0.00%

$Q_{2(UP)}$=80.0 cfs $V_{2(UP)}$=5.3 fps $froude_{2(UP)}$=0.74
$Q_{2(DOWN)}$=80.0 cfs $V_{2(DOWN)}$=3.0 fps $froude_{2(DOWN)}$=0.43

EX. 48" CULVERT (TO BE REMOVED)
$Q_{2(UP)}$=80.0 cfs $V_{2(UP)}$=1.8 fps $froude_{2(UP)}$=0.16
$Q_{2(DOWN)}$=80.0 cfs $V_{2(DOWN)}$=3.1 fps $froude_{2(DOWN)}$=0.44

*Q_{10}=481.97 cfs (WITH EXISTING 48" CMP CULVERT)
Q_{10}=493.81 cfs (WITH REMOVAL OF 48" CMP CULVERT AND REPLACEMENT WITH BOTTOMLESS ARCH CULVERT)

*THIS ANALYSIS INCLUDES THE AFFECT OF PONDING BEHIND THE EXISTING CULVERT.

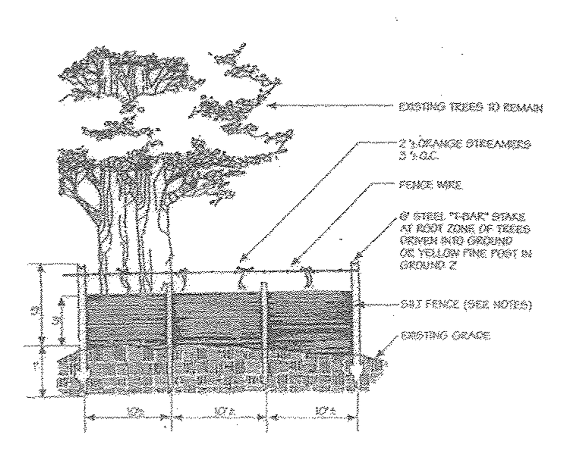
SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR) / PAVEMENT MATERIAL (INCHES)	MIN HMA WITH GAB 3 TO <5	MIN HMA WITH GAB 5 TO <7	MIN HMA WITH GAB ≥ 7	HMA WITH CONSTANT GAB 3 TO <5	HMA WITH CONSTANT GAB 5 TO <7	HMA WITH CONSTANT GAB ≥ 7
P-1	PARKING BAYS: RESIDENTIAL AND NON-RESIDENTIAL; PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 2 HEAVY TRUCKS PER DAY	HMA SUPERPAVE FINAL SURFACE 9.5 MM PG 64-22, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE (NA)	NA	NA	NA	NA	NA	NA
		HMA SUPERPAVE BASE 19.0 MM, PG 64-22, LEVEL 1 (ESAL)	2.0	2.0	2.0	3.5	3.0	2.5
		GRADED AGGREGATE BASE (GAB)	8.5	7.0	5.0	4.0	4.0	4.0
P-2	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY; LOCAL ROADS: ACESS PLACE, ACCESS STREET; CUL-DE-SACS: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE 9.5 MM, PG 64-22, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE 9.5 MM, PG 64-22, LEVEL 1 (ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		HMA SUPERPAVE BASE 19.0 MM, PG 64-22, LEVEL 1 (ESAL)	2.0	2.0	2.0	3.5	2.0	2.0
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	4.0
P-3	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY; LOCAL ROADS: ACCESS PLACE, ACCESS STREET; CUL-DE-SACS: NON-RESIDENTIAL; MINOR COLLECTORS: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE 9.5 MM, PG 64-22, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE 9.5 MM, PG 64-22, LEVEL 1 (ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		HMA SUPERPAVE BASE 19.0 MM, PG 64-22, LEVEL 1 (ESAL)	3.0	3.0	3.0	4.5	3.0	2.0
		GRADED AGGREGATE BASE (GAB)	10.0	6.0	3.0	6.0	6.0	6.0
P-4	MINOR COLLECTORS: NON-RESIDENTIAL; MAJOR COLLECTORS	HMA SUPERPAVE FINAL SURFACE 12.5 MM, PG 64-22, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	2.0
		HMA SUPERPAVE INTERMEDIATE SURFACE 12.5 MM, PG 64-22, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	2.0
		HMA SUPERPAVE BASE 19.0 MM, PG 64-22, LEVEL 2 (LOW ESAL)	4.0	4.0	3.0	6.0	5.0	3.0
		GRADED AGGREGATE BASE (GAB)	12.0	[illegible]	4.0	6.0	6.0	6.0

Notes:
1) HEAVY TRUCKS ARE DEFINED AS THOSE WITH SIX (6) WHEELS OR MORE INCLUDING GARBAGE TRUCKS.
2) HMA SUPERPAVE LAYERS SHALL BE PLACED IN APPROPRIATE COMPACTED LIFT THICKNESS: 19.0 MM BASE (2.0" MIN. TO 4.0" MAX), 12.5 MM SURFACE (1.5" MIN TO 3.0" MAX), AND 9.5 MM SURFACE (1.0" MIN TO 2.0" MAX)
3) GRADED AGGREGATE BASE (GAB) TO BE PLACED AND COMPACTED IN 6" MAX COMPACTED THICKNESS LAYERS.
4) THE INTERMEDIATE SURFACE COURSE LAYER MUST BE PLACED WITHIN 2 WEEKS OF PLACEMENT OF BASE COURSE, AND IS REQUIRED PRIOR TO SUBSTANTIAL COMPLETION INSPECTION AND BOND REDUCTION.
5) IN LIEU OF PLACING THE INTERMEDIATE SURFACE COURSE LAYER FOR COMMERCIAL/INDUSTRIAL ENTRANCE APRONS WITHIN THE COUNTY RIGHT-OF-WAY WHERE AUXILIARY LANES ARE NOT REQUIRED, THE THICKNESS OF THE INTERMEDIATE PAVEMENT LAYER CAN BE ADDED TO THE REQUIRED THICKNESS OF THE BASE ASPHALT LAYER.
6) THE CONSTRUCTION DRAWINGS SHALL SHOW THE PAVING SECTION, ROAD CLASSIFICATION AND CBR VALUE FOR EACH ROADWAY

HMA SUPERPAVE FINAL SURFACE
HMA SUPERPAVE INTERMEDIATE SURFACE
HMA SUPERPAVE BASE
GRADED AGGREGATE BASE (GAB)

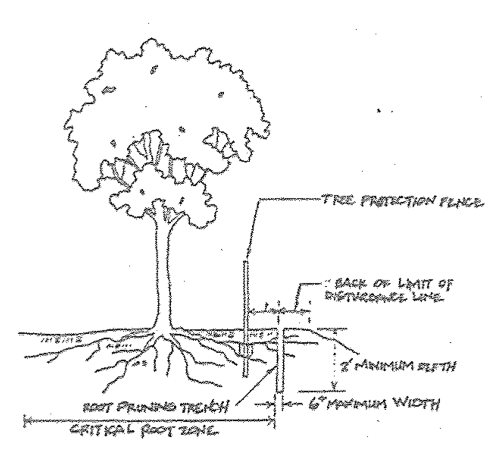
Howard County, Maryland Department of Public Works — Approved: Chief, Bureau of Engineering — 5/7/2007 — PAVING SECTIONS P-1 to P-4 — Detail R-2.01

PAVING SECTION
(GEOTECHNICAL ENGINEER TO CONFIRM PAVING SECTION PRIOR TO CONSTRUCTION)



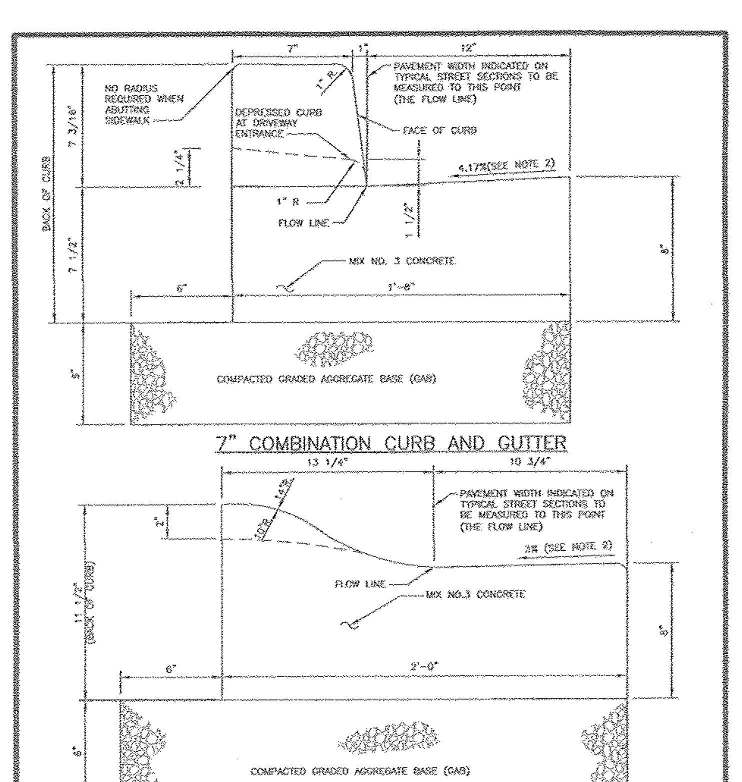
Notes:
1. Silt fence to be heeled into the soil.
2. Wire, snow fence, etc. for tree protection only.
3. Boundaries of Retention Area will be established as part of the forest conservation plan review process.
4. Boundaries of Retention Area should be staked and flagged prior to installing device.
5. Avoid root damage when placing anchor posts.
6. Device should be properly maintained throughout construction.
7. Protection signs are also required, see Figure C-4.
8. Locate fence outside the Critical Root Zone.

TYPICAL TREE PROTECTION FENCE DETAIL
NOT TO SCALE



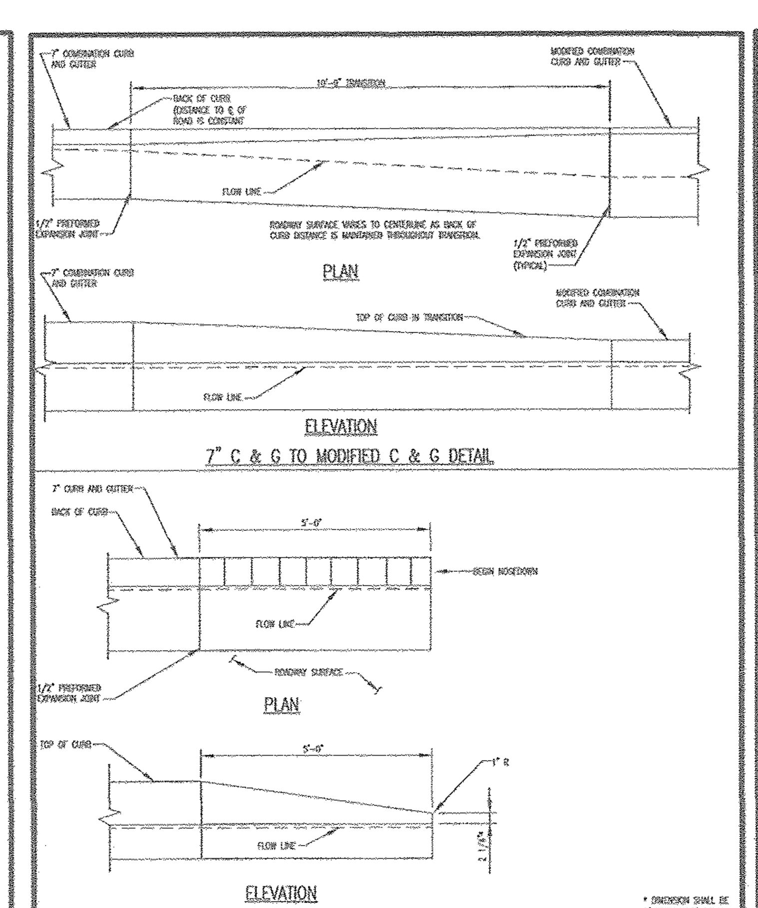
Notes:
1. Retention Areas will be set as part of the review process
2. Boundaries of Retention Areas should be staked flagged prior to trenching
3. Exact location of trench should be identified
4. Trench should be immediately backfilled with soil removed or other high organic soil
5. Roots should be cleanly cut using vibratory knife or other acceptable equipment

ROOT PRUNING DETAIL
NOT TO SCALE

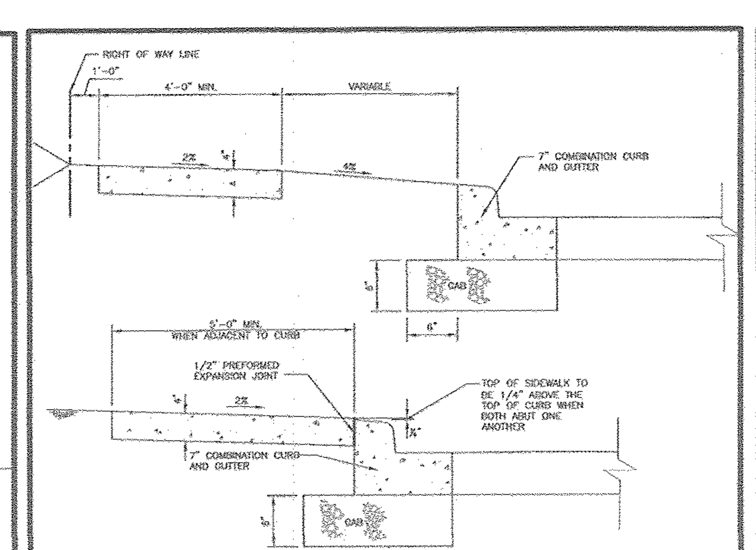


NOTE: MODIFIED COMBINATION CURB AND GUTTER
1. A REVERSE GUTTER PAN SHALL HAVE A GUTTER SLOPE OF 4.17% AWAY FROM THE FLOW LINE, AND SHALL NOT BE USED WHERE THIS DRAINAGE CREATES A HAZARDOUS CONDITION.
2. GUTTER PAN AT THE MEDIAN EDGE OF INTERMEDIATE ARTERIALS OR THE HIGH SIDE OF SUPERELEVATED SECTIONS SHALL BE SLOPED AT THE SAME RATE AND IN THE SAME DIRECTION AS THE PAVEMENT. MATCH PAVEMENT CROSS SLOPE WHEN CURB IS LOCATED ON THE LOW SIDE OF SUPERELEVATED SECTION AND THE RATE OF SUPERELEVATION IS GREATER THAN 3% FOR MODIFIED CURB & GUTTER.
3. A MINIMUM OF TWO (2) FEET OF COMPACTED STABILIZED EARTH, OR EQUIVALENT, SHALL SUPPORT THE ENTIRE BACK OF CURB.
4. POSITIVE DRAINAGE SHALL BE PROVIDED BOTH BEHIND THE CURB AND ALONG THE GUTTER AND FLOW LINE.

Howard County, Maryland Department of Public Works — CURB AND GUTTER 7" & Modified — Detail R-3.01

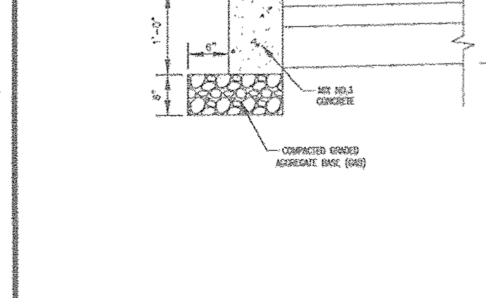


Howard County, Maryland Department of Public Works — CURB AND GUTTER 7" Transition to Modified & Nose Down — Detail R-3.02



NOTES:
1. SIDEWALK TO BE SCRIBED IN 5'-0" MAXIMUM SQUARES.
2. EXPANSION JOINTS ACROSS THE SIDEWALK NOT TO BE MORE THAN 15' APART.
3. 1/2" PREFORMED EXPANSION MATERIAL IN EXPANSION JOINTS TO BE KEPT 1/4" BELOW SURFACE OF SIDEWALK.
4. CONCRETE TO BE MIX NO.3.
5. WHEN SIDEWALK ABUTS CURB, SIDEWALK SHALL BE 1/4" ABOVE CURB WITH 1/2" PREFORMED EXPANSION JOINT BETWEEN SIDEWALK AND CURB.
6. ON LONGITUDINAL SIDEWALK GRADES OF 5% OR GREATER, A CONCRETE HEADER, 6" THICK AND 6" DEEP BELOW THE NORMAL 4" SIDEWALK THICKNESS SHALL BE CONSTRUCTED FOR THE FULL WIDTH OF THE SIDEWALK AT INTERVALS OF 48 FEET. THE HEADERS SHALL BE PLACED AT THE EXPANSION JOINT LOCATIONS AND SHALL BE MONOLITHIC WITH THE SIDEWALK.
7. SIDEWALK WIDTH ADJACENT TO CURB SHALL BE 5'-0" MINIMUM EXCEPT SIDEWALK ADJACENT TO CURB IN CUL-DE-SAC BULBS MAY BE 4'-0" WIDE.
8. SIDEWALK LOCATED 2' OR MORE FROM CURB MAY BE 4'-0" IN WIDTH WITH A 5'x5' PAVED SECTION PLACED 200' APART.
9. 4'-0" SIDEWALK REQUIRES A PASSING AREA (SEE DETAIL R-4.01).

Howard County, Maryland Department of Public Works — Concrete Sidewalk — Detail R-3.05



Howard County, Maryland Department of Public Works — Curb Flush — Detail R-3.07

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 5.12.16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 8-9-16
DIRECTOR	DATE 8-11-16

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

ROAD PROFILE & SITE DETAILS

BUCH ROAD EXTENSION

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ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
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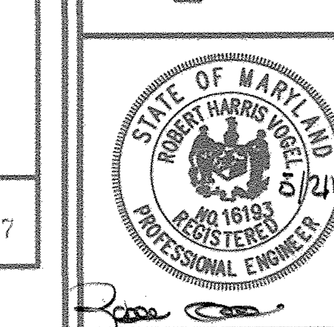

ROBERT H. VOGEL, PE No.16193

DESIGN BY:	RHV/DZE
DRAWN BY:	DZE/KG
CHECKED BY:	RHV
DATE:	APRIL 2016
SCALE:	AS SHOWN
W.O. NO.:	12-50.01

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2016

SDP-15-071

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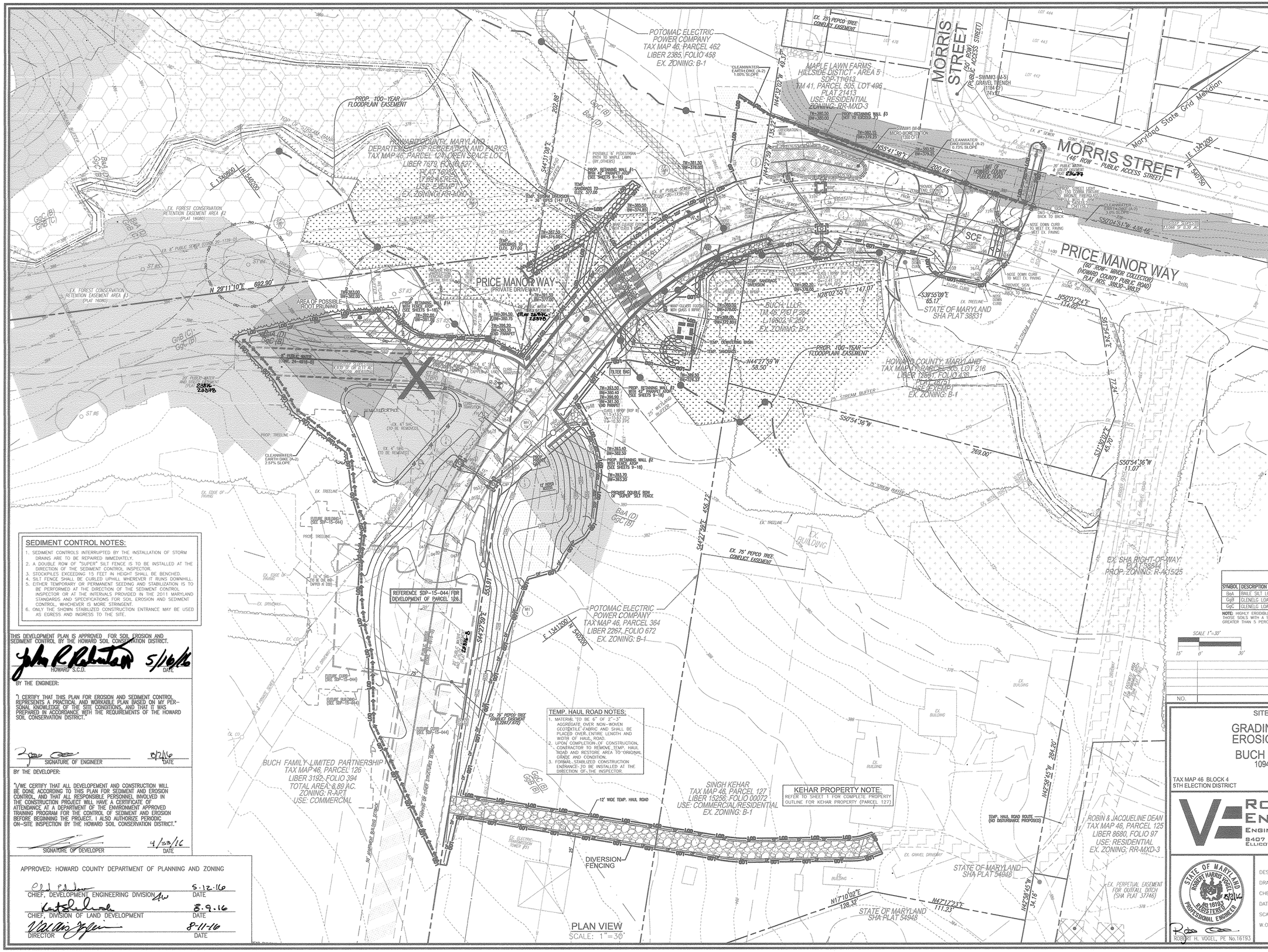

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING WETLANDS
- LIMITS OF FLOODPLAIN
- PROPOSED PUBLIC WATER AND UTILITY EASEMENT
- PROPOSED STORMDRAIN
- PROPOSED STORMDRAIN INLET
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED SIDEWALK
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- MODERATE SLOPES (15% - 24.99%)
- STEEP SLOPE (>25%)
- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- LOD — PROPOSED EARTH DIKE
- LOD — LIMIT OF DISTURBANCE
- CIP — CURB INLET PROTECTION
- AGIP — AT GRADE INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE
- BaA (D) / GgC (B) — SOILS BOUNDARY
- PRIVATE STREET TREES
- MICRO-BIORETENTION (M-6)
- PROP. 100 YEAR FLOODPLAIN EASEMENT
- EX. DFIRM 100 YR. FLOODPLAIN EASEMENT
- EX. RIPRAP
- PROP. RIPRAP (REF. PLAN FOR TYPE)
- EXISTING SPECIMEN TREE
- CRZ — CRZ — CRZ — CRITICAL ROOT ZONE
- AREA SUBJECT TO ROOT PRUNING

SEDIMENT CONTROL NOTES:

1. SEDIMENT CONTROLS INTERRUPTED BY THE INSTALLATION OF STORM DRAINS ARE TO BE REPAIRED IMMEDIATELY.
2. A DOUBLE ROW OF "SUPER" SILT FENCE IS TO BE INSTALLED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
3. STOCKPILES EXCEEDING 15 FEET IN HEIGHT SHALL BE BENCHED.
4. SILT FENCE SHALL BE CURLED UPHILL WHENEVER IT RUNS DOWNHILL.
5. EITHER TEMPORARY OR PERMANENT SEEDING AND STABILIZATION IS TO BE PERFORMED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE INTERVALS PROVIDED IN THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, WHICHEVER IS MORE STRINGENT.
6. ONLY THE SHOWN STABILIZED CONSTRUCTION ENTRANCE MAY BE USED AS EGRESS AND INGRESS TO THE SITE.

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

HOWARD S.C.D. — DATE 5/10/16

BY THE ENGINEER:

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

SIGNATURE OF ENGINEER — DATE 5/2/16

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE 4/20/16

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 5.12.16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 8.9.16
DIRECTOR	DATE 8-11-16

TEMP. HAUL ROAD NOTES:

1. MATERIAL TO BE 6" OF 2"-3" AGGREGATE OVER NON-WOVEN GEOTEXTILE FABRIC AND SHALL BE PLACED OVER ENTIRE LENGTH AND WIDTH OF HAUL ROAD.
2. UPON COMPLETION OF CONSTRUCTION, CONTRACTOR TO REMOVE TEMP. HAUL ROAD AND RESTORE AREA TO ORIGINAL GRADE AND CONDITION.
3. FORMAL STABILIZED CONSTRUCTION ENTRANCE TO BE INSTALLED AT THE DIRECTION OF THE INSPECTOR.

KEHAR PROPERTY NOTE:

REFER TO SHEET 1 FOR COMPLETE PROPERTY OUTLINE FOR KEHAR PROPERTY (PARCEL 127)

PLAN VIEW
SCALE: 1"=30'

SOILS LEGEND
HOWARD COUNTY SOIL MAP 23

SYMBOL	DESCRIPTION	TYPE	HYDRIC	K FACTOR	ERODIBLE
BaA	BALTIMORE SILT LOAM, 0 TO 3 PERCENT SLOPES	D	YES	0.32	NO
GgB	GLENELG LOAM, 3 TO 8 PERCENT SLOPES	B	NO	0.20	NO
GgC	GLENELG LOAM, 8 TO 15 PERCENT SLOPES	B	NO	0.20	NO

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

SCALE 1"=30'
15' 0' 30'

OWNER/DEVELOPER

BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

GRADING, SEDIMENT AND EROSION CONTROL PLAN

BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELLICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER — 5/2/16

ROBERT H. VOGEL, PE No.16193

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SDP-15-071

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B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING AND SOIL AMENDMENTS

DEFINITION
THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION.

PURPOSE
TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES
WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

CRITERIA
A. SOIL PREPARATION
1. TEMPORARY STABILIZATION
A. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISCHARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
B. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
C. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
2. PERMANENT STABILIZATION
A. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
I. SOIL PH BETWEEN 6.0 AND 7.0.
II. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
III. SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
IV. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
V. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
B. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
C. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES.
D. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
E. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

B. TOPSOILING
1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCEM HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.
2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.
3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
A. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
B. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
C. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
D. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
A. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1½ INCHES IN DIAMETER.
B. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
C. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
6. TOPSOIL APPLICATION
A. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
B. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
C. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.
2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

DEFINITION
TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

PURPOSE
TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES
EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

CRITERIA
1. SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.1 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.1 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.
2. FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.
3. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONE AS PRESCRIBED IN SECTION B-4-3.A.1.B AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

TEMPORARY SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE B.3): ZONE 6b
SEED MIXTURE (FROM TABLE B.1):

NO	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	FELIZER RATE (10-20-20)	LIME RATE
1	COOL SEASON ANNUAL RYEGRASS OR EQUAL	40 LB / AC	MAR 1 TO MAY 15 AUG 1 TO OCT 15	0.5 IN.	436 LB/AC (10 LB PER 1000 SF)	2 TONS/AC (90 LB PER 1000 SF)
2	WARM SEASON FOXTAIL MILLET OR EQUAL	30 LB / AC	MAY 16 TO JUL 31	0.5 IN.		

Table B.1: Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate[1/] lb/ac	Seeding Rate[1/] lb/1000 ft²	Seeding Depth[2/] (inches)	Recommended Seeding Dates by Plant Hardiness Zone[3/] 5b and 6a	6b	7a and 7b	FERTILIZER RATE (10-20-20)	LIME RATE
Cool-Season Grasses								
Annual Ryegrass (*Lolium perenne ssp. multiflorum*)	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30		
Barley (*Hordeum vulgare*)	96	2.2	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30		
Oats (*Avena sativa*)	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30		
Wheat (*Triticum aestivum*)	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 15 to Nov 30	436 LB/AC (10 LB PER 1000 SF)	2 TONS/AC (90 LB PER 1000 SF)
Cereal Rye (*Secale cereale*)	112	2.8	1.0	Mar 15 to May 31; Aug 1 to Oct 31	Mar 1 to May 15; Aug 1 to Nov 15	Feb 15 to Apr 30; Aug 15 to Dec 15		
Warm-Season Grasses								
Foxtail Millet (*Setaria italica*)	30	0.7	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14		
Pearl Millet (*Pennisetum glaucum*)	20	0.5	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14		

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

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

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

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

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

DEFINITION
THE APPLICATION OF SEED AND MULCH TO ESTABLISH VEGETATIVE COVER.

PURPOSE
TO PROTECT DISTURBED SOILS FROM EROSION DURING AND AT THE END OF CONSTRUCTION.

CONDITIONS WHERE PRACTICE APPLIES
TO THE SURFACE OF ALL PERIMETER CONTROLS, SLOPES, AND ANY DISTURBED AREA NOT UNDER ACTIVE GRADING.

CRITERIA
A. SEEDING
1. SPECIFICATIONS
A. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
B. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
C. INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
D. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
2. APPLICATION
A. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
I. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.
II. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
B. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
I. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
II. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
C. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
I. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P2O5 (PHOSPHOROUS), 200 POUNDS PER ACRE; K2O (POTASSIUM), 200 POUNDS PER ACRE.
II. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
III. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
IV. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

B. MULCHING
1. MULCH MATERIALS (IN ORDER OF PREFERENCE)
A. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, LYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY.
NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
B. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
I. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
II. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
III. WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
IV. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
V. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
2. APPLICATION
A. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
B. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
C. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
3. ANCHORING
A. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
I. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
II. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
III. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
IV. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION, (313-1855).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEENOBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
6. SITE ANALYSIS:

TOTAL SITE AREA	1.85 ACRES
AREA DISTURBED	1.85 ACRES
AREA TO BE ROOFED OR PAVED	0.38 ACRES
AREA TO BE VEGETATIVELY STABILIZED	1.47 ACRES
TOTAL CUT	0 CY*
TOTAL FILL	4975 CY*
OFFSITE WASTE/BORROW LOCATION	ON-SITE **

7. ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
8. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
9. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
10. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.
11. ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.
12. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE ENFORCEMENT AUTHORITY. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE APPROVAL AUTHORITY, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

* ESTIMATE ONLY. CONTRACTOR SHALL VERIFY QUANTITIES TO HIS OWN SATISFACTION.
**TO BE DETERMINED BY CONTRACTOR, WITH PRE-APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, WITH AN APPROVED AND ACTIVE GRADING PERMIT.

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

DEFINITION
TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

PURPOSE
TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

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

CRITERIA
A. SEED MIXTURES
1. GENERAL USE
A. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3) AND BASED ON THE SITE CONDITION OR PURPOSE FOUND ON TABLE B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
B. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BANKS, OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 - CRITICAL AREA PLANTING.
C. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY.
D. FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3-1/2 POUNDS PER 1000 SQUARE FEET (150 POUNDS PER ACRE) AT THE TIME OF SEEDING IN ADDITION TO THE SOIL AMENDMENTS SHOWN IN THE PERMANENT SEEDING SUMMARY.
2. TURFGRASS MIXTURES
A. AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
B. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
I. KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 POUNDS PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
II. KENTUCKY BLUEGRASS/PERENNIAL RYE: FULL SUN MIXTURE: FOR USE IN FULL SUN AREAS WHERE RAPID ESTABLISHMENT IS NECESSARY AND WHEN TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CULTIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
III. TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES; CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 8 POUNDS PER 1000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE BLENDED.
IV. KENTUCKY BLUEGRASS/FINE FESCUE: SHADE MIXTURE: FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURF AREA. MIXTURE INCLUDES; CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30 TO 40 PERCENT AND CERTIFIED FINE FESCUE AND 60 TO 70 PERCENT. SEEDING RATE: 1½ TO 3 POUNDS PER 1000 SQUARE FEET.
NOTES:
SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND".
CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION, PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENETIC LINE.
C. IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES
WESTEM MD: MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5B, 6A)
CENTRAL MD: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6B)
SOUTHERN MD, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7A, 7B)
D. TILL AREAS TO RECEIVE SEED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCHES, LEVEL AND RAKE THE AREAS TO PREPARE A PROPER SEEDBED. REMOVE STONES AND DEBRIS OVER 1½ INCHES IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY.
E. IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (1/2 TO 1 INCH EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS, OR ON ADVERSE SITES.

PERMANENT SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE B.3): ZONE 6b
SEED MIXTURE (FROM TABLE B.3): 9

NO	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	FELIZER RATE (10-20-20) N	P_2O_5	K_2O	LIME RATE
1	COOL SEASON TALL FESCUE & KENTUCKY BLUEGRASS OR EQUAL	T.F. 60 LB / AC K.B. 40 LB / AC	MAR 1 TO MAY 15 AUG 15 TO OCT 15	1/4-1/2 IN.	45 LB/AC (1 LB PER 1000 SF)	90 LB/AC (2 LB PER 1000 SF)	90 LB/AC (2 LB PER 1000 SF)	2 TONS/AC (90 LB PER 1000 SF)

B. SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).
1. GENERAL SPECIFICATIONS
A. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
B. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4 INCH, PLUS OR MINUS ¼ INCH, AT THE TIME OF CUTTING. MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP GROWTH AND THATCH. BROKEN PADS AND TOM OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.
C. STANDARD SIZE SECTIONS OF SOD MUST BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM GRASP ON THE UPPER 10 PERCENT OF THE SECTION.
D. SOD MUST NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.
E. SOD MUST BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD NOT TRANSPLANTED WITHIN THIS PERIOD MUST BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO ITS INSTALLATION.
2. SOD INSTALLATION
A. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD.
B. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.
C. WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO PREVENT SLIPPAGE ON SLOPES. ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.
D. WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD WITHIN EIGHT HOURS.
3. SOD MAINTENANCE
A. IN THE ABSENCE OF ADEQUATE RAINFALL, WATER DAILY DURING THE FIRST WEEK OR AS OFTEN AND SUFFICIENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF 4 INCHES. WATER SOD DURING THE HEAT OF THE DAY TO PREVENT WILTING.
B. AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT.
C. DO NOT MOW UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN 1/3 OF THE GRASS LEAF MUST BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. MAINTAIN A GRASS HEIGHT OF AT LEAST 3 INCHES UNLESS OTHERWISE SPECIFIED.

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

DEFINITION
A MOUND OR PILE OF SOIL PROTECTION BY APPROPRIATELY DESIGNED EROSION AND SEDIMENT CONTROL MEASURES.
PURPOSE
TO PROVIDE A DESIGNATED LOCATION FOR THE TEMPORARY STORAGE OF SOIL THAT CONTROLS THE POTENTIAL FOR EROSION, SEDIMENTATION, AND CHANGES TO DRAINAGE PATTERNS.
CONDITIONS WHERE PRACTICE APPLIES
STOCKPILE AREAS ARE UTILIZED WHEN IT IS NECESSARY TO SALVAGE AND STORE SOIL FOR LATER USE.

CRITERIA
1. THE STOCKPILE LOCATION AND ALL RELATED SEDIMENT CONTROL PRACTICES MUST BE CLEARLY INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN.
2. THE FOOTPRINT OF THE STOCKPILE MUST BE SIZED TO ACCOMMODATE THE ANTICIPATED VOLUME OF MATERIAL AND BASED ON A SIDE SLOPE RATIO NO STEEPER THAN 2:1. BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING.
3. RUNOFF FROM THE STOCKPILE AREA MUST DRAIN TO A SUITABLE SEDIMENT CONTROL PRACTICE.
4. ACCESS THE STOCKPILE AREA FROM THE UPGRADE SIDE.
5. CLEAR WATER RUNOFF INTO THE STOCKPILE AREA MUST BE MINIMIZED BY USE OF A DIVERSION DEVICE SUCH AS AN EARTH DIKE, TEMPORARY SWALE OR DIVERSION FENCE. PROVISIONS MUST BE MADE FOR DISCHARGING CONCENTRATED FLOW IN A NON-EROSIVE MANNER.
6. WHERE RUNOFF CONCENTRATES ALONG THE TOE OF THE STOCKPILE FILL, AN APPROPRIATE EROSION/SEDIMENT CONTROL PRACTICE MUST BE USED TO INTERCEPT THE DISCHARGE.
7. STOCKPILES MUST BE STABILIZED IN ACCORDANCE WITH THE 3/7 DAY STABILIZATION REQUIREMENT AS WELL AS STANDARD B-4-1 INCREMENTAL STABILIZATION AND STANDARD B-4-4 TEMPORARY STABILIZATION.
8. IF THE STOCKPILE IS LOCATED ON AN IMPERVIOUS SURFACE, A LINER SHOULD BE PROVIDED BELOW THE STOCKPILE TO FACILITATE CLEANUP. STOCKPILES CONTAINING CONTAMINATED MATERIAL MUST BE COVERED WITH IMPERMEABLE SHEETING.

MAINTENANCE
THE STOCKPILE AREA MUST CONTINUOUSLY MEET THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION. SIDE SLOPES MUST BE MAINTAINED AT NO STEEPER THAN A 2:1 RATIO. THE STOCKPILE AREA MUST BE KEPT FREE OF EROSION. IF THE VERTICAL HEIGHT OF A STOCKPILE EXCEEDS 20 FEET FOR 2:1 SLOPES, 30 FEET FOR 3:1 SLOPES, OR 40 FEET FOR 4:1 SLOPES, BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING.

H-5 STANDARDS AND SPECIFICATIONS

FOR

DUST CONTROL

Definition

Controlling the suspension of dust particles from construction activities.

Purpose

To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and traffic hazards.

Conditions Where Practice Applies

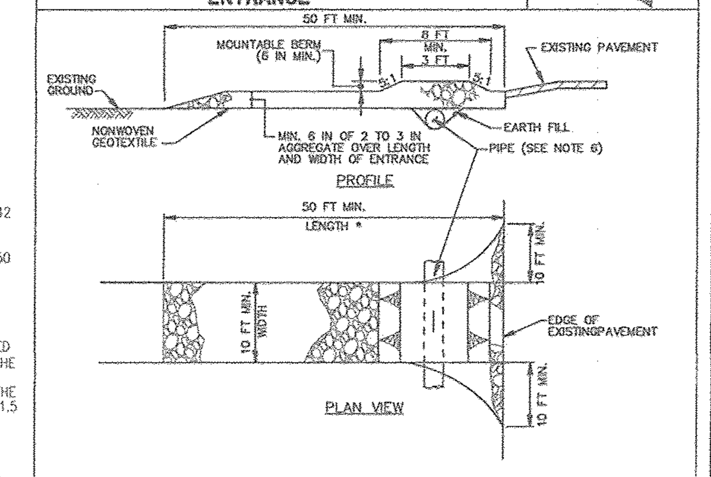
Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications

1. Mulches: See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
2. Vegetative Cover: See Section B-4-4 Temporary Stabilization.
3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment that may produce the desired effect.
4. Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
5. Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
6. Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority.

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



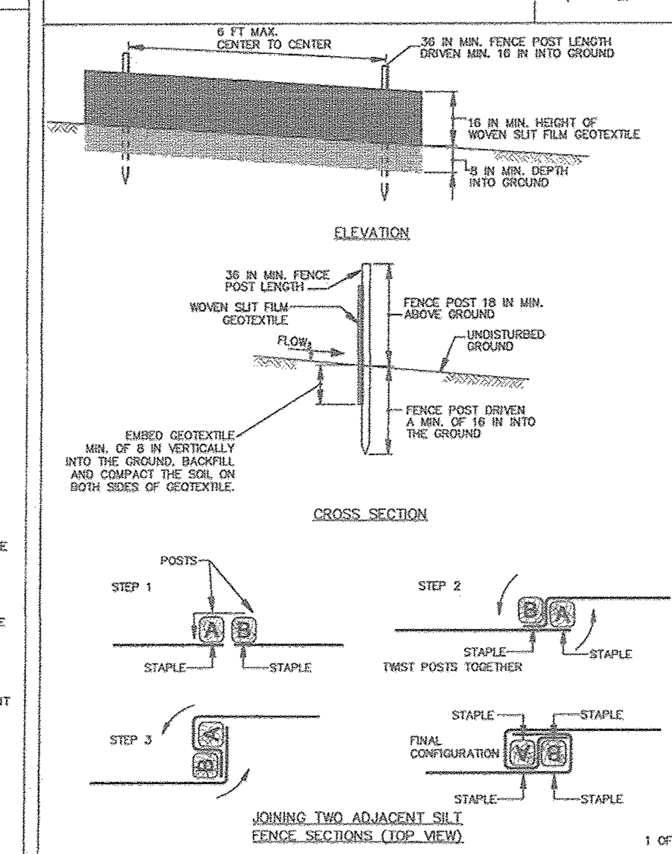
CONSTRUCTION SPECIFICATIONS

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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF



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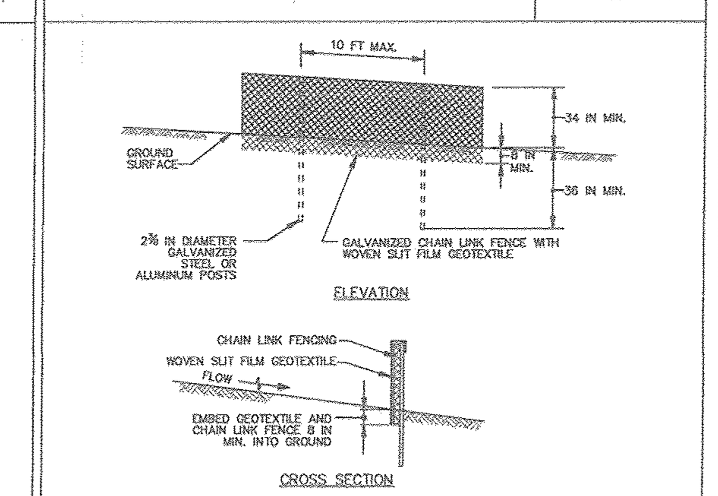
DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
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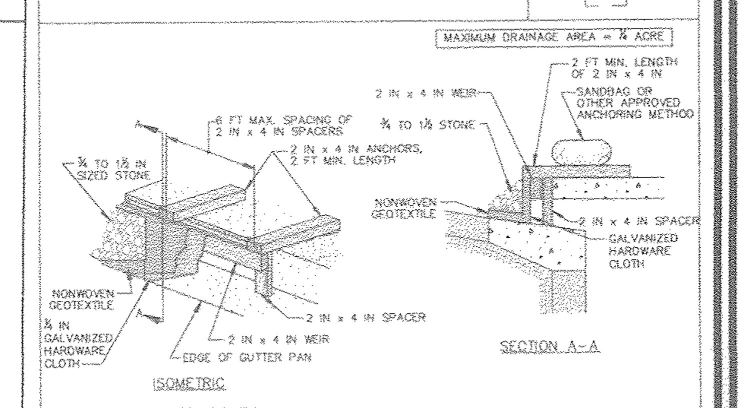
DETAIL E-9-3 CURB INLET PROTECTION

STANDARD SYMBOL: CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



CONSTRUCTION SPECIFICATIONS

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

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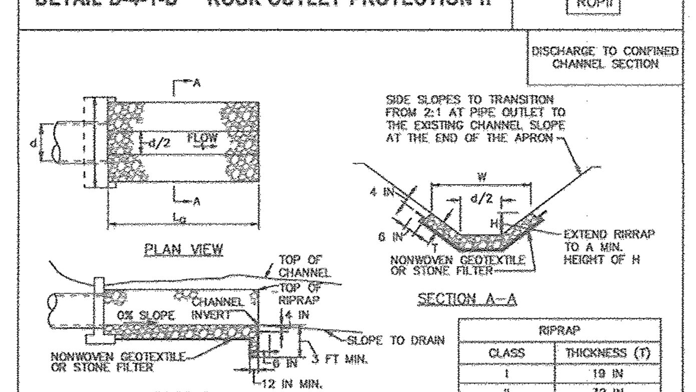
DETAIL D-4-1-B ROCK OUTLET PROTECTION II

STANDARD SYMBOL: ROPII

DISCHARGE TO CONFINED CHANNEL SECTION



CLASS	THICKNESS (T)
I	19 IN
II	32 IN
III	46 IN

CONSTRUCTION SPECIFICATIONS

1. RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.
3. PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (⅜ TO 1½ INCH STONE FOR 6 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF RIPRAP.
5. CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE STONE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.
7. CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.
8. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

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DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅛ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

CONSTRUCTION SPECIFICATIONS

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

FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

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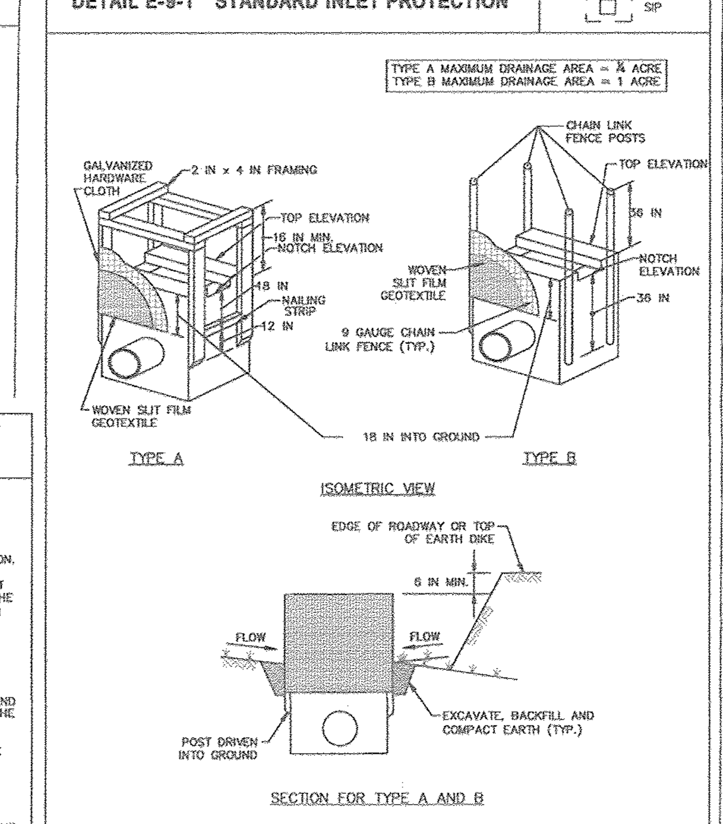
DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

TYPE A MAXIMUM DRAINAGE AREA = ¼ ACRE
TYPE B MAXIMUM DRAINAGE AREA = 1 ACRE



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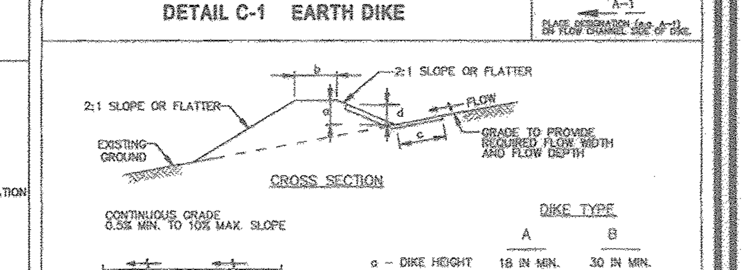
DETAIL C-1 EARTH DIKE

STANDARD SYMBOL: A-1 (PLACE DESIGNATION (e.g. A-1) ON FLOW CHANNEL SIDE OF DIKE)



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

FLOW CHANNEL STABILIZATION

A-1	SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A-2/B-2	SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A-3/B-3	4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

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

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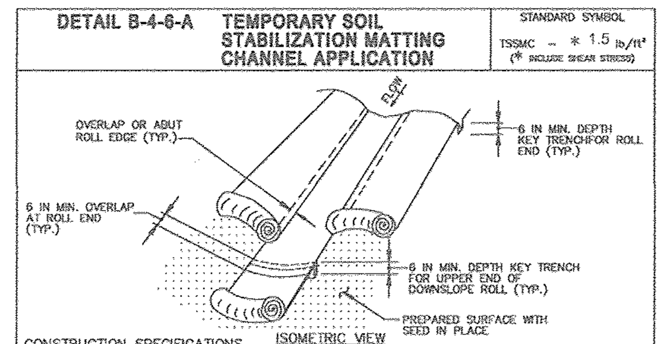
C-5

DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: TSSMC - * 1.5 lb/ft² (* INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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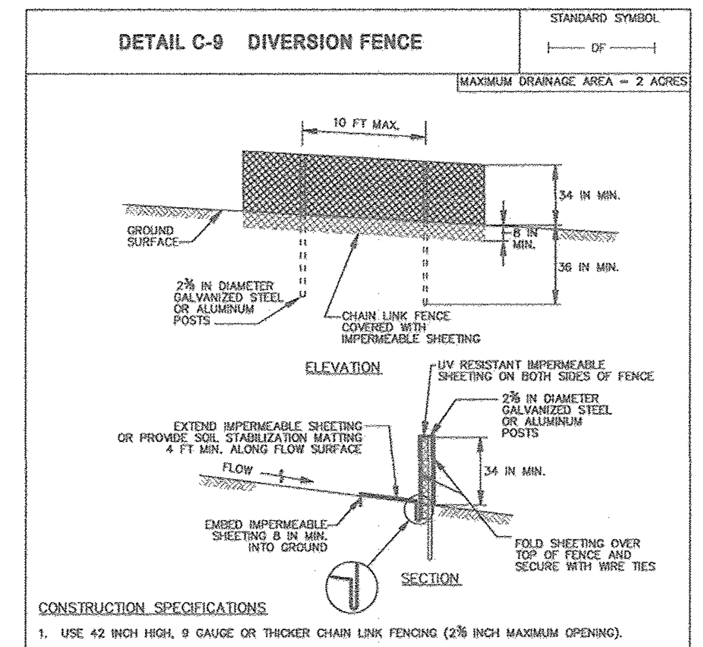
DETAIL C-9 DIVERSION FENCE

STANDARD SYMBOL: DF

MAXIMUM DRAINAGE AREA = 2 ACRES



CONSTRUCTION SPECIFICATIONS

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

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SEQUENCE OF CONSTRUCTION

1. OBTAIN GRADING PERMIT (1 DAY)
2. REVIEW PERMIT CONDITIONS: MDE PERMIT 14-NT-3329/201461731. IN-STREAM WORK IS PROHIBITED MARCH 1 THROUGH JUNE 15.
2. DEVELOPER/CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING WITH THE SEDIMENT CONTROL INSPECTOR PRIOR TO ANY LAND DISTURBANCE. (1 DAY)
3. NOTIFY HOWARD COUNTY BUREAU OF ENGINEERING, CONSTRUCTION INSPECTION DIVISION (410-313-1880) AT LEAST 24 HRS BEFORE STARTING WORK. (1 DAY)
4. STAKEOUT LIMITS OF DISTURBANCE (2 DAYS)
5. EXCAVATE AND INSTALL THE 2 - 36" TEMPORARY STREAM DIVERSION PIPES (MGWC 1.4) USING SANDBAGE CHANNEL DIVERSIO (MGWC 1.5) AT UPSTREAM TO ELEVATION 377.00. (2 WEEKS)
6. INSTALL STABILIZED CONSTRUCTION ENTRANCE WITH MOUNTABLE BERM. (1 DAY)
7. CLEAR AND GRUB FOR THE INSTALLATION OF ALL PERIMETER CONTROLS. (2 DAYS)
8. INSTALL PERIMETER CONTROLS INCLUDING EARTH DIKES, DIKE/SWALES, SILT FENCE AND SUPER SILT FENCE. PROVIDE TREE PROTECTION FENCING (SSF) FOR SPECIMEN TREES TO REMAIN AS SHOWN ON THESE PLANS (ST-2 AND ST-3) AT THE CRITICAL ROOT ZONE (AS SHOWN ON THESE PLANS). TREE PROTECTION FENCING AND ROOT PRUNING SHOWN ON SHEET 3. (3 DAYS)
9. REMOVE EXISTING 48" CULVERT AND EXISTING WALL. (WEEK 3)
10. CONSTRUCT FOOTINGS (PER PLANS BY ECS) AND INSTALL RIPRAP. BEGIN INSTALLATION OF BOTTOMLESS BOX CULVERT. (WEEK 3)
11. CONSTRUCT WALLS (PER PLANS BY ECS) AND BACKFILL BOTTOMLESS BOX CULVERT IN ACCORDANCE WITH SPECIFICATIONS. (WEEK 4)
12. REMOVE PUMPS, SANDBAG DIKES, TEMPERARY DIVERSION AND ANY OTHER DIVICES ASSOCIATED WITH MGWC 1.4 AND 1.5. (WEEK 6)
13. WITH APPROVAL OF SEDIMENT CONTROL INSPECTOR, CLEAR AND GRUB REMAINDER OF SITE. (1 WEEK)
14. COMPLETE SITE GRADING
13. BEGIN INSTALLATION OF SITE UTILITIES (STORM DRAIN, WATER, AND MICROBIORETENTION FACILIETY). PROVIDE INLET PROTECTION AS SHOWN ON THESE PLAN. (12 WEEKS)
A. MICROBIORETENTION CONSTRUCTION:
CONSTRUCT STORM DRAIN SYSTEM INCLUDING MICROBIORETENTION UNDERDRAINS AND #57 STONE. COVER STONE WITH POLY SHEET PLASTIC TO PREVENT CONTAMINATION, AND TEMPORARILY BACKFILL.
14. WITH INSPECTOR'S APPROVAL, BEGIN INSTALLATION OF ROAD BASE PAVING AND CURB. (3 WEEKS)
15. COMPLETE INSTALLATION OF MICRO-BIORETENTION FACILITIES. (1 MONTH)
A. MICROBIORETENTION CONSTRUCTION:
WITH SITE CONSTRUCTION COMPLETE, REMOVE TEMPORARY FILL IN MICROBIORETENTION FACILITES AND CAREFULLY REMOVE POLY SHEET PLASTIC AND INSTALL FILTER FABRIC (SIDES ONLY), PEA GRAVEL AND PLANTING SOIL. CONTRACTOR TO PROVIDE PLANTING SOIL CERTIFICATION. IMMEDIATELY PROTECT FACILITY WITH SILT FENCE. PLACE MULCH AND INSTALL PLANTINGS. ANY COMPACTION OF THE PLANTING SOIL WILL REQUIRE REPLACEMENT OF THE PLANTING SOIL.
16. INSTALL PAVING SURFACE COURSE. (1 WEEK)
17. INSTALL SIDEWALKS. (1 MONTH)
18. COMPLETE RETAINING WALL CONSTRUCTION AND GRADING OPERATION. (1 WEEK)
19. WITH INSPECTOR'S APPROVAL, FINE GRADE AND STABILIZE ALL AREAS OF PARCEL INCLUDING ANY EXPOSED EARTH AREAS OUTSIDE THE LOD. REMOVE ALL TRASH JUNK AND DEBRIS FROM THE LIMIT OF DISTURBANCE. (3 WEEKS)
20. WHEN ALL CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED, REMOVE SILT FENCE AROUND M ICROBIORETENTION FACILITY.
20. FLUSH STORM DRAIN SYSTEM AND REMOVE ALL REMAINING SEDIMENT CONTROLS AFTER RECIEVING APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR.
21. INSTALL SITE LANDSCAPING. (1 WEEK)
22. AFTER PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR REMOVE ANY CONTROLS AND STABILIZE ALL REAMINIG DISTURBED AREAS WITH PERMANENT SEEDING MIXTURE AND STRAW AND MULCH (1 WEEK.)

NOTES:
1. DURING GRADING AND AFTER EACH RAINFALL, CONTRACTOR WILL INSPECT AND PROVIDE NECESSARY MAINTENANCE TO THE SEDIMENT CONTROL MEASURES ON THIS PLAN.
2. FOLLOWING INITIAL SOIL DISTURBANCES OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
A. THREE (7) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND
B. SEVEN (14) CALENDAR DAYS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
3. ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5.12.16
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8.9.16
DIRECTOR — DATE 8-11-16

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE 4/28/16

BY THE ENGINEER:

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

SIGNATURE OF ENGINEER — DATE 5/2/16

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

HOWARD S.C.D. — DATE 5/6/16

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

SEDIMENT AND EROSION CONTROL NOTES & DETAILS

BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELLICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

STATE OF MARYLAND — ROBERT HARRIS VOGEL — NO. 16193 — REGISTERED PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY:	RHV/DZE
DRAWN BY:	DZE/KG
CHECKED BY:	RHV
DATE:	APRIL 2016
SCALE:	AS SHOWN
W.O. NO.:	12-50.01

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2016

SDP-15-071

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MGWC 1.1: Dewatering Basins

Temporary measure for filtering sediment-laden water

Description

The work should consist of installing dewatering basins jointly with channel diversion measures to filter sediment-laden water from in-stream construction sites before the water re-enters the downstream reach.

Effective Uses & Limitations

Undersized dewatering basins will not adequately filter sediment-laden water from the construction site.

Material Specifications

Materials for dewatering basins should meet the following requirements:

- *Riprap*: Riprap should be washed and have a diameter ranging from 4 to 6 inches (10 to 15 centimeters).
- *Filter Cloth*: Filter cloth should be a woven or non-woven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric should be inert to commonly encountered chemicals, hydro-carbons, ultraviolet light, and mildew and should be rot resistant.
- *Straw Bales/Silt Fence*: Straw bales should meet the criteria as specified in the *1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control*.

Installation Guidelines

Due to the danger of overtopping by events greater than the design flow, dewatering basins require a vegetative buffer strip to filter sediment-laden overflow. A 50-foot (15-meter) minimum grass-covered buffer width is required for slopes less than 20 degrees (1:2.7) when right-of-way is not limited. For slopes greater than 20 degrees, basins should have a 100-foot (30-meter) minimum buffer width when practical.

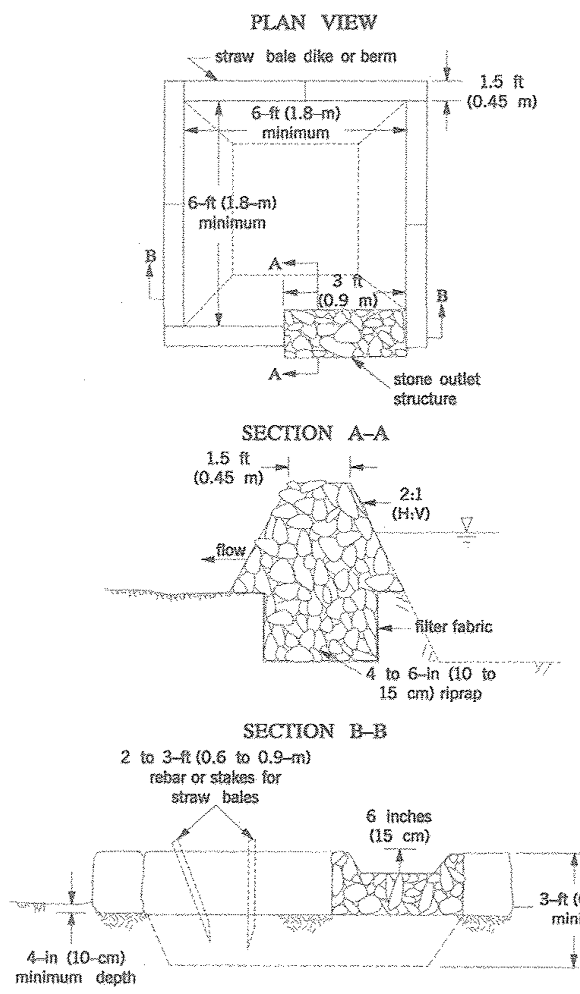
All erosion and sediment control devices should be installed as the first order of business according to a plan approved by the Water Management Administration (WMA) or local authority. Dewatering basins should be constructed as follows (refer to Detail 1.1):

1. Excavated subsoil and topsoil should be stored separately and replaced in their natural order. Additionally, the excavated sediments should be prevented from entering the waterway by using sediment perimeter controls or other measures.
2. The dewatering basin should have a minimum depth of 3 feet (1 meter) where basin depth is measured from the top of the straw bales to the bottom of the excavation.
3. Once the dewatering basin becomes filled to one-half of the excavated depth, accumulated sediment should be removed and disposed of in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
4. Sediment control devices should remain in place until all disturbed areas are stabilized and the inspecting authority approves their removal. All disturbed ground contours should be returned to their original condition unless otherwise approved by the WMA or local authority.

Temporary Instream Construction Measures — *Maryland Department of the Environment, Waterway Construction Guidelines, Revised November 2000*

Page 1.1 - 1

Maryland's Guidelines To Waterway Construction
DETAIL 1.1: DEWATERING BASINS



TEMPORARY INSTREAM CONSTRUCTION MEASURES	REVISED NOVEMBER 2000 PAGE 1.1 - 2	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MGWC 1.4: Diversion Pipe

Temporary measure for dewatering in-channel construction sites

Description

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

Effective Uses & Limitations

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

Material Specifications

Materials for stream diversions should meet the following requirements:

- *Riprap*: Stone should be washed and have a minimum diameter of 6 inches (15 centimeters).
- *Sandbags*: Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
- *Sheeting*: Sheeting should consist of polyethylene or other material which is impervious and resistant to puncture and tearing.

Installation Guidelines

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

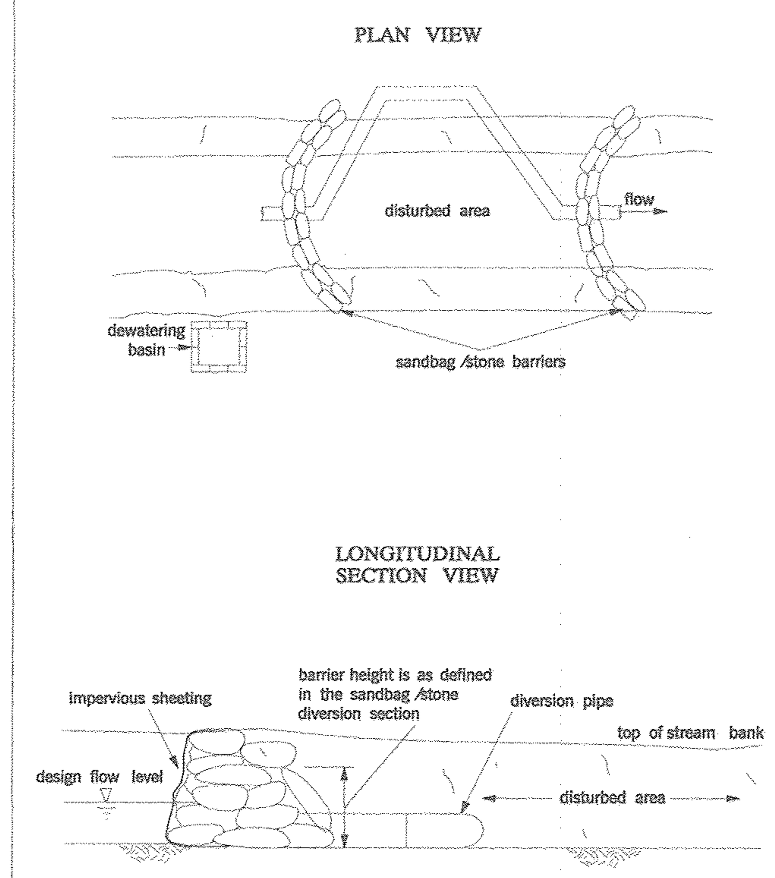
Diversion pipes with sandbag or stone barriers should be completed as follows (refer to Detail 1.4):

1. Sandbag/stone barriers should be sized and installed as detailed in MGWC 1.5: Sandbag/Stone Diversion. The materials should be sized to withstand baseflow velocities.
2. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
3. Sediment-laden water from the construction area should be pumped to a dewatering basin.
4. The diversion pipe should have a minimum capacity sufficient to convey the 2-year flow for projects with a duration of two weeks or greater. For projects of shorter duration, the capacity of the pipe can be reduced accordingly.
5. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.
6. Sediment control devices are to remain in place until all disturbed areas are stabilized and the inspecting authority approves their removal.

Temporary Instream Construction Measures — *Maryland Department of the Environment, Waterway Construction Guidelines, Revised November 2000*

Page 1.4 - 1

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



TEMPORARY INSTREAM CONSTRUCTION MEASURES	REVISED NOVEMBER 2000 PAGE 1.4 - 2	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MGWC 1.5: Sandbag/Stone Channel Diversion

Temporary measure for dewatering in-channel construction sites

Description

The work should consist of installing sandbag or stone flow diversions for the purpose of erosion control when construction activities occur within the stream channel.

Effective Uses & Limitations

Diversions are used to isolate work areas from flow during the construction of in-stream projects. Diversions which have an insufficient flow capacity can fail and severely erode the disturbed channel section under construction. Therefore, in-channel construction activities should occur only during periods of low rainfall. This temporary measure may not be practical in large channels.

Material Specifications

Materials for sandbag and stone stream diversions should meet the following requirements:

- *Riprap*: Riprap should be washed and have a minimum diameter of 6 inches (0.15 meters).
- *Sandbags*: Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of the fill material (i.e., sand, fine gravel, etc.).
- *Sheeting*: Sheeting should consist of polyethylene or other materials which are impervious and resistant to puncture and tearing.

Installation Guidelines

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during periods of low flow. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Sandbag/stone diversions can be used independently or as components of other stream diversion techniques. Installation of this measure should proceed as follows (refer to Detail 1.5):

1. The diversion structure should be installed from upstream to downstream.
2. The height of the sandbag/stone diversion should be a function of the duration of the project in the stream reach. For projects with a duration less than 2 weeks, the height of the diversion should be one half the streambank height, measured from the channel bed, plus 1 foot (0.3 meters) or bankfull height, whichever is greater. For projects of longer duration, the top of the sandbag or stone diversion should correspond to bankfull height. For diversion structures utilizing sandbags, the stream bed should be hand prepared prior to placement of the base layer of sandbags in order to ensure a water tight fit. Additionally, it may be necessary to prepare the bank in a similar fashion.
3. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
4. Sediment-laden water from the construction area should be pumped to a dewatering basin.

Temporary Instream Construction Measures — *Maryland Department of the Environment, Waterway Construction Guidelines, Revised November 2000*

Page 1.5 - 1

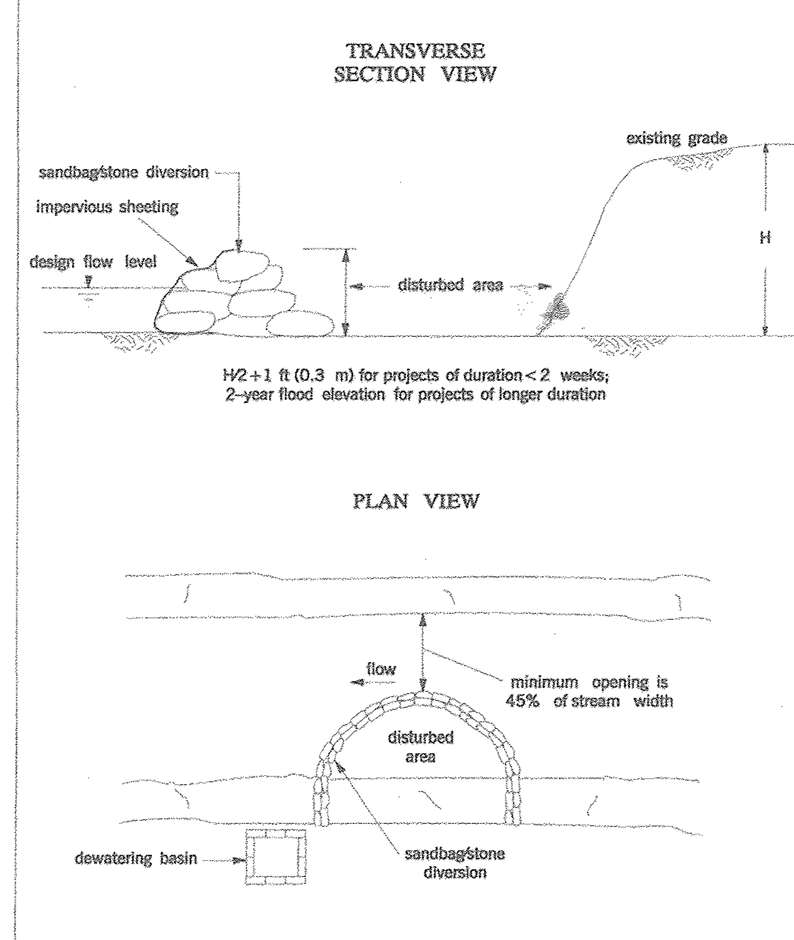
MGWC 1.5: Sandbag/Stone Channel Diversion

5. Sheeting on the diversion should be positioned such that the upstream portion covers the downstream portion with at least a 18-inch (0.45 meters) overlap.
6. Sandbag or stone diversions should not obstruct more than 45% of the stream width. Additionally, bank stabilization measures should be placed in the constricted section if accelerated erosion and bank scour are observed during the construction time or if project time is expected to last more than 2 weeks.
7. Prior to removal of these temporary structures, any accumulated sediment should be removed, deposited and stabilized in an approved area outside the 100-year floodplain unless authorized by the WMA.
8. Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

Temporary Instream Construction Measures — *Maryland Department of the Environment, Waterway Construction Guidelines, Revised November 2000*

Page 1.5 - 2

Maryland's Guidelines To Waterway Construction
DETAIL 1.5: SANDBAG/STONE DIVERSION



TEMPORARY INSTREAM CONSTRUCTION MEASURES	REVISED NOVEMBER 2000 PAGE 1.5 - 3	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Edmondson — 5.12.16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

Kent Sheubrooks — 8.9.16
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

Valdis Lazdins — 8-11-16
DIRECTOR — DATE

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE 4/28/16

BY THE ENGINEER:

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

SIGNATURE OF ENGINEER — DATE 5/2/16

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

John R Robertson — HOWARD S.C.D. — DATE 5/6/16

OWNER/DEVELOPER

BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

WATERWAY CONSTRUCTION NOTES AND DETAILS
BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
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ELLICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

STATE OF MARYLAND — ROBERT HARRIS VOGEL — NO. 16193 — REGISTERED PROFESSIONAL ENGINEER — 5/2/16

ROBERT H. VOGEL, PE No.16193

DESIGN BY:	RHV/DZE
DRAWN BY:	DZE/KG
CHECKED BY:	RHV
DATE:	APRIL 2016
SCALE:	AS SHOWN
W.O. NO.:	12-50.01

PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2016

SDP-15-071

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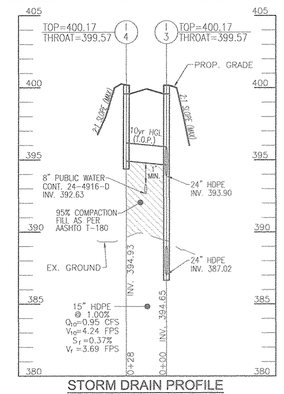
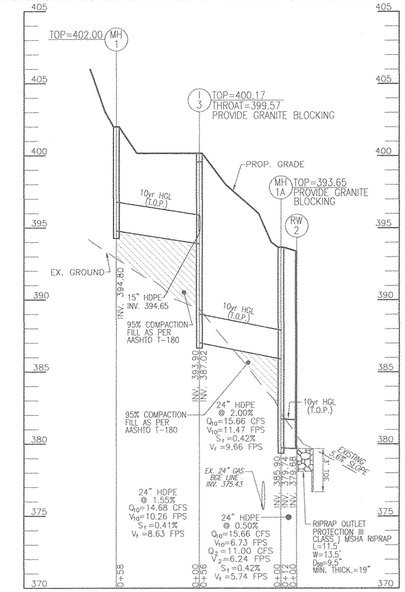
PLAN VIEW
SCALE: 1"=50'

LEGEND:

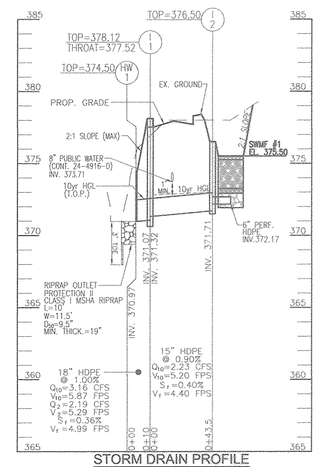
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- 398 EXISTING 2' CONTOUR
- 400 EXISTING 10' CONTOUR
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- SMH EXISTING SANITARY MANHOLE
- SS EXISTING SANITARY LINE
- CO EXISTING CLEANOUT
- FH EXISTING FIRE HYDRANT
- W EXISTING WATER LINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING LIMIT OF WETLANDS
- EXISTING WETLANDS
- LIMITS OF FLOODPLAIN
- PROPOSED PUBLIC WATER AND UTILITY EASEMENT
- PROPOSED STORMDRAIN
- PROPOSED STORMDRAIN INLET
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED SIDEWALK
- 330 PROPOSED 10' CONTOUR
- 328 PROPOSED 2' CONTOUR
- MODERATE SLOPES (15% - 24.99%)
- STEEP SLOPE (>25%)
- BaA (D) / GgC (B) SOILS BOUNDARY
- STREET TREES
- MICRO-BIORETENTION (M-6)
- PROP. 100 YEAR FLOODPLAIN EASEMENT
- EX. DFIRM 100 YR FLOODPLAIN EASEMENT
- DRAINAGE DIVIDE



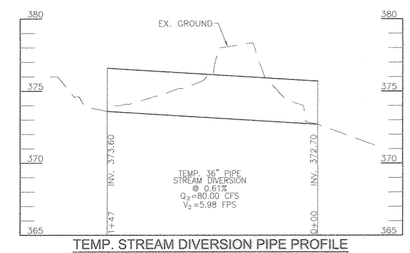
STORM DRAIN PROFILE
SCALE : HORIZONTAL - 1"=50'
VERTICAL - 1"=5'



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



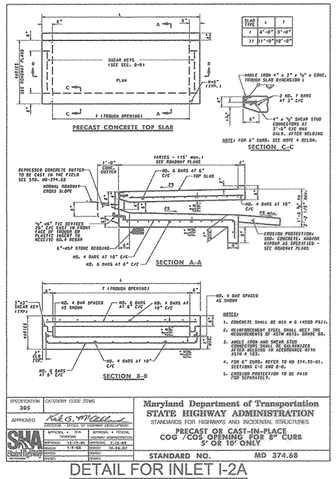
STORM DRAIN PROFILE
SCALE : HORIZONTAL - 1"=50'
VERTICAL - 1"=5'



TEMP. STREAM DIVERSION PIPE PROFILE
SCALE : HORIZONTAL - 1"=50'
VERTICAL - 1"=5'

TEMP. STREAM DIVERSION NOTES:

1. TEMPORARY STREAM DIVERSION TO BE CONSTRUCTED DURING A 5-DAY CLEAR (NO-PRECIPITATION) PERIOD AND IN ACCORDANCE WITH DATES STIPULATED BY THE MDE PERMIT.
2. CONTRACTOR SHOULD ONLY BEING TEMPORARY AND FINAL STREAM DIVERSION WORK IN AN AREA WHICH CAN BE COMPLETED BY THE END OF THE EACH DAY, INCLUDING GRADING ADJACENT TO THE CHANNEL.
3. AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED FROM THE CHANNEL.
4. WORK SHOULD NOT BE CONDUCTED IN THE CHANNEL DURING RAIN EVENTS.
5. WORK WILL BE PERMITTED IN THE STREAM ONLY DURING THOSE TIMES DICTATED BY THE MDE PERMIT.



DETAIL FOR INLET I-2A

OWNER/DEVELOPER

BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

STORM DRAIN DRAINAGE AREA MAP AND PROFILES

BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
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STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER
5/2/16
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV/DZE
DRAWN BY: DZE/KG
CHECKED BY: RHV
DATE: APRIL 2016
SCALE: AS SHOWN
W.O. NO.: 12-50.01

PROFESSIONAL CERTIFICATE

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SDP-15-071

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 5-12-16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 5-9-16
DIRECTOR	DATE 5-11-16

PIPE SCHEDULE

SIZE	TYPE	LENGTH
15"	HDPE (SD)	72
18"	HDPE (SD)	10
24"	HDPE (SD)	143
6"	PERF. HDPE (SWM)	74

STORM DRAIN STRUCTURE SCHEDULE

NO.	TYPE	LOCATION NORTHING	LOCATION EASTING	THROAT	TOP	INV. IN	INV. OUT	COMMENTS
I-1	TYPE A-5 INLET	540510.86	1341080.96	377.52	378.12	374.30	371.07	HO. CO. STD D-4.01
I-2	YARD INLET	540511.94	1341039.26		376.50	6" 372.17	15" 371.71	HO. CO. STD D-4.14
I-2A	PRECAST COS OPENING INLET (5' WIDE x 5.67' DEEP)	540524.71	1341061.36	377.52	378.12			SHA MD 374.68
I-3	TYPE A-5 INLET	540212.33	1341086.71	399.57	400.17	15" 394.65 24" 393.90	387.02	HO. CO. STD D-4.01
I-4	TYPE A-5 INLET	540203.44	1341064.39	399.57	400.17		394.93	HO. CO. STD D-4.01
MH-1	STANDARD 4' PRECAST MANHOLE	540173.35	1341130.28		402.00		394.80	HO. CO. STD. G-5.12
MH-1A	STANDARD 4' PRECAST MANHOLE	540269.02	1341084.77		393.65	385.90	379.74	HO. CO. STD. G-5.13
ES-1	CONCRETE HEADWALL	540663.70	1341200.44		374.47	373.60		HO. CO. STD. D-5.51
ES-2	CONCRETE HEADWALL	540532.96	1341023.51		383.18	375.00		HO. CO. STD. D-5.51
HW-1	TYPE 'A' HEADWALL	540503.57	1341091.15		374.47	370.97		HO. CO. STD. D-5.11

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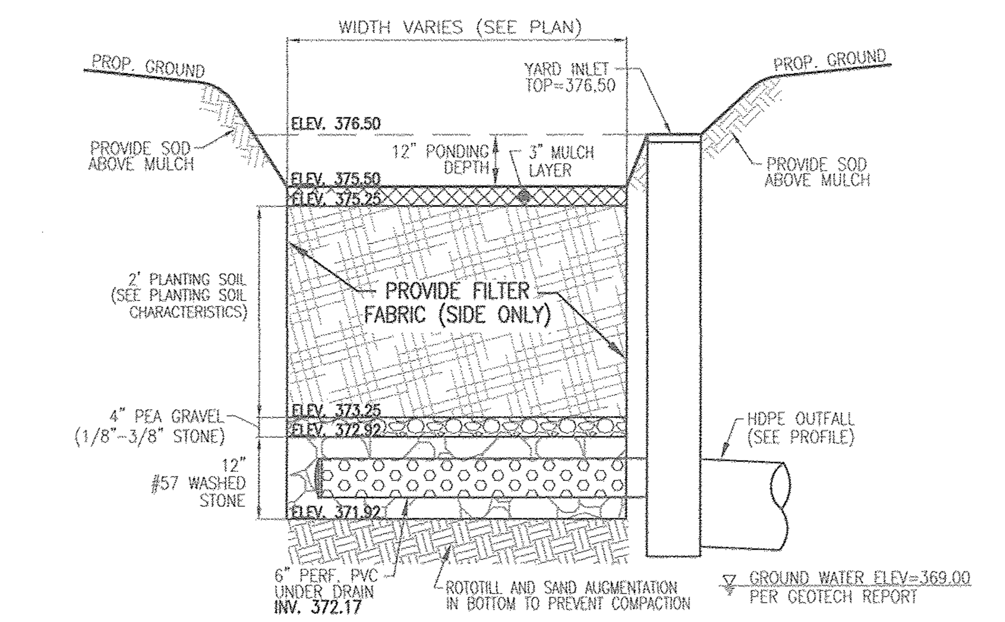
PLAN VIEW
SCALE: 1"=50'

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- EXISTING CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING LIMIT OF WETLANDS
- EXISTING WETLANDS
- LIMITS OF FLOODPLAIN
- PROPOSED PUBLIC WATER AND UTILITY EASEMENT
- PROPOSED STORMDRAIN
- PROPOSED STORMDRAIN INLET
- PROPOSED TREELINE
- PROPOSED CURB
- PROPOSED SIDEWALK
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- MODERATE SLOPES (15% – 24.99%)
- STEEP SLOPE (>25%)
- BaA (D) / GgC (B) SOILS BOUNDARY
- STREET TREES
- MICRO-BIORETENTION (M-6)
- PROP. 100 YEAR FLOODPLAIN EASEMENT
- EX. DFIRM 100 YR FLOODPLAIN EASEMENT
- DRAINAGE DIVIDE



MICRO-BIORETENTION
NOT TO SCALE

MICROBIORETENTION NOTES:
1. ONLY THE SIDES OF MICROBIORETENTION ARE TO ~~BE WRAPPED IN~~ HAVE FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETNTION WILL CAUSE THE MBR TO FAIL, AND THERFORE SHALL NOT BE INSTALLED.
2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH.

Pe= 1.27
ESDv=(PexRvxA)/12
Rv=0.05+0.009xI
V min=1.0" rainfall (1.0xRvxA)/12
Vmax= 1yr rainfall=2.6" (2.6xRvxA)/12

DA	% IMPERV	Rv	DA	ESDv REQ	MINIMUM VOLUME	MAXIMUM VOLUME	VOLUME PROVIDED *	FACILITY TYPE	SURFACE AREA	STORAGE DEPTH (FT)
1	62	0.61	0.27	770	606	1576	1316	MICRO-BIORETENTION	1316	1.0

TOTAL ESDv BY SUBAREA: 770 1,316

DRAINAGE AREA #	AREA TREATED (SF)	FACILITY NUMBER	ENVIRONMENTAL SITE DESIGN PRACTICE: PERMEABLE PAVEMENT (A-2)	ADD UNDER PERM. PAVE (A-2)	LANDSCAPE INFILTRATION (M-3)	PERVIOUS SIDEWALK (A-2)	BIO SWALE (M-8)	GRAVEL TRENCH (M-5)	MICRO BIO RETENTION (M-6)	ESDv VOLUME PROVIDED
1	11903	SWM#1	0	0	0	0	0	0	1316	1316
		SUBTOTAL 1	0	0	0	0	0	0	1316	1316

TOTAL AREA 11903 SF
0.27 AC

TOTAL ESDv PROVIDED: 1316

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

Table B.4.1 Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration-

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

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION. RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

1. MATERIAL SPECIFICATIONS

THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL

THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.
THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:
* SOIL COMPONENT – LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION).
* ORGANIC CONTEN – MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
* CLAY CONTENT – MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
* PH RANGE – SHOULD BE BETWEEN 5.5 – 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE

THERE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

3. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.
COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.
ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.
WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.
WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

4. PLANT MATERIAL

RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.

5. PLANT INSTALLATION

COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.
GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.
THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS

UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
* PIPE – SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTMF 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).
* PERFORATIONS – IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4x4) GALVANIZED HARDWARE CLOTH.
* GRAVEL – THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
* THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
* A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,0000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
* A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS

THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

OPERATION AND MAINTENANCE SCHEDULE FOR LANSCAPE INFILTRATION (M-3), MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIORETENTION SWALE (M-8), AND ENHANCED FILTERS (M-9)

1. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULTCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL, PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.

2. THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

3. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.

4. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

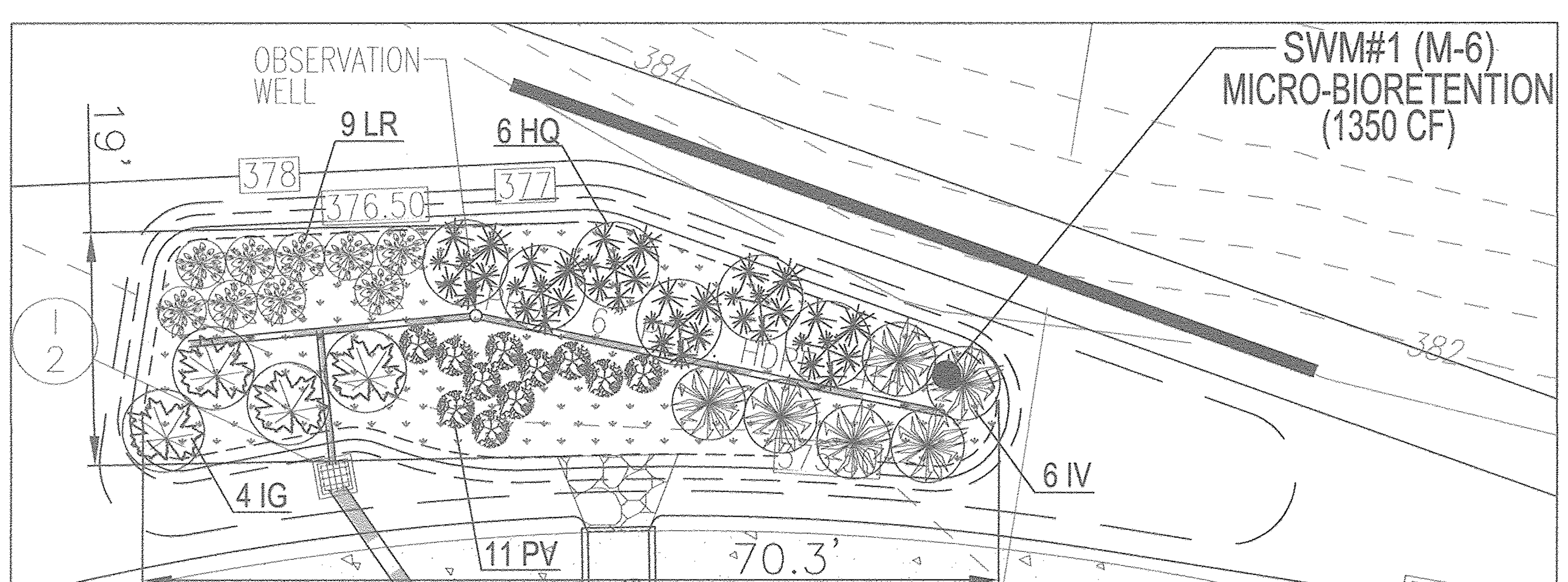
5. SHOULD SYSTEM FAIL, AND UPON DETERMINING FAILURE OF SYSTEM IS DUE TO PLANTING MEDIA, ALL PLANT MATERIAL WITHIN THE UNIT, INCLUDING TREES, SHALL BE REMOVED AND REPLACED.

BIORETENTION PLANTING SCHEDULE (SHRUB/ORNIMENTAL GRASSES)

LEGEND/KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
IG	4	ILEX GLABRA 'SHAMROCK' INKBERRY HOLLEY	1 GALLON	18" O.C.
IV	6	ITEA VIRGINICA 'HENRY'S GARNETT' VIRGINIA SWEETSPIRE	1 GALLON	18" O.C.
HQ	6	HYDRANGEA QUERCIFOLIA OAKLEAF HYDRANGEA	1 GALLON	30" O.C.
LR	9	LEUCOTHEO RACEMOSA FETTERBUSH	1 GAL.	30" O.C.
PV	11	PANICUM VIRGATUM SWITCHGRASS	1 GAL.	36" O.C.

PERENNIALS/GROUNDCOVER PLANTING SCHEDULE

LEGEND	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
	37	BAPTISIA AUSTRALIS FALSE INDIGO	4" POT	12"–15" O.C. FOR SIDES AND BOTTOM OF MBR. MIX ALL VARIETIES IN A NATURALIZED RANDOM PATTERN THROUGHOUT. PLANT IN GROUPS OF NO LESS THAN 9 PLANTS PER CLUMP
	37	ACORUS GRAMINEUS 'OGON' GOLDEN VARIEGATED SWEET FLAG	1 QT.	



BIORETENTION PLANTING PLAN (SWM #1)
SCALE: 1"= 10'

MICRO-BIORETENTION PLANTING REQUIREMENTS: MBR #	LF	AREA	STEMS REQUIRED (0.0229)	STEMS PROVIDED	PLANTINGS PROVIDED: IG	IV	HQ	LR	PV	PERRENIALS/GROUND COVER PROVIDED: BA	AG	TOTAL
1	161.92	1080.15	25	36	4	6	6	9	11	37	37	74
TOTALS :	162	1080	25	36	4	6	6	9	11	37	37	74

BIORETENTION AREAS ARE TO BE PLANTED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (0.0229 STEMS PER SQUARE FOOT).

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5.12.16
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5.9.16
DIRECTOR — DATE 8-11-16

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

STORMWATER MANAGEMENT DRAINAGE AREA MAP, NOTES AND DETAILS

BUCH ROAD EXTENSION
10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELLICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER — 8/2/16
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV/DZE
DRAWN BY: DZE/KG
CHECKED BY: RHV
DATE: APRIL 2016
SCALE: AS SHOWN
W.O. NO.: 12-50.01

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2016

SDP-15-071

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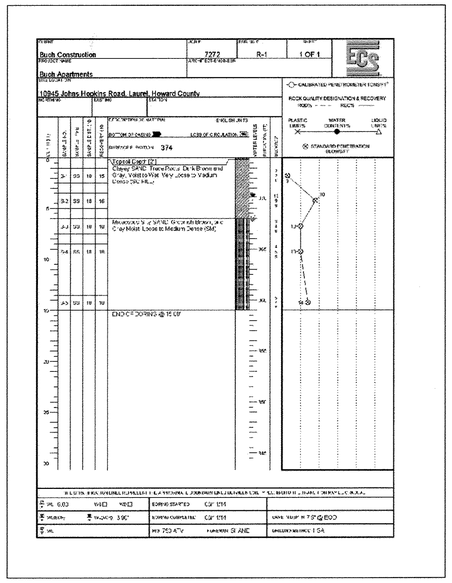
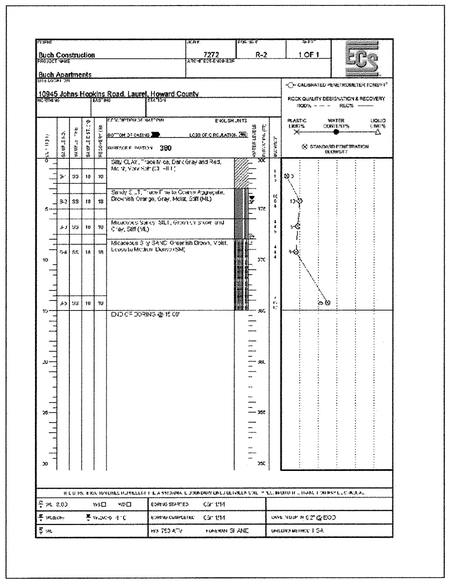
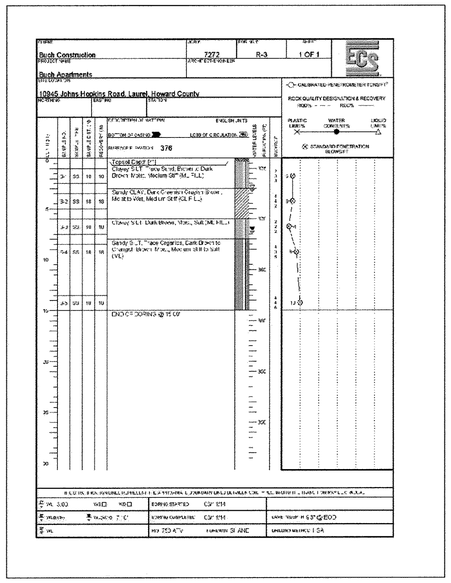






GENERAL NOTES:

SPECIFICATIONS: SHA SPECIFICATIONS DATED JULY, 2008 REVISIONS THEREOF AND ADDITIONS THERETO AND SPECIAL PROVISIONS FOR MATERIALS & CONSTRUCTION

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS DATED 2010 AND ALL INTERIMS.

CONCRETE: LOAD AND RESISTANCE FACTOR DESIGN METHOD fc = 4500 PSI.

REINFORCING STEEL DESIGN: fY = 60,000 PSI

LOADING: HS-25

CONCRETE: CULVERT ENDS FOOTINGS, WING WALLS AND HEAD WALLS SHALL BE CAST-IN-PLACE. ALL CONCRETE SHALL BE MIX 6 (4500 PSI).

REINFORCING STEEL: REINFORCING STEEL SHALL CONFORM TO ASTM A 615 GRADE 60.

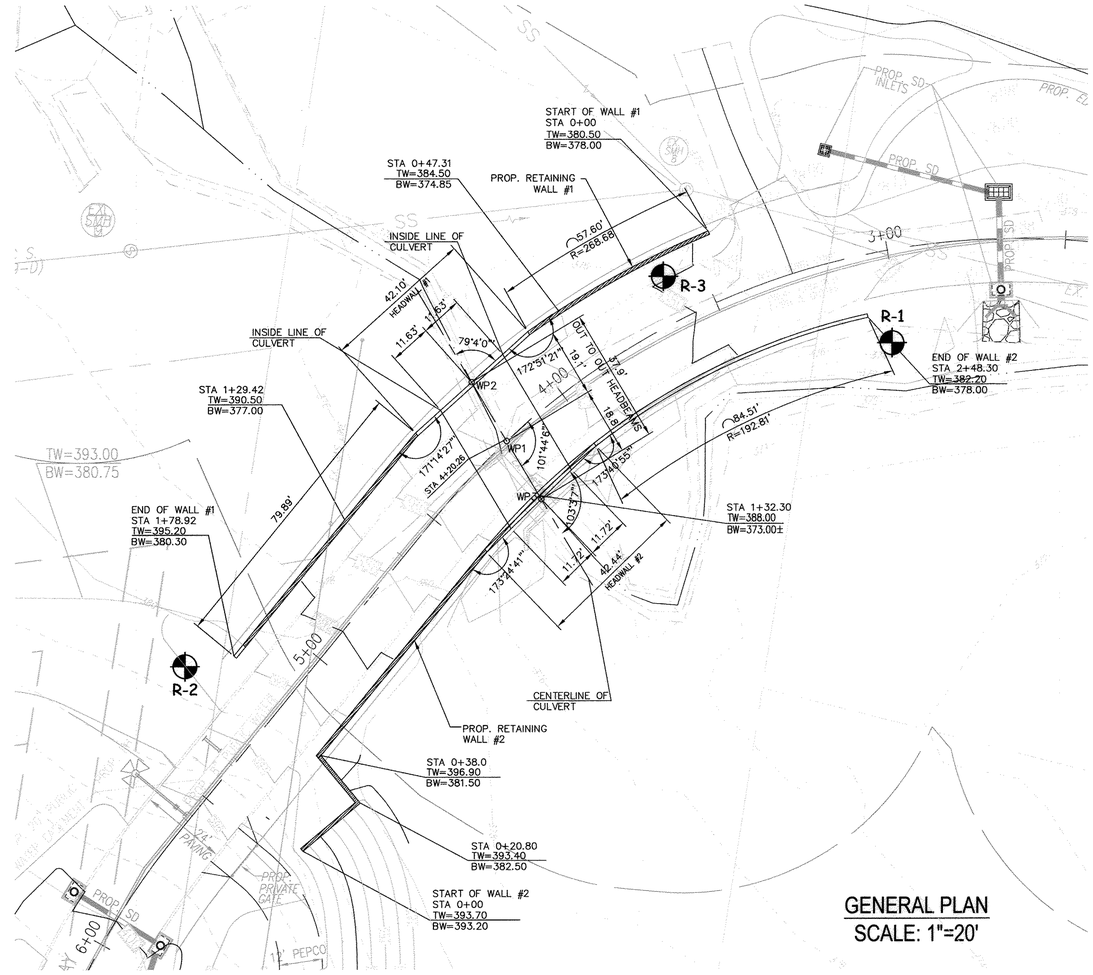
ONLY GRADE 60 CAN BE USED ON THIS PROJECT.

ALL SPLICES, NOT SHOWN, SHALL BE LAPPED AS PER BAR LAP CHARTS. MINIMUM COVER FOR ANY BAR SHALL BE 2" UNLESS OTHERWISE NOTED, WITH THE EXCEPTION OF BARS AT THE BOTTOM AND SIDES OF ALL FOOTINGS WHICH SHALL HAVE 3" MINIMUM COVER UNLESS OTHERWISE NOTED.

KEYS: ALL KEYS ARE NOMINAL SIZE.

RESTRICTIONS FOR PLACING EQUIPMENT ON EXISTING OR NEW STRUCTURE OR STORING MATERIALS ON/ OR AGAINST STRUCTURES: THERE ARE RESTRICTIONS ON PLACING EQUIPMENT ON EXISTING AND NEW STRUCTURES AND STORING MATERIALS ON/OR AGAINST EXISTING AND NEW STRUCTURE(S) ELEMENTS. THE LIMITATIONS BASICALLY RELATE TO LOADS THAT ARE BEYOND MARYLAND'S LEGAL VEHICLES AND/OR POSTED LOAD LIMITS (WHERE APPLICABLE) AND MATERIALS STOCKPILED ON/OR AGAINST STRUCTURES OR STRUCTURAL ELEMENTS. FOR DETAILS OF SUCH RESTRUCTIONS SEE SECTION TC 6.14 TITLED "RESTRICTIONS FOR PLACING AND USING EQUIPMENT ON STRUCTURES, OR STORING MATERIALS ON/OR AGAINST STRUCTURES" IN THE CONTRACT DOCUMENTS. IN ORDER TO COMPLY WITH THIS ARTICLE, THE CONTRACTOR SHALL READ SECTION TC 6.14 PRIOR TO COMMENCING ANY WORK ON STRUCTURES IN THIS CONTRACT.

COVER FOR CULVERT: NO HEAVY CONSTRUCTION EQUIPMENT SHALL BE PERMITTED TO PASS OVER THE CULVERT UNTIL A MINIMUM OF 3 FT OF COMPACTED FILL HAS BEEN PLACED OVER THE CULVERT.



GENERAL PLAN
SCALE: 1"=20'

NOTES:
TW: TOP OF WALL/PARAPET (PARAPET IS 42 INCHES HIGH)
BW: LOW SIDE FINISHED GRADE

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

ARCH CULVERT GENERAL PLAN

BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)
TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT
PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

1340 CHARWOOD ROAD
SUITE A
HANOVER, MARYLAND 21076
PHONE: (410) 859 - 4300
FAX: (410) 859 - 4324

STATE OF MARYLAND — HASAN M. ABOUMATAR — No. 29553 — PROFESSIONAL ENGINEER
HASAN M. ABOUMATAR, P.E.

DESIGN BY: DMA/HMA
DRAWN BY: DMA/HMA
CHECKED BY: HMA
DATE: APR 2016
SCALE: AS SHOWN
W.O. NO.: 7272-B

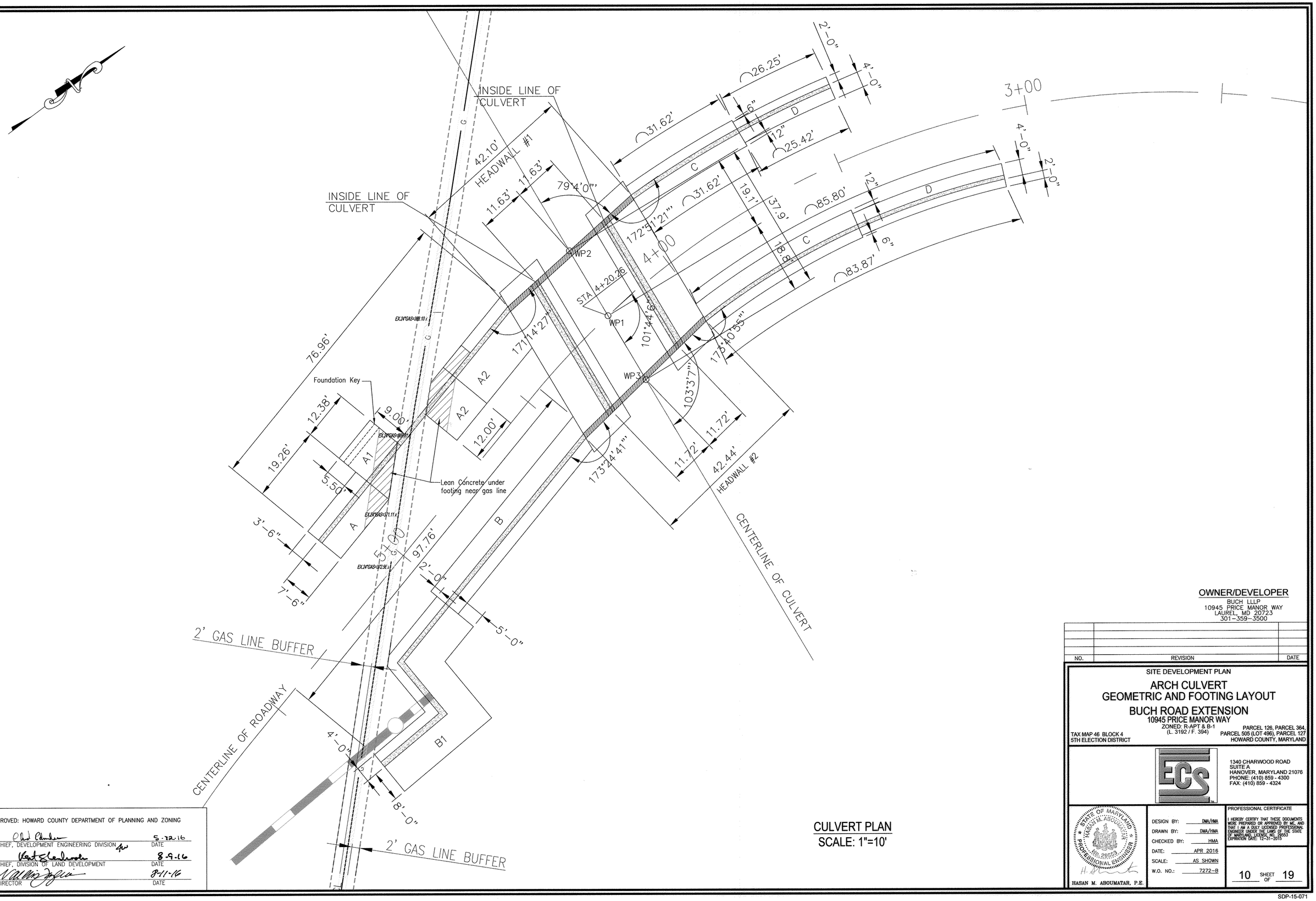
PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 29553 EXPIRATION DATE: 12-31-2015

SHEET 9 OF 19

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Edmondson CHIEF, DEVELOPMENT ENGINEERING DIVISION	5-12-16 DATE
Kent Sheubrooks CHIEF, DIVISION OF LAND DEVELOPMENT	8-9-16 DATE
Valdis Lazdins DIRECTOR	8-11-16 DATE

SDP-15-071



CULVERT PLAN
SCALE: 1"=10'

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

ARCH CULVERT GEOMETRIC AND FOOTING LAYOUT

BUCH ROAD EXTENSION

10945 PRICE MANOR WAY

ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

ECS
1340 CHARWOOD ROAD
SUITE A
HANOVER, MARYLAND 21076
PHONE: (410) 859 - 4300
FAX: (410) 859 - 4324

STATE OF MARYLAND
HASAN M. ABOUMATAR
No. 28559
PROFESSIONAL ENGINEER

HASAN M. ABOUMATAR, P.E.

DESIGN BY:	DMA/HMA
DRAWN BY:	DMA/HMA
CHECKED BY:	HMA
DATE:	APR 2016
SCALE:	AS SHOWN
W.O. NO.:	7272-B

PROFESSIONAL CERTIFICATE

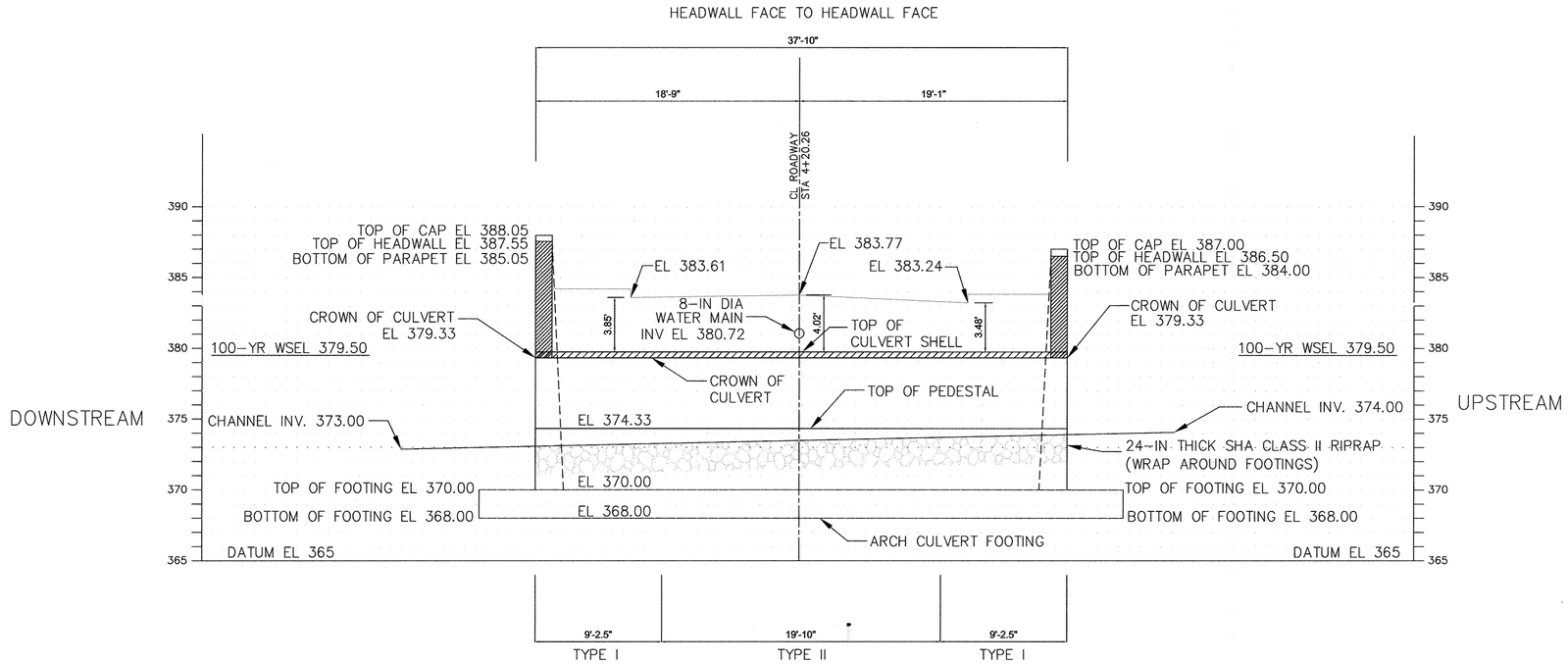
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 28559
EXPIRATION DATE: 12-31-2015

SHEET 10 OF 19

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 5-23-16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 8-9-16
DIRECTOR	DATE 8-11-16

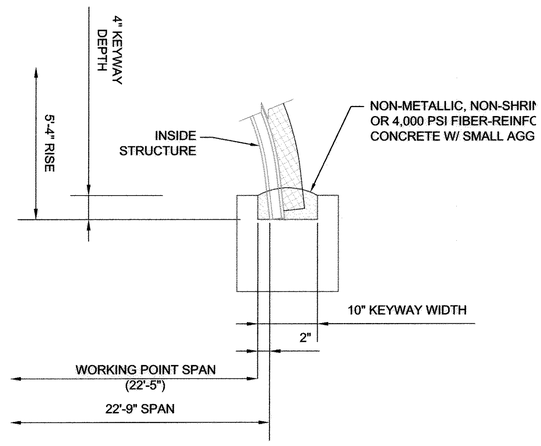
SDP-15-071



CULVERT LONGITUDINAL SECTION AT CENTERLINE

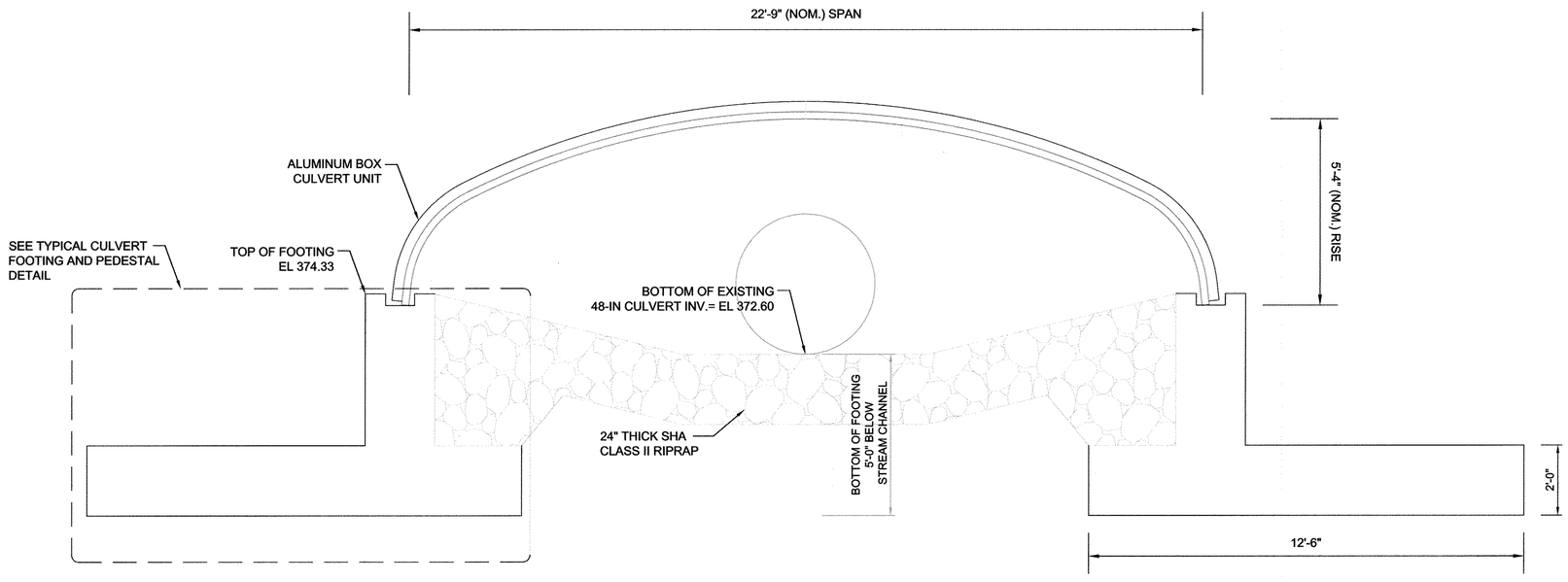
SCALE: 1"=5'

NOTE: I&II INDICATES CULVERT FOOTING AND PEDESTAL DETAIL TYPE



TYPICAL CULVERT UNIT GROUT DETAIL

NOT TO SCALE



CULVERT SECTION @ CENTERLINE OF ROADWAY

SCALE: 1/2" = 1'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 5-12-16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 8-9-16
DIRECTOR	DATE 8-11-16

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

ARCH CULVERT CULVERT PROFILE

BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364,
PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

ECS
1340 CHARWOOD ROAD
SUITE A
HANOVER, MARYLAND 21076
PHONE: (410) 859 - 4300
FAX: (410) 859 - 4324

STATE OF MARYLAND
HASAN M. ABOUMATAR
No. 29553
PROFESSIONAL ENGINEER

HASAN M. ABOUMATAR, P.E.

DESIGN BY:	DMA/HMA
DRAWN BY:	DMA/HMA
CHECKED BY:	HMA
DATE:	APR 2016
SCALE:	AS SHOWN
W.O. NO.:	7272-B

PROFESSIONAL CERTIFICATE

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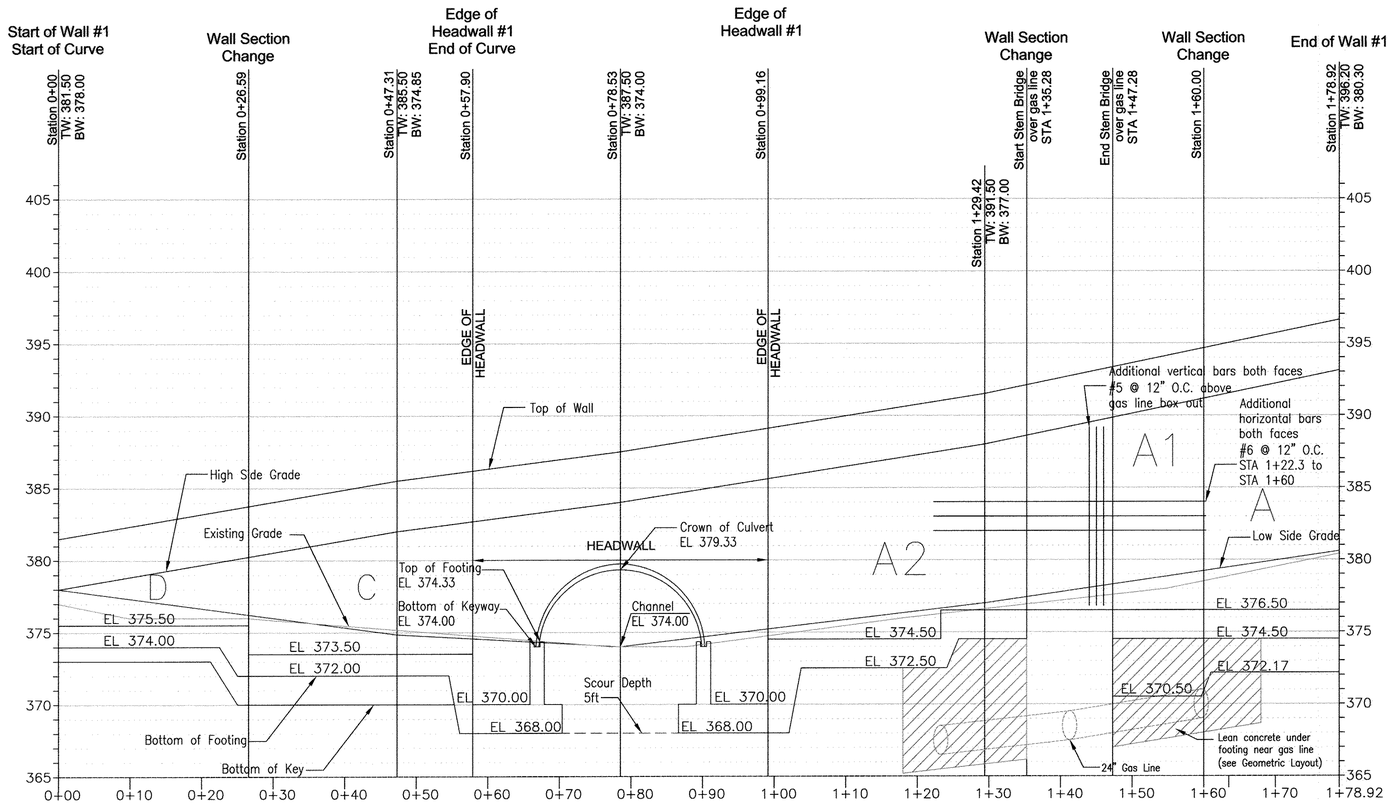
EXPIRATION DATE: 12-31-2015

SDP-15-071



HEADWALL 1 PROFILE
HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=5'

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LAUREL, MD 20723
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SITE DEVELOPMENT PLAN

ARCH CULVERT
HEADWALL #1 & WINGWALLS PROFILE
BUCH ROAD EXTENSION
10945 PRICE MANOR WAY
ZONED: R-APT & B-1
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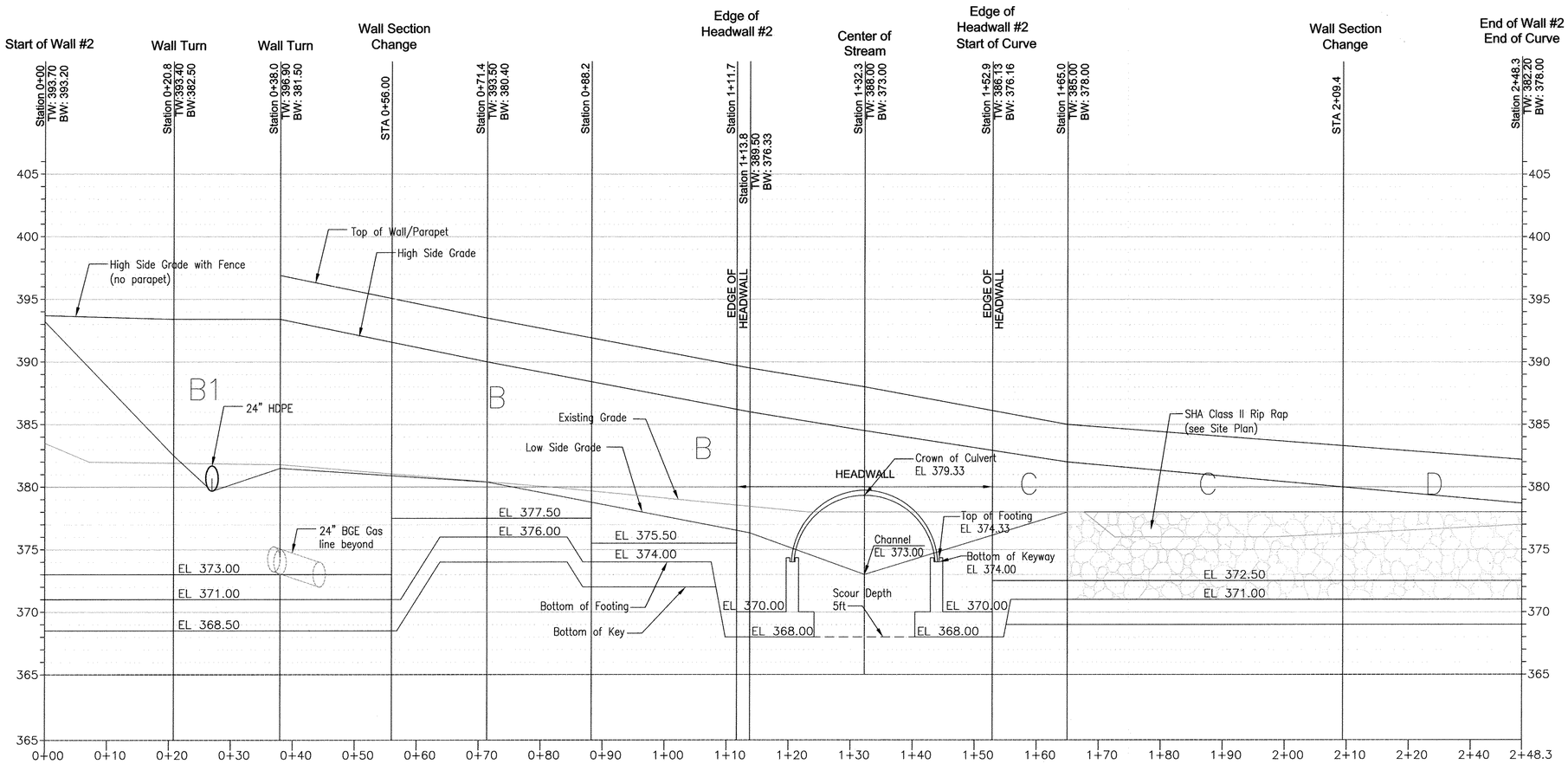
DIRECTOR	DATE 8-11-16

NOTES:
TW: TOP OF WALL/PARAPET (PARAPET IS 42 INCHES HIGH)
BW: LOW SIDE FINISHED GRADE
A, B, C OR D INDICATES WING WALL TYPE. SEE WING WALL SCHEDULE FOR DETAILS.



HEADWALL 2 PROFILE
HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=5'

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

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SITE DEVELOPMENT PLAN

ARCH CULVERT
HEADWALL #2 & WINGWALLS PROFILE
BUCH ROAD EXTENSION
10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
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SHEET 13 OF 19

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

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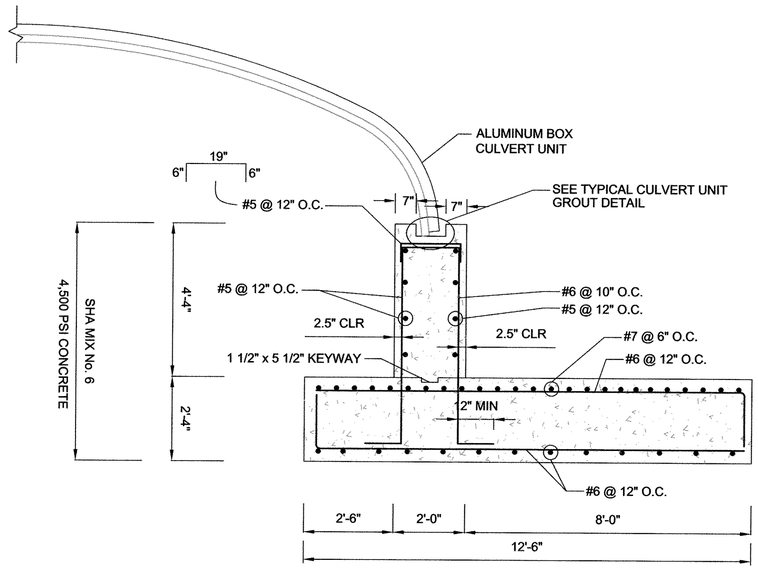
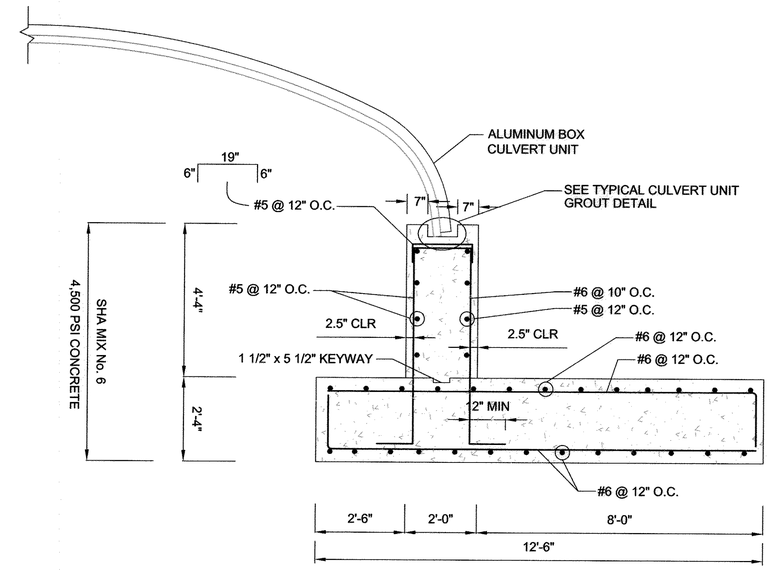
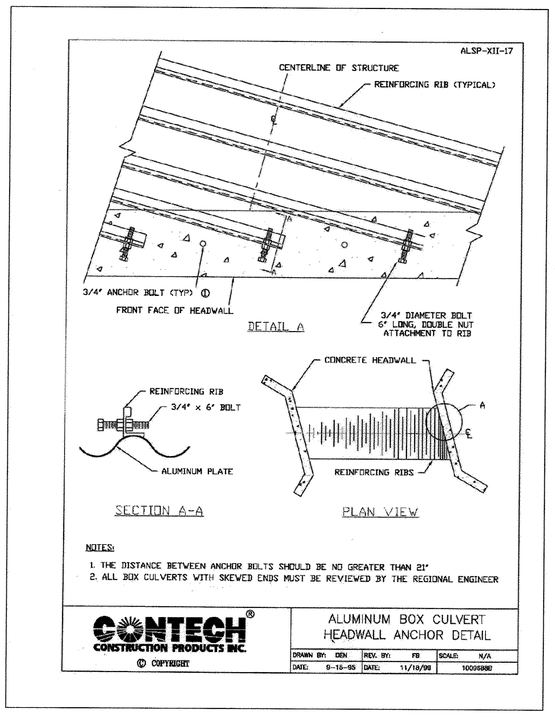
SDP-15-071



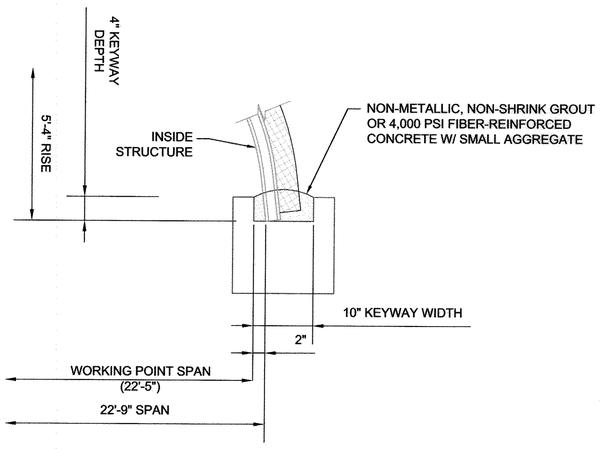
TYPE I CULVERT FOOTING AND PEDESTAL DETAIL
SCALE: 1/2" = 1'



TYPE II CULVERT FOOTING AND PEDESTAL DETAIL
SCALE: 1/2" = 1'



CULVERT HEADWALL ANCHOR DETAIL
SCALE: NTS



TYPICAL ALBC STRIP FOOTING
KEYWAY DETAIL
NOT TO SCALE

OWNER/DEVELOPER
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LAUREL, MD 20723
301-359-3500

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SITE DEVELOPMENT PLAN

ARCH CULVERT
CULVERT FOOTING DETAILS
BUCH ROAD EXTENSION

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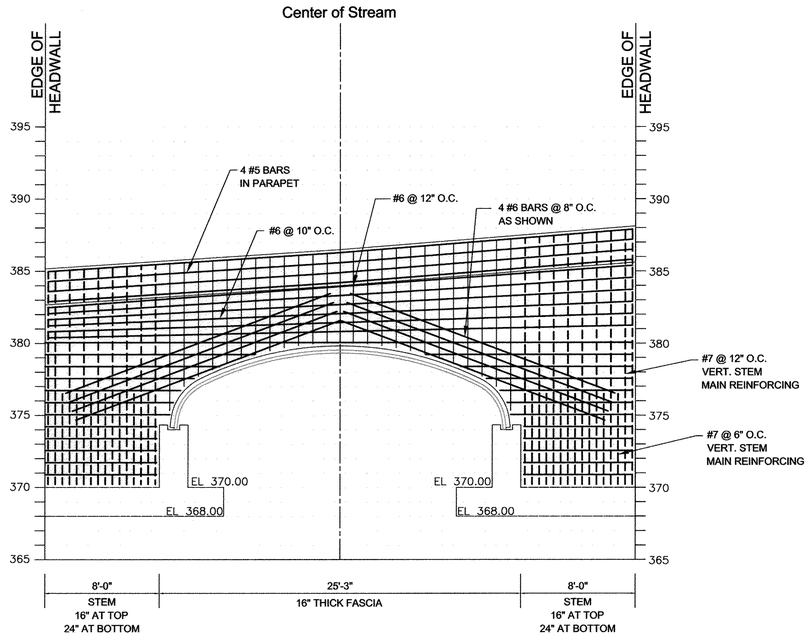
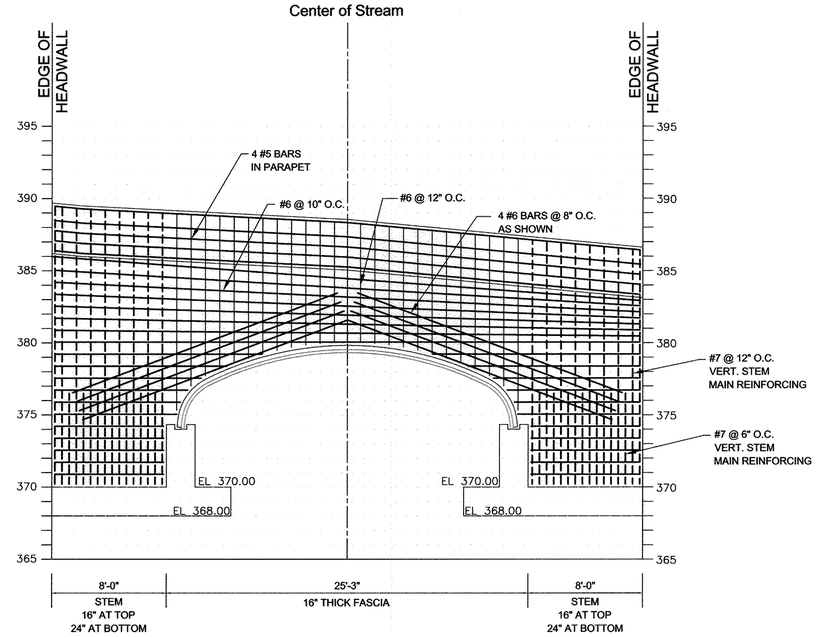
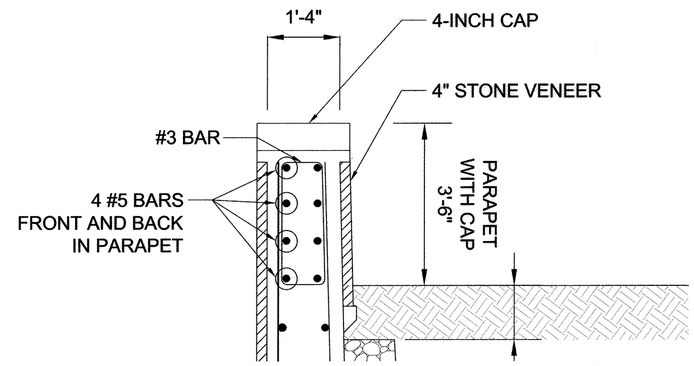


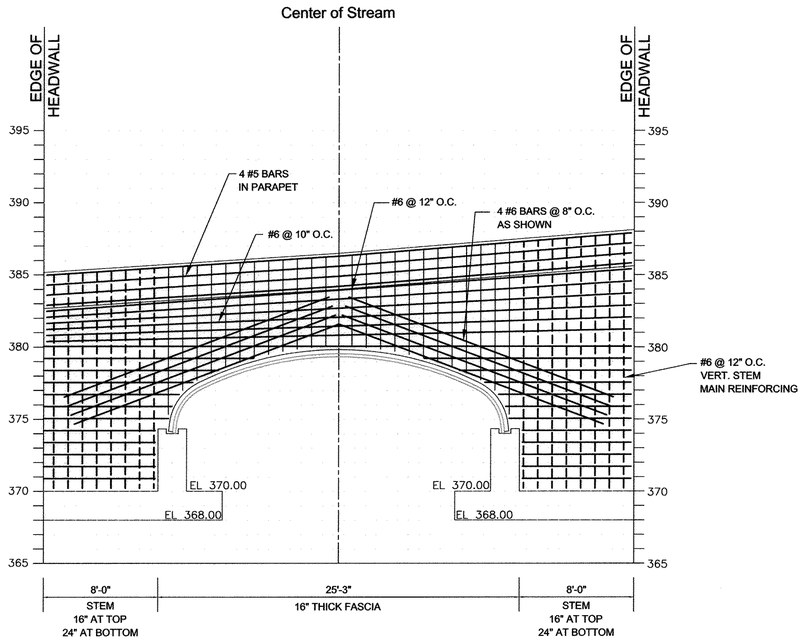
HEADWALL 1 (UPSTREAM) ELEVATION - REAR STEEL
SCALE: 1" = 5'



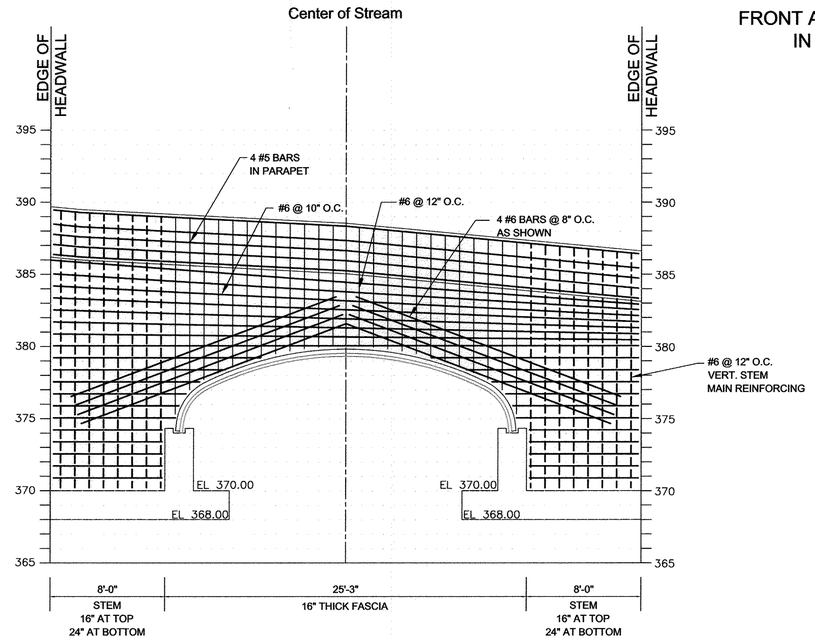
HEADWALL 2 (DOWNSTREAM) ELEVATION - REAR STEEL
SCALE: 1" = 5'



PARAPET REINFORCING DETAIL
NTS



HEADWALL 1 (UPSTREAM) ELEVATION - FRONT STEEL
SCALE: 1" = 5'



HEADWALL 2 (DOWNSTREAM) ELEVATION - FRONT STEEL
SCALE: 1" = 5'

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SITE DEVELOPMENT PLAN

ARCH CULVERT
CULVERT FOOTING DETAILS
BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)
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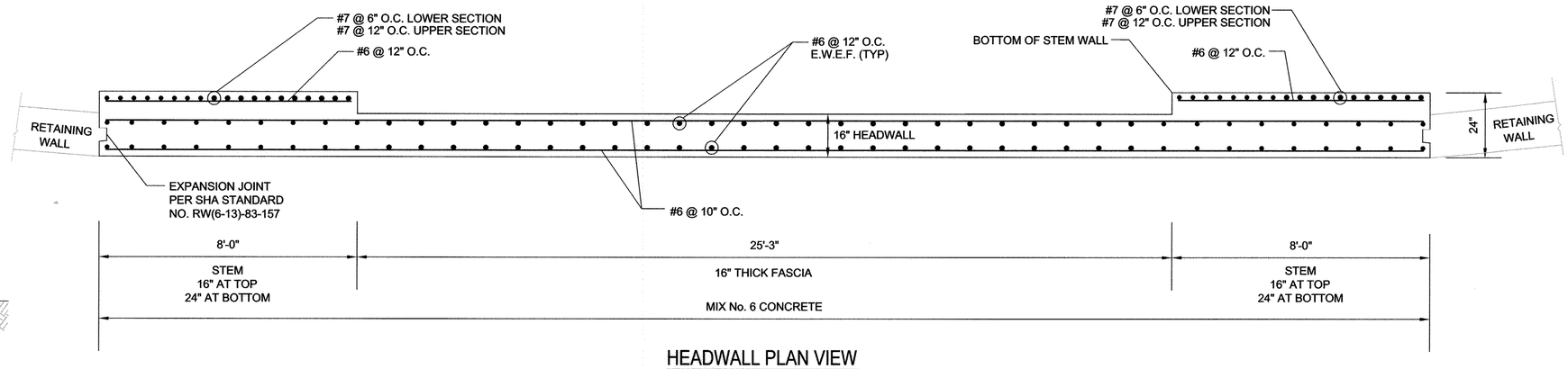
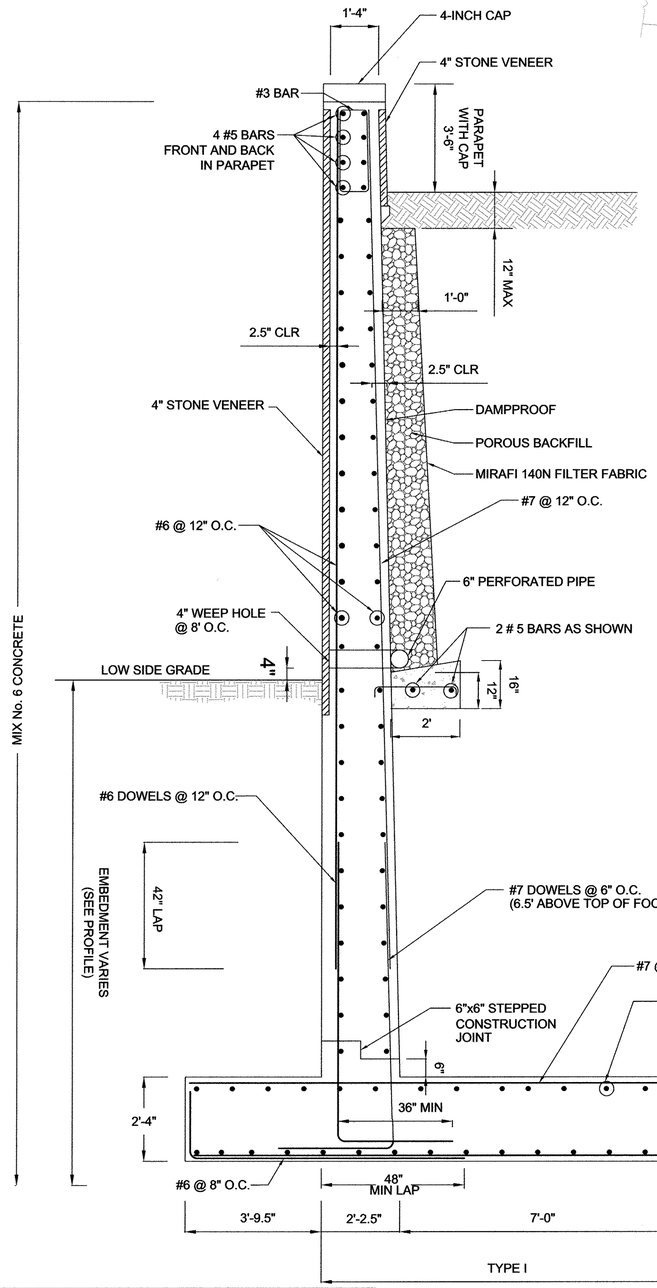
SHEET 15 OF 19

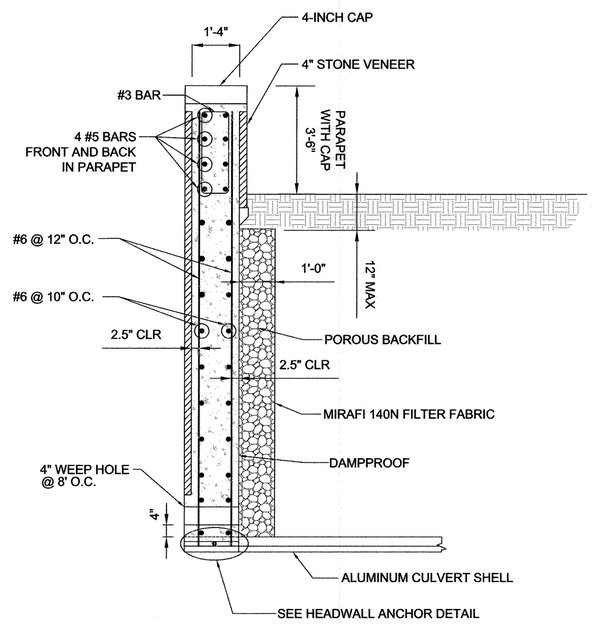
SDP-15-071



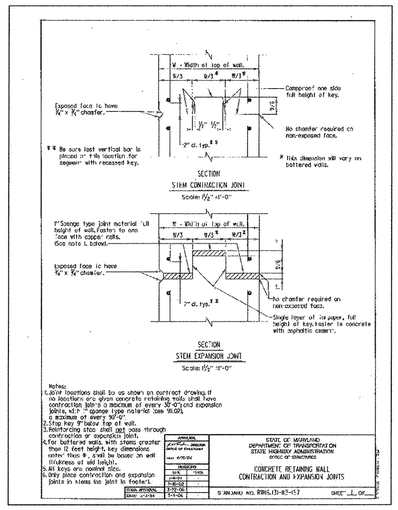
HEADWALL PLAN VIEW
SCALE: 1/2" = 1'



STEMWALL SECTION
SCALE: 1/2" = 1'



HEADWALL SECTION
SCALE: 1/2" = 1'



EXPANSION JOINT DETAIL
NTS

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

ARCH CULVERT
HEADWALL SECTIONS & DETAILS
BUCH ROAD EXTENSION
10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364,
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HOWARD COUNTY, MARYLAND

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16 SHEET OF 19

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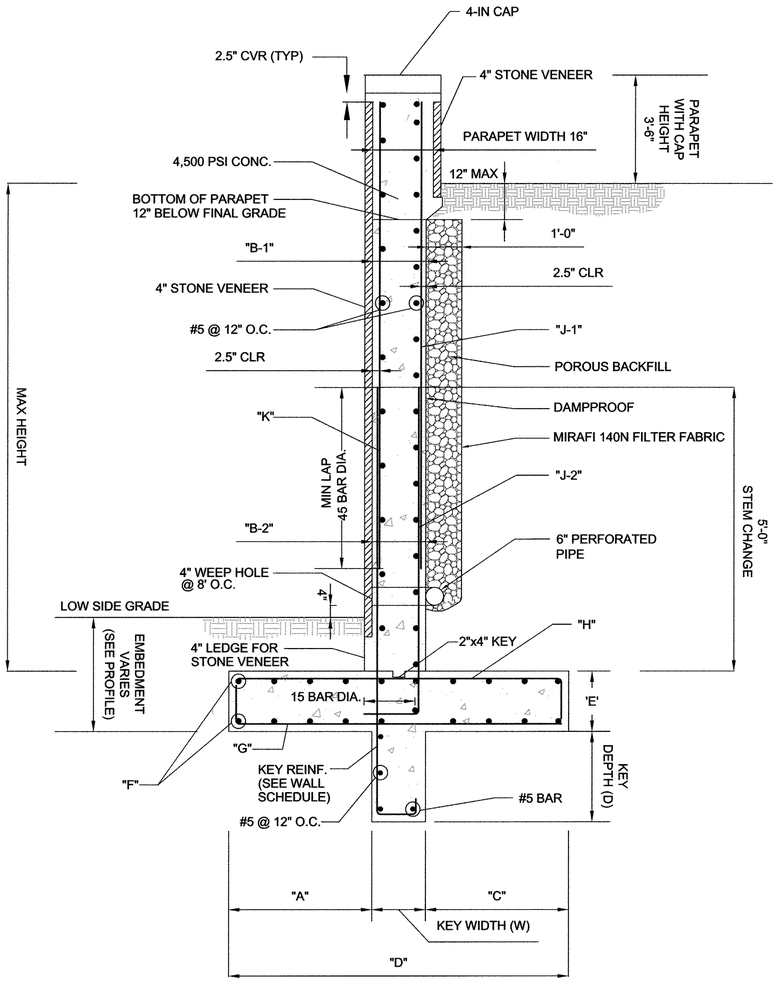
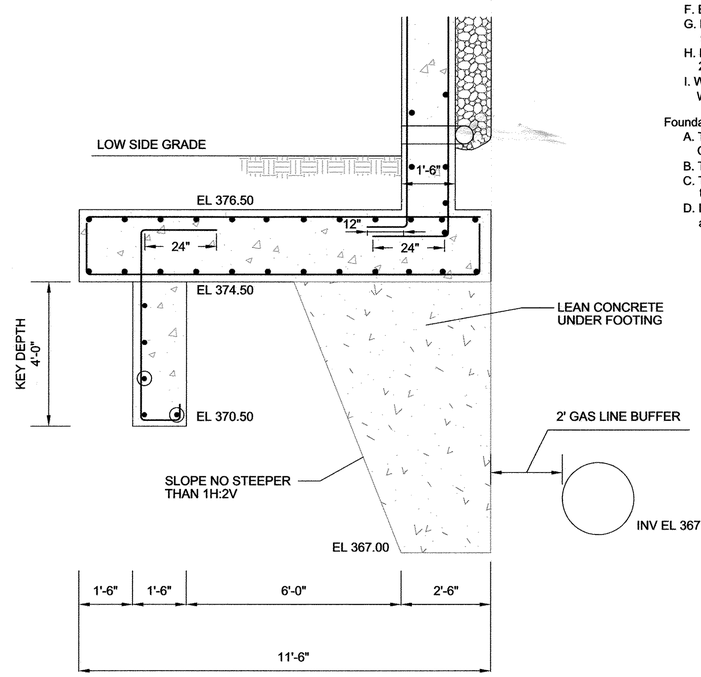
SDP-15-071



TYPICAL RETAINING WALL SECTION
SEE WING WALL SCHEDULE FOR DETAILS
NOT TO SCALE



TYPICAL RETAINING WALL SECTION A1
NOT TO SCALE

Quality Assurance

A. The Owner shall engage a qualified testing agency to provide observation and testing services as described below.

B. Concrete Placement

1. The agency shall inspect the formwork and reinforcing steel placement for compliance with the contract documents. Reinforcing steel should be inspected for correct size, quantity, and spacing.
2. Fresh concrete shall be sampled in accordance with ASTM C 172, and tested for slump, air entrainment, and temperature.
3. Test cylinders shall be molded in accordance with ASTM C 31. Four test cylinders shall be molded for each day's pour, or for every 50 cubic yards of concrete placed, whichever is greater.

C. Fill Placement

1. All soil fills shall be tested in accordance with ASTM D 2922.
2. A minimum of one compaction test per lift should be made per 2,500 square feet of fill lift area, but not fewer than two tests per lift should be made.
3. The elevations and locations of the field density tests should be clearly identified at the time of fill placement and compaction.

D. Field Verification

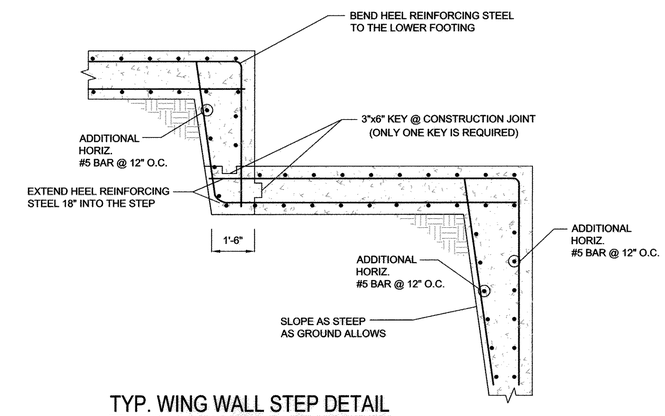
1. Wall foundations shall be excavated to the grades shown; however, no contractor or subcontractor shall rely on dimensions & grades shown on these drawings without verifying their correctness by field measure.

Soil Backfill

A. Material should consist of soil classified as SM or more granular, in accordance with ASTM D 2487.
B. Material should have no particle larger than 2.5 inches and shall contain at least 36 percent, by weight, retained on the U.S. No. 200 sieve.
C. Materials should have a Liquid Limit less than 40, and a Plasticity Index less than 10.
D. Material should have a minimum friction angle of 32 degrees.
E. The Contractor should submit samples of the proposed backfill soils to the Geotechnical Engineer of Record for approval prior to their use.
F. Backfill shall be moisture conditioned to within 2 percentage points of the optimum moisture content, as determined in accordance with ASTM D-1557.
G. Backfill shall be placed in loose lifts, not exceeding 8 inches in thickness, and then compacted to at least 95 percent of the maximum dry density, as determined in accordance with ASTM D-1557.
H. Backfilling shall not occur against the wall until the wall concrete has attained at least 75 percent of the 28-day design strength, and no earlier than 3 days after placement.
I. Where feasible, maintain equal grades on each side of the wall during backfilling to prevent overturning and lateral movements. When the grade differential at the wall exceeds 12 inches, only hand-operated compaction equipment shall be allowed.

Foundation

A. The wall foundation shall be excavated to the grades and lines as shown on the construction drawings. Contractor should take care not to disturb foundation soils beyond the lines and grades shown.
B. The foundation shall bear at the minimum embedment depths indicated, as measured from the final grade at the front of the wall.
C. The foundation subgrade soils shall be testing by a qualified representative of the Geotechnical Engineer to verify the availability of the design bearing pressure of 3,000 psf.
D. If unsuitable soils are encountered at design foundation levels, the unsuitable soils shall be removed and the over-excavated areas shall be replaced with compacted structural fill.



TYP. WING WALL STEP DETAIL
SCALE: 1/2"=1'

OWNER/DEVELOPER
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10945 PRICE MANOR WAY
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301-359-3500

WING WALL SCHEDULE

WALL TYPE	MAX. HEIGHT	WALL & FOOTING DIMENSION						FOOTING REINFORCEMENT			STEM REINFORCEMENT			KEY*	
		TOE "A"	STEM "B-1"	STEM "B-2"	HEEL "C"	WIDTH "D"	THICKNESS "E"	"F"	"G"	"H"	"J-1"	"J-2"	"K"	REINFOR.	SIZE (WXD)
A	16'-6"	3'-6"	14"	16"	6'-2"	11'-0"	1'-6"	#5@12"	#6@12"	#6@6"	#7@12"	#7@6"	#5@12"	#6@18"	16"x34"
B	13'-0"	3'-0"	14"	14"	4'-10"	9'-0"	1'-6"	#5@12"	#6@12"	#6@6"	#7@12"	#7@6"	#5@12"	#6@18"	14"x24"
C	11'-0"	2'-6"	14"	14"	3'-10"	7'-6"	1'-6"	#5@12"	#6@12"	#6@12"	#5@12"	#7@12"	#5@12"	#6@18"	14"x24"
D	7'-6"	2'-0"	12"	12"	3'-0"	6'-0"	1'-2"	#5@12"	#6@12"	#6@12"	#6@12"	#6@12"	#5@12"	#6@18"	12"12"
A1	13'-6"	9'-0"	16"	18"	1'-0"	11'-6"	2'-0"	#5@12"	#6@8"	#5@12"	#5@12"	#7@8"	#5@12"	#6@12"	18"X48"
A2	11'-6"	1'2"	16"	18"	11'-8"	14'-2"	2'-0"	#5@12"	#6@12"	#7@12"	#6@12"	#8@8"	#5@12"	NONE	NO KEY
B1	18'0"	8'-0"	16"	18"	2'-6"	12'-0"	2'-0"	#5@12"	#6@8"	#5@12"	#6@12"	#7@6"	#5@12"	#6@12"	18"X30"

* NOTE: All footing keys aligned with stem, with the exception of Wall Type A1. See typical section for A1 for details.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

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SITE DEVELOPMENT PLAN

ARCH CULVERT
WING WALL SECTIONS & DETAILS
BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
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TAX MAP 46 BLOCK 4
5TH ELECTION DISTRICT

PARCEL 126, PARCEL 364, PARCEL 505 (LOT 496), PARCEL 127
HOWARD COUNTY, MARYLAND

1340 CHARWOOD ROAD
SUITE A
HANOVER, MARYLAND 21076
PHONE: (410) 859 - 4300
FAX: (410) 859 - 4324

STATE OF MARYLAND
HASAN M. ABOUMATAR
No. 29553
PROFESSIONAL ENGINEER

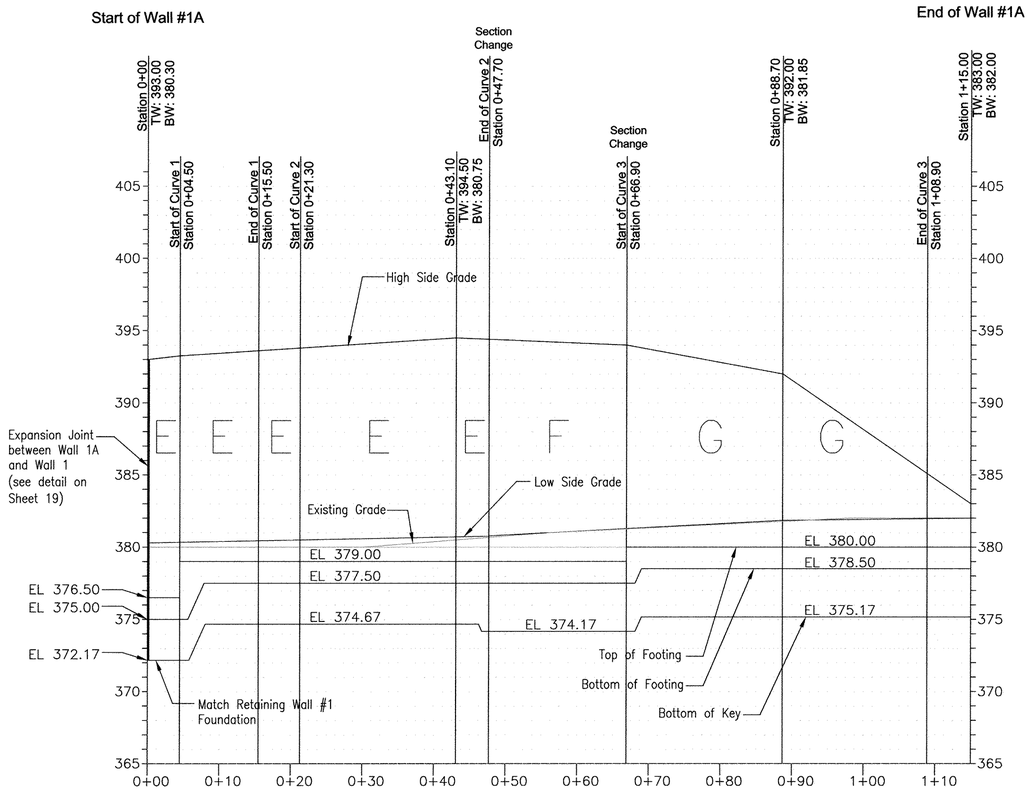
HASAN M. ABOUMATAR, P.E.

DESIGN BY:	DMA/HMA
DRAWN BY:	DMA/HMA
CHECKED BY:	HMA
DATE:	APR 2016
SCALE:	AS SHOWN
W.O. NO.:	7272-B

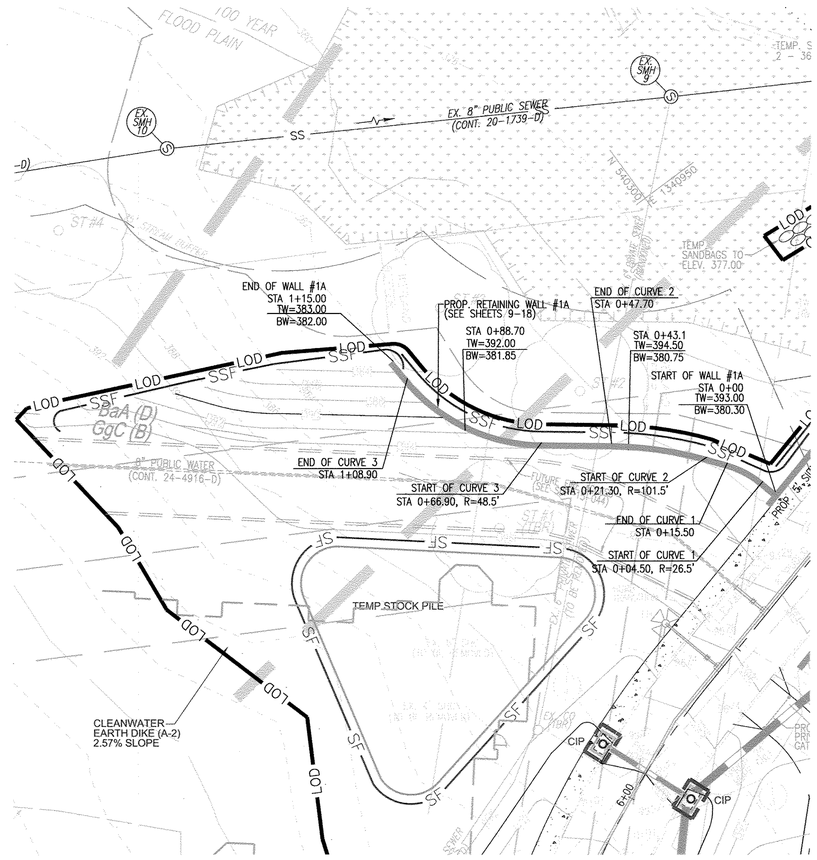
PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 29553. EXPIRATION DATE: 12-31-2015

SDP-15-071



RETAINING WALL 1A PROFILE
HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=5'



SITE PLAN
SCALE: 1"=20'

OWNER/DEVELOPER
BUCH LLLP
10945 PRICE MANOR WAY
LAUREL, MD 20723
301-359-3500

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

ARCH CULVERT
RETAINING WALL #1A PLAN & PROFILE
BUCH ROAD EXTENSION

10945 PRICE MANOR WAY
ZONED: R-APT & B-1
(L. 3192 / F. 394)

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EXPIRATION DATE: 12-31-2015

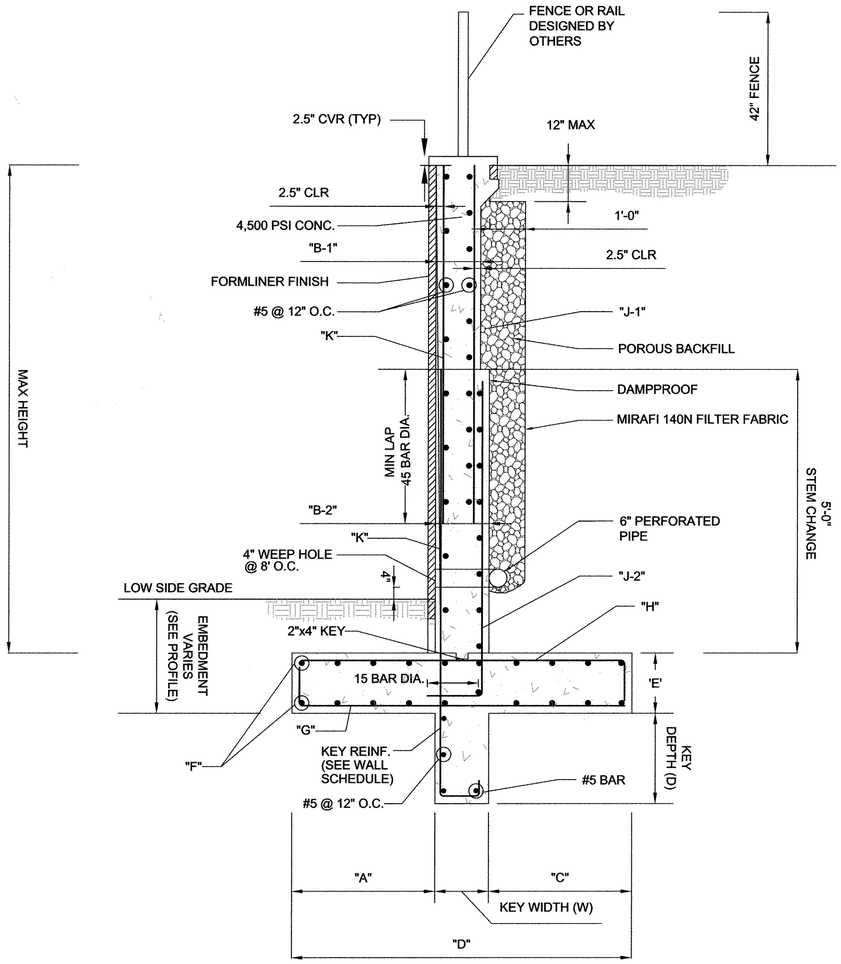
SHEET 18 OF 19

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 5-12-16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 8-9-16
DIRECTOR	DATE 8-11-16

NOTES:
TW: HIGH SIDE FINISHED GRADE
BW: LOW SIDE FINISHED GRADE
E, F OR G INDICATES RETAINING WALL TYPE. SEE RETAINING WALL SCHEDULE FOR DETAILS.

SDP-15-071



TYPICAL RETAINING WALL 1A SECTION
SEE RETAINING WALL SCHEDULE FOR DETAILS
NOT TO SCALE

Quality Assurance

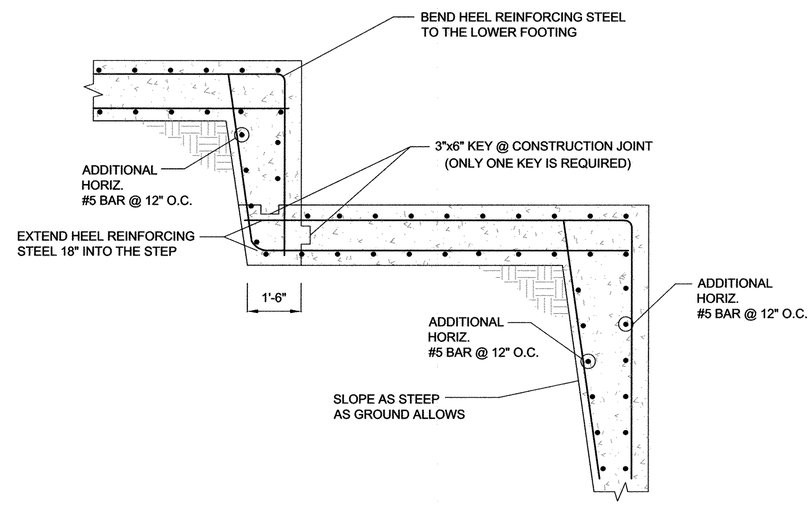
A. The Owner shall engage a qualified testing agency to provide observation and testing services as described below.
B. Concrete Placement
   1. The agency shall inspect the formwork and reinforcing steel placement for compliance with the contract documents. Reinforcing steel should be inspected for correct size, quantity, and spacing.
   2. Fresh concrete shall be sampled in accordance with ASTM C 172, and tested for slump, air entrainment, and temperature.
   3. Test cylinders shall be molded in accordance with ASTM C 31. Four test cylinders shall be molded for each day's pour, or for every 50 cubic yards of concrete placed, whichever is greater.
C. Fill Placement
   1. All soil fills shall be tested in accordance with ASTM D 2922.
   2. A minimum of one compaction test per lift should be made per 2,500 square feet of fill lift area, but not fewer than two tests per lift should be made.
   3. The elevations and locations of the field density tests should be clearly identified at the time of fill placement and compaction.
D. Field Verification
   1. Wall foundations shall be excavated to the grades shown; however, no contractor or subcontractor shall rely on dimensions & grades shown on these drawings without verifying their correctness by field measure.

Soil Backfill

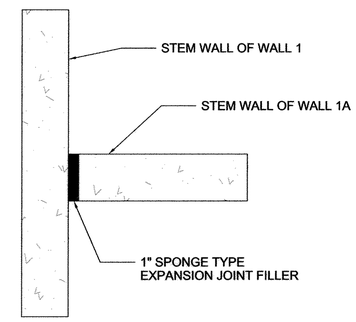
A. Material should consist of soil classified as SM or more granular, in accordance with ASTM D 2487.
B. Material should have no particle larger than 2.5 inches and shall contain at least 36 percent, by weight, retained on the U.S. No. 200 sieve.
C. Materials should have a Liquid Limit less than 40, and a Plasticity Index less than 10.
D. Material should have a minimum friction angle of 32 degrees.
E. The Contractor should submit samples of the proposed backfill soils to the Geotechnical Engineer of Record for approval prior to their use.
F. Backfill shall be moisture conditioned to within 2 percentage points of the optimum moisture content, as determined in accordance with ASTM D-1557.
G. Backfill shall be placed in loose lifts, not exceeding 8 inches in thickness, and then compacted to at least 95 percent of the maximum dry density, as determined in accordance with ASTM D-1557.
H. Backfilling shall not occur against the wall until the wall concrete has attained at least 75 percent of the 28-day design strength, and no earlier than 3 days after placement.
I. Where feasible, maintain equal grades on each side of the wall during backfilling to prevent overturning and lateral movements. When the grade differential at the wall exceeds 12 inches, only hand-operated compaction equipment shall be allowed.

Foundation

A. The wall foundation shall be excavated to the grades and lines as shown on the construction drawings. Contractor should take care not to disturb foundation soils beyond the lines and grades shown.
B. The foundation shall bear at the minimum embedment depths indicated, as measured from the final grade at the front of the wall.
C. The foundation subgrade soils shall be testing by a qualified representative of the Geotechnical Engineer to verify the availability of the design bearing pressure of 3,000 psf.
D. If unsuitable soils are encountered at design foundation levels, the unsuitable soils shall be removed and the over-excavated areas shall be replaced with compacted structural fill.



TYP. RETAINING WALL 1A STEP DETAIL
SCALE: 1/2"=1'



PLAN VIEW OF RET. WALL 1A AND WALL 1
TYP. EXPANSION JOINT DETAIL
NTS'

RETAINING WALL 1A SCHEDULE

WALL TYPE	MAX. HEIGHT	WALL & FOOTING DIMENSION						FOOTING REINFORCEMENT			STEM REINFORCEMENT			KEY	
		TOE "A"	STEM "B-1"	STEM "B-2"	HEEL "C"	WIDTH "D"	THICKNESS "E"	"F"	"G"	"H"	"J-1"	"J-2"	"K"	REINFOR.	SIZE (WXD)
E	16'-6"	3'-6"	1'-2"	1'-4"	6'-2"	11'-0"	1'-6"	#5@12"	#6@12"	#6@6"	#7@12"	#7@6"	#5@12"	#6@18"	16"x34"
F	15'-5"	4'-11"	1'-2"	1'-4"	2'-11"	9'-2"	1'-6"	#5@12"	#7@12"	#7@12"	#7@12"	#7@6"	#5@12"	#6@18"	16"x40"
G	14'-0"	6'-2"	1'-2"	1'-2"	1'-5"	8'-11"	1'-6"	#5@12"	#7@12"	#7@12"	#7@10"	#7@10"	#5@12"	#6@18"	16"x40"

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SITE DEVELOPMENT PLAN
ARCH CULVERT
RETAINING WALL# 1A SECTIONS & DETAILS
BUCH ROAD EXTENSION
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ZONED: R-APT & B-1
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