

**GENERAL NOTES**

- SUBJECT PROPERTY ZONED R-20 PER 2/02/04 COMPREHENSIVE ZONING PLAN AND COMP LITE ZONING REGULATIONS EFFECTIVE 7/28/06.
- COORDINATES BASED ON NAD '83, MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 31A3 AND NO. 31D4.  
STATION NO. 31A3 NORTH 573,217.9149 EAST 1,368,237.7247  
STATION NO. 31D4 NORTH 571,700.7034 EAST 1,369,606.3509
- THIS PLAN IS BASED ON FIELD RUN MONUMENTED BOUNDARY SURVEY PERFORMED ON OR ABOUT JANUARY, 2012, BY FISHER, COLLINS & CARTER, INC. B.R.L. DENOTES BUILDING RESTRICTION LINE.
- FOR FLAG OR PIPESTEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE ARE PROVIDED TO THE JUNCTION OF THE FLAG OR PIPESTEM AND ROAD RIGHT-OF-WAY LINE AND NOT ONTO THE PIPESTEM LOT DRIVEWAY.
- DRIVEWAYS SHALL BE PROVIDED PRIOR TO ISSUANCE OF A USE AND OCCUPANCY PERMIT FOR ANY NEW DWELLINGS TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING (MINIMUM) REQUIREMENTS:  
A) WIDTH - 12 FEET (16 FEET SERVING MORE THAN ONE RESIDENCE);  
B) SURFACE - SIX (6") INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CHIP COATING (1 - 1/2" MINIMUM);  
C) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND 45-FOOT TURNING RADIUS;  
D) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25-LOADING);  
E) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER SURFACE;  
F) MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE.
- ALL LOT AREAS ARE MORE OR LESS (±).
- DISTANCES SHOWN ARE BASED ON SURFACE MEASUREMENT AND NOT REDUCED TO NAD '83 GRID MEASUREMENT.
- STORMWATER MANAGEMENT REQUIREMENTS FOR LOTS 1 THRU 5 WILL BE MET USING ENVIRONMENTAL SITE DESIGN TO THE MAXIMUM EXTENT POSSIBLE IN ACCORDANCE WITH THE MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II, EFFECTIVE IN MAY OF 2010. THE PROPOSED PRACTICES WILL BE LOCATED ON THE INDIVIDUAL LOTS AS FOLLOWS:  
LOT 1: MICRO-BIORETENTION (M-6) AND DRYWELLS (M-5) FOR THE PROPOSED HOUSE AND A BIO-SWALE (M-8) FOR THE PROPOSED DRIVEWAY.  
LOT 2: NON-ROOFTOP DISCONNECTION (N-2) FOR THE PROPOSED DRIVEWAY. THE EXISTING HOUSE WILL REMAIN FOR WHICH SWM IS NOT REQUIRED.  
LOT 3: DRYWELLS (M-5) FOR THE PROPOSED HOUSE AND NON-ROOFTOP DISCONNECTION (N-2) FOR THE PROPOSED DRIVEWAY.  
LOT 4: ROOFTOP DISCONNECTION (N-1) AND DRYWELLS (M-5) FOR THE PROPOSED HOUSE AND NON-ROOFTOP DISCONNECTION (N-2) FOR THE PROPOSED DRIVEWAY.  
LOT 5: ROOFTOP DISCONNECTION (N-1) AND DRYWELLS (M-5) FOR THE PROPOSED HOUSE AND NON-ROOFTOPDISCONNECTION (N-2) FOR THE PROPOSED DRIVEWAY.
- THESE PRACTICES SHALL BE PRIVATELY OWNED AND MAINTAINED IN ACCORDANCE WITH INDIVIDUAL DECLARATIONS OF COVENANTS.
- THE TRAFFIC STUDY FOR THIS PROJECT WAS PREPARED BY MARS GROUP, DATED SEPTEMBER, 2012 AND APPROVED OCTOBER 31TH, 2012.
- NO CHETERTON LOTS OR STRUCTURES EXIST ON THIS SITE BASED ON VISUAL SURVEY AND BASED ON AN EXAMINATION OF THE HOWARD COUNTY CEMETERY INVENTORY MAP AND NO HISTORIC STRUCTURES, SITES OR FEATURES EXIST.
- THE FOREST CONSERVATION REQUIREMENTS FEE-IN-LIEU PAYMENT WAS PAID UNDER F-13-021.
- LANDSCAPING FOR LOTS 1, 3, 4 AND 5 IS PROVIDED IN ACCORDANCE WITH A CERTIFIED LANDSCAPE PLAN FOR F-13-021. IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL A LANDSCAPE SURETY IN THE AMOUNT OF \$14,250.00 IS BONDED WITH THE WATER & SEWER AGENCY AGREEMENT.  
LOT 1: SURETY (4 SHADE TREE @ \$300/SHADE TREE) & (17 EVER GREENS @ \$150/EVER GREEN TREE) = \$3,750.00  
LOT 2: SURETY (5 SHADE TREE @ \$300/SHADE TREE) = \$1,500.00  
LOT 3: SURETY (7 SHADE TREE @ \$300/SHADE TREE) = \$2,100.00  
LOT 4: SURETY (2 SHADE TREE @ \$300/SHADE TREE) & (6 EVER GREENS @ \$150/EVER GREEN TREE) = \$1,500.00  
LOT 5: SURETY (15 SHADE TREE @ \$150/SHADE TREE) & (6 EVER GREENS @ \$150/EVER GREEN TREE) = \$3,450.00
- WATER AND SEWER SERVICE TO THESE LOTS WILL BE GRANTED UNDER THE PROVISIONS OF SECTION 18.122B OF THE HOWARD COUNTY CODE.
- PUBLIC WATER AND SEWAGE ALLOCATIONS WILL BE GRANTED AT TIME OF ISSUANCE OF THE BUILDING PERMIT IF CAPACITY IS AVAILABLE AT THAT TIME.
- APPROVAL OF A SITE DEVELOPMENT PLAN IS REQUIRED FOR THE DEVELOPMENT OF ALL RESIDENTIAL LOTS WITHIN THIS SUBDIVISION PRIOR TO ISSUANCE OF ANY GRADING OR BUILDING PERMITS FOR NEW HOUSE CONSTRUCTION IN ACCORDANCE WITH SECTION 16.155 OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
- PROPERTY SUBJECT TO DEPARTMENT OF PLANNING AND ZONING FILE NOS. ECP-12-052, WP-12-156 AND F-13-021.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT AND WILL BE SERVED BY PUBLIC WATER AND SEWER UNDER CONTRACT 14-4745-D.
- THERE IS AN EXISTING DWELLING/STRUCTURE(S) LOCATED ON LOT 2 TO REMAIN. NO NEW BUILDINGS, EXTENSIONS OR ADDITIONS TO THE EXISTING DWELLING(S) ARE TO BE CONSTRUCTED AT A DISTANCE LESS THAN THE ZONING REGULATION REQUIREMENTS.
- THERE ARE NO DISTURBANCES TO ENVIRONMENTAL FEATURES AS THERE ARE NO ENVIRONMENTAL FEATURES LOCATED ON THIS PROPERTY.
- THIS PLAN IS IN COMPLIANCE WITH THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS PER COUNCIL BILL 45-2003 AND THE ZONING REGULATIONS AS AMENDED BY COUNCIL BILL 75-2003. DEVELOPMENT OR CONSTRUCTION ON THESE LOTS 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 AND PER THE COMP-LITE ZONING REGULATIONS DATED JULY 28, 2006.
- PLAT SUBJECT TO WP-12-156 WHICH THE PLANNING DIRECTOR ON JUNE 27, 2012 APPROVED A WAIVER FROM SECTION 16.1205(A)(7) TO ALLOW REMOVAL OF THE THREE (3) TREES 30" IN DIAMETER OR LARGER. THE PLANNING DIRECTOR ALSO APPROVED A REQUEST TO WAIVE SECTION 16.120(B)(6)(V)(C) TO ALLOW PIPESTEM LOTS TO BE CREATED ON BOTH SIDES OF A FRONTAGE LOT IN THE SAME SUBDIVISION. FINALLY, THE PLANNING DIRECTOR APPROVED A REQUEST TO WAIVE SECTION 16.145 TO ALLOW SUBMISSION OF A FINAL SUBDIVISION PLAN WITHOUT FIRST SUBMITTING A SKETCH PLAN OR PRELIMINARY EQUIVALENT SKETCH PLAN, SUBJECT TO THE FOLLOWING CONDITIONS:  
1) REMOVAL OF THE THREE (3) SPECIMEN TREES WILL REQUIRE REPLACEMENT MITIGATION AT A RATIO OF TWO (2) LARGER CALIPER TREES (AT LEAST FOUR (4) INCHES DBH) FOR EACH SPECIMEN TREE REMOVED. THE MITIGATION PLANTING CAN BE PROVIDED AS PART OF THE REQUIRED PERIMETER LANDSCAPING FOR THIS PROJECT. YOU MUST SUBMIT A SUPPLEMENTAL PLAN WITH YOUR FINAL SUBDIVISION PLAN FOR THIS PROJECT THAT SHOWS HOW YOU PLAN TO ADDRESS THIS ALTERNATIVE LANDSCAPE MITIGATION.  
2) SUBMISSION OF A FINAL PLAN APPLICATION, INCLUDING A FINAL SUBDIVISION PLAN AND A SUPPLEMENTAL PLAN.  
3) THE PROPOSED DRIVEWAY TO SERVE NEW LOT 1 SHALL COMPLY WITH SECTION 16.120(B)(VI) OF THE HOWARD COUNTY SUBDIVISION REGULATIONS AND CAN BE LOCATED AT LEAST 10 FEET FROM THE PROJECT BOUNDARY AT ALL POINTS TO PROVIDE ADEQUATE ROOM FOR PERIMETER LANDSCAPING. THE APPLICANT MUST PROVIDE A LANDSCAPING BUFFER ALONG THE ENTIRE PROJECT BOUNDARY LINE BETWEEN THE DRIVEWAY AND THE ADJOINING SATINITE PARCEL, PARCEL 351, LOT 35, WITH A SINGLE ROW OF LEYLAND CYPRESS TREES, OR AN EQUIVALENT SPECIES, AT A SPACING OF 15 FEET ON CENTER (TOTAL OF 15 TREES).
- THE 36' PRIVATE USE-IN-COMMON DRIVEWAY MAINTENANCE AGREEMENTS FOR LOT 1 THRU 5, THE 36' PRIVATE USE-IN-COMMON DRIVEWAY MAINTENANCE AGREEMENTS FOR LOTS 2 THRU 5 & THE 20' PRIVATE USE-IN-COMMON DRIVEWAY MAINTENANCE AGREEMENT FOR LOT 1 HAVE BEEN RECORDED IN THE HOWARD COUNTY LAND RECORDS OFFICE SIMULTANEOUSLY WITH THE RECORDING OF THIS SUBDIVISION PLAN.
- OPEN SPACE REQUIREMENTS ARE PROVIDED BY A FEE-IN-LIEU PAYMENT OF \$6,000.00 UNDER F-13-021.
- THIS DEVELOPMENT IS DESIGNED TO BE IN ACCORDANCE WITH SECTION 16.127-RESIDENTIAL INFILL DEVELOPMENT -OF SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE DEVELOPER OF THIS PROJECT SHALL CREATE COMPATIBILITY WITH THE EXISTING NEIGHBORHOOD THROUGH THE USE OF ENHANCED PERIMETER LANDSCAPING, BERMS, FENCES, SIMILAR HOUSING UNIT TYPES AND THE DIRECTIONAL ORIENTATION OF THE PROPOSED HOUSES.
- NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT PER HOWARD COUNTY DESIGN MANUAL, VOLUME III, SECTION 5.2.(F).
- A COMMUNITY MEETING WAS CONDUCTED ON JANUARY 4, 2012 FOR THE PURPOSE OF THE DEVELOPER TO PROVIDE INFORMATION TO THE COMMUNITY REGARDING THE PROPOSED RESIDENTIAL DEVELOPMENT AND TO ALLOW THE COMMUNITY TO ASK QUESTIONS AND TO MAKE COMMENTS, PER SECTION 16.128(D), OF THE SUBDIVISION REGULATIONS.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND STRUCTURE SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH CONTOUR INTERVALS PREPARED BY FISHER, COLLINS AND CARTER, INC. DATED FEB. 15, 2012 AND SUPPLEMENTED WITH HOWARD COUNTY GIS INFORMATION.
- EXISTING UTILITIES SHOWN ARE BASED ON AVAILABLE CONSTRUCTION DRAWINGS.
- A PRIVATE RANGE OF PRIVATE RANGE SHALL BE FABRICATED AND INSTALLED BY HOWARD COUNTY BUREAU OF HIGHWAYS AT THE DEVELOPERS/OWNERS EXPENSE. CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-2430 FOR DETAILS AND COST ESTIMATE.
- ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- THERE IS NO FLOORPLAN ON THIS SITE.
- THERE ARE NO WETLANDS ON THIS SITE.
- STREET LIGHT PLACEMENT AND TYPE OF FIXTURES AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III, SECTION 5.5.A. A MINIMUM OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
- IN ACCORDANCE WITH SECTION 129 OF THE HOWARD COUNTY ZONING REGULATIONS, BAY WINDOWS, CHIMNEYS OR EXTERIOR STAIRWAYS NOT MORE THAN 16 FEET IN WIDTH MAY PROJECT NOT MORE THAN 4 FEET INTO ANY SETBACKS, PORCHES OR DECKS. OPEN OR ENCLOSED MAY PROJECT NOT MORE THAN 10 FEET INTO THE FRONT OR REAR SETBACK.
- ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
- SHC ELEVATIONS SHOWN ARE LOCATED AT THE PROPERTY LINE.
- FOR DRIVEWAY ENTRANCE DETAILS, REFER TO THE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD DETAIL R-6.01.
- ALTHOUGH THE PLAN INDICATES VEHICULAR ACCESS RESTRICTIONS TO MONTGOMERY ROAD, THE EXISTING HOUSE MAY ACCESS MONTGOMERY ROAD UNTIL THE PROPOSED DRIVEWAY IS CONSTRUCTED WITH THIS SDP.
- OPEN SPACE LOTS 6 AND 7 ARE OWNED AND MAINTAINED BY THE CLEARWATER CROSSING HOMEOWNERS ASSOCIATION, INC.
- ARTICLES OF INCORPORATION FOR THE CLEARWATER CROSSING HOMEOWNERS ASSOCIATION, INC. ARE FILED WITH THE MARYLAND STATE DEPARTMENT OF TAXATION AND ASSESSMENTS ON JULY 24, 2013 HAVING RECEIPT NO. D15364126.

# SITE DEVELOPMENT PLAN CLEARWATER CROSSING LOTS 1 THRU 5 & OPEN SPACE LOTS 6 & 7

ADDRESS CHART	
LOT NUMBER	STREET ADDRESS
1	4953 CLEARWATER DRIVE
2	4957 CLEARWATER DRIVE
3	4954 CLEARWATER DRIVE
4	4956 CLEARWATER DRIVE
5	4962 CLEARWATER DRIVE

\* EXISTING HOUSE TO REMAIN

SHEET INDEX	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SITE DEVELOPMENT PLAN
3	SEDIMENT AND EROSION CONTROL PLAN
4	STORMWATER MANAGEMENT NOTES, CHARTS AND DETAILS
7	SEDIMENT AND EROSION CONTROL DETAILS
6	SEDIMENT AND EROSION CONTROL NOTES
7	DRAINAGE AREA MAP

STREET LIGHT CHART			
STREET NAME	NORTHING	EASTING	FIXTURE/POLE TYPE
CLEARWATER DRIVE	571.698.19	1,370,558.37	100-WATT H.P.S. COLONIAL POST TOP MOUNTED ON A 14-FOOT BLACK FIBERGLASS POLE

LOT NUMBER	ADDRESS	DISCONNECTION OF ROOFTOP RUN-OFF N-1 (NUMBER)	DISCONNECTION OF NON-ROOFTOP RUN-OFF N-2 (Y/N)	DRY WELLS M-5 (NUMBER)	MICRO-BIO-RETENTION M-6 (NUMBER)	SWALES M-8 (NUMBER)
1	4953 CLEARWATER DRIVE	N/A	N/A	2	1	1
2*	4957 CLEARWATER DRIVE	N/A	Y	N/A	N/A	N/A
3	4954 CLEARWATER DRIVE	N/A	Y	3	N/A	N/A
4	4956 CLEARWATER DRIVE	4	Y	2	N/A	N/A
5	4962 CLEARWATER DRIVE	4	Y	4	N/A	N/A

\* EXISTING HOUSE TO REMAIN

**SITE ANALYSIS DATA CHART**

A. TOTAL AREA OF THIS SUBMISSION = 3.765540 AC.  
 B. LIMIT OF DISTURBED AREA =  
 L.O.D. ASSOCIATED WITH THE BUILDING SITE: 108,708 SqFt. or 2.50 AC.  
 L.O.D. ASSOCIATED WITH THE REMOVAL OF EXISTING DRIVEWAY: 6,557 SqFt. or 0.15 AC.  
 TOTAL L.O.D. = 115,265 or 2.65 AC.

C. PRESENT ZONING DESIGNATION = R-20 (PER 2/04/2004 COMPREHENSIVE ZONING PLAN AND THE COMP-LITE ZONING AMENDMENTS DATED 7/28/2006)

D. PROPOSED USE: RESIDENTIAL

E. BUILDING COVERAGE OF SITE: 14.15%

F. PREVIOUS HOWARD COUNTY FILES: ECP-12-052 & WP-12-156, F-13-021.

G. TOTAL AREA OF FLOORPLAN LOCATED ON SITE: 0.00 AC.

H. TOTAL AREA OF SLOPES IN EXCESS OF 15% = 0.00 AC.

I. TOTAL AREA OF SLOPES IN EXCESS OF 25% = 0.00 AC.

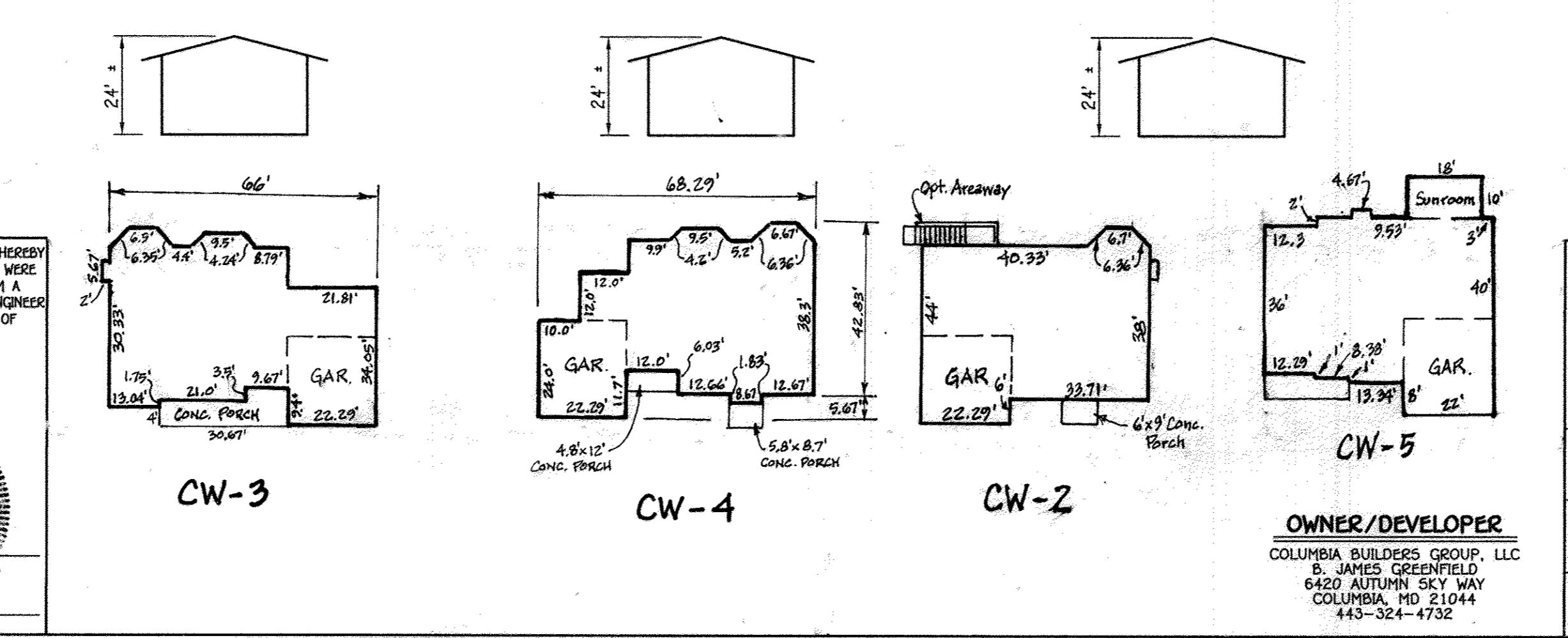
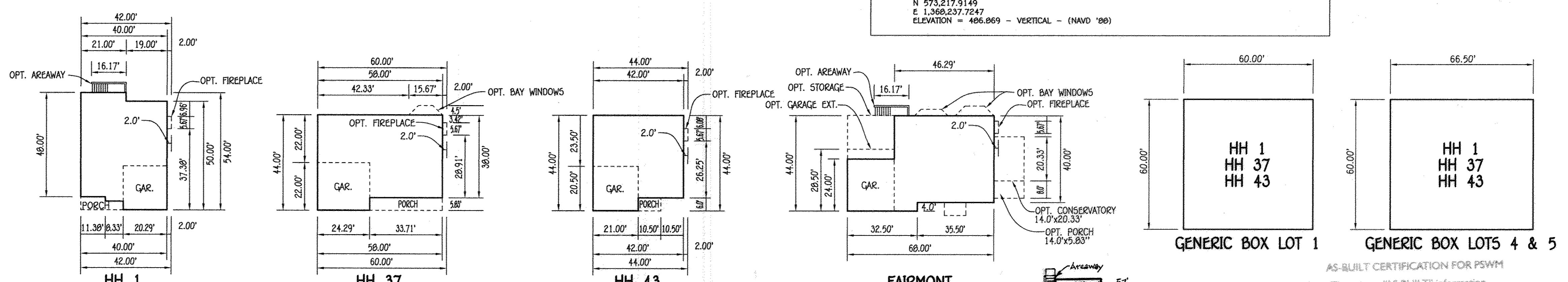
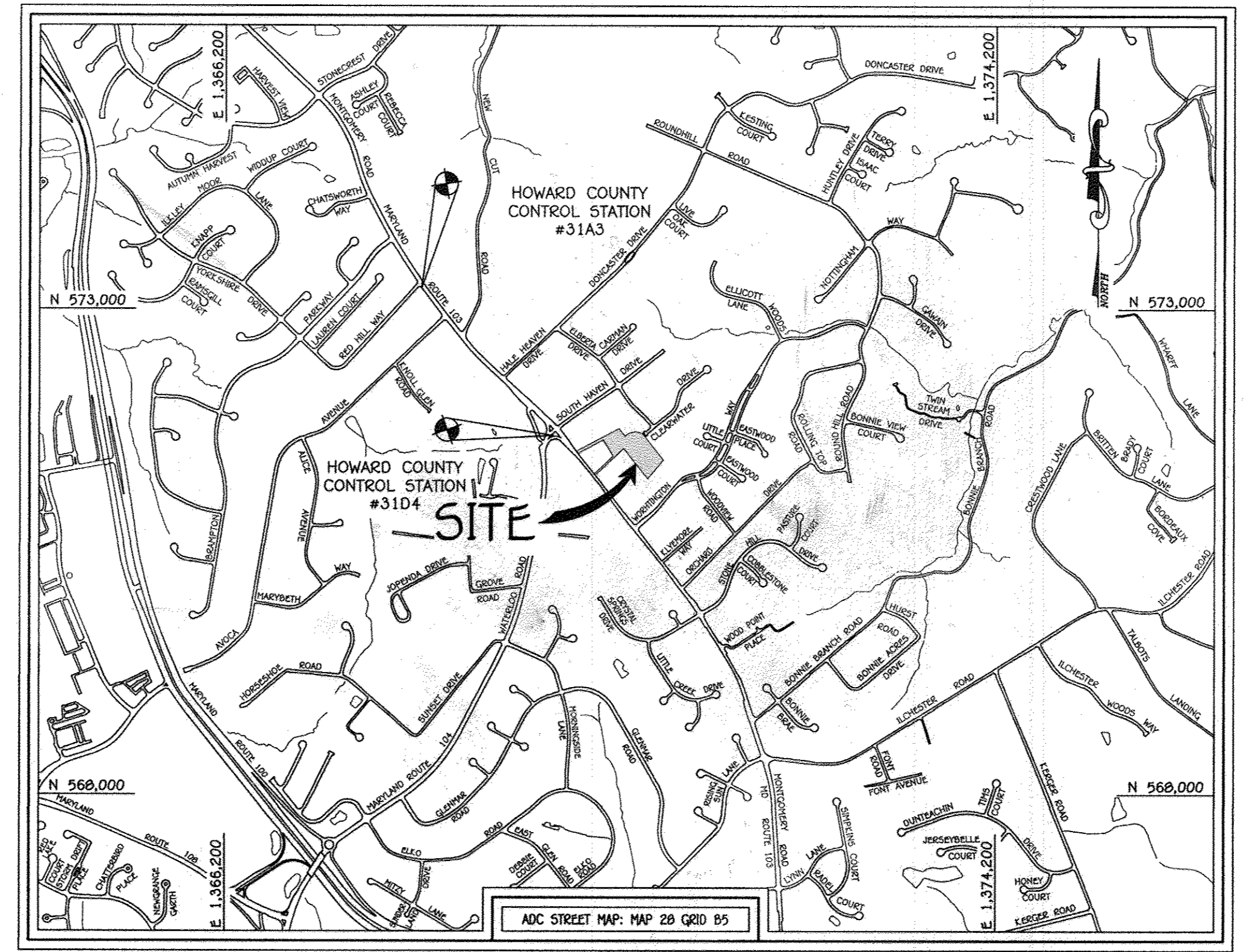
J. NET TRACT AREA = 3.765540 AC.  
 K. TOTAL SITE AREA - FLOODPLAIN - STEEP SLOPES AREA = 0 AC.  
 L. TOTAL AREA OF WETLANDS (INCLUDING BUFFER) = 0 AC.  
 M. TOTAL GREEN OPEN AREA = 2.97 AC.  
 N. TOTAL IMPERVIOUS AREA = 0.80 AC.  
 O. TOTAL AREA OF SEVERELY ERODIBLE SOILS = 0.014 AC.

**BENCHMARK INFORMATION**

B.M.#31D4 - HOWARD COUNTY CONTROL STATION - HORIZONTAL - NAD '83 (LOCATED IN THE ISLAND AT THE INTERSECTION OF ROUTE 103; MONTGOMERY ROAD AND ROUTE 104, APPROX. 16.5' FROM THE EDGE OF CURB)  
 N 571,700.7034  
 E 1,369,606.3509  
 ELEVATION = 494.406 - VERTICAL - (NAVD '88)

B.M.#31A3 - HOWARD COUNTY CONTROL STATION - HORIZONTAL - (NAD '83) (LOCATED ALONG ROUTE 103; MONTGOMERY ROAD, SOUTH EAST FROM RED HILL WAY, APPROX. 15.2' BEHIND THE EDGE OF PAVING)  
 N 573,217.9149  
 E 1,368,237.7247  
 ELEVATION = 486.869 - VERTICAL - (NAVD '88)

SYMBOL	DESCRIPTION
(---)	EXISTING CONTOUR 2' INTERVAL
(---)	PROPOSED CONTOUR 2' INTERVAL
(---)	SET FENCE
(---)	SUPER SALT FENCE
(---)	LIMIT OF DISTURBANCE
(---)	EXISTING FENCE LINE
(---)	EX. LIMIT OF TREES AND FOREST
(---)	PROPOSED LANDSCAPING
(---)	EXISTING TREES
(---)	EXISTING GRAVEL AREA TO BE REMOVED
(---)	PROPOSED PBA GRAVEL
(---)	EXISTING GRAVEL
(---)	EXISTING CONCRETE WALK
(---)	PROPOSED CONCRETE WALK
(---)	EXISTING DRIVEWAY TO BE REMOVED
(---)	DISCONNECTION IMPERVIOUS AREA
(---)	DISCONNECTION RECEIVING AREA
(---)	DRAINAGE AREA
(---)	ACCESS EASEMENT
(---)	PUBLIC STORMWATER EASEMENT
(---)	PRIVATE STORMWATER EASEMENT
(---)	TREE WARE EASEMENT



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Kate Schaefer* 11-24-13  
 Chief, Division of Land Development Date

*David Edwards* 10-28-13  
 Chief, Development Engineering Division Date

*Joseph A. Lepple* 11/14/13  
 Director - Department of Planning and Zoning Date

PROJECT	SECTION	LOT NO.
CLEARWATER CROSSING		1 THRU 5
PARCEL 593		

PLAT	BLOCK NO.	ZONE	TAX/ZONE	ELEC. DIST.	CENSUS TR.
Z.2.560	8	R-20	31	SECOND	6027
Z.2.562					

ECP-12-052, WP-12-156  
 F-13-021, GP-14-008

TITLE SHEET

**CLEARWATER CROSSING  
LOTS 1 THRU 5 &  
OPEN SPACE LOTS 6 & 7**

ZONED R-20 TAX MAP NO.: 31 GRID NO.: 8  
 PARCEL NO.: 593  
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 SCALE: AS SHOWN DATE: OCTOBER, 2013  
 SHEET 1 OF 7

**FISHER, COLLINS & CARTER, INC.**  
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
 CENTRAL SERVICE OFFICE: 10772 BALTIMORE NATIONALS  
 SUITE 1000 BALTIMORE, MARYLAND 21042  
 (410) 461-2895

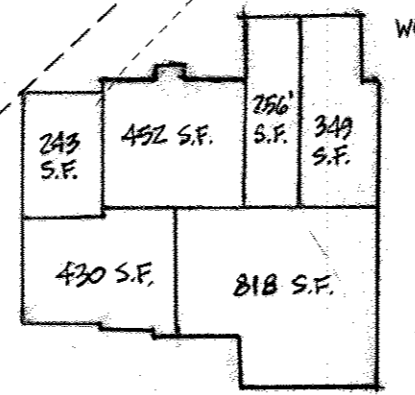
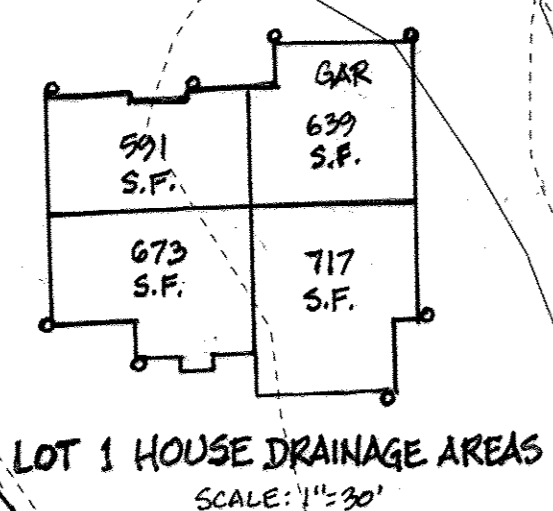
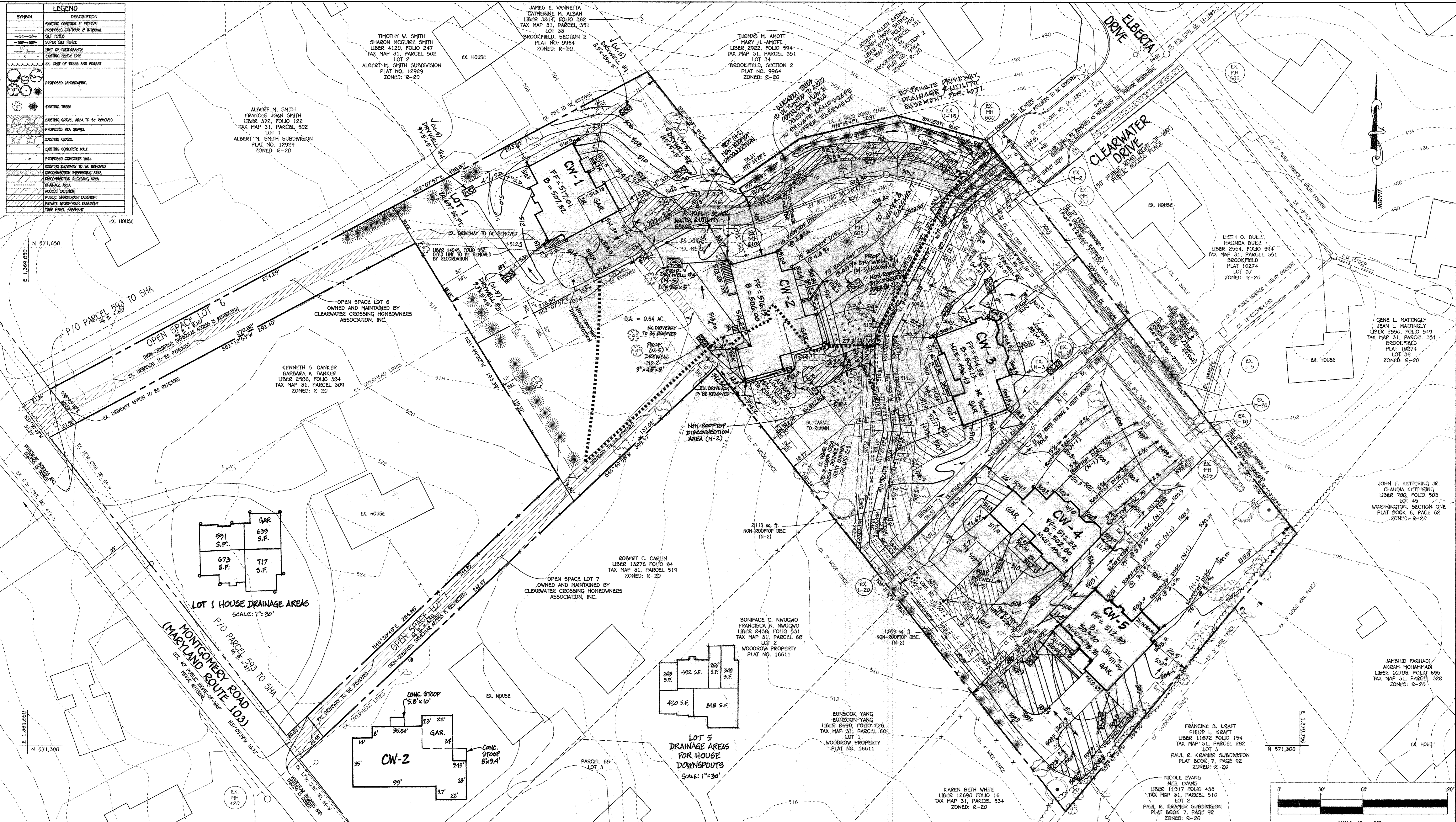
**PROFESSIONAL CERTIFICATION** I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 20748, EXPIRATION DATE 2-22-15.

*[Signature]*  
 DATE: 10/14/13

NO.	REVISION	DATE
4	REV. LOT 1 TO CW-1 HOUSETYPE, GRADING, & SWM	5/10/13
3	REV. LOTS 2-5 CW-2 HOUSETYPE, GRADING, & SWM	11/12/13
2	REV. LOT 2 TO CW-2 HOUSETYPE & ASSESS. GRADING & SWM	9/19/13
1	ADD CW-3 & CW-4 HOUSETYPES FOR LOTS 3 & 4; REV. SWM CHART	3/20/13



LEGEND	
SYMBOL	DESCRIPTION
	EXISTING CONTOUR 2' INTERVAL
	PROPOSED CONTOUR 2' INTERVAL
	SILT FENCE
	SUPER SILT FENCE
	LIMIT OF DISTURBANCE
	EXISTING FENCE LINE
	EX. LINE OF TREES AND FOREST
	PROPOSED LANDSCAPING
	EXISTING TREES
	EXISTING GRAVEL AREA TO BE REMOVED
	PROPOSED PEA GRAVEL
	EXISTING GRAVEL
	EXISTING CONCRETE WALK
	PROPOSED CONCRETE WALK
	EXISTING DRIVEWAY TO BE REMOVED
	DISCONNECTION IMPERVIOUS AREA
	DRIVEWAY AREA
	ACCESS EASEMENT
	PUBLIC STORMWATER EASEMENT
	PRIVATE STORMWATER EASEMENT
	TREE RIGHT EASEMENT



**FISHER, COLLINS & CARTER, INC.**  
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
 CENTENNIAL SQUARE OFFICE PARK - 18722 BALTIMORE NATIONAL PIKE  
 CLIFTON CITY, MARYLAND 21042  
 (410) 461-2295

NO.	REVISION	DATE
1	REV. LOT 1 TO NEW CW-1 HOUSETYPE, GRADING, & SWM	5/24/16
2	REV. LOT 2 TO NEW CW-2 HOUSETYPE, GRADING, & SWM	1/11/16
3	REV. LOT 3 TO NEW CW-3 HOUSETYPE & ASSOC. GRADING & SWM	11/13/15
4	REV. LOT 4 TO NEW CW-4 HOUSETYPE & ASSOC. GRADING & SWM	9/29/15
5	REV. LOT 5 TO SHOW AS-BUILT ELEVATIONS	8/21/15
6	REV. LOT 3 TO CW-3 HOUSETYPE & ASSOC. GRADING & SWM	3/20/15
7	REV. LOT 4 TO CW-4 HOUSETYPE & ASSOC. GRADING AND SWM	1/15/15

PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 20746, EXPIRATION DATE 2-22-15.

*Alvin M. Adams*  
 ALVIN M. ADAMS, P.E.  
 PROFESSIONAL ENGINEER

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Howard County Seal*

OWNER/DEVELOPER  
 COLUMBIA BUILDERS GROUP, LLC  
 6420 AUTUMN SKY WAY  
 COLUMBIA, MD 21044  
 443-324-4732

AS-BUILT DRYWELLS  
 6/6/17

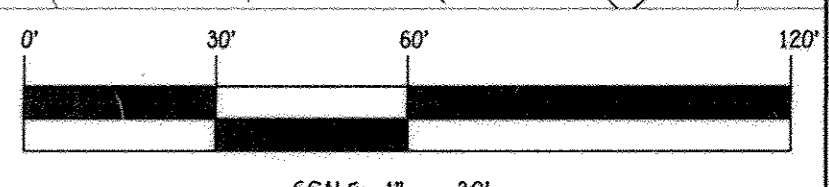
PLAT	BLOCK NO.	ZONE	TAX/ZONE	ELEC. DIST.	CENSUS TR.
22560-22562	8	R-20	31	SECOND	6027

ECP-12-092, WP-12-156  
 F-13-021, GP-14-008

**SITE DEVELOPMENT PLAN**

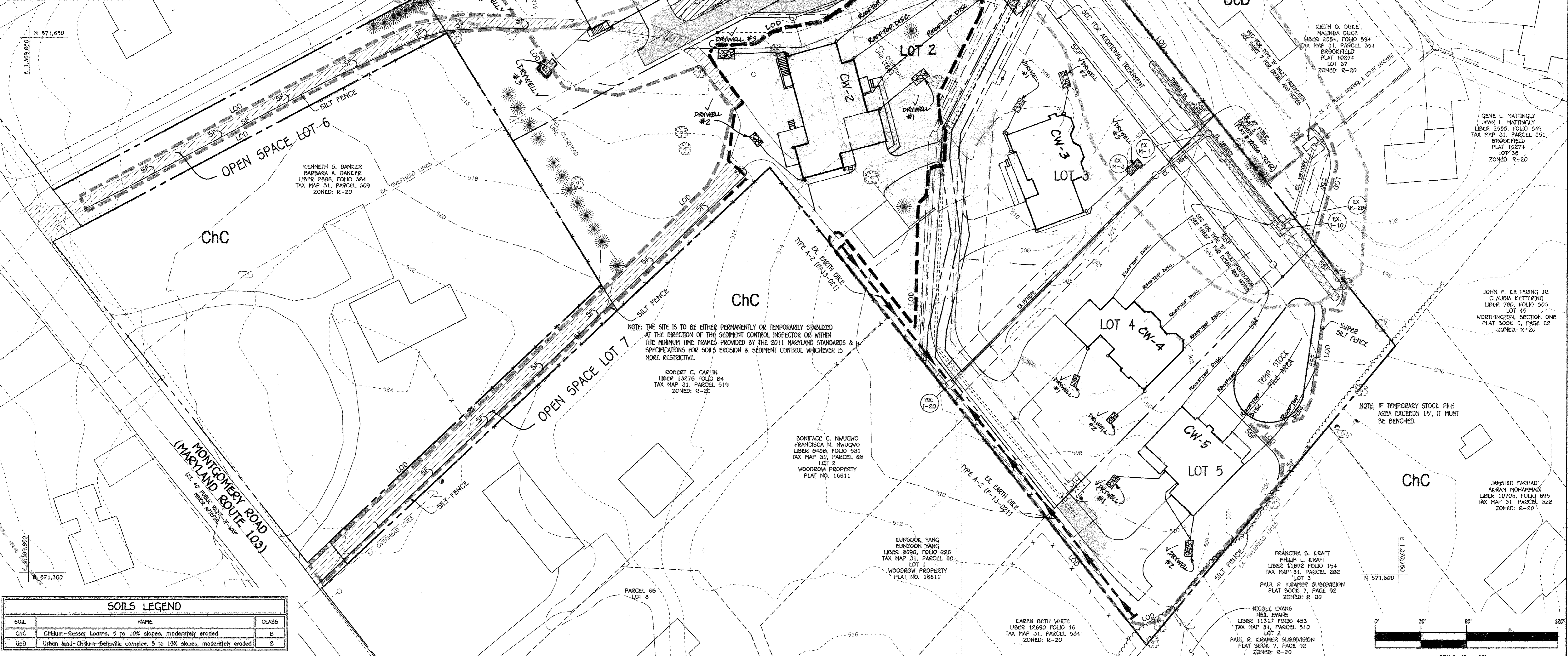
**CLEARWATER CROSSING  
 LOTS 1 THRU 5 &  
 OPEN SPACE LOTS 6 & 7**

ZONED R-20 TAX MAP NO.: 31 GRID NO.: 8  
 PARCEL NO.: 593  
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 SCALE: AS SHOWN DATE: OCTOBER, 2013  
 SHEET 2 OF 7





SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
---	SILT FENCE
---	SUPER SILT FENCE
---	LINE OF DISTURBANCE
---	EXISTING FENCE LINE
---	EX. LINE OF TREES AND FOREST
---	PROPOSED LANDSCAPING
---	EXISTING TREES
---	EXISTING GRAVEL AREA TO BE REMOVED
---	PROPOSED PFA GRAVEL
---	EXISTING GRAVEL
---	EXISTING CONCRETE WALK
---	PROPOSED CONCRETE WALK
---	EXISTING DRIVEWAY TO BE REMOVED
---	DISCONNECTION IMPERVIOUS AREA
---	DISCONNECTION RECEIVING AREA
---	DRAINAGE AREA
---	ACCESS EASEMENT
---	PUBLIC STORMDRAIN EASEMENT
---	PRIVATE STORMDRAIN EASEMENT
---	TREE PLANT EASEMENT



SOIL	NAME	CLASS
ChC	Chillum-Russet Loams, 5 to 10% slopes, moderately eroded	B
UcD	Urban land-Chillum-Beltville complex, 5 to 15% slopes, moderately eroded	B

**FISHER, COLLINS & CARTER, INC.**  
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
 CENTENNIAL SQUARE OFFICE PARK - 10275 BALTIMORE NATIONAL PIKE  
 ELLETTT CITY, MARYLAND 21042  
 (410) 461-2895

NO.	REVISION	DATE
0	REV. CIVIL DESIGN TERRITORY DEVELOPMENT NUMBER LOT 1 TO 10000000	1/10/17
1	REV. LOT 1 TO CW-1 HOUSETYPE, GRADING, & SWM	5/24/16
2	REV. LOT 2 TO NEW CW-2 HOUSETYPE, GRADING, & SWM	1/11/16
3	REV. LOT 5 TO CW-5 HOUSETYPE & ASSOC. SWM	11/19/15
4	REV. LOT 2 TO CW-2 HOUSETYPE & ASSOC. GRADING & SWM	9/29/15
1	REV. LOTS 3 & 4 TO CW-3 & CW-4 HOUSETYPES, ASSOC. GRADING, & SWM	3/20/15

**ENGINEER'S CERTIFICATE**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND THAT I AM A QUALIFIED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 20748, EXPIRATION DATE 2-22-15."

*John K. Robertson*  
 DATE: 10-16-13

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

*B. James Greenfield*  
 DATE: 11-16-13

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

*John K. Robertson*  
 DATE: 10/24/13

**OWNER/DEVELOPER**  
 COLUMBIA BUILDERS GROUP, LLC  
 B. JAMES GREENFIELD  
 6420 AUTUMN SKY WAY  
 COLUMBIA, MD 21044  
 443-324-4732

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*John K. Robertson*  
 DATE: 11-04-13

*John K. Robertson*  
 DATE: 10-28-13

*Paul R. Kramer*  
 DATE: 11/4/13

PROJECT	SECTION	LOT NO.
CLEARWATER CROSSING		1 THRU 5
PARCEL 593		

PLAT	BLOCK NO.	ZONE	TAX/ZONE	ELEC. DIST.	CENSUS TR.
22560-22562	8	R-20	31	SECOND	6027

ECP-12-052, WP-12-156  
 F-13-021, GP-14-008

**SEDIMENT & EROSION CONTROL LIMITS OF DISTURBANCE & SOILS PLAN**

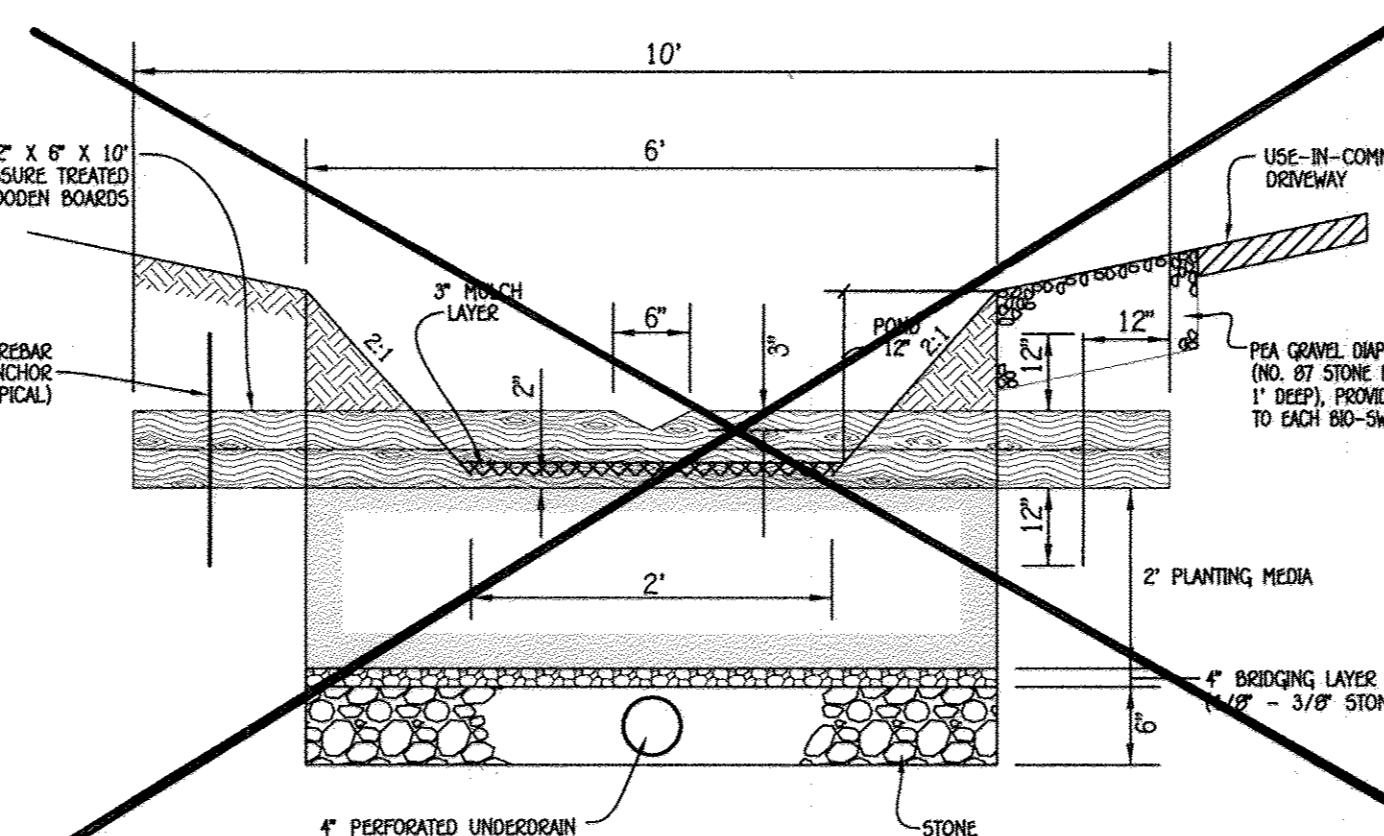
**CLEARWATER CROSSING**  
 LOTS 1 THRU 5 &  
 OPEN SPACE LOTS 6 & 7  
 ZONED R-20 TAX MAP NO.: 31 GRID NO.: 8  
 PARCEL NO.: 593  
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 SCALE: AS SHOWN DATE: OCTOBER, 2013  
 SHEET 3 OF 7



**SOIL BORING SUMMARY**

Soil Boring was performed on August 3, 2012 in the location of the proposed Bio-retention facilities at the Clearwater Crossing site. Attendees included Mr. Brandon Ripple of Fisher Collins and Carter Inc. and Mr. Ron Tash of Columbia Builders Group.

- The existing elevations of Boring #1 is approximately 512.14 and the proposed elevation will be approximately 513.00. There was no rock or water encountered in the excavation. The proposed facility in this area is approximately 3.5 in depth.
- The existing elevations of Boring #2 is approximately 508.19 and the proposed elevation will be approximately 507.50. There was no rock or water encountered in the excavation. The proposed facility in this area is approximately 3.5 in depth.
- The existing elevations of Boring #3 is approximately 509.40 and the proposed elevation will be approximately 509.75. There was no rock or water encountered in the excavation. The proposed facility in this area is approximately 3.5 in depth.
- The existing elevations of Boring #4 is approximately 505.32 and the proposed elevation will be approximately 504.00. There was no rock or water encountered in the excavation. The proposed facility in this area is approximately 3.5 in depth.
- The existing elevations of Boring #5 is approximately 505.37 and the proposed elevation will be approximately 505.00. There was no rock or water encountered in the excavation. The proposed facility in this area is approximately 5.0 in depth.
- The existing elevations of Boring #6 is approximately 503.73 and the proposed elevation will be approximately 509.46. There was no rock or water encountered in the excavation. The proposed facility in this area is approximately 5.0 in depth.
- The existing elevations of Boring #7 is approximately 507.71 and the proposed elevation will be approximately 510.50. There was no rock or water encountered in the excavation. The proposed facility in this area is approximately 5.0 in depth.



**BIO-SWALE (M-2) & WOODEN CHUCK ON DETAIL**

SECTION "A-A" NOT TO SCALE

BORING NO.	NORTHING	EASTING	DEPTH	REMARKS
1	57164.25	137023.00	10.5 FT.	NO GROUNDWATER OR ROCK ENCOUNTERED
2	57171.06	137030.90	11 FT.	NO GROUNDWATER OR ROCK ENCOUNTERED
3	57175.38	137049.13	10 FT.	NO GROUNDWATER OR ROCK ENCOUNTERED
4	57170.70	137049.91	11 FT.	NO GROUNDWATER OR ROCK ENCOUNTERED
5	57166.07	137052.34	10 FT.	NO GROUNDWATER OR ROCK ENCOUNTERED
6	57148.42	137054.80	10.7 FT.	NO GROUNDWATER OR ROCK ENCOUNTERED
7	57138.50	137058.72	10.5 FT.	NO GROUNDWATER OR ROCK ENCOUNTERED

**B.4.C Specifications for Micro-Bioretenion. Rain Gardens, Landscape Infiltration & Infiltration Berms**

- Material Specifications**  
The allowable materials to be used in these practices are detailed in Table B.4.1.
- Filtering Media or Planting Soil**  
The soil shall be a uniform mix, free of stones, spines, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the micro-bioretenion practice that may be harmful to growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05. The planting soil shall be tested and shall meet the following criteria:  
Soil Component - Loamy Sand or Sandy Loam (USDA Soil Textural Classification)  
Organic Content - Minimum 10% by dry weight (ASTM D 2974). In general, this can be met with a mixture of loamy 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 into the soil to increase or decrease pH.
- Compaction**  
It is very important to minimize compaction of both the base of bioretention practices and the required backfill. When possible, use excavation hoers to remove original soil. If practices

**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" x 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, fertilizers, 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 (ASTM F 758, Type P5 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or HDPE).  
Perforations - If perforated pipe is used, perforations should be 1/2" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/2" (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 1,000 square feet) to provide a clean-out port and monitor performance of the filter.  
A 4" layer of pea gravel (1/2" to 3/4" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

**7. Miscellaneous**

These practices may not be constructed until all contributing drainage area has been stabilized

**INFILTRATION AND FILTER SYSTEM CONSTRUCTION**

INFILTRATION AND FILTER SYSTEMS EITHER TAKE ADVANTAGE OF EXISTING PERMEABLE SOILS OR CREATE A PERMEABLE MEDIUM SUCH AS SAND FOR FLOW. AND RE VE IN SOME INSTANCES WHERE PERMEABILITY IS GREAT, THESE FACILITIES MAY BE USED FOR QP AS WELL. THE MOST COMMON SYSTEMS INCLUDE INFILTRATION TRENCHES, INFILTRATION BASINS, SAND FILTERS, AND ORGANIC FILTERS.  
WHEN PROPERLY PLANTED, VEGETATION WILL THRIVE AND ENHANCE THE FUNCTIONING OF THESE SYSTEMS. FOR EXAMPLE, PRE-TREATMENT BUFFERS WILL TRAP SEDIMENTS THAT OFTEN ACCUMULATE WITH PHOSPHORUS AND METALS. VEGETATION PLANTED IN THE FACILITY WILL AID IN NUTRIENT UPTAKE AND WATER STORAGE. ADDITIONALLY, PLANT ROOTS WILL PROVIDE AERATION FOR STORMWATER TO PERMEATE SOIL FOR GROUNDWATER RECHARGE. FINALLY, SUCCESSFUL PLANTINGS PROVIDE AESTHETIC VALUE AND WILDLIFE HABITAT MAKING THESE FACILITIES MORE DESIRABLE TO THE PUBLIC.

**DESIGN CONSTRAINTS:**

- PLANTING BUFFER STRIPS OF AT LEAST 20 FEET WILL CAUSE SEDIMENTS TO SETTLE OUT BEFORE REACHING THE FACILITY, THEREBY REDUCING THE POSSIBILITY OF CLOGGING.
- DETERMINE AREAS THAT WILL BE SATURATED WITH WATER AND WATER TABLE DEPTH SO THAT APPROPRIATE PLANTS MAY BE SELECTED (HYDROLOGY WILL BE SIMILAR TO BIORETENTION FACILITIES). SEE FIGURE A.5 AND TABLE A.4 FOR PLANTING MATERIAL GUIDANCE.
- PLANTS KNOWN TO SEND DOWN DEEP TAPROOTS SHOULD BE AVOIDED IN SYSTEMS WHERE FILTER FABRIC IS USED AS PART OF FACILITY DESIGN.
- TEST SOIL CONDITIONS TO DETERMINE IF SOIL AMENDMENTS ARE NECESSARY.
- PLANTS SHALL BE LOCATED SO THAT ACCESS IS POSSIBLE FOR STRUCTURE MAINTENANCE.
- STABILIZE HEAVY FLOW AREAS WITH EROSION CONTROL MATS OR SOIL.
- TEMPORARILY DIVERT FLOWS FROM SEEDING AREAS UNTIL VEGETATION IS ESTABLISHED.
- SEE TABLE A.5 FOR ADDITIONAL DESIGN CONSIDERATIONS.

**BIO-RETENTION SOIL BED CHARACTERISTICS**

THE CHARACTERISTICS OF THE SOIL FOR THE BIORETENTION FACILITY ARE AS IMPORTANT AS THE FACILITY LOCATION, SIZE, AND TREATMENT VOLUME. THE SOIL MUST BE PERMEABLE ENOUGH TO ALLOW RUNOFF TO FILTER THROUGH THE MEDIA, WHILE HAVING CHARACTERISTICS SUITABLE TO PROMOTE AND SUSTAIN A ROBUST VEGETATIVE COVER CROP. IN ADDITION, MUCH OF THE NUTRIENT POLLUTANT UPTAKE (NITROGEN AND PHOSPHORUS) IS ACCOMPLISHED THROUGH ABSORPTION AND MICROBIAL ACTIVITY WITHIN THE SOIL PROFILE. THEREFORE, SOILS MUST BALANCE THEIR CHEMICAL AND PHYSICAL PROPERTIES TO SUPPORT BIOTIC COMMUNITIES ABOVE AND BELOW GROUND.

THE PLANTING SOIL SHOULD BE A SANDY LOAM, LOAMY SAND, LOAM (USDA), OR A LOAM/SAND MIX (WHICH CONTAIN A MINIMUM 35 TO 60% SAND, BY VOLUME). THE CLAY CONTENT FOR THESE SOILS SHOULD BE LESS THAN 25% BY VOLUME (ENVIRONMENTAL QUALITY RESOURCES (EQRS), 1996; ENGINEERING TECHNOLOGY INC. AND BIOHARTS, INC. (ETAB), 1993). SOILS SHOULD FALL WITHIN THE SM, ML, SC CLASSIFICATIONS OR THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS). A PERMEABILITY OF AT LEAST 1.0 FEET PER DAY (0.5" HR) IS REQUIRED (A CONSERVATIVE VALUE OF 0.5 FEET PER DAY IS USED FOR DESIGN). THE SOIL SHOULD BE FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 1" IN DIAMETER. BRUSH OR SEEDS FROM NOXIOUS WEEDS (E.G., JOHNSON GRASS, MUGWORT, NUTSEDGE, AND CANADA THISTLE OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05) SHOULD NOT BE PRESENT IN THE SOILS. PLACEMENT OF THE PLANTING SOIL SHOULD BE IN 12 TO 18 LIFTS THAT ARE LOOSELY COMPACTED (TAMPED LIGHTLY WITH A BACKHOE BUCKET OR TRAVELERS BY DOZER TRACKS). THE SPECIFIC CHARACTERISTICS ARE PRESENTED IN TABLE A.3.

PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0% (BY WEIGHT)
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (PHOSPHATE - P2O5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (POTASH - K2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	500 PPM
CLAY	10 TO 25 %
SILT	30 TO 55 %
SAND	35 TO 60%

**TABLE A.3 PLANTING SOIL CHARACTERISTICS**

PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0% (BY WEIGHT)
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (PHOSPHATE - P2O5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (POTASH - K2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	500 PPM
CLAY	10 TO 25 %
SILT	30 TO 55 %
SAND	35 TO 60%

**MULCH LAYER**

THE MULCH LAYER PLAYS AN IMPORTANT ROLE IN THE PERFORMANCE OF THE BIORETENTION SYSTEM. THE MULCH LAYER HELPS MAINTAIN SOIL MOISTURE AND AVOIDS SURFACE SEALING, WHICH REDUCES PERMEABILITY. MULCH HELPS PREVENT EROSION, AND PROVIDES A MICROENVIRONMENT SUITABLE FOR SOIL BIOTA AT THE MULCH/SOIL INTERFACE. IT ALSO SERVES AS A PRETREATMENT LAYER, TRAPPING THE FINER SEDIMENTS, WHICH REMAIN SUSPENDED AFTER THE PRIMARY PRETREATMENT.

THE MULCH LAYER SHOULD BE STANDARD LANDSCAPE STYLE, SINGLE OR DOUBLE SHREDDED HARDWOOD MULCH OR CHIPS. THE MULCH LAYER SHOULD BE WELL AGED (STOCKPILED OR STORED FOR AT LEAST 12 MONTHS), UNIFORM IN COLOR, AND FREE OF OTHER MATERIALS, SUCH AS WEED SEEDS, SOIL, ROOTS, ETC. THE MULCH SHOULD BE APPLIED TO A MAXIMUM DEPTH OF THREE INCHES. GRASS CLIPPINGS SHOULD NOT BE USED AS A MULCH MATERIAL.

**PLANTING GUIDANCE**

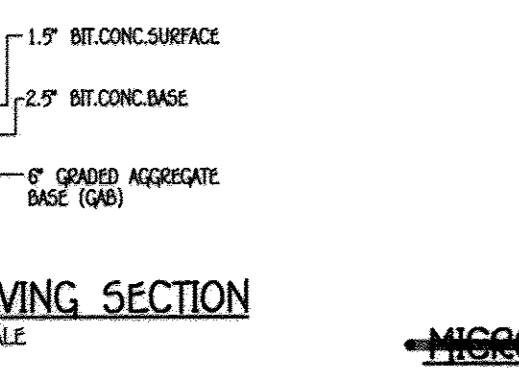
PLANT MATERIAL SELECTION SHOULD BE BASED ON THE GOAL OF SIMULATING A TERRESTRIAL FORESTED COMMUNITY OF NATIVE SPECIES. BIORETENTION SIMULATES AN UPLAND-SPECIES ECOSYSTEM. THE COMMUNITY SHOULD BE DOMINATED BY TREES, BUT HAVE A DISTINGUISHED COMMUNITY OF UNDERSTORY TREES, SHRUBS AND HERBACEOUS MATERIALS. BY CREATING DIVERSE, DENSE PLANT COVER, A BIORETENTION FACILITY WILL BE ABLE TO TREAT STORMWATER RUNOFF AND WITHSTAND URBAN STRESSES FROM INSECTS, DISEASE, DROUGHT, TEMPERATURE, WIND, AND EXPOSURE. THE PROPER SELECTION AND INSTALLATION OF PLANT MATERIALS IS KEY TO A SUCCESSFUL SYSTEM. ARE ESSENTIALLY THREE ZONES WITHIN A BIORETENTION FACILITY (FIGURE A.5). THE LOWEST ELEVATION SUPPORTS PLANT SPECIES ADAPTED TO STANDING AND FLUCTUATING WATER LEVELS. THE MIDDLE ELEVATION SUPPORTS PLANTS THAT LIKE DRIER SOIL CONDITIONS, BUT CAN STILL TOLERATE OCCASIONAL INUNDATION BY WATER. THE OUTER EDGE IS THE HIGHEST ELEVATION AND GENERALLY SUPPORTS PLANTS ADAPTED TO DRIER CONDITIONS. A SAMPLE OF APPROPRIATE PLANT MATERIALS FOR BIORETENTION FACILITIES ARE INCLUDED IN TABLE A.4. THE LAYOUT OF PLANT MATERIAL SHOULD BE FLEXIBLE, BUT SHOULD FOLLOW THE GENERAL PRINCIPALS DESCRIBED IN TABLE A.5. THE OBJECTIVE IS TO HAVE A SYSTEM, WHICH RESEMBLES A RANDOM, AND NATURAL PLANT LAYOUT, WHILE MAINTAINING OPTIMAL CONDITIONS FOR PLANT ESTABLISHMENT AND GROWTH. FOR A MORE EXTENSIVE BIORETENTION PLAN, CONSULT ETAB, 1993 OR CLAYTON AND SCHUELER, 1997.

**OPERATION & MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6) AND BIORETENTION SWALE (M-8)**

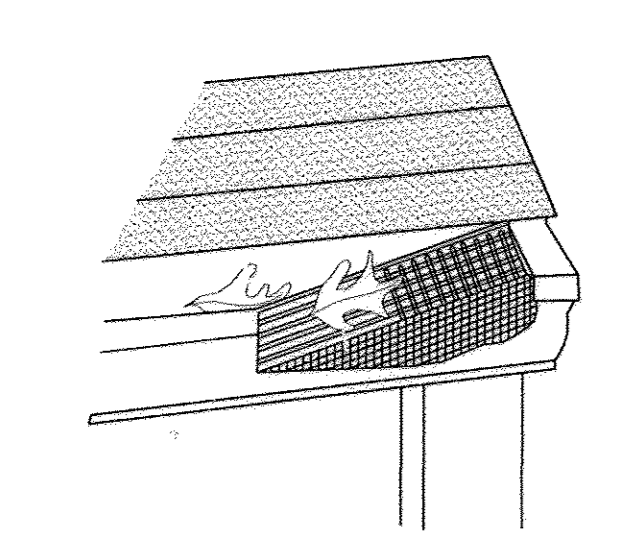
- THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYERS ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO COLLECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.
- 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.
- THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

AS-BUILT CERTIFICATION FOR PSWMM  
 Note: There is no "AS BUILT" information provided on this sheet.  
  
 CHARLES J. CRONIN, JR. NO. 192604 Date: 10/17/13  
 SCALE: 1" = 30'

**DRY WELL DETAIL (M-5)**



**P-1 DRIVEWAY PAVING SECTION**



**GUTTER DRAIN FILTER DETAIL**

NOT TO SCALE

**STORMWATER MANAGEMENT NOTES**

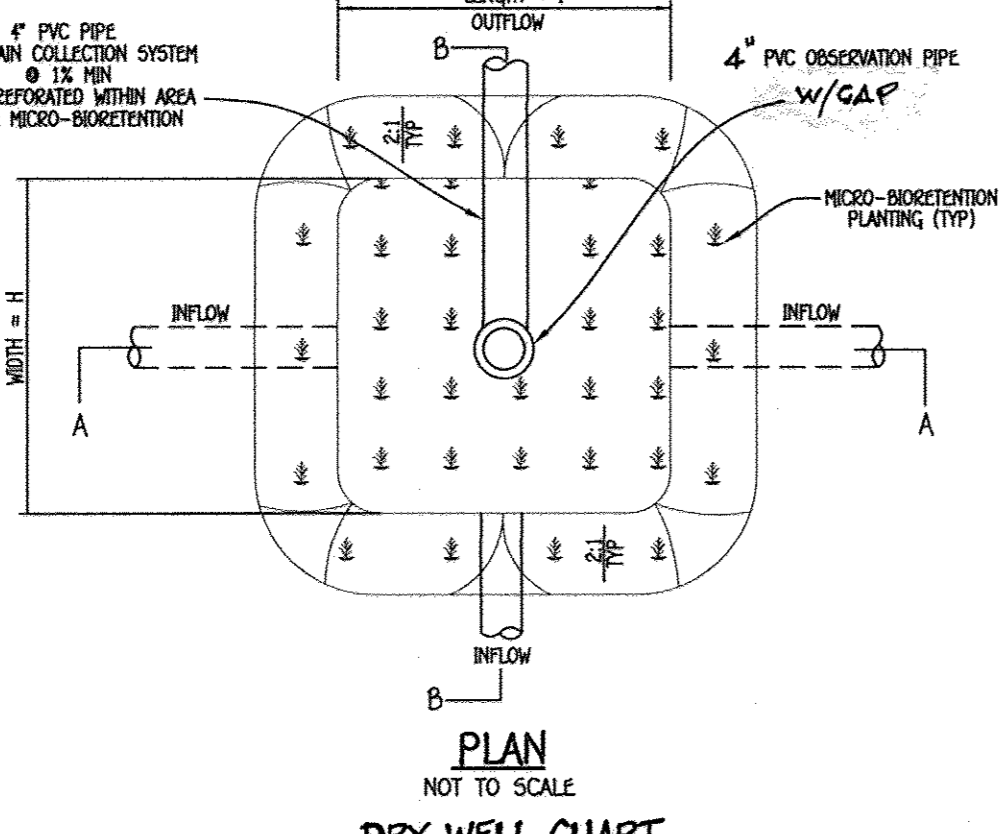
- STORMWATER MANAGEMENT IS PROVIDED IN ACCORDANCE WITH CHAPTER 5, "ENVIRONMENTAL SITE DESIGN" OF THE 2007 MARYLAND STORMWATER MANAGEMENT DESIGN MANUAL, EFFECTIVE MAY 4, 2010.
- MAXIMUM CONTRIBUTING ROOF TOP AREA TO EACH DOWNSPOUT SHALL BE 1,000 SQ. FT. OR LESS.
- DOWNSPOUTS SHALL BE PROVIDED AT LOCATIONS WHERE THE LENGTH OF DISCONNECTION IS LESS THAN 75' AT 5% THE SIZE AND CONSTRUCTION OF THE DOWNSPOUT SHALL BE IN ACCORDANCE WITH THE DETAIL SHOWN ON THIS SHEET.
- FINAL GRADING IS SHOWN ON THIS SITE DEVELOPMENT PLAN.

**OPERATION & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DRY WELLS (M-5)**

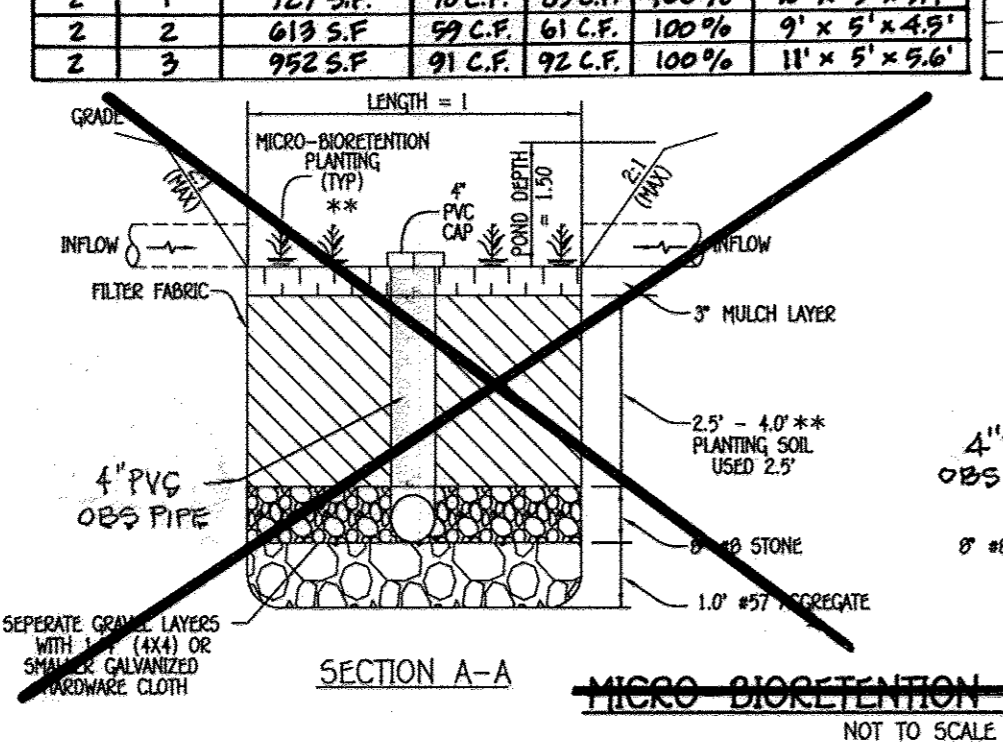
- THE OWNER SHALL INSPECT THE MONITORING WELLS AND STRUCTURES ON A QUARTERLY BASIS AND AFTER EVERY HEAVY STORM EVENT.
- THE OWNER SHALL RECORD THE WATER LEVELS AND SEDIMENT BUILD UP IN THE MONITORING WELLS ONCE A PERIOD OF SEVERAL DAYS TO ENSURE TRENCH DRAINAGE.
- THE OWNER SHALL MAINTAIN A LOG BOOK TO DETERMINE THE DATE AT WHICH THE FACILITY DRAINS.
- WHEN THE FACILITY BECOMES CLOGGED SO THAT IT DOES NOT DRAIN DOWN WITHIN A SEVENTY-TWO (72) HOUR PERIOD, CORRECTIVE ACTION SHALL BE TAKEN.
- THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION FACILITY HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

**DRY WELL CHART**

LOT NO.	DRYWELL NO.	AREA OF ROOF PER DOWNSPUT	VOLUME REQUIRED FOR TREATMENT	VOLUME PROVIDED	AREA OF TREATMENT	%	L x D x W
1	1	228 & 443 S.F.	64 C.F.	60 C.F.	9' x 5' x 5'	100%	
2	2	405 & 473 S.F.	86 C.F.	91 C.F.	11' x 5' x 5'	100%	
3	3	193 & 261 S.F.	51 C.F.	57 C.F.	11' x 5' x 5'	100%	
4	4	266 & 433 S.F.	67 C.F.	68 C.F.	9' x 5' x 4'	100%	
5	1	465 SQ. FT.	45 C.F.	48 C.F.	8' x 5' x 4'	100%	
5	2	220 & 210 SQ. FT.	41 C.F.	60 C.F.	8' x 5' x 5'	100%	
5	3	378 & 440 SQ. FT.	78 C.F.	83 C.F.	11' x 5' x 5'	100%	
8	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		
9	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		
10	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		
11	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		
12	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		
13	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		
14	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		
15	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		
16	500 SQ. FT.	45.52 C.F.	57.6 C.F.	100%	8' x 6' x 4'		



**DRY WELL CHART**



**SECTION A-A MICRO-BIORETENTION DETAIL (M-6)**

**STORMWATER MANAGEMENT SUMMARY CHART**

AREA = 3.32 ACRES  
 RCN = 95  
 TARGET PE = 1.2"

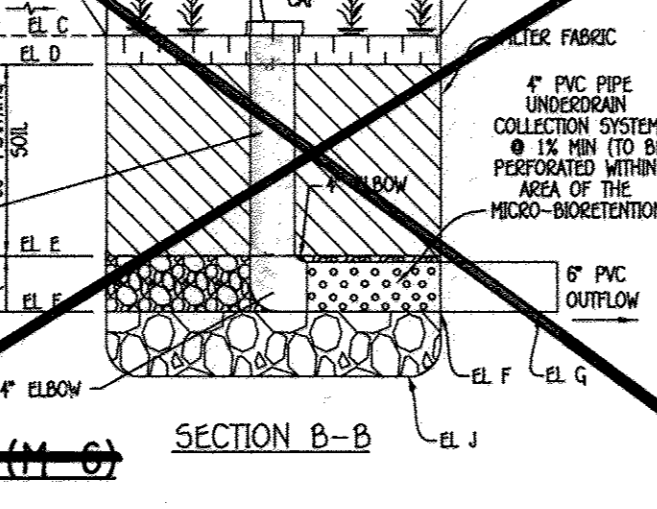
AREA ID	ESDV REQ. cu.ft.	ESDV PVD. cu.ft.	REMARKS
LOT 1	629.6	629	NON-ROOFTOP (M-2) DIS-CONNECTION, DRYWELLS (M-5)
LOT 2	474	482	NON-ROOFTOP DISCONNECTION (M-2)
LOT 3	426	435	DRY WELLS (M-5) & NON-ROOFTOP DISCONNECTION (M-2)
LOT 4	475	475	DRY WELLS (M-5) & ROOFTOP DISCONNECTION (M-1) & NON-ROOFTOP DISCONNECTION (M-2)
LOT 5	477	478	DRY WELLS (M-5), ROOFTOP DISCONNECTION (M-1) & NON-ROOFTOP DISCONNECTION (M-2)
TOTALS	3326	3720	

**CALCULATE THE PE PROVIDED AS FOLLOWS:**

PE PROVIDED =  $ESDV \times 12 = 3720 \times 12 = 58,560$   
 $R \times A = 0.23 \times (3.32 \text{ acres}) = 43,560$   
 AS SUCH, 112% (1.12/1.2) OF THE REQUIRED ESDV VOLUME HAS BEEN PROVIDED.

**LOT DRYWELL AREA OF ROOF PER DOWNSPUT REQUIRED PROVIDED TREATMENT**

LOT NO.	DRYWELL NO.	AREA OF ROOF PER DOWNSPUT	VOLUME REQUIRED FOR TREATMENT	VOLUME PROVIDED	AREA OF TREATMENT	%	L x D x W
1	1	228 & 443	64 C.F.	60 C.F.	9' x 5' x 5'	100%	
2	2	405 & 473	86 C.F.	91 C.F.	11' x 5' x 5'	100%	
3	3	193 & 261	51 C.F.	57 C.F.	11' x 5' x 5'	100%	
4	4	266 & 433	67 C.F.	68 C.F.	9' x 5' x 4'	100%	
5	1	465	45 C.F.	48 C.F.	8' x 5' x 4'	100%	
5	2	220 & 210	41 C.F.	60 C.F.	8' x 5' x 5'	100%	
5	3	378 & 440	78 C.F.	83 C.F.	11' x 5' x 5'	100%	



**SECTION B-B MICRO-BIORETENTION DETAIL (M-6)**

**DRY WELL CHART**

LOT NO.	DRYWELL NO.	AREA OF ROOF PER DOWNSPUT	VOLUME REQUIRED FOR TREATMENT	VOLUME PROVIDED	AREA OF TREATMENT	%	L x D x W
1	1	228 & 443	64 C.F.	60 C.F.	9' x 5' x 5'	100%	
2	2	405 & 473	86 C.F.	91 C.F.	11' x 5' x 5'	100%	
3	3	193 & 261	51 C.F.	57 C.F.	11' x 5' x 5'	100%	
4	4	266 & 433	67 C.F.	68 C.F.	9' x 5' x 4'	100%	
5	1	465	45 C.F.	48 C.F.	8' x 5' x 4'	100%	
5	2	220 & 210	41 C.F.	60 C.F.	8' x 5' x 5'	100%	
5	3	378 & 440	78 C.F.	83 C.F.	11' x 5' x 5'	100%	

**FISHER, COLLINS & CARTER, INC.**  
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
 CENTENNIAL SQUARE OFFICE PARK - 10272 BALDWIN NATIONAL PARK  
 ELICOTT CITY, MARYLAND 21042  
 (410) 461-2995

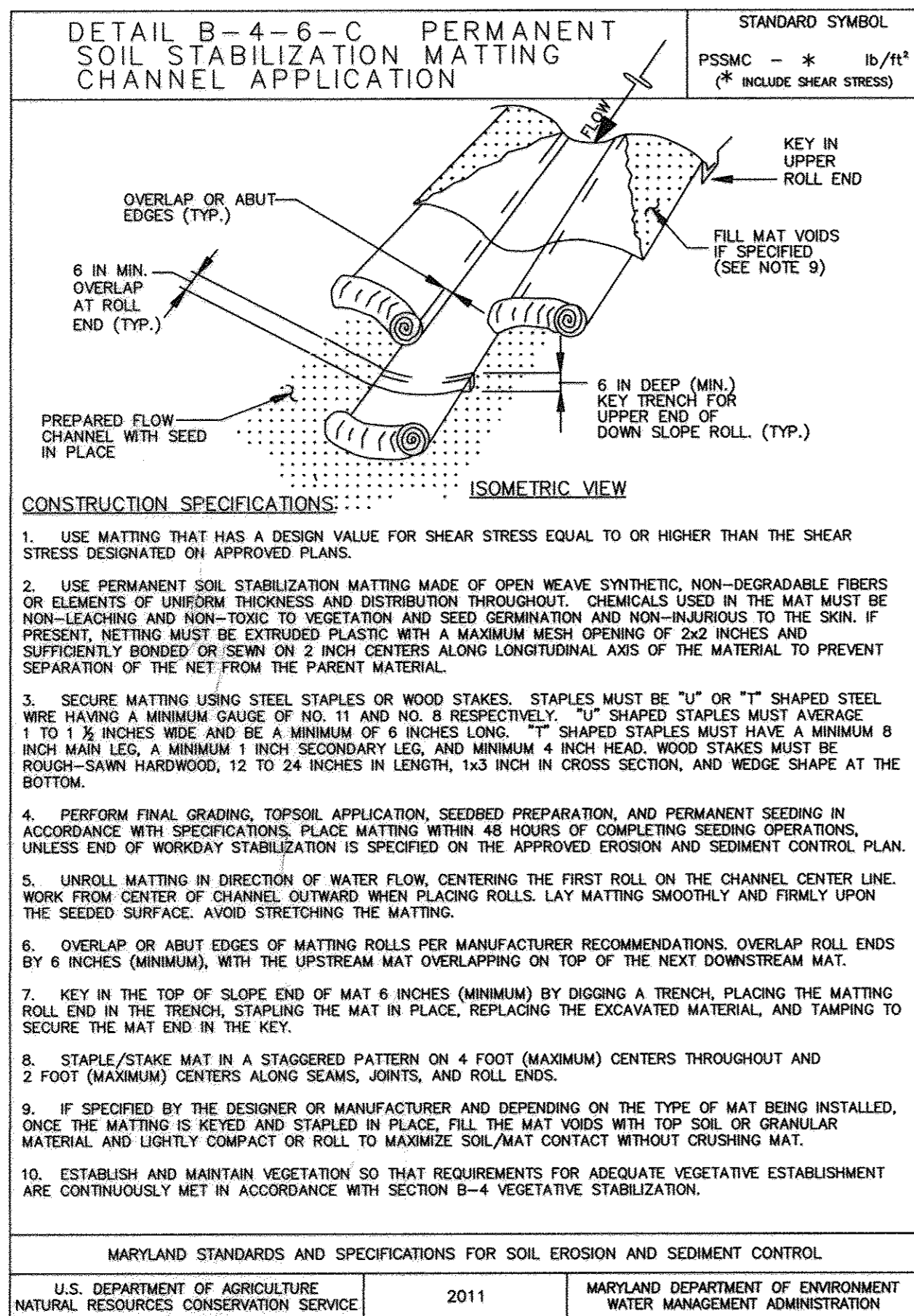
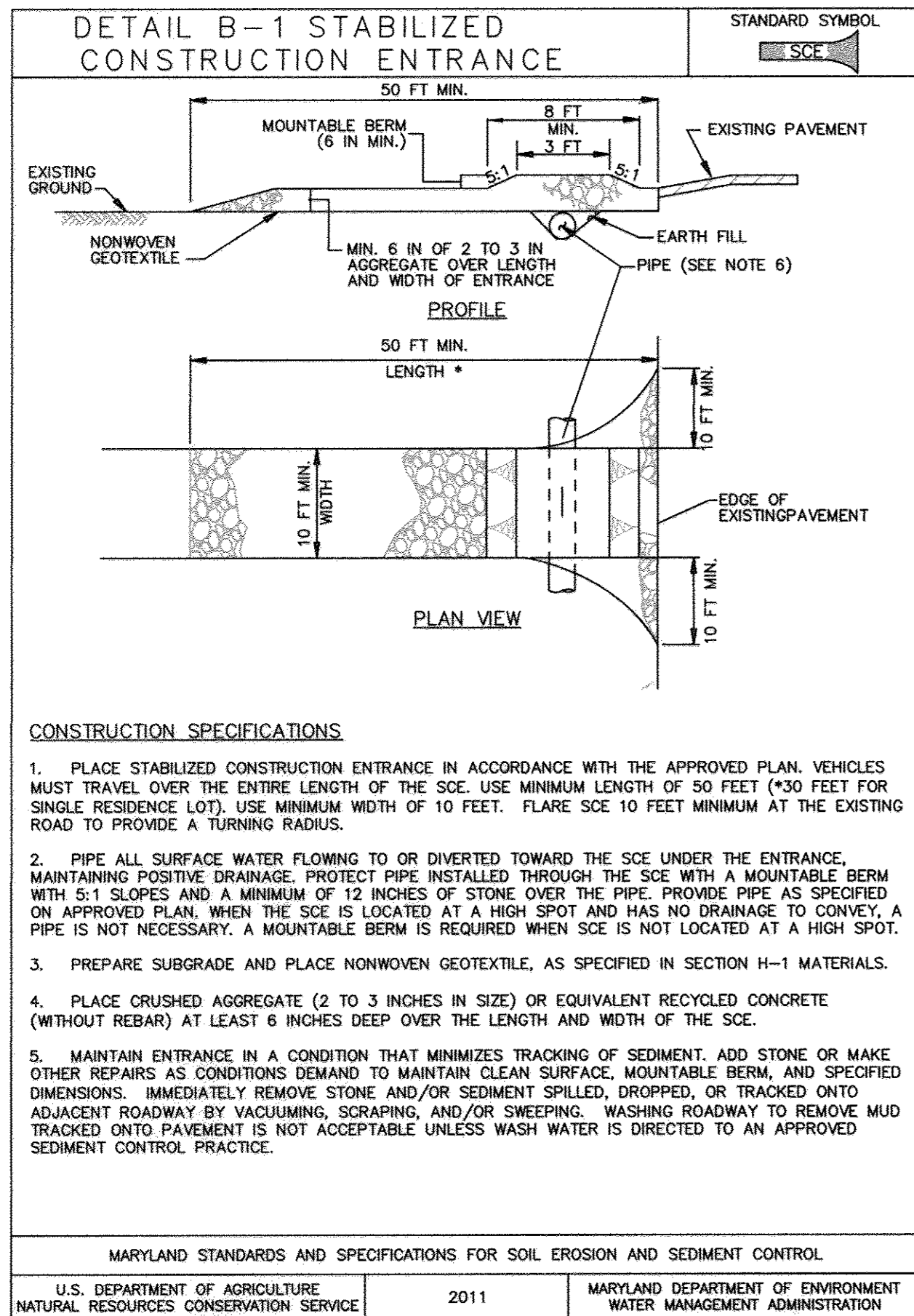
**PROFESSIONAL CERTIFICATION** I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 20748, EXPIRATION DATE 2-22-15.

NO.	REVISION	DATE
1	REV. SWM SUMMARY CHART	1/10/17
2	REV. LOT 1 TO COM-1 HARDWARE, GROUNDING, & SWM	5/14/18
3	REV. LOT 2 TO COM-2 HARDWARE, GROUNDING, & SWM	1/11/18
4	REV. SWM SUMMARY CHART & DRY WELL CHART FOR LOTS 3 & 4	3/22/19

**OWNER/DEVELOPER**  
 COLUMBIA BUILDERS GROUP, LLC  
 B. JAMES GREENFIELD  
 6425 FULTON RD, SUITE 107  
 COLUMBIA, MD 21044  
 443-324-4732

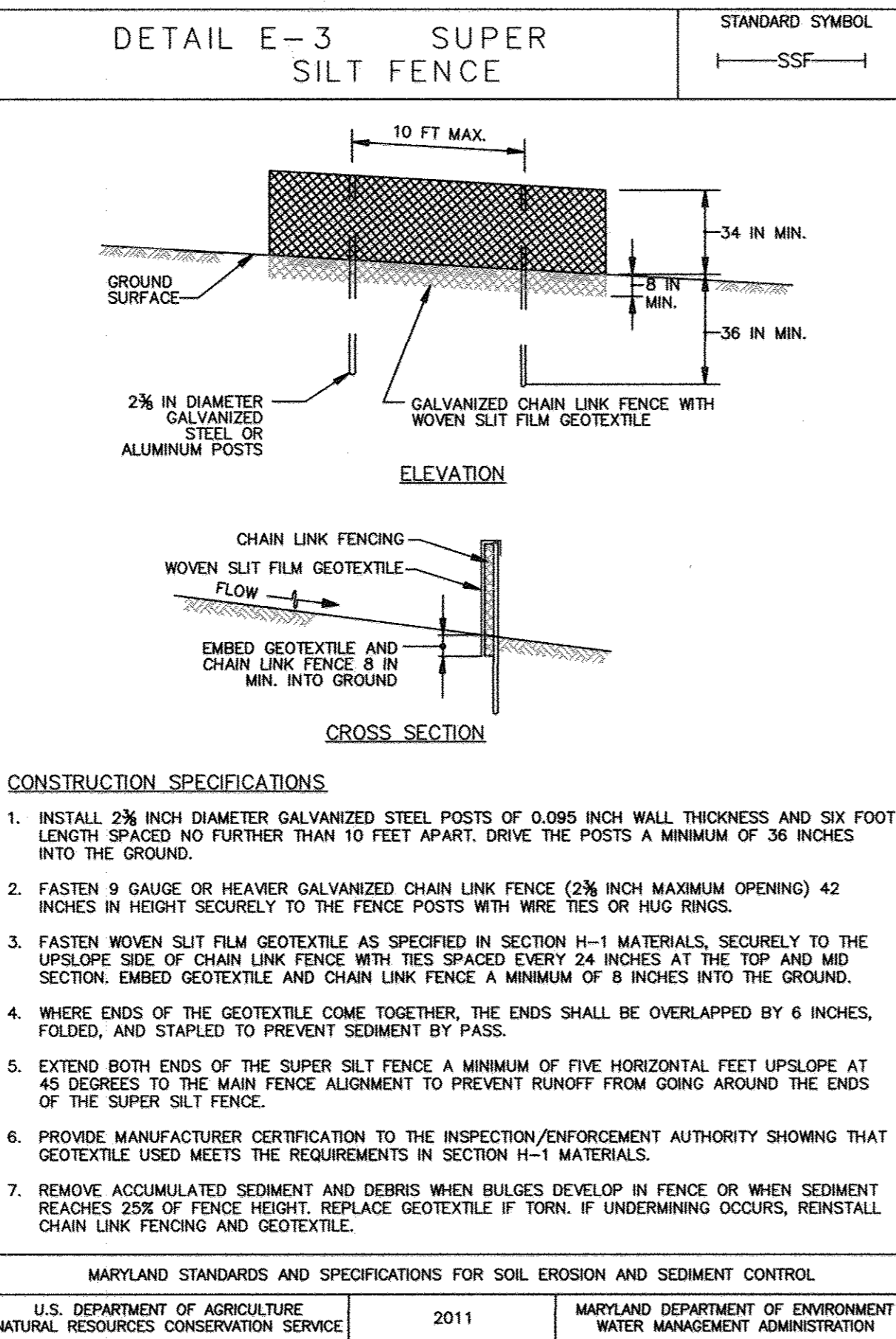
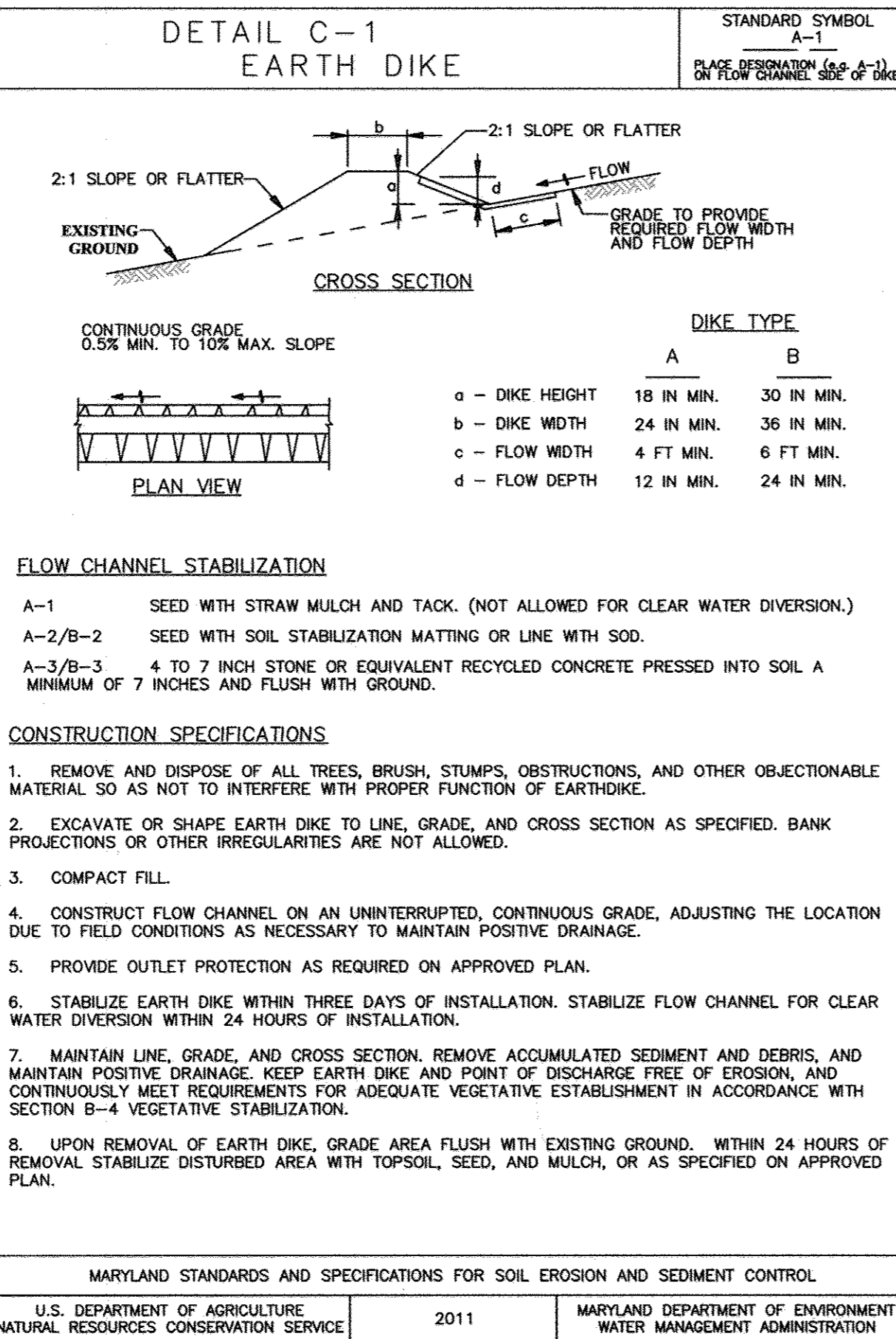
**APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING**  
 Chief, Division of Land Development:





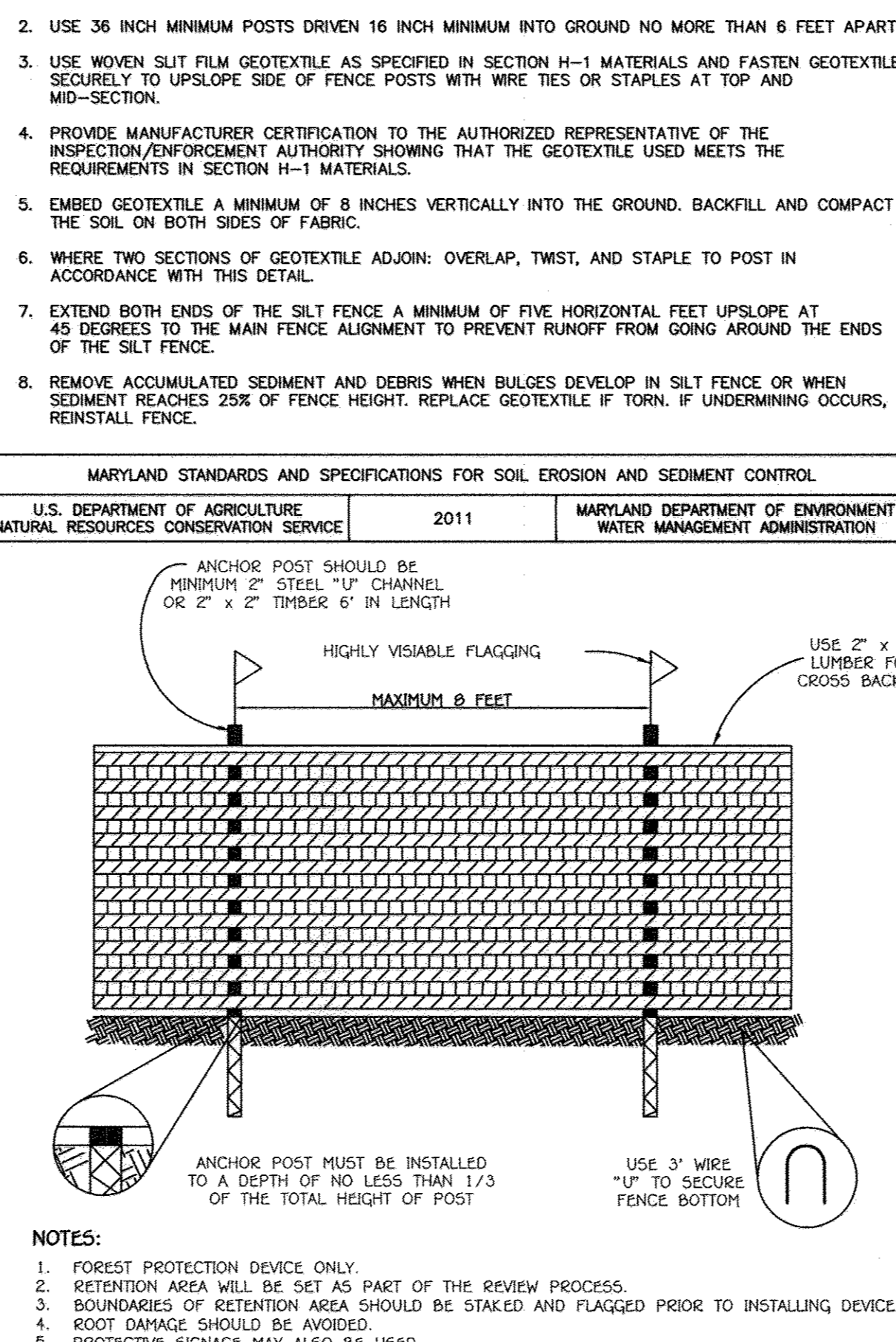
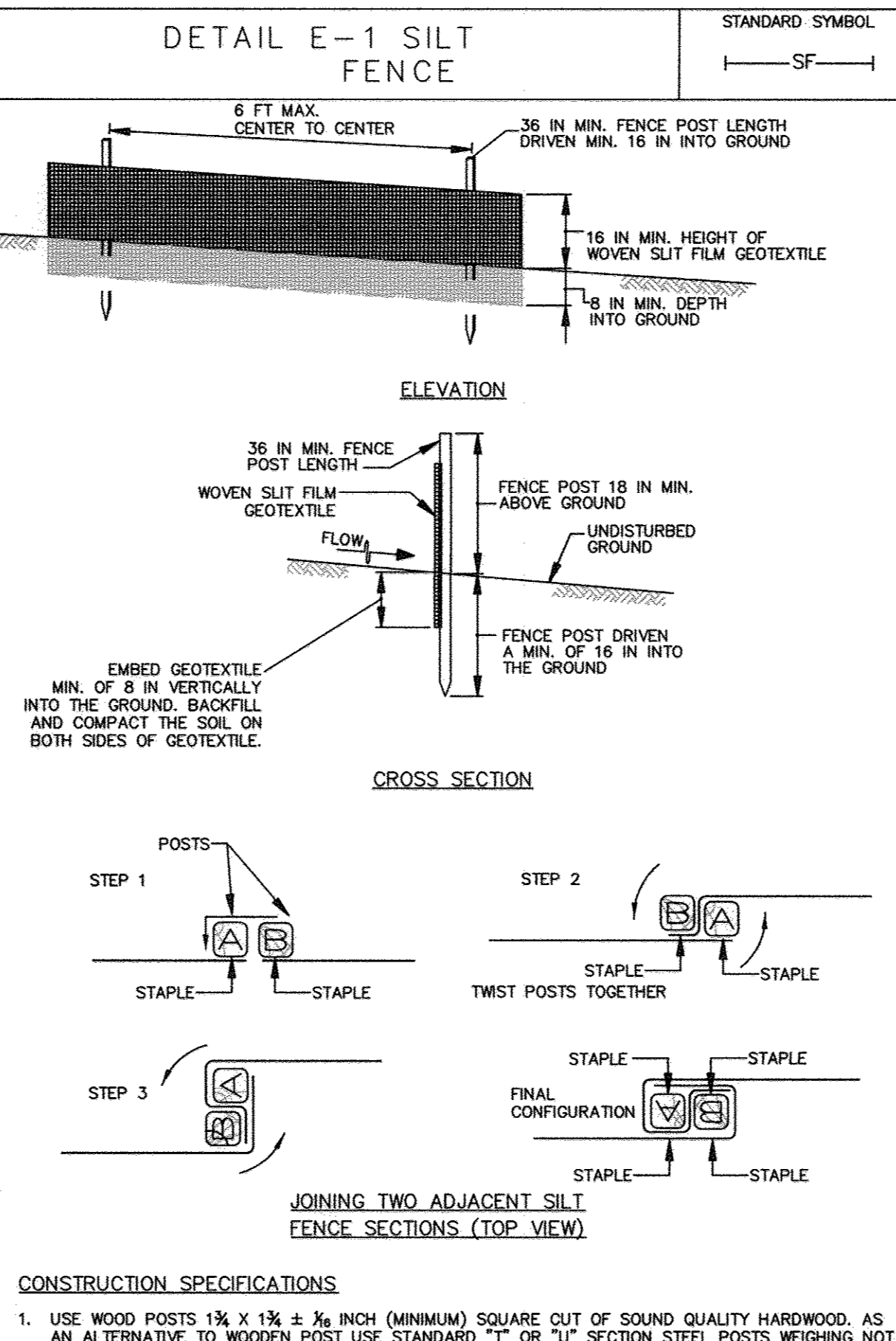
NO.	REVISION	DATE

**FISHER, COLLINS & CARTER, INC.**  
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS  
 NATIONAL SQUARE OFFICE PARK - 10272 BALDOR NATIONAL FEE  
 GLENNVIEW CITY, MARYLAND 21042  
 (410) 461 - 2995



**ENGINEER'S CERTIFICATE**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 20740, EXPIRATION DATE 2-22-15.

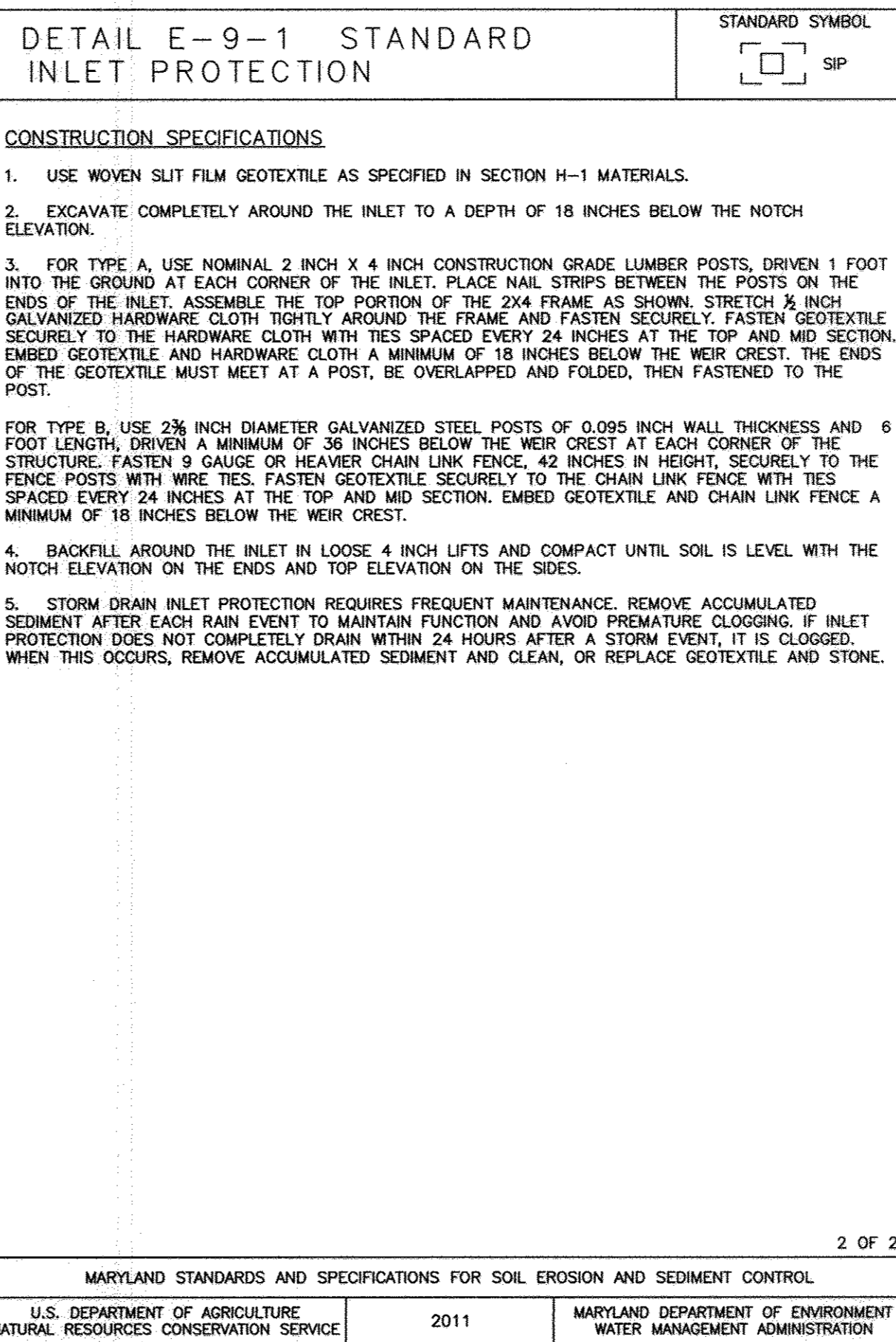
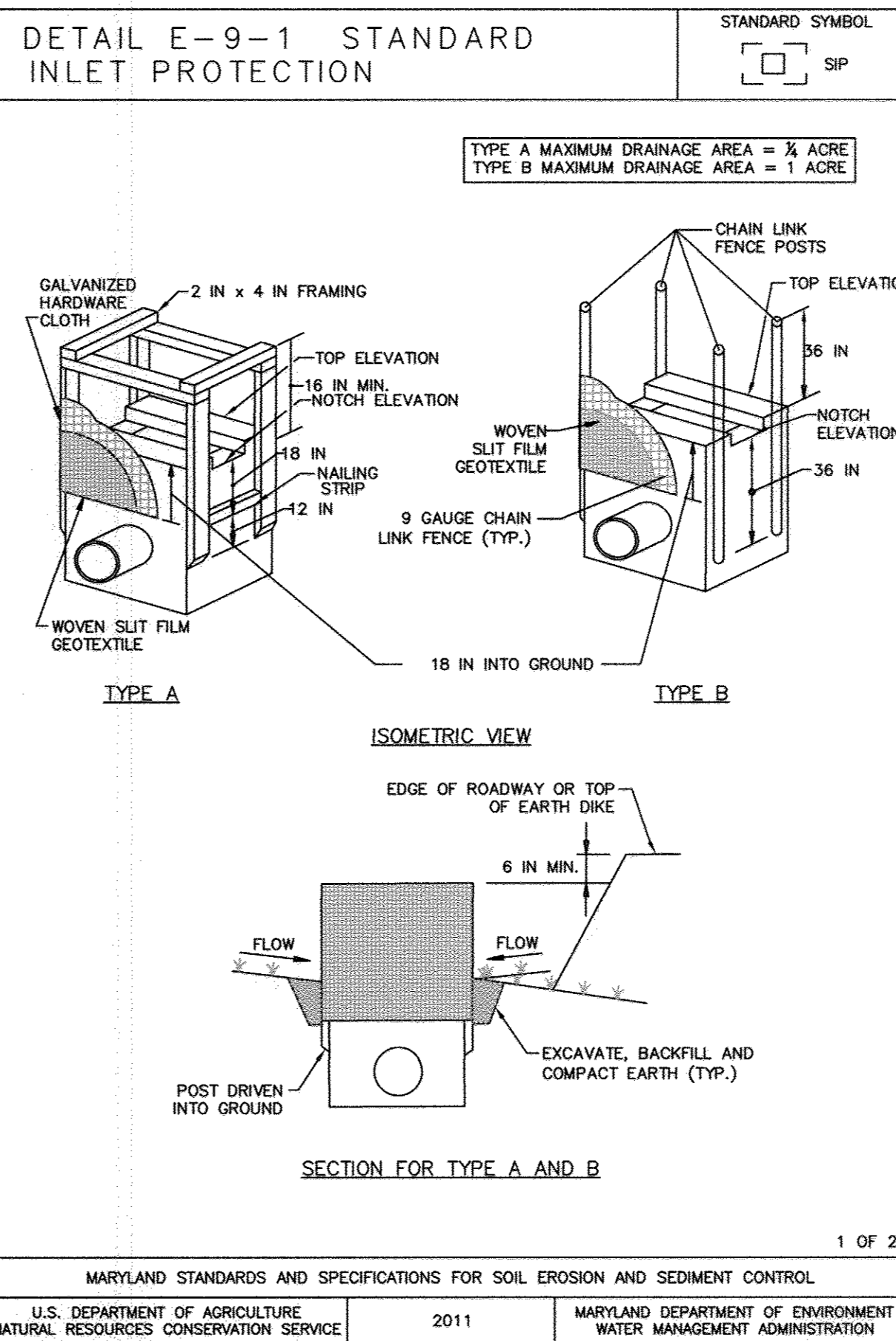
**DEVELOPER'S CERTIFICATE**  
 I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBILITY INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING 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.



**AS-BUILT CERTIFICATION FOR PSWM**  
 Note: There is no "AS BUILT" information provided on this sheet.

**APPROVED:** HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 Chief, Division of Land Development: 11-04-13  
 Chief, Development Engineering Division: 10-22-13  
 Director - Department of Planning and Zoning: 11/4/13

**OWNER/DEVELOPER**  
 COLUMBIA BUILDERS GROUP, LLC  
 6 JAMES GREENFIELD  
 6420 AUTUMN SKY WAY  
 COLUMBIA, MD 21044  
 443-324-4732



PLAT	BLOCK NO.	ZONE	TAX/ZONE	ELEC. DIST.	CENSUS TR.
22560-	8	R-20	31	SECOND	6027

## SEDIMENT & EROSION CONTROL DETAILS

### CLEARWATER CROSSING LOTS 1 THRU 5 & OPEN SPACE LOTS 6 & 7

ZONED R-20 TAX MAP NO.: 31 GRID NO.: 8  
 PARCEL NO.: 593  
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 SCALE: AS SHOWN DATE: OCTOBER, 2013  
 SHEET 5 OF 7

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

F:\2011\1040\dwg\546 13-075\1040.dwg, Plan Sheet 5, 10/16/2013, 10:27:37 AM







SYMBOL	DESCRIPTION
	EXISTING CONTOUR 2' INTERVAL
	PROPOSED CONTOUR 2' INTERVAL
	SILT FENCE
	SUPER SILT FENCE
	LINE OF DISTANCE
	EXISTING FENCE LINE
	EX. LINE OF TREES AND FOREST
	PROPOSED LANDSCAPING
	EXISTING TREES
	EXISTING GRAVEL AREA TO BE REMOVED
	PROPOSED PEA GRAVEL
	EXISTING GRAVEL
	EXISTING CONCRETE WALK
	PROPOSED CONCRETE WALK
	EXISTING DRIVEWAY TO BE REMOVED
	DISCONNECTION IMPERVIOUS AREA
	DISCONNECTION RECEIVING AREA
	DRIVEWAY AREA
	ACCESS EASEMENT
	PUBLIC STORMWATER EASEMENT
	PRIVATE STORMWATER EASEMENT
	TREE PLANT EASEMENT



STORM DRAINAGE AREAS						
SUB AREA (B)	ZONING	AREA (ac) (A)	AREA (sq mi) (A)	"C" FACTOR (C)	% IMPERVIOUS (P)	Tc (hr)
1	R-20	2.92	0.0046	0.39	20	0.08
2	R-20	0.64	0.0010	0.39	20	0.08
3	R-20	1.20	0.0019	0.39	20	0.08
4	R-20	0.10	0.0002	0.39	20	0.08

SOILS LEGEND		
SOIL	NAME	CLASS
ChC	Chillum-Russett Loams, 5 to 10% slopes, moderately eroded	B
UcD	Urban land-Chillum-Beltville complex, 5 to 15% slopes, moderately eroded	B

AS-BUILT CERTIFICATION FOR PSWM  
 Note: There is no "AS BUILT" information provided on this sheet.  
 Signature: Charles J. Okoro, No. 19204  
 Date: 6/6/17  
 Scale: 1" = 50'

NO.	REVISION	DATE

"PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 20748, EXPIRATION DATE 2-22-15."

**FISHER, COLLINS & CARTER, INC.**  
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 COLUMBIA, MD 21044  
 443-324-4732

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Division of Land Development	11-04-13
Chief, Development Engineering Division	10-28-13
Director - Department Planning and Zoning	11/14/13

PROJECT	SECTION	LOT NO.
CLEARWATER CROSSING		1 THRU 5
PLAT	BLOCK NO.	ZONE
22560-22562	8	R-20
TAX/ZONE	ELEC. DIST.	CENSUS TR.
31	SECOND	6027

ECP-12-092, WP-12-156  
 F-13-021, GP-14-008

**DRAINAGE AREA MAP**

**CLEARWATER CROSSING**  
 LOTS 1 THRU 5 &  
 OPEN SPACE LOTS 6 & 7  
 ZONED R-20 TAX MAP NO.: 31 GRID NO.: 8  
 PARCEL NO.: 593  
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND  
 SCALE: AS SHOWN DATE: OCTOBER, 2013  
 SHEET 7 OF 7