### GENERAL NOTES

1.) THIS PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED. 2.) THE SUBJECT PROPERTY IS ZONED R-ED PER THE 2-2-2004 COMPREHENSIZE ZONING PLAN AND THE "COMP LITE" ZONING AMENDMENTS EFFECTIVE 7-28-2006. 3.) COORDINATES BASED ON NAD '83, MARYLAND COORDINATE SYSTEM AS PROJECTED BY

HÓWARD COUNTY GEODETIC CONTROL STATIONS 31E6 AND 31E7. 4.) TRACT BOUNDARY IS BASED ON A FIELD RUN BOUNDARY SURVEY PERFORMED ON OR ABOUT MARCH, 2000 BY CENTURY ENGINEERING, INC. AND VERIFIED BY BENCHMARK ENGINEERING, INC. IN OCTOBER, 2010.

5.) THE EXISTING TOPOGRAPHY SHOWN IS BASED SDP-05-017, SDP-04-122 AND ON A FIELD SURVEY BY BENCHMARK ENGINEERING, INC. IN OCTOBER, 2010.

6.) A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.

7.) WETLAND DELINEATION WAS PROVIDED BY ECO-SCIENCE PROFESSIONALS IN JULY, 2004. 8.) AN APFO TRAFFIC STUDY IS NOT REQUIRED FOR THIS PROJECT AS IT IS LOCATED MORE THAN 1.5 MILES FROM THE NEAREST INTERSECTION OF TWO MAJOR COLLECTOR ROADWAYS.

9.) THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT. 10.) WATER IS PUBLIC. THE CONTRACT NUMBER IS 14-4290-D.

11.) SEWER IS PUBLIC. THE CONTRACT NUMBER IS 14-4290-D

12.) THIS SUBDIVISION IS SUBJECT TO SECTION 18.122B OF THE HOWARD COUNTY CODE. PUBLIC WATER AND/OR SEWER SERVICE SHALL BE GRANTED UNDER THE TERMS AND PROVISIONS OF DEVELOPER AGREEMENT #14-1490-D.

13.) THERE IS NO 100-YEAR FLOODPLAIN OR STEEP SLOPES LOCATED ON THIS SITE. 14.) TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERY LOCATIONS ON-SITE.

15.) THERE ARE NO HISTORIC SITES/FEATURES LOCATED ON THIS SITE.

16.) NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, OR THEIR REQUIRED BUFFERS OR FOREST CONSERVATION RETENTION AREAS.

17.) THE GEOTECHNICAL REPORT WAS PREPARED BY HILLIS-CARNES ENGINEERING ASSOCIATES, INC. DATED OCTOBER, 2004 AND APRIL, 2005.

18.) STORMWATER MANAGEMENT IS PROVIDED IN ACCORDANCE WITH THE 2000 MARLAND STÓRMWATER DESIGN MANUAL. THIS PROJECT MEETS THE CRITERIA OUTLINED IN THE MDE GUIDELINES TO GRANT AN ADMINISTRATIVE WAIVER. THIS PLAN RECEIVED PRELIMINARY APPROVAL (SP-05-017) ON 8-11-2006 AND FINAL PLAN APPROVAL (F-11-034) ON 3-30-2011. A GRADING PERMIT SHALL BE APPROVED PRIOR TO MAY 4, 2013. THIS PLAN IS ALSO SUBJECT TO THE EXPIRATION OF THIS WAIVER UNLESS STORMWATER PRACTICES ARE CONSTRUCTED BY MAY 4, 2017.

STORMWATER MANAGEMENT WQV IS BE PROVIDED BY A P-5 POCKET POND, SHEETFLOW TO BUFFER CREDIT, NON-ROOFTOP DISCONNECTION AND RAINGARDENS. REV SHALL BE PROVIDED BY SHEETFLOW TO BUFFER CREDIT, NON-ROOFTOP DISCONNECTION AND RAINGARDENS. CPV SHALL BE PROVIDED BY THE P-5 POCKET POND. THE P-5 POCKET POND SHALL BE PRIVATELY OWNED AND JOINTLY MAINTAINED. THE RAINGARDENS SHALL BE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

19.) LANDSCAPING IS PROVIDED IN ACCORANCE WITH A CERTIFIED LANDSCAPE PLAN INCLUDED IN THIS ROAD CONSTRUCTION PLAN SET IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$7,050.00 (\$4,800.00 FOR 16 SHADE TREES, \$1,650.00 FOR 11 EVERGREENS AND \$600.00 FOR 20 SHRUBS, FINANCIAL SURETY FOR THE REQUIRED STREET TREES SHALL BE INCLUDED IN THE COST ESTIMATE GENERATED BY HOWARD COUNTY DEVELOPMENT ENGINEERING DIVISION

20.) FOREST CONSERVATION FOR THIS SITE WAS PREVIOUSLY PROVIDED UNDER SDP-05-017. THE EASEMENTS WERE RECORDED AS PLAT NO. 17426-17427. HOWEVER, UNDER THIS PLAN THERE IS PROPOSED DISTURBANCE WITHIN EXISTING FOREST CONSERVATION EASEMENT #2 ON PARCEL 'A' OF OUR LADY OF PERPETUAL HELP, RECORDED AS PLAT 17427 AND EXISTING FOREST CONSERVATION EASEMENT #2 ON OPEN SPACE LOT 75 OF CASCADE OVERLOOK SECTION ONE, RECORDED AS PLAT 16657-59. THE DISTURBANCE AMOUNTS ARE 11.000 S.F. AND 1,258 S.F., RESPECTIVELY, FINANCIAL SURETY IN THE AMOUNT OF \$6,129.00 FOR THE TOTAL DISTURBANCE AMOUNT OF 12,258 S.F. SHALL BE POSTED AS PART OF THE DEVELOPERS AGREEMENT FOR THIS PLAN (F-11-034).

21.) STREET LIGHT PLACEMENT AND TYPE OF FIXTURES AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006), SECTION 5.5.A. A MINIMUM OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

22.) 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 THE FLAG OR PIPESTEM LOT DRIVEWAY.

23.) DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:

- a) WIDTH 12' (16' SERVING MORE THAN ONE RESIDENCE). b) SURFACE - 6" OF COMPACT CRUSHER RUN BASE WITH TAR AND CHIP COATING (1-
- 1/2" MIN.) ) GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND MINIMUM 45'
- FURNING RADIUS. d) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS
- (H25 LOADING). e) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOODPLAIN WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY. f) STRUCTURE CLEARANCES - MINIMUM 12 FEET.
- ) MAINTENANCE SUFFICIENT TO INSURE ALL WEATHER USE.

24.) WAIVER PETITION (WP-06-007) A REQUEST TO WAIVE SECTION 16.120(b)(4)(iv) AND 16.121(e), TO PERMIT STORMWATER MANAGEMENT ACCESS TO BE LOCATED ON RESIDENTIAL LOTS, THE PIPESTEM AREAS OF PROPOSED LOTS 5-9 AND TO PERMIT THE SWMF FOR OUR LADY OF PERPETUAL HELP CHURCH TO BE LOCATED WITHOUT FRONTAGE ON A PUBLIC ROAD WAS APPROVED ON SEPTEMBER 22, 2005 AND NOVEMBER 15, 2005, RESPECTIVELY, SUBJECT TO THE FOLLOWING CONDITION:

1. OUR LADY OFPERPETUAL HELP CHURCH/ARCHDIOCESE OF BALTIMORE ROMAN CATHOLIC CHURCH SHALL BE A PARTY IN THE SHARED ACCESS EASEMENT AND MAINTENANCE AGREEMENT FOR THE SHARED DRIVEWAY FOR LOT 5-9 AND THE CHURCH'S SWMF, AND SHALL ONLY USE THE SHARED DRIVEWAY TO ACCESS THE SWMF FOR MAINTENANCE OR REPAIR PURPOSES. 25.) WAIVER PETITION (WP-10-084) A REQUEST TO WAIVE SECTION 16.144(k)(3), WHICH STATES THAT THE FINAL PLAN MUST BE SUBMITTED WITHIN FOUR (4) MONTHS OF THE PRELIMINARY EQUIVALENT SKETCH PLAN APPROVAL FOR SUBDIVISIONS WITH 50 OR FEWER HOUSING UNITS WAS APPROVED ON JANUARY 27, 2010 SUBJECT TO THE FOLLOWING CONDITIONS:

1. COMPLIANCE WITH THE DECISION AND ORDER ISSUED ON MAY 25, 2006 AND ALL SRC AGENCY COMMENTS GENERATED WITH THE REVIEW OF THE PRELIMINARY EQUIVALENT SKETCH PLAN, SP-05-017.

2. THE DEVELOPER MUST SUBMIT THE FINAL PLAN IN ASSOCIATION WITH PHASE 1 OF SP-05-017 (CASCADE OVERLOOK, SECTION III) WITHIN ONE (1) YEAR OF FEBRUARY 8, 2010 (ON OR BEFORE FEBRUARY 8, 2011).

26.) A DESIGN MANUAL WAIVER, A REQUEST TO WAIVE SECTION 2.4.1 OF DESIGN MANUAL VOLUME III TO ALLOW A DEVIATION FROM THE STANDARD TYPICAL SECTION TO HAVE A 2:1 SLOPE AFTER THE CURB ALONG THE SOUTH SIDE OF MARCH BROWN ROAD IN ORDER TO SAVE TREES WAS APPROVED ON FEBRUARY 22, 2005.

27.) 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 ANY WORK. 28.) THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48

HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.

APPROVED: DEPARTMENT OF PUB	LIC WORKS
Mill Z. aulill.	6-27-2011
CHIEF, BUREAU OF HIGHWAYS	DATE
APPROVED: DEPARTMENT OF PLAN	
Ket sherlevolue	7/06/11
CHIEF, DIVISION OF LAND DEVELOPMENT	♥ DATE
Manne	7/1/0
CHIEF, DEVELOPMENT ENGINEERING DIVISION	6 DATE

# CASCADE OVERLOOK **SECTION III** LOTS 1 thru 14 AND OPEN SPACE LOTS 15 thru 17 ROAD, STORM DRAIN AND STORMWATER MANAGEMENT PLANS

29.) THE DECISION AND ORDER FOR PB372 (SP-05-017) WAS SIGNED MAY 25, 2006 FOR 14 RESIDENTIAL LOTS IN AN R-ED DISTRICT. 30.) BOARD OF APPEALS REFERENCES: BA CASE 83-39E, BA CASE 90-24E AND BA CASE 01-51C. THE CONDITION OF 01-51C INDICATED THAT THE CONDITIONAL USE APPLIES ONLY TO THE PROPOSED MULTI-PURPOSE BUILDING AND SITE IMPROVEMENTS.

31.) A PRIVATE RANGE OF ADDRESS SIGN ASSEMBLY FOR THE FLAG LOT DRIVEWAY IN THE CUL-DE-SAC SHALL BE FABRICATED AND INSTALLED BY HOWARD COUNTY BUREAU OF HIGHWAYS AT THE DEVELOPERS/OWNERS EXPENSE WHERE NEEDED. CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-5752 FOR DETAILS AND COST ESTIMATES.

32.) STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLES 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.

33.) THE PURPOSE OF OPEN SPACE LOT 15 IS FOR STORMWATER MANAGEMENT AND THE PORTION OF THE LOTS NOT CONTAINING ANY STORMWATER MANAGEMENT EASEMENTS SHALL BE USED FOR RECREATIONAL OPEN SPACE. LOT 15 IS PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.

THE PURPOSE OF OPEN SPACE LOTS 16 IS TO PRESERVE THE FOREST CONSERVATION EASEMENT AREAS. IT IS DEDICATED TO HOWARD COUNTY, MARYLAND.

THE PURPOSE OF OPEN SPACE LOT 17 IS FOR STORMWATER MANAGEMENT AND ACCESS TO THE EXISTING SWMF SERVING OUR LADY OF PERPETUAL HELP CREATED UNDER SDP-05-017. IT IS PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSICATION.

34.) UNINTERRUPTED ACCESS TO THE EXISTING DRIVE ALONG THE SOUTH SIDE OF LOT 1 MUST BE AVAILABLE AT ALL TIMES DURING CONSTRUCTION OF MARCH BROWN ROAD. 35.) ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND

SPÉCIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE. 36. a) THE TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE

AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-5752) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES. b) ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES"

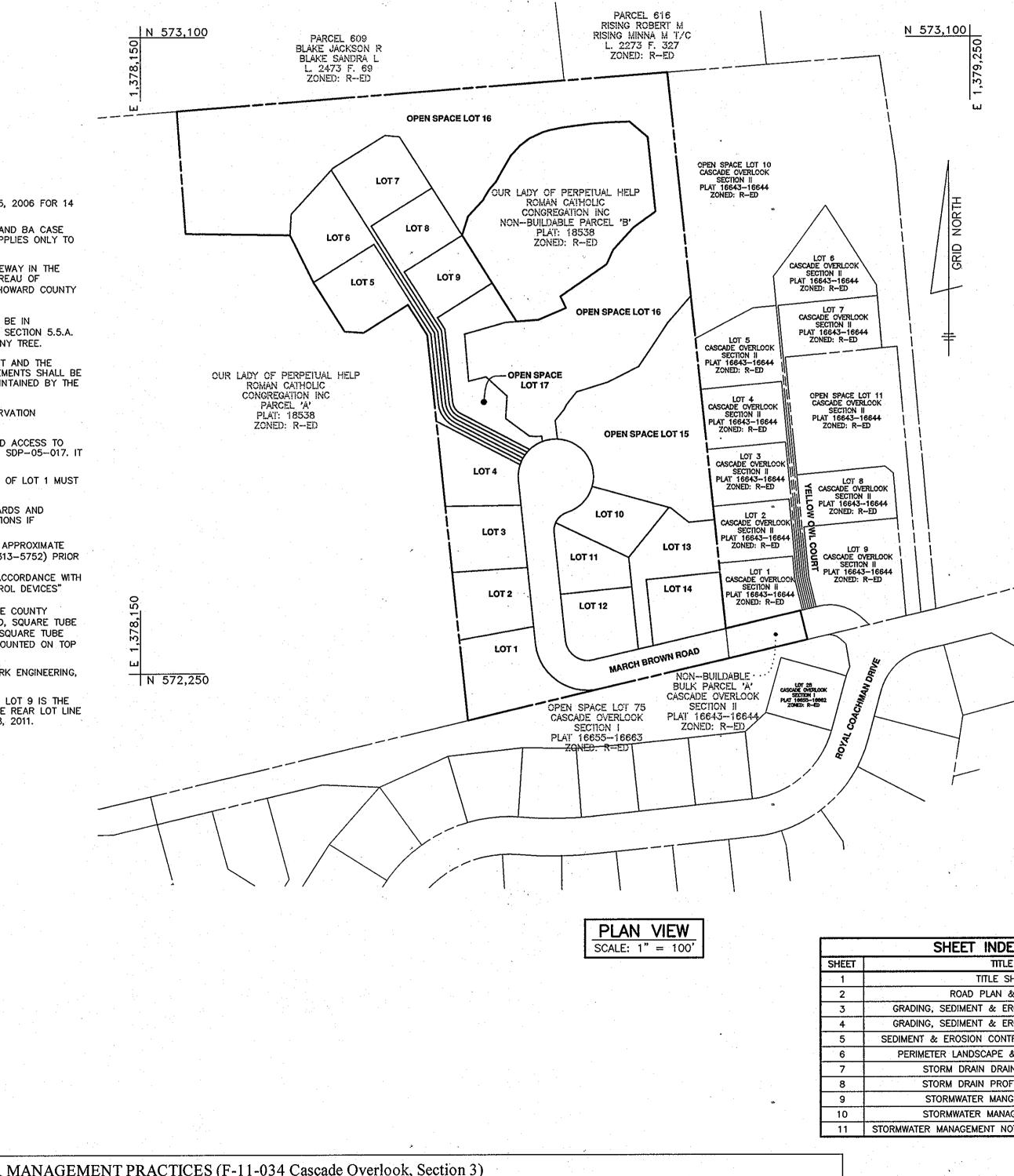
(MdMUTCD). c) ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP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

37.) EXISTING UTILITIES ARE BASED ON FIELD SURVEY LOCATION BY BENCHMARK ENGINEERING, INC. AND PER F-03-150.

38.) THE SETBACK REQUIREMENT FOR THE REAR PORTIONS OF LOTS 1-6 AND LOT 9 IS THE STANDARD STRUCTURE SETBACK IN THE R-ED DISTRICT OF 25 FEET FROM THE REAR LOT LINE AS DETERMINED BY THE DEPARTMENT OF PLANNING AND ZONING ON MARCH 8, 2011.

	ADDR	ESS CH	HART	
LOT	· ·	STREET A	DDRESS	
1	4915	MARCH	BROWN	ROAD
2	4919	MARCH	BROWN	ROAD
3	4923	MARCH	BROWN	ROAD
. 4	4927	MARCH	BROWN	ROAD
5	4945	MARCH	BROWN	ROAD
6	4949	MARCH	BROWN	ROAD
7	4948	MARCH	BROWN	ROAD
8	4944	MARCH	BROWN	ROAD
- 9	4940	MARCH	BROWN	ROAD
10	4926	MARCH	BROWN	ROAD
11	4922	MARCH	BROWN	ROAD
12	4918	MARCH	BROWN	ROAD
13	4914	MARCH	BROWN	ROAD
14	4910	MARCH	BROWN	ROAD

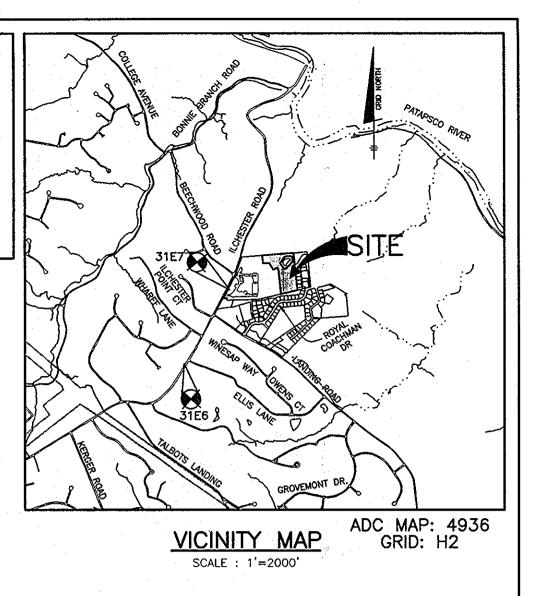
				STORM	WATER
LOT NUMBER	ADDRESS	GREEN ROOFS	PERMEABLE PA VEMENTS	REINFORCED TURF	DISCONNEC OF ROOF RUNOF
		. A-1	A-2	A-3	N-1
		 (Y/N)	(Y/N)	(Y/N)	(NUMBE
10	4926 March Brown Road	N	N	N	N
11	4922 March Brown Road	 N	N	N	N
12	4918 March Brown Road	N	N	N	N
13	4914 March Brown Road	· N	N	N .	N
14	4910 March Brown Road	N	N	N N	N



R MA	NAGEMEN	Г PRACTICE	S (F-11-03	34 Cascade	e Overlook,	Section 3)					
IECTION OFTOP OFF	DISCONNECTION OF NON- ROOFTOP RUNOFF	CONSERVATION	RAINWATER HARVESTING		LANSCAPE INFILTRATION	INFILTRATION BERMS	DRY WELLS	MICRO- BIORETENTION	RA IN GA RDENS	SWALES	ENHANCED FILTERS
1	N-2	N-3	M-1	M-2	M-3	M-4	M-5	M-6	M-7	M-8	M-9
BER)	(Y/N)	(Y/N)	(NUMBER)	(NUMBER)	(NUMBER)	(NUMBER)	(NUMBER)	(NUMBER)	(NUMBER)	(NUMBER)	(NUMBER)
	N	N	N	N	N	N	N	N	Y	N .	N
	N	N	N	N	N	N	N	N	Y	N	N
1	N	N	N	N	N N	N	N	N	Y	N	N
	Y	N	N	N	N	N	N	N	Y (2)	N	N
. · ·	N	N	N	N	N	N	N	N	Y (2)	N	N
			· · · ·	· · · ·						•	

### BENCH MARKS NAD'83 HO. CO. #31E6 3/4" REBAR 0.5' BELOW SURFACE 5' SOUTHWEST OF ILCHESTER ROAD PAVING 500'± WEST OF WHARF LANE. E 1376700.6467 N 570852.3717' HO. CO. #31E7 3/4" REBAR 0.5' BELOW SURFACE 9' SOUTHEAST OF ILCHESTER ROAD PAVING 250'± WEST OF BEECHWOOD ROAD N 572335.3503 E 1377504.0332 HO. CO. BM#2745004 ELEV. 364.78

USED FOR VERTICAL CONTROL.



# SITE DATA ANALYSIS

1) GENERAL SITE DATA

- a. PRESENT ZONING: R-ED b. APPLICABLE DPZ FILE REFERENCES: SP-05-017
- F-03-150 PB 372
- c. DEED REFERENCES: L. 13053 F. 035
- d. PROPOSED USE OF SITE: RESIDENTIAL/SFD HOMES
- e. PROPOSED WATER AND SEWER SYSTEMS: PUBLIC

2) AREA TABULATION

-,	
a	(INCLUDES 0.10 AC FROM PARCEL 'A' RECORDED UNDER F-03-150)
b	
C.	AREA OF STEEP SLOPES ON SITE
d	. NET AREA OF SITE
e	AREA OF PROPOSED BUILDABLE LOTS
f.	AREA OF PROPOSED OPEN SPACE LOTS
g.	AREA OF PROPOSED PUBLIC ROAD R/W 0.69± AC TO BE DEDICATED TO HOWARD COUNTY
3)	LOT TABULATION
a	. TOTAL NUMBER OF RESIDENTIAL LOTS PROPOSED ON THIS SUBMISSION
Ь	TOTAL NUMBER OF OPEN SPACE LOTS PROPOSED 3
4)	OPEN SPACE DATA
a	
b	. OPEN SPACE REQUIRED (50% OF 7.21 AC.)
C	. OPEN SPACE PROVIDED (51.2% OF 7.21 AC.)

- d. AREA OF RECREATION OPEN SPACE REQUIRED ........... 4,200 S.F. (300 S.F. PER UNIT x 14 UNITS)
- e. AREA OF RECREATION OPEN SPACE PROVIDED ......... 4,200 S.F.

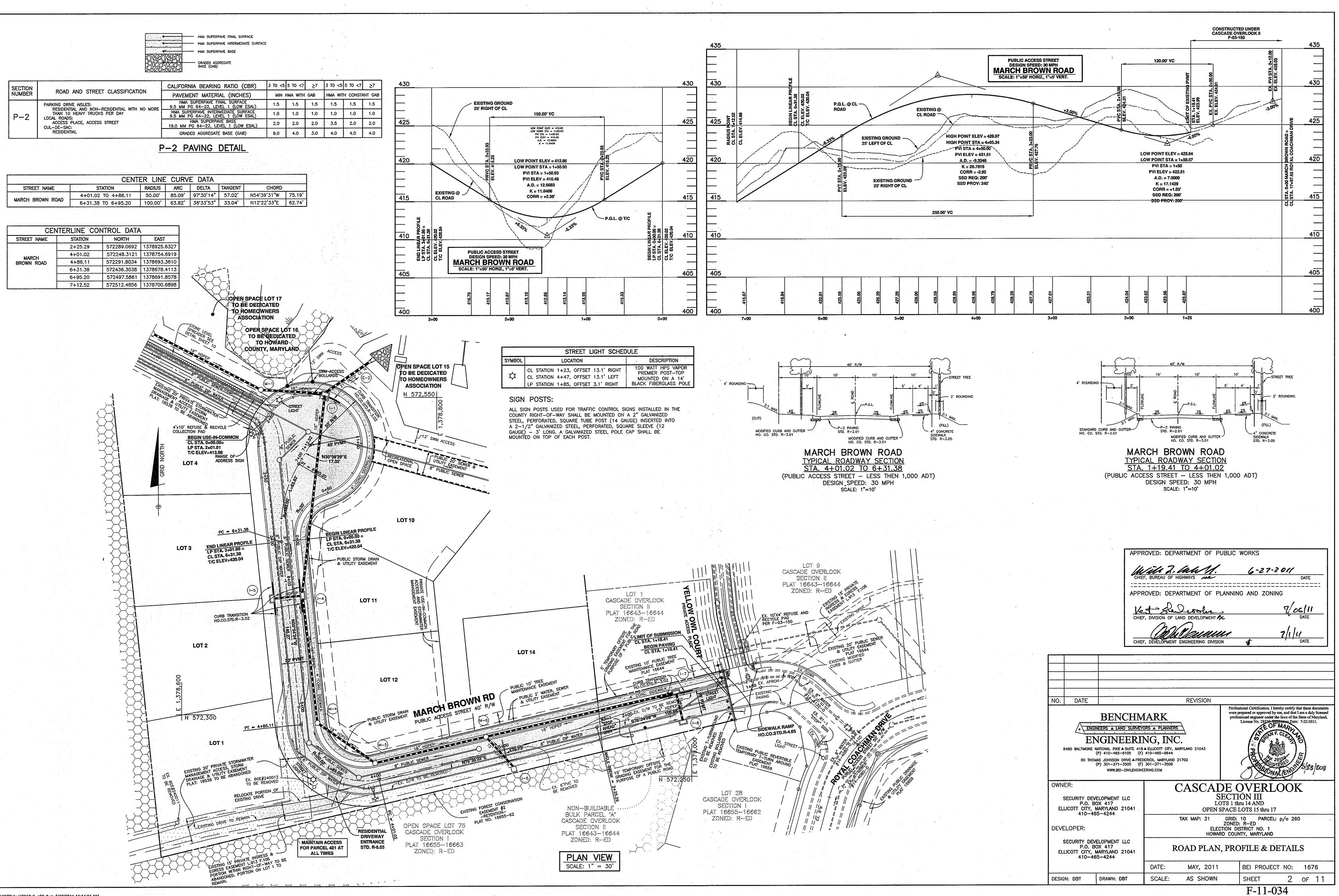
\* OPEN SPACE FOR PARCEL 'A' (0.10 AC.), PREVIOUSLY RECORDED UNDER CASCADE OVERLOOK SECTION II. PLAT NO. 16644, WAS PROVIDED UNDER CASCADE OVERLOOK SECTION II, F-03-150.

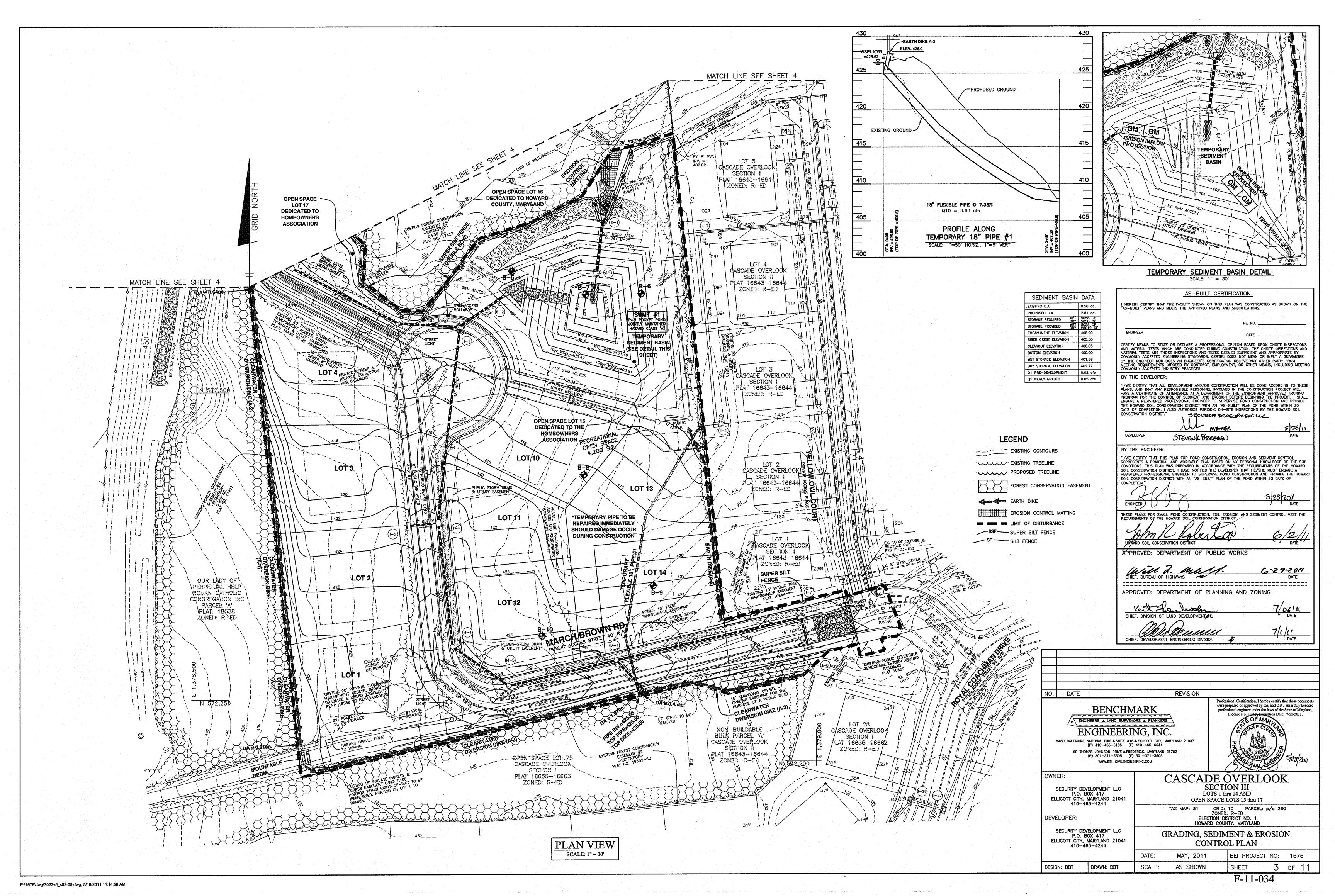
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EET	NO. DATE			REVISION				
PROFILE					fessional Certification. I hereby certify that these documents			
OSION CONTROL PLAN		BENCHM	<b>IARK</b>		re prepared or approved by me, and that I am a duly licensed of the State of Maryland,			
OSION CONTROL PLAN	Vinimiter			<b>m</b> .:	License No. 28559, Expiration Date: 7-22-2011.			
ROL NOTES AND DETAILS		INEERS A LAND SURVEY		$\neg$	TE OF MARK			
: STREET TREE PLAN	FI				AT SAN F. CLEY FR			
IAGE AREA MAP		ENGINEERING, INC.						
LES & DETAILS	8480 BALTIMORE NATIONAL PIKE & SUITE 418 & ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 60 THOMAS JOHNSON DRIVE & FREDERICK, MARYLAND 21702							
EMENT DETAILS								
EMENT DETAILS		(P) 301-371-3505 (F) 301-371-3506 WWW.BEI-CIMLENGINEERING.COM						
TES & SOIL BORING LOGS					ONAL RU			
	OWNER:	VELOPMENT LLC	(	CASCADE	OVERLOOK			
	P.O. E ELLICOTT CITY,	BOX 417 MARYLAND 21041		LOTS 1	thru 14 AND E LOTS 15 thru 17			
	DEVELOPER:	65–4244		ZON ELECTION	D: 10 PARCEL: p/o 260 ED: R-ED DISTRICT NO. 1 UNTY, MARYLAND			
	P.O. E Ellicott City,	VELOPMENT LLC 30X 417 MARYLAND 21041 65-4244	TITLE SHEET					
			DATE:	MAY, 2011	BEI PROJECT NO: 1676			
	DESIGN: DBT	DRAWN: DBT	SCALE:	AS SHOWN	SHEET 1 OF 11			

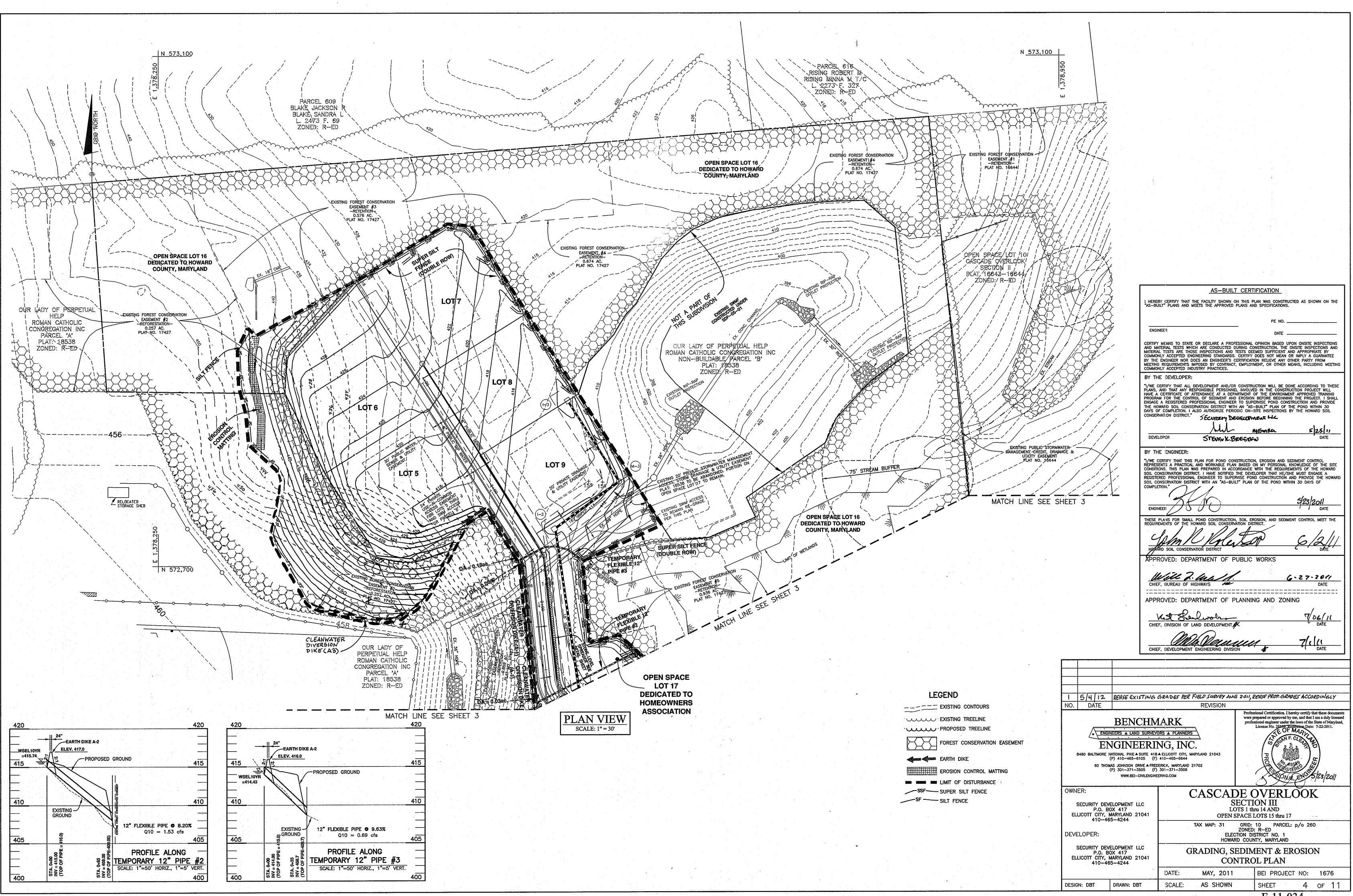
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ROAD PLAN &







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### SEDIMENT CONTROL NOTES

1.	A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT
	OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE
	START OF ANY CONSTRUCTION, (313–1850).

- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO 2. THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL", REVISIONS THERETO.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY 3. STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- 4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- 5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SEC. 51) SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

7. SITE

ANALYSIS:	
TOTAL AREA OF SITE	7.3 ACRES
AREA DISTURBED	5.0 ACRES
AREA TO BE ROOFED OR PAVED	O.6 ACRES
AREA TO BE VEGETATIVELY STABILIZED	4.4 ACRES
TOTAL CUT	15,886 cY
TOTAL FILL	13,475 cY
OFFSITE WASTE AREA LOCATION	A SITE WITH AN ACTIVE GRADING PERMIT

- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED. IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- 10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER FARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

### TEMPORARY SEEDBED PREPARATIONS

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT). SEEDING: FOR PERIOD MARCH 1 THROUGH APRIL 30 AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2-1/2 BUSHELS PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT). FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 SQ FT). FOR THE PERIOD NOVEMBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

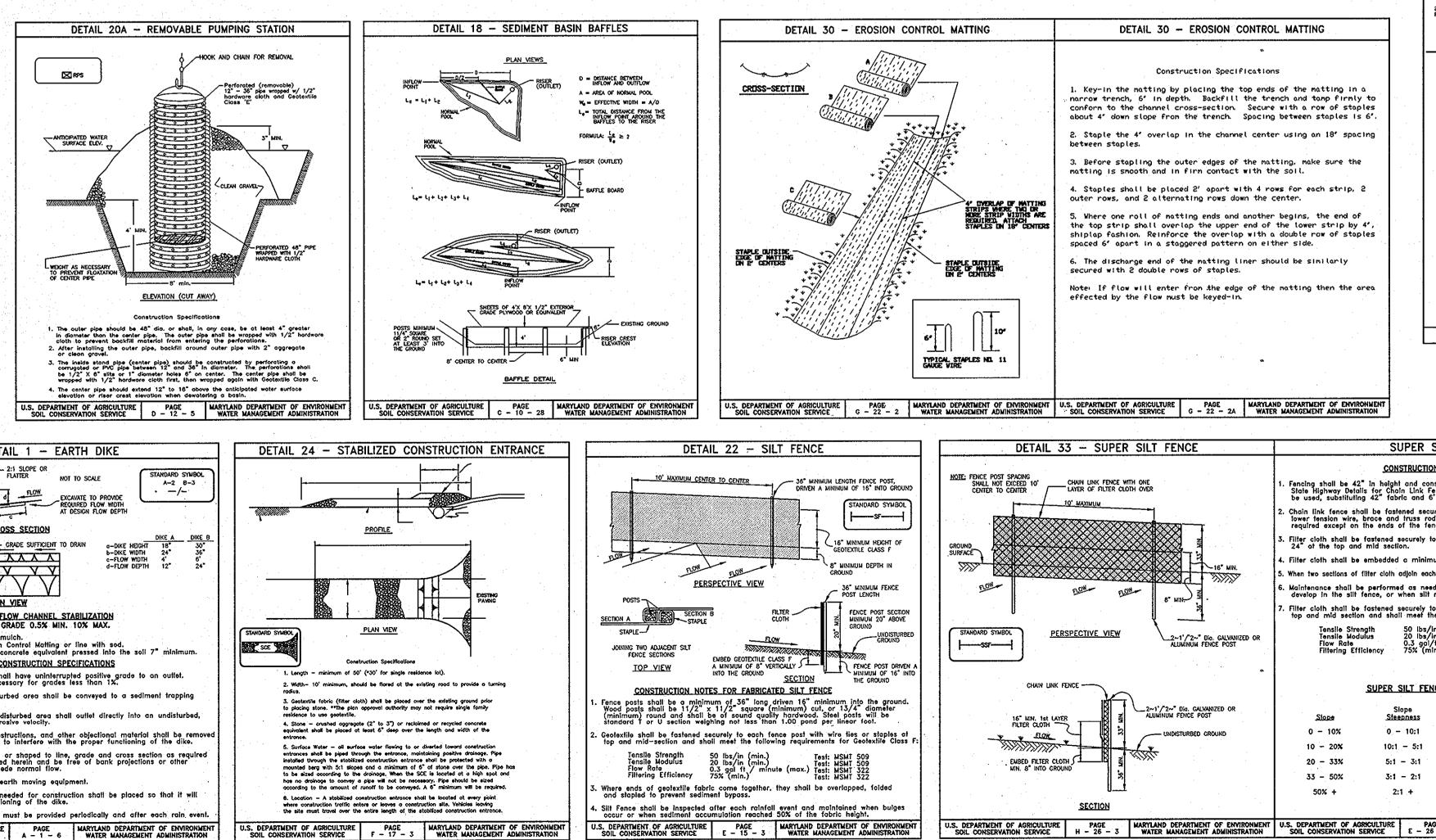
MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES, 8 FT. OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

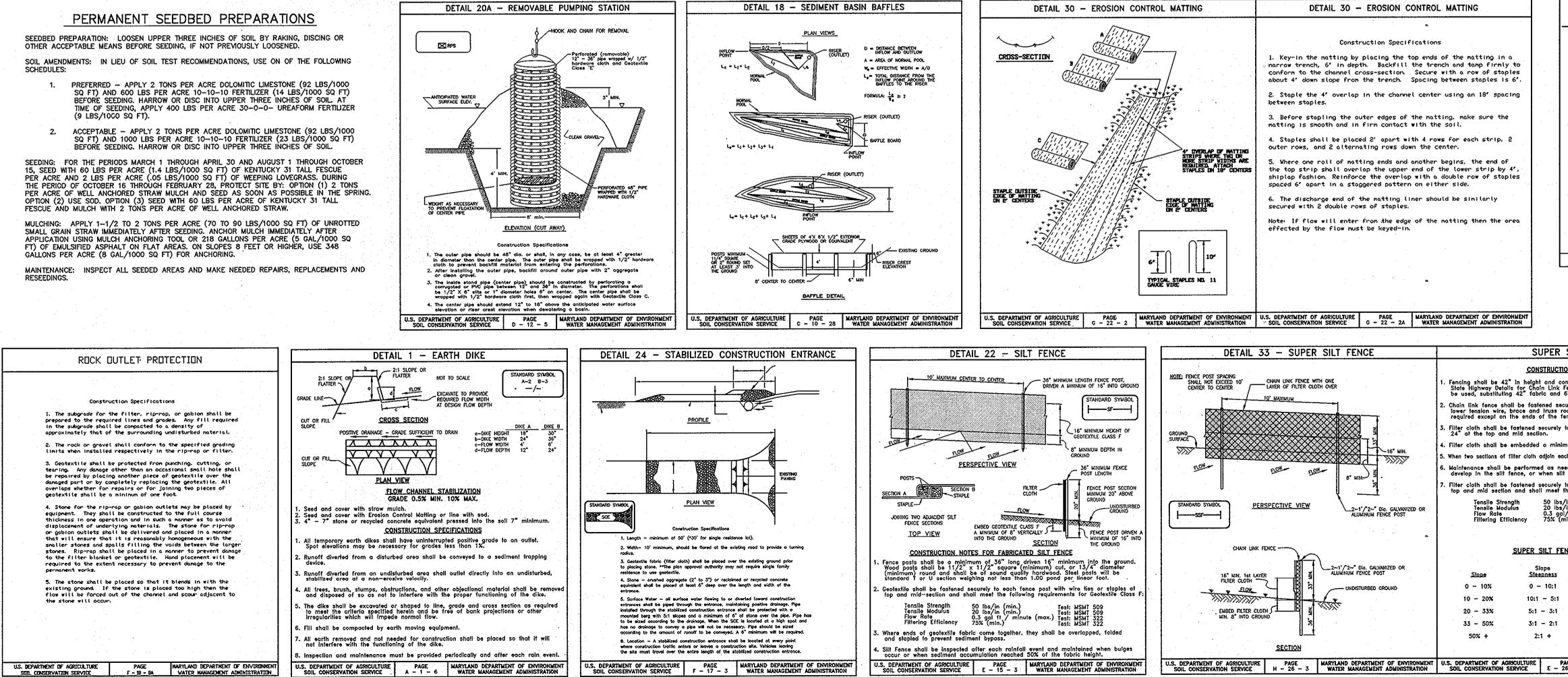
REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

- PREFERRED APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT

### TOPSOIL SPECIFICATIONS

- I. Topsoil salvaged from the existing site may be used provided that it meets that 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-SCS in cooperation with Maryland Agricultural Experimental Station.
- II. Topsoil Specifications Soil to be used as topsoil must meet the following I. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting texture subsoils and shall contain less than 5% by under a contain approved by the appropriate approved subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than  $1-1/2^*$  in diameter.
- ii. Topsoil must be free of plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nutsedge, poison ivy, thistle, or others as specified.
- iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.
- III. For sites having disturbed areas under 5 acres: Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization — Section I — Vegetative Stabilization Methods and Materials.
- N. For sites having disturbed areas over 5 acres: I. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
  - a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
  - b. Organic content or topsoil shall be not less than 1.5 percent by weight.
  - c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
  - d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
- Note: 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
- Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization Section I Vegetative Stabilization Methods and Materials.
- V. Topsoil Application
  - When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, earth dikes, slope silt fence and sediment traps and basins.
- ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" 8" higher in elevation.
- iii. Topsoil shall be uniformly distributed in a 4" ~ 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that 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 shall be corrected in order to prevent the formation of depressions or water procedulate
- iv. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
- VI. Alternative for Permanent Seeding -- Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:
- I. Composted Sludge Material for use as a soil conditioner for sites having distributed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements:
- a. Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.
- b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a pH of 7.0 to 8.0. I compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.
- c. Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.
- iv. Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lb/1,000 square feet, and 1/3 the normal lime application rate. References: Guidelines Specifications, Soil Preparation and Sodding. MD–VA, Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institutes, Revised 1973.





# 30.0 DUST CONTROL

### Definition

Controlling dust blowing and movement on construction sites and roads.

Purpose

To prevent blowing and movement of dust from exposed soil surfaces, reduce on and off-site amage, health hazards, and improve traffic safety.

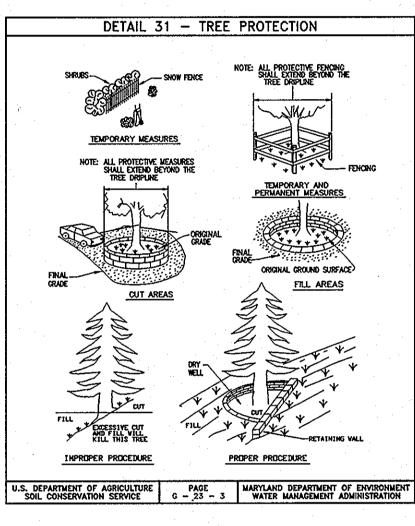
Conditions Where Practice Applies This practice is applicable to areas subject to dust blowing and movement where on and off—site domage is likely without treatment.

### Specifications

Temporary Methods 1. Mulches - See standards for vegetative stabilization with mulches only. Mulch should be crimped or tracked to prevent blowing.

- 2. Vegetative Cover See standards for temporary vegetative cover.
- 3. Tillage To roughen surface and bring clods to the surface. This is an emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12° apart, spring-toothed harrows, and similiar plows are examples of equipment which may produce the desired effect.
- 4. Irrigation This is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. Repeat as needed. At no time should the site be irrigated to the point that runoff begins to flow.
- 5. Barriers Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similiar material can be used to control air currents and soil blowing. Barriers placed at right angles to prevailing currents at intervals of about 10 times their height are effective in controlling soil blowing.
- 6. Calcium Chloride Apply at rates that will keep surface moist. May need retreatment.
- Permanent Methods
   Permanent Vegetation See standards for permanent vegetative cover, and permanent stabilization with sod. Existing trees or large shrubs may afford valuable protection if left in place.
- 2. Topsoiling Covering with less erosive soil materials. See standards for topsoiling.
- 3. Stone Cover surface with crushed stone or coarse gravel.
- References Agriculture Handbook 346. Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss.

2. Agriculture Information Bulletin 354. How to Control Wind Erosion, USDA-ARS.



### SEQUENCE OF CONSTRUCTION

### NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF WORK

### PHASE 1

1. Obtain grading permit. (day 1)

2. Install stabilized construction entrance, silt fences, super silt fences, clean water diversion dikes and temporary pipes. (day 2-7)

3. Construct temporary sediment basin. Once complete, install earth dike along eastern edge of property (day 8-16)

4. Upon approval of the Howard County sediment control inspector, bring road bed to subgrade and commence mass grading. Stabilize slopes in accordance with the temporary seedbed notes. Utilize dust control methods. (day 17-24)

5. Install storm drain, water and sewer mains. (day 25-39)

6. Once storm drain to I-6 is installed, remove temporary pipe #1.

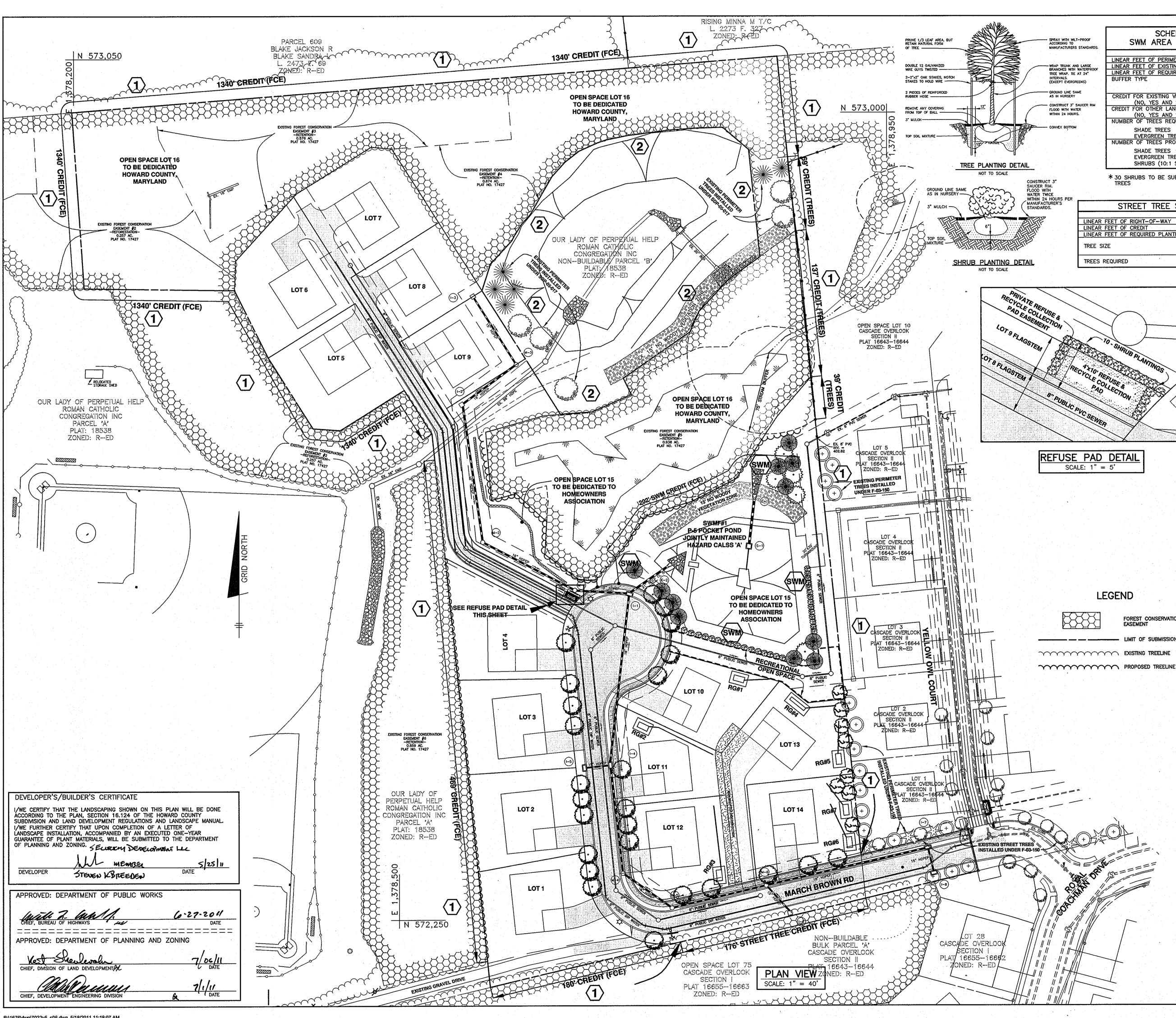
7. Install curb and base paving. (day 40-47)

8. Stabilize all areas in accordance with the temporary seedbed notes. (day 48)

9. Upon approval from the Howard County sediment control inspector, remove sediment control devices and stabilize disturbed areas in accordance with the PERMANENT seedbed notes. (day 49-55)

10. Convert temporary basin to its final pond design. After completion perform as-built. Forward as-built approval letter to inspector. (day 56-60)

				· · <b>Γ</b>	BY THE DEVELOPER:
					"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL
				· .	HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL
					ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30
					DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT." SECURITY DEVELOPMENT LLC
DETAIL 6 - GABION INFLOW	PROTECTI	DN			111 - holy 1
					DEVELOPER STEVEN & BREEDEN DATE
	č	_			
COMPACTED		ED Ent			BY THE ENGINEER:
					"I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS: THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD
2-1 SLOPE DR					SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD
	STA	NDARD SYMBO	ה   י	a se a companya da se a c	SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF
		GH			shalo a
	· · · ·				
PERSPECTIVE VIEW		1			
TRAP/BASIN BUTTOM	The state of the s				THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
3'	12' FILTER	CLOTH			John // Val the alali
PROFILE ALON	G CENTERLINE				HOWARD SOIL CONSERVATION DISTRICT DATE
		-			APPROVED: DEPARTMENT OF PUBLIC WORKS
					ALLINGTED, DELARTIMENT OF FODER WORKS
Construction Specifications					With 7. aug 1. 4.27.2011
<ol> <li>Cabion inflow protection shall be constructed of baskets forming a trapezoidal cross section 1' and a 3' bottom width.</li> </ol>					CHIEF, BUREAU OF HIGHWAYS DATE DATE
and a 3 bottom width. 2. Geotextile Class C shall be installed under all gabion baskets.					APPROVED: DEPARTMENT OF PLANNING AND ZONING
3. The stone used to fill the gablon baskets shall t					ALTINUVED. DEFANTIMENT OF FEANINING AND ZOMING
<ol> <li>Gabions shall be installed in accordance with marks.</li> <li>Gabion inflow Protection shall be used where contact of the state of</li></ol>					Vest Stendurge 7/06/11
on slopes steeper than 4:1.					CHIEF, DIVISION OF LAND DEVELOPMENT
U.S. DEPARTMENT DF AGRICULTURE PAGE H SDIL CONSERVATION SERVICE B - 7 - 2	WARYLAND DEPARTHE WATER MANAGENEI				(MACAN)e -1.1.
· · · · · · · · · · · · · · · · · · ·					CHIEF. DEVELOPMENT ENGINEERING DIVISION
	-	<u> </u>		L.	
	•	┝──┼			
SILT FENCE			· .		
		1	5-4-12	REVISE SI	SITE ANALYSIS DATA #7
<u>N SPECIFICATIONS</u> structed in accordance with the latest Maryland		NO.	DATE		REVISION
ncing. The specification for a 6' fence shall length posts.					Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed
rely to the fence posts with wire tles. The s, drive anchors ond post caps are not ce.			A		CHMARK professional engineer under the laws of the State of Maryland, License No. 28559, Expiration Date: 7-22-2011.
the chain link fence with ties spaced every					SURVEYORS A PLANNERS
um of 8" into the ground.			El	NGINE	ERING, INC.
other, they shall be overlapped by 6" and folded. Ied and silt buildups removed when "bulges"		84			SUITE 418 A EILICOTT CITY, MARYLAND 21043 105 (F) 410-465-6644
reaches 50% of fence height			60 THO	WAS JOHNSON DRIV	RIVE & FREDERICK, MARYLAND 21702
each fence post with wire ties or staples at e following requirements for Geotextille Class F: n (min.) Test: MSMT 509					CMLENGINEERING.COM
n (min.) Test: MSMT 509 n (min.) Test: MSMT 509 [f /minute (max.) Test: MSMT 322 n.) Test: MSMT 322		OWNE	<b>D</b> •	<u> </u>	
ny itali mami 322		OWNER	<b>\</b> .		CASCADE OVERLOOK
CE DESIGN_CRITERIA		SE		ELOPMENT LLC	LC SECTION III LOTS 1 thru 14 AND
Slope Length Slit Fence Length	-	ELLIC	COTT CITY,	MARYLAND 210 35-4244	
(maximum) (maximum) Unlimited Unlimited				·	TAX MAP: 31 GRID: 10 PARCEL: p/o 260 ZONED: R-ED
200 feet 1,500 feet		DEVEL	OPER:		ELECTION DISTRICT NO. 1 HOWARD COUNTY, MARYLAND
100 feet 1,000 feet		SE	CURITY DEV	ELOPMENT LL	
100 feet 500 feet 50 feet 250 feet			P.O. B	OX 417 MARYLAND 21(	SEDIVIENT & ERUSION CONTROL NOTES
			410-46	65-4244	
A MARYLAND DEPARTMENT OF ENVIRONMENT - 3A WATER MANAGEMENT ADMINISTRATION			· · ·	· · ·	DATE: MAY, 2011 BEI PROJECT NO: 1676
		DESIGN	DBT	DRAWN: DBT	T SCALE: AS SHOWN SHEET 5 OF 11
				. <u> </u>	F-11-034
			1.	. · ·	



P:\1676\dwg\7022v5\_s06.dwg, 5/18/2011 11:18:07 AM

H WLT-PROOF TO RERS STANDARDS.	SCHEDULE D SWM AREA LANDSCAPII	NG
· · · · · · · · · · · · · · · · · · ·		SWM1
	LINEAR FEET OF PERIMETER	622
K AND LARGE	LINEAR FEET OF EXISTING WOODS LINE	202'
WITH WATERPROOF	LINEAR FEET OF REQUIRED PLANTING	420'
ERGREENS) IE SAME	BUFFER TYPE	"B" 1:50 shade 1:40 evergreen
3" SAUCER RIM	CREDIT FOR EXISTING VEGETATION (NO, YES AND %)	YES 32%
WATER HOURS.	CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	NO
	NUMBER OF TREES REQUIRED	
TTOM	SHADE TREES EVERGREEN TREES	- 8 11
	NUMBER OF TREES PROVIDED	
	SHADE TREES EVERGREEN TREES SHRUBS (10:1 SUBSTITUTE)	5 11 30 <b>*</b>

STREET TREE SCHEDULE

LINEAR FEET OF RIGHT-OF-WAY LINEAR FEET OF CREDIT

TREE SIZE

TREES REQUIRED

INEAR FEET OF REQUIRED PLANTING

MARCH BROWN RD

LARGE

1:40 LF

25

SCHEDULE A PERIMETER LANDSCAPE EDGE						
CATEGORY	ADJACENT TO PERIM. PROPERTY	ADJACENT TO PERIM. PROPERTY	ADJACENT TO ROAD (LOT 12)		ADJACENT TRASH PAD	
LANDSCAPE TYPE	A 1:60 shad <del>a</del>	A 1:60 shade	B 1:50 shade 1:40 evergreen	B 1:50 shade 1:40 evergreen	B 1:50 shade 1:40 evergreen	
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	2690 LF	821 LF	87 LF	99 LF	28 LF 10+10+4+4	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	YES 2234 LF	YES <b>**</b> 821 LF	NO	NO	NO	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTE) SHRUBS	456 LF 8 0 0 0	0 LF 0 0 0 0	87 LF 2 3 0 0	99 LF 2 3 0 0	28 LF 1  -	
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTE) SHRUBS (10:1 SUBSTITUTE)	8 0 0 0	0 0 0 0	2* 3* 0 0	2* 3* 0 0	0 0 0 20	

\* TO BE DEFERRED TO SITE DEVELOPMENT PLAN.

\*\* CREDIT IS TAKEN FOR SURROUNDING EXISTING FOREST CONSERVATION EASEMENTS AS WELL AS THE PERIMETER TREES INSTALLED UNDER SDP-05-017.

# LANDSCAPE NOTES:

1. STREET TREES TO BE PLANTED 3 FEET BEHIND SIDEWALK DISTANCE BETWEEN SIDEWALK AND CURB IS LESS THAN 6 FEET. STREET TREES TO BE PLANTED 6 FEET BEHIND BACK OF CURB WHERE THERE IS NO SIDEWALK. TREES MAY NOT BE PLANTED WITHIN 5 FEET OF A DRAIN INLET, 5 FEET OF AN OPEN SPACE ACCESS STRIP, OR 10 FEET OF A DRIVEWAY.

2. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL,

3. AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.

4. THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

5. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$7,050.00 (\$4,800.00 FOR 16 SHADE TREES, \$1,650.00 FOR 11 EVERGREENS AND \$600.00 FOR 20 SHRUBS). FINANCIAL SURETY FOR THE REQUIRED STREET TREES SHALL BE INCLUDED IN THE COST ESTIMATE GENERATED BY HOWARD COUNTY DEVELOPMENT ENGINEERING DIVISION.

PUBLIC STREET TREE PLANTING LIST									
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION					
0	25	TILIA CORDATA 'GREENSPIRE' (Greenspire Littleleaf Linden)	2.5" –3" col.	TO BE PLANTED ALONG MARCH BROWN ROAD AND PROVIDED BY THE DEVELOPER					

	PERIMETER LANDSCAPE PLANTING LIST								
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION					
8		PLATANUS X ACERIFOLIA 'BLOODGOOD' (Bloodgood London Plane)	2.5" — 3"cai.	SHADE TREES ALONG PERIMETER TO BE PROVIDED BY THE DEVELOPER					
89 89	20	JUNIPERUS CHINENSIS (Pfitzerana Compacta) Compact Pfitzer Juniper	2' – 2.5' hgt.	NEEDLE EVERGREEN SHRUB PLANTED AROUND REFUSE PAD TO BE PROVIDED BY THE DEVELOPER					
	11	ILEX OPACA (American Holly)	5' – 6' ht.	EVERGREEN TREES ALONG SWMF PERIMETER TO BE PROVIDED BY THE DEVELOPER					
**************************************	5	ACER RUBRUM 'RED SUNSET' (Red Sunset Red Maple)	2 1/2" –3" cal.	SHADE TREES ALONG SWMF PERIMETER TO BE PROVIDED BY THE DEVELOPER					
ଊଊଊ	. 30	AZALEA 'DELAWARE VALLEY WHITE' (Delaware Valley White Azalea)	18"-24" sp.	SHRUBS PLANTED ALONG SWMF PERIMETER. TO BE PROVIDED BY THE DEVELOPER					

# \*SEE SHEET 11 FOR INTERNAL SWMF PLANTING\*

			· · · · ·	<u></u>		
			•			
			1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			
NO.	DATE			REVISION		
8	EN B480 BALTIMORE N 60 THOM	ATIONAL PIKE & SUITE 418 (P) 410-465-6105 (F) AS JOHNSON DRIVE & FREE	NG, INC A ELLICOTT CITY, MA 410-465-6644 DERICK, MARYLAND 2 301-371-3506	ARYLAND 21043	profes	repared or approved by me, and that I am a duly licensed sional engineer under the laws of the State of Maryland, License No. 28569; Expiration Date: 7-22-2011.
	SECURITY DEVI P.O. BO LICOTT CITY, N	ARYLAND 21041	(	S LC	ECTI DTS 1 th	OVERLOOK ON III ru 14 AND .OTS 15 thru 17
DEVE	410-46 LOPER:	<b>5</b> -42 <del>14</del>				
	P.O. B(	MARYLAND 21041	· · ·	- 1		ANDSCAPE & REE PLAN
			DATE:	MAY, 2011		BEI PROJECT NO: 1676
DESIG	N: DBT	DRAWN: DBT	SCALE:	AS SHOWN		SHEET 6 OF 11

F-11-034

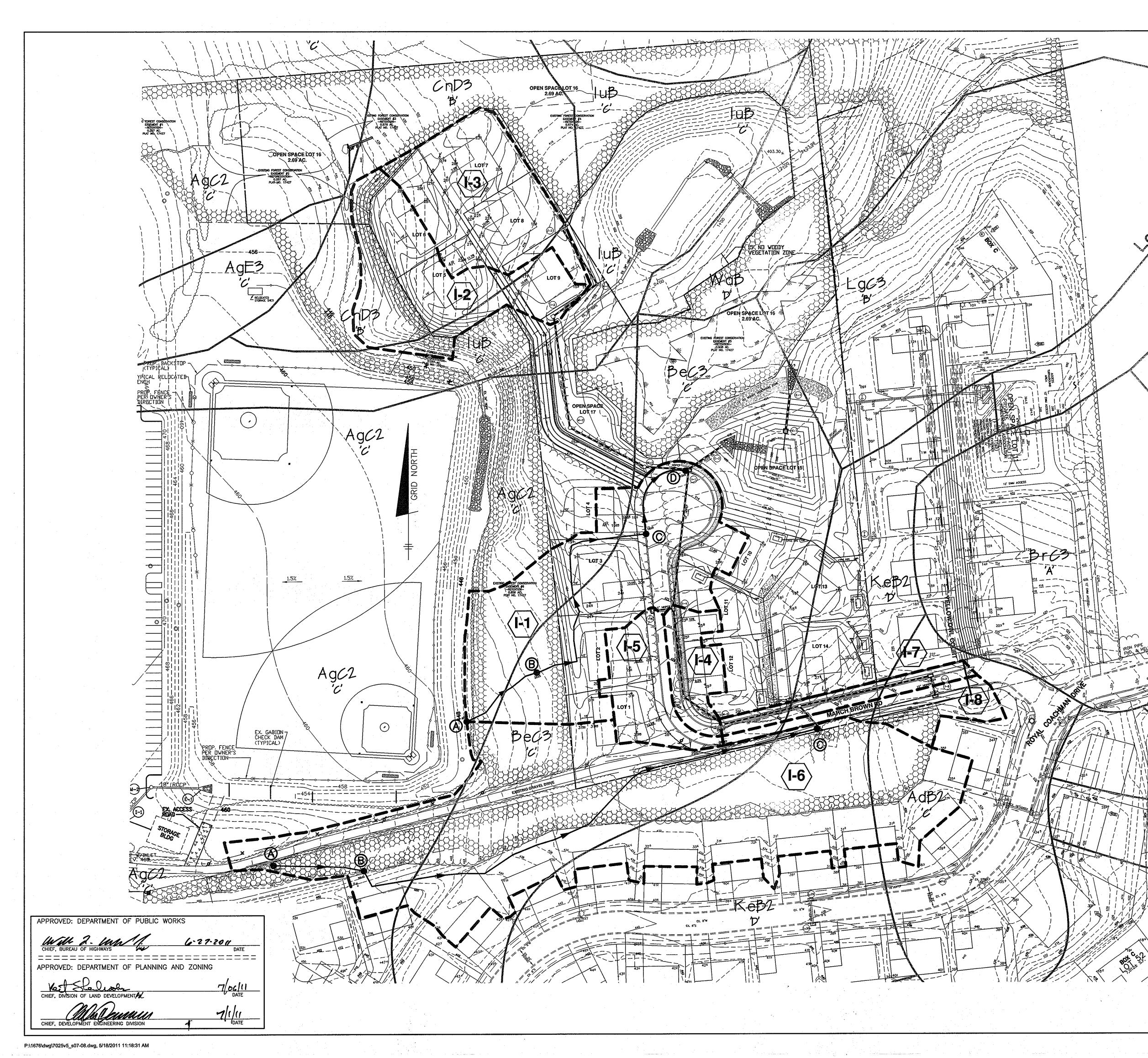
LEGEND

SCALE: 1'' = 5'

FOREST CONSERVATION EASEMENT

CONTRACTOR OF A CONTRACT OF A

LIMIT OF SUBMISSION



· · ·	· · · · · · · ·		SOILS CHART
SYMBOL	HYDRIC	GROUP	NAME
AdB2	YES	С	ALDINO SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
AgC2	·	С	AURA GRAVELLY LOAM, 5 TO 10 PERCENT SLOPES, MODERATELY ERODED
AgE3		C	AURA GRAVELLY LOAM, 10 TO 30 PERCENT SLOPES, SEVERELY ERODED
BeC3	YES	С	BELTSVILLE SILT LOAM, 5 TO 10 PERCENT SLOPES, SEVERELY ERODED
BrC3		A	BRANDYWINE LOAM, 8 TO 15 PERCENT SLOPES SEVERELY ERODED
CnD3		В	CHILLUM-FAIRFAX LOAMS, 5 TO 15 PERCENT SLOPES, SEVERELY ERODED
luB	YES	С	IUKA LOAM, LOCAL ALLUVIUM, 1 TO 5 PERCENT SLOPES
KeB2	YES	D	KELLY CLAY LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
LeC2	· · · ·	B	LEGORE SILT LOAM, 8 TO 15 PERCENT SLOPES, MODERATELY ERODED
LgC3		B	LEGORE SILTY CLAY LOAM, 8 TO 15 PERCENT SLOPES, SEVERELY ERODED
WaB	YES	D	WATCHUNG SILT LOAM, 3 TO 8 PERCENT SLOPES

### AREA AND "C" FACTOR TABULATION

### PROJECT: Cascade Overlook III DATE: 5/9/2011 BY: DBT

PHASE	INLET#	ZONING	SUBAREA	AREA (Ac)	"C" FACTOR	% IMPERVIOUS
		(Z)	(B)	(A)	(C)<25	(P)<25
	I-1	R-ED		1.20	0.38	50.9
	I-2	R-ED		0.62	0.24	40.9
	I-3	R-ED		0.57	0.30	63.9
	I-4	R-ED		0.18	0.57	84.4
	I-5	R-ED		0.26	0.51	77.1
	I-6	R-ED		2.54	0.26	32.4
	I-7	R-ED		0.13	0.86	100.0
	I-8	R-ED		0.20	0.54	55.0

## LEGEND

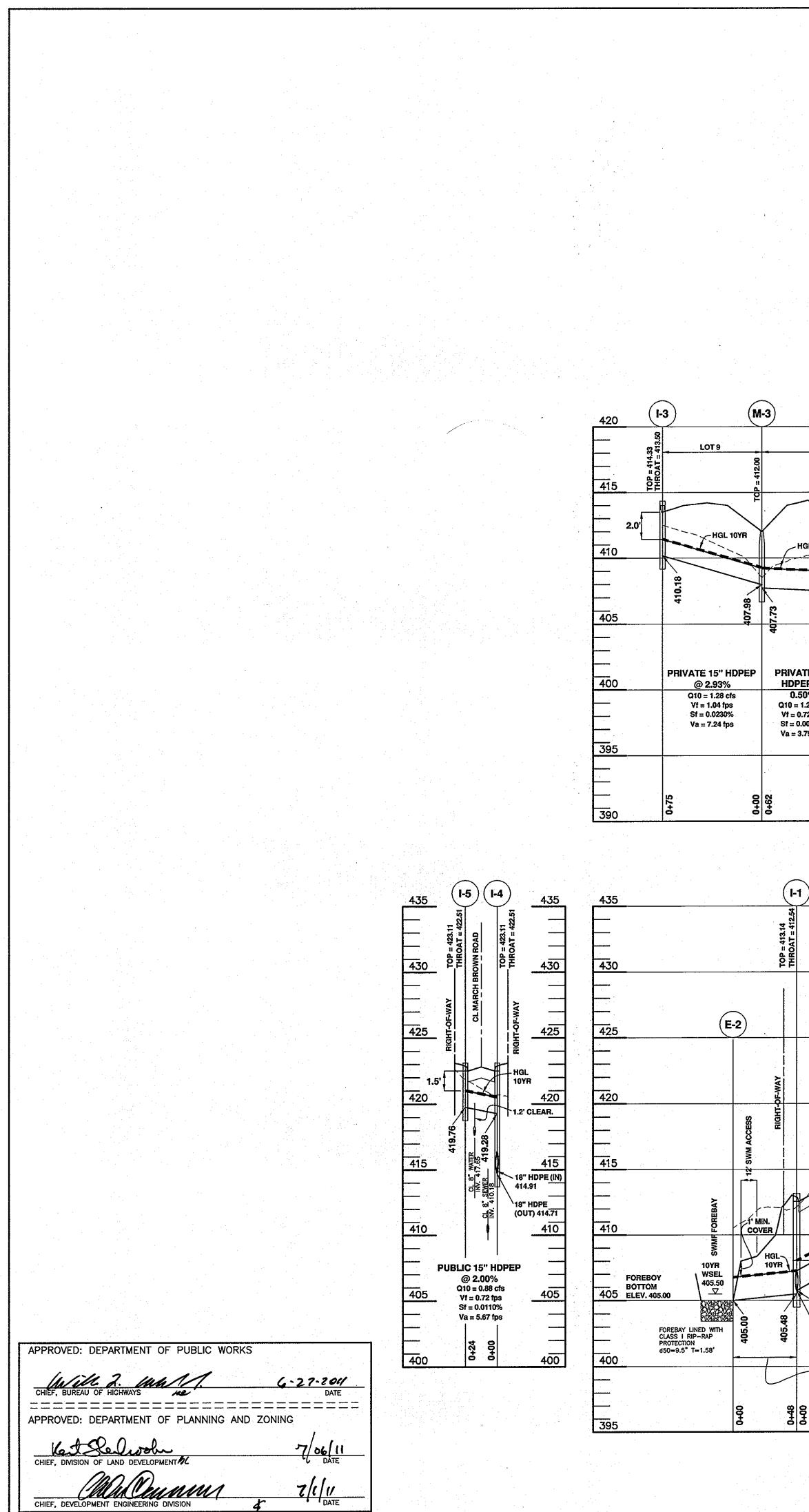
PROPOSED TREELINE

DRAINAGE DIVIDE

Bec3 SOILS TYPE 'C'

SOILS DELINEATION LINE

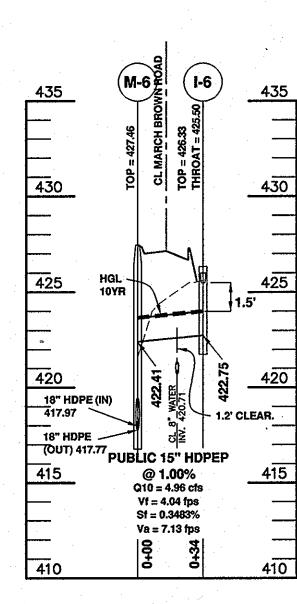
NO. DATE REVISION Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28539, Expiration Date: 7-22-2011. BENCHMARK ENGINEERS A LAND SURVEYORS A PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418 ▲ ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 60 THOMAS JOHNSON DRIVE & FREDERICK, MARYLAND 21702 (P) 301-371-3505 (F) 301-371-3506 WWW.BEI-CIVILENGINEERING.COM <sup>5</sup>/23/201j VAL/EN CASCADE OVERLOOK SECTION III LOTS 1 thru 14 AND OPEN SPACE LOTS 15 thru 17 OWNER: SECURITY DEVELOPMENT LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244 31 GRID: 10 PARCEL: p/o 260 ZONED: R-ED ELECTION DISTRICT NO. 1 HOWARD COUNTY, MARYLAND TAX MAP: 31 DEVELOPER: SECURITY DEVELOPMENT LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244 STORM DRAIN DRAINAGE AREA MAP DATE: MAY, 2011 BEI PROJECT NO: 1676 DESIGN: DBT DRAWN: DBT SHEET 7 OF 11 SCALE: AS SHOWN



NUMBER	TYPE	LOCATION	1617/2	RTIN	I INVERTOUT	TOP ELEV.		HO. CO. STD. DETAIL	IMAINTE NANC
NUMBER	ITPE	LOCATION				TOF ELEV.	INNOATELEV	HU. CO. 31D. DE IAIL	
				INLETS					-
l-1	A-5	LP STA. 1+50.00 OFFSET 0.132' LEFT	405.73	405.73	405.48	413.14	412.54	D-4.01 & D-4.02	PUBLIC
-2	<u> </u>	N 572728.8521 E 1378557.7931	407.42	NA	407.32	414.33	413.50	D-4.10 & D-4.11	PRIVATE
I-3	Digital in the	N 572829.3390 E 1378568.1671	NA	NA	410.18	414.33	413.50	D-4.10 & D-4.11	PRIVATE
-4	A-5	CL STA. 5+87.39 OFFSET 10.00' RIGHT	414.91 (18")	419.28 (15")	414.71	423.11	422.51	D-4.01 & D-4.02	PUBLIC
l-5	A-5	CL STA. 5+87.39 OFFSET 10.00' LEFT	NA	NA	419.76	423.11	422.51	D-4.01 & D-4.02	PUBLIC
l-6	D	CL STA. 2+96.31 OFFSET 17.00' LEFT	NA	NA NA	422.75	426.33	425.50	D-4.10 & D-4.11	PUBLIC
I-7	A-5	CL STA. 1+58.57 OFFSET 10.00' RIGHT	419.75	NA	419.50	423.84	423.24	D-4.01 & D-4.02	PUBLIC
-8	A-5	CL STA. 1+58.57 OFFSET 10.00' LEFT	NA	NA	<sup>'</sup> 419.99	423.84	423.24	D-4.01 & D-4.02	PUBLIC
<b>_</b>			M	ANHOLES	· .			· · · · · · · · · · · · · · · · · · ·	· · · ·
M-1	4' DIA	N 572556.3460 E 1378662.0985	406.09	NA	405.99	413.30	NA	G-5.12	PRIVATE
M-2	4' DIA	N 572600.9982 E 1378577.1151	406.67	NA	406.57	414.70	NA	G-5.12	PRIVATE
M-3	4' DIA	N 572765.8251 E 1378608.1044	407.98	NA	407.73	412.00	NA	G-5.12	PRIVATE
M-4	4' DIA	CL STA. 4+86.11 OFFSET 13.05' RIGHT	416.12	NA	415.92	427.86	NA	G-5.12	PUBLIC
M-5	4' DIA	CL STA. 4+01.02 OFFSET 13.05' RIGHT	416.88	NA	416.68	429.06	NA	G-5.12	PUBLIC
M-6	4' DIA	CL STA. 3+11.67 OFFSET 13.05' RIGHT	417.97 (18")	422.41 (15")	417.77	427.46	NA	G-5.12	PUBLIC
			ENC	SECTIONS					
E-1	24" CONC.	N 572644.5318 E 1378828.2187	399.57	NA	399.50	NA	NA	D-5.51	PRIVATE
E-2	21" CONC.	N 572580.6035 E 1378751.1204	450.06	NA	450.00	NA	NA	D-5.51	PRIVATE
			ST	RUCTURES					
S-1	SEE SWM	N 572596.8386 E 1378822.8006	401.49	400.00	400.00	408.00	405.00 (WEIR)	SEE SWM DETAILS	PRIVATE

STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE RIM. STRUCTURE LOCATION FOR INLETS IS AT THE CENTER OF THE INLET FACE. STRUCTURE LOCATION FOR THE END-SECTIONS IS AT THE MIDPOINT OF THE END OF THE STRUCTURE. PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.

435



(1-2	SWM ACC		-2)	M-1	(•	1 42	20
33 413.50	12'	OPEN SPACE LOT 17			.14 412.54		
TOP = 41433 THROAT = 413.50		PROPOSED		TOP = 413.30 RIGHT-OF-WAY	TOP = 413.14 THROAT = 412.54	41	5
		GROUND	EXISTING GROUND	TOP		-	
-HGL 10YR		HGL 10YR				41	0
	╢╓╴ ┝╋╸╼╍╴╋╼╴ ╽╴╴╴╽		HGL 10YR		-HGL 10YR	-	
407.42	32	1.9' CLEARANCE				18" HDPE (IN) 405.73 40	)5
40	407.32	406.67 ~	406.57 ~	406.09	405.73 /	21" HDPE (OUT) 405.48	
VATE 18" DPEP @	36" HDPE . 402.28±	PRIVATE 18" HDPEP @ 0.50%	PRIVATE 18" HDPEP @ 0.50%	1	PRIVATE 8" HDPEP	40	00
0.50% = 1.28 cfs = 0.72 fps = 0.0087%	CL 36	Q10 = 2.12 cfs Vf = 1.20 fps Sf = 0.0242% Va = 4.38 fps	Q10 = 2.12 cfs Vf = 1.20 fps Sf = 0.0242% Va = 4.38 fps	Q	@ 0.50% 10 = 2.12 cfs /f = 1.20 fps if = 0.0242%		 
= 3.79 fps	· · · · ·			· · · · · ·	/a = 4.38 fps	39	95
· · · · ·	SCALE:	RM DRAIN PROFILE 1"=50' HORIZ., 1"=5' VERT.				-	
00+0	1+29	00+0	96+0	0+00 0+51	00+0	39	90

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-  -	1	-4) (M	-4) (M	-5) (N	1-6	(1-7	ノヘラ	)
[ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [	TOP = 423.11 THROAT = 422.51	TOP = 427.86	TOP = 429.06			TOP = 423.84 THROAT = 423.24		THROAT = 423.24
						, , , , , , , , , , , , , , , , , , ,	CL MARCH	/
				15" HDPE (IN) 422.41 HGL	HQL 10YR	HGL- 10YR		2.0'
••		15" HDPE (IN) 419.28 HGL 10YR	HGL 10YR	10YR	7.97	419.50		66. 67 14 1.2' CLEAR.
	HGL 10VR	415.92	416.12	416.88	4		CL 8" WATER INV. 418.0	
	1.6' CLEAR.	PUBLIC 18" HDPEP @ 1.00% Q10 = 5.98 cfs Vf = 3.39 fps St = 0.1919% Va = 7.47 fps		PUBLIC 18" HDPEP @ 1.00% G10 = 5.98 cfs Vf = 3.39 fps St = 0.1919% Va = 7.47 fps	PUBLIC 18" HDPEP @ 1.00% Q10 = 1.60 cfs Vf = 0.91 fps Sf = 0.0138% Va = 5.17 fps		@ ' Q10 = Vf = Sf =	15" HDPEP 1.00% = 0.81 cfs 0.66 fps 0.0093% 4.33 fps
ſ	405.73       Q10 = 6.78 cfs         Vf = 3.84 fps         18" HDPE (IN)         Sf = 0.2463%         405.73         Va = 14.48 fps	P	UBLIC 18" HDPEI @ 1.00% Q10 = 5.98 cfs Vf = 3.39 fps Sf = 0.1919% Va = 7.47 fps					
	@ 1.00% Q10 = 11.25 cfs Vf = 4.67 fps Sf = 0.2981% Va = 8.63 fps	0+00 1+01	0+00	00 00 00 00 00 00 00 00 00 00 00 00 00	00+0	1+53	0+00 0+24	

	PIPE SCHEDU	JLE	а. Ф
SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
15"	HDPEP	82	PUBLIC
18"	HDPEP	559	PUBLIC
21"	RCCP CL IV	48	PUBLIC
24"	ASTM C-361 B-25	46	PUBLIC
15"	HDPEP	75	PRIVATE
18"	HDPEP	338	PRIVATE

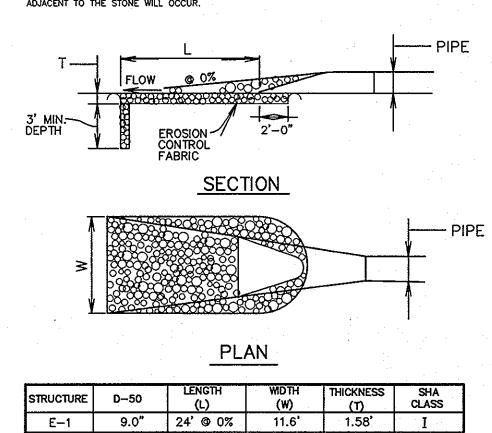
All pipes shall have smooth interior. No interior corrugations.

### CONSTRUCTION SPECIFICATIONS

 THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
 THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
 GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.

4. STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR HE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEDTEXTILE FABRIC, HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.

5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

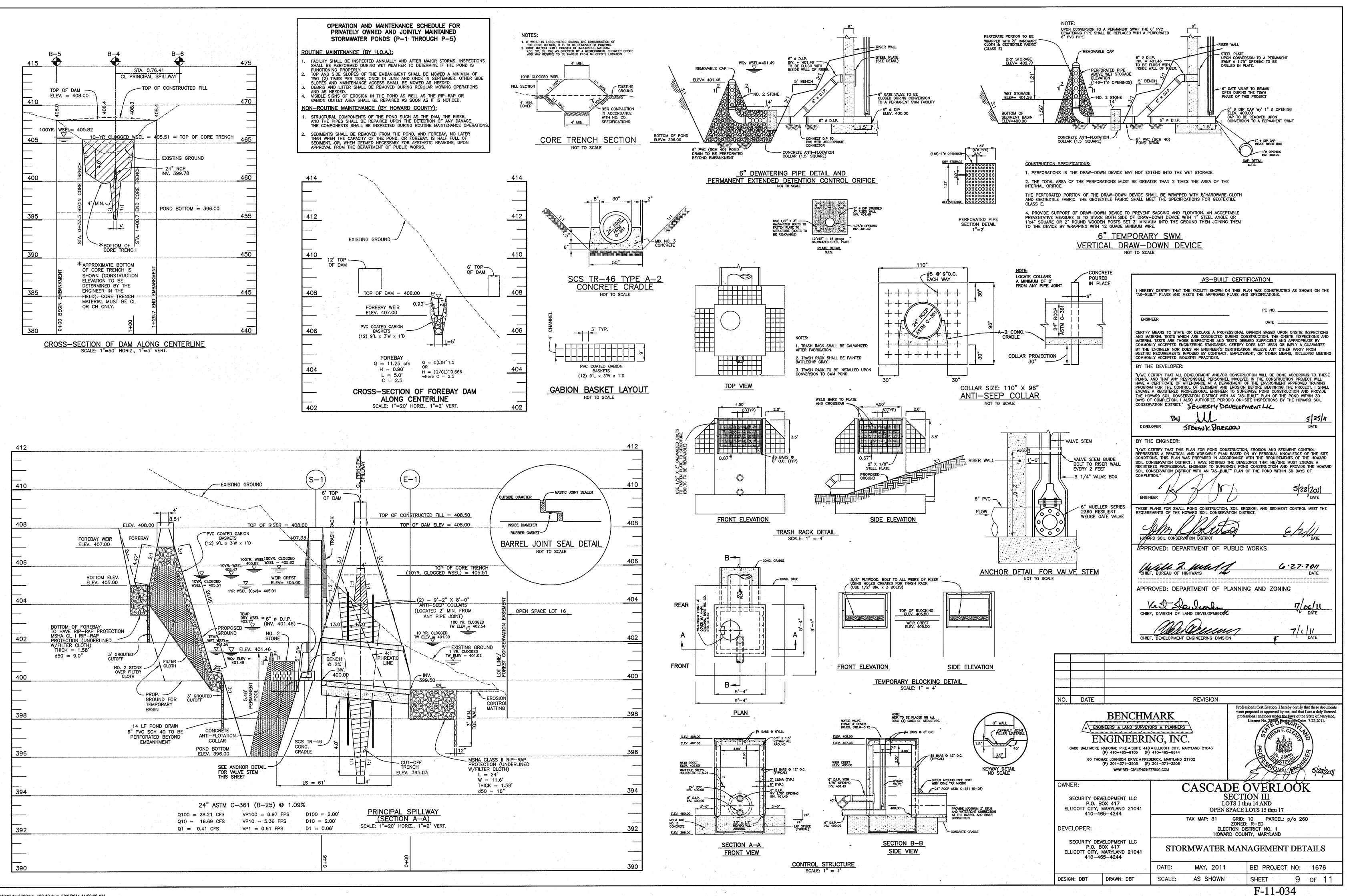


9.5" FOREBAY FOREBAY 1.58' OUTLET PROTECTION DETAIL

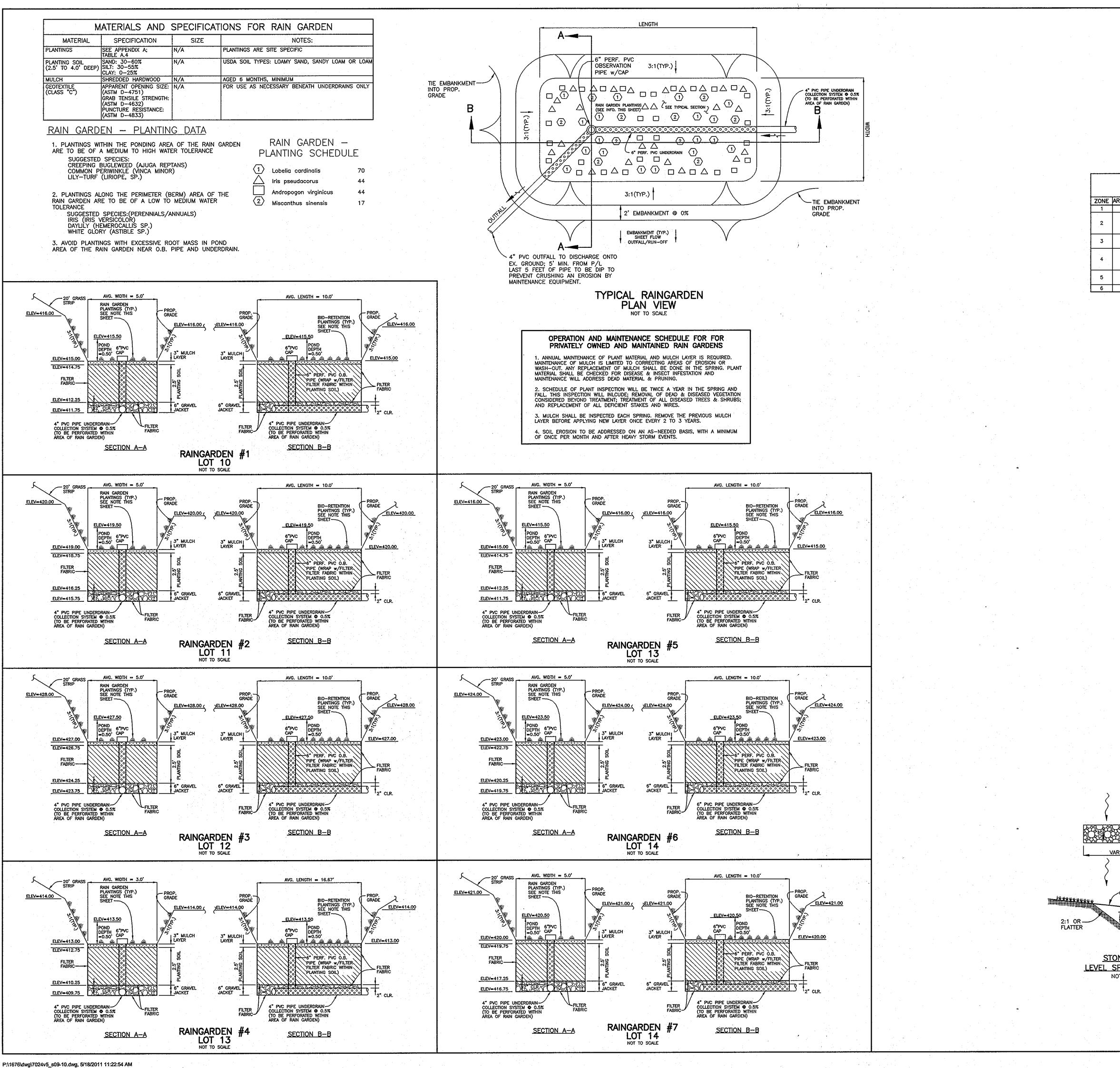
NOT TO SCALE

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NO.	DATE	а. 		REVISION			·	
	EN 8480 BALTIMORE N 60 THOM	IAS JOHNSON DRIVE A FRED	NG, INC A ELLICOTT CITY, M 410-465-6644 DERICK, MARYLAND 301-371-3506	ARYLAND 21043	were profess	ional Certification. I hereby certification. I hereby certification of approved by me, and the sional engineer under the laws of License No. 28559. Expiration D	at I am a duly licensed the State of Maryland,	
OWN	IER:		(	CASCAI			Т <b>Ќ</b>	
1	P.O. B(	ELOPMENT LLC OX 417 WARYLAND 21041	SECTION III LOTS 1 thru 14 AND OPEN SPACE LOTS 15 thru 17					
DEV	ELOPER:	5-4244	TAX MAP: 31 GRID: 10 PARCEL: p/o 260 ZONED: R-ED ELECTION DISTRICT NO. 1 HOWARD COUNTY, MARYLAND					
	P.O. BO LICOTT CITY, M	ELOPMENT LLC OX 417 WARYLAND 21041 5-4244	STORM DRAIN PROFILES					
	· ·		DATE:	MAY, 2011		BEI PROJECT NO:	1676	
DESIC	GN: DBT	DRAWN: DBT	SCALE:	AS SHOWN		SHEET 8	OF 11	



P:\1676\dwg\7024v5\_s09-10.dwg, 5/18/2011 11:23:08 AM



PLANTIN	IG LEGEND
ZONE 1	
ZONE 2	
ZONE 3	不可兴
ZONE 4	
ZONE 5	

### INTERNAL PLANTING SCHEDULE FOR D 5 DOOVET DONID

P-5 PUCKET PUND								
AREA (SF)	ELEVATION RANGE	PLANT MIX	QUANTITIES					
1,621	396.00 - 400.40	100% WATER LILLY	180					
		50% BROAD WATER WEED	85					
1,536	400.40 - 401.46	25% DUCK POTATO	43					
		25% ARROW ARUM	43					
4 00 4	401.46 - 404.00	50% CUTGRASS, RICE	105					
1,894	401.40 - 404.00	50% SWITCHGRASS	105					
	(CPv)	50% LOVEGRASS-MEADOW	49					
873	404.00 - 405.01	25% VIOLETS, COMMON BLUE	24					
		25% CONEFLOWER, CUT-LEAF	- 24					
660	(CPv) (100YR)	75% WITCHGRASS, NEEDLE-LEAF	55					
662	405.01 - 405.82	25% CONEFLOWER, SWEET	18					
0	N/A	N/A	0					

NOTES:

- 1. LOOSEN SOIL IN PLANTING ZONES TO A DEPTH OF THREE TO FIVE INCHES BEFORE PLANTING.
- 2. PLANTING HOLES TO HAVE A DIAMETER 6" GREATER THAN THE ROOT BALL BEING PLANTED IN THEM.

3. NO WOODY VEGETATION IS PERMITTED WITHIN 15' OF THE TOE OF SLOPE OR 25' OF THE SPILLWAY.

12' SWM ACCESS -408.3F INTERNAL LANDSCAPING FOR P-5 POCKET POND SCALE: 1" = 30'AS-BUILT CERTIFICATION I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS. ENGINEER DATE CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ONSITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFIC DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES. BY THE DEVELOPER: "I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. 1 ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT." SECURITY DEVELOPMENT LLL BU <u>5 25 u</u> DEVELOPER STEVENK BREEDEN BY THE ENGINEER: "I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."/ 5/23/2011 ENGINEER DATE THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. <u>6/2///</u> DATE APPROVED: DEPARTMENT OF PUBLIC WORKS with R. marg 6-27-2011 CHIEF. BUREAU OF HIGHWAYS - jus DATE APPROVED: DEPARTMENT OF PLANNING AND ZONING CHIEF, DMSION OF LAND DEVELOPMENT 7/06/11 <u>Albannu</u> 7/1 (1/ DATE CHIEF, DEVELOPMENT ENGINEERING DIVISION REVISION rofessional Certification. I hereby certify that these documen were prepared or approved by me, and that I am a duly licenses **BENCHMARK** professional engineer under the laws of the State of Maryland License No. 28559; Expirition Date: 7-22-2011. ENGINEERS A LAND SURVEYORS A PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418 ▲ ELLICOTT CITY, MARYLAND 21043 (P) 410-465-6105 (F) 410-465-6644 60 THOMAS JOHNSON DRIVE ▲ FREDERICK, MARYLAND 21702 (P) 301-371-3505 (F) 301-371-3506 5[23/20]] WWW.BEI-CIMLENGINEERING.COM ONAVENS CASCADE OVERLOOK SECTION III SECURITY DEVELOPMENT LLC P.O. BOX 417 LOTS 1 thru 14 AND ELLICOTT CITY, MARYLAND 21041 OPEN SPACE LOTS 15 thru 17 410-465-4244 GRID: 10 · PARCEL: p/o 260 ZONED: R-ED TAX MAP: 31 ELECTION DISTRICT NO. 1 HOWARD COUNTY, MARYLAND

ORIGINAL GROUND LEVEL TOP 0% GRADE OWNER: 3"-4"ø-STONE STONE TRENCH LEVEL SPREADER DETAIL NOT TO SCALE DEVELOPER: SECURITY DEVELOPMENT LLC ELLICOTT CITY, MARYLAND 21041

FLOW ENTERS AS SHEET FLOW

2.0'

DATE

P.O. BOX 417

NO.

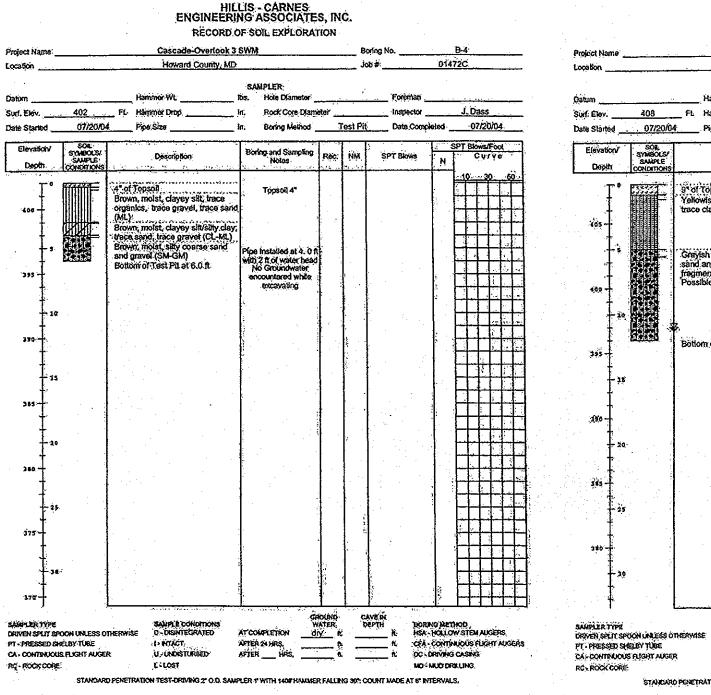
OR CONCENTRATED FLOW

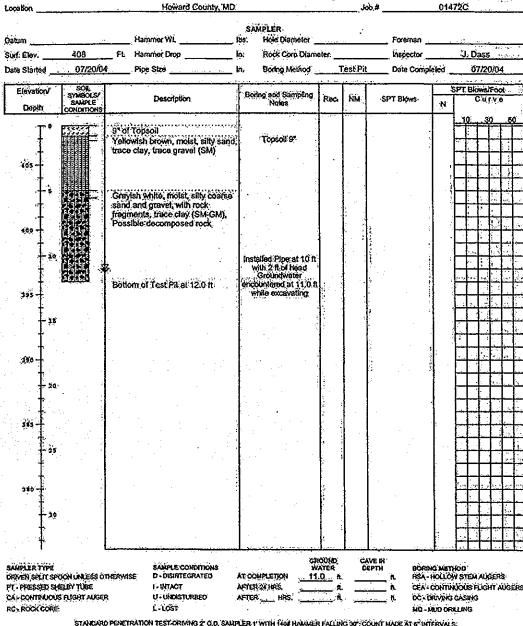
FLOW EXITS AS SHEET FLOW

STORMWATER MANAGEMENT DETAILS

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410-	-465-4244	DATE:	MAY, 2011	BEI PROJECT NO:	1676
DESIGN: DBT	DRAWN: DBT	SCALE:	AS SHOWN	SHEET 10	OF 11
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HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

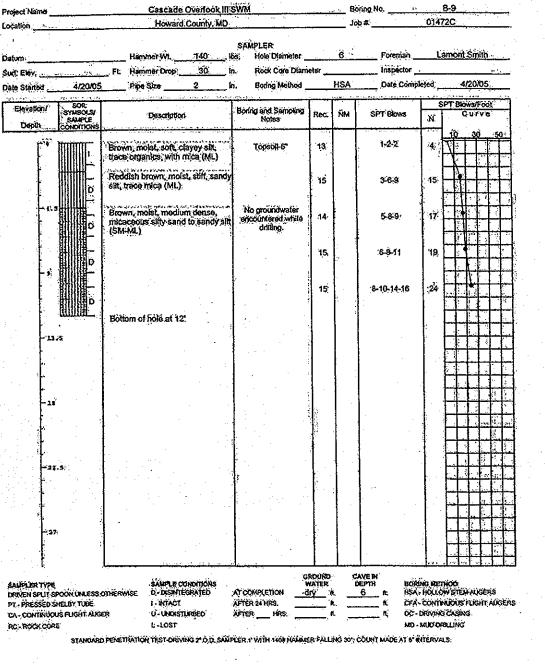
RECORD OF SOIL EXPLORATION.

Boring No.

Cascade Overlook 3 SWM

### HILLIS - CARNES ENGINEERING ASSOCIATES, INC RECORD OF SOIL EXPLORATION Boring No. Cascade Overlook III SWM Job #\_\_\_\_\_01472C Howard County, MD Hamimer Wc: 140/ Ros. Hole Diameter 6 Foreman: Lamont Smith Staff Elev: \_\_\_\_\_\_ Fl. Hammer Drop \_\_\_\_\_ 30:\_\_\_ In. Rock Core Diameter \_\_\_\_\_\_ Inspector Detor Started \_\_\_\_\_\_\_ Ar20/05 \_\_\_\_\_\_ Plee Size \_\_\_\_\_\_ In Boring Method \_\_\_\_\_\_ HSA \_\_\_\_ Date Completed \_\_\_\_\_\_ 4/20/05 Elevation/ SON SYMBOLS/ SAMPLE Cprve Boring and Sampling, Roc. INM SPT Blows Description Notes Depth, ોગોની Light brown, moist, very soft, Tooso8-6 micaceous silly clay, trace sand and organics (CL) end organics (CE) Light brown, moist, medium stiff, to stiff, sandy silt, trace mice, 3,4.4 race to no clay (ML) 4.5.7 Groundwater incountered at 61 while drilling. 4,4 8 Brown; moist, stiff, micaceou 34-14-16 silty sand to sandy silt (SM-M Boltom of hole at 12 GROUND WATER dry #. CAVE IN OEPTH 6 A BORDIO METHOD HSA-HOLLOW STEM AUGER SAMPLER TYPE ORIVEN SPLIT SPOON UNLESS OTHERWISE: SAMPLE CONDITIONS D'-DISINTEGRATED PT - PRESSED SHELBY TUBE I-INTACT AFTER 24 HRS. CFA-CONTINUOUS FLIGHT AUGE CA - CONTINUOUS FUGHTAUGER U-UNDISTURBED OC - DRIVING CASIN AFTER HR \_\_\_\_\_ R\_ \_\_\_\_\_ f HO - LIVO DRILLING L-LOST RC ROCK CORE ER FALLING 30" COUNT MADE AT & INTERVALS.

# HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION



APPROVED: DEPARTMENT OF PUBLIC WOR	<s< th=""></s<>
CHIEF, BUREAU OF HIGHWAYS	<b>G-27-2011</b> DATE
APPROVED: DEPARTMENT OF PLANNING AN	
CHIEF, DIVISION OF LAND DEVELOPMENT/K	-1/06/11 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	7/1/11 DATE

### HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name		Cascade-Overlook 3 SWM							van be roo					01472C					
Location	<u></u>		Howard County, MD.						# dol					014/20					
1				S	wpler														
Datum	an de c	Ham	mor WL	lbs.	MPLER Hole Diameter					Foreir	iain						<u>.</u>		
	400	Ft Ham	mer Dron								clor J. Dass								
	Elev. <u>409</u> Ft. Hamm Started <u>07/20/04</u> Pipe S			io`			Test Pit			'Date (	Comol	eled 07/20/04							
Date Started	07720/04	rupe			County Indered	. <u></u>							27.000				1		
Elevation	SOIL STNIBOLS/			Bo	ning and Samplin		Rec. NM						SPT Blows/Foot				-		
Depth	SAMPLE		Description		Notes	- I Rec.	×.	NM:	SPT Blow		v3.	». N		v	014	0			
Debat	CONDITIONS	<u> </u>	م الحرب المتعلق و رود الم ال				-						کنی ا	<u>.</u>	30	: \$	<u>j.</u>		
Т°	CERT	8 of Tops	oll sist, clayey silt, with			-	1	ł					T	·		$\square$			
: <del>†</del>		Brown, mo	pist, clayey silt, with		Topsoli 8"	1							ſП	Т	- <u> </u>	П			
ł		sand and (CL-ML)	gravel, trace organi	CS .							1	ļ	П	Т		Π	T		
ł		Brown, m	pist, silly sand, trace	3					ŀ.					-		Π	F		
405		gravel (SI	Ą.			4	- 1		i.						Т	Π			
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- 4						į,			ļ.			ľ					Ē		
+		Brown, m	olst, sandy silt, trace	clay			_ [		<b> </b> -	•		;				1.	Γ		
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+ 10	(明治)。	sand with	reravel and rock	1		E.	- 5		2						-	1			
ł		fragments	(SM-GM) et, brown, very coa			ſ			} `			1				1-	f		
ł		silly sand	and gravel with roc	Sci 1	Groundwater		÷						Γ				1		
ł	RECEI	fragments	(Possible Decomp	osed en	countered at 12.0 while excavaling	0 ft	- 1		1				-			1	F		
399-		<ul> <li>Rock)</li> <li>Bottom of</li> </ul>	test Pat at 13 ft	1	inde execteding	' · 1	- 9		18			-			-	1	F		
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SANPLER TYPE			SAMPLE CONDITIONS	s	a la baran n	WAT	ER		DEPTH		BOR	ING M	THO		(********	****			
DRIVEN SPUTS	POON UNLESS	<b>THERWISE</b>	D-DISINTEGRATED		COMPLETION _	<u>12</u> R				R. K		HOU,							
PT - PRESSED SHELBY TUBE CA - CONTINUOUS FUCHT AUGER		1- INTACT 11- UNDISTURBED	AFTER 24 HRS AFTER HRS			R		n. ft					2						
RC-ROCK COR		, in	L-LOST				- · "	-				NUD							
NO NOR OUN	STANDA																		

### HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION Cascade Overlook III SWM \_\_\_\_\_ Boring No. \_\_\_\_\_\_ 8-10

d, Eley,	FU	Hammer Wr Hammer Drop _		SAMPLER bs. Hole Dja)nete n. Rock Core Dia	meter		ins	ernan		Imoni	<u>Smi</u>	<u>lh</u>	
e Stanted4/2	0/06	Pipe Size	2:1	n. Boring Method	l <u></u>	HSA	Dat	e Cómo	leted	••••.4	120/	)5	<del>.</del> .
Élevation/ Som Sylaso Copin Conom	e Ma	Description	<b>)</b>	Boring and Samplar Notes	ġ Rec.	ŇM	SPT BI	ows	N SI	PT Bk	ows/F Curv		
[° 77	D Bro	vin, moist, soft, s a organics and h	andy clay, hica:(CL)	Topsoli-6*	12		1-2-	2	4	$\frac{10}{1}$			<u>م</u>
	– Yelk D <sup>silty</sup>	ow, moist, medil sand, trace grav	im dense, /c[ (SM)		14:		4-6-	7	13				
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SAMPLER TYPE SAMPLE CONDITIONS DRIVEN SFUT SFOON DALESS OTHERWISE D- OSAFTEGRATEO PRI-PRESERSIBLERY TWEE I-INTACT CA- CONTINUOUS FLIGHT NUSER U-UNDISTURGED			ORATEO	AT COMPLETION AFTER 24 HRS.	Inon <u>diry</u> r. <u>4.5</u> r. Hisa-Hollow Sten Isa r. <u>r. 4.5</u> r. Hisa-Hollow Sten Isa r. <u>r. r. r. r. cfa-continuous</u> f				en augers Is flicht auger				

### Job'# 01472C \_\_\_\_\_\_ Hammer WL 140 Ibs. Hole Diameter 6 Foreman Lamont Smith FL Hammer Drop 30 In. Rock Core Diameter \_\_\_\_\_\_ Inspector \_\_\_\_\_ Surf. Elev. Boring and Sampling Rec. NM SPT Blows SAMPLE Depth بينهم والمستعد الأرياق مسرعان 1-1-2 Brown, molst, very soft micaceous silt, trace sand, claj and organics (ML) Topsoll-6\* Brown to reddish brown, moi medium dense, micaceous si 6.7-11 sand to sandy sitt (SM-ML 4-8-7 griñing, 6-9-11 7-9-13-21 ┉┟┈┝╌┠╌┥╌┥ Bottom of hole at 12

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Cascade Overlook III SWM

Boring No.

 GROUND: CAVE IN WATER DEPTH BORING METHOD AT COMPLETION dry # 6.5 ft HSA-HOLLOW STEM AUGERS AFTER 24 HRS. \_\_\_\_\_\_ft \_\_\_\_\_ft CFA-CONTINUOUS FLIGHT AUGERS. AFTER \_\_\_\_\_HRS. \_\_\_\_\_ft \_\_\_\_\_ft DC+ORMING CASING SAMPLE CONDITIONS Q - DISINTEGRATED I - INTACT. SAMPLER TYPE DRIVEN SPUT SPOON ONLESS OTHERWISE PT - PRESSED SHELBY TUBE U - UNDISTURBED L-LOST STANDARD PENETRATION TEST DRIVING 2" CLD, SAMPLER 1" WITH 1409 HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

circumstances shall equipment be driven over any part of a concrete structure or pipe,

materials

Pipe Conduits

between 4 and 9.

# GEOTECHNICAL ENGINEER RECOMMENDATION

EMBANKMENT AND CUT-OFF TRENCH CONSTRUCTION THE AREAS OF THE PROPOSED SWM FACILITIES SHOULD B STRIPPED OF TOPSOIL AND ANY OTHER UNSUITABLE MATERI THE EMBANKMENT OR STRUCTURE AREAS IN ACCORDANCE V CONSERVATION GUIDELINES. AFTER STRIPPING OPERATIONS BEEN COMPLETED, THE EXPOSED SUBGRADE MATERIALS SHO PROOFROLLED WITH A LOADED DUMP TRUCK OR SIMILAR EC IN THE PRESENCE OF A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE, FOR AREAS THAT ARE NOT ACCESSIBLE T TRUCK, THE EXPOSED MATERIALS SHOULD BE OBSERVED A TESTED BY A GEOTECHNICAL ENGINEER OR HIS REPRESENTA UTILIZING A DYNAMIC CONE PENETROMETER. ANY EXCESSIVE OR LOOSE MATERIALS IDENTIFIED BY PROOFROLLING OR PENETROMETER TESTING SHOULD BE EXCAVATED TO SUITABL SOIL, AND THEN GRADES RE-ESTABLISHED BY BACKFILLING SUITABLE SOIL.

A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER SHOUL PRESENT TO MONITOR PLACEMENT AND COMPACTION OF FIL THE EMBANKMENT AND CUT-OFF TRENCH. IN ACCORDANCE NRCS-MD CODE NO. 378 POND STANDARDS/SPECIFICATIONS CONSIDERED SUITABLE FOR THE CENTER OF EMBANKMENT / CUTOFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFI GC, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASS #200 SIEVE. IT IS OUR PROFESSIONAL OPINION THAT IN ADDITION TO THE

MATERIALS DESCRIBED ABOVE, A FINE-GRAINED SOIL, INCLUI SILT(ML) WITH A PLASTICITY INDEX OF 10 OR MORE CAN BE UTILIZED FOR THE CENTER OF THE EMBANKMENT AND CORE TRENCH. ALL FILL MATERIALS MUST BE PLACED AND COMP ACCORDANCE WITH NRCS-MD CODE NO. 378 SPECIFICATION

### CONSTRUCTION SPECIFICATIONS

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

# Site Preparation

Earth Fill

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped to topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment. Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater

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

management ponds, a minimum of a 25-foot radius around the inlet structure shall be

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

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

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

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

When required by the reviewing gaency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within  $\pm$  2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

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

Embankment Core — The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the cores shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment

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

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

### All pipes shall be circular in cross section

Corrugated Metal Pipe - all of the following criteria shall apply for corrugated metal pipe: 1. Materials — (Polymer Coated steel pipe) — Steel pipes with polymeric coatings shall bave a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M—245 & M-246 with watertight coupling bands or flanges.

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

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be

2. Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must l use of rubber or plastic insulating materials at

3. Connections - All connections with pipes mu barrel connection to the riser shall be welded Anti-seep collars shall be connected to the pip watertight. Dimple bands are not considered to each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, prepunched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having c minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches i diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flance is also acceptable

All connection shall use a rubber or neoprene gasket when joining pipe sections. The end of

Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead. 4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

5. Backfilling shall conform to "Structure Backfill".

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

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

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

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

4. Backfilling shall conform to "Structure Backfill".

pedding is not permitted.

5. Other details (anti-seep collars, valves, etc.) shall be shown on the drawings. Plastic Pipe - The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4' – 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S. 2. Joints and connections to anti-seep collars shall be completely watertight

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

4. Backfilling shall conform to "Structure Backfill".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings. <u>Drainage Diaphragms</u> — When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

### <u>Concrete</u>

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

Rock riprop shall meet the requirements of Maryland Department of Transportation. State Highway Administration Standard Specifications for Construction and Materials, Section 311 Geotextile shall be placed under all riprap and shall meet the requirements of Maryland

Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C. Care of Water during Construction

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

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

Erosion and Sediment Control

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

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