

SITE DATA

LOCATION: TAX MAP 47, GRID 12, PARCEL 119
 DEED REFERENCE: L-9070 F.598
 6TH ELECTION DISTRICT
 EXISTING ZONING: R-SC
 PER THE COMPREHENSIVE ZONING PLAN DATED 2/02/04.
 GROSS AREA OF PARCEL: 0.6351 AC.
 AREA OF FLOODPLAIN: N/A
 AREA OF STEEP SLOPES: N/A
 NET AREA OF PROJECT: 0.6351 AC.
 NUMBER OF RESIDENTIAL LOTS PROPOSED: 2 LOTS
 AREA OF PROPOSED RESIDENTIAL LOTS: 27,663 SF (0.6351 AC)
 AREA OF SMALLEST BUILDABLE LOT PROPOSED: 11,294 SF
 NUMBER OF PROPOSED OPEN SPACE LOTS: 0
 NUMBER OF NON-BUILDABLE BULK PARCELS: 0

GENERAL NOTES

- THE PROJECT BOUNDARY IS BASED ON A FIELD RUN BOUNDARY SURVEY PREPARED BY ROBERT H. VOGEL ENGINEERING, INC. DATED 1/26/06
- THE TOPOGRAPHY SHOWN HEREON IS BASED ON FIELD RUN TOPOGRAPHY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC. DATED 3/26/06
- WATER AND SEWER SERVICE FOR THIS PROJECT WILL BE PUBLIC. WATER AND SEWER SERVICE WILL BE GRANTED UNDER THE PROVISIONS OF SECTION 16.122B OF THE HOWARD COUNTY CODE.
- THIS SITE IS NOT LOCATED IN A HISTORIC DISTRICT.
- NO STREAMS OR STREAM BUFFERS EXIST ON SITE.
- NO 100-YEAR FLOODPLAIN EXIST ON SITE.
- THERE ARE NO WETLANDS AND WETLAND BUFFERS ON THIS SITE.
- SUBJECT PROPERTY ZONED R-SC PER 2/02/04 COMPREHENSIVE ZONING PLAN AND AMENDED BY THE COMPREHENSIVE LIFE AMENDMENT DATED 07/28/06.
- LANDSCAPING FOR THIS PROJECT IS PROVIDED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL. LANDSCAPING AND SURETY WILL BE ADDRESSED WITH THE S.D.P. LANDSCAPING SHOWN HERE IS CONCEPTUAL ONLY.
- THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS (COUNCIL BILL 45-2003).
- DRIVEWAYS SHALL BE PROVIDED PRIOR TO RESIDENTIAL OCCUPANCY TO INSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
 - WIDTH - 12 FEET (16 FEET SERVING MORE THAN ONE RESIDENCE).
 - SURFACE - 6 INCHES OF COMPACTED CRUSHER RUN BASE WITH TAR AND CUR COATING.
 - GEOMETRY - MAXIMUM 15% GRADE, MAXIMUM 10% CHANGE AND MINIMUM 0.5' DEPTH TURNING RADIUS.
 - STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25 LOADING).
 - DRAINAGE ELEMENTS CAPABLE OF SAFELY PASSING 100-YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER DRIVEWAY SURFACE.
 - STRUCTURE CLEARANCES - MINIMUM 12 FEET.
 - MAINTENANCE - SUFFICIENT TO INSURE ALL WEATHER USE.
- DPZ FILE NUMBERS: ECP-11-049 AND ZB 1072m.
- THERE IS NO EXISTING HOUSE OR CONSTRUCTION ON THIS PROPERTY. STORM WATER MANAGEMENT ADDRESSED FOR SITE USING 2007 MARYLAND STORMWATER DESIGN MANUAL (CHAPTER 5).
- A. CHANNEL PROTECTION VOLUME (CPV) IS NOT REQUIRED (Pe FOR ENTIRE SITE IS EQUAL TO OR UNDER 1.0')
 B. WATER QUALITY VOLUME (WQV) AND RECHARGE VOLUME (REV) TO BE PROVIDED BY ROOF TOP DISCONNECT (N-1), MICRO BIORETENTION FACILITIES (M-6), PERMEABLE CONCRETE (A-2) AND RAIN BARRELS (M-1). (DETAILED SHEET 3 OF 3).
- FOREST STAND DELINEATION PREPARED BY ROBERT H. VOGEL ENGINEERING, INC. DATED MARCH 2011.
- A NOISE STUDY WAS PREPARED BY ROBERT H. VOGEL ENGINEERING, INC. DATED FEBRUARY 2011.
- TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL/CEMETERY LOCATIONS ON SITE.
- THERE ARE NO STEEP SLOPES LOCATED ON SITE.
- THIS PROJECT IS EXEMPT FROM FOREST CONSERVATION IN ACCORDANCE WITH SECTION 16.1202(b)(1)(i) OF THE HOWARD COUNTY CODE FOR DEVELOPMENT ON LAND WHICH IS LESS THAN 40,000 SQUARE FEET.
- THE 65dBA NOISE CONTOUR LINE DRAWN ON THIS SUBDIVISION PLAN IS ADVISORY AS REQUIRED BY THE HOWARD COUNTY DESIGN MANUAL, CHAPTER 5, REVISED FEBRUARY, 1992 AND CANNOT BE CONSIDERED TO EXACTLY LOCATE THE 65dBA NOISE EXPOSURE. THE 64dBA NOISE LINE WAS ESTABLISHED BY HOWARD COUNTY TO ALERT DEVELOPERS, BUILDERS, AND FUTURE RESIDENTS THAT AREAS BEYOND THIS THRESHOLD MAY EXCEED GENERALLY ACCEPTED NOISE LEVELS ESTABLISHED BY THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.

SUPPLEMENTAL INFORMATION, FOREST CONSERVATION LANDSCAPE, SIGHT DISTANCE AND STORMWATER MANAGEMENT PLAN

TOTARO PROPERTY

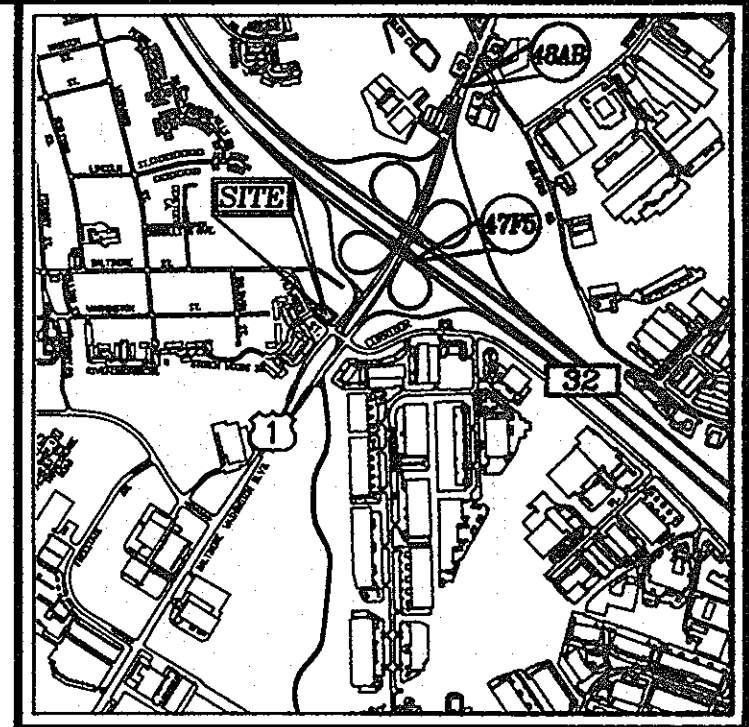
LOTS 1 & 2

LIBER 9070, FOLIO 598

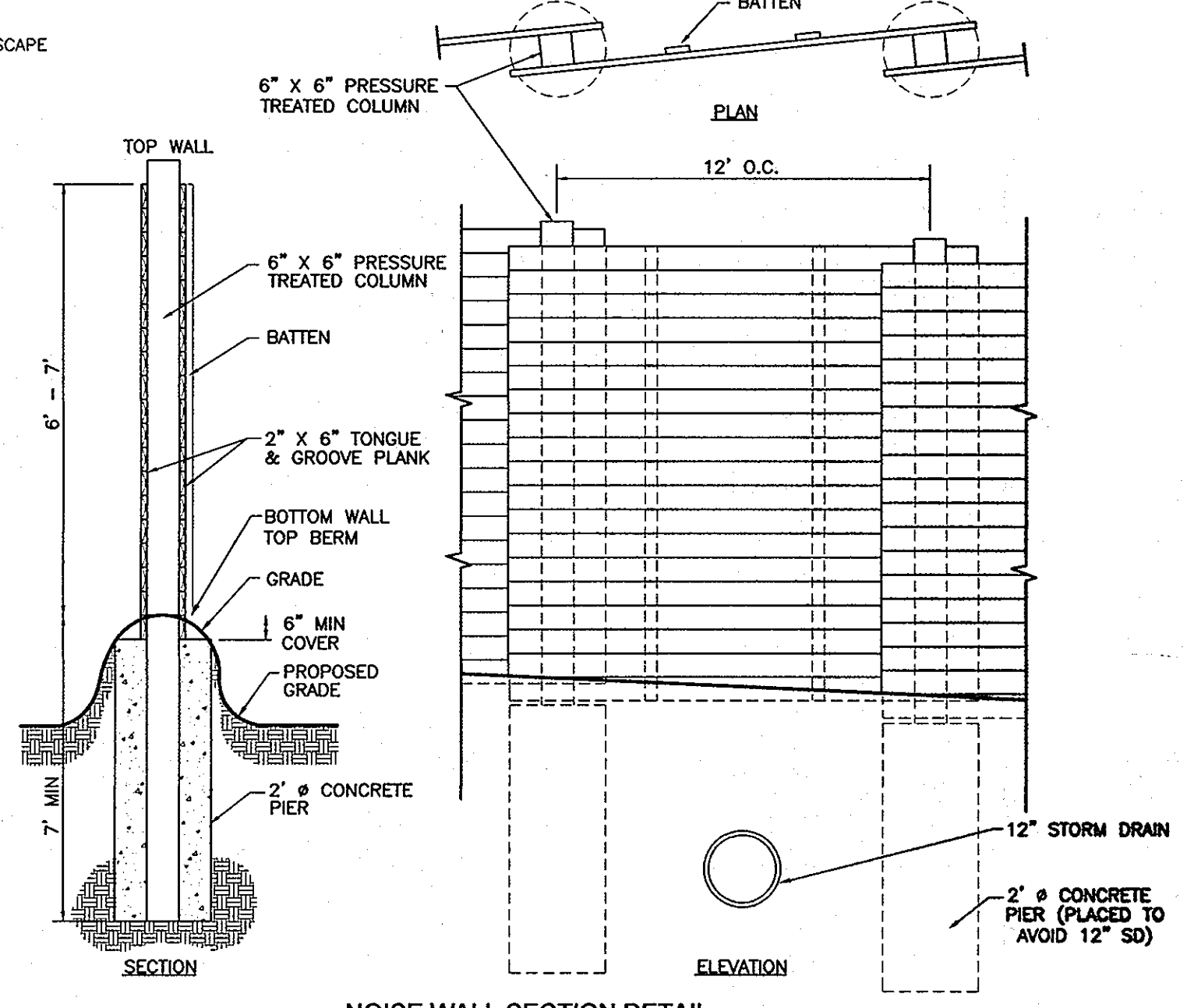
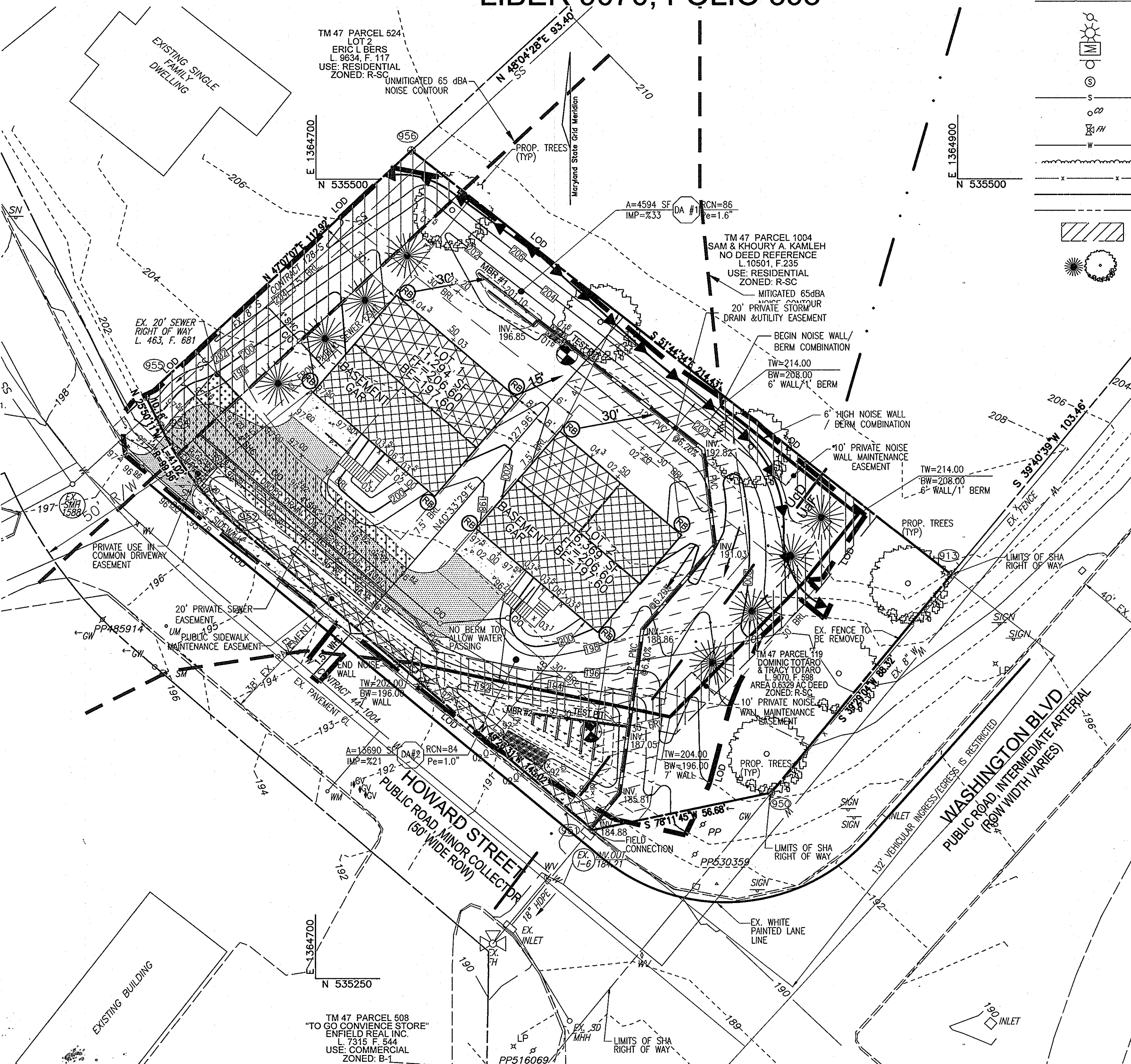
BENCHMARKS
 HOWARD COUNTY BENCHMARK - 47FS (CONC. MONUMENT) E.235.045
 N.535985.024 E.1365653.51
 HOWARD COUNTY BENCHMARK - 48AB (CONC. MONUMENT) E.225.70
 N.536384.453 E.1366415.81

LEGEND:

- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING TREELINE
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- EXISTING SEWER EASEMENT
- PROPOSED LANDSCAPE
- EXISTING SOIL
- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN
- PROPOSED CLEAN WATER DIKE (MOUNTABLE)
- PROPOSED RAIN BARREL
- AREA TO RAIN BARREL W/ DISCONNECT
- PROPOSED PERVIOUS CONCRETE
- PROPOSED CONCRETE
- PROPOSED MICRO BIORETENTION FACILITY
- 20' PRIVATE SEWER EASEMENT
- PRIVATE USE IN COMMON DRIVEWAY EASEMENT
- LIMIT OF DISTURBANCE
- PROPOSED NOISE WALL
- STABILIZED CONSTRUCTION ENTRANCE
- SUPER SILT FENCE
- PRIVATE NOISE WALL MAINTENANCE EASEMENT
- PUBLIC SIDEWALK MAINTENANCE EASEMENT



VICINITY MAP
 SCALE: 1"=2000'
 ADC MAP/GRID NUMBER: 5053 / K9



OWNER
 DOMINIC TOTARO
 TRACY TOTARO
 12309 CAROL DR
 FULTON, MD 20759
 PHONE: 301-674-6383

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	PERIMETER/FRONTAGE DESIGNATION			TOTAL
	1 A	2 B	3 -	
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	327'	145'	196'	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	NO	NO	NO	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	NO	NO	NO	
NUMBER OF PLANTS REQUIRED	327	145	196	
SHADE TREES	1:60	5	1:50	3
EVERGREEN TREES	-	1:40	4	4
SHRUBS	-	-	-	-
NUMBER OF PLANTS PROVIDED	3	4	4	6
SHADE TREES	-	-	-	-
EVERGREEN TREES (2:1 SUB)	4	4	4	12
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	-
SHRUBS (10:1 SUBSTITUTION)	-	-	-	-
DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED				

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

[Signature] 10/26/2011
 DEVELOPER DATE

FOREST STAND ANALYSIS TABLE

KEY	TYPE OF COMMUNITY	AREA	SOILS INFORMATION		EXISTING VEGETATION	STAND CHARACTERISTICS	FOREST AGE IN SEN. ENV.			
			SOILS TYPICAL FOR SOILS TYPE	WOODLAND FOREST SUITABILITY INDEX				1. SIZE (AC)	2. AGE (YRS)	3. COND.
AF-1	ABANDONED FIELD	0.60 AC	UcF	N/A	12	1	GRASSES, MAPLE	12"-22" 15-20	POOR	0.00 AC
			UcD	N/A	16	1	OAK, HICKORY	12"-22" 15-20	POOR	0.00 AC
STAND AF-1		0.60 ACRES								
TOTAL		0.60 ACRES (ENTIRE SITE)								

SOILS LEGEND

SYMBOL	NAME/DESCRIPTION	TYPE
UcF	UOORTHENTS HIGHWAY, 0 TO 65 PERCENT SLOPES	D
UcD	URBAN LAND-CHILLUM-BELTSVILLE COMPLEX, 5 TO 15 PERCENT SLOPES	D

COORDINATE LIST

POINT	NORTHING	EASTING
913	535376.201	1364898.118
950	535308.036	1364841.958
951	535296.441	1364786.476
952	535290.735	1364676.298
954	535422.989	1364651.424
955	535432.134	1364646.996
956	535508.974	1364729.739

SHEET INDEX

SHT NO.	DESCRIPTION
1 OF 3	SUPPLEMENTAL INFORMATION, FOREST CONSERVATION AND LANDSCAPE PLAN
2 OF 3	SIGHT DISTANCE ANALYSIS, SWM DA MAP
3 OF 3	SWM AND MICROBIORETENTION DETAILS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 11/09/11
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

SUPPLEMENTAL INFORMATION, FOREST CONSERVATION, LANDSCAPE, SIGHT DISTANCE AND STORMWATER MANAGEMENT PLAN

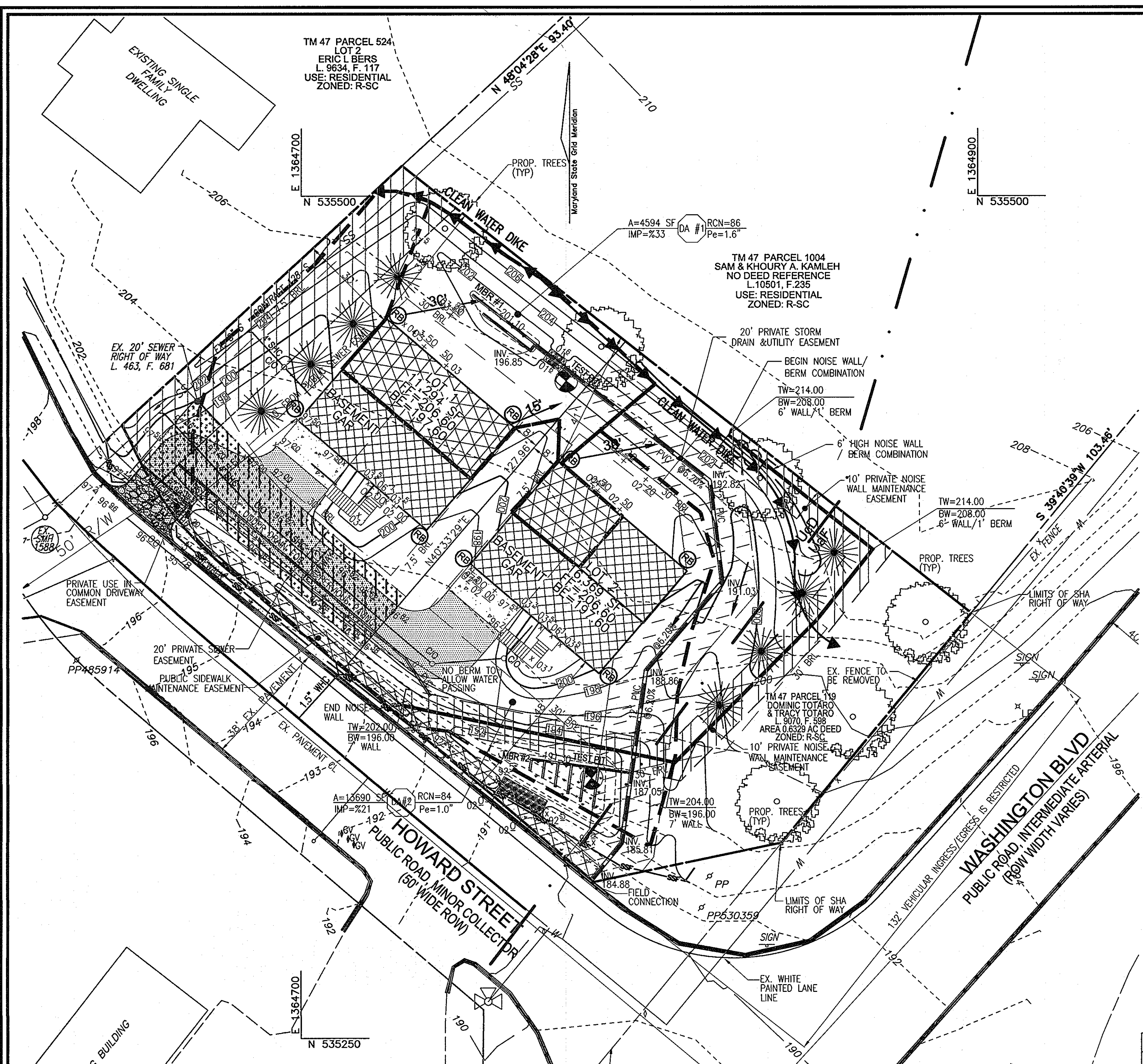
TOTARO PROPERTY
 LOTS 1 & 2
 LIBER 9070, FOLIO 598
 6TH ELECTION DISTRICT
 TAX MAP: 47 GRID: 12
 DPZ REF'S: ZB1072m, ECP-11-049
 ZONING: R-SC
 PARCELS: 119
 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET
 ELLICOTT CITY, MD 21043
 TEL: 410.461.7566
 FAX: 410.461.8961

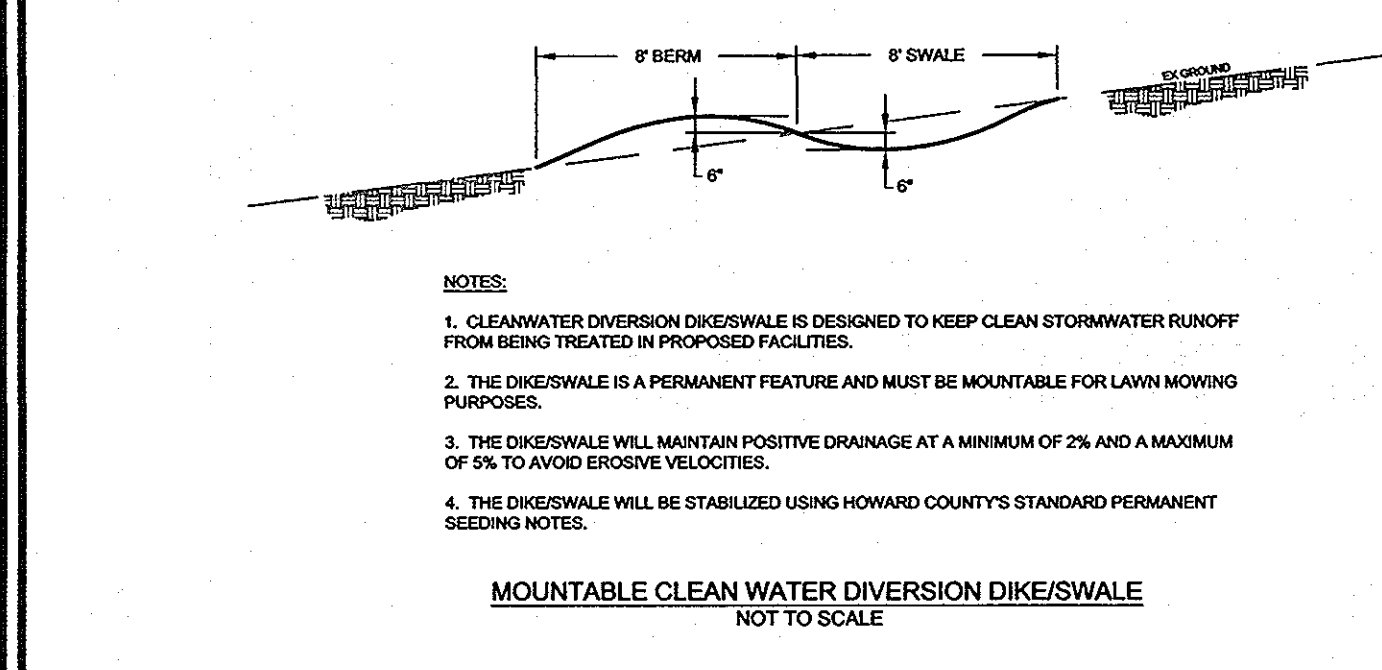
PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 10163, EXPIRATION DATE: 12-10-2012

DESIGN BY: JTD
 DRAWN BY: JTD
 CHECKED BY: RHV
 DATE: OCTOBER 2011
 SCALE: 1"=20'
 W.O. NO.: 05-26

1 SHEET OF 3



SWM DRAINAGE AREA MAP & SEDIMENT CONTROL
SCALE: 1" = 20'



NOTES:

- CLEANWATER DIVERSION DIKE/SWALE IS DESIGNED TO KEEP CLEAN STORMWATER RUNOFF FROM BEING TREATED IN PROPOSED FACILITIES.
- THE DIKE/SWALE IS A PERMANENT FEATURE AND MUST BE MOUNTABLE FOR LAWN MOWING PURPOSES.
- THE DIKE/SWALE WILL MAINTAIN POSITIVE DRAINAGE AT A MINIMUM OF 2% AND A MAXIMUM OF 5% TO AVOID EROSION VELOCITIES.
- THE DIKE/SWALE WILL BE STABILIZED USING HOWARD COUNTY'S STANDARD PERMANENT SEEDING NOTES.

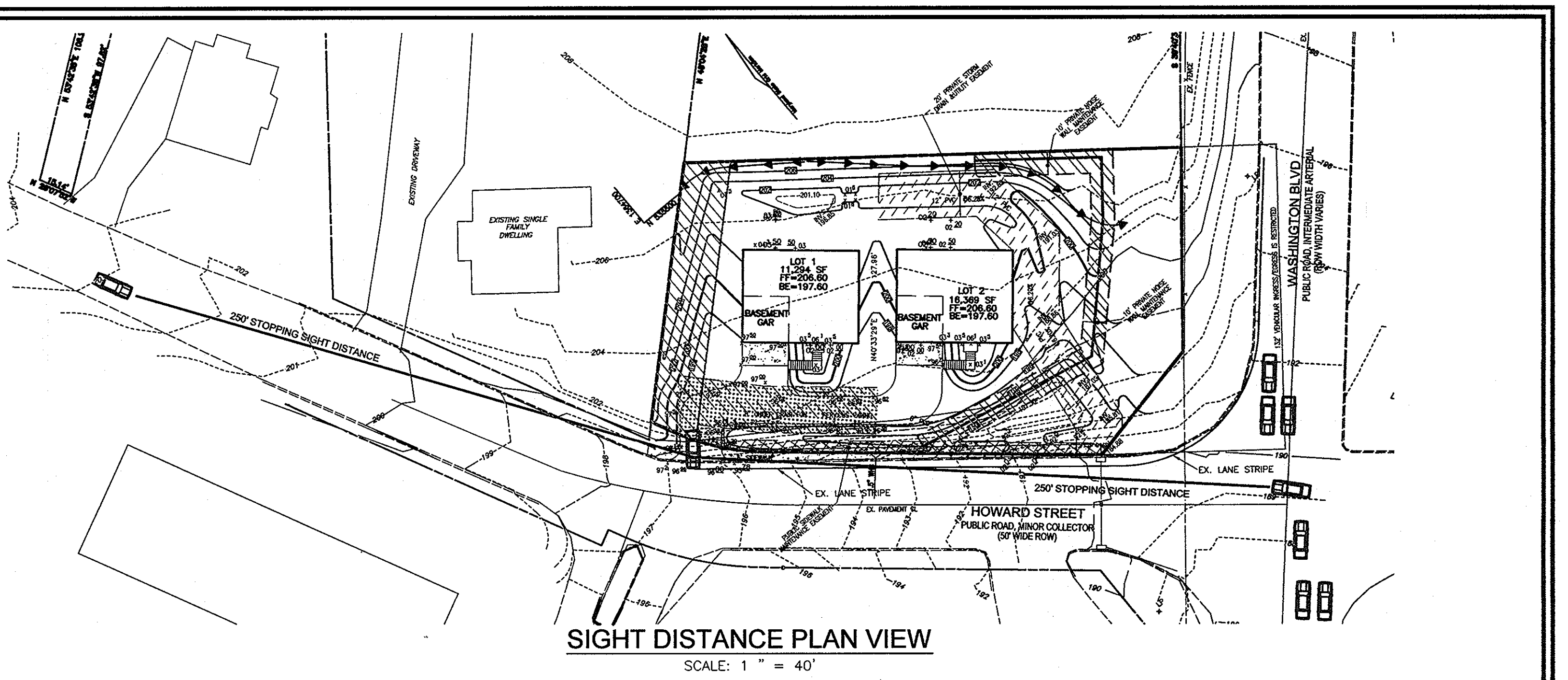
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 11/7/11
CHIEF, DEVELOPMENT ENGINEERING DIVISION J.S. DATE

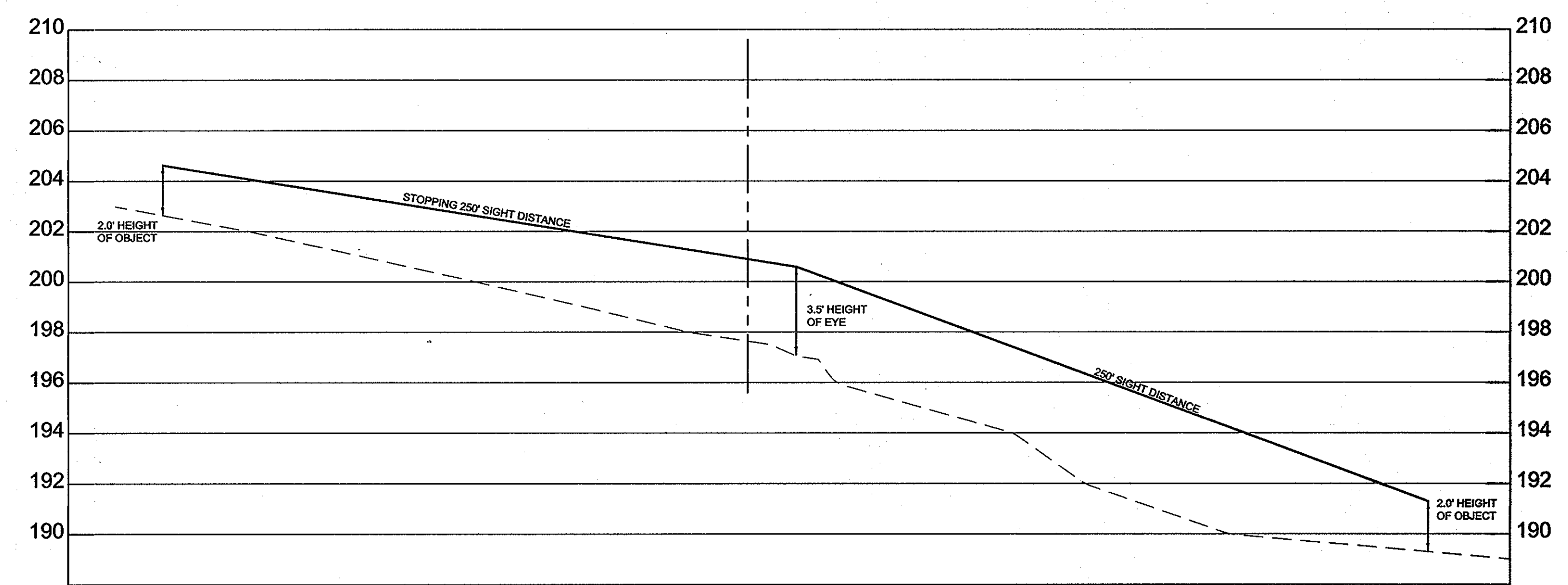
[Signature] 11/09/11
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

LEGEND:

	EXISTING CONTOUR		AREA TO RAIN BARREL
	PROPOSED CONTOUR		AREA TO RAIN BARREL W/ DISCONNECT
	EXISTING SPOT ELEVATION		PROPOSED PERVIOUS CONCRETE
	EXISTING CURB AND GUTTER		PROPOSED CONCRETE
	EXISTING UTILITY POLE		PROPOSED MICRO BORE RETENTION FACILITY
	EXISTING LIGHT POLE		20' PRIVATE SEWER EASEMENT
	EXISTING MAILBOX		PRIVATE USE IN COMMON DRIVEWAY EASEMENT
	EXISTING SIGN		LIMIT OF DISTURBANCE
	EXISTING SANITARY MANHOLE		SWM AREA
	EXISTING SANITARY LINE		PROPOSED CLEAN WATER DIKE (MOUNTABLE)
	EXISTING CLEANOUT		PROPOSED NOISE WALL
	EXISTING FIRE HYDRANT		STABILIZED CONSTRUCTION ENTRANCE
	EXISTING WATER LINE		
	EXISTING TREE LINE		
	EXISTING FENCE		
	PROPERTY LINE		
	RIGHT-OF-WAY LINE		
	EXISTING SEWER EASEMENT		
	PROPOSED LANDSCAPE		
	EXISTING SOIL		
	PROPOSED STORM DRAIN		
	PROPOSED RAIN BARREL		



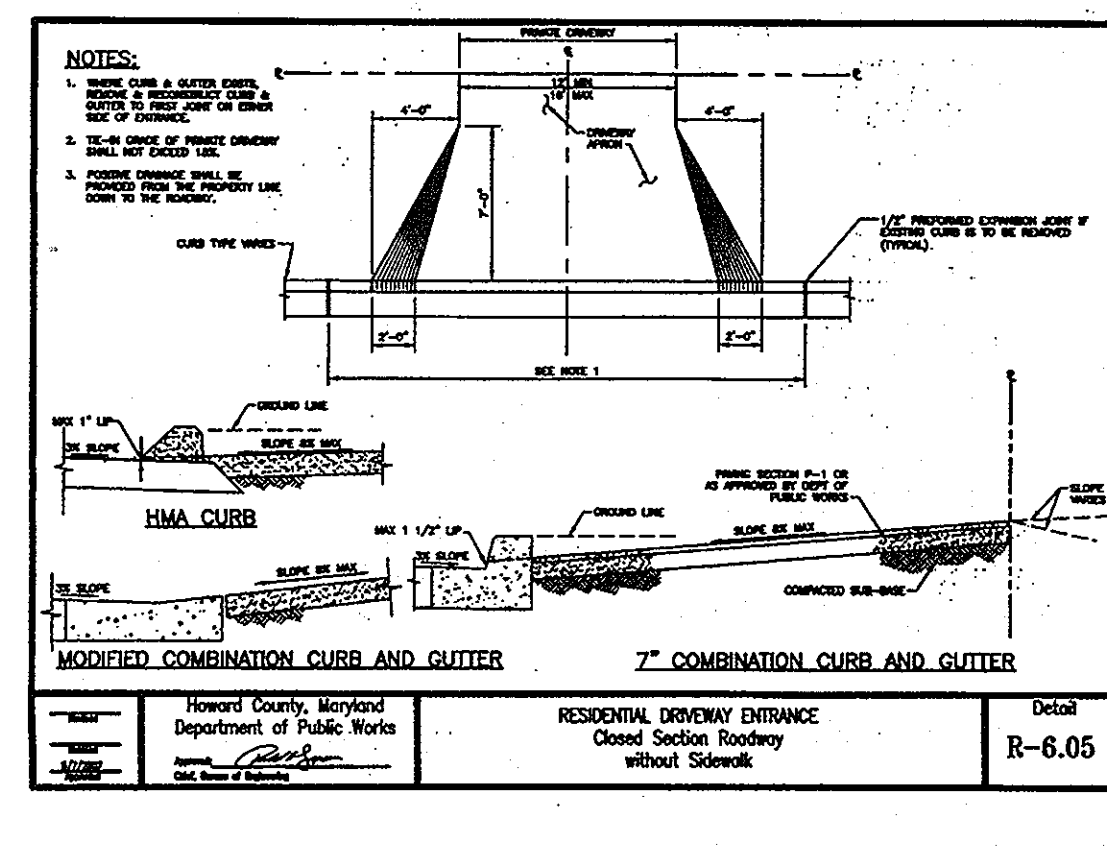
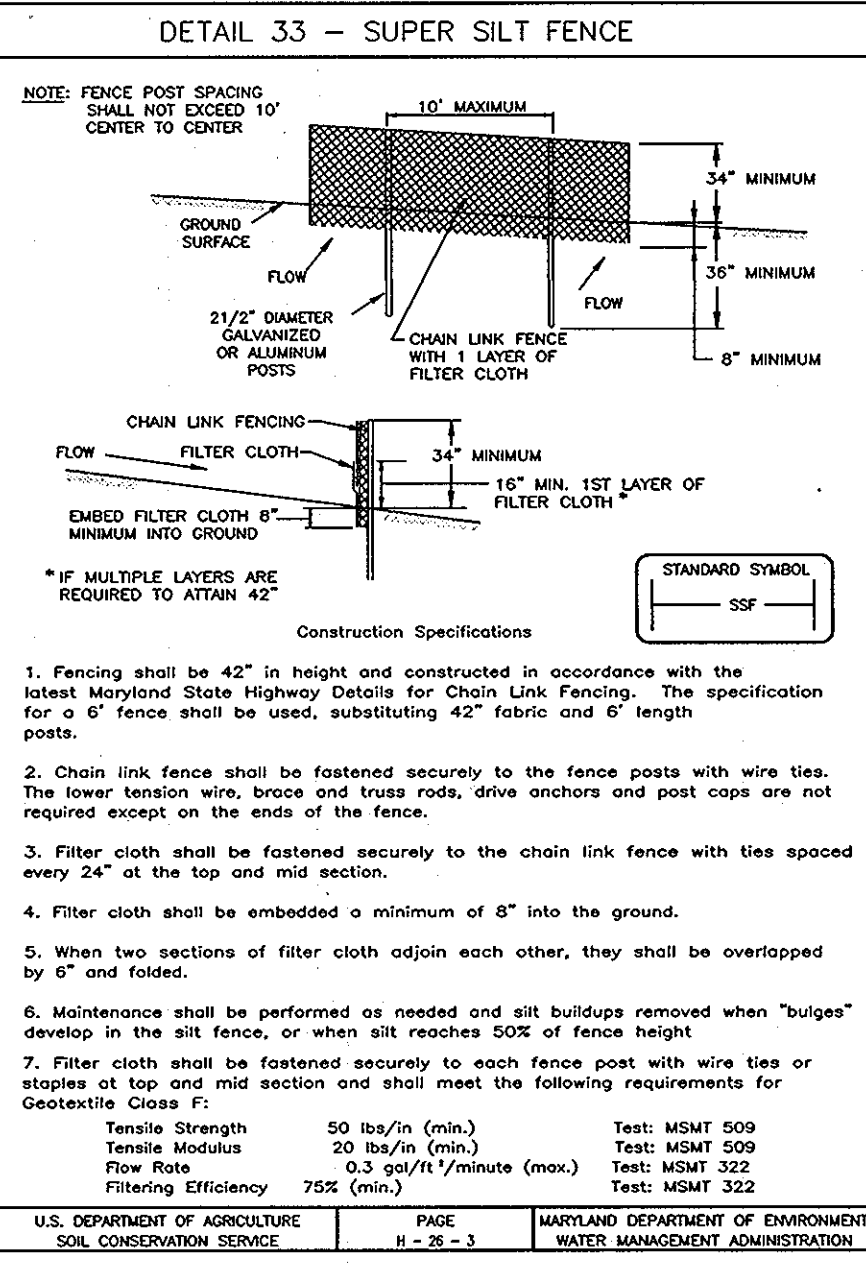
SIGHT DISTANCE PLAN VIEW
SCALE: 1" = 40'



STOPPING SIGHT DISTANCE ANALYSIS

© HOWARD STREET
MINOR COLLECTOR
DESIGN SPEED: 35 MPH
STOPPING SIGHT DISTANCE REQUIRED = 250'
STOPPING SIGHT DISTANCE PROVIDED = 250'
SCALE: 1" = 40' HORZ.
1" = 4' VERT.

OWNER
DOMINIC TOTARO
TRACY TOTARO
12309 CAROL DR
FULTON, MD 20759
PHONE: 301-674-6383



NO.	REVISION	DATE

SUPPLEMENTAL INFORMATION, FOREST CONSERVATION, LANDSCAPE, SIGHT DISTANCE AND STORMWATER MANAGEMENT PLAN, SIGHT DISTANCE ANALYSIS, SWM DA MAP

TOTARO PROPERTY
LOTS 1 & 2
LIBER 9070, FOLIO 598
ECP-11-049 & ZB1072m
HOWARD COUNTY, MARYLAND

6TH ELECTION DISTRICT
TAX MAP: 47 GRID: 12
DPZ REF'S: ZB1072m, ECP-11-049

ZONING: R-SC
PARCELS: 119

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

PROFESSIONAL CERTIFICATE

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 10763, EXPIRATION DATE 12-10-2012.

DESIGN BY: JTD
DRAWN BY: JTD
CHECKED BY: RHV
DATE: OCTOBER 2011
SCALE: AS SHOWN
W.O. NO.: 05-26

2 SHEET OF 3

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

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

2. FILTERING MEDIA OR PLANTING SOIL
 THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICES THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVIDE AN OBSTACLE 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 15.08.01.02.

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 2%
 • PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G. LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.

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

3. COMPACTION
 IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR WASH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACATURE THE SOIL PROFILE THROUGHOUT THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REMOVE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BERMS.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED ALONG THE PERIMETER OF THE BASIN TO SUPPLY SOIL AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH WASH TRACKS.

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

5. PLANT INSTALLATION
 COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDED 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. SHREDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOTS OF THE PLANT MATERIAL SHALL BE KEPT MOST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/2TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 4" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

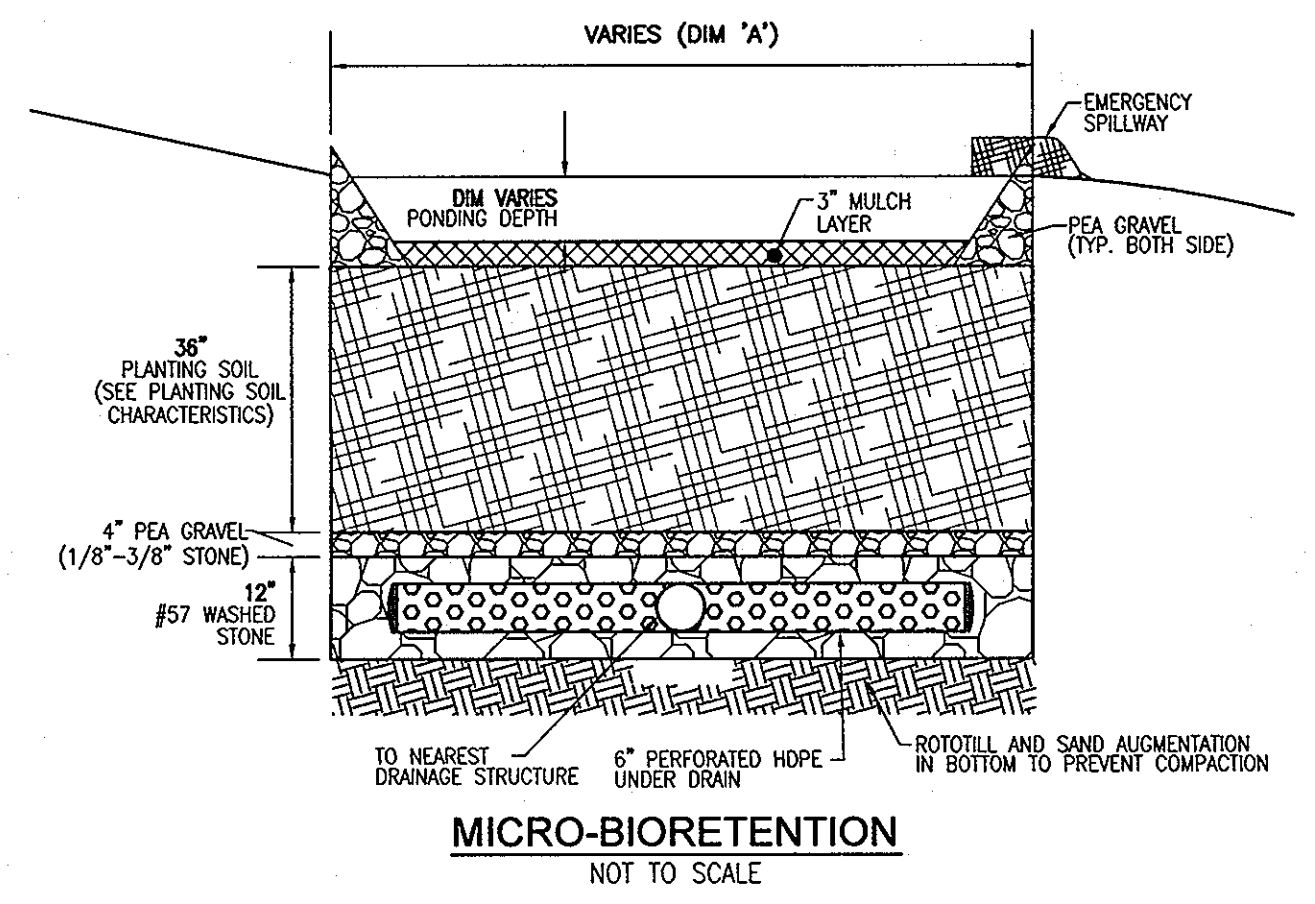
GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

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 DEFLECTS, 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 PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER.
 • PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" NO. 4 OR 444 GALVANIZED HARDWARE CLOTH.
 • GRAVEL - THE GRAVEL LAYER UNDER 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 (1/8" TO 3/8" 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".

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

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

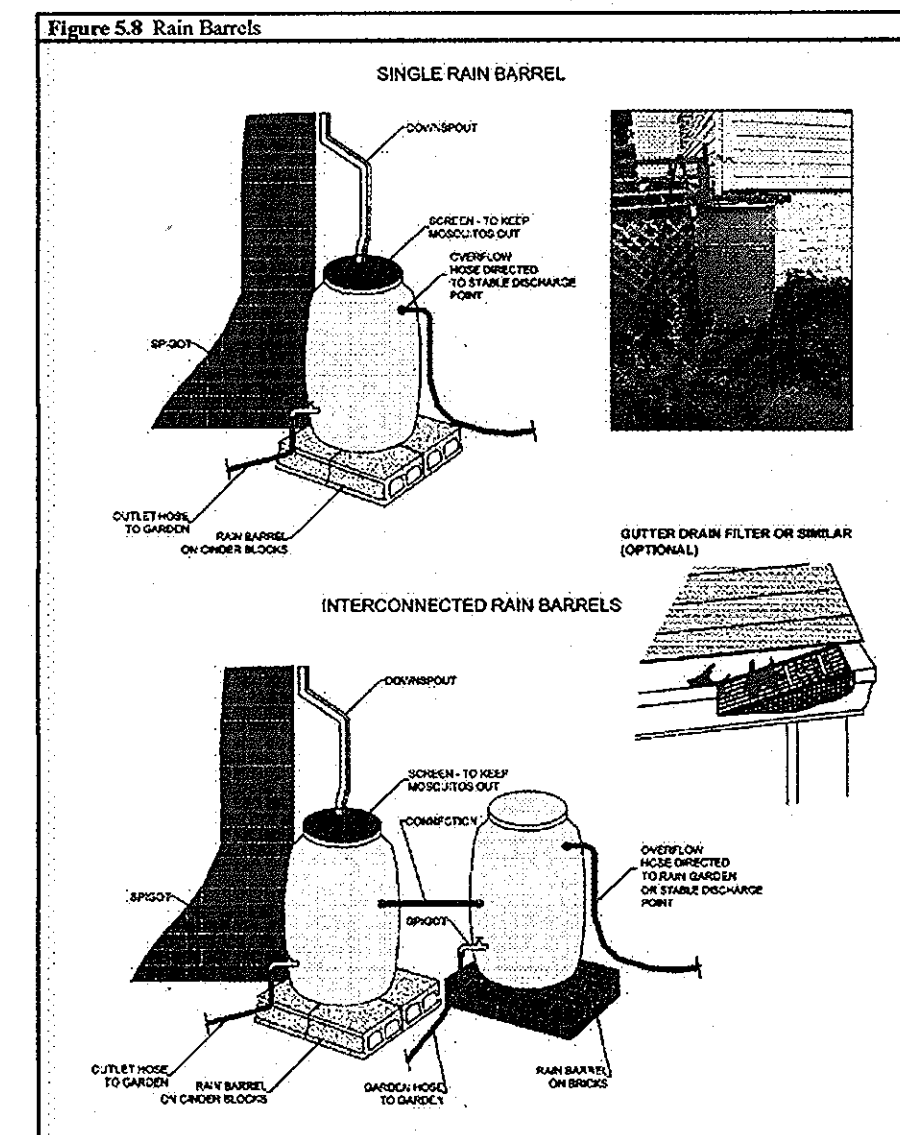


SWM DRAINAGE AREA INFO						
FACILITY	DA	% IMP	ESDY REQ	ESDY PROV	FACILITY TYPE	
MBR #1	4594 SF	33%	72 CF	78 CF	MICRO BIORETENTION	
MBR #2	13690 SF	21%	175 CF	250 CF	MICRO BIORETENTION	

OPERATION AND MAINTENANCE SCHEDULE FOR MICROBIORETENTION AREAS

- ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.
- MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
- SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

MICROBIORETENTION PLANTING SCHEDULE						
KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS		
AR	TBD	ACER RUBRUM	OCTOBER GLORY	2 1/2"-3" CAL	B & B	
IG	TBD	OCTOBER GLORY	RED MAPLE	2 1/2"-3" HT	CONT	
PV	TBD	LEX OVARIA	INGEBERRY	2 1/2"-3" HT	CONT	
PV	TBD	SWITCH GRASS	PANICUM VIRGATUM	1 GALLON	24" O.C.	
MD	TBD	BEE BALM	MONARDA DIDYMA	1 GALLON	24" O.C.	
EP	TBD	JOE PYE WEEB	EUPATORIUM PURPUREUM	1 GALLON	48" O.C.	



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

Material	Specification	Size	Notes
Planting soil (2' to 4' deep)	see Appendix A, Table A.4	see Appendix A, Table A.4	Identifies site-specific
Organic content	see Appendix A, Table A.4	see Appendix A, Table A.4	Identifies site-specific
Pea gravel (1/8"-3/8" stone)	see Appendix A, Table A.4	see Appendix A, Table A.4	USDA soil types loamy sand or sandy loam; clay content < 5%
Gravel (underdrains and infiltration berms)	see Appendix A, Table A.4	see Appendix A, Table A.4	USDA soil types loamy sand or sandy loam; clay content < 5%
Underdrain pipe	see Appendix A, Table A.4	see Appendix A, Table A.4	28 day strength and slump test; all concrete design (cast-in-place or precast) not using precast approved form or steel reinforcement system design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 318.1R/95; vertical loading (24 in or 30 in) allowable horizontal loading based on soil strength and analysis of potential caping.
Observation well	see Appendix A, Table A.4	see Appendix A, Table A.4	28 day strength and slump test; all concrete design (cast-in-place or precast) not using precast approved form or steel reinforcement system design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 318.1R/95; vertical loading (24 in or 30 in) allowable horizontal loading based on soil strength and analysis of potential caping.
Substrate	see Appendix A, Table A.4	see Appendix A, Table A.4	28 day strength and slump test; all concrete design (cast-in-place or precast) not using precast approved form or steel reinforcement system design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 318.1R/95; vertical loading (24 in or 30 in) allowable horizontal loading based on soil strength and analysis of potential caping.

B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TURF

THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS AND ARE NOT EXCLUSIVE OR LIMITING. THE DESIGNER IS RESPONSIBLE FOR DEVELOPING SPECIFICATIONS FOR INDIVIDUAL PROJECTS AND SPECIFIC CONDITIONS.

1. PERMEABLE CONCRETE SPECIFICATIONS
 DESIGN THICKNESS - PERMEABLE CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING EITHER STANDARD PROCEDURES (E.G., ASPHALT, ACI 308.9R, ACI 309R) OR USING SPECIAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.

MIX & INSTALLATION - PORTLAND CEMENTS (ASTM C 150, C 1157) MAY BE USED IN PERMEABLE CONCRETE APPLICATIONS. PHOSPHORUS ADMIXTURES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TENSILE STRENGTH) PRIOR TO CONSTRUCTION SO THAT CRITICAL PROPERTIES (E.G., SETTING TIME, RATE OF STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.

AGGREGATE - PERMEABLE CONCRETE CONTAINS A LIMITED FINE AGGREGATE CONTENT. COMMONLY USED GRADATIONS INCLUDE ASTM C 33 NO. 67 (3/4 IN. TO NO. 4), NO. 8 (3/8 IN. TO NO. 16) AND NO. 89 (3/8 IN. TO NO. 50) SIEVES. SINGLE-SIZED AGGREGATE (UP TO 1 INCH) MAY ALSO BE USED.

WATER CONTENT - WATER-TO-CEMENT RATIOS BETWEEN 0.27 AND 0.30 ARE USED ROUTINELY WITH PROPER INCLUSION OF CHEMICAL ADMIXTURES. WATER QUALITY SHOULD MEET ACI 308.9R AS A GENERAL RULE. PORTLAND CEMENT WATER-TO-CEMENT RATIO SHOULD BE 0.27 TO 0.30.

ADMIXTURES - CHEMICAL ADMIXTURES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPECIAL PROPERTIES IN PERMEABLE CONCRETE. USE OF ADMIXTURES SHOULD MEET ASTM C 494 (CHEMICAL ADMIXTURES) AND ASTM C 360 (FOR ENTRAINING ADMIXTURES) AND CLOSELY FOLLOW MANUFACTURER'S RECOMMENDATIONS.

BASE COURSE - THE BASE COURSE SHALL BE ASPHALT NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

2. PERMEABLE INTERLOCKING CONCRETE PAVEMENTS (PICP)
 PAPER BLOCKS - BLOCKS SHOULD BE EITHER 39 IN. OR 4 IN. THICK AND MEET ASTM C 936 OR CSA A231.2 REQUIREMENTS. APPLICATIONS SHOULD HAVE 20% OR MORE (WAS PREFERRED) OF THE SURFACE AREA OPEN. INSTALLATION SHOULD FOLLOW MANUFACTURER'S INSTRUCTIONS, EXCEPT THAT INFILL AND BASE COURSE MATERIALS AND DIMENSIONS SPECIFIED IN THIS APPENDIX SHALL BE FOLLOWED.

INFILL MATERIALS AND LEVELING COURSE - OPENINGS SHALL BE FILLED WITH ASTM C-33 GRADED SAND OR SANDY LOAM. PICP BLOCKS SHALL BE PLACED ON A ONE-INCH THICK LEVELING COURSE OF ASTM C-33 SAND.

BASE COURSE - THE BASE COURSE SHALL BE ASPHALT NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).

3. REINFORCED TURF
 REINFORCED GRASS PAVEMENT (RGP) - WHETHER USED WITH GRASS OR CRAWEL, THE RGP THICKNESS SHALL BE AT LEAST 1-3/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.

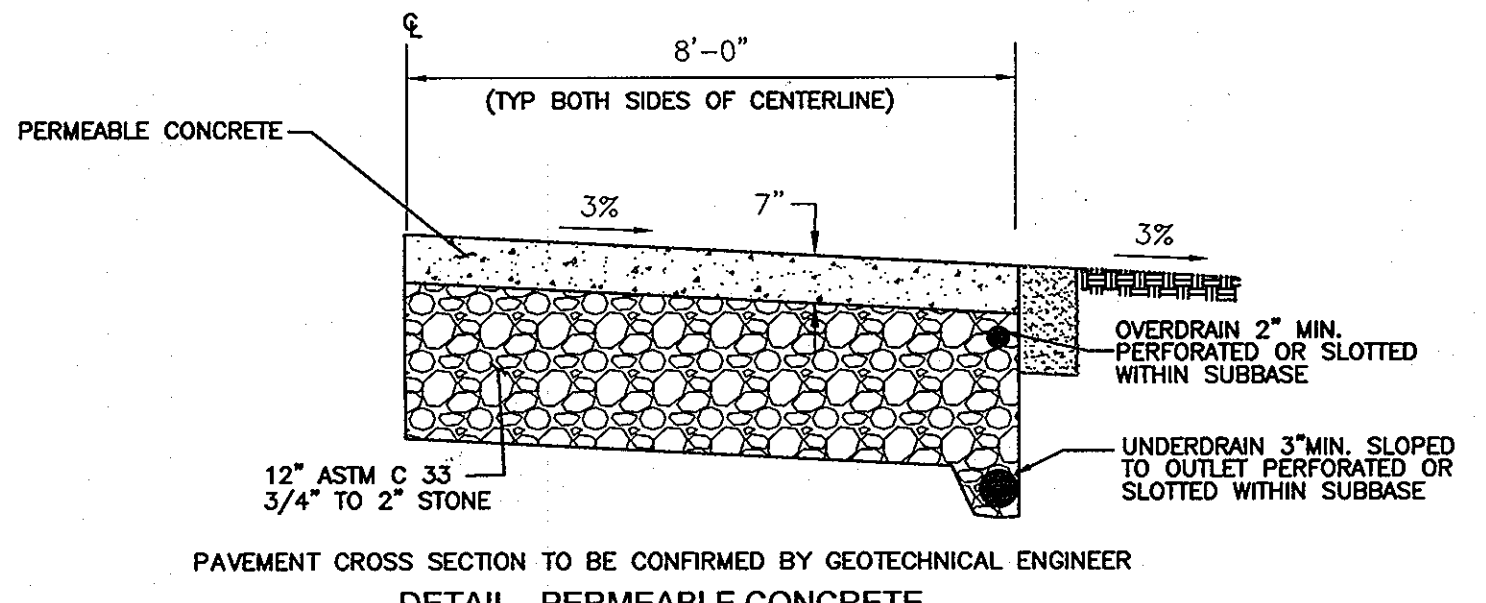
OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7) AND ROOF TOP DISCONNECTS (N-1)

- THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL 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 PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
- 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.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 11/21/11
 CHIEF, DEVELOPMENT ENGINEERING DIVISION J.R. DATE

[Signature] 11/21/11
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE



PAVEMENT CROSS SECTION TO BE CONFIRMED BY GEOTECHNICAL ENGINEER
DETAIL - PERMEABLE CONCRETE
 NOT TO SCALE
 ALL PERMEABLE CONCRETE THICKNESS, MIX AND SUB-BASE TO BE DETERMINED BY GEOTECHNICAL ENGINEER ONSITE.

SEQUENCE OF CONSTRUCTION

- OBTAIN HOWARD COUNTY GRADING PERMIT (1 WEEK)
- NOTIFY HOWARD COUNTY AT LEAST 48 HOURS PRIOR TO START OF CONSTRUCTION (2 DAYS)
- CONDUCT A PRECONSTRUCTION MEETING WITH THE SEDIMENT CONTROL INSPECTOR PRIOR TO ANY LAND DISTURBANCE. (1 WEEK)
- INSTALL STABILIZED CONSTRUCTION ENTRANCE WITH MOUNTABLE BERM AND INSTALL SUPER SILT FENCE ON THE HOWARD STREET SIDE OF THE PROPERTY. (3 DAYS)
- INSTALL CLEANWATER EARTH DIKE (PERMANENT) ON THE NORTH SIDE OF THE SITE. (4 DAYS)
- BEGIN GRADING OPERATIONS ON INTERIOR OF SITE. BRING SITE TO SUBGRADE ELEVATIONS. (2 WEEKS)
- INSTALL ALL UNDER DRAINS, SEWER HOUSE CONNECTIONS AND WATERHOUSE CONNECTIONS. EXCAVATE FOR MICRO BIORETENTION, BUT DO NOT FILL WITH SPECIFIED SOILS AND PLANTINGS UNTIL SITE IS STABILIZED. (4 WEEKS)
- BEGIN HOUSE CONSTRUCTION. (8 WEEKS)
- PAVE ALL DRIVEWAY AREAS WITH THE EXCEPTION OF THE PERVIOUS CONCRETE. PERVIOUS CONCRETE AND MICRO BIORETENTION SHALL NOT BE INSTALLED UNTIL THE SURROUNDING AREA IS STABILIZED. (1 WEEK)
- WHEN BUILDINGS ARE NEARING COMPLETION, FINE GRADE, INSTALL LANDSCAPING AND STABILIZE ALL LAWN AREAS USING THE PERMANENT SEEDING SPECIFICATIONS. (2 DAYS)
- ONCE ALL AREAS ARE STABILIZED AND THE BUILDINGS ARE COMPLETE, FINISH THE INSTALLATION OF THE MICRO BIORETENTION FACILITIES. (1 WEEK)
- WHEN THE MICRO BIORETENTION FACILITIES ARE COMPLETED AND NO CONSTRUCTION TRAFFIC IS PLACED ON THE DRIVEWAY, PAVE WITH THE PERVIOUS CONCRETE. (2 DAYS)
- WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, REMOVE ALL PERIMETER CONTROL MEASURES. STABILIZE ALL REMAINING DISTURBED AREAS AFTER THE CONTROLS ARE REMOVED.

OWNER
 DOMINIC TOTARO
 TRACY TOTARO
 12309 CAROL DR
 FULTON, MD 20759
 PHONE: 301-674-6383

NO.	REVISION	DATE

SUPPLEMENTAL INFORMATION, FOREST CONSERVATION, LANDSCAPE, SIGHT DISTANCE AND STORMWATER MANAGEMENT PLAN

SWM AND MICROBIORETENTION DETAILS

TOTARO PROPERTY
 LOTS 1 & 2
 6TH ELECTION DISTRICT LIBER 9070, FOLIO 598 ZONING: R-SC
 TAX MAP: 47 GRID: 12 ECP-11-049 & ZB1072m PARCELS: 119
 DFZ REF'S: ZB1072m, ECP-11-049 HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE

DESIGN BY: JTD
 DRAWN BY: JTD
 CHECKED BY: RHV
 DATE: OCTOBER 2011
 SCALE: AS SHOWN
 W.O. NO.: 05-26

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. 111111. EXPIRATION DATE: 12-16-2012

3 SHEET OF 3