

GENERAL NOTES

1. ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS ALTERNATIVE COMPLIANCES HAVE BEEN APPROVED.
2. EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS, PUBLIC WATER AND SEWER EXTENSION PLANS AND AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTOR'S INFORMATION. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
3. THE COORDINATES SHOWN HEREON ARE BASED UPON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE SYSTEM. HOWARD COUNTY MONUMENT NOS. 248A AND 248C WERE USED FOR THIS PROJECT.
4. THE PROPERTY LINES SHOWN HEREON IS BASED ON A BOUNDARY SURVEY PERFORMED BY ROBERT H. VOGEL ENGINEERING, INC., DATED MAY 9, 2011.
5. THE EXISTING TOPOGRAPHY SHOWN HEREON IS TAKEN FROM FIELD RUN SURVEY BY ROBERT H. VOGEL ENGINEERING, INC., ON MARCH 02, 2011 AND AUGUST 25, 2011.
6. GEOTECHNICAL REPORT TO BE PROVIDED AT SITE DEVELOPMENT PHASE.
7. WETLANDS AND STREAMS SHOWN ON-SITE ARE BASED ON A FIELD INVESTIGATION PERFORMED BY ECO-SCIENCE PROFESSIONALS, INC., DATED 08/13/2011.
8. THERE IS NO 100-YEAR FLOODPLAIN LOCATED ON-SITE.
9. THE SUBJECT PROPERTY IS ZONED R-SI PER THE 02/02/2004 COMPREHENSIVE ZONING PLAN AND THE COMP LITE ZONING REGULATION AMENDMENTS EFFECTIVE ON 07/28/06.
10. PUBLIC WATER AVAILABLE THROUGH CONTRACT NO. 14-1399-D.
11. PUBLIC SEWER AVAILABLE THROUGH CONTRACT NO. 32-5.
12. ALL BUILDINGS TO HAVE ROOF LEADERS WHICH EMPTY INTO STORM DRAIN SYSTEM.
13. ALL ELEVATIONS ARE TO FLOWLINE/BOTTOM OF CURB UNLESS OTHERWISE NOTED.
14. FOREST STAND DELINEATION PLAN PREPARED BY ECO-SCIENCE PROFESSIONALS, INC., DATED 09/13/2011. THE FOREST CONSERVATION REQUIREMENTS FOR THIS PROJECT WILL BE MET WITH THE SITE DEVELOPMENT PLAN.
15. EXISTING ST. JOHNS LANE IS CLASSIFIED AS A MINOR COLLECTOR.
16. THERE ARE NO BURIAL GROUNDS, CEMETERIES, OR HISTORIC STRUCTURES LOCATED ON THIS PROPERTY.
17. THE PROPOSED BUILDINGS WILL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
18. THIS PROJECT IS SUBJECT TO COMPLIANCE WITH THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, DEVELOPMENT OR CONSTRUCTION ON THIS PROPERTY MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION APPLICATION OR BUILDING/GRADING PERMIT APPLICATIONS.
19. A KNOX BOX IS REQUIRED TO BE PLACED ON THE FRONT OF THE BUILDING. IT SHALL BE PLACED TO THE RIGHT OF THE MAIN ENTRANCE AT A RANGE OF 4'-6" IN HEIGHT AND NO MORE THAN 6' LATERALLY FROM THE DOOR. ITS LOCATION IS SHOWN ON THESE PLANS. THE BOX SHALL BE ELECTRONICALLY SUPERVISED TO NOTIFY THE OWNER THAT IT IS BEING ACCESSSED (INTEGRATED WITH THE FIRE ALARM SYSTEM).
20. LANDSCAPING NOT PERMITTED WITHIN 7'-1/2' OF EACH SIDE OF THE FIRE DEPARTMENT CONNECTION. PROVIDE A CLEAR UNOBSTRUCTED ACCESS PATH TO THE FIRE DEPARTMENT CONNECTION. NFPA-1 13.1.4
21. FIRE LANES SHOULD BE PROVIDED IN THIS SITE TO ALLOW EMERGENCY VEHICLE ACCESS. EITHER FIRE LANE SIGNAGE SHOULD BE INSTALLED, OR THE CURBS SHOULD BE PAINTED IN RED AND STENCILED TO IDENTIFY THE ROAD AS A FIRE LANE.
22. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON GALVANIZED STEEL, PERFORATED SQUARE TUBE POST (1 1/2" DIA) INSERTED INTO A 2" X 1/2" GALVANIZED STEEL, PERFORATED SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
23. ALL EXTERIOR LIGHTING TO COMPLY WITH THE REQUIREMENTS FOUND IN ZONING SECTION 134 OF THE HOWARD COUNTY ZONING REGULATIONS.
24. SIGNAGE SHALL BE PROVIDED ON THE BUILDING IDENTIFYING THE BUILDING ADDRESS.
25. TRASH COLLECTION AND RECYCLABLES TO BE PRIVATE.
26. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, STREAM, THEIR BUFFERS, FOREST CONSERVATION AREAS, AND STEEP SLOPE AREAS.
27. THERE ARE NO SPECIMEN OR CHAMPION TREES WITHIN THE LOD.
28. APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN STAGES AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
29. THE TWO EXISTING PREFABRICATED SHEDS (NO FOUNDATION) LOCATED WITHIN THE WETLAND BUFFER SHALL BE RELOCATED AS PART OF THE SITE CONSTRUCTION PHASE.

ENVIRONMENTAL CONCEPT PLAN

BETHEL KOREAN PRESBYTERIAN CHURCH

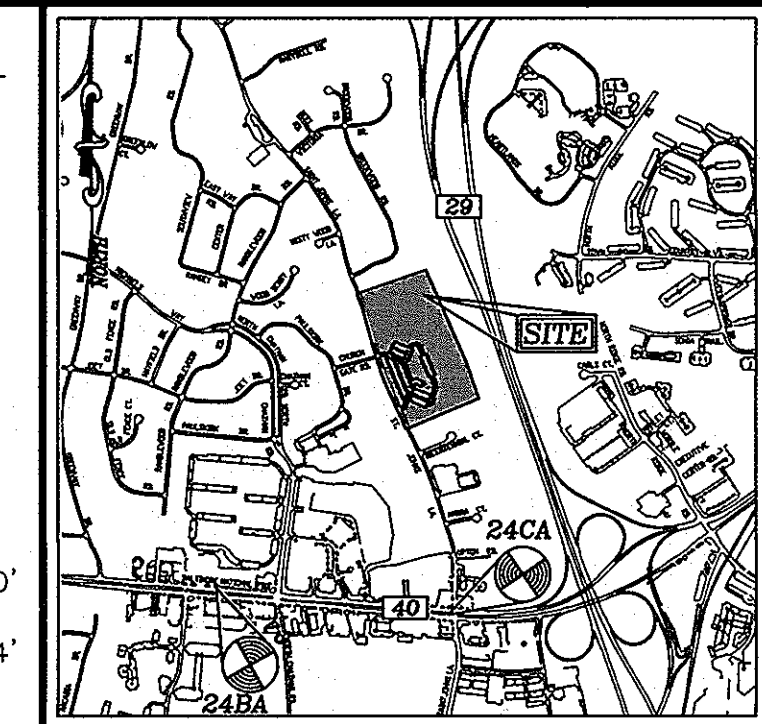
LIBER 01127 - FOLIO 0227

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- DIRECTION OF FLOW
- EXISTING TREES TO REMAIN
- LIGHT POLES
- CONCRETE

BENCHMARKS

HOWARD COUNTY BENCHMARK 248A
N 586,783.242 E 1,359,211.656 ELEV.: 385.660'
HOWARD COUNTY BENCHMARK 24CA
N 586,506.177 E 1,361,634.289 ELEV.: 398.314'



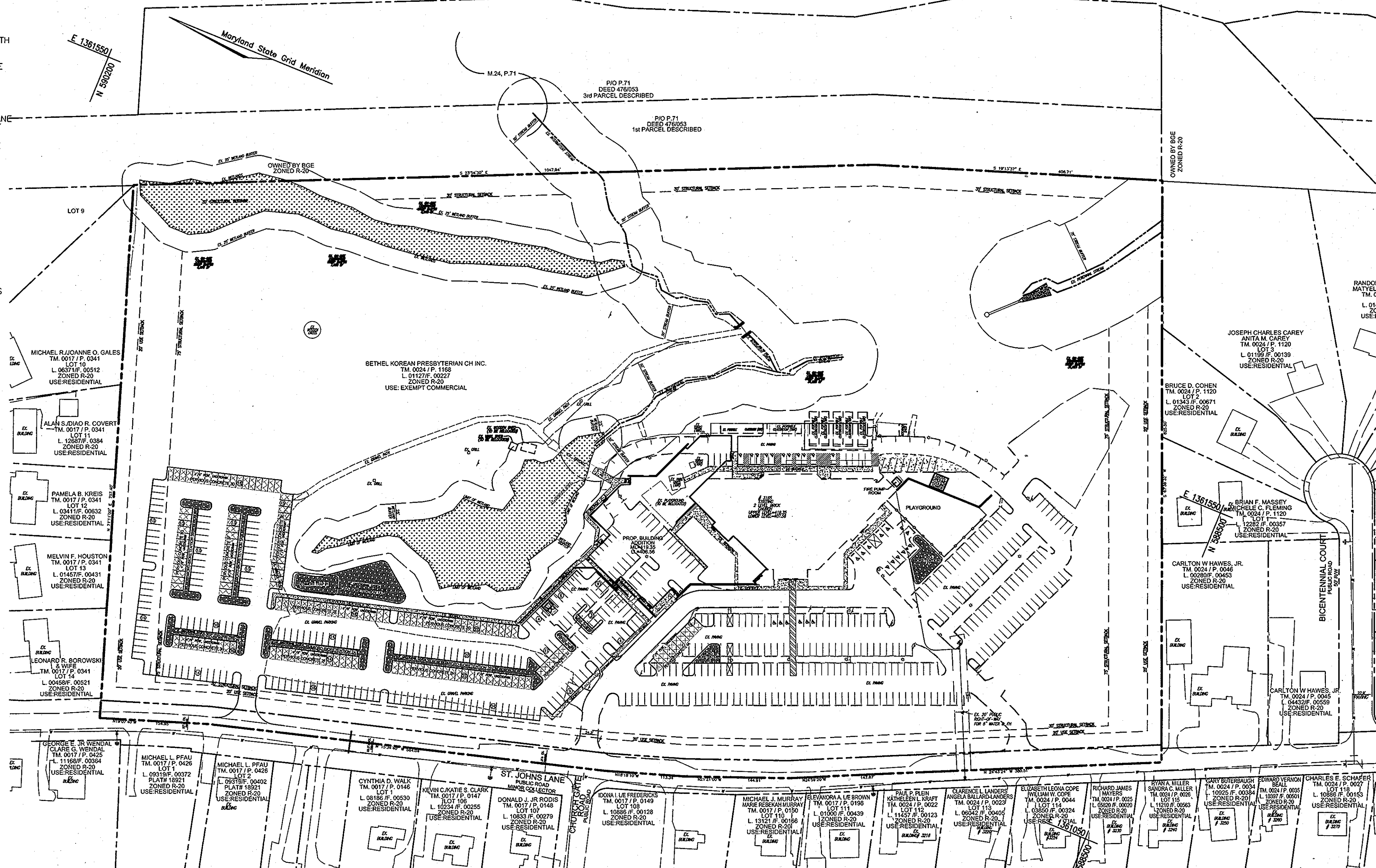
SITE DATA

LOCATION: PARCEL 1168
TAX MAP 17, GRID 23
TAX MAP 24, GRID 6
TAX MAP 24, GRID 6 "SDAT"
2ND ELECTION DISTRICT
PRESENT ZONING: R-SI
SUBDIVISION: ELLICOTT CITY SECTION/AREA 11A
SITE AREA: 28.03 AC.
SITE ADDRESS: 3165 SAINT JOHNS LANE, ELLICOTT CITY, MD. 21042
DEED/PLAT REFERENCES: L-1127, F-230, L-1127/F-227
DPZ REFERENCES: SDP-85-143, B.A. CASE #84-34E
USE OF EXISTING AND PROPOSED STRUCTURE: RELIGIOUS FACILITY
TOTAL BUILDING COVERAGE:
EXISTING BUILDING: 26,929 SF (0.82 AC OR 3.44% OF GROSS AREA)
PROPOSED BUILDING: 31,456 SF (0.72 AC OR 3.98% OF GROSS AREA)
WETLANDS ON SITE: 1.31 AC.
WETLAND BUFFERS ON SITE: 1.40 AC.
STREAM BUFFERS ON SITE: 3.04 AC.
AREA OF ON-SITE 100-YEAR FLOODPLAIN: 0.00 AC.
AREA OF ON-SITE 100-YEAR FLOODPLAIN BUFFER: 7.60 AC.
AREA OF STEEP SLOPES: 0.86 AC.
AREA OF ERODIBLE SOILS: 0.00 AC.
PROJECT AREA/LIMIT OF DISTURBED AREA: 6.10 AC
AREA MANAGED BY ESDV (*THIS PLAN): 6.04 AC.
*IMPERVIOUS AREA: 3.89 AC.
*GREEN AREA: 2.15 AC.

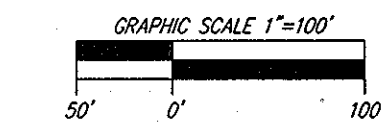
ENVIRONMENTAL SITE DESIGN NARRATIVE

1. THE PROPERTY CONTAINS AN EXISTING CHURCH, SEVERAL PORTABLE TRAILERS AND ASSOCIATED PARKING IN ACCORDANCE WITH SDP-85-143. STORMWATER MANAGEMENT WAS DESIGNED AND CONSTRUCTED IN CONJUNCTION WITH THE PREVIOUS SITE DEVELOPMENT PLAN. THE POND WAS SIZED TO ACCOMMODATE THE DEVELOPMENT UTILIZING THE REQUIREMENTS IN EFFECT AT THE TIME. THE BALANCE OF THE SITE INCLUDES INFORMAL PARKING AREAS, WETLANDS, STREAMS, BRUSH, FOREST AND MAINTAINED LAWN. THE SITE CONSISTS OF HYDROLOGIC SOIL GROUP TYPE 'B' AND 'D' SOILS.
2. THE SITE HAS BEEN ANALYZED AS "REDEVELOPMENT". DEDUCTING THE "UNDEVELOPABLE" AREAS FROM THE GROSS SITE AREA, THE IMPERVIOUS AREA IS APPROXIMATELY 30% WHICH IS LESS THAN THE 40% THRESHOLD. THEREFORE, THE ENVIRONMENTAL SITE DESIGN IS BASED ON THE PROPOSED LIMIT OF DISTURBANCE AND CONSIDERING THE IMPROVEMENTS AS NEW DEVELOPMENT. THE TOTAL SITE AREA IS 28.0 ACRES HOWEVER; THE AREA OF THE CURRENT PROJECT AND THE LIMIT OF DISTURBANCE IS 6.1 ACRES.
3. STORMWATER MANAGEMENT IS PROVIDED IN ACCORDANCE WITH THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, CHAPTER 5, ENVIRONMENTAL SITE DESIGN.
4. THE OFFSITE DRAINAGE FLOWING TO THE SITE WILL BE DIVERTED AROUND THE PROPOSED DEVELOPMENT AND WILL NOT BE MANAGED OR TREATED, BUT WILL BE REDIRECTED INTO THE EXISTING WETLAND/STREAMS SYSTEM.
5. THE ON-SITE DRAINAGE IS DIVIDED IN FIVE PREDOMINANT AREAS, WITH VARIOUS SUB AREAS, OUTFALLING AT 5 LOCATIONS.
6. THE AREAS WHICH WERE PREVIOUSLY DEVELOPED AS PARKING LOT WHICH ARE BEING REPLACED BY THE BUILDING ADDITION AND NEW PARKING WILL BE MANAGED BY THE CURRENT ESDV. METHODOLOGY IN ADDITION TO BEING ACCOMMODATED BY THE EXISTING STORMWATER MANAGEMENT POND. SINCE THE RESULT OF ESDV IS TO MIMIC "WOODS IN GOOD CONDITION", NO FURTHER ANALYSIS IS REQUIRED OF THE EXISTING STORMWATER MANAGEMENT POND.
7. TO ACCOMMODATE NEWLY DEVELOPED AREAS, THIS PROJECT UTILIZES MICRO-BIOTENTION FACILITIES (M-6) AND PERMEABLE PAVING (A-2), WHICH COMBINED SATISFIES THE ESD VOLUME REQUIRED FOR THE PROJECT.
8. NATURAL RESOURCE PROTECTION IS PROVIDED BY AVOIDING IMPACTS TO EXISTING STREAMS, WETLANDS AND ASSOCIATED BUFFERS. ADDITIONALLY, EXISTING IMPERVIOUS SURFACES WILL BE REMOVED FROM THE BUFFERS.
9. THE VARIOUS OUTFALLS FROM THE ESD PRACTICES DISCHARGE WITHIN NATURAL DRAINAGE AREAS.
10. THE SEDIMENT CONTROLS ARE DESIGNED TO MOST EFFECTIVELY PROTECT THE NATURAL RESOURCES.

OWNER
BETHEL KOREAN PRESBYTERIAN CHURCH, INC.
3165 SAINT JOHNS LANE
ELLICOTT CITY, MARYLAND 21042
C/O TED JEE
PHONE: 410-461-1235



LOCATION MAP
SCALE: 1"=100'



SHEET INDEX		
DESCRIPTION	SHEET NO.	
COVER SHEET	1 OF 4	
LAYOUT PLAN	2 OF 4	
SWM DRAINAGE AREA MAP	3 OF 4	
SWM DETAILS	4 OF 4	

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION

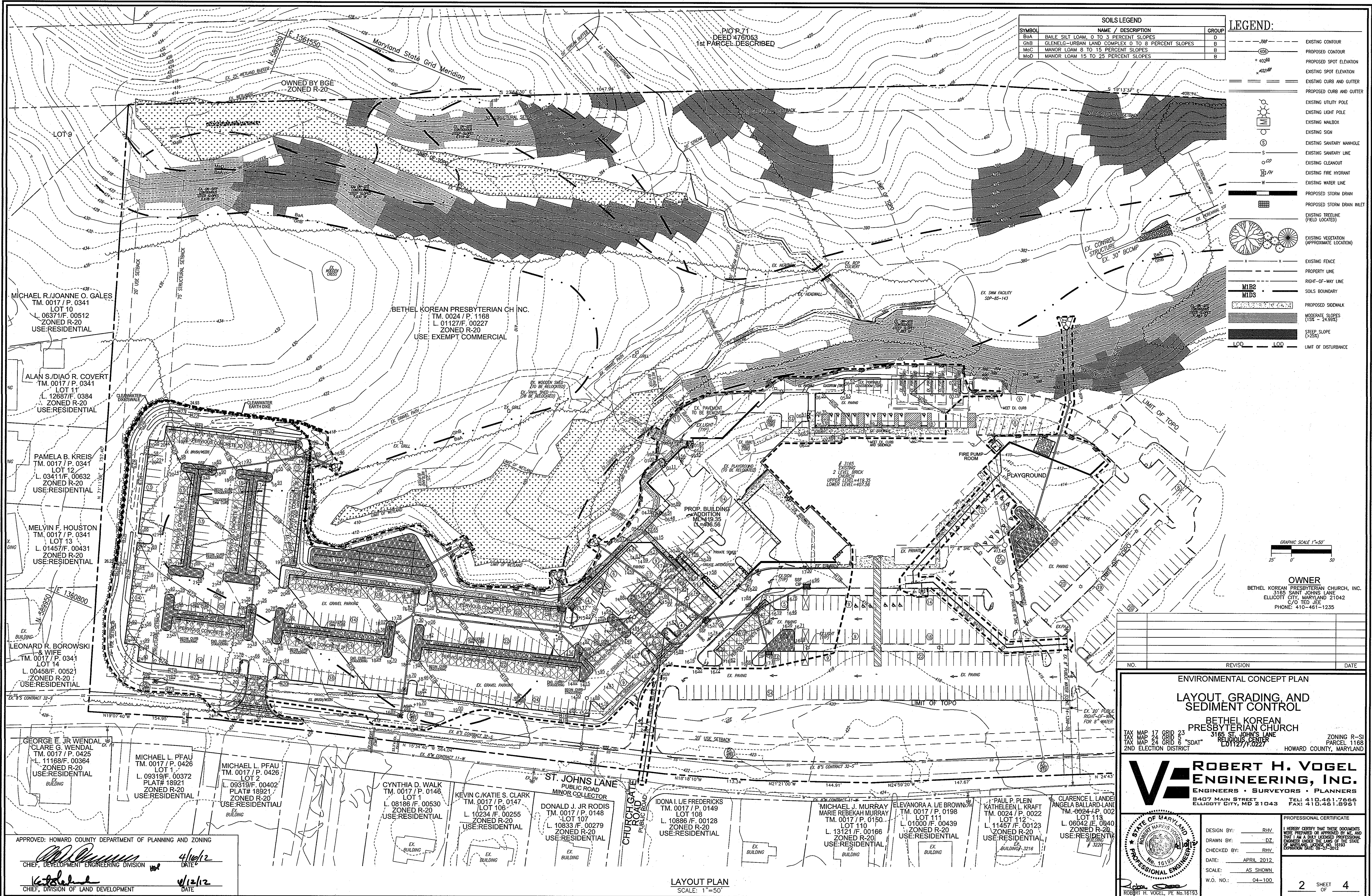
 CHIEF, DIVISION OF LAND DEVELOPMENT

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
COVER SHEET
 BETHEL KOREAN PRESBYTERIAN CHURCH
 3165 SAINT JOHNS LANE
 ELLICOTT CITY, MARYLAND 21042
 PARCEL 1168
 HOWARD COUNTY, MARYLAND

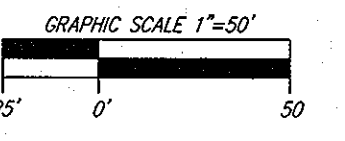
ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET
 ELLICOTT CITY, MD 21043
 TEL: 410.461.7666
 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 16193. EXPIRATION DATE: 09-27-2013.
 DESIGN BY: RHV
 DRAWN BY: DJ
 CHECKED BY: RHV
 DATE: APRIL 2012
 SCALE: AS SHOWN
 W.O. NO.: 04-100
 1 SHEET OF 4



SOILS LEGEND		
SYMBOL	NAME / DESCRIPTION	GROUP
BaA	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	D
GhB	CLENELG-URBAN LAND COMPLEX 0 TO 8 PERCENT SLOPES	B
MoC	MANOR LOAM 8 TO 15 PERCENT SLOPES	B
MoD	MANOR LOAM 15 TO 25 PERCENT SLOPES	B

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
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING TREELINE (FIELD LOCATED)
	EXISTING VEGETATION (APPROXIMATE LOCATION)
	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	SOILS BOUNDARY
	PROPOSED SIDEWALK
	MODERATE SLOPES (15% - 24.99%)
	STEEP SLOPE (>25%)
	LIMIT OF DISTURBANCE



OWNER
 BETHEL KOREAN PRESBYTERIAN CHURCH, INC.
 3165 SAINT JOHN'S LANE
 ELLICOTT CITY, MARYLAND 21042
 C/O TED JEE
 PHONE: 410-461-1235

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
LAYOUT, GRADING AND SEDIMENT CONTROL

BETHEL KOREAN PRESBYTERIAN CHURCH
 3165 SAINT JOHN'S LANE
 RELIGIOUS CENTER
 LOT 1127/F.0227

TAX MAP 17 GRID 23 ZONING R-20
 TAX MAP 24 GRID 8 PARCEL 1168
 2ND ELECTION DISTRICT "SDAT" HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
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 ELLICOTT CITY, MD 21043 FAX: 410.461.8961



PROFESSIONAL CERTIFICATE
 DESIGN BY: RHY
 DRAWN BY: DJ
 CHECKED BY: RHY
 DATE: APRIL 2012
 SCALE: AS SHOWN
 W.O. NO.: 04-100

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. 19130, EXPIRATION DATE 06-27-2012.

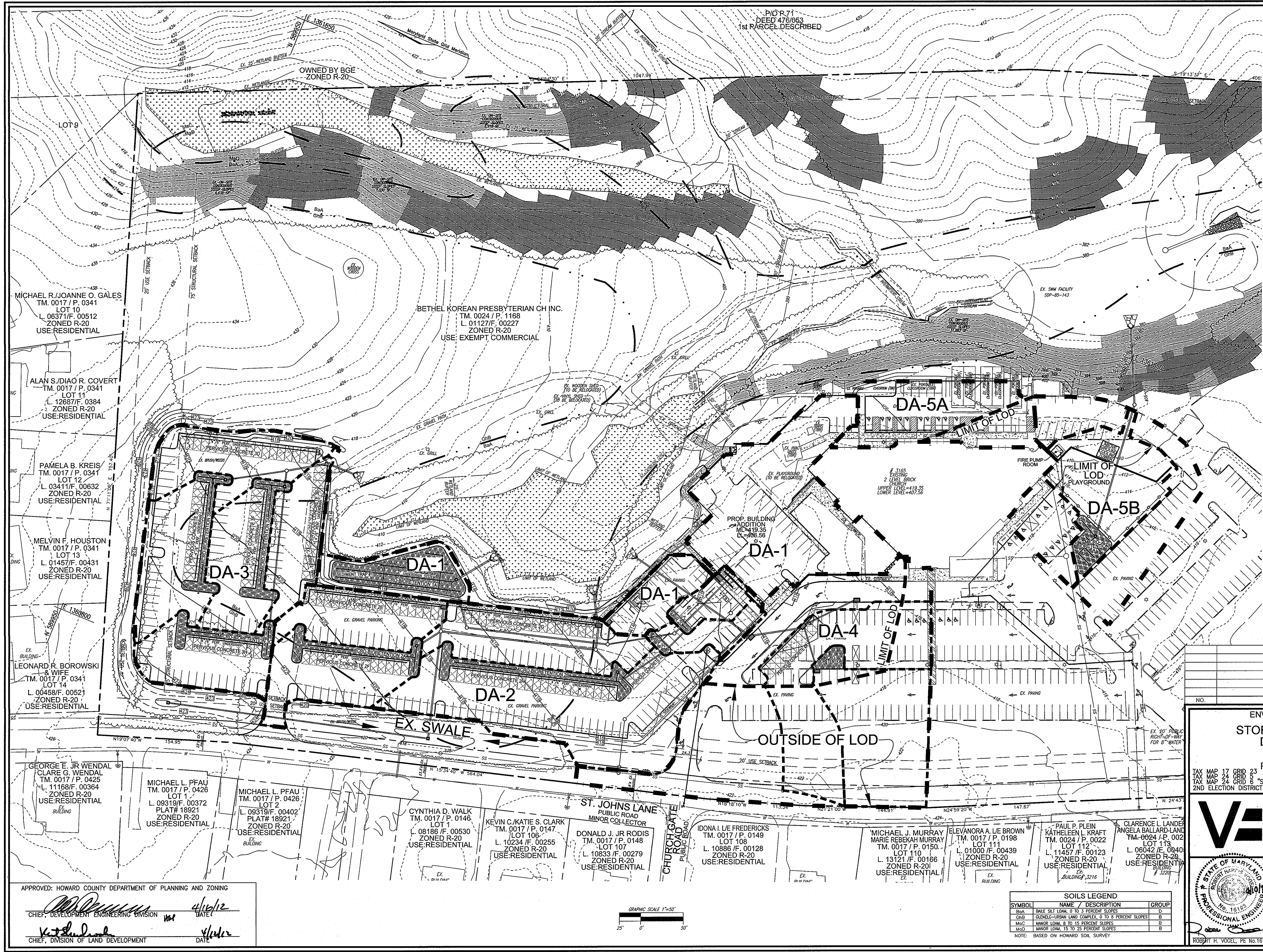
2 SHEET OF 4

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 4/16/12

CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 4/12/12

LAYOUT PLAN
 SCALE: 1"=50'



LEGEND:

- - - - - EXISTING CONTOUR
- - - - - PROPOSED CONTOUR
- + 402.68 EXISTING SPOT ELEVATION
- + 402.68 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
- - - - - PROPOSED STORM DRAIN
- - - - - PROPOSED STORM DRAIN WILET
- ⊙ EXISTING TREELINE (FIELD LOCATED)
- ⊙ EXISTING VEGETATION (APPROXIMATE LOCATION)
- - - - - EXISTING FENCE
- - - - - PROPERTY LINE
- - - - - RIGHT-OF-WAY LINE
- - - - - SOILS BOUNDARY
- - - - - PROPOSED SIDEWALK
- - - - - MODERATE SLOPES (15% - 24.99%)
- - - - - STEEP SLOPE (>25%)
- - - - - LIMIT OF DISTURBANCE
- - - - - SWM DRAINAGE DIVIDE
- - - - - SD DRAINAGE DIVIDE

NOTES:
 TOTAL SITE AREA: 28.03 AC.
 DEVELOPMENT AREA/LIMIT OF DISTURBANCE: 6.10 AC.
 WITHIN DEVELOPMENT AREA:
 AREA OF 'B' SOILS: 3.70 AC.
 EX. IMPERVIOUS AREA WITHIN 'B' SOILS: 2.03 AC.
 PROP. IMPERVIOUS AREA WITHIN 'B' SOILS: 1.67 AC.
 AREA OF 'D' SOILS: 2.40 AC.
 EX. IMPERVIOUS AREA WITHIN 'D' SOILS: 1.35 AC.
 PROP. IMPERVIOUS AREA WITHIN 'D' SOILS: 2.35 AC.
 AREA OF 'C' SOILS: 2.40 AC.
 EX. IMPERVIOUS AREA WITHIN 'C' SOILS: 1.50 AC.
 PROP. IMPERVIOUS AREA WITHIN 'C' SOILS: 0.95 AC.
 AREA OF 'E' SOILS: 0.95 AC.
 EX. IMPERVIOUS AREA WITHIN 'E' SOILS: 0.95 AC.
 PROP. IMPERVIOUS AREA WITHIN 'E' SOILS: 1.45 AC.

OWNER
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 PHONE: 410-461-1235

NO.	REVISION	DATE

**ENVIRONMENTAL CONCEPT PLAN
 STORMWATER MANAGEMENT
 DRAINAGE AREA MAP**

BETHEL KOREAN PRESBYTERIAN CHURCH
 3165 ST. JOHN'S LANE
 RELIGIOUS CENTER
 LOT 12 / F. 0027

ZONING R-SI
 PARCEL 1168
 HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE

DESIGN BY: RHV
 DRAWN BY: DJ
 CHECKED BY: RHV
 DATE: APRIL 2012
 SCALE: AS SHOWN
 W.O. NO.: 04-100

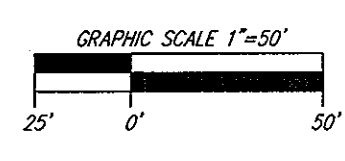
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A duly LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. MY LICENSE NO. IS 18123 AND MY EXPIRATION DATE IS 09-30-2015.

3 SHEET OF **4**

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 4/16/12

CHIEF, DIVISION OF LAND DEVELOPMENT DATE: 4/16/12



SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP
Ba	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	D
Ch	CLENELG-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	B
Mc	MAJOR LOAM, 8 TO 15 PERCENT SLOPES	B
Md	MAJOR LOAM, 15 TO 25 PERCENT SLOPES	B

NOTE: BASED ON HOWARD SOIL SURVEY

K:\Projects\006\NORTH\EC\PC\SWM\MAP.dwg 4/20/12 8:41 AM

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

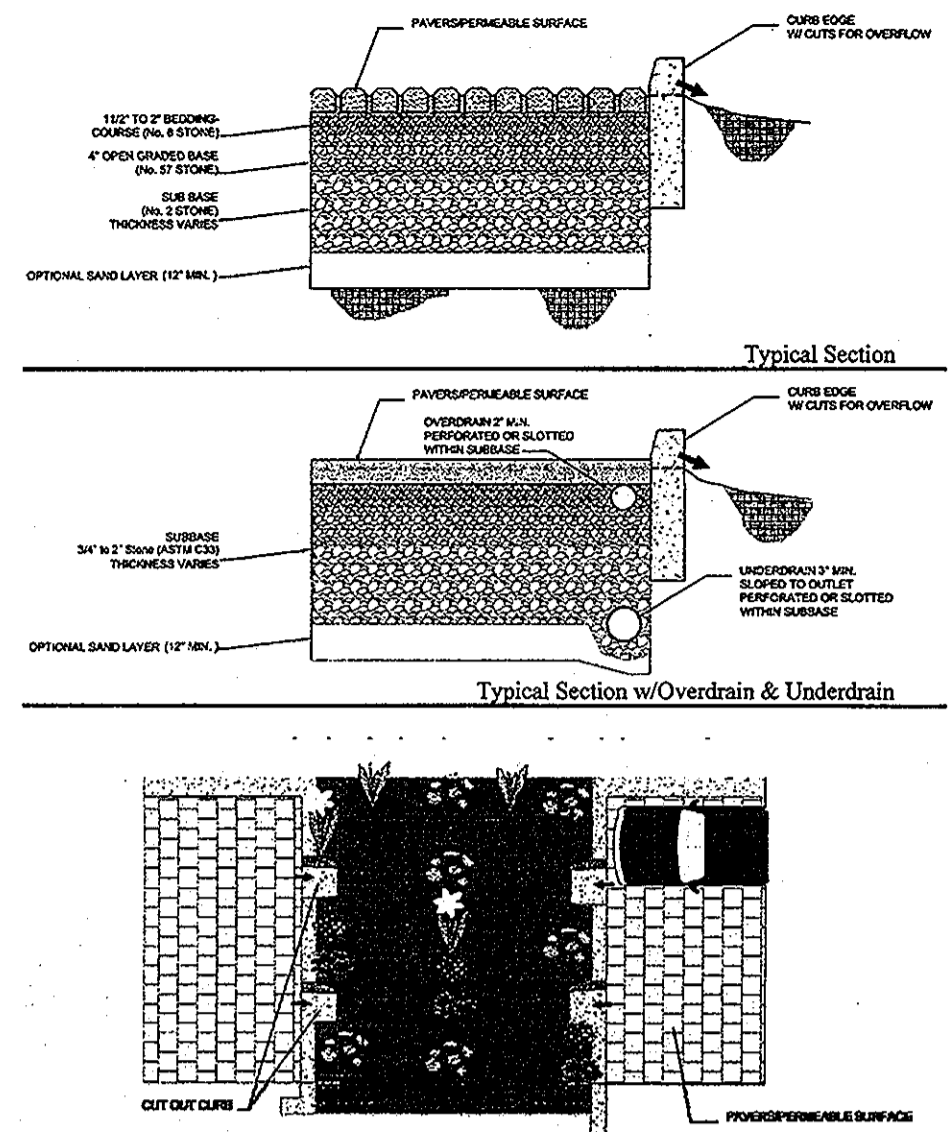
1. MATERIAL SPECIFICATIONS
THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HAZARD TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERAMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.
THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:
• SOIL COMPONENT – LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)
• ORGANIC CONTENT – MINIMUM 10% BY DRY WEIGHT (ASTM D 2974), IN GENERAL THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
• CLAY CONTENT – MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
• PH RANGE – SHOULD BE BETWEEN 5.5 – 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED 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 OF ORGANIC MATTER AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE SPECIFIED TOPSOIL. IF TOPSOIL IS IMPAIRED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXAMINED.

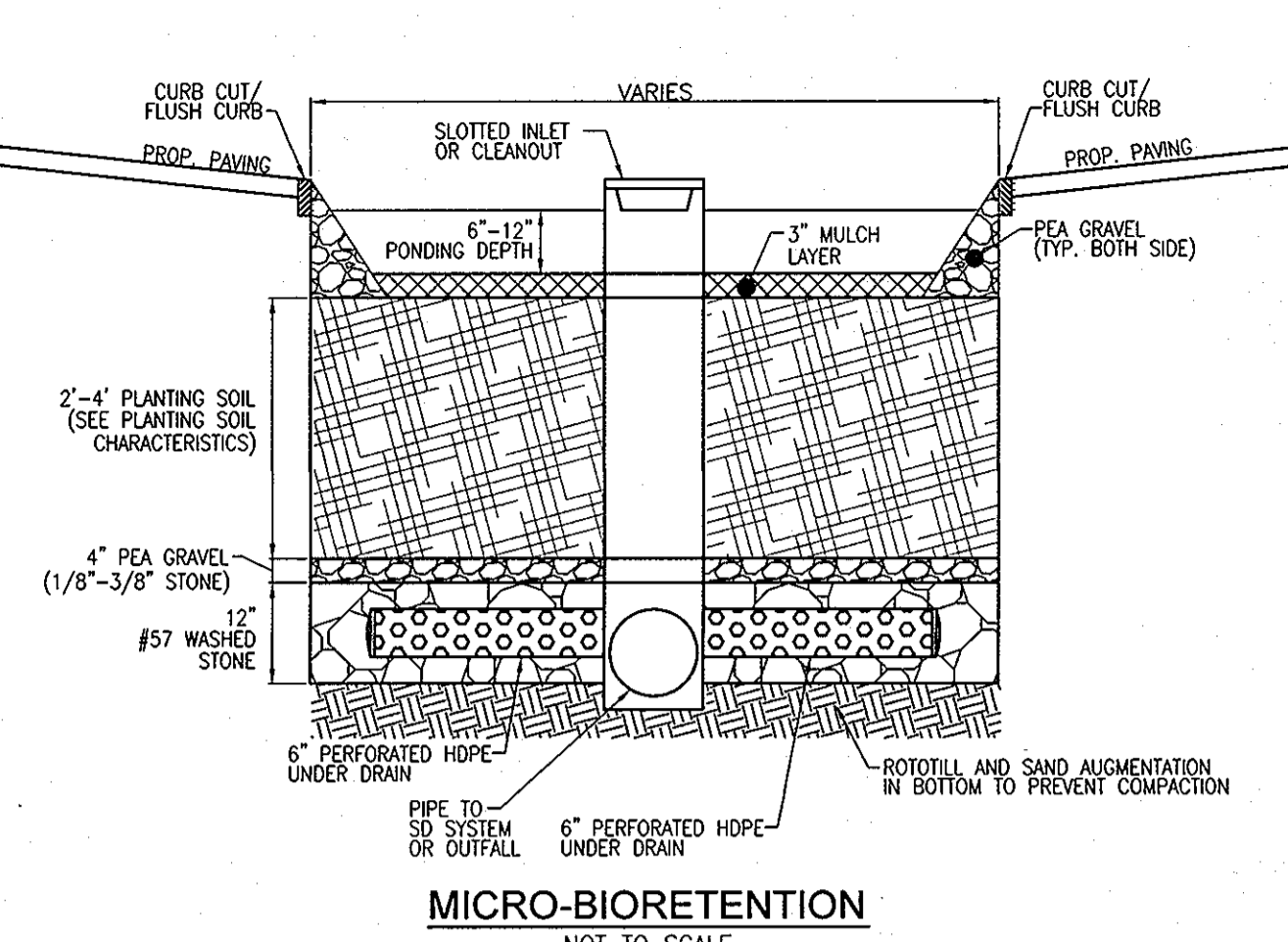
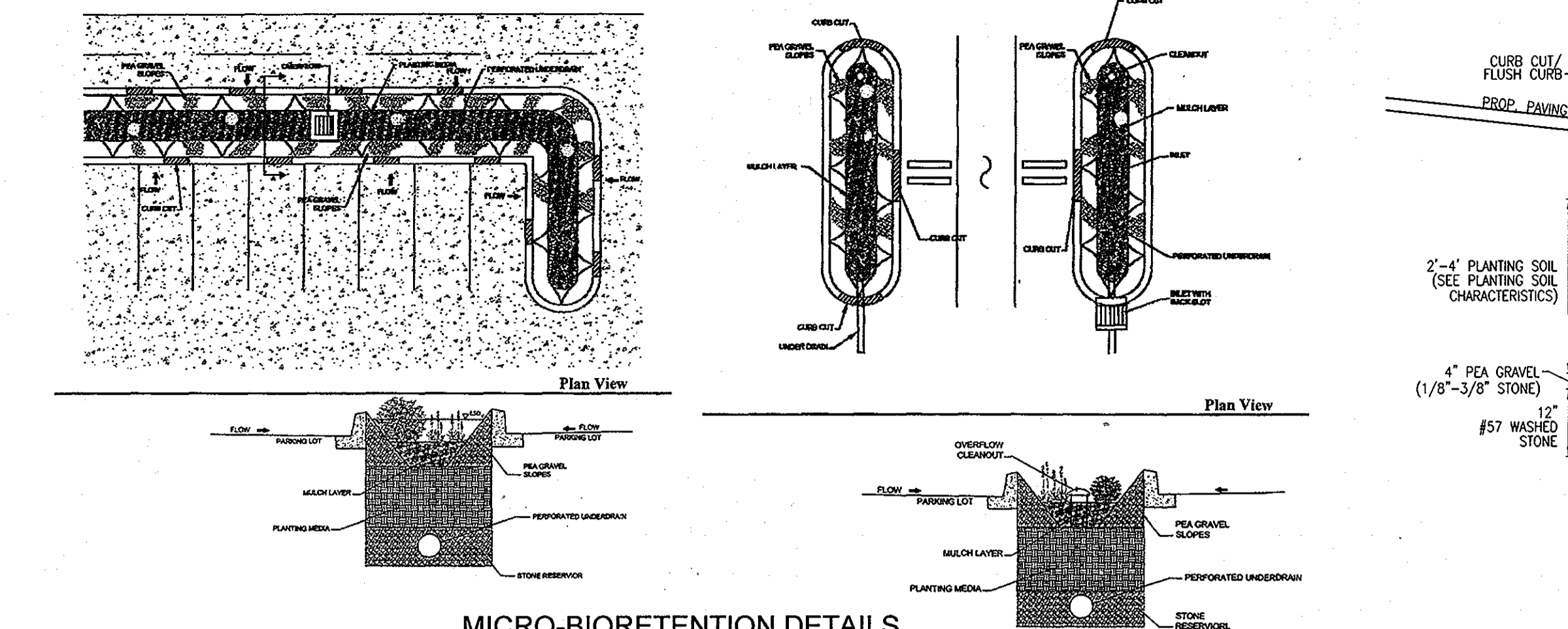
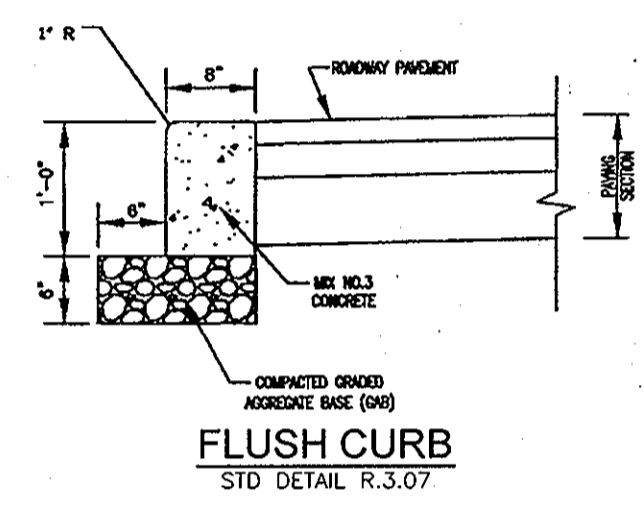
3. COMPACTION
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR WALKER TRACK EQUIPMENT OR LIGHT EQUIPMENT WITH TURF TIRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LOGS, 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 AVOIDED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHELSEY PLOW, RIPPER, OR SUBSIDER. THESE TILLING OPERATIONS ARE TO RESTRUCTURE THE SOIL PROFILE THROUGHOUT THE 12 INCH COMPACTION ZONE. SUBSTITUTIVE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT. ROTOILL 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 (ROTOILLING) BASE.
WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 2 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.
WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPORT STAKES AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARCH 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. FINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL ACED (6 TO 12 MONTHS) FOR ACCEPTANCE.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/3RD OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.
GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.
THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO INCREASE WATER QUALITY. ADDING FERTILIZERS OR PESTICIDES OR AT A MINIMUM MIXES THIS SOIL ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.



PERMEABLE PAVEMENT DETAIL
NOT TO SCALE



DRAINAGE AREA #	TOTAL AREA TREATED	FACILITY NUMBER	ENVIRONMENTAL SITE DESIGN PRACTICE						ESDv VOLUME			
			PERMEABLE PAVEMENT	ADD UNDER PAVE	LANDSCAPE INFILTRATION	PERVIOUS SIDEWALK	BIO SWALE	GRAVEL TRENCH		MICRO BIO RETENTION	X	
1	71874	1A	0	0	0	0	0	0	4813	0	4813	
		SUBTOTAL DA-1:										
			0	0	0	0	0	0	4813	0	4813	
2	76230	2A	0	0	0	0	0	0	2132	0	2132	
		2B	0	0	0	0	0	0	2811	0	2811	
		2C	0	0	0	0	0	0	373	0	373	
		2D	0	0	0	0	0	0	292	0	292	
		2E	564	82	0	0	0	0	0	0	646	
		2F	439	64	0	0	0	0	0	0	503	
		2G	595	87	0	0	0	0	0	0	682	
		2H	690	100	0	0	0	0	0	0	790	
		2J	188	27	0	0	0	0	0	0	215	
		2K	0	0	794	0	0	0	0	0	794	
		SUBTOTAL DA-2:										
			2476	360	0	794	0	0	0	5608	0	9238
3	67954	3A	0	0	0	0	0	0	2333	0	2333	
		3B	0	0	0	0	0	0	2080	0	2080	
		3C	0	0	0	0	0	0	2079	0	2079	
		3D	580	0	0	0	0	0	0	0	580	
		3E	483	0	0	0	0	0	0	0	483	
		3F	419	0	0	0	0	0	0	0	419	
		3G	419	0	0	0	0	0	0	0	419	
		3H	322	0	0	0	0	0	0	0	322	
		SUBTOTAL DA-3:										
			2223	0	0	0	0	0	0	6492	0	8715
4	23958	4A	317	648	0	0	0	0	0	0	965	
		4B	0	0	0	0	0	0	625	0	625	
		SUBTOTAL DA-4:										
			317	648	0	0	0	0	0	625	0	1590
5	23087	5A	0	0	0	0	0	0	1600	0	1600	
		SUBTOTAL DA-5:										
			0	0	0	0	0	0	0	1600	0	1600
TOTAL AREA	263103 SF											TOTAL ESDv PROVIDED 25956

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

Material	Specification	Size	Notes
Plantings	See Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil (2" to 4" deep)	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)	n/a	Min. 10% by dry weight (ASTM D 2974)
Mulch	shredded hardwood	4"	aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curbstone	ornamental stone: washed cobblets	stone: 2" to 5"	
Geotextile		n/a	PE Type I nonwoven
Gravel (underdrains and infiltration berms)	AASHTO-M-43	NO. 57 OR NO. 6 AGGREGATE (1/8" TO 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" or 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underdrain pipes. Perforated pipe shall be wrapped with 1/4" inch polyurethane hardware cloth.
Formed in place concrete (if required)	MSHA Mix No. 3; F _c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved data or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland (design to include meeting ACI Code 318.8.2); vertical loading (H+10 or H+20); allowable horizontal loading (based on soil pressure); and analysis of potential cracking.
Sand	AASHTO-M-6 or ASTM-C-33	0.075" to 0.04"	Sand substitutions such as Dulse and Graysone (AASHTO #10) are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

OWNER
BETHEL KOREAN PRESBYTERIAN CHURCH, INC.
3165 SAINT JOHNS LANE
ELLICOTT CITY, MARYLAND 21042
PHONE: 410-461-1235

DA	% IMPERV	Rv	DA	MINIMUM VOLUME	MAXIMUM VOLUME	VOLUME PROVIDED
1	72	0.698	1.65	4181	10870	4813
2	61	0.599	1.75	3805	9893	9238
3	69	0.671	1.56	3800	9879	8715
4	68	0.662	0.55	1322	3436	1590
5	34	0.356	0.53	685	1781	1600
TOTAL VOLUME PROVIDED				25956		

ENVIRONMENTAL CONCEPT PLAN
STORMWATER MANAGEMENT NOTES AND DETAILS

BETHEL KOREAN PRESBYTERIAN CHURCH
3165 ST. JOHNS LANE
ELLICOTT CITY, MD 21042
LOT 127/027

TAX MAP 17 GRID 23
TAX MAP 12 GRID 23
TAX MAP 24 GRID 6 "SDAT"
2ND ELECTION DISTRICT

ZONING R-SI
PARCEL 1168
HOWARD COUNTY, MARYLAND

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

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A duly licensed professional engineer under the laws of the State of Maryland, License No. 16193, EXPIRATION DATE: 09-27-2012

DESIGN BY: RHV
DRAWN BY: DZ
CHECKED BY: RHV
DATE: APRIL 2012
SCALE: AS SHOWN
W.O. NO.: 04-100

4 SHEET OF 4

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Signature 4/16/12 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION
Signature 4/12/12 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT