FIRST BAPTIST CHURCH OF GUILFORD

SITE DEVELOPMENT PLAN

GENERAL NOTES

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

MISS UTILITY	1-800-257-7777
C & P TELEPHONE COMPANY:	725-9976
HOWARD COUNTY BUREAU OF UTILITIES:	313-2366
AT&T CABLE LOCATION DIVISION:	393-3553
B.G.&E. CO. CONTRACTOR SERVICES:	850-4620
B.G.&E. CO. UNDERGROUND DAMAGE CONTROL:	787-4620
STATE HIGHWAY ADMINISTRATION:	531-5533

4. SITE ANALYSIS:
   TOTAL AREA OF PARCELS 227 AND 9 : 9.06 AC±
   AREA OF PARCEL 227: 4.22 AC±
   AREA OF PARCEL 9 : 4.84 AC±
   AREA TO BE DEDICATED TO HOWARD COUNTY FOR THE PURPOSES OF A PUBLIC RIGHT-OF-WAY: 0.36 AC±
   NET AREA: 8.70 AC± - PAR. A

   PRESENT ZONING : R-SI
   USE OF STRUCTURE : CHURCH AND RELIGIOUS COMPLEX
   BUILDING AREA : EXIST. CHURCH : 5047 SF±
   PROP. CHURCH 27153 SF±

   EXISTING BUILDING COVERAGE ON SITE: 5047 SF±
   PROPOSED BUILDING COVERAGE ON SITE: 0.74 AC (32,292 SF) OR 8.5% OF GROSS AREA
   PAVED PARKING LOT/AREA ON SITE: 4.38 AC OR 50.93% OF GROSS AREA
   AREA OF LANDSCAPE ISLAND: 0.28 AC = 12516.5 SF
   DISTURBED AREA = 8.63 AC
   CUT = 12000 CY FILL = 12000 CY
5. PROJECT BACKGROUND:
   LOCATION : COLUMBIA, MD.; TAX MAP 42, PARCELS 227 & 9
   ZONING : RSI
   SECTION/AREA : N/A
   SITE AREA: 8.53 AC±
   DPZ REFERENCES: BA-03-02C&V, SDP-80-120, F-05-133.
6. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO START OF WORK.
7. ANY DAMAGE TO PUBLIC RIGHT-OF-WAYS, PAVING, OR EXISTING UTILITIES WILL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
8. EXISTING UTILITIES LOCATED FROM ROAD CONSTRUCTION PLANS, FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN FOR THE CONTRACTORS INFORMATION. CONTRACTOR SHALL LOCATE EXISTING UTILITIES WELL IN ADVANCE OF CONSTRUCTION ACTIVITIES AND TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
9. ALL REINFORCED CONCRETE FOR STORM DRAIN STRUCTURES SHALL HAVE A MINIMUM OF 28 DAYS STRENGTH OF 3,500 P.S.I.
10. TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
11. ESTIMATES OF EARTHWORK QUANTITIES ARE PROVIDED SOLEY FOR THE PURPOSE OF CALCULATING FEES.
12. SOIL COMPACTION SPECIFICATIONS, REQUIREMENTS, METHODS AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE PROJECT GEOTECHNICAL ENGINEER. GEOTECHNICAL ENGINEER TO CONFIRM ACCEPTABILITY OF PROPOSED PAVING SECTION, BASED ON SOILS TEST.
13. ALL STORM DRAIN PIPE BEDDING SHALL BE CLASS 'C' .
14. COORDINATES AND ELEVATIONS ARE BASED ON THE FOLLOWING HOWARD COUNTY MONUMENTS

42E4	N 544,850.922	E 1,359,466.467	EL. 337.610
42E3	N 546,528.833	E 1,357,894.405	EL. 306.522

15. A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT.
16. EXISTING TOPOGRAPHY IS FROM A TOPOGRAPHIC SURVEY PERFORMED BY A COMBINATION OF HICKS ENGINEERING CO., INC. DATED FEB. 1995 AND SUPPLEMENTED BY A FIELD SURVEY BY VOGEL & ASSOCIATES, INC., DATED NOVEMBER 1996 AND NOVEMBER 1998.
17. ALL ON-SITE PAVING TO BE P-2 PAVING UNLESS OTHERWISE NOTED. ALL PUBLIC ROAD PAVING TO BE P-3 PAVING.
18. ALL CURB AND GUTTER TO BE HOWARD COUNTY STANDARD CONCRETE DETAIL 3.01 UNLESS OTHERWISE SPECIFIED.
19. CONTRACTOR RESPONSIBLE TO CONSTRUCT ALL HANDICAP PARKING AND HANDICAP ACCESS IN ACCORDANCE WITH CURRENT ADA REQUIREMENTS.
20. WHERE DRAINAGE FLOWS AWAY FROM CURB, CONTRACTOR TO REVERSE THE GUTTER PAN.
21. PUBLIC WATER AVAILABLE ALONG OAKLAND MILLS ROAD(12" WATER) CONTRACT NO. 609-W&S.
22. PUBLIC SEWER AVAILABLE ALONG GUILFORD ROAD(8" SEWER) CONTRACT NO. 609-S.
23. STORMWATER MANAGEMENT IS PROVIDED BY A COMBINATION OF UNDERGROUND PIPE DETENTION SYSTEM (Cpv) AND BAYSAVER FILTER(WQv) AND BIORENTION (WQv) FACILITIES. ALL FACILITIES TO BE PRIVATELY OWNED AND MAINTAINED BY THE FIRST BAPTIST CHURCH OF GUILFORD.
24. ALL EXTERIOR LIGHTING SHALL CONFORM TO THE REQUIREMENTS OF ZONING REGULATIONS SECTION 134.
25. ALL ELEVATIONS ARE TO FLOWLINE UNLESS OTHERWISE NOTED.
26. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
27. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPING MANUAL.
28. ANY EXISTING STREET TREES DAMAGED OR DESTROYED DURING CONSTRUCTION WILL BE REPLACED BY THE CONTRACTOR.
29. GEOTECHNICAL REPORT PREPARED BY FROEHLING & ROBERTSON, INC. DATED NOVEMBER 1996
30. IN ACCORDANCE WITH SECTION 16.1202 OF HOWARD COUNTY CODE AND FOREST CONSERVATION MANUAL, THE FOREST CONSERVATION OBLIGATION OF FOR THIS PLAN HAS BEEN MET BY THE CREATION OF A 0.52 ACRE ONSITE RETENTION EASEMENT AND A FEE-IN-LIEU PAYMENT OF $39,639.60 TO THE HOWARD COUNTY FOREST CONSERVATION FUND FOR THE 1.82 ACRES OF REQUIRED REFORESTATION.
31. PERIMETER LANDSCAPING IN ACCORDANCE WITH SECTION 16.124 OF HOWARD COUNTY CODE AND LANDSCAPING MANUAL, SHALL BE PROVIDED AS SHOWN ON APPROVED LANDSCAPING PLAN. FINANCIAL SURETY IN THE AMOUNT OF $49,830.00 FOR 81 SHADE TREES, 40 EVERGREEN TREES AND 331 SHRUBS, HAS BEEN POSTED WITH THE DEVELOPER'S AGREEMENT.
32. THERE ARE NO EXISTING STREAMS, WETLANDS, THEIR BUFFERS AND FLOOD PLAIN AREAS LOCATED ON THIS SITE IN ACCORDANCE WITH AN ENVIRONMENTAL STUDY BY EXPLORATION RESEARCH ON JULY 20, 2004.
33. NO CEMETERIES EXIST ON THIS SITE.
34. THE PROPOSED SWM IS FOR THE ULTIMATE CONDITIONS; HOWEVER, DUE TO MEASURED IMPERVIOUS AREAS ANY ADDITIONAL DEVELOPMENT WILL REQUIRE THE RE-EVALUATION OF SWM REQUIREMENT BY FIRST BAPTIST CHURCH.
35. AN APFO TRAFFIC STUDY WAS PREPARED BY THE TRAFFIC GROUP DATED MAY 20, 2004.
36. THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION REGULATIONS.
37. RELATED ZONING CASE, BA-03-02C&V, DENIED NOVEMBER 14, 2003, FOR A CONDITIONAL USE FOR THE EXPANSION OF A STUCTURE USED PRIMARILY FOR RELIGIOUS ACTIVITIES AND A VARIENCE TO REDUCE THE 39' FRONT OR SIDE SETBACK FROM FROM AN ARTERIAL OR COLLECTOR PUBLIC STREET RIGHT-OF-WAY TO 30.6' IN AN R-12 (RESIDENTIAL: SINGLE) ZONED DISTRICT, FILED PURSUANT TO SECTIONS 131.N.38 AND 130.B.2 OF THE HOWARD COUNTY ZONING REGULATIONS. (AN APPROVED CONDITIONAL USE ZONING CASE IS NO LONGER REQUIRED FOR A RELIGIOUS FACILITY ON THIS SITE BECAUSE IT WAS REZONED FROM R-12 TO R-SI PER THE 02/02/04 COMPREHENSIVE ZONING PLAN.)
38. THE RELOCATION OF THE EXISTING UTILITY POLES ARE TO BE COMPLETED BY THE UTILITY COMPANY AT OWNERS EXPENSE.

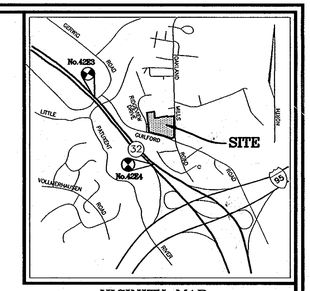
LEGEND

EXISTING CONTOUR	382
PROPOSED CONTOUR	382
SPOT ELEVATION	+82.53
DIRECTION OF FLOW	
EXISTING TREES TO REMAIN	

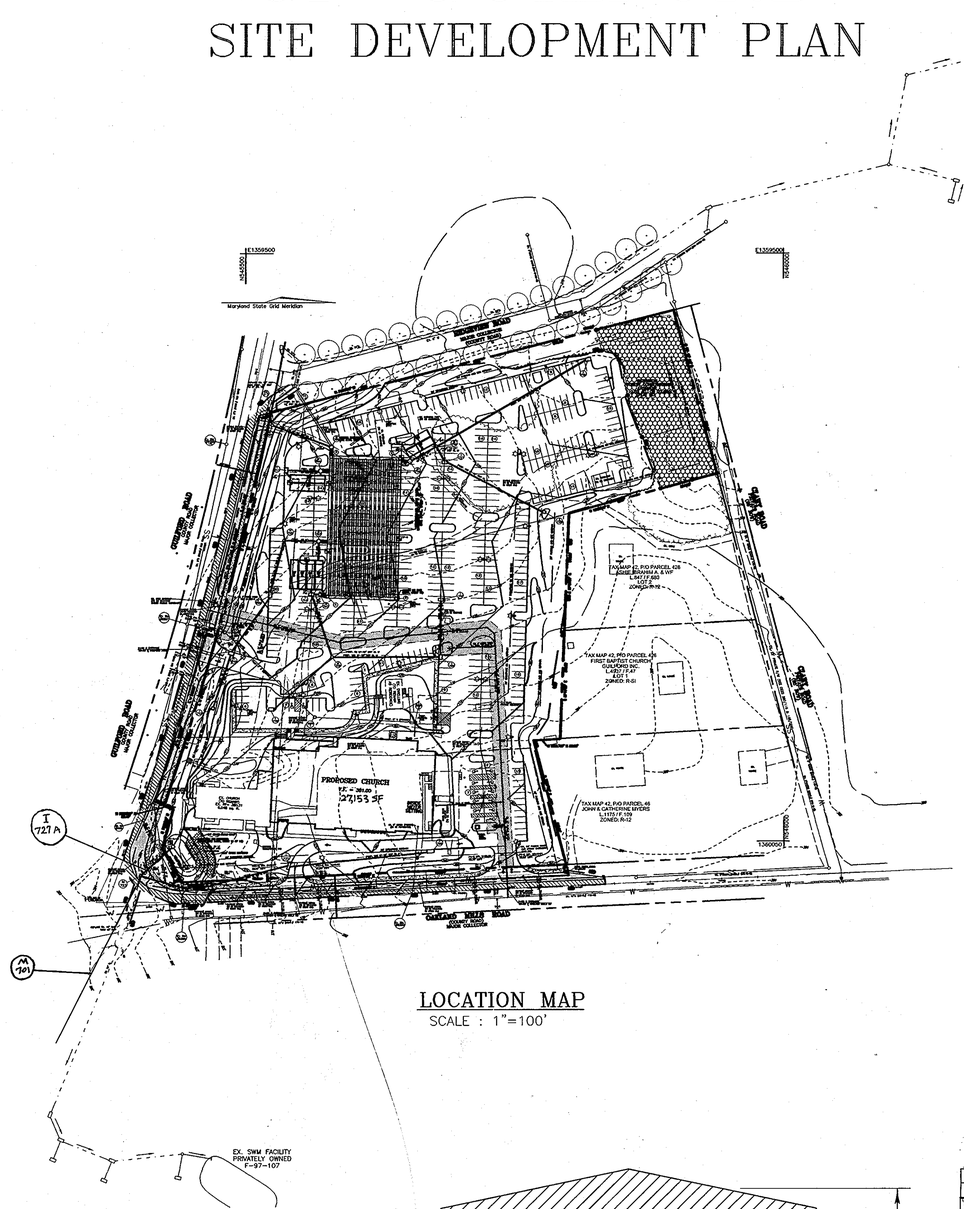
BENCHMARKS

HOWARD COUNTY CONTROL TRAVERSE NO. 42E3
N 546528.833 E 1357894.405 ELEV. 306.552

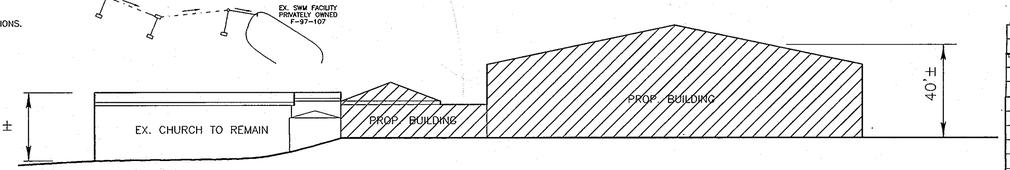
HOWARD COUNTY CONTROL TRAVERSE NO. 42E4
N 544850.922 E 1359466.467 ELEV. 337.610



VICINITY MAP
SCALE: 1"=2000'



LOCATION MAP
SCALE : 1"=100'



BUILDING ELEVATION
SCALE : 1"=30'

PARKING TABULATION

REQUIRED
BENCH SEATING : 24,000 INCHES OF BENCH @ 24 INCHES PER SEAT = 1000 BENCH SEATS
TOTAL SEATING : 1000 SEATS
1 SPACE PER 3 SEATS = 333 SPACES REQUIRED
HANDICAP REQUIRED : 8 HANDICAP SPACES
VAN ACCESSIBLE REQUIRED : 2 HANDICAP SPACES

TOTAL PARKING SPACES REQUIRED: 335 SPACES

TOTAL PARKING SPACES PROVIDED:
500 REGULAR SPACES
14 REGULAR HANDICAP SPACES, 6 VAN ACCESSIBLE SPACE
3 REGULAR SPACES FOR EXISTING DWELLING
4 BUS SPACES
TOTAL PARKING SPACES PROVIDED (EXCLUDING BUS SPACES): 517 SPACES

SHEET INDEX

DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 20
SITE LAYOUT PLAN	2 OF 20
SITE LAYOUT PLAN	3 OF 20
SEDIMENT AND EROSION CONTROL PLAN	4 OF 20
SEDIMENT AND EROSION CONTROL PLAN	5 OF 20
SEDIMENT AND EROSION CONTROL NOTES AND DETAILS AND SITE DETAILS	6 OF 20
STORM DRAIN DRAINAGE AREA MAP AND UTILITY PROFILES	7 OF 20
UTILITY PROFILES	8 OF 20
PAVEMENT MARKING AND SIGNAGE PLAN	9 OF 20
STORMWATER MANAGEMENT NOTES AND DETAILS	10 OF 20
STORMWATER MANAGMENT AND BIORETENTION NOTES AND DETAILS	11 OF 20
SAND FILTER DETAILS	12 OF 20
LANDSCAPE PLAN	13 OF 20
LANDSCAPE PLAN	14 OF 20
FOREST CONSERVATION PLAN	15 OF 20
FOREST CONSERVATION PLAN	16 OF 20
SITE LIGHTING PLAN	17 OF 20
LIGHTING DETAIL, SCHEDULES & DIAGRAMS	18 OF 20
ELECTRICAL SPECIFICATIONS	19 OF 20
STORM WATER MANAGEMENT NOTES AND DETAILS	20 OF 20

OWNER/DEVELOPER

FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
4	REVISE STORM WATER MANAGEMENT FACILITY AND ASSOCIATED STORM DRAIN	10-18-07
3	Add Church Entrance, Revise SHTS 2,4,7,8,13	
2	REVISE SD ACROSS OAKLAND MILLS ROAD	8/1/06
1	Revise parking count, SHC to building 2, bioretention area, associated grading and paving changes	6/30/06
6	REVISE ROOF LEADERS, ADD SUMP PUMP AND UPDATE ASSOCIATED STORM DRAIN PROFILES	8/24/2010
5	REVISE STAIRS TO LOWER ENTRY OF PROPOSED BUILDING; ADD STAIRS TO EXISTING BUILDING	11-28-07

ADDRESS CHART

LOT/PARCEL#	STREET ADDRESS
A	7504 OAKLAND MILLS ROAD

PERMIT INFORMATION CHART

SUBDIVISION NAME			SECTION/AREA		PARCEL NUMBER
N/A			N/A		A
PLAT No.	BLOCK NO.	ZONE	TAX/ZONE	ELECT. DIST.	CENSUS TR.
17917	16	RSI	42	6TH	6087.03
WATER CODE: E14			SEWER CODE: 5200400		

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 9/20/05
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 1/10/06
DIRECTOR	DATE 1/11/06

APPROVED : FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS

for COUNTY HEALTH OFFICER HOWARD COUNTY HEALTH DEPARTMENT	10/4/05 DATE

SITE DEVELOPMENT PLAN

COVER SHEET

FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16 6TH ELECTION DISTRICT T.M.PARCELS 9 & 227 PARCEL A HOWARD COUNTY, MARYLAND

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

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

DESIGN BY:	RHV
DRAWN BY:	MAN/DZ
CHECKED BY:	RHV
DATE:	SEPTEMBER 2005
SCALE:	AS SHOWN
W.O. NO.:	04-67

SHEET 1 OF 20

SDP-05-11

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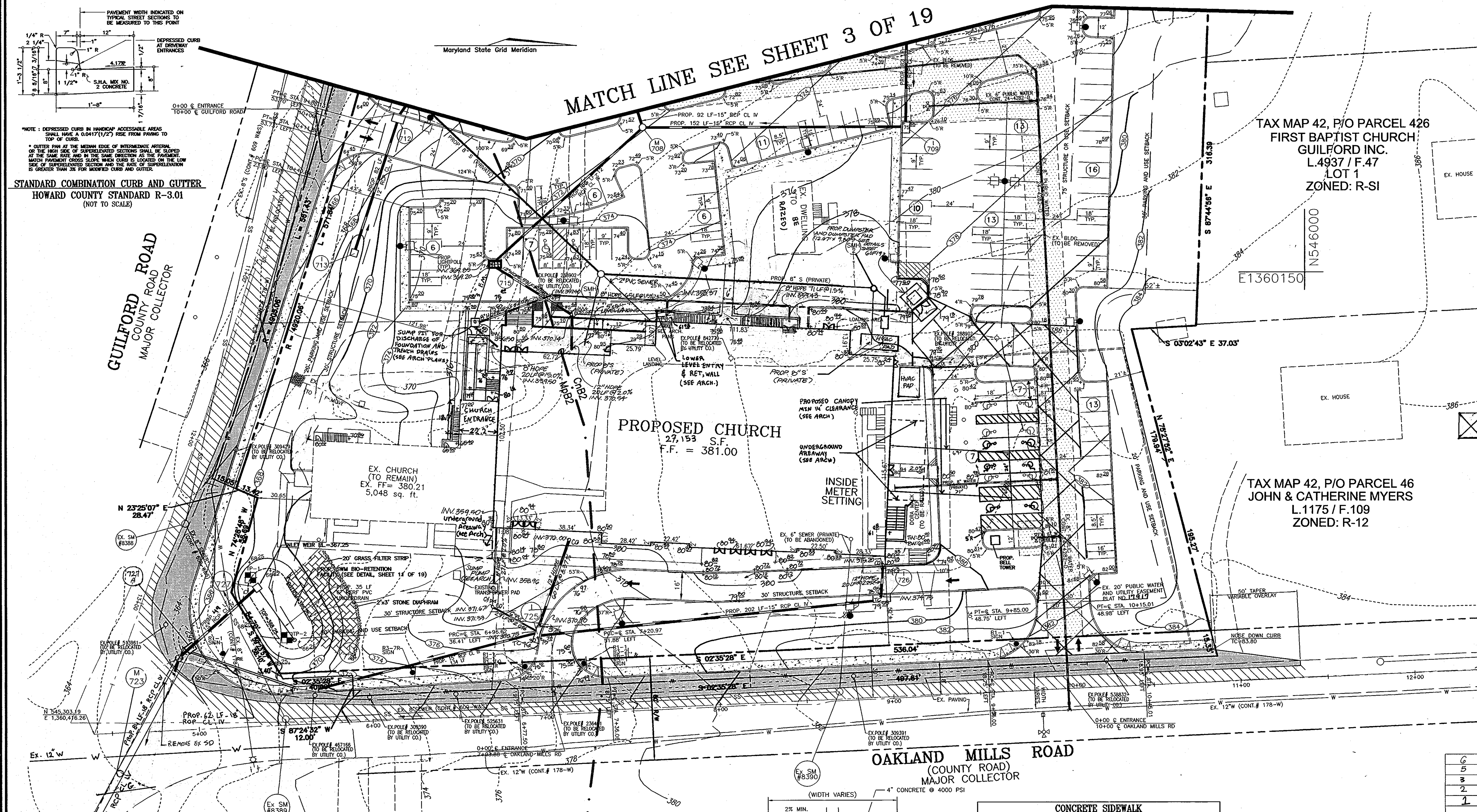
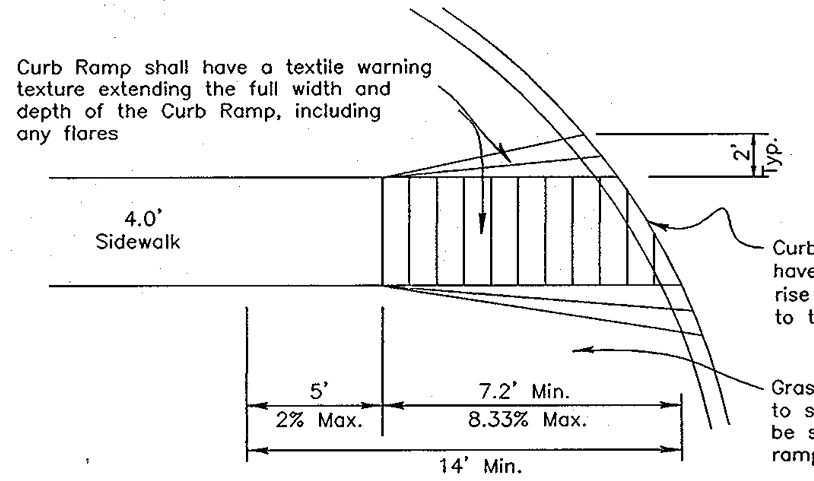


NOTE: ALL SWM FACILITES SHOWN ON THIS PLAN TO BE PRIVATELY OWNED AND MAINTAINED BY THE FIRST BAPTIST CHURCH OF GUILFORD

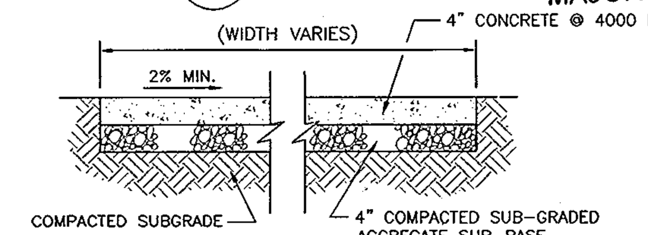
PLAN
SCALE: 1"=30'

SIGNAGE LOCATION CHART

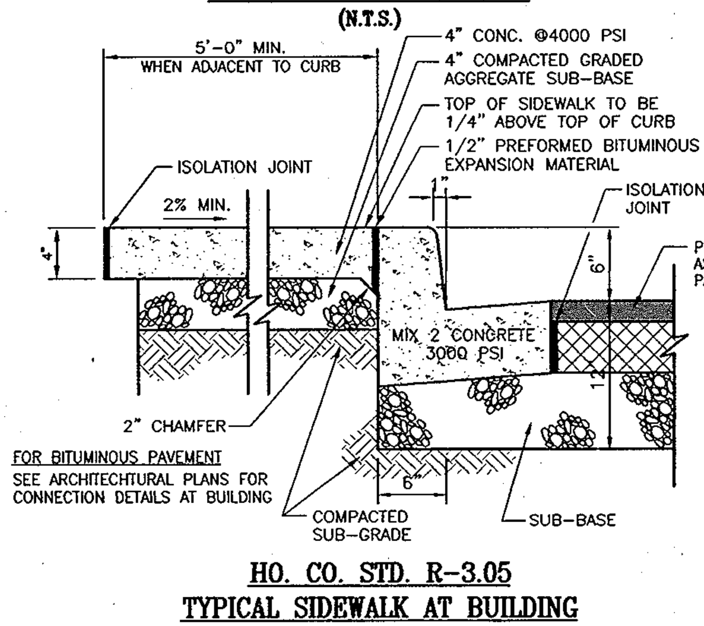
DWG. NO.	STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE
2 OF 19	OAKLAND MILLS ROAD	9+67	27' LEFT	R1-1 "STOP"
3 OF 19	GUILFORD ROAD	9+64	27' LEFT	
2 OF 19	OAKLAND MILLS ROAD	6+83	27' LEFT	R1-1 "STOP" WITH R3-2L MOUNTED BELOW "NO LEFT TURN"



HANDICAP RAMP
NOT TO SCALE

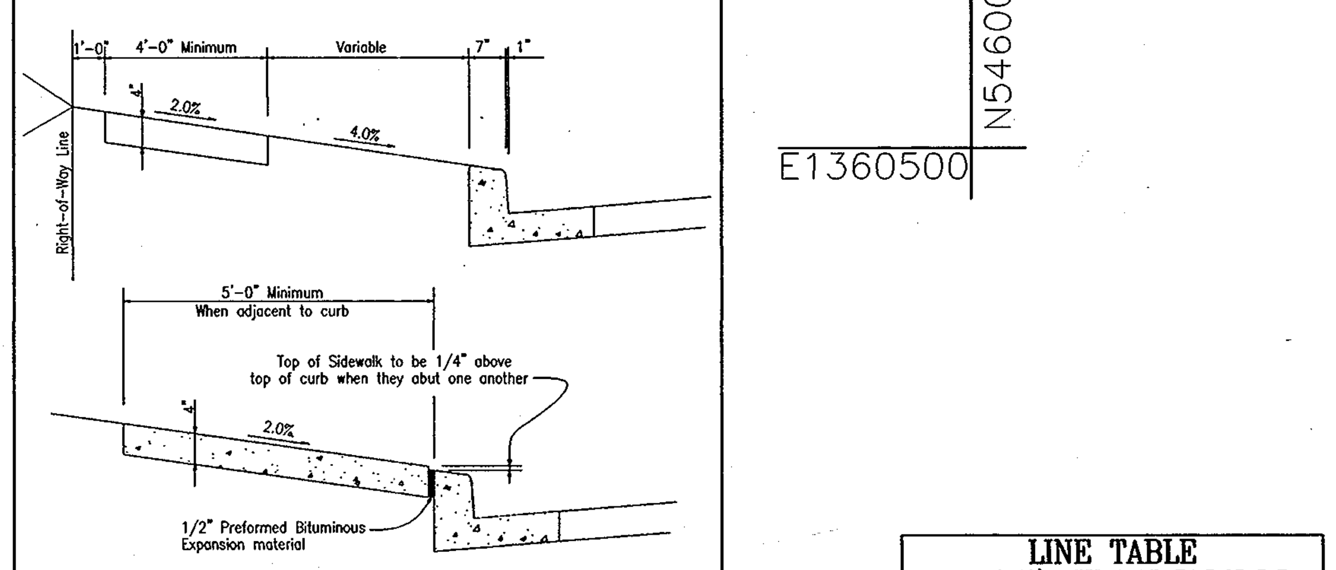


HO. CO. STD. R-3.05
TYPICAL SIDEWALK DETAIL
(N.T.S.)



HO. CO. STD. R-3.05
TYPICAL SIDEWALK AT BUILDING
(N.T.S.)

CONCRETE SIDEWALK
HOWARD COUNTY STANDARD DETAIL R3.05



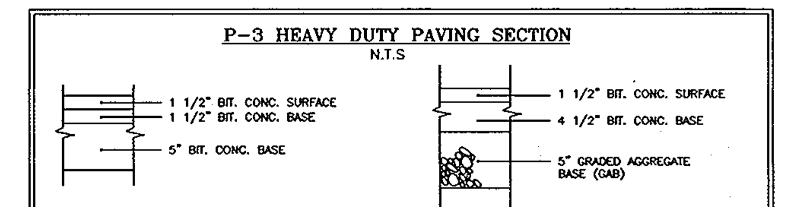
Construction Specifications

1. Sidewalk to be scribed in 5'-0" maximum squares.
2. Expansion joints across the sidewalk not to be more than 15' apart.
3. 1/2" Preformed Bituminous Expansion material in expansion joints to be kept 1/4" below surface of sidewalk.
4. Concrete to be mix number 2.
5. Where sidewalk abuts curb, sidewalk shall be 1/4" above curb with 1/2" Preformed Bituminous Expansion material between sidewalk and curb.
6. On longitudinal sidewalk grades of 5% or greater, a concrete header, 6" thick and 6" deep below the normal 4" sidewalk thickness shall be constructed for the full width of the sidewalk at intervals of 48 feet. The headers shall be placed at expansion joint locations and shall be monolithic with the curb.
7. Sidewalk width adjacent to curb shall be 5'-0" minimum except sidewalk adjacent to curb in cul-de-sac bulbs may be 4'-0" wide.
8. Sidewalk located 2' or more from curb may be 4'-0" in width with a 5'x5' paved section placed 200' apart.

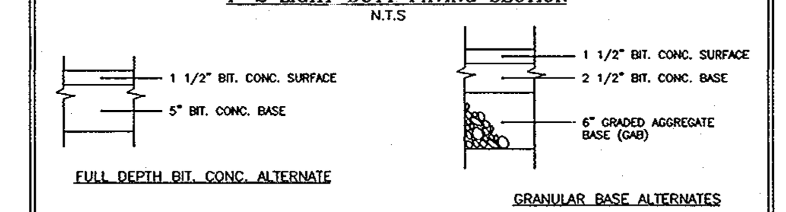
LEGEND:

398	EXISTING CONTOUR
406	PROPOSED CONTOUR
+ 402.68	PROPOSED SPOT ELEVATION
× 402.68	EXISTING SPOT ELEVATION
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
M	EXISTING MAILBOX
	EXISTING SIGN
S	EXISTING SANITARY MANHOLE
S	EXISTING SANITARY LINE
CO	EXISTING CLEANOUT
FH	EXISTING FIRE HYDRANT
W	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING TREES (FIELD LOCATED)
	EXISTING TREELINE (FIELD LOCATED)
x	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
M1B2 / M1D3	SOILS BOUNDARY
	PROPOSED LIGHT POLE
	PROPOSED SIDEWALK
	FOREST CONSERVATION EASEMENT
	LIMITS OF P-3 PAVING (SEE DETAIL THIS SHEET)
	MILL TO CENTERLINE AND PROVIDE 2" SURFACE COURSE OVERLAY (SEE DETAIL SHEET 3 OF 19)

P-3 HEAVY DUTY PAVING SECTION
N.T.S



P-2 LIGHT DUTY PAVING SECTION
N.T.S



LINE TABLE
PUBLIC 20' WATER & UTILITY EASEMENT

COURSE	BEARING	DISTANCE
L1	N 2°35'28" W	20.00'
L2	S 87°5'32" W	320.67'
L3	S 2°54'28" E	78.27'
L4	N 87°5'32" E	20.00'
L5	N 2°54'28" W	58.27'
L6	N 87°5'32" E	232.43'
L7	S 2°54'28" E	8.98'
L8	N 87°5'32" E	20.00'
L9	N 2°54'28" W	8.98'
L10	N 87°5'32" E	48.13'

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
6	REVISE ROOF LEADERS ADD SUMP PUMP AND UPDATE ASSOCIATED STORM DRAIN PROFILES	8/24/10
5	REVISE STAIRS TO LOWER ENTRY OF PROPOSED BUILDING; ADD STAIRS TO EX. BUILDING	11-29-07
3	ADD NEW CHURCH ENTRANCE, REVISE REAR STAIR ADD STAIR @ CANOPY, ADD ROOF LEADER TRUNK LINE & SUMP PIT	10/6/06
2	REVISE SD FROM I724 & I727 TO EX. SD	8/1/06
1	ADD MECHANICAL AREAWAYS, CANOPY, HVAC PADS, LOWER LEVEL ENTRY, RELOCATE DUMPSTER & SHIFT HC SPACES & P-3 PAVING, SEWER	6/30/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/26/10
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/10/06
DIRECTOR — DATE 1/11/06

SITE DEVELOPMENT PLAN

SITE LAYOUT PLAN

FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16 PARCEL A
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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

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

DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04-67

SHEET 2 OF 20

SDP-05-11

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SUMMARY TABLE AREA 1, 2, 2A, 3

AREA 6.10 AC.	REQUIREMENT	VOLUME REQUIREMENT W/O CREDITS	CREDITS	VOLUME REQUIREMENT AFTER CREDITS	NOTES
1	WATER QUALITY VOLUME WQV	0.3267 AC.FT.	N/A	0.6775 AC. FT.	PROVIDED IN BAY FILTER
2	RECHARGE VOLUME REV	0.0650 AC.FT.	N/A	0.0650 AC-FT	PROVIDED BELOW GRAVEL TRENCH

SUMMARY TABLE AREA 4

AREA 0.63 AC.	REQUIREMENT	VOLUME REQUIREMENT W/O CREDITS	CREDITS	VOLUME REQUIREMENT AFTER CREDITS	NOTES (GUILFORD ROAD R/W)
1	WATER QUALITY VOLUME WQV	0.0760 AC-FT.	N/A	0.0760 AC-FT.	CAN NOT BE TREATED
2	RECHARGE VOLUME REV	0.0152 AC-FT.	N/A	0.0152 AC-FT	CAN NOT BE TREATED

SUMMARY TABLE AREA 5

AREA 1.22 AC.	REQUIREMENT	VOLUME REQUIREMENT W/O CREDITS	CREDITS	VOLUME REQUIREMENT AFTER CREDITS	NOTES
1	WATER QUALITY VOLUME WQV	0.244 AC. IMPERVIOUS	0.17 AC. IMPERVIOUS REDUCTION	0.006 AC. FT.	PROVIDED IN BIORETENTION REMAINDER OF REQUIRED 20%
2	RECHARGE VOLUME REV	N/A	N/A	N/A	REDEVELOPMENT

SIGNAGE LOCATION CHART

DWG. NO.	STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE
2 OF 19	OAKLAND MILLS ROAD	9+67	27' LEFT	R1-1 "STOP"
3 OF 19	GUILFORD ROAD	9+64	27' LEFT	R1-1 "STOP"
2 OF 19	OAKLAND MILLS ROAD	6+83	27' LEFT	R1-1 "STOP" WITH R3-2L MOUNTED BELOW "NO LEFT TURN"

Maryland State Grid Meridian

SUMMARY TABLE

REQUIREMENT	VOLUME REQUIREMENT W/O CREDITS	CREDITS	VOLUME REQUIREMENT AFTER CREDITS	NOTES
CHANNEL PROTECTION VOLUME CPV	0.5965 AC.FT.	N/A	0.5965 AC-FT.	PROVIDED IN UNDERGROUND PIPE

AREA	EX. 1-YR	EX. 10-YR	DEV. 1-YR	DEV. 10-YR
1	4.19 CFS	18.86 CFS	0.28 CFS	13.99 CFS
1A	N/A	N/A	0.79 CFS	3.16 CFS
1+1A	N/A	N/A	0.98 CFS	14.58 CFS
2	2.71 CFS	8.02 CFS	3.24 CFS	8.45 CFS
3	0.58 CFS	2.75 CFS	0.45 CFS	1.83 CFS

LINE TABLE
FOREST CONSERVATION EASEMENT

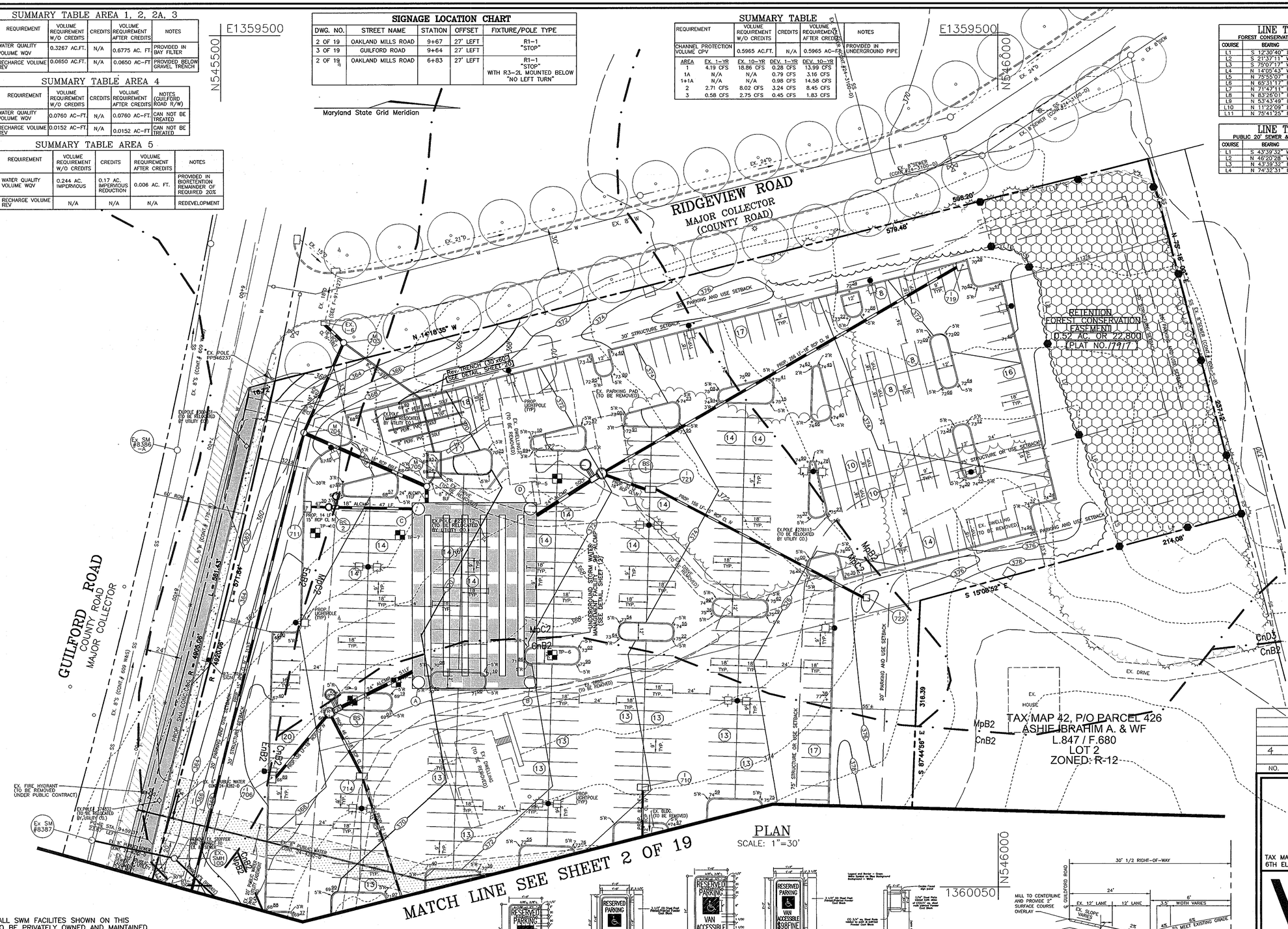
COURSE	BEARING	DISTANCE
L1	S 12°30'40" E	91.32'
L2	S 21°37'11" W	21.11'
L3	S 75°07'17" W	220.11'
L4	N 14°05'43" W	81.86'
L5	N 75°55'07" E	35.72
L6	N 65°31'17" E	46.80'
L7	N 71°47'11" E	55.01'
L8	N 83°26'01" E	39.89'
L9	N 53°43'49" E	25.04'
L10	N 11°22'09" E	17.01'
L11	N 75°41'25" E	30.00'

LINE TABLE
PUBLIC 20' SEWER & UTILITY EASEMENT

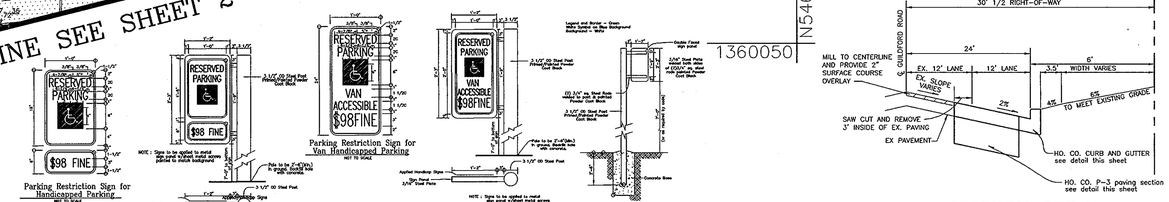
COURSE	BEARING	DISTANCE
L1	S 43°39'32" W	19.57'
L2	N 46°20'28" W	20.00'
L3	N 43°39'32" E	8.85'
L4	N 74°32'31" E	22.69'

LEGEND:

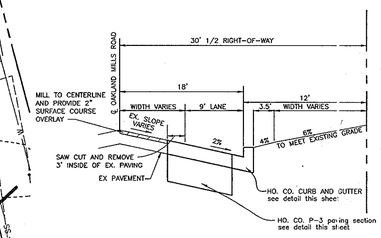
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- EXISTING TREES (FIELD LOCATED)
- EXISTING TREELINE (FIELD LOCATED)
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- SOILS BOUNDARY
- PROPOSED LIGHT POLE
- PROPOSED SIDEWALK
- FOREST CONSERVATION EASEMENT
- LIMITS OF P-1 PAVING (SEE DETAIL SHEET 2 OF 19)
- MILL TO CENTERLINE AND PROVIDE 2" SURFACE COURSE OVERLAY (SEE DETAIL THIS SHEET)



PLAN
SCALE: 1"=30'



WIDENING DETAIL
GUILFORD ROAD
NOT TO SCALE



WIDENING DETAIL
OAKLAND MILLS ROAD
NOT TO SCALE

Parking Restriction Sign for Handicapped Parking
NOT TO SCALE

Mounting Detail for Parking Restriction Sign
NOT TO SCALE

Parking Restriction Sign for Van Handicapped Parking
NOT TO SCALE

Mounting Detail for Parking Restriction Sign
NOT TO SCALE

HANDICAP PARKING SIGNS
(NOT TO SCALE)

NOTE: ALL SWM FACILITES SHOWN ON THIS PLAN TO BE PRIVATELY OWNED AND MAINTAINED BY THE FIRST BAPTIST CHURCH OF GUILFORD

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 10/30/07
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 11/1/07
DIRECTOR	DATE 11/2/07

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
4	REVISE STORMWATER MANAGEMENT FACILITY AND ASSOCIATED STORM DRAIN-REPLACEMENT SHEET	10/18/07

SITE DEVELOPMENT PLAN
REVISED
SITE LAYOUT PLAN

FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16 PARCEL A PARCEL 227 & 9
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

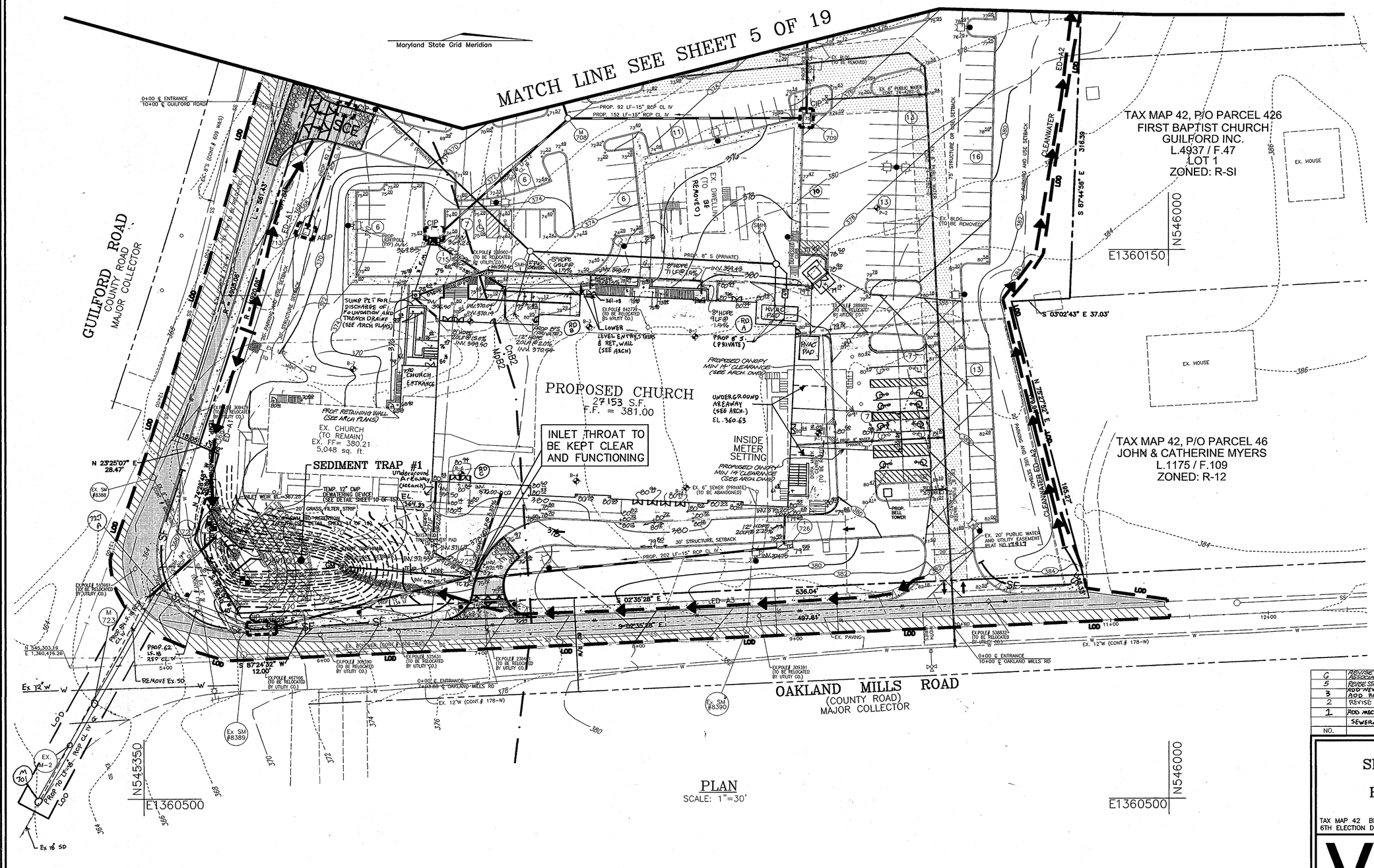
ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET TEL: 410.461.7666
ELLICOTT CITY, MD 21043 FAX: 410.461.8961

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER 10/18/07
ROBERT H. VOGEL, PE No.16193

DESIGN BY:	RHV
DRAWN BY:	MAN/DZ
CHECKED BY:	RHV
DATE:	SEPTEMBER 2005
SCALE:	AS SHOWN
W.O. NO.:	04-67

REPLACEMENT SHEET
SHEET 3 OF 20

SDP-05-11



PLAN
SCALE: 1"=30'

LEGEND:

- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- PROP. TEMP. 2' CONTOUR
- PROP. TEMP. 10' CONTOUR
- PROP. FINAL 2' CONTOUR
- PROP. FINAL 10' 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 TREES (FIELD LOCATED)
- EXISTING TREELINE (FIELD LOCATED)
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- SOILS BOUNDARY (MIB2, MID3)
- PROPOSED LIGHT POLE
- PROPOSED SIDEWALK
- FOREST CONSERVATION EASEMENT

SEDIMENT TRAP #1

TRAP NO. : 1
TRAP TYPE : PIPE OUTLET ST-1
EXISTING DRAINAGE AREA : 2.86 AC.
PROPOSED DRAINAGE AREA : 2.29 AC.
WET STORAGE REQUIRED : 5148 CF
WET STORAGE PROVIDED : 5246 CF
DRY STORAGE REQUIRED : 5148 CF
DRY STORAGE PROVIDED : 5711 CF
BOTTOM DIMENSIONS : 71'x13'
BOTTOM ELEVATION : 360.00
RISER CREST ELEVATION : 365.00
WEIR LENGTH : 6.33'
WET STORAGE ELEVATION : 363.30
DRY STORAGE ELEVATION : 365.00
TOTAL STORAGE DEPTH : 5.0'
TOP OF EMBANKMENT : 367.00
CLEANOUT ELEVATION : 361.65
SIDE SLOPES : 2:1
OUTFALL CONDITION : EX. STORM DRAIN SYSTEM
BARREL : 15" RCP
RISER : TYPE 'D' INLET-OPEN 4 SIDES

OWNER/DEVELOPER

FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
G	REVISE ROOF LEADERS, ADD SUMP PUMP AND UPDATE DESIGNATED STORM DRAIN PROFILES	8/24/10
5	REVISE STAIR TO UNDERNEATH OF PROPOSED BUILDING; ADD STAIR TO EX. BUILDING	11-29-07
3	ADD NEW CHURCH ENTRANCE; REVISE REAR STAIR ADD STAIR @ CANOPY,	10/6/06
2	REVISE SD FROM E724 & E727 TO EX. SD	8/1/06
1	ADD MECHANICAL AREAWAYS, CANOPY, HVAC PADS, LOWER LVL ENTRY; SEWER, RELOCATE DUMPSTER, SHIFT HC, ADD 23 PARKG REVISE SPOTS @ DUMPSTER & LOWER ENTRY	6/30/06

SITE DEVELOPMENT PLAN

SEDIMENT AND EROSION CONTROL PLAN FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
HOWARD COUNTY, MARYLAND

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

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER 9/14/05
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04-67

SHEET 4 OF 20

NOTE: ALL SWM FACILITES SHOWN ON THIS PLAN TO BE PRIVATELY OWNED AND MAINTAINED BY THE FIRST BAPTIST CHURCH OF GUILFORD

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 9/26/05
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 1/10/06
DIRECTOR	DATE 1/11/06

REVIEWED FOR HOWARD S.C.D. & MEETS TECHNICAL REQUIREMENTS.

USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE 9-22-05

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

HOWARD S.C.D. — DATE 9-22-05

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE Sept 14-05

BY THE ENGINEER:

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

SIGNATURE OF ENGINEER ROBERT H. VOGEL, P.E. — DATE 9/14/05

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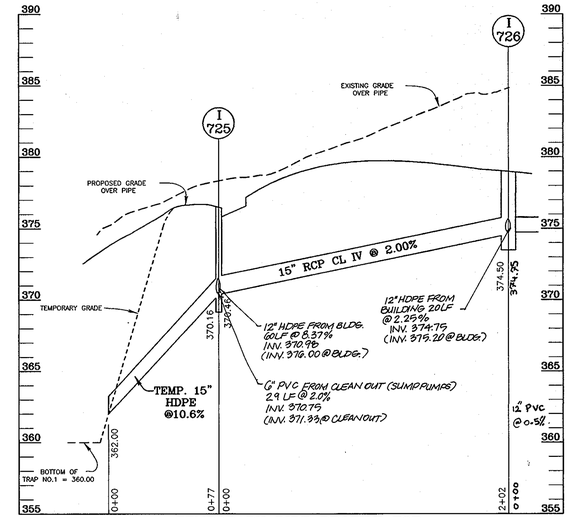
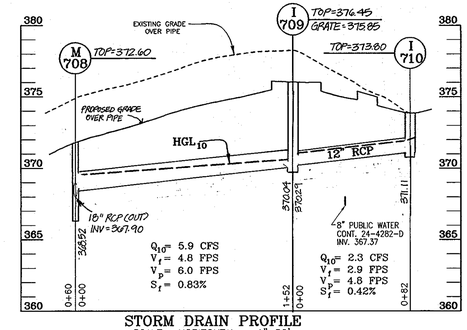
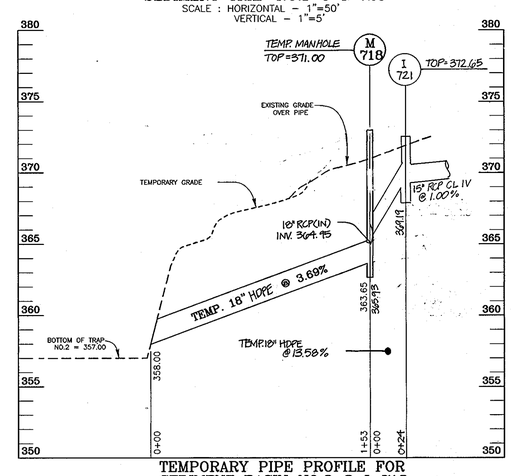
SDP-05-11



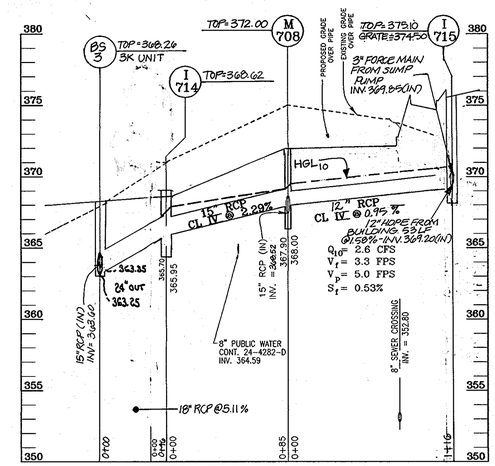
TEMPORARY PIPE PROFILE FOR
SEDIMENT TRAP NO.1 @ I-725
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



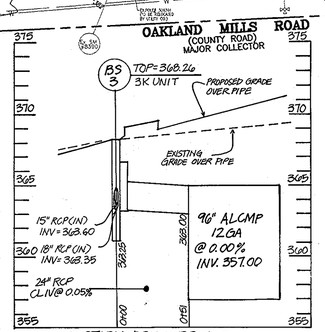
STORM DRAIN PROFILE
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



TEMPORARY PIPE PROFILE FOR
SEDIMENT BASIN NO.2 @ I-718
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



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



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

OWNER/DEVELOPER

FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
4	REVISE STORMWATER MANAGEMENT FACILITY AND ASSOCIATED STORM DRAIN	10/18/07
3	REVISE PROFILE, PIPE, STRUCTURE SCHEDULE FOR I 715, I 726, I 725	10/6/06
2	REVISE M 701, M 723, I 727A	8/1/06
1	REVISE 727 TOP. ELEV., ADD CANOPY, HVAC, LOWER LEVEL ENTRY	6/30/06

STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	TOP ELEV.	INV. IN	INV. OUT	REMARKS
701	4' SHALLOW PRECAST MANHOLE		362.20	358.03	357.93	DET. G5.12
△703	STD. PRECAST MANHOLE		361.51	354.48(2)	354.38	DET. G5.11
704	STD. PRECAST MANHOLE		360.00	350.00/ 350.85	355.60	DET. G5.11
705	4' STANDARD PRECAST MANHOLE		368.83	361.50	360.00/ 359.50	DET. G5.11
706	DOUBLE 'S' COMBINATION INLET		367.49		363.60	DET. SD4.34
708	4' SHALLOW PRECAST MANHOLE		372.60	368.00/ 368.52	367.90	DET. G5.12
709	DOUBLE 'S' COMBINATION INLET		376.45	370.29	370.04	DET. SD4.34
710	DOUBLE 'S' INLET		373.80	–	371.11	DET. SD4.23
711	DOUBLE 'S' COMBINATION INLET		373.80	–	364.32	DET. SD4.34
712	DOUBLE 'S' COMBINATION INLET		368.34	361.30	361.05	DET. SD4.34
713	PRECAST STANDARD TYPE 'D' INLET		367.00*	–	363.30	DET. SD4.39
714	DOUBLE 'S' INLET		368.62	365.95	365.70	DET. SD4.23
715	DOUBLE 'S' COMBINATION INLET		375.10	369.89/ 369.20	369.10	DET. SD4.34
718	4' STANDARD PRECAST MANHOLE		371.00	366.93/ 364.93	364.65	DET. G5.11
719	DOUBLE 'S' COMBINATION INLET		370.80	–	368.05	DET. SD4.34
721	DOUBLE 'S' INLET		372.65	369.44	369.19	DET. SD4.23
722	PRECAST STANDARD TYPE 'D' INLET		373.90*	–	371.00	DET. SD4.39
723	4' PRECAST MANHOLE		364.25	360.91	358.52	DET. G5.12
724	PRECAST RECT. COG-15 INLET		368.71	365.02	362.49	MD-374.51
725	PRECAST A-10 INLET (WIDTH=3'-6" O/O)		376.51	370.70/ 370.52	370.16	DET. SD4.41
726	PRECAST A-10 INLET (WIDTH=3'-6" O/O)		379.00	374.75	374.50	DET. SD4.41
△727	PRECAST STANDARD TYPE 'D' INLET		367.25	362.54	362.34	DET. SD4.39 WEIR 367.00
727A	'S' INLET		365.52	361.74/ 362.07	361.54	

* – ELEVATION @ THROAT – OPENINGS ON 4 SIDES
△ – PROVIDE OPENING FOR TEMPORARY STORM DRAIN PIPES(SEE SEDIMENT & EROSION CONTROL PLAN AND PROFILE SHEETS

PIPE SUMMARY

SIZE	TYPE	LENGTH
8"	DIP (WATER)	150'
8"	DIP (SAN.)	313'
12"	RCP CLASS IV	262'
15"	RCP CLASS III	134'
15"	RCP CLASS IV	976'
"	"	"
18"	RCP CLASS IV	789'
18"	ALCMP	47'
24"	ALCMP	112'
8"	PVC	97'
6"	PERF. PVC	35'
8"	PERF. PVC	150'
12"	PVC	305'
96"	ALCMP GA 12	900'

NO.	REVISION	DATE
G	REVISE ROOF LEADERS, ADD SUMP PUMP AND UPDATE ASSOCIATED STORM DRAIN PROFILES	8/24/200

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/26/05
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/9/06
DIRECTOR — DATE 1/11/06

SITE DEVELOPMENT PLAN

STORM DRAIN DRAINAGE AREA MAP AND STORM DRAIN PROFILES FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
HOWARD COUNTY, MARYLAND

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

STATE OF MARYLAND ROBERT HARRY VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: 1"=50'
W.O. NO.: 04-67

SHEET 7 OF 20

SDP-05-11

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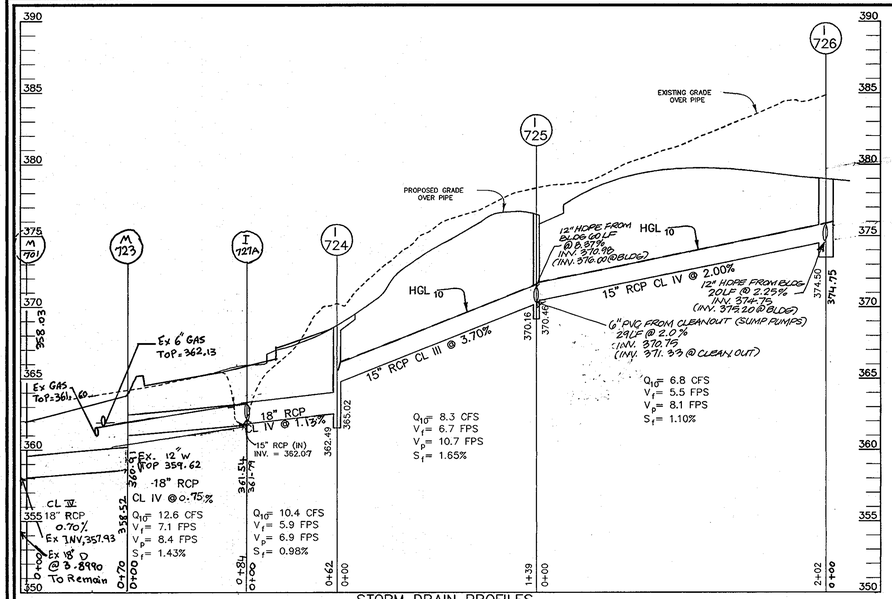
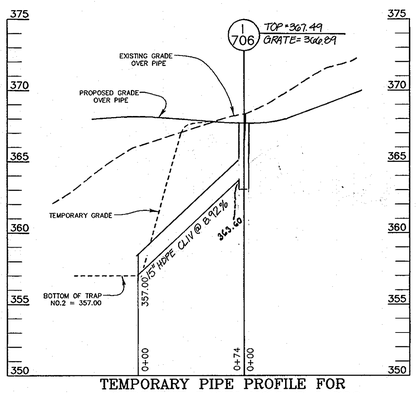
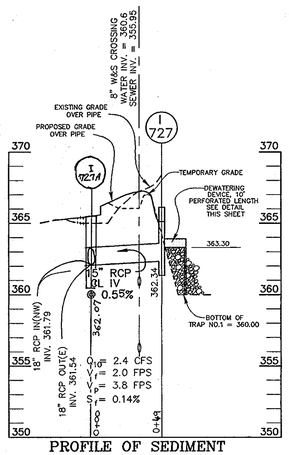


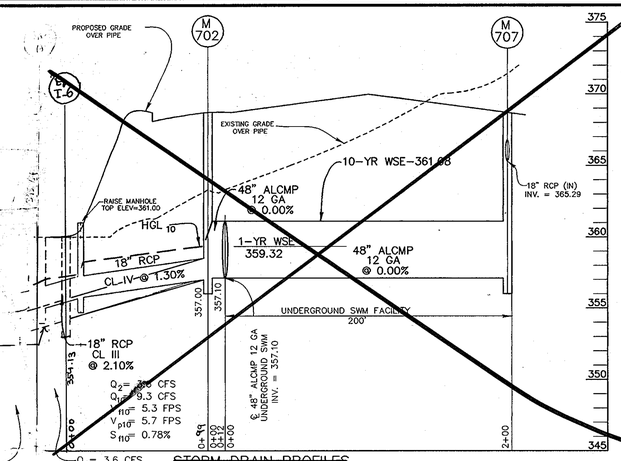
STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



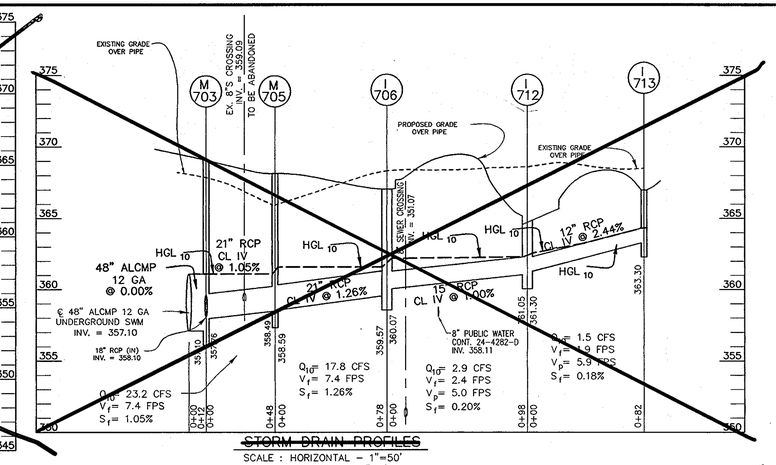
TEMPORARY PIPE PROFILE FOR SEDIMENT BASIN NO.2 @ I-706
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



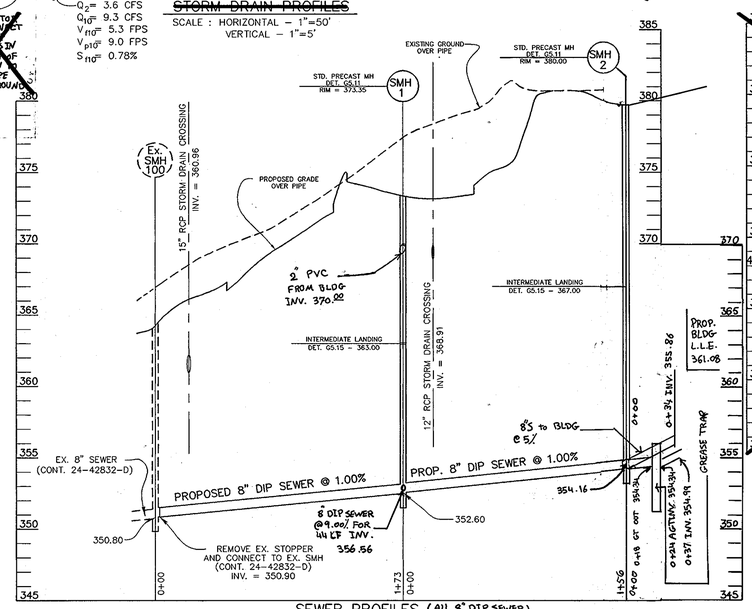
PROFILE OF SEDIMENT TRAP NO.1 OUTFALL
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



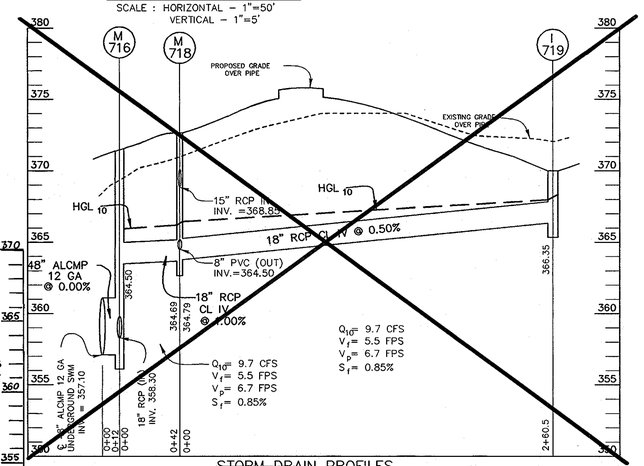
STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'

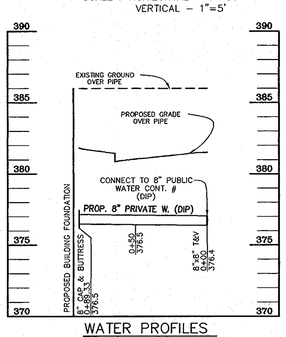


SEWER PROFILES (ALL 8" DIP SEWER)
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'

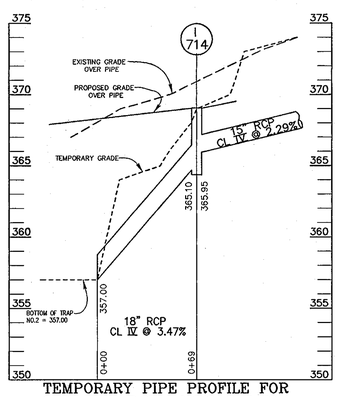


STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'

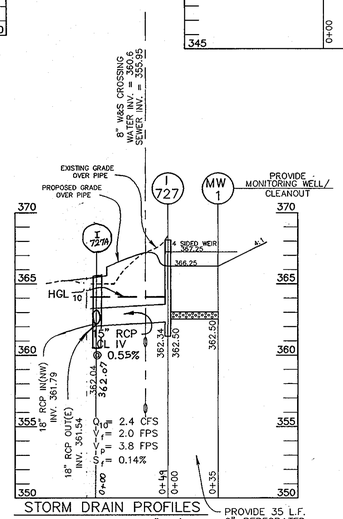
NO.	REVISION	DATE
G	REVISE ROOF LEADERS, ADD SUMP PUMP AND UPDATE ASSOCIATED STORM DRAIN PROFILES	8/24/200



WATER PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'

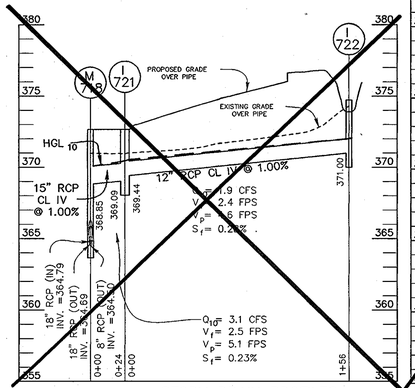


TEMPORARY PIPE PROFILE FOR SEDIMENT BASIN NO.2 @ I-714
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'

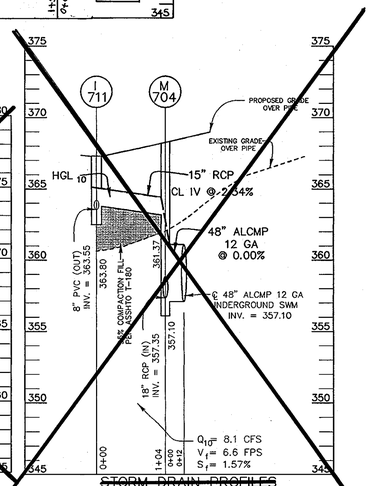


STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'

PROVIDE 35 L.F. 6"-PERFORATED PVC-SCH 40 PIPE (SEE DETAIL SHEET 11)



STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'

NO.	REVISION	DATE
4	REVISE STORMWATER MANAGEMENT FACILITY AND ASSOCIATED STORM DRAIN	10/8/07
3	REVISE PROFILE FOR I 725, I 726	10/6/06
2	REVISE M703, M 723, I 727A, Ex 16" PROFILES	8/1/06
1	REVISE SEWER PROFILE	6/30/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/26/05

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/10/06

DIRECTOR — DATE 1/11/06

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

SITE DEVELOPMENT PLAN

UTILITY PROFILES

FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
HOWARD COUNTY, MARYLAND

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

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER — 9/26/05

ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04-67

SHEET 8 OF 20

SDP-05-11

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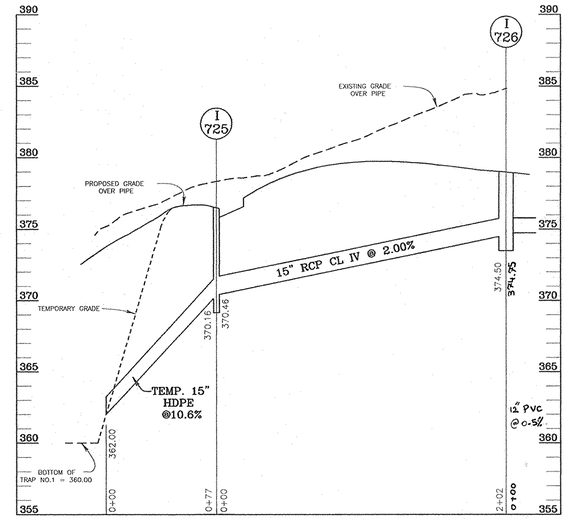
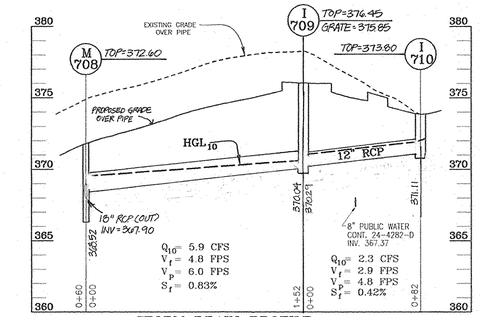
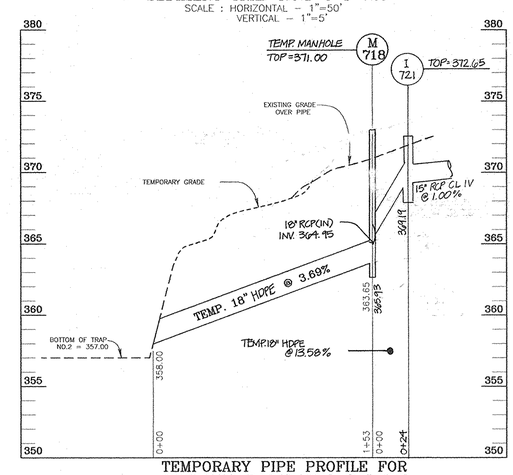


TEMPORARY PIPE PROFILE FOR SEDIMENT TRAP NO.1 @ I-725
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



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



TEMPORARY PIPE PROFILE FOR SEDIMENT BASIN NO.2 @ I-718
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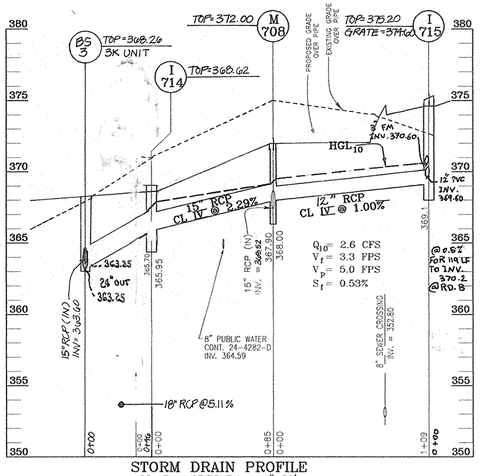
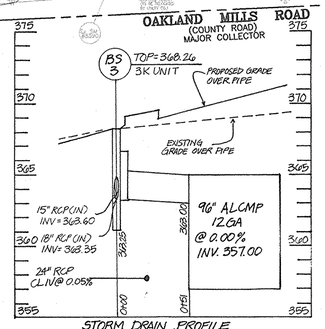
VERTICAL – 1"=5'



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

OWNER/DEVELOPER

FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096



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

STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	TOP ELEV.	INV. IN	INV. OUT	REMARKS
701	4' SHALLOW PRECAST MANHOLE		362.20	358.03	357.93	DET. G5.12
△703	STD. PRECAST MANHOLE		361.51	354.48(3)	354.38	DET. G5.11
704	STD. PRECAST MANHOLE		360.00	350.00/ 355.85	355.60	DET. G5.11
705	4' STANDARD PRECAST MANHOLE		368.83	357.50	360.50/ 357.50	DET. G5.11
706	DOUBLE 'S' COMBINATION INLET		367.49		363.60	DET. SD4.34
708	4' SHALLOW PRECAST MANHOLE		372.60	368.00/ 368.52	367.90	DET. G5.12
709	DOUBLE 'S' COMBINATION INLET		376.45	370.29	370.04	DET. SD4.34
710	DOUBLE 'S' INLET		373.80	–	371.11	DET. SD4.23
711	DOUBLE 'S' COMBINATION INLET		373.00	–	364.32	DET. SD4.34
712	DOUBLE 'S' COMBINATION INLET		368.34	361.30	361.05	DET. SD4.34
713	PRECAST STANDARD TYPE 'D' INLET		367.00*	–	363.30	DET. SD4.39
714	DOUBLE 'S' INLET		368.62	365.95	365.70	DET. SD4.23
715	DOUBLE 'S' COMBINATION INLET		373.20	369.60 370.60	369.10	DET. SD4.34
718	4' STANDARD PRECAST MANHOLE		371.00	368.93/ 368.43	368.65	DET. G5.11
719	DOUBLE 'S' COMBINATION INLET		370.80	–	368.05	DET. SD4.34
721	DOUBLE 'S' INLET		372.85	369.44	369.19	DET. SD4.23
722	PRECAST STANDARD TYPE 'D' INLET		373.90*	–	371.00	DET. SD4.39
723	4' PRECAST MANHOLE		364.25	360.91	358.52	DET. G5.12
724	PRECAST RECT. COG-15 INLET		368.71	365.02	362.49	MD-374.51
725	PRECAST A-10 INLET (WIDTH=3'-6" O/O)		376.51	370.46 370.21	370.16	DET. SD4.41
726	PRECAST A-10 INLET (WIDTH=3'-6" O/O)		379.00	374.75	374.50	DET. SD4.41
△727	PRECAST STANDARD TYPE 'D' INLET		367.25	362.54	362.34	DET. SD4.39 WEIR 367.00
727A	'S' INLET		365.52	361.79	361.54	

* – ELEVATION @ THROAT – OPENINGS ON 4 SIDES
△ – PROVIDE OPENING FOR TEMPORARY STORM DRAIN PIPES(SEE SEDIMENT & EROSION CONTROL PLAN AND PROFILE SHEETS

PIPE SUMMARY

SIZE	TYPE	LENGTH
8"	DIP (WATER)	150'
8"	DIP (SAN.)	313'
12"	RCP CLASS IV	262'
15"	RCP CLASS III	134'
15"	RCP CLASS IV	976'
"	"	"
18"	RCP CLASS IV	784'
18"	ALCMP	47'
24"	ALCMP	112'
8"	PVC	97'
6"	PERF. PVC	35'
8"	PERF. PVC	150'
12"	PVC	305'
96"	ALCMP GA 12	900'

NO.	REVISION	DATE
4	REVISE STORMWATER MANAGEMENT FACILITY AND ASSOCIATED STORM DRAIN	10/18/07
3	REVISE PROFILE PIPE, STRUCTURE SCHEDULE FOR I 715, I 726, I 725	10/6/06
2	REVISE M 701, M 723, I 727A	8/1/06
1	REVISE 727 TOP. ELEV, ADD CANOPY, HVAC, LOWER LEVEL ENTRY	6/30/06

SITE DEVELOPMENT PLAN

STORM DRAIN DRAINAGE AREA MAP AND STORM DRAIN PROFILES FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
HOWARD COUNTY, MARYLAND

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STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER
9/14/07
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: 1"=50'
W.O. NO.: 04-67

SHEET 7 OF 20

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/26/05
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/10/06
DIRECTOR — DATE 1/11/06

SDP-05-11

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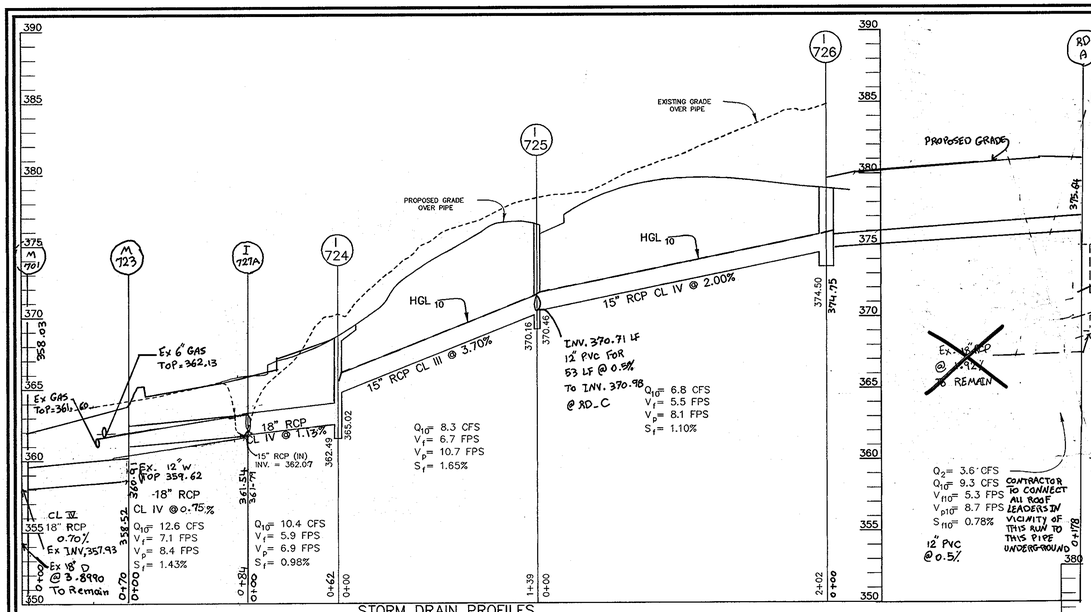

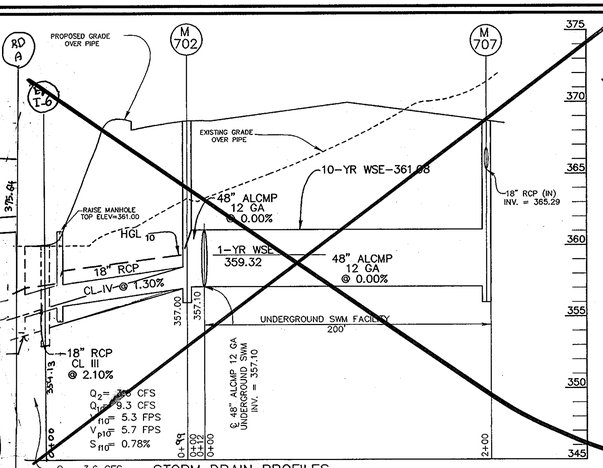

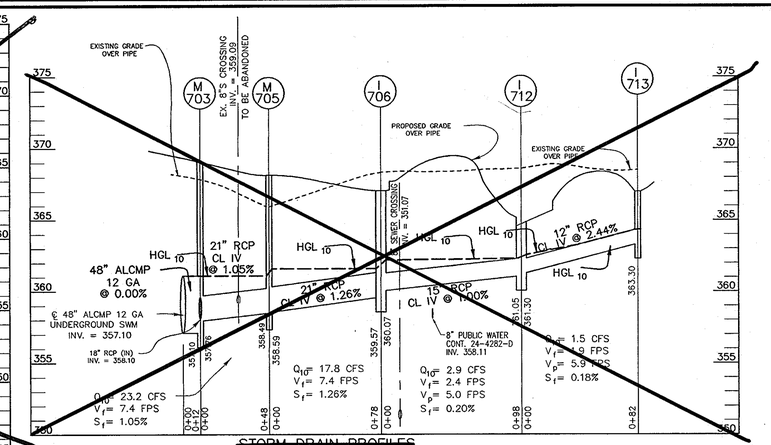

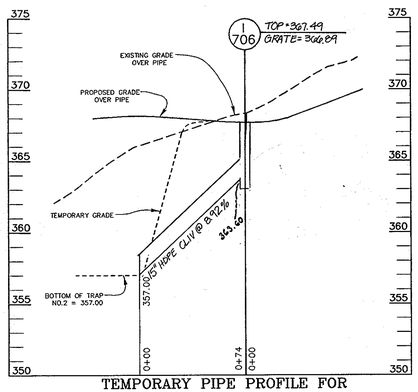

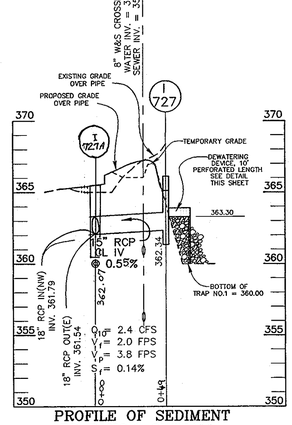

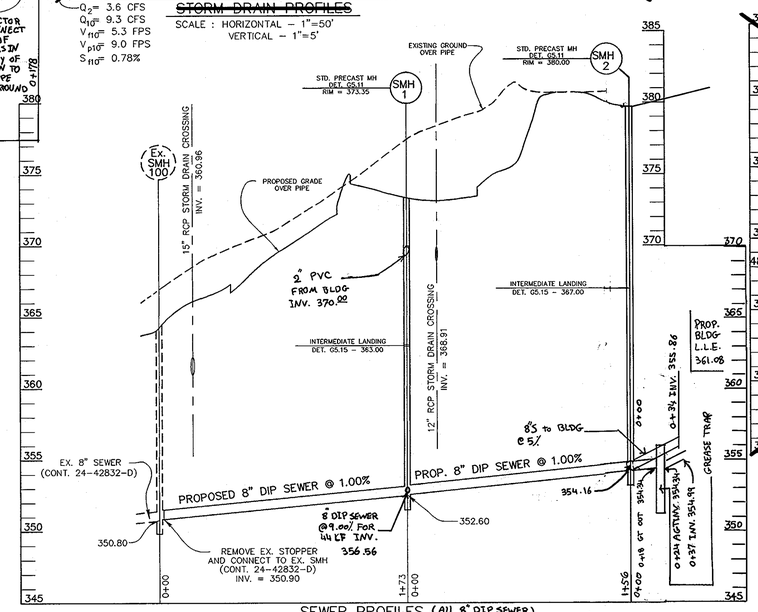

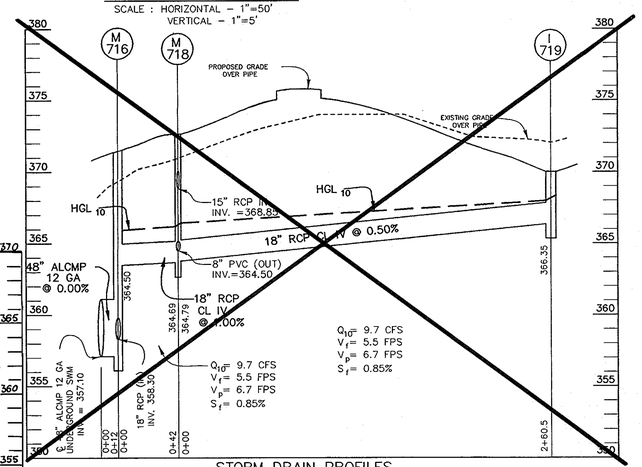

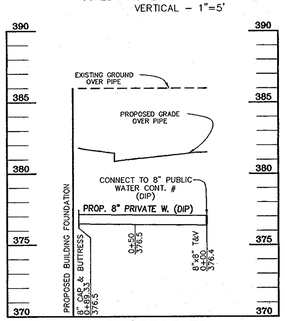

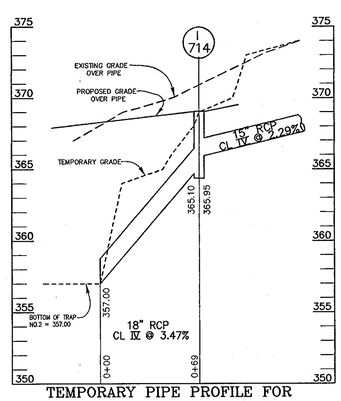

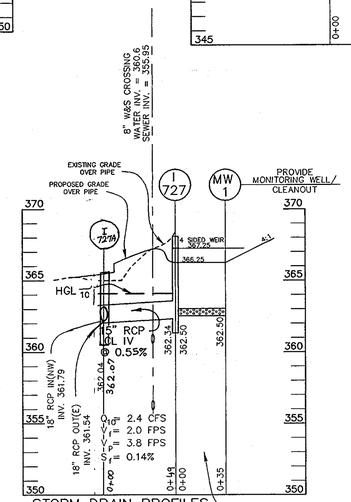

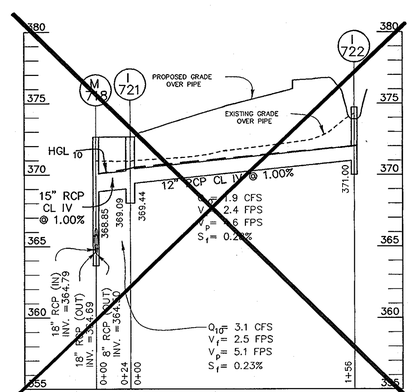

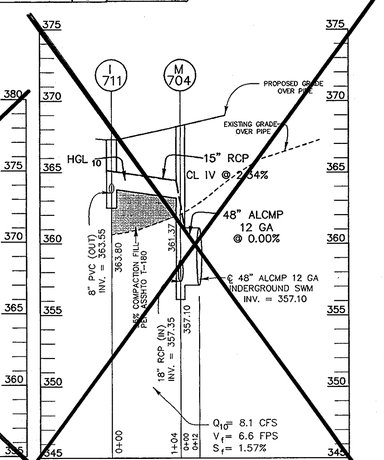

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 9/22/05
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 1/10/06
DIRECTOR	DATE 1/11/06

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
4	REVISE STORMWATER MANAGEMENT FACILITY AND ASSOCIATED STORM DRAIN	10/8/07
3	REVISE PROFILE FOR I 725, I 726	10/6/06
2	REVISE M701, M 723, I 727A, EX I6 PROFILES	8/1/06
1	REVISE SEWER PROFILE	6/30/06

SITE DEVELOPMENT PLAN
UTILITY PROFILES
FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT
PARCEL A
HOWARD COUNTY, MARYLAND

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DESIGN BY:	RHV
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SDP-05-11

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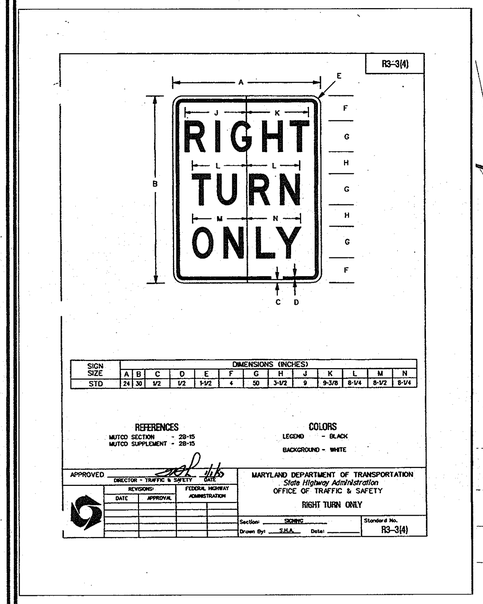

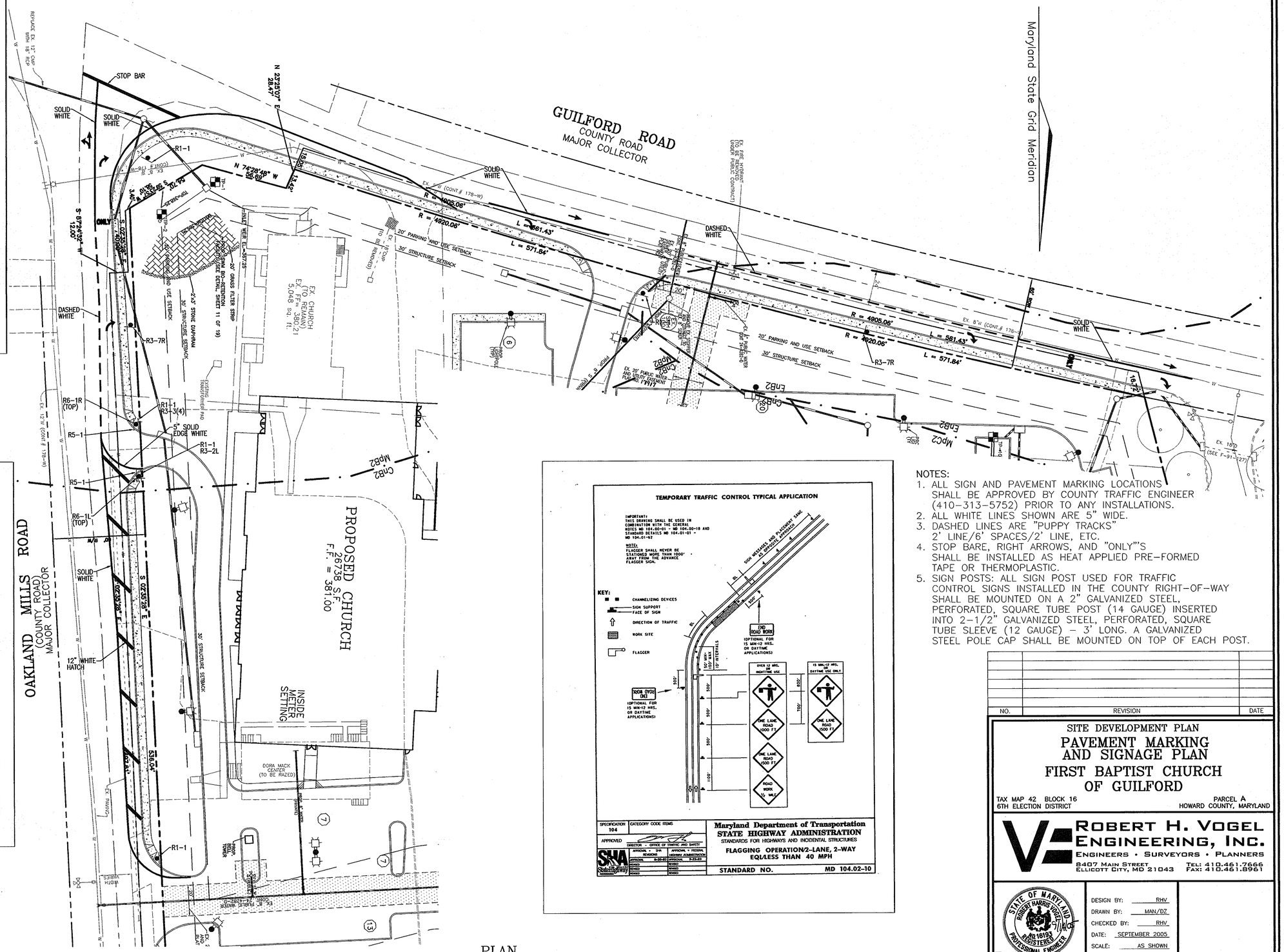

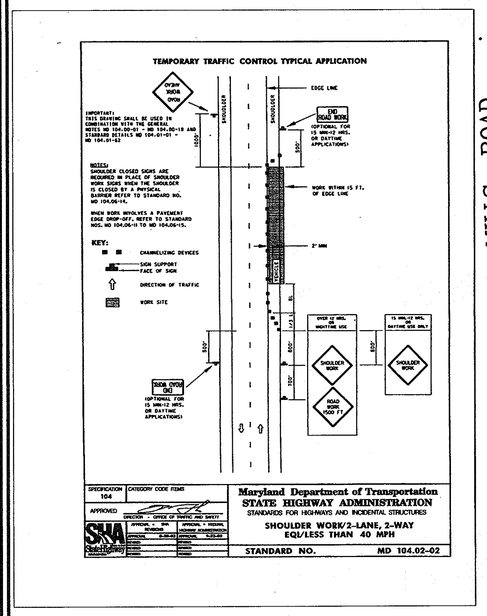

NOTES:

1. ALL SIGN AND PAVEMENT MARKING LOCATIONS SHALL BE APPROVED BY COUNTY TRAFFIC ENGINEER (410-313-5752) PRIOR TO ANY INSTALLATIONS.
2. ALL WHITE LINES SHOWN ARE 5" WIDE.
3. DASHED LINES ARE "PUPPY TRACKS" 2' LINE/6' SPACES/2' LINE, ETC.
4. STOP BARE, RIGHT ARROWS, AND "ONLY"'S SHALL BE INSTALLED AS HEAT APPLIED PRE-FORMED TAPE OR THERMOPLASTIC.
5. SIGN POSTS: ALL SIGN POST 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 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.

NO.	REVISION	DATE

PLAN
SCALE: 1"=30'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/20/05

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/10/06

DIRECTOR — DATE 1/11/06

SITE DEVELOPMENT PLAN

PAVEMENT MARKING AND SIGNAGE PLAN

FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
HOWARD COUNTY, MARYLAND

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STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER — 5/11/06

ROBERT H. VOGEL, PE No.16193

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DATE: SEPTEMBER 2005
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SHEET 9 OF 20

SDP-05-11

MARYLAND 378
STORMWATER MANAGEMENT POND CONSTRUCTION SPECIFICATIONS

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 version.

Site Preparation

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of 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 tow 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 management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

All cleared and grubbed 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.

Earth Fill

Material – The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable materials. 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 embankment.

Placement – Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials 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.

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 the 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 agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within +\-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 excavation, with the minimum width being four feet. The depth shall be at 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 core 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 currently with the outer shell of 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 operated closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, 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 resistivity of 2,000 ohm-cm. Material shall be placed such that minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the sides 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 the structure. Under no circumstances shall equipment be driven over any part of c structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill (flowable fill)zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

Pipe Conduits

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 Cooted steel pipe)– Steel pipes with polymeric coating shall have 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.

Materials – (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.

POND BOTTOM SOIL CONDITIONS

If broken rock fragments are encountered at finished pond bottom, under cut a minimum of 12" below basin grade and to a horizontal distance of at least 18" beyond each edge of the broken rock and backfill with fine-grained ML or CL soils compacted to a firm condition. This procedure should be performed under the supervision of the project Geotechnical Engineer.

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 in 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 between 4 and 9.

2. Coupling, bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at lease 24 mils in thickness.

3. Connections – All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.

All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of 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 diameter: flanges on both ends of the pipe with a circular 3/8 inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in 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 flange is also acceptable.

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 t"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 pipe:

1. 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 under 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 as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe – Bell and spigot pipe shall be placed 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 from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform t"Structure Backfill ".

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 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.

4. Backfilling shall conform t"Structure Backfill ".

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

Drainage Diaphragms – When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

Concrete

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 Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction Materials, Section 311.

Geotexile shall be placed under all riprap and shall meet 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

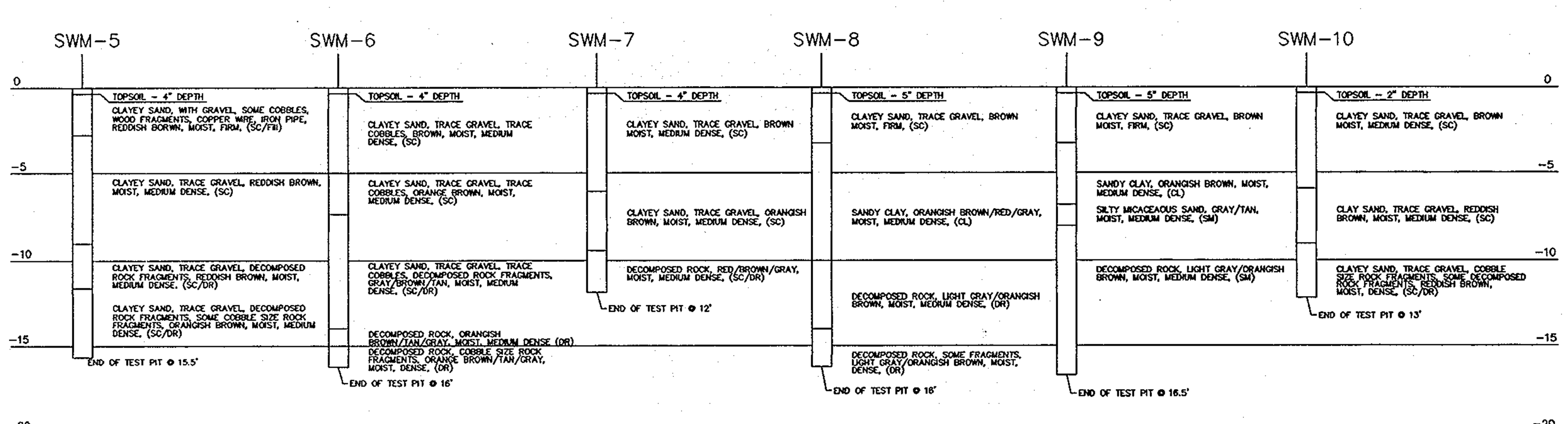
All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part 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 locations 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

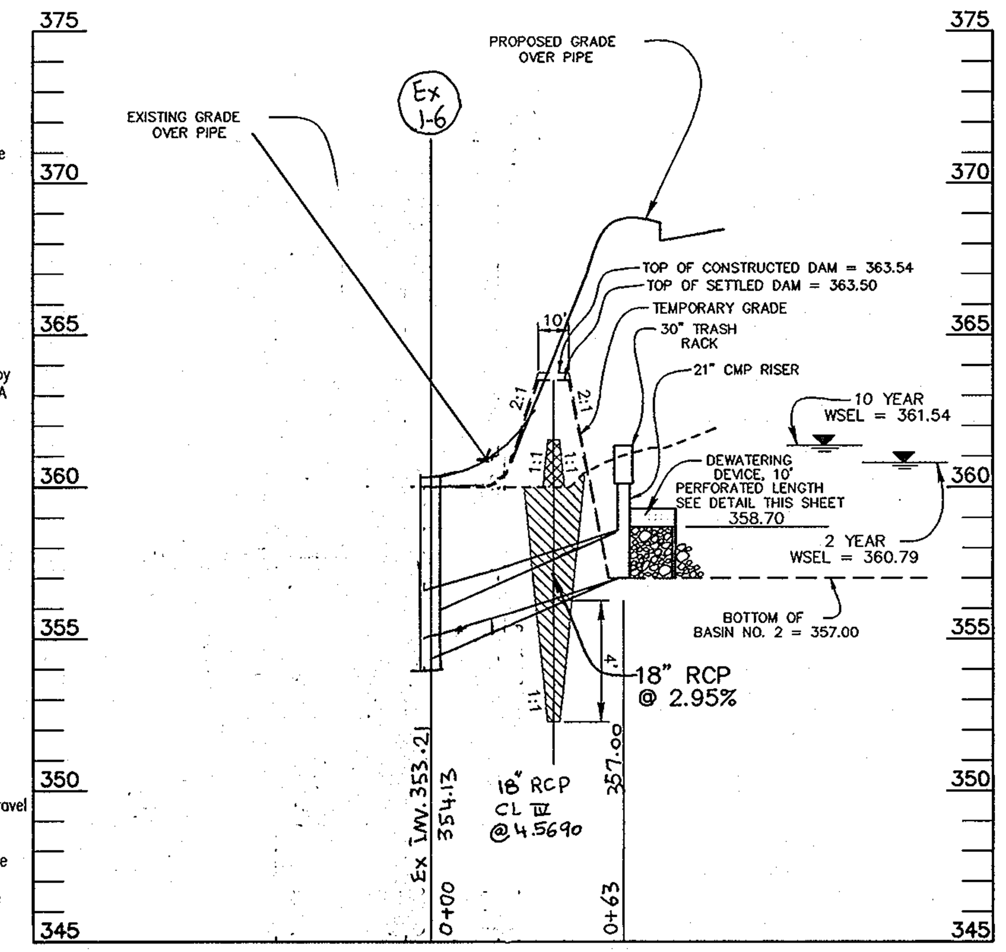
All borrow areas shall be graded to provide proper drainage and left I a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service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

Erosion and Sediment Control

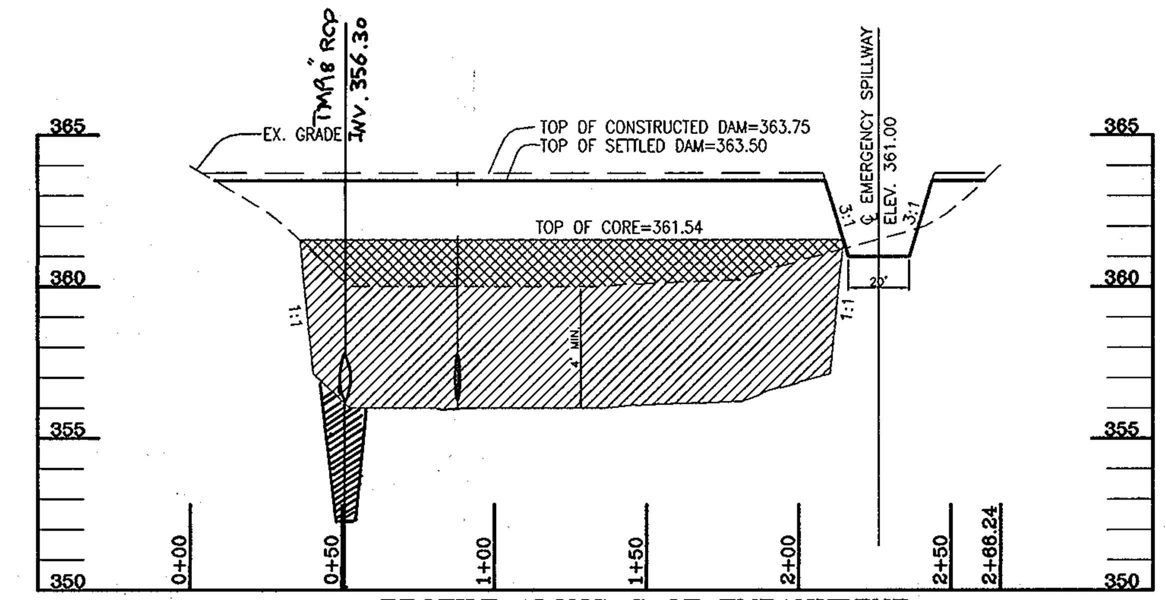
Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans



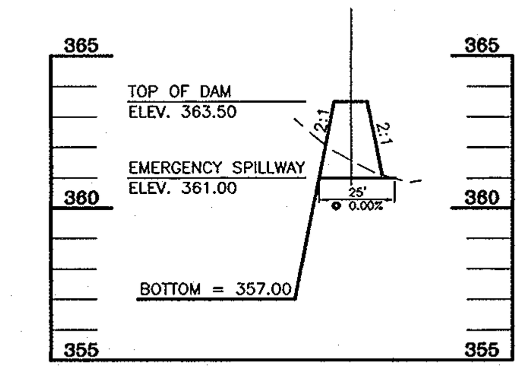
S.W.M. BORING PROFILES
NOT TO SCALE



PROFILE OF SEDIMENT BASIN NO.2 OUTFALL
SCALE: 1"=50' HORIZ. 1"=5' VERT.

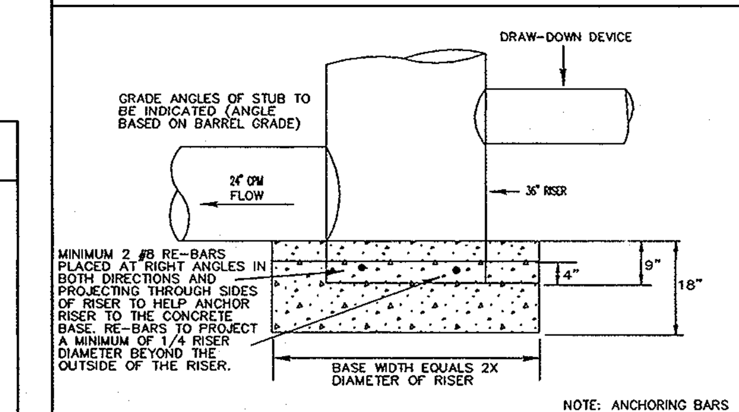


PROFILE ALONG ℄ OF EMBANKBENT
SEDIMENT BASIN NO. 2
SCALE: 1"=50' HORIZ. 1"=5' VERT.



EMERGENCY SPILLWAY PROFILE
SEDIMENT BASIN NO. 2
SCALE: 1"=50' HORIZ. 1"=5' VERT.

DETAIL 15 – RISER BASE DETAIL



Construction Specifications

The riser shall have a base attached with a watertight connection and shall have sufficient weight to prevent flotation of the riser. Two approved bases for risers 10" or less in height are:

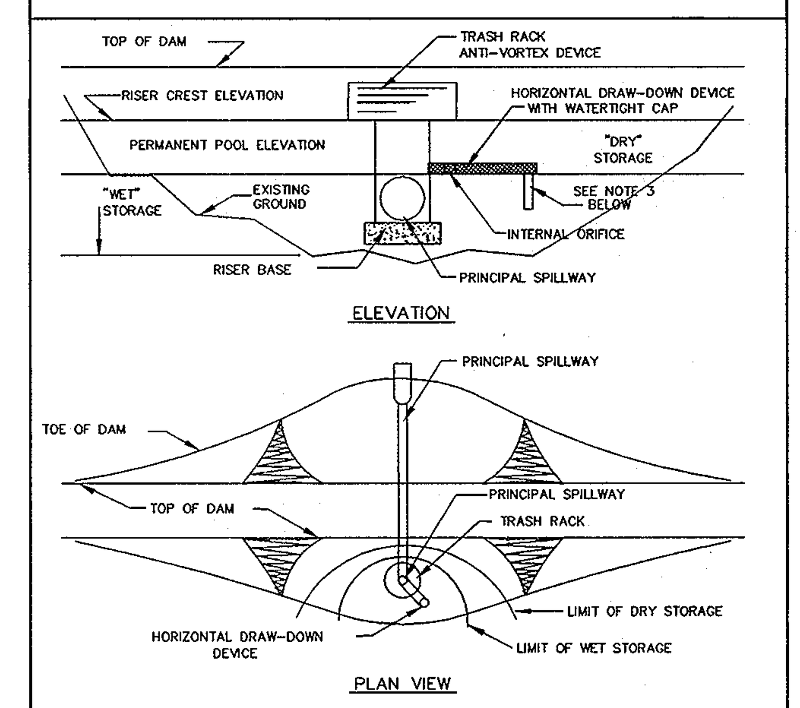
1. A concrete base 18" thick with the riser embedded 9" in the base.

2. A 1/4" minimum thickness steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2' of stone, gravel, or compacted earth placed on it to prevent flotation. In either case, each side of the square base shall be twice the riser diameter.

Note: For risers greater than ten feet high computations shall be made to design a base which will prevent floatation. The minimum factor of safety shall be 1.20 (downward forces = 1.20 x upward forces).

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 10 - 25	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

BASIN DRAWDOWN SCHEMATIC VERTICAL DRAWDOWN DEVICE



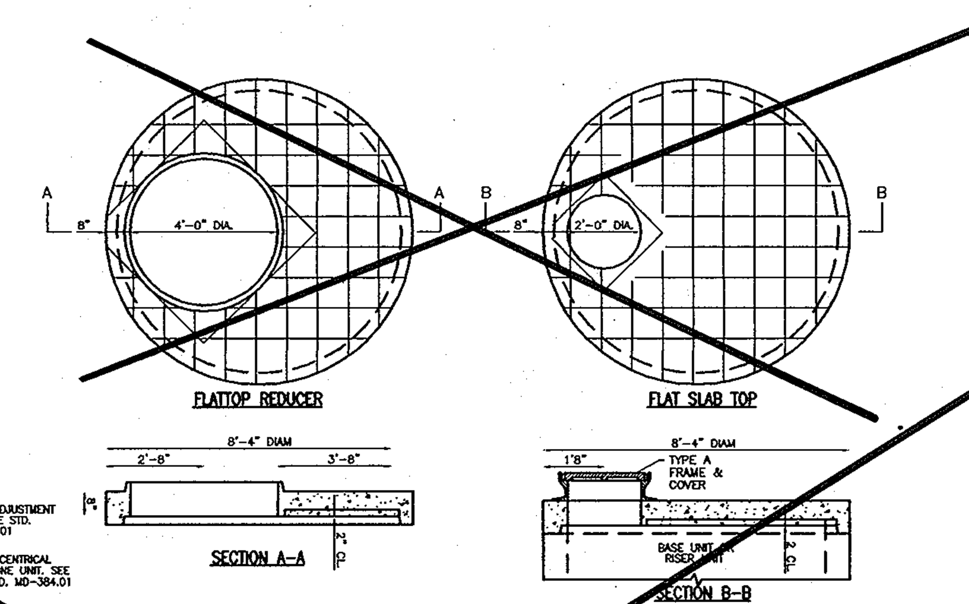
Construction Specification

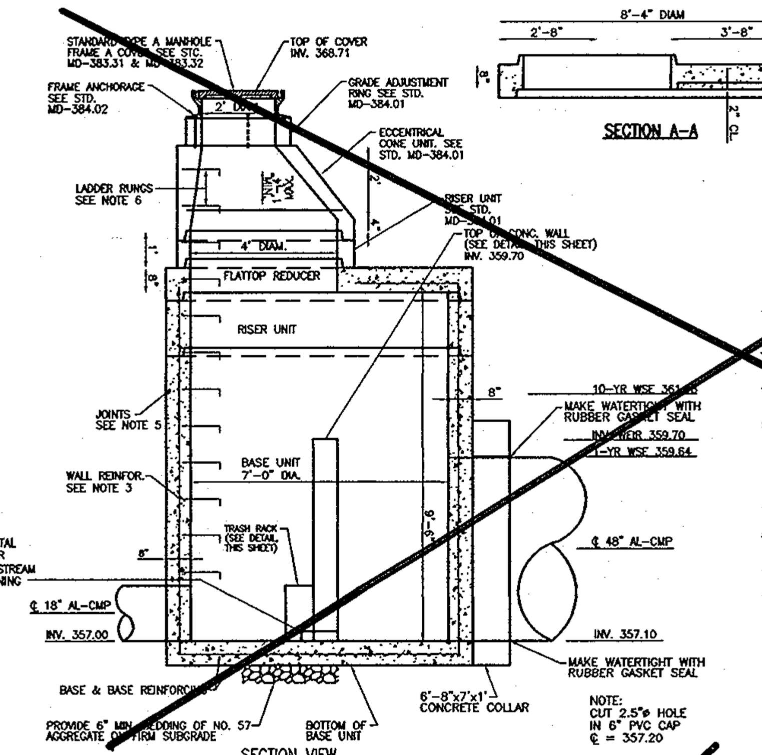
1. The total area of the perforations must be greater than 4 times the area of the internal orifice.

2. The perforated portion of the draw-down device shall be wrapped with 1/2" hardware clothe and geotextile fabric. The geotextile fabric shall meet the specifications for Geotextile Class E.

3. Provide support of draw-down device to prevent sagging and floatation. An acceptable preventative measure is to stake both sides of draw-down device with 1" steel angle, or 1' by 4" square or 2" round wooden posts set 3' min. into the ground then joining them to the device by wrapping with 12 gauge minimum wire.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C – 10 – 29	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

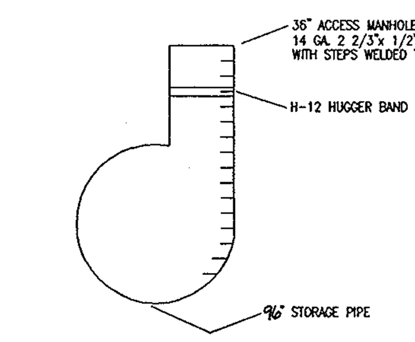




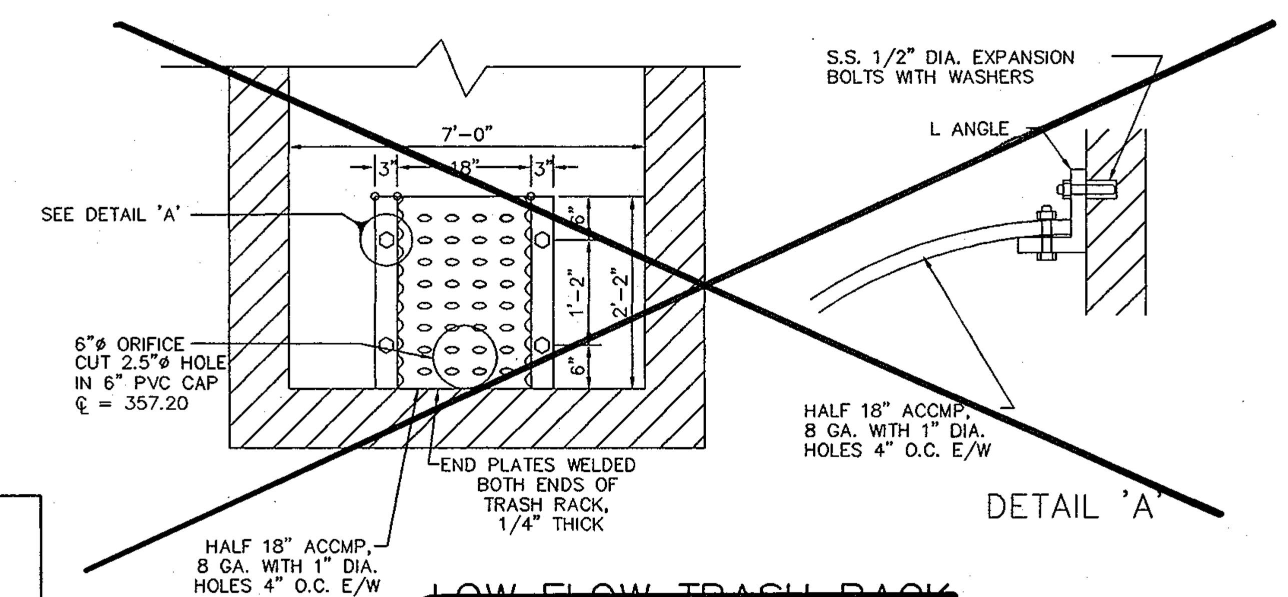
CONTROL STRUCTURE NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M 199.
2. CONCRETE SHALL BE MIX NO. 6 (4500 P.S.I.)
3. WALL REINFORCEMENT FOR BASE UNITS AND RISER UNITS SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABERIC WITH A MINIMUM AREA OF 0.2 in./ft FOR THE 84" DIAMETER MANHOLES. WELDED WIRE FABERIC SHALL CONFORM TO ASTM A 185 AND A 82.
4. BASE REINFORCEMENT TO BE REINFORCEMENT BARS OR WELDED WIRE FABERIC WITH A MINIMUM AREA OF 0.27 in./ft. THE BASE SHALL BE CAST MONOLITHIC WITH THE BASE UNIT OR JOINTED PER MANUFACTURERS DESIGN.
5. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERTIGHT USING (WHERE APPLICABLE) MORTAR, RUBBER O-RING GASKETS MEETING ASTM C361 AND C 443 OR FLEXIBLE PLASTIC GASKETS MEETING AASHTO M 198 TYPE B.
6. LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1'-4" MAXIMUM C/C. RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARDS MD-383.91 OR MD-383.92. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
7. WHEN THE DISTANCE BETWEEN MULTIPLE PIPE OPENINGS IN THE BASE UNIT OR ANY RISER UNIT IS LESS THEN 6" ADDITIONAL NO. 3 BARS ARE REQUIRED AROUND OPENINGS.
8. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
9. MIX NO. 2 CONCRETE OR BRICK CHANNEL SHALL BE PROVIDED IN THE FIELD AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.
10. THE DRIP STONE LANDING SHALL BE USED ONLY WHEN THERE ARE PIPES CONNECTED TO THE RISER UNITS. SEE STD.MD-384.13 FOR DETAILS.
11. MINIMUM DEPTH PAYMENT PER EACH SHALL BE 10'-1" MEASURED FROM THE BOTTOM OF THE BASE UNIT TO THE TOP OF THE MANHOLE COVER. VERTICAL DEPTH PAYMENT PER LINEAR FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 10'-1" THE COST OF THE DRIP STONE LANDING, NO. 57 AGGREGATE GROUT, SEALENT, AND ALL NESSASARY APPURTENANCES SHALL BE INCIDENTAL TO THE PRICE BID.

~~M-702~~
~~CAST-IN-PLACE~~
~~SWM CONTROL STRUCTURE~~
~~MD SHA STD. 384.07~~
NOT TO SCALE



ACCESS MANHOLE DETAIL FOR UNDERGROUND SWM FACILITY
(NOT TO SCALE)



~~LOW FLOW TRASH RACK~~
~~FOR STRUCTURE M-702~~
NOT TO SCALE

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
4	REMOVE DETAILS FOR LOW FLOW TRASH RACK AND MD SHA STD. 384.07	10.18.07
2	REVISE PROFILE BASIN NO.2 OUTFALL	8/1/06

SITE DEVELOPMENT PLAN
STORMWATER MANAGEMENT NOTES AND DETAILS
FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16 PARCEL A
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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

STATE OF MARYLAND ROBERT HARRIS VOGEL NO.16193 REGISTERED PROFESSIONAL ENGINEER 9/14/05
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04-67

10 SHEET OF 20

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 9/26/05
CHIEF, DIVISION OF LAND DEVELOPMENT DATE 1/10/06
DIRECTOR DATE 1/11/06

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR ~~SMALL POND CONSTRUCTION,~~ SOIL EROSION AND SEDIMENT CONTROL.
USDA–NATURAL RESOURCES CONSERVATION SERVICE DATE 9.22.05

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD S.C.D. DATE 9.22.05

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE IN ACCORDANCE 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."~~

SIGNATURE OF DEVELOPER DATE Sept 14-05

BY THE ENGINEER:

"I HEREBY 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."~~

SIGNATURE OF ENGINEER ROBERT H. VOGEL, P.E. DATE 9/14/05

SDP-05-11

K:\Projects\04-67\ENGR\dwg\SDP\CD10.dwg, 9/12/2005 10:57:36 AM

Appendix B.3. Construction Specifications for Sand Filters, Bioretention and Open Channels

Specifications for Bioretention

1. Material Specifications

The allowable materials to be used in bioretention area are detailed in Table B.3.2.

2. 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 bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05.

The planting soil shall be tested and shall meet the following criteria:

pH range 5.2 – 7.0
organic matter 1.5 –4 % (by weight)
magnesium 35 lb./ac
phosphorus (phosphate – P_2O_5) 75 lb./ac
potassium (potash – K_2O) 85 lb./ac
soluble salts not to exceed 500 ppm

All bioretention areas shall have a minimum of one test. Each test shall consist of both the standard soil test for pH, phosphorus, and potassium and additional test of organic matter, and soluble salts. A textural analysis shall be performed for each location where the top soil was excavated.

Since different lab calibrate their testing equipment differently, all testing results shall come from the same testing facility.

Should the pH fall out of the acceptable range, it may be modified (higher) with lime or (lower) with iron sulfate plus sulfur.

3. Compaction

It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, use hoes to remove original soil. If bioretention areas are excavated using loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tire. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretenion facility before backfilling the required sand layer. Pump any ponded water before preparing (rototilling) base.

When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

4. Plant Material

Refer to Plant List on sheet 23 of 26 for plant material in the bioretention areas.

5. Plant Installation

Mulch should be placed to a uniform thickness of 2" to 3". Shredded hardwood much is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Root stock of the plant material shall be kept moist during transport and on–site storage. The plant root ball should be planted so 1/8th of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process.

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 pinting specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds of nitrogen per 1000 square feet.

6. Underdrains

Underdrains are to be placed on a 3'–0" wide section filter cloth. Pipe is placed next, followed by the gravel bedding. The ends of underdrain pipes not terminating in an observation well shall be capped.

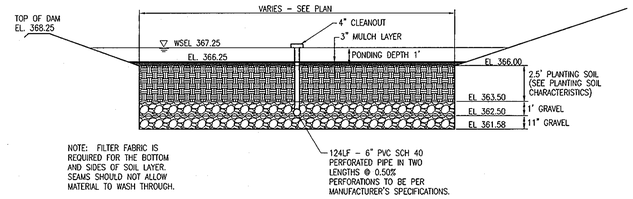
The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation well and/or clean–out pipes must be provided (one minimum per every 1000 square feet of surface area).

7. Miscellaneous

The bioretention facility may not be constructed until all contributing drainage area has been stabilized.

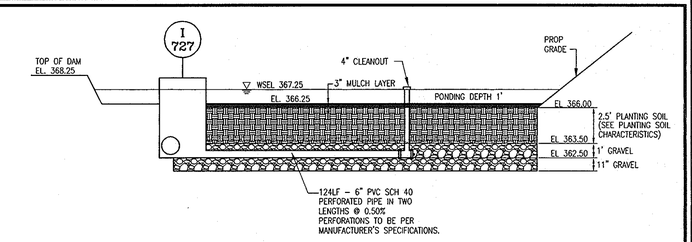
TABLE B.3.2 MATERIALS SPECIFICATIONS FOR BIORETENTION

MATERIAL	SPECIFICATION	SIZE	NOTES
PLANTINGS	SEE APPENDIX A, TABLE A.4	N/A	PLANTINGS ARE SITE–SPECIFIC
PLANTING SOIL [2.5' TO 4' DEEP]	SAND 35–60% SILT 30–55% CLAY 10–25%	N/A	USDA SOIL TYPES LOAMY SAND, SANDY LOAM OR LOAM
MULCH	SHREDDED HARDWOOD		AGED 6 MONTHS, MINIMUM
PEA GRAVEL DIAPHRAGM AND CURTAIN DRAIN	PEA GRAVEL: ASTM–D–448 ORNAMENTAL STONE: WASHED COBBLES	PEA GRAVEL: NO. 6 STONE: 2" TO 5"	
GEOTEXTILE	CLASS "C"– APPARENT OPENING SIZE (ASTM–D–4751), GRAB TENSILE STRENGTH (ASTM–D–4632), PUNCTURE RESISTANCE (ASTM–D–4833)	N/A	FOR USE AS NECESSARY BENEATH UNDERDRAINS ONLY
UNDERDRAIN GRAVEL	AASHTO M–43	0.375" TO 0.75"	
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR AASHTO M–278	4" TO 6" RIGID SCHEDULE 40 PVC OR SDR35	3/8" PERF. @ 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES: NOT NECESSARY UNDERNEATH PIPES
POURED IN PLACE CONCRETE (IF REQUIRED)	MSHA MIX NO. 3; f'c=3500 PSI@ 28 DAYS, NORMAL WEIGHT, AIR–ENTRAINED; REINFORCING TO MEET ASTM–615–60	N/A	ON–SITE TESTING OF POURED–IN–PLACE CONCRETE REQUIRED: 28 DAY STRENGTH AND SLUMP TEST; ALL CONCRETE DESIGN (CAST–IN–PLACE OR PRE–CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND – DESIGN TO INCLUDE MEETING ACI CODE 350.R/89; VERTICAL LOADING [H–10 OR H–20]; ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING
SAND [1' DEEP]	AASHTO–M–6 OR ASTM–C–33	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.



SECTION B–B – BIORETENTION AREA #1

SCALE: 1"=5'



SECTION A–A – BIORETENTION AREA #1

SCALE: 1"=5'

BIORETENTION PLANTING SCHEDULE

KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
×	4	CLADRASTIS LUTEA 'SWEETSHADE' SWEETSHADE YELLOWWOOD	1 1/2"–2" CAL	B & B
	16	ILEX GLABRA COMPACTA DWARF INKBERRY	3 GALLON	CONT
	14	RHODODENDRON HY. 'GLACIER' OR 'WHITE ROSEBUD' GLACIER OR WHITE ROSEBUD HYBRID AZALEA	3 GALLON	CONT
	669	LIRIOPE MUSCARI 'MAJESTIC' MAJESTIC LILY TURF	2" POT	1' O.C.

BIORETENTION PLANTING REQUIREMENTS

AREA	STEMS REQUIRED	STEMS PROVIDED
1007 SF	23	33

BIORETENTION AREAS ARE LANDSCAPED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (.0229 STEMS PER SQUARE FOOT).

SWM SYSTEM SPECIFICATIONS

PIPE MATERIALS
ALL PIPE SHALL BE OF SIZE AND GAUGE SHOWN ON PLANS. PIPE SHALL BE 2–2/3"x1/2" CORRUGATIONS, LOCK SEAM, ALUMINIZED TYPE 2 COATED PER AASHTO M–274–87. PIPE SHALL HAVE A MINIMUM OF 2 RE–ROLLED CORRUGATIONS EACH END AND SHALL BE JOINED WITH A 13" HUGGER TYPE BAND, O–RING GASKETS AND TC40 JOINT SEALANT.

FITTINGS
SHALL BE SHOP FABRICATED AND ALL CUTS TO BE FULLY WELDED FOR THE FULL PERIPHERY. PIPE MANUFACTURERS SHALL DETERMINE TYPE OF FITTING ARRANGEMENT BASED ON BEST LAYOUT, PRACTICAL SHIPPING LOADS, ETC.

SHOP DRAWINGS AND JOINT INSTALLATION GUIDE
SHALL BE SUBMITTED TO THE ENGINEER BY THE PIPE SUPPLIER FOR REVIEW AND APPROVAL.

GUAGE
ALL STORMWATER MANAGEMENT PIPE TO BE GAUGE 12.

BACKFILL AND BEDDING
OF STORMWATER RETENTION SYSTEM SHALL CONFORM TO THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION INSTALLATION MANUAL AND MANUFACTURERS SPECIFICATIONS. CARE SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT PIPE FROM OFF HIGHWAY EQUIPMENT LOADS UNTIL FINAL COVER AND PAVING IS IN PLACE.

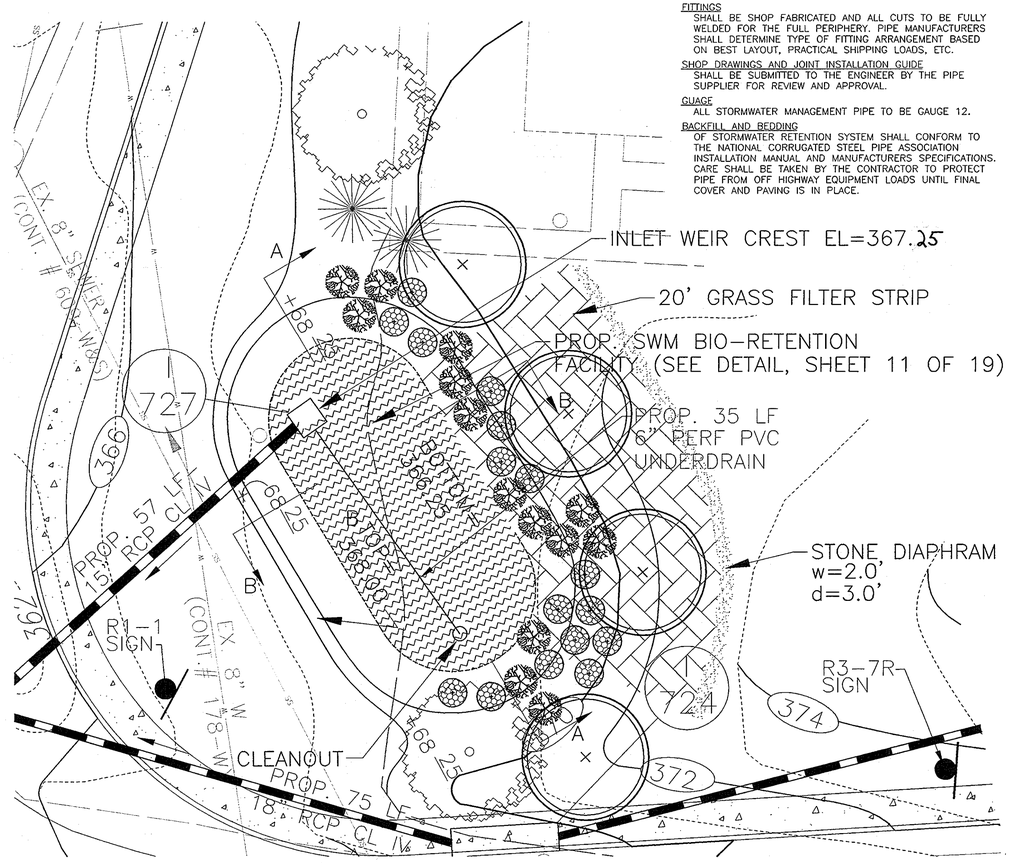
OPERATION AND MAINTENANCE SCHEDULE FOR BIORETENTION AREAS

1. 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.

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 deficient stakes and wires.

3. mulch shall be inspected each spring. remove previous mulch Layer before applying new layer once every 2 to 3 years.

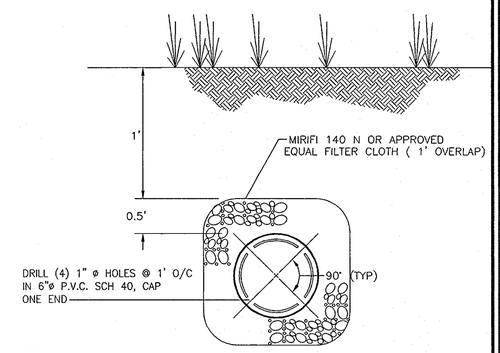
4. soil erosion to be addressed on an as needed basis, with a Minimum of once per month and after heavy storm events.



BIORETENTION AREA #1

PLANTING DETAIL

SCALE: 1"=10'



UNDERDRAIN DETAIL

6" P.V.C. SCH–40

NOT TO SCALE

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410–792–7096

NO.	REVISION	DATE
1	REVISE INLET WEIR CREST ELEV. & STEM COUNT	6/30/06

SITE DEVELOPMENT PLAN
SWM AND BIORETENTION NOTES & DETAILS
FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT
PARCEL A
HOWARD COUNTY, MARYLAND

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

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER 9/14/05
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04–67

SHEET 11 OF 20

NOTE: ALL SWM FACILITES SHOWN ON THIS PLAN TO BE PRIVATELY OWNED AND MAINTAINED BY THE FIRST BAPTIST CHURCH OF GUILFORD

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/20/05
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/10/06
DIRECTOR — DATE 1/11/06

REVIEWED FOR HOWARD S.C.D. & MEETS TECHNICAL REQUIREMENTS.

USDA–NATURAL RESOURCES CONSERVATION SERVICE — DATE 9.27.05

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

HOWARD S.C.D. — DATE 9.27.05

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE 9/14/05

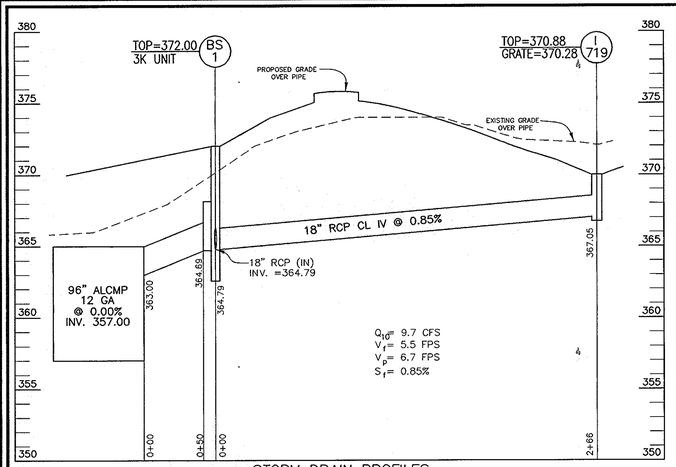
BY THE ENGINEER:

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

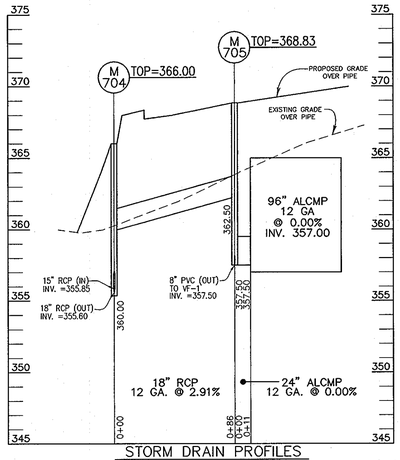
SIGNATURE OF ENGINEER ROBERT H. VOGEL, P.E. — DATE 9/14/05

K:\Projects\04-67\ENGR\dwg\SDP\CD1-.dwg, 9/12/2005 10:58:10 AM

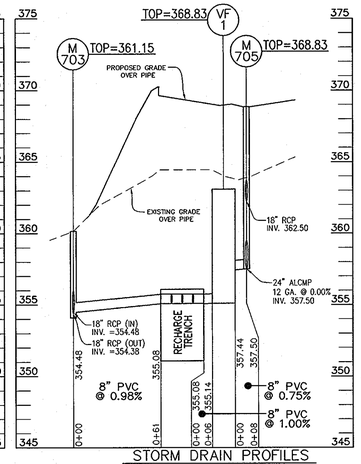
SDP–05–11



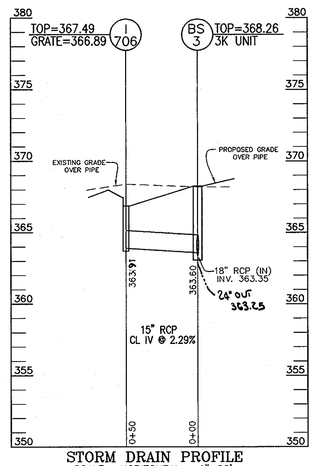
STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



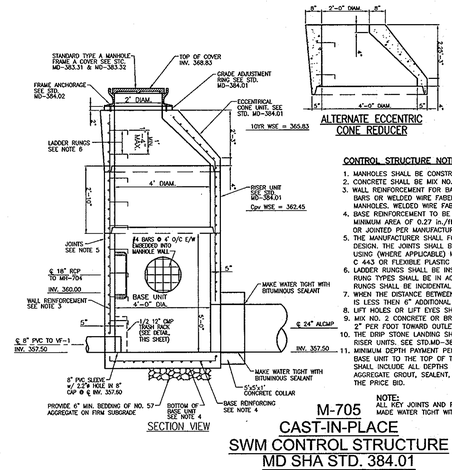
STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



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

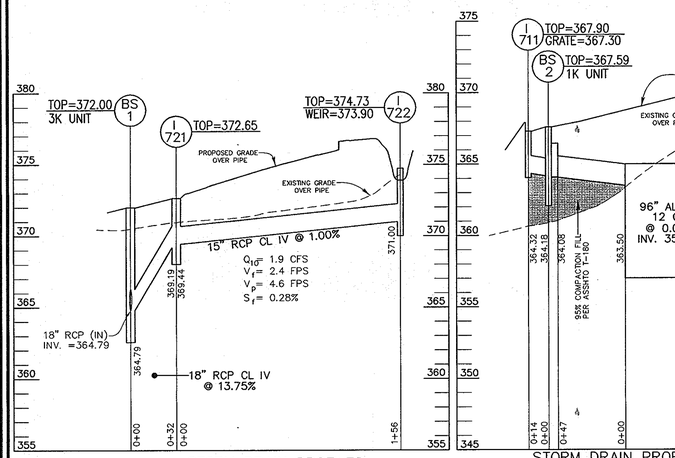


CONTROL STRUCTURE NOTES:

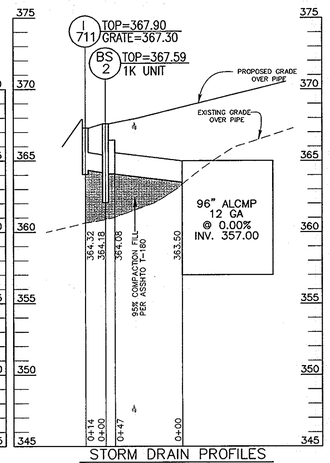
1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M 199.
2. CONCRETE SHALL BE MIX NO. 6 (4500 P.S.I.)
3. WALL REINFORCEMENT FOR BASE UNITS AND RISER UNITS SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABERIC WITH A MINIMUM AREA OF 0.2 in./ft FOR THE 84" DIAMETER MANHOLES. WELDED WIRE FABERIC SHALL CONFORM TO ASTM A 185 AND A 82.
4. BASE REINFORCEMENT TO BE REINFORCEMENT BARS OR WELDED WIRE FABERIC WITH A MINIMUM AREA OF 0.27 in./ft. THE BASE SHALL BE CAST MONOLITHIC WITH THE BASE UNIT OR JOINTED PER MANUFACTURERS DESIGN.
5. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERTIGHT USING (WHERE APPLICABLE) MORTAR. RUBBER O-RING GASKETS MEETING ASTM C361 AND C 443 OR FLEXIBLE PLASTIC GASKETS MEETING AASHTO M 198 TYPE B.
6. LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1'-4" MAXIMUM C/C. RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARDS MD-383.91 OR MD-383.92. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
7. WHEN THE DISTANCE BETWEEN MULTIPLE PIPE OPENINGS IN THE BASE UNIT OR ANY RISER UNIT IS LESS THEN 6" ADDITIONAL NO. 3 BARS ARE REQUIRED AROUND OPENINGS.
8. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
9. MIX NO. 2 CONCRETE OR BRICK CHANNELS SHALL BE PROVIDED IN THE FIELD AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.
10. THE DRIP STONE LANDING SHALL BE USED ONLY WHEN THERE ARE PIPES CONNECTED TO THE RISER UNITS. SEE STD.MD-384.13 FOR DETAILS.
11. MINIMUM DEPTH PAYMENT PER EACH SHALL BE 10'-1" MEASURED FROM THE BOTTOM OF THE BASE UNIT TO THE TOP OF THE MANHOLE COVER. VERTICAL DEPTH PAYMENT PER LINEAR FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 10'-1" THE COST OF THE DRIP STONE LANDING, NO. 57 AGGREGATE GROUT, SEALENT, AND ALL NESSAGARY APPURTENANCES SHALL BE INCIDENTAL TO THE PRICE BID.

NOTE:
ALL KEY JOINTS AND PIPE CONNECTIONS TO BE MADE WATER TIGHT WITH BITUMINOUS SEALANT.

M-705
CAST-IN-PLACE
SWM CONTROL STRUCTURE
MD SHA STD. 384.01
SCALE: 1"=3'



STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'



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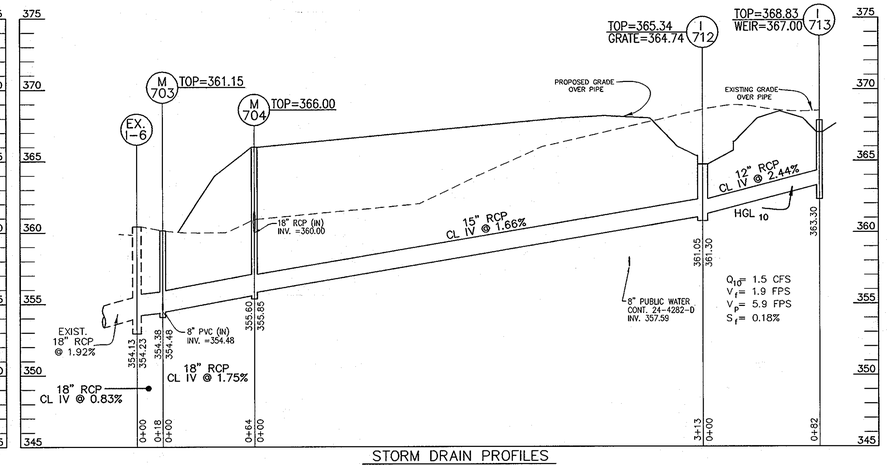


STORM DRAIN PROFILES
SCALE : HORIZONTAL – 1"=50'
VERTICAL – 1"=5'

PIPE STORAGE SWM SYSTEM SPECIFICATIONS

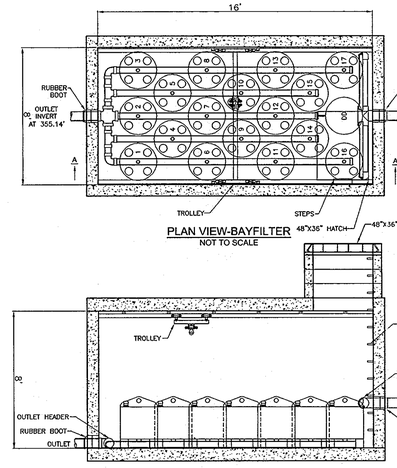
PIPE MATERIALS
ALL PIPE SHALL BE OF SIZE AND GAUGE SHOWN ON PLANS. PIPE SHALL BE 2-2/3"x1/2" CORRUGATIONS, LOCK SEAM, ALUMINIZED TYPE 2 COATED PER AASHTO M-274-87. PIPE SHALL HAVE A MINIMUM OF 2 RE-ROLLED CORRUGATIONS EACH END AND SHALL BE JOINED WITH A 13" HUGGER TYPE BAND, O-RING GASKETS AND TC40 JOINT SEALANT.

FITTINGS
SHALL BE SHOP FABRICATED AND ALL CUTS TO BE FULLY WELDED FOR THE FULL PERIPHERY. PIPE MANUFACTURERS SHALL DETERMINE TYPE OF FITTING ARRANGEMENT BASED ON BEST LAYOUT, PRACTICAL SHIPPING LOADS, ETC.

SHOP DRAWINGS AND JOINT INSTALLATION GUIDE
SHALL BE SUBMITTED TO THE ENGINEER BY THE PIPE SUPPLIER FOR REVIEW AND APPROVAL.

GUAGE
ALL STORMWATER MANAGEMENT PIPE TO BE GAUGE 12.

BACKFILL AND BEDDING
OF STORMWATER RETENTION SYSTEM SHALL CONFORM TO THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION INSTALLATION MANUAL AND MANUFACTURERS SPECIFICATIONS. CARE SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT PIPE FROM OFF HIGHWAY EQUIPMENT LOADS UNTIL FINAL COVER AND PAVING IS IN PLACE.



Maintenance of the BayFilter™ System

The BayFilter™ system requires periodic maintenance to continue operating at the design efficiency. The maintenance process comprises the removal and replacement of each BayFilter™ cartridge and the cleaning of the vault or manhole with a vacuum truck. BayFilter™ maintenance should be performed by a BaySaver Technologies, Inc. certified maintenance contractor.

The maintenance cycle of the BayFilter™ system will be driven mostly by the actual solids load on the filter. The system should be periodically monitored to be certain it is operating correctly. Since stormwater solids loads can be variable, it is possible that the maintenance cycle could be more or less than the projected duration.

When a BayFilter™ system is first installed, it is recommended that it be inspected every six (6) months. When the filter system exhibits flows below design levels the system should be maintained. Filter cartridge replacement should also be considered when sediment levels are at or above the level of the 4 collector pipes to the manifold. Please contact the BaySaver Technologies Inc. Engineering Department for maintenance cycle estimations or assistance at 1.800.229.7283.

Maintenance Procedures

1. Remove the manhole covers and open all access hatches.
2. Before entering the system make sure the air is safe per OSHA Standards or use a breathing apparatus. Use low O_2, high CO, or other applicable warning devices per regulatory requirements.
3. Using a vacuum truck remove any liquid and sediments that can be removed prior to entry.
4. Using a small lift or the boom of the vacuum truck, remove the used cartridges by lifting them out.
5. Any cartridges that cannot be readily lifted can be slid along the floor to a location where they can be lifted via a boom lift.
6. When all cartridges are removed, remove the balance of the solids and water; then loosen the stainless clamps on the Fumco couplings for the manifold and remove the drain pipes as well. Carefully cap the manifold and the Fumco's and rinse the floor removing the balance of the collected solids.
7. Clean the manifold pipes, inspect, and reinstall.
8. Install the exchange cartridges and close all covers.
9. The used cartridges must be sent back to BaySaver Technologies, Inc. for exchange/recycling and credit on undamaged units.

Installation of Precast Vault BayFilter™

1. Contact utility locator to mark any nearby underground utilities and make sure it is safe to excavate.
2. Reference the site plan and stake out the location of the BayFilter™ vault.
3. Excavate the hole, providing any shoring and shoring necessary to comply with all federal, state and local safety regulations.
4. Level the subgrade to the proper elevation. Verify the elevation against the manhole dimensions, the invert elevations, and the site plans. Adjust the base aggregate, if necessary.
5. Have the soil bearing capacity verified by a licensed engineer for the required load bearing capacity. On solid subgrade, set the first section of the BayFilter™ precast vault.
6. Check the level and elevation of the first section to ensure it is correct before adding any more sections.
7. If additional section(s) are required, add a watertight seal to the first section of the BayFilter™ vault. Set additional section(s) of the vault, adding a watertight seal to each joint.
8. Install the PVC outlet manifold and outlet chamber system.
9. Install the PVC outlet pipe in BayFilter™ vault.
10. Install the inlet pipe to the BayFilter™ vault.
11. Install the energy dissipator/level spreader at the inlet pipe.
12. After the site is stabilized, remove any accumulated sediment or debris from the vault and install the BayFilter™ cartridges.

BayFilter™ Detailed Operating Sequence

The cycle operation of a BayFilter™ is as follows:

A. Vault Fill and Air Release: As water fills the BayFilter™ stormwater filtration system vault, it enters through an inlet pipe to an energy dissipator/level spreader. This allows for even flow into the vault and limits any high velocity scouring of the sediment. As the water fills the vault, influent water passes through the inlet plate.

As the level rises in the vault, air from inside the BFC is exhausted via an air release valve. This operation is critical for the proper functioning of the siphon, which drives the BayFilter™ during periods of low water level in the vault. (Refer to Figure A-1 for details on this operation).

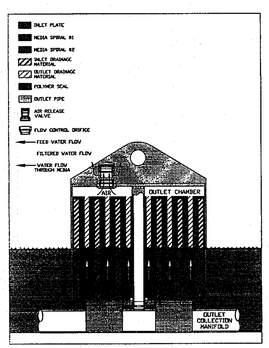


Figure A-1: Vault fill operation and release

B. Filtration: As water enters the inlet drainage spiral, which is one continuous spiral, the air is exhausted. Water then flows horizontally through the engineered media. Next it flows to the outlet drainage spiral, which is also one single spiral of outlet material. The filtered water then flows vertically to the outlet chamber located on the inside top of the filter. Finally, the filtered water flows to the center outlet drain and out through the outlet manifold below the inlet plate. (Figure A-2)

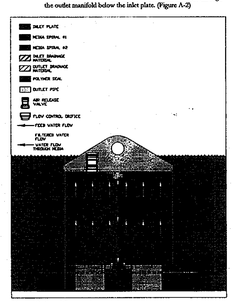


Figure A-2: Normal filter operation

C. Siphon Filtration: After the water level in the vault falls below the top of the filter, a siphon is established and water will continue to flow (Figure A-3) until the siphon is broken. During siphon flow the level in the vault will decrease until it reaches the base of the BFC, air enters the filter, breaks the siphon, filtration flow stops, and the hydrodynamic backwash begins.

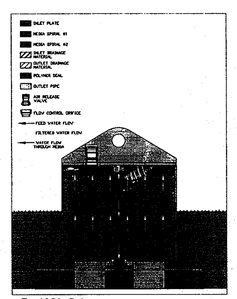


Figure A-3: Siphon filtration

D. When air enters the filter, the siphon breaks (Figure A-4), and a gravity-driven backwash occurs with all of the water flowing from the outlet chamber backwards through the filter (Figure A-5). This backwash has the effect of dislodging particles captured in the filtration layers and re-establishing porosity. Dislodged particles are transported by the backwash and accumulate on the vault floor.

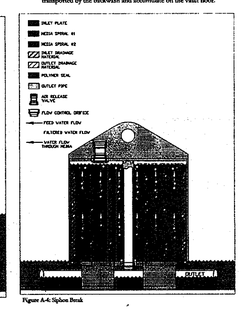


Figure A-4: Siphon Break

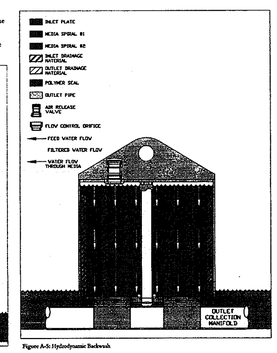


Figure A-5: Hydrodynamic Backwash

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
4	REVISE STORMWATER MANAGEMENT FACILITY AND ASSOCIATED STORM DRAIN-REPLACEMENT SHEET	10-18-07

SITE DEVELOPMENT PLAN
REVISED
SWM PROFILE AND DETAILS
FIRST BAPTIST CHURCH OF GUILFORD
PARCEL A

TAX MAP 42 BLOCK 16 — 6TH ELECTION DISTRICT
PARCEL 227 & 9 — HOWARD COUNTY, MARYLAND

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

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

DESIGN BY:	RHV
DRAWN BY:	MAN/DZ
CHECKED BY:	RHV
DATE:	SEPTEMBER 2005
SCALE:	AS SHOWN
W.O. NO.:	04-67

REPLACEMENT SHEET
SHEET 12 OF 20

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 10/30/07
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 11/1/07
DIRECTOR	DATE 11/2/07

REVIEWED FOR HOWARD S.C.D. & MEETS TECHNICAL REQUIREMENTS.

USDA-NATURAL RESOURCES CONSERVATION SERVICE

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

HOWARD S.C.D. — DATE

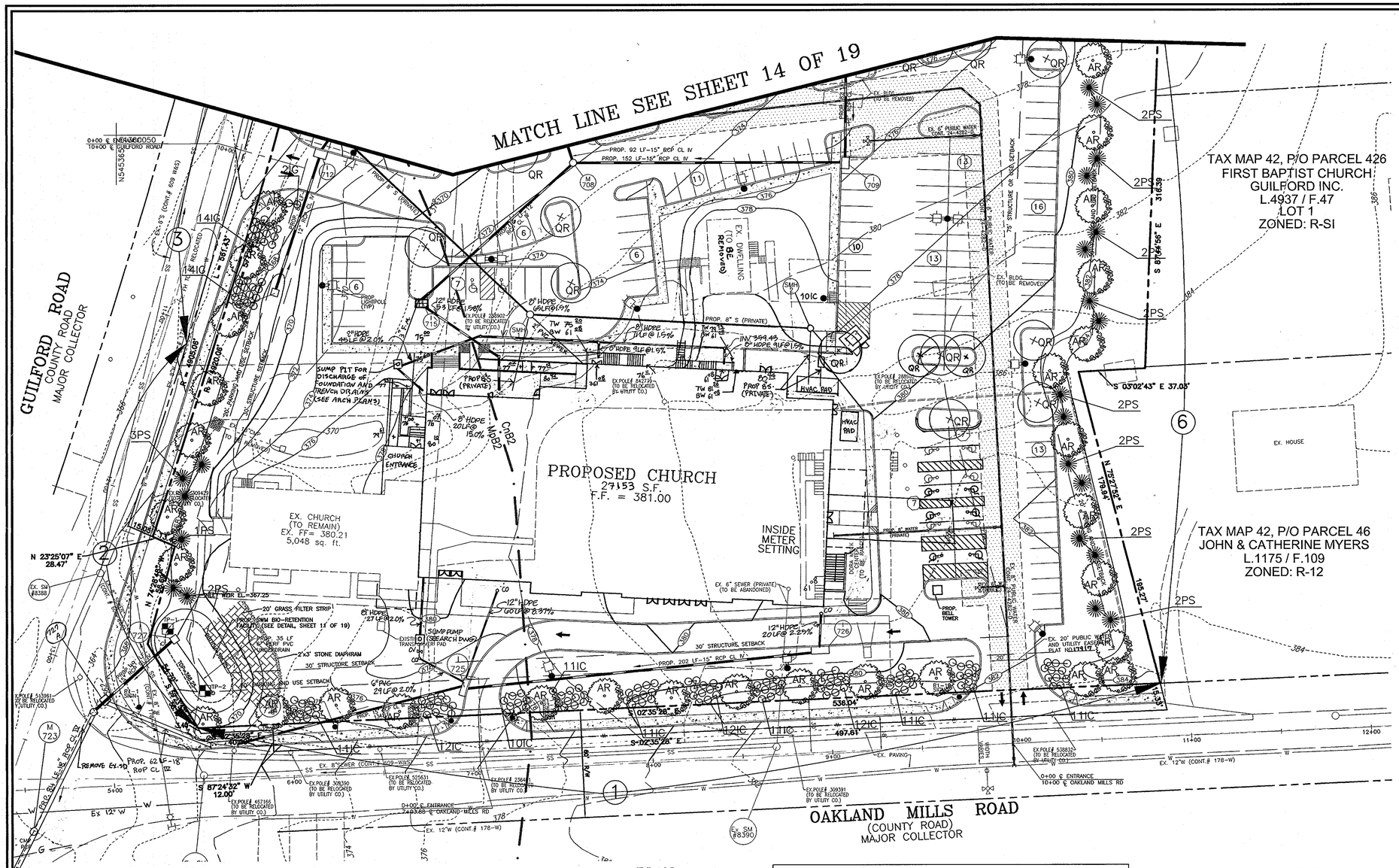
BY THE DEVELOPER:
"I/WE CERTIFY THAT ALL DEVELOPEMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING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

SIGNATURE OF DEVELOPER — DATE 10-12-07

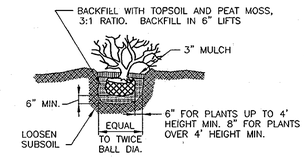
BY THE ENGINEER:
"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF ENGINEER ROBERT H. VOGEL, P.E. — DATE 10/17/07

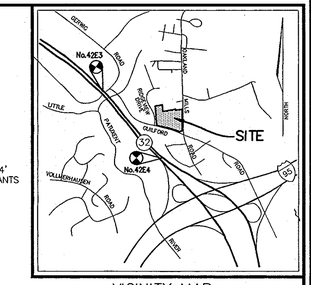
SDP-05-11



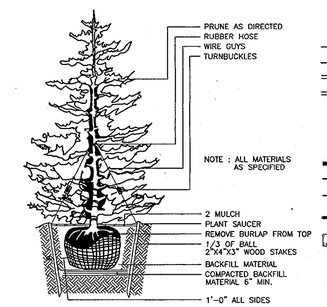
PLAN
SCALE: 1"=30'



SHRUB PLANTING DETAIL
NOT TO SCALE



VICINITY MAP
SCALE: 1"=2000'



TYPICAL EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING UTILITY POLE
- EXISTING MAILBOX
- EXISTING SIGN
- PROPOSED STORM DRAIN
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- MIC2 BrB2 — SOILS BOUNDARY
- PROPOSED SIDEWALK
- PROPOSED LIGHT POLE
- PROPOSED SHADE TREE
- PROPOSED EVERGREEN TREE
- PERIMETER LANDSCAPING
- PROPOSED SHRUBS

GENERAL NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. THE REQUIRED PARKING AND PERIMETER LANDSCAPING WILL BE BONDED PER THIS SUBMISSION.
2. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DEVELOPER'S AGREEMENT IN THE AMOUNT OF $49,830.00 FOR THE REQUIRED 81 SHADE TREES, 40 EVERGREEN TREES, AND 331 SHRUBS.

LANDSCAPE SCHEDULE NOTES:

1. ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH LCAMW PLANTING SPECIFICATIONS.
2. MAINTENANCE TO INCLUDE MONITORING AND HAND WATERING AS NEEDED FOR THE FIRST TWO GROWING SEASONS TO ESTABLISH WOODY PLANTS. SPECIALIZED PLANTING AREAS INCLUDING FOUNDATION PLANTING OR ANNUAL BEDS MAY REQUIRE REGULAR HAND WATERING OR IRRIGATION.
3. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNGERGROUND UTILITIES PRIOR TO DIGGING.
4. CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.
5. FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.

NO.	REVISION	DATE
G	REVISE ROOF LEADERS, ADD SUMP PUMP AND UPDATE ASSOCIATED STORM DRAIN PROFILES	8/24/2006
3	ADD NEW CHURCH ENTRANCE REVISE REAR STAIR ADD STAIRS CANOPY, ADD ROOF LEADER TRUNK LINES & SUMP PIT	10/6/06
2	REVISE SD FROM I724 & I727 TO EX. SD	8/1/06
1	ADD LOWER LEVEL EXIT; HVAC PADS; CANOPY. REVISE LOCATION OF SEWER, HC SPACE & DUMPSTER. REVISE PLANTINGS @ DUMPSTER & SCHEDULE.	6/30/06

NOTE: ALL SWM FACILITES SHOWN ON THIS PLAN TO BE PRIVATELY OWNED AND MAINTAINED BY THE FIRST BAPTIST CHURCH OF GUILFORD

DEVELOPER'S/BUILDER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE: September 17-06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

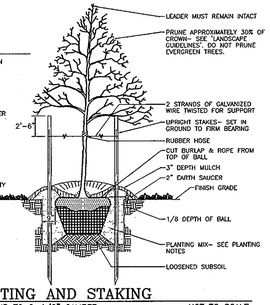
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 9/20/06

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 10/10/06

DIRECTOR — DATE: 11/1/06

NOTES

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



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

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	SOIL GROUP
CnB2	CHILLUM-FAIRFAX LOAMS, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	B
CnD3	CHILLUM-FAIRFAX LOAMS, 5 TO 15 PERCENT SLOPES, SEVERELY ERODED	B
EnB2	ELSINBORO LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	B
MpB2	MONTALTO SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C
MpC2	MONTALTO SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C

NOTE: BASED ON HOWARD SOIL SURVEY, MAP NUMBER 30

SCHEDULE B
PARKING LOT INTERNAL LANDSCAPING

Number of parking spaces	517
Number of trees and islands required	26
Number of trees and islands provided	
Shade Trees	26
Other Trees (2:1 Substitution)	–

SCHEDULE A
PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAYS				ADJACENT TO PERIMETER PROPERTIES	
Perimeter/Frontage Designation Landscape Type	1 E	2 B	3 E	4 E	5 C	6 C
Linear Feet of Roadway Frontage/Perimeter	491	233	464	596	237	749
Credit for Existing Vegetation (Yes, No, Linear Feet Describe below if needed)	No	No	No	No	No	No
Credit for Wall, Fence or Berm (Yes, No, Linear Feet Describe below if needed)	No	No	No	Yes *230	Yes *237	Yes *63
Number of Plants Required						
Shade Trees	1:40 12	1:50 5	1:40 12	1:40 9	1:40 0	1:40 17
Evergreen Trees	–	1:40 6	–	–	1:20 0	1:20 34
Shrubs	1:4 123	–	1:4 116	1:4 92	–	–
Number of Plants Provided						
Shade Trees	12	5	12	9	–	17
Evergreen Trees	–	6	–	–	–	34
Other Trees (2:1 Substitution)	123	–	116	92	–	–
Shrubs (10:1 Substitution)						

*EXISTING WOODS TO REMAIN

LANDSCAPE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	REM.
AR	55	Acer Rubrum 'October Glory' October Glory Red Maple	2 1/2" -3"Cal.	B & B
PS	40	Pinus strobus Eastern White Pine	6' - 8' Ht.	B & B
QR	27	Quercus rubra Red Oak	2 1/2" -3"Cal.	B & B
IC	341	Ilex glabra 'Compacta'/Compact Inkberry	2 1/2' -3'Ht	B & B

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046

SITE DEVELOPMENT PLAN

LANDSCAPE PLAN

FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
HOWARD COUNTY, MARYLAND

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

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04-67

SHEET 13 OF 20

SDP-05-11

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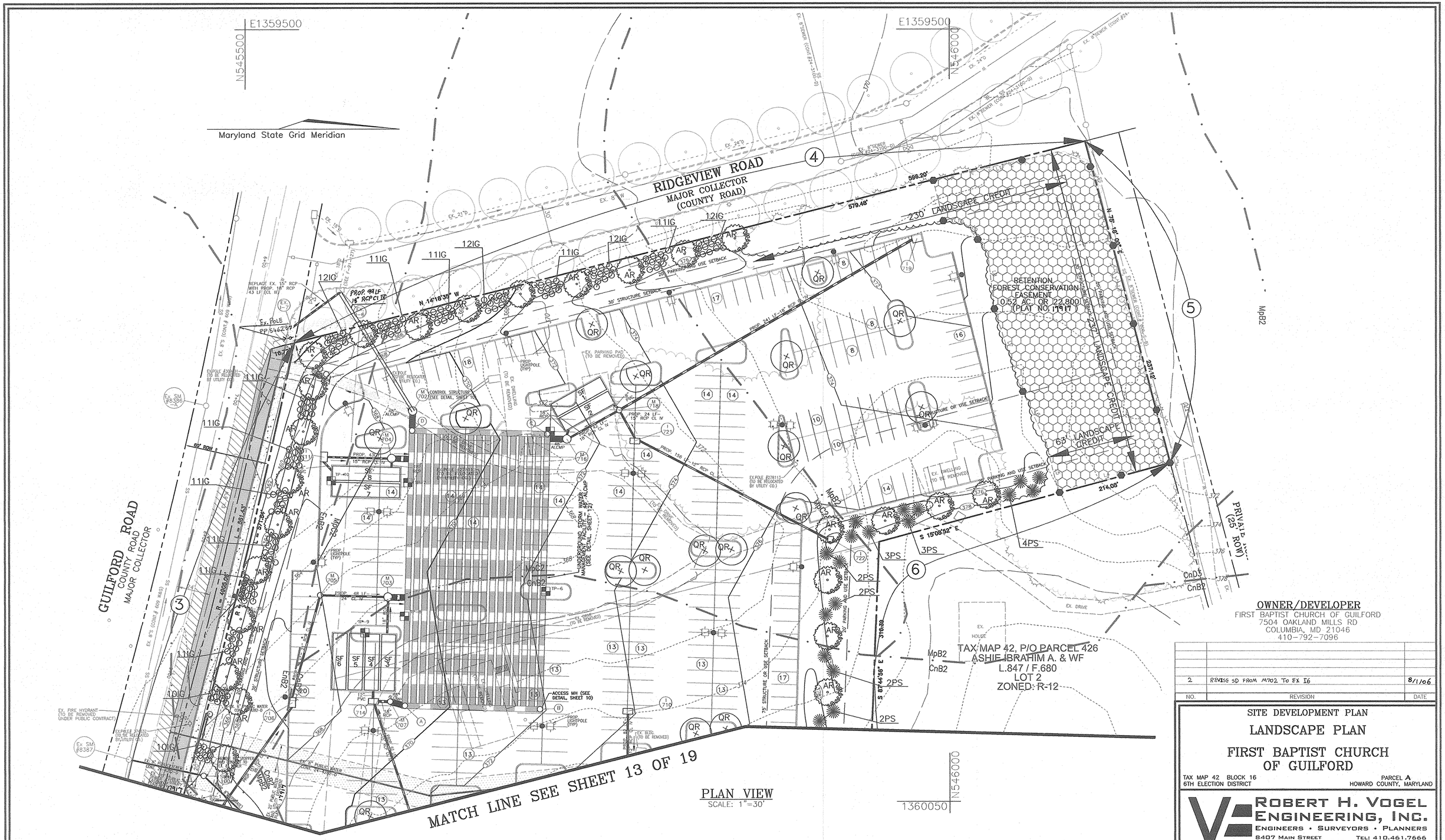

PLAN VIEW
SCALE: 1"=30'

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
2	REVISE SD FROM M702 TO EX I6	8/1/06

SITE DEVELOPMENT PLAN

LANDSCAPE PLAN

FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
HOWARD COUNTY, MARYLAND

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DESIGN BY: RHV
DRAWN BY: MAN/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04-67

SHEET 14 OF 20

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/26/05

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/10/06

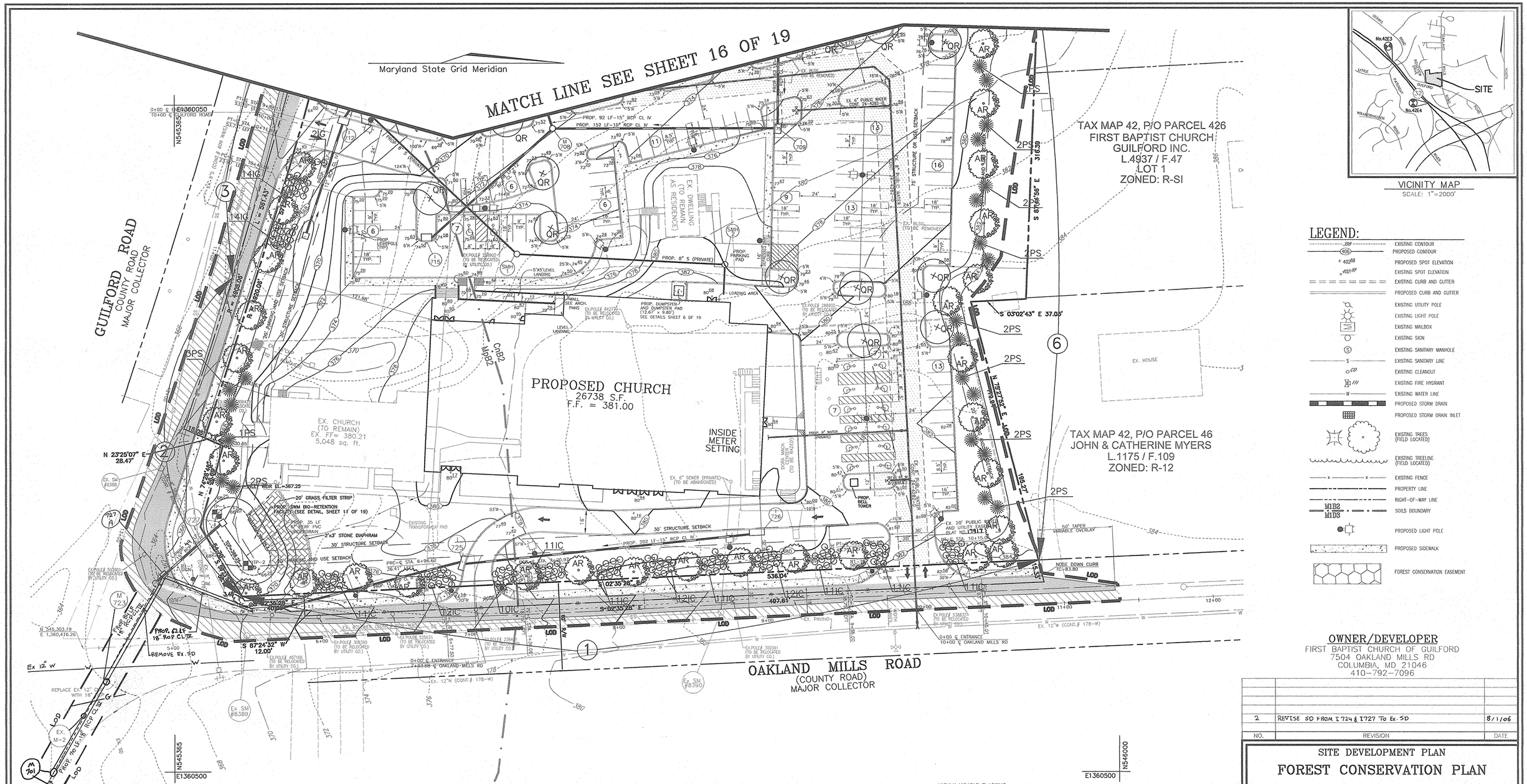
DIRECTOR — DATE 11/10/06

DEVELOPER'S/BUILDER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE Sept 14-05

SDP-05-11



VICINITY MAP
SCALE: 1"=2000'

LEGEND:

388	EXISTING CONTOUR
406	PROPOSED CONTOUR
+ 402.68	PROPOSED SPOT ELEVATION
× 402.68	EXISTING SPOT ELEVATION
	EXISTING CURB AND GUTTER
	PROPOSED CURB AND GUTTER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING MAILBOX
	EXISTING SIGN
S	EXISTING SANITARY MANHOLE
S	EXISTING SANITARY LINE
CO	EXISTING CLEANOUT
	EXISTING FIRE HYDRANT
W	EXISTING WATER LINE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING TREES (FIELD LOCATED)
	EXISTING TREELINE (FIELD LOCATED)
x x	EXISTING FENCE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
MtB2 MtD3	SOILS BOUNDARY
	PROPOSED LIGHT POLE
	PROPOSED SIDEWALK
	FOREST CONSERVATION EASEMENT

OWNER/DEVELOPER

FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

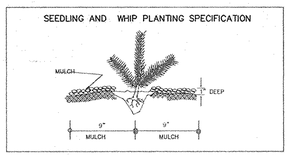
NO.	REVISION	DATE
2	REVISE SD FROM I 724 & I 727 TO Ex. SD	8/1/06

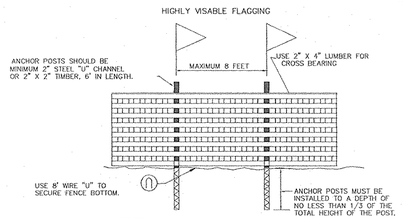
FOREST CONSERVATION AREA
DO NOT DISTURB
MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS PROHIBITED
VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE MARYLAND FOREST CONSERVATION ACT OF 1991
Min. 11" × Min. 15"

SPECIMEN TREE
DO NOT REMOVE
MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS PROHIBITED
VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE MARYLAND FOREST CONSERVATION ACT OF 1991
Min. 11" × Min. 15"

Note:
1. Bottom of signs to be higher than top of tree protection fence.
2. Signs to be placed approximately 50-100' feet apart. Conditions on site affecting visibility my warrant placing signs closer or farther apart.
3. Attachment of signs to trees is prohibited.

SEEDLING AND WHIP PLANTING SPECIFICATION





NOTES:
1. Forest protection device only.
2. Retention area will be set as part of the review process.
3. Boundaries of retention area should be staked and flagged prior to installing device.
4. Roof damage should be avoided.
5. Protection signage should be used.
6. Device should be maintained throughout construction.

BLAZE ORANGE PLASTIC MESH
TYPICAL TREE PROTECTION FENCE DETAIL
NO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 9/20/05
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 1/10/06
DIRECTOR	DATE 1/10/06

SITE DEVELOPMENT PLAN

FOREST CONSERVATION PLAN

FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
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

LARRY J. VOGELSON
DNR QUALIFIED PROFESSIONAL

DESIGN BY:	RHV
DRAWN BY:	MAN/DZ
CHECKED BY:	LJT
DATE:	SEPTEMBER 2005
SCALE:	AS SHOWN
W.O. NO.:	04-67

SDP-05-11

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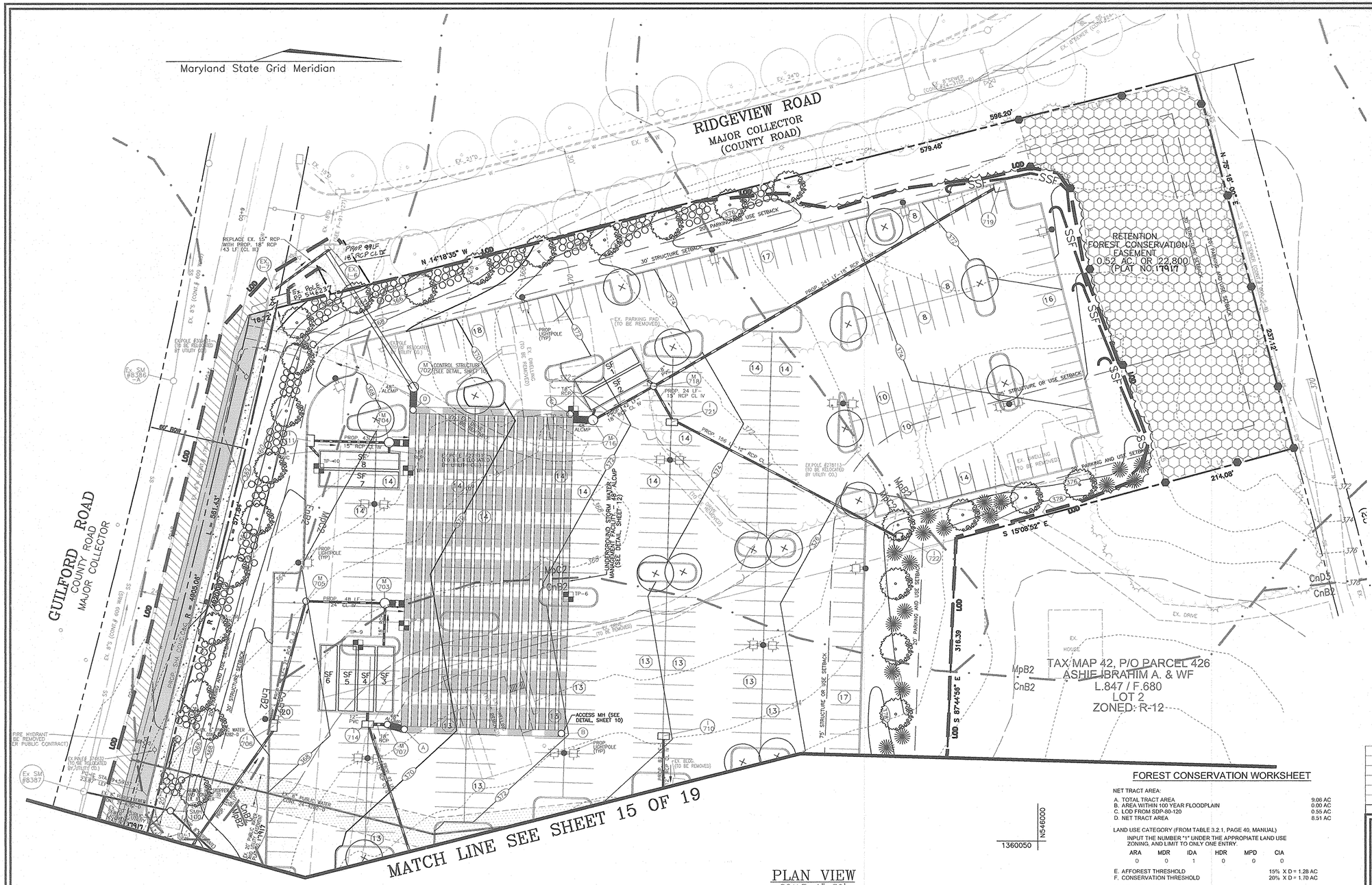
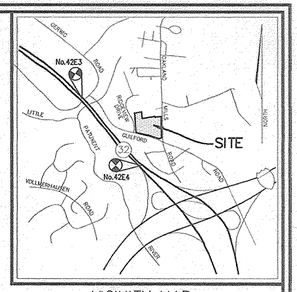


PLAN VIEW
SCALE: 1"=30'



VICINITY MAP
SCALE: 1"=2000'

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 TREES (FIELD LOCATED)
- EXISTING TREELINE (FIELD LOCATED)
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- SOILS BOUNDARY
- PROPOSED LIGHT POLE
- PROPOSED SIDEWALK
- FOREST CONSERVATION EASEMENT

OWNER/DEVELOPER

FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

FOREST CONSERVATION WORKSHEET

NET TRACT AREA:

A. TOTAL TRACT AREA	9.06 AC
B. AREA WITHIN 100 YEAR FLOODPLAIN	0.00 AC
C. LOD FROM SDP-80-120	0.55 AC
D. NET TRACT AREA	8.51 AC

LAND USE CATEGORY (FROM TABLE 3.2.1, PAGE 40, MANUAL)
INPUT THE NUMBER "1" UNDER THE APPROPIATE LAND USE ZONING, AND LIMIT TO ONLY ONE ENTRY.

ARA	MDR	IDA	HDR	MPD	CIA
0	0	1	0	0	0

E. AFFOREST THRESHOLD	15% X D = 1.28 AC
F. CONSERVATION THRESHOLD	20% X D = 1.70 AC

EXISTING FOREST COVER:

G. EXISTING FOREST COVER (EXCLUDING FLOODPLAIN) =	1.43 AC
H. AREA OF FOREST ABOVE AFFORESTATION THRESHOLD =	0.15 AC
I. AREA OF FOREST ABOVE CONSERVATION THRESHOLD =	0.00 AC

BREAK EVEN POINT: (1.43)

J. FOREST RETENTION WITH NO MITIGATION REQUIRED =	0.00 AC
K. CLEARING PERMITTED WITHOUT MITIGATION =	0.00 AC

PROPOSED FOREST CLEARING:

L. TOTAL AREA OF FOREST TO BE CLEARED =	0.91 AC
M. TOTAL AREA OF FOREST TO BE RETAINED =	0.52 AC

PLANTING REQUIREMENTS:

N. REFORESTATION FOR CLEARING ABOVE CONSERVATION THRESHOLD =	0.00 AC
P. REFORESTATION FOR CLEARING BELOW CONSERVATION THRESHOLD =	1.82 AC
Q. CREDIT FOR RETENTION ABOVE CONSERVATION THRESHOLD =	0.00 AC
R. TOTAL REFORESTATION REQUIRED =	1.82 AC
S. TOTAL AFFORESTATION REQUIRED =	0.00 AC
T. TOTAL REFORESTATION AND AFFORESTATION REQUIRED =	1.82 AC

THE FOREST CONSERVATION OBLIGATION FOR THIS PLAN HAS BEEN MET BY THE CREATION OF A 0.52 ACRE ONSITE RETENTION EASEMENT AND A FEE-IN-LIEU PAYMENT OF $39,639.60 TO THE HO. CO. FOREST CONSERVATION FUND FOR THE 1.82 ACRES OF REQUIRED REFORESTATION.

SURETY IN THE AMOUNT OF $4,530 FOR THE 0.52 ACRE ONSITE RETENTION EASEMENT HAS BEEN POSTED AS A PART OF THE DEVELOPER'S AGREEMENT.

NO.	REVISION	DATE
2	REVISE SD FROM M702 TO Ex. 16	8/1/06

SITE DEVELOPMENT PLAN
FOREST CONSERVATION PLAN
FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16 — PARCEL A
6TH ELECTION DISTRICT — 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

NOTE: ALL SWM FACILITES SHOWN ON THIS PLAN TO BE PRIVATELY OWNED AND MAINTAINED BY THE FIRST BAPTIST CHURCH OF GUILFORD

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 8/22/06
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 1/12/06
DIRECTOR	DATE 1/12/06

LARRY J. THOMPSON
DNR QUALIFIED PROFESSIONAL

DESIGN BY:	RHV
DRAWN BY:	MAN/DZ
CHECKED BY:	LJT
DATE:	SEPTEMBER 2005
SCALE:	AS SHOWN
W.O. NO.:	04-67

SHEET 16 OF 20

SDP-05-11

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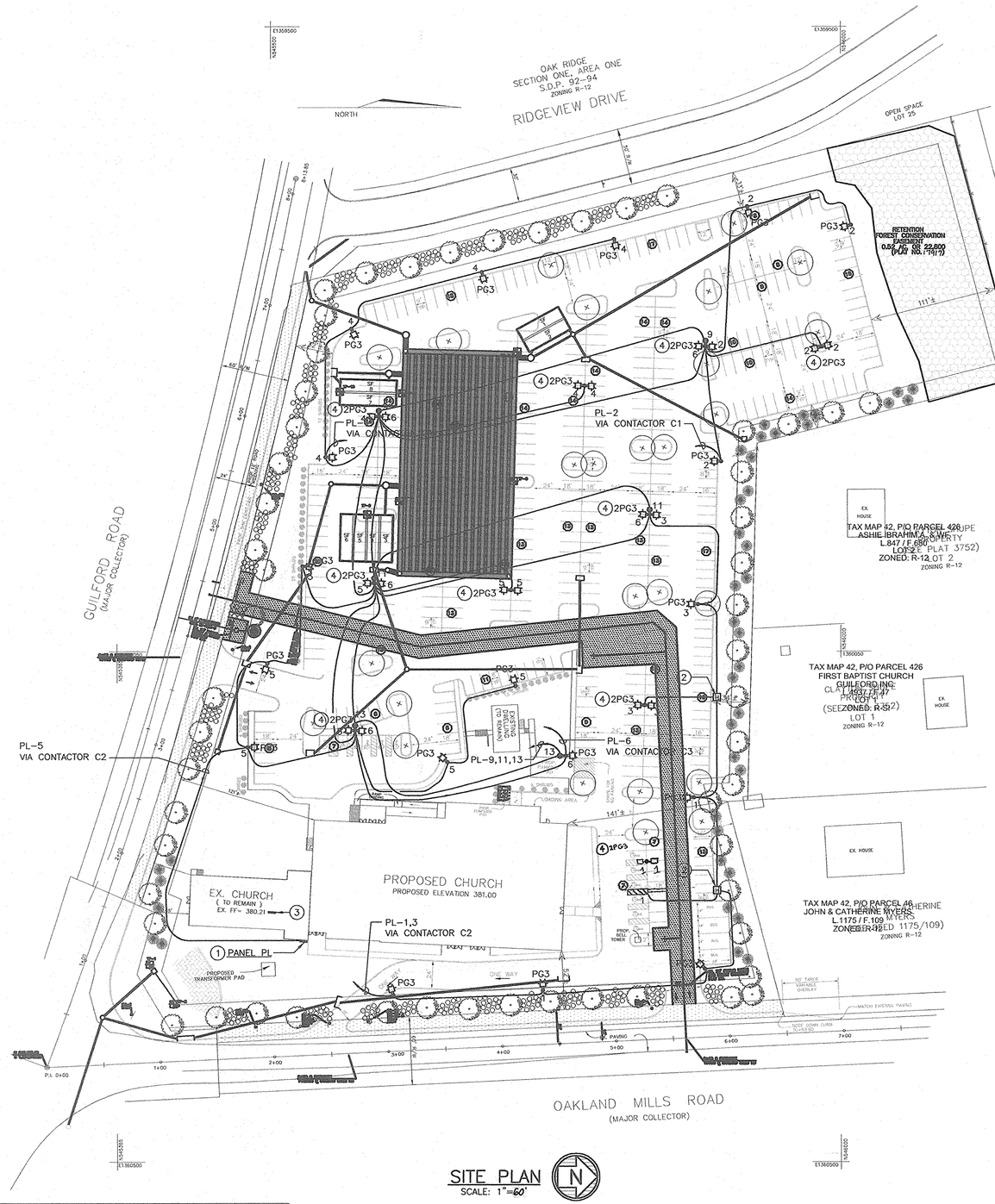


SITE PLAN

SCALE: 1"=60'

DRAWING NOTES:

1. REFER TO CUSTOM LIGHTING CONTROL PANEL ON SHEET E-2.
2. PROVIDE HANDHOLES AS REQUIRED. REFER TO DETAIL THIS SHEET.
3. EX. POWER PANEL. REFER TO POWER RISER DIAGRAM ON SHEET E-2.
4. PROVIDE BANNER ARM ASSEMBLY.

GENERAL NOTES:

1. COORDINATE ROUTING OF ALL CONDUIT WITH SITE PHASING.

ELECTRICAL LEGEND

(MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICES UNLESS OTHERWISE NOTED.)

LIGHTING

HID LIGHTING FIXTURE – SINGLE, TWIN – POLE MOUNTED

SWITCHES

PC — PHOTOCELL – CABINET MOUNTED

POWER

PANELBOARD – M.H. 6'-6" AFF TO TOP OF PANEL

GFCI RECEPTACLE – NEMA 5-20R

H — HANDHOLE – REFER TO DETAIL THIS SHEET

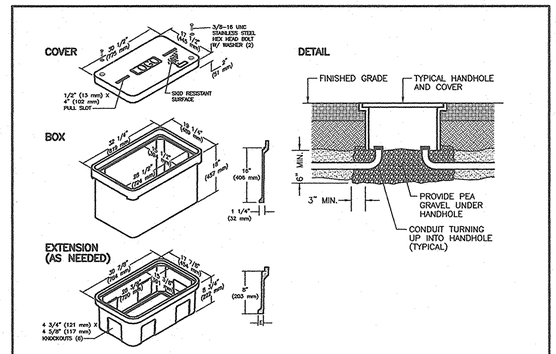
CONDUIT

HOME RUN TO PANELBOARD

UNDERGROUND CONDUIT AND WIRE

MISCELLANEOUS

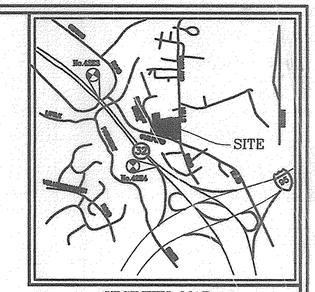
1 — DENOTES REFERENCE TO DRAWING NOTE



HANDHOLE DETAIL

NOT TO SCALE

* ALL HANDHOLES LOCATED IN PAVEMENT SHALL BE H2O LOAD RATED.
PROVIDE QUANTITY OF HANDHOLES AS REQUIRED. HANDHOLE SHALL BE QUAZITE OR EQUAL.



VICINITY MAP

SCALE: 1"=2000'

ABBREVIATIONS:

A	AMP, AMPERE, AMPERES
AFG	ABOVE FINISHED GRADE
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
DWG	DRAWING
ETR	EXISTING TO REMAIN
EX	EXISTING
GRD	GROUND
GW	GROUND WIRE
KVA	KILO VOLT AMPERES
KW	KILO WATT AMPERES
LTG	LIGHTING
MCB	MAIN CIRCUIT BREAKER
MFGR	MANUFACTURER
MH	MOUNTING HEIGHT OR MANHOLE
MLO	MAIN LUGS ONLY
MTD	MOUNTED
P	POLE, POLES
PNL	PANEL
RX	REMOVE EXISTING
RGS	RIGID GALVANIZED STEEL
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
V	VOLT, VOLTS
WP	WEATHERPROOF
W	WIRE, WIRES
W/	WITH
Ø	PHASE
XFMR	TRANSFORMER

NO.	REVISION	DATE
1	RELOCATE LIGHT POLE	6/30/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 9/20/05
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 1/10/06
DIRECTOR	DATE 1/11/06

ATTORNEY
JAMES L. ROUSE
2516 N. CHARLES STREET
BALTIMORE, MARYLAND 21218
(410) 366-6664

OWNER\PETITIONER
THE FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS ROAD
COLUMBIA, MARYLAND 21046

ARCHITECT AND PLANNER
SRR & ASSOCIATES, PC
2605 BANISTER ROAD, SUITE # A-110
BALTIMORE, MARYLAND 21215
(410) 367-1857

SITE DEVELOPMENT PLAN

SITE LIGHTING PLAN
FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16
6TH ELECTION DISTRICT

PARCEL A
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
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ELLICOTT CITY, MD 21043
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STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.16193

DESIGN BY:	RHV
DRAWN BY:	MAN/DZ
CHECKED BY:	RHV
DATE:	SEPTEMBER 2005
SCALE:	1"=50'
W.O. NO.:	04-57

SHEET 17 OF 20

SDP-05-11

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	VOLTS	LAMPS	MOUNTING	MANUFACTURER	REMARKS
P	POLE MOUNTED HID CUT-OFF FIXTURE W/ CAST ALUMINUM HOUSING, CAST ALUMINUM DOOR WITH TEMPERED GLASS LENS, SPECULAR ANODIZED ALUMINUM REFLECTOR, IES TYPE III DISTRIBUTION AND TEXTURED BRONZE POWDERCOAT FINISH	208	(1)250W MH	POLE	GARDCO MODEL NO G18-_-3XL-250MH-208-BRP OR APPROVED EQUAL	PROVIDE BREAKAWAY BANNER ARM ASSEMBLY FOR 5" POLE WITH TWIN 18" BY 36" BANNERS WHERE INDICATED. PROVIDE NUMBER OF LUMINAIRES PER POLE AS INDICATED ON SITE PLAN. PROVIDE ALL REQUIRED ARMS AND MOUNTING HARDWARE.
	6" WIDE, 0.250" THICK, 25' HIGH SQUARE STRAIGHT STEEL POLE WITH TEXTURED BRONZE POLYESTER POWDERCOAT FINISH TO MATCH TYPE 'P' FIXTURES.				LUMEC MODEL NO SPS6V-25 OR APPROVED EQUAL	REFER TO POLE BASE DETAIL
	18" DOUBLE BREAK-AWAY BANNER ARM WITH SAFETY CABLE, STEEL 1 1/16" DIAMETER ARM AND FITTER FOR SQUARE POLE WITH TEXTURED BRONZE POLYESTER POWDERCOAT FINISH TO MATCH TYPE 'P' FIXTURES.				LUMEC MODEL NO BABD18 OR APPROVED EQUAL	PROVIDE ALL REQUIRED FITTERS AND MOUNTING HARDWARE

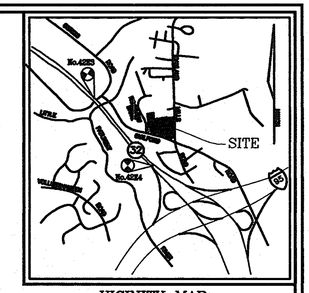
LIGHTING NOTES:

1. PROVIDE LAMPS FOR ALL FIXTURES.
2. PROVIDE NUMBER OF LUMINAIRES PER POLE AS INDICATED ON PLANS AND PROVIDE ALL REQUIRED ARMS AND MOUNTING HARDWARE.

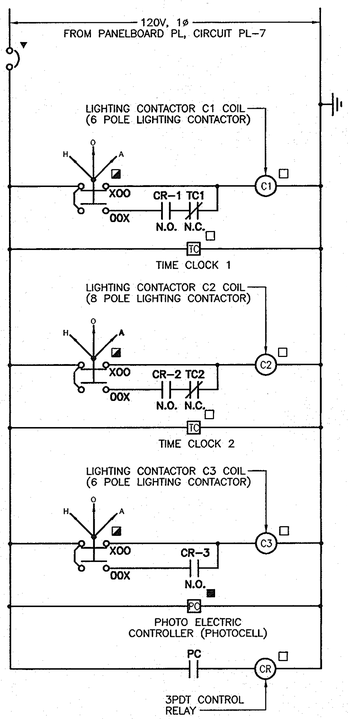
PANEL **PL** MOUNTING: **SURFACE**
VOLTAGE: **208/120V, 3ø, 4W** **NEMA 4 ENCLOSURE** LOCATION: **OUTSIDE EX CHURCH**
100 AMPERE FRAME | **60** AMPERE MAIN **CIRCUIT BREAKER** | **100%** RATED NEUTRAL BUS | **22,000** A.I.C.

CONN KVA	CKT	DESCRIPTION	CIRCUIT BREAKER P	CIRCUIT BREAKER TRIP	CIRCUIT WIRING NO	CIRCUIT WIRING SIZE	CIRCUIT WIRING GND	CIRCUIT WIRING C	CKT	DESCRIPTION	CIRCUIT BREAKER P	CIRCUIT BREAKER TRIP	CIRCUIT WIRING NO	CIRCUIT WIRING SIZE	CIRCUIT WIRING GND	CIRCUIT WIRING C	CONN KVA
1.8	1	SITE LIGHTING	2	20	3	4	4	2"	2	SITE LIGHTING	2	20	3	4	4	2"	1.8
1.8	3	SITE LIGHTING	2	20	3	4	4	2"	4	SITE LIGHTING	2	20	3	4	4	2"	2.1
1.8	5	SITE LIGHTING	2	20	3	4	4	2"	6	SITE LIGHTING	2	20	3	4	4	2"	1.8
0.2	7	LIGHTING CONTACTORS	2	20	3	12	12	3/4"	8	RECEPTACLE	1	20	2	12	12	3/4"	0.2
1.0	9	POLE RECEPTACLES	1	20	2	10	10	1"	10	SPARE	1	20	–	–	–	–	–
1.0	11	POLE RECEPTACLES	1	20	2	10	10	1"	12	SPARE	1	20	–	–	–	–	
1.0	13	POLE RECEPTACLES	1	20	2	10	10	1"	14	SPARE	1	20	–	–	–	–	–
–	15	SPACE	1	20	–	–	–	–	16	SPACE	1	–	–	–	–	–	–
–	17	SPACE	1	20	–	–	–	–	18	SPACE	1	–	–	–	–	–	–
–	19	SPACE	1	20	–	–	–	–	20	SPACE	1	–	–	–	–	–	–
–	21	SPACE	1	20	–	–	–	–	22	SPACE	1	–	–	–	–	–	–
–	23	SPACE	1	20	–	–	–	–	24	SPACE	1	–	–	–	–	–	–

TOTAL CONNECTED LOAD: **14.5 KVA**



VICINITY MAP
SCALE: 1"=2000'

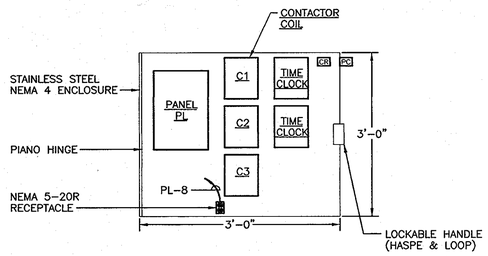


LEGEND:

- ▼ CIRCUIT BREAKER AT PANEL PL
- ◪ MOUNT ON FRONT OF PANEL PL
- □ IN CUSTOM LIGHTING CONTROL PANEL
- ■ MOUNT ON SIDE OF CUSTOM LIGHTING CONTROL PANEL.

LIGHTING CONTROL DIAGRAM

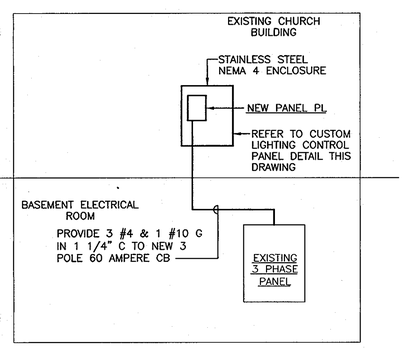
NOT TO SCALE



CUSTOM LIGHTING CONTROL PANEL

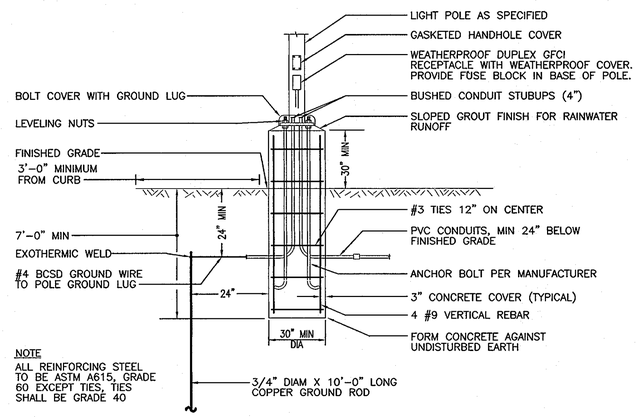
NOT TO SCALE

NOTE: REFER TO LIGHTING CONTROL DIAGRAM FOR CONNECTIONS



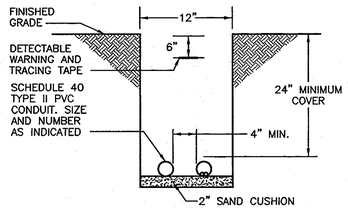
POWER RISER DIAGRAM

NOT TO SCALE



PARKING AREA – ELEVATED POLE BASE

NOT TO SCALE



LIGHTING/RECEPTACLE CONDUITS

NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 9/26/06
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 9/26/06
DIRECTOR	DATE 1/8/06

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2605 BANISTER ROAD, SUITE # A-110
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NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
LIGHTING DETAILS, SCHEDULES & DIAGRAMS
FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16 6TH ELECTION DISTRICT — PARCEL A HOWARD COUNTY, MARYLAND

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

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER 9/14/06
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAH/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04-67

SHEET 18 OF 20

SDP-05-11

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SECTION 16010
GENERAL ELECTRICAL REQUIREMENTS

PART 1 – RELATED DOCUMENTS

1.1 GENERAL:

PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES NECESSARY FOR AND INCIDENTAL TO THE COMPLETE INSTALLATION AND OPERATION OF ALL ELECTRICAL WORK.

ALL WORK UNDER THIS DIVISION IS SUBJECT TO THE GENERAL CONDITIONS AND SPECIAL REQUIREMENTS FOR THE ENTIRE CONTRACT.

CONFORM TO REQUIREMENTS OF ALL RULES, REGULATIONS, AND CODES OF LOCAL, STATE, AND FEDERAL AUTHORITIES HAVING JURISDICTION. CONFORM TO THE NATIONAL ELECTRICAL CODE AND NECA – STANDARDS OF INSTALLATION.

THE CONTRACT DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ALL OFFSETS, BENDS, FITTINGS, AND ACCESSORIES ARE NOT NECESSARILY SHOWN. PROVIDE ALL SUCH ITEMS AS MAY BE REQUIRED TO FIT THE WORK TO THE CONDITIONS.

1.2 PERMITS AND FEES:

OBTAIN, PAY FOR, AND DELIVER ALL PERMITS, CERTIFICATES OF INSPECTION, ETC., REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. DELIVER CERTIFICATES TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF THE WORK.

PART 2 – PRODUCTS

2.1 MATERIAL AND EQUIPMENT:

MATERIAL AND EQUIPMENT INSTALLED AS A PART OF THE PERMANENT INSTALLATION SHALL BE NEW, UNLESS OTHERWISE INDICATED OR SPECIFIED, AND SHALL BE APPROVED BY THE UNDERWRITERS' LABORATORIES, INC., FOR INSTALLATION IN EACH PARTICULAR CASE WHERE STANDARDS HAVE BEEN ESTABLISHED.

2.2 SUBMITTALS, REVIEW, AND ACCEPTANCE:

PREPARE AND SUBMIT SHOP DRAWINGS AND/OR DIAGRAMS FOR LISTED ITEMS, TO INCLUDE PLANS, ELEVATIONS, SECTIONS, MOUNTING DETAILS OF COMPONENT PARTS, POINT–TO–POINT INTERCONNECTION DIAGRAMS, AND ANY OTHER INFORMATION NECESSARY TO SHOW THE FABRICATION AND CONNECTION OF THE COMPLETE ITEM OR SYSTEM.

EQUIPMENT, MATERIAL, INSTALLATION, WORKMANSHIP AND ARRANGEMENT OF WORK ARE SUBJECT TO REVIEW AND ACCEPTANCE. NO SUBSTITUTION SHALL BE PERMITTED AFTER ACCEPTANCE OF EQUIPMENT OR MATERIALS EXCEPT WHERE SUCH SUBSTITUTION IS CONSIDERED BY THE ENGINEER TO BE IN THE BEST INTEREST OF THE OWNER.

PART 3 – EXECUTION

3.1 SUPERVISION AND COORDINATION:

PROVIDE COMPLETE SUPERVISION, DIRECTION, SCHEDULING AND COORDINATION OF ALL WORK UNDER THE CONTRACT, INCLUDING THAT OF SUBCONTRACTORS. BE RESPONSIBLE FOR ALL WORK AND MAKE ALL SUBCONTRACTORS, SUPPLIERS AND MANUFACTURERS FULLY AWARE OF ALL REQUIREMENTS OF THE CONTRACT.

3.2 GUARANTEE:

GUARANTEE THE COMPLETE ELECTRICAL SYSTEM FREE FROM AL MECHANICAL AND ELECTRICAL DEFECTS FOR THE PERIOD OF TWO YEARS BEGINNING FROM THE DAY OF FINAL ACCEPTANCE OF THE WORK BYTHE OWNER. ALSO DURING THE GUARANTEE PERIOD, BE RESPONSIBLE FOR THE PROPER ADJUSTMENTS OF ALL SYSTEMS, EQUIPMENT AND APPARATUS INSTALLED AND DO ALL WORK NECESSARY TO ENSURE EFFICIENT AND PROPER FUNCTIONING OF THE SYSTEMS AND EQUIPMENT. UPON RECEIPT OF NOTICE FROM THE OWNER OF FAILURE OF ANY PART OF THE ELECTRICAL INSTALLATION DURING THE GUARANTEE PERIOD, NEW REPLACEMENT PARTS SHALL BE FURNISHED AND INSTALLED PROMPTLY AT NO COST.

END OF SECTION

SECTION 16100
BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.1 STORAGE AND PROTECTION OF EQUIPMENT:

ALL ELECTRICAL EQUIPMENT TO BE USED IN THE CONSTRUCTION SHALL BE PROPERLY STORED AND PROTECTED. ALL EQUIPMENT SHALL BE STORED UNDER COVER.

PROTECT ELECTRICAL EQUIPMENT AND MATERIALS AGAINST DAMAGE CAUSED BY INSTALLATION OF ANY BUILDING SYSTEMS.

EQUIPMENT DAMAGED AS A RESULT OF THE ABOVE CONDITIONS SHALL BE PROPERLY REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE, IF, IN THE OPINION OF THE ENGINEER, THE

EQUIPMENT HAS BEEN DAMAGED TO SUCH AN EXTENT IT CANNOT OPERATE PROPERLY AFTER REPAIRS ARE MADE.

1.2 PENETRATION OF WATERPROOF CONSTRUCTION:

COORDINATE THE WORK TO MINIMIZE PENETRATION OF WATERPROOF CONSTRUCTION, INCLUDING ROOFS, EXTERIOR WALLS AND INTERIOR WATERPROOF CONSTRUCTION. WHERE SUCH PENETRATIONS ARE NECESSARY, PROVIDE NECESSARY CURBS, SLEEVES, SHIELDS, FLASHINGS, FITTINGS AND CAULKING TO MAKE THE PENETRATIONS ABSOLUTELY WATERTIGHT.

1.3 PENETRATION OF FIRE–RATED CONSTRUCTION:

ALL AREAS IN AND AROUND CONDUITS PASSING THROUGH FIRE–RATED, FIRE–RESISTANT OR FIRE–STOPPED WALLS, CEILINGS, PARTITIONS AND FLOORS SHALL BE SEALED WITH A FIRE RESISTIVE MATERIAL. FIRE RESISTIVE MATERIAL SHALL BE A UL 1479 LISTED, TWO PART, RTV SILICONE ELASTOMER EXPANDING FOAM. FOAM SHALL FLOW INTO THE CAVITY TO BE SEALED AND EXPAND TO 3–4 TIMES ORIGINAL VOLUME. FOAM SHALL BE DOW CORNING FIRE STOP FOAM, OR EQUAL, AND SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

FOR SMALL VOIDS (LESS THAN 1") AND AREAS WHERE FOAM WILL NOT FLOW PROPERLY, A FIRE RESISTIVE SEALANT MATERIAL MAY BE USED. SEALANT SHALL BE A UL 11479 LISTED, ONE PART, RTV SILICONE ELASTOMER WHICH IS APPLIED WITH A CAULKING GUN. SEALANT SHALL BE DOW CORNING FIRE STOP SEALANT, OR EQUAL, APPLIED PER MANUFACTURER'S RECOMMENDATIONS.

1.4 OPERATION OF EQUIPMENT:

LUBRICATE, CLEAN, ADJUST AND TEST ALL EQUIPMENT AND LIGHT FIXTURES IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS PRIOR TO OPERATION.

1.5 TESTING AND ADJUSTMENT:

PERFORM ALL TESTS WHICH ARE SPECIFIED OR REQUIRED TO DEMONSTRATE THAT WORK IS INSTALLED AND OPERATING PROPERLY. WHERE FORMAL TESTS ARE REQUIRED, GIVE PROPER NOTICES AND PERFORM ALL NECESSARY PRELIMINARY TESTS TO ASSURE THAT THE WORK IS COMPLETE ON READY FOR FINAL TEST. ON ALL CIRCUITS, 600 VOLTS OR LESS, PROVIDE CIRCUITS THAT ARE FREE FROM GROUND FAULTS, SHORT CIRCUITS AND OPEN CIRCUITS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE	9/16/05
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE	1/10/06
DIRECTOR	DATE	1/11/06

PART 2 – PRODUCTS

2.1 CONDUIT AND FITTINGS:

GENERAL:

INSTALL ALL BUILDING WIRING IN RACEWAYS AS INDICATED. MINIMUM CONDUIT SIZE SHALL BE 3/4–INCH. INSTALL ALL CONDUIT CONCEALED WHERE POSSIBLE.

SUPPORT ALL CONDUIT NOT EMBEDDED IN CONCRETE OR MASONRY SO THAT STRAIN IS NOT TRANSMITTED TO OUTLET BOXES AND PULL BOXES, ETC. SUPPORTS TO BE SUFFICIENTLY RIGID TO PREVENT DISTORTION OF CONDUITS DURING WIRE PULLING.

IN AREAS WITH NO CEILING, INSTALL CONDUITS AS CLOSE TO STRUCTURE AS POSSIBLE.

SUPPORT ALL CONDUIT NOT EMBEDDED IN CONCRETE OR MASONRY SO THAT STRAIN IS NOT TRANSMITTED TO OUTLET BOXES AND PULL BOXES, ETC. SUPPORTS TO BE SUFFICIENTLY RIGID TO PREVENT DISTORTION OF CONDUITS DURING WIRE PULLING.

CONDUITS:

PROVIDE HOT–DIP GALVANIZED, RIGID STEEL CONDUIT, GALVANIZED INTERMEDIATE METAL CONDUIT (IMC) FOR CONCEALED WORK ABOVE SUSPENDED CEILINGS AND WITHIN INTERIOR PARTITIONS. MAXIMUM EMT SIZE PERMITTED IS TWO INCHES. PROVIDE PVC CONDUIT FOR EXTERIOR EXPOSED AND DIRECT BURIED APPLICATIONS.

ALUMINUM CONDUIT IS PROHIBITED IN ANY LOCATION.

FITTINGS:

ALL FITTINGS TO MATCH CONDUIT MATERIAL AND TO BE SUITABLE FOR THE PURPOSE INTENDED.

PROVIDE COMPOUND FILLED SEALING FITTINGS FOR HAZARDOUS LOCATIONS FOR CONDUITS PASSING FROM INTERIOR TO EXTERIOR, AND AT THE INTERFACE OF WIDELY DIFFERENT SPACE TEMPERATURES SUCH AS REFRIGERATION OR COLD STORAGE ROOMS, AND FOR VERMIN PROOFING AT FOOD PREPARATION AREAS.

PROVIDE EXPANSION FITTINGS WITH BONDING JUMPERS WHERE CONDUITS CROSS EXPANSION JOINTS OR WHERE OTHERWISE REQUIRED TO COMPENSATE FOR THERMAL EXPANSION AND CONTRACTION.

INSTALLATION:

KEEP ALL CONDUITS MINIMUM 6 INCHES AWAY FROM FLUES, STEAM PIPES, HOT WATER PIPES OR OTHER HOT SURFACES ABOVE 90 DEGREES F.

INSTALL EXPOSED CONDUITS PARALLEL AND PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, CEILINGS AND INTERIOR SURFACES; INSTALL PLUMB.

PROVIDE A NYLON PULL LINE IN EACH CONDUIT TO BE LEFT EMPTY.

WHERE EXPOSED CONDUIT IS INSTALLED ON WATER BEARING WALLS AND WALLS BELOW GRADE, PROVIDE STAND–OFF BRACKETS TO MAINTAIN A MINIMUM 1/2–INCH AIR SPACE BETWEEN THE CONDUIT AND THE MOUNTING SURFACE.

SUPPORTS:

ALL PARTS AND HARDWARE USED FOR SUPPORT OF EQUIPMENT, CONDUITS, AND FITTINGS SHALL BE GALVANIZED FOR DRY LOCATIONS AND GALVANIZED WITH PVC BONDED (PLASTI–BOND) JACKET FOR EXTERIOR, DAMP, OR WET LOCATIONS. PROVIDE GALVANIZED FASTENERS FOR DRY LOCATIONS AND STAINLESS STEEL (326 GRADE MINIMUM) FOR EXTERIOR, DAMP, OR WET LOCATIONS.

SUPPORT SINGLE RUNS OF SUSPENDED FEEDER CONDUIT WITH "KINDORF" C–149 OR C–150 ADJUSTABLE HANGERS, OR EQUAL, USING 3/8–INCH RODS FOR CONDUITS UP TO 2 INCH AND 1/2–INCH RODS FOR CONDUITS LARGER THAN 2 INCHES. SUPPORT GROUPS OF SUSPENDED CONDUITS RUN IN PARALLEL ON TRAPEZE HANGERS CONSTRUCTED OF "KINDORF" CHANNELS WITH C–149 CONDUIT STRAPS, OR EQUAL, AND SUSPENDED WITH 1/2–INCH HANGER RODS.

SUPPORT SURFACE RUNS OF CONDUIT USING ONE HOLE PIPE STRAPS OR TWO HOLE PIPE STRAPS. STRAP SPACING MAXIMUM 6 FEET ON CENTERS. FASTEN PIPE STRAPS AND HANGERS TO CONCRETE USING INSERTS OR EXPANSION BOLTS AND TO HOLLOW MASONRY USING TOGGLE BOLTS. SUPPORTS FOR PVC–COATED CONDUITS TO HAVE PVC BONDED COATING.

2.2 OUTLET BOXES AND WIRE TROUGHS:

SMALL BOXES SHALL BE GALVANIZED STEEL FOR GENERAL USE, CAST ALUMINUM FOR WET LOCATIONS. LARGE BOXES AND TROUGHS SHALL BE GALVANIZED STEEL FOR GENERAL USE, CAST ALUMINUM OR PVC FOR EXPOSED EXTERIOR USE, CAST ALUMINUM OR REINFORCED FIBERGLASS FOR UNDERGROUND USE. COVERS SHALL MATCH BOXES OR BE AS INDICATED. BOXES AND CONDUIT FITTINGS FOR EXTERIOR USE SHALL HAVE GASKETED COVER PLATES.

JUNCTION AND PULL BOXES SHALL BE FURNISHED AND INSTALLED AS SHOWN OR WHERE REQUIRED TO FACILITATE PULLING OF WIRES OR CABLES. SUCH BOXES SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS.

2.3 WIRES AND CABLES:

BUILDING WIRE, UNLESS OTHERWISE INDICATED, SHALL BE 600 VOLT, TYPE THWN OR THHN FOR #8 AWG AND SMALLER, TYPE THWN OR THEW FOR #6 AWG AND LARGER FOR INTERIOR USE, AND TYPE THW OR THWN INSULATION FOR UNDERGROUND OR EXTERIOR INSTALLATIONS. CONDUCTORS SHALL BE SIZED AND RUN AS INDICATED. CONDUCTORS SHALL BE SOFT DRAWN COPPER OF NOT LESS THAN 98% CONDUCTIVITY.

MINIMUM WIRE SIZE SHALL BE #12 AWG. ALL WIRE #8 AND LARGER SHALL BE STRANDED. BUILDING WIRE SHALL BE COLOR CODED AS FOLLOWS: PHASE A (BLACK), PHASE B (RED), PHASE C (BLUE), NEUTRAL (WHITE), GROUND (GREEN).

WIRING FOR GENERAL 15 AND 20 AMP 120 VOLT BRANCH CIRCUIT WORK SHALL BE AS FOLLOWS UNLESS OTHERWISE INDICATED:

HOME RUN LENGTH AND WIRE SIZE	CIRCUIT LENGTH AND WIRE SIZE
0–60 FT = #12	0–100 FT = #12
60–100 FT = #10	0–100 FT = #12
100 FT & UP = #8	

CIRCUIT LENGTH AS GIVEN ABOVE SHALL BE THE WIRE LENGTH BETWEEN THE FIRST AND LAST OUTLET ON THE CIRCUIT. HOME RUN LENGTH AS GIVEN ABOVE SHALL BE THE WIRE LENGTH BETWEEN THE FIRST OUTLET AND THE PANELBOARD. THE NEUTRAL CONDUCTOR IN A RUN SHALL BE THE SAME SIZE AS THE LARGEST PHASE CONDUCTOR.

2.3 SPLICING – 600 VOLTS AND BELOW:

ACCESSIBLE CONNECTORS WITH THERMOPLASTIC OR RUBBER COVERS OR WRAPPED WITH INSULATING TAPE.

2.5 LOW VOLTAGE FUSES (0–600 VOLTS):

LINKS WITH FUSING ALLOY SOLDERED TO LINKS WITH UL CLASS L LABEL FOR 601–6000 AMPERES. DUAL ELEMENT CURRENT LIMITING TIME DELAY TYPE WITH UL CLASS RK–1 LABEL FOR 600 AMPERES AND LESS. PROVIDE 10% SPARE FUSES IN WALL–MOUNTED CABINET.

2.8 WIRING DEVICES:

ALL DEVICES SHALL BE OF THE SAME MANUFACTURER. DEVICES SHALL BE ARROW–HART, LEVITON, HUBBELL OR EQUAL.

WALL SWITCHES: TOGGLE SWITCHES SHALL BE OF THE SILENT MECHANICAL TYPE RATED 20 AMPERE, 120/277 VOLT. SINGLE POLE SWITCHES SHALL BE ARROW–HART #991–1 OR EQUAL. THREE AND FOUR–WAY SWITCHES SHALL BE OF THE SAME MANUFACTURER AND GRADE.

PART 3 – EXECUTION

3.1 CUTTING AND PATCHING:

PROVIDE ALL CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OF THE ELECTRICAL WORK. ANY DAMAGE DONE TO THE WORK ALREADY IN PLACE BY REASON OF THIS WORK SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE BY QUALIFIED PERSONNEL EXPERIENCED IN SUCH WORK. PATCHING SHALL BE UNIFORM IN APPEARANCE AND SHALL MATCH WITH THE SURROUNDING SURFACE. DO NOT CUT STRUCTURAL MEMBERS WITHOUT APPROVAL BY STRUCTURAL ENGINEER.

3.2 PROVISION FOR ACCESS:

PROVIDE ADEQUATE ACCESS TO ALL EQUIPMENT, JUNCTION BOXES, SWITCHES, CONTROLS AND OTHER DEVICES. WHERE ACCESS DOORS ARE NECESSARY, PROVIDE MANUFACTURED STEEL DOOR ASSEMBLIES CONSISTING OF HINGED DOOR, FLUSH SCREWDRIVER CAMLOCKS AND FRAME, DESIGNED FOR THE PARTICULAR WALL OR CEILING CONSTRUCTION. PROPERLY SIZE AND LOCATE EACH DOOR DOORS SHALL BE MILCOR METAL ACCESS DOORS BY INLAND–RYERSON OR EQUAL.

END OF SECTION

SECTION 16400
SERVICE AND DISTRIBUTION

PART 1 – GENERAL

1.1 DESCRIPTION OF SERVICE:

ELECTRICAL SERVICE TO THE FACILITY IS EXISTING TO REMAIN. PROVIDE MODIFICATIONS AND EXTENSIONS AS INDICATED.

1.2 GROUNDING:

GROUNDING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND AS HEREINAFTER SPECIFIED AND/OR INDICATED ON THE DRAWINGS.

PROVIDE GROUND FOR SECONDARY SERVICE NEUTRAL, AND ALL RACEWAYS, DEVICES, AND UTILIZATION EQUIPMENT PERMANENTLY AND EFFECTIVELY. CONTINUITY OF RIGID STEEL RACEWAYS SHALL BE ENSURED BY DOUBLE LOCKNUTS. ALL GROUNDED NEUTRAL CONDUCTORS SHALL BE CONTINUOUSLY IDENTIFIED. ALL GROUNDING AND BONDING CONNECTIONS SHALL BE SOLDERLESS. GROUND FITTINGS AT WATER SYSTEM CONNECTIONS SHALL HAVE RIGID CLAMP JAWS.

PROVIDE INSULATED GROUNDING CONDUCTORS FOR FEEDERS AND BRANCH CIRCUIT WIRING AS CALLED FOR ON THE PLANS. PROVIDE GROUNDING BLOCKS, TERMINALS, ETC., FOR CONNECTION OF GROUNDING WIRES IN ALL DISTRIBUTION EQUIPMENT, OUTLETS, JUNCTION BOXES, AND UTILIZATION EQUIPMENT.

1.3 LIGHTING CONTROL CABINET

PROVIDE A CUSTOM LIGHTING CONTROL CABINET BY A SPECIALTY PANEL OR FABRICATOR, SUCH AS RETRO ELECTRIC CO. OR EL–TEX INDUSTRIES OR APPROVED EQUAL.

PROVIDE CUSTOM LIGHTING CONTROL CABINET HOUSING THE POWER DISTRIBUTION AND CONTROL EQUIPMENT. THE EQUIPMENT CABINET SHALL BE COMPLETELY INSTALLED AND PRE–WIRED BY THE FABRICATOR BEFORE SHIPMENT TO THE CONTRACTOR. THE LIGHTING CONTROL CABINET SHALL BE COMPLETE WITH ALL HINGES, HANDLES, PANELBOARDS, RECEPTACLE, TIME CLOCK, CONTACTOR, PHOTOCELLS, SUPPORTS, CHANNELS AND REQUIRED ACCESSORIES.

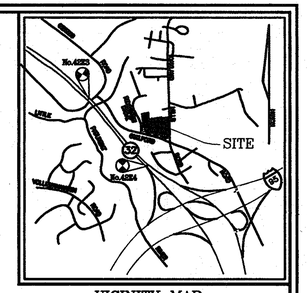
1.4 PANELBOARD
PROVIDE SQUARE "D" TYPE NQOD PANELBOARD OR APPROVED EQUAL.

1.5 TIMECLOCK
PROVIDE INTERMATIC 7–DAY TIMECLOCK OR APPROVED EQUAL.

1.6 LIGHTING CONTACTORS
PROVIDE SQUARE "D" ELECTRICALLY OPERATED, MECHANICALLY HELD LIGHTING CONTACTOR OR APPROVED EQUAL.

1.7 PHOTOCELL
PROVIDE OUTDOOR SEALED SOLID STATE PHOTOELECTRIC RELAY BY INTERMATIC OR APPROVED EQUAL.

END OF SECTION



VICINITY MAP
SCALE: 1"=2000'

SECTION 16500
LIGHTING

PART 1 – GENERAL

1.1 GENERAL:

PROVIDE ALL LIGHTING FIXTURES COMPLETE AND READY FOR OPERATION. ALL FIXTURES SHALL BE UL LISTED WITH UL LISTED WIRING. FIXTURE TYPES SHALL BE AS SCHEDULED ON THE DRAWINGS.

PART 2 – PRODUCTS

2.1 LAMPS:

METAL HALIDE LAMPS SHALL BE PHOSPHOR COATED, AND FLUORESCENT LAMPS SHALL BE T–8 "WHITE" AS INDICATED. ALL FIXTURES SHALL BE PROVIDED WITH LAMPS. LAMPS SHALL BE MANUFACTURED BY GENERAL ELECTRIC, PHILLIPS, OR OSRAM–SYLVANIA. ALL LAMPS SHALL BE BY ONE MANUFACTURER.

2.2 BALLASTS:

HID BALLASTS SHALL BE CONSTANT WATTAGE TYPE, HIGH POWER FACTOR.
ALL BALLASTS FOR OUTDOOR USE SHALL BE OF THE LOW TEMPERATURE TYPE, SUITABLE FOR STARTING AT 0 DEGREES F.

PART 3 – EXECUTION

3.1 INSTALLATION AND COORDINATION:

CLEAN ALL INSTALLED FIXTURES AND REPLACE BURNED–OUT LAMPS AND NOISY BALLASTS BEFORE FINAL OWNER ACCEPTANCE. AIM ALL ADJUSTABLE FIXTURES AS DIRECTED BY THE ARCHITECT.

END OF SECTION

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NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

ELECTRICAL SPECIFICATIONS
FIRST BAPTIST CHURCH
OF GUILFORD

TAX MAP 42 BLOCK 16 — PARCEL A
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
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8407 MAIN STREET, ELLICOTT CITY, MD 21043 — TEL: 410.461.7666 FAX: 410.461.8961

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER — 9/14/05
ROBERT H. VOGEL, PE No.16193

DESIGN BY: RHV
DRAWN BY: MAH/DZ
CHECKED BY: RHV
DATE: SEPTEMBER 2005
SCALE: AS SHOWN
W.O. NO.: 04–87

19 SHEET OF 20

SDP–05–11

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Construction

BaySaver® Separation Systems are installed as part of the stormwater treatment system. The BaySaver Separator Unit and the system inlet pipe are grouted into the primary manhole using standard storm drain connections. The parallel pipes entering and leaving the storage manhole require watertight connections; these are made using standard boots or other locally approved seals. Flexible couplers join the BaySaver Separator Unit to the parallel inlet and outlet pipes from the storage manhole. These flexible seals prevent system failure in the case of differential settling between the two structures.

Important Note: The pipes extending down from the separator unit interfere with compaction of the backfill material. For this reason, the area below the separator unit must be backfilled with flowable fill or ¾" minus stone. The flowable fill or stone should extend up to the crown of the pipe and run the length of the separator unit to provide suitable bedding for the BaySaver Separator Unit and connecting pipes.

Installation Instructions

1. Contact utility locator to mark underground utilities and to make certain it is safe to excavate.
2. Reference the BaySaver Standard Detail Sheet to determine the location of the BaySaver Separation System. Determine the separator configuration (right-handed or left-handed), and compare it to the configuration specified on the site plan. To determine the configuration, look at the plans and imagine standing upstream and looking downstream through the system. If the storage manhole is located on the right - then the unit is "right-handed", and vice versa. If the unit is not properly configured, the stub pipes must be repositioned, see instruction 3. If correct go to instruction 8. Verify the sub grade elevation against the manhole dimensions and connecting storm drain inverts. Adjust base aggregate if necessary.
3. Beginning with one flange, unscrew the nuts from each of the bolts. With the nuts removed, lift the stub pipe vertically away from the body of the separator unit.
4. Turn the stub pipe 180 degrees from its original configuration.
5. Before placing the stub pipe back down on the unit, make sure that the gasket located between the flanged end of the stub pipe and the flanged end of the separator unit, is sitting flush on the separator unit flange, void of any wrinkles.
6. Place the stub pipe back down onto the unit. The bolts will pass directly back up through the holes in the stub pipe flange.
7. In order to ensure a watertight seal between the stub pipe flange and the separator unit flange, the bolts must be tightened in the following pattern and to the appropriate torque. Always use a crisscross pattern for tightening. For example, tighten 1 to 20% of final torque, then tighten 2 to 20% of final torque, then tighten 3 to 20% of final torque, then tighten 4 to 20% of final torque, and so on and forth until all bolts are tightened to 100% of the final torque.

Figure 10: Crisscross Pattern

Table 8: Appropriate Torque Measurements

BaySaver® Separator Unit Size	Pounds of Torque
1|K	30 ft.
1K	30 ft.
3K	30 ft.
5K	30 ft.
10K	30 ft.

8. Excavate to proper depth, length, and width in accordance with regulations to ensure safe site conditions.

Table 6: BaySaver Separator System Footprint Measurements

BaySaver® Separator Unit Size	Footprint Width	Footprint Length
1|K	165"	107"
1K	165"	107"
3K	174"	135"
5K	216"	143"
10K	282"	218"

9. Level sub grade to the proper elevation and check against finished grade dimensions to ensure adequate depth.
10. On solid sub grade, set the base of the primary manhole.
11. Set the base of the storage manhole downstream as specified by dimension AE on BaySaver standard detail sheet and off to either the left or right side as specified by dimension AD on the BaySaver standard detail sheet.

Table 7: BaySaver Separator System Dimensions

BaySaver® Separator Unit Size	Downstream Offset	Center Line Offset
1|K	4'-6"	8'-11"
1K	4'-6"	8'-11"
3K	5'-7"	8'-6"
5K	5'-8"	10'-4"
10K	8'-9"	11'-10"

12. Check the level of both the primary and storage manhole bases and correct level if needed before adding additional risers.
13. Add water tight seal (either mastic rope or rubber gasket) to the base of each manhole.
14. Set riser section on the base of each structure.
15. Add additional riser sections as previously detailed, until structures reach grade. Be sure to install water tight seals.
16. Align the opening in the primary manhole for the separator unit with the proposed outlet to the storm drain.
17. Align the inlet and outlet holes in the storage manhole such that they will be 90 degrees on center to the separator unit.
18. Once the inlets and outlets for the primary and storage manholes are properly aligned back fill to the bottom of the inlet and outlet of the storage manhole.
19. Insert the BaySaver Separator Unit into the primary manhole. Be sure of the following:
    A - The BaySaver Separator Unit penetrates the inside wall of the primary manhole to a depth of at least 1 corrugation.
    B - The tee pipes of the BaySaver Separator Unit are vertical and not skewed.
20. Support the body of the BaySaver Separator Unit and level the unit so that there is no slope from the front to the back of the separator unit.
21. Once the BaySaver is level, insert the two connector pipes into the inlet and outlet of the storage manhole. Be sure the end of the connector pipe labeled "IN" is inserted into the storage manhole.
22. Line up the connector pipes with the stub pipes coming out of the bottom of the BaySaver Separator Unit.
23. Tighten the water tight boots in the storage manhole down on the connector pipes.
24. Tighten Permco couplers and shear rings on the joint between the stub pipes and the connector pipes.
25. Back fill a flowable fill around the connector pipes up to the bottom of the separator unit. This backfill must have a compaction of 95%.
26. If the outlet pipe that is to be attached to the BaySaver Separator Unit is of a different diameter than the BaySaver, then the supplied reducer/adapter must be used to make the connection.
27. Align reducer/adapter such that the small end of the reducer/adapter is in alignment with the outlet pipe.
28. Use the larger supplied MarMac to couple the BaySaver to the reducer/adapter. Use the smaller MarMac to couple the reducer to the outlet pipe. For further information see instructions included with MarMacs.
29. Using non-shrinking grout, seal the separator unit into the primary manhole.
30. Continue backfill with flowable fill to the mid-point of the BaySaver Separator Unit, ensure 95% compaction.
31. Backfill with flowable fill to 1' above the crown of the 1/2K, 1K, 3K, and 5K; and 1 ½' over the crown for the 10K separator unit.
32. Install additional grade riser as needed and install frame and covers.
33. Backfill to grade.
34. Once the site is stabilized, the primary and storage manhole must be evacuated and recharged with clean water.

Inspection and Maintenance

One of the advantages of the BaySaver Separation System is the ease of maintenance. Like any system that collects pollutants, the BaySaver Separation System must be maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Maintenance contractors can access the pollutants stored in the manholes through two 30" manhole covers. This allows them to gain unobstructed access to the bottom of the manholes. There is no confined space entry necessary for inspection or maintenance.

Vacuum hoses can reach the entire sump area of both manholes to remove sediments and trash. The entire maintenance procedure typically takes from 2 to 4 hours, depending on the size of the system and the capacity of the vacuum truck.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor.

Inspection and Cleaning Cycle

Periodic inspection is necessary to determine the need for and frequency of maintenance. You should begin inspecting as soon as construction is complete and thereafter on a quarterly basis. Typically, the system needs to be cleaned every 12 months.

The cycle may be less than 12 months if there is a chance that excessive oils, fuels or sediments will accumulate. That is why periodic inspection is important.

The system needs to be cleaned when 2 feet (0.6 meters) of sediment has accumulated at the bottom of either structure or when visual inspection shows a large accumulation of debris or oil.

Measuring Sediment Depth

You can determine the sediment depth by lowering a pole into the manhole until it hits the sediment and measuring the distance from the bottom of the pole to the water line mark on the pole. If this is less than 6 feet (1.8 meters), the system needs to be cleaned.

Summary

- You can access the pollutants through the 2 manhole covers.
- You can see the entire floor/sump area of each manhole from the surface.
- There is no confined space entry for inspection or maintenance.
- During maintenance, you can transfer water from the primary to the storage manhole, minimizing the amount of water for disposal.

Maintenance Instructions

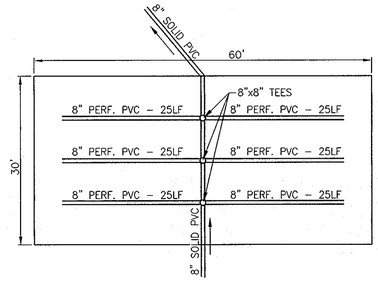
Note: For each BaySaver System, there are 2 manholes to clean: the **primary manhole and storage manhole**. You may view the maintenance animation on our website.

1. Remove the manhole covers to provide access to the pollutant storage.
2. **Storage manhole:** Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment.
3. **Storage manhole:** Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. **Primary manhole:** Use a submersible pump to pump the bulk of the water from the primary manhole into the clean storage manhole:
   a. Keep the pump intake below the water surface.
   b. Stop pumping when the water surface is one (1) foot above the accumulated sediments.
5. **Primary manhole:** Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment.
6. **Primary manhole:** Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
7. **Primary manhole:** Fill the cleaned primary manhole with water until you have a depth of 8 feet (or 2.44 meters).
8. **Storage manhole:** Top off the storage manhole with water until you have a depth of 8 feet (or 2.44 meters).
9. Replace the two manhole covers.
10. Dispose of the polluted water, oils, sediment and trash at an approved facility.
    - Local regulations prohibit the discharge of solid material into the sanitary system. Check with the local sewer authority for authority to discharge the liquid.
    - Many places treat the pollutants as leachate. Check with local regulators about disposal requirements.

Important: Additional local regulations may apply to the maintenance procedure.

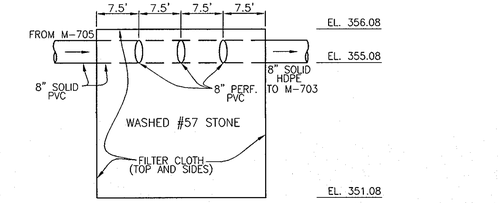
This procedure is intended to remove all the collected pollutants from the system while minimizing the volume of water that must be disposed. Additional local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor; therefore maintenance should be performed only by a qualified contractor.

BaySaver Technologies™ can assist in coordinating a maintenance contractor in the installation area, or work directly with owners who wish to perform their own maintenance. Contact BaySaver Technologies at 1-800-229-7283 (1-800-BaySaver) for more information.



Rev TRENCH - PLAN VIEW

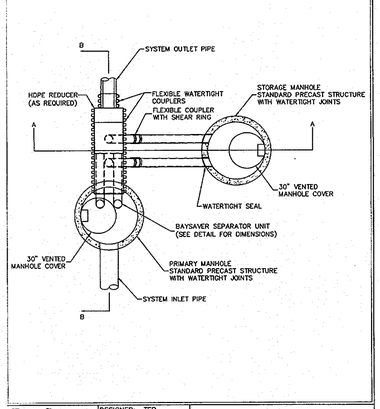
NOT TO SCALE



Rev TRENCH - SECTION

NOT TO SCALE

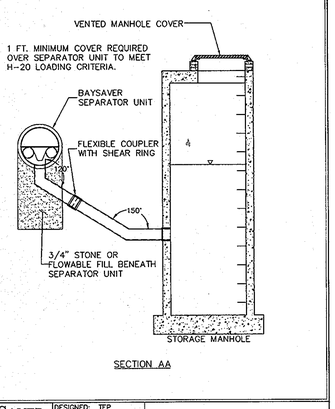
BaySaver® Separation Systems protected by U.S. Patent #5746911



BaySaver 1302 Rising Ridge Rd. Mount Airy, MD 21771 (301) 829-6470	DESIGNED: TEP DRAWN: PTT CHECKED: ATM DATE: 5/7/03 SCALE: N.T.S. SHEET: 1 OF 3

BAYSAVER SEPARATION SYSTEM PLAN VIEW

BaySaver® Separation Systems protected by U.S. Patent #5746911

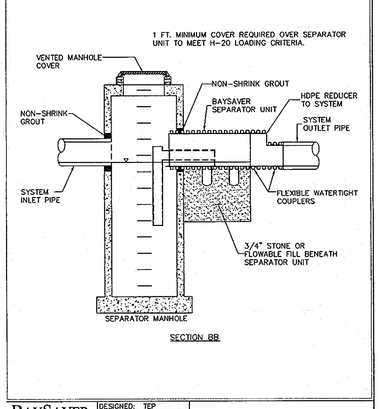


SECTION AA

BaySaver 1302 Rising Ridge Rd. Mount Airy, MD 21771 (301) 829-6470	DESIGNED: TEP DRAWN: PTT CHECKED: ATM DATE: 5/7/03 SCALE: N. T. S. SHEET: 2 OF 3

BAYSAVER SYSTEM SECTION A-A

BaySaver® Separation Systems protected by U.S. Patent #5746911

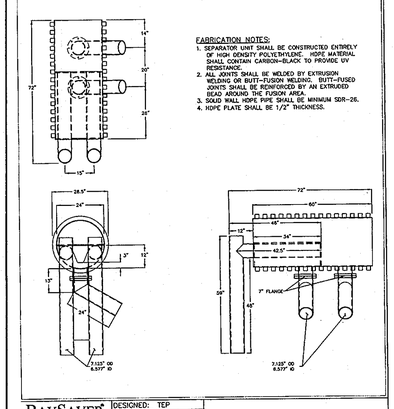


SECTION BB

BaySaver 1302 Rising Ridge Rd. Mount Airy, MD 21771 (301) 829-6470	DESIGNED: TEP DRAWN: PTT CHECKED: ATM DATE: 5/7/03 SCALE: N.T.S. SHEET: 3 OF 3

BAYSAVER SYSTEM SECTION B-B

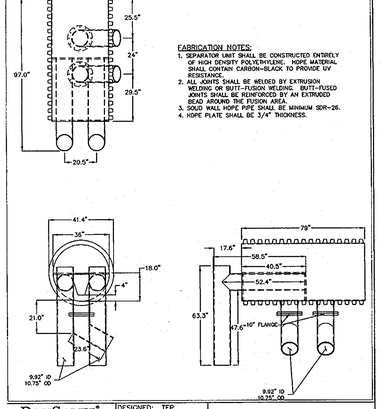
BaySaver® Separation Systems protected by U.S. Patent



BaySaver 1302 Rising Ridge Road Unit 1 Mount Airy, MD 21771 (301) 829-6470	DESIGNED: TEP DRAWN: PTT CHECKED: ATM DATE: 8/13/03 SCALE: N.T.S SHEET: 1 OF 2

1K SEPARATOR UNIT

BaySaver® Separation Systems protected by U.S. Patent



BaySaver 1302 Rising Ridge Road Mount Airy, MD 21771 (301) 829-6470	DESIGNED: TEP DRAWN: PTT CHECKED: ATM DATE: 8/13/03 SCALE: N.T.S SHEET: 1 OF 2

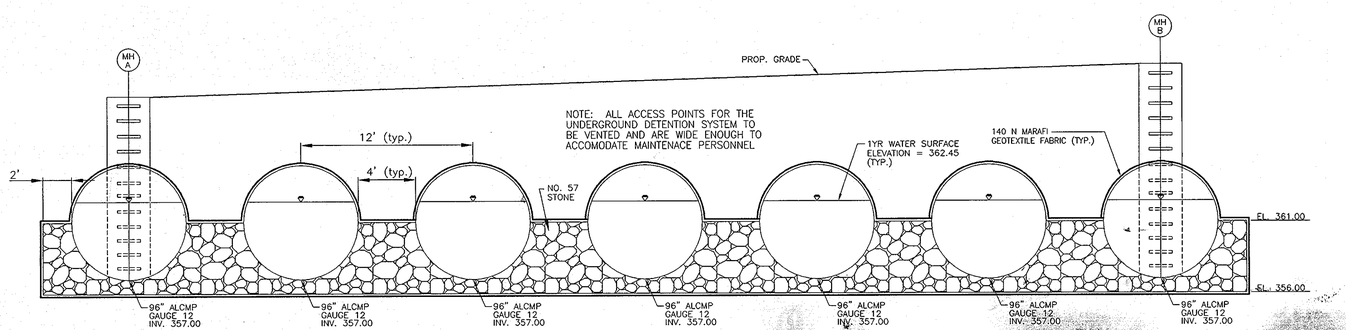
3K SEPARATOR UNIT

OPERATION AND MAINTAINANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED UNDERGROUND FACILITIES

A. THE UNDERGROUND STORMWATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN IT'S OPERATION AND FUNCTION.
B. THE UNDERGROUND STORMWATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVENTS.
C. WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHALL BE CLEANED.
D. THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEANUP OPERATION.
E. THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORMWATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
F. THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX (6) MONTHS. IF OBSTRUCTIONS ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.

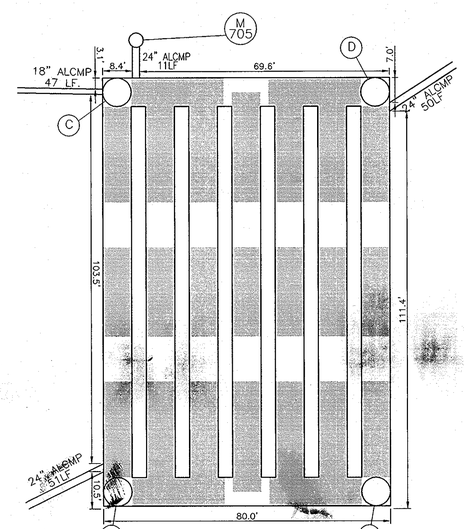
NOTE: CONTRACTOR SHALL ENSURE THAT THE S.W.M. FACILITY IS WATERTIGHT.

1. ALL PIPE CONNECTIONS AT STRUCTURES SHALL BE CEMENTED TO ENSURE WATERTIGHT CONNECTION.
2. ALL ACCMP PIPE JOINTS SHALL USE 12" WIDE HUGGER BAND WITH "O" RING GASKETS.
3. TEES AND ELBOWS TO BE FACTORY FABRICATED WELDS, ONE PIECE.
4. TRENCH BEDDING TO BE IN ACCORDANCE WITH RECOMMENDATIONS FROM THE GEOTECHNICAL ENGINEER IN THE FIELD.
5. PROVIDE WATERTIGHT JOINTS AT ALL PIPE CONNECTIONS. (FOR REINFORCED CONCRETE PIPE, ASTM C-361, RUBBER GASKET PIPE).



UNDERGROUND SWMF TYPICAL SECTION

SCALE: 1"=5'



UNDERGROUND STORMWATER MANAGEMENT FACILITY

96" ALCMP, 12 GA.

SCALE: 1"=20'

NOTE: DEBRIS IS TO BE KEPT OUT OF STORMWATER MANAGEMENT FACILITIES DURING AND AFTER CONSTRUCTION.

OWNER/DEVELOPER
FIRST BAPTIST CHURCH OF GUILFORD
7504 OAKLAND MILLS RD
COLUMBIA, MD 21046
410-792-7096

NO.	REVISION	DATE
4	REVISE STORMWATER MANAGEMENT FACILITY AND ASSOCIATED STORM DRAIN-REPLACEMENT SHEET	10.18.07

SITE DEVELOPMENT PLAN
REVISED
SWM PROFILE AND DETAILS
FIRST BAPTIST CHURCH OF GUILFORD

TAX MAP 42 BLOCK 16 PARCEL A PARCEL 227 & 9
6TH ELECTION DISTRICT 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

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER
10/17/07
ROBERT H. VOGEL, PE No.16193

DESIGN BY:	RHV
DRAWN BY:	MAN/DZ
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W.O. NO.:	04-67

ADDITIONAL SUPPLEMENTAL SHEET
SHEET 20 OF 20

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 10/30/07
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 11/1/07
DIRECTOR	DATE 11/2/07

REVIEWED FOR HOWARD S.C.D. & MEETS TECHNICAL REQUIREMENTS

USDA-NATURAL RESOURCES CONSERVATION SERVICE	DATE
HOWARD S.C.D.	DATE

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

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER	DATE 10-12-07

BY THE ENGINEER:

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

SIGNATURE OF ENGINEER ROBERT H. VOGEL, P.E.	DATE 10/17/07

SDP-05-11