

CHECK LIST FOR SUBMISSION OF
"COMBINED SWM DEVELOPMENT
AND IMPROVEMENT PLAN"

- Plan title shall be “Stormwater Management Development and Improvement Plan”
- All of the information provided in SWM concept plan
- Comments received by review agencies during the concept plan
- Determination of final site layout and acreage of total impervious area onsite.
- Proposed topography
- Proposed drainage areas at all points of discharge from the site.
- Proposed SWM volume requirements for ESD targets and quantity control.
- The location and size of ESD practices used to the MEP and all nonstructural, alternative surfaces, and micro-scale practices used.
- Proposed hydrology analysis for runoff rates, storage volumes, and discharge velocities.
- SWM design details and specifications.
- Discharge calculations demonstrating stable conveyance of runoff off site.
- Preliminary erosion and sediment control plans showing LOD, sensitive areas, buffers, and forest preservation, proposed phasing, construction sequencing, proposed practices, and stabilization techniques.
- An overlay plan showing the location of SWM ESD practices and proposed erosion and sediment controls.
- A narrative to support the site development design and demonstrate that ESD will be achieved to MEP.

- Development detail and site data including site area, disturbed area, new impervious area, and total impervious area.
- Existing and proposed topography.
- Existing and proposed drainage areas.
- Representative Cross sections and details (existing and proposed structure elevations and water surface elevations).
- --The locations of existing and proposed structures.
 - Construction specifications.
 - Operation and maintenance plans.
 - As-Built design certification block.
 - Inspection schedule.
 - Easements and right of way.
 - Certification by the owner/developer that all construction will be done according to the plan.
 - Final erosion and sediment control plans.
 - SWM Facility sizing table.

Stormwater management design report including:

- A narrative to support the final design and demonstrate that ESD will be achieved to MEP.
- Table showing ESD and Unified Sizing Criteria.
- Hydrology and hydraulic analysis of the stormwater management system for applicable sizing criteria. -
- Final sizing calculations for stormwater controls including drainage area, storage, discharge points and Final analysis of stable conveyance to downstream discharge points.
- Geotechnical investigations report including soil maps, borings, and site-specific recommendations.

APPLICATION TYPE**IMPROVEMENT AND SWM DEVELOPMENT PLANS
FOR****NAME OF PROJECT****FREDERICK BAPTIST CHURCH****BATCH STAMP AREA**

Reviewed in accordance with local County requirements. Frederick County assumes no liability for two (2) years after the last date shown above. The project must be under construction before approval expiration to be considered active. Otherwise, resubmittal of plans, including applicable fees, must be made to Development Review for resubmittal. Fees for resubmittal cannot be waived.

GENERAL CONSTRUCTION NOTES

- All construction on these plans shall be performed in accordance with Frederick County Specifications and Standard. Secondly, construction shall meet the Book of Standards, Highway and Standardized Structures and Standard Specifications for Construction and Materials by Maryland Department of Transportation State Highway Administration; 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control by Maryland Department of the Environment (Water Management Administration), Natural Resources Conservation Service, and Maryland Association of Soil Conservation Districts; 2007 Stormwater Management Act and 2000 Maryland Stormwater Design Manual Volumes I & II, per Maryland Department of the Environment (Water Management Administration), unless otherwise specified.
- The location of existing utilities shown is approximate only. Contractor shall verify the existence, location and depth of any utilities and shall notify the engineer of any discrepancy prior to beginning work.
- Contractor shall be responsible for notifying the engineering office of Terra Solutions Engineering, LLC at 301-578-9842 in the event of any discrepancies in the plans or in the relationships of finished grades to existing grade prior to beginning work.
- Contractor shall be responsible for maintenance of traffic on any existing roads and installation of proposed signs and pavement markings along proposed roads in accordance with Maryland State Highway Administration (*Maryland Manual on Uniform Traffic Control Devices*) standards.
- The contractor shall note that in case of a discrepancy between the scaled and figured dimensions shown on these plans, the figured dimensions shall govern.
- It shall be distinctly understood that the failure to mention specifically any work which would normally be required to complete the project, shall not relieve the contractor of his responsibility to perform such work.
- The contractor shall notify the following at least two working days before starting any construction:
 Potomac Edison.....301-695-5700
 Verizon (telephone).....301-275-2355
 Frederick Cos.....301-662-2151
 Frederick County Environmental Compliance Section (ECS).....301-600-3507
 Comcast (cable).....301-662-6822, ext. 133
 Miss Utility.....1-800-257-7777
- All existing paving disturbed by the contractor shall be replaced to the same thickness according to Frederick County specifications.
- All rip-rap shall be loose-laid stone. Rip-rap placed at storm drain outfalls in existing swales shall be placed so as to completely line the existing swale with only the minimum possible grading or shaping of the swale.
- Inlets in swales shall be constructed level at the elevation given in the structure schedule or profile. Inlets on grade shall be adjusted so the grade on the top slab matches the grade of the curb.
- Terra Solutions Engineering, LLC is not responsible for the contractor's means or methods for construction, including but not limited to the contractor's utilization of men, materials, equipment or safety equipment. In the performance of any work for this construction, the contractor assumes all responsibility for performing the work correctly, safely and in conformance with all federal, state and local code and/or regulatory requirements.
- Certified areas in Frederick County are located within the Monocacy Valley region which is historically considered to contain subsurface limestone formations with inherent solution cavities commonly referred to as sinkholes. Terra Solutions Engineering, LLC recommends the party responsible for construction of this development retain the services of a professional geotechnical engineer to investigate the site's suitability for construction and make recommendations for site development and corrective measures if subsurface conditions affecting the site are discovered.
- Any attempts to estimate costs associated with rock-handling/removal and/or subsurface conditions must be based on geotechnical reports and recommendations. Geotechnical reports may include information pertinent to the development of the site which is not included on the plans. The contractor must consult any existing geotechnical and other consultant's reports in conjunction with this set of plans.
- All construction shall conform to the State of Maryland Handicapped Code and the Americans with Disabilities Act (ADA).
- Placement of any work such as curb, gutter, sidewalks, driveway aprons, etc. shall be commenced only after the installation of all utilities including gas lines, electrical lines, street light conduits, television cable, water and sewer lines and roof drains, etc., are in place.
- These plans are for civil site construction only. See A.S.M.E.P. plans for all other elements. Building services (gas, CATV, electric, telephone) and roof drains are not part of these plans.
- Safe and legal disposal of demolished items is the contractor's responsibility.

BASIC STORM DRAIN NOTES:

EFFECTIVE DATE: JANUARY 1, 2002

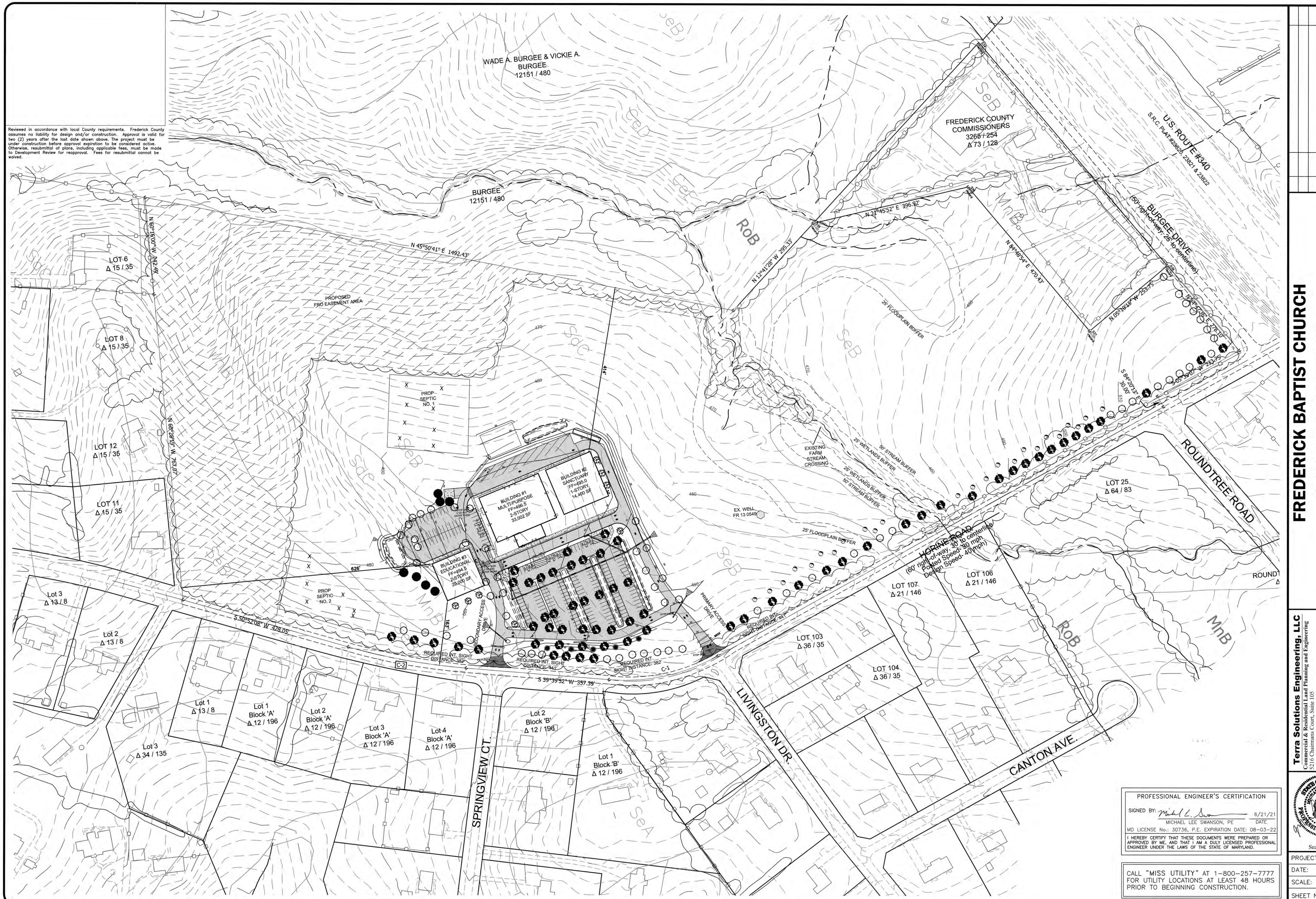
- Unless otherwise noted, the following stormdrain materials may be used as substitutes for one another:
 - Aluminized, Type 2 coated spiral-ribbed corrugated metal pipe (3/4" x 3/4" x 7-1/2" corrugations) and labeled as "ALCMP-SR" on the plans with Gage identified.
 - Reinforced Concrete Pipe - labeled as "RCP" on plans with Class identified.
 - Smoothbore, high-density polyethylene pipe meeting the specifications of AASHTO M294, Type S (Examples include Hancor HI-Q, ADS N-12 or an approved equivalent) and labeled as "HDPE, Type S" on plans.
- All backfill to be per the pipe manufacturer's specifications at a minimum. Typical backfill shall be suitable material, such as free-draining sand and gravel conforming to ASTM D232, Class I, II, or III material and be placed in lifts as necessary and compacted to 95 percent minimum dry density according to AASHTO-T193 minimum (per AASHTO-T180 in road right-of-way areas).
- In areas of known karst (limestone formations), all stormdrain connections shall be watertight. Storm-drain connection examples are as follows:
 - Watertight Aluminized, Type 2 corrugated metal pipe shall use rubber O-ring gaskets, rubber sleeve gaskets, strip gasket or geotextile wrap in conjunction with an appropriate band connector.
 - Reinforced concrete pipe shall utilize rubber O-rings, rubber strip gaskets or other acceptable watertight practice.
 - Smoothbore, high-density polyethylene pipe shall utilize watertight sleeves and rubber gaskets. Examples include: Hancor Titeline, ADS ProLink-WT or an approved equivalent.
- Basic pipe materials allowed are as follows:
 - All corrugated metal pipe shall be Aluminized, Type 2 coated and labeled as "ALCMP" Type 2 on the plan views and profiles.
 - High density pipe shall be smoothbore meeting the specifications of AASHTO M252, Type "S" for 4" to 10" pipe & meeting the specification of AASHTO M294, Type "S" for 12" pipe and larger, and shall all be labeled as HDPE on plan views and profiles.

DETAILED PROJECT LOCATION**TAX MAP 084, PARCEL 12****SITUATED ALONG HORINE ROAD, JEFFERSON
FREDERICK COUNTY, MARYLAND****ATTACHMENT "E"****PRECAST/PRESTRESSED MATERIAL ACCEPTANCE POLICY**

EFFECTIVE DATE: JANUARY 1, 2002

REVISED FEBRUARY 6, 2003 AND SEPTEMBER 23, 2003

REVISERED FEBRUARY 6, 2003 AND SEPTEMBER 23, 2003



FREDERICK BAPTIST CHURCH

**Situated along the North and West Side of Horine Road
Jefferson Election District No. 14
Brunswick Planning Region**

IMPROVEMENT AND SWIMMING POOL ANSWERS

IMPROVEMENT AND SWM DEVELOPMENT PLANS - OVERALL PLAN

Terra Solutions Engineering, LLC
Commercial & Residential Land Planning and Engineering
116 Chairmans Court, Suite 105
Federick, MD 21703

Phone: 301-378-9842 Email: TerraSolutionsEngineering@gmail.com

ST. L. O. PROPS.

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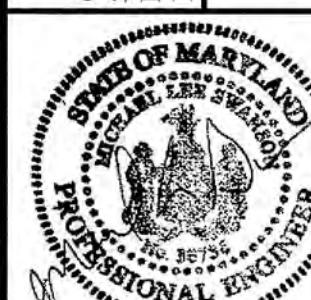
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PROFESSIONAL ENGINEER'S CERTIFICATION	
SIGNED BY:	<u><i>Michael L. Swanson</i></u>
	6/21/21
MICHAEL LEE SWANSON, PE DATE	
MD LICENSE No.: 30736, P.E. EXPIRATION DATE: 08-03-22	
HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.	

CALL "MISS UTILITY" AT 1-800-257-7777
FOR UTILITY LOCATIONS AT LEAST 48 HOURS
PRIOR TO BEGINNING CONSTRUCTION.



Seal & Signature

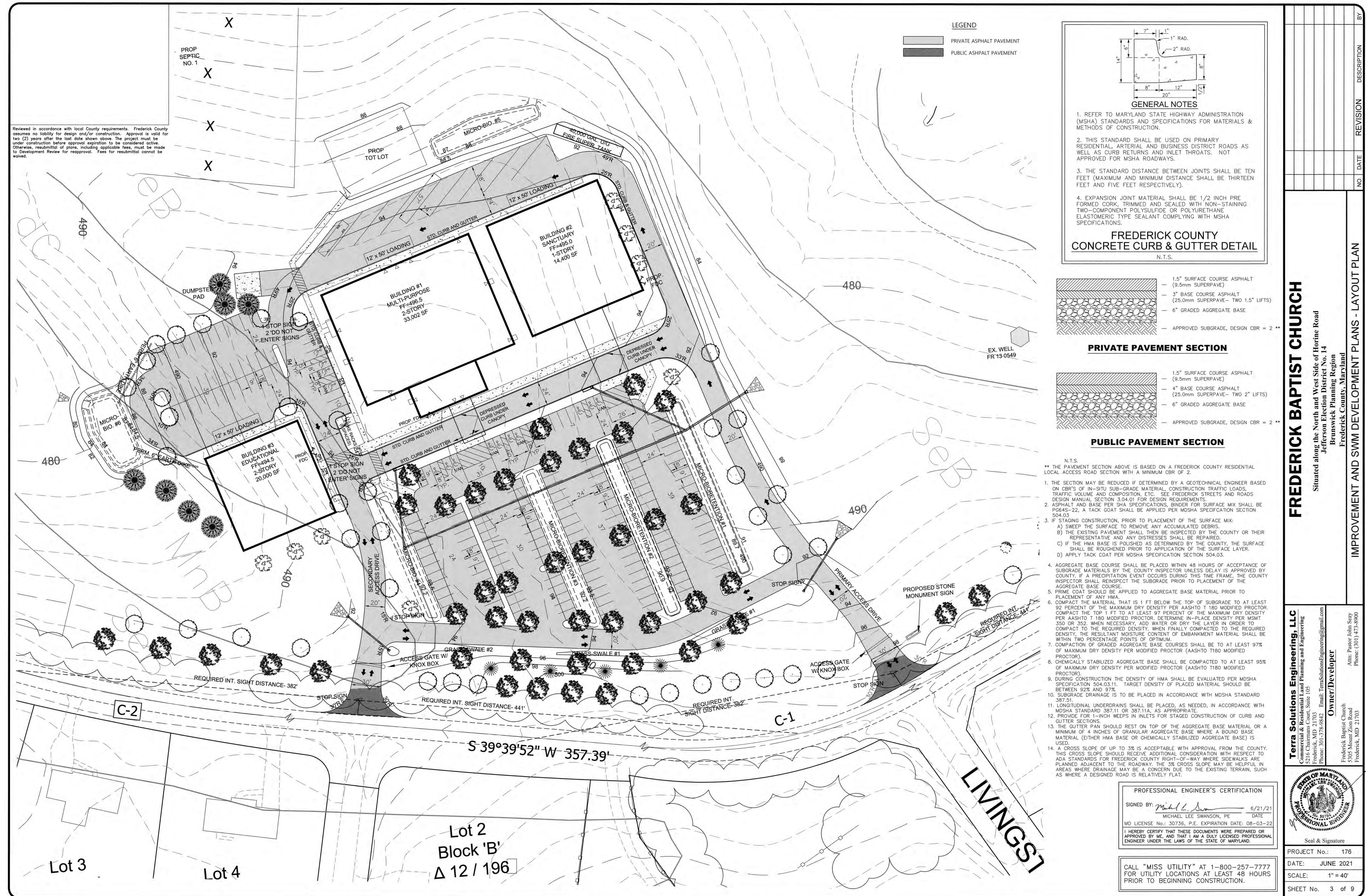
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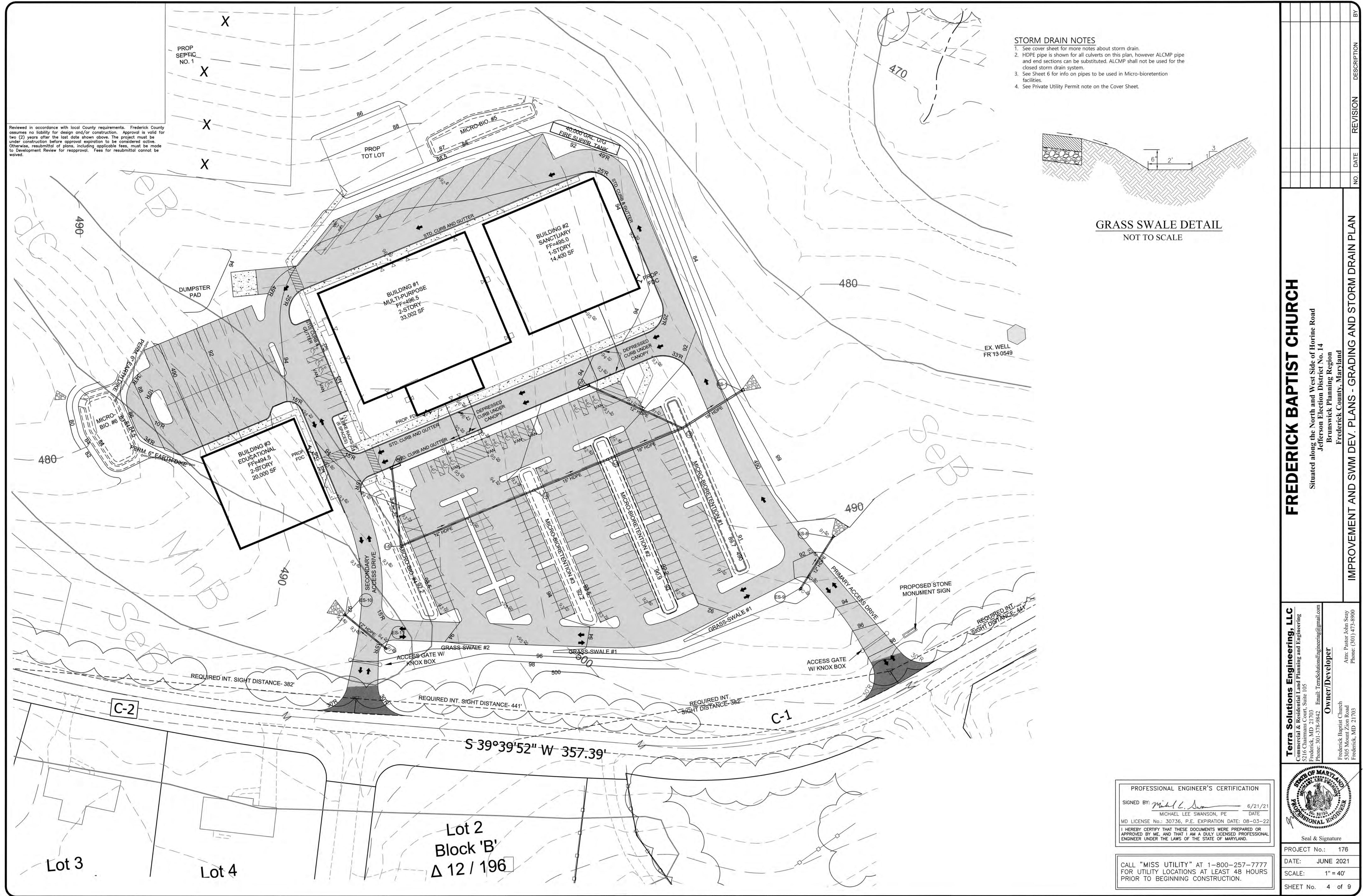
DATE: JUNE 20

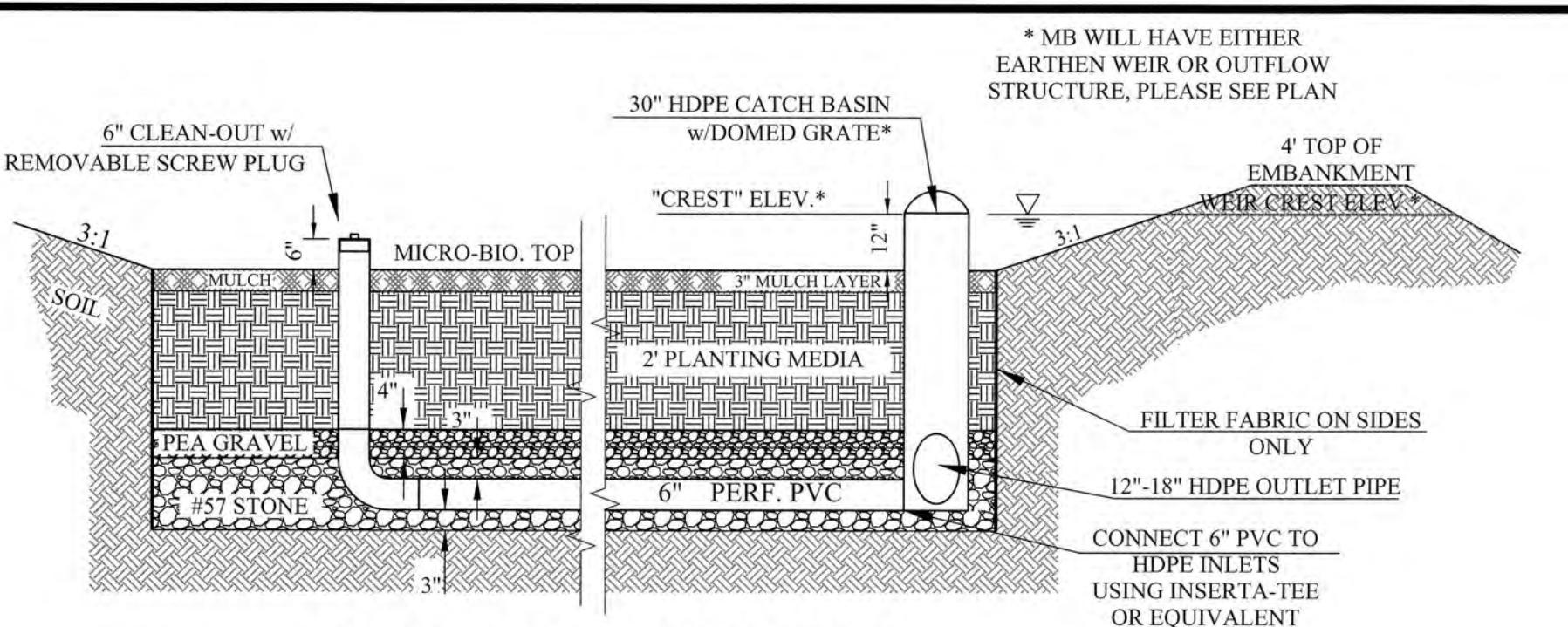
SCALE: 1" = 100'

SHEET No. 3 of

STREET NO. 2 01







MICRO-BIORETENTION DETAIL

NOT TO SCALE

ESD FACILITY	MB TOP ELEV. * (ft)	BIO-MEDIA (SOIL) DEPTH (inches)	OUTLET CREST ELEV. (ft) **	BERM/ TOP ELEV. (ft)	FILTER BED SURFACE AREA (sf)	NUMBER OF COLUMN A (SHRUBS) ~ 1 PER 50 sf ***	NUMBER OF COLUMN B (HERB.) ~ 1 PER 25 sf ***
MICRO-BIO. #1	489.7	24	490.7	491.0	1,611	32	64
MICRO-BIO. #2	490.9	24	491.9	492.2	1,611	32	64
MICRO-BIO. #3	492.2	24	493.2	493.5	1,425	29	57
MICRO-BIO. #4	492.2	24	493.2	492.5	1,157	23	46
MICRO-BIO. #5	487.0	24	488.0	488.5	1,521	30	61
MICROBIO #6	483.0	24	484.0	484.5	1,631	33	65

* THE TOP OF THE MICRO-BIO. IS THE TOP OF THE 3" MULCH LAYER

** MICRO-BIOS #1-#4 OUTLET CREST IS THE TOP OF STAND PIPE OR BOTTOM OF DOME GRATE, SEE DETAIL ABOVE. MICRO-BIO. #5 & #6 HAVE THE CREST AS AN EARTHEN WEIR THROUGH THE BERM.

*** THE MINIMUM TOP OF BERM, FILL, OR TOP OF EXCAVATION, HIGH ENOUGH TO ALLOW FREEBOARD FOR LARGER STORMS.

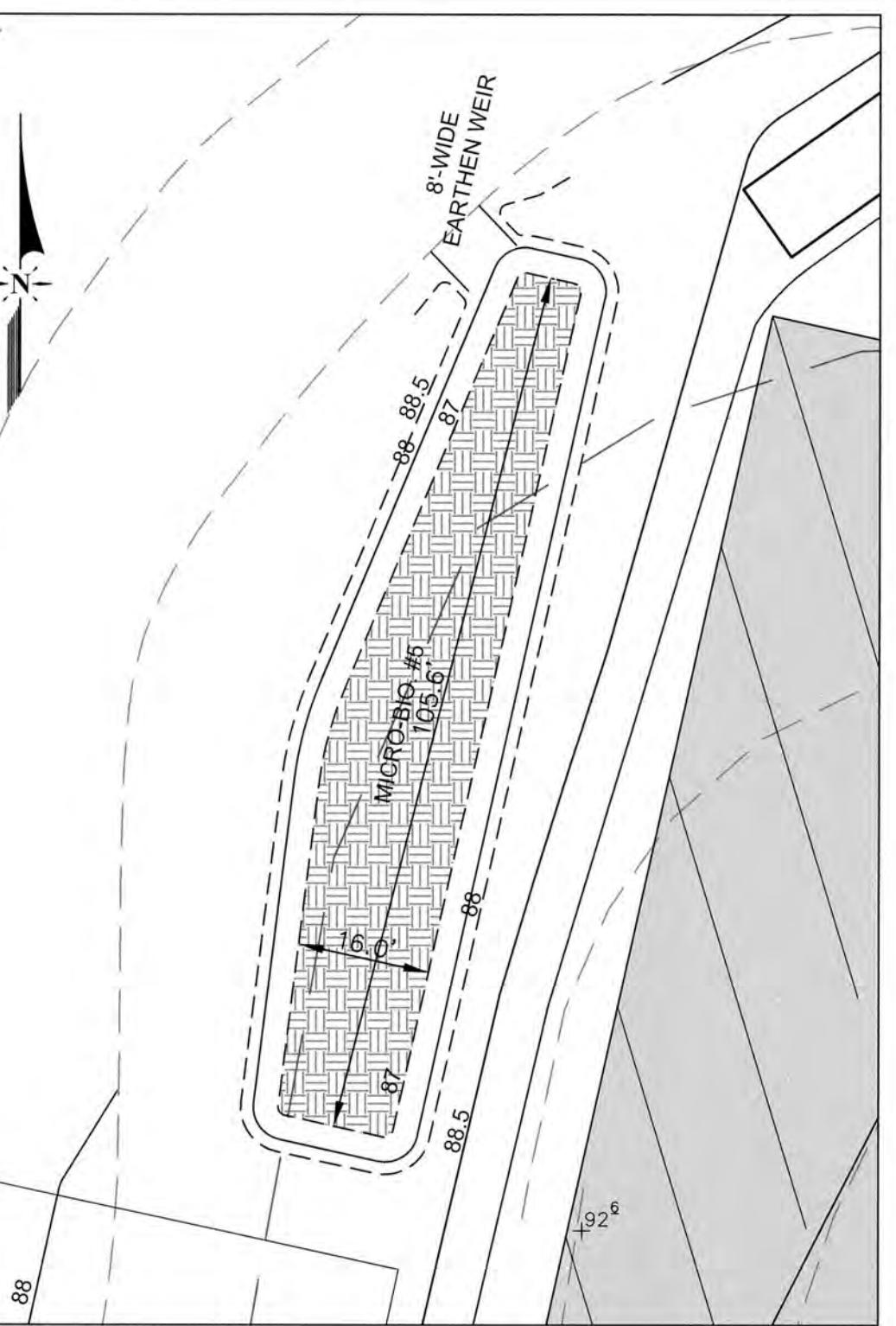
**** THREE VARIETIES OF EACH TYPE (A AND B) SHALL BE CHOSEN. (SO EACH MICRO-BIO. SHALL HAVE SIX DIFFERENT VARIETIES OF PLANTINGS), SEE THIS SHEET FOR LIST OF ACCEPTABLE PLANTINGS

NOTE: SEE APPENDIX A IN THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, FOR MORE INFORMATION. EACH MICRO-BIO. SHALL HAVE SIX DIFFERENT VARIETIES, THREE FROM EACH COLUMN. SUBSTITUTIONS MAY BE ALLOWED AFTER ENGINEER REVIEW.

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

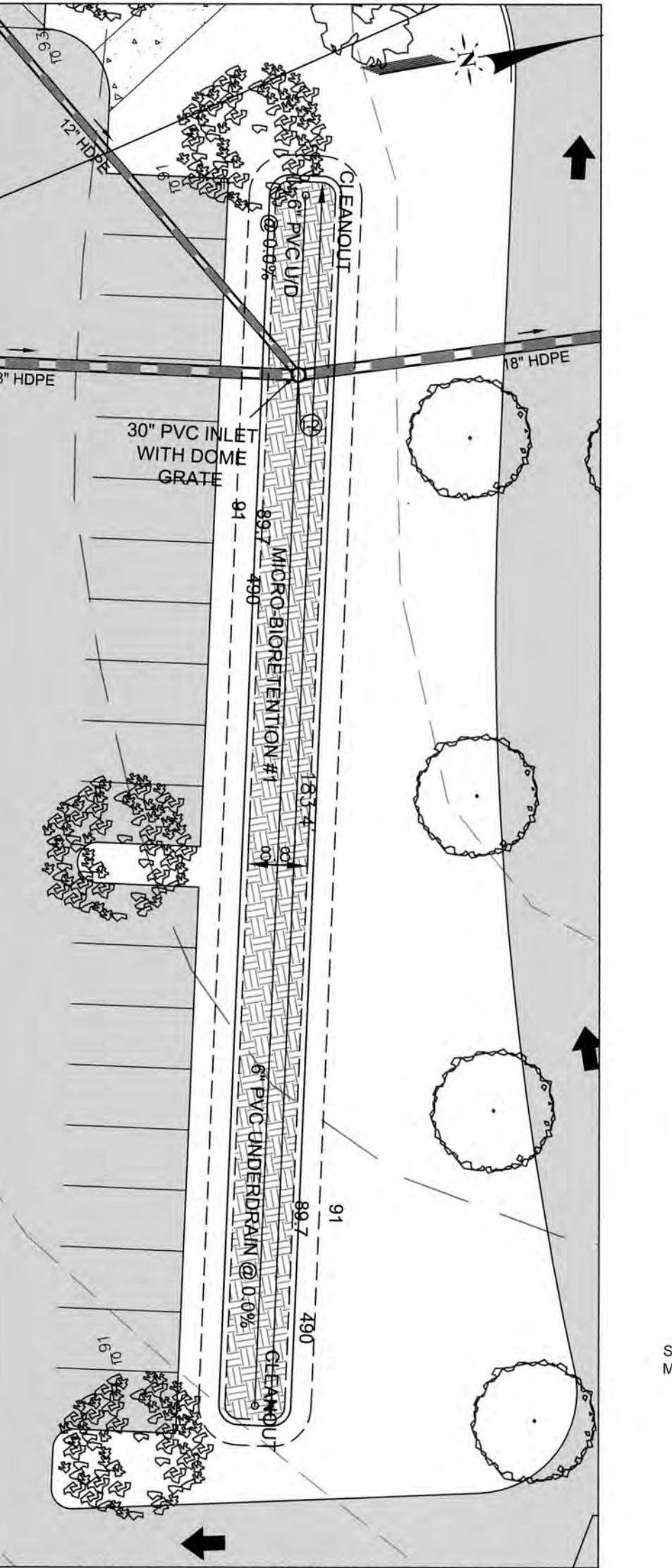
Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2" to 4" deep]	loamy sand (60 - 65%) & compost (35 - 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTMD 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile	n/a	PE Type 1 nonwoven	
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" TO 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
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) <i>not using previously approved State or local standards</i> requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACT Code 350.R/89, vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

MICRO-BIO. SPECIFICATIONS



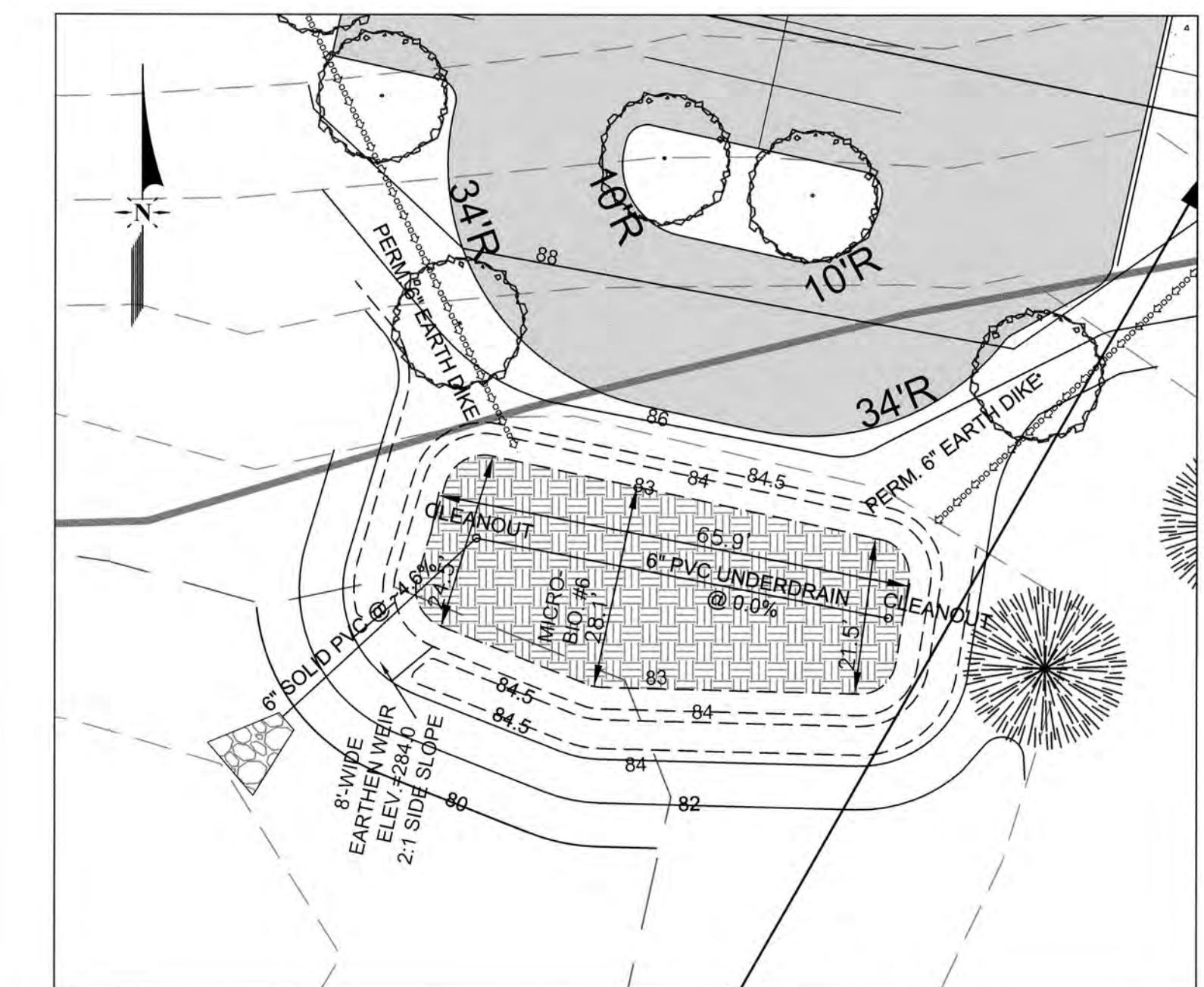
MICRO-BIORETENTION #5 PLAN

SCALE- 1"=20'



MICRO-BIORETENTION #1 PLAN

SCALE- 1"=20'



MICRO-BIORETENTION #6 PLAN

SCALE- 1"=20'

COLUMN A- SHRUB OPTIONS IN No. 3 (3 GALLON) CONTAINER:

BOTTLEBRUSH BUCKEYE
BUTTONBUSH
HIGHBUSH BLUEBERRY
INKBERRY

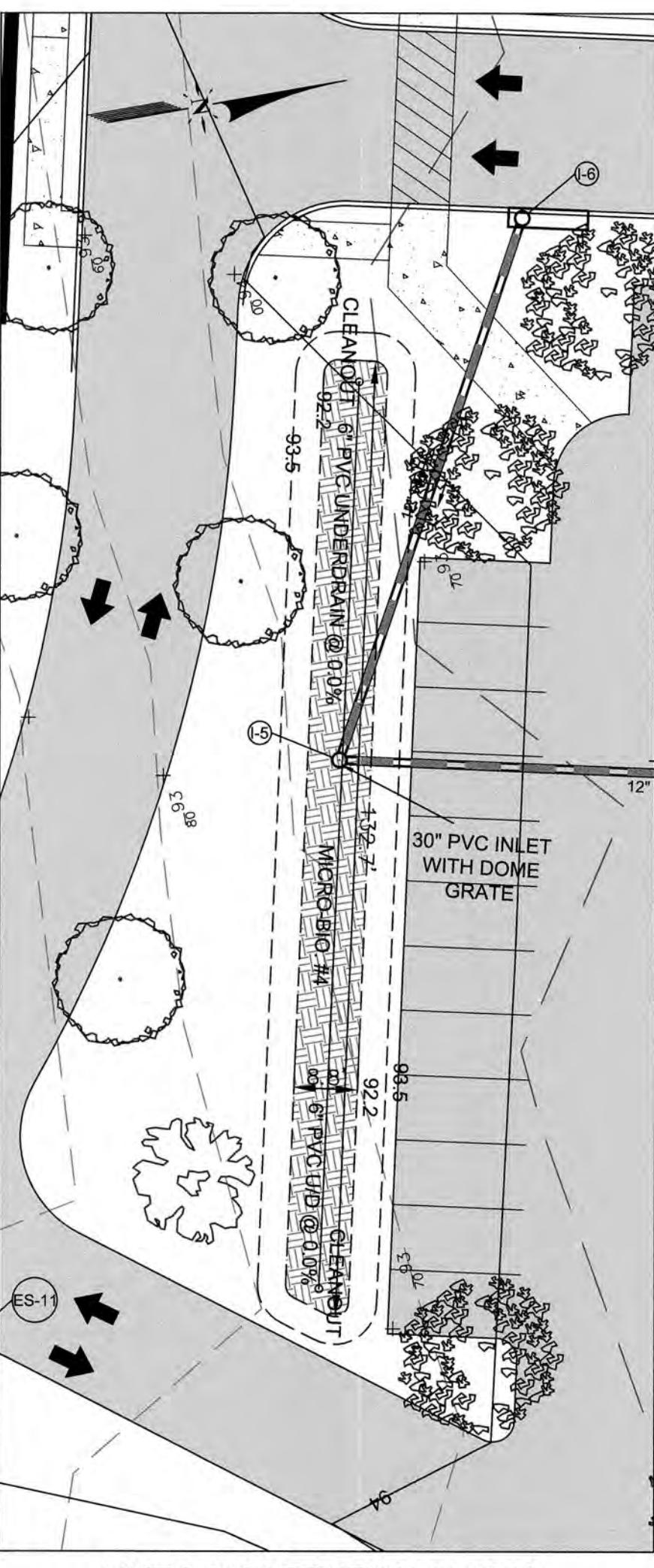
WINTERBERRY
ARROWWOOD
SPICEBUSH
BAYBERRY

COLUMN B- HERBACEOUS OPTIONS IN No. 1 (1 GALLON) CONTAINER:

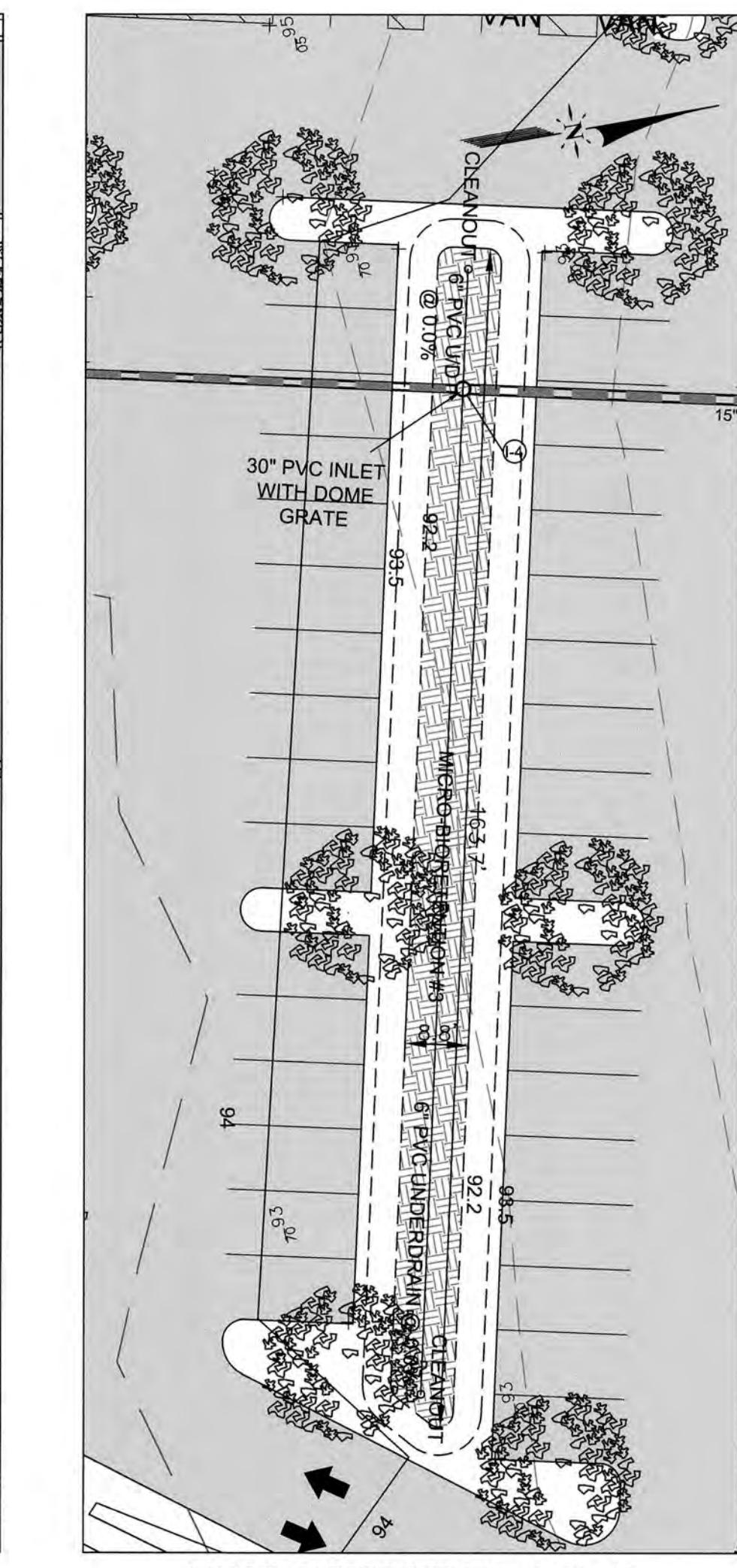
BROOKSIDE
JOE PYE WEED
THREE SQUARE BULRUSH
BLUE FLAG
CARDINAL FLOWER

SWITCHGRASS
BROOM PANIC GRASS
TALL CONEFLOWER
WOOLGRASS
NEW YORK IRONWEED

MICRO-BIORETENTION LANDSCAPING LIST

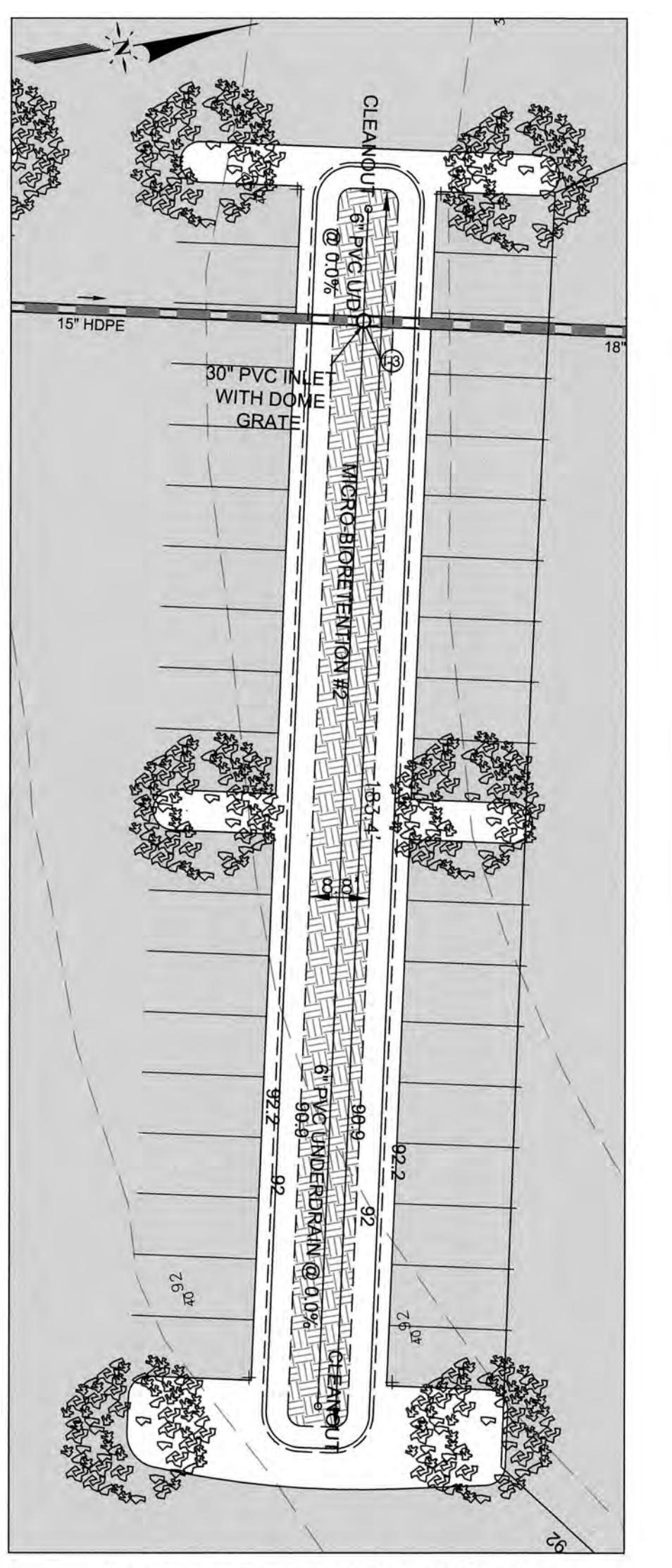


MICRO-BIORETENTION #4 PLAN



MICRO-BIORETENTION #3 PLAN

SCALE- 1"=20'



MICRO-BIORETENTION #2 PLAN

SCALE- 1"=20'

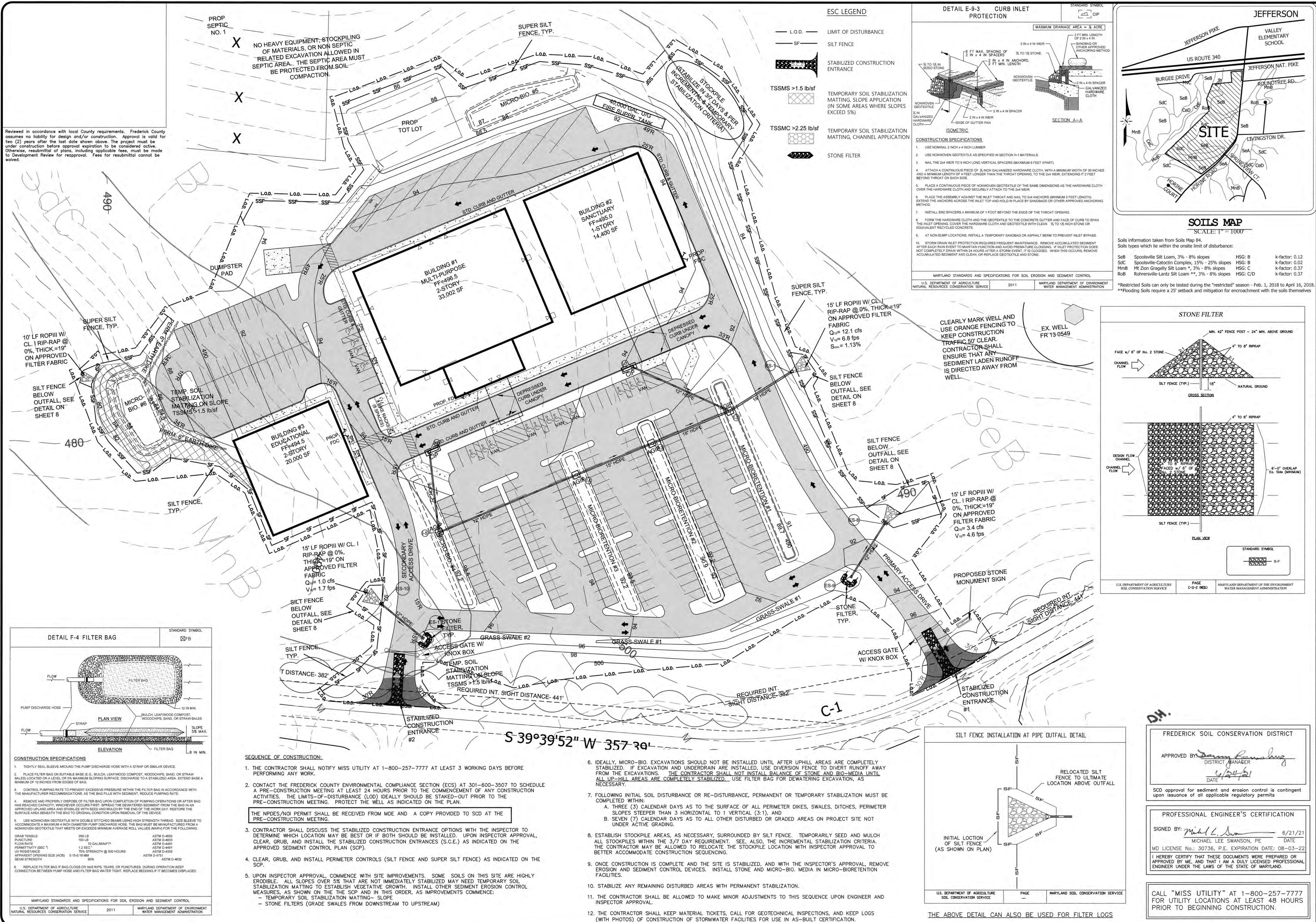
Facility Name and Number	Rooftop Disconnect, (Bldg #1)	Rooftop Disconnect, (Bldg #2)	Rooftop Disconnect, (Bldg #3)	Non-Rooftop Disconnect, (Main Entr.)	Non-Rooftop Disconnect, (Sec. Entr.)	Non-Rooftop Disconnect, (Bus Park.)	Non-Rooftop Disconnect, (North Drive)	Non-Rooftop Disconnect, (Ex. Horne Rd.)	Grass Swale #1	Grass Swale #2	Micro-Bio. #1	Micro-Bio. #2	Micro-Bio. #3	Micro-Bio. #4	Micro-Bio. #5	Micro-Bio. #6
Drainage Area to Facility:	0.22 acres	0.17 acres	0.17 acres	0.18 acres	0.13 acres	0.29 acres	0.78 acres	0.08 acres	0.74 acres	0.19 acres	0.53 acres	0.49 acres	0.40 acres	0.40 acres	0.64 acres	0.80 acres
Drainage Area Number:	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Post RCN:	96	98	98	91	98	94	72	98	63	63	85	87	91	83	87	87
Post Tc:	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.
Pe Target:	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches
Pe Provided:	0.4 inches	0.4 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	1.0 inches	0.18 inches	0.28 inches	2.4 inches	2.3 inches	2.3 inches	1.6 inches	1.3 inches	1.3 inches
Impervious Area Treated:	9,600 sf	7,200 sf	7,500 sf	6,714 sf	5,612 sf	12,619 sf	34,139 sf	3,647 sf	3,009 sf	638 sf	14,939 sf	15,693 sf	17,219 sf	17,297 sf	19,727 sf	23,908 sf
ESDv Provided:	304 cf	228 cf	594 cf	537 cf	444 cf	904 cf	916 cf	289 cf	63 cf	23 cf	2,929 cf	2,929 cf	2,598 cf	2,118 cf	2,511 cf	2,533 cf

Terra Solutions Engineering, LLC	
Commercial & Residential Land Planning and Engineering	
5216 Chiarman's Court, Suite 105	
Frederick, MD 21703	
Phone: (301) 378-9842 Email: TerraSolutionsEngineering@gmail.com	
Owner/Developer	
Frederick Baptist Church	
5305 Mount Zion Road	
Frederick, MD 21703	
Phone: (301) 473-8900	

PROFESSIONAL ENGINEER'S CERTIFICATION	
SIGNED BY: Michael L. Swanson, PE	
DATE: 6/21/21	
MD LICENSE NO.: 30736, P.E. EXPIRATION DATE: 08-03-22	
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.	
Seal & Signature	
PROJECT No.: 176	
DATE: JUNE 2021	
SCALE: 1" = 10'	
SHEET No. 6 of 9	

SITUATED along the North and West Side of Horne Road	
Jefferson Election District No. 14	
Brunswick Planning Region	
Frederick County, Maryland	
IMPROVEMENT AND SWM DEV. PLANS - SWM PLANS AND DETAILS	

NO.	DATE	REVISION	DESCRIPTION
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FREDERICK BAPTIST CHURCH

Situated along the North and West Side of Horine Road
Jefferson Election District No. 14
Brunswick Planning Region
Frederick County, Maryland

Frederick, MD 21703
Phone: 301-378-9842 Email: TerraSolutionsEngineering@gmail.com

Owner/Developer

Attn: Pastor John Seay
Phone: (301) 473-8900

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FREDERICK BAPTIST CHURCH

Situated along the North and West Side of Horine Road
Jefferson Elevation District No. 14
Frederick County, Maryland

IMPROVEMENT AND SWM DEVELOPMENT PLANS - ESC NOTES AND DETAILS

Owner/Developer: Terra Solutions Engineering, LLC

Attn: Pastor John Seay

Phone: (301) 378-5982

Fax: (301) 737-8900

Email: TerraSolutionsEngineering@gmail.com

Commercial & Residential Land Planning and Engineering

5216 Chairmans Court, Suite 105

Frederick, MD 21703

Phone: (301) 378-5982

Fax: (301) 737-8900

Email: TerraSolutionsEngineering@gmail.com

Seal & Signature

Seal of Maryland

PROFESSIONAL ENGINEER

Seal of Maryland

PROFESSIONAL ENGINEER

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