INDEX OF SHEETS

SHEET NO. TITLE TITLE SHEET GEOMETRY LAYOUT

SITE PLAN STORMWATER MANAGEMENT PROFILES STORMWATER MANAGEMENT DETAILS

EROSION AND SEDIMENT CONTROL PLAN EROSION AND SEDIMENT CONTROL NOTES EROSION AND SEDIMENT CONTROL DETAIL SHEET

13–15 POND CONSTRUCTION SPECIFICATIONS

BORING LOGS LANDSCAPE PLAN

WATERWAY CONSTRUCTION PERMIT NO.

Sediment, Stormwater, and Dam Safety Program

This PERMIT is granted subject to the following:

obtained from the Department in writing.



Maryland Department of the Environment

Water and Science Administration

Dam Safety Division

In accordance with §§5-501 through 5-514, et seq. of the Environment Article, Annotated Code of Maryland, permission is hereby granted to Howard County Government, Stormwater Management

as "the Owner" or "the Permittee", by the Maryland Department of the Environment, Dam Safety

Division ("the Department") for the Glenmar Pond #2 Dam Retrofit Project as shown on sheets 1-17

The site is located at 5322 Debbie Court, Ellicott City, on Patapsco River in Howard County, at latitude

GENERAL CONDITIONS

1. This Permit is valid only for use by the Permittee. Permission to transfer the Permit must be

Maryland Department of the Environment

Water and Science Administration

Permit # 18-MR-0010

Dam Safety Division

39.222846 degrees north, longitude – 76.799720 W degrees west, ADC map/grid: 4936/B5.

on plans prepared by Andrew McLean, P.E., McCormick Taylor, Inc. and approved by the Department

THIS PROJECT, LOCATED WITHIN THE GLENMAR SECTION 2 DEVELOPMENT IN ELLICOTT CITY, MD, IS CLASSIFIED AS A STORMWATER RETROFIT WITH THE GOAL OF REPLACING A DETERIORATING CMP SPILLWAY AND RISER AS WELL AS STABILIZATION AND RETROFIT OF THE EMBANKMENT AND OUTFALL PROPOSED FACILITY STORAGE IS DESIGNED TO ENSURE ALL PONDING IS MAINTAINED WITHIN THE HOWARD COUNTY PARCEL AND CLEAR OF THE SURROUNDING PRIVATE PROPERTIES WHILE PROVIDING SUFFICIENT FREEBOARD. OVERALL, POND DISCHARGES WILL BE REDUCED.

EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED THROUGHOUT THE DURATION OF THE PROJECT.

LEGEND

	PROPOSED MEDIAN BARRIER — — — ELECTRICAL HAND BOX – SIGNALS —	
	FLOW LINE — — — — —	
	STATE, COUNTY OR CITY LINES — — EXISTING TRAFFIC BARRIER — — — — PROPOSED FENCE LINE — — — — PROPERTY LINE — — — — — EASEMENT LINE — — — — — —	± ± -x - xx - xx - x - x -
	EXISTING ROADWAY	
	BASE OR SURVEY LINE	3) +50 32
	TRAVERSE POINT — — — — — — — — APPROXIMATE LIMITS	——180—
	LIMIT OF DISTURBANCE	
	EXISTING MAJOR CONTOURS — — EXISTING MINOR CONTOURS — —	
1	EXISTING PIPE/CULVERT EXISTING DROP INLET	
	WETLAND	
i	WATERS OF THE US	
	HEDGE /TREE LINE — — — — — — — — — — — — — — — — — — —	₩. ⊙
	LIGHT POLE	- \$-

BUSH /TREE TO BE REMOVED -----

DIRECTOR OF RECREATION AND PARKS

DEPARTMENT OF RECREATION AND PARKS, HOWARD COUNTY, MD

REVIEWED FOR HOWARD SOIL CONSERVATION

DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT

CONTROL BY THE HOWARD SQIL CONSERVATION DISTRICT

HOWARD COUNTY

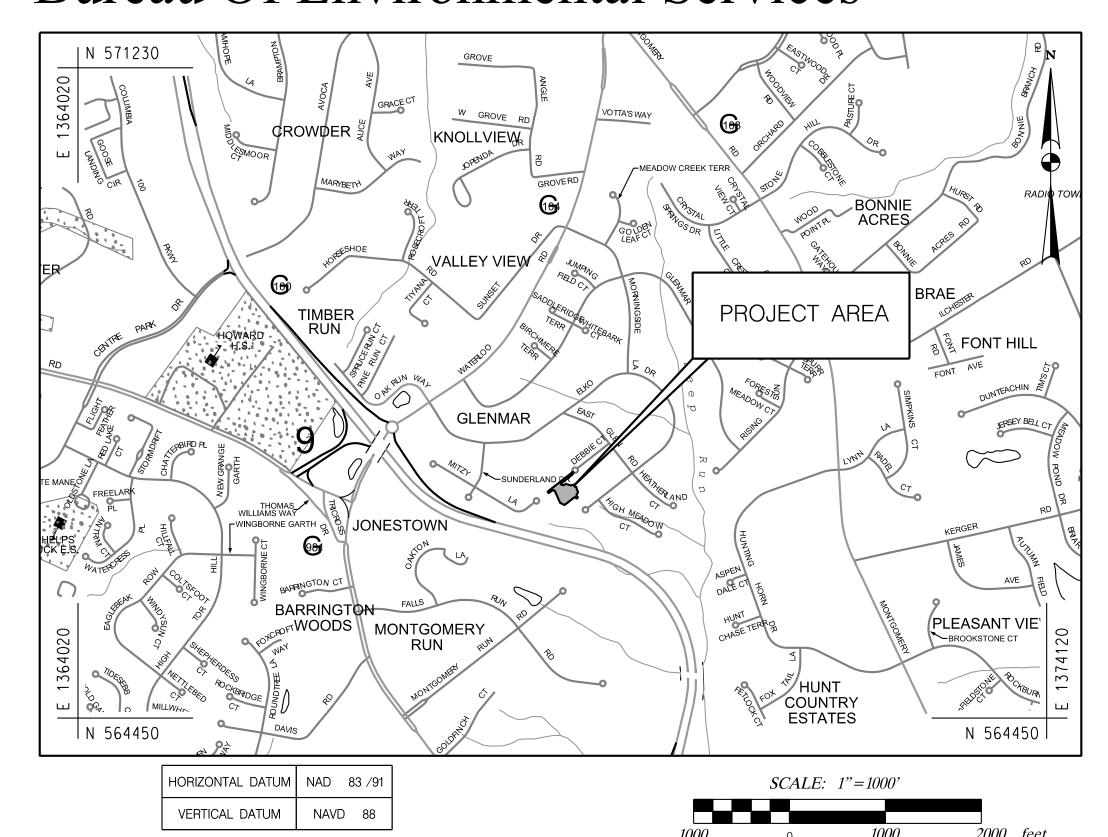
Capital Project #D-1159

Glenmar Pond #2 Principal Spillway Replacement Project

MDE DAM #577

NID #MD00577

Storm Water Management Division Bureau Of Environmental Services



PROFESSIONAL CERTIFICATION

THEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED

DESIGN CERTIFICATION

THEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS. THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT 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

NUMBER

GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT HOWARD COUNTY CAPITAL PROJECT #D-1159 HSCD #: EP-17-40 **MD DAM NO. 577**

TITLE SHEET

SHEET

SHOWN

SCALE

1 OF 17

OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 49427, EXPIRATION DATE: 6 /13 /2020

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE 'AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION PRIOR TO BEGINNING THE PROJECT. I SHALL ENGAGE A MARYLAND REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION, AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE.

GENERAL NOTES

DAYS PRIOR TO ANY WORK BEING DONE.

SAME PARTIES PRIOR TO DEMOBILIZING.

WERE PROVIDED BY AB CONSULTANTS, INC.

12. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS

FOR SEDIMENT, NUTRIENTS, BACTERIA, AND METALS,

HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MDSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.

2. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) WORKING

3. THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE

4. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS /BUREAU

OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AND MDE DAM SAFETY DIVISION AT (410) 537-3655 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK

MDE-DSD, AND CONTRACTOR. A POST-CONSTRUCTION MEETING SHALL BE SCHEDULED WITH THE

6. THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH

7. WETLANDS AND WATERS OF THE US WERE DELINEATED BY McCORMICK TAYLOR - FEBRUARY 2017.

COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION

SOURCES AND SHALL BE VERIFIED BEFORE STARTING CONSTRUCTION. HOWARD COUNTY DOES NOT

10. THE CONTRACTORS SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES

11. SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS. THE CONTRACTOR SHALL NOTIFY McCORMICK TAYLOR IMMEDIATELY TO RESOLVE THE SITUATION.

14. SITE DEVELOPMENT DETAILS ARE REFERENCED FROM THE AS-BUILT PLANS FOR GLENMAR - SECTION

AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTORS'S

OPERATION SHALL BE REPAIRED IMMEDIATELY. ALL UTILITIES SHALL HAVE A CLEARANCE BY A

13. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES,

TWO (F-84-200), APPROVED JUNE 6, 1984, AND MONTGOMERY MEADOWS - SECTION ONE AREA

15. THERE ARE NO JURISDICTIONAL WETLANDS OR WATERWAYS FOR THIS PROJECT. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT TRACKING NUMBER FOR THIS PROJECT IS AI#156245.

16. THE PROJECT SITE IS LOCATED WITHIN THE PATAPSCO WATERSHED WHICH HAS NO TIER II STREAM

17. CONTRACTOR SHALL PROVIDE STRUCTURAL SHOP DRAWINGS FOR ALL PRECAST OR PRE-FABRICATED

DATE APPLIED

NOT REQUIRED

8 /29 /2017

30% 04 /17 /2017 65% 06 /21 /2017

90%

OWNER'S DEVELOPER'S CERTIFICATION

02 /09 /2018

06 /19 /2018

Final 08/28/2018 Final 08/29/2018

DATE APPROVED

NOT REQUIRED

30% 05 /11 /2017

65% 07 /11 /2017

90% 03 /16 /2018

11 / 27 /2018

07 /12 /2018

SEGMENTS REQUIRING THE IMPLEMENTATION OF MARYLAND'S ANTIDEGRADATION POLICY. HOWEVER. THE PATAPSCO WATERSHED HAS BEEN IDENTIFIED AS IMPAIRED AND IS CURRENTLY UNDER A TMDL

8. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND McCORMICK TAYLOR DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR

9. THE EXISTING INFORMATION SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE

GUARANTEE THE COMPLETENESS OR THE CORRECTNESS OF THE SHOWN INFORMATION.

MINIMUM OF 6 INCHES VERTICALLY AND A MINIMUM OF 5 FEET HORIZONTALLY.

SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.

STRUCTURES FOR ENGINEER'S APPROVAL PRIOR TO CONSTRUCTION.

APPROVALS/PERMITS

Al #156245

18-MR-0010

EP-17-40

IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. BENCHMARKS SHOWN HEREON

AND SCHEDULE A PRE-CONSTRUCTION MEETING WITH OWNER(S), ENGINEER-IN-CHARGE (EIC),

5. SURVEY OF THIS SITE WAS PERFORMED BY AB CONSULTANTS, INC - DECEMBER 2016 AND

AGENCY

MDE JOINT PERMIT APPLICATION

MDE DAM SAFETY

HOWARD SOIL

CONSERVATION DISTRICT

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

CHIEF BUREAU OF ENVIRONMENTAL SERVICES

MANAGEMENT DIVISION

Visty P. Dalal

Sr. Regulatory & Compliance Engineer

509 South Exeter Street 4th Floor Baltimore, Maryland 21202 (410) 662-7400

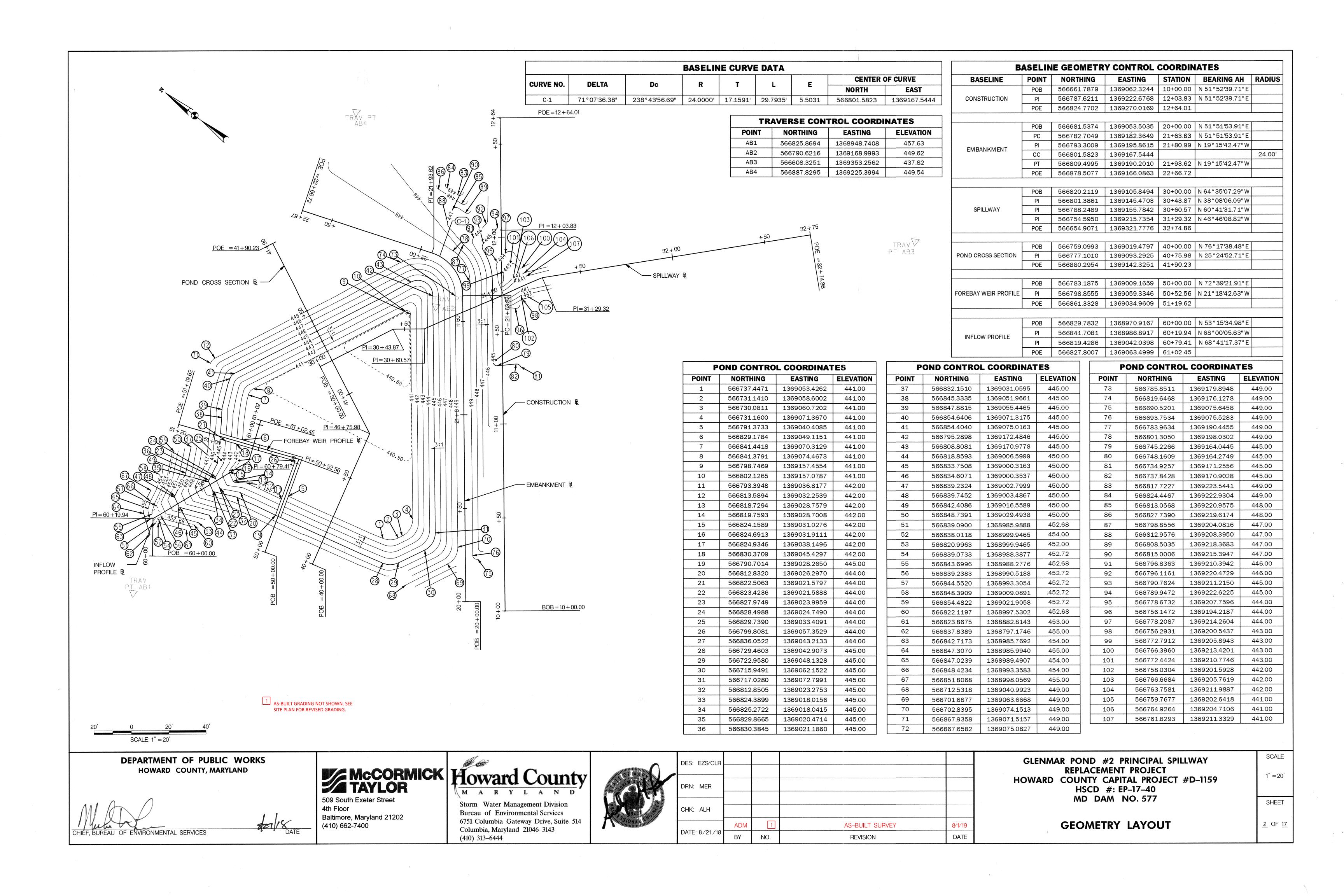
MARYLAND

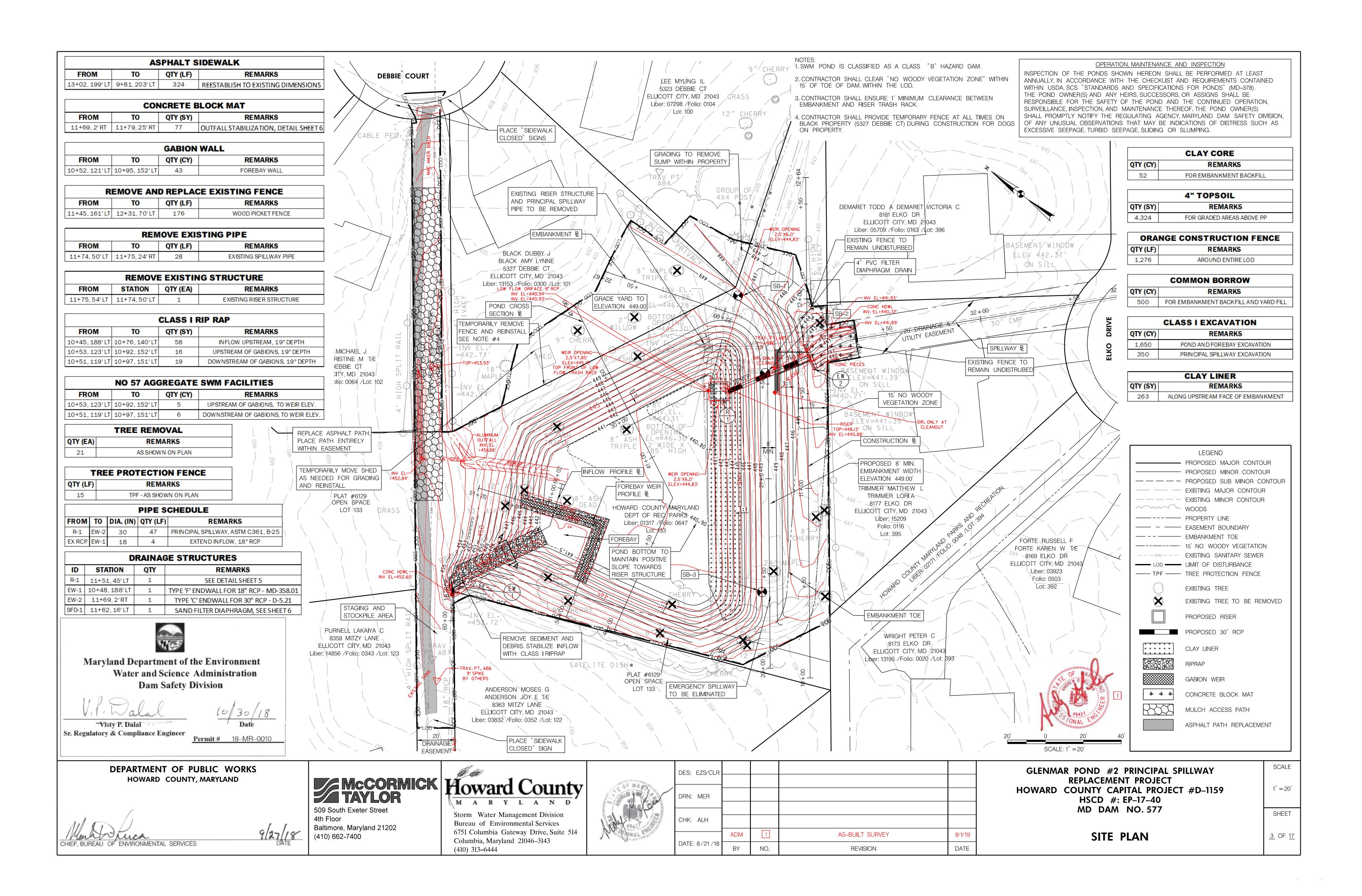
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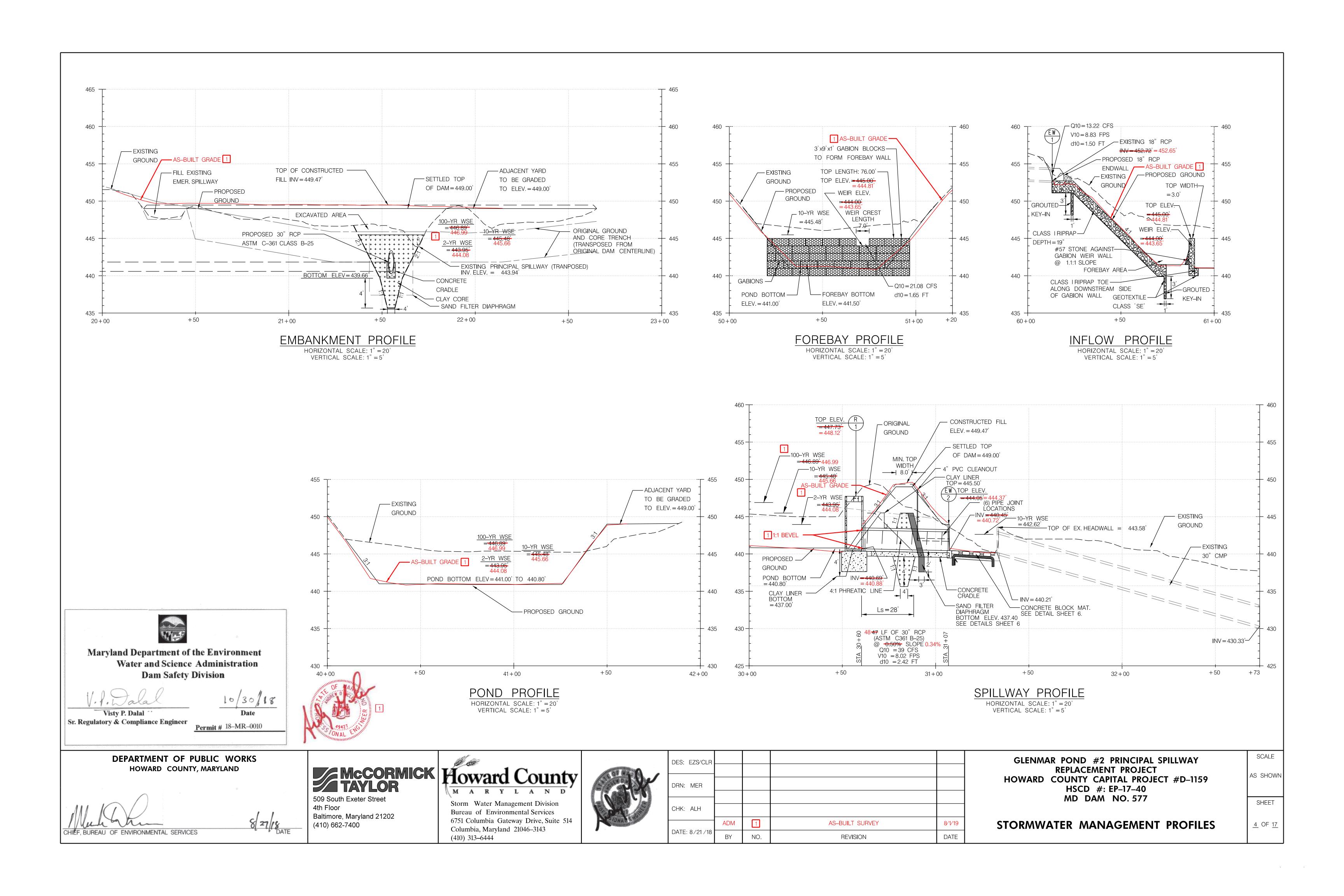
Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046–3143 (410) 313–6444

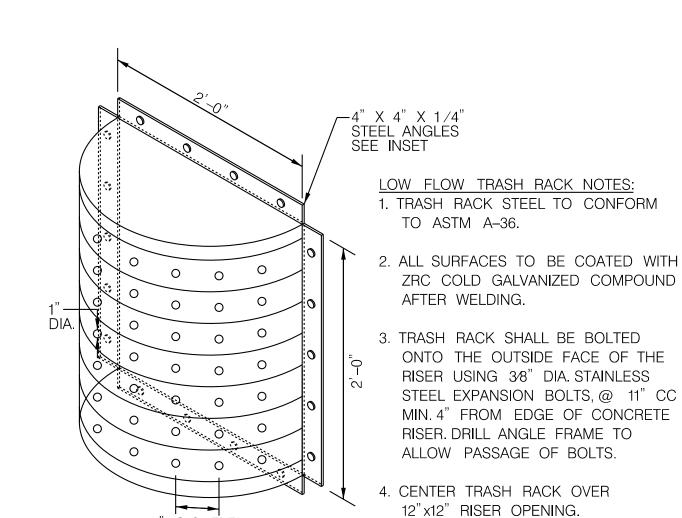


DES:	DES: EZS/CLR					
	DRN: MER					
CHK	CHK: ALH					
DAT	DATE 0 (04 (10	ADM	1	AS-BUILT SURVEY	8/1/19	
	DATE: 8/21/18	BY	NO.	REVISION	DATE	









NOT TO SCALE

RISER CONSTRUCTION NOTES

LOW FLOW TRASH RACK DETAIL

- 1. RISER STEPS SHALL FOLLOW DETAIL G-5.21 FOR MANHOLE AND INLET STEPS
- 2. SHA MIX NO.3 CONCRETE SHALL BE USED AND SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITION OF ACI 301 AND ACI 318.
- 3. RISER STRUCTURE SHALL BE DESIGNED IN ACCORDANCE TO LOADING SPECIFIED IN LATEST EDITIONS OF ASTM C857 AND ASTM C890.
- 4. RISER STRUCTURE SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITIONS OF ASTM C858 AND MARYLAND NRCS POND CODE MD-378.
- 5. RESILIENT CONNECTORS BETWEEN MANHOLE STRUCTURES, PIPES AND LATERALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF LATEST EDITIONS OF ASTM C923.
- 6. INVERT SHALL BE APPROVED SHA MIX NO.3 CONCRETE. INVERT TO SLOPE DOWN TOWARD OUTLET AS SHOWN ON PLAN, OR AS DIRECTED BY ENGINEER.
- 7. REFER TO DETAIL G-2-9 FOR CONCRETE PROJECTION COLLAR.

4" O.C. (TYP)

- 8. REFER TO DETAIL D-3.91 FOR SIDEWALK FRAME AND COVER FOR MANHOLE COVER.
- 9. FIRST BARREL JOINT OF CONCRETE PIPE SHALL HAVE A WATERTIGHT CONNECTION AND BE PLACED LESS THAN 4 FEET FROM THE RISER. THIS SECTION OF THE BARREL SHALL BE INCLUDED IN PLACE PRIOR TO THE RISER POUR.
- 10. RISER SHALL BE CONSTRUCTED AS A CAST-IN-PLACE, MONOLITHIC STRUCTURE.
- 11. CONSTRUCT CONCRETE COLLARS TO ENSURE WATERTIGHT SEALS AT RISER AND PIPE CONNECTIONS.
- THE RISER WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER EACH RISER. THE PAYMENT WILL BE FULL COMPENSATION FOR ALL EXCAVATION, CONCRETE, MASONRY, REINFORCEMENT, LADDER RUNGS, DRIP STONES, AGGREGATE, UNDERDRAIN STUBS, FRAMES, GRATES AND COVERS, GRADE AND SLOPE ADJUSTMENTS, BACKFILL, GASKET, WATERTIGHT SEALS, PROJECTION COLLAR, TRASH RACKS, DRAIN VALVES, VALVE STEMS AND FOR ALL MATERIAL, LABOR, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
- 14. USE NON-SHRINK GROUT TO PARGE THE PIPE CONNECTION INSIDE THE RISER.
- 15. TRASH RACK SHOP DRAWING MUST BE APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.

WSEL. = 446.89²446.99

 $\overline{\text{WSEL.}} = \frac{445.48}{445.66}$

-#5 BARS @

6" O.C. (TYP.

2 YR

 $\overline{\text{WSEL.}} = \frac{443.95}{443.95}$

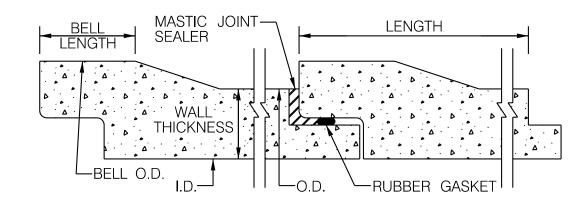
ENTRANCE BEVELED AT 1:1-

EL. = 440.69

BOTTOM OF FOOTER

 $EL = 437.40^{\circ}$

16. REINFORCEMENT SHALL HAVE A MINIMUM 2" COVER FROM ANY SURFACE.



- **BARREL JOINT SEALER NOTES:**
- 1. MASTIC JOINT SEALER TO BE APPLIED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
- 2. JOINT SEALER SHOULD HAVE WATERTIGHT CONNECTION.
- 3. THE SEALER SHALL BE A MIXTURE OF ASPHALT, MINERAL FILLER, AND PETROLEUM SOLVENTS AND SHALL HAVE
- THE SEALER SHALL CONFORM TO THE FOLLOWING:

ADHESIVE AND COHESIVE PROPERTIES.

PIPE JOINT

TEST AND METHOD	SPECIFICATION LIMITS
RESIDUES BY EVAPORATION, NONVOLITILE MATTER, D 2939, % MIN.	70
INORGANIC FILLER ON IGNITION, ASH CONTENT, D 2939, %	15–45

BARREL JOINT SEAL DETAIL

NOT TO SCALE

RCP

8'-0"

10' –0"

14' –0"

RISER PLAN 1

SCALE: 1'' = 2'

TRASH RACK CONSTRUCTION NOTES:

- 1. FRAME SHALL BE CONSTRUCTED OF 4" X 4" X 1/4" STEEL ANGLE WITH THE CORNERS MITRED AND BUTT WELDED.
- 2. THE FRAME SHALL BE PAINTED WITH TWO COATS OF COLD GALVANIZED COMPOUND IN "BATTLESHIP GREY".
- 3. BARS SHALL BE #6 REBAR AT 6" CC EACH WAY, HOT-DIPPED GALVANIZED AND FILLET WELDED TO THE ANGLE FRAME.
- 4. ALL STEEL SHALL BE ASTM A-36.

ENTRANCE BEVELED AT 1:1

- #5 BARS @ 6" O.C. (TYP.)

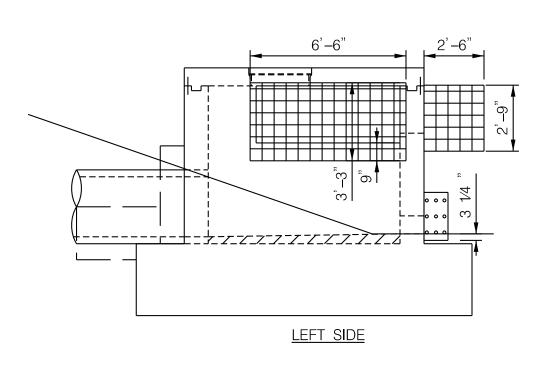
EL = 445.00

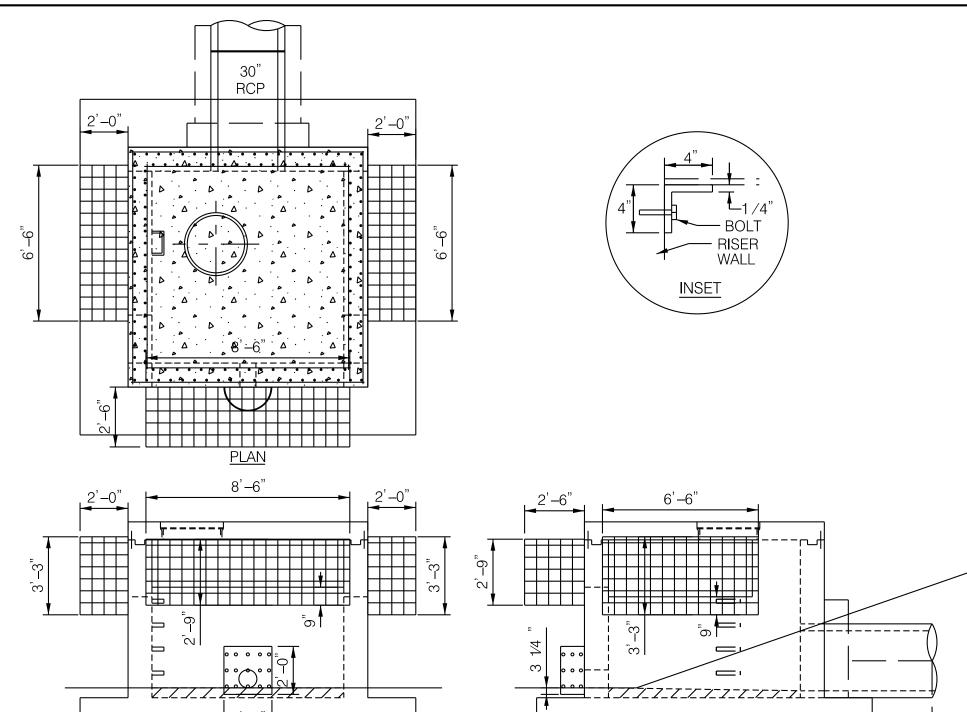
LOW FLOW

OPENING

10'-0"

- 5. TRASH RACK SHALL BE BOLTED ONTO THE OUTSIDE FACE OF THE RISER USING 3/8" DIA. STAINLESS STEEL EXPANSION BOLTS, @ 11" CC MIN. 4" FROM EDGE OF CONCRETE RISER. DRILL ANGLE FRAME TO ALLOW PASSAGE OF BOLTS.
- 6. ENSURE A 1' CLEARANCE BETWEEN TRASH RACK AND DAM EMBANKMENT SLOPE.
- 7. SHOP DRAWING OF TRASH RACK SHALL BE SUBMITED TO AND APPROVED BY MDE DAM SAFETY DIVISION AND THE ENGINEER BEFORE CONSTRUCTION.





TRASH RACK DETAIL SCALE: 1'' = 2'

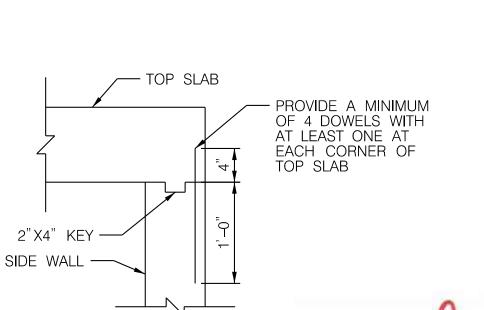
GRADE

SHEET 7

SEE PROJECTION

COLLAR DETAIL

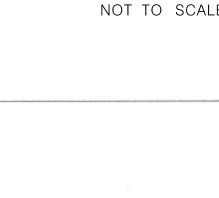
<u>FRONT</u>



RIGHT SIDE







Maryland Department of the Environment Water and Science Administration **Dam Safety Division**

· Visty P. Dalal Sr. Regulatory & Compliance Engineer

Permit # 18-MR-0010

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

|----

14'–0"

<u>BACK</u>

8/27/18/ DATE CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

McCORMICK TAYLOR 509 South Exeter Street

LEFT SIDE

RISER ELEVATION 1

SCALE: 1" = 2'

TOP OF RISER

EL = 447.73'

4th Floor

(410) 662-7400

Baltimore, Maryland 21202

- PROPOSEI GRADE

M A R Y L A N D

POURED

INVERT

Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046–3143 (410) 313-6444



-CONCRETE CRADLE

-RISER FOOTER

(TO BE POURED

SEE SHEET 7

13' –10"

<u>FRONT</u>

EL. = 440.80

	DES: EZS/CLR					
•						
	DRN: MER					
	CHK: ALH					
		ADM	1	AS-BUILT SURVEY	8/1/19	
DA	DATE: 8/21/18	BY	NO.	REVISION	DATE	

14'-0"

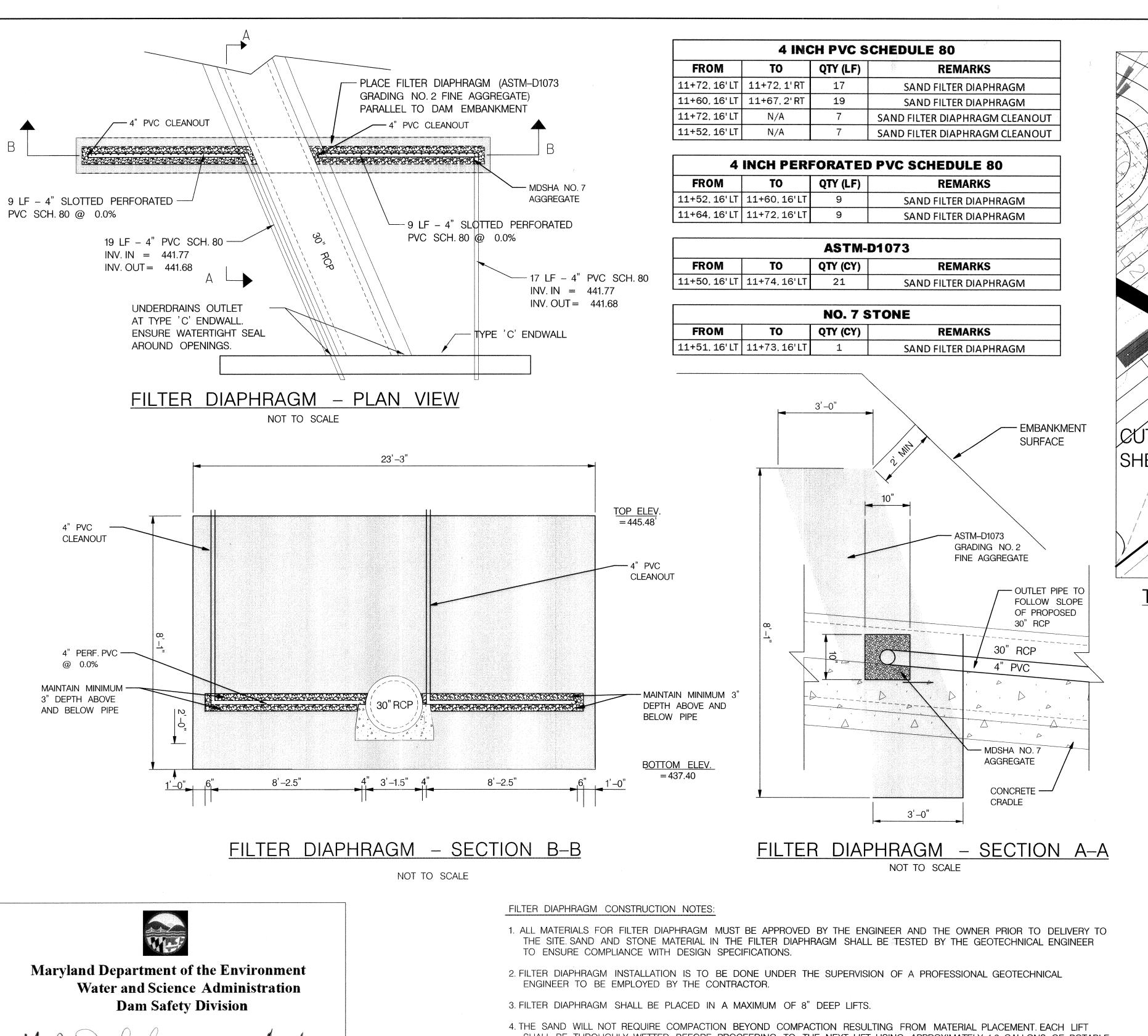
RIGHT SIDE

GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT **HOWARD COUNTY CAPITAL PROJECT #D-1159** HSCD #: EP-17-40 **MD DAM NO. 577**

STORMWATER MANAGEMENT DETAILS

AS SHOWN SHEET <u>5</u> OF <u>17</u>

SCALE



- 4. THE SAND WILL NOT REQUIRE COMPACTION BEYOND COMPACTION RESULTING FROM MATERIAL PLACEMENT. EACH LIFT SHALL BE THROUGHLY WETTED BEFORE PROCEEDING TO THE NEXT LIFT USING APPROXIMATELY 1.2 GALLONS OF POTABLE WATER PER CUBIC FOOT OF MATERIAL.
- 5. PERFORATED PIPE SHALL BE SCH. 80 PVC WITH 1/8" WIDE X 2" LONG PERFORATIONS. FOUR PERFORATIONS PER LINEAR FOOT, SPACED EVENLY AROUND THE CIRCUMFERENCE OF THE PIPE.
- 6. SAND SHALL BE PLACED TO AVOID SEGREGATION OF PARTICLE SIZES AND NO FOREIGN MATERIAL WILL BE ALLOWED TO INTERMIX WITH THE SAND MATERIAL.

CONSTRUCTION NOTES 1. APPLY SEED DIRECTLY TO PREPARED SOIL USE SEED/FERTILIZER PER PROJECT SPECIFICATIONS. 2. FORTRAC 3D-30 UNDERLAYMENT OR EQUIVALENT SHALL BE PLACED OVER THE SEEDED EXISTING GROUND AND SHALL UNDERLAP EXISTING RIP RAP AND OVERLAP EXISTING GEOTEXTILE AT DOWNSTREAM END. RIP RAP SHALL BE ADJUSTED BY HAND TO ACHIEVE THIS. THE UNDERLAYMENT SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS WITH PROPERTIES DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROPERTIES: **PROPERTY** TEST METHOD <u>UNITS</u> ASTM D-5261 MASS/UNIT AREA 8.8 oz /yd PERCENT OPEN AREA CW022015 50% ULTIMATE WIDE WIDTH ASTM D-6637 2055 lb /ft TENSILE STRENGTH ELONGATION AT BREAK ASTM D-6637 10% ASTM D-4355 UV RESISTANCE 80% 3. INSTALL THE TIED CONCRETE BLOCK MAT AS SHOWN AS PER FLEXAMAT SPECIFICATIONS OR EQUIVALENT. 4. THE CUTOFF SHEETS AS SHOWN CONSIST OF A FOLDED DOUBLE LAYER OF 6 MIL POLYETHYLENE SHEETING TRENCHED A MINIMUM OF 18 INCHES INTO EXISTING GROUND, WITH A 6 INCH HORIZONTAL LAP FOLDED OVER IN A DOWNSTREAM SHEETING DIRECTION, DIRECTLY UNDER THE UNDERLAYMENT AS SHOWN. ONE CUTOFF SHEET IS REQUIRED AT EW-2 AS SHOWN ON THE DETAIL THIS SHEET. A SECOND CUTOFF SHEET IS RQUIRED WHERE THE CONCRETE BLOCK STARTS IN THE CHANNEL AS SHOWN IN THE CONCRETE BLOCK MAT PLAN VIEW DETAIL, THIS SHEET. THE COST SHALL BE INCIDENTAL TO THE TIED CONCRETE BLOCK INSTALLATION. TIED CONCRETE BLOCK MAT PLAN VIEW 1 AS-BUILT GRADING NOT SHOWN. SEE PROPOSED TYPE 'C' -EXISTING ENDWALL AT OUTFALL (EW-2) /-TIED BLOCK MAT TYPE 'C **ENDWALL** -UNDERLAYMENT **EMBED** UNDERLAYMENT A MINIMUM OF 18" VERTICALLY INTO THE GROUND WITH CUTOFF SHEETING. CUTOFF SHEETING-PROFILE VIEW EXISTING SHED -- EXISTING **FENCE**

EXISTING GROUND-

CROSS SECTION VIEW

TIED CONCRETE BLOCK MAT DETAIL

(NOT TO SCALE)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Permit # 18-MR-0010

Sr. Regulatory & Compliance Engineer

EF, BUREAU OF ENVIRONMENTAL SERVICES

8/27/A

McCORMICK
TAYLOR

509 South Exeter Street
4th Floor
Baltimore, Maryland 21202

(410) 662-7400

Howard County

M A R Y L A N D

Storm Water Management Division

Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046–3143 (410) 313–6444



DES: EZS/CLR				
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DATE: 8/21/18	BY	NO.	REVISION	DATE

GLENMAR POND #2 PRINCIPAL SPILLWAY
REPLACEMENT PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-40
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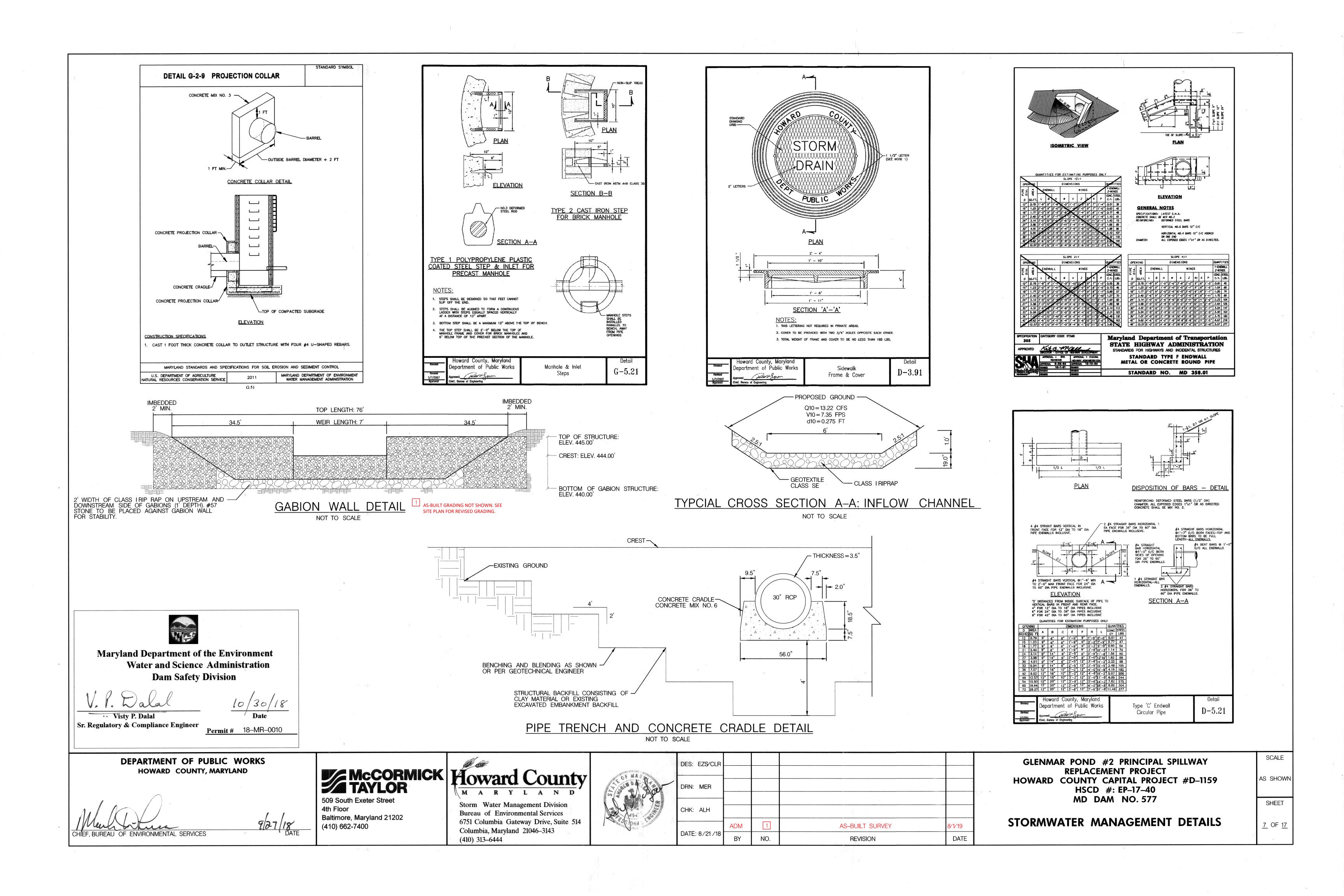
STORMWATER MANAGEMENT DETAILS

<u>6</u> OF <u>17</u>

SCALE

AS SHOWN

SHEET





Maryland Department of the Environment Water and Science Administration **Dam Safety Division**

Visty P. Dalal

Sr. Regulatory & Compliance Engineer

Permit # 18-MR-0010

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES





Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046–3143 (410) 313-6444



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DATE	DATE: 8/21/18	BY	NO.	REVISION	DATE

GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT **HOWARD COUNTY CAPITAL PROJECT #D-1159** HSCD #: EP-17-40 MD DAM NO. 577

STORMWATER MANAGEMENT DETAILS

<u>8</u> OF <u>17</u>

GEOSYNTHETIC CLAY LINER SPECIFICATIONS

GCL HYDRAULIC CONDUCTIVITY

GCL HYDRATED INTERNAL SHEAR STRENGTH 500 psf typ.

THE GEOSYNTHETIC CLAY LINER (GCL) SHALL BE BENTOMAT CL OR EQUIVALENT AND SHALL BE FOLLOW THE DETAILED GUIDELINES AND REQUIREMENTS SPECIFIED BY THE MANUFACTURER.

THE GCL SHALL HAVE THE FOLLOWING MINIMUM STRUCTURAL VALUES WHEN TESTED IN ACCORDANCE WITH THE NOTED METHODS.

MATERIAL PROPERTY REQUIRED VALUES TEST METHOD BENTONITE SWELL INDEX 24mL /2 g min. ASTM D 5890 BENTONITE FLUID LOSS ASTM D 5891 18mL max. BENTONITE MASS/AREA 0.75 lb /ft2 min. ASTM D 5993 GCL GRAB (TENSILE) STRENGTH 45 lbs /in MARV ASTM D 6768 GCL PEEL STRENGTH ASTM D 6496 3.5 lbs /in min.

MATERIALS:

BENTONITE SHALL BE HIGH SWELLING WITH A MINIMUM SWELL INDEX OF 24 mL/2g AND A MAXIMUM FLUID LOSS OF 18 mL. BENTONITE SHALL BE CG-50 GRANULAR BENTONITE, MINE AND PROCESSED BY AMERICAN COLLOID COMPANY.

5 x 10(-10) cm/sec max. ASTM D 5887

ASTM D 5321/6243

BENTONITE SHALL HAVE A GRANULAR CONSISTENCY OF (1 PERCENT MAX. PASSING A NO. 200 SIEVE) TO ENSURE UNIFORM DISTRIBUTION THROUGHOUT THE GCL. STRUCTURAL REQUIREMENTS:

THE PRODUCT SHALL CONSIST OF A LAYER OF GRANULAR SODIUM BENTONITE BETWEEN TWO GEOTEXTILES NEEDLEPUNCHED TOGETHER. PRODUCT IS LAMINATED TO A THIN FLEXIBLE MEMBERANE LINER.

INSTALLATION:

NOTE: CONTRACTOR SHALL AVOID TRACKING OVER CLAY LINER AFTER INSTALLATION HAS OCCURED.

PROPOSED GRADE-

POND BOTTOM =441.00' MIN.

SEE ANCHOR DETAIL THIS SHEET

CLAY LINER-

LINER TO EXTEND 4FT BELOW EMBANKMENT TOE ELEVATION TO PROVIDE SEEPAGE PROTECTION

CLAY LINER TIE-IN DETAIL NOT TO SCALE

THE EARTHEN SURFACE UPON WHICH THE GCL IS INSTALLED SHALL BE PREPARED ANC COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND DRAWINGS. THE SURFACE SHALL BE SMOOTH, FIRM UNYEILDING, AND FREE FROM VEGETATION, SHARP ROCKS, VOID SPACES, STANDING WATER, ABRUPT ELEVATION CHANGES, AND CRACKS LARGER THAN ONE INCH.

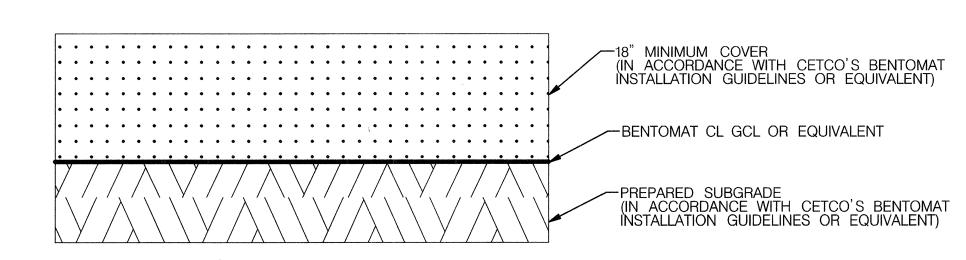
IMMEDIATELY PRIOR TO GCL DEPLOYMENT, SUBGRADE SHALL BE FINAL-GRADED AND SMOOTH-ROLLED TO PROVIDE BEST PRACTICABLE SURFACE FOR INSTALLATION. NO WHEEL RUTS, FOOTPRINTS, OR OTHER IRREGULARITIES SHALL BE PRESENT. ALL PROTRUSIONS EXTENDING MORE THAN ONE-HALF INCH FROM THE SURFACE SHALL BE REMOVED OR PUNCHED IN THE SURFACE.

AT THE TOP OF THE SLOPED AREAS, AN ANCHOR TRENCH FOR THE GCL SHALL BE EXCAVATED OR AN EQUIVALENT RUNOUT SHALL BE UTILIZED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

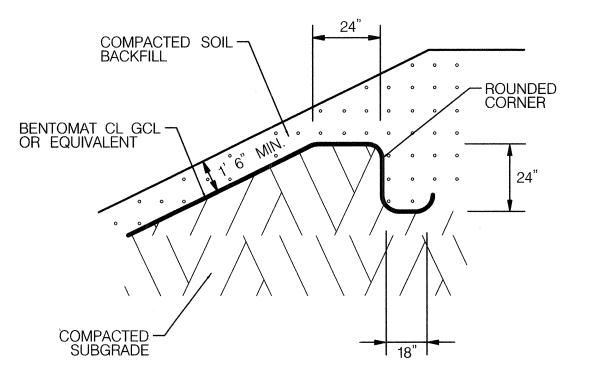
MINIMIZE THE EXTENT TO WHICH THE GCL IS DRAGGED ACROSS THE SUBGRADE. A SLIP SHEET MAY BE USED TO REDUCE DAMAGE DURING PLACEMENT.

GCL PANELS SHALL BE PLACED PARALLEL TO THE DIRECTION OF THE SLOPE AND SHOULD LIE FLAT WITH NO WRINKLES OR FOLDS. GCL SHALL NOT BE LEFT UNCOVERED OVERNIGHT.

COVER SOIL SHALL BE FREE OF ANGULAR STONES OR OTHER DAMAGING FOREIGN MATTER. SOIL SHALL BE PLACED A MINIMUM OF 1.5 FOOT THICKNESS OVER THE GCL AND SHALL BE PUSHED UP SLOPES TO MINIMIZE TENSILE FORCE ON THE GCL. PENETRATIONS AND SEAMS SHALL BE SEALED WITH BENTONITE POWDER PER CURRENT MANUFACTURER INSTALLATION GUIDANCE DOCUMENTS.



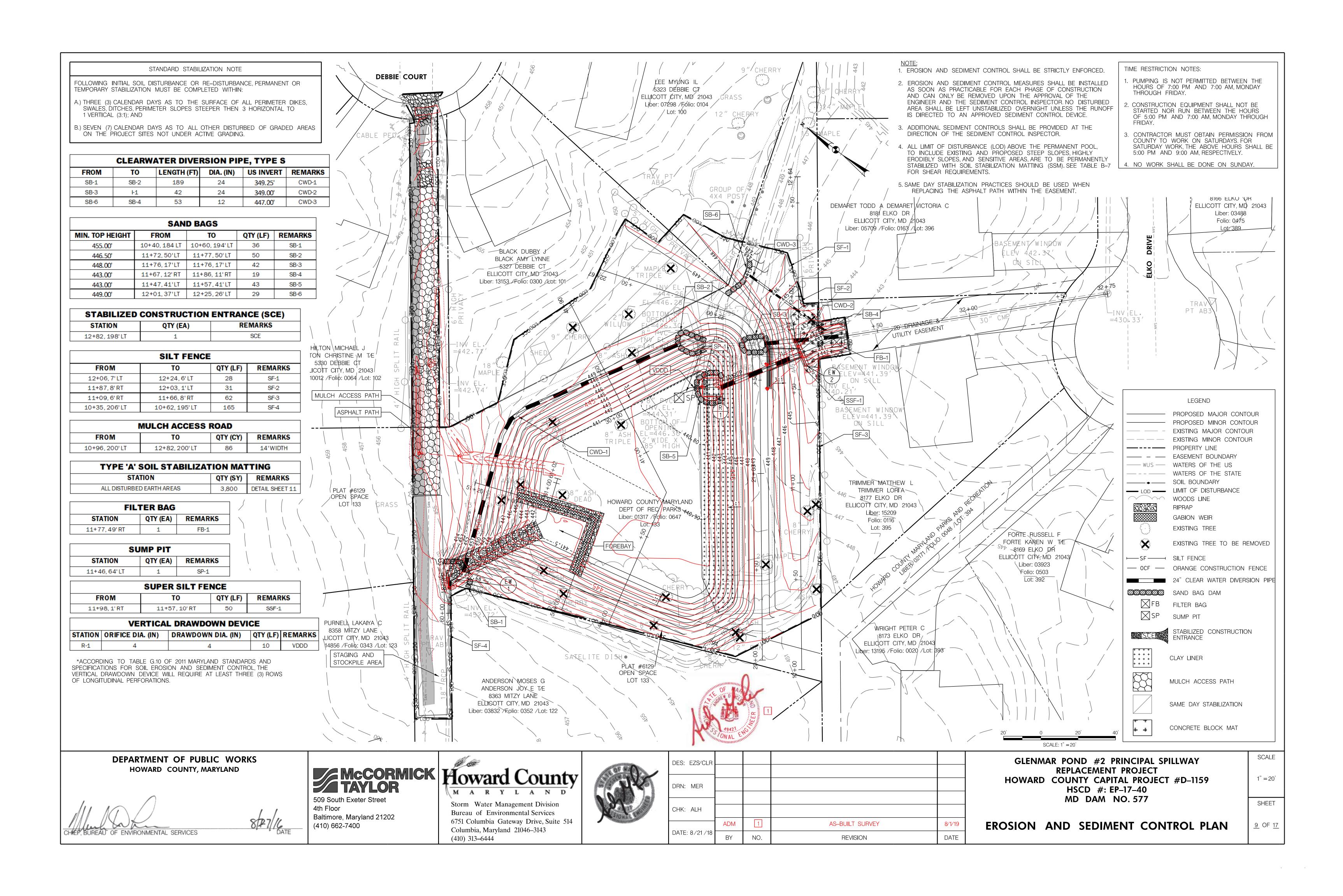
GEOSYNTHETIC CLAY LINER DETAIL NOT TO SCALE



GEOSYNTHETIC CLAY LINER ANCHOR DETAIL NOT TO SCALE

SCALE AS SHOWN

SHEET



EROSION AND SEDIMENT CONTROL - GENERAL NOTES

SEQUENCE OF CONSTRUCTION

1. OBTAIN GRADING PERMIT AND MDE PERMIT (TRACKING NUMBER 201761367).

- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) DAYS PRIOR TO THE START OF WORK. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (410) 313-1880 A MINIMUM OF 5 DAYS PRIOR TO THE START OF ANY CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY THE HOWARD COUNTY BUREAU OF UTILITIES (410) 313-4900 AND MARYLAND DEPARTMENT OF THE ENVIRONMENT, DAM SAFETY DEVISION INSPECTOR AT (410) 537-3538, FIVE(5) DAYS BEFORE ANY LAND DISTURBING ACTIVITY. (1 DAY)
- STAKFOUT LOD AS SHOWN ON THE PLANS AND INSTALL ORANGE CONSTRUCTION FENCE (OCF) AROUND THE PERIMETER OF THE LOD. THIS SHALL BE COMPLETED BY AND INSPECTED AT THE PRE-CONSTRUCTION MEETING. (1 DAY)
- 4. THE CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COUNTY PROJECT MANAGER, THE ENGINEER, A REPRESENTATIVE FROM HOWARD COUNTY CONSTRUCTION INSPECTION, MDE DAM SAFETY, AND THE CONTRACTOR. (1 DAY)
- 5. INSTALL THE FOLLOWING PERIMETER CONTROLS AS SHOWN ON THE PLAN: STABILIZED CONSTRUCTION ENTRANCE, MULCH ACCESS ROAD, AND SILT FENCE, CLEARING ONLY THE AREA NEEDED TO INSTALL THE E&S CONTROLS. CONSTRUCT THE FOLLOWING DIVERSION AND DEWATERING CONTROLS AS SHOWN ON THE PLANS: SF-1, SF-2, SF-3, SF-4, SB-1, SB-2, SB-3, SB-4, CWD-1, CWD-2, FB-1, SP-1, AND ASSOCIATED HOSES, DIVERT CWD-1 AND CWD-2 THROUGH EXISTING PRINCIPAL SPILLWAY PIPE AND EXISTING STORM DRAIN. INSTALL CLEAR WATER DIVERSION PIPES FROM DOWNSTREAM TO UPSTREAM. (5 DAYS)
- 6. WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR BEFORE PROCEEDING AND DURING A 5 DAY DRY FORECAST FROM THE NATIONAL WEATHER SERVICE, COMPLETE OUTFALL GRADING UP TO ELEVATION 444 AND INSTALL TIED CONCRETE BLOCK MAT AS SHOWN ON THE PLAN. PERMANENTLY STABILIZE AREA BETWEEN SB-4 AND THE EXISTING HEADWALL. LEAVE THIS PERMANENTLY STABILIZED AREA UNDISTURBED FOR THE REMAINDER OF THE PROJECT DURATION.
- 7. COMPLETE GRADING ON PRIVATE PROPERTY AT 5327 AND 5323 DEBBIE COURT, TIE INTO OUTFALL GRADING AND EXISTING EMBANKMENT IN THE NORTHEAST CORNER OF THE POND. INSTALL SB-6 AND CWD-3. UTILIZE SAME DAY STABILIZATION ON PRIVATE PROPERTY. PERMANENTLY STABILIZE 5327 AND 5323 DEBBIE COURT AND INSTALL WOODEN FENCE. THE CONTRACTOR SHALL LEAVE THESE PERMANENTLY STABILIZED AREAS UNDISTURBED FOR THE REMAINDER OF THE PROJECT DURATION. (5 DAYS)
- 8. WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR BEFORE PROCEEDING AND DURING A 5 DAY DRY FORECAST FROM THE NATIONAL WEATHER SERVICE, REMOVE EXISITNG RISER AND PRINCIPAL SPILLWAY PIPE AND EXCAVATE TRENCH FOR PROPOSED SPILLWAY PIPE. RELOCATE CWD-1 AND CWD-2 THROUGH THE EMBANKMENT TRENCH AND INSTALL SSF-1, ADJUSTING AS NEEDED. INSTALL 30" RCP PRINCIPAL SPILLWAY PIPE, ENDWALL (EW-2) AND RISER (R-1). PLACE SB-5 IN PROPOSED PRINCIPAL SPILLWAY AT THE END OF EACH DAY AS NEEDED TO CONTAIN DIRTY WATER WITHIN THE SITE. (15 DAYS)
- RELOCATE CWD-1, CWD-2, SB-3, AND SB-5 TO DIVERT FLOW THROUGH PROPOSED RISER WEIR OPENINGS AND PROPOSED PRINCIPAL SPILLWAY PIPE. INSTALL VERTICAL DRAWDOWN DEVICE (VDDD). GRADE EMBANKMENT, INSTALL CLAY CORE AND SAND FILTER DIAPHRAGM. (7 DAYS)
- 10. EXCAVATE AND GRADE THE POND AS SHOWN ON THE PLANS, INSTALL CLAY LINER, BACKFILL AND COMPACT EMBANKMENT. INSTALL RIPRAP PROTECTION AT STORM DRAIN INFLOW AND FOREBAY WEIR GABIONS. INSTALL 18" RCP AND ENDWALL (EW-1). ADJUST CLEAR WATER DIVERSION PIPES AND DEWATER TO FILTER BAG AS NEEDED TO GRADE POND. (10
- 11. INSTALL TRASH RACKS ON RISER. REPLACE ASPHALT WALKING PATH WITHIN LOD WITH NEW ASPHALT PATH ENTIRELY WITHIN EASEMENT. STABILIZE AREAS WITH SOIL STABILIZATION MATTING, SOD, TOPSOIL AND VEGETATION AS SHOWN ON THE LANDSCAPE PLAN. (4 DAYS)
- 12. WHEN AREAS ARE FULLY STABILIZED AND WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE THE EROSION AND SEDIMENT CONTROLS. STABILIZE ANY REMAINING DISTURBED AREAS WITH PERMANENT STABILIZATION AS SHOWN ON THE PLANS. DEMOBILIZE EQUIPMENT (3 DAYS).

HOWARD COUNTY CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

- 1. A PRE-CONSTRUCTION MEETING MUST OCCUR WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (CID), 410-313-1855 AFTER THE FUTURE LOD AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELD. A MINIMUM OF 48 HOUR NOTICE TO CID MUST BE GIVEN AT THE FOLLOWING STAGES:
- PRIOR TO THE STARTE OF EARTH DISTRUBANCE,
- B. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS,
 BUT BEFORE PROCEEDING WITH ANY OTHER DISTURBANCE OR GRADING,
 C. PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT,
 D. PRIOR TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES.
- OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE. OTHER RELATED STATE AND FEDERAL PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS PLAN.
- 2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
- 3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1. B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- 4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL FOR TOPSOIL (SEC.B-4-2), PERMANENT SEEDING (SEC.B-4-5), TEMPORARY SEEDING (SEC.B-4-4) AND MULCHING (SEC.B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES IF THE GROUND IS FROZEN. INCREMENTAL STABILIZATION (SEC.B-4-1) SPECIFICATIONS SHALL BE ENFORCED IN AREAS WITH >15' OF CUT AND/OR FILL. STOCKPILES (SEC.B-4-8) IN EXCESS OF 20' MUST BE BENCHED WITH STABLE OUTLET. ALL CONCENTRATED FLOW, STEEP SLOPE, AND HIGHLY ERODIBLE AREAS SHALL RECEIVE SOILS STABILIZATION MATTING (SEC.B-4-6).
- 5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- 6. SITE ANALYSIS:
 TOTAL AREA OF SITE
 AREA DISTURBED 0.963 ACRES 0.040 ACRES BE ROOFED OR PAVED
 BE VEGETATIVELY STABILIZED 0.896 ACRES
- 2356 CY OFFSITE WASTE/BORROW AREA LOCATION SEE NOTE #17
- 7. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- 8. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR. THE SITE AND ALL CONTROLS SHALL BE INSPECTED BY THE CONTRACTOR WEEKLY; AND THE NEXT DAY AFTER EACH RAIN EVENT. A WRITTEN REPORT BY THE CONTRACTOR, MADE AVAILABLE UPON REQUEST IS PART OF EVERY INSPECTION AND SHALL INCLUDE ITEMS LISTED AT HOWARDSCD.ORG.
- 9. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORK DAY, WHICHEVER IS SHORTER.
- 10. ANY MAJOR CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE HSCD PRIOR TO PROCEEDING WITH CONSTRUCTION. MINOR REVISIONS MAY BE ALLOWED BY THE CID PER THE LIST OF HSCD-APPROVED FIELD CHANGES.

HOWARD COUNTY CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

11. DISTURBANCE SHALL NOT OCCUR OUTSIDE THE L.O.D. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE CID. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE CID. NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME. 12. WASH WATER FROM ANY EQUIPMENT, VEHICLES, WHEELS, PAVEMENT, AND OTHER SOURCES MUST BE TREATED IN A SEDIMENT BASIN OR OTHER APPROVED WASHOUT STRUCTURE TOPSOIL SHALL BE STOCKPILED AND PRESERVED ON-SITE FOR REDISTRIBUTION ONTO FINAL GRADE. 14. ALL SILT FENCE AND SUPER SILT FENCE SHALL BE PLACED ON-THE-CONTOUR, AND BE IMBRICATED AT 25 MINIMUM INTERVALS, WITH LOWER ENDS CURLED UPHILL BY 2 IN ELEVATION. 15. STREAM CHANNELS MUST NOT BE DISTURBED DURING THE FOLLOWING RESTRICTED TIME PERIODS (INCLUSIVE): USE I AND IP MARCH 1 - JUNE 15 USE III AND IIIP OCTOBER 1 - APRIL 30 USE IV MARCH 1 - MAY 31

B-4-2 SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

SEDIMENT CONTROL, AND ASSOCIATED PERMITS SHALL BE ON-SITE AND AVAILABLE WHEN THE SITE IS ACTIVE.

16. A COPY OF THIS PLAN, THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND

17. OFFSITE WASTE / BORROW SITE SHALL HAVE AN APPROVED SEDIMENT CONTROL PLAN AND PERMIT.

A. SOIL PREPARATION 1. TEMPORARY STABILIZATION A. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. B. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS. C. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
2.PERMANENT STABILIZATION A. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE: I.SOIL PH BETWEEN 6.0 AND 7.0. II.SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM). III.SOLUBLE SALTS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE. IV.SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT. V.SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION. B. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS. C. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES. D. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST. E. MIX SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.
P TOPSOTI INC

1.TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION. 2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS. 3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:

A. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH. B.THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS. C. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH. D. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.

4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN. 5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA: A. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 INCH IN DIAMETER. B. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.

C. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL. A. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL B. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL

SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER

OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION. C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS) 1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.

2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER. 3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE

GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #1.00 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE. 4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY

DISKING OR OTHER SUITABLE MEANS. 5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

B-4-4 TEMPORARY STABILIZATION

	HARDINESS ZONE (F SEED MIXTURE (F	FERTILIZER RATE (10-20-20)	LIME				
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEED ING DATES	SEEDING DEPTHS	436 LB/AC	RATE	
	ANNUAL RYEGRASS	40	MAR. 1 TO MAY 15; AUG. 1 TO OCT 15	0.5	(10 LB/ 1000 SF)	2 TON/AC (90 LB/	
	FOXTAIL MILLET	30	MAY 16 TO JULY 31	0.5	1000 37)	1000 SF)	

B-4-3 SEEDING AND MULCHING

	DING	IG CIFICATIONS	
1 •	Α.	ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LA A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.	D WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST AND SEEDING RATE. TES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE
	D.	FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COUTS TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT AS COUTS OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMI	S MUST NOT BE USED LATER THAN THE DATE INDICATED E. USE FOUR TIMES THE RECOMMENDED RATE WHEN L AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE ULANT LESS EFFECTIVE. H SOIL STERILANTS OR CHEMICALS USED FOR WEED
2.	Α.	PLICATION DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST I. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES. II. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD	TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING APPLY HALF THE SEEDING RATE IN EACH DIRECTION, SEED TO SOIL CONTACT.
		I. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND I. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A COVERING. SEEDBED MUST BE FIRM AFTER PLANTING. II. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLIBED IN IFFERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLIT OF SEEDING, THE APPLIED AT THE TIME OF SEEDING.	FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL APPLY HALF THE SEEDING RATE IN EACH DIRECTION. UDES SEED AND FERTILIZER). PLICATION RATES SHOULD NOT EXCEED THE FOLLOWING:
		K20 (POTASSIUM), 200 POUNDS PER ACRE. II. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING A LIME WHEN HYDROSEEDING. III. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WILLIAM HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.	PER ACRE MAY BE APPLIED BY HYDROSEEDING). T ANY ONE TIME. DO NOT USE BURNT OR HYDRATED
	A. B.		AW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR HERE ONE SPECIES OF GRASS IS DESIRED.
		I. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY. II. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH IN THE WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPI	NHIBITING FACTORS. A MANNER THAT THE WOOD CELLULOSE FIBER MULCH AND WILL BLEND WITH SEED, FERTILIZER AND OTHER MUST FORM A BLOTTER-LIKE GROUND COVER, ON ERTIES AND MUST COVER AND HOLD GRASS SEED IN
2.		CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GIV. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCIV. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FILDIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, HOLDING CAPACITY OF 90 PERCENT MINIMUM. PLICATION	ENTRATION LEVELS THAT WILL BE PHYTO-TOXIC, BER LENGTH OF APPROXIMATELY 10 MILLIMETERS,
	В.	. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF SOFT WATER.	AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. TO 2.5 TONS PER ACRE. EIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD
3.		ICHORING • PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCI BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), HAZARD:	DEPENDING UPON THE SIZE OF THE AREA AND EROSION
		I. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON L. WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND II. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATEL CELLULOSE FIBER PER 100 GALLONS OF WATER.	ARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES , THIS PRACTICE SHOULD FOLLOW THE CONTOUR. THE FIBER BINDER AT A NET DRY WEIGHT OF
		III. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, I APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPI LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED. IV. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACKNETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND	ECIFIED BY THE MANUFACTURER, APPLICATION OF CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS CORDING TO MANUFACTURER RECOMMENDATIONS.

B-4-5 PERMANENT STABILIZATION

	HARDINESS ZONE (F SEED MIXTURE (F	FER	LIME									
NO.	SPECIES .	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P ₂ O ₅	K ₂ O	RATE				
	SWITCH GRASS	10	MAR. 1 TO MAY 15; MAY 16 TO JUNE 15	1/4-1/2 IN.	i .	į .	i	i	ľ	90 18/40	90 18/40	2 TON/AC
1	CREEPING RED FESCUE	SCUE 15 MAR. 1 TO MAY 15; 1/4-1/2 IN. (1	(1.0 LB/	5 LB/AC 90 LB/AC 90 LB/ 1.0 LB/ (2.0 LB/ (2.0 L	(2.0 LB/	/ (90 LB/						
	PARTRIDGE PEA	4	MAR. 1 TO MAY 15; MAY 16 TO JUNE 15	1/4-1/2 IN.	1000 SF)	1000 SF)	1000 SF)	1000 SF)				

NOTE: MAY 16 TO JUNE 15 ARE ADDITIONAL PLANTING DATES DURING WHICH SUPPLEMENTAL WATERING MAY BE NEEDED TO ENSURE PLANT ESTABLISHMENT

	HARDINESS ZONE (F SEED MIXTURE (F	FEF	LIME								
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	N	P ₂ O ₅	K ₂ O	RATE				
6	TALL FESCUE	40	MAR. 1 TO MAY 15; AUG. 1 TO OCT. 15	1/4-1/2 IN.	45 LB/AC	1	1	i i	LB/AC 90 LB/AC	90 18/40	2 TON/AC
	PERENNIAL RYEGRASS	25	MAR. 1 TO MAY 15; AUG. 1 TO OCT. 15	1/4-1/2 IN.	i .	1	(2.0 LB/	(90 LB/			
	WHITE CLOVER	5	MAR. 1 TO MAY 15; AUG. 1 TO OCT. 15	1/4-1/2 IN.	1000 37	1000 317	1000 37	1000 35)			

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

HIEF, BUREAU OF ENVIRONMENTAL SERVICES

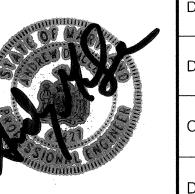
509 South Exeter Street 4th Floor Baltimore, Maryland 21202

(410) 662-7400

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Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046–3143 (410) 313–6444



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GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT HOWARD COUNTY CAPITAL PROJECT #D-1159 HSCD #: EP-17-40 **MD DAM NO. 577**

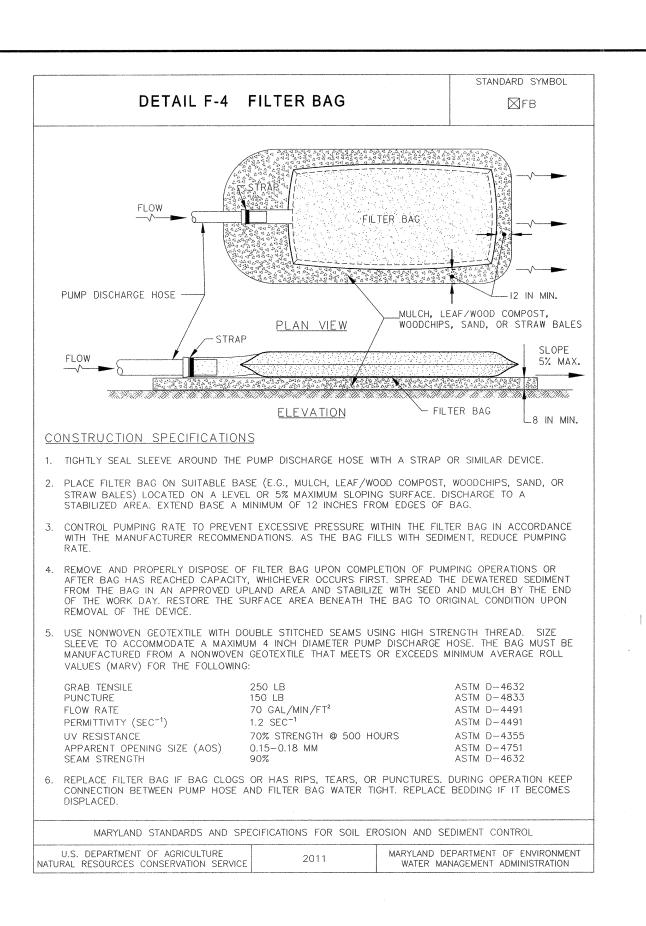
> **EROSION AND SEDIMENT CONTROL NOTES**

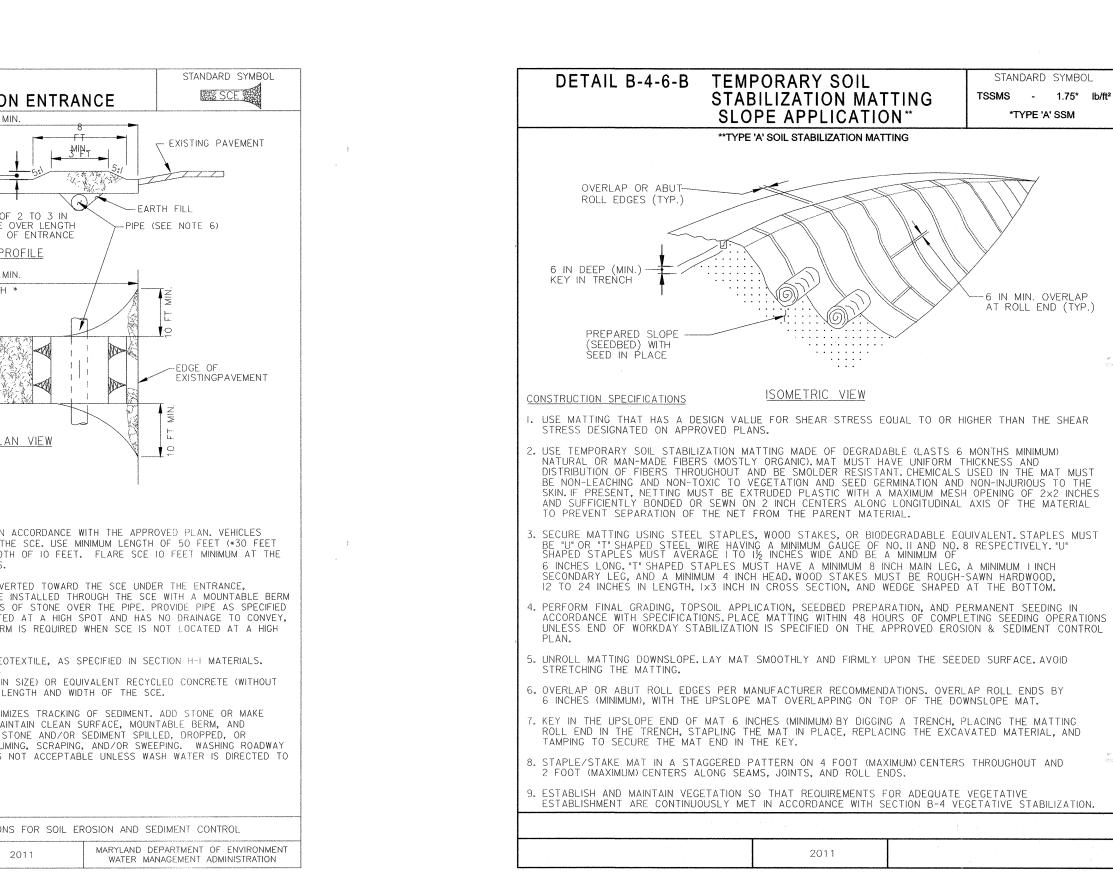
SHEET

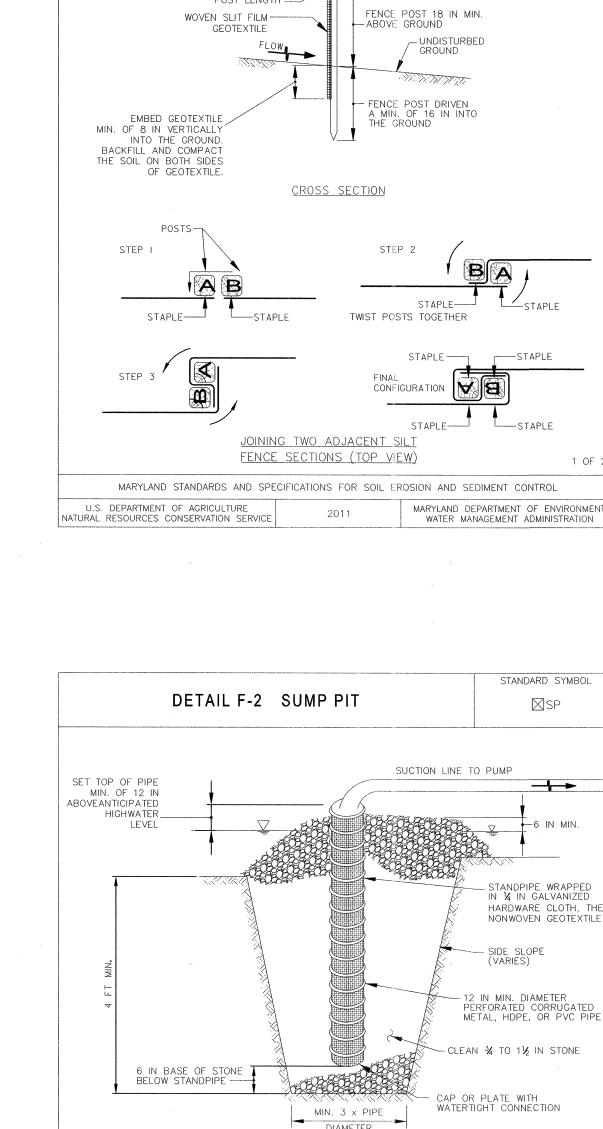
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10 OF 17



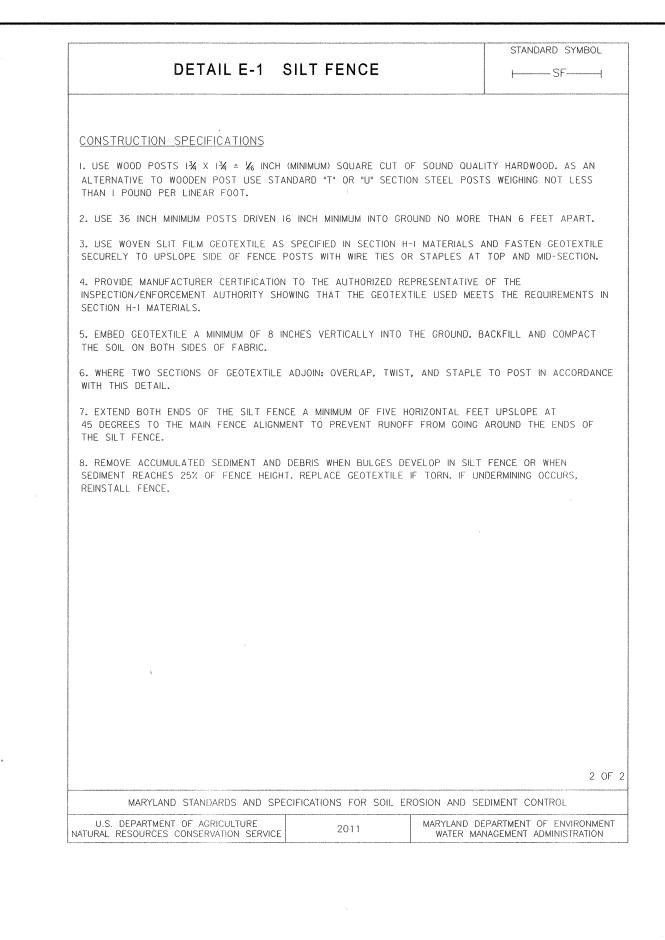


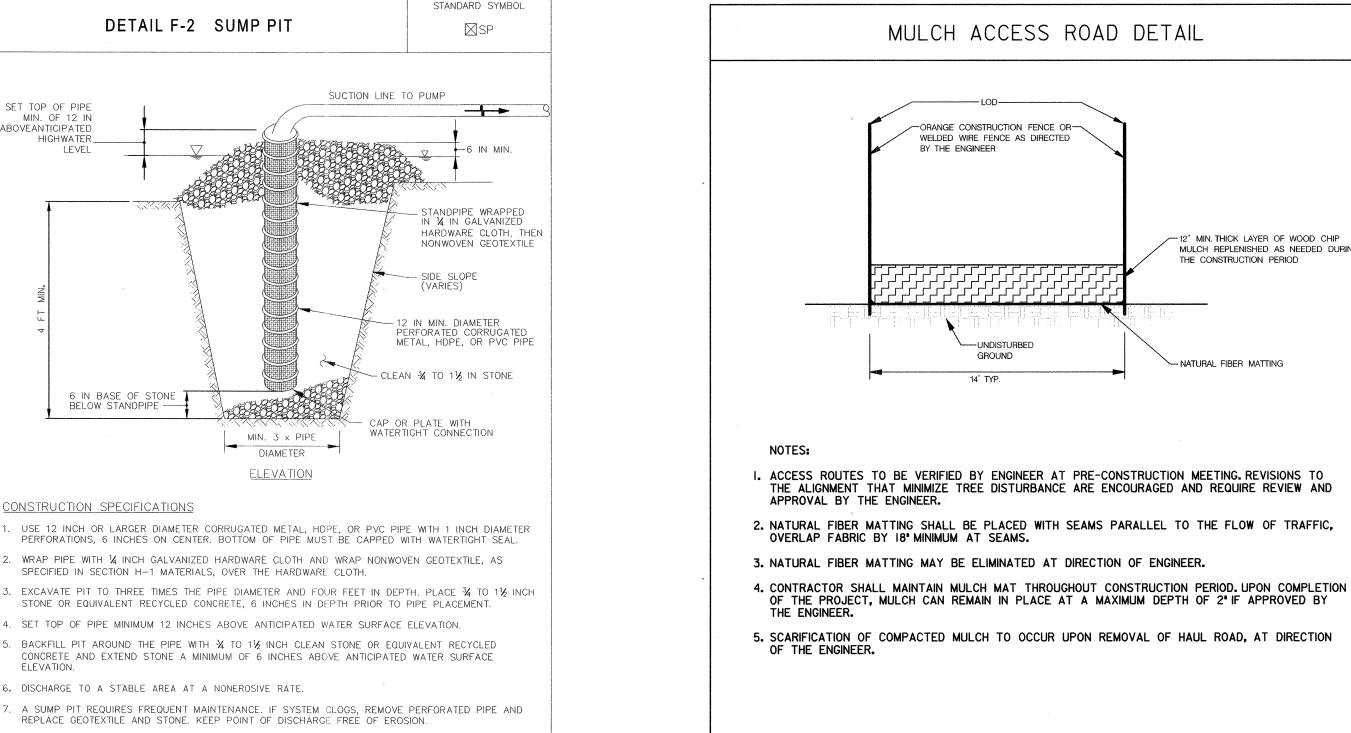


DETAIL E-1 SILT FENCE

CENTER TO CENTER

ELEVATION





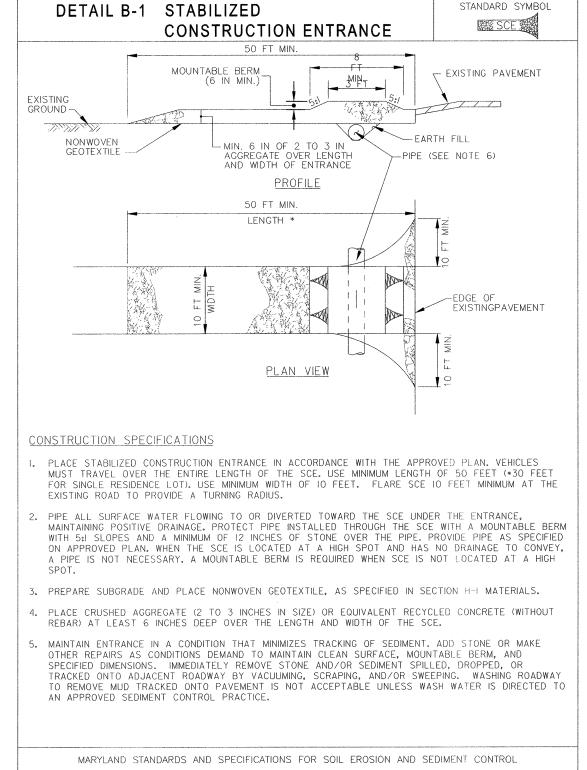
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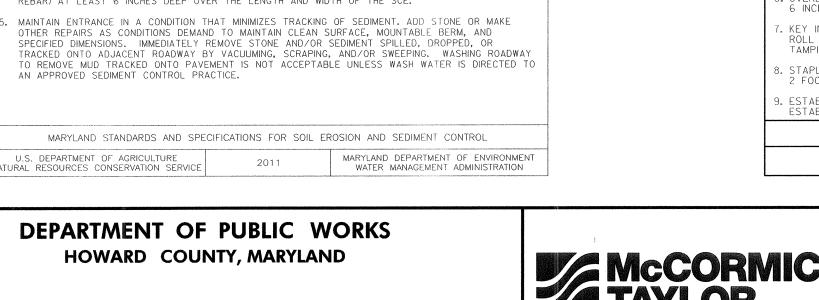
36 IN MIN. FENCE POST LENGTH

16 IN MIN. HEIGHT OF

---STAPLE



HIEF. BUREAU OF ENVIRONMENTAL SERVICES



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Baltimore, Maryland 21202

4th Floor

(410) 662-7400



DETAIL C-6 CLEAR WATER DIVERSION

PIPE AS SHOWN ON PLAN-

`∽SANDBAG DIKE

-IMPERMEABLE SHEETING

<u>CONSTRUCTION SPECIFICATIONS</u>

U.S. DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

USED. MAKE ALL JOINTS WATERTIGHT.

FLOW

CWD - 12

DESIGNATION CWD-12 REFERS TO 12 INCH CLEAR WATER DIVERSION.

OUTLET TREATMENT AS REQUIRED -

DEWATERING DEVICE

SECTION THROUGH SANDBAGS

WATER MANAGEMENT ADMINISTRATION

FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE

FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA-VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.

. USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNTURING AND TEARING.

. PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A

5. SET HEIGHT OF SANDBAG DIKE AT TWICE THE PIPE DIAMETER. MAINTAIN HEIGHT ALONG LENGTH OF SANDBAG DIKE. PLACE DOUBLE ROW OF SANDBAGS.

9. DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

O. KEEP POINT OF DISCHARGE FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE

6. AT A MINIMUM, SECURELY ANCHOR DIVERSION PIPE AT EACH DOWNGRADE JOINT.

7. SET OUTLET END OF DIVERSION PIPE LOWER THAN INLET END.

8. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.

DRAINAGE, REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.

Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046–3143 (410) 313–6444



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MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

MARYLAND DEPARTMENT OF ENVIRONMENT

WATER MANAGEMENT ADMINISTRATION

U.S. DEPARTMENT OF AGRICULTURE

TURAL RESOURCES CONSERVATION SERVICE

GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT **HOWARD COUNTY CAPITAL PROJECT #D-1159** HSCD #: EP-17-40 **MD DAM NO. 577**

NOT TO SCALE SHEET

SCALE

11 OF 17

EROSION AND SEDIMENT CONTROL DETAIL SHEET

-12" MIN. THICK LAYER OF WOOD CHIP MULCH REPLENISHED AS NEEDED DURING

THE CONSTRUCTION PERIOD

B-4-8 STANDARDS AND SPECIFICATIONS

<u>FOR</u>

STOCKPILE AREA

efinition

A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpos

To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

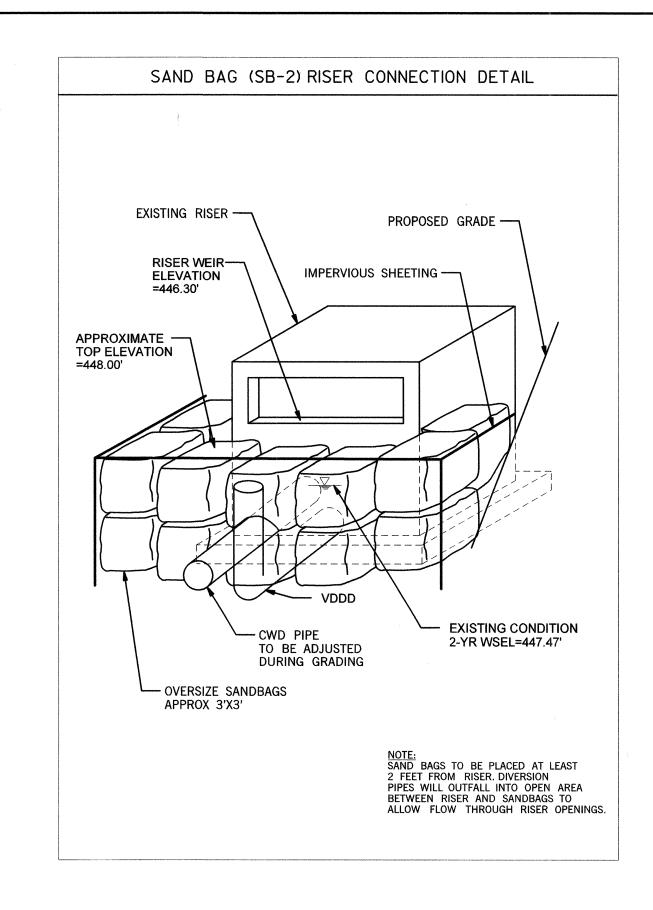
<u>Criteria</u>

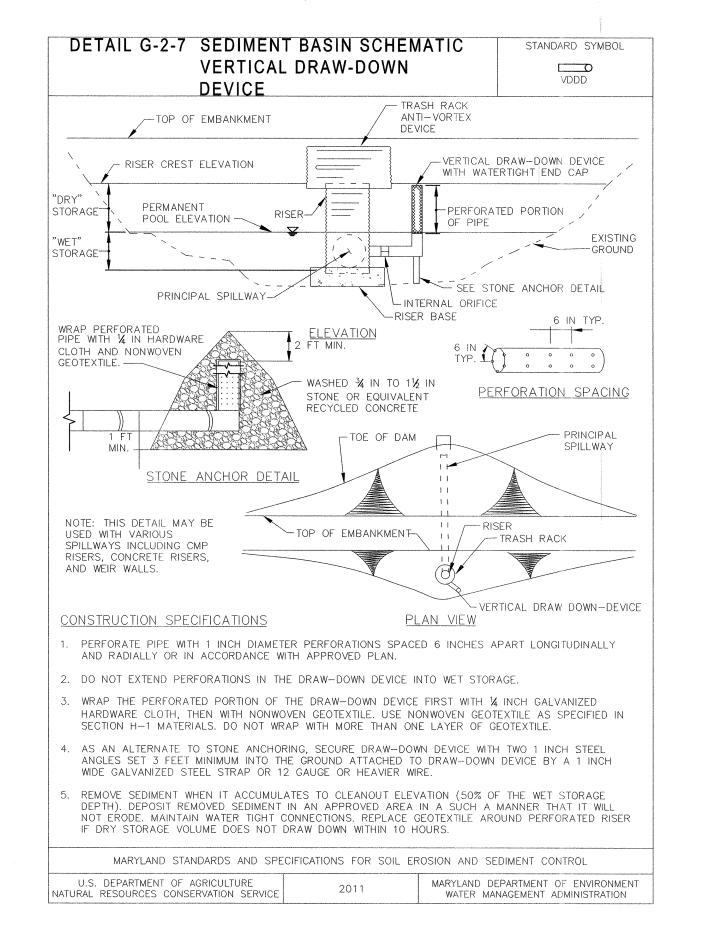
- The stockpile location and all related sediment control practices must be clearly indicated on the
 erosion and sediment control plan.
- 2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
- 3. Runoff from the stockpile area must drain to a suitable sediment control practice.
- 4. Access the stockpile area from the upgrade side.
- Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
- Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
- 7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
- If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to
 facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable
 sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

B.43





DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

HIEF, BUREAU OF ENVIRONMENTAL SERVICES

8(27/18/ DATE



Baltimore, Maryland 21202

(410) 662-7400

Howard County

M A R Y L A N D

Storm Water Management Division
Bureau of Environmental Services

6751 Columbia Gateway Drive, Suite 514

Columbia, Maryland 21046–3143

(410) 313–6444



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GLENMAR POND #2 PRINCIPAL SPILLWAY
REPLACEMENT PROJECT
HOWARD COUNTY CAPITAL PROJECT #D-1159
HSCD #: EP-17-40
MD DAM NO. 577

EROSION AND SEDIMENT CONTROL DETAIL SHEET

NOT TO SCALE SHEET

<u>12</u> OF <u>17</u>

THE WORK WILL BE PERFORMED IN COORDINATION WITH AND UNDER THE OVERSIGHT OF THE ENGINEER-IN-CHARGE (EIC) DESIGNATED BY THE OWNER AND APPROVED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER AND SCIENCE ADMINISTRATION DAM SAFETY DIVISION (MDE) ANY DEVIATION FROM THE APPROVED PLANS FOR ANY REASON MUST BE APPROVED BY THE EIC AND MDE BEFORE PROCEEDING WITH THOSE DEVIATIONS FROM THE APPROVED PLANS.

THE CONTRACTOR SHALL PERFORM THE WORK IN ACCORDANCE WITH ALL REQUIRED PERMITS. THE WORK IS NOT CONSIDERED COMPLETE UNTIL THE EIC, OWNER AND MDE HAVE COMPLETED FINAL INSPECTION OF THE PROJECT AND THE AS-BUILT PLANS HAVE BEEN APPROVED BY MDE.

THE CONTRACTOR SHALL ENSURE THE QUALITY OF WORK BY EMPLOYING QUALIFIED, EXPERIENCED PERSONNEL, TRAINED IN DAM CONSTRUCTION. THE CONTRACTOR WILL PROVIDE ALL NECESSARY MANAGEMENT, SUPERVISION, PERSONNEL, LABOR, TOOLS, MATERIALS, AND EQUIPMENT NECESSARY FOR ALL ASPECTS OF CONSTRUCTION.

THE EIC SHALL SUPERVISE AND INSPECT CONSTRUCTION TO ENSURE IT IS COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE EIC MAY DESIGNATE OTHER INDIVIDUALS TO SUPERVISE AND INSPECT CONSTRUCTION AS APPROPRIATE FOR THE TYPE OF CONSTRUCTION BEING COMPLETED. THE EIC IS RESPONSIBLE FOR THE ACCURACY AND QUALITY OF THE WORK PERFORMED BY OTHER APPOINTED INDIVIDUALS ON THE PROJECT. FOR THE PURPOSES OF THESE SPECIFICATIONS, THOSE INDIVIDUALS MAY INCLUDE THE FOLLOWING:

- GEOTECHNICAL ENGINEER THE GEOTECHNICAL ENGINEER MUST BE A MARYLAND-LICENSED PROFESSIONAL ENGINEER EXPERIENCED IN GEOTECHNICAL ENGINEERING, DAM ENGINEERING, AND DAM CONSTRUCTION. THE GEOTECHNICAL ENGINEER MAY APPOINT INSPECTORS ACTING UNDER RESPONSIBLE CHARGE OF THAT ENGINEER TO COMPLETE INSPECTION AND TESTING OF CONSTRUCTION.
- INSPECTOR THE INSPECTOR IS AN ENGINEERING TECHNICIAN APPOINTED BY AND ACTING UNDER RESPONSIBLE CHARGE OF THE GEOTECHNICAL ENGINEER OR EIC TO COMPLETE INSPECTION AND TESTING OF CONSTRUCTION AS REQUIRED BY THE

FOR THE PURPOSES OF THESE SPECIFICATIONS, REFERENCES TO THE EIC UNDER THE SUPERVISION AND INSPECTION SECTION OF EACH SPECIFICATION MAY REFER TO EITHER THE EIC, GEOTECHNICAL ENGINEER, OR INSPECTOR.

B REFERENCED STANDARDS AND SPECIFICATIONS THE FOLLOWING SPECIFICATIONS AND STANDARDS, INCLUDING ADDENDA, AMENDMENTS AND ERRATA, FORM A PART OF THIS

SPECIFICATION TO THE EXTENT REQUIRED BY THE REFERENCES THERETO. THE CONTRACTOR MUST ADHERE TO ANY NEWER VERSIONS OF THE REFERENCED STANDARDS AND SPECIFICATIONS. THE LIST BELOW IS THE MOST FREQUENTLY USED STANDARDS THAT ARE REFERENCED BUT OTHER REFERENCES MAY BE REFERENCED IN THE STANDARD SPECIFICATIONS.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO). WASHINGTON D.C. <http://www.transportation.org/>. Referenced as "Aashto".

AMERICAN CONCRETE INSTITUTE (ACI), FARMINGTON HILLS, MICHIGAN. <http://www.concrete.org/general/home.asp> - ACI-318-11 - "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE". ACI-350-06 - "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES AND COMMENTARY".

ACI SP-66-04 - "ACI DETAILING MANUAL". THIS STANDARD REPLACED ACI 315-92. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), "TREE CARE OPERATIONS: STANDARD PRACTICES FOR TREE, SHRUB AND

OTHER WOODY PLANT MAINTENANCE", WASHINGTON, D.C. 2008. REFERENCED AS STANDARD A300. AMERICAN PUBLIC HEALTH ASSOCIATION (APHA), AMERICAN WATER WORKS ASSOCIATION (AWWA), AND WATER ENVIRONMENT

FEDERATION (WEF), "STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER", WASHINGTON D.C. 2012, 22ND EDITION, < HTTP://WWW.STANDARDMETHODS.ORG/>, REFERENCED AS "STANDARD METHODS FOR THE EXAMINATION OF WATER

AMERICAN SOCIETY OF TESTING AND MATERIALS INTERNATIONAL, STANDARDS WORLDWIDE. WEST CONSHOHOCKEN, PA. <http://www.astm.org/standard/index.shtml>, referenced as "astm"

CONCRETE REINFORCING STEEL INSTITUTE (CRSI). SCHAUMBURG, ILLINOIS. http://www.crsi.org/. REFERENCED AS "CRSI" CRSI "MANUAL OF STANDARD PRACTICE 2009", 28TH EDITION. CRSI "PLACING REINFORCING BARS 2011", 9TH EDITION,

INTERNATIONAL CODE COUNCIL (ICC), INTERNATIONAL BUILDING CODE (IBC). WASHINGTON D.C. http://www.iccsafe.org/

MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE), WATER MANAGEMENT ADMINISTRATION IN ASSOCIATION WITH SOIL CONSERVATION SERVICE AND STATE SOIL CONSERVATION COMMITTEE, "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL". BALTIMORE, MARYLAND. 2011. REFERENCED AS "MDE SPECIFICATIONS FOR SOIL

MARYLAND DEPARTMENT OF ENVIRONMENT, WATER RESOURCES ADMINISTRATION, "MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION", BALTIMORE, MARYLAND, NOVEMBER 2000 REVISION, REFERENCED AS "MDE CONSTRUCTION GUIDELINES".

MARYLAND DEPARTMENT OF TRANSPORTATION (MDOT), STATE HIGHWAY ADMINISTRATION (MSHA), HANOVER, MARYLAND. <http://www.roads.maryland.gov/home.aspx/>. As revised on MSHA Website. Referenced as "MSHA".

· "BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES". REFERENCED AS "MSHA STANDARD DETAILS". "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS", LATEST EDITION. REFERENCED AS "MSHA STANDARD SPECIFICATIONS" OR "MSHA"

UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), "CONFINED SPACES STANDARD, 2004". WASHINGTON D.C. < HTTP://WWW.OSHA.GOV>.

C. SPECIFICATIONS/SCOPE OF WORK: WHERE APPLICABLE, ITEMS ARE CROSS-REFERENCED TO, AND INCORPORATE, INFORMATION AND REQUIREMENTS PROVIDED IN THE PART III. TECHNICAL REQUIREMENTS OF THE MARYLAND STATE HIGHWAY ADMINISTRATION (MSHA) STANDARD

SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, LATEST EDITION AND THE MSHA BOOK OF STANDARDS, LATEST REVISION. THE LINK TO THE SPECIFICATIONS DOCUMENT IS:

AL.MDOT.MARYLAND.GOV/MEDIAWIKI/INDEX.PHP?TITLE=2017_STANDARD_SPECIFICATIONS_FOR_ CONSTRUCTION_AND_MATERIALS

- 1. PART I (GENERAL PROVISIONS) AND PART II (TERMS AND CONDITIONS) OF THE MSHA STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS DO NOT APPLY TO, AND ARE NOT INCORPORATED INTO THESE SPECIFICATIONS.
- 2. ANY REFERENCES IN MSHA PART III TECHNICAL REQUIREMENTS TO THE "ADMINISTRATION" OR "MSHA" SHALL BE INTERPRETED AS REFERRING TO THE OWNER.
- 3. ANY REFERENCES IN MSHA PART III TECHNICAL REQUIREMENTS TO THE "ENGINEER" SHALL BE INTERPRETED AS REFERRING
- 4. ANY REFERENCE TO "CONTRACT DOCUMENTS" IN THE SPECIFICATIONS SHALL BE INTERPRETED AS REFERRING TO APPROVED
- 5. THE REFERENCED MSHA SECTIONS AND SUBSECTIONS APPLY UNLESS NOTED OTHERWISE ELSEWHERE IN THE CONTRACT DOCUMENTS. IN CASE OF CONFLICT BETWEEN MSHA SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS, THE REQUIREMENTS OF THE OTHER CONTRACT DOCUMENTS SHALL APPLY.

DESCRIPTION:

COMPLY WITH SUBSECTION 101.01 OF MSHA OF THESE SPECIFICATIONS UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THIS WORK CONSISTS OF CLEARING AND GRUBBING WITHIN THE LIMITS SPECIFIED IN THE CONTRACT DOCUMENTS. CLEARING INCLUDES REMOVING AND DISPOSING OF ALL TREES, BRUSH, SHRUBS, VEGETATION, ROTTEN WOOD, RUBBISH, FENCES AND STRUCTURES IN CONSTRUCTION AREA FOR REMOVAL AND DISPOSAL, AND TRIMMING AND DISPOSAL OF TREE LIMBS THAT INTERFERE WITH PERFORMANCE OF THE WORK. GRUBBING COVERS REMOVAL AND DISPOSAL OF ALL STUMPS, ROOTS, STUBS, BRUSH AND DEBRIS WITHIN LIMITS OF DISTURBANCES SPECIFIED IN THE CONTRACT DOCUMENTS, WOODY VEGETATION WITHIN 15-FEET OF THE DAM'S EMBANKMENT AND APPURTENANT WORKS MUST BE REMOVED IF PRESENT.

PROVIDE PROTECTION FOR TREES DESIGNATED TO BE PROTECTED PER THE CONTRACT DOCUMENTS.

NOT APPLICABLE

SUBMITTALS: NOT APPLICABLE

COMPLY WITH SUBSECTION 101.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. 1. VEGETATION: THE CONTRACTOR MUST MARK (DO NOT USE PAINT) THE CLEARING LIMITS INCLUDING ANY TREES. SHRUBBERY. AND PLANTS THAT ARE TO BE REMOVED, AS WELL AS THOSE THAT ARE TO REMAIN AND BE PROTECTED, PRIOR TO WORK. THE OWNER AND OTHER APPROPRIATE REGULATORY AGENCIES MUST REVIEW AND APPROVE THE CLEARING LIMITS. THE CONTRACTOR MUST PROTECT THE MARKED ITEMS FROM ANY DAMAGE. BRANCHES AND EXPOSED ROOTS OF TREES OVERHANGING AND INTERFERING WITH THE WORK MUST NOT BE CUT WITHOUT THE OWNER'S PRIOR APPROVAL. ALL TRIMMING MUST BE DONE UNDER THE FIELD SUPERVISION OF A LICENSED ARBORIST OR TREE EXPERT LICENSED BY THE STATE OF MARYLAND AND FURNISHED BY THE CONTRACTOR, INCLUDING TRIMMING OF TREES BY THE CONTRACTOR FOR ANY OTHER REASON. TRIMMING, AND/OR REPAIR OF CUTS AND SCARS MUST BE PROPERLY BANDAGED (REFERENCED STANDARDS: AMERICAN NATIONAL STANDARD INSTITUTE (ANSI), "AMERICAN NATIONAL STANDARD FOR PRUNING.")

a. ALL EMBEDDED STUMPS AND ROOTS MUST BE REMOVED TO A DEPTH OF NOT LESS THAN 3 FEET BELOW THE SUBGRADE OR SLOPE SURFACES. DEPRESSIONS MADE BELOW THE SUBGRADE OR SLOPE SURFACES BY REMOVAL OF STUMPS MUST BE

SHALL BE CLEARED AND REMOVED PER THIS CLEARING AND GRUBBING SECTION.

- REFILLED WITH SOIL OR AS SPECIFIED ON CONTRACT DOCUMENTS b. IN THE AREA OF A DAM EMBANKMENT, ALL EMBEDDED STUMPS AND ROOTS MUST BE COMPLETELY REMOVED ON THE EMBANKMENT OR BENEATH THE EMBANKMENT SUBGRADE. DEPRESSIONS MADE BELOW THE SUBGRADE OR EMBANKMENT SURFACES BY REMOVAL OF STUMPS MUST BE REFILLED WITH MATERIALS SUITABLE FOR DAM EMBANKMENT CONSTRUCTION, AND COMPACTED PER REQUIREMENTS IN THESE SPECIFICATIONS. THE EMBANKMENT MATERIAL MUST BE OVERLAID WITH 6" OF TOP SOIL, SEEDED, AND MULCHED. THE FINAL GRADE MUST MATCH THE ADJACENT GRADES.
- BECAUSE OF THE CLEARING AND GRUBBING OPERATION IS THE PROPERTY OF THE CONTRACTOR AND MUST BE DISPOSED OF IN ACCORDANCE WITH THE LOCAL AND STATE REGULATIONS. NO BURNING WILL BE PERMITTED WITHIN THE WORK SITE 3. FALLEN AND STORM-DAMAGED TREES: REMOVAL OF ALL FALLEN AND/OR STORM-DAMAGED TREES, REGARDLESS OF SIZE,

c. DISPOSAL: UNLESS DESIGNATED FOR REUSE ON THE CONTRACT DOCUMENTS, MATERIAL AND DEBRIS COLLECTED

THE EIC WILL INSPECT THE LIMITS OF CLEARING WITHIN 15 FEET OF THE DAM'S EMBANKMENT OR APPURTENANT STRUCTURES. THE LIMITS OF CLEARING WITHIN 15 FEET OF THE DAM'S EMBANKMENT OR APPURTENANT STRUCTURES MUST BE SURVEYED AND INCLUDED ON THE AS-BUILT PLANS.

REMOVAL AND DISPOSAL OF EXISTING STRUCTURES

COMPLY WITH SUBSECTION 102.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

NOT APPLICABLE

NOT APPLICABLE

COMPLY WITH SUBSECTION 102.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THE EIC MUST INSPECT THE LIMITS OF REMOVAL OF EXISTING STRUCTURES FOLLOWING REMOVAL TO ENSURE THAT THEY COMPLY WITH THE CONTRACT DOCUMENTS.

CONSTRUCTION STAKEOUT

COMPLY WITH SUBSECTION 107.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THIS WORK CONSISTS OF PROVIDING A CONSTRUCTION LAYOUT (STAKEOUT) PERFORMED BY PERSONNEL ACTING UNDER RESPONSIBLE CHARGE OF A PROFESSIONAL LAND SURVEYOR CURRENTLY REGISTERED IN THE STATE OF MARYLAND.

NOTE: THE CONTRACTOR MUST USE COMPETENT PERSONNEL AND APPROPRIATE EQUIPMENT FOR ALL WORK REQUIRED TO SET AND MAINTAIN THE ELEVATIONS AND DIMENSIONS AS SPECIFIED IN THE CONTRACT DOCUMENTS. IF ANY DISCREPANCIES BETWEEN PLAN AND FIELD CONDITIONS ARE FOUND, THE CONTRACTOR MUST RESOLVE ANY NEEDED FIELD ADJUSTMENTS WITH THE EIC AND OWNER BEFORE STARTING CONSTRUCTION.

COMPLY WITH SUBSECTION 107.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THE SURVEYOR MUST USE

MARKER MATERIALS THAT CAN BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION. DEMARCATION OF WETLANDS USING SHA WETLAND TAPE AS DESCRIBED IN SECTION 107.03.09 IS NOT REQUIRED UNLESS SPECIFICALLY CALLED FOR ON CONTRACT DOCUMENTS.

PRIOR TO CONSTRUCTION OF STRUCTURES, CONDUIT, EARTHWORK, OR OTHER INSTALLATIONS, THE CONTRACTOR SHALL SUBMIT STAKEOUT CUT/FILL SHEETS TO THE EIC FOR REVIEW AND APPROVAL. STAKEOUT SHEETS FOR LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL DEVICE. AND LANDSCAPE STAKEOUT ARE NOT REQUIRED TO BE SUBMITTED. THE STAKEOUT CUT/FILL SHEETS SHALL INCLUDE A PLAN SHOWING THE LOCATION AND IDENTIFICATION OF ALL STAKES/HUBS AND A TABLE SHOWING:

- 1. STAKE/HUB IDENTIFICATION 2. SURVEYED ELEVATION
- 3. PROPOSED ELEVATION 4. RESULTANT CUT OR FILL DEPTH
- 5. OFFSETS OR OTHER PERTINENT NOTES CONCERNING THE STAKE/HUB POINT.

COMPLY WITH SUBSECTION 107.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THE CONTRACTOR MUST HAVE THE LICENSED SURVEYOR PROVIDE THE FOLLOWING

- 1. PROJECT LAYOUT: THE CONTRACTOR'S SURVEYOR SHALL ACCURATELY LOCATE THE WORK HORIZONTALLY AND VERTICALLY -TO ENSURE THAT THE WORK IS PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- a. THE SURVEYOR MUST STAKEOUT ALL CONSTRUCTION BASELINES WITH THE MAXIMUM SPACING OF STATIONS (STAKES, NAILS, CROSSES, ETC.) OF 100 FEET UNLESS CLOSER STAKEOUTS ARE SPECIFIED IN THE CONTRACT DOCUMENTS.
- 3. SITE STAKEOUT a. THE CONTRACTOR MUST PERFORM A SURVEYED STAKE OUT OF ANY ALIGNMENT CENTERLINES (E.G., EMBANKMENTS) AND
- b. THE CONTRACTOR SHALL MAINTAIN ALIGNMENT CENTERLINE STAKE OUT SURVEY MARKERS SUCH THAT THE EIC CAN RECORD THE STATION AND ELEVATION OF EACH COMPACTION TEST WITHIN +/- 1-FOOT HORIZONTAL ACCURACY AND
- +/-0.25-FOOT VERTICAL ACCURACY. 4. AS-BUILT SURVEY a. AN AS-BUILT SURVEY OF THE COMPLETED SUBSURFACE WORK SHALL BE PERFORMED AND SHALL INCLUDE BUT NOT LIMITED TO: HORIZONTAL DIMENSIONS, GRADING LIMITS, ELEVATIONS, SLOPES, TYPES/LENGTH/HEIGHT OF FEATURES NOT
- ABLE TO BE SURVEYED AFTER PROJECT COMPLETION. DOCUMENTATION OF THIS SURVEY INCLUDING RED-LINE PLANS, NOTES, DIMENSIONS, ETC. MUST BE PROVIDED TO THE EIC UPON COMPLETION OF THE PROJECT. 5. CONTROL MARKERS: THE CONTRACTOR MUST PRESERVE THE CENTER LINE AND BENCH MARKS SET BY THE SURVEYOR. WHEN THE CENTER LINE AND BENCH MARKS ARE DISTURBED OR DESTROYED, THEY MUST BE REPLACED BY THE
- 6. CONTROL STAKES: FOR CONSTRUCTION BASELINES, THE SURVEYOR MUST FURNISH AND SET STAKES AT EACH STATION AS SHOWN ON THE CONTRACT DOCUMENTS OR OFFSET ALONG ONE SIDE OF THE PROJECT AS SITE CONDITIONS REQUIRE AND PER THE EIC'S APPROVAL. AS APPLICABLE, EACH OF THESE STAKES MUST BE MARKED WITH ITS OFFSET DISTANCE FROM THE CENTER LINE ALONG WITH KEY REFERENCE ELEVATION(S) NEEDED FOR PROPER CONSTRUCTION. MAINTENANCE OF SURVEYOR STAKES AND ADDITIONAL STAKES NEEDED FOR THE HORIZONTAL AND VERTICAL CONTROLS NECESSARY FOR THE CORRECT LAYOUT OF THE WORK MUST BE PROVIDED BY THE CONTRACTOR.
- 7. UTILITIES: WHEN APPLICABLE, THE CONTRACTOR MUST FURNISH TO THE UTILITY COMPANIES OR AGENCIES WORKING WITHIN THE LIMITS OF THE PROJECT, REFERENCE INFORMATION RELATED TO CONTROL POINTS, ALIGNMENT AND GRADE DATA. THESE MUST BE FURNISHED PROMPTLY UPON REQUEST, SO THAT THE UTILITY COMPANIES MAY PROPERLY LOCATE AND COORDINATE THEIR WORK RELATED TO THE PROJECT.

NOT APPLICABLE

GENERAL DESCRIPTION: WORK CONSISTS OF ALL LABOR. MATERIALS, EQUIPMENT, DEWATERING, SHEETING AND SHORING, AND SERVICES NECESSARY FOR AND INCIDENTAL TO THE EXECUTION AND COMPLETION OF GRADING (EARTHWORK). AS INDICATED ON THE CONTRACT DOCUMENTS AND SPECIFIED HEREIN. THE EXTENT OF EXCAVATION FILLING, AND GRADING IS SHOWN IN THE CONTRACT DOCUMENTS. PREPARATION OF SUBGRADE FOR CONDUITS. STRUCTURES. AND FILLS IS PART OF THIS WORK. BACKFILLING REQUIRED TO ESTABLISH PROPOSED GRADE AROUND INSTALLATIONS SUCH AS STRUCTURES IS INCLUDED AS PART

ALL BORROW SITES AND OFF-SITE DISPOSAL SITES UTILIZED BY THE CONTRACTOR TO PERFORM WORK UNDER THIS CONTRACT MUST HAVE ALL NECESSARY STATE AND LOCAL PERMITS. THE CONTRACTOR MUST IDENTIFY THESE SITES AND PROVIDE A COPY OF APPROPRIATE PERMIT(S) TO THE OWNER UPON REQUEST PRIOR TO STARTING WORK

- 1. NOTIFY "MISS UTILITY" A MINIMUM OF 48 HOURS PRIOR TO PERFORMING EARTHWORK BY CALLING 1-800-257-7777. LOCATE EXISTING UNDERGROUND UTILITIES IN THE AREAS OF WORK. IF UTILITIES ARE TO REMAIN IN PLACE, PROVIDE ADEQUATE MEANS OF PROTECTION DURING EARTHWORK OPERATIONS. THE CONTRACTOR MUST REPAIR ANY CONTRACTOR DAMAGE TO UTILITIES SHOWN ON THE CONTRACT DOCUMENTS OR IDENTIFIED IN THE FIELD. ALL UTILITY WORK MUST BE DONE IN ACCORDANCE WITH SPECIFIC UTILITY REQUIREMENTS INCLUDING THE USE OF UTILITY-APPROVED CONTRACTORS AND/OR
- INSPECTORS AS APPROPRIATE 2. SHOULD PIPE CONDUITS OR OTHER UTILITIES (NOT SHOWN ON THE CONTRACT DOCUMENTS) BE ENCOUNTERED DURING EXCAVATION. STOP WORK IN THAT AREA AND CONSULT THE EIC IMMEDIATELY FOR DIRECTION. COOPERATE WITH THE OWNER AND UTILITY COMPANIES IN KEEPING RESPECTIVE SERVICES AND FACILITIES IN OPERATION. REPAIR ANY
- CONTRACTOR-DAMAGED UTILITIES TO SATISFACTION OF UTILITY COMPANY 3. DO NOT INTERRUPT EXISTING UTILITIES SERVING OCCUPIED FACILITIES. EXCEPT WHEN PERMITTED IN WRITING BY THE

GENERAL EXECUTION REQUIREMENTS:

- 1. USE OF EXPLOSIVES: THE USE OF EXPLOSIVES IS PROHIBITED UNLESS AUTHORIZED IN WRITING BY THE OWNER AND APPROVED BY MDE.
- 2. PROTECTION:
- a. SAFETY: PROVIDE PROTECTIVE MEASURES NECESSARY FOR THE SAFETY OF THE WORKERS, PUBLIC, THE EXISTING DAM EMBANKMENT, AND ADJACENT PROPERTY. PREVENT CAVE-INS, COLLAPSE OF WALLS, STRUCTURES AND SLOPES, BOTH ON b. STANDARDS: COMPLY WITH REGULATIONS OF LOCAL AUTHORITIES HAVING JURISDICTION, INCLUDING ALL APPLICABLE OSHA AND MOSH REQUIREMENTS.
- c. REPAIR: REMOVE DAMAGED MATERIALS AND REPLACE WITH NEW MATERIALS (AS REQUIRED BY THE CONTRACT DOCUMENTS) WHERE SUCH MATERIALS ARE AFFECTED BY SETTLEMENT OR OTHER DAMAGE CAUSED BY IMPROPER

EARTH EXCAVATION

COMPLY WITH SUBSECTION 201.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

OWNER, AND ONLY AFTER ACCEPTABLE TEMPORARY UTILITY SERVICES HAVE BEEN PROVIDED.

ALTHOUGH THE MSHA TITLE AND SPECIFICATION SECTION REFERS ONLY TO ROADWAY EXCAVATION, THIS SECTION APPLIES TO ALL EXCAVATION NOT IDENTIFIED ELSEWHERE IN THESE SPECIFICATIONS.

THIS SECTION COVERS EXCAVATION AND HANDLING OF ANY SOIL MATERIAL. EARTH EXCAVATED FOR REUSE AS FILL ON SITE MUST BE KEPT IN SEPARATE STOCKPILES FOR TOP SOIL AND GENERAL SOIL RE-GRADING AS REQUIRED BY THE CONTRACT DOCUMENTS. OWNER, OR APPLICABLE PERMIT INSPECTORS.

COMPLY WITH SUBSECTION 201.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

- 1. STOCKPILE EXCAVATED MATERIAL SUITABLE FOR BACKFILL OR FILL WHERE PERMITTED BY THE CONTRACT DOCUMENTS. UNTIL REQUIRED. PLACE, GRADE AND SHAPE STOCKPILES FOR PROPER DRAINAGE.
- 2. LOCATE AND RETAIN SOIL MATERIALS AWAY FROM EDGE OF EXCAVATIONS. 3. DISPOSE OF EXCESS AND OR UNSATISFACTORY MATERIALS AS SPECIFIED HEREIN. 4. TEMPORARILY STABILIZE OR COVER THE STOCKPILE AS REQUIRED.

NOT APPLICABLE

6. EXCAVATION FOR STRUCTURES:

COMPLY WITH SUBSECTION 201.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. 1. EXCAVATION CONSISTS OF CUTTING, REMOVING, STOCKPILING AND GRADING OF MATERIAL ENCOUNTERED WHEN

MATERIAL TO BRING ELEVATIONS TO GRADE AS SPECIFIED AND TO THE SATISFACTION OF THE OWNER.

ESTABLISHING REQUIRED GRADE ELEVATIONS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS THAT ARE NOT CLASSIFIED ROCK EXCAVATION, POND DREDGING OR UNAUTHORIZED EXCAVATION. 2. UNAUTHORIZED EXCAVATION CONSISTS OF SITE GRADING THAT EXTENDS BEYOND THE SPECIFIED BOTTOM ELEVATIONS OR HORIZONTAL LIMITS WITHOUT THE DIRECTION OF THE OWNER. ALL REMEDIAL WORK, TO CORRECT UNAUTHORIZED EXCAVATION, INCLUDING BACKFILLING AND COMPACTING WITH EARTH OR GRAVEL, LEAN CONCRETE FILL OR ANY OTHER

3. THE EIC MUST BE CONTACTED, AND WORK IN THAT AREA MUST BE STOPPED, IF UNSUITABLE BEARING MATERIALS, AS DETERMINED BY THE GEOTECHNICAL ENGINEER, ARE ENCOUNTERED AT REQUIRED ELEVATIONS. ANY ADDITIONAL WORK MUST BE AUTHORIZED BY THE EIC AND THE OWNER BEFORE WORK CONTINUES INCLUDING DEEPER EXCAVATION AND PLACEMENT OF SUITABLE REPLACEMENT MATERIAL. EXCAVATING UNSUITABLE MATERIAL SOLELY TO FACILITATE

PERFORMANCE OF OTHER WORK SHALL BE CONSIDERED CONTRACTOR "MEANS AND METHODS". 4. STABILITY OF EXCAVATIONS: SLOPE SIDES OF EXCAVATIONS TO COMPLY WITH LOCAL CODES AND ORDINANCES HAVING JURISDICTION. SHORE AND BRACE THE EXCAVATION WHERE SLOPING IS NOT POSSIBLE BECAUSE OF SPACE RESTRICTIONS OR STABILITY OF MATERIALS EXCAVATED. SHEETING, SHORING, AND BRACING IS NOT PERMITTED FOR EXCAVATIONS IN DAM EMBANKMENTS. THE EMBANKMENT MUST BE EXCAVATED TO SAFE, STABLE SLOPES (2-HORIZONTAL-TO-1-VERTICAL MINIMUM). NO VERTICAL TRENCHING IS ALLOWED. ALL CONDUITS PENETRATING THROUGH THE DAM'S EMBANKMENT MUST BE INSTALLED DURING CONSTRUCTION/RE-CONSTRUCTION OF THE EMBANKMENT. CONDUITS MAY NOT BE INSTALLED IN VERTICAL TRENCHES AFTER THE EMBANKMENT HAS BEEN CONSTRUCTED.

5. SITE INFORMATION: DATA ON INDICATED SUBSURFACE CONDITIONS IS NOT INTENDED TO BE A REPRESENTATION OR WARRANT OF CONTINUITY OF SUCH CONDITIONS BETWEEN SOIL BORINGS. IT IS EXPRESSLY UNDERSTOOD THAT THE OWNER WILL NOT BE RESPONSIBLE FOR INTERPRETATIONS OR CONCLUSIONS DRAWN THERE FROM BY THE CONTRACTOR. DATA IS MADE AVAILABLE FOR THE CONVENIENCE OF THE CONTRACTOR.

a. EXCAVATION FOR STRUCTURES MUST CONFORM TO ELEVATIONS AND DIMENSIONS SHOWN ON THE CONTRACT DOCUMENTS WITHIN A TOLERANCE OF PLUS OR MINUS 0.1 FOOT. EXCAVATION SHOULD EXTEND 36 INCHES MINIMUM FROM FOOTINGS AND FOUNDATIONS TO PERMIT PLACING AND REMOVAL OF CONCRETE FORMWORK AND COMPACTING BACKFILL IN ADDITION TO PLACING OTHER CONDUITS OR ADJACENT STRUCTURES. EXCAVATION MUST NOT BE BACKFILLED WITHOUT THE EIC'S

BOTTOM OF EXCAVATION. EXCAVATE BY HAND TO FINAL GRADE JUST BEFORE CONCRETE OR OTHER BACKFILL MATERIAL IS PLACED. THE HORIZONTAL LIMITS OF EXCAVATION MUST BE WITHIN 36 INCHES OF THE SURFACE OF INSTALLED STRUCTURES UNLESS SPECIFIED OTHERWISE ON THE CONTRACT DOCUMENTS OR COVERED SEPARATELY FOR DEEP c. ABANDONED STRUCTURES, WHICH MAY EXIST WHERE STRUCTURE FOOTINGS AND FOUNDATIONS, CONDUITS, CRADLES,

b. IN EXCAVATING FOR STRUCTURE FOOTINGS AND FOUNDATIONS, CONDUITS, CRADLES, DRAINS, ETC. DO NOT DISTURB

DRAINS, ETC., ARE TO BE PLACED, ARE TO BE REMOVED IN THEIR ENTIRETY. a. GENERAL: UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING UNDER THIS SECTION, INCLUDING ADJACENT TRANSITION AREAS. SMOOTH FINISH SURFACE WITHIN SPECIFIED TOLERANCES, WITH UNIFORM LEVELS OR SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE SHOWN, OR BETWEEN SUCH POINTS AND EXISTING GRADES. b. DITCHES: FINISH DITCHES TO ENSURE PROPER FLOW AND DRAINAGE. MANAGE EXCAVATION EQUIPMENT AND TRAVEL

PATHS AS TO MINIMIZE SOIL COMPACTION. STABILIZE THE SOIL SURFACE WITH TEMPORARY OR FINAL STABILIZATION IN ACCORDANCE WITH SEDIMENT CONTROL GUIDELINES. c. GRASS AREAS: FINISH AREAS TO RECEIVE TOPSOIL MUST CONFORM TO WITHIN A TOLERANCE OF 0.1 FOOT ABOVE OR

a. PROTECTION OF GRADED AREAS: PROTECT NEWLY GRADED AREAS FROM TRAFFIC AND EROSION IN ACCORDANCE WITH LOCAL AND STATE SEDIMENT CONTROL STANDARDS AND KEEP FREE OF TRASH AND DEBRIS. REPAIR AND REESTABLISH GRADES IN SETTLED, ERODED, AND RUTTED AREAS TO SPECIFIED TOLERANCES. b. RECONDITIONING COMPACTED AREAS: WHERE COMPLETED COMPACTED AREAS ARE DISTURBED BY SUBSEQUENT CONSTRUCTION OPERATIONS OR ADVERSE WEATHER, SCARIFY SURFACE, RESHAPE, AND COMPACT TO REQUIRED DENSITY

c. DISPOSAL OF EXCESS AND WASTE MATERIALS: REMOVE WASTE MATERIALS, INCLUDING UNACCEPTABLE EXCAVATED MATERIAL, TRASH, AND DEBRIS FROM THE CONSTRUCTION SITE. ALL EXCESS AND WASTE MATERIALS MUST BE DISPOSED OF IN ACCORDANCE WITH LOCAL REQUIREMENTS.

b. CLEAN ALL ROCK AND OTHER HARD FOUNDATION MATERIAL OF LOOSE MATERIAL AND CUT TO A FIRM SURFACE, EITHER LEVEL OR STEPPED, AS DIRECTED, CLEAN OUT AND GROUT ALL SEAMS AND CREVICES USING A WATER JET AND/OR COMPRESSED AIR AND EXCAVATE THE CRACK TO THREE (3) TIMES THE CRACK WIDTH. REMOVE ALL LOOSE AND

DISINTEGRATED ROCK AND THIN STRATA. c. ROCK EXCAVATION CONSISTS OF REMOVAL AND DISPOSAL OF MATERIALS ENCOUNTERED THAT CANNOT BE EXCAVATED WITHOUT THE USE OF EXPLOSIVES OR PNEUMATIC EQUIPMENT. TYPICAL MATERIALS CLASSIFIED AS ROCK ARE, SOLID ROCK, ROCK IN LEDGES, AND ROCK HARD AGGREGATE DEPOSITS. INTERMITTENT DRILLING PERFORMED TO INCREASE PRODUCTION AND NOT NECESSARY TO PERMIT EXCAVATION OF MATERIAL ENCOUNTERED WILL BE CLASSIFIED AS EARTH EXCAVATION.

d. THE DETERMINATION OF ROCK EXCAVATION WILL BE DETERMINED AND MEASURED IN THE FIELD BY THE EIC. ROCK IS DEFINED AS THAT MATERIAL WHICH CANNOT BE REMOVED BY USE OF A BULLDOZER BLADE WITH A SINGLE-TOOTH RIPPER OR USE OF PNEUMATIC EQUIPMENT AND MAY REQUIRE BLASTING. THE REMOVAL OF DISINTEGRATED ROCK IS CLASSIFIED e. MINIMUM EFFORT: IF ROCK IS NOT REMOVED DURING THE PROCESS OF NORMAL DIGGING AND RIPPING, CONTACT THE EIC AND OWNER FOR PRIOR APPROVAL, THEN EXTEND THE EXCAVATION TO EXPOSE THE ROCK SURFACE WITHIN THE LIMIT OF

ORIGINAL EXCAVATION. THE CONTRACTOR MUST PERFORM ANY AND ALL ROCK EXCAVATION REQUIRED TO COMPLETE THE

ALL EXCAVATIONS SHALL BE SUPERVISED AND INSPECTED BY THE EIC. ALL ROCK EXCAVATIONS, ROCK SURFACE CLEANING, AND ROCK SURFACE PREPARATION SHALL BE SUPERVISED BY AN ENGINEERING GEOLOGIST APPOINTED BY THE EIC. THE EIC SHALL ISSUE REPORTS FOR EACH EXCAVATION INDICATING:

1. DATE OF INSPECTION 2. EXCAVATION INTENT (E.G. FOR STRUCTURE, FOR CONDUIT, ETC.)

B. APPROXIMATE LOCATION (BASE LINE STATION, OFFSET, AND BOTTOM ELEVATION) OF THE EXCAVATION

5. VISUAL OBSERVATIONS OF THE EXCAVATION INCLUDING GROUND SURFACE CONDITION, ANY CLEANING, DELETERIOUS MATERIAL REMOVAL, AND/OR SURFACE PREPARATION COMPLETED, 6. PHOTOS OF THE EXCAVATION 7. SKETCHES OF THE EXCAVATION GEOMETRY (HORIZONTAL AND VERTICAL) NOTING DIMENSIONS, SIDE SLOPES, AND DEPTH

PLACEMENT OF EARTH FILL MATERIALS AT DAMS

THE WORK CONSISTS OF THE PROVISION AND PLACEMENT OF EARTH FILL MATERIAL AT DAMS. FILL IS MATERIAL, DESCRIBED BELOW, PLACED ABOVE AN EXISTING OR INTERIM GRADE REQUIRED BY THE CONTRACT DOCUMENTS

THE CONTRACTOR MUST PROVIDE THE PROPER CARE OF EXCAVATED MATERIAL TO BE USED AS DAM EMBANKMENT AND/OR

IMPERVIOUS MATERIAL INCLUDING PROTECTION AGAINST CONTAMINATION, MOISTURE AND OTHER UNDESIRABLE EFFECTS. 1. COARSE-GRAINED MATERIALS USED FOR THE EMBANKMENT SHELL MUST BE CLASSIFIED IN ACCORDANCE WITH UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SOIL TYPES GC, GM, SC, OR SM, AND THE MAXIMUM DRY DENSITY MUST BE NOT LESS THAN 110 PCF AS DETERMINED BY ASTM D698 OR AASHTO T-99. 2. FINE-GRAINED MATERIALS USED FOR THE EMBANKMENT SHELL MUST BE CLASSIFIED IN ACCORDANCE WITH USCS SOIL TYPES CL, OR ML AND THE MAXIMUM DRY DENSITY MUST BE NOT LESS THAN 105 PCF AS DETERMINED BY ASTM D698 OR AASHTO T-99.

3. MATERIALS USED FOR THE IMPERVIOUS CORE, CUTOFF TRENCH OR LINER MUST BE CLASSIFIED IN ACCORDANCE WITH USCS

SOIL TYPES GC, SC, OR CL AND MUST HAVE A MINIMUM OF 30% PASSING THE #200 SIEVE. THE MATERIAL MUST HAVE A MAXIMUM DRY DENSITY NOT LESS THAN 105 PCF AS DETERMINED BY ASTM D698 OR AASHTO T-99 4. ALL SATISFACTORY SOIL MATERIALS MUST BE FREE OF ROCK OR GRAVEL LARGER THAN TWO (2) INCHES IN ANY DIMENSION, DEBRIS, WASTE/RUBBISH, FROZEN MATERIALS, ORGANIC, AND OTHER OBJECTIONABLE MATERIALS 5. MATERIAL REQUIRED FOR FILTERS AND DRAINS IS NOT SPECIFIED IN THIS SECTION BUT IS SPECIFIED ELSEWHERE IN THESE

PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND RECEIVE APPROVAL OF TEST RESULTS NOT OLDER THAN 60 DAYS FROM AN ACCREDITED LABORATORY CONFIRMING THE ACCEPTABILITY OF EACH EARTH FILL MATERIAL FOR USE IN

CONSTRUCTION. FOR THE IMPERVIOUS CORE, CUTOFF TRENCH, AND/OR LINER, THE SUBMITTAL MUST INCLUDE: 1. SAMPLE LOCATION ID (NOTE: IF MULTIPLE SUBMITTALS ARE PROVIDED FROM THE SAME SITE, EACH SUBMITTAL MUST HAVE A

UNIQUE LOCATION ID AND THIS ID MUST BE PROVIDED ON THE DELIVERY TICKET SO THE APPROPRIATE PROCTOR ANALYSIS CAN BE USED DURING COMPACTION TESTING) 2. PARTICLE SIZE DISTRIBUTION REPORT INCLUDING HYDROMETER ANALYSIS DEMONSTRATING THAT THE EARTH FILL MATERIAL CONTAINS 30% PASSING THE #200 SIEVE PER ASTM D421/D422

3. ATTERBERG LIMITS ANALYSIS INCLUDING VALUES FOR LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX PER ASTM D4318 AND USCS CLASSIFICATION PER ASTM D2487 4. PROCTOR ANALYSIS PER ASTM D698 OR AASHTO T-99 NOTING:

a. MAXIMUM DRY DENSITY b. OPTIMUM MOISTURE CONTENT

c. NATURAL MOISTURE CONTENT

FOR EMBANKMENT SHELL MATERIAL, THE SUBMITTAL MUST INCLUDE:

- 1. SAMPLE LOCATION ID (NOTE: IF MULTIPLE SUBMITTALS ARE PROVIDED FROM THE SAME SITE, EACH SUBMITTAL MUST HAVE A UNIQUE LOCATION ID AND THIS ID MUST BE PROVIDED ON THE DELIVERY TICKET SO THE APPROPRIATE PROCTOR ANALYSIS
- CAN BE USED DURING COMPACTION TESTING) 2. PARTICLE SIZE DISTRIBUTION REPORT DEMONSTRATING THAT THE EARTH FILL MATERIAL CONTAINS NO MATERIAL LARGER THAN TWO (2) INCHES PER ASTM D421/D422
- 3. ATTERBERG LIMITS ANALYSIS INCLUDING VALUES FOR LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX PER ASTM D4318 AND USCS CLASSIFICATION PER ASTM D2487
- 4. PROCTOR ANALYSIS PER ASTM D698 OR AASHTO T-99 NOTING:
- a. MAXIMUM DRY DENSITY b. OPTIMUM MOISTURE CONTENT

THE CONTRACTOR SHALL ALSO SUBMIT TO THE EIC FOR APPROVAL SPECIFICATION SHEETS FOR EACH TYPE OF COMPACTION EQUIPMENT TO BE USED FOR COMPACTING EMBANKMENT FILL. THE SPECIFICATION SHEET SHOULD INCLUDE THE FOLLOWING

1. MAKE AND MODEL OF THE EQUIPMENT

- 2. OPERATING WEIGHT 3. DIMENSION OF THE EQUIPMENT'S COMPACTION DEVICE (E.G. DRUM LENGTH AND DIAMETER, PLATE AREA, ETC.) INCLUDING
- TINE DIMENSIONS (LENGTH, WIDTH, DEPTH) 4. VIBRATION FREQUENCY OF THE EQUIPMENT'S COMPACTION DEVICE

5. CENTRIFUGAL FORCE

CONSTRUCTION: CONSTRUCTION MUST BE IN ACCORDANCE WITH MSHA SECTION 204, UNLESS NOTED OTHERWISE. SECTIONS 204,02,01 204.03.01(B), AND 204.03.02(A) DO NOT APPLY TO THIS SPECIFICATION. ROCK IS NOT TO BE USED IN EMBANKMENT FILL UNLESS. SPECIFICALLY CALLED FOR IN THE CONTRACT DOCUMENTS AND APPROVED BY THE EIC AND MDE. AREAS ON WHICH FILL IS TO BE PLACED MUST BE STRIPPED OF ALL TOPSOIL, ROOTS, AND OTHER DELETERIOUS MATERIALS AND THEN SCARIFIED PRIOR TO PLACEMENT OF FILE. ALL FILE MATERIAL MUST BE INSPECTED BY THE FIC PRIOR TO PLACEMENT FOR CONSISTENCY WITH THE APPROVED SUBMITTAL FILL MATERIALS MUST BE PLACED IN MAXIMUM PRE-COMPACTION HORIZONTAL LIETS OF FOUR (4) INCHES AROUND PIPES OR STRUCTURES AND EIGHT (8) INCHES FOR EMBANKMENT AND OTHER FILLS UNLESS SPECIFIED OTHERWISE IN THE CONTRACT DOCUMENTS. LIETS SHALL BE CONTINUOUS AND HORIZONTAL OVER THE ENTIRE LENGTH OF FILL. EACH LAYER OF EMBANKMENT FILL MUST BE COMPACTED BY A POWER SHEEPSFOOT OR PAD-FOOT ROLLER APPROVED BY THE EIC. COMPACTION. OF FILL MATERIALS MUST BE TO 95% OF THE LABORATORY MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 OR AASHTO METHOD T-99 (STANDARD PROCTOR) WITH MOISTURE CONTENT BETWEEN -2% AND +4% OF LABORATORY OPTIMUM UNLESS SPECIFIED OTHERWISE IN THE CONTRACT DOCUMENTS.

BACKFILL ADJACENT TO PIPES AND STRUCTURES ASSOCIATED WITH DAM EMBANKMENTS MUST BE OF THE TYPE AND QUALITY CONFORMING TO THAT FOR ADJOINING FILL. THE FILL MUST BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR (4) INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS. THE FILL MATERIAL MUST FILL COMPLETELY ALL VOIDS UNDER AND ADJACENT TO PIPES AND STRUCTURES. EQUIPMENT MUST NOT BE DRIVEN OVER ANY PART OF CONCRETE STRUCTURE OR PIPE UNLESS THERE IS COMPACTED FILL OF 24 INCHES OR MORE OVER THE STRUCTURE OR PIPE.

IMPERVIOUS CORES MUST BE CONSTRUCTED TO THE ELEVATION AND DIMENSIONS NOTED IN THE CONTRACT DOCUMENTS. THE IMPERVIOUS BACKFILL MATERIAL MUST BE PLACED IN LAYERS NOT EXCEEDING EIGHT (8) INCHES FOR THE ENTIRE LENGTH OF THE EMBANKMENT FILL UNLESS SPECIFIED OTHERWISE IN THE CONTRACT DOCUMENTS. PLACE THE IMPERVIOUS CORE MATERIAL CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT

THE EIC SHALL PERFORM COMPACTION TESTS IN ACCORDANCE WITH ASTM D6938 OR AASTO T-310 (NUCLEAR METHOD) OR ASTM D1556 OR AASHTO T191 (SAND CONE METHOD). TEST FREQUENCY SHALL BE A MINIMUM OF ONE PER 5,000 SF BUT NOT LESS THAN ONE PER LIFT OF MATERIAL. CUTOFF TRENCH COMPACTION SHALL BE TESTED A MINIMUM OF ONE PER 50 LF OF TRENCH BUT NOT LESS THAN ONE PER LIFT OF MATERIAL. THE EIC RESERVES THE RIGHT TO TEST AT MORE FREQUENT INTERVALS.

THE EIC WILL PREPARE AND MAKE AVAILABLE WRITTEN REPORTS DOCUMENTING THE FOLLOWING:

- 1. VERIFICATION OF EACH FOOTING SUBGRADE INCLUDING BEARING TESTS AS APPLICABLE 2. COMPACTION TEST RESULTS:
- b. GAUGE SERIAL NUMBER c. STATION/OFFSET LOCATION
- d. ELEVATION e. DEPTH OF TEST (THROUGH LIFT)
- f. WET DENSITY g. MOISTURE COUNT
- h. MOISTURE CONTENT DRY DENSITY . MAXIMUM DRY DENSITY (FROM APPROVED SUBMITTAL)
- k. OPTIMUM MOISTURE CONTENT (FROM APPROVED SUBMITTAL) I. % COMPACTION REQUIRED (FROM CONTRACT DOCUMENTS)

m.% COMPACTION OBTAINED n. ANY RELEVANT REMARKS ("FAILURE", "RE-TEST", ETC.)

COMPLY WITH SUBSECTION 208.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

COMPLY WITH SUBSECTION 208.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

NOT APPLICABLE

SUBGRADE PREPARATION

CONSTRUCTION: COMPLY WITH SUBSECTION 208.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS

SUBGRADE FOR CONDUIT AND STRUCTURES MUST BE INSPECTED AND APPROVED BY THE EIC. FOR STRUCTURE FOUNDATIONS. THE EIC SHALL ASSESS THE BEARING CAPACITY OF THE SUBGRADE USING A DYNAMIC CONE PENETRATION (DCP) TEST PER ASTM

D6951 OR OTHER METHOD AS APPROVED TO ENSURE IT EQUALS OR EXCEEDS THE DESIGN BEARING CAPACITY ASSUMPTION. THE EIC SHALL ISSUE WRITTEN REPORTS CONCERNING SUBGRADE PREPARATION NOTING THE FOLLOWING:

1. DATE OF INSPECTION 2. SUBGRADE PREPARATION INTENT (E.G. FOR STRUCTURE, FOR CONDUIT, ETC.)

3. APPROXIMATE LOCATION (BASE LINE STATION, OFFSET, AND BOTTOM ELEVATION) OF THE SUBGRADE PREPARATION

6. MODIFICATIONS TO THE SUBGRADE MADE BY THE CONTRACTOR AS A RESULT OF FINDINGS (E.G. "RECOMPACT", "POUR

4. AREA OF THE SUBGRADE PREPARATION 5. VISUAL OBSERVATIONS OF THE SUBGRADE INCLUDING GROUND SURFACE CONDITION, ANY CLEANING, DELETERIOUS MATERIAL REMOVAL, AND/OR SURFACE PREPARATION COMPLETED, MEASURED BEARING CAPACITY, ETC.

MUDMAT" (WITH DETAILS OF THICKNESS AND MATERIAL USED), ETC.) 7. PHOTOS OF THE SUBGRADE ALLATION. THE CONTRACTOR MAY NOT PROCEED WITH BACKFILLING THE STRUCTURE WITHOUT APPROVAL OF THE EIC.



Maryland Department of the Environment Water and Science Administration **Dam Safety Division**

Visty P. Dalal

Sr. Regulatory & Compliance Engineer **Permit** # 18-MR-0010

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GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT HOWARD COUNTY CAPITAL PROJECT #D-1159 HSCD #: EP-17-40 MD DAM NO. 577

POND CONSTRUCTION SPECIFICATIONS

13 OF 17

SCALE

NOT TO SCALE

SHEET

F. BUREAU OF ENVIRONMENTAL SERVICES





COMPLY WITH SUBSECTION 303.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THIS SECTION INCLUDES THE REQUIREMENTS TO INSTALL AND/OR RECONSTRUCT TEMPORARY AND PERMANENT PIPING SYSTEMS TO THE LIMITS INDICATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

THIS WORK INCLUDES TRENCH EXCAVATION FOR INSTALLATION OF PIPE, INCLUDING WHEN THE TRENCH EXCAVATION REQUIRES

COMPLY WITH SUBSECTION 303.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. BEDDING SECTION SHALL BE

BEDDING: ALL CONCRETE PIPE CONDUITS SHALL BE FIRMLY AND UNIFORMLY BEDDED IN CONCRETE CRADLES MEETING DIMENSIONS SHOWN ON THE CONTRACT DOCUMENTS. CONCRETE CRADLE MATERIAL SHALL MEET SUBSECTION 902.10 OF MSHA MIX NO. 3. REINFORCEMENT OF THE CRADLE SHALL BE PROVIDED AS SPECIFIED BY THE CONTRACT DOCUMENTS. ALL OTHER CONDUITS SHALL BE FIRMLY AND UNIFORMLY BEDDED IN EARTH FILL MATERIALS MEETING THE MATERIAL REQUIREMENTS OF THE PLACEMENT OF EARTH FILL MATERIALS AT DAMS SECTION OF THESE SPECIFICATIONS.

ALL PIPE CONDUITS SHALL HAVE A MANUFACTURER'S STAMP INDICATING THE SIZE AND CLASS OF THE PIPE ON EACH LENGTH OF PIPE CONDUIT INSTALLED. STAMPS ON REINFORCED CONCRETE PIPES SHALL BE LOCATED ON THE INSIDE WALL OF THE PIPE.

REINFORCED CONCRETE PIPE ASSOCIATED WITH DAM EMBANKMENTS AND SPILLWAYS MUST BE WATERTIGHT AND MEET ASTM C361 STANDARDS UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. THESE PIPES MUST HAVE BELL AND SPIGOT JOINTS

HEAVY DUTY CORRUGATED BLACK POLYETHYLENE PIPE (HDPE), SLOTTED OR SOLID MUST MEET THE REQUIREMENTS OF AASHTO M252 TYPE S FOR DIAMETERS OF THREE INCHES THROUGH 10 INCHES AND AASHTO M294 TYPE S FOR DIAMETERS OF 12 INCHES THROUGH 60 INCHES. ALL PIPE MUST HAVE A SMOOTH WALLED INTERIOR.

DIP DUCTILE IRON PIPE (DIP) MUST MEET AWWA C150 AND C151 AND FOLLOW SPECIAL THICKNESS CLASS MINIMUM CLASS 51 FOR FOUR (4)-INCH THROUGH 54-INCH DIAMETERS. DIP MUST INCLUDE RESTRAINING JOINTS IF LOCATED WITHIN A DAM EMBANKMENT. DIP FITTINGS SHALL BE EITHER DUCTILE IRON BELL, MECHANICAL, OR PUSH-ON JOINT UNLESS NOTED OTHERWISE ON THE CONTRACT DOCUMENTS. FITTINGS SHALL MEET AWWA C110 OR AWWA C153 AND AWWA C111. FLANGED FITTINGS WHERE NOTED ON THE CONTRACT DOCUMENTS SHALL MEET AWWA C110. BOLTS, NUTS, AND STUDS FOR FLANGES SHALL BE 304 STAINLESS

POLYVINYL CHLORIDE (PVC) PLASTIC PIPE MUST MEET THE REQUIREMENTS OF ASTM D1785 FOR THE SCHEDULE NOTED ON THE CONTRACT DOCUMENTS. PVC FITTINGS MUST MEET THE REQUIREMENTS OF ASTM D2466 (SCHEDULE 40) OR D2467 (SCHEDULE 80) FOR THE SCHEDULE NOTED ON THE CONTRACT DOCUMENTS.

PRIOR TO INSTALLATION OF PIPE CONDUITS, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE

- 1. MANUFACTURER'S CERTIFICATION THAT PIPE MEETS THE APPROPRIATE MATERIAL SPECIFICATION (E.G. AWWA C301, ASTM
- 2. MIX DESIGN OF CEMENTITIOUS BEDDING MATERIALS (E.G. CONCRETE FOR CRADLE) 3. SUPPLIER'S STEEL DRAWING OF REINFORCEMENT FOR CRADLE (IF REQUIRED BY CONTRACT DOCUMENTS) INDICATING ALL REINFORCEMENT TO BE USED INCLUDING:

C361, ETC.). THIS SHALL INCLUDE THE SIZE, MATERIAL, AND SPECIFICATION FOR EACH TYPE OF PIPE USED IN THE PROJECT.

- a. BAR SIZE AND LENGTHS
- b. BEND TYPES AND DIMENSIONS c. QUANTITIES OF ALL REINFORCEMENT MATERIALS

COMPLY WITH SUBSECTION 303.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. VERTICAL TRENCHING IS NOT ALLOWED. ALL EXCAVATIONS FOR PIPE CONDUITS SHALL COMPLY WITH CONSTRUCTION SECTION 4 OF THE EARTH EXCAVATION SECTION OF THESE SPECIFICATIONS.

REINFORCED CONCRETE PIPE INSTALLATION IN DAM EMBANKMENTS MUST MEET THE MANUFACTURER'S RECOMMENDATION AND MUST BE LAID IN A CONCRETE CRADLE ONLY AFTER THE ENTIRE CONDUIT IS INSTALLED AND ALL JOINTS SEALED. BELL AND SPIGOT JOINTS SHALL BE INSTALLED WITH THE BELL END UPSTREAM. PIPE CONDUIT SHALL BE INSTALLED FROM DOWNSTREAM TO UPSTREAM. MECHANICAL PIPE PULLERS OR COME-ALONG DEVICES MUST BE UTILIZED TO BRING THE PIPE JOINS INTO THE "HOME" POSITION. ALL BACKFILL NEAR PIPE CONDUITS AND IN OTHER CRITICAL AREAS IDENTIFIED ON THE CONTRACT DOCUMENTS WILL BE COMPACTED TO 95% OF THE LABORATORY MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 OR AASHTO T-99. REINFORCED CONCRETE PIPE INSTALLED IN A DAM EMBANKMENT AND ASSOCIATED WITH A CONCRETE STRUCTURE MUST BE INSTALLED PRIOR TO CONSTRUCTION OF THE STRUCTURE WITH THE STRUCTURE THEN CAST AROUND THE PIPE. THE FIRST DOWNSTREAM JOINT OF THE PIPE SHALL BE NO LESS THAN TWO (2) FEET BUT NO MORE THAN FOUR (4) FEET FROM THE OUTSIDE

DUCTILE IRON PIPE CONSTRUCTION SHALL BE IN ACCORDANCE WITH MSHA 303.03 (ALTHOUGH NOT SPECIFIED IN MSHA 303 DUCTILE IRON PIPE INSTALLED IN A DAM EMBANKMENT AND ASSOCIATED WITH A CONCRETE STRUCTURE MUST BE INSTALLED PRIOR TO CONSTRUCTION OF THE STRUCTURE WITH THE STRUCTURE THEN CAST AROUND THE PIPE. THIS INSTALLATION REQUIRES BENTONITE WATER STOP TO BE INSTALLED AROUND THE PIPE TO WORK AS A GASKET TO ENSURE WATERTIGHT

HDPE AND PVC PIPE MUST CONFORM WITH MSHA 303.

ALL TEMPORARY PIPES MUST BE REMOVED AT THE END OF THE PROJECT.

- 1. ALL PIPE CONDUITS MUST BE INSTALLED UNDER SUPERVISION OF THE EIC. THE EIC WILL MUST INSPECT THE PIPE CONDUIT INSTALLATION PRIOR TO BACKFILL TO ENSURE THE CONDUIT INSTALLATION MEETS THE INTENDED LINE AND GRADE SPECIFIED ON THE CONTRACT DOCUMENTS, THAT ALL JOINTS ARE PROPERLY SEATED, AND THAT THERE IS NO DAMAGE TO THE
- 2. CONCRETE CRADLES MUST BE INSTALLED UNDER SUPERVISION OF THE EIC. REINFORCEMENT FOR CRADLES MUST BE INSPECTED BY THE FIG PRIOR TO CLOSING FORMWORK DURING CONSTRUCTION THE CONCRETE SHALL BE TESTED IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTION 902.10.08. THE EIC MUST ALSO MAKE TEST CYLINDERS FOR ALL CONCRETE POURS FOR CRADLES. SEVEN-DAY (LAB CURED) AND 28-DAY (LAB CURED AND FIELD CURED) TESTS MUST BI CONDUCTED. FOR EACH DAY THAT CONCRETE IS POURED ON A PROJECT SITE, A MINIMUM OF EIGHT TEST CYLINDERS MUST BE MADE FOR EACH MIX DESIGN TO BE TESTED AT AN ACCREDITED LABORATORY FOR EVERY 50 CUBIC YARDS OF CONCRETE PLACED OR FRACTION THEREOF. SIX (6) TEST CYLINDERS MUST BE CURED UNDER THE LABORATORY CONDITIONS (TWO (2)) FOR SEVEN (7) DAYS, TWO (2) FOR 28 DAYS, TWO (2) FOR 56 DAYS) AND TWO (2) CYLINDERS MUST BE CURED UNDER FIELD CONDITIONS (FOR 28 DAYS). THE OWNER OR EIC MAY REQUIRE AN EQUAL NUMBER OF TEST CYLINDERS CURED UNDER THE JOB CONDITIONS. THE TEST RESULTS MUST BE MADE AVAILABLE WITHIN SEVEN DAYS OF EACH COMPLETED TEST. IF THE CONCRETE FAILS TO MEET THE CONTRACTUAL REQUIREMENTS, THE OWNER HAS THE RIGHT TO REQUIRE ADDITIONAL
- TESTING OR REJECT THE CONCRETE. 3. THE EIC WILL BE REQUIRED TO PRODUCE WRITTEN REPORTS SUMMARIZING CONCRETE PLACEMENT AND INCLUDING:
- a. DATE/TIME OF PLACEMENT b. WEATHER CONDITIONS
- c. LOCATION OF PLACEMEN d. CONCRETE SUPPLIER
- e. ESTIMATED QUANTITY OF CONCRETE PLACED
- f. CONCRETE SLUMP g. CONCRETE AIR PERCENTAGE
- h. CONCRETE TEMPERATURE i NUMBER OF CYLINDERS MADE
- j. SPECIAL MEASURES TAKEN BY CONTRACTOR TO PROTECT CONCRETE (E.G. HOT WEATHER OR COLD WEATHER
- MEASURES) k. CONCRETE DELIVERY TICKETS

I. PHOTOS OF CONCRETE PLACEMENT MISCELLANEOUS STRUCTURES

CHIEF, BUREAU OF ÉNVIRONMENTAL SERVICES

COMPLY WITH SUBSECTION 305.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THIS WORK INCLUDES EXCAVATION FOR INSTALLATION OF UNDERGROUND STRUCTURES, INCLUDING WHEN THE EXCAVATION REQUIRES SHORING

COMPLY WITH SUBSECTION 305.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

REINFORCED CONCRETE PIPE AND END SECTIONS ASSOCIATED WITH STORM DRAINS MUST MEET THE APPLICABLE MSHA STANDARD SPECIFICATIONS PROVIDED IN SECTION 905. END SECTIONS MUST CONFORM WITH MSHA 305 AND THE CONTRACT

CORRUGATED METAL PIPE END SECTIONS MUST MEET THE REQUIREMENTS OF MSHA STANDARD SPECIFICATIONS SECTION 905. MANHOLE FRAMES, COVERS, AND STEPS MUST BE PROVIDED IN ACCORDANCE WITH CONSTRUCTION DOCUMENTS. WHERE MATERIALS ARE TRAFFIC BEARING, THEY MUST BE DESIGNED TO WITHSTAND H-20 LOADING. MANHOLES STEPS MUST BE POLYPROPYLENE ENCAPSULATED MANUFACTURED AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS

PRIOR TO FABRICATION. THE CONTRACTOR MUST SUBMIT TO THE EIC AND OBTAIN APPROVAL OF SHOP DRAWINGS FOR EACH

- STRUCTURE TO BE FABRICATED PRIOR TO INSTALLATION. THE SHOP DRAWING MUST INCLUDE: 1. IDENTIFICATION OF THE STRUCTURE (MATCHING NOTATION FOR THE STRUCTURE SHOWN THE CONTRACT DOCUMENTS)
- 2. DETAILED DRAWINGS SHOWING ALL DIMENSIONS, THICKNESSES, PROJECTION DISTANCES, APPURTENANCES, REINFORCEMENT (BAR SIZE, SPACING, AND BENDS) FOR THE STRUCTURE.
- 3. DETAILED CALCULATIONS SUPPORTING THE DESIGN OF THE STRUCTURE INCLUDING STABILITY ANALYSIS (BUOYANCY, OVERTURNING, AND SLIDING) AND REINFORCEMENT SIZING
- 4. THE SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A MARYLAND-LICENSED PROFESSIONAL ENGINEER

COMPLY WITH SUBSECTION 305.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SHEETING, SHORING, AND BRACING IS NOT PERMITTED FOR STRUCTURE INSTALLATION IN DAM EMBANKMENTS. THE EMBANKMENT MUST BE EXCAVATED TO SAFE, STABLE SLOPES (2-HORIZONTAL-TO-1-VERTICAL MINIMUM) FOR STRUCTURE INSTALLATION.

PRIOR TO INSTALLATION, THE EIC MUST INSPECT THE STRUCTURE FOR DAMAGE AND TO ENSURE THAT IT MATCHES THE APPROVED SHOP DRAWINGS. THE CONTRACTOR SHALL NOT PROCEED WITH INSTALLATION OF THE STRUCTURE WITHOUT APPROVAL OF THE EIC. THE EIC MUST ALSO INSPECT THE STRUCTURE AFTER INSTALLATION AND PRIOR TO BACKFILL TO ENSURE PROPER JOINT CONNECTIONS TO ADJACENT CONDUITS, AND TO ENSURE THAT EH STRUCTURE WAS NOT DAMAGED DURING INSTALLATION. THE CONTRACTOR MAY NOT PROCEED WITH BACKFILLING THE STRUCTURE WITHOUT APPROVAL OF THE EIC.

COMPLY WITH SUBSECTION 306.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

COMPLY WITH SUBSECTION 306.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. POLYVINYL CHLORIDE (PVC) PLASTIC PIPE MUST MEET THE REQUIREMENTS OF ASTM D1785 FOR THE SCHEDULE NOTED ON THE CONTRACT DOCUMENTS. PVC FITTINGS MUST MEET THE REQUIREMENTS OF ASTM D2466 (SCHEDULE 40) OR D2467 (SCHEDULE 80) FOR THE SCHEDULE NOTED ON THE CONTRACT DOCUMENTS. NO GEOTEXTILES ARE PERMITTED WITHIN DAM EMBANKMENTS OR DRAIN FEATURES UNLESS SPECIFICALLY NOTED IN THE CONTRACT DOCUMENTS.

EXCEPT FOR CLEANOUT FITTINGS AND AS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS, ALL BENDS IN DRAINS INTERNAL TO

UNLESS NOTED OTHERWISE, PERFORATED PIPES USED FOR DRAINS MUST HAVE 3/8" INCH DIAMETER PERFORATIONS SPACED AT 4 INCHES ON CENTER EVERY 90 DEGREES AROUND THE PIPE. FOR SLOTTED PIPE USED FOR DRAINS, THE SLOT WIDTH MUST BE 1/8-INCH, SLOT LENGTH 1.9 INCHES, 4 SLOTS PER ROW, AND 4 SLOTS PER LINEAR FOOT

DRAIN CLEANOUT CAPS MUST BE WATER TIGHT SCREW TYPE LID. THE PIPE MUST HAVE A PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING CAP. THE SCREW TOP LID MUST BE A "PANELLA" TYPE (OR OWNER-APPROVED EQUAL). CLEANOUT

PRIOR TO INSTALLATION OF PIPE CONDUITS, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE

1. MANUFACTURER'S CERTIFICATION THAT PIPE AND FITTINGS (BENDS, Y'S, ETC.) MEET THE APPROPRIATE MATERIA SPECIFICATION (E.G. 4-INCH P.V.C. SCHEDULE 80, ETC.) THIS SHALL INCLUDE THE SIZE, MATERIAL, AND SPECIFICATION FOR EACH TYPE OF PIPE USED IN THE PROJECT 2. SUPPLIER SAMPLE SHEET FOR DRAIN CLEANOUT CAPS

COMPLY WITH SUBSECTION 306.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

ALL DRAINS MUST BE INSTALLED UNDER SUPERVISION OF THE EIC. THE EIC WILL MUST INSPECT THE DRAIN CONDUIT INSTALLATION PRIOR TO BACKFILL TO ENSURE THE CONDUIT INSTALLATION MEETS THE INTENDED LINE AND GRADE SPECIFIED ON THE CONTRACT DOCUMENTS, THAT ALL JOINTS ARE PROPERLY SEATED, BONDED OR MECHANICALLY ATTACHED, AND THAT THERE IS NO DAMAGE TO THE INSTALLED PIPE.

RIPRAP SLOPE AND CHANNEL PROTECTION

COMPLY WITH SUBSECTION 312.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THIS SECTION INCLUDES THE REQUIREMENTS FOR THE PROVISION AND INSTALLATION OF RIP-RAP FOR CHANNEL AND SLOPE STABILIZATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

COMPLY WITH SUBSECTION 312.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THE MATERIAL FOR RIP-RAP SLOPE AND CHANNEL PROTECTION MUST CONFORM TO THE REQUIREMENTS OF MSHA STANDARD SPECIFICATIONS LISTED BELOW UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS:

Α	AGGREGATE FILTER BLANKET (GRADED AGGREGATE SUB-BASE)	901, TABLE 901A
В	STONE (ROCK)	901.02
С	GEOTEXTILE, CLASS AS SPECIFIED	921.09

LOCALLY HARVESTED RIPRAP: WHEN THE CONTRACTOR AND THE EIC JOINTLY DETERMINE THAT LOCAL ROCK MEETS THE ABOVE-SPECIFIED REQUIREMENTS. THE ROCK MAY BE USED TO CONSTRUCT PROJECT INSTALLATIONS PER THE CONTRACT DOCUMENTS. STONE MUST BE HARVESTED WITHIN THE LIMITS OF DISTURBANCE OF THE PROJECT SITE. THE INSTALLATION OF THE ROCK MUST ADHERE TO ALL REQUIREMENTS STATED IN THIS SECTION (INCLUDING FILTER CLOTH)

PRIOR TO INSTALLATION OF RIPRAP SLOPE AND CHANNEL PROTECTION, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE FOLLOWING

1. RIPRAP STONE INCLUDING: a. GRADATION

- b. CERTIFICATION THAT THE RIPRAP MEETS THE CLASS(ES) SPECIFIED IN THE CONTRACT DOCUMENTS 2. AGGREGATE FILTER BLANKET INCLUDING: a. GRADATION
- b. CERTIFICATION THAT THE AGGREGATE MEETS THE GRADATION SPECIFIED IN THE CONTRACT DOCUMENTS 3. GEOTEXTILE SUPPLIER'S MATERIAL SPECIFICATION SHEET a. MATERIAL SPECIFICATION SHEET MUST INCLUDE VALUES FOR ALL PARAMETERS NOTED IN SECTION 919.01 OF MSHA

COMPLY WITH SUBSECTION 312.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

EXCAVATION MUST CONFORM TO THE LINES AND GRADES SPECIFIED IN THE CONTRACT DOCUMENTS. THE SUBGRADE MUST BE SMOOTH AND FIRM. FREE FROM PROTRUDING OBJECTS THAT WOULD DAMAGE THE GEOTEXTILE

GEOTEXTILE FILTER CLOTH: UNLESS SPECIFIED OTHERWISE BY CONTRACT DOCUMENTS, THE GEOTEXTILE MUST BE PLACED ON THE PREPARED SUBGRADE WITH THE ADJACENT EDGES OVERLAPPING A MINIMUM OF 2 FEET (0.6M). GEOTEXTILE TORN OR

DAMAGED MUST BE REPLACED OR REPAIRED AGGREGATE FILTER BLANKET (GRADED AGGREGATE SUB-BASE): WHEN AGGREGATE FILTER BLANKET IS SPECIFIED IN LIEU OF GEOTEXTILE, IT MUST CONFORM TO THE LINES AND GRADES SPECIFIED IN THE CONTRACT DOCUMENTS

INSTALLATION OF RIP-RAP APRONS MUST BE IN ACCORDANCE WITH MSHA SECTION 312. INSTALLATION OF RIP-RAP IN STACKED CONFIGURATIONS MUST BE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION MUST BE FOLLOWED UNLESS SPECIFIED OTHERWISE IN THE

BACKFILL: ANY EXCAVATION VOIDS EXISTING ALONG THE EDGES OF THE COMPLETED SLOPE AND CHANNEL PROTECTION MUST BE COMPLETELY BACKFILLED

THE FIG WILL MUST INSPECT THE RIPRAP SLOPE AND CHANNEL PROTECTION INSTALLATION TO ENSURE THE INSTALLATION MEETS THE INTENDED LINE AND GRADE SPECIFIED ON THE CONTRACT DOCUMENTS, THAT ROCK IS PLACED AT UNIFORM DEPTHS AND MEETS THE MINIMUM REQUIRED DEPTH, AND THAT THERE IS NO DAMAGE TO THE GEOTEXTILE IF INSTALLED.

GABIONS DESCRIPTION COMPLY WITH SUBSECTION 313.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THIS WORK CONSISTS OF PROTECTING SLOPES AND CHANNELS WITH STONE FILLED WIRE BASKETS AS SPECIFIED IN THE CONTRACT DOCUMENTS

COMPLY WITH SUBSECTION 313.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

GABION WIRE BASKETS MUST BE PVC-COATED OR GALVANIZED AND MUST BE IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTIONS 313 AND 906.01. STONE MATERIAL USED TO FILL GABION BASKETS MUST CONFORM TO THE QUALITY AND SIZE SPECIFIED IN MSHA STANDARD SPECIFICATIONS SECTION 901.05, AND MANUFACTURER'S RECOMMENDATIONS. GEOTEXTILE SHALL CONFORM TO MSHA STANDARD SPECIFICATIONS SECTION 919.

PRIOR TO INSTALLATION OF GABIONS, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE FOLLOWING:

- b. CERTIFICATION THAT THE STONE MEETS THE SPECIFICATION IN THE CONTRACT DOCUMENTS
- 2. WIRE BASKET SUPPLIER'S MATERIAL SPECIFICATION SHEET a. MATERIAL SPECIFICATION SHEET SHALL INCLUDE CONFIRMATION THAT THE WIRE BASKET WIRE, TIES, AND CONNECTING WIRE HAVE A MINIMUM TENSILE STRENGTH OF 60,000 PSI
- b. FASTENERS, IF SUBSTITUTED FOR WIRE TIES ARE STAINLESS STEEL INTERLOCKING AND MEET ASTM A313 AND MAINTAIN CLOSED AND LOCKED POSITION WHEN SUBJECTED TO A FORCE OF UP TO 900 POUNDS
- c. GALVANIZED COATING MEETS ASTM A123 AND GALVANIZATION RATE IS 0.8 OZ./SF MINIMUM d. PVC COATING MEETS MSMT 508 AND EXHIBITS NO WEIGHT LOSS.
- 3. GEOTEXTILE SUPPLIER'S MATERIAL SPECIFICATION SHEET a. MATERIAL SPECIFICATION SHEET MUST INCLUDE VALUES FOR ALL PARAMETERS NOTED IN SECTION 919.01 OF MSHA

COMPLY WITH SUBSECTION 313.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

EXCAVATION MUST CONFORM TO THE LINES AND GRADES SPECIFIED IN THE CONTRACT DOCUMENTS. THE SUBGRADE MUST BE SMOOTH AND FIRM, FREE FROM PROTRUDING OBJECTS THAT WOULD DAMAGE THE GEOTEXTILE, AND CONSTRUCTED IN A MANNER ACCEPTABLE TO THE OWNER. THE INSTALLATION OF THE GABIONS, FILLED WITH STONE, MUST BE IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTIONS 313. THE WORK WILL REQUIRE MANUAL ADJUSTMENT OF STONE WITHIN THE BASKETS

GABIONS SHALL BE CAREFULLY FILLED WITH ROCK BY MACHINE OR HAND METHODS TO ENSURE ALIGNMENT, AVOID BULGES, AND PROVIDE A COMPACT MASS THAT MINIMIZES VOIDS. MACHINE PLACEMENT REQUIRES SUPPLEMENTING WITH HAND WORK TO ENSURE THE DESIRED RESULTS. THE CELLS IN ANY ROW SHALL BE FILLED IN STAGES SO THAT THE DEPTH OF ROCK PLACED IN ANY ONE CELL DOES NOT EXCEED THE DEPTH OF ROCK IN ANY ADJOINING CELL BY MORE THAN 12 INCHES. ALONG THE EXPOSED FACES, THE OUTER LAYER OF STONE SHALL BE CAREFULLY PLACED AND ARRANGED BY HAND TO ENSURE A NEAT, COMPACT PLACEMENT WITH A UNIFORM APPEARANCE. THE LAST LAYER OF ROCK SHALL BE UNIFORMLY LEVELED TO THE TOP EDGES OF THE

THE EIC MUST INSPECT THE GABION INSTALLATION TO ENSURE THE INSTALLATION MEETS THE INTENDED LINE AND GRADE SPECIFIED ON THE CONTRACT DOCUMENTS, THAT ROCK IS PLACED AS SPECIFIED IN THIS SECTION, THAT THE WIRE BASKETS ARE PROPERLY CLOSED, TIED, AND FASTENED, AND THAT THERE IS NO DAMAGE TO THE GEOTEXTILE, WIRE BASKETS, OR TIES. STRUCTURE EXCAVATION

EXCAVATE FOR INSTALLATION OF RISERS, INTAKE TOWERS, RETAINING WALLS (E.G. HEAD WALLS, END WALLS, WING WALLS), WEIR WALLS. THIS EXCAVATION INCLUDES EXCAVATION DONE SOLELY TO FACILITATE INSTALLATION OF THE STRUCTURE AND IS ABOVE AND BEYOND EXCAVATION REQUIRED TO INSTALL CONDUITS OR MAKE OTHER MODIFICATIONS TO THE DAM COVERED UNDER THE

COMPLY WITH SUBSECTION 402.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS. CRUSHER RUN AGGREGATE CR-6 SHALL NOT BE USED AS BACKFILL MATERIAL AROUND STRUCTURES.

COMPLY WITH SUBSECTION 402.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

WHERE STRUCTURES ARE LOCATED WITHIN DAM EMBANKMENT, SHEETING, SHORING, AND BRACING IS NOT PERMITTED. THE EMBANKMENT MUST BE EXCAVATED TO SAFE, STABLE SLOPES (2-HORIZONTAL-TO-1-VERTICAL MINIMUM) FOR CONDUIT

BACKFILL OF THE FOOTING FOUNDATION SHALL BE DONE WITH EARTH FILL MEETING THE REQUIREMENTS SPECIFIED IN THE PLACEMENT OF EARTH FILL MATERIALS AT DAMS SECTION OF THESE SPECIFICATIONS, OR SUB FOUNDATION CONCRETE. AGGREGATE (INCLUDING CRUSHER RUN AGGREGATE CR-6) IS NOT PERMITTED A BACKFILL MATERIAL. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE LABORATORY MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT BETWEEN -2% AND +4% OF THE LABORATORY OPTIMUM PER ASTM D698 OR AASHTO T-99.

ALL EXCAVATIONS SHALL BE SUPERVISED AND INSPECTED BY THE EIC. ALL ROCK EXCAVATIONS, ROCK SURFACE CLEANING, AND

ROCK SURFACE PREPARATION SHALL BE SUPERVISED BY AN ENGINEERING GEOLOGIST. EIC SHALL ISSUE WRITTEN REPORTS FOR EACH EXCAVATION INDICATING:

- 2. EXCAVATION INTENT (E.G. FOR STRUCTURE, FOR CONDUIT, ETC.)
- 3. APPROXIMATE LOCATION (BASE LINE STATION, OFFSET, AND BOTTOM ELEVATION) OF THE EXCAVATION 4. AREA OF THE EXCAVATION
- 5. VISUAL OBSERVATIONS OF THE EXCAVATION INCLUDING GROUND SURFACE CONDITION, ANY CLEANING, DELETERIOUS MATERIAL REMOVAL, AND/OR SURFACE PREPARATION COMPLETED, 6. PHOTOS OF THE EXCAVATION
- 7. SKETCHES OF THE EXCAVATION GEOMETRY (HORIZONTAL AND VERTICAL) NOTING DIMENSIONS, SIDE SLOPES, AND DEPTH FOR STRUCTURE EXCAVATION BACKFILL. THE EIC SHALL PERFORM COMPACTION TESTS PER ASTM D6938 OR AASTO T-310
- (NUCLEAR METHOD) OR ASTM D1556 OR AASHTO T191 (SAND CONE METHOD). TEST FREQUENCY SHALL BE A MINIMUM OF ONE PER 2,000 SY BUT NOT LESS THAN ONE PER LIFT OF MATERIAL. THE EIC RESERVES THE RIGHT TO TEST AT MORE FREQUENT INTERVALS.
- HE FIC WILL PREPARE AND MAKE AVAILABLE WRITTEN REPORTS DOCUMENTING THE FOLLOWING 1. VERIFICATION OF EACH FOOTING SUBGRADE INCLUDING BEARING TESTS AS APPLICABLE
- 2. COMPACTION TEST RESULTS: a. TEST DATE
- b. GAUGE SERIAL NUMBER
- c. STATION/OFFSET LOCATION d. ELEVATION
- e. DEPTH OF TEST (THROUGH LIFT f. WET DENSITY
- g. MOISTURE COUNT h. MOISTURE CONTENT
- i. DRY DENSITY j. MAXIMUM DRY DENSITY (FROM APPROVED SUBMITTAL)
- k. OPTIMUM MOISTURE CONTENT (FROM APPROVED SUBMITTAL) I. % COMPACTION REQUIRED (FROM CONTRACT DOCUMENTS)
- m.% COMPACTION OBTAINED n. ANY RELEVANT REMARKS ("FAILURE", "RE-TEST", ETC.)

PORTLAND CEMENT CONCRETE STRUCTURES

COMPLY WITH SUBSECTION 420.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THE PURPOSE OF THIS SPECIFICATION IS TO OBTAIN A DENSE AND DURABLE CONCRETE HAVING THE SPECIFIED STRENGTH AND OTHER CHARACTERISTICS TO RESIST ENVIRONMENTAL STRESSES TO ENSURE A WATERTIGHT CONSTRUCTION IN ACCORDANCE WITH ACL 350. THE FIC MAY INSPECT AND REJECT ANY CONCRETE STRUCTURE THAT IS POOR IN QUALITY FOR REASONS INCLUDING BUT NOT LIMITED TO: EXPOSED REINFORCING STEEL, MISALIGNED FEATURES, POOR CONSOLIDATION OF CONCRETE ("HONEYCOMBING", "ROCK POCKETS", ETC.), UNACCEPTABLE JOINTS, SPALLS, CRACKS, DAMAGES OR POOR WORKMANSHIP CONCRETE DELIVERY AND PLACEMENT SHALL BE SCHEDULED SO THAT EACH LAYER IS PLACED WHILE THE PROCEEDING ONE IS STILL PLASTIC TO AVOID COLD JOINTS. COLD JOINTS RESULTING FROM UNTIMELY CONCRETE PLACEMENT SHALL BE CONSIDERED DEFECTIVE WORK AND SHALL BE REMOVED AND REPLACED AT NO COST TO THE OWNER

WORK INCLUDES CONSTRUCTING CONCRETE STRUCTURES SUCH AS RISERS, HEADWALLS, WEIRS, OUTLET STRUCTURES. FOUNDATIONS, SLABS, UNDERGROUND VAULTS, MANHOLES, PIPE CRADLES, AND ANY OTHER CONCRETE STRUCTURES ON THE CONTRACT DOCUMENTS. THE WORK ALSO INCLUDES FURNISHING, FORMING, TRANSPORTING, MIXING, PLACING, CURING, AND FINISHING OF PORTLAND CEMENT CONCRETE AND PROTECTING THE WORK AS CALLED FOR IN THE CONTRACT DOCUMENTS. PRE-CAST UNITS MAY NOT BE SUBSTITUTED FOR CAST IN-PLACE CONCRETE WITHOUT PRIOR WRITTEN AUTHORIZATION OF THE OWNER, THE EIC, AND APPROVAL BY MDE, AS APPLICABLE.

UNREINFORCED NON-STRUCTURAL CONCRETE MAY BE FORMED OR UNFORMED, AND IS USED IN CONSTRUCTION OF PIPE CRADLES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF THE FOLLOWING SUBMITTALS:

- a. SEE REINFORCEMENT STEEL SECTION OF THESE SPECIFICATIONS
- a. PRIOR TO PLACING CONCRETE, SUBMIT DESIGN MIXES FOR EACH CLASS AND TYPE OF CONCRETE, CERTIFYING THAT
- PROPOSED CONCRETE INGREDIENTS AND PROPORTIONS WILL RESULT IN CONCRETE MIX MEETING SPECIFIED
- b. INCLUDE FOR EACH CLASS AND TYPE OF CONCRETE, AS MANY MIX DESIGNS AS THERE ARE COMBINATIONS OF DIFFERENT INGREDIENTS OR TYPE OF INGREDIENTS ANTICIPATED TO COVER REQUIREMENTS OF THE WORK. c. ESTABLISH MIX DESIGNS THROUGH AN ACCREDITED LABORATORY. DESIGN CONCRETE MIX FOR PROTECTION AGAINST ALKALI-SILICA REACTIVITY (ASR). ASR MUST BE TESTED PER ASTM C1567 WITH 14-DAY MORTAR BAR EXPANSION NOT

EXCEEDING 0.08%. DOCUMENTATION OF ASR MITIGATION MUST BE INCLUDED WITH THE CONCRETE MIX DESIGN SUBMITTAL

- 3. CAST IN PLACE INSTALLATION DOCUMENTATION: PROPOSED METHODS FOR CONTROLLING CONCRETE TEMPERATURE AND PLANS FOR PLACING CONCRETE CONSIDERING SUN, HEAT, WIND, AMBIENT AIR TEMPERATURE OR OTHER LIMITATIONS OF FACILITIES THAT WILL PREVENT PROPER FINISHING OR CURING. FOLLOW ACI 305R FOR "HOT WEATHER CONCRETING" AND/OR ACI 306R FOR "COLD WEATHER CONCRETING" AS APPLICABLE.
- 4. POURED CONCRETE CERTIFICATIONS a. SUBMIT WITH MIX DESIGN, LABORATORY TEST REPORTS AND MILL OR MANUFACTURER'S CERTIFICATES VERIFYING THAT INGREDIENTS CONFORM TO SPECIFIED REQUIREMENTS. USE INGREDIENTS IN DESIGN MIX WHICH ARE REPRESENTATIVE
- SAMPLES OF MATERIALS TO BE USED IN THE WORK b. SUBMIT TEST RESULTS WHENEVER THE AGGREGATES, CEMENT OR OTHER ADDITIVES TO BE USED IN THE CONCRETE COME FROM A DIFFERENT LOT, SOURCE, OTHER AREA OF QUARRY, DIFFERENT QUARRY OR FROM OTHER THAN THE REPRESENTATIVE STOCKPILE OR BATCH FROM WHICH THE ORIGINAL MATERIAL WAS TESTED AND APPROVED.
- c. IF THE SOURCE, BRAND OR CHARACTERISTIC PROPERTIES OF INGREDIENTS NEED TO BE REVISED DURING THE TERM OF THE CONTRACT, SUBMIT REVISED LABORATORY-MIX REPORT IN ACCORDANCE WITH PROCEDURES SPECIFIED FOR ORIGINAL MIX DESIGN.
- 5. CONCRETE BATCH TICKETS: BEFORE UNLOADING AT THE SITE, SUBMIT CERTIFICATION OR DELIVERY TICKET FROM CONCRETE SUPPLIER WITH EACH BATCH DELIVERED TO THE SITE BEARING THE FOLLOWING INFORMATION: a. NAME OF SUPPLIER
- b. NAME OF BATCHING PLANT AND LOCATION
- c. SERIES NUMBER OF TICKET
- e. TRUCK NUMBER f. SPECIFIC JOB DESIGNATION: CONTRACT NUMBER AND LOCATION g. VOLUME OF CONCRETE IN CUBIC YARDS
- TYPE AND BRAND OF CEMEN

h. CLASS AND TYPE OF CONCRETE

- k. WEIGHT OF CEMENT AND FLY ASH OR GROUND-IRON BLAST-FURNACE SLAG.
- m. WEIGHTS OF COARSE AND FINE AGGREGATES
- n. MAXIMUM AMOUNT OF WATER TO BE ADDED AND AMOUNT OF WATER ADDED AT THE SITE o. KIND AND QUANTITY OF ADMIXTURES - ADMIXTURES CONTAINING CALCIUM CHLORIDE MUST NOT BE ALLOWED
- a. MANUFACTURER'S CERTIFICATES b. MILL TESTS ON EACH HEAT SHOWING CHEMICAL AND PHYSICAL ANALYSES PERFORMED IN ACCORDANCE WITH ASTM A615,

${\tt CONCRETE\ CODES,\ REGULATIONS,\ REFERENCED\ STANDARDS\ AND\ SPECIFICATIONS:}$

COMPLY WITH SUBSECTION 420.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

- 1. INTERNATIONAL BUILDING CODE, LATEST VERSION 2. AMERICAN CONCRETE INSTITUTE, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", ACI 318-02 3. AMERICAN CONCRETE INSTITUTE, "ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES", ACI 350/350R-01 4. DETAIL AND DETAILING OF CONCRETE REINFORCEMENT ACI 325-92 5. MSHA "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS", LATEST EDITION, SECTIONS 420, 902, 908, 909, 911,
- 6. AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM) CONCRETE STRUCTURE MATERIAL SPECIFICATIONS: 1. BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACR 318, MANUAL OF STANDARD PRACTICE FOR DETAILING
- REINFORCED CONCRETE, ACI 315. 2. MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION "STANDARD SPECIFICATION FOR CONSTRUCTION AND MATERIALS", LATEST EDITION, SECTION 421, 902, AND 908. 3. CRSI: MANUAL OF STANDARD PRACTICE AND RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS
- 4. AASHTO: STANDARD SPECIFICATION FOR HIGHWAY BRIDGES.
- 1. AS A MINIMUM, THE MATERIALS FOR STRUCTURAL CAST IN PLACE CONCRETE MUST BE PROVIDED IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTION 420.02. CONCRETE MATERIAL FOR SPILLWAYS AND CONTROL STRUCTURES MUST ALSO MEET ACI 350. STRUCTURAL CONCRETE MUST BE AS DESIGNATED ON THE CONTRACT DOCUMENTS. ALL EXPOSED CORNERS OF CONCRETE STRUCTURES MUST HAVE 1/2" X 1/2" CHAMFERED EDGES OR AS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS. NOTE: THE SLUMP MEASURED AT THE POINT OF PLACEMENT AS DETERMINED IN ACCORDANCE WITH ASTM C143 WILL BE: THREE (3)-INCH MAXIMUM FOR FOOTINGS AND SUBSTRUCTURE WALLS, AND FOUR (4)-INCH MAXIMUM FOR BEAMS,
- 2. IN ADDITION TO MEETING THE REQUIREMENTS OF MSHA STANDARD SPECIFICATIONS SECTION 420 AND RELATED SECTIONS UNLESS NOTED OTHERWISE, THE COMPRESSIVE STRENGTH OF PRECAST STRUCTURES MUST BE 5,000 PSI AT 28 DAYS. FIELD CORING OF NEW PRECAST STRUCTURES IS NOT ALLOWED. THE OWNER RESERVES THE RIGHT TO REJECT ANY STRUCTURE DELIVERED TO THE JOBSITE WHICH IS POOR IN ITS QUALITY, WITH REGARD TO EXPOSED REINFORCING STEEL, MISALIGNED FEATURES, POOR CONSOLIDATION OF CONCRETE, UNACCEPTABLE JOINTS, SPALLS OR WORKMANSHIP. REJECTED POOR QUALITY STRUCTURES MUST BE REPLACED.
- UNLESS NOTED OTHERWISE, NON-STRUCTURAL CONCRETE MUST MEET ALL REQUIREMENTS FOR MSHA MIX #1 (MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI AT 28 DAYS) AS SPECIFIED IN MSHA SECTION 420.

COMPLY WITH SUBSECTION 420.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

SATISFACTION OF THE OWNER MUST BE REMOVED AND REPLACED BY THE CONTRACTOR.

STRUCTURES MUST HAVE CHAMFERED EDGES.

- 1. THE BASE ON WHICH CONCRETE IS TO BE POURED MUST BE FREE OF WATER, MUD, DEBRIS, LOOSE MATERIALS, OIL, FROST, AND ICE. GRAVEL MUST NOT BE USED AS CONCRETE SUB-BASE IN DAM EMBANKMENTS.
- 2. PROPER FORMS (MSHA SECTION 420,03,02) MUST BE LAID PROVIDING THE REQUIRED DEPTH FOR THE CONCRETE AS SHOWN ON THE PLANS. FORMS MUST BE HEAVY AND SECURE IN PLACE SO AS NOT TO MOVE DURING THE CONSTRUCTION PROCESS. 3. CONCRETE MUST BE PLACED FROM A TRUCK WHICH SHOULD BE NO MORE THAN 15 FEET FROM THE AREA BEING POURED. TREMIES, TUBES OR CHUTES, IF USED, MUST HAVE METAL LINING, AND MUST HAVE ENDS LOWERED AS CLOSE AS POSSIBLE TO THE NEWLY POURED CONCRETE. CONCRETE MUST NOT BE DROPPED FROM MORE THAN TWO (2) FEET ABOVE THE FORMS.
- CONCRETE MUST BE PLACED IN SUCH A MANNER THAT THERE IS NO SEGREGATION OF MATERIAL OR DISPLACEMENT OF REINFORCEMENT. 4. CURING OF CONCRETE MUST BE IN ACCORDANCE WITH MSHA SECTIONS 420 AND 902. ANY OPTIONS SHOWN IN MSHA SECTION 420.03.09 WILL BE ACCEPTABLE. SPRAYING WITH LIQUID MEMBRANE IS ENCOURAGED. PRODUCT SPECIFICATIONS WITH
- APPLICATION RATES MUST BE SUBMITTED TO THE EIC FOR APPROVAL. FAILURE TO CURE CONCRETE PER SPECIFICATIONS MAY RESULT IN REJECTION AND OWNER-DIRECTED REMOVAL OF THE POURED CONCRETE. 5. CONCRETE MUST BE POURED WITHIN A TEMPERATURE RANGE OF 50 AND 90 DEGREES FAHRENHEIT. SPECIAL PROVISIONS MUST BE DEVELOPED AND APPROVED BY THE EIC WHEN POURING OUTSIDE OF THIS RANGE.
- 6. CONCRETE MUST BE THOROUGHLY CONSOLIDATED DURING AND IMMEDIATELY AFTER DEPOSITING BY MECHANICAL VIBRATION, INTERNAL OR EXTERNAL AS APPROVED BY THE EIC. 7. A BROOM FINISH WILL BE USED WHEN SPECIFIED ON DRAWINGS OR DETAILS, AND IT MUST BE PROVIDED BEFORE THE INITIAL SET. ORDINARY SURFACE FINISH MUST BE USED ON ALL OTHER STRUCTURES. SEE MSHA 420.03.07(A). ALL CONCRETE

8. IF ANY CONCRETE IS FOUND TO BE DEFECTIVE. THE CONTRACTOR MUST, AT THE DIRECTION OF THE OWNER, REMOVE

DEFECTIVE CONCRETE. CONCRETE MUST BE DEEMED DEFECTIVE IF: THE SURFACE IS NOT FINISHED PROPERLY TO THE

SATISFACTION OF THE OWNER, IT DOES NOT MEET THE STRENGTH REQUIREMENTS, IT IS NOT CURED PROPERLY, IT SHOWS

EXCESSIVE CRACKING, OR IT FAILS TO MEET OTHER CONTRACT REQUIREMENTS. ANY CONCRETE NOT ACCEPTED TO THE



Maryland Department of the Environment Water and Science Administration **Dam Safety Division**

Visty P. Dalal

Sr. Regulatory & Compliance Engineer

Permit # 18-MR-0010

DEPARTMENT OF PUBLIC WORKS



MARYLAND Storm Water Management Division

Bureau of Environmental Services

Columbia, Maryland 21046–3143

6751 Columbia Gateway Drive, Suite 514



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GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT HOWARD COUNTY CAPITAL PROJECT #D-1159 HSCD #: EP-17-40 MD DAM NO. 577

POND CONSTRUCTION SPECIFICATIONS

NOT TO SCALE

SCALE

14 OF 17

SHEET

HOWARD COUNTY, MARYLAND

Baltimore, Maryland 21202 (410) 662-7400

509 South Exeter Street 4th Floor

(410) 313–6444

CONCRETE JOINTS: WHERE REQUIRED, CONCRETE JOINTS MUST BE INSTALLED TO INCLUDE WATER STOPS TO ENSURE A WATERTIGHT STRUCTURE. COMMONLY USED WATER STOPS INCLUDE RUBBER, PVC, AND BENTONITE. TYPE AND SIZE OF THE WATER STOPS AND ACCOMMODATIONS FOR NEARBY REINFORCEMENT MUST BE PER CONTRACT DOCUMENTS. PVC WATER STOPS MUST BE AT LEAST SIX (6) INCHES WIDE, MEET MSHA STANDARD SPECIFICATION'S SECTION 911.08, AND MUST BE SUPPORTED AND CENTERED ON THE JOINT, PVC WATER STOP CAN BE FIELD SPLICED BY USING THE ELECTRIC SPLICING IRON OR BY USING FITTINGS TO ASSURE CONTINUITY, SWELL TYPE BENTONITE WATER STOPS MUST BE PLACED TO ENSURE A MINIMUM OF TWO (2) INCHES OF CONCRETE COVER. SWELL TYPE BENTONITE WATER STOPS SHALL ONLY BE USED IN THE FOLLOWING CASES:

1. AROUND A CONDUIT PENETRATION THROUGH A CONCRETE STRUCTURE WHERE THE CONDUIT MATERIAL IS NOT CONCRETE (E.G. DUCTILE IRON PIPE, PVC PIPE, ETC.) 2. AT A JOINT BETWEEN EXISTING PRE-CONSTRUCTION CONCRETE AND FRESHLY PLACED CONCRETE. THIS APPLICATION

TYPICALLY OCCURS DURING REPAIRS OR MODIFICATIONS TO AN EXISTING CONCRETE STRUCTURE. 3. OTHERWISE NOTED IN THE CONTRACT DOCUMENTS.

INSTALLATION SHALL BE COMPLETED UNDER SUPERVISION OF THE EIC. THE EIC MUST BE PRESENT AND COMPLETE OBSERVATION AND TESTING FOR THE FOLLOWING:

- 1. PRIOR TO ANY INSTALLATION OF A CONCRETE STRUCTURE OR CONVEYANCE PIPING, THE SUB-GRADE MUST BE TESTED AND APPROVED BY THE EIC. REFER TO THE SUBGRADE PREPARATION SECTION OF THESE SPECIFICATIONS FOR MORE
- 2. THE OWNER AND EIC MUST BE NOTIFIED AT LEAST 48 HOURS IN ADVANCE OF CONCRETE PLACEMENT. FORM WORK MUST BE APPROVED FOR LINES AND GRADES BY EIC PRIOR TO PLACING CONCRETE. CONCRETE MUST BE POURED ONLY IN THE PRESENCE OF THE EIC DURING CONSTRUCTION AND THE CONCRETE SHALL BE TESTED IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTION 902.10.08. THE EIC MUST ALSO MAKE TEST CYLINDERS IN ACCORDANCE WITH ASTM C31 OR AASHTO T23 FOR ALL CONCRETE POURS FOR CRADLES. SEVEN-DAY (LAB CURED) AND 28-DAY (LAB CURED AND FIELD CURED) TESTS MUST BE CONDUCTED IN ACCORDANCE WITH ASTM C39 OR AASHTO T22. FOR EACH DAY THAT CONCRETE IS POURED ON A PROJECT SITE, A MINIMUM OF EIGHT TEST CYLINDERS MUST BE MADE FOR EACH MIX DESIGN TO BE TESTED AT AN ACCREDITED LABORATORY FOR EVERY 50 CUBIC YARDS OF CONCRETE PLACED OR FRACTION THEREOF. SIX (6) TEST CYLINDERS MUST BE CURED UNDER THE LABORATORY CONDITIONS (TWO (2) FOR SEVEN (7) DAYS, TWO (2) FOR 28 DAYS, TWO (2) FOR 56 DAYS) AND TWO (2) CYLINDERS MUST BE CURED UNDER FIELD CONDITIONS (FOR 28 DAYS). THE OWNER OR EIC MAY REQUIRE AN EQUAL NUMBER OF TEST CYLINDERS CURED UNDER THE JOB CONDITIONS. THE TEST RESULTS MUST BE MADE AVAILABLE WITHIN SEVEN DAYS OF EACH COMPLETED TEST. IF THE CONCRETE FAILS TO MEET THE CONTRACTUAL
- REQUIREMENTS, THE OWNER HAS THE RIGHT TO REQUIRE ADDITIONAL TESTING OR REJECT THE CONCRETE. 3. THE EIC WILL BE REQUIRED TO PRODUCE WRITTEN REPORTS SUMMARIZING CONCRETE PLACEMENT AND INCLUDING:
- a. DATE/TIME OF PLACEMENT b. WEATHER CONDITIONS
- c. LOCATION OF PLACEMENT
- d. CONCRETE SUPPLIER e. ESTIMATED QUANTITY OF CONCRETE PLACED
- f. CONCRETE SLUMP (ASTM C172/C143 OR AASHTO R60/T119) g. CONCRETE AIR CONTENT (ASTM C172/C173 OR C231 OR AASHTO R60/T152 OR T196)
- h. CONCRETE TEMPERATURE (ASTM C172/C1064 OR AASHTO R60/T309) i. NUMBER OF CYLINDERS MADE (ASTM C39/ASTM C31 OR AASHTO T23/T22)
- j. SPECIAL MEASURES TAKEN BY CONTRACTOR TO PROTECT CONCRETE (E.G. HOT WEATHER OR COLD WEATHER MEASURES)
- k. CONCRETE DELIVERY TICKETS I. PHOTOS OF CONCRETE PLACEMENT

REINFORCEMENT STEEL

COMPLY WITH SUBSECTION 421.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

1. DETAIL REINFORCING IN ACCORDANCE WITH ACI DETAILING MANUAL 2. BAR LISTS SHOWING THE INDIVIDUAL WEIGHT OF EACH BAR, TOTAL WEIGHT OF EACH BAR SIZE AND TOTAL WEIGHT OF BARS ON LIST. BASE CALCULATED WEIGHTS ON THEORETICAL UNIT WEIGHTS SHOW IN ASTM A615, TABLE 1. 3. REPRODUCTION OF THE REINFORCEMENT PLAN DRAWINGS IS NOT ACCEPTABLE.

COMPLY WITH SUBSECTION 421.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

RUST CAUSING CONDITIONS

COMPLY WITH SUBSECTION 421.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

- REINFORCEMENT PRODUCT DELIVERY, STORAGE, AND HANDLING: 1. SHIP REINFORCING STEEL IN BUNDLES LIMITED TO ONE SIZE AND LENGTH.
- 2. TAG EACH BUNDLE AT MILL WITH WATERPROOF TAG SHOWING NAME OF MILL, HEAT NUMBER, GRADE AND SIZE OF BARS AND IDENTIFYING NUMBER. 3. PROTECT REINFORCING STEEL AND WIRE FABRIC FROM DAMAGE; FOREIGN MATTER SUCH AS DIRT, OIL AND GREASE; AND

1. ALL REINFORCEMENT STEEL MUST BE NEW BILLET STEEL TO CONFORM TO ASTM A615 GRADE 60, AND MSHA STANDARD

- SPECIFICATIONS SECTION 421.02 TO 421.03 EXCEPT AS MODIFIED HEREIN. 2. CONCRETE PROTECTION FOR REINFORCEMENT: REINFORCEMENT MUST BE PROTECTED BY THE THICKNESS OF THE CONCRETE INDICATED IN THE CONTRACT DOCUMENTS. WHERE NOT OTHERWISE SHOWN, THE THICKNESS OF CONCRETE
- OVER THE REINFORCEMENT MUST BE AS FOLLOWS: a. WHERE CONCRETE IS DEPOSITED AGAINST THE GROUND WITHOUT THE USE OF FORMS, THE CONTRACTOR MUST PROVIDE
- NOT LESS THAN THREE (3) INCHES OF CONCRETE COVER. b. WHERE CONCRETE IS EXPOSED TO WEATHER OR GROUND BUT PLACED IN FORMS, THE CONTRACTOR MUST PROVIDE TWO (2) INCHES OF CONCRETE COVER OVER ALL REINFORCING STEEL.
- 3. STEEL REINFORCING: ALL STEEL REINFORCING MUST BE NEW BILLET STEEL TO CONFIRM TO ASTM A 615 GRADE 60 UNLESS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS.
- 4. CONCRETE JOINTS: WHERE REQUIRED, CONCRETE JOINTS, INCLUDING WATER STOPS, MUST BE INSTALLED TO ENSURE WATERTIGHT STRUCTURE. SUBMITTALS INDICATING SPECIFIC TYPE AND SIZE OF THE WATER STOPS AND ACCOMMODATIONS

ALLOWABLE TOLERANCES: CUT AND BEND REINFORCING STEEL TO CONFORM TO DIMENSIONS SHOWN WITHIN THE FOLLOWING TOLERANCES:

1. SHEARED LENGTH: PLUS OR MINUS ONE INCH 2. ALL OTHER BENDS: PLUS OR MINUS ONE INCH

SUPERVISION AND INSPECTION:

REINFORCING MUST BE INSPECTED IN THE FORMS AND APPROVED BY THE EIC BEFORE ANY CONCRETE IS PLACED. WATER STOPS ARE TO BE INSTALLED AS SPECIFIED, AND INSPECTED PRIOR TO CONCRETE PLACEMENT. THE EIC SHALL INSPECT THE BAR TYPE, BAR SIZES, BAR SPACING, CLEARANCE TO FORMS, WATER STOP LOCATION, TYPE, AND DIMENSIONS. THE EIC SHALL COMPLETE A WRITTEN REPORT NOTING THE FOLLOWING

- 1. DATE OF INSPECTION
- 2. STRUCTURE/PORTION OF STRUCTURE INSPECTED (E.G. "EW-1 FOOTING") 3. INSPECTED ITEMS (REINFORCEMENT, WATER STOP)
- 5. REPAIR/REVISION RECOMMENDATIONS MADE TO THE CONTRACTOR 6. PERTINENT PHOTOS OF THE INSPECTION

METAL STRUCTURES

COMPLY WITH SUBSECTION 430.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

WORK INCLUDES FABRICATING, FURNISHING, GALVANIZING AND INSTALLING LADDERS, ACCESS HATCHES AND TRASH-RACKS IN RISER STRUCTURES, ORIFICE PLATES, AND OTHER MISCELLANEOUS METAL ITEMS, AND ALL ACCESSORIES AS SHOWN IN THE CONTRACT DOCUMENTS.

COMPLY WITH SUBSECTION 430.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

UNLESS STATED OTHERWISE; ALL STEEL MUST MEET THE REQUIREMENTS OF ASTM A-36, AND BE GALVANIZED IN ACCORDANCE WITH ASTM A-153 AND FABRICATED AS SHOWN IN THE CONTRACT DOCUMENTS. ALL COMPONENTS OF EACH INSTALLATION MUST BE FULLY WELDED AS ONE-PIECE AND GALVANIZED AFTER FABRICATION.

PRIOR TO FABRICATION OF METAL STRUCTURES, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF SHOP DRAWINGS OR MANUFACTURER'S DETAIL SHEETS. FOR ITEMS THAT MUST BE CUSTOM FABRICATED SUCH AS LADDERS, CATWALKS, TRASH RACKS, ETC., THE SHOP DRAWING SHALL INCLUDE THE FOLLOWING

- 1. SPECIFICATIONS FOR ALL MATERIALS TO BE USED IN THE FABRICATION
- 2. ALL DIMENSIONS REQUIRED FOR FABRICATION 3 FINISHES FOR THE FABRICATION (E.G. HOT DIP GALVANIZER
- 4. IN-FIELD CONSTRUCTION ITEM SPECIFICATIONS SUCH AS BOLTS, SCREWS, TIES, CAULK, ETC. 5. HIGHLIGHT ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS
- FOR ITEMS THAT DO NOT HAVE TO BE FABRICATED SUCH AS MANHOLE COVERS, VAULT DOORS, ETC., THE MANUFACTURER'S

1. NAME, MODEL, AND MANUFACTURER'S IDENTIFICATION NUMBER OF THE ITEM

- 2. ALL DIMENSIONS OF THE ITEM 3. SPECIFICATION FOR THE MATERIALS USED IN THE ITEM 4. SPECIFICATIONS FOR FINISHES USED IN THE ITEM
- REPRODUCTION OF DETAILS PROVIDED OR REFERENCED IN THE CONTRACT DOCUMENTS IS NOT ACCEPTABLE AND WILL BE

COMPLY WITH SUBSECTION 430.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

CODES, REGULATIONS, REFERENÇE STANDARDS AND SPECIFICATIONS:

OSHA REGULATIONS (LADDERS FOR RISER STRUCTURES AND RAILINGS) MSHA STANDARD SPECIFICATIONS SECTIONS 430 AND 461

BOLTS AND EXPANSION BOLT MATERIALS: EXPANSION ANCHOR BOLTS USED FOR ANCHORING THE LADDERS, HATCHES, SECURITY BARS AND PLATES TO EXISTING CONCRETE STRUCTURE MUST BE "KWIK-BOLT" AS MANUFACTURED BY HILTI, INC., OR EQUIVALENT AS APPROVED BY THE EIC. ALL BOLTS OR EXPANSION BOLTS MUST BE A304 STAINLESS STEEL.

BAR TYPE TRASH RACK MUST INCLUDE TRASH RACKS MADE FROM SMOOTH STEEL BARS WELDED TO A STEEL FRAME AND MUST BE FABRICATED AS NOTED ON THE CONSTRUCTION DOCUMENTS.

EXPANDED STEEL GRATE LOW FLOW TRASH RACK MUST BE FABRICATED AS NOTED ON THE CONSTRUCTION DOCUMENTS. LADDERS AND HAND RAILS FOR RISER STRUCTURES MUST BE FABRICATED AS NOTED ON THE CONSTRUCTION DOCUMENTS AND MUST BE ERECTED PLUMB. LADDER RUNGS MUST BE SPACED AT 12" MAXIMUM ON CENTER, UNLESS NOTED OTHERWISE.

ORIFICE PLATES MUST BE 1/2" THICK. APPLY A BEAD OF SILICON AROUND PERIMETER OF PLATE AND AROUND ALL BOLT HOLES. HOOD TYPE CORRUGATED METAL TRASH RACKS AND ANTI-VORTEX DEVICES MUST BE FABRICATED AS NOTED ON THE CONSTRUCTION DOCUMENTS.

SUPERVISION AND INSPECTION: THE EIC WILL MUST INSPECT ALL METAL STRUCTURE INSTALLATIONS TO ENSURE THE INSTALLATION MEETS THE INTENTION OF THE CONTRACT DOCUMENTS. THAT THE INSTALLATION CONNECTIONS TO STRUCTURES ARE NOT LOOSE AND ARE PROPERLY SEALED. AND THAT ALL MECHANICAL INSTALLATIONS SUCH AS VAULT DOORS, LIDS, ETC. FUNCTION PROPERLY.

COMPLY WITH SUBSECTION 461.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

COMPLY WITH SUBSECTION 461.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

PRIOR TO FABRICATION OF METAL RAILINGS, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF SHOP DRAWINGS. THE SHOP DRAWING SHALL INCLUDE THE FOLLOWING:

1. SPECIFICATIONS FOR ALL MATERIALS TO BE USED IN THE FABRICATION

2. ALL DIMENSIONS REQUIRED FOR FABRICATION

4. IN-FIELD CONSTRUCTION ITEM SPECIFICATIONS SUCH AS BOLTS, SCREWS, TIES, CAULK, ETC. 5. HIGHLIGHT ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS

REPRODUCTION OF DETAILS PROVIDED OR REFERENCED IN THE CONTRACT DOCUMENTS IS NOT ACCEPTABLE AND WILL BE

COMPLY WITH SUBSECTION 461.03 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

THE EIC WILL MUST INSPECT ALL METAL RAILING INSTALLATIONS TO ENSURE THE INSTALLATION MEETS THE INTENTION OF THE CONTRACT DOCUMENTS AND THAT THE INSTALLATION CONNECTIONS TO STRUCTURES ARE NOT LOOSE AND ARE PROPERLY

COMPLY WITH SUBSECTION 499.01 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

COMPLY WITH SUBSECTION 499.02 OF MSHA UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS.

COMPLY WITH SUBSECTION 499.03 OF MSHA, UNLESS NOTED OTHERWISE ON CONTRACT DOCUMENTS, EXCEPT IN SUBSECTIONS 499.03.03 AND 499.03.04, REPLACE "DIRECTOR - OFFICE OF STRUCTURES" WITH "OWNER" AND REMOVE "DISTRICT ENGINEER".

NOT APPLICABLE. SEE THE FOLLOWING SECTIONS FOR SUBMITTAL REQUIREMENTS:

1. REINFORCEMENT STEEL 2. METAL STRUCTURES

3. METAL RAILING

IN ADDITION TO CONFORMANCE WITH MSHA SECTION 901 (TABLES 901 A AND B), AGGREGATE MUST CONFORM TO THE FOLLOWING ASTM/AASHTO GRADATION TABLE (M 43). WASHED AGGREGATE MUST ALSO CONFORM TO ASTM C-33.

						AGGR	EGATE - AA	SHTO M 43 (NCHES)							
SIZE NUMBER	NOMINAL SIZE SQUARE OPENINGS (1)		AMOUNTS FINER THAN EACH LABORATORY SEIVE (SQUARE OPENINGS), PERCENTAGE BY WEIGHT													
		4	3-1/2	3	2-1/2	2	1-1/2	1	3/4	1/2	8-Mar	No. 4	No. 8	No. 18	No. 50	No. 100
1	3-1/2 to 1-1/2.	100	90 to 100		25 to 60		0 to 15		0 to 5							
2	2-1/2 to 1-1/2.			100	90 to 100	35 to 70	0 to 15		0 to 5							
24	3-1/2 to 3/4.			100	90 to 100		25 to 60		0 to 10	0 to 5						
3	2 to 1.				100	90 to 100	35 to 70	0 to 15		0 to 5						
357	2 to No. 4.				100	95 to 100		35 to 70		10 to 30		0 to 5		,		
4	1-1/2 to 3/4.					100	90 to 100	20 to 55	0 to 15		0 to 5					
467	1-1/2 to No. 4.				,	100	95 to 100		35 to 70		10 to 30	0 to 5				
5	1 to ½.			. ,			100	90 to 100	20 to 55	0 to 10	0 to 5					
56	1 to 3/8						100	90 to 100	40 to 75	15 to 35	0 to 15	0 to 5				
57	1 to No. 4.						100	95 to 100		25 to 60		0 to 10	0 to 5			
6	¾ to 3/8.							100	90 to 100	20 to 55	0 to 15	0 to 5				
67	¾ to No. 4.	-						100	90 to 100		20 to 55	0 to 10	0 to 5			
68	¾ to No. 8.			į.				100	90 to 100		30 to 65	5 to 25	0 to 10	0 to 5		
7	½ to No. 4.								100	90 to 100	40 to 70	0 to 15	0 to 5			
78	1/2 to No. 8.								100	90 to 100	40 to 75	5 to 25	0 to 10	0 to 5		
8	3/8 to No. 8.									100	85 to 100	10 to 30	0 to 10	0 to 5		
89	3/8 to No. 16.									100	90 to 100	20 to 55	5 to 30	0 to 10	0 to 5	
9	No. 4 to No. 16.										100	85 to 100	10 to 40	0 to 10	0 to 5	
10	No. 4 to 0 (2).										100	85 to 100				10 to 30

(1) IN INCHES, EXCEPT WHERE OTHERWISE INDICATED. NUMBERED SEIVES ARE THOSE OF U.S. STANDARD SEIVE SERIES.

(2) SCREENINGS. WHERE STANDARD SIZES OF COARSE AGGREGATE DEESIGNATED BY TWO OR THREE DIGIT NUMBERS ARE SPECIFIED, THE SPECIFIED GRADATION MAY BE OBTAINED BY COMINBINING TH BE DONE AS DIRECTED BY THE LABORATORY

GEOTEXTILES

GEOTEXTILE FILTER FABRIC (NON-WOVEN): IN ADDITION TO CONFORMANCE WITH MSHA SUBSECTION 919, NON-WOVEN GEOTEXTILE FILTER FABRIC MUST CONFORM TO CLASS C PER TABLE H-24-1 IN THE MDE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL." THE FABRIC MUST HAVE MINIMUM GRAB STRENGTH OF 200 POUNDS AND MINIMUM PUNCTURE STRENGTH OF 80 POUNDS. NOTE: THIS ITEM WILL NOT BE PAID WHEN FABRIC IS INCIDENTAL TO OTHER WORK (E.G., RIPRAP). ALL GEOTEXTILES SHALL BE STORED UNDER COVER PER MANUFACTURER'S SPECIFICATIONS UNTIL INSTALLATION. GEOTEXTILE SHALL BE COMPLETELY COVERED WITH BACKFILL, AGGREGATE, RIPRAP, OR OTHER MATERIAL AFTER

SEEPAGE CONTROL FILTER

SEEPAGE CONTROL FILTERS (E.G. FILTER DIAPHRAGMS, CHIMNEY FILTERS, BLANKET DRAINS, TOE DRAINS) ARE USED TO CONTROL SEEPAGE IN THE DAM EMBANKMENTS. A FILTER IS A CRITICAL FEATURE WITHIN THE DAM, AND MUST BE CONSTRUCTED ACCORDING TO SPECIFICATIONS. FILTERS ARE GENERALLY LOCATED INSIDE OF THE DAM'S EMBANKMENT DOWNSTREAM OF THE

THE SIZE AND EXTENT OF THE SEEPAGE CONTROL MEASURES AND ANY PIPING NECESSARY MUST BE IN ACCORDANCE WITH THE

FINE AGGREGATE MEDIA: FINE AGGREGATE MEDIA MUST MEET THE SIEVE REQUIREMENTS OF THE FINE AGGREGATE MEDIA REFERENCE NOTED IN THE CONTRACT DOCUMENTS. FINE AGGREGATE MUST BE CLEAN WASHED FINE AGGREGATE. LIMESTONE BASED PRODUCTS, MANUFACTURED SAND AND STONE DUST ARE NOT ACCEPTABLE.

COARSE AGGREGATE MEDIA: COARSE AGGREGATE MATERIAL MUST MEET THE GRADATION REFERENCE NOTED IN THE CONTRACT DOCUMENTS. COARSE AGGREGATE MUST BE CLEAN WASHED COARSE AGGREGATE. LIMESTONE BASED PRODUCTS ARE NOT

PIPE CONDUIT AND FITTINGS: PER DRAINS SECTION.

PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT TO THE EIC AND OBTAIN APPROVAL OF MANUFACTURER'S CERTIFICATIONS THAT THE FINE AND COARSE AGGREGATE MEDIA MEET THE SPECIFICATIONS AND GRADATIONS REQUIRED IN THE CONTRACT DOCUMENTS.

1. PLACE AGGREGATE UNIFORM EIGHT (8)-INCH LOOSE LIFTS (MEASURED BEFORE COMPACTION).

- INSTALLATION MUST BE IN ACCORDANCE WITH THE REQUIREMENTS STATED IN THE CONTRACT DOCUMENTS AND AS FOLLOWS:
- 2. WET EACH LIFT THOROUGHLY WITH POTABLE WATER PRIOR TO COMPACTION. 3. COMPACT WITH A MINIMUM OF TWO (2) PASSES OF A VIBRATORY PLATE COMPACTOR WEIGHING AT LEAST 160 POUNDS. THE COMPACTOR SHALL HAVE A MINIMUM CENTRIFUGAL FORCE OF 2.450 POUNDS AT A VIBRATING FREQUENCY OF NO LESS THAN 5.000 CYCLES PER MINUTE OR BY A MINIMUM OF TWO PASSES OF A VIBRATORY SMOOTH WHEELED ROLLER WEIGHT NO LESS THAN 325 POUNDS WITH A CENTRIFUGAL FORCE OF 2.250 POUNDS AT A VIBRATING FREQUENCY OF NO LESS THAN 4.500
- CYCLES PER MINUTE 4. PLACE AGGREGATE TO AVOID SEGREGATION OF PARTICLE SIZES AND TO ENSURE CONTINUITY AND INTEGRITY OF ALL ZONES.
- 5. TAKE PROPER MEASURES TO PREVENT CONTAMINATION OF THE FILTER MEDIA BY ADJACENT SOIL LIFTS, CONSTRUCTION DEBRIS, OR OTHER MATERIAL. CONTAMINATED AREAS MUST BE REMOVED AND REPLACED.
- 6. ANY DAMAGE TO THE FOUNDATION SURFACE OR THE TRENCH SIDES OR BOTTOM DURING PLACEMENT SHALL BE REPAIRED BEFORE PLACEMENT OF THE SAND MEDIA CONTINUES
- 7. THE UPPER SURFACE OF THE FILTER ZONE CONSTRUCTED CONCURRENTLY WITH ADJACENT FILL ZONES SHALL BE MAINTAINED AT A MINIMUM ELEVATION OF ONE (1) FOOT ABOVE THE UPPER SURFACE OF ADJACENT FILL. 8. THE FILTER DIAPHRAGM TOE DRAIN(S) SHALL OUTLET AT THE PRINCIPAL SPILLWAY OUTLET AND EXTEND A MINIMUM OF TWO

SUPERVISION AND INSPECTION

(2) INCHES BEYOND THE END OF ANY SUPPORT WALL.

1. INSTALLATION SHALL BE COMPLETED UNDER SUPERVISION BY THE EIC. 2. THE EIC SHALL CONFIRM THE VALIDITY OF THE MATERIAL DELIVERED TO THE SITE BOTH BY VISUAL-MANUAL CLASSIFICATION OF THE MATERIAL AND BY COLLECTING AND REVIEWING THE MATERIAL TICKET FOR EACH LOAD OF MATERIAL DELIVERED AND CONFIRMS THAT IT MEETS THE SPECIFICATION IN THE CONTRACT DOCUMENTS. ONE SIEVE ANALYSIS IN ACCORDANCE WITH ASTM C136 OR AASHTO T27 SHALL BE PERFORMED FOR EVERY 500 CY OF MATERIAL INSTALLED WITH ONE TEST REQUIRED

3. THE EIC SHALL CONFIRM THAT ALL STEPS OF THE PROCESS DETAILED IN THE CONSTRUCTION SECTION ARE FOLLOWED FOR EACH LIFT. 4. THE EIC SHALL MANUALLY INSPECT THE WETTED FINE AGGREGATE BY SAMPLING THE INSTALLED FINE AGGREGATE A MINIMUM OF ONCE PER LIFT OF MATERIAL INSTALLED.

Maryland Department of the Environment Water and Science Administration **Dam Safety Division**

 Visty P. Dalal Sr. Regulatory & Compliance Enginee

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND



Baltimore, Maryland 21202

(410) 662-7400

McCORMICK Howard County Storm Water Management Division

Bureau of Environmental Services

Columbia, Maryland 21046–3143

(410) 313-6444

6751 Columbia Gateway Drive, Suite 514



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	DATE: 8/21/18	BY	NO.	REVISION	DATE	
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GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT **HOWARD COUNTY CAPITAL PROJECT #D-1159** HSCD #: EP-17-40 **MD DAM NO. 577**

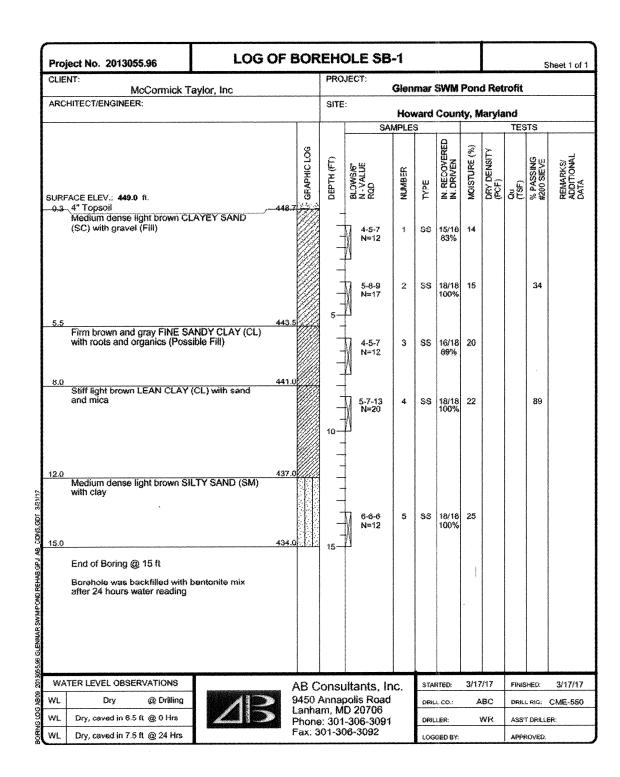
POND CONSTRUCTION SPECIFICATIONS

15 OF 17

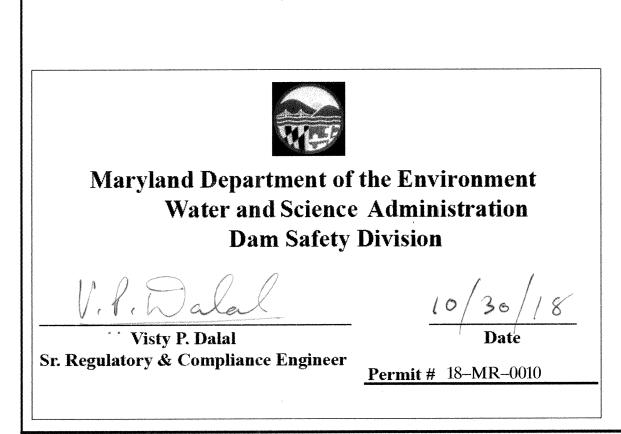
SHEET

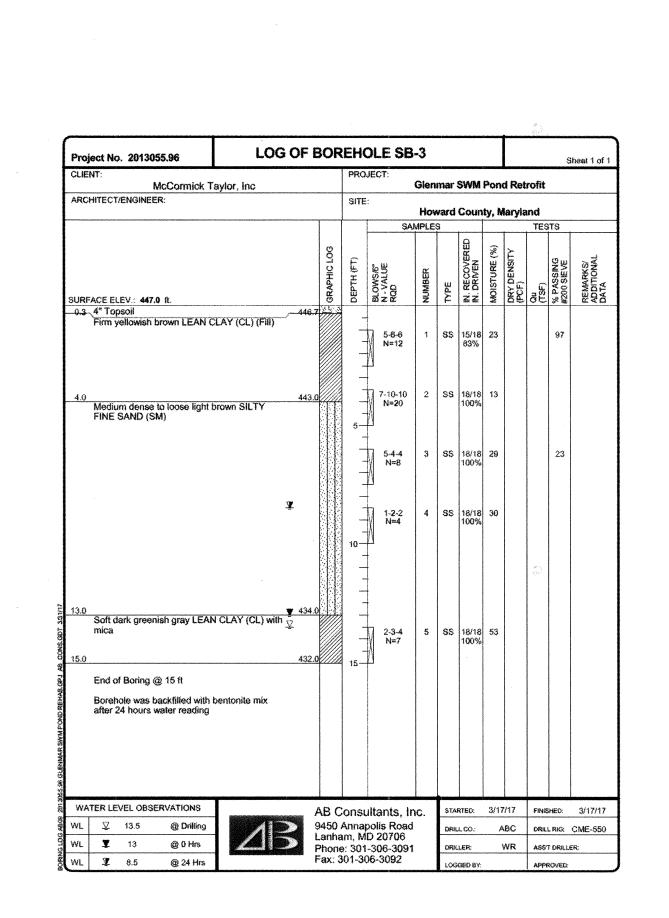
SCALE

NOT TO SCALE



Proje	ect No. 2013055.96	LOG OF E	3OR	EH(OLE SB	-2				l		s	heet 1 of
CLIENT: McCormick Taylor, Inc				PRO	JECT:	Gien	mar	SWM	Pon	d Rat	rofit		
ARCH	HITECT/ENGINEER:	nor, no		SITE	:			~ 4 3 101	. 411	~ : \	· VIII		
								Coun	ty, N	laryia			
					SA	MPLE	35				TES	18	····
			GRAPHIC LOG	DEPTH (FT)	BLOWS/6" NVALUE ROD	NUMBER	TYPE	IN. RECOVERED IN. DRIVEN	MOISTURE (%)	DRY DENSITY (PCF)	38 <u>(</u>)	% PASSING #200 SIEVE	REMARKS/ ADDITIONAL
	ACE ELEV.: 449.0 ft. .4" Topsoil	448.3	1000 21	۵	ŏz&	Z	F	ZZ	2	26	ät	洛费	24.5
	Medium dense yellowish brown SAND (SC) with gravel (Fill)			-	6-8-6 N=12	***	SS	17/18 94%	8			20	
5.5		443.5		5—	6-6-6 N=12	2	SS	3/18 17%	13				
7.0	Stiff light brown FINE SANDY ((Possible Fill) Stiff light brown FINE SANDY (gravel	CLAY (CL)		 	13-10-9 N=19	3	SS	18/18 100%	16			62	
8.5	₩.m.m.	440.5								,			
44.5	Dense to loose light brown SILT with mice			10-	17-21-16 N=37	5	SS	18/18 100%					
14.5 15.0	Firm tan LEAN CLAY (CL)	434.5 434.0	987777										
	End of Boring @ 15 ft Borehole was backfilled with be after 24 hours water reading			15									
WAT WL	TER LEVEL OBSERVATIONS Dry @ Drilling		9450 /	Annaj	ultants, Ir		l	RTED:	3/17	7/17 NBC	FINIS DRIL		3/17/1: CME-556
WL	Dry, caved in 6.5 ft @ 0 Hrs				D 20706 -306-3091		ORIL	LER:		WR	ASST	ORILLE	R:
WL Dry, caved in 5.5 ft @ 24 Hrs													





DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

ENVIRONMENTAL SERVICES

McCORMICK Howard County
MARIAN FOR SOUTH TO SENTE THE PROPERTY OF THE PROPERTY 509 South Exeter Street 4th Floor

Baltimore, Maryland 21202

(410) 662-7400

Storm Water Management Division Bureau of Environmental Services 6751 Columbia Gateway Drive, Suite 514 Columbia, Maryland 21046–3143

(410) 313–6444



	DES: EZS/CLR					
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	DRN: MER					
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		ADM	1	AS-BUILT SURVEY	8/1/19	
DATE: 8/21/18	BY	NO.	REVISION	DATE		

BLACK AMY LYNNE 5327 DEBBIE CT ELLICOTT CITY, MD 21043 Liber: 13153 /Folio: 0300 /Lot: 101

ANDERSON MOSES G

ANDERSON JOY E TÆ 8363 MITZY LANE ELLICOTT CITY, MD 21043

Liber: 03832 /Folio: 0352 /Lot: 122

HOWARD COUNTY MARYLAND

OPEN SPACE

WARD COUNTY IVIAL DEPT OF REC PARKS 940.90

GLENMAR POND #2 PRINCIPAL SPILLWAY REPLACEMENT PROJECT HOWARD COUNTY CAPITAL PROJECT #D-1159 HSCD #: EP-17-40 MD DAM NO. 577

BORING PLAN VIEW

AS-BUILT GRADING NOT SHOWN. SEE SITE PLAN FOR REVISED GRADING.

BORING LOGS

SCALE 1'' = 20'SHEET

<u>16</u> OF <u>17</u>

DEMARET TODD A DEN

W ELEV=441.39'

BASEMENT WINDO ELEV=441.39' ON SILL

TRIMMER MATTH

ELLICOTT CITY, ME

TRIMMER LOF

8177 ELKO E

Liber: 15209 Folio: 0116 Lot: 395

WRIGHT

8173 E ELLICOTT C

Liber: 13195 /Fo

8181 ELKC

ELLICOTT CITY,

Liber: 05709 /Folio:

