INDEX OF SHEETS

LEGEND

OVERALL LOD

EXISTING CONTOUT

PROPERTY LINE

EASEMENT LINE

LIMITS OF DISTURBANCE

PROPOSED CONTOUR

WETLAND BOUNDARY

25' WETLAND BUFFER

WATERS OF THE U.S.

LIMIT OF EXCAVATION

WOODY FREE ZONE

EX. STORM DRAIN

EX. WOODS LINE

EX. SANITARY LINE

SOIL BORING

EX. TREE

SHEET NO.	DESCRIPTION	
1 2 3 4-5 6 7 8	TITLE SHEET ENVIRONMENTAL RESOURCES MAP STORMWATER MANAGEMENT PLAN STORMWATER MANAGEMENT PROFILES STORMWATER MANAGEMENT DETAILS STORMWATER MANAGEMENT NOTES & DET SOIL BORING LOGS	TAILS
9-11 12-13 14-15 16 17	EROSION & SEDIMENT CONTOL PLANS EROSION & SEDIMENT CONTOL DETAILS EROSION & SEDIMENT CONTOL NOTES LANDSCAPE PLAN LANDSCAPE NOTES & DETAILS	

SITE ANALYSI	S DATA
SITE AREA (AC)	1.58
WETLAND AREA (AC)	0.81
WETLAND BUFFER (AC)	1.24
FLOODPLAIN AREA (AC)	0.00
FOREST LIMITS (AC)	0.45
STEEP SLOPE AREA >15% (AC)	0.51
ERODIBLE SOILS (AC)	1.58
LIMIT OF DISTURBANCE (AC)	1.58
PROPOSED SITE USE	STORMWATER MANAGEMENT
PROPOSED IMPERVIOUS AREA (AC)	0.00

DN
02-06-00
14.34
15.13 16.47
58.88
-1.61 -2.11
100%

* THERE IS NO DEVELOPMENT IN THE WATERSHED, SO THERE IS NO WATER QUALITY REQUIREMENT. THE PROPOSED PROJECT IS A PRINCIPAL SPILLWAY REPLACEMENT, SEDIMENT DEMUCKING, AND RETROFIT TO PROVIDE WATER QUALITY IN A WET POND.

SPECIAL CONTRACTOR NOTES

- CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE LIMIT OF DISTURBANCE SHOWN ON THE PLANS.
- 2. UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES,

PHOTOGRAPHS OF THE PROPOSED WORK AREA AND

ACCESS SHALL BE TAKEN

EX. WATER LINE

PROPOSED RIPRAP

DISCHARGE HOSE

SUPER SILT FENCE

SANDBAG DAM

FILTER BAG ON RIPRAP PAD

STABILIZED CONSTRUCTION ENTRANCE

25% SLOPES OR GREATER

HIGHLY ERODIBLE SOILS

HOWARD CO. SOILS BOUNDARY

SOIL STABILIZATION MATTING

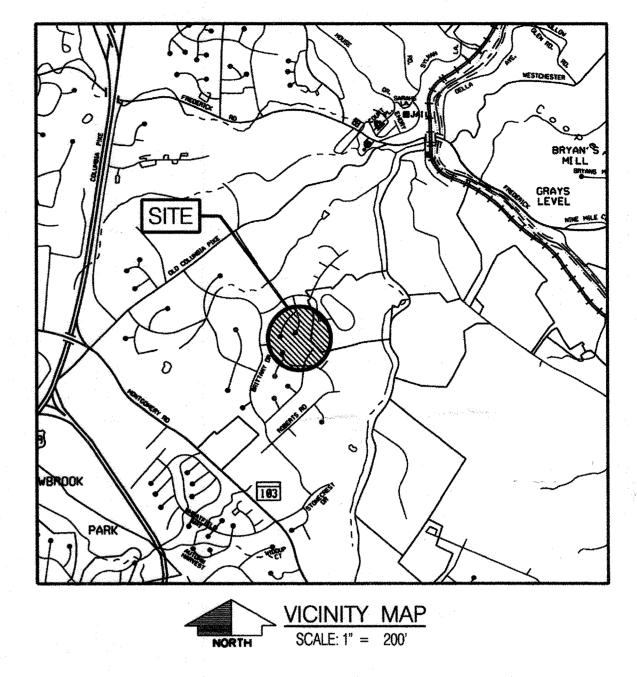
15%-25% SLOPES

AUTUMN MANOR POND RETROFIT

HOWARD COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS CAPITAL PROJECT D-1159

VALS /PER	RMITS	
PERMIT .	DATE APPLIED	DATE APPROVED
CENAB-OPR-MN 2019-60413-M44	04/15/2019	10/08/2019
EP-19-15	10/25/2018	12/10/2019
MDRCM04RT	11/14/2019	01/02/2020
	PERMIT • CENAB-OPR-MN 2019-60413-M44 EP-19-15	CENAB-OPR-MN 2019-60413-M44 04/15/2019 EP-19-15 10/25/2018

HOWARD	COUNTY	SURVEY C	ONTROL
DESIGNATION	NORTHING	EASTING	ELEVATION
25GB	577875.934	1368199.622	410.934
25GC	576967.074	1367204.664	445.268



GENERAL INFORMATION

- 1. EXISTING FACILITY WAS ORIGINALLY CONSTRUCTED UNDER AS-BUILT PLAN F-88-141 DATED FEBRUARY 1992 BY HOWARD COUNTY, LAND SERVICES, INC. AS ACCEPTED BY HOWARD SOIL
- CONSERVATION DISTRICT ON FEBRUARY 24, 1992.
- 2. THERE ARE NO KNOWN BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE PROJECT SITE . ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY, AS APPLICABLE
- 5. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 5 DAYS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- 6. THE COORDINATES SHOWN HEREIN ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND COORDINATE SYSTEM (MCS), NAD83 (2014).
- WATER IS PUBLIC.
- 8. SEWER IS PUBLIC.
- 9. THE RECEIVING STREAM IS USE CLASS I. TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IN USE I WATERSHEDS SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
- 10. THERE ARE NO TIER II WATERS WITHIN THE CONSTRUCTION AREA.
- 11. ACCORDING TO THE CLEAN WATER ACT 303(D) LISTING OF IMPAIRED WATERS THE RECEIVING WATERWAY IS IMPAIRED BY SEDIMENT.
- 12. EXISTING UTILITIES ARE BASED ON MISS UTILITY MARK OUT SEPTEMBER 2018 AND FIELD SURVEYS. CONTRACTOR TO VERIFY INFORMATION TO HIS/HER OWN SATISFACTION.
- 13. KCI TECHNOLOGIES, INC. PERFORMED A SITE VISIT ON AUGUST 27, 2018 TO PERFORM A WETLAND DELINEATION.
- 14. THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS IN NAVD88 VERTICAL DATUM PREPARED BY DAFT MCCUNE WALKER, INC. SEPTEMBER 2018.
- 15. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- 16. THE EXISTING INFORMATION SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE SOURCES AND SHALL BE VERIFIED BEFORE STARTING CONSTRUCTION. HOWARD COUNTY DOES NOT GUARANTEE THE COMPLETENESS OR CORRECTNESS OF THE INFORMATION SHOWN.
- 17. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND KCI TECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION ON ITS OWN. 18. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION.
- THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE ENGINEER, THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES. 19. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE
- CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY. ALL UTILITIES SHALL HAVE A CLEARANCE BY A MINIMUM OF SIX (6) INCHES VERTICALLY AND A MINIMUM OF FIVE (5) FEET HORIZONTALLY, PLEASE NOTE THAT MORE RESTRICTIVE CLEARANCES SHALL BE ADHERED TO WHEN APPROPRIATE.
- 20. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS.
- 21. THERE ARE NO CRITICAL AREAS WITHIN THE STUDY AREA.
- 22. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEAN, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS
- 23. CONTRACTOR SHALL PROVIDE STRUCTURAL SHOP DRAWINGS FOR ALL PRECAST OR PRE-FABRICATED STRUCTURES FOR ENGINEER*S APPROVAL PRIOR TO CONSTRUCTION.
- 24. CONTRACTOR SHALL CONTINUOUSLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
- 25. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN. ACTIVITIES NEAR TREES THAT ARE TO REMAIN SHALL BE DONE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE OR WITHIN THE DRIP LINE OF THE TREES. ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION. THE LOCATION OF THE PROTECTIVE ORANGE FENCE SHALL BE APPROVED BY THE HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS PRIOR TO CONSTRUCTION.
- 26. ALL TREES TO BE REMOVED SHALL BE CUT AT THE BASE WITH A SAW AND NOT PUSHED OVER. TREE STUMPS OUTSIDE THE EMBANKMENT MAY BE LEFT IN PLACE, UNLESS OTHERWISE DIRECTED ON THE PLANS OR BY THE ENGINEER
- 27. ALL MATERIAL SHALL BE REMOVED AND DISPOSED OF OFFSITE. REMOVED TREES AND BRUSH MAY BE REDISTRIBUTED ON SITE AT THE DISCRETION OF THE ENGINEER OR HIS/HER REPRESENTATIVE.
- 28. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN ENTERING AND EXITING THE PROJECT SITE AND PAY CLOSE ATTENTION TO PEDESTRIANS AND TRAFFIC NEAR THE SITE.
- 29. THE STORMWATER MANAGEMENT POND IS ON HOWARD COUNTY DEPARTMENT OF PARKS AND RECREATION PLAT NO. 8397 30. CONSTRUCTION ACTIVITIES TO TAKE PLACE DURING NORMAL WORKING HOUR OF BUSINESS OPERATION (MONDAY - FRIDAY; 7AM - 5PM); WRITTEN APPROVAL FROM HOWARD COUNTY DPW
- IS REQUIRED SHOULD THE CONTRACTOR IDENTIFY A NEED TO WORK OUTSIDE OF THE SCHEDULE LIMITATIONS ABOVE.
- 31. IN A LETTER DATED, JULY 1, 2019, THE HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING APPROVED THE REQUEST TO ALLOW STREAM BUFFER, WETLANDS AND WETLANDS BUFFER, AND STEEP SLOPE DISTURBANCES AS ESSENTIAL OR NECESSARY DISTURBANCES IN ACCORDANCE WITH SECTION 16.116(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.

PROJECT LOCATION POND

SITE LOCATION

DESIGN NARRATIVE

THIS PROJECT WILL SERVE TO PROTECT NATURAL RESOURCES BY PROVIDING STORMWATER MANAGEMENT AND CHANNEL STABILIZATION. THE PROPOSED WET POND ENHANCEMENT WILL IMPROVE WATER QUALITY TO TREAT LEGACY IMPERVIOUS AREA, THIS WILL REDUCE THE DISCHARGE OF SEDIMENT AND NUTRIENTS DOWNSTREAM. AS THIS PROJECT INVOLVES REPAIR TO AN EXISTING STORMWATER FACILITY, THERE IS NO ALTERATION TO A NATURAL FLOW PATH THERE IS NO IMPERVIOUS AREA WITHIN THE SITE TO BE REDUCED THERE IS AN EXISTING PUBLIC SEWER LINE THAT SHOULD BE PROTECTED THROUGHOUT ALL PHASES OF THE PROJECT SEDIMENT CONTROL FOR POND CONSTRUCTION WILL BE PROVIDED THROUGH PROVISION OF SANDBAG BERMS ACROSS THE DOWNSTREAM LIMIT OF WORK IN THE CHANNEL A REMOVABLE PUMPING STATION WILL BE UTILITZED TO DEWATER THE BASIN TO AN APPROVED FILTER BAG DOWNSTREAM OF THE WORK AREA THE PROPOSED WORK, INCLUDING PRINCIPAL SPILLWAY REPLACEMENT, RISER REPLACEMENT, STABILIZATION OF THE FOUR INFLOWS, CONSTRUCTION OF THE PROPOSED WET POND, AND RECEIVING CHANNEL ENHANCEMENTS, WILL BE CONSTRUCTED IN PHASES, ENSURING THE WORK AREA IS DEWATERED THROUGHOUT THE DURATION OF CONSTRUCTION. THE PROPOSED WORK IS WITHIN AN EXISTING STRUCTURAL BMP: THEREFORE, IMPLEMENTATION OF ESD PRACTICES IS NOT APPLICABLE.

THEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS. 03/19/2021 REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. 12/10/19 DEPARTMENT OF RECREATION AND PARKS HOWARD COUNTY, MARYLAND 12/10/19 DIRECTOR OF RECREATION AND PARKS

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or

approved by me, and that I am a duly licensed professional engineer under the laws

of the State Of Maryland, License No. 39696, Expiration Date 1/04/2021

	DES: DID			AS-BUILT	03/2021	
	DRN: DID					
			:			
'	CHK: RWB					5.8
219	DATE: NOV , 2019	BY	NO.	REVISION	DATE	600' SCALE MAP NO.

TITLE SHEET

CAPITAL PROJECT No. D-1159

AUTUMN MANOR POND RETROFIT

AS SHOWN SHEET

AS-BUIL

EP-19-15

SCALE

DEPARTMENT OF PUBLIC WORKS

ENGINEER'S CERTIFICATE

CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH

DEVELOPER'S CERTIFICATE

'WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMEN'

HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE THE BEGINNING OF THE PROJECT. I ALSO AUTHORIZE PERIODIC

AS-BUILT CERTIFICATION

AND EROSION CONTROL AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL

THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) James M. Irvin

SIGNATURE OF ENGINEED (PRINT NAME BELOW SIGNATURE)

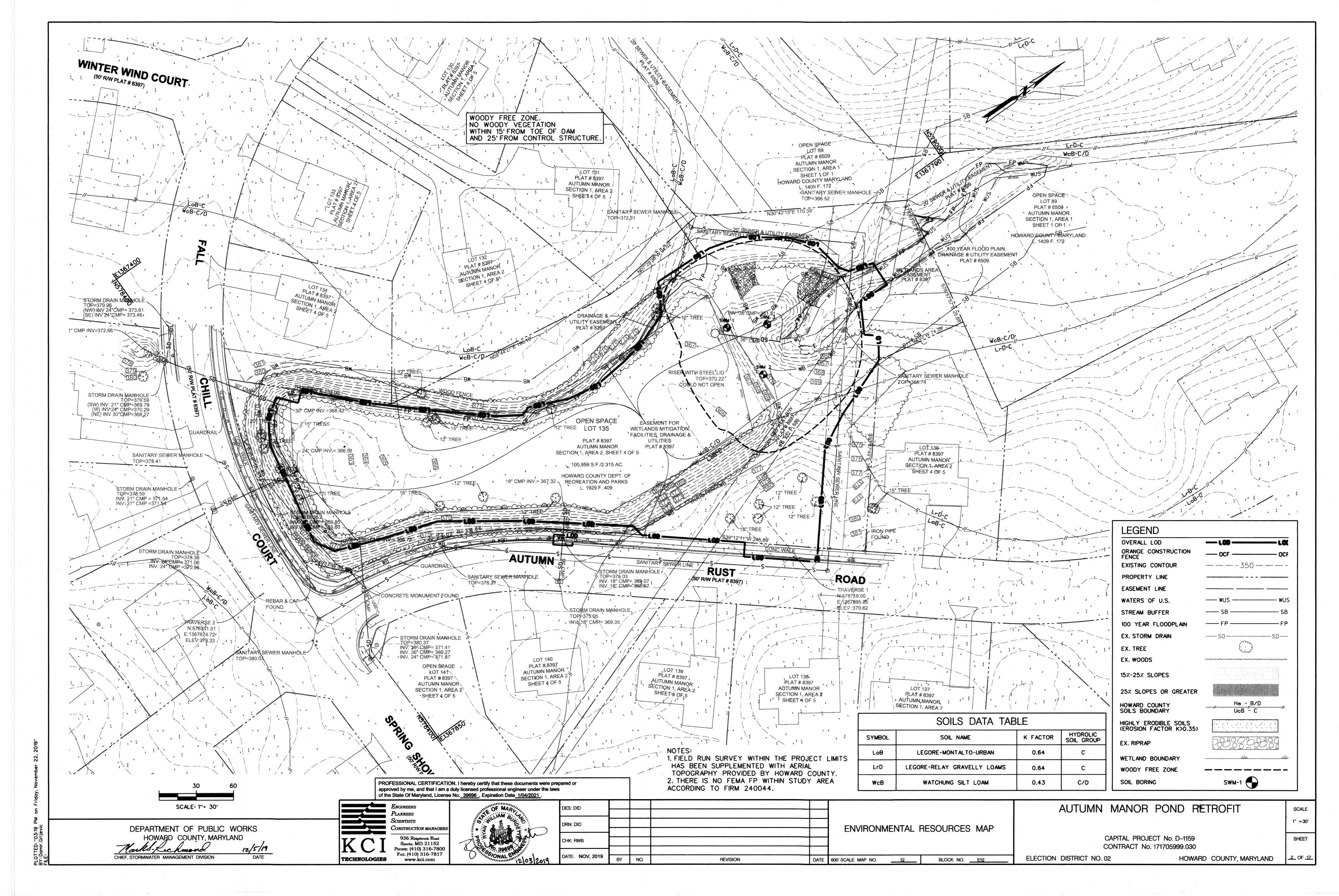
TECHNOLOGIES

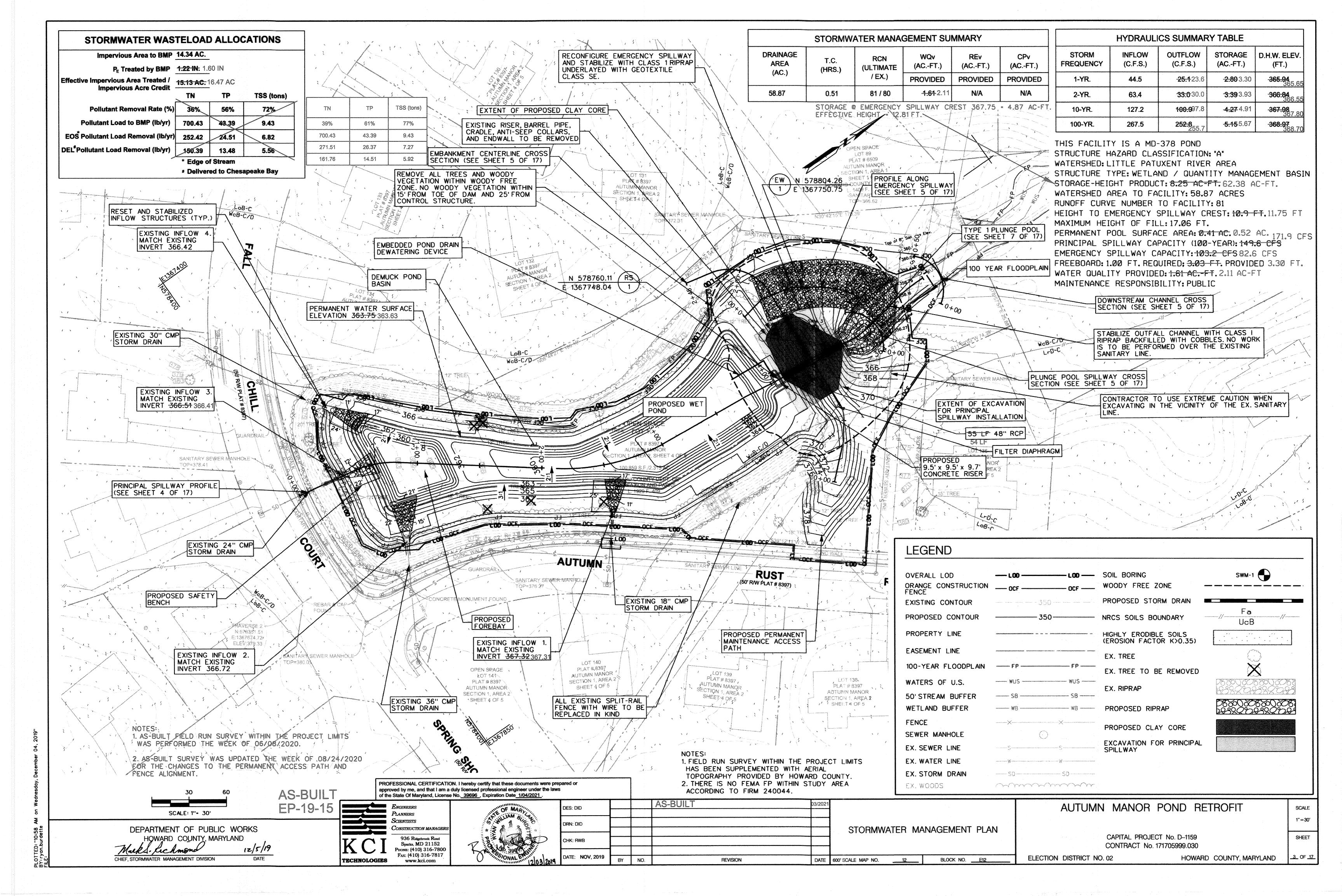
Construction managers Sparks, MD 21152 PHONE: (410) 316-7800 Fax: (410) 316-7817 www.kci.com

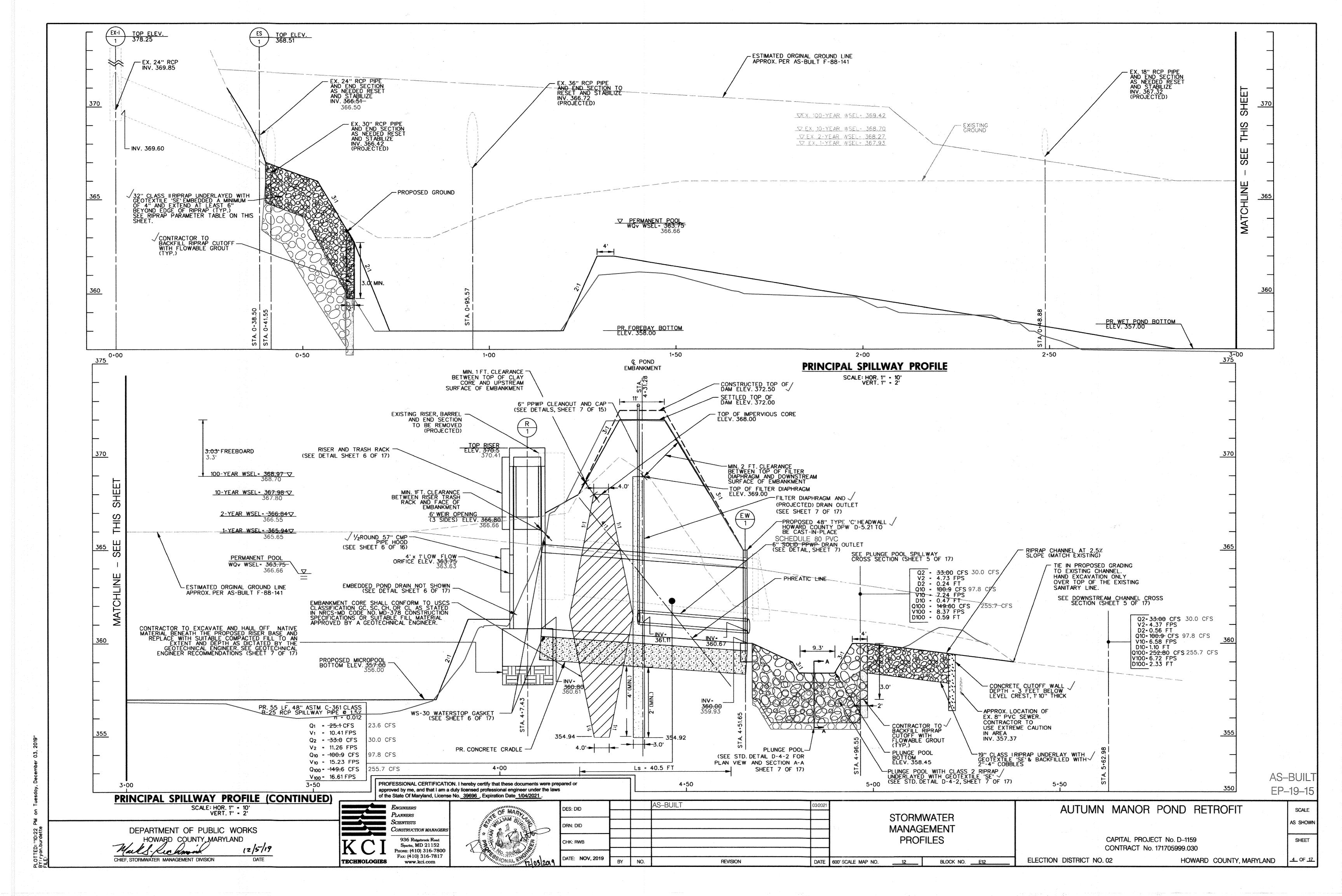
BLOCK NO. E12

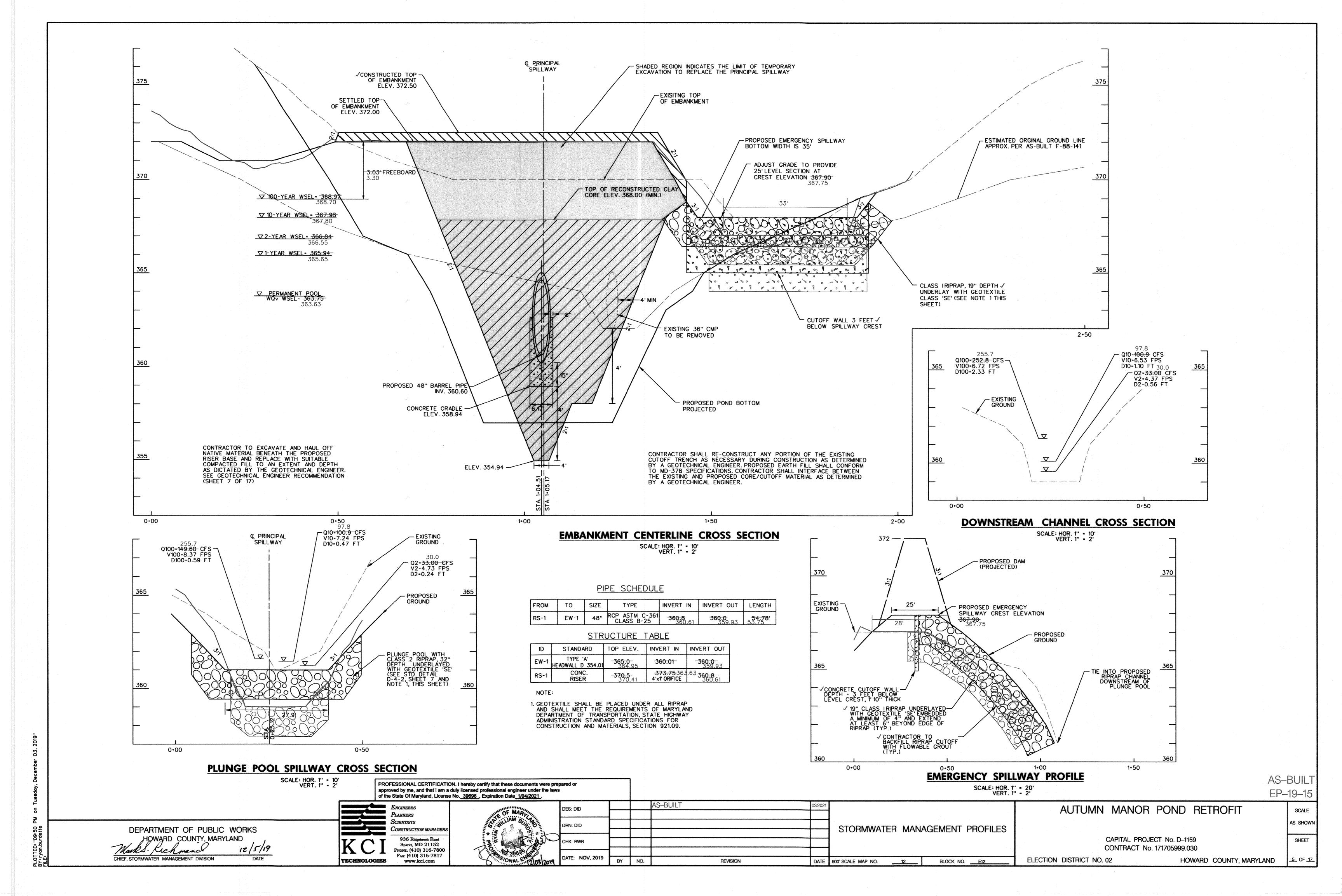
CONTRACT No. 171705999.030 **ELECTION DISTRICT NO. 02** HOWARD COUNTY, MARYLAND

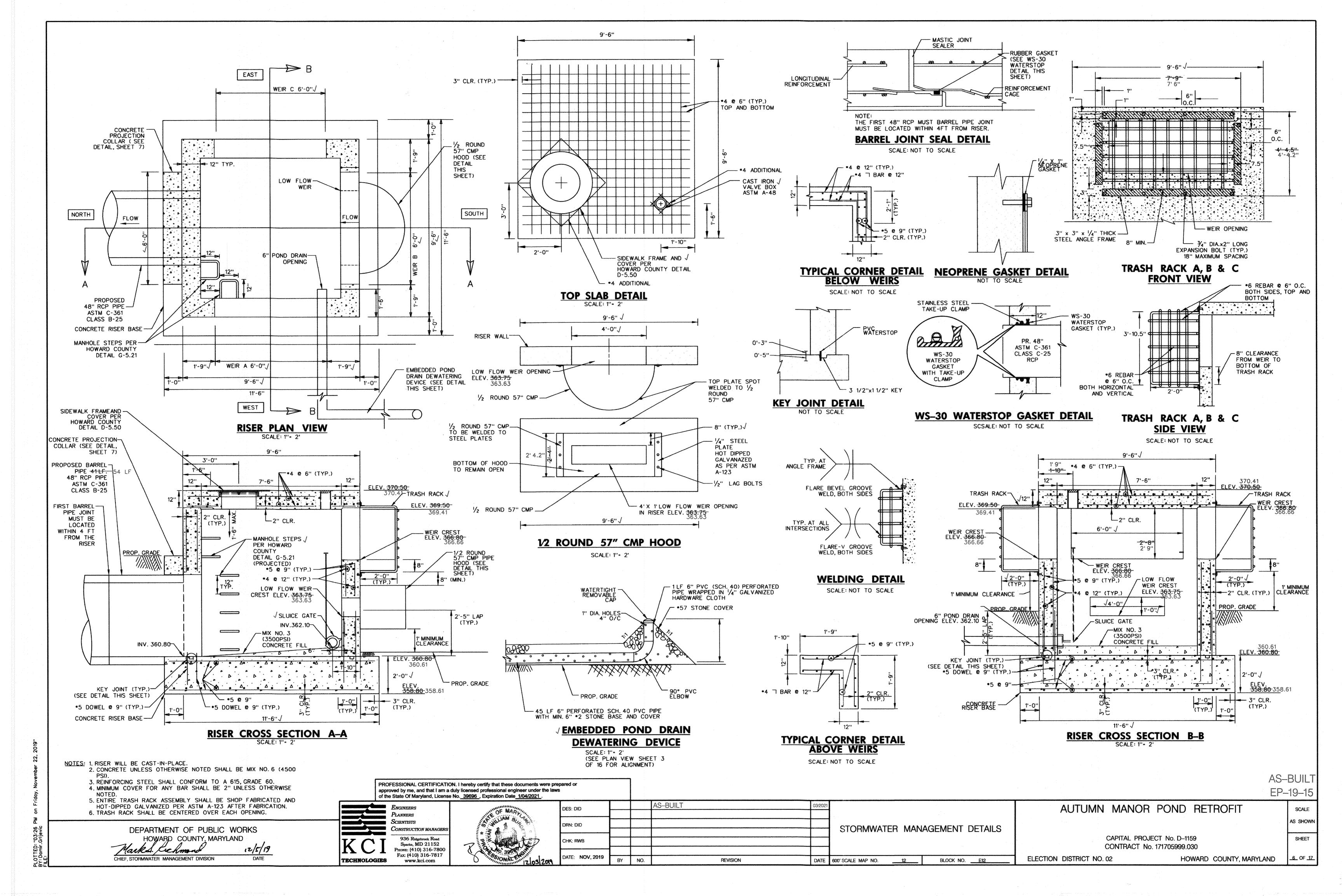
SUREAU OF ENVIRONMENTAL SEVICES











AREAS DISIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED. CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAT 1:1. ALL TREES SHALL BE CLEARED AND GRUBBED WITHIN 15 FEET OF THE THE EMBANKMENT

AREAS TO BE COVERED BY THE RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED ON THE PLANS. TREES, BRUSH, AND STUMPS SHALL BE CUT APPROXIMATELY LEVEL WITH THE GROUND SURFACE. FOR DRY STORMWATER MANAGEMENT A MINIMUM OF A 25-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL

ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF OUTSIDE AND BELOW THE LIMITS OF THE DAM AND RESERVOIR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE. WHEN SPECIFIED, A SUFFICIENT QUANTITY OF TOPSOIL WILL BE STOCKPILED IN A SUITABLE LOCATION FOR USE ON THE EMBANKMENT AND OTHER DESIGNATED.

SITE PREPARATION

MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT, AND CUTOFF TRENCH SHALL CONFORM TO UNIFIED SOIL CALSSIFICATION GC, SC, CH, OR CL AND MUST HAVE AT LEAST 30%. PASSING THE *200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER. SUCH SPECIAL DESIGNS MUST HAVE CONSTRUCTION SUPERVISED BY A GEOTECHNICAL ENGINEER. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.

PLACEMENT - AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT

COMPACTION - THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF HEAVY EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPSFOOT, RUBBER TIRED OR VIBRATORY ROLLER. FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTIANED WITH THE EQUIPMENT USED.
THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED INTO A
BALL IT WILL NOT CRUMBLE, YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT. REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT I

LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN 1/2 2% OF

THE OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR). CUT OFF TRENCH - THE CUTOFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL ALONG OR PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE BOTTOM WIDTH OF THE TRENCH SHALL BE GOVERNED BY THE EQUIPMENT USED FOR EXCAVATION, WITH THE MINIMUM WIDTH BEING FOUR FEET. THE DEPTH SHALL BE AT LEAST FOUR FEET BELOW EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPES OF THE TRENCH SHALL BE 1 TO 1 OR FLATTER. THE BACKFILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND

EMBANKMENT CORE - THE CORE SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10 YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

STRUCTURE BACKFILL BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN

THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE.

STRUCTURE BACKFILL MAY BE FLOWABLE FILL MEETING THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 313 AS MODIFIED. THE MIXTURE SHALL HAVE A 100-200 PSI; 28 DAY UNCONFINED COMPRESSIVE STRENGTH. THE FLOWABLE FILL SHALL HAVE A MINIMUM PHOF 4.0 AND A MINIMUM RESISTIVITY OF 2,000 OHM-CM. MATERIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) OF FLOWABLE FILL SHALL BE UNDER (BEDDING), OVER AND, ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIDGID CONDUITS. AVERAGE SLUMP OF THE FILL SHALL BE 7" TO ASSURE FLOWABILITY OF THE MATERIAL. ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING THE PIPE. WHEN USING FLOWABLE FILL, ALL METAL PIPE SHALL BE BITUMINOUS COATED. ANY ADJOINING SOIL FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL SHALL COMPLETELY FILL ALL VOIDS ADJACENT TO THE FLOWABLE FILL ZONE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. BACKFILL MATERIAL OUTSIDE THE STRUCTURAL BACKFILL (FLOWABLE FILL) ZONE SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE CORE OF THE EMBANKMENT OR OTHER EMBANKMENT MATERIALS.

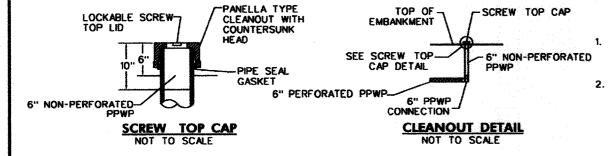
PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION

CORRUGATED METAL PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR CORRUGATED METAL PIPE: MATERIALS - (POLYMER COATED STEEL PIPE) - STEEL PIPES WITH POLYMERIC

COATINGS SHALL HAVE A MINIMUM COATING THICKNESS OF 0.01 INCH (10 MIL) ON BOTH SIDES OF THE PIPE. THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATIONS M-245 & M-246 WITH WATERTIGHT COUPLING BANDS OR FLANGES.

MATERIALS - (ALUMINUM COATED STEEL PIPE) - THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION ON M-274 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ALUMINUM COATED STEEL PIPE, WHEN USED WITH FLOWABLE FILL OR WHEN SOIL AND/OR WATER CONDITIONS WARRANT THE NEED FOR INCREASED DURABILITY, SHALL BE FULLY BITUMINOUS COATED PER REQUIREMENTS OF AASHTO SPECIFICATION ON M-190 TYPE A. ANY ALUMINUM COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND. ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER OR TWO COATS OF ASPHALT.



- (ALUMINUM PIPE) - THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-196 OR M-211 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ALUMINUM PIPE, WHEN USED WITH FLOWABLE FILL OR WHEN SOIL AND/OR WATER CONDITIONS WARRANT FOR INCREASED DURABILITY, SHALL BE FULLY BITUMINOUS COATED PER REQUIREMENTS OF AASHTO SPECIFICATION M-190 TYPE A. ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER OR TWO COATS OF ASPHALT. HOT DIP GALVANIZED BOLTS MAY BE USED FOR CONNECTIONS. THE PH OF THE SURROUNDING SOILS SHALL BE BETWEEN 4 AND 9.

2. COUPLING BANDS, ANTI-SEEP COLLARS, END SECTIONS, ETC., MUST BE COMPOSED OF THE SAME MATERIAL AND COATINGS AS THE PIPE. METALS MUST BE INSULATED FROM DISSIMILAR MATERIALS WITH USE OF RUBBER OR PLASTIC INSULATING MATERIALS AT LEAST 24 MILS IN THICKNESS.

3. CONNECTIONS - ALL CONNECTIONS WITH PIPES MUST BE COMPLETELY WATERTIGHT. THE DRAIN PIPE OR BARREL CONNECTION TO THE RISER SHALL BE WELDED ALL AROUND WHEN THE PIPE AND RISER ARE METAL. ANTI-SEEP COLLARS SHALL BE CONNECTED TO THE PIPE IN SUCH A MANNER AS TO BE COMPLETLEY WATERTIGHT. DIMPLE BANDS ARE NOT CONSIDERED TO BE WATERTIGHT.

ALL CONNECTIONS SHALL USE A RUBBER OR NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE RE-ROLLED AN ADEQUATE NUMBER OF CORRUGATIONS TO ACCOMMODATE THE BANDWIDTH. THE FOLLOWING TYPE CONNECTIONS ARE ACCEPTABLE FOR PIPES LESS THAN 24 INCHES IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE WITH A CIRCULAR % INCH CLOSED CELL NEOPRENE GASKET, PRE-PUNCHED TO THE FLANGE BOLT CIRCLE, SANDWICHED BETWEEN ADJACENT FLANGES; A 12 INCH WIDE STANDARD LAP TYPE BAND WITH 12 INCH WIDE BY % INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12 INCH WIDE HUGGER TYPE BAND WITH O-RING GASKETS HAVING A MINIMUM DIAMETER OF ½ INCH GREATER THAN THE CORRUGATION DEPTH. PIPES 24 INCHES IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24 INCH LONG ANNULAR CORRUGATED BAND USING A MINIMUM OF 4 (FOUR) RODS AND LUGS, 2 ON EACH CONNECTING PIPE END. A 24 INCH WIDE BY % INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET WILL BE INSTALLED WITH 12 INCHES ON THE END OF EACH PIPE. FLANGED JOINTS WITH % INCH CLOSED CELL GASKETS THE FULL WIDTH OF THE FLANGE IS ALSO ACCEPTABLE. HELICALLY CORRUGATED PIPE SHALL HAVE EITHER CONTINUOUSLY WELDED SEAMS OR HAVE LOCK SEAMS WITH INTERNAL CAULKING OR CONTINUOUSLY WELDED SEAMS OR HAVE LOCK SEAMS WITH INTERNAL CAULKING OR

4. BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

5. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL"

6. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE

REINFORCED CONCRETE PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:

1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361

2. BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING/CRADLE FOR THEIR ENTIRE LENGTH. THIS BEDDING/CRADLE SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 50% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 6 INCHES. WHERE A CONCRETE CRADLE IS NOT NEEDED FOR STRUCTURAL REASONS, FLOWABLE FILL MAY BE USED AS DESCRIBED IN THE "STRUCTURE BACKFILL" SECTION OF THIS STANDARD. GRAVEL BEDDING IS NOT PERMITTED.

3. LAYING PIPE - BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 4 FEET FROM THE RISER.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE

PLASTIC PIPE - THE FOLLOWING CRITERIA SHALL APPLY FOR PLASTIC PIPE:

1. MATERIAL - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM D-2241. CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE, COUPLINGS AND FITTINGS SHALL CONFORM TO THE FOLLOWING: 4"-10" INCH PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M2 52 TYPE S, AND 12" THROUGH 24" INCH SHALL MEET THE REQUIREMENTS OF AASHTO M294 TYPE S.

2. JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY

3. BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSUITABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE

DRAINAGE DIAPHRAGMS - WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311. GEOTEXTILE SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATION OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATION OF TRANSPORTATION AND MATERIAL SPECIFICATION AND M SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 921.09, CLASS C.

CARE OF WATER DURING CONSTRUCTION

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE

AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OR WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE IN ANY WAY WITH THE OPERATION OR MAINTENANCE OF THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS. THE REMOVAL OF WATER FROM THE REQUIRED EXCAVATION AND THE FOUNDATION SHALL BE ACCOMPLISHED IN A MANNER AND TO THE EXTENT THAT WILL MAINTAIN STABILITY OF THE EXCAVATED SLOPES AND BOTTOM REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS, DURING THE PLACING AND COMPACTING OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER SUMPS FROM WHICH THE WATER SHALL BE PUMPED. FROM WHICH THE WATER SHALL BE PUMPED. STABILIZATION

ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SIGHTLY CONDITION. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH THE NATURAL RESOURCES CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS FOR CRITICAL AREA PLANTING (MD-342) OR AS SHOWN ON THE ACCOMPANING DRAWINGS.

 FOR OBSERVATION WELL/CLEANOUT, PROVIDE A TUBE MADE OF NON-CORROSIVE MATERIAL, AT LEAST THREE FEET LONG WITH AN INSIDE DIAMETER OF AT LEAST 6 INCHES.

2. THE TUBE SHALL HAVE A FACTORY ATTACHED CAST IRON OR HIGH IMPACT PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING SCREW TOP LID. THE SCREW TOP LID SHALL BE CAST IRON OR HIGH IMPACT PLASTIC THAT WILL-WITHSTAND ULTRA-VIOLET RAYS. EROSION AND SEDIMENT CONTROL

CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. CONSTRUCTION PLANS SHALL DETAIL EROSION AND SEDIMENT CONTROL MEASURES.

WOODY VEGETATION NOTE

TREES, SHRUBS, OR OTHER WOODY VEGETATION WILL NOT BE ALLOWED WITHIN A 25' RADIUS OF THE INLET STRUCTURE IN THE POOL AREA, AND NOT ALLOWED ON, OR WITHIN 15' OF ANY PORTION OF THE EMBANKMENT.

CONTRACTOR'S AS-BUILT NOTE

AS-BUILT PLANS AND CERTIFICATION ARE REQUIRED FOR THIS STORM WATER MANAGEMENT FACILITY. THIS MUST BE PREPARED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER. AFTER FINAL ACCEPTANCE OF THE FACILITY, THE AS-BUILT PLANS AND CERTIFICATION WILL BE PREPARED BY THE ENGINEER FOR SUBMISSION TO HOWARD COUNTY.

TO PREPARE THE REQUIRED AS-BUILT PLANS AND CERTIFICATION, THE STORM WATER MANAGEMENT FACILITY MUST BE INSPECTED BY THE ENGINEER AT SPECIFIC STAGES DURING THE CONSTRUCTION AS REQUIRED BY THE CURRENT HOWARD COUNTY STORM WATER MANAGEMENT POLICY AND DESIGN MANUAL. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE PLANS.

CONSTRUCTION NOTE

UNLESS OTHERWISE NOTED, ALL CONSTRUCTION AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH:

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.

MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION. 2011, STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIAL

GENERAL NOTES

- 1. THE PROPOSED GRADING SHOWN ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY THE HOWARD COUNTY, HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
- 2. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION, OR DISTURBANCE OF VEGETATION IN ANY FOREST RETENTION AREAS, EXCEPT AS PERMITTED BY HOWARD COUNTY
- 3. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. KCI TECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR THE COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY ALL SUCH INFORMATION TO HIS OWN SATISFACTION.
- 4. CONTRACTOR WILL CALL "MISS UTILITY" (800-257-7777) AT LEAST 48 HOURS PRIOR TO
- 5. SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS. THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT WRITTEN PERMISSION OF THE ENGINEER, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.

OPERATION AND MAINTENANCE SCHEDULE

ROUTINE MAINTENANCE:

NON-ROUTINE MAINTENANCE:

- 1. FACILITY SHALL BE INSPECTED ONCE EVERY THREE YEARS. INSPECTIONS SHALL BE PERFORMED DURING OR SHORTLY AFTER WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
- 2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES PER YEAR, ONCE IN JUNE AND ONCE IN MOWED AS NEEDED.
- 3. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
- 4. VISIBLE SIGNS OF EROSION IN THE FOREBAYS, POND AND RIP-RAP OUTLET AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
- 5. SEDIMENT SHALL BE REMOVED FROM THE FOREBAYS WHEN 50% OF THE TOTAL FOREBAY CAPACITY HAS BEEN LOST.

1. STRUCTURAL COMPONENTS OF THE FACILITY SUCH AS THE EMBANKMENT, DEWATERING SYSTEM, AND OVERFLOWS SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE.

GEOTECHNICAL ENGINEER RECOMMENDATIONS

- 1. ANY IN-SITU FAT CLAYS ENCOUNTERED AT STRUCTURE BEARING LEVELS SHOULD BE EXCAVATED A MINIMUM OF 12 INCHES AND REPLACED WITH COMPACTED STRUCTURAL BACKFILL.
- 2. AREAS TO BE COVERED BY THE RESERVOIR OR NEW CONSTRUCTION SHOULD BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL, VEGETATION, TREES, ROOTS, STUMPS AND OTHER UNSUITABLE OR OBJECTIONABLE MATERIALS INCLUDING ORGANICS.
- 3. PRIOR TO PLACING NEW FILL, THE EXPOSED SUBGRADE SHOULD BE PROOF-ROLLED COMPACTED WITH APPROPRIATE CONSTRUCTION EQUIPMENT.
- 4. MATERIALS EXCAVATED FROM THE SITE AND EMBANKMENT SHOULD BE PLACED AWAY FROM THE TOP OF SLOPE TO MAINTAIN SLOPE STABILITY.
- 5. TREE ROOTS WITHIN THE WOODY FREE ZONE OF THE EMBANKMENT SHOULD BE REMOVED AND CUT PER THE GUIDELINES PROVIDED IN THE GENERAL RECOMMENDATIONS FOR TREE REMOVAL TABLE SHOWN
- 6. BASED ON THE IN-SITU SOIL TYPES, GROUNDWATER LEVELS AND WET CONDITIONS WITHIN THE EXISTING POND EMBANKMENT, PROPOSED CUT SLOPES SHOULD BE PROTECTED FROM PROLONGED MOISTURE EXPOSURE AND MAINTAINED AT STABLE INCLINATIONS TO PREVENT OR MINIMIZE INSTABILITY PROBLEMS.
- 7. EXCAVATIONS SHOULD BE ACCOMPLISHED BY LAYING SLOPES BACK AT STABLE CONFIGURATIONS. EXCAVATIONS SHOULD CONFORM TO HOWARD COUNTY STANDARDS AND OSHA STANDARDS FOR THE CONSTRUCTION INDUSTRY (29 CFR PART 1926 SUBPART P).
- 8. ON-SITE MATERIALS DESIRED TO BE RE-USED AS COMPACTED BACKFILL SHOULD BE EVALUATED AND TESTED DURING CONSTRUCTION TO MEET CLASSIFICATION AND GRADATION REQUIREMENTS SPECIFIED
- 9. THE MOISTURE CONTENT OF THE FILL SHOULD BE MAINTAINED WITHIN -2% AND +4% OF THE OPTIMUM MOISTURE CONTENT DETERMINED FROM THE DENSITY TESTS. EACH LIFT SHOULD BE CONTINUOUS FOR THE ENTIRE LENGTH OF THE EMBANKMENT.
- 10. DUE TO THE ELEVATED FINES CONTENT OF THE ON-SITE SOILS, WE RECOMMEND THAT THESE SOILS BE EVALUATED IN THE FIELD DURING CONSTRUCTION ACTIVITIES UNDER THE SUPERVISION OF AN EXPERIENCED
- 11. BEFORE FILLING OPERATIONS BEGIN, REPRESENTATIVE SAMPLES OF FILL MATERIAL SHOULD BE TESTED TO DETERMINE THE MAXIMUM DRY DENSITY, OPTIMUM WATER CONTENTS, MOISTURE CONTENTS AND GRADATION.

PLAN VIEW CONCRETE COLLAR DETAIL لـــا --- 2D (3 FT MAX.) لـــا NONWOVEN GEOTEXTILE-____ SECTION A-A CAST-IN-PLACE CONCRETE CONSTRUCTION SPECIFICATIONS PROJECTION COLLAR USE SPECIFIED CLASS OF RIPRA USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL. CAST-IN-PLACE CONCRETE CRADLE EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 6 CAST-IN-PLACE CONCRETE INCHES BEYOND THE EDGE OF THE SCOUR HOLE PROJECTION COLLAR STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES, PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE, HAND PLACE TO THE EXTENT TOP OF COMPACTED SUBGRADE ELEVATION CONSTRUCTION SPECIFICATIONS AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE. CAST 1 FOOT THICK CONCRETE COLLAR TO OUTLET STRUCTURE WITH FOUR #4 U-SHAPED REBARS. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION, REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP, MAKE NECESSARY REPAIRS IMMEDIATELY. MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION U.S. DEPARTMENT OF AGRICULTURE TURAL RESOURCES CONSERVATION SERVICE MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION RECONSTRUCT EXISTING CORE TRENCH (SEE TOP EDGES OF--EXISTING EMBANKMENT CENTERLINE CROSS SECTION CONRETE CRADLE GROUND SHEET 5 OF 16) TO BE CHAMFERED FILL MATERIAL AS DEFINED IN PROFILE AND SECTION ON SHEET 4 AND 5 AND SPECIFICATIONS ON 48" RCP ASTM C-361 THIS SHEET. CLASS B-25 PRINCIPAL SPILLWAY CAST-IN-PLACE CONCRETE CRADLE, CONCRETE SHALL MEET THE REQUIREMENTS OF MD DOT SHA - SEE PROFILE AND SECTION STANDARD SPECIFICATION FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3 6" NON-PERFORATED PPWP CLEANOUT -6" NON-PERFORATED PPWP PIPE TRENCH (TYP.) AND CONCRETE CRADLE DETAIL (SEE DETAIL, THIS SHEET CLEANOUT (SEE DETAIL, THIS SHEET) NOT TO SCALE _ 2' - 0" (MIN.) -PIPE TRENCH EXCAVATION (TYP.) CLEANOUT - PROPOSED GRADE ASTM C-33 SAND TOP OF DIAPHRAGM 2'-0" CONCRETE CRADLE - ASTM C-33 SAND CONCRETE CRADLE √2'-0" (MIN. -6" SOLID PPWP 6" PERFORATED PPWP (TYP. 1/4" @ 1.5% (TYP.) SECTION X-X AASHTO NO. 8 STONE -AASHTO NO. 8 STONE PERFORATIONS (MAX.) 14 PER -6" PPWP LINEAR FOOT (MIN.) INV. B CLEANOUT END CAP (TYP.)-SECTION Y-Y -ASTM C-33 SAND

STANDARD SYMBOL

PLUNGE POOL

DIMENSIONS

- 1.59' E - 3.17'

- 15.88' 2E - 6.34'

- 19.05' | 3E - 9.51'

D - 2.67' d - 3.17'

DETAIL D-4-2 PLUNGE POOL

DETAIL G-2-9 PROJECTION

CONCRETE MIX NO.

COLLAR

FILTER DIAPHRAGM INSTALLATION NOTES: 1. LOCATION AND GEOMETRY

CLEANOUT

AASHTO NO. 8 STONE-

6" SOLID PPWP

PLAN VIEW

e 1.5% (TYP.)

1.1 SHALL BE LOCATED IMMEDIATELY DOWNSTREAM OF THE IMPERVIOUS CORE AND A MINIMUM OF THREE (3) FEET THICK.
1.2 SHALL BE CONSTRUCTED TO DEPTH OF TWO (2) FEET BELOW THE CONCRETE CRADLE AND THE TOP ELEVATION SHALL BE AT A MINIMUM ELEVATION EQUAL TO THE 10 YEAR WSEL.

2 MATERIALS 2.1 SHALL CONSIST OF SAND MEETING ASTM 33 FINE CONCRETE AGGREGATE REQUIREMENTS, STONE MEETING MSHA .7 GRADATION REQUIREMENTS, AND PIPE MEETING SCHEDULE 80 P.V.C. REQUIREMENTS.

" PERFORATED PPWP (TYP.)

1/4" PERFORATIONS (MAX.)

14 PER LINEAR FOOT (MIN.)

2.2 THE 6" DIA. PIPE SHALL BE AASHTO M 304-03 PPWP.
2.3 PERFORATED P.V.C. SHALL HAVE PERFORATIONS MEASURING AINCHES SPACED EVENLY AROUND THE CIRCUMFERENCE OF THE PIPE EVERY 90 DEGREES (FOUR (4) PER RING) AND FOUR
(4) INCHES LONGITUDINALLY ALONG THE ENTIRE LENGTH OF THE DESIGNATED PERFORATED P.V.C. PIPE SECTION. HOLES MAY BE MACHINED AS PART OF THE PIPE FABRICATION OR DRILLED ON SITE 3. PLACEMENT

3.1 THE SAND SHALL BE PLACED IN UNIFORM EIGHT (8) INCH LIFTS (MEASURED BEFORE COMPACTION). 3.2 WET EACH LIFT THOROUGHLY WITH APPROXIMATELY 1.2 GALLONS OF POTABLE WATER PER CUBIC FOOT OF LOOSE DRAIN MATERIAL PRIOR TO COMPACTION.
3.3 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

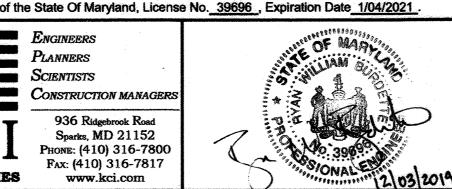
WEIGHING AT LEAST 325 POUNDS WITH A CENTRIFUGAL FORCE OF 2,250 POUNDS AT A VIBRATING FREQUENCY OF NO LESS THAN 4,500 CYCLES PER MINUTE). 3.4 THE SAND SHALL BE PLACED TO AVOID SEGREGATION OF PARTICLE SIZES AND TO ENSURE CONTINUITY AND INTEGRITY OF ALL ZONES.
3.5 THE CONTRACTOR SHALL TAKE PROPER MEASURES TO PREVENT CONTAMINATION OF THE FILTER MEDIA BY ADJACENT SOIL LIFTS, CONSTRUCTION DEBRIS, OR OTHER MATERIALS. CONTAMINATED AREAS SHOULD BE REMOVED AND REPLACED.

3.6 ANY DAMAGE TO THE FOUNDATION SURFACE OR THE TRENCH SIDES OR BOTTIM OCCURING DURING PLACEMENT OF SAND FILTER MEDIA SHALL BE REPAIRED BEFORE THE SAND FILTER MEDIA PLACEMENT IS CONTINUED. 3.7 THE UPPER SURFACE OF THE SAND FILTER ZONE CONSTRUCTED CONCURRENTLY WITH ADJACENT ZONES OF EARTHFILL SHALL BE MAINTAINED AT A MINIMUM ELEVATION OF

ONE (1) FOOT ABOVE THE UPPER SURFACE OF ADJACENT EARTHFILL. 3.8 THE FILTER DIAPHRAGM TOE DRAIN(S) SHALL OUTLET AT THE PRINCIPAL SPILLWAY END WALL AND EXTEND TWO (2) INCHES (MIN.) BEYOND THE DOWNSTREAM FACE OF THE END 4. REFER TO POND SPECIFICATION CODE MD-378 FOR APPITIONAL SPECIFICATIONS.

FILTER DRAINAGE DIAPHRAGM

LNGINEERS Planners MALL Scientists CONSTRUCTION MANAGER 936 Ridgebrook Road



AS-BUILT DES: DID DRN: DID CHK: RWB NO.

STORMWATER MANAGEMENT **NOTES & DETAILS**

BLOCK NO.

AUTUMN MANOR POND RETROFIT

CAPITAL PROJECT No. D-1159 CONTRACT No. 171705999.030

HOWARD COUNTY, MARYLAND

DIAPHRAGM ELEVATIONS/DIMENSIONS V

C | D | E |

14'-1" 85'-1" 42'-7" 34'-6"

AS SHOW

SHEET

В

369.00 361.11

Mark'S- Fichmans CHIEF, STORMWATER MANAGEMENT DIVISION

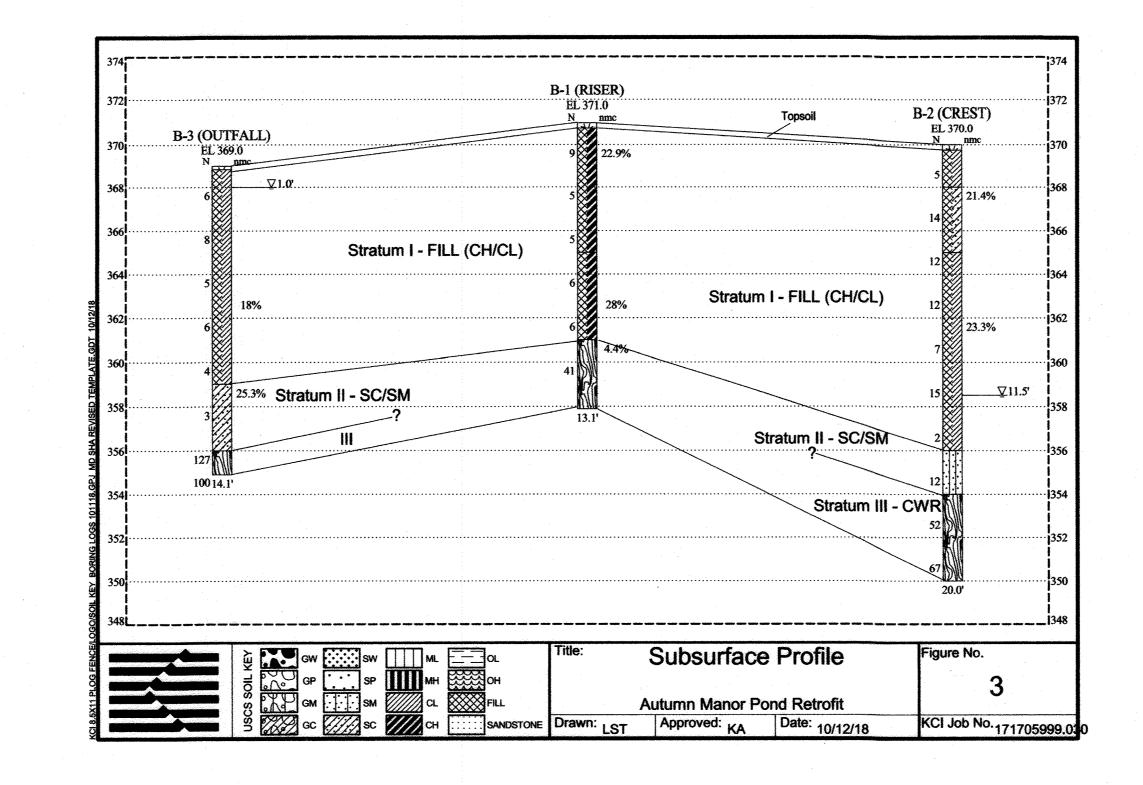
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

TECHNOLOGIES

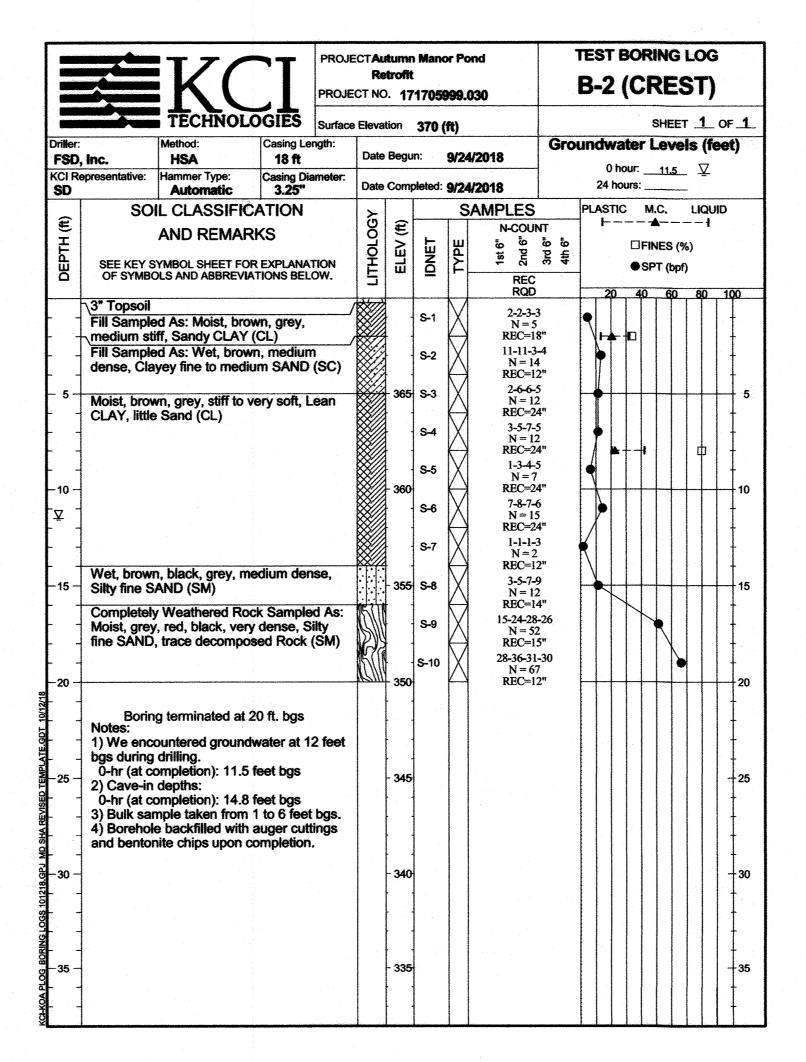
Sparks, MD 21152 PHONE: (410) 316-7800 Fax: (410) 316-7817 www.kci.com

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws

DATE 600' SCALE MAP NO.



		KC		OJECTA R OJECT N	etrofil	ŧ ·			,		ORING (RISI	
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10 -	Completely	Weathered Roo	k Sampled As	· 16.11				N = 6 REC=2	**			10
-	Damp, brov	vn, white, dense	to very dense		∮ 360	S-6	IXI	9-15-26- N = 41			•	
]	trace Rock	medium SAND, fragments (SM)	trace Quartz,	127	1	S-7		REC=1- 50/1"				
4]	3-1		REC=1	n			
15 –	Boring	terminated at 1	3.1 ft. bgs				-					15
+					- 355	1	***************************************					
						1	Apparation and the second					+
4	Notes 1) We did n	not encounter gr	oundwater	-	-	-						
20 –	during drilli			- Proposition of the Proposition	-					The second secon		-20
-	2) Cave-in	depths:	elicario (350	1		** .				
		mpletion): 11.8 mple taken from				1						
_	4) Auger ar	nd spoon refusal ssible top of bed	at 13.1 feet	-	-							-
25 –	5) Borehole	backfilled with	auger cuttings				u-vylejdestolajola					+25
-	and benton	ite chips upon c	ompletion.	and the same of th	345	H	And Andreas					-
				ANADAMAN	t	1						+
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		K(PROJE	Re	trofit						ORING	LOG)
		TECHNOL	OGIES	Surface	Eleva	tion	369	(ft)				SHE	ET <u>1</u> C)F
Driller:		Method: HSA	Casing Le		T	Begu			1/2018	Gro	undwa	ter Lev	els (fe	et)
		Hammer Type:	Casing Dia	ameter:	+-					-		our: <u>1.0</u>	-	
SD		Automatic IL CLASSIFIC	3.25"		Date	Comp	pleted:		W2018	<u> </u>	·	urs:		
€	30	AND REMAR			ŏ	æ		_ 3	AMPLES N-COU	VT				,
ЕРТН (#)	SEE KEY S	AND REWAR		TION	LITHOLOGY	ELEV (ft)	DNET	TYPE	1st 6" 2nd 6"	3rd 6" 4th 6"	and the state of t	□FINES ●SPT (b	• • •	
8		OLS AND ABBREVE			5	ш		-	REC RQD		20	40 60		100
Ā	\2" Topsoil	I Sampled As: N	Asiet brow				S-1	M	3-3-3-					Ţ
	gray, soft to	o medium stiff, (e Gravel (CL)						()	N = 6 REC=1: 2-3-5-	8"				+
	J	<i>J</i>				365	S-2		N = 8 REC=1		17			Ţ
- 5 -							S-3	X	2-2-3- N = 5		 		+++	┥;
				** *				(REC=2 2-2-4-	4 "				+
[]							S-4	\triangle	N = 6 REC=2					Ţ
						360	S-5	IXI	2-2-2- N = 4	2				+
10 —		et, brown, very k	oose, fine	Clayey					REC=1 2-2-1-	8"		 		 11
	SAND (SC)	V				S-6	\triangle	N = 3 REC=1	_		+++		1
-15 -	Moist, white	Weathered Ro e, brown, very d SAND, trace Qo terminated at 1	lense, Silty uartz (SM)	fine		355	S-7 S-8	A	1-27-50 N = 12 REC=1 -50/1' N = 10 REC=1	7 2" 0				1!
	Notes: 1) We ence bgs during 0-hr (at co 2) Cave-in	ountered ground drilling. ompletion): 1 foo depths:	lwater at 1 ot bgs			- 350								+20
- 25	3) Auger refeet bgs, or4) Borehold	ompletion): 12 for efusal and Spoo n possible top o e backfilled with hite chips upon o	n refusal a f bedrock. auger cut	tings	April and the second	- 345								+ + + + + + + + + + + + + + + + + + + +
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SOIL BORING LOGS

BLOCK NO. E12

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. <u>39696</u>, Expiration Date <u>1/04/2021</u>.

ENGINEERS TECHNOLOGIES

CONSTRUCTION MANAGERS 936 Ridgebrook Road Sparks, MD 21152 Fax: (410) 316-7817 www.kci.com



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019	DATE: NOV, 2019	BY	NO.	REVISION	DATE	600' SCALE MAP NO.

AUTUMN MANOR POND RETROFIT

CAPITAL PROJECT No. D-1159 CONTRACT No. 171705999.030 HOWARD COUNTY, MARYLAND ELECTION DISTRICT NO. 02

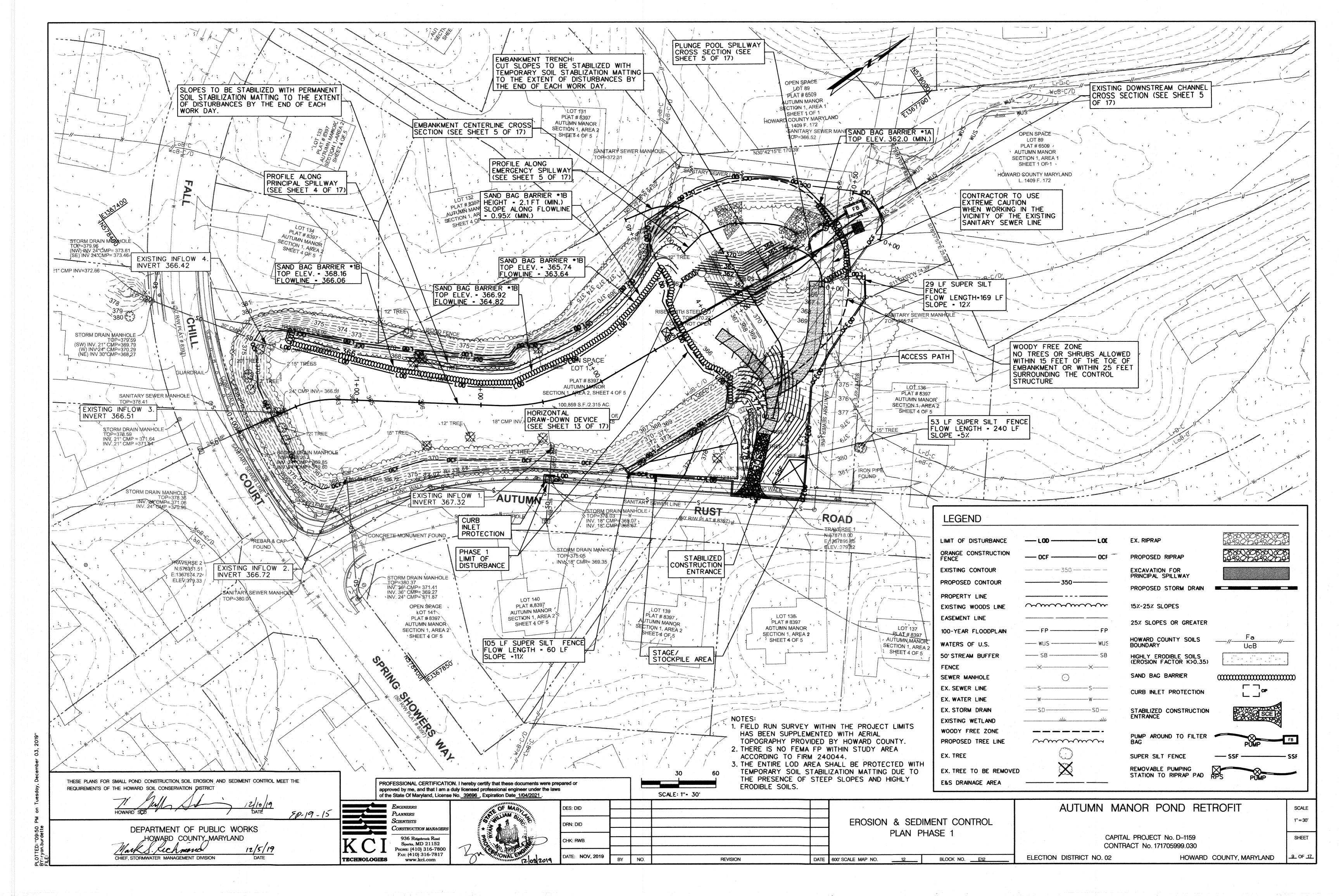
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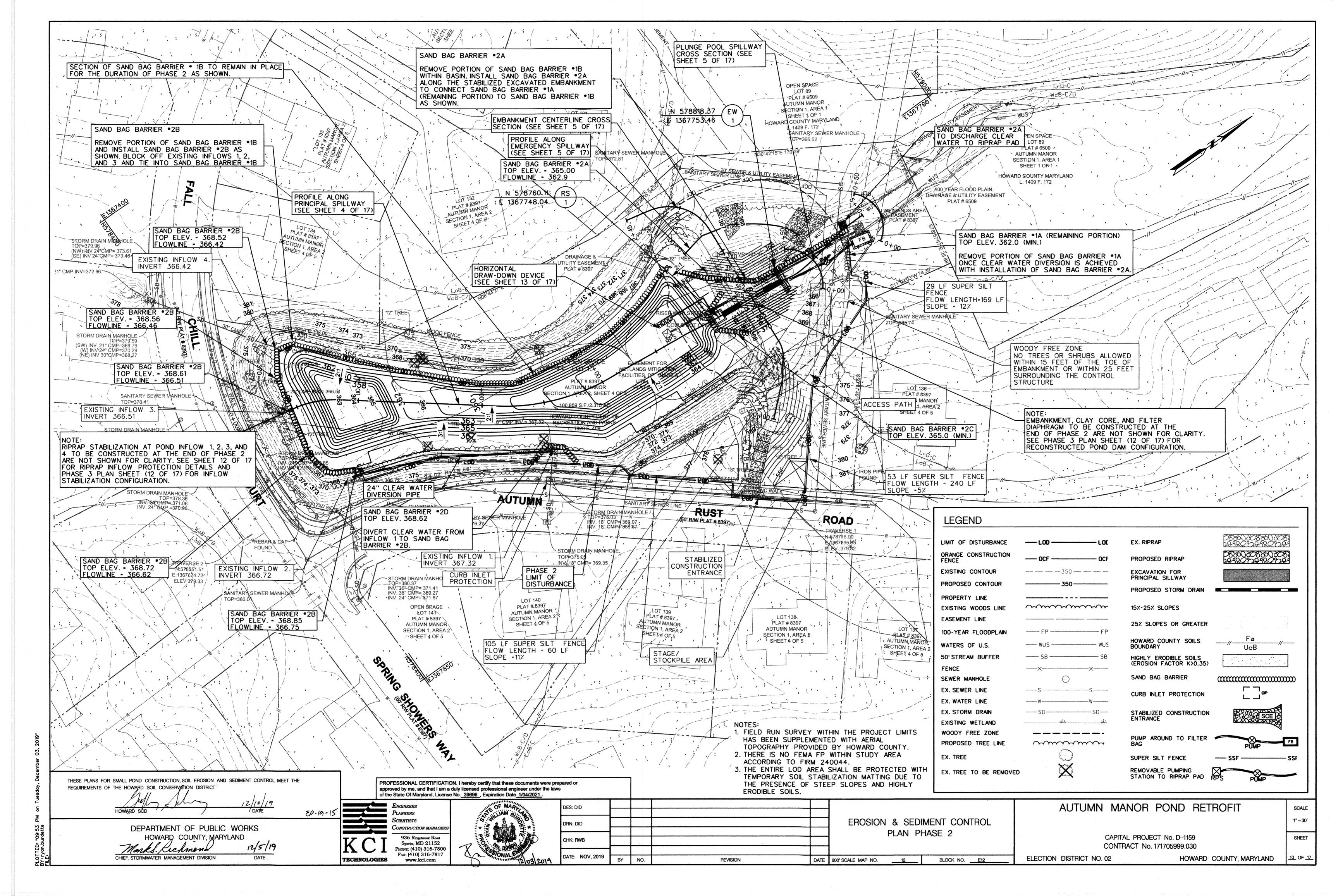
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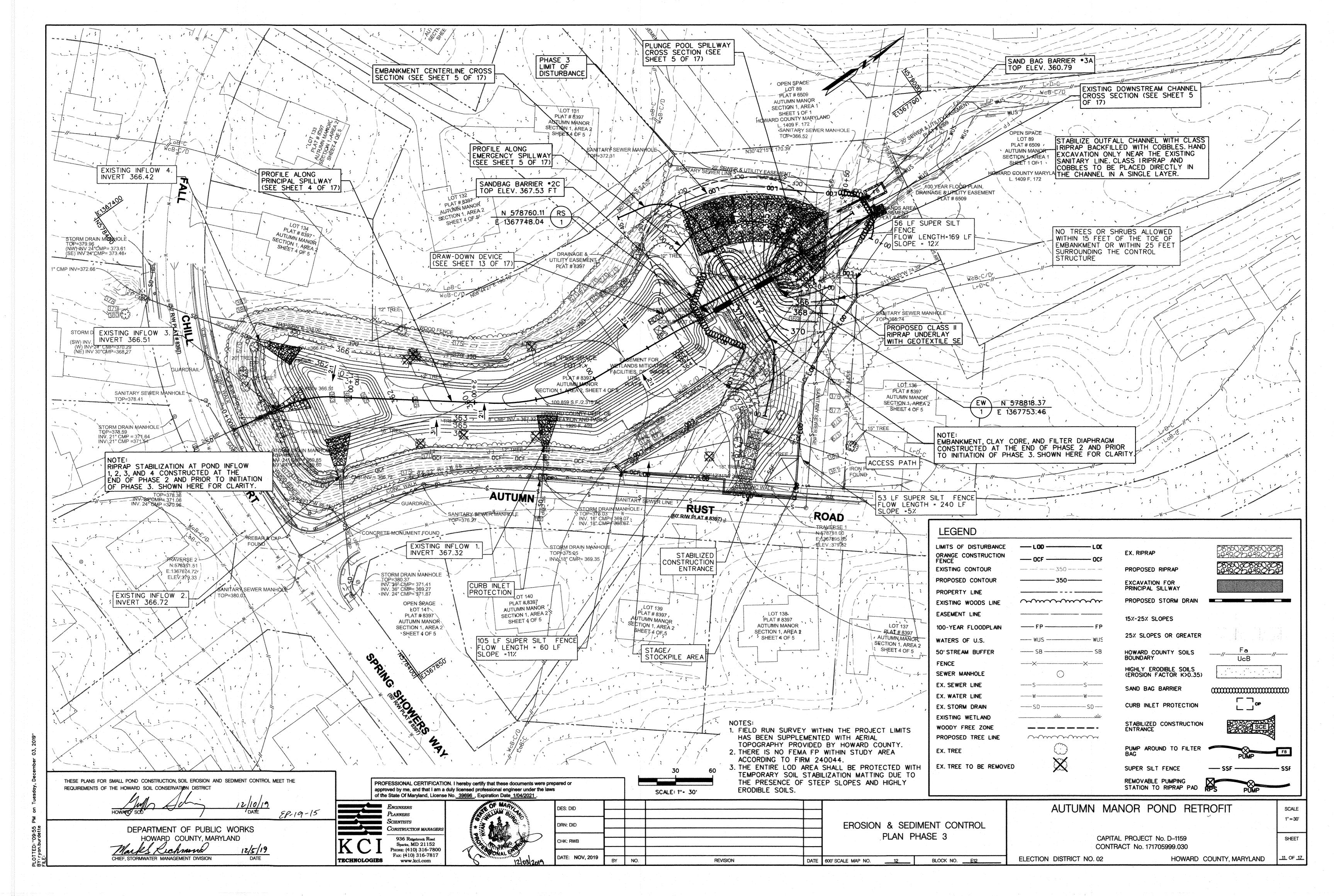
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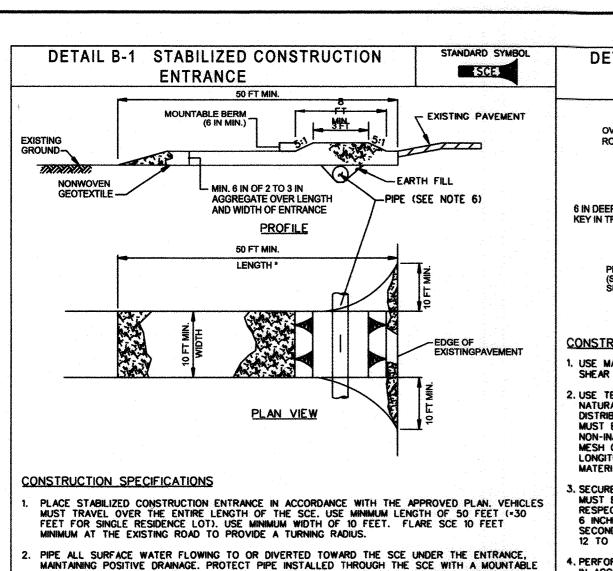
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Mark S. Lichmon 12/5/19 CHIEF, STORMWATER MANAGEMENT DIVISION

PHONE: (410) 316-7800









MAINTAINING POSITIVE DRAINAGE, PROTECT PIPE INSTALLED THROUGH THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE, PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE, PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN, WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT NECESSARY. NOT LOCATED AT A HIGH SPOT.

5. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1:MATERIALS 4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.

MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMEN' U.S. DEPARIMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE WATER MANAGEMENT ADMINISTRATION DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING TSSMS - 0.88 lb/ SLOPE APPLICATION INCLUDE SHEAR STRESS) OVERLAP OR ABUT ROLL EDGES (TYP.) PREPARED SLOPE (SEEDBED) WITH SEED IN PLACE

CONSTRUCTION SPECIFICATIONS USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.

QUIRED= 0.88 LB/SQ FT.

2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM)
NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND
DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT
MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT

8. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8
RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF
6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH
SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM

4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & S. UNROLL MATTING DOWNSLOPE, LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID

6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT. 7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.

2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS. 9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

Anchor posts should be minimum

at least 6' in length.

2" steel U-channel or 2"X2" timber

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE ENVIRONMEN

Highly visible flagging

the tops of the

anchor posts.

should be attached to

DETAIL B-4-6-D PSSMS . 1.73 lb/ft2 STABILIZATION (* INCLUDE SHEAR STRE MATTING SLOPE APPLICATION EDGES (TYP. EY IN TRENCH AT ROLL END

MUM SHEAR STRENGTH RATING CONSTRUCTION SPECIFICATIONS

USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS. . USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF

2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE ROTTOM

. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.

UNROLL MATTING DOWN SLOPE, LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING,

OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL

. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT

10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION

2011

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DETAIL 33 - SUPER SILT FENCE NOTE: FENCE POST SPACING SHALL NOT EXCEED 10 CENTER TO CENTER 10' MAXIMUM 33" MINIMUM TIANTA TAKE GROUND SURFACE FLOW SIX (6) GAUGE OR HEAVIER CHAIN LINK FENCING GEOTEXTILE CLASS A FILTER CLOTH -EMBED FILTER CLOTH 8" MINIMUM INTO GROUND STANDARD SYMBOL I AY FILTER CLOTH IN BOTTOM OF 24" MIN. WIDE TRENCH

. Fencing shall be 42 inches in height and constructed in accordance with the latest Maryland State Highway (SHA) Details for Chain Link Fencing. The (SHA) specification for a 6 foot fence shall be used, substituting 42 inch fabric and 6 foot length posts.

2. The posts do not need to be set in concrete.

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SOIL CONSERVATION SERVICE

3. Chain link fence shall be fastened securely to the fence posts with wire ties or staples. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence. The chain link fencing shall be six (6) gauge or heavier.

4. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

5. Filter cloth shall be embedded a minimum of 8" into the ground.

6. When two sections of geotextile fabric adjoin each other, they shall be laintenance shall be performed as needed and silt buildups removed when

"bulges" develop in the silt fence, or when silt reaches 50% of fence height

MODIFIED

Silt Fence Length Slope Steepness maximum maximum 0 - 10:1 Unlimited Unlimited 1,500 feet 10 - 20% 10:1 - 5:1 5:1 - 3:11,000 feet 20 - 33% 500 feet 33 - 50%3:1 - 2:1250 feet 2:1 + 50 feet

Design Criteria

SUPER SILT FENCE

PUMP DISCHARGE HOSE -PLAN VIEW ELEVATION FILTER BAG CONSTRUCTION SPECIFICATIONS

⊠FB

DETAIL F-4 FILTER BAG

TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.

PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.

REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.

USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

ASTM 70 GAL/MIN/FT* ASTM 1.2 SEC -1 ASTM 0.15-0.18 MM SEAM STRENGTH D-4632 ASTM

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMEN U.S. DEPARTMENT OF AGRICULTURE
IATURAL RESOURCES CONSERVATION SERVICE

Logging Mats ndicates travel direction

SPECIFICATIONS FOR LOGGING MATS

A logging mat is a portable fabrication, usually constructed of boards or timbers and held

This practice protects the surface soil structure from excessive compaction and rutting.

This practice applies to any part of the forest harvest access system where rutting could

become an erosion or water handling problem. It is often used as a substitute for stone or other stabilizing materials at the entrance of a forest harvest site and isolated wet areas on

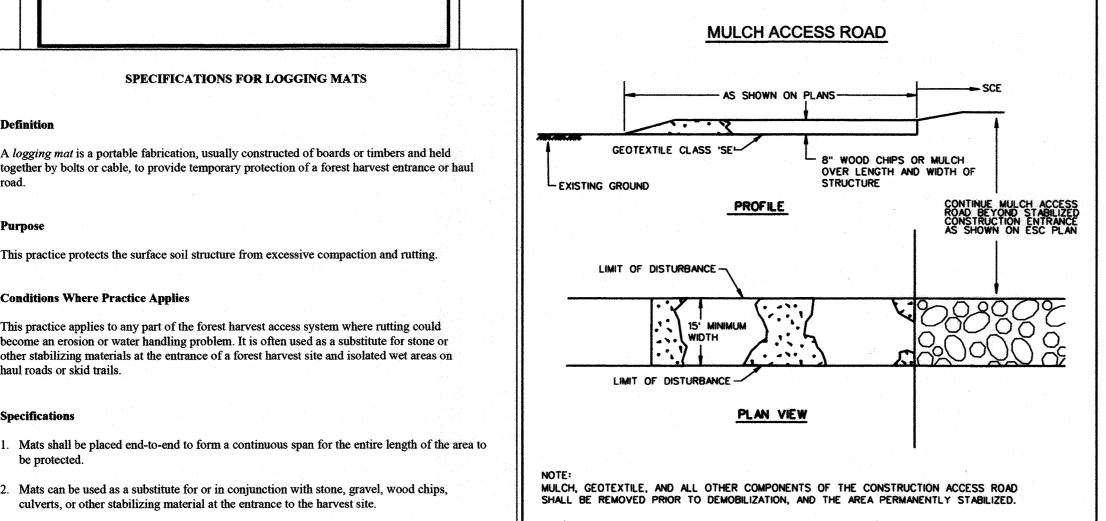
2. Mats can be used as a substitute for or in conjunction with stone, gravel, wood chips,

3. Mats shall be inspected frequently and maintained or replaced as necessary to ensure their

culverts, or other stabilizing material at the entrance to the harvest site.

together by bolts or cable, to provide temporary protection of a forest harvest entrance or haul

/-Use 2"X4" lumber MAXIMUM for cross bracing 6 FEET anchor posts must be put in the ground to a depth of at least Use on 8" wire 1/3 of the total height "U" to secure of the post the bottom DETAIL FOR BLAZE ORANGE PLASTIC MESH SAFETY FENCE NOT TO SCALE



DETAIL F-1 REMOVABLE PUMPING STATION - HOOK AND CHAIN FOR REMOVAL GEOTEXTILE REMOVABLE PERFORATED PIPE CLOTH WRAPPED FIRST WITH '4 IN 0 0 0 CLOTH, THEN NONWOVEN 0 0 0 0 GEOTEXTILE 0 0 0 0 0 0 0 SECTION A-A 0000 -ANTICIPATED 0000 0000 CIFAN STONE 0000 % TO 1 2 IN7 2000 2000 2000 0000 0000 0 0 0 0 PERFORATED PIPE WRAPPED WITH 14 IN HARDWARE CLOTH EACH PIPE WITH WATERTIGHT SEAL ADD WEIGHT AS NECESSARY TO PREVENT LOATATION OF INNER CONSTRUCTION SPECIFICATIONS ELEVATION USE CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS 6 INCHES ON CENTER.

USE A MINIMUM 12 INCH DIAMETER INNER PIPE WITH AN OUTER PIPE A MINIMUM 6 INCHES LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE CAPPED WITH WATERTIGHT SEAL. . WRAP EACH PIPE WITH % INCH GALVANIZED HARDWARE CLOTH. ON INNER PIPE WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH. EXCAVATE 8 FEET X 8 FEET X 4 FEET DEEP PIT FOR PIPE PLACEMENT. PLACE CLEAN % TO 1% INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT SET TOP OF INNER AND OUTER PIPES MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION (OR RISER CREST ELEVATION WHEN DEWATERING A BASIN). BACKFILL PIT AROUND THE OUTER PIPE WITH 34 TO 15 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE. A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

2011

DETAIL D-4-1-A ROCK OUTLET PROTECTION ROP1 (MODIFIED) SEMI CONFINED d/2 | SECTION A-A PLAN VIEW SLOPE MI PR **PROFILE** CONSTRUCTION SPECIFICATIONS

RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.

. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.

PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (% TO 1/2 INCH STONE FOR 6 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED

. EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF THE RIPRAP.

5. CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE STONE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.

. WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.

CONSTRUCT APRON AS SHOWN ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.

3. MAINTAIN LINE, GRADE, AND CROSS SECTION, KEEP OUTLET FREE OF EROSION, REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE FURAL RESOURCES CONSERVATION SERVICE MARYLAND DEPARTMENT OF ENVIRONMEN WATER MANAGEMENT ADMINISTRATION

Ε>	KISTING IN	FLOW PI	IPE DETAI	LS
EX. INFLOW ID		EX. SD PIPE		COMMENT
EV TINE LOW ID	SIZE (IN.)	TYPE	INVERT	COMMENT
INFLOW 1	18	CES	367.32	RESET & STABILIZE EX.
INFLOW 2	36	CES	366.72	CONCRETE END
INFLOW 3	24	CES	366.51	SECTION TO EX.
INFLOW 4	30	CES	366.42	NEEDED NEEDED

PAGE MARYLAND DEPARTMENT OF ENVIRONMENT
H - 26 - 3A WATER MANAGEMENT ADMINISTRATION

TNICT ON A	APRON TYPE RIPRAP CLASS LTOT W	TYPE BIRDAR CLASS		ADDON TYPE DIDDAD CLASS LIDT	т	1.	M ₁	me	
INFLOW	APRON TYPE	KIPKAP CLASS	La	Ls	W		"		
1	ROP 1	CLASS I	12.0	12.7	10.60	19	0.75	12:1	3:1
2	ROP 1	CLASS I	11.0	11.3	14.70	19	1.50	12:1	3:1
3	RDP 1	CLASS II	12.0	9.6	12.20	32	1.00	12:1	3:1
4	ROP 1	CLASS I	9.6	13.9	11.00	19	1.25	12:1	3:1

MATERIALS SPECIFICATIONS

THE PROPERTIES SHALL BE DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES: - APPARENT OPENING SIZE MSMT 323

-GRAB TENSILE STRENGTH ASTM D 1682 4"x8" SPECIMEN 1"x2" CLAMPS, 12"/ MIM. STRAIN RATE IN BOTH PRINCIPAL DIRECTIONS OF GEOTEXTILEFABRIC.

ASTM D 3786

THE FABRIC SHALL BE INERT TO COMMONLY ENCOUNTERED CHEMICALS AND HYDRCARBONS, AND WILL BE ROT AND MILDEW RESISTANT. IT SHALL BE MANUFACTURED FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS, AND COMPOSED OF A MINIMUM OF 85% BY WEIGHT OF POLYOLEPHINS, POLYESTERS, OR POLYAMIDES. THE GEOTEXTILE FABRIC SHALL RESIST DETERIORATION FROM ULTRAVIOLET EXPOSURE.

IN ADDITION CLASSES A THROUGH E SHALL HAVE A 0.01 CM/SEC. MINIMUM PERMEABILITY WHEN TESTED IN ACCORDANCE WITH MSMT 507, AND AN APPARENT MINIMUM OF 20 PERCENT (20%) WHEN TESTED IN ACCORDANCE WITH THE GRAB TENSILE STRENGTH REQUIREMENTS LISTED ABOVE.

CLASS F GEATEXTILE FABRICS FOR ALL SILT FENCE SHALL HAVE A 50LB./IN. MINIMUM TENSILE STRENGTH AND A 20 LB/IN MINIMUM TENSILE MODULES WHEN TESTED WITH MSMT 509. MATERIAL SHALL ALSO HAVE A 0.3 GAL./FT.SQUARED/MIN. FLOW RATE AND SEVENTY-FIVE PERCENT (75%) MINIMUM FILTERING EFFICIENCY WHEN TESTED IN ACCORDANCE WITH MSMT 322.

GEOTEXTILE FABRICS USED IN THE CONSTRUCTION OF THE SILT FENCE SHALL RESIST DETERIORATION FROM ULTRAVIOLET EXPOSURE. THE FABRIC SHALL CONTAIN AMOUNTS OF ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 12 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 TO 120 DEGREES F

TADI C 00 CTONE 0170

U.S. DEPARTMENT OF AGRICULTURE

STANDARD SYMBO

SOIL CONSERVATION SERVICE

	SIZE RANGE	D 50	D 100	AASHTO	HEIGHT
NUMBER 57*	3/8"-1 1/2"			M-43	N/A
NUMBER 1	2"-3"		3"	M-43	N/A
RIP-RAP**	4"-7"		7"	N/A	N/A
CLASS I	N/A		15"	N/A	150 LB. MAX.
CLASS II	N/A		24'	N/A	700 LB. MAX
CLASS III	N/A		34"	N/A	2000 LB. MAX

** THIS CLASSIFICATION IS TO BE USED WHENEVER SMALL RIP-RAP IS REQUIRED THE STATE HIGHWAY ADMINISTRATION DESIGNATION FOR THIS STONE IS STONE FOR GARIONS (905.01.04).

24.0 MATERIALS AND SPECIFICATIONS TABLE 27 GEOTEXTILE FABRICS

CLASS	APPARENT OPENING SIZE MM. MAX.	GRAB TENSILE STRENGTH LB. MIN.	BURST STRENGTH PSI MIN.
A	0.30**	250	500
В	0.60	200	320
С	0.30	200	320
D	0.60	90	145
Ε	0.30	90	145
F (SILT FENCE)	0.40 - 0.80 *	90	190
STD. SIEVE CW-02215	** ,50	MM. MAX. FOR SUPER SILT	FENCE

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND



of the State Of Maryland, License No. 3969 ONSTRUCTION MANAGER 936 Ridgebrook Road Sparks, MD 21152 PHONE: (410) 316-7800 Fax: (410) 316-7817

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REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE

ENVIRONMENT

EROSION & SEDIMENT CONTROL DETAILS

600' SCALE MAP NO.

BLOCK NO. E12

AUTUMN MANOR POND RETROFIT

CAPITAL PROJECT No. D-1159 CONTRACT No. 171705999.030 **ELECTION DISTRICT NO. 02** HOWARD COUNTY, MARYLAND

AS SHOWN SHEET _12_ OF _17_

SCALE

Definition

Purpose

Conditions Where Practice Applies

haul roads or skid trails.

Specifications

be protected.

proper function.

Marks Krchmond 12/5/19

PLANNERS SCIENTISTS

www.kci.com

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws

U.S. DEPARTMENT OF AGRICULTURE

B-4-1 STANDARDS AND SPECIFICATIONS

<u>FOR</u>

INCREMENTAL STABILIZATION

Establishment of vegetative cover on cut and fill slopes.

To provide timely vegetative cover on cut and fill slopes as work progresses.

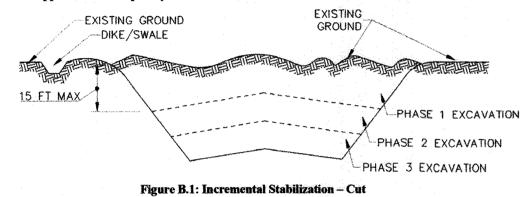
Conditions Where Practice Applies

Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles

A. Incremental Stabilization - Cut Slopes

- 1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
- 2. Construction sequence example (Refer to Figure B.1):
- a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
- b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
- c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as
- d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.



Incremental Stabilization - Fill Slopes

- 1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
- 2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
- 3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
- 4. Construction sequence example (Refer to Figure B.2):
- a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address
- b. At the end of each day, install temporary water conveyance practice(s), as necessary, to
- intercept surface runoff and convey it down the slope in a non-erosive manner. c. Place Phase 1 fill, prepare seedbed, and stabilize
- d. Place Phase 2 fill, prepare seedbed, and stabilize.
- e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

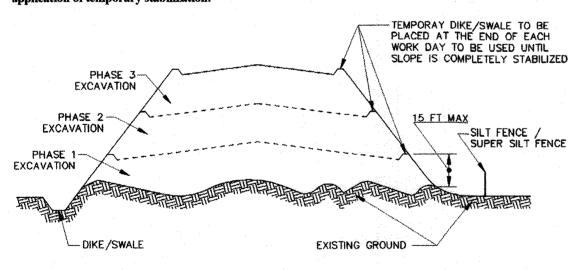


Figure B.2: Incremental Stabilization - Fill

B.11

MGWC 1.2: PUMP-AROUND PRACTICE

channel construction sites

DESCRIPTION

The work should consist of installing a temporary pump around and supporting measures to divert flow around instream construction sites.

IMPLEMENTATION SEQUENCE

Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

- 1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.
- 2. The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
- 3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.
- 4. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
- 5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
- 6. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.

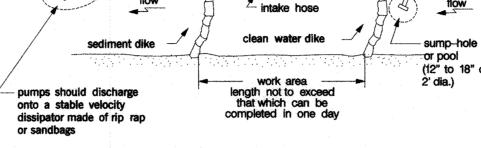
TEMPORARY INSTREAM CONSTRUCTION MEASURES MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES PAGE 1.2 - 1

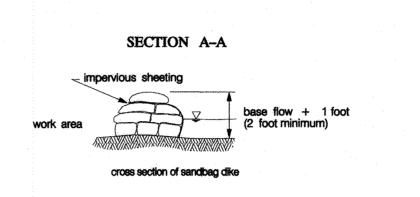
MGWC 1.2: PUMP-AROUND PRACTICE

- Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
- 8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction).
- 9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with
- 10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed
- 11. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
- 12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
- 13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
- 14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan

TEMPORARY INSTREAM CONSTRUCTION MEASURES MARYLAND DEPARTMENT OF THE ENVIRONMEN WATERWAY CONSTRUCTION GUIDELINE PAGE 1.2 - 2

Maryland's Guidelines To Waterway Construction DETAIL 1.2: PUMP-AROUND PRACTICE PLAN VIEW discharge hoses





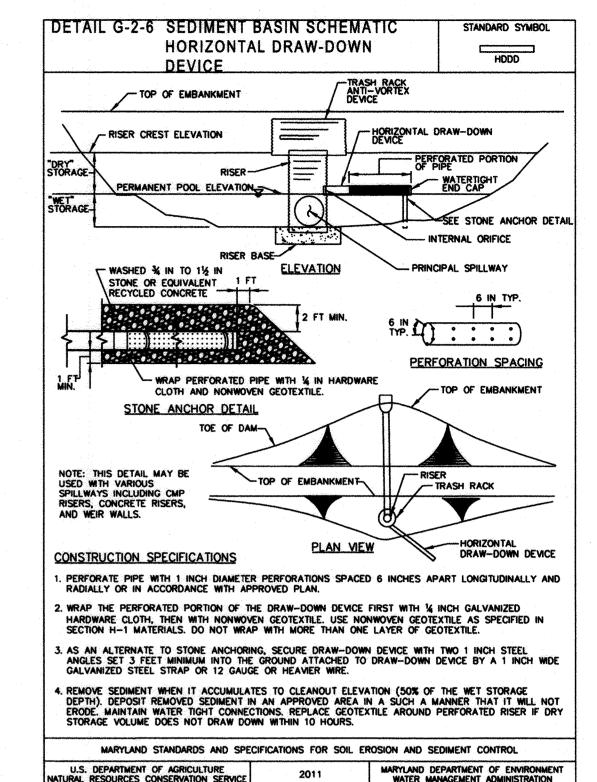
REVISED NOVEMBER 2000 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

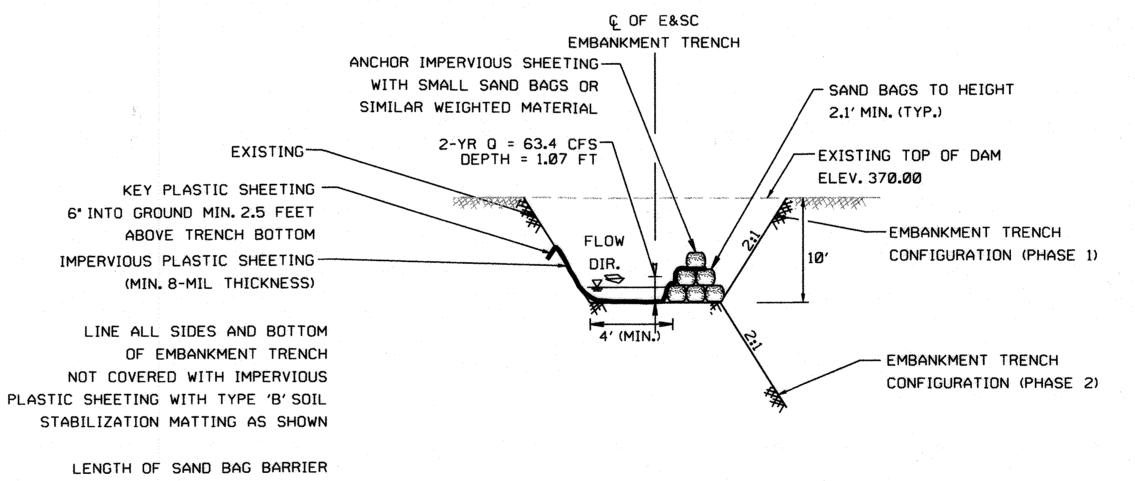
PER PLAN VIEW

DETAIL E-9-3 CURB INLET PROTECTION MAXIMUM DRAINAGE AREA - X ACRE OF 2 IN x 4 IN 2 IN x 4 IN WEIR-6 FT MAX. SPACING OF % TO 1½ STONE -NONWOVEN GEOTEXTILE -2 IN x 4 IN WEIR SECTION A-A LEDGE OF GUTTER PAN ISOMETRIC CONSTRUCTION SPECIFICATIONS . USE NOMINAL 2 INCH x 4 INCH LUMBER 2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS. . NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART). ATTACH A CONTINUOUS PIECE OF $\frac{1}{2}$ Inch galvanized hardware cloth, with a minimum width of 30 inches and a minimum length of 4 feet longer than the throat opening, to the 2×4 weir, extending it 2 feet beyond throat on each side. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING. AT NON-SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET D. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

E.27





NOT TO SCALE

SAND BAG BARRIER THROUGH EMBANKMENT TRENCH

ANCHOR IMPERVIOUS SHEETING-WITH SMALL SAND BAGS OR SIMILAR WEIGHTED MATERIAL 2-YR Q = 63.4 CFS-DEPTH = 1.07 FT. EXISTING-SAND BAGS TO HEIGHT KEY 6' INTO-2.1' MIN. (TYP.) GROUND MIN. 2.5 FEET FLOW\ ABOVE AQUATIC BENCH BOTTOM INTERIOR IMPERVIOUS PLASTIC SHEETING (MIN. 8-MIL THICKNESS) GRADE BENCH AS SHOWN ON PLANS PRIOR TO PLACING SAND BAG BARRIER LENGTH OF SAND BAG BARRIER PER PLAN VIEW

SAND BAG BARRIER IN POND BASIN

NOT TO SCALE

NOTES:

MARYLAND DEPARTMENT OF ENVIRONMEN WATER MANAGEMENT ADMINISTRATION

1.CONTRACTOR TO ENSURE A WATERTIGHT CONNECTION BETWWN EXISTING AND PROPOSED RISER AND DRAW-DOWN DEVICE.

2. THIS DETAIL MAY BE USED WITH VARIOUS SPILLWAYS INCLUDING CMP RISERS, CONCRETE RISERS, AND WEIR WALLS.

3. TEMPORARY PIPE CONNECTION SHALL BE INSTALLED AT THE END OF EACH WORKING DAY, AND SHALL BE REMOVED FOLLOWING ACTIVATION OF THE PUMP-AROUND PRACTICE AT THE BEGINNING OF EACH WORKING DAY OR AS DIRECTED BY THE INSPECTOR.

CONSTRUCTION SPECIFICATIONS:

1. PERFORATE PIPE WITH 1 INCH DIAMETER PERFORATIONS SPACED 6 INCHES APART LONGITUDINALLY AND RADIALLY OR IN ACCORDANCE WITH APPROVED PLAN.

2. WRAP THE PERFORATED PORTION OF THE DRAW-DOWN DEVICE FIRST WITH 1/4 INCH GALVANIZED HARDWARE CLOTH, THEN WITH NONWOVEN GEOTEXTILE. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS. DO NOT WRAP WITH MORE THAN ONE LAYER OF GEOTEXTILE.

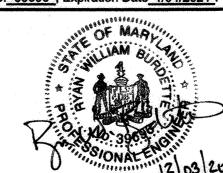
3. AS AN ALTERNATIVE TO STONE ANCHORING, SECURE DRAW-DOWN DEVICE WITH TWO 1 INCH STEEL ANGLES SET 3 FEET MINIMUM INTO THE GROUND ATTACHED TO DRAW-DOWN DEVICE BY A 1 INCH WIDE GALVANIZED STEEL STRAP OR 12 GAUGE OR HEAVIER WIRE HEAVIER WIRE. 4. REMOVE SEDIMENT WHEN IT ACCUMULATES TO CLEANOUT ELEVATION (50% OF THE WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA IN SUCH A MANNER THAT IT WILL NOT ERODE. MAINTAIN WATER TIGHT CONNECTIONS. REPLACE GEOTEXTILE AROUND PERFORATED RISER IF DRY STORAGE VOLUME DOES NOT DRAW DOWN WITHING 10 HOURS.

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Carles - tickmond DATE CHIEF, STORMWATER MANAGEMENT DIVISION

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 39696, Expiration Date 1/04/2021





امانتستانان	S		l		Marie Company	
	DES: DID					
	DRN: DID					EROSION & SEDIMEN
						CONTROL DETAILS
	CHK: RWB		:			
1	DATE: NOV , 2019	BY	NO.	REVISION	DATE	600' SCALE MAP NO. 12 BLOCK NO.

ELECTION DISTRICT NO. 02

& SEDIMENT

BLOCK NO.

AUTUMN MANOR POND RETROFIT

CAPITAL PROJECT No. D-1159 CONTRACT No. 171705999.030 HOWARD COUNTY, MARYLAND

13 OF _17_

SCALE

AS SHOWN

SHEET

SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

The process of preparing the soils to sustain adequate vegetative

To provide a suitable soil medium for vegetative arowth.

Conditions Where Practice Applies Where vegetative stabilization is to be established.

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. SoilpH between 6.0 and 7.0. . Soluble salts less than 500 parts per million (ppm).

iii. Soil contains 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 into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready 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.

3. Topsoiling 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. s 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

d. The soil is so acidic that treatment with limestone is not feasible.

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.

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 1/2 inches 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. . 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. 6. Topsoil Application 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. c. 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

*100 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

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT 12/10/19

DEPARTMENT OF PUBLIC WORKS

HOWARD COUNTY, MARYLAND Machs-Krekmand CHIEF, STORMWATER MANAGEMENT DIVISION

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

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

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.

1. 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. . Access the stockpile area from the upgrade side.

5. 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

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. 8. 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-4-3 STANDARDS AND SPECIFICATIONS

FOR SFFDING AND MULCHING Definition

The application of seed and mulch to establish vegetative cover.

Purpose

To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criterio A. Seeding

1. Specifications

a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed. and seeding rate.

b. Mulch alone may be applied between the fall and spring seeding dates only if the ground if frozen.

The appropriate seeding mixture must be applied when the ground thaws.

c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.

d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic

2. Application

a. Dry Seeding: This includes use of conventional drop or broadcast spreaders. i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent

Seeding Table B.3. or site-specific seeding summaries. ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. koll the seeded area with a weighted roller to provide good seed to soil contact

b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil. i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.

c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer). i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P205 (phosphorous), 200 pounds per acre; K20

(potassium), 200 pounds per acre. ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding).

Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.

iii. Mix seed and fertilizer on site and seed immediately and without interruption.

iv. When hydroseeding do not incorporate seed into the soil. Mulchina

1. Mulch Materials (in order of preference) a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.

b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state. . WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to

facilitate visual inspection of the uniformly spread slurry.

ii. WCFM, including dye, must contain no germination or growth inhibiting factors. iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.

iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic. v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water

holding capacity of 90 percent minimum.

a. Apply mulch to all seeded areas immediately after seeding.

PLANNERS

Scientists

b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.

c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.

TECHNOLOGIES

a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion

i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.

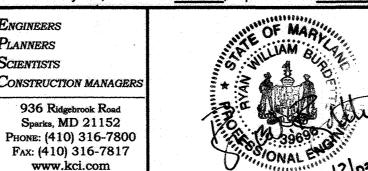
ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons

iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other

approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited. iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws

of the State Of Maryland, License No. 39696, Expiration Date 1/04/2021.



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DATE: NOV, 2019	BY	NO.	REVISION		
CHK: RWB					
DRN: DID					
DES: DID					

1. General Specifications

B-4-5 STANDARDS AND SPECIFICATIONS

PERMANENT STABILIZATION

Definition

Purpose

Conditions Where Practice Applies

a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant

b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or

c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil

d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per

a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites

b. Select one or more of the species or mixtures listed below based on the site conditions or

purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent

i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive

ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where

management. Irrigation required in the areas of central Maryland and Eastern Shore.

Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per

1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each

rapid establishment is necessary and when turf will receive medium to intensive

management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding

Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky

for areas receiving low to medium management in full sun to medium shade.

Recommended mixture includes; Certified Tall Fescue Cultivars 95 to 100 percent,

Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per

lawns. For establishment in high quality, intensively managed turf area. Mixture includes;

Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60

Select turfgrass varieties from those listed in the most current University of Maryland

Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"

Choose certified material. Certified material is the best guarantee of cultivar purity. The

certification program of the Maryland Department of Agriculture, Turf and Seed Section,

provides a reliable means of consumer protection and assures a pure genetic line

Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)

(Hardiness Zones: 7a, 7b)

and rake the areas to prepare a proper seedbed. Remove stones and debris over 11/2 inches in

diameter. The resulting seedbed must be in such condition that future mowing of grasses will

inch every 3 to 4 days depending on soil texture) until they are firmly established. This is

especially true when seedings are made late in the planting season, in abnormally dry or hot

Fertilizer Rate

(10-20-20)

 P_2O_5

90 lb/ac

1000 sf)

90 lb/ac

1000 sf)

EROSION & SEDIMENT

CONTROL NOTES

(2.1b/

(2 lb/

Lime Rate

2 tons/ac

(90 lb/

 $1000 \, sf$

2 tons/ac

(90 lb/)

BLOCK NO.

1000 sf)

 K_20

90 lb/ac

1000 sf)

90 lb/ac

1000 sf)

Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)

d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level

e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1

Permanent Seeding Summary

1/4- ½ in | 45 pounds

per acre

(1.0 lb/

 $1000 \, sf$

45 pounds

per acre

 $1.0 \, lb/$

1000 sf)

Seeding

Depths

1/4- ½ in

1/4- 1/2 in

1/4- 1/2 in

1/4- 1/2 in

DATE 600' SCALE MAP NO.

Nov. 1 to Nov. 30 1/4- 1/2 in

Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15

bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.

iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or

iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass

1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments

USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.

Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table

B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding

dunes or for special purposes such as wildlife or aesthetic treatment may be found in

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Summary. The Summary is to be placed on the plan.

shown in the Permanent Seeding Summary.

which will receive a medium to high level of maintenance.

Seeding Summary. The summary is to be placed on the plan

ranging from 10 to 35 percent of the total mixture by weight.

1000 square feet. One or more cultivars may be blended.

c. Ideal Times of Seeding for Turf Grass Mixtures

pose no difficulty.

Hardiness Zone (from Figure B.3): 70

Application

Rate (lb/ac)

10

25

Seed Mixture (from Table B.3):

No.

Species

Common Lespedeze

Perennial Ryegrass

•3 Red Top

seasons, or on adverse sites.

Seeding

eb. 15 to Apr. 30 and

Dates

to 70 percent. Seeding Rate: 1½ to 3 pounds per 1000 square feet.

To stabilize disturbed soils with permanent vegetation

Seed Mixtures

1. General Use

testing agency.

2. Turfgrass Mixtures

Exposed soils where ground cover is needed for 6 months or more

a. Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.

b. Sod must be machine cut at a uniform soil thickness of \(^3\)4 inch, plus or minus \(^4\)4 inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.

c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the

d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.

e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its

a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.

b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots

c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.

d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laving, tamping and irrigating for any piece of sod within eight hours.

3. Sod Maintenance

a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.

b. After the first week, sod watering is required as necessary to maintain adequate moisture

c. Do not mow until the sod is firmly rooted. No more than \(\frac{1}{3}\) of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless

TEMPORARY STABILIZATION

Definition

To stabilize disturbed soils with vegetation for up to 6 months

Purpose

To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria

1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.

2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.

3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

Temporary Seeding Summary

		one (from Figure e (from Table B.	,		Fertilizer Rate	Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	(10-20-20)	Line Rate
	Annual Ryegrass	40	Feb. 15 to Apr. 30 &	0.5	436 lb/ac	2 tons/ac
	Barley	96	Aug. 15 to Nov. 30	1.0		
	Foxtail Millet	30	May 1 to Aug. 14	0.5	(10 lb/1000 sf)	(90 lb/1000 sf)
						·

NOTES:

Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season.

Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seed mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cerealrye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.

Oats are the recommended nurse crop for warm-season grasses.

2. For sandy soils, plant seeds at twice the depth listed above.

3. The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

AUTUMN MANOR POND RETROFIT

CAPITAL PROJECT No. D-1159 CONTRACT No. 171705999.030

SCALE

AS SHOWN

SHEET

ELECTION DISTRICT NO. 02 HOWARD COUNTY, MARYLAND

HOWARD SOIL CONSERVATION DISTRICT (HSCD) STANDARD SEDIMENT CONTROL NOTES

- 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:
 - a. Prior to the start of earth disturbance,
 - b. Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth 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.

- All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
- Following initial soil disturbance or re-disturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.
- All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL FROSION 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 ft. must be benched with stable outlet. All concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).
- 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 CID
- Site Analysis:

Anaiysis:		
Total Area of Site:	1.71	Acres
Area Disturbed:	1.71	Acres
Area to be roofed or paved:	0.0	Acres
Area to be vegetatively stabilized:	1.71	Acres
Total Cut:	7620.46	Cu. Yds.
Total Fill:	505.94	Cu. Yds.
Offsite waste/borrow area location:	TBD	
Total to Export Offsite:	7114.52	Cu. Y

- 7. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
- Additional sediment control must be provided, if deemed necessary by the CID. 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 should include:
 - Inspection date
 - Inspection type (routine, pre-storm event, during rain event)
 - Name and title of inspector
 - Weather information (current conditions as well as time and amount of last recorded precipitation)
 - Brief description of project's status (e.g., percent complete) and/or current activities

 - Evidence of sediment discharges
 - Identification of plan deficiencies
 - Identification of sediment controls that require maintenance
 - Identification of missing or improperly installed sediment controls • Compliance status regarding the sequence of construction and stabilization requirements
 - Photographs

 - Monitoring/sampling
 - Maintenance and/or corrective action performed
 - Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE).
- 9. Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back-filled and stabilized by the end of each workday, whichever is shorter.
- 10. Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may allowed by the CID per the list of HSCD-approved field changes.
- 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.
- 13. 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
- 16. A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD, SOIL CONSERVATION DISTRICT

DEPARTMENT OF PUBLIC WORKS HOWARD/COUNTY, MARYLAND

GENERAL CONSTRUCTION NOTES

*TRUCK AND EQUIPMENT OPERATORS SHALL USE CAUTION WHILE TRAVERSING THE ACCESS ROAD, ON THE TEMPORARY ACCESS PATHWAYS, AND WITHIN THE VICINITY OF THE EXISTING SANITARY SEWER LINE LOCATED DOWNSTREAM OF THE POND OUTFALL. *CONTRACTOR SHALL MINIMIZE IMPACTS TO EXISTING TREES, WETLANDS, U.S. WATERS, EXISTING UTILITIES, AND ALL OTHER EXISTING FEATURES. *ALL DREDGING OPERATIONS SHALL BE DONE IN STRICT ACCORDANCE WITH THE PUMP AROUND CRITERIA. DISCHARGE FROM DISTURBED AREAS SHALL BE THROUGH AN REMOVABLE PUMPING STATION, FILTER BAG ON RIPRAP PAD POSITIONED ON THE DOWNSTREAM SIDE OF THE DAM. OR OTHER FILTERING DEVICE AS APPROVED BY THE INSPECTOR. *ALL EXCAVATED SEDIMENT UNSUITABLE FOR RE-USE FOR THIS PROJECT SHALL BE TRANSPORTED TO AN APPROVED LOCATION OFFSITE.

*THE CONTRACTOR IS TO ENSURE A 24-HOUR POWER SOURCE IS AVAILABLE TO DRAW DOWN THE PERMANENT POOL IN THE WORK AREA *ALL PERIMETER CONTROLS INSTALLED IN PHASE 1 TO REMAIN IN PLACE AND MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION.

*PHASE 2 AND PHASE 3 MAY NOT BEGIN UNTIL CONSTRUCTION MATERIALS ARE ON SITE.

SEQUENCE OF CONSTRUCTION

PHASE 1 (6 WEEKS)

1. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777, HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/ CONSTRUCTION INSPECTION DIVISION (410)-313-1880 AND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION (410)-537-3510 AT LEAST SEVEN (7) DAYS PRIOR TO BEGINNING ANY WORK.

2. THE CONTRACTOR SHALL NOTIFY HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION IN WRITING AT LEAST THREE (3) DAYS PRIOR TO INITIATING ANY WORK.

3. THE CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING TO INCLUDE, BUT NOT LIMITED TO, COUNTY PROJECT MANAGER, ENGINEER, A REPRESENTATIVE FROM HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION. (1 DAY)

4. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE CERTIFYING ENGINEER AT LEAST FIVE (5) WORKING DAYS PRIOR TO BEGINNING STORMWATER MANAGEMENT CONSTRUCTION. (5 DAYS)

5. THE CONTRACTOR SHALL STAKE OUT THE PROJECT LIMIT OF DISTURBANCE (LOD) AND TREE SAVES PRIOR TO THE PRE-CONSTRUCTION

6. THE CONTRACTOR IS RESPONSIBLE FOR AVOIDING ALL IMPACTS TO THE EXISTING SANITARY SEWER LINE. IT IS RECOMMENDED THAT THE

EXISTING SANITARY LINE BE STAKED TO INDICATE THE SEWER LINE ALIGNMENT AND DEPTH AT FREQUENT (10-FOOT) INTERVALS WITHIN THE

PROJECT LOD. (1 DAY) 7. THE CONTRACTOR SHALL OBTAIN GRADING PERMIT AND ALL NECESSARY PERMITS FOR CONSTRUCTION (INCLUDING MDE PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY AND NPDES PERMIT). MDE TRACKING NUMBER CENAB-OPR-MN (HO DPW - AUTUMN

8. WITH PERMISSION FROM THE INSPECTOR CLEAR AND GRUB AS NECESSARY TO INSTALL THE ACCESS PATH AND PERIMETER SEDIMENT CONTROL MEASURES INCLUDING ORANGE CONSTRUCTION FENCE, SUPER SILT FENCE, CURB INLET PROTECTION, AND STABILIZED CONSTRUCTION ENTRANCE ACCORDING TO APPROVED SEDIMENT CONTROL PLAN (5 DAYS).

9. WITH PERMISSION FROM THE INSPECTOR, INSTALL REMOVABLE PUMP STATION INSIDE THE BASIN TO DRAW DOWN THE WET POOL WITHIN THE FACILITY AND DISCHARGE TO RIPRAP PAD AT THE DOWNSTREAM CHANNEL ONCE THE PERMANENT POOL IS DRAWN DOWN, INSTALL THE HORIZONTAL DRAW-DOWN DEVICE (SHOWN ON SHEET 13 OF 17) ONTO THE EXISTING RISER. INSTALL BAG BARRIER •1A AT THE DOWNSTREAM CHANNEL AS SHOWN WITH PUMP AROUND TO FILTER BAG, INSTALL SAND BAG BARRIER *1B WITHIN THE BASIN AS SHOWN. THE CONTRACTOR SHALL LINE THE SAND BAG BARRIERS WITH IMPERVIOUS PLASTIC SHEETING AND ANCHOR WITH SAND BAGS AS SHOWN IN THE DETAILS, SHEET 12 OF 16. (10 DAYS)

10. ONCE ALL PRELIMINARY CLEARING, ENTRANCE/ACCESS, AND STAGING INSTALLED AND STABILIZED, AND PERIMETER CONTROLS INSTALLED AND FUNCTIONING, WITH PERMISSION FROM THE INSPECTOR, CONTRACTOR SHALL PROCEED WITH CONSTRUCTION ACTIVITIES. (1 DAY)

NOTE: STEP 11 AND STEP 12 MAY TAKE PLACE CONCURRENTLY.

11. TREE REMOVAL - CLEAR WOODY VEGETATION WITHIN THE WOODY FREE ZONE PER THE "GENERAL RECOMMENDATIONS FOR TREE REMOVAL" TABLE AND TREE REMOVAL NOTES ON THIS SHEET. USE CAUTION WHEN REMOVING TREES SO THAT NO LARGE LIMBS FALL DIRECTLY ON THE EMBANKMENT. TREES OUTSIDE OF THE WOODY FREE ZONE OF THE POND DAM THAT ARE WITHIN THE LIMIT OF DISTURBANCE AND REQUIRE REMOVAL CAN BE CLEARED AT THE DISCRETION OF THE CONTRACTOR STABILIZE ALL CLEARED AREAS WITH SOIL STABILIZATION MATTING AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN. (5 DAYS)

12. COMPLETE SAND BAG BARRIER DIVERSION - WITH PERMISSION FROM THE INSPECTOR, WORKING FROM DOWNSTREAM TO UPSTREAM, EXCAVATE THE EMBANKMENT TO REMOVE THE EXISTING 42" CMP BARREL PIPE [SLIPLINED WITH 36" HDPE PIPE1, EXISTING CRADLE, ANTI-SEEP COLLARS, AND CMP RISER. AFTER THE EXISTING BARREL PIPE, CRADLE, ANTI-SEEP COLLARS, AND CMP RISER HAVE BEEN REMOVED, WITH PERMISSION FROM THE INSPECTOR, WORKING FROM DOWNSTREAM TO UPSTREAM, BEGIN GRADING WITHIN SAND BAG BARRIER *1B AND ADJUSTING SAND BAGS AS NEEDED PER THE SAND BAG BARRIER *1B TOP ELEVATIONS AND FLOW LINE ELEVATIONS SHOWN ON SHEET 09 OF 17, CONTRACTOR IS TO ENSURE THAT POSITIVE DRAINAGE IS ACHIEVED WITHIN SAND BAG BARRIER . 1B, THROUGH THE DAM OPENING, AND TO THE DOWNSTREAM CHANNEL. FOR THE DURATION OF PHASE 1, ALL POTENTIAL RUNOFF FROM WITHIN THE LIMIT OF DISTURBANCE SHALL GRAVITY FLOW WITHIN SAND BAG BARRIER *1B, THROUGH THE DAM OPENING TO THE DOWNSTREAM CHANNEL, AND BE INTERCEPTED BY SAND BAG BARRIER *1A AND DEWATERED VIA PUMP AROUND PRACTICE TO FILTER BAG OR APPROVED EQUIVALENT. (10 DAYS)

13. AFTER GRADING AND INSTALLATION OF SAND BAG BARRIER *1B ALONG THE WESTERN TOE OF SLOPE AND THROUGH THE EXCAVATED DAM ARE COMPLETE AND STABILIZED, WITH PERMISSION FROM THE INSPECTOR, CONTRACTOR SHALL PROCEED WITH PHASE 2. (1 DAY)

NOTE: ALL AREAS DRAINING TO PUMP AROUND MUST BE STABILIZED DAILY.

PHASE 2 (10 WEEKS)

14. PERFORM ANY MAINTENANCE AND STABILIZATION OF SAND BAG BARRIERS, PUMP AROUNDS, AND EROSION AND SEDIMENT CONTROL MEASURES INSTALLED IN PHASE 1 AS NEEDED OR AS DIRECTED BY THE INSPECTOR. (1 DAY)

15. COMPLETE CLEAR WATER DIVERSION OF STORMDRAIN INFLOWS AROUND THE WORK AREA - DURING ANTICIPATED DRY WEATHER CONDITIONS. WORKING FROM DOWNSTREAM TO UPSTREAM, INSTALL SAND BAG BARRIER *2A WITH IMPERVIOUS PLASTIC SHEETING AND ANCHORS (PER DETAIL SHEET 9 OF 17) ALONG THE EXCAVATED EMBANKMENT TRENCH AND CONNECT TO SAND BAG BARRIER .1B AT THE NORTHWEST CORNER OF THE EXISTING POND BOTTOM AS SHOWN, REMOVE THE UPSTREAM PORTION OF SAND BAG BARRIER *1B WITHIN THE BASIN AND INSTALL ADDITIONAL SAND BAG BARRIER *2B INCLUDING PLASTIC SHEETING AND ANCHORS TO BLOCK OFF AND INTERCEPT RUNOFF FROM EXISTING INFLOWS 2.3. AND 4 AS SHOWN. INSTALL SAND BAG BARRIER .2D AT INFLOW 1 WITH 24-INCH PIPE TO THE CLEAN WATER DIVERSION CHANNEL WITHIN SAND BAG BARRIER *2B. WITH PERMISSION FORM THE INSPECTOR, REMOVE PORTION OF THE SAND BAG BARRIER *1A BLOCKING THE DOWNSTREAM CHANNEL AND INSTALL RIPRAP PAD AS SHOWN TO COMPLETE CLEAR WATER DIVERSION OF ALL STORMDRAIN INFLOWS AROUND THE WORK AREA VIA SAND BAG BARRIER. (5 DAYS)

16. INSTALL SAND BAG BARRIER *2C UPSTREAM OF THE PROPOSED RISER. SAND BAG BARRIER *1A (REMAINING PORTION) AND PUMP TO FILTER BAG INSTALLED IN PHASE 1 TO REMAIN IN PLACE AND FUNCTIONING. (1 DAY)

17. WITH CLEAR WATER DIVERSION BARRIER IN PLACE, STABLE, AND FUNCTIONING (SPECIFICALLY, SAND BAG BARRIER *2D AND 24-INCH CLEAR WATER DIVERSION PIPE TO SAND BAG BARRIER *2B/*1B/*2A TO RIPRAP PAD, SAND BAG BARRIER *2C AND SAND BAG BARRIER *1A (REMAINING PORTION) TO FILTER BAG), WITH PERMISSION FROM THE INSPECTOR, PROCEED WITH STEP 18 AND STEP 19.

NOTE : STEP 18 AND STEP 19 MAY TAKE PLACE CONCURRENTLY.

18. DEMUCK POND BASIN AND PERFORM GRADING OPERATIONS AS SHOWN. THE SAND BAG BARRIERS CAN BE SHIFTED AS NEEDED TO PERFORM GRADING OPERATIONS. (6 WEEKS)

19. WORKING FROM DOWNSTREAM TO UPSTREAM, EXCAVATE THE EMBANKMENT AS SHOWN TO INSTALL THE PROPOSED PRINCIPAL SPILLWAY, INCLUDING ENDWALL, 48" RCP BARREL PIPE, CONCRETE CRADLE, RISER FOUNDATION, CONCRETE BOX RISER, TRASH RACKS, POND DRAIN, AND DEWATERING SYSTEM PER THE PLANS. INSTALL THE HORIZONTAL DRAW-DOWN DEVICE (SHOWN ON SHEET 13 OF 17) ONTO THE LOW FLOW OPENING IN THE RISER TO FILTER NON-DIVERTED RUNOFF IN THE POND BASIN DURING NON-WORK HOURS FOR THE DURATION OF CONSTRUCTION, CONTRACTOR SHALL INSPECT AND DEWATER THE POND BASIN EACH DAY, 7 DAYS A WEEK. (6 WEEKS)

TREE REMOVAL NOTES:

I. CONTRACTOR IS TO USE CAUTION WHEN REMOVING TREES WITHIN CLOSE PROXIMITY TO THE EXISTING POND DAM. REMOVAL OF LARGE LIMBS SHOULD BE CONTROLLED TO AVOID FALLING ONTO THE EMBANKMENT.

2. EMBANKMENT WITHIN WOODY-FREE ZONE IS DIVIDED INTO THREE TREE LOCATION ZONES: TREE LOCATION ZONE 1, 2, AND 3 AS SHOWN IN TABLE A. - ZONE 1 REPRESENTS THE UPSTREAM SLOPE OF THE POND EMBANKMENT. ALL TREES WITHIN ZONE 1 ARE TO BE CUT WITH

STUMPS KILLED, AS NOTED IN TABLE A. - ZONE 2 REPRESENTS THE TOP OF THE POND EMBANKMENT OR CREST. ALL TREES WITHIN ZONE 2 ARE TO BE CUT WITH STUMPS AND ROOT MASS GRUBBED TO A SPECIFIED DEPTH AND AREA AS DIRECTED BY TABLE A.

- ZONE 3 REPRESENTS THE DOWNSTREAM SLOPE OF THE POND EMBANKMENT. ALL TREES WITHIN ZONE 3 ARE TO BE CUT WITH STUMPS AND ROOT MASS GRUBBED TO A SPECIFIED DEPTH AND AREA AS DIRECTED BY TABLE A. ONCE ALL SELECTIVE TREES ARE REMOVED AND GRUBBED/TREATED AS NECESSARY, WITH PERMISSION FROM THE INSPECTOR, PROCEED WITH CONSTRUCTION.

PHASE 2 (CONTINUED)

NOTE: THE CONCRETE PIPE CRADLE SHOULD BE INSTALLED AS A CONTINUOUS LAYER, DO NOT ALLOW CONCRETE TO HARDEN IN SECTIONS.

NOTE: CONTRACTOR TO EXCAVATE AND HAUL OFF NATIVE MATERIAL BENEATH THE PROPOSED RISER BASE AND REPLACE WITH SUITABLE COMPACTED FILL TO AN EXTENT AND DEPTH AS DICTATED BY THE GEOTECHNICAL ENGINEER. A GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS PROJECT BY KCITECHNOLOGIES, INC. THIS REPORT IS FOR INFORMATION PURPOSES ONLY AND SHALL NOT BE CONSIDERED AS PART OF THE CONTRACT DOCUMENTS. DECISIONS REGARDING SUITABILITY OF MATERIALS AND ADEQUACY OF COMPACTION TO BE AT THE DIRECTION OF THE ONSITE GEOTECHNICAL ENGINEER DURING CONSTRUCTION.

20. ONCE THE PRINCIPAL SPILLWAY IS INSTALLED AND STABILIZED, WITH PERMISSION FROM THE INSPECTOR, RECONSTRUCT THE DAM INCLUDING FILTER DIAPHRAGM, OUTLET PIPES, AND CLAY CORE. STABILIZE ALL DISTURBED AREAS ON THE EMBANKMENT WITH PERMANENT SOIL STABILIZATION MATTING, RECONSTRUCTING THE DAM WILL PREVENT THE GRAVITY CLEAR WATER DIVERSION BARRIER FROM FUNCTIONING. CONTRACTOR TO DEWATER THE WORK AREA BETWEEN SAND BAG BARRIER *2C AND SAND BAG BARRIER *1A VIA PUMP AROUND TO FILTER BAG WHEN RECONSTRUCTING THE DAM. WITH PERMISSION FROM THE INSPECTOR, REMOVE SAND BAG BARRIER *2D AND 24-INCH CLEAR WATER DIVERSION PIPE, REMOVE SAND BAG BARRIER *2B/*1B/*2A. WITH ANTICIPATED DRY WEATHER CONDITIONS, REPAIR/RESET EXISTING STORMDRAIN INFLOWS, IF NECESSARY, AND INSTALL RIPRAP APRONS AT INFLOWS AS SHOWN ON THE PLANS AND DETAIL SHEET 12 OF 17. IF THE EXISTING PIPES AND END SECTIONS ARE DAMAGED AND/OR NOT SALVAGEABLE, THE CONTRACTOR IS TO REPLACE THE END SECTIONS AND LAST SECTION OF PIPE ALONG THE SAME HORIZONTAL AND VERTICAL ALIGNMENTS. GRADE THE REMAINING SECTIONS OF THE POND TO THE FINAL CONFIGURATION. (3 WEEKS)

21. ONCE POND GRADING IS COMPLETE WITH RIPRAP AT INFLOWS INSTALLED; RISER, PRINCIPAL SPILLWAY, ENDWALL, FILTER DIAPHRAGM, CLAY CORE INSTALLED AND DAM RECONSTRUCTED AND STABILIZED AS SHOWN FOR PHASE 2, WITH PERMISSION FROM THE INSPECTOR, CONTRACTOR SHALL PROCEED WITH PHASE 3.

PHASE 3 (2 WEEKS)

22. PERFORM ANY MAINTENANCE AND STABILIZATION OF SAND BAG BARRIERS .2C AND *1A (REMAINING PORTION). MAINTAIN REMOVABLE PUMP STATION, HORIZONTAL DEWATERING DEVICE, AND PUMP TO FILTER BAG AND EROSION AND SEDIMENT CONTROL MEASURES INSTALLED IN PHASES 1 AND 2 AS NEEDED OR AS DIRECTED BY THE INSPECTOR.

23. WITH ANTICIPATED 3-DAY DRY WEATHER FORECAST AND WITH PERMISSION FROM THE INSPECTOR, SHIFT SANDBAG BARRIER •1A (REMAINING PORTION) DOWNSTREAM AND INCREASE THE EXTENT OF BARRIER AS SHOWN ON SHEET 11 OF 17 (LABELED SAND BAG BARRIER *3A). CONTINUE WITH PUMP AROUND TO FILTER BAG TO DEWATER THE WORK AREA CONTAINED BY SAND BAG BARRIER . 3A. WORKING FROM DOWNSTREAM TO UPSTREAM, CONSTRUCT CHANNEL IMPROVEMENTS BY GRADING THE PROPOSED CHANNEL, PLUNGE POOL, AND EMERGENCY SPILLWAY, INSTALL CLASS IRIPRAP AND CUTOFF IN THE PLUNGE POOL AND EMERGENCY SPILLWAY AS SHOWN ON DETAIL, SHEET 7 OF 16 AND PROFILE, SHEET 5 OF 16. PLACE RIPRAP BACKFILLED WITH COBBLES IN THE CHANNEL DOWNSTREAM OF THE PLUNGE POOL TO THE LIMIT OF DISTURBANCE. (5 DAYS)

24 ONCE ALL PROJECT IMPROVEMENTS SHOWN IN PHASE 1, 2, AND 3 ARE CONSTRUCTED AND STABILIZED, WITH PERMISSION FROM THE INSPECTOR, REMOVE SANDBAG BARRIER *3A AND SANDBAG BARRIER •2C, HORIZONTAL DEWATERING DEVICE, REMOVABLE PUMP STATION, PUMP AROUND PRACTICE TO FILTER BAG, TEMPORARY RIPRAP, AND ANY OTHER DEVICES USED TO DEWATER THE BASIN AND WORK AREA DURING CONSTRUCTION.

25 INSTALL LANDSCAPING PLANTINGS PER SHEET 16 AND 17, REPLACE THE EXISTING SPLIT-RAIL PERIMETER FENCE AS DIRECTED BY HOWARD COUNTY DPW, AND STABILIZE ALL REMAINING DISTURBED AREAS. (3 DAYS)

26. AFTER COMPLETION OF A POST-CONSTRUCTION SITE MEETING WITH (BUT NOT LIMITED TO) HOWARD COUNTY DPW, CONTRACTOR, ENGINEER, AND INSPECTOR, WITH PERMISSION FROM THE INSPECTOR, REMOVE ALL PERIMITER CONTROLS, ORANGE SAFETY FENCING, CURB INLET PROTECTION, PERMANENTLY STABILIZE ANY AREA DISTURBED BY THIS PROCESS AND DEMOBILIZE FROM THE SITE. (2 DAYS)

27. PREPARE AS-BUILT PLANS OF THE FINAL PROJECT CONFIGURATION AND SUBMIT TO DPW

TOTAL ANTICIPATED DURATION OF CONSTRUCTION IS 18 WEEKS FROM KICKOFF.

TREE

ZONE

LOCATIO

Maryland Department of the Environment Best Management Practices for Working in Nontidal Wetlands, the Nontidal Wetland Buffer, Waters of the State and the 100-Year Floodplain

- 1. No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain
- 2. Place materials in a location and manner that does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100vear floodplain.
- 3. Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, unsightly debris, toxic material, or any other deleterious substance.
- 4. Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
- 5. Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
- 6. Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
- 7. All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (Lolium multiflorum), Millet (Setaria italica), Barley (Hordeum sp.), Oats (Uniola sp.), and/or Rye (Secale cereale). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-persistent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division. Kentucky 31 fescue shall not be utilized in wetland or buffer areas. The area should be seeded and mulched to reduce erosion after construction activities have been completed.
- 8. After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
- 9. To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:
 - Use I waters: In-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
- 10. Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
- 11. Culverts shall be constructed and any riprap placed so as not to obstruct the movement of aquatic species, unless the purpose of the activity is to impound water.

TREE TYPE B (SPREADING ROOTS)

2-1-81

SCALE

AS SHOWN

SHEET

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GENERAL RECOMMENDATIONS FOR TREE REMOVAL 1/

stumps and stumps and root mass to mass to 24" stumps and root mass to stumps. 2, stumps. 21 18" depth 18" depth depth in 1/2 root mass root mass to 18" depth in crown width uniformly. crown width uniformly. 12" depth 24" depth diameter area. diameter area. uniformly. uniformly. Cut and grub Cut and grub Cut and grub Cut and grub stumps and Cut and grub Cut and grub stumps and root stumps and Cut and kill stumps and Cut and kill stumps and stumps and root mass to mass to 24" root mass to root mass to stumps. 51 stumps. root mass to root mass to 18" depth depth in 1/2 12" depth 18" depth 18" depth 12" depth in crown width uniformly. 6/ crown width uniformly.

1, Tree growth smaller than 2" DBH will be removed by spraying, injection or cutting and stump killing. Trees and shrubs planted for shoreline protection in Zone 1 shall be maintained at heights < 4 feet

uniformly.

21 In embankment type (a) dispersed soil--cut stumps 12 inches below surface and backfill with compacted soil.

diameter area. 31

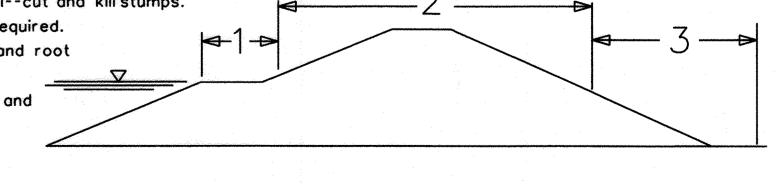
3 In embankment type (d) earthfill with low piping potential--cut and kill stumps.

TREE TYPE A (TAP ROOT)

4/ In riprapped or heavy rockfill sections grubbing is not required.

5/ For water-loving trees such as willows, remove stump and root mass in twice the crown width area. 6, For water-loving trees such as willows, remove stumps and

root mass to 18" depth uniformly. 7, Individual large trees in this zone may need the special treatment as described in Section 3.

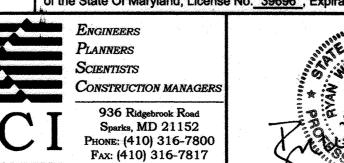


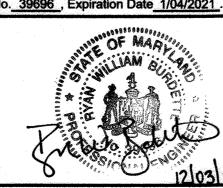
AUTUMN MANOR POND RETROFIT

uniformly. 51

diameter area. 3/

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 39696, Expiration Date 1/04/2021





910	DATE: NOV, 2019	BY	NO.	REVISION	DATE	600' SCALE MAP NO.
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EROSION & SEDIMENT CONTROL NOTES

CAPITAL PROJECT No. D-1159

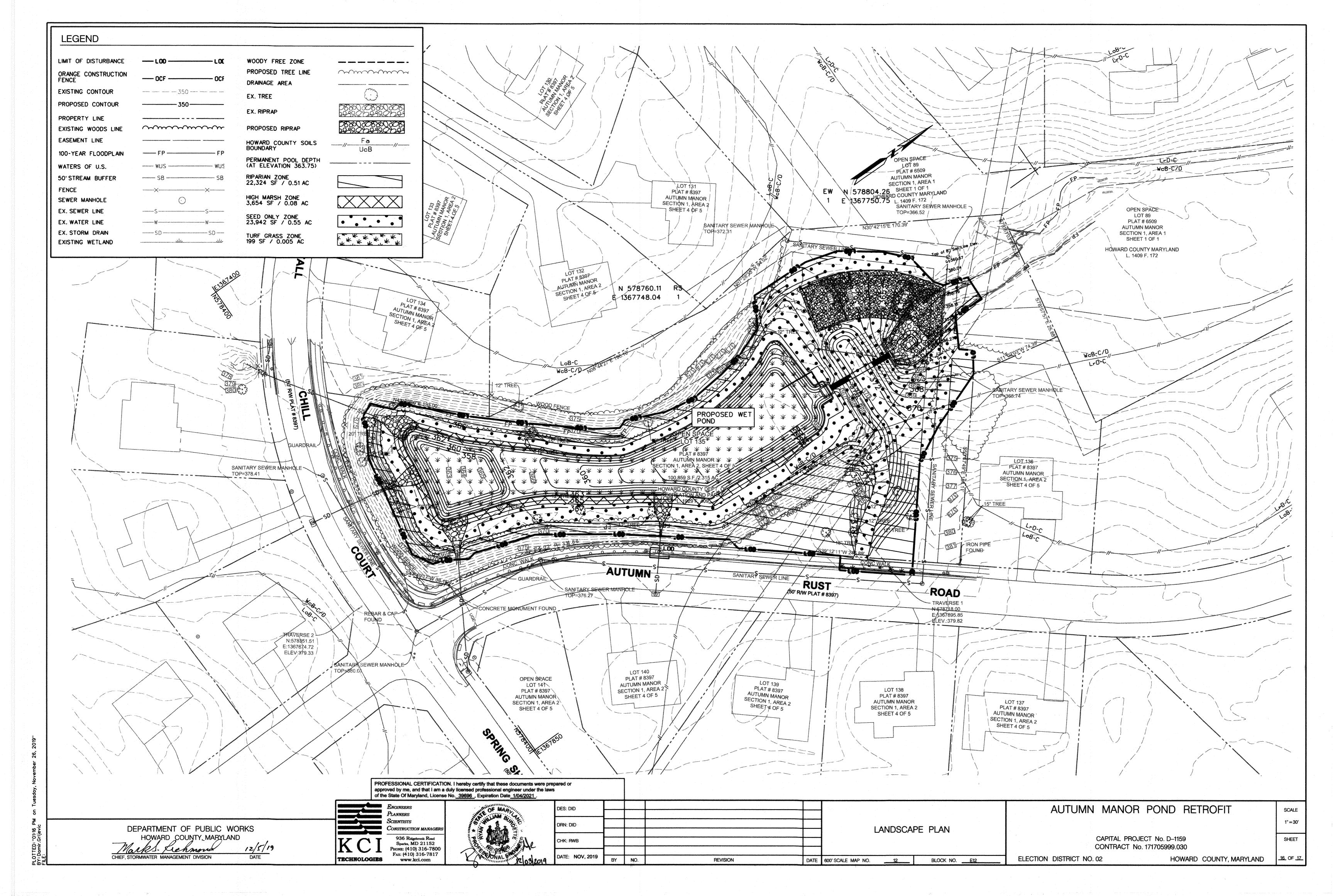
CONTRACT No. 171705999.030 HOWARD COUNTY, MARYLAND

ELECTION DISTRICT NO. 02 BLOCK NO. E12

Marks. Tichmand CHIEF, STORMWATER MANAGEMENT DIVISION TECHNOLOGIES

Rev. 8/2

www.kci.com



High Marsh Zone					
(3,400 SF / 0.08 AC)					
Botanical Name	Common Name	Size	Form	Spacing	Quantity
Betula nigra	River birch	6' Height	Container	10' O.C	13
Carpinus caroliniana	Ironwood	6' Height	Container	10' O.C	12
Ulmus rubra	Slippery Elm	6' Height	Container	10' O.C	12
Riparian Zone				Parameter and the second secon	
(17,846 SF / 0.41 AC)		Section (Annual Section Control Contro		in the second se	
Botanical Name	Common Name	Size	Form	Spacing	Quantity
Acer rubrum	Red maple	6' Height	Container	10' O.C	37
Amelanchier canadensis	Serviceberry	6' Height	Container	10' O.C	37
Asiminia triloba	Pawpaw	6' Height	Container	10' O.C	37
Nyssa sylvatica	Black gum	6' Height	Container	10' O.C	37
Quercus phellos	Willow oak	6' Height	Container	10' O.C	38
Quercus palustris	Pin Oak	6' Height	Container	10' O.C	37
High Marsh Zone Seed Mix					en general en agustur e hand sambalan an statut sambalan statut en
(3,400 SF / 0.08 AC)	nder gegenne und ernen er er er er er er år er er et er		<u>and the statement and a statement and a supplemental and a statement and a st</u>		
Seed Mix		Seed Rate	Quantity	1977	eranan saide gararan kapan perinti peranta karan karan kerinta da da da da karan karan beran da da da da da da
ERNST 723 - Lower Midland	FACW Mix	20 lb per acre	1.6		
Riparian and Seed Only Zon	es established and the second and th				
(40.713 SE / 0.93 AC)			and the state of t	and his new management of the estimate population of the same	орушчэг алутаалаган, алутаалагы чөөгөөгөөр та өчилгөөгөөр өчүү черө элөөрөг -

NOTES:

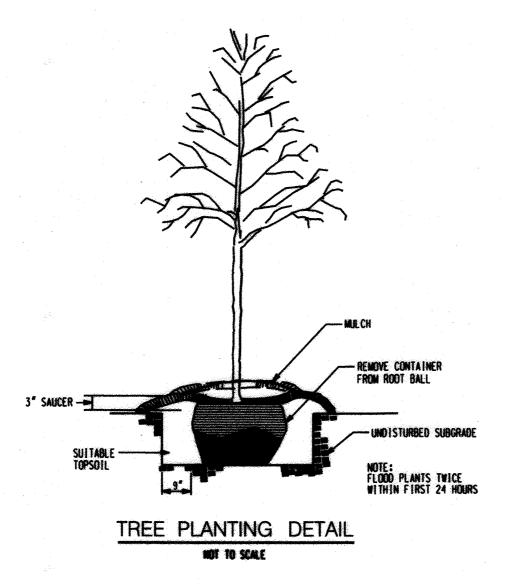
1. NO TREES OR SHRUBS ARE TO BE PLANTED DIRECTLY OVER UTILITY LINES.

2. ALL TREES MUST BE BRANCHING.

3. CONTAINER TREES (6' HEIGHT) ARE TO BE PLACED ACCORDING TO THIS PLAN.

4. TREES ARE TO BE PLACED RANDOMLY WITHIN THE ZONES DESCRIBED HEREIN.

5. DO NOT PLANT ANY TREES OR SHRUBS DIRECTLY WITHIN THE CENTERLINE OF THE STREAM CHANNEL.

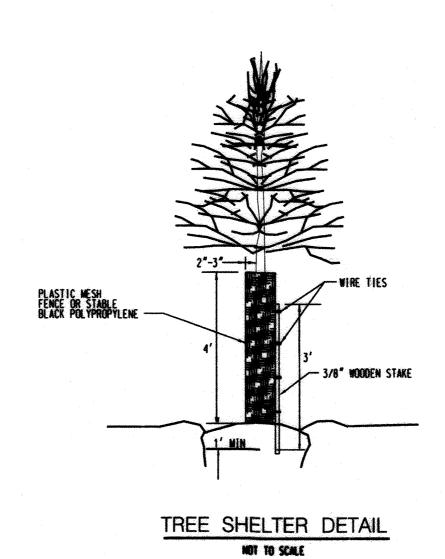


Seed Rate

20 lb per acre

Quantity

21.2



A: MINIMUM SPACING PER SCHEDULE

X, Z TREE SPECIES

B: DUPLICATE SPECIES SPACING MINIMUM
2 TIMES MINIMUM SPACING TREE AND SHRUB RANDOM SPACING

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 39696, Expiration Date 1/04/2021.

936 Ridgebrook Road Sparks, MD 21152 PHONE: (410) 316-7800 FAX: (410) 316-7817 www.kci.com

Seed Mix

SHA special purpose

seed mix 920.06.07 (b)

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ATE: NOV, 2019	BY	NO.	REVISION	DATE	600' SCALE MAP NO. 12 BLOCK NO. <u>E12</u>	
HK: RWB						
					LANDSCAPE DETAILS & NOTES	
RN: DID					LANDOCADE DETAILS & MOTES	
			donor discourse			

AUTUMN MANOR POND RETROFIT

CAPITAL PROJECT No. D-1159 CONTRACT No. 171705999.030

ELECTION DISTRICT NO. 02

HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS

SCALE

AS SHOWN

SHEET