SHEET INDEX

DWG. NO. SHEET NO. SHEET TITLE 1 TITLE SHEET 2 ENVIRONMENTAL RESOURCES MAP GS-01 TO GS-03 3-5 GEOMETRY PLANS GRADING PLANS

GR-01 TO GR-02 DE-01 TO DE-03 8-10 STREAM DETAILS

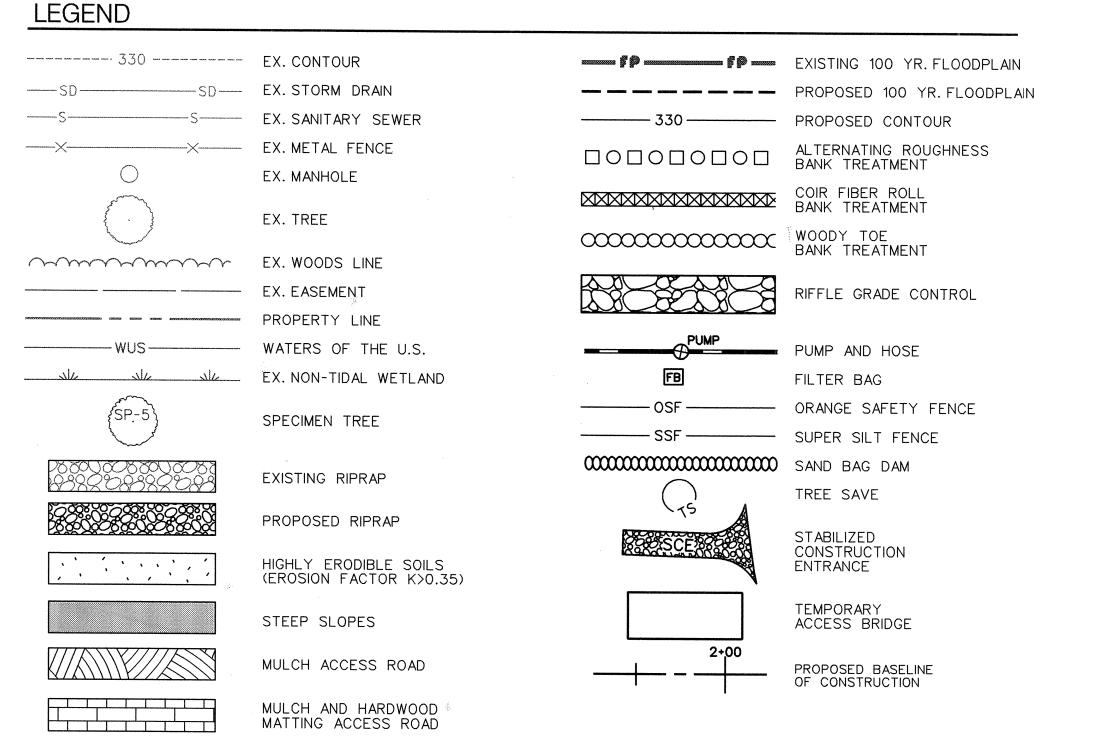
PR-01 TO PR-02 ES-01 TO ES-02 EROSION & SEDIMENT CONTROL PLANS ESD-01 TO ESD-02 EROSION & SEDIMENT CONTROL DETAILS ESN-01 TO ESN-02 EROSION & SEDIMENT CONTROL NOTES

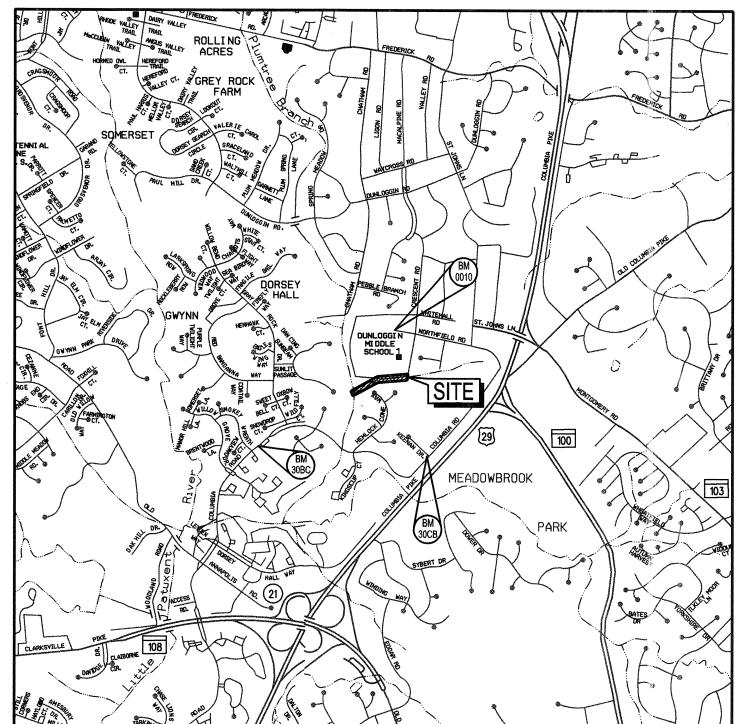
LANDSCAPE PLANS LANDSCAPE DETAILS FCP-01 TO FCP-02 FOREST CONSERVATION PLANS HOWARD COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS

DUNLOGGIN MIDDLE SCHOOL

STREAM RESTORATION PROJECT

CAPITAL PROJECT D-1158





VICINITY MAP SCALE: 1" = 2000'

ADC MAP: 12 / A12

DESIGN INFORMATION			
WATERSHED ID	02-13-11		
IMPERVIOUS AREA (AC)	39.15		
IMPERVIOUS TREATED (AC)	0.00*		
DRAINAGE AREA (AC)	133.67		
WATER QUALITY VOLUME (CF)	0.00*		
% TREATED	0.00*		

OUTFALL INFORMATION						
SPEEDWELL NORTH FIELD HEMLOCK CONE COURT ELEM. SCHOOL WAY SWALE						
PIPE SIZE & TYPE	21" RCP	18" RCP	15" RCP			
IMPERVIOUS AREA (AC)	2.05	3.46	0.45	0.26		
DRAINAGE AREA (AC) 6.34 6.10 0.91 2.89						

HOWARD	COUNTY	SURVEY C	ONTROL
DESIGNATION	NORTHING	EASTING	ELEVATION
30CB	576541.337	1361211.313	379.501
30BC	576751.268	1357633.282	366.732
0010	579167.044	1360260.252	357.152

HORIZ NAD 83/91 VERT NAVD 88

SITE ANALYSIS DATA				
SITE AREA (AC)	2.31			
WETLAND AREA (AC)	0.31			
WETLAND BUFFER (AC)	0.09			
FLOODPLAIN AREA (AC)	1.64			
FOREST LIMITS (AC)	1.66			
STEEP SLOPE AREA <15% (AC)	0.33			
ERODIBLE SOILS (AC)	1.08			
LIMIT OF DISTURBANCE (AC)	2.31			
PROPOSED SITE USE	STREAM RESTORATION			
PROPOSED IMPERVIOUS AREA (AC)	0.00			

GENERAL INFORMATION

- 1. THE SUBJECT PROPERTIES ARE ZONED R-20 PER COMPREHENSIVE ZONING PLAN AND THE COMPLETE ZONING AMENDMENTS.
- 2. THIS PROJECT IS NOT A SUBDIVISION, AND THEREFORE THIS PLAN IS NOT REQUIRED TO MEET THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- THERE ARE NO BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE PROJECT SITE.
- 4. THIS PLAN MEETS THE REQUIREMENTS OF THE FOREST CONSERVATION REGULATIONS.
- 5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY CONTAINED HEREIN PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
- 6. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING/
- CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 24 HOURS IN ADVANCE OF ANY WORK BEING DONE. 7. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY
- 8. THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NUMBERS 30CB, 30BC, & 0010 WERE USED FOR THIS SITE.
- 9. WATER IS PUBLIC.

EXCAVATION WORK BEING DONE.

- 10. SEWER IS PUBLIC.
- 11. EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS.
- THE WETLANDS DELINEATION FOR THIS PROJECT WAS PERFORMED BY KCI TECHNOLOGIES INC. ON JUNE 21, 2016.
- 13. THE EXISTING TOPOGRAPHY IS BASED ON NAD 83/91 AND NAVD 88 AND IS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY KCITECHNOLOGIES, INC., ON AUGUST 19, 2016.
- 14. ALL WORK SHALL CONFORM TO THE MDE BEST MANAGEMENT PRACTICES FOR WETLANDS AND WATERWAYS AS LISTED IN THE REQUIREMENTS OF THE NONTIDAL WETLANDS AND WATERWAYS PERMIT APPROVED ON MARCH 10, 2017 (MDE TRACKING *16-NT-0416/201661829).
- 15. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- 16. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND KCITECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. 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.
- 17. 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 AT THE CONTRACTOR'S EXPENSE
- 18. A WAIVER PETITION (WP-17-066) WAS APPROVED ON MARCH 10, 2017 FROM SECTION 16.155(a)(1)(ii), MAKING THE PROJECT EXEMPT FROM AN SDP SUBMITTAL; SECTION 16.1201(n) AND 16.1202(b)(1)(j). THAT ALLOWS THE USE OF THE AREA INSIDE THE LIMIT OF DISTURBANCE AS THE NET TRACT AREA IN THE FOREST CONSERVATION CALCULATIONS; AND SECTION 16.1205(a)(7), THAT ALLOWS THE REMOVAL OF TWO SPECIMEN TREES WITHIN THE PROJECT AREA. APPROVAL OF THE WAIVER PETITION IS NOT SUBJECT TO ANY CONDITIONS.
- 19. THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) HAS SATISFIED THE FOREST CONSERVATION OBLIGATION OF 0.15 ACRES OF REFORESTATION FOR THIS PLAN WITH A FEE-IN-LIEU PAYMENT OF \$4,900.50 MADE TO THE HOWARD COUNTY FOREST CONSERVATION FUND

SPECIAL CONTRACTOR NOTES

- 1. 100-YEAR FLOODPLAIN LIMIT IS GRAPHICALLY SHOWN ON THE PLANS.
- 2. NO STOCKPILE OF ANY MATERIAL IS ALLOWED IN THE 100-YEAR FLOODPLAIN.
- 3. IN-STREAM WORK IS PROHIBITED FROM MARCH 1 TO MAY 31, INCLUSIVE. STREAM CLASSIFICATIONS: USE IV.
- 4. CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
- 5. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN AT THE CONSTRUCTION SITE. ALL EARTH CUTS AND ACTIVITIES IN THE VICINITY OF TREES TO REMAIN SHALL BE MADE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE WITHIN THE DRIPLINE OF THE TREE, PROTECTIVE ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION. THE LOCATION OF THE PROTECTIVE ORANGE FENCING SHALL BE APPROVED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS PRIOR TO CONSTRUCTION.
- 6. CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
- 7. 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.
- 8. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
- 9. ALL TREES TO BE REMOVED SHALL BE CUT AT THE BASE WITH A SAW AND NOT PUSHED OVER. TREE STUMPS MAY BE LEFT IN PLACE, UNLESS OTHERWISE DIRECTED ON THE PLANS.
- 10. ALL MATERIAL SHALL BE REMOVED AND DISPOSED OF OFFSITE.
- 11. THE CONTRACTOR SHALL PAY CLOSE ATTENTION TO PEDESTRIANS WALKING NEAR THE WORK SITE. ALL PEDESTRIAN TRAFFIC SHALL BE BLOCKED FROM CROSSING THE PEDESTRIAN FOOT BRIDGE NEAREST TO THE ACTIVE WORK ZONE AND SHALL BE DIRECTED TO USE THE PEDESTRIAN FOOT BRIDGE FURTHEST FROM THE ACTIVE ZONE.
- 12. WORKING HOURS ARE 7AM TO 7PM MONDAY THROUGH FRIDAY.
- 13. THE CONTRACTOR SHALL AVOID TRACKING HEAVY EQUIPMENT OVER THE CRITICAL ROOT ZONE OF SPECIMEN TREES. IF UNAVOIDABLE, LOAD MATS SHOULD BE USED WHEN TRACKING OVER THE CRITICAL ROOT ZONES.
- 14. CONTRACTOR SHALL REMOVE ALL MULCH APPLIED TO VEGETATED AREAS PRIOR TO FINAL SEEDING

DESIGN NARRATIVE

THIS IS A STREAM RESTORATION PROJECT THAT WILL RESTORE THE EXISTING CHANNEL AND BANKS OF AN UNNAMED TRIBUTARY STREAM TO PLUMTREE BRANCH LOCATED IN ELLICOTT CITY, MARYLAND. PROJECT IMPROVEMENTS WILL PROTECT NATURAL RESOURCES BY RESTORING THE DEGRADING SEGMENT OF THE TRIBUTARY AND PREVENTING FUTURE DEGRADATION AND TRANSPORT OF SEDIMENT DOWNSTREAM. THE PROJECT RESTORATION AREA HAS INCISED STEADILY OVER TIME AND IS WIDENING; THE BANKS ARE ERODING AND UNDERCUTTING WITH MINIMAL SURFACE PROTECTION; AND THE FLOODPLAIN IS MOSTLY INACCESSIBLE. APPROXIMATELY 1,475 LINEAR FEET OF STREAM CHANNEL WILL BE RESTORED BEGINNING FROM THE EASTERN MOST PROPERTY LINE OF NORTHFIELD ELEMENTARY SCHOOL WEST TO THE CONFLUENCE WITH PLUMTREE BRANCH. IMPROVEMENTS INCLUDE RECONNECTING THE CHANNEL TO THE FLOODPLAIN, STREAM REALIGNMENT, BANK GRADING, STABILIZATION OF STORM DRAIN OUTFALLS, AND WETLAND CREATION / PRESERVATION.

NO IMPROVEMENTS TO THE REACH DRAINAGE AREA ARE PROPOSED, THEREFORE WATER QUALITY VOLUME REQUIREMENTS ARE NOT APPLICABLE. NO IMPERVIOUS AREA WITHIN THE SITE TO BE ALTERED, THEREFORE, IMPLEMENTATION OF ESD PRACTICES IS NOT APPLICABLE. COMPREHENSIVE EROSION AND SEDIMENT CONTROL WILL BE REQUIRED FOR THE DURATION OF THE PROJECT. WATER HANDLING MEASURES WILL INVOLVE DIVERTING BASEFLOW AROUND THE WORK AREA USING A COMBINATION OF SANDBAG DAMS AND PUMP-AROUND PRACTICES TO A FILTER BAG. PERIMETER CONTROLS WILL BE INSTALLED DIRECTLY DOWNSTREAM OF STAGING AND STOCKPILE AREAS AND CONSTRUCTION ACCESS ROADS. ACCESS WILL BE VIA A STABILIZED CONSTRUCTION ENTRANCE FROM THE ADJACENT PUBLIC SCHOOL(S).

AS-BUILT CERTIFICATION

IHEREBY CERTIFY THAT THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

PE NO. SIGNATURE

JUNE 2017 17133314.94 PITAL PROJECT NO.: RMIT ISSUE:

ONSTRUCTION ISSUE:

SHEET

AS SHOWN

GEBROOK ROAD ARYLAND 21152 (410)316-7800 0)316-7818

RK

93

SHEET NO.: 1 OF 24

OF PUBLIC WORKS, HOWARD COUNTY, MD WORKS

BUREAU OF ENVIRONMENTAL SERVICES

PRINTED NAME & TITLE

DIRECTOR DPU)

REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

ENGINEER (PRINT NAME BELOW SIGNATURE)

HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."

HOWARD COUNTY PUBLIC SCHOOL SYSTEM EXECUTIVE DIRECTOR OF SCHOOL FACILITIES

SIGNATURE OF

)WWNER'S/ DEWELOPER'S SIGNATURE

KATHY L. HONERMAN, PE

STORMWATER MANAGEMENT DIVISION DATE RECREATION AND PARKS, HOWARD COUNTY, MD

6/8/2017

"IHEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND

SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN

BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE

DESIGN CERTIFICATE

OWNERS / DEVELOPER CERTIFICATION

"I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO

THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A

MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL ON EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY

P.E. * 38311

DIRECTOR OF RECREATION AND PARKS

PERMIT INFORMATION CHART PARKS 8 1064, 1005 602306

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS THESE PLANS FOR SOIL EROSION AND SEDIMENT CONTROL MEET THE

REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. EP.17.6

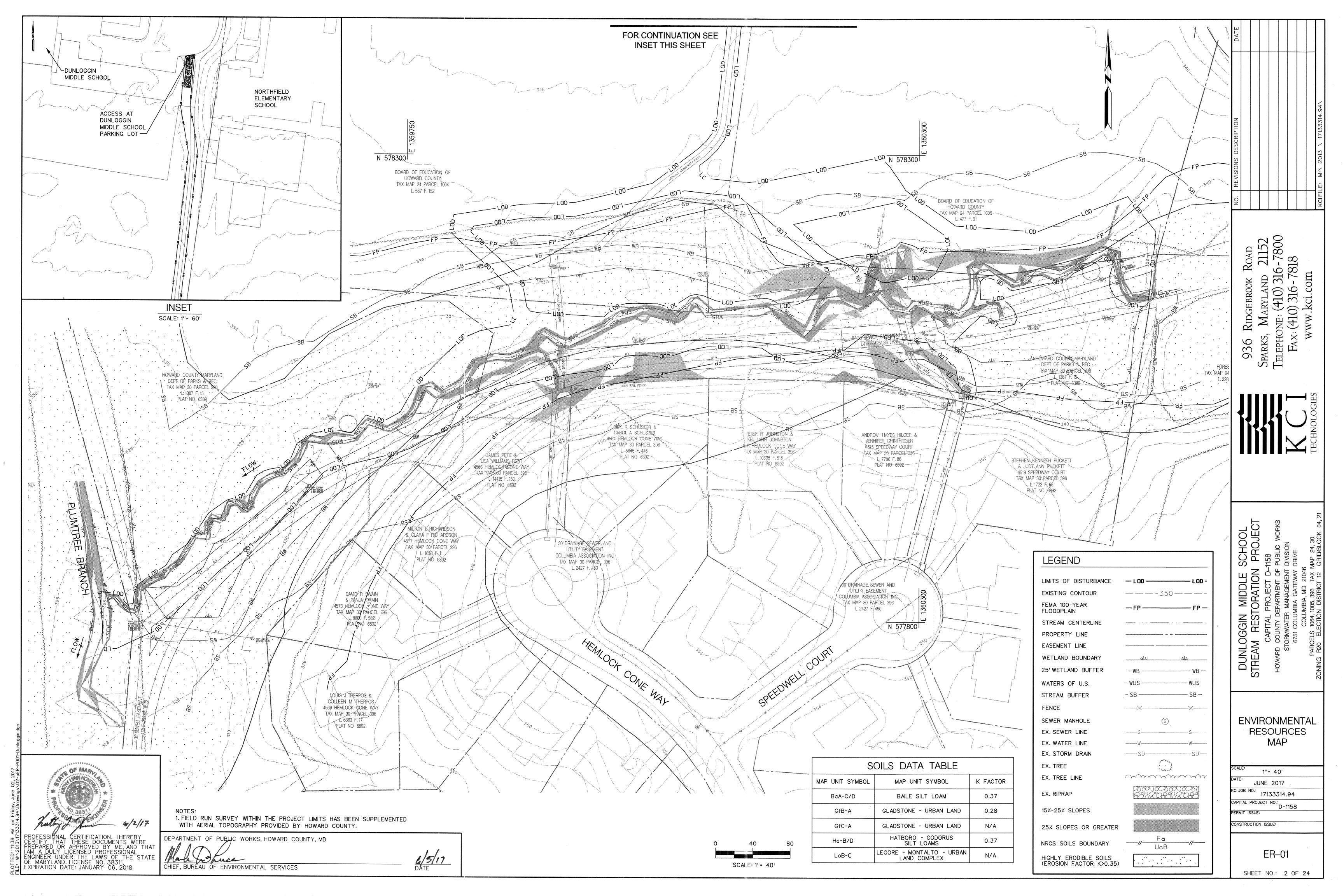
HOWARD COUNTY 6751 COLUMBIA GATEWAY DRIVE COLUMBIA, MD 21046 410-313-6444

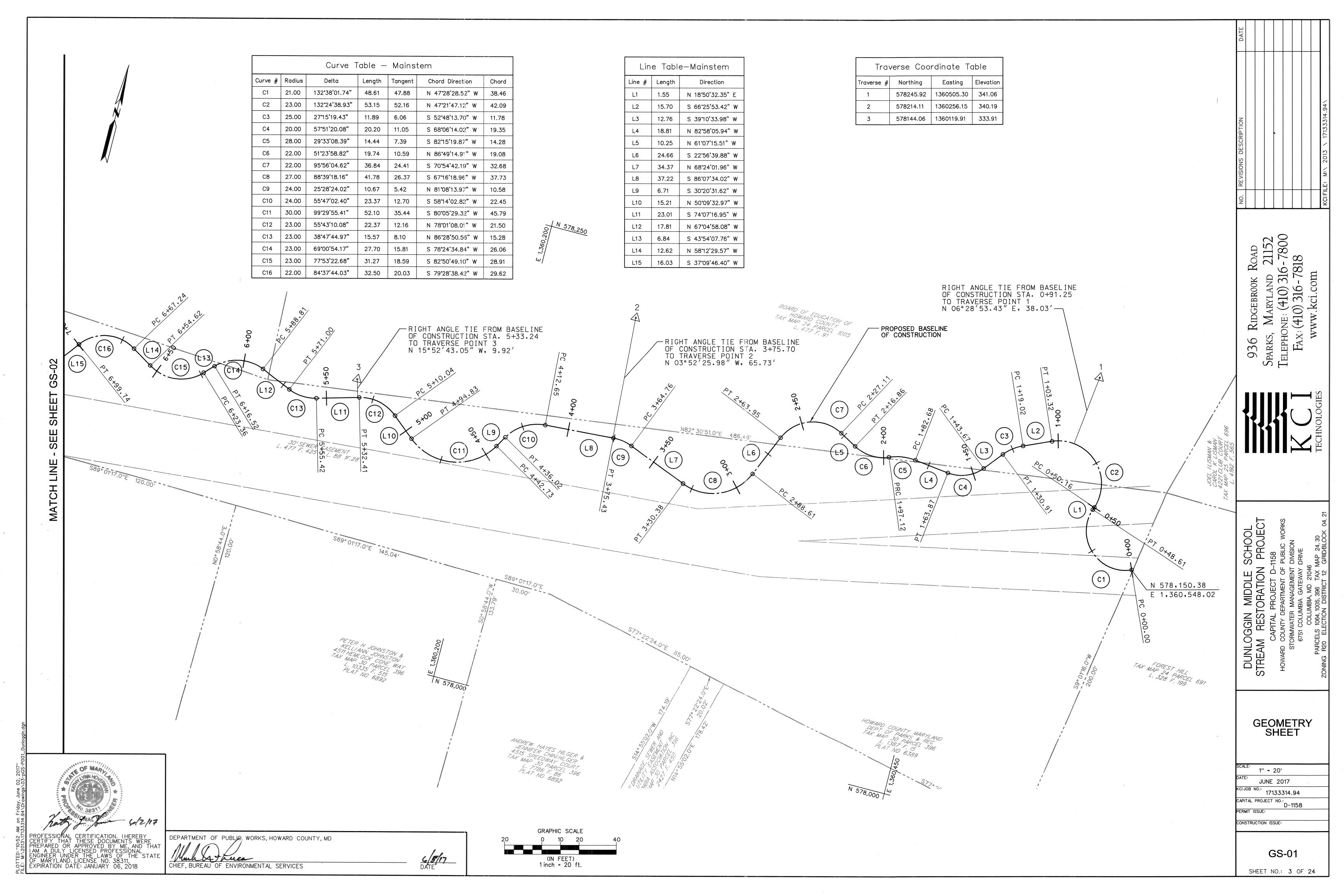
DEPARTMENT OF PUBLIC WORKS

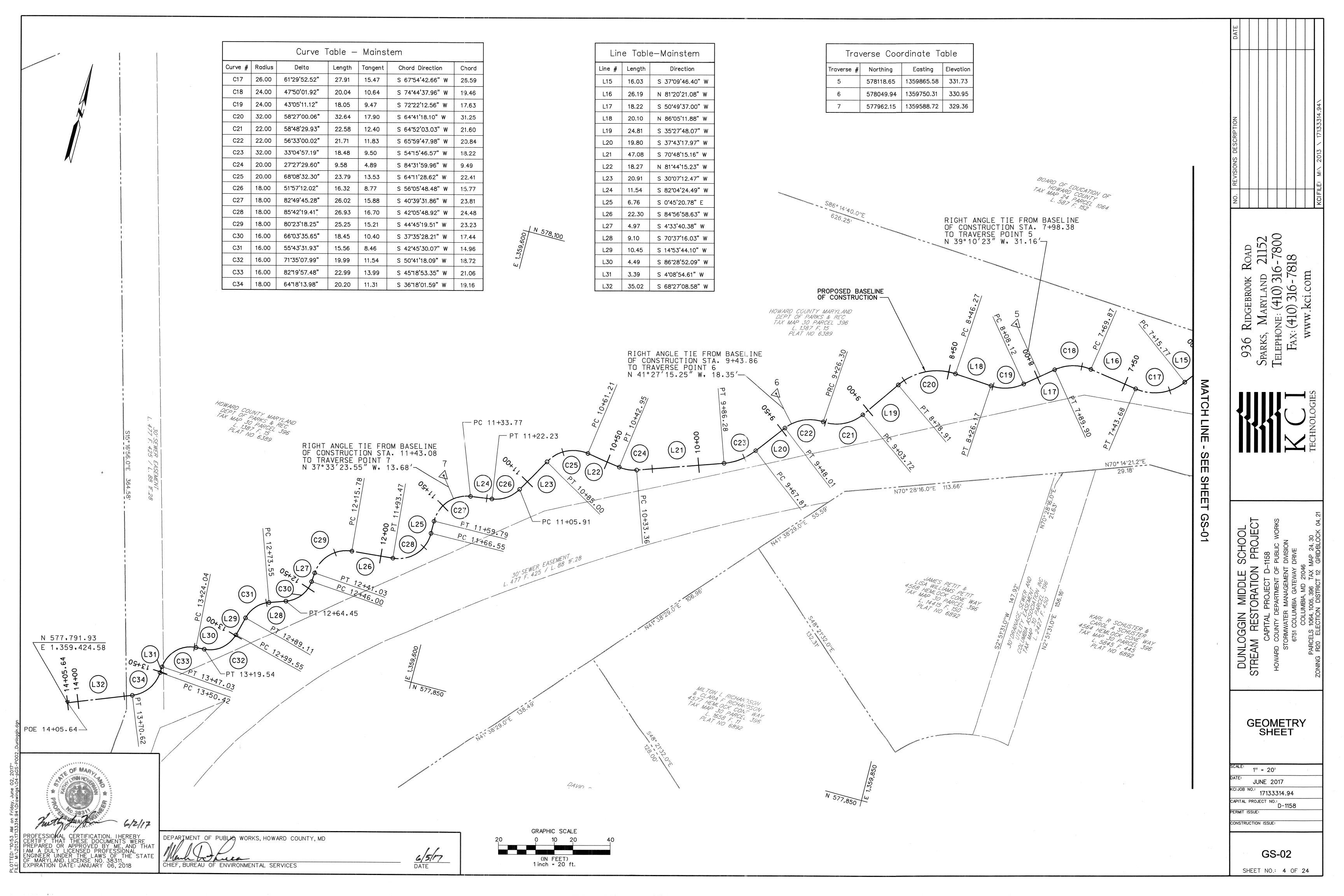
PROFESSIONAL CERTIFICATION: "I HERERBY

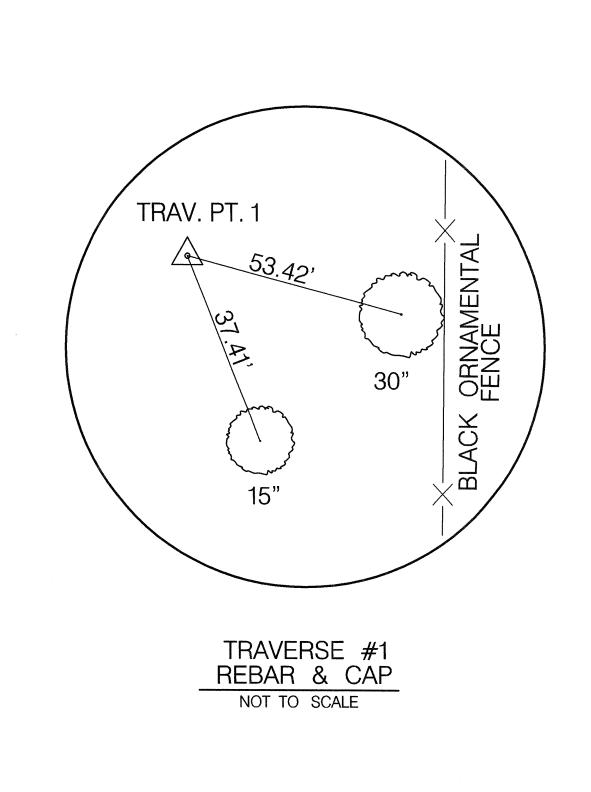
OF MAD

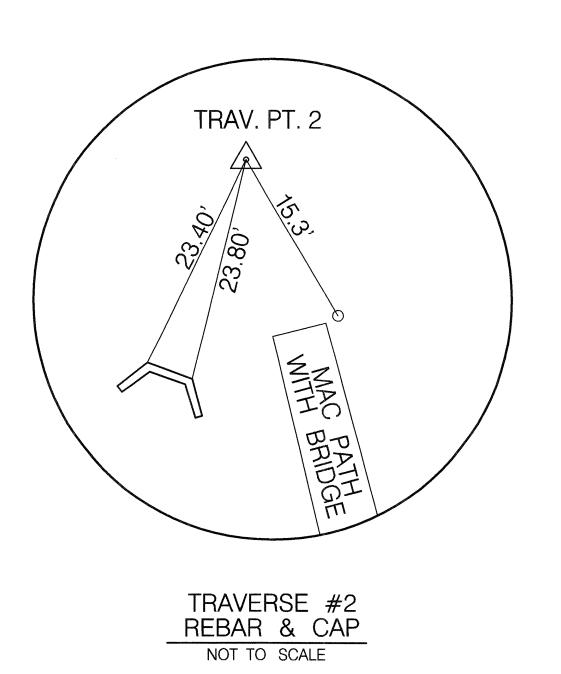
CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME , AND THAT IAM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311. EXPIRATION DATE: JANUARY 6, 2018'

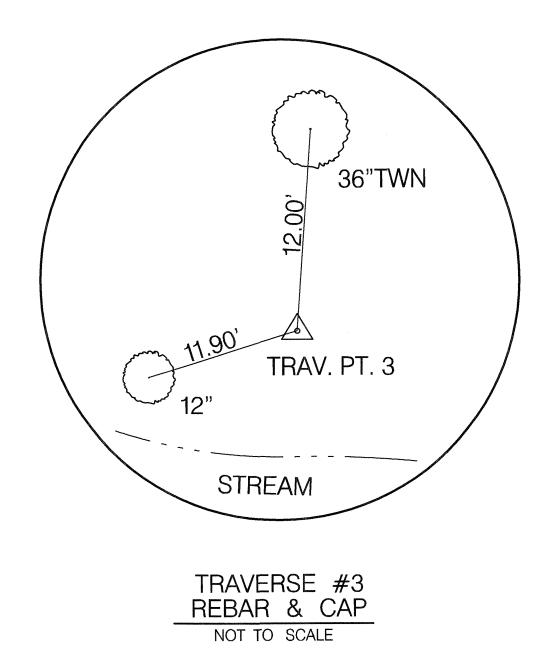


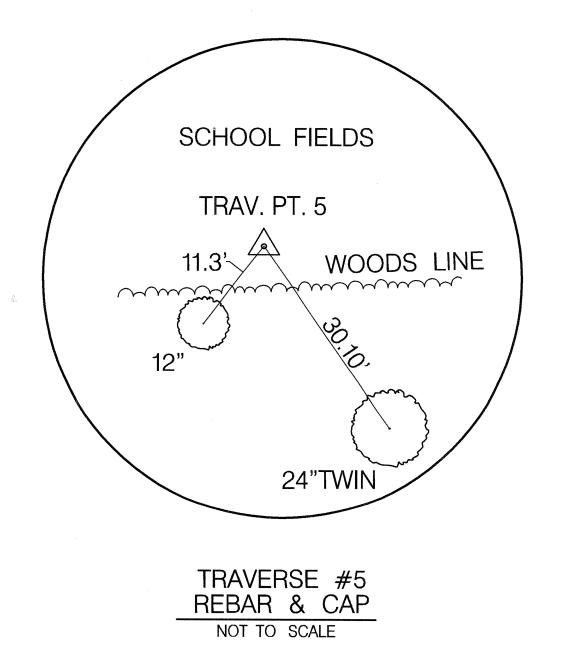


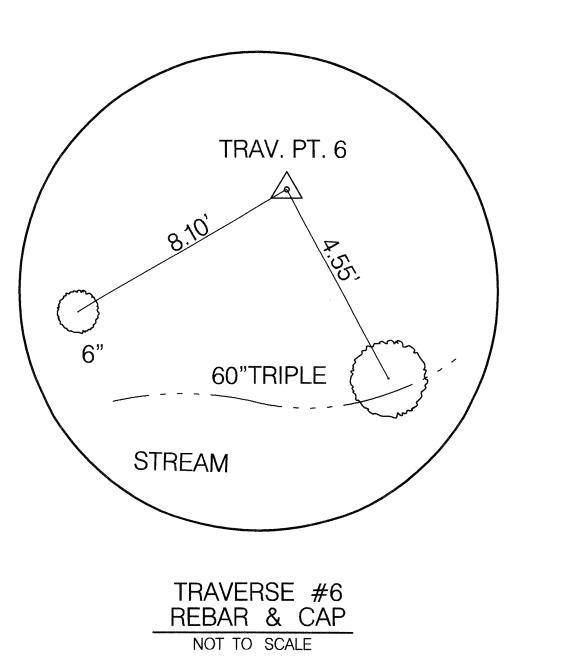


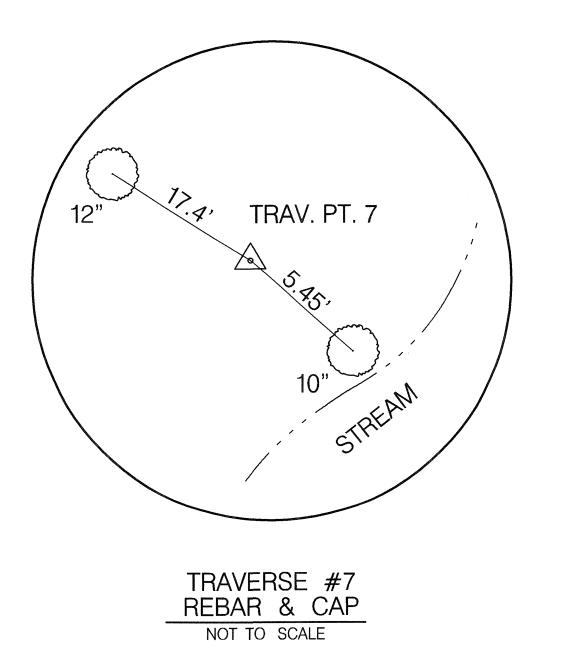


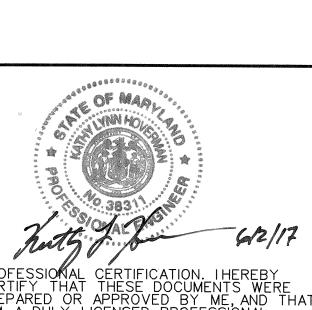












DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

6/5/17 DATE

GEOMETRY SHEET

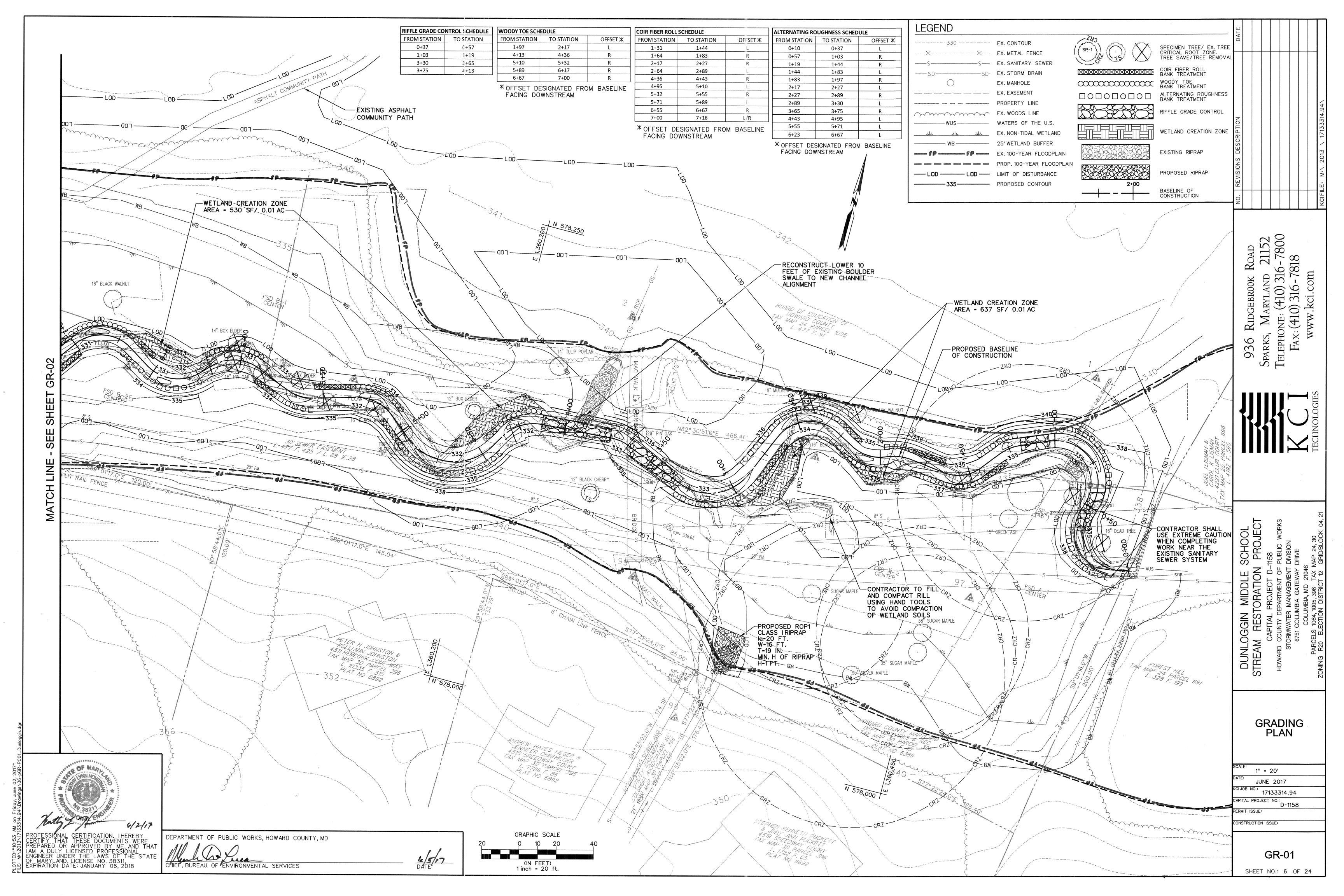
936 RIDGEBROOK ROAD SPARKS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com

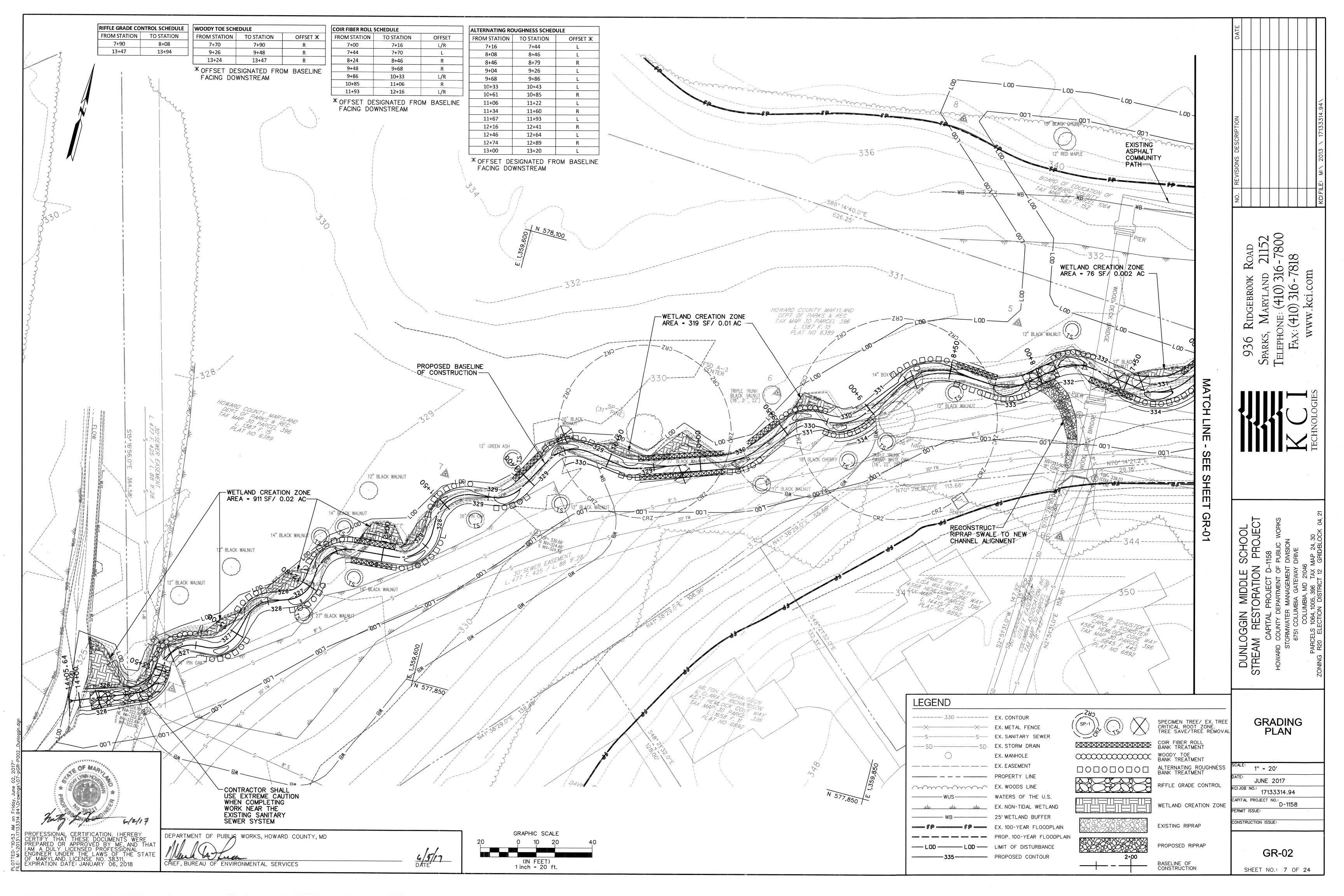
NOT TO SCALE JUNE 2017 KCI JOB NO.: 17133314.94 CAPITAL PROJECT NO.: D-1158

PERMIT ISSUE: CONSTRUCTION ISSUE:

GS-03

SHEET NO.: 5 OF 24





TIE-IN SLOPE VARIES, SEE CROSS SECTION. MAX SLOPE 2:1— TIE-IN SLOPE VARIES, SEE CROSS SECTION, MAX SLOPE 2:1— NATURAL FIBER MATTING NATURAL FIBER MATTING TOP OF BANK WITH 4" TOPSOIL — WITH 4" TOPSOIL — BANK TREATMENTS VARY. SEE GRADING PLANS FOR BANK TREATMENT LOCATIONS AND DETAIL SHEETS FOR SPECIFICS OF BANK TREATMENTS. - CHANNEL SAND AND GRAVEL 8" DEPTH MAX SLOPE 1.5:1 TOE OF BANK

NOTE: POOL RIGHT IS A MIRROR IMAGE OF POOL LEFT.

TYPICAL SECTION POOL LEFT

NOT TO SCALE

TYPICAL POOL						
PROFILE FEATURE	Α	В	С	D	E	F
POOL 1/2/3	1.3'	2.0'	9.3'	2.0'	1.9'	0.5'
P00L 4	1.3'	1.5'	8.0'	2.0'	1.9'	0.6'
SHORT POOL 2	1.3'	2.0'	9.3'	2.0'	1.5'	0.4'
SHORT POOL 3	1.3'	2.0'	8.5'	2.0'	1.5'	0.5'
CHUDT DUUI V	1 71	15'	7 5'	2 01	151	0.51

TOE OF BANK -

CHANNEL BED

NOTE: CHANNEL BED MATERIAL SHALL BE SALVAGED WHEN POSSIBLE. ONLY FURNISH

CHANNEL BED MATERIAL WHEN SALVAGED

MATERIAL IS NOT AVAILABLE. MATERIAL SHALL NOT BE COMPRISED OF RIPRAP BUT OF A NATURAL STREAM MATERIAL.

100

84

60

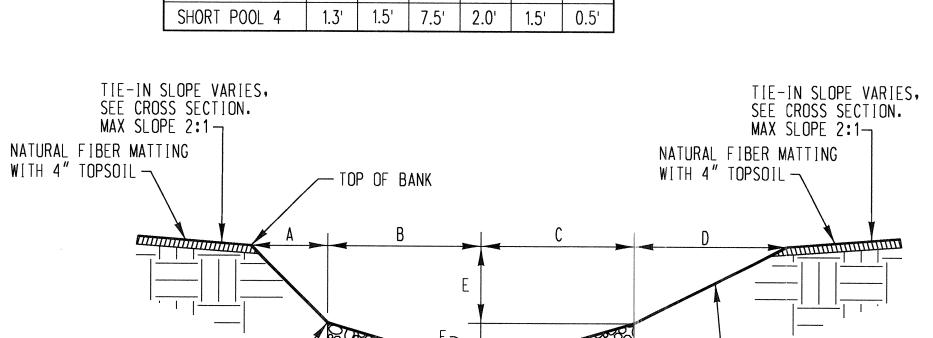
50

30

10

CHANNEL MATERIAL

12" DEPTH



NOTE: TRANSITION RIFFLE RIGHT IS A MIRROR IMAGE OF TRANSITION RIFFLE LEFT.

TYPICAL SECTION TRANSITION RIFFLE LEFT NOT TO SCALE

BACKFILL CHANNEL

AS NEEDED

TYPICAL TRANSITION RIFFLE						
PROFILE FEATURE	Α	В	С	D	E	- F
RIFFLE 1/2/3	1.8'	3.5'	3.5'	2.5'	1.1'	0.3'
RIFFLE 4	1.3'	3.5'	3.5'	1.7'	*.1'	0.3'

RIFFLE GRADE CONTROL

RIFFLE GRADE CONTROL BANK STONES 1.8' 1.1' - 1.5' NOTE: ALL STONES SHALL BE GREY OR BROWN IN COLOR.

-BANK TREATMENTS VARY.

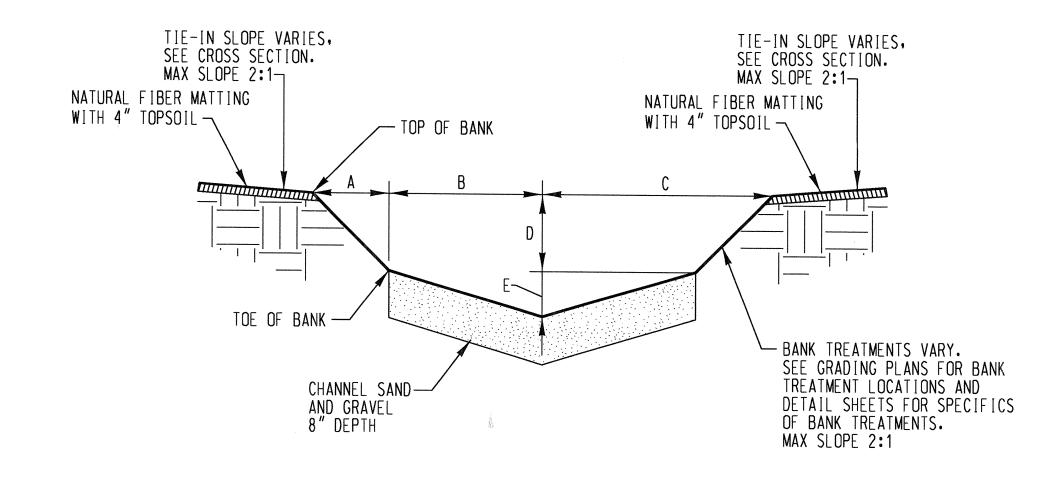
MAX SLOPE 2:1

SEE GRADING PLANS FOR BANK TREATMENT LOCATIONS AND DETAIL SHEET FOR SPECIFICS OF BANK TREATMENTS.

TYPICAL SECTION RIFFLE

NOT TO SCALE

TYPICAL RIFFLE					
PROFILE FEATURE	Α	В	С	D	E
RIFFLE 1/2/3	1.8'	3.5'	5.3'	1.1'	0.3'
RIFFLE 4	1.3'	3.5'	4.8'	1.1'	0.3'



TYPICAL SECTION POOL-POOL TRANSITION NOT TO SCALE

TYPICAL PO	YPICAL POOL-POOL				ΓΙΟΝ
STATIONS A B			С	D	E
1+97.12 & 9+26.30	1.8'	3.5'	5.3'	1.4'	0.3'

3	FILTER AND ND & GRAVEL
% LESS THAN	PARTICLE SIZE
100	2.5 in
85-100	1.0 in
60-100	0.5 in
35-70	No. 10
20-50	No. 40
3-20	No. 200

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD FOR MARK DELUCA

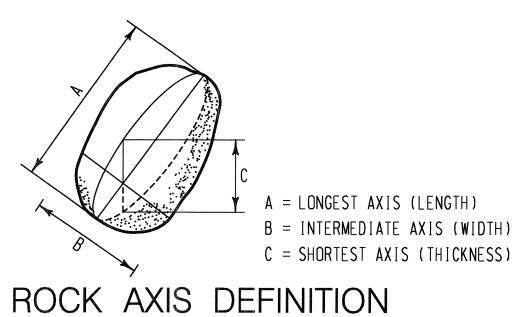
CHEE, BUREAU OF ENVIRONMENTAL SERVICES

6/12/11 DATE

MATERIAL MATERIAL PARTICLE SIZE % LESS THAN % LESS THAN | PARTICLE SIZE 5.6 in 100 9.6 in 4.7 in 84 8.1 in 60 6.2 in 3.5 in 50 2.8 in 4.8 in 30 3.2 in 2.0 in 0.6 in 10 0.8 in

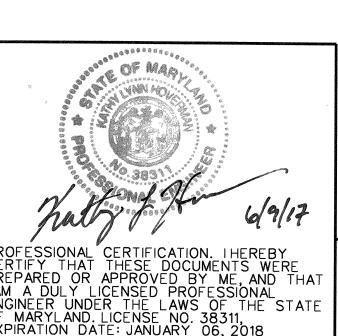
GROUND CLASS IRIPRAP EXTEND GEOTEXTILE AT LEAST 6" BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4" AT GEOTEXTILE SIDES OF THE RIPRAP.

> STONE OUTLET DITCH NOT TO SCALE



NOT TO SCALE

SIZES F	OR STONE T	YPES	
AXIS	A (LONGEST)	B (INTERMEDIATE)	C (SHORTEST
STONE TYPE	MAX.	RANGE	MIN.
ALTERNATING ROUGHNESS STONES	1.5'	0.8' - 1.3'	0.8′



DE-01 SHEET NO.: 8 OF 24

STREAM

DETAILS

NOT TO SCALE

JUNE 2017

KCI JOB NO.: 17133314.94

CONSTRUCTION ISSUE:

(CAPITAL PROJECT NO.: D-1158

KIDGEBROOK ROAD
MARYLAND 21152
ONE: (410) 316-7818

SPARKS, Telepho

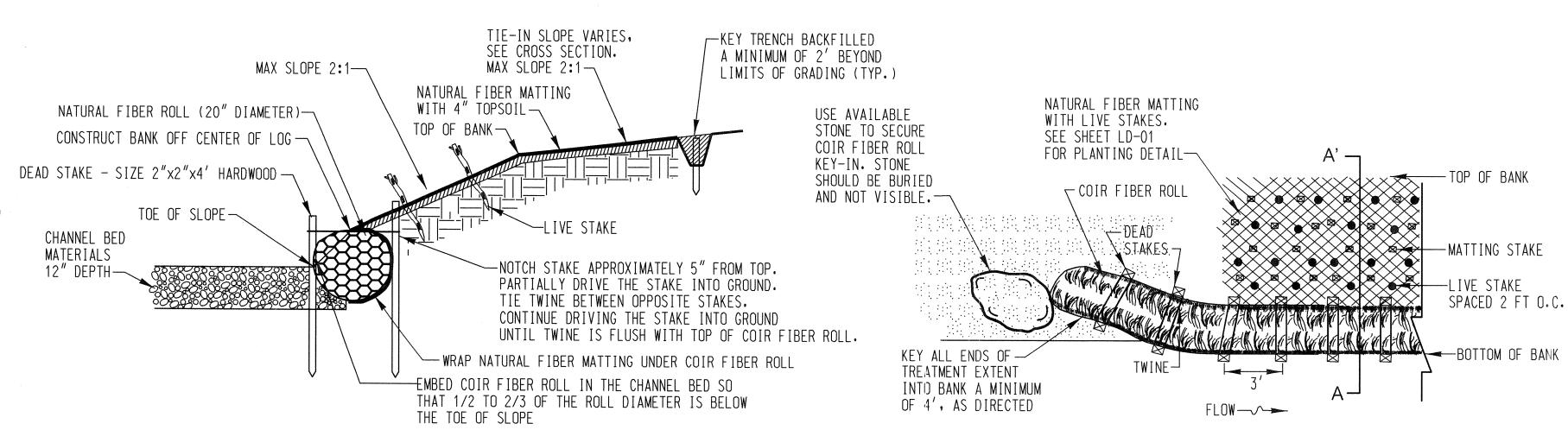
EPHONE: (4) FAX: (410)

RIDGEBROOK

936

DUNLOGGIN STREAM REST(

COIR FIBER ROLL DETAILS



COIR FIBER ROLL WITH MATTING - SECTION A-A'

NOT TO SCALE

COIR FIBER ROLL WITH MATTING

- PLAN VIEW DETAIL

NOT TO SCALE

NOTES FOR COIR FIBER ROLL:

1. DEAD STAKES SHOULD BE USED TO ANCHOR THE COIR FIBER ROLLS IN PLACE. STAKES SHOULD BE NOTCHED APPROXIMATELY 5 INCHES (13 CENTIMETERS) FROM THEIR TOPS AND POUNDED PARTIALLY INTO THE GROUND ON EITHER SIDE OF THE BUNDLE AT A SPACING STAKE TO THE NOTCH IN THE STAKE DIRECTLY OPPOSITE. THE STAKES SHOULD THEN BE DRIVEN SO THAT THE TWINE IS SECURED AGAINST THE TOP OF THE ROLL. IDEALLY, THE TOP OF THE STAKE SHOULD BE FLUSH WITH THE TOP OF THE ROLL.

2. THE ENDS OF ADJACENT LOGS SHOULD BE LACED TOGETHER WITH TWINE BY MAKING / NUMBER OF PASSES IN THE END NETTING BETWEEN THE LOGS AND PULLING THE TWINE TAUT WHERE A FIBER ROLL DOES NOT ABUT ANOTHER FIBER ROLL, THE END SHOULD BE BENT INWARD AND BURIED IN THE BANK TO PREVENT WATER FROM INTRUDING BEHIND THE ROLL AND DISLODGING

3. SUCCESSIVE ROWS OF FIBER ROLLS SHOULD BE OFFSET 3 TO 8 INCHES (8 TO 20 CENTIMETERS). ADDITIONALLY, TO ENSURE THAT ROOTS EXTEND INTO THE SOIL, PLANTS SHOULD BE PLUGGED INTO THE SIDES OF THE FIBER LOG NEAR THE SOIL. THE NEED TO BACKFILL/CONTOUR THE SOIL BEHIND THE FIBER LOGS AND BETWEEN SUCCESSIVE LIFTS WILL DEPEND ON THE SPECIFIC AESTHETIC AND PHYSICAL REQUIREMENTS OF THE PROJECT. THE RE-CONTOURED SOIL SHOULD BE SEEDED AND/OR

-KEY-IN TOP 6" (MIN.) DEPTH. REINFORCE WITH STAKES (18" SPACING) AND BACKFILL 2' BEYOND LIMITS-OF GRADING, BUT NOT TO EXCEED THE LIMITS OF DISTURBANCE MATTING STAKE-KEY-IN BOTTOM 1' (MIN DEPTH BEHIND BANK TYPICAL PLAN VIEW STABILIZATION STRUCTURE

NATURAL FIBER MATTING REINFORCED NATURAL FIBER MATTING

NOT TO SCALE

NOTES FOR NATURAL AND REINFORCED NATURAL FIBER MATTING:

1. NATURAL FIBER MATTING TO BE ROLLED LENGTHWISE ALONG STREAMBANK EXTENDING TO THE BOTTOM OF BANK STABILIZATION STRUCTURE WHERE SPECIFIED AND A MINIMUM OF TWO FEET PAST THE LIMITS OF GRADING. IF MORE THAN ONE ROLL IS REQUIRED, MID-BANK OVERLAP SHOULD BE A MINIMUM OF ONE FOOT AND SECURELY FASTENED WITH STAKES. AT TRANSITION BETWEEN NATURAL FIBER MATTING AND REINFORCED NATURAL FIBER MATTING, MATTING SHOULD BE OVERLAPPED A MINIMUM OF ONE FOOT AND SECURELY

2. NATURAL FIBER MATTING IS TO BE INSTALLED ON ALL GRADED SLOPES, HIGHLY ERODIBLE SOILS (SEE SHEETS ES-01 AND ES-02), AND WETLAND AREAS.

3. NATURAL FIBER MATTING. MATTING FOR THE BANK TREATMENT AREAS SHALL CONSIST OF A MACHINE PRODUCED MAT OF DEGRADABLE NATURAL FIBERS AND SHALL MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

MATERIAL: WOVEN COIR FIBER YARN OR TWINE THICKNESS: 0.20 IN. WEIGHT: 20 OZ/SY (700 GRAMS/SM) FLOW VELOCITY: 8 FT./SEC. (2.4 M/SEC.) SHEAR STRESS: 2 LBS./SQ. FT. (96 Pa) LONGEVITY: 2 YEARS

FASTENED WITH STAKES.

4. REINFORCED NATURAL FIBER MATTING. MATTING SHALL CONSIST OF A DOUBLE-LAYERED BIODEGRADABLE FABRIC: A BOTTOM LAYER OF JUTE FABRIC AND A TOP LAYER OF HIGH STRENGTH COIR MATTING, CONNECTED TOGETHER. REINFORCED NATURAL FIBER MATTING SHALL MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

MATERIALS: WOVEN COIR FIBER (TOP LAYER) AND JUTE FABRIC (BOTTOM LAYER) THICKNESS: 0.30 IN. WEIGHT: 28 OZ/SY (900 GRAMS/SM) FLOW VELOCITY: 10 FT/SEC. (3.0 M/SEC.) SHEAR STRESS: 3 LBS./SQ. FT. (144 Pa) LONGEVITY: 3 YEARS

5. MATTING STAKES. STAKES FOR SECURING THE MATTING ALONG OTHER PORTIONS OF THE MATTING MATERIAL ABOVE THE TOE TRENCH AND FOR THE KEY-IN TRENCH AT THE TOP OF THE SLOPE SHALL CONSIST OF 1-1/2" X 1-1/2" HARDWOOD STAKES, 18-INCHES IN LENGTH, TAPERED AT THE BOTTOM END FOR EASY INSERTION INTO THE SOIL AND FLAT AT THE TOP END FOR HAMMERING.

SHEAR STRESS: 4.5 PSF FLOW VELOCITY: 12 FT./SEC. LIFE EXPECTANCY: 3 YEARS IN REINFORCED NATURAL FIBER MATTING

6. SEE DETAIL B-4-6-B AND DETAIL B-4-6-D ON SHEET ESD-01 FOR ADDITIONAL INFORMATION ON INSTALLATION.

FINAL GRADE --SEED AND PLANT AS DIRECTED -SURFACE TO BE ROUGH GRADED ONLY AND ON THE LANDSCAPE PLANS APPROXIMATELY 6" BELOW FINAL GRADE SHOWN ON GRADING PLANS AND CROSS SECTIONS -NATURAL FIBER MATTING WHERE SPECIFIED ON PLANS TYPICAL SECTION - CREATED WETLANDS -6" MIN. SALVAGED WETLAND SOIL LAYER - USE TYPICAL NOT TO SCALE BACKFILL IF NOT AVAILABLE

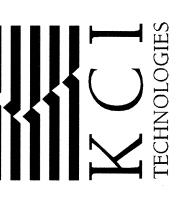
WHERE SPECIFIED

OF 3 TO 4 FEET (0.9 TO 1.2 METERS). TWINE SHOULD BE TIED FROM THE NOTCH IN ONE

PLUGGED WITH APPROPRIATE VEGETATIVE SPECIES AND COVERED WITH AN EROSION CONTROL BLANKET TO PREVENT SLOPE EROSION.

RIDGEBROOK ROAD 5, MARYLAND 21152 IONE: (410) 316-7800 K: (410) 316-7818 SPARKS, INL.

TELEPHONE: (4) $\mathbf{F}_{4}\mathbf{X}$: (410)936



DUNLOGGIN MIDDLE STREAM RESTORATION

STREAM **DETAILS**

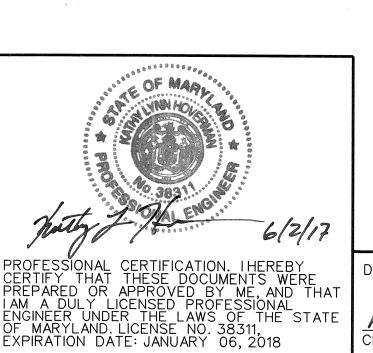
NOT TO SCALE JUNE 2017 (CI JOB NO.: 17133314.94 CAPITAL PROJECT NO.: D-1158

CONSTRUCTION ISSUE:

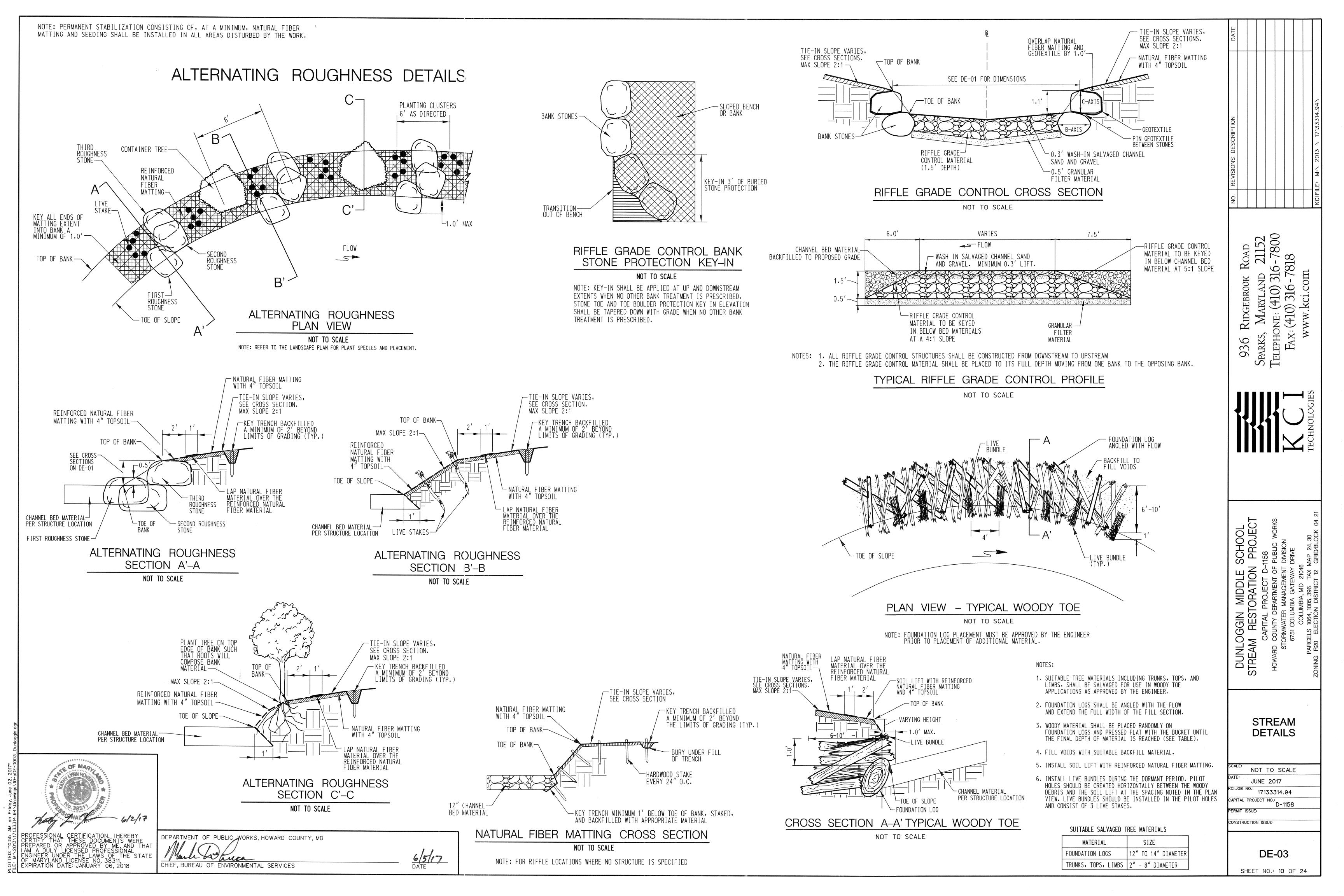
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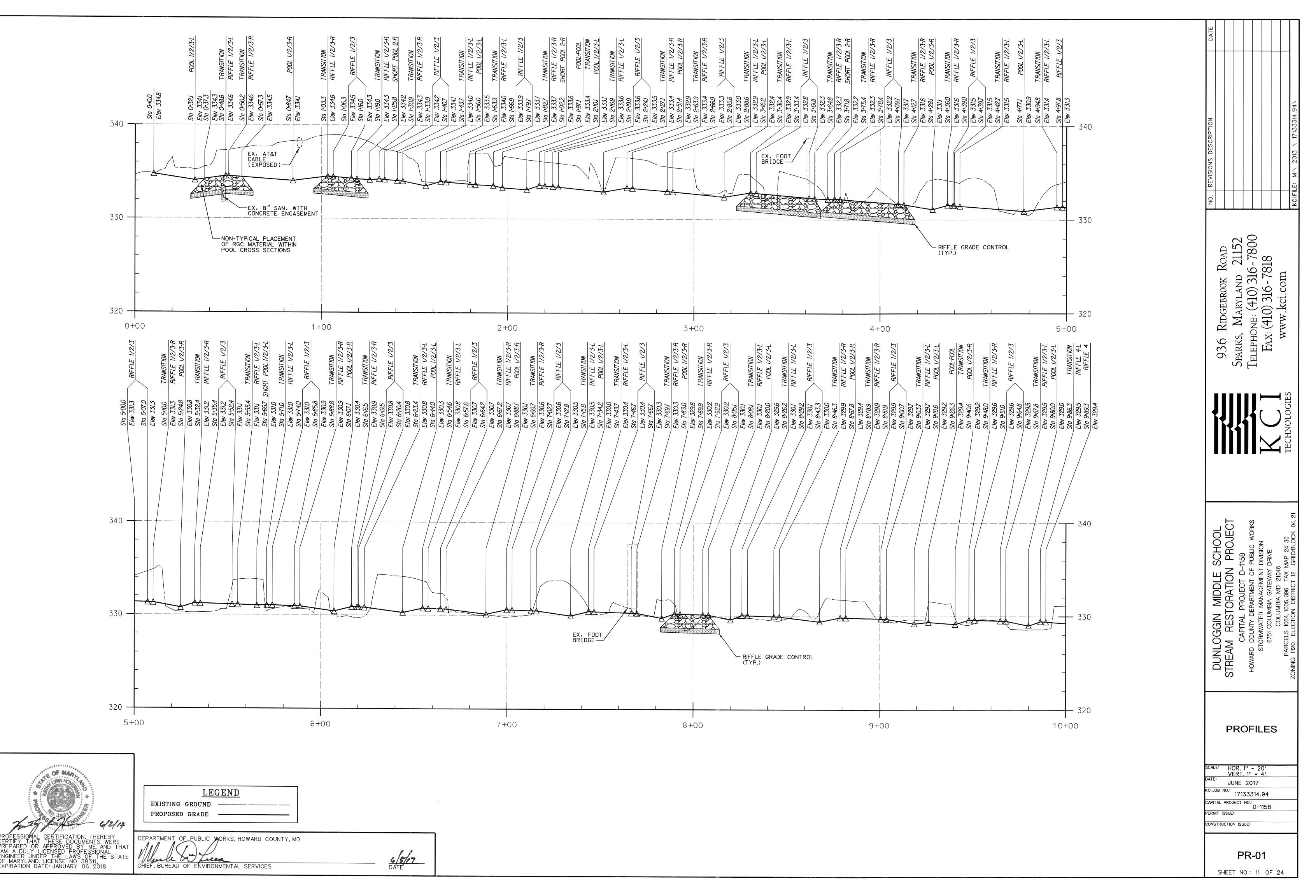
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SHEET NO.: 9 OF 24

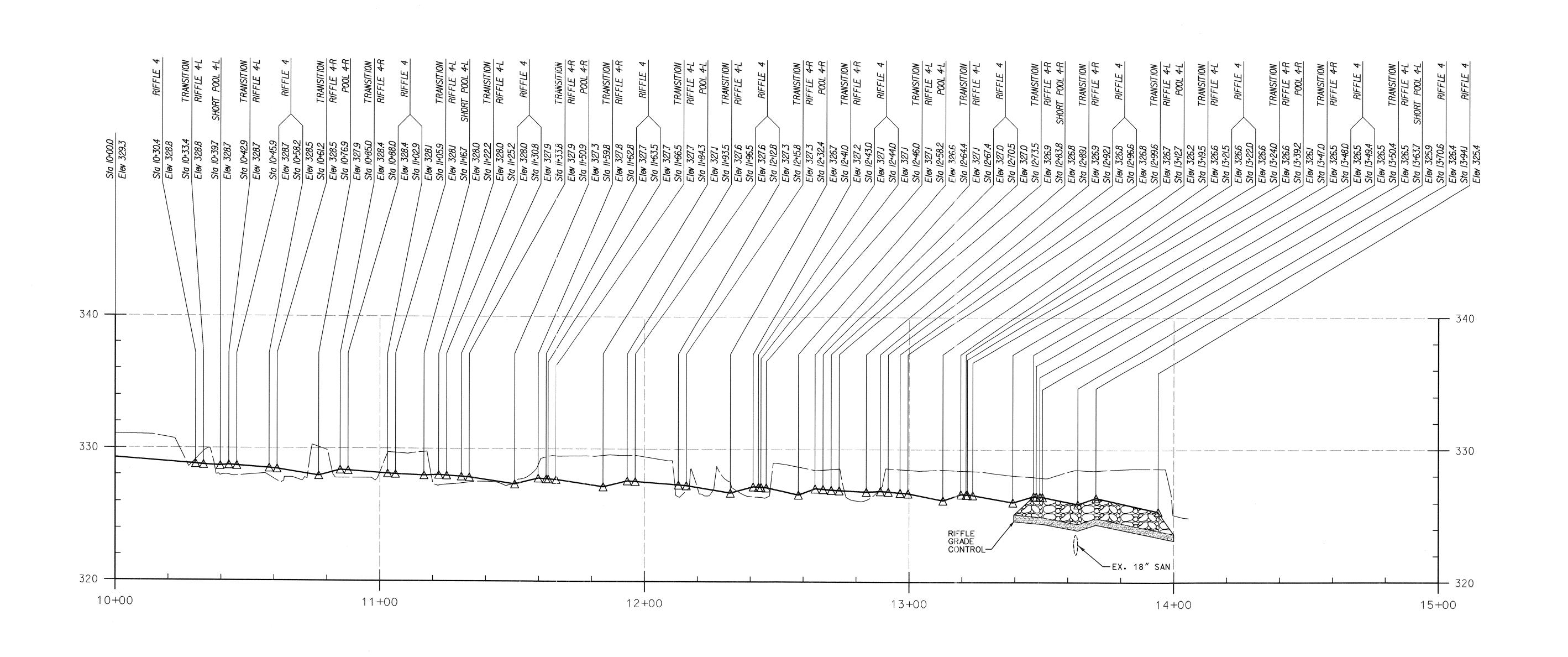


DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD CHIEF, BUREAU OF ENVIRONMENTAL SERVICES





DTTED: "10:55 AM on Friday, June 02, 2017"
E: M:\2013\17133314.94\Drawings\11-pPR-P00



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. 38311, EXPIRATION DATE: JANUARY 06, 2018

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

6/5/17 DATÉ

936 RIDGEBROOK ROAD SPARKS, MARYLAND 21152 TELEPHONE: (410) 316-7800 FAX: (410) 316-7818 www.kci.com

STREAM RESTORATION PROJECT CAPITAL PROJECT D-1158
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CAPITAL PROJECT I
HOWARD COUNTY DEPARTMENT (
STORMWATER MANAGEMEN
6751 COLUMBIA GATEWA
COLUMBIA, MD 210

PROFILES

DATE: JUNE 2017

KCIJOB NO.: 17133314.94

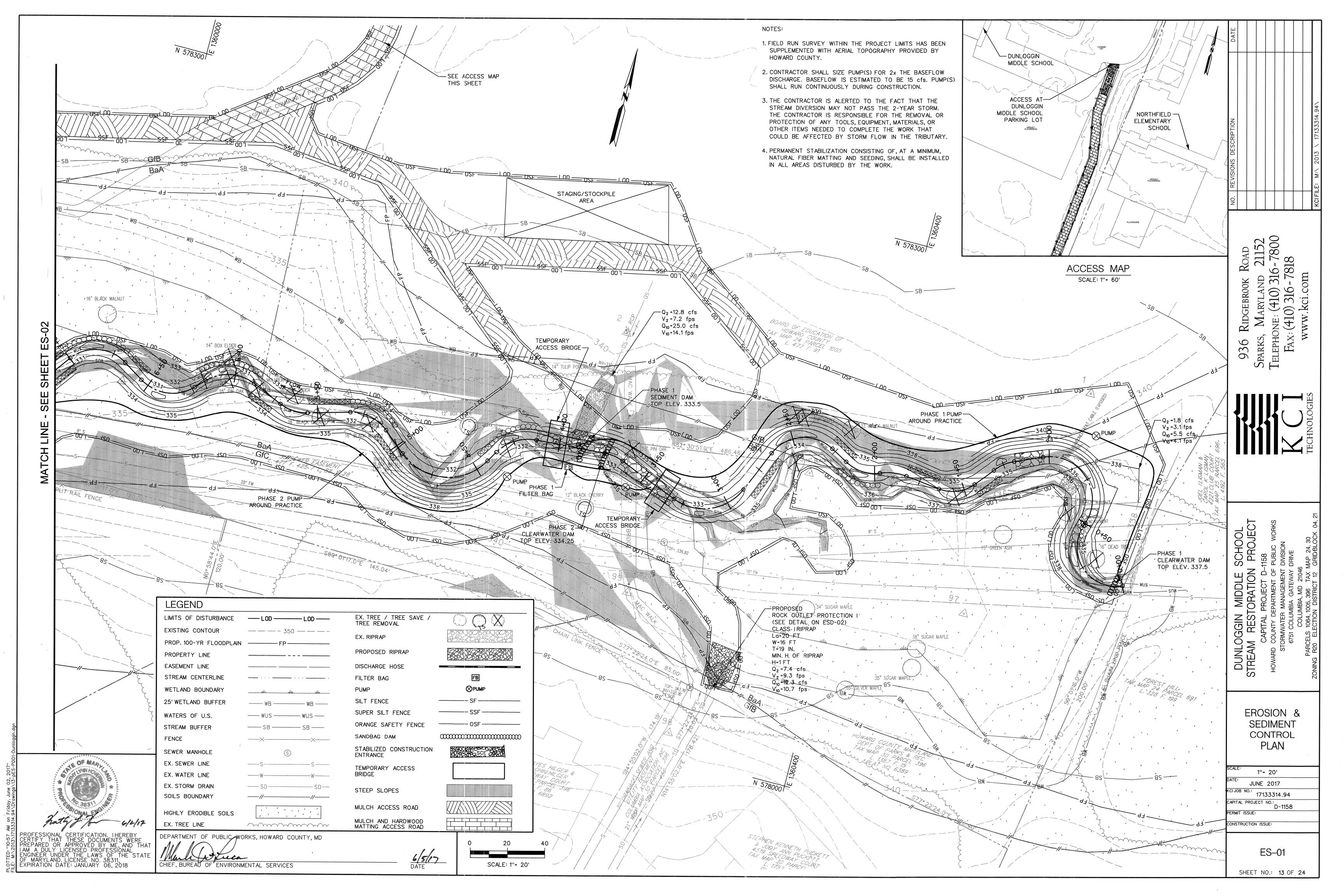
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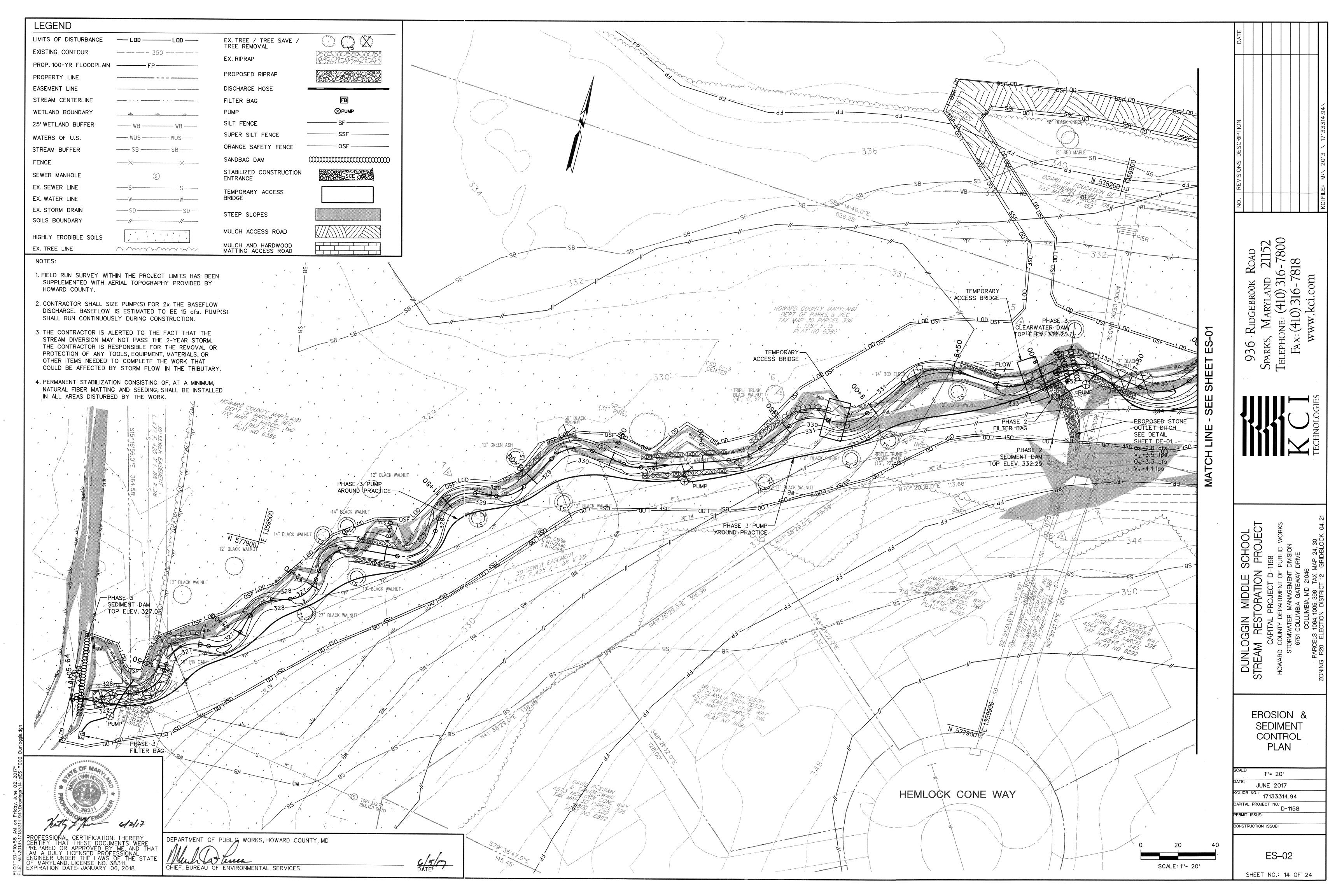
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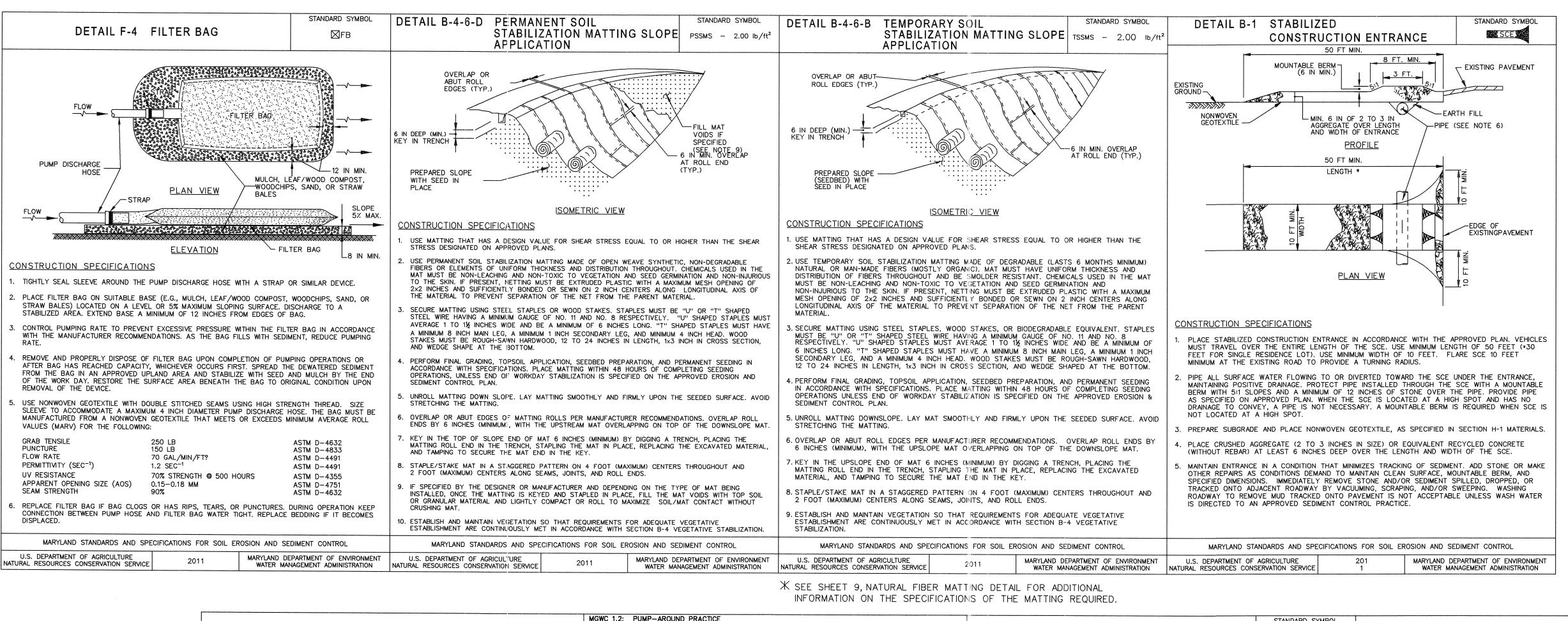
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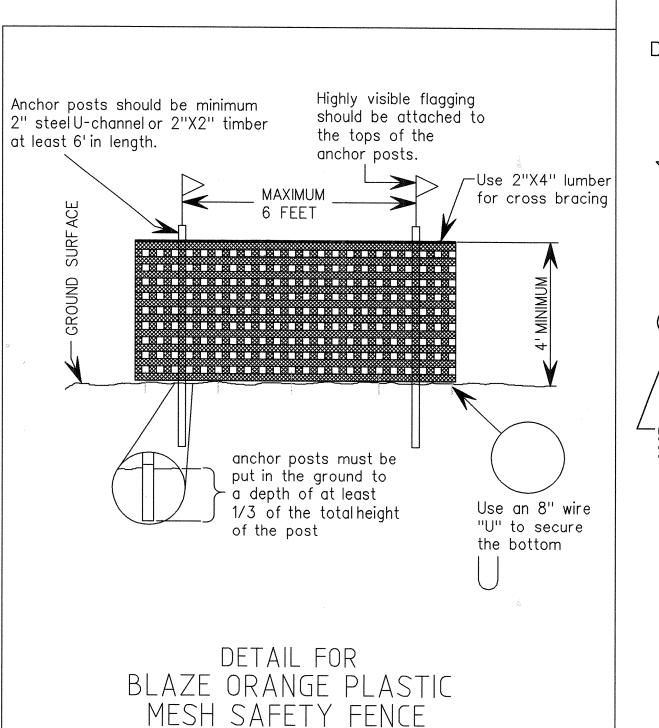
PR-02

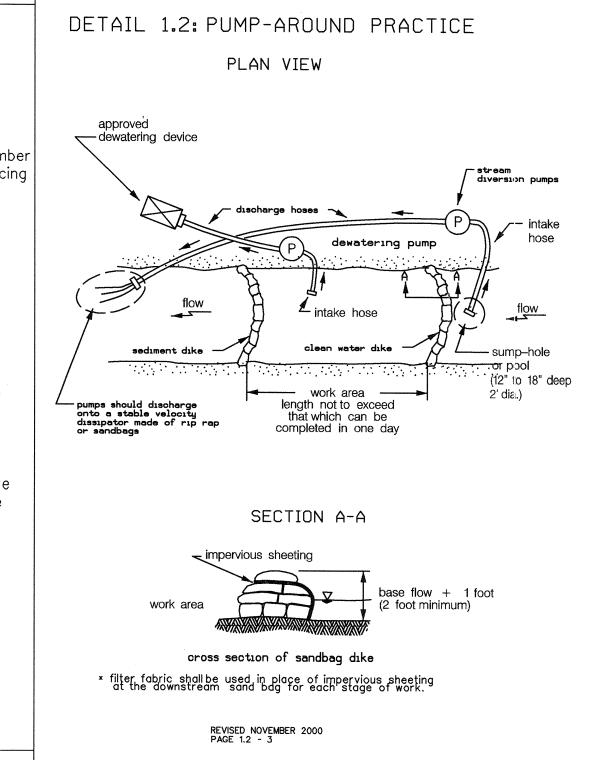
SHEET NO.: 12 OF 24





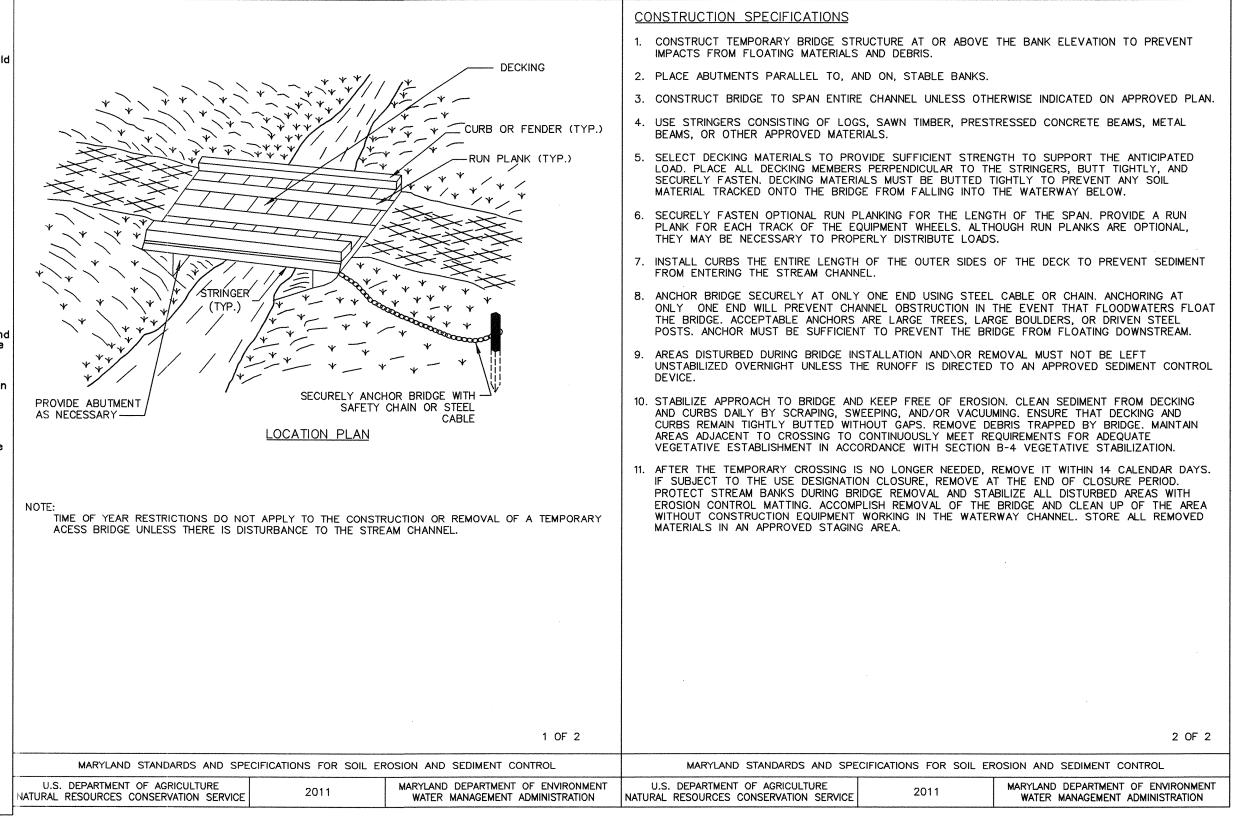


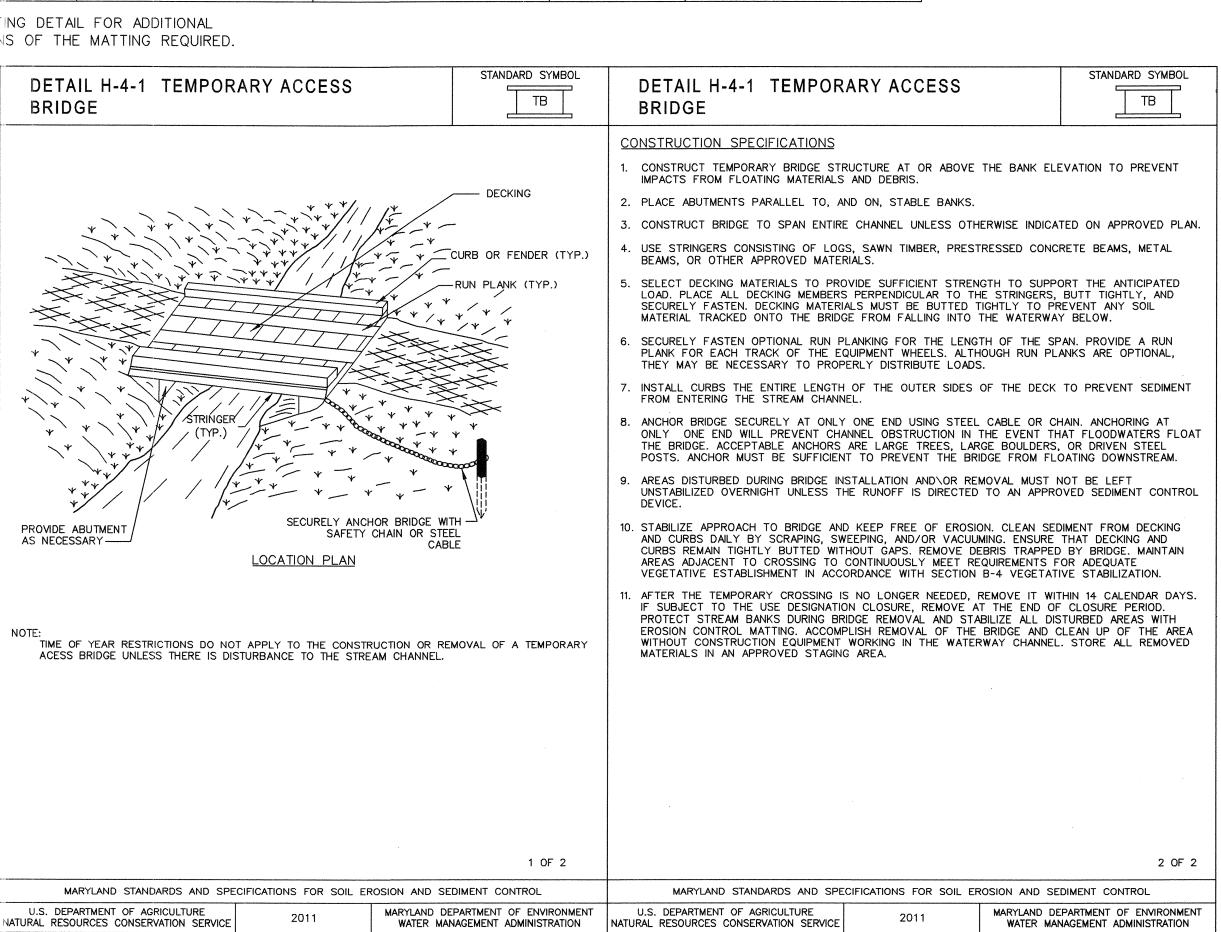


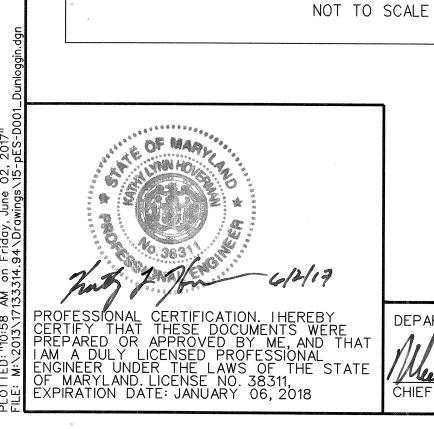


AGWC 1.2: PUMP—AROUND PRACTICE	
Temporary measure for dewatering in-channel construction sites	
DESCRIPTION	
The work should consist of installing a temporary pump around and supporting measures to divert flow pround in-stream construction sites.	
MPLEMENTATION SEQUENCE	
Sediment control measures, pump—around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):	
. 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.	
5. 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.	
6. 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 workday, 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.	
5. 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.	
7. 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.	
 3. 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).	N
 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 seed and mulch or seed and matting as specified on the plans. 	
 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. 	
1. 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.	
2. If a tributary is to be restored, construction should take place on the tributary before work on the main steam 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.	
3. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.	NAT

14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.







DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD Merketheren CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

N/A JUNE 2017 CIJOB NO.: 17133314.94 CAPITAL PROJECT NO.: PERMIT ISSUE:

EROSION &

SEDIMENT

CONTROL

DETAILS

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GAIN MIDDLE S RESTORATION

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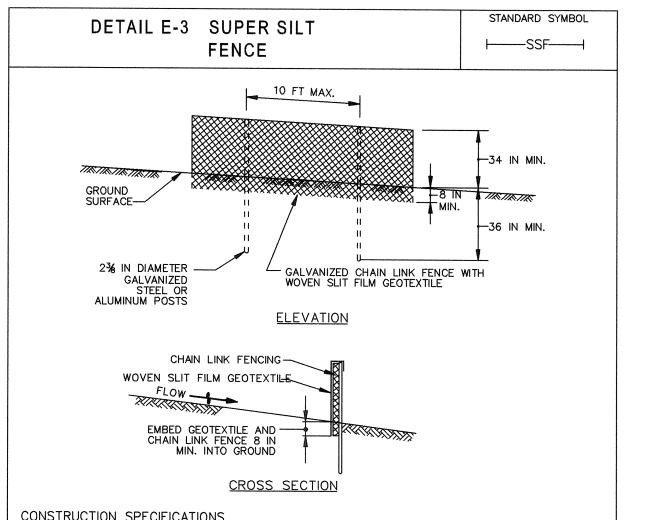
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ESD-01

CONSTRUCTION ISSUE:

SHEET NO.: 15 OF 24



CONSTRUCTION SPECIFICATIONS

INSTALL 2% INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.

- 2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (23/4 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
- 3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE
- 4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
- 5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
- 3. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- . REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE MARYLAND DEPARTMENT OF ENVIRONMENT **B-4-8 STANDARDS AND SPECIFICATIONS**

STOCKPILE AREA

<u>Definition</u>

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

<u>Purpose</u>

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.

Criteria

- 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.
- 4. 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 manner.
- 6. 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

<u>Maintenance</u>

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

B.43

B-4-7 STANDARDS AND SPECIFICATIONS

<u>FOR</u> HEAVY USE AREA PROTECTION

The stabilization of areas frequently and intensively used by surfacing with suitable materials (e.g., mulch and

To provide a stable, non-eroding surface for areas frequently used and to improve the water quality from the nunoff of these areas.

Conditions Where Practice Applies

This practice applies to intensively used areas (e.g., equipment and material storage, staging areas, heavily used

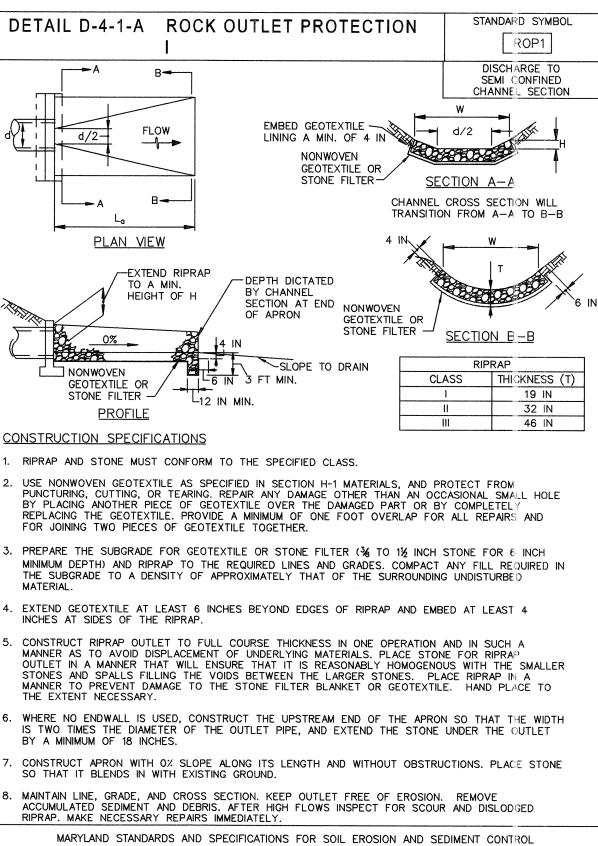
- 1. A minimum 4-inch base course of crushed stone or other suitable materials including wood chips over nonwoven geotextile should be provided as specified in Section H-1 Materials.
- 2. Select the stabilizing material based on the intended use, desired maintenance frequency, and runoff
- 3. The transport of sediments, nutrients, oils, chemicals, particulate matter associated with vehicular traffic and equipment, and material storage needs to be considered in the selection of material
- 4. Surface erosion can be a problem on large heavy use areas. In these situations, measures to reduce the flow length of runoff or erosive velocities need to be considered.

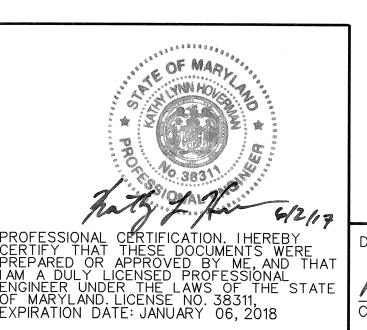
Additional control measures may be necessary to control some of these potential pollutants.

The heavy use areas must be maintained in a condition that minimizes erosion. This may require adding suitable material, as specified on the approved plans, to maintain a clean surface.

B.42

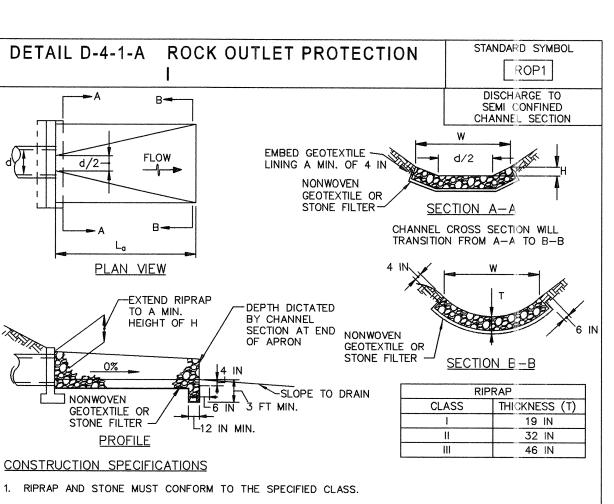
STANDARD SYMBOL STANDARD SYMBOL DETAIL E-1 SILT FENCE DETAIL E-1 SILT FENCE ├──SF----⊢——SF—— 6 FT MAX. CENTER TO CENTER _36 IN MIN. FENCE POST LENGTH DRIVEN MIN. 16 IN INTO GROUND CONSTRUCTION SPECIFICATIONS USE WOOD POSTS 13/4 X 13/4 ± 1/6 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT — 16 IN MIN. HEIGHT OF WOVEN SLIT FILM GEOTEXTILE 2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET KKKKKKKKK USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN L8 IN MIN. DEPTH INTO GROUND GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE **ELEVATION** REQUIREMENTS IN SECTION H-1 MATERIALS. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND 36 IN MIN. FENCE POST LENGTH _____ COMPACT THE SOIL ON BOTH SIDES OF FABRIC. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN WOVEN SLIT FILM-GEOTEXTILE EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE WAY THE REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING A MIN. OF 16 IN INTO THE GROUND EMBED GEOTEXTILE MIN. OF 8 IN VERTICALLY INTO THE GROUND BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF GEOTEXTILE. CROSS SECTION STEP 1 STAPLE-STAPLE--------STAPLE TWIST POSTS TOGETHER STAPLE ----STAPLE STEP 3 CONFIGURATION | STAPLE----___STAPLE <u>JOINING TWO ADJACENT SILT</u> FENCE SECTIONS (TOP VIEW) 2 OF 2 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION WATER MANAGEMENT ADMINISTRATION



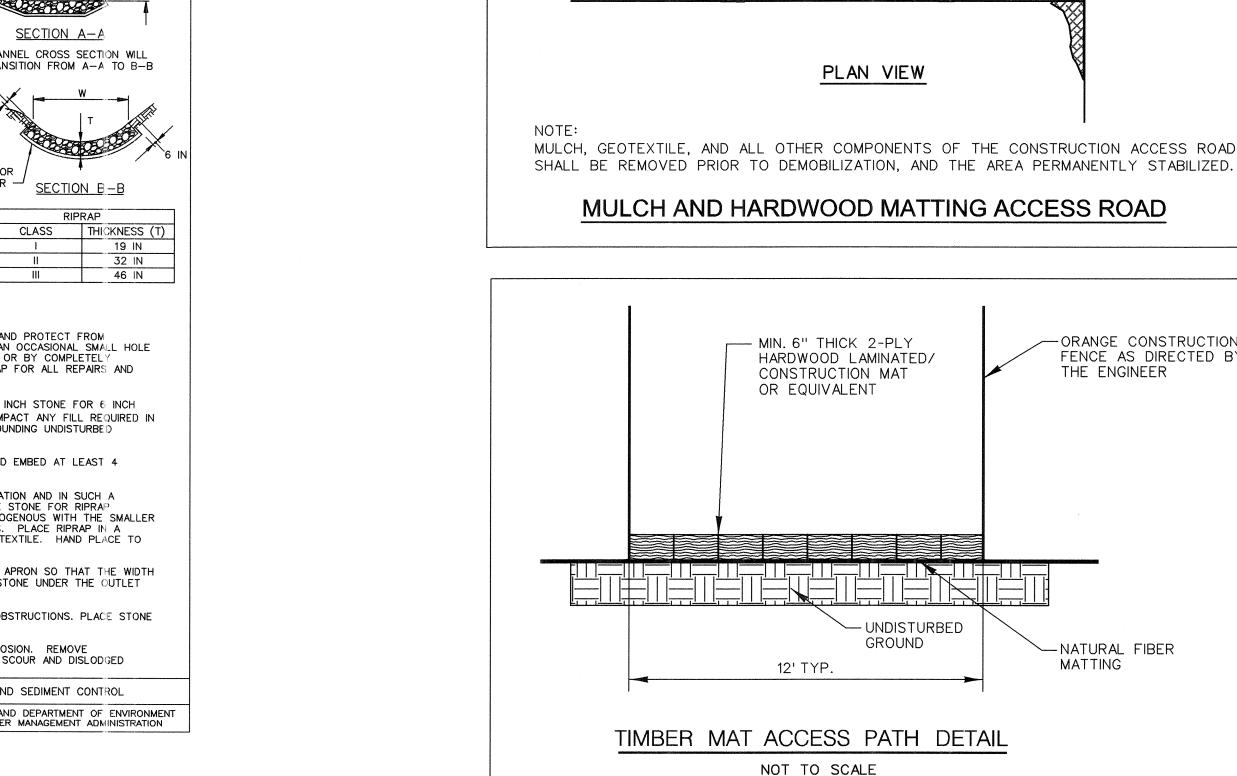


DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES



MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE



ZONES OF TREES 24" AND GREATER, WETLANDS, AND OVER SANITARY LINES.

1. TIMBER MATS TO BE INSTALLED AS INDICATED ON PLANS IN CRITICAL ROOT

AS SHOWN ON PLANS-

PROFILE

12' MINIMUM

PLAN VIEW

MULCH, GEOTEXTILE, AND ALL OTHER COMPONENTS OF THE CONSTRUCTION ACCESS ROAD

SHALL BE REMOVED PRIOR TO DEMOBILIZATION, AND THE AREA PERMANENTLY STABILIZED.

MULCH ACCESS ROAD

- AS SHOWN ON PLANS-

PROFILE

12' MINIMUM

GEOTEXTILE CLASS 'SE'

GEOTEXTILE CLASS 'SE'

LEXISTING GROUND

LEXISTING GROUND

EXISTING PAVEMENT

HARDWOOD MATTING

MIN. 4" WOOD CHIPS OR MULCH

UNDER LENGTH AND WIDTH OF

STRUCTURE

EXISTING PAVEMENT

ORANGE CONSTRUCTION FENCE AS DIRECTED BY

THE ENGINEER

- NATURAL FIBER

MATTING

8" WOOD CHIPS OR MULCH OVER LENGTH AND WIDTH OF

STRUCTURE

2. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. MINOR ADJUSTMENTS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR.

3. NATURAL FIBER MATTING SHALL BE PLACED WITH SEAMS PARALLEL TO THE FLOW OF TRAFFIC. OVERLAP FABRIC BY 18" MINIMUM AT SEAMS.

4. STABILIZE ALL EXPOSED SOIL WITH PERMANENT SEED MIX AS DEFINED IN THE PLANTING PLANS. SOIL STABILIZATION MATTING MAY BE REQUIRED AT THE DISCRETION OF THE SEDIMENT CONTROL INSPECTOR TO STABILIZE SLOPED AREAS.

OK ROAD
ND 21152
316-7800
1-7818 RIDGEBROOK ARYLANI: (410) 3: (0) 316-)NE: (... (410). SPARKS, TELEPH(36 0



SCHOOL PROJEC AM RESTORATION

> **EROSION &** SEDIMENT CONTROL **DETAILS**

N/A JUNE 2017 KCIJOB NO.: 17133314.94 APITAL PROJECT NO .:

ERMIT ISSUE:

ONSTRUCTION ISSUE:

ESD-02

SHEET NO.: 16 OF 24

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 <u>before</u> 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 EROSION AND SEDIMENT CONTROL for topsoil (Sec. B-4-2), permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec. B-4-3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B-4-1) specifications shall be enforced in areas with >15' of cut and/or fill. Stockpiles (Sec. B-4-8) in excess of 20 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:

lalysis:		
Total Area of Site:	-2.31	Acres
Area Disturbed:	-2.31	Acres
Area to be roofed or paved:	0.0	Acres
Area to be vegetatively stabilized:	-2.24	Acres
Total Cut:	1,011	Cu. Yds.
Total Fill:	457	Cu. Yds.
Offsite waste/borrow area location:	TO SIT	E WITH AN
	ACTIVE	GRADING
diment control and stick which is disc. 1, 11		1

- PERMIT 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
 - 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).
- 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.
- 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.
- 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.
- 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.
- 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.

B-4-1 STANDARDS AND SPECIFICATIONS

INCREMENTAL STABILIZATION

<u>Definition</u>

Establishment of vegetative cover on cut and fill slopes.

<u>Purpose</u>

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.

<u>Criteria</u>

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 areas as necessary.

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.

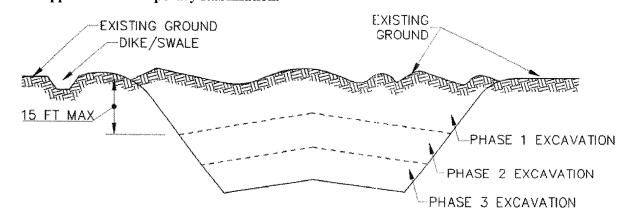


Figure B.1: Incremental Stabilization – Cut

Incremental Stabilization - Fill Slopes

- 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):
- 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.

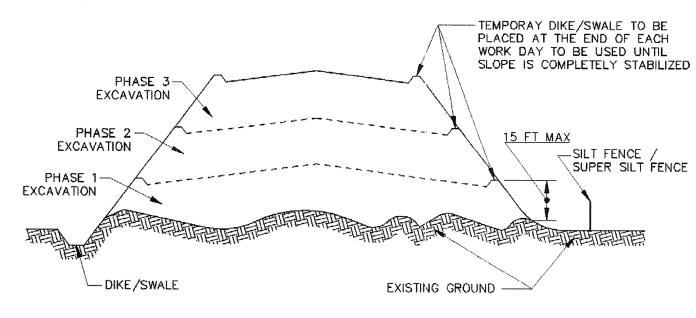


Figure B.2: Incremental Stabilization - Fill

B-4-2 STANDARDS AND SPECIFICATIONS

FOR

SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

<u>Purpose</u>

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

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

2. Permanent Stabilization

- a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - i. Soil pH between 6.0 and 7.0.
 - ii. Soluble salts less than 500 parts per million (ppm).
 - iii. 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
- 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.

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. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
- 2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
- 3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
- a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
- b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
- c. The original soil to be vegetated contains material toxic to plant growth.
- d. The soil is so acidic that treatment with limestone is not feasible
- 4. Areas having slopes steeper than 2:1 require special consideration and design.
- 5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
- a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ 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.
- c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

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

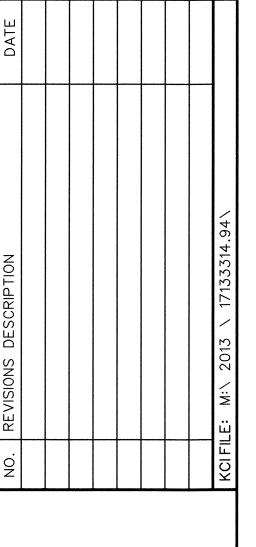
and seedbed preparation.

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 of topsoil.

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

- No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
- Place materials in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year
- 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
- 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.
- 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.
- Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
- 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 nonpersistent 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
- After installation has been completed, make post-construction grades and elevations the same as
- the original grades and elevations in temporarily impacted areas. 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 Use III waters: In-stream work shall not be conducted during the period October 1 through April 30, inclusive, during any year. Use IV waters: In-stream work shall not be conducted during the period March 1 through May 31, inclusive, during any year.
- Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
 - 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.



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SCHOOL PROJEC STREAM RESTORATION
CAPITAL PROJECT D-11

3D ST(

EROSION & SEDIMENT CONTROL

NOTES

N/A JUNE 2017 17133314.94 SAPITAL PROJECT NO.: D-1158

ERMIT ISSUE:

ONSTRUCTION ISSUE:

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SHEET NO.: 17 OF 24

F MARYLAND. LICENSE NO. 38311, XPIRATION DATE: JANUARY 06, 2018

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD Newlet Tres

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover-

<u>Purpose</u>

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.

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 is 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 materials.

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. Roll 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
- c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
- the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P₂O₅ (phosphorous), 200 pounds per acre; K₂O (potassium), 200 pounds per acre. ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by

i. If fertilizer is being applied at the time of seeding, the application rates should not exceed

- 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.

Mulching

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.
- i. 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
- 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.

2. Application

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

3. Anchoring

- 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 hazard:
- 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 of water.
- 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
- 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.

B-4-4 STANDARDS AND SPECIFICATIONS

<u>FOR</u>

TEMPORARY STABILIZATION

Definition

<u>Purpose</u>

To stabilize disturbed soils with vegetation for up to 6 months

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

HARDINESS ZONE (FROM FIGURE B.3): 6B SEED MIXTURE (FROM TABLE B.1)					FERTILIZER RATE	LIME
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEED ING DEPTHS	(10-20-20)	RATE
1	CEREAL RYE	112	3/15-5/15 8/1-11/15	1 INCH	436 LB/AC (10 LB/1000 SF)	2 tons/ac (90 LB/ 1000 SF)
2	FOXTAIL MILLET	20	5/16-7/31	1/2 INCH		

1/ 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 grasses.

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 seeding 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. Cereal rye 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.

For sandy soils, plant seeds at twice the depth listed above. The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

B-4-5 STANDARDS AND SPECIFICATIONS

<u>FOR</u>

PERMANENT STABILIZATION

<u>Definition</u>

To stabilize disturbed soils with permanent vegetation.

<u>Purpose</u>

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

Conditions Where Practice Applies

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

Criteria

1. General Use

A. Seed Mixtures

- a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant 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 Summary. The Summary is to be placed on the plan.
- b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
- 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 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.

Turfgrass Mixtures

- a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
- 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 Seeding Summary. The summary is to be placed on the plan.
- i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive 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 ranging from 10 to 35 percent of the total mixture by weight.
- ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where 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 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 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 1000 square feet. One or more cultivars may be blended
- iv. Kentucky Bluegrass/Fine Fescue Shade Mixture: For use in areas with shade in Bluegrass 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 to 70 percent. Seeding Rate: 1½ to 3 pounds per 1000 square feet.

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

c. Ideal Times of Seeding for Turf Grass Mixtures

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

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

Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)

- d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
- e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 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 seasons, or on adverse sites.

PERMANENT SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE SEED MIXTURE (FROM TABLE B.				FERTILIZER (10-20-20)	RATE		LIME
NO. SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEED ING DEPTHS	N	P205	K20	
SWITCH GRASS 1 CREEPING RED FESCUE BUSH CLOVER	10 15 2	3/1-5/15 5/16-6/15	1/4-1/2 INCH		00 11 /		2 +
7 CREEPING RED FESCUE KENTUCKY BLUEGRASS	60 15	3/1-5/15 8/1-10/15	1/4-1/2 INCH	45 LB/AC	90 lb/ac (2.0 LB/	90 lb/ac (2.0 LB/	2 tons/ac (90 LB/ 1000 SF)
CREEPING RED FESCUE 11 CHEWINGS FESCUE KENTUCKY BLUEGRASS	30 30 20	3/1-5/15 8/1-10/15	1/4-1/2 INCH	1000 SF)	1000 SF)	1000 SF)	1000 31 7
ERNST SEED MIX ERNMX-722 MD LOWER MIDLAND RIPARIAN MIX	15	2/15-10/31	1 INCH	NONE	NONE	NONE	NONE

NOTE: ERNST SEED MIX TO BE USED IN FORESTED AREAS AS SHOWN ON THE LANDSCAPE PLANS. THE REMAINING MIXES ARE SUITABLE OUTSIDE OF FOREST AND TURF ZONES.

Sod: To provide quick cover on disturbed areas (2:1 grade or flatter).

1. General Specifications

- 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 ¹/₄ 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 installation.

2. Sod Installation

- 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 laying, 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 ½ of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

SEQUENCE OF CONSTRUCTION

COMMENCE PHASE 2 STREAM WORK. (1 DAY)

COMPLETION OF CONSTRUCTION. (30 DAYS)

14. PERMANENTLY STABILIZE WORK AREA WITHIN PHASE 3. (2 DAYS)

1. OBTAIN GRADING PERMIT. STREAM IS USE IV-P WITH CLOSURE PERIOD FROM MARCH 1 MAY 31, INCLUSIVE. (MDE PERMIT TRACKING #16-NT-0416/201661829). PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, A VIDEOTAPE AND PHOTOGRAPHS OF THE PROPOSED WORK AREA SHALL BE TAKEN. (1 DAY)

. CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING THAT SHALL INCLUDE, BUT NOT BE LIMITED TO, THE COUNTY PROJECT MANAGER, THE ENGINEER, AND A REPRESENTATIVE FROM HOWARD COUNTY CONSTRUCTION INSPECTION. THE LIMIT OF DISTURBANCE SHALL BE STAKED PRIOR TO THE MEETING. (1 DAY)

3. NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT'S NONTIDAL WETLANDS AND WATERWAYS INSPECTIONS AND COMPLIANCE DIVISION AT LEAST FIVE (5) DAYS PRIOR TO ANY EARTH MOVING CONSTRUCTION WITHIN NONTIDAL WETLANDS AND/OR THEIR BUFFERS THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY WORK BEING DONE. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (410-313-1880) A MINIMUM OF 24 HOURS PRIOR TO THE START OF ANY CONSTRUCTION. (5 DAYS)

4. CONSTRUCT ORANGE SAFETY FENCE AS SHOWN ON THE PLANS. HOWARD COUNTY STORMWATER MANAGEMENT DIVISION SHALL REVIEW AND APPROVE THE LOCATION OF THE ORANGE SAFETY FENCE PRIOR TO ANY EARTH MOVING OR REMOVAL OF EXISTING TREES OR SHRUBS

5. CLEAR AND GRUB ONLY AS NECESSARY FOR INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND DEVICES. INSTALL THE

STABILIZED CONSTRUCTION ENTRANCES AT SOUTHVIEW ROAD AND RAMBLEWOOD ROAD, TEMPORARY ACCESS BRIDGES AND SILT FENCE DOWNSTREAM OF THE TEMPORARY STOCKPILE AREAS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR-THE ACCESS PATH SHALL BE STABILIZED OR LINED WITH SILT FENCE AT THE INSPECTOR'S DISCRETION. WITH PERMISSION FROM INSPECTOR, CONTRACTOR SHALL PROCEED WITH PHASE 1. (5 DAYS)

6. INSTALL PUMP-AROUND PRACTICES AS SHOWN ON SHEET ES-O1. WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, COMMENCE PHASE 1 STREAM WORK. (1 DAY)

7. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON CHANNEL AS SHOWN ON PLANS, AND STABILIZE ALL DISTURBED

AREAS AT FINAL GRADE, PUMP-AROUNDS MAY BE SHIFTED AS NECESSARY TO PERFORM GRADING AND STREAM WORK WITH APPROVAL OF

THE SEDIMENT CONTROL INSPECTOR. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA THAT CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY THE END OF EACH DAY. (2 WEEKS) 8. PERMANENTLY STABILIZE WORK AREA WITHIN PHASE 1 AND WITH APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, PROCEED WITH PHASE 2. (2 DAYS)

9. INSTALL PUMP-AROUND PRACTICES AS SHOWN ON SHEET ES-01 AND ES-02. WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR.

10. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON CHANNEL AS SHOWN ON PLANS, AND STABILIZE ALL DISTURBED AREAS AT FINAL GRADE. PUMP-AROUNDS MAY BE SHIFTED AS NECESSARY TO PERFORM GRADING AND STREAM WORK WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA THAT CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY THE END OF EACH DAY. (2 WEEKS)

11. PERMANENTLY STABILIZE WORK AREA WITHIN PHASE 2 AND WITH APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, PROCEED WITH PHASE 3. (2 DAYS)

COMMENCE PHASE 3 STREAM WORK. (1 DAY)

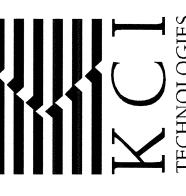
12. INSTALL PUMP-AROUND PRACTICES AS SHOWN ON SHEET ES-02. WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR.

13. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON CHANNEL AS SHOWN ON PLANS, AND STABILIZE ALL DISTURBED AREAS AT FINAL GRADE. PUMP-AROUNDS MAY BE SHIFTED AS NECESSARY TO PERFORM GRADING AND STREAM WORK WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA THAT CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY THE END OF EACH DAY. (2 WEEKS

15. WHEN VEGETATION IS ESTABLISHED AND WITH PERMISSION OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR. REMOVE ALL REMAINING EROSION AND SEDIMENT CONTROL MEASURES AND PERMANENTLY STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS.

16. CONDUCT FINAL "AS-BUILT" SURVEY OF STREAM RESTORATION MEASURES, STREAM PROFILE WITHIN RESTORATION AREAS, AND STORM DRAIN AND SUBMIT "AS-BUILT" PLANS TO THE DEPARTMENT OF PUBLIC WORKS, STORMWATER MANAGEMENT DIVISION WITHIN 30 DAYS OF

ROAD 21152 16-7800 7818 MARYLAND
ONE: (410) 316
: (410) 316 - 78
ww.kci.com RIDGEBROOK EPHO)
FAX: (936 RK



DUNL STREAN

EROSION & SEDIMENT CONTROL NOTES

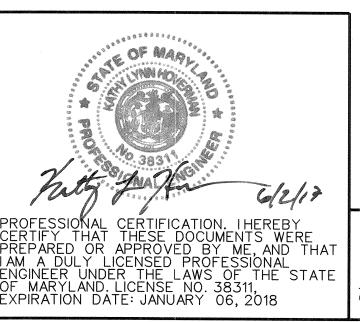
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CONSTRUCTION ISSUE:

RMIT ISSUE:

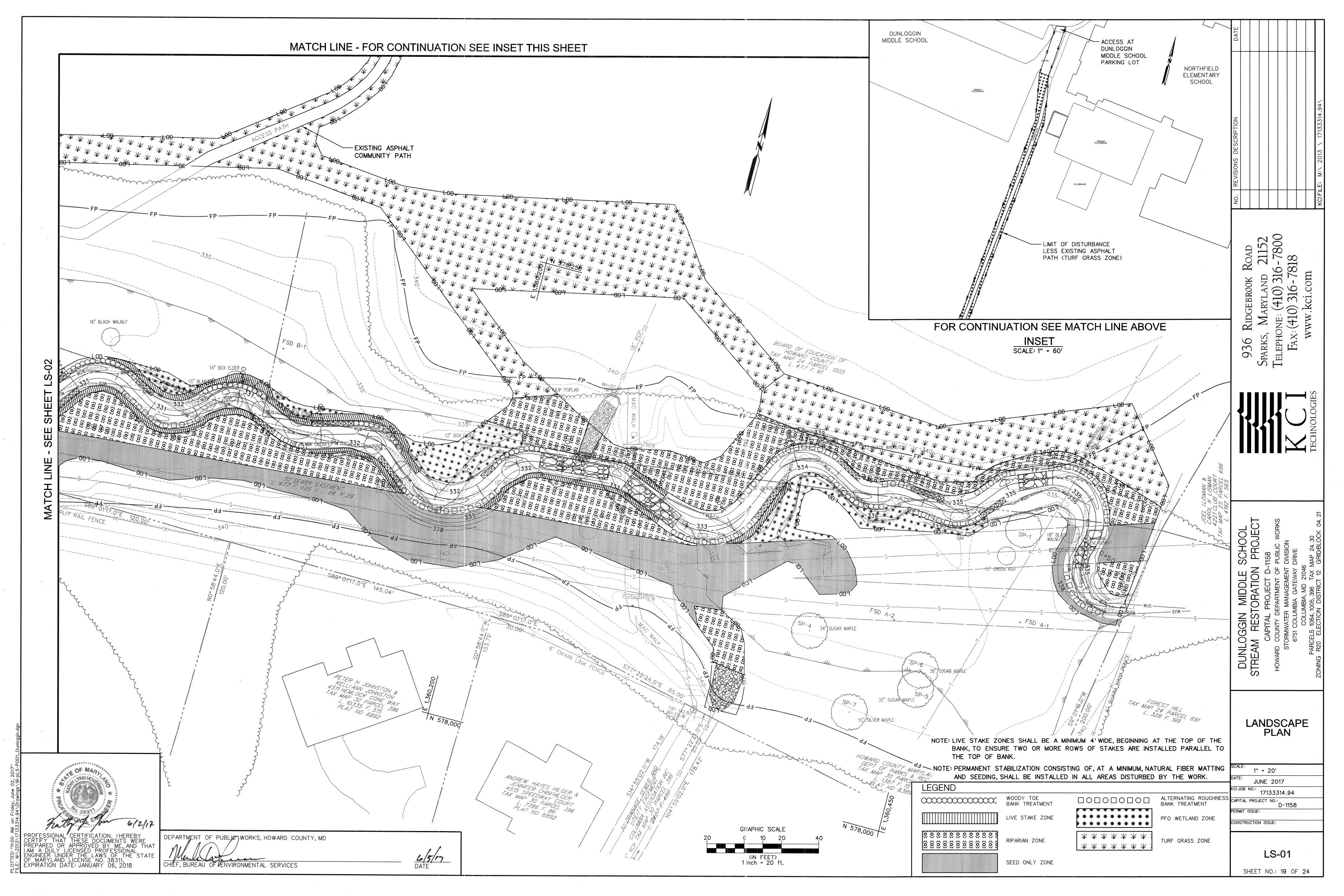
ESN-02

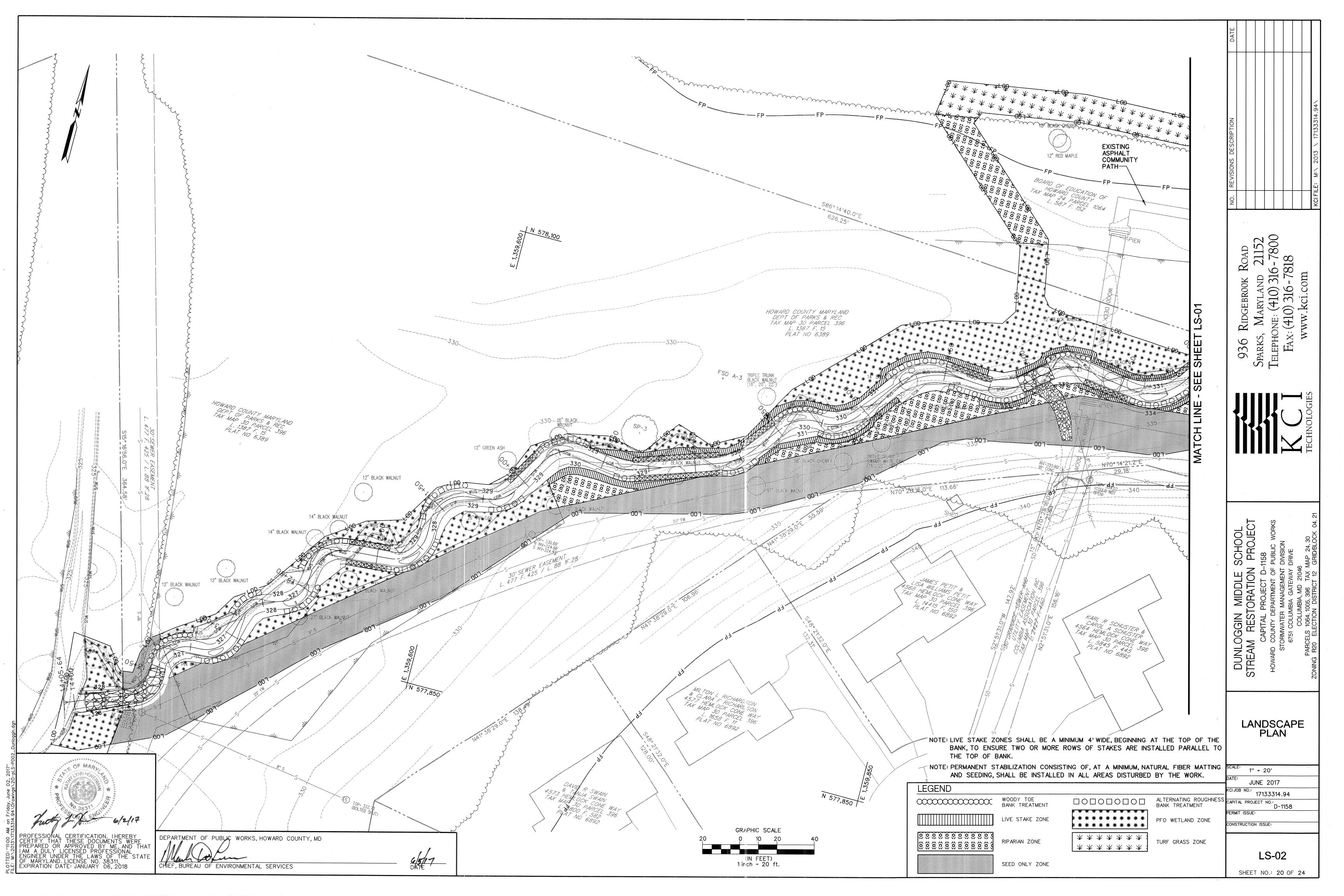
SHEET NO .: 18 OF 24



DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ÉNVIRONMENTAL SERVICES





MASTER PLANT SCHEDULE +

RIPARIAN ZONE

(SHEETS 19 - 20) (13,685 SQ FT / 0.31 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
TREES		•			
21	Quercus rubra	Northern Red Oak	5' Height	Container	11' O.C.
21	Quercus palustris	Pin Oak	5' Height	Container	11' O.C.
21	Prunus serotina	Black cherry	5' Height	Container	11' O.C.
21	Quercus alba	White Oak	5' Height	Container	11' O.C.
21	Betula nigra	River Birch	5' Height	Container	11' O.C.
SHRUBS					
14	Cercis canadensis	Eastern redbud	3' Height	Container	6'-8' O.C.
14	Viburnum dentatum	Arrowwood viburnum	3' Height	Container	6'-8' O.C.

* * * * *

PFO WETLAND ZONE (11,528 SQ FT / 0.26 AC)

(SHEETS 19 - 20)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
TREES					
18	Platanus occidentalis	American Sycamore	5' Height	Container	11' O.C.
18	Quercus palustris	Pin Oak	5' Height	Container	11' O.C.
18	Acer negundo	Boxelder	5' Height	Container	11' O.C.
18	Acer rubrum	Red maple	5' Height	Container	11' O.C.
18	Nyssa sylvatica	Black gum	5' Height	Container	11' O.C.
SHRUBS					
12	Linder benzoin	Northern Spicebush	3' Height	Container	6'-8' O.C.
12	Carpinus caroliniana	Musclewood	3' Height	Container	6'-8' O.C.

WOODY TOE (SHEETS 19 – 20) (690 SF / 0.02 AC, 251 LF)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
LIVE BUN	DLES				
48	Cornus racemosa	Gray Dogwood	3' Length 0.5"-1.0" dia.	Dormant stems	Bundles of three, every
48	Cornus amomum	Silky Dogwood	3' Length 0.5"-1.0" dia.		Bundles of three, every
48	Salix sericea	Silky Willow	3' Length 0.5"-1.0" dia.		Bundles of three, every
48	Salix eriocephala		w 3' Length 0.5"-1.0" dia.		Bundles of three, every

Note: Dormant stem quantites represent the total number of individual stems.

ALTERNATING ROUGHNESS PLANTINGS (2,382 SQ FT / 0.05 AC, 866 LF)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
TREES					
19	Celtis occidentalis	Hackberry	2" Caliper	Container	12' O.C.
19	Quercus bicolor	Swamp White Oak	2" Caliper	Container	12' O.C.
19	Platanus occidentalis	Sycamore	2" Caliper	Container	12' O.C.
19	Acer saccharinum	Silver Maple	2" Caliper	Container	12' O.C.
LIVE STAK	ES				
181	Cornus racemosa	Gray Dogwood	3' Length 0.5"-1.5" dia.	Dormant stems	5/cluster/6 LF
181	Cornus amomum	Silky Dogwood	3' Length 0.5"-1.5" dia.	Dormant stems	5/cluster/6 LF
181	Salix sericea	Silky Willow	3' Length 0.5"-1.5" dia.	Dormant stems	5/cluster/6 LF
181	Salix lucida	Shinning Willow	3' Length 0.5"-1.5" dig.	Dormant stems	5/cluster/6 LF

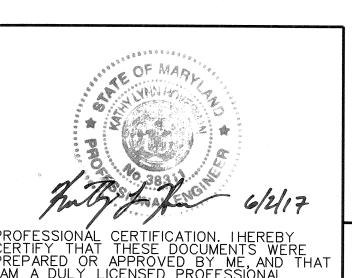
Note: Alternate Roughness Planting locations shall be staked for approval by the engineer, prior to installation. Dormant stem quantites represent the total number of individual stems.

LIVE STAKES ZONE (SHEETS 19 - 20) (3,320 SQ FT / 0.08 AC)

L	Qty	Botanical Name Common Name		Size	Form	Spacing/Rate
L	139	Cornus sericea	Red Osier Dogwood	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.
	139	Cornus amomum		3' Length 0.5"-1.5" dia.		<u> </u>
	139	Viburnum dentatum		3' Length 0.5"-1.5" dia.		
	139	Cephalanthus occidentalis	Buttonbush	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.
	139	Salix lucida	Shinning Willow	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.
L	139	Salix sericea	Silky Willow	3' Length 0.5"-1.5" dia.	Dormant Stems	2' O.C.

+NOTES:

1. 4 INCHES OF TOPSOIL SHALL BE PLACED THROUGHOUT THE SITE EXCEPT IN EXISTING WETLANDS TO INCREASE SOIL FERTILITY.
2. ALL PLANT MATERIAL EXCEPT TEMPORARY SEEDING SHOULD BE INSTALLED AFTER CONSTRUCTION DURING THE DORMANT PERIOD (BEGINNING MID-AUGUST).



DEPARTMENT OF PUBLIC, WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

PERMANENT SEEDING FOR

LIVE STAKES, WOODY TOE & ALTERNATING ROUGHNESS (SHEETS 19 - 20)

 ∞ Qty(lbs)* Seed Mix 2.3 ERNMX-723 OR EQUIVALENT

*Seeding shall be applied at a 15 lbs/AC seeding rate.

PERMANENT SEEDING FOR SEED ONLY, RIPARIAN ZONE & PFO WETLAND ZONE

* * * *

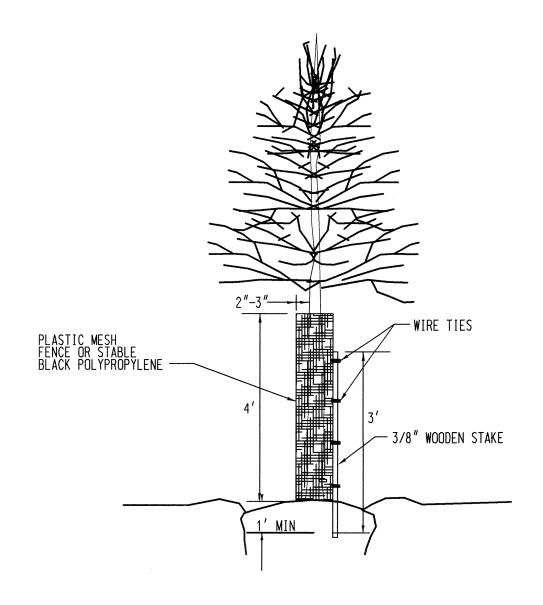
Qty(lbs)* Seed Mix ERNMX-722 OR EQUIVALENT

*Seeding shall be applied at a 15 lbs/AC seeding rate.

TURF GRASS ZONE (SHEETS 19 - 20) (25,302 SQ FT / 0.58 AC)

Qty(lbs)*	Seed Mix
116.0	SHA Seed mix No. 1 (920.06.07 a)

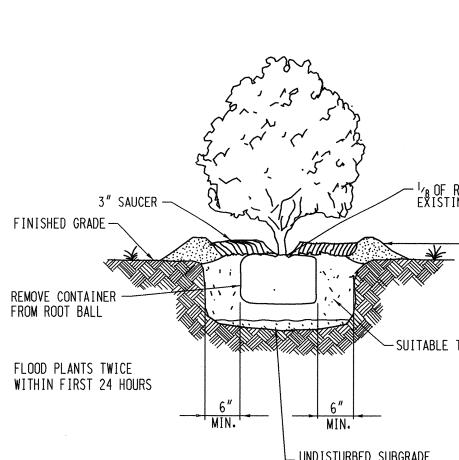
*Seeding shall be applied at a 200 lbs/AC seeding rate.



TREE SHELTER DETAIL NOT TO SCALE



LIVE STAKE DETAIL NOT TO SCALE



--- REMOVE CONTAINER FROM ROOT BALL

TREE PLANTING DETAIL

NOT TO SCALE

NOTE: FLOOD PLANTS TWICE WITHIN FIRST 24 HOURS

SQUARE CUT-

LIVE CUTTING —— (0.5" MIN. DIAMETER)

__ UNDISTURBED SUBGRADE

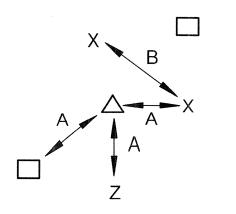
SHRUB PLANTING DETAIL NOT TO SCALE

LANDSCAPE DETAILS

NOT TO SCALE JUNE 2017 KCI JOB NO.: 17133314.94 CAPITAL PROJECT NO.: D-1158 CONSTRUCTION ISSUE:

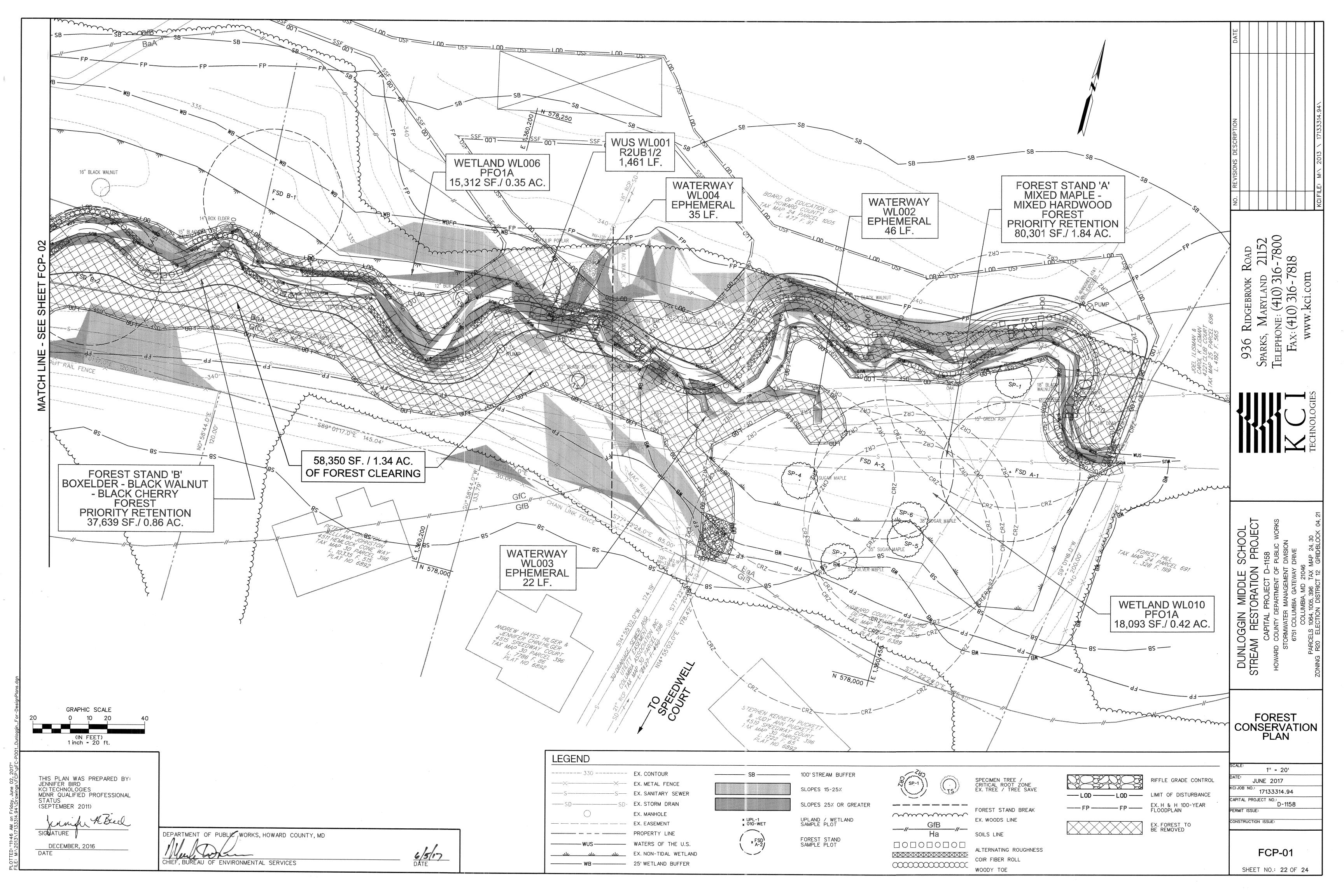
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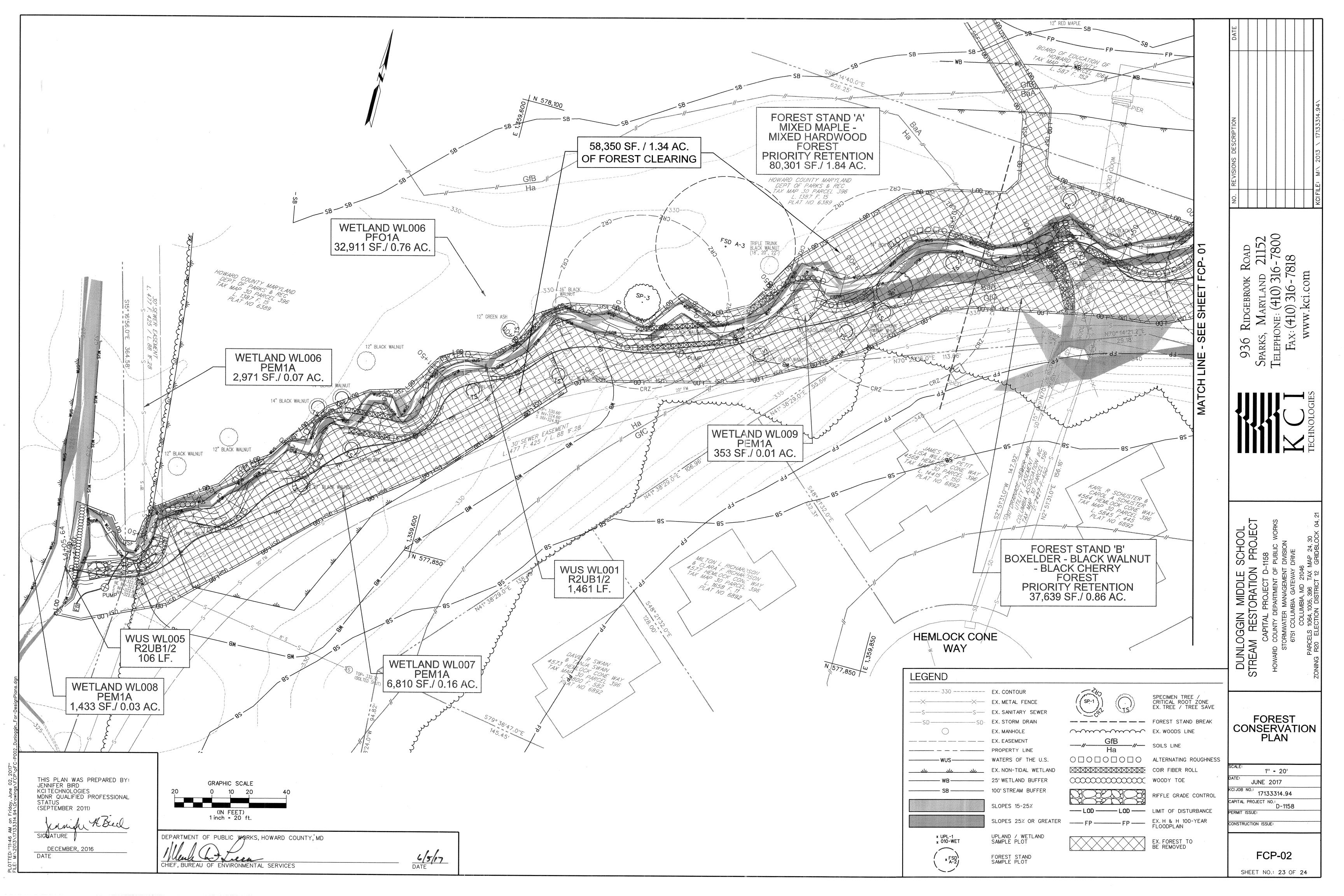
SHEET NO.: 21 OF 24



Z SHRUB SPECIES B: DUPLICATE SPECIES SPACING MINIMUM 2 TIMES MINIMUM SPACING

TREE AND SHRUB RANDOM SPACING NOT TO SCALE





WATER RESOURCES NOTES

- 1. WATERS OF THE UNITED STATES (WUS) AND WETLANDS WERE DELINEATED BY KCI TECNOLOGIES, INC. IN JUNE 2016.
- 2. FIVE NONTIDAL WETLAND, TWO WUS, AND THREE EPHEMERAL CHANNELS WERE IDENTIFIED WITHIN THE STUDY AREA.
- 3. WETLANDS SHOWN REPRESENT THE VERIFIED USACE BOUNDARIES.

FOREST RESOURCES NOTES

- 1. THE STUDY AREA BOUNDARY IS APPROXIMATELY 100-FEET WIDE.
- 2. FOREST STANDS EXTEND BEYOND THE STUDY AREA BOUNDARY.
- 3. TWO FOREST STANDS WERE IDENTIFIED DURING FIELD INVESTIGATIONS AND ARE CLASSIFIED AS PRIORITY RETENTION.
- 4. SEVEN SPECIMEN TREES WERE LOCATED DURING FIELD INVESTIGATIONS (SEE TABLE, THIS SHEET).

FOREST CONSERVATION NOTES

- 1. THE LOD (LIMIT OF DISTURBANCE) WAS USED AS THE TOTAL TRACT FOR FOREST CONSERVATION CALCULATIONS AS APPROVED UNDER WAIVER PETITION WP-17-066.
- 2. 1.32 ACRES OF CLEARING WILL BE WITHIN THE 100-YEAR FLOODPLAIN. THESE AREAS WILL BE REPLANTED AS SEEN ON THE LANDSCAPE PLANS, SHEETS 18 THROUGH 19 AND THE LANDSCAPE DETAILS ON SHEET 20.
- 3. ALL EFFORTS TO MINIMIZE THE AREA OF DISTURBANCE WILL BE MADE.
- 4. THE 0.15 ACRES OF FOREST MITIGATION WILL BE SATISFIED THROUGH FEE-IN-LIEU. FEE-IN-LIEU WILL BE PAID AT \$0.75/SF. $(6,534 \text{ SF. } \times \$0.75 = \$4,900.50).$
- 5. CURRENT ACREAGE OF FOREST WITHIN THE LOD IS 1.34 ACRES. THE ENTIRE LOD WILL BE REPLANTED.

GENERAL NOTES

- 1. TOPOGRAPHICAL SURVEY DATA PROVIDED BY KCI TECHNOLOGIES, INC. WAS COMPLETED IN AUGUST 2016.
- 2. THE EXISTING LAND USE IS FORESTED. SURROUNDING LAND USE IS DESIGNATED AS MEDIUM DENSITY RESIDENTIAL.
- 3. EXISTING ZONING IS RESIDENTIAL SINGLE (R-20).
- 4. CRITICAL HABITATS CONSIST OF NONTIDAL WETLANDS, THEIR BUFFERS, STEEP SLOPES, AND THE PERENNIAL UNNAMED TRIBUTARIES TO PLUMTREE BRANCH.
- 5. NO RARE, THREATENED OR ENDANGERED SPECIES WERE ENCOUNTERED DURING THE FIELD INVESTIGATIONS. CORRESPONDENCE WITH THE THE MARYLAND HISTORICAL TRUST INDICATE NO HISTORIC RESOURCES WITHIN THE STUDY AREA. IN ADDITION, CORRESPONDENCE WITH THE U.S. FISH & WILDLIFE SERVICE AND THE MARYLAND DEPARTMENT OF NATURAL RESOURCES INDICATE NO RARE, THREATENED OR ENDANGERED SPECIES WITHIN THE STUDY AREA.
- 6. THE PROJECT AREA IS LOCATED ON PROPERTIES OWNED BY HOWARD COUNTY PARKS AND RECREATION AND HOWARD COUNTY BOARD OF EDUCATION (MAP 30 PARCEL 396, AND MAP 24, PARCELS 1005 AND 1064).
- 7. TOTAL AREA OF NONTIDAL WETLANDS WITHIN THE PROJECT AREA: 13,400 SF / 0.31 AC.
- 8 TOTAL LINEAR FEET OF PERENNIAL AND INTERMITTENT STREAMS: 1,500 LF.
- 9. TOTAL FORESTED AREA WITHIN LIMITS OF DISTURBANCE BUT OUTSIDE THE 100 YEAR FLOODPLAIN IS: 0.02 AC
- 10. NO SPECIMEN TREES WILL BE REMOVED.
- 11. TREE SAVES ARE SHOWN WITHIN THE LOD BECAUSE AN ATTEMPT WILL BE MADE TO SAVE THESE TREES. TREES WILL ONLY BE REMOVED IF NECESSARY FOR GRADING OR ACCESS.

Forest Conservation Worksheet 2.2

Net Tra	act Area			•		
A.	Total Tract Area				A =	2.31
B.	Deductions			•	B =	1.64
C.	Net Tract Area				C =	0.67
Land L	lse Category					
	Input the number "1" u	nder the ar	propriate	land use		******************
	zoning, and limit to only					
	ARA MDR IDA	HDR	MPD	CIA		
	0 1 0	0	0	; O		
D.	Afforestation Threshold (Net Tra	ct Area x	20%		D =	0.13
-,· Е.	Conservation Threshold (Net Tra	and the second second	25%	. /	E =	0.17
Existin	g Forest Cover			/		<u> </u>
F.	Existing Forest Cover within the N	et Tract Are	ea		F = .	0.02
G.	Area of Forest Above Conservatio				G= -	0.00
Break l	Even Point				-	
H.	Break Even Point				H = 1	0.02
1.	Forest Clearing Permitted Without	Mitigation	and the second second		=	0.00
Propos	sed Forest Clearing				-	
J.	Total Area of Forest to be Cleared				J =	0.02
K.	Total Area of Forest to be Retaine	d			K=	0.00
Plantin	g Requirements				-	
L.	Reforestation for Clearing Above t	he Conser	vation Thr	eshold	L =	0.00
M.	Reforestation for Clearing Below to	ne Conserv	ation Thr	eshold	M =	0.04
N.	Credit for Retention above the Cor	nservation i	Threshold		N =	0.00
Ρ.	Total Reforestation Required			•	P =	0.04
Q.	Total Afforestation Required			•	Q =	0.11
R.	Total Planting Requirement				R =	0.15

TOTAL FOREST CLEARING WITHIN THE LOD = 1.34 AC. CLEARING OUTSIDE THE FLOODPLAIN BUT WITHIN THE LOD = 0.02 AC.

SPECIMEN TREES

Number	Species	Common Name	Size, DBH (in)	Condition	Comments
1	Quercus palustris	Pin oak	46.0	Fair	Vines, broken branches
2	Quercus rubra	Northern red oak	36.0	Good	Located on streambank
3	Quercus palustris	Pin oak	31.0	Poor	Broken/dead branches, one trunk dead
4	Acer saccharinum	Silver maple	34.0	Fair	Vines, broken branches
5	Acer saccharum	Sugar maple	35.0	Fair	Missing branches, splits above dbh
6	Acer saccharinum	Silver maple	38.0	Fair	Some hollow spots on branches, missing branches
7	Acer saccharum	Sugar maple	55.0	Fair	Broken, missing branches

SOILS TABLE

Soil Unit Name

Gladstone-Urban land complex

Gladstone-Urban land complex

Baile silt loam

MACHINERY, DUMPING

OR STORAGE OF

ANY MATERIALS IS

PROHIBITED

VIOLATORS ARE SUBJECT 1

FINES AS IMPOSED BY THE

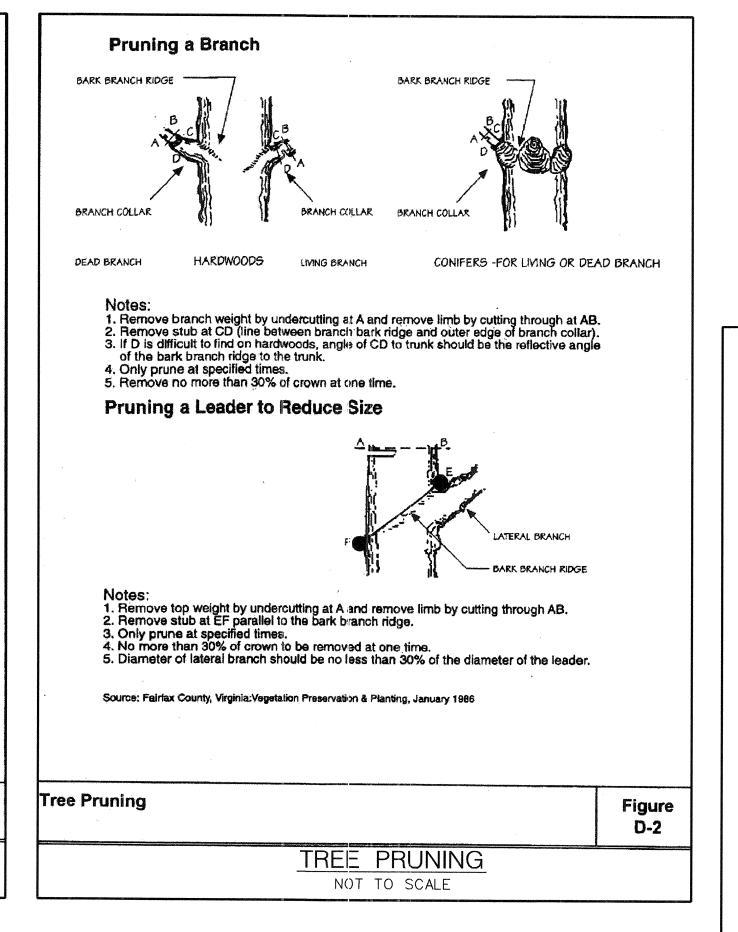
MARYLAND FOREST

CONSERVATION ACT OF

TREE PROTECTION FENCE -FENCE WITHIN 1' OF TRENCH LINE -TRENCH WITHIN I' OF LIMIT OF S DISTURBANCE LINE - LIMIT OF DISTURBANCE ----2' MINIMUM DEPTH ROOT PRUNING TRENCH? CRITICAL ROOT ZONE - 6" MAXIMUM WIDTH Retention Areas to be established as part of the forest conservation plan review process. Boundaries of Retention Areas to be staked, flagged and/or fenced prior to trenching. Exact location of trench should be identified. Trench should be immediately backfilled with soil removed or organic soil. 5. Roots should be cleanly cut using vibratory knife or other acceptable equipment. Source: Adapted from Steve Clark & Associates/ACRT, Inc. and Forest Conservation Manual, 1991 **Root Pruning Figure ROOT PRUNING** NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES



6/5/17 DATE

MIN. 11'' MIN. 11" SPECIMEN FOREST TREE RETENTION AREA DO NOT REMOVE

Slope K_f value Hydric (Y/N)

No

No

0-3 0.37 Yes

0-8 0.28

MACHINERY, DUMPING

OR STORAGE OF

ANY MATERIALS IS

PROHIBITED

VIOLATORS ARE SUBJECT

FINES AS IMPOSED BY THE

MARYLAND FOREST

CONSERVATION ACT OF

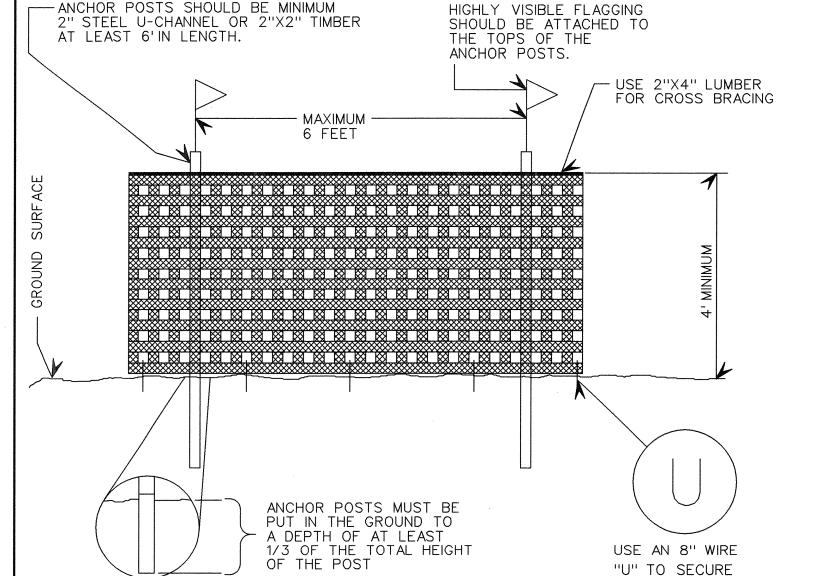
8-15

Soil Symbol

- 1. BOTTOM OF SIGN TO BE HIGHER THAN TREE PROTECTION FENCE.
- SIGNS TO BE PLACED 50 TO 100' APART. CONDITIONS ON SITE AFFECTING VISIBILITY MAY WARRANT PLACING SIGNS CLOSER OR FARTHER APART WITHIN THE ACCEPTABLE NOTED RANGE.
- 3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.
- 4. SIGNS MAY BE REMOVED FROM RESIDENTIAL LOTS UPON ISSUANCE OF USE AND OCCUPANCY RETENTION FOREST ONLY.
- 5. ALL SIGNAGE MUST REMAIN DURING THE MAINTENANCE PERIOD.
- 6. THE SIGNS NOTIFY CONSTRUCTION WORKERS AND FUTURE RESIDENTS OF THE NEWLY PLANTED MATERIAL, IMPROVING THE TREES' SURVIVAL
- SIGNS MAY BE ADAPTED BY RESIDENTS FOR IDENTIFICATION OF FOREST RETENTION AREAS.

FOREST CONSERVATION SIGNAGE

NOT TO SCALE



BLAZE ORANGE PLASTIC MESH SAFETY FENCE/TREE PROTECTION DETAIL NOT TO SCALE

PLACEMENT OF ORANGE HIGH VISIBILITY FENCE:

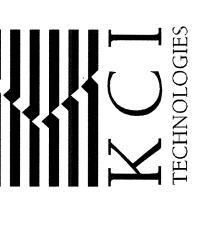
ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMITS OF DISTURBANCE, WHERE THAT LIMIT IS WITHIN 50' OF THE FOREST CONSERVATION/ FOREST BUFFER EASEMENTS AND SHALL FUNCTION AS A FOREST PROTECTION DEVICE.

THE BOTTOM

- 2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
- BOUNDARIES OF THE RETENTION AREA SHALL BE STAKES AND FLAGGED PRIOR TO INSTALLING THE DEVICE.
- 4. ROOT DAMAGE SHALL BE AVOIDED.
- 5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
- 6. DEVICE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

STANDARD SYMBOL --- OSF ----

JAEBROOK ROAD
JAEBROOK ROAD
JARYLAND 21152
TELEPHONE: (410) 316-7800
FAX: (410) 316-7818
www.kci cr Sparks, Telepho



DUNLOGGIN I STREAM RESTC

FOREST CONSERVATION PLAN NOTES & **DETAILS**

JUNE 2017 17133314.94 (CAPITAL PROJECT NO.: D-1158

ERMIT ISSUE: CONSTRUCTION ISSUE:

FCP-03

SHEET NO .: 24 OF 24

THIS PLAN WAS PREPARED BY: JENNIFER BIRD KCITECHNOLOGIES
MDNR QUALIFIED PROFESSIONAL STATUS (SEPTEMBER 2011)

DECEMBER, 2016 DATE