

# BONNIE BRANCH

## BANK STABILIZATION PROJECT - CAPITAL PROJECT # D-1158

HOWARD COUNTY, MARYLAND - DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENVIRONMENTAL SERVICES, STORMWATER MANAGEMENT DIVISION

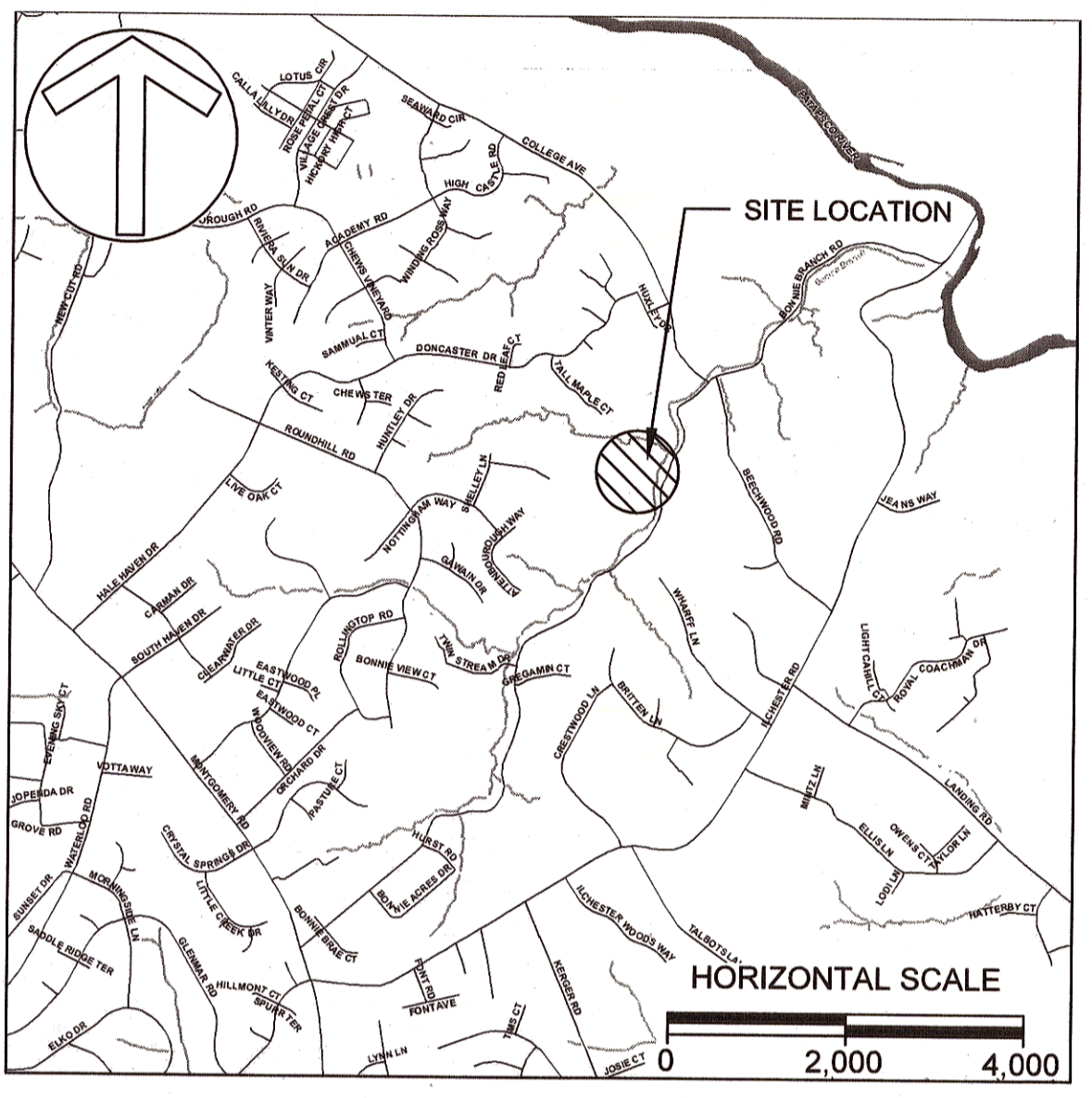
CLIENT  
HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

### GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE EXISTING INFORMATION SHOWN ON THESE PLANS WAS TAKEN FROM THE BEST AVAILABLE SOURCES AND SHALL BE VERIFIED BEFORE STARTING CONSTRUCTION. HOWARD COUNTY DOES NOT GUARANTEE THE COMPLETENESS OR THE CORRECTNESS OF THE SHOWN INFORMATION.
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE START OF WORK.
- A JOINT PERMIT APPLICATION HAS BEEN SUBMITTED TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT FOR THIS PROJECT. (TRACKING NUMBER AI #146044) PROJECT IMPACTS INCLUDE WORK IN A USE 1 STREAM. UNDER THIS PERMIT, IN-STREAM WORK IS PROHIBITED FROM MARCH 1 TO JUNE 15, INCLUSIVE OF ANY YEAR.
- THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
- THE EXISTING TOPOGRAPHY WAS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY AB CONSULTANTS, INC. 2/11/2015.
- HORIZONTAL DATUM IS IN MARYLAND STATE PLANE NAD 2011 AND VERTICAL DATUM IS NAVD 88 AS DETERMINED BY THE ELLIPSOIDAL HEIGHT. RTK GPS OBSERVATIONS USING A VRS NETWORK SERVICE WERE USED TO ESTABLISH THE COORDINATES. HOWARD COUNTY CONTROL MONUMENTS 31BA AND 0081 WERE USED AS CHECK STATIONS.
- WATER IS PUBLIC.
- SEWER IS PUBLIC.
- 100-YR FLOODPLAIN ELEVATION IS SHOWN ON THE PLANS.
- THE STREAM IS NOT A TIER II WATER OR AN IMPAIRED WATERWAY WITH THE FOLLOWING TMDLs:
  - TOTAL NITROGEN - GIS ID: G2390, REPORT: BALTIMORE HARBOR TIDAL NUTRIENTS
  - TOTAL PHOSPHORUS - GIS ID: G2390, REPORT: BALTIMORE HARBOR TIDAL NUTRIENTS
  - TSS - GIS ID: G1149, REPORT: PATAPSCO RIVER LOWER NORTH BRANCH SEDIMENT
  - ECOLI - GIS ID: G1149, REPORT: PATAPSCO RIVER LOWER NORTH BRANCH BACT
  - CHLORDANE - GIS ID: G2390, REPORT: BALTIMORE HARBOR CHLORDANE
- TEMPORARY STAGING AND/OR STOCKPILING OF ERODIBLE MATERIALS (E.G., EXCAVATED MATERIAL) WITHIN THE 100-YEAR FLOODPLAIN DESIGNATED ON THE PLANS SHALL BE LIMITED TO THE AMOUNT OF MATERIAL THE CONTRACTOR CAN PLACE AND/OR HAUL OFF IN A SINGLE DAY. THE CONTRACTOR SHALL MONITOR THE WEATHER FORECAST AND ADJUST STOCKPILE/STAGING OPERATIONS ACCORDINGLY TO MINIMIZE THE LOSS OF MATERIAL OR OTHER ADVERSE IMPACTS.
- THE CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS, AND/OR SUPPLIES BEYOND THE LIMIT OF DISTURBANCE SHOWN ON THE PLANS.
- EXISTING UTILITIES ARE BASED ON AVAILABLE RECORDS. THE CONTRACTOR MUST VERIFY INFORMATION TO HIS/HER SATISFACTION.
- THE WETLANDS DELINEATION FOR THIS SITE WAS PREPARED BY BIOHABITATS, DATED 10/14/14.
- DPZ HAS DETERMINED THE DISTURBANCE WITHIN THE REGULATED 75' PERENNIAL STREAMBANK BUFFER, WETLANDS, WETLAND BUFFER, AND 100-YR FLOODPLAIN ARE ESSENTIAL AND NECESSARY FOR CONSTRUCTION OF THE STREAM STABILIZATION PROJECT IN ACCORDANCE WITH SECTION 16.116(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATION.
- THE PROJECT LIMITS ARE WITHIN A FOREST CONSERVATION ACT EASEMENT - FILE #F-99-045, ANSI CODE 24027H1. TREE CLEARING WITHIN THE EXISTING FOREST CONSERVATION ACT EASEMENT WAS DETERMINED NECESSARY AND ESSENTIAL FOR THE IMPLEMENTATION OF THIS STREAM STABILIZATION PROJECT. TREE REMOVAL WILL BE LIMITED TO THE MINIMUM NECESSARY TO COMPLETE THE WORK AND REFORESTATION SHALL OCCUR IN ACCORDANCE WITH THE FOREST CONSERVATION ACT REQUIREMENTS. TREE CLEARING WITHIN THE FOREST CONSERVATION ACT EASEMENT IS 2,640 SF OR 0.06 AC.
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- THE SUBJECT PROPERTY IS ZONED R-ED PER THE 10/6/2013 COMPREHENSIVE ZONING PLAN.
- THERE ARE NO BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE PROJECT SITE.
- THIS RESTORATION PROJECT FOR IMPROVEMENTS TO THE BONNIE BRANCH STREAM CORRIDOR UNDER CAPITAL PROJECT No. D1158 COMPLIES WITH THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION BY THE PAYMENT OF A FEE-IN-LIEU IN THE AMOUNT OF \$7,840.80 FOR THE REQUIRED 0.24 ACRE REFORESTATION OBLIGATION.
- OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY, AND BIOHABITATS, 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

- 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.
- 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. ALL UTILITIES SHALL HAVE A CLEARANCE BY A MINIMUM OF 6 INCHES VERTICALLY AND A MINIMUM OF 5 FEET HORIZONTALLY.
- THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN. 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 THE ENGINEER OR HIS/HER REPRESENTATIVE PRIOR TO CONSTRUCTION.
- 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 OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
- BIOHABITATS SHALL CERTIFY IN WRITTEN LETTER THAT THE CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED IN ACCORDANCE TO THESE PLANS.
- DPZ APPROVED WAIVER PETITION #WP-16-050 ON 11/4/2015 TO WAIVE SECTION 16.155(a)(1)(ii) ON NOVEMBER 4, 2015 WHICH REQUIRES A SITE DEVELOPMENT PLAN FOR DISTURBANCE GREATER THAN 5,000 SQUARE FEET AND SECTION 16.120(n) TO ALLOW THE LIMIT OF DISTURBANCE TO SERVE AS THE NET TRACT AREA WHEN DETERMINING THE FOREST CONSERVATION OBLIGATION. THE APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:
  - THE WAIVER PETITION PLAN EXHIBIT SHALL SERVE AS THE SUBSTITUTE FOR A SITE DEVELOPMENT PLAN FOR DEVELOPMENT. NO DISTURBANCE IS PERMITTED BEYOND THE 1.5 ACRE LIMIT OF DISTURBANCE AS SHOWN ON THE WAIVER EXHIBIT UNLESS IT CAN BE SUFFICIENTLY DEMONSTRATED BY THE APPLICANT TO BE JUSTIFIED.
  - PRIOR TO THE COMMENCEMENT OF CAPITAL PROJECT D-1158, THE DEPARTMENT OF PUBLIC WORKS SHALL PAY A FEE-IN-LIEU IN THE AMOUNT OF \$7,840.80 FOR THE REFORESTATION OBLIGATION OF 0.24 ACRES. THE PAYMENT SHALL BE MADE THROUGH THE TRANSFER OF FUNDS TO SAP ACCOUNT 2060000000-3000-3000000000-PWPZ000000000000-432521. A COPY OF THE TRANSFER RECEIPT SHALL BE SUBMITTED TO DPZ - DIVISION OF LAND DEVELOPMENT A COMPLETED FOREST CONSERVATION DATA SUMMARY FOR THIS PROJECT.
  - THE PROPOSED 2,640 SQUARE FEET OF DISTURBANCE TO THE EXISTING FOREST CONSERVATION EASEMENT SHALL BE REPLANTED ON-SITE WITHIN THE EXISTING EASEMENT IN ACCORDANCE WITH HOWARD COUNTY RECREATION & PARKS STANDARDS.
  - THE REMOVAL OF STATE CHAMPION TREES, TREES 75% OF THE DIAMETER OF STATE CHAMPION TREES OR TREES 30" IN DIAMETER OR LARGER IS NOT PERMITTED UNDER THIS WAIVER REQUEST. ANY REMOVAL OF SPECIMEN TREES WILL REQUIRE A WAIVER TO SECTION 16.1205(a)(7) OF THE SUBDIVISION & LAND DEVELOPMENT REGULATIONS. ALL EFFORTS SHALL BE MADE TO REDUCE IMPACTS TO SPECIMEN TREES DURING CONSTRUCTION. TREE PROTECTION FENCING AS DETAILED ON THE PLAN EXHIBIT SHALL BE UTILIZED AS NECESSARY.
  - ONCE CAPITAL PROJECT D-1158 IS COMPLETE, THE LIMIT OF DISTURBANCE SHALL BE RESTORED TO ITS PREVIOUS CONDITION THROUGH STABILIZATION AND REPLANTING OF FOREST RESOURCES.
  - COMPLIANCE WITH THE ATTACHED COMMENTS FROM DPZ - DIVISION OF LAND DEVELOPMENT. SUBMIT A REVISED FOREST CONSERVATION WORKSHEET AND REVISED EXHIBIT PLAN FOR FILE RETENTION RECORDS.
  - THE APPLICANT SHALL OBTAIN ALL REQUIRED AUTHORIZATIONS AND PERMITS FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT AND U.S. ARMY CORPS OF ENGINEERS FOR DISTURBANCES WITHIN THE FLOODPLAIN, WETLANDS, STREAMS AND THEIR BUFFERS. REFERENCE ANY APPLICABLE MDE OR USACE PERMITS OR TRACKING NUMBERS ON THE BUILDING OR GRADING PERMITS.

VICINITY MAP



Sheet Number	Sheet Title
1	TITLE SHEET (AS-BUILT)
2	EXISTING CONDITIONS AND GEOMETRY
3	EXISTING CONDITIONS AND GEOMETRY
4	PROPOSED CONDITIONS (AS-BUILT)
5	PROPOSED CONDITIONS (AS-BUILT)
6	PROFILE & CROSS SECTIONS
7	DETAILS
8	DETAILS
9	EROSION AND SEDIMENT CONTROL PLAN
10	EROSION AND SEDIMENT CONTROL PLAN
11	SUPPLEMENTAL SOILS INFO FOR ESC
12	SUPPLEMENTAL SOILS INFO FOR ESC
13	EROSION AND SEDIMENT CONTROL DETAILS
14	EROSION AND SEDIMENT CONTROL DETAILS
15	EROSION AND SEDIMENT CONTROL DETAILS
16	EROSION AND SEDIMENT CONTROL DETAILS
17	EROSION AND SEDIMENT CONTROL NOTES
18	PLANTING PLAN
19	PLANTING PLAN
20	PLANTING DETAILS

SOIL SYMBOL	SOIL DESCRIPTION	HYDRIC	K FACTOR	HIGHLY ERODIBLE
Co	CODORUS AND HATBORO SILT LOAMS, 0-3% SLOPES	YES	0.37	NO
GdC	GLADSTONE-LEGORE COMPLEX, 8-15% SLOPES, STONY	NO	0.20	NO
GdD	GLADSTONE-LEGORE COMPLEX, 15-25% SLOPES, STONY	NO	0.20	YES
GoB	GLENVILLE-CODORUS SILT LOAMS, 0-8% SLOPES	NO	0.37	NO
MgF	MANOR-BANNERTOWN SANDY LOAMS, 25-65% SLOPES	NO	0.24	YES

This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT  
  
 Howard Soil Conservation District  
 Date: 12/21/15  
 EP-16-013

DEPARTMENT OF PUBLIC WORKS, HOWARD CO, MD  
  
 DIRECTOR, DEPARTMENT OF PUBLIC WORKS  
 DATE: 12/19/15  
  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES  
 DATE: 12/18/15  
  
 CHIEF, STORMWATER MANAGEMENT DIVISION  
 DATE: 12/18/15  
 DEPARTMENT OF RECREATION AND PARKS, HOWARD CO, MD  
  
 DIRECTOR OF RECREATION AND PARKS  
 DATE: 12/18/15

STATE OF MARYLAND  
 AMY LONGCRIER  
 PROFESSIONAL ENGINEER  
 No. 45474  
 12/31/15  
 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 # 45474  
 EXPIRATION DATE: 6/12/2016

DESIGN CERTIFICATION  
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
  
 DESIGNER'S SIGNATURE  
 DATE: 12/21/2015  
 PRINTED NAME: AMY LONGCRIER  
 MD REGISTRATION No. 45474  
 (P.E., R.L.S., or R.L.A. (circle one))  
 OWNERS/DEVELOPER CERTIFICATION  
 I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT 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 OF EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE.  
  
 OWNER'S/DEVELOPER'S SIGNATURE  
 DATE: 12/18/15  
 PRINTED NAME: Mark S. Richmond

Biohabitats  
 The Stables Building 2081 Clipper Park Road  
 Baltimore, MD 21211 / ph: 410.554.0156  
 fx: 410.554.0168 / www.biohabitats.com  
 Restore the Earth & Inspire Ecological Stewardship

### BONNIE BRANCH BANK STABILIZATION PROJECT

ELECTION DISTRICT: 02  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

TITLE SHEET  
 AS-BUILT  
 PROJECT NO.: 13005.19 SCALE: AS SHOWN  
 SEAL:   
 BY: AL, TB, KT CHECK: MDT  
 DWG. NO.:  
 1 OF 20

**LEGEND**

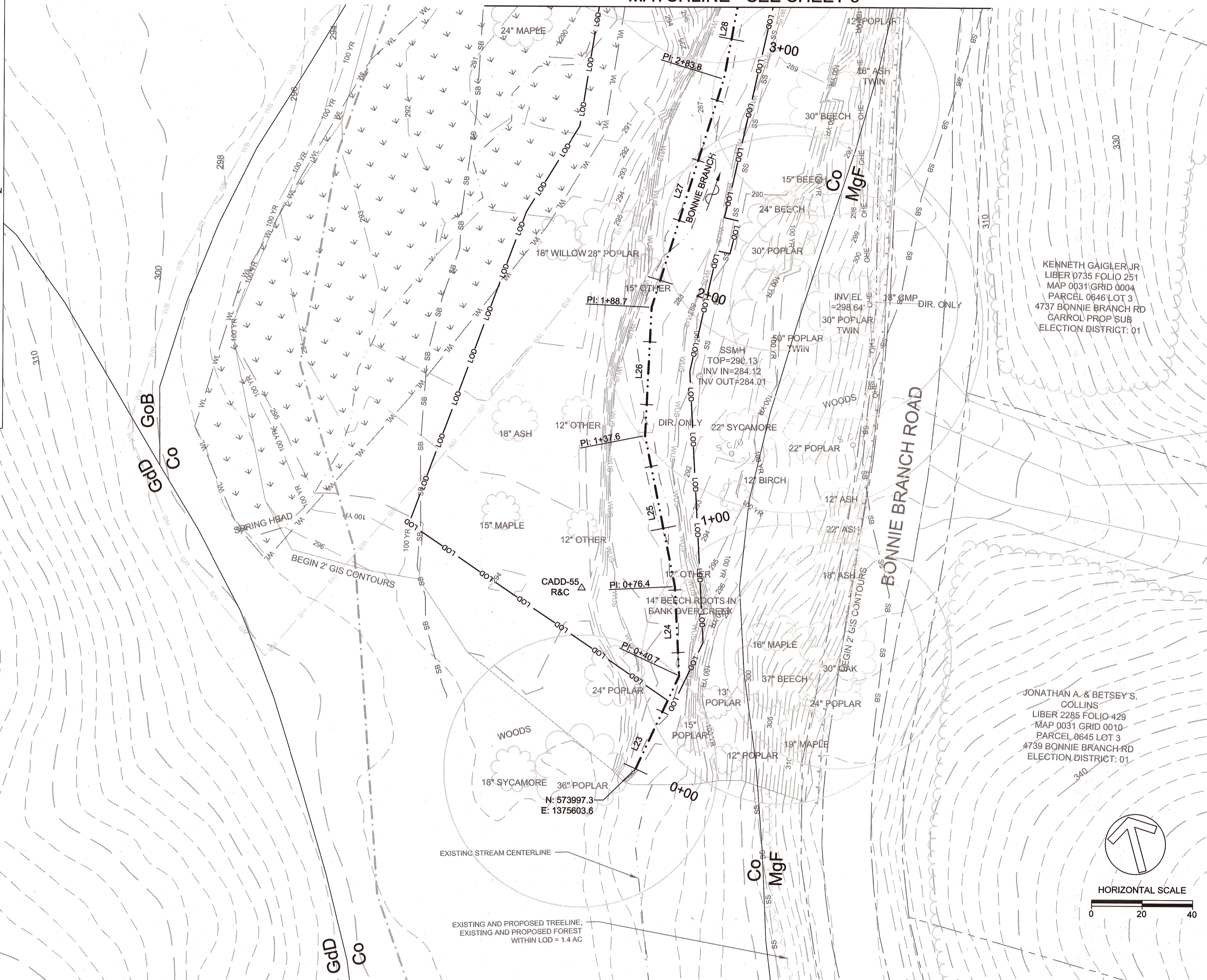
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- ROADWAY
- SS SANITARY SEWER
- OHE OVERHEAD ELECTRIC
- LOD LIMIT OF DISTURBANCE
- EXISTING THALWEG
- BASELINE
- WUS WATERS OF THE US
- SB 75' STREAM BUFFER
- 100 YR EXISTING 100-YR FLOODPLAIN
- TREE LINE
- EXISTING FOREST CONSERVATION ACT EASEMENT
- GUARDRAIL
- WL WETLAND
- WB WETLAND BUFFER
- GdC SOIL DIVIDE AND LABEL
- TREE
- CRITICAL ROOT ZONE
- △ TRAVERSE POINT
- SANITARY SEWER MANHOLE
- ELECTRIC POLE/GUY WIRE

**TRAVERSE COORDINATE LIST**

PT#	NORTHING	EASTING	ELEVATION
CADD-55 R&C	574072.2990'	1375601.2420'	294.460'

**MATCHLINE - SEE SHEET 3**

Line #	Length	Direction
L23	40.7	N39° 44' 05"E
L24	35.7	N11° 55' 23"E
L25	61.2	N03° 36' 08"E
L26	51.1	N17° 35' 46"E
L27	95.1	N32° 09' 48"E
L28	38.1	N25° 28' 44"E



**CLIENT**

HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

KENNETH GAIGLER JR  
 LIBER 0735 FOLIO 251  
 MAP 0031 GRID 0004  
 PARCEL 0646 LOT 3  
 4737 BONNIE BRANCH RD  
 CARROL PROP SUB  
 ELECTION DISTRICT: 01

APPROVED: *[Signature]* 12/15/15  
 DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES  
 DATE

**Biohabitats**  
 The Stables Building 2081 Clipper Park Road  
 Baltimore, MD 21211 / ph: 410.554.0156  
 fx: 410.554.0168 / www.biohabitats.com  
 Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02,  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #VP-16-050

**EXISTING CONDITIONS AND GEOMETRY**

PROJECT NO.: 13005.19 SCALE: 1" = 20'

BY: AL, TB, KT CHECK: MDT

DWG. NO.: 2 OF 20

**LEGEND**

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- ROADWAY
- SS SANITARY SEWER
- OHE OVERHEAD ELECTRIC
- LOD LIMIT OF DISTURBANCE
- EXISTING THALWEG
- BASELINE
- WUS WATERS OF THE US
- SB 75' STREAM BUFFER
- 100 YR EXISTING 100-YR FLOODPLAIN
- TREE LINE
- EXISTING FOREST CONSERVATION ACT EASEMENT
- GUARDRAIL
- WL WETLAND
- WB WETLAND BUFFER
- GdC SOIL DIVIDE AND LABEL
- TREE
- CRITICAL ROOT ZONE
- △ TRAVERSE POINT
- ⊙ SANITARY SEWER MANHOLE
- ELECTRIC POLE/GUY WIRE

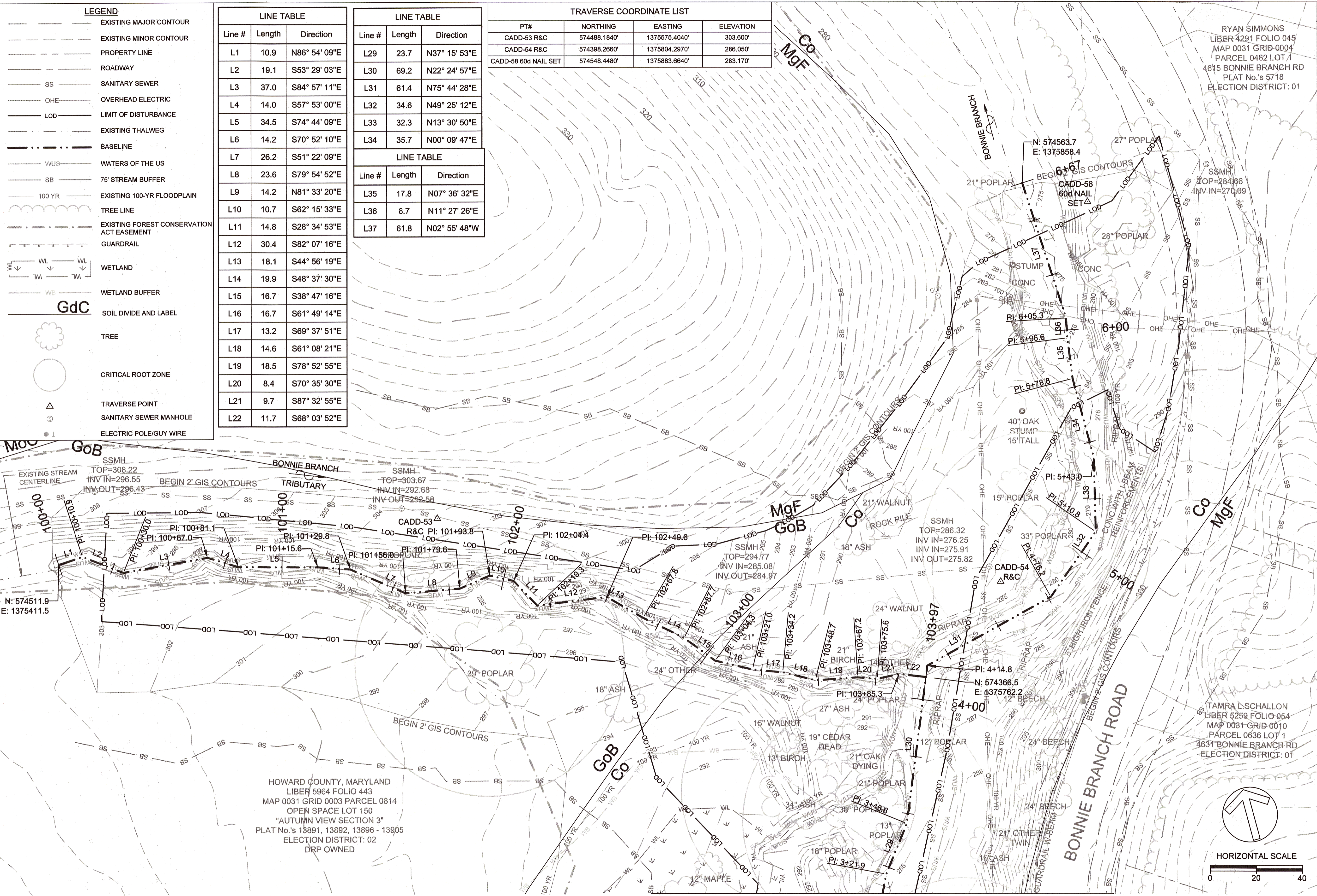
LINE TABLE		
Line #	Length	Direction
L1	10.9	N86° 54' 09"E
L2	19.1	S53° 29' 03"E
L3	37.0	S84° 57' 11"E
L4	14.0	S57° 53' 00"E
L5	34.5	S74° 44' 09"E
L6	14.2	S70° 52' 10"E
L7	26.2	S51° 22' 09"E
L8	23.6	S79° 54' 52"E
L9	14.2	N81° 33' 20"E
L10	10.7	S62° 15' 33"E
L11	14.8	S28° 34' 53"E
L12	30.4	S82° 07' 16"E
L13	18.1	S44° 56' 19"E
L14	19.9	S48° 37' 30"E
L15	16.7	S38° 47' 16"E
L16	16.7	S61° 49' 14"E
L17	13.2	S69° 37' 51"E
L18	14.6	S61° 08' 21"E
L19	18.5	S78° 52' 55"E
L20	8.4	S70° 35' 30"E
L21	9.7	S87° 32' 55"E
L22	11.7	S68° 03' 52"E

LINE TABLE		
Line #	Length	Direction
L29	23.7	N37° 15' 53"E
L30	69.2	N22° 24' 57"E
L31	61.4	N75° 44' 28"E
L32	34.6	N49° 25' 12"E
L33	32.3	N13° 30' 50"E
L34	35.7	N00° 09' 47"E

LINE TABLE		
Line #	Length	Direction
L35	17.8	N07° 36' 32"E
L36	8.7	N11° 27' 26"E
L37	61.8	N02° 55' 48"W

TRAVERSE COORDINATE LIST			
PT#	NORTHING	EASTING	ELEVATION
CADD-53 R&C	574488.1840'	1375575.4040'	303.600'
CADD-54 R&C	574398.2860'	1375804.2970'	286.050'
CADD-58 60d NAIL SET	574548.4480'	1375883.6640'	283.170'



**CLIENT**

HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

APPROVED: *[Signature]* 12/18/15  
 DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES  
 DATE

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 Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

**EXISTING CONDITIONS AND GEOMETRY**

PROJECT NO.: 13005.19 SCALE: 1" = 20'

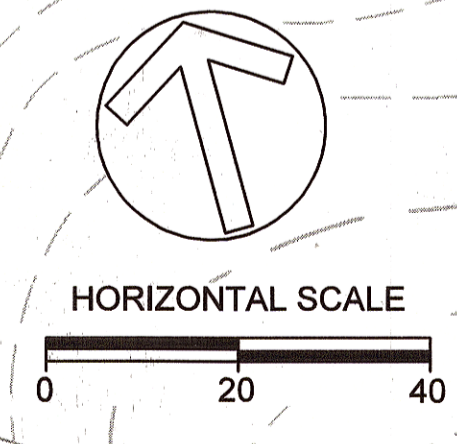
BY: AL, TB, KT CHECK: MDT

DWG. NO.: 3 OF 20

12/31/15

HOWARD COUNTY, MARYLAND  
 LIBER 5964 FOLIO 443  
 MAP 0031 GRID 0003 PARCEL 0814  
 OPEN SPACE LOT 150  
 "AUTUMN VIEW SECTION 3"  
 PLAT No.'s 13891, 13892, 13896 - 13905  
 ELECTION DISTRICT: 02  
 DRP OWNED

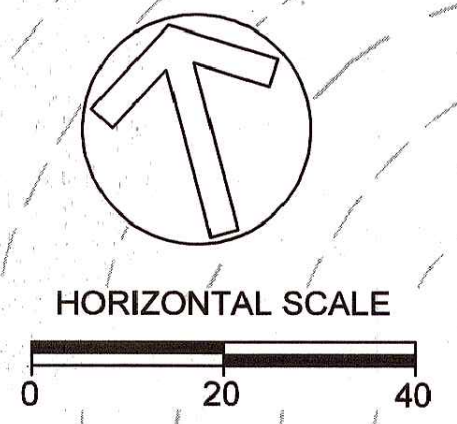
MATCHLINE - SEE SHEET 2



LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	LIMIT OF DISTURBANCE
	PROPERTY LINE
	ROADWAY
	SANITARY SEWER
	OVERHEAD ELECTRIC
	EXISTING THALWEG
	PROPOSED THALWEG
	WATERS OF THE US
	75' STREAM BUFFER
	EXISTING 100-YR FLOODPLAIN
	PROPOSED 100-YR FLOODPLAIN
	TREE LINE
	EXISTING FOREST CONSERVATION ACT EASEMENT
	TREE PROTECTION FENCE
	GUARDRAIL
	WETLAND
	WETLAND BUFFER
	SOIL DIVIDE AND LABEL
	PROPOSED BOULDER TOE
	PROPOSED COBBLE RIFFLE
	PROPOSED RANDOM BOULDER
	PROPOSED LARGE WOODY DEBRIS
	TREE
	CRITICAL ROOT ZONE
	TREE PROTECTION
	TRAVERSE POINT
	SANITARY SEWER MANHOLE
	ELECTRIC POLE/GUY WIRE

AS-BUILT LEGEND	
	THALWEG
	MAJOR CONTOUR
	MINOR CONTOUR

MATCHLINE - SEE SHEET 5



NOTE: BOULDER TOE AND LARGE WOODY DEBRIS HABITAT STRUCTURES MAY VARY BASED ON AVAILABILITY OF ONSITE MATERIALS.

**CLIENT**  
 HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL



AS-BUILT CERTIFICATION  
 I HEREBY CERTIFY, BY MY SEAL, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND

*AL*  
 NAME: DATE: 10/31/16

APPROVED: 12/10/15  
 DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE: 12/10/15

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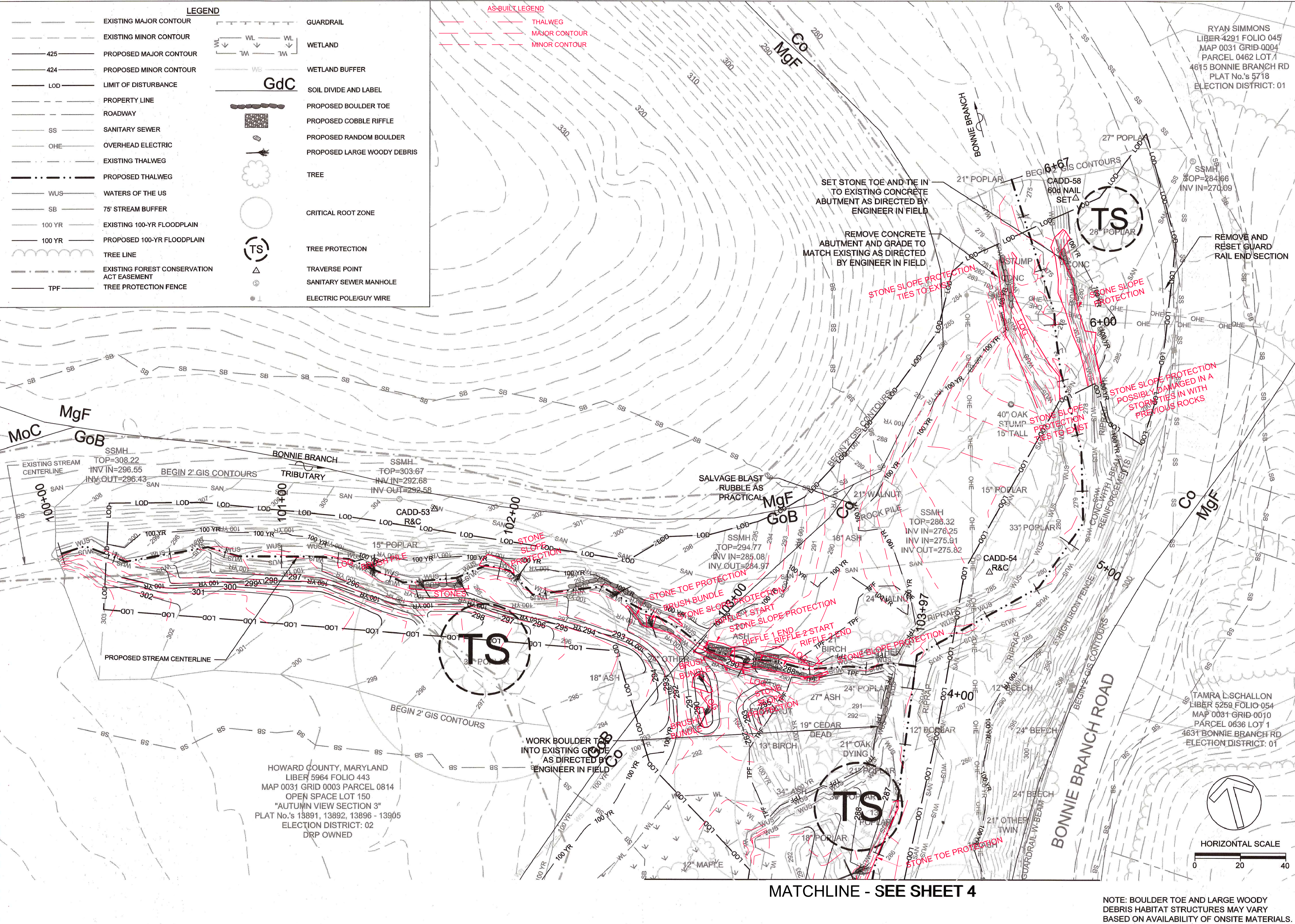
**BONNIE BRANCH BANK STABILIZATION PROJECT**  
 ELECTION DISTRICT: 02  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

**PROPOSED CONDITIONS AS-BUILT**

PROJECT NO.: 13005.19	SCALE: 1" = 20'
BY: AL, TB, KT	CHECK: MDT
DWG. NO.: 4 OF 20	

LEGEND	
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	LIMIT OF DISTURBANCE
	PROPERTY LINE
	ROADWAY
	SANITARY SEWER
	OVERHEAD ELECTRIC
	EXISTING THALWEG
	PROPOSED THALWEG
	WATERS OF THE US
	75' STREAM BUFFER
	EXISTING 100-YR FLOODPLAIN
	PROPOSED 100-YR FLOODPLAIN
	TREE LINE
	EXISTING FOREST CONSERVATION ACT EASEMENT
	TPF
	GUARDRAIL
	WETLAND
	WETLAND BUFFER
	SOIL DIVIDE AND LABEL
	PROPOSED BOULDER TOE
	PROPOSED COBBLE RIFFLE
	PROPOSED RANDOM BOULDER
	PROPOSED LARGE WOODY DEBRIS
	TREE
	CRITICAL ROOT ZONE
	TREE PROTECTION
	TRAVERSE POINT
	SANITARY SEWER MANHOLE
	ELECTRIC POLE/GUY WIRE

AS-BUILT LEGEND	
	THALWEG
	MAJOR CONTOUR
	MINOR CONTOUR



**CLIENT**  
 HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL



AS-BUILT CERTIFICATION  
 I HEREBY CERTIFY, BY MY SEAL, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE FACILITIES SHOWN ON THIS PLAN WERE CONSTRUCTED AS SHOWN ON THIS "AS-BUILT" PLAN MEET THE APPROVED PLANS AND

*[Signature]*  
 NAME: DATE: 10/31/16

APPROVED: *[Signature]* 12/15/15  
 DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

**Biohabitats**  
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 fx: 410.554.0168 / www.biohabitats.com  
 Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**  
 ELECTION DISTRICT: 02  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

**PROPOSED CONDITIONS**  
 AS-BUILT

PROJECT NO.: 13005.19	SCALE: 1" = 20'
SEAL:	BY: AL, TB, KT CHECK: MDT
	DWG. NO.: 5 OF 20

NOTE: BOULDER TOE AND LARGE WOODY DEBRIS HABITAT STRUCTURES MAY VARY BASED ON AVAILABILITY OF ONSITE MATERIALS.

MATCHLINE - SEE SHEET 4

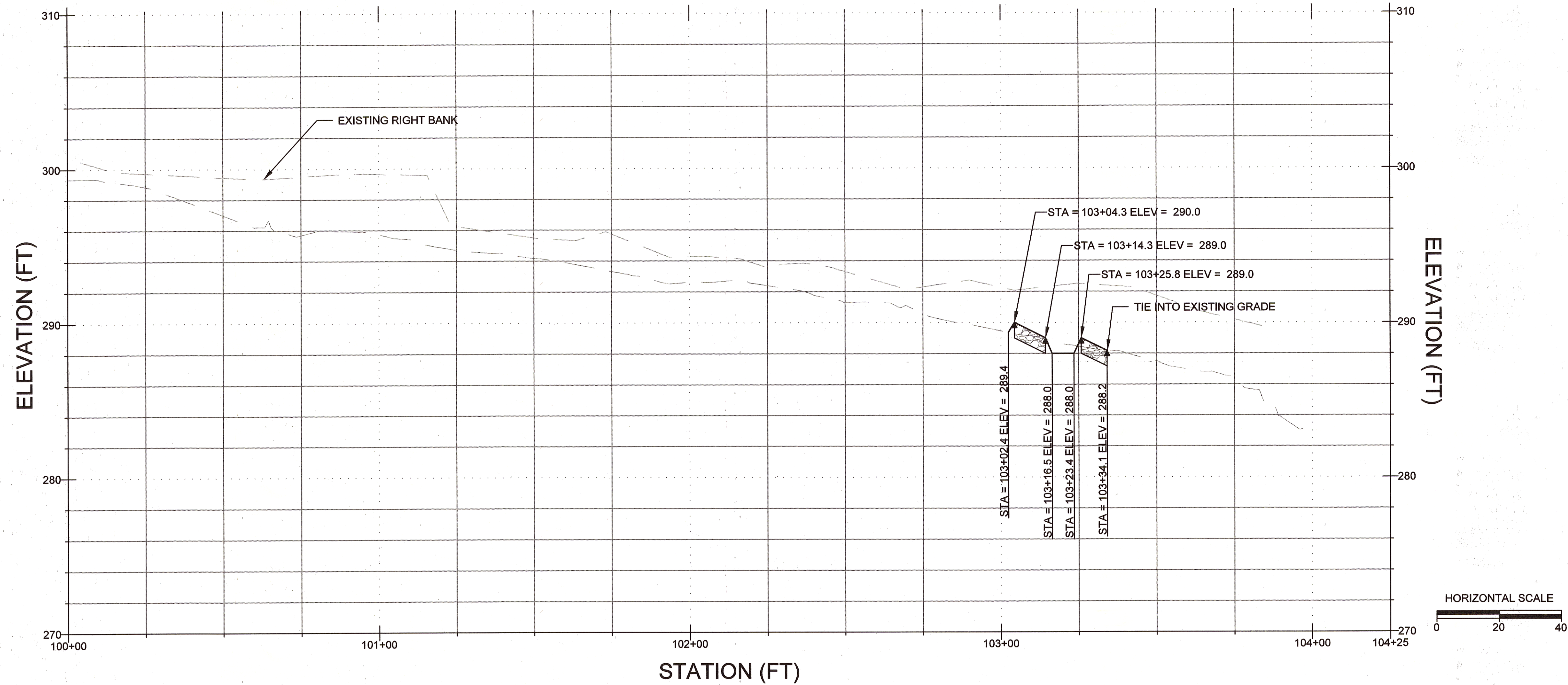
**CLIENT**

HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE: 11/11/2015  
 ISSUES / REVISIONS: 100% SUBMITTAL

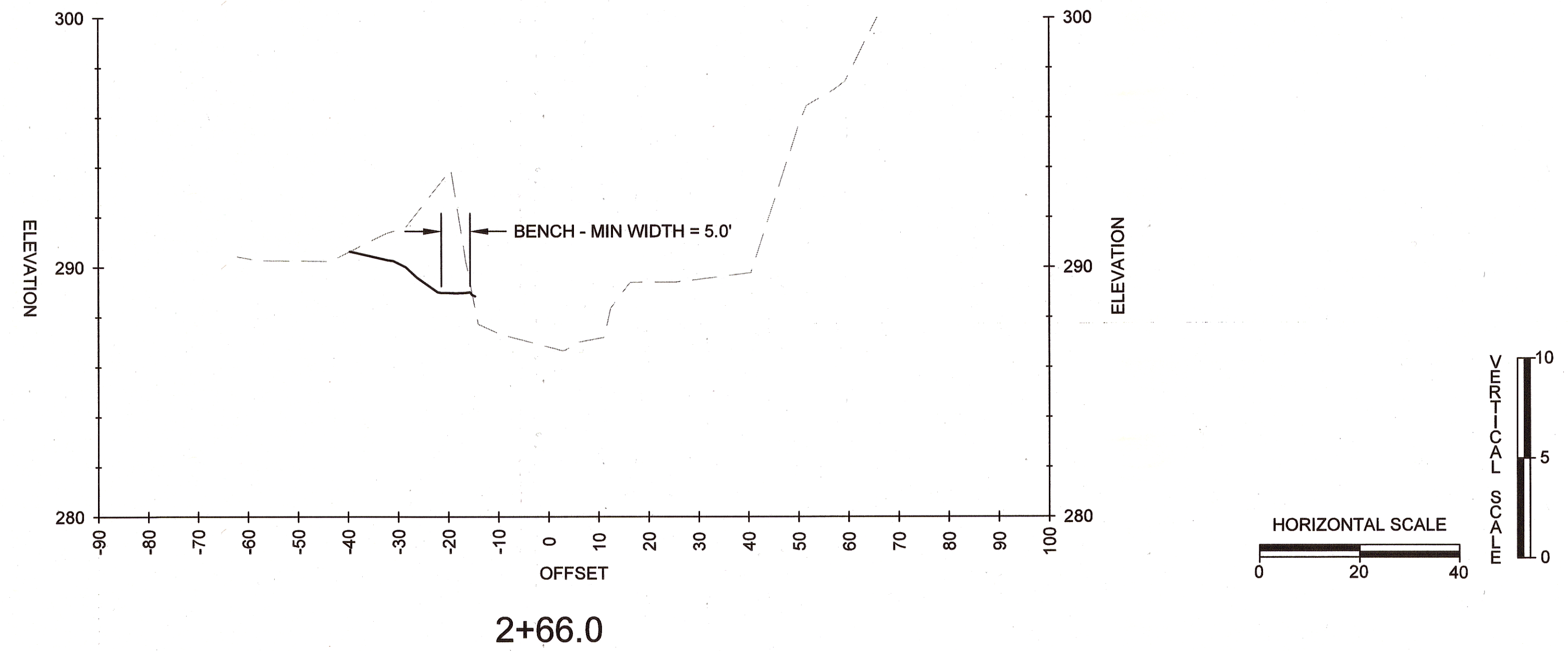
APPROVED: *[Signature]* DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES  
 DATE: 12/18/15

**PROFILE VIEW OF TRIBUTARY**



**PROFILE LEGEND**

- EXISTING THALWEG
- EXISTING RIGHT BANK
- PROPOSED THALWEG
- ROCK GRADE CONTROL
- COBBLE RIFFLE GRADE CONTROL



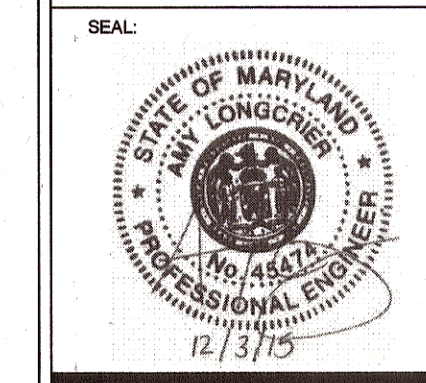
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**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

**PROFILE & CROSS SECTIONS**

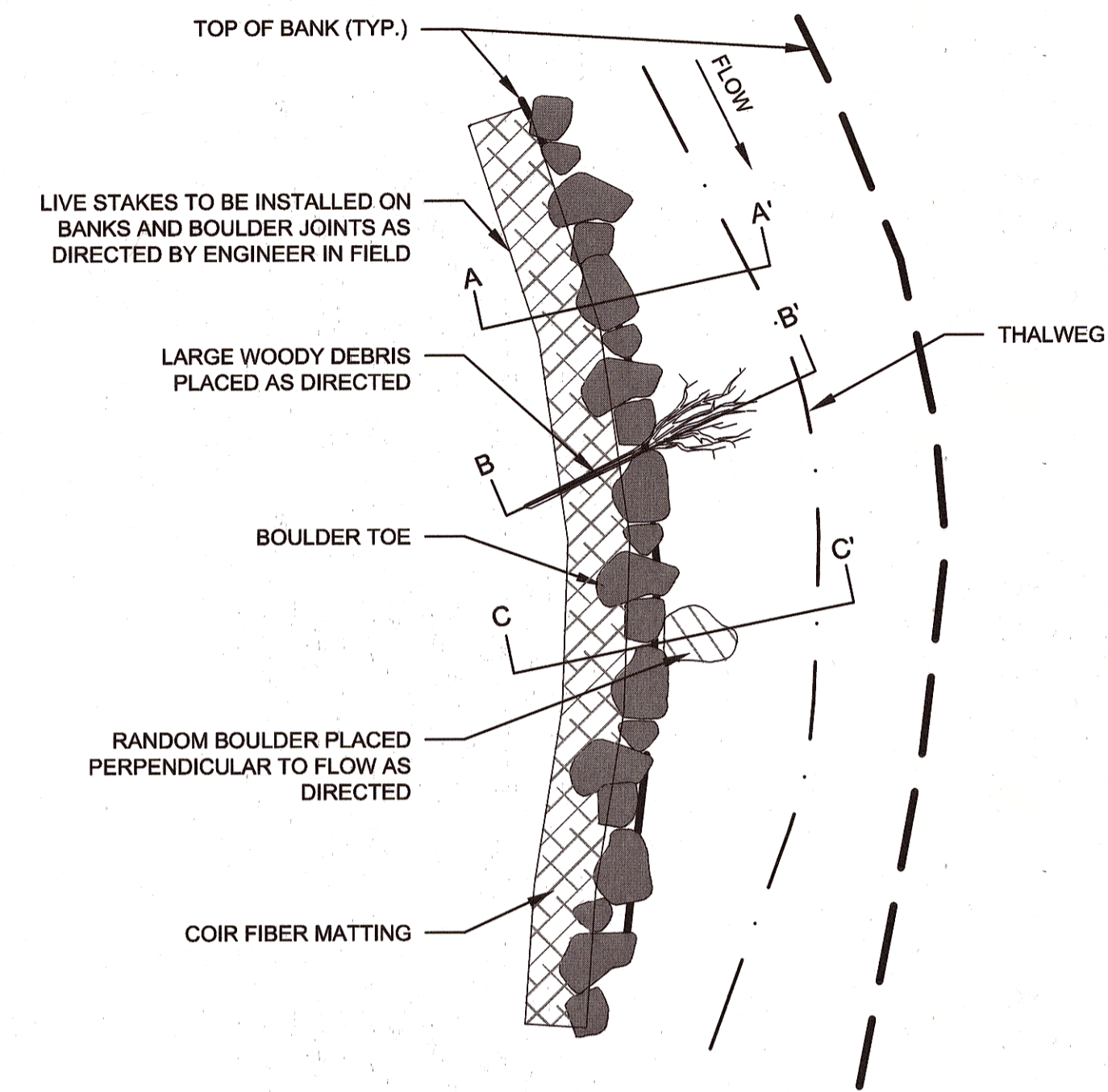
PROJECT NO.: 13005.19 SCALE: AS SHOWN  
 BY: AL, TB, KT CHECK: MDT  
 DWG. NO.:



**CLIENT**

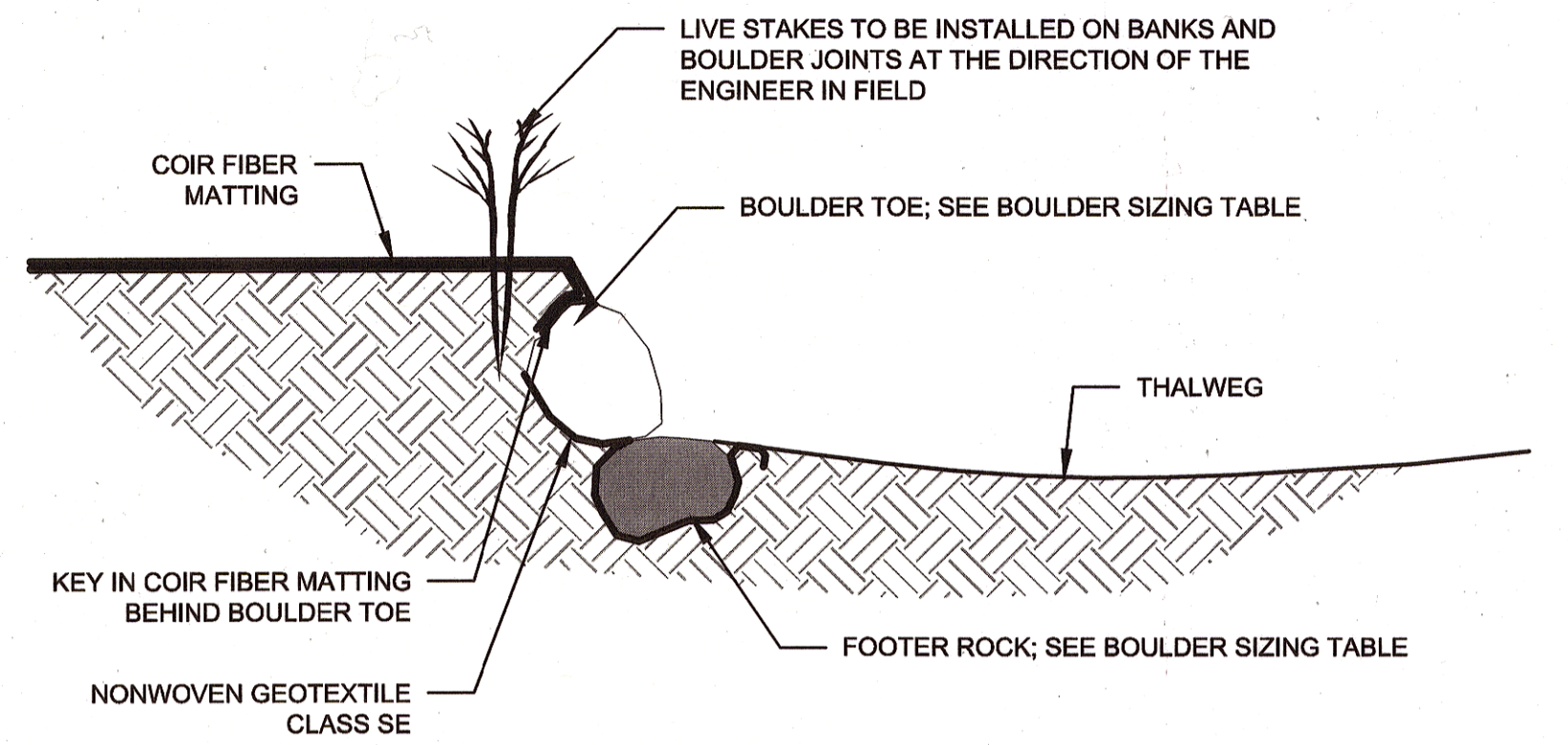
HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

DATE: 11/11/2015  
ISSUES / REVISIONS: 100% SUBMITTAL



**BOULDER TOE PROTECTION  
PLAN -TYPICAL**

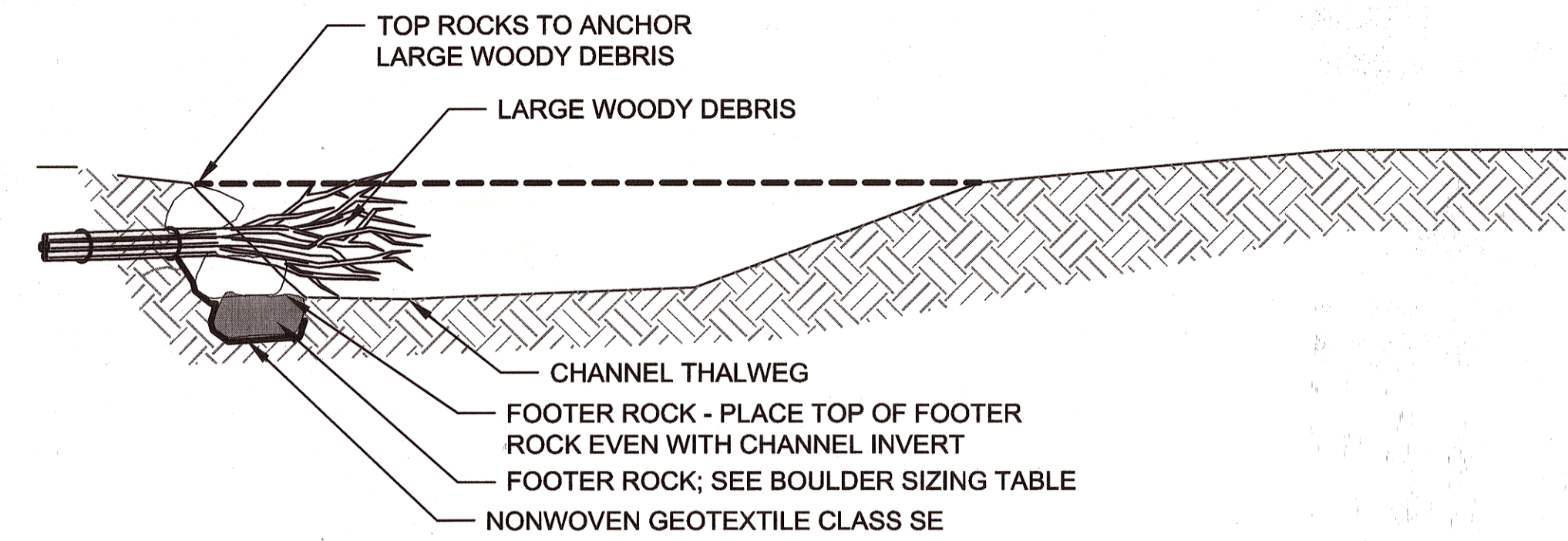
NOT TO SCALE



**BOULDER TOE PROTECTION  
SECTION A-A'**

NOT TO SCALE

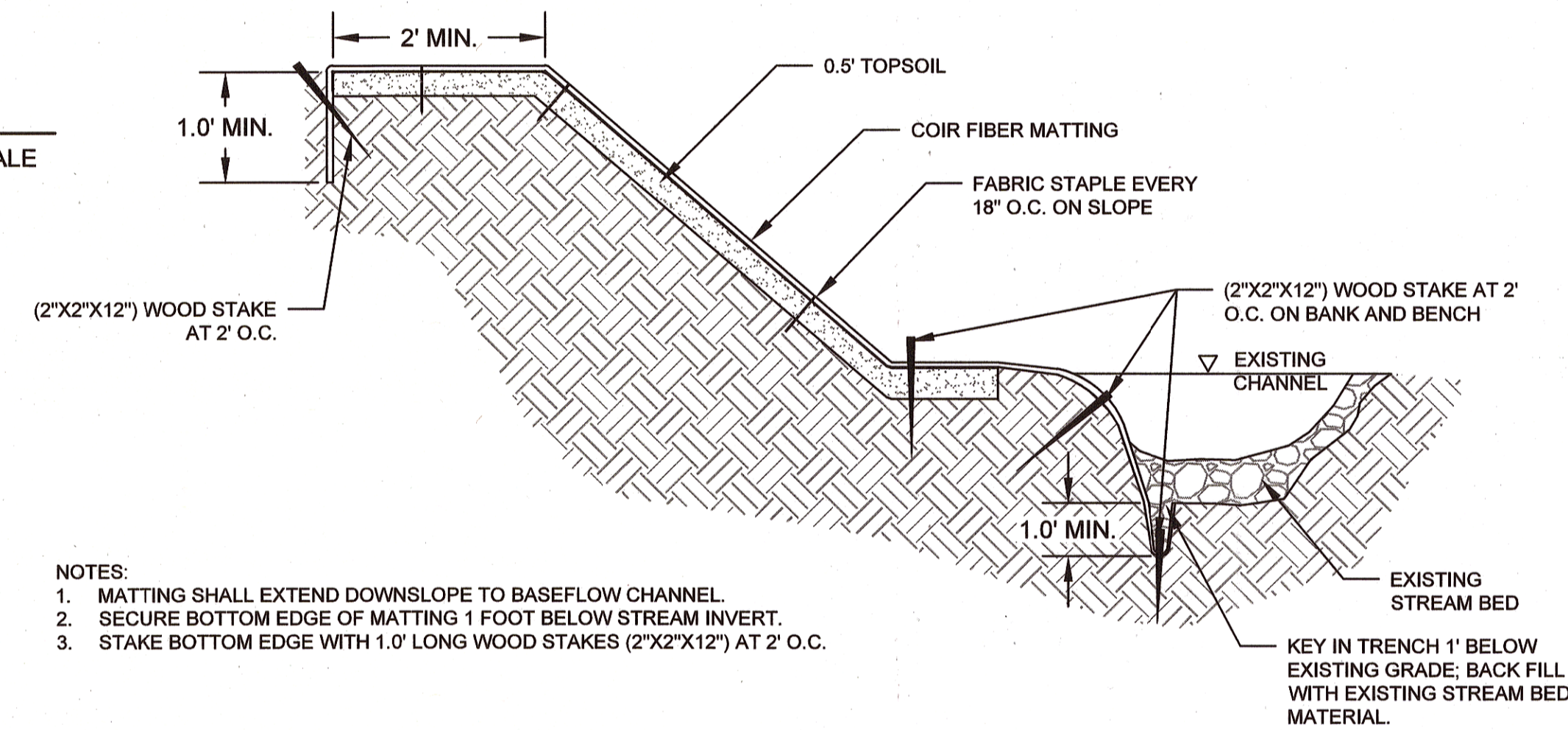
**BOULDER TOE NOTES:**  
BOULDER TOE BETWEEN APPROX STATION 6+00 AND 6+67 MAY REQUIRE ADDITIONAL (2 OR MORE) COURSES OF STONE TO CREATE A STABLE TIE IN. THIS WORK SHALL BE PERFORMED AT THE DIRECTION OF THE ENGINEER.



**NOTE:**  
1. WHEN BACKFILLING OVER AND AROUND FOOTER ROCKS AND LARGE WOODY DEBRIS, PACK ROCK AND SOIL IN BETWEEN ALL VOIDS TO FIRMLY SECURE ALL COMPONENTS INCLUDING JOINTS, CONNECTIONS AND GAPS.

**BOULDER TOE PROTECTION WITH LARGE WOODY DEBRIS  
SECTION B-B'**

NOT TO SCALE

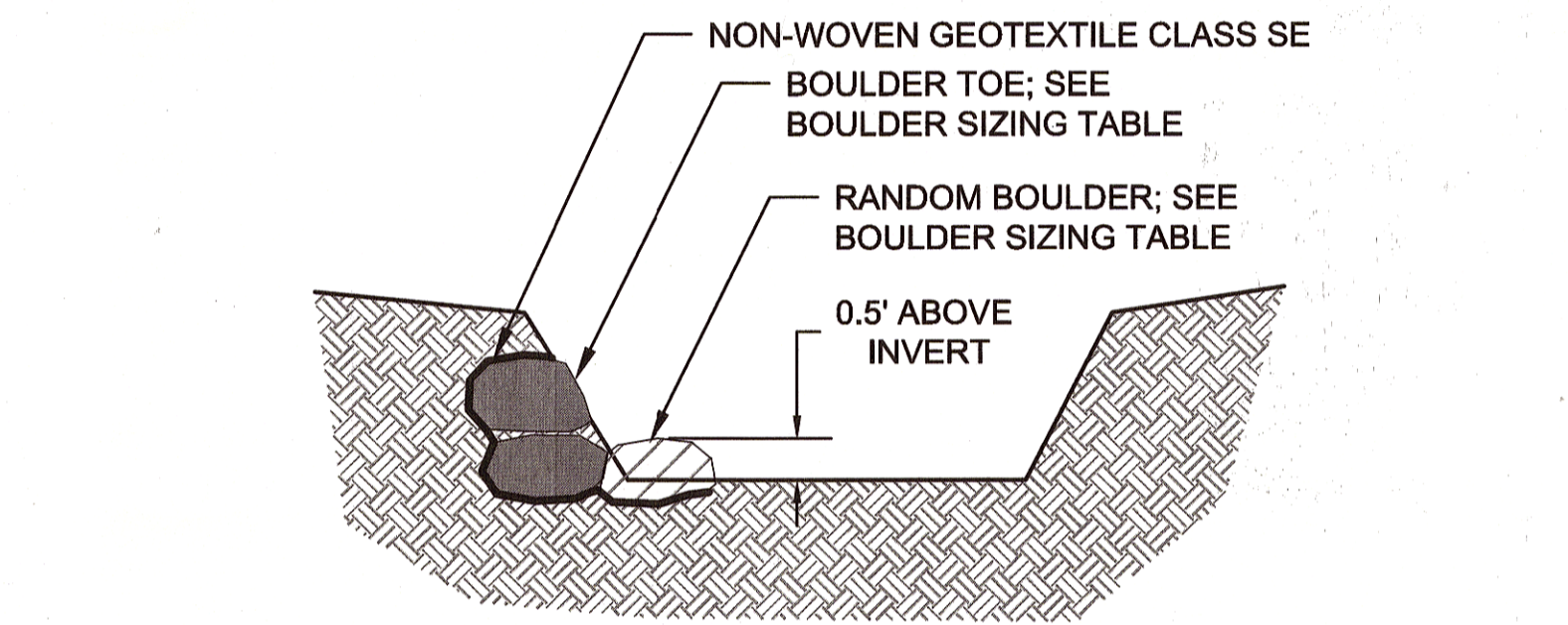


**NOTES:**  
1. MATTING SHALL EXTEND DOWNSLOPE TO BASEFLOW CHANNEL.  
2. SECURE BOTTOM EDGE OF MATTING 1 FOOT BELOW STREAM INVERT.  
3. STAKE BOTTOM EDGE WITH 1.0' LONG WOOD STAKES (2\"/>

**NOTE:** COIR FIBER MATTING SHALL BE ROLLED LENGTH WISE ALONG EACH STREAM BANK EXTENDING FROM TOE OF SLOPE TO A MINIMUM OF TWO FEET PAST THE TOP OF SLOPE UPON COMPLETION OF GRADING AND APPLICATION OF HERBACEOUS PERMANENT SEEDING. IF MORE THAN ONE ROLL IS REQUIRED, MID-BANK OVERLAP SHOULD BE A MINIMUM OF ONE FOOT AND SECURELY FASTENED WITH STAPLES. MATTING CAN BE INSTALLED INCREMENTALLY AS CONSTRUCTION PROGRESSES, PER THE SEQUENCE OF CONSTRUCTION.

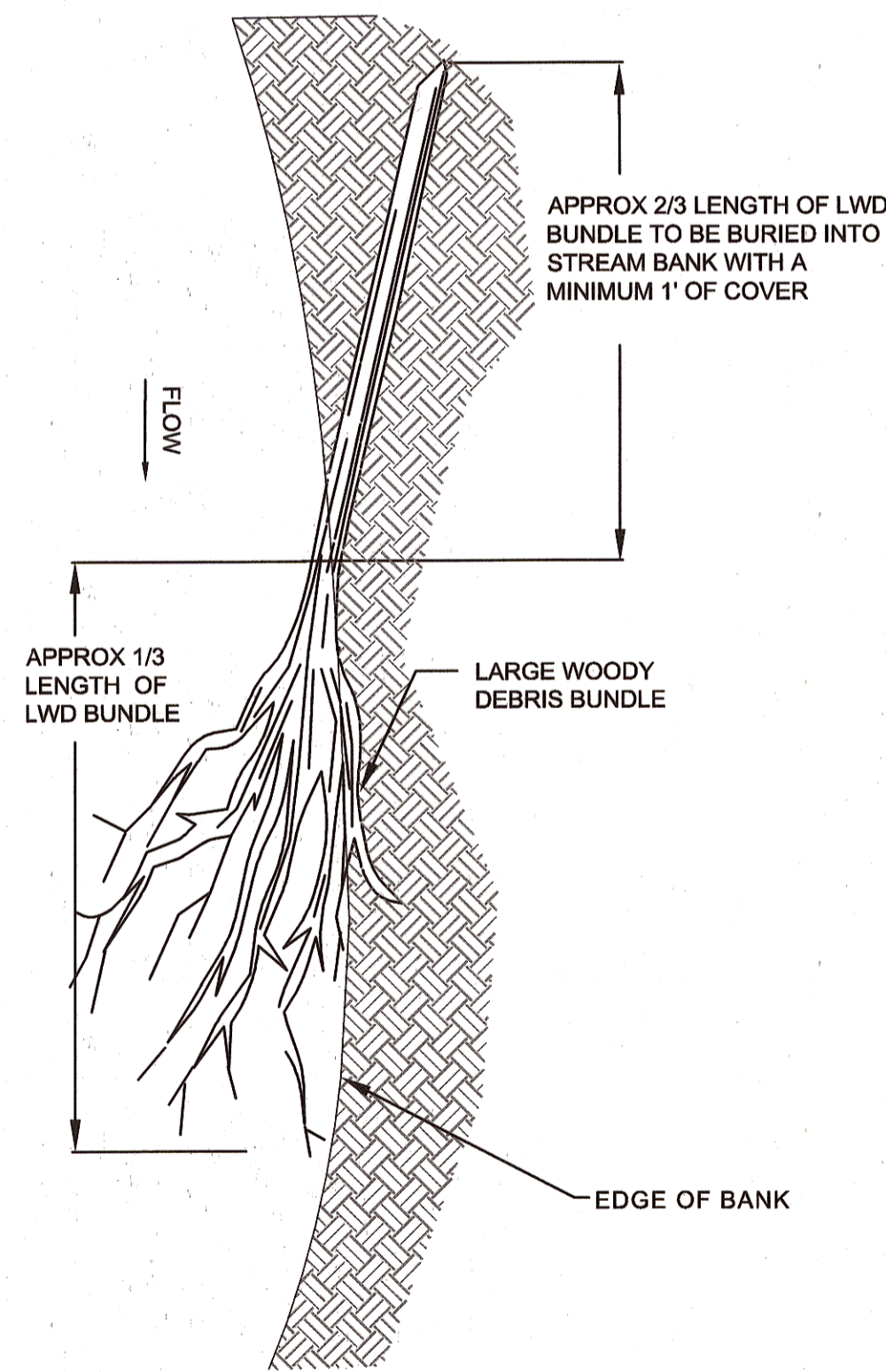
**COIR FIBER MATTING - TYPICAL SLOPE CROSS SECTION**

NOT TO SCALE



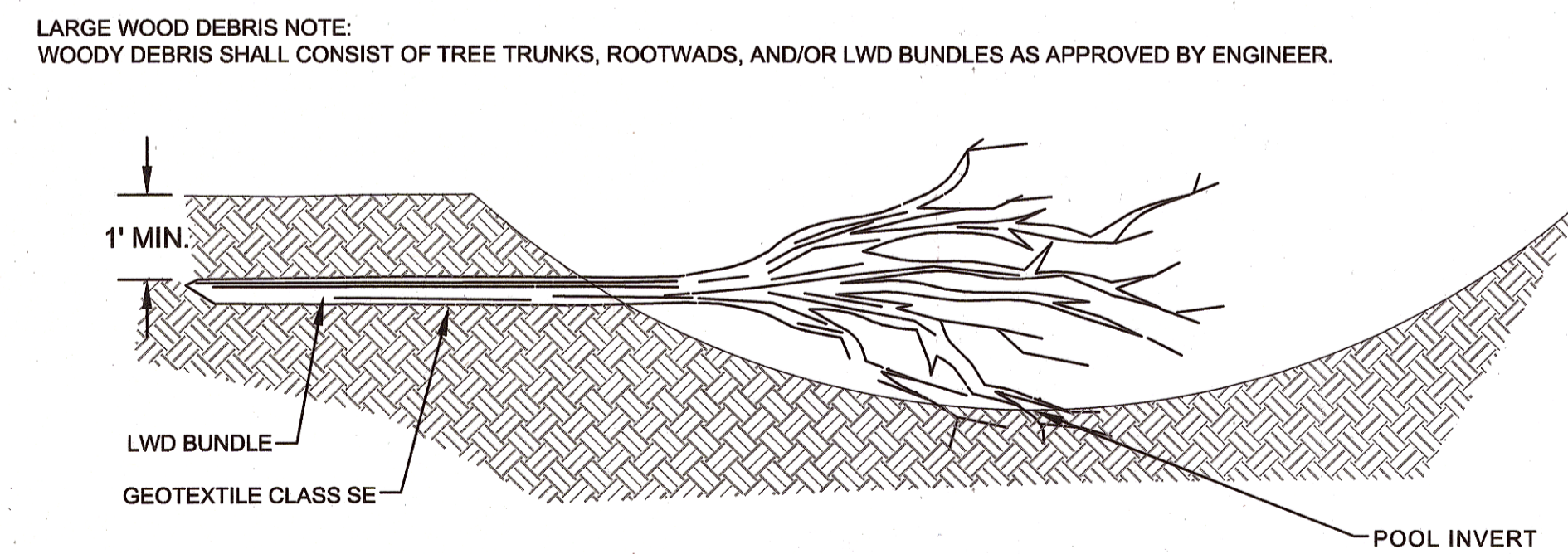
**RANDOM BOULDER DETAIL  
SECTION C-C'**

NOT TO SCALE



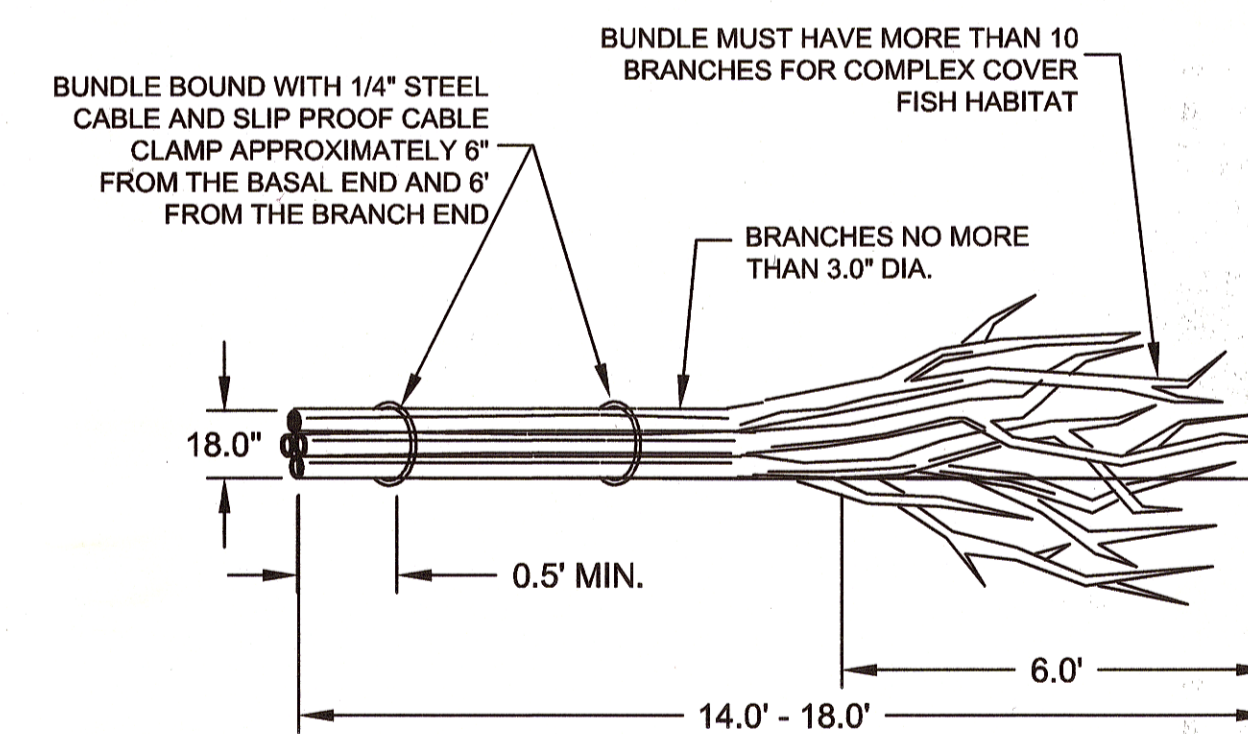
**LARGE WOODY DEBRIS (LWD)  
PLAN VIEW- TYPICAL**

NOT TO SCALE



**LARGE WOODY DEBRIS (LWD)  
CROSS SECTION**

NOT TO SCALE



**INSTREAM LWD NOTE:**  
1. ENGINEER WILL APPROVE ON-SITE WOODY MATERIALS, OR MATERIALS OF OPPORTUNITY BEFORE INSTALLATION.  
2. INSTALL IN-STREAM LARGE WOODY DEBRIS AS DIRECTED BY ENGINEER IN FIELD AT LOCATIONS SHOWN ON GRADING PLANS  
3. PARTIALLY BURY ONSITE LWD INTO THE STREAM BANK APPROXIMATELY 2/3 OF TOTAL LENGTH TO SECURE IN PLACE AS DIRECTED BY THE ENGINEER

**LARGE WOODY DEBRIS (LWD)  
BUNDLE DETAIL**

NOT TO SCALE

APPROVED: [Signature] 12/10/15  
DEPARTMENT OF PUBLIC WORKS  
[Signature] 12/10/15  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH  
BANK STABILIZATION  
PROJECT**

ELECTION DISTRICT: 02  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**DETAILS**

PROJECT NO.: 13005.19 SCALE: N.T.S.

SEAL: BY: AL, TB, KT CHECK: MDT

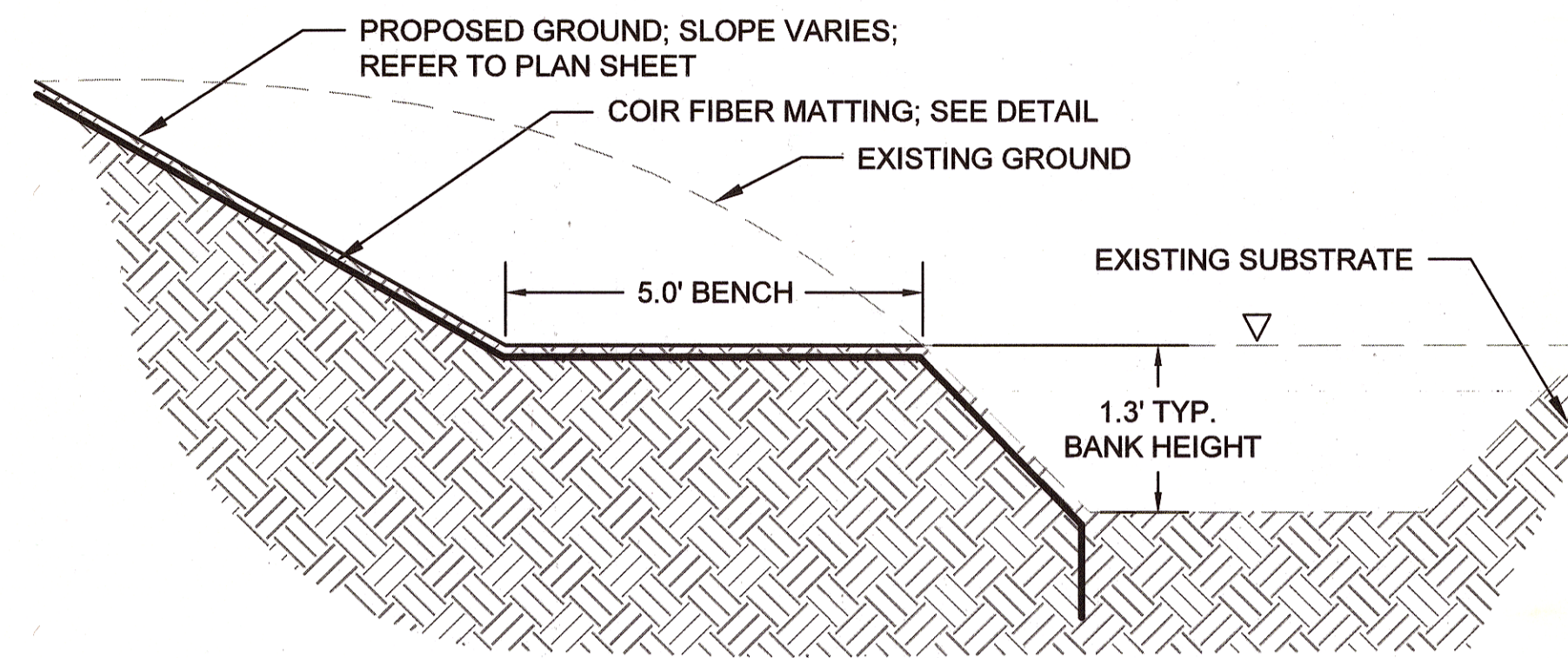
DWG. NO.: 7 OF 20

**CLIENT**

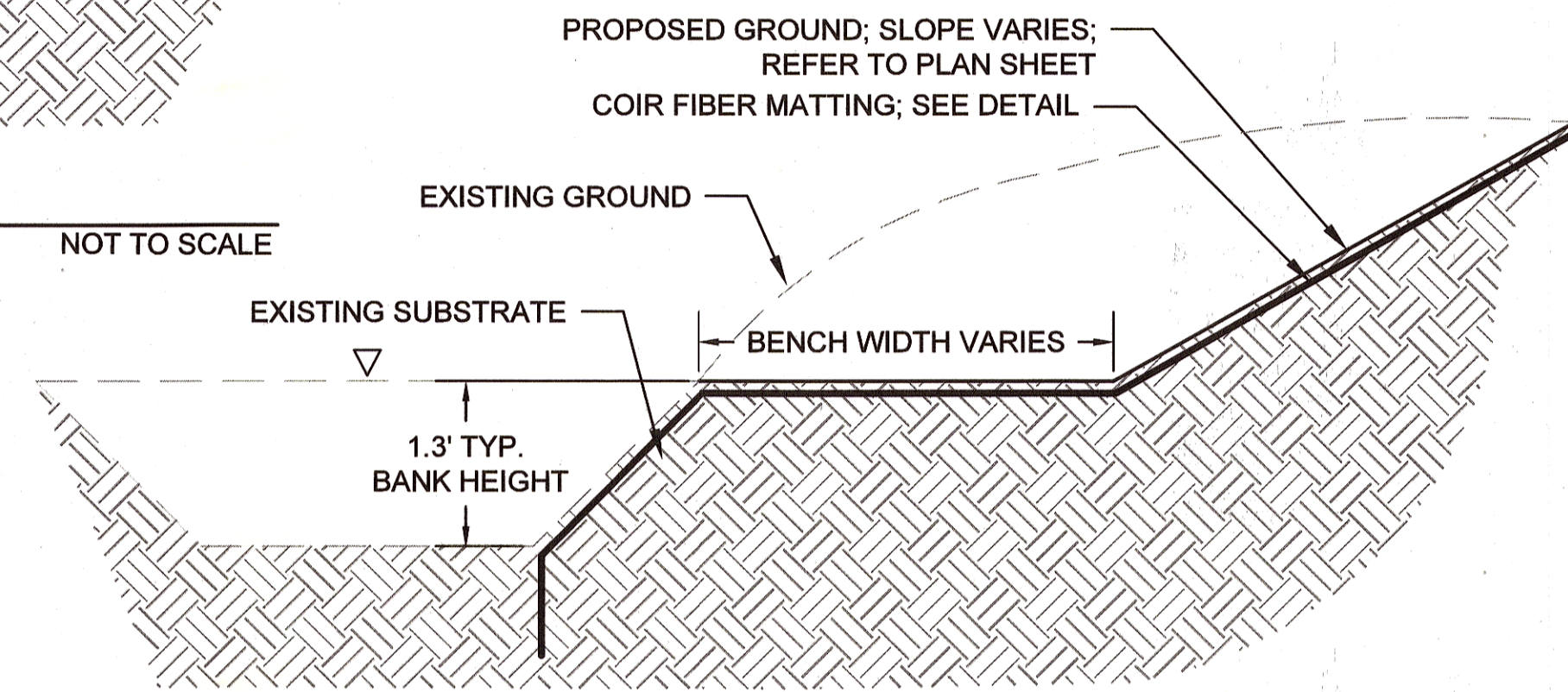
HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

DATE: 11/11/2015  
ISSUES / REVISIONS: 100% SUBMITTAL

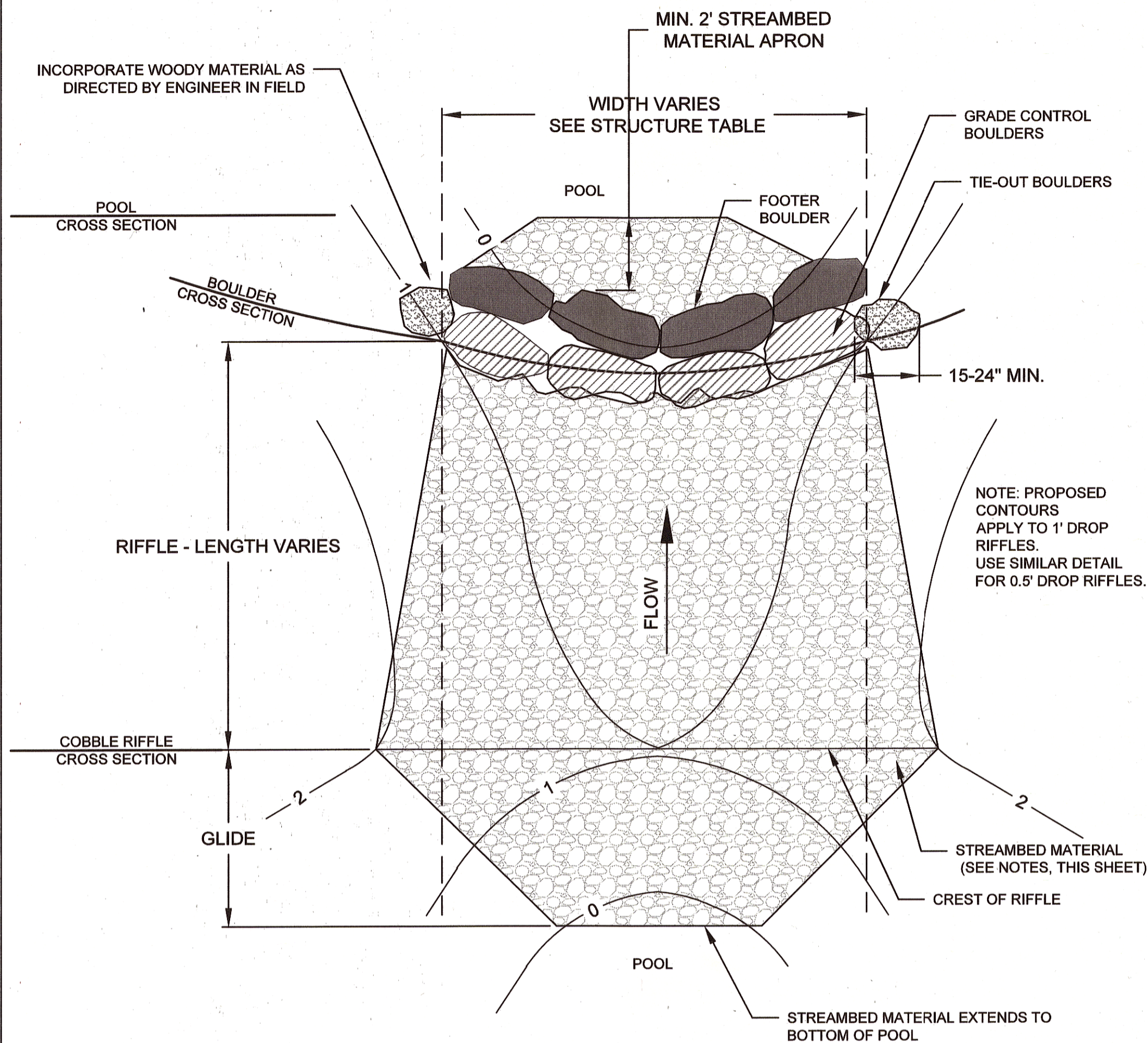
BOULDER SIZING TABLE		
TYPE	SIZE	NOTES
FOOTER	15" - 24"	DIMENSION BASED ON INTERMEDIATE AXIS
TOE	15" - 24"	DIMENSION BASED ON INTERMEDIATE AXIS
RANDOM	15" - 24"	DIMENSION BASED ON INTERMEDIATE AXIS



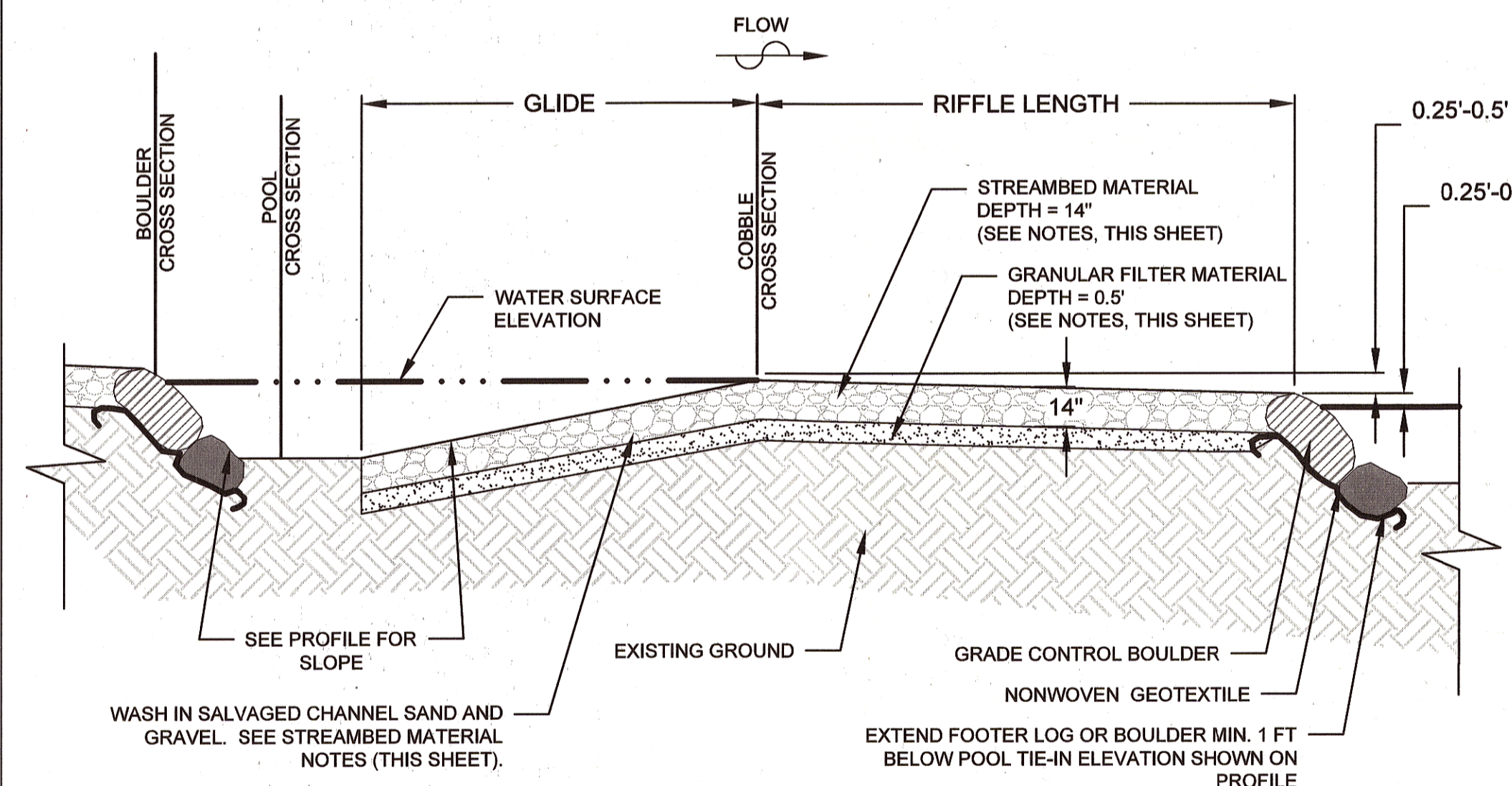
**TYPICAL BANK HEIGHT, MAINSTEM CROSS SECTION**



**TYPICAL BANK HEIGHT, TRIBUTARY CROSS SECTION**



**COBBLE RIFFLE GRADE CONTROL PLAN VIEW**



- COBBLE RIFFLE GRADE CONTROL NOTES:**
1. ALL COBBLE RIFFLE GRADE CONTROL STRUCTURES SHALL BE CONSTRUCTED FROM DOWNSTREAM TO UPSTREAM
  2. REFER TO STREAMBED MATERIAL NOTES FOR DIRECTIONS FOR HOW RIFFLE GRADE CONTROL MATERIAL SHALL BE PLACED.
  3. CONTRACTOR AND ENGINEER SHALL WALK SITE TO IDENTIFY SUITABLE MATERIAL FOR ALL COBBLE RIFFLE GRADE CONTROLS.
  4. CONTRACTOR SHALL EXHAUST SUITABLE MATERIALS FROM ON-SITE EXCAVATION PRIOR TO IMPORTING NEW COBBLE RIFFLE GRADE CONTROL MATERIALS.
  5. ENGINEER WILL APPROVE ALL ON-SITE MATERIAL.
  6. ALL COBBLE RIFFLE GRADE CONTROL MATERIAL MUST BE CLEAN AND FREE FROM TRASH.
  7. INCORPORATE LARGE WOODY DEBRIS IN POOLS AS DIRECTED BY ENGINEER IN FIELD.
  8. WHERE EXISTING CHANNEL INVERT IS AT OR HIGHER THAN FINISHED GRADE, FILL IS NOT NEEDED.

**COBBLE RIFFLE GRADE CONTROL PROFILE**

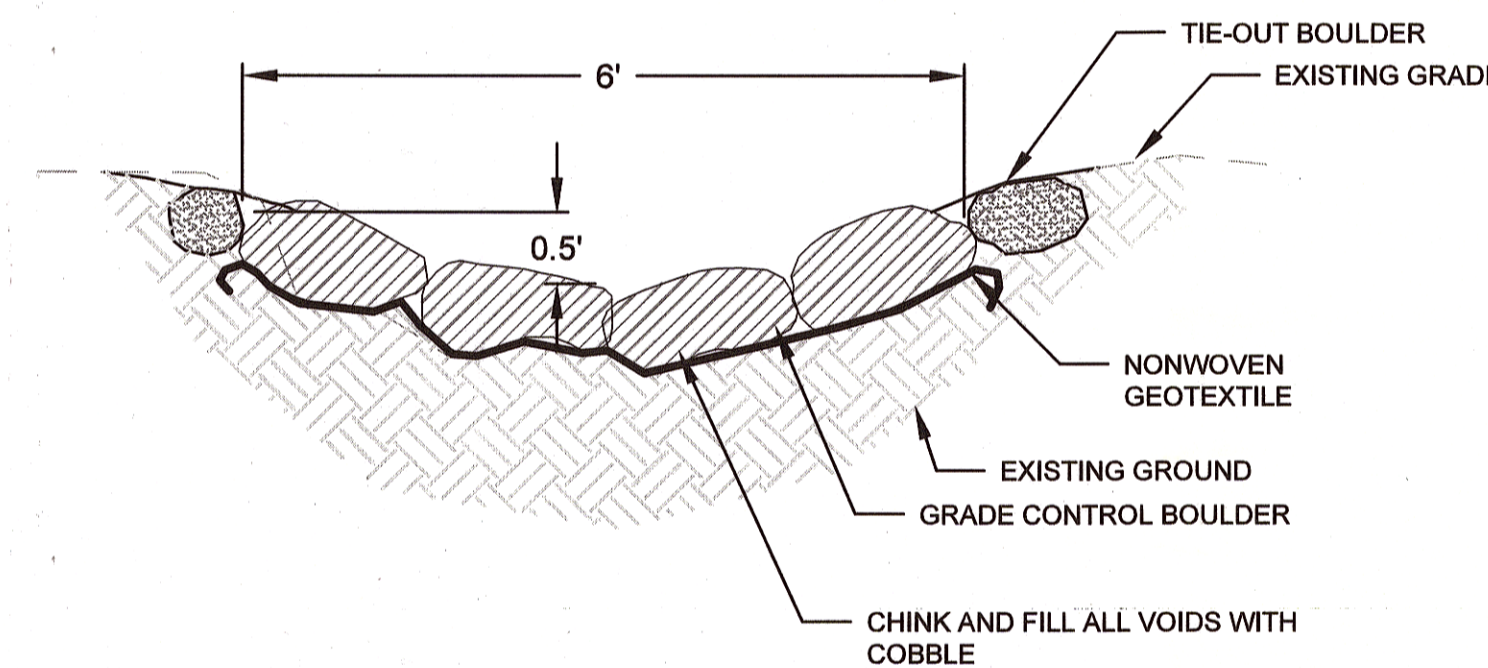
GRANULAR FILTER MATERIAL	
CUMULATIVE % FINER	COBBLE SIZE (IN)
100	2 1/2 in (64 mm)
85-100	1 in (25 mm)
60-100	1/2 in (13 mm)
35-70	No. 10
20-50	No. 40
3-20	No. 200

RIFFLE GRADE CONTROL MATERIAL	
CUMULATIVE % FINER	COBBLE SIZE (IN)
100	14.0
84	11.8
60	8.4
50	7.0
30	4.7
10	1.3

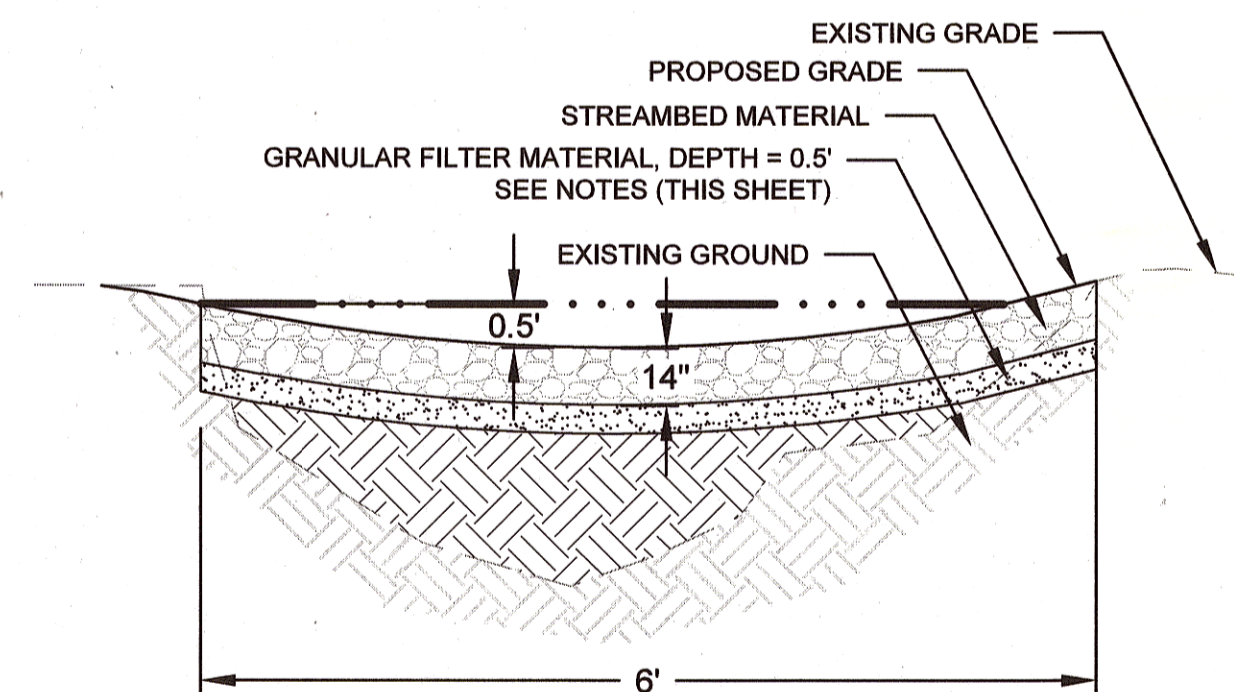
**COBBLE RIFFLE GRADE CONTROL**

NOT TO SCALE

**COBBLE RIFFLE GRADE CONTROL BOULDER CROSS SECTION**



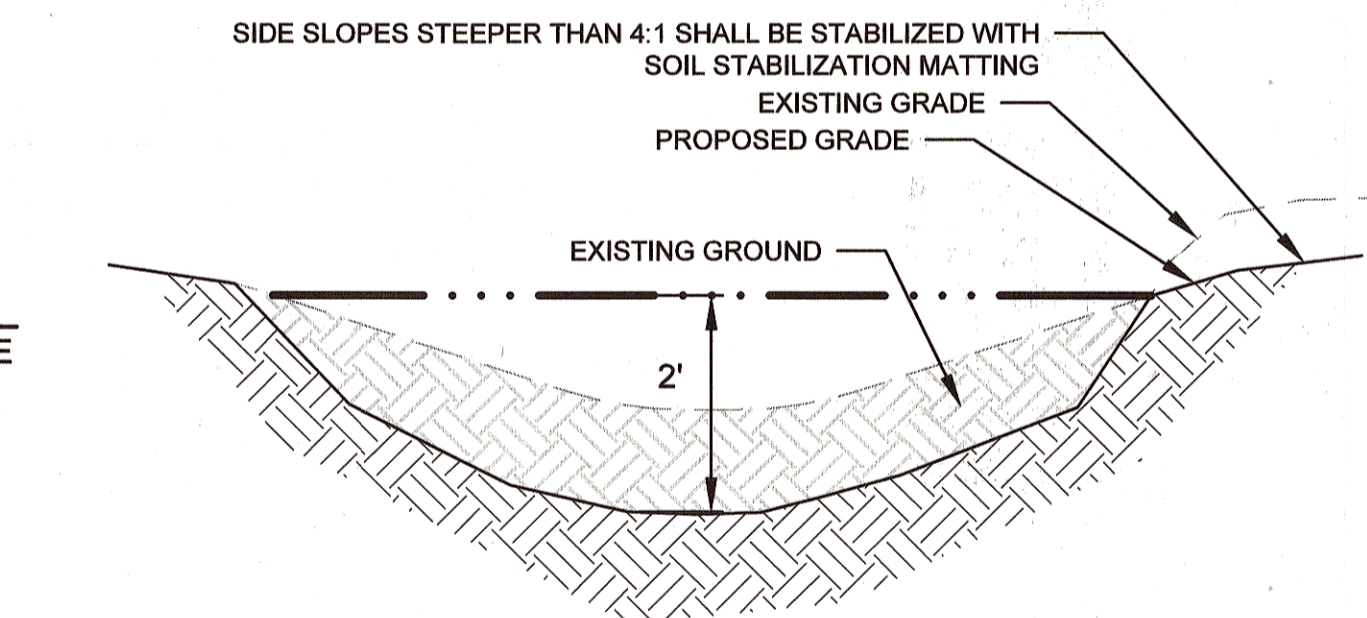
NOT TO SCALE



- STREAMBED MATERIAL NOTES:**
1. PLACE COBBLE IN A LIFT WITH THICKNESS EQUAL TO THE LARGEST STONE IN GRADATION. DO NOT DROP STONES FROM A HEIGHT GREATER THAN 2 FEET ABOVE THE FINISHED SUBGRADE.
  2. PLACE SAND AND GRAVEL ON TOP OF EACH LIFT OF THE FRAMEWORK GRADATION AND USE PRESSURIZED WATER TO WASH THE FINES INTO THE VOIDS IN THE STONE LAYER. APPLY WATER SUFFICIENT TO ASSURE THAT ALL VOID SPACES ARE FILLED.
  3. REMOVE ANY EXCESS SAND AND GRAVEL PRIOR TO PLACING THE NEXT LIFT OF COBBLE TO ASSURE COBBLE-TO-COBBLE CONTACT AND THAT THE SUBSEQUENT LIFT DOES NOT REST ON SAND AND GRAVEL.
  4. PLACE THE NEXT LIFT AS DESCRIBED ABOVE UNTIL THE FINISH GRADE HAS BEEN REACHED.
  5. ALL SAND AND GRAVEL SHALL BE APPROVED BY ENGINEER. SHOULD SUITABLE MATERIAL NOT BE AVAILABLE ON SITE, FURNISHED MATERIAL MEETING SPECIFICATIONS FOR GRANULAR FILL MAY BE USED AS APPROVED BY ENGINEER.

**COBBLE RIFFLE GRADE CONTROL COBBLE CROSS SECTION**

NOT TO SCALE



- FILL MATERIAL NOTES:**
1. FILL MATERIAL SHALL BE SUITABLE MATERIAL FROM ON-SITE EXCAVATIONS FIRST, THEN FROM OTHER SOURCES.
  2. THE MATERIAL SHALL BE CLEAN EARTH.
  3. THE MATERIAL SHALL BE FREE FROM VEGETABLE MATTER, ORGANIC MATERIAL, SLUDGE, GRIT, TRASH, DEBRIS, MUCK, SWAMP MUCK, ROOTS, ROOT MAT, LOGS, STUMPS, TREE STUMPS, BRUSH, FROZEN MATERIAL OR OTHER DELETERIOUS SUBSTANCES.

**COBBLE RIFFLE GRADE CONTROL POOL CROSS SECTION**

NOT TO SCALE

APPROVED: [Signature] 12/16/15  
DEPARTMENT OF PUBLIC WORKS  
[Signature] 12/16/15  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

**Biohabitats**  
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fx: 410.554.0168 / www.biohabitats.com  
Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**DETAILS**

PROJECT NO.: 13005.19 SCALE: N.T.S.

SEAL: [Blank] BY: AL, TB, KT CHECK: MDT

DWG. NO.:

STATE OF MARYLAND  
Professional Engineer  
No. 4567  
12/3/15



**CLIENT**

HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

DATE: 11/11/2015  
ISSUES / REVISIONS: 100% SUBMITTAL

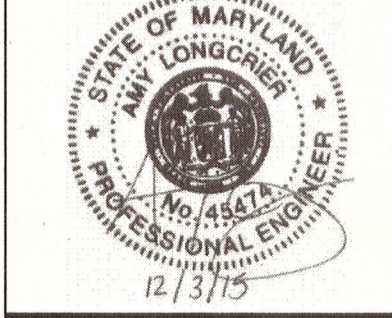
APPROVED: *[Signature]* 12/22/15  
DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES  
*[Signature]* 12/18/15  
DATE

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**BONNIE BRANCH BANK STABILIZATION PROJECT**  
ELECTION DISTRICT: 02  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**EROSION AND SEDIMENT CONTROL PLAN**

PROJECT NO.: 13005.19 SCALE: 1" = 20'  
BY: AL, TB, KT CHECK: MDT

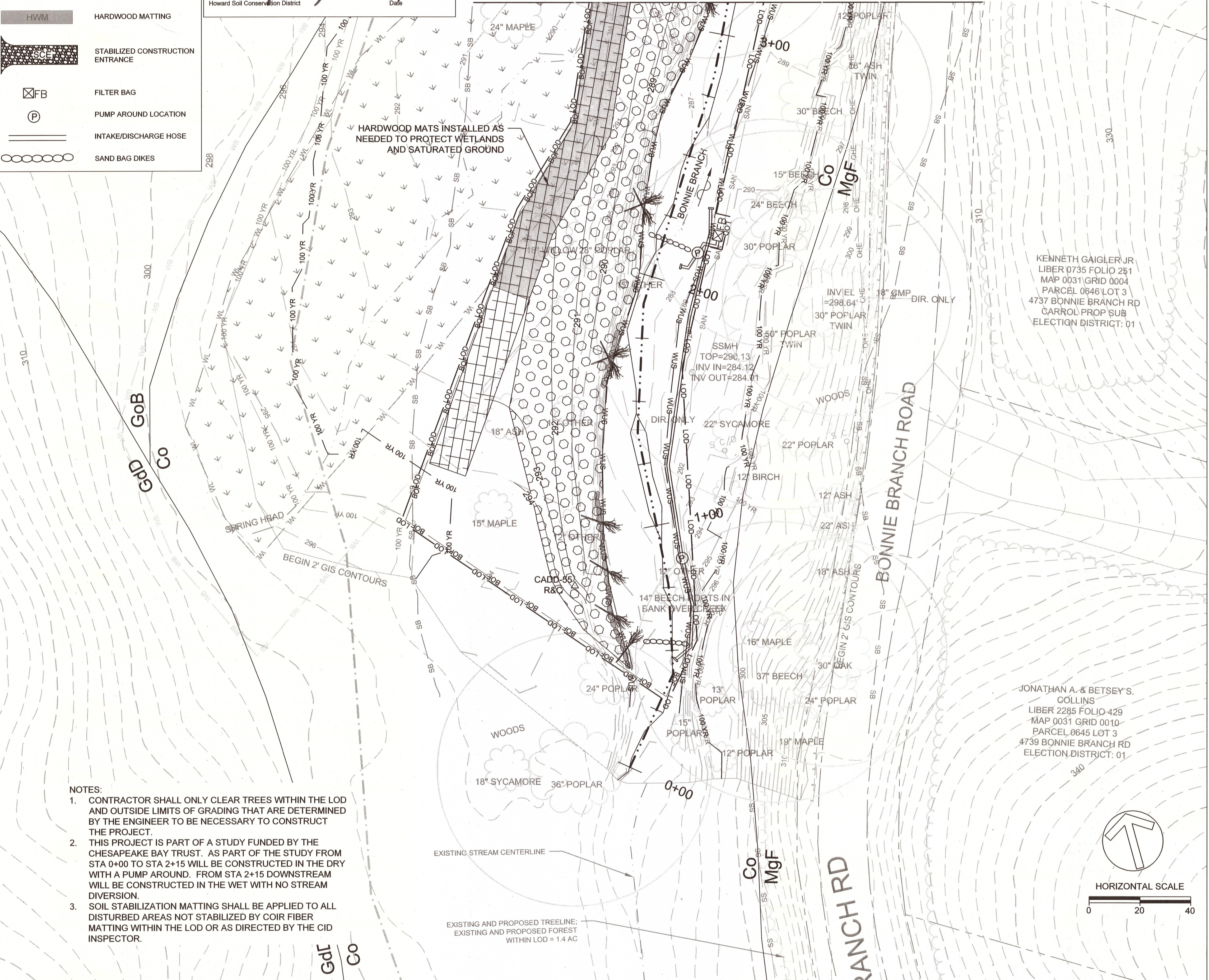


This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT  
*[Signature]* 12/18/15  
Howard Soil Conservation District Date

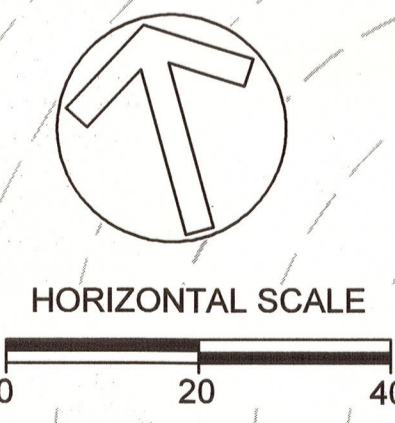
**MATCHLINE - SEE SHEET 10**

**LEGEND**

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 425 PROPOSED MAJOR CONTOUR
- 424 PROPOSED MINOR CONTOUR
- LOD LIMIT OF DISTURBANCE
- PROPERTY LINE
- ROADWAY
- SS SANITARY SEWER
- OHE OVERHEAD ELECTRIC
- EXISTING THALWEG
- PROPOSED THALWEG
- WUS WATERS OF THE US
- SB 75' STREAM BUFFER
- 100 YR EXISTING 100-YR FLOODPLAIN
- 100 YR PROPOSED 100-YR FLOODPLAIN
- TREE LINE
- EXISTING FOREST CONSERVATION ACT EASEMENT
- TPF TREE PROTECTION FENCE
- GUARDRAIL
- WETLAND
- WETLAND BUFFER
- PROPOSED BOULDER TOE HABITAT
- PROPOSED COBBLE RIFFLE
- PROPOSED RANDOM BOULDER
- PROPOSED LARGE WOODY DEBRIS
- TREE
- CRITICAL ROOT ZONE
- TS TREE PROTECTION
- TRAVERSE POINT
- SANITARY SEWER MANHOLE
- ELECTRIC POLE/GUY WIRE
- SSF SUPER SILT FENCE
- BOF BLAZE ORANGE FENCE
- FL-18 FILTER LOG
- TB TEMPORARY BRIDGE
- STAGING AND STOCKPILING AREA
- MULCH ACCESS ROAD
- COIR FIBER MATTING
- HARDWOOD MATTING
- SCF STABILIZED CONSTRUCTION ENTRANCE
- FB FILTER BAG
- P PUMP AROUND LOCATION
- INTAKE/DISCHARGE HOSE
- SAND BAG DIKES



- NOTES:**
- CONTRACTOR SHALL ONLY CLEAR TREES WITHIN THE LOD AND OUTSIDE LIMITS OF GRADING THAT ARE DETERMINED BY THE ENGINEER TO BE NECESSARY TO CONSTRUCT THE PROJECT.
  - THIS PROJECT IS PART OF A STUDY FUNDED BY THE CHESAPEAKE BAY TRUST. AS PART OF THE STUDY FROM STA 0+00 TO STA 2+15 WILL BE CONSTRUCTED IN THE DRY WITH A PUMP AROUND. FROM STA 2+15 DOWNSTREAM WILL BE CONSTRUCTED IN THE WET WITH NO STREAM DIVERSION.
  - SOIL STABILIZATION MATTING SHALL BE APPLIED TO ALL DISTURBED AREAS NOT STABILIZED BY COIR FIBER MATTING WITHIN THE LOD OR AS DIRECTED BY THE CID INSPECTOR.



LEGEND					
---	EXISTING MAJOR CONTOUR	WB	WETLAND BUFFER	[Hatched Box]	STAGING AND STOCKPILING AREA
---	EXISTING MINOR CONTOUR	[Boulder Pattern]	PROPOSED BOULDER TOE HABITAT	[Cross-hatched Box]	MULCH ACCESS ROAD
425	PROPOSED MAJOR CONTOUR	[Cobble Pattern]	PROPOSED COBBLE RIFFLE	[Coir Fiber Pattern]	COIR FIBER MATTING
424	PROPOSED MINOR CONTOUR	[Random Boulder]	PROPOSED RANDOM BOULDER	[Hardwood Pattern]	HARDWOOD MATTING
LOD	LIMIT OF DISTURBANCE	[Large Woody Debris]	PROPOSED LARGE WOODY DEBRIS	[Stabilized Entrance]	STABILIZED CONSTRUCTION ENTRANCE
---	PROPERTY LINE	[Tree]	TREE	[Filter Bag]	FILTER BAG
---	ROADWAY	[Tree Protection]	TREE PROTECTION	[Pump]	PUMP AROUND LOCATION
SS	SANITARY SEWER	[Electric Pole]	ELECTRIC POLE/GUY WIRE	[Intake/Discharge]	INTAKE/DISCHARGE HOSE
OHE	OVERHEAD ELECTRIC	[Silt Fence]	SUPER SILT FENCE	[Sand Bag]	SAND BAG DIKES
---	EXISTING THALWEG	[Blaze Orange Fence]	BLAZE ORANGE FENCE		
---	PROPOSED THALWEG	[Filter Log]	FILTER LOG		
---	WUS	[Temporary Bridge]	TEMPORARY BRIDGE		
SB	75' STREAM BUFFER				
100	EXISTING 100-YR FLOODPLAIN				
100	PROPOSED 100-YR FLOODPLAIN				
[Tree Line]	TREE LINE				
[Forest Easement]	EXISTING FOREST CONSERVATION ACT EASEMENT				
TPF	TREE PROTECTION FENCE				
[Guardrail]	GUARDRAIL				
[Wetland]	WETLAND				

This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

*[Signature]* 12/11/15  
 Date  
 Howard Soil Conservation District

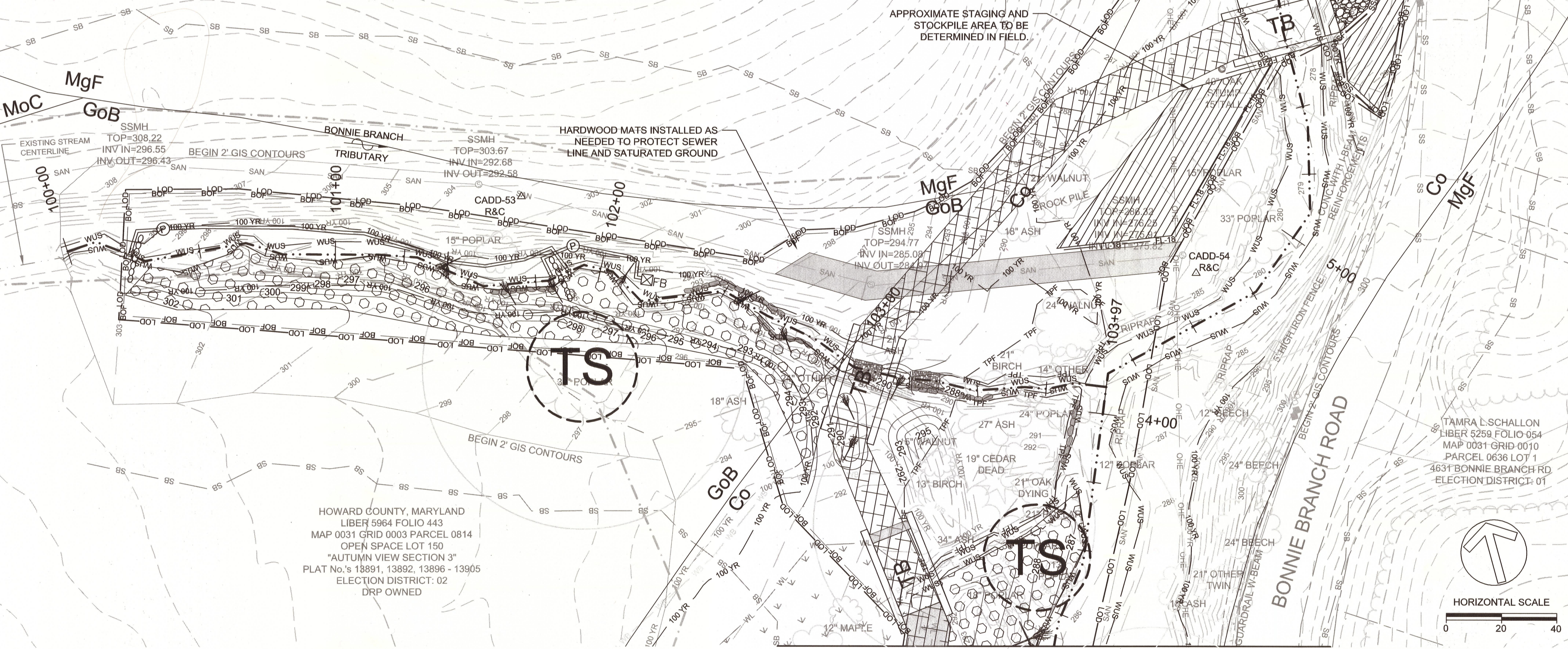
RYAN SIMMONS  
 LIBER 4291 FOLIO 045  
 MAP 0031 GRID 0004  
 PARCEL 0462 LOT 1  
 4615 BONNIE BRANCH RD  
 PLAT No.'s 5718  
 ELECTION DISTRICT: 01

**CLIENT**

HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

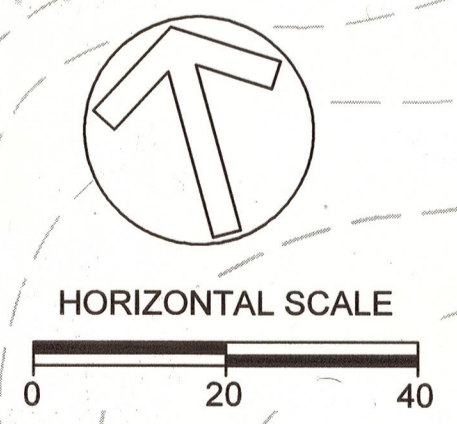
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APPROXIMATE STAGING AND STOCKPILE AREA TO BE DETERMINED IN FIELD.

HARDWOOD MATS INSTALLED AS NEEDED TO PROTECT SEWER LINE AND SATURATED GROUND

HOWARD COUNTY, MARYLAND  
 LIBER 5964 FOLIO 443  
 MAP 0031 GRID 0003 PARCEL 0814  
 OPEN SPACE LOT 150  
 "AUTUMN VIEW SECTION 3"  
 PLAT No.'s 13891, 13892, 13896 - 13905  
 ELECTION DISTRICT: 02  
 DRP OWNED



MATCHLINE - SEE SHEET 9

*[Signature]* 12/11/15  
 APPROVED: DEPARTMENT OF PUBLIC WORKS  
*[Signature]* 12/11/15  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

**Biohabitats**

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 Baltimore, MD 21211 / ph: 410.554.0156  
 fx: 410.554.0168 / www.biohabitats.com

Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

TITLE: **EROSION AND SEDIMENT CONTROL PLAN**

PROJECT NO.: 13005.19 SCALE: 1" = 20'

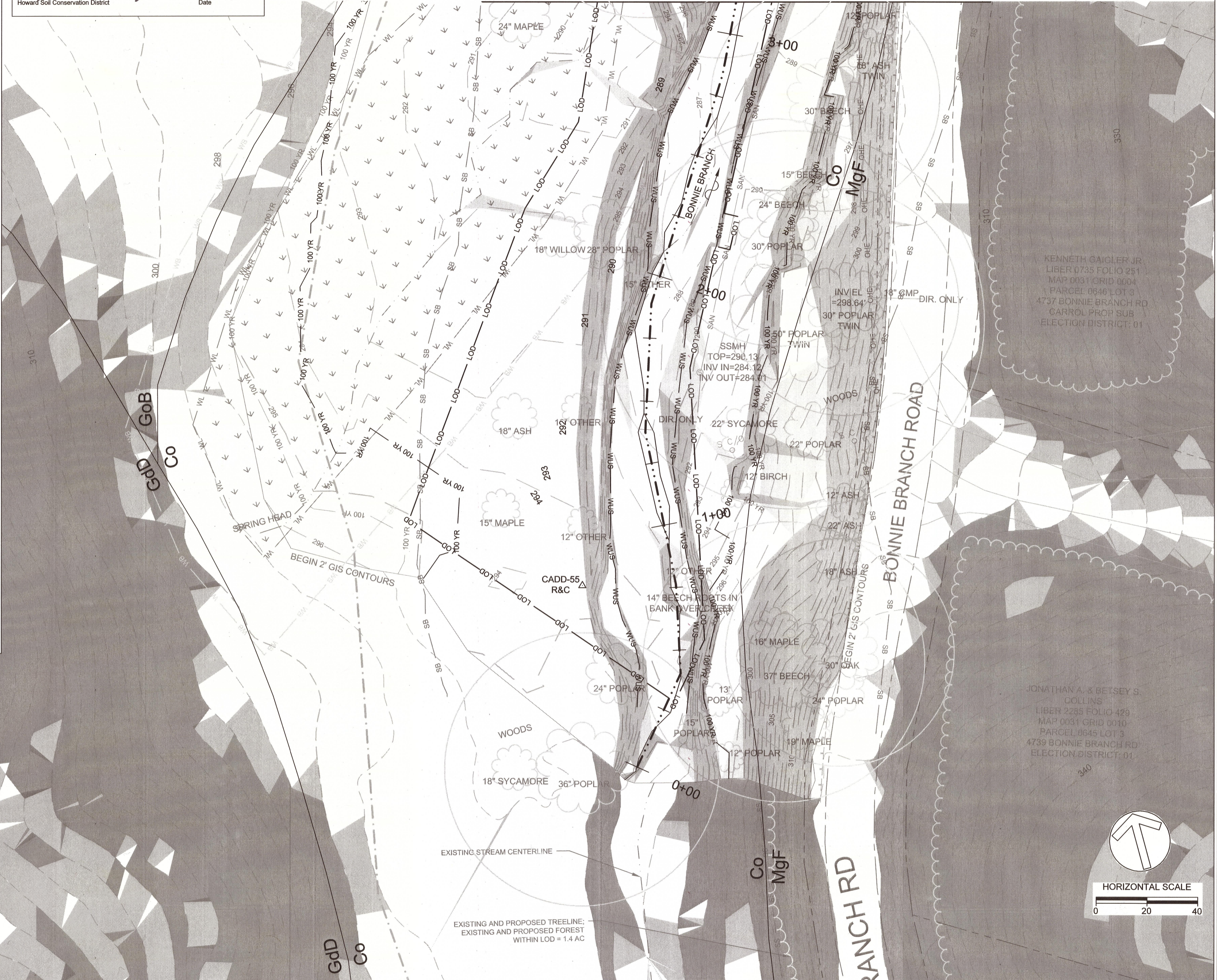
SEAL: [Professional Engineer Seal] BY: AL, TB, KT CHECK: MDT  
 DWS. NO.: [Blank]

- LEGEND**
- EXISTING MAJOR CONTOUR
  - EXISTING MINOR CONTOUR
  - 425 PROPOSED MAJOR CONTOUR
  - 424 PROPOSED MINOR CONTOUR
  - LOD LIMIT OF DISTURBANCE
  - PROPERTY LINE
  - ROADWAY
  - SS SANITARY SEWER
  - OHE OVERHEAD ELECTRIC
  - EXISTING THALWEG
  - PROPOSED THALWEG
  - WUS WATERS OF THE US
  - SB 75' STREAM BUFFER
  - 100 YR EXISTING 100-YR FLOODPLAIN
  - 100 YR PROPOSED 100-YR FLOODPLAIN
  - TREE LINE
  - EXISTING FOREST CONSERVATION ACT EASEMENT
  - GUARDRAIL
  - WL WETLAND
  - WB WETLAND BUFFER
  - STABILIZED CONSTRUCTION ENTRANCE
  - HIGHLY ERODIBLE SOILS - SLOPE > 15% OR SOILS WITH A K FACTOR > 0.35 AND SLOPE > 5%
  - STEEP SLOPES - SLOPE > 20%
  - GdC SOIL DIVIDE AND LABEL
  - TREE
  - CRITICAL ROOT ZONE
  - (TS) TREE PROTECTION
  - Δ TRAVERSE POINT
  - ○ SANITARY SEWER MANHOLE
  - ● ELECTRIC POLE/GUY WIRE

This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

*[Signature]* 12/21/15  
 Howard Soil Conservation District Date

MATCHLINE - SEE SHEET 12



**CLIENT**

HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

KENNETH CAIGLER JR.  
 LIBER 0735 FOLIO 251  
 MAP 0031 GRID 0604  
 PARCEL 0546 LOT 3  
 4737 BONNIE BRANCH RD  
 CARROL PROP SUB  
 ELECTION DISTRICT: 01

*[Signature]* 12/18/15  
 APPROVED: DEPARTMENT OF PUBLIC WORKS  
*[Signature]* 12/18/15  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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 Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

TITLE: **SUPPLEMENTAL SOILS INFO FOR ESC**

PROJECT NO.:	13005.19	SCALE:	VALUE
SEAL:		BY:	AL, TB, KT
		CHECK:	MDT

DWS. NO.:

**11 OF 20**

*[Professional Engineer Seal]*  
 STATE OF MARYLAND  
 JOHN LONGCHER  
 PROFESSIONAL ENGINEER  
 No. 45274  
 12/31/15

**LEGEND**

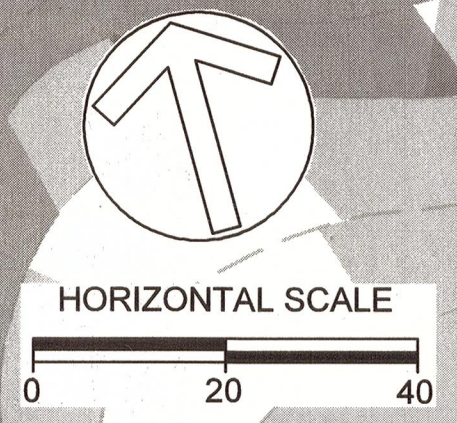
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- EXISTING MINOR CONTOUR
- 425 PROPOSED MAJOR CONTOUR
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- CRITICAL ROOT ZONE
- TREE PROTECTION
- TRAVERSE POINT
- SANITARY SEWER MANHOLE
- ELECTRIC POLE/GUY WIRE

This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

*[Signature]* 12/24/15  
 Howard Soil Conservation District Date



HOWARD COUNTY, MARYLAND  
 LIBER 5964 FOLIO 443  
 MAP 0031 GRID 0003 PARCEL 0814  
 OPEN SPACE LOT 150  
 "AUTUMN VIEW SECTION 3"  
 PLAT No.'s 13891, 13892, 13896 - 13905  
 ELECTION DISTRICT: 02  
 DRP OWNED



MATCHLINE - SEE SHEET 11

**CLIENT**

HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

*[Signature]* 12/24/15  
 APPROVED: DEPARTMENT OF PUBLIC WORKS  
*[Signature]* 12/24/15  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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 fx: 410.554.0168 / www.biohabitats.com  
 Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**

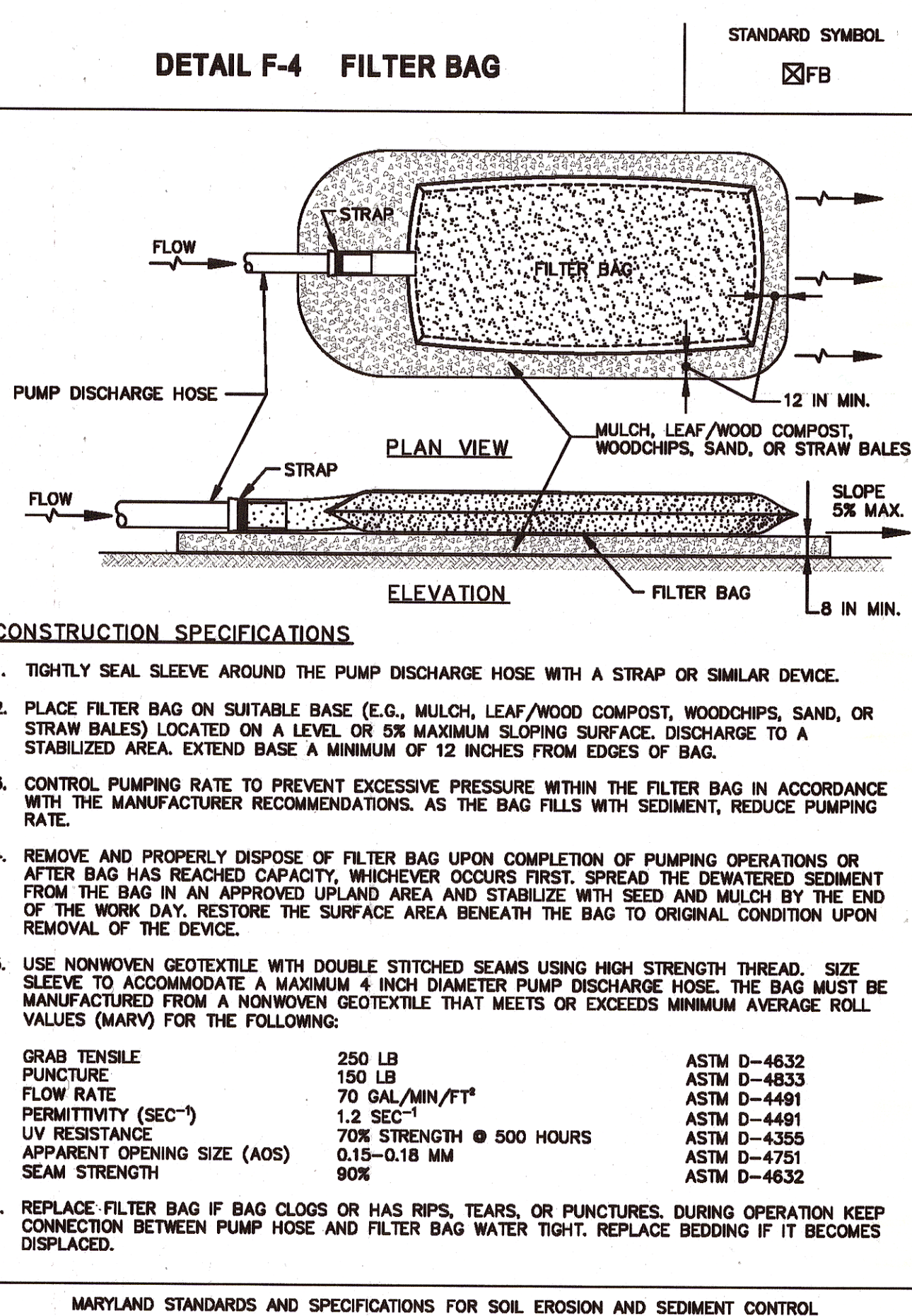
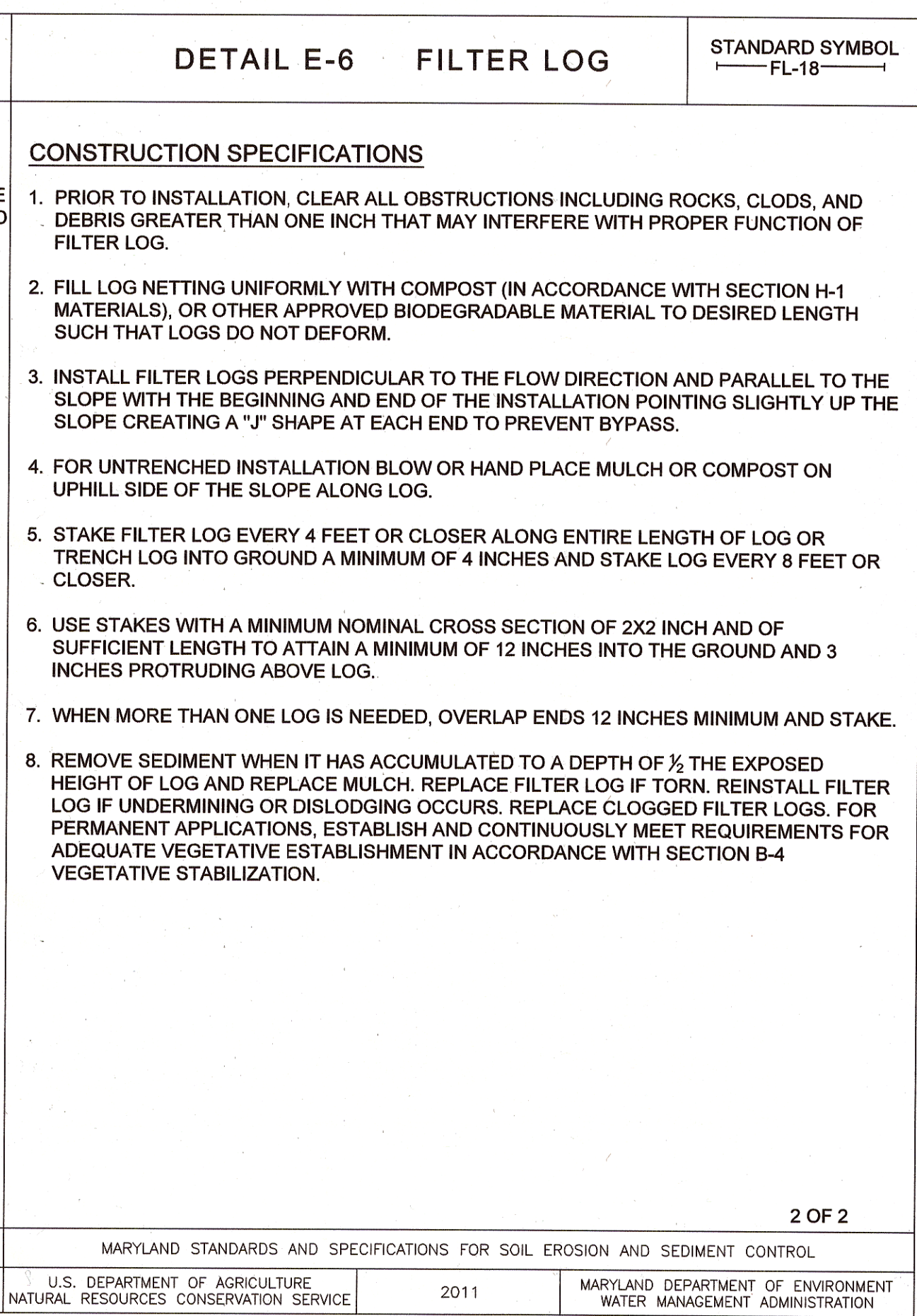
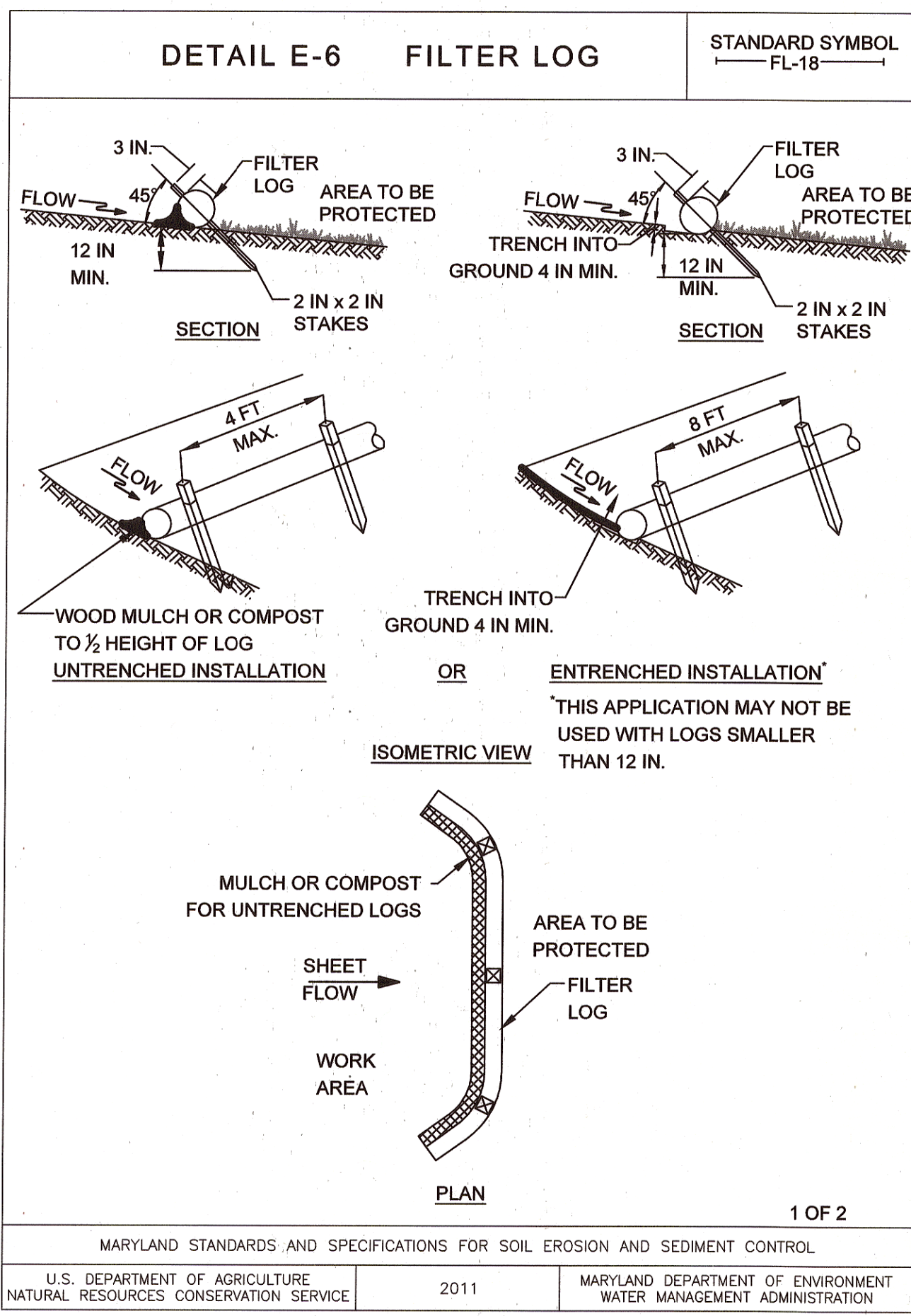
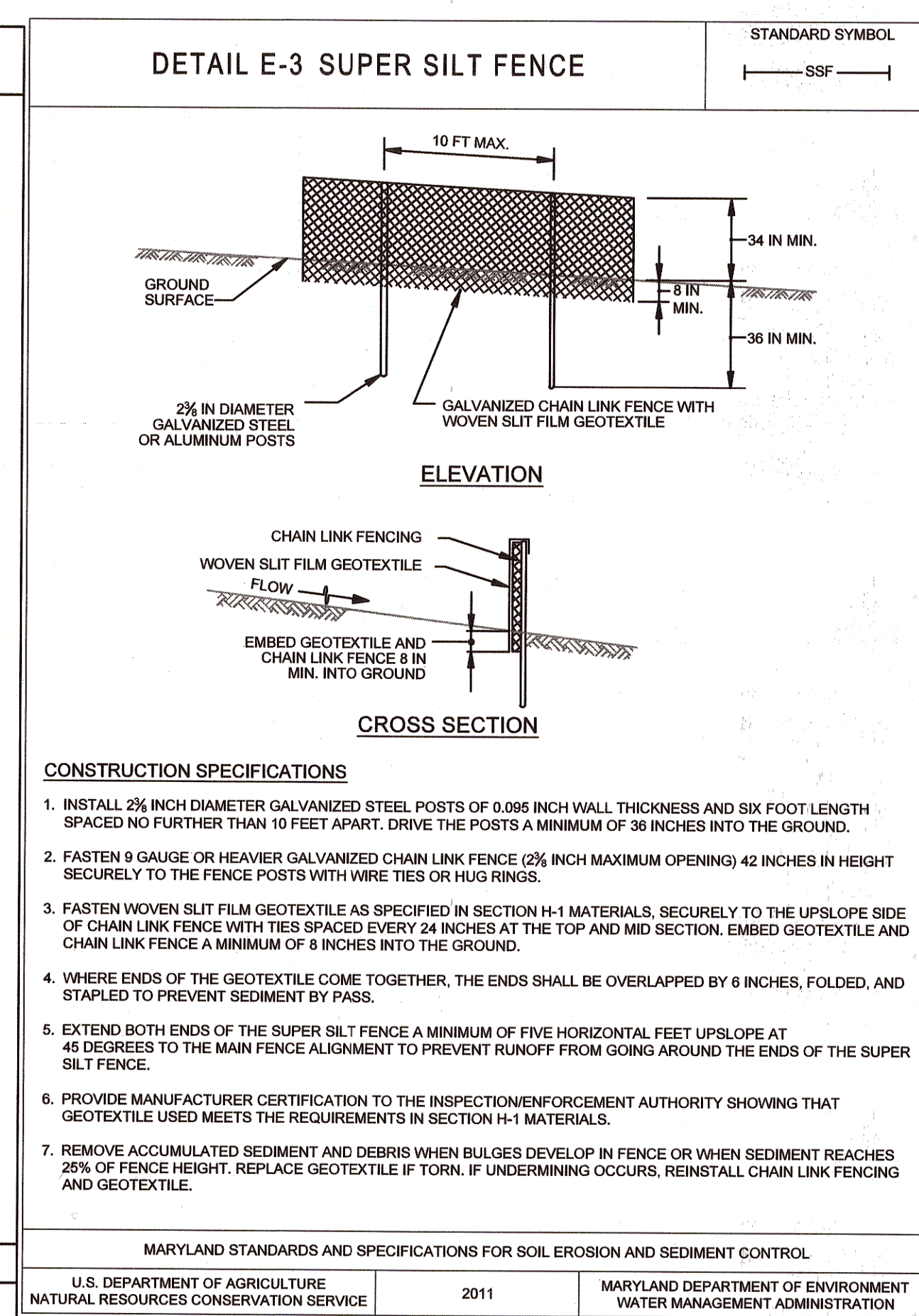
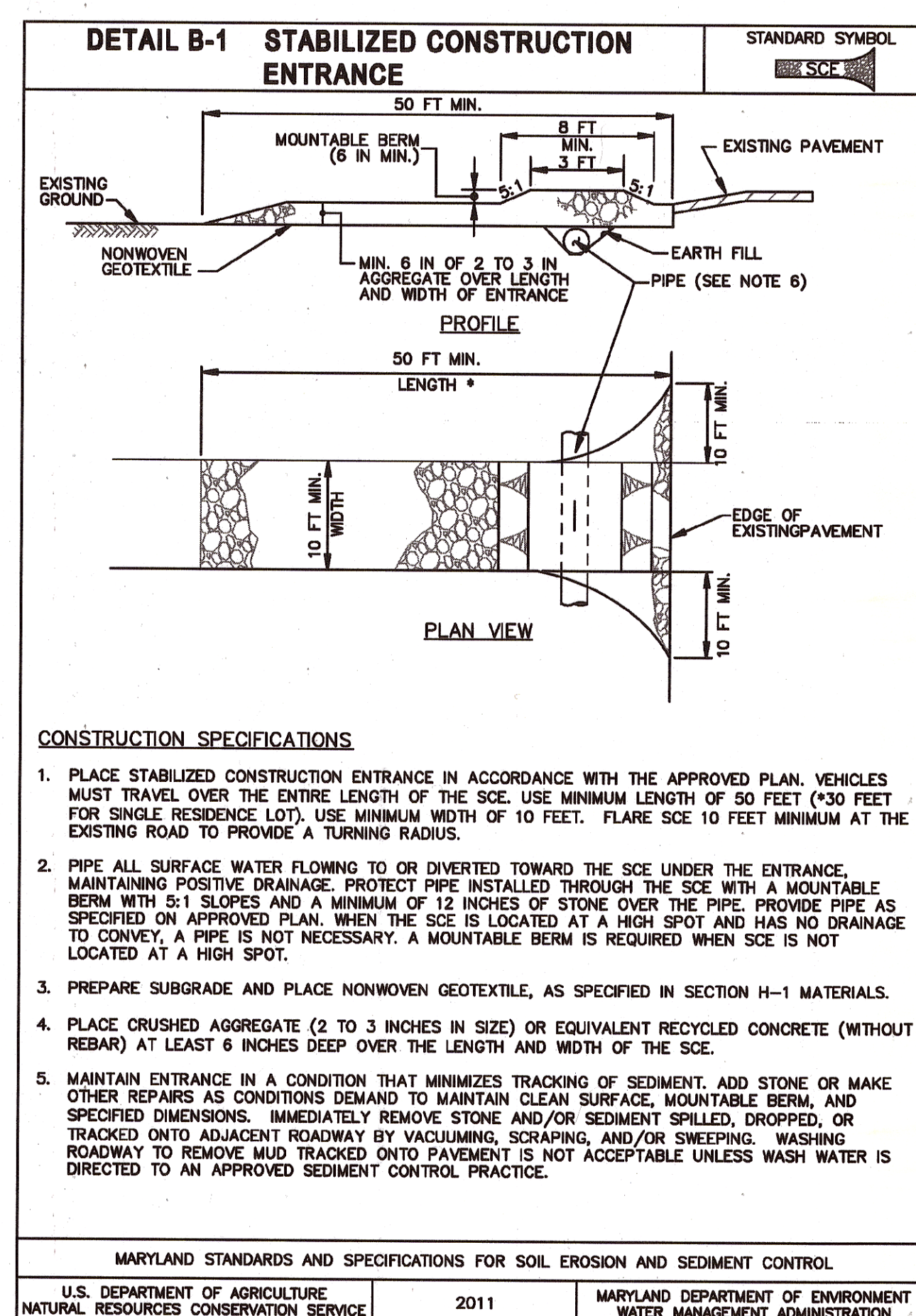
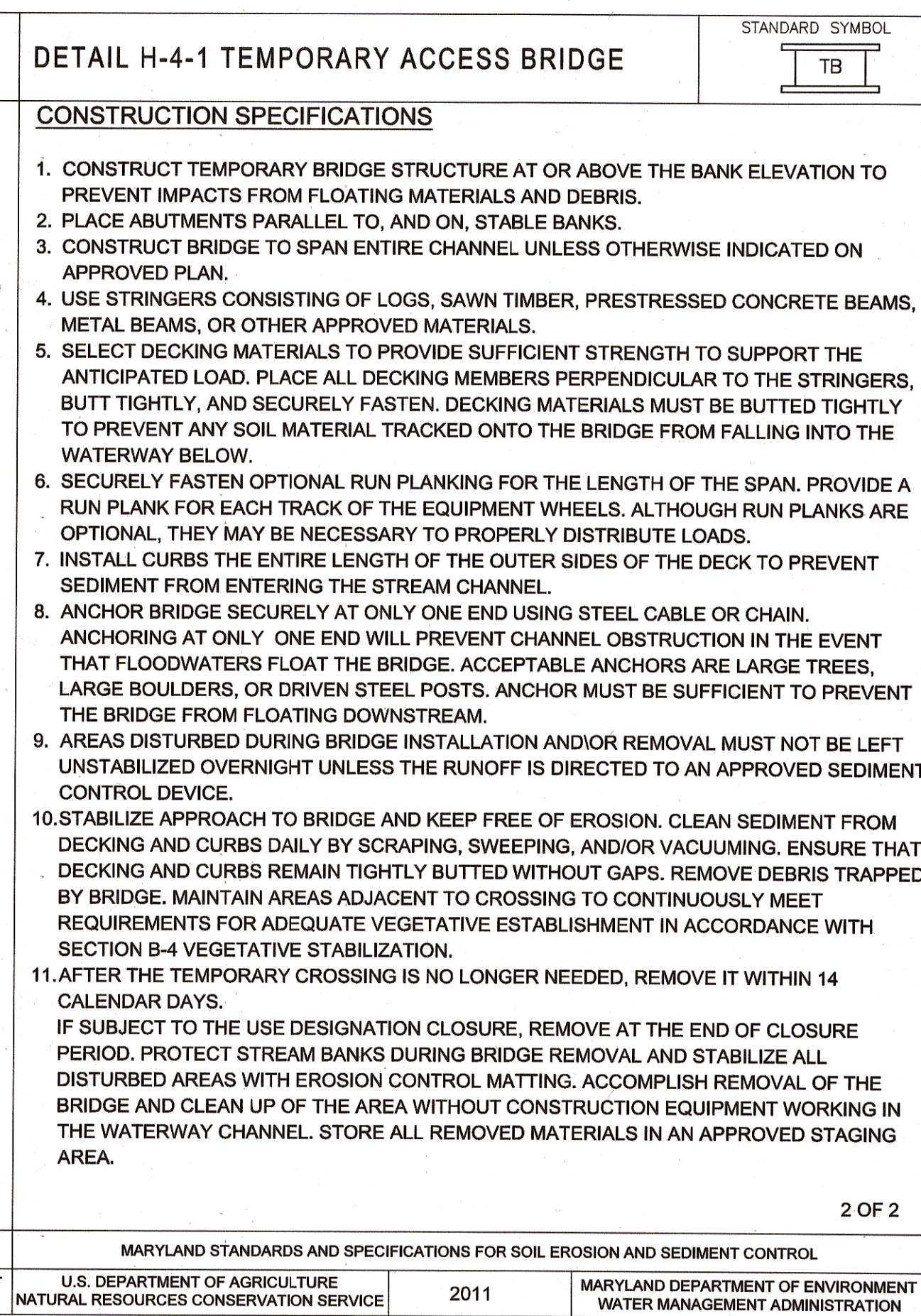
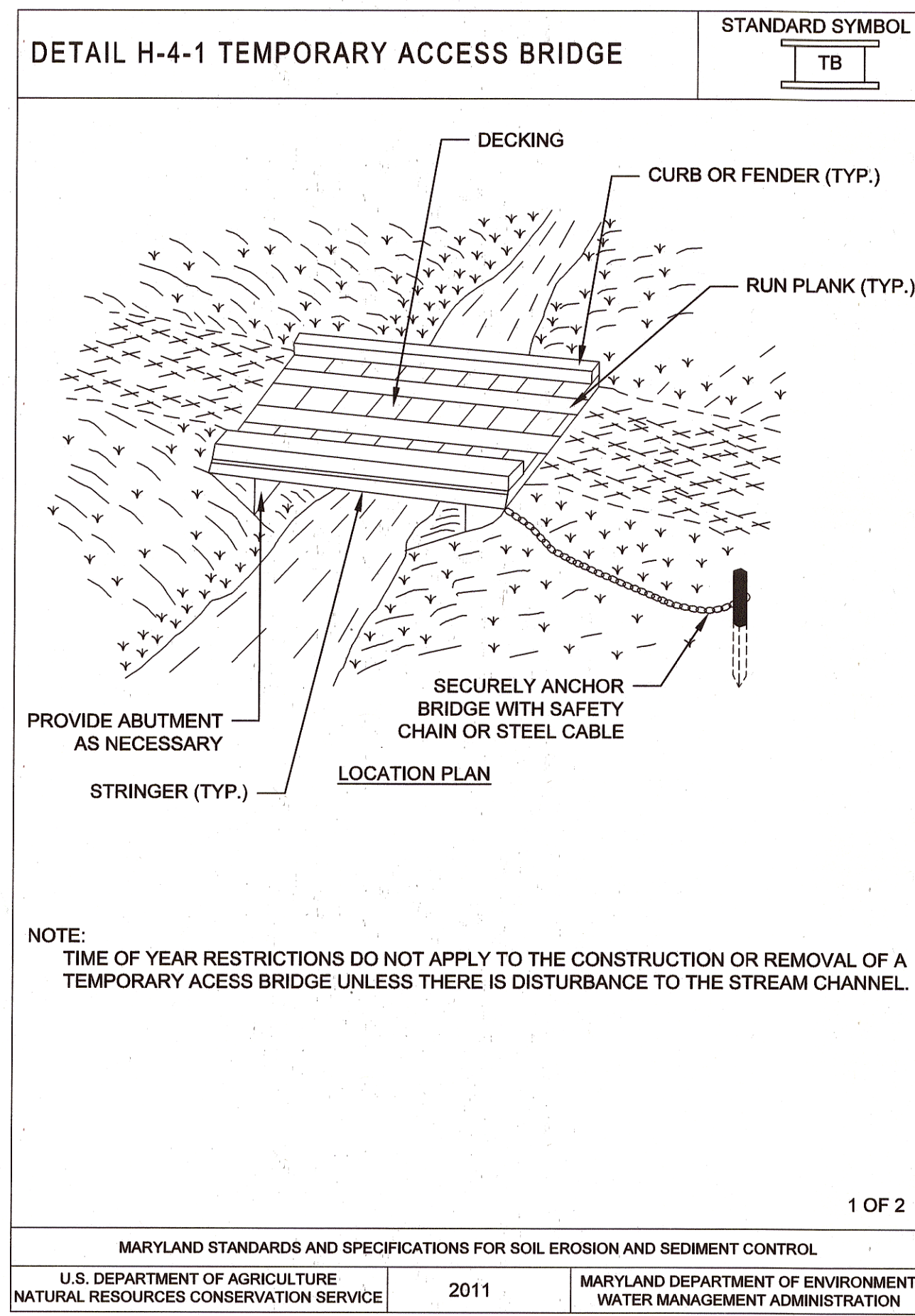
ELECTION DISTRICT: 02  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

**SUPPLEMENTAL SOILS INFO FOR ESC**

PROJECT NO.: 13005.19 SCALE: VALUE

SEAL: BY: AL, TB, KT CHECK: MDT

DWG. NO.: 12 OF 20



**CLIENT**

HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

APPROVED: *[Signature]* 12/15/15  
DEPARTMENT OF PUBLIC WORKS

*[Signature]* 12/15/15  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH  
BANK STABILIZATION  
PROJECT**

ELECTION DISTRICT: 02  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**EROSION AND  
SEDIMENT  
CONTROL DETAILS**

PROJECT NO.: 13005.19	SCALE: VALUE
SEAL:	BY: AL, TB, KT CHECK: MDT
	DWG. NO.: 13 OF 20

This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

*[Signature]* 12/21/15  
Date  
EA-16-013

Howard Soil Conservation District

MGWC 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 around in-stream construction sites.

IMPLEMENTATION SEQUENCE

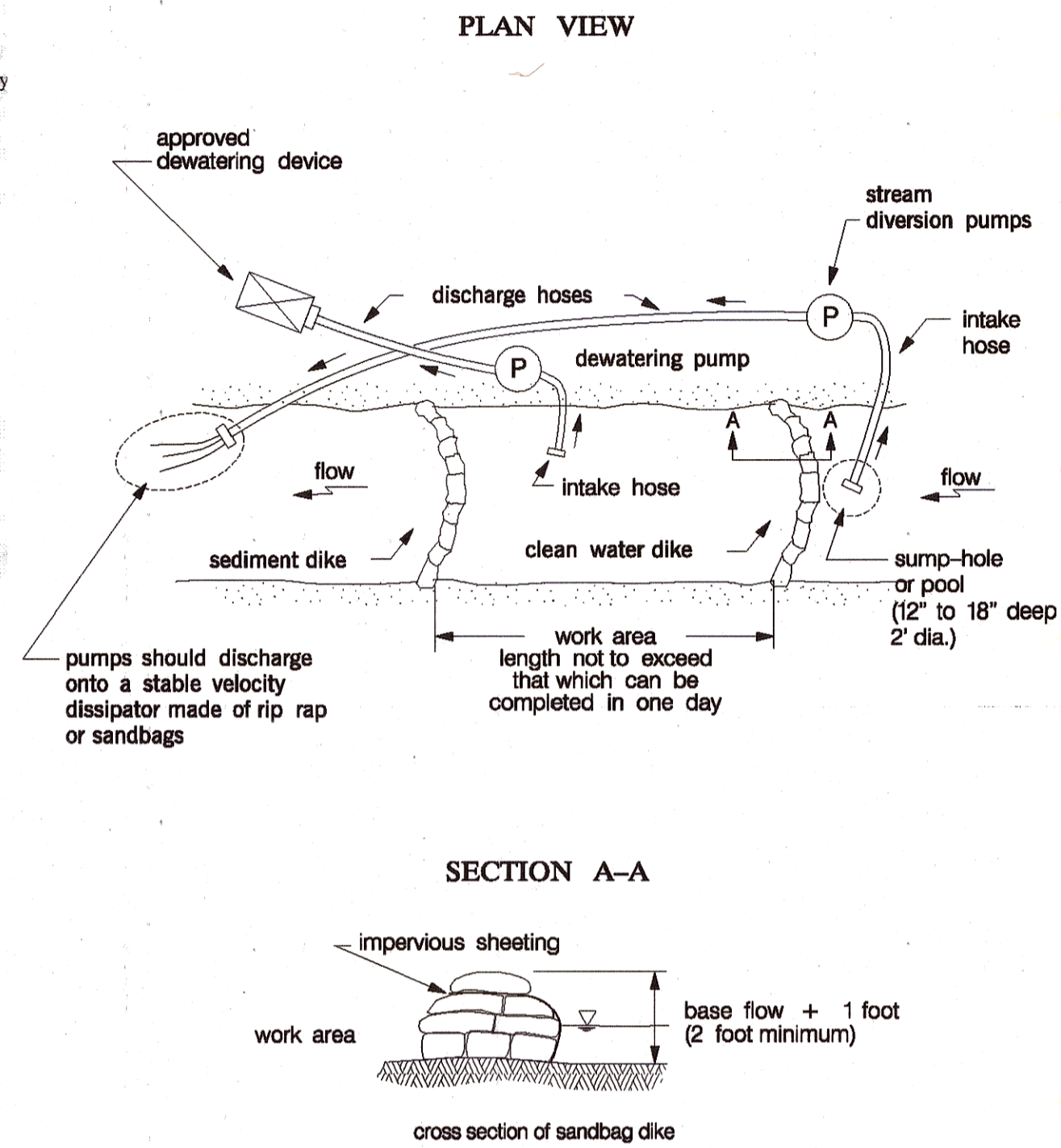
Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

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

MGWC 1.2: PUMP-AROUND PRACTICE

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

Maryland's Guidelines To Waterway Construction
DETAIL 1.2: PUMP-AROUND PRACTICE



TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2000

PAGE 1.2 - 1

TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2000

PAGE 1.2 - 2

TEMPORARY INSTREAM CONSTRUCTION MEASURES

REVISED NOVEMBER 2000
PAGE 1.2 - 3

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

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.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

- A. Soil Preparation
1. Temporary Stabilization
a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
b. Apply fertilizer and lime as prescribed on the plans.
c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
i. Soil pH between 6.0 and 7.0.
ii. Soluble salts less than 500 parts per million (ppm).
iii. 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.

B.12

- d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. 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 1 1/2 inches in diameter.
b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
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.

B.13

B-4 STANDARDS AND SPECIFICATIONS

FOR

VEGETATIVE STABILIZATION

Definition

Using vegetation as cover to protect exposed soil from erosion.

Purpose

To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies

On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity

Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment

Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseeding within the planting season.

- 1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B.9

CLIENT

HOWARD COUNTY
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
SUITE 514
COLUMBIA, MD 21046

DATE: ISSUES / REVISIONS
11/11/2015 100% SUBMITTAL

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE 12/15/15

Biohabitats
The Stables Building 2081 Clipper Park Road
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Restore the Earth & Inspire Ecological Stewardship

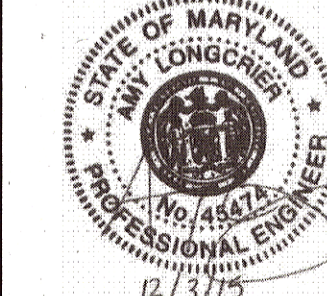
BONNIE BRANCH
BANK STABILIZATION
PROJECT

ELECTION DISTRICT: 02
TAX MAP/GRID/PARCEL: 0031/0003/0814
OPEN LOT #150
WAIVER PETITION #WP-16-050

EROSION AND
SEDIMENT
CONTROL DETAILS

PROJECT NO.: 13005.19 SCALE: VALUE

SEAL: BY: AL, TB, KT CHECK: MDT

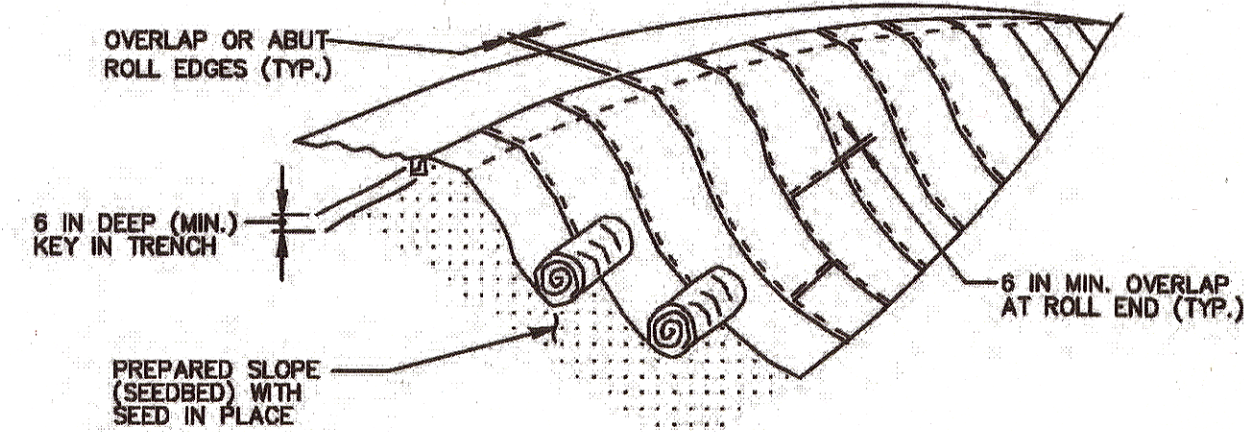


14 OF 20

This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT
Howard Soil Conservation District
Date 12/15/15
12/16/15

**DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION**

STANDARD SYMBOL  
TSSMS - \* 1.5 lb/ft<sup>2</sup>  
(\* INCLUDE SHEAR STRESS)



ISOMETRIC VIEW

**CONSTRUCTION SPECIFICATIONS**

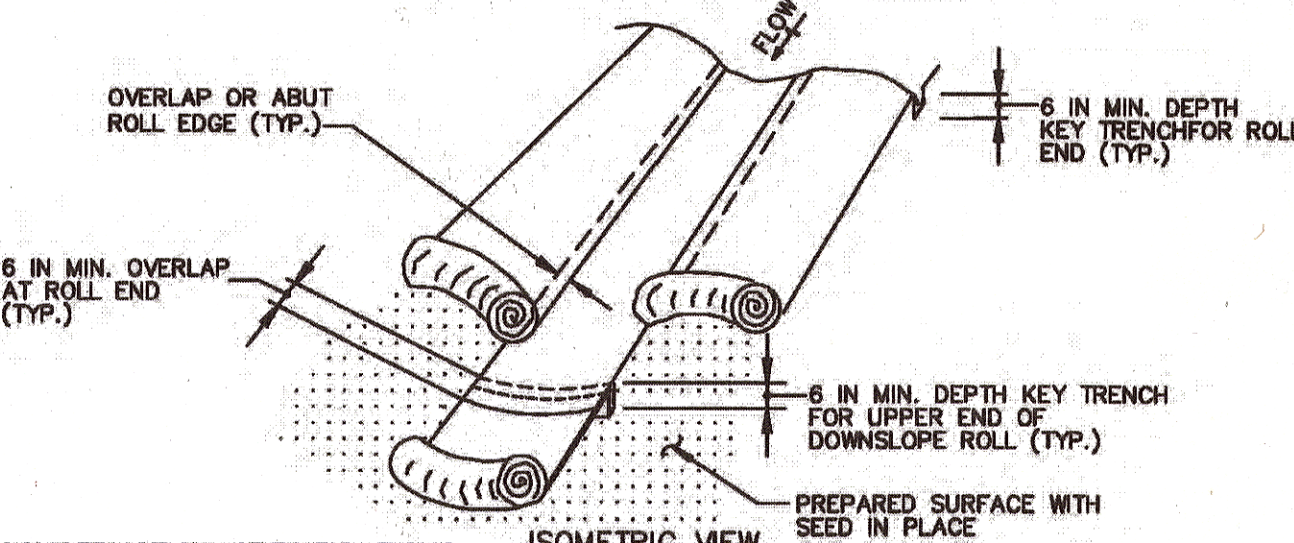
- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
- USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOOTHER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
- SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
- PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
- UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDBED SURFACE. AVOID STRETCHING THE MATTING.
- OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
- KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
- STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
- ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION**

STANDARD SYMBOL  
TSSMC - \* 5 lb/ft<sup>2</sup>  
(\* INCLUDE SHEAR STRESS)



ISOMETRIC VIEW

**CONSTRUCTION SPECIFICATIONS**

- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
- USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOOTHER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
- SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
- PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
- UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDBED SURFACE. AVOID STRETCHING THE MATTING.
- KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
- OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE NEXT DOWNSLOPE MAT.
- STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
- ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

B-4-5 STANDARDS AND SPECIFICATIONS

FOR PERMANENT STABILIZATION

Definition  
To stabilize disturbed soils with permanent vegetation.

Purpose  
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  
A. Seed Mixtures

- General Use
  - Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardness 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.
  - 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.
  - For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
  - For areas requiring low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 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
  - Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
  - 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.
    - 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.
    - 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.
    - 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.
    - 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: 1 1/2 to 3 pounds per 1000 square feet.

Notes:  
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. 1 certification program of the Maryland Department of Agriculture, Turf and Seed Secti provides a reliable means of consumer protection and assures a pure genetic line

- 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)
- 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 1 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
- If soil moisture is deficient, supply new seedlings with adequate water for plant growth (1/2 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

No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)			Lime Rate
					N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	
Hardness Zone (from Figure B.3): 6b Seed Mixture (from Table B.3): 4								
4	DEERTONGUE	15	3/1 - 5/15 8/15 - 10/15	1/4 - 1/2 in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/ac (2 lb/1000 sf)	90 lb/ac (2 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	CREeping RED FESCUE	20	3/1 - 5/15 8/15 - 10/15	1/4 - 1/2 in				
	VIRGINIA WILD RYE	5	3/1 - 5/15 8/15 - 10/15	1/4 - 1/2 in				

- Sod: To provide quick cover on disturbed areas (2:1 grade or flatter)
  - General Specifications
    - Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
    - 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.
    - 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 section.
    - Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
    - 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.
  - Sod Installation
    - During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
    - 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.
    - 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.
    - 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.
  - Sod Maintenance
    - 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.
    - After the first week, sod watering is required as necessary to maintain adequate moisture content.
    - Do not mow until the sod is firmly rooted. No more than 1/2 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.

B-4-4 STANDARDS AND SPECIFICATIONS

FOR TEMPORARY STABILIZATION

Definition  
To stabilize disturbed soils with vegetation for up to 6 months.

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

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

- Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardness 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.
- For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
- 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

No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)		Lime Rate
					N	P <sub>2</sub> O <sub>5</sub>	
Hardness Zone (from Figure B.3): 6b Seed Mixture (from Table B.1): ANNUAL RYEGRASS/FOXTAIL MILLET							
	ANNUAL RYEGRASS	40	5/1 - 5/15 8/1 - 10/15	0.5			
	FOXTAIL MILLET	30	5/16 - 7/31	0.5			
					436 lb/ac (10 lb/1000 sf)		2 tons/ac (90 lb/1000 sf)

**CLIENT**  
HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

DATE	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

APPROVED: [Signature] 12/10/15  
DEPARTMENT OF PUBLIC WORKS  
[Signature] 12/18/15  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

**Biohabitats**  
The Stables Building 2081 Clipper Park Road  
Baltimore, MD 21211 / ph: 410.554.0156  
fx: 410.554.0168 / www.biohabitats.com  
Restore the Earth & Inspire Ecological Stewardship

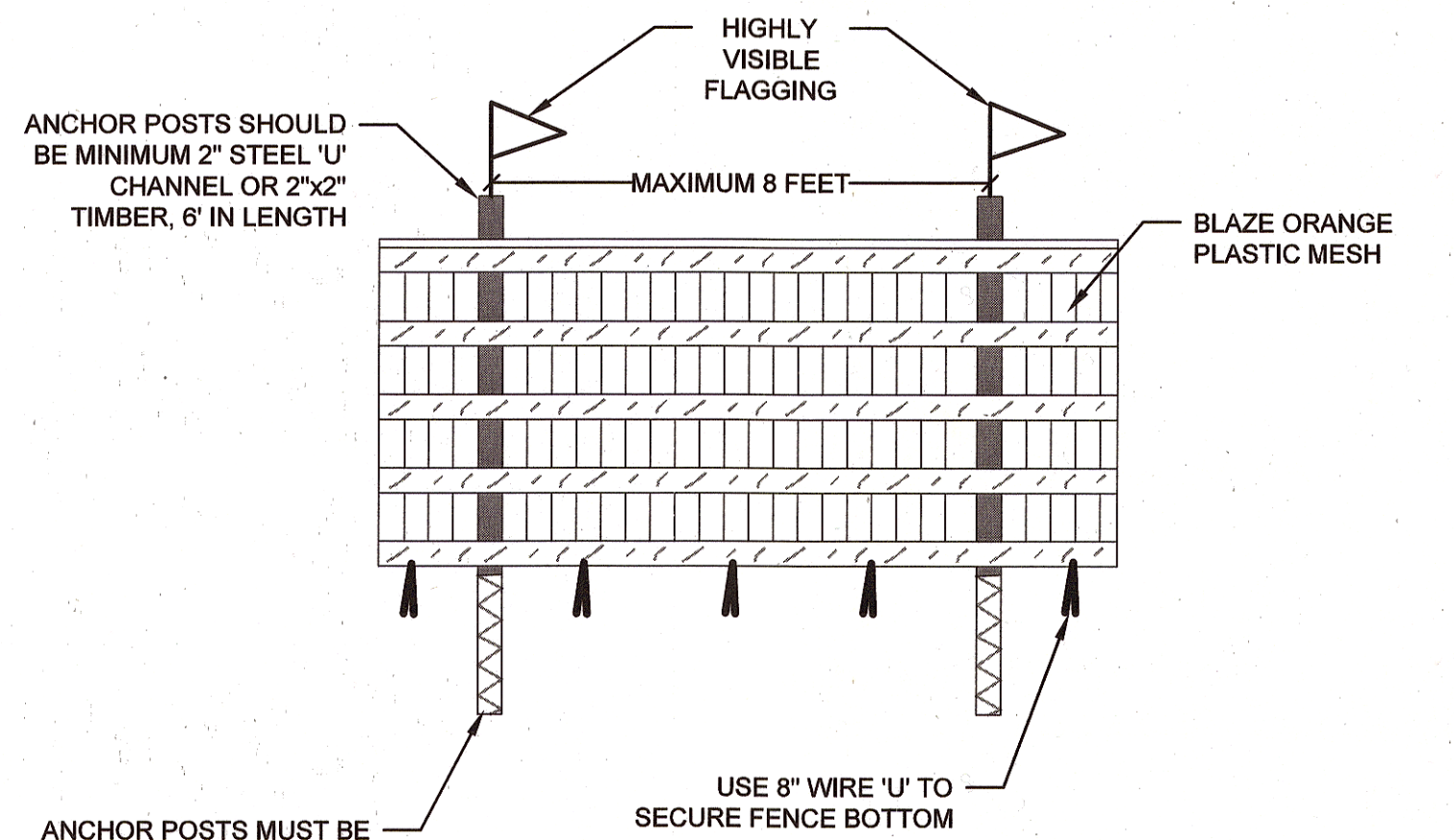
**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**EROSION AND SEDIMENT CONTROL DETAILS**

PROJECT NO.: 13005.19	SCALE: VALUE
SEAL: [Professional Engineer Seal]	BY: AL, TB, KT CHECK: MDT
	DWG. NO.: 15 OF 20

This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT  
[Signature] 12/21/15  
Date 12/21/15  
Howard Soil Conservation District



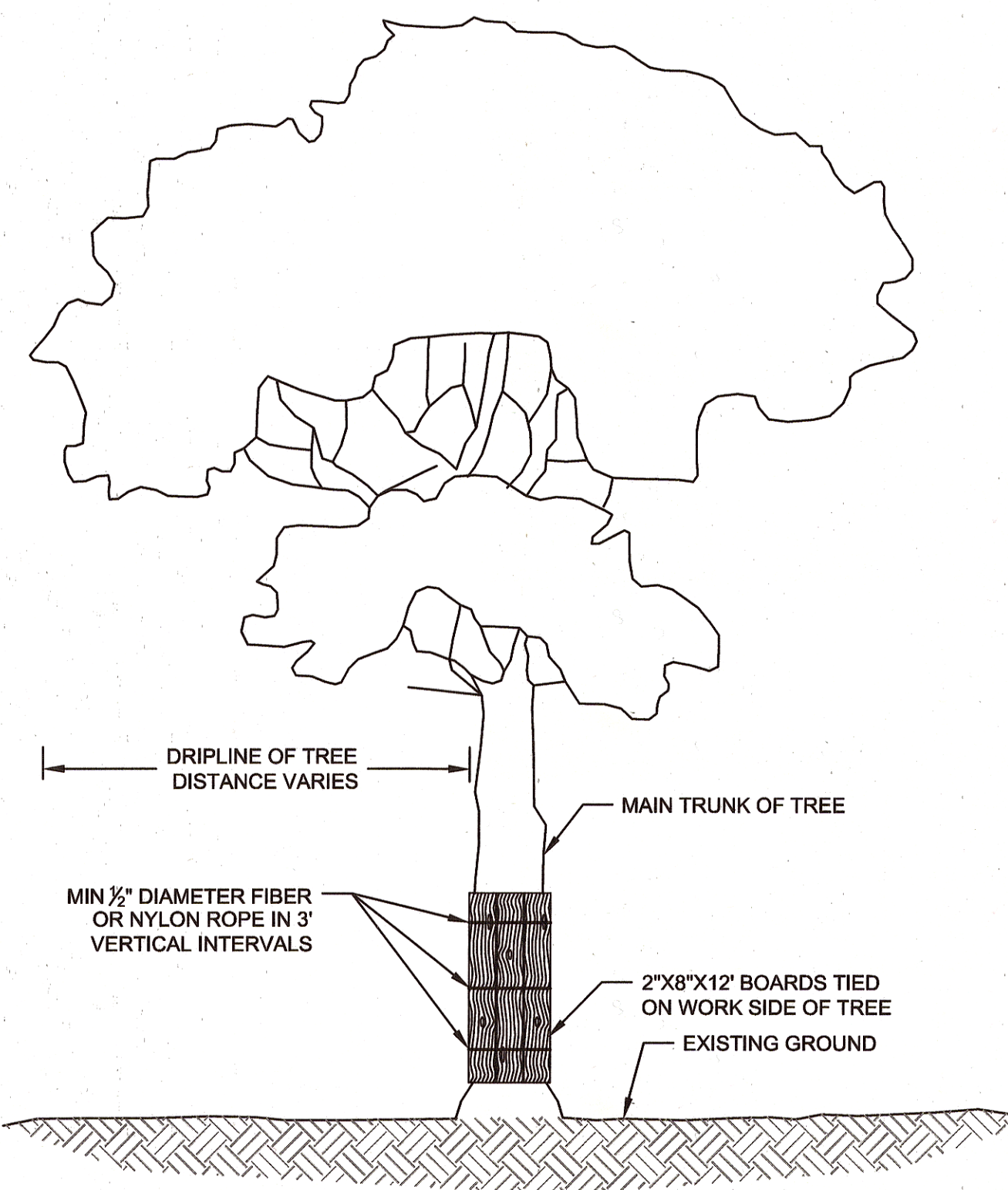
ANCHOR POSTS MUST BE INSTALLED TO A DEPTH OF NO LESS THAN 1/3 OF THE TOTAL HEIGHT OF POST.

USE 8" WIRE 'U' TO SECURE FENCE BOTTOM

NOTES:

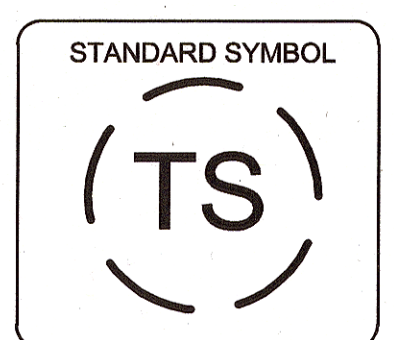
1. PROTECTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
2. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
3. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

**BLAZE ORANGE PLASTIC FENCE** NOT TO SCALE

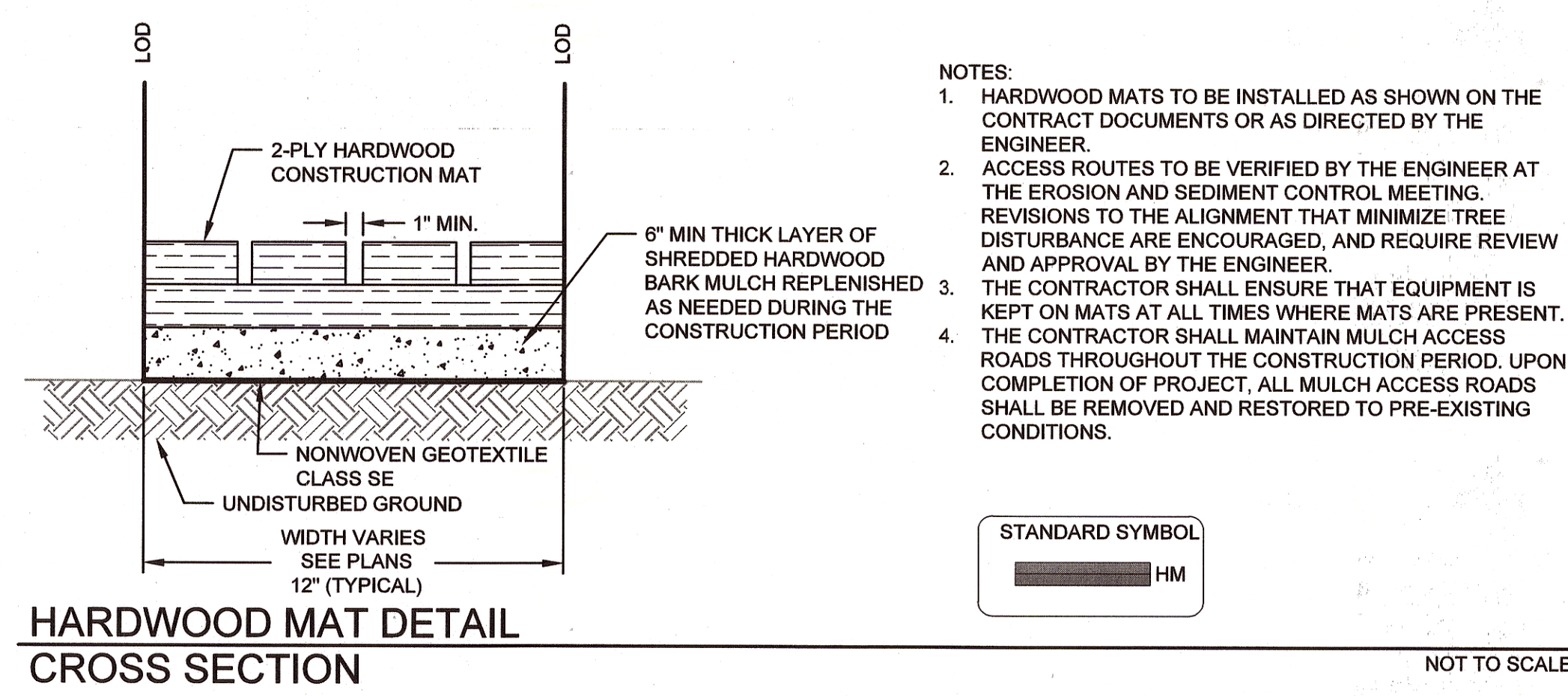


NOTES:

1. TIE SUFFICIENT 2"x8"x12" BOARDS AROUND MAIN TRUNK OF TREE WITH 1/2" DIAMETER ROPE (FIBER OR NYLON) TO PROTECT ALL AREAS EXPOSED TO CONSTRUCTION.
2. INSTALL WIRE EYE BOLTS WITH MINIMUM INNER DIAMETER OF 3/8" AND MINIMUM LENGTH OF 4" FIRMLY IN EACH PLANK WHERE FIBER OR NYLON ROPES CROSS OVER PLANKS.
3. WHERE SIGNIFICANT TREE BRANCHES EXIST WHICH PREVENT PLANK INSTALLATION, PLANKING SHALL EXTEND TO THE ELEVATION OF THE LOWEST BRANCH.

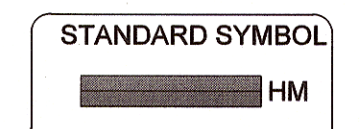


**TREE PLANKING** NOT TO SCALE

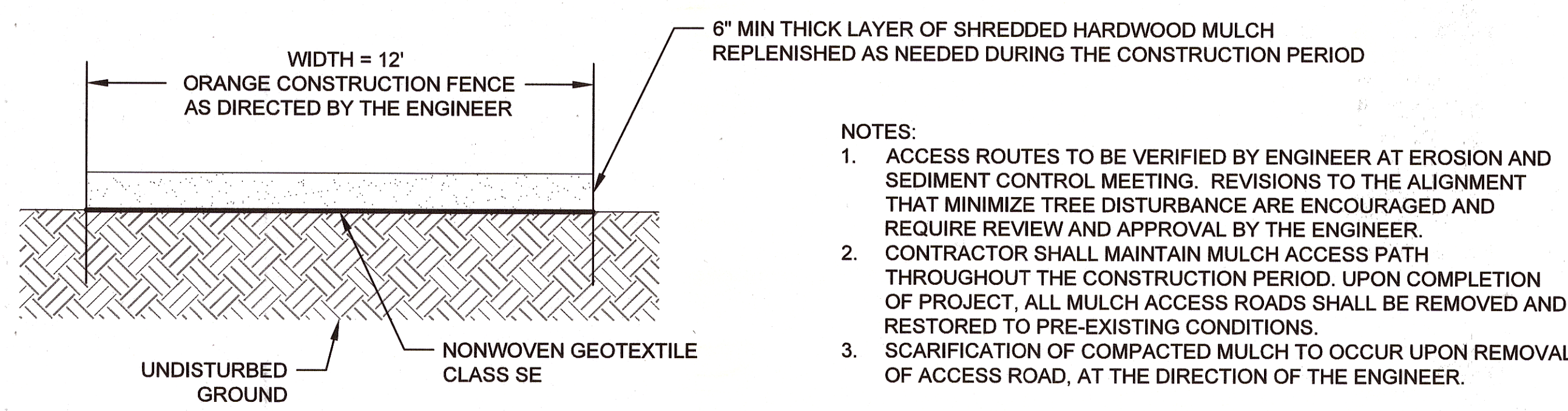


NOTES:

1. HARDWOOD MATS TO BE INSTALLED AS SHOWN ON THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER.
2. ACCESS ROUTES TO BE VERIFIED BY THE ENGINEER AT THE EROSION AND SEDIMENT CONTROL MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED, AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
3. THE CONTRACTOR SHALL ENSURE THAT EQUIPMENT IS KEPT ON MATS AT ALL TIMES WHERE MATS ARE PRESENT.
4. THE CONTRACTOR SHALL MAINTAIN MULCH ACCESS ROADS THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF PROJECT, ALL MULCH ACCESS ROADS SHALL BE REMOVED AND RESTORED TO PRE-EXISTING CONDITIONS.



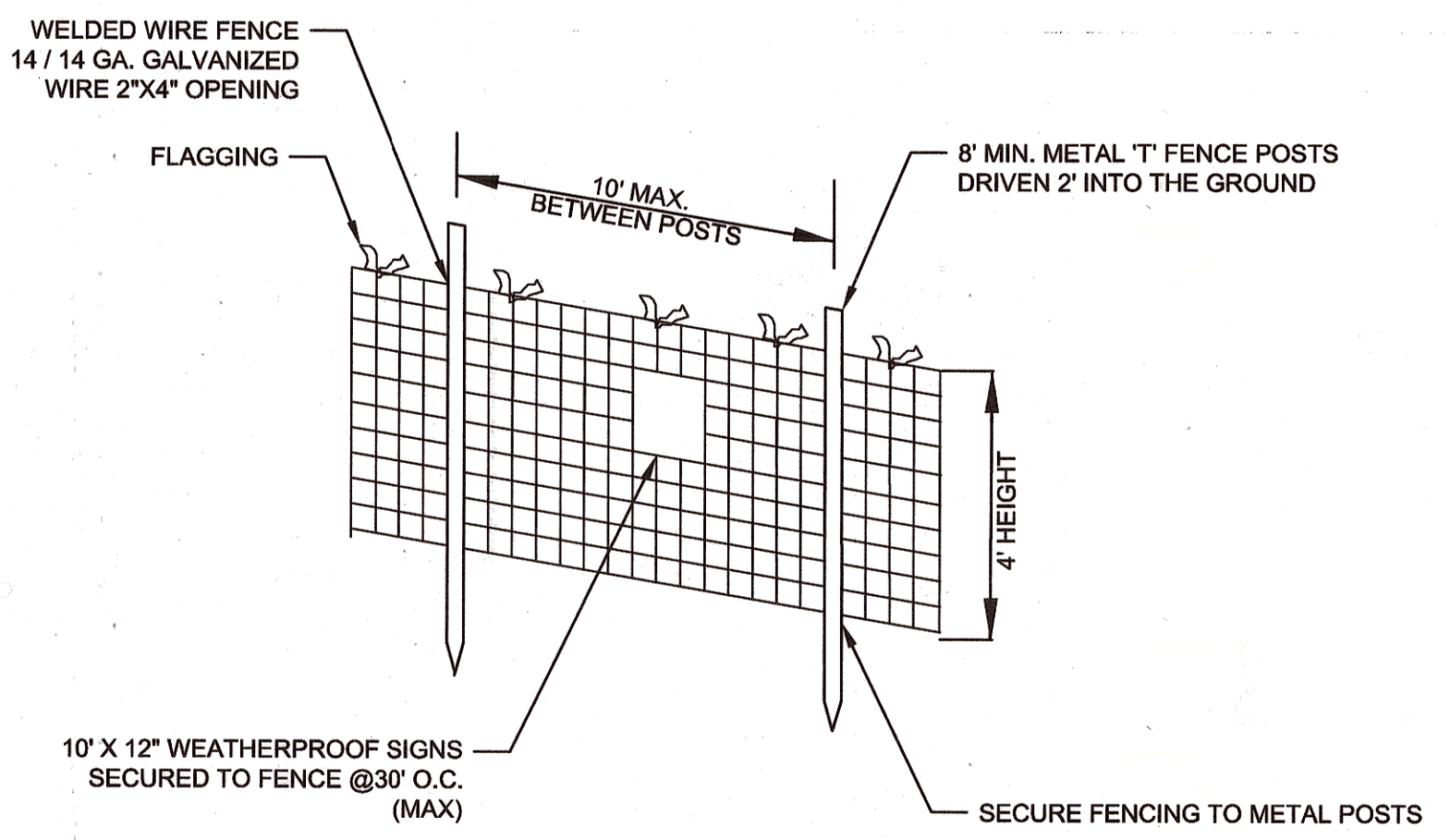
**HARDWOOD MAT DETAIL CROSS SECTION** NOT TO SCALE



NOTES:

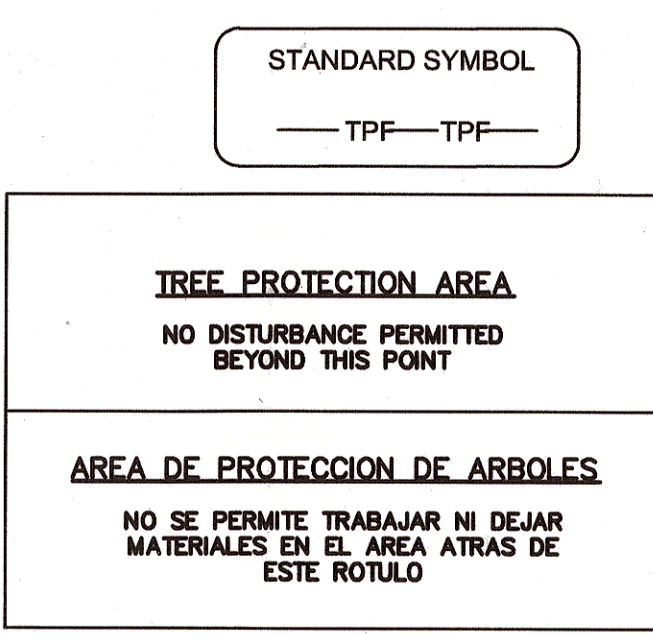
1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT EROSION AND SEDIMENT CONTROL MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
2. CONTRACTOR SHALL MAINTAIN MULCH ACCESS PATH THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF PROJECT, ALL MULCH ACCESS ROADS SHALL BE REMOVED AND RESTORED TO PRE-EXISTING CONDITIONS.
3. SCARIFICATION OF COMPACTED MULCH TO OCCUR UPON REMOVAL OF ACCESS ROAD, AT THE DIRECTION OF THE ENGINEER.

**MULCH ACCESS ROAD** NOT TO SCALE



NOTES:

1. PRACTICE MAY BE COMBINED WITH SEDIMENT CONTROL FENCING.
2. LOCATION AND LIMITS OF FENCING SHALL COORDINATED IN FIELD WITH ARBORIST.
3. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED PRIOR TO INSTALLING PROTECTIVE DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE IS REQUIRED.
6. FENCING SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.



**TREE PROTECTION FENCE DETAIL** NOT TO SCALE

This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

*[Signature]* Date: 12/16/15

Howard Soil Conservation District

**CLIENT**

HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

DATE: 11/11/2015 ISSUES / REVISIONS: 100% SUBMITTAL

APPROVED: *[Signature]* 12/16/15  
DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES *[Signature]* 12/16/15 DATE

**Biohabitats**

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fx: 410.554.0168 / www.biohabitats.com  
Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**EROSION AND SEDIMENT CONTROL DETAILS**

PROJECT NO.: 13005.19 SCALE: VALUE

SEAL: BY: AL, TB, KT CHECK: MDT

DWG. NO.: 16 OF 20



**SEQUENCE OF CONSTRUCTION**

**EROSION AND SEDIMENT CONTROL SETUP - 1 WEEK**

- THE CONTRACTOR SHALL STAKE OUT THE LIMITS OF DISTURBANCE AS SHOWN ON THE GRADING PLAN. THE CONTRACTOR MUST OBTAIN A GRADING PERMIT. STREAM CHANNEL MUST NOT BE DISTURBED DURING MARCH 1 TO JUNE 15. (1 DAY) THIS PROJECT IS SUBJECT TO THE FOLLOWING APPROVALS:
    - U.S. ARMY CORPS OF ENGINEERS NONTIDAL WETLANDS AND WATERWAYS PERMIT #CENAB-OPR-M (HO DPWB/BONNIE BRANCH ROAD/BAY TRUST FUND PROJ/BANK STABILIZATION) 2015-61394-M37
    - MDE NONTIDAL WETLANDS AND WATERWAYS PERMIT #201561394
    - MDE NOI PERMIT #MDRCN020I
  - THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ONSITE WITH SEDIMENT CONTROL INSPECTOR AND THE ENGINEER TO REVIEW THE LIMITS OF DISTURBANCE, STRUCTURE STAKEOUT, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION. THE PARTICIPANTS WILL ALSO VERIFY THE LOCATION OF THE TEMPORARY STOCKPILE AREA AND ANY NECESSARY STAGING AREA, AND FLAG ANY TREES WITHIN THE LIMITS OF DISTURBANCE WHICH WILL BE REMOVED FOR CONSTRUCTION ACCESS AND GRADING. (1 DAY)
  - THE CONTRACTOR SHALL INSTALL THE STABILIZED CONSTRUCTION ENTRANCE AND BLAZE ORANGE FENCE AND TREE PROTECTION AREAS AS SHOWN ON THE GRADING PLANS OR AS DIRECTED BY THE ENGINEER. (1 WEEK)
  - THE CONTRACTOR SHALL ESTABLISH THE TEMPORARY STOCKPILE AREA IN THE LOCATION INDICATED ON THE GRADING PLAN (NOTE: INSTALL FILTER LOGS AND SUPER SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE AREA AS SHOWN). (1 DAY)
  - INSTALL REMAINING PERIMETER EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLANS, INCLUDING FENCING, FILTER LOGS, AND PUMPS. (1 DAY)
  - THE HOWARD COUNTY DEPARTMENT OF INSPECTION AND PERMITS SHALL BE NOTIFIED UPON COMPLETION OF CONTROL INSTALLATION FOR EACH PHASE OF CONSTRUCTION. UPON COMPLETION OF CONTROL INSTALLATION WITH APPROVAL OF SEDIMENT AND EROSION CONTROL INSPECTOR, THE CONTRACTOR MAY BEGIN GRADING OPERATIONS. CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION AND GRADING PLANS AND EROSION AND SEDIMENT CONTROL STANDARD DETAILS AND NOTES. DO NOT CLEAR AND GRUB THE ENTIRE PROJECT AREA. CLEAR AND GRUB ONLY AS DIRECTED BY THE ENGINEER AND ONLY WHERE CONSTRUCTION ACCESS IS NEEDED. (1 DAY)
- PHASE 1: BONNIE BRANCH MAINSTEM STA. 0+40 TO 4+10 (4 WEEKS)
- NOTE: A THREE DAY DRY WEATHER PERIOD PER THE NOAA FORECAST IS REQUIRED PRIOR TO INITIATING THE PHASE 1 WORK.
- CLEAR BONNIE BRANCH MAINSTEM AS REQUIRED TO INSTALL THE MULCH ACCESS ROAD. INSTALL MULCH ACCESS ROAD AND STABILIZE DISTURBED AREAS WITH MULCH AS WORK PROGRESSES. (3 DAYS)
  - CLEAR BONNIE BRANCH MAINSTEM AS REQUIRED AND BEGIN EXCAVATING TO GRADES SHOWN ON PLANS FROM UPSTREAM TO DOWNSTREAM. GRADING SHALL BE LIMITED TO THE AREA THAT CAN BE STABILIZED IN A SINGLE WORK DAY. PLACE IN STREAM STRUCTURES (BOULDER TOE AND LWD) AND COIR MATTING AS WORK PROGRESSES DAILY. (3 WEEKS)
  - STABILIZE REMAINDER OF WORK AREA. (1 DAY)
  - WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE ENGINEER REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES. (1 DAY)
- PHASE 2: BONNIE BRANCH TRIBUTARY STA. 100+20 TO 103+97 (4 WEEKS)
- NOTE: A THREE DAY DRY WEATHER PERIOD PER THE NOAA FORECAST IS REQUIRED PRIOR TO INITIATING THE PHASE 2 WORK.
- CLEAR BONNIE BRANCH TRIBUTARY AS REQUIRED AND BEGIN EXCAVATING TO GRADES SHOWN ON PLANS FROM UPSTREAM TO DOWNSTREAM. GRADING SHALL BE LIMITED TO THE AREA THAT CAN BE STABILIZED IN A SINGLE WORK DAY. PLACE IN STREAM STRUCTURES (BOULDER TOE AND LWD) AND COIR MATTING AS WORK PROGRESSES DAILY. (3 WEEKS)
  - STABILIZE REMAINDER OF WORK AREA. (1 DAY)
  - WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE ENGINEER REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES. (1 DAY)
- PHASE 3: BONNIE BRANCH MAINSTEM STA. 6+00 TO 6+40 (1 WEEKS)
- NOTE: A THREE DAY DRY WEATHER PERIOD PER THE NOAA FORECAST IS REQUIRED PRIOR TO INITIATING THE PHASE 3 WORK.
- CLEAR BONNIE BRANCH MAINSTEM AS REQUIRED TO INSTALL THE MULCH ACCESS ROAD. INSTALL MULCH ACCESS ROAD AND STABILIZE DISTURBED AREAS WITH MULCH AS WORK PROGRESSES. (1 DAY)
  - CLEAR BONNIE BRANCH MAINSTEM AS REQUIRED AND REMOVE EXISTING CONCRETE ABUTMENT FROM DOWNSTREAM TO UPSTREAM. GRADE BANKS TO A STABLE ANGLE AS DIRECTED. GRADING SHALL BE LIMITED TO THE AREA THAT CAN BE STABILIZED IN A SINGLE WORK DAY. PLACE BOULDER TOE AND COIR MATTING AS WORK PROGRESSES DAILY. (3 DAYS)
  - STABILIZE REMAINDER OF WORK AREA. (1 DAY)
  - WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE ENGINEER REMOVE ALL REMAINING SEDIMENT AND EROSION CONTROL MEASURES. (1 DAY)
  - PLANT SITE ACCORDING TO PLANTING PLAN IN APPROPRIATE PLANTING SEASON. (1 WEEK)

**HOWARD SOIL CONSERVATION DISTRICT STANDARD (HSCD)**

**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:
  - PRIOR TO THE START OF EARTH DISTURBANCE,
  - UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING,
  - PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT,
  - 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:
 

TOTAL AREA OF SITE:	1.5 ACRES
AREA DISTURBED:	1.5 ACRES
AREA TO BE ROOFED OR PAVED:	0.0 ACRES
AREA TO BE VEGETATIVELY STABILIZED:	1.5 ACRES
TOTAL CUT:	1145 CU. YDS.
TOTAL FILL:	20 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION:	TBD AS APPROVED BY CID; SITE MUST HAVE AN ACTIVE GRADING 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 PRECIPITATION)
  - BRIEF DESCRIPTION OF PROJECT'S STATUS (E.G., PERCENT COMPLETE) AND/OR CURRENT ACTIVITIES
  - EVIDENCE OF SEDIMENT DISCHARGES
  - IDENTIFICATION OF PLAN DEFICIENCIES
  - IDENTIFICATION OF SEDIMENT CONTROLS THAT REQUIRE MAINTENANCE
  - IDENTIFICATION OF MISSING OR IMPROPERLY INSTALLED SEDIMENT CONTROLS
  - COMPLIANCE STATUS REGARDING THE SEQUENCE OF CONSTRUCTION AND STABILIZATION REQUIREMENTS
  - PHOTOGRAPHS
  - MONITORING/SAMPLING
  - MAINTENANCE AND/OR CORRECTIVE ACTION PERFORMED
  - OTHER INSPECTION ITEMS AS REQUIRED BY THE GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES (NPDES, MDE).
- 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.
- 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 UP HILL BY 2' IN ELEVATION.
- STREAM CHANNELS MUST NOT BE DISTURBED DURING THE FOLLOWING RESTRICTED TIME PERIODS (INCLUSIVE):
  - USE I AND IIIP MARCH 1 - JUNE 15
  - USE III AND IIIP OCTOBER 1 - APRIL 30
  - USE IV MARCH 1 - MAY 31
- 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.

**SEDIMENT CONTROL NOTES**

- NOTE: CONDUCT A PRE-CONSTRUCTION MEETING. NOTIFY THE DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT LEAST 48 HOURS BEFORE COMMENCING WORK AT (410) 313-1880. WORK MAY NOT COMMENCE UNTIL THE PERMITTEE OR THE RESPONSIBLE PE HAVE MET ON SITE WITH THE SEDIMENT AND EROSION CONTROL INSPECTOR TO REVIEW THE APPROVED PLANS.
- A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENCES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
- THE CONTRACTOR SHALL NOTIFY "MISS-UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO. CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BEGIN UNTIL ALL REQUIRED EASEMENTS AND RIGHT-OF-WAYS HAVE BEEN OBTAINED. CONSTRUCTION SHALL NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. THE CONTRACTOR SHALL STAY WITHIN THE LIMIT OF DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORKING AREA WHEREVER POSSIBLE. NO TREES SHALL BE REMOVED WITHIN THE LIMIT OF DISTURBANCE WITHOUT APPROVAL FROM THE ENGINEER. THE CONSTRUCTION SEQUENCE MUST BE FOLLOWED UNLESS THE CONTRACTOR GETS WRITTEN APPROVAL FROM THE HOWARD COUNTY SOIL CONSERVATION DISTRICT OR THE SEDIMENT CONTROL INSPECTOR.
- FOR ALL ASPECTS OF CONSTRUCTION FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN:
  - THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER 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 OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
- ANY SEDIMENT CONTROL PRACTICE THAT 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 HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORK DAY, WHICHEVER IS SHORTER.

**2011 MD STANDARDS & SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL - B-4-8 STOCKPILE AREA**

DEFINITION - A MOUND OR PILE OF SOIL PROTECTED BY APPROPRIATELY DESIGNED EROSION AND SEDIMENT CONTROL MEASURES.

PURPOSE - 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:**

- THE STOCKPILE LOCATION AND ALL RELATED SEDIMENT CONTROL PRACTICES MUST BE CLEARLY INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN.
- 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.
- RUNOFF FROM THE STOCKPILE AREA MUST DRAIN TO A SUITABLE SEDIMENT CONTROL PRACTICE.
- ACCESS THE STOCKPILE AREA FROM THE UPGRADE SIDE.
- CLEAR WATER RUNOFF INTO THE STOCKPILE AREA MUST BE MINIMIZED BY USE OF A DIVERSION DEVICE SUCH AS AN EARTH DIKE, TEMPORARY SWALE OR DIVERSION FENCE. PROVISIONS MUST BE MADE FOR DISCHARGING CONCENTRATED FLOW IN A NON-EROSIVE MANNER.
- WHERE RUNOFF CONCENTRATES ALONG THE TOE OF THE STOCKPILE FILL, AN APPROPRIATE EROSION/SEDIMENT CONTROL PRACTICE MUST BE USED TO INTERCEPT THE DISCHARGE.
- STOCKPILES MUST BE STABILIZED IN ACCORDANCE WITH THE 3/7 DAY STABILIZATION REQUIREMENT AS WELL AS STANDARD B-4-1 INCREMENTAL STABILIZATION AND STANDARD B-4-4 TEMPORARY STABILIZATION.
- IF THE STOCKPILE IS LOCATED ON AN IMPERVIOUS SURFACE, A LINER SHOULD BE PROVIDED BELOW THE STOCKPILE TO FACILITATE CLEANUP. STOCKPILES CONTAINING CONTAMINATED MATERIAL MUST BE COVERED WITH IMPERMEABLE SHEETING.

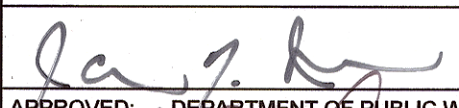

**MAINTENANCE:**

THE STOCKPILE AREA MUST CONTINUOUSLY MEET THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION. SIDE SLOPES MUST BE MAINTAINED AT NO STEEPER THAN A 2:1 RATIO. THE STOCKPILE AREA MUST BE KEPT FREE OF EROSION. IF THE VERTICAL HEIGHT OF A STOCKPILE EXCEEDS 20 FEET FOR 2:1 SLOPES, 30 FEET FOR 3:1 SLOPES, OR 40 FEET FOR 4:1 SLOPES, BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING.

**CLIENT**

HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

 12/24/15  
 APPROVED: DEPARTMENT OF PUBLIC WORKS  
 12/24/15  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE



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Baltimore, MD 21211 / ph: 410.554.0156  
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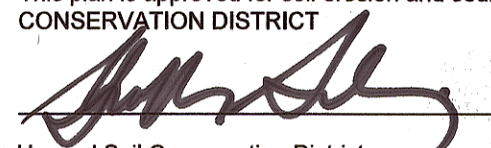
**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02,  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**EROSION AND SEDIMENT CONTROL NOTES**

PROJECT NO.:	13005.19	SCALE:	VALUE
SEAL:		BY:	AL, TB, KT CHECK MDT
		DWG. NO.:	

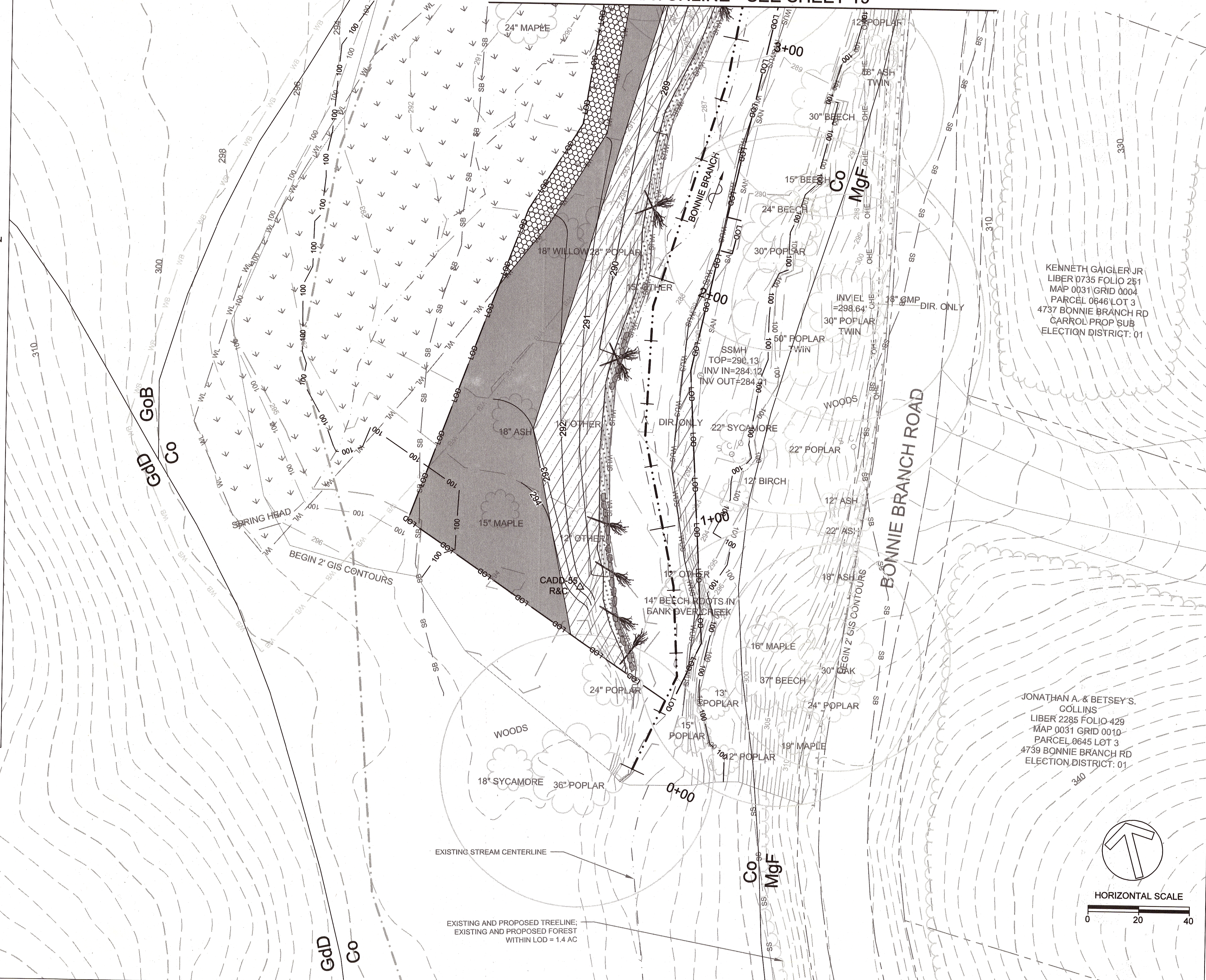


This plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT  
  
 Date 12/24/15  
 12/16/15

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 425- PROPOSED MAJOR CONTOUR
- 424- PROPOSED MINOR CONTOUR
- LOD --- LIMIT OF DISTURBANCE
- PROPERTY LINE
- ROADWAY
- SS SANITARY SEWER
- OHE OVERHEAD ELECTRIC
- - - EXISTING THALWEG
- - - PROPOSED THALWEG
- WUS WATERS OF THE US
- SB 75' STREAM BUFFER
- 100 YR EXISTING 100-YR FLOODPLAIN
- 100 YR PROPOSED 100-YR FLOODPLAIN
- TREE LINE
- EXISTING FOREST CONSERVATION ACT EASEMENT
- TPF --- TREE PROTECTION FENCE
- GUARDRAIL
- WL --- WETLAND
- WB --- WETLAND BUFFER
- GdC SOIL DIVIDE AND LABEL
- PROPOSED BOULDER TOE
- PROPOSED COBBLE RIFFLE
- PROPOSED RANDOM BOULDER
- PROPOSED LARGE WOODY DEBRIS
- TREE
- CRITICAL ROOT ZONE
- (TS) TREE PROTECTION
- △ TRAVERSE POINT
- ⊙ SANITARY SEWER MANHOLE
- ELECTRIC POLE/GUY WIRE
- PLANTING ZONE 1 - FLOODPLAIN FOREST/REFORESTATION
- PLANTING ZONE 2 - DRP FLOODPLAIN FOREST/REFORESTATION
- PLANTING ZONE 3 - WETLAND
- PLANTING ZONE 4 - STREAM BANK

MATCHLINE - SEE SHEET 19



**CLIENT**

HOWARD COUNTY  
 STORMWATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 SUITE 514  
 COLUMBIA, MD 21046

DATE	ISSUES / REVISIONS
11/12/2015	100% SUBMITTAL

KENNETH GAIGLER JR  
 LIBER 0735 FOLIO 251  
 MAP 0031 GRID 0004  
 PARCEL 0646 LOT 3  
 4737 BONNIE BRANCH RD  
 CARROL PROP SUB  
 ELECTION DISTRICT: 01

APPROVED: *[Signature]* 12/18/15  
 DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

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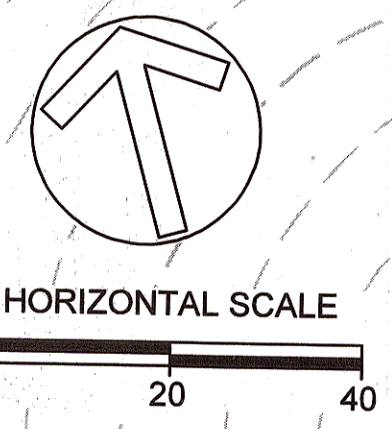
**BONNIE BRANCH  
 BANK STABILIZATION  
 PROJECT**

ELECTION DISTRICT: 02,  
 TAX MAP/GRID/PARCEL: 0031/0003/0814  
 OPEN LOT #150  
 WAIVER PETITION #WP-16-050

PLANTING PLAN

PROJECT NO.: 13005.19 SCALE: 1" = 20'

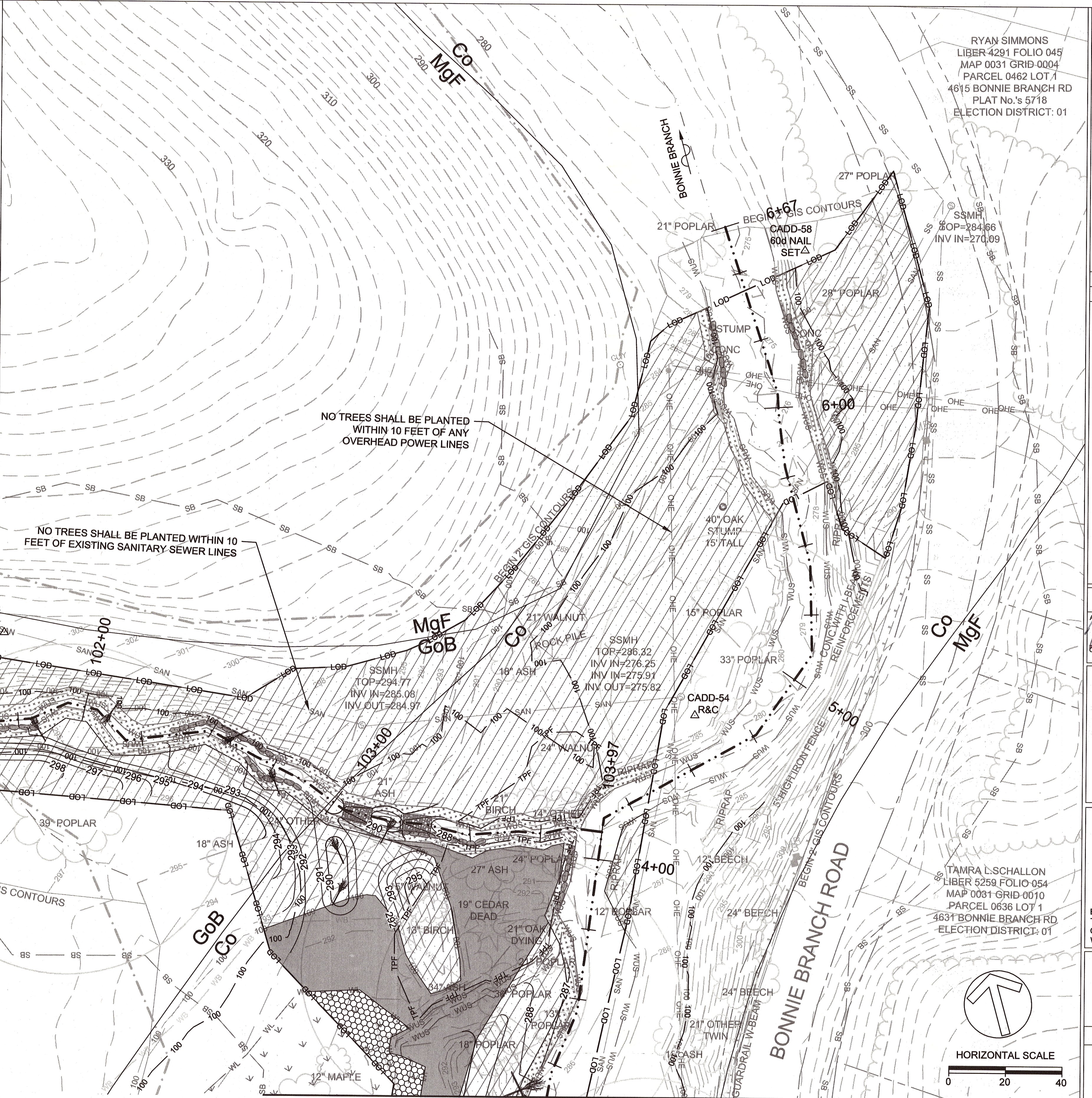
BY: AL, TB, KT CHECK: MDT  
 DWG. NO.: 18 OF 20



4/24/2015 1:\Projects\13005.19 Bonnie Branch\CAD\Plans\p1010b.dwg

**LEGEND**

—	EXISTING MAJOR CONTOUR		PROPOSED BOULDER TOE
- - -	EXISTING MINOR CONTOUR		PROPOSED COBBLE RIFFLE
— 425 —	PROPOSED MAJOR CONTOUR		PROPOSED RANDOM BOULDER
— 424 —	PROPOSED MINOR CONTOUR		PROPOSED LARGE WOODY DEBRIS
— LOD —	LIMIT OF DISTURBANCE		TREE
—	PROPERTY LINE		CRITICAL ROOT ZONE
—	ROADWAY		TREE PROTECTION
SS	SANITARY SEWER		TRAVERSE POINT
OHE	OVERHEAD ELECTRIC		SANITARY SEWER MANHOLE
- - -	EXISTING THALWEG		ELECTRIC POLE/GUY WIRE
- · - · -	PROPOSED THALWEG		PLANTING ZONE 1 - FLOODPLAIN FOREST/REFORESTATION
WUS	WATERS OF THE US		PLANTING ZONE 2 - DRP FLOODPLAIN FOREST/REFORESTATION
SB	75' STREAM BUFFER		PLANTING ZONE 3 - WETLAND
100 YR	EXISTING 100-YR FLOODPLAIN		PLANTING ZONE 4 - STREAM BANK
100 YR	PROPOSED 100-YR FLOODPLAIN		TREE LINE
	EXISTING FOREST CONSERVATION ACT EASEMENT		TREE PROTECTION FENCE
TPF	TREE PROTECTION FENCE		GUARDRAIL
	WETLAND		WETLAND BUFFER
WLB	WETLAND BUFFER		SOIL DIVIDE AND LABEL
GdC	SOIL DIVIDE AND LABEL		



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STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

RYAN SIMMONS  
LIBER 4291 FOLIO 045  
MAP 0031 GRID-0004  
PARCEL 0462 LOT 1  
4615 BONNIE BRANCH RD  
PLAT No.'s 5718  
ELECTION DISTRICT: 01

DATE:	ISSUES / REVISIONS
11/11/2015	100% SUBMITTAL

APPROVED:

DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

DATE: 12/15/15

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Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH BANK STABILIZATION PROJECT**

ELECTION DISTRICT: 02  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**PLANTING PLAN**

PROJECT NO.: 13005.19 SCALE: 1" = 20'

BY: AL, TB, KT CHECK: MDT

DWG. NO.: 19 OF 20

**CLIENT**

HOWARD COUNTY  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
SUITE 514  
COLUMBIA, MD 21046

DATE: 11/11/2015 ISSUES / REVISIONS: 100% SUBMITTAL

APPROVED: [Signature] DEPARTMENT OF PUBLIC WORKS  
[Signature] CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE: 12/14/15

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Restore the Earth & Inspire Ecological Stewardship

**BONNIE BRANCH  
BANK STABILIZATION  
PROJECT**

ELECTION DISTRICT: 02,  
TAX MAP/GRID/PARCEL: 0031/0003/0814  
OPEN LOT #150  
WAIVER PETITION #WP-16-050

**PLANTING DETAILS**

PROJECT NO.: 13005.19 SCALE: N.T.S.

BY: AL, TB, KT CHECK: MDT

SEAL: [Professional Engineer Seal] DWG. NO.: 20 OF 20

**PLANT COMPOSITION SCHEDULE**

**ZONE 1 - Floodplain Forest/Reforestation**

Size (acres): 0.82

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
<b>TREES</b>									
30	48	15	6	<i>Acer rubrum</i>	Red maple	B&B	Random	2.5" CAL	77
		15	6	<i>Acer saccharinum</i>	Silver maple	B&B	Random	2.5" CAL	77
		15	6	<i>Betula nigra</i>	River birch	B&B	Random	2.5" CAL	77
		20	8	<i>Platanus occidentalis</i>	American sycamore	B&B	Random	2.5" CAL	67
		20	8	<i>Quercus bicolor</i>	Swamp white oak	B&B	Random	2.5" CAL	67
		15	6	<i>Ulmus americana</i>	American elm	B&B	Random	2.5" CAL	77
		100	40	= total					
<b>SHRUB</b>									
15	194	20	32	<i>Cornus sericea</i>	Red-osier dogwood	CON	Random	24-36"	33
		15	24	<i>Alnus serrulata</i>	Smooth alder	CON	Random	24-36"	39
		30	48	<i>Lindera benzoin</i>	Common spicebush	CON	Random	24-36"	27
		15	24	<i>Sambucus canadensis</i>	American elder	CON	Random	24-36"	39
		20	32	<i>Viburnum dentatum</i>	Southern arrowwood	CON	Random	24-36"	33
		100	160	= total					
<b>HERBACEOUS SEED</b>									
N/A	35	10	2.9	<i>Scirpus cyperinus</i>	Wool grass	SEED	LB of P.L.S. 76 %	N/A	N/A
		25	7.2	<i>Elymus riparius</i>	Riverbank wild rye	SEED	LB of P.L.S. 78 %	N/A	N/A
		25	7.2	<i>Elymus virginicus</i>	Virginia wild rye	SEED	LB of P.L.S. 78 %	N/A	N/A
		25	7.2	<i>Tridens flavus</i>	Purpletop	SEED	LB of P.L.S. 78 %	N/A	N/A
		15	4.3	<i>Dichanthelium clandestinum</i>	Deertongue	SEED	LB of P.L.S. 76 %	N/A	N/A
		100	28.8	= total					

CON = Containerized  
P.L.S. = Pure Live Seed  
B&B = Balled & Burlapped

**PLANT COMPOSITION SCHEDULE**

**ZONE 2 - DRP Floodplain Forest/Reforestation**

Size (acres): 0.24

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
<b>TREES</b>									
15	194	15	7	<i>Acer rubrum</i>	Red maple	CON	Random	1.0" CAL	39
		15	7	<i>Acer saccharinum</i>	Silver maple	CON	Random	1.0" CAL	39
		15	7	<i>Betula nigra</i>	River birch	CON	Random	1.0" CAL	39
		20	9	<i>Platanus occidentalis</i>	American sycamore	CON	Random	1.0" CAL	34
		20	9	<i>Quercus bicolor</i>	Swamp white oak	CON	Random	1.0" CAL	34
		15	7	<i>Ulmus americana</i>	American elm	CON	Random	1.0" CAL	39
		100	46	= total					
<b>SHRUB</b>									
15	194	20	9	<i>Cornus sericea</i>	Red-osier dogwood	CON	Random	24-36"	34
		15	7	<i>Alnus serrulata</i>	Smooth alder	CON	Random	24-36"	39
		30	14	<i>Lindera benzoin</i>	Common spicebush	CON	Random	24-36"	27
		15	7	<i>Sambucus canadensis</i>	American elder	CON	Random	24-36"	39
		20	9	<i>Viburnum dentatum</i>	Southern arrowwood	CON	Random	24-36"	34
		100	46	= total					
<b>HERBACEOUS SEED</b>									
N/A	35	10	0.8	<i>Scirpus cyperinus</i>	Wool grass	SEED	LB of P.L.S. 76 %	N/A	N/A
		25	2.1	<i>Elymus riparius</i>	Riverbank wild rye	SEED	LB of P.L.S. 76 %	N/A	N/A
		25	2.1	<i>Elymus virginicus</i>	Virginia wild rye	SEED	LB of P.L.S. 76 %	N/A	N/A
		25	2.1	<i>Tridens flavus</i>	Purpletop	SEED	LB of P.L.S. 76 %	N/A	N/A
		15	1.3	<i>Dichanthelium clandestinum</i>	Deertongue	SEED	LB of P.L.S. 76 %	N/A	N/A
		100	8.4	= total					

CON = Containerized  
P.L.S. = Pure Live Seed

**PLANT COMPOSITION SCHEDULE**

**ZONE 3 - Shaded Emergent Freshwater Wetland**

Size (acres): 0.04

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
<b>HERBACEOUS PLANTS</b>									
2.5	6970	15	40	<i>Iris versicolor</i>	Blue flag iris	CON	Clump	2" Plug	6
		20	54	<i>Peltandra virginica</i>	Pickereelweed	CON	Clump	2" Plug	6
		10	27	<i>Peltandra virginica</i>	Arrow arum	CON	Clump	2" Plug	8
		20	54	<i>Saururus cernuus</i>	Lizards tail	CON	Clump	2" Plug	6
		15	40	<i>Juncus effusus</i>	Soft rush	CON	Clump	2" Plug	6
		20	54	<i>Carex stricta</i>	Tussock sedge	CON	Clump	2" Plug	6
		100	269	= total					

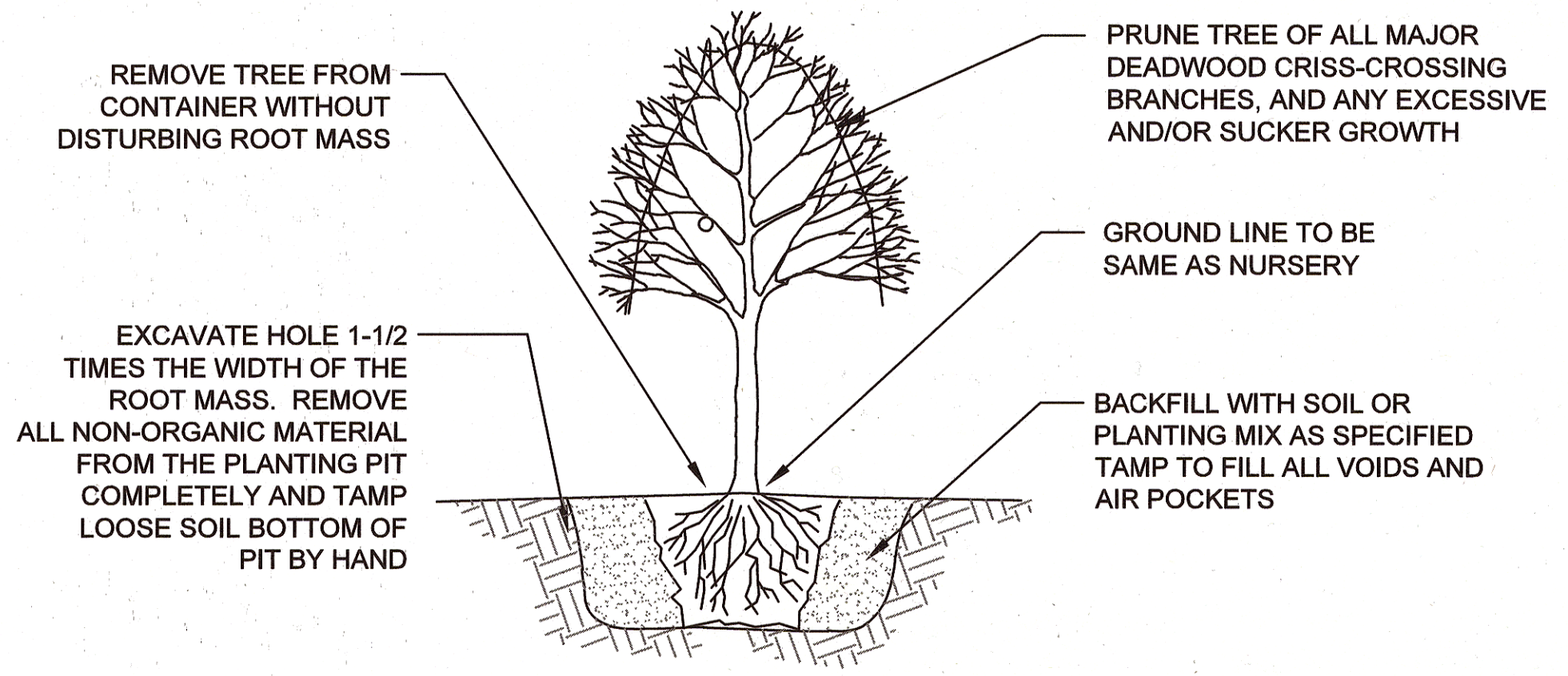
CON = Containerized

**PLANT COMPOSITION SCHEDULE**

**ZONE 4 - Stream Bank Restoration**

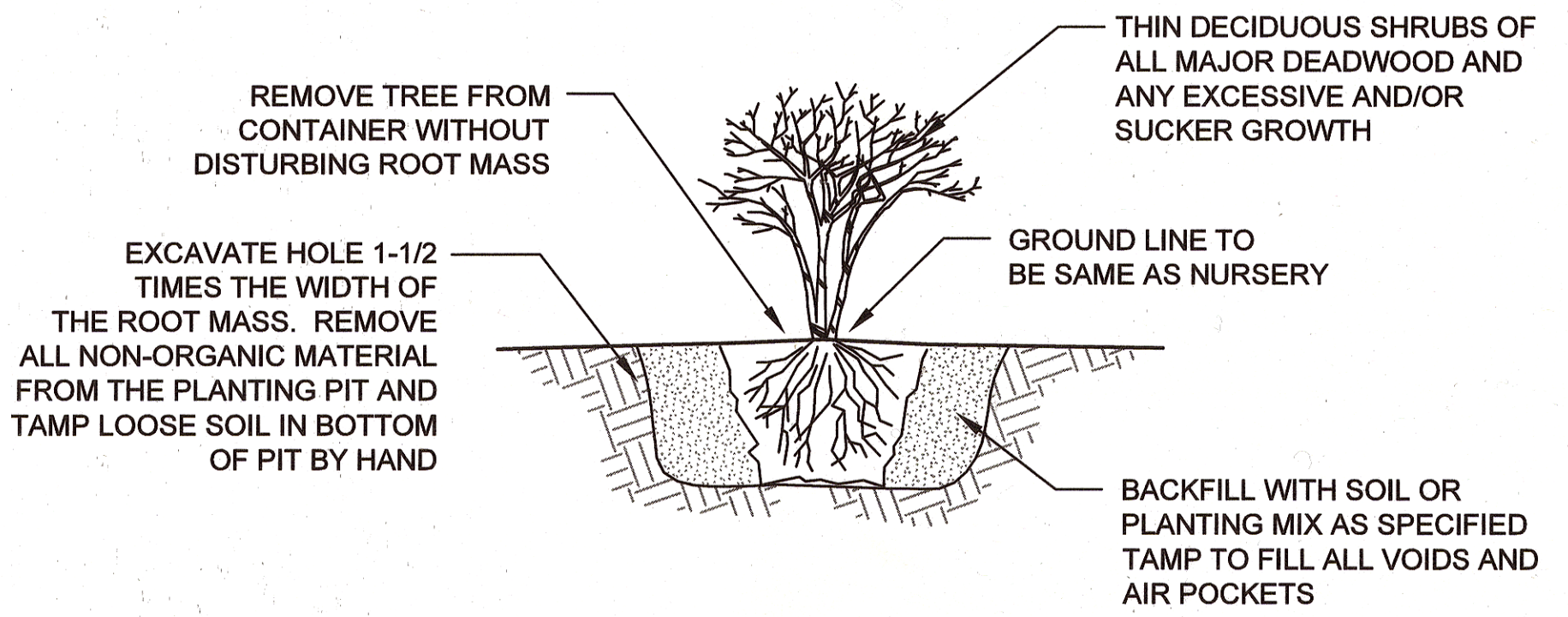
Size (acres): 0.13

Overall Minimum Spacing (ft.)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Minimum Spacing (ft.)
<b>TREES</b>									
2	10890	20	290	<i>Salix nigra</i>	Black willow	18" LIVE STAKE	Random	2.5" CAL	4
		20	290	<i>Salix interior</i>	Sandbar willow	18" LIVE STAKE	Random	2.5" CAL	4
		20	290	<i>Salix discolor</i>	Pussy willow	18" LIVE STAKE	Random	2.5" CAL	4
		20	290	<i>Salix sericea</i>	Silky willow	18" LIVE STAKE	Random	2.5" CAL	4
		20	290	<i>Sambucus canadensis</i>	American elder	18" LIVE STAKE	Random	2.5" CAL	4
		100	1450	= total					
<b>SHRUB</b>									
20	109	50	7	<i>Cornus sericea</i>	Red-osier dogwood	18" LIVE STAKE	Random	0.5 - 1" CAL	29
		50	7	<i>Cornus amomum</i>	Silky dogwood	18" LIVE STAKE	Random	0.5 - 1" CAL	29
		100	14	= total					
<b>HERBACEOUS PLANTS</b>									
2.5	6970	30	279	<i>Scirpus cyperinus</i>	Wool grass	PLUG	Clump	2" Plug	5
		30	279	<i>Elymus riparius</i>	Riverbank wild rye	PLUG	Clump	2" Plug	5
		40	372	<i>Juncus effusus</i>	Soft rush	PLUG	Clump	2" Plug	4
		100	930	= total					



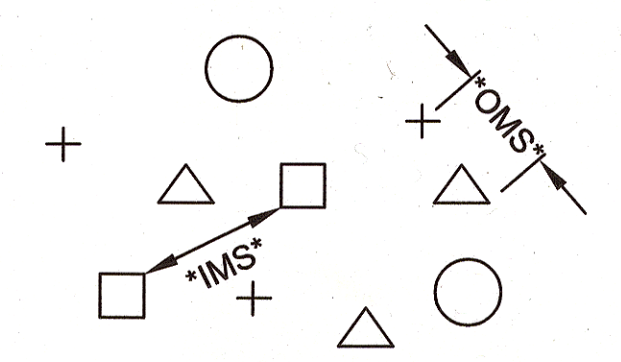
**TREE PLANTING - CONTAINER GROWN**

NOT TO SCALE



**SHRUB PLANTING - CONTAINER GROWN**

NOT TO SCALE



O.M.S.- AN OVERALL MINIMUM SPACING DISTANCE "O.M.S." IS ASSIGNED TO THE PLANTING CONFIGURATION "SEE PLANT SCHEDULE"  
I.M.S.- AN INDIVIDUAL MINIMUM SPACING DISTANCES "I.M.S." IS ASSIGNED TO EACH INDIVIDUAL SPECIES "SEE PLANT SCHEDULE"

**PLANT SPACING - RANDOM**

NOTE: EACH SYMBOL INDICATES A DIFFERENT SPECIES  
NOT TO SCALE

**PLAN VIEW**