D-1158 CHERRYTREE FARM STREAM RESTORATION

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

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21	LS-03	LANDSCAPE NOTES & DETAILS
22	LS-04	LANDSCAPE NOTES & DETAILS

SITE INFORMATION

STREET ADDRESS:
SWEET CHERRY LANE
LAUREL, MARYLAND 21043

HOWARD COUNTY DPW PROPERTY
LOT 45
PARCEL: 0190 TAX MAP: 0046 GRID: 0010
ELECTION DISTRICT: 3
ZONING: R-20
PLAT NO.: 6928

HOWARD COUNTY DPR PROPERTY
LOT 28
PARCEL: 0190 TAX MAP: 0046 GRID: 0010
ELECTION DISTRICT: 3
ZONING: R-20
PLAT NO.: 6928

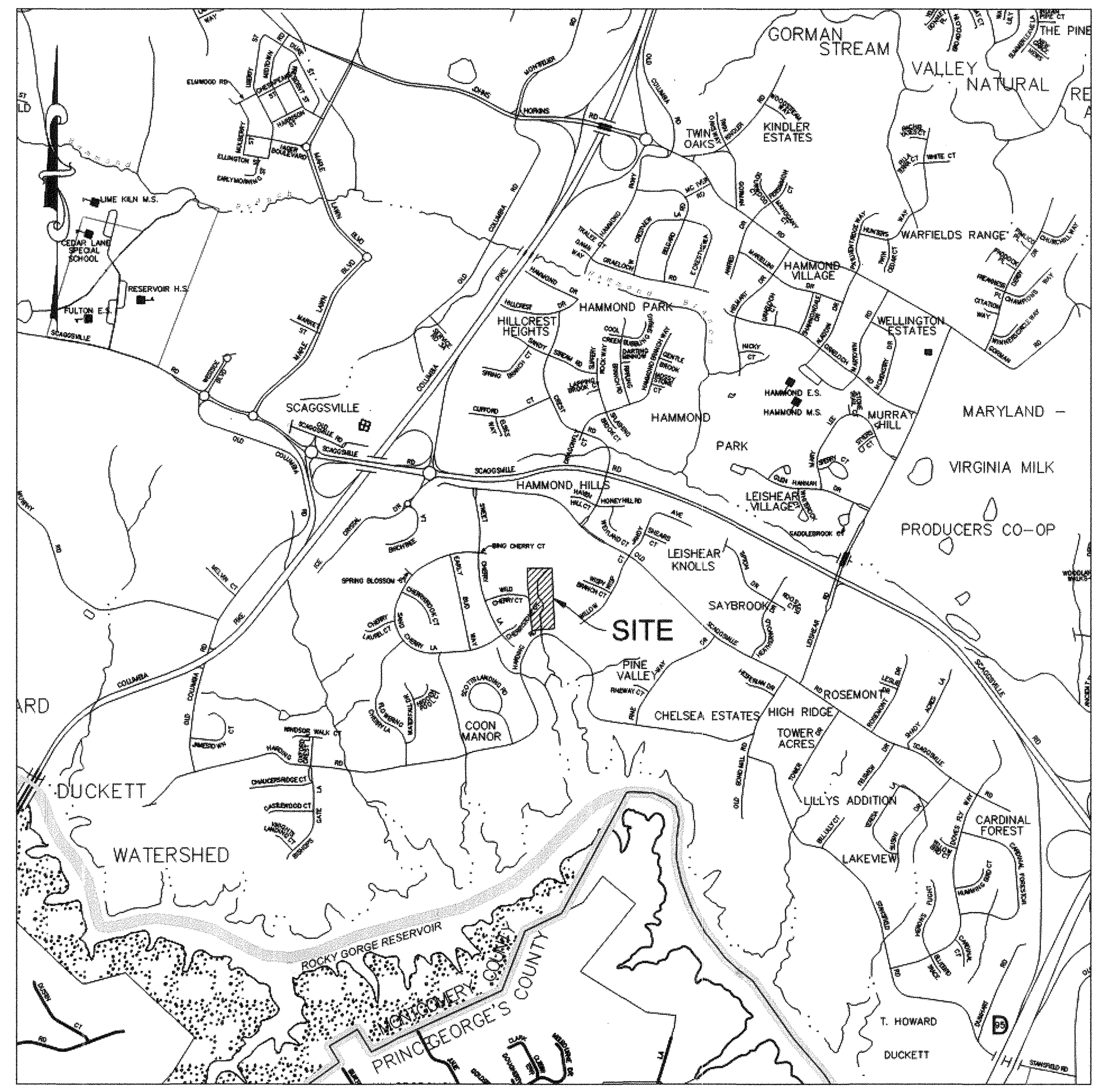
WSSC PROPERTY
LIBER: 228-75

WSSC PROPERTY
LIBER: 218-150

CLIENT/LAND OWNER:
HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENVIRONMENTAL SERVICES
9801 BROKEN LAND PARKWAY
COLUMBIA, MARYLAND 21046-3143
PHONE: 410.313.6429

FINAL (100%) DESIGN

WILD CHERRY COURT
PARCELS 11881, 6928
6TH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND



VICINITY MAP
SCALE: 1"=2000'
HOWARD COUNTY
ADC MAP 19 GRID B-7

DESIGN NARRATIVE

PROJECT OVERVIEW

THIS PROJECT SCOPE IS THE RESTORATION OF APPROXIMATELY 1,273 LINEAR FEET OF AN UNNAMED TRIBUTARY TO THE ROCKY GORGE RESERVOIR IN THE CHERRYTREE FARM NEIGHBORHOOD OF HOWARD COUNTY, MARYLAND. THE PRIMARY GOAL OF THE PROJECT IS TO REDUCE STREAM BED AND BANK EROSION AND THE ASSOCIATED NITROGEN AND PHOSPHOROUS TO ASSIST THE COUNTY IN MEETING MS4/TMDL REQUIREMENTS, WHILE A SECONDARY GOAL FOCUSES ON CREATING OPPORTUNITIES FOR ECOLOGICAL UPLIFT. THE SPECIFIC RESTORATION/STABILIZATION ACTIONS TAKEN INCLUDE:

- CONSTRUCTING A SERIES OF ROCK STEP-POOLS AND ARMORED RIFFLES TO PROVIDE A STABLE CHANNEL PROFILE WITH FLOW DIVERSITY AND POOL HABITAT, WHILE REDUCING THE CHANNEL / FLOODPLAIN FOOTPRINT AND DISTURBANCE.
- CREATING FLOODPLAIN BENCHES WITHIN THE CONFINED SYSTEM TO REDUCE DEPTH AND SUBSEQUENT STRESSES IN THE CHANNEL.
- STABILIZATION OF THE CONFLUENCE WITH TWO ADJACENT TRIBUTARIES TO PREVENT THE POTENTIAL FOR FUTURE HEADCUT MIGRATION THROUGH THE CONSTRUCTION OF BOULDER DROP STRUCTURES AND CLASS I RIPRAP.

NATURAL RESOURCE PROTECTION AND ENHANCEMENT

THE MAJORITY OF THE SITE IS LOCATED ON PROPERTY OWNED BY HOWARD COUNTY, MARYLAND WITH THE EXCEPTION OF THE AREA DOWNSTREAM OF THE EXISTING STORMWATER OUTFALL WHERE THE SITE CONTINUES ONTO WASHINGTON SANITARY SEWER COMMISSION (WSSC) PROPERTY. ADDITIONALLY, A COLONIAL GAS EASEMENT CROSSES THROUGH THE SITE. THE SITE WILL BE ACCESSED VIA AN EXISTING, PAVED DRIVE OFF OF SWEET CHERRY LANE, ASSOCIATED WITH A HOWARD COUNTY SEWER PUMPING STATION. THE SITE IS BORDERED TO THE NORTH, EAST, AND WEST BY DECIDUOUS FOREST SURROUNDED BY EXISTING SINGLE FAMILY RESIDENTIAL DEVELOPMENTS. A NATURAL RESOURCES SURVEY WAS COMPLETED OF THE SITE. TREES GREATER THAN 12 INCHES WERE IDENTIFIED AND ASSESSED. 25 SPECIMEN TREES WERE IDENTIFIED DURING THE ASSESSMENT.

THE DESIGN APPROACH SEEKS TO PRESERVE NATURAL RESOURCES LOCATED ON AND ADJACENT TO THE PROJECT SITE. THEREFORE, THE FOOTPRINT OF THE CHANNEL/FLOODPLAIN HAS BEEN MINIMIZED TO THE GREATEST EXTENT POSSIBLE WHILE MAINTAINING A STABLE CHANNEL GEOMETRY AND PLANFORM. FOR THE MOST PART, THE CONSTRUCTED CHANNEL WILL REMAIN WITHIN THE EXISTING CHANNEL FOOTPRINT TO REDUCE DISTURBANCE TO EXISTING RESOURCES. 10 TREES GREATER THAN 12" DBH ARE PROPOSED TO BE REMOVED. NO SPECIMEN TREES ARE PROPOSED FOR REMOVAL. TREES REMOVED WILL BE MITIGATED THROUGH ON-SITE TREE PLANTING. DISTURBANCE TO THREE WETLANDS IS UNAVOIDABLE IN ORDER TO CREATE A STABLE CHANNEL PROFILE. NATURAL RESOURCES WILL BE PROTECTED ALONG THE SITE'S PERIMETER WITH BLAZE ORANGE CONSTRUCTION SAFETY FENCING AS WELL AS SEDIMENT CONTROL FENCING (E.G. SILT FENCE) WHERE REQUIRED.

MAINTENANCE OF NATURAL FLOW PATTERNS

THIS PROJECT DOES NOT ALTER THE EXISTING CONDITION FLOW PATTERNS ALONG THE MAJORITY OF THE PROJECT REACH. MINOR CHANNEL PLANFORM ADJUSTMENTS ARE PROPOSED IN AREAS OF TIGHT MEANDER BENDS TO REDUCE STRESS ON THE OUTER BANK AND CREATE A STABLE CHANNEL ALIGNMENT.

REDUCTION OF IMPERVIOUS AREAS THROUGH BETTER SITE DESIGN

THIS PROJECT WILL NOT INCREASE IMPERVIOUS AREAS ON THE SITE.

INTEGRATION OF EROSION AND SEDIMENT CONTROL CONTROLS INTO SWM STRATEGY

THE CONSTRUCTION APPROACH FOR THE PROJECT WAS DESIGNED TO MAXIMIZE BYPASS CLEAN WATER AROUND THE CONSTRUCTION AREA. SANDBAG DIVERSIONS AND PUMP AROUND PRACTICE WILL BE UTILIZED IN PHASES TO ALLOW FOR THE MAINTENANCE OF STREAM BASEFLOW. ALL SEDIMENT LADEN WATER WITHIN THE WORK AREA WILL BE PUMPED TO A FILTER BAG BEFORE DISCHARGING DOWNSTREAM OF THE WORK AREA. ALL DISTURBED AREAS NOT DRAINING TO AN APPROVED SEDIMENT CONTROL DEVICE MUST BE STABILIZED AT THE END OF EACH DAY. CONTRACTOR SHALL LIMIT WORK ACTIVITIES IN SUCH A MANNER THAT ALL DISTURBED AREAS CAN BE STABILIZED TO THE FINAL GRADE AT THE END OF EACH WORKING DAY. NO DISTURBED AREAS SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS RUNOFF IS DIRECTED TO AN MDE APPROVED SEDIMENT CONTROL DEVICE. CLEAR WATER DIVERSIONS WILL BE UTILIZED FOR THE EPHEMERAL STORMWATER OUTFALL TO STABLE OUTLET PROTECTION LOCATED DOWNSTREAM OF THE WORK AREA. TRIBUTARY 1 IS AN EPHEMERAL CHANNEL AND THEREFORE A SANDBAG DIVERSION AND PUMP AROUND WILL BE UTILIZED AS NECESSARY TO DIVERT FLOW AROUND THE WORK AREA. SUPER SILT FENCE IS PROPOSED AROUND ALL STOCKPILE AREAS. PERMANENT STABILIZATION MATTING AND SEED IS PROPOSED FOR ALL DISTURBED SLOPES FOR RAPID STABILIZATION.

IMPLEMENTATION OF ESD PLANNING TECHNIQUES AND PRACTICES

THE PROJECT OBJECTIVE IS STREAM RESTORATION/STABILIZATION. THEREFORE, ESD PLANNING TECHNIQUES AND PRACTICES ARE NOT RELEVANT TO THIS PROJECT.

REQUEST FOR DESIGN MANUAL AND WAIVER PETITION FOR ENVIRONMENTAL AND STORMWATER DESIGN

NO WAIVERS ARE REQUESTED.

GENERAL NOTES:

1. 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
2. NO STOCKPILE OF ANY MATERIAL IS ALLOWED IN THE 100-YEAR FLOODPLAIN
3. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT 410.313.1880 AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL NOTIFY MISS UTILITY AT 1.800.257.7777 AT LEAST TWO (2) WORKING DAYS BEFORE STARTING WORK.
4. THE HORIZONTAL AND VERTICAL CONTROL FOR THESE PLANS ARE BASED ON THE MARYLAND STATE SYSTEM OF PLANE COORDINATES AS ESTABLISHED FROM THE FOLLOWING HOWARD COUNTY CONTROL POINTS.
   - 4.1. 46FD 535892.901 1345540.058 379.934
   - 4.2. 43CD 537123.037 1344291.422 394.632
5. THE SYSTEM OF COORDINATES USED IS BASED ON THE FOLLOWING DATUMS:
   - 5.1. HORIZONTAL: MARYLAND COORDINATE SYSTEM (MCS), NORTH AMERICAN DATUM 1983 (NAD83), LAST ADJUSTMENT: 2014
   - 5.2. VERTICAL: NORTH AMERICAN VERTICAL DATUM (NAVD), LAST ADJUSTMENT 1988
6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY AND MSHA IF APPLICABLE
7. THIS PLAN IS PREPARED IN ACCORDANCE WITH THE PROVISION OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
8. TOPOGRAPHIC SURVEYS WERE PERFORMED BY CENTURY ENGINEERING IN SEPTEMBER 2017.
9. PROPERTY LINES AND EASEMENTS SHOWN ON THIS PLAN ARE APPROXIMATE AND FOR REFERENCE ONLY.
10. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE DESIGNER IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE COUNTY, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
11. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
13. UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND TAKEN FROM AVAILABLE PLANS, RECORDS,AND/OR FIELD RECONNAISSANCE. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO LOCATE AND 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.
    - 13.1. UTILITY CONTACTS:
      - 13.1.1. BALTIMORE GAS AND ELECTRIC - ELECTRIC: 410.597.7920
      - 13.1.2. BALTIMORE GAS AND ELECTRIC - GAS: 410.291.4844
      - 13.1.3. VERIZON: 410.224.9285
      - 13.1.4. COMCAST: 301.630.7094
      - 13.1.5. COLONIAL GAS: 443.821.1797
14. THE WETLAND DELINEATION FOR THIS SITE WAS PERFORMED BY CENTURY ENGINEERING IN AUGUST 2017.
15. A WETLANDS PERMIT IS REQUIRED FOR THIS PROJECT. THE PERMIT NUMBER IS 201960539/19-NT-3076.
16. ALL SPECIFIED OR PROPRIETARY PRODUCTS SHOWN HEREON MAY BE SUBJECT TO SUBSTITUTION WITH OTHER PRODUCTS RECOMMENDED BY THE CONTRACTOR SUBJECT TO WRITTEN REVIEW AND APPROVAL BY THE COUNTY.
17. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND CENTURY ENGINEERING DOES NOT WARRANT OR GUARANTEE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY SUCH INFORMATION ON ITS OWN.
18. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY. ALL UTILITIES SHALL HAVE A CLEARANCE BY A MINIMUM OF SIX (6) INCHES VERTICALLY AND A MINIMUM OF FIVE (5) FEET HORIZONTALLY. PLEASE NOTE THAT MORE RESTRICTIVE CLEARANCES SHALL BE ADHERED TO WHEN APPROPRIATE.
19. THE CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
20. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES THAT INVOLVE CUTTING, FILLING, OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN. TREE PROTECTION PLANKING SHALL BE INSTALLED AROUND TREES TO REMAIN WITHIN THE LOD PRIOR TO CONSTRUCTION.
21. THE CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS, AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
22. UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
23. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN BY THE CONTRACTOR.
24. TREES TO BE REMOVED SHALL BE CUT AT THE BASE WITH A SAW AND NOT PUSHED OVER. TREE STUMPS MAY BE LEFT IN PLACE, UNLESS OTHERWISE DIRECTED ON THE PLANS.
25. ALL MATERIAL SHALL BE REMOVED AND DISPOSED OF OFFSITE. REMOVED TREES AND BRUSH MAY BE REDISTRIBUTED ON SITE AT THE DISCRETION OF THE ENGINEER OR HIS/HER REPRESENTATIVE.
26. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN EXITING THE PROJECT SITE AND PAY CLOSE ATTENTION TO PEDESTRIANS WALKING NEAR THE PROJECT SITE.
27. WORKING HOURS ARE 7AM TO 7PM MONDAY THROUGH FRIDAY. WITH ADVANCED PERMISSION FROM THE COUNTY, CONTRACTORS MAY WORK ON SATURDAY 9AM TO 3PM. NO WORK IS ALLOWED ON SUNDAY.
28. THE CONTRACTOR SHALL AVOID TRACKING HEAVY EQUIPMENT OVER THE CRITICAL ROOT ZONE OF SPECIMEN TREES. IF UNAVOIDABLE, LOAD MATS SHOULD BE USED WHEN TRACKING OVER THE CRITICAL ROOT ZONES.

PROJECT NOTES:

1. THIS WORK TAKES PLACE IN USE I-P WATERS. IN-STREAM WORK IS PROHIBITED BETWEEN MARCH 1 AND JUNE 15 OF ANY CALENDAR YEAR INCLUSIVE.
2. FEMA FIRM 24027C0145D. THERE ARE NOT FEMA REGULATED FLOODPLAINS LOCATED WITHIN THE PROJECT BOUNDARY.
3. NATURAL RESOURCES DELINEATED ON THIS PLAN WERE FIELD VERIFIED BY CENTURY ENGINEERING UNDER THE DIRECTION OF DAN YEAGER, A MARYLAND DEPARTMENT OF NATURAL RESOURCES QUALIFIED PROFESSIONAL IN AUGUST AND SEPTEMBER 2017.
4. THE SITE IS NOT LOCATED IN NOR DOES IT DISCHARGE TO A TIER II WATERBODY.
5. THE SITE IS LOCATED IN THE ROCKY GORGE DAM WATERSHED. THIS PORTION OF THE WATERSHED IS NOTED AS IMPAIRED BY NUTRIENTS AND SEDIMENTS BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.
6. FOR STREAM CHANNEL WORK, THE CONTRACTOR SHALL ONLY DISTURB THE LENGTH OF CHANNEL THAT CAN AND SHALL BE STABILIZED AT THE END OF EACH WORK DAY.
7. THE ALTERNATIVE COMPLIANCE APPROVAL (WP-20-018) WILL REMAIN VALID FOR ONE YEAR FROM 9/30/2019 OR AS LONG AS A CAPITAL PROJECT PLAN OR GRADING PLAN IS BEING ACTIVELY PROCESSED IN ACCORDANCE WITH THE PROCESSING PROVISIONS OF THE REGULATIONS.
8. THE 0.2 ACRE REFORESTATION OBLIGATION IS TO BE SATISFIED THROUGH FEE-IN-LIEU PAYMENT OF $6,534.00 TO THE DEPARTMENT OF PLANNING AND ZONING.
9. A COMMUNITY OUTREACH MEETING FOR THIS PROJECT WAS HELD ON MAY 22, 2019 AT THE SAVAGE PUBLIC LIBRARY.
10. THE ALTERNATIVE COMPLIANCE PLAN EXHIBIT SHALL SERVE AS THE SUBSTITUTE FOR A SITE DEVELOPMENT PLAN FOR DEVELOPMENT. NO DISTURBANCE IS PERMITTED BEYOND THE 1.53-ACRE LIMIT OF DISTURBANCE AS SHOWN ON THE ALTERNATIVE COMPLIANCE EXHIBIT UNLESS IT CAN BE SUFFICIENTLY DEMONSTRATED BY THE APPLICANT TO BE JUSTIFIED.
11. THE REMOVAL OF STATE CHAMPION TREES, TREES 78% OF THE DIAMETER OF STATE CHAMPION TREES OR TREES 30" IN DIAMETER OR LARGER IS NOT PERMITTED UNDER THIS ALTERNATIVE COMPLIANCE REQUEST. ANY REMOVAL OF SPECIMEN TREES WILL REQUIRE ALTERNATIVE COMPLIANCE TO SECTION 16.1205(a)(7) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. ALL EFFORTS SHALL BE MADE TO REDUCE IMPACTS TO SPECIMEN TREES DURING CONSTRUCTION. TREE PROTECTION MEASURES AS DETAILED ON THE PLAN EXHIBIT SHALL BE UTILIZED AS NECESSARY.
12. THE PROPOSED DISTURBANCE TO THE EXISTING FOREST CONSERVATION EASEMENTS ON PARCEL 56 SHALL BE REPLANTED ON-SITE WITHIN THE EASEMENTS PER HOWARD COUNTY RECREATION AND PARKS STANDARDS. ANY PERMANENT IMPACTS TO THE EXISTING FOREST CONSERVATION EASEMENTS MAY REQUIRE ADDITIONAL PLANTING AND RECORDATION OF A REVISED EASEMENT. THE APPLICANT SHALL COORDINATE ALL PROPOSED IMPACTS AND PLANTING WITH THE DEPARTMENT OF RECREATION & PARKS.
13. ONCE THE PROPOSED STREAM RESTORATION WORK IS COMPLETE, THE LIMIT OF DISTURBANCE SHALL BE RESTORED TO ITS PREVIOUS CONDITION THROUGH STABILIZATION AND REPLANTING OF FOREST RESOURCES.

APPROVALS / PERMITS			
AGENCY	PERMIT #	DATE APPLIED	DATE APPROVED
MDE WETLANDS / WATERWAYS AUTHORIZATION	201960539/19-NT-3076 AI NO. 162158	3/14/2019	11/22/2019
HOWARD SOIL CONSERVATION	EP-19-25	12/17/2018	
HOWARD COUNTY DPZ ALTERNATIVE COMPLIANCE	WP-20-018	7/12/2019	9/30/2019
MDE GENERAL DISCHARGE PERMIT			

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGN 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.

[signature] 12/26/2019
DESIGNER'S SIGNATURE DATE

CRAIG LYNCH 28371
PRINTED NAME & TITLE MD REGISTRATION NO.
P.E., P.L.S., OR R.L.A. (CIRCLE ONE)

OWNER/DEVELOPER'S CERTIFICATION

I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION ,OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE 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.

[signature] 1/2/20
SIGNATURE OF OWNER/DEVELOPER DATE

[handwritten name] DIRECTOR
PRINTED NAME & TITLE

PERMIT INFORMATION CHART					
SUBDIVISION NAME		SECTION	AREA	LOT/PARCEL	
WILD CHERRY COURT				45/0190, 45/0057, 28/0190, 20/0057	
PLAT # OF L/F	GRID NO.	ZONING	TAX MAP NO.	ELECTION DIST.	CENSUS TRACT
6928, 11881, 6928, 11881	10, 11	R-20	46	6	606805
WATER CODE			SEWER CODE		

HOWARD SOIL CONSERVATION DISTRICT

THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

[signature] 1/2/20
HOWARD SOIL CONSERVATION DISTRICT DATE

DEPARTMENT OF PARKS AND RECREATION, HOWARD COUNTY, MARYLAND

[signature] 1/3/2020
CHIEF, DEPARTMENT OF PARKS AND RECREATION DATE

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MARYLAND

[signature] 1/2/20
DIRECTOR OF PUBLIC WORKS DATE

[signature] 12/31/19
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

MISS UTILITY

CALL "MISS UTILITY" AT 1.800.257.7777, A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK. THE EXCAVATOR MUST NOTIFY ALL PUBLIC UTILITY COMPANIES WITH UNDERGROUND FACILITIES IN THE AREA OF THE PROPOSED EXCAVATION AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION.

SUMMARY OF ENVIRONMENTAL IMPACTS								
TREE REMOVAL (EA)	STREAM DISTURBANCE (LF)	TEMPORARY WETLAND DISTURBANCE (SF)	PERMANENT WETLAND DISTURBANCE (SF)	LIMIT OF DISTURBANCE (SF)	LIMIT OF DISTURBANCE (AC)	CUT (CY)	FILL (CY)	NET CUT / FILL (CY)
10	1432	243	334	66,405	1.52	1,085	895	-190

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

SEAL: STATE OF MARYLAND — CRAIG A. LYNCH — NO. 28371 — PROFESSIONAL ENGINEER
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND

[signature] 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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 #: 28371 EXPIRES: 01/01/2021

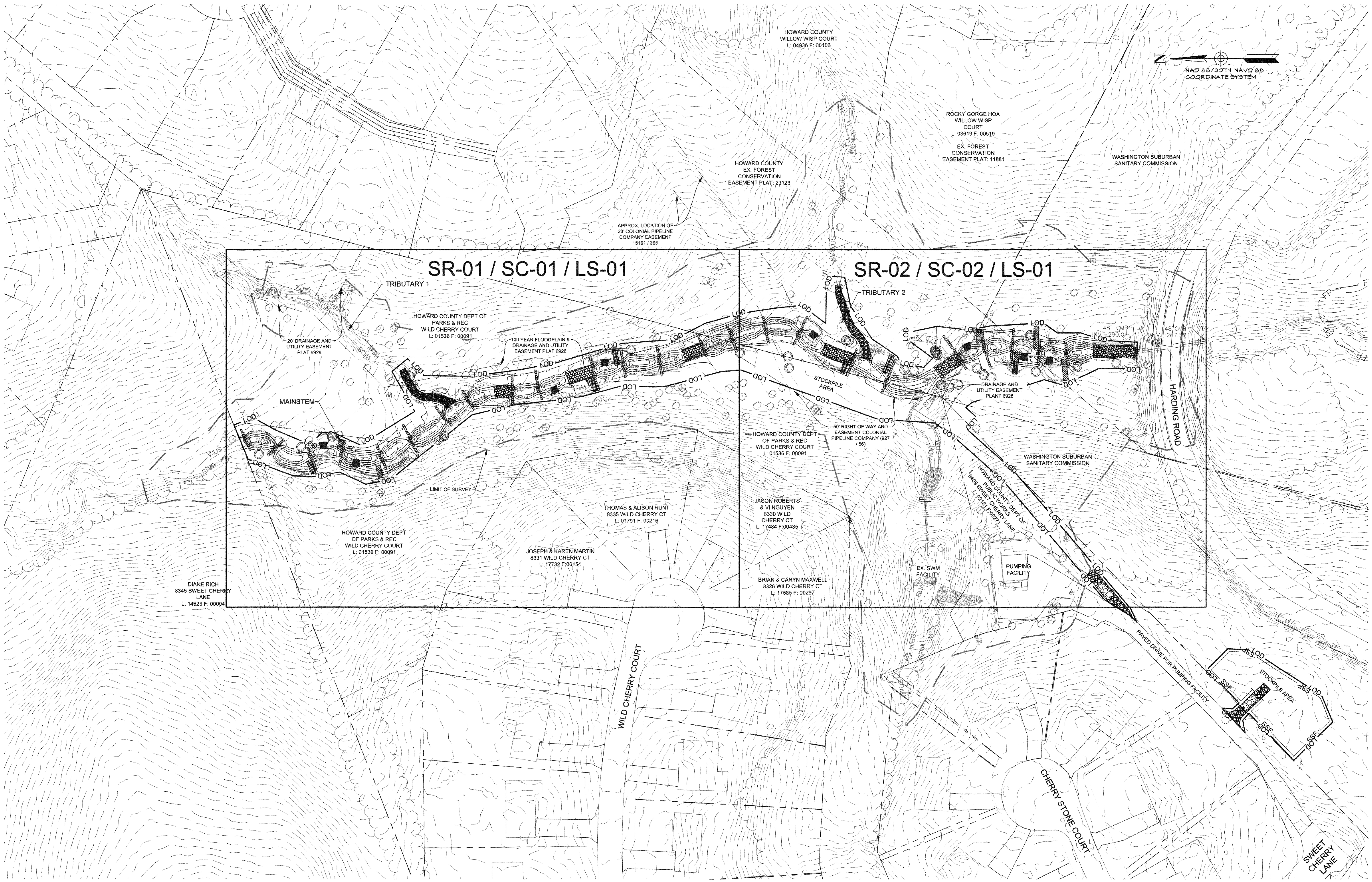
REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

COVER SHEET

PROJECT NO.: 121104.64	
SCALE: AS SHOWN	DATE: 12/26/19
DESIGN: SH	DRAWN: JT / CHECK: CL
DWG NO: GN-01 OF GN-01	
SHEET NO: 01 OF 22	



50' 0 50' 100'
ORIGINAL SCALE: 1"=50'

CENTURY
ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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 #: 28371 EXPIRES: 01/01/2021

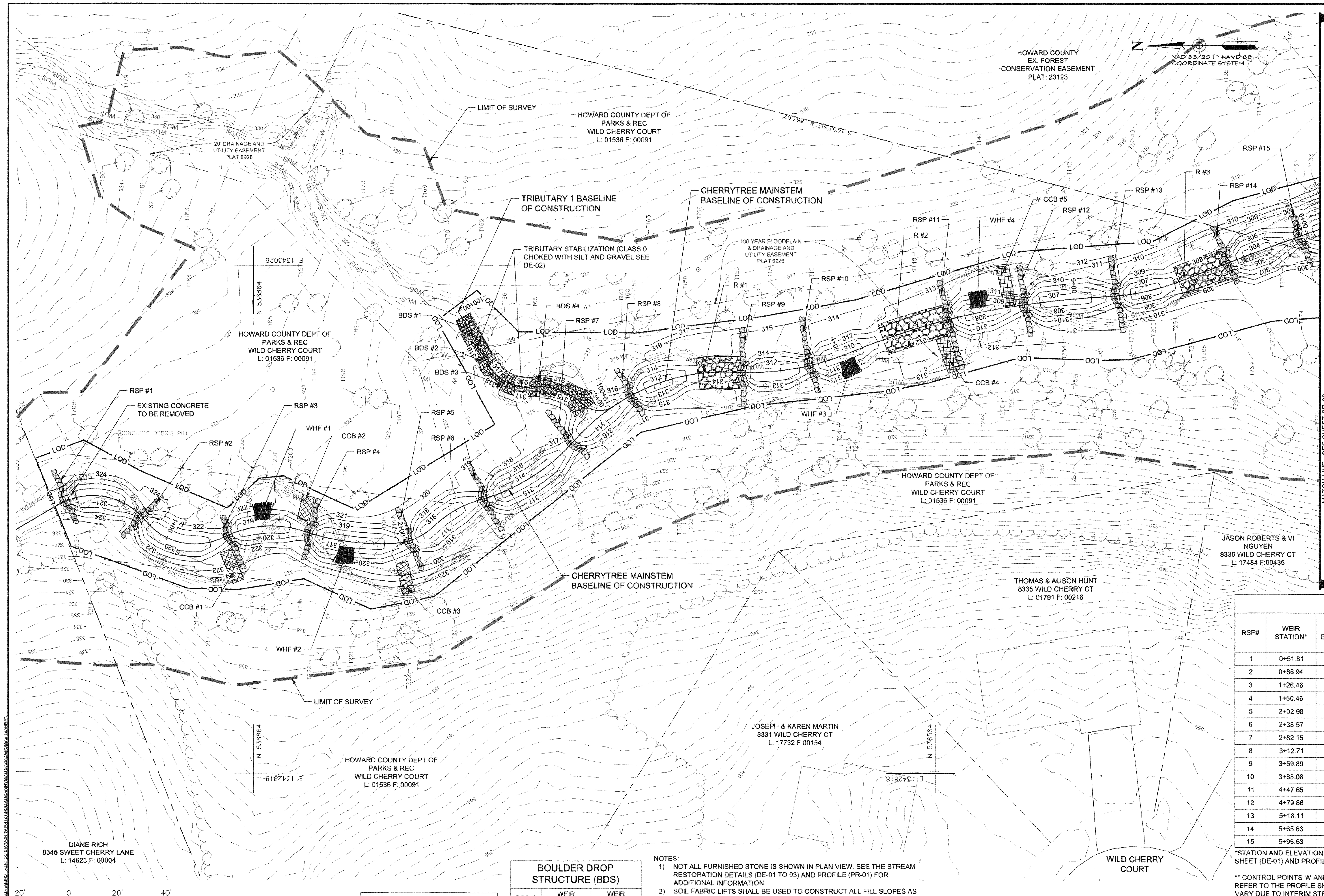
REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM
STREAM RESTORATION

FINAL (100%) DESIGN

SHEET LAYOUT

PROJECT NO.: 121104.64	
SCALE: 1" = 50'	DATE: 12/26/19
DESIGN: SH	DRAWN: JT	CHECK: CL
DWG NO: OV-01 OF OV-01	
SHEET NO: 02 OF 22	



PROPOSED FEATURES LEGEND

- LIMIT OF DISTURBANCE
- 1' MINOR CONTOUR
- 5' MAJOR CONTOUR
- WOODY HABITAT FEATURE (WHF)
- BOULDER DROP STRUCTURE (BDS)
- ROCK STEP-POOL STRUCTURE (RSP)
- ARMORED RIFFLE (R)
- CLASS 0 RIPRAP CHOKED WITH SILT AND GRAVEL
- CLAY CHANNEL BLOCK (CCB)

EXISTING FEATURES LEGEND

- EX. BUILDING
- EX. NONTIDAL WETLAND
- EX. WATERS OF THE U.S.
- EX. FENCE
- EX. PROPERTY BOUNDARY
- EX. EASEMENT
- EX. EDGE OF PAVEMENT
- EX. GAS MAIN
- EX. TREELINE
- EX. CONCRETE DEBRIS
- EX. RIPRAP
- EX. CONCRETE MONUMENT
- EX. TREE
- EX. TRAVERSE POINT
- EX. STORMDRAIN
- EX. 1' MINOR CONTOUR
- EX. 5' MAJOR CONTOUR

CLAY CHANNEL BLOCK (CCB)

CCB #	FROM STATION	OFFSET	TO STATION	OFFSET
1	1+22.61	5.44 R	1+22.77	19.07 R
2	1+55.95	14.59 L	1+56.49	4.47 L
3	1+97.66	8.26 R	1+98.27	21.03 R
4	4+42.65	6.28 R	4+44.03	21.10 R
5	4+72.88	17.05 L	4+73.08	0.46 L

ROCK STEP POOL (RSP)

RSP#	WEIR STATION*	WEIR ELEVATION*	WEIR WIDTH	A**		B**	
				NORTHING	EASTING	NORTHING	EASTING
1	0+51.81	323.54	4.0'	536946.2130	1342942.2986	536936.6808	1342920.3496
2	0+86.94	322.29	4.0'	536901.5754	1342932.3254	536918.0471	1342914.8399
3	1+26.46	321.04	4.0'	536876.5975	1342923.6811	536867.2011	1342901.6965
4	1+60.46	320.04	4.0'	536837.3747	1342930.7476	536844.1989	1342905.3638
5	2+02.98	318.54	4.0'	536805.1205	1342927.0091	536794.9877	1342901.0607
6	2+38.57	317.29	4.0'	536776.9678	1342947.6132	536761.0282	1342917.5642
7	2+82.15	315.79	4.0'	536743.7868	1342966.5835	536726.5689	1342947.1405
8	3+12.71	314.79	4.0'	536714.9101	1342983.4225	536702.3700	1342963.2532
9	3+59.89	313.54	6.0'	536663.3816	1343000.3779	536662.5964	1342968.5693
10	3+88.06	312.54	4.0'	536638.9115	1343004.7758	536632.0192	1342973.9217
11	4+47.65	311.04	6.0'	536582.2213	1343019.9764	536572.6422	1342983.3899
12	4+79.86	309.79	4.0'	536550.0593	1343026.5290	536544.9565	1342996.8604
13	5+18.11	308.54	4.0'	536512.0192	1343030.1396	536506.8535	1342998.4233
14	5+65.63	307.04	4.0'	536470.0162	1343042.2043	536460.0433	1343018.8281
15	5+96.63	305.79	4.0'	536439.0900	1343051.8906	536429.7796	1343025.6610

*STATION AND ELEVATIONS DENOTE THE DOWNSTREAM EDGE OF THE WEIR STONE. REFER TO THE DETAIL SHEET (DE-01) AND PROFILE SHEET (PR-01) FOR ADDITIONAL INFORMATION.

** CONTROL POINTS 'A' AND 'B' ARE ONLY TO DENOTE THE ORIENTATION OF THE ROCK STEP STRUCTURE. REFER TO THE PROFILE SHEET (PR-01) FOR STATIONS AND ELEVATIONS. ACTUAL CUT-OFF SILL LENGTH MAY VARY DUE TO INTERIM STREAM BANK EROSION. SILL MUST KEY INTO EXISTING BANK A MINIMUM OF 3.0'. SEE DETAIL SHEET DE-01.

NOTES:

1) NOT ALL FURNISHED STONE IS SHOWN IN PLAN VIEW. SEE THE STREAM RESTORATION DETAILS (DE-01 TO 03) AND PROFILE (PR-01) FOR ADDITIONAL INFORMATION.
2) SOIL FABRIC LIFTS SHALL BE USED TO CONSTRUCT ALL FILL SLOPES AS SHOWN ON DETAIL SHEET DE-03.

ARMORED RIFFLE (R)

R#	STA. FROM	STA. TO
1	3+40.98	3+57.89
2	4+17.75	4+45.65
3	5+43.36	5+63.63

WOODY HABITAT FEATURE (WHF)

WHF #	STA. FROM	STA. TO
1	1+38.38	1+44.34
2	1+73.06	1+79.59
3	3+98.91	4+05.53
4	4+57.63	4+64.30

TRIBUTARY STABILIZATION (CLASS 0 RIPRAP)

STA. FROM	STA. TO
100+02.08	100+05.59
100+09.85	100+20.59
100+25.00	100+33.59
100+36.95	100+47.59
100+51.82	100+65.92

BOULDER DROP STRUCTURE (BDS)

BDS #	WEIR STATION	WEIR ELEVATION
1	100+07.59	319.48
2	100+22.59	317.98
3	100+34.59	316.73
4	100+49.59	315.73

*STATION AND ELEVATIONS DENOTE THE DOWNSTREAM EDGE OF THE WEIR STONE. REFER TO THE DETAIL SHEET (DE-01) AND PROFILE SHEET (PR-01) FOR ADDITIONAL INFORMATION.

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HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND CRAIG A. LYNG NO. 28371 PROFESSIONAL ENGINEER 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
Mark S. Richmond 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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 #: 28371 EXPIRES: 01/01/2021

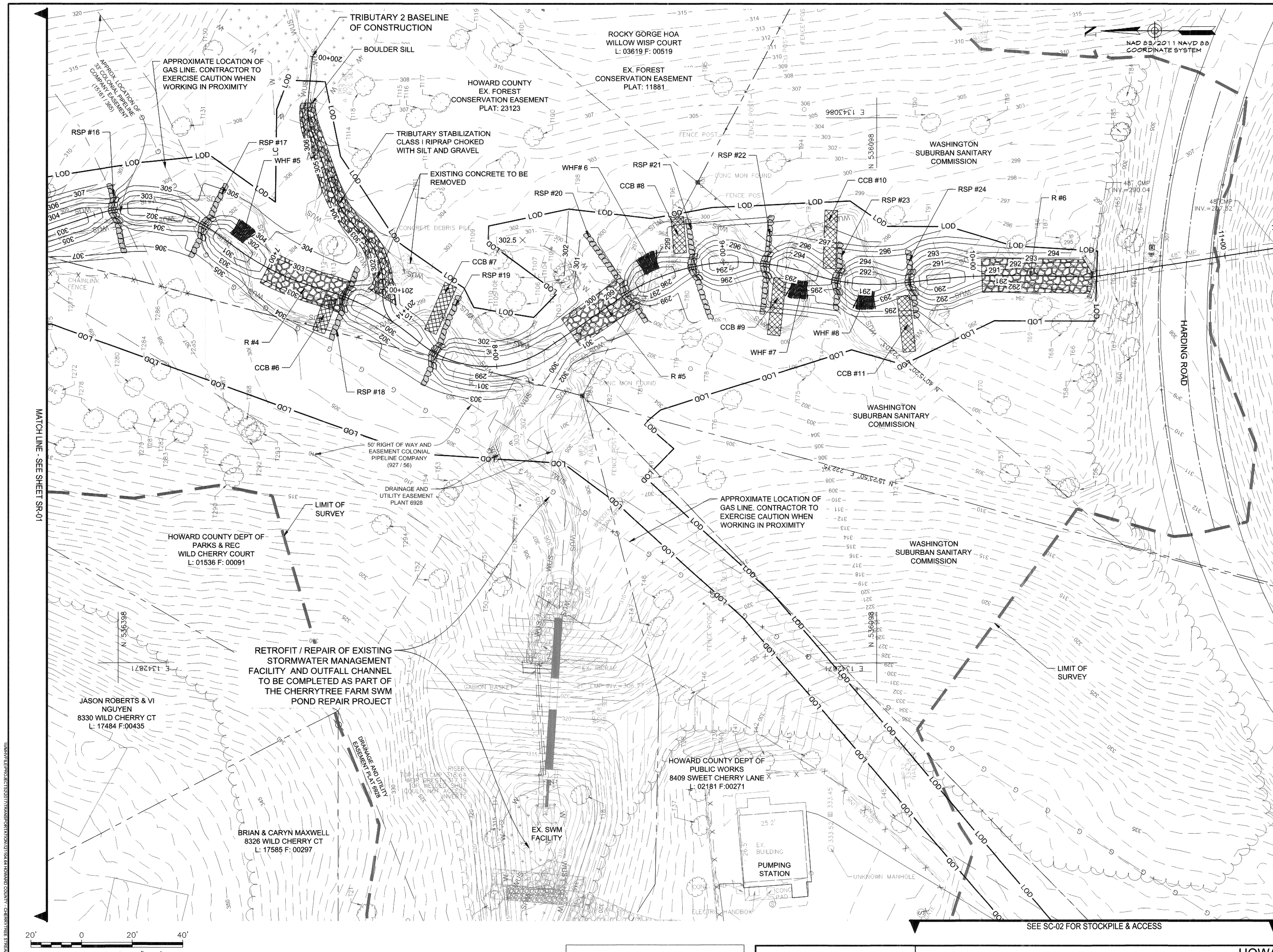
REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

STREAM RESTORATION PLAN

PROJECT NO.: 121104.64
SCALE: 1" = 20' DATE: 12/26/19
DESIGN: SH DRAWN: JT CHECK: CL
DWG NO: SR-01 OF SR-02



PROPOSED FEATURES LEGEND

- LIMIT OF DISTURBANCE
- 1' MINOR CONTOUR
- 5' MAJOR CONTOUR
- WOODY HABITAT FEATURE (WHF)
- BOULDER SILL
- ROCK STEP-POOL STRUCTURE (RSP)
- ARMORED RIFFLE (R)
- TRIBUTARY STABILIZATION (CLASS I RIPRAP CHOKED WITH SILT AND GRAVEL)
- CLAY CHANNEL BLOCK (CCB)

EXISTING FEATURES LEGEND

- EX. BUILDING
- EX. NONTIDAL WETLAND
- EX. WATERS OF THE U.S.
- EX. FENCE
- EX. PROPERTY BOUNDARY
- EX. EASEMENT
- EX. EDGE OF PAVEMENT
- EX. GAS MAIN
- EX. TREELINE
- EX. CONCRETE DEBRIS
- EX. RIPRAP
- EX. CONCRETE MONUMENT
- EX. TREE
- EX. TRAVERSE POINT
- EX. STORMDRAIN
- EX. 1' MINOR CONTOUR
- EX. 5' MAJOR CONTOUR

BOULDER SILL

STA. FROM	STA. TO
200+19.65	200+21.65

ARMORED RIFFLE (R)

R#	STA. FROM	STA. TO
4	6+99.96	7+31.59
5	8+32.65	8+58.95
6	10+03.34	10+46.95

CLAY CHANNEL BLOCK (CCB)

CCB #	FROM STATION	OFFSET	TO STATION	OFFSET
6	7+26.89	16.33 R	7+27.42	1.80 R
7	7+62.85	25.26 L	7+67.99	5.91 L
8	8+84.31	6.31 L	8+86.19	20.37 L
9	9+23.45	4.59 R	9+25.78	27.02 R
10	9+35.14	26.14 L	9+41.72	4.06 L
11	9+71.48	5.15 R	9+71.51	27.13 R

ROCK STEP POOL (RSP)

RSP #	WEIR STATION*	WEIR ELEVATION*	WEIR WIDTH	A**		B**	
				NORTHING	EASTING	NORTHING	EASTING
16	6+33.48	304.54	4.0'	536401.4133	1343059.7463	536395.3637	1343032.3710
17	6+70.96	303.29	4.0'	536354.9570	1343059.4856	536396.3314	1343030.8654
18	7+31.59	302.04	6.0'	536303.2226	1343026.5160	536313.8211	1342998.5248
19	7+73.64	301.04	4.0'	536263.3398	1343015.6800	536277.5425	1342980.4492
20	8+58.95	298.54	6.0	536213.0952	1343040.1589	536189.2499	1343005.5164
21	8+87.53	297.04	4.0'	536172.7682	1343045.8651	536163.3871	1343006.6658
22	9+16.05	295.54	4.0'	536139.5732	1343047.1981	536143.3430	1343008.7069
23	9+44.98	294.04	4.0'	536112.4696	1343036.7216	536114.1103	1343010.2371
24	9+73.39	292.54	4.0'	536085.3465	1343031.7314	536082.2108	1343007.1954

*STATION AND ELEVATIONS DENOTE THE DOWNSTREAM EDGE OF THE WEIR STONE. REFER TO THE DETAIL SHEET (DE-01) AND PROFILE SHEET (PR-01) FOR ADDITIONAL INFORMATION.

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NOTES:
1) NOT ALL FURNISHED STONE IS SHOWN IN PLAN VIEW. SEE THE STREAM RESTORATION DETAILS (DE-01 TO 03) AND PROFILE (PR-01) FOR ADDITIONAL INFORMATION.
2) SOIL FABRIC LIFTS SHALL BE USED TO CONSTRUCT ALL FILL SLOPES AS SHOWN ON DETAIL SHEET (DE-01).

TRIBUTARY STABILIZATION (CLASS I RIPRAP)

STA. FROM	STA. TO
200+20.53	200+95.92

WOODY HABITAT FEATURE (WHF)

WHF #	STA. FROM	STA. TO
5	6+79.86	6+87.24
6	8+69.08	8+75.47
7	9+28.28	9+35.57
8	9+54.22	9+60.68

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HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND CRAIG A. LYNCH NO. 28371 PROFESSIONAL ENGINEER 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
[signature] 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

REVISIONS

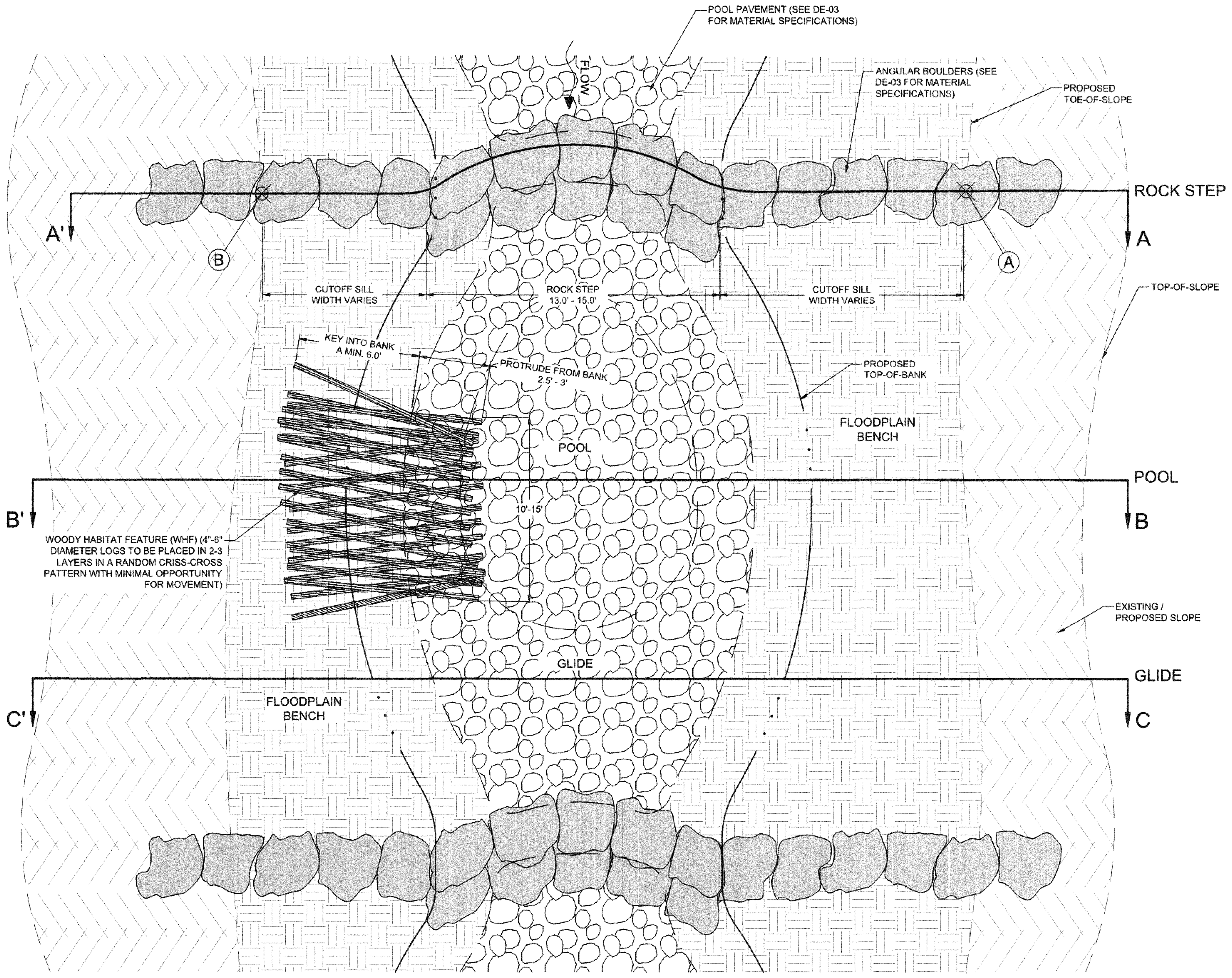
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

STREAM RESTORATION PLAN

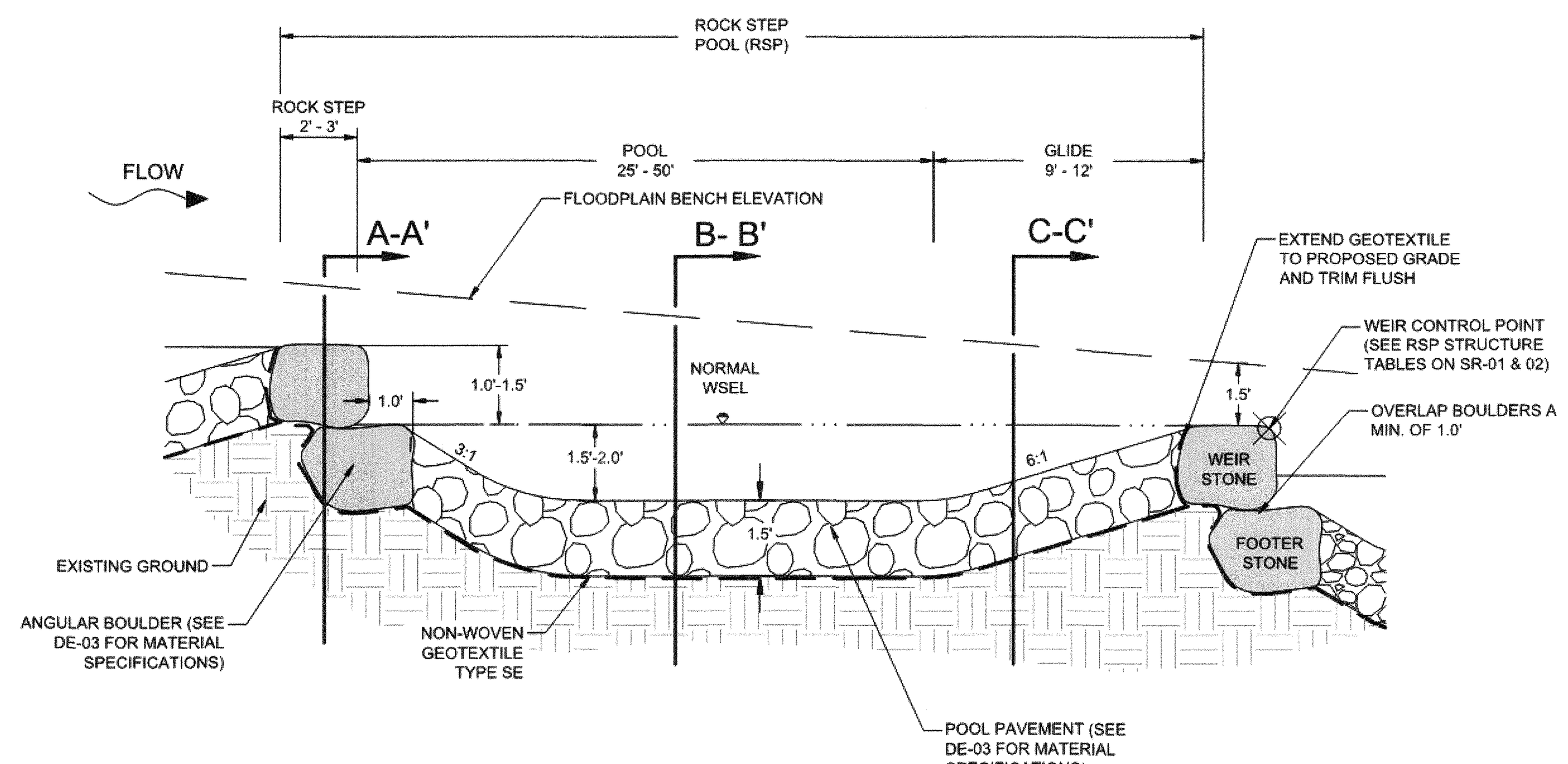
PROJECT NO.: 121104.64
SCALE: 1" = 20' DATE: 12/26/19
DESIGN: SH DRAWN: JT CHECK: CL
DWG NO: SR-02 OF SR-02



ROCK STEP POOL (RSP) SERIES - PLAN VIEW

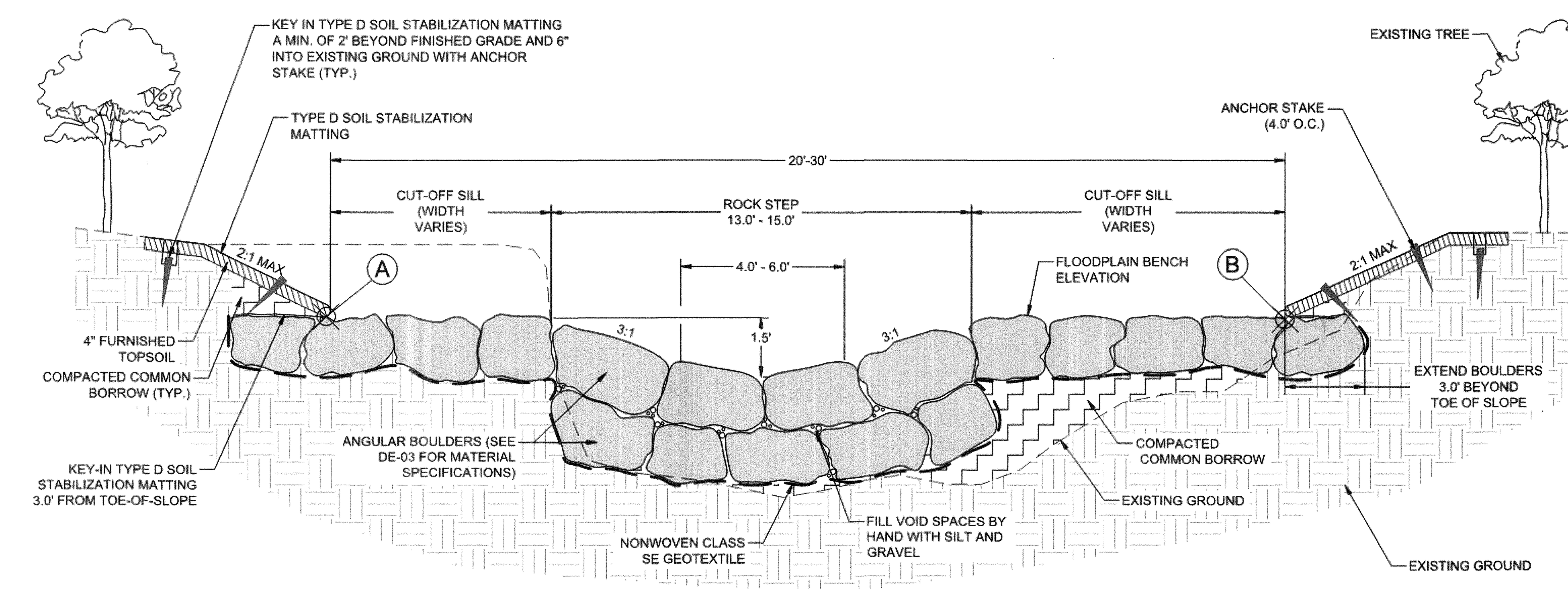
NOTE: CONTROL POINTS (A) AND (B) REFER TO STRUCTURE TABLES ON SR-01 & SR-02 AND ARE TO DENOTE THE ORIENTATION OF THE ROCK STEP IN PLAN VIEW ONLY. REFER TO THE PROFILE SHEET (PR-01) FOR STATIONS AND ELEVATIONS.

NOT TO SCALE



ROCK STEP POOL (RSP) SERIES - PROFILE VIEW

NOT TO SCALE

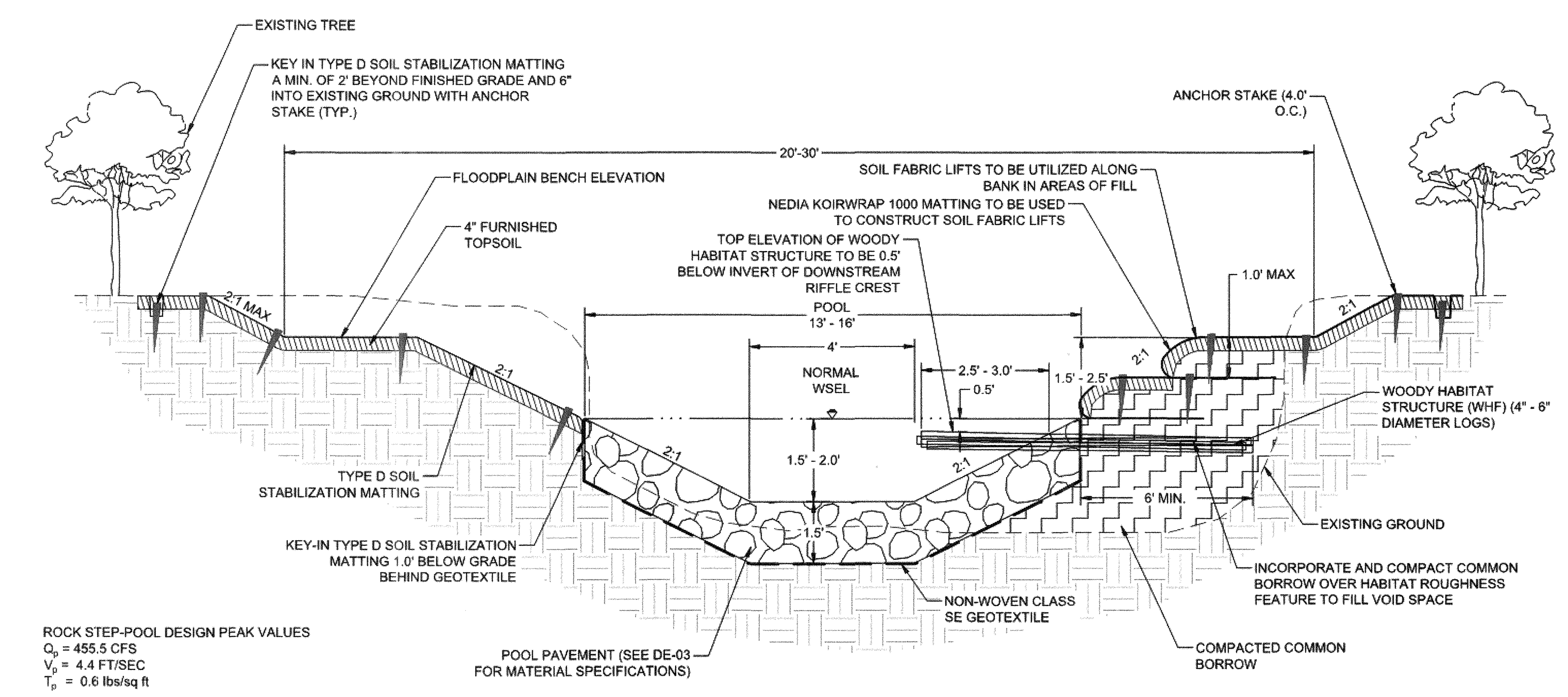


ROCK STEP - TYPICAL SECTION A - A'

NOT TO SCALE

ROCK STEP STRUCTURE DESIGN PEAK VALUES
Q_p = 455.5 CFS
V_p = 10.5 FT/SEC
T_p = 4.3 lbs/sq ft

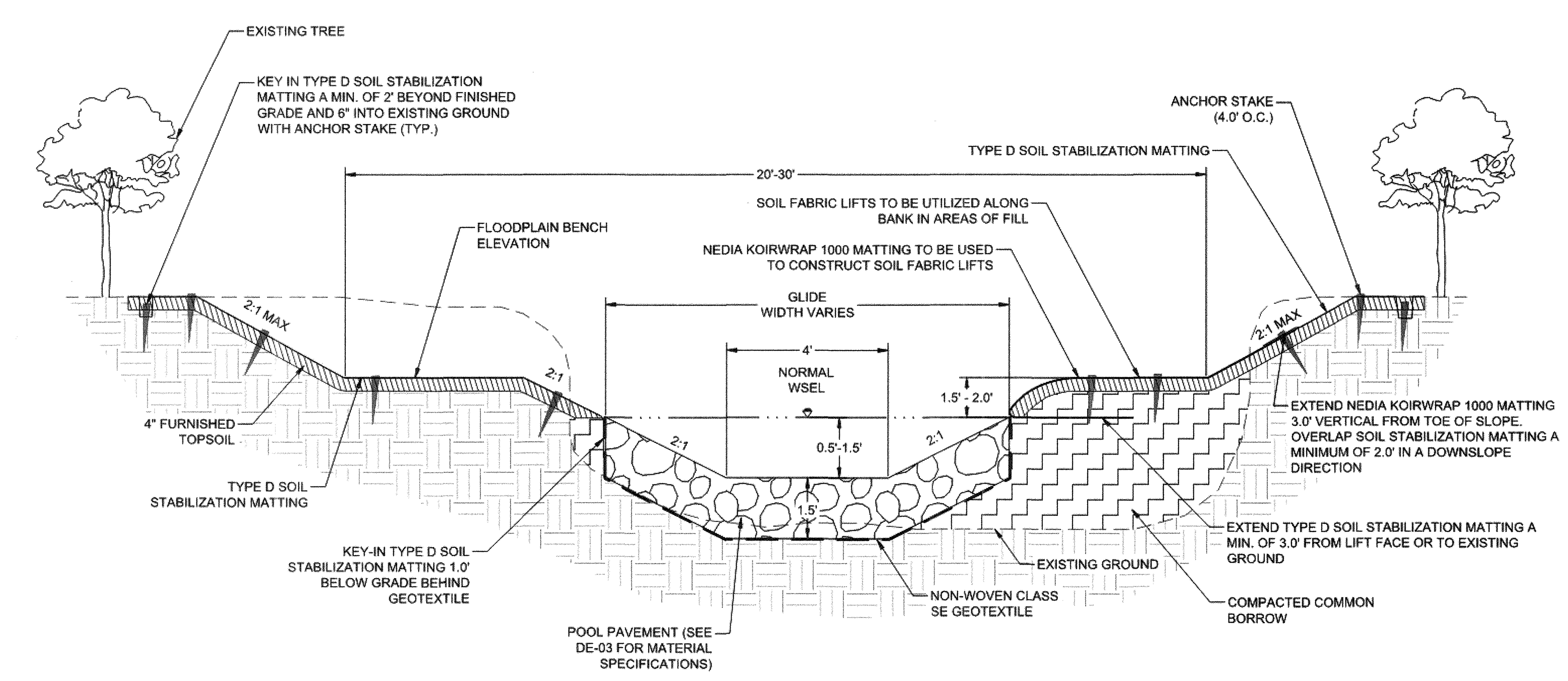
NOTE: ROCK-STEPS LOCATED IMMEDIATELY DOWNSTREAM OF ARMORED RIFFLES HAVE 6.0' BOTTOM WIDTH. ALL OTHER ROCK STEPS HAVE A 4.0' BOTTOM WIDTH. SEE ROCK-STEP POOL STRUCTURE TABLES ON DWG NO. SR-01 AND SR-02.



ROCK STEP-POOL DESIGN PEAK VALUES
Q_p = 455.5 CFS
V_p = 4.4 FT/SEC
T_p = 0.6 lbs/sq ft

POOL - TYPICAL SECTION B - B'

NOT TO SCALE



GLIDE - TYPICAL SECTION C - C'

NOT TO SCALE

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HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND PROFESSIONAL ENGINEER NO. 28371 — 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND

[signature] 12/30/19

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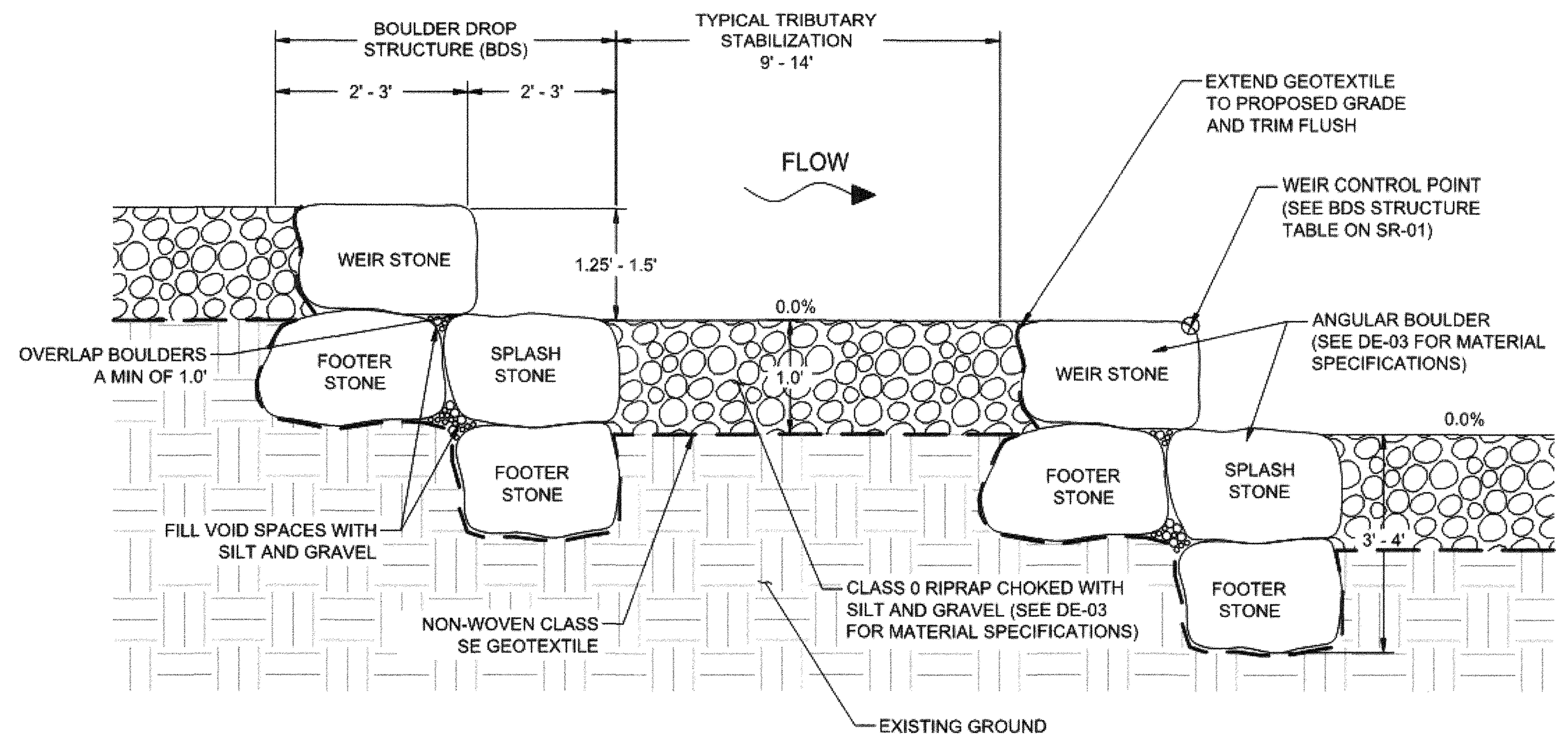
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

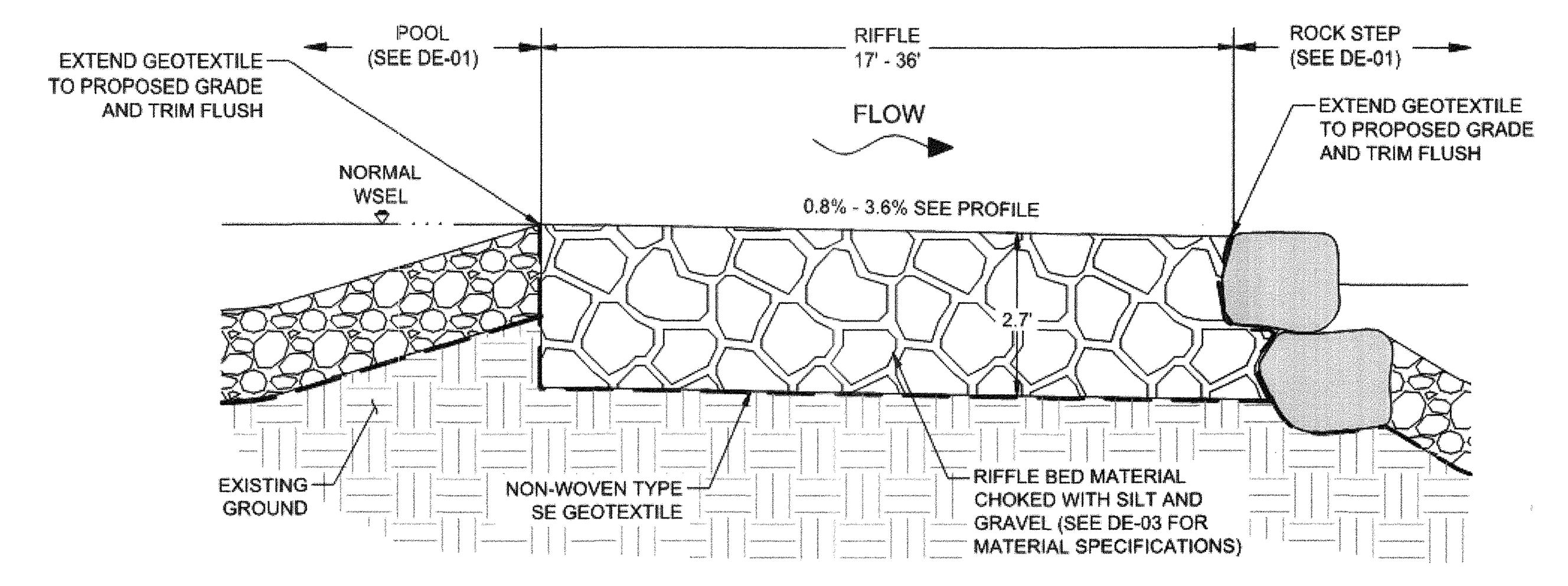
STREAM RESTORATION DETAIL SHEET

PROJECT NO.:	121104.64
SCALE: N.T.S.	DATE: 12/26/19
DESIGN: SH	DRAWN: JT	CHECK: CL
DWG NO.:	DE-01 OF DE-03
SHEET NO.:	05 OF 22



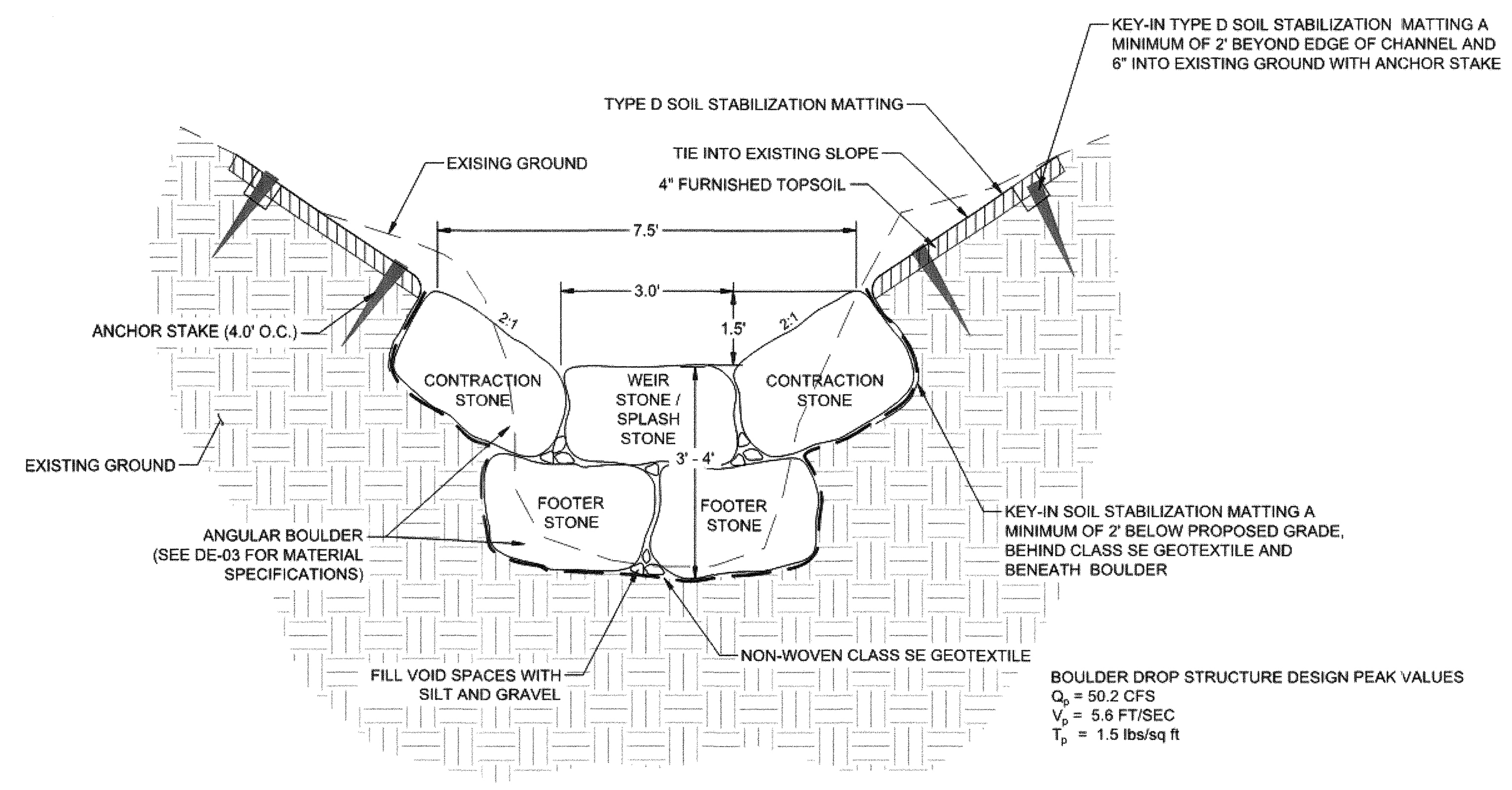
BOULDER DROP STRUCTURE (BDS) - PROFILE VIEW (TRIBUTARY 1)

NOT TO SCALE



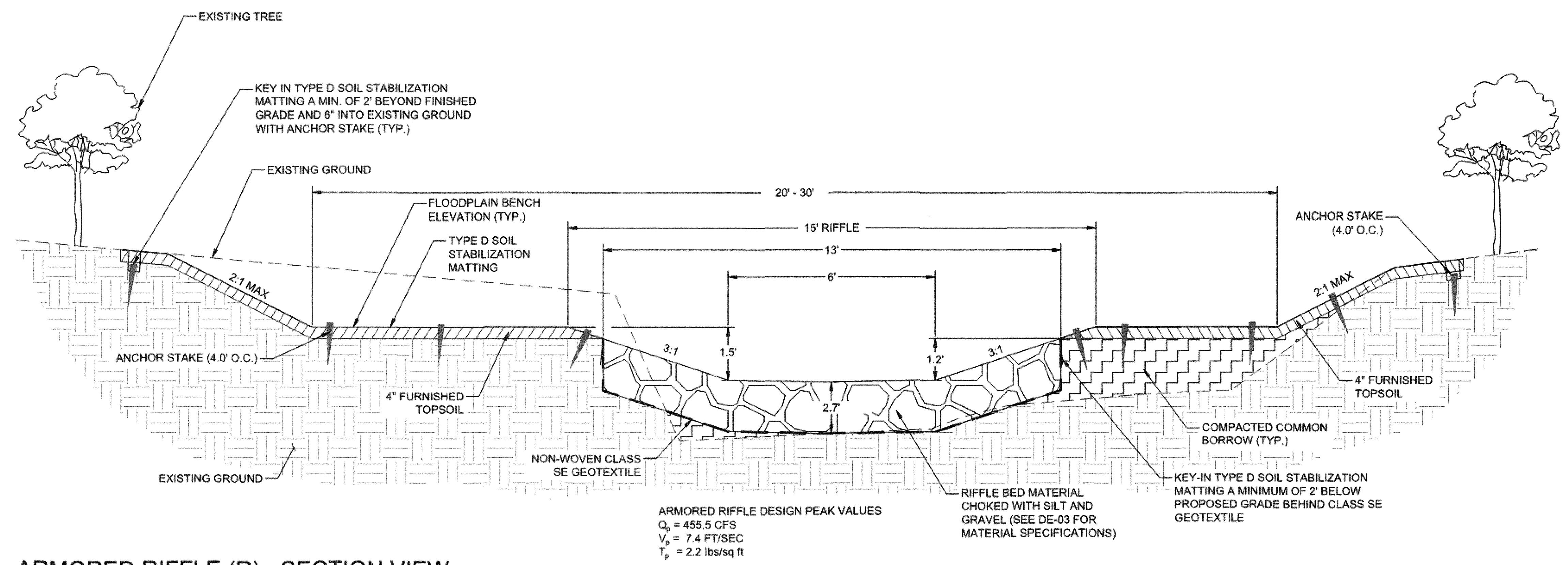
ARMORED RIFFLE (R) - PROFILE VIEW

NOT TO SCALE



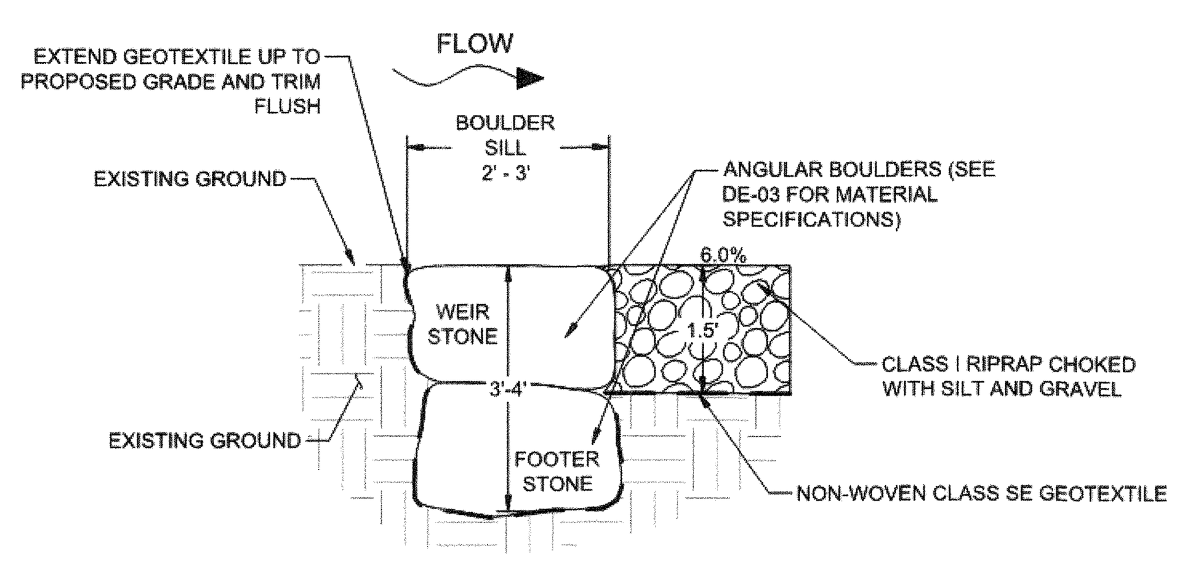
BOULDER DROP STRUCTURE (BDS) - WEIR / SPLASH STONE SECTION VIEW (TRIBUTARY 1)
BOULDER SILL - SECTION VIEW (TRIBUTARY 2)

NOT TO SCALE



ARMORED RIFFLE (R) - SECTION VIEW

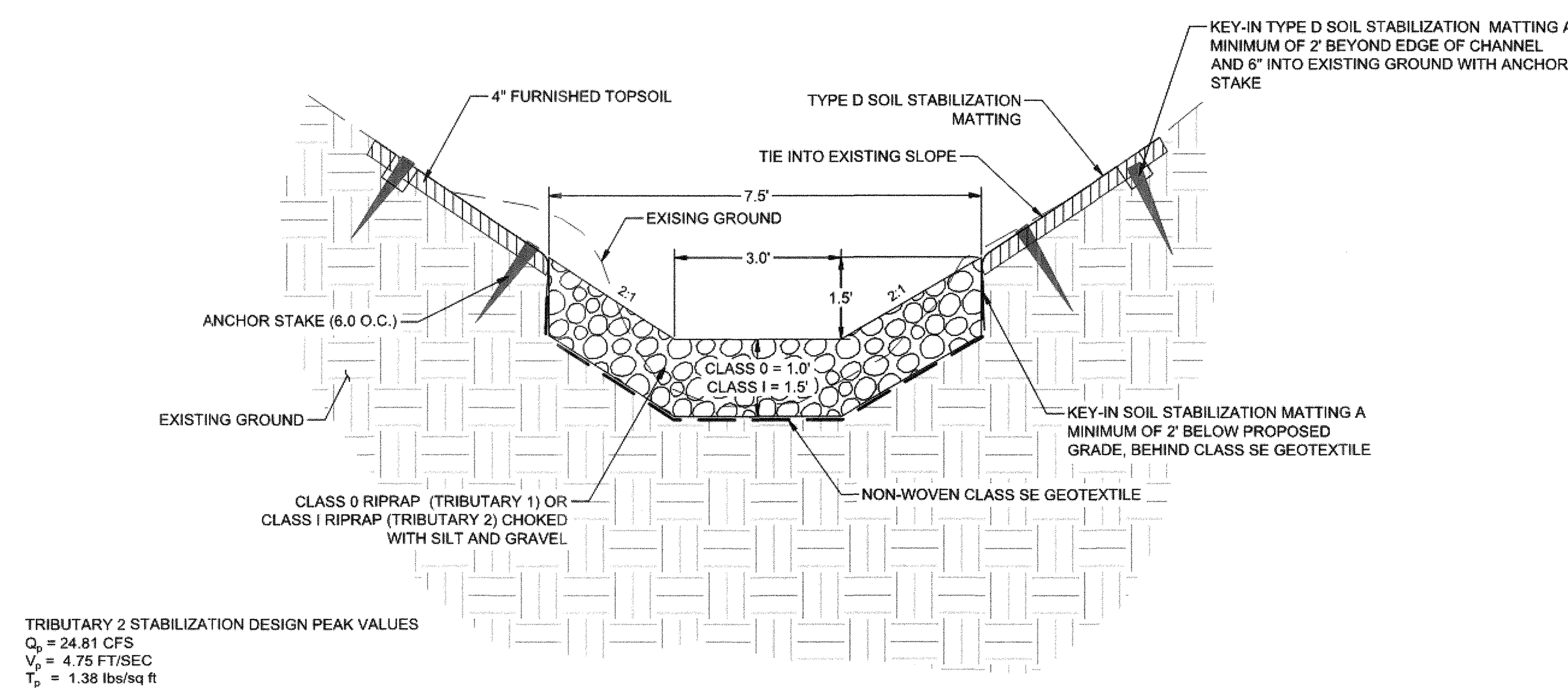
NOT TO SCALE



BOULDER SILL - PROFILE VIEW (TRIBUTARY 2)

NOT TO SCALE

NOTE: SEE SECTION VIEW ABOVE ON THIS DETAIL SHEET FOR ADDITIONAL INFORMATION.



TYPICAL TRIBUTARY STABILIZATION - SECTION VIEW

NOT TO SCALE

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HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

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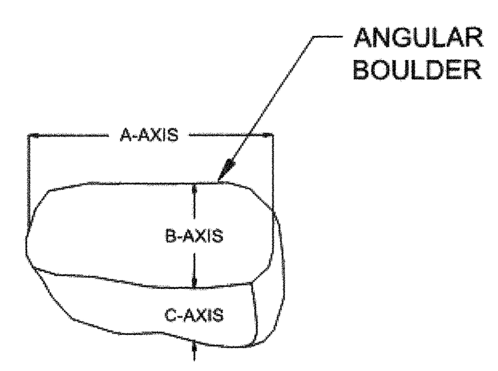
NO.	DATE	DESCRIPTION

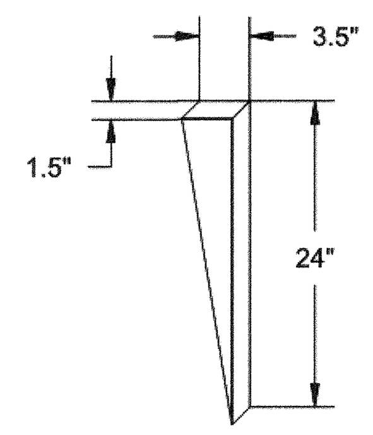
D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

STREAM RESTORATION DETAIL SHEET

PROJECT NO.: 121104.64	
SCALE: N.T.S.	DATE: 12/26/19
DESIGN: SH	DRAWN: JT	CHECK: CL
DWG NO: DE-02 OF DE-03	
SHEET NO: 06 OF 22	





ANCHOR STAKE DETAIL

NOT TO SCALE

NOTE: ANCHOR STAKES SHALL BE TAPERED TWO FOOT LONG WOODEN STAKES CONSISTING OF STANDARD 2" X 4" WOODEN BOARDS CUT DIAGONALLY.

POOL PAVEMENT	
CLASS 0	50%
CLASS I	50%

RIFFLE BED MATERIAL	
CLASS I	40%
CLASS II	60%

NOTE: ALL POOL PAVEMENT AND RIFFLE BED MATERIAL TO BE CHOKED WITH FURNISHED SILT AND GRAVEL TO ENSURE SURFACE FLOW.

ANGULAR BOULDER				
	A AXIS (LONG)	B AXIS (INTERMEDIATE)	C AXIS (SHORT)	WEIGHT
MINIMUM SIZE	2.5 FT.	1.5 FT.	1.0 FT.	600 LBS.
MAXIMUM SIZE	3.5 FT.	2.5 FT.	2.0 FT.	2800 LBS.

MD SHA STANDARD RIPRAP SIZE CLASSES		
MD SHA RIPRAP	D_{50}	D_{100}
CLASS 0	5.8 in.	8.7 in.
CLASS I	9.5 in.	15 in.
CLASS II	16 in.	24 in.

SILT AND GRAVEL	
% PARTICLE SIZE LESS THAN	PARTICLE DIAMETER PASSING THROUGH SIEVE (IN) OR SIEVE NO.
100	2.5 in.
85	1 in.
50	0.5 in.
30	No. 40
16	No. 200

FURNISHED STONE NOTES:

1. STONE MUST MEET THE ABOVE REQUIREMENTS AND BE APPROVED BY THE ENGINEER.
2. STONE USED AS CLASS I OR II RIPRAP AND BOULDERS MUST HAVE A MINIMUM DENSITY GREATER THAN 160 LBS/FT^3 AND BE BROWN OR GRAY IN COLOR. NO WHITE STONE WILL BE ALLOWED. THE STONE SHALL NOT DISINTEGRATE FROM THE ACTION OF AIR, WATER, OR HANDLING AND PLACING. GRANULAR SEDIMENTARY STONE WILL GENERALLY BE UNACCEPTABLE.
3. FURNISHED STONE SHALL BE COMPOSED OF ANGULAR QUARRY STONE. NO ROUND STONE WILL BE PERMITTED.
4. CONCRETE WILL NOT BE CONSIDERED AS AN ALTERNATIVE FOR STONE.

STRUCTURE CONSTRUCTION NOTES:

1. EXCAVATE THE BED AND BANKS ACCORDING TO THE PLANS TO OBTAIN THE NECESSARY SUBGRADE. PLACE NONWOVEN GEOTEXTILE CLASS SE AS ILLUSTRATED ON THE CONTRACT DOCUMENTS. GEOTEXTILE TORN OR DAMAGED SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. GEOTEXTILE SHALL BE KEYED-IN AND TRIMMED TO AVOID EXPOSED EDGES UPON COMPLETION OF CONSTRUCTION.
2. RIPRAP SHALL BE PLACED SO THAT SMALL AND LARGE STONES ARE MIXED TO MINIMIZE VOID SPACE AND PROMOTE INTERLOCKING. SILT AND GRAVEL SHALL BE WASHED-INTO THE FURNISHED STONE TO ENSURE ALL INTERSTITIAL VOIDS ARE FILLED AND SURFACE FLOW IS ACHIEVED. DUMPING OF STONE WILL NOT BE PERMITTED.
3. PLACED MATERIAL NOT CONFORMING TO THE SPECIFIED LIMITS SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST. A DEFINED THALWEG MUST BE ACHIEVED AND APPROVED BY THE ENGINEER.
4. IF FOOTER DEPTH CANNOT BE ACHIEVED DUE TO BEDROCK, BOULDERS ARE TO BE PLACED DIRECTLY ON BEDROCK TO MEET PROPOSED GRADE. BEDROCK MUST BE FREE OF DIRT AND GRAVELS PRIOR TO BOULDER PLACEMENT. BOULDERS MUST BE PROPERLY SEATED WITH MINIMAL OPPORTUNITY FOR MOVEMENT.

MATERIAL SPECIFICATIONS

TYPE D SOIL STABILIZATION MATTING

Type D Soil Stabilization Matting. Matting for the bank treatment areas shall consist of a machine produced mat of degradable natural fibers and shall meet the following minimum specifications:

Material:	Woven coir fiber yarn or twine
Thickness:	0.25 in.
Elongation (Dry/Wet):	29%/35%
Weight:	20 oz/SY
Open Area:	50%
Size:	6 ft. wide X 150 ft in length (100 SY per roll)
Flow Velocity:	8 ft./sec.
Life Expectancy:	3 years

COMMON BORROW

COMMON BORROW SHALL BE PER MDOT MSHA 916.01 COMMON BORROW. COMMON BORROW SHALL BE A NATURAL, FRIABLE SUBSURFACE SOIL UNIFORM IN TEXTURE AND FREE FROM ANY PARTS OF NON-NATIVE INVASIVE SPECIES. MATERIAL SHALL BE FREE OF ROOTS, CONCRETE, AND STONES LARGER THAN 3- INCHES. FROZEN MATERIAL WILL NOT BE APPROVED FOR USE AS SUBSOIL.

PLACING, SPREADING, AND COMPACTING COMMON BORROW. COMMON BORROW SHALL BE PLACED, SPREAD, AND COMPACTED IN MAXIMUM LAYERS OF 8 IN. TO PRODUCE A UNIFORM FIRM LAYER OF SUBSOIL. THE COMPLETED WORK SHALL BE IN CONFORMANCE WITH THE THICKNESS, LINES, GRADES, AND ELEVATIONS SPECIFIED IN THE CONTRACT DOCUMENTS. STONES AND OTHER FOREIGN MATERIAL LARGER THAN 4 IN. SHALL BE REMOVED AND DISPOSED BY THE CONTRACTOR. SLOPES 4:1 TO 2:1 SHALL BE TRACKED WITH CLEATED TRACT TYPE EQUIPMENT OPERATING PERPENDICULAR TO THE SLOPE.

TOPSOIL

TOPSOIL SHALL BE PER MDOT SHA 920.01.02 FURNISHED TOPSOIL.

NOTE: ALL REFERENCES TO MDOT SHA REFER TO THE MD SHA STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION MATERIALS, 2017, AND ALL SUBSEQUENT REVISIONS.

CLAY CHANNEL BLOCK

CLAY CHANNEL BLOCK MATERIAL MUST BE UNIFIED SOIL CLASSIFICATION SC OR CL-ML AND SHALL PASS A MINIMUM OF 35% COMPONENTS THROUGH THE #200 SIEVE.

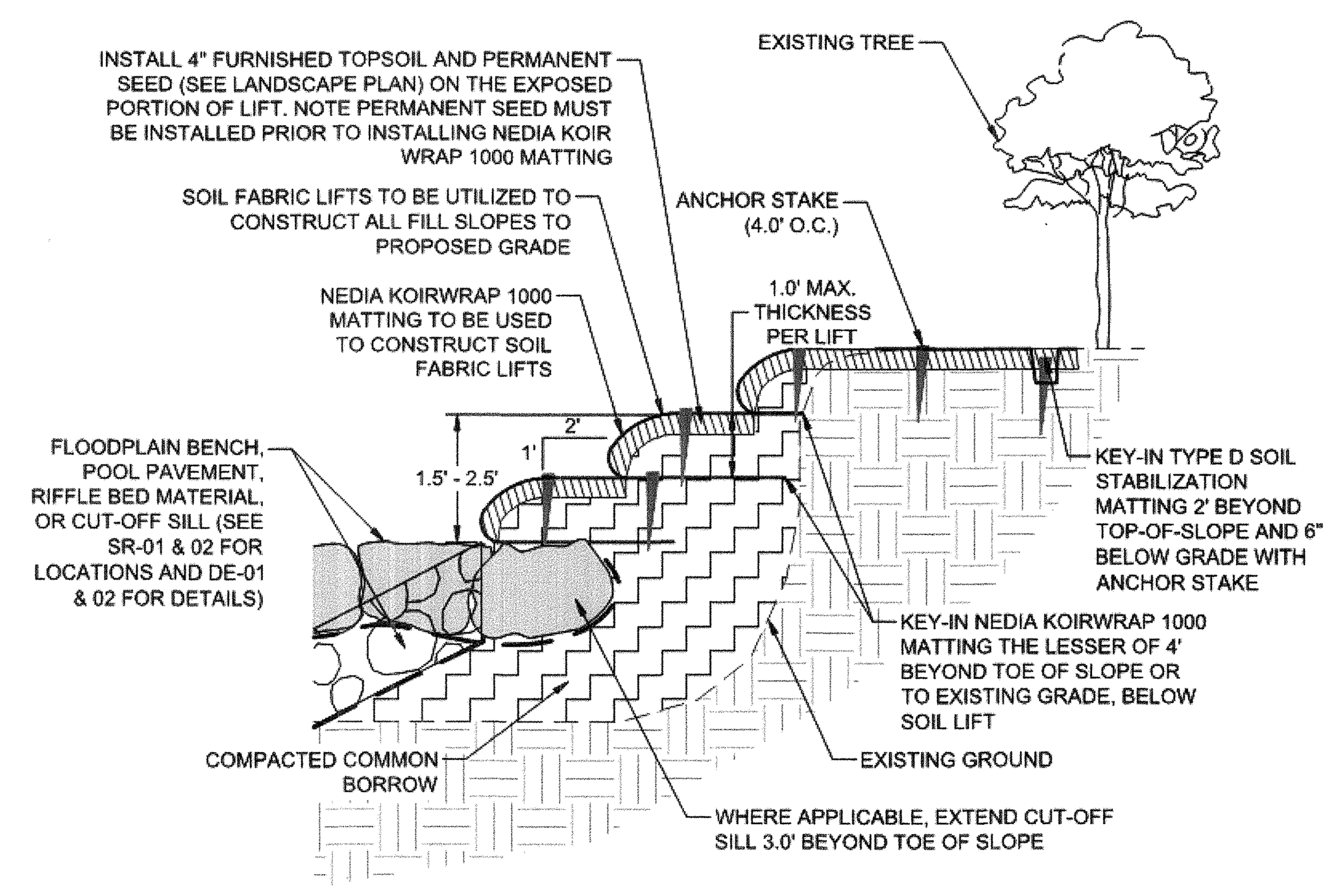
PLACE CLAY CHANNEL BLOCK MATERIAL IN MAXIMUM 8-INCH THICK PRE-COMPACTION LAYERS. EACH LAYER OF FILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ENSURE MAXIMUM COMPACTION AND MINIMUM PERMEABILITY AND WILL BE APPROVED BY THE ENGINEER.

GEOTEXTILE

MARYLAND APPLICATION CLASS		TYPE OF GEOTEXTILE	GRAB STRENGTH lb	PUNCTURE STRENGTH lb	PERMITTIVITY sec⁻¹	APPARENT OPENING SIZE, MAX mm	TRAPEZOID TEAR STRENGTH (MD***) lb
			D 4632	D 6241	D4491	D 4751	D 4533
SD	TYPE I	NONWOVEN	160	310	0.50	0.43	55
		WOVEN, MONOFILAMENT	250	495	0.50	0.43	90
	TYPE II	NONWOVEN	160	310	0.20	0.25	55
		WOVEN, MONOFILAMENT	250	495	0.20	0.25	90
PE	TYPE I	NONWOVEN	200	430	0.70	0.43	80
		WOVEN, MONOFILAMENT	250	620	0.70	0.43	90
	TYPE II	NONWOVEN	200	310	0.20	0.25	55
		WOVEN, MONOFILAMENT	250	495	0.20	0.25	90
	TYPE III	NONWOVEN	200	220	0.10	0.22	40
		WOVEN, MONOFILAMENT	250	370	0.10	0.22	70
SE		NONWOVEN	160	310	0.20	0.30	80
		WOVEN	250	495	0.20	0.30	90
ST		WOVEN	300*	600	0.05	0.15**	110
F		WOVEN	200	450	0.05	0.60	75
E		NONWOVEN	200	450	1.1	0.21	80
		WOVEN, MONOFILAMENT	370	900	0.28	0.21	100

NOTE 1: ALL PROPERTY VALUES IN THE ABOVE TABLE ARE BASED ON MINIMUM AVERAGE ROLL VALUES IN THE WEAKEST PRINCIPLE DIRECTION EXCEPT FOR APPARENT OPENING SIZE.
NOTE 2: THE ULTRAVIOLET STABILITY SHALL BE 50 PERCENT AFTER 500 HRS OF EXPOSURE FOR ALL CLASSES, EXCEPT CLASS F, WHICH SHALL BE 70 PERCENT (D 4355).

*15% ELONGATION FOR SILT FENCE AND MONOFILAMENT WOVEN GEOTEXTILE IN MACHINE DIRECTION
**THIS IS A MINIMUM APPARENT OPENING SIZE, NOT A MAXIMUM.
***MACHINE DIRECTION



SOIL FABRIC LIFTS - TYPICAL SECTION VIEW

NOT TO SCALE

SOIL FABRIC LIFT NOTES:

1. SOIL FABRIC LIFTS ARE TO BE USED TO CONSTRUCT ALL FILL SLOPES.
2. REFER TO THE PLAN VIEW SHOWN ON SHEETS SR-01 & 02 FOR LOCATIONS OF POOL PAVEMENT, CUT-OFF SILLS, AND RIFFLE BED MATERIAL. REFER TO THE DETAILS SHOWN ON SHEETS DE-01 & 02 FOR INFORMATION REGARDING THE ROCK-STEP POOL SERIES AND ARMORED RIFFLE CONSTRUCTION.
3. REFER TO THE PLAN VIEW SHOWN ON SHEETS SR-01 & 02 AND THE CROSS-SECTIONS SHOWN ON SHEETS CS-01 TO CS-04 FOR PROPOSED GRADING AND TIE-INS.
4. SOIL FABRIC LIFT CONSTRUCTION IS TO BE CONSIDERED INCIDENTAL TO THE UNIT PRICE PER SQUARE YARD OF NEDIA KOIRWRAP 1000 MATTING.

Nedia Enterprises, Inc.

Tel: (888) 725-6999
Fax: (571) 223-0202

Technical Specifications for

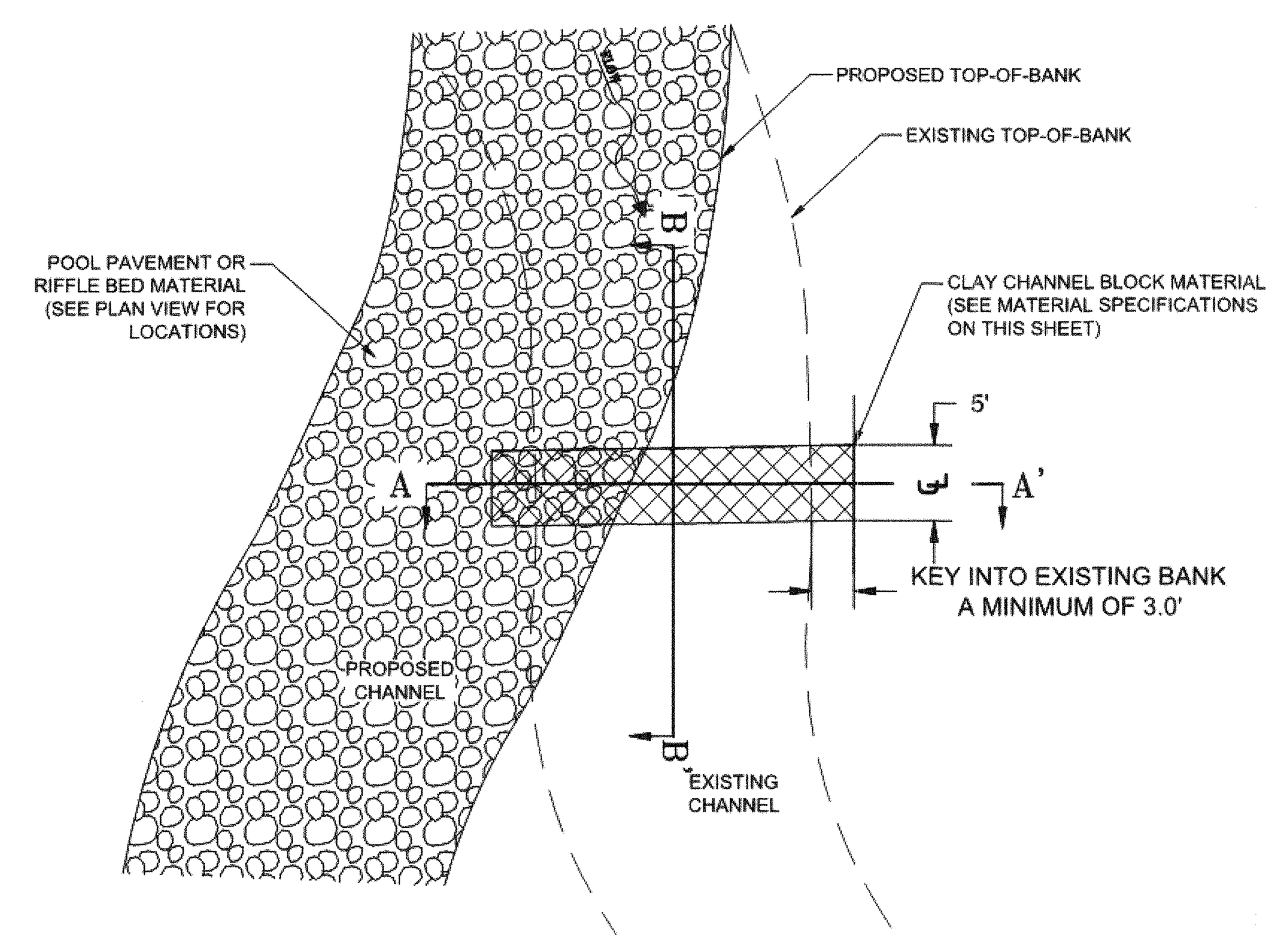
Nedia KoirWrap™ 1000

Nedia KoirWrap™ 1000 is a double layered biodegradable erosion control fabric made up of an outer layer of high strength coir fabric and an inner layer of lightweight jute fabric tied together at regular intervals. Ideal for fabric encapsulated soil lifts; this product effectively replaces the traditional use of a coir fiber matting in combination with a non-woven coir blanket.

Property	Test Method	Typical Value	
		English Units	Metric Units
Thickness	ASTM D 5199	0.35 in	0.90 cm
Mass per unit area	ASTM D 5261	33.3 oz/sq.yd	1130 g/sq.m
Wide Width Tensile Strength MD x TD (Primary Layer)	ASTM D 4595	1008 x 936 lbs/ft	14.7 x 13.7 kN/m
Maximum Elongation MD x TD (Primary Layer)	ASTM D 4595	30% x 26%	
Wide Width Tensile Strength MD x TD (Secondary Layer)	ASTM D 4595	612 x 468 lbs/ft	8.94 x 6.83 kN/m
Maximum Elongation MD x TD (Secondary Layer)	ASTM D 4595	8% x 9%	
Puncture Strength (Secondary Layer)	GRI GS1	553 lbs	2,461 N
Flexural Rigidity (Stiffness)	ASTM D 1388	0.692 x 0.690 oz-in	49.8 x 49.7 g-cm
Water Absorption	ASTM D 1117	146%	
Shear Stress (Recommended)	Flume Test	4.5 psf	215 Pa
Water Velocity (Recommended)	Flume Test	12 ft./sec	3.7 m/sec
Functional Longivity	Observed	3 to 5 years	
Permittivity	ASTM D 4491	3.07/sec	
Permeability	ASTM D 4491	1.03 in/sec	2.61 cm/sec
Flow Rate	ASTM D 4491	229 gal/min/sq.ft	9.36 cu.m/min/sq.m

Standard Roll Size: 13.1'x 83' (4m x 25m) – 120 sy/roll

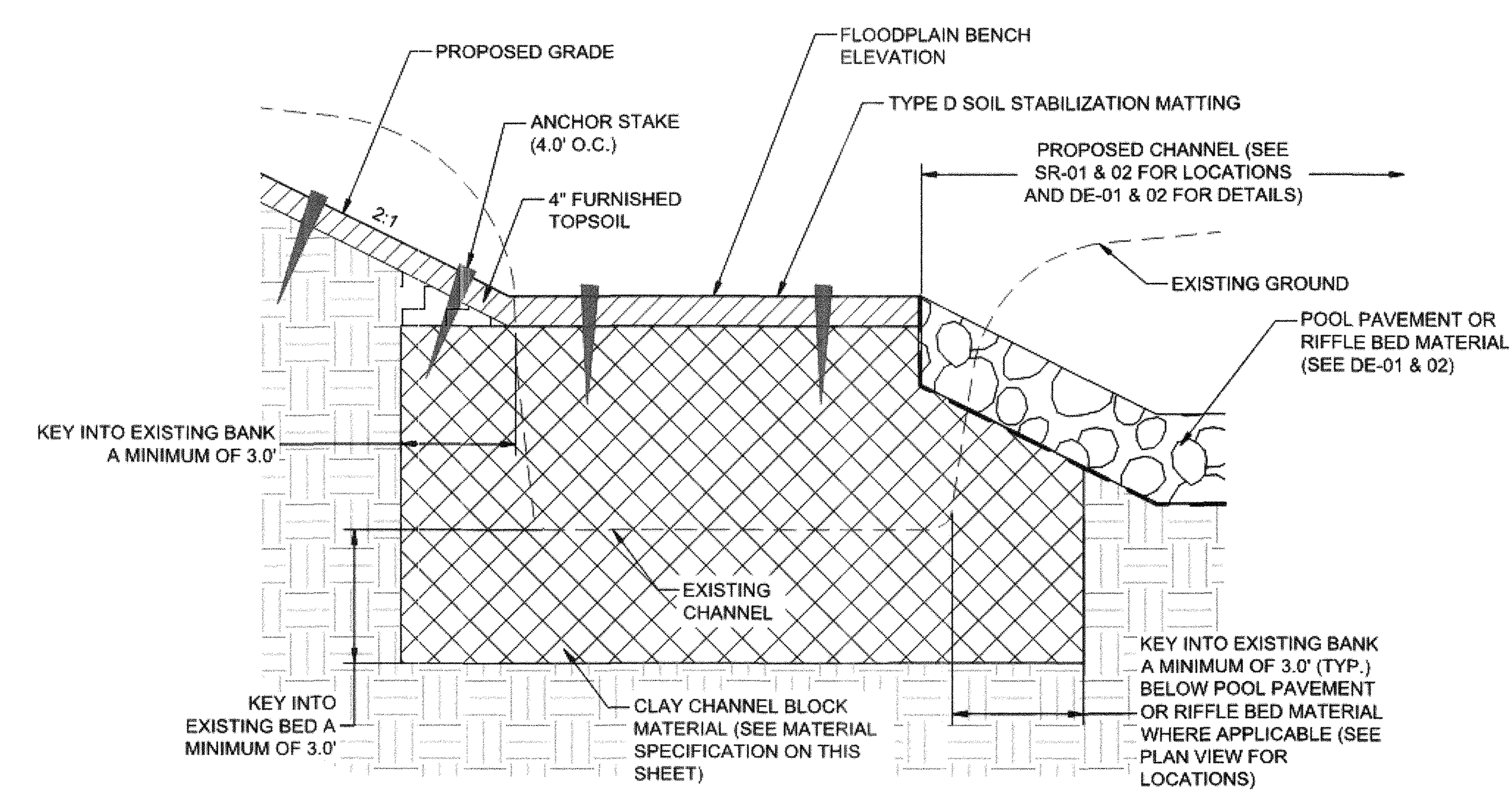
www.nedia.com • info@nedia.com



CLAY CHANNEL BLOCK (CCB) - PLAN VIEW

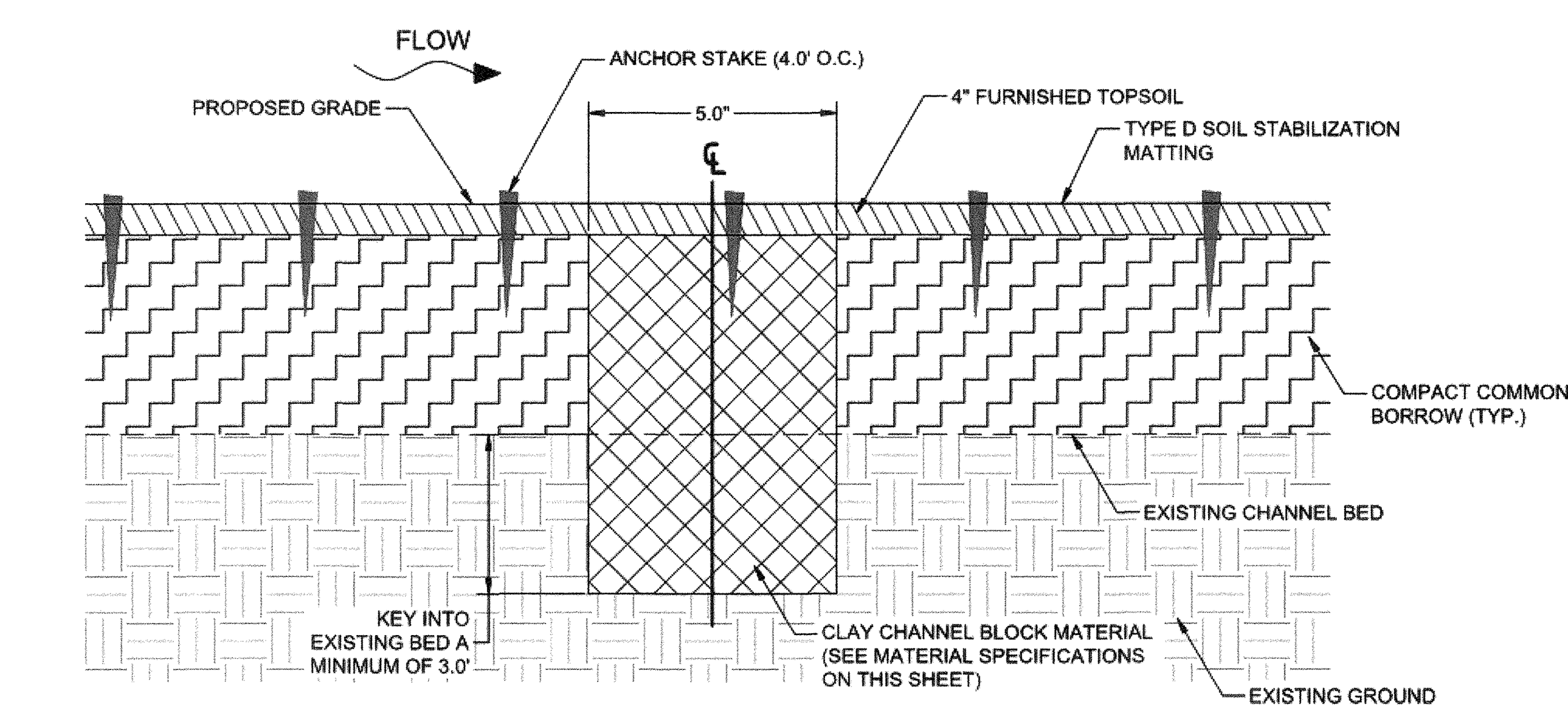
NOT TO SCALE

NOTE: SEE CLAY CHANNEL BLOCK CROSS-SECTION DETAILS ON THIS SHEET FOR ADDITIONAL INFORMATION REGARDING SUBGRADE CONSTRUCTION.



CLAY CHANNEL BLOCK (CCB) - CROSS SECTION A-A'

NOT TO SCALE



CLAY CHANNEL BLOCK (CCB) - CROSS SECTION B-B'

NOT TO SCALE

HOWARD COUNTY

DEPARTMENT OF PUBLIC WORKS

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

SEAL: 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND

CHIEF, STORMWATER MANAGEMENT DIVISION — DATE 12/30/19

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 #: 28371 EXPIRES: 01/01/2021

REVISIONS		
NO.	DATE	DESCRIPTION

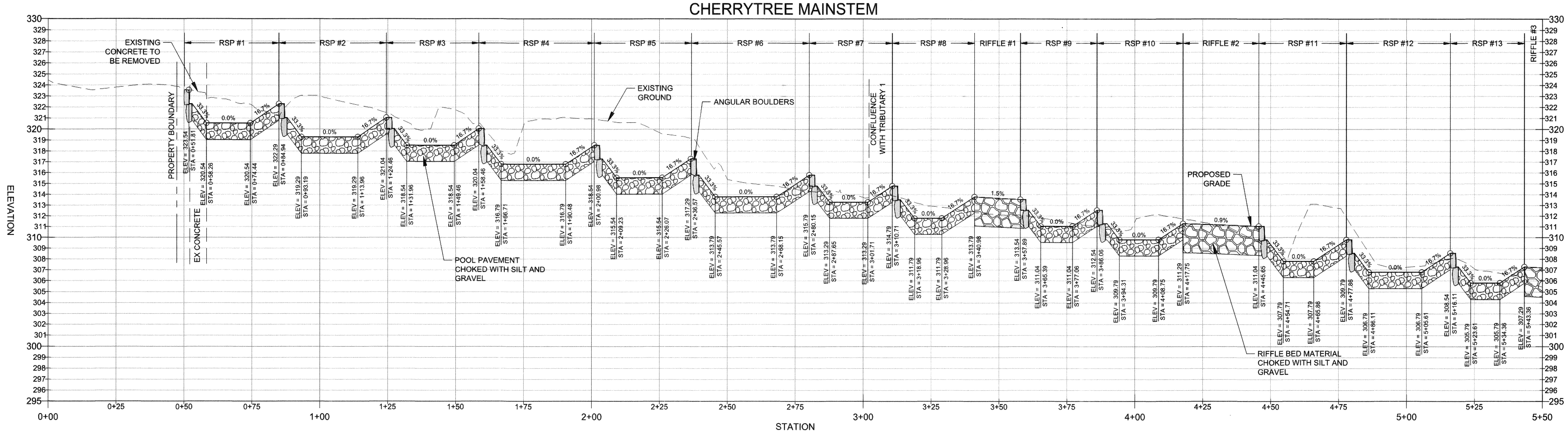
D-1158 CHERRYTREE FARM STREAM RESTORATION

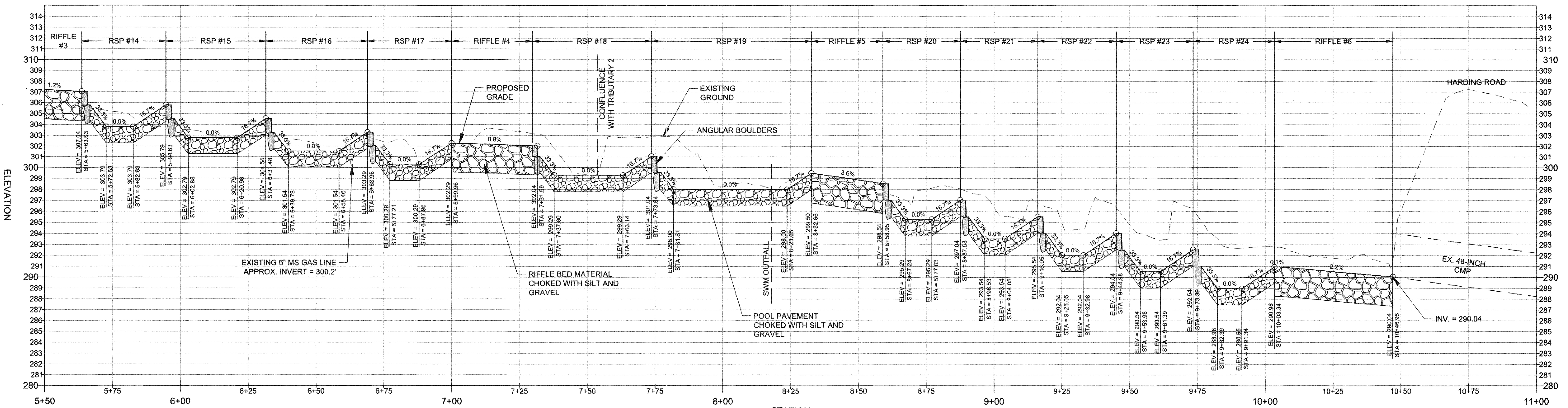
FINAL (100%) DESIGN

STREAM RESTORATION DETAIL SHEET

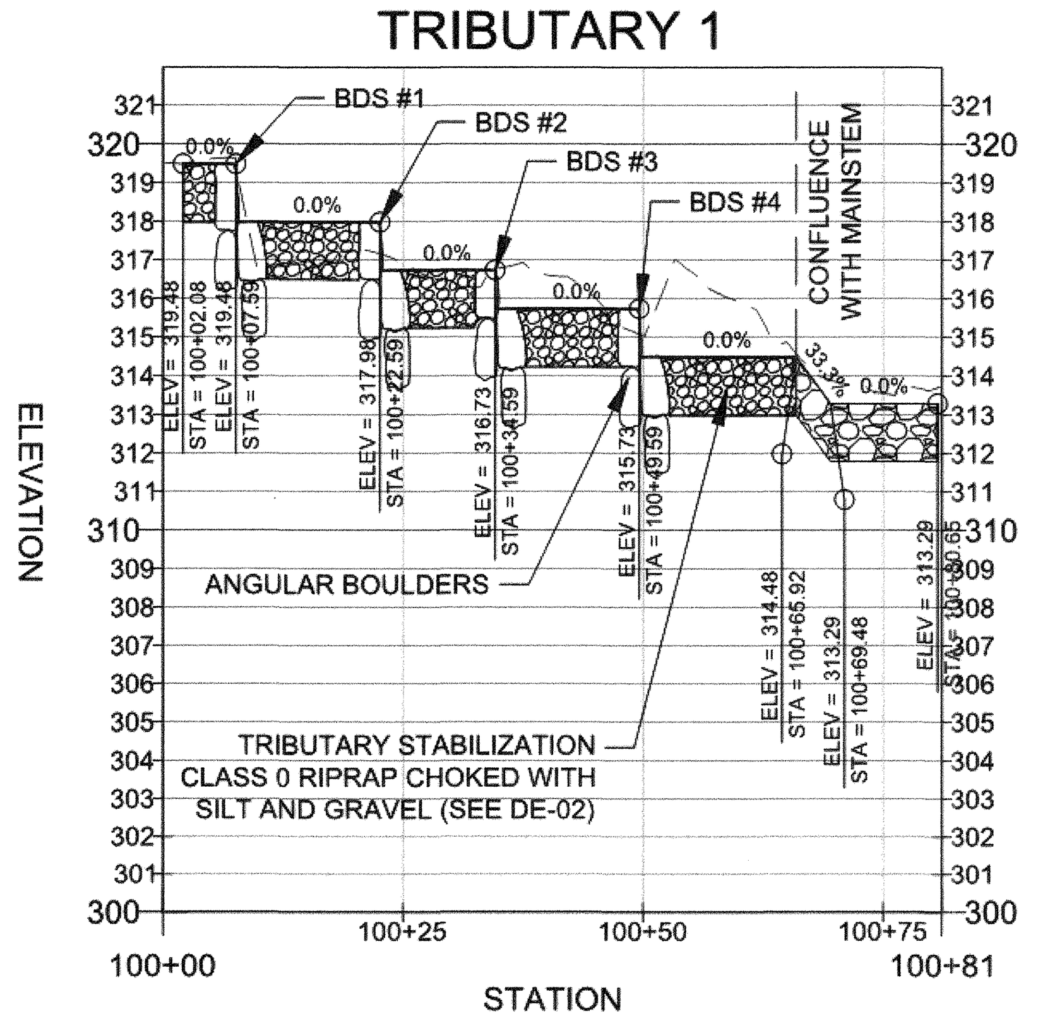
PROJECT NO.: 121104.64
SCALE: N.T.S. DATE: 12/26/19
DESIGN: SH DRAWN: JT CHECK: CL
DWG NO: DE-03 OF DE-03

CHERRYTREE MAINSTEM

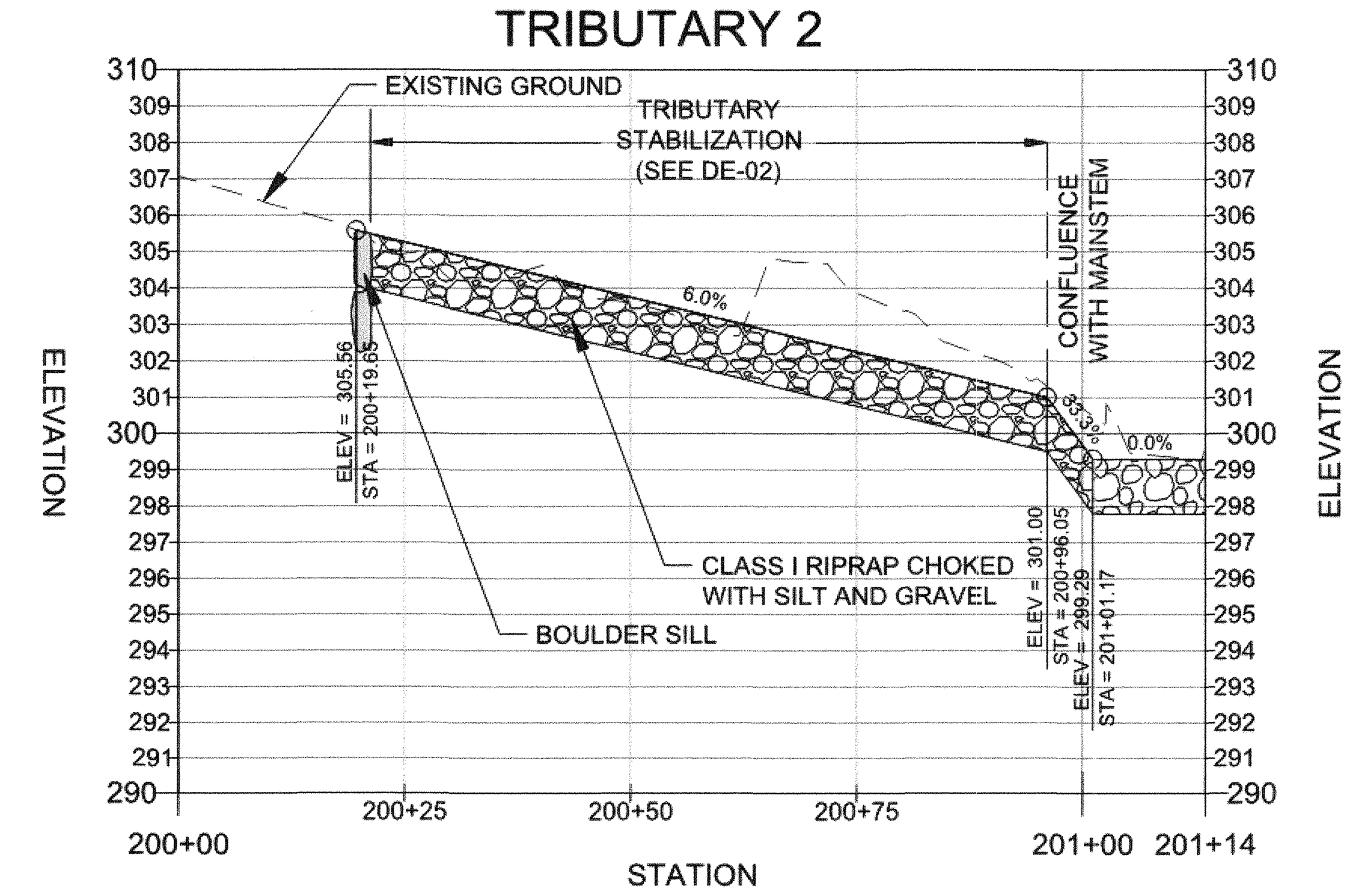




TRIBUTARY 1



TRIBUTARY 2



NOTE: NOT ALL STRUCTURES AND MATERIALS ARE SHOWN IN PROFILE VIEW. SEE THE STREAM RESTORATION PLAN SHEETS (SR-01 TO 02), DETAIL SHEETS (DE-01 TO 03), AND CROSS-SECTION SHEETS (CS-01 TO 04) FOR INFORMATION REGARDING CLAY CHANNEL BLOCKS AND WOODY HABITAT FEATURES

ORIGINAL SCALE: 1"=20'

ORIGINAL SCALE: 1"=5'

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

SEAL: 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND

Mark S. Richmond 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

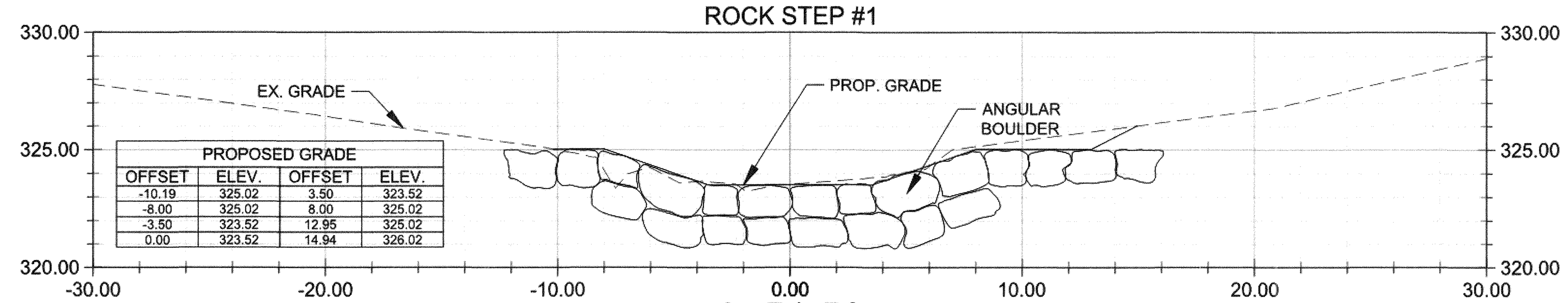
FINAL (100%) DESIGN

STREAM RESTORATION PROFILE SHEET

PROJECT NO.: 121104.64	DATE: 12/26/19
SCALE: 1" = 20'	
DESIGN: SH	DRAWN: JT	CHECK: CL
DWG NO: PR-01 OF PR-01	
SHEET NO: 08 OF 22	

MAINSTEM

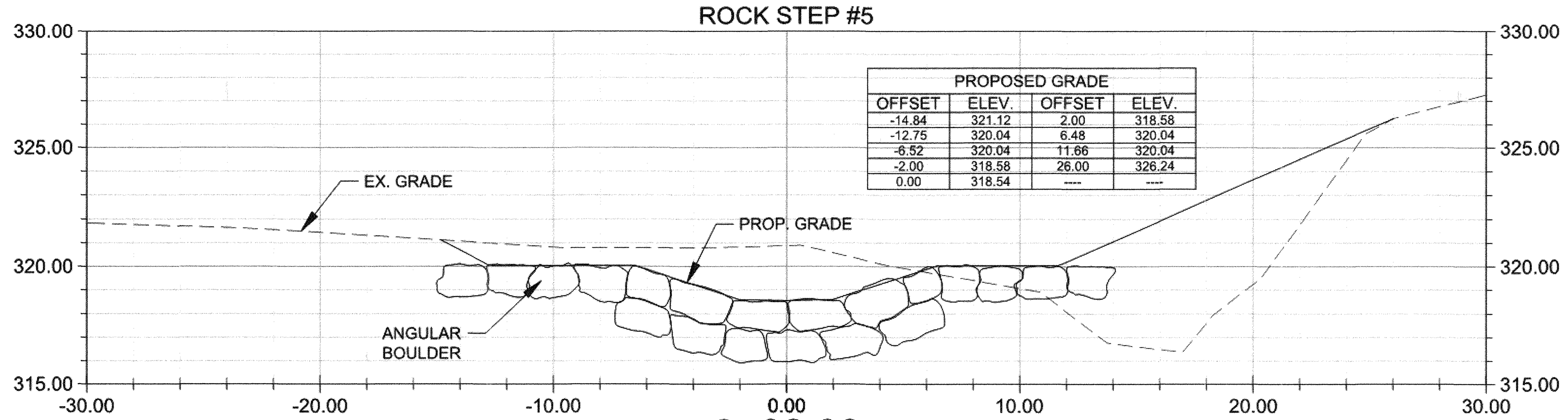
ROCK STEP #1



0+51.50

PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-10.19	325.02	3.50	323.52
-8.00	325.02	8.00	325.02
-3.50	323.52	12.95	325.02
0.00	323.52	14.94	326.02

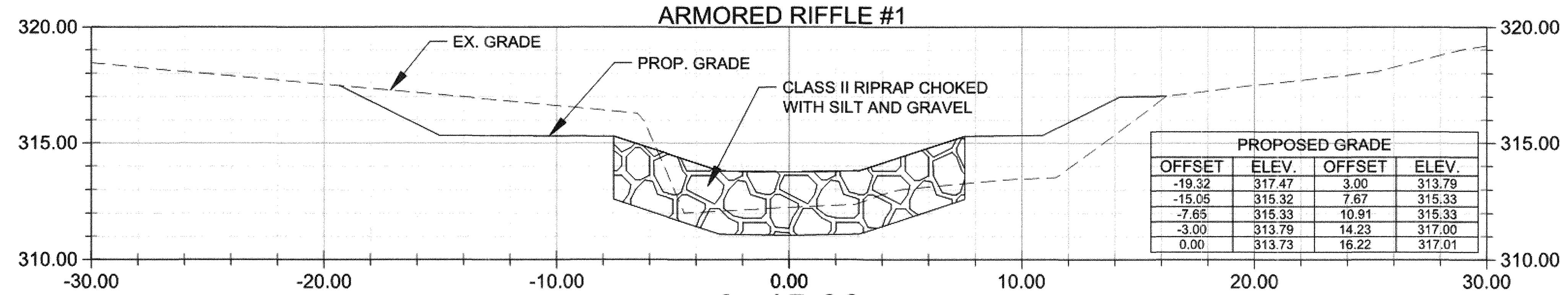
ROCK STEP #5



2+02.00

PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-14.84	321.12	2.00	318.58
-12.75	320.04	6.48	320.04
-6.52	320.04	11.66	320.04
-2.00	318.58	26.00	326.24
0.00	318.54	----	----

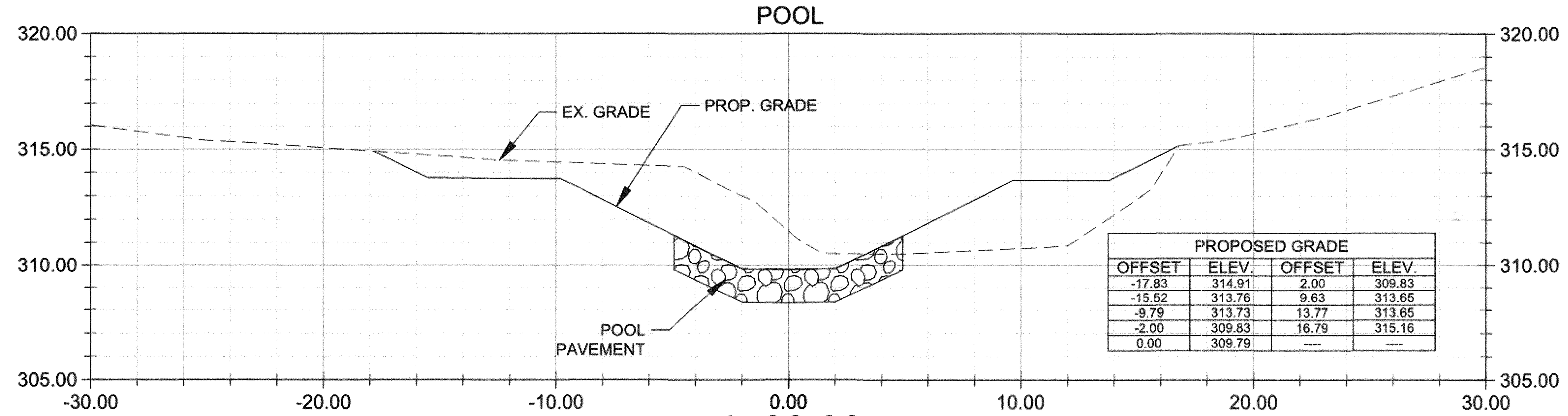
ARMORED RIFFLE #1



3+45.00

PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-19.32	317.47	3.00	313.79
-15.05	315.32	7.67	315.33
-7.65	315.33	10.91	315.33
-3.00	313.79	14.23	317.00
0.00	313.73	16.22	317.01

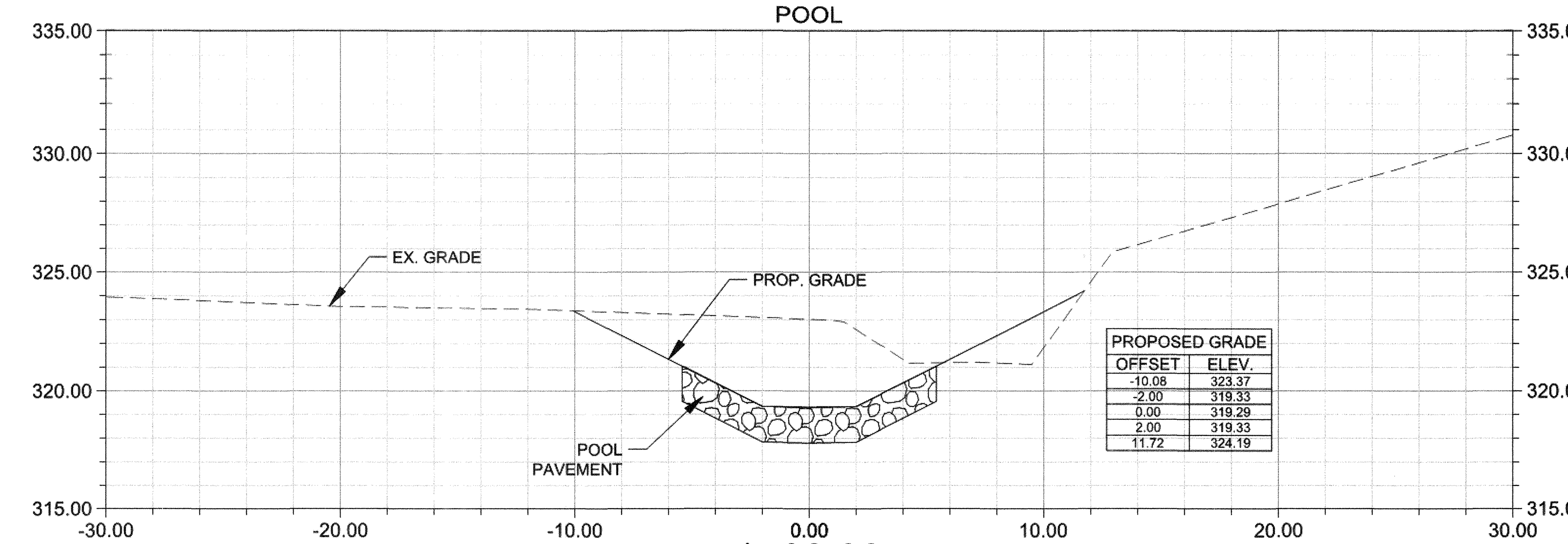
POOL



4+00.00

PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-17.83	314.91	2.00	309.83
-15.52	313.76	9.63	313.65
-9.79	313.73	13.77	313.65
-2.00	309.83	16.79	315.16
0.00	309.79	----	----

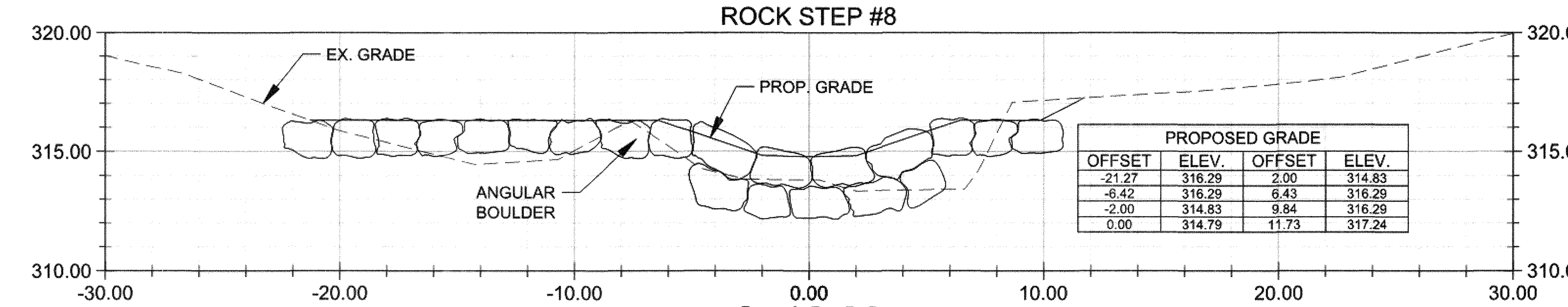
POOL



1+00.00

PROPOSED GRADE	
OFFSET	ELEV.
-10.08	323.37
-2.00	319.33
0.00	319.29
2.00	319.33
11.72	324.19

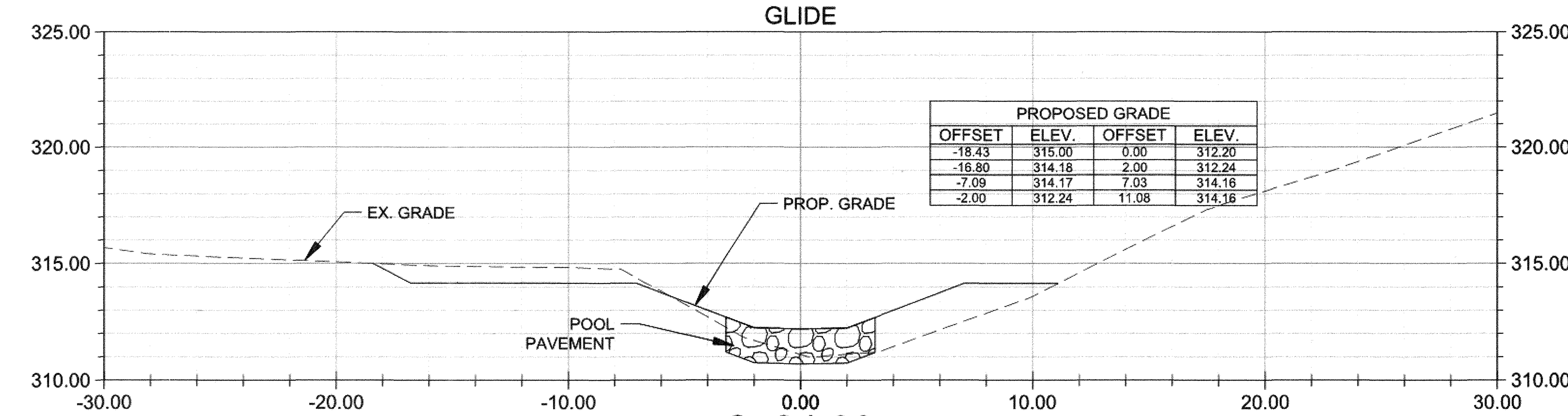
ROCK STEP #8



3+12.00

PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-21.27	316.29	2.00	314.83
-6.42	316.29	6.43	316.29
-2.00	314.83	9.84	316.29
0.00	314.79	11.73	317.24

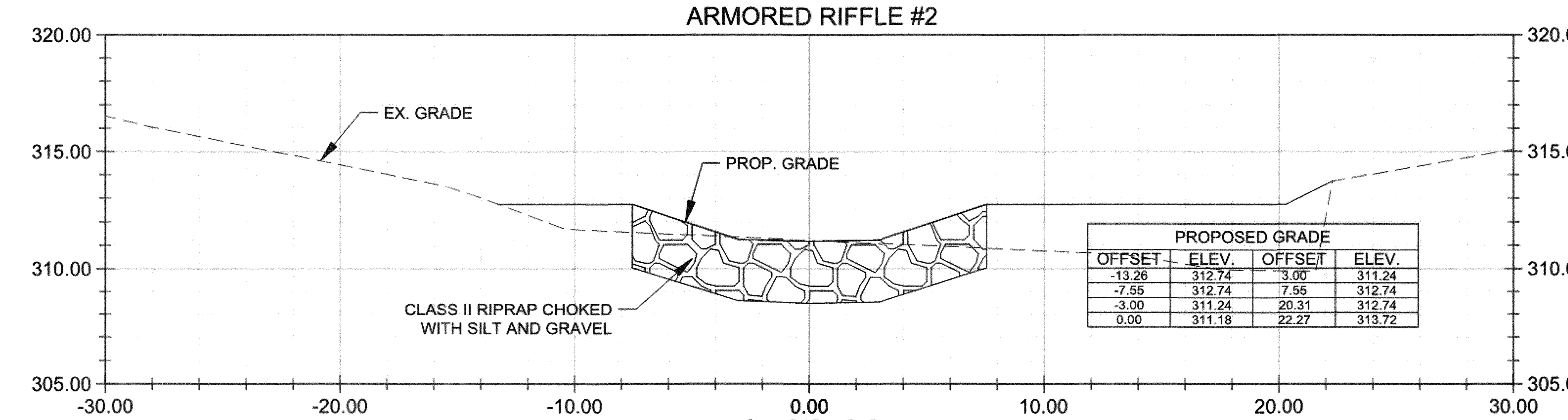
GLIDE



3+84.00

PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-18.43	315.00	0.00	312.20
-16.80	314.18	2.00	312.24
-7.09	314.17	7.03	314.16
-2.00	312.24	11.08	314.16

ARMORED RIFFLE #2



4+30.00

PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-13.26	312.74	3.00	311.24
-7.55	312.74	7.55	312.74
-3.00	311.24	20.31	312.74
0.00	311.18	22.27	313.72

ORIGINAL SCALE: 1"=5'

5' 0 5' 10'

ORIGINAL SCALE: 1"=5'

NOTES
1) ONLY FURNISHED STONE IS SHOWN IN CROSS-SECTIONS. REFER TO STREAM RESTORATION PLAN SHEETS AND DETAIL SHEETS FOR INFORMATION REGARDING TOPSOIL, CLAY CHANNEL BLOCK, SOIL FABRIC LIFTS, WOODY HABITAT FEATURES, GEOTEXTILE PLACEMENT AND EXTENTS.
2) SOIL FABRIC LIFTS ARE TO BE USED TO CONSTRUCT ALL FILL SLOPES. REFER TO DE-01 FOR CONSTRUCTION INFORMATION

CENTURY ENGINEERING
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HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND PROFESSIONAL ENGINEER 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
Mark Richmond 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

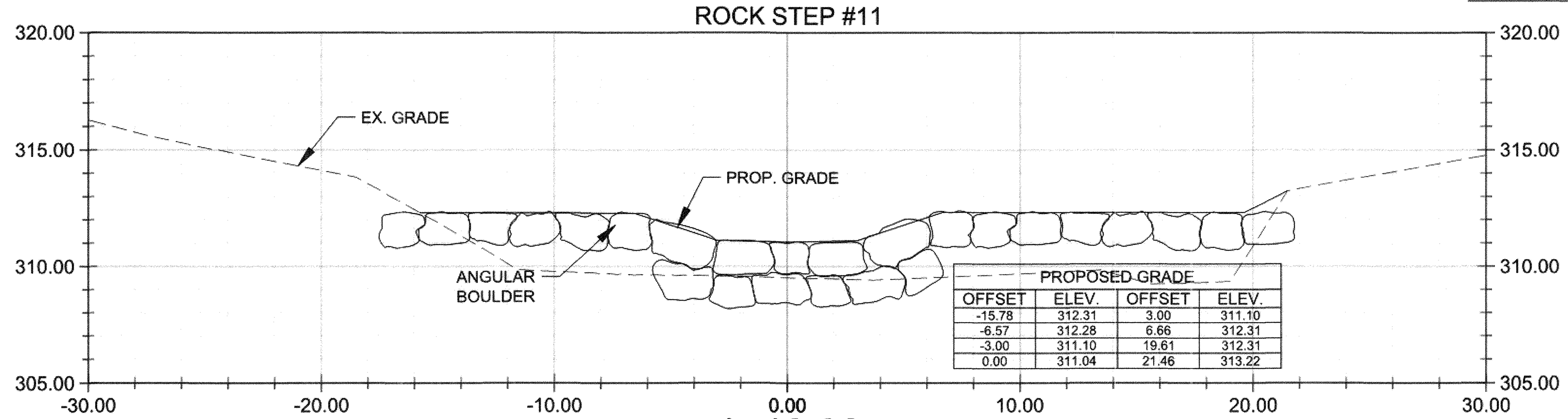
FINAL (100%) DESIGN

STREAM RESTORATION CROSS-SECTION SHEET

PROJECT NO.: 121104.64		
SCALE: AS NOTED	DATE: 12/26/19	
DESIGN: SH	DRAWN: JT	CHECK: CL
DWG NO: CS-01 OF CS-04		
SHEET NO: 09 OF 22		

MAINSTEM

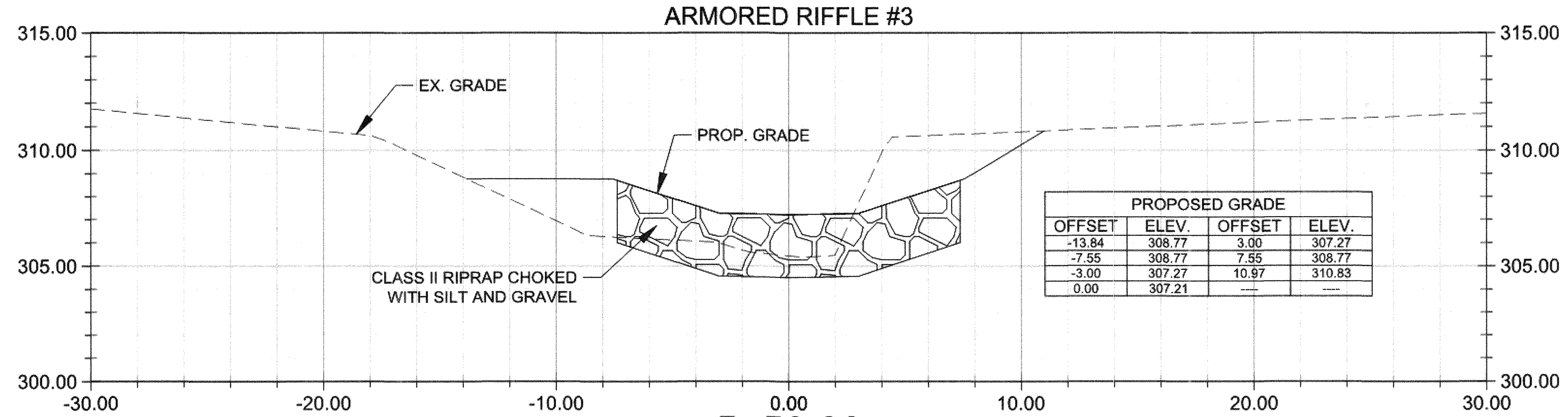
ROCK STEP #11



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-15.78	312.31	3.00	311.10
-6.57	312.28	6.66	312.31
-3.00	311.10	19.61	312.31
0.00	311.04	21.46	313.22

4+46.00

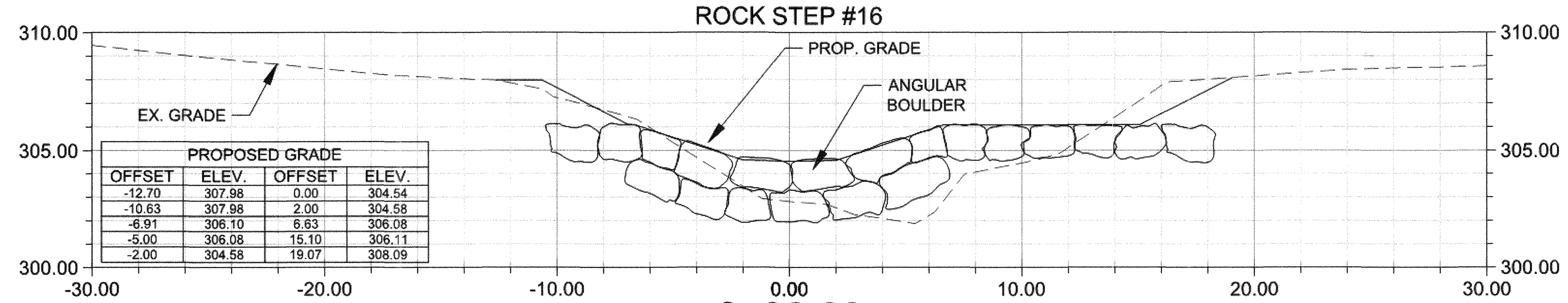
ARMORED RIFFLE #3



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-13.84	308.77	3.00	307.27
-7.55	308.77	7.55	308.77
-3.00	307.27	10.97	310.83
0.00	307.21	----	----

5+50.00

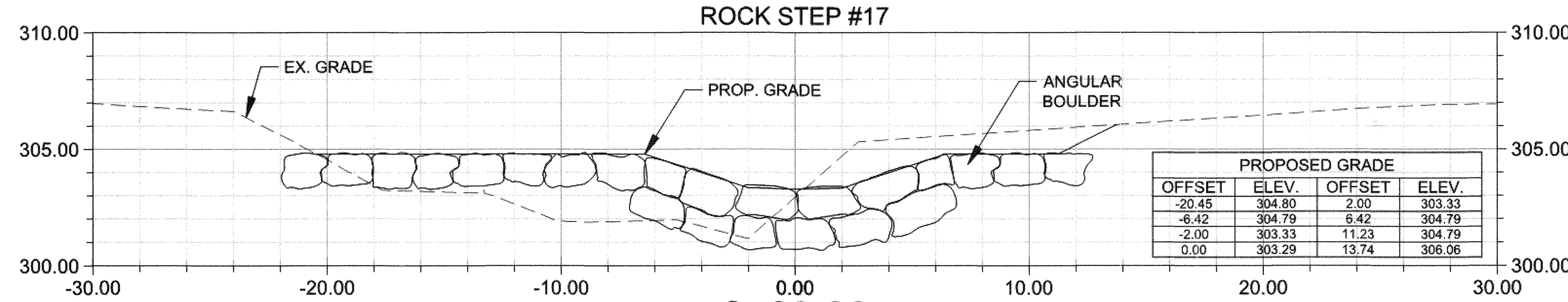
ROCK STEP #16



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-12.70	307.98	0.00	304.54
-10.63	307.98	2.00	304.58
-6.91	306.10	6.63	306.08
-5.00	306.08	15.10	306.11
-2.00	304.58	19.07	308.09

6+32.00

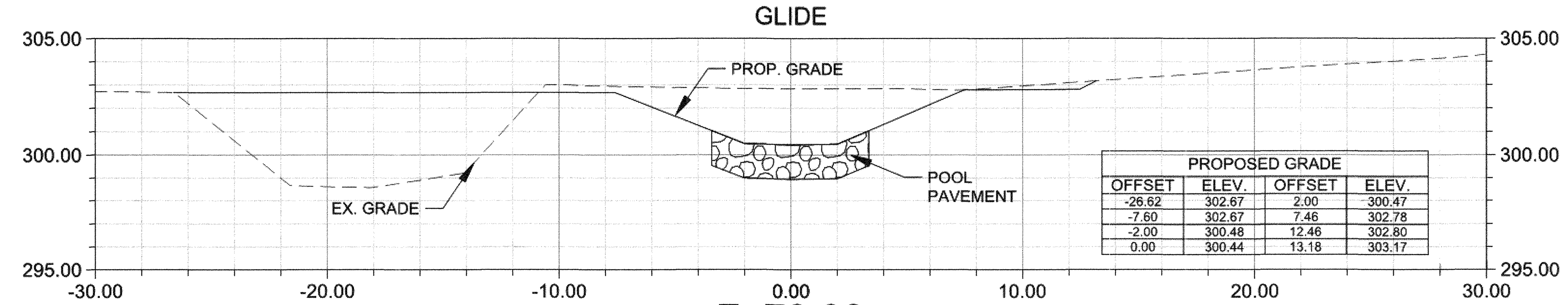
ROCK STEP #17



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-20.45	304.80	2.00	303.33
-6.42	304.79	6.42	304.79
-2.00	303.33	11.23	304.79
0.00	303.29	13.74	306.06

6+69.00

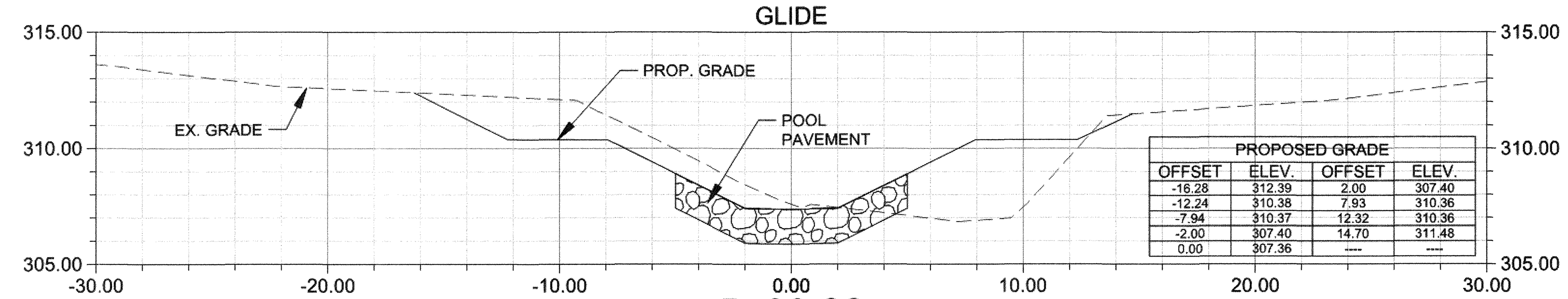
GLIDE



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-26.62	302.67	2.00	300.47
-7.60	302.67	7.46	302.78
-2.00	300.48	12.46	302.80
0.00	300.44	13.18	303.17

7+70.00

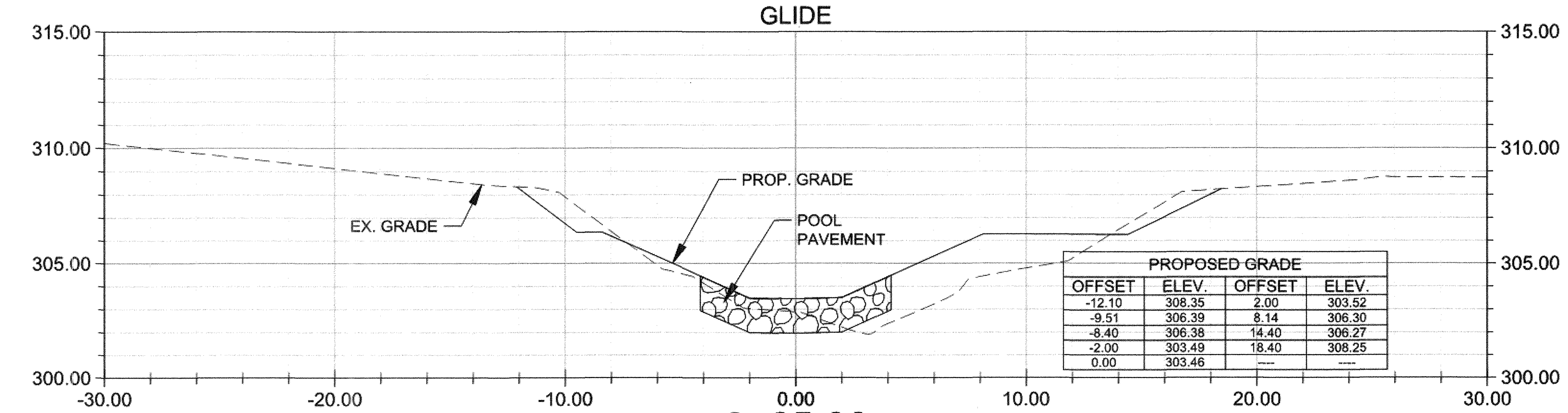
GLIDE



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-16.28	312.39	2.00	307.40
-12.24	310.38	7.93	310.36
-7.94	310.37	12.32	310.36
-2.00	307.40	14.70	311.48
0.00	307.36	----	----

5+09.00

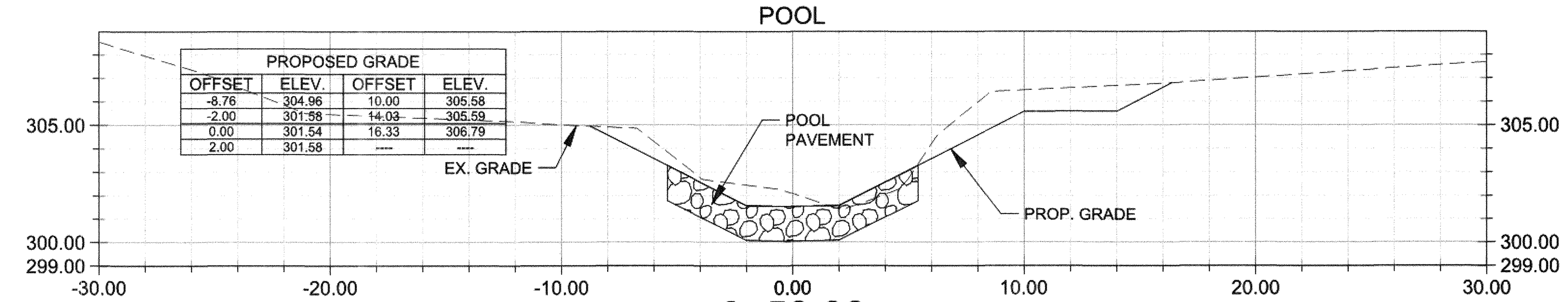
GLIDE



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-12.10	308.35	2.00	303.52
-9.51	306.39	8.14	306.30
-8.40	306.38	14.40	306.27
-2.00	303.49	18.40	308.25
0.00	303.46	----	----

6+25.00

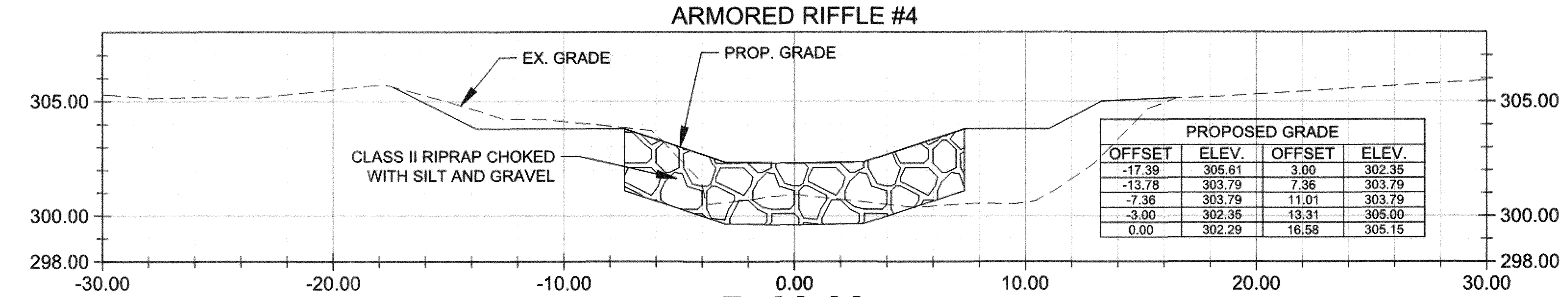
POOL



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-8.76	304.96	10.00	305.58
-2.00	301.58	14.03	305.59
0.00	301.54	16.33	306.79
2.00	301.58	----	----

6+50.00

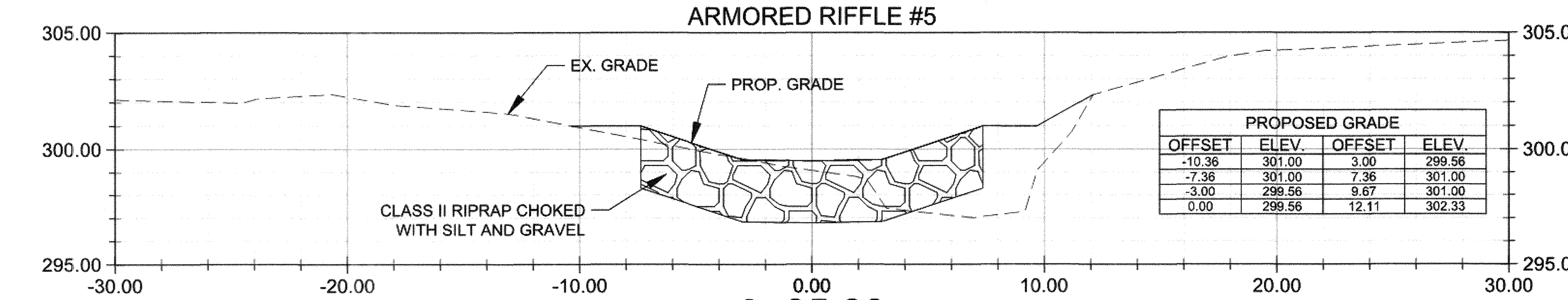
ARMORED RIFFLE #4



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-17.39	305.61	3.00	302.35
-13.78	303.79	7.36	303.79
-7.36	303.79	11.01	303.79
-3.00	302.35	13.31	305.00
0.00	302.29	16.58	305.15

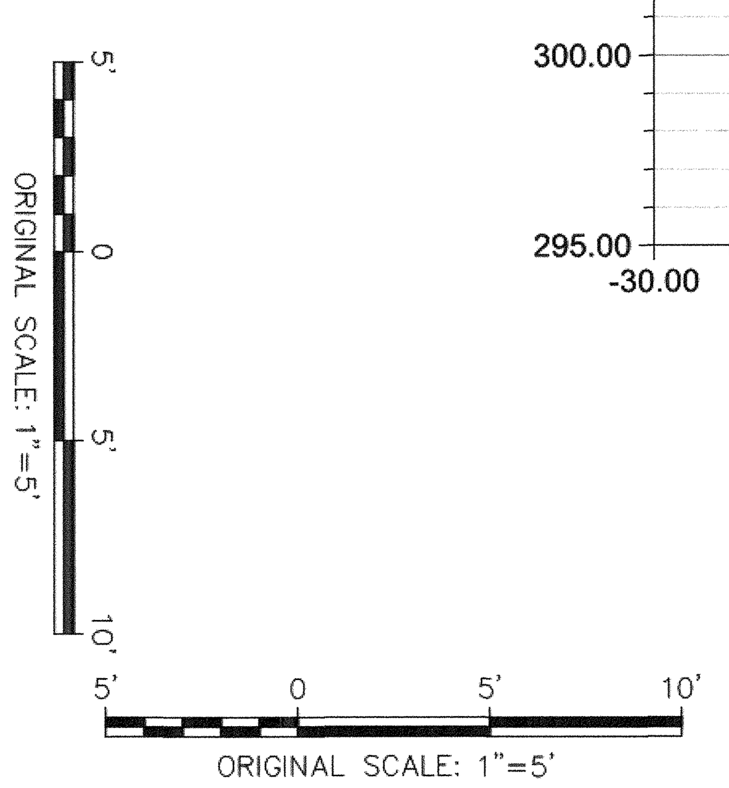
7+00.00

ARMORED RIFFLE #5



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-10.36	301.00	3.00	299.56
-7.36	301.00	7.36	301.00
-3.00	299.56	9.67	301.00
0.00	299.56	12.11	302.33

8+35.00



NOTES
1) ONLY FURNISHED STONE IS SHOWN IN CROSS-SECTIONS. REFER TO STREAM RESTORATION PLAN SHEETS AND DETAIL SHEETS FOR INFORMATION REGARDING TOPSOIL, CLAY CHANNEL BLOCK, SOIL FABRIC LIFTS, WOODY HABITAT FEATURES, GEOTEXTILE PLACEMENT AND EXTENTS.
2) SOIL FABRIC LIFTS ARE TO BE USED TO CONSTRUCT ALL FILL SLOPES. REFER TO DE-01 FOR CONSTRUCTION INFORMATION

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CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND CRAIG A. LYNCH NO. 28371 PROFESSIONAL ENGINEER
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
Mark S. Richmond 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

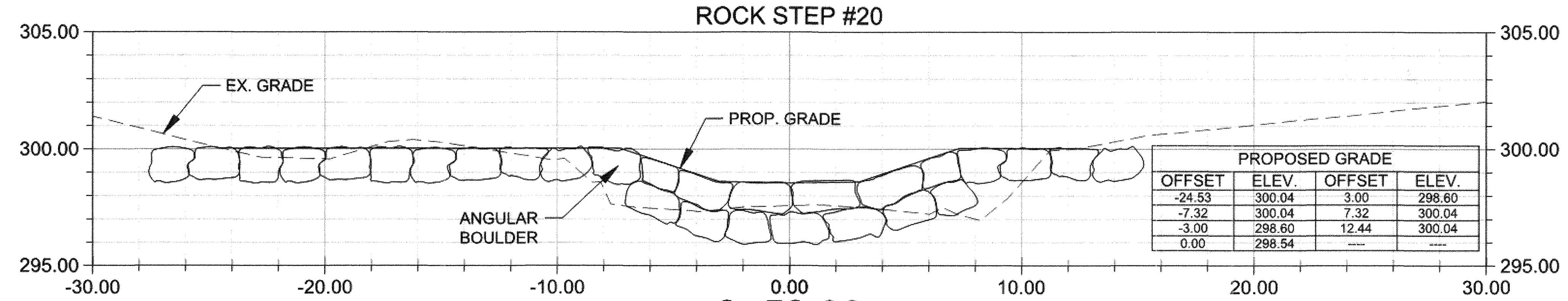
FINAL (100%) DESIGN

STREAM RESTORATION CROSS-SECTION SHEET

PROJECT NO.: 121104.64
SCALE: AS NOTED | DATE: 12/26/19
DESIGN: SH | DRAWN: JT | CHECK: CL
DWG NO: CS-02 OF CS-04

MAINSTEM

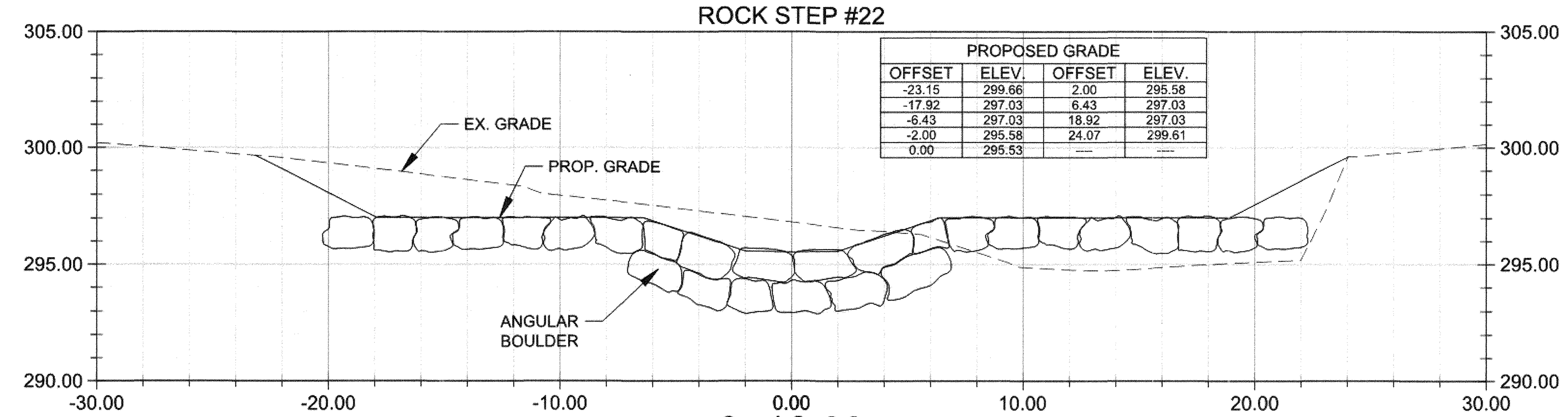
ROCK STEP #20



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-24.53	300.04	3.00	298.60
-7.32	300.04	7.32	300.04
-3.00	298.60	12.44	300.04
0.00	298.54	----	----

8+59.00

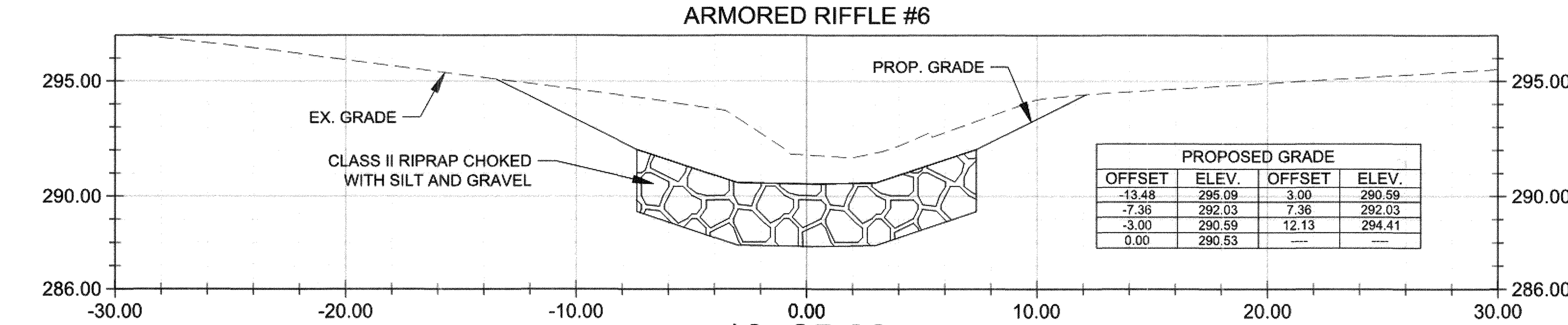
ROCK STEP #22



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-23.15	299.66	2.00	295.58
-17.92	297.03	6.43	297.03
-6.43	297.03	18.92	297.03
-2.00	295.58	24.07	299.61
0.00	295.53	----	----

9+16.00

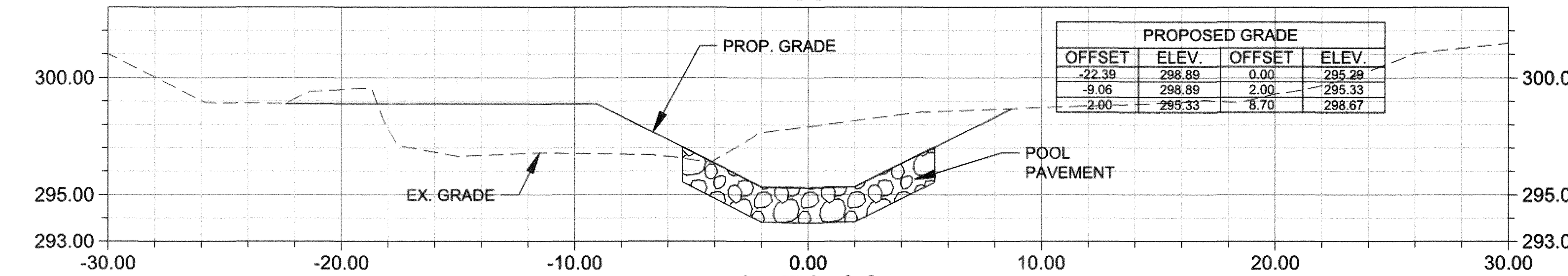
ARMORED RIFFLE #6



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-13.48	295.09	3.00	290.59
-7.36	292.03	7.36	292.03
-3.00	290.59	12.13	294.41
0.00	290.53	----	----

10+25.00

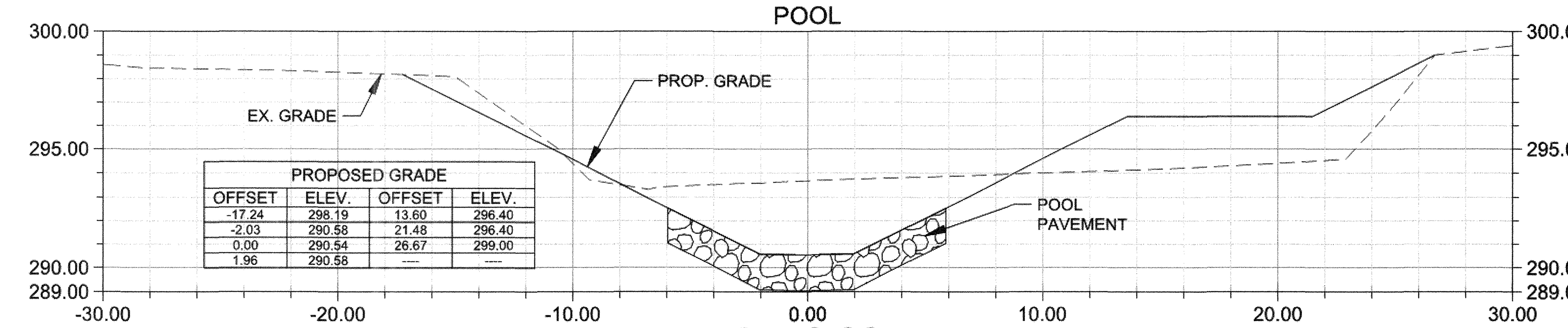
POOL



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-22.39	298.89	0.00	295.29
-9.06	298.89	2.00	295.33
-2.00	295.33	8.70	298.67

8+72.00

POOL



PROPOSED GRADE			
OFFSET	ELEV.	OFFSET	ELEV.
-17.24	298.19	13.60	296.40
-2.03	290.58	21.48	296.40
0.00	290.54	26.67	299.00
1.96	290.58	----	----

9+58.00

5' 0 5' 10'
ORIGINAL SCALE: 1"=5'

NOTES
1) ONLY FURNISHED STONE IS SHOWN IN CROSS-SECTIONS. REFER TO STREAM RESTORATION PLAN SHEETS AND DETAIL SHEETS FOR INFORMATION REGARDING TOPSOIL, CLAY CHANNEL BLOCK, SOIL FABRIC LIFTS, WOODY HABITAT FEATURES, GEOTEXTILE PLACEMENT AND EXTENTS.
2) SOIL FABRIC LIFTS ARE TO BE USED TO CONSTRUCT ALL FILL SLOPES. REFER TO DE-01 FOR CONSTRUCTION INFORMATION

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND · CRAIG A. LYNCH · NO. 28371 · PROFESSIONAL ENGINEER
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
Mark S. Richmond 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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 #: 28371 EXPIRES: 01/01/2021

REVISIONS		
NO.	DATE	DESCRIPTION

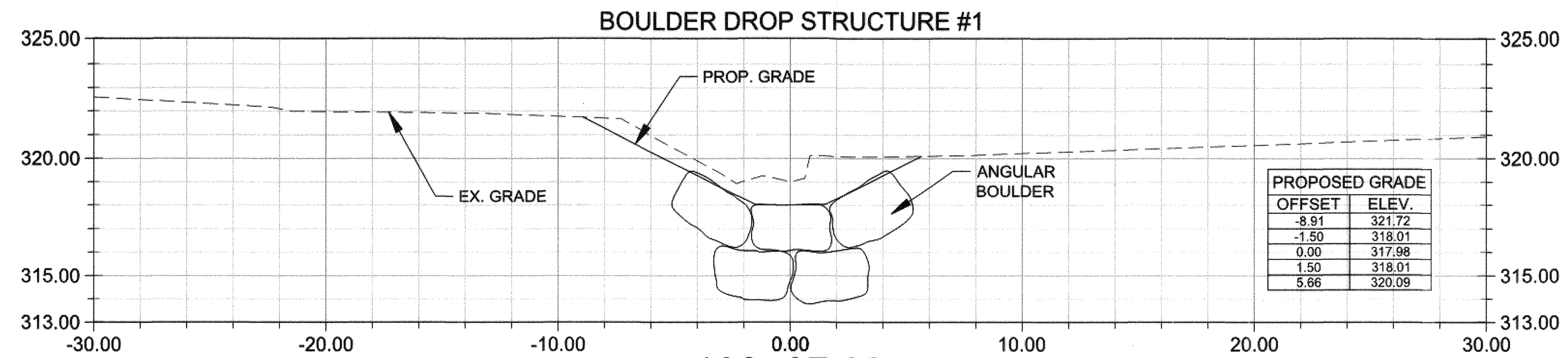
D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

STREAM RESTORATION CROSS-SECTION SHEET

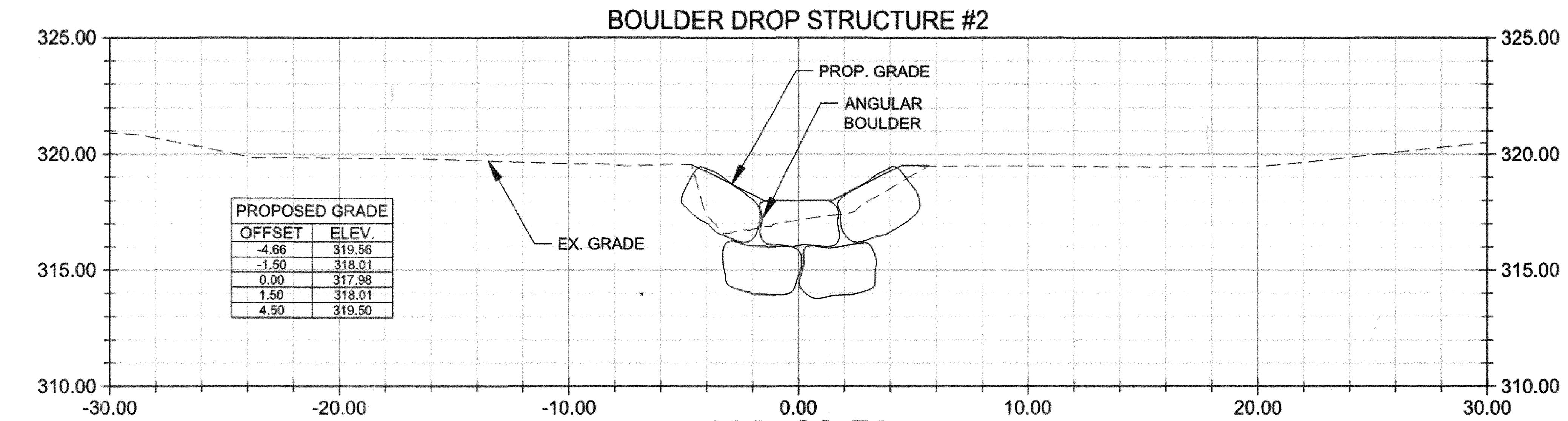
PROJECT NO.: 121104.64
SCALE: AS NOTED
DATE: 12/26/19
DESIGN: SH
DRAWN: JT
CHECK: CL
DWG NO: CS-03 OF CS-04

TRIBUTARY 1



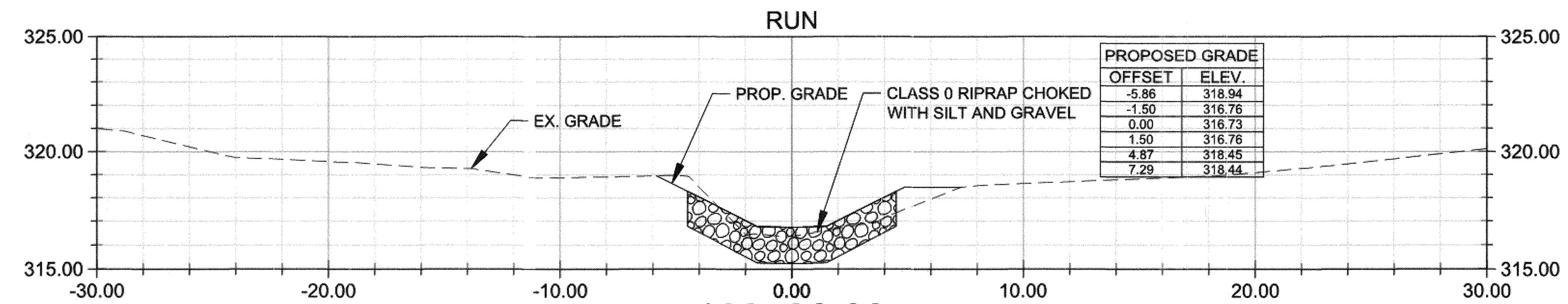
PROPOSED GRADE	
OFFSET	ELEV.
-8.91	321.72
-1.50	318.01
0.00	317.98
1.50	318.01
5.66	320.09

100+07.90



PROPOSED GRADE	
OFFSET	ELEV.
-4.66	319.56
-1.50	318.01
0.00	317.98
1.50	318.01
4.50	319.50

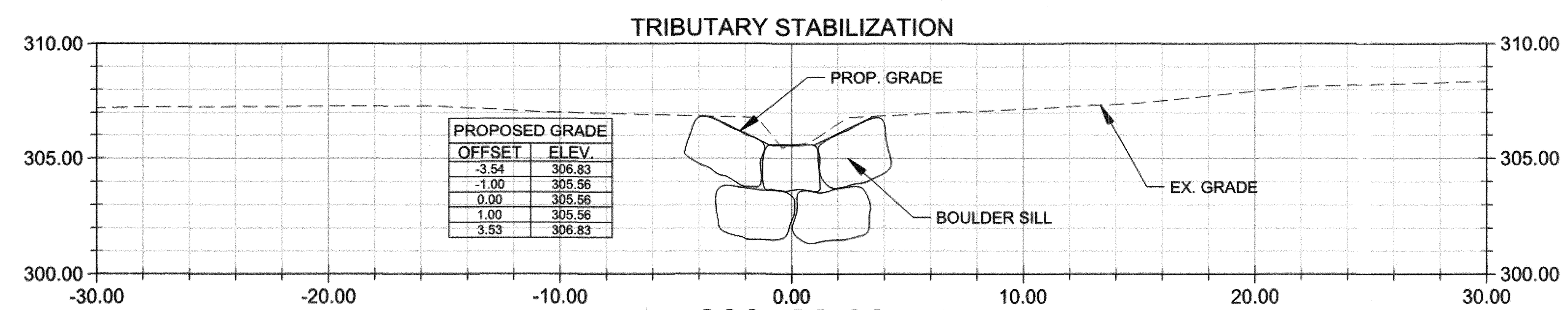
100+22.59



PROPOSED GRADE	
OFFSET	ELEV.
-5.86	318.94
-1.50	316.76
0.00	316.73
1.50	316.76
4.87	318.45
7.29	318.44

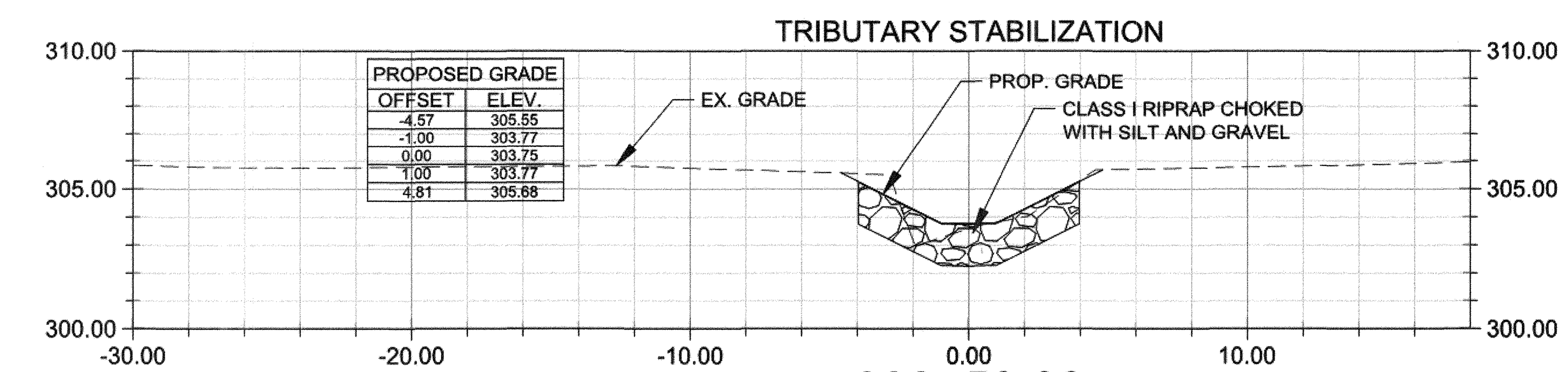
100+30.00

TRIBUTARY 2



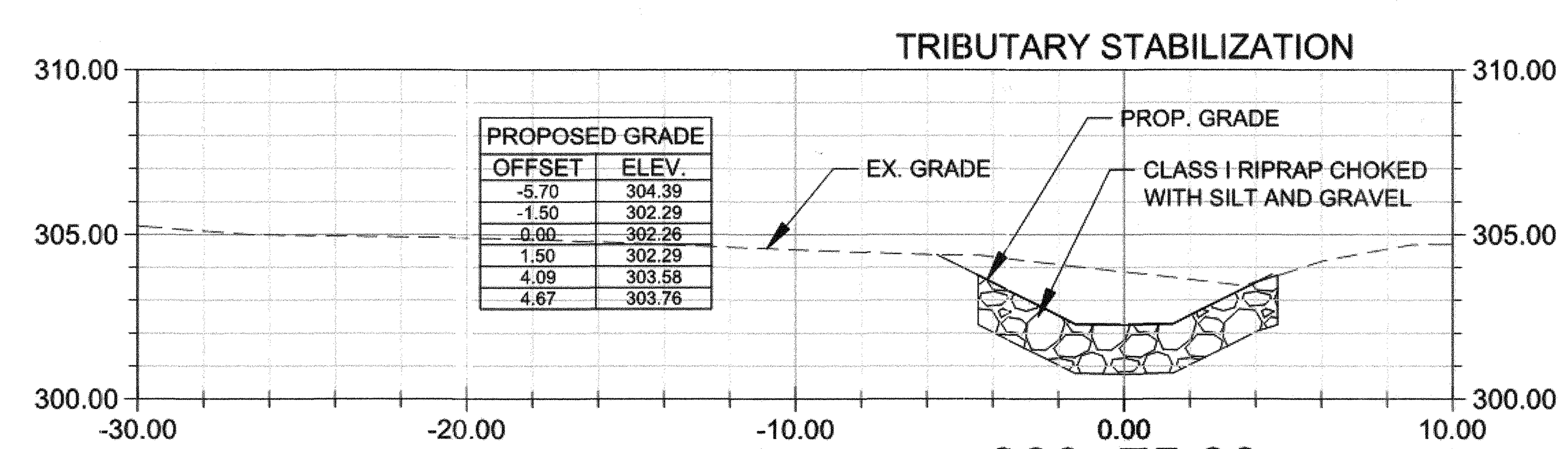
PROPOSED GRADE	
OFFSET	ELEV.
-3.54	306.83
-1.00	305.56
0.00	305.56
1.00	305.56
3.53	306.83

200+20.00



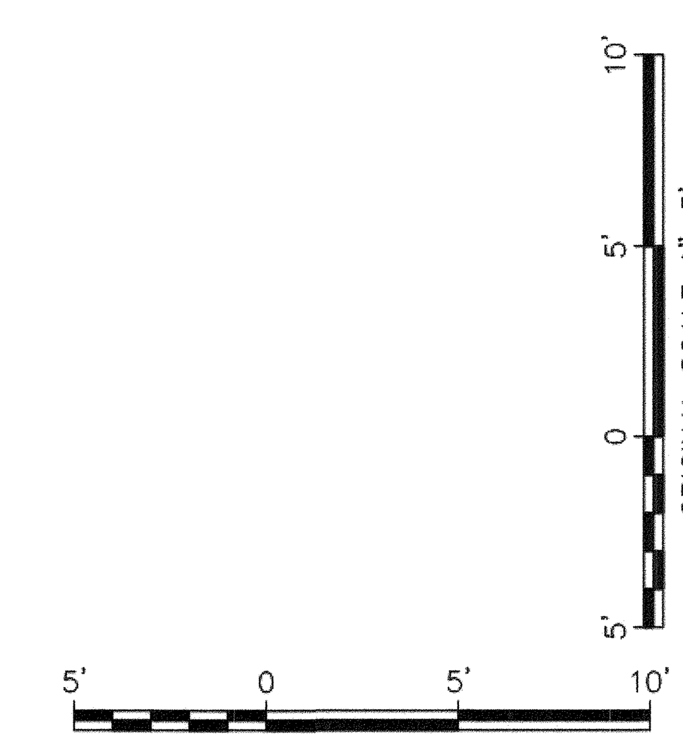
PROPOSED GRADE	
OFFSET	ELEV.
-4.57	305.55
-1.00	303.77
0.00	303.75
1.00	303.77
4.81	305.68

200+50.00



PROPOSED GRADE	
OFFSET	ELEV.
-5.70	304.39
-1.50	302.29
0.00	302.26
1.50	302.29
4.09	303.58
4.67	303.76

200+75.00



NOTES
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PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND CRAIG A. LYNCH NO. 28371 PROFESSIONAL ENGINEER
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
Mark S. Dechmone 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

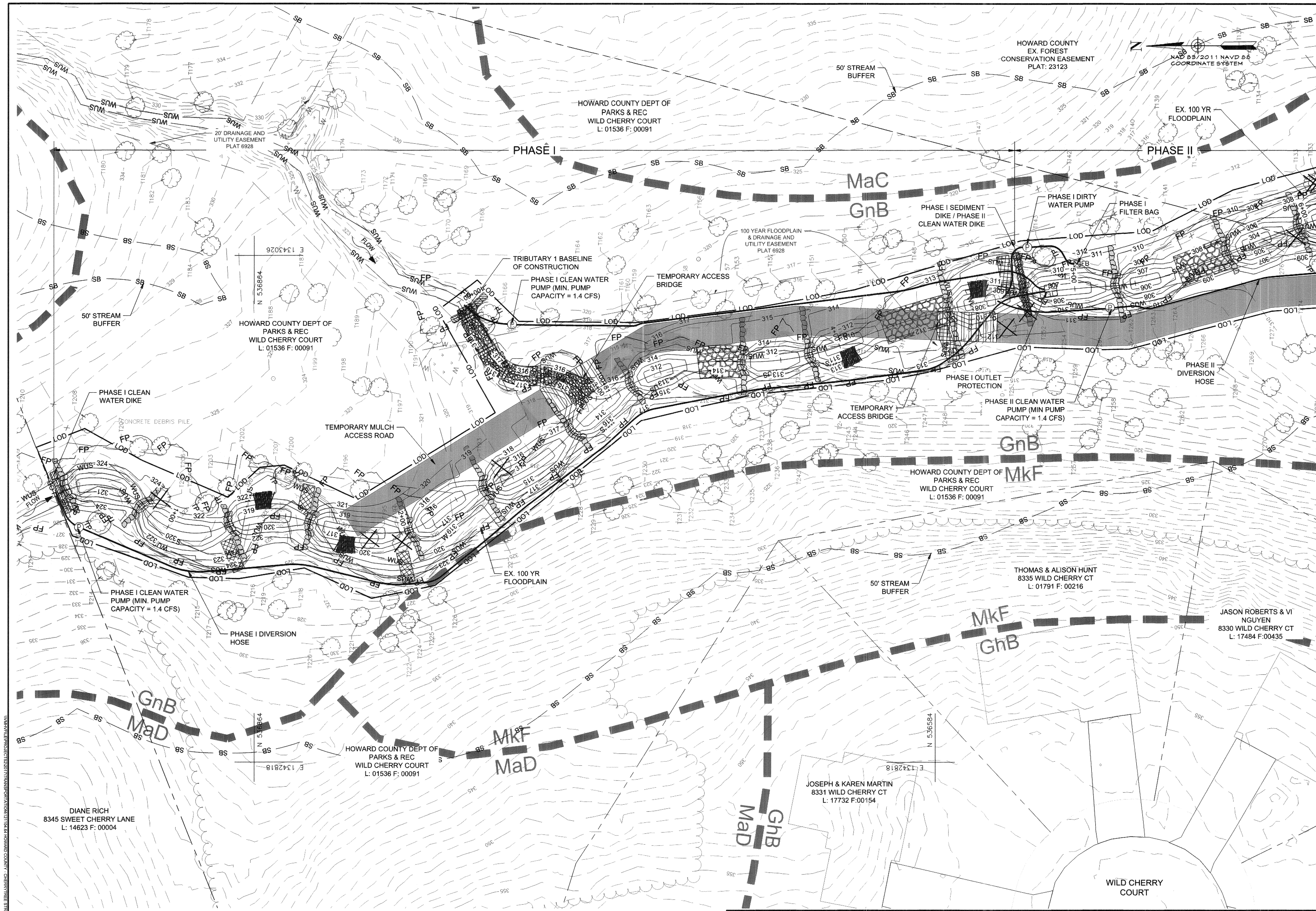
REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

STREAM RESTORATION CROSS-SECTION SHEET

PROJECT NO.: 121104.64
SCALE: AS NOTED DATE: 12/26/19
DESIGN: SH DRAWN: JT CHECK: CL
DWG NO: CS-04 OF CS-04
SHEET NO: 12 OF 22



PROPOSED FEATURES LEGEND

- 1' MINOR CONTOUR
- 5' MAJOR CONTOUR
- WOODY HABITAT FEATURE (WHF)
- BOULDER DROP STRUCTURE (BDS)
- ROCK STEP STRUCTURE (RSS)
- ARMORED RIFFLE (R)
- CLASS 0 RIPRAP CHOKED WITH SILT AND GRAVEL
- CLAY CHANNEL BLOCK (CCB)

EXISTING FEATURES LEGEND

- EX. BUILDING
- EX. NONTIDAL WETLAND
- EX. WATERS OF THE U.S.
- EX. FENCE
- EX. PROPERTY BOUNDARY
- EX. EASEMENT
- EX. EDGE OF PAVEMENT
- EX. GAS MAIN
- EX. TREELINE
- EX. CONCRETE DEBRIS
- EX. RIPRAP
- EX. CONCRETE MONUMENT
- EX. TREE
- EX. TRAVERSE POINT
- EX. STORMDRAIN
- EX. 1' MINOR CONTOUR
- EX. 5' MAJOR CONTOUR

EROSION & SEDIMENT CONTROL LEGEND

- LIMIT OF DISTURBANCE — LOD
- STREAM BUFFER — SB
- WATERS OF THE U.S. — WUS
- 100 YR FLOODPLAIN — FP
- SOIL BOUNDARY
- CLEAN WATER / SEDIMENT DIKE
- DIVERSION HOSE
- OUTLET PROTECTION
- FILTER BAG — FB
- PUMP — P
- TEMPORARY ACCESS BRIDGE
- TIMBER MAT
- STABILIZED CONSTRUCTION ENTRANCE
- TREE TO BE REMOVED
- PROTECTED EXISTING TREE
- SLOPES > 15%

STABILIZATION NOTE:
ALL DISTURBED SLOPES GREATER THAN 4:1 AND SENSITIVE AREAS (STREAM BUFFER, FLOODPLAIN, STEEP (>20%) SLOPES, HIGHLY ERODIBLE SOILS) MUST BE PERMANENTLY STABILIZED WITH SOIL STABILIZATION MATTING.

20' 0 20' 40'
ORIGINAL SCALE: 1"=20'

THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

[signature] 1/2/20
HOWARD SOIL CONSERVATION DISTRICT DATE

NOTES:
1) NOT ALL FURNISHED STONE IS SHOWN IN PLAN VIEW. SEE THE STREAM RESTORATION DETAILS AND PROFILE FOR ADDITIONAL INFORMATION.
2) REMOVE THE TEMPORARY MULCH ACCESS ROAD AS NECESSARY TO COMPLETE GRADING OPERATIONS
3) THE CONTRACTOR MUST ENSURE POSITIVE DRAINAGE FROM THE PROPOSED CHANNEL TO THE EXISTING CHANNEL AT THE END OF THE WORKING DAY. THIS SHALL BE DONE THROUGH TEMPORARY GRADING AND STABILIZATION WITH CLASS I RIPRAP, EXCEPT WHERE EROSION & SEDIMENT CONTROL INSPECTOR ALLOWS THE USE OF TEMPORARY SOIL STABILIZATION MATTING.
4) AT THE END OF EACH WORK DAY THE CONTRACTOR SHALL STABILIZE ANY DISTURBED AREA WITHIN THE LOD NOT DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE AND REMOVE SANDBAG DIVERSION AND PUMP AROUND PRACTICE. THE WORK AREA SHALL BE DEWATERED UTILIZING DEWATERING PUMPS AND PORTABLE SEDIMENT TANK/FILTER BAG OR MDE APPROCED SUBSTITUTE.

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND — CRAIG A. LYNCH — NO. 28371 — PROFESSIONAL ENGINEER
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
[signature] 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

REVISIONS

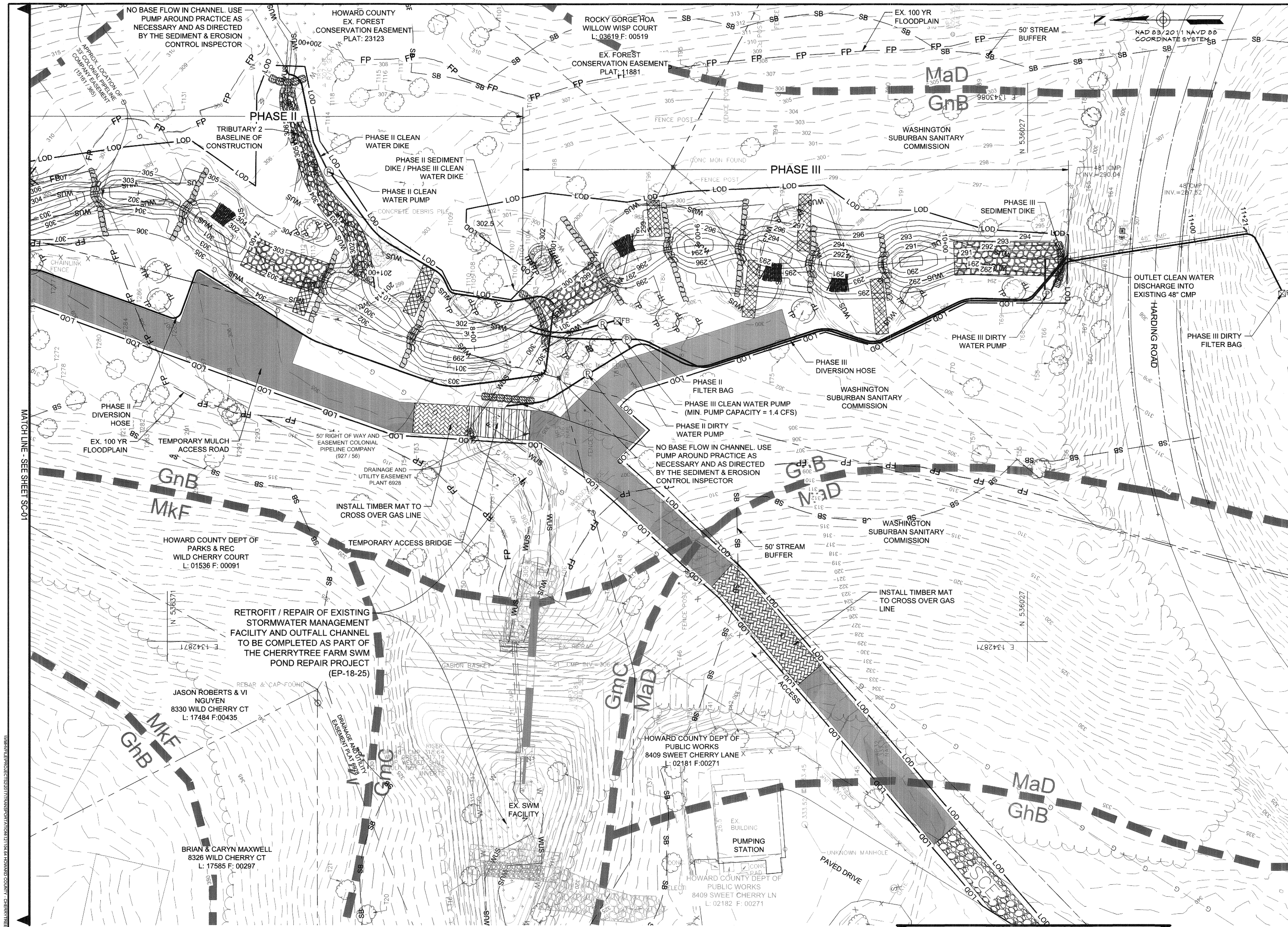
NO.	DATE	DESCRIPTION

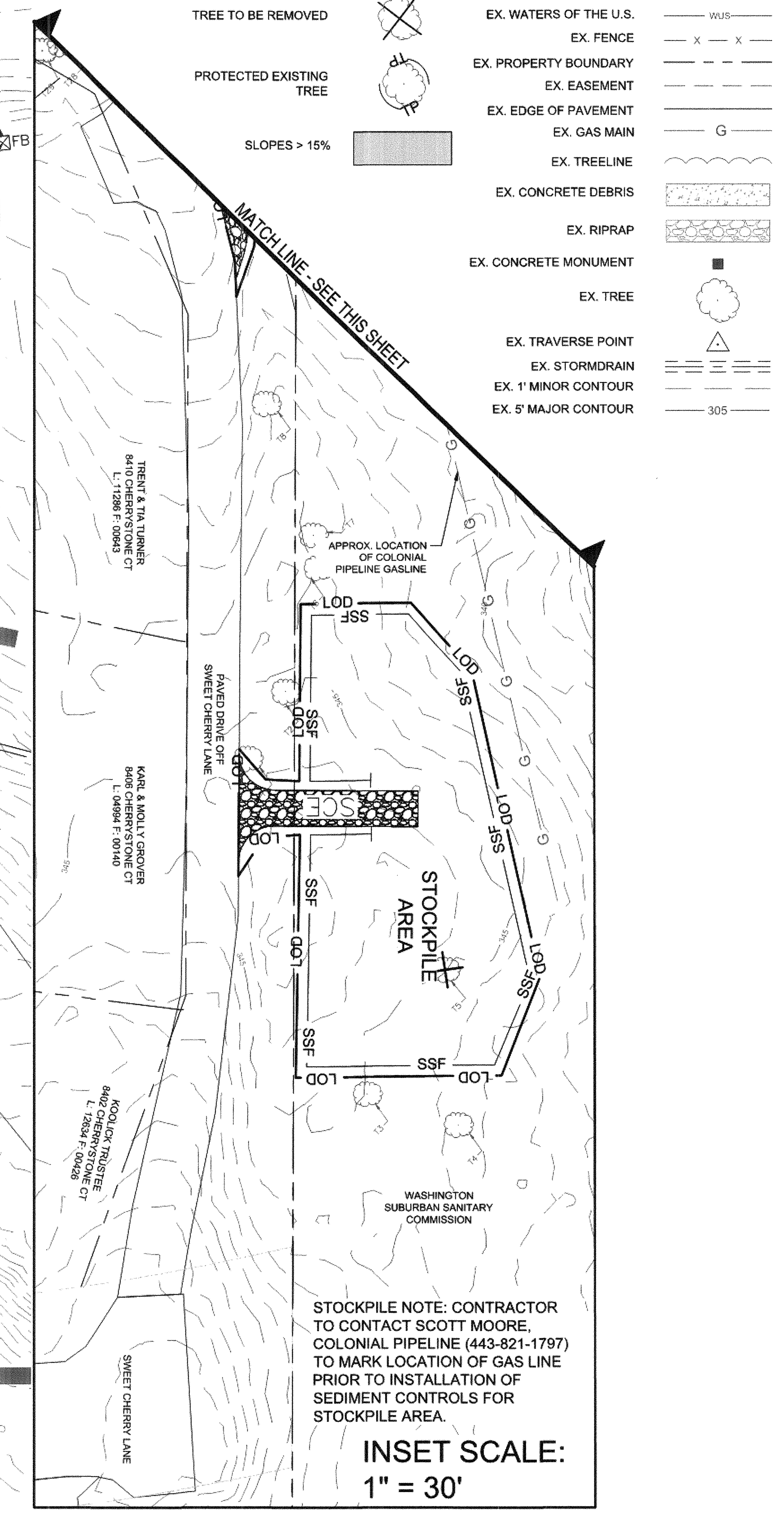
D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.: 121104.64
SCALE: 1" = 20' DATE: 12/26/19
DESIGN: SH DRAWN: JT CHECK: CL
DWG NO: SC-01 OF SC-05





STOCKPILE NOTE: CONTRACTOR TO CONTACT SCOTT MOORE, COLONIAL PIPELINE (443-821-1797) TO MARK LOCATION OF GAS LINE PRIOR TO INSTALLATION OF SEDIMENT CONTROLS FOR STOCKPILE AREA.

INSET SCALE: 1" = 30'

EROSION & SEDIMENT CONTROL LEGEND

- LIMIT OF DISTURBANCE — LOD
- STREAM BUFFER — SB
- WATERS OF THE U.S. — WUS
- 100 YR FLOODPLAIN — FP
- SOIL BOUNDARY
- CLEAN WATER / SEDIMENT DIKE
- DIVERSION HOSE
- OUTLET PROTECTION
- FILTER BAG — FB
- PUMP — P
- TEMPORARY ACCESS BRIDGE
- TIMBER MAT
- STABILIZED CONSTRUCTION ENTRANCE
- TREE TO BE REMOVED
- PROTECTED EXISTING TREE — TP
- SLOPES > 15%

PROPOSED FEATURES LEGEND

- 1' MINOR CONTOUR
- 5' MAJOR CONTOUR — 305
- WOODY HABITAT FEATURE (WHF)
- BOULDER SILL
- ROCK STEP-POOL STRUCTURE (RSP)
- ARMORED RIFFLE (R)
- TRIBUTARY STABILIZATION (CLASS I RIPRAP CHOKED WITH SILT AND GRAVEL)
- CLAY CHANNEL BLOCK (CCB)

EXISTING FEATURES LEGEND

- EX. BUILDING
- EX. NONTIDAL WETLAND — W
- EX. WATERS OF THE U.S. — WUS
- EX. FENCE — X
- EX. PROPERTY BOUNDARY
- EX. EASEMENT
- EX. EDGE OF PAVEMENT
- EX. GAS MAIN — G
- EX. TREELINE
- EX. CONCRETE DEBRIS
- EX. RIPRAP
- EX. CONCRETE MONUMENT
- EX. TREE
- EX. TRAVERSE POINT
- EX. STORMDRAIN
- EX. 1' MINOR CONTOUR
- EX. 5' MAJOR CONTOUR — 305

20' 0 20' 40'
ORIGINAL SCALE: 1"=20'

THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

[signature] 1/2/20
HOWARD SOIL CONSERVATION DISTRICT — DATE

NOTES:
1) NOT ALL FURNISHED STONE IS SHOWN IN PLAN VIEW. SEE THE STREAM RESTORATION DETAILS AND PROFILE FOR ADDITIONAL INFORMATION.
2) REMOVE THE TEMPORARY MULCH ACCESS ROAD AS NECESSARY TO COMPLETE GRADING OPERATIONS
3) THE CONTRACTOR MUST ENSURE POSITIVE DRAINAGE FROM THE PROPOSED CHANNEL TO THE EXISTING CHANNEL AT THE END OF THE WORKING DAY. THIS SHALL BE DONE THROUGH TEMPORARY GRADING AND STABILIZATION WITH CLASS I RIPRAP, EXCEPT WHERE EROSION & SEDIMENT CONTROL INSPECTOR ALLOWS THE USE OF TEMPORARY SOIL STABILIZATION.
4) AT THE END OF EACH WORK DAY THE CONTRACTOR SHALL STABILIZE ANY DISTURBED AREA WITHIN THE LOD NOT DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE AND REMOVE SANDBAG DIVERSION AND PUMP AROUND PRACTICE. THE WORK AREA SHALL BE DEWATERED UTILIZING DEWATERING PUMPS AND PORTABLE SEDIMENT TANK/FILTER BAG OR MDE APPROCED SUBSTITUTE.

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PHONE: (443) 589-2400 FAX: (443) 589-2401

SEAL: 12/26/2019

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND

[signature] 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

REVISIONS

NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.:	121104.64
SCALE:	1" = 20'
DATE:	12/26/19
DESIGN:	SH
DRAWN:	JT
CHECK:	CL
DWG NO:	SC-02 OF SC-05
SHEET NO:	14 OF 22

HOWARD SOIL CONSERVATION DISTRICT STANDARD EROSION AND SEDIMENT CONTROL NOTES

1. A PRE-CONSTRUCTION MEETING MUST BE CONDUCTED WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (C.I.D.), 410-313-1855 AFTER THE FUTURE LOD AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELD. A MINIMUM OF 48 HOUR NOTICE TO C.I.D. MUST BE GIVEN AT THE FOLLOWING STAGES:
   - 1.1. PRIOR TO THE START OF EARTH DISTURBANCE,
   - 1.2. UPON COMPLETION OF THE INSTALLATION OF PERIMETER SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING,
   - 1.3. PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT,
   - 1.4. PRIOR TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES.

   OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE. OTHER RELATED STATE AND FEDERAL PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS PLAN.
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND REVISIONS THERETO.
3. 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 GREATER THAN 3H:1V; AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED AREAS ON THE PROJECT SITE EXCEPT FOR THOSE AREAS UNDER ACTIVE GRADING.
4. 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).
5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE C.I.D.
6. SITE ANALYSIS:

TOTAL AREA OF SITE:	66,530 SF (1.53 ACRES)
AREA DISTURBED	66,530 SF (1.53 ACRES)
AREA TO BE ROOFED OR PAVED	0 SF (0 ACRES)
AREA TO BE VEGETATIVELY STABILIZED	52,931 SF (1.22 ACRES)
TOTAL CUT	1,085 CY
TOTAL FILL	895 CY
OFFSITE WASTE/BORROW AREA LOCATION	TBD BY CONTRACTOR*

   *OFFSITE WASTE/BORROW AREA LOCATION MUST HAVE AN ACTIVE GRADING PERMIT.
7. ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
8. ANY SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE C.I.D. 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:
   - 8.1. INSPECTION DATE
   - 8.2. INSPECTION TYPE (ROUTINE, PRE-STORM EVENT, DURING RAIN EVENT)
   - 8.3. NAME AND TITLE OF INSPECTOR
   - 8.4. WEATHER INFORMATION (CURRENT CONDITIONS AS WELL AS TIME AND AMOUNT OF LAST RECORDED PRECIPITATION)
   - 8.5. BRIEF DESCRIPTION OF PROJECT'S STATUS (E.G. PERCENT COMPLETE) AND/OR CURRENT ACTIVITIES
   - 8.6. EVIDENCE OF SEDIMENT DISCHARGES
   - 8.7. IDENTIFICATION OF PLAN DEFICIENCIES
   - 8.8. IDENTIFICATION OF SEDIMENT CONTROLS THAT REQUIRE MAINTENANCE
   - 8.9. IDENTIFICATION OF MISSING OR IMPROPERLY INSTALLED SEDIMENT CONTROLS
   - 8.10. COMPLIANCE STATUS REGARDING THE SEQUENCE OF CONSTRUCTION AND STABILIZATION REQUIREMENTS
   - 8.11. PHOTOGRAPHS
   - 8.12. MONITORING/SAMPLING
   - 8.13. MAINTENANCE AND/OR CORRECTIVE ACTION REQUIRED
   - 8.14. OTHER INSPECTION ITEMS AS REQUIRED BY THE GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES (NPDES, MDE)
9. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.
10. ANY MAJOR CHANGES OR REVISIONS TO THE PLAN OR SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE HSCD PRIOR TO PROCEEDING WITH CONSTRUCTION. MINOR REVISIONS MAY BE ALLOWED BY THE C.I.D. PER THE LIST OF HSCD-APPROVED FIELD CHANGES.
11. DISTURBANCE SHALL NOT OCCUR OUTSIDE THE L.O.D. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE C.I.D. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THEC.I.D., NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.
12. WASH WATER FROM ANY EQUIPMENT, VEHICLES, WHEELS, PAVEMENT, AND OTHER SOURCES MUST BE TREATED IN A SEDIMENT BASIN OR OTHER APPROVED WASHOUT STRUCTURE.
13. TOPSOIL SHALL BE STOCKPILED AND PRESERVED ON-SITE FOR REDISTRIBUTION ONTO FINAL GRADE.
14. ALL SILT FENCE AND SUPER SILT FENCE SHALL BE PLACED ON-THE-CONTOUR, AND BE IMBRICATED AT 25' MINIMUM INTERVALS, WITH LOWER ENDS CURLED UP BY 2' IN ELEVATION.
15. STREAM CHANNELS MUST NOT BE DISTURBED DURING THE FOLLOWING RESTRICTED TIME PERIODS (INCLUSIVE):
   - 15.1. USE I AND I-P (MARCH 1 - JUNE 15)
   - 15.2. USE III AND III-P (OCTOBER 1 - APRIL 30)
   - 15.3. USE IV (MARCH 1 - MAY 31)
16. A COPY OF THIS PLAN, THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, THE ASSOCIATED PERMITS SHALL BE ON-SITE AND AVAILABLE WHEN THE SITE IS ACTIVE.

THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 1/2/20

MDE STANDARD 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
A.1. TEMPORARY STABILIZATION
A.1.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.
A.1.b. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
A.1.c. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
A.2. PERMANENT STABILIZATION
A.2.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:
A.2.a.• SOIL PH BETWEEN 6.0 AND 7.0.
A.2.a.• SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
A.2.a.• 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.
A.2.a.• SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
A.2.a.• SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
A.2.b. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
A.2.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.
A.2.d. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
A.2.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
B.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.
B.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.
B.3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
B.3.a. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
B.3.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.
B.3.c. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
B.3.d. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
B.4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
B.5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
B.5.a. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND.
B.5.b. 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 SUB-SOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1½ INCHES IN DIAMETER.
B.5.c. 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.
B.5.d. 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.
B.6. TOPSOIL APPLICATION
B.6.a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
B.6.b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESSOF 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.
B.6.c. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
C.1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.
C.2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
C.3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
C.4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
C.5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.
SUPPLEMENTAL REQUIREMENTS
1. TOPSOIL SHALL CONTAIN 50-75% SAND, 15-25% SILT, AND 10-20% CLAY AND NOT LESS THAN 2.5% ORGANIC MATTER BY WEIGHT. TOPSOIL SHALL NOT HAVE A pH VALUE LESS THAN 5.8.

PERMANENT SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 6B) FROM TABLE B.3					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC.)	SEEDING DATES	SEEDING DEPTHS	N	P2O5	K2O	
1	SWITCH GRASS	120	1 MARCH TO 15 MAY; 16 MAY TO 15 JUNE WITH ADDITIONAL WATERING	1/4" TO 1/2"	45LB/AC (1 LB/1,000 SF)	90 LB/AC (2 LB/1,000 SF)	90 LB/AC (2 LB/1,000 SF)	2 TONS/AC (90 LB/1000 SF)
	CREEPING RED FESCUE	181						
	PARTRIDGE PEA	49						
3	DEER TONGUE	131						
	CREEPING RED FESCUE	175						
	VIRGINIA WILD RYE	43						
9	TALL FESCUE	175	15 AUGUST TO 15 OCTOBER					
	KENTUCKY BLUEGRASS	117						
	PERENNIAL RYE	58						

TEMPORARY SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 6B) FROM TABLE B.1					FERTILIZER RATE (10-10-10)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC.)	SEEDING DATES	SEEDING DEPTHS		
1	ANNUAL RYEGRASS	40	1 MARCH TO 31 MAY 1 AUG. TO 15 OCT.	1"	436 LB/AC (10 LB/1,000 SF)	2 TONS/AC (90 LB/1000 SF)
2	BARLEY	96	1 MARCH TO 31 MAY 1 AUG. TO 15 OCT.	1/2"	436 LB/AC (10 LB/1,000 SF)	2 TONS/AC (90 LB/1000 SF)
3	FOXTAIL MILLET	30	16 MAY TO 31 JULY	1/2"	436 LB/AC (10 LB/1,000 SF)	2 TONS/AC (90 LB/1000 SF)

NOTE: IF PERMANENT STABILIZATION IS REQUIRED OUTSIDE OF SPECIFIED SEEDING DATES, THE CONTRACTOR SHALL PROVIDE TEMPORARY STABILIZATION MEASURES (SEED AND MULCH) UNTIL THE APPROPRIATE SEEDING DATES FOR THE SPECFIED SEED MIXES OCCUR. THE CONTRACTOR SHALL PROVIDE PERMANENT STABILIZATION SEEDING WITHIN THE SPECIFIED SEEDING DATES.

MDE STANDARD B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

DEFINITION
THE APPLICATION OF SEED AND MULCH TO ESTABLISH VEGETATIVE COVER.

PURPOSE
TO PROTECT DISTURBED SOILS FROM EROSION DURING AND AT THE END OF CONSTRUCTION.

CONDITIONS WHERE PRACTICE APPLIES
TO THE SURFACE OF ALL PERIMETER CONTROLS, SLOPES, AND ANY DISTURBED AREA NOT UNDER ACTIVE GRADING.

CRITERIA
A. SEEDING
A.1. SPECIFICATIONS
A.1.a. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
A.1.b. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
A.1.c. INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
A.1.d. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
A.2. APPLICATION
A.2.a. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
A.2.a.• INCORPORATE SEED INTO THE SOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.
A.2.a.• APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
A.2.b. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
A.2.b.• CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
A.2.b.• APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
A.2.c. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
A.2.c.• IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P2O5 (PHOSPHOROUS), 200 POUNDS PER ACRE; K2O (POTASSIUM), 200 POUNDS PER ACRE.
A.2.c.• LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
A.2.c.• MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
A.2.c.• WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.
B. MULCHING
B.1. MULCH MATERIALS (IN ORDER OF PREFERENCE)
B.1.a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
B.1.b. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
B.1.b.• WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
B.1.b.• WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
B.1.b.• WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
B.1.b.• WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
B.1.b.• WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
B.2. APPLICATION
B.2.a. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
B.2.b. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
B.2.c. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
B.3. ANCHORING
B.3.a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
B.3.a.• A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
B.3.a.• WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
B.3.a.• SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
B.3.a.• LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

MDE STANDARD B-4-8 STANDARDS AND SPECIFICATIONS FOR 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
1. THE STOCKPILE LOCATION AND ALL RELATED SEDIMENT CONTROL PRACTICES MUST BE CLEARLY INDICATED ON THE EROSION AND SEDIMENT CONTROL PLAN.
2. THE FOOTPRINT OF THE STOCKPILE MUST BE SIZED TO ACCOMMODATE THE ANTICIPATED VOLUME OF MATERIAL AND BASED ON A SIDE SLOPE RATIO NO STEEPER THAN 2:1. BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING.
3. RUNOFF FROM THE STOCKPILE AREA MUST DRAIN TO A SUITABLE SEDIMENT CONTROL PRACTICE.
4. ACCESS THE STOCKPILE AREA FROM THE UPGRADE SIDE.
5. CLEAR WATER RUNOFF INTO THE STOCKPILE AREA MUST BE MINIMIZED BY USE OF A DIVERSION DEVICE SUCH AS AN EARTH DIKE, TEMPORARY SWALE OR DIVERSION FENCE. PROVISIONS MUST BE MADE FOR DISCHARGING CONCENTRATED FLOW IN A NON-EROSIVE MANNER.
6. WHERE RUNOFF CONCENTRATES ALONG THE TOE OF THE STOCKPILE FILL, AN APPROPRIATE EROSION/SEDIMENT CONTROL PRACTICE MUST BE USED TO INTERCEPT THE DISCHARGE.
7. STOCKPILES MUST BE STABILIZED IN ACCORDANCE WITH THE 3/7 DAY STABILIZATION REQUIREMENT AS WELL AS STANDARD B-4-1 INCREMENTAL STABILIZATION AND STANDARD B-4-4 TEMPORARY STABILIZATION.
8. IF THE STOCKPILE IS LOCATED ON AN IMPERVIOUS SURFACE, A LINER SHOULD BE PROVIDED BELOW THE STOCKPILE TO FACILITATE CLEANUP. STOCKPILES CONTAINING CONTAMINATED MATERIAL MUST BE COVERED WITH IMPERMEABLE 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.

SEQUENCE OF CONSTRUCTION

1. OBTAIN ALL PERMITS (HOWARD COUNTY GRADING, MDE NON-TIDAL WETLANDS AND WATERWAYS AUTHORIZATION) PRIOR TO MOBILIZATION. THIS PROJECT IS LOCATED IN USE I WATERS. NO CONSTRUCTION SHALL TAKE PLACE BETWEEN MARCH 1 AND JUNE 15 INCLUSIVE OF ANY YEAR.
   - 1.1. NPDES NO.
   - 1.2. MDE AUTHORIZATION NO. 201960539/19-NT-3076
2. (DAY 1) PRIOR TO CLEARING, GRUBBING, GRADING, OR ANY LAND DISTURBANCE OF ANY KIND, THE CONTRACTOR SHALL HOLD A PRE-CONSTRUCTION MEETING ON-SITE TO REVIEW THE LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL REQUIREMENTS AND THE SEQUENCE OF CONSTRUCTION WITH THE FOLLOWING PARTIES:
   - 2.1. SEDIMENT AND EROSION CONTROL INSPECTOR - HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (C.I.D.) (410.313.1855 - 48 HOURS' NOTICE).
   - 2.2. MARYLAND DEPARTMENT OF THE ENVIRONMENT INSPECTOR(S) (NON-TIDAL WETLANDS AND WATERWAYS - FIVE DAYS' NOTICE).
   - 2.3. OWNER - HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS BUREAU OF ENVIRONMENTAL SERVICES ENGINEER (410.313.0844 - 48 HOURS' NOTICE).
   - 2.4. OWNER'S ENGINEER - CENTURY ENGINEERING, INC. (443.589.2400 - 48 HOURS' NOTICE).
   - 2.5. COLONIAL PIPELINE COMPANY - SCOTT MOORE (443-821-1797 - 48 HOURS NOTICE)

   THE MEETING WILL ALSO SERVE AS A FORUM TO VERIFY THE LOCATION OF ANY STAGING/STOCKPILE AREAS AND FLAG ANY TREES WITHIN THE LIMITS OF DISTURBANCE TO BE REMOVED FOR CONSTRUCTION AND ACCESS. **THE LIMITS OF DISTURBANCE SHALL BE FIELD-MARKED PRIOR TO HOLDING THIS MEETING.**

PHASE 1:

3. (DAYS 2-3) WITH THREE DAY CLEAR WEATHER FORECAST, CLEAR AND GRUB FOR INSTALLATION OF CONSTRUCTION SAFETY FENCING, PERIMETER SEDIMENT CONTROLS AND CONSTRUCTION ENTRANCE OFF OF SWEET CHERRY LANE.
4. (DAYS 4-7) INSTALL STABILIZED CONSTRUCTION ENTRANCE, CONSTRUCTION SAFETY FENCING, TEMPORARY ACCESS BRIDGE, TEMPORARY ACCESS CULVERT, TEMPORARY MULCH ACCESS ROAD, AND PERIMETER SEDIMENT CONTROLS.
5. (DAY 8) OBTAIN APPROVAL FROM THE C.I.D. INSPECTOR OF EROSION AND SEDIMENT CONTROLS BEFORE PROCEEDING WITH ANY FURTHER CLEARING, GRUBBING, GRADING, OR OTHER CONSTRUCTION ACTIVITIES.
6. (DAYS 9-13) INSTALL SANDBAG DIVERSIONS, PUMP-AROUND, AND DE-WATERING SYSTEMS (FILTER BAG) AS NECESSARY TO PERFORM IN-STREAM WORK WITHIN PHASE 1. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING FOR PHASE 1 STREAM CONSTRUCTION.
7. (DAYS 14-37) INSTALL THE ROCK STEP-POOL SERIES (RSS), ARMORED RIFFLES (R), CLAY CHANNEL BLOCKS (CCB) ALONG THE MAINSTEM (STA. 0+51 TO 4+50) AND THE BOULDER DROP STRUCTURES (BDS) ALONG TRIBUTARY 1 (STA. 100+02 TO 100+80) WORKING FROM UPSTREAM TO DOWNSTREAM IN THE FOLLOWING SEQUENCE:
   - 7.1. EXCAVATE AND GRADE FOR STRUCTURE INSTALLATION.
   - 7.2. WHERE SHOWN ON PLAN, INSTALL CLAY CHANNEL BLOCK MATERIAL.
   - 7.3. INSTALL FILTER FABRIC FOR ALL STRUCTURE COMPONENTS.
   - 7.4. INSTALL ANGULAR BOULDERS, POOL PAVEMENT, RIFFLE BED MATERIAL, WOODY HABITAT FEATURES, AND CLASS 0 RIPRAP.
   - 7.5. COMPLETE ENTIRE STRUCTURE (ALL COMPONENTS AS SHOWN ON THE CONSTRUCTION DOCUMENTS) PRIOR TO MOVING TO THE NEXT STRUCTURE.
   - 7.6. DAILY LIMITS OF DISTURBANCE ARE LIMITED TO WHAT CAN BE CONSTRUCTED AND PERMANENTLY STABILIZED AT THE END OF THE WORK DAY. ADJUST THE CLEAN WATER DIVERSION PIPE ACCORDINGLY TO MAINTAIN BYPASS FLOW AND COMPLETE WORK.
   - 7.7. REMOVE THE TEMPORARY MULCH ACCESS ROAD AND TEMPORARY ACCESS BRIDGE AS NECESSARY TO COMPLETE GRADING AND STRUCTURE INSTALLATION.
8. (DAYS 38-39) PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. ONCE STABILIZATION HAS BEEN ACHIEVED AND WITH THE APPROVAL OF THE C.I.D. INSPECTOR AND THE OWNER, PROCEED TO PHASE 2.

PHASE 2:

9. (DAYS 40-41) WITH THREE DAY CLEAR WEATHER FORECAST, CLEAR AND GRUB THE WORK AREA WITHIN PHASE 2. PERFORM ONLY THE NECESSARY CLEARING AND GRUBBING FOR PHASE 2 STREAM CONSTRUCTION.
10. (DAY 42) INSTALL SANDBAG DIVERSIONS, PUMP-AROUND, AND DE-WATERING SYSTEMS (FILTER BAG) AS NECESSARY TO PERFORM IN-STREAM WORK WITHIN PHASE 2.
11. (DAYS 43-63) INSTALL THE ROCK STEP-POOL (RSP) SERIES, ARMORED RIFFLES (R), AND CLAY CHANNEL BLOCKS (CCB) ALONG THE MAINSTEM (STA. 4+50 TO 8+00) AND THE BOULDER SILL AND TRIBUTARY STABILIZATION ALONG TRIBUTARY 2 (STA. 200+19 TO 200+92) WORKING FROM UPSTREAM TO DOWNSTREAM IN THE FOLLOWING SEQUENCE:
12. EXCAVATE AND GRADE FOR STRUCTURE INSTALLATION.
   - 12.1. INSTALL FILTER FABRIC FOR ALL STRUCTURE COMPONENTS.
   - 12.2. WHERE SHOWN ON THE PLANS, INSTALL CLAY CHANNEL BLOCK MATERIAL.
   - 12.3. INSTALL ANGULAR BOULDERS, POOL PAVEMENT, WOODY HABITAT FEATURES, RIFFLE BED MATERIAL, AND CLASS I RIPRAP.
   - 12.4. COMPLETE ENTIRE STRUCTURE (ALL COMPONENTS AS SHOWN ON THE CONSTRUCTION DOCUMENTS) PRIOR TO MOVING TO THE NEXT STRUCTURE.
   - 12.5. DAILY LIMITS OF DISTURBANCE ARE LIMITED TO WHAT CAN BE CONSTRUCTED AND PERMANENTLY STABILIZED AT THE END OF THE WORK DAY, ENSURING POSITIVE DRAINAGE IS MAINTAINED FROM THE PROPOSED CHANNEL TO THE EXISTING CHANNEL. DAILY PUMP AROUND OPERATIONS SHALL BE INSTALLED AND REMOVED FROM STREAM EACH WORKING DAY.
   - 12.6. REMOVE THE TEMPORARY MULCH ACCESS ROAD AS NECESSARY TO COMPLETE GRADING AND STRUCTURE INSTALLATION.
13. (DAY 64) UPON COMPLETION OF ENTIRE STRUCTURE SERIES, REMOVE THE SAND BAG DIVERSION, AND PUMP AROUND MEASURES.
14. (DAY 65) PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING. ONCE STABILIZATION HAS BEEN ACHIEVED AND WITH THE APPROVAL OF THE C.I.D. INSPECTOR AND THE OWNER, PROCEED TO PHASE 3.

PHASE 3:

15. (DAYS 66) WITH THREE DAY CLEAR WEATHER FORECAST, CLEAR AND GRUB THE AREA WITHIN PHASE 3 NECESSARY FOR IN STREAM CONSTRUCTION.
16. (DAY 67) INSTALL SANDBAG DIVERSIONS, PUMP-AROUND, AND DE-WATERING SYSTEMS (FILTER BAG) AS NECESSARY TO PERFORM IN-STREAM WORK WITHIN PHASE 3.
17. (DAYS 68-93) INSTALL THE ROCK STEP-POOL (RSP) SERIES, ARMORED RIFFLES (R), AND CLAY CHANNEL BLOCKS (CCB) ALONG THE MAINSTEM (STA. 10+46 TO 8+00) WORKING FROM DOWNSTREAM TO UPSTREAM IN THE FOLLOWING SEQUENCE:
   - 17.1. EXCAVATE AND GRADE FOR STRUCTURE INSTALLATION.
   - 17.2. WHERE SHOWN ON THE PLANS, INSTALL CLAY CHANNEL BLOCK MATERIAL.
   - 17.3. INSTALL FILTER FABRIC FOR ALL STRUCTURE COMPONENTS.
   - 17.4. INSTALL ANGULAR BOULDERS, POOL PAVEMENT, WOODY HABITAT FEATURES, AND RIFFLE BED MATERIAL.
   - 17.5. COMPLETE ENTIRE STRUCTURE (ALL COMPONENTS SHOWN ON THE CONSTRUCTION DOCUMENTS) PRIOR TO MOVING TO THE NEXT STRUCTURE.
   - 17.6. DAILY LIMITS OF DISTURBANCE ARE LIMITED TO WHAT CAN BE CONSTRUCTED AND PERMANENTLY STABILIZED AT THE END OF THE WORK DAY, ENSURING POSITIVE DRAINAGE IS MAINTAINED FROM THE PROPOSED CHANNEL TO THE EXISTING CHANNEL. DAILY PUMP AROUND OPERATIONS SHALL BE INSTALLED AND REMOVED FROM STREAM EACH WORKING DAY.
   - 17.7. REMOVE THE TEMPORARY MULCH ACCESS ROAD AS NECESSARY TO TO COMPLETE GRADING AND STRUCTURE INSTALLATION.
18. (DAY 94) UPON COMPLETION OF ENTIRE STRUCTURE SERIES, REMOVE THE SAND BAG DIVERSION, AND PUMP AROUND MEASURES.
19. (DAYS 95-96) PERMANENTLY STABILIZE WITH TOPSOIL, SEED/MULCH, AND STABILIZATION MATTING.

PROJECT COMPLETION

20. (DAY 97) COMPLETE IN-KIND RESTORATION OF ANY DAMAGE TO EXISTING INFRASTRUCTURE EITHER ON-SITE OR OFF-SITE. THIS INCLUDES BUT IS NOT LIMITED TO: SIDEWALK, CURB AND GUTTER, PAVEMENT, UTILITY APPURTENANCES, TREES, SIGNS, ETC.)
21. (DAY 98) COMPLETE FINAL PERMANENT VEGETATIVE STABILIZATION OF SITE PER THE LANDSCAPE PLAN.
22. (DAY 99) WITH THE APPROVAL OF THE C.I.D. INSPECTOR, OWNER, AND OWNER'S ENGINEER, REMOVE REMAINING SEDIMENT CONTROLS AND STABILIZE ANY REMAINING DISTURBED AREAS.

SOILS DESCRIPTION

THE PROJECT AREA CONSISTS MOSTLY OF SILT LOAM SOILS AND IS LOCATED WITHIN THE BOUNDARIES OF THREE SOIL GROUPS. THE MAJORITY OF THE CHERRYTREE FARM STREAM VALLEY IS CLASSIFIED AS GLENVILLE-BAILE SILT LOAM (GnB), 0 TO 8 PERCENT SLOPES, WHICH HAS A SLOW INFILTRATION RATE AND IS CONSIDERED A HIGHLY ERODIBLE SOIL BY COMAR 27.02.01.01. THE FORESTED AREA TO THE EAST CONSISTS MOSTLY OF MANOR LOAM, 8 TO 15 PERCENT SLOPES. THIS SOIL IS CLASSIFIED AS HYDROLOGIC SOIL GROUP B AND HAS A MODERATE INFILTRATION RATE. THE FORESTED AREA TO THE WEST OF CHERRYTREE STREAM CONSISTS OF MANOR-BRINKLOW COMPLEX, 25 TO 65 PERCENT SLOPES. THIS SOIL IS CLASSIFIED AS HYDROLOGIC SOIL GROUP B AND CONSIDERED TO BE A ROCKY SOIL WITH A MODERATE INFILTRATION RATE.

SOILS TABLE

SYMBOL	NAME	SLOPES	TYPE	HSG	Kw	HYDRIC
GnB	Glenville-Baile silt loams	0-8%	silt loam	C	0.49	YES
MaD	Manor loam	15-25%	sandy loam	B	0.32	NO
GhB	Glenelg-Urban land complex	0-8%	loam	B	0.43	NO

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

SEAL: STATE OF MARYLAND — CRAIG A. LYNCH — PROFESSIONAL ENGINEER — NO. 28371 — 12/26/2019

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE 12/30/19

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 #: 28371 EXPIRES: 01/01/2021

REVISIONS

NO.	DATE	DESCRIPTION

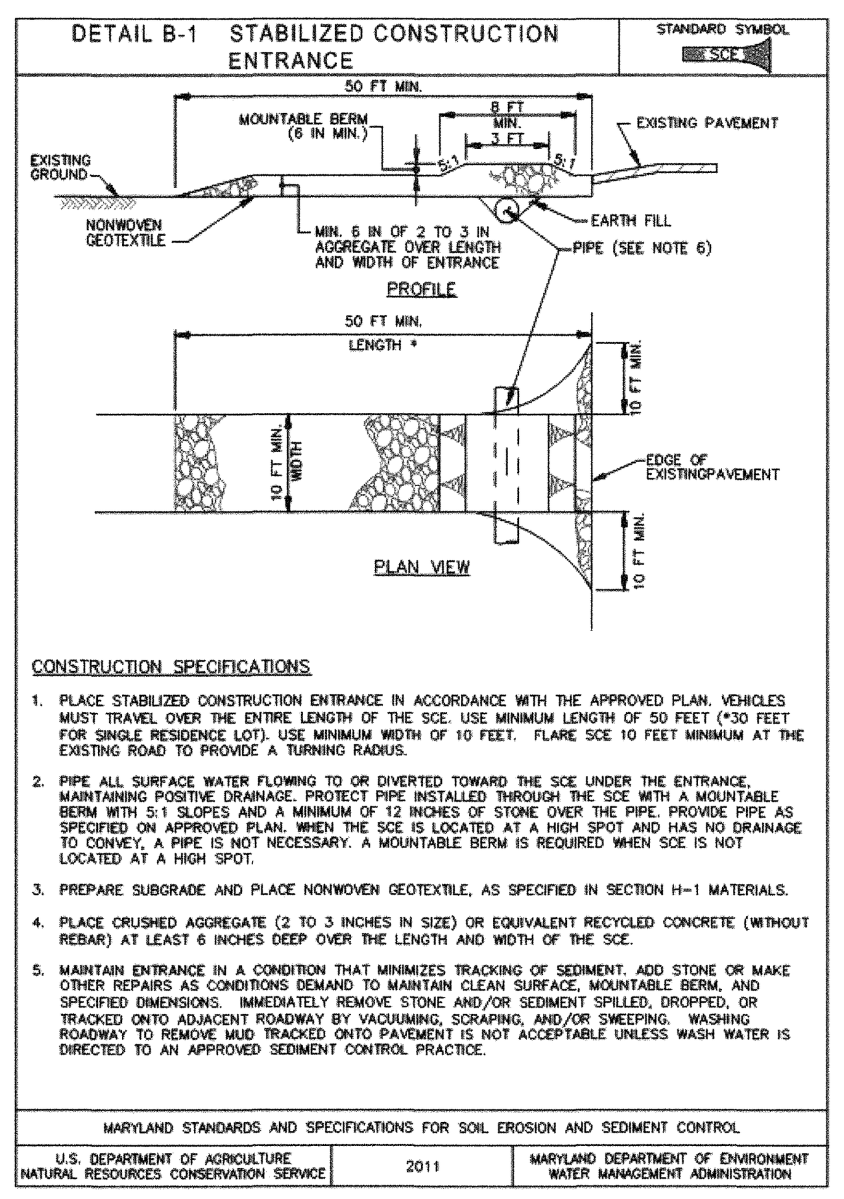
D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

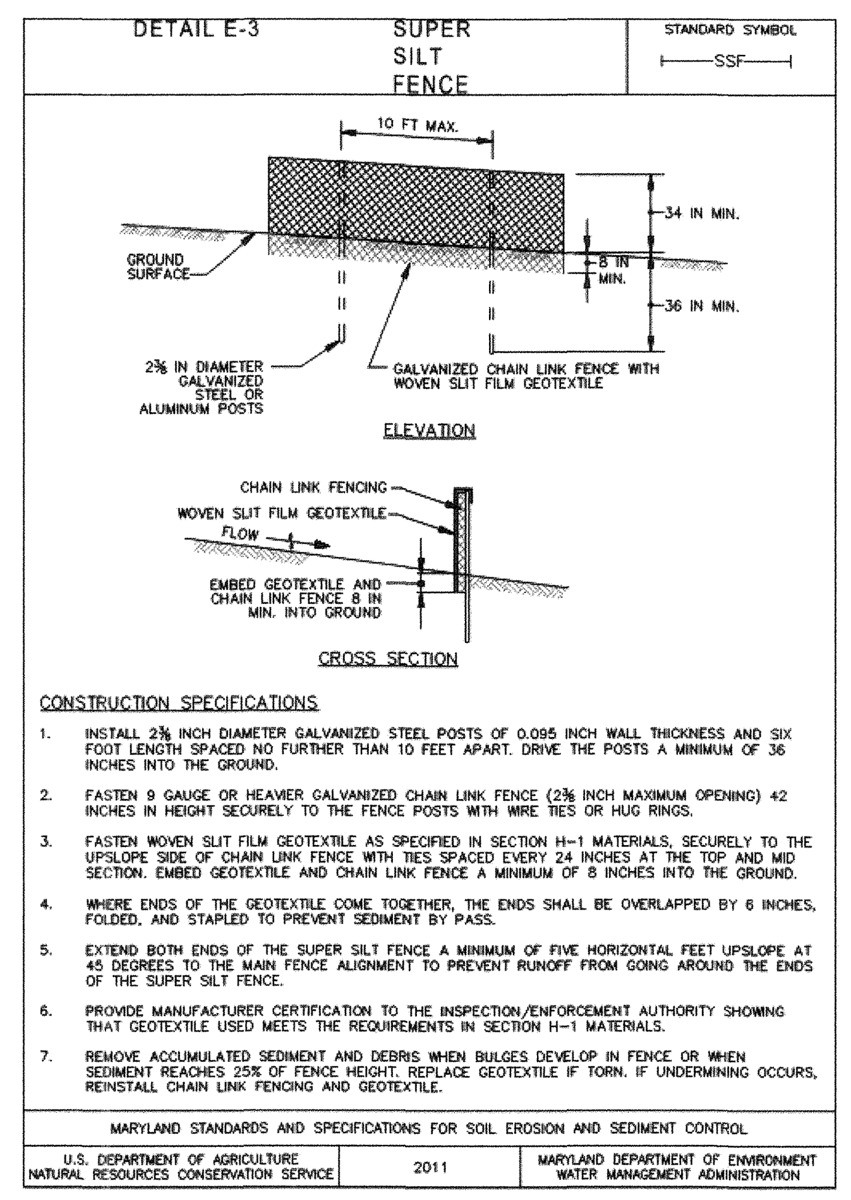
EROSION AND SEDIMENT CONTROL NOTES

PROJECT NO.: 121104.64
SCALE: N.T.S. DATE: 12/26/19
DESIGN: SH DRAWN: JT CHECK: CL
DWG NO: SC-03 OF SC-05

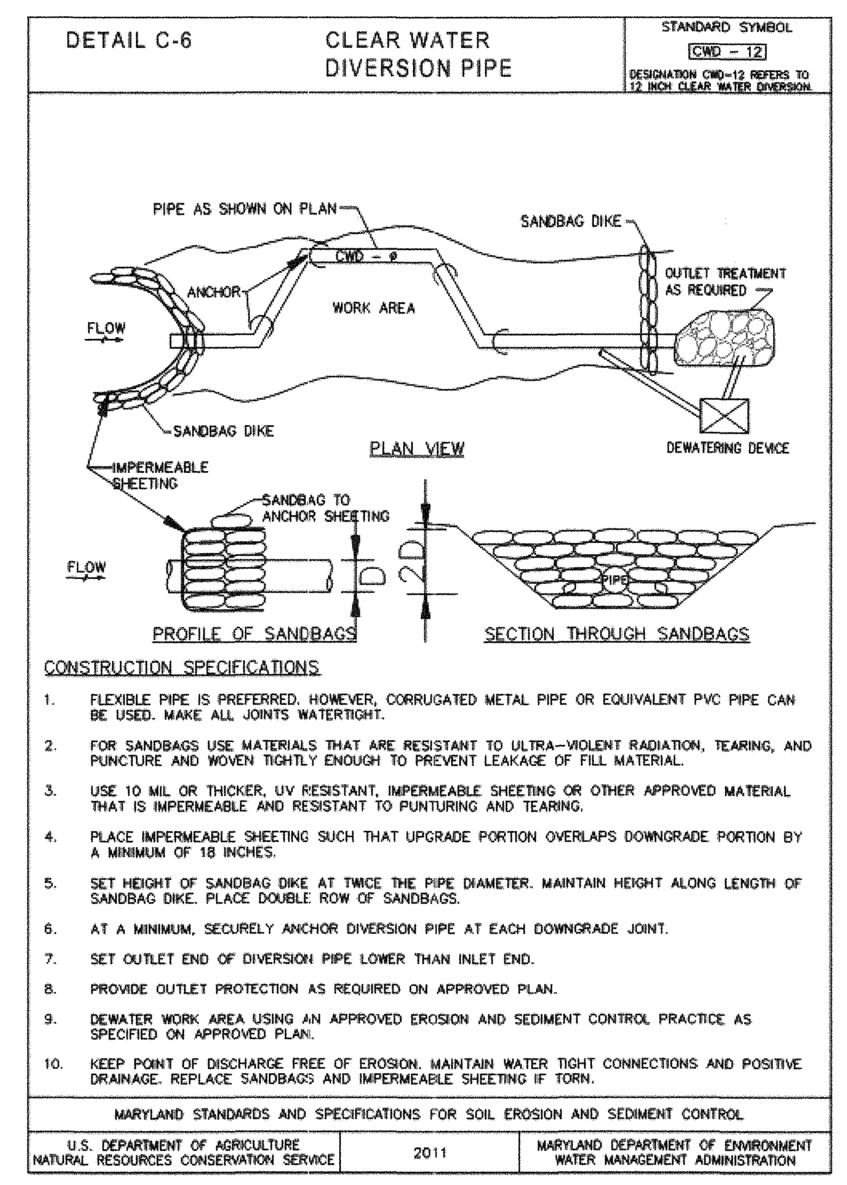
DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

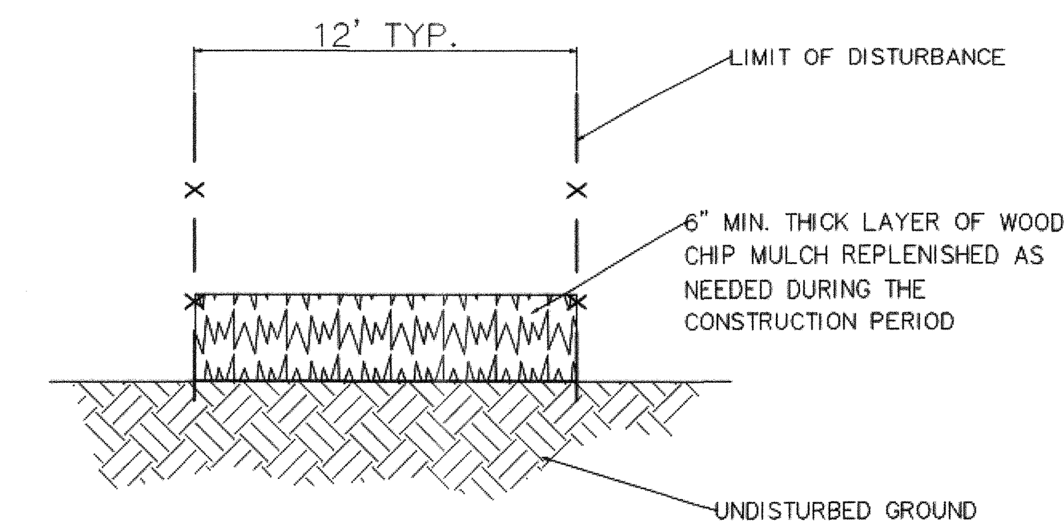


DETAIL E-3 SUPER SILT FENCE



DETAIL C-6 CLEAR WATER DIVERSION PIPE

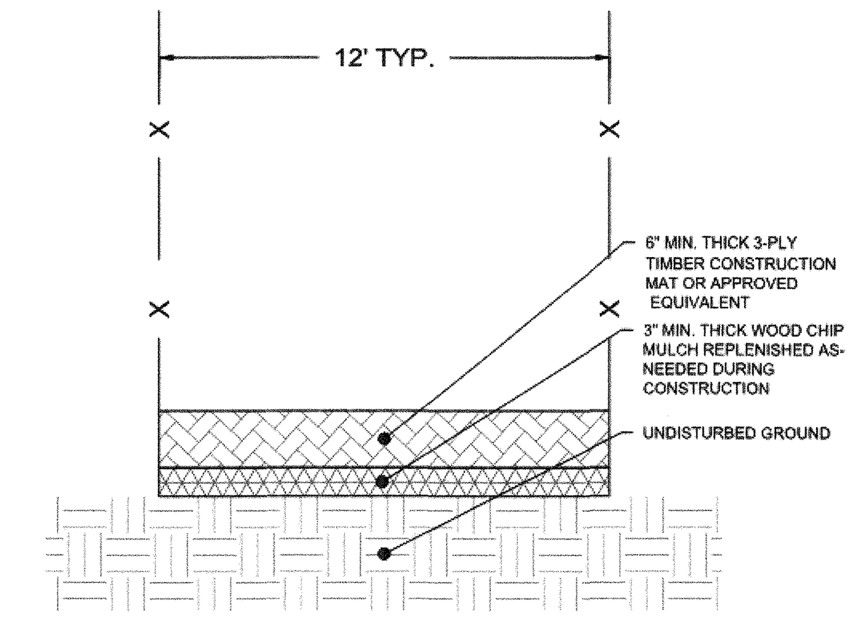




1. MULCH SHALL BE PLACED PRIOR TO HEAVY EQUIPMENT UTILIZING THE ACCESS ROAD.
2. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
3. CONTRACTOR SHALL MAINTAIN MULCH THROUGHOUT CONSTRUCTION PERIOD. UPON COMPLETION OF THE PROJECT, MULCH CAN REMAIN IN PLACE AT A MAX. DEPTH OF 2".
4. SCARIFICATION OF COMPACTED MULCH TO OCCUR UPON REMOVAL OF ACCESS ROUTE. AT DIRECTION OF ENGINEER.
5. THE ACCESS ROUTE IS DESIGNED TO PREVENT COMPACTION OF EXISTING SOILS USING LOW PRESSURE EQUIPMENT WHICH EXERTS NO MORE THAN 8 PSI. IF THE CONTRACTOR INTENDS TO USE ANY EQUIPMENT WITH HIGHER LOADS, ADDITIONAL PROTECTION MEASURES MUST BE PROVIDED, AT NO ADDITIONAL COST TO THE COUNTY, AND THOSE MEASURES MUST BE APPROVED BY THE ENGINEER AND MDE PRIOR TO IMPLEMENTATION.

TEMPORARY ACCESS ROUTE - MULCH ONLY DETAIL

NOT TO SCALE

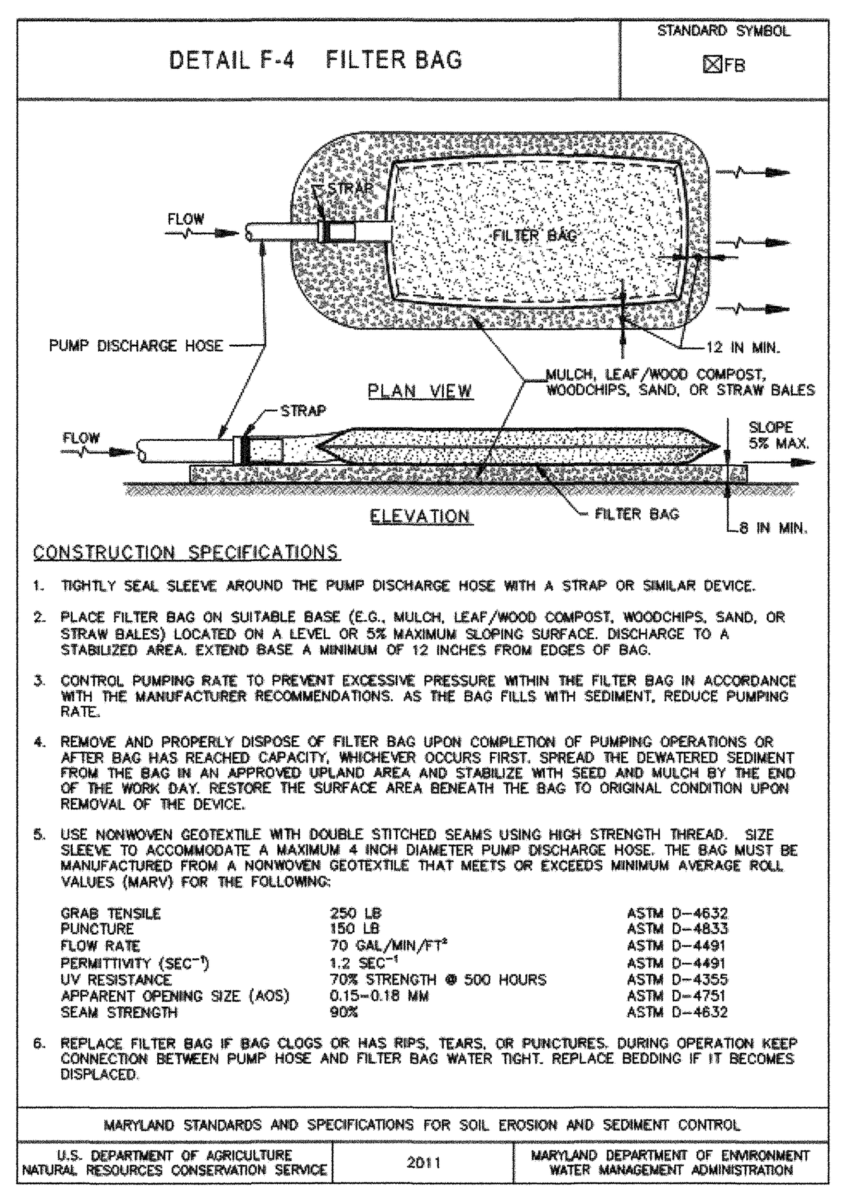


NOTES:
1. TIMBER MATS TO BE INSTALLED AS NEEDED AS SHOWN ON THE APPROVED PLAN AND OVER CRITICAL ROOT ZONES OF TREES, IN WETLANDS, AND OVER SANITARY PIPES AT THE DIRECTION OF THE ENGINEER.
2. MULCH AND TIMBER MATS SHALL BE PLACED PRIOR TO HEAVY EQUIPMENT TRAVERSING THE ACCESS ROUTE.
3. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND INSPECTORS.
5. THE CONTRACTOR SHALL MAINTAIN MULCH MAT THROUGHOUT CONSTRUCTION. UPON COMPLETION OF THE PROJECT, THE MULCH AND TIMBER MATTING SHALL BE REMOVED IN THEIR ENTIRETY AND THE ACCESS ROUTE RESTORED TO PRE-CONSTRUCTION CONDITION UNLESS OTHERWISE NOTED ON THE PLANS OR DIRECTED BY THE ENGINEER.

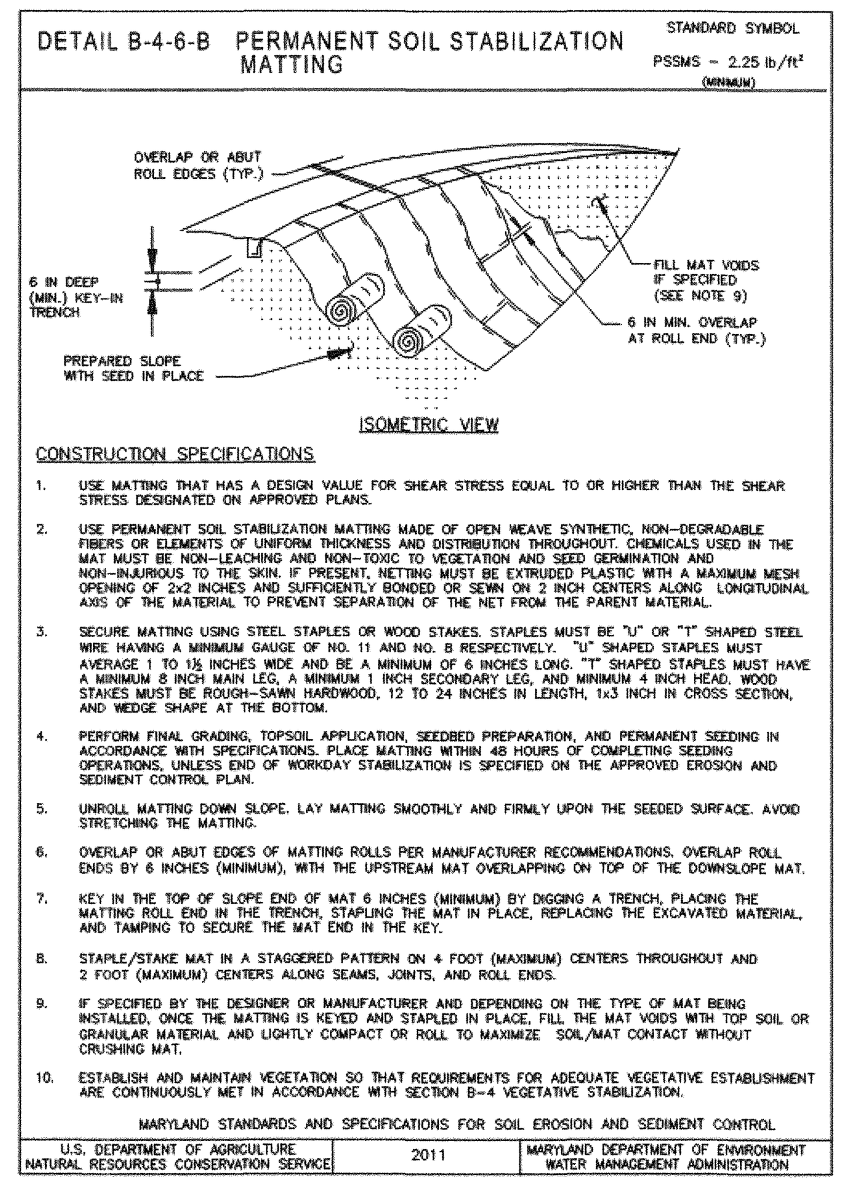
TEMPORARY TIMBER MATTING AND MULCH ACCESS ROUTE DETAIL

SCALE: N.T.S.

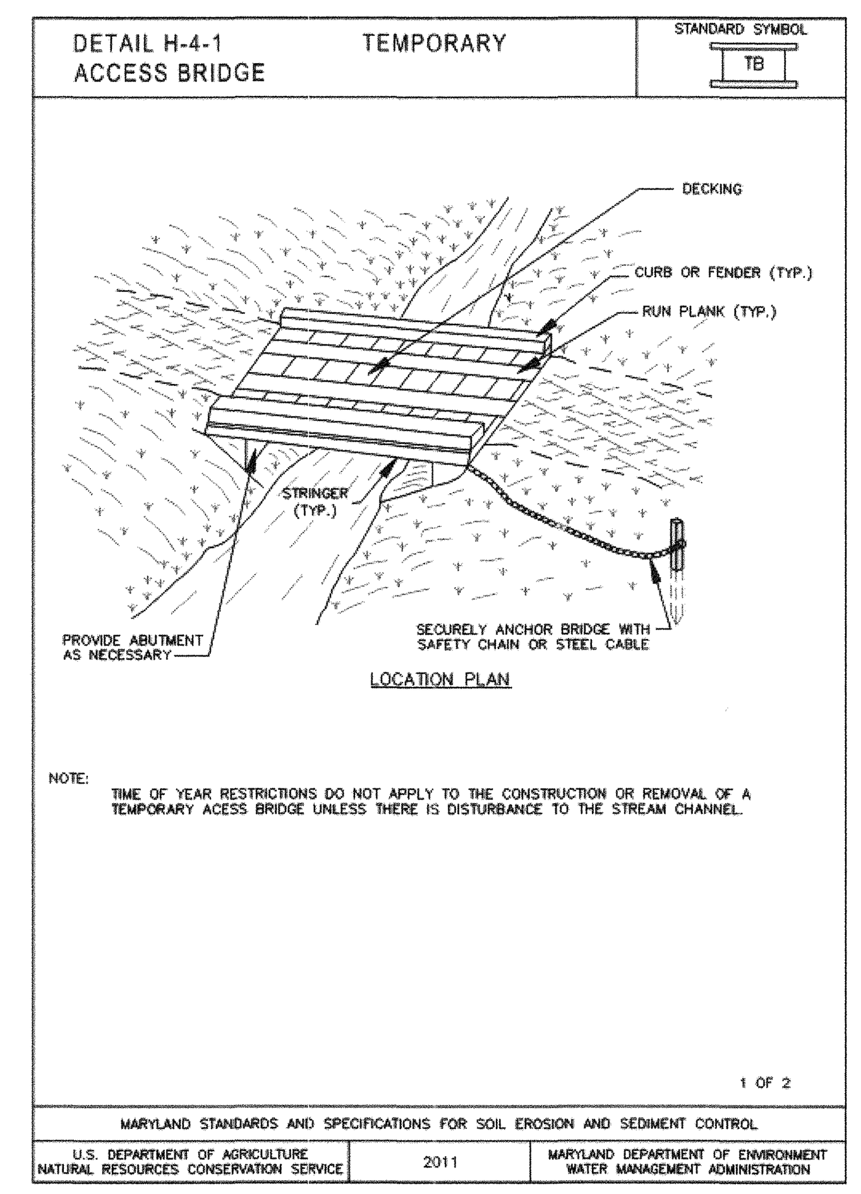
DETAIL F-4 FILTER BAG



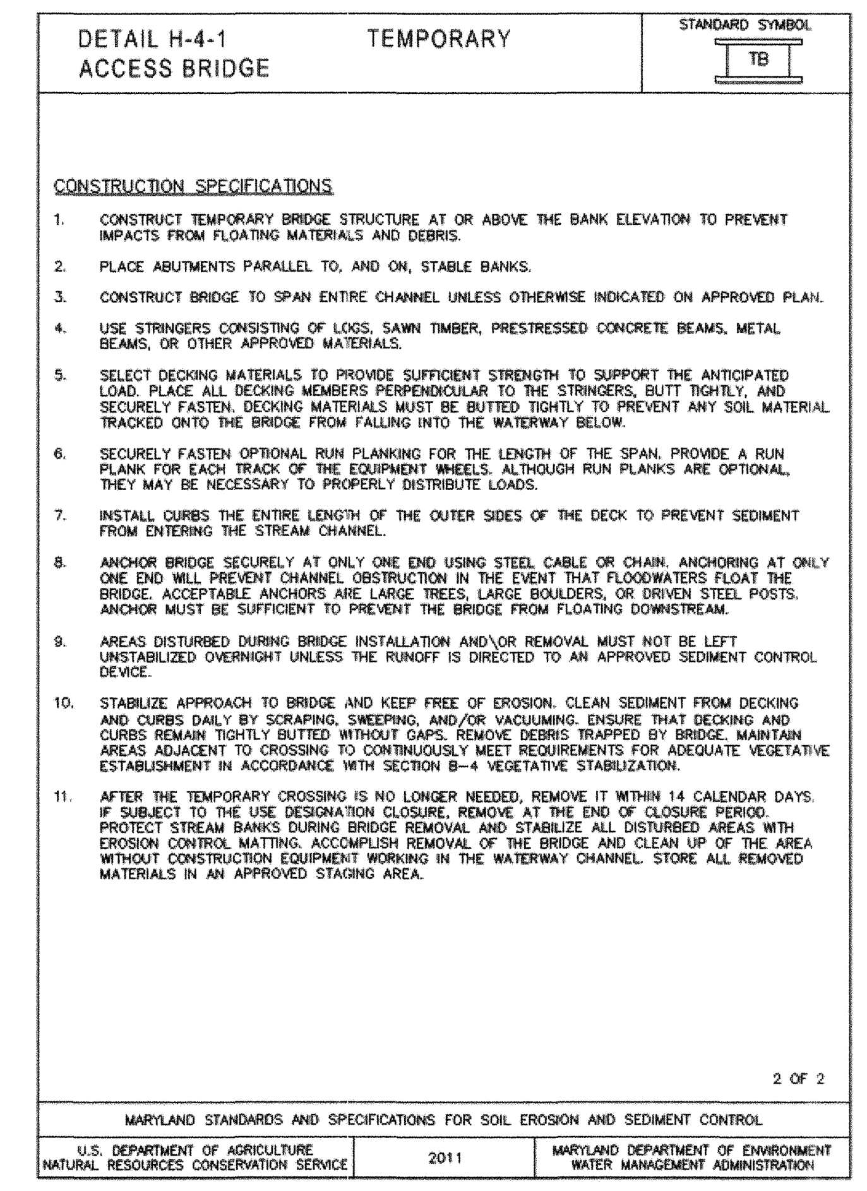
DETAIL B-4-6-B PERMANENT SOIL STABILIZATION MATTING



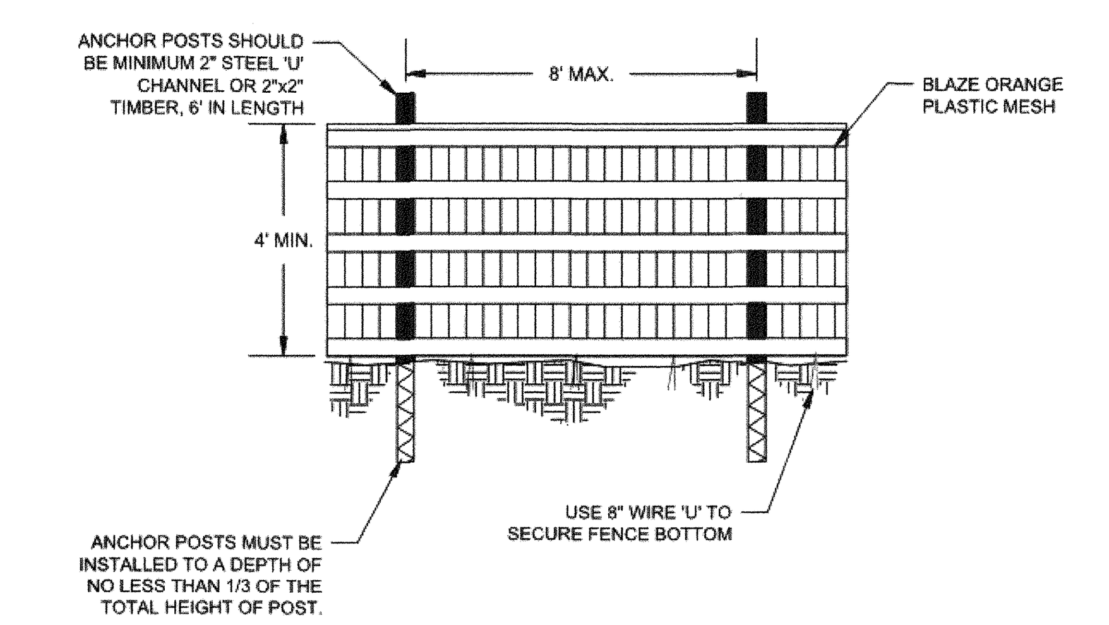
DETAIL H-4-1 TEMPORARY ACCESS BRIDGE (1 OF 2)



DETAIL H-4-1 TEMPORARY ACCESS BRIDGE (2 OF 2)



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



BLAZE ORANGE PLASTIC FENCE

NOT TO SCALE

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. AVOID DAMAGE TO CRITICAL ROOT ZONES. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING.
4. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

TABLE B.7: SOIL STABILIZATION ON SLOPES

SLOPE	20:1 OR FLATTER (<=5%)			<20:1 TO 4:1 (>5-25%)			<4:1 TO 3:1 (>25-33%)			<3:1 TO 2.5:1 (>33 - 40%)			<2.5:1 TO 2:1** (>40-50%)		
SLOPE LENGTH (FEET)*	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120	0-30	30-60	60-120
STRAW MULCH/WOOD CELLULOSE FIBER	[shaded]	[shaded]	[shaded]	[shaded] FOR K<= 0.35***	[shaded]	[shaded]	[shaded]	[shaded]							
TEMPORARY MATTING WITH DESIGN STRESS >= 1.5 PSF	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]						
TEMPORARY MATTING WITH DESIGN SHEAR STRESS >= 1.75 PSF	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]				
TEMPORARY MATTING WITH DESIGN SHEAR STRESS >= 2.0 PSF	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]		
→ TEMPORARY MATTING WITH DESIGN SHEAR STRESS >= 2.25 PSF	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	[shaded]	X	[shaded]	[shaded]

** SLOPE LENGTH INCLUDES CONTRIBUTING FLOW LENGTH*

*** SLOPES STEEPER THAN 2:1 MUST BE ENGINEERED.*

**** SOIL HAVING A K FACTOR LESS THAN OR EQUAL TO 0.35 CAN BE STABILIZED EFFECTIVELY WITH STRAW MULCH OR WOOD CELLULOSE FIBER WHEN LOCATED ON SLOPES STEEPER THAN 5%. SOIL STBAILIZATION MATTING IS REQUIRED ON ALL SLOPES STEEPER THAN 5% THAT HAVE SOIL WITH A K FACTOR GREATER THAN 0.35.*

THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

[signature] 1/2/20
HOWARD SOIL CONSERVATION DISTRICT — DATE

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND — CRAIG A. LYNCH — NO. 28371 — PROFESSIONAL ENGINEER — 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
[signature] 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

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 #: 28371 EXPIRES: 01/01/2021

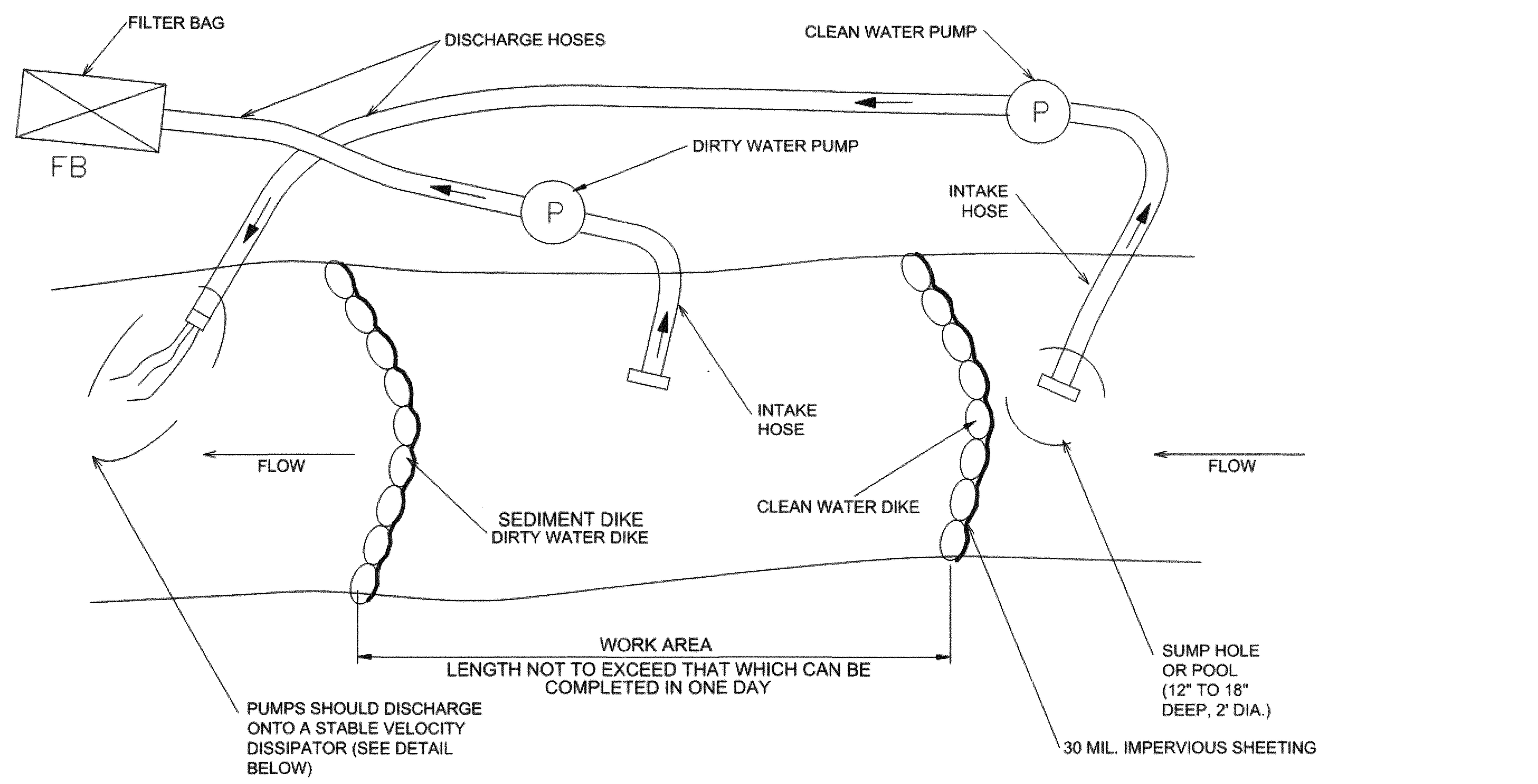
REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

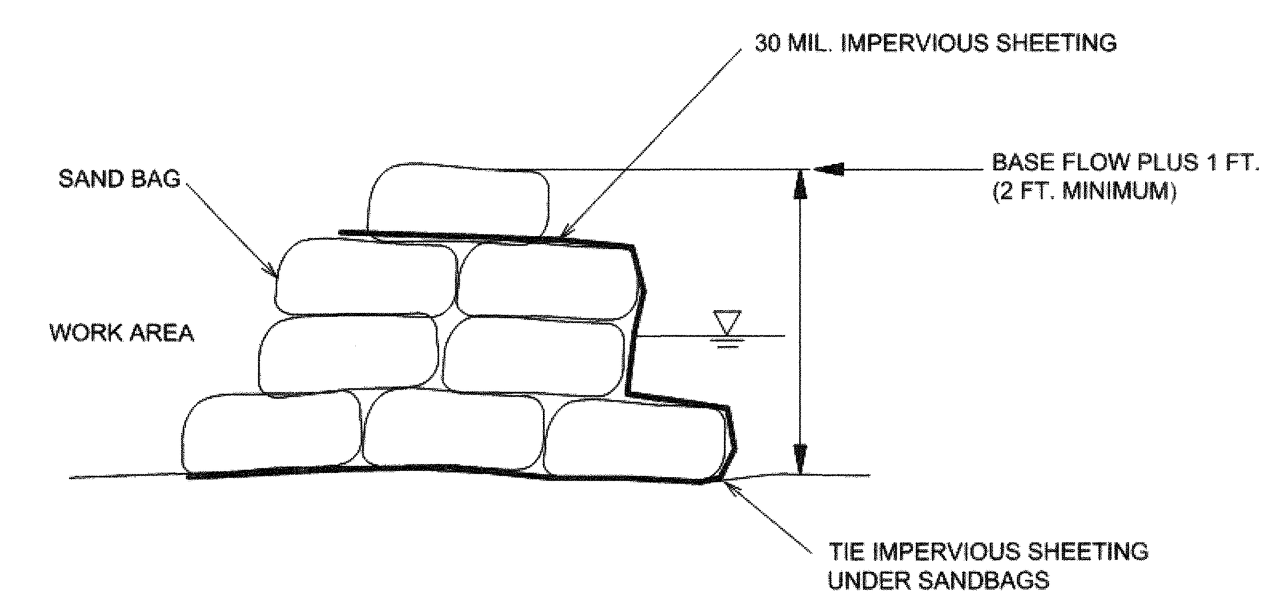
EROSION AND SEDIMENT CONTROL DETAILS

PROJECT NO.: 121104.64	
SCALE: N.T.S.	DATE: 12/26/19
DESIGN: SH	DRAWN: JT · CHECK: CL
DWG NO: SC-04 OF SC-05	
SHEET NO: 16 OF 22	



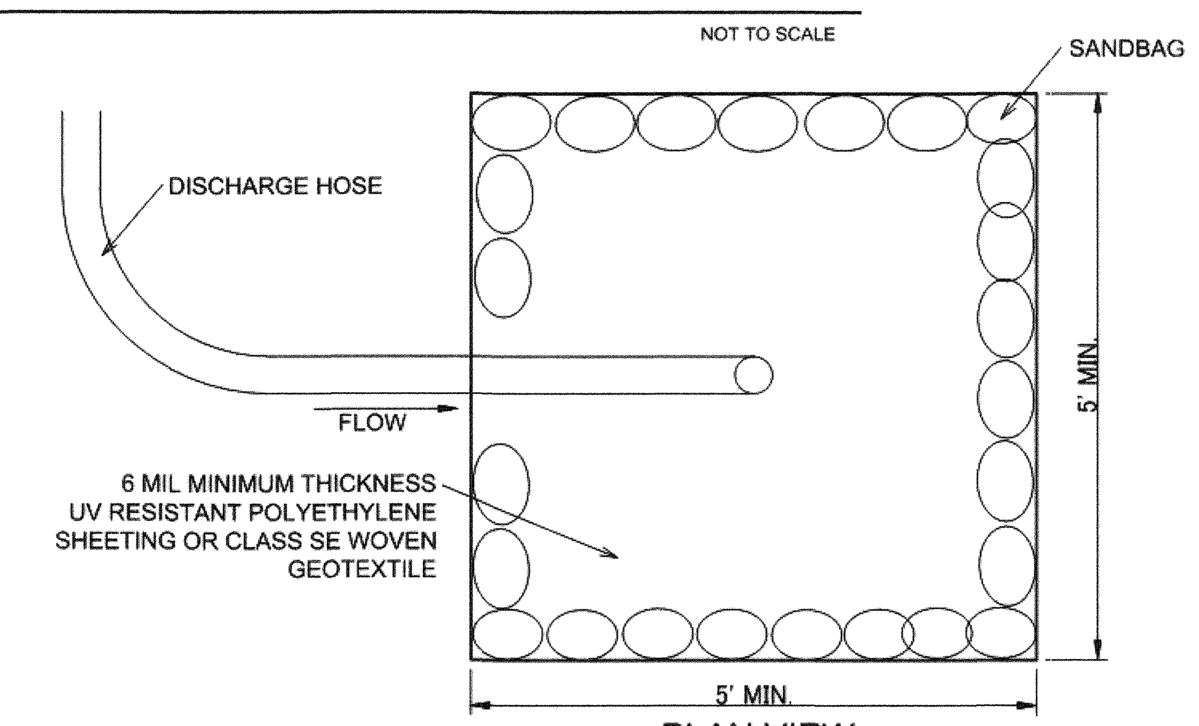
SANDBAG DIVERSION, WITH PUMP AROUND PRACTICE - PLAN VIEW

NOT TO SCALE



SANDBAG DIVERSION, WITH PUMP AROUND PRACTICE - TYPICAL CROSS SECTION

NOT TO SCALE



PLAN VIEW

NOTES:
1. PLACE DISCHARGE HOSE IN CENTER OF OUTLET PROTECTION.
2. OUTLET PROTECTION SHALL BE LOCATED INSIDE THE LOD.

OUTLET PROTECTION (OP)

NOT TO SCALE

MGWC 1.2: PUMP-AROUND PRACTICE

DESCRIPTION THE WORK SHALL CONSIST OF INSTALLING A TEMPORARY PUMP AROUND AND SUPPORTING MEASURES TO DIVERT FLOW AROUND INSTREAM CONSTRUCTION SITES.

IMPLEMENTATION SEQUENCE SEDIMENT CONTROL MEASURES, PUMP-AROUND PRACTICES, AND ASSOCIATED CHANNEL AND BANK CONSTRUCTION SHALL BE COMPLETED IN THE FOLLOWING SEQUENCE (REFER TO DETAIL 1.2):

1. CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT BEGIN UNTIL ALL NECESSARY EASEMENTS AND/OR RIGHT-OF-WAYS HAVE BEEN ACQUIRED. ALL EXISTING UTILITIES SHALL BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT MAY RESULT FROM CONSTRUCTION AND SHALL REPAIR THE DAMAGE AT HIS/HER OWN EXPENSE TO THE COUNTY'S OR UTILITY COMPANY'S SATISFACTION.

2. THE CONTRACTOR SHALL NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT OR WMA SEDIMENT CONTROL INSPECTOR AT LEAST 5 DAYS BEFORE BEGINNING CONSTRUCTION. ADDITIONALLY, THE CONTRACTOR SHALL 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 SHALL 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 SHALL 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 SHALL NOT BE REMOVED WITHIN THE LIMIT OF DISTURBANCE WITHOUT APPROVAL FROM THE WMA OR LOCAL AUTHORITY.

4. 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 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 SHALL 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 SHALL 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 SHALL NOT BE CONDUCTED IN THE CHANNEL DURING RAIN EVENTS.

6. SANDBAG DIKES SHALL BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA AS SHOWN ON THE PLANS, AND STREAM FLOW SHALL BE PUMPED AROUND THE WORK AREA. THE PUMP SHALL DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANDBAGS. TEMPORARY MEASURE FOR DEWATERING INCHANNEL CONSTRUCTION SITES.

7. WATER FROM THE WORK AREA SHALL BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN, SEDIMENT BAG, OR OTHER APPROVED SOURCE. THE MEASURE SHALL 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 SHALL BE AVOIDED. IF EQUIPMENT HAS TO TRAVERSE SUCH A REACH FOR ACCESS TO ANOTHER AREA, THEN TIMBER MATS OR SIMILAR MEASURES SHALL BE USED TO MINIMIZE DISTURBANCE TO THE CHANNEL. TEMPORARY STREAM CROSSINGS SHALL BE USED ONLY WHEN NECESSARY AND SHALL BE USED ONLY WHERE NOTED ON THE PLANS OR SPECIFIED. (SEE SECTION 4, STREAM CROSSINGS, MARYLAND GUIDELINES TO WATERWAY CONSTRUCTION).

9. ALL STREAM RESTORATION MEASURES SHALL 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 SHALL BE REMOVED. AFTER THE FIRST SEDIMENT FLUSH, A NEW CLEAN WATER DIKE SHALL BE ESTABLISHED UPSTREAM FROM THE OLD SEDIMENT DIKE. FINALLY, UPON ESTABLISHMENT OF A NEW SEDIMENT DIKE BELOW THE OLD ONE, THE OLD SEDIMENT DIKE SHALL BE REMOVED.

11. A PUMP AROUND MUST BE INSTALLED ON ANY TRIBUTARY OR STORM DRAIN OUTFALL WHICH CONTRIBUTES BASEFLOW TO THE WORK AREA. THIS SHALL 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 SHALL DISCHARGE ONTO THE SAME VELOCITY DISSIPATER USED FOR THE MAIN STEM PUMP AROUND.

12. IF A TRIBUTARY IS TO BE RESTORED, CONSTRUCTION SHALL TAKE PLACE ON THE TRIBUTARY BEFORE WORK ON THE MAIN STEM REACHES THE TRIBUTARY CONFLUENCE. CONSTRUCTION IN THE TRIBUTARY, INCLUDING PUMP AROUND PRACTICES, SHALL 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 SHALL RESUME. WATER FROM THE TRIBUTARY SHALL 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 SHALL BE REGRADED AND REVEGETATED AS PER THE PLANTING PLAN.

15. IF, IN THE JUDGMENT OF THE ENGINEER, INADEQUATE ENERGY DISSIPATION OR CHANNEL BED EROSION IS OCCURRING, THE CONTRACTOR SHALL BE REQUIRED TO INCREASE THE MATERIAL OR PLACEMENT SIZE OF THE OUTFALL PROTECTION AT THE DIRECTION OF THE ENGINEER.

16. THE CONDITION OF THE OUTLET PROTECTION SANDBAGS IS TO BE CHECKED TWICE PER DAY (START OF WORK DAY AND MID-DAY) TO ENSURE THAT SAND IS NOT ESCAPING BAGS. DAMAGED OR LEAKING BAGS ARE TO BE REMOVED AND REPLACED.

17. OUTFALL PROTECTION MATERIALS AND GEOTEXTILE SHALL BE REMOVED FROM THE CHANNEL AT THE COMPLETION OF EACH CONSTRUCTION STAGE.

THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

1/2/20

HOWARD SOIL CONSERVATION DISTRICT — DATE

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND — CRAIG A. LYNCH — NO. 28371 — PROFESSIONAL ENGINEER
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

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 #: 28371 EXPIRES: 01/01/2021

REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

EROSION AND SEDIMENT CONTROL DETAILS

PROJECT NO.: 121104.64		
SCALE: N.T.S.	DATE: 12/26/19	
DESIGN: SH	DRAWN: JT	CHECK: CL
DWG NO: SC-05 OF SC-05		

SURVEYED TREES DATA TABLE
(TREES ≥ 12" DBH)

Tree #	Species	DBH (in.)	Condition
1	Scarlett oak	25.4	Good
2	Sugar maple	15.5	Good
3	Black walnut	14	Good
4	River birch	20	Good
5	River birch	13.2	Good
6	River birch	16.4	Good
7	Black Willow	13.6	Fair
8	Black Willow	17.5	Fair
9	Tulip Poplar	29	Fair
10	Tulip Poplar	13.2	Good
11	Tulip Poplar	21.1	Good
12	Black walnut	15.4	Fair
13	Tulip Poplar	14.1	Good
14	Tulip Poplar	14	Good
15	Tulip Poplar	15	Good
16	Tulip Poplar	12.4	Good
17	Tulip Poplar	15.6	Good
18	Black walnut	14.6	Good
19	Tulip Poplar	16	Good
28	White Pine	13	Good
29	White Pine	18	Good
30	White Pine	15	Good
31	White Pine	19.7	Good
32	White Pine	20.8	Good
33	White Pine	18.3	Good
34	White Pine	16	Good
35	White Pine	20.5	Good
36	White Pine	12.3	Good
37	White Pine	12.7	Good
38	White Pine	15.6	Good
39	White Pine	13.4	Good
40	White Pine	14.1	Good
41	White Pine	15	Good
42	White Pine	13.8	Good
43	White Pine	16.1	Good
44	White Pine	15.7	Good
45	White Pine	22	Good
46	Tulip Poplar	32.9	Good
47	Tulip Poplar	13.8	Good
48	Tulip Poplar	13.1	Good
49	Tulip Poplar	125	Good
51	Tulip Poplar	26.1	Good
50	Tulip Poplar	25.9	Good
52	Mockernut hickory	15.2	Good
53	Tulip Poplar	20.7	Good
54	Tulip Poplar	13.9	Good
57	Tulip Poplar	31.8	Fair
58	Red Maple	14.9	Good
59	Tulip Poplar	19	Good
60	Tulip Poplar	19.9	Good
61	Tulip Poplar	16.1	Good
62	Tulip Poplar	15.3	Good

Tree #	Species	DBH (in.)	Condition
63	Tulip Poplar	12	Good
64	Tulip Poplar	13.5	Good
65	Tulip Poplar	15.8	Good
66	Tulip Poplar	20.9	Good
67	Tulip Poplar	13.1	Good
68	Tulip Poplar	18.8	Good
71	Tulip Poplar	24.5	Good
73	Mockernut Hickory	15.8	Good
74	Tulip Poplar	22.8	Good
75	Tulip Poplar	33.9	Good
77	White Oak	27.6	Good
78	Tulip Poplar	36.1	Good
79	Tulip Poplar	33.8	Good
80	Tulip Poplar	35.9	Fair
81	Tulip Poplar	24.2	Good
82	Tulip Poplar	44.4	Fair
83	Tulip Poplar	32	Fair
85	Northern Red Oak	29.6	Good
86	Northern Red Oak	20.8	Good
87	Tulip Poplar	31.8	Good
88	Tulip Poplar	20.5	Good
89	Northern Red Oak	16.6	Good
90	White Oak	17.9	Good
91	Red Maple	13.7	Good
92	Tulip Poplar	21	Fair
93	Tulip Poplar	23.7	Fair
94	Tulip Poplar	21.7	Poor
96	Tulip Poplar	35.5	Fair
97	Tulip Poplar	18.9	Good
98	White Oak	15.1	Fair
99	Northern Red Oak	23.7	Good
100	Black Oak	16.3	Good
101	Northern Red Oak	19.8	Good
102	Tulip Poplar	26.7	Good
103	Tulip Poplar	30.5	Fair
104	Tulip Poplar	15.2	Fair
105	White Oak	21.2	Fair
106	Tulip Poplar	28.8	Good
107	Tulip Poplar	16.1	Good
108	Tulip Poplar	19	Good
109	Tulip Poplar	20.6	Good
110	Tulip Poplar	39.8	Fair
111	White Oak	15.9	Good
112	Red Maple	24	Fair
113	Red Maple	17.5	Fair
114	Red Maple	14.6	Good
115	Tulip Poplar	33	Fair
116	White Oak	17.8	Fair
117	Tulip Poplar	13.2	Poor
118	Tulip Poplar	22.7	Good
119	White Oak	15.7	Good
120	Mockernut Hickory	16	Good

Tree #	Species	DBH (in.)	Condition
121	White Oak	20	Good
122	Northern Red Oak	25	Good
123	Northern Red Oak	25.2	Good
124	Northern Red Oak	19.8	Good
127	White Oak	25.6	Good
128	White Oak	21.4	Good
129	Red Maple	21.3	Fair
130	Tulip Poplar	40.6	Good
131	White Oak	31	Good
132	Tulip Poplar	23.8	Good
133	Black Walnu	19.9	Good
134	Tulip Poplar	29	Good
135	Tulip Poplar	26.3	Good
138	Mockernut Hickory	14.4	Good
139	Tulip Poplar	25.1	Good
140	Northern Red Oak	23.4	Good
141	White Oak	14.6	Good
142	Tulip Poplar	31.1	Good
143	Mockernut Hickory	14.7	Good
144	Mockernut Hickory	13.7	Good
145	Mockernut Hickory	14.1	Good
146	Red Maple	20.4	Good
148	Northern Red Oak	21.9	Poor
149	Tulip Poplar	221	Poor
150	Tulip Poplar	34	Fair
151	Red Maple	12	Poor
152	Red Maple	19	Poor
153	Tulip Poplar	15.9	Good
155	White Oak	31.5	Good
156	Tulip Poplar	23	Fair
157	Red Maple	17.7	Good
158	Tulip Poplar	20.5	Good
159	Tulip Poplar	14.2	Good
160	Tulip Poplar	17.9	Good
161	Tulip Poplar	25.4	Good
162	Tulip Poplar	17.4	Fair
163	Tulip Poplar	15	Fair
164	Red Maple	22.2	Good
165	Tulip Poplar	18.4	Good
166	Red Maple	27.3	Fair
167	Red Maple	16	Fair
168	Black Cherry	14.1	Good
169	Tulip Poplar	14.2	Good
170	Red Maple	18.5	Good
171	Tulip Poplar	18.5	Good
172	Tulip Poplar	15.8	Good
173	Red Maple	20.8	Fair
174	Tulip Poplar	30.1	Fair
176	Red Maple	15.3	Fair
177	Red Maple	25.1	Fair
179	Tulip Poplar	14	Fair
180	Red Maple	19.2	Fair

Tree #	Species	DBH (in.)	Condition
181	Mockernut Hickory	21.2	Fair
182	Tulip Poplar	12.7	Good
185	White Oak	20.3	Fair
186	Tulip Poplar	17.2	Good
187	Tulip Poplar	23.3	Good
188	Tulip Poplar	13.5	Poor
189	Tulip Poplar	244	Good
190	Red Maple	17	Good
191	Red Maple	16.4	Good
192	Red Maple	14	Good
193	Black Cherry	15	Fair
194	Red Maple	20.6	Good
195	Tulip Poplar	21.2	Good
196	Black Cherry	12.2	Good
197	Tulip Poplar	17.3	Good
198	Tulip Poplar	23.2	Good
199	Red Maple	22.8	Good
200	Tulip Poplar	22.2	Fair
201	Tulip Poplar	18.3	Fair
202	Red Maple	13.6	Fair
202	Black gum	16.1	Fair
203	Tulip Poplar	16.5	Good
204	Red Maple	18.6	Good
205	Red Maple	20	Good
206	Tulip Poplar	20.2	Good
207	Tulip Poplar	13.2	Good
209	White Oak	16.8	Good
211	White Oak	26.5	Fair
212	Black gum	16.1	Fair
213	Tulip Poplar	24.8	Good
214	Tulip Poplar	20	Good
215	Tulip Poplar	20.6	Good
216	Tulip Poplar	20.6	Good
217	Tulip Poplar	20.6	Good
218	Tulip Poplar	17	Good
219	Black Walnu	13.6	Fair
221	Tulip Poplar	20.8	Good
222	Tulip Poplar	16.9	Good
223	Tulip Poplar	22.3	Fair
225	Tulip Poplar	13	Good
226	Tulip Poplar	19.7	Good
227	Black walnu	16.1	Fair
228	Tulip Poplar	38.2	Poor
229	Tulip Poplar	18.6	Good
230	Tulip Poplar	14.2	Good
232	Tulip Poplar	18.5	Good
233	Tulip Poplar	18.5	Good
237	Tulip Poplar	14.8	Good
238	Tulip Poplar	14.8	Good
239	Tulip Poplar	15	Good
240	Tulip Poplar	234	Good
241	Tulip Poplar	15.8	Good

Tree #	Species	DBH (in.)	Condition
245	Tulip Poplar	28.8	Good
248	Tulip Poplar	19.2	Good
249	Tulip Poplar	19.1	Good
250	Tulip Poplar	18.1	Good
251	Tulip Poplar	20.5	Good
252	Red Maple	12.5	Good
253	Tulip Poplar	12.7	Good
254	Tulip Poplar	15.5	Good
259	Tulip Poplar	12.2	Good
260	Tulip Poplar	16	Good
261	Tulip Poplar	17.1	Good
262	Tulip Poplar	20.1	Good
263	Tulip Poplar	14.5	Good
264	Tulip Poplar	15.8	Good
265	Tulip Poplar	18.5	Good
266	Tulip Poplar	20.1	Good
268	Tulip Poplar	20.8	Good
269	Tulip Poplar	21.9	Good
270	Tulip Poplar	17.2	Good
271	Tulip Poplar	19.5	Good
272	Tulip Poplar	19.4	Good
273	Tulip Poplar	12.1	Good
274	Tulip Poplar	14.4	Good
275	Tulip Poplar	22	Good
276	Black walnu	17.4	Poor
277	Tulip Poplar	27.8	Good
278	Tulip Poplar	20.4	Good
279	Tulip Poplar	12.3	Good
280	Tulip Poplar	22.9	Good
281	Tulip Poplar	13.8	Good
282	Tulip Poplar	23.6	Good
283	Tulip Poplar	18.1	Good
284	Tulip Poplar	23	Good
285	Red Maple	13.2	Good
286	Red Maple	13.5	Good
287	Tulip Poplar	14.8	Good
288	Tulip Poplar	16.5	Good
291	Tulip Poplar	15.2	Good
292	Tulip Poplar	19.6	Good
293	Tulip Poplar	18.3	Good
295	Northern Red Oak	31	Good

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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 #: 28371 EXPIRES: 01/01/2021

REVISIONS

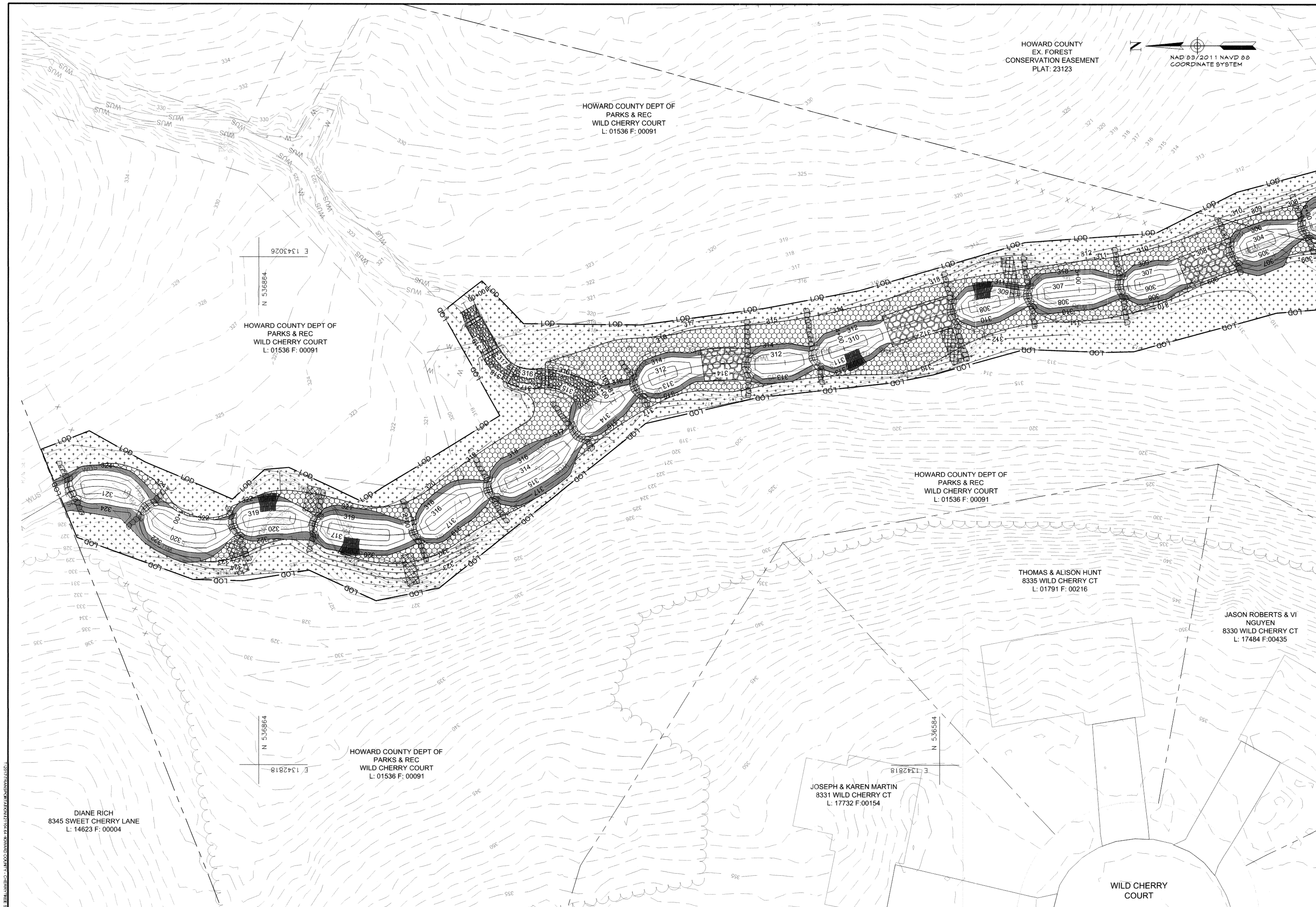
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

SURVEYED TREE LIST

PROJECT NO. 121104.64
SCALE N.T.S. DATE 12/30/19
DESIGN SH DRAWN JT CHECK CL
DWG NO. TR-01 OF TR-01
SHEET NO. 18 OF 22



20' 0 20' 40'
ORIGINAL SCALE: 1"=20'

STABILIZATION NOTE:
ALL DISTURBED SLOPES GREATER THAN 4:1 AND SENSITIVE AREAS (STREAM BUFFER, FLOODPLAIN, STEEP (>20%) SLOPES, HIGHLY ERODIBLE SOILS) MUST BE PERMANENTLY STABILIZED WITH SOIL STABILIZATION MATTING.

PROPOSED LANDSCAPE LEGEND

HERBACEOUS PLUG PLANTINGS: 1,804 SF / 0.04 AC
*EXTEND FROM THE EDGE OF STONE TO THE TOP OF GRADED STREAM BANK.

FLOODPLAIN BENCH PLANTINGS: 2,526 SF / 0.06 AC

RIPARIAN FOREST PLANTINGS: 20,011 SF / 0.46 AC

UPLAND MEADOW SEED ESTABLISHMENT: 11,457 SF / 0.26 AC

PROPOSED FEATURES LEGEND

LIMIT OF DISTURBANCE — LOD
1' MINOR CONTOUR
5' MAJOR CONTOUR — 305
WOODY HABITAT FEATURE (WHF)
BOULDER DROP STRUCTURE (BDS)
ROCK STEP STRUCTURE (RSS)
ARMORED RIFFLE (R)
CLASS 0 RIPRAP CHOKED WITH SILT AND GRAVEL
CLAY CHANNEL BLOCK (CCB)

EXISTING FEATURES LEGEND

EX. BUILDING
EX. NONTIDAL WETLAND
EX. WATERS OF THE U.S. — WUS
EX. FENCE
EX. PROPERTY BOUNDARY
EX. EASEMENT
EX. EDGE OF PAVEMENT
EX. GAS MAIN — G
EX. TREELINE
EX. CONCRETE DEBRIS
EX. RIPRAP
EX. CONCRETE MONUMENT
EX. TREE
EX. TRAVERSE POINT
EX. STORMDRAIN
EX. 1' MINOR CONTOUR
EX. 5' MAJOR CONTOUR — 305

ALL TREE AND WOODY PLANTINGS SHALL STRICTLY ADHERE TO THE FOLLOWING PLANTINGS OFFSETS:
*WATER, SANITARY SEWER, & STORMDRAIN PIPES - 7' PLUS ½ PIPE DIAMETER
*MANHOLES - 10'
*GAS PIPELINES - 10'
*BURIED WIRE - 5'
*RISER PIPES & STRUCTRES - 25'
*EXISTING TREES - 10' (APPLIES TO TREES ONLY)
*DAM EMBANKMENTS - 15'
*ROAD EDGE - 20'
**NO WOODY VEGETATION IS TO BE PLANTED DIRECTLY OVER ROCK STEP STRUCTURE SILLS.

NOTE:
NOT ALL FURNISHED STONE IS SHOWN IN PLAN VIEW. SEE THE STREAM RESTORATION DETAILS AND PROFILE FOR ADDITIONAL INFORMATION.

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL: STATE OF MARYLAND — CRAIG A. LYNCH — NO. 28371 — PROFESSIONAL ENGINEER
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
Mark S. Richmond 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE

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 #: 28371 EXPIRES: 01/01/2021

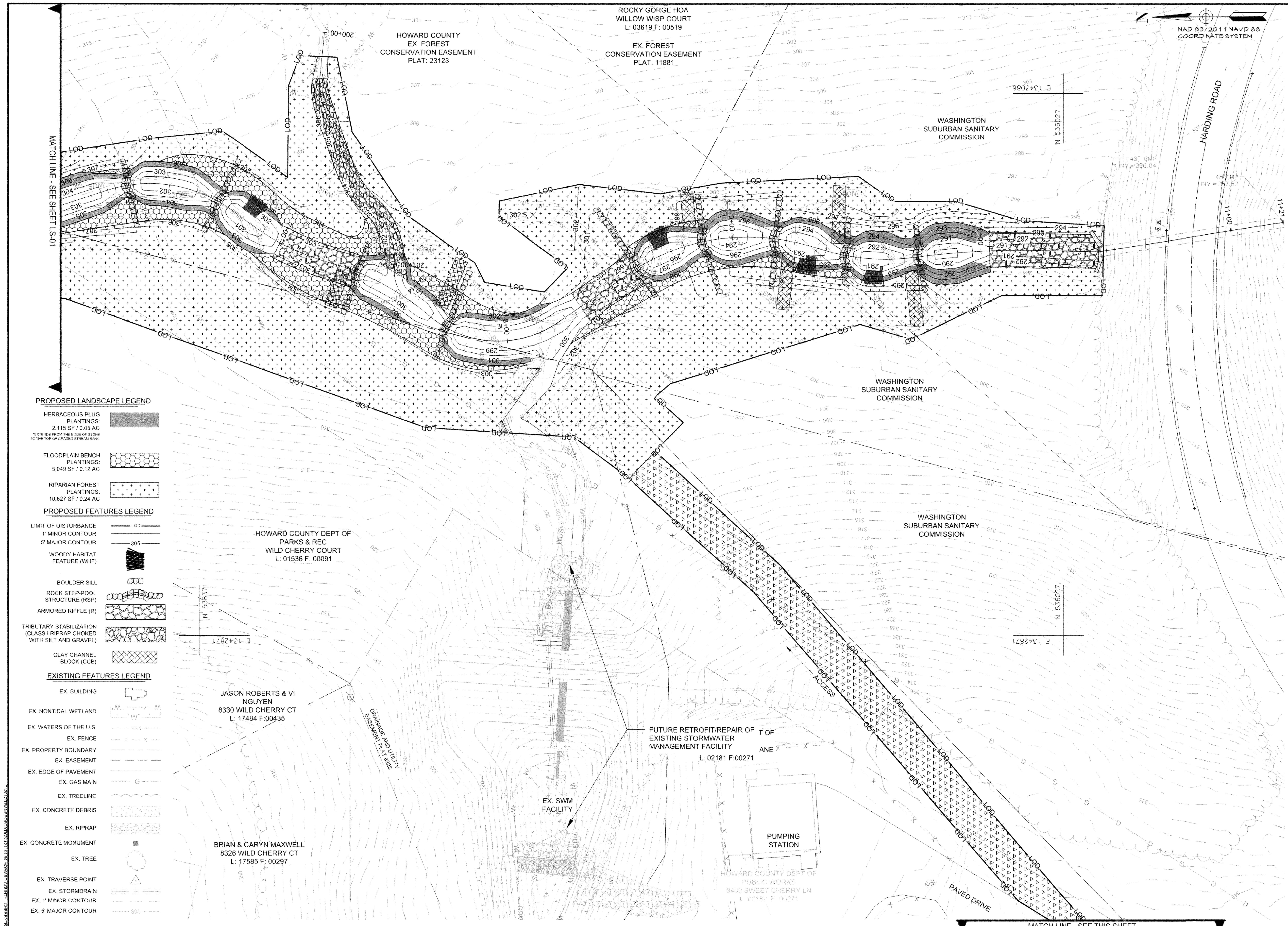
REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

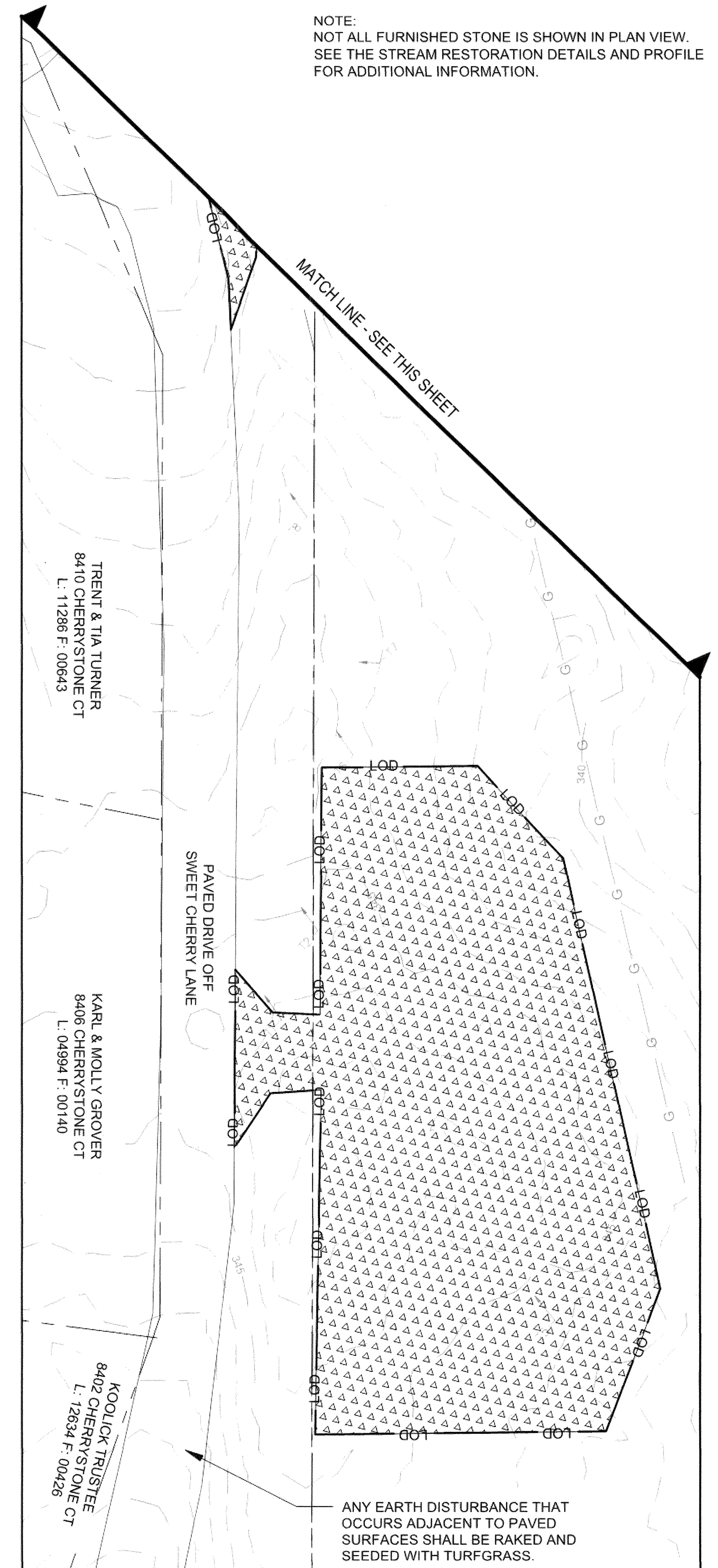
FINAL (100%) DESIGN

LANDSCAPE SHEET

PROJECT NO.: 121104.64		
SCALE: 1" = 20'	DATE: 12/30/19	
DESIGN: CR	DRAWN: JT	CHECK: EW
DWG NO: LS-01 OF LS-04		
SHEET NO: 19 OF 22		



ROCKY GORGE HOA
WILLOW WISP COURT
L: 03619 F: 00519
EX. FOREST CONSERVATION EASEMENT
PLAT: 11881
HOWARD COUNTY
EX. FOREST
CONSERVATION EASEMENT
PLAT: 23123
NAD 83/2011 NAVD 88 COORDINATE SYSTEM
MATCH LINE - SEE SHEET LS-01
WASHINGTON SUBURBAN SANITARY COMMISSION
HARDING ROAD
HOWARD COUNTY DEPT OF PARKS & REC
WILD CHERRY COURT
L: 01536 F: 00091
JASON ROBERTS & VI NGUYEN
8330 WILD CHERRY CT
L: 17484 F:00435
DRAINAGE AND UTILITY EASEMENT PLAT 6928
FUTURE RETROFIT/REPAIR OF EXISTING STORMWATER MANAGEMENT FACILITY
L: 02181 F:00271
EX. SWM FACILITY
PUMPING STATION
BRIAN & CARYN MAXWELL
8326 WILD CHERRY CT
L: 17585 F: 00297
ACCESS
PAVED DRIVE
MATCH LINE - SEE THIS SHEET



MATCH LINE - SEE THIS SHEET
TRENT & TIA TURNER
8410 CHERRYSTONE CT
L: 11286 F: 00643
PAVED DRIVE OFF SWEET CHERRY LANE
KARL & MOLLY GROVER
8406 CHERRYSTONE CT
L: 04994 F: 00140
KOOLICK TRUSTEE
8402 CHERRYSTONE CT
L: 12634 F: 00426
ANY EARTH DISTURBANCE THAT OCCURS ADJACENT TO PAVED SURFACES SHALL BE RAKED AND SEEDED WITH TURFGRASS.

SCALE: 1" = 20'

ALL TREE AND WOODY PLANTINGS SHALL STRICTLY ADHERE TO THE FOLLOWING PLANTINGS OFFSETS:
*WATER, SANITARY SEWER, & STORMDRAIN PIPES - 7' PLUS ½ PIPE DIAMETER
*MANHOLES - 10'
*GAS PIPELINES - 10'
*BURIED WIRE - 5'
*RISER PIPES & STRUCTRES - 25'
*EXISTING TREES - 10' (APPLIES TO TREES ONLY)
*DAM EMBANKMENTS - 15'
*ROAD EDGE - 20'
**NO WOODY VEGETATION IS TO BE PLANTED DIRECTLY OVER ROCK STEP STRUCTURE SILLS.

NOTE:
NOT ALL FURNISHED STONE IS SHOWN IN PLAN VIEW. SEE THE STREAM RESTORATION DETAILS AND PROFILE FOR ADDITIONAL INFORMATION.

PROPOSED LANDSCAPE LEGEND

- HERBACEOUS PLUG PLANTINGS: 2,115 SF / 0.05 AC (*EXTENDS FROM THE EDGE OF STONE TO THE TOP OF GRADED STREAM BANK)
- FLOODPLAIN BENCH PLANTINGS: 5,049 SF / 0.12 AC
- RIPARIAN FOREST PLANTINGS: 10,627 SF / 0.24 AC

PROPOSED FEATURES LEGEND

- LIMIT OF DISTURBANCE
- 1' MINOR CONTOUR
- 5' MAJOR CONTOUR
- WOODY HABITAT FEATURE (WHF)
- BOULDER SILL
- ROCK STEP-POOL STRUCTURE (RSP)
- ARMORED RIFFLE (R)
- TRIBUTARY STABILIZATION (CLASS I RIPRAP CHOKED WITH SILT AND GRAVEL)
- CLAY CHANNEL BLOCK (CCB)

EXISTING FEATURES LEGEND

- EX. BUILDING
- EX. NONTIDAL WETLAND
- EX. WATERS OF THE U.S.
- EX. FENCE
- EX. PROPERTY BOUNDARY
- EX. EASEMENT
- EX. EDGE OF PAVEMENT
- EX. GAS MAIN
- EX. TREELINE
- EX. CONCRETE DEBRIS
- EX. RIPRAP
- EX. CONCRETE MONUMENT
- EX. TREE
- EX. TRAVERSE POINT
- EX. STORMDRAIN
- EX. 1' MINOR CONTOUR
- EX. 5' MAJOR CONTOUR

20' 0 20' 40'
ORIGINAL SCALE: 1"=20'

CENTURY ENGINEERING
CONSULTING ENGINEERS - PLANNERS
10710 GILROY ROAD
HUNT VALLEY, MARYLAND 21031
PHONE: (443) 589-2400 FAX: (443) 589-2401

HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL 12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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 #: 28371 EXPIRES: 01/01/2021

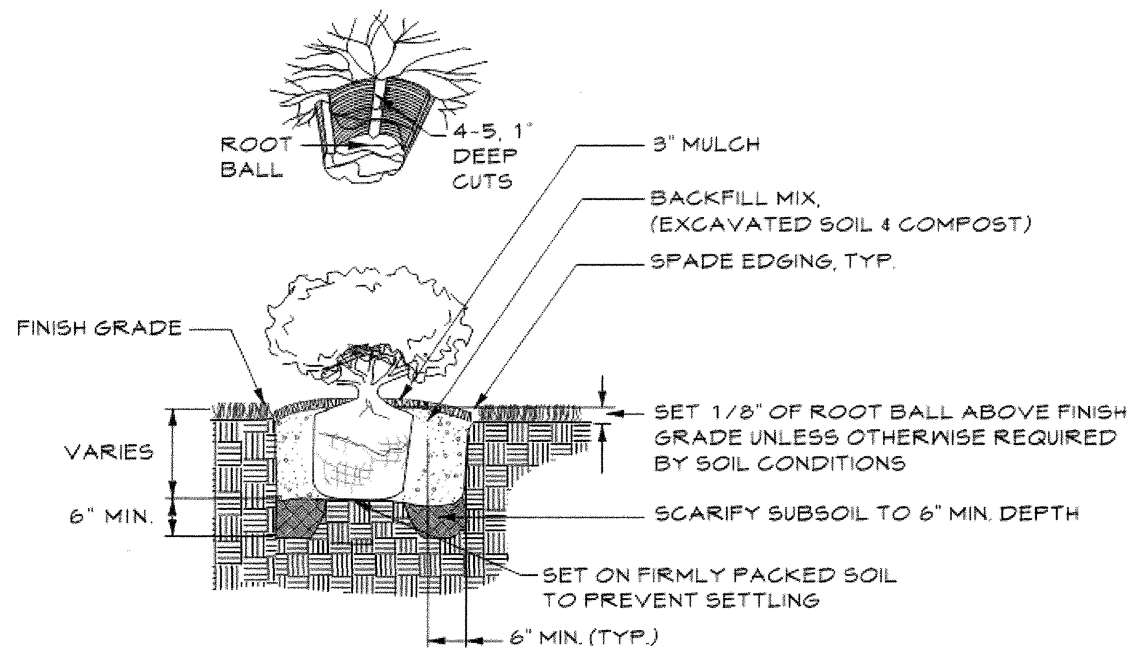
REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

LANDSCAPE SHEET

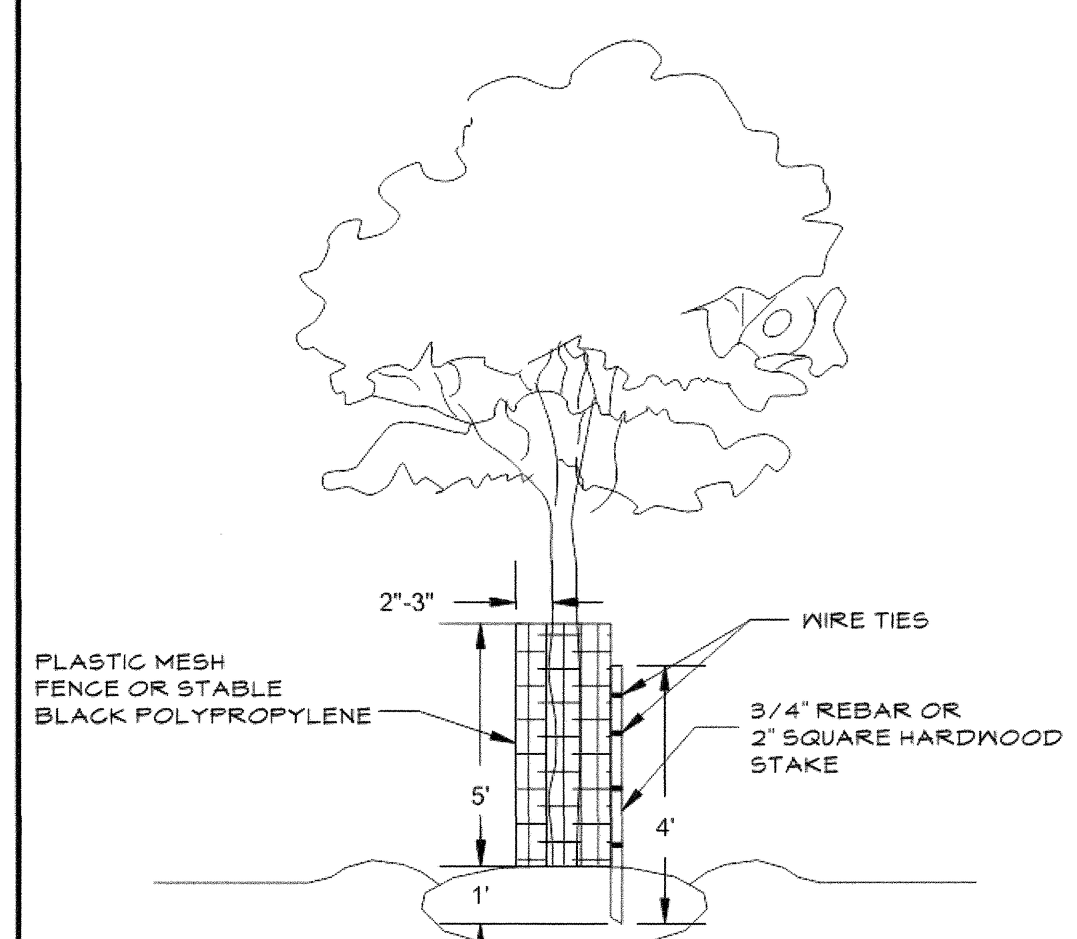
PROJECT NO.	121104.64
SCALE	1" = 20'
DATE	12/30/19
DESIGN	CR
DRAWN	JT
CHECK	EW
DWG NO.	LS-02 OF LS-04
SHEET NO.	20 OF 22



NOTES:
1. FOR CONTAINER SHRUBS, COMPLETELY REMOVE ALL NON-BIODEGRADABLE CONTAINERS AND SCARIFY ROOTBALL BY USING A SHARP BLADE AND MAKING 4 TO 5 ONE INCH CUTS THE LENGTH OF THE ROOTBALL.
2. FOR B&B SHRUBS, CUT AND REMOVE BURLAP FROM TOP 1/3 OF ROOTBALL.

SHRUB PLANTING

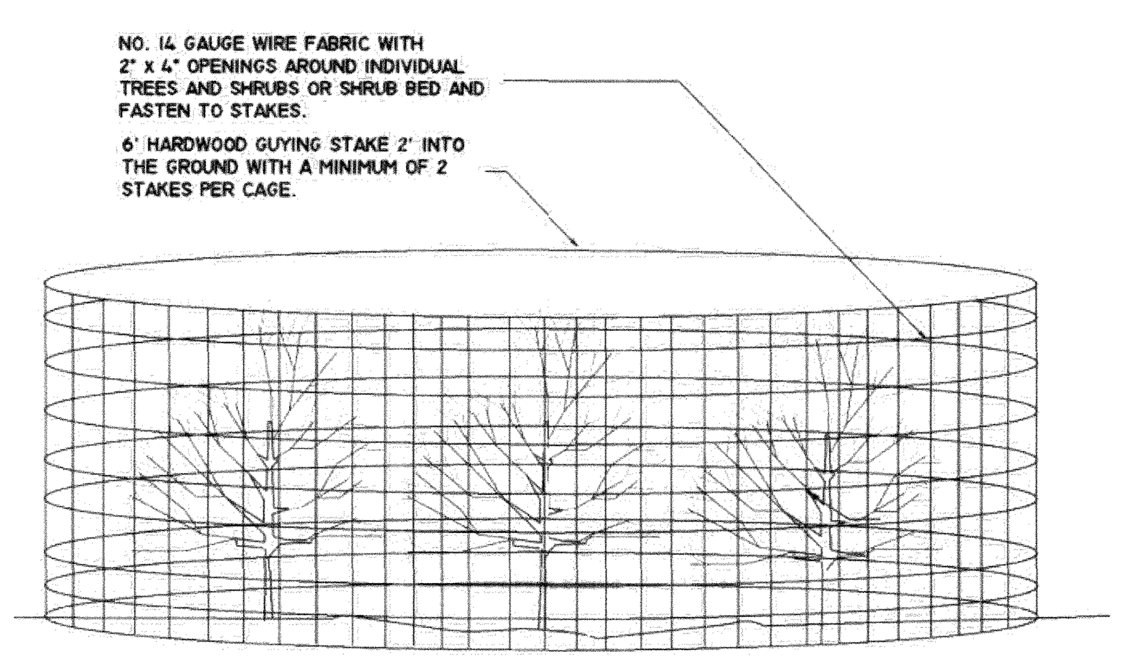
Not To Scale



NOTES:
1. TO BE USED ON SINGLE STEM TREES.
2. HEIGHT OF SHELTER TO BE ADJUSTED TO PREVENT CANOPY BREAKAGE.
3. TREE SHELTERS ARE TO BE CONSIDERED INCIDENTAL TO EACH TREE PLANTING.

TREE SHELTER

Not To Scale

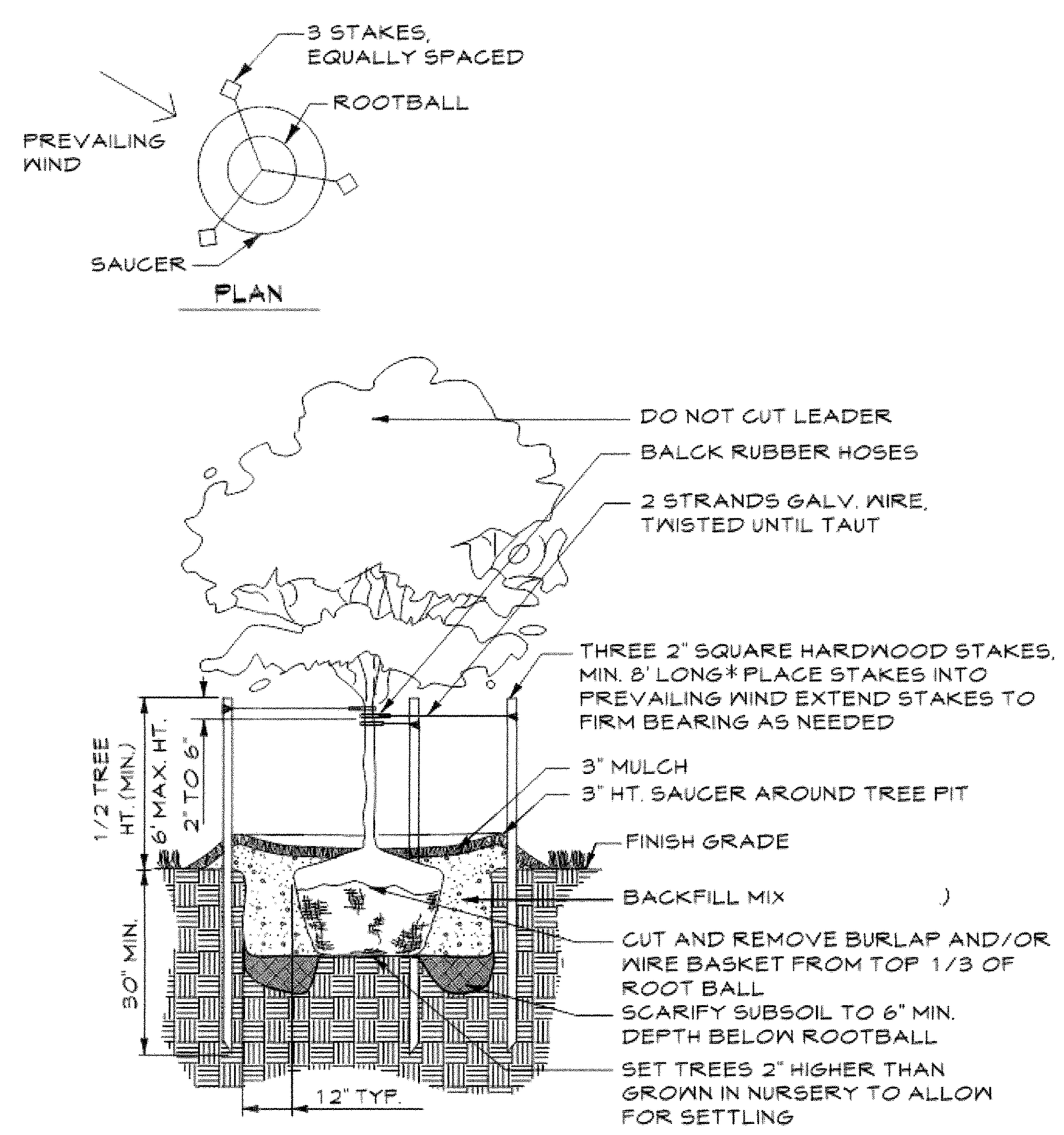


CLUSTER SHRUB DEER PROTECTION

NOTES:

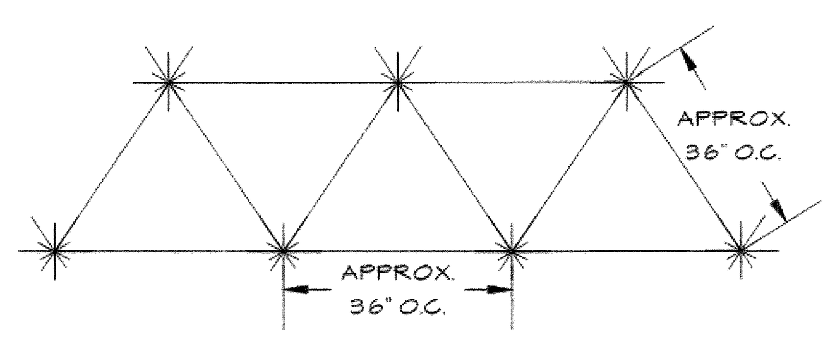
Not To Scale

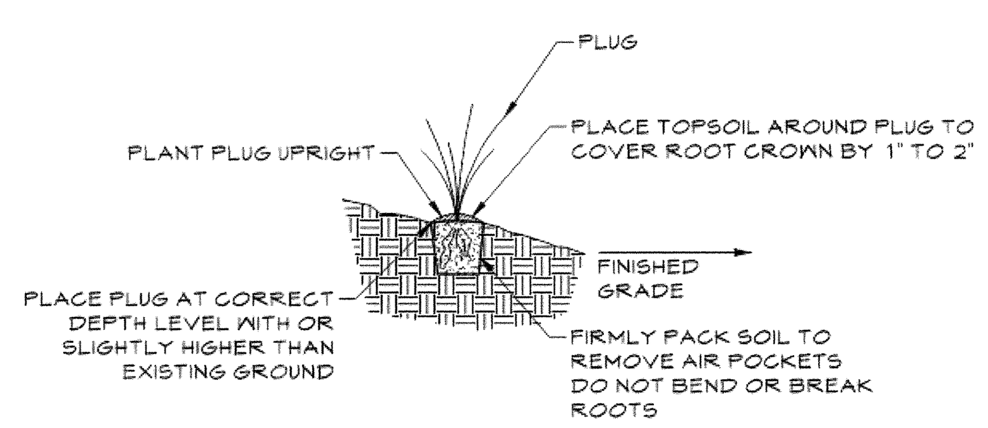
1. THIS DETAIL IS TO BE USED FOR INDIVIDUAL SHRUBS AND SHRUB BEDS. IN ADDITION, IT WILL BE USED FOR EVERGREEN TREES OR DECIDUOUS TREES WITH BRANCHES LOWER THAN 4' IN HEIGHT.
2. HEIGHT OF CAGE SHALL BE 4 FEET MINIMUM WITH A MAXIMUM DIAMETER OF 10 FEET.
3. CAGE SHALL BE FASTENED TO STAKE WITH 3 (MIN.) TWIST TIE EVENLY SPACED WITH A 6" (MIN.) ABOVE THE GROUND.
4. CAGE SHALL SURROUND ALL SHRUBS AND TREES WITH A 1 FOOT SPACING FROM THE OUTSIDE OF THE PLANT.
5. STAKES SHALL BE PLACED AT A MAXIMUM 5 FOOT SPACING.
6. CAGES TO BE REMOVED AT DIRECTION OF HOWARD COUNTY.
7. HARDWOOD MULCH SHALL BE PLACED TO 2-3 INCH DEPTH WITHIN FENCING.
8. CLUSTER SHRUB DEER PROTECTION IS TO BE CONSIDERED INCIDENTAL TO SHRUB PLANTINGS.



DECIDUOUS TREE PLANTING

Not To Scale





2" PERENNIAL PLUG DETAIL

Not To Scale

LANDSCAPING NOTES:

PLANT MATERIAL SELECTION -

1. THE CONTRACTOR SHALL FURNISH PLANT MATERIALS IN SIZES AND QUANTITIES SPECIFIED IN THE PLANT SCHEDULES ON SHEET LS-04.

2. NURSERY GROWN PLANT MATERIAL SHOULD MEET OR EXCEED THE REQUIREMENTS OF THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION'S' (A.N.L.A.) LATEST EDITION OF "AMERICAN STANDARD NURSERY STOCK" (ANSI Z60.1) SPECIFICATIONS, PARTICULARLY REGARDING THE SIZE, GROWTH, SIZE OF THE ROOT BALL, AND DENSITY OF BRANCH STRUCTURE.

3. ALL PLANTING MATERIAL SHALL BE SOURCED FROM WITHIN 100 MILES OF THE SITE.

4. NO SUBSTITUTIONS SHALL BE MADE WITHOUT THE WRITTEN CONSENT OF THE OWNER AND/OR LANDSCAPE ARCHITECT.

5. THE LANDSCAPE ARCHITECT OR OWNER SHALL HAVE THE RIGHT, AT ANY STAGE OF THE OPERATIONS, TO REJECT ANY AND ALL WORK AND MATERIALS WHICH, IN HIS OR HER OPINION, DO NOT MEET THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS. ALL REJECTED MATERIAL SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

6. SEE PLANT LISTS ON SHEET LS-04 FOR SIZE, TYPE, SPECIES, SPACING, QUANTITIES AND APPLICATION RATES.

7. SEED MIXES SHALL HAVE A MINIMUM PURITY OF 98% AND A MINIMUM GERMINATION OF 85% PER PLANTING ZONE. THE SEED MIX IS TO BE ENDOPHYTE-FREE AND CONTAIN LESS THAN 1% INERT MATTER.

PLANT MATERIAL TRANSPORT, APPROVAL, & STORAGE -

1. PLANT MATERIAL SHALL BE PROTECTED TO PREVENT SUN SCALD, DESICCATION, AND STRUCTURAL DAMAGE DURING TRANSPORT TO THE SITE. ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT FROM THE SOURCE TO THE JOB SITE AND UNTIL PLANTED.

2. PLANT MATERIAL SHALL BE INSPECTED TO BE FREE OF DISEASE, DAMAGE, INSECT INFESTATION, AND VIGOR UPON DELIVERY TO THE SITE. ALL PLANTS SHOULD BE HEALTHY AND WELL STRUCTURED. NO HEELED-COLD STORAGE OR COLLECTED STOCK WILL BE ACCEPTED. PLANTS IN POOR CONDITION SHALL BE REJECTED, REMOVED FROM THE SITE AND REPLACED WITH ACCEPTABLE MATERIALS.

3. PLANT MATERIAL SHALL BE STORED IN A COOL, SHADED AREA ON THE SITE AND KEPT MOIST TO PREVENT DESICCATION UNTIL READY FOR PLANTING. PLANTING SHALL BEGIN WITHIN 24 HOURS OF PLANT DELIVERY TO THE SITE. PLANT MATERIAL THAT REMAINS UNPLANTED BEYOND 24 HOURS SHALL BE PROTECTED FROM DIRECT SUN AND WEATHER, AND KEPT MOIST. PLANT MATERIALS SHALL NOT BE LEFT UNPLANTED FOR MORE THAN 2 WEEKS.

4. THE CONTRACTOR IS REQUIRED TO OBTAIN CLEAN FRESH WATER FOR USE DURING PLANTING OPERATIONS AND THE SUBSEQUENT MAINTENANCE PERIOD.

SITE PREPARATION -

1. THE SITE AND AREAS ABUTTING THE LOD SHALL BE TREATED FOR INVASIVE SPECIES PRIOR TO THE START OF CONSTRUCTION.

2. NO CLEARING OR GRADING SHALL BEGIN BEFORE STRESS-REDUCTION MEASURES HAVE BEEN IMPLEMENTED. SUCH MEASURES MAY INCLUDE TREE PROTECTION PLANKING, ROOT PRUNING, CROWN REDUCTION OR PRUNING, ETC. AT THE DISCRETION OF THE PLAN PREPARER, DESIGNATED SPECIALIST, OR AN MDLTE/ISA CERTIFIED ARBORIST.

3. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, TREE PROTECTION FENCING SHALL BE INSTALLED ALONG ALL SECTIONS OF THE LOD ABUTTING WOODED/FORESTED AREAS AND AROUND ALL 'TREE SAVE' AREAS TO ENSURE PRESERVATION OF THESE AREAS.

4. ALL TREE PROTECTION MEASURES MUST BE IN PLACE AT THE TIME OF THE SEDIMENT & EROSION CONTROL INSPECTION, PRIOR TO THE COMMENCEMENT OF DEMOLITION, SITE CLEARING, GRADING, OR CONSTRUCTION. TREE PROTECTION DEVICES SHALL BE MAINTAINED FOR THE DURATION OF CONSTRUCTION. NO EQUIPMENT, TRUCKS, MATERIALS, OR DEBRIS MAY BE STORED WITHIN THE TREE PROTECTION AREAS DURING THE ENTIRE CONSTRUCTION PROJECT.

5. ALL TREES TO BE REMOVED MUST BE REMOVED IN A MANNER THAT WILL NOT DAMAGE THE REMAINING TREES. THE CONTRACTOR SHALL DISPOSE OF STUMPS AND MAJOR ROOTS OF ALL PLANTS TO BE REMOVED. ANY DEPRESSIONS CAUSED BY REMOVAL OPERATIONS SHALL BE REFILLED WITH FERTILE, FRIABLE, SOIL PLACED AND COMPACTED SO AS TO REESTABLISH PROPER GRADE FOR NEW PLANTING AND/OR LAWN AREAS.

6. ANY TREES THAT ARE TO REMAIN THAT ARE DAMAGED DURING THE CLEARING OPERATION MUST BE REPAIRED OR REMOVED AND REPLACED IN AN APPROVED MANNER BY AN MDLTE/ISA CERTIFIED ARBORIST, DESIGNATED SPECIALIST, OR HOWARD COUNTY DPW REPRESENTATIVE AS SOON AS FINAL CLEARING HAS BEEN COMPLETED.

7. ROOT PRUNING MAY BE NECESSARY WHERE THE CRITICAL ROOT ZONE IS IMPACTED, AS DETERMINED BY THE PLAN PREPARER OR AN MDLTE/ISA CERTIFIED ARBORIST. PRUNING SHALL BE ALONG THE LOD ADJACENT TO TREE PROTECTION FENCING. A CERTIFIED ARBORIST SHALL SUPERVISE OR CONDUCT ROOT PRUNING.

PLANTING AND SCHEDULE -

1. REFER TO THE MDSHA STANDARDS AND SPECIFICATIONS SECTION 710.03.01 PLANTING SEASONS TABLE FOR ACCEPTABLE PLANTING PERIOD. PLANTING SHALL NOT BE COMPLETED IN SUB-FREEZING TEMPERATURES; WHEN THE GROUND IS FROZEN; WHEN WEATHER CONDITIONS WILL ADVERSELY AFFECT PLANT MATERIALS; OR WHEN THE SOIL IS TOO WET OR OTHERWISE IN A CONDITION NOT ACCEPTABLE FOR PLANTING.

2. THE CONTRACTOR SHALL STABILIZE, SEED WITH THE DESIGNATED PERMANENT SEED MIX (SEE LANDSCAPE SCHEDULES), AND MULCH THE SITE IMMEDIATELY FOLLOWING THE ESTABLISHMENT OF FINISHED GRADE.

3. MOW PLANTING AREA CLOSE TO THE GROUND ONE WEEK (OR LESS) PRIOR TO PLANTING DATE.

4. THE CONTRACTOR IS RESPONSIBLE FOR TESTING PROJECT SOILS. THE CONTRACTOR IS TO PROVIDE A CERTIFIED SOILS REPORT TO THE OWNER. THE CONTRACTOR SHALL VERIFY THAT THE SOILS ON SITE ARE ACCEPTABLE FOR THE PROPER GROWTH OF THE PROPOSED PLANT MATERIAL. SHOULD THE CONTRACTOR FIND POOR SOIL CONDITIONS, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE SOIL AMENDMENTS AS NECESSARY. THESE AMENDMENTS SHALL INCLUDE, BUT NOT BE LIMITED TO FERTILIZERS, LIME, AND TOPSOIL. PROPER PLANTING SOILS MUST BE VERIFIED PRIOR TO WHEN PLANTING MATERIALS ARE INSTALLED.

5. PREPARE PLANTING PITS PER MDSHA STANDARDS AND SPECIFICATIONS SECTION 710.03.04.

6. NO TREES ARE TO BE PLANTED DIRECTLY OVER UTILITY LINES.

7. INSTALL PLANT MATERIALS PER MDSHA STANDARDS AND SPECIFICATIONS 710.03.09.

8. MAINTAIN ALL MINIMUM WOODY VEGETATION OFFSETS LISTED ON SHEETS LS-01 AND LS-02.

9. UPON COMPLETION OF ALL LANDSCAPING, AN ACCEPTANCE OF THE WORK SHALL BE HELD. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT, DESIGNATED SPECIALIST, OR THE OWNER FOR SCHEDULING OF THE INSPECTION AT LEAST SEVEN (7) DAYS PRIOR TO THE ANTICIPATED INSPECTION DATE.

10. AFTER INSTALLATION OF PLANTS, THE CONTRACTOR SHALL MONITOR THE SOIL MOISTURE AND WATER NEEDS OF PLANTS AND SEED AS NECESSARY TO ENSURE SURVIVABILITY. WATERING PLANTING PITS AND SEEDED AREAS SHOULD OCCUR AS SPECIFIED IN MDSHA STANDARDS AND SPECIFICATIONS SECTION 710.03.04(C).

MAINTENANCE -

1. UPON COMPLETION OF INSTALLATION, THE PLANTING AREA IS TO BE MAINTAINED FOR A 1 YEAR PERIOD. AN 100% SURVIVAL RATE MUST BE ACHIEVED FROM THE DATE OF ACCEPTANCE TO THE TERMINATION OF THE MAINTENANCE PERIOD. MAINTENANCE SHALL BE AS FOLLOWS:

   a. ANY PLANT MATERIAL SHOWING SIGNS OF DISTRESS ARE TO BE REPLACED IMMEDIATELY BY THE CONTRACTOR.

   b. NATIVE VOLUNTEER SEEDLINGS SHALL BE REMOVED ONLY IF THEY ARE ADVERSELY IMPACTING THE GROWTH OF THE PLANTED MATERIAL. NON-NATIVE AND INVASIVE SPECIES ARE TO BE REMOVED FROM THE ENTIRE PLANTING AREA THROUGH SELECTED AND APPROVED MEANS.

   c. ALL MAN-MADE MATERIALS SHALL BE REMOVED FROM THE SITE WHICH WOULD IMPACT THE ESTABLISHMENT OF THE PLANTED MATERIALS.

   d. THOROUGHLY WATER PLANTED MATERIAL ONCE WEEKLY OR AS NEEDED DURING THE GROWING SEASON.

   e. PLANTED MATERIAL IS TO BE MONITORED FOR SIGNS OF DAMAGE AND APPROPRIATE ACTIONS SHALL BE TAKEN TO PREVENT FURTHER DAMAGE. THIS MAY INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING: PEST DAMAGE OR INFESTATION, DISEASE OR BROWSING; ANY DEAD OR DECIMATED MATERIAL SHALL BE REPLACED WITH THE IDENTICAL SPECIES OR AN APPROVED REPLACEMENT.

   f. AT THE END OF THE 1 YEAR MAINTENANCE PERIOD, THE SITE SHALL BE INSPECTED FOR THE 100% SURVIVAL RATE AS REQUIRED BY THE HOWARD COUNTY DPW.

CENTURY ENGINEERING
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HUNT VALLEY, MARYLAND 21031
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HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
Mark S. Richmond 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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 #: 28371 EXPIRES: 01/01/2021

REVISIONS		
NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

LANDSCAPE NOTES & DETAILS

PROJECT NO. 121104.64	
SCALE 1" = 20'	DATE: 12/30/19
DESIGN: CR	DRAWN: JT
CHECK: EW	
DWG NO: LS-03 OF LS-04	
SHEET NO: 21 OF 22	

Riparian Seed Mix (30,638 SF / 0.70 AC)

Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)
Andropogon gerardii	Big bluestem	35.00%	14.00	9.80
Panicum virgatum	Switchgrass	28.00%	11.20	7.84
Elymus virginicus	Virginia wildrye	22.00%	8.80	6.16
Sorghastrum nutans	Indiangrass	12.00%	4.80	3.36
Desmodium canadese	Showy ticktrefoil	1.00%	0.40	0.28
Symphyotrichum novae-angliae	New England aster	1.00%	0.40	0.28
Aquilegia canadensis	New England aster	1.00%	0.40	0.28
			Total:	**28.00**

Total Application Rate of 40 lbs/ac. To be applied with 15lbs/ac of perennial ryegrass *(Lolium perenne)* and 60lbs/ac of hard fescue *(Festuca trachyphylla)* during the periods of March 1 to May 15 and August 1 to October 15 or foxtail millet *(Setaria italica)* if during May 16 to July 31.

Riparian Forest Plantings (30,638 SF / 0.70 AC)

Species	Common Name	Layer	Size	Type	Spacing	Quantity
Quercus alba	White oak	Canopy tree	6'-8' Height	Container	18'-20' O.C.	21
Quercus rubra	Northern red oak	Canopy tree	6'-8' Height	Container	18'-20' O.C.	21
Liriodendron tulipifera	Tuliptree	Canopy tree	6'-8' Height	Container	18'-20' O.C.	21
Carya glabra	Pignut hickory	Canopy tree	6'-8' Height	Container	18'-20' O.C.	22
					Total:	**85**
Cornus florida	Flowering dogwood	Understory tree	5' Height	Container	12'-14' O.C.	18
Prunus serotina	Black cherry	Understory tree	5' Height	Container	12'-14' O.C.	18
Ostrya virginiana	Hophornbeam	Understory tree	5' Height	Container	12'-14' O.C.	18
					Total:	**54**

Note: Assume 100% canopy and 30% understory coverage.

Floodplain Seed Mix (Floodplain Bench Plantings, and Herbaceous Plug Plug Plantings TOTAL: 11,494 SF / 0.26 AC)

Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)
Panicum clandestinum	Deertongue	22.00%	8.80	2.29
Elymus virginicus	Virginia wildrye	21.00%	8.40	2.18
Andropogon gerardii	Big bluestem	17.00%	6.80	1.77
Panicum virgatum	Switchgrass	15.00%	6.00	1.56
Carex vulpinoidea	Fox sedge	11.00%	4.40	1.14
Heliopsis helianthoides	Oxeye sunflower	8.00%	3.20	0.83
Desmodium paniculatum	Panicled-leaf ticktrefoil	3.00%	1.20	0.31
Eupatorium fistulosum	Joe pye weed	2.00%	0.80	0.21
Juncus tenuis	Path rush	1.00%	0.40	0.10
			Total:	**10.40**

Total Application Rate of 40 lbs/ac. To be applied with 15lbs/ac of perennial ryegrass *(Lolium perenne)* and 60lbs/ac of hard fescue *(Festuca trachyphylla)* during the periods of March 1 to May 15 and August 1 to October 15 or foxtail millet *(Setaria italica)* if during May 16 to July 31.

Floodplain Bench Plantings (7,575 SF / 0.17 AC)

Species	Common Name	Layer	Size	Type	Spacing	Quantity
Cornus amomum	Silky dogwood	Understory tree	5' Height	Container	12'-14' O.C.	7
Carpinus caroliniana	American hornbeam	Understory tree	5' Height	Container	12'-14' O.C.	7
Amelanchier canadensis	Canadian serviceberry	Understory tree	5' Height	Container	12'-14' O.C.	8
					Total:	**22**
Alnus serrulata	Hazel alder	Shrub	2'-3' Height	Container	6-8' O.C.	15
Lindera benzoin	Spicebush	Shrub	2'-3' Height	Container	6-8' O.C.	15
Viburnum dentatum	Southern arrowwood	Shrub	2'-3' Height	Container	6-8' O.C.	16
					Total:	**46**

Note: Assume 50% understory and 30% shrub coverage. Shrubs to be planted in clusters of 5-7.

Upland Meadow Seed Establishment (11,457 SF / 0.26 AC)

Botanical Name	Common Name	Percent of Mix	Application Rate (lbs/AC)	Quantity (lbs)
Andropogon gerardii	Big bluestem	40.00%	16.00	4.16
Elymus virginicus	Virginia wildrye	25.00%	10.00	2.60
Panicum virgatum	Switchgrass	15.00%	6.00	1.56
Sorghastrum nutans	Indiangrass	8.00%	3.20	0.83
Asclepias tuberosa	Butterflyweed	5.00%	2.00	0.52
Asclepias syriaca	Common milkweed	4.00%	1.60	0.42
Rudbeckia hirta	Blackeyed susan	3.00%	1.20	0.31
			Total:	**10.40**

Total Application Rate of 40 lbs/ac. To be applied with 15lbs/ac of perennial ryegrass *(Lolium perenne)* and 60lbs/ac of hard fescue *(Festuca trachyphylla)* during the periods of March 1 to May 15 and August 1 to October 15 or foxtail millet *(Setaria italica)* if during May 16 to July 31.

Herbaceous Plug Plantings (3,919 SF / 0.09 AC)

Species	Common Name	Size	Root	Spacing	Quantity	Notes
Iris versicolor	Blue flag	2" Plug	5" Depth	3' O.C.	72	Lower on stream bank
Carex crinita	Long hair sedge	2" Plug	5" Depth	3' O.C.	72	Lower on stream bank
Elymus riparius	Riverbank wild-rye	2" Plug	5" Depth	3' O.C.	72	Lower on stream bank
Panicum virgatum	Switchgrass	2" Plug	5" Depth	3' O.C.	73	Higher on stream bank
Elymus hystrix	Bottlebrush grass	2" Plug	5" Depth	3' O.C.	73	Higher on stream bank
Athyrium angustum	Lady fern	2" Plug	5" Depth	3' O.C.	73	Higher on stream bank
				Total:	**435**	

Note: Arrange plug plantings according to listed notes.

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HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS

SEAL
STATE OF MARYLAND · CRAIG A. LYNCH · NO. 28371 · PROFESSIONAL ENGINEER
12/26/2019

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY MARYLAND
[signature] 12/30/19
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

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LICENSE #: 28371 EXPIRES: 01/01/2021

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NO.	DATE	DESCRIPTION

D-1158 CHERRYTREE FARM STREAM RESTORATION

FINAL (100%) DESIGN

LANDSCAPE NOTES & DETAILS

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