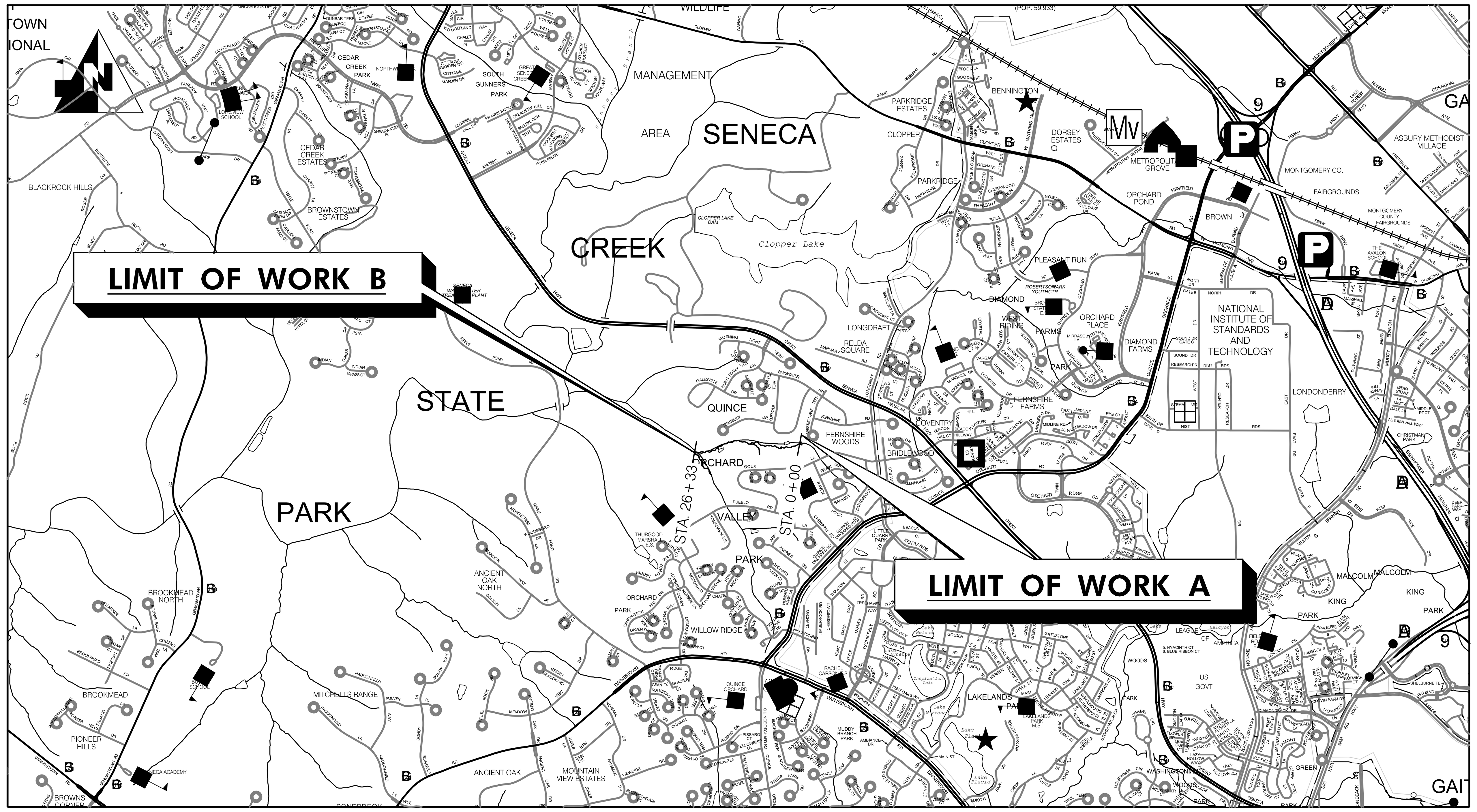
MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

S.H.A. CONTRACT NO. – AW073B12
FEDERAL AID PROJECT NO. – XX
I–495 & I–270 MANAGED LANES STUDY P3 PROGRAM
STREAM RESTORATION OF CA–5
(UNNAMED TRIBUTARY TO GREAT SENECA CREEK)



MONTGOMERY COUNTY

LIMIT OF WORK INFORMATION

LIMIT OF WORK A – CA–5 RIVER STA. 0+00
LIMIT OF WORK B – CA–5 RIVER STA. 26+33

LENGTH OF PROJECT:
CA–5 – 3,567 LF

HORIZONTAL DATUM	NAD 83 (2001)
VERTICAL DATUM	NAD 88

SCALE: 1" = 2000'

2000 0 2000 4000 feet

GEOMETRIC DESIGN CRITERIA

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE 2011 PUBLICATION OF AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."

STANDARD SPECIFICATIONS BOOK, BOOK OF STANDARDS AND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

ALL WORK ON THIS PROJECT SHALL CONFORM TO: THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION (MDOT SHA) SPECIFICATIONS ENTITLED **"STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS"** DATED MAY 2017 REVISIONS THEREOF OR ADDITIONS THERETO; THE SPECIAL PROVISIONS INCLUDED IN THE INVITATION FOR BIDS BOOK; THE ADMINISTRATION'S **"BOOK OF STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES"** AND THE LATEST ADOPTED MUTCD.

RIGHT OF WAY

RIGHT OF WAY AND EASEMENT LINES SHOWN ON THESE PLANS ARE FOR ASSISTANCE IN INTERPRETING THE PLANS. THEY ARE NOT OFFICIAL. FOR OFFICIAL FEE RIGHT OF WAY AND EASEMENT INFORMATION, SEE APPROPRIATE RIGHT OF WAY PLATS.

UTILITIES

THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE OF THE ACCURACY OF SAID LOCATIONS.

ADA COMPLIANCE

THE DESIGN OF THIS PROJECT HAS INCORPORATED FACILITIES TO ACCOMODATE PERSONS WITH DISABILITIES IN COMPLIANCE WITH STATE AND FEDERAL REQUIREMENTS.

ENVIRONMENTAL INFORMATION

ALL STORMWATER MANAGEMENT FACILITIES CONSTRUCTED FOR THIS CONTRACT SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE MDOT SHA BEST MANAGEMENT PRACTICES (BMP) INSPECTION AND REMEDIATION PROGRAM.

STANDARD STABILIZATION NOTE:

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1), AND SEVEN DAYS (7) AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

OWNERS / DEVELOPERS CERTIFICATION:

I / WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY MDE COMPLIANCE INSPECTORS.

EXISTING STRUCTURES PLANS

FOR THE CONVENIENCE AND INFORMATION OF BIDDERS, PRINTS OF PLANS OF EXISTING PERTINENT STRUCTURE(S) ARE INCLUDED WITH THIS CONTRACT. NO RESPONSIBILITY FOR THEIR ACCURACY OR COMPLETENESS IS ASSUMED BY THE MDOT SHA. DIMENSIONS, DETAILS, ETC., AS SHOWN THEREON MAY NOT BE AS BUILT.

SEMI-FINAL PLANS: NOT FOR CONSTRUCTION

SURVEY BOOK NUMBERS	RIGHT OF WAY PLAT NUMBERS	REVISIONS NOTE: SEE SHEET NO. 2 FOR LIST OF REVISED SHEET NUMBERS
–	–	SEMI-FINAL REVIEW NOVEMBER 1, 2021
–	–	THIS DOCUMENT/PLAN IS DRAFT AND SUBJECT TO CHANGE. IT IS AN INTERAGENCY/INTRA-AGENCY DELIBERATIVE COMMUNICATION THAT IS NOT FOR PUBLIC DISCLOSURE UNDER MD. GENERAL PROVISIONS CODE ANN. § 4-344 (MARYLAND PUBLIC INFORMATION ACT).

PLAN ACCEPTED

"THESE PLANS" REFER TO:
STREAM RESTORATION OF CA–5 (UNNAMED TRIBUTARY TO GREAT SENECA CREEK)

*NOTE

ACCEPTANCE OF THESE PLANS BY THE ADMINISTRATION SHALL NOT RELIEVE THE DESIGN-BUILDER OF THEIR RESPONSIBILITY TO COORDINATE ALL DESIGN AND CONSTRUCTION ACTIVITIES TO ENSURE COMPLIANCE WITH THE CONTRACT REQUIREMENTS. IN SIGNING, SEALING AND SUBMITTING ANY SEGMENT OF THE COMPLETE PROJECT PLANS FOR DESIGN, THE DESIGN–BUILD TEAM SHALL BE RESPONSIBLE FOR ANY CHANGES NECESSARY TO ADDRESS COMMENTS ON FUTURE PLAN SUBMITTALS.

PLAN ACCEPTED FOR CONSTRUCTION

CHIEF, INNOVATIVE CONTRACTING DIVISION DATE

COASTAL RESOURCES INC.

SHEET NOS. AND OTHER CLARIFICATIONS

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.

MD LICENSE NO.__________ EXPIRATION DATE:__________

BY: caln –

DRILL HOLES

STRUCTURE INVENTORY NO.:

INDEX OF SHEETS

SHEET NUMBER	DRAWING NUMBER	SHEET TITLE
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BY: caln –

COASTAL RESOURCES INC.

REVISIONS

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MDOT
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

INDEX OF SHEETS

SCALE NA   DATE DECEMBER 2021   CONTRACT NO. AW073B12

DESIGNED BY SCN   COUNTY MONTGOMERY
DRAWN BY CJN   LOGMILE
CHECKED BY KSK   HORIZONTAL SCALE
MDE/PRD 168251/20–PR–0040–01   VERTICAL SCALE

DRAWING NO. **IN-01** OF **01**   SHEET NO. 02 OF 76

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pGN-I001_CA5.dgn

CONVENTIONAL SIGNS
(SAMPLES)

- PROPOSED MEDIAN BARRIER
- ELECTRICAL HAND BOX – SIGNALS (H.B.)
- FLOW LINE
- STATE, COUNTY OR CITY LINES
- PROPOSED TRAFFIC BARRIER
- EXISTING TRAFFIC BARRIER
- PROPOSED FENCE LINE
- EXISTING FENCE LINE
- RIGHT OF WAY LINE
- EXISTING ROADWAY
- RAILROAD
- BASE LINE OR SURVEY LINE (+50)
- FIRE HYDRANT (F.H.)
- HISTORIC BOUNDARY (H)
- WATERS OF THE U.S.
- WETLAND BOUNDARY
- EXISTING MAJOR CONTOUR (SURVEY)
- EXISTING MINOR CONTOUR (SURVEY)
- EXISTING CONTOUR (LIDAR)
- PROPOSED PIPE / CULVERT
- EXISTING PIPE / CULVERT
- EXISTING DROP INLET
- UTILITY POLE
- WETLAND
- WETLAND BUFFER (B)
- WATERS OF THE U.S. (JS)
- HEDGE / TREE LINE
- BUSH / TREE
- CONIFEROUS TREE
- GROUND ELEVATION (DATUM LINE, 173.6)
- GRADE ELEVATION (DATUM LINE, 210.22)
- SANITARY SEWER LINE (SAN)
- WATER LINE (W)

ABBREVIATIONS

AASHTO	American Association of State Highway Transportation Officials
ADT	Average Daily Traffic
AHD	Ahead
APPROX.	Approximate
BL or B/L	Baseline
BK	Back / Book
BIT.	Bituminous
B.C.	Bituminous Concrete
B.M.	Bench Mark
BOT.	Bottom
C.C.	Center of Curve
CAP	Corrugated Aluminum Pipe
CAPA	Corrugated Aluminum Pipe Arch
CATV	Cable Television
C.B.R.	California Bearing Ratio
℄ or C/L	Centerline
CL.	Class
CLF	Chainlink Fence
CMP	Corrugated Metal Pipe
C.O.	Cleanout
COMB.	Combination
CONC.	Concrete
CONSTR.	Construction
COR.	Corner
CORR.	Correction
CPP–S	Corrugated Polyethylene Pipe – Type 'S'
CSP	Corrugated Steel Pipe – Aluminized Type 2
CSPA	Corrugated Steel Pipe Arch – Aluminized Type 2
DC	Degree of Curve
D.H.V.	Design Hourly Volume
D.I.	Drop Inlet
DIA.	Diameter
D.O.	Double Opening
E	East
E	Electric
E	External Distance
EA	Each
EB	Eastbound
ELEV	Elevation
ES	End Section
EX or EXIST	Existing
FT	Feet
F or FL	Flowline
F.B.D.	Flat Bottom Ditch
F.H.	Fire Hydrant
FWD.	Forward
G	Gas
G.V.	Gas Valve
H.B.	Handbox
HDPE	High Density Polyetheylene
HDWL.	Headwall
HERCP	Horizontal Ellipitical Reinforced Concrete Pipe
HP	High Point
IN	Inch
I.S.T.	Inlet Sediment Trap
INV.	Invert
J.B.	Junction Box
K	K Inlet
L	Length
LF	Linear Feet
L.L.	Liquid Limit
LP	Low Point
L.P.	Light Pole
LT.	Left
MAC.	Macadam
M.C.	Moisture Content
MAX.	Maximum
M.D.D.	Maximum Dry Content
MOD.	Modified
MIN.	Minimum
N	North
NB	Northbound
NE	Northeast
N.P.	Non–Plastic
O.C.	On Center
OHE	Overhead Electric
O.M.	Optimum Moisture
PAV'T.	Pavement
PC	Point of Curvature
PCC	Point of Compound Curvature
P/C	Point of Crown
P/GE	Profile Grade Elevation
P.G.E.	Profile Ground Elevation
P.G.L.	Profile Grade Line
P/GL	Profile Ground Line
P/R	Point of Rotation
P.I.	Plasticity Index
PI	Point of Intersection
POC	Point On Curve
POT	Point On Tangent
PPWP	Polyvinyl Chloride Profile Wall Pipe
PROP	Proposed
PRC	Point of Reverse Curve
PT	Point
PT	Point of Tangency
PVC	Point of Vertical Curve
PVC	Polyvinyl Chloride
PVI	Point of Vertical Intersection
PVRC	Point of Vertical Reverse Curve
PVT	Point of Vertical Tangency
R	Radius
R.F.	Rock Fragments
RT	Right
RW or R/W	Right of Way
RCP	Reinforced Concrete Pipe
RCPP	Reinforced Concrete Pressure Pipe
R.Q.D.	Rock Quality Designation
R.M.	Rootmat
S	South
SAN.	Sanitary Sewer
SB or S/B	Southbound
S.D.	Storm Drain
S.D.D.	Surface Drain Ditch
S/E	Super Elevation
SF	Silt Fence
SF	Square Feet
SHT.	Sheet
SPP	Structural Steel Plate Pipe
SPPA	Structural Steel Plate Pipe Arch
S.P.T.	Standard Penetration Testing
SRP	Steel Spiral Rib Pipe – Aluminized Type 2
SRPA	Steel Spiral Rib Pipe Arch – Aluminized Type 2
SSD	Stopping Sight Distance
SSF	Super Silt Fence
SSM	Soil Stabilization Matting
STD.	Standard
STA.	Station
SO.	Single Opening
SY	Square Yards
SWM	Stormwater Management
T	Tangent
T	Telephone
T.C.	Top of Cover
T.G.	Top of Grate
T or TL	Traverse Line
T.M.	Top of Manhole
TRAV.	Traverse
TS	Temporary Swale
T.S.	Top of Slab
T.S.	Topsoil
TYP.	Typical
U.D.	Under Drain
U.G.	Underground
U.P.	Utility Pole
USDA	United States Department of Agriculture
VCL	Vertical Clearance
V.C.L.	Vertical Curve Length
W	Water
W	West
WB	Westbound
WB	Wetland Buffer
W.M.	Water Meter
W.S.	Wrapped Steel
WUS	Waters of the United States
W.V.	Water Valve

GENERAL NOTES

1. THE LOCATION OF THE UNDERGROUND AND SURFACE UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE AS TO THE ACCURACY OF SAID LOCATIONS. CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 1–800–257–7777, 48 HOURS PRIOR TO EXCAVATION FOR MARKING AND LOCATION OF UTILITIES.
2. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION. ANY CONFLICTS CONCERNING THE CONSTRUCTION AROUND EXISTING OBSTRUCTIONS PER THESE PLANS SHALL BE RESOLVED BETWEEN THE CONTRACTOR AND THE QAD INSPECTOR.
3. THE CONTRACTOR AND OTHERS SHALL PERFORM ALL WORK IN A MANNER THAT WILL ENSURE THE LEAST PRACTICAL OBSTRUCTION TO TRAFFIC, PEDESTRIANS, BUSINESSES, RESIDENTS, AND BE CONSISTENT WITH SAFETY.
4. ALL INVERT ELEVATIONS ARE APPROXIMATE AND MAY BE MODIFIED TO MEET CONDITIONS ENCOUNTERED DURING INSTALLATION OF DRAINAGE STRUCTURES, EXCEPT STORMWATER MANAGEMENT FACILITIES.
5. THE CONTRACTOR SHALL VERIFY ALL PIPE LENGTHS AND SIZES IN THE FIELD BEFORE ORDERING ANY DRAINAGE STRUCTURES
6. ALL BENCHMARKS AND COORDINATES SHOWN ON THE CONTRACT PLANS ARE "NAD83(2001) AND "NAVD 88".
7. ALL EXISTING UTILITY FRAMES AND GRATES WITHIN THE LIMITS OF CONSTRUCTION SHALL BE ADJUSTED TO FINISHED GRADE.
8. THE CONTRACTOR WILL NOTIFY PROPERTY OWNERS 72 HOURS PRIOR TO IMPACTS OR OBSTRUCTIONS OF DRIVEWAY ENTRANCES.
9. THE TIME OF YEAR RESTRICTION FOR IN-STREAM WORK IS MARCH 1 THROUGH JUNE 15, INCLUSIVE, OF ANY YEAR.

STREAM LEGEND

- PROPOSED BASELINE
- PROPOSED MAJOR CONTOUR (350)
- PROPOSED MINOR CONTOUR
- OXBOW WETLAND
- TOE LOG
- RIFFLE GRADE CONTROL MIX
- CLAY CHANNEL BLOCK
- STONE TOE
- ROCK J-HOOK
- ROCK SILL
- BOULDER CASCADE
- LOG ROLLER
- VEGETATED ROCK PACK
- EXISTING 100 YEAR FLOODPLAIN
- PROPOSED 100 YEAR FLOODPLAIN
- SURVEY BOUNDARY
  NOTE: CONTOURS OUTSIDE SURVEY BOUNDARY FROM MONTGOMERY COUNTY LIDAR
- KNICKPOINT TREATMENT

COASTAL RESOURCES INC.

BY: caln –

HIGHWAY HYDRAULICS DIVISION

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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GENERAL NOTES

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20–PR–0040–01
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. GN-01 OF 01

100' 0 100' 200'

SCALE: 1" = 100'

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

	PROPOSED BASELINE
	PROPERTY LINE
LOD	LIMIT OF DISTURBANCE

HIGHWAY HYDRAULICS DIVISION

MDOT
MARYLAND DEPARTMENT OF TRANSPORTATION
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CA-5 KEY MAP

SCALE 1" = 100' DATE DECEMBER 2021 CONTRACT NO. AW073B12

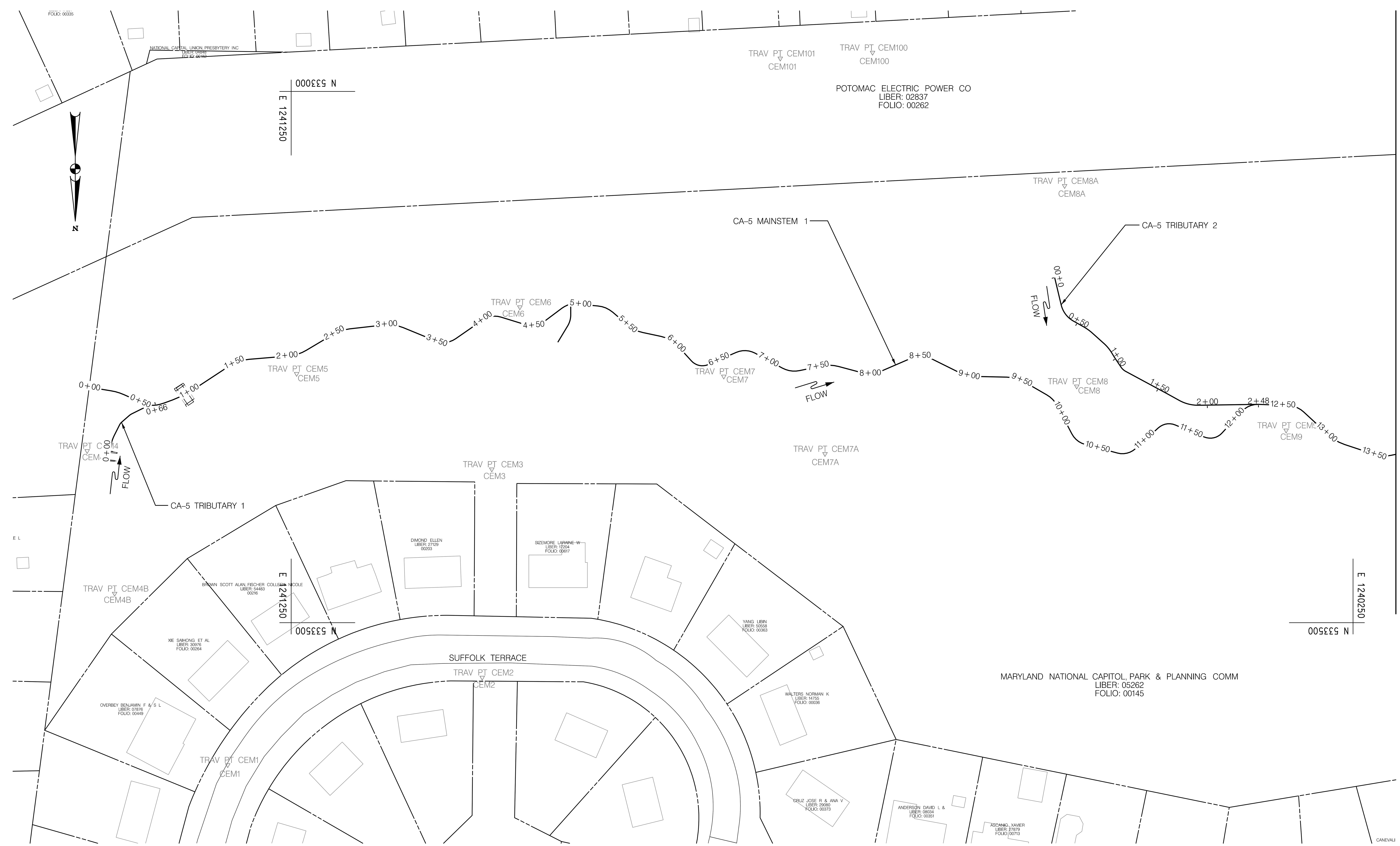
DESIGNED BY SCN COUNTY MONTGOMERY
DRAWN BY CJN LOGMILE
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

DRAWING NO. KE-01 OF 01 SHEET NO. 04 OF 76

COASTAL RESOURCES INC.

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pSR-P000_CA5_KeyMap.dgn



CA-5 TRAVERSE DATA			
TRAVERSE POINT NO.	NORTHING	EASTING	ELEVATION
CEM1	533633.9357	1241309.7423	391.7832
CEM2	533551.6221	1241070.0751	391.4471
CEM3	533355.6335	1241061.0744	375.1505
CEM4	533338.3008	1241442.1427	365.8423
CEM4B	533472.6240	1241416.2494	368.8816
CEM5	533265.7102	1241244.8547	353.9733
CEM6	533203.0244	1241034.6170	349.5832
CEM7	533268.2191	1240842.5756	343.6390
CEM7A	533341.1103	1240747.2458	347.4910
CEM8	533277.5611	1240510.2063	335.5591
CEM8A	533088.8805	1240521.5718	349.5015
CEM9	533318.9800	1240312.9542	329.1078
CEM100	532963.4315	1240702.4856	369.9270
CEM101	532968.9264	1240789.3847	381.0300

SCALE: 1" = 50'

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

PROPOSED BASELINE
PROPERTY LINE

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
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STATE HIGHWAY ADMINISTRATION

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CA-5 STREAM RESTORATION GEOMETRY DATA

SCALE 1" = 50' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

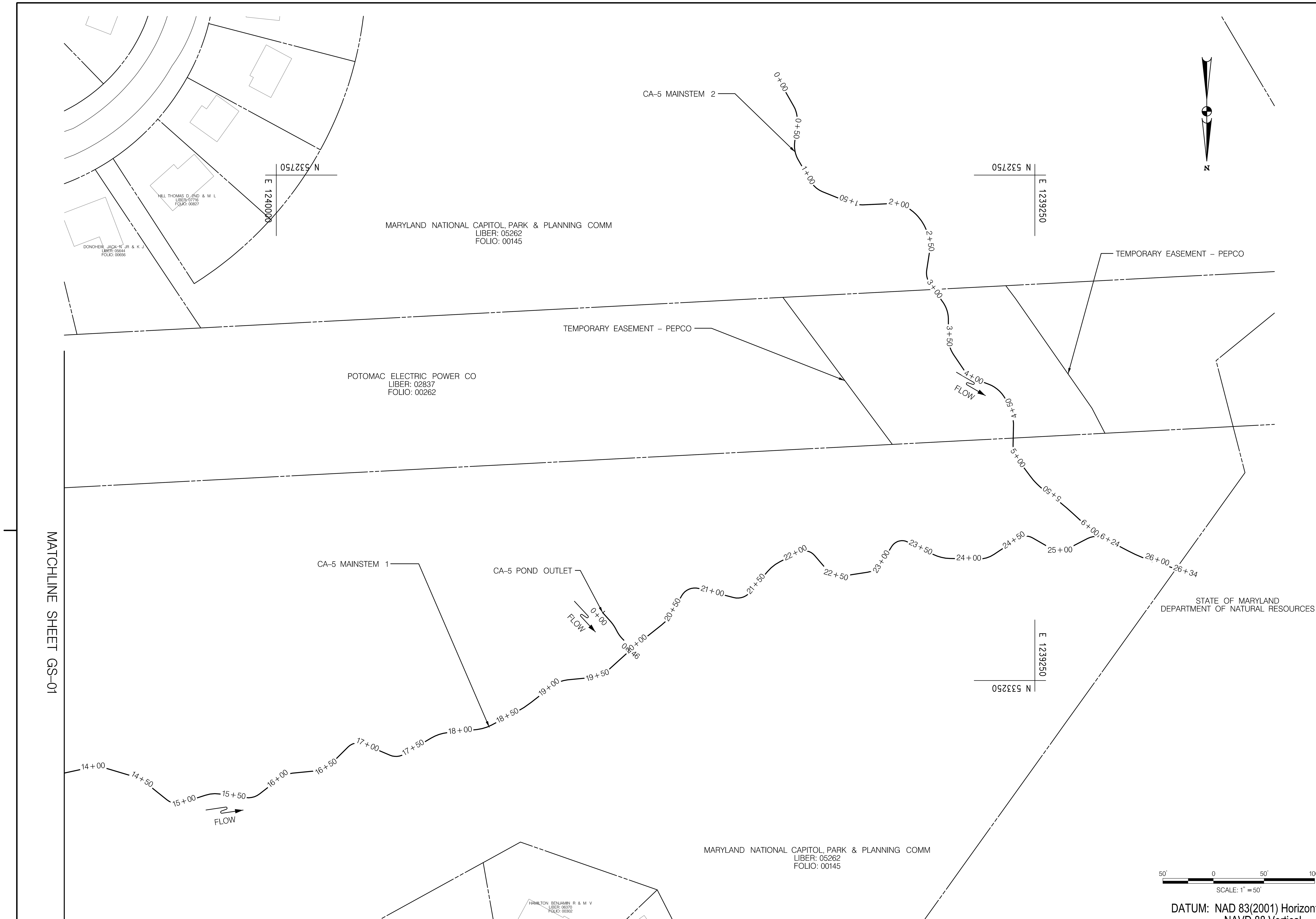
DRAWING NO. GS-01 OF 04

SHEET NO. 05 OF 76

COASTAL RESOURCES INC.

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pGS-P001_CA5.dgn



DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

———	PROPOSED BASELINE
— — —	PROPERTY LINE

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
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CA-5 STREAM RESTORATION GEOMETRY DATA

SCALE 1" = 50' DATE DECEMBER 2021 CONTRACT NO. AW073B12

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DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. GS-02 OF 04

SHEET NO. 06 OF 76

COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pGS-P002_CA5.dgn

BASELINE FOR CONSTRUCTION (CA-5 MAINSTEM 1)					
CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING
	POB	0	533,278.43	1,241,440.10	
MS1-1	PC	0+20.52	533,281.73	1,241,419.85	
	PI		533,282.78	1,241,413.40	
	CC		533,331.64	1,241,427.98	
	PT	0+33.52	533,285.44	1,241,407.43	N66.019286W
MS1-2	PC	0+53.17	533,293.43	1,241,389.47	
	PI		533,297.01	1,241,381.42	
	CC		533,272.31	1,241,380.08	
	PT	0+70.00	533,294.32	1,241,373.03	S72.250728W
MS1-3	PC	0+73.94	533,293.12	1,241,369.28	
	PI		533,288.04	1,241,353.39	
	CC		533,176.40	1,241,406.64	
	PT	1+07.11	533,278.89	1,241,339.44	S56.745664W
MS1-4	PC	1+44.14	533,258.58	1,241,308.47	
	PI		533,253.02	1,241,299.99	
	CC		533,292.03	1,241,286.54	
	PT	1+64.00	533,252.17	1,241,289.89	S85.197783W
MS1-5	PC	2+01.28	533,249.05	1,241,252.74	
	PI		533,248.28	1,241,243.58	
	CC		533,209.19	1,241,256.09	
	PT	2+19.36	533,243.59	1,241,235.67	S59.308494W
MS1-6	PC	2+48.25	533,228.84	1,241,210.82	
	PI		533,224.46	1,241,203.45	
	CC		533,263.24	1,241,190.40	
	PT	2+65.15	533,223.49	1,241,194.93	S83.509542W
MS1-7	PC	2+97.88	533,219.79	1,241,162.40	
	PI		533,218.75	1,241,153.22	
	CC		533,255.56	1,241,158.33	
	PT	3+15.98	533,222.26	1,241,144.67	N67.693342W
MS1-8	PC	3+49.08	533,234.82	1,241,114.04	
	PI		533,238.96	1,241,103.96	
	CC		533,216.32	1,241,106.45	
	PT	3+69.03	533,232.74	1,241,095.02	S55.174386W
MS1-9	PC	3+99.89	533,215.11	1,241,069.69	
	PI		533,209.55	1,241,061.69	
	CC		533,231.53	1,241,058.27	
	PT	4+18.03	533,212.42	1,241,052.37	N72.850486W
MS1-10	PC	4+43.08	533,219.81	1,241,028.44	
	PI		533,222.51	1,241,019.67	
	CC		533,202.61	1,241,023.13	
	PT	4+60.05	533,217.01	1,241,012.33	S53.128553W
MS1-11	PC	4+81.73	533,203.99	1,240,994.98	
	PI		533,199.38	1,240,988.83	
	CC		533,219.99	1,240,982.98	
	PT	4+96.42	533,200.08	1,240,981.16	N84.782108W
MS1-12	PC	5+16.54	533,201.91	1,240,961.14	
	PI		533,202.63	1,240,953.23	
	CC		533,226.80	1,240,963.41	
	PT	5+31.91	533,207.78	1,240,947.19	N49.553078W
MS1-13	PC	5+50.74	533,220.00	1,240,932.86	
	PI		533,225.28	1,240,926.66	
	CC		533,195.64	1,240,912.10	
	PT	5+66.69	533,226.96	1,240,918.69	N78.100869W
MS1-14	PC	5+84.02	533,230.53	1,240,901.73	
	PI		533,232.53	1,240,892.24	
	CC		533,259.89	1,240,907.92	
	PT	6+02.78	533,239.71	1,240,885.72	N42.275869W
MS1-15	PC	6+21.59	533,253.63	1,240,873.06	
	PI		533,261.04	1,240,866.32	
	CC		533,244.21	1,240,862.70	
	PT	6+38.99	533,257.05	1,240,857.13	S66.541547W
MS1-16	PC	6+67.82	533,245.57	1,240,830.68	
	PI		533,241.69	1,240,821.73	
	CC		533,263.92	1,240,822.72	
	PT	6+85.98	533,246.35	1,240,813.15	N61.431078W

BASELINE FOR CONSTRUCTION (CA-5 MAINSTEM 1)					
CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING
MS1-17	PC	7+15.24	533,260.34	1,240,787.46	
	PI		533,264.57	1,240,779.70	
	CC		533,239.27	1,240,775.99	
	PT	7+32.17	533,262.75	1,240,771.05	S78.130253W
MS1-18	PC	7+52.99	533,258.47	1,240,750.68	
	PI		533,256.75	1,240,742.51	
	CC		533,292.72	1,240,743.48	
	PT	7+69.38	533,258.91	1,240,734.44	N75.028897W
MS1-19	PC	7+92.84	533,264.97	1,240,711.78	
	PI		533,267.21	1,240,703.40	
	CC		533,240.82	1,240,705.32	
	PT	8+09.54	533,263.78	1,240,695.43	S66.693211W
MS1-20	PC	8+41.45	533,251.15	1,240,666.13	
	PI		533,246.94	1,240,656.35	
	CC		533,272.28	1,240,657.03	
	PT	8+61.39	533,251.67	1,240,646.81	N63.643772W
MS1-21	PC	8+89.52	533,264.16	1,240,621.61	
	PI		533,268.11	1,240,613.63	
	CC		533,228.31	1,240,603.85	
	PT	9+07.04	533,268.30	1,240,604.73	N88.745219W
MS1-22	PC	9+35.68	533,268.93	1,240,576.10	
	PI		533,269.13	1,240,566.88	
	CC		533,304.92	1,240,576.88	
	PT	9+53.73	533,273.74	1,240,558.90	N60.018939W
MS1-23	PC	9+77.49	533,285.61	1,240,538.31	
	PI		533,289.26	1,240,532.00	
	CC		533,307.27	1,240,550.81	
	PT	9+91.67	533,295.72	1,240,528.63	N27.509956W
MS1-24	PC	10+21.49	533,322.17	1,240,514.86	
	PI		533,329.99	1,240,510.79	
	CC		533,312.93	1,240,497.12	
	PT	10+38.11	533,332.26	1,240,502.26	N75.098144W
MS1-25	PC	10+69.72	533,340.39	1,240,471.71	
	PI		533,342.91	1,240,462.25	
	CC		533,322.99	1,240,467.08	
	PT	10+87.66	533,336.33	1,240,454.99	S47.807694W
MS1-26	PC	11+16.96	533,316.65	1,240,433.28	
	PI		533,310.27	1,240,426.25	
	CC		533,327.76	1,240,423.21	
	PT	11+33.90	533,313.90	1,240,417.47	N67.509547W
MS1-27	PC	11+63.50	533,325.23	1,240,390.12	
	PI		533,329.25	1,240,380.41	
	CC		533,311.37	1,240,384.38	
	PT	11+81.84	533,321.50	1,240,373.31	S42.463608W
MS1-28	PC	12+09.57	533,301.04	1,240,354.59	
	PI		533,294.21	1,240,348.34	
	CC		533,314.54	1,240,339.83	
	PT	12+26.91	533,294.55	1,240,339.09	N87.870767W
MS1-29	PC	12+54.84	533,295.59	1,240,311.17	
	PI		533,295.91	1,240,302.69	
	CC		533,318.58	1,240,312.03	
	PT	12+71.10	533,301.66	1,240,296.45	N47.361803W
MS1-30	PC	13+03.77	533,323.78	1,240,272.42	
	PI		533,329.61	1,240,266.09	
	CC		533,294.36	1,240,245.33	
	PT	13+20.72	533,332.32	1,240,257.92	N71.652144W
MS1-31	PC	13+50.38	533,341.66	1,240,229.77	
	PI		533,344.24	1,240,221.98	
	CC		533,313.18	1,240,220.33	
	PT	13+66.40	533,342.50	1,240,213.96	S77.736331W
MS1-32	PC	13+94.41	533,336.55	1,240,186.59	
	PI		533,334.35	1,240,176.50	
	CC		533,375.64	1,240,178.10	
	PT	14+14.63	533,337.32	1,240,166.60	N73.295700W
MS1-33	PC	14+40.53	533,344.77	1,240,141.79	
	PI		533,347.01	1,240,134.33	
	CC		533,383.08	1,240,153.29	
	PT	14+55.93	533,351.89	1,240,128.25	N51.245089W
MS1-34	PC	14+81.57	533,367.94	1,240,108.25	
	PI		533,373.50	1,240,101.32	
	CC		533,355.08	1,240,097.92	
	PT	14+97.87	533,370.78	1,240,092.87	S72.170789W

BASELINE FOR CONSTRUCTION (CA-5 MAINSTEM 1)					
CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING
MS1-35	PC	15+21.70	533,363.48	1,240,070.18	
	PI		533,361.25	1,240,063.23	
	CC		533,393.95	1,240,060.38	
	PT	15+36.05	533,362.25	1,240,056.00	N82.137942W
MS1-36	PC	15+62.23	533,365.83	1,240,030.07	
	PI		533,366.87	1,240,022.54	
	CC		533,348.00	1,240,027.60	
	PT	15+76.62	533,362.20	1,240,016.54	S52.081931W
MS1-37	PC	16+01.66	533,346.81	1,239,996.79	
	PI		533,342.37	1,239,991.09	
	CC		533,366.53	1,239,981.43	
	PT	16+15.72	533,341.66	1,239,983.90	S84.309567W
MS1-38	PC	16+40.72	533,339.18	1,239,959.03	
	PI		533,338.47	1,239,951.97	
	CC		533,319.28	1,239,961.01	
	PT	16+54.35	533,333.48	1,239,946.93	S45.255489W
MS1-39	PC	16+79.59	533,315.71	1,239,929.00	
	PI		533,309.09	1,239,922.32	
	CC		533,325.65	1,239,919.15	
	PT	16+96.16	533,312.77	1,239,913.66	N66.938247W
MS1-40	PC	17+24.58	533,323.91	1,239,887.51	
	PI		533,326.88	1,239,880.52	
	CC		533,310.11	1,239,881.64	
	PT	17+38.65	533,323.01	1,239,873.99	S59.346236W
MS1-41	PC	17+70.18	533,306.93	1,239,846.86	
	PI		533,302.49	1,239,839.37	
	CC		533,341.34	1,239,826.47	
	PT	17+87.34	533,301.57	1,239,830.71	S83.920681W
MS1-42	PC	18+16.63	533,298.47	1,239,801.57	
	PI		533,297.65	1,239,793.92	
	CC		533,258.69	1,239,805.81	
	PT	18+31.84	533,294.05	1,239,787.11	S62.136161W
MS1-43	PC	18+59.88	533,280.95	1,239,762.32	
	PI		533,277.02	1,239,754.89	
	CC		533,196.98	1,239,806.72	
	PT	18+76.65	533,271.85	1,239,748.27	S52.023161W
MS1-44	PC	19+03.12	533,255.56	1,239,727.40	
	PI		533,250.19	1,239,720.52	
	CC		533,279.21	1,239,708.94	
	PT	19+20.11	533,249.35	1,239,711.84	S84.463531W
MS1-45	PC	19+43.88	533,247.05	1,239,688.17	
	PI		533,246.16	1,239,678.98	
	CC		533,219.18	1,239,690.87	
	PT	19+61.73	533,239.97	1,239,672.12	S47.945772W
MS1-46	PC	19+87.24	533,222.88	1,239,653.17	
	PI		533,216.45	1,239,646.04	
	CC		533,445.64	1,239,452.22	
	PT	20+06.44	533,210.49	1,239,638.52	S51.611322W
MS1-47	PC	20+31.23	533,195.09	1,239,619.08	
	PI		533,190.31	1,239,613.05	
	CC		533,163.74	1,239,643.92	
	PT	20+46.44	533,183.63	1,239,609.22	S29.824631W
MS1-48	PC	20+66.77	533,166.00	1,239,599.11	
	PI		533,156.05	1,239,593.41	
	CC		533,173.46	1,239,586.10	
	PT	20+86.35	533,158.95	1,239,582.31	N75.368919W
MS1-49	PC	21+21.89	533,167.93	1,239,547.92	
	PI		533,170.48	1,239,538.15	
	CC		533,152.44	1,239,543.88	
	PT	21+39.90	533,162.76	1,239,531.65	S40.128483W
MS1-50	PC	21+66.69	533,142.27	1,239,514.38	
	PI		533,136.11	1,239,509.19	
	CC		533,168.05	1,239,483.80	
	PT	21+82.59	533,132.44	1,239,502.02	S62.906167W
MS1-51	PC	22+03.17	533,123.07	1,239,483.70	
	PI		533,118.42	1,239,474.60	
	CC		533,134.64	1,239,477.77	
	PT	22+20.49	533,126.15	1,239,467.93	N40.777106W
MS1-52	PC	22+40.57	533,141.36	1,239,454.82	
	PI		533,148.07	1,239,449.03	
	CC		533,130.91	1,239,442.70	
	PT	22+56.75	533,146.72	1,239,440.28	S81.291919W

BASELINE FOR CONSTRUCTION (CA-5 MAINSTEM 1)					
CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING
MS1-53	PC	22+81.83	533,142.93	1,239,415.48	
	PI		533,141.52	1,239,406.32	
	CC		533,123.16	1,239,418.51	
	PT	22+99.18	533,133.64	1,239,401.47	S31.596939W
MS1-54	PC	23+18.30	533,117.35	1,239,391.45	
	PI		533,108.08	1,239,385.75	
	CC		533,123.64	1,239,381.23	
	PT	23+35.98	533,112.85	1,239,375.97	N63.998989W
MS1-55	PC	23+64.28	533,125.26	1,239,350.53	
	PI		533,129.13	1,239,342.59	
	CC		533,089.31	1,239,333.00	
	PT	23+81.68	533,129.30	1,239,333.75	N88.918500W
MS1-56	PC	24+09.50	533,129.82	1,239,305.93	
	PI		533,129.98	1,239,297.45	
	CC		533,102.83	1,239,305.42	
	PT	24+25.94	533,125.27	1,239,290.40	S56.197275W
MS1-57	PC	24+54.32	533,109.48	1,239,266.82	
	PI		533,104.63	1,239,259.58	
	CC		533,121.11	1,239,259.04	
	PT	24+69.90	533,108.99	1,239,252.04	N60.012036W
MS1-58	PC	24+91.24	533,119.65	1,239,233.56	
	PI		533,124.02	1,239,225.98	
	CC		533,105.79	1,239,225.56	
	PT	25+07.25	533,120.01	1,239,218.22	S62.679825W
MS1-59	PC	25+30.24	533,109.45	1,239,197.78	
	PI		533,105.15	1,239,189.46	
	CC		533,125.45	1,239,189.52	
	PT	25+47.52	533,109.51	1,239,181.16	N62.323264W
MS1-60	PC	25+73.81	533,121.72	1,239,157.88	
	PI		533,127.28	1,239,147.27	
	CC		532,988.88	1,239,088.20	
	PT	25+97.72	533,131.09	1,239,135.91	N71.455231W
	POE	26+34.18	533,142.69	1,239,101.35	

CURVE DATA (CA-5 MAINSTEM 1)						
CURVE	DELTA	Dc	RADIUS	TANGENT	LENGTH	EXTERNAL
MS1-1	14° 43' 51.3"	113° 19' 23.0"	50.55968	6.535558261	12.99903501	0.420656987
MS1-2	41° 43' 47.9"	247° 53' 53.2"	23.11263	8.809679063	16.83352298	1.622044062
MS1-3	15° 30' 18.2"	46° 44' 56.9"	122.5601	16.68521249	33.16652697	1.13054007
MS1-4	28° 27' 7.6"	143° 14' 22.0"	40	10.14091612	19.86332627	1.265459888
MS1-5	25° 53' 21.4"	143° 14' 22.0"	40	9.194031805	18.07413399	1.043028895
MS1-6	24° 12' 3.8"	143° 14' 22.0"	40	8.575639055	16.89551775	0.908942607
MS1-7	28° 47' 49.6"	159° 9' 17.8"	36	9.242263574	18.09376229	1.167451298
MS1-8	57° 7' 56.2"	286° 28' 44.0"	20	10.88902443	19.94292533	2.772150822
MS1-9	51° 58' 30.5"	286° 28' 44.0"	20	9.749278854	18.14274249	2.249684002
MS1-10	54° 1' 15.5"	318° 18' 35.6"	18	9.175605648	16.97118515	2.203755567
MS1-11	42° 5' 21.6"	286° 28' 44.0"	20	7.695176125	14.69195069	1.429319532
MS1-12	35° 13' 44.5"	229° 10' 59.2"	25	7.937438186	15.3715638	1.229809854
MS1-13	28° 32' 52.0"	179° 2' 57.5"	32	8.141172914	15.94409461	1.019368504
MS1-14	35° 49' 30.0"	190° 59' 9.4"	30	9.696964631	18.75792679	1.528259119
MS1-15	71° 10' 57.3"	49° 15' 20.0"	14	10.01979762	17.39318655	3.216165206
MS1-16	52° 1' 38.6"	286° 28' 44.0"	20	9.760567214	18.16098046	2.254632604
MS1-17	40° 26' 19.2"	238° 43' 56.7"	24	8.839477068	16.93891026	1.576089514
MS1-18	26° 50' 27.1"	163° 42' 8.0"	35	8.351361918	16.39614147	0.982568639
MS1-19	38° 16' 40.4"	229° 10' 59.2"	25	8.676061504	16.70188071	1.462691534
MS1-20	49° 39' 46.9"	249° 6' 43.5"	23	10.64284464	19.93601265	2.343049184
MS1-21	25° 6' 5.2"	143° 14' 22.0"	40	8.904945802	17.52411565	0.979239375
MS1-22	28° 43' 34.6"	159° 9' 17.8"	36	9.218546088	18.04925338	1.161560677
MS1-23	32° 30' 32.3"	229° 10' 59.2"	25	7.288962035	14.18472014	1.040909499
MS1-24	47° 35' 17.5"	286° 28' 44.0"	20	8.818588576	16.61141139	1.857893413
MS1-25	57° 5' 39.0"	318° 18' 35.6"	18	9.792362467	17.93666	2.491226481
MS1-26	64° 40' 57.9"	21° 58' 18.7"	15	9.497775809	16.9339067	2.754090946
MS1-27	70° 1' 36.6"	21° 58' 18.7"	15	10.508351	18.33298539	3.314623683
MS1-28	49° 39' 56.3"	286° 28' 44.0"	20	9.255200438	17.33657399	2.037666282
MS1-29	40° 30' 32.3"	249° 6' 43.5"	23	8.487192068	16.26134032	1.515962743
MS1-30	24° 17' 25.2"	143° 14' 22.0"	40	8.608246988	16.95785736	0.915790548
MS1-31	30° 36' 41.5"	190° 59' 9.4"	30	8.210314056	16.02815631	1.103203322
MS1-32	28° 58' 4.7"	143° 14' 22.0"	40	10.33277487	20.2234563	1.313027443
MS1-33	22° 3' 2.2"	143° 14' 22.0"	40	7.793548085	15.39423068	0.752170393
MS1-34	56° 35' 2.8"	347° 14' 49.7"	16.5	8.881385558	16.29505705	2.238436686
MS1-35	25° 41' 28.6"	179° 2' 57.5"	32	7.297029359	14.34871182	0.82143564
MS1-36	45° 46' 48.5"	318° 18' 35.6"	18	7.599819726	14.38225179	1.538609466
MS1-37	32° 13' 39.5"	229° 10' 59.2"	25	7.222411401	14.06195931	1.022360124
MS1-38	39° 3' 14.7"	286° 28' 44.0"	20	7.092995216	13.63244499	1.22052264
MS1-39	67° 48' 22.6"	49° 15' 20.0"	14	9.40872078	16.56819626	2.867840013
MS1-40	53° 42' 55.9"	21° 58' 18.7"	15	7.596034435	14.06268954	1.813677145
MS1-41	24° 34' 28.0"	143° 14' 22.0"	40	8.712066425	17.15619909	0.937758871
MS1-42	21° 47' 4.3"	143° 14' 22.0"	40	7.697182226	15.2084642	0.733850962
MS1-43	10° 6' 46.8"	60° 18' 40.8"	95	8.405829483	16.76799032	0.371159002
MS1-44	32° 26' 25.3"	190° 59' 9.4"	30	8.72726748	16.98573744	1.243642516
MS1-45	36° 31' 3.9"	204° 37' 40.0"	28	9.237826289	17.84594281	1.484528732
MS1-46	3° 39' 56.0"	19° 5' 54.9"	300	9.599662085	19.19277529	0.153549891
MS1-47	21° 47' 12.1"	143° 14' 22.0"	40	7.697968791	15.20998116	0.733999601
MS1-48	74° 48' 23.2"	21° 58' 18.7"	15	11.4697044	19.58428349	3.882640679
MS1-49	64° 30' 9.4"	358° 5' 55.0"	16	10.0957557	18.01252388	2.918886945
MS1-50	22° 46' 39.7"	143° 14' 22.0"	40	8.057308404	15.90182283	0.803433908
MS1-51	76° 19' 0.2"	80° 44' 12.4"	13	10.21470327	17.31571651	3.533002236
MS1-52	57° 55' 51.5"	358° 5' 55.0"	16	8.856350131	16.17738017	2.287562376
MS1-53	49° 41' 41.9"	286° 28' 44.0"	20	9.261421591	17.34682056	2.040279715
MS1-54	84° 24' 14.7"	117° 27' 53.4"	12	10.88171261	17.67754752	4.199125572
MS1-55	24° 55' 10.2"	143° 14' 22.0"	40	8.838314562	17.39710118	0.964811782
MS1-56	34° 53' 3.2"	212° 12' 23.7"	27	8.483085836	16.43880324	1.301285224
MS1-57	63° 47' 26.5"	49° 15' 20.0"	14	8.712654168	15.58700557	2.489704141
MS1-58	57° 18' 29.3"	358° 5' 55.0"	16	8.743080391	16.00345093	2.232977122
MS1-59	54° 59' 48.9"	318° 18' 35.6"	18	9.369589894	17.27778866	2.292590145
MS1-60	9° 7' 55.1"	38° 11' 49.9"	150	11.97908299	23.90742726	0.477567861

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

THIS DOCUMENT/PLAN IS DRAFT AND SUBJECT TO CHANGE. IT IS AN INTERAGENCY/INTRA-AGENCY DELIBERATIVE COMMUNICATION THAT IS NOT FOR PUBLIC DISCLOSURE UNDER MD. GENERAL PROVISIONS CODE ANN. § 4-344 (MARYLAND PUBLIC INFORMATION ACT).

CA–5 STREAM RESTORATION GEOMETRY DATA

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. GS-03 OF 04

COASTAL RESOURCES INC.

BY: cain –

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pGS-P003_CA5.dgn

BASELINE FOR CONSTRUCTION (CA-5 MAINSTEM 2)					
CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING
	POB	0	532,657.99	1,239,501.98	
MS2-1	PC	0+27.47	532,681.87	1,239,488.39	
	PI		532,689.24	1,239,484.19	
	CC		532,694.73	1,239,510.99	
	PT	0+43.88	532,697.68	1,239,485.15	N6.514586E
MS2-2	PC	0+64.18	532,717.84	1,239,487.46	
	PI		532,727.01	1,239,488.50	
	CC		532,721.02	1,239,459.64	
	PT	0+82.01	532,735.00	1,239,483.89	N29.971494W
MS2-3	PC	1+06.12	532,755.90	1,239,471.85	
	PI		532,763.34	1,239,467.55	
	CC		532,743.41	1,239,450.19	
	PT	1+22.68	532,766.57	1,239,459.58	N67.923286W
MS2-4	PC	1+49.08	532,776.49	1,239,435.13	
	PI		532,779.78	1,239,427.02	
	CC		532,739.41	1,239,420.08	
	PT	1+66.30	532,779.39	1,239,418.29	S87.428925W
MS2-5	PC	1+90.70	532,778.29	1,239,393.91	
	PI		532,777.64	1,239,379.26	
	CC		532,812.64	1,239,392.37	
	PT	2+18.42	532,787.75	1,239,368.65	N46.380011W
MS2-6	PC	2+18.91	532,788.09	1,239,368.29	
	PI		532,804.72	1,239,350.84	
	CC		532,821.49	1,239,400.13	
	PT	2+63.34	532,828.54	1,239,354.52	N8.786475E
MS2-7	PC	2+78.77	532,843.80	1,239,356.88	
	PI		532,851.45	1,239,358.07	
	CC		532,846.72	1,239,337.98	
	PT	2+93.49	532,857.78	1,239,353.59	N35.297081W
MS2-8	PC	3+15.24	532,875.53	1,239,341.02	
	PI		532,883.31	1,239,335.51	
	CC		532,892.96	1,239,365.64	
	PT	3+33.71	532,892.84	1,239,335.48	N0.228136W
MS2-9	PC	3+51.94	532,911.07	1,239,335.40	
	PI		532,920.23	1,239,335.37	
	CC		532,910.95	1,239,305.38	
	PT	3+69.73	532,927.81	1,239,330.22	N34.170575W
MS2-10	PC	3+86.97	532,942.08	1,239,320.54	
	PI		532949.45	1239315.53	
	CC		532926.4	1239297.44	
	PT	4+04.22	532952.56	1239307.18	N69.575825W
MS2-11	PC	4+16.13	532956.72	1239296.02	
	PI		532961.73	1239282.55	
	CC		532986.48	1239307.11	
	PT	4+43.13	532975.17	1239277.43	N20.875889W
MS2-12	PC	4+55.68	532986.89	1239272.96	
	PI		532992.11	1239270.97	
	CC		532997.04	1239299.57	
	PT	4+66.70	532997.69	1239271.09	N1.297014E
MS2-13	PC	4+85.55	533016.53	1239271.52	
	PI		533024.8	1239271.71	
	CC		533017.07	1239247.48	
	PT	5+01.49	533031.44	1239266.76	N36.692972W
MS2-14	PC	5+21.87	533047.78	1239254.58	
	PI		533055.8	1239248.61	
	CC		533005.6	1239197.98	
	PT	5+41.73	533061.84	1239240.65	N52.811908W
MS2-15	PC	5+54.43	533069.52	1239230.53	
	PI		533076.51	1239221.32	
	CC		533262.69	1239377.09	
	PT	5+77.54	533084.34	1239212.81	N47.351994W
MS2-16	PC	5+95.46	533096.48	1239199.63	
	PI		533104.2	1239191.25	
	CC		533032.59	1239140.79	
	PT	6+18.12	533109.5	1239181.16	N62.302297W
	POE	6+23.57	533112.03	1239176.33	

BASELINE FOR CONSTRUCTION (CA-5 TRIBUTARY 1)					
CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING
	POB	0	533,338.69	1,241,420.60	S38.791030W
T1-1	PC	0+00.49	533,338.20	1,241,420.56	
	PI		533,330.33	1,241,419.93	
	CC		533,341.38	1,241,380.69	
	PT	0+16.08	533,323.29	1,241,416.36	S26.886036W
T1-2	PC	0+26.90	533,313.64	1,241,411.47	
	PI		533,312.38	1,241,410.83	
	CC		533,316.94	1,241,404.97	
	PT	0+29.69	533,311.45	1,241,409.77	S48.830067W
T1-3	PC	0+39.33	533,305.10	1,241,402.51	
	PI		533,304.07	1,241,401.33	
	CC		533,314.27	1,241,394.49	
	PT	0+42.46	533,303.37	1,241,399.92	S63.519375W
T1-4	PC	0+52.36	533,298.95	1,241,391.05	
	PI		533,298.23	1,241,389.61	
	CC		533,312.39	1,241,384.36	
	PT	0+55.57	533,297.83	1,241,388.05	S75.762072W
	POE	0+66.21	533,295.22	1,241,377.74	S75.762072W

CURVE DATA (CA-5 TRIBUTARY 1)						
CURVE	DELTA	Dc	RADIUS	TANGENT	LENGTH	EXTERNAL
T1-1	22° 20' 5.5"	143° 14' 22.0"	40	7.89658521	15.59267167	0.772001
T1-2	21° 56' 38.5"	425° 50' 3.6"	7.291076191	1.413546374	2.792450142	0.135761
T1-3	14° 41' 21.5"	110° 11' 28.3"	12.18563433	1.570669449	3.124113584	0.100809
T1-4	12° 14' 33.7"	21° 26' 50.4"	15.02062689	1.610903021	3.209538489	0.086135

CURVE DATA (CA-5 MAINSTEM 2)						
CURVE	DELTA	Dc	RADIUS	TANGENT	LENGTH	EXTERNAL
MS2-1	36° 9' 19.9"	220° 22' 6.2"	26.00000001	8.486945964	16.40686353	1.350105151
MS2-2	36° 29' 9.9"	204° 37' 40.0"	28	9.229244664	17.83046296	1.481841141
MS2-3	37° 57' 6.4"	229° 10' 59.2"	25	8.596427289	16.5595924	1.436689697
MS2-4	24° 38' 52.0"	143° 9' 24.6"	40.02308379	8.743929931	17.21733358	0.944019436
MS2-5	46° 11' 27.8"	166° 38' 15.5"	34.3834588	14.66261941	27.71946897	2.99587569
MS2-6	55° 9' 59.3"	124° 9' 52.4"	46.1450407	24.10686261	44.4301441	5.917475626
MS2-7	44° 5' 0.8"	299° 29' 42.1"	19.13079512	7.745574214	14.71929482	1.508517897
MS2-8	35° 4' 8.2"	189° 57' 28.9"	30.16233674	9.530103124	18.46141709	1.469758088
MS2-9	33° 56' 32.8"	190° 49' 22.0"	30.02565059	9.163272897	17.78741479	1.367107548
MS2-10	35° 24' 18.9"	205° 12' 51.8"	27.91996347	8.911806257	17.25281129	1.387794051
MS2-11	48° 41' 59.8"	180° 23' 2.9"	31.76320051	14.37499568	26.99790082	3.101414895
MS2-12	22° 10' 22.5"	201° 8' 30.5"	28.48526826	5.581593013	11.02351918	0.54169659
MS2-13	37° 59' 24.0"	238° 18' 37.1"	24.04251056	8.276150521	15.94139533	1.384580927
MS2-14	16° 7' 8.2"	81° 10' 3.0"	70.58954998	9.995437101	19.85885062	0.704161729
MS2-15	5° 27' 35.7"	23° 37' 43.8"	242.4823418	11.56224391	23.10698601	0.275503735
MS2-16	14° 57' 1.1"	65° 57' 53.3"	86.85810373	11.39676667	22.66406055	0.744501677

BASELINE FOR CONSTRUCTION (CA-5 TRIBUTARY 2)					
CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING
	POB	0	533,076.15	1,240,540.68	N13.389292W
T2-1	PC	0+26.30	533,200.83	1,240,524.85	
	PI		533,211.05	1,240,522.42	
	CC		533,195.27	1,240,501.52	
	PT	0+46.11	533,216.19	1,240,513.25	N60.709550W
T2-2	PC	0+57.01	533,221.53	1,240,503.75	
	PI		533,223.92	1,240,499.49	
	CC		533,260.69	1,240,525.72	
	PT	0+66.74	533,227.16	1,240,495.84	N48.294614W
T2-3	PC	0+81.99	533,237.31	1,240,484.45	
	PI		533,241.02	1,240,480.29	
	CC		533,265.39	1,240,509.48	
	PT	0+93.06	533,245.78	1,240,477.38	N31.425925W
T2-4	PC	1+09.39	533,259.48	1,240,468.51	
	PI		533,261.98	1,240,466.85	
	CC		533,252.87	1,240,458.54	
	PT	1+15.26	533,263.40	1,240,464.21	N61.687656W
T2-5	PC	1+72.88	533,290.84	1,240,413.56	
	PI		533,295.50	1,240,405.12	
	CC		533,259.07	1,240,396.00	
	PT	1+91.72	533,295.36	1,240,395.48	S89.177536W
	POE	2+48.12	533,294.55	1,240,339.09	S89.177536W

CURVE DATA (CA-5 TRIBUTARY 2)						
CURVE	DELTA	Dc	RADIUS	TANGENT	LENGTH	EXTERNAL
T2-1	47° 19' 12.9"	238° 53' 6.4"	23.98465817	10.50862864	19.80879313	2.201122389
T2-2	12° 24' 53.8"	127° 34' 35.6"	44.91090452	4.884808262	9.731362244	0.26487103
T2-3	16° 52' 7.3"	152° 20' 47.1"	37.60887648	5.576632873	11.07258564	0.411202745
T2-4	28° 8' 21.0"	119° 12' 32.1"	11.95632614	2.996474002	5.872002794	0.369767775
T2-5	29° 44' 42.6"	157° 51' 39.4"	36.29509352	9.6387824	18.84263672	1.258067995

BASELINE FOR CONSTRUCTION (CA-5 POND OUTLET)					
CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING
	POB	0	533,183.02	1,239,677.12	N41.718275W
PO-1	PC	0+11.03	533,191.25	1,239,669.78	
	PI		533,194.99	1,239,666.44	
	CC		533,218.14	1,239,699.94	
	PT	0+20.99	533,199.43	1,239,664.13	N27.591186W
PO-2	PC	0+23.03	533,201.23	1,239,663.18	
	PI		533,207.40	1,239,659.96	
	CC		533,186.12	1,239,634.26	
	PT	0+36.74	533,211.72	1,239,654.50	N51.659208W
	POE	0+46.17	533,217.56	1,239,647.11	N51.659208W

CURVE DATA (CA-5 POND OUTLET)						
CURVE	DELTA	Dc	RADIUS	TANGENT	LENGTH	EXTERNAL
PO-1	14° 7' 37.5"	141° 47' 45.1"	40.4072276	5.006879739	9.962976696	0.30902084
PO-2	24° 4' 4.9"	175° 34' 7.6"	32.63437639	6.956901145	13.70860061	0.733287536

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

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SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. GS-04 OF 04 SHEET NO. 08 OF 76

COASTAL RESOURCES INC.

BY: caln

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pGS-P004_CA5.dgn

EROSION AND SEDIMENT CONTROL – GENERAL NOTES

1. NOTIFICATION

NOTIFY THE REGIONAL ENVIRONMENTAL COORDINATOR (REC) IN WRITING AND/OR BY TELEPHONE AT (410) 365-0164 PRIOR TO THE FOLLOWING POINTS:
- PRE-CONSTRUCTION MEETING.
- EROSION AND SEDIMENT CONTROL (ESC) MEETING (MINIMUM 7 WORKING DAYS PRIOR TO COMMENCING EARTH DISTURBING ACTIVITIES).
- UPON INSTALLATION OF INITIAL ESC MEASURES.
- INSTALLATION OF MAJOR ESC BASINS/TRAPS.
- REMOVAL OR MODIFICATION OF ANY ESC MEASURES.
- REMOVAL OF ALL ESC DEVICES.
- FINAL ACCEPTANCE BY THE ADMINISTRATION.

2. STANDARDS AND SPECIFICATIONS

CONSTRUCT THIS PLAN ACCORDING TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", THE MDE "2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II", THE MDOT SHA "FIELD GUIDE FOR EROSION AND SEDIMENT CONTROL", THE ANNOTATED CODE OF MARYLAND, THE CODE OF MARYLAND (COMAR) 26.17.01 AND 26.17.02, ALL REVISIONS THERE OF, AND AS SPECIFIED. KEEP A COPY OF THE 2011 "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" ON THE SITE AT ALL TIMES. PERFORM VEGETATIVE STABILIZATION ACCORDING TO THOSE STANDARDS AND AS SPECIFIED.

3. INSPECTION

DAILY INSPECT ALL ESC MEASURES AND MAINTAIN THEM IN A CONTINUOUSLY-EFFECTIVE OPERATING CONDITION UNTIL REMOVED AS APPROVED BY THE REC AND THE ENGINEER.

4. SHUTDOWNS / LIQUIDATED DAMAGES

COMPLETE COMPLIANCE WITH THE APPROVED ESC PLAN IS EXPECTED AT ALL TIMES. IN CASES WHERE THE CONTRACTOR IS FOUND TO BE IN NON-COMPLIANCE, THE ADMINISTRATION WILL TAKE STEPS TO IMPOSE SELECTED OR TOTAL SHUTDOWNS AND MAY IMPOSE LIQUIDATED DAMAGES FOR NON-COMPLIANCE.

THE ADMINISTRATION'S DISTRICT ENGINEER MAY IMPOSE A TOTAL OR PARTIAL SHUTDOWN IF THE PROJECT MAY ADVERSELY IMPACT THE WATERS OF THE STATE.

5. RECORD KEEPING

ENSURE THE STORMWATER MANAGEMENT (SWM)/ESC APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, APPROVED MODIFICATIONS, MODIFICATION APPROVAL LETTER(S), DAILY LOG BOOKS, TEST REPORTS, AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) NOTICE OF INTENT (NOI) PERMIT ARE AVAILABLE ON-SITE FOR REVIEW AND INSPECTION BY THE ADMINISTRATION.

6. CLEARING AND GRUBBING

UNLESS OTHERWISE SPECIFIED OR APPROVED, LIMIT THE CLEARING AND GRUBBING AREA TO A SINGLE 20-ACRE GRADING UNIT PER GRADING OPERATION. ONCE THIS FIRST UNIT IS HALF GRADED, STABILIZATION MEASURES ARE IN PLACE, AND APPROVED, WORK MAY PROCEED TO A SECOND 20-ACRE GRADING UNIT. UNLESS SPECIFICALLY APPROVED, NO MORE THAN 30 ACRES MAY BE DISTURBED AT ANY TIME.

7. SENSITIVE AREAS

WITH THE APPROVAL AND ASSISTANCE OF THE ENGINEER, COORDINATE WITH THE APPROPRIATE ADMINISTRATION REPRESENTATIVES TO COORDINATE WITH THE APPROPRIATE REGULATORY AGENCIES TO ENSURE THAT ALL PERMIT CONDITIONS ARE MET PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES WITHIN SPECIFIED SENSITIVE AREAS. SENSITIVE AREAS INCLUDE BUT ARE NOT LIMITED TO FLOODPLAINS, WETLANDS, WETLAND BUFFERS, CHESAPEAKE BAY CRITICAL AREA, FORESTS, ARCHEOLOGICAL SITES, HISTORIC SITES, PARKLAND, AND OPEN WATERS. DESIGNATE A RESPONSIBLE PARTY TO MONITOR ALL WORK IN THESE AREAS AND ENSURE THAT REASONABLE CARE IS TAKEN DURING WORK IN AND ADJACENT TO THESE AREAS.

8. INGRESS / EGRESS CONTROLS

PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS AND PREVENT THE DEPOSITION OF MATERIALS ON PUBLIC ROADS. IF DEPOSITION OCCURS, MECHANICALLY REMOVE ALL MATERIALS DEPOSITED ON PUBLIC ROADS IMMEDIATELY. FLUSHING OF ROAD SURFACES IS PROHIBITED.

9. EROSION AND SEDIMENT CONTROL EXCAVATION

DISPOSE OF MATERIAL REMOVED FROM ESC DEVICES IN AN APPROVED WASTE SITE AS SPECIFIED IN SECTION 201. MATERIALS MAY BE STORED FOR RE-USE. MATERIALS STORED ON-SITE MAY BE REUSED ONCE IT IS DRIED AND IF IT MEETS THE REQUIREMENTS FOR EMBANKMENTS OR OTHER UNSPECIFIED NEEDS.

10. DEWATERING PRACTICES

OPERATE DEWATERING PRACTICES IN A MANNER THAT DOES NOT DISCHARGE SEDIMENT INTO WATERWAYS. NO VISIBLE CHANGES TO STREAM CLARITY ARE ACCEPTABLE.

11. STANDARD STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, COMPLETE PERMANENT OR TEMPORARY STABILIZATION WITHIN THREE (3) CALENDAR DAYS FOR SURFACES OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE SITE. ENSURE CONTINUED STABILIZATION.

12. INCREMENTAL STABILIZATION

REFER TO THE MDE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR THE INCREMENTAL STABILIZATION OF CUT AND FILLS.

13. SEDIMENT TRAPS AND BASINS

PLAN DIMENSIONS ARE RELATIVE TO THE OUTLET ELEVATION. MAINTAIN INFLOW AND OUTFLOW LOCATIONS FOR TRAPS AND BASINS IN STABLE CONDITION.

14. OFF–SITE UTILITY WORK

FOLLOW ADDITIONAL BEST MANAGEMENT ESC PRACTICES FOR UTILITY CONSTRUCTION IN AREAS OUTSIDE OF DESIGNED CONTROLS:

(a) CALL "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO THE START OF WORK.
(b) PLACE EXCAVATED MATERIAL ON THE HIGH SIDE OF TRENCHES.
(c) BACKFILL, COMPACT, AND STABILIZE AT THE END OF EACH WORKING DAY ALL TRENCHES FOR UTILITY INSTALLATIONS. WHEN THIS IS NOT POSSIBLE, CONFORM TO (d).
(d) PLACE TEMPORARY SILT FENCES IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREA THAT IS INTENDED TO REMAIN DISTURBED FOR MORE THAN ONE (1) DAY.

15. SITE INFORMATION*

A. TOTAL AREA DISTURBED	6.7	ACRES
B. TOTAL CUT	1,738	CU. YDS.
C. TOTAL FILL	4,498	CU. YDS.
D. OFFSITE WASTE/BORROW AREA LOCATION (IF KNOWN)	TBD	

* (NOT FOR BIDDING PURPOSES)

16. MODIFICATIONS

SUBMIT MODIFICATIONS OF THE ESC MEASURES OR PLAN TO THE ADMINISTRATION FOR APPROVAL. OBTAIN ALL APPROVALS PRIOR TO IMPLEMENTING ANY MODIFICATION.

STANDARD SYMBOLS

Symbol		Symbol		Symbol	
AT-GRADE INLET PROTECTION	AGIP	PERMANENT SOIL STABILIZATION MATTING-TYPE B		TEMPORARY ACCESS BRIDGE	TB
BAFFLE BOARDS	BB	PERMANENT SOIL STABILIZATION MATTING-TYPE C		TEMPORARY ACCESS CULVERT	
BENCHING	BENCHING	PIPE OUTLET SEDIMENT TRAP ST I	ST-I	TEMPORARY ASPHALT BERM	TAB
CATCH BASIN INSERT	CBI	PIPE SLOPE DRAIN (NOTE: DESIGNATION PSD-12 REFERS TO PIPE SLOPE DRAIN WITH 12 IN PIPE)	PSD – 12	TEMPORARY BARRIER DIVERSION	TBD
CLEAR WATER DIVERSION PIPE (NOTE: DESIGNATION CWD-12 REFERS TO CLEAR WATER DIVERSION WITH 12 INCH PIPE.)	CWD – 12	PLUNGE POOL	PP	TEMPORARY GABION OUTLET STRUCTURE	TGOS
CLEAR WATER PIPE	CWP	PORTABLE SEDIMENT TANK	PST	TEMPORARY SOIL STABILIZATION MATTING-TYPE A	
COMBINATION INLET PROTECTION	COIP	REMOVABLE PUMPING STATION	RPS	TEMPORARY SOIL STABILIZATION MATTING-TYPE E	
CONCRETE WASHOUT STRUCTURE	CWS	RIPRAP INFLOW PROTECTION	RRP	TEMPORARY SOIL STABILIZATION MATTING-TYPE D	
CURB INLET PROTECTION	CIP	RIPRAP OUTLET SEDIMENT TRAP ST III	ST-III	TEMPORARY STONE OUTLET STRUCTURE	TSOS
DIVERSION FENCE	DF	ROCK OUTLET PROTECTION I	ROPI	TEMPORARY SWALE (NOTE: PLACE DESIGNATION (A-1, B-2, ETC.) ON FLOW CHANNEL SIDE OF SWALE.)	A–1
EARTH DIKE (NOTE: PLACE DESIGNATION (A-1, B-2, ETC.) ON FLOW CHANNEL SIDE OF DIKE.)	A–1	ROCK OUTLET PROTECTION II	ROPII	VERTICAL DRAW-DOWN DEVICE	VDDD
EMERGENCY SPILLWAY	ES	ROCK OUTLET PROTECTION III	ROPIII	WASH RACK OPTION	WR
FILTER BAG	FB	SILT FENCE	SF	CHESAPEAKE BAY CRITICAL AREA	CBCA
FILTER BERM	FB–A / FB–B	SILT FENCE ON PAVEMENT	SFOP	DRAINAGE BOUNDARY	DA
FILTER LOG (NOTE: DESIGNATION FL-18 REFERS TO FILTER LOG WITH 18 INCH DIAMETER.)	FL–18	SOD		EXISTING CONTOURS	100
GABION INFLOW PROTECTION	GP	STABILIZED CONSTRUCTION ENTRANCE (SCE)	SCE	LIMIT OF DISTURBANCE (LOD)	LOD
GABION INLET PROTECTION	GIP	STANDARD INLET PROTECTION	SIP	PROPOSED CONTOURS	100
HORIZONTAL DRAW-DOWN DEVICE	HDDD	STOCKPILE AREA		TEMPORARY ORANGE CONSTRUCTION FENCE (TOCF)	
LIMIT OF DISTURBANCE	LOD	STONE CHECK DAM	CD	TREE PROTECTION FENCE	TPF
MEDIAN INLET PROTECTION	MIP	STONE/RIPRAP OUTLET SEDIMENT TRAP ST II	ST-II	WETLAND	• • • • • •
MEDIAN SUMP INLET PROTECTION	MSIP	SUBSURFACE DRAINS	SSD	WETLAND BUFFER	B
MOUNTABLE BERM	MB	SUMP PIT	SP	100-YEAR FLOODPLAIN	
PERIMETER DIKE/SWALE	PDS–I	SUPER SILT FENCE	SSF	SANITARY SEWER	SAN
OVERHEAD UTILITY LINE	E	PROPERTY LINE		MANHOLE	
				PEDESTRIAN TRAIL	

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

1) NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100–YEAR FLOODPLAIN.
2) PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100–YEAR FLOODPLAIN.
3) DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4) PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100–YEAR FLOODPLAIN.
5) REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100–YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6) RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100–YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7) ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOLA SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON– PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8) AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST–CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9) TO PROTECT AQUATIC SPECIES, IN–STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:
   USE I WATERS: IN–STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
   USE III WATERS: IN–STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THROUGH APRIL 30, INCLUSIVE, DURING ANY YEAR.
   USE IV WATERS: IN–STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.
10) STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11) CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

P.E. CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND

LICENSE NO. ____________

EXPIRATION DATE: ____________

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES 1 & II INCLUDING SUPPLEMENTS, THE ENVIRONMENT ARTICLE SECTIONS 4–101 THROUGH 116 AND SECTIONS 4–201 AND 215, AND THE CODE OF MARYLAND REGULATIONS (COMAR) 26.17.01 AND COMAR 26.17.02 FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT, RESPECTIVELY.

DATE ____________ DESIGNER'S SIGNATURE ____________

MD REGISTRATION NO. ____________ PRINTED NAME ____________
P.E., R.L.S., R.L.A., OR R.A. (CIRCLE ONE)

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

CA–5 STREAM RESTORATION ESC NOTES AND DETAILS

SCALE: NTS	DATE: DECEMBER 2021	CONTRACT NO.: AW073B12	
DESIGNED BY: SCN		COUNTY: MONTGOMERY	
DRAWN BY: CJN		LOGMILE:	
CHECKED BY: KSK		HORIZONTAL SCALE:	
MDE/PRD: 168251/20–PR–0040–01		VERTICAL SCALE:	
DRAWING NO. EN-01 OF 04		SHEET NO. 09 OF 76	

BY: caln –

EROSION AND SEDIMENT CONTROL – GENERAL NOTES AND SEQUENCE OF CONSTRUCTION

PARK PERMIT GENERAL NOTES

1. THE CONTRACTOR MUST NOTIFY M–NCPPC OF THEIR INTENTION TO START PERMIT WORK AS STATED IN THE PARK PERMIT. A PRE–CONSTRUCTION MEETING SHALL BE SCHEDULED AND CONDUCTED BY M–NCPPC CONSTRUCTION STAFF. PRIOR TO THIS MEETING THE CONTRACTOR SHALL NOT PERFORM ANY CONSTRUCTION RELATED ACTIVITY AT THE PROJECT SITE, EXCEPT LIMITED CLEARANCE FOR STAKEOUT AND FLAGGING OF LOD. ALL STAKEOUT AND FLAGGING WORK MUST BE DONE BY HAND AND ANY SMALL VEGETATION CLEARED FOR INSTALLATION OF THE LOD SHALL BE CUT TO THE GROUND. THE LOD SHALL BE APPROVED BY M–NCPPC CONSTRUCTION STAFF AND PERMITTING AGENCIES HAVING JURISDICTION. M–NCPPC CONSTRUCTION STAFF MAY REQUIRE MINOR ADJUSTMENTS TO THE LOD TO REDUCE IMPACTS ON EXISTING INFRASTRUCTURE AND NATURAL RESOURCES THAT ARE TO REMAIN WITH THE APPROVAL OF PERMITTING AUTHORITIES. THIS ADJUSTMENT SHALL BE PERFORMED AT NO ADDITIONAL COST TO M–NCPPC.
2. THE CONTRACTOR SHALL FOLLOW ALL THE REQUIREMENTS AND INSTRUCTIONS FOUND IN THE PARK PERMIT INCLUDING WHO TO NOTIFY BEFORE WORK BEGINS.
3. UNLESS NOTED OTHERWISE, ALL WORK SHALL BE NEW AND M–NCPPC WILL NOT PROVIDE ANY EQUIPMENT, MATERIALS, OR LABOR FOR THE WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL ITEMS REQUIRED TO PROVIDE A SITE CLEAR OF OBSTRUCTIONS (ABOVE AND BELOW GRADE) AND ROUGH GRADE TO SPECIFIED ELEVATIONS AT THE BEGINNING OF CONSTRUCTION.
5. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST APPLICABLE CODES, STANDARDS AND SPECIFICATIONS OF M–NCPPC, MONTGOMERY COUNTY, MARYLAND STATE AND FEDERAL REQUIREMENTS.
6. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL ELEMENTS ARE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN DOCUMENTS AND CONTRACT CONDITIONS INCLUDING THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN (ADA), THE MARYLAND ACCESSIBILITY CODE, MONTGOMERY PARKS ADA COMPLIANCE MANUAL, AND UPDATES. IF THE CONTRACTOR OBSERVES THAT PORTIONS OF THE PROJECT ARE NON–COMPLIANT WITH THE ADA, HE SHALL NOTIFY THE M–NCPPC CONSTRUCTION STAFF SO THAT A FIELD ADJUSTMENT CAN BE MADE TO ENSURE COMPLIANCE. GRADE TOLERANCES SHALL BE MEASURED WITH A TWO (2) FOOT DIGITAL LEVEL.
7. PRIOR TO THE START OF CONSTRUCTION, TREE PROTECTION MEASURES SHALL BE INSTALLED, INSPECTED AND SHALL BE MAINTAINED DURING CONSTRUCTION.
8. ALL EXISTING CONDITIONS TO REMAIN SHALL BE VERIFIED, PHOTOGRAPHED AND DOCUMENTED PRIOR TO CONSTRUCTION. IF THEY ARE DIFFERENT FROM THE CONDITIONS SHOWN ON THE CONTRACT DRAWINGS, THE M–NCPPC CONSTRUCTION STAFF SHALL BE NOTIFIED BEFORE PROCEEDING WITH THE WORK. ALL OTHER DAMAGES SHALL BE CORRECTED, AND RESTORATION WORK SHALL BE PERFORMED IN ACCORDANCE WITH M–NCPPC REQUIREMENTS AND TO THE SATISFACTION OF THE M–NCPPC CONSTRUCTION STAFF AT NO COST TO M–NCPPC.
9. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL MEET CURRENT MONTGOMERY COUNTY DPS STANDARDS AND INSPECTOR DIRECTIVES. THESE SHALL BE APPROVED BY THE PERMITTING AUTHORITIES PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO MEET THE REQUIREMENTS OF THE MDE NOI. BEFORE THE START OF CONSTRUCTION, A SITE REPRESENTATIVE OF THE CONTRACTOR SHALL HAVE PROOF OF COMPLETION OF THE MDE RESPONSIBLE PERSONNEL CERTIFICATION.
10. ANY WORK WITHIN THE MONTGOMERY COUNTY RIGHT–OF–WAY SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST MCDOT STANDARDS AND SPECIFICATIONS. ANY WORK WITHIN THE MARYLAND STATE HIGHWAY ADMINISTRATION RIGHT–OF–WAY SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST MDSHA STANDARDS AND SPECIFICATIONS. THIS WORK INCLUDES, BUT IS NOT LIMITED TO, REPAIRING, RESTORING, AND OBTAINING FINAL INSPECTION APPROVAL.
11. IF IT IS DETERMINED THAT TREES ARE DAMAGED DURING CONSTRUCTION, A CERTIFIED ARBORIST SHALL INSPECT THEM AND SUBMIT A REPORT RECOMMENDING APPROPRIATE ACTION EITHER TO REPAIR OR REPLACE. IF APPROVED BY M–NCPPC CONSTRUCTION STAFF, CORRECTIVE WORK AND/OR REPLACEMENT SHALL BE PERFORMED AT NO COST TO M–NCPPC.

PARK PERMIT GENERAL NOTES CONTINUED

12. LOCATION FOR STABILIZED CONSTRUCTION ENTRANCE, STAGING AND STORAGE AREAS AND ACCESS ROUTES SHALL BE IDENTIFIED AND ADJUSTED IN THE FIELD WITH APPROVAL FROM THE M–NCPPC CONSTRUCTION STAFF.
13. THE CONTRACTOR IS RESPONSIBLE FOR CLEARING ALL UTILITIES, INCLUDING CALLING *MISS UTILITY*AND ALL OTHER PRIVATE UTILITY LOCATING SERVICES FOR UTILITY LOCATION AT LEAST 48 HOURS PRIOR TO THE START OF ANY WORK. ALL THE EXISTING UTILITIES MAY NOT BE SHOWN ON THE DRAWINGS. PRIOR TO THE START OF CONSTRUCTION RELATED ACTIVITY, ALL UTILITIES WITHIN THE LOD OR TREE PLANTING AREAS SHALL BE LOCATED AND IDENTIFIED UTILIZING APPROPRIATED INSTRUMENTS. THE LOCATIONS SHALL BE STAKED AND FLAGGED.
14. THE CONTRACTOR SHALL NOTIFY THE M–NCPPC CONSTRUCTION STAFF IMMEDIATELY IF EXISTING UTILITIES ARE FOUND WITHIN THE WORK AREA THAT ARE NOT SHOWN ON THE DRAWINGS AND IMPACT THE CONTRACT WORK.
15. EXISTING SIGNS, FENCES, AND OTHER MINOR SITE FEATURES IN THE WAY OF PROPOSED CONSTRUCTION, WHETHER SHOWN OR NOT SHOWN ON THESE PLANS, SHALL BE REMOVED AND REPLACED AT NO COST TO M–NCPPC.
16. DAMAGES TO EXISTING UTILITIES SHALL BE CORRECTED IMMEDIATELY IN ACCORDANCE WITH THE REQUIREMENTS OF THE AFFECTED UTILITY. UPON COMPLETION OF THE CORRECTIVE ACTION A COPY OF THE APPROVAL DOCUMENTATION FROM THE UTILITY SHALL BE SUBMITTED TO THE M–NCPPC CONSTRUCTION STAFF. REPAIR WORK WILL BE AT NO COST TO M–NCPPC. NO WORK SHALL BE PERFORMED OUTSIDE OF THE LOD WITHOUT PRIOR APPROVAL OF THE M–NCPPC CONSTRUCTION STAFF. AREAS DISTURBED OUTSIDE APPROVED LOD SHALL BE RESTORED IMMEDIATELY TO THE SATISFACTION OF M–NCPPC CONSTRUCTION STAFF AT NO COST TO M–NCPPC.
17. UNLESS OTHERWISE NOTED, THE PARK FACILITIES SHALL REMAIN OPEN THROUGHOUT CONSTRUCTION FOR USE BY PARKS STAFF AND THE PUBLIC. SAFE ACCESS FOR ALL USERS SHALL BE PROVIDED WITH APPROPRIATE DETOURS, FENCING, TEMPORARY FACILITIES, SIGNAGE, ETC. AND SHALL BE APPROVED BY M–NCPPC CONSTRUCTION STAFF.
18. IF THE CONTRACTOR FINDS THAT CONFLICTS EXIST AMONG VARIOUS CONTRACT/PERMIT REQUIREMENTS, THE CONTRACTOR SHALL COMPLY WITH THE MOST STRINGENT REQUIREMENT.
19. ONLY APPROVED PLANS THAT HAVE BEEN SIGNED BY THE APPROPRIATE AUTHORITIES SHALL BE USED FOR THE CONSTRUCTION OF THE IMPROVEMENTS.
20. PRIOR TO VEGETATIVE STABILIZATION, ALL DISTURBED AREAS MUST BE TOPSOILED PER THE MONTGOMERY COUNTY "STANDARDS AND SPECIFICATIONS FOR TOPSOIL". IF ON–SITE MATERIALS DO NOT MEET REQUIREMENTS OF TOPSOIL, COORDINATE WITH M–NCPPC REGARDING TILLING–IN OF CERTIFIED COMPOST TO ON–SITE SOILS TO MEET SPECIFICATIONS. IF THERE IS A CONFLICT BETWEEN MONTGOMERY COUNTY AND M–NCPPC SPECIFICATIONS, THE STRICTER SPECIFICATION WILL BE USED.
21. METAL LANDSCAPE STAPLES ARE NOT ALLOWED TO BE USED FOR ANCHORING ANYTHING ON PARK PROPERTY. ALSO, EROSION CONTROL MATTING WITH PLASTIC NON–BIODEGRADABLE FIBERS OR FILAMENTS IN THEM WILL NOT BE ALLOWED ON PARK PROPERTY.
22. PAVEMENT REMOVAL SHALL INCLUDE REMOVAL OF GRAVEL SUBBASE AND SCARIFICATION OF SUBGRADE, UNLESS OTHERWISE DIRECTED BY M–NCPPC CONSTRUCTION STAFF.
23. TOPOGRAPHIC SURVEY COMPLETED BY CHESAPEAKE ENVIRONMENTAL MANAGEMENT (CEM), 4/14/2020–10/27/2020, USING NAD 83(2001) HORIZONTAL AND NAVD 88 VERTICAL DATUM.
24. THIS SITE IS LOCATED WITHIN THE SENECA CREEK WATERSHED OF MONTGOMERY COUNTY. RUNOFF FROM THIS SITE DRAINS INTO GREAT SENECA CREEK. THE CONTRACTOR SHALL TAKE PRECAUTIONS NOT TO CONTAMINATE THE RECEIVING WATERS.

SEQUENCE OF CONSTRUCTION

1. THE CONTRACTOR SHALL NOTIFY THE REGIONAL ENVIRONMENTAL COORDINATOR AT LEAST SEVEN (7) DAYS BEFORE ANY LAND DISTURBING ACTIVITY AND HOLD A PRE–CONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES AND LANDOWNERS.
2. LOD, ACCESS ROUTES, AND STAGING AREAS SHALL BE STAKED AND REVIEWED IN THE FIELD WITH THE QAD INSPECTOR PRIOR TO CONSTRUCTION TO ALLOW FOR ADJUSTMENTS. ANY ADJUSTMENT MUST BE APPROVED BY THE QAD INSPECTOR AND PRD PRIOR TO CONSTRUCTION. ALL PROTECTED RESOURCES WITHIN THE PROPOSED LOD ARE CONSIDERED TO BE IMPACTED DURING CONSTRUCTION. PROTECTED RESOURCES OUTSIDE OF THE LOD SHOULD BE FLAGGED TO 25 FEET BEYOND THE LOD AND REVIEWED BY THE QAD INSPECTOR BEFORE CONSTRUCTION.
3. TREE PROTECTION FENCING (TPF) SHALL BE INSTALLED ALONG THE ENTIRE LIMITS OF DISTURBANCE PRIOR TO CONSTRUCTION. ALL TREES WITHIN THE LOD NOT MARKED FOR REMOVAL WILL RECEIVE TREE PLANKING (TP) AND TPF. TPF MAY BE INSTALLED AROUND CLUMPS OF TREES AS SHOWN ON PLANS. TREES JUST OUTSIDE OF THE LOD SHALL ALSO RECEIVE TP AND TPF AS SHOWN ON THE PLANS. INSTALL ALL TP OUTSIDE THE LOD BY HAND. INSTALL TPF AND TREE PLANKING IMMEDIATELY AFTER CONSTRUCTION LOD STAKEOUT AND PRIOR TO THE INSTALLATION OF SEDIMENT AND EROSION CONTROLS. LOCATION AND INSTALLATION OF THE TPF AND TREE PLANKING MUST BE APPROVED BY THE INSPECTOR.
4. CLEAR AND GRUB FOR THE MINIMUM AREA REQUIRED FOR INSTALLATION OF THE STABILIZED CONSTRUCTION ENTRANCE (SCE), DIVERSION FENCE (DF), OUTLET PROTECTION (OP), AND SUPER SILT FENCE (SSF). INSTALL SCE, SSF, DF, ACCESS ROADS, AND STAGING/STOCKPILE AREAS.
5. THE CONTRACTOR SHALL STABILIZE ALL DISTURBED AREAS BY THE END OF EACH WORKDAY.
6. WHERE PUMP AROUND PRACTICES ARE UTILIZED, THE EXACT LOCATION OF THE HOSES AND FILTER BAG MAY BE MODIFIED IN THE FIELD BASED ON EXISTING CONDITIONS. ANY ADJUSTMENTS MUST BE APPROVED BY THE QAD INSPECTOR.
7. UNLESS OTHERWISE STATED, THE WORK AREAS OF THE SOC ARE ASSUMED TO INCLUDE ALL WORK WITHIN THE LOD IN THE STATION RANGE OF THE WORK AREA, INCLUDING FLOODPLAIN GRADING AND STRUCTURE INSTALLATION. WORK WITHIN THE FLOODPLAIN SHALL BE CONDUCTED IN AN ORDER WHICH DOES NOT REQUIRE THE CONTRACTOR TO TRACK OVER FINISHED GRADING OR CROSS OVER THE STREAM IN ANY AREAS OTHER THAN THOSE SHOWN ON THE PLANS.
8. WORK IN THE STREAM AREAS MUST OCCUR FROM UPSTREAM TO DOWNSTREAM UNLESS OTHERWISE SPECIFIED.
9. UPON FINAL APPROVAL OF THE INSPECTOR, PERMANENTLY STABILIZE AND VEGETATE ALL REMAINING DISTURBED AREAS. COMPLETE FINAL FLOODPLAIN GRADING AS ACCESS ROAD IS REMOVED. REMOVE AND DISPOSE OF MULCH ACCESS ROAD MATERIALS PRIOR TO VEGETATING. ONCE DISTURBED AREAS ARE FULLY COMPLETED AND STABILIZED WITH VEGETATION, REMOVE ANY REMAINING EROSION AND SEDIMENT CONTROL MEASURES AND STABILIZE ANY AREAS DISTURBED BY THEIR REMOVAL.
10. ALL EXISTING HARD SURFACE TRAILS USED FOR ACCESS SHALL BE REHABILITATED UPON DEMOBILIZATION FROM THE SITE PER PARKS DETAIL #538–ASPHALT TRAIL REHAB –MILL AND OVERLAY.

MAINSTEM 1

WORK AREA 1 (MAINSTEM 1 STA. 0+00–2+21, TRIBUTARY 1 STA. 0+00–0+66)

11. INSTALL PUMP AROUND 1 (PA–1) INCLUDING SD–1 US, SD–1 DS, SD–1 TRIB, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
12. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
13. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE ESC PRACTICES INCLUDING PA–1, TB–1, AND THE MULCH ACCESS ROAD ON THE SOUTH SIDE OF THE STREAM.

WORK AREA 2 (MAINSTEM 1 STA. 1+64–3+36)

14. INSTALL PA–2 INCLUDING SD–2 US, SD–2/3 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
15. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
16. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE ESC PRACTICES INCLUDING PA–2 AND THE MULCH ACCESS ROAD WITHIN THE WORK AREA. LEAVE SD–2/3 DS IN PLACE. RESTORE THE WETLAND ON THE RIGHT BANK TO EXISTING CONDITIONS AFTER REMOVING CONTROLS.

WORK AREA 3 (MAINSTEM 1 STA. 2+85 – 4+50)

17. INSTALL PA–3 INCLUDING SD–3 US, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP). SD–2/3 DS SHOULD ALREADY BE IN PLACE FROM WORK AREA 2.
18. INSTALL FABRIC BASED STREAM DIVERSION 1 (FBSD–1), AS SHOWN IN THE PLANSET. ONCE FBSD–1 IS INSTALLED AND APPROVED BY THE QAD INSPECTOR, REMOVE PA–3, BUT LEAVE SD–2/3 DS IN PLACE TO FORCE FLOWS INTO FBSD–1.
19. INSTALL PROPOSED STRUCTURES FROM STATION 3+50 UP TO APPROXIMATELY STATION 4+50, AS SHOWN ON THE PLANS. INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
20. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, RE–INSTALL SD–3 US AND THE CWP TO DIVERT FLOWS AROUND FBSD–1. REMOVE THE FBSD–1, GRADE THE PROPOSED CHANNEL, AND INSTALL THE STRUCTURE BETWEEN STATION 3+00 AND STATION 3+50.
21. ONCE THE REMAINING STRUCTURE AND CHANNEL GRADING HAS BEEN APPROVED BY THE QAD INSPECTOR AND THE ENTIRE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE ESC PRACTICES INCLUDING SD–3 US. SD–2/3 DS, AND THE MULCH ACCESS ROAD WITHIN THE WORK AREA.

WORK AREA 4 (MAINSTEM 1 STA. 4+22–5+29)

22. INSTALL PA–4 INCLUDING SD–4 US, SD–4 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
23. INSTALL PROPOSED STRUCTURES AND FILL EXISTING CHANNEL WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
24. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE ESC PRACTICES INCLUDING SD–4 US, SD–4 DS, AND THE MULCH ACCESS ROAD WITHIN THE WORK AREA.

WORK AREA 5 (MAINSTEM 1 STA. 5+00–8+17)

25. INSTALL PA–5 INCLUDING SD–5 US, SD–5 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
26. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
27. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE ESC PRACTICES INCLUDING SD–5 US, SD–5 DS, AND THE MULCH ACCESS ROAD WITHIN THE WORK AREA.

WORK AREA 6 (MAINSTEM 1 STA. 7+80–10+30)

28. INSTALL PA–6 INCLUDING SD–6 US, SD–6 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
29. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
30. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE PA–7.

WORK AREA 7 (MAINSTEM 1 STA. 9+93–12+87, TRIBUTARY 2 STA. 0+82–3+48)

31. INSTALL PA–7 INCLUDING SD–7 US, SD–7 DS, SD–7 TRIB, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP). TRIB 2 IS EPHEMERAL AND DOES NOT NEED TO BE ACTIVELY PUMPED UNLESS FLOW IS PRESENT DURING WORK.
32. INSTALL PROPOSED STRUCTURES AND FILL EXISTING CHANNEL WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
33. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE PA–7.

WORK AREA 8 (MAINSTEM 1 STA. 12+27–14+46)

34. INSTALL PA–8 INCLUDING SD–8 US, SD–8 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
35. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
36. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE PA–8.

WORK AREA 9 (MAINSTEM 1 STA. 15+00 – 18+34)

37. INSTALL PA–9 INCLUDING SD–9 US, SD–9 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
38. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
39. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE PA–9.

WORK AREA 10 (MAINSTEM 1 STA. 17+80 – 20+92, POND OUTLET STA. 0+00–0+46)

40. INSTALL PA–10 INCLUDING SD–10 US, SD–10 DS, SD–10 POND, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP). SD–10 POND SHOULD BE PLACED UPSTREAM OF THE EXISTING POND OUTLET TO BLOCK FLOWS FROM EXITING THE POND.
41. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
42. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE PA–10.

WORK AREA 11 (MAINSTEM 1 STA. 20+46 – 23+95)

43. INSTALL PA–11 INCLUDING SD–11 US, SD–11 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
44. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
45. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE PA–11.

WORK AREA 12 (MAINSTEM 1 STA. 23+77 – 26+17)

46. INSTALL PA–12 INCLUDING SD–12 US, SD–12 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
47. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
48. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE PA–12.

MAINSTEM 2

WORK AREA 13 (MAINSTEM 2 STA. 0+00 – 6+20)

49. CONSTRUCTION ACTIVITIES IN WORK AREA 12 AND WORK AREA 13 CAN BE CONDUCTED CONCURRENTLY.
50. INSTALL PA–13 INCLUDING SD–13 US, SD–13 DS, CLEAN WATER PUMP (CWP), DIRTY WATER PUMP (DWP), FILTER BAG (FB), AND OUTLET PROTECTION (OP).
51. INSTALL PROPOSED STRUCTURES WITHIN THE WORK AREA, AS SHOWN ON THE PLANS. GRADING AND INSTALLATION OF STRUCTURES SHOULD BE DIRECTED BY THE DESIGNATED SPECIALIST AND APPROVED BY THE QAD INSPECTOR.
52. ONCE STRUCTURES HAVE BEEN APPROVED BY THE QAD INSPECTOR AND THE WORK AREA HAS BEEN PERMANENTLY STABILIZED, REMOVE PA–13.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

THIS DOCUMENT/PLAN IS DRAFT AND SUBJECT TO CHANGE. IT IS AN INTERAGENCY/INTRA-AGENCY DELIBERATIVE COMMUNICATION THAT IS NOT FOR PUBLIC DISCLOSURE UNDER MD. GENERAL PROVISIONS CODE ANN. § 4-344 (MARYLAND PUBLIC INFORMATION ACT) .

CA–5 STREAM RESTORATION ESC NOTES AND DETAILS

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825I/20–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. **EN-02** OF **04**

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pES-N002_CA5.dgn

EROSION AND SEDIMENT CONTROL – DETAILS

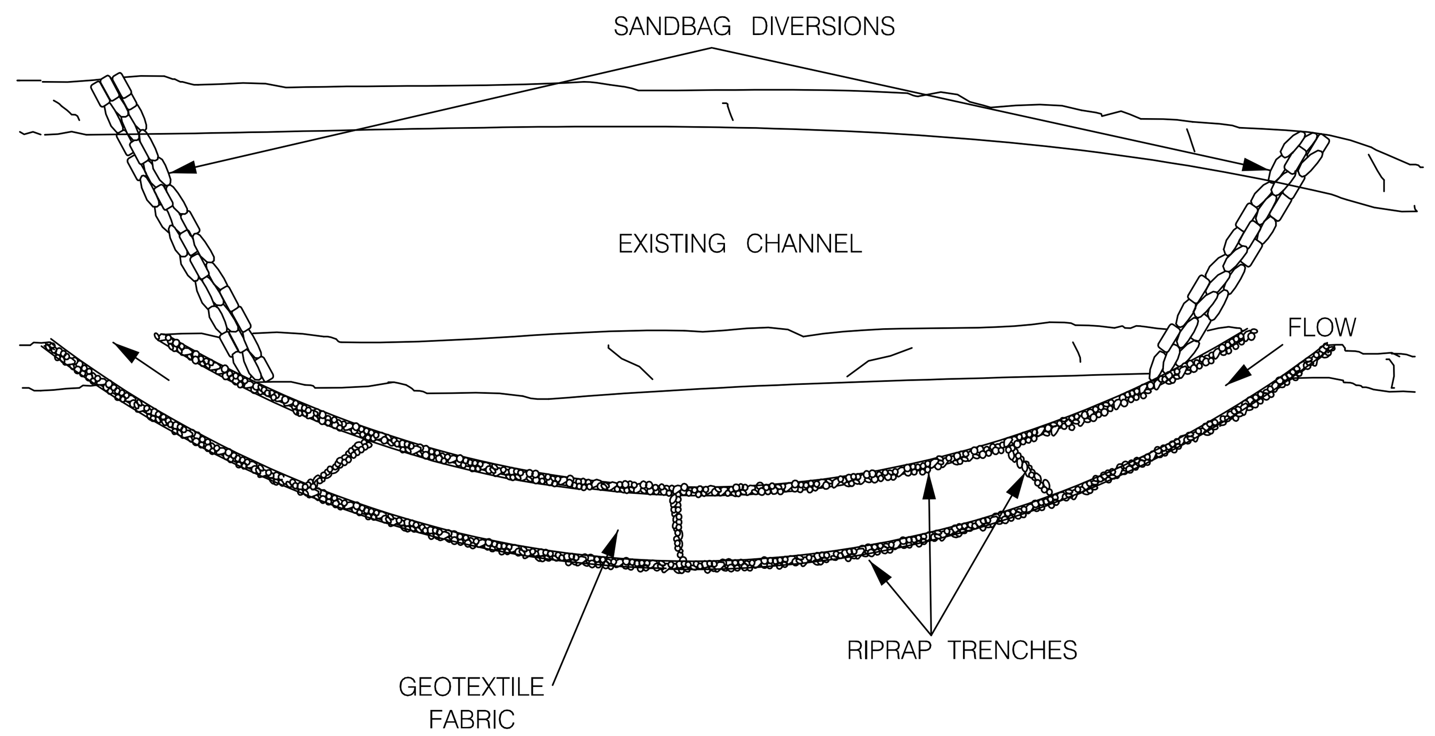
FABRIC– BASED STREAM DIVERSION

CHANNEL EXCAVATION
1. ALL DISTURBANCES RESULTING FROM CONSTRUCTION OF THE CHANNEL SHOULD BE CONTAINED BY APPROPRIATE SEDIMENT CONTROL MEASURES.
2. EXCAVATION OF THE CHANNEL SHOULD BEGIN AT THE DOWNSTREAM END AND PROCEED UPSTREAM. THE CHANNEL SHOULD HAVE A MINIMUM CAPACITY SUFFICIENT TO CONVEY THE STREAM'S BASE FLOW FOR PROJECTS WITH DURATION OF 2 WEEKS OR LESS. FOR PROJECTS OF LONGER DURATION, CHANNELS SHOULD HAVE A CAPACITY SUFFICIENT TO CONVEY BANKFULL FLOW. ALL EXCAVATED MATERIALS SHOULD BE STOCKPILED OUTSIDE OF THE 100 YEAR FLOOD PLAIN AND TEMPORARILY STABILIZED TO PREVENT RE–ENTRY INTO THE STREAM CHANNEL.
3. THE PROCESS OF EXCAVATION AND STABILIZATION WITH FABRIC SHOULD BE A CONTINUOUS AND UNINTERRUPTED OPERATION. ALL MATERIALS SHOULD BE ON–SITE PRIOR TO CHANNEL CONSTRUCTION.
4. THE DOWNSTREAM AND UPSTREAM CONNECTION TO THE NATURAL CHANNEL SHOULD BE CONSTRUCTED UNDER DRY CONDITIONS. THE STREAM SHOULD BE CONTAINED BY SANDBAGS ALONG THE OPPOSING BANK DURING THE PROCESS OF CUTTING THE DIVERSION CHANNEL INTO THE NATURAL STREAM CHANNEL. EXCAVATION AND STABILIZATION SHOULD BE A CONTINUOUS AND UNINTERRUPTED OPERATION.
5. ALL DEBRIS SUCH AS ROCKS, STICKS, ETC. SHOULD BE REMOVED AND THE CHANNEL SURFACES MADE SMOOTH SO THAT THE FABRIC WILL REST FLUSH WITH THE CHANNEL AT ALL SIDES AND BOTTOM.

STABILIZATION WITH GEOTEXTILE FABRIC
1. THE FABRIC SHOULD HAVE A MINIMUM WIDTH SUCH THAT IT IS KEYED IN AND ANCHORED AT THE TOP OF STREAM BANK.
2. FABRIC SHOULD BE PLACED SO THAT IT RESTS FLUSH WITH THE CHANNEL AT ALL POINTS OF CONTACT.
3. FABRIC SHOULD BE PLACED SUCH THAT ONE PIECE WILL LINE THE ENTIRE CHANNEL. IF THIS IS NOT POSSIBLE, FABRIC SHOULD BE PLACED SO THAT TRANSVERSE OVERLAPPING OCCURS IN ACCORDANCE WITH THE DETAIL. LONGITUDINAL OVERLAPS SHOULD NOT BE ALLOWED. UPSTREAM SECTIONS SHOULD OVERLAP DOWNSTREAM SECTIONS. OVERLAP WIDTH SHOULD EQUAL 2 FEET (0.6 METERS) MINIMUM.
4. THE FABRIC SHOULD BE KEYED INTO 2 BY 2–FOOT (0.6 BY 0.6–METER) TRENCHES LOCATED AT THE UPSTREAM EDGE AND AT 50–FOOT (15.25–METER) INTERVALS WITH THE OVERLAP PLACED NEAREST TO EACH 50 FEET INCREMENT. THE KEY–IN SHOULD BE FROM TOP OF CHANNEL TO TOP OF CHANNEL. CLASS I RIPRAP SHOULD BE CAREFULLY PLACED INTO THE TRENCH WITH ZERO DROP HEIGHT.
5. THE FABRIC SECTIONS SHOULD BE SECURED WITH HOLD DOWN PINS AND WASHERS. OVERLAPS SHOULD BE PINNED ALONG TRANSVERSE AND LONGITUDINAL AXES WITH SPACING EQUAL TO 3 FEET (0.9 METERS) MAXIMUM.
6. SEDIMENT FROM SURROUNDING AREAS OF DISTURBANCE SHOULD NOT BE ALLOWED TO ENTER THE DIVERSION CHANNEL.

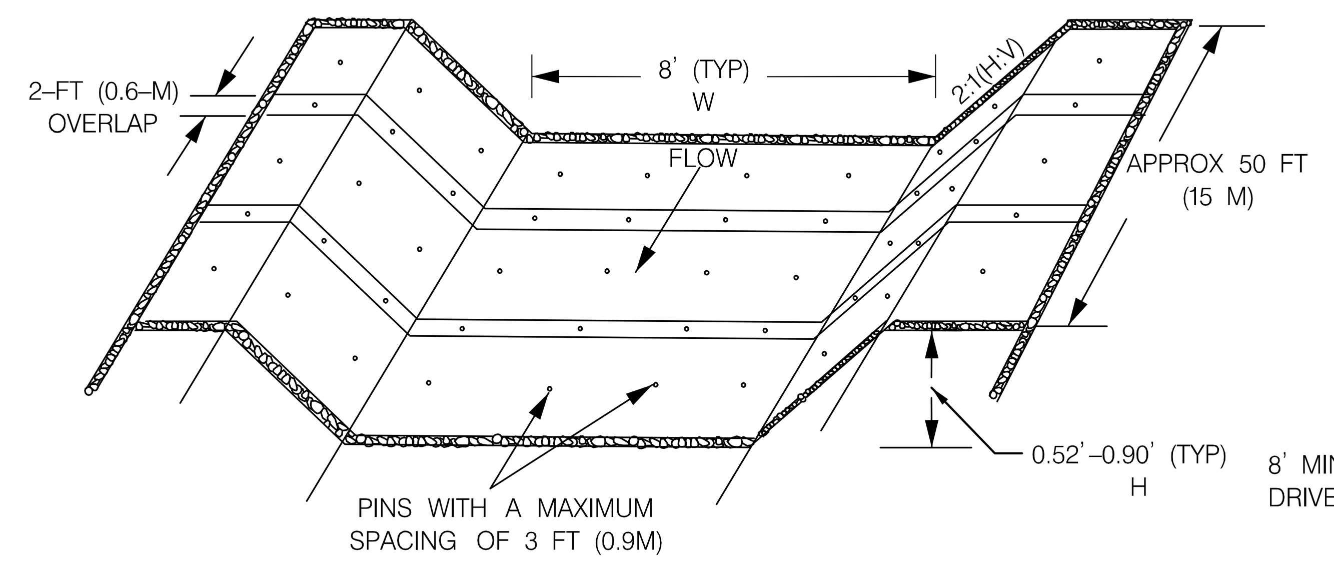
ALTERNATE METHODS OF PLACING THE FABRIC
1. THE ABOVE DESIGN MAY BE MODIFIED TO ALLOW SEWING OF THE GEOTEXTILE FABRIC. SEWING OF THE GEOTEXTILE FABRIC, RATHER THAN OVERLAPPING, SHOULD ELIMINATE THE REQUIREMENT FOR TRANSVERSE PLACEMENT OF THE FABRIC. EITHER TRANSVERSE OR LONGITUDINAL PLACEMENT SHOULD WORK EQUALLY WELL.
2. THE SPACING OF THE PINS COULD BE EITHER LARGER OR SMALLER DEPENDING ON THE ANTICIPATED VELOCITIES AND THICKNESS AND TYPE OF GEOTEXTILE FABRIC.
3. THE ENTIRE BOTTOM OF THE CHANNEL COULD BE RIPRAPPED IF HIGH VELOCITIES ARE ANTICIPATED. WHEN THE AREA IS RIPRAPPED, IT IS NOT REQUIRED THAT THE GEOTEXTILE FABRIC UNDERNEATH THE RIPRAP BE PINNED.

REMOVAL OF DIVERSION
1. WATER SHOULD NOT BE ALLOWED THROUGH THE NATURAL STREAM UNTIL ALL CONSTRUCTION IS COMPLETED.
2. AFTER REDIRECTING THE FLOW THROUGH THE NATURAL CHANNEL, ALL FABRIC SHOULD BE REMOVED FROM THE TEMPORARY DIVERSION. THE DIVERSION SHOULD THEN BE BACKFILLED AND STABILIZED. POINTS OF TIE–IN TO THE NATURAL CHANNEL SHOULD BE PROTECTED WITH RIPRAP ACCORDING TO THE RIPRAP GUIDELINES.



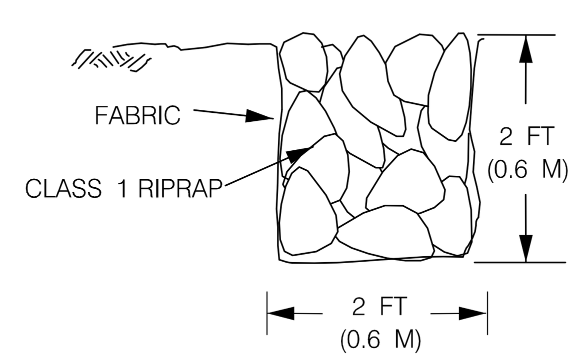
FABRIC BASED STREAM DIVERSION (FBSD)– PLAN VIEW

NOT TO SCALE



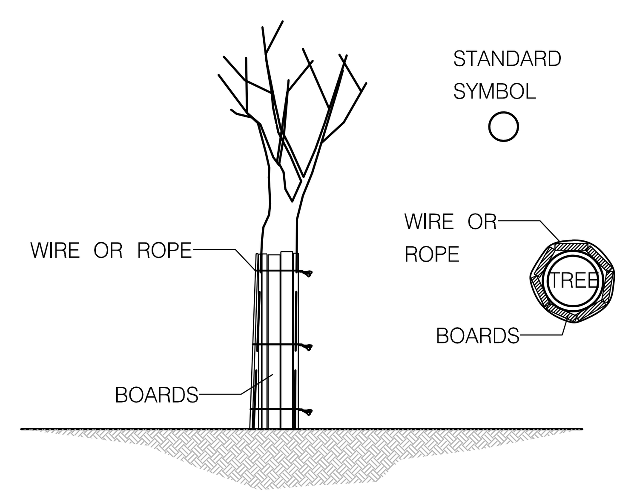
FBSD– SECTION VIEW

NOT TO SCALE



FBSD– TRENCHING DETAIL

NOT TO SCALE



1. ALL TREES WITHIN THE LOD NOT MARKED FOR REMOVAL SHALL RECEIVE TREE PLANKING. LOCATION OF ADDITIONAL TREES ALONG THE EDGE OF THE LOD, ETC. SHOWN ON PLANS. ADDITIONAL PLANKING MAY BE REQUIRED AT THE DIRECTION OF THE QAD INSPECTOR.
2. USE 2"x10"x12', OR APPROPRIATE SIZE, BOARDS AROUND TRUNK OF TREE TO PROTECT ALL AREAS EXPOSED TO CONSTRUCTION.
3. USE 0.5" DIAMETER ROPE OR HEAVY GAUGE WIRE TO WRAP AROUND OUTSIDE OF BOARDS TO SECURE IT TO THE TREE.
4. NOTHING SHALL BE DIRECTLY ATTACHED OR SCREWED INTO THE TREE TRUNK TO SECURE THE BOARDS.

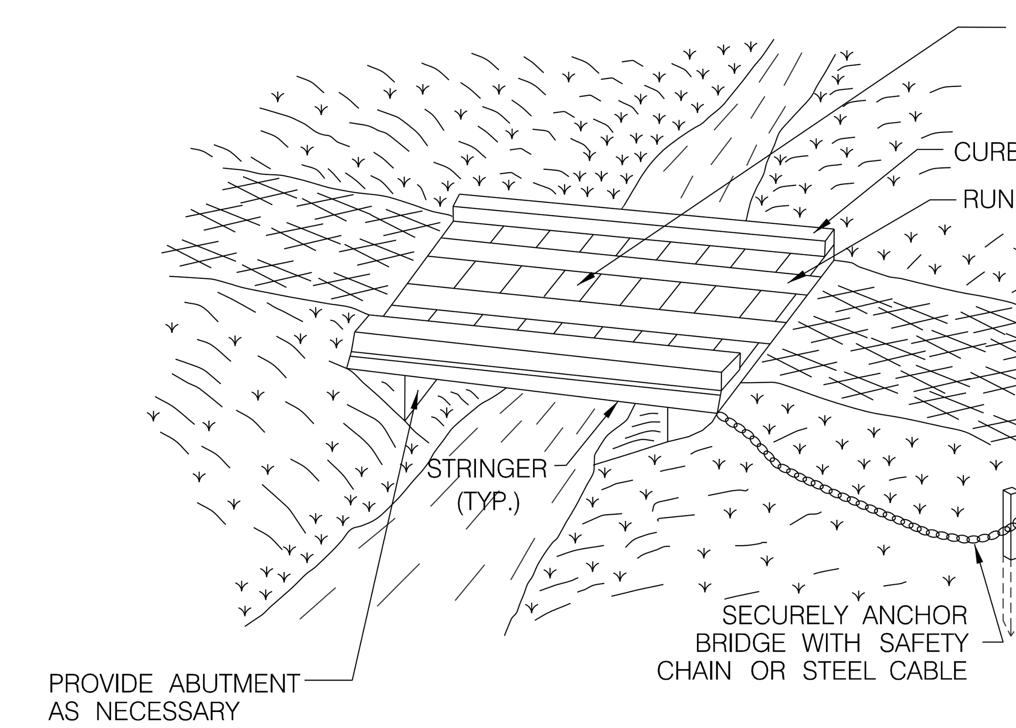
TREE PLANKING

NOT TO SCALE

293 TREES REQUIRE TREE PLANKING

TEMPORARY ACCESS BRIDGE

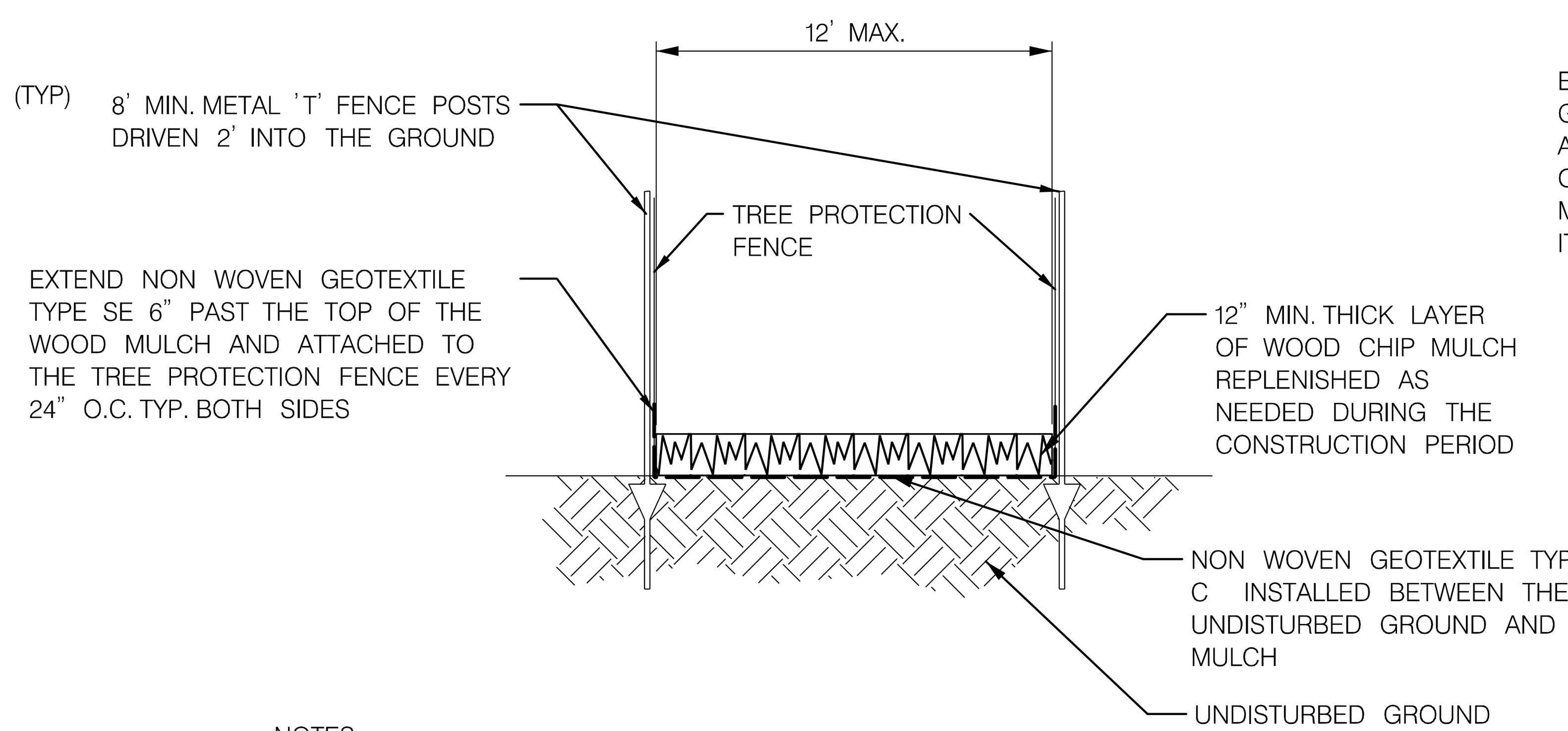
1. ABUTMENTS SHOULD BE PLACED PARALLEL TO, AND ON, STABLE BANKS SUCH THAT THE STRUCTURE IS AT OR ABOVE BANKFULL DEPTH TO PREVENT THE ENTRAPMENT OF FLOATING MATERIALS AND DEBRIS.
2. TEMPORARY ACCESS BRIDGES SHOULD BE CONSTRUCTED TO SPAN THE ENTIRE CHANNEL. IF THE BANKFULL CHANNEL WIDTH EXCEEDS 8 FEET (2.5 METERS), THEN A FOOTING, PIER, OR OTHER BRIDGE SUPPORT MAY BE CONSTRUCTED WITHIN THE WATERWAY. NO SUPPORT WILL BE PERMITTED WITHIN THE CHANNEL FOR WATERWAYS LESS THAN 8 FEET WIDE. ONE ADDITIONAL BRIDGE SUPPORT WILL BE PERMITTED FOR EACH ADDITIONAL 8–FOOT WIDTH OF THE CHANNEL.
3. ALL DECKING MEMBERS SHOULD BE PLACED PERPENDICULARLY TO THE STRINGERS, BUTTED TIGHTLY, AND SECURELY FASTENED TO THE STRINGERS. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY.
4. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS. ONE RUN PLANK SHOULD BE PROVIDED FOR EACH TRACK OF THE EQUIPMENT WHEELS AND SHOULD BE SECURELY FASTENED TO THE LENGTH OF THE SPAN.
5. CURBS OR FENDERS MAY BE INSTALLED ALONG THE OUTER SIDES OF THE DECK TO PROVIDE ADDITIONAL SAFETY.
6. BRIDGES SHOULD BE SECURELY ANCHORED AT ONE END USING STEEL CABLE OR CHAIN TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM AND POSSIBLY CAUSING AN OBSTRUCTION TO THE FLOW. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOOD WATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, BOULDERS, OR DRIVEN STEEL ANCHORS.
7. ALL AREAS DISTURBED DURING INSTALLATION SHOULD BE STABILIZED WITHIN 14 CALENDAR DAYS IN ACCORDANCE WITH A REVEGETATION PLAN APPROVED BY THE WMA.
8. PERIODIC INSPECTION SHOULD BE PERFORMED BY THE USER TO ENSURE THAT THE BRIDGE, STREAM BED, AND STREAM BANKS ARE MAINTAINED AND NOT DAMAGED.
9. MAINTENANCE SHOULD BE PERFORMED AS NEEDED TO ENSURE THAT THE STRUCTURE COMPLIES WITH ALL STANDARDS AND SPECIFICATIONS. THIS SHOULD INCLUDE THE REMOVAL OF TRAPPED SEDIMENT AND DEBRIS WHICH SHOULD THEN BE DISPOSED OF AND STABILIZED OUTSIDE THE FLOODPLAIN.
10. WHEN THE TEMPORARY BRIDGE IS NO LONGER NEEDED, ALL STRUCTURES INCLUDING ABUTMENTS AND OTHER BRIDGING MATERIALS SHOULD BE REMOVED WITHIN 14 CALENDAR DAYS. IN ALL CASES, THE BRIDGE MATERIALS SHOULD BE REMOVED WITHIN 1 YEAR OF INSTALLATION. REMOVAL OF THE BRIDGE AND CLEAN–UP OF THE AREA, INCLUDING PROTECTION AND STABILIZATION OF DISTURBED STREAM BANKS, SHOULD BE ACCOMPLISHED WITHOUT THE USE OF CONSTRUCTION EQUIPMENT IN THE WATERWAY.



TEMPORARY ACCESS BRIDGE

NOT TO SCALE

NOTE:
TIME OF YEAR RESTRICTIONS DO NOT APPLY TO THE CONSTRUCTION OR REMOVAL OF A TEMPORARY ACESS BRIDGE UNLESS THERE IS DISTURBANCE TO THE STREAM CHANNEL.

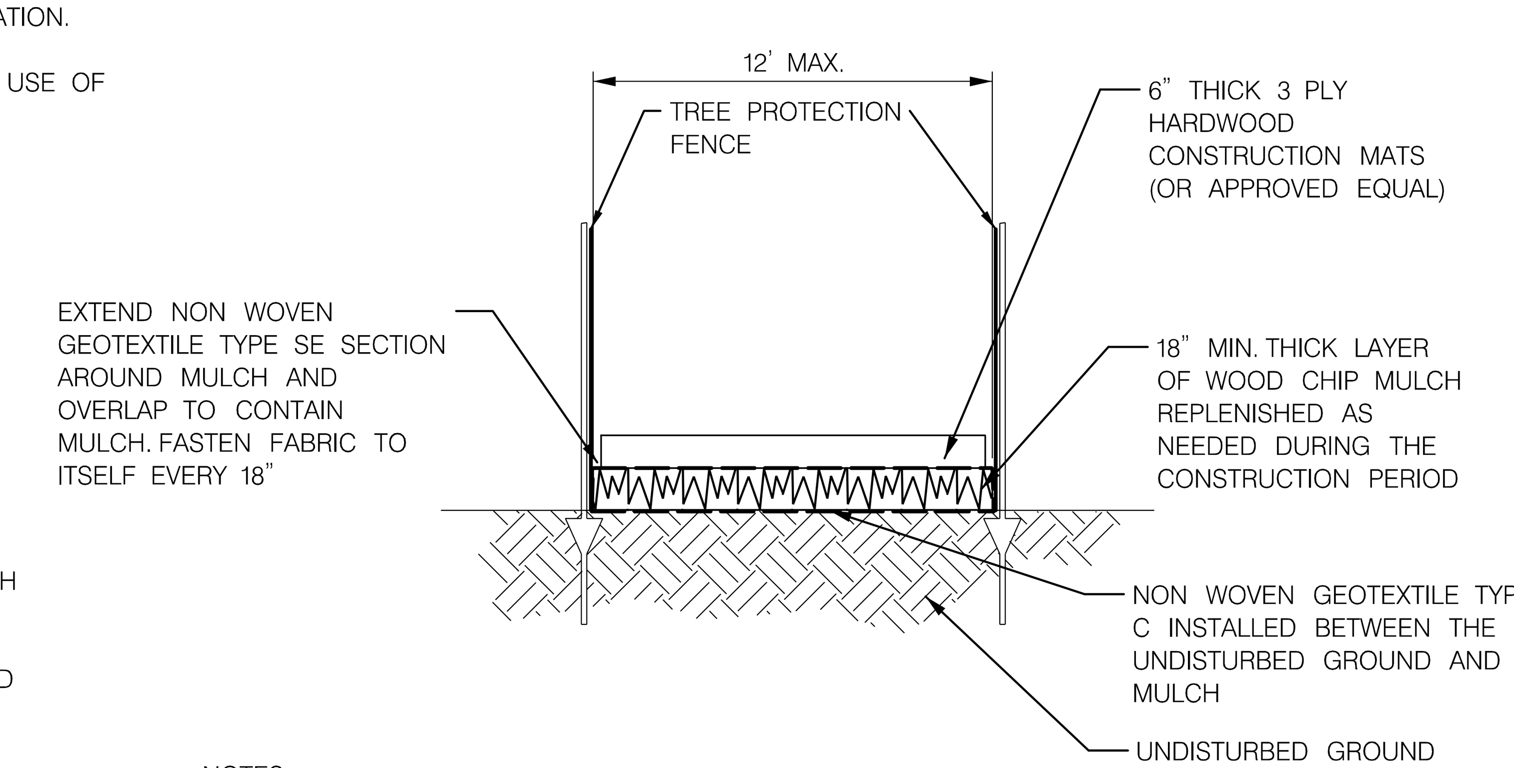


NOTES:

1. ACCESS ROUTES TO BE FIELD LOCATED WITH THE QAD INSPECTOR AND M–NCPPC AT PRE–CONSTRUCTION MEETING.
2. CONTRACTOR SHALL SEQUENCE CONSTRUCTION SUCH THAT NO EQUIPMENT IMPACTS AREA TO BE PROTECTED PRIOR TO MULCH PLACEMENT
3. NON WOVEN GEOTEXTILE TYPE SE SHALL BE A SINGLE PIECE ACROSS WIDTH. OVERLAP GEOTEXTILE BY 18" MIN. ALONG LENGTH OF ROUTE.
4. GEOTEXTILE MAY ONLY BE ELIMINATED AT DIRECTION OF THE QAD INSPECTOR.
5. CONTRACTOR SHALL MAINTAIN MULCH MAT THROUGHOUT CONSTRUCTION PERIOD.
6. MULCH SHALL BE DISPOSED OF OFF–SITE UNLESS OTHERWISE APPROVED BY THE QAD INSPECTOR.

MULCH ACCESS ROAD (MEDIUM DUTY MULCH MAT) DETAIL

NOT TO SCALE



NOTES:

1. CONTRACTOR SHALL SEQUENCE CONSTRUCTION SUCH THAT NO EQUIPMENT IMPACTS AREA TO BE PROTECTED PRIOR TO MULCH PLACEMENT.
2. ACCESS ROUTES TO BE FIELD LOCATED WITH THE QAD INSPECTOR AND M–NCPPC AT PRE–CONSTRUCTION MEETING.
3. NON WOVEN GEOTEXTILE TYPE SE SHALL BE A SINGLE PIECE ACROSS WIDTH. OVERLAP GEOTEXTILE BY 18" MIN. ALONG LENGTH OF ROUTE.
4. GEOTEXTILE MAY ONLY BE ELIMINATED AT DIRECTION OF THE QAD INSPECTOR.
5. CONTRACTOR SHALL MAINTAIN MULCH MAT THROUGHOUT CONSTRUCTION PERIOD. MULCH SHALL BE DISPOSED OF OFF–SITE UNLESS OTHERWISE APPROVED BY THE QAD INSPECTOR.
6. FOLLOWING CONSTRUCTION, CONTRACTOR SHALL DISPOSE OFF–SITE UNLESS IT IS TO REMAIN, FILTER FABRIC TO BE A BIODEGRADABLE TYPE.

HEAVY DUTY MULCH ACCESS ROAD (HEAVY DUTY MULCH MAT) DETAIL

NOT TO SCALE

HIGHWAY HYDRAULICS DIVISION

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION ESC NOTES AND DETAILS

SCALE NTS	DATE DECEMBER 2021	CONTRACT NO. AW073B12

DESIGNED BY SCN	COUNTY MONTGOMERY
DRAWN BY CJN	LOGMILE
CHECKED BY KSK	HORIZONTAL SCALE
MDE/PRD 168251/20–PR–0040–01	VERTICAL SCALE
DRAWING NO. **EN-03** OF **04**	SHEET NO. 11 OF 76

COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pES-N003_CA5.dgn

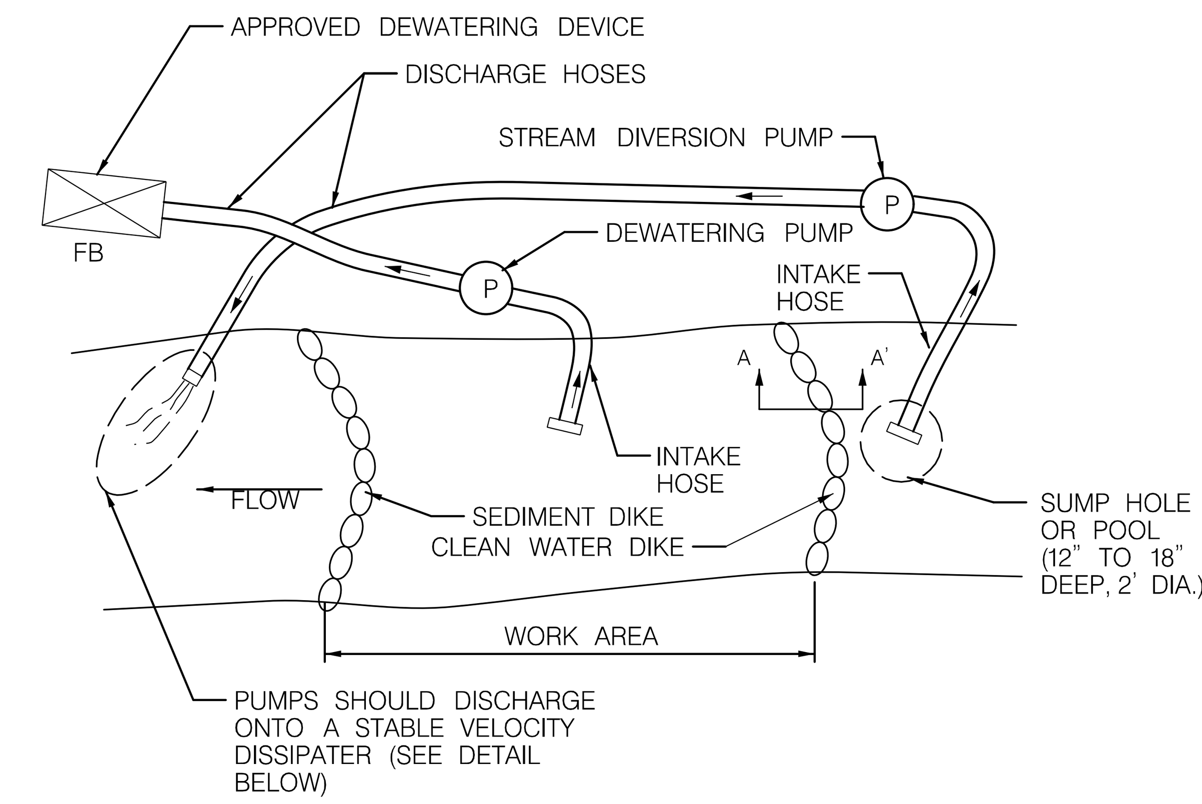
EROSION AND SEDIMENT CONTROL – DETAILS

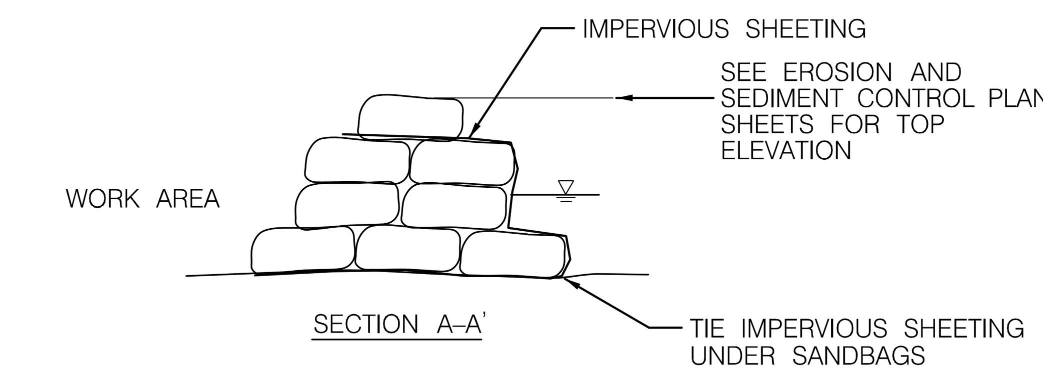
PUMP–AROUND PRACTICE

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. 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 REGIONAL ENVIRONMENTAL COORDINATOR AT (410) 365–0164 AT LEAST SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY.
3. THE CONTRACTOR SHALL CONDUCT A PRE–CONSTRUCTION MEETING ON SITE WITH THE SEDIMENT CONTROL INSPECTOR AND THE QAD INSPECTOR 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 INSPECTOR.
4. CONSTRUCTION SHALL NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE QAD INSPECTOR 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. 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 AS A TEMPORARY MEASURE FOR DEWATERING IN CHANNEL 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.
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 QAD INSPECTOR, 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 QAD INSPECTOR.
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





PUMP AROUND DETAIL

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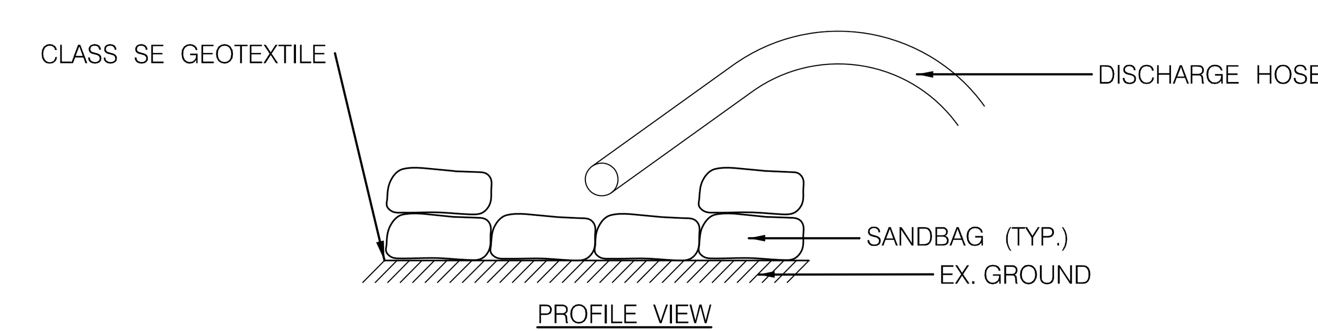

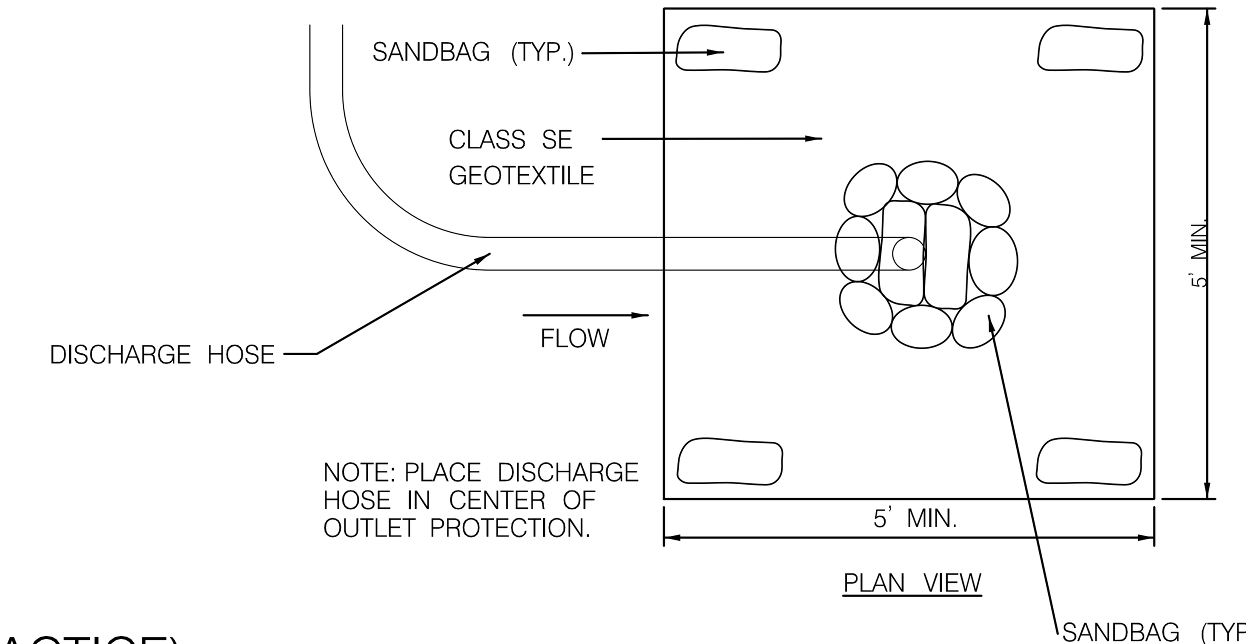

OUTLET PROTECTION (FOR PUMP AROUND PRACTICE)

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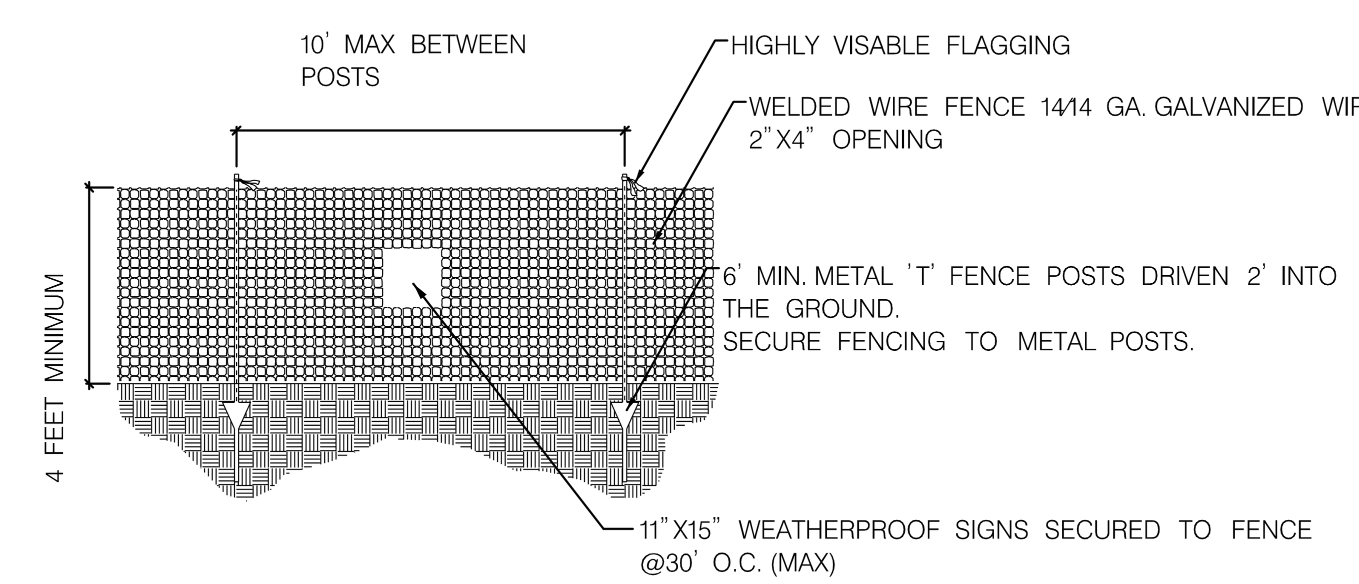
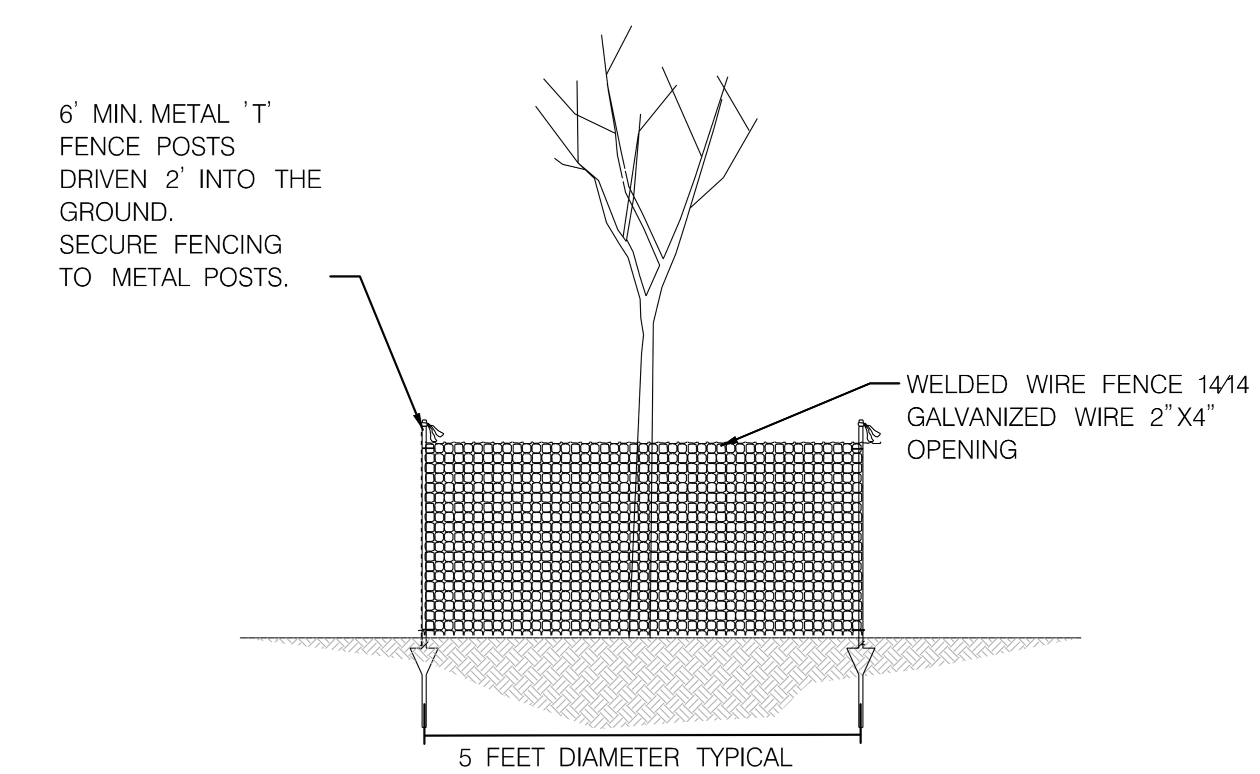




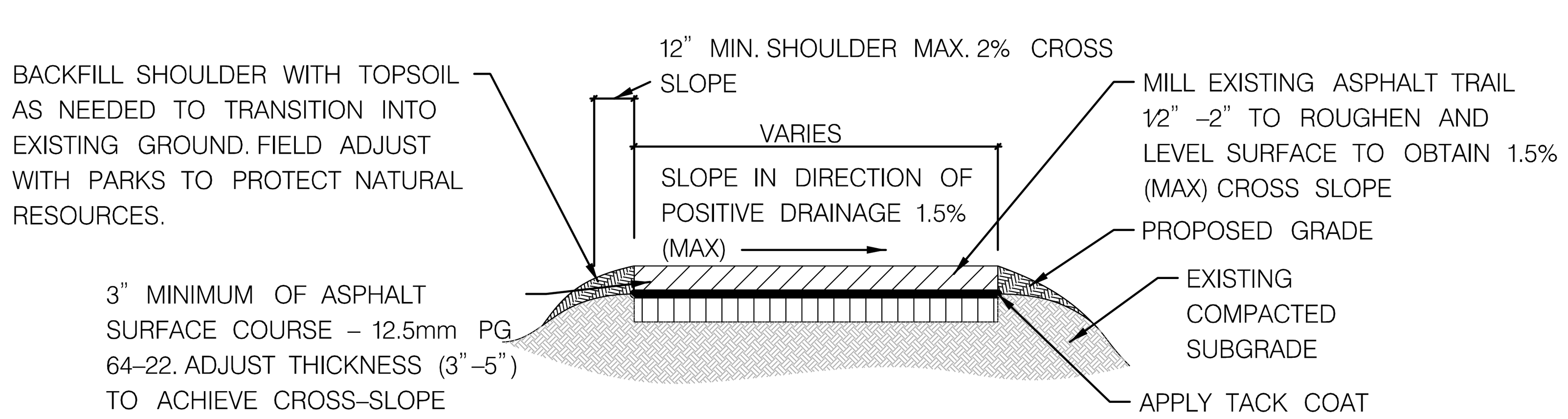
TREE PROTECTION FENCE

STANDARD SYMBOL
—TPF—

NOT TO SCALE

NOTES:
1. PRACTICE MAY BE COMBINED WITH SEDIMENT CONTROL FENCING.
2. INSTALL TPF AROUND ALL TREES WITHIN LOD NOT MARKED FOR REMOVAL. WHERE TPF IS SHOWN ON THE PLANS AROUND GROUPS OF TREES, TPF IS NOT REQUIRED AROUND INDIVIDUAL TREES. LOCATIONS AND LIMITS OF FENCING SHALL BE COORDINATED WITH QAD INSPECTOR AND ARBORIST PRIOR TO INSTALLATION.
3. DEMARCATE ENTIRE LOD WITH FENCING.
4. INSTALL TPF AROUND TREES OUSIDE THE LOD AS SHOWN ON PLANS. ALL TPF INSTALLD OUTSIDE OF LOD WILL BE DONE BY HAND.

20,938 LF OF TREE PROTECTION FENCING PROPOSED



M–NCPPC ASPHALT TRAIL REHAB (PARKS DETAIL 538)

NOT TO SCALE

1. ALL EXISTING HARD SURFACE TRAILS USED FOR ACCESS SHALL BE REHABILITATED UPON DEMOBILIZATION FROM THE SITE.
2. CLEAR DEBRIS AND LOOSE MATERIALS FROM WORK AREA PRIOR TO MILLING AND PATCHING.
3. FIELD ADJUST MILLING DEPTH AS NEEDED TO LEVEL AND ROUGHEN REMAINING TRAIL SURFACE.
4. COLLECT AND SEPARATE MILLINGS TO BE REUSED AS RECYCLED ASPHALT MILLINGS.
5. REMOVE LOOSE DEBRIS PRIOR TO TACK COATING SURFACE.
6. BACKFILL, SEED, AND MULCH SHOULDERS AS REQUIRED.
7. TRAIL AND SHOULDER WIDTHS MAY BE ADJUSTED WITH PARKS TO AVOID NATURAL RESOURCE IMPACTS.

COASTAL RESOURCES INC.

BY: caln –

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

CA–5 STREAM RESTORATION ESC NOTES AND DETAILS

SCALE	NTS	DATE	DECEMBER 2021	CONTRACT NO.	AW073B12
DESIGNED BY	SCN			COUNTY	MONTGOMERY
DRAWN BY	CJN			LOGMILE	-
CHECKED BY	KSK			HORIZONTAL SCALE	-
MDE/PRD	16825120-PR-0040-01			VERTICAL SCALE	-

DRAWING NO. EN-04 OF 04 SHEET NO. 12 OF 76

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pES-N004_CA5.dgn

NOTES:
1. EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.
2. REFER TO KEY MAP (SHEET KM–01) FOR PARCEL INFORMATION.
3. ENTIRE LOD SHOULD BE DEMARCATED USING TREE PROTECTION FENCE, OTHER THAN LOCATIONS WHERE THERE IS SUPER SILT FENCE OR DIVERSION FENCE ALONG THE LOD.
4. SPECIAL CONDITIONS REGARDING FLOOD ACTION PLAN REQUIREMENTS MAY BE INCLUDED IN THE PERMIT.
5. ALL TREES WITHIN THE LOD NOT MARKED FOR REMOVAL WILL RECEIVE TREE PROTECTION FENCE (TPF) AND TREE PLANKING (TP). CLUSTERS OF TREES MAY RECEIVE TPF AND TP AROUND THE CLUSTER INSTEAD OF EACH INDIVIDUAL TREE.
6. INSTALL TPF AND TP BY HAND ON ALL TREES MARKED ON PLAN.
7. WHERE POSSIBLE, FLUSH CUT TREES DESIGNATED FOR REMOVAL AND LEAVE ROOTBALL IN PLACE. M–NCPPC MAY PROVIDE FEEDBACK ON WHERE FLUSH CUTTING OR REMOVAL IS APPROPRIATE PRIOR TO CONSTRUCTION.
8. NO OUTLET PROTECTION IS REQUIRED FOR DIVERSION FENCE.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

SUPER SILT FENCE (SSF)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
1+14.10	35.99 RT.	1+14.42	81.31 RT.	53	MAINSTEM 1

SANDBAG DIVERSION (SD)

STREAM	SANDBAG DIVERSION	SANDBAG TOP ELEV. (FT)
MAINSTEM 1	PA-1 US	360.0
MAINSTEM 1	PA-2 US	353.5
TRIBUTARY 1	SD-1	361.0

TEMPORARY BRIDGE (TB)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY	STREAM
1+44.80	17.75 LT./ 13.95 RT.	1+59.07	20.19 LT./ 11.51 RT.	1	MAINSTEM 1

MULCH MATTING

TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
0+34 LT.	1+49 LT.	151.22	MAINSTEM 1
0+98 RT.	1+74 RT.	111.89	MAINSTEM 1

HEAVY DUTY MULCH MATTING

TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
1+74 RT.	1+92 RT.	24.56	MAINSTEM 1

DIVERSION FENCE (DF)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
0+98.70	27.89 RT.	1+14.42	81.31 RT.	62	MAINSTEM 1

COASTAL RESOURCES INC.

LEGEND
TREE REMOVAL
TREE PLANKING/TREE PROTECTION FENCE
TPF — TREE PROTECTION FENCE
SANDBAG DIVERSION
CLEAR WATER DIVERSION PIPE
SSF — SUPER SILT FENCE
DF — DIVERSION FENCE
TEMPORARY BRIDGE
MULCH ACCESS ROAD
HEAVY DUTY MULCH ACCESS ROAD
STAGING/STOCKPILE AREA

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MDOT
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

CA–5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN COUNTY MONTGOMERY
DRAWN BY CJN LOGMILE
CHECKED BY KSK HORIZONTAL SCALE
MDE/PRD 16825\20–PR–0040–01 VERTICAL SCALE

DRAWING NO. ES-01 OF 09 SHEET NO. 13 OF 76

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pES-P001_CA5.dgn

SUPER SILT FENCE (SSF)

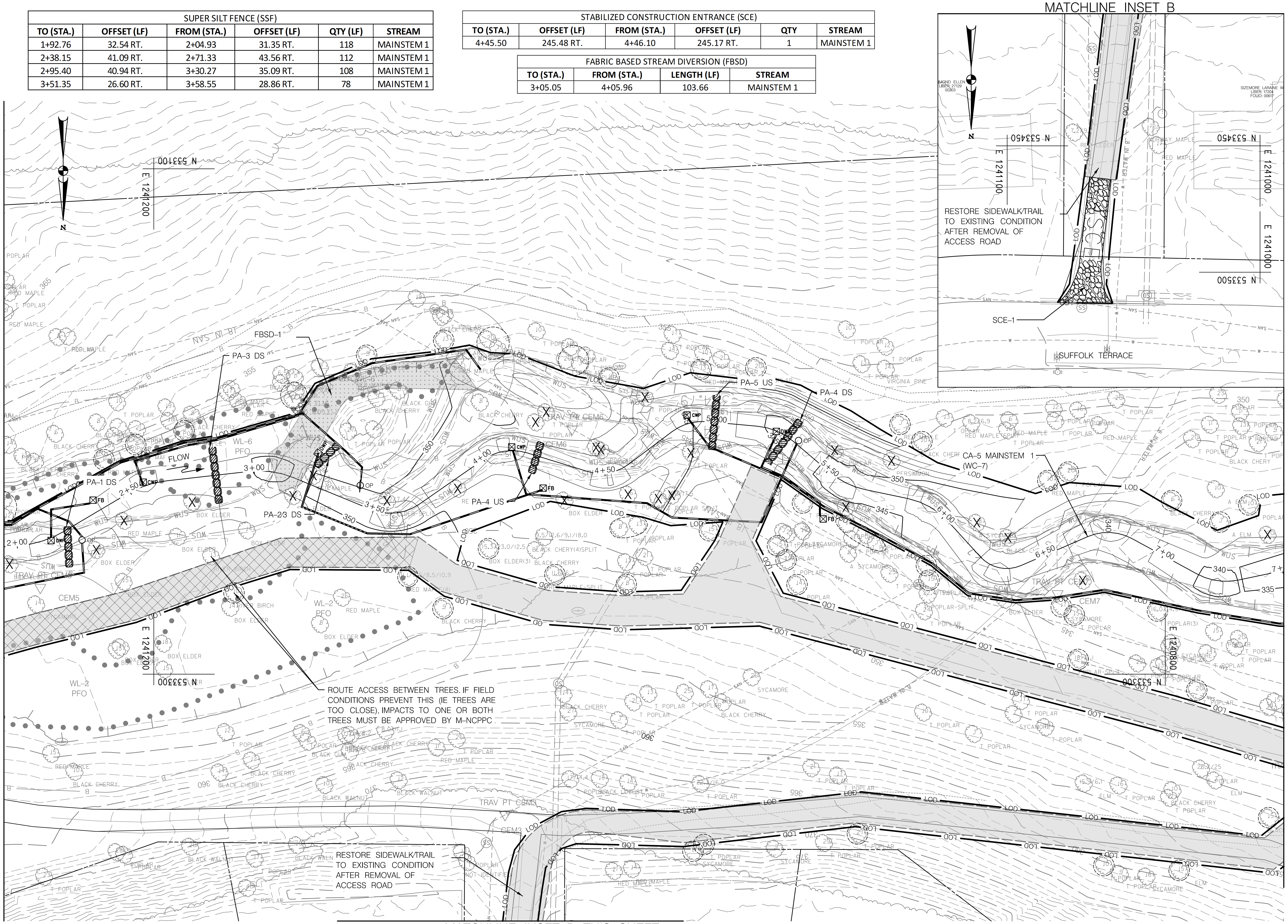
TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
1+92.76	32.54 RT.	2+04.93	31.35 RT.	118	MAINSTEM 1
2+38.15	41.09 RT.	2+71.33	43.56 RT.	112	MAINSTEM 1
2+95.40	40.94 RT.	3+30.27	35.09 RT.	108	MAINSTEM 1
3+51.35	26.60 RT.	3+58.55	28.86 RT.	78	MAINSTEM 1

STABILIZED CONSTRUCTION ENTRANCE (SCE)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY	STREAM
4+45.50	245.48 RT.	4+46.10	245.17 RT.	1	MAINSTEM 1

FABRIC BASED STREAM DIVERSION (FBSD)

TO (STA.)	FROM (STA.)	LENGTH (LF)	STREAM
3+05.05	4+05.96	103.66	MAINSTEM 1



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SCALE: 1" = 20'

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NAVD 88 Vertical

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN- NOT FOR CONSTRUCTION

COASTAL RESOURCES INC.

LEGEND

- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
- TPF — TREE PROTECTION FENCE
- SANDBAG DIVERSION
- CLEAR WATER DIVERSION PIPE
- SSF — SUPER SILT FENCE
- DF — DIVERSION FENCE
- TEMPORARY BRIDGE
- MULCH ACCESS ROAD
- HEAVY DUTY MULCH ACCESS ROAD
- STAGING/STOCKPILE AREA

MULCH MATTING

TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
3+63 RT.	7+36 RT.	572.11	MAINSTEM 1
5+58 RT.	6+06 RT.	87.67	MAINSTEM 1
6+06 RT.	7+79 RT.	440.33	MAINSTEM 1

HEAVY DUTY MULCH MATTING

TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
1+92 RT.	3+63 RT.	218.89	MAINSTEM 1

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20'	DATE DECEMBER 2021	CONTRACT NO. AW073B12	
DESIGNED BY SCN		COUNTY MONTGOMERY	
DRAWN BY CJN		LOGMILE	
CHECKED BY KSK		HORIZONTAL SCALE	
MDE/PRD 16825120-PR-0040-01		VERTICAL SCALE	
DRAWING NO. ES-02 OF 09		SHEET NO. 14 OF 76	

BY: caln -

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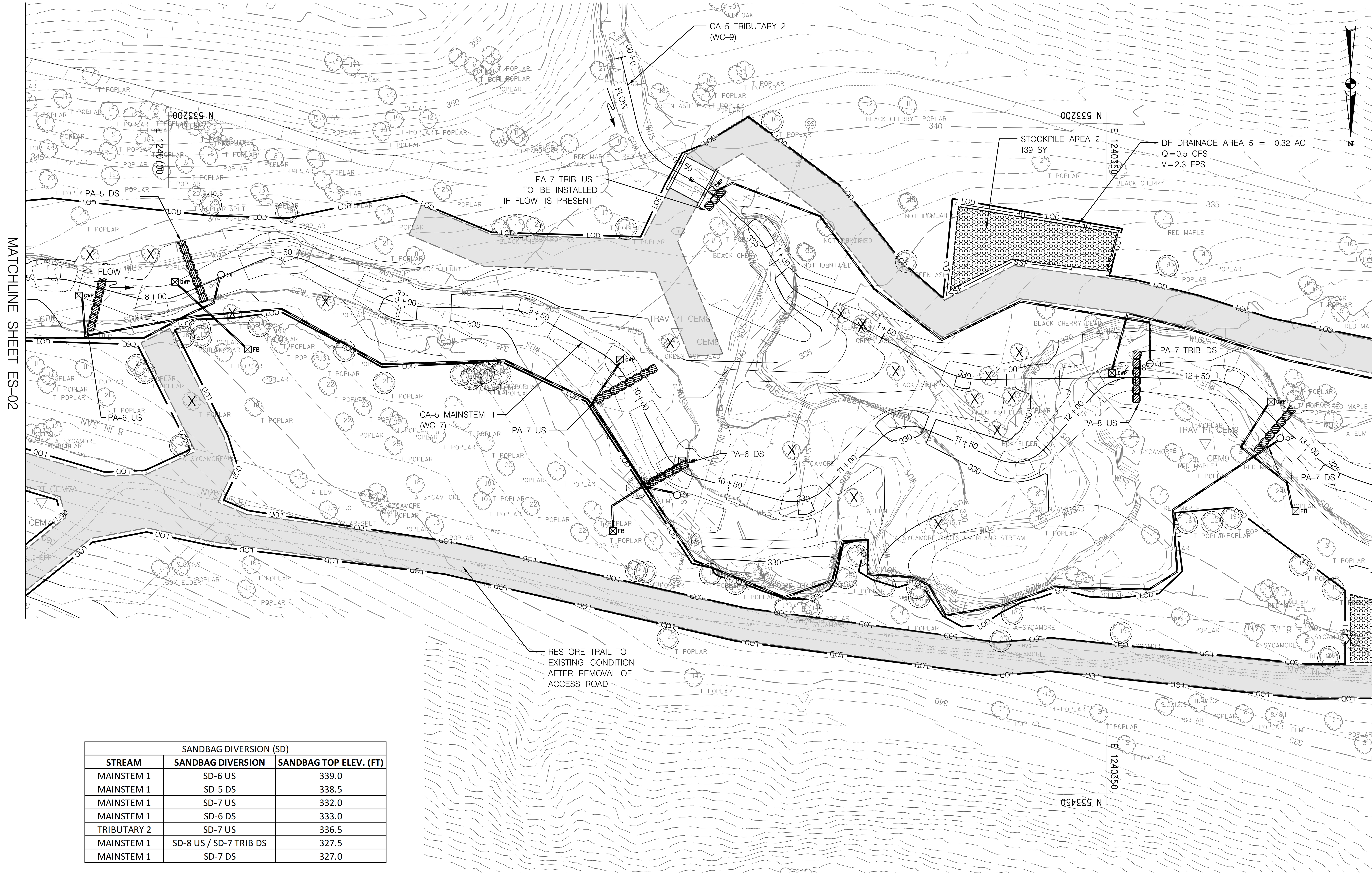

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DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

SANDBAG DIVERSION (SD)

STREAM	SANDBAG DIVERSION	SANDBAG TOP ELEV. (FT)
MAINSTEM 1	SD-6 US	339.0
MAINSTEM 1	SD-5 DS	338.5
MAINSTEM 1	SD-7 US	332.0
MAINSTEM 1	SD-6 DS	333.0
TRIBUTARY 2	SD-7 US	336.5
MAINSTEM 1	SD-8 US / SD-7 TRIB DS	327.5
MAINSTEM 1	SD-7 DS	327.0

SUPER SILT FENCE (SSF)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
11+21.05	60.12 LT.	12+19.72	44.63 LT.	60	MAINSTEM 1
12+23.41	55.04 LT.	12+24.88	38.92 LT.	18	MAINSTEM 1
SEE ES-04 FOR STOCKPILE AREA 3 SSF TABLE					

MULCH MATTING

TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
7+36 RT.	12+03 RT.	872.22	MAINSTEM 1
8+91 LT.	9+75 LT.	206.22	MAINSTEM 1
9+74 LT.	12+98 LT.	385.00	MAINSTEM 1

DIVERSION FENCE (DF)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
11+30.67	84.78 LT.	12+23.41	55.04 LT.	62	MAINSTEM 1

TEMPORARY BRIDGE (TB)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY	STREAM
1+49.11	7.73 LT./ 7.47 RT.	1+63.16	8.41 LT./ 6.79 RT.	1	TRIB 2

LEGEND

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COASTAL RESOURCES INC.

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120–PR–0040–01
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. ES-03 OF 09

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
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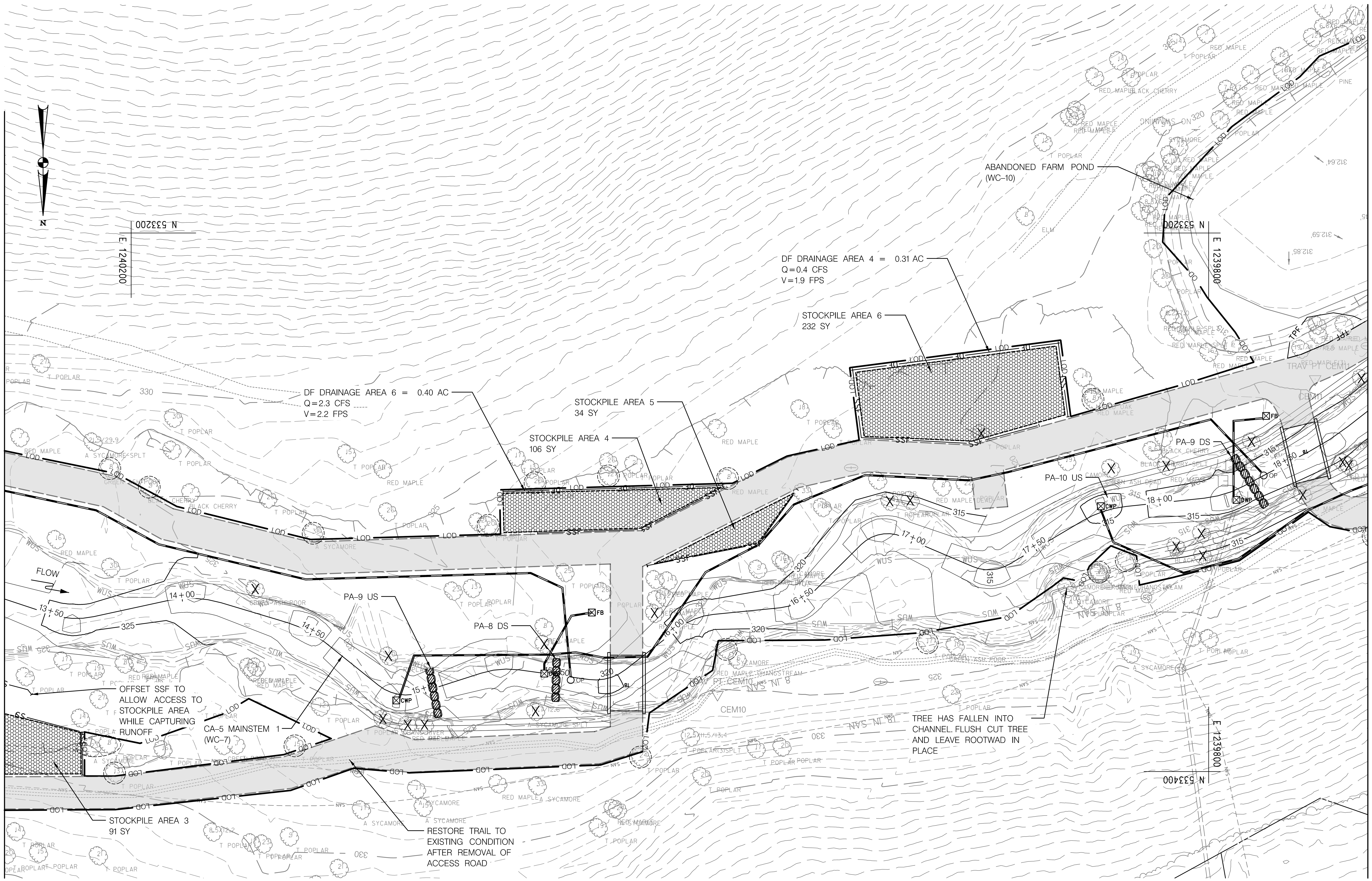

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20' 0 20' 40'
SCALE: 1" = 20'

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

MULCH MATTING

TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
12+98 LT.	19+02 LT.	784.67	MAINSTEM 1
12+03 RT.	15+70 RT.	330.44	MAINSTEM 1
18+55 RT.	18+67 RT.	35.56	MAINSTEM 1

TEMPORARY BRIDGE (TB)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY	STREAM
15+65.35	11.35 LT./ 11.35 RT.	15+79.70	13.24 LT./ 9.46 RT.	1	MAINSTEM 1
18+49.40	13.69 LT./ 9.01 RT.	18+63.95	9.63 LT./ 13.07 RT.	1	MAINSTEM 1

SANDBAG DIVERSION (SD)

STREAM	SANDBAG DIVERSION	SANDBAG TOP ELEV. (FT)
MAINSTEM 1	SD-9 US	322.0
MAINSTEM 1	SD-8 DS	322.0
MAINSTEM 1	SD-9 DS	318.0

SUPER SILT FENCE (SSF)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
13+29.62	31.77 LT.	13+50.42	30.63 LT.	25	MAINSTEM 1
13+49.20	39.36 LT.	13+61.05	58.23 LT.	42	MAINSTEM 1
15+25.78	53.65 LT.	16+09.68	40.54 LT.	54	MAINSTEM 1
16+04.41	25.84 LT.	16+76.57	31.21 LT.	67	MAINSTEM 1
16+88.60	61.94 LT.	17+71.76	39.68 LT.	93	MAINSTEM 1
17+78.51	64.69 LT.	17+78.77	37.56 LT.	28	MAINSTEM 1

DIVERSION FENCE (DF)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
15+25.37	66.64 LT.	16+57.91	51.78 LT.	82	MAINSTEM 1
16+88.60	61.94 LT.	17+78.51	64.69 LT.	77	MAINSTEM 1

COASTAL RESOURCES INC.

LEGEND

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- STAGING/STOCKPILE AREA

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
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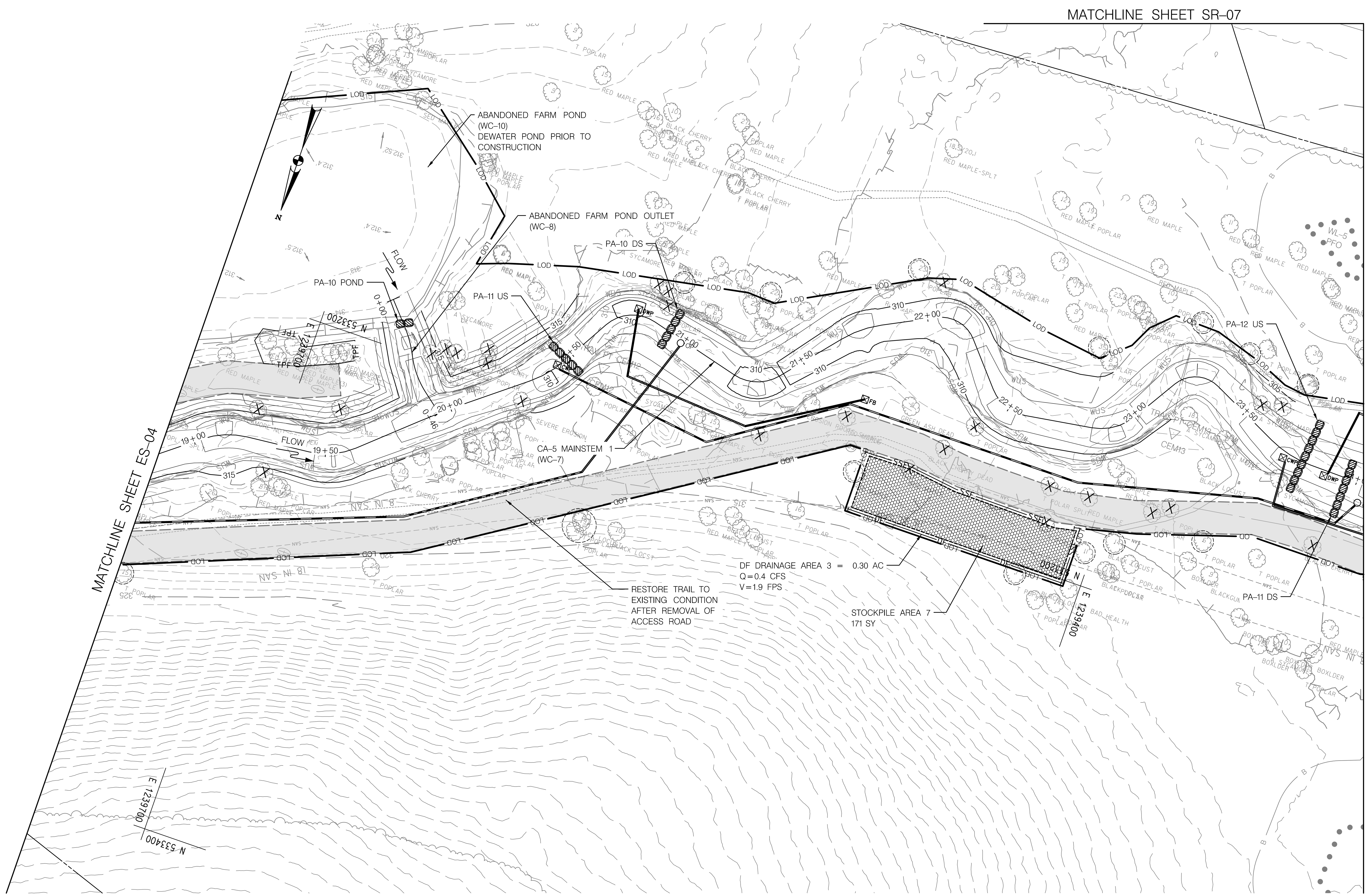
CA–5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20–PR–0040–01
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. ES-04 OF 09

BY: caln –



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

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NAVD 88 Vertical

MULCH MATTING			
TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
19+02 LT.	19+65 LT.	78.78	MAINSTEM 1
18+67 RT.	24+09 RT.	632.89	MAINSTEM 1

SUPER SILT FENCE (SSF)					
TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
21+51.69	40.88 RT.	22+68.90	37.35 RT.	71	MAINSTEM 1
22+79.89	58.95 RT.	22+81.46	37.78 RT.	24	MAINSTEM 1

DIVERSION FENCE (DF)					
TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
22+44.07	69.78 RT.	22+79.89	58.95 RT.	84	MAINSTEM 1

SANDBAG DIVERSION (SD)		
STREAM	SANDBAG DIVERSION	SANDBAG TOP ELEV. (FT)
POND OUTLET	SD-10 POND	315.0
MAINSTEM 1	SD-11 US	313.5
MAINSTEM 1	SD-10 DS	312.0
MAINSTEM 1	SD-12 US	304.0
MAINSTEM 1	SD-11 DS	303.5

COASTAL RESOURCES INC.

LEGEND

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MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION

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CA–5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120–PR–0040–01
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. ES-05 OF 09

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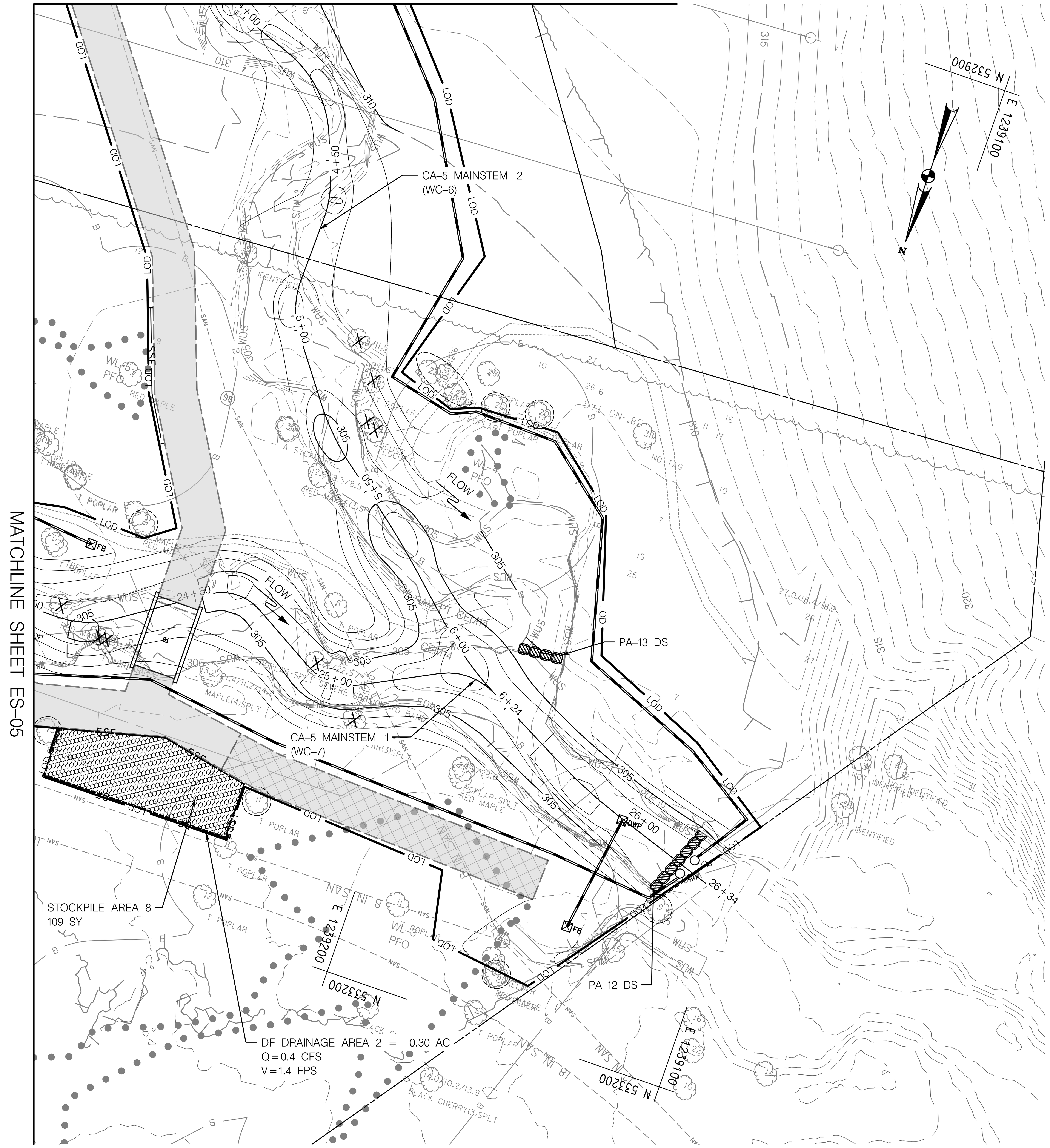
MATCHLINE SHEET ES–07



SUPER SILT FENCE (SSF)					
TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
23+13.70	30.75 RT.	24+91.07	39.04 RT.	47	MAINSTEM 1
24+94.05	37.34 RT.	24+95.10	53.26 RT.	17	MAINSTEM 1
5+03.85	55.76 RT.	5+22.00	55.88 RT.	39	MAINSTEM 2
SEE ES-07 FOR STOCKPILE AREA 9 SSF TABLE					

DIVERSION FENCE (DF)					
TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
24+12.81	44.60 RT.	24+95.10	53.26 RT.	55	MAINSTEM 1

TEMPORARY BRIDGE (TB)					
TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY	STREAM
24+35.75 RT.	5.48 LT./ 17.22 RT.	24+50.00	25.95 RT.	1	MAINSTEM 1

MULCH MATTING			
TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
24+09 RT.	24+48 RT.	85.33	MAINSTEM 1
3+85 RT.	5+47 RT.	234.56	MAINSTEM 2

HEAVY DUTY MULCH MATTING			
TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
24+48 RT.	25+91 RT.	126.89	MAINSTEM 1

SANDBAG DIVERSION (SD)		
STREAM	SANDBAG DIVERSION	SANDBAG TOP ELEV. (FT)
MAINSTEM 1	SD-13 DS	305.2
MAINSTEM 1	SD-12 DS	305.0

NOTES:
1. EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.
2. REFER TO KEY MAP (SHEET KM–01) FOR PARCEL INFORMATION.
3. ENTIRE LOD SHOULD BE DEMARCATED USING TREE PROTECTION FENCE, OTHER THAN LOCATIONS WHERE THERE IS SUPER SILT FENCE OR DIVERSION FENCE ALONG THE LOD.
4. SPECIAL CONDITIONS REGARDING FLOOD ACTION PLAN REQUIREMENTS MAY BE INCLUDED IN THE PERMIT.
5. ALL TREES WITHIN THE LOD NOT MARKED FOR REMOVAL WILL RECEIVE TREE PROTECTION FENCE (TPF) AND TREE PLANKING (TP). CLUSTERS OF TREES MAY RECEIVE TPF AND TP AROUND THE CLUSTER INSTEAD OF EACH INDIVIDUAL TREE.
6. INSTALL TPF AND TP BY HAND ON ALL TREES MARKED ON PLAN.
7. WHERE POSSIBLE, FLUSH CUT TREES DESIGNATED FOR REMOVAL AND LEAVE ROOTBALL IN PLACE. M–NCPPC MAY PROVIDE FEEDBACK ON WHERE FLUSH CUTTING OR REMOVAL IS APPROPRIATE PRIOR TO CONSTRUCTION.
8. NO OUTLET PROTECTION IS REQUIRED FOR DIVERSION FENCE.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LEGEND
- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
- TPF — TREE PROTECTION FENCE
- SANDBAG DIVERSION
- CLEAR WATER DIVERSION PIPE
- SSF — SUPER SILT FENCE
- DF — DIVERSION FENCE
- TEMPORARY BRIDGE
- MULCH ACCESS ROAD
- HEAVY DUTY MULCH ACCESS ROAD
- STAGING/STOCKPILE AREA

COASTAL RESOURCES INC.

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

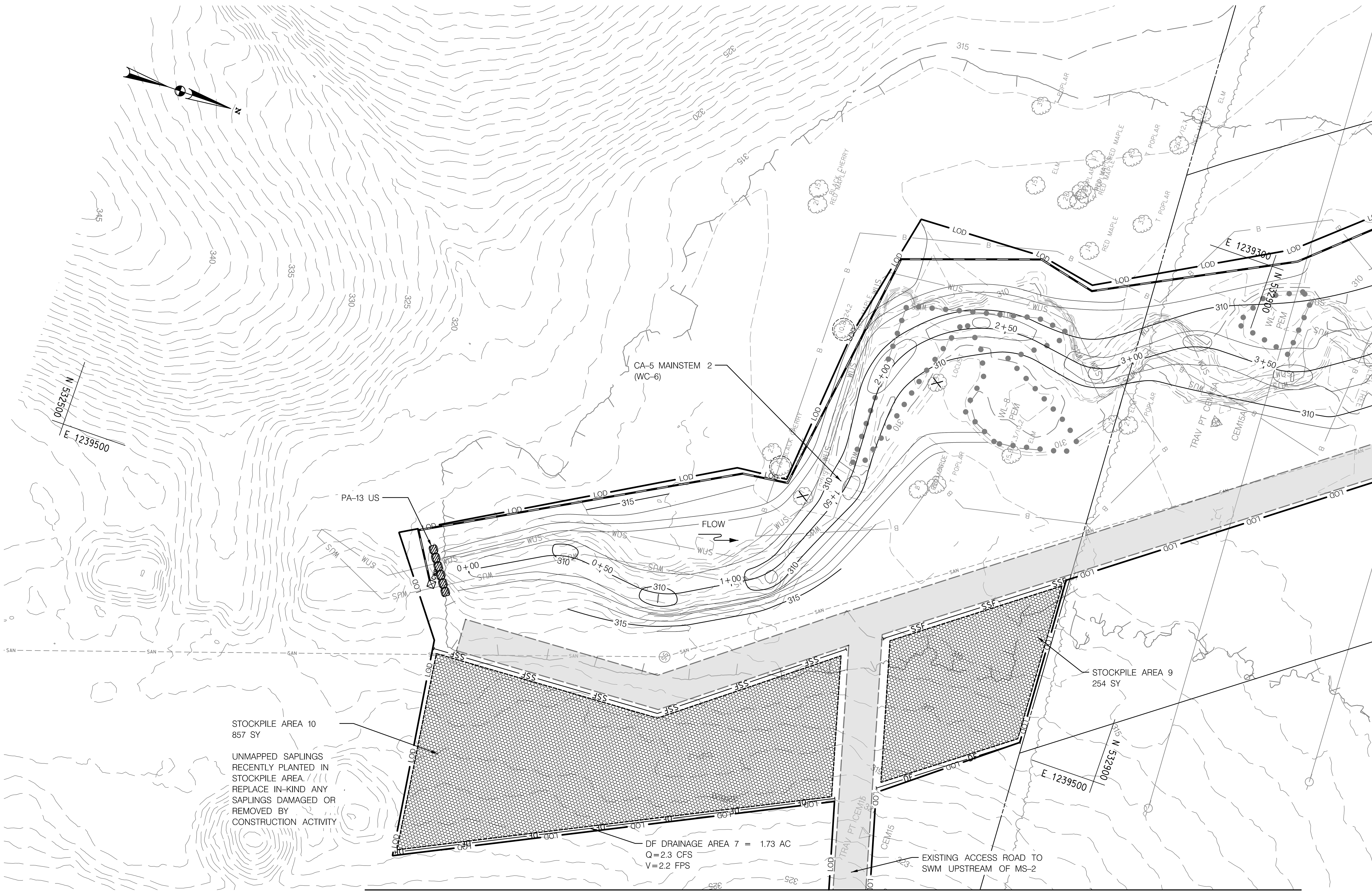
DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. ES-06 OF 09

BY: cain –

PLOTTED: Tuesday, March 08, 2022 AT 11:00 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pES-P006_CA5.dgn



NOTES:
1. EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.
2. REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.
3. ENTIRE LOD SHOULD BE DEMARCATED USING TREE PROTECTION FENCE, OTHER THAN LOCATIONS WHERE THERE IS SUPER SILT FENCE OR DIVERSION FENCE ALONG THE LOD.
4. SPECIAL CONDITIONS REGARDING FLOOD ACTION PLAN REQUIREMENTS MAY BE INCLUDED IN THE PERMIT.
5. ALL TREES WITHIN THE LOD NOT MARKED FOR REMOVAL WILL RECEIVE TREE PROTECTION FENCE (TPF) AND TREE PLANKING (TP). CLUSTERS OF TREES MAY RECEIVE TPF AND TP AROUND THE CLUSTER INSTEAD OF EACH INDIVIDUAL TREE.
6. INSTALL TPF AND TP BY HAND ON ALL TREES MARKED ON PLAN.
7. WHERE POSSIBLE, FLUSH CUT TREES DESIGNATED FOR REMOVAL AND LEAVE ROOTBALL IN PLACE. M-NCPPC MAY PROVIDE FEEDBACK ON WHERE FLUSH CUTTING OR REMOVAL IS APPROPRIATE PRIOR TO CONSTRUCTION.
8. NO OUTLET PROTECTION IS REQUIRED FOR DIVERSION FENCE.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

SUPER SILT FENCE (SSF)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
-0+17.66	25.95 RT.	1+16.78	39.63 RT.	159	MAINSTEM 2
1+26.29	46.34 RT.	2+84.61	78.50 RT.	233	MAINSTEM 2

DIVERSION FENCE (DF)

TO (STA.)	OFFSET (LF)	FROM (STA.)	OFFSET (LF)	QTY (LF)	STREAM
-0+45.31	96.81 RT.	1+09.02	85.92 RT.	56	MAINSTEM 2
1+12.40	88.48 RT.	1+28.27	109.09 RT.	163	MAINSTEM 2

MULCH MATTING

TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
-0+07 RT.	3+85 RT.	595.89	MAINSTEM 2

SANDBAG DIVERSION (SD)

STREAM	SANDBAG DIVERSION	SANDBAG TOP ELEV. (FT)
MAINSTEM 2	SD-13 US	315.2

COASTAL RESOURCES INC.

LEGEND

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- TEMPORARY BRIDGE
- MULCH ACCESS ROAD
- HEAVY DUTY MULCH ACCESS ROAD
- STAGING/STOCKPILE AREA

BY: caln -

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN- NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20-PR-0040-01
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. ES-07 OF 09

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

MULCH MATTING			
TO (STA.)	FROM (STA.)	QTY (SY)	STREAM
10+20 LT.	14+20 LT.	616.22	MAINSTEM 1

LEGEND
- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
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- MULCH ACCESS ROAD
- HEAVY DUTY MULCH ACCESS ROAD
- STAGING/STOCKPILE AREA

COASTAL RESOURCES INC.

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
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CA-5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825I20-PR-0040-01
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. ES-08 OF 09

BY: caln -

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NOTES:
1. EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.
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8. NO OUTLET PROTECTION IS REQUIRED FOR DIVERSION FENCE.

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

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NAVD 88 Vertical

STABILIZED CONSTRUCTION ENTRANCE (SCE)					
TO (STA.)	**OFFSET (LF)**	**FROM (STA.)**	**OFFSET (LF)**	**QTY**	**STREAM**
12+60.43	554.86 LT.	12+60.66	561.37 LT.	1	MAINSTEM 1

MULCH MATTING			
TO (STA.)	**FROM (STA.)**	**QTY (SY)**	**STREAM**
13+56 LT.	14+20 LT.	254.11	MAINSTEM 1

LEGEND
- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
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- SANDBAG DIVERSION
- CLEAR WATER DIVERSION PIPE
- SSF — SUPER SILT FENCE
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- TEMPORARY BRIDGE
- MULCH ACCESS ROAD
- HEAVY DUTY MULCH ACCESS ROAD
- STAGING/STOCKPILE AREA

COASTAL RESOURCES INC.

BY: caln –

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

CA-5 STREAM RESTORATION ESC PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. ES-09 OF 09

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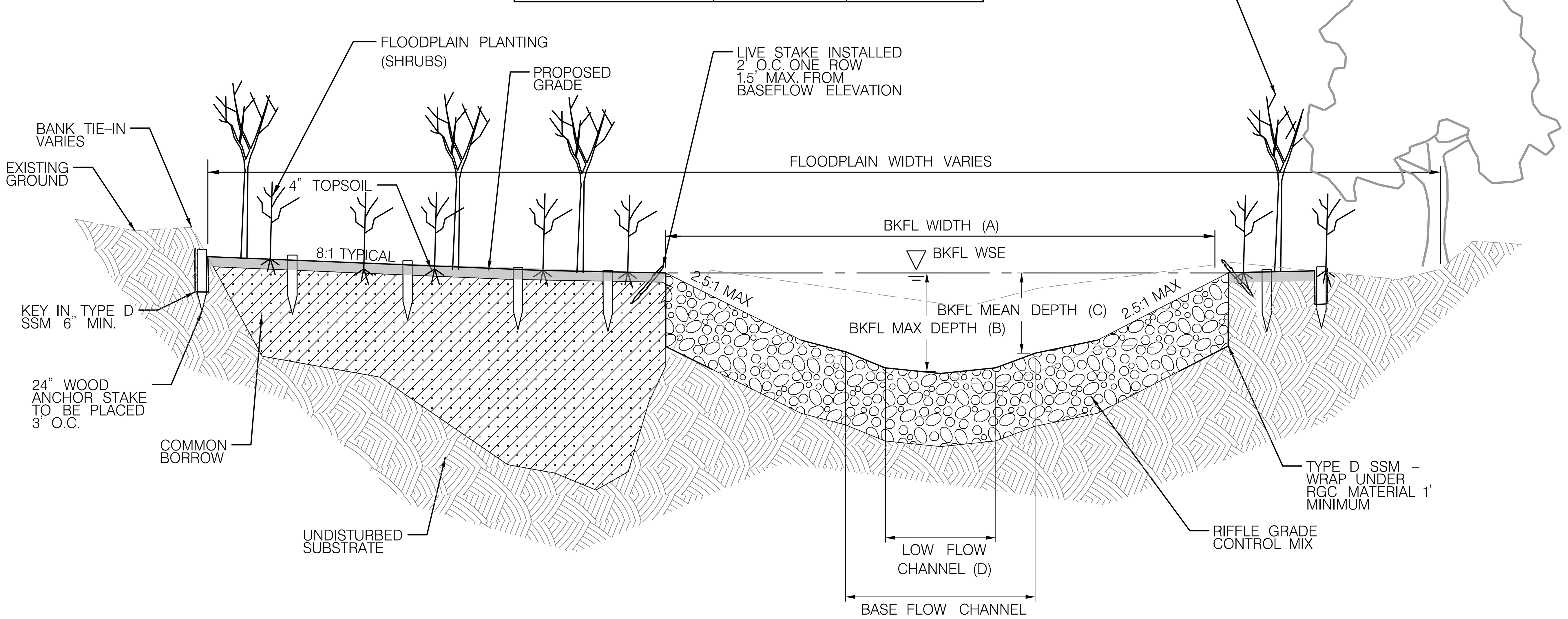
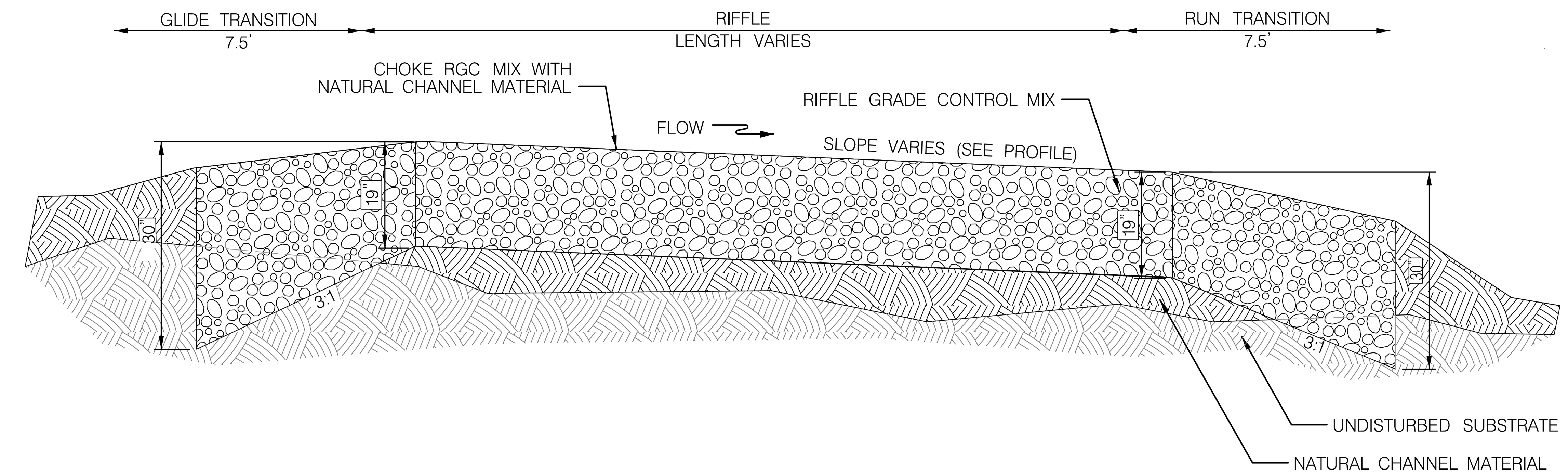
DIMENSIONS	MAINSTEM 1	MAINSTEM 2
BKFL WIDTH (A)	14.7'	14.0'
BKFL MAX DEPTH (B)	1.1'	1.0'
BKFL MEAN DEPTH (C)	0.8'	0.6'
LOW FLOW WIDTH (D)	8.3'	6.0'



TYPICAL RIFFLE GRADE CONTROL (RGC) – SECTION VIEW AT CHANNEL RELOCATION /LIFTING

NOT TO SCALE

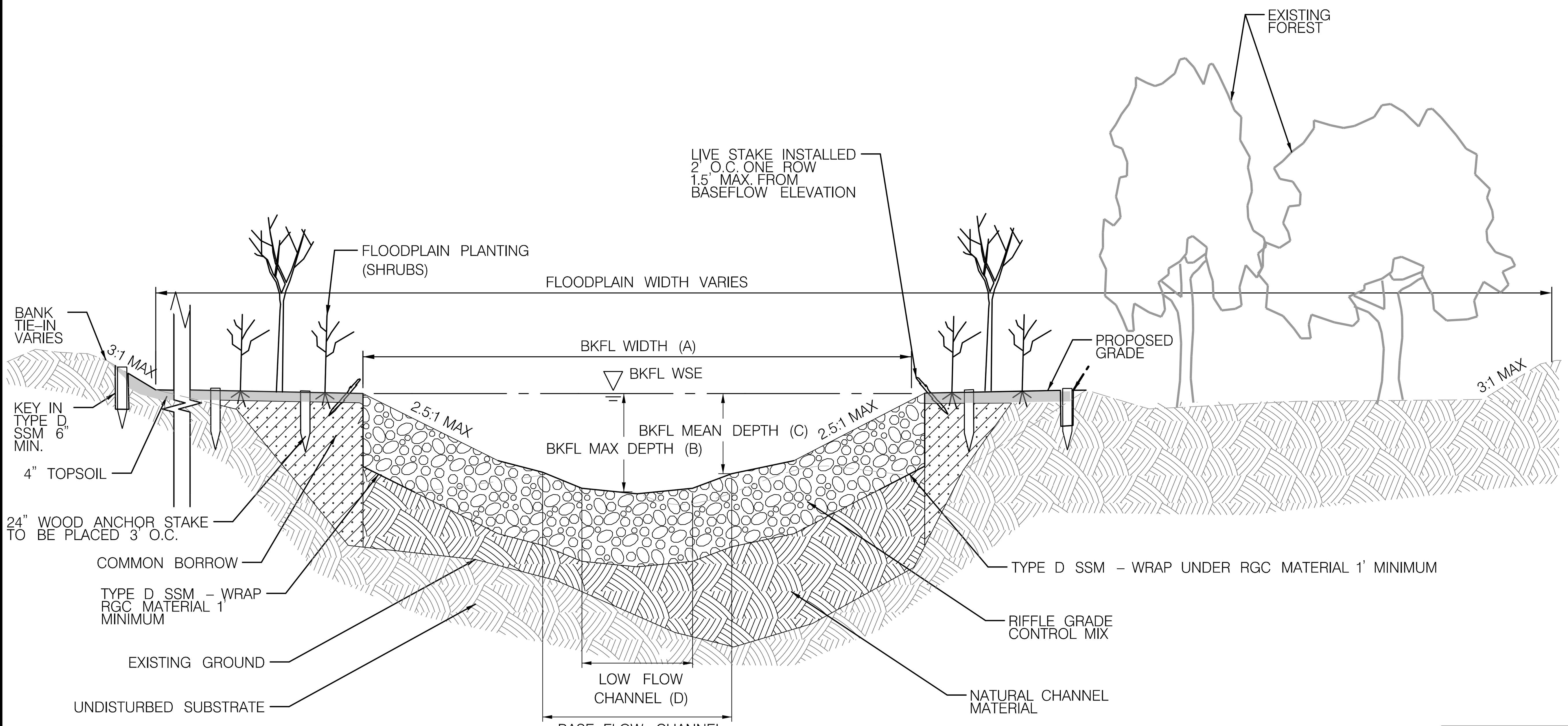


TYPICAL RIFFLE GRADE CONTROL (RGC) – PROFILE VIEW (SHOWN AT THALWEG)

NOT TO SCALE

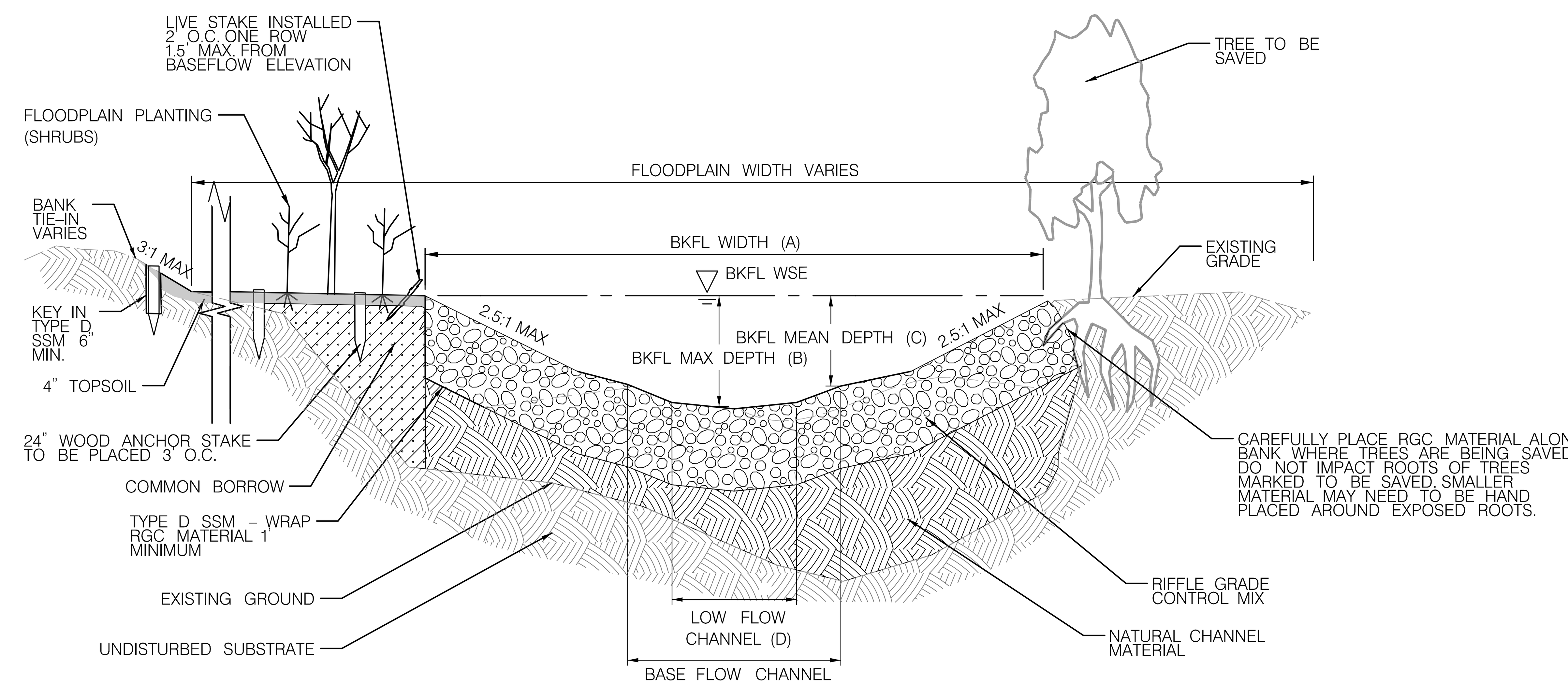
NOTES:

1. CROSS–SECTIONAL DIMENSIONS AND LONGITUDINAL SPACING OF FEATURES VARY. SEE CROSS–SECTIONS AND PROFILES FOR DIMENSIONS OF EACH INDIVIDUAL STRUCTURE.
2. SMALL AND LARGE STONES SHALL BE MIXED TO MINIMIZE VOID SPACES. RIPRAP MUST BE PLACED IN A MANNER TO PROMOTE INTERLOCKING AND PROVIDE SURFACE FLOW.
3. PLACE LARGEST OF RIFFLE GRADE CONTROL MIX MATERIAL AT TOP AND BOTTOM OF RIFFLE GRADE CONTROL TO HOLD PROFILE ELEVATIONS AND LOCK IN MATERIAL.
4. THALWEG MAY BE MODIFIED IN FIELD PER THE ENGINEER OR QAD.
5. SALVAGED NATURAL CHANNEL MATERIAL SHALL BE USED TO CHOKE INTERSTITIAL SPACES IN RIFFLE GRADE CONTROL MIX TO ENSURE SURFACE FLOW. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL. FURNISHED NATURAL CHANNEL MATERIAL TO BE APPROVED BY THE ENGINEER OR QAD.
6. COMMON BORROW PER SHA SPECIFICATION 916.01 MAY BE USED AS FILL MATERIAL OUTSIDE THE BANKFULL WIDTH AND/OR ABOVE THE BANKFULL ELEVATION.
7. SEE CROSS SECTIONS AND PROFILES FOR PROPOSED GRADES.
8. THE CROSS SECTIONAL ELEVATIONS OF THE RIFFLE GRADE CONTROL FEATURES ARE MEASURED FROM THE TOP OF THE RIFFLE GRADE CONTROL MIX AND DO NOT INCLUDE ANY NATURAL CHANNEL MATERIAL THAT IS PLACED OVER THE STRUCTURE.



TYPICAL RIFFLE GRADE CONTROL (RGC) – SECTION VIEW IN EXISTING CHANNEL

NOT TO SCALE



TYPICAL RIFFLE GRADE CONTROL (RGC) – SECTION VIEW NEAR TREE SAVES

NOT TO SCALE

RIFFLE GRADE CONTROL MIX	
CLASS 0 RIPRAP	20%
CLASS I RIPRAP	40%
CLASS II RIPRAP	20%
NATURAL CHANNEL MATERIAL	20%

COASTAL RESOURCES INC.

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I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
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STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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STREAM RESTORATION DETAILS

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE -
HORIZONTAL SCALE -
VERTICAL SCALE -

DRAWING NO. SD-01 OF 09 SHEET NO. 22 OF 76

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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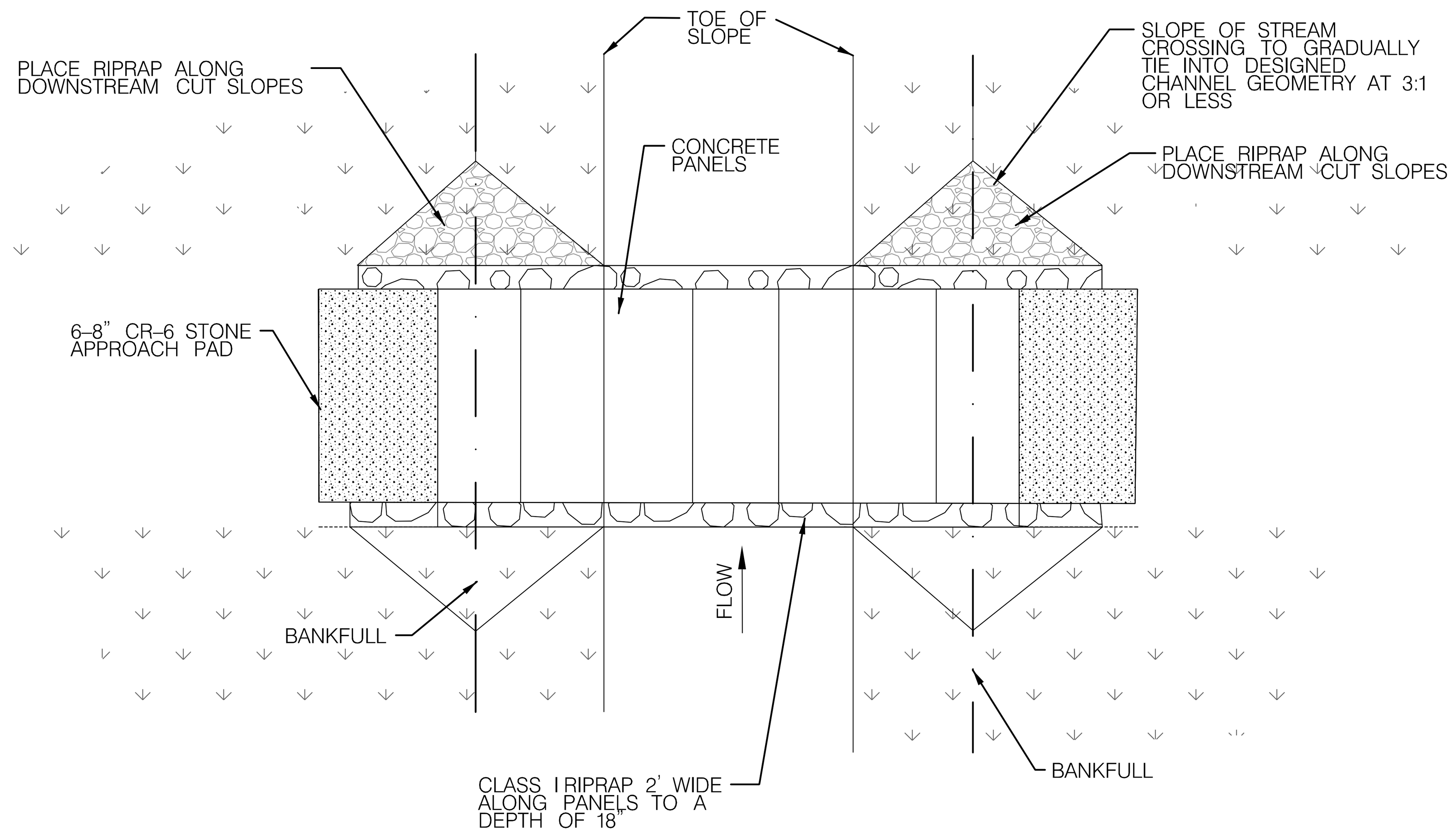
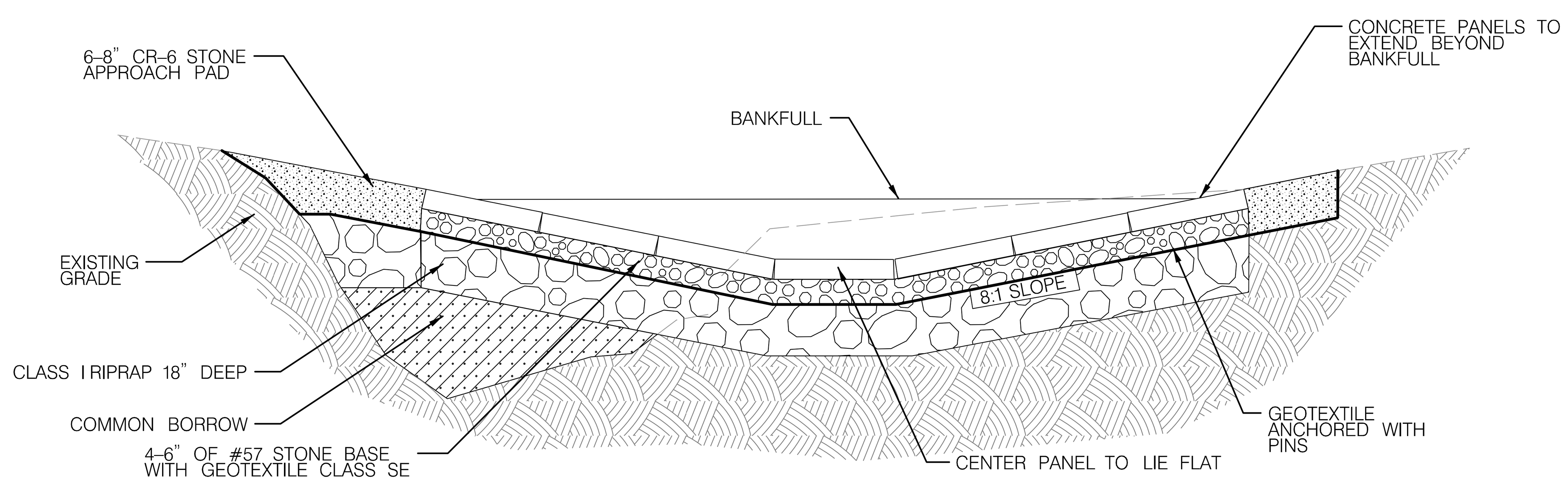


STREAM CROSSING – PLANVIEW

NOT TO SCALE

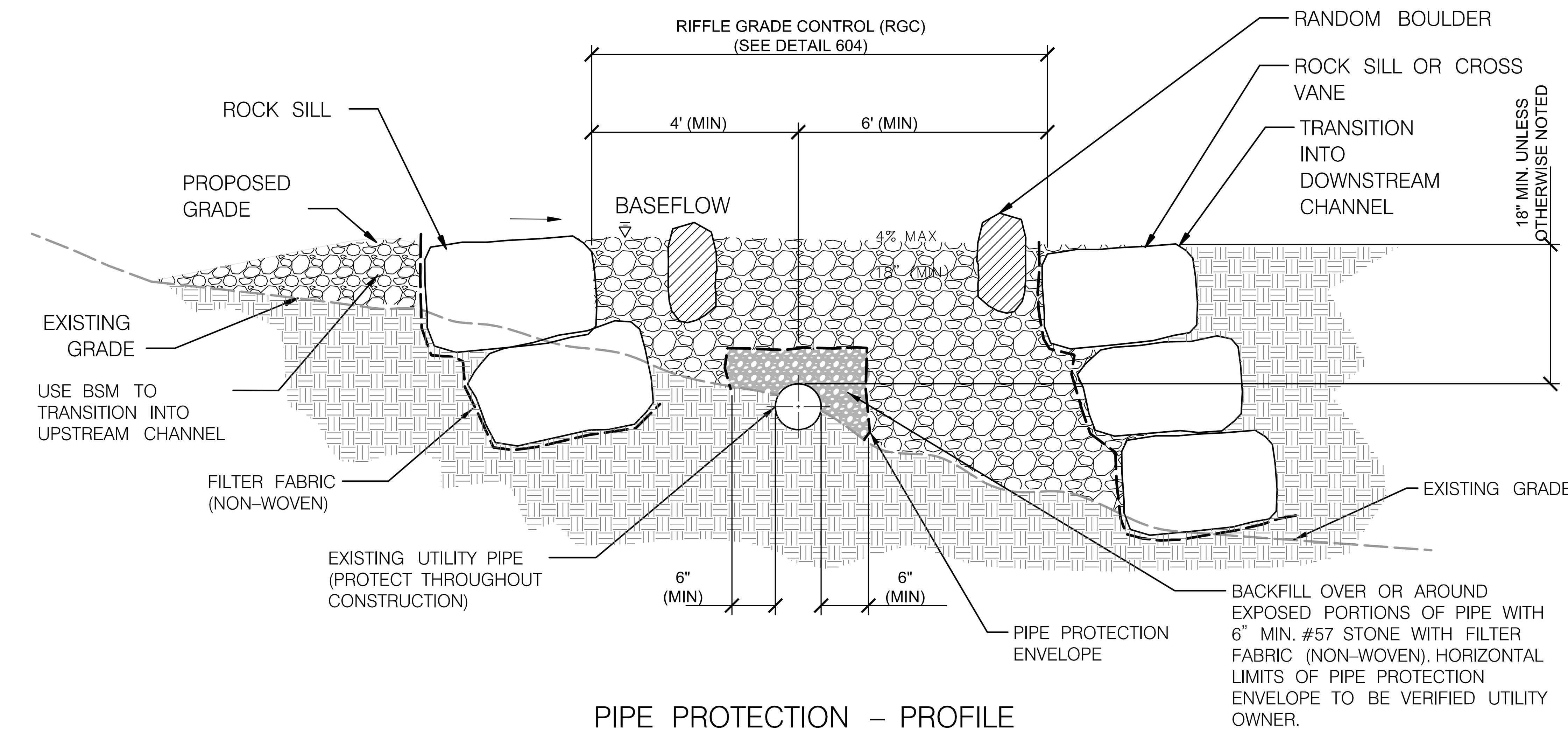


STREAM CROSSING – SECTION VIEW

NOT TO SCALE

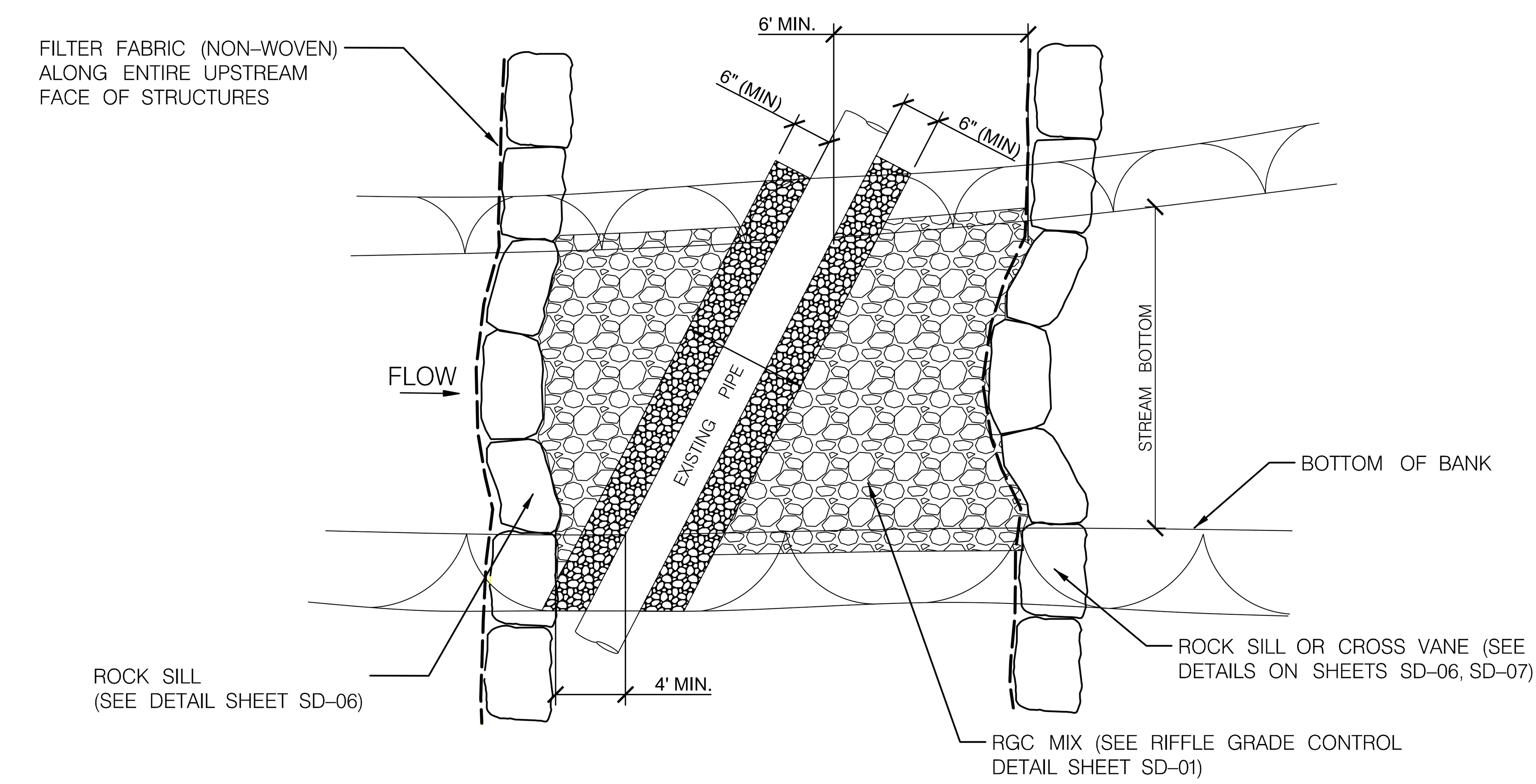
NOTES:

1. THE CROSS-SECTIONAL AREA OF THE CROSSING SHALL NOT BE LESS THAN THE DESIGNED CHANNEL CROSS-SECTIONAL AREA.
2. DEPRESS A PORTION OF THE CROSSING AT OR BELOW THE AVERAGE STREAM BOTTOM ELEVATION WHEN NEEDED TO KEEP BASE FLOWS OR LOW FLOWS CONCENTRATED.
3. THE FINISHED TOP SURFACE OF THE FORD CROSSING IN THE BOTTOM OF THE WATERCOURSE SHALL BE NO HIGHER THAN THE ORIGINAL STREAM BOTTOM AT THE UPSTREAM EDGE OF THE FORD CROSSING.
4. PREFABRICATED CONCRETE FORD PANELS SHALL BE USED AND HAVE THE DIMENSIONS OF APPROXIMATELY 4' x 12' x 5".
5. CLASS 1 RIPRAP SHALL BE USED UPSTREAM AND DOWNSTREAM OF THE CONCRETE PANELS AND INSTALLED TO A DEPTH OF 2 FT.
6. #57 STONE SHALL BE USED AS BASE UNDERNEATH OF THE CONCRETE PANELS.
7. CR–6 STONE WILL BE INSTALLED ABOVE BANKFULL TO TIE INTO EXISTING GROUND.
8. #57 STONE SHALL BE USED TO CHINK IN VOID SPACES IN PANELS.
9. EXCAVATE CHANNEL TO DIMENSIONS SHOWN ON DETAIL WITH TWO TRENCHES 18 INCHES DEEP AND TWO FEET WIDE UPSTREAM AND DOWNSTREAM OF THE CONCRETE PANEL LOCATION.
10. FILL EXISTING CHANNEL WITH COMPACTED BORROW TO SUBGRADE ELEVATION. CONTINUE CLASS I RIPRAP AND CR–6 FILL OUTSIDE LIMITS OF STREAM CROSSING AT SPECIFIED DEPTHS TO FILL REMAINDER OF EXISTING CHANNEL.
11. LAY GEOTEXTILE IN EXCAVATED CHANNEL AND EXTEND PAST BANKFULL. ANCHOR WITH NO. 3 REINFORCING STEEL ANCHORING PINS OR EQUIVALENT MATERIAL. WHERE GEOTEXTILE OVERLAPS, IT SHOULD BE OVERLAPPED A MINIMUM OF 1 FT WITH THE UPSTREAM FABRIC OVERLAPPING THE DOWNSTREAM FABRIC AND BE ANCHORED WITH ANCHORING PINS.
12. PLACE A BASE LAYER OF #57 STONE A MINIMUM OF 6 INCHES THICK UNDERNEATH OF WHERE THE CONCRETE PANELS WILL BE INSTALLED. SIMULTANEOUSLY, PLACE CLASS I RIPRAP INTO TRENCHES MATCHING HEIGHT OF #57 STONE.
13. PLACE THE CONCRETE PANELS SUCH THAT THE FINAL SURFACE OF STREAM CROSSING WILL BE THE SAME AS THE PROPOSED STREAM INVERT ELEVATION.



PIPE PROTECTION – PROFILE

NOT TO SCALE



PIPE PROTECTION – PLAN VIEW

NOT TO SCALE

NOTES:
1. INSTALL PIPE PROTECTION UNDER RIFFLE GRADE CONTROLS WHERE INDICATED ON THE PLANS. AT THE DIRECTION OF THE ENGINEER, INSTALL PIPE PROTECTION AT ANY LOCATION WHERE A UTILITY BECOMES EXPOSED DURING CONSTRUCTION.
2. REMOVE ANY LOOSE OR UNSTABLE BED MATERIAL FROM AROUND THE EXPOSED PIPE. DO NOT DISTURB ANY COMPACTED BED MATERIAL ENCASEMENT OR BEDROCK THAT IS SUPPORTING THE PIPE. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE PIPE. THE SIZE OF EXPOSED AREA WILL VARY IN ACCORDANCE WITH THE UTILITY OWNERS' DIRECTIVE. THE EXPOSED PIPE TO BE SUPPORTED AT ALL TIMES BY THE CONTRACTOR.
3. THE EXPOSED PIPE, PLUS 6" (MIN) IN EACH DIRECTION, SHALL BE BACKFILLED WITH NO. 57 STONE. THE NO. 57 STONE SHALL EXTEND SIX (6) INCHES ABOVE THE CROWN OF THE EXPOSED PIPE AND FILL ALL VOIDS AND SUPPORT THE PIPE.
4. ROCK SILLS AND VANES UPSTREAM AND DOWNSTREAM OF THE CROSSING SHALL BE ORIENTED PERPENDICULAR TO CHANNEL IRRESPECTIVE OF PIPE DIRECTION. THE INVERTS OF THE FOOTER ROCKS SHALL BE AT OR BELOW THE INVERT OF THE EXPOSED PIPE TO PREVENT FURTHER EXPOSURE. THE TOP ELEVATION OF THE RGC AT PIPE SHALL BE AT MINIMUM 18 INCHES (AT THE THALWEG) ABOVE THE PIPE CROWN UNLESS OTHERWISE NOTED.
5. THE SPACE BETWEEN ROCK SILLS /VANES AND THE NO. 57 STONE PIPE PROTECTION SHALL BE BACKFILLED WITH RGC MIX PER THE RIFFLE GRADE CONTROL DETAIL.
6. PARKS RESERVES THE RIGHT TO ADJUST THE LOCATION /ANGLE, SIZE /EXTENT OR ELEVATION OF THE PROPOSED STRUCTURE.
7. HARVEST AND REUSE EXISTING STREAMBED MATERIALS TO EXTENT POSSIBLE. OFFSITE STREAMBED MATERIAL SHALL BE USED TO CHOKE BOTTOM LAYERS OF ROCK WITH SALVAGED MATERIAL SAVED FOR TOP LAYERS.

COASTAL RESOURCES INC.

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

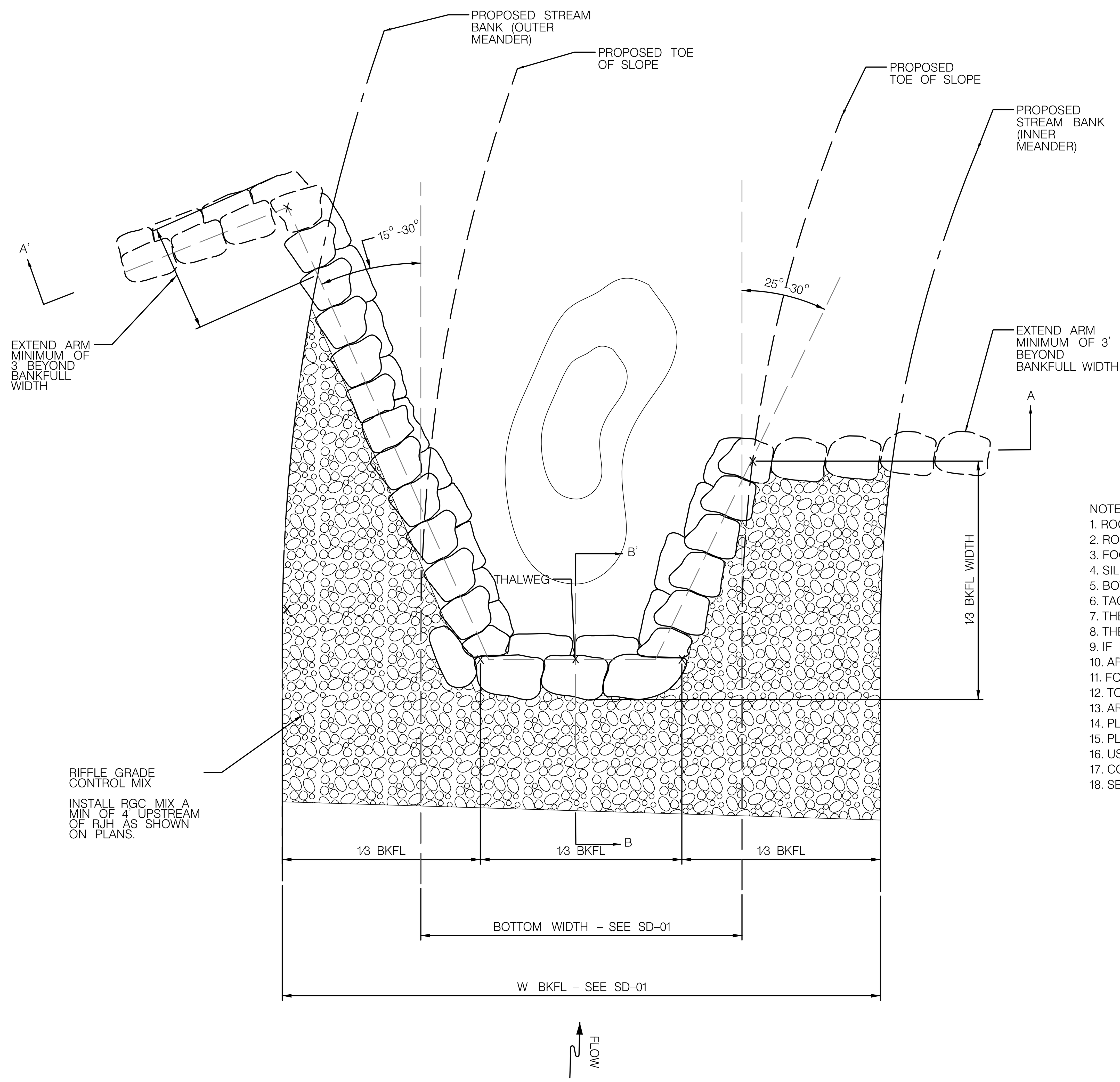
SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

STREAM RESTORATION DETAILS

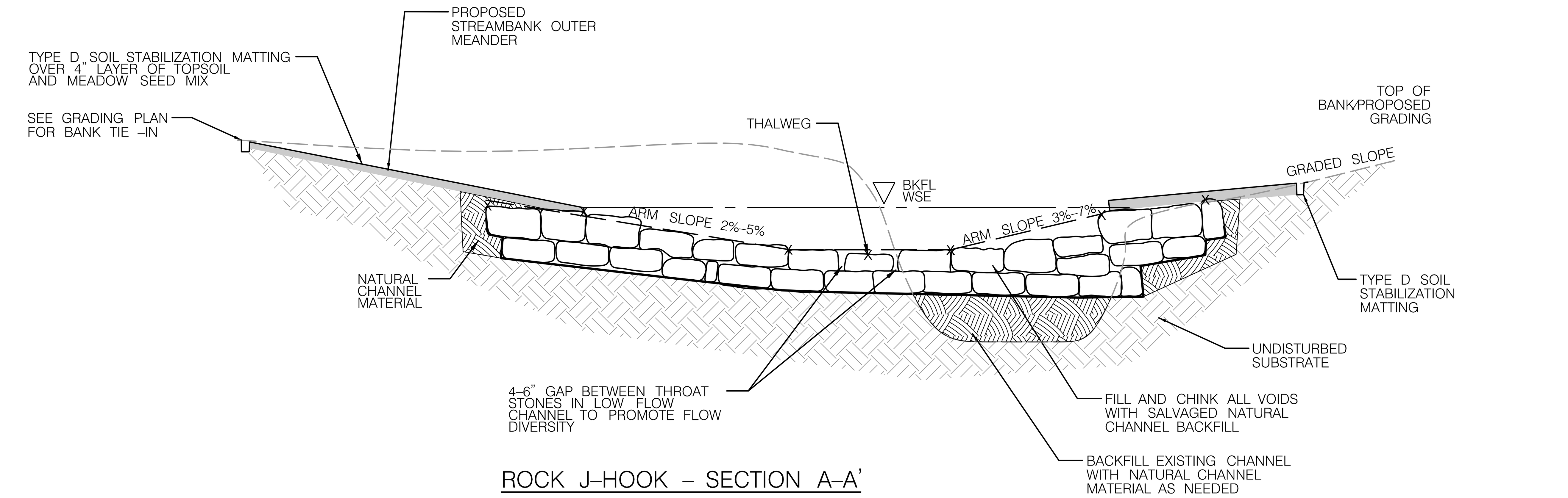
SCALE NTS	DATE DECEMBER 2021	CONTRACT NO. AW073B12	
DESIGNED BY SCN		COUNTY MONTGOMERY	
DRAWN BY CJN		LOGMILE	
CHECKED BY KSK		HORIZONTAL SCALE	
MDE/PRD 16825120-PR-0040-01		VERTICAL SCALE	
DRAWING NO. SD-02 OF 09		SHEET NO. 23 OF 76	

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pSD-D002_CA-5.dgn

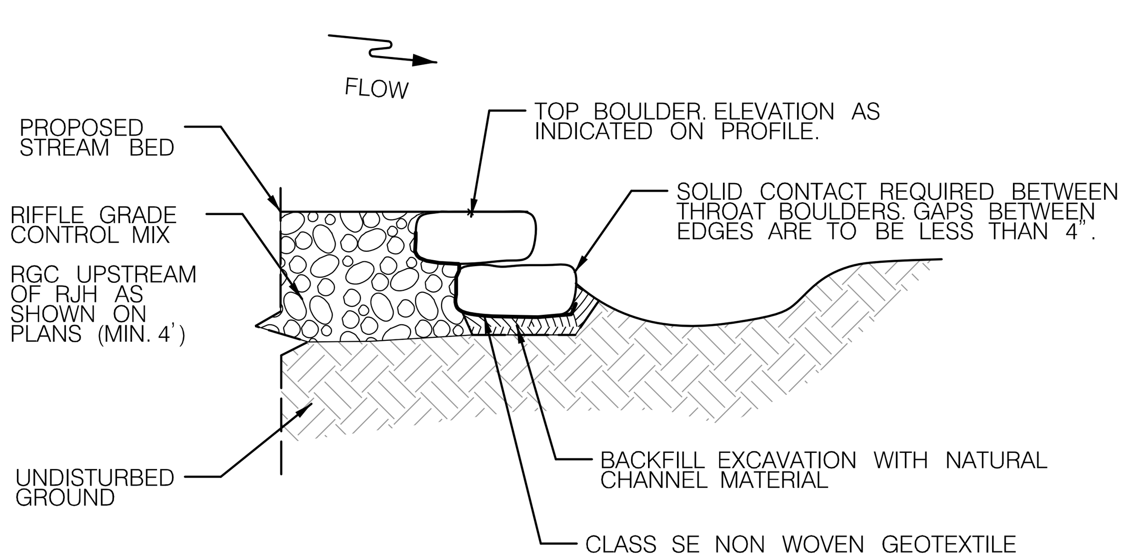


ROCK J-HOOK - PLAN VIEW
NOT TO SCALE

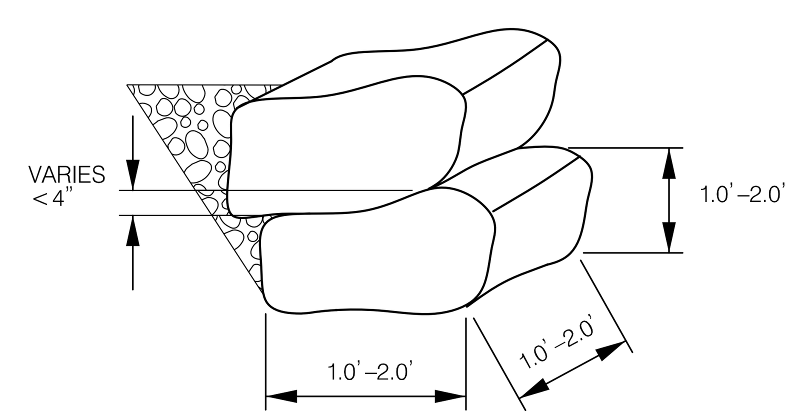


ROCK J-HOOK - SECTION A-A'
NOT TO SCALE

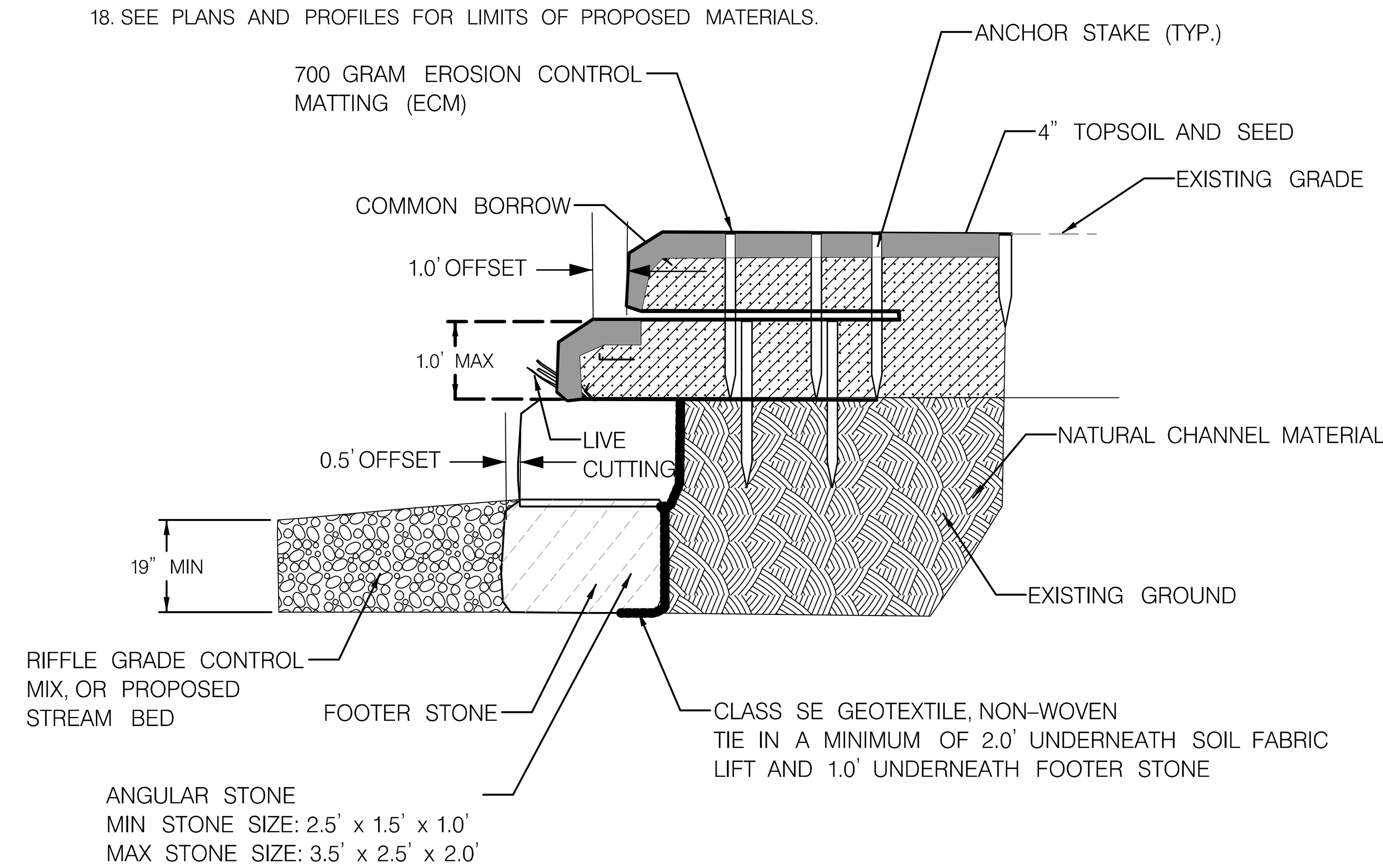
NOTES:
1. ROCK J-HOOK SHALL BE PLACED UNDER DIRECT SUPERVISION OF THE ENGINEER OR QAD. ALL ROCK ANGLES/SLOPES/ELEVATIONS SHOULD BE APPROVED BY ENGINEER OR QAD.
2. ROCK J-HOOK IS CONSTRUCTED USING IMBRICATED ROCKS OR APPROVED HAND PICKED CLASS II ROCK.
3. FOOTER ROCKS TRENCH FOR THE OUTSIDE ARM SHOULD BE EXCAVATED AT A 15-30 DEGREE ANGLE FROM PARALLEL TO THE OUTSIDE MEANDER BANK. OVER-EXCAVATION OF THE FOOTER TRENCH SHOULD BE AVOIDED IF POSSIBLE.
4. SILL/ARM ROCKS SHOULD BE INSTALLED OFFSET OF THE FOOTERS IN THE UPSTREAM DIRECTION (MAX 6 INCHES).
5. BOTTOM ELEVATION OF THE FOOTERS SHOULD BE LOWER THAN THE ELEVATION OF THE DEEPEST POINT OF THE POOL IMMEDIATELY DOWNSTREAM OF THE STRUCTURE.
6. TACK GEOTEXTILE TO ENTIRE LENGTH OF UPSTREAM SIDE OF SILL ROCK AND LAY FLAT ON UPSTREAM EXCAVATED TRENCH.
7. THE ROCKS SHOULD BE RECTANGULAR, OR NEARLY SO, AT THE ROCK TO ROCK CONTACT.
8. THE ROCK TO ROCK CONTACT SHOULD BE UNIFORM AND STABLE.
9. IF ROCKS ARE NOT PERFECTLY FLAT, THE THICKER END SHOULD BE PLACED DOWNSTREAM.
10. ARM STONES SHALL ABUT FOR CLOSE CONTACT, GAPS BETWEEN IRREGULAR STONE EDGES SHALL BE NO GREATER THAN 2".
11. FOOTER STONES AT SILL SHALL ABUT FOR CLOSE CONTACT, GAPS BETWEEN IRREGULAR STONE EDGES SHALL BE NO GREATER THAN 2".
12. TOP STONES AT SILL SHALL HAVE BETWEEN 4" TO 6" GAPS BETWEEN STONES AT THE THROAT (CENTER 1/3 BKFL CHANNEL) OF RJH WITHIN THE LOW FLOW CHANNEL TO PROVIDE FLOW DIVERSITY.
13. ARMS SHALL EXTEND A MINIMUM OF 3' BEYOND BANKFULL WIDTH.
14. PLACE GEOTEXTILE UNDER FOOTER ROCKS AND WRAP UP TO TOP UPSTREAM EDGE OF SILL AND ARM ROCKS.
15. PLACE RIFFLE GRADE CONTROL MIX OVER TOP OF GEOTEXTILE AND CONSTRUCT THE RIFFLE GRADE CONTROL STRUCTURE PER SD-01.
16. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED FROM ABANDONED CHANNEL IF AVAILABLE. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL.
17. COMMON BORROW PER SHA SPECIFICATION 916.01 MAY BE USED AS FILL MATERIAL OUTSIDE THE BANKFULL WIDTH AND/OR ABOVE THE BANKFULL ELEVATION.
18. SEE PLANS AND PROFILES FOR LIMITS OF PROPOSED MATERIALS.



ROCK J-HOOK - SECTION B-B'
NOT TO SCALE

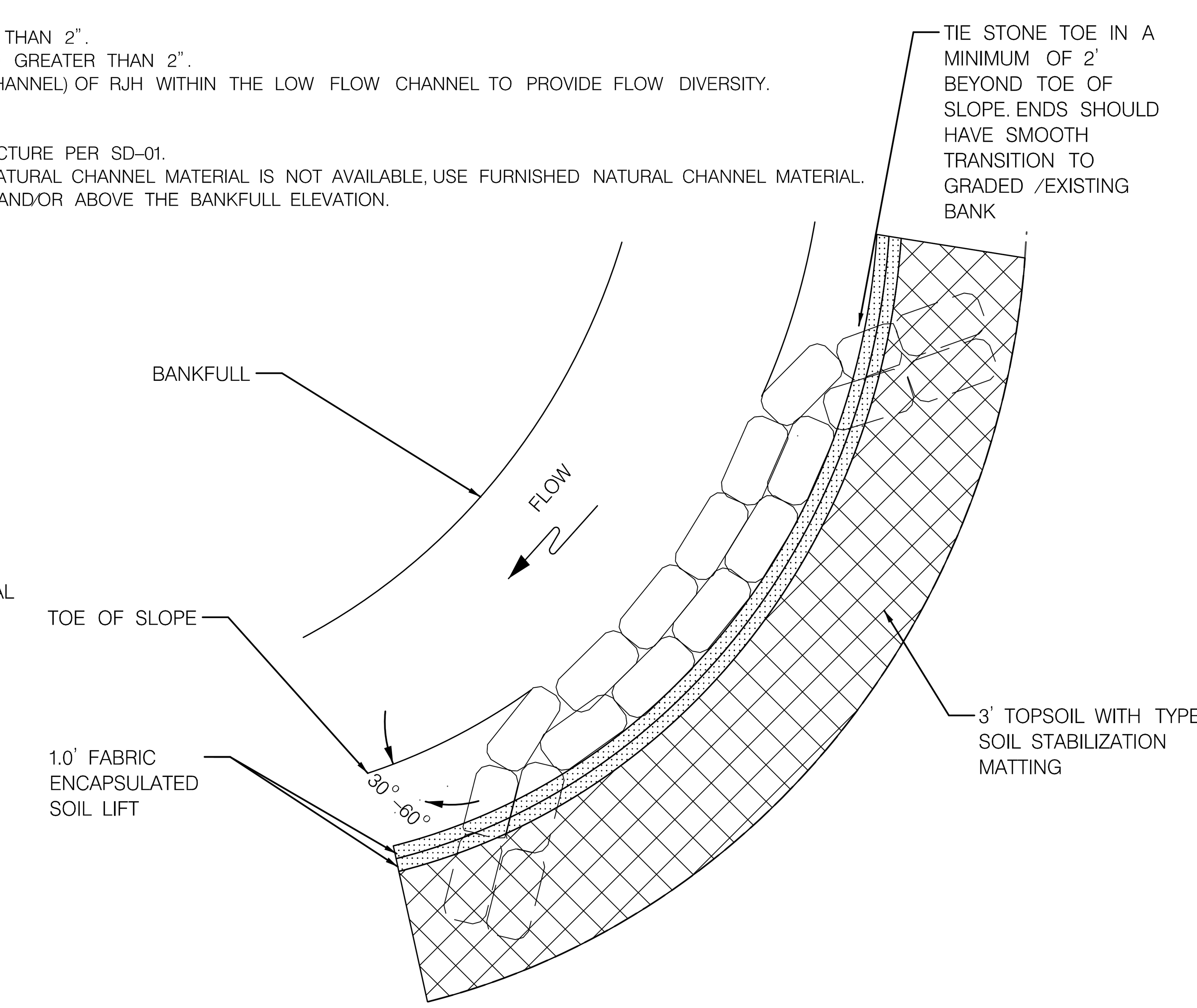


TYPICAL BOULDERS AND PLACEMENT
NOT TO SCALE



STONE TOE (ST) - SECTION VIEW
NOT TO SCALE

NOTES:
1. ALL BOULDERS SHALL BE STRUCTURAL STONE, CUBICAL OR RECTANGULAR IN SHAPE. BOULDERS AVAILABLE ONSITE MAY BE USED IF APPROVED BY THE ENGINEER OR QAD. BOULDERS SHALL BE 3.0' X 2.0' X 1.5' (W X H X L) +/- 0.5'.
2. EACH ROW OF STACKED BOULDERS SHALL BE OFFSET BY 0.5' TOWARD THE STREAM BANK FROM THE ROW BELOW.
3. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED ON SITE. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL. FURNISHED NATURAL CHANNEL MATERIAL TO BE APPROVED BY THE ENGINEER OR QAD.
4. COMMON BORROW PER SHA SPECIFICATION 916.01 MAY BE USED AS FILL MATERIAL ABOVE THE TOP ROW OF STACKED BOULDERS.
5. PLACE A LAYER OF 6.5 FEET WIDE 700 GRAM EROSION CONTROL MATTING, OR EQUIVALENT, ON TOP OF THE BOULDER WALL AND BELOW THE GRAVEL LEVELING COURSE SUCH THAT 2.5 FEET OF THE BLANKET WILL BE BURIED BELOW THE SOIL BACKFILL.
6. SOIL LIFTS CAN BE SECURED USING WOODEN STAKES.
7. THE EROSION CONTROL FABRIC SHALL BE PULLED AS TIGHT AS POSSIBLE WITHOUT TEARING OR EXCESSIVELY DISTORTING THE FABRIC.
8. SECURE THE EROSION CONTROL AND NON-WOVEN MATTING IN PLACE BY STAKING THE END OF THE EROSION CONTROL FABRIC WITH WOODEN STAKES AT 1.5-FOOT ON CENTER.
9. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE GRADES, AND CROSS SECTIONS OR ELEVATIONS SHOWN ON THE PLAN VIEW DRAWINGS. TIE STONE TOE IN A MINIMUM OF 2' BEYOND TOE OF SLOPE.
10. THE HEIGHT OF THE STRUCTURE AND TOTAL NUMBER OF COURSES OF STONE TOE AND SOIL LIFT ARE TO BE DETERMINED BY THE GRADES, AND CROSS SECTIONS OR ELEVATIONS SHOWN ON THE PLAN VIEW DRAWINGS.



STONE TOE (ST) - PLAN VIEW
NOT TO SCALE

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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STREAM RESTORATION DETAILS

SCALE NTS	DATE DECEMBER 2021	CONTRACT NO. AW073B12	
DESIGNED BY SCN		COUNTY MONTGOMERY	
DRAWN BY CJN		LOGMILE -	
CHECKED BY KSK		HORIZONTAL SCALE -	
MDE/PRD 16825120-PR-0040-01		VERTICAL SCALE -	
DRAWING NO. SD-03 OF 09		SHEET NO. 24 OF 76	

BY: caln -

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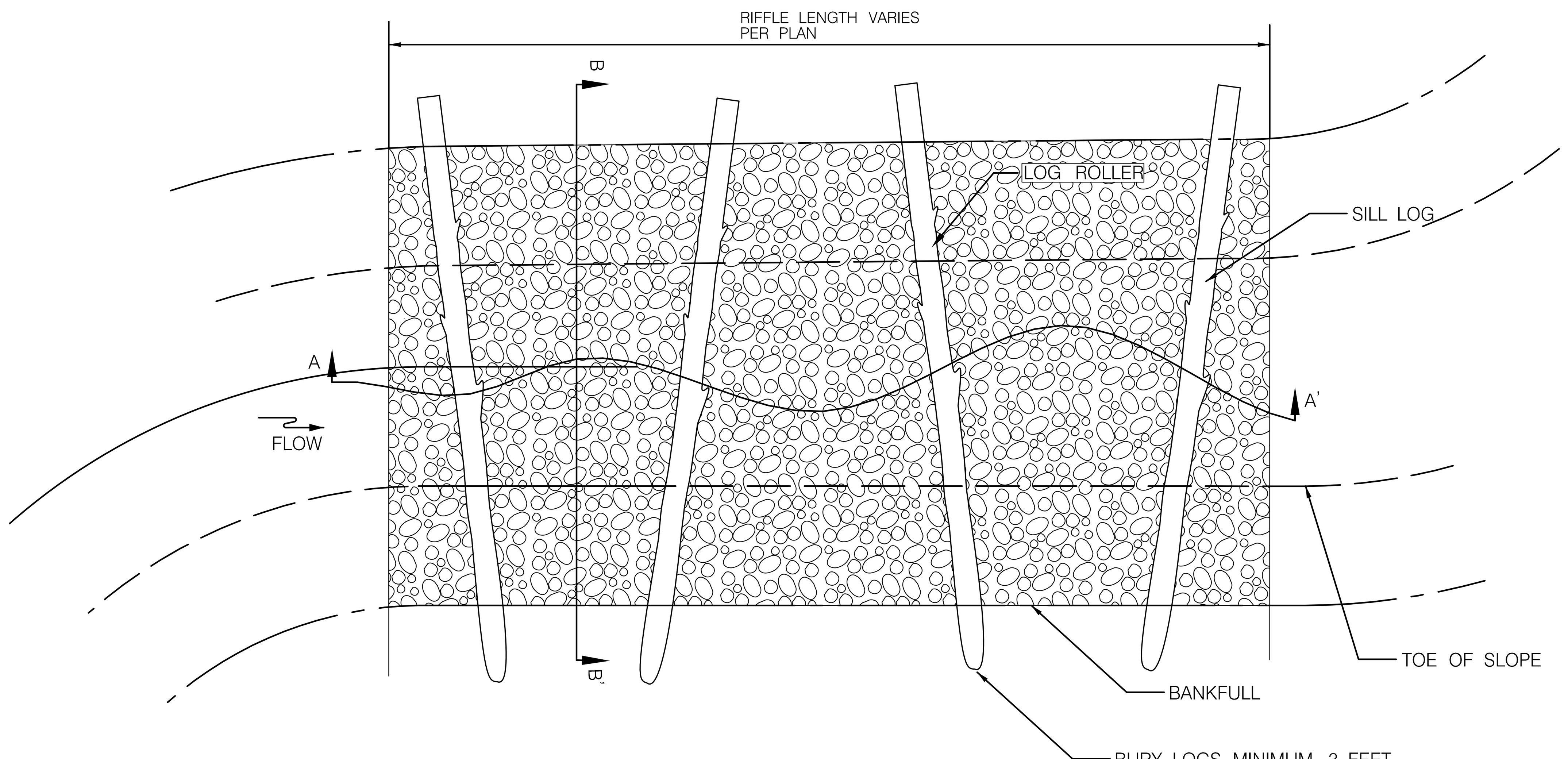
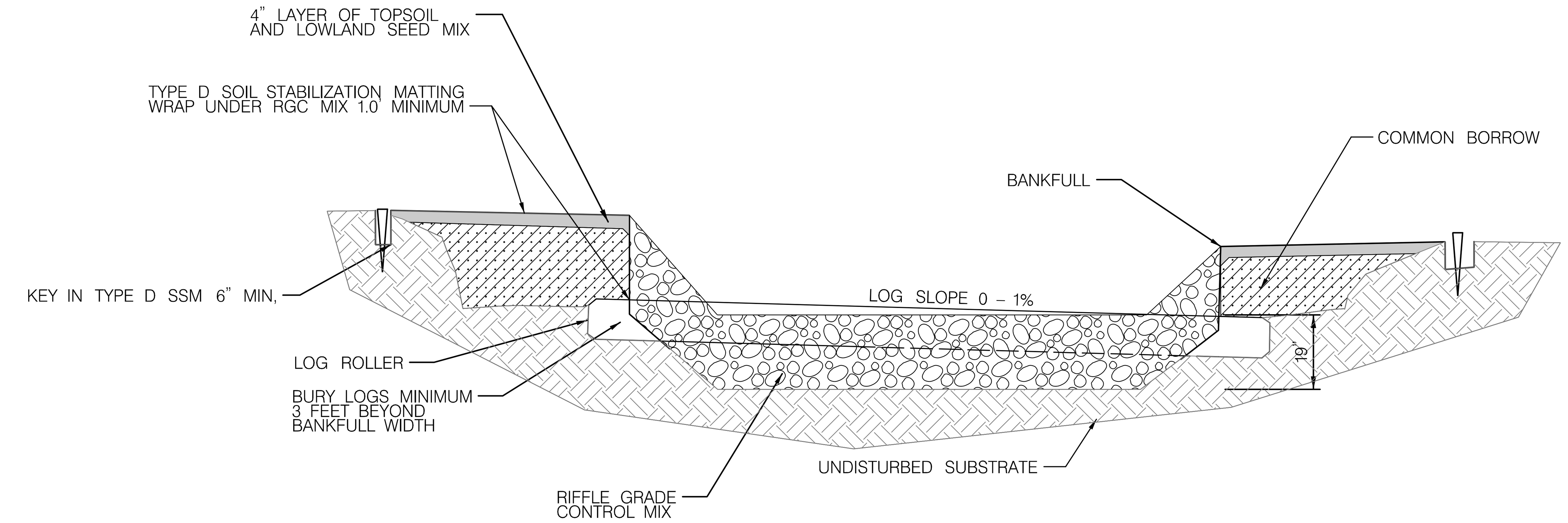


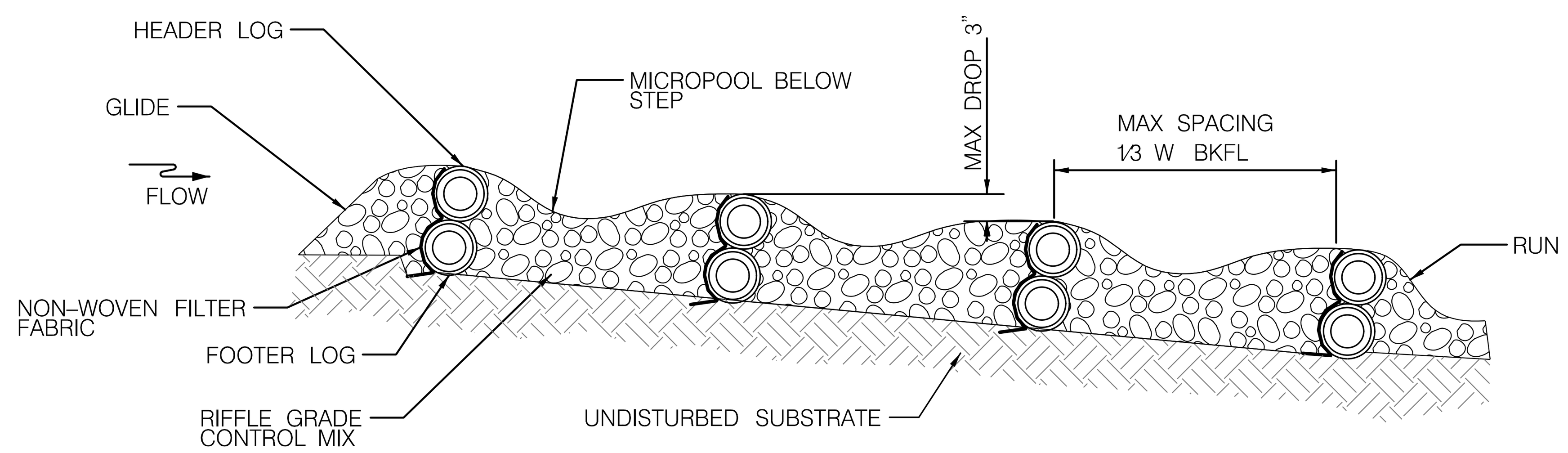
LOG ROLLER (LR) – DETAILED PLAN
NOT TO SCALE



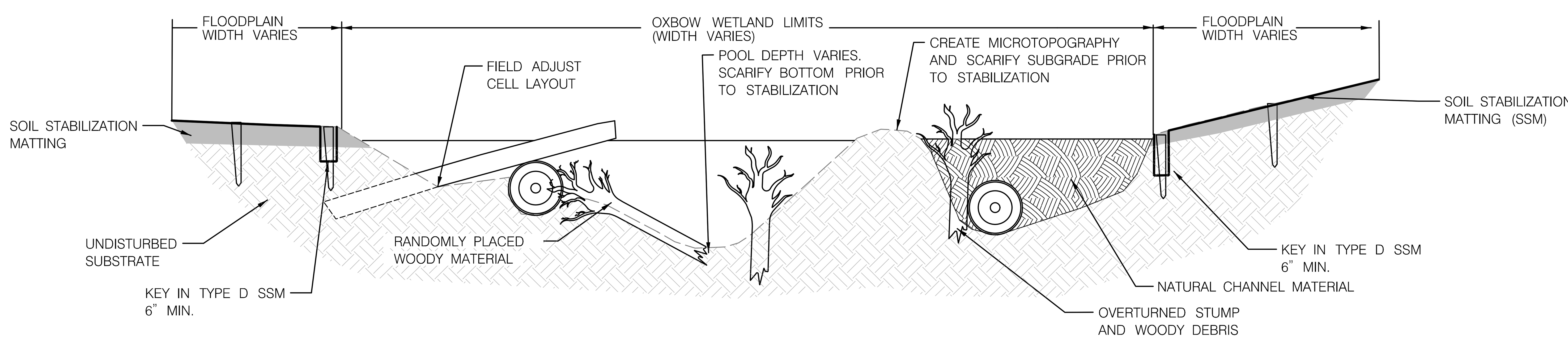
LOG ROLLER (LR) – DETAILED SECTION B – B'
NOT TO SCALE

NOTES:

1. ALL LOGS SHALL BE RELATIVELY STRAIGHT AND LIMBS AND BRANCHES SHALL BE TRIMMED FLUSH. LOGS SHALL HAVE A DIAMETER OF 12–18". WITH THE APPROVAL OF THE ENGINEER OR QAD, ONE 18–24" LOG MAY BE USED IN PLACE OF TWO 12–18" LOGS. LOGS SHALL HAVE A MINIMUM LENGTH OF 21 FEET.
2. HEADER LOGS SHALL BE UNDERLAIN BY FOOTER LOGS TO PROVIDE A SILL UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR QAD. HEADER LOGS SHALL BE OFFSET SLIGHTLY DOWNSTREAM OF THE FOOTER LOG.
3. SET SILL INVERTS AT ELEVATION SHOWN ON THE PLAN AND PROFILE SHEETS. NO ELEVATIONS OF THE LOG SILLS MAY VARY FROM THE PLAN SHEETS UNLESS APPROVED BY THE ENGINEER OR QAD.
4. THE VERTICAL SLOPE OF EACH LOG SHALL NOT EXCEED 1% UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR QAD.
5. ON THE UPSTREAM SIDE OF THE SILL LOGS, NON–WOVEN GEOTEXTILE FABRIC SHALL BE PLACED ON THE ENTIRE LENGTH OF THE STRUCTURE. FILTER FABRIC SHALL EXTEND FROM THE BOTTOM OF THE LOG TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF THE STRUCTURE. RIFFLE GRADE CONTROL MIX SHALL BE USED AS BACKFILL MATERIAL AROUND THE AROUND THE LOGS AND MICROPOOLS SHALL BE ESTABLISHED BELOW EACH LOG.
6. LOGS SHOULD TIE INTO THE BANK A MINIMUM OF 3' ON EACH SIDE. WITH THE APPROVAL OF THE ENGINEER OR QAD, THIS TIE–IN MAY BE ADJUSTED TO AVOID IMPACTS TO EXISTING NATURAL RESOURCES.
7. FINE WOODY MATERIAL LESS THAN 3" IN DIAMETER MAY BE INCORPORATED INTO THIS STRUCTURE TO INCREASE IN–STREAM ORGANIC MATERIAL AND ENHANCE FLOW DIVERSITY.
8. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED FROM ABANDONED CHANNEL IF AVAILABLE. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL. FURNISHED NATURAL CHANNEL MATERIAL TO BE APPROVED BY THE ENGINEER OR QAD.
9. COMMON BORROW PER SHA SPECIFICATION 916.01 MAY BE USED AS FILL MATERIAL OUTSIDE THE BANKFULL WIDTH AND/OR ABOVE THE BANKFULL ELEVATION.
10. SEE PLANS AND PROFILES FOR LIMITS OF PROPOSED MATERIALS.



LOG ROLLER (LR) – DETAILED SECTION A – A'
NOT TO SCALE



OXBOW WETLAND (OW) – TYPICAL SECTION VIEW
NOT TO SCALE

NOTES:
1. RANDOMLY PLACED WOODY MATERIAL SHALL BE INSTALLED AT THE DIRECTION OF THE ENGINEER OR QAD. INSTALLATION SHALL NOT DISTURB EXISTING TREE ROOTS OR OTHER NATURAL RESOURCES.
2. THE SIZE, FINAL LOCATION, AND ORIENTATION OF PROPOSED RANDOMLY PLACED WOODY MATERIAL MAY VARY AND WILL BE DETERMINED BY THE ENGINEER OR QAD BASED ON SITE CONDITIONS DURING CONSTRUCTION.
3. REFER TO CROSS SECTIONS AND GRADING PLANS FOR OXBOW WETLAND GRADING.
4. REFER TO STREAM RELOCATION PLAN SHEETS FOR OXBOW WETLAND LOCATIONS.
5. WHERE PROPOSED OXBOW WETLANDS ARE CONSTRUCTED IN THE LOCATION OF THE EXISTING CHANNEL, BACKFILL EXISTING CHANNEL TO PROPOSED BOTTOM ELEVATION OF 4" TOPSOIL.
6. AT LEAST 25% OF THE LENGTH OF THE LARGE AND SMALL RANDOMLY PLACED LOGS SHALL BE BURIED WITHIN THE OXBOW WETLAND SO THAT THEY WILL NOT BE DISPLACED BY HIGH FLOWS.
7. LARGE AND SMALL RANDOMLY PLACED LOGS SHALL BE PLACED AT THE DIRECTION OF THE ENGINEER OR QAD.
8. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED FROM ABANDONED CHANNEL IF AVAILABLE. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL. FURNISHED NATURAL CHANNEL MATERIAL TO BE APPROVED BY THE ENGINEER OR QAD.

COASTAL
RESOURCES
INC.

BY: caln –

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED
LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
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REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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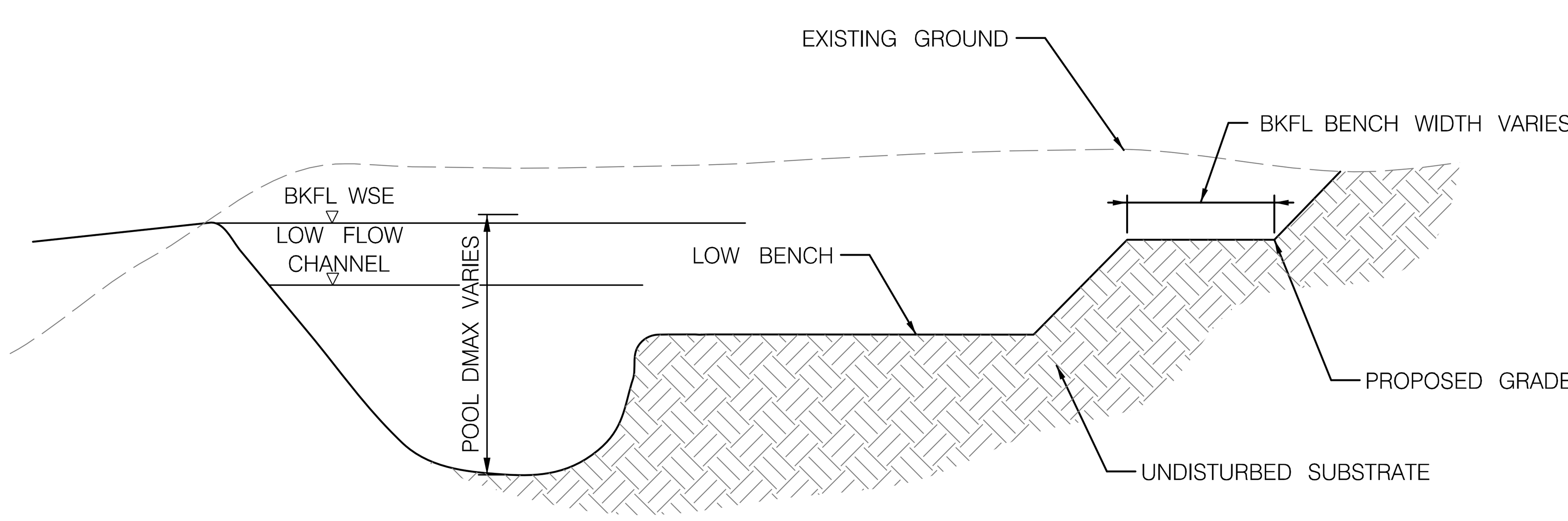
STREAM RESTORATION DETAILS

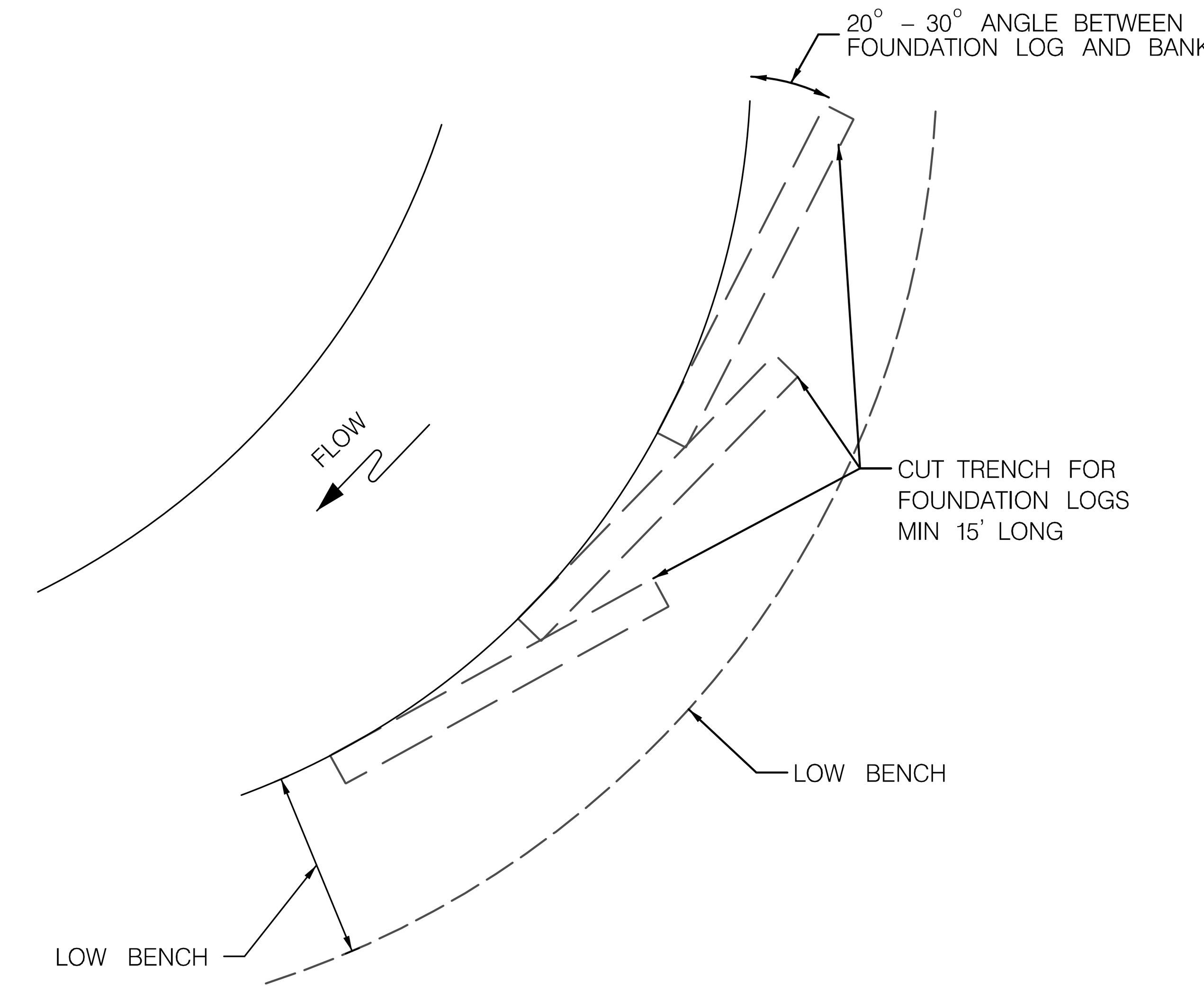
SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	
CHECKED BY	KSK	HORIZONTAL SCALE	
MDE/PRD	16825120-PR-0040-01	VERTICAL SCALE	

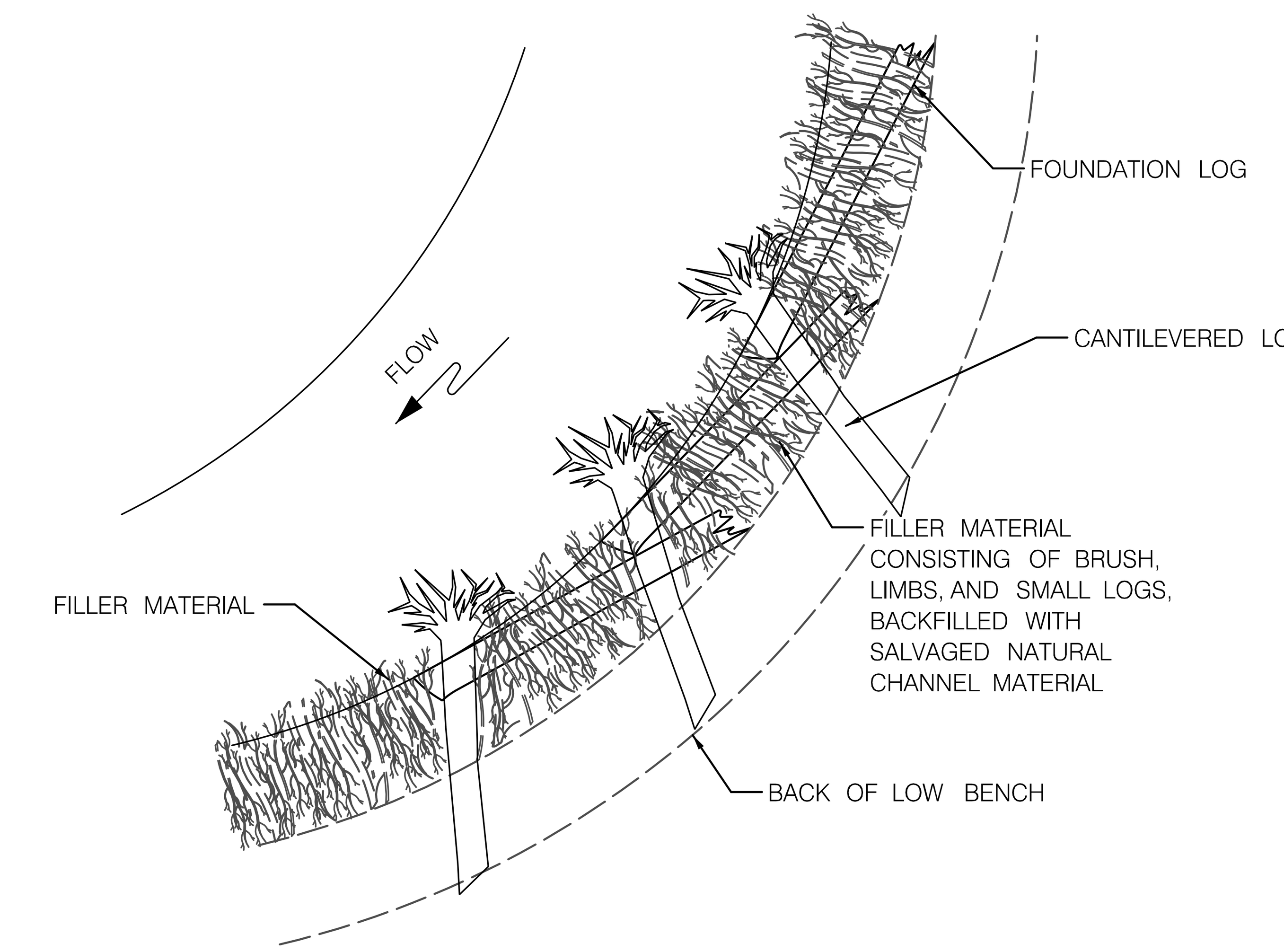
DRAWING NO. SD-04 OF 09 SHEET NO. 25 OF 76



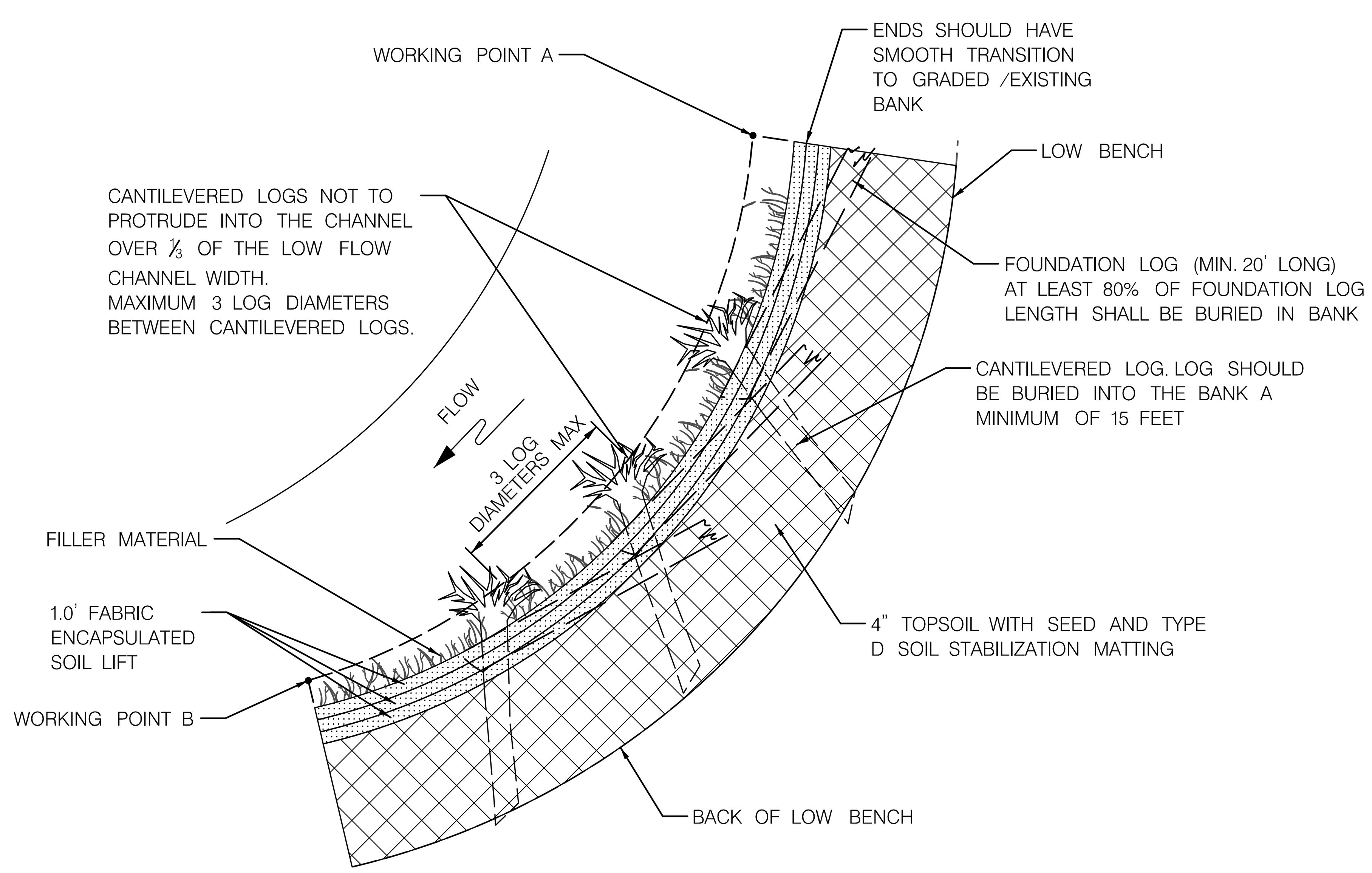
TOE LOG (TL) – CONSTRUCTION PHASE 1 – SECTION VIEW
NOT TO SCALE



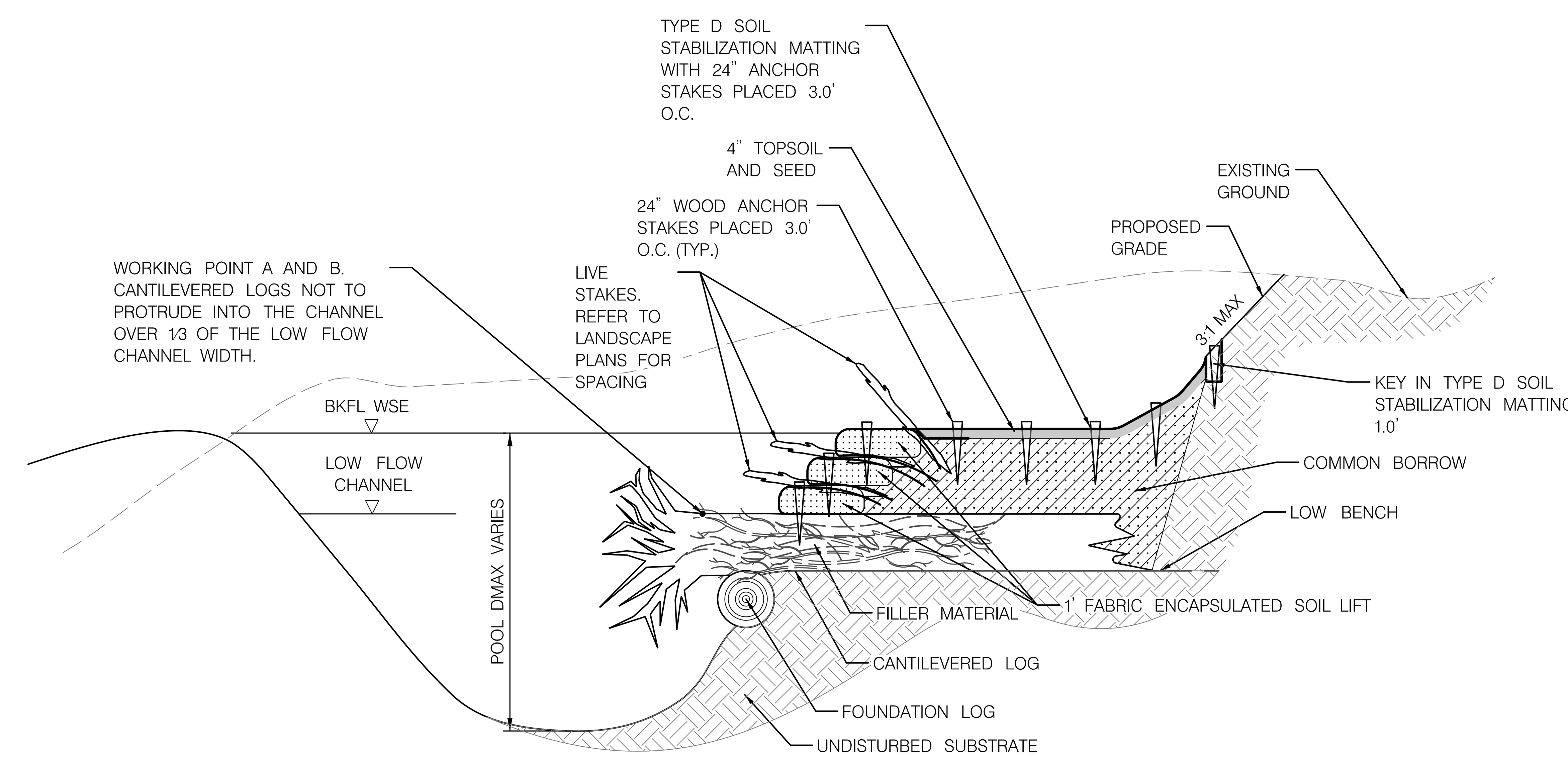
TOE LOG (TL) – CONSTRUCTION PHASE 2 – PLAN VIEW
NOT TO SCALE



TOE LOG (TL) – CONSTRUCTION PHASE 3 – PLAN VIEW
NOT TO SCALE



TOE LOG (TL) – CONSTRUCTION PHASE 4 – PLAN VIEW
NOT TO SCALE



TOE LOG (TL) – CONSTRUCTION PHASE 4 – SECTION VIEW
NOT TO SCALE

NOTES:
1. THE TOE LOG STRUCTURE IS TO BE CONSTRUCTED UNDER THE DIRECT SUPERVISION OF AND/OR SUBJECT TO THE APPROVAL OF THE ENGINEER OR QAD.
2. HARVEST WOODY MATERIAL FROM TREES THAT WILL BE REMOVED ON-SITE, WHERE POSSIBLE. THE LENGTH OF CANTILEVERED LOG AND FOUNDATION LOG WILL VARY DEPENDING ON THE DISTANCE COVERED BY THE PROPOSED FILL SLOPE.
3. FILLER MATERIAL SUCH AS BRUSH, TREE TOPS, AND BRANCHES MAY HAVE DIAMETERS RANGING FROM 2"-8".
4. FOUNDATION LOGS WILL HAVE A DIAMETER OF 12"-18" AND BE A MINIMUM OF 15' IN LENGTH WITH NO ROOT MASS. FOUNDATION LOGS WILL BE ORIENTED IN THE DOWNSTREAM DIRECTION WITH AN ANGLE FROM THE LOG TO THE BANK BETWEEN 20 AND 30 DEGREES.
5. CANTILEVERED LOGS WILL HAVE A DIAMETER OF 15"-24" AND BE A MINIMUM OF 15' IN LENGTH WITH AN ATTACHED ROOT MASS. CANTILEVERED LOGS SHOULD BE INSTALLED WITH A MAJORITY OF THE LOG BELOW THE NORMAL BASE FLOW OR LOW FLOW WATER ELEVATION.
6. BACKFILL THE GAPS BETWEEN THE FILLER MATERIAL UP TO THE ELEVATION OF THE TOP OF THE CANTILEVERED LOGS WITH SALVAGED NATURAL CHANNEL MATERIAL.
7. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED FROM ABANDONED CHANNEL. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL. FURNISHED NATURAL CHANNEL MATERIAL TO BE APPROVED BY THE ENGINEER OR QAD.
8. COMMON BORROW PER SHA SPECIFICATION 916.01 MAY BE USED AS FILL MATERIAL OUTSIDE THE BANKFULL WIDTH AND/OR ABOVE THE BANKFULL ELEVATION.

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN–NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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STREAM RESTORATION DETAILS

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	-
CHECKED BY	KSK	HORIZONTAL SCALE	-
MDE/PRD	16825120-PR-0040-01	VERTICAL SCALE	-

DRAWING NO. SD-05 OF 09 SHEET NO. 26 OF 76

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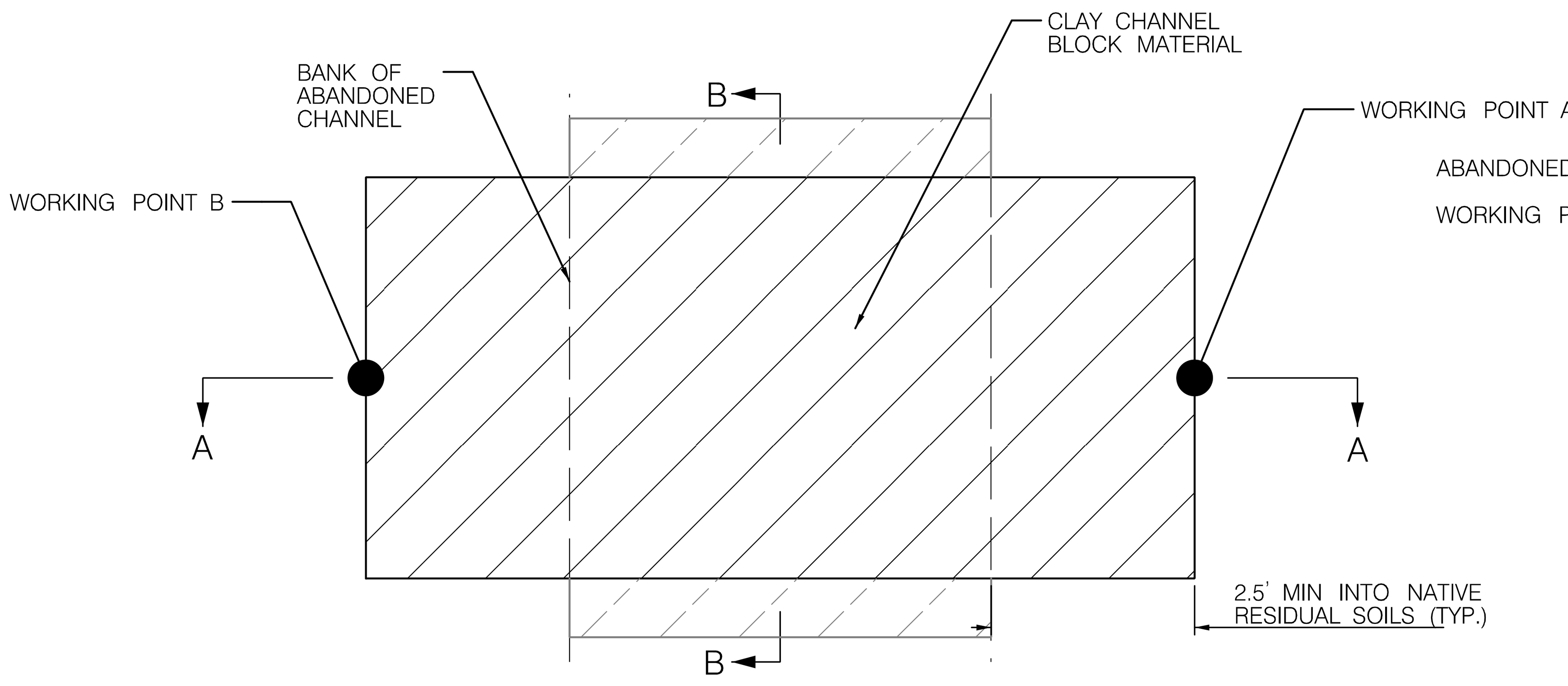
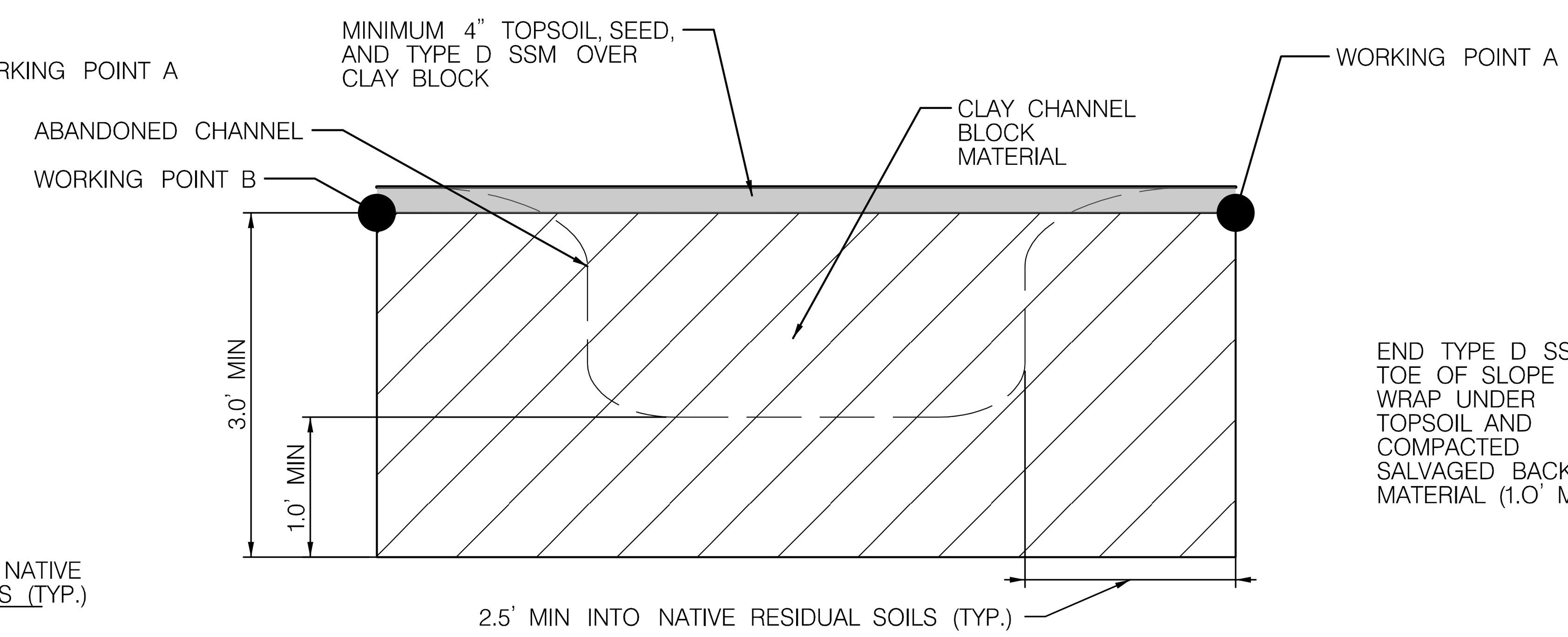
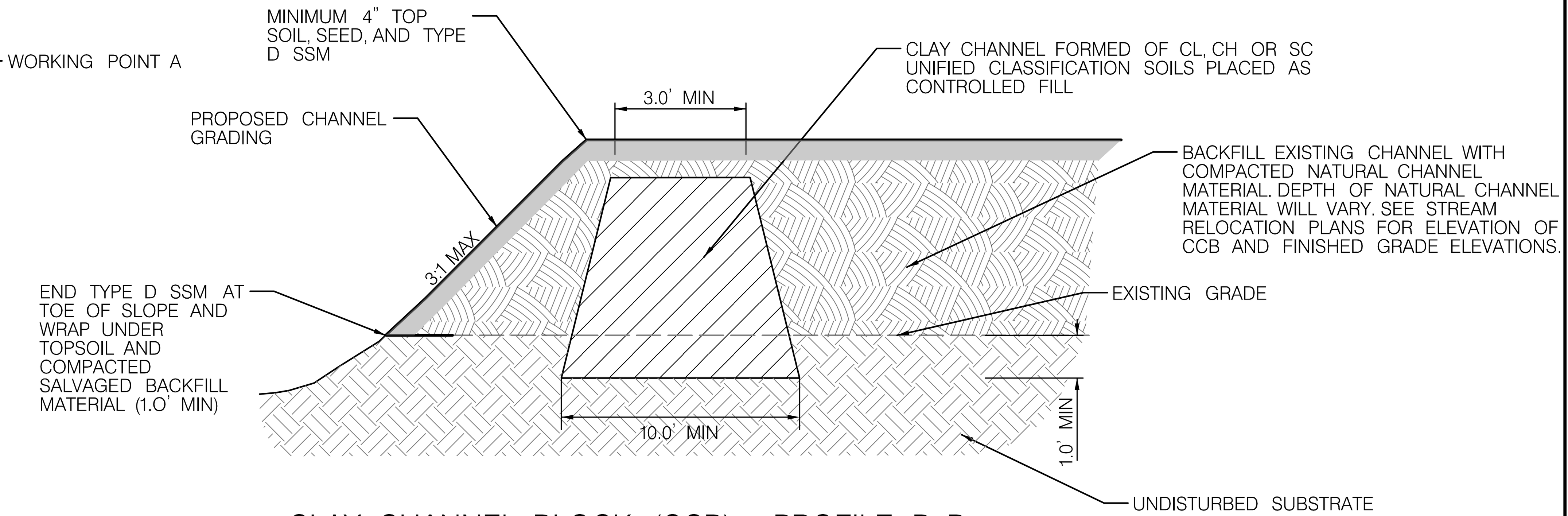


CLAY CHANNEL BLOCK (CCB) — PLAN VIEW
NOT TO SCALE

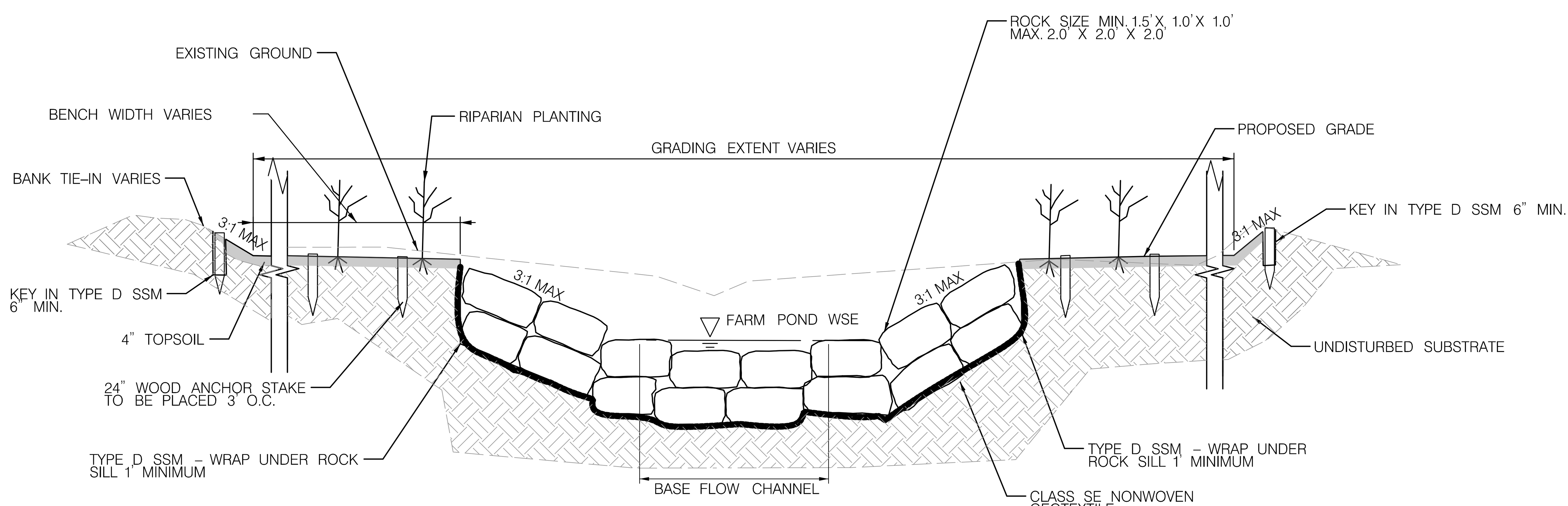


CLAY CHANNEL BLOCK (CCB) – CROSS SECTION A–A
NOT TO SCALE

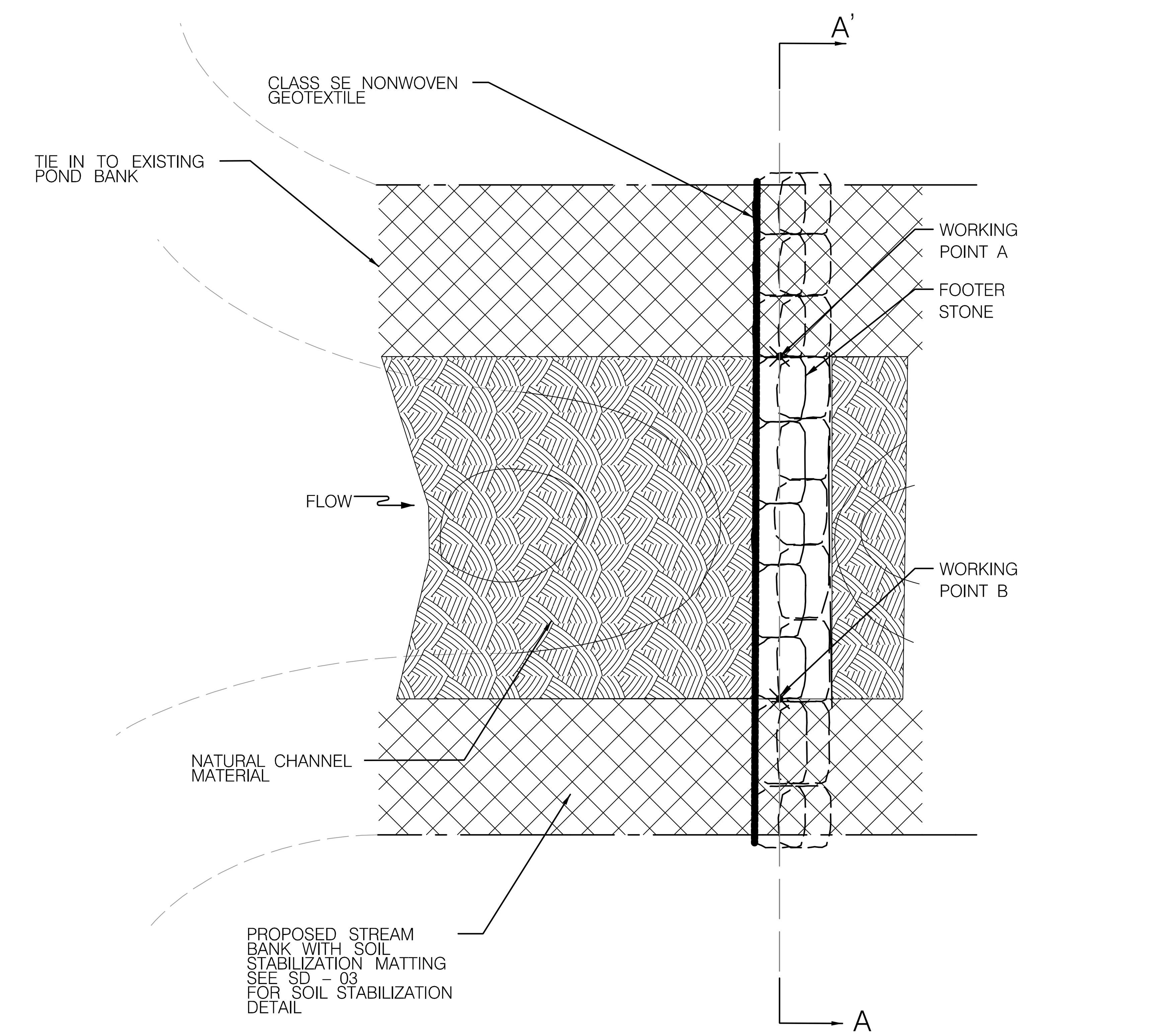


CLAY CHANNEL BLOCK (CCB) – PROFILE B–B
NOT TO SCALE

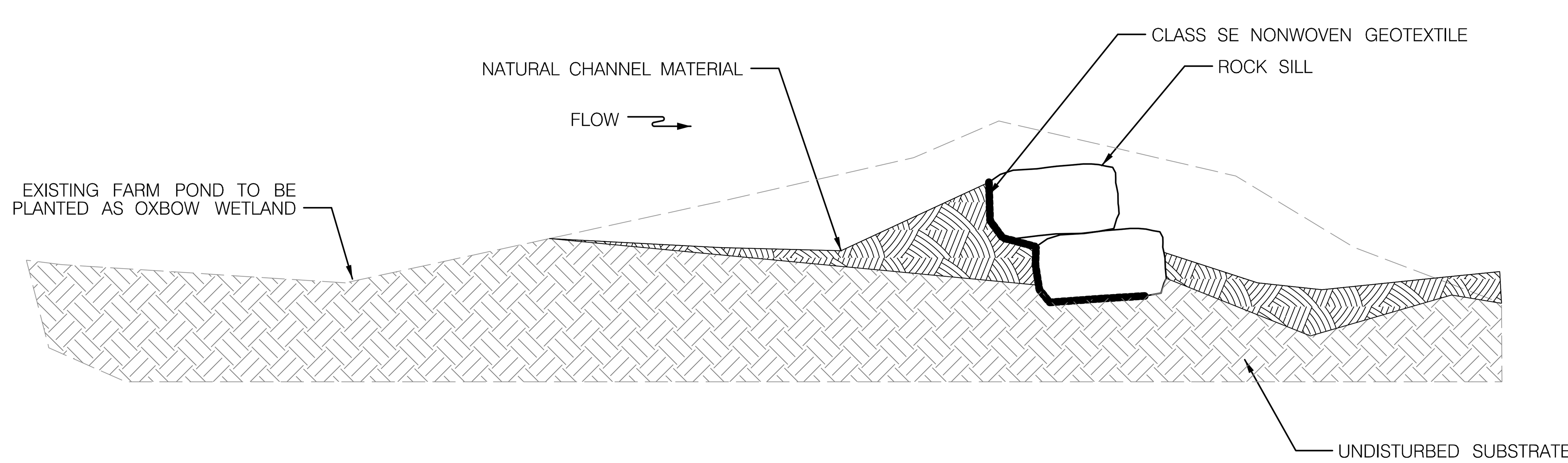
NOTES:
1. CLAY CHANNEL BLOCK IS DESIGNED TO PLUG ABANDONED SECTIONS OF EXISTING CHANNEL AT INTERSECTION WITH PROPOSED CHANNEL WHERE PROPOSED STREAM IS RE-ALIGNED TO ABANDON EXISTING CHANNEL.
2. PLACE SELECT CLAY MATERIAL IN 6-INCH LIFTS AND COMPACT WITH CONSTRUCTION EQUIPMENT SUCH AS EXCAVATOR BUCKET, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM COMPACTION AND MINIMUM PERMEABILITY.
3. PLACEMENT OF THE CLAY CHANNEL BLOCK MATERIAL SHALL BE APPROVED BY THE DESIGN ENGINEER OR QAD AT THE TIME OF CONSTRUCTION.
4. ONCE THE CLAY CHANNEL BLOCK IS INSTALLED TO THE SPECIFIED ELEVATION, USE SALVAGED NATURAL CHANNEL MATERIAL AND TOPSOIL TO BURY THE CLAY CHANNEL BLOCK AND MEET FINAL GRADE ELEVATIONS AS SHOWN IN THE STREAM PLANS.
5. PLACE A MINIMUM OF 4 INCHES OF TOPSOIL ON STREAM BANKS AND ON TOP OF BURIED CLAY CHANNEL BLOCK. TILL, INSTALL PLANTINGS ACCORDING TO THE LANDSCAPING PLANS (LD-01 – LD-06) AND INSTALL TYPE D SSM.
6. ALL MATTING SHALL OVERLAP IN A DOWN VALLEY OR DOWNSTREAM DIRECTION.



ROCK SILL (RS) – SECTION VIEW WITH BANK GRADING (A–A')
NOT TO SCALE



ROCK SILL (RS) – PLAN VIEW
NOT TO SCALE



ROCK SILL (RS) – PROFILE VIEW (SHOWN AT THALWEG)
NOT TO SCALE

NOTES:
1. SILL ROCKS SHALL BE INSTALLED OFFSET OF THE FOOTERS IN THE UPSTREAM DIRECTION (MAX. 6 INCHES).
2. THALWEG MAY BE MODIFIED IN FIELD PER THE STREAM ENGINEER OR QAD.
3. PLACE COMMON BORROW TO BACKFILL TO PROPOSED GRADES.
3. SEE CROSS SECTIONS AND PROFILES FOR PROPOSED GRADES.

COASTAL RESOURCES INC.

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
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REVISIONS

SEMI-FINAL REVIEW
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STREAM RESTORATION DETAILS

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	
CHECKED BY	KSK	HORIZONTAL SCALE	
MDE/PRD	16825120-PR-0040-01	VERTICAL SCALE	

DRAWING NO. SD-06 OF 09 SHEET NO. 27 OF 76

BY: caln –

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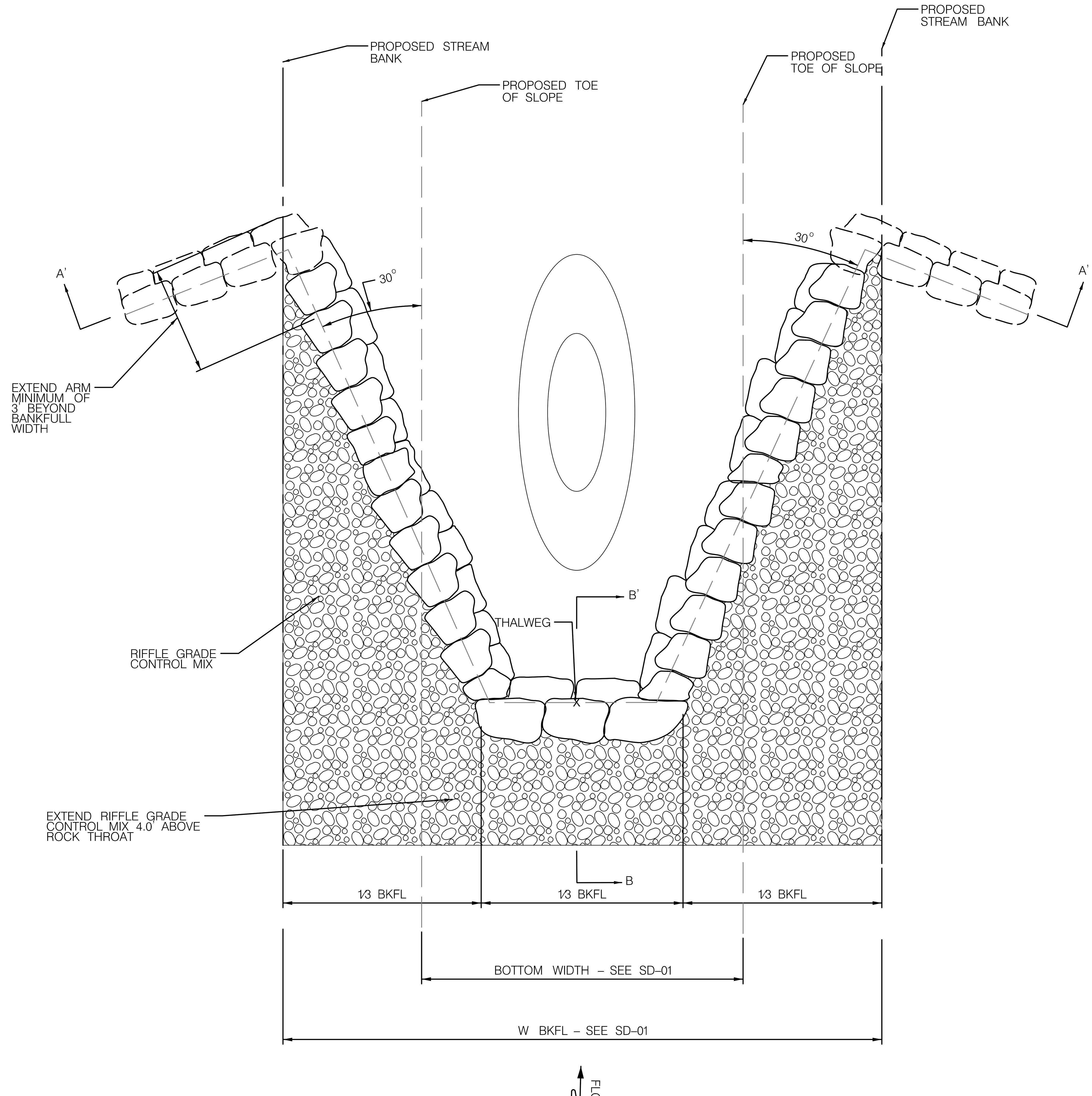
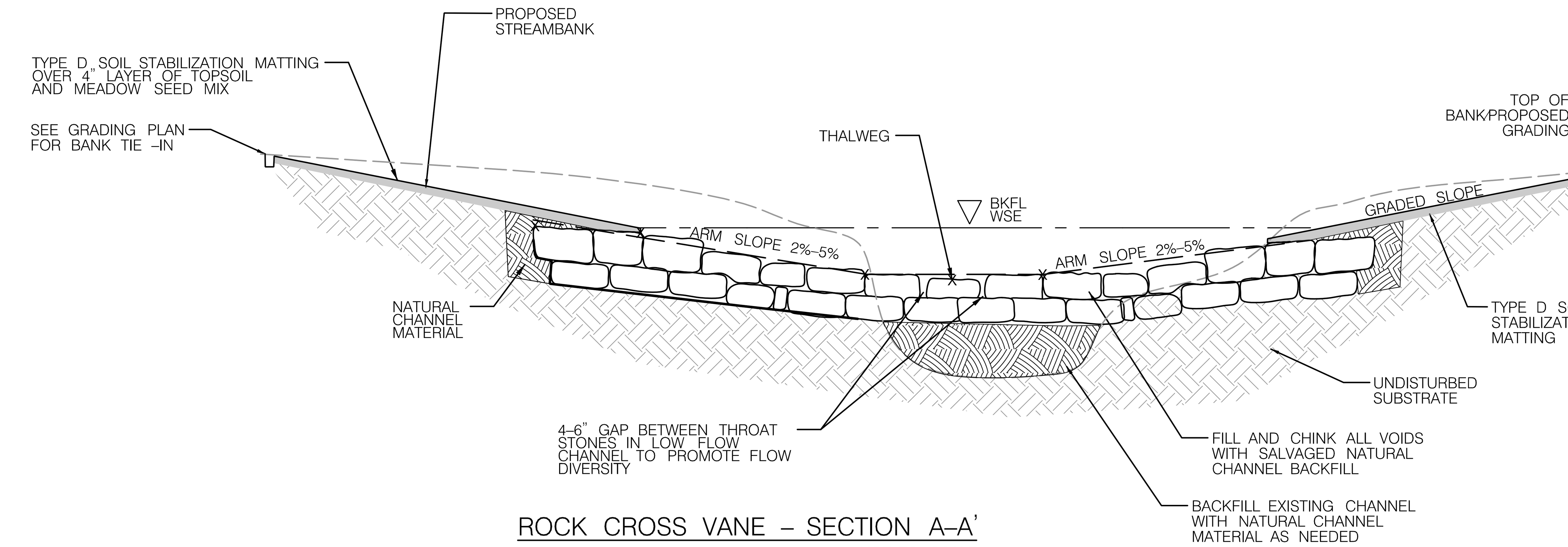


ROCK CROSS VANE – PLAN VIEW

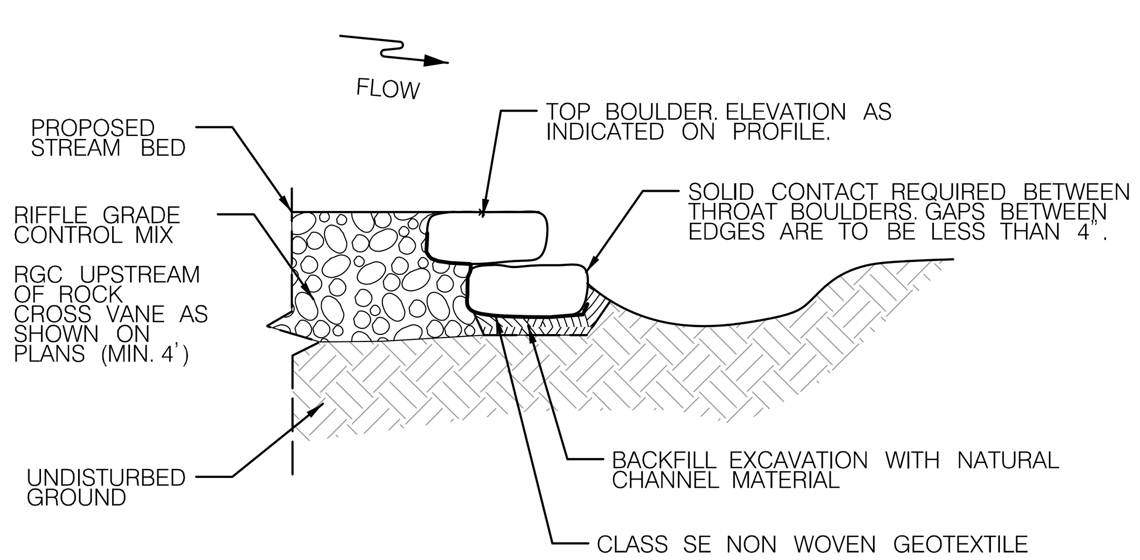
NOT TO SCALE



ROCK CROSS VANE – SECTION A–A'

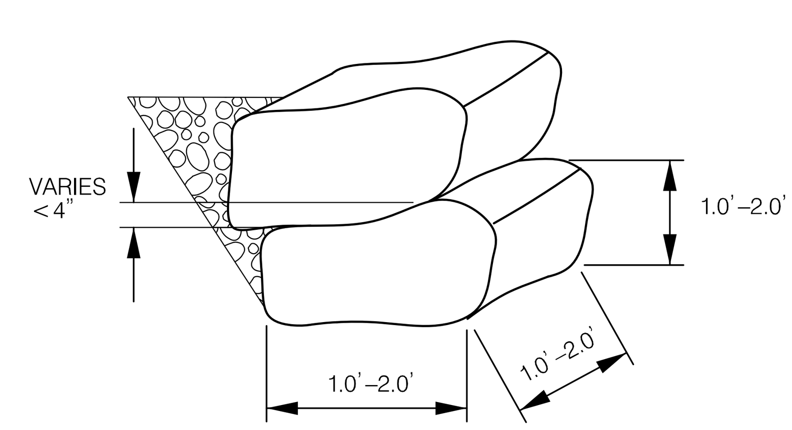
NOT TO SCALE

NOTES:
1. ROCK CROSS VANE SHALL BE PLACED UNDER DIRECT SUPERVISION OF THE ENGINEER. ALL ROCK ANGLES/SLOPES/ELEVATIONS SHOULD BE APPROVED BY ENGINEER.
2. ROCK CROSS VANE IS CONSTRUCTED USING IMBRICATED ROCKS OR APPROVED HAND PICKED CLASS II ROCK.
3. FOOTER ROCKS TRENCH SHOULD BE EXCAVATED AT A 30 DEGREE ANGLE FROM PARALLEL TO THE BANK. OVER-EXCAVATION OF THE FOOTER TRENCH SHOULD BE AVOIDED IF POSSIBLE.
4. SILL/ARM ROCKS SHOULD BE INSTALLED OFFSET OF THE FOOTERS IN THE UPSTREAM DIRECTION (MAX 6 INCHES).
5. BOTTOM ELEVATION OF THE FOOTERS SHOULD BE LOWER THAN THE ELEVATION OF THE DEEPEST POINT OF THE POOL IMMEDIATELY DOWNSTREAM OF THE STRUCTURE.
6. TACK GEOTEXTILE TO ENTIRE LENGTH OF UPSTREAM SIDE OF SILL ROCK AND LAY FLAT ON UPSTREAM EXCAVATED TRENCH.
7. THE ROCKS SHOULD BE RECTANGULAR, OR NEARLY SO, AT THE ROCK TO ROCK CONTACT.
8. THE ROCK TO ROCK CONTACT SHOULD BE UNIFORM AND STABLE.
9. IF ROCKS ARE NOT PERFECTLY FLAT, THE THICKER END SHOULD BE PLACED DOWNSTREAM.
10. ARM STONES SHALL ABUT FOR CLOSE CONTACT, GAPS BETWEEN IRREGULAR STONE EDGES SHALL BE NO GREATER THAN 2".
11. FOOTER STONES AT SILL SHALL ABUT FOR CLOSE CONTACT, GAPS BETWEEN IRREGULAR STONE EDGES SHALL BE NO GREATER THAN 2".
12. TOP STONES AT SILL SHALL HAVE BETWEEN 4" TO 6" GAPS BETWEEN STONES AT THE THROAT (CENTER 1/3 BKFL CHANNEL) OF ROCK CROSS VANE WITHIN THE LOW FLOW CHANNEL TO PROVIDE FLOW DIVERSITY.
13. PLACE GEOTEXTILE UNDER FOOTER ROCKS AND WRAP UP TO TOP UPSTREAM EDGE OF SILL AND ARM ROCKS.
14. PLACE RIFFLE GRADE CONTROL MIX OVER TOP OF GEOTEXTILE AND CONSTRUCT THE RIFFLE GRADE CONTROL STRUCTURE PER SD–01.
15. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED FROM ABANDONED CHANNEL IF AVAILABLE. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL.
16. COMMON BORROW PER SHA SPECIFICATION 916.01 MAY BE USED AS FILL MATERIAL OUTSIDE THE BANKFULL WIDTH AND/OR ABOVE THE BANKFULL ELEVATION.
17. SEE PLANS AND PROFILES FOR LIMITS OF PROPOSED MATERIALS.



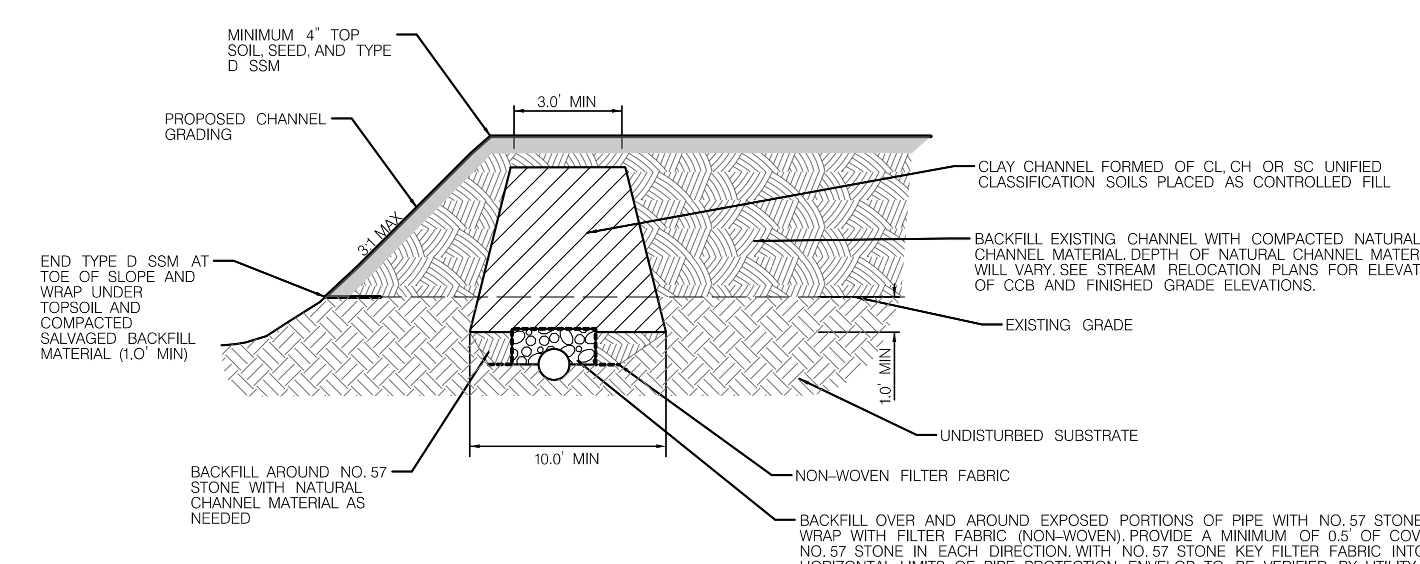
ROCK CROSS VANE – SECTION B–B'

NOT TO SCALE



TYPICAL BOULDERS AND PLACEMENT

NOT TO SCALE



CLAY CHANNEL BLOCK (CCB) OVER UTILITY PIPE– PROFILE B–B

NOT TO SCALE

NOTES:
1. APPLICABLE TO CCB–5 ONLY.
2. REMOVE ANY LOOSE OR UNSTABLE BED MATERIAL FROM AROUND THE EXPOSED PIPE. DO NOT DISTURB ANY COMPACTED BED MATERIAL, ENCASEMENT, OR BEDROCK THAT IS SUPPORTING THE PIPE. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE PIPE. THE LIMITS OF EXPOSED AREA WILL VARY IN ACCORDANCE WITH THE UTILITY OWNERS' DIRECTIVE. THE EXPOSED PIPE TO BE SUPPORTED AT ALL TIMES BY THE CONTRACTOR.
3. THE EXPOSED PIPE, AND A 0.5' (MIN) BUFFER IN EACH DIRECTION SHALL BE BACKFILLED WITH NO. 57 STONE. THE NO. 57 STONE SHALL EXTEND 0.5' (MIN) ABOVE THE CROWN OF THE EXPOSED PIPE AND FILL ALL VOIDS AND SUPPORT THE PIPE.
4. USE EXTREME CAUTION WHEN COMPACTING THE CLAY CHANNEL BLOCK MATERIAL OVER TOP OF THE EXPOSED PIPE.
5. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED FROM ABANDONED CHANNEL IF AVAILABLE. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL. FURNISHED NATURAL CHANNEL MATERIAL TO BE APPROVED BY THE ENGINEER OR QAD.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

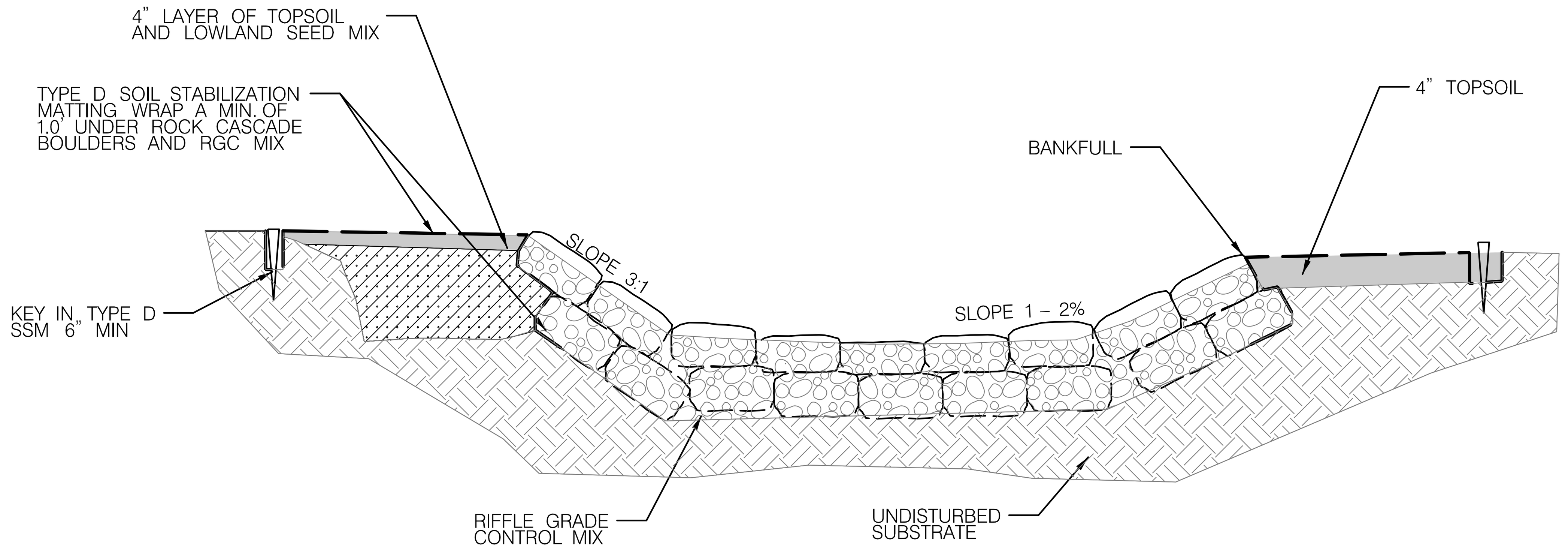
STREAM RESTORATION DETAILS

SCALE NTS	DATE DECEMBER 2021	CONTRACT NO. AW073B12	
DESIGNED BY SCN		COUNTY MONTGOMERY	
DRAWN BY CJN		LOGMILE	
CHECKED BY KSK		HORIZONTAL SCALE	
MDE/PRD 168251/20–PR–0040–01		VERTICAL SCALE	
DRAWING NO. SD-07 OF 09		SHEET NO. 28 OF 76	

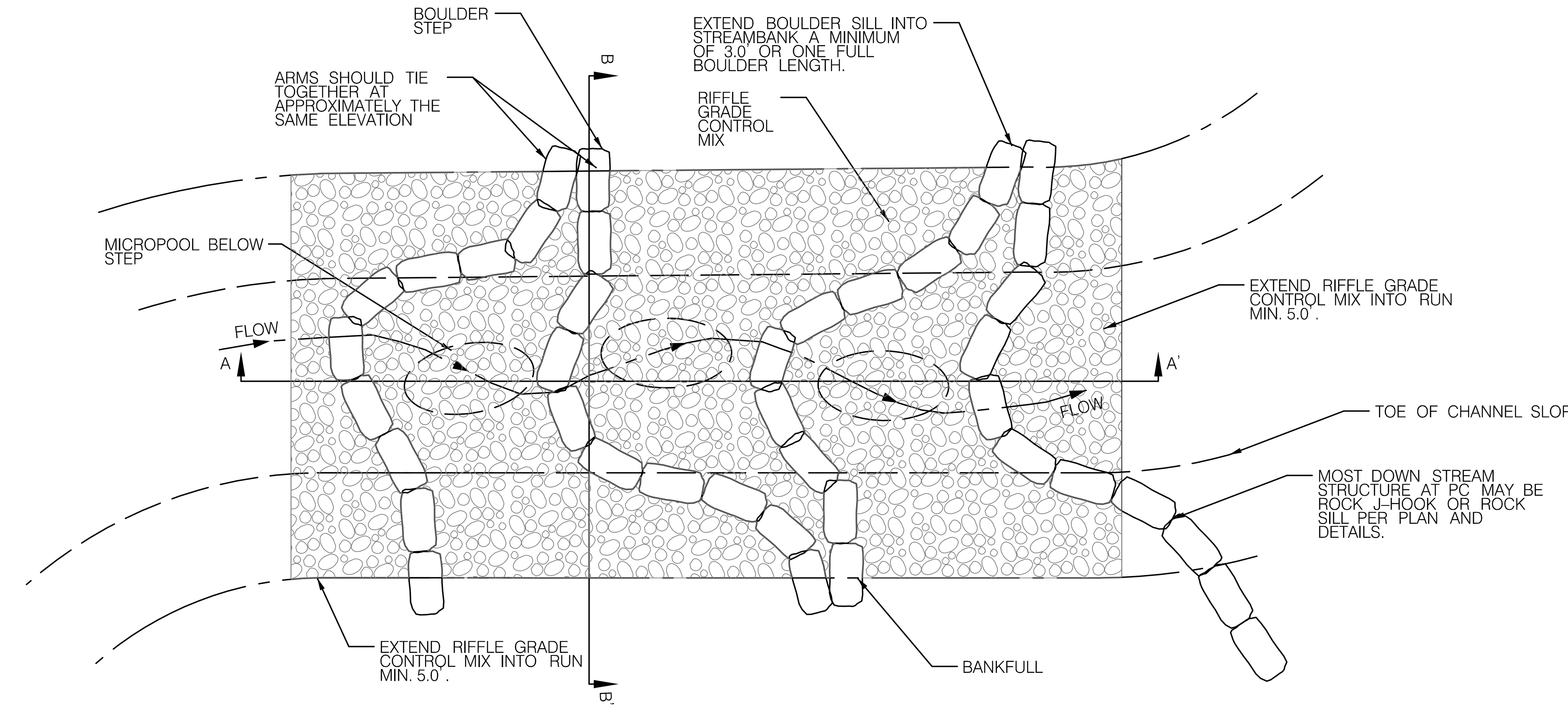
COASTAL RESOURCES INC.

BY: caln –

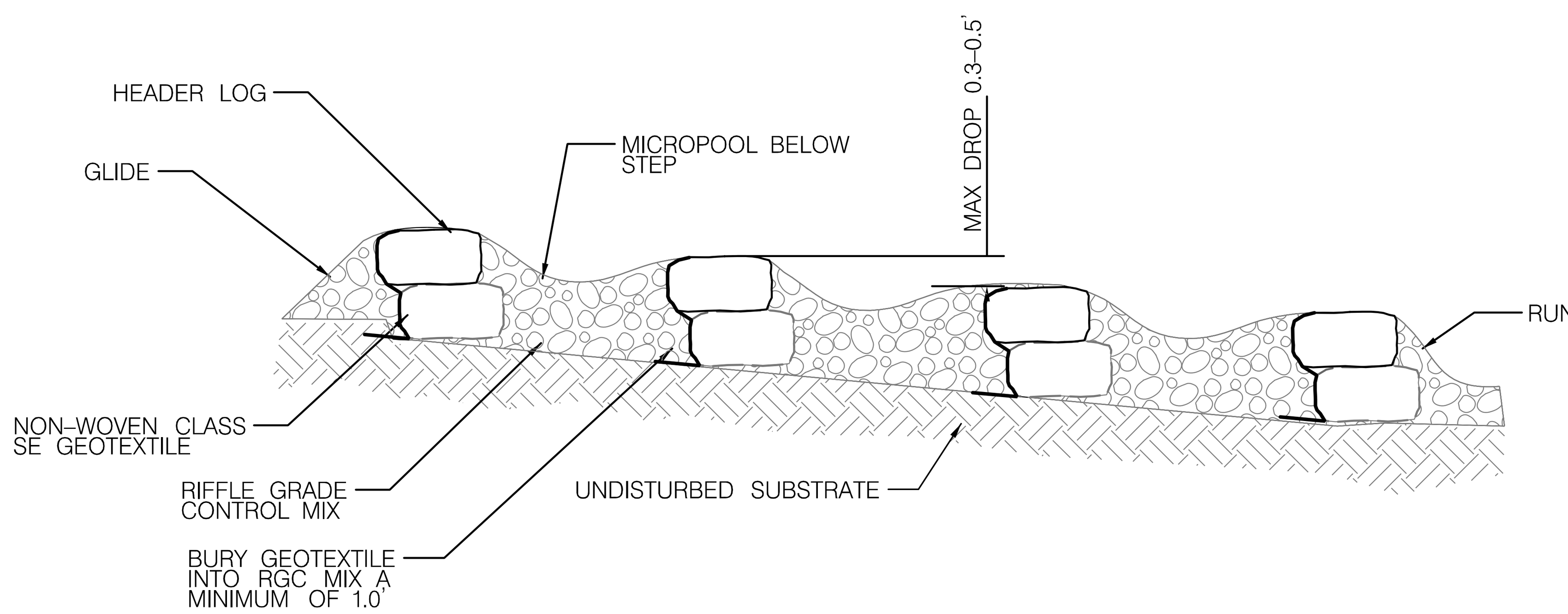
PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pSD-D007_CA-5.dgn



ROCK CASCADE (RC) – SECTION B – B'
NOT TO SCALE



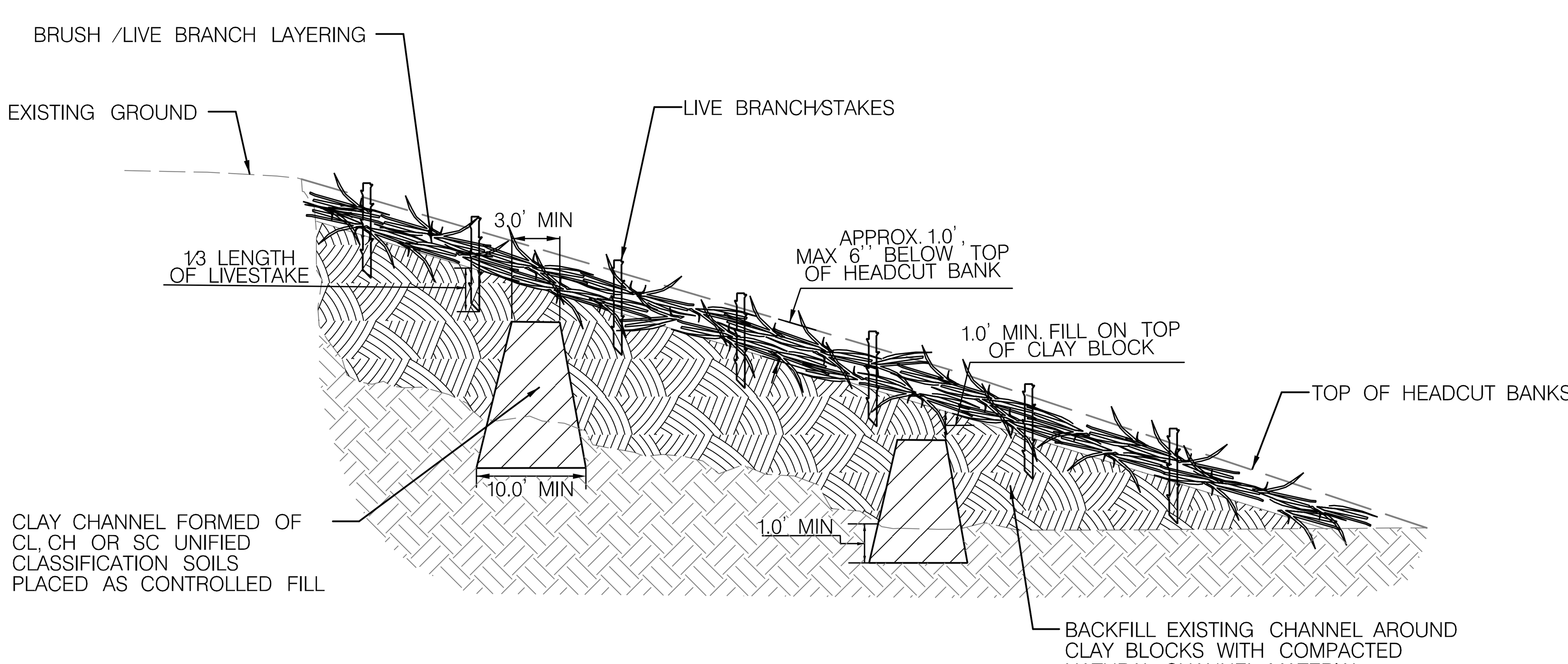
ROCK CASCADE (RC) – PLAN VIEW
NOT TO SCALE



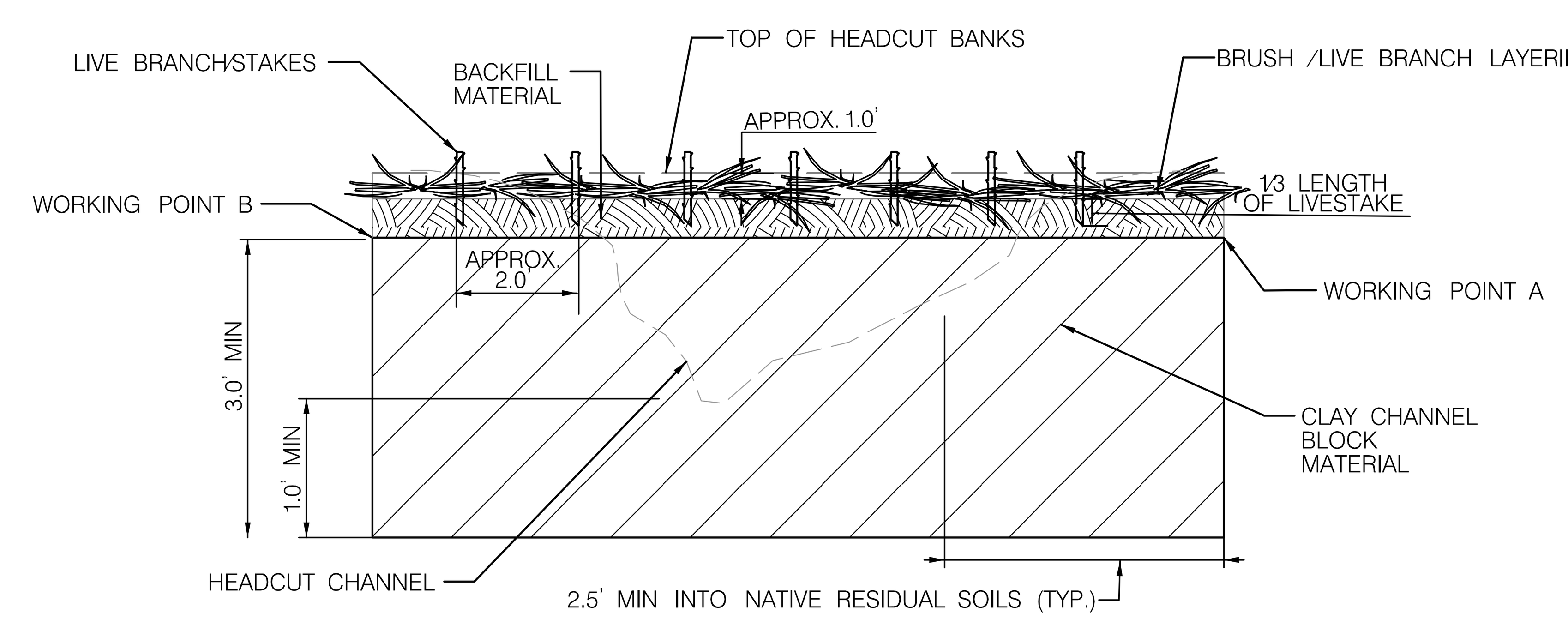
ROCK CASCADE (RC) – SECTION A – A'
NOT TO SCALE

NOTES:

1. ALL BOULDERS SHALL BE CUBICAL OR RECTANGULAR IN SHAPE. THE ENGINEER OR QAD MUST APPROVE THE USE OF ANY BOULDERS THAT MAY BE AVAILABLE ON SITE. BOULDER DIMENSIONS SHALL BE 3.0' X 2.0' X 2.5' (L X W X H). ±0.5'.
2. TOP BOULDERS SHALL BE UNDERLAIN BY FOOTER BOULDERS TO PROVIDE A SILL UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR QAD. TOP BOULDERS SHALL BE OFFSET SLIGHTLY DOWNSTREAM OF THE FOOTER BOULDERS.
3. SET STEP INVERTS AT ELEVATION SHOWN ON THE PLAN AND PROFILE SHEETS. NO ELEVATIONS OF THE ROCK CASCADES MAY VARY FROM THE PLAN SHEETS UNLESS APPROVED BY THE ENGINEER OR QAD.
4. BOULDER ARMS WILL EXTEND UP TO THE STREAMBANK AT A 1% – 2% SLOPE AND INTO THE STREAMBANK A MINIMUM OF 3.0' OR ONE FULL BOULDER LENGTH.
5. ON THE UPSTREAM SIDE OF THE BOULDERS, NON-WOVEN CLASS SE GEOTEXTILE FABRIC SHALL BE PLACED ON THE ENTIRE LENGTH OF THE STRUCTURE. GEOTEXTILE FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER BOULDER TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF THE STRUCTURE. RIFFLE GRADE CONTROL MIX SHALL BE USED AS BACKFILL MATERIAL AROUND THE BOULDERS AND MICROPOOLS SHALL BE ESTABLISHED BELOW EACH STEP.
6. RIFFLE GRADE CONTROL MIX SHOULD EXTEND A MINIMUM OF 5.0' UPSTREAM OF THE P.T. INTO THE GLIDE AND A MINIMUM 5.0' DOWNSTREAM OF THE P.C. INTO THE RUN.
7. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED FROM ABANDONED CHANNEL IF AVAILABLE. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL. FURNISHED NATURAL CHANNEL MATERIAL TO BE APPROVED BY THE ENGINEER OR QAD.
8. COMMON BORROW PER SHA SPECIFICATION 916.01 MAY BE USED AS FILL MATERIAL OUTSIDE THE BANKFULL WIDTH AND/OR ABOVE THE BANKFULL ELEVATION.
9. SEE PLANS AND PROFILES FOR LIMITS OF PROPOSED MATERIALS.



KNICKPOINT TREATMENT (KPT) – PROFILE VIEW
NOT TO SCALE



KNICKPOINT TREATMENT (KPT) – CROSS SECTION A–A
NOT TO SCALE

NOTES:
1. CLAY CHANNEL BLOCK IS DESIGNED TO PLUG ABANDONED HEADCUT OF THE EXISTING CHANNEL.
2. PLACE SELECT CLAY MATERIAL IN 6-INCH LIFTS AND COMPACT WITH CONSTRUCTION EQUIPMENT SUCH AS EXCAVATOR BUCKET, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM COMPACTION AND MINIMUM PERMEABILITY.
3. PLACEMENT OF THE CLAY CHANNEL BLOCK MATERIAL SHALL BE APPROVED BY THE DESIGN ENGINEER OR QAD AT THE TIME OF CONSTRUCTION.
4. USE EXTREME CAUTION WHEN COMPACTING THE CLAY CHANNEL BLOCK MATERIAL NEAR THE SEWER LINE OR MANHOLE.
5. ONCE THE CLAY CHANNEL BLOCK IS INSTALLED, USE SALVAGED NATURAL CHANNEL MATERIAL TO FILL AND BURY THE CLAY CHANNEL BLOCK.
6. PLACE A MINIMUM OF 1 FOOT OF BRUSH /LIVE BRANCH LAYERING ON TOP OF THE INSTALLED CLAY BLOCKS.
7. THE FINAL ELEVATION OF THE CLAY BLOCKS AND BRUSH /LIVE BRANCH LAYERING SHOULD FILL, MAX 6" BELOW, THE CHANNEL TO THE TOP OF THE HEADCUT BANKS.
8. PLACE LIVE BRANCH/STAKES PERPENDICULAR TO SLOPE, APPROXIMATELY 1/3 LENGTH OF CUTTING INTO NATURAL CHANNEL FILL MATERIAL.. LIVE CUTTING SHOULD BE .5–1.5" IN DIAMETER AND A MINIMUM OF 2' LONG, WITH A 30–45 DEGREE CUT AT THE BOTTOM END OF THE STAKE. THE CUTTINGS SHOULD BE INSTALLED EARLY SPRING TO LATE FALL AND KEPT WET. THE CUTTINGS SHOULD BE SPACED APPROXIMATELY 2 FEET APART WITHIN FILLED CHANNEL OR AT DISTANCE SPECIFIED BY THE ENGINEER OR QAD AT TIME OF CONSTRUCTION.
9. THE CLAY CHANNEL BLOCK PLACEMENT MAY BE ADJUSTED IN THE FIELD TO AVOID IMPACTING THE ADJACENT SEWER LINE/MANHOLE AT THE DIRECTION OF THE ENGINEER OR QAD.

COASTAL RESOURCES INC.

BY: caln –

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

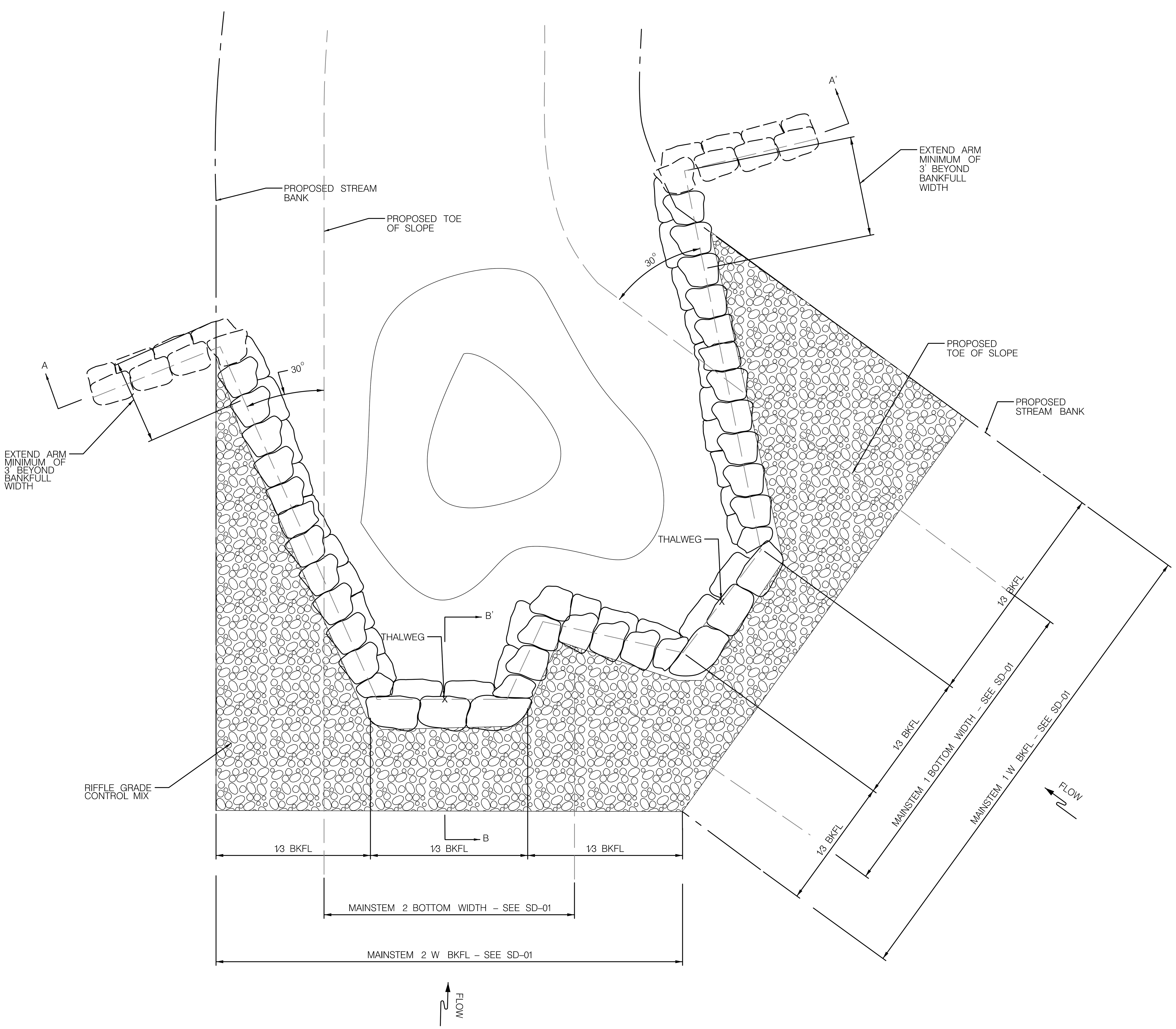
STREAM RESTORATION DETAILS

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN | COUNTY MONTGOMERY
DRAWN BY CJN | LOGMILE -
CHECKED BY KSK | HORIZONTAL SCALE -
MDE/PRD 16825120-PR-0040-01 | VERTICAL SCALE -

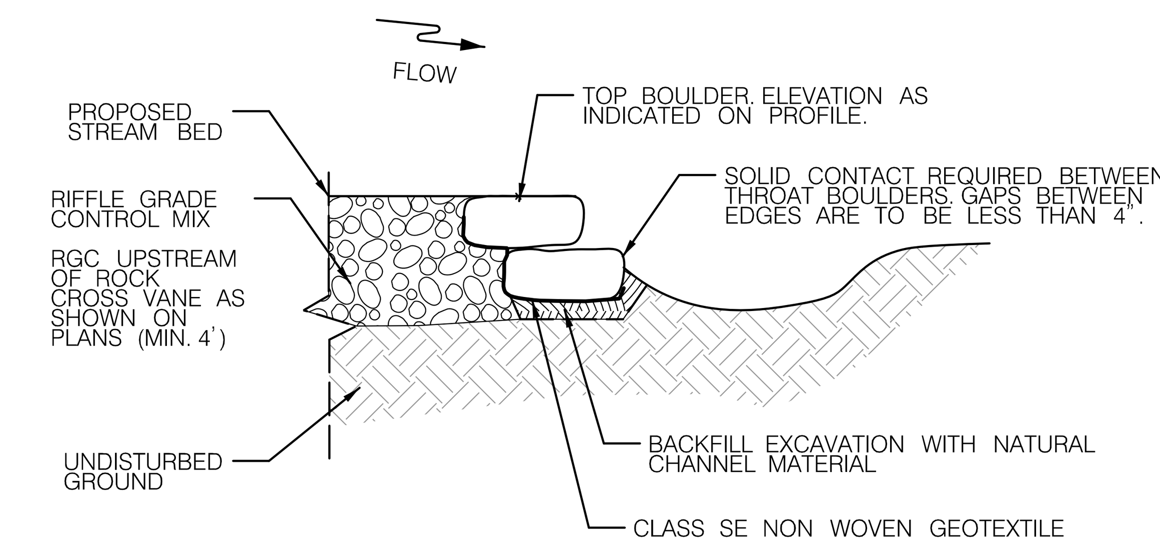
DRAWING NO. SD-08 OF 09 | SHEET NO. 29 OF 76

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pSD-D008_CA-5.dgn



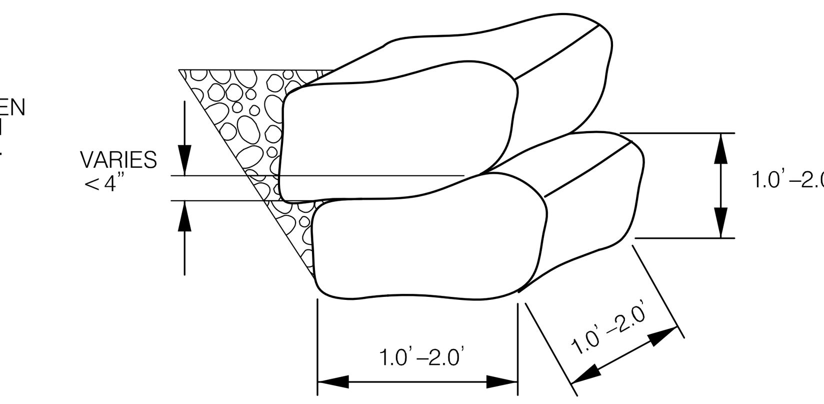
COMPOUND ROCK CROSS VANE – PLAN VIEW

NOT TO SCALE



COMPOUND ROCK CROSS VANE – SECTION B–B'

NOT TO SCALE



TYPICAL BOULDERS AND PLACEMENT

NOT TO SCALE

NOTES:

1. COMPOUND ROCK CROSS VANE SHALL BE PLACED UNDER DIRECT SUPERVISION OF THE ENGINEER OR QAD. ALL ROCK ANGLES/SLOPES/ELEVATIONS SHOULD BE APPROVED BY ENGINEER OR QAD.
2. COMPOUND ROCK CROSS VANE IS CONSTRUCTED USING IMBRICATED ROCKS OR APPROVED HAND PICKED CLASS II ROCK.
3. FOOTER ROCK TRENCH SHOULD BE EXCAVATED AT A 30 DEGREE ANGLE FROM PARALLEL TO THE BANK. OVER-EXCAVATION OF THE FOOTER TRENCH SHOULD BE AVOIDED IF POSSIBLE.
4. SILL/ARM ROCKS SHOULD BE INSTALLED OFFSET OF THE FOOTERS IN THE UPSTREAM DIRECTION (MAX 6 INCHES).
5. BOTTOM ELEVATION OF THE FOOTERS SHOULD BE LOWER THAN THE ELEVATION OF THE DEEPEST POINT OF THE POOL IMMEDIATELY DOWNSTREAM OF THE STRUCTURE.
6. TACK GEOTEXTILE TO ENTIRE LENGTH OF UPSTREAM SIDE OF SILL ROCK AND LAY FLAT ON UPSTREAM EXCAVATED TRENCH.
7. THE ROCKS SHOULD BE RECTANGULAR, OR NEARLY SO, AT THE ROCK TO ROCK CONTACT.
8. THE ROCK TO ROCK CONTACT SHOULD BE UNIFORM AND STABLE.
9. IF ROCKS ARE NOT PERFECTLY FLAT, THE THICKER END SHOULD BE PLACED DOWNSTREAM.
10. ARM STONES SHALL ABUT FOR CLOSE CONTACT, GAPS BETWEEN IRREGULAR STONE EDGES SHALL BE NO GREATER THAN 2".
11. FOOTER STONES AT SILL SHALL ABUT FOR CLOSE CONTACT, GAPS BETWEEN IRREGULAR STONE EDGES SHALL BE NO GREATER THAN 2".
12. TOP STONES AT SILL SHALL HAVE BETWEEN 4" TO 6" GAPS BETWEEN STONES AT THE THROAT (CENTER 1/3 BKFL CHANNEL) OF COMPOUND ROCK CROSS VANE WITHIN THE LOW FLOW CHANNEL TO PROVIDE FLOW DIVERSITY.
13. PLACE GEOTEXTILE UNDER FOOTER ROCKS AND WRAP UP TO TOP UPSTREAM EDGE OF SILL AND ARM ROCKS.
14. PLACE RIFFLE GRADE CONTROL MIX OVER TOP OF GEOTEXTILE AND CONSTRUCT THE RIFFLE GRADE CONTROL STRUCTURE PER SD-01.
15. USE SALVAGED NATURAL CHANNEL MATERIAL HARVESTED FROM ABANDONED CHANNEL IF AVAILABLE. IF SALVAGED NATURAL CHANNEL MATERIAL IS NOT AVAILABLE, USE FURNISHED NATURAL CHANNEL MATERIAL.
16. COMMON BORROW PER SHA SPECIFICATION 916.01 MAY BE USED AS FILL MATERIAL OUTSIDE THE BANKFULL WIDTH AND/OR ABOVE THE BANKFULL ELEVATION.
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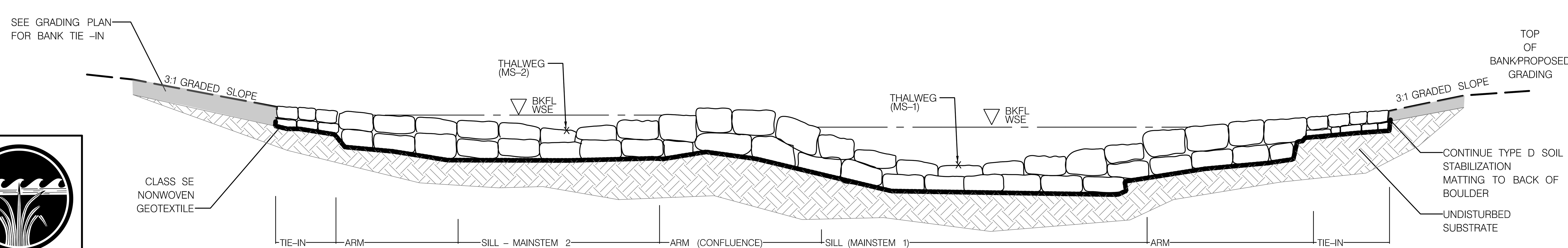

COMPOUND ROCK CROSS VANE – SECTION A–A' VIEW

NOT TO SCALE

COASTAL RESOURCES INC.

BY: caln –

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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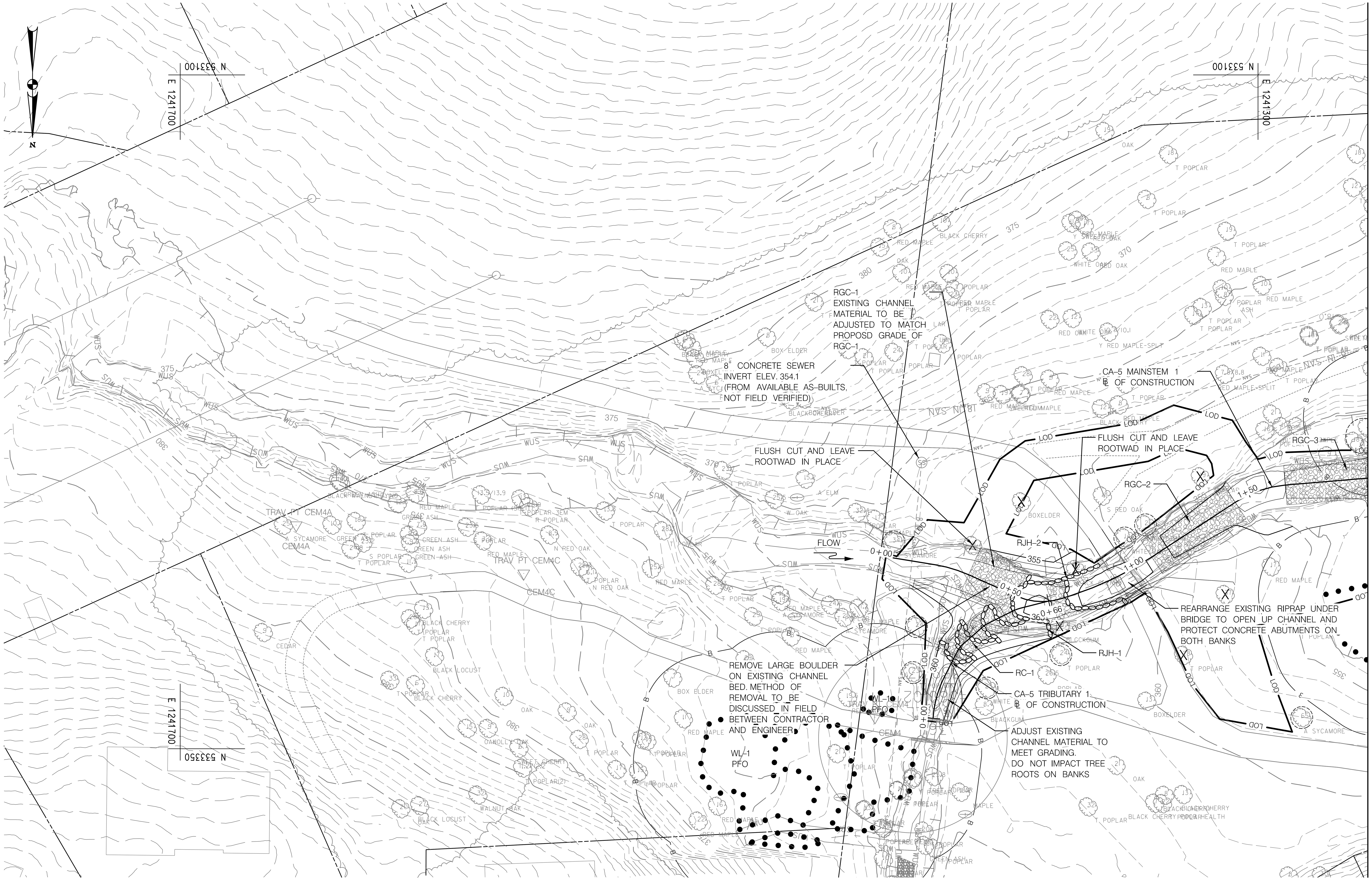
STREAM RESTORATION DETAILS

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN COUNTY MONTGOMERY
DRAWN BY CJN LOGMILE
CHECKED BY KSK HORIZONTAL SCALE
MDE/PRD 16825120-PR-0040-01 VERTICAL SCALE

DRAWING NO. SD-09 OF 09 SHEET NO. 30 OF 76



NOTE:
1. REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.
2. ALL TREES WITHIN THE LOD NOT MARKED FOR REMOVAL WILL RECEIVE TREE PROTECTION FENCE (TPF) AND TREE PLANKING (TP). CLUSTERS OF TREES MAY RECEIVE TPF AND TP AROUND THE CLUSTER INSTEAD OF EACH INDIVIDUAL TREE.
3. INSTALL TPF AND TP BY HAND ON ALL TREES MARKED ON PLAN.
4. WHERE POSSIBLE, FLUSH CUT TREES DESIGNATED FOR REMOVAL AND LEAVE ROOTBALL IN PLACE. M-NCPPC MAY PROVIDE FEEDBACK ON WHERE FLUSH CUTTING OR REMOVAL IS APPROPRIATE PRIOR TO CONSTRUCTION.

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

DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

ROCK CASCADE (RC)

RC #	RIFFLE- START			RIFFLE - END			QTY (CY)	STREAM
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)		
RC-1	5+90.70	359.19	7.35 LT. / 7.35 RT.	6+50.99	357.01	7.35 LT. / 7.35 RT.	13	TRIB 1

ROCK J-HOOK (RJH)

RJH #	THALWEG STA.	ELEV. (FT)	STREAM
RJH-1	0+53.00	355.97	MS 1
RJH-2	0+74.00	355.52	MS 1

RIFFLE GRADE CONTROL (RGC)

RGC #	RIFFLE- START			RIFFLE - END			STREAM
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	
RGC-1	0+33.52	356.72	7.35 LT. / 7.35 RT.	0+53.00	355.97	7.35 LT. / 7.35 RT.	MS 1
RGC-2	1+07.11	355.22	7.35 LT. / 7.35 RT.	1+44.14	354.00	7.35 LT. / 7.35 RT.	MS 1
RGC-3	1+64.00	354.00	7.35 LT. / 7.35 RT.	2+01.50	352.77	7.35 LT. / 7.35 RT.	MS 1

LEGEND

- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
- TPF — TREE PROTECTION FENCE
- OXBOW WETLAND
- TOE LOG
- RIFFLE GRADE CONTROL MIX
- CLAY CHANNEL BLOCK
- STONE TOE
- ROCK J-HOOK
- ROCK SILL
- ROCK CASCADE
- LOG ROLLER

COASTAL RESOURCES INC.

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CA-5 STREAM RESTORATION PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. SR-01 OF 09

BY: caln -

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LOG ROLLER (LR)

LR #	RIFFLE- START			RIFFLE - END			STREAM
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	STREAM
LR-1	5+32.00	345.51	7.35 LT. / 7.35 RT.	5+51.00	344.85	7.35 LT. / 7.35 RT.	MS 1
LR-2	5+66.69	344.65	7.35 LT. / 7.35 RT.	5+84.02	343.99	7.35 LT. / 7.35 RT.	MS 1
LR-3	7+32.17	340.06	7.35 LT. / 7.35 RT.	7+53.29	339.26	7.35 LT. / 7.35 RT.	MS 1

ROCK CASCADE (RC)

RC #	RIFFLE- START			RIFFLE - END			STREAM
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	
RC-2 WITH PIPE PROTECTION	4+60.16	347.33	7.35 LT. / 7.35 RT.	4+81.73	346.61	7.35 LT. / 7.35 RT.	MS 1
RC-3	4+96.54	346.41	7.35 LT. / 7.35 RT.	5+17.38	345.71	7.35 LT. / 7.35 RT.	MS 1
RC-4	6+02.89	343.79	7.35 LT. / 7.35 RT.	6+21.81	343.07	7.35 LT. / 7.35 RT.	MS 1
RC-5	6+39.10	342.77	7.35 LT. / 7.35 RT.	6+67.52	341.68	7.35 LT. / 7.35 RT.	MS 1
RC-6	6+86.10	341.38	7.35 LT. / 7.35 RT.	7+14.56	340.27	7.35 LT. / 7.35 RT.	MS 1

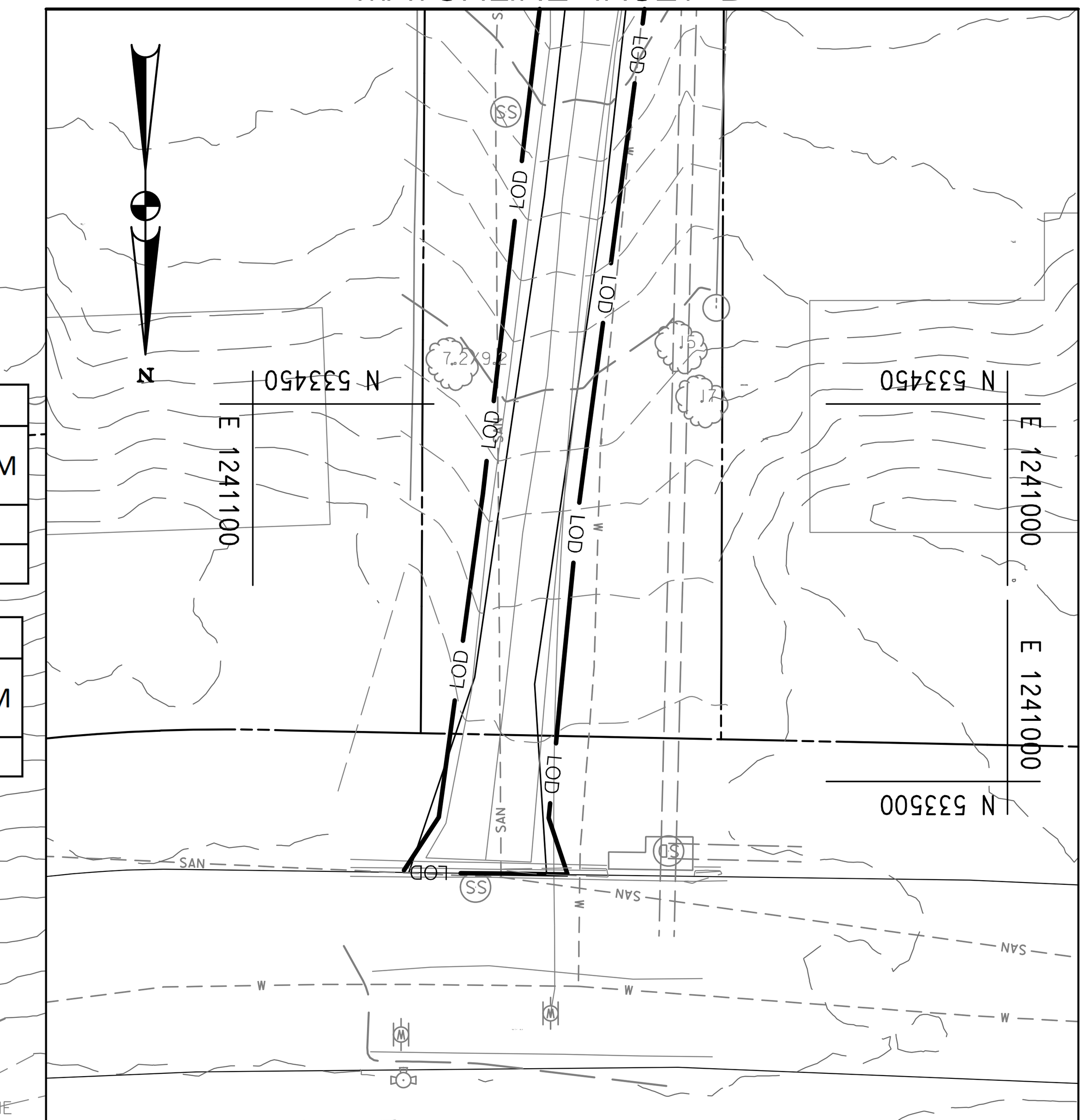
CLAY CHANNEL BLOCK (CCB)

CCB #	WORKING POINT A			WORKING POINT B			WIDTH (FT)	QTY (CY)	STREAM
	STA.	OFFSET (FT.)	TOP ELEV.	STA.	OFFSET (FT.)	TOP ELEV.			
CCB-1	2+14.51	12.35 RT.	351.00	2+65.15	12.35 RT.	351.00	10	45	MS 1
CCB-2	3+45.64	15.35 LT.	349.00	3+71.15	15.35 LT.	348.00	10	37	MS 1

KNICKPOINT TREATMENT (KPT)

KPT CCB #	WORKING POINT A			WORKING POINT B			WIDTH (FT)	QTY (CY)	STREAM
	STA.	OFFSET (FT.)	TOP ELEV.	STA.	OFFSET (FT.)	TOP ELEV.			
KPT 1 (CCB-1)	3+50.25	9.15 RT.	349.00	3+56.72	14.08 RT.	349.00	3	6	MS 1

MATCHLINE INSET B



CLASS I RIPRAP FOR SLOPE AND CHANNEL PROTECTION

41 SY

ROCK J-HOOK (RJH)

RJH #	THALWEG STA.	ELEV. (FT)	STREAM
RJH-3	2+01.00	352.77	MS 1
RJH-4	2+98.00	350.54	MS 1
RJH-5	4+82.00	346.61	MS 1
RJH-6	5+17.00	345.71	MS 1
RJH-7	5+51.00	344.85	MS 1
RJH-8	5+84.00	343.99	MS 1
RJH-9	6+22.00	343.07	MS 1
RJH-10	6+68.00	341.68	MS 1
RJH-11	7+15.00	340.27	MS 1

REMOVAL OF EXISTING PIPE

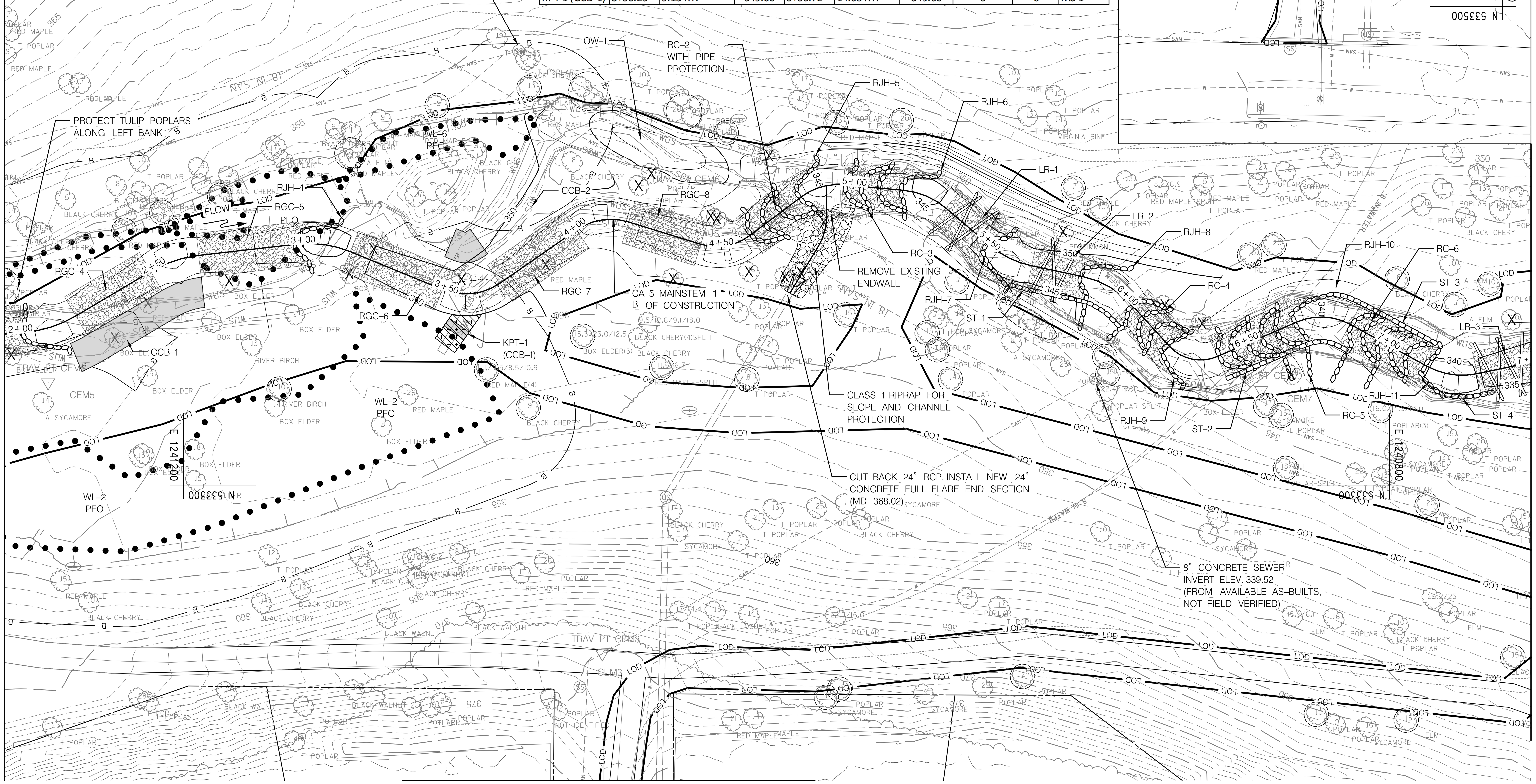
32 LF

24 INCH STANDARD CONCRETE END SECTION

1 EA

STONE TOE (ST)

ST #	START		END		QTY (LF)	STREAM
	STA.	OFFSET (FT)	STA.	OFFSET (FT)		
ST-1	5+61.48	7.35 RT.	602.48	7.35 RT.	41	MS-1
ST-2	6+39.00	7.35 RT.	6+83.00	7.35 RT.	44	MS-1
ST-3	6+79.14	7.35 LT.	7+14.88	7.35 LT.	38	MS-1
ST-4	723.06	7.35 RT.	7+40.06	7.35 RT.	17	MS-1



NOTE:
1. REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.
2. ALL TREES WITHIN THE LOD NOT MARKED FOR REMOVAL WILL RECEIVE TREE PROTECTION FENCE (TPF) AND TREE PLANKING (TP). CLUSTERS OF TREES MAY RECEIVE TPF AND TP AROUND THE CLUSTER INSTEAD OF EACH INDIVIDUAL TREE.
3. INSTALL TPF AND TP BY HAND ON ALL TREES MARKED ON PLAN.
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SCALE: 1" = 20'

DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
- TPF — TREE PROTECTION FENCE
- OXBOW WETLAND
- TOE LOG
- RIFFLE GRADE CONTROL MIX
- CLAY CHANNEL BLOCK
- STONE TOE
- ROCK J-HOOK
- ROCK SILL
- ROCK CASCADE
- LOG ROLLER

RIFFLE GRADE CONTROL (RGC)

RGC #	RIFFLE- START			RIFFLE - END			STREAM
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	
RGC-4	2+19.36	352.57	7.35 LT. / 7.35 RT.	2+48.25	351.62	7.35 LT. / 7.35 RT.	MS 1
RGC-5	2+65.15	351.62	7.35 LT. / 7.35 RT.	2+97.88	350.54	7.35 LT. / 7.35 RT.	MS 1
RGC-6	3+15.98	350.24	7.35 LT. / 7.35 RT.	3+49.08	349.15	7.35 LT. / 7.35 RT.	MS 1
RGC-7	3+69.03	349.15	7.35 LT. / 7.35 RT.	3+99.89	348.13	7.35 LT. / 7.35 RT.	MS 1
RGC-8	4+18.03	348.13	7.35 LT. / 7.35 RT.	4+43.08	347.33	7.35 LT. / 7.35 RT.	MS 1

COASTAL RESOURCES INC.

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN- NOT FOR CONSTRUCTION

CA-5 STREAM RESTORATION PLAN

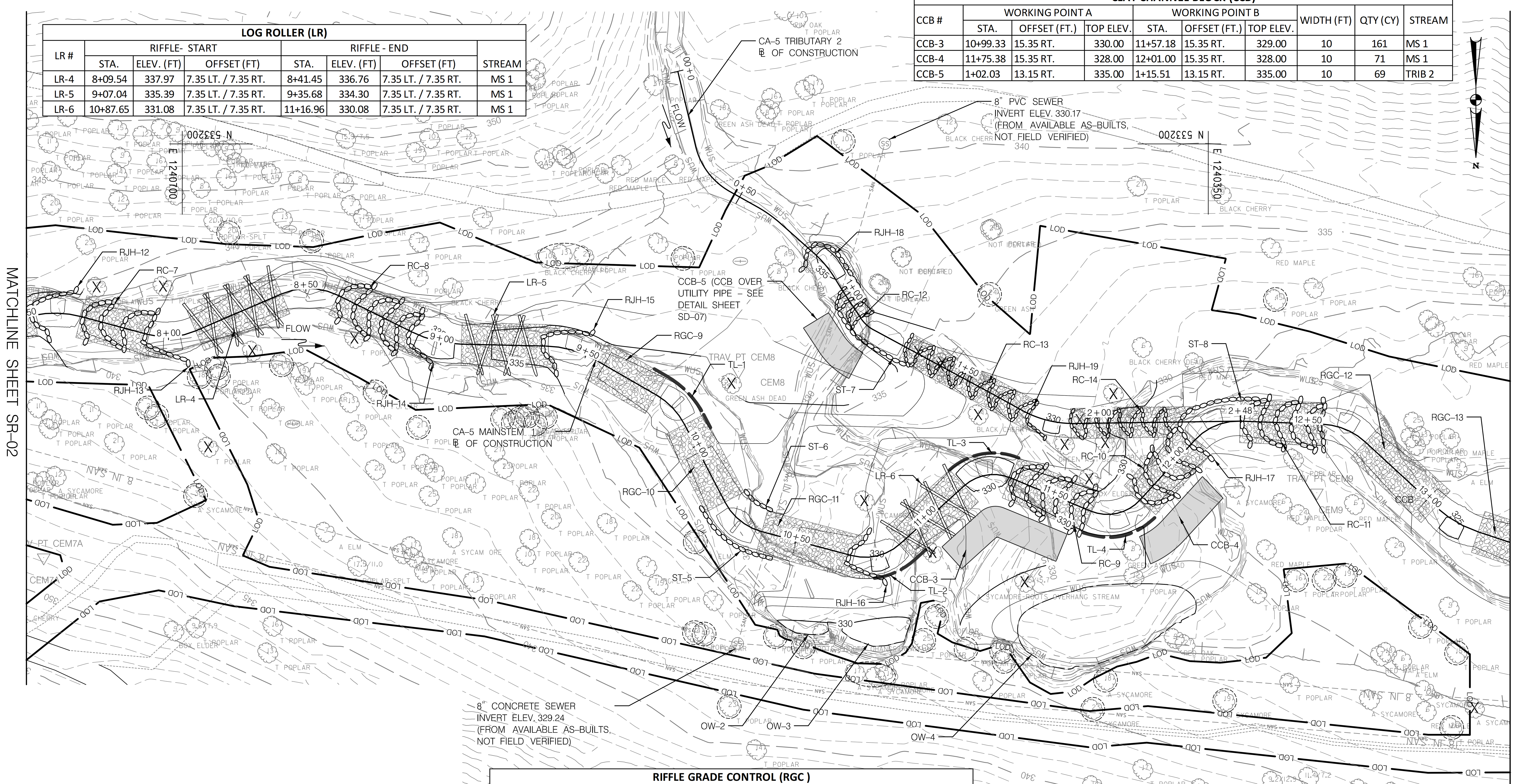
SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN — COUNTY MONTGOMERY
DRAWN BY CJN — LOGMILE -
CHECKED BY KSK — HORIZONTAL SCALE -
MDE/PRD 1682512O-PR-0040-01 — VERTICAL SCALE -

DRAWING NO. SR-02 OF 09 — SHEET NO. 32 OF 76

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pSR-P002_CA5.dgn



LOG ROLLER (LR)

LR #	RIFFLE- START			RIFFLE - END			STREAM
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	
LR-4	8+09.54	337.97	7.35 LT. / 7.35 RT.	8+41.45	336.76	7.35 LT. / 7.35 RT.	MS 1
LR-5	9+07.04	335.39	7.35 LT. / 7.35 RT.	9+35.68	334.30	7.35 LT. / 7.35 RT.	MS 1
LR-6	10+87.65	331.08	7.35 LT. / 7.35 RT.	11+16.96	330.08	7.35 LT. / 7.35 RT.	MS 1

CLAY CHANNEL BLOCK (CCB)

CCB #	WORKING POINT A			WORKING POINT B			WIDTH (FT)	QTY (CY)	STREAM
	STA.	OFFSET (FT.)	TOP ELEV.	STA.	OFFSET (FT.)	TOP ELEV.			
CCB-3	10+99.33	15.35 RT.	330.00	11+57.18	15.35 RT.	329.00	10	161	MS 1
CCB-4	11+75.38	15.35 RT.	328.00	12+01.00	15.35 RT.	328.00	10	71	MS 1
CCB-5	1+02.03	13.15 RT.	335.00	1+15.51	13.15 RT.	335.00	10	69	TRIB 2

STONE TOE (ST)

ST #	START		END		QTY	STREAM
	STA.	OFFSET (FT)	STA.	OFFSET (FT)	(LF)	
ST-5	10+18.95	7.35 RT.	10+43.92	7.35 RT.	31	MS-1
ST-6	10+20.86	7.35 LT.	10+35.86	7.35 LT.	15	MS-1
ST-7	1+02.87	5.15 RT.	1+29.87	5.15 RT.	27	TRIB 2
ST-8	12+15.45	7.35 LT.	12+38.45	7.35 LT.	23	MS-1

ROCK J-HOOK (RJH)

RJH #	THALWEG STA.	ELEV. (FT)	STREAM
RJH-12	7+53.00	339.26	MS 1
RJH-13	7+93.00	338.17	MS 1
RJH-14	8+90.00	335.69	MS 1
RJH-15	9+36.00	334.30	MS 1
RJH-16	10+70.00	331.38	MS 1
RJH-17	12+09.57	328.07	MS 1
RJH-18	0+79.29	335.93	TRIB 2
RJH-19	1+75.27	331.17	TRIB 2

RIFFLE GRADE CONTROL (RGC)

RGC #	RIFFLE- START			RIFFLE - END			STREAM
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	
RGC-9	9+54.00	334.10	7.35 LT. / 7.35 RT.	9+77.00	333.34	7.35 LT. / 7.35 RT.	MS 1
RGC-10	9+92.00	333.34	7.35 LT. / 7.35 RT.	10+21.50	332.39	7.35 LT. / 7.35 RT.	MS 1
RGC-11	10+38.11	332.39	7.35 LT. / 7.35 RT.	10+69.72	331.38	7.35 LT. / 7.35 RT.	MS 1
RGC-12	12+71.10	326.92	7.35 LT. / 7.35 RT.	13+03.77	325.88	7.35 LT. / 7.35 RT.	MS 1
RGC-13	13+20.72	325.88	7.35 LT. / 7.35 RT.	13+50.38	324.93	7.35 LT. / 7.35 RT.	MS 1

ROCK CASCADE (RC)

RC #	RIFFLE- START			RIFFLE - END			STREAM
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	
RC-7	7+69.38	339.06	7.35 LT. / 7.35 RT.	7+92.81	338.17	7.35 LT. / 7.35 RT.	MS 1
RC-8	8+61.39	336.76	7.35 LT. / 7.35 RT.	8+89.52	335.69	7.35 LT. / 7.35 RT.	MS 1
RC-9	11+33.89	330.08	11.25 LT. / 11.25 RT.	11+63.50	329.04	11.25 LT. / 11.25 RT.	MS 1
RC-10	11+81.84	329.04	11.25 LT. / 11.25 RT.	12+09.57	328.07	11.25 LT. / 11.25 RT.	MS 1
RC-11	12+26.91	327.97	11.25 LT. / 11.25 RT.	12+54.84	327.02	11.25 LT. / 11.25 RT.	MS 1
RC-12	0+97.94	334.40	11.25 LT. / 11.25 RT.	1+09.39	334.59	11.25 LT. / 11.25 RT.	TRIB 2
RC-13	1+27.66	334.09	11.25 LT. / 11.25 RT.	1+75.27	331.07	11.25 LT. / 11.25 RT.	TRIB 2
RC-14	1+90.39	330.67	11.25 LT. / 11.25 RT.	2+27.57	328.21	11.25 LT. / 11.25 RT.	TRIB 2

TOE LOG (TL)

TL #	WORKING POINT A			WORKING POINT B			LENGTH (FT)	STREAM
	STA.	MIN OFFSET (FT)	TOP ELEV. (FT)	STA.	MIN. OFFSET (FT)	TOP ELEV. (FT)		
TL-1	9+72.49	2.00 LT	333.40	9+96.67	2.00 LT	333.40	43.3	MS 1
TL-2	10+76.11	2.00 RT	331.20	10+92.66	2.00 RT	331.20	40.6	MS 1
TL-3	11+26.31	2.00 LT	330.20	11+33.90	2.00 LT	330.20	26.5	MS 1
TL-4	11+63.50	2.00 RT	329.04	11+81.73	2.00 RT	329.04	27.3	MS 1

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

DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

LEGEND
- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
- TPF — TREE PROTECTION FENCE
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- LOG ROLLER

COASTAL RESOURCES INC.

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN- NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE -
HORIZONTAL SCALE -
VERTICAL SCALE -

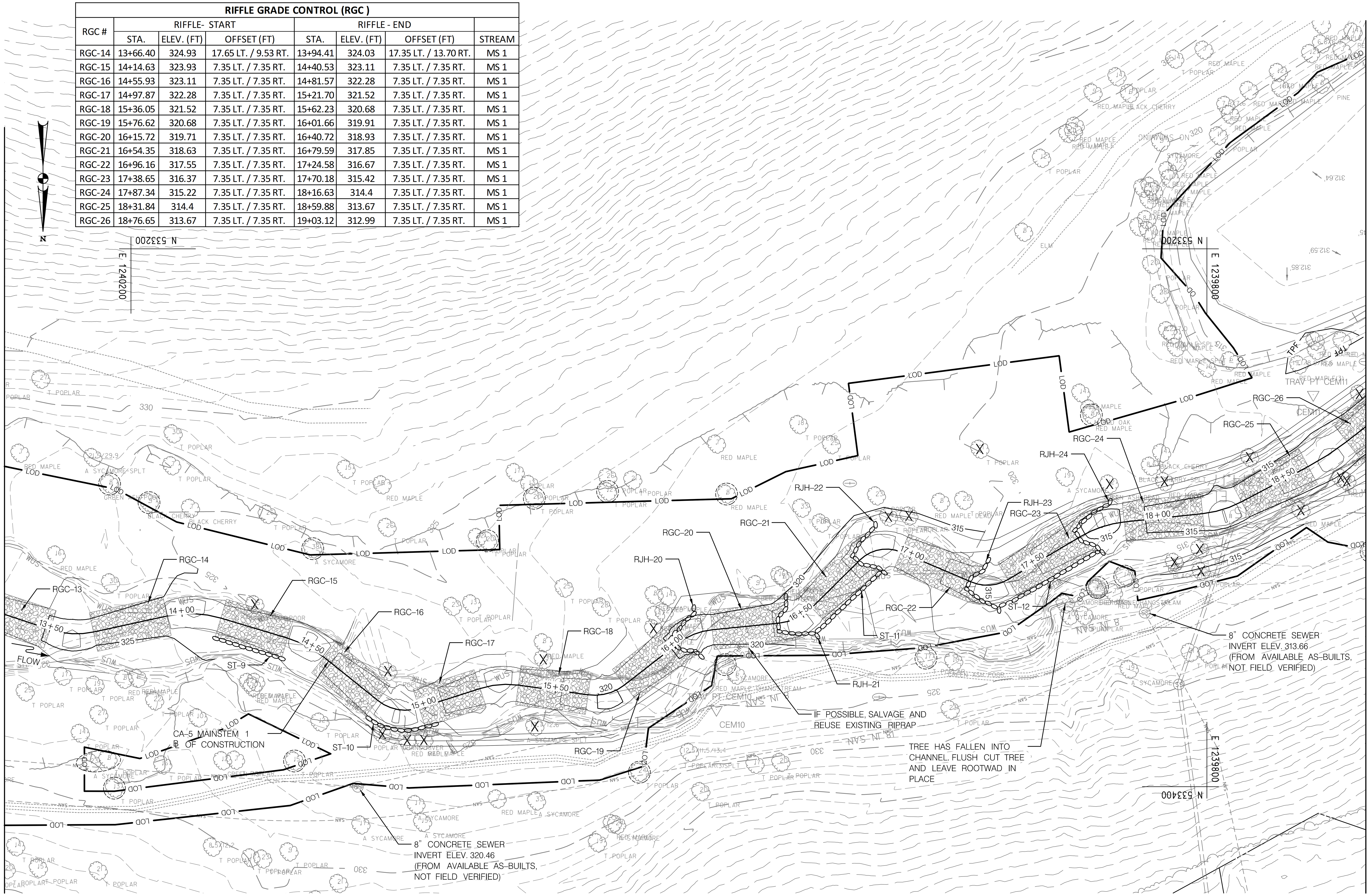
DRAWING NO. SR-03 OF 09

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pSR-P003_CA5.dgn

RIFFLE GRADE CONTROL (RGC)							
RGC #	RIFFLE- START			RIFFLE - END			
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	STREAM
RGC-14	13+66.40	324.93	17.65 LT. / 9.53 RT.	13+94.41	324.03	17.35 LT. / 13.70 RT.	MS 1
RGC-15	14+14.63	323.93	7.35 LT. / 7.35 RT.	14+40.53	323.11	7.35 LT. / 7.35 RT.	MS 1
RGC-16	14+55.93	323.11	7.35 LT. / 7.35 RT.	14+81.57	322.28	7.35 LT. / 7.35 RT.	MS 1
RGC-17	14+97.87	322.28	7.35 LT. / 7.35 RT.	15+21.70	321.52	7.35 LT. / 7.35 RT.	MS 1
RGC-18	15+36.05	321.52	7.35 LT. / 7.35 RT.	15+62.23	320.68	7.35 LT. / 7.35 RT.	MS 1
RGC-19	15+76.62	320.68	7.35 LT. / 7.35 RT.	16+01.66	319.91	7.35 LT. / 7.35 RT.	MS 1
RGC-20	16+15.72	319.71	7.35 LT. / 7.35 RT.	16+40.72	318.93	7.35 LT. / 7.35 RT.	MS 1
RGC-21	16+54.35	318.63	7.35 LT. / 7.35 RT.	16+79.59	317.85	7.35 LT. / 7.35 RT.	MS 1
RGC-22	16+96.16	317.55	7.35 LT. / 7.35 RT.	17+24.58	316.67	7.35 LT. / 7.35 RT.	MS 1
RGC-23	17+38.65	316.37	7.35 LT. / 7.35 RT.	17+70.18	315.42	7.35 LT. / 7.35 RT.	MS 1
RGC-24	17+87.34	315.22	7.35 LT. / 7.35 RT.	18+16.63	314.4	7.35 LT. / 7.35 RT.	MS 1
RGC-25	18+31.84	314.4	7.35 LT. / 7.35 RT.	18+59.88	313.67	7.35 LT. / 7.35 RT.	MS 1
RGC-26	18+76.65	313.67	7.35 LT. / 7.35 RT.	19+03.12	312.99	7.35 LT. / 7.35 RT.	MS 1

ROCK J-HOOK (RJH)			
RJH #	THALWEG STA.	ELEV.(FT)	STREAM
RJH-20	16+01.66	319.91	MS 1
RJH-21	16+40.72	318.93	MS 1
RJH-22	16+79.59	317.85	MS 1
RJH-23	17+24.58	316.67	MS 1
RJH-24	17+70.18	315.42	MS 1



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

DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

LEGEND
- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
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- OXBOW WETLAND
- TOE LOG
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- LOG ROLLER

COASTAL RESOURCES INC.

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE -
HORIZONTAL SCALE -
VERTICAL SCALE -

DRAWING NO. SR-04 OF 09 SHEET NO. 34 OF 76

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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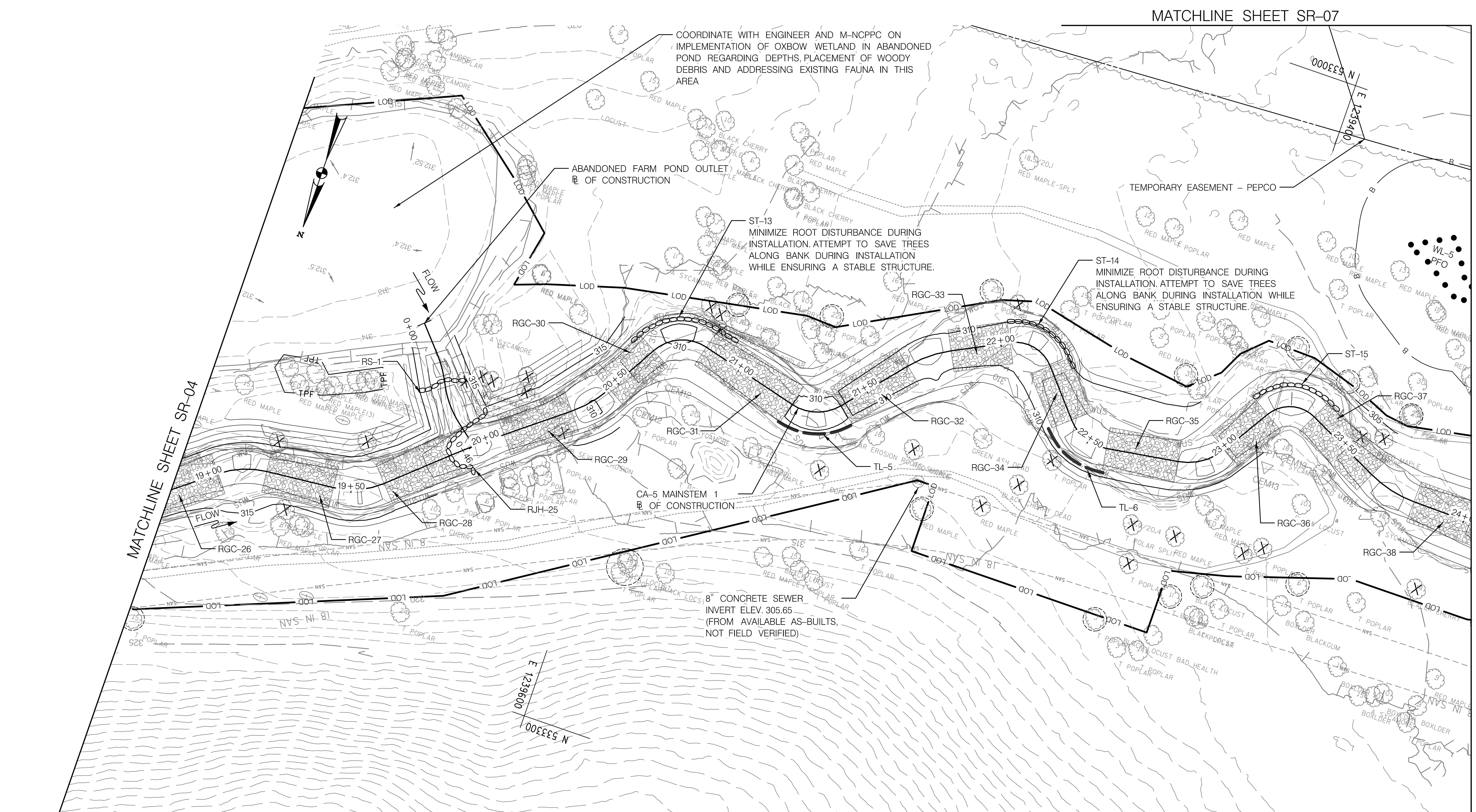

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20' 0 20' 40'
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DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

ROCK J-HOOK (RJH)

RJH #	THALWEG STA.	ELEV.(FT)	STREAM
RJH-25	19+87.24	311.78	MS 1

STONE TOE (ST)

ST #	START		END		QTY	STREAM
	STA.	OFFSET (FT)	STA.	OFFSET (FT)	(LF)	
ST-13	20+63.66	7.35 LT.	20+94.55	7.35 LT.	41	MS-1
ST-14	22+03.23	7.35 LT.	22+24.24	7.35 LT.	31	MS-1
ST-15	23+18.24	7.35 LT.	23+40.57	7.35 LT.	33	MS-1

RIFFLE GRADE CONTROL (RGC)

RGC #	RIFFLE- START			RIFFLE - END			
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	STREAM
RGC-27	19+20.11	312.99	7.35 LT. / 7.35 RT.	19+43.88	312.37	7.35 LT. / 7.35 RT.	MS 1
RGC-28	19+61.73	312.37	7.35 LT. / 7.35 RT.	19+87.24	311.78	7.35 LT. / 7.35 RT.	MS 1
RGC-29	20+06.44	311.78	7.35 LT. / 7.35 RT.	20+31.24	311.21	7.35 LT. / 7.35 RT.	MS 1
RGC-30	20+46.44	311.21	7.35 LT. / 7.35 RT.	20+66.77	310.74	7.35 LT. / 7.35 RT.	MS 1
RGC-31	20+86.35	310.74	7.35 LT. / 7.35 RT.	21+21.89	310.03	7.35 LT. / 7.35 RT.	MS 1
RGC-32	12+39.90	310.03	7.35 LT. / 7.35 RT.	21+66.69	309.5	7.35 LT. / 7.35 RT.	MS 1
RGC-33	21+82.59	309.5	7.35 LT. / 7.35 RT.	22+03.17	309.08	7.35 LT. / 7.35 RT.	MS 1
RGC-34	22+20.49	309.08	7.35 LT. / 7.35 RT.	22+40.57	308.64	7.35 LT. / 7.35 RT.	MS 1
RGC-35	22+56.75	308.64	7.35 LT. / 7.35 RT.	22+81.83	308.04	7.35 LT. / 7.35 RT.	MS 1
RGC-36	22+99.18	308.04	7.35 LT. / 7.35 RT.	23+18.30	307.47	7.35 LT. / 7.35 RT.	MS 1
RGC-37	23+35.98	307.47	7.35 LT. / 7.35 RT.	23+64.28	306.62	7.35 LT. / 7.35 RT.	MS 1
RGC-38	23+81.68	306.62	7.35 LT. / 7.35 RT.	24+09.50	305.78	7.35 LT. / 7.35 RT.	MS 1

ROCK SILL (RS)

RS #	WORKING POINT	STA.	OFFSET (FT)	ELEV.(FT)	WORKING POINT	STA.	OFFSET (FT)	ELEV.(FT)	STREAM
RS-1	A	0+21.00	9.00 LT.	312.70	B	0+21.00	9.00 RT.	312.70	POND OUTLET

TOE LOG (TL)

TL #	WORKING POINT A			WORKING POINT B				
	STA.	MIN OFFSET (FT)	TOP ELEV. (FT)	STA.	MIN. OFFSET (FT)	TOP ELEV. (FT)	LENGTH (FT)	STREAM
TL-5	21+21.90	2.00 RT.	310.03	21+39.88	2.00 RT.	310.03	27.9	MS 1
TL-6	22+40.55	2.00 RT.	308.64	22+56.69	2.00 RT.	308.64	25.3	MS 1

COASTAL RESOURCES INC.

LEGEND

TREE REMOVAL
TREE PLANKING/TREE PROTECTION FENCE
TPF TREE PROTECTION FENCE
OXBOW WETLAND
TOE LOG
RIFFLE GRADE CONTROL MIX
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REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

CA–5 STREAM RESTORATION PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. SR-05 OF 09

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pSR-P005_CA5.dgn

RIFFLE GRADE CONTROL (RGC)							
RGC #	RIFFLE- START			RIFFLE - END			
	STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	STREAM
RGC-39	24+25.94	305.78	7.35 LT. / 7.35 RT.	24+54.32	304.93	7.35 LT. / 7.35 RT.	MS 1
RGC-40	24+69.90	304.93	7.35 LT. / 7.35 RT.	24+91.24	304.29	7.35 LT. / 7.35 RT.	MS 1
RGC-41	25+07.25	304.29	7.35 LT. / 7.35 RT.	25+30.24	303.60	7.35 LT. / 7.35 RT.	MS 1
RGC-42	25+47.52	303.6	7.35 LT. / 7.35 RT.	25+73.82	302.81	7.35 LT. / 7.35 RT.	MS 1
RGC-52	4+04.00	308.03	7.50 LT. / 7.50 RT.	4+16.00	307.83	7.50 LT. / 7.50 RT.	MS 2
RGC-53	4+43.00	307.83	7.50 LT. / 7.50 RT.	4+56.00	307.48	7.50 LT. / 7.50 RT.	MS 2
RGC-54	4+67.00	307.48	7.50 LT. / 7.50 RT.	4+86.00	306.96	7.50 LT. / 7.50 RT.	MS 2
RGC-55	5+01.00	306.46	7.50 LT. / 7.50 RT.	5+22.00	305.9	7.50 LT. / 7.50 RT.	MS 2
RGC-56	5+42.00	305.4	7.50 LT. / 7.50 RT.	5+54.00	305.05	7.50 LT. / 7.50 RT.	MS 2
RGC-57	5+78.00	304.55	7.50 LT. / 7.50 RT.	5+95.00	304.11	7.50 LT. / 7.50 RT.	MS 2

ROCK J-HOOK (RJH)			
RJH #	THALWEG STA.	ELEV.(FT)	STREAM
RJH-26	4+86.00	306.96	MS 2
RJH-27	5+22.00	305.9	MS 2
RJH-28	5+54.00	305.05	MS 2

KNICKPOINT TREATMENT (KPT)									
KPT CCB #	WORKING POINT A			WORKING POINT B			WIDTH (FT)	QTY (CY)	STREAM
	STA.	OFFSET (FT.)	TOP ELEV.	STA.	OFFSET (FT.)	TOP ELEV.			
KPT 2 (CCB-1)	25+85.09	43.31 RT.	306.00	25+87.32	35.78 RT.	306.00	3	6	MS 1
KPT 2 (CCB-2)	26+01.64	48.23 RT.	305.00	26+01.17	40.20 RT.	305.00	3	6	MS 1

ROCK CROSS VANE (RCV)			
RCV #	THALWEG STA.	ELEV. (FT)	STREAM
RCV-1	25+73.82	302.81	MS 1

COMPOUND ROCK CROSS VANE (CRCV)					
CRCV #	MS-1 THALWEG STA.	MS-1 ELEV. (FT)	MS-2 THALWEG STA.	MS-2 ELEV. (FT)	STREAM
CRCV-1	25+30.24	303.60	5+95.00	304.11	MS-1/MS-2 CONFLUENCE

TOE LOG (TL)								
TL #	WORKING POINT A			WORKING POINT B				
	STA.	MIN OFFSET (FT)	TOP ELEV. (FT)	STA.	MIN. OFFSET (FT)	TOP ELEV. (FT)	LENGTH (FT)	STREAM
TL-7	24+52.48	2.00 LT.	304.93	24+72.20	2.00 LT.	304.93	28.4	MS-1
TL-8	24+90.79	2.00 RT.	304.29	25+08.22	2.00 RT.	304.29	24.2	MS-1
TL-9	3+86.41	2.00 RT.	308.03	4+04.20	2.00 RT.	308.03	23.1	MS-2
TL-10	4+55.66	2.00 LT.	307.48	4+67.01	2.00 LT.	307.48	14.1	MS-2

STONE TOE (ST)						
ST #	START		END		QTY (LF)	STREAM
	STA.	OFFSET (FT)	STA.	OFFSET (FT)		
ST-16	4+16.03	7.50 LT.	4+43.01	7.50 LT.	33	MS-2

CLAY CHANNEL BLOCK (CCB)									
CCB #	WORKING POINT A			WORKING POINT B			WIDTH (FT)	QTY (CY)	STREAM
	STA.	OFFSET (FT.)	TOP ELEV.	STA.	OFFSET (FT.)	TOP ELEV.			
CCB-6	25+43.23	12.45 LT.	305.00	25+62.34	9.54 LT.	305.00	16.5	21	MS 1

NOTE:
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4. WHERE POSSIBLE, FLUSH CUT TREES DESIGNATED FOR REMOVAL AND LEAVE ROOTBALL IN PLACE. M–NCPPC MAY PROVIDE FEEDBACK ON WHERE FLUSH CUTTING OR REMOVAL IS APPROPRIATE PRIOR TO CONSTRUCTION.

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

DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

LEGEND
- TREE REMOVAL
- TREE PLANKING/TREE PROTECTION FENCE
- TPF — TREE PROTECTION FENCE
- OXBOW WETLAND
- TOE LOG
- RIFFLE GRADE CONTROL MIX
- CLAY CHANNEL BLOCK
- STONE TOE
- ROCK J–HOOK
- ROCK SILL
- ROCK CASCADE
- LOG ROLLER

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN — COUNTY MONTGOMERY
DRAWN BY CJN — LOGMILE
CHECKED BY KSK — HORIZONTAL SCALE
MDE/PRD 16825\20–PR–0040–01 — VERTICAL SCALE

DRAWING NO. SR-06 OF 09 — SHEET NO. 36 OF 76

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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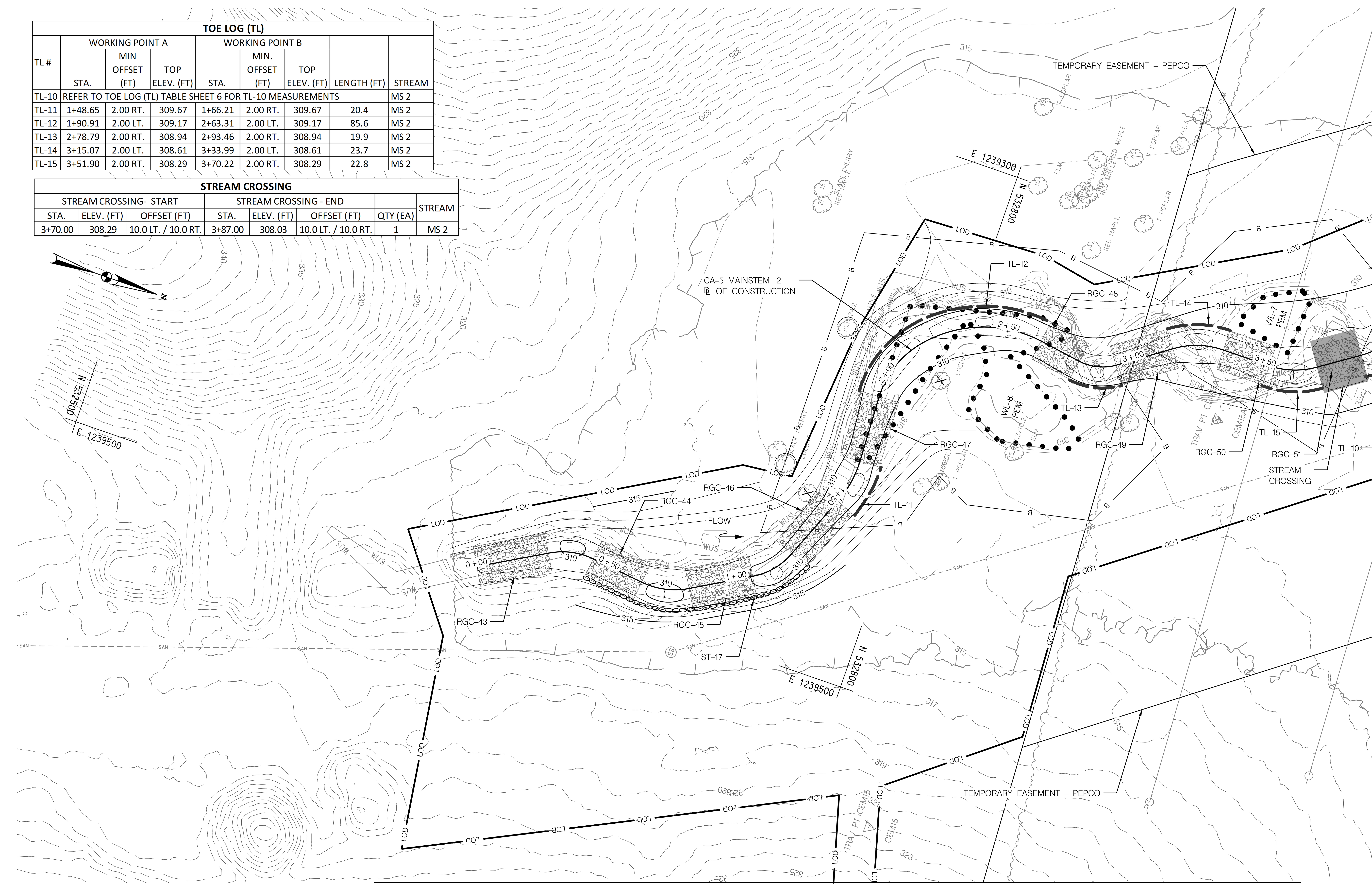

TOE LOG (TL)

TL #	WORKING POINT A STA.	MIN OFFSET (FT)	TOP ELEV. (FT)	WORKING POINT B STA.	MIN. OFFSET (FT)	TOP ELEV. (FT)	LENGTH (FT)	STREAM
TL-10	REFER TO TOE LOG (TL) TABLE SHEET 6 FOR TL-10 MEASUREMENTS							MS 2
TL-11	1+48.65	2.00 RT.	309.67	1+66.21	2.00 RT.	309.67	20.4	MS 2
TL-12	1+90.91	2.00 LT.	309.17	2+63.31	2.00 LT.	309.17	85.6	MS 2
TL-13	2+78.79	2.00 RT.	308.94	2+93.46	2.00 RT.	308.94	19.9	MS 2
TL-14	3+15.07	2.00 LT.	308.61	3+33.99	2.00 LT.	308.61	23.7	MS 2
TL-15	3+51.90	2.00 RT.	308.29	3+70.22	2.00 RT.	308.29	22.8	MS 2

STREAM CROSSING

STREAM CROSSING- START			STREAM CROSSING - END				
STA.	ELEV. (FT)	OFFSET (FT)	STA.	ELEV. (FT)	OFFSET (FT)	QTY (EA)	STREAM
3+70.00	308.29	10.0 LT. / 10.0 RT.	3+87.00	308.03	10.0 LT. / 10.0 RT.	1	MS 2

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

DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

STONE TOE (ST)

ST #	START STA.	START OFFSET (FT)	END STA.	END OFFSET (FT)	QTY (LF)	STREAM
ST-17	0+43.76	7.50 RT.	1+23.78	7.50 RT.	90	MS 2

RIFFLE GRADE CONTROL (RGC)

RGC #	RIFFLE- START STA.	ELEV. (FT)	OFFSET (FT)	RIFFLE - END STA.	ELEV. (FT)	OFFSET (FT)	STREAM
RGC-43	0+00.00	311.00	7.50 LT. / 7.50 RT.	0+27.00	310.59	7.50 LT. / 7.50 RT.	MS 2
RGC-44	0+44.00	310.59	7.50 LT. / 7.50 RT.	0+64.00	310.35	7.50 LT. / 7.50 RT.	MS 2
RGC-45	0+82.00	310.35	7.50 LT. / 7.50 RT.	1+06.00	309.99	7.50 LT. / 7.50 RT.	MS 2
RGC-46	1+23.00	309.99	7.50 LT. / 7.50 RT.	1+49.00	309.67	7.50 LT. / 7.50 RT.	MS 2
RGC-47	1+66.00	309.67	7.50 LT. / 7.50 RT.	1+91.00	309.18	7.50 LT. / 7.50 RT.	MS 2
RGC-48	2+63.00	309.17	7.50 LT. / 7.50 RT.	2+79.00	308.94	7.50 LT. / 7.50 RT.	MS 2
RGC-49	2+93.00	308.94	7.50 LT. / 7.50 RT.	3+15.00	308.61	7.50 LT. / 7.50 RT.	MS 2
RGC-50	3+34.00	308.61	7.50 LT. / 7.50 RT.	3+52.00	308.29	7.50 LT. / 7.50 RT.	MS 2
RGC-51	3+70.00	308.29	7.50 LT. / 7.50 RT.	3+87.00	308.03	7.50 LT. / 7.50 RT.	MS 2

COASTAL RESOURCES INC.

LEGEND
TREE REMOVAL
TREE PLANKING/TREE PROTECTION FENCE
TPF TREE PROTECTION FENCE
OXBOW WETLAND
TOE LOG
RIFFLE GRADE CONTROL MIX
CLAY CHANNEL BLOCK
STONE TOE
ROCK J-HOOK
ROCK SILL
ROCK CASCADE
LOG ROLLER

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
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DECEMBER 2021

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CA-5 STREAM RESTORATION PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12
DESIGNED BY SCN COUNTY MONTGOMERY
DRAWN BY CJN LOGMILE
CHECKED BY KSK HORIZONTAL SCALE
MDE/PRD 16825120-PR-0040-01 VERTICAL SCALE
DRAWING NO. SR-07 OF 09 SHEET NO. 37 OF 76

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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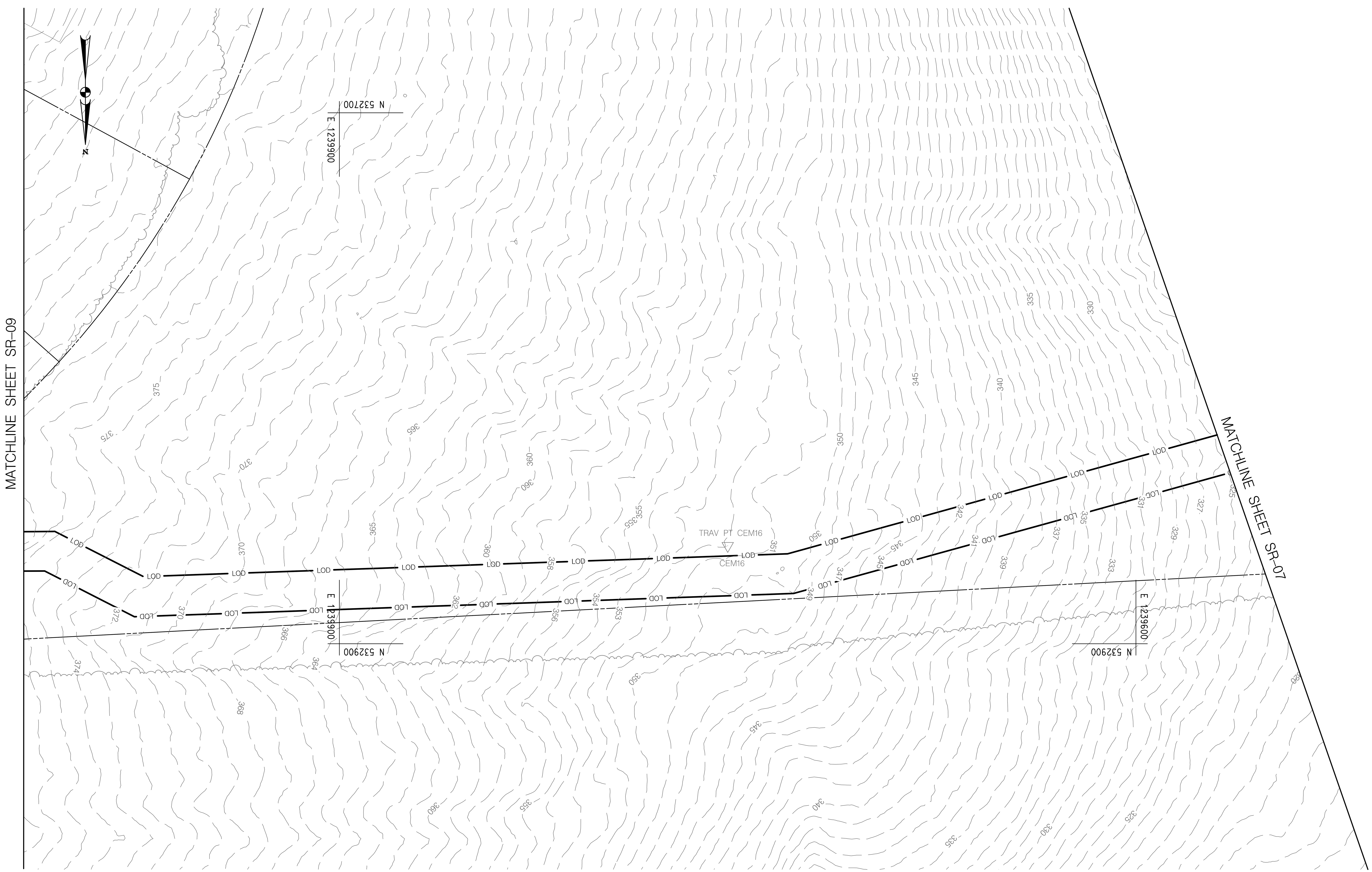

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20' 0 20' 40'
SCALE: 1" = 20'

DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

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COASTAL RESOURCES INC.

LEGEND

TREE REMOVAL
TREE PLANKING/TREE PROTECTION FENCE
TPF TREE PROTECTION FENCE
OXBOW WETLAND
TOE LOG
RIFFLE GRADE CONTROL MIX
CLAY CHANNEL BLOCK
STONE TOE
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CA-5 STREAM RESTORATION PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. SR-08 OF 09
SHEET NO. 38 OF 76

BY: caln

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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MATCHLINE SHEET SR-08

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20' 0 20' 40'
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DATUM: NAD83(2001) Horizontal
NAVD 88 Vertical

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

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COASTAL RESOURCES INC.

LEGEND

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- TREE PLANKING/TREE PROTECTION FENCE
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- OXBOW WETLAND
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CA-5 STREAM RESTORATION PLAN

SCALE	1" = 20'	DATE	DECEMBER 2021	CONTRACT NO.	AW073B12
DESIGNED BY	SCN	COUNTY	MONTGOMERY		
DRAWN BY	CJN	LOGMILE			
CHECKED BY	KSK	HORIZONTAL SCALE			
MDE/PRD	16825120-PR-0040-01	VERTICAL SCALE			
DRAWING NO.	SR-09 OF 09	SHEET NO.	39 OF 76		

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pSR-P009_CA5.dgn

LIVE STAKES					
AREA (AC)		1.13			
Quantity	Botanical Name	Common Name	Indicator Status	Spacing	Planting Dates
3272	*Salix nigra*	Black Willow	OBL	Maximum Spacing 3' OC	11/1-3/31
1091	*Cornus amomum*	Silky Dogwood	FACW		
1091	*Viburnum dentatum*	Arrowwood Viburnum	FAC		

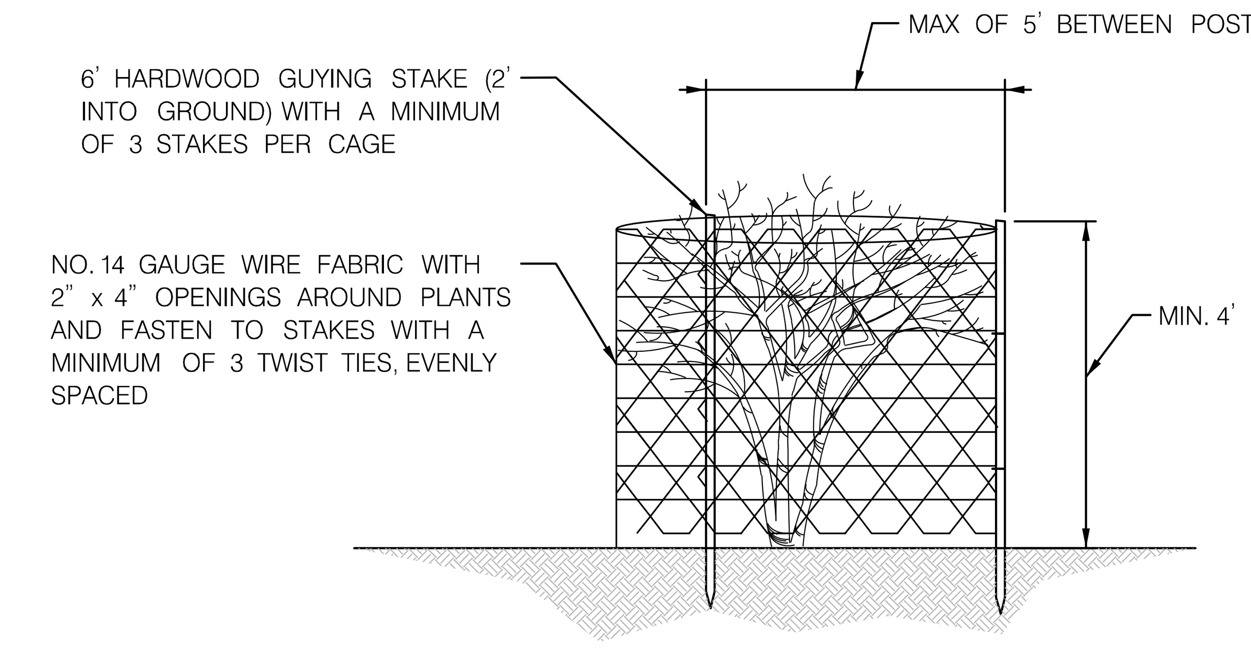
RIPARIAN PLANTINGS						
AREA (AC)			3.33			
Quantity	Botanical Name	Common Name	Indicator Status	Size	Rate	Planting Dates
Overstory						
Major Deciduous Trees						
108	*Acer rubrum*	Red Maple	FAC	5' CG	Maximum Spacing 20' OC	Spring: 3/1-5/15 Fall: 10/15-12/15
108	*Betula nigra*	River Birch	FACW	5' CG		
108	*Platanus occidentalis*	American Sycamore	FACW	5' CG		
108	*Quercus bicolor*	Swamp White Oak	FACW	5' CG		
Minor Deciduous Trees						
59	*Amelanchier arborea*	Common Serviceberry	FAC	5' CG	Maximum Spacing 15' OC	Spring: 3/1-5/15 Fall: 10/15-12/15
59	*Carpinus caroliniana*	American Hornbeam	FAC	5' CG		
59	*Magnolia virginiana*	Sweetbay Magnolia	FACW	5' CG		
Shrubs						
70	*Alnus serrulata*	Hazel Alder	FACW	3 GALLON CG	Maximum Spacing 3' OC	Spring: 3/1-5/15 Fall: 10/15-12/15
70	*Cornus amomum*	Silky Dogwood	FACW	3 GALLON CG		
70	*Lindera benzoin*	Spicebush	FACW	3 GALLON CG		
70	*Sambucus nigra ssp. canadensis*	American Black Elderberry	FACW	3 GALLON CG		

OXBOW WETLAND PLANTINGS						
AREA (AC)			0.31			
Quantity	Botanical Name	Common Name	Indicator Status	Size	Spacing	Planting Dates
498	*Juncus effusus*	Lamp Rush	FACW	PLUG	Maximum Spacing 2' OC	Spring: 4/15-6/30 Fall: 9/1-10/30
332	*Peltandra virginica*	Arrow Arum	OBL	PLUG		
665	*Pontederia cordata*	Pickerelweed	OBL	PLUG		
399	*Sagittaria latifolia*	Duck Potato	OBL	PLUG		
166	*Nuphar advena*	Yellow Pond-Lily	OBL	1 QUART CG		
399	*Carex crinita*	Fringe Sedge	OBL	PLUG		
532	*Scirpus cyperinus*	Cottongrass Bulrush	FACW	PLUG		
332	*Schoenoplectus tabernaemontani*	Soft-Stem Club-Rush	OBL	PLUG		

Seed Establishment Totals		
Type	Acres (AC)	Square Yards (SY)
Lowland Meadow Establishment	4.71	22,798.82
Wet Meadow Establishment	0.34	1,646.32
Turf Grass Establishment	0.26	1,279.21

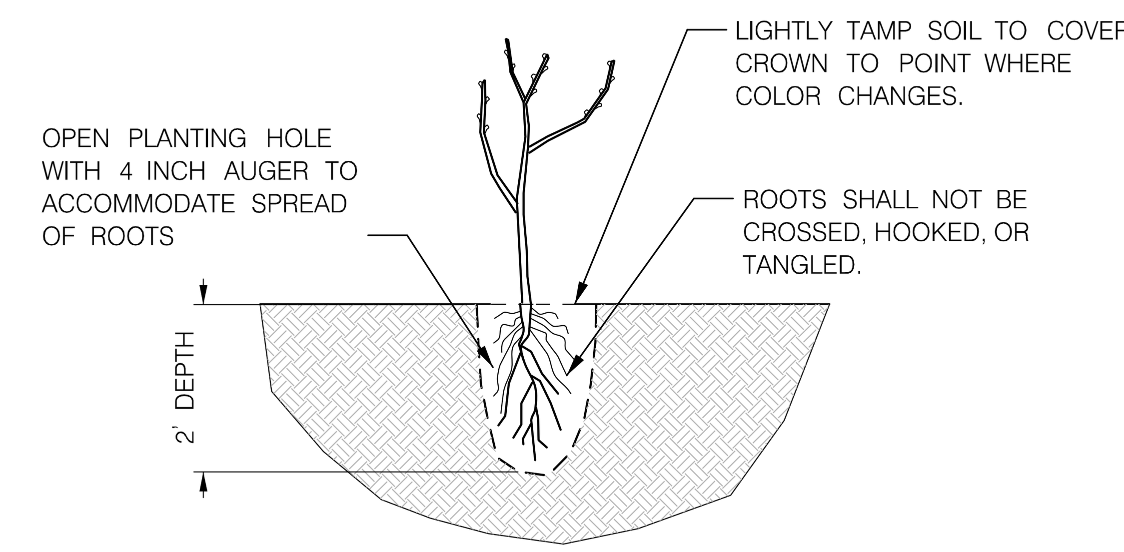
PLACING FURNISHED TOPSOIL - 4 INCH DEPTH	
14,639	SY

SOIL STABILIZATION MATTING - TYPE D	
13,222	SY



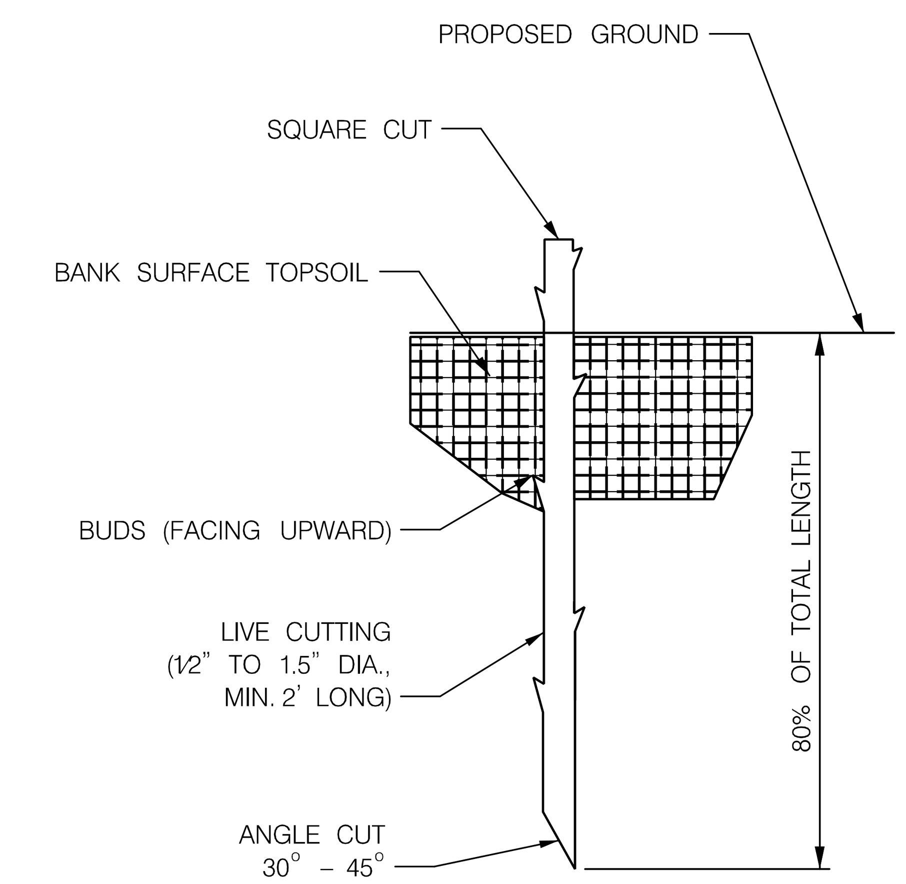
DEER PROTECTION FOR SHRUBS, EVERGREEN/MULTISTEM TREES (M–NCPPC DETAIL No. 704)

NOT TO SCALE



EMERGENT WETLAND HERBACEOUS PLANTING – PLUG

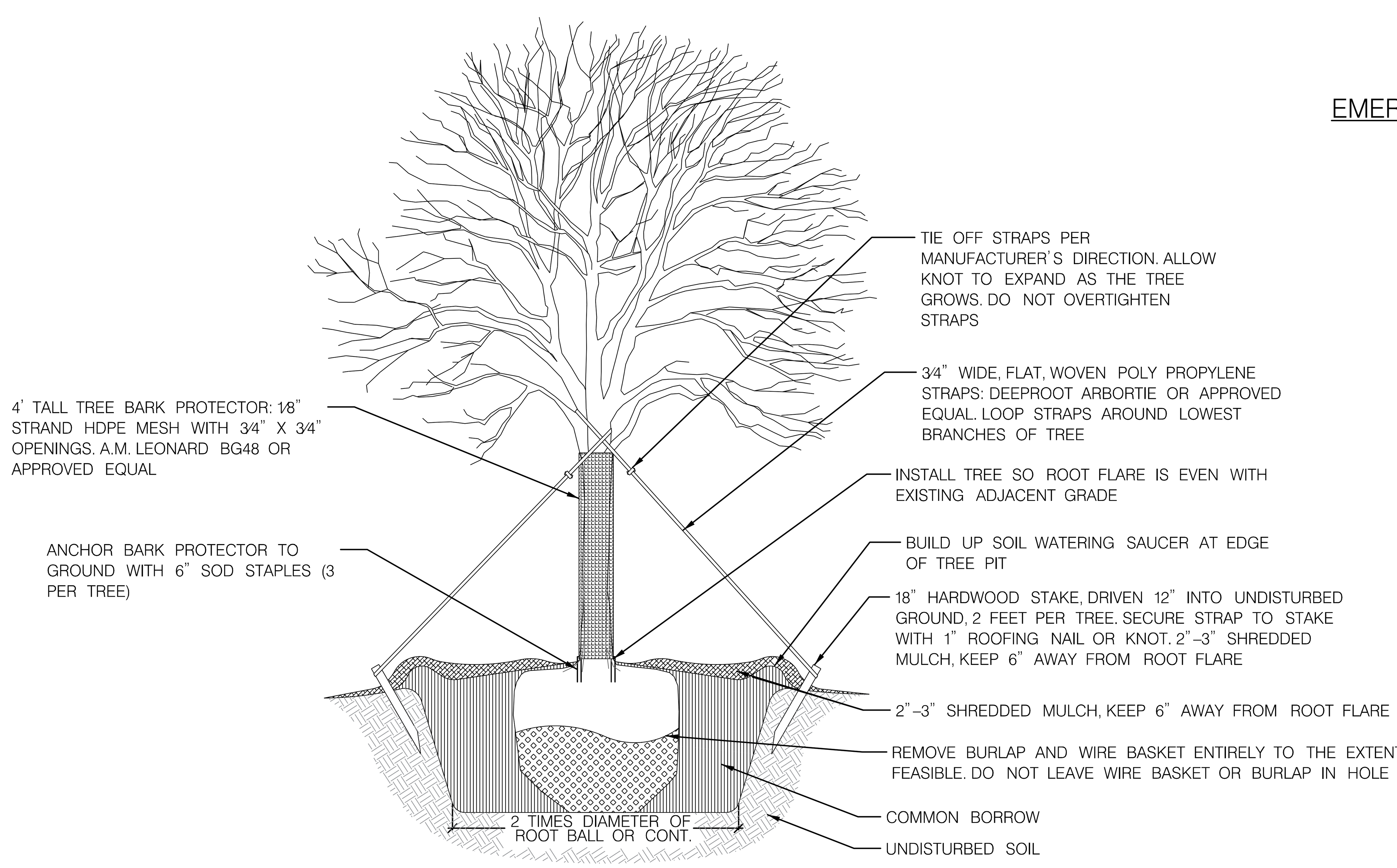
NOT TO SCALE



NOTES:
1. ANGLE CUT MUST TAKE PLACE IMMEDIATELY BEFORE INSTALLATION.
2. LIVE STAKES MUST BE INSTALLED WHILE DORMANT (LATE FALL TO EARLY SPRING). DO NOT ALLOW THEM TO DRY OUT.
3. USE DIGGING BAR, REBAR, OR SIMILAR TO DRIVE PILOT HOLE BEFORE INSTALLING LIVE STAKE.

LIVE STAKE

NOT TO SCALE



DECIDUOUS TREE PLANTING WITH DEER PROTECTION (M–NCPPC DETAIL No. 701)

NOT TO SCALE

NOTES:

1. STAKES AND WIRES MUST BE REMOVED 12 MONTHS AFTER PLANTING.
2. PLANTING HOLE SHALL BE DUG BY BACKHOE OR OTHER MACHINE AND FINISHED BY HAND.
3. IF SURROUNDING SOIL IS COMPACTED AS DETERMINED BY THE ENGINEER OR QAD, AN AREA UP TO 5 TIMES THE DIAMETER OF THE ROOT MASS SHALL BE EXCAVATED OR ROTOTILLED TO A 1' DEPTH AND SOIL SHALL BE AMENDED.
4. PRUNE ONLY DEAD, DECAYING, BROKEN, CROSSING OR INWARD GROWING BRANCHES. NEVER DAMAGE OR CUT LEADER.

COASTAL RESOURCES INC.

LANDSCAPE ARCHITECTURE DIVISION

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
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CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

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SEMI-FINAL REVIEW
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CA–5 STREAM RESTORATION LANDSCAPE DETAILS

SCALE NTS DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN COUNTY MONTGOMERY
DRAWN BY CJN LOGMILE
CHECKED BY KSK HORIZONTAL SCALE
MDE/PRD 16825120-PR-0040-01 VERTICAL SCALE

DRAWING NO. LD-01 OF 01

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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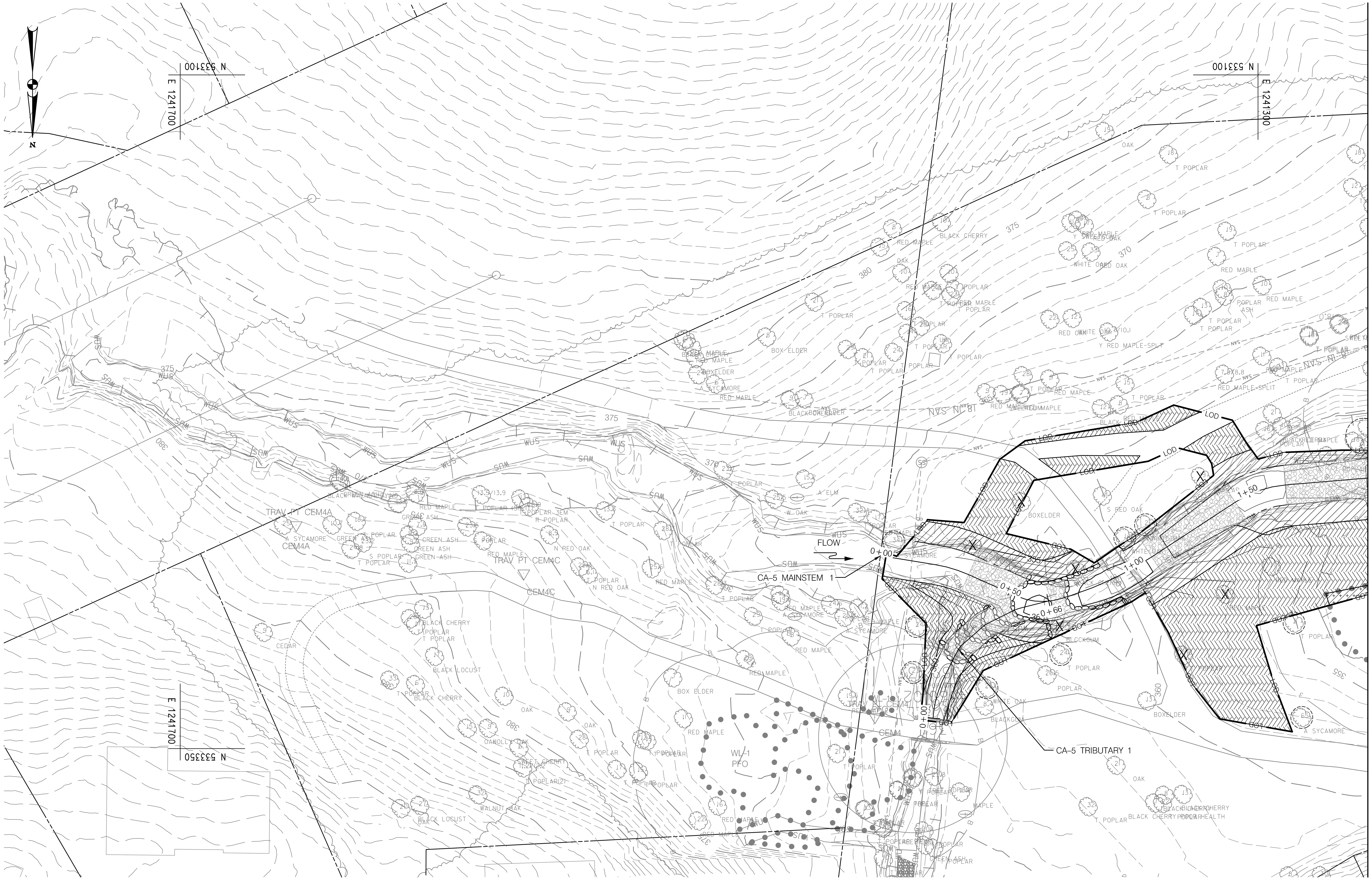

LIVE STAKES	
AREA (AC)	0.04
AREA (SF)	1942.78
AREA (SY)	215.86

RIPARIAN PLANTINGS	
AREA (AC)	0.13
AREA (SF)	5532.12
AREA (SY)	614.68

LOWLAND MEADOW SEED	
AREA (AC)	0.17
AREA (SF)	7474.90
AREA (SY)	830.54

WET MEADOW SEED	
AREA (AC)	0.01
AREA (SF)	435.60
AREA (SY)	48.40

NOTE:
REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

COASTAL RESOURCES INC.

BY: caln -

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
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CA-5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LS-01 OF 09 SHEET NO. 41 OF 76

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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LIVE STAKES	
AREA (AC)	0.20
AREA (SF)	8524.69
AREA (SY)	947.19

OXBOW WETLAND PLANTINGS	
AREA (AC)	0.01
AREA (SF)	378.97
AREA (SY)	42.11

RIPARIAN PLANTINGS	
AREA (AC)	0.42
AREA (SF)	18338.76
AREA (SY)	2037.64

LOWLAND MEADOW SEED	
AREA (AC)	0.62
AREA (SF)	26863.45
AREA (SY)	2984.83

WET MEADOW SEED	
AREA (AC)	0.03
AREA (SF)	1467.97
AREA (SY)	163.11

TURFGRASS ESTABLISHMENT	
AREA (AC)	0.02
AREA (SF)	805.86
AREA (SY)	89.54

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

NOTE:
REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LS-02 OF 09

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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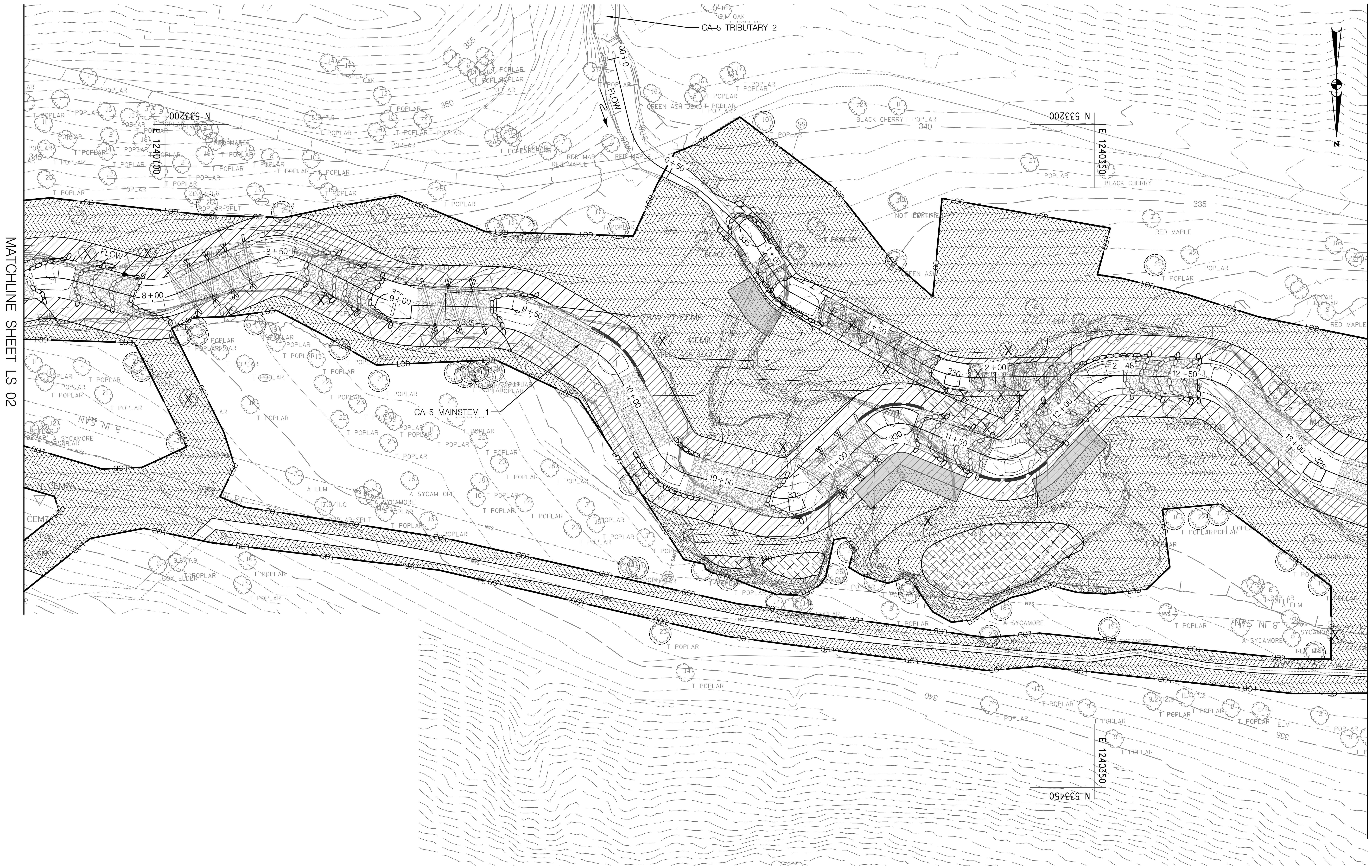

LIVE STAKES	
AREA (AC)	0.22
AREA (SF)	9766.15
AREA (SY)	1085.13

OXBOW WETLAND PLANTINGS	
AREA (AC)	0.03
AREA (SF)	1472.33
AREA (SY)	163.59

RIPARIAN PLANTINGS	
AREA (AC)	0.74
AREA (SF)	32277.96
AREA (SY)	3586.44

LOWLAND MEADOW SEED	
AREA (AC)	0.97
AREA (SF)	42044.11
AREA (SY)	4671.57

WET MEADOW SEED	
AREA (AC)	0.03
AREA (SF)	1472.33
AREA (SY)	163.59

NOTE:
REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

COASTAL RESOURCES INC.

BY: caln –

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

CA-5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN COUNTY MONTGOMERY
DRAWN BY CJN LOGMILE
CHECKED BY KSK HORIZONTAL SCALE
MDE/PRD 16825120-PR-0040-01 VERTICAL SCALE

DRAWING NO. LS-03 OF 09

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LIVE STAKES	
AREA (AC)	0.20
AREA (SF)	8707.64
AREA (SY)	967.52

OXBOW WETLAND PLANTINGS	
AREA (AC)	0.10
AREA (SF)	4434.41
AREA (SY)	492.71

RIPARIAN PLANTINGS	
AREA (AC)	0.65
AREA (SF)	28161.54
AREA (SY)	3129.06

LOWLAND MEADOW SEED	
AREA (AC)	0.85
AREA (SF)	36869.18
AREA (SY)	4096.58

WET MEADOW SEED	
AREA (AC)	0.10
AREA (SF)	4434.41
AREA (SY)	492.71

NOTE:
REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

COASTAL RESOURCES INC.

BY: caln -

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
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CA-5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LS-04 OF 09

PLOTTED: Tuesday, March 08, 2022 AT 11:01 AM
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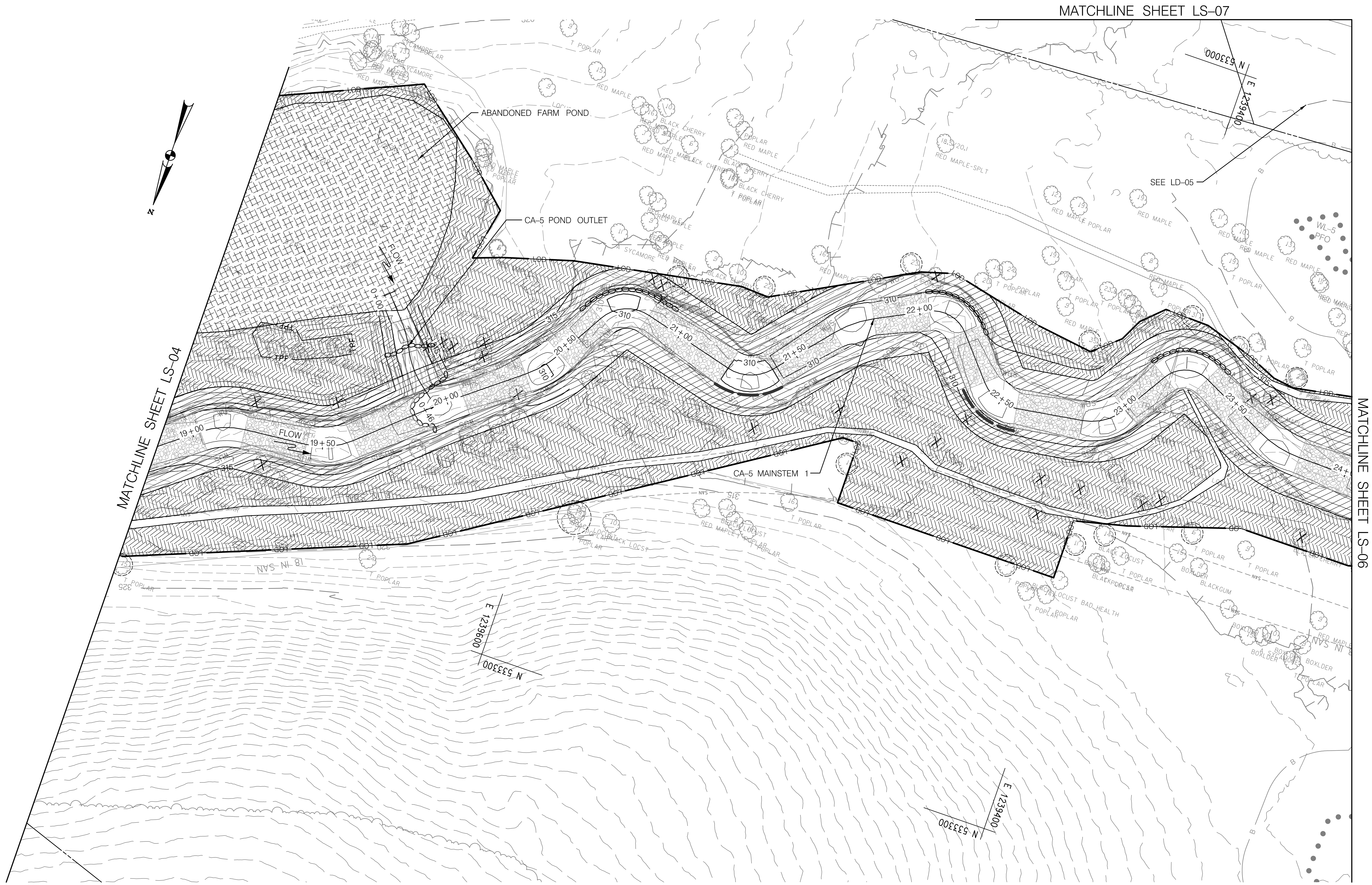

LIVE STAKES	
AREA (AC)	0.17
AREA (SF)	7614.29
AREA (SY)	846.03

OXBOW WETLAND PLANTINGS	
AREA (AC)	0.14
AREA (SF)	6259.57
AREA (SY)	695.51

RIPARIAN PLANTINGS	
AREA (AC)	0.46
AREA (SF)	20028.89
AREA (SY)	2225.43

LOWLAND MEADOW SEED	
AREA (AC)	0.63
AREA (SF)	27643.18
AREA (SY)	3071.46

WET MEADOW SEED	
AREA (AC)	0.14
AREA (SF)	6259.57
AREA (SY)	695.51

NOTE:
REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

COASTAL RESOURCES INC.

BY: caln -

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

CA-5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LS-05 OF 09

MATCHLINE SHEET LS–07

MATCHLINE SHEET LS–05

LIVE STAKES	
AREA (AC)	0.15
AREA (SF)	6425.10
AREA (SY)	713.90

RIPARIAN PLANTINGS	
AREA (AC)	0.31
AREA (SF)	13503.60
AREA (SY)	1500.40

LOWLAND MEADOW SEED	
AREA (AC)	0.46
AREA (SF)	19928.70
AREA (SY)	2214.30

OXBOW WETLAND PLANTINGS	
AREA (AC)	0.02
AREA (SF)	746.97
AREA (SY)	83.00

LOWLAND MEADOW SEED	
AREA (AC)	0.10
AREA (SF)	4525.88
AREA (SY)	502.88

NOTE:
REFER TO KEY MAP (SHEET KM–01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

COASTAL RESOURCES INC.

BY: caln –

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

CA–5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20–PR–0040–01

COUNTY MONTGOMERY
LOGMILE -
HORIZONTAL SCALE -
VERTICAL SCALE -

DRAWING NO. LS-06 OF 09

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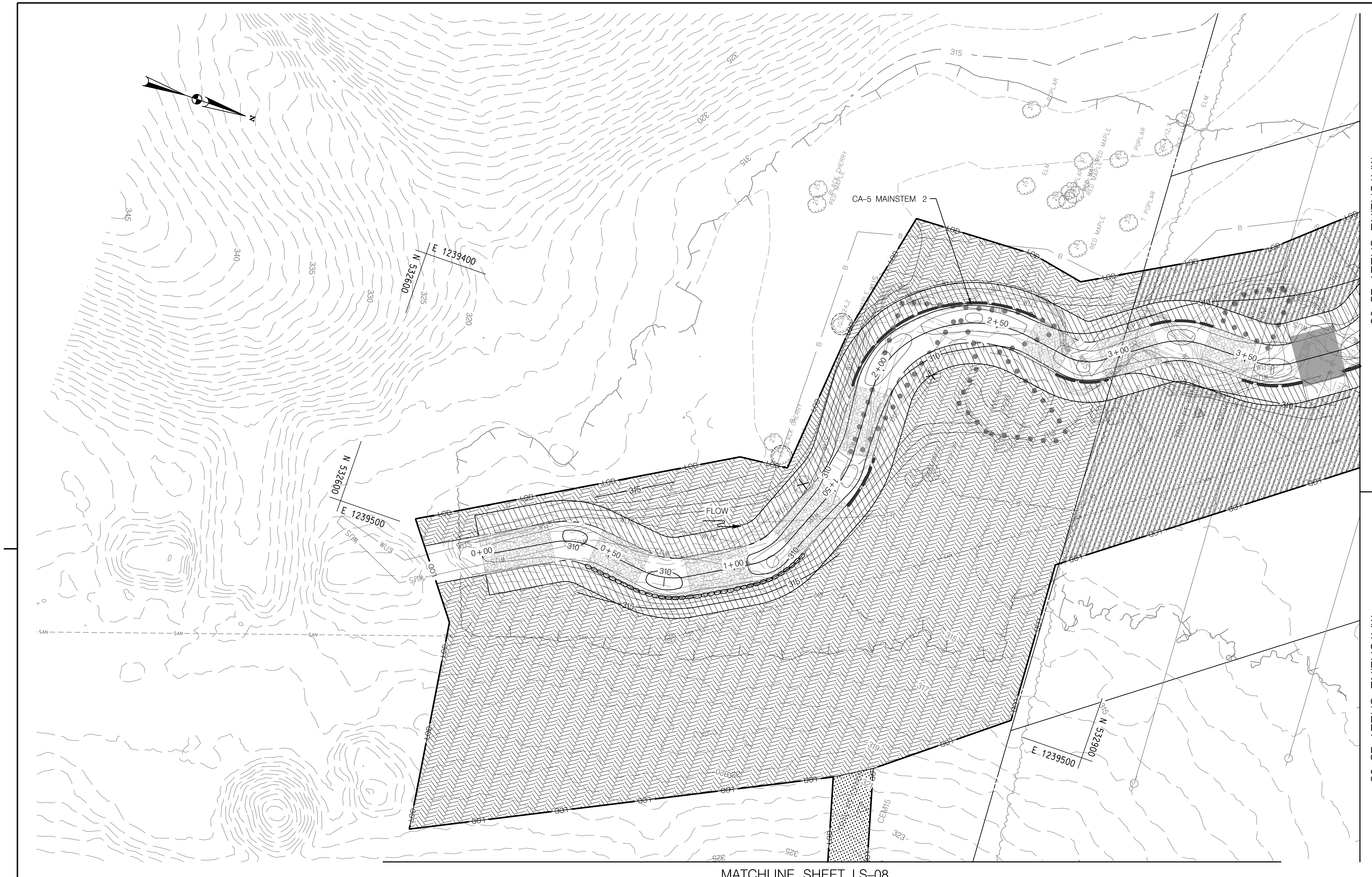

LIVE STAKES	
AREA (AC)	0.14
AREA (SF)	6098.40
AREA (SY)	677.60

RIPARIAN PLANTINGS	
AREA (AC)	0.62
AREA (SF)	27007.20
AREA (SY)	3000.80

LOWLAND MEADOW SEED	
AREA (AC)	0.76
AREA (SF)	33105.60
AREA (SY)	3678.40

LOWLAND MEADOW SEED	
AREA (AC)	0.15
AREA (SF)	6734.38
AREA (SY)	748.26

TURFGRASS ESTABLISHMENT	
AREA (AC)	0.01
AREA (SF)	435.60
AREA (SY)	48.40

NOTE:
REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

COASTAL RESOURCES INC.

BY: caln -

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
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REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LS-07 OF 09
SHEET NO. 47 OF 76

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
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TURFGRASS ESTABLISHMENT	
AREA (AC)	0.16
AREA (SF)	6934.75
AREA (SY)	770.53

NOTE:
REFER TO KEY MAP (SHEET KM-01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

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REVISIONS

SEMI-FINAL REVIEW
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CA-5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN COUNTY MONTGOMERY
DRAWN BY CJN LOGMILE
CHECKED BY KSK HORIZONTAL SCALE
MDE/PRD 16825I20-PR-0040-01 VERTICAL SCALE

DRAWING NO. LS-08 OF 09

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pLD-P008_CA5.dgn

TURFGRASS ESTABLISHMENT	
AREA (AC)	0.08
AREA (SF)	3336.70
AREA (SY)	370.74

MATCHLINE SHEET LS–08

NOTE:
REFER TO KEY MAP (SHEET KM–01) FOR PARCEL INFORMATION.

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

DATUM: NAD 83(2001) Horizontal
NAVD 88 Vertical

LEGEND

- RIPARIAN PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- RIPARIAN SHRUB PLANTING (LOWLAND MEADOW ESTABLISHMENT)
- LIVE STAKES (LOWLAND MEADOW ESTABLISHMENT)
- OXBOW WETLAND (WET MEADOW ESTABLISHMENT)
- DISTURBED PFO (RIPARIAN PLANTINGS AND WET MEADOW ESTABLISHMENT)
- TURFGRASS ESTABLISHMENT

COASTAL RESOURCES INC.

BY: caln –

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE ARCHITECTURE DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
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SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION LANDSCAPE PLAN

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE -
HORIZONTAL SCALE -
VERTICAL SCALE -

DRAWING NO. LS-09 OF 09 SHEET NO. 49 OF 76

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
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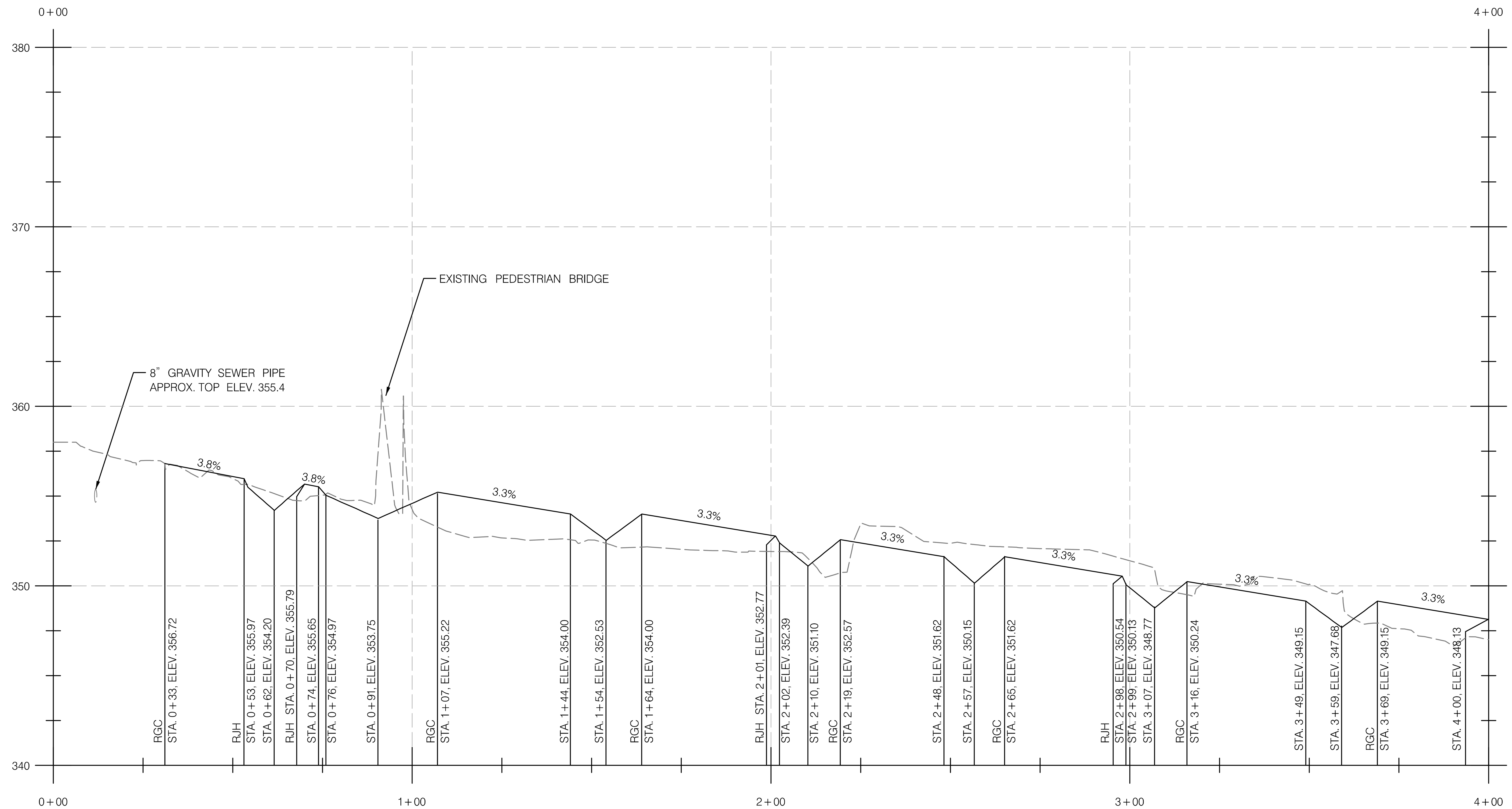

CA–5 MAINSTEM 1 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

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

8' 4' 0
SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

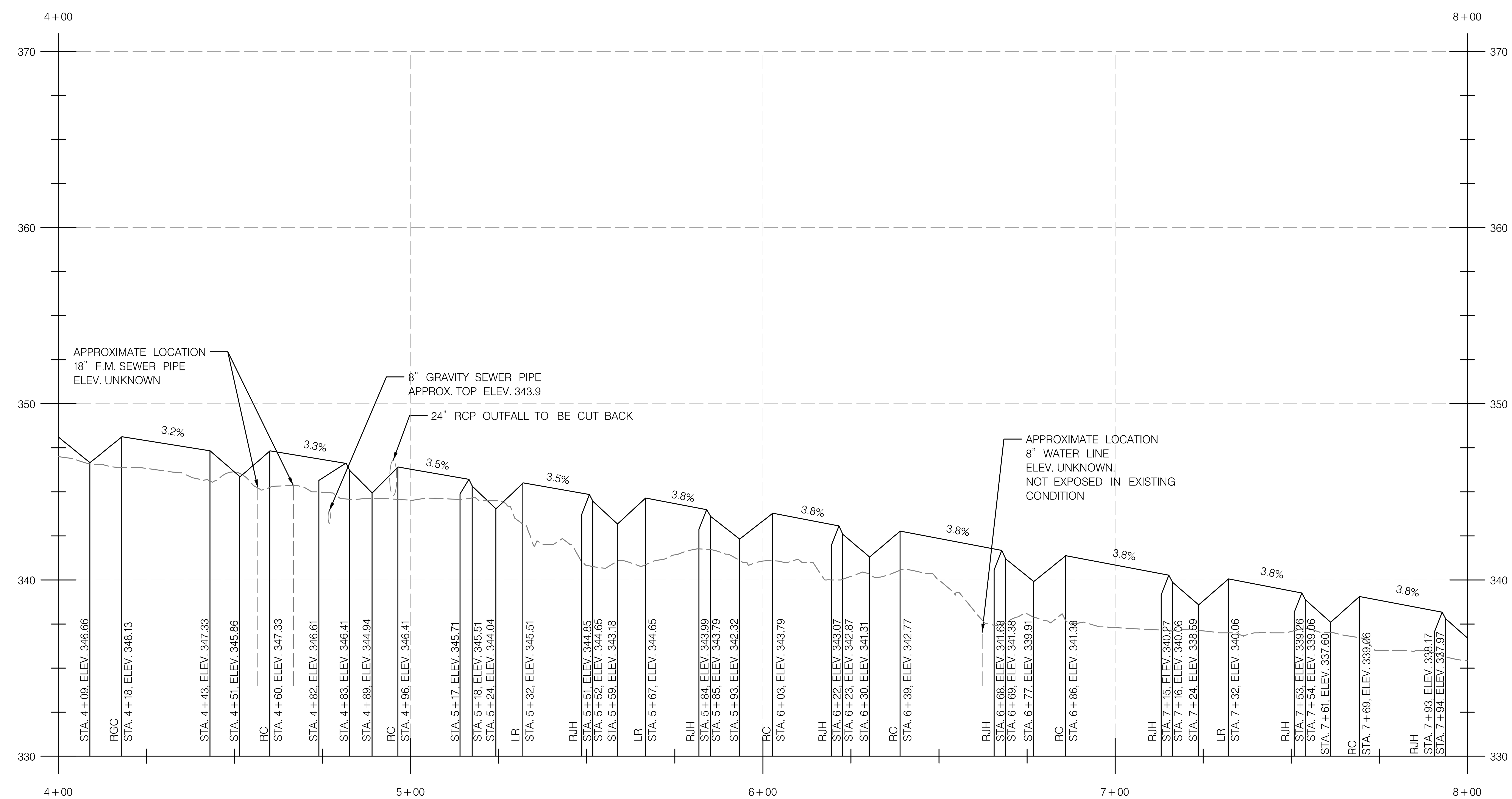
DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 20'
VERTICAL SCALE 1" = 4'

DRAWING NO. DP - 01 OF 12

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V001_CA5.dgn



CA–5 MAINSTEM 1 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

————	PROPOSED GROUND
— — — —	EXISTING GROUND

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

8' 4' 0 SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

BY: caln –

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
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STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
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REVISIONS

SEMI-FINAL REVIEW
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CA–5 STREAM RESTORATION PROFILE

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	
CHECKED BY	KSK	HORIZONTAL SCALE	1" = 20'
MDE/PRD	16825120-PR-0040-01	VERTICAL SCALE	1" = 4'

DRAWING NO. DP - 02 OF 12 SHEET NO. 51 OF 76

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
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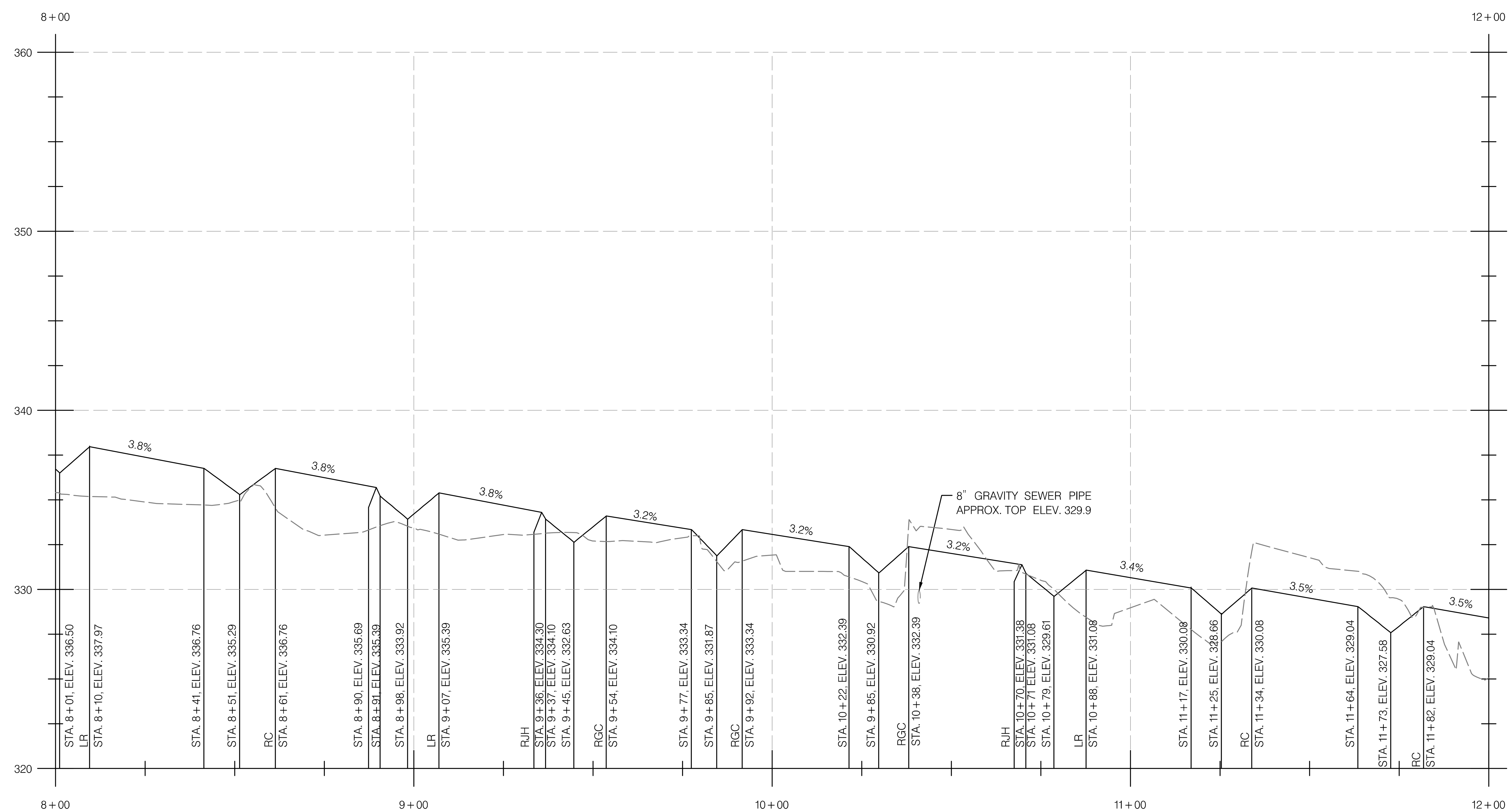

CA–5 MAINSTEM 1 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

———————	PROPOSED GROUND
— — — — —	EXISTING GROUND

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

8' 4' 0
SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
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CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

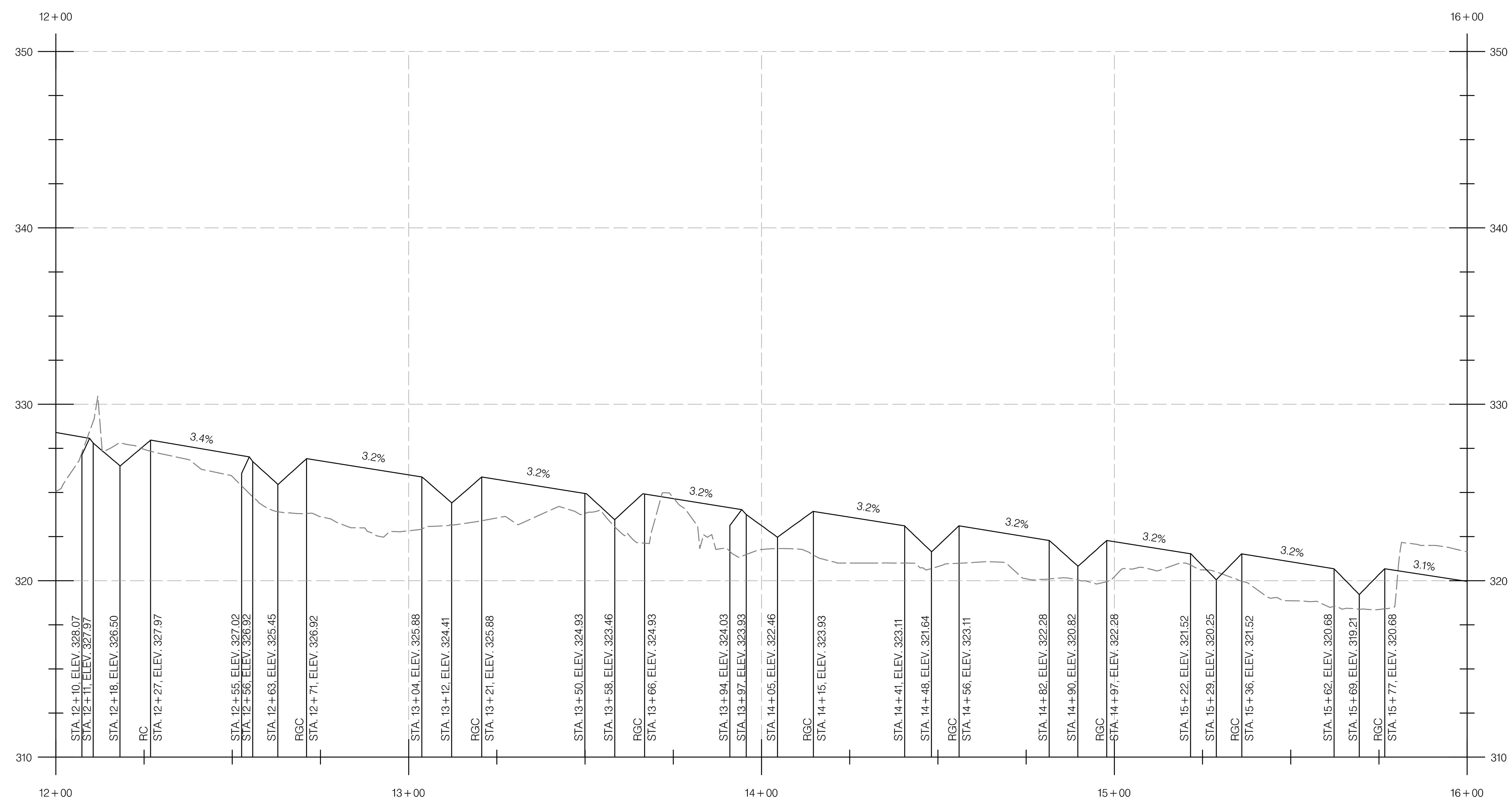
SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	
CHECKED BY	KSK	HORIZONTAL SCALE	1" = 20'
MDE/PRD	168251/20–PR–0040–01	VERTICAL SCALE	1" = 4'

DRAWING NO. **DP - 03** OF **12** SHEET NO. 52 OF 76

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V003_CA5.dgn



CA–5 MAINSTEM 1 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

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

8' 4' 0
SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

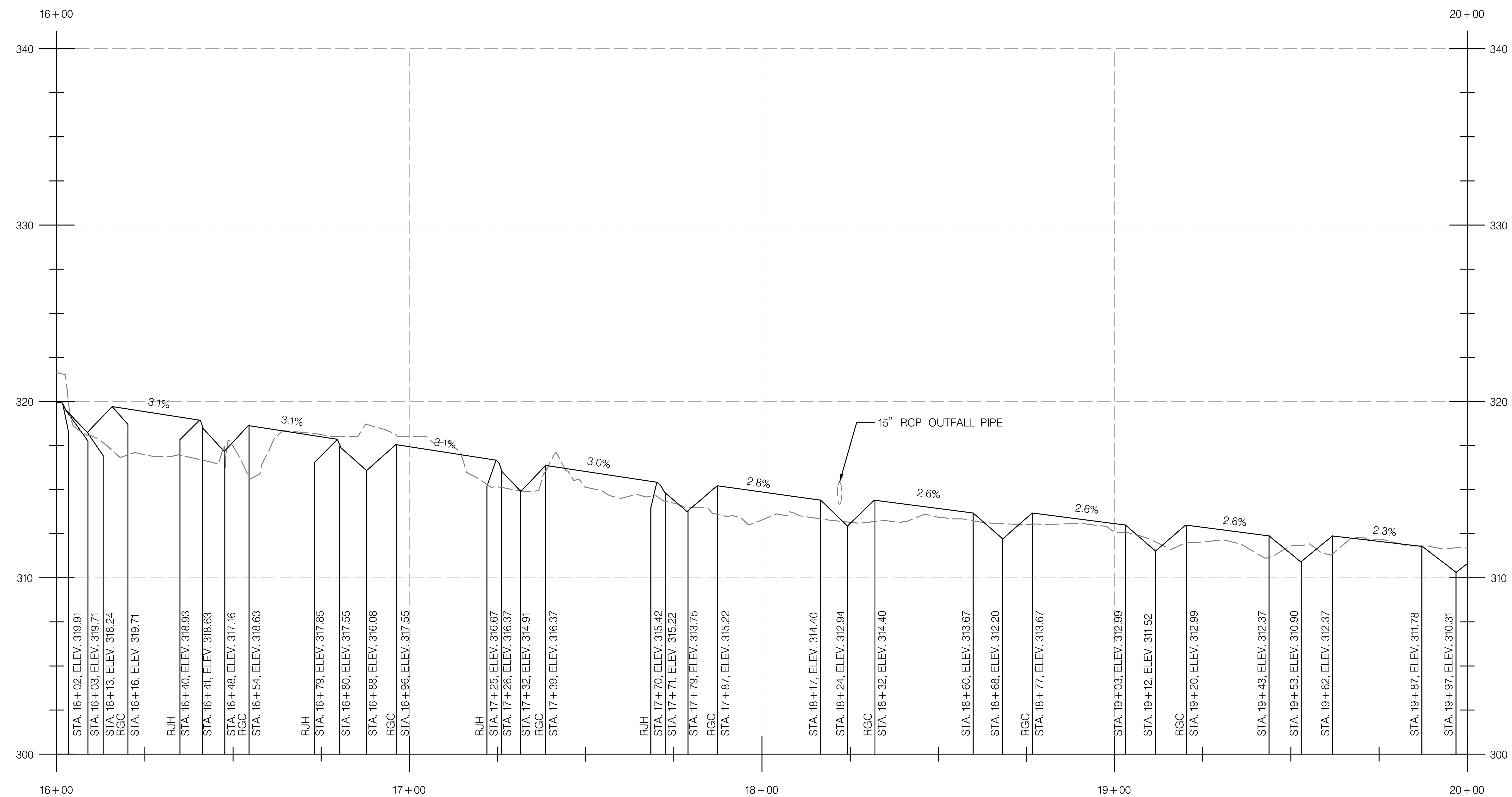
SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN	COUNTY MONTGOMERY
DRAWN BY CJN	LOGMILE
CHECKED BY KSK	HORIZONTAL SCALE 1" = 20'
MDE/PRD 16825120-PR-0040-01	VERTICAL SCALE 1" = 4'

DRAWING NO. DP - 04 OF 12 SHEET NO. 53 OF 76

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V004_CA5.dgn



CA–5 MAINSTEM 1 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

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

8' 4' 0 SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

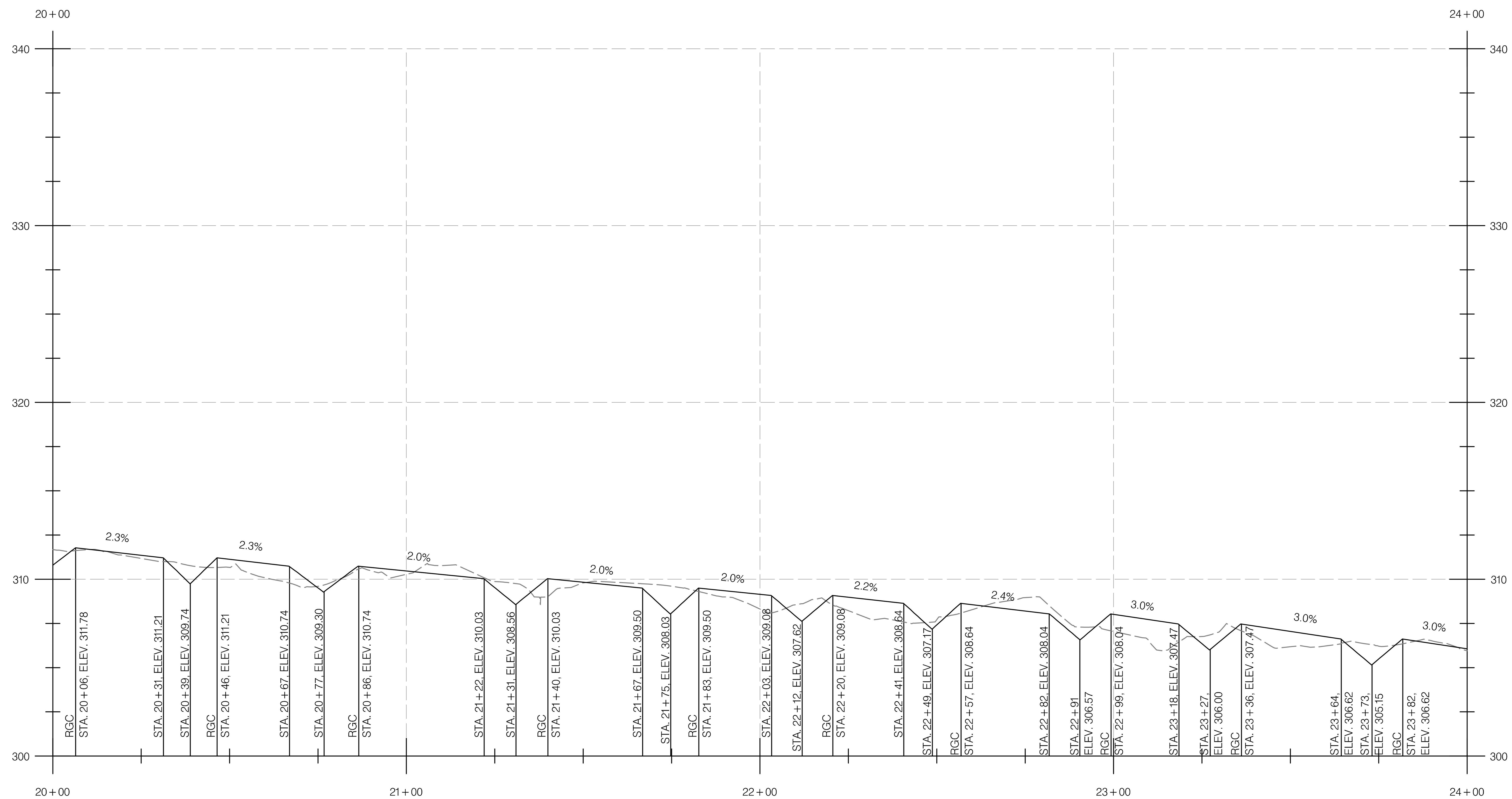
DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825I20–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 20'
VERTICAL SCALE 1" = 4'

DRAWING NO. DP - 05 OF 12

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V005_CA5.dgn



CA–5 MAINSTEM 1 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

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

8' 4' 0 SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

SCALE 1" = 20'	DATE DECEMBER 2021	CONTRACT NO. AW073B12	
DESIGNED BY SCN		COUNTY MONTGOMERY	
DRAWN BY CJN		LOGMILE	
CHECKED BY KSK		HORIZONTAL SCALE 1" = 20'	
MDE/PRD 168251/20–PR–0040–01		VERTICAL SCALE 1" = 4'	
DRAWING NO. DP - 06 OF 12		SHEET NO. 55 OF 76	

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
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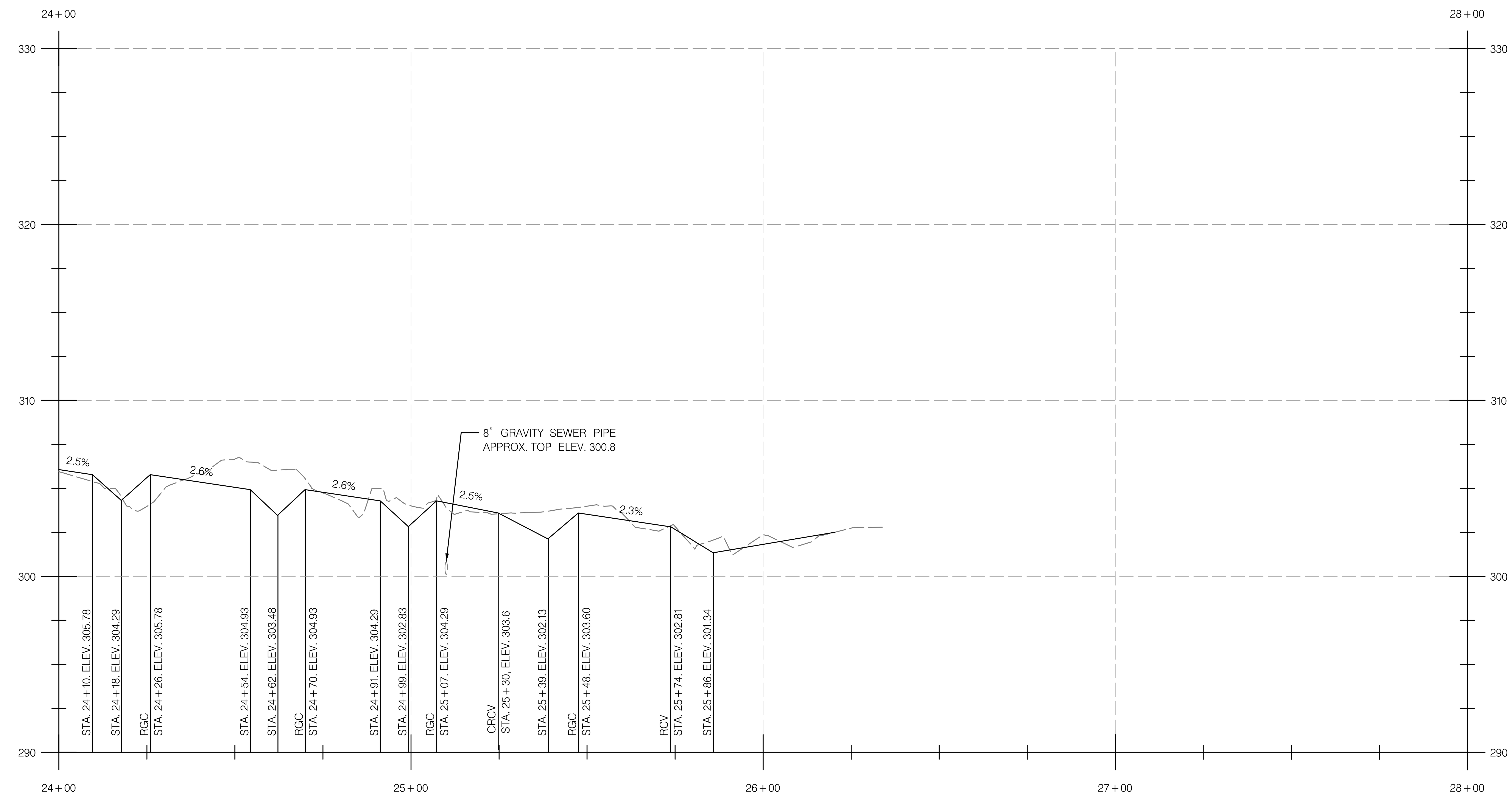

CA–5 MAINSTEM 1 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

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

8' 4' 0
SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
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REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

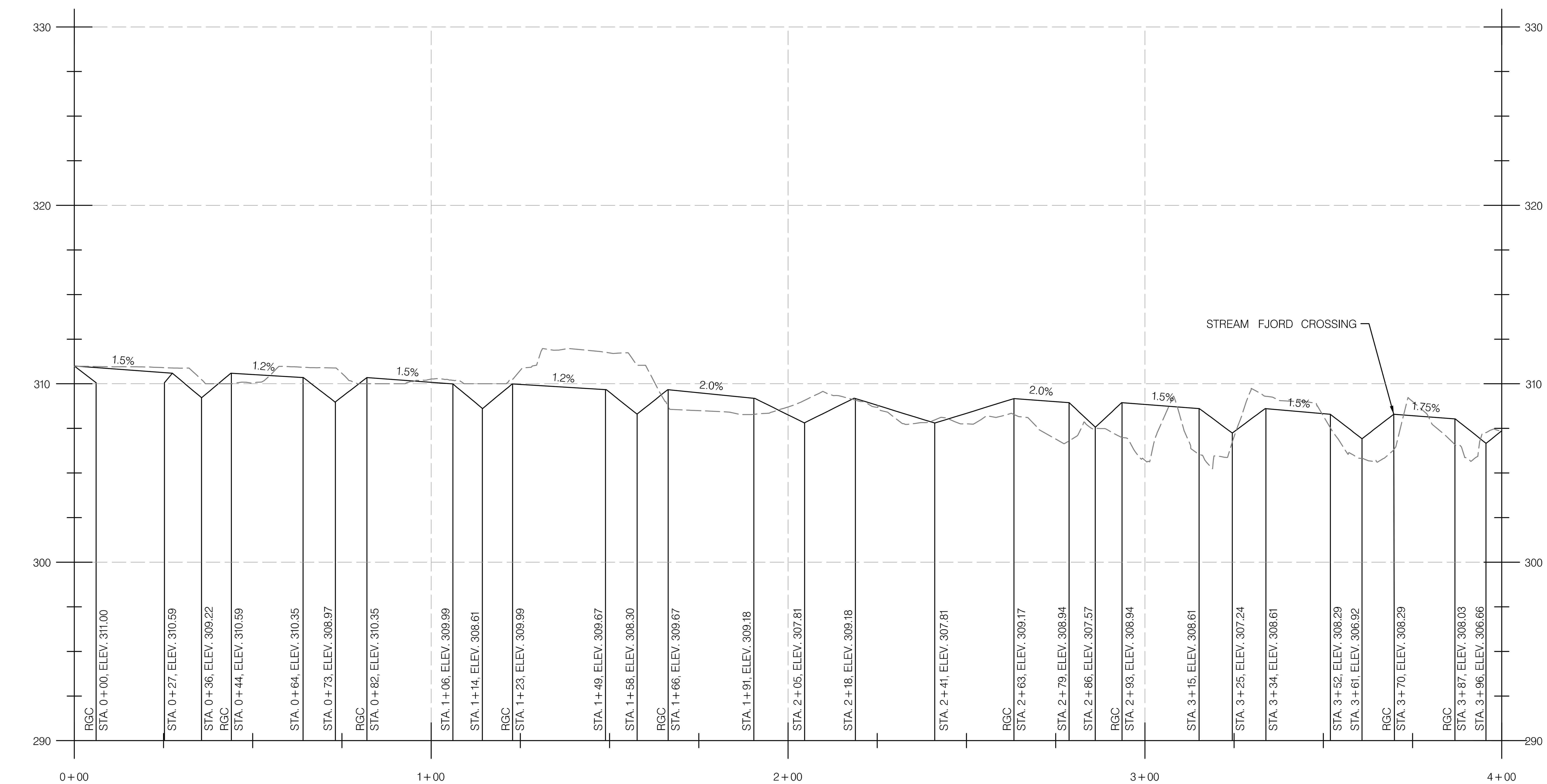
DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 20'
VERTICAL SCALE 1" = 4'

DRAWING NO. DP -07 OF 12

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V007_CA5.dgn



CA–5 MAINSTEM 2 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

SCALE: 1" = 20'

SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

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SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

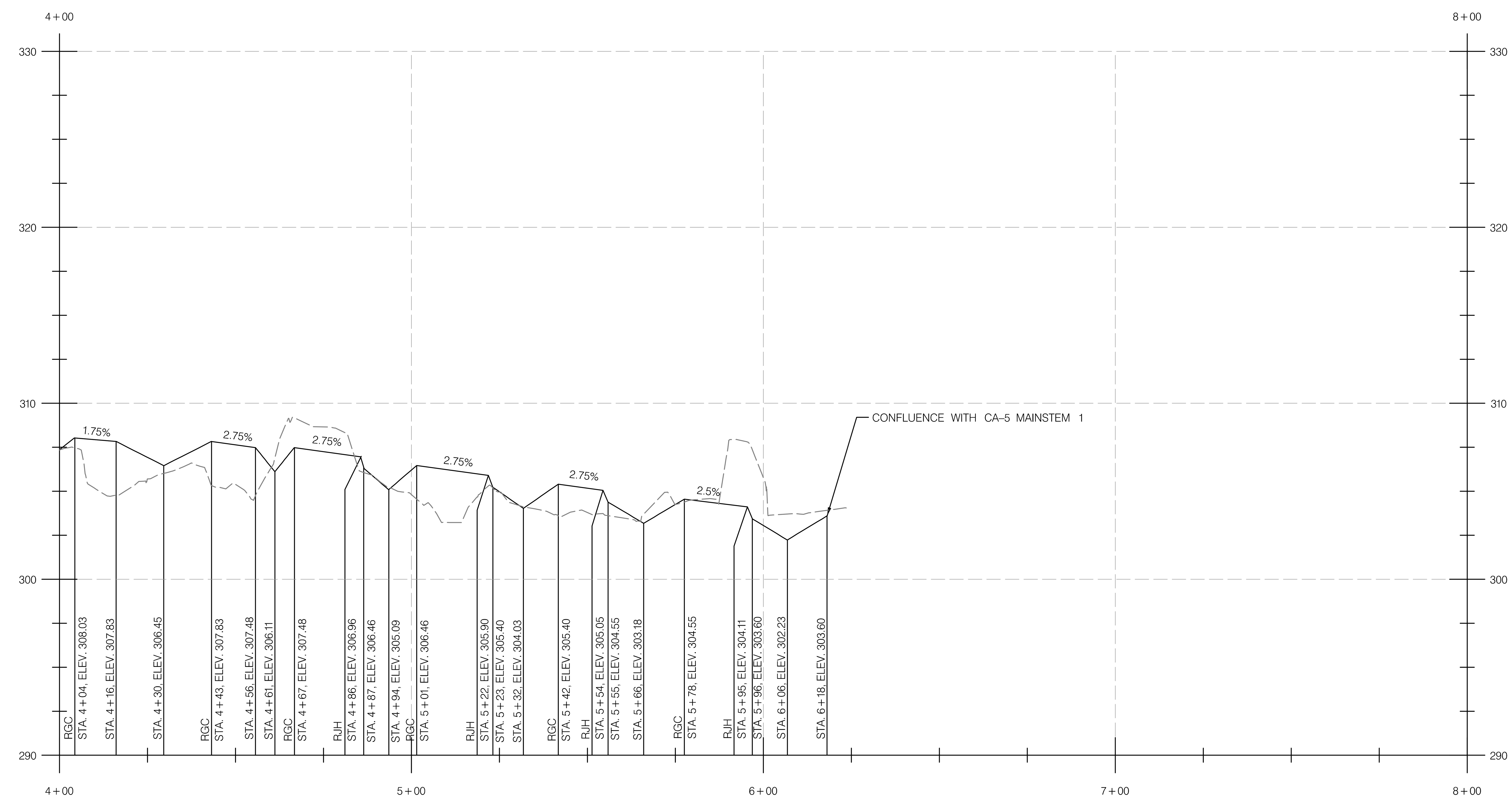
DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 20'
VERTICAL SCALE 1" = 4'

DRAWING NO. DP - 08 OF 12

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V008_CA5.dgn



CA–5 MAINSTEM 2 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

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

8' 4' 0
SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

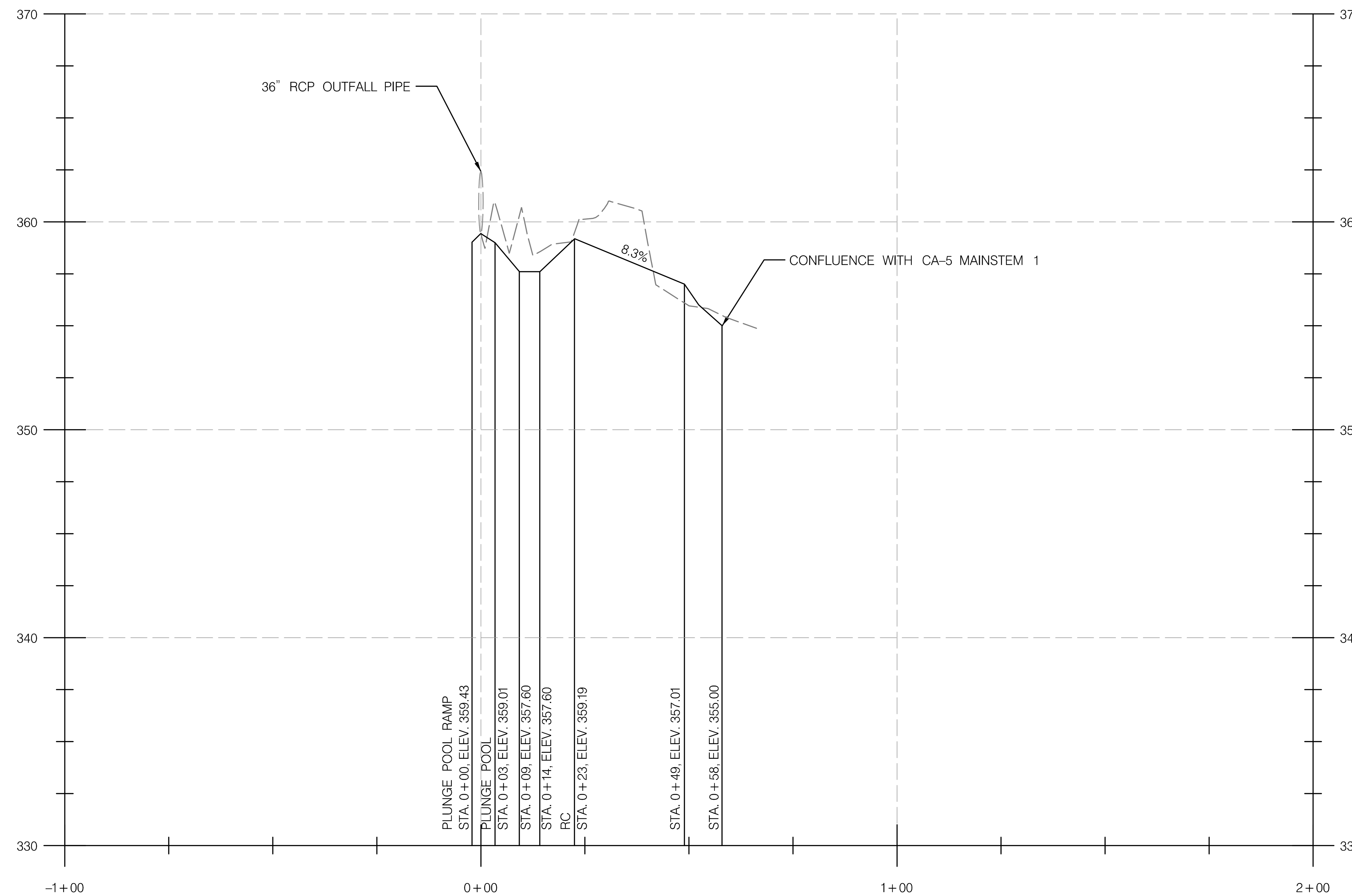
SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	
CHECKED BY	KSK	HORIZONTAL SCALE	1" = 20'
MDE/PRD	16825120-PR-0040-01	VERTICAL SCALE	1" = 4'

DRAWING NO. **DP - 09** OF **12** SHEET NO. 58 OF 76

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V009_CA5.dgn



CA-5 TRIBUTARY 1 PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

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

8' 4' 0
SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION PROFILE

SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

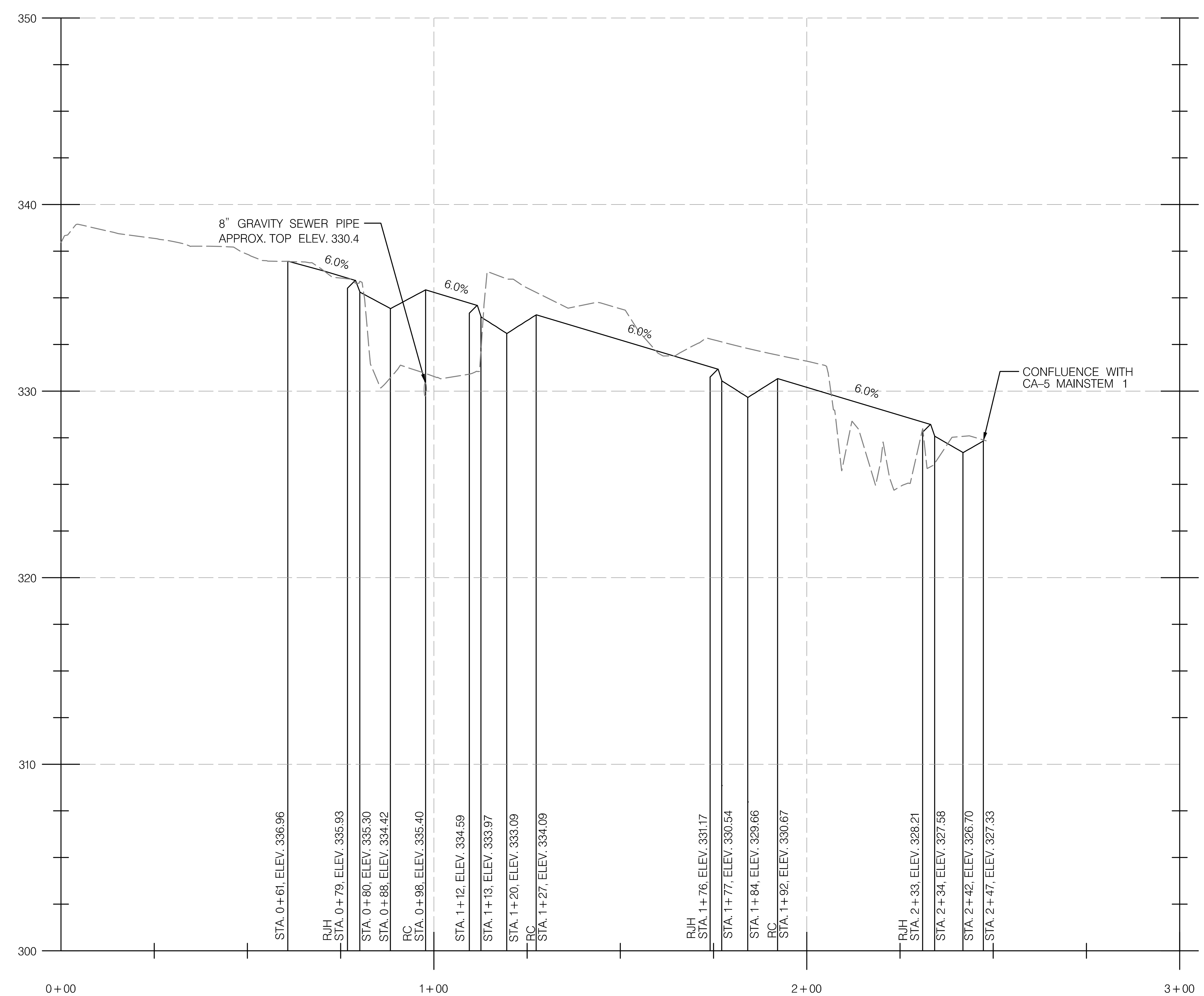
DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 20'
VERTICAL SCALE 1" = 4'

DRAWING NO. DP-10 OF 12

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V010_CA5.dgn



CA-5 TRIBUTARY 2 PROFILE

8'
4'
0
SCALE: 1" = 4'

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

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

————	PROPOSED GROUND
— — — —	EXISTING GROUND

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
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REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION PROFILE

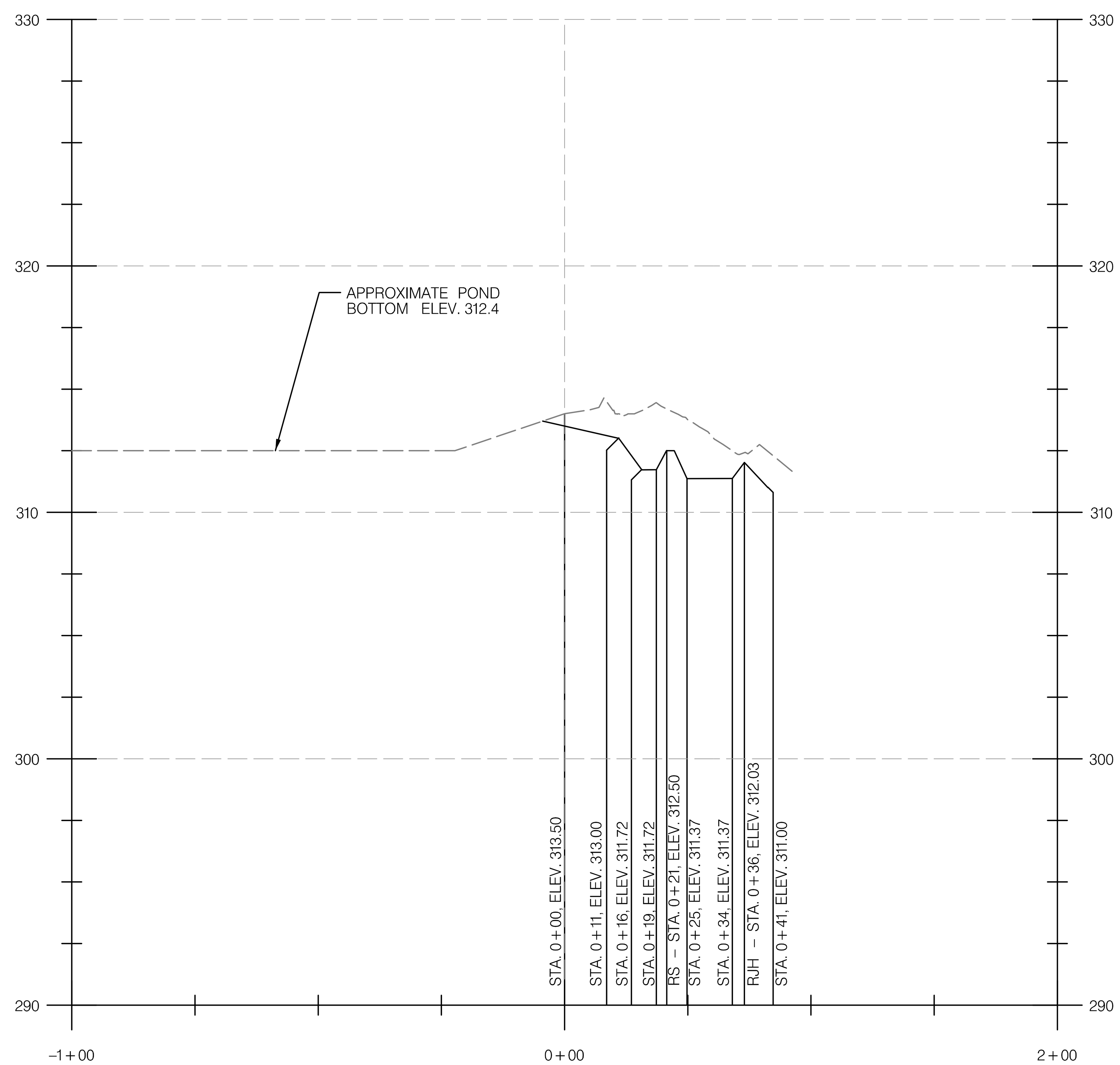
SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	
CHECKED BY	KSK	HORIZONTAL SCALE	1" = 20'
MDE/PRD	16825I20-PR-0040-01	VERTICAL SCALE	1" = 4'

DRAWING NO. DP-11 OF 12 SHEET NO. 60 OF 76

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V011_CA5.dgn



CA–5 POND OUTLET PROFILE

NOTE: UTILITY ELEVATIONS UNKNOWN. STREAM CROSSING LOCATIONS APPROXIMATED FROM FIELD SURVEY AND GIS DATA. UTILITY TEST PITS HAVE NOT YET BEEN PERFORMED. EXACT STATION AND ELEVATIONS OF CROSSINGS WILL BE INDICATED ONCE DATA IS AVAILABLE.

LEGEND

PROPOSED GROUND
EXISTING GROUND

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

8'
4'
0
SCALE: 1" = 4'

DATUM: NAD 83 (2001) Horizontal
NAVD 88 Vertical

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY HYDRAULICS DIVISION
I–495 & I–270 MANAGED
LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION PROFILE

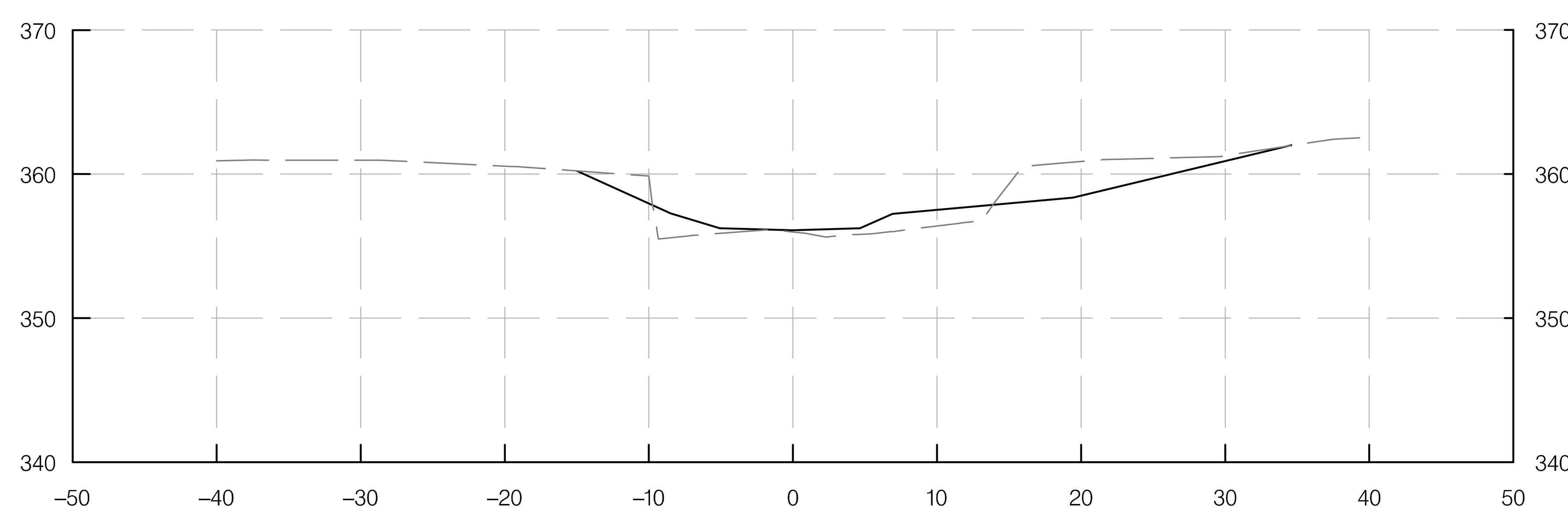
SCALE 1" = 20' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN	COUNTY MONTGOMERY
DRAWN BY CJN	LOGMILE
CHECKED BY KSK	HORIZONTAL SCALE 1" = 20'
MDE/PRD 16825120-PR-0040-01	VERTICAL SCALE 1" = 4'

DRAWING NO. **DP -12** OF **12** SHEET NO. 61 OF 76

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pDP-V012_CA5.dgn



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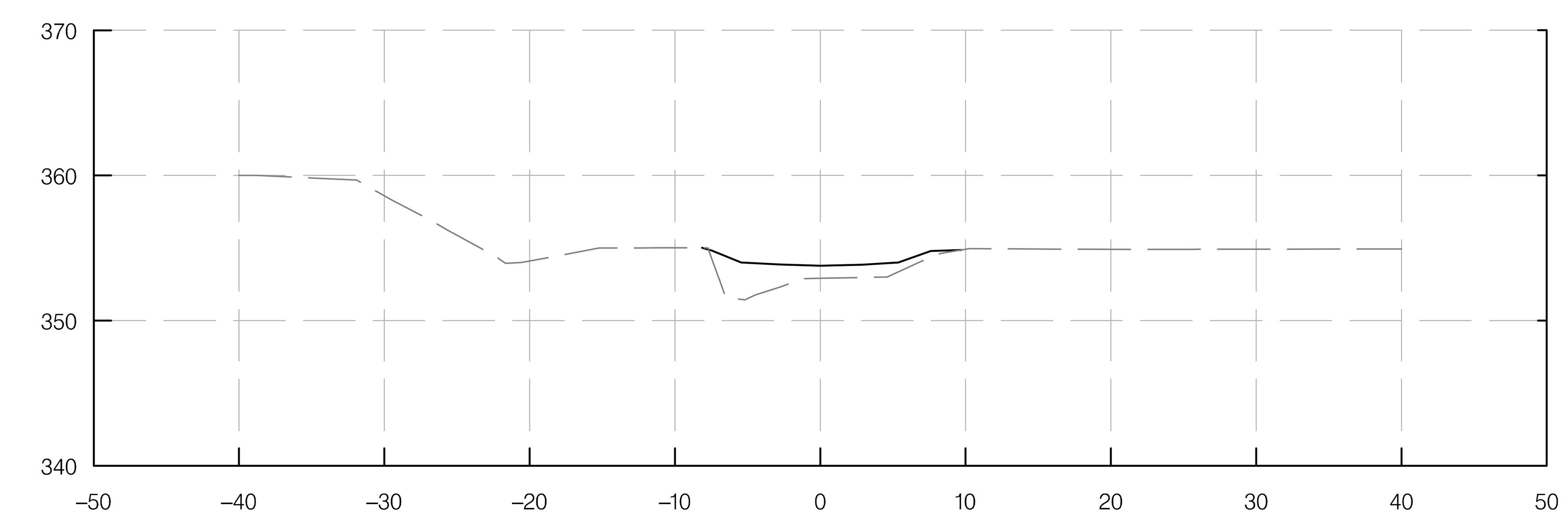

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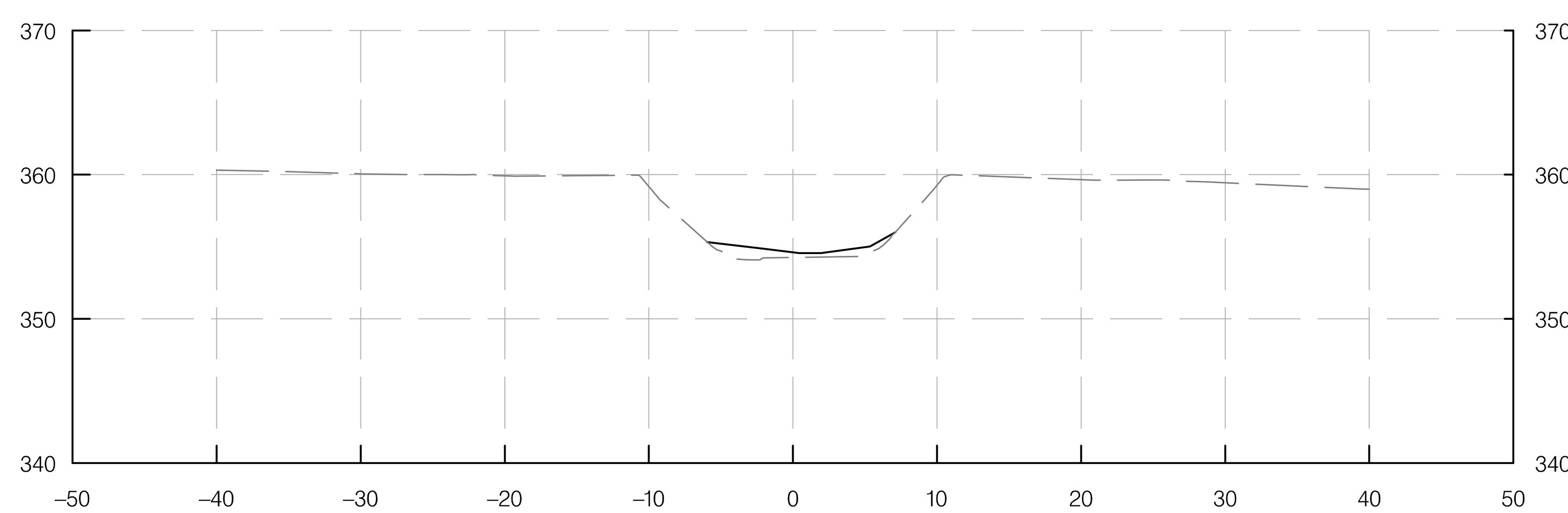

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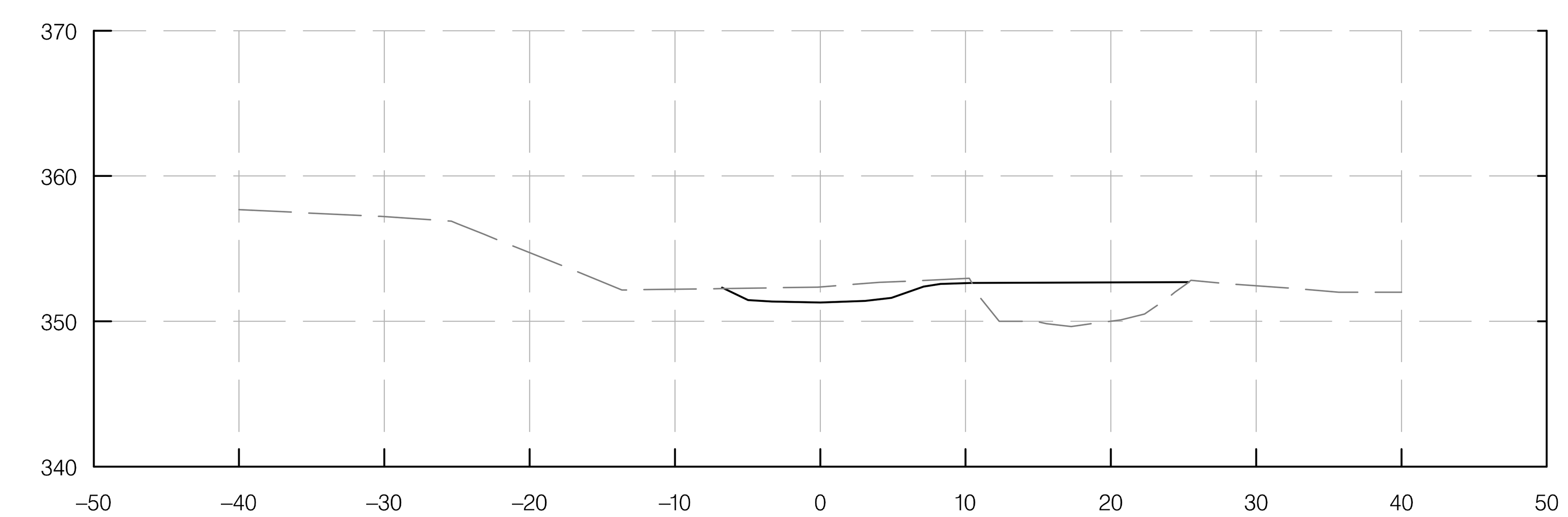

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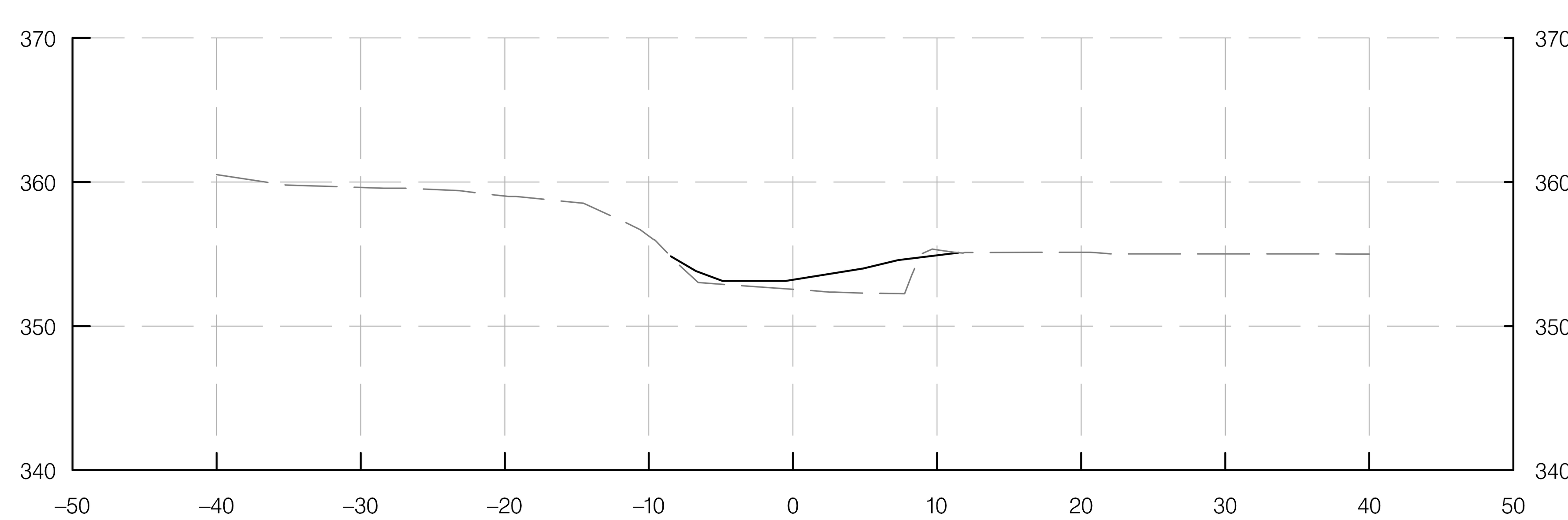

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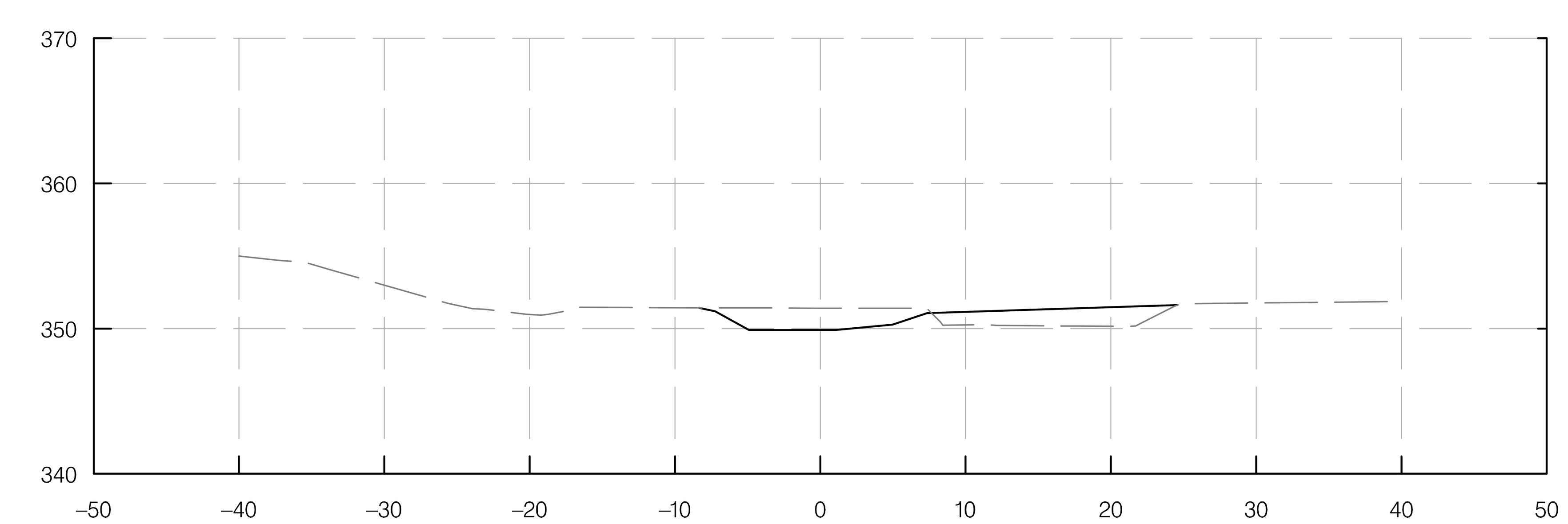

STA 3+00.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20-PR-0040-01

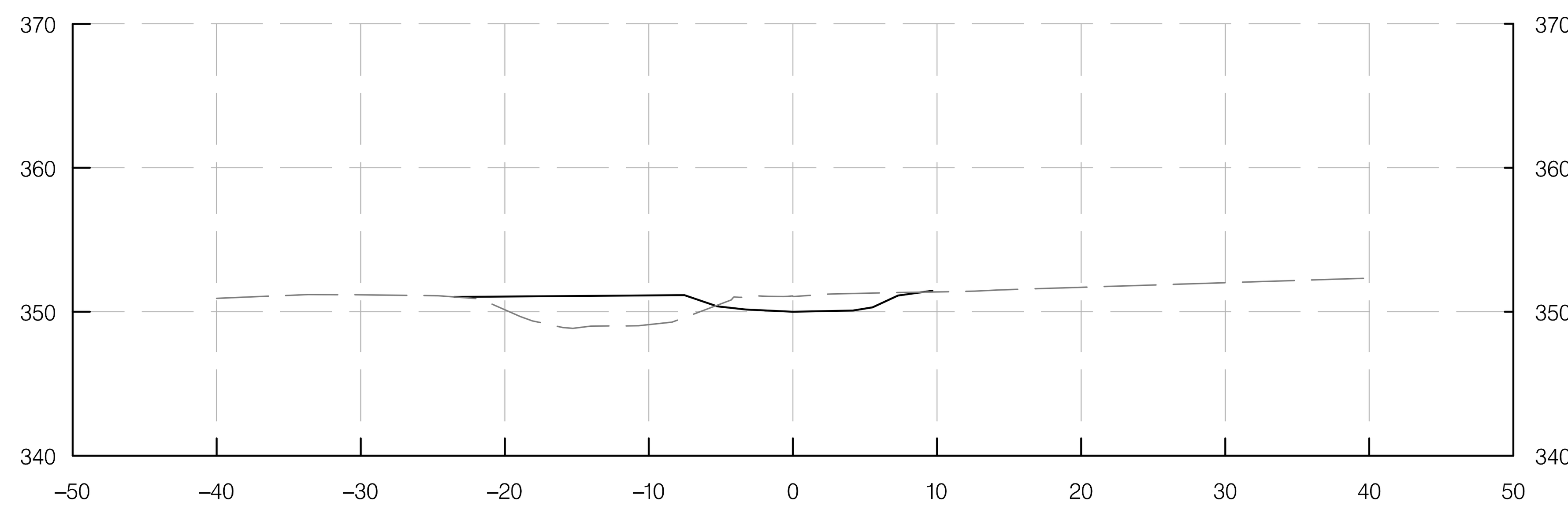
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DRAWING NO. XS-01 OF 15 SHEET NO. 62 OF 76

COASTAL RESOURCES INC.

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X001_CA5.dgn



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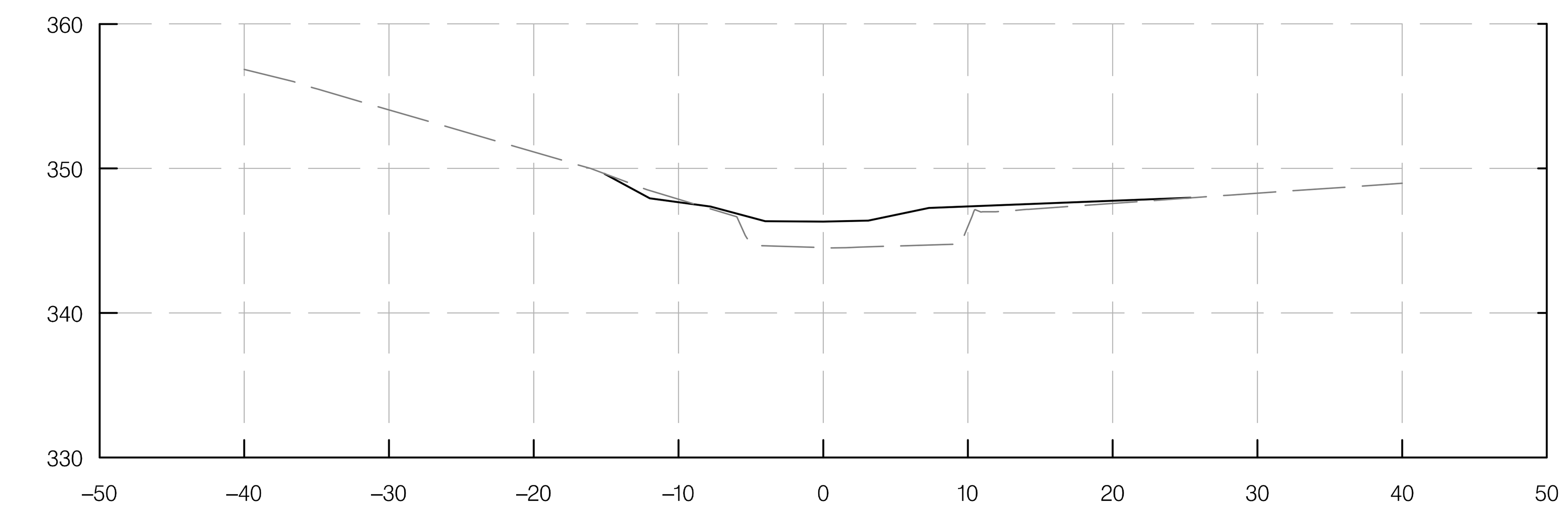

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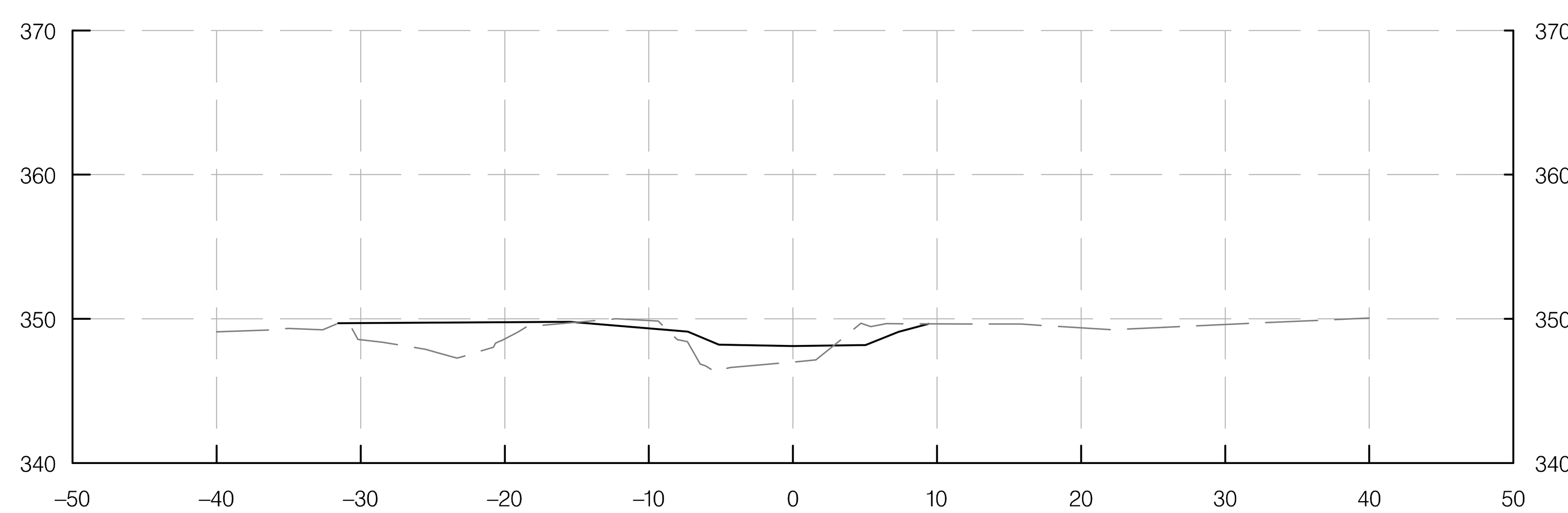

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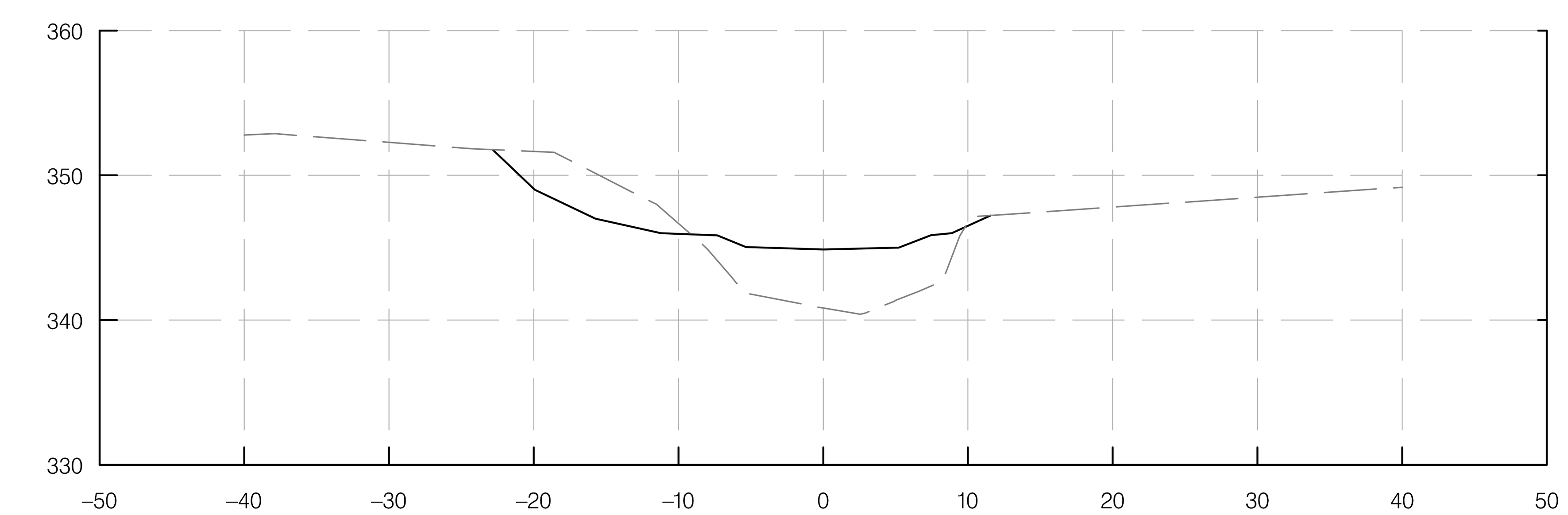

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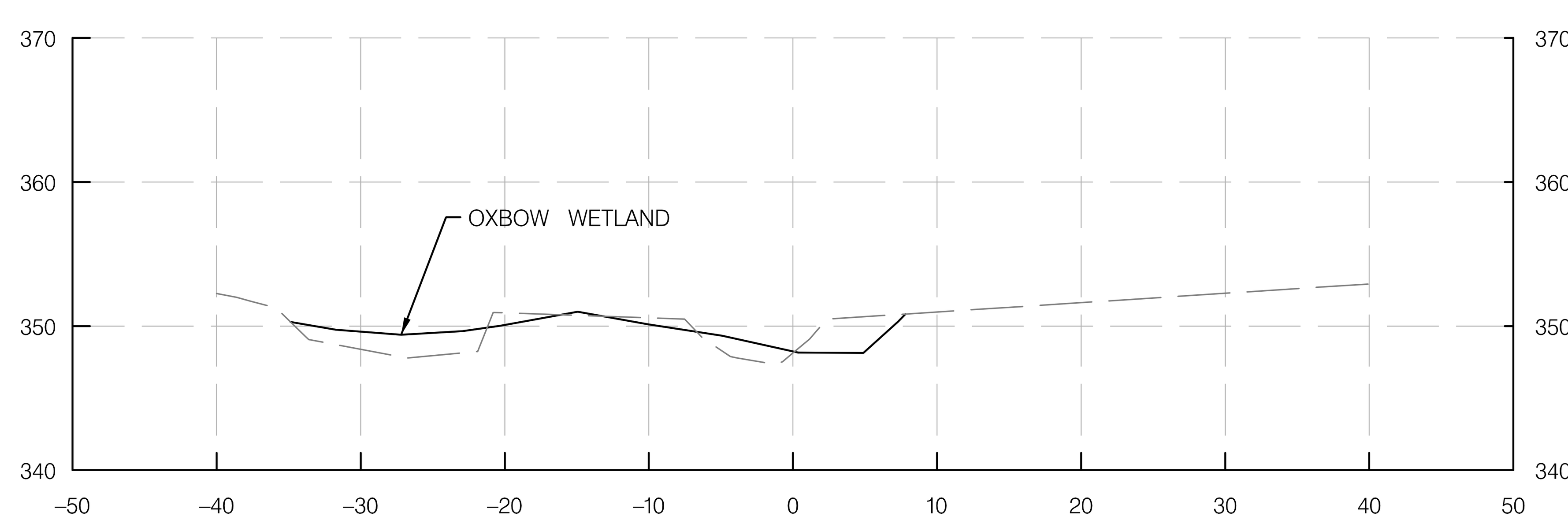

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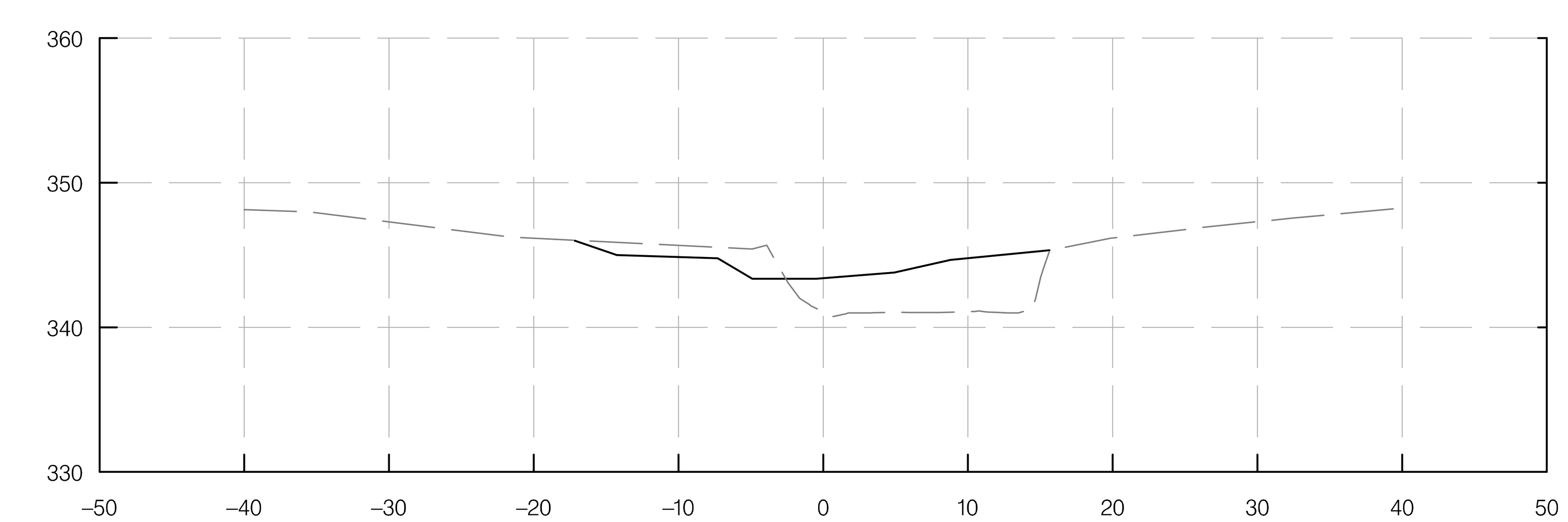

STA 6+00.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION CROSS SECTION

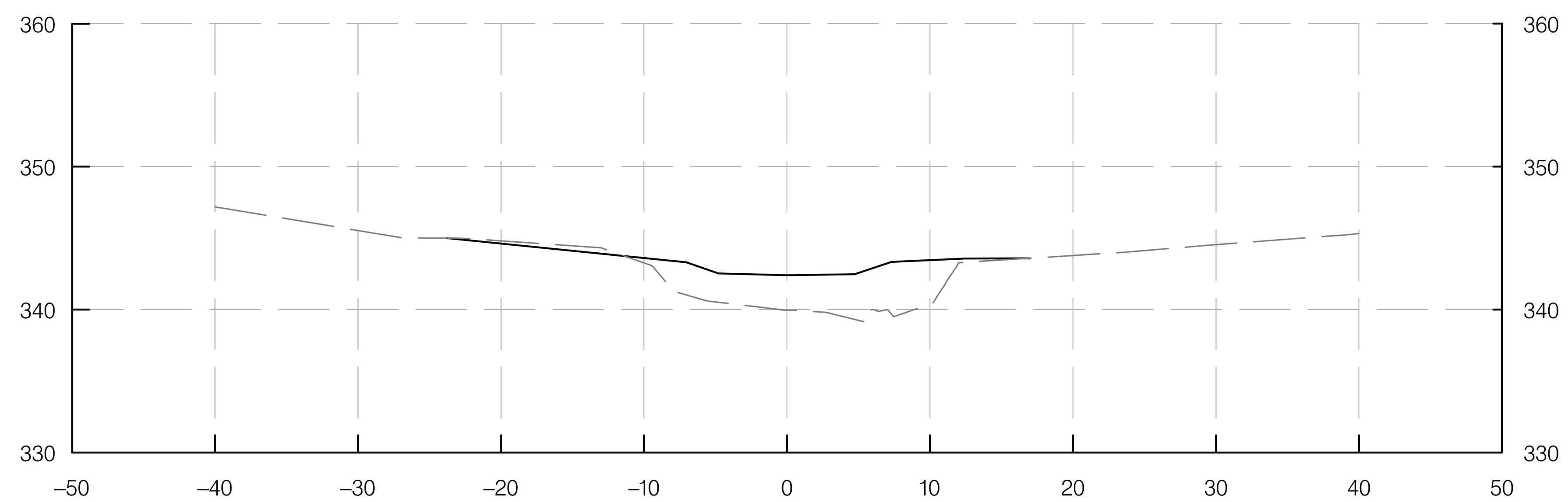
SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	
CHECKED BY	KSK	HORIZONTAL SCALE	1" = 10'
MDE/PRD	16825120-PR-0040-01	VERTICAL SCALE	1" = 10'

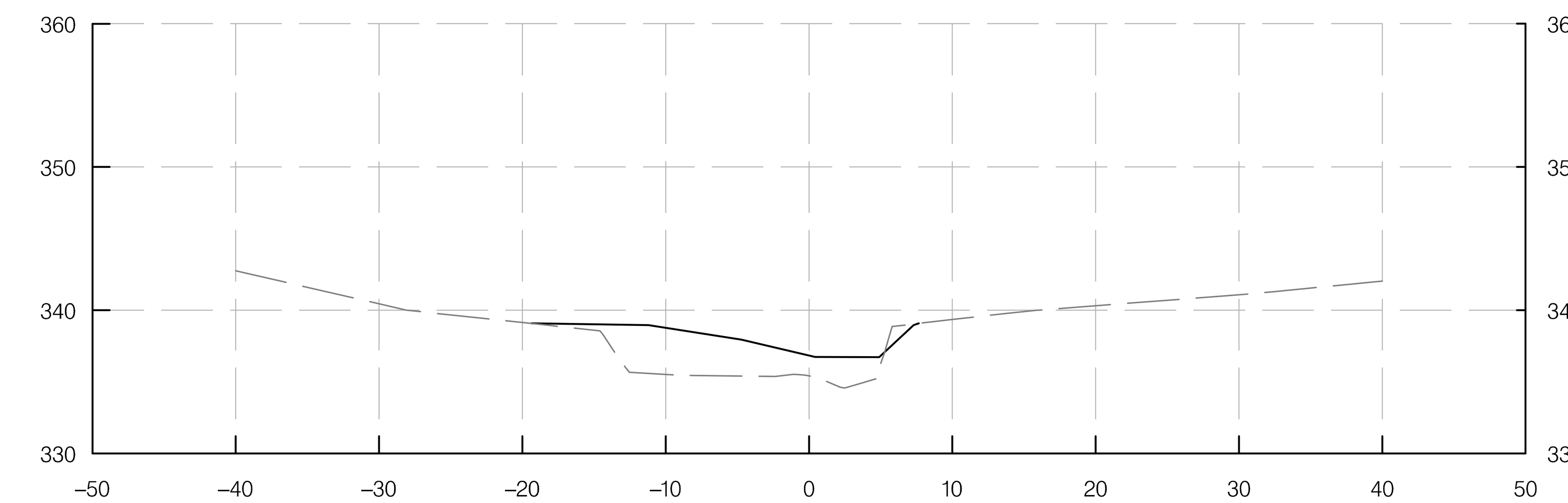
DRAWING NO. XS-02 OF 15 SHEET NO. 63 OF 76

COASTAL RESOURCES INC.

BY: caln -



STA 6+50.00



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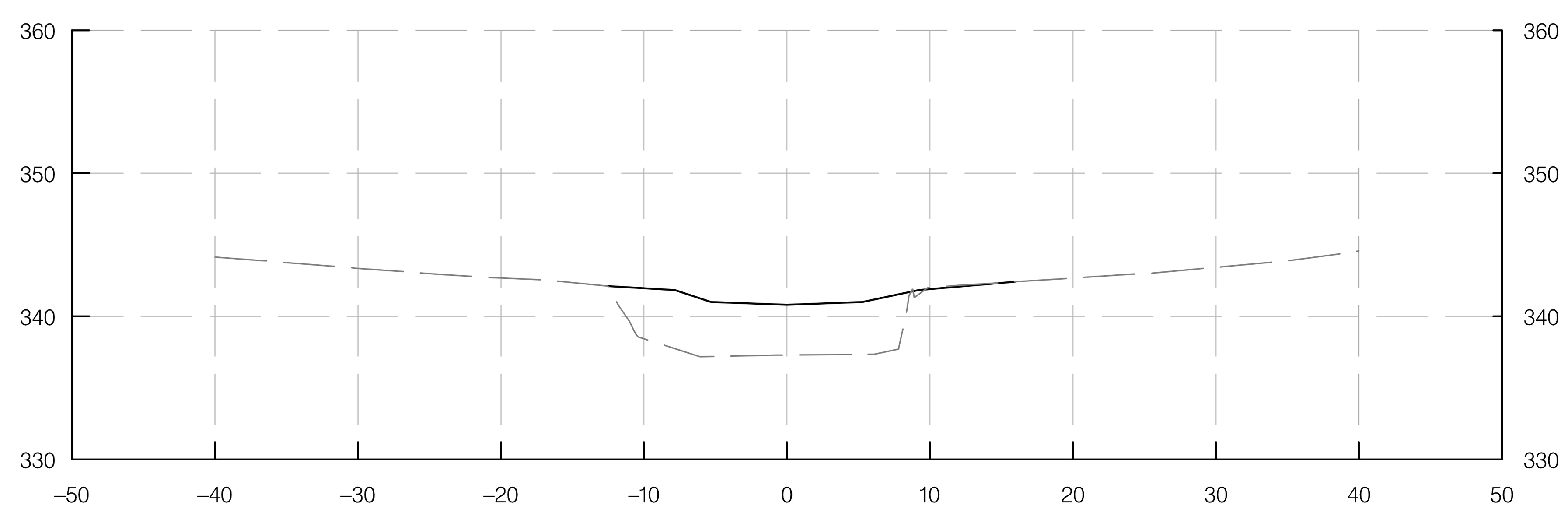

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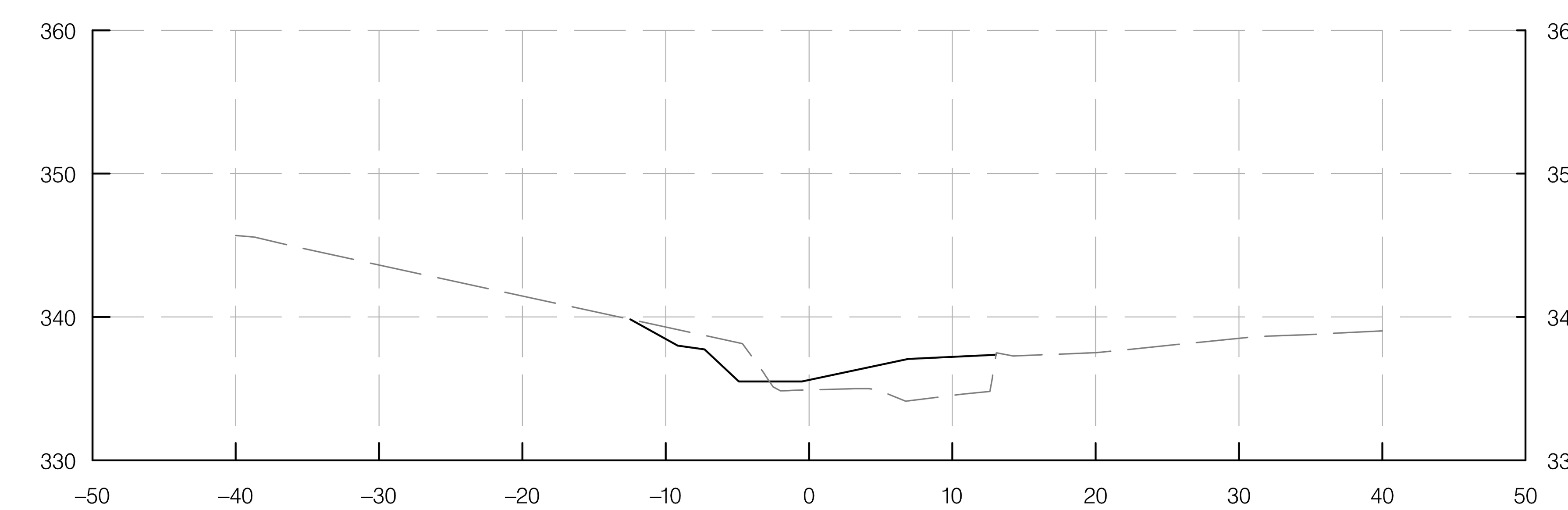
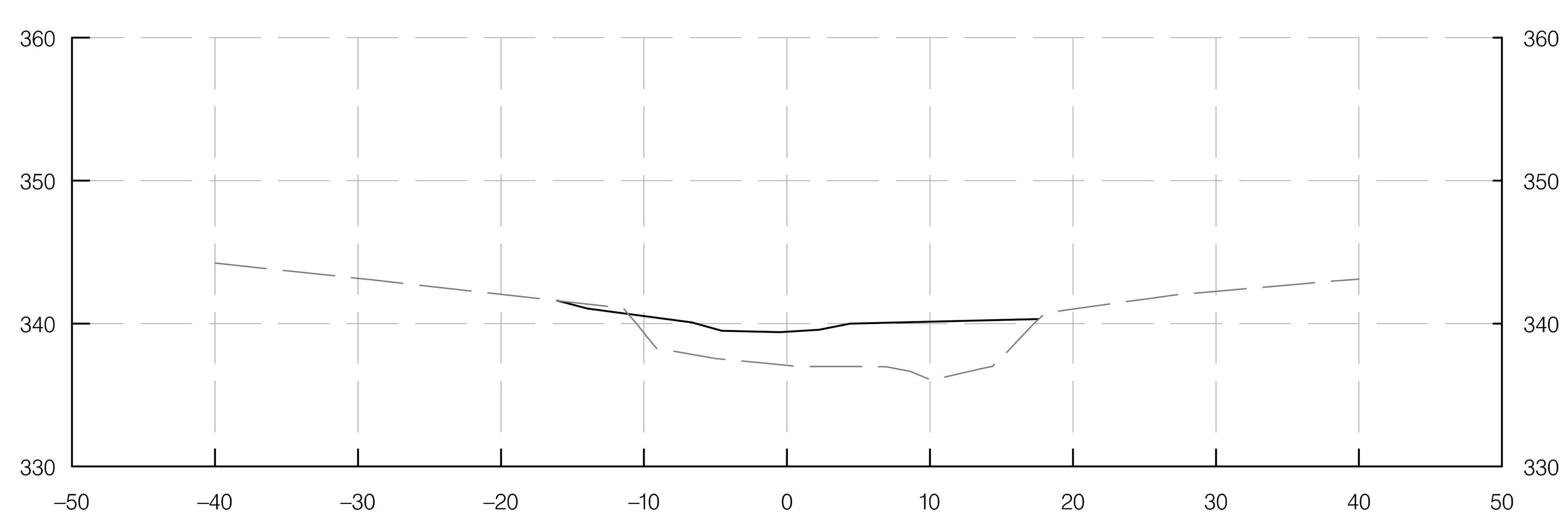


STA 8+50.00



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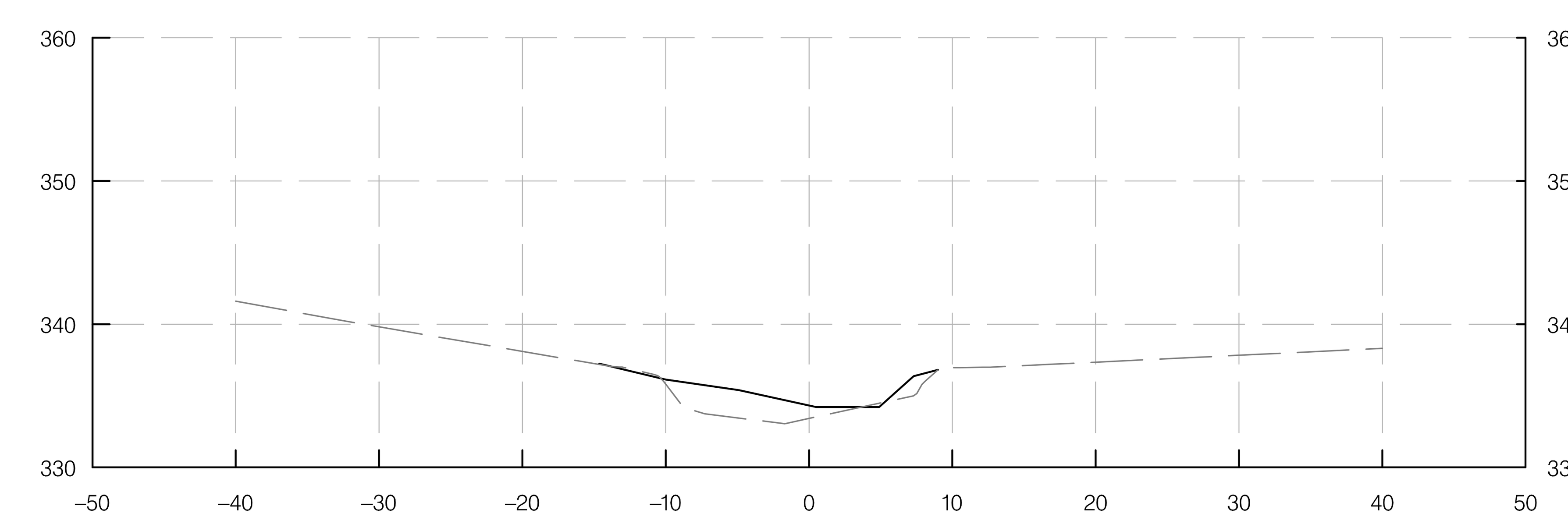

STA 9+00.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825l/20–PR–0040–01

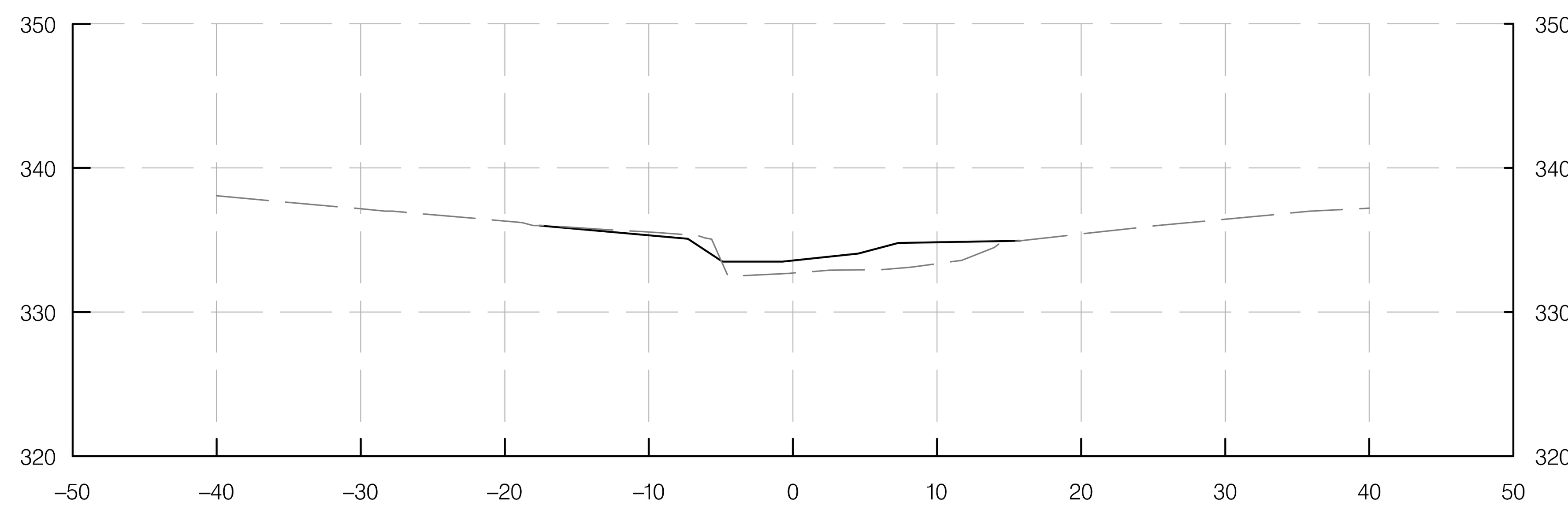
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DRAWING NO. XS-03 OF 15 SHEET NO. 64 OF 76

COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X003_CA5.dgn



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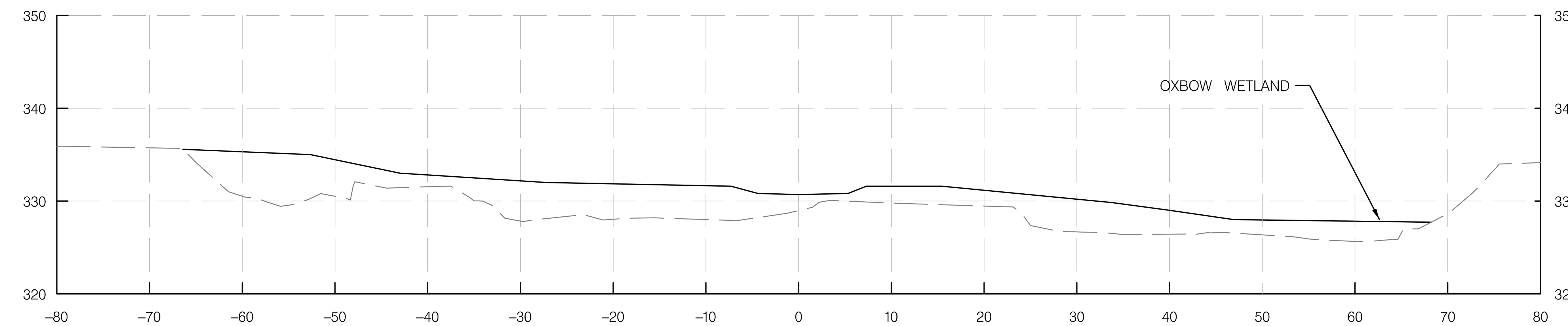

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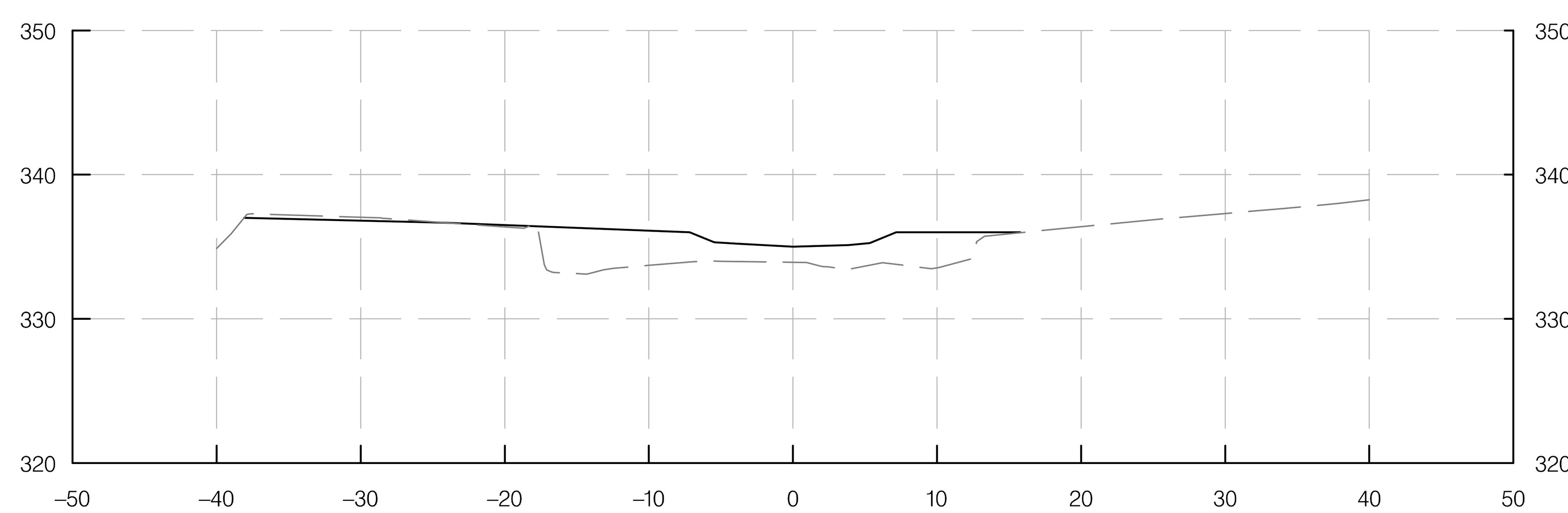

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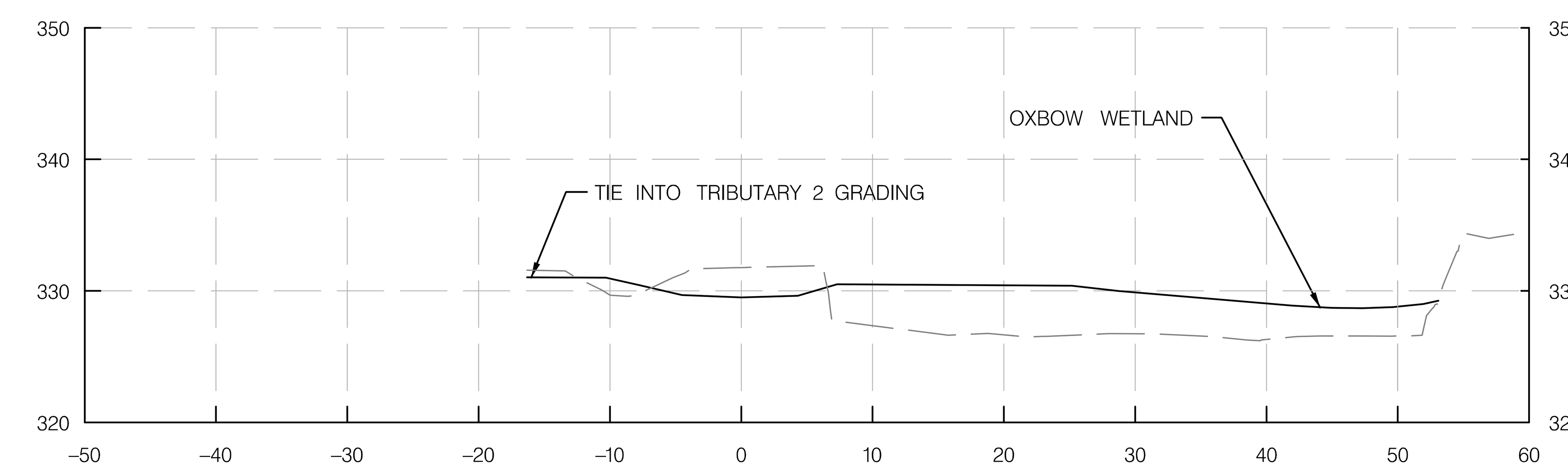

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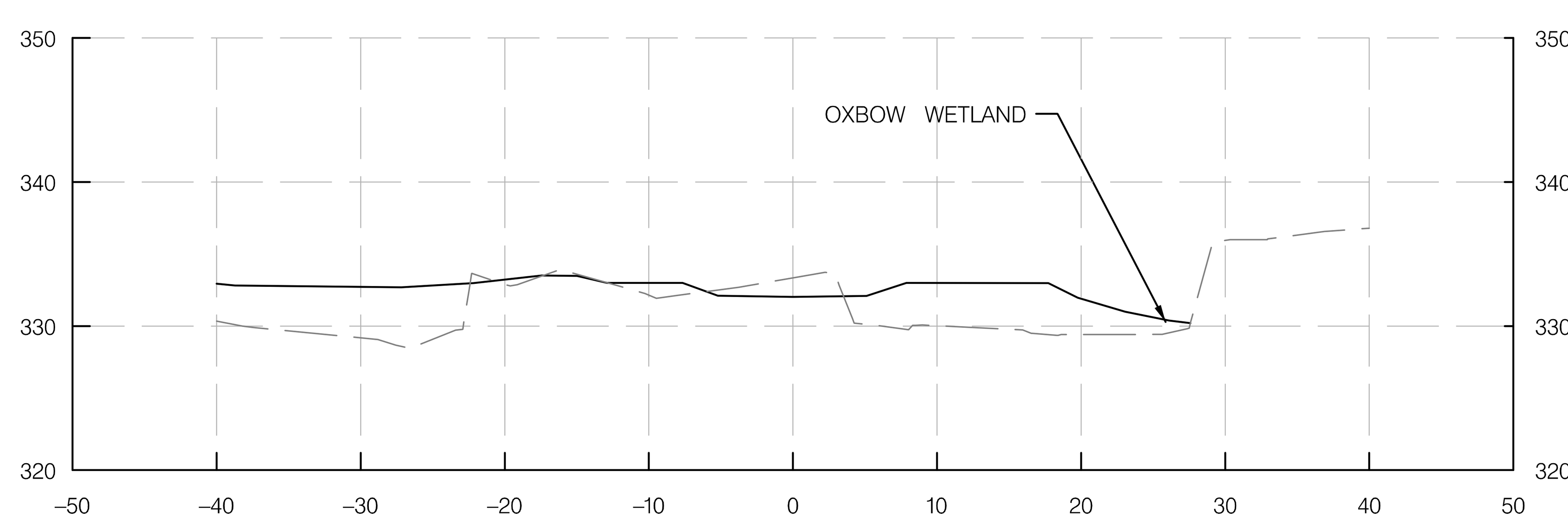

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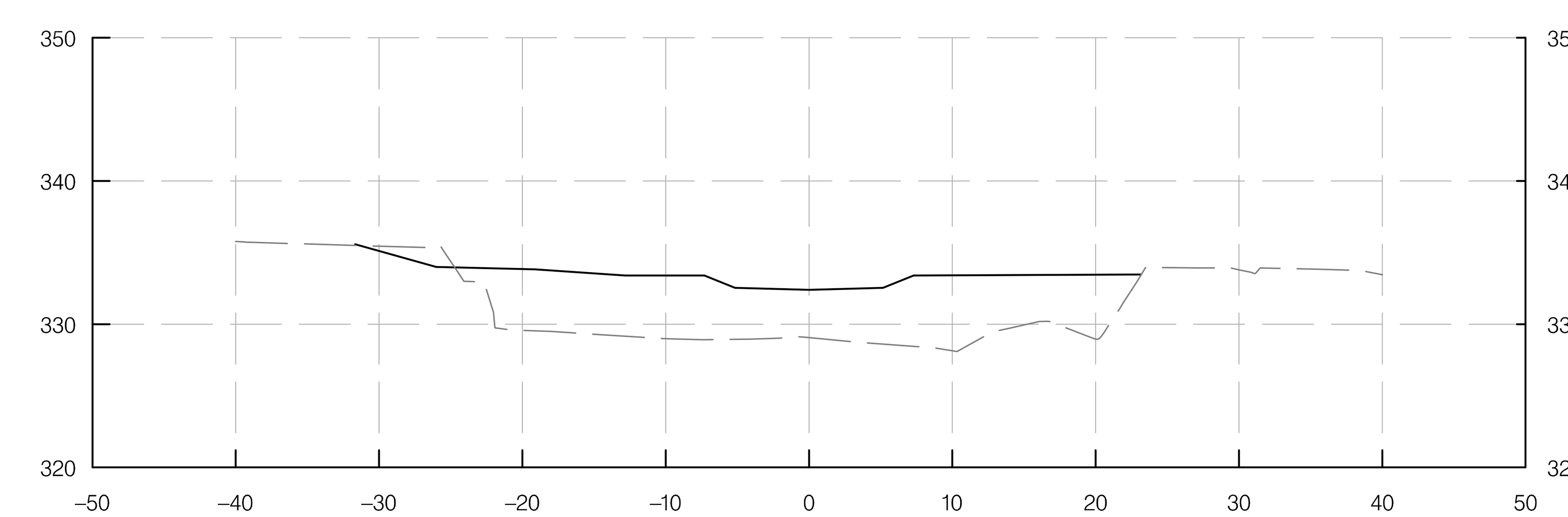

STA 12+00.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20-PR-0040-01

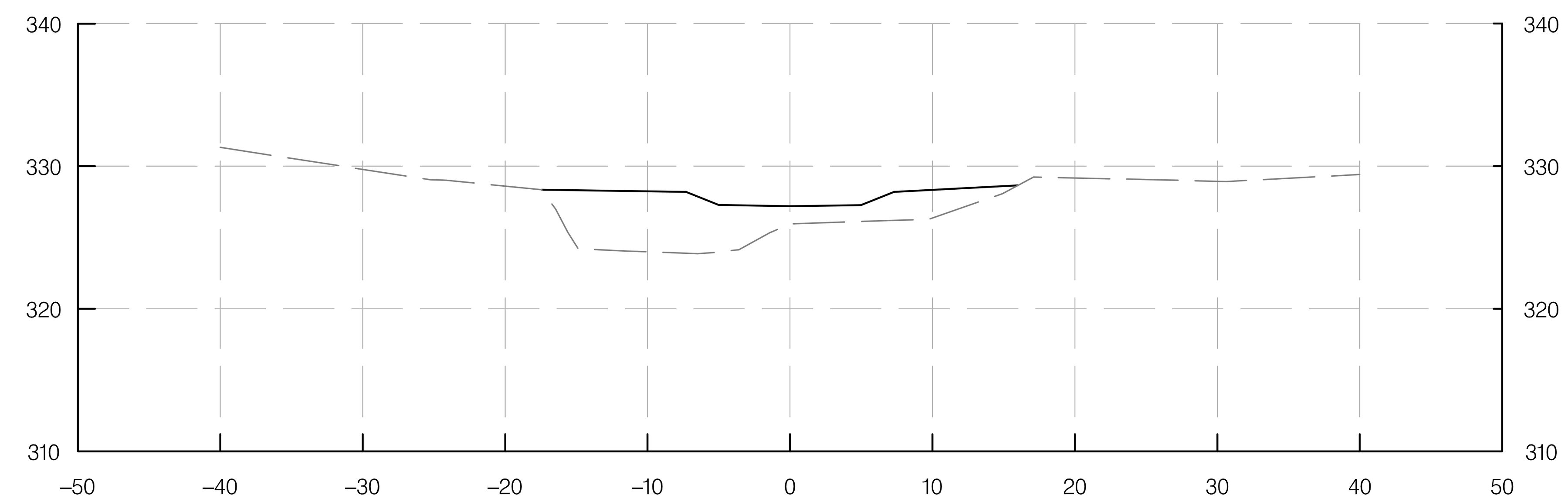
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DRAWING NO. XS-04 OF 15

COASTAL RESOURCES INC.

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X004_CA5.dgn



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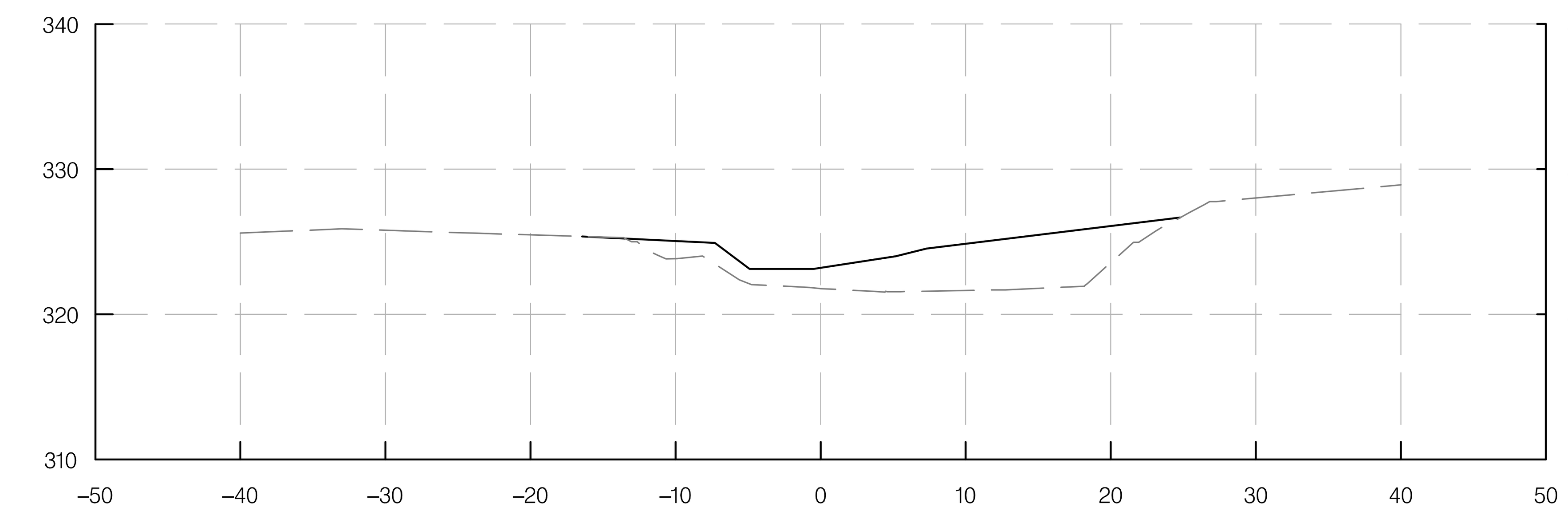

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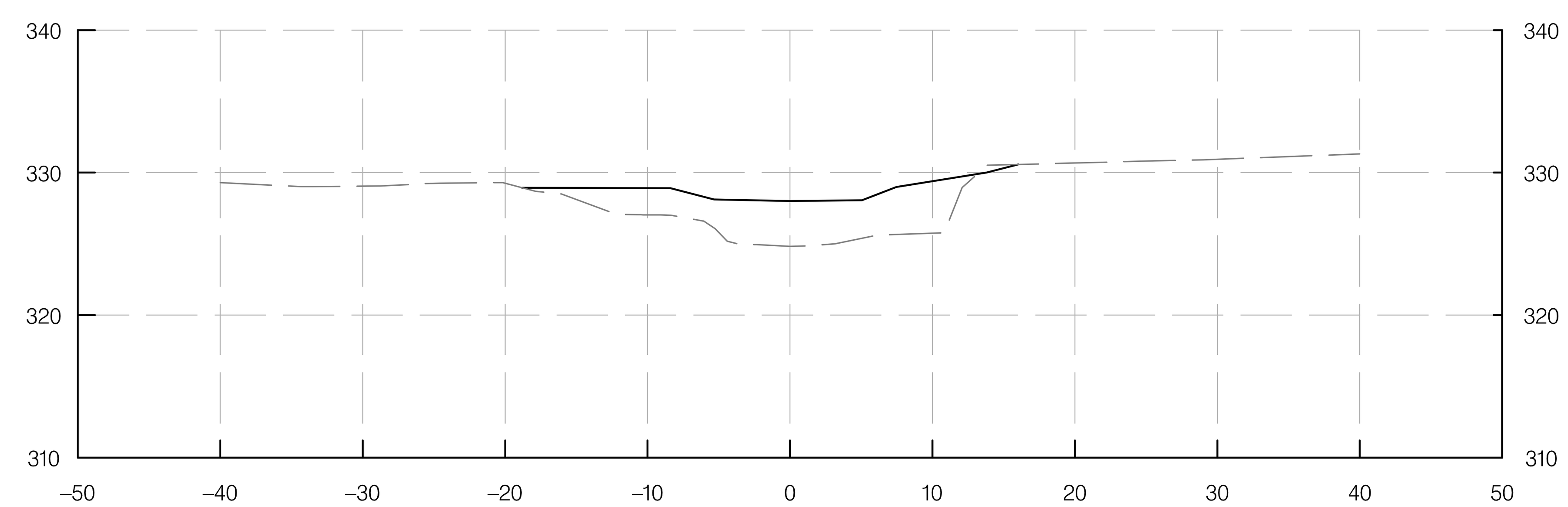

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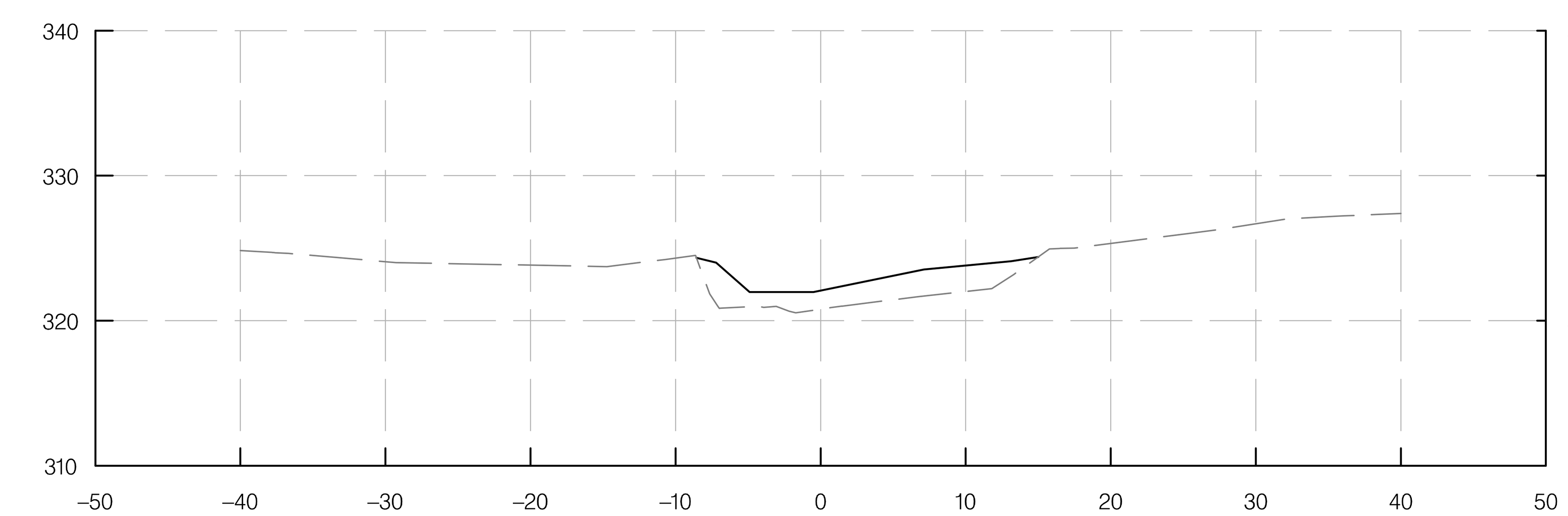

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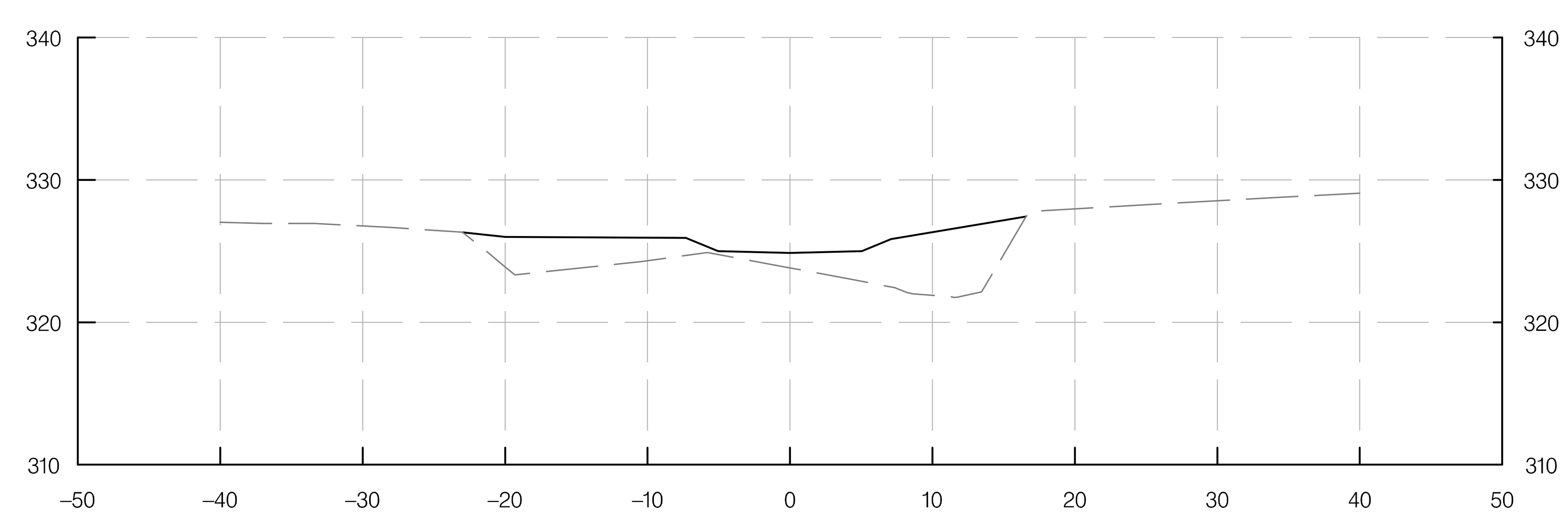

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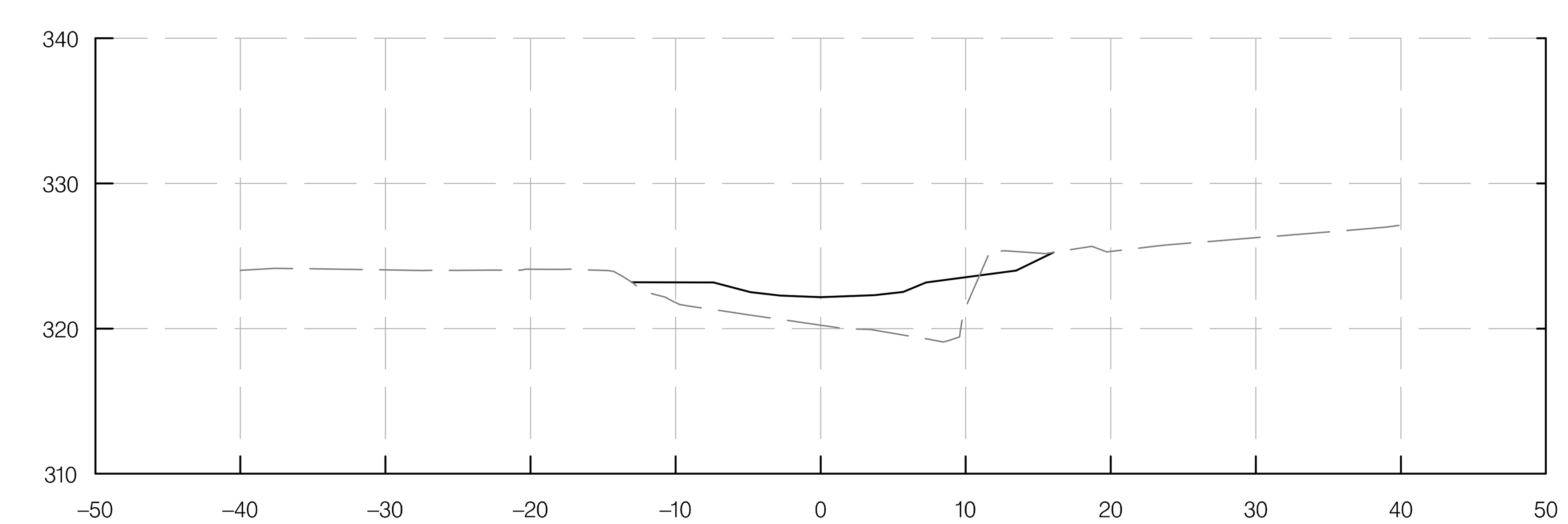

STA 15+00.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

COASTAL RESOURCES INC.

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120-PR-0040-01

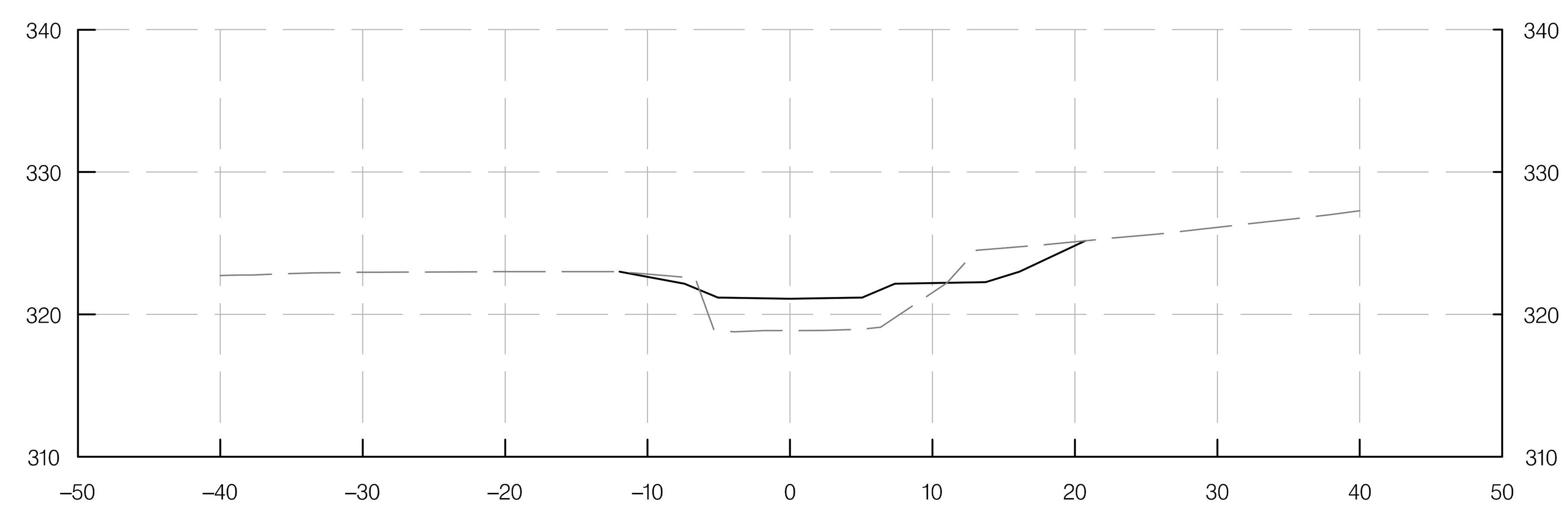
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DRAWING NO. XS-05 OF 15

SHEET NO. 66 OF 76

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X005_CA5.dgn



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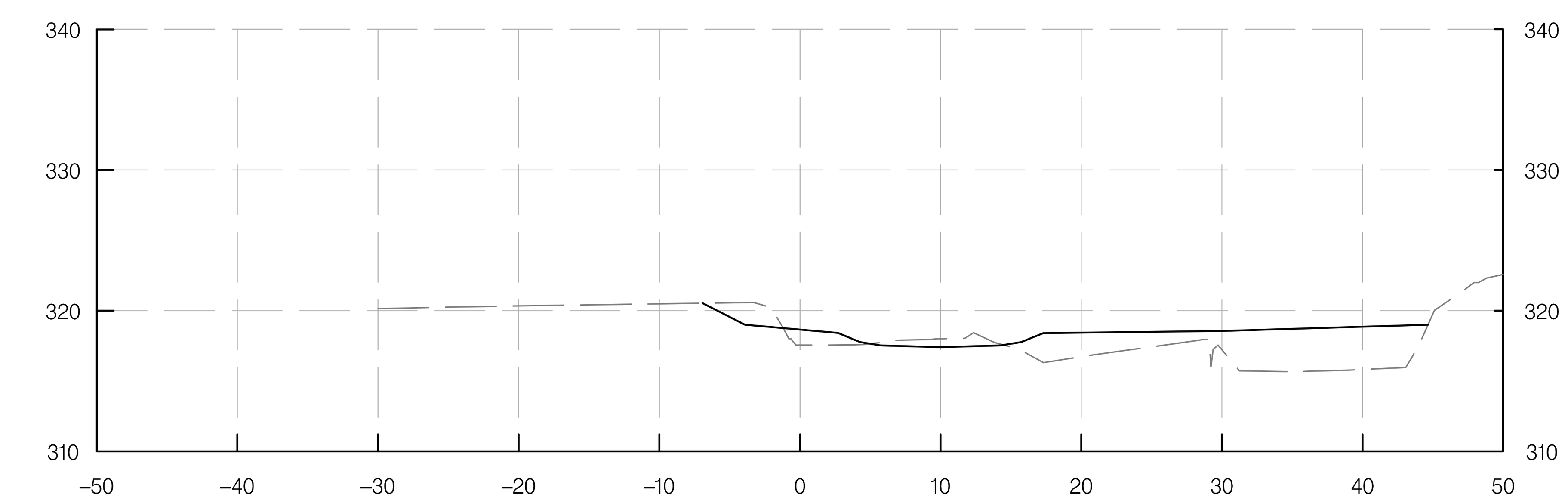

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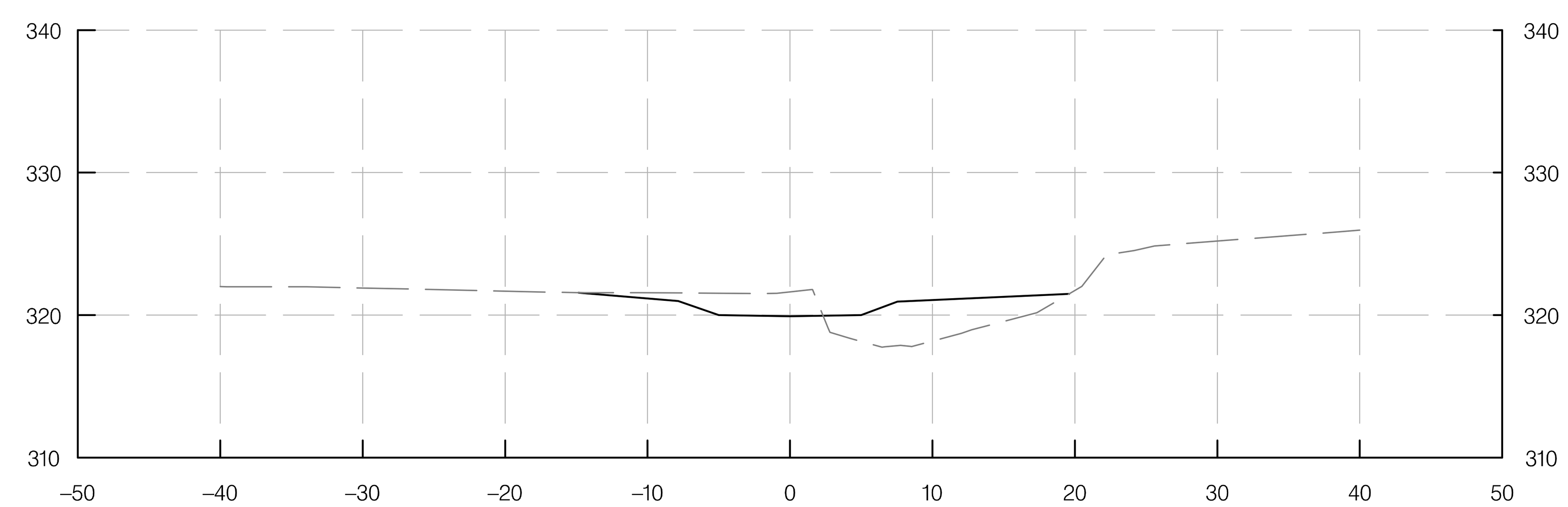

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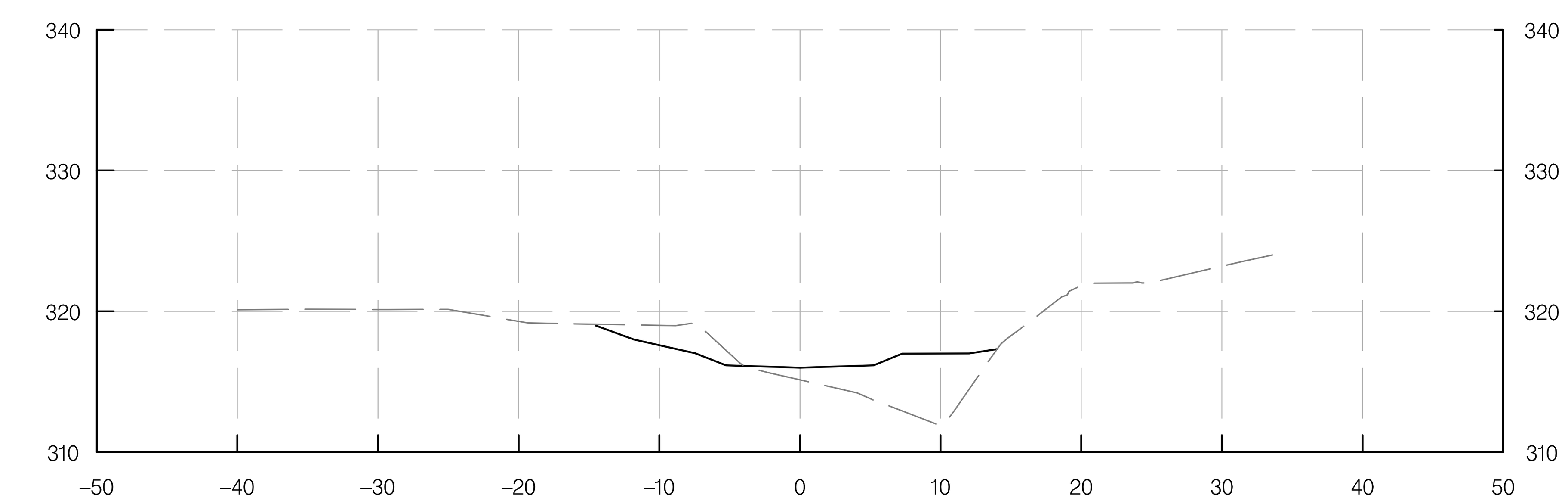

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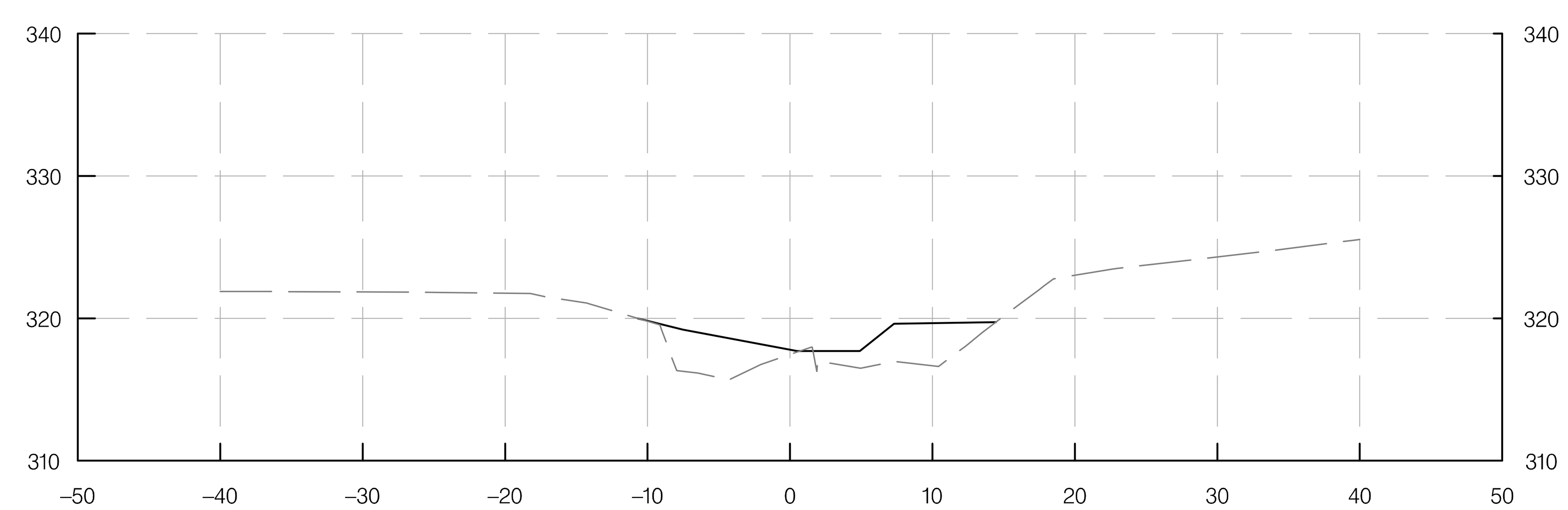

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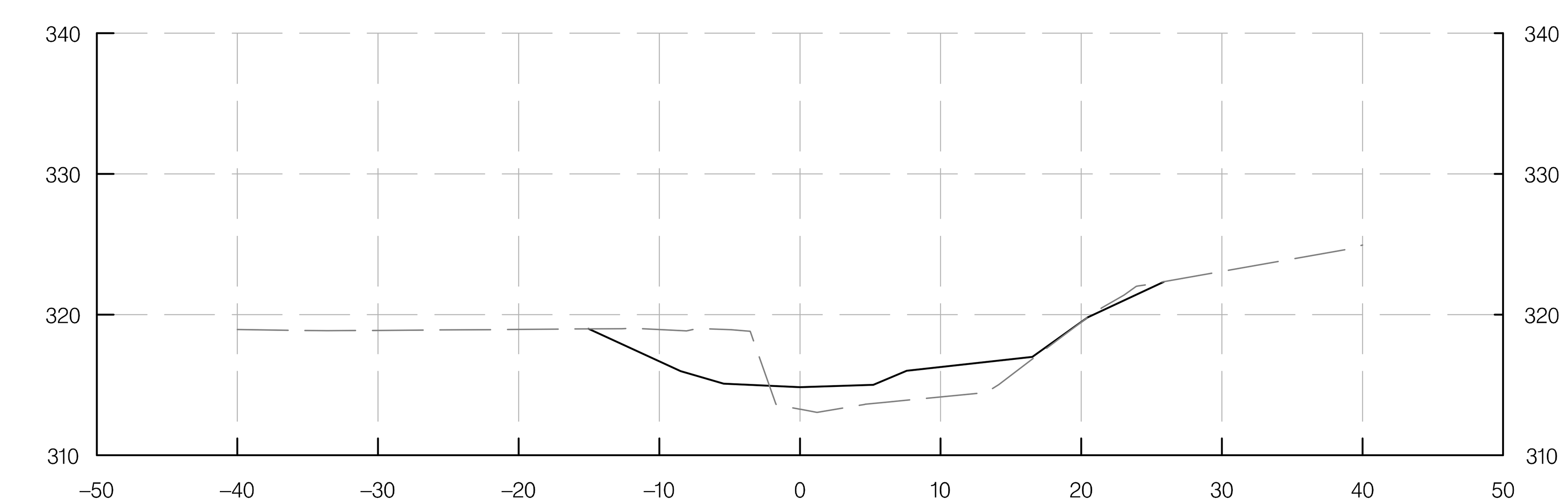

STA 18+00.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

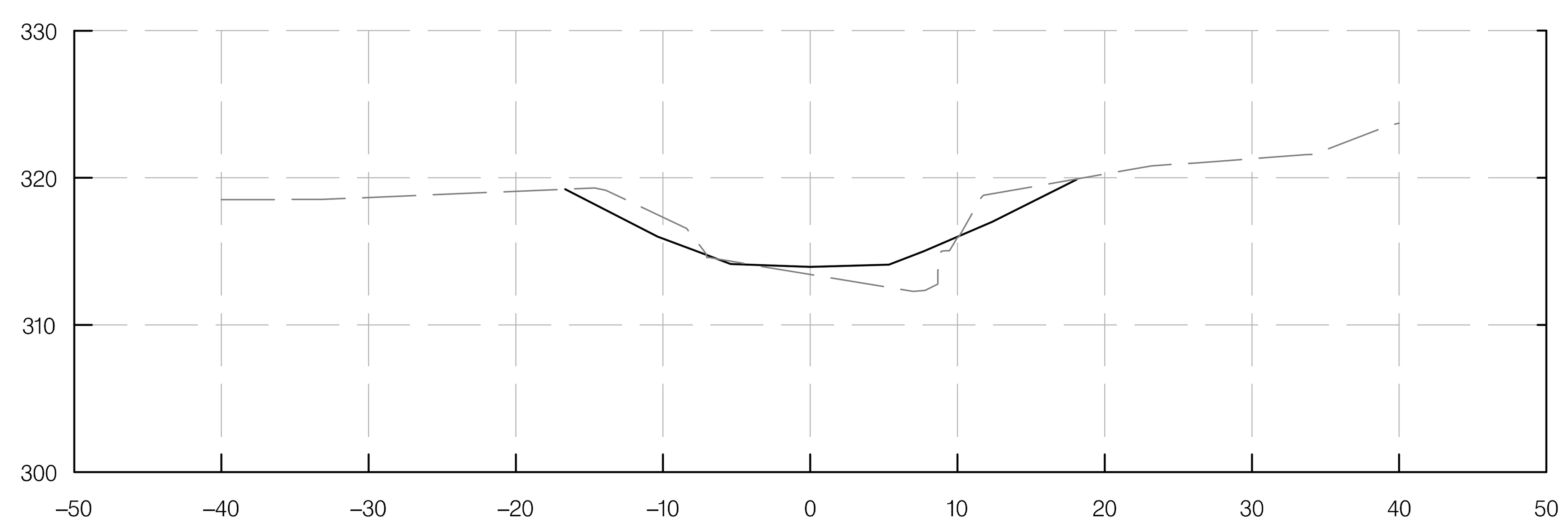
DESIGNED BY SCN	COUNTY MONTGOMERY
DRAWN BY CJN	LOGMILE
CHECKED BY KSK	HORIZONTAL SCALE 1" = 10'
MDE/PRD 168251/20–PR–0040–01	VERTICAL SCALE 1" = 10'

DRAWING NO. XS-06 OF 15 SHEET NO. 67 OF 76

COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X006_CA5.dgn



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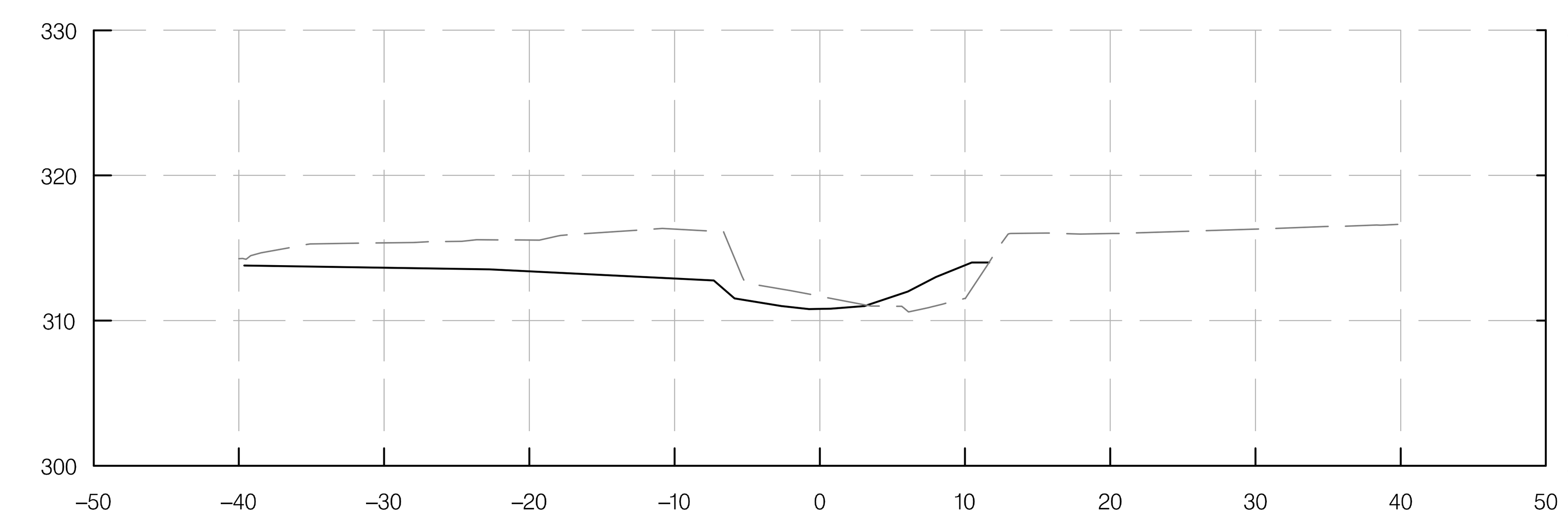

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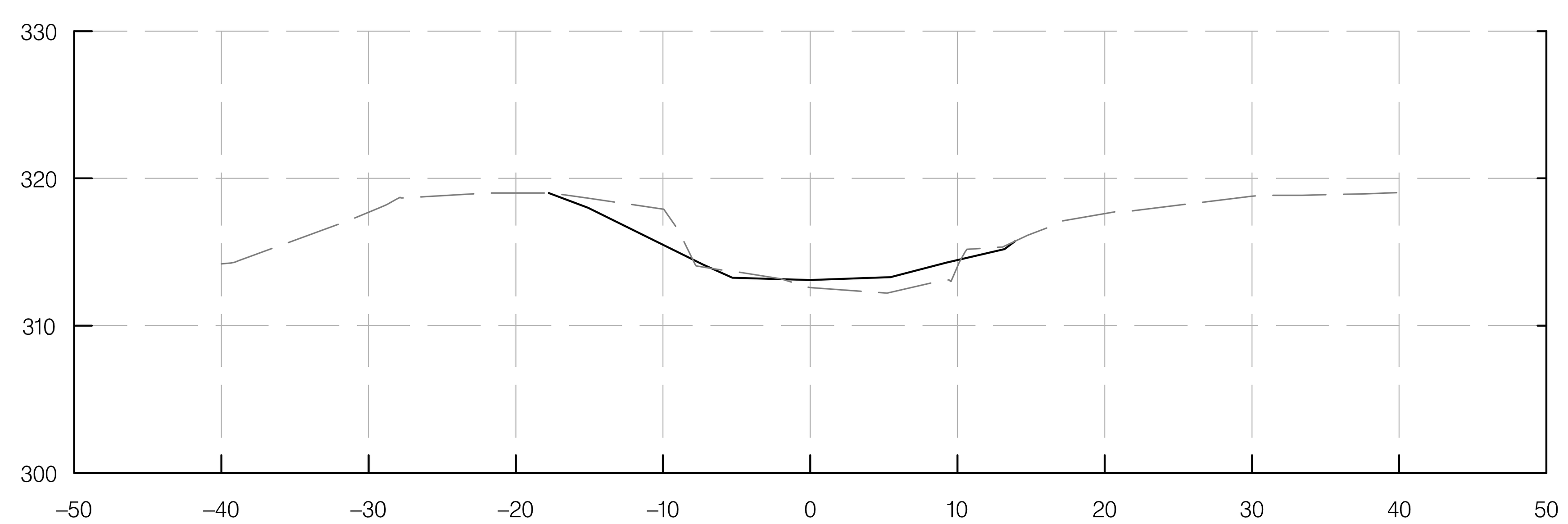

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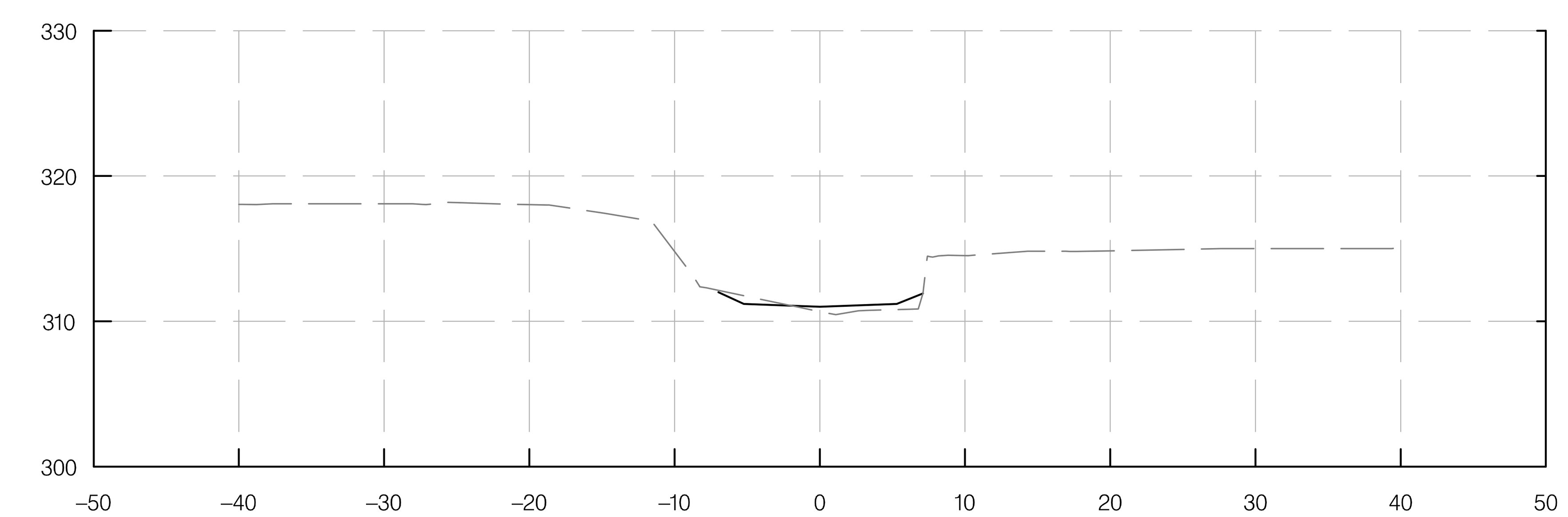

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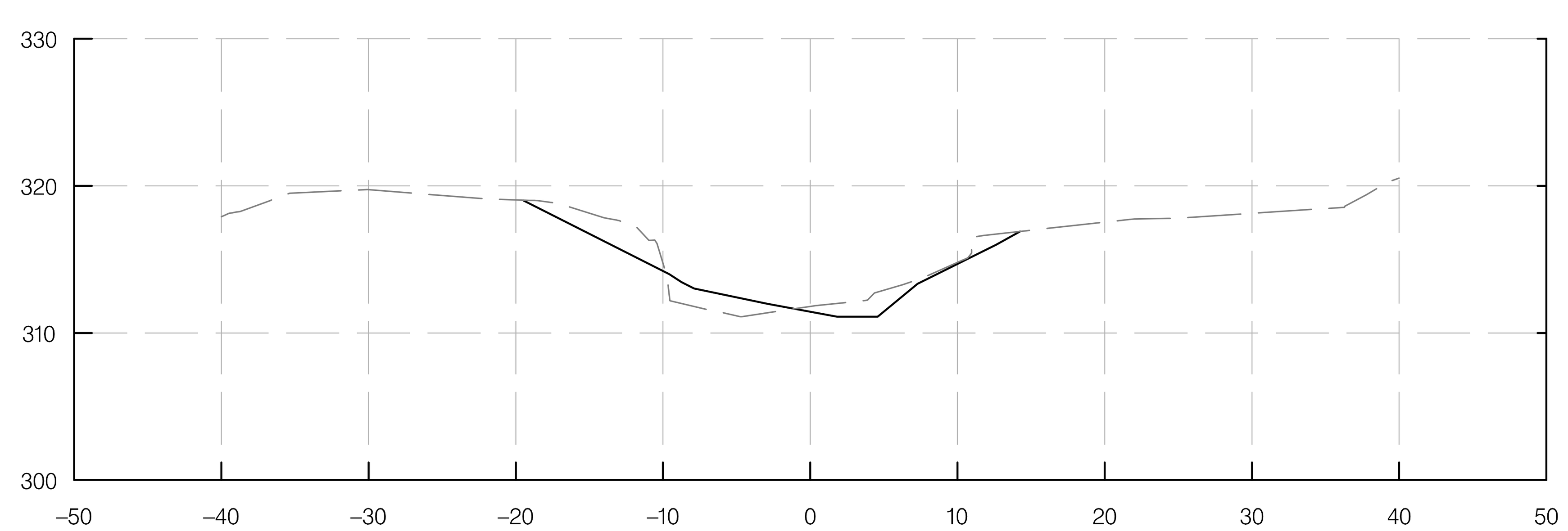

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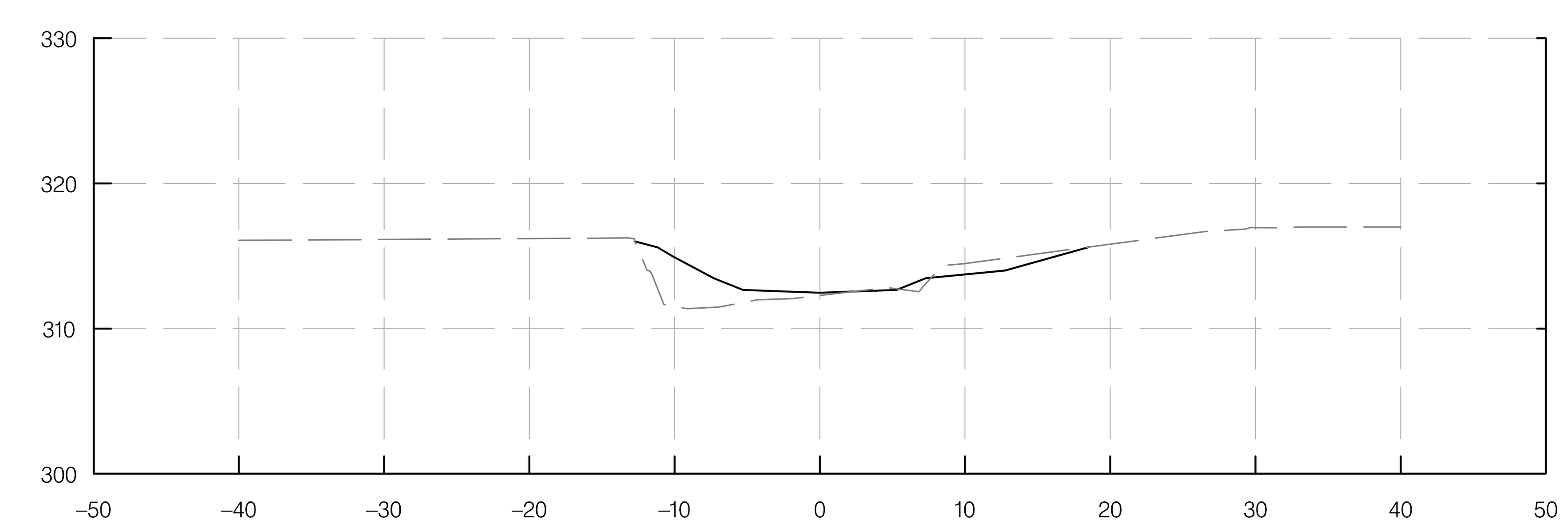

STA 21 + 00.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20–PR–0040–01

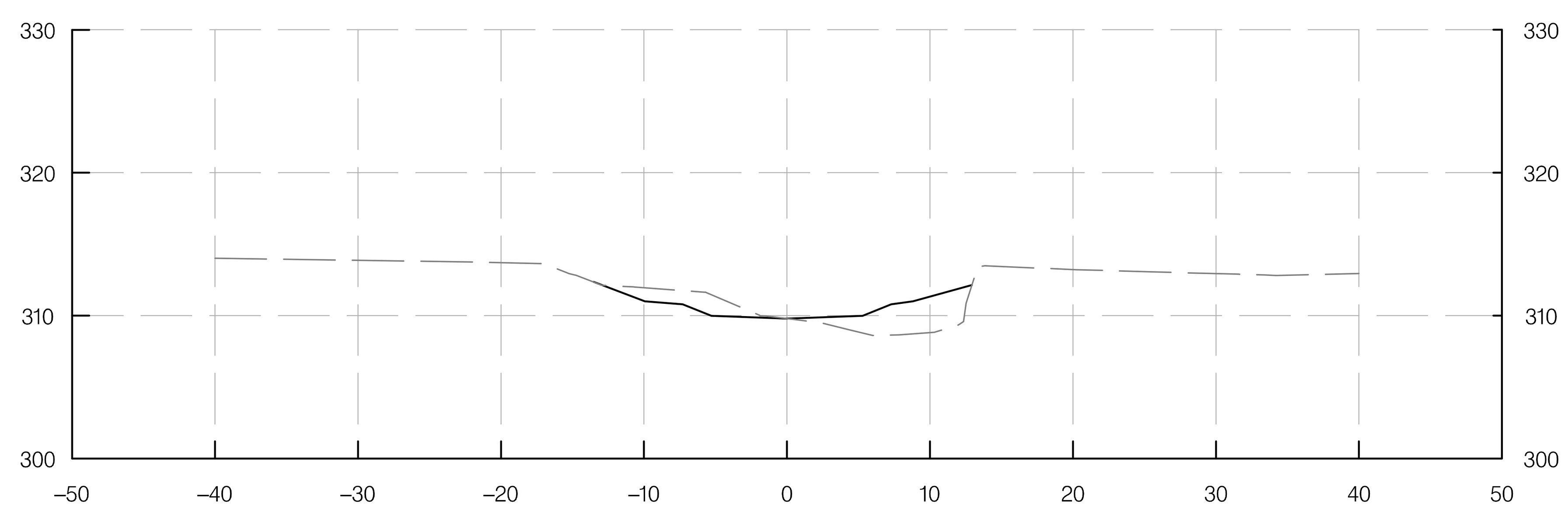
COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DRAWING NO. XS-07 OF 15

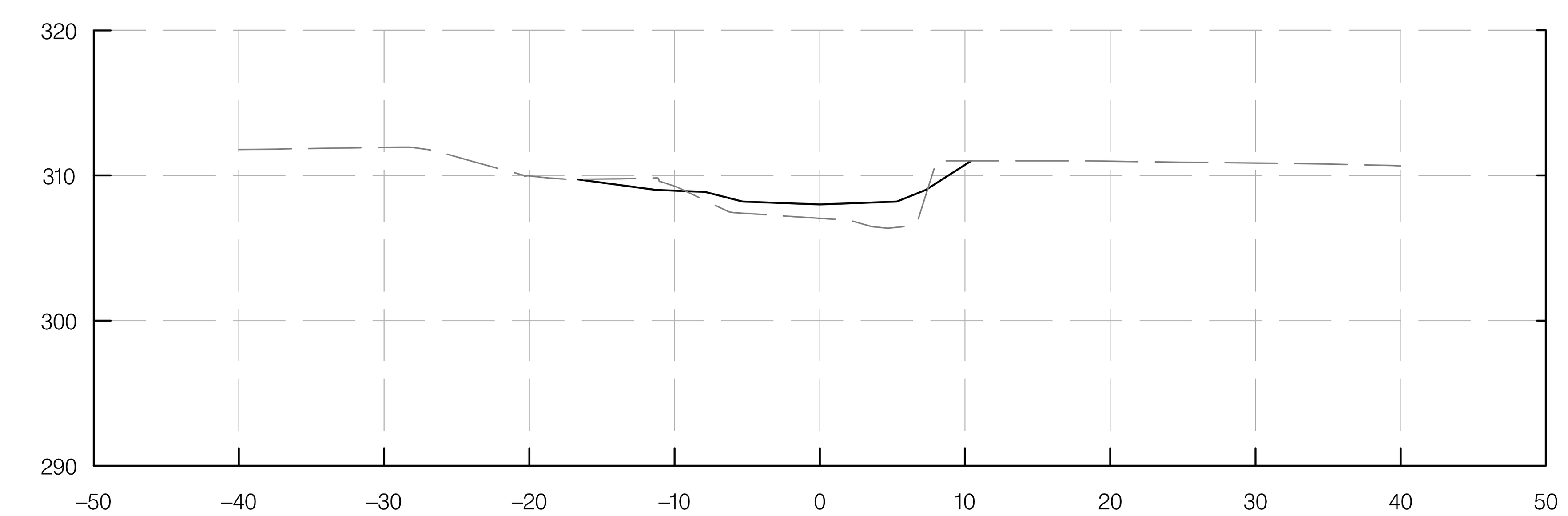
COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X007_CA5.dgn



STA 21+50.00



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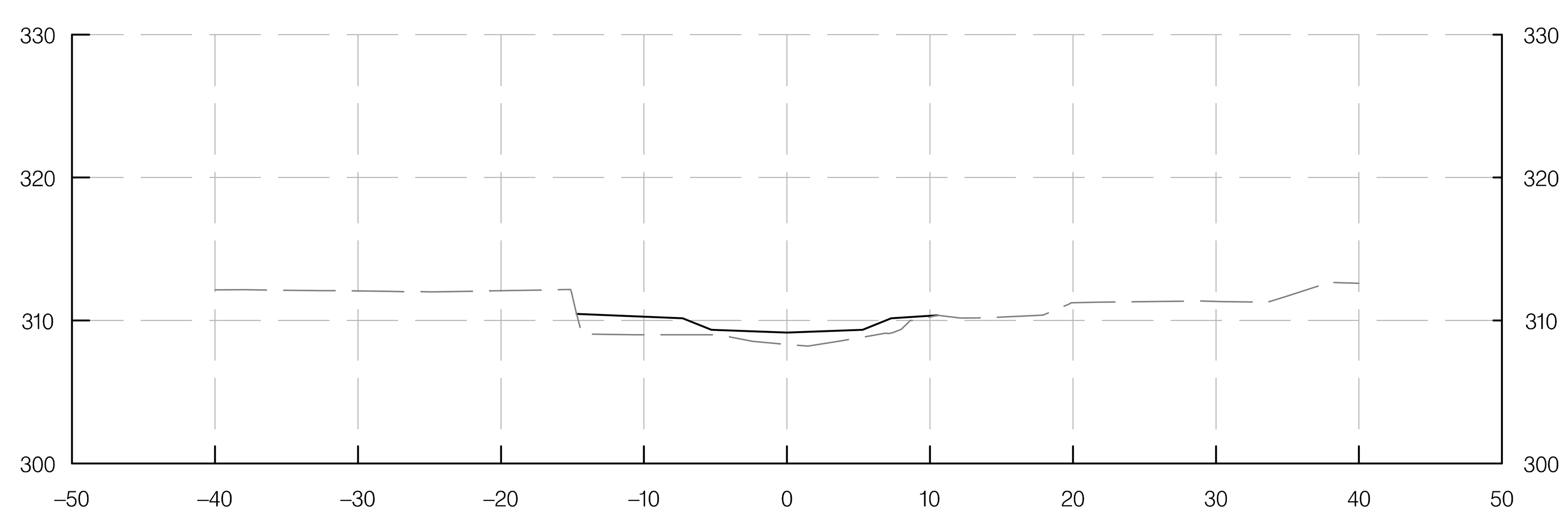

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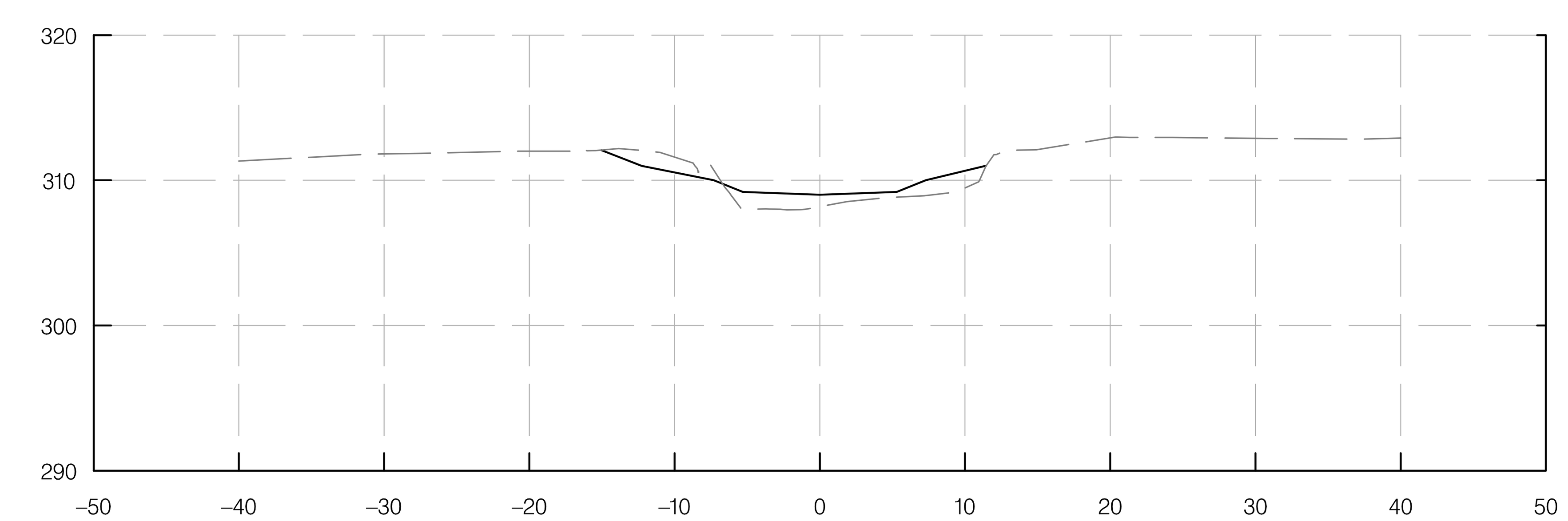

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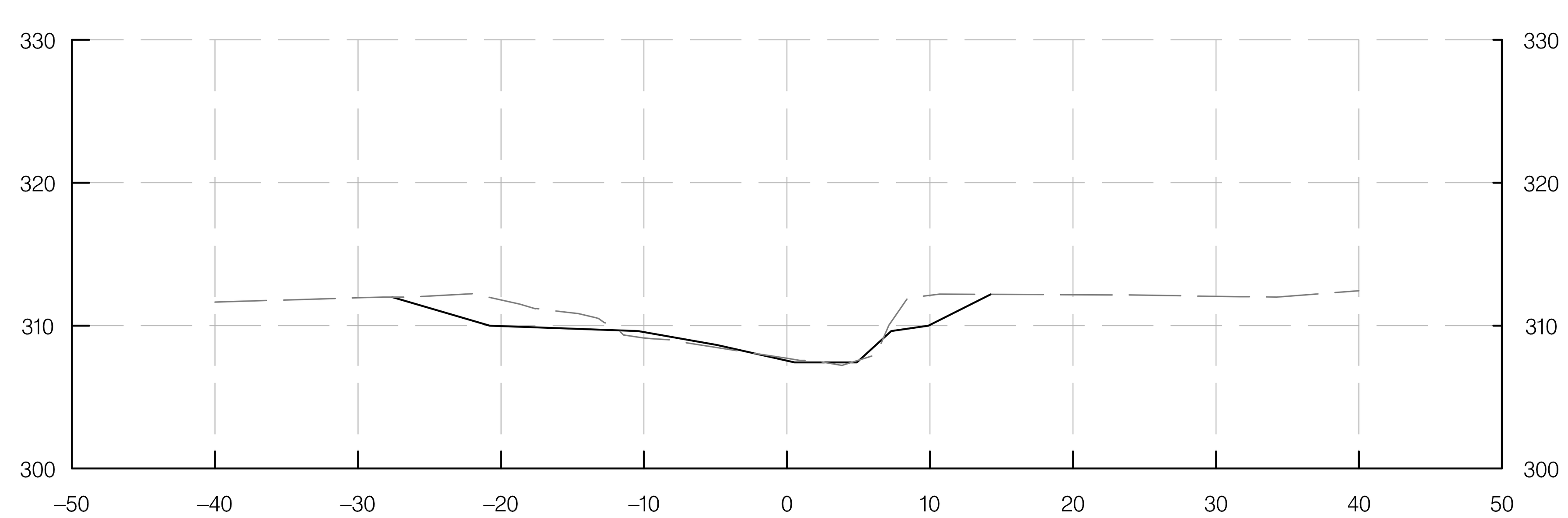

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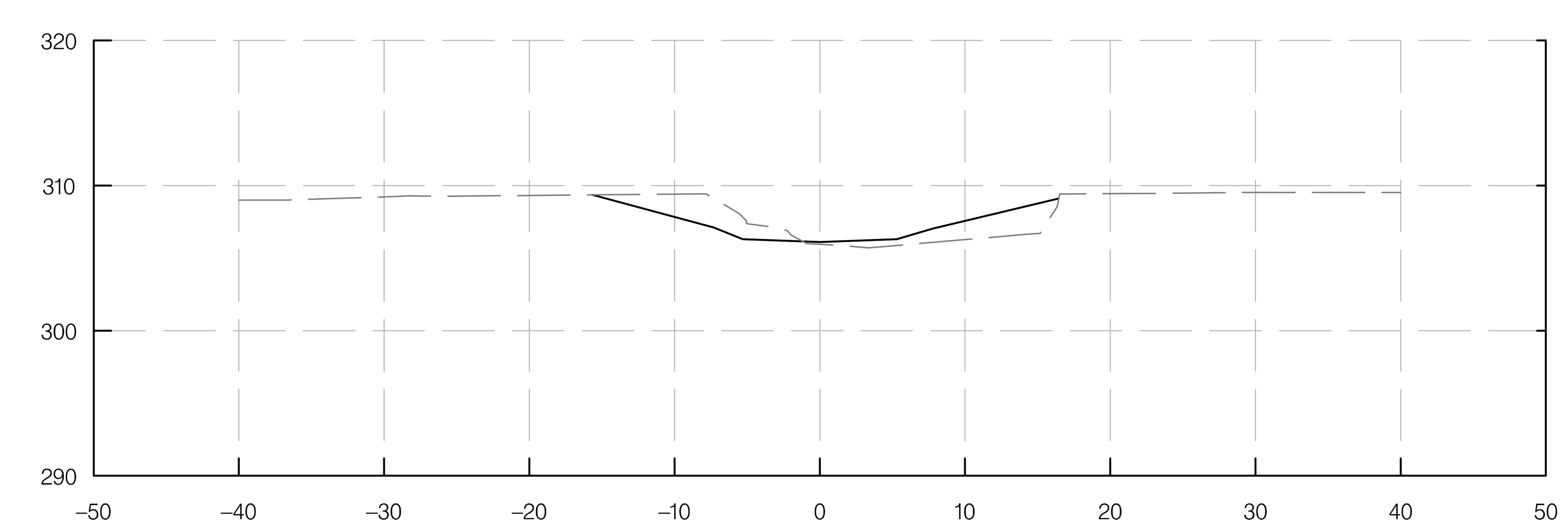

STA 24+00.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

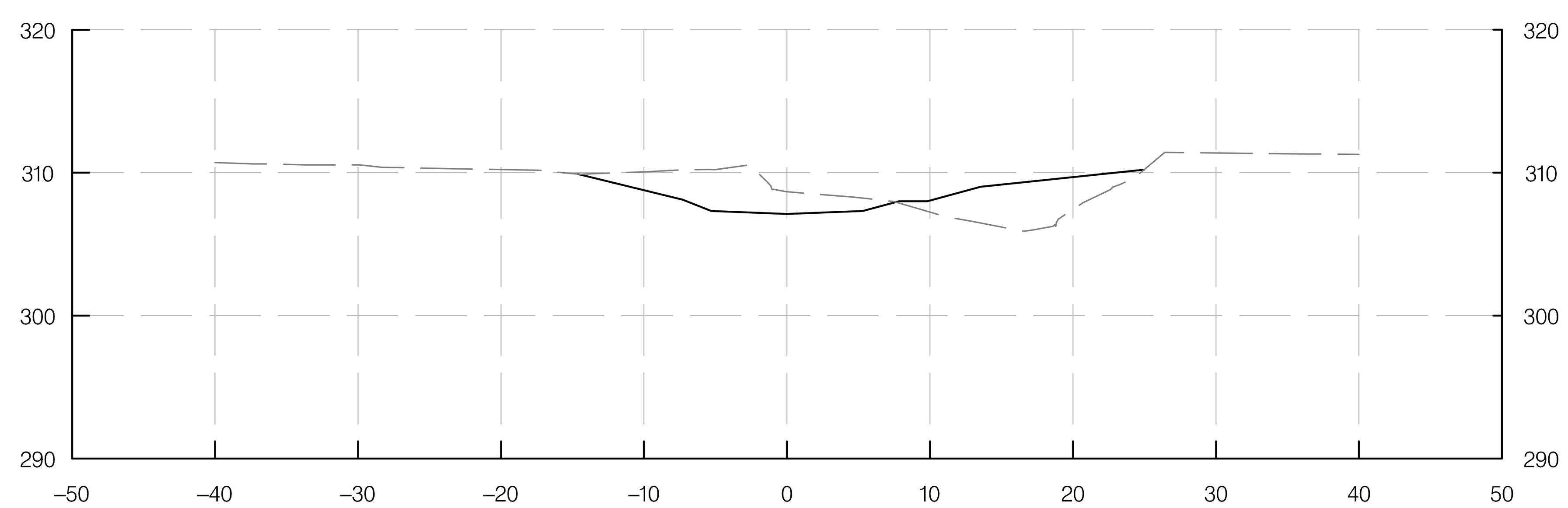
DRAWING NO. XS-08 OF 15

SHEET NO. 69 OF 76

COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X008_CA5.dgn



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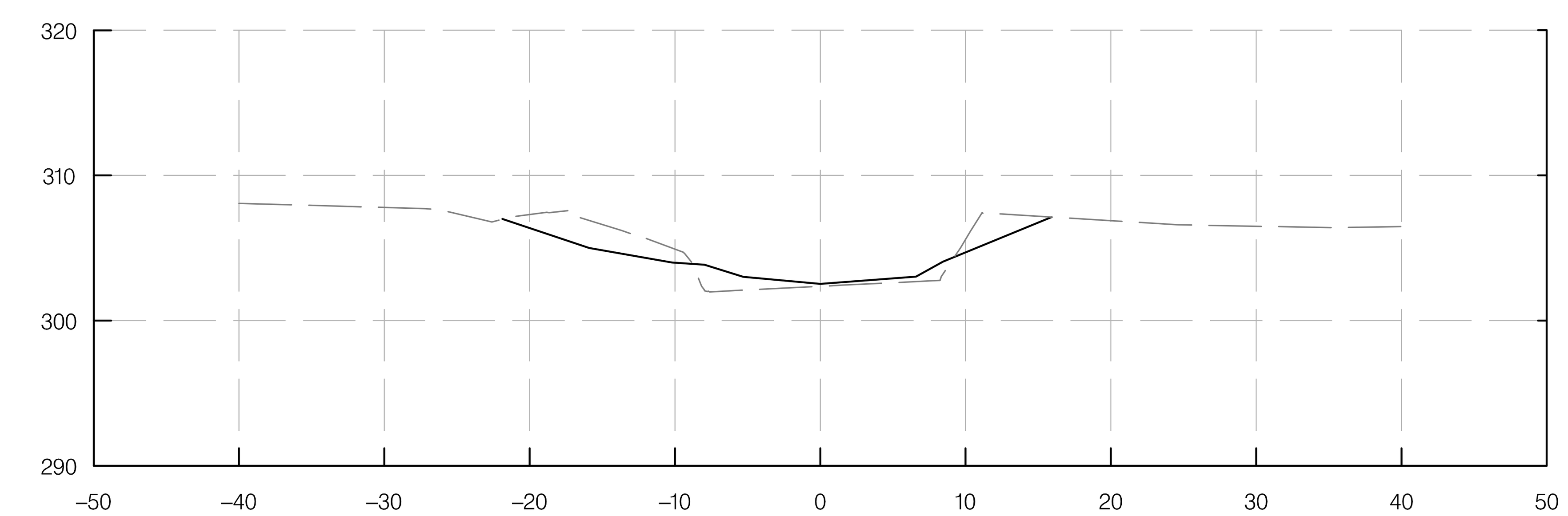

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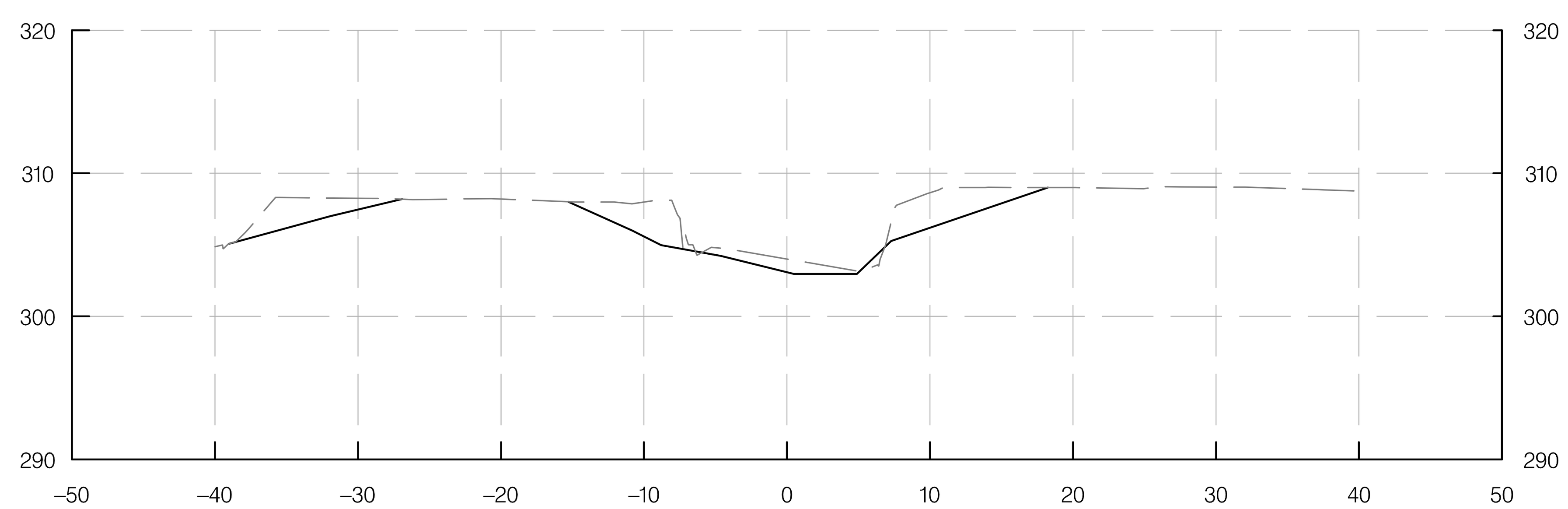
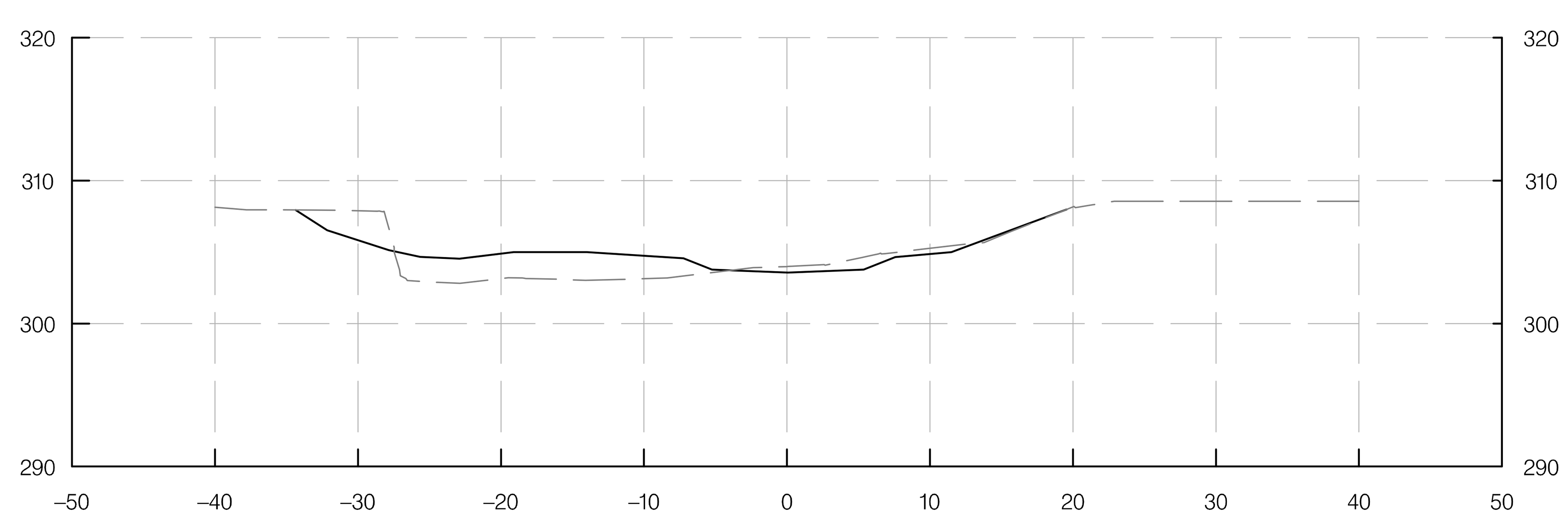


STA 25+00.00



STA 25+50.00

MAINSTEM 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

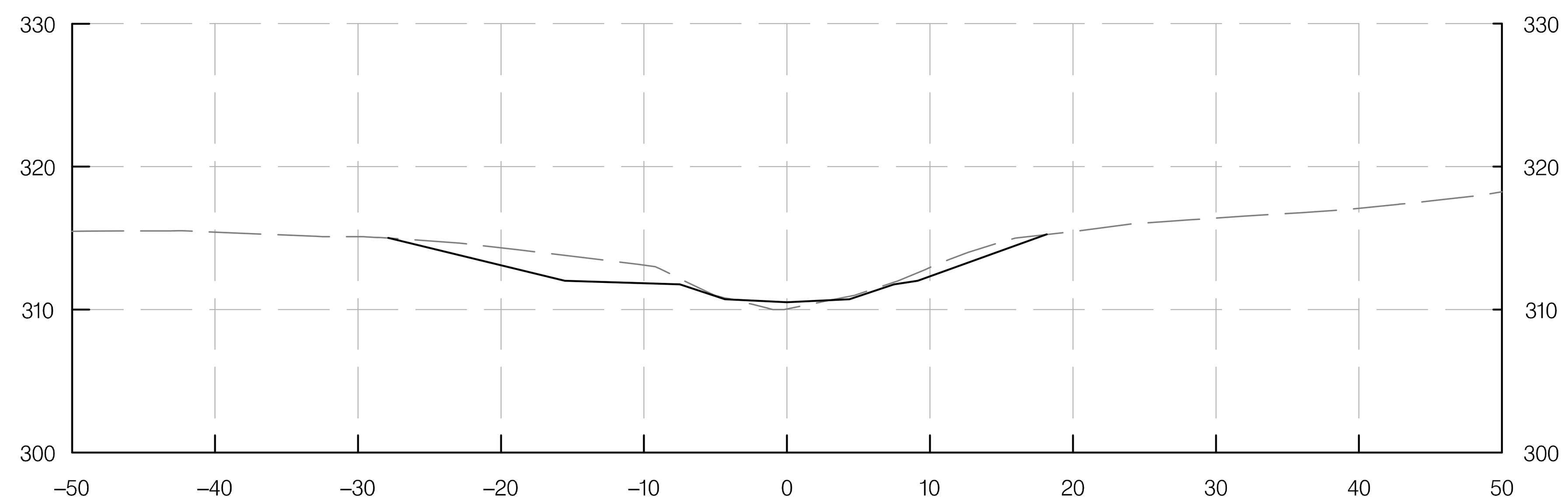
DESIGNED BY	SCN	COUNTY	MONTGOMERY
DRAWN BY	CJN	LOGMILE	
CHECKED BY	KSK	HORIZONTAL SCALE	1" = 10'
MDE/PRD	168251/20–PR–0040–01	VERTICAL SCALE	1" = 10'

DRAWING NO. **XS-09** OF **15**

COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X009_CA5.dgn



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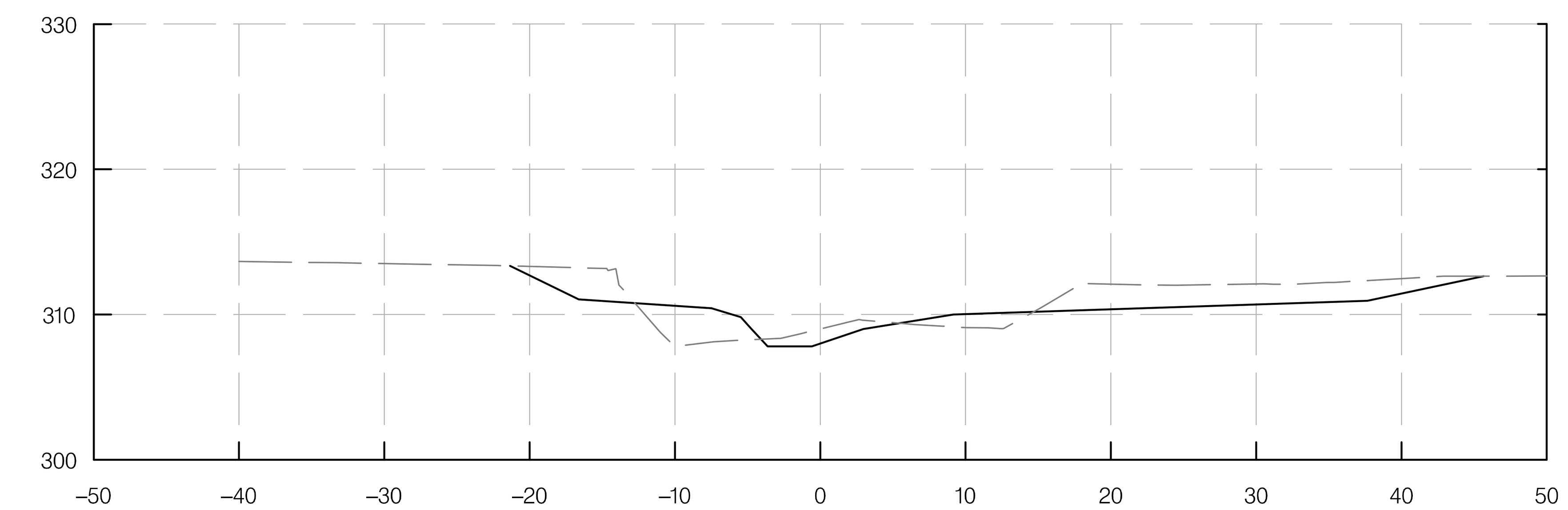

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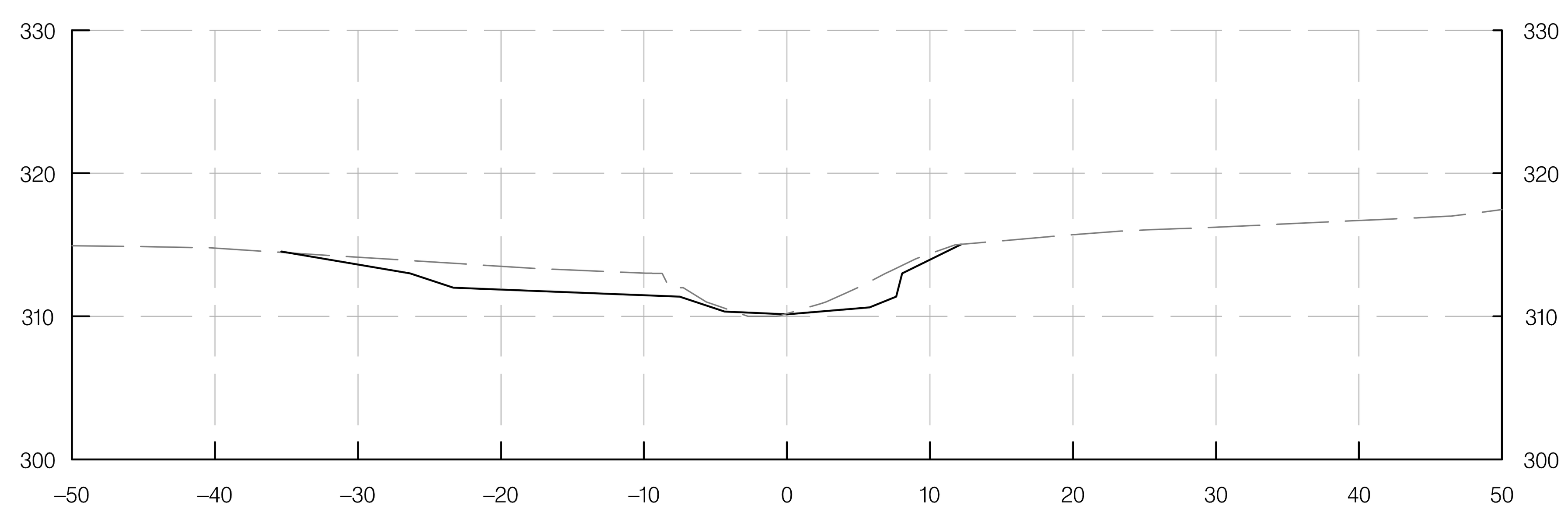

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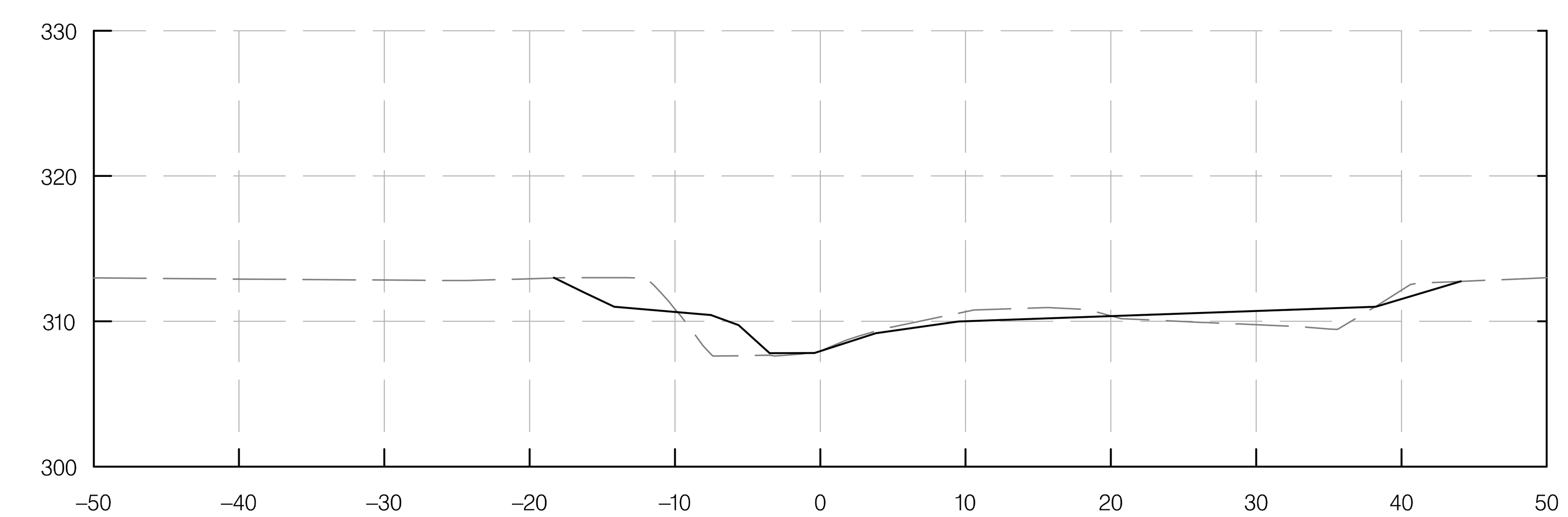

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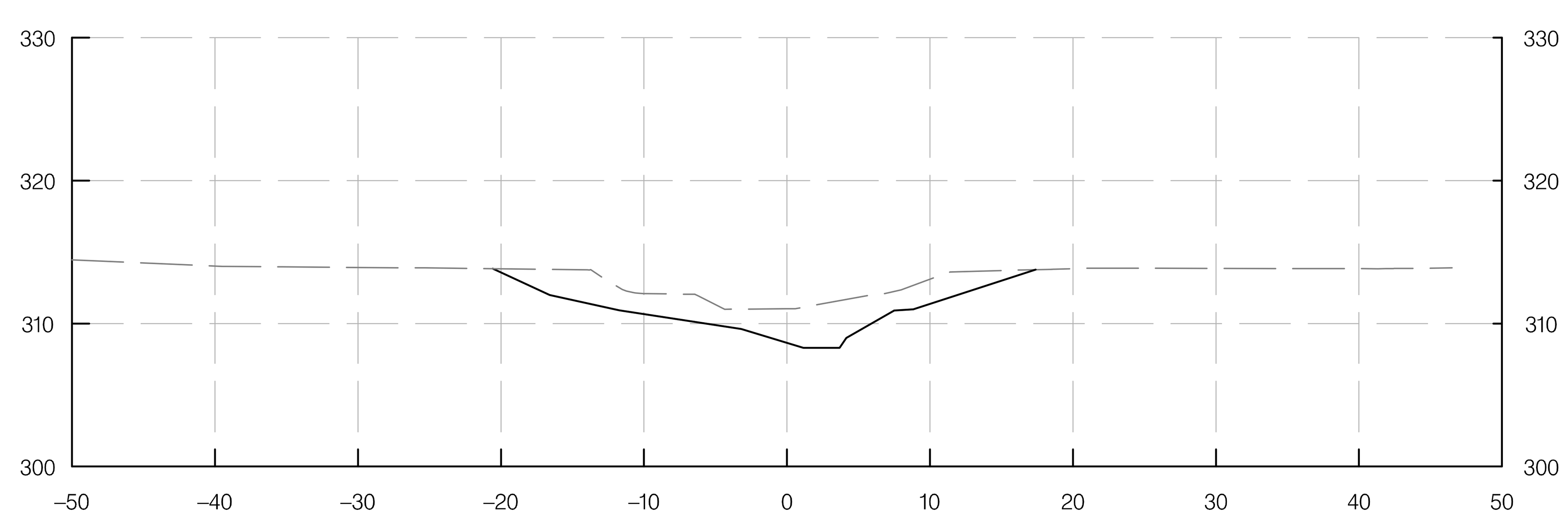
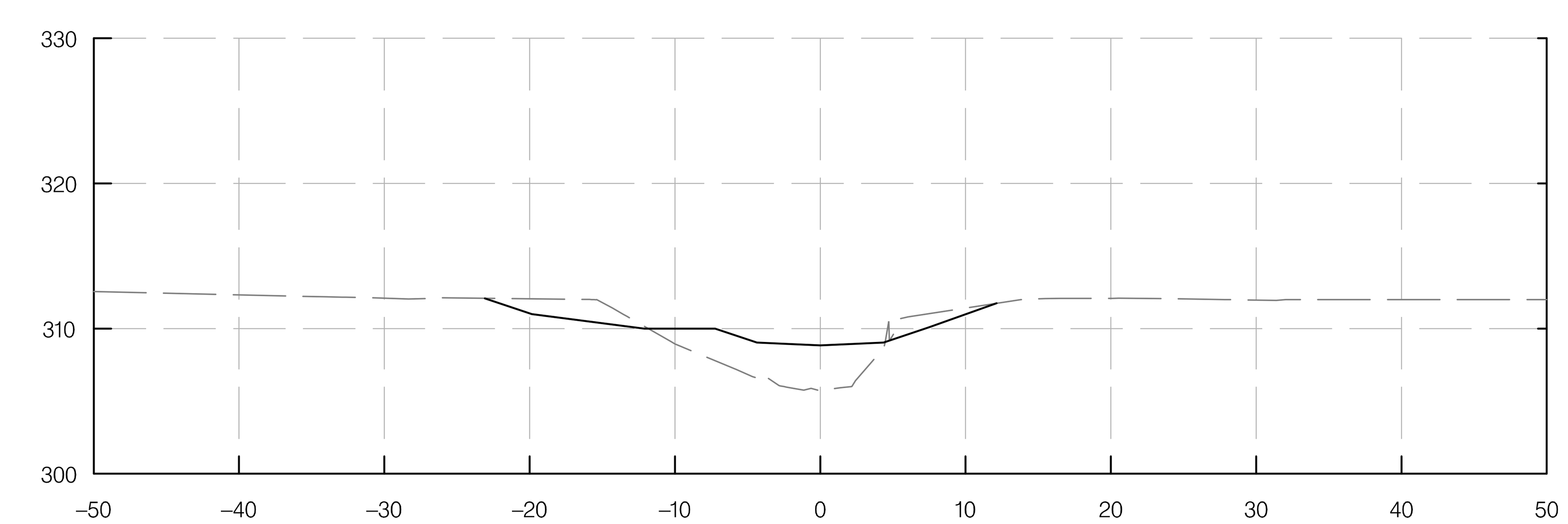


STA 1+58.00



STA 3+00.00

MAINSTEM 2

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN–
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

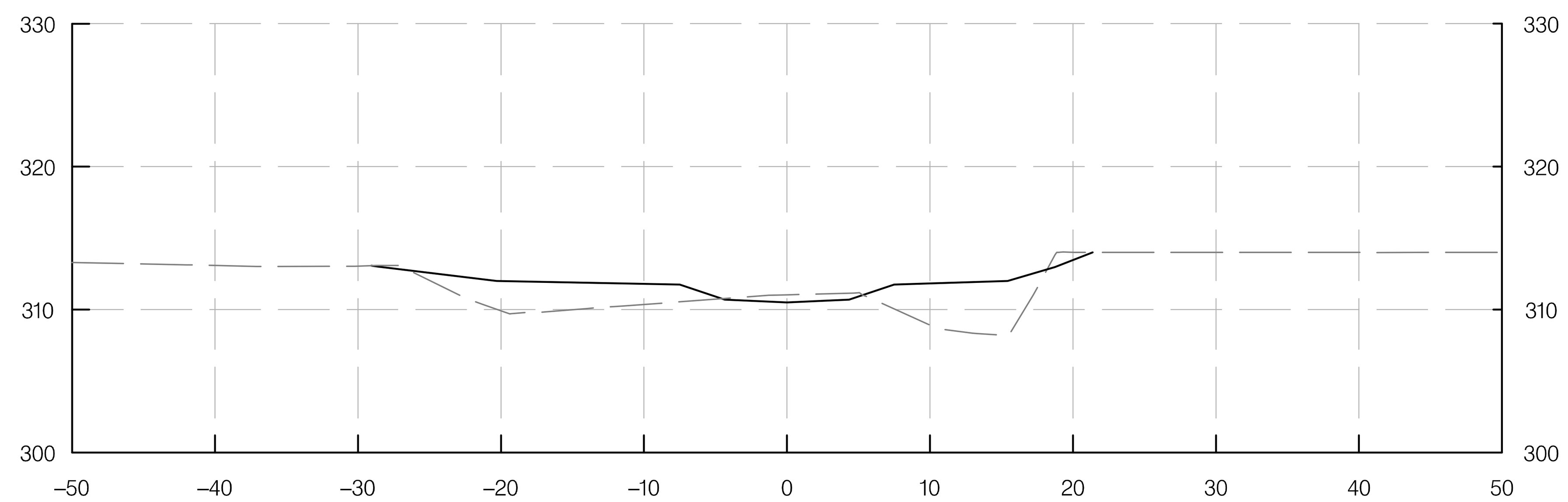
DRAWING NO. **XS-10** OF **15**

SHEET NO. 71 OF 76

COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X010_CA5.dgn



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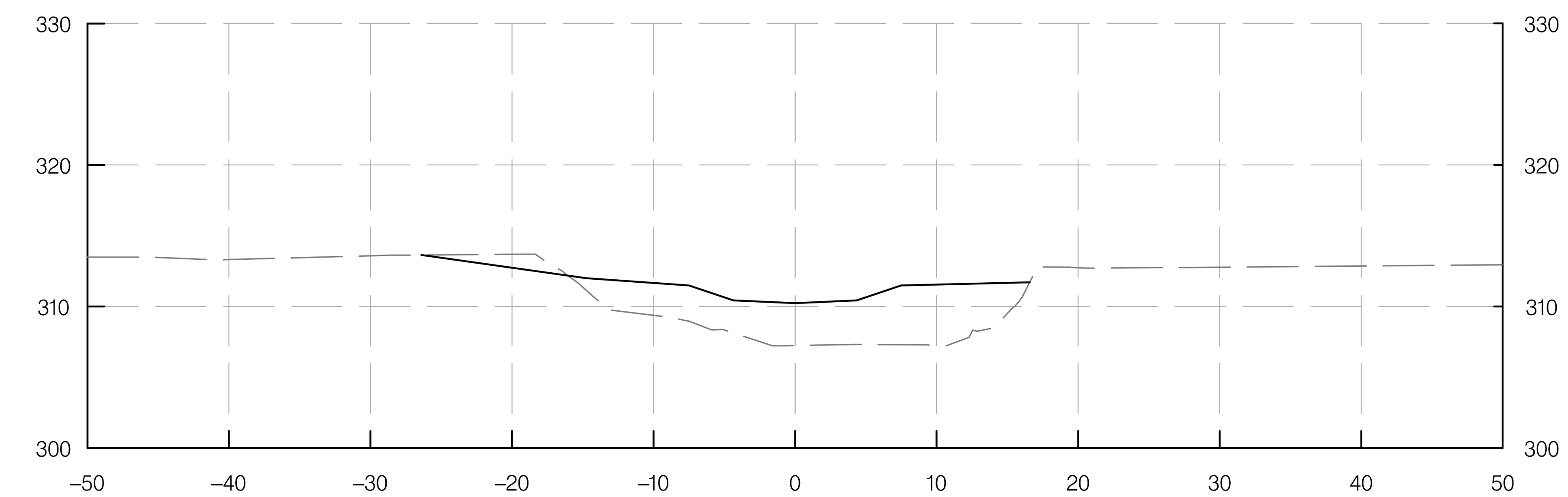
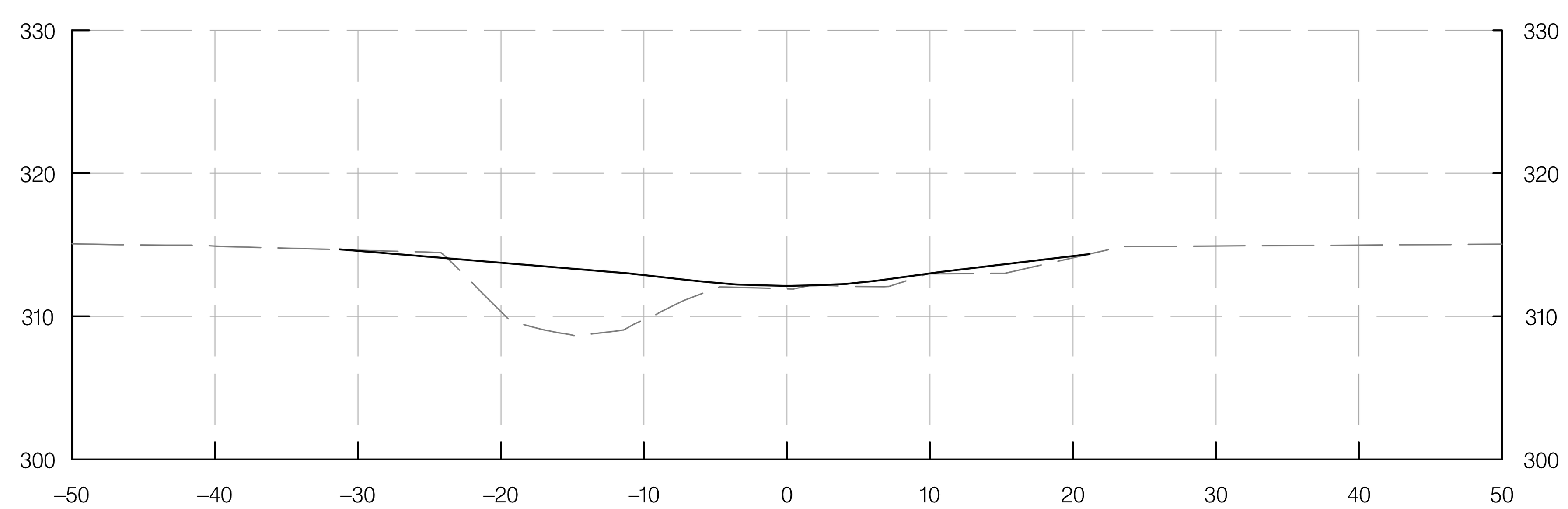


STA 5+10.00



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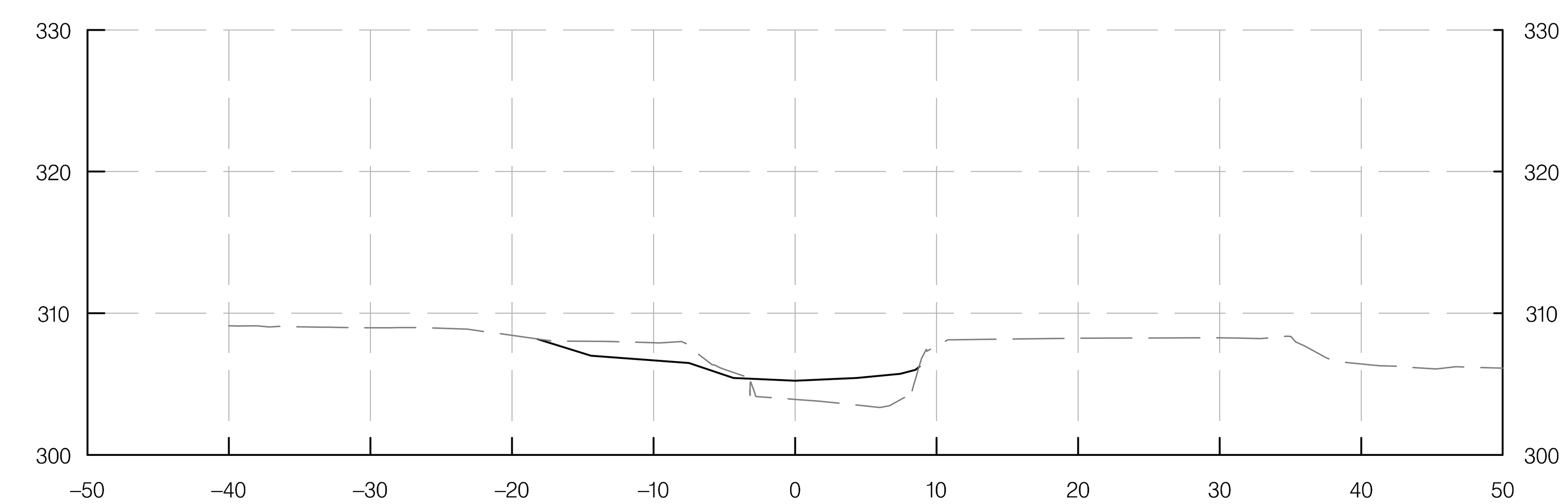

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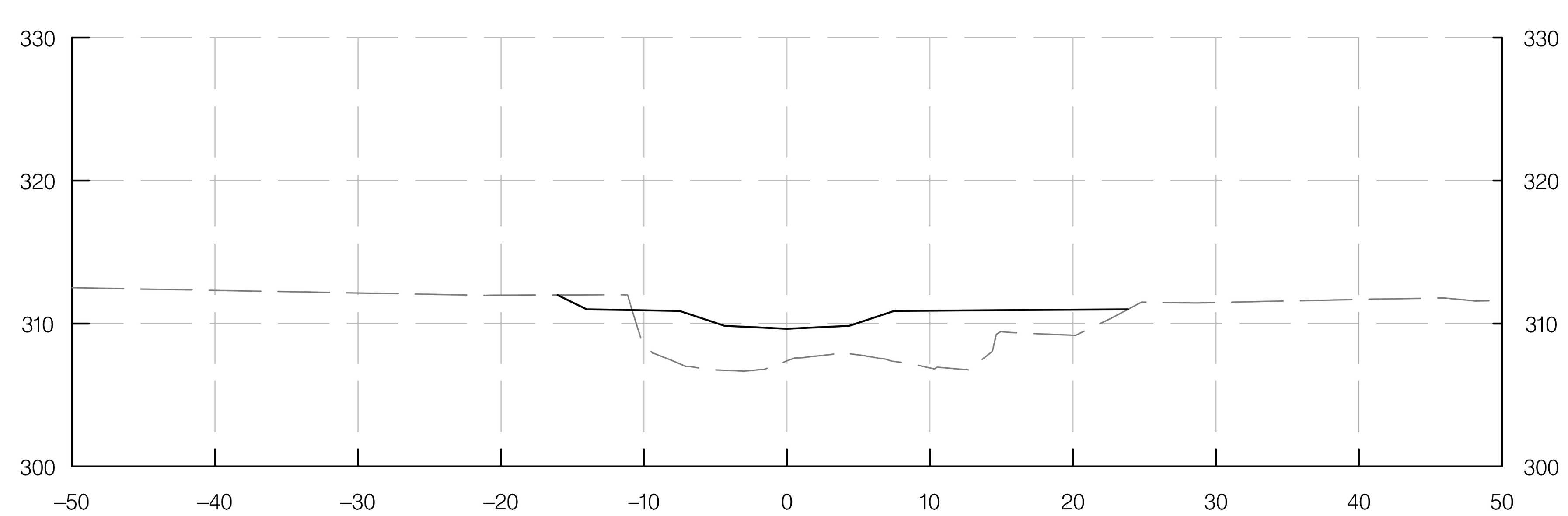

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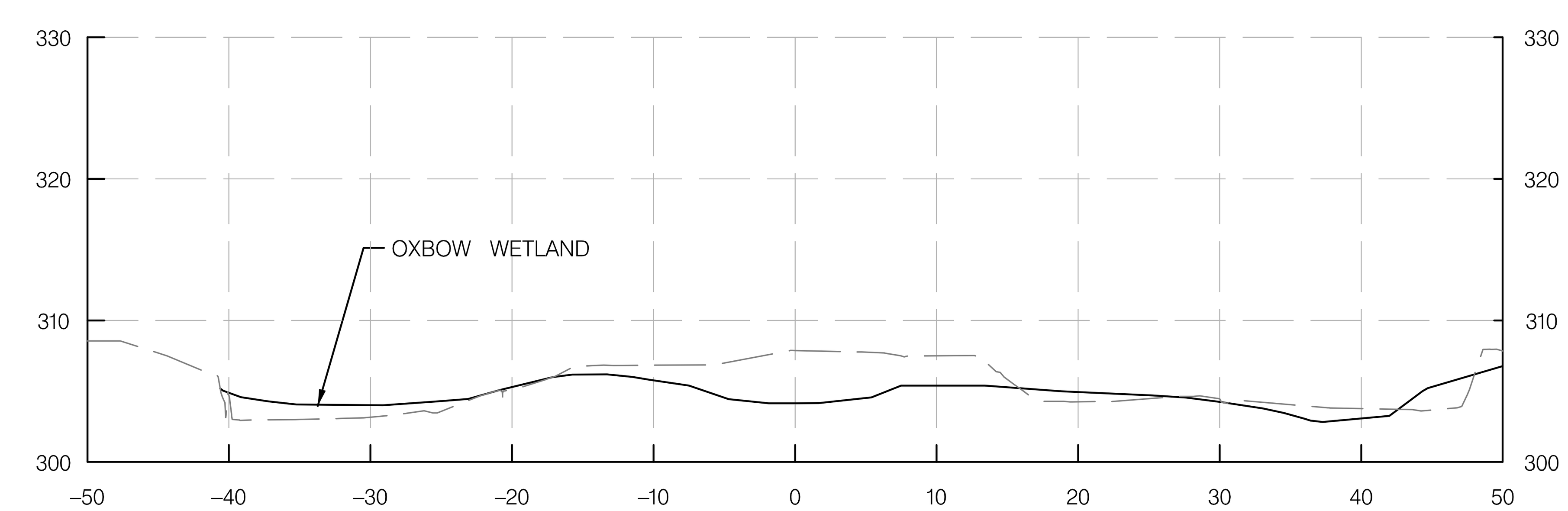

STA 5+94.00

MAINSTEM 2

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

COASTAL RESOURCES INC.

BY: caln –

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

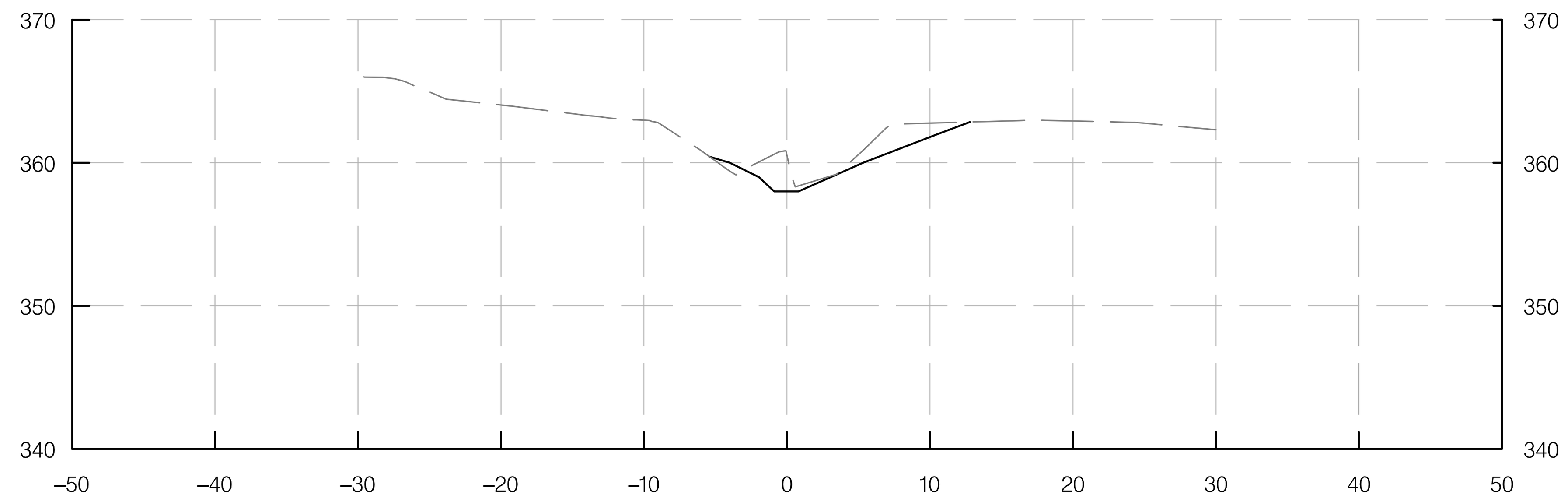
DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DRAWING NO. XS-11 OF 15

SHEET NO. 72 OF 76

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X011_CA5.dgn



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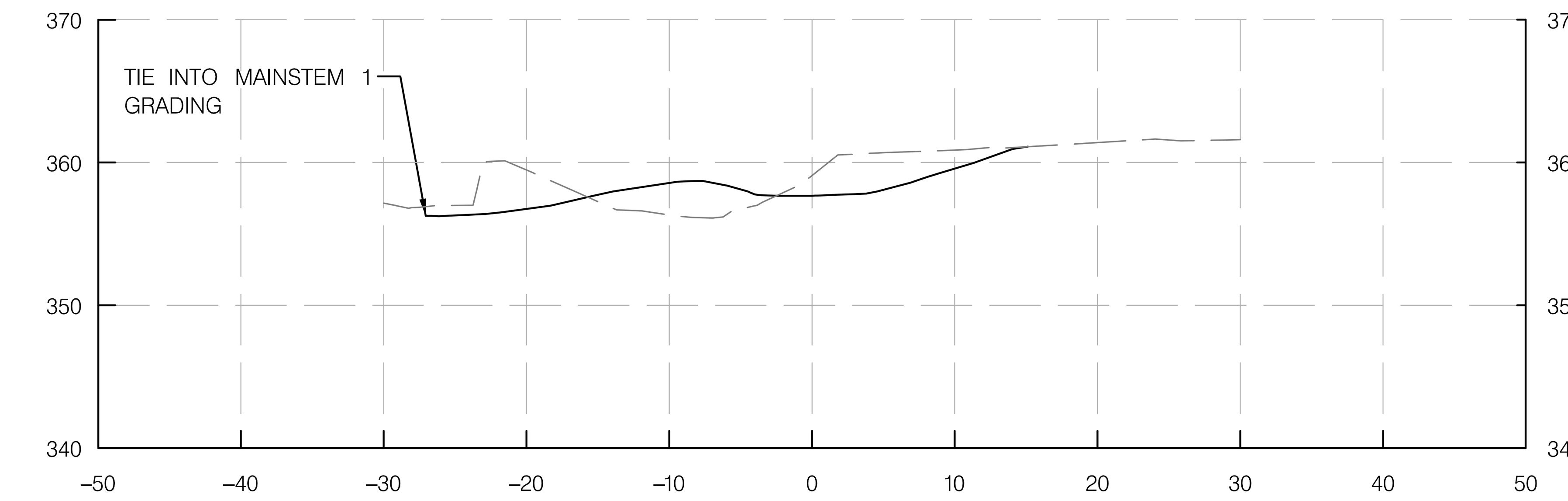

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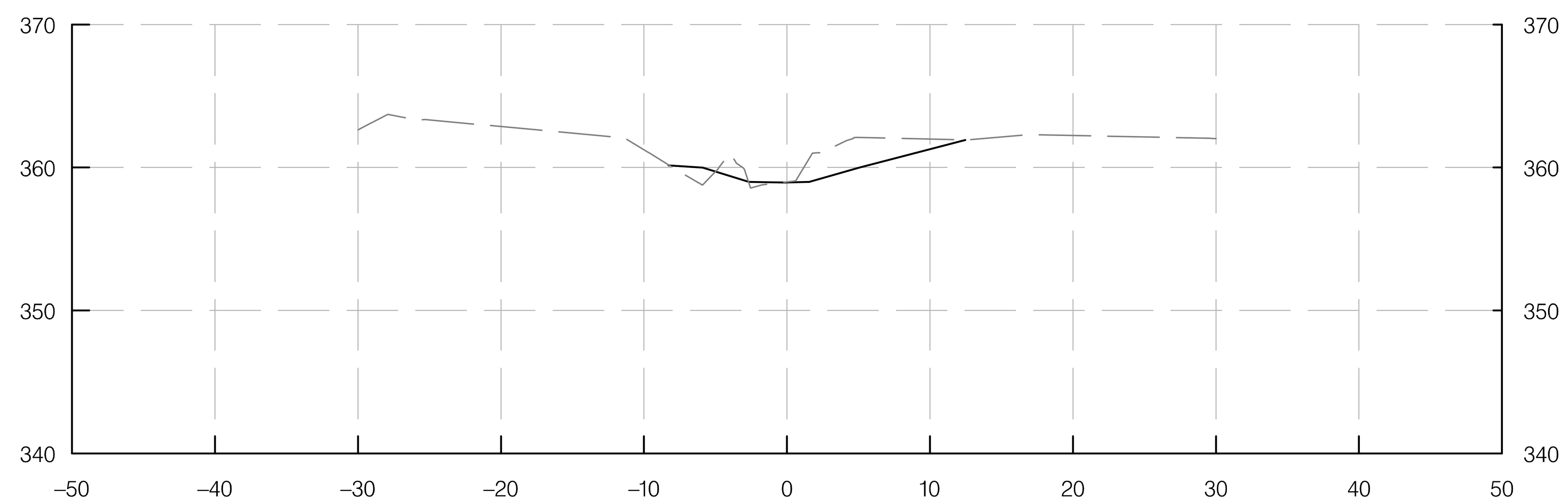

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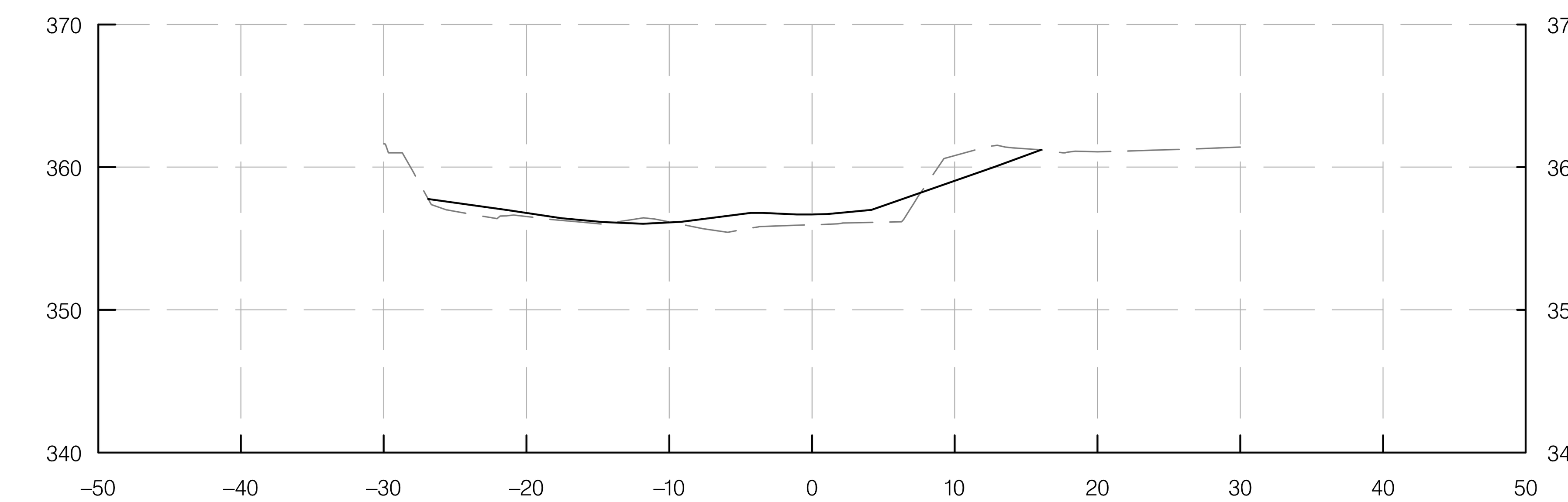

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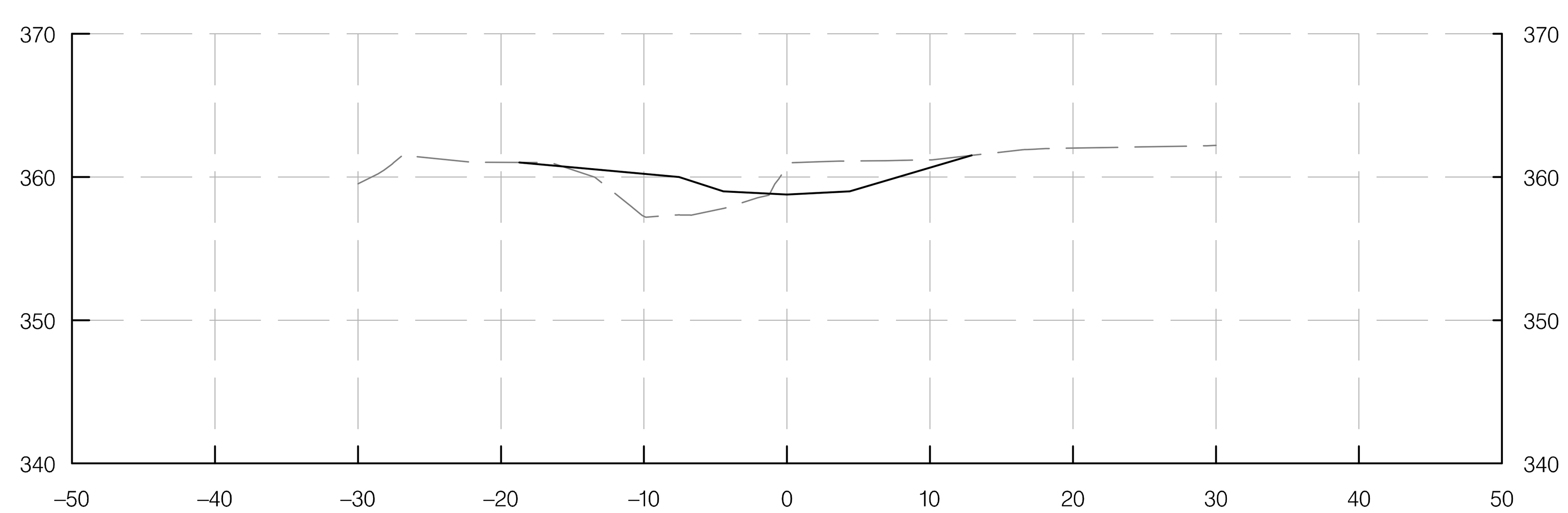

STA 0+30.00

TRIBUTARY 1

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

COASTAL RESOURCES INC.

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA-5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

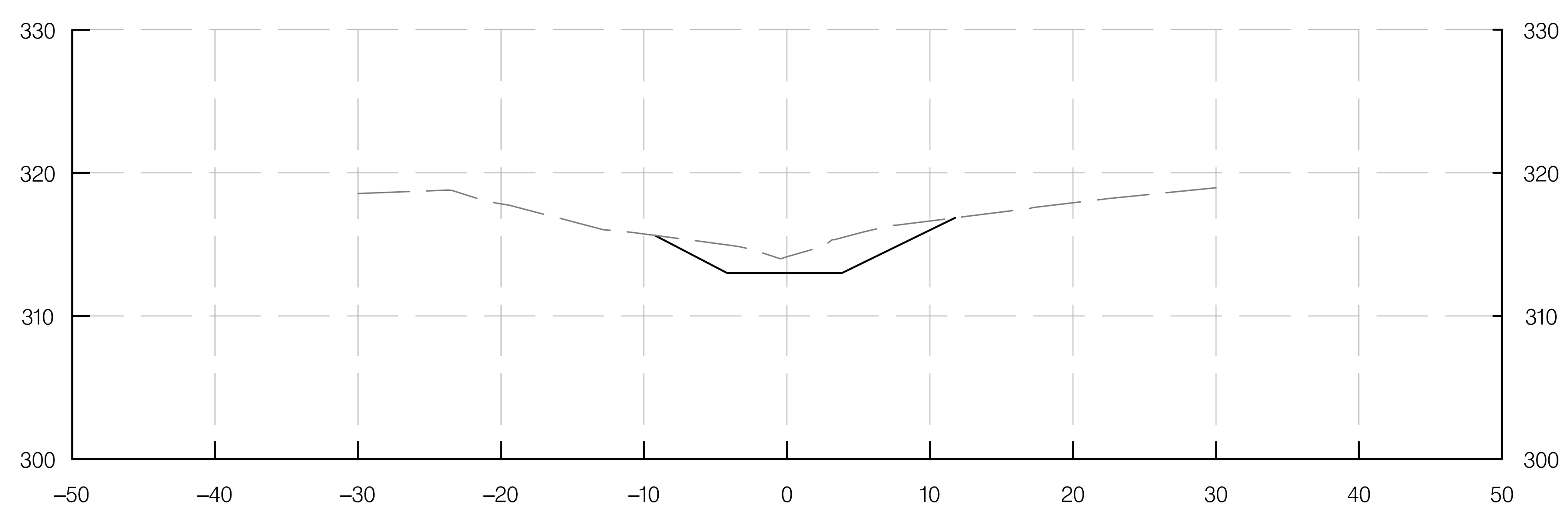
DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DRAWING NO. XS-12 OF 15 SHEET NO. 73 OF 76

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X012_CA5.dgn



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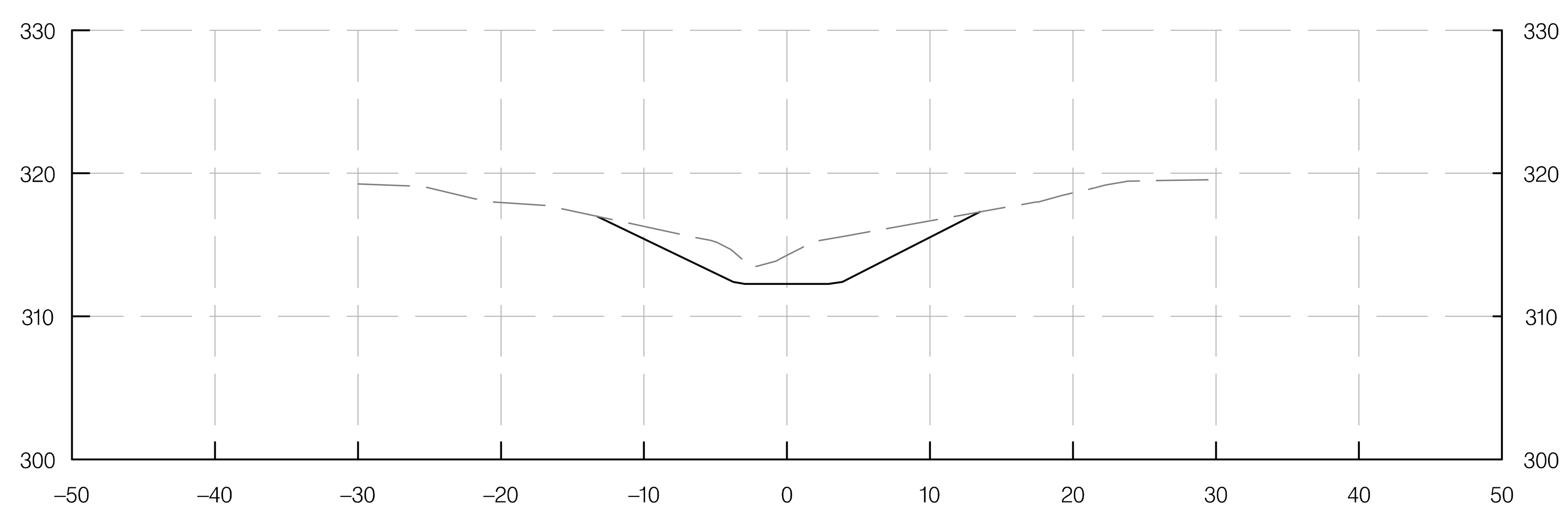

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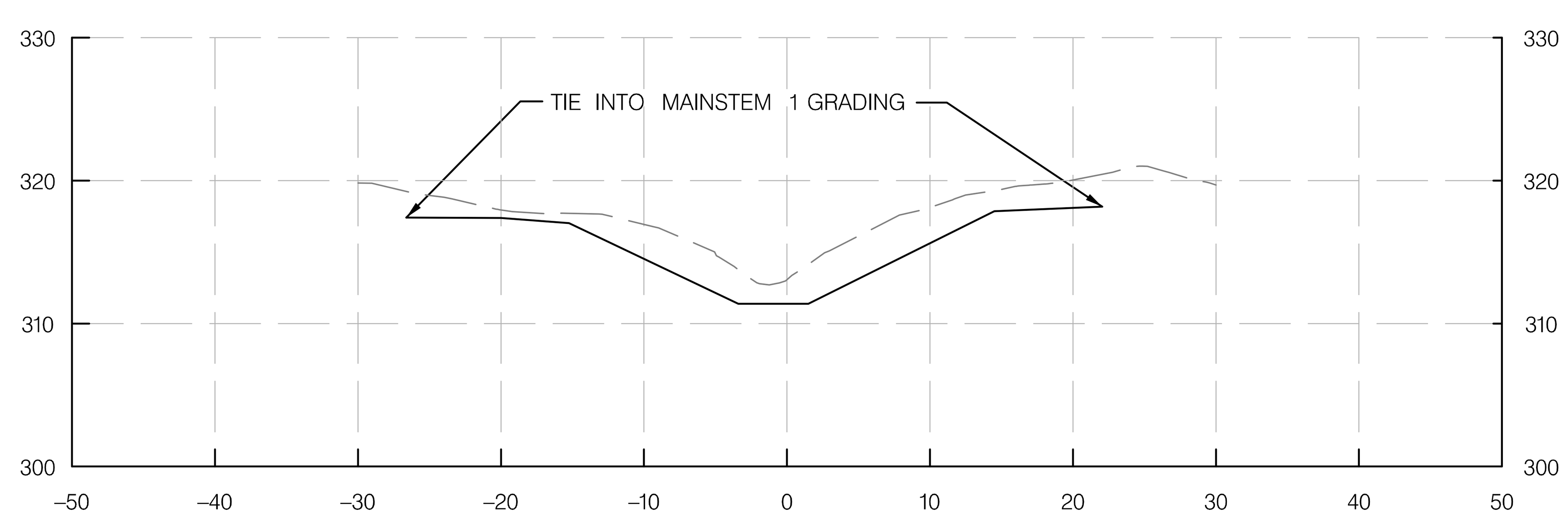

STA 0+30.00

POND OUTFALL

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN-
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DECEMBER 2021

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CA-5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 168251/20-PR-0040-01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

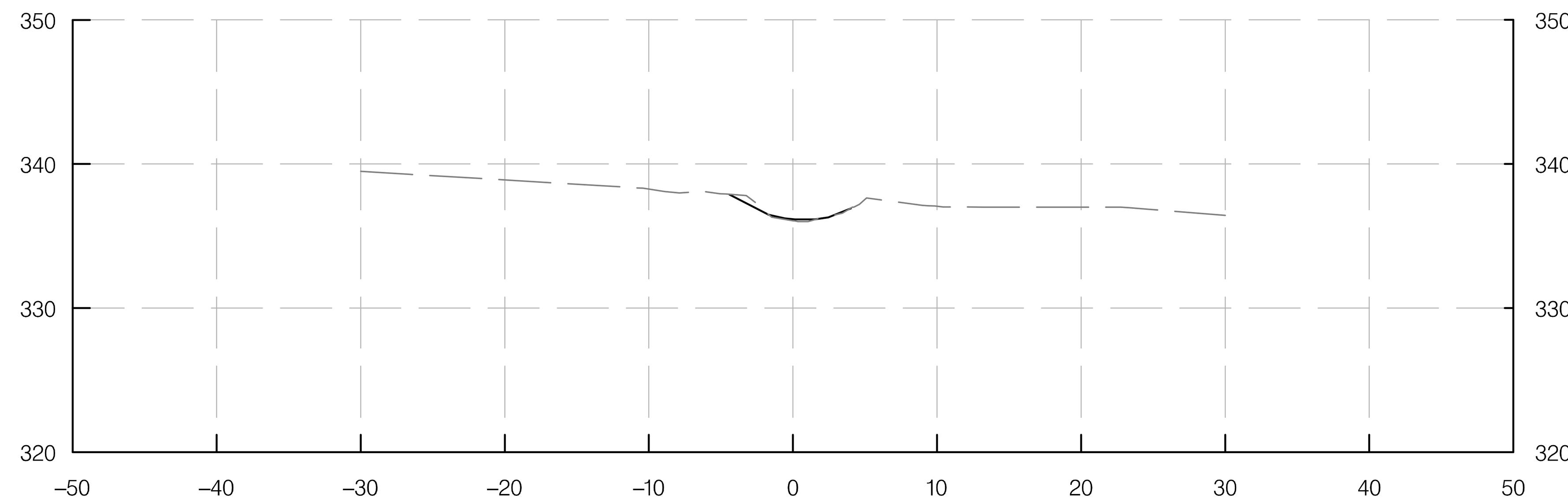
DRAWING NO. XS-13 OF 15

SHEET NO. 74 OF 76

COASTAL RESOURCES INC.

BY: caln -

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X013_CA5.dgn



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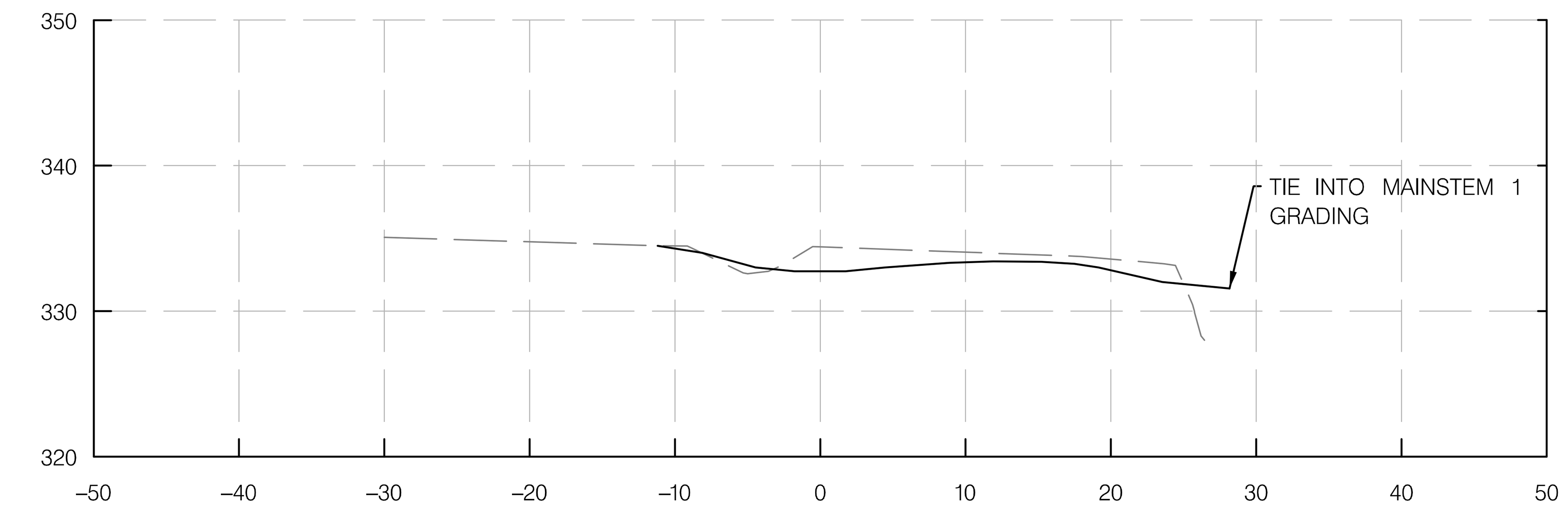

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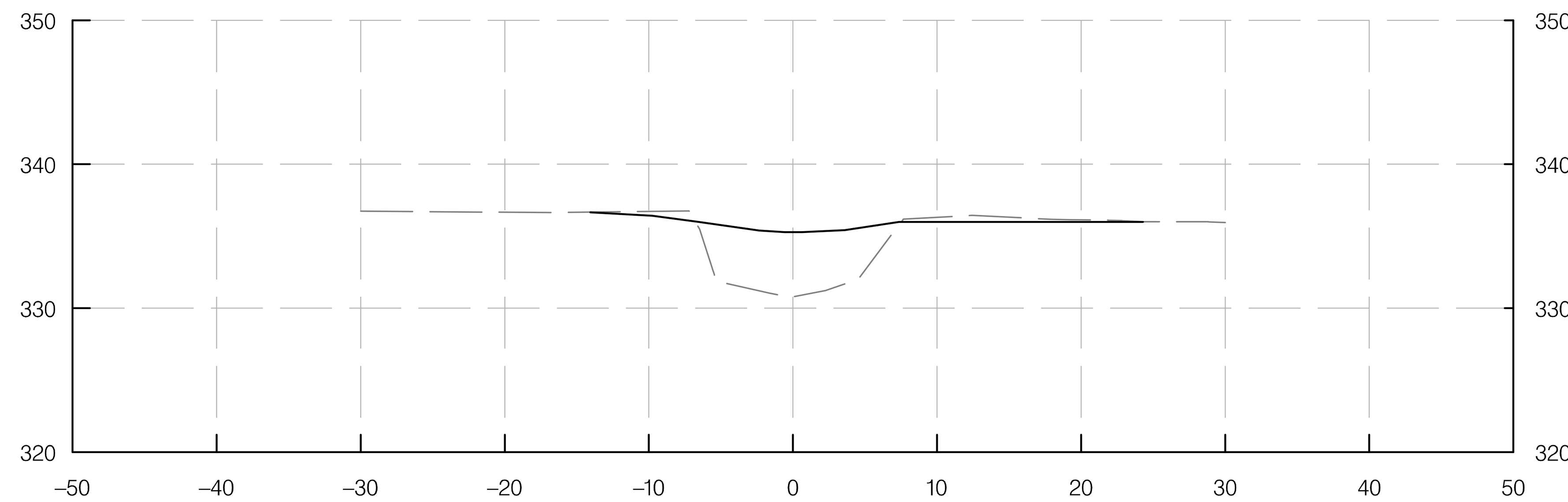

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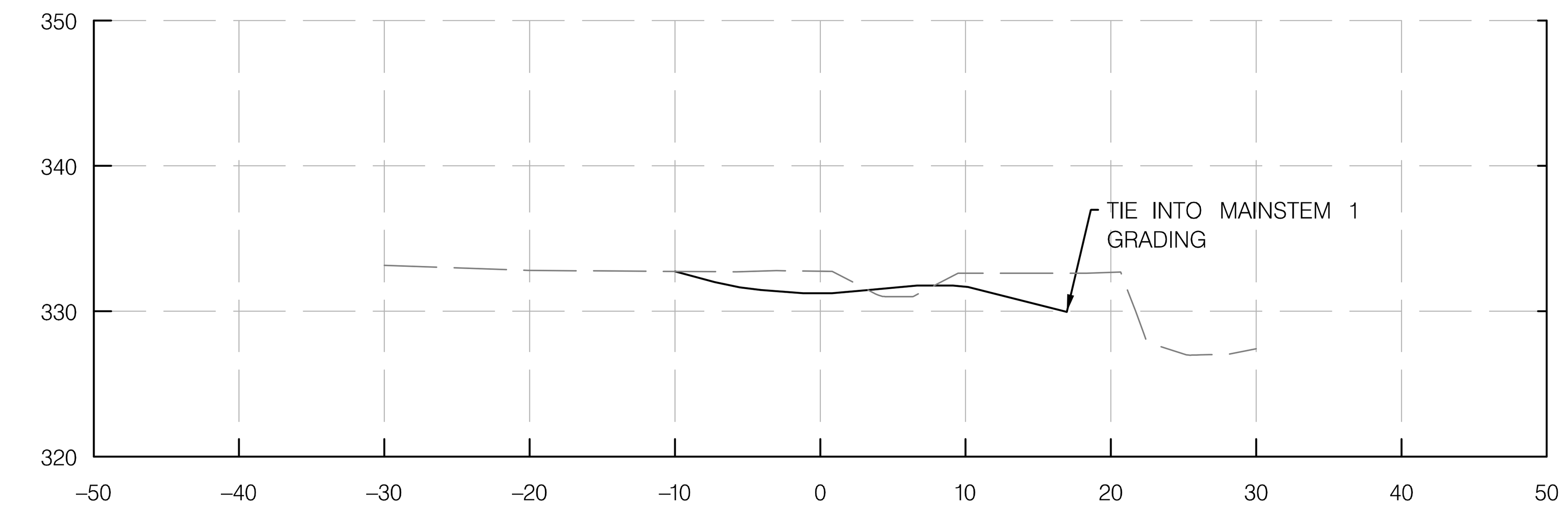

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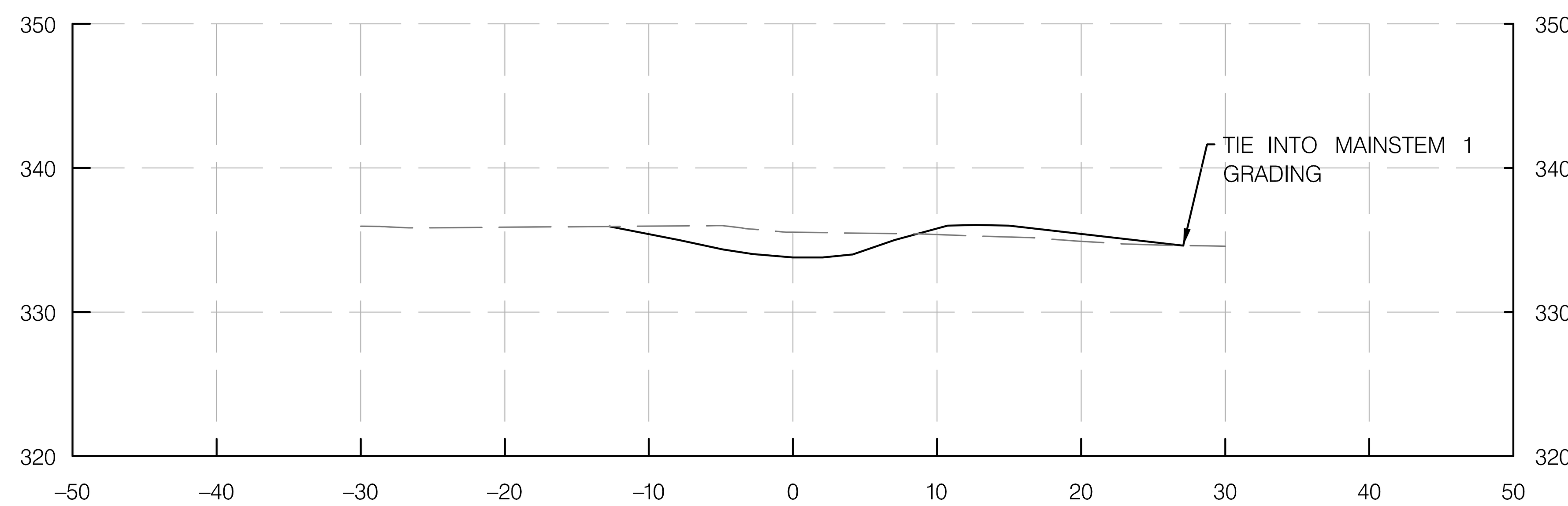

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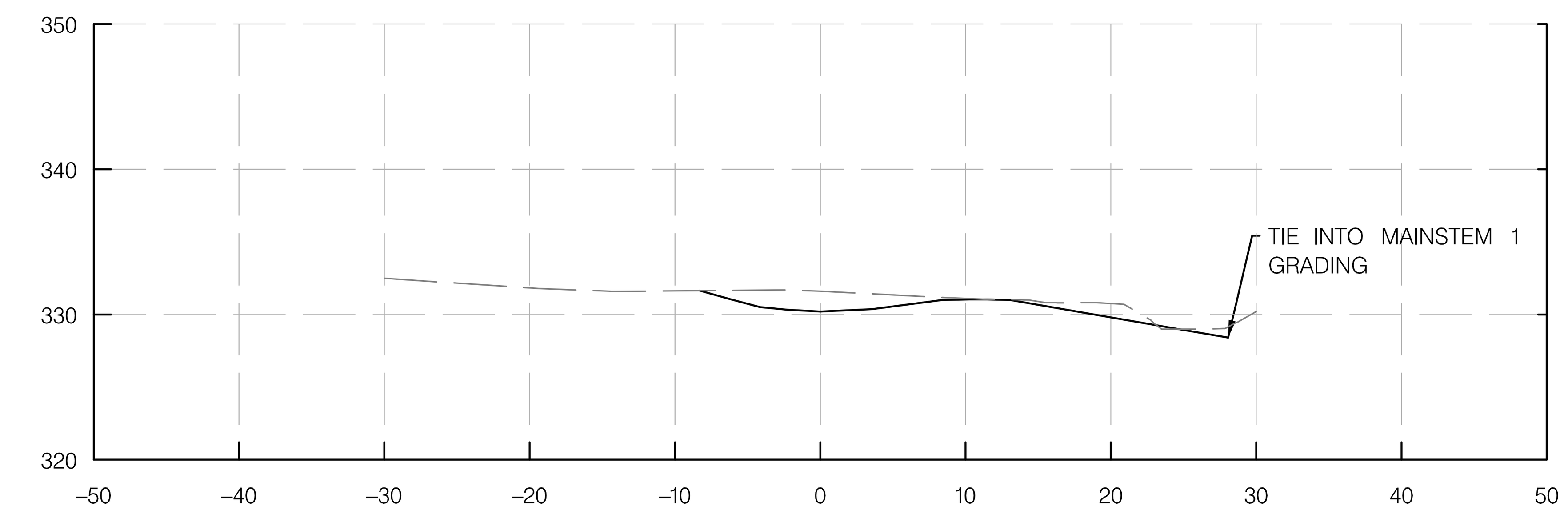

STA 2+00.00

TRIBUTARY 2

LEGEND

PROPOSED GROUND
EXISTING GROUND

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I-495 & I-270 MANAGED LANES STUDY
P3 PROGRAM
CA-5
STREAM RESTORATION

SEMI-FINAL (65%) DESIGN–
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REVISIONS

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DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

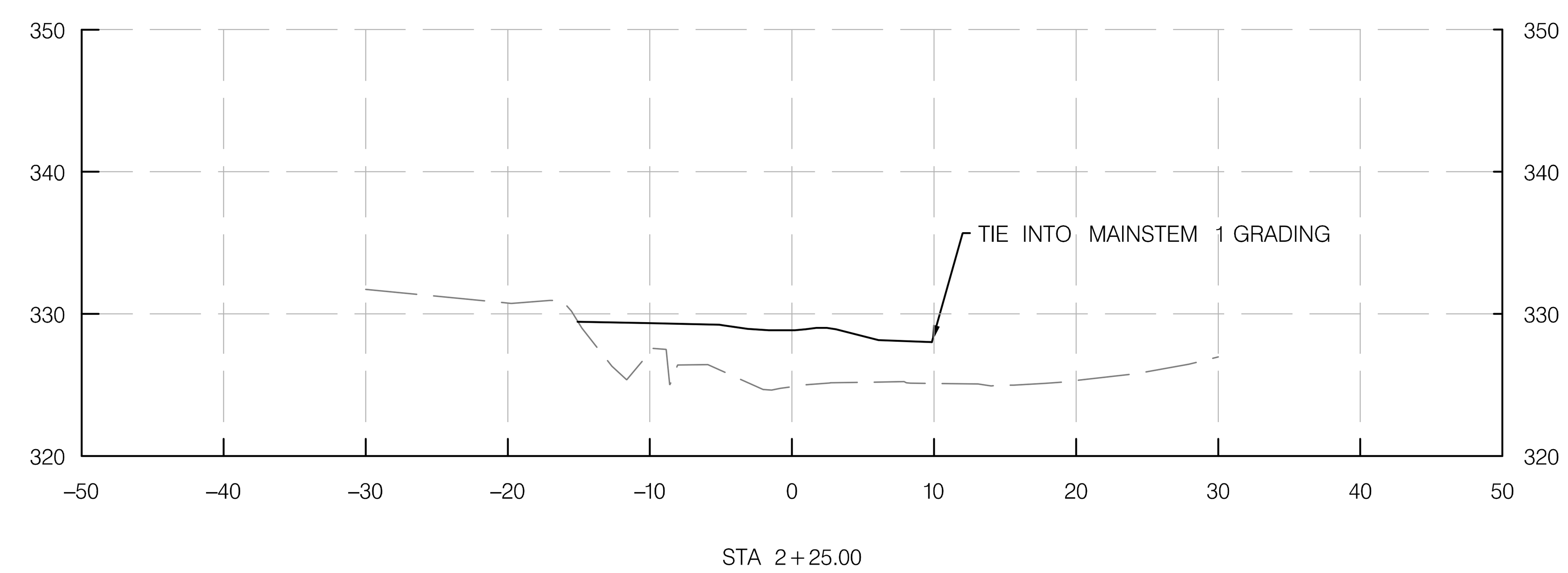
DESIGNED BY SCN	COUNTY MONTGOMERY
DRAWN BY CJN	LOGMILE
CHECKED BY KSK	HORIZONTAL SCALE 1" = 10'
MDE/PRD 16825120-PR-0040-01	VERTICAL SCALE 1" = 10'

DRAWING NO. XS-14 OF 15   SHEET NO. 75 OF 76

COASTAL RESOURCES INC.

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X014_CA5.dgn



TRIBUTARY 2

LEGEND

PROPOSED GROUND
EXISTING GROUND

COASTAL RESOURCES INC.

10' 0 10' 20'
SCALE: 1" = 10'

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

I–495 & I–270 MANAGED LANES STUDY
P3 PROGRAM
CA–5
STREAM RESTORATION

SEMI–FINAL (65%) DESIGN– NOT FOR CONSTRUCTION

REVISIONS

SEMI-FINAL REVIEW
DECEMBER 2021

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CA–5 STREAM RESTORATION CROSS SECTION

SCALE 1" = 10' DATE DECEMBER 2021 CONTRACT NO. AW073B12

DESIGNED BY SCN
DRAWN BY CJN
CHECKED BY KSK
MDE/PRD 16825120–PR–0040–01

COUNTY MONTGOMERY
LOGMILE
HORIZONTAL SCALE 1" = 10'
VERTICAL SCALE 1" = 10'

DRAWING NO. XS-15 OF 15

SHEET NO. 76 OF 76

BY: caln –

PLOTTED: Tuesday, March 08, 2022 AT 11:02 AM
FILE: G:\Active\2017-29 BCS 2015-05A Design-Construction, WRA\Task 25 CA-5 Phase II design\Mapping\CAD\pHC-X015_CA5.dgn