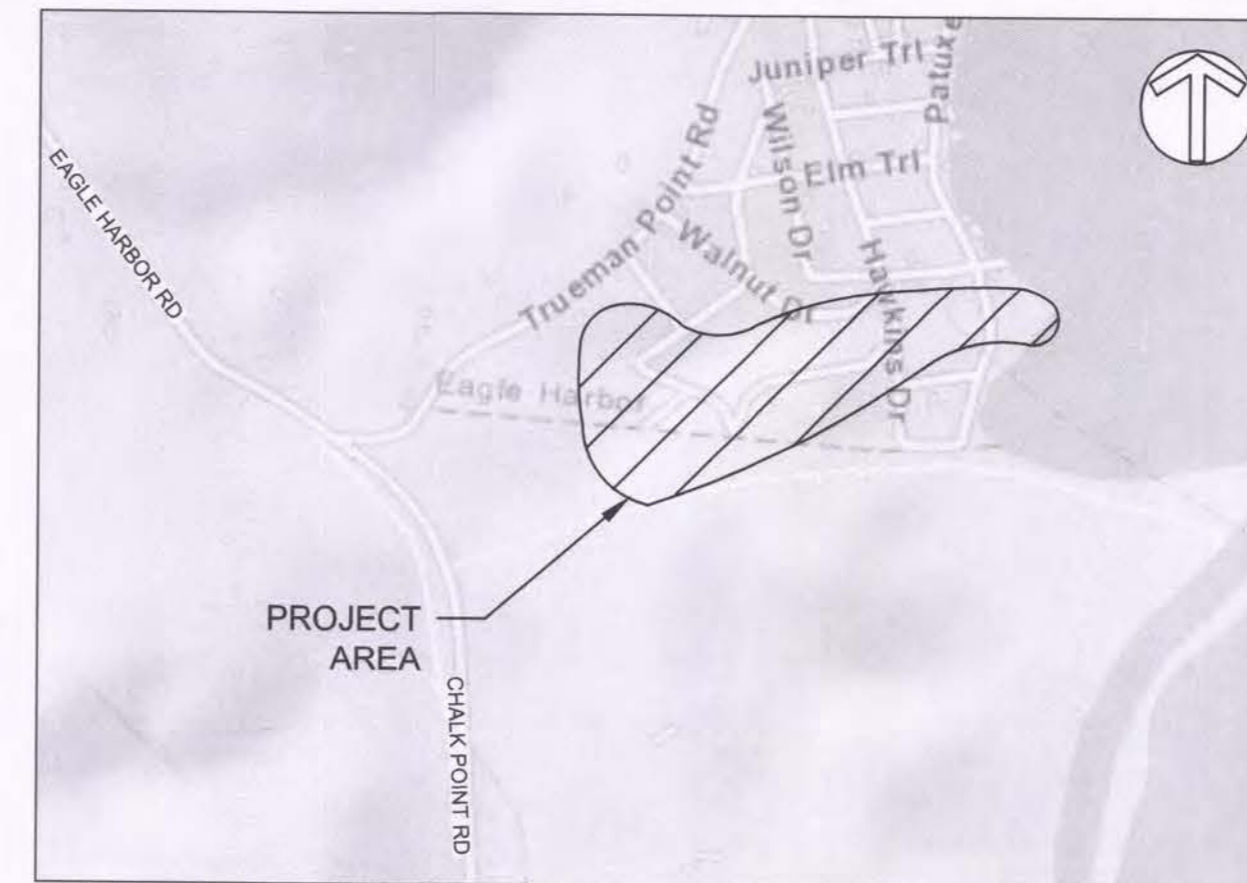


# PRINCE GEORGE'S COUNTY, MARYLAND EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

AT  
TOWN OF EAGLE HARBOR  
COUNTY COUNCIL DISTRICT 9

## 100% FINAL DESIGN PLAN (DOE CASE NO: 38079-2022-0)

### VICINITY MAP



TAX MAP PAGE: 0183, GRID: D3  
ADC MAP BOOK: 6120A10  
WSSC 200' BOOK No. 230SE16

SCALE: 1" = 1,000'

### MISS UTILITY NOTE

INFORMATION CONCERNING EXISTING UNDERGROUND UTILITIES WAS OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES AND UTILITY CROSSINGS BY DIGGING TEST PITS BY HAND, WELL IN ADVANCE OF THE START OF EXCAVATION. CONTACT "MISS UTILITY" AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF EXCAVATION. IF CLEARANCES ARE LESS THAN SHOWN ON THIS PLAN OR TWELVE (12) INCHES, WHICHEVER IS LESS, CONTACT THE ENGINEER AND THE UTILITY COMPANY BEFORE PROCEEDING WITH CONSTRUCTION. CLEARANCES LESS THAN NOTED MAY REQUIRE REVISIONS TO THIS PLAN.

### STANDARD STABILIZATION NOTE

STABILIZATION PRACTICES ON ALL PROJECTS MUST BE IN COMPLIANCE WITH THE REQUIREMENTS OF COMAR 26.17.1.08 G REGULATIONS BY JANUARY 9, 2013 REGARDLESS OF WHEN AN EROSION AND SEDIMENT CONTROL PLAN WAS APPROVED. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

### SWM CONCEPT SUFFICIENCY UPDATE 11/29/2023

THE CROSS CULVERTS IMPROVEMENTS ARE DESIGNED BASED ON PRACTICAL SITE CONDITIONS AND CONSTRAINTS POSED BY THE NON-STANDARD ROADWAY AND RIGHT OF WAY SECTIONS. THE DESIGN ACHIEVES IMPROVEMENTS FOR FREQUENT STORM FLOW CONVEYANCE, BUT NOT NECESSARILY TO MEET THE 10-YEAR STORM DISCHARGE (Q<sub>10</sub>) AND HYDRAULIC GRADIENT REQUIREMENTS AS SPECIFIED BY THE PRINCE GEORGE'S COUNTY SWM DESIGN GUIDELINES.

ADDITIONALLY, THE EXISTING CHANNEL AND PROPOSED CHANNEL CONDITIONS 100 YEAR MODE SHOW THAT THE 100-YEAR PEAK DISCHARGE FLOWS WILL NOT BE CONVEYED WITH "ADEQUATE" FREEBOARD TO THE EXISTING / FINAL ROADWAY PROFILE.

PRINCE GEORGE'S SOIL CONSERVATION DISTRICT FINAL APPROVAL GRADING, EROSION AND SEDIMENT CONTROL	
FSC# 128-23	01-03-27 EXPIRATION DATE
POND (P#)	
Signature: <i>Jeff DeHan</i>	01-03-24 APPROVAL DATE
DISTRICT SIGNATURE	APPROVAL DATE



PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024-05-28

DWG/FSC: 01 OF 73

TITLE:

## COVER SHEET

### SWM CONCEPT CERTIFICATION

THIS PLAN HAS BEEN APPROVED FOR STORMWATER MANAGEMENT CONCEPT SUFFICIENCY WITH STIPULATION.

PLEASE SEE **NOTE 2**.  
NAME: El Hadji Fall DATE: 11/30/2022  
SIGNATURE: El Hadji D Fall

**NOTE 2:** THIS PLAN SET IS APPROVED FOR CONCEPT SUFFICIENCY EVEN THOUGH IT DOES NOT INCLUDE THE DESIGN OF THE CULVERTS UNDER PATUXENT BOULEVARD AND UNDER HAWKINS ROAD. A SEPARATE HY-8 HYDRAULIC REPORT FOR BOTH CULVERTS WAS PROVIDED BY GREENVEST. FURTHERMORE, THE PROPOSED CULVERT'S HYDRAULICS AND ROADWAY PROFILE AND SECTION WILL NOT MEET RESPECTIVELY ALL SUBTITLE 32 AND SUBTITLE 23 REQUIREMENTS.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND

### PEER REVIEW APPROVAL STAMP

"I hereby certify that I have successfully completed participation in DPPE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
Signature: *Tanvir Bhuiyan*  
Tanvir Bhuiyan

### Conditions of Approval

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MD  
PEER REVIEW APPROVAL STAMP

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPPE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

APPROVAL DATE: 12/05/2023  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE: *Benjamin Mosier*  
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40808  
PERMIT NUMBER: 38079-2022-0

TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

DEPARTMENT OF THE ENVIRONMENT  
STORMWATER MANAGEMENT DIVISION  
PRINCE GEORGE'S COUNTY,  
MARYLAND

ELECTION DISTRICT 9  
Signature: *Jeff DeHan*  
ASSOCIATE DIRECTOR 12/18/2023  
DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: N/A BY: GB CHECK: DS

## EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

### ENGINEERS & DRAINAGE CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN CONFORMS TO THE REQUIREMENTS OF SUBTITLE 32, DIVISION 2 OF THE CODE OF PRINCE GEORGE'S COUNTY, WATER RESOURCES PROTECTION AND GRADING CODE, AND THAT I OR MY STAFF HAVE INSPECTED THIS SITE AND THAT DRAINAGE FLOWS FROM UPHILL PROPERTIES ONTO THIS SITE, AND FROM THIS SITE ONTO DOWNHILL PROPERTIES, HAVE BEEN ADDRESSED IN SUBSTANTIAL ACCORDANCE WITH APPLICABLE CODES.

Signature: *Douglas Streaker* 10/20/23  
DOUG STREAKER DATE  
MD P.E. No. 30734

### CONSULTANT'S CERTIFICATION

I CERTIFY THAT THIS ENVIRONMENTAL SITE DEVELOPMENT GRADING, EROSION AND SEDIMENT CONTROL PLAN REPRESENTS ALL SIGNIFICANT NATURAL RESOURCES AND IS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PRINCE GEORGE'S SOIL CONSERVATION DISTRICT AND "STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL."

I HAVE REVIEWED THIS ENVIRONMENTAL SITE DEVELOPMENT GRADING, EROSION AND SEDIMENT CONTROL PLAN WITH THE OWNER/DEVELOPER.

Signature: *Douglas Streaker* 10/20/23  
DOUG STREAKER DATE  
MD P.E. No. 30734

BIOHABITATS, INC.  
2081 CLIPPER PARK DRIVE  
BALTIMORE, MARYLAND 21211  
(410) 554-0156

### UTILITY CERTIFICATION

"I HEREBY CERTIFY, TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION, AND BELIEF, THAT THE EXISTING AND/OR PROPOSED UNDERGROUND UTILITY INFORMATION SHOWN HEREON HAS BEEN CORRECTLY DUPLICATED FROM UTILITY COMPANY RECORDS. FURTHER THAT THIS PROJECT HAS BEEN CAREFULLY COORDINATED WITH EACH UTILITY COMPANY AND ALL AVAILABLE UNDERGROUND UTILITY INFORMATION RELATIVE TO THIS PLAN HAS BEEN SOLICITED FROM THEM."

Signature: *Douglas Streaker* 10/20/23  
DOUG STREAKER DATE  
MD P.E. No. 30734

### AS-BUILT CERTIFICATION

"I HEREBY CERTIFY THAT THIS AS-BUILT REPRESENTS EXISTING FIELD CONDITIONS INCLUDING BUT NOT LIMITED TO SIZES, DIAMETERS, LINE AND GRADE, AND ELEVATIONS."

### OWNER'S/DEVELOPER'S CERTIFICATION

"I/WE HEREBY CERTIFY THAT I/WE HAVE REVIEWED THIS EROSION AND SEDIMENT CONTROL PLAN AND THAT ANY CLEARING, GRADING, DRAINAGE, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVAL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT. PRINCE GEORGE'S SOIL CONSERVATION DISTRICT AND THE ENFORCEMENT AUTHORITY SHALL HAVE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION."

SIGNATURE: *Jeff DeHan* DATE: 12/18/2023

NAME (PRINTED): Jeff DeHan TITLE: Associate Director

Signed as agent for Prince George's County  
PH# 301-883-5795 FIRM Prince George's County Department of Environment

COMPLETE ADDRESS 1801 McCormick Drive, Suite 500, Largo, Md 20774

### SCOPE OF THE PROJECT

THIS PROJECT CONSISTS OF 2 PROJECT AREAS BEING SUBMITTED FOR PERMITS AS A SINGLE INTEGRATED PROJECT INTENDED TO BE BUILT AS A SINGLE PROJECT.

PROJECT AREA 1 - TOWN OF EAGLE HARBOR PROJECT, FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP)  
PROJECT AREA 2 - GREENVEST, LLC FULL DELIVERY TMDL PROJECT, FUNDED BY PRINCE GEORGE'S COUNTY

### PROJECT AREA 1

PROJECT AREA 1 (REACH 1, 2, 3) OF THE COLEMAN CREEK RESTORATION PROJECT ORIGINATES WEST OF HAWKINS DRIVE AND SOUTH OF TRUMAN POINT ROAD IN EAGLE HARBOR, MARYLAND. WITHIN THE PROJECT LIMITS, COLEMAN CREEK CROSSES SEVERAL PROPERTIES THAT ARE EITHER PRIVATELY OWNED OR OWNED BY THE TOWN OF EAGLE HARBOR AND TWO ROADS: HAWKINS DR AND PATUXENT BLVD. ROUGHLY 950 FT OF THE PROJECT AREA IS FORESTED WHILE THE REMAINING 450 FT ARE RESIDENTIAL WITH LAWN. APPROXIMATELY 1,400 LINEAR FT OF COLEMAN CREEK WAS ORIGINALLY INCLUDED IN THIS ASSESSMENT AND DESIGN.

### PROJECT AREA 2

PROJECT AREA 2 (REACH 4, 5) OF THE COLEMAN CREEK RESTORATION PROJECT ORIGINATES AT THE HEADWATERS OF TWO BRANCHES OF COLEMAN CREEK AND CONTINUES DOWN TO THEIR CONFLUENCE WHERE PROJECT AREA 1 BEGINS. THIS PROJECT AREA 2 WORK ALSO INCLUDES REPLACEMENT OF TWO UNDERSIZED CULVERTS AND EXCAVATION OF AN EXPANDED WETLAND WITHIN PROJECT AREA 1 LIMITS TO FURTHER REDUCE FLOODING.

### GENERAL NOTES:

- BASEMAPPING SHOWN INCLUDES FIELD RUN TOPOGRAPHIC SURVEY OF THE STREAM AND FLOODPLAIN, MERGED WITH SURROUNDING PRINCE GEORGE'S COUNTY PLANNING DEPARTMENT GIS 2 FOOT TOPOGRAPHY. BASEMAPPING INCLUDES ALL KNOWN EXISTING STRUCTURES AND SITE FEATURES, INCLUDING CULTURAL FEATURES, HISTORIC SITES AND EASEMENTS, EXISTING UTILITIES AND UTILITY EASEMENTS. HORIZONTAL COORDINATES, BEARING & DISTANCES ARE REFERRED TO THE MARYLAND STATE PLANE COORDINATE SYSTEM (NAD 83/2011). ELEVATIONS ARE REFERRED TO NAVD 88
- THIS PROJECT IS A STREAM RESTORATION AND INCLUDES NO PROPOSED STORMWATER MANAGEMENT BMP FACILITIES, AS THERE WILL BE NO NEW IMPERVIOUS SURFACE AS A RESULT OF THIS PROJECT.
- FOR PG COUNTY'S FLOODPLAIN REQUIREMENTS AND REGULATIONS, THE SITE'S DRAINAGE AREA DOES NOT EXCEED 50 ACRES UNTIL APPROXIMATE STATION 15+00. ALL PORTIONS OF THE SITE UPSTREAM OF STATION 15+00 WILL BE OUTSIDE OF THE COUNTY'S REGULATED FLOODPLAIN.

PROPOSED WORK TO BE COMPLETED PURSUANT TO THE FOLLOWING PERMITS:

- USACE: PRELIMINARY JURISDICTIONAL DETERMINATION
- MDE/USACE: JOINT PERMIT FOR THE ALTERATION OF FLOODPLAIN, WATERWAYS, TIDAL/NONTIDAL WETLANDS
- NPDES: PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY
- PGSCD: PRINCE GEORGE'S COUNTY SOIL CONSERVATION DISTRICT APPROVAL
- DOE: FINE GRADING PERMIT

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STREAM RESTORATION DESIGN BY BIOHABITATS, INC  
\*CULVERT DESIGN BY ZEST LLC

### BMP SUMMARY TABLE

COUNTY STRUCTURE ID	POI	LABEL NAME	MD NORTH	MD EAST	LAND USE	CONSTRUCTION PURPOSE	DRAINAGE AREA [AC]	TOTAL IMPERVIOUS AREA [AC]	NEW IMPERVIOUS AREA [AC]	EXISTING IMPERVIOUS AREA [AC]	IMPERVIOUS AREA TREATED BY OTHERS [AC]	PERCENT IMPERVIOUS [%]	Rv	TARGET PE [IN]	TARGET VOLUME [CF]	DESIGN VOLUME USING ESD PRACTICES [CF]	DESIGN VOLUME USING STRUCTURAL PRACTICES [CF]	MAX ESD VOLUME [CF]	RCN	ON_OFF SITE	IMPERVIOUS ACRES CREDIT AVAILABLE [AC]	IMPERVIOUS ACRES CREDIT TO BE CLAIMED [AC]
Eagle Harbor	5	Eagle Harbor	327484.23	1402798.12	RR, IH, AG	STREAM RESTORATION	68.3	11.6	0	11.6	N/A	17.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ON SITE	TBD	TBD









**SEQUENCE OF CONSTRUCTION**

**GENERAL NOTES**

- NO CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHALL BEGIN UNTIL ALL REQUIRED EASEMENTS, RIGHT-OF-WAYS AND PERMITS HAVE BEEN OBTAINED.
- PRIOR TO THE PRE-CONSTRUCTION MEETING THE CONTRACTOR SHALL:
  - THE CONTRACTOR SHALL NOTIFY THE PRINCE GEORGES COUNTY DEPARTMENT OF INSPECTIONS AND PERMITS AT LEAST 48 HOURS BEFORE COMMENCING WORK. WORK MAY NOT COMMENCE UNTIL THE PERMITTEE OR THE RESPONSIBLE PERSONNEL HAVE MET ON SITE WITH THE SEDIMENT AND EROSION CONTROL INSPECTOR TO REVIEW THE APPROVED PLANS.
  - THE CONTRACTOR SHALL NOTIFY MDE COMPLIANCE INSPECTOR AT 410-537-3510 AT LEAST 24 HOURS BEFORE COMMENCING WORK.
  - THE CONTRACTOR SHALL NOTIFY MISS UTILITY AT 1-800-277-7777 A MINIMUM OF FORTY-EIGHT (48) HOURS BEFORE STARTING WORK. ALL EXISTING UTILITIES MUST BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION.
  - THE CONTRACTOR SHALL CONTACT PRINCE GEORGES COUNTY SOIL CONSERVATION DISTRICT AT LEAST 3 DAYS PRIOR TO WORK TO ARRANGE A PRE-CONSTRUCTION MEETING.
  - THE CONTRACTOR SHALL STAKE OUT THE LIMIT OF DISTURBANCE, DESIGNATE THE STAGING AND STOCKPILE AREAS, ANY ACCESS ROADS AND FLAG ALL TREES WHICH WILL BE REMOVED WITHIN THE LIMITS OF DISTURBANCE.
- THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION MEETING ONSITE WITH OWNER REPRESENTATIVE(S), SEDIMENT CONTROL INSPECTOR, CONSTRUCTION SUPERVISOR, AND THE ENGINEER/DESIGNATED SPECIALIST TO REVIEW THE LIMITS OF DISTURBANCE, CONSTRUCTION ACCESS ROUTE, EROSION AND SEDIMENT CONTROL REQUIREMENTS, UTILITY LOCATIONS, AND THE SEQUENCE OF CONSTRUCTION. THE CONSTRUCTION ACCESS ROUTES AND STAGING/STOCKPILE AREAS MAY BE ADJUSTED IN THE FIELD TO MINIMIZE IMPACT TO NATURAL RESOURCES WITH APPROVAL FROM THE PROJECT ENGINEER/DESIGNATED SPECIALIST AND INSPECTOR. THE PARTICIPANTS WILL ALSO FLAG ANY TREES WITHIN THE LIMITS OF DISTURBANCE WHICH WILL BE REMOVED. THE CONTRACTOR MUST COMPLETE THE PRE-CONSTRUCTION MEETING, E&S INSPECTION, AND TREE INSPECTIONS BEFORE ANY CONSTRUCTION CAN BEGIN.
- CONSTRUCTION SHALL NOT BEGIN ON A CONSTRUCTION PHASE UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES FOR THAT SECTION HAVE BEEN INSTALLED AND APPROVED BY THE PROJECT ENGINEER/DESIGNATED SPECIALIST AND THE SEDIMENT CONTROL INSPECTOR.
- THE LIMIT OF DISTURBANCE (LOD) SHOWN ON THE PLANS ENCOMPASSES ALL DISTURBANCE ACTIVITIES RELATED TO THE STREAM CHANNEL IMPROVEMENTS AND CONSTRUCTION ACCESS. ALL HEAVY EQUIPMENT AND VEHICLE ACCESS SHALL GENERALLY FOLLOW THE PRIMARY CONSTRUCTION ACCESS AND GRADING AREA AS SHOWN ALONG THE MAIN STREAM CHANNELS, BUT MAY BE ADJUSTED IN THE FIELD TO MINIMIZE IMPACT TO NATURAL RESOURCES WITH APPROVAL FROM THE ENGINEER/DESIGNATED SPECIALIST. LAND DISTURBANCE OUTSIDE OF THIS PRIMARY ACCESS AND GRADING AREA SHALL BE MINIMIZED BUT SHALL INCLUDE SELECTIVE TREE HARVESTING AND PLANTING ACTIVITIES.
- THE LIMIT OF HAND WORK (LOW) INCLUDES WORK PERFORMED OUTSIDE OF THE LOD IMPLEMENTED BY HAND LABOR ONLY. NO CONSTRUCTION EQUIPMENT IS ALLOWED WITHIN THE LOW, THUS GROUND DISTURBANCE IS NEGLIGIBLE AND DOES NOT REQUIRE SEDIMENT CONTROL MEASURES.
- SPECIFIC TREES TO BE HARVESTED FOR STREAM RESTORATION STRUCTURES AND TREE PROTECTION MEASURES FOR TREES TO REMAIN SHALL BE DETERMINED AND MARKED IN THE FIELD BY THE DESIGNATED SPECIALIST PER NOTES AND DETAILS.
- WHEN STREAM DIVERSION PRACTICES ARE UTILIZED, THE EXACT LOCATION OF THE PUMPS, HOSES, SEDIMENT DIKES, AND FILTER BAGS MAY BE MODIFIED IN THE FIELD BASED ON EXISTING CONDITIONS. ANY ADJUSTMENTS MUST BE APPROVED BY THE ENGINEER/DESIGNATED SPECIALIST AND SEDIMENT CONTROL INSPECTOR.
- FOR ALL ASPECTS OF STREAM WORK AND THROUGHOUT THE TIMEFRAME OF CONSTRUCTION OF THE STREAM IMPROVEMENTS, THE FOLLOWING APPLIES:
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING THAT THE SEDIMENT CONTROL MEASURES ARE FUNCTIONAL ON A DAY TO DAY BASIS. NO DISTURBED AREAS ARE TO BE ALLOWED TO DRAIN UNTREATED DIRECTLY OFF SITE.
  - NO INSTREAM WORK IS ALLOWED WITHIN PERENNIAL AND INTERMITTENT REACHES FROM MARCH 1ST TO JUNE 15TH OF ANY YEAR TO MINIMIZE IMPACT TO AQUATIC SPECIES.
- FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
  - THREE CALENDAR DAYS FOR THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1);
  - SEVEN DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON PROJECT SITE
- WOODCHIPS OR HARDWOOD MULCH MAY BE USED FOR STABILIZATION WITHIN A FORESTED AREA; AND SHALL BE DERIVED FROM FRESH OR AGED HARDWOOD INCLUDING BARK, WOOD FRAGMENTS AND GRINDINGS. WOODCHIPS AND HARDWOOD MULCH SHALL BE FREE OF LEAVES, VINES INCLUDING POISON IVY, TRASH AND FOREIGN MATTER, AND MAY INCLUDE CHUNKS UP TO 3 INCHES IN ANY DIMENSION. WITHIN THE TURFGRASS AREAS, STRAW MULCH SHALL BE USED FOR TEMPORARY STABILIZATION.

- AREAS, INCLUDING TRAVEL LANES.
- CONSTRUCTION ACCESS LOCATIONS SHALL BE ESTABLISHED, INCLUDING THE INSTALLATION OF A STABILIZED CONSTRUCTION ENTRANCE AND ASSOCIATED STAGING AND STOCKPILE AREAS. INSTALL CONSTRUCTION ACCESS ROAD, IN-STREAM HAUL ROAD/BASEFLOW DIVERSION, AND TEMPORARY ACCESS BRIDGES AS SHOWN (SEE EROSION AND SEDIMENT PLAN AND CONSTRUCTION ACCESS ROAD DETAIL). CONTRACTOR SHALL INSTALL HARDWOOD MATS AS ADDITIONAL PROTECTION IN WET OR HEAVY TRAFFIC AREAS (SEE DETAIL). RETAIN HARVESTED LOGS, ROOT WADS, AND OTHER WOODY DEBRIS SUITABLE FOR USE AS INSTREAM STRUCTURES AND WOODY DEBRIS PLACEMENT ON-SITE; DO NOT CHIP MATERIALS THAT MEET THE REQUIREMENTS OF ANY WOOD STRUCTURE.
  - THE CONTRACTOR SHALL INSTALL THE TREE PROTECTION MEASURES (TREE PROTECTION FENCE AND/OR TREE PLANKING) AS AGREED UPON WITH THE DESIGNATED SPECIALIST PER THE NOTES AND DETAILS.
  - INSTALL PERIMETER CONTROLS AROUND STAGING AND STOCKPILE AREAS. STOCKPILE PLACEMENT OF ERODIBLE MATERIAL SHALL BE OUTSIDE THE EXISTING AND PROPOSED 100 WSEL AND SURROUNDED ALONG THE PERIMETER WITH SILT FENCE IF LOCATED OUTSIDE OF A FORESTED AREA. WITHIN A FORESTED AREA, A FILTER LOG MAY BE USED AROUND STOCKPILE AREAS IN PLACE OF SILT FENCE TO PROTECT TREE ROOT ZONES. STAGING AND STOCKPILE AREA NOT TO EXCEED 15' IN HEIGHT OR 2:1 SLOPE. BORROW MATERIAL TO BE TAKEN OFF SITE TO A SITE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN. TEMPORARILY STABILIZE STOCKPILE AS PER THE STABILIZATION SPEC OR COVER THE STOCKPILE WITH PLASTIC TARP AND ANCHOR AT THE END OF EACH WORK DAY. STAGING AND STOCKPILING AREAS TO BE PROTECTED USING SAME PROTECTION AND REPLENISHMENT REQUIREMENTS AS MULCH ACCESS ROAD.
  - AS SITE CONDITIONS DICTATE; THE CONTRACTOR SHALL INSTALL A STREAM DIVERSION (CLEAR WATER DIVERSION AND/OR PUMP AROUND PRACTICE) WITHIN THE STREAM CHANNEL TO MAINTAIN A DRY ACTIVE WORK AREA(S). EACH WORK AREA LENGTH SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY. PUMP-AROUND PRACTICE SHALL FOLLOW MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION DETAIL 1.2 (WHICH INCLUDES INSTALLATION OF SANDBAG DIKES STREAM DIVERSION PUMPS AND HOSES, AND APPROVED DEWATERING DEVICE. CLEAR WATER DIVERSION PRACTICE SHALL FOLLOW MDE DETAIL C-6, WHICH INCLUDES INSTALLATION OF SANDBAG DIKES, DIVERSION PIPES AND APPROVED DEWATERING DEVICE.
  - THE SEDIMENT AND EROSION CONTROL INSPECTOR WILL BE NOTIFIED UPON COMPLETION OF THE SEDIMENT CONTROL INSTALLATION. UPON COMPLETION OF CONTROL INSTALLATION AND WITH APPROVAL OF THE SEDIMENT AND EROSION CONTROL INSPECTOR, THE CONTRACTOR MAY BEGIN GRADING OPERATIONS.
  - CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION, CONSTRUCTION PLANS AND EROSION AND SEDIMENT CONTROL DETAILS AND NOTES. DO NOT CLEAR AND GRUB THE ENTIRE PROJECT AREA. CLEAR AND GRUB ONLY AS DIRECTED BY THE ENGINEER/DESIGNATED SPECIALIST AND ONLY WHERE CONSTRUCTION ACCESS IS NEEDED, OR CHANNEL CONSTRUCTION IS TAKING PLACE AND CAN BE STABILIZED IN ONE WORKING DAY (IN 250 FT INCREMENTS MAXIMUM). MULTIPLE PHASES MAY BE UNDER CONSTRUCTION CONCURRENTLY, OR IN A DIFFERENT PHASE ORDER OR DIRECTION OF WORK THAN LISTED IN THE SEQUENCE WITH APPROVAL FROM THE ENGINEER/DESIGNATED SPECIALIST AND ALL PHASE SEDIMENT CONTROL MEASURES ARE APPROVED. SIDE CHANNELS MAY BE CONSTRUCTED SIMULTANEOUSLY WITH MAIN CHANNEL WORK. BEGIN SELECT TREE REMOVAL AND HARVESTING AND NECESSARY CLEARING AND GRUBBING ACTIVITIES PER THE CONSTRUCTION PLANS TO FACILITATE CONSTRUCTION ACCESS TO THE ACTIVE WORK AREA(S). CARE MUST BE TAKEN TO MINIMIZE SITE DISTURBANCE AND UNNECESSARY CLEARING AND GRUBBING. RETAIN HARVESTED LOGS, ROOT WADS, AND OTHER WOODY DEBRIS SUITABLE FOR USE AS INSTREAM STRUCTURES AND WOODY DEBRIS PLACEMENT ON-SITE.
  - THE CONTRACTOR SHALL STAKE OUT THE PROPOSED WORK AS SHOWN ON THE PLANS AND STRUCTURE TABLES.
  - WITHIN THE LOD, LOCATIONS OF STRUCTURES AND CONSTRUCTION ACCESS ROUTES MAY BE ADJUSTED IN THE FIELD TO MINIMIZE IMPACT TO NATURAL RESOURCES WITH APPROVAL FROM THE ENGINEER/DESIGNATED SPECIALIST. ADDITIONAL WOOD STRUCTURES MAY BE ADDED WITHIN THE LOD AT LOCATIONS DIRECTED BY THE PROJECT ENGINEER/DESIGNATED SPECIALIST BASED ON SITE CONDITIONS AND AVAILABLE MATERIAL.

**CONSTRUCTION PHASE A- PROJECT AREA 1, REACH 3**

- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN-PLACE PRIOR TO GRADING. WITH APPROVAL FROM EROSION AND SEDIMENT CONTROL INSPECTOR, BEGIN CONSTRUCTION OF THIS SECTION OF WORK.
- WITH ACTIVE WORK AREA DEWATERED, BEGIN INSTREAM WORK STARTING AT THE DOWNSTREAM END AND WORKING UPSTREAM. INSTALL STREAM GRADE CONTROL STRUCTURES AND PERFORM GRADING PER PLANS AND CONSTRUCTION DETAILS.(LENGTH OF EACH WORK AREA SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY).
- WITH ACTIVE WORK AREA DEWATERED, REPLACE CULVERT UNDER PATUXENT BLVD. REFER TO CULVERT SEQUENCE OF CONSTRUCTION ON CULVERT PLANS, SHEETS 57-73.

**CONSTRUCTION PHASE B- PROJECT AREA 1, REACH 2**

- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN-PLACE PRIOR TO GRADING. WITH APPROVAL FROM EROSION AND SEDIMENT CONTROL INSPECTOR, BEGIN CONSTRUCTION OF THIS SECTION OF WORK.
- WITH ACTIVE WORK AREA DEWATERED, BEGIN INSTREAM WORK STARTING AT THE DOWNSTREAM END AND WORKING UPSTREAM. INSTALL STREAM GRADE CONTROL STRUCTURES, BOULDER TOE AND PERFORM GRADING PER PLANS AND CONSTRUCTION DETAILS.(LENGTH OF EACH WORK AREA SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY).

**CONSTRUCTION PHASE C- PROJECT AREA 1, REACH 1**

- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN-PLACE PRIOR TO GRADING. WITH APPROVAL FROM EROSION AND SEDIMENT CONTROL INSPECTOR, BEGIN CONSTRUCTION OF THIS SECTION OF WORK.
- WITH ACTIVE WORK AREA DEWATERED, BEGIN INSTREAM WORK STARTING AT THE UPSTREAM END AND WORKING DOWNSTREAM. INSTALL STREAM GRADE CONTROL STRUCTURES AND PERFORM GRADING PER PLANS AND CONSTRUCTION DETAILS.(LENGTH OF EACH WORK AREA SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY).
- WITH ACTIVE WORK AREA DEWATERED, REPLACE CULVERT UNDER HAWKINS DR. REFER TO CULVERT SEQUENCE OF CONSTRUCTION ON CULVERT PLANS, SHEETS 57-73.

**CONSTRUCTION PHASE D- PROJECT AREA 2, REACH 4**

- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN-PLACE PRIOR TO GRADING. WITH APPROVAL FROM EROSION AND SEDIMENT CONTROL INSPECTOR, BEGIN CONSTRUCTION OF THIS SECTION OF WORK.
- WITH ACTIVE WORK AREA DEWATERED, BEGIN INSTREAM WORK STARTING AT THE UPSTREAM END AND WORKING DOWNSTREAM. INSTALL STREAM GRADE CONTROL STRUCTURES AND PERFORM GRADING PER PLANS AND CONSTRUCTION DETAILS.(LENGTH OF EACH WORK AREA SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY).

**CONSTRUCTION PHASE E- PROJECT AREA 2, REACH 5**

- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN-PLACE PRIOR TO GRADING. WITH APPROVAL FROM EROSION AND SEDIMENT CONTROL INSPECTOR, BEGIN CONSTRUCTION OF THIS SECTION OF WORK.
- WITH ACTIVE WORK AREA DEWATERED, BEGIN INSTREAM WORK STARTING AT THE UPSTREAM END AND WORKING DOWNSTREAM. INSTALL STREAM GRADE CONTROL STRUCTURES AND PERFORM GRADING PER PLANS AND CONSTRUCTION DETAILS.(LENGTH OF EACH WORK AREA SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY).

**STABILIZATION (CONCURRENT WITH CONSTRUCTION OF ALL PHASES)**

- WITHIN AREAS ADJACENT TO ACTIVE STREAM CHANNELS, TREAT DISTURBED AREAS DAILY WITH TEMPORARY SEED AND A MINIMUM OF 2" OF WOODCHIPS OR HARDWOOD MULCH STABILIZATION. OVERSEED WITH PERMANENT SEED PER THE PLANTING SCHEDULE AND INSTALL SOIL STABILIZATION MATTING PER DETAIL AS COMPLETED AREAS ARE APPROVED BY THE INSPECTOR AND ENGINEER/DESIGNATED SPECIALIST. SOIL STABILIZATION MATTING SHALL BE INSTALLED CONSTRUCTION DETAILS AND ON ALL GRADED STREAM BANKS WITH SLOPES 3:1 OR GREATER (SEE TYPICAL POOL GRADING DETAIL). ALL OTHER DISTURBED AREAS AWAY FROM STREAM CHANNELS SHALL BE STABILIZED PER MDE STANDARD OF WITHIN THREE CALENDAR DAYS.
- IF WITHIN THE APPROPRIATE TIME OF YEAR FOR THE PLANT MATERIAL TYPE (PLUGS, LIVE STAKE, BARE ROOT, CONTAINER), CONTRACTOR MAY INSTALL TREE, SHRUB AND HERBACEOUS MATERIAL AT THIS TIME PER THE PLANTING PLAN AND DETAILS.
- ONCE PHASE IS TEMPORARILY STABILIZED PER THE MDE STANDARDS, AND WITH THE INSPECTOR'S APPROVAL, REMOVE ALL SEDIMENT CONTROL DEVICES NOT NEEDED FOR SUBSEQUENT PHASES.
- WHEN CONSTRUCTION WITHIN PROJECT AREA IS COMPLETE, STABILIZE ANY REMAINING DISTURBED AREAS AND FINALIZE SEEDING ON ALL REMAINING AREAS NOT PREVIOUSLY ADDRESSSED.

**LANDSCAPING**

- COMPLETE INSTALLATION OF ALL REMAINING TREE, SHRUB AND HERBACEOUS MATERIAL NOT INSTALLED PREVIOUSLY UNDER COMPLETED PHASES PER THE PLANTING PLAN AND DETAILS.

**APPROXIMATE CONSTRUCTION SCHEDULE**

TASK	WEEKS FROM CONSTRUCTION COMMENCEMENT
Pre-Construction Meeting	0
Commencement of Construction	1
Construction Stakeout and Site Controls	3
Grading/Earthwork/In-Stream Structure Placement	30
Site Stabilization and Landscaping	37
As-Built Survey and Metes/Bounds	40
Construction Completion Report	43



PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30794  
EXP. DATE: 10/20/23

DWG/FSC: 03 OF 73  
TITLE:

**SEQUENCE OF CONSTRUCTION**

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND

**PEER REVIEW APPROVAL STAMP**

"I hereby certify that I have successfully completed participation in DPE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 2022-0273  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 0000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
*Tanvir Bhuiyan*  
ENVIRONMENT

**Conditions of Approval**

- The above approval is conditioned upon the following:
- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
  - Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
  - This approval does NOT represent a permit to construct.



TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

*Jeff Easton* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: N/A BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**



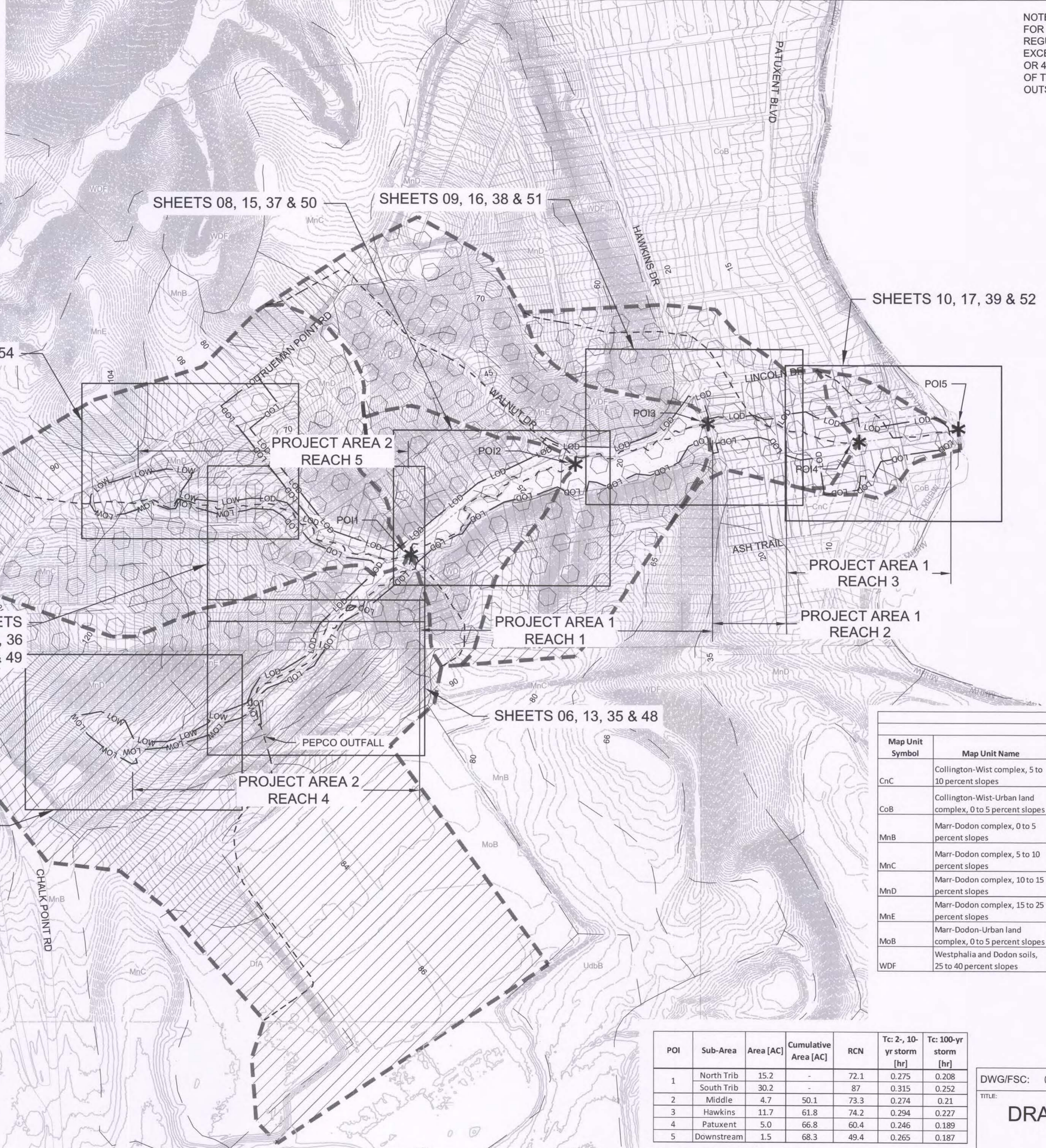


**LAND USE LEGEND**

- RESIDENTIAL, RURAL
- AGRICULTURAL AND PRESERVATION
- INDUSTRIAL, HEAVY

**TIME OF CONCENTRATION LEGEND**

- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- CHANNEL FLOW



NOTE:  
FOR PG COUNTY'S FLOODPLAIN REQUIREMENTS AND REGULATIONS, THE SITE'S DRAINAGE AREA DOES NOT EXCEED 50 ACRES UNTIL APPROXIMATE STATION 15+00 OR 45 FEET UPSTREAM OF POI 2 SHOWN. ALL PORTIONS OF THE SITE UPSTREAM OF STATION 15+00 WILL BE OUTSIDE OF THE COUNTY'S REGULATED FLOODPLAIN.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND

**PEER REVIEW APPROVAL STAMP**

"I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

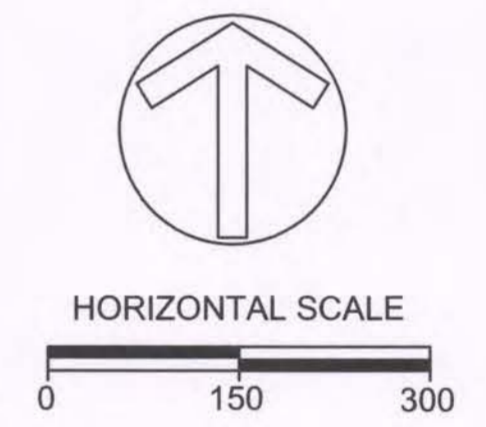
The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: COMMUNITY RESILIENCY PROJECT  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
**Tanvir Bhuiyan**

**Conditions of Approval**

The above approval is conditioned upon the following:

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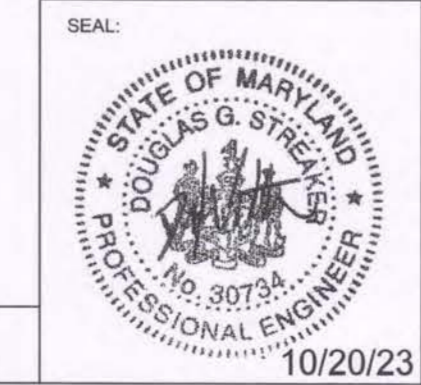
**Soils Table**

Map Unit Symbol	Map Unit Name	K-Factor (Whole Soil)	Hydric Rating	Hydrologic Soil Group	Drainage Class
CnC	Collington-Wist complex, 5 to 10 percent slopes	0.17	No	B	Well drained
CoB	Collington-Wist-Urban land complex, 0 to 5 percent slopes	0.2	No	A	Well drained
MnB	Marr-Dodon complex, 0 to 5 percent slopes	0.2	No	B	Well drained
MnC	Marr-Dodon complex, 5 to 10 percent slopes	0.2	No	C	Well drained
MnD	Marr-Dodon complex, 10 to 15 percent slopes	0.2	No	C	Well drained
MnE	Marr-Dodon complex, 15 to 25 percent slopes	0.2	No	B	Well drained
MoB	Marr-Dodon-Urban land complex, 0 to 5 percent slopes	0.2	No	B	Well drained
WDF	Westphalia and Dodon soils, 25 to 40 percent slopes	0.17	No	C	Well drained

POI	Sub-Area	Area [AC]	Cumulative Area [AC]	RCN	Tc: 2-, 10-yr storm [hr]	Tc: 100-yr storm [hr]
1	North Trib	15.2	-	72.1	0.275	0.208
	South Trib	30.2	-	87	0.315	0.252
2	Middle	4.7	50.1	73.3	0.274	0.21
3	Hawkins	11.7	61.8	74.2	0.294	0.227
4	Patuxent	5.0	66.8	60.4	0.246	0.189
5	Downstream	1.5	68.3	49.4	0.265	0.187

TOTAL DRAINAGE AREA = 68.3 AC

DWG/FSC: 04 OF 73  
TITLE: **DRAINAGE AREA MAP AND SHEET INDEX**



PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024-06-28

**GreenVest**  
VISION · PERFORMANCE · RESULTS

**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: *Jeff Dopfen* 12/18/2023  
ASSOCIATE DIRECTOR DATE

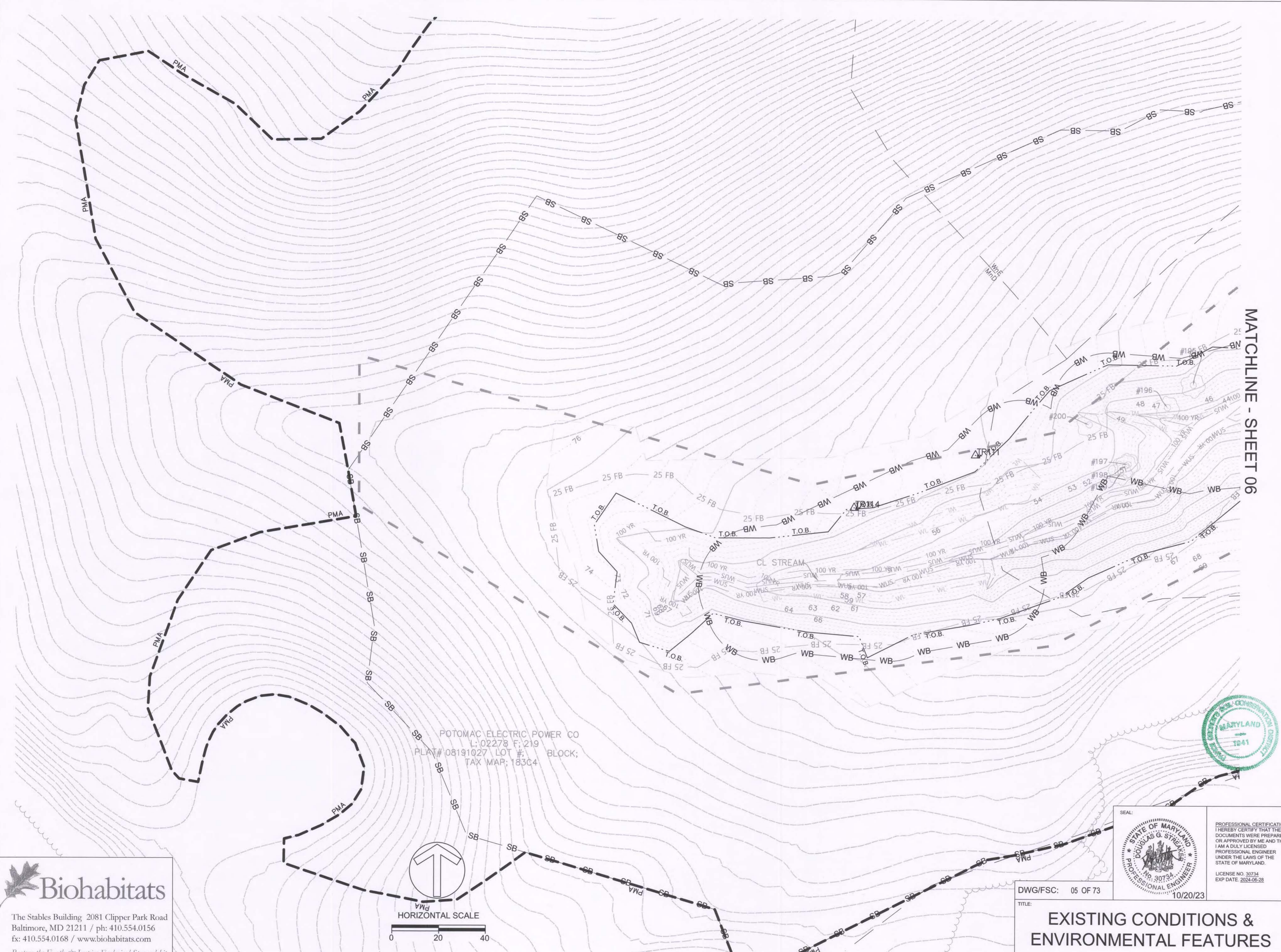
APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: 1" = 150' BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

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

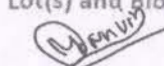





CONTROL POINTS		
ID	NORTHING	EASTING
TR111	326699.20	1400750.51
TR114	326676.40	1400698.55

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
 Case Number: 30734  
 Case Type: CIP WQ  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
 **Tanvir Bhuiyan**  


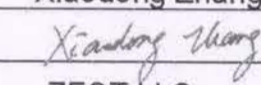
**Conditions of Approval**  
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DEPARTMENT OF THE ENVIRONMENT (DoE)  
 PRINCE GEORGE'S COUNTY, MARYLAND

**PEER REVIEW APPROVAL STAMP**

"I hereby certify that I have successfully completed participation in DP/E's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023  
 PEER REVIEWER'S NAME: Xiaodong Zhang  
 PEER REVIEWER'S SIGNATURE:   
 COMPANY NAME: ZEST LLC  
 LICENSE NUMBER: 36713  
 PERMIT NUMBER: 38079-2022-0



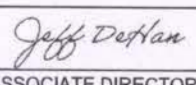
TOWN OF EAGLE HARBOR  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

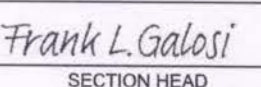


PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

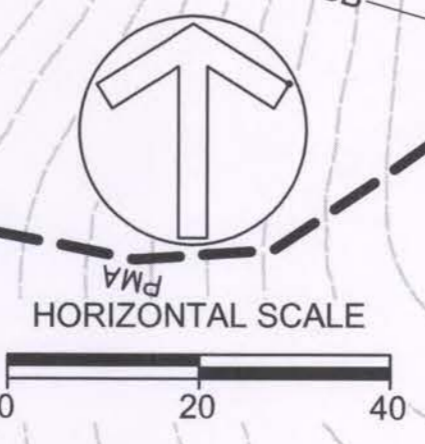
ELECTION DISTRICT 9

 12/18/2023  
 ASSOCIATE DIRECTOR DATE

APPROVED  12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

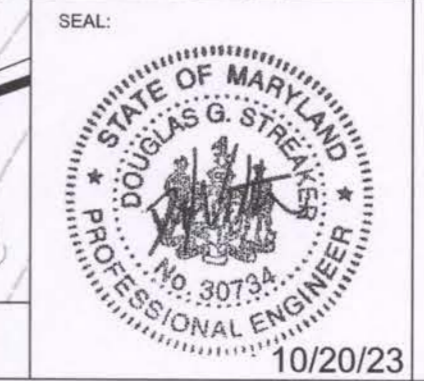
 **Biohabitats**  
 The Stables Building 2081 Clipper Park Road  
 Baltimore, MD 21211 / ph: 410.554.0156  
 fx: 410.554.0168 / www.biohabitats.com  
 Restore the Earth & Inspire Ecological Stewardship



POTOMAC ELECTRIC POWER CO  
 L: 02278 F: 219  
 PLAT# 08191027 LOT # BLOCK:  
 TAX MAP: 183C4

DWG/FSC: 05 OF 73

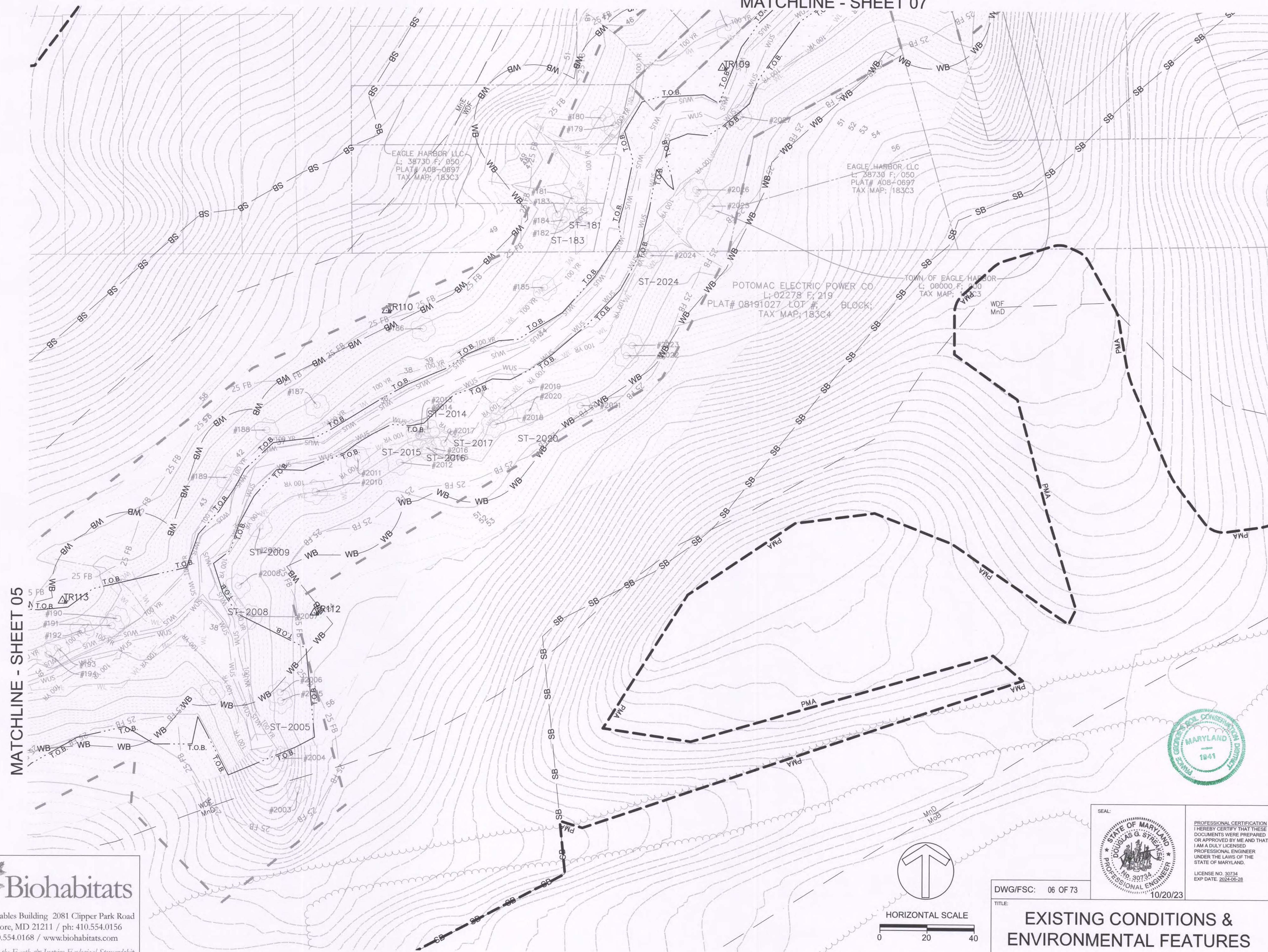
TITLE: **EXISTING CONDITIONS & ENVIRONMENTAL FEATURES**



PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP. DATE: 10/20/23



MATCHLINE - SHEET 07



CONTROL POINTS		
ID	NORTHING	EASTING
TR109	326976.01	1401156.18
TR110	326872.63	1401014.22
TR112	326744.56	1400984.10
TR113	326749.06	1400877.40

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
Tanvir Bhuiyan

- Conditions of Approval
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DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND  
PEER REVIEW APPROVAL STAMP

"I hereby certify that I have successfully completed participation in DPEI's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0



TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: *Jeff Durlan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

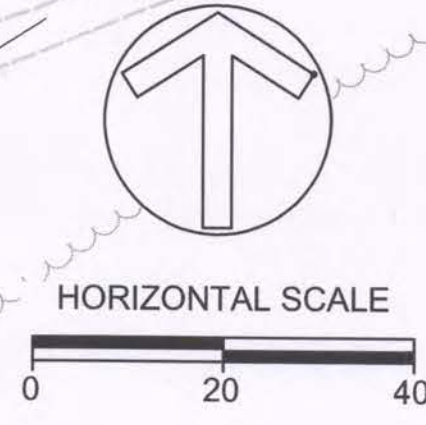
PROJECT MANAGER: CONTRACT NO.: C.I.P.  
PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS



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LICENSE NO. 30734  
EXP. DATE: 2024-05-28

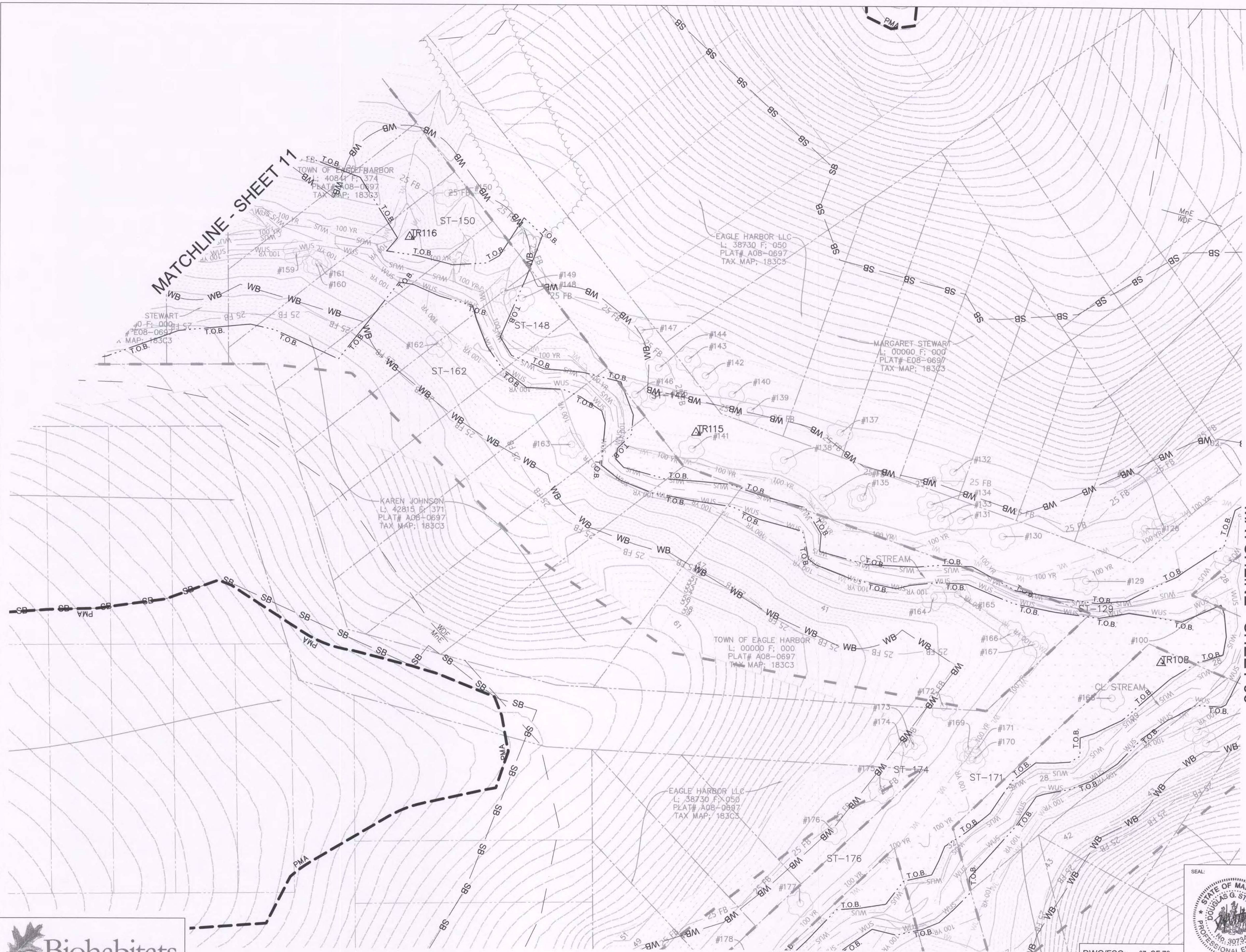
DWG/FSC: 06 OF 73

TITLE: EXISTING CONDITIONS & ENVIRONMENTAL FEATURES



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





CONTROL POINTS		
ID	NORTHING	EASTING
TR108	327116.33	1401323.18
TR115	327207.69	1401135.05
TR116	327285.90	1401019.24

Prince George's County Maryland  
 Department of the Environment (DoE)  
 APPROVED PLAN SET  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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 Case Type: CIP WQ  
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 Address: 0000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
 Tanvir Bhuiyan ENVIRONMENT

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 PRINCE GEORGE'S COUNTY, MARYLAND  
 PEER REVIEW APPROVAL STAMP

"I hereby certify that I have successfully completed participation in DPPE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

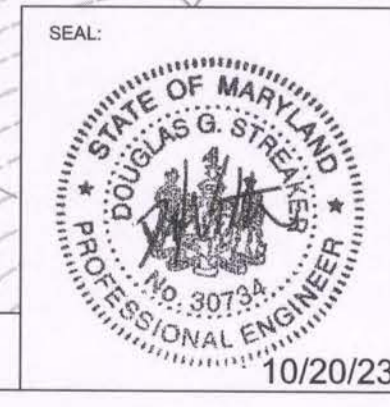
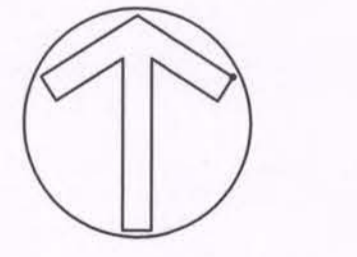
APPROVAL DATE: 11/16/2023  
 PEER REVIEWER'S NAME: Xiaodong Zhang  
 PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
 COMPANY NAME: ZEST LLC  
 LICENSE NUMBER: 36713  
 PERMIT NUMBER: 38079-2022-0



TOWN OF EAGLE HARBOR  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
 ELECTION DISTRICT 9

APPROVED: *Jeff Dorian* 12/18/2023  
 ASSOCIATE DIRECTOR DATE  
 APPROVED: *Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE  
 PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS



DWG/FSC: 07 OF 73  
 TITLE: EXISTING CONDITIONS & ENVIRONMENTAL FEATURES  
 DATE: 10/20/23

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



MATCHLINE - SHEET 07

MATCHLINE - SHEET 09

CONTROL POINTS		
ID	NORTHING	EASTING
TR105	327439.92	1401827.78
TR106	327323.93	1401668.48
TR107	327230.53	1401464.58

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
**Tanvir Bhuiyan**

Conditions of Approval

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

DEPARTMENT OF THE ENVIRONMENT (DOE)  
PRINCE GEORGE'S COUNTY, MARYLAND  
PEER REVIEW APPROVAL STAMP

"I hereby certify that I have successfully completed participation in DP/IE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023

PEER REVIEWER'S NAME: Xiaodong Zhang

PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*

COMPANY NAME: ZEST LLC

LICENSE NUMBER: 36713

PERMIT NUMBER: 38079-2022-0



TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR



PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

APPROVED: *Jeff DeHaven* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024-06-28

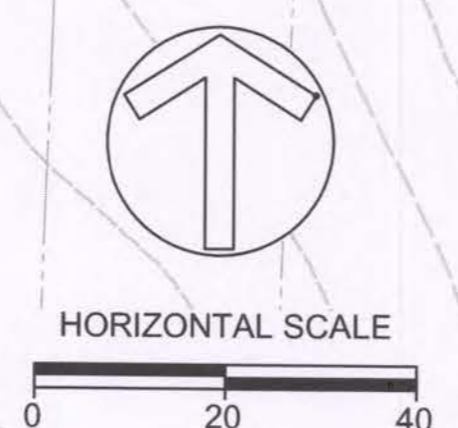
10/20/23

DWG/FSC: 08 OF 73

TITLE: EXISTING CONDITIONS & ENVIRONMENTAL FEATURES

EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

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







CONTROL POINTS		
ID	NORTHING	EASTING
TR102	327489.71	1402300.02
TR103	327505.79	1402150.04
TR104	327466.88	1402012.43

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
Case Number: **22025.01**  
Case Type: **CIP WQ**  
Issuance Date: **12/15/2023**  
Address: **00000 HAWKINS DR AQUASCO, Maryland 20608**  
Lot(s) and Block(s):  
**Tanvir Bhuiyan**

**Conditions of Approval**

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND  
**PEER REVIEW APPROVAL STAMP**

"I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: **11/16/2023**  
PEER REVIEWER'S NAME: **Xiaodong Zhang**  
PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: **ZEST LLC**  
LICENSE NUMBER: **36713**  
PERMIT NUMBER: **38079-2022-0**



**TOWN OF EAGLE HARBOR, INCORPORATED**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

*Jeff Duffin* 12/18/2023  
ASSOCIATE DIRECTOR DATE

*Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

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

**DOUGLAS G. STREIBER**  
PROFESSIONAL ENGINEER  
LICENSE NO. 30734  
EXP. DATE: 2024-06-28

10/20/23

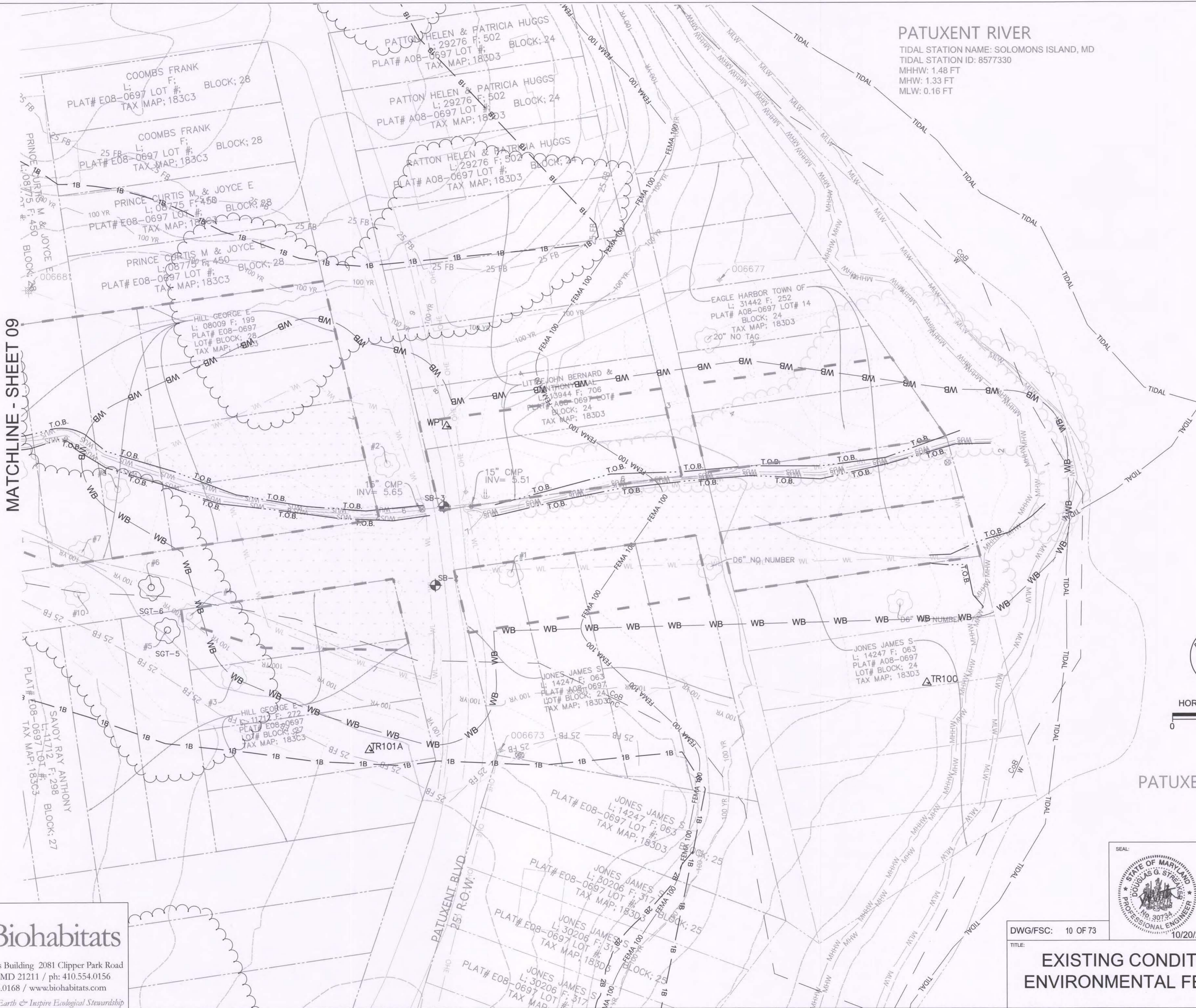
**EXISTING CONDITIONS & ENVIRONMENTAL FEATURES**

DWG/FSC: 09 OF 73  
TITLE:

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



MATCHLINE - SHEET 09



**PATUXENT RIVER**

TIDAL STATION NAME: SOLOMONS ISLAND, MD  
 TIDAL STATION ID: 8577330  
 MHHW: 1.48 FT  
 MHW: 1.33 FT  
 MLW: 0.16 FT

CONTROL POINTS		
ID	NORTHING	EASTING
TR100	327380.75	1402744.49
TR101A	327353.52	1402515.52
WP1	327486.17	1402547.77

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
 Case Number: 2022-0019  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
**Tanvir Bhuiyan**

**Conditions of Approval**

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for flood drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
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DEPARTMENT OF THE ENVIRONMENT (DoE)  
 PRINCE GEORGE'S COUNTY, MARYLAND  
**PEER REVIEW APPROVAL STAMP**

"I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

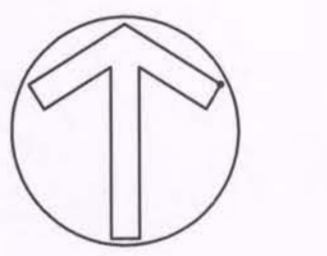
APPROVAL DATE: 11/16/2023  
 PEER REVIEWER'S NAME: Xiaodong Zhang  
 PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
 COMPANY NAME: ZEST LLC  
 LICENSE NUMBER: 36713  
 PERMIT NUMBER: 38079-2022-0



TOWN OF EAGLE HARBOR  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: *Jeff Dehan* 12/18/2023  
 ASSOCIATE DIRECTOR DATE  
 APPROVED: *Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE  
 PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS



HORIZONTAL SCALE  
 0 20 40



SEAL: *Douglas G. Strickland*  
 PROFESSIONAL ENGINEER  
 UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP. DATE: 2024-06-28  
 10/20/23

DWG/FSC: 10 OF 73

**EXISTING CONDITIONS & ENVIRONMENTAL FEATURES**

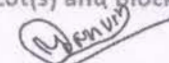
The Stables Building 2081 Clipper Park Road  
 Baltimore, MD 21211 / ph: 410.554.0156  
 fx: 410.554.0168 / www.biohabitats.com  
 Restore the Earth & Inspire Ecological Stewardship



CONTROL POINTS		
ID	NORTHING	EASTING
TR117	327289.94	1400918.47
TR118	327258.40	1400745.98

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
 **Tanvir Bhuiyan**  
ENVIRONMENT

- Conditions of Approval
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DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND  
PEER REVIEW APPROVAL STAMP

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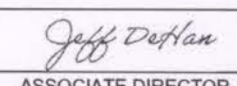
APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE:   
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0




TOWN OF EAGLE HARBOR, INCORPORATED 1829  
TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

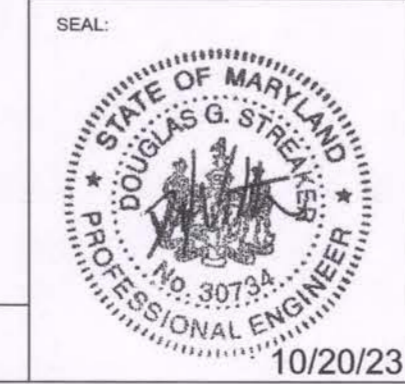
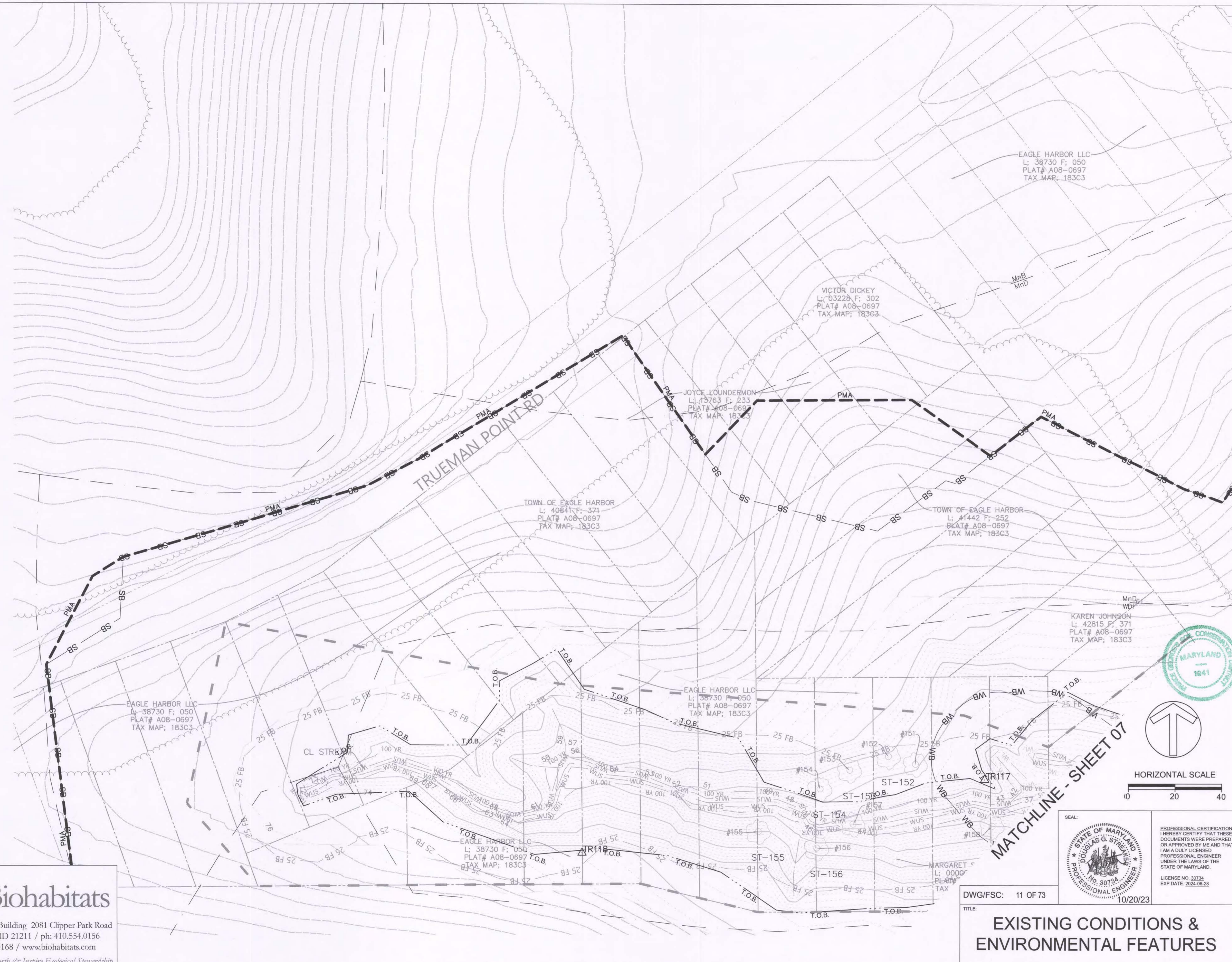
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9  
 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED  12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

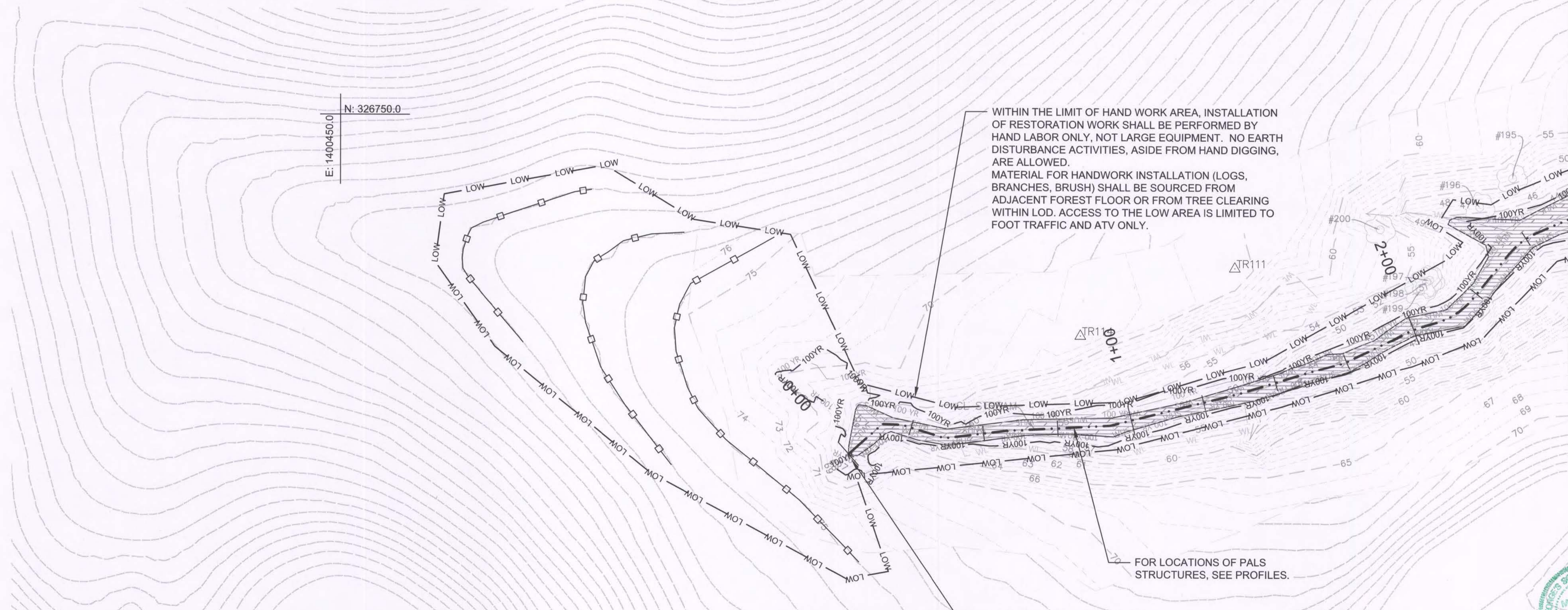


DWG/FSC: 11 OF 73  
TITLE: EXISTING CONDITIONS & ENVIRONMENTAL FEATURES  
DATE: 10/20/23

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



PROPOSED LEGEND			
— 425 —	MAJOR CONTOUR	□ — □	WATTLE STRUCTURE
— 424 —	MINOR CONTOUR		BOULDER RIFFLE
— • • —	BASELINE		CASCADE
— LOD —	LIMIT OF DISTURBANCE		CHANNEL PLUG
— LOW — LOW —	LIMIT OF HAND WORK	PP	PLUNGE POOL
— SD —	STORM DRAIN		BOULDER TOE PROTECTION
— 100YR —	PROPOSED 100-YEAR FLOODPLAIN (HEC-RAS)		FLOODPLAIN LOG SILL
	PRIMARY LOG JAM		INVERTED ROOTWAD
	SECONDARY LOG JAM		
	STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)		
	HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)		



MATCHLINE - SHEET 13

DEPARTMENT OF THE ENVIRONMENT (DoE)  
 PRINCE GEORGE'S COUNTY, MARYLAND  
**PEER REVIEW APPROVAL STAMP**  
 "I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."  
 APPROVAL DATE: 11/16/2023  
 PEER REVIEWER'S NAME: Xiaodong Zhang  
 PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
 COMPANY NAME: ZEST LLC  
 LICENSE NUMBER: 36713  
 PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY  
 The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.  
 Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
 Case Number: 38079-2022-0  
 Case Type: CIP WQ  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
*Tanvir Bhuiyan*  
 ENVIRONMENT

- Conditions of Approval
- The above approval is conditioned upon the following:
- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
  - Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
  - This approval does NOT represent a permit to construct.



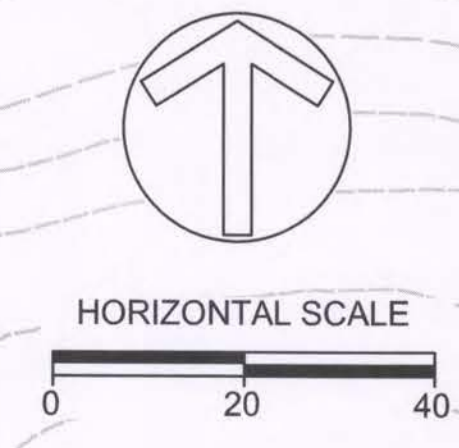
TOWN OF EAGLE HARBOR, INCORPORATED 1923  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
 ELECTION DISTRICT 9

*Jeff Drexler* 12/18/2023  
 ASSOCIATE DIRECTOR DATE  
 APPROVED *Frank L Galosi* 12/18/2023  
 SECTION HEAD DATE  
 PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

SEAL:  
  
 PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP DATE: 2024-06-28  
 10/20/23

DWG/FSC: 12 OF 73  
 TITLE: PROPOSED CONDITIONS



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



MATCHLINE - SEE SHEET 14

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
 Case Number: **2022-022**  
 Case Type: **CIP WQ**  
 Issuance Date: **12/15/2023**  
 Address: **00000 HAWKINS DR AQUASCO, Maryland 20608**  
 Lot(s) and Block(s):  
 L: 1401300.0  
 E: 1400900.0  
**Tanvir Bhuiyan**  
 ENVIRONMENT

Conditions of Approval

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
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STRUCTURE ID	LEFT EL.	INVERT EL.	RIGHT EL.
L-01	38.3	38.00	38.3
L-02	37.9	37.67	37.9
L-03	37.6	37.33	37.6
L-04	37.3	37.00	37.3
L-05	36.9	36.67	36.9
L-06	36.6	36.33	36.6
L-07	36.2	36.00	36.2
L-08	35.9	35.67	35.9
L-09	35.6	35.33	35.6
L-10	35.2	35.00	35.2
L-11	34.9	34.67	34.9
L-12	34.6	34.33	34.6
L-13	34.3	34.00	34.3
L-14	33.9	33.67	33.9

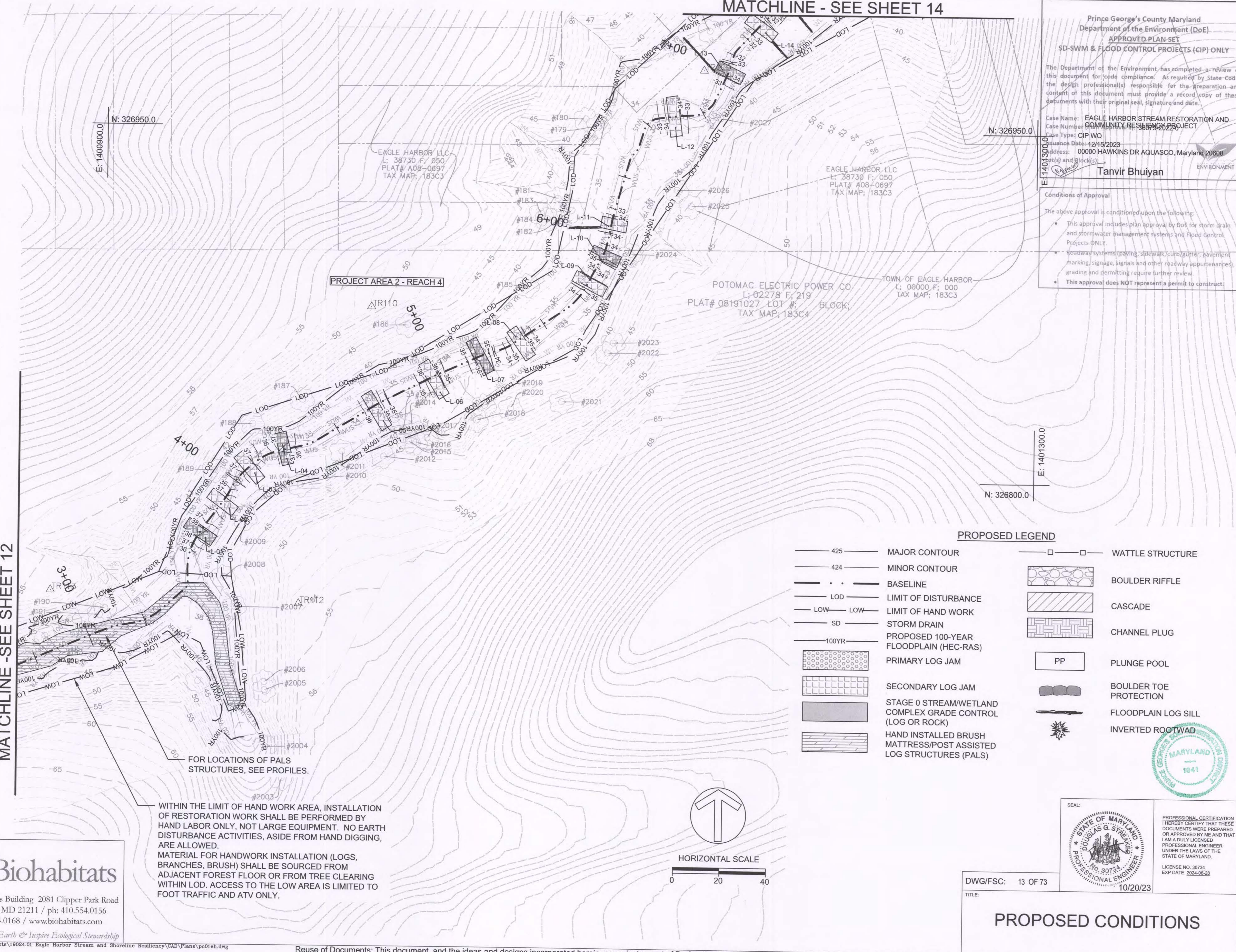
N: 326950.0  
 E: 1400900.0

N: 326950.0  
 E: 1401300.0

N: 326800.0  
 E: 1401300.0

PROJECT AREA 2 - REACH 4

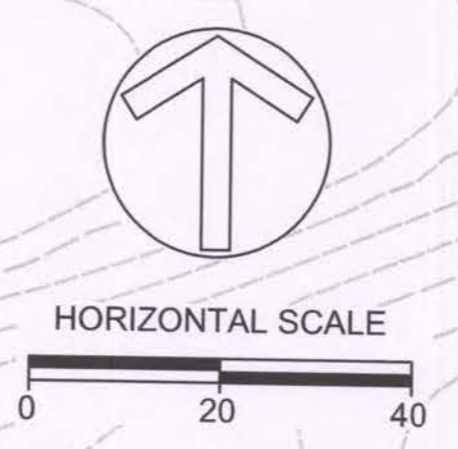
MATCHLINE - SEE SHEET 12



**PROPOSED LEGEND**

— 425 —	MAJOR CONTOUR	□ — □	WATTLE STRUCTURE
— 424 —	MINOR CONTOUR	[Pattern]	BOULDER RIFFLE
— · · —	BASELINE	[Pattern]	CASCADE
— LOD —	LIMIT OF DISTURBANCE	[Pattern]	CHANNEL PLUG
— LOW —	LIMIT OF HAND WORK	PP	PLUNGE POOL
— SD —	STORM DRAIN	[Pattern]	BOULDER TOE PROTECTION
— 100YR —	PROPOSED 100-YEAR FLOODPLAIN (HEC-RAS)	[Pattern]	FLOODPLAIN LOG SILL
[Pattern]	PRIMARY LOG JAM	[Pattern]	INVERTED ROOTWAD
[Pattern]	SECONDARY LOG JAM		
[Pattern]	STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)		
[Pattern]	HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)		

WITHIN THE LIMIT OF HAND WORK AREA, INSTALLATION OF RESTORATION WORK SHALL BE PERFORMED BY HAND LABOR ONLY, NOT LARGE EQUIPMENT. NO EARTH DISTURBANCE ACTIVITIES, ASIDE FROM HAND DIGGING, ARE ALLOWED. MATERIAL FOR HANDWORK INSTALLATION (LOGS, BRANCHES, BRUSH) SHALL BE SOURCED FROM ADJACENT FOREST FLOOR OR FROM TREE CLEARING WITHIN LOD. ACCESS TO THE LOW AREA IS LIMITED TO FOOT TRAFFIC AND ATV ONLY.



**Biohabitats**

The Stables Building 2081 Clipper Park Road  
 Baltimore, MD 21211 / ph: 410.554.0156  
 fx: 410.554.0168 / www.biohabitats.com

Restore the Earth & Inspire Ecological Stewardship

SEAL:

PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP. DATE: 2024-06-28

DWG/FSC: 13 OF 73  
 TITLE: **PROPOSED CONDITIONS**  
 DATE: 10/20/23

DEPARTMENT OF THE ENVIRONMENT (DoE)  
 PRINCE GEORGE'S COUNTY, MARYLAND

**PEER REVIEW APPROVAL STAMP**

"I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023  
 PEER REVIEWER'S NAME: Xiaodong Zhang  
 PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
 COMPANY NAME: ZEST LLC  
 LICENSE NUMBER: 36713  
 PERMIT NUMBER: 38079-2022-0

**GreenVest**  
 VISION • PERFORMANCE • RESULTS

**MLS**

TOWN OF EAGLE HARBOR  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: *Jeff Duffan* 12/18/2023  
 ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**



"I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
N: 327300.0

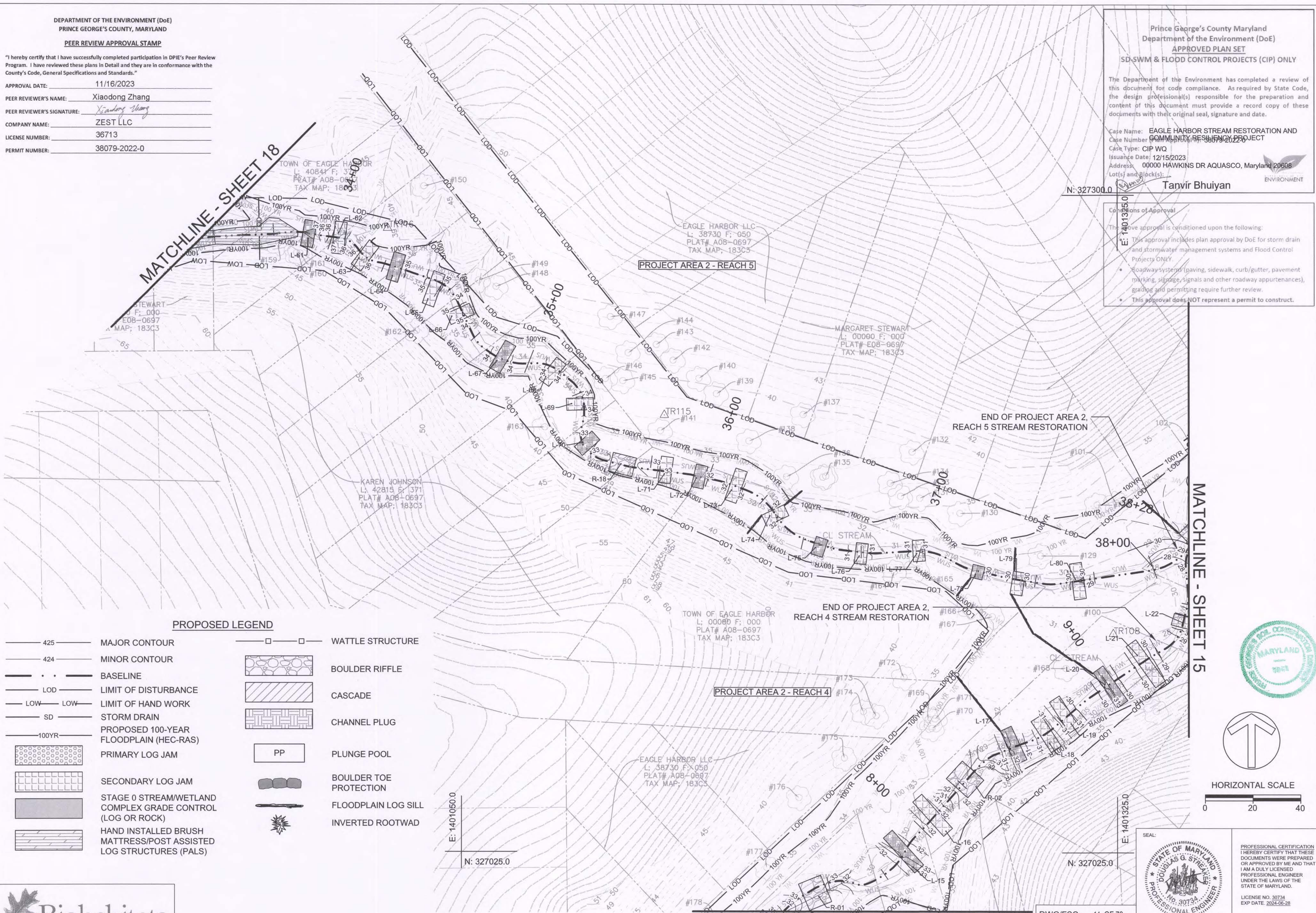
Tanvir Bhuiyan

Conditions of Approval

- This approval is conditioned upon the following:
- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
  - Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
  - This approval does NOT represent a permit to construct.

STRUCTURE ID		LEFT EL.	INVERT EL.	RIGHT EL.
R-01	U/S	33.6	33.33	33.6
	D/S	33.3	33.00	33.3
L-15		33.3	33.00	33.3
L-16		32.9	32.67	32.9
R-02	U/S	32.6	32.33	32.6
	D/S	32.3	32.00	32.3
L-17		32.3	32.00	32.3
L-18		31.9	31.67	31.9
L-19		31.6	31.33	31.6
L-20		31.3	31.00	31.3
L-21		30.9	30.67	30.9
L-22		30.6	30.33	30.6

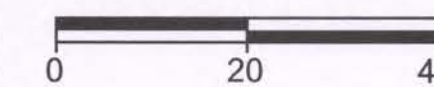
STRUCTURE ID		LEFT EL.	INVERT EL.	RIGHT EL.
L-61		37.3	37.00	37.3
L-62		36.9	36.67	36.9
L-63		36.6	36.33	36.6
L-64		36.3	36.00	36.3
L-65		35.9	35.67	35.9
L-66		35.6	35.33	35.6
L-67		35.3	35.00	35.3
L-68		34.9	34.67	34.9
L-69		34.6	34.33	34.6
L-70		34.3	34.00	34.3
R-18	U/S	33.9	33.67	33.9
	D/S	33.6	33.33	33.6
L-71		33.6	33.33	33.6
L-72		33.3	33.00	33.3
L-73		32.9	32.67	32.9
L-74		32.6	32.33	32.6
L-75		32.3	32.00	32.3
L-76		31.9	31.67	31.9
L-77		31.6	31.33	31.6
L-78		31.3	31.00	31.3
L-79		30.9	30.67	30.9
L-80		30.6	30.33	30.6



PROPOSED LEGEND

- |           |   |           |                        |
|-----------|---|-----------|------------------------|
| — 425 —   | MAJOR CONTOUR   | □ — □ — □ | WATTLE STRUCTURE       |
| — 424 —   | MINOR CONTOUR   | ▨         | BOULDER RIFFLE         |
| — · · —   | BASELINE  | ▨         | CASCADE                |
| — LOD —   | LIMIT OF DISTURBANCE  | ▨         | CHANNEL PLUG           |
| — LOW —   | LIMIT OF HAND WORK  | PP        | PLUNGE POOL            |
| — SD —    | STORM DRAIN   | ▨         | BOULDER TOE PROTECTION |
| — 100YR — | PROPOSED 100-YEAR FLOODPLAIN (HEC-RAS)                            | ▨         | FLOODPLAIN LOG SILL    |
| ▨         | PRIMARY LOG JAM   | ▨         | INVERTED ROOTWAD       |
| ▨         | SECONDARY LOG JAM   |           |                        |
| ▨         | STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)        |           |                        |
| ▨         | HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS) |           |                        |

HORIZONTAL SCALE



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

10/17/2023 E:\Projects\19024.01 Eagle Harbor Stream and Shoreline Resiliency\CAD\Plans\p01eh.dwg

Reuse of Documents: This document, and the ideas and designs incorporated herein, as an instrument of Professional Service, is the property of Biohabitats, Inc. and is not to be used in whole or in part, for any other project without the written authorization of Biohabitats, Inc.



TOWN OF EAGLE HARBOR, INCORPORATED  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR



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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

APPROVED: *Frank L. Galosi* SECTION HEAD  
DATE: 12/18/2023

PROJECT MANAGER: *Jeff Duffan* ASSOCIATE DIRECTOR  
CONTRACT NO.:  
C.I.P.:  
PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

DWG/FSC: 14 OF 73

TITLE:

**PROPOSED CONDITIONS**

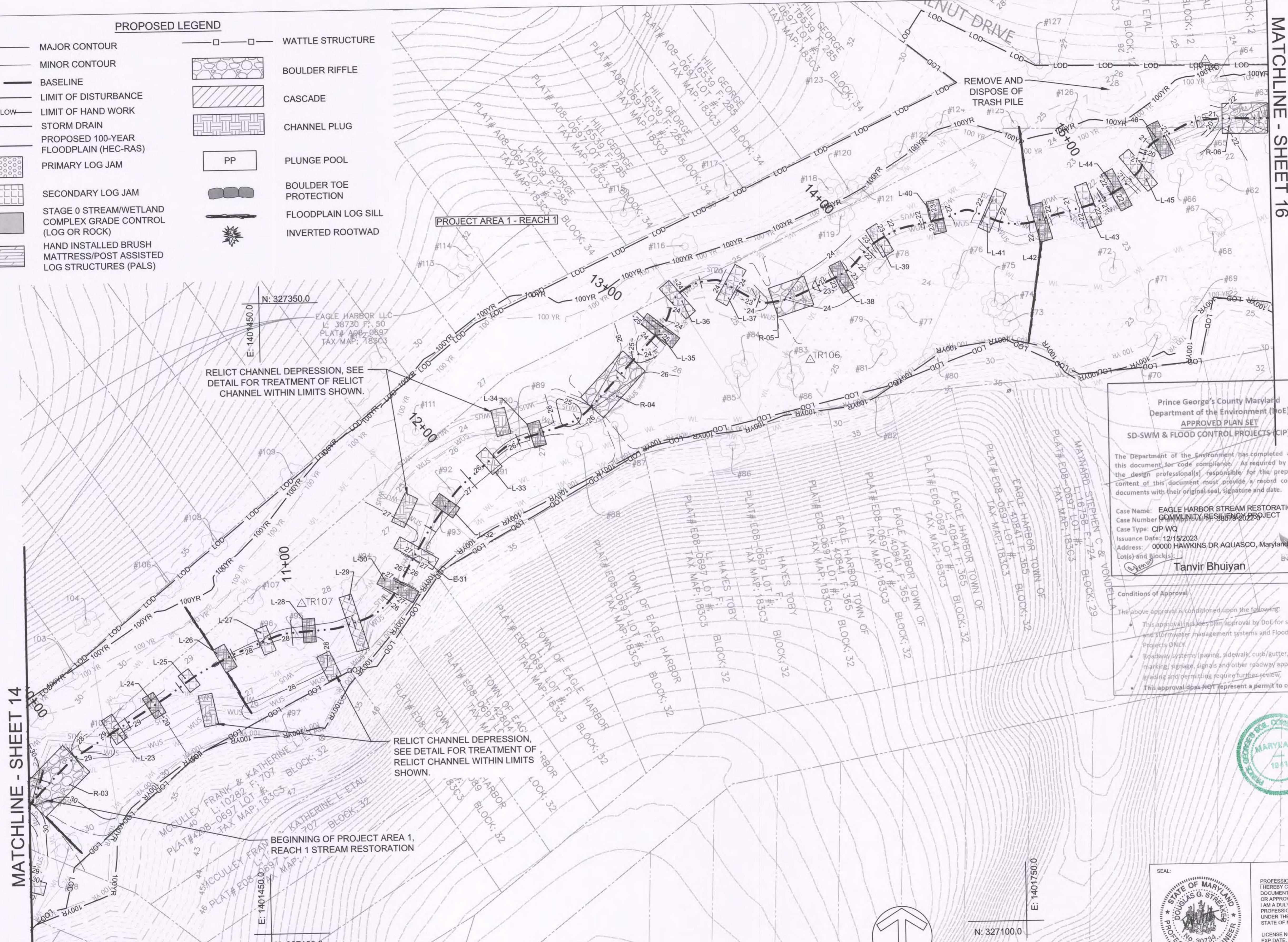
PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024-06-28  
10/20/23





PROPOSED LEGEND

- 425 — MAJOR CONTOUR
- 424 — MINOR CONTOUR
- · · — BASELINE
- LOD — LIMIT OF DISTURBANCE
- LOW — LIMIT OF HAND WORK
- SD — STORM DRAIN
- 100YR — PROPOSED 100-YEAR FLOODPLAIN (HEC-RAS)
- PRIMARY LOG JAM
- SECONDARY LOG JAM
- STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)
- HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)
- WATTLE STRUCTURE
- BOULDER RIFFLE
- CASCADE
- CHANNEL PLUG
- PLUNGE POOL
- BOULDER TOE PROTECTION
- FLOODPLAIN LOG SILL
- INVERTED ROOTWAD



STRUCTURE ID		LEFT EL.	INVERT EL.	RIGHT EL.
R-03	U/S	30.5	30.00	30.5
	D/S	29.5	29.00	29.5
L-23		29.3	29.00	29.3
L-24		29.0	28.75	29.0
L-25		28.8	28.50	28.8
L-26		28.5	28.25	28.5
L-27		28.3	28.00	28.3
L-28		28.0	27.75	28.0
L-29		27.8	27.50	27.8
L-30		27.5	27.25	27.5
L-31		27.3	27.00	27.3
L-32		27.0	26.75	27.0
L-33		26.8	26.50	26.8
L-34		26.5	26.25	26.5
R-04	U/S	26.5	26.00	26.5
	D/S	25.5	25.00	25.5
L-35		25.3	25.00	25.3
L-36		25.0	24.75	25.0
L-37		24.8	24.50	24.8
R-05	U/S	24.8	24.25	24.8
	D/S	24.0	23.50	24.0
L-38		23.8	23.50	23.8
L-39		23.5	23.25	23.5
L-40		23.3	23.00	23.3
L-41		23.0	22.75	23.0
L-42		22.8	22.50	22.8
L-43		22.5	22.25	22.5
L-44		22.3	22.00	22.3
L-45		22.0	21.75	22.0
L-46		21.8	21.50	21.8
R-06	U/S	21.8	21.25	21.8
	D/S	20.8	20.25	20.8

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 2022-01  
Case Type: CIP-WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):

**Tanvir Bhuiyan**  
ENVIRONMENT

Conditions of Approval  
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DEPARTMENT OF THE ENVIRONMENT (DOE)  
PRINCE GEORGE'S COUNTY, MARYLAND  
PEER REVIEW APPROVAL STAMP

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APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0



TOWN OF EAGLE HARBOR, INCORPORATED 1929  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

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ELECTION DISTRICT 9

*Jeff DeHaven* 12/18/2023  
ASSOCIATE DIRECTOR DATE

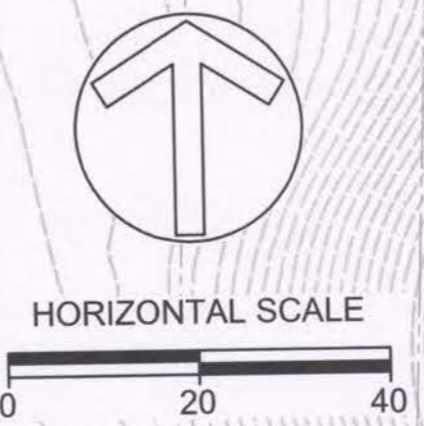
*Frank L. Gabosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

SEAL:

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 06/28/2024

DWG/FSC: 15 OF 73  
TITLE: PROPOSED CONDITIONS

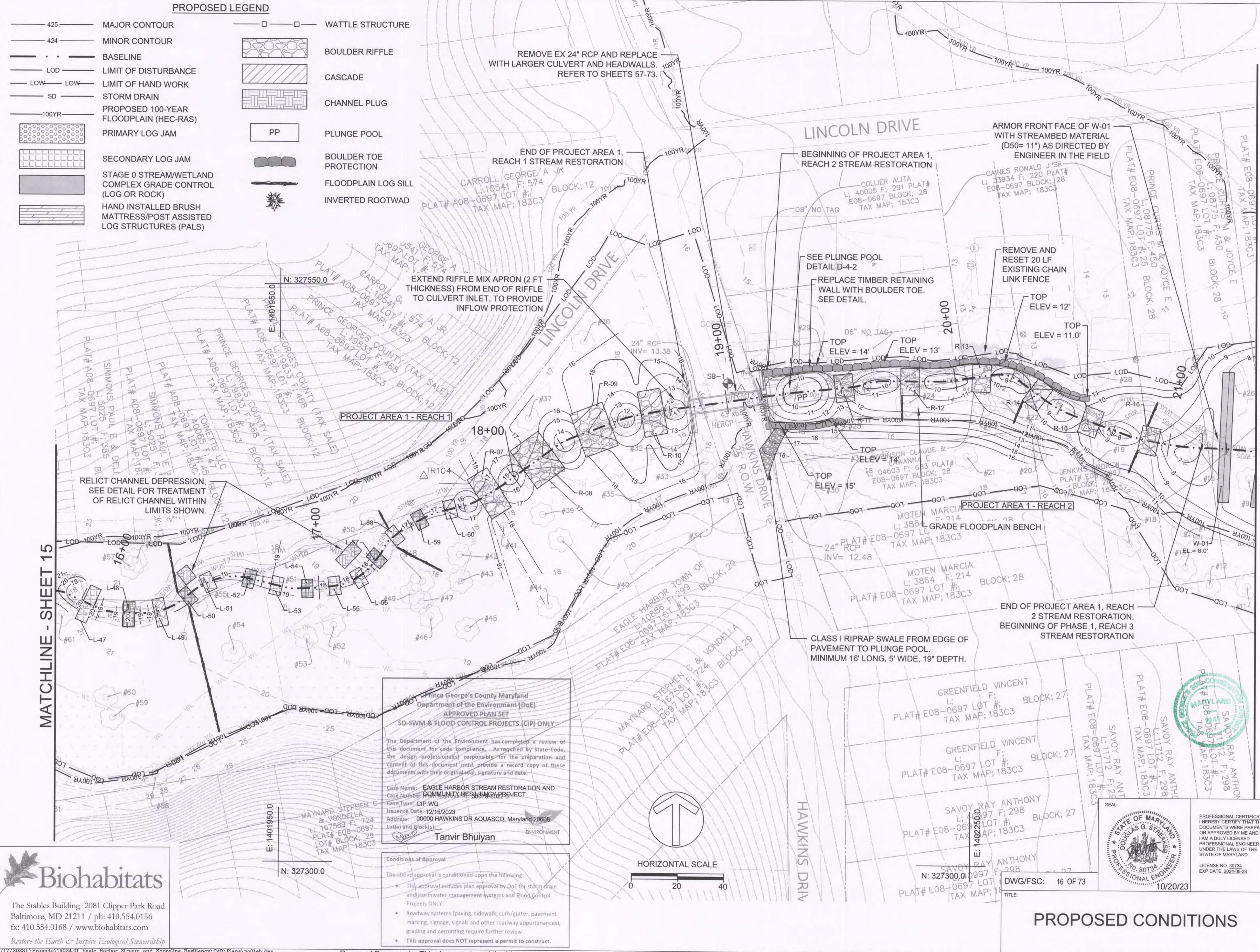


**Biohabitats**  
The Stables Building 2081 Clipper Park Road  
Baltimore, MD 21211 / ph: 410.554.0156  
fx: 410.554.0168 / www.biohabitats.com  
Restore the Earth & Inspire Ecological Stewardship



**PROPOSED LEGEND**

— 425 —	MAJOR CONTOUR	□ — □	WATTLE STRUCTURE
— 424 —	MINOR CONTOUR		BOULDER RIFFLE
— · —	BASELINE		CASCADE
— LOD —	LIMIT OF DISTURBANCE		CHANNEL PLUG
— LOW —	LIMIT OF HAND WORK	PP	PLUNGE POOL
— SD —	STORM DRAIN		BOULDER TOE PROTECTION
— 100YR —	PROPOSED 100-YEAR FLOODPLAIN (HEC-RAS)		FLOODPLAIN LOG SILL
	PRIMARY LOG JAM		INVERTED ROOTWAD
	SECONDARY LOG JAM		
	STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)		
	HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)		



STRUCTURE ID	LEFT EL.	INVERT EL.	RIGHT EL.
L-47	20.5	20.25	20.5
L-48	20.3	20.00	20.3
L-49	20.0	19.75	20.0
L-50	19.8	19.50	19.8
L-51	19.5	19.25	19.5
L-52	19.3	19.00	19.3
L-53	19.0	18.75	19.0
L-54	18.8	18.50	18.8
L-55	18.5	18.25	18.5
L-56	18.3	18.00	18.3
L-57	18.0	17.75	18.0
L-58	17.8	17.50	17.8
L-59	17.5	17.25	17.5
L-60	17.3	17.00	17.3
R-07	U/S 18.4	16.75	18.4
	D/S 17.6	16.00	17.6
R-08	U/S 17.6	16.00	17.6
	D/S 16.1	14.50	16.1
R-09	U/S 16.1	14.50	16.1
	D/S 14.6	13.00	14.6
R-10	U/S 14.6	13.00	14.6
	D/S 13.6	12.00	13.6
R-11	U/S 12.2	11.70	12.2
	D/S 11.5	11.00	11.5
R-12	U/S 11.5	11.00	11.5
	D/S 11.0	10.50	11.0
R-13	U/S 11.0	10.50	11.0
	D/S 10.5	10.00	10.5
R-14	U/S 10.5	10.00	10.5
	D/S 10.0	9.50	10.0
R-15	U/S 10.0	9.50	10.0
	D/S 9.5	9.00	9.5
R-16	U/S 9.5	9.00	9.5
	D/S 9.0	8.50	9.0

DEPARTMENT OF THE ENVIRONMENT (DOE)  
PRINCE GEORGE'S COUNTY, MARYLAND

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APPROVAL DATE: 11/16/2023  
 PEER REVIEWER'S NAME: Xiaodong Zhang  
 PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
 COMPANY NAME: ZEST LLC  
 LICENSE NUMBER: 36713  
 PERMIT NUMBER: 38079-2022-0



**TOWN OF EAGLE HARBOR**  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
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 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: *Jeff Duffin* 12/18/2023  
 ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER: *Frank L. Galosi* CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

# EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

The Stables Building 2081 Clipper Park Road  
 Baltimore, MD 21211 / ph: 410.554.0156  
 fx: 410.554.0168 / www.biohabitats.com

Restore the Earth & Inspire Ecological Stewardship

Prince George's County Maryland  
 Department of the Environment (DoE)  
 APPROVED PLAN SET  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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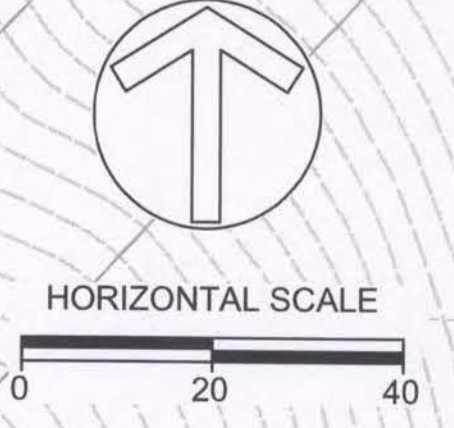
Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
 Case Number: 14022300  
 Case Type: CIP WQ  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s): 14022300

**Tanvir Bhuiyan** ENVIRONMENT

Conditions of Approval

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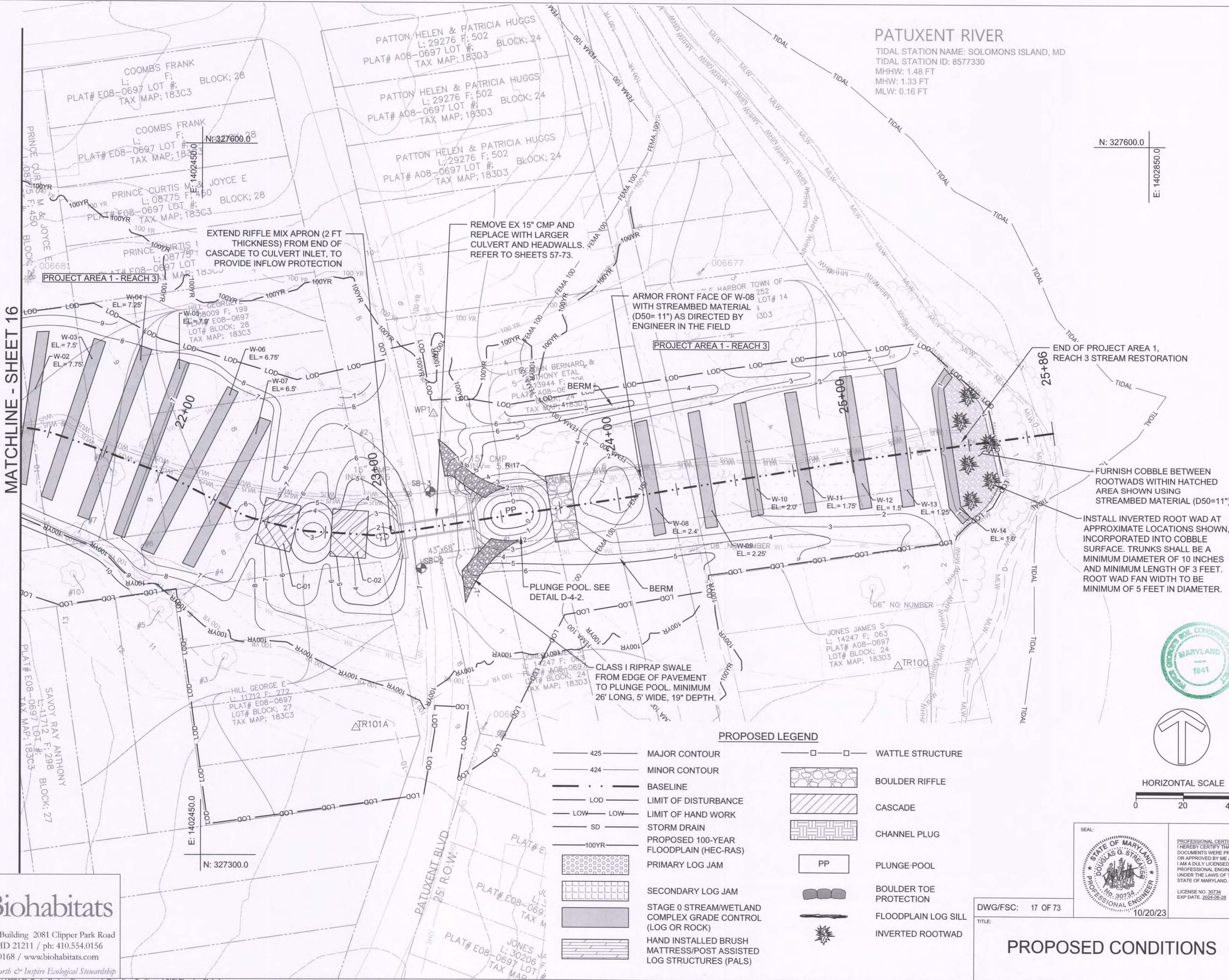
PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

LICENSE NO. 30734  
 EXP. DATE: 10/20/23

## PROPOSED CONDITIONS



MATCHLINE - SHEET 16



**PATUXENT RIVER**

TIDAL STATION NAME: SOLOMONS ISLAND, MD  
 TIDAL STATION ID: 8577330  
 MHHW: 1.48 FT  
 MHW: 1.33 FT  
 MLW: 0.16 FT

N: 327600.0

E: 1402850.0

STRUCTURE ID		LEFT EL.	INVERT EL.	RIGHT EL.
C-01	U/S	7.9	6.25	7.9
	D/S	5.6	4.00	5.6
C-02	U/S	5.6	4.00	5.6
	D/S	3.6	2.00	3.6
R-17	U/S	3.5	3.00	3.5
	D/S	3.0	2.50	3.0

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
 Case Number: 38079-2022-0  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
 Tanvir Bhuiyan

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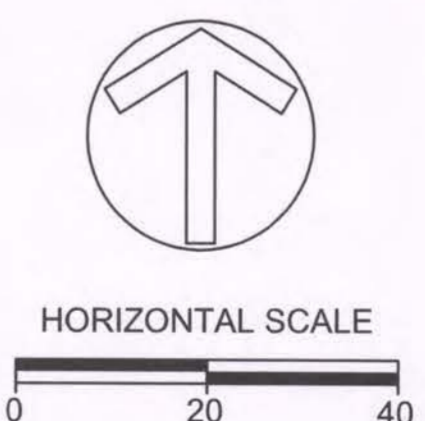
APPROVED: *Jeff Duffan* 12/18/2023  
 ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER: *Tanvir Bhuiyan* CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

**PROPOSED LEGEND**

	425 MAJOR CONTOUR		WATTLE STRUCTURE
	424 MINOR CONTOUR		BOULDER RIFFLE
	BASILINE		CASCADE
	LOD LIMIT OF DISTURBANCE		CHANNEL PLUG
	LOW LIMIT OF HAND WORK		PLUNGE POOL
	SD STORM DRAIN		BOULDER TOE PROTECTION
	100YR PROPOSED 100-YEAR FLOODPLAIN (HEC-RAS)		FLOODPLAIN LOG SILL
	PRIMARY LOG JAM		INVERTED ROOTWAD
	SECONDARY LOG JAM		
	STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)		
	HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)		



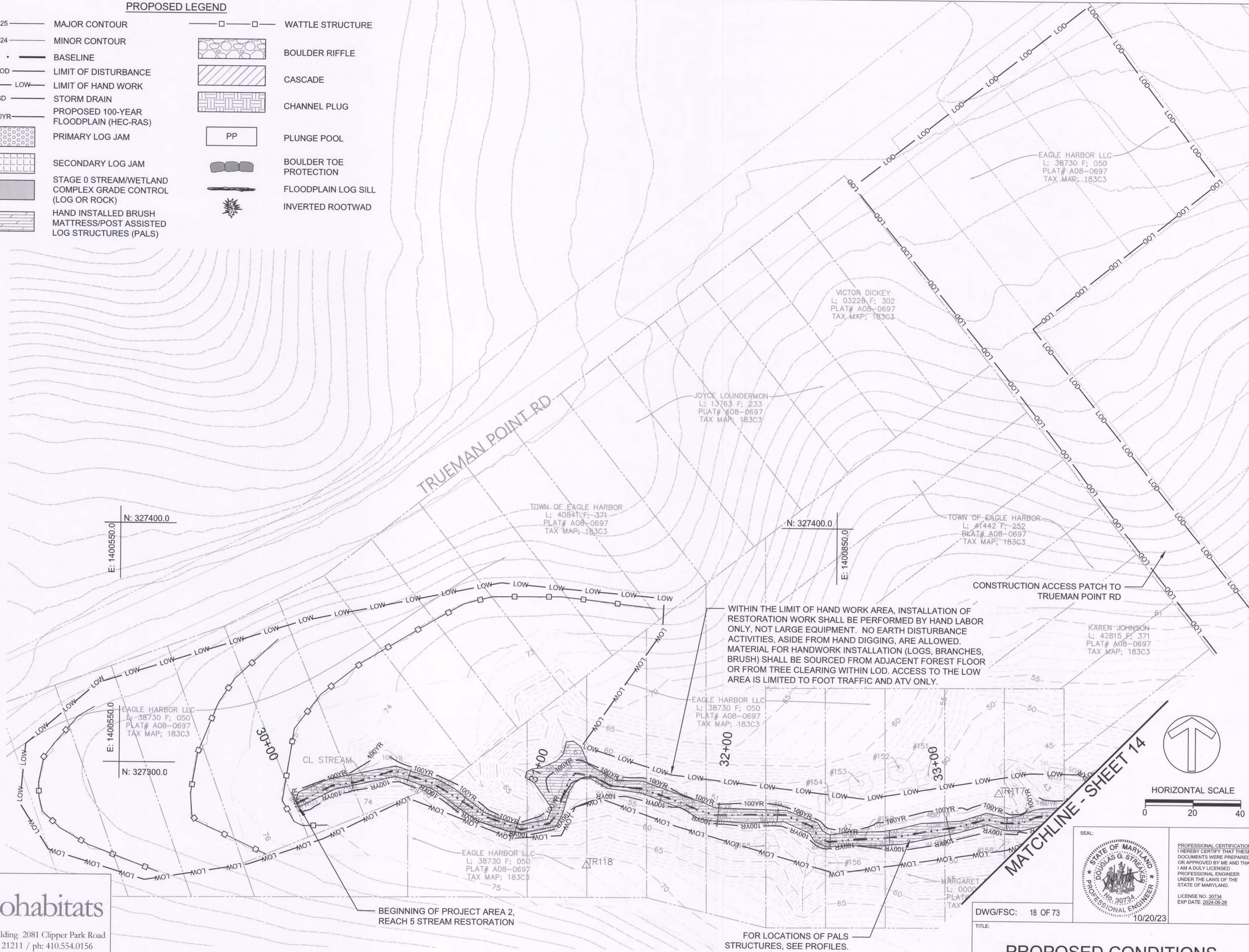
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 LICENSE NO. 30734  
 EXP. DATE: 02/24/26-28  
 10/20/23

DWG/FSC: 17 OF 73  
 TITLE: **PROPOSED CONDITIONS**

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



PROPOSED LEGEND			
— 425 —	MAJOR CONTOUR	□ — □ —	WATTLE STRUCTURE
— 424 —	MINOR CONTOUR		BOULDER RIFFLE
— · · —	BASELINE		CASCADE
— LOD —	LIMIT OF DISTURBANCE		CHANNEL PLUG
— LOW —	LIMIT OF HAND WORK		PLUNGE POOL
— SD —	STORM DRAIN		BOULDER TOE PROTECTION
— 100YR —	PROPOSED 100-YEAR FLOODPLAIN (HEC-RAS)		FLOODPLAIN LOG SILL
	PRIMARY LOG JAM		INVERTED ROOTWAD
	SECONDARY LOG JAM		
	STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)		
	HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)		



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10/17/2023:\Projects\19024.01 Eagle Harbor Stream and Shoreline Resiliency\CAD\Plans\pc01eh.dwg

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DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND

**PEER REVIEW APPROVAL STAMP**

"I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023  
 PEER REVIEWER'S NAME: Xiaodong Zhang  
 PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
 COMPANY NAME: ZEST LLC  
 LICENSE NUMBER: 36713  
 PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
 Case Number: 38079-2022-0  
 Case Type: CIP WO  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
 Tanvir Bhuiyan

- Conditions of Approval
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TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

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 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: *Jeff Duplan* 12/18/2023  
 ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

DWG/FSC: 18 OF 73

TITLE: **PROPOSED CONDITIONS**

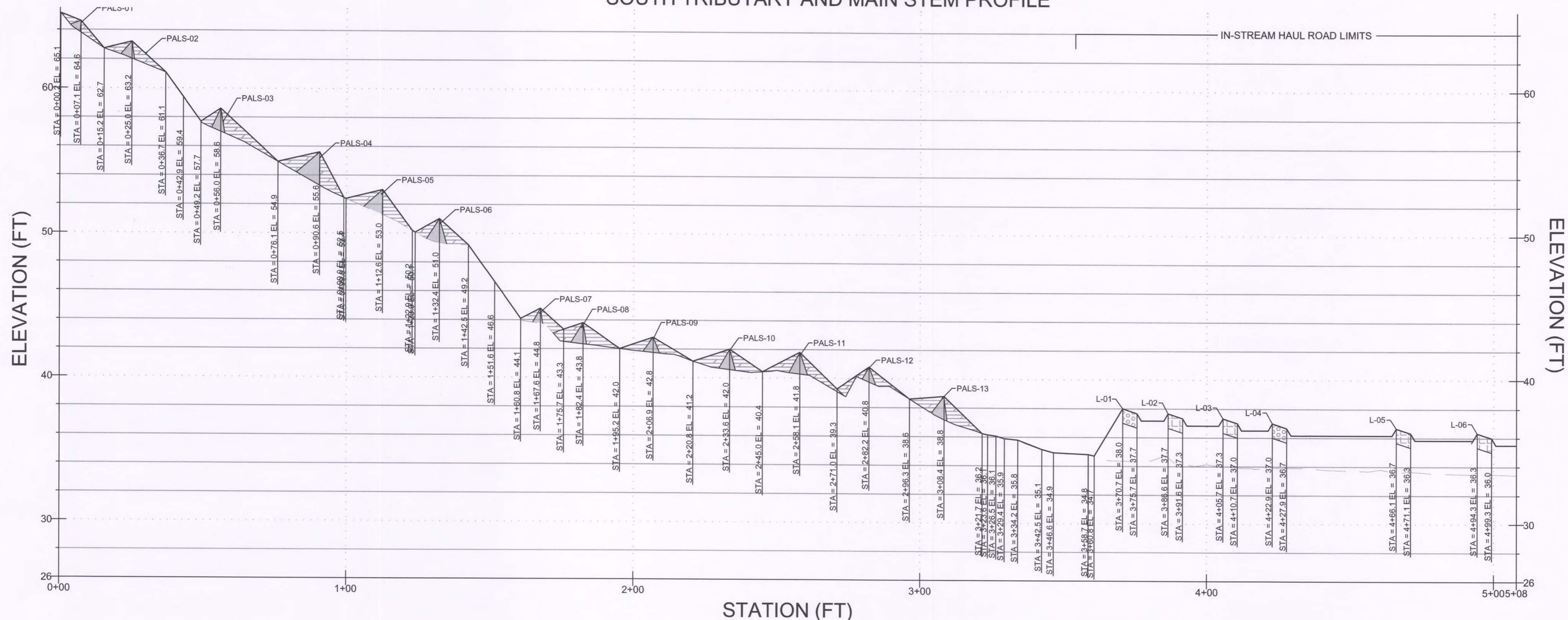
FOR LOCATIONS OF PALS STRUCTURES, SEE PROFILES.

PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP. DATE: 2024-06-28  
 10/20/23

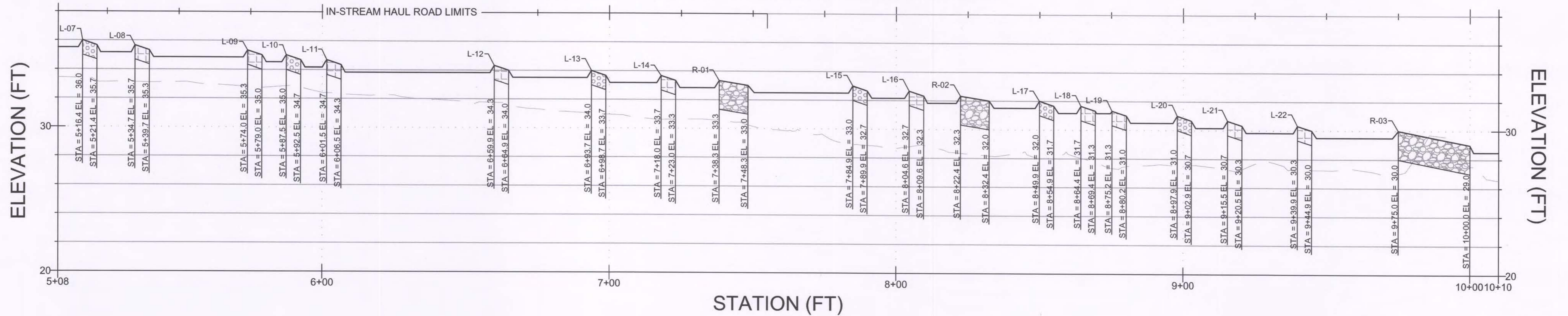
**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**



# SOUTH TRIBUTARY AND MAIN STEM PROFILE



# SOUTH TRIBUTARY AND MAIN STEM PROFILE



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- NOTES:**
1. PROFILE DOES NOT SHOW ALL ELEMENTS OF EACH STRUCTURE. SEE STRUCTURE TABLES, CONSTRUCTION DETAILS, AND NOTES FOR INSTALLATION AND DETAIL OF EACH STRUCTURE.
  2. PROFILE REFLECTS 0.5' POOL DEPTHS TYP. BUT CONTRACTOR MAY VARY FROM 0.5' TO 1' DEEP.

**PROFILE LEGEND**

	EXISTING GROUND		BOULDER RIFFLE		HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)
	PROPOSED GROUND		PRIMARY LOG JAM		STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)
	CASCADE		SECONDARY LOG JAM		

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 LICENSE NO. 30734  
 EXP. DATE: 2024-06-28

SEAL:

DWG/FSC: 19 OF 73  
 TITLE: **STREAM PROFILES**

DEPARTMENT OF THE ENVIRONMENT (DoE)  
 PRINCE GEORGE'S COUNTY, MARYLAND

**PEER REVIEW APPROVAL STAMP**

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 PEER REVIEWER'S SIGNATURE:   
 COMPANY NAME: ZEST LLC  
 LICENSE NUMBER: 36713  
 PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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 Case Number: 38079-2022-0  
 Case Type: CIP WQ  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
  
 Tanvir Bhuiyan

- Conditions of Approval**
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**TOWN OF EAGLE HARBOR, INCORPORATED 1923**  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

**PRINCE GEORGE'S COUNTY, MARYLAND**  
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 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
 ELECTION DISTRICT 9

JEFF DALTON  
 ASSOCIATE DIRECTOR  
 DATE: 12/18/2023

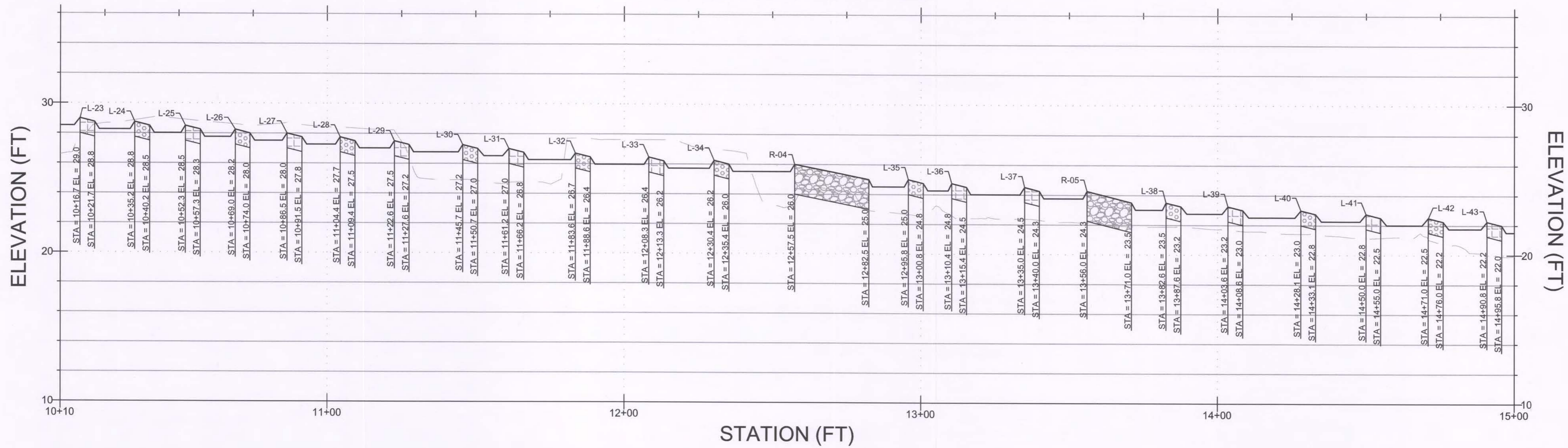
FRANK L. GALOSI  
 SECTION HEAD  
 DATE: 12/18/2023

PROJECT MANAGER:   
 CONTRACT NO.:  
 C.I.P.:  
 PROJECT NO.: 22025.01 SCALE: AS SHOWN GB CHECK: DS

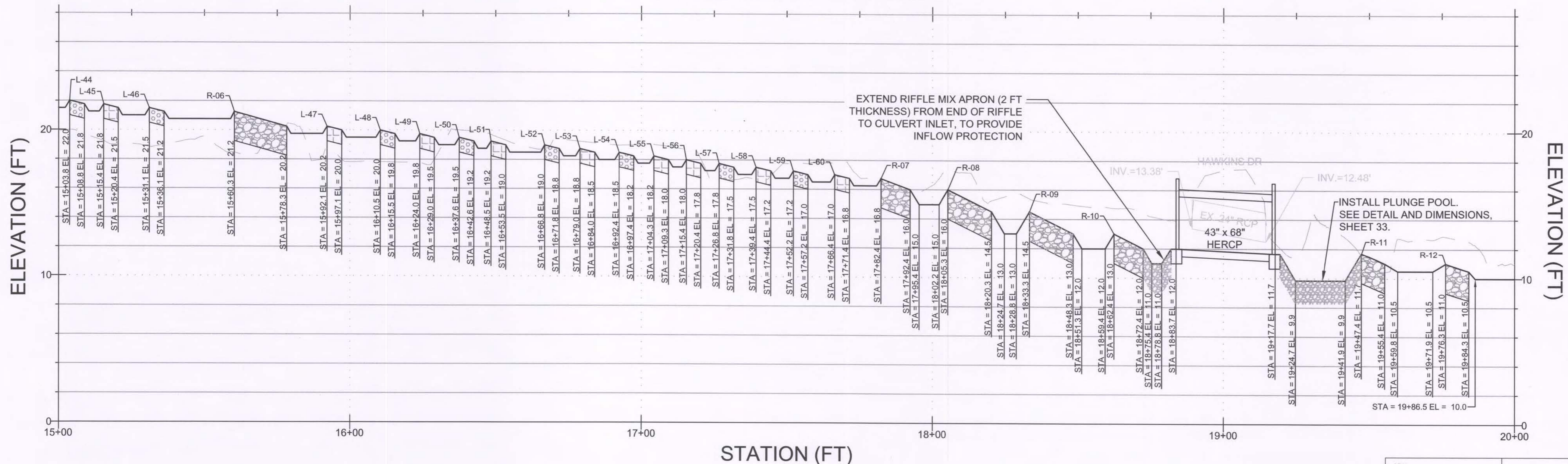
# EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT



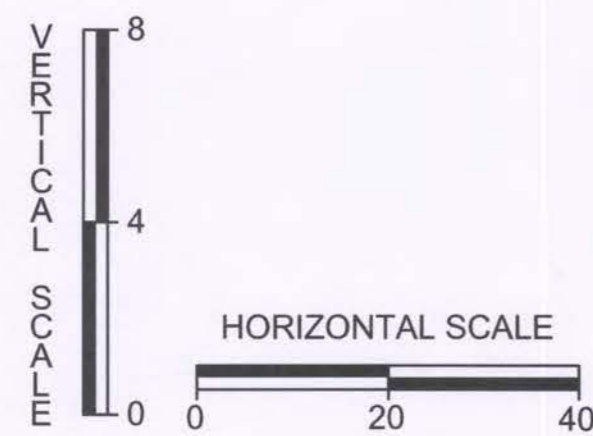
PROFILE VIEW OF MAINSTEM



PROFILE VIEW OF MAINSTEM



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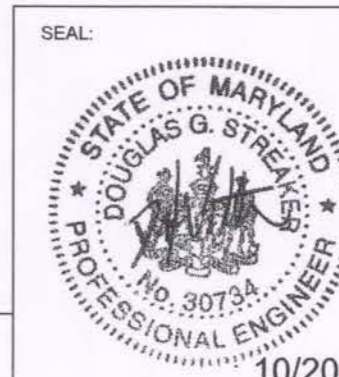
PROFILE LEGEND

EXISTING GROUND	BOULDER RIFFLE	HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)
PROPOSED GROUND	CASCADE	STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG OR ROCK)
PRIMARY LOG JAM		
SECONDARY LOG JAM		

DWG/FSC: 20 OF 73

TITLE:

STREAM PROFILES



PROFESSIONAL CERTIFICATION  
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LICENSE NO. 30734  
EXP. DATE: 2024-06-28

DEPARTMENT OF THE ENVIRONMENT (DoE)

PRINCE GEORGE'S COUNTY, MARYLAND

PEER REVIEW APPROVAL STAMP

"I hereby certify that I have successfully completed participation in DPPE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023

PEER REVIEWER'S NAME: Xiaodong Zhang

PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*

COMPANY NAME: ZEST LLC

LICENSE NUMBER: 36713

PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 2022-01-0001  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):

*Tanvir Bhuiyan*  
Tanvir Bhuiyan  
ENVIRONMENT

Conditions of Approval

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23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR



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ELECTION DISTRICT 9

*Jeff Duffan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

*Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT NO.: 22025.01 SCALE: AS SHOWN GB CHECK: DS

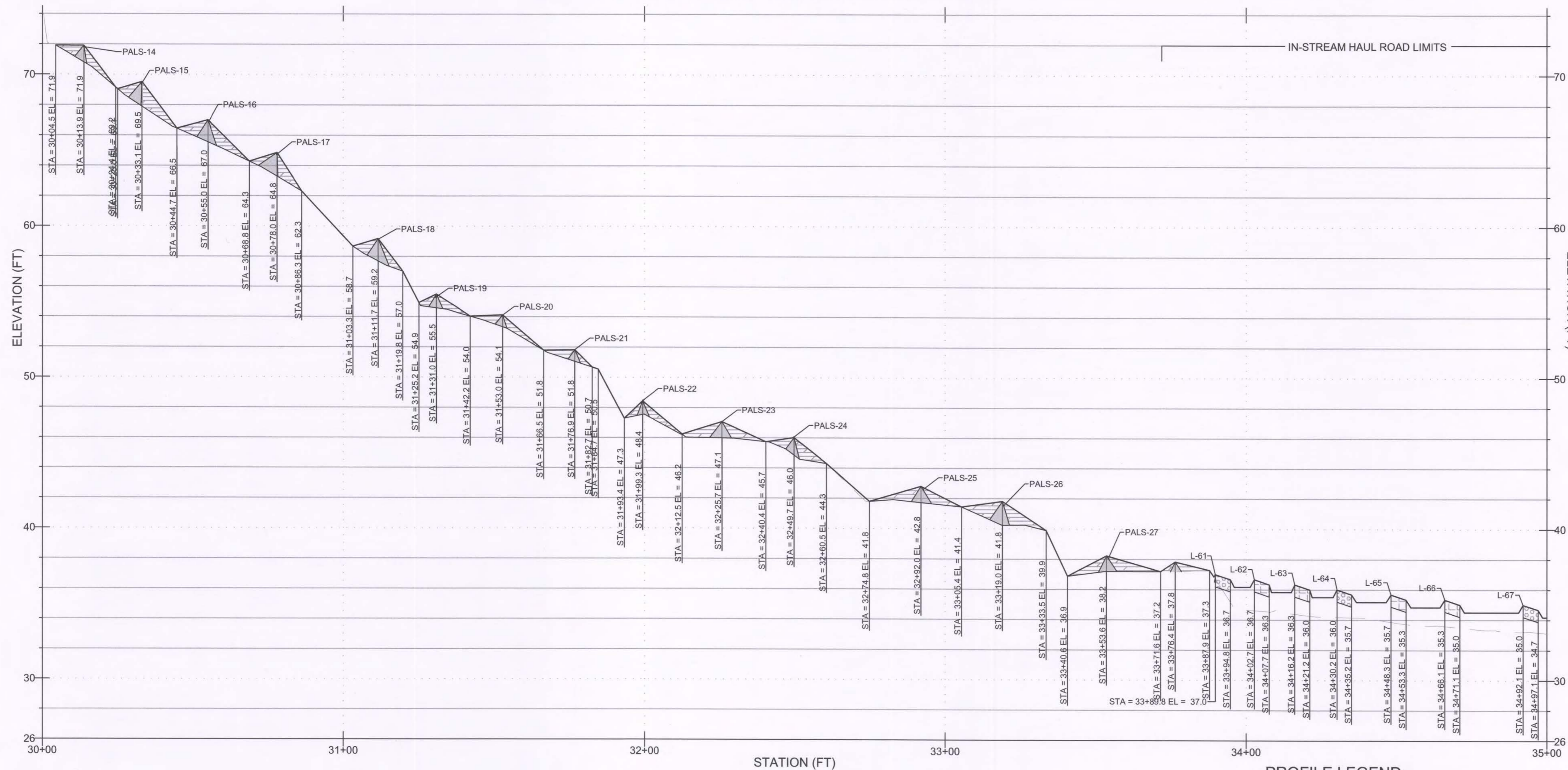
EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT







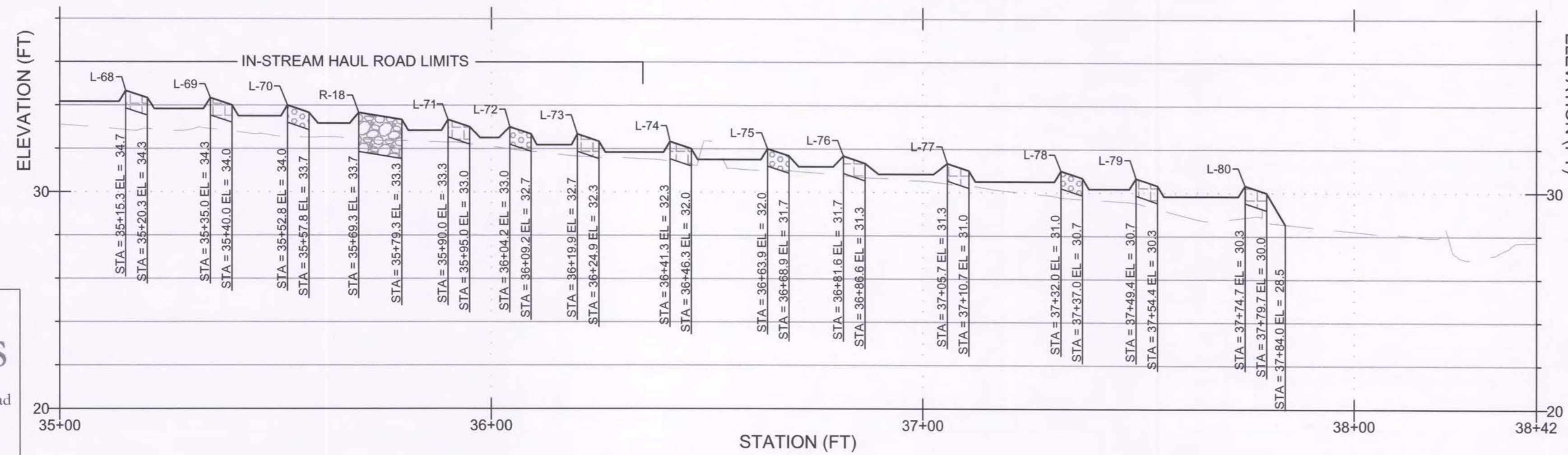
# PROFILE VIEW OF NORTH TRIBUTARY



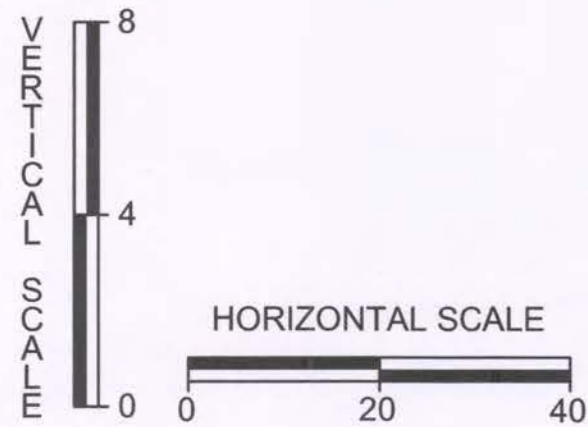
### PROFILE LEGEND

- EXISTING GROUND
- PROPOSED GROUND
- PRIMARY LOG JAM
- SECONDARY LOG JAM
- BOULDER RIFFLE
- CASCADE
- HAND INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURES (PALS)
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# PROFILE VIEW OF NORTH TRIBUTARY



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 LICENSE NO. 30734  
 EXP. DATE: 10/20/23

DWG/FSC: 22 OF 73

## STREAM PROFILES

DEPARTMENT OF THE ENVIRONMENT (DoE)  
 PRINCE GEORGE'S COUNTY, MARYLAND  
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 Department of the Environment (DoE)  
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 Case Number: 2022-0001  
 Case Type: CIP WQ  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
  
**Tanvir Bhuiyan** ENVIRONMENT

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 ELECTION DISTRICT 9

JEFF DUFFAN  
 ASSOCIATE DIRECTOR  
 DATE: 12/18/2023

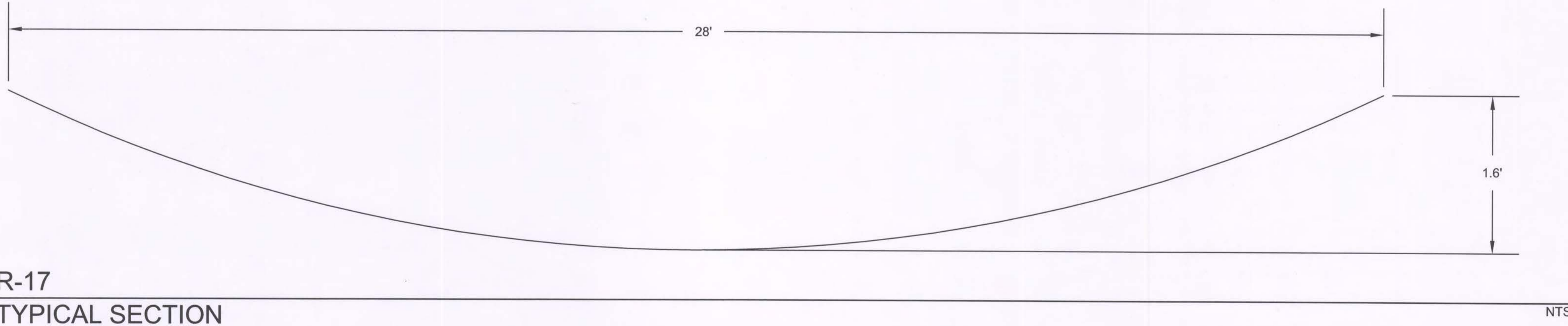
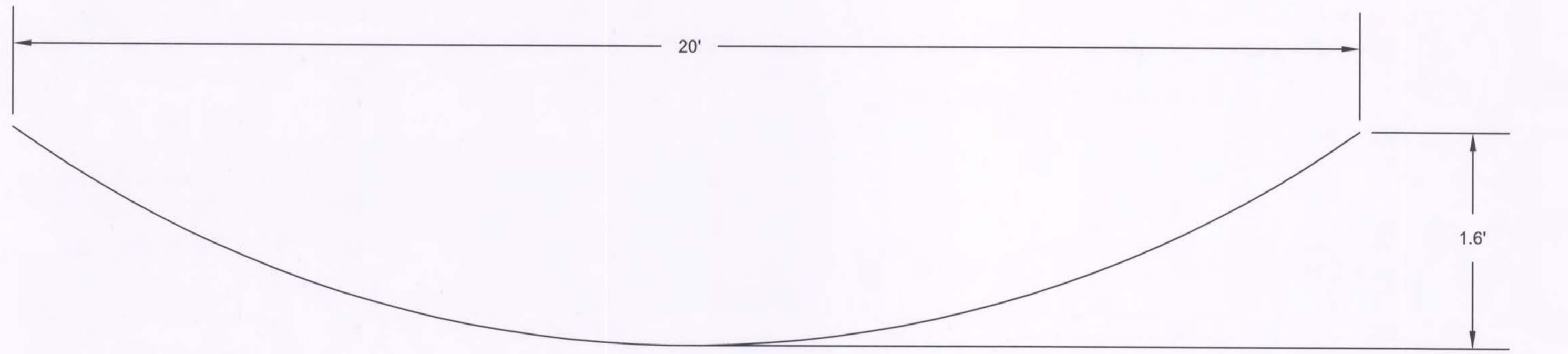
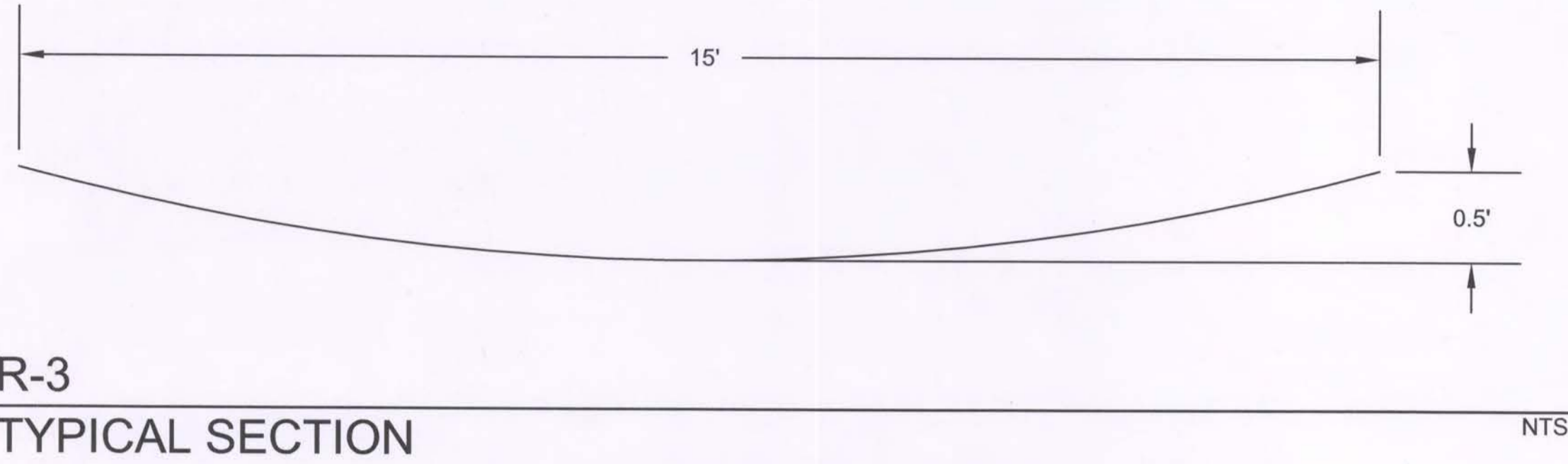
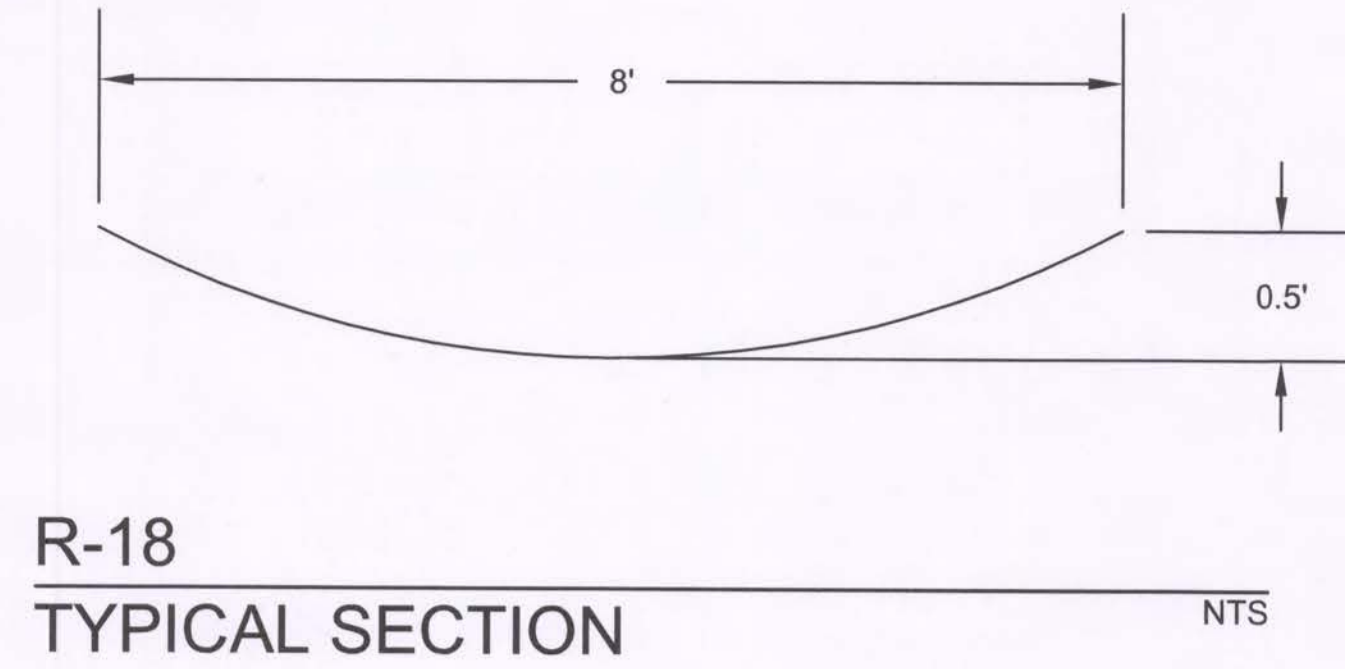
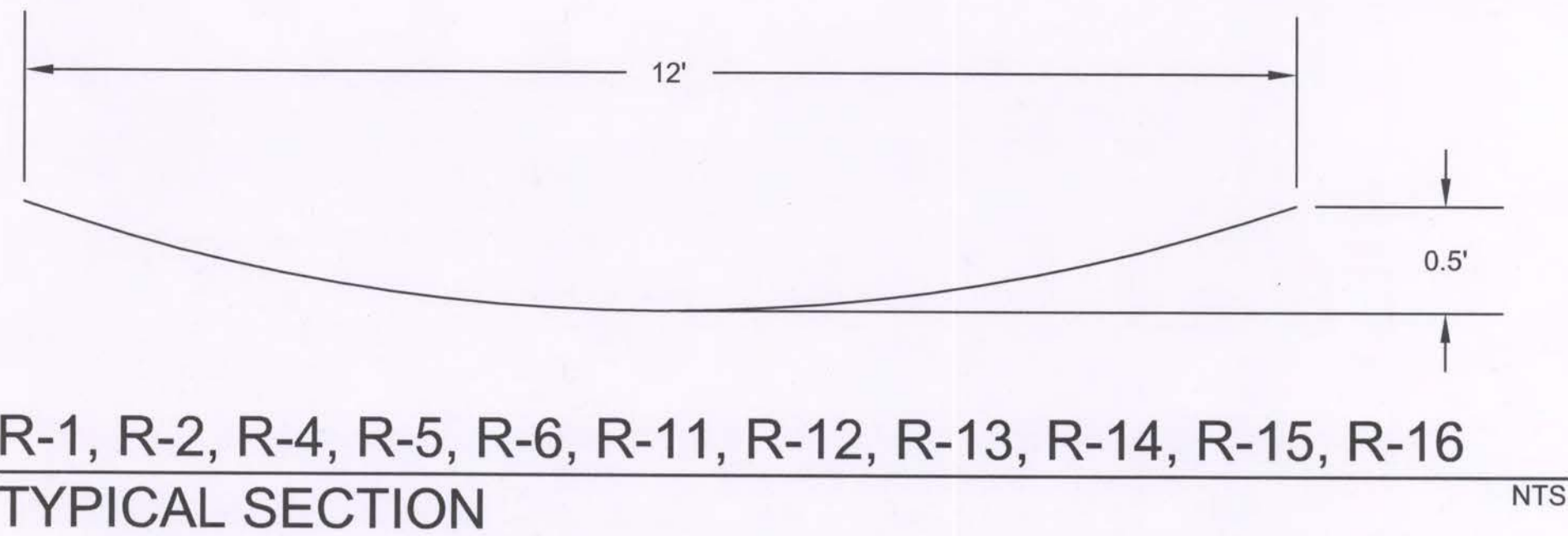
FRANK L. GALOSI  
 SECTION HEAD  
 DATE: 12/18/2023

APPROVED

PROJECT MANAGER:   
 CONTRACT NO.:  
 C.I.P.:  
 PROJECT NO.: 22025.01 SCALE: AS SHOWN GB CHECK: DS

# EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT





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ASSOCIATE DIRECTOR DATE

APPROVED *Frank L. Galosi* 12/18/2023  
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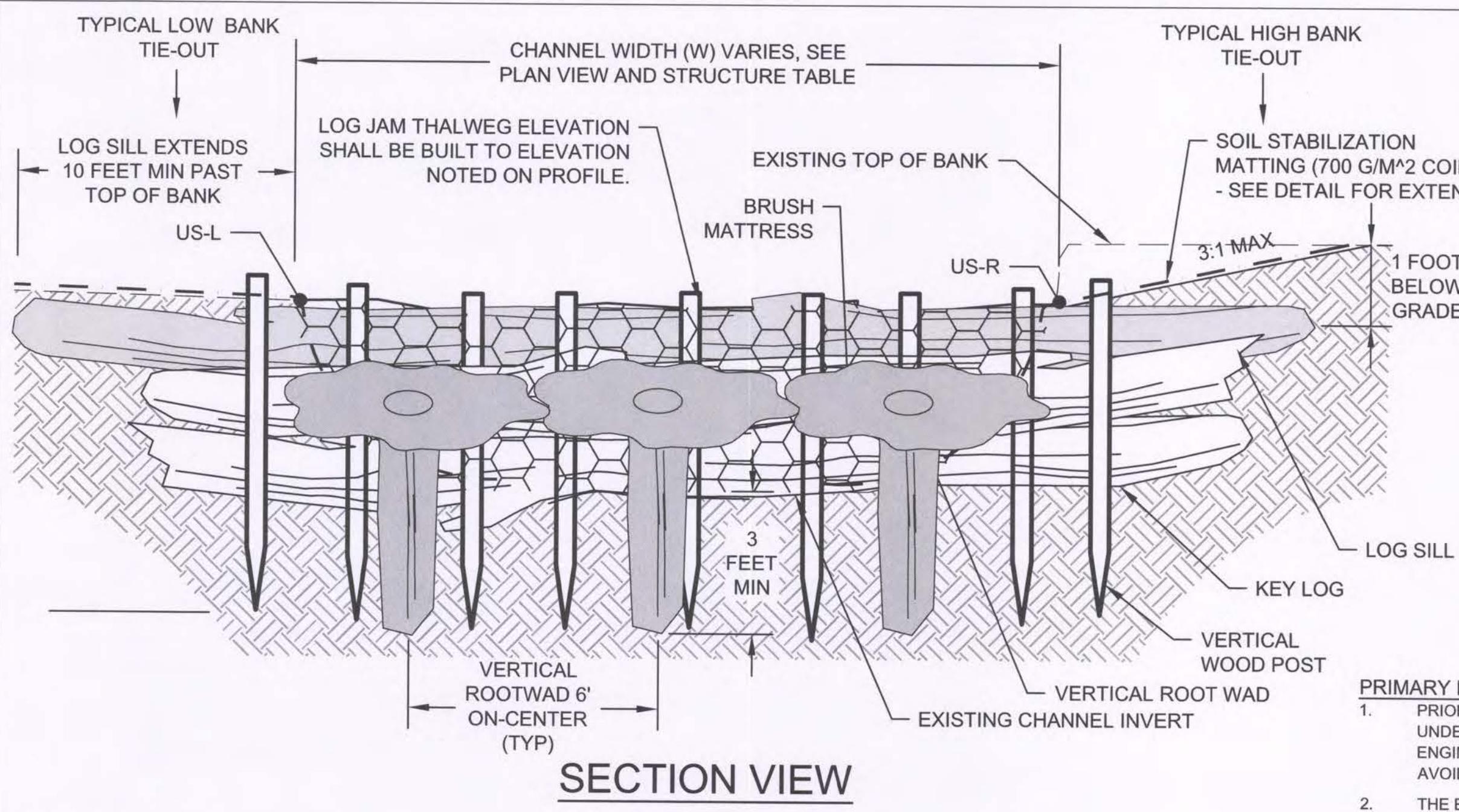
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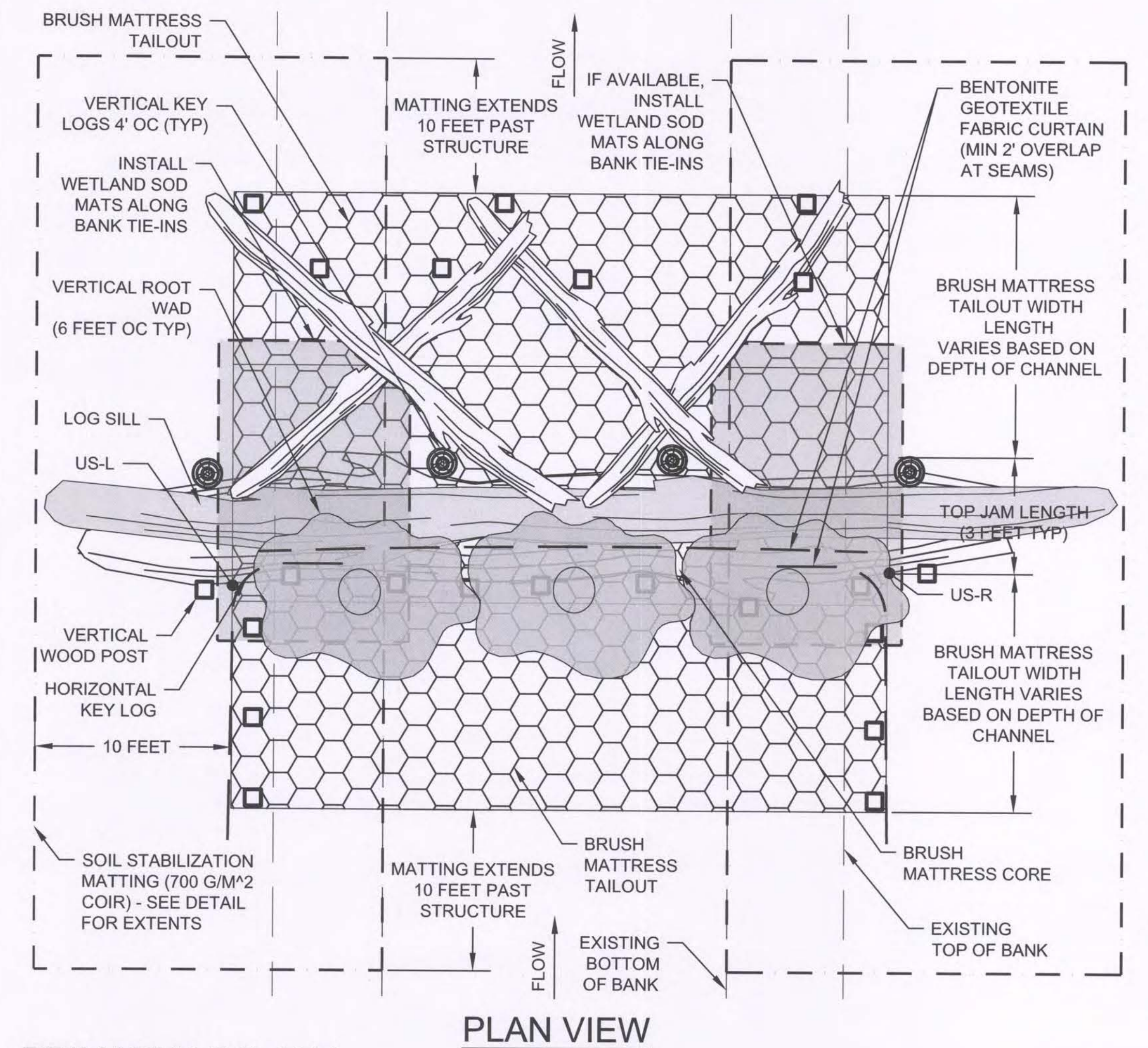
DWG/FSC: 23 OF 73  
TITLE: TYPICAL SECTIONS

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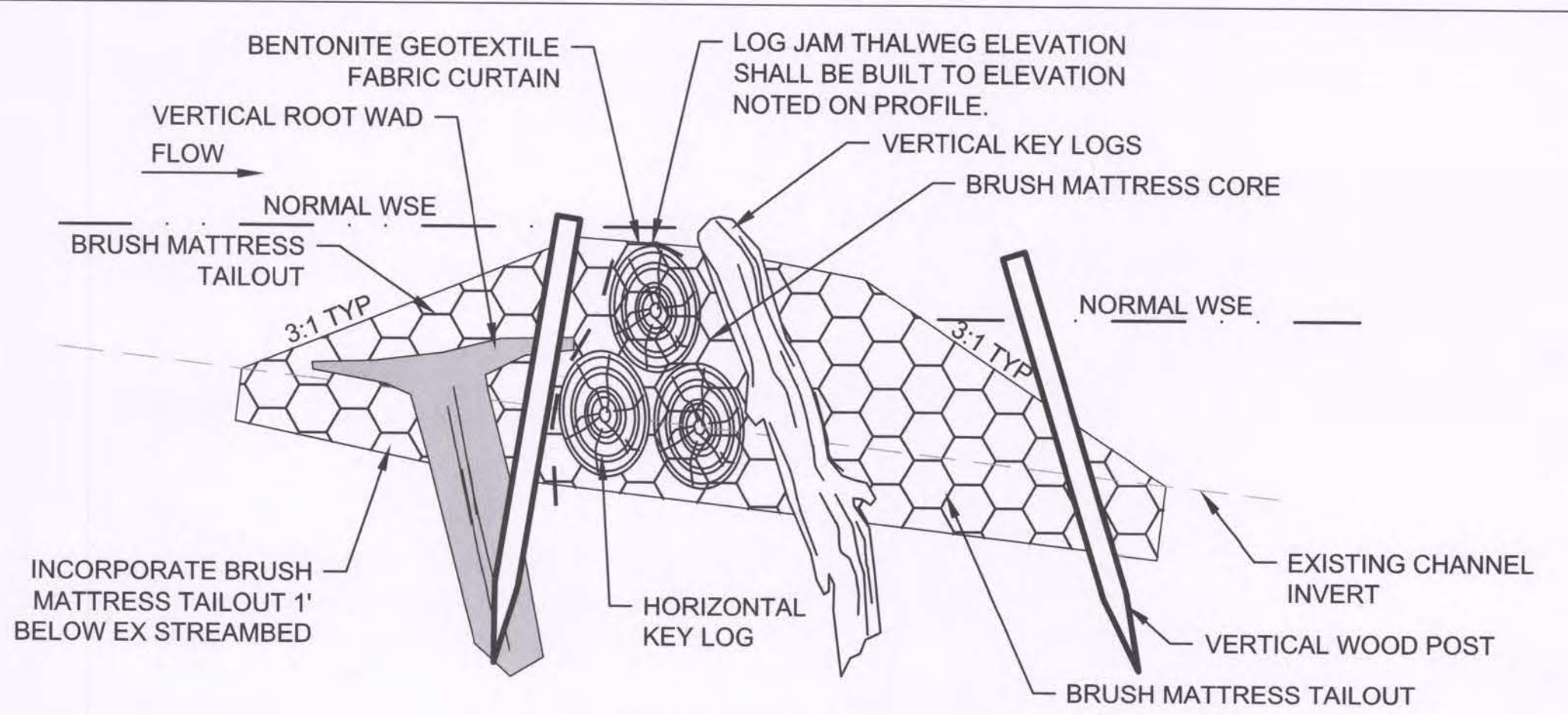
**SECTION VIEW**



**PLAN VIEW**

**PRIMARY LOG JAM**

NOT TO SCALE



**PROFILE VIEW**

**PRIMARY LOG JAM SEQUENCE OF CONSTRUCTION:**

- PRIOR TO THE INSTALLATION OF LOG JAM, INSPECT STREAMBANKS TO IDENTIFY ANY SIGNIFICANT UNDERCUTS OR VOIDS ALONG BANKS AT THE PROPOSED LOCATION. IF VOIDS ARE FOUND, ENGINEER/DESIGNATED SPECIALIST SHALL MAKE DETERMINATION IF LOG JAM LOCATION IS SHIFTED TO AVOID OR IF VOIDS CAN BE SUFFICIENTLY COMPACTED AND PLUGGED.
- THE EXISTING STREAMBED MATERIAL SHALL BE HARVESTED WITHIN THE FOOTPRINT OF THE STRUCTURE PRIOR TO THE INSTALLATION OF LOG JAM FOR REUSE AS A COMPONENT OF THE BRUSH MATTRESS IF IT MEETS THE SPECIFICATIONS FOR SALVAGED ON-SITE FILL MATERIAL.
- COMPACT STREAMBANKS AS DIRECTED AND LAY SOIL STABILIZATION MATTING ALONG BOTH BANKS FOR FULL LENGTH OF STRUCTURE PLUS MIN. 10 FEET UPSTREAM AND DOWNSTREAM, KEYING LOWER EDGE INTO TOE OF SLOPE PRIOR TO INSTALLING WOOD. UPPER EDGE OF MATTING TO EXTEND 10 FEET PAST EXISTING TOP OF BANK.
- INSTALL THE LOWER ROW OF KEY LOGS HORIZONTALLY ACROSS FULL WIDTH OF EXISTING CHANNEL, SHARPENED ENDS KEYED INTO EXISTING BANK/BED A MINIMUM OF 3 FEET PAST TOP OF BANK. THE BOTTOM OF THE LOWER ROW SHALL BE 1 FOOT BELOW THE EXISTING GRADE. IF MULTIPLE KEY LOGS ARE NEEDED TO SPAN CHANNEL WIDTH, THE MINIMUM OVERLAP SHALL BE 3 FEET. THE HEIGHT OF KEY LOGS SHALL EXTEND FROM 1' BELOW THE EXISTING STREAMBED TO THE PROPOSED STRUCTURE INVERT. TOP ROW SHALL FORM A SHALLOW, PARABOLIC CROSS SECTION FROM PROPOSED INVERT UP TO BANK TIE-IN ELEVATION.
- BACKFILL IN AND AROUND KEY LOGS AS THEY ARE INSTALLED WITH BRUSH MATTRESS AND SALVAGED ON-SITE FILL MATERIAL IN 1 FOOT COMPACTED LIFTS TO FORM DENSE BRUSH MATTRESS CORE INTERWOVEN BETWEEN THE KEY LOGS. EACH 1 FOOT LAYER OF BRUSH MATTRESS AND SOIL SHALL BE WET COMPACTED TO PREVENT SETTLEMENT AND ELIMINATE VOIDS.
- INSTALL BENTONITE GEOTEXTILE FABRIC ON THE UPSTREAM FACE OF THE KEY LOGS TO FORM A CONTINUOUS CURTAIN THAT EXTENDS THE FULL WIDTH OF THE SECTION AND WRAPS UPSTREAM ALONG BOTH BANKS FOR A MINIMUM OF 6 FEET. THE HEIGHT OF BENTONITE CURTAIN SHALL EXTEND FROM A MINIMUM OF 1' BELOW EXISTING GRADE TO TOP OF KEY LOGS. ENSURE THE BENTONITE CURTAIN IS INSTALLED IN GOOD CONTACT WITH BANK FACES SO THERE ARE NO VOIDS AT TIE IN POINTS. INSTALL VERTICAL WOOD POSTS ON UPSTREAM SIDE OF BENTONITE CURTAIN TO PIN AGAINST THE KEY LOGS AND BANKS. IF MULTIPLE SHEETS OF BENTONITE FABRIC ARE NEEDED, MINIMUM OF 2' OVERLAP IS REQUIRED.
- INSTALL FIRST LAYERS OF BRUSH MATTRESS TAILOUTS ON UP AND DOWNSTREAM SIDES OF STRUCTURE IN 1 FOOT COMPACTED LIFTS, INCORPORATING THE MATERIAL INTO THE STREAMBED A MINIMUM OF 1 FOOT.
- INSTALL VERTICAL KEY LOGS ACROSS CHANNEL (TYPICALLY 4 FEET ON-CENTER) ON DOWNSTREAM SIDE OF HORIZONTAL KEY LOGS, SHARPENED END KEYED INTO EXISTING BED A MINIMUM OF 3 FEET. CONTINUE TO BACKFILL AND COMPACT ALL VOIDS WITH BRUSH MATTRESS AND ON-SITE FILL MATERIAL.
- INSTALL VERTICAL ROOT WADS ACROSS CHANNEL (TYPICALLY 6 FEET ON-CENTER) ON UPSTREAM SIDE OF KEY LOGS, SHARPENED END KEYED INTO EXISTING BED A MINIMUM OF 3 FEET. ROOT FAN OF EACH SHOULD OVERLAP A MINIMUM OF 1 FOOT. ENSURE ROOT FAN IS PRESSED TIGHT TO SURFACE BELOW ROOT FAN TO ELIMINATE ALL VOIDS. CONTINUE TO BACKFILL AND COMPACT ALL VOIDS WITH BRUSH MATTRESS AND ON-SITE FILL MATERIAL.
- IF HORIZONTAL KEY LOGS ARE KEYED INTO BANK LESS THAN 5 FEET, EXTEND LOG SILL TO ACHIEVE A MINIMUM LENGTH OF 5' FROM EDGE OF STRUCTURE. SILL LOGS SHALL BE INCORPORATED INTO LOG JAMS TO ELIMINATE UNPROTECTED SURFACE AT TOP OF BANK TIE IN LOCATION. COMPACT GROUND SURROUNDING LOG SILL AND ALL TIE-IN POINTS ALONG THE STRUCTURE. LOG SILL SHALL EXTEND FURTHER THAN 5 FEET WHEN SHOWN ON PLANS AS FLOODPLAIN LOG SILLS.
- INSTALL FINAL TOP LAYERS OF BRUSH MATTRESS TAILOUTS ON UP AND DOWNSTREAM SIDES OF STRUCTURE, BACKFILLED WITH ON-SITE FILL MATERIAL IN 1 FOOT COMPACTED LIFTS. ENSURE SUFFICIENT BRUSH MATTRESS TAILOUT IS PROVIDED ON DOWNSTREAM SIDE TO MINIMIZE VERTICAL PLUNGING FLOWS. FINISHED SURFACE OF DOWNSTREAM TAILOUT SHALL BE DRESSED WITH LARGER DIAMETER BRUSH (4" TO 8" DIAMETER) BALLASTED DOWN WITH 8" TO 10" DIAMETER BRANCHES/TRUNKS PLACED IN THE DIRECTION OF FLOW.
- INSTALL VERTICAL WOOD POSTS ACROSS THE CHANNEL AT DOWNSTREAM END OF BRUSH MATTRESS TAILOUT IN STAGGERED PATTERN, ON 3 FOOT CENTERS PUSHED INTO EXISTING BED A MINIMUM OF 3 FEET. POSTS SHALL BE ANGLED UPSTREAM APPROXIMATELY 30 DEGREES FROM VERTICAL TO PIN BALLAST LOGS/BRUSH MATTRESS IN PLACE.
- THE STRUCTURE IS NOT CONSIDERED COMPLETE UNTIL STREAM BASEFLOW IS IMPOUNDED UPSTREAM OF STRUCTURE TO THE CREST ELEVATION AND BASEFLOW IS FLOWING OVERTOP THE FACE OF THE STRUCTURE AT THE DISCRETION OF THE ENGINEER/ DESIGNATED SPECIALIST.
- PRIOR TO COMPLETION OF EACH STRUCTURE, ENGINEER/DESIGNATED SPECIALIST MAY REQUEST THE CONTRACTOR PERFORM A DYE TEST TO CONFIRM NO DIRECT PIPING FLOW THROUGH THE STRUCTURE. IF PIPING FLOW PATHS ARE OBSERVED, THE CONTRACTOR SHALL ADD MATERIAL UNTIL IT IS CONSIDERED ACCEPTABLE BY ENGINEER/DESIGNATED SPECIALIST.
- ONCE LOG JAM IS CONSTRUCTED, COMPLETE INSTALLATION OF SOIL STABILIZATION MATTING AND IMMEDIATELY STABILIZE ALL DISTURBED TIE-IN LOCATIONS AS SPECIFIED.
- COARSE WOODY DEBRIS SHALL BE INSTALLED IN POOLS BETWEEN LOG JAMS AS SHOWN ON GRADING PLAN, OR AS DIRECTED BY THE ENGINEER/DESIGNATED SPECIALIST.

**PRIMARY LOG JAM GENERAL NOTES:**

- SEE PROFILE FOR THALWEG SLOPE BREAKS DEFINING STRUCTURE SLOPE AND UPSTREAM AND DOWNSTREAM EXTENT OF TAILOUTS.
- FOR ALL MATERIAL SIZE AND TYPE, REFER TO SPECIFICATIONS AND NOTES PROVIDED ON THIS DETAIL.
- ALL WOODY MATERIAL (KEY LOGS, ROOT WADS, BRUSH, LIMBS) SHALL BE OBTAINED ON-SITE TO MAXIMUM EXTENT. ROT-RESISTANT SPECIES ARE PREFERRED FOR USE IF AVAILABLE, BUT ANY WOOD FREE OF DEFECTS, MAJOR DAMAGE AND DECAY CAN BE USED AS NEEDED.
- KEY LOGS SHALL BE A MINIMUM OF 10 INCHES DIAMETER CUT TO REQUIRED LENGTH. HORIZONTAL KEY LOGS ARE TYPICALLY 1.5 X CHANNEL WIDTH TO ACHIEVE SINGLE SPAN WITH BANK KEY-IN. VERTICAL KEY LOGS ARE TYPICALLY BANK HEIGHT + 3' TO ACHIEVE BED KEY IN.
- ROOT WAD TRUNKS SHALL BE A MINIMUM OF 10 INCHES DIAMETER CUT TO A LENGTH OF THE BANK HEIGHT + 3' TO ACHIEVE BED KEY IN. ROOT WAD FAN WIDTH TO BE MINIMUM OF 6 FEET IN DIAMETER TO ENSURE OVERLAP OF FANS.
- THE BRUSH MATTRESS SHALL BE COMPOSED OF A MIX OF WOODY MATERIAL (BRUSH, LIMBS AND SMALL ROOTWADS) AND SALVAGED ON-SITE FILL MATERIAL. BRUSH SHALL BE 1 TO 4 INCHES IN DIAMETER AND BROKEN INTO 2 TO 4 FOOT LONG PIECES. SMALL ROOTWAD TRUNKS SHALL BE 4 TO 8 INCHES IN DIAMETER AND 4 TO 6 FOOT LONG. THIS WOODY MATERIAL SHALL BE EVENLY MIXED WITH SALVAGED ON-SITE FILL MATERIAL (50% WOODY AND 50% FILL). BENTONITE PELLETS SHALL BE INCORPORATED INTO THE BRUSH MATTRESS AS DIRECTED BY THE ENGINEER/DESIGNATED SPECIALIST.
- BALLAST LOGS SHALL BE COMPOSED OF 6 TO 10 INCH DIAMETER BRANCHES/TRUNKS, APPROXIMATELY 6 TO 8 FOOT LONG.
- VERTICAL WOOD POSTS SHALL BE CEDAR POSTS AND BE A MINIMUM OF 4 INCHES DIAMETER AND OF SUFFICIENT LENGTH TO ACHIEVE 3 FEET KEY IN DEPTH PLUS HEIGHT OF THE PROPOSED STRUCTURE.
- THE NUMBER AND LENGTH OF KEY LOGS AND ROOT WADS MAY VARY PER STRUCTURE, DEPENDING ON THE EXISTING CHANNEL WIDTH AND DEPTH. SUFFICIENT MATERIAL IS NECESSARY TO ACHIEVE SPECIFIED GRADE, SECTION, AND DENSITY TO INFLUENCE WATER SURFACE ELEVATION AT BASEFLOW SO THAT IT IS FLOWING OVERTOP OF STRUCTURE.
- WHERE POSSIBLE, ALL MATERIAL SHALL BE DRIVEN OR PUSHED INTO STREAM BED AND BANKS TO DEPTHS SPECIFIED WITH MINIMAL EXCAVATION. SHARPEN ENDS OF LOG WITH A CHAINSAW AND DRIVE SHARPENED INTO GROUND AS DIRECTED BY THE ENGINEER/DESIGNATED SPECIALIST.
- ALL EXPOSED LOG ENDS SHALL HAVE BROKEN OR ROUGHENED END, RATHER THAN SAW CUT END WHEN POSSIBLE.
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The Stables Building 2081 Clipper Park Road  
Baltimore, MD 21211 / ph: 410.554.0156  
fx: 410.554.0168 / www.biohabitats.com  
Restore the Earth & Inspire Ecological Stewardship

DWG/FSC: 24 OF 73  
TITLE:  
SEAL: [Professional Engineer Seal for Douglas G. Stevens, License No. 30734, State of Maryland, 10/20/23]

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024/06/28

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND  
**PEER REVIEW APPROVAL STAMP**  
"I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."  
APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: [Signature]  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY  
The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.  
Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 2022-01  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
[Signature]  
Tanvir Bhuiyan

**Conditions of Approval**  
The above approval is conditioned upon the following:  

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

VISION - PERFORMANCE - RESULTS  
MLA  
TOWN OF EAGLE HARBOR, INCORPORATED 1924

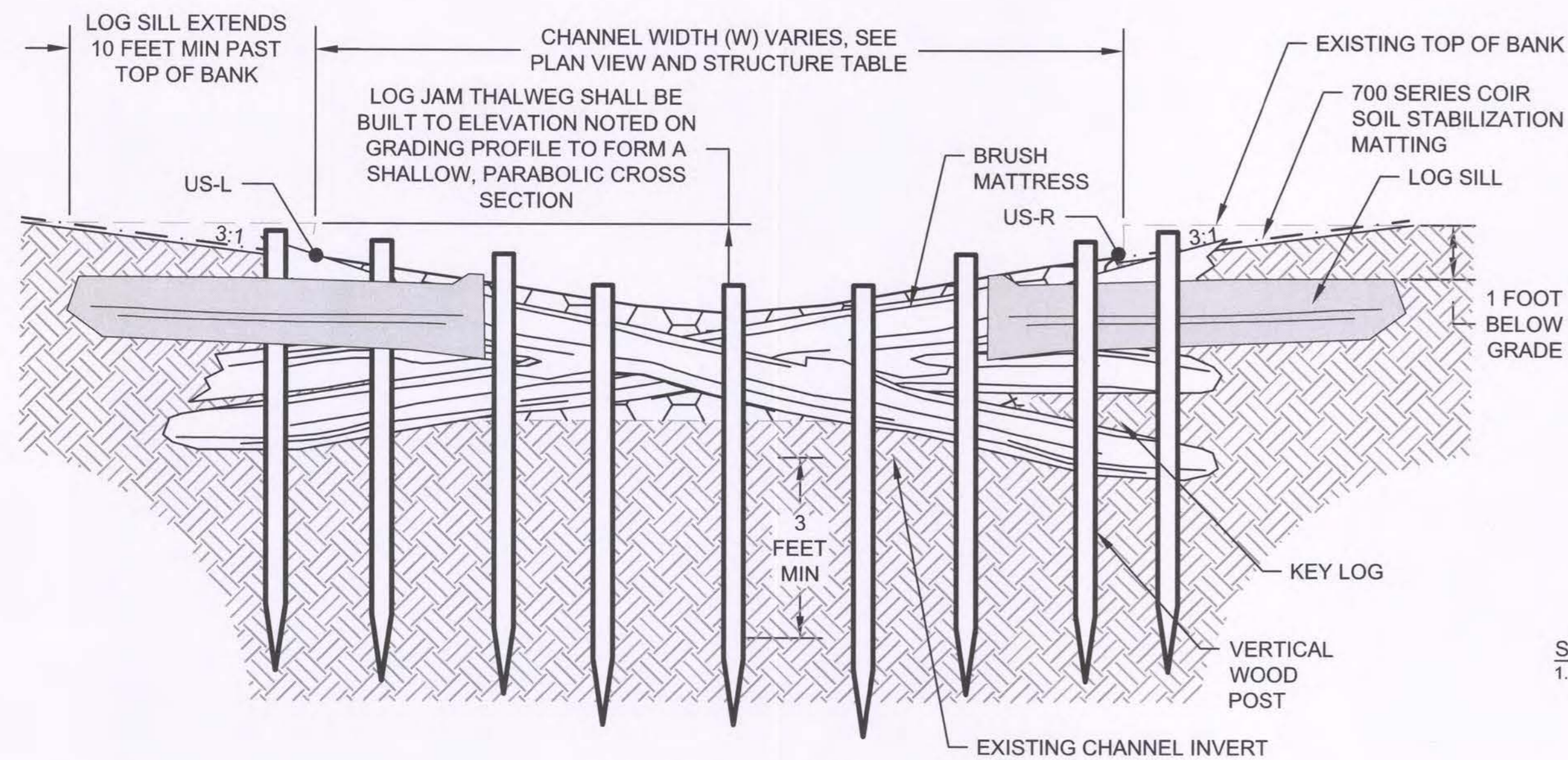
TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
ELECTION DISTRICT 9

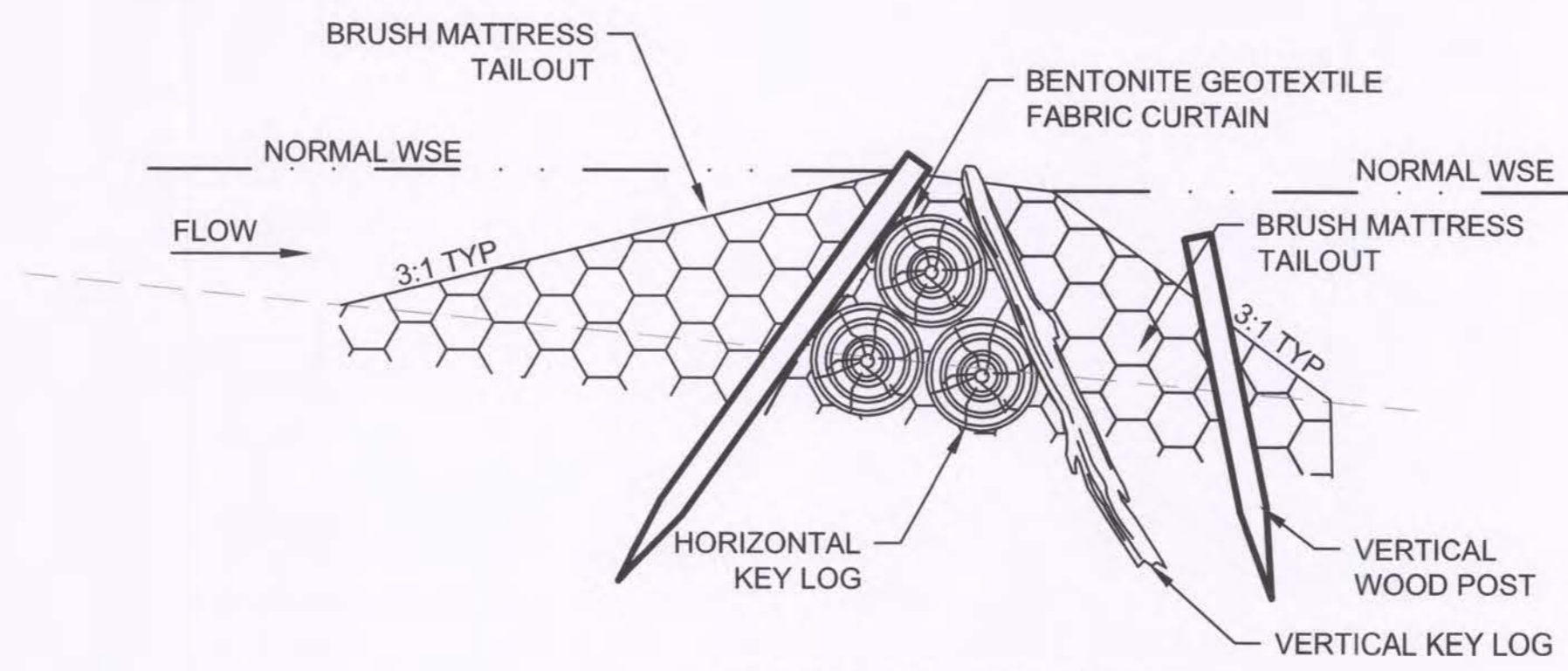
APPROVED: [Signature] 12/18/2023  
ASSOCIATE DIRECTOR DATE  
APPROVED: Frank L. Galosi 12/18/2023  
SECTION HEAD DATE  
PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

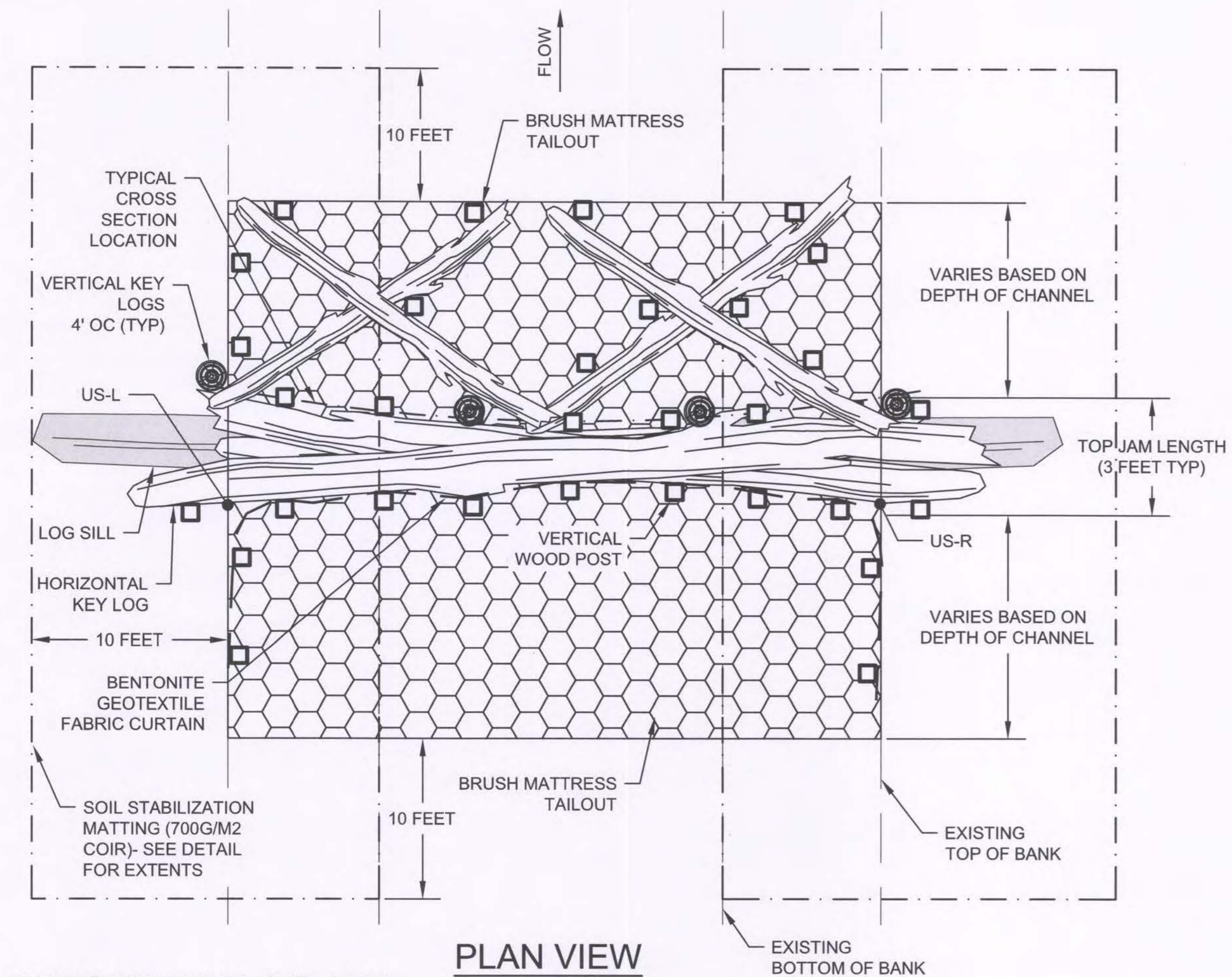




**SECTION VIEW**



**PROFILE VIEW**



**PLAN VIEW**

**SECONDARY LOG JAM**

NOT TO SCALE

**SECONDARY LOG JAM SEQUENCE OF CONSTRUCTION:**

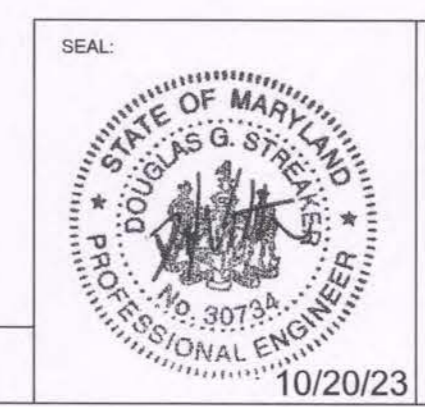
1. PRIOR TO THE INSTALLATION OF LOG JAM, INSPECT STREAMBANKS TO IDENTIFY ANY SIGNIFICANT UNDERCUTS OR VOIDS ALONG BANKS AT THE PROPOSED LOCATION. IF VOIDS ARE FOUND, ENGINEER/DESIGNATED SPECIALIST SHALL MAKE DETERMINATION IF LOG JAM LOCATION IS SHIFTED TO AVOID OR IF VOIDS CAN BE SUFFICIENTLY COMPACTED AND PLUGGED.
2. THE EXISTING STREAMBED MATERIAL SHALL BE HARVESTED WITHIN THE FOOTPRINT OF THE STRUCTURE PRIOR TO THE INSTALLATION OF LOG JAM FOR REUSE AS A COMPONENT OF THE BRUSH MATTRESS IF IT MEETS THE SPECIFICATIONS FOR SALVAGED ON-SITE FILL MATERIAL.
3. COMPACT STREAMBANKS AS DIRECTED AND LAY SOIL STABILIZATION MATTING ALONG BOTH BANKS FOR FULL LENGTH OF STRUCTURE PLUS MIN. 10 FEET UPSTREAM AND DOWNSTREAM, KEYING LOWER EDGE INTO TOE OF SLOPE PRIOR TO INSTALLING WOOD. UPPER EDGE OF MATTING TO EXTEND 10 FEET PAST EXISTING TOP OF BANK.
4. INSTALL THE LOWER ROW OF KEY LOGS HORIZONTALLY ACROSS FULL WIDTH OF EXISTING CHANNEL, SHARPENED ENDS KEYED INTO EXISTING BANK/BED A MINIMUM OF 3 FEET PAST TOP OF BANK. THE BOTTOM OF THE LOWER ROW SHALL BE 1 FOOT BELOW THE EXISTING GRADE. IF MULTIPLE KEY LOGS ARE NEEDED TO SPAN CHANNEL WIDTH, THE MINIMUM OVERLAP SHALL BE 3 FEET. THE HEIGHT OF KEY LOGS SHALL EXTEND FROM 1' BELOW THE EXISTING STREAMBED TO THE PROPOSED STRUCTURE INVERT. TOP ROW SHALL FORM A SHALLOW, PARABOLIC CROSS SECTION FROM PROPOSED INVERT UP TO BANK TIE-IN ELEVATION.
5. BACKFILL IN AND AROUND KEY LOGS AS THEY ARE INSTALLED WITH BRUSH MATTRESS AND SALVAGED ON-SITE FILL MATERIAL IN 1 FOOT COMPACTED LIFTS TO FORM DENSE BRUSH MATTRESS CORE INTERWOVEN BETWEEN THE KEY LOGS. EACH 1 FOOT LAYER OF BRUSH MATTRESS AND SOIL SHALL BE WET COMPACTED TO PREVENT SETTLEMENT AND ELIMINATE VOIDS.
6. INSTALL BENTONITE GEOTEXTILE FABRIC ON THE UPSTREAM FACE OF THE KEY LOGS TO FORM A CONTINUOUS CURTAIN THAT EXTENDS THE FULL WIDTH OF THE SECTION AND WRAPS UPSTREAM ALONG BOTH BANKS FOR A MINIMUM OF 6 FEET. THE HEIGHT OF BENTONITE CURTAIN SHALL EXTEND FROM A MINIMUM OF 1' BELOW EXISTING GRADE TO TOP OF KEY LOGS. ENSURE THE BENTONITE CURTAIN IS INSTALLED IN GOOD CONTACT WITH BANK FACES SO THERE ARE NO VOIDS AT TIE IN POINTS. INSTALL VERTICAL WOOD POSTS ON UPSTREAM SIDE OF BENTONITE CURTAIN TO PIN IN AGAINST THE KEY LOGS AND BANKS.
7. INSTALL FIRST LAYERS OF BRUSH MATTRESS TAILOUTS ON UP AND DOWNSTREAM SIDES OF STRUCTURE IN 1 FOOT COMPACTED LIFTS, INCORPORATING THE MATERIAL INTO THE STREAMBED A MINIMUM OF 1 FOOT.
8. INSTALL VERTICAL KEY LOGS ACROSS CHANNEL (TYPICALLY 4 FEET ON-CENTER) ON DOWNSTREAM SIDE OF HORIZONTAL KEY LOGS, SHARPENED END KEYED INTO EXISTING BED A MINIMUM OF 3 FEET. CONTINUE TO BACKFILL AND COMPACT ALL VOIDS WITH BRUSH MATTRESS AND ON-SITE FILL MATERIAL.
9. IF TOP ROW OF HORIZONTAL KEY LOGS ARE KEYED INTO BANK LESS THAN 5 FEET, EXTEND LOG SILL TO ACHIEVE A MINIMUM LENGTH OF 5' FROM EDGE OF STRUCTURE. SILL LOGS SHALL BE INCORPORATED INTO LOG JAMS TO ELIMINATE UNPROTECTED SURFACE AT TOP OF BANK TIE IN LOCATION. COMPACT GROUND SURROUNDING LOG SILL AND ALL TIE-IN POINTS ALONG THE STRUCTURE. LOG SILL SHALL EXTEND FURTHER THAN 5 FEET WHEN SHOWN ON PLANS AS FLOODPLAIN LOG SILLS.
10. INSTALL FINAL TOP LAYERS OF BRUSH MATTRESS TAILOUTS ON UP AND DOWNSTREAM SIDES OF STRUCTURE, BACKFILLED WITH ON-SITE FILL MATERIAL IN 1 FOOT COMPACTED LIFTS. ENSURE SUFFICIENT BRUSH MATTRESS TAILOUT IS PROVIDED ON DOWNSTREAM SIDE TO MINIMIZE VERTICAL PLUNGING FLOWS. FINISHED SURFACE OF DOWNSTREAM TAILOUT SHALL BE DRESSED WITH LARGER DIAMETER BRUSH (4" TO 8" DIAMETER) BALLASTED DOWN WITH 8" TO 10" DIAMETER BRANCHES/TRUNKS PLACED IN THE DIRECTION OF FLOW.
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12. THE STRUCTURE IS NOT CONSIDERED COMPLETE UNTIL STREAM BASEFLOW IS IMPOUNDED UPSTREAM OF STRUCTURE TO THE CREST ELEVATION AND BASEFLOW IS FLOWING OVERTOP THE FACE OF THE STRUCTURE AT THE DISCRETION OF THE ENGINEER/ DESIGNATED SPECIALIST.
13. PRIOR TO COMPLETION OF EACH STRUCTURE, ENGINEER/DESIGNATED SPECIALIST MAY REQUEST THE CONTRACTOR PERFORM A DYE TEST TO CONFIRM NO DIRECT PIPING FLOW THROUGH THE STRUCTURE. IF PIPING FLOW PATHS ARE OBSERVED, THE CONTRACTOR SHALL ADD MATERIAL UNTIL IT IS CONSIDERED ACCEPTABLE BY ENGINEER/DESIGNATED SPECIALIST.
14. ONCE LOG JAM IS CONSTRUCTED, COMPLETE INSTALLATION OF SOIL STABILIZATION MATTING AND IMMEDIATELY STABILIZE ALL DISTURBED TIE-IN LOCATIONS AS SPECIFIED.
15. COARSE WOODY DEBRIS SHALL BE INSTALLED IN POOLS BETWEEN LOG JAMS AS SHOWN ON GRADING PLAN, OR AS DIRECTED BY THE ENGINEER/DESIGNATED SPECIALIST.

**SECONDARY LOG JAM GENERAL NOTES:**

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2. FOR ALL MATERIAL SIZE AND TYPE, REFER TO SPECIFICATIONS AND NOTES PROVIDED ON THIS DETAIL.
3. ALL WOODY MATERIAL (KEY LOGS, ROOT WADS, BRUSH, LIMBS) SHALL BE OBTAINED ONSITE TO MAXIMUM EXTENT. ROT-RESISTANT SPECIES ARE PREFERRED FOR USE IF AVAILABLE, BUT ANY WOOD FREE OF DEFECTS, MAJOR DAMAGE AND DECAY CAN BE USED AS NEEDED.
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LICENSE NO. 30734  
EXP DATE: 2024-06-28

DWG/FSC: 25 OF 73

TITLE:

**DETAILS**

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND

PEER REVIEW APPROVAL STAMP

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APPROVAL DATE: 11/16/2023

PEER REVIEWER'S NAME: Xiaodong Zhang

PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*

COMPANY NAME: ZEST LLC

LICENSE NUMBER: 36713

PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):

*Tanvir Bhuiyan*  
Tanvir Bhuiyan

Conditions of Approval

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TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

*Jeff Duffan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

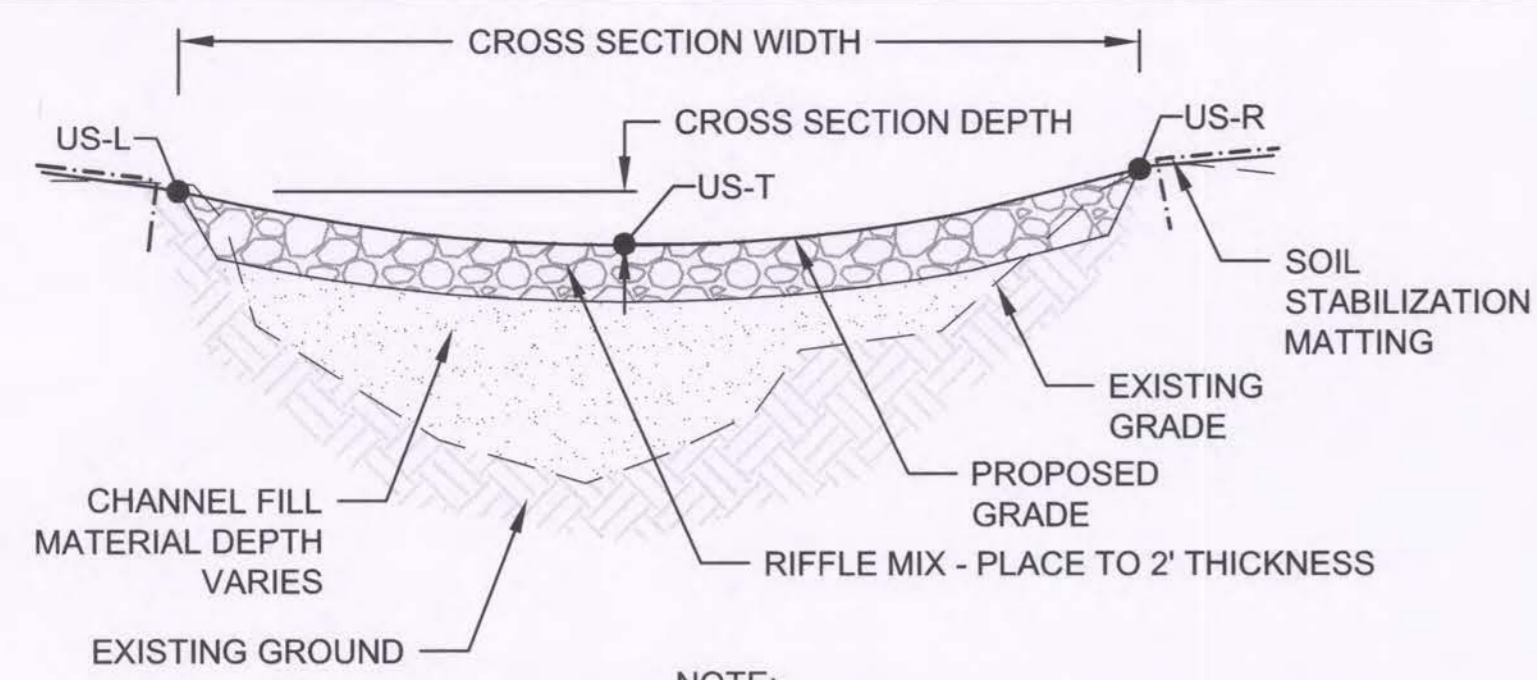
**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

**Biohabitats**

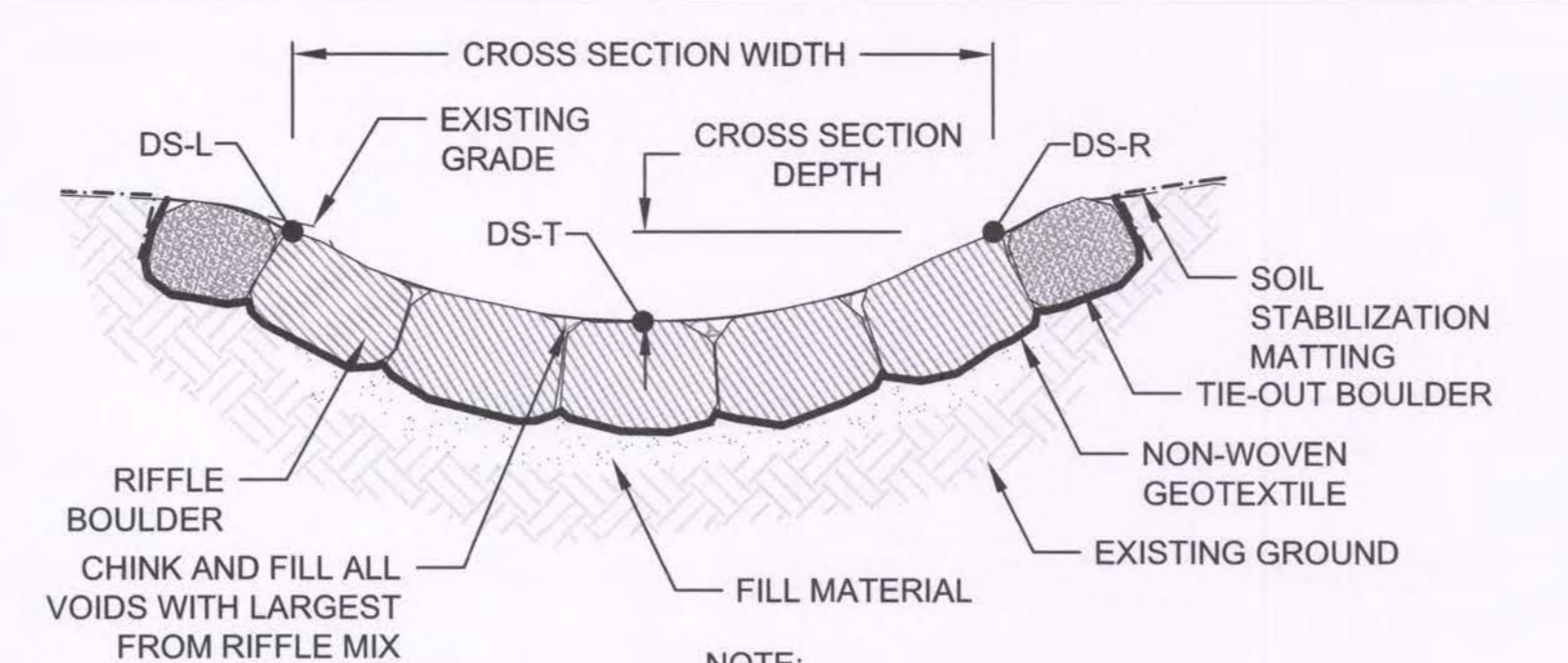
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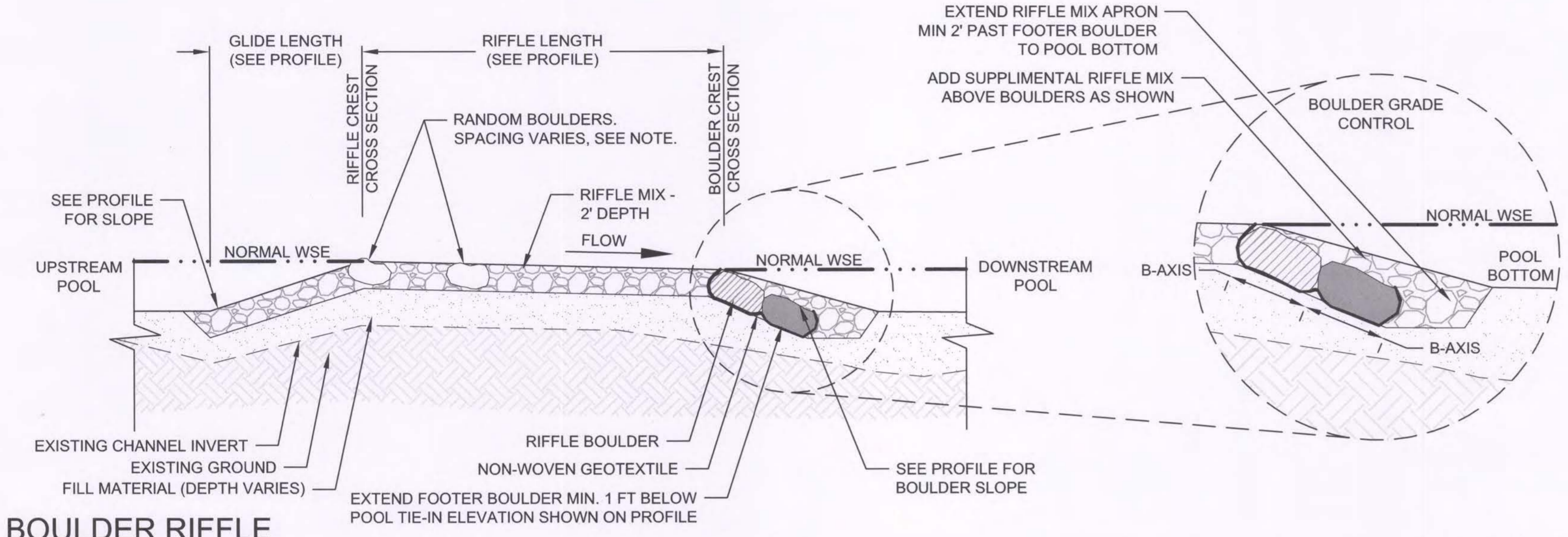




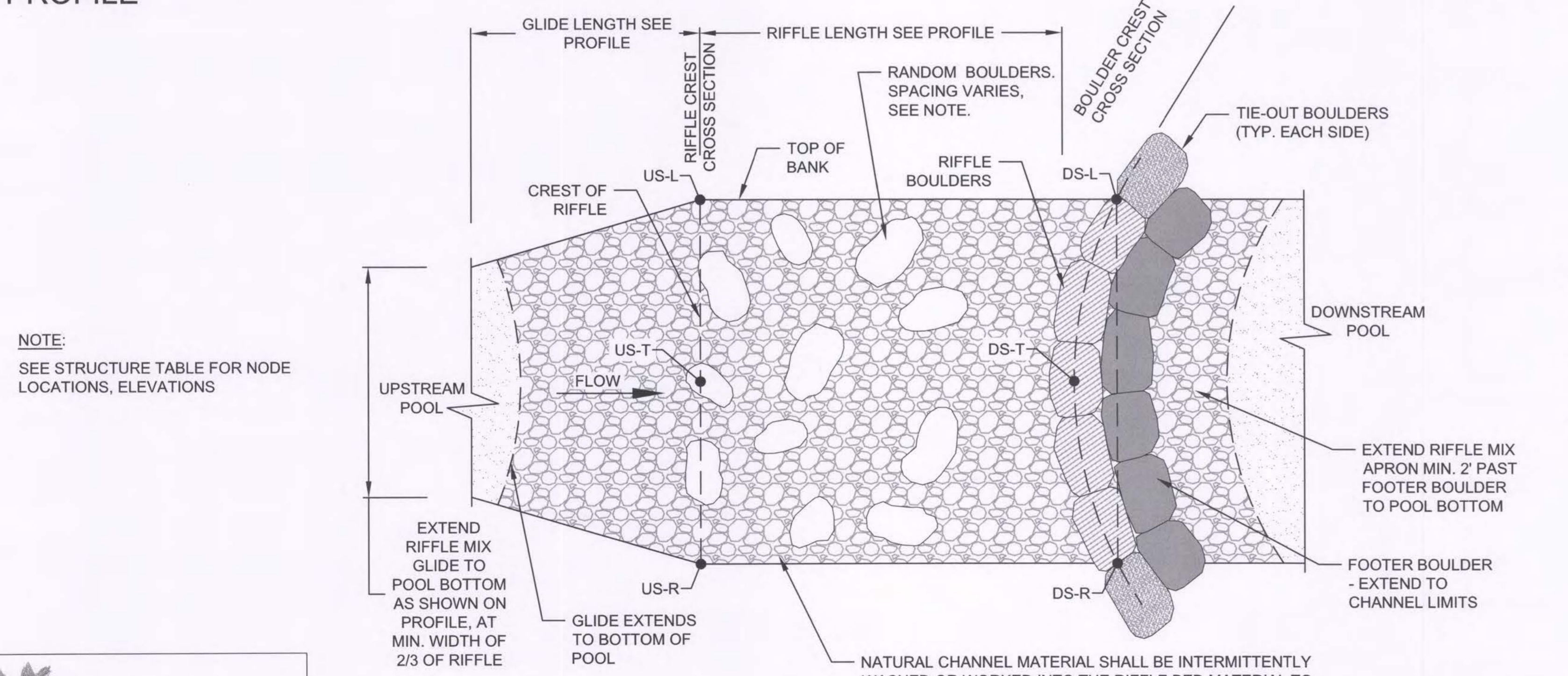
**BOULDER RIFFLE RIFFLE CREST CROSS SECTION**  
NOTE: SEE TYPICAL SECTION FOR TOP WIDTH AND DEPTH  
NOT TO SCALE



**BOULDER RIFFLE BOULDER CROSS SECTION**  
NOTE: SEE TYPICAL SECTION FOR TOP WIDTH AND DEPTH  
NOT TO SCALE



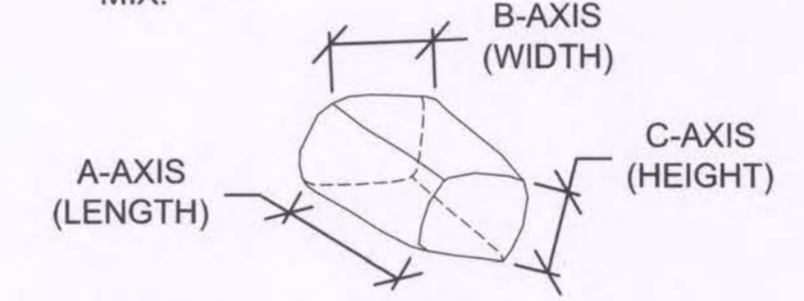
**BOULDER RIFFLE PROFILE**  
NOT TO SCALE



**BOULDER RIFFLE PLAN VIEW**  
NOTE: SEE STRUCTURE TABLE FOR NODE LOCATIONS, ELEVATIONS  
NOT TO SCALE

**BOULDER RIFFLE NOTES:**

- REFER TO STRUCTURE TABLE FOR NODE LOCATIONS AND ELEVATIONS DEFINING THE FOOTPRINT OF RIFFLE. SEE PROFILE FOR UPSTREAM AND DOWNSTREAM EXTENT OF PROTECTION (GLIDE AND APRON).
- SEE TYPICAL SECTIONS FOR DEPTH AND WIDTH OF CHANNEL CROSS SECTION. THE CROSS SECTION SHALL BE CONSTRUCTED IN A PARABOLIC SHAPE BETWEEN GIVEN NODES.
- FOR ALL MATERIAL SIZES, REFER TO SPECIFICATIONS AND TABLES PROVIDED IN THIS DETAIL.
- NATURAL CHANNEL MATERIAL MAY BE HARVESTED ON-SITE PRIOR TO INSTALLATION OF RIFFLE IF IT MEETS THE SPECIFICATIONS.
- RIFFLE MIX SHALL BE A MINIMUM THICKNESS OF TWICE THE SPECIFIED D50 OF THE MATERIAL OR 2', WHICHEVER IS LARGER.
- THE NUMBER OF BOULDERS VARIES DEPENDING ON TYPICAL SECTION WIDTH AND BOULDER DIMENSIONS.
- IN AREAS OF CUT, CHANNEL FILL MATERIAL UNDER RIFFLE MIX IS NOT NEEDED. IN AREAS OF FILL, EXISTING STREAM CHANNEL TO BE FILLED IN 8" LIFTS WITH CHANNEL FILL MATERIAL TO ELEVATION SPECIFIED ON PROFILE.
- AS NEEDED, EXCAVATE THE DOWNSTREAM TIE OUT AREA FOR FOOTER BOULDERS AND INSTALL THE BOULDER GRADE CONTROL FOOTERS AND RIFFLE BOULDERS, LAYING A CONTINUOUS SHEET OF GEOTEXTILE UNDER ALL BOULDERS. TOP OF RIFFLE BOULDERS SHALL BE PARABOLIC IN SHAPE AND MEET FINISHED GRADE DEFINED BY STRUCTURE TABLE NODES.
- GEOTEXTILE MAY BE REPLACED WITH A GRANULAR FILTER BLANKET (MIN. 6" THICKNESS) IF APPROVED BY ENGINEER.
- THE BOULDERS SHALL BE TILTED DOWNSTREAM AS SHOWN ON THE DETAIL AND NOT STACKED. STAGGER SEAMS OF BOULDERS BETWEEN EACH ROW. INSTALL RIFFLE MIX APRON TO BLEND INTO DOWN STREAM POOL AS SHOWN ON DETAIL.
- TIE-OUT BOULDER SHALL EXTEND PAST THE CORNER NODES DS-R & DS-L A MIN. OF ONE BOULDER LENGTH (B-AXIS) INTO EXISTING BANK. WHERE THIS CONFLICTS WITH EXISTING TREE ROOTS OR BEDROCK, TIE-OUT BOULDER MAY BE ELIMINATED OR ADJUSTED AT DIRECTION OF ENGINEER.
- PLACE RIFFLE MIX UPSTREAM OF THE BOULDER GRADE CONTROL TO THE FINISHED GRADES, COMPRESSING MATERIALS TO MAINTAIN PARABOLIC CROSS SECTION SHAPE.
- CHANNEL WASH-IN MATERIAL SHALL BE REPEATEDLY WORKED INTO FULL DEPTH OF THE RIFFLE MIX TO FILL VOIDS.
- EXCAVATE UPSTREAM POOL AND INSTALL RIFFLE MIX GLIDE AS SHOWN ON DETAIL.
- TRIM ALL GEOTEXTILE AT OR BELOW FINISHED GRADE.
- ONCE RIFFLE IS CONSTRUCTED, STABILIZE ALL DISTURBED TIE-IN LOCATIONS AS SPECIFIED.
- RIFFLE BOULDERS SHALL BE INCORPORATED IN A RANDOM PLACEMENT WITHIN FOOTPRINT OF RIFFLE WITH SPACING OF 24"-36" WITHIN RIFFLES R-1 THROUGH R-6, R-11 THROUGH R-16, AND R-18. RIFFLE BOULDER SPACING SHALL BE 12"-18" WITHIN RIFFLES R-7 THROUGH R-10 AND R-17. TOPS OF RIFFLE BOULDERS SHALL BE FLUSH WITH FINISHED GRADE OF RIFFLE MIX.

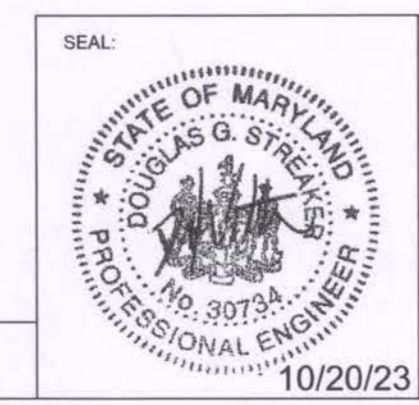


**BOULDER RIFFLE BOULDER AXIS**  
NOT TO SCALE

BOULDER DIMENSIONS (FT)			
BOULDER TYPE	A-AXIS	B-AXIS	C-AXIS
RANDOM	2	1.5-2	1.5
FOOTER	2-3	2-3	1.5-2
RIFFLE	1.5-2.5	2	1.5
TIE-OUT	2-3	2-3	1.5

RIFFLE GRADATION TABLE	
CUMULATIVE % FINER	SIZE (IN)
10	5
15	6
30	8
50	11
85	16
100	18

- NOTES:**
- BOULDERS SHALL CONSIST OF ANGULAR GRANITE OR SANDSTONE BOULDERS OF SIMILAR COLOR TO NATIVE BOULDERS AND OBTAINED FROM AN APPROVED SOURCE. LIMESTONE IS NOT ACCEPTABLE. BOULDERS SHALL HAVE A MINIMUM UNIT WEIGHT OF 160 LB PER CUBIC FOOT AND MEET THE BOULDER SIZE WITHIN THE RANGES SPECIFIED ABOVE.
  - STREAMBED MATERIAL SHALL MEET THE GRADATIONS SHOWN IN THE TABLE AND BE COMPOSED OF A COMBINATION OF APPROXIMATELY 70% SILICA COBBLE, RANGING FROM ROUNDED TO SUB-ANGULAR SHAPED, AND UP TO 30% ANGULAR ROCK THAT MEETS THE SIZE GRADATIONS SHOWN.
  - ONSITE SALVAGED OR IMPORTED CHANNEL WASH-IN MATERIAL SHALL BE INCORPORATED INTO THE STREAMBED MATERIAL VOIDS. CHANNEL WASH-IN SHALL BE DONE TO THE SATISFACTION OF THE ENGINEER/DESIGNATED SPECIALIST. THE VOLUME OF CHANNEL WASH-IN MATERIAL REQUIRED MAY VARY BUT IS TYPICALLY EQUAL TO APPROXIMATELY 20% OF THE STREAMBED MATERIAL VOLUME.



PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 10/20/23

DWG/FSC: 26 OF 73  
TITLE:

**DETAILS**

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND

**PEER REVIEW APPROVAL STAMP**

"I hereby certify that I have successfully completed participation in DPE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

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PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Number: 22025.01  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
*Tanvir Bhuiyan*  
ENVIRONMENT

- Conditions of Approval**
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**GreenVest**  
VISION - PERFORMANCE - RESULTS  
MLS

TOWN OF EAGLE HARBOR, INCORPORATED 1929  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
ELECTION DISTRICT 9

*Jeff Doshan* 12/18/2023  
ASSOCIATE DIRECTOR DATE  
*Frank L. Galosi* 12/18/2023  
APPROVED SECTION HEAD DATE  
PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

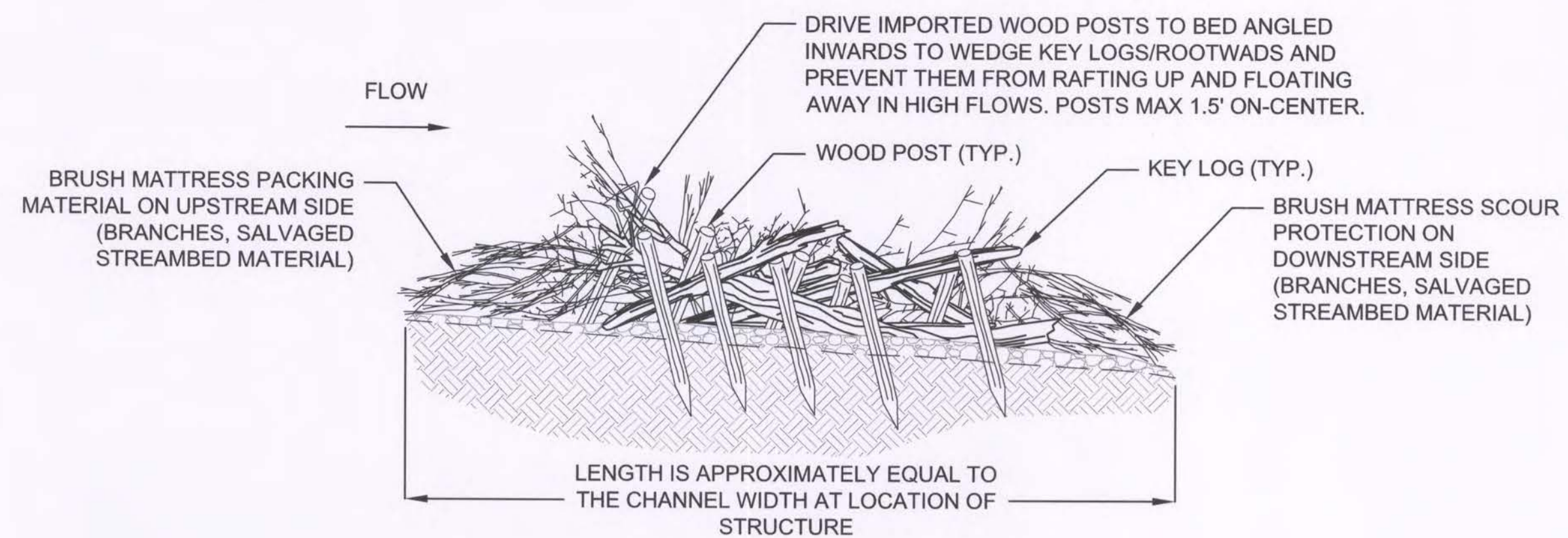
**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

**Biohabitats**  
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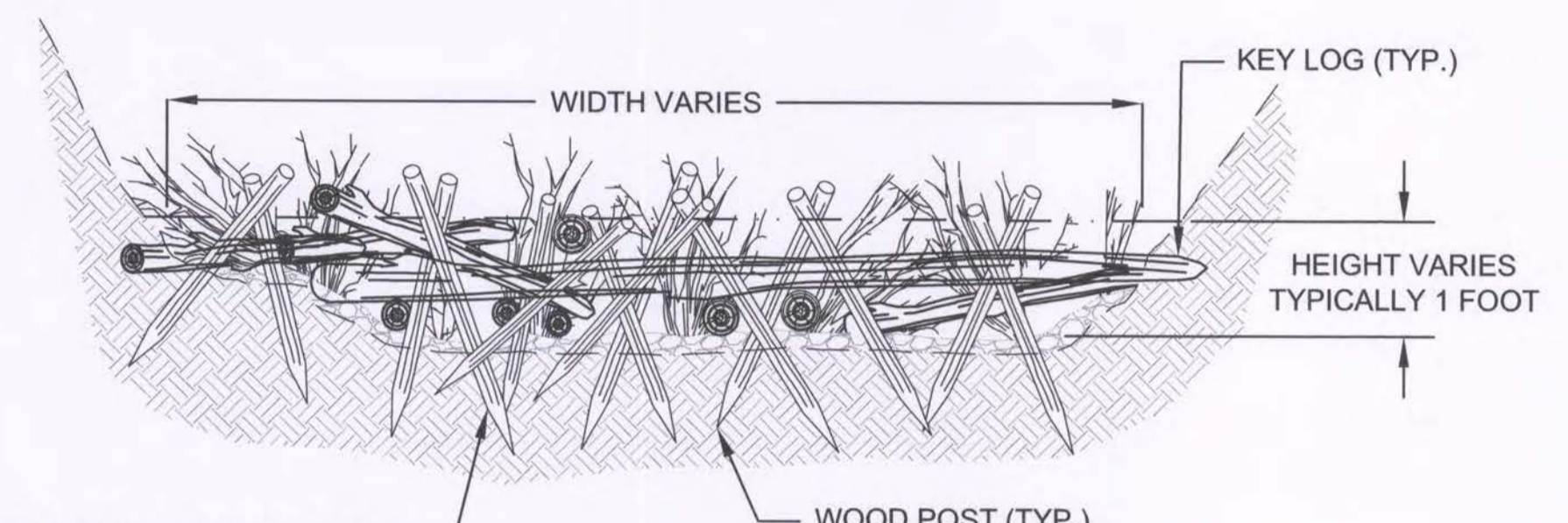








**PROFILE**

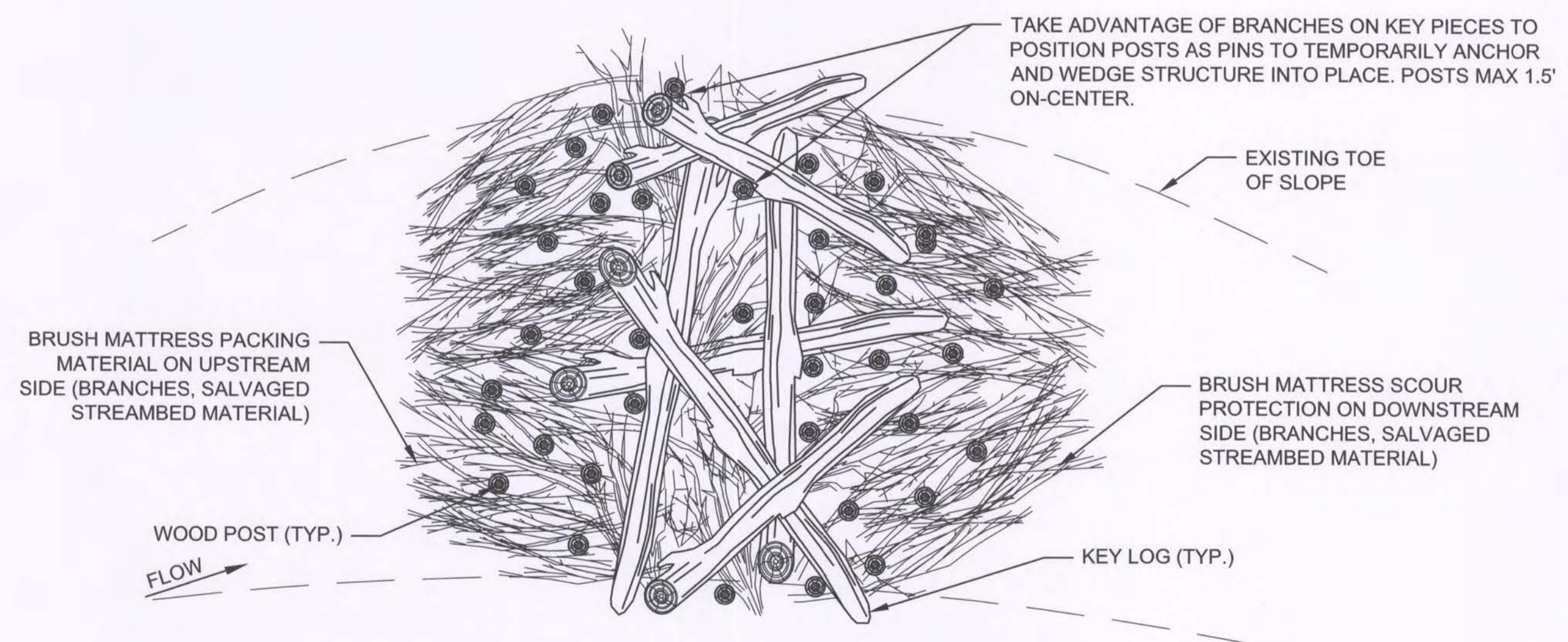


DRIVE IMPORTED WOOD POSTS AT ANGLES TO WEDGE AND PIN WOODY DEBRIS TOGETHER. ATTEMPT TO DRIVE AT LEAST 1/4 TO 1/3 FINISHED LENGTH OF STAKE INTO BED.

**NOTE:**

1. STRUCTURE HEIGHTS AND WIDTHS VARY, SEE GRADING PLAN AND PROFILE.
2. SPACING OF PALS IS APPROXIMATELY ONE EVERY 25 HORIZONTAL FEET.
3. BRUSH MATTRESS SHALL BE INSTALLED BETWEEN EACH PALS AS SHOWN ON THE PROFILE.

**SECTION**



ADAPTED FROM CHANNEL-SPANNING PALS DETAIL, UTAH STATE LOW TECH PROCESSED BASED RESTORATION MANUAL

**PLAN**

**HAND-INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURE (PALS)**  
NOT TO SCALE

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**HAND-INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURE (PALS) SEQUENCE OF CONSTRUCTION:**

1. INSTALL KEY LOGS AND/OR SMALL ROOT WADS ORIENTED STREAM-WISE AND FACE THE BUTT-END OR ROOT WAD UPSTREAM TO MAXIMIZE WIDTH OF BLOCKAGE THAT WILL CREATE DIVERGENT FLOW PATHS AROUND IT.
2. INSTALL KEY LOGS AND/OR ROOT WAD ORIENTED PARALLEL TO FLOW, PUSHING ENDS INTO TOE OF BANK. USE A MIX OF VARIOUS SIZE WOOD AND TANGLE TOGETHER WITH BRANCHES OF PARALLEL KEY LOGS.
3. BACKFILL AROUND KEY LOGS/ROOT WADS WITH BRUSH MATTRESS AND SALVAGED STREAMBED MATERIAL MATERIAL IN 1 FOOT COMPACTED LIFTS TO FORM DENSE BRUSH MATTRESS CORE INTERWOVEN WITHIN THE KEY LOGS.
4. DRIVE POSTS INTO BED ANGLED INWARDS TO WEDGE KEY LOGS/ROOT WADS/BRUSH MATTRESS AND PREVENT THEM FROM RAFTING UP AND FLOATING AWAY IN HIGH FLOWS. POSTS SHALL BE SPACED A MAXIMUM OF 1.5' ON-CENTER. DRIVE AT LEAST 1/4 TO 1/3 FINISHED LENGTH OF POST INTO BED.
5. INSTALL BRUSH MATTRESS TAILOUTS ON UP AND DOWNSTREAM SIDES OF STRUCTURE, WEAVING BRUSH MATTRESS WITHIN VERTICAL IN 1 FOOT HAND-COMPACTED LIFTS. ENSURE SUFFICIENT BRUSH MATTRESS TAILOUT IS PROVIDED ON DOWNSTREAM SIDE TO MINIMIZE VERTICAL PLUNGING FLOWS
6. DRIVE POSTS TO BED ANGLED INWARDS TO WEDGE BOTH UP AND DOWNSTREAM BRUSH MATTRESS TAILOUTS AND PREVENT THEM FROM RAFTING UP AND FLOATING AWAY IN HIGH FLOWS. POSTS SHALL BE SPACED A MAXIMUM OF 1.5' ON-CENTER. DRIVE AT LEAST 1/4 TO 1/3 FINISHED LENGTH OF POST INTO BED.
7. ONCE PAL IS CONSTRUCTED, IMMEDIATELY STABILIZE ALL DISTURBED TIE-IN LOCATIONS AS SPECIFIED.

**HAND-INSTALLED BRUSH MATTRESS/POST ASSISTED LOG STRUCTURE (PALS) NOTES:**

1. REFER TO STRUCTURE TABLE FOR NODE LOCATIONS AND ELEVATIONS DEFINING THE FOOTPRINT OF STRUCTURE. SEE PROFILE FOR THALWEG SLOPE BREAKS DEFINING STRUCTURE SLOPE AND UPSTREAM AND DOWNSTREAM EXTENT OF TAILOUTS.
2. FOR ALL MATERIAL SIZE AND TYPE, REFER TO SPECIFICATIONS AND TABLES PROVIDED ON THIS DETAIL.
3. KEY LOGS SHALL BE A MINIMUM OF 4 INCHES DIAMETER CUT TO REQUIRED LENGTH (APPROX. 1.5 X CHANNEL WIDTH). ROOT WAD TRUNKS SHALL BE A MINIMUM OF 4 INCHES DIAMETER. KEY LOGS, ROOT WADS, AND BRUSH MATTRESS SHALL BE OBTAINED ONSITE TO MAXIMUM EXTENT. ROT-RESISTANT SPECIES ARE PREFERRED FOR USE IF AVAILABLE, BUT ANY WOOD FREE OF DEFECTS, MAJOR DAMAGE AND DECAY CAN BE USED AS NEEDED.
4. BRUSH MATTRESS SHALL BE COMPOSED OF BRUSH, LIMBS AND SMALL ROOTWAD BETWEEN 1" TO 2" DIAMETER AND BETWEEN OF 3' TO 5' LONG, MIXED EVENLY WITH SMALLER DIAMETER BRUSH AND ON-SITE FILL MATERIAL.
5. ROOT WAD SHALL BE HARVESTED AND INSTALLED IN SUCH A MANNER THAT ENSURES SOIL REMAINS ATTACHED TO ROOTS TO MAX EXTENT POSSIBLE.
6. IMPORTED WOOD POSTS TO BE A MINIMUM OF 4 INCHES DIAMETER AND 4 FOOT LENGTH.
7. THE NUMBER AND LENGTH OF KEY LOGS AND ROOT WADS MAY VARY PER STRUCTURE, DEPENDING ON THE EXISTING CHANNEL WIDTH AND DEPTH. SUFFICIENT MATERIAL IS NECESSARY TO ACHIEVE SPECIFIED GRADE, SECTION, AND DENSITY TO INFLUENCE WATER SURFACE ELEVATION SO THAT IT IS FLOWING OVERTOP OF STRUCTURE DURING STORM EVENTS.
8. WHERE POSSIBLE, ALL MATERIAL SHALL BE DRIVEN OR PUSHED INTO STREAM BED AND BANKS TO DEPTHS SPECIFIED WITH MINIMAL EXCAVATION. SHARPEN ENDS OF LOG WITH A CHAINSAW AND DRIVE SHARPENED INTO GROUND AS DIRECTED BY THE ENGINEER/DESIGNATED SPECIALIST.
9. ALL EXPOSED LOG ENDS SHALL HAVE BROKEN OR ROUGHENED END, RATHER THAN SAW CUT END WHEN POSSIBLE.
10. THIS DETAIL DEPICTS THE TYPICAL PREFERRED COMPOSITION AND CONFIGURATION OF LOG MEMBERS. ALTERATION OF THIS COMPOSITION/CONFIGURATION DUE TO ISSUES OBTAINING NECESSARY MATERIALS OR OTHER REASON IS ACCEPTABLE ONLY WITH PRIOR APPROVAL FROM THE ENGINEER/DESIGNATED SPECIALIST. FINISHED GRADE OF ALTERED STRUCTURES SHALL REMAIN AS SPECIFIED ON THE PLANS.

DWG/FSC: 28 OF 73

TITLE:



PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 10/20/23

**DETAILS**

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND

**PEER REVIEW APPROVAL STAMP**

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APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: [Signature]  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
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Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
[Signature] Tanvir Bhuiyan

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TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

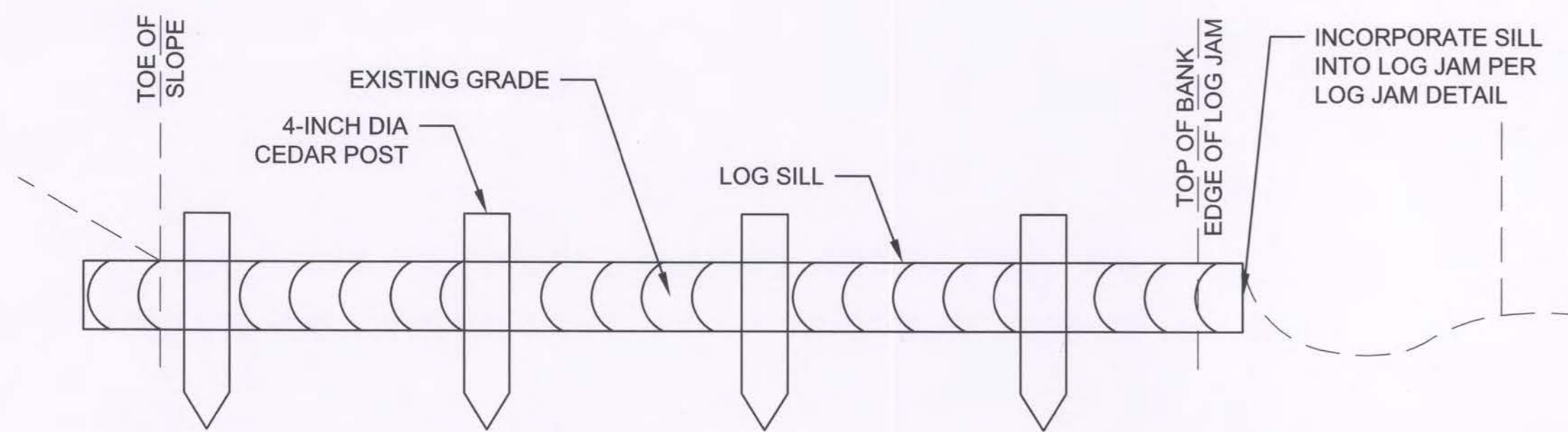
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ELECTION DISTRICT 9

APPROVED: [Signature] 12/18/2023  
ASSOCIATE DIRECTOR DATE  
APPROVED: [Signature] 12/18/2023  
SECTION HEAD DATE

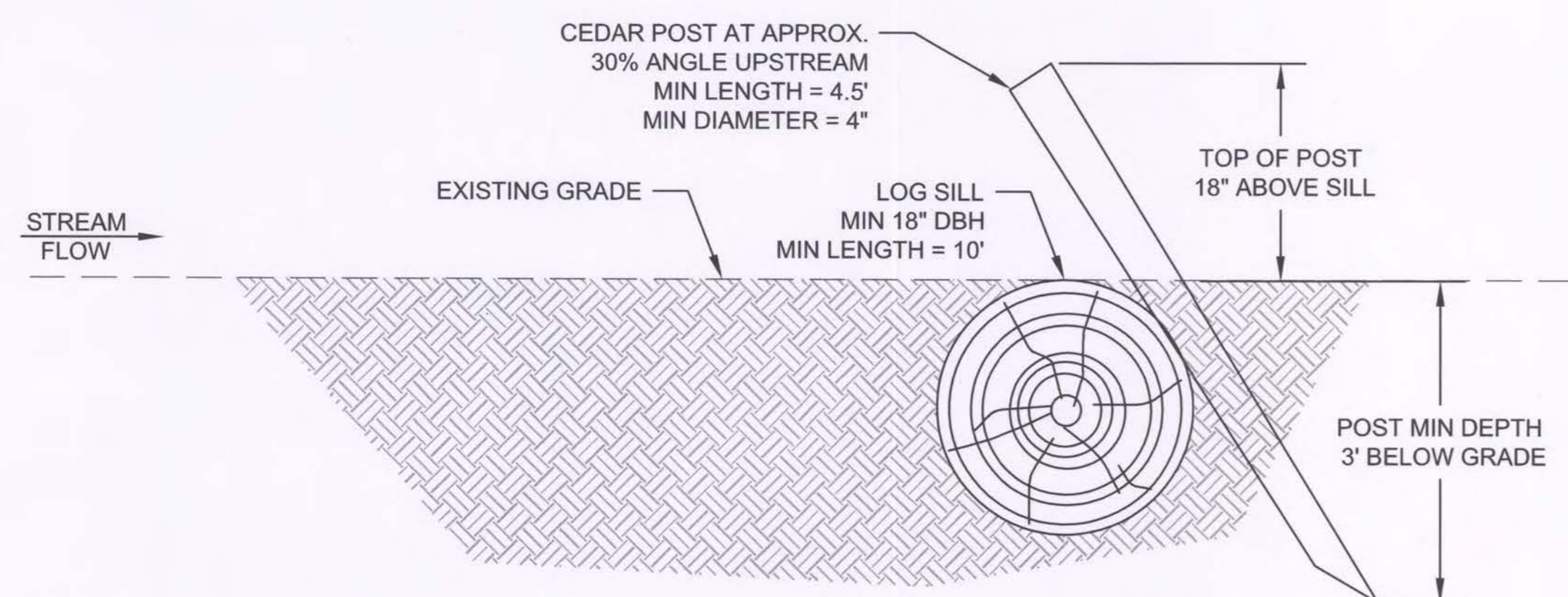
PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**





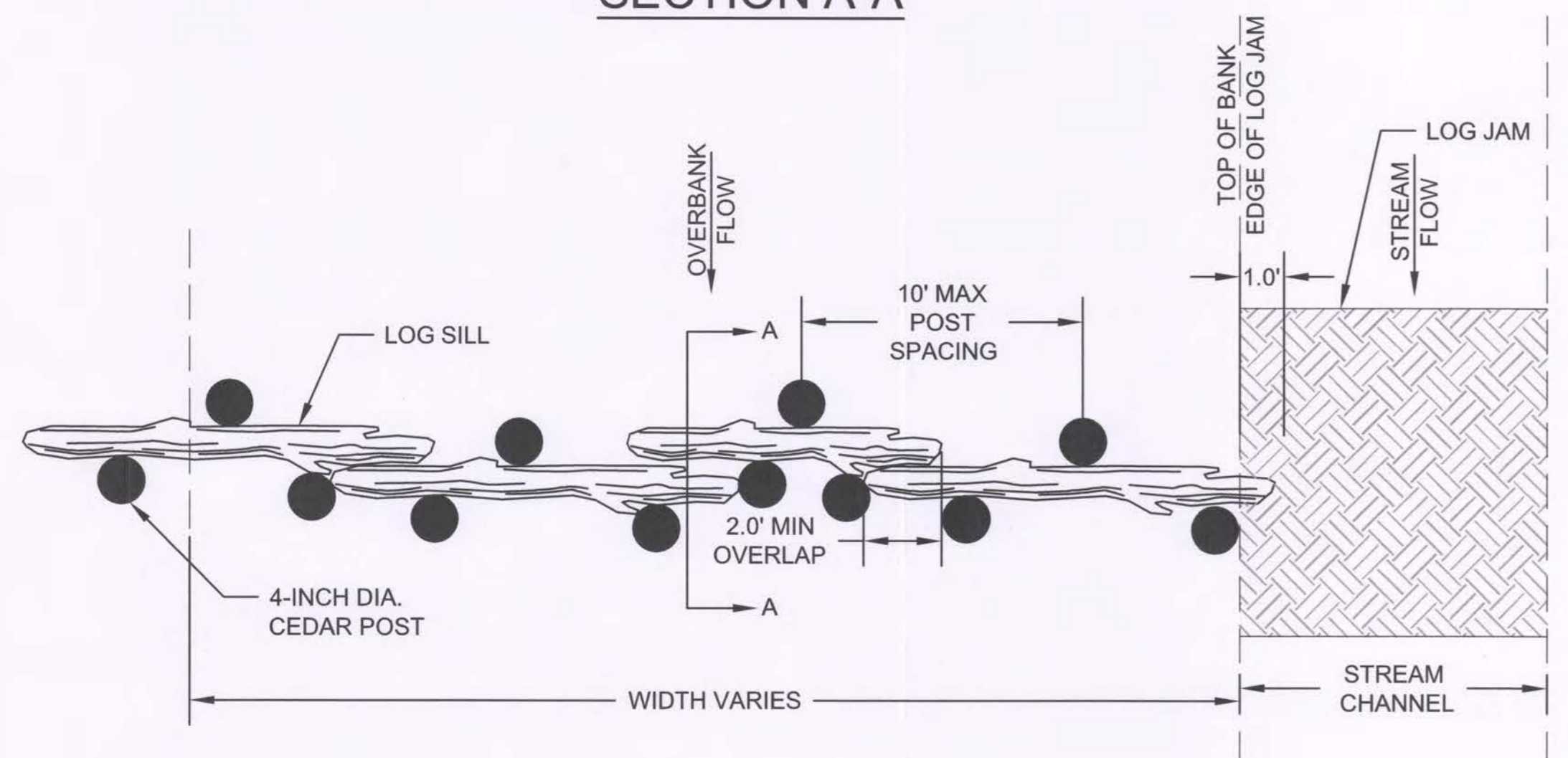
**PROFILE VIEW**



**NOTES:**

1. LOCATION AND ALIGNMENT OF FLOODPLAIN SILL SHALL BE ADJUSTED TO AVOID SIGNIFICANT IMPACTS TO EXISTING ROOT STRUCTURES. SILL MAY BE ELIMINATED AT THE DISCRETION OF THE ENGINEER.
2. INSTALLATION OF SILLS SHALL INCLUDE MINIMAL EXCAVATION, AND SHALL BE PUSHED BELOW GRADE WHERE POSSIBLE.
3. POSTS SHALL BE INSTALLED EVERY 10' MAX SPACING, WITH A MINIMUM OF 1 ON THE UPSTREAM SIDE AND 2 AND THE DOWNSTREAM SIDE OF EACH LOG SEGMENT.
4. MULTIPLE LOGS(6-10" DBH) MAY BE USED IN PLACE OF SINGLE 10" OR GREATER LOG.
5. LOGS SHALL BE GENERALLY INSTALLED FLUSH WITH GRADE. THE TOP OF LOG MAY EXTEND ABOVE GRADE A MAXIMUM OF 3 INCHES.

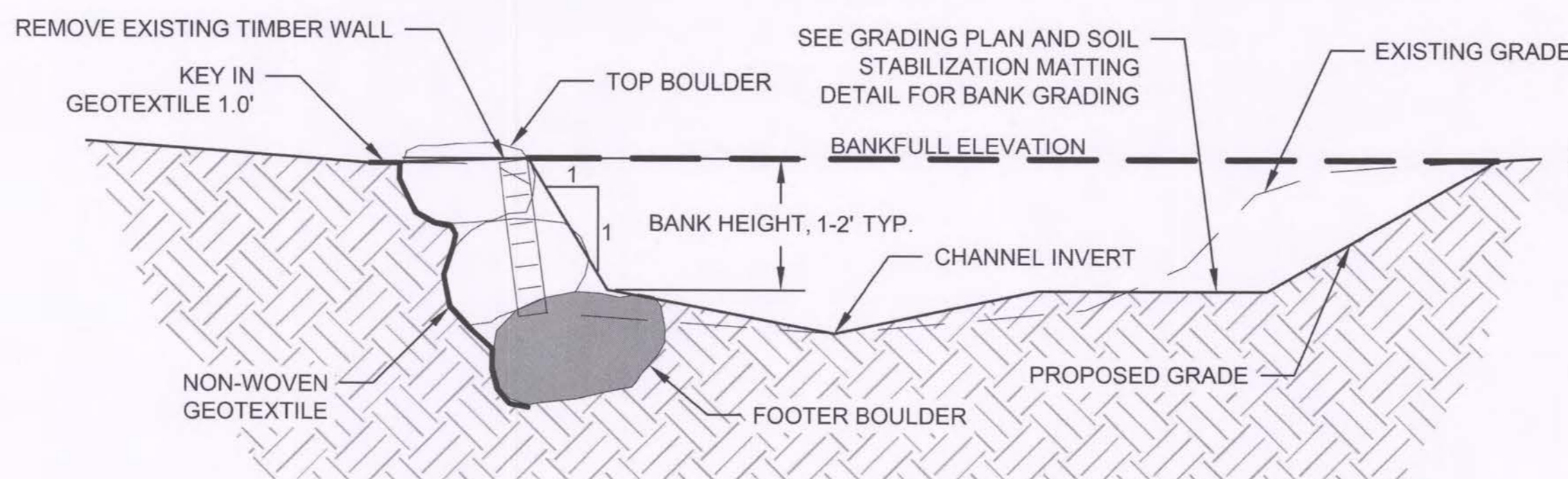
**SECTION A-A**



**PLAN**

**FLOODPLAIN LOG SILL**

NOT TO SCALE



**NOTES:**

1. FOOTER BOULDER TO BE KEYPED INTO TOE OF SLOPE SO THAT TOP OF FOOTER IS MAX 1' ABOVE CHANNEL INVERT.
2. TOP ELEVATION OF TOP BOULDER TO MATCH EXISTING TOP OF BANK/TOP OF WALL.

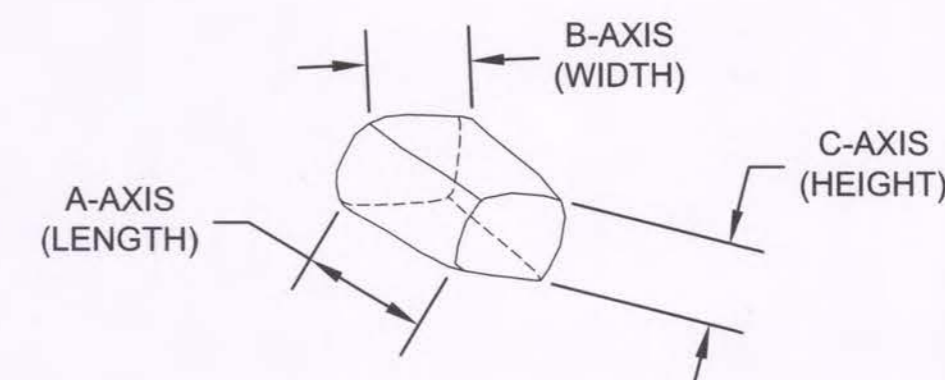
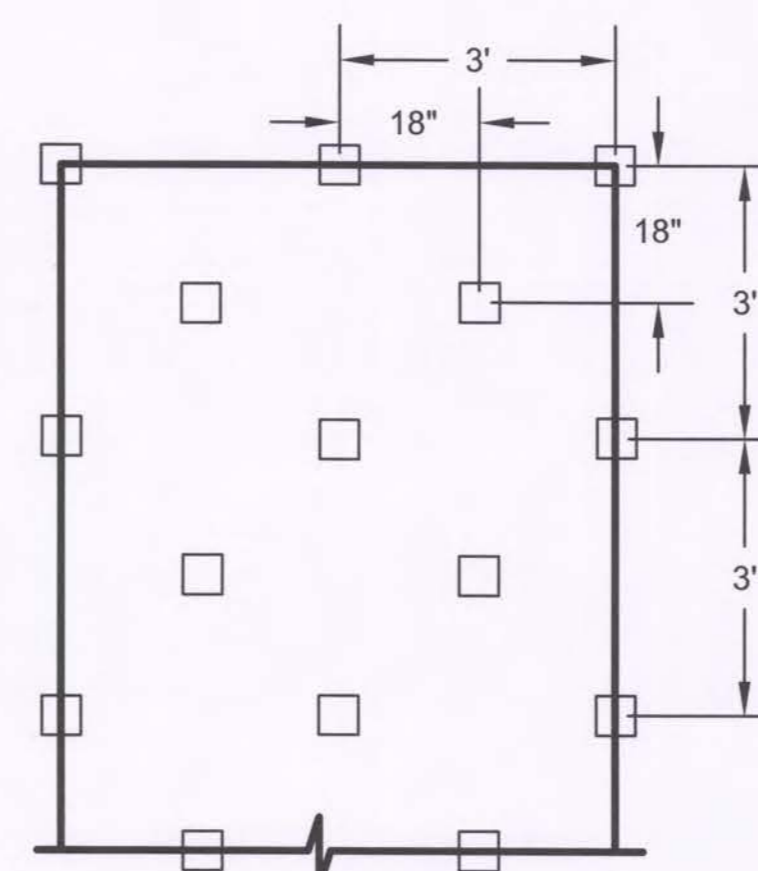
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NOT TO SCALE

**BOULDER TOE PROTECTION CROSS SECTION**

**NOTES:**

1. ANCHOR PATTERN 2 ANCHORS/SQUARE YARD
2. WOODEN STAKES (AT LEAST 12" LONG) SHALL BE USED TO ANCHOR COIR MATTING TO THE GROUND SURFACE.
3. KEY COIR MATTING INTO TOE OF SLOPE. SECURE WITH 2" X 2" X 12" HARDWOOD STAKES OR APPROVED EQUAL. CONTRACTOR SHALL CUT NOTCH INTO SIDE OF STAKE 1" FROM TOP.
4. USE 2" X 2" X 12" HARDWOOD STAKES OR APPROVED EQUAL TO SECURE ALL OTHER AREAS OF COIR MATTING, USING NOTCHES AS IN #3
5. OVERLAP EDGES OF MATTING MINIMUM OF 6". WITH UPSTREAM FABRIC ON TOP OF D/S FABRIC.
6. STAKE SPACING 8-12" MAX ALONG OVERLAP.
7. ALL MATTING SHALL BE COIR MAT 700 OR EQUIVALENT



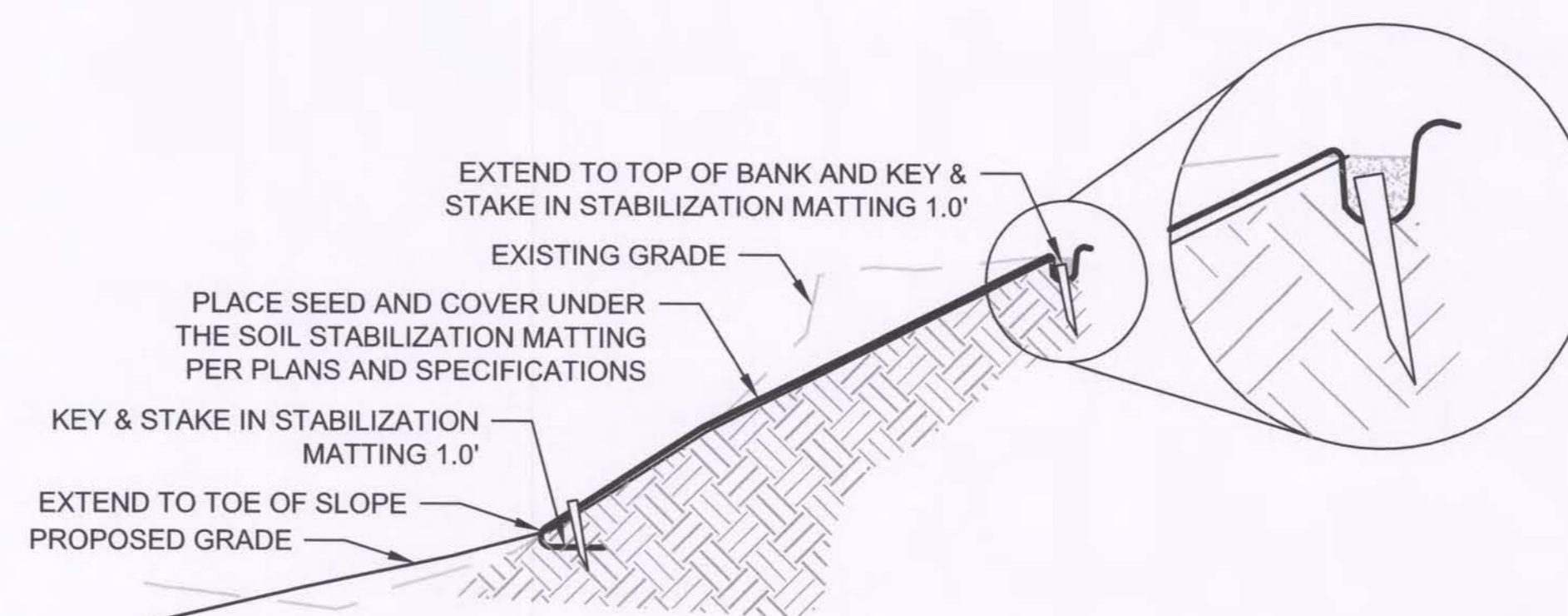
**BOULDER RIFFLE BOULDER AXIS**

BOULDER DIMENSIONS (FT)  
A-AXIS B-AXIS C-AXIS

FOOTER TOP

NOT TO SCALE

**PLAN**



**CROSS SECTION**

**NOTE:**

SOIL STABILIZATION MATTING SHALL BE INSTALLED ON ALL FINISHED STREAMBANKS BETWEEN EACH STRUCTURE WITH SIDESLOPES GREATER THAN 4:1

**SOIL STABILIZATION MATTING**

NOT TO SCALE

DWG/FSC: 29 OF 73

TITLE:

SEAL:



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LICENSE NO. 30734  
EXP DATE: 2024-08-28

**DETAILS**

DEPARTMENT OF THE ENVIRONMENT (DoE)

PRINCE GEORGE'S COUNTY, MARYLAND

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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

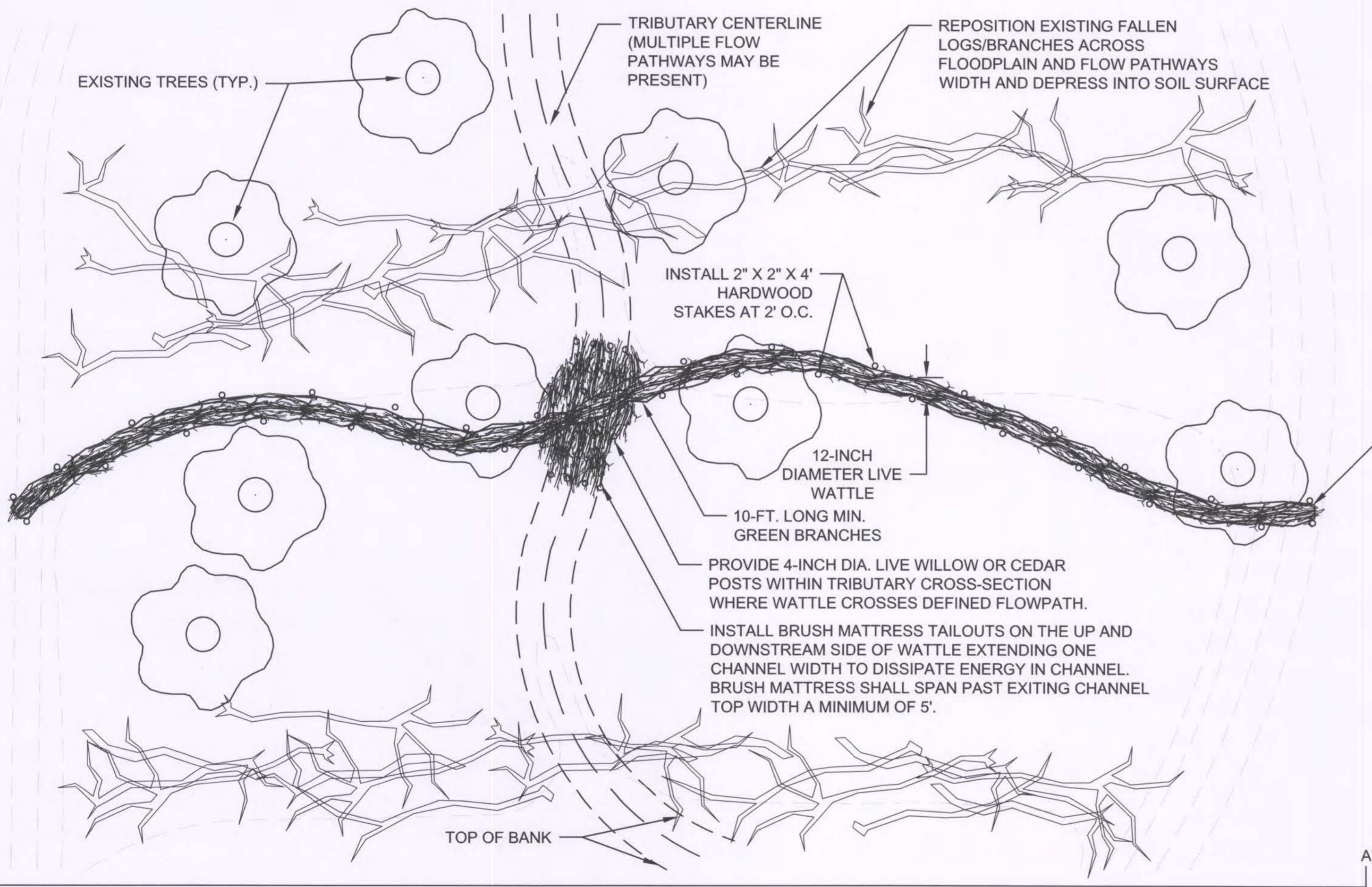
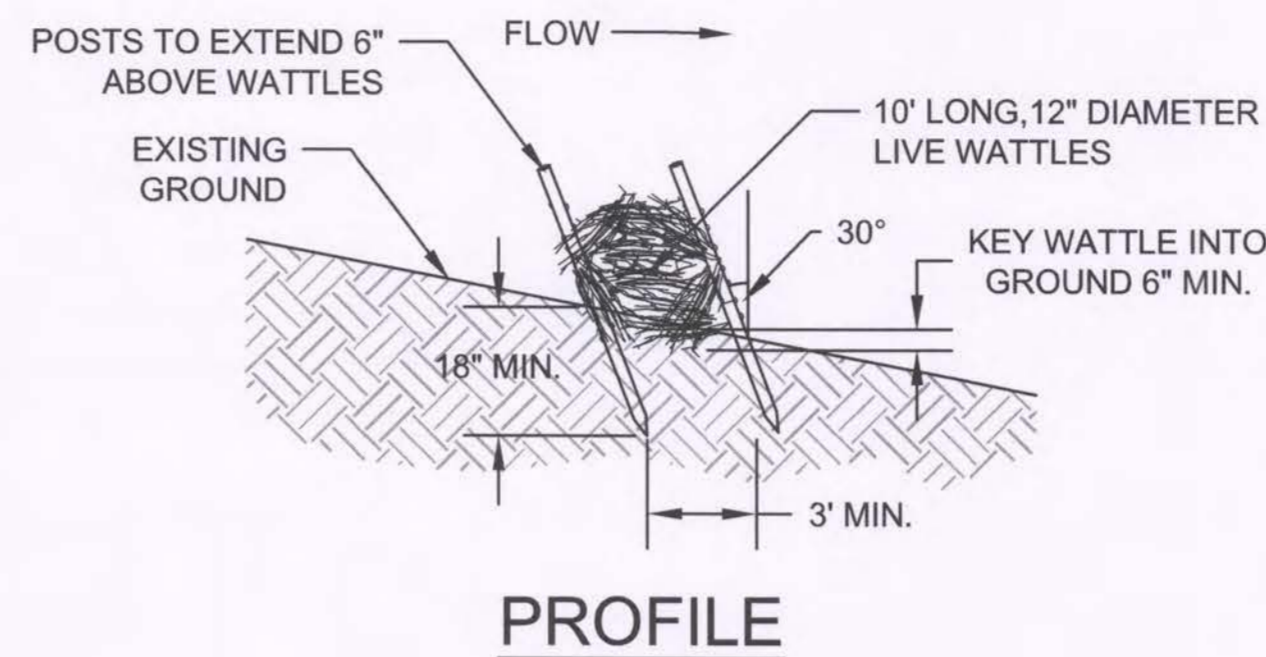
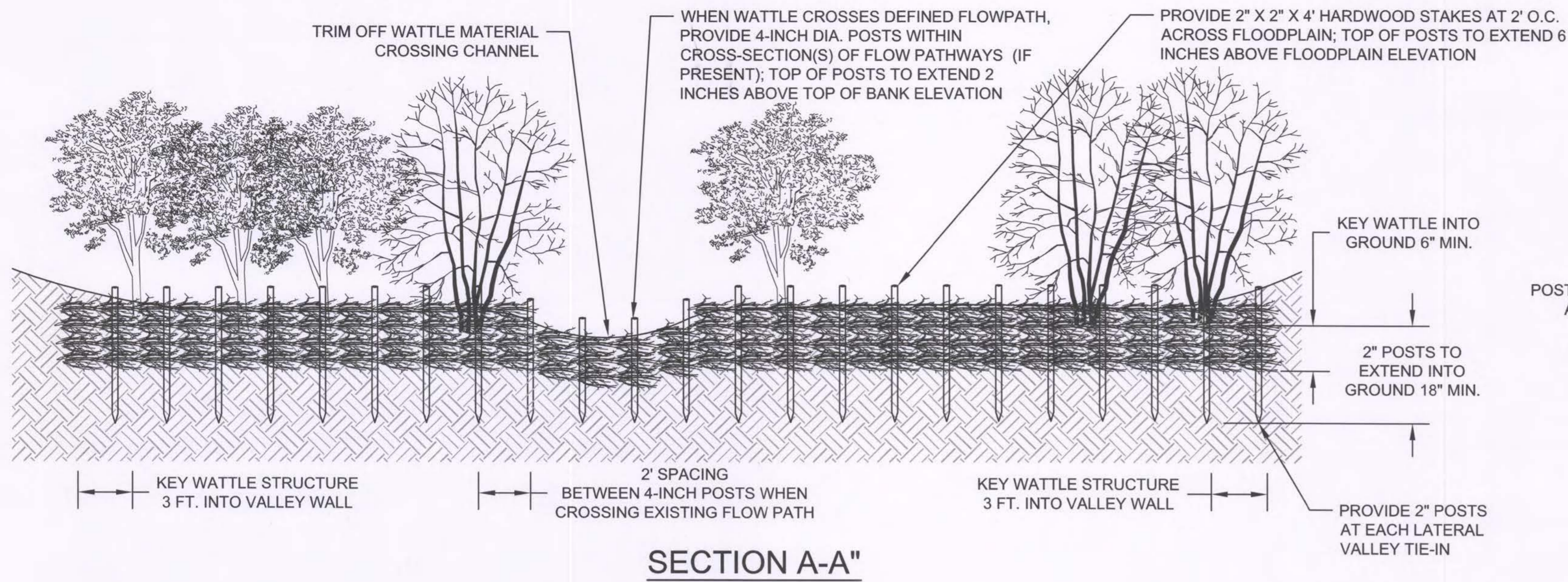
APPROVED: *Jeff Duffan* 12/18/2023  
ASSOCIATE DIRECTOR DATE  
*Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

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





KEY WATTLE STRUCTURE 3 FT. HORIZONTALLY INTO VALLEY WALLS AND PROVIDE 2-INCH POSTS AT TIE-INS

**NOTES:**

1. INSTALL WATTLE STRUCTURES AT APPROXIMATE LOCATIONS SHOWN ON GRADING PLAN SHEET OR AS DIRECTED BY ENGINEERING OR DESIGNATED SPECIALIST.
2. ALL INSTALLATION OUTSIDE OF THE LOD SHALL BE PERFORMED BY HAND LABOR ONLY, MAKING ALL EFFORTS TO MINIMIZE IMPACTS TO WETLAND AND STREAM CHANNEL.
3. IN AREAS OF ADEQUATE TREE CANOPY GAPS WHERE AMPLE SUNLIGHT EXTENDS TO VALLEY FLOOR, USE LIVE WILLOW IN PLACE OF HARDWOOD DEAD STAKES. IN SHADED AREAS, USE CEDAR FOR POSTS.
4. WATTLES SHALL CONSIST OF GREEN BRANCH CUTTINGS/BRUSH COMPOSED OF 1 TO 2 INCH DIAMETER MATERIALS, 5 TO 10 FEET LONG, WOVEN, COMPRESSED, AND BUNDLED TOGETHER. MATERIAL SHALL BE COMPRESSED USING A RATCHET STRAP OF SIMILAR METHOD AND TIED WITH A NATURAL FIBER ROPE.

**WATTLE STRUCTURE**

NOT TO SCALE

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PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE  
DOCUMENTS WERE PREPARED  
OR APPROVED BY ME AND THAT  
I AM A DULY LICENSED  
PROFESSIONAL ENGINEER  
UNDER THE LAWS OF THE  
STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP DATE 2024-06-28

DWG/FSC: 30 OF 73

TITLE:

**DETAILS**

"I hereby certify that I have successfully completed participation in DPIE's Peer Review Program. I have reviewed these plans in Detail and they are in conformance with the County's Code, General Specifications and Standards."

APPROVAL DATE: 11/16/2023

PEER REVIEWER'S NAME: Xiaodong Zhang

PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*

COMPANY NAME: ZEST LLC

LICENSE NUMBER: 36713

PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: CIP WQ  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):

Tanvir Bhuiyan

**Conditions of Approval**

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TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR



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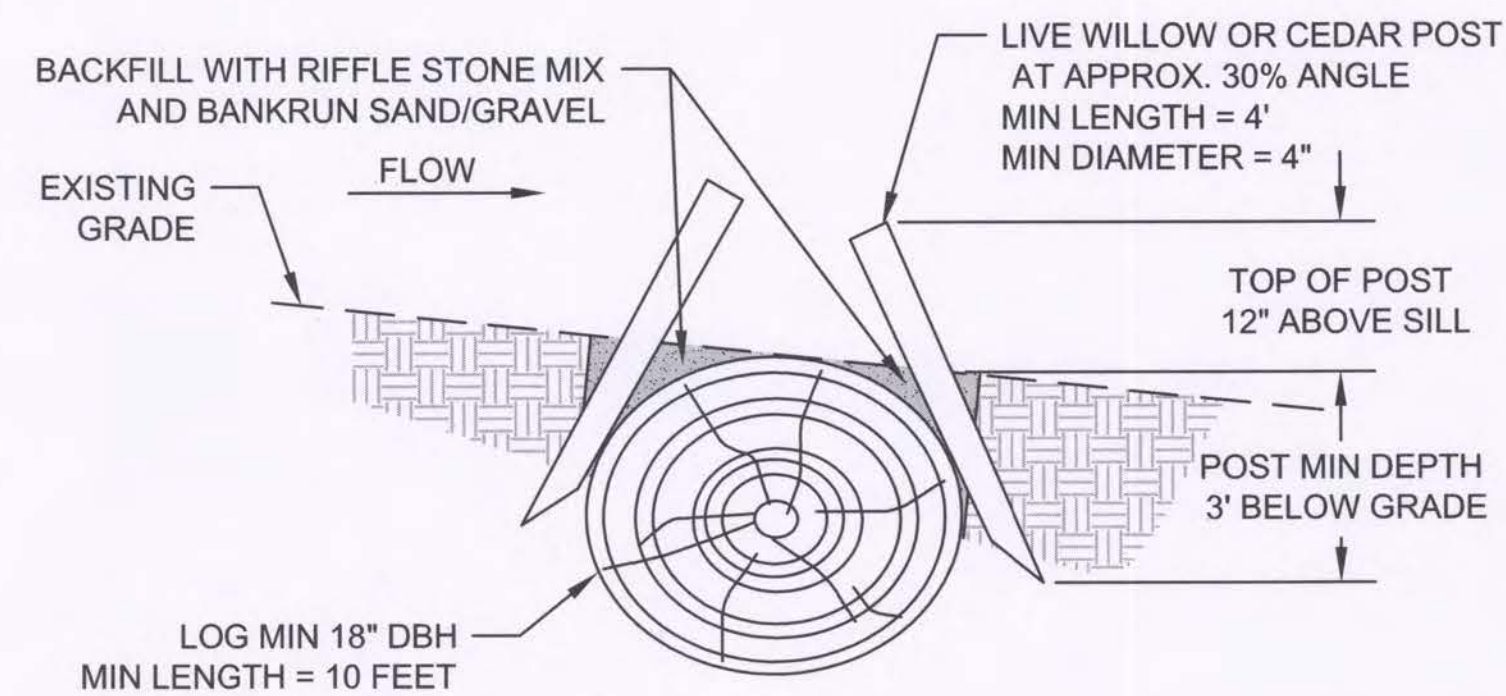
ELECTION DISTRICT 9

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ASSOCIATE DIRECTOR DATE  
*Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

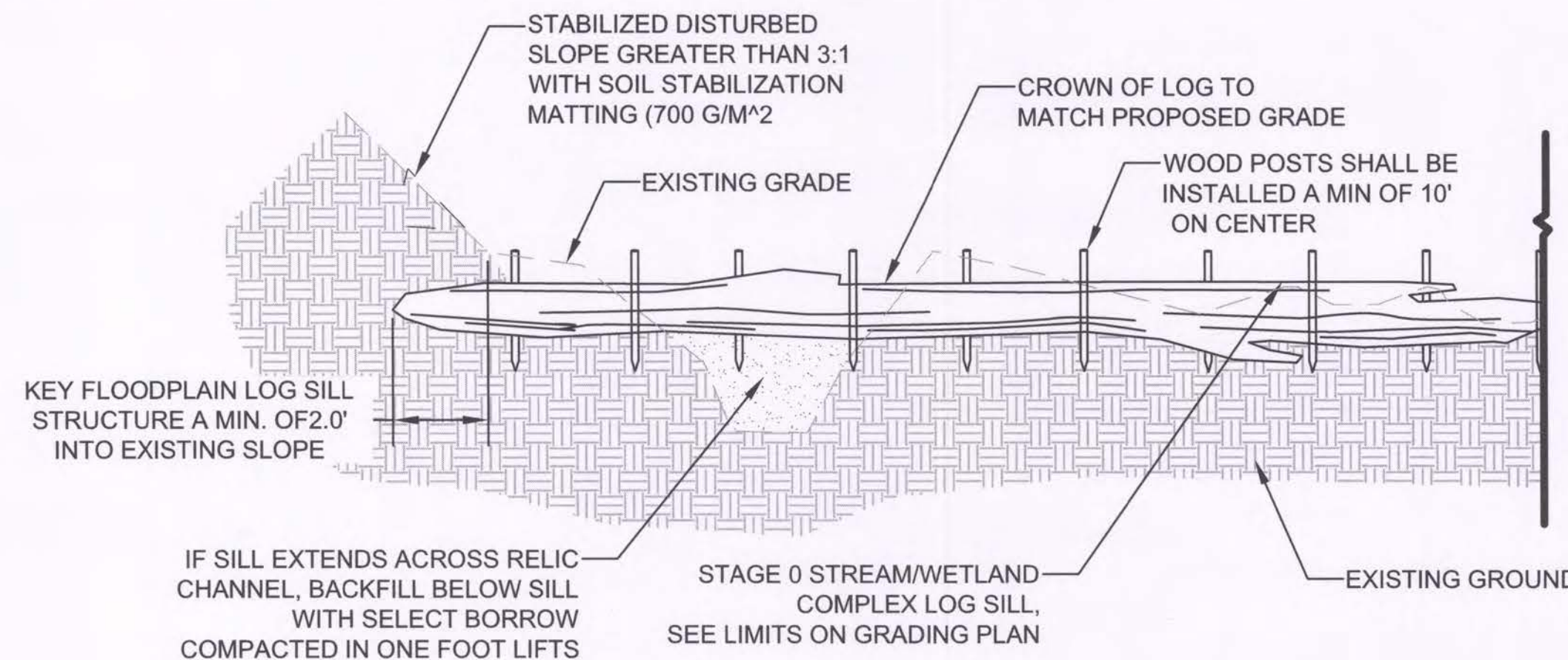
PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

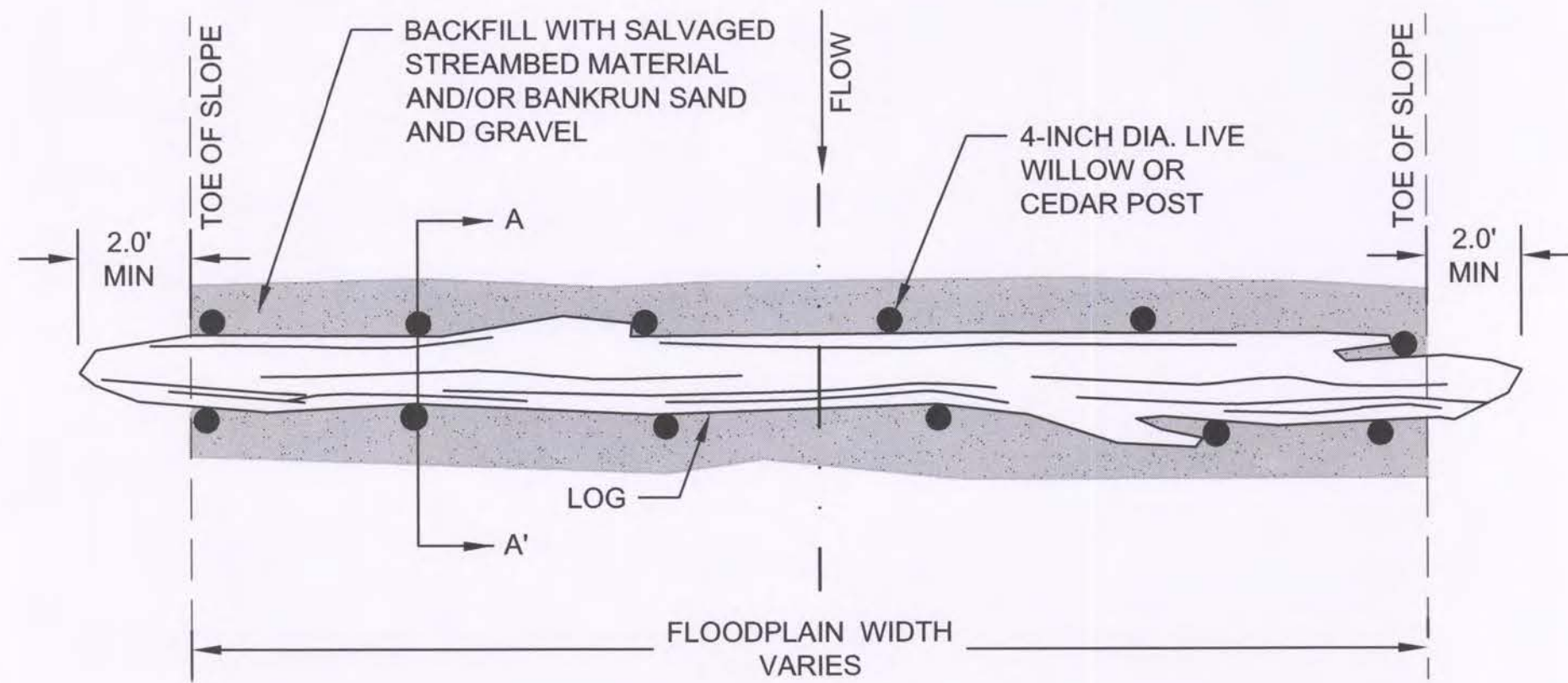




SECTION A-A'



CROSS SECTION



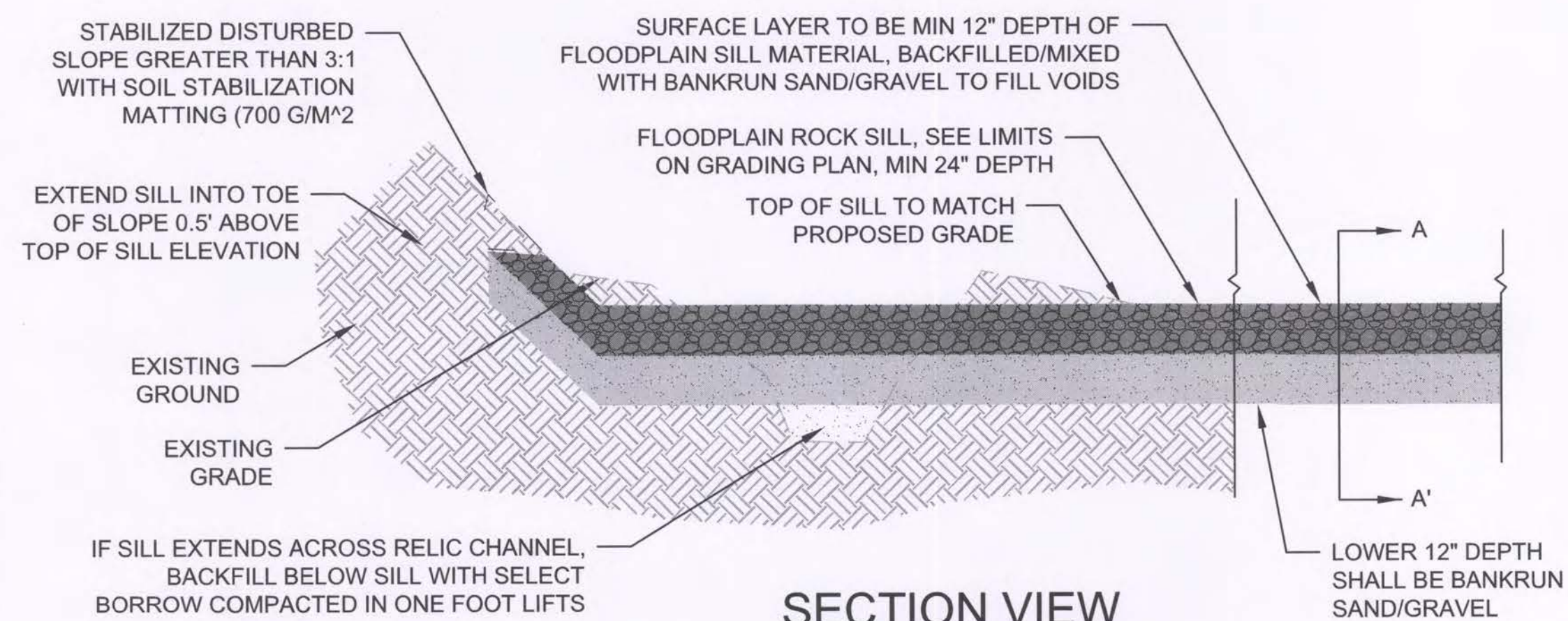
PLAN

NOTES:

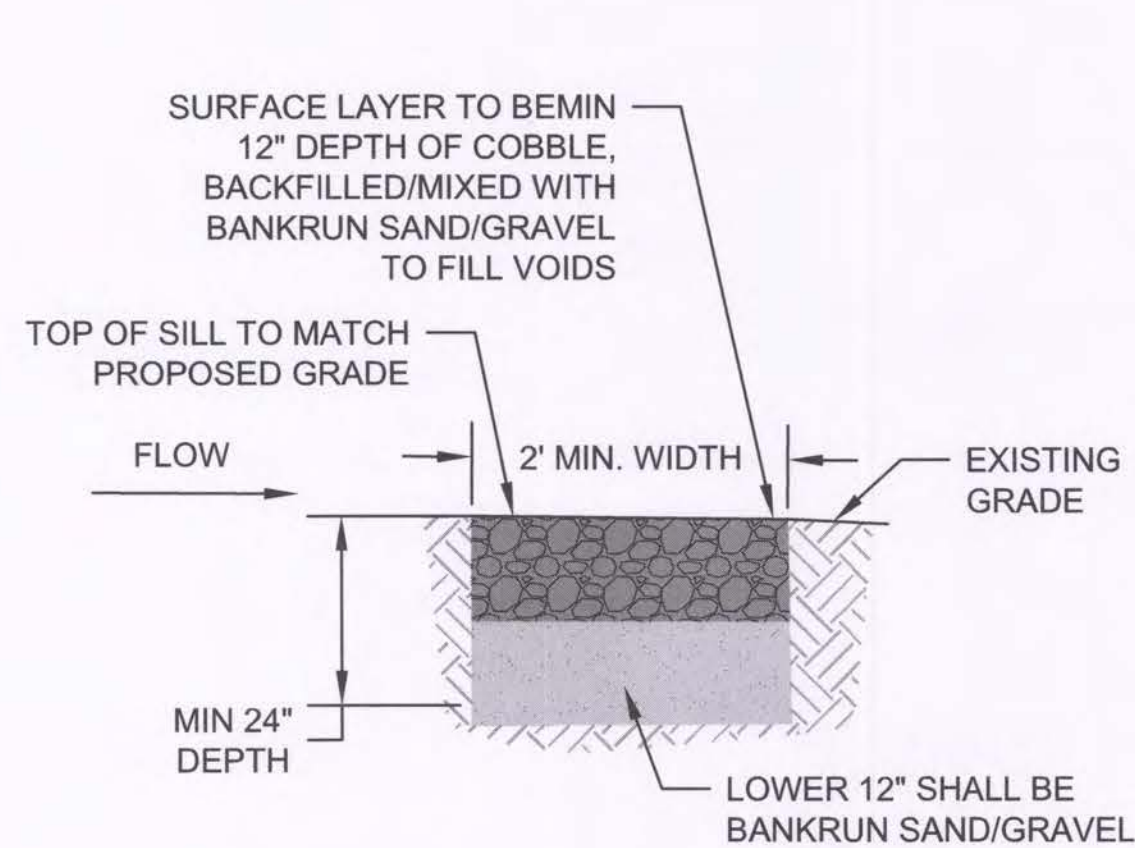
1. STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL SHALL BE INSTALLED AT APPROXIMATE LOCATION SHOWN ON GRADING PLAN. EXACT SILL ALIGNMENT SHALL BE FIELD LOCATED TO AVOID SIGNIFICANT IMPACTS TO EXISTING NATURAL RESOURCES/ROOT STRUCTURES, AT DIRECTION OF ENGINEER/DESIGNATED SPECIALIST. USE OF LOG OR ROCK GRADE CONTROL SHALL BE DETERMINED BASED ON DIRECTION OF ENGINEER/DESIGNATED SPECIALIST.
2. THE CROWN OF LOGS SHALL BE PLACED FLUSH WITH THE PROPOSED GRADE OF FLOODPLAIN.
3. INSTALLATION OF SILLS SHALL BE DONE IN A MANNER THAT MINIMIZED EXCAVATION/DISTURBANCE OF SURROUNDING GRADE, UNLESS GRADING IS SHOWN ON GRADING PLAN. SILLS SHALL BE PRESSED INTO EXISTING GRADE WHEN POSSIBLE, TO ACHIEVE THE GRADES SHOWN.
4. LOGS SHALL TIE INTO VALLEY SIDESLOPE A MINIMUM OF 2'.
5. JOINTS BETWEEN 2 ABUTTING LOGS SHALL BE STAGGERED SO THEY ARE NO CLOSER THAN 2' FROM JOINTS IN OTHER ROWS.
6. POSTS SHALL BE INSTALLED ACROSS FULL WIDTH OF SILL, ONE ON EITHER END OF EACH LOG, AND EVERY 10 FEET MAX SPACING. NOT LOCATED AT JOINT BETWEEN 2 LOGS.
7. WOOD POST MATERIAL SELECTION WILL BE BASED ON THE SURROUNDING HABITAT COMPOSITION. IN SHADED AREAS, WOOD POSTS SHALL BE CEDAR POSTS. IN AREAS OF ADEQUATE TREE CANOPY GAPS WHERE AMPLE SUNLIGHT EXTENDS TO VALLEY FLOOR AND INSTALLATION WILL BE DURING THE DORMANT SEASON, USE LIVE WILLOW IN PLACE OF WOOD POSTS. MATERIAL SELECTION IS AT THE DISCRETION OF THE OWNER'S REPRESENTATIVE OR ENGINEER/DESIGNATED SPECIALIST.
8. LOGS USED FOR SILLS SHALL BE A MINIMUM LENGTH OF 10 FEET AND MINIMUM DIAMETER OF 18 INCHES. ROT-RESISTANT SPECIES ARE PREFERRED FOR USE IF AVAILABLE, BUT ANY WOOD FREE OF DEFECTS, MAJOR DAMAGE AND DECAY CAN BE USED AS NEEDED.
9. BACKFILL AROUND LOGS (UPSTREAM DOWNSTREAM) USING FLOODPLAIN SILL MATERIAL AND BANKRUN SAND AND GRAVEL COMPRESSING THE SURFACE SEVERAL TIME WITH EXCAVATOR BUCKET, BEING CAREFUL NOT TO DAMAGE LOG SILL.
10. MULTIPLE LOGS (6-10" DBH) MAY BE USED IN PLACE OF SINGLE 18" OR GREATER LOG.
11. THE CONTRACTOR SHALL SCATTER/PARTIALLY BURY FLOODPLAIN ROUGHNESS WOOD ON EXCAVATED FLOODPLAINS BETWEEN EACH GRADE CONTROL STRUCTURE AT THE DIRECTION OF THE ENGINEER/DESIGNATED SPECIALIST.

STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (LOG)

NOT TO SCALE



SECTION VIEW



SECTION A-A' (AT GRADE)

NOTES:

1. STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL SHALL BE INSTALLED AT APPROXIMATE LOCATION SHOWN ON GRADING PLAN. EXACT SILL ALIGNMENT SHALL BE FIELD LOCATED TO AVOID SIGNIFICANT IMPACTS TO EXISTING NATURAL RESOURCES/ROOT STRUCTURES, AT DIRECTION OF ENGINEER/DESIGNATED SPECIALIST. USE OF LOG OR ROCK GRADE CONTROL SHALL BE DETERMINED BASED ON DIRECTION OF ENGINEER/DESIGNATED SPECIALIST.
2. THE TOP OF THE ROCK SILL SHALL BE PLACED FLUSH WITH THE PROPOSED GRADE OF FLOODPLAIN.
3. ROCKS SHALL EXTEND UP THE VALLEY SIDESLOPE A MINIMUM OF 0.5'.
4. CONTRACTOR SHALL TRACK OVER STRUCTURE SEVERAL TIMES WITH THE EXCAVATOR TO COMPRESS SILL MATERIAL IN PLACE IN ONE FOOT LIFTS, ENSURING IT FORMS A COMPACTED, CONSOLIDATED SILL FOR THE FULL DEPTH.
5. FLOODPLAIN ROCK SILL MATERIAL SHALL BE COMPOSED OF AN EVENLY DISTRIBUTED MIX OF MATERIALS FOR THE FULL DEPTH SPECIFIED THAT MEET THE GRADATIONS SHOWN IN TABLE.
6. FLOODPLAIN ROCK SILL MATERIAL SHALL BE COMPOSED OF A COMBINATION OF APPROXIMATELY 70% SILICA COBBLE, RANGING FROM ROUNDED TO SUB-ANGULAR SHAPED, AND UP TO 30% ANGULAR ROCK THAT MEETS THE SIZE GRADATIONS SHOWN.
7. ONSITE SALVAGED OR IMPORTED BANKRUN SAND AND GRAVEL SHALL BE INCORPORATED INTO BURIED SILL MATERIAL Voids AS CHANNEL WASH-IN MATERIAL. CHANNEL WASH-IN SHALL BE DONE TO THE SATISFACTION OF THE ENGINEER. THE VOLUME OF CHANNEL WASH-IN MATERIAL REQUIRED MAY VARY BUT IS TYPICALLY EQUAL TO APPROXIMATELY 30% OF VOLUME OF BURIED SILL MATERIAL.
8. THE CONTRACTOR SHALL SCATTER/PARTIALLY BURY FLOODPLAIN ROUGHNESS WOOD ON EXCAVATED FLOODPLAINS BETWEEN EACH GRADE CONTROL STRUCTURE AT THE DIRECTION OF THE ENGINEER/DESIGNATED SPECIALIST.

STAGE 0 STREAM/WETLAND COMPLEX GRADE CONTROL (ROCK)

NOT TO SCALE

FLOODPLAIN ROCK SILL MATERIAL GRADATION TABLE	
CUMULATIVE % FINER	SIZE (IN)
10	1.40
15	1.60
50	2.20
60	3.10
80	4.40
100	5.00

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DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MARYLAND

PEER REVIEW APPROVAL STAMP

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APPROVAL DATE: 11/16/2023  
PEER REVIEWER'S NAME: Xiaodong Zhang  
PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*  
COMPANY NAME: ZEST LLC  
LICENSE NUMBER: 36713  
PERMIT NUMBER: 38079-2022-0

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Type: CIP WQ  
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Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
Tanvir Bhuiyan

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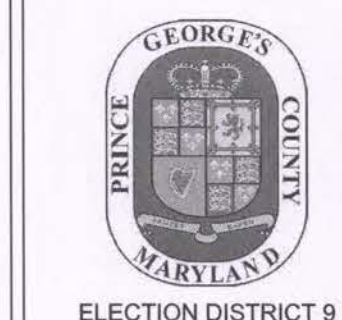
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TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR



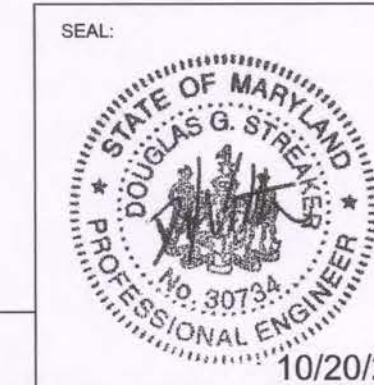
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ELECTION DISTRICT 9

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS



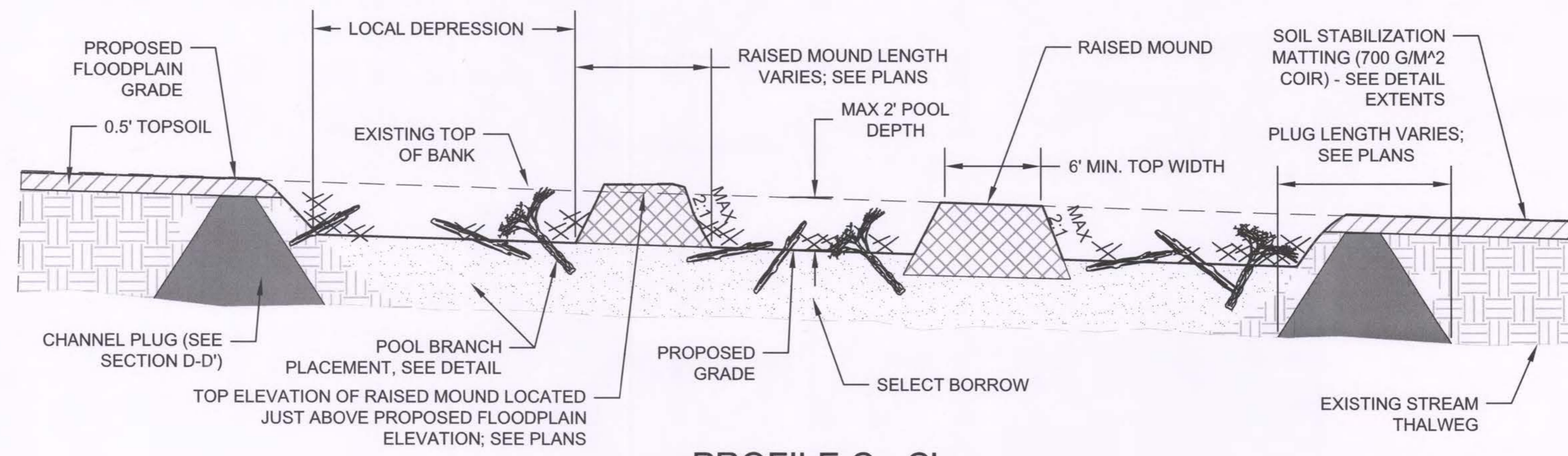
PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP DATE: 2024-06-28

DWG/FSC: 31 OF 73

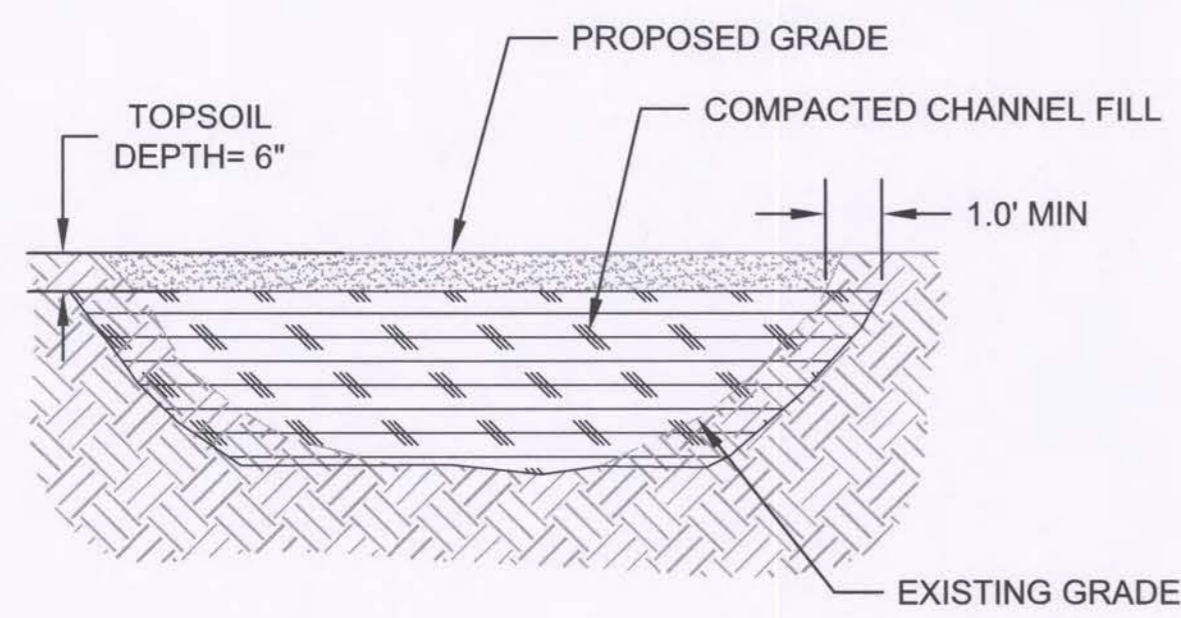
DETAILS

EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

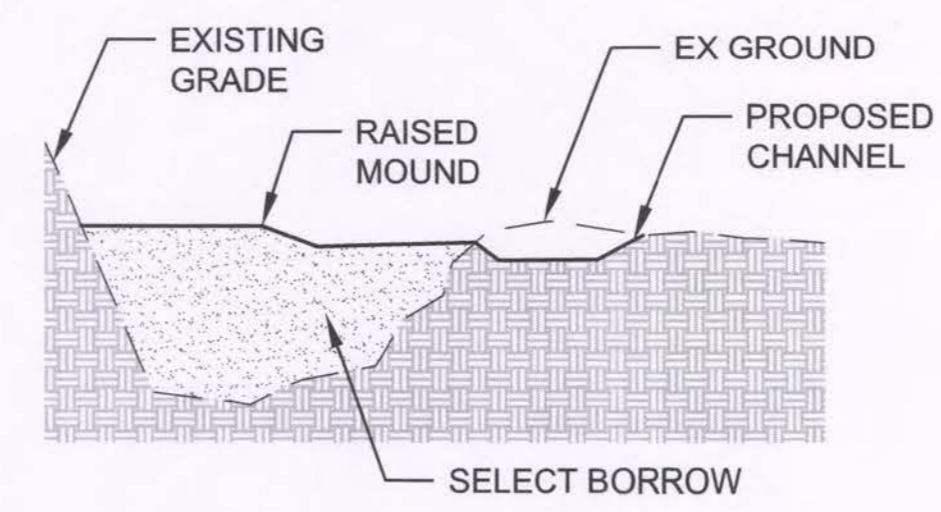




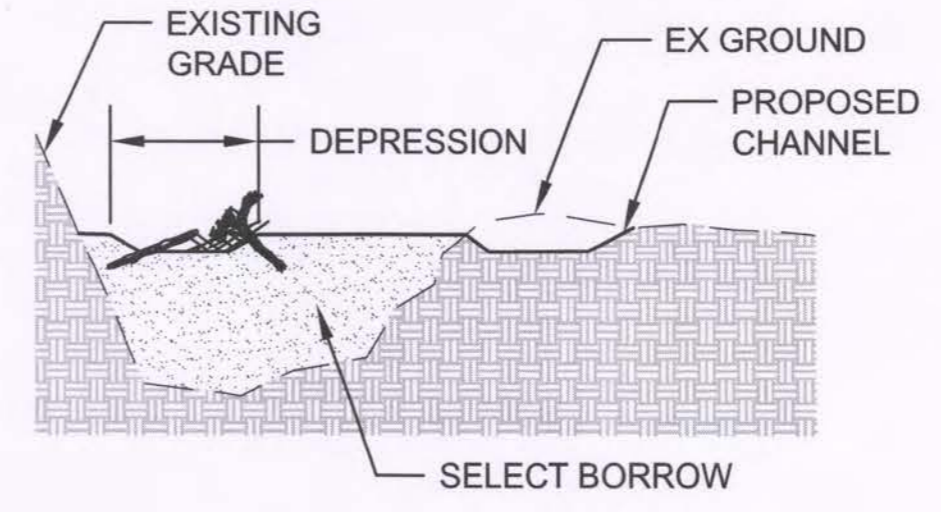
PROFILE C - C'



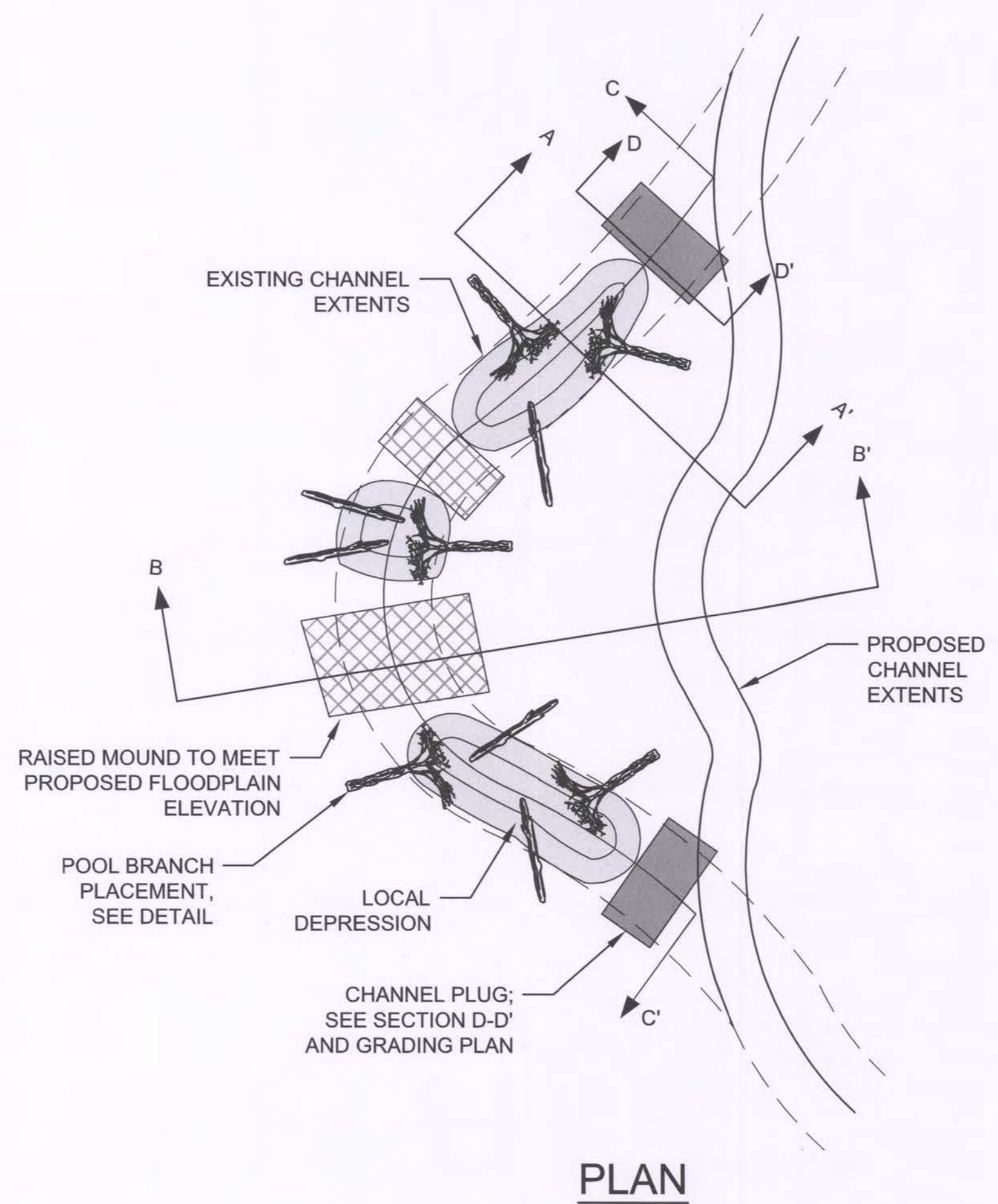
SECTION D-D'



SECTION B-B'



SECTION A-A'



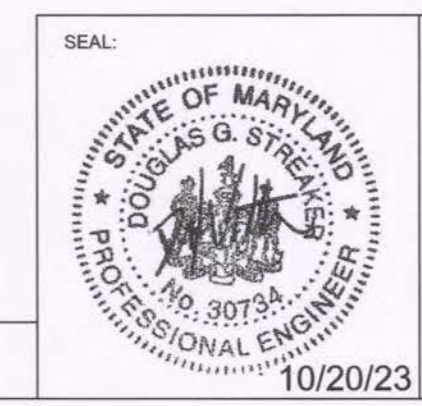
PLAN

NOTES:

1. CONTRACTOR SHALL ADD 3 COARSE WOODY DEBRIS ELEMENTS (LOGS, BRANCHES, ROOTWADS) TYPICAL TO EACH LOCAL DEPRESSION WITHIN THE RELICT CHANNEL DEPRESSION, OR AS DIRECTED BY THE ENGINEER.
2. COARSE WOODY DEBRIS SHALL NOT EXTEND MORE THAN 1' ABOVE THE PONDING DEPTH.
3. COARSE WOODY DEBRIS SHALL BE DRIVEN INTO THE BOTTOM OF THE RELICT CHANNEL DEPRESSION.
4. RAISED MOUNDS SHALL BE CONSTRUCTED WITHIN THE EXISTING CHANNEL EXTENTS TO THE ELEVATION JUST ABOVE THE PROPOSED FLOODPLAIN, AS DIRECTED BY THE ENGINEER.

RELICT CHANNEL DEPRESSIONAL/ROUGHNESS FEATURE

NOT TO SCALE



PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
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DWG/FSC: 32 OF 73

TITLE:

DETAILS

DEPARTMENT OF THE ENVIRONMENT (DoE)

PRINCE GEORGE'S COUNTY, MARYLAND

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PEER REVIEWER'S SIGNATURE: *Xiaodong Zhang*

COMPANY NAME: ZEST LLC

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Prince George's County Maryland  
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Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):

*Tanvir Bhuiyan*  
Tanvir Bhuiyan

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NOAH E. WATERS, PHD, MAYOR

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ELECTION DISTRICT 9

<i>Jeff Dorian</i>	12/18/2023
ASSOCIATE DIRECTOR	DATE
<i>Frank L. Galosi</i>	12/18/2023
SECTION HEAD	DATE
PROJECT MANAGER	CONTRACT NO.
C.I.P.	
PROJECT NO.: 22025.01	SCALE: NTS
BY: GB	CHECK: DS

EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

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**D-4-2 STANDARDS AND SPECIFICATIONS**

**FOR**

**PLUNGE POOL**

**Definition**

An excavated depression lined with riprap and placed at the outfall of a culvert.

**Purpose**

To dissipate the energy of a discharge and prevent scour at a pipe outfall.

**Conditions Where Practice Applies**

Where discharge velocity and energy at a pipe outlet is sufficient to erode the downstream channel reach. This applies to outlets of all types such as road culverts, sediment basins, and stormwater management facilities. Plunge pools are an alternative to rock outlet protection and are preferable in locations where space constraints exist. A plunge pool may be temporary or permanent, based on design.

**Design Criteria**

- Select type of plunge pool (larger stone required for Type I):

**Type I:** Plunge pool is depressed 1/2 the size of the culvert rise.  
**Type II:** Plunge pool is depressed the full height of the culvert rise.

- Determine the riprap (d<sub>50</sub>) stone size for the plunge pool type and design storm flow.

**Type I:**  $d_{50} = (0.0125d^2/Tw) \times (Q/d^2.5)^{0.5}$   
**Type II:**  $d_{50} = (0.0082d^2/Tw) \times (Q/d^2.5)^{0.5}$

- Determine plunge pool dimensions.

$C = (3 \times d) + (6 \times F)$   
 $B = (2 \times d) + (6 \times F)$

Where: d<sub>50</sub> = the median stone size in feet (refer to Table H.2: Stone Size)  
 d = the culvert diameter or span in feet  
 Tw = the tailwater depth in feet  
 Q = the design flow for the culvert, minimum 10-year, 24-hour storm, in cfs  
 B = the plunge pool width in feet  
 C = the plunge pool length in feet  
 D = 2 x d<sub>50</sub> = riprap thickness in feet  
 E = the culvert diameter or span in feet equal to d  
 3E = the plunge pool bottom length in feet  
 2E = the plunge pool bottom width in feet  
 F = plunge pool depth in feet = d (for Type II) or 0.5 d (for Type I)

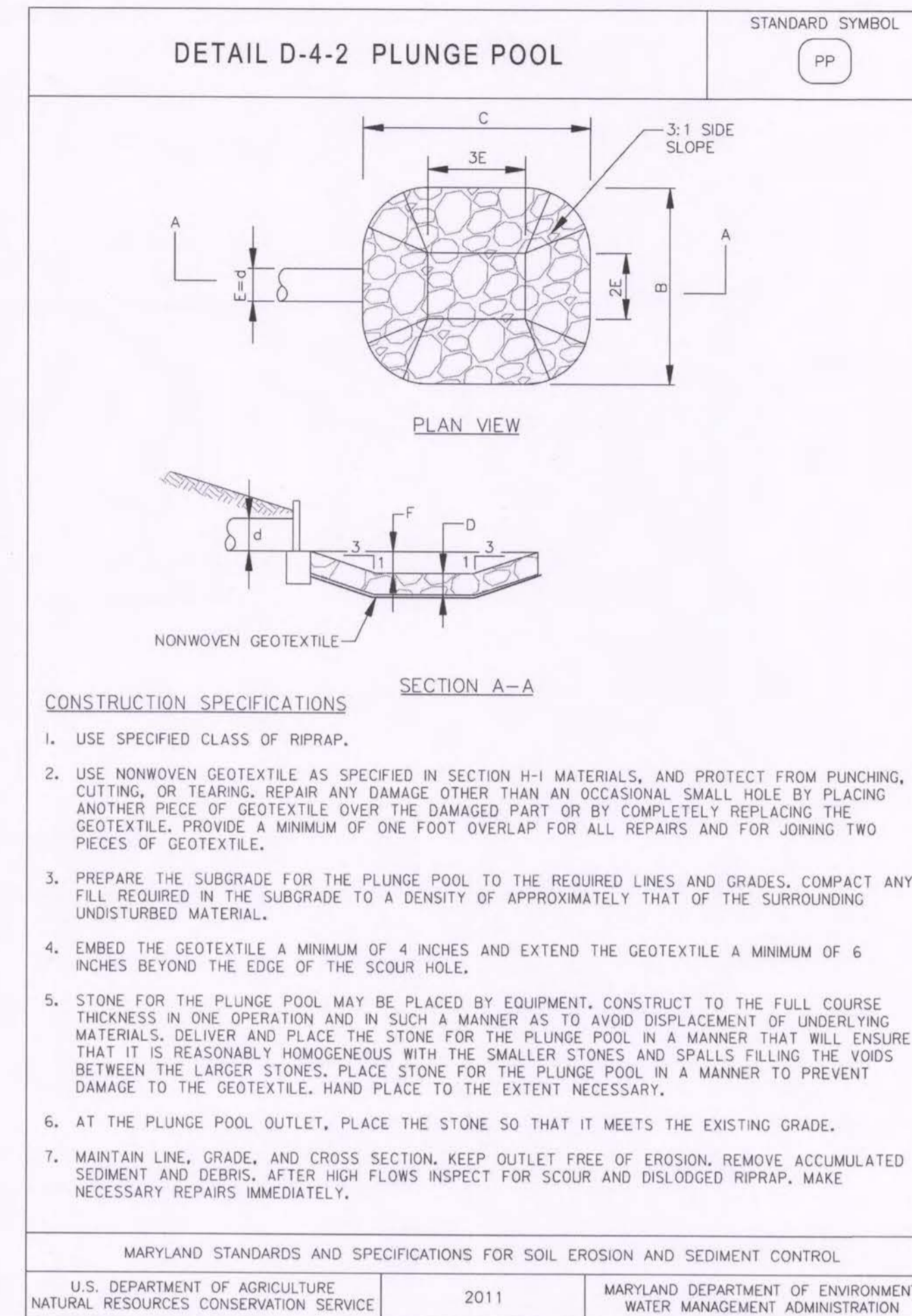
D.23

- For permanent pools, provide a toe wall at the downstream end at a depth twice the (E) dimension and at a width equal to the (D) dimension, or nonwoven geotextile. Extend the rip-rap a minimum of 18 inches under the outlet pipe if the outlet does not have a footer or headwall.
- Provide an underdrain to a suitable outfall if standing water in the plunge pool is an issue or as required by the appropriate approval authority.
- Provide the design values on the plans for the following dimensions: B, C, D, E, and F.

**Maintenance**

Maintenance needs are generally low for plunge pools. The line, grade, and cross section must be maintained, and the outlet must be kept free of erosion. After high flows inspect for scour and dislodged riprap. Repairs must be made immediately. Accumulated sediment and debris must be removed.

D.24



**PLUNGE POOL DESIGN/AS-BUILT LENGTHS**

DIMENSION	HAWKINS DR	PATUXENT BLVD
	MIN. LENGTH	MIN. LENGTH
B	19.7 FT	26.5 FT
C	28.1 FT	30.8 FT
D	19"	19"
F	1.8 FT	2.5 FT
D50	9.5"	9.5"

**MINIMUM PLUNGE POOL DIMENSIONS PER MDE DETAIL**

DIMENSION	HAWKINS DR	PATUXENT BLVD
	MIN. LENGTH	MIN. LENGTH
B	22.1 FT	22.1 FT
C	27.8 FT	27.8 FT
D	0.84 FT	1.14 FT
F	1.8 FT	1.8 FT
D50	5.0"	6.8"

**NOTES:**

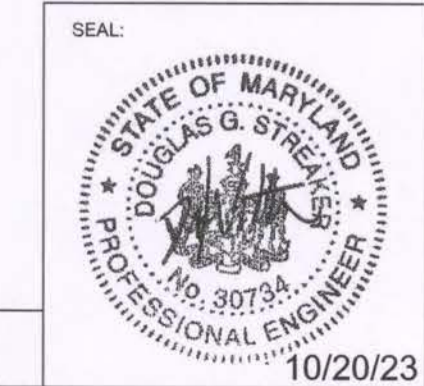
- PLUNGE POOLS TO BE PROTECTED WITH CLASS I RIPRAP.
- FULL, SYMMETRIC PLUNGE POOL WIDTH DOWNSTREAM OF HAWKINS DRIVE IS NOT FEASIBLE DUE TO LATERAL CONSTRAINTS ON PRIVATE PROPERTY. HOWEVER, THE NARROWED LEFT BANK OF THE PLUNGE POOL WILL FEATURE A NON-ERODIBLE BOULDER TOE WALL. THE CONTRACTOR SHALL INSTALL CLASS I RIPRAP TO THE MINIMUM SPECIFIED DEPTH THE FULL WIDTH BETWEEN BOTH PROPOSED BOULDER TOES. MAXIMUM WIDTH OF PROVIDED RIPRAP PROTECTION IS APPROXIMATELY 22'.



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DWG/FSC: 33 OF 73



**DETAILS**

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 PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPIE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

12/05/2023  
 APPROVAL DATE:  
 PEER REVIEWER'S NAME: BENJAMIN MOSIER  
 SIGNATURE: [Signature]  
 COMPANY NAME: SOLTESZ  
 LICENSE NUMBER: 40806  
 PERMIT NUMBER: 38079-2022-0

TOWN OF EAGLE HARBOR  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

Jeff Duffan 12/18/2023  
 ASSOCIATE DIRECTOR DATE





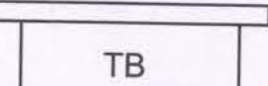

Frank L. Galosi 12/18/2023  
 SECTION HEAD DATE

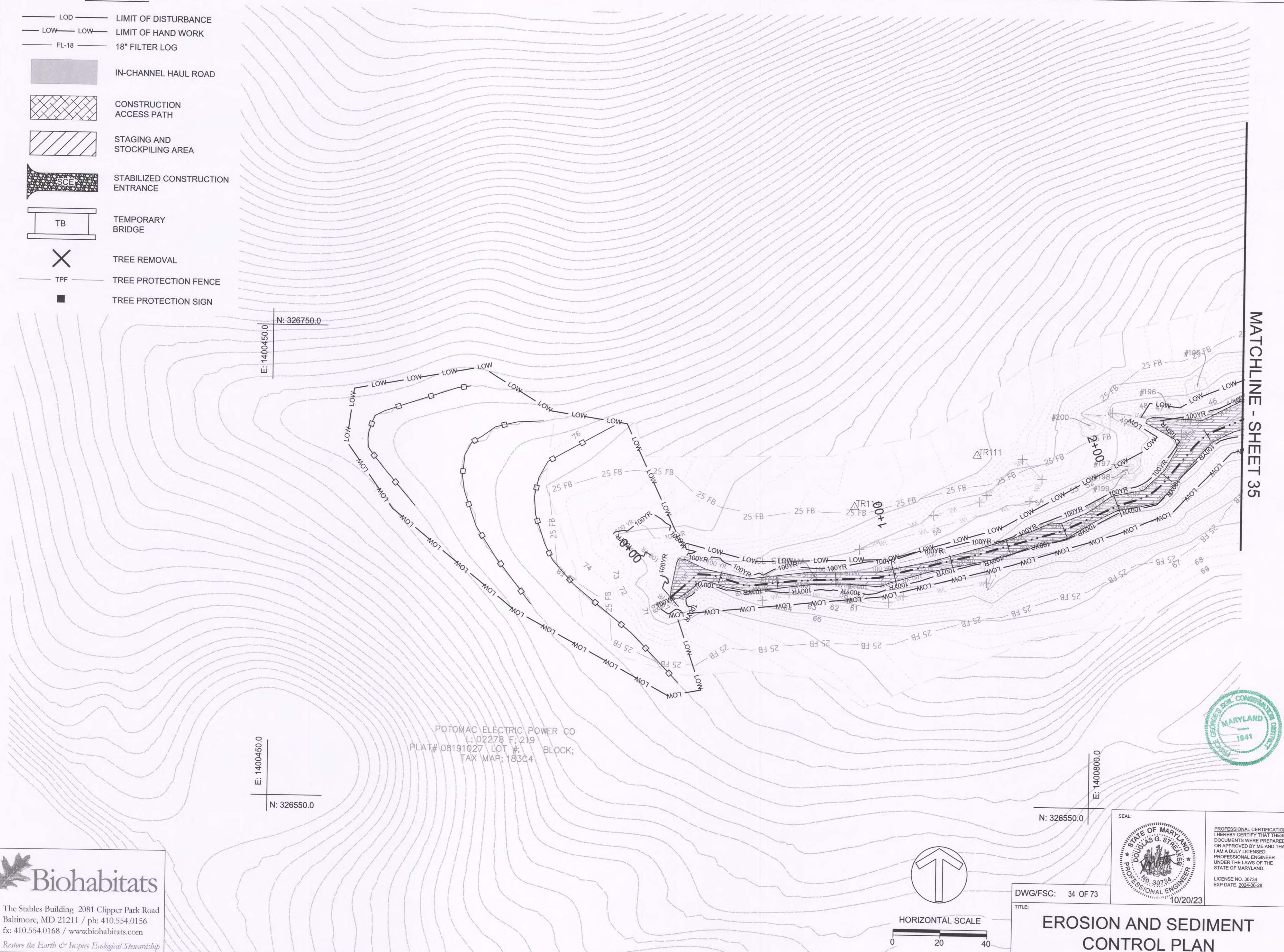
PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**



**ESC LEGEND**

- LOD — LIMIT OF DISTURBANCE
- LOW — LIMIT OF HAND WORK
- FL-18 — 18" FILTER LOG
-  IN-CHANNEL HAUL ROAD
-  CONSTRUCTION ACCESS PATH
-  STAGING AND STOCKPILING AREA
-  STABILIZED CONSTRUCTION ENTRANCE
-  TEMPORARY BRIDGE
-  TREE REMOVAL
- TPF — TREE PROTECTION FENCE
- TREE PROTECTION SIGN



POTOMAC ELECTRIC POWER CO  
 L: 02278 F: 219  
 PLAT# 08191027 LOT # BLOCK;  
 TAX MAP: 183C4

- NOTE:**
1. FOR IN-STREAM WORK WITHIN THE LOD, THE CONTRACTOR SHALL INSTALL A STREAM DIVERSION (CLEAR WATER DIVERSION AND/OR PUMP AROUND PRACTICE) WITHIN THE STREAM CHANNEL TO MAINTAIN A DRY ACTIVE WORK AREA(S). EACH WORK AREA LENGTH SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY. PUMP-AROUND PRACTICE SHALL FOLLOW MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION DETAIL 1.2 (WHICH INCLUDES INSTALLATION OF SANDBAG DIKES STREAM DIVERSION PUMPS AND HOSES, AND APPROVED DEWATERING DEVICE. CLEAR WATER DIVERSION PRACTICE SHALL FOLLOW MDE DETAIL C-6, WHICH INCLUDES INSTALLATION OF SANDBAG DIKES, DIVERSION PIPES AND APPROVED DEWATERING DEVICE. THE LAYOUTS OF THE STREAM DIVERSIONS SHOWN ARE REPRESENTATIVE AND MAY BE ADJUSTED IN THE FIELD WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR.
  2. TEMPORARY MEASURES FOR DIVERTING FLOW AROUND EACH ACTIVE STREAM WORK AREA SHALL BE SUFFICIENTLY SIZED TO CONVEY BASEFLOW WHEN THE DIVERSION DURATION IS LESS THAN TWO WEEKS, WHICH SHALL BE THE TYPICAL SITUATION. IF A DIVERSION SETUP IS ANTICIPATED TO LAST LONGER THAN TWO WEEKS, THE FLOW DIVERSION SHALL BE SIZED TO CONVEY THE 2-YEAR PEAK DISCHARGE. SEE PLANS FROM THE MINIMUM SIZE DIVERSION AT EACH LOCATION TO DIVERT BASEFLOW.
  3. THE LIMIT OF HAND WORK (LOW) INCLUDES WORK PERFORMED OUTSIDE THE LOD IMPLEMENTED BY HAND LABOR ONLY. NO CONSTRUCTION EQUIPMENT IS ALLOWED WITHIN THE LOW, THUS GROUND DISTURBANCE IS NEGLIGIBLE AND DOES NOT REQUIRE SEDIMENT CONTROL MEASURES OR FLOW DIVERSION.
  4. WITHIN AREAS ADJACENT TO ACTIVE STREAM CHANNELS, TREAT DISTURBED AREAS DAILY WITH TEMPORARY SEED AND A MINIMUM OF 2" OF WOODCHIPS OR HARDWOOD MULCH STABILIZATION. OVERSEED WITH PERMANENT SEED PER THE PLANTING SCHEDULE AND INSTALL SOIL STABILIZATION MATTING PER DETAIL AS COMPLETED AREAS ARE APPROVED BY THE INSPECTOR AND ENGINEER/DESIGNATED SPECIALIST. SOIL STABILIZATION MATTING SHALL BE INSTALLED CONSTRUCTION DETAILS AND ON ALL GRADED STREAM BANKS WITH SLOPES 3:1 OR GREATER (SEE TYPICAL POOL GRADING DETAIL). ALL OTHER DISTURBED AREAS AWAY FROM STREAM CHANNELS SHALL BE STABILIZED PER MDE STANDARD OF WITHIN THREE CALENDAR DAYS.



**TOWN OF EAGLE HARBOR, INCORPORATED 1929**  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

**PRINCE GEORGE'S COUNTY MARYLAND**  
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 ELECTION DISTRICT 9

APPROVED	<i>Jeff Dehan</i> ASSOCIATE DIRECTOR	12/18/2023	DATE
APPROVED	<i>Frank L. Galosi</i> SECTION HEAD	12/18/2023	DATE
PROJECT MANAGER	CONTRACT NO.	C.I.P.	
PROJECT NO.: 22025.01	SCALE: 1" = 20'	BY: GB	CHECK: DS

SEAL:  
**STATE OF MARYLAND**  
**DOUGLAS G. STEIN**  
 PROFESSIONAL ENGINEER  
 LICENSE NO. 30734  
 EXP DATE 2024-06-28  
 10/20/23

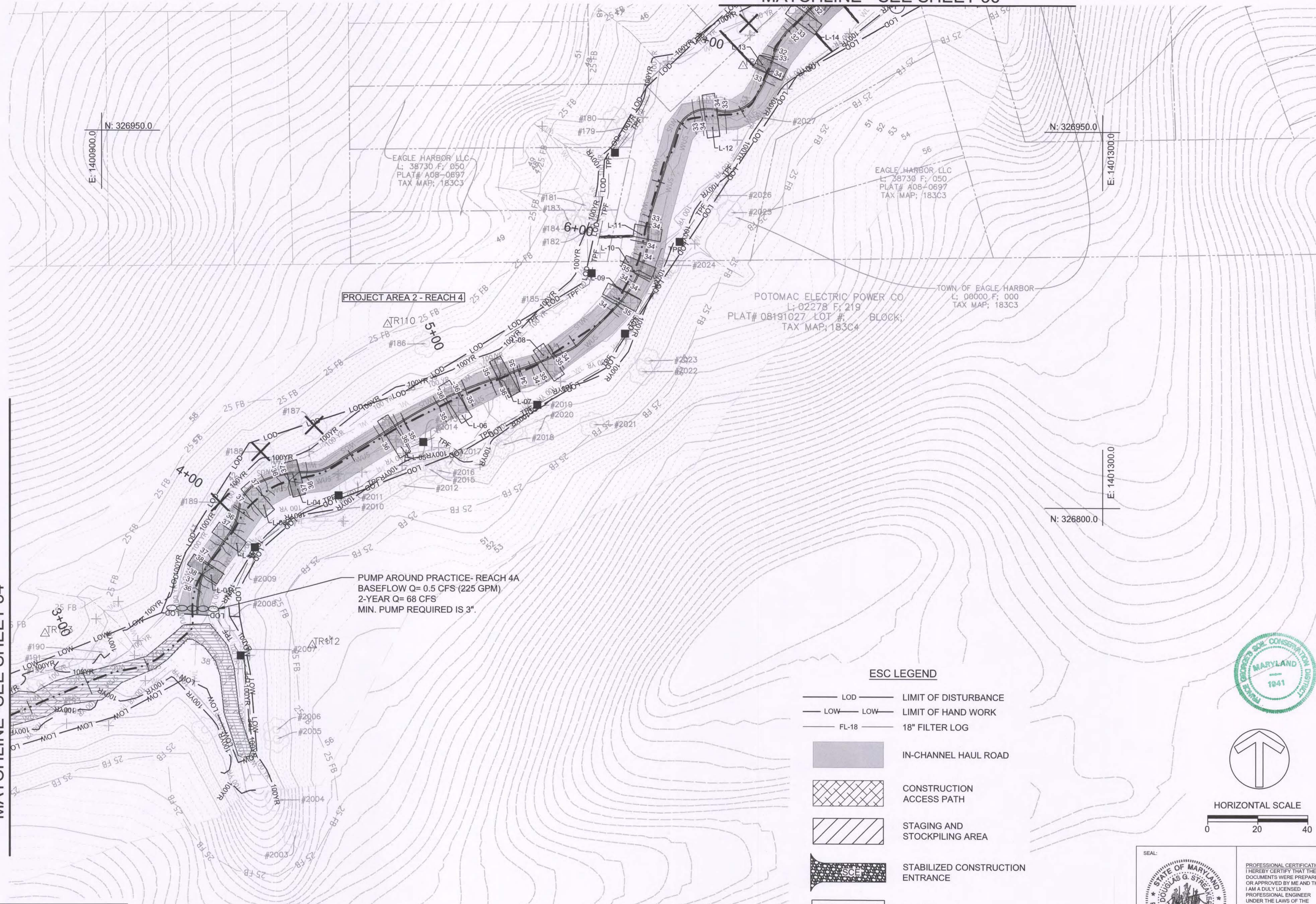
DWG/FSC: 34 OF 73  
 TITLE: **EROSION AND SEDIMENT CONTROL PLAN**

**Biohabitats**  
 The Stables Building 2081 Clipper Park Road  
 Baltimore, MD 21211 / ph: 410.554.0156  
 fx: 410.554.0168 / www.biohabitats.com  
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MATCHLINE - SEE SHEET 36

MATCHLINE - SEE SHEET 34



EAGLE HARBOR LLC  
L: 38730 F: 050  
PLAT# A08-0697  
TAX MAP: 183C3

EAGLE HARBOR LLC  
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TAX MAP: 183C3

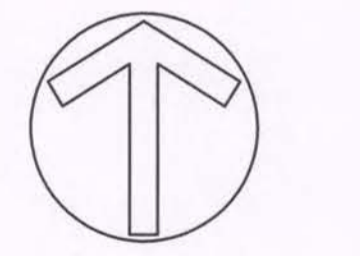
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TOWN OF EAGLE HARBOR  
L: 00000 F: 000  
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PUMP AROUND PRACTICE- REACH 4A  
BASEFLOW Q= 0.5 CFS (225 GPM)  
2-YEAR Q= 68 CFS  
MIN. PUMP REQUIRED IS 3".

ESC LEGEND

- LOD — LIMIT OF DISTURBANCE
- LOW — LIMIT OF HAND WORK
- FL-18 — 18" FILTER LOG
- [Solid Grey Box] IN-CHANNEL HAUL ROAD
- [Cross-hatched Box] CONSTRUCTION ACCESS PATH
- [Diagonal Lines Box] STAGING AND STOCKPILING AREA
- [Stippled Box] STABILIZED CONSTRUCTION ENTRANCE
- [Rectangular Box] TEMPORARY BRIDGE
- ✕ TREE REMOVAL
- TPF — TREE PROTECTION FENCE
- TREE PROTECTION SIGN



DWG/FSC: 35 OF 73

EROSION AND SEDIMENT CONTROL PLAN

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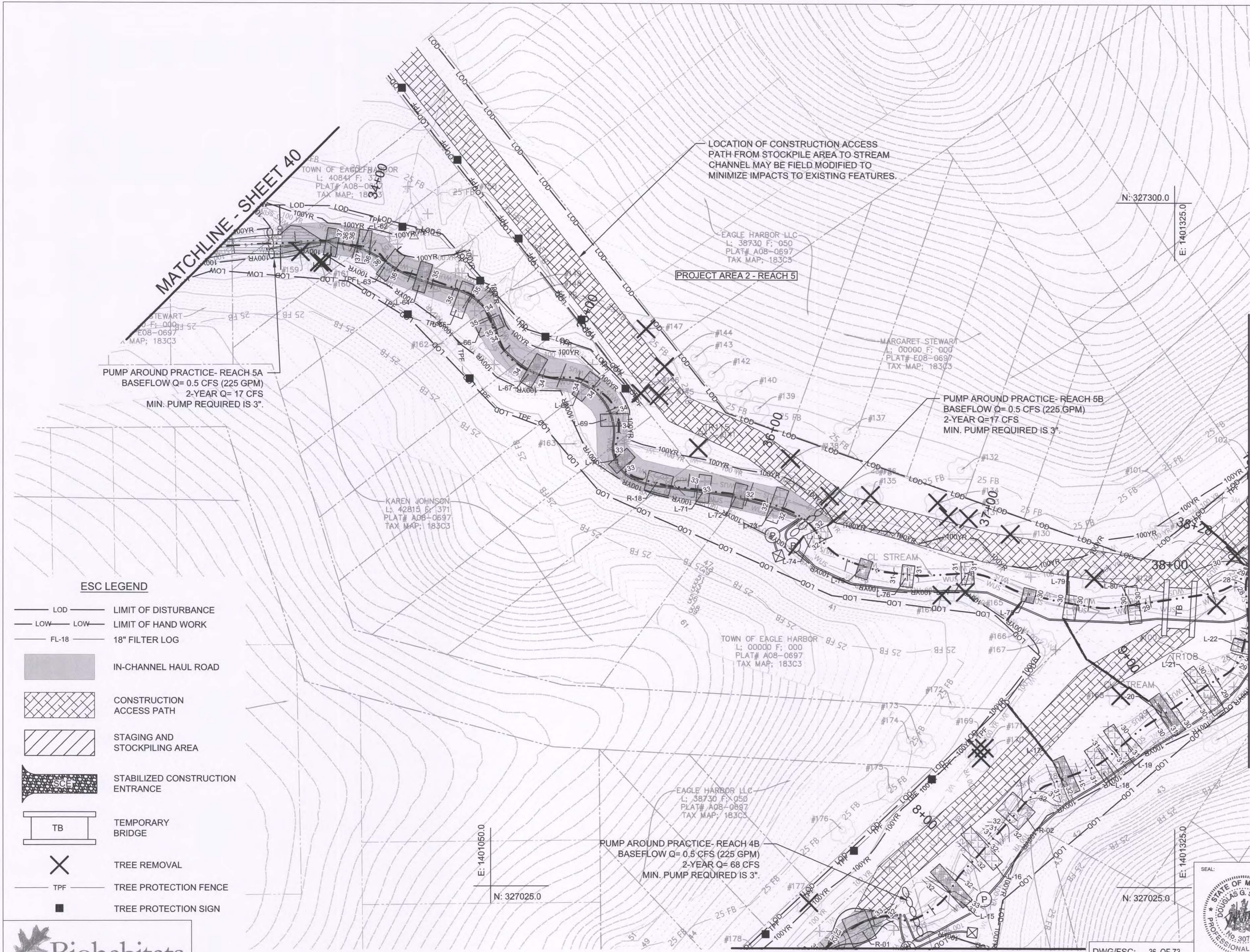
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APPROVED: <i>Jeff Duffan</i>		12/18/2023
ASSOCIATE DIRECTOR		DATE
APPROVED: <i>Frank L. Galosi</i>		12/18/2023
SECTION HEAD		DATE
PROJECT MANAGER	CONTRACT NO.	C.I.P.
PROJECT NO.: 22025.01	SCALE: 1" = 20'	BY: GB CHECK: DS

EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

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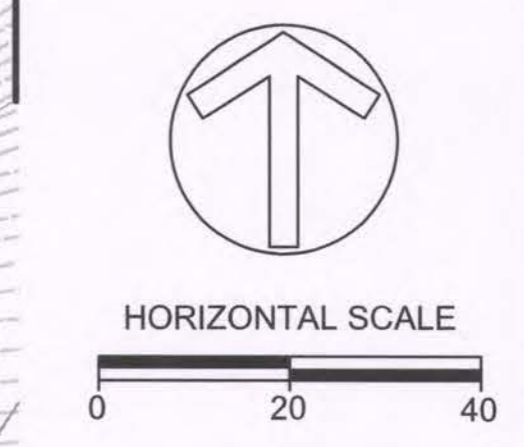


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MATCHLINE - SHEET 37



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 Restore the Earth & Inspire Ecological Stewardship

DWG/FSC: 36 OF 73  
 TITLE: **EROSION AND SEDIMENT CONTROL PLAN**



PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP. DATE: 2024-06-28



**TOWN OF EAGLE HARBOR**  
 23308 HAWKINS DR  
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 PHONE: 301-888-2410  
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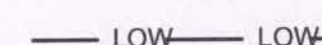
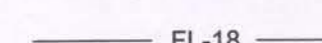



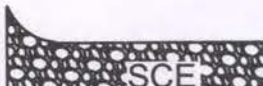
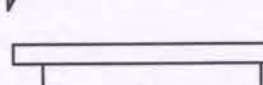



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ASSOCIATE DIRECTOR	DATE
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**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

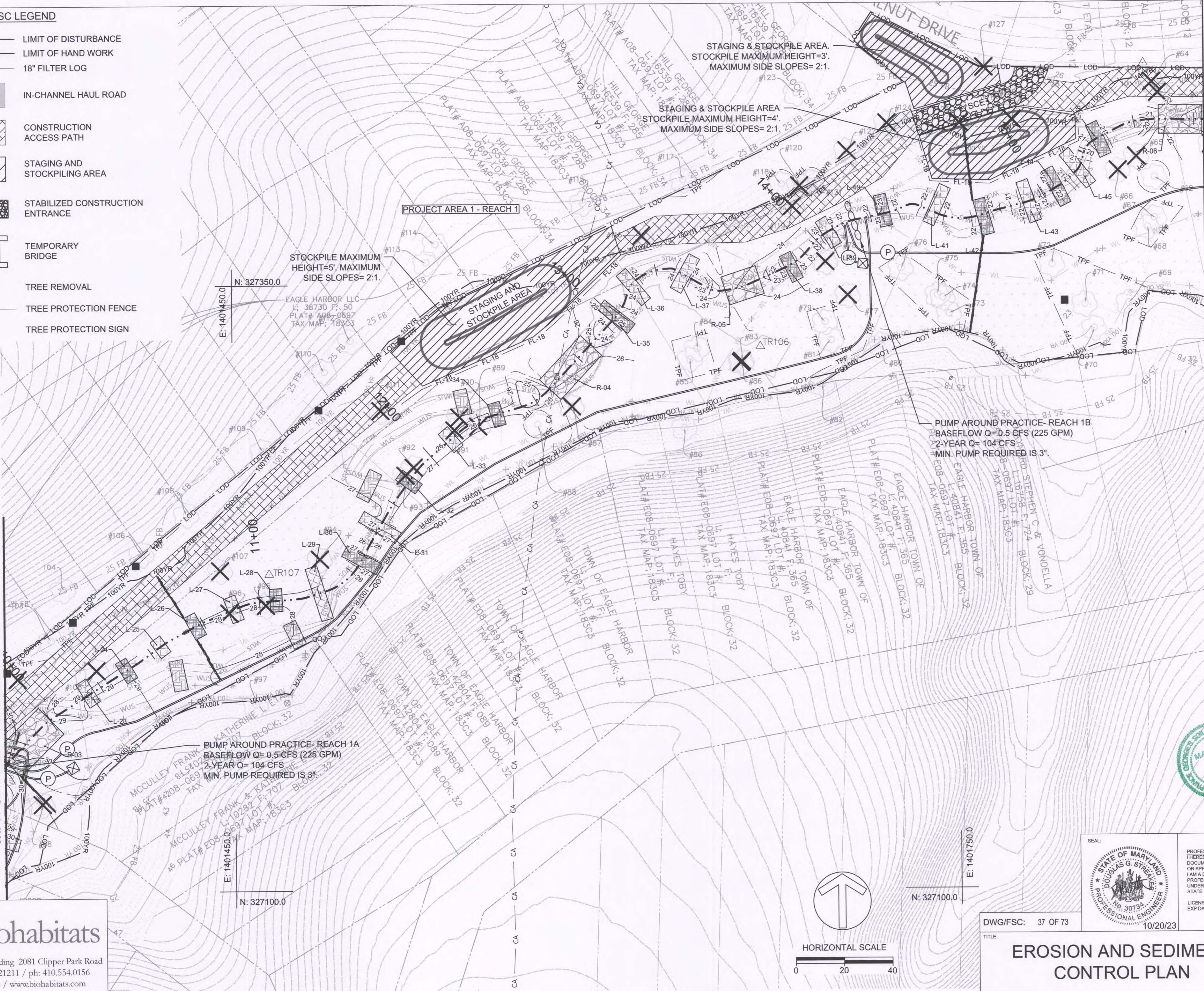


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-  TB TEMPORARY BRIDGE
-  TREE REMOVAL
-  TPF TREE PROTECTION FENCE
-  TREE PROTECTION SIGN

MATCHLINE - SHEET 36

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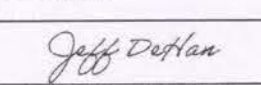



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  4. STOCKPILE LIMITS MUST BE CONTAINED WITHIN THE DESIGNATED STAGING AND STOCKPILE AREAS. REFER TO MAXIMUM STOCKPILE HEIGHTS LABELED. SIDESLOPES OF STOCKPILES SHALL NOT EXCEED 2:1.
  5. WITHIN AREAS ADJACENT TO ACTIVE STREAM CHANNELS, TREAT DISTURBED AREAS DAILY WITH TEMPORARY SEED AND A MINIMUM OF 2" OF WOODCHIPS OR HARDWOOD MULCH STABILIZATION. OVERSEED WITH PERMANENT SEED PER THE PLANTING SCHEDULE AND INSTALL SOIL STABILIZATION MATTING PER DETAIL AS COMPLETED AREAS ARE APPROVED BY THE INSPECTOR AND ENGINEER/DESIGNATED SPECIALIST. SOIL STABILIZATION MATTING SHALL BE INSTALLED CONSTRUCTION DETAILS AND ON ALL GRADED STREAM BANKS WITH SLOPES 3:1 OR GREATER (SEE TYPICAL POOL GRADING DETAIL). ALL OTHER DISTURBED AREAS AWAY FROM STREAM CHANNELS SHALL BE STABILIZED PER MDE STANDARD OF WITHIN THREE CALENDAR DAYS.



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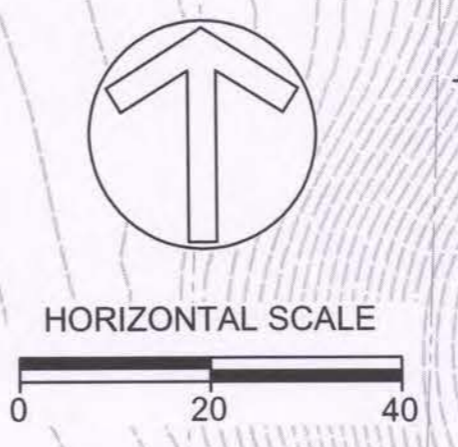
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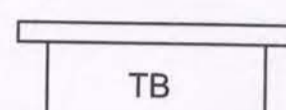

**EROSION AND SEDIMENT CONTROL PLAN**

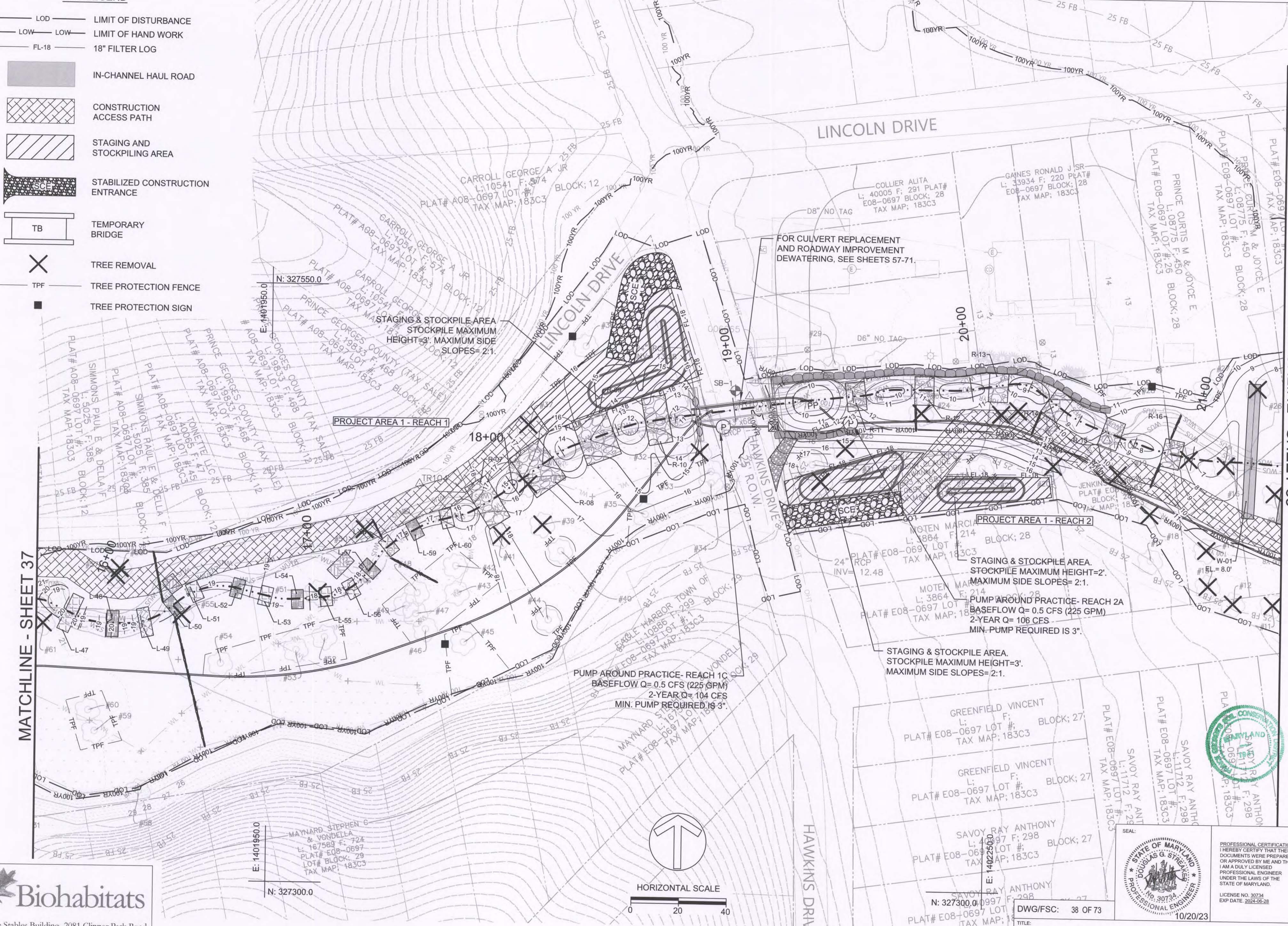



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4. STOCKPILE LIMITS MUST BE CONTAINED WITHIN THE DESIGNATED STAGING AND STOCKPILE AREAS. REFER TO MAXIMUM STOCKPILE HEIGHTS LABELED. SIDESLOPES OF STOCKPILES SHALL NOT EXCEED 2:1.
5. WITHIN AREAS ADJACENT TO ACTIVE STREAM CHANNELS, TREAT DISTURBED AREAS DAILY WITH TEMPORARY SEED AND A MINIMUM OF 2" OF WOODCHIPS OR HARDWOOD MULCH STABILIZATION. OVERSEED WITH PERMANENT SEED PER THE PLANTING SCHEDULE AND INSTALL SOIL STABILIZATION MATTING PER DETAIL AS COMPLETED AREAS ARE APPROVED BY THE INSPECTOR AND ENGINEER/DESIGNATED SPECIALIST. SOIL STABILIZATION MATTING SHALL BE INSTALLED CONSTRUCTION DETAILS AND ON ALL GRADED STREAM BANKS WITH SLOPES 3:1 OR GREATER (SEE TYPICAL POOL GRADING DETAIL). ALL OTHER DISTURBED AREAS AWAY FROM STREAM CHANNELS SHALL BE STABILIZED PER MDE STANDARD OF WITHIN THREE CALENDAR DAYS.

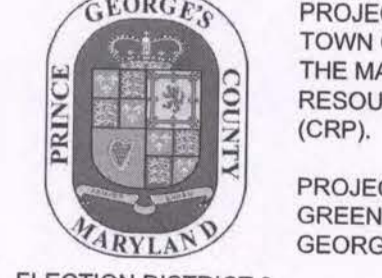


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**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

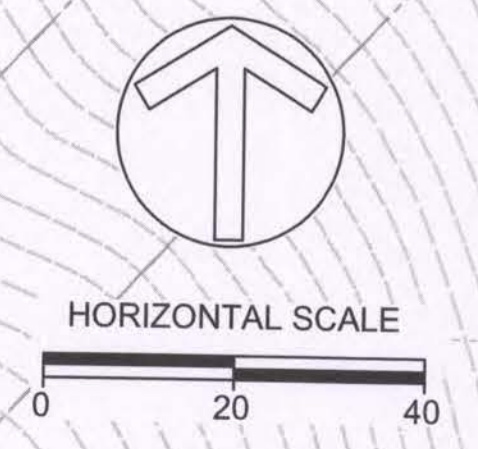


PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
ELECTION DISTRICT 9



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

N: 327300.0  
E: 1401950.0




PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024-08-28

SEAL: 

10/20/23

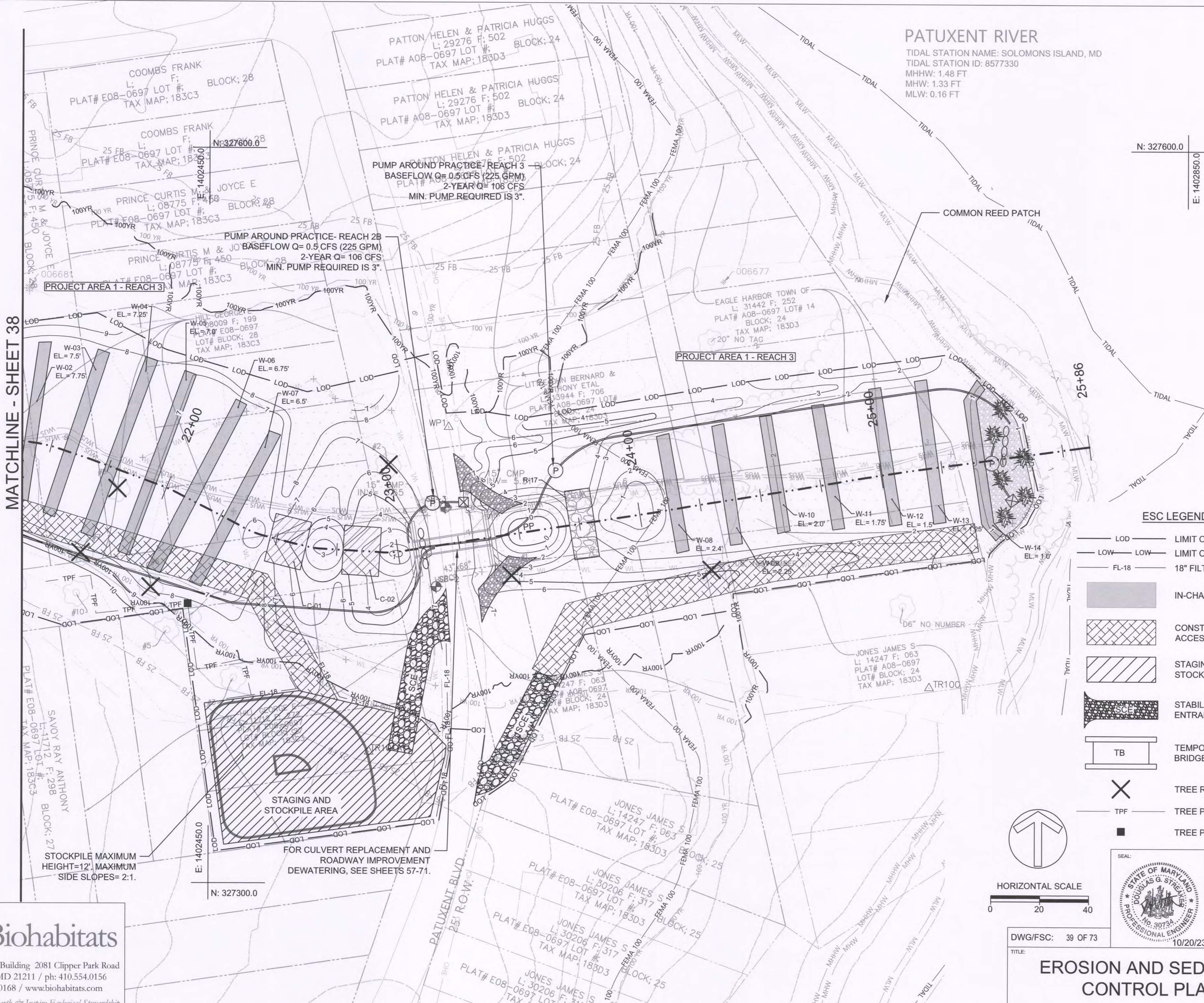
DWG/FSC: 38 OF 73  
TITLE: **EROSION AND SEDIMENT CONTROL PLAN**

APPROVED: 	DATE: 12/18/2023
SECTION HEAD	
PROJECT MANAGER	CONTRACT NO.
C.I.P.	
PROJECT NO.: 22025.01	SCALE: 1" = 20'
BY: GB	CHECK: DS

## EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT



MATCHLINE - SHEET 38



### PATUXENT RIVER

TIDAL STATION NAME: SOLOMONS ISLAND, MD  
TIDAL STATION ID: 8577330  
MHHW: 1.48 FT  
MHW: 1.33 FT  
MLW: 0.16 FT

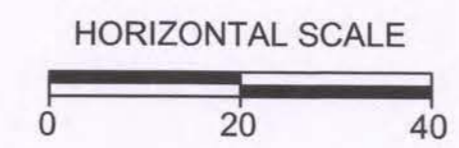
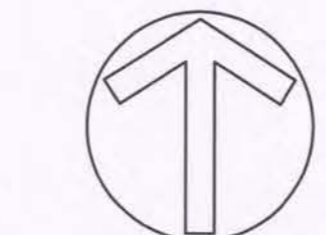
N: 327600.0

E: 1402850.0

- NOTE:**
- FOR IN-STREAM WORK WITHIN THE LOD, THE CONTRACTOR SHALL INSTALL A STREAM DIVERSION (CLEAR WATER DIVERSION AND/OR PUMP AROUND PRACTICE) WITHIN THE STREAM CHANNEL TO MAINTAIN A DRY ACTIVE WORK AREA(S). EACH WORK AREA LENGTH SHALL NOT EXCEED WHAT CAN BE COMPLETED IN ONE DAY. PUMP-AROUND PRACTICE SHALL FOLLOW MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION DETAIL 1.2 (WHICH INCLUDES INSTALLATION OF SANDBAG DIKES, STREAM DIVERSION PUMPS AND HOSES, AND APPROVED DEWATERING DEVICE. CLEAR WATER DIVERSION PRACTICE SHALL FOLLOW MDE DETAIL C-6, WHICH INCLUDES INSTALLATION OF SANDBAG DIKES, DIVERSION PIPES AND APPROVED DEWATERING DEVICE. THE LAYOUTS OF THE STREAM DIVERSIONS SHOWN ARE REPRESENTATIVE AND MAY BE ADJUSTED IN THE FIELD WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR.
  - TEMPORARY MEASURES FOR DIVERTING FLOW AROUND EACH ACTIVE STREAM WORK AREA SHALL BE SUFFICIENTLY SIZED TO CONVEY BASEFLOW WHEN THE DIVERSION DURATION IS LESS THAN TWO WEEKS, WHICH SHALL BE THE TYPICAL SITUATION. IF A DIVERSION SETUP IS ANTICIPATED TO LAST LONGER THAN TWO WEEKS, THE FLOW DIVERSION SHALL BE SIZED TO CONVEY THE 2-YEAR PEAK DISCHARGE. SEE PLANS FROM THE MINIMUM SIZE DIVERSION AT EACH LOCATION TO DIVERT BASEFLOW.
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### ESC LEGEND

- LOD LIMIT OF DISTURBANCE
- LOW LIMIT OF HAND WORK
- FL-18 18" FILTER LOG
- IN-CHANNEL HAUL ROAD
- CONSTRUCTION ACCESS PATH
- STAGING AND STOCKPILING AREA
- STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY BRIDGE
- TREE REMOVAL
- TREE PROTECTION FENCE
- TREE PROTECTION SIGN



DWG/FSC: 39 OF 73

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LICENSE NO. 30734  
EXP. DATE: 2024-06-28



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NOAH E. WATERS, PHD, MAYOR

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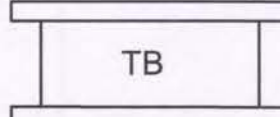

APPROVED	Jeff Dufane	12/18/2023
	ASSOCIATE DIRECTOR	DATE
APPROVED	Frank L. Galosi	12/18/2023
	SECTION HEAD	DATE
PROJECT MANAGER	CONTRACT NO.	C.I.P.
PROJECT NO.: 22025.01	SCALE: 1" = 20'	BY: GB
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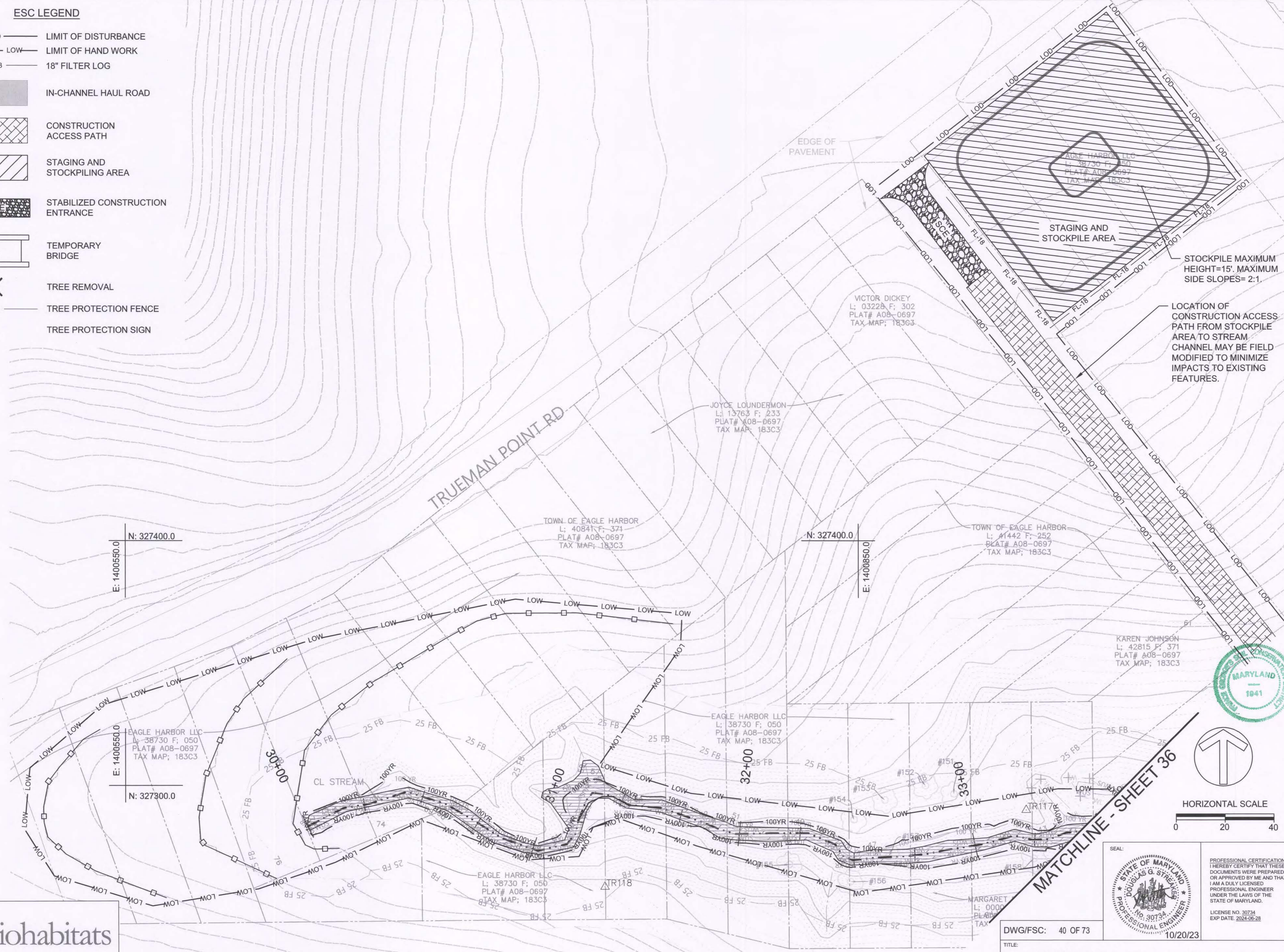
## EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

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



**ESC LEGEND**

- LOD — LIMIT OF DISTURBANCE
- LOW — LIMIT OF HAND WORK
- FL-18 — 18" FILTER LOG
-  IN-CHANNEL HAUL ROAD
-  CONSTRUCTION ACCESS PATH
-  STAGING AND STOCKPILING AREA
-  STABILIZED CONSTRUCTION ENTRANCE
-  TEMPORARY BRIDGE
-  TREE REMOVAL
- TPF — TREE PROTECTION FENCE
- TREE PROTECTION SIGN



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 ELECTION DISTRICT 9

APPROVED: <i>Jeff Dushan</i>	12/18/2023		
ASSOCIATE DIRECTOR	DATE		
APPROVED: <i>Frank L. Galosi</i>	12/18/2023		
SECTION HEAD	DATE		
PROJECT MANAGER	CONTRACT NO.	C.I.P.	
PROJECT NO.: 22025.01	SCALE: 1" = 20'	BY: GB	CHECK: DS

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 EXP. DATE: 2024-06-28  
 10/20/23

DWG/FSC: 40 OF 73  
 TITLE: **EROSION AND SEDIMENT CONTROL PLAN**

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**EROSION AND SEDIMENT CONTROL NOTES**

- THE OWNER/DEVELOPER IS RESPONSIBLE FOR THE ACQUISITION OF ALL REQUIRED EASEMENT, RIGHT AND/OR RIGHTS-OF-WAY PURSUANT TO THE DISCHARGE FROM THE EROSION AND SEDIMENT CONTROL PRACTICES, STORMWATER MANAGEMENT PRACTICES AND THE DISCHARGE OF STORMWATER ONTO OR ACROSS ADJACENT OR DOWNSTREAM PROPERTIES AFFECTED BY THIS PLAN. NO CONSTRUCTION ACTIVITY SHALL TAKE PLACE UNTIL ALL REQUIRED PERMITS HAVE BEEN OBTAINED.
- THE LIMITS OF DISTURBANCE SHALL BE CLEARLY DELINEATED IN THE FIELD PRIOR TO GRADING OF THE SITE TO ENSURE COMPLIANCE WITH APPROVED PLANS. ANY WORK BEYOND LIMITS OF DISTURBANCE IS CONSIDERED TO BE A VIOLATION OF THIS PLAN.
- ALL SEDIMENT CONTROL PRACTICES MUST BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITY. UPON COMPLETION OF INSTALLATION OF SEDIMENT CONTROL PRACTICES THE SITE MUST BE INSPECTED BY DPHE. NO ADDITIONAL CONSTRUCTION ACTIVITY WILL BE AUTHORIZED WITHOUT THE APPROVAL OF DPHE.
- ALL POINTS INGRESS AND EGRESS SHALL BE PROTECTED TO PREVENT TRACKING OF MUD INTO PUBLIC WAYS. DURING CONSTRUCTION, EVERY MEANS WILL BE TAKEN TO CONTROL SOIL EROSION AND SEDIMENTATION. IF NECESSARY A WASH RACK MAY NEED TO BE ESTABLISHED. EARTH DIKES, SEDIMENT TRAPS, ETC. WILL BE LOCATED AS SHOWN ON THESE DRAWINGS. FIELD CHANGES AND MINOR ADJUSTMENTS ARE PERMISSIBLE AS LONG AS THE INSTALLATION FUNCTIONS AND CONFORMS TO SPECIFICATIONS. ALL SUCH CHANGES TO THE APPROVED PLAN WILL REQUIRE PRE-APPROVAL BY THE PRINCE GEORGES COUNTY SOIL CONSERVATION DISTRICT.
- FOLLOWING INITIAL SOIL DISTURBANCE, 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 THREE HORIZONTAL TO ONE VERTICAL (3:1); AND,
  - SEVEN (7) CALENDAR DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE, THE IN-PLACE SEDIMENT CONTROL MEASURES WILL BE MAINTAINED ON A CONTINUING BASIS UNTIL THE SITE IS PERMANENTLY STABILIZED AND ALL PERMIT REQUIREMENTS ARE MET.
- THE OWNER/DEVELOPER OR REPRESENTATIVE SHALL REQUEST THAT THE INSPECTION AUTHORITY APPROVE WORK COMPLETED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE GRADING OR BUILDING PERMIT AND SHALL OBTAIN WRITTEN INSPECTION APPROVALS BY THE INSPECTOR AT THE FOLLOWING STAGES IN THE DEVELOPMENT OF THE SITE:
  - PRIOR TO THE START OF EARTH DISTURBANCE;
  - UPON COMPLETION OF INSTALLATION OF TREE PROTECTION DEVICES, FOLLOWED BY THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, PRIOR TO PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL INITIAL APPROVAL BY THE INSPECTOR IS MADE;
  - UPON COMPLETION OF STRIPPING, THE STOCKPILING OF TOPSOIL, THE CONSTRUCTION OF TEMPORARY SEDIMENT AND EROSION CONTROL FACILITIES, DISPOSAL OF ALL WASTE MATERIAL AND PREPARATION OF THE GROUND;
  - UPON COMPLETION OF ROUGH GRADING, BUT PRIOR TO PLACING TOPSOIL, PERMANENT DRAINAGE OR OTHER SITE DEVELOPMENT IMPROVEMENTS AND GROUND COVERS;
  - PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT;
  - PRIOR TO THE REMOVAL OF SEDIMENT CONTROL PRACTICES; AND
  - UPON COMPLETION OF FINAL GRADING, REFORESTING, PERMANENT DRAINAGE AND EROSION CONTROL FACILITIES INCLUDING ESTABLISHED GROUND COVERS AND PLANTING, AND ALL OTHER WORK OF THE BUILDING PERMITS.
- APPROVAL SHALL BE REQUESTED UPON FINAL STABILIZATION OF ALL SITES WITH DISTURBED AREAS IN EXCESS OF TWO ACRES BEFORE REMOVAL OF CONTROLS.
- ALL PERMITS UNDER AN EROSION AND SEDIMENT CONTROL PLAN MUST AND CAN ONLY BE ISSUED TO THE OWNER/DEVELOPER THAT SIGNS THE CERTIFICATION ON THE PLAN. THE OWNER/DEVELOPER THAT SIGNS THE CERTIFICATION ON AN EROSION AND SEDIMENT CONTROL PLAN IS THE RESPONSIBLE PARTY REGARDLESS OF ANY SALE OF THE PROPERTY OR WORK OF SUBCONTRACTORS. EROSION AND SEDIMENT CONTROL PLANS ARE APPROVED FOR ONE OWNER/DEVELOPER ONLY.
- PGSCD APPROVAL OF AN EROSION AND SEDIMENT CONTROL PLAN, PURSUANT TO MEETING LOCAL PERMIT REQUIREMENTS FOR GRADING, BUILDING OR STREET PERMITS, ETC. IS VALID ONLY WHEN THE WORK TO BE PERFORMED UNDER THE PERMIT IS THE SAME AS (NO MORE/NO LESS THAN) THAT CONTAINED IN THE PLAN AS APPROVED BY THE PGSCD.
- ANY CHANGES OR MODIFICATIONS TO AN APPROVED EROSION AND SEDIMENT CONTROL PLAN, NOT APPROVED BY THE PGSCD, SHALL INVALIDATE THE PLAN APPROVAL.
- AT THE END OF EACH WORKING DAY ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT OPERATIONAL. A WEEKLY LOG WILL BE KEPT IN ACCORDANCE WITH NOI/INPDES REGULATIONS. A COPY OF THE APPROVED SEDIMENT CONTROL PLANS SHALL BE AVAILABLE AT THE SITE AT ALL TIMES.
- SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRAVERSING THE SLOPES OR BY INSTALLING MECHANICAL DEVICES TO SAFELY CONVEY WATER DOWN SLOPES WITHOUT CAUSING EROSION.
- OFFSITE WASTE OR BORROW AREAS SHALL HAVE AN APPROVED EROSION AND SEDIMENT CONTROL PLAN PRIOR TO THE IMPORT OR EXPORT OF MATERIAL TO THE PROJECT SITE.
- ALL MATERIAL ORIGINATING FROM THE DEVELOPMENT OF THE PROPERTY AND DEPOSITED ON THE PUBLIC RIGHT-OF-WAY SHALL BE IMMEDIATELY REMOVED.
- TOP SOILING, LIMING, FERTILIZING, SEEDING, MULCHING, SODDING, ETC ARE ALL ESSENTIAL PARTS OF SEDIMENT CONTROL AND MUST BE COMPLETED ALONG WITH ALL OTHER PRACTICES. SEDIMENT CONTROL PRACTICES WILL BE MAINTAINED UNTIL ALL DISTURBED AREAS FOR WHICH THE PRACTICES WERE INSTALLED HAVE BEEN STABILIZED. SEDIMENT CONTROL PRACTICES MAY BE REMOVED ONLY WITH THE AUTHORIZATION OF DP&WT. ALL DISTURBED AREAS RESULTING FROM THE REMOVAL OF SEDIMENT CONTROL DEVICES SHALL BE STABILIZED IMMEDIATELY. REMOVAL PRIOR TO INSPECTOR APPROVAL CONSTITUTES A VIOLATION.
- TEMPORARY DESIGNED SEDIMENT BASINS SHALL BE REMOVED WITHIN 36 MONTHS AFTER THE BEGINNING OF CONSTRUCTION OF THE BASIN.
- ON SMALL POND APPROVALS:
  - THE OWNER OR ENGINEER WILL NOTIFY PGSCD PROMPTLY IN WRITING WHEN CONSTRUCTION IS BEGUN AND WHEN CONSTRUCTION IS COMPLETED.
  - THE PROJECT SHALL BE CONSTRUCTED UNDER THE SUPERVISION OF THE ENGINEER-IN-CHARGE. WITHIN 30 DAYS OF THE COMPLETION OF CONSTRUCTION, THE ENGINEER-IN-CHARGE THAT DESIGNED THE STRUCTURE SHALL PROVIDE PGSCD WITH AN AS-BUILT PLAN AND SHALL CERTIFY, WITH THE ENGINEER'S SEAL, THAT THE PROJECT WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS.
  - THE APPROVAL IS VALID ONLY FOR USE BY THE APPLICANT AND MAY NOT BE TRANSFERRED TO ANOTHER UNLESS WRITTEN APPROVAL FOR SUCH TRANSFER IS OBTAINED FROM PGSCD.
- DISTURBED SURFACE AREA:** 4.73 ACRES  
**VEGETATIVELY STABILIZED AREA:** 4.17 ACRES  
**VOLUME OF SPOIL MATERIAL:** 0 CY  
**VOLUME OF CUT:** 3,210 CY  
**VOLUME OF BORROW MATERIAL:** 0 CY  
**VOLUME OF FILL:** 3,210 CY

- LIST PREDOMINANT SOIL TYPES AND GENERAL DESCRIPTION PER PGSCD SOIL SURVEY. SEE SHEET 4 FOR DETAILED LIST OF SOIL TYPES.
- SEDIMENT CONTROL MEASURES MUST BE INSPECTED AND MAINTAINED REGULARLY TO ENSURE THAT THE INTENDED PURPOSES ARE ACCOMPLISHED.
- REFER TO MDE 2011 MARYLAND "STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN.
- WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, MINOR FIELD ADJUSTMENT CAN AND WILL BE MADE TO INSURE THE CONTROL OF ANY SEDIMENT. CHANGES IN SEDIMENT CONTROL PRACTICES REQUIRE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR.
- AT THE END OF EACH WORKING DAY, ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT IN OPERATIONAL CONDITION.
- ANY DISTURBED EARTH LEFT IDLE FOR PERIODS EXCEEDING 1 DAY SHALL BE STABILIZED ACCORDING TO TEMPORARY STABILIZATION SPECIFICATIONS.
- ANY CHANGE TO THE GRADING PROPOSED ON THE PLAN REQUIRES RESUBMISSION TO DPHE FOR APPROVAL.
- ANY VARIATIONS FROM THE SEQUENCE OF OPERATIONS STATED ON THIS PLAN REQUIRES THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR PRIOR TO THE INITIATION OF THE CHANGE.
- ANY MATERIAL REMOVED FROM THE SITE SHALL BE TAKEN TO AN APPROVED PRINCE GEORGE'S COUNTY DISPOSAL SITE.
- ALL PROPOSED SEDIMENT CONTROL MEASURES ARE TEMPORARY MEASURES UNLESS SPECIFIED OTHERWISE ON PLANS.
- PROVIDE CONTINUOUS INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL MEASURES TO ENSURE THAT MAXIMUM CONTROL EFFICIENCY IS OBTAINED THROUGHOUT THE LIFE OF THE PROJECT.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL LOCAL, STATE (MOSH), AND FEDERAL (OSHA) CONSTRUCTION SAFETY REGULATIONS ARE FOLLOWED DURING IMPLEMENTATION OF THIS PLAN.

**GENERAL NOTES**

- CONTRACTOR SHALL VERIFY SITE CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER/DESIGNATED SPECIALIST PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL ENSURE ALL PERMITS AND PERMIT WAIVERS HAVE BEEN REQUESTED AND GRANTED PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PERMITTING, INSPECTIONS, AND ENFORCEMENT INSPECTION DIVISION AT (301) 833-3820 24 HOURS IN ADVANCE OF ANY WORK BEING DONE.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF PRINCE GEORGE'S COUNTY CONTAINED HEREIN PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- THE COORDINATES SHOWN HEREON ARE BASED ON THE MARYLAND STATE PLANE COORDINATE SYSTEM, HORIZ. DATUM NAD83/2011 AND VERT. DATUM NAVD88.
- THERE IS NO PUBLIC WATER AND SEWER ON THIS SITE.
- THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- NO STOCKPILE OF ANY ERODIBLE MATERIAL IS ALLOWED IN THE 100-YEAR FLOODPLAIN.
- THE CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
- ALL TREES NOT REQUIRING REMOVAL FOR ACCESS OR RESTORATION ACTIVITY SHALL BE AVOIDED AND PROTECTED DURING CONSTRUCTION. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES ON THE CONSTRUCTION SITE. ALL EARTH CUTS AND ACTIVITIES IN THE VICINITY OF TREES TO REMAIN SHALL BE MADE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE WITHIN THE DRIPLINE OF THE TREE. CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
- UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
- WORKING HOURS ARE 7AM TO 7PM MONDAY THROUGH FRIDAY.
- THE CONTRACTOR SHALL AVOID TRACKING HEAVY EQUIPMENT OVER THE CRITICAL ROOT ZONE OF SPECIMEN TREES. IF UNAVOIDABLE, LOAD MATS SHOULD BE USED WHEN TRACKING OVER THE CRITICAL ROOT ZONES.

**VEGETATIVE STABILIZATION**

- SEDIMENT CONTROL PRACTICES MUST REMAIN IN PLACE DURING GRADING, SEEDBED PREPARATION, SEEDING, MULCHING, AND VEGETATIVE ESTABLISHMENT
- INSPECT SEEDING AREA FOR VEGETATIVE ESTABLISHMENT AND MAKE NECESSARY REPAIRS, REPLACEMENTS AND RESEEDING WITHIN THE PLANTING SEASON.
  - ADEQUATE VEGETATIVE STABILIZATION REQUIRES 95 PERCENT GROUND COVER
  - IF AN AREA HAS LESS THAN 40 PERCENT GROUND COVER, RESTABILIZE FOLLOWING THE ORIGINAL RECOMMENDATIONS FOR LIME, FERTILIZER, SEEDBED PREPARATION AND SEEDING.
  - IF AN AREA HAS BETWEEN 40 AND 94 PERCENT GROUND COVER, OVER-SEED AND FERTILIZE USING HALF OF THE RATES ORIGINALLY SPECIFIED.
  - PERMANENT SEEDING RATES ARE SHOWN IN THE LANDSCAPE SCHEDULES. NOT FERTILIZER OR LIME IS REQUIRED FOR THIS PROJECT.
- IN SHADED AREAS WHERE 95 PERCENT GROUND COVER IS NOT ACHIEVABLE, STABILIZATION IS ACHIEVED WHEN THE DISTURBED AREA IS COVERED WITH 2 TO 4 INCHES OF WOOD CHIPS TRACKED INTO SOIL AND THE NATIVE PLANTING PLAN (INCLUDING PERMANENT SEEDING) HAS BEEN IMPLEMENTED.

**B-3 STANDARDS AND SPECIFICATIONS FOR LAND GRADING**

**DEFINITION**

RESHAPING THE EXISTING LAND SURFACE TO PROVIDE SUITABLE TOPOGRAPHY FOR BUILDING FACILITIES AND OTHER SITE IMPROVEMENTS.

**PURPOSE**

TO PROVIDE EROSION CONTROL AND VEGETATIVE ESTABLISHMENT FOR EXTREME CHANGES IN GRADE.

**CONDITIONS WHERE PRACTICE APPLIES**

EARTH DISTURBANCES OR EXTREME GRADE MODIFICATIONS ON STEEP OR LONG SLOPES.

**DESIGN CRITERIA**

THE GRADING PLAN SHOULD BE BASED ON THE INCORPORATION OF BUILDING DESIGNS AND STREET LAYOUTS THAT FIT AND UTILIZE EXISTING TOPOGRAPHY AND DESIRABLE NATURAL SURROUNDINGS TO AVOID EXTREME GRADE MODIFICATIONS. INFORMATION SUBMITTED MUST PROVIDE SUFFICIENT TOPOGRAPHIC SURVEYS AND SOIL INVESTIGATIONS TO DETERMINE LIMITATIONS THAT MUST BE IMPOSED ON THE GRADING OPERATION RELATED TO SLOPE STABILITY, ADJACENT PROPERTIES, DRAINAGE PATTERNS, MEASURES FOR WATER REMOVAL, AND VEGETATIVE TREATMENT, ETC.

MANY JURISDICTIONS HAVE REGULATIONS AND DESIGN PROCEDURES ALREADY ESTABLISHED FOR LAND GRADING THAT MUST BE FOLLOWED. THE PLAN MUST SHOW EXISTING AND PROPOSED CONTOURS FOR THE AREA(S) TO BE GRADED INCLUDING PRACTICES FOR EROSION CONTROL, SLOPE STABILIZATION, AND SAFE CONVEYANCE OF RUNOFF (E.G., WATERWAYS, LINED CHANNELS, REVERSE BENCHES, GRADE STABILIZATION STRUCTURES). THE GRADING/CONSTRUCTION PLANS ARE TO INCLUDE THE PHASING OF THESE PRACTICES AND CONSIDERATION OF THE FOLLOWING:

- PROVISIONS TO SAFELY CONVEY SURFACE RUNOFF TO STORM DRAINS, PROTECTED OUTLETS OR STABLE WATER COURSES TO ENSURE THAT SURFACE RUNOFF WILL NOT DAMAGE SLOPES OR OTHER GRADED AREAS.
- CUT AND FILL SLOPES, STABILIZED WITH GRASSES, NO STEEPER THAN 2:1. (WHERE THE SLOPE IS TO BE MOWED, THE SLOPE SHOULD BE NO STEEPER THAN 3:1, BUT 4:1 IS PREFERRED BECAUSE OF SAFETY FACTORS RELATED TO MOWING STEEP SLOPES.) SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL DESIGN AND STABILIZATION CONSIDERATIONS TO BE SHOWN ON THE PLANS.
- BENCHING PER DETAIL B-3-1 WHENEVER THE VERTICAL INTERVAL (HEIGHT) OF ANY 2:1 SLOPE EXCEEDS 20 FEET; FOR 3:1 SLOPES, WHEN IT EXCEEDS 30 FEET; AND FOR 4:1 SLOPES, WHEN IT EXCEEDS 40 FEET. LOCATE BENCHES TO DIVIDE THE SLOPE FACE AS EQUALLY AS POSSIBLE AND TO CONVEY THE WATER TO A STABLE OUTLET. SOILS, SEEPS, ROCK OUTCROPS, ETC. ARE TO BE TAKEN INTO CONSIDERATION WHEN DESIGNING BENCHES.
  - PROVIDE BENCHES WITH A MINIMUM WIDTH OF SIX FEET FOR EASE OF MAINTENANCE.
  - DESIGN BENCHES WITH A REVERSE SLOPE OF 6:1 OR FLATTER TO THE TOE OF THE UPPER SLOPE AND WITH A MINIMUM OF ONE FOOT IN DEPTH. GRADE THE LONGITUDINAL SLOPE OF THE BENCH BETWEEN 2 PERCENT AND 3 PERCENT, UNLESS ACCOMPANIED BY APPROPRIATE DESIGN AND COMPUTATIONS.
  - THE MAXIMUM ALLOWABLE FLOW LENGTH WITHIN A BENCH IS 800 FEET UNLESS ACCOMPANIED BY APPROPRIATE DESIGN AND COMPUTATIONS.
- DIVERSION OF SURFACE WATER FROM THE FACE OF ALL CUT AND FILL SLOPES USING EARTH DIKES OR SWALES. CONVEY SURFACE WATER DOWN SLOPE USING A DESIGNED STRUCTURE AND:
  - PROTECT THE FACE OF ALL GRADED SLOPES FROM SURFACE RUNOFF UNTIL THEY ARE STABILIZED.
  - DO NOT SUBJECT THE SLOPE'S FACE TO ANY CONCENTRATED FLOW OF SURFACE WATER SUCH AS FROM NATURAL DRAINAGE WAYS, GRADED SWALES, DOWNSPOUTS, ETC.
  - PROTECT THE FACE OF THE SLOPE BY SPECIAL EROSION CONTROL MATERIALS TO INCLUDE, BUT NOT BE LIMITED TO, APPROVED VEGETATIVE STABILIZATION PRACTICES, RIPRAP OR OTHER APPROVED STABILIZATION METHODS.
- THE STEEPEST ALLOWABLE SLOPE FOR RIPABLE ROCK IS 1.5:1. FOR NON ROCK SURFACES, THE SLOPES ARE TO BE 2:1 OR FLATTER. THESE STEPS WILL WEATHER AND ACT TO HOLD MOISTURE, LIME FERTILIZER AND SEED THUS PRODUCING A MUCH QUICKER AND LONGER LIVED VEGETATIVE COVER AND BETTER SLOPE STABILIZATION.
- SUBSURFACE DRAINAGE PROVISIONS, PROVIDE SUBSURFACE DRAINAGE WHERE NECESSARY TO INTERCEPT SEEPAGE THAT WOULD OTHERWISE ADVERSELY AFFECT SLOPE STABILITY OR CREATE EXCESSIVELY WET SITE CONDITIONS.
- PROXIMITY TO ADJACENT PROPERTY. SLOPES MUST NOT BE CREATED CLOSE TO PROPERTY LINES WITHOUT ADEQUATE PROTECTION AGAINST SEDIMENTATION, EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE, OR OTHER RELATED DAMAGES.
- QUALITY OF FILL MATERIAL. FILL MATERIAL MUST BE FREE OF BRUSH, RUBBISH, LOGS, STUMPS, BUILDING DEBRIS, AND OTHER OBJECTIONABLE MATERIAL. DO NOT PLACE FROZEN MATERIALS IN THE FILL NOR PLACE THE FILL MATERIAL ON A FROZEN FOUNDATION.
- STABILIZATION STABILIZE ALL DISTURBED AREAS STRUCTURALLY OR VEGETATIVELY IN COMPLIANCE WITH SECTION B-4 STANDARDS AND SPECIFICATIONS FOR STABILIZATION PRACTICES.

**MAINTENANCE**

THE LINE, GRADE AND CROSS SECTION OF BENCHING AND SERRATED SLOPES MUST BE MAINTAINED. BENCHES AND SERRATED SLOPES MUST CONTINUOUSLY MEET THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL SECTION B-4 VEGETATIVE STABILIZATION.

**B-4-1 INCREMENTAL STABILIZATION**

THE GRADING PLANS SHOULD BE BASED ON THE INCORPORATION OF BUILDING DESIGNS

- CUT SLOPES
  - EXCAVATE AND STABILIZE CUT SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL CUT SLOPES AS THE WORK PROGRESSES.
  - NOTE: ONCE EXCAVATION HAS BEGUN THE OPERATION SHALL BE CONTINUOUS FROM GRUBBING THROUGH COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR (COMPLETING THE OPERATION OUT OF THE SEEDING SEASON) WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

NOTE: ONCE EXCAVATION HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

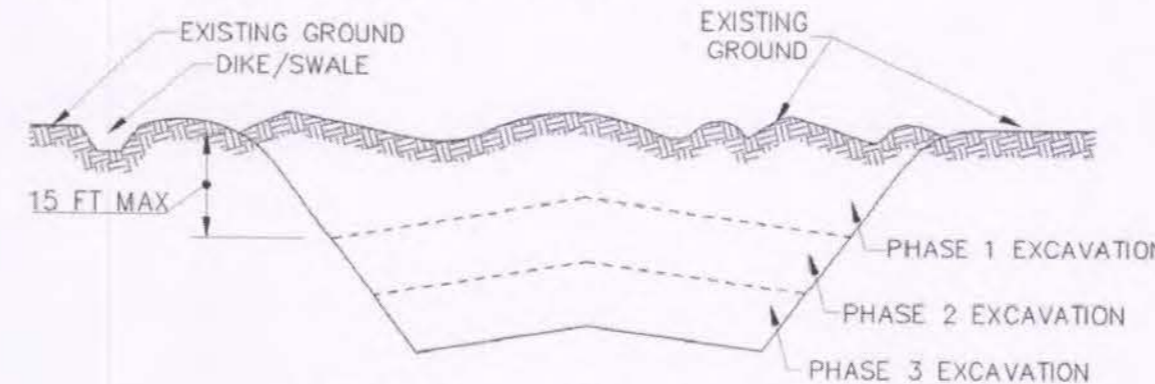


Figure B.1: Incremental Stabilization - Cut

**B. FILL SLOPES**

- CONSTRUCT AND STABILIZE FILL SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL SLOPES AS THE WORK PROGRESSES.
- STABILIZE SLOPES IMMEDIATELY WHEN THE VERTICAL HEIGHT OF A LIFT REACHES 15 FEET, OR WHEN THE GRADING OPERATION CEASES AS PRESCRIBED IN THE PLANS.
- AT THE END OF EACH DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
- NOTE: ONCE THE PLACEMENT OF FILL HAS BEGUN THE OPERATION SHALL BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

NOTE: ONCE THE PLACEMENT OF FILL HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.



PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP DATE: 02/24/2028

DWG/FSC: 41 OF 73

TITLE:

**EROSION AND SEDIMENT CONTROL NOTES**



**TOWN OF EAGLE HARBOR**  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

 ASSOCIATE DIRECTOR		12/18/2023
DATE		
 SECTION HEAD		12/18/2023
DATE		
PROJECT MANAGER	CONTRACT NO.	C.I.P.
PROJECT NO.: 22025.01	SCALE: NA	BY: GB
CHECK: DS		

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

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



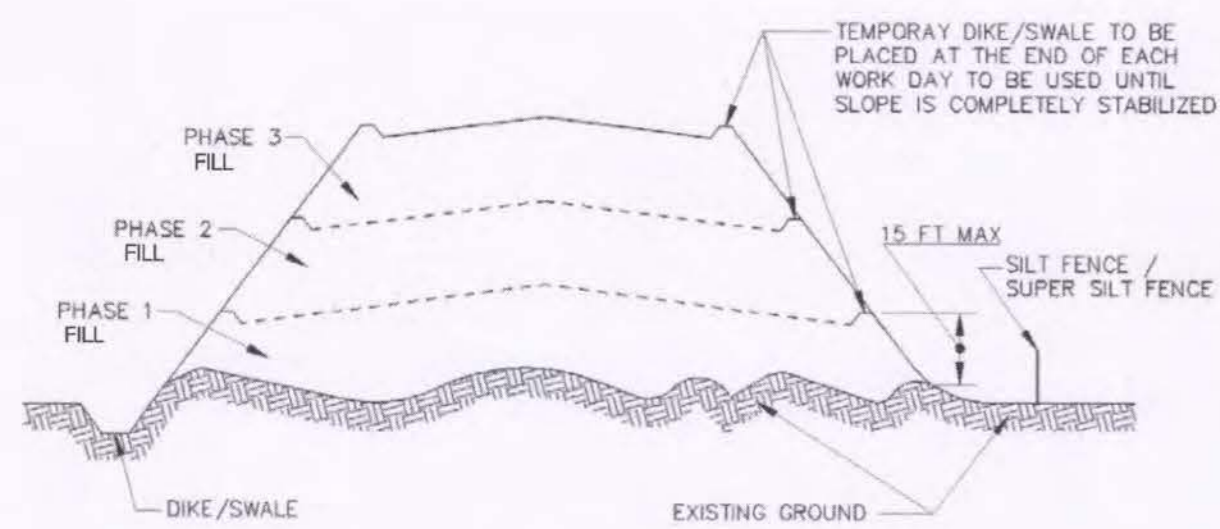


Figure B.2: Incremental Stabilization - Fill

B-4-2 SOIL PREPARATION, TOPSOILING AND SOIL AMENDMENTS

A. SOIL PREPARATION

- (1) TEMPORARY STABILIZATION
- (A) SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
- (B) APPLY FERTILIZER AND LIME AS PRESCRIBED ON THESE PLANS.
- (C) INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
- (2) PERMANENT STABILIZATION
- (A) A SOIL TEST IS REQUIRED FOR EVERY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
- (I) SOIL PH BETWEEN 6.0 AND 7.0.
- (II) SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
- (III) SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
- (IV) SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
- (V) SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
- (B) APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
- (C) GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES.
- (D) APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
- (E) MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. MAKE LAWN AREAS TO SMOOTH THE SURFACE. REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT MANUAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSEN AND FRABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

B-4-3 SEEDING AND MULCHING

- A. SEEDING SPECIFICATIONS
- (1) ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST BE TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL. ON ANY PROJECT, REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
- (2) MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE MULCH MIXTURE MUST BE APPLIED WHEN THE GROUND THAW.
- (3) INOCULANTS: THE INOCULANTS FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANTS AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANTS LESS EFFECTIVE.
- (4) SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.

B. TOPSOILING

- (1) TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS AND/OR UNACCEPTABLE SOIL GRADATION.
- (2) TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.
- (3) TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
- (A) THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
- (B) THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
- (C) THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANTS GROWTH.
- (D) THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
- (4) AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
- (5) TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
- (A) TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CHINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH OR OTHER MATERIALS LARGER THAN TWO INCHES IN DIAMETER.
- (B) TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERBERIS GRASS, QUACK GRASS, JOHNSON GRASS, NUT SLEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
- (C) TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
- (6) TOPSOIL APPLICATION
- (A) EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
- (B) UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM SODDING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
- (C) TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
- C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
- (1) SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSIS.
- (2) FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
- (3) LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
- (4) LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
- (5) WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

B. SEEDING APPLICATION

- (1) DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
- (A) INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3 OR SITE-SPECIFIC SEEDING SUMMARIES.
- (B) APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDING AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
- (2) DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
- (A) CULTIPACKER SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING SEEDBED MUST BE FIRM AFTER PLANTING.
- (B) APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
- (3) HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
- (A) IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P205 (PHOSPHOROUS), 200 POUNDS PER ACRE; K20 (POTASSIUM), 200 POUNDS PER ACRE.
- (B) LIME USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
- (C) MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
- (D) WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.
- C. MULCH MATERIALS (IN ORDER OF PREFERENCE)
- (1) STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLLY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
- (2) WOOD CELLULOSE FIBER MULCH (WCFFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
- (A) WCFFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
- (B) WCFFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
- (C) WCFFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDINGS.
- (D) WCFFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
- (E) WCFFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
- D. MULCH APPLICATION
- (1) APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
- (2) WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
- (3) WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1,500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
- E. MULCH ANCHORING
- (1) PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON SIZE OF THE AREA AND EROSION HAZARD:
- (A) A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE. A MINIMUM OF 2 INCHES THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
- (B) WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
- (C) SYNTHETIC BINDERS SUCH AS ACRYLIC (DURA-GRACK), DCA-70, PETROSEAL TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW THE APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
- (D) LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

B-4-4 TEMPORARY STABILIZATION

- A. EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.
- (1) SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.1 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.1 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.
- (2) FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.
- (3) WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONE AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

TEMPORARY SEEDING SUMMARY

Seed Mixture (Hardiness Zone <u>7a</u> ) From Table B.1						
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depth	Fertilizer Rate (10-10-10)	Lime Rate
	ANNUAL RYE	40	2/15-4/30, 8/15-11/30	1/2"	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	CEREAL RYE	50	5/1 - 8/14	1/2"		

B-4-5 PERMANENT STABILIZATION

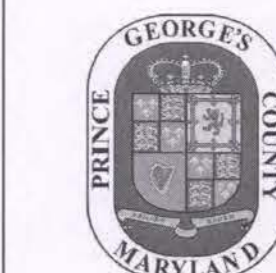
- A. EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.
- B. SEED MIXTURES
- (1) GENERAL USE
- (A) SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3) AND BASED ON SITE CONDITION OR PURPOSE SPECIFIED ON TABLE B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
- (B) ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BANKS OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342-CRITICAL AREA PLANTING.
- (C) FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY.
- (D) FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3 1/2 POUNDS PER 1,000 SQUARE FEET (550 POUNDS PER ACRE) AT THE TIME OF SEEDING IN ADDITION TO THE SOIL AMENDMENTS SHOWN IN THE PERMANENT SEEDING SUMMARY.
- (2) TURFGRASS MIXTURES
- (A) AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
- (B) SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
- (I) KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS RESULTING FROM SEEDING RATE: 1.5 TO 2.0 POUNDS PER 1,000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
- (II) KENTUCKY BLUEGRASS/PERENNIAL RYE: FULL SUN MIXTURE: FOR USE IN FULL SUN AREAS WHERE RAPID ESTABLISHMENT IS NECESSARY AND WHEN TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CULTIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1,000 SQUARE FEET. CHOOSE A MINIMUM OF THREE CERTIFIED BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
- (III) TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES: CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 8 POUNDS PER 1,000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE BLENDED.
- (IV) KENTUCKY BLUEGRASS/FINE FESCUE: SHADE MIXTURE: FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURF AREA MIXTURE INCLUDES: CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30 TO 40 PERCENT AND CERTIFIED FINE FESCUE AND 60 TO 70 PERCENT. SEEDING RATE: 1 1/2 TO 3 POUNDS PER 1,000 SQUARE FEET.

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

- NO EXCESS FILL, CONSTRUCTION MATERIAL OR DEBRIS ARE TO BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
- PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF THE NONTIDAL WETLAND, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
- 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.
- PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO THE NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
- REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLAND, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
- RECTIFY ANY NONTIDAL WETLAND, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
- ALL TEMPORARY SEED STABILIZATION IN THE NONTIDAL WETLAND AND 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 RE-VEGETATION OF NATURAL WETLANDS SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NON-TIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDING AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
- AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATIONS OF NONTIDAL WETLANDS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
- TO PROTECT IMPORTANT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM AS FOLLOWS: CLASS 1 MARCH 1 - JUNE 15, INCLUSIVE, DURING ANY YEAR.
- STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
- CULVERT(S) SHALL BE CONSTRUCTED AND ANY RIP-RAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPROVE WATER.



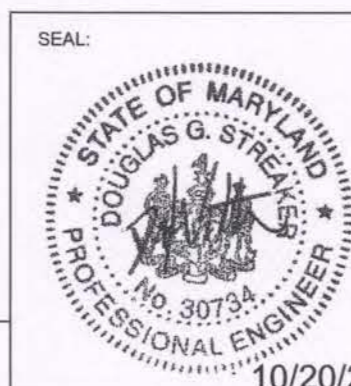
TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR



PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED		DATE	
J. Duffan		12/18/2023	
ASSOCIATE DIRECTOR		DATE	
Frank L. Galosi		12/18/2023	
SECTION HEAD		DATE	
PROJECT MANAGER	CONTRACT NO.	C.I.P.	
PROJECT NO.: 22025.01	SCALE: NTS	BY: GB	CHECK: DS



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

LICENSE NO. 30734  
EXP. DATE: 2024-06-28

DWG/FSC: 42 OF 73

TITLE:

EROSION AND SEDIMENT CONTROL NOTES



**MGWC 1.2: PUMP-AROUND PRACTICE**

Temporary measure for dewatering in-channel construction sites

**DESCRIPTION**

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

**IMPLEMENTATION SEQUENCE**

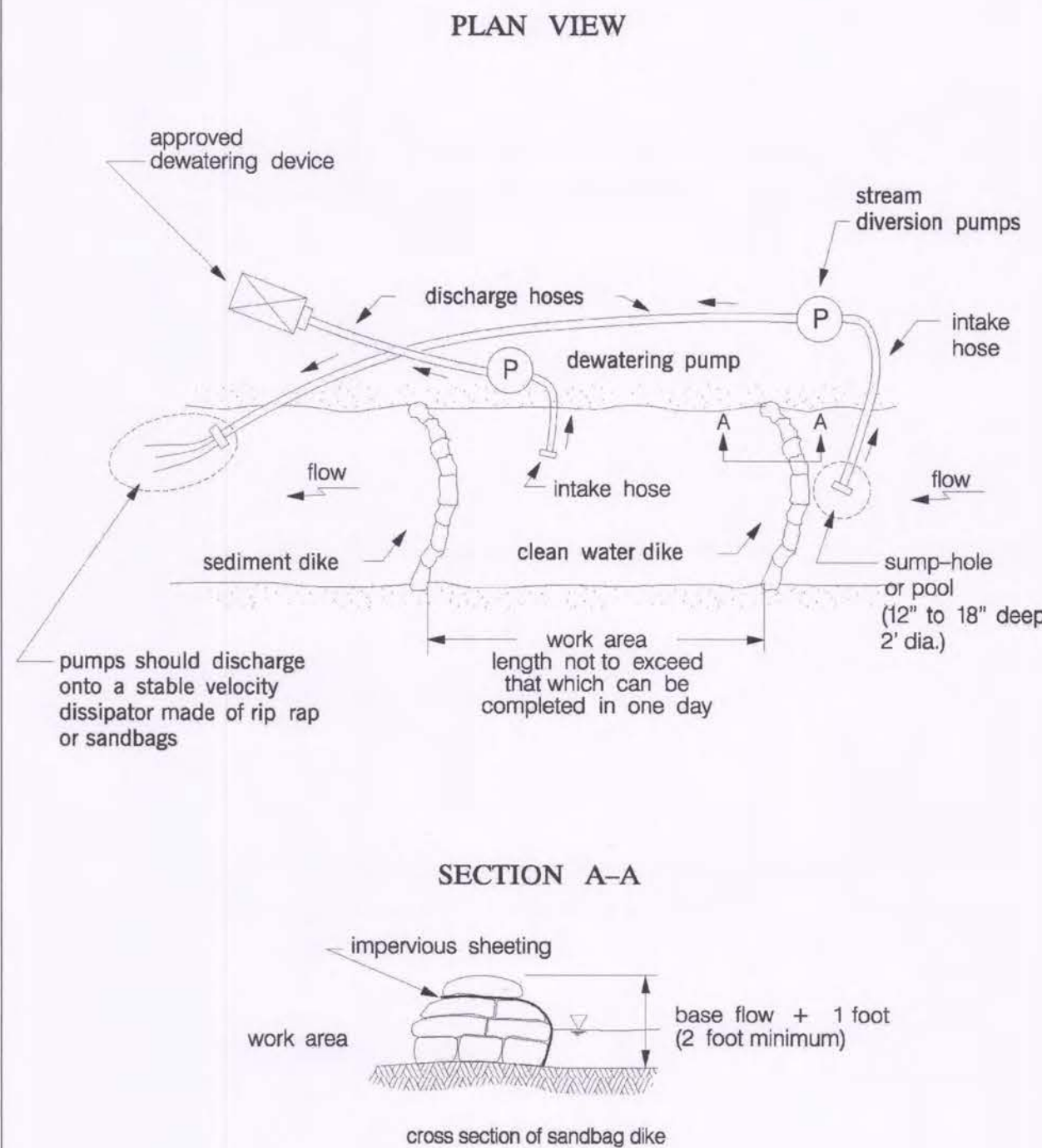
Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

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

**MGWC 1.2: PUMP-AROUND PRACTICE**

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

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



TEMPORARY INSTREAM CONSTRUCTION MEASURES  
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MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION

TEMPORARY INSTREAM CONSTRUCTION MEASURES

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WATERWAY CONSTRUCTION GUIDELINES  
REVISED NOVEMBER 2000

TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATERWAY CONSTRUCTION GUIDELINES  
REVISED NOVEMBER 2000

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**DETAIL F-4 FILTER BAG**

STANDARD SYMBOL:

**CONSTRUCTION SPECIFICATIONS**

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4633
FLOW RATE	70 GAL/MIN/FT <sup>2</sup>	ASTM D-4491
PERMITTIVITY (SEC <sup>-1</sup> )	1.2 SEC <sup>-1</sup>	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
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**DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION**

STANDARD SYMBOL:

**CONSTRUCTION SPECIFICATIONS**

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

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024-06-28

DWG/FSC: 43 OF 73

TITLE: **EROSION AND SEDIMENT CONTROL DETAILS**



**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

*Jeff Dushan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

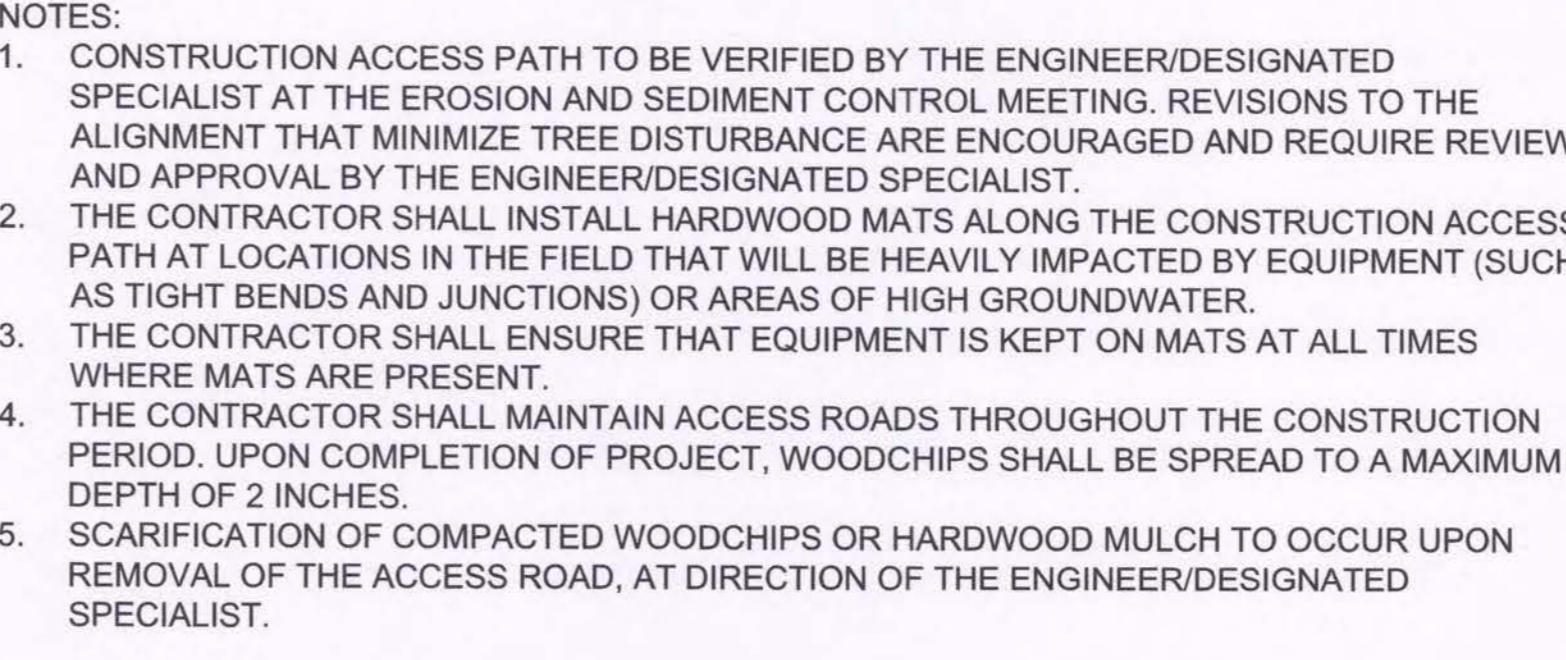
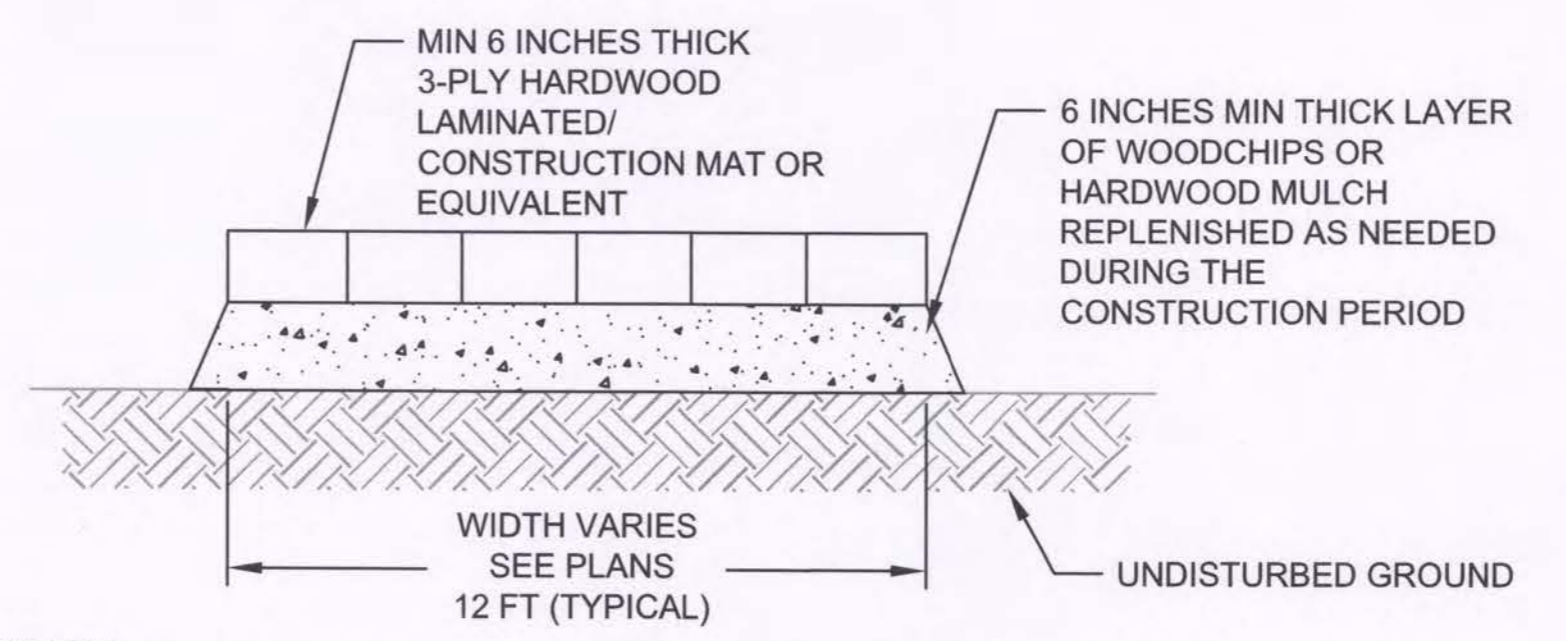
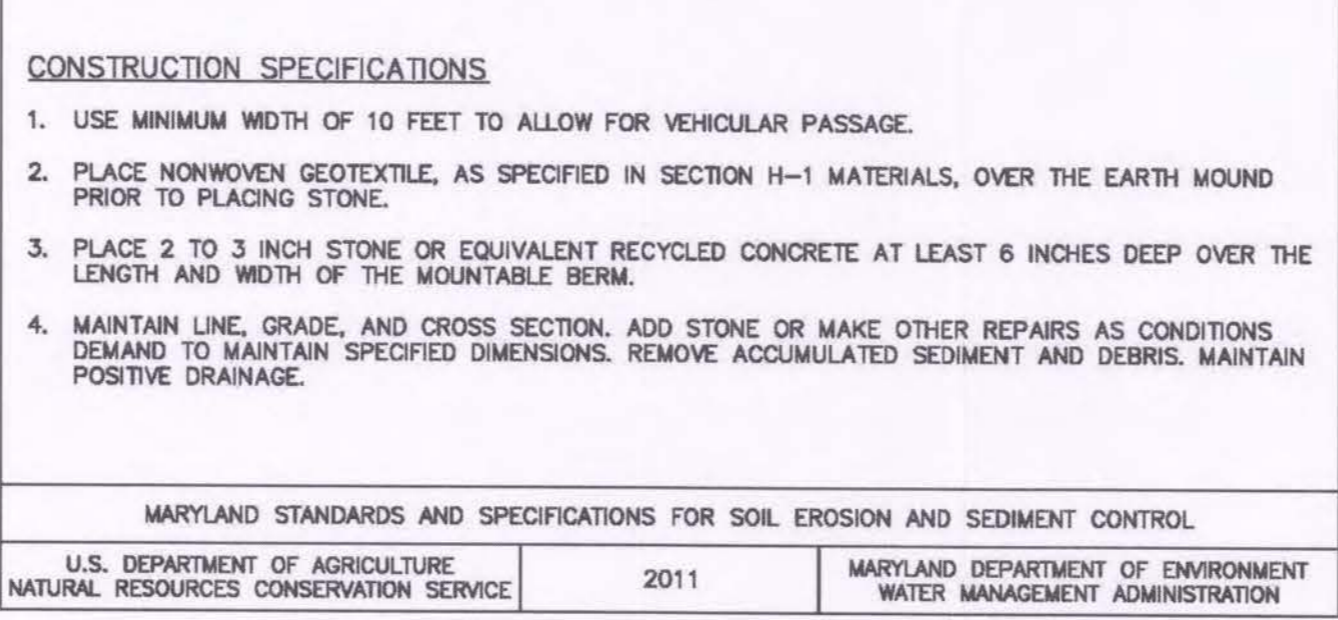
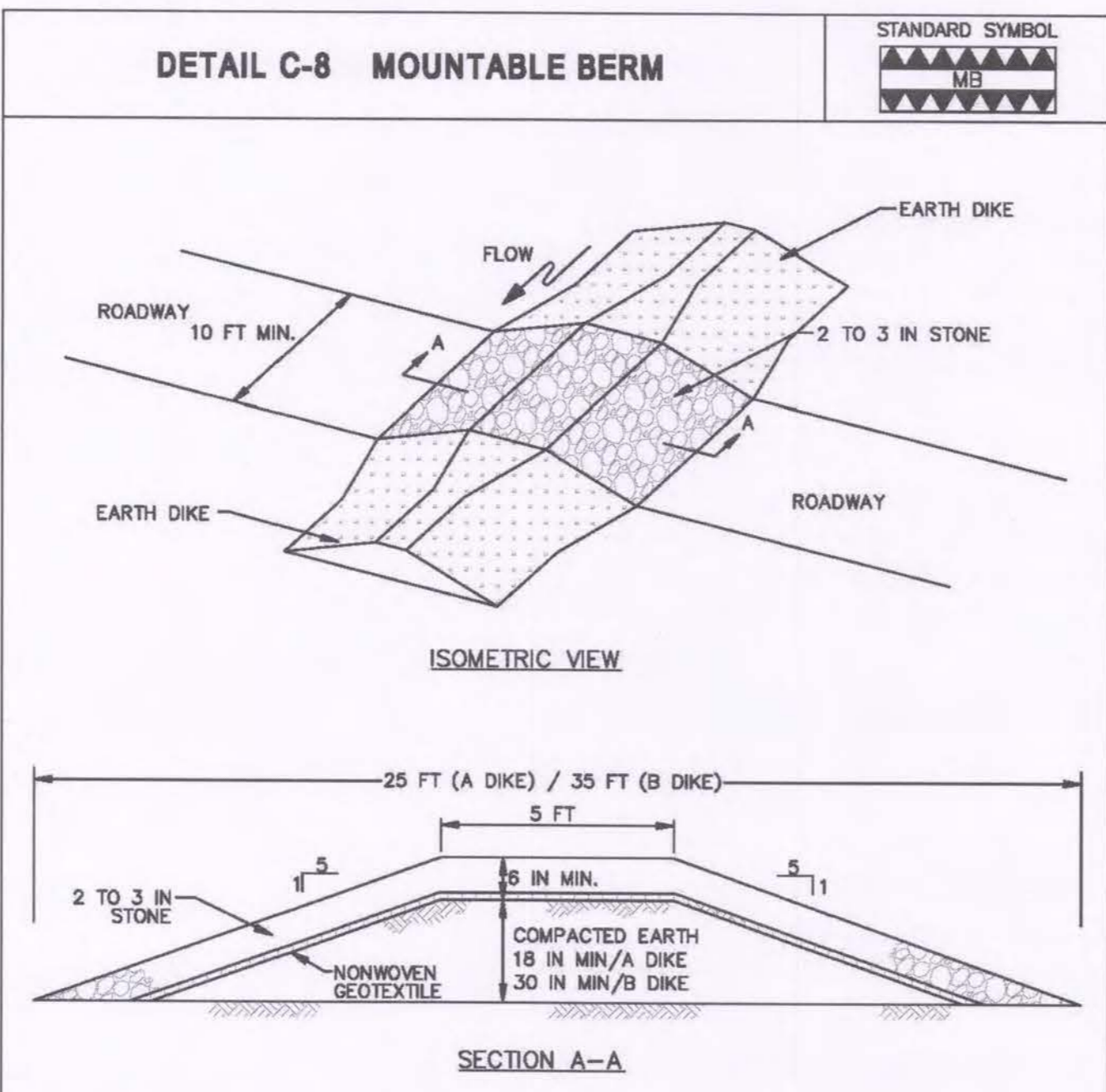
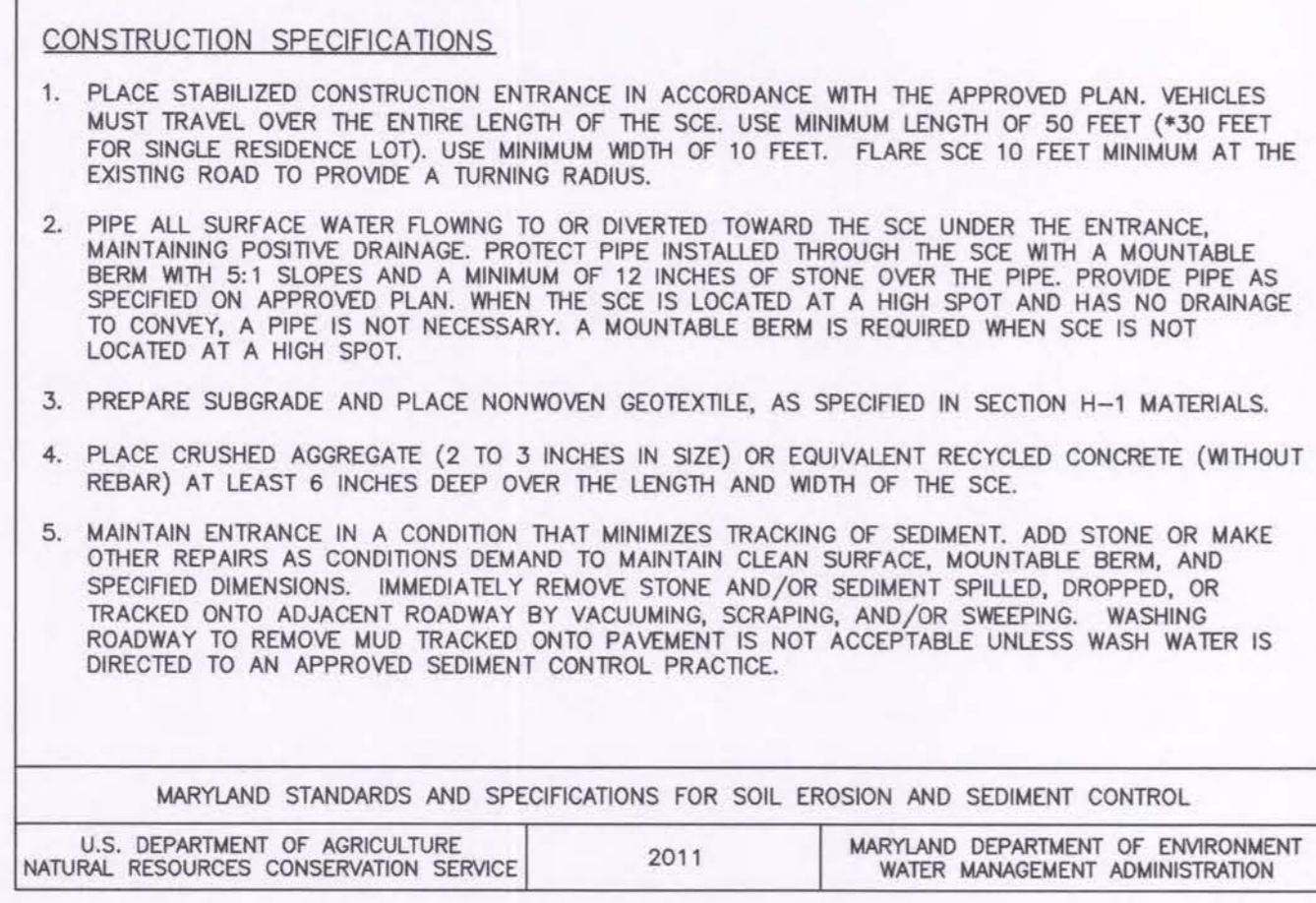
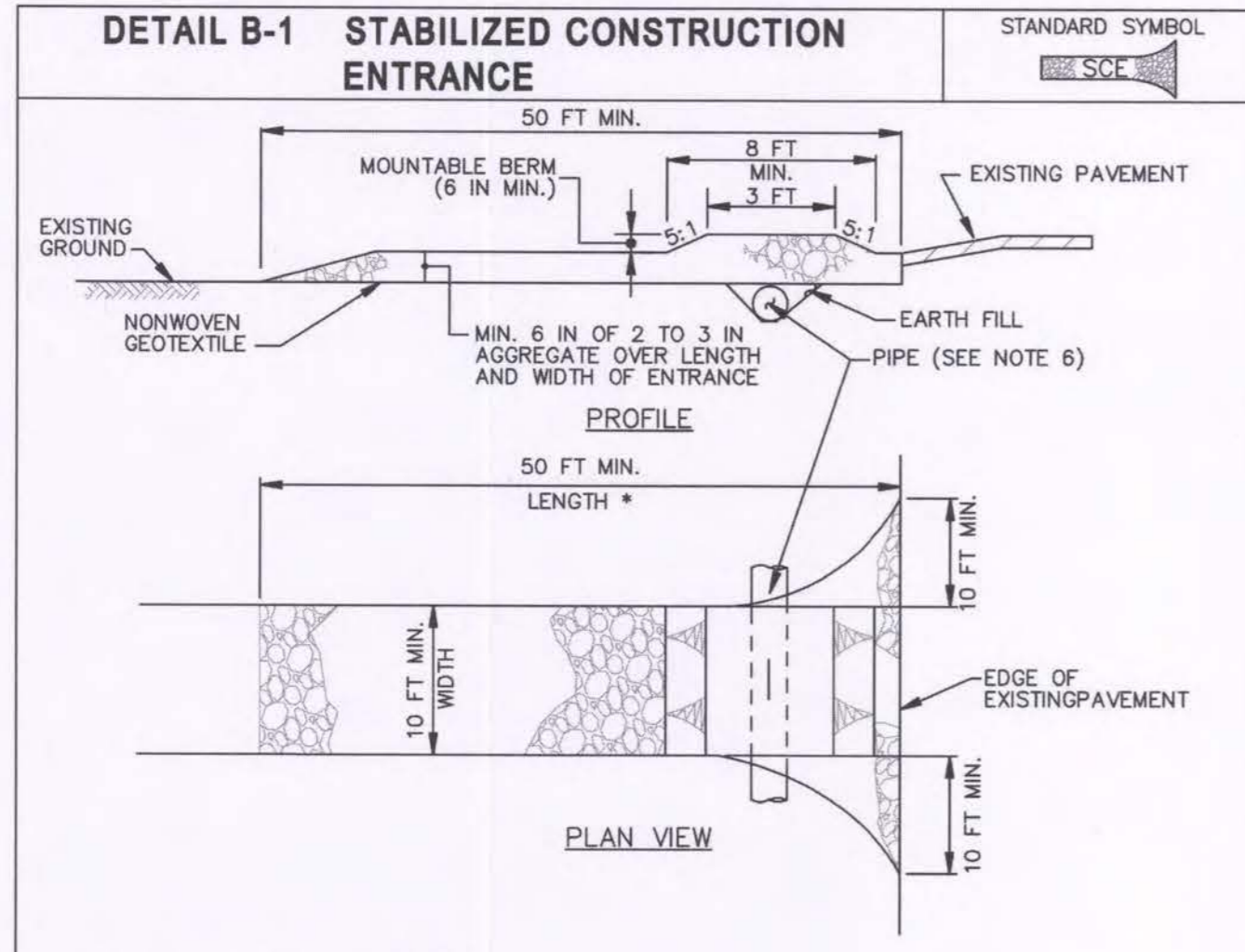
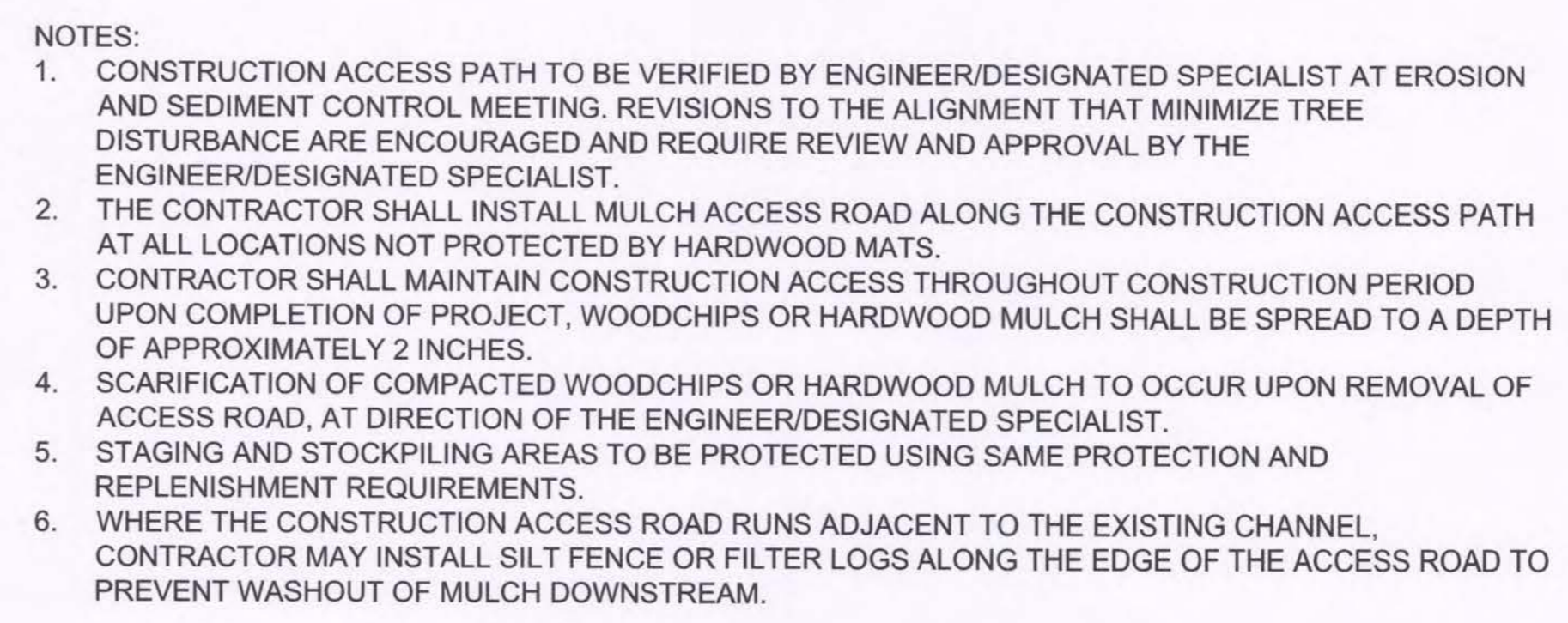
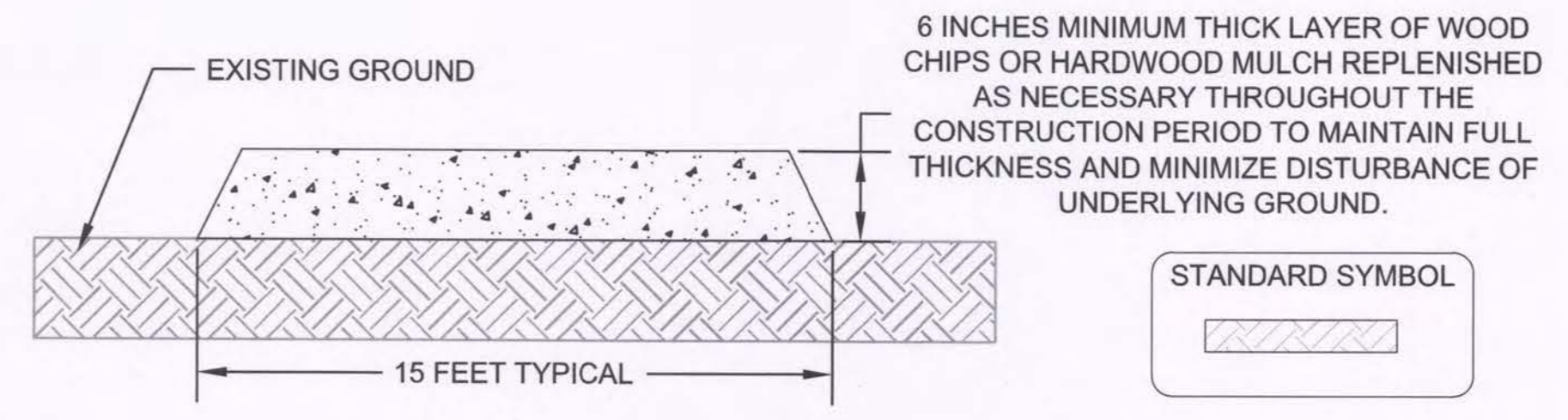
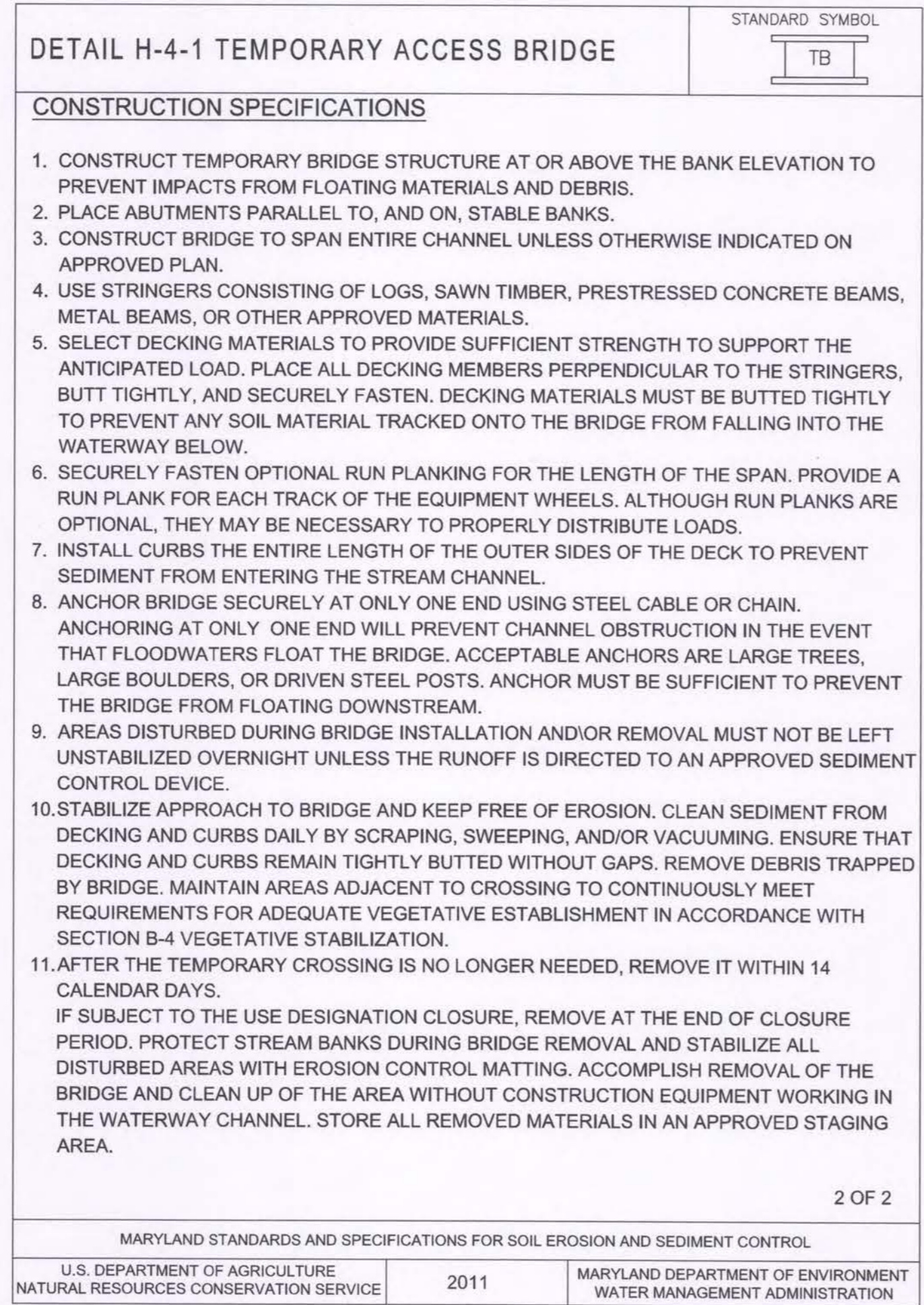
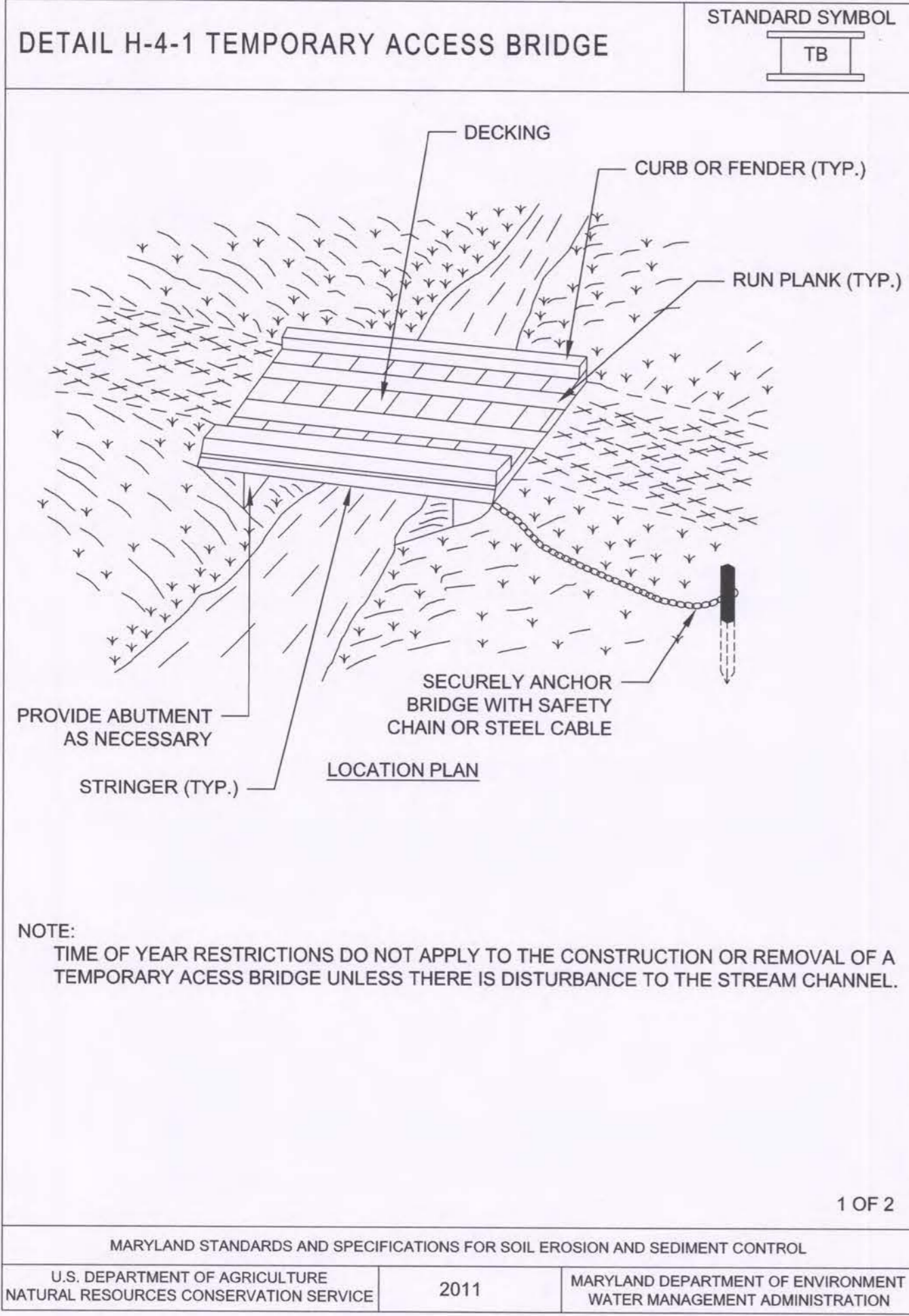
**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

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**TOWN OF EAGLE HARBOR, INCORPORATED 1941**

23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

**PRINCE GEORGE'S COUNTY, MARYLAND**  
ELECTION DISTRICT 9

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

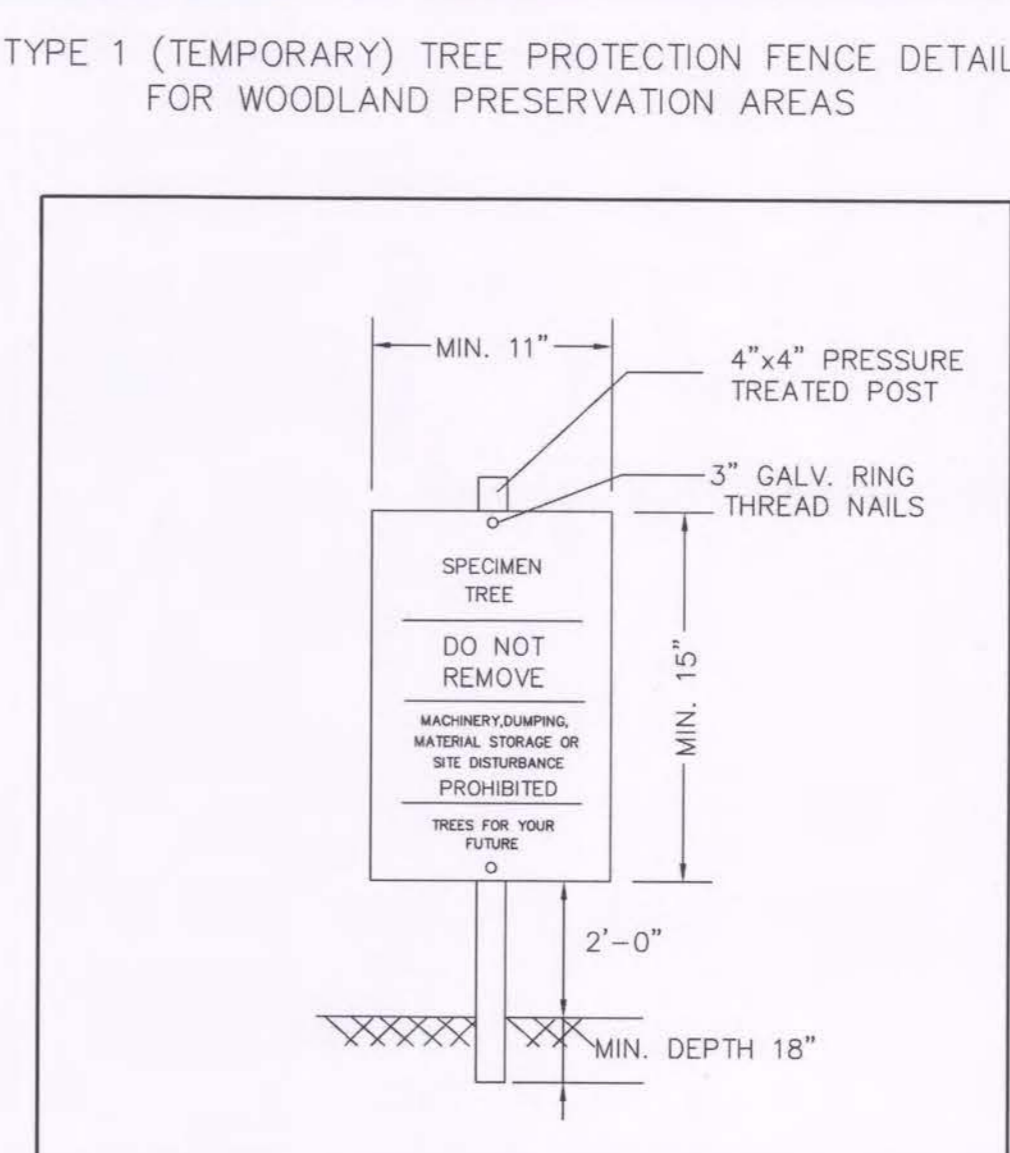
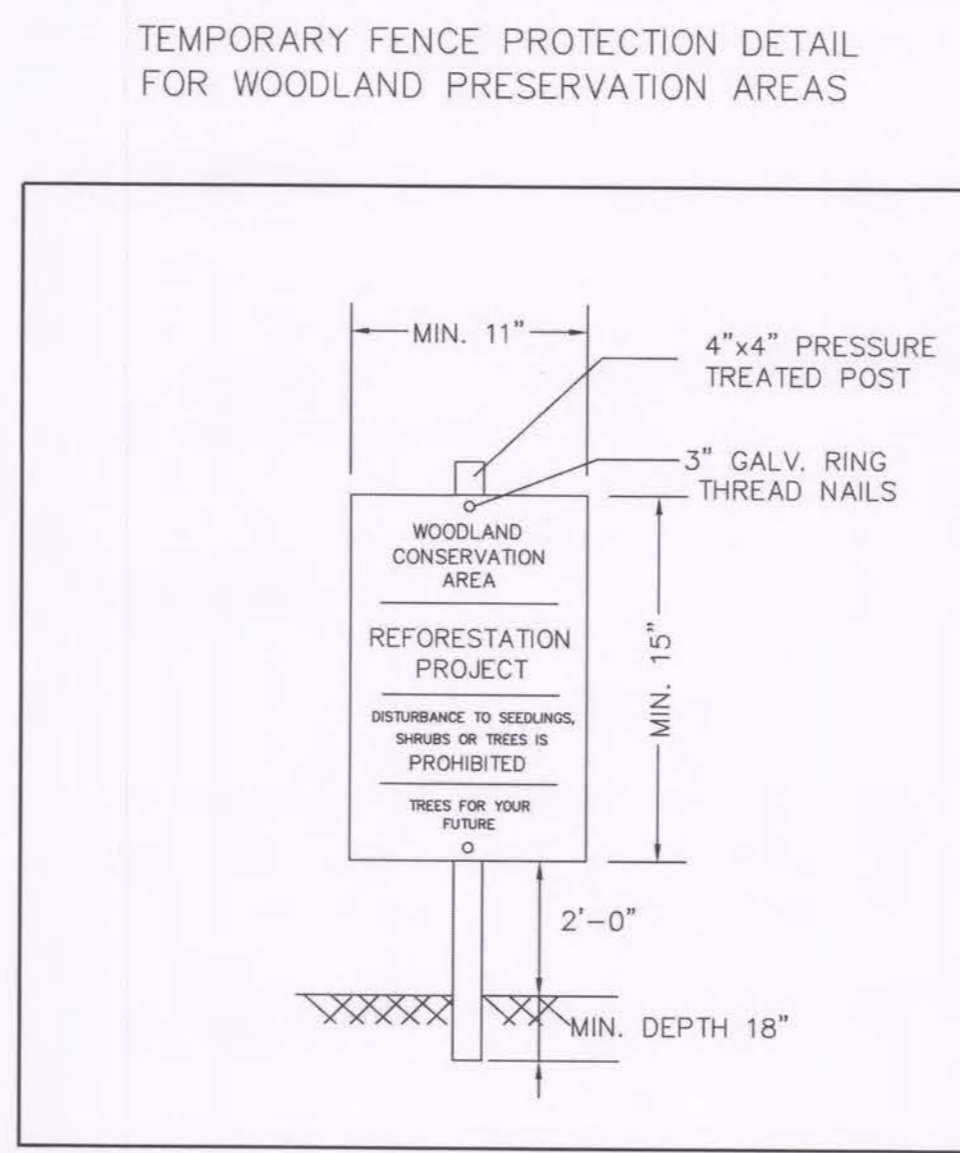
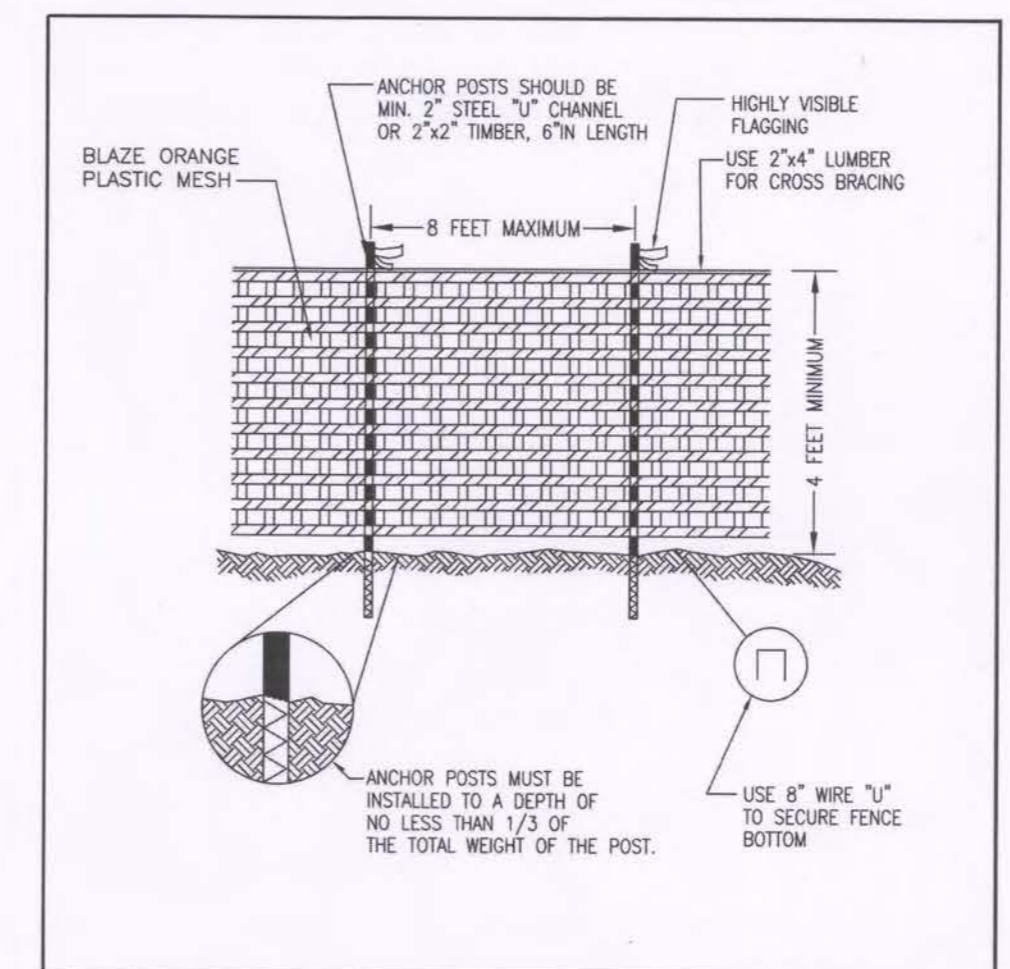
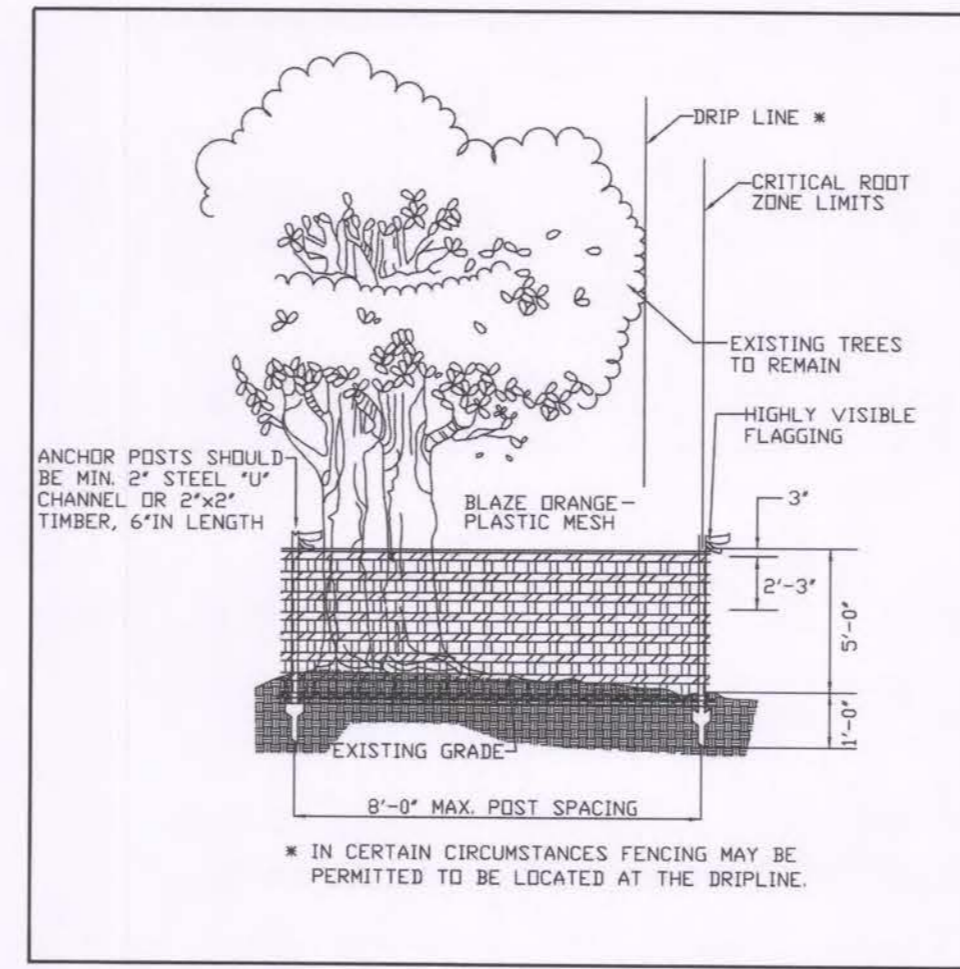
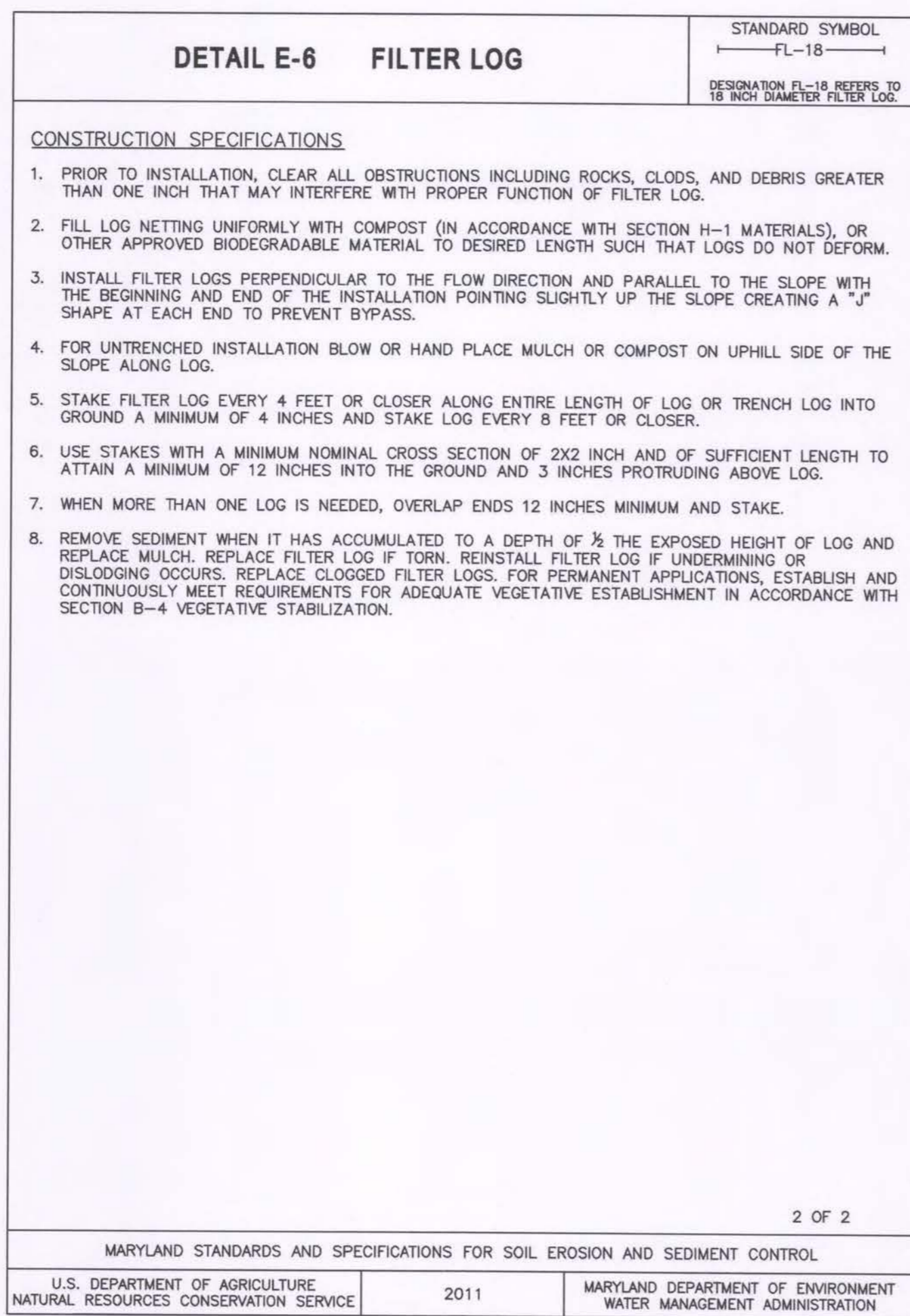
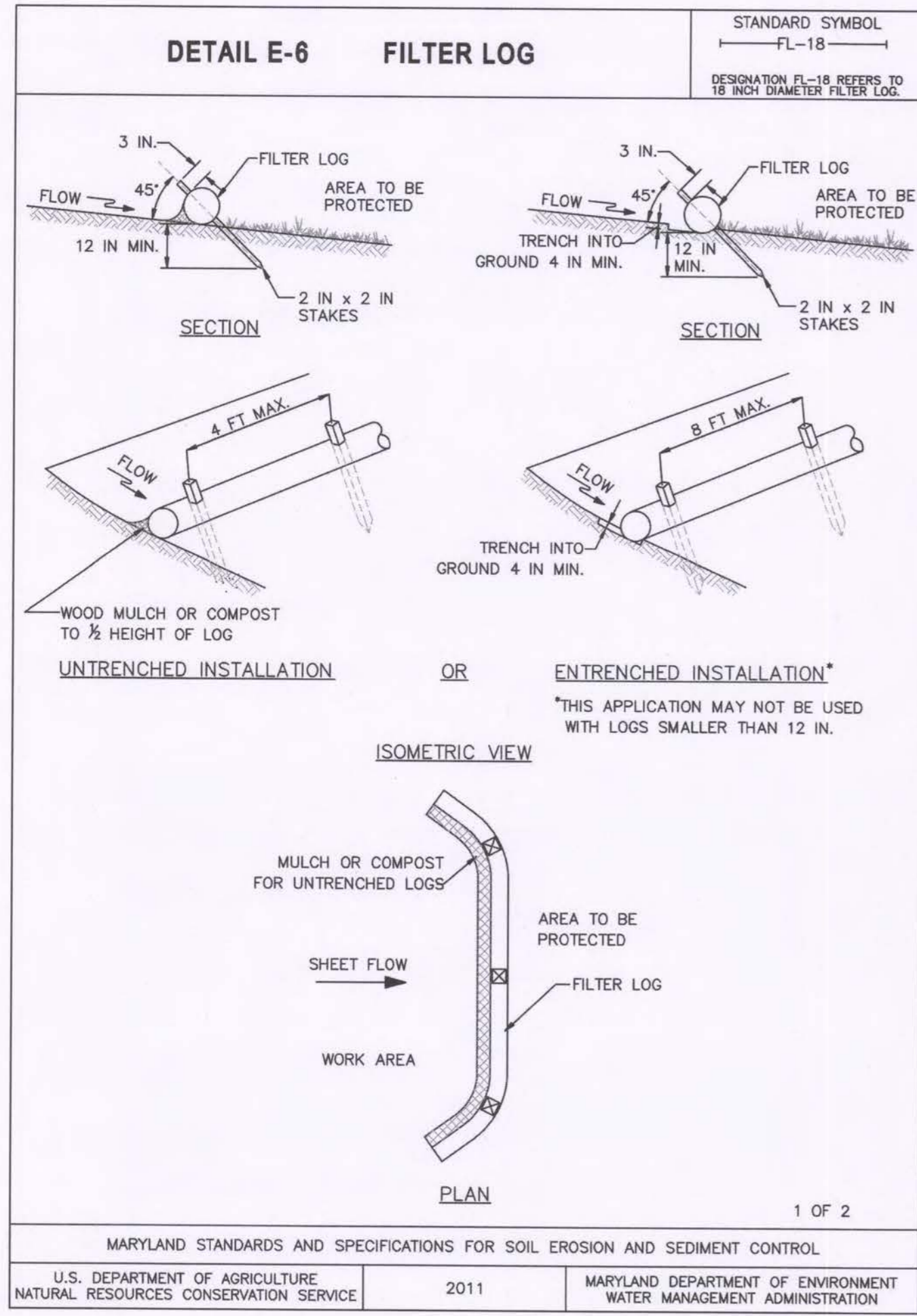
APPROVED	<i>Jeff Duffan</i>	12/18/2023
	ASSOCIATE DIRECTOR	DATE
APPROVED	<i>Frank L. Galosi</i>	12/18/2023
	SECTION HEAD	DATE
PROJECT MANAGER	CONTRACT NO.	C.I.P.
PROJECT NO.: 22025.01	SCALE: NTS	BY: GB
	CHECK: DS	

**EROSION AND SEDIMENT CONTROL DETAILS**

DWG/FSC: 44 OF 73

PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024-06-28  
10/20/23





REFORESTATION AREA SIGN

SPECIMEN TREE SIGN



DWG/FSC: 45 OF 73  
TITLE: EROSION AND SEDIMENT CONTROL DETAILS

SEAL: DOUGLAS G. STREIBER, PROFESSIONAL ENGINEER, LICENSE NO. 30734, EXP. DATE: 2024-06-28

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TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
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PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

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ELECTION DISTRICT 9

APPROVED: *Jeff Duffan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**



NOTES: SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATION FOR MARYLAND". CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION, PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENETIC LINE.

(C) IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES: CENTRAL MD: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6B) SOUTHERN MD, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7A,7B)

(D) TILL AREAS TO RECEIVE SEED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCH LEVEL AND RAKE THE AREAS TO PREPARE A PROPER SEEDBED. REMOVE STONES AND DEBRIS OVER 1/2 INCH IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY.

(E) IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (1/2 INCH EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS, OR ON ADVERSE SITES.

PERMANENT SEEDING SUMMARY

Seed Mixture (Hardiness Zone 7a)					Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P205	K20	
9	TALL FESCUE	60	2/15 - 4/30	1/4" - 1/2"	1 lb/1000 sf	2 lb/1000 sf	2 lb/1000 sf	2 tons/ac (90 lb/1000 sf)
	PERENNIAL RYEGRASS	20	8/15 - 10/31	1/4" - 1/2"				
	KENTUCKY RYEGRASS	40						
					225 lbs/ac 10-20-20			

NOTE: PERMANENT SEED SPECIFIED FOR THIS PROJECT IS REFERENCED IN LANDSCAPE PLANS LS-01 TO LS-13

SOD TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).

- (1) GENERAL SPECIFICATIONS
- (A) CLASS OF TURFGRASS SOD MUST BE MARYLAND CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
  - (B) SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4 INCH, PLUS OR MINUS 1/8 INCH. AT THE TIME OF CUTTING, MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP GROWTH AND THATCH. BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.
  - (C) STANDARD SIZE SECTIONS OF SOD MUST BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM GRASP ON THE UPPER 10 PERCENT OF THE SECTION.
  - (D) SOD MUST NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.
  - (E) SOD MUST BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD NOT TRANSPLANTED WITHIN THIS PERIOD MUST BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO INSTALLATION.

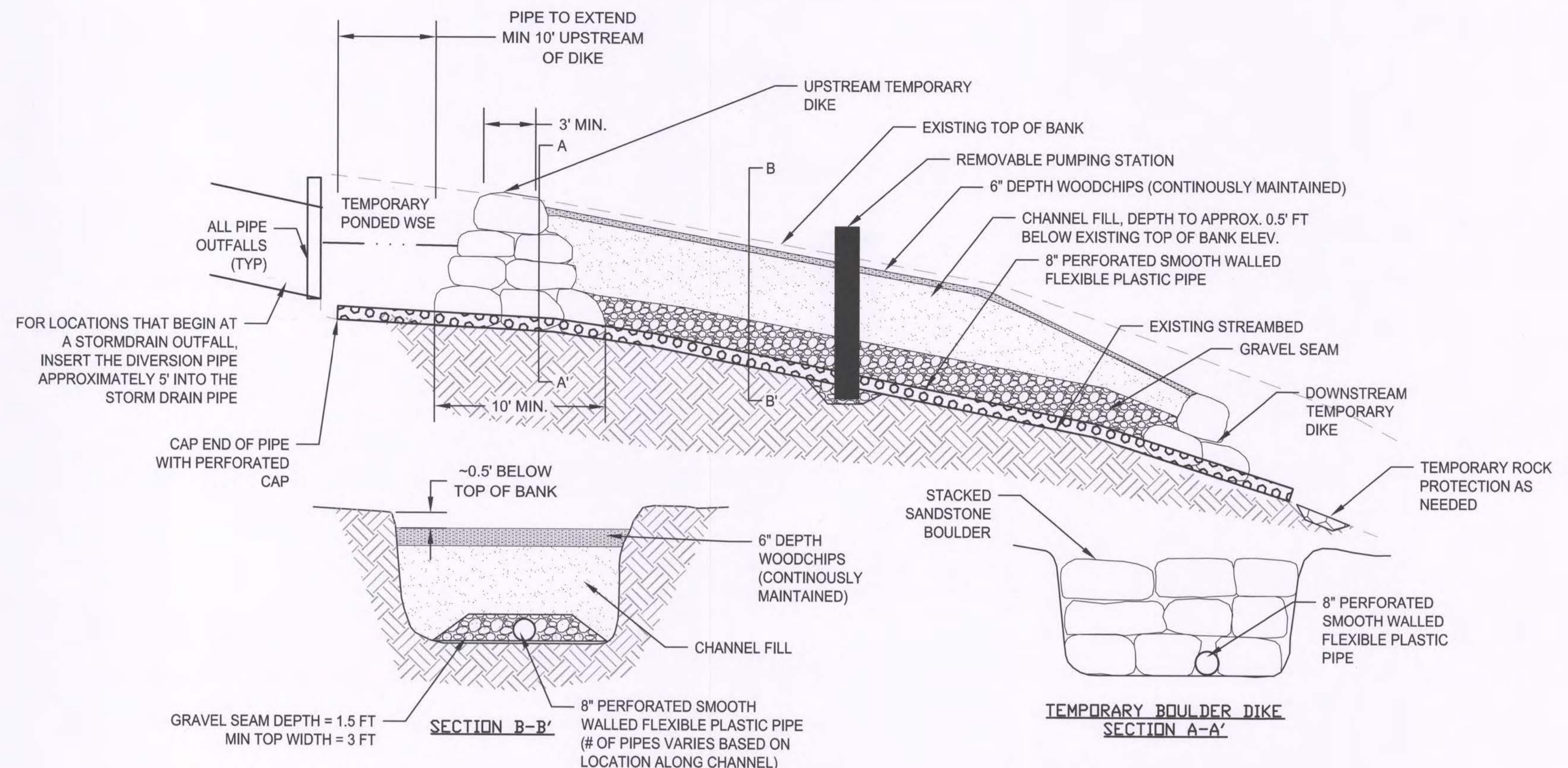
- (2) SOD INSTALLATION
- (A) DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD.
  - (B) LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.
  - (C) WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO PREVENT SLIPPAGE ON SLOPES. ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.
  - (D) WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD WITHIN EIGHT HOURS.

- (3) SOD MAINTENANCE
- (A) IN THE ABSENCE OF ADEQUATE RAINFALL, WATER DAILY DURING THE FIRST WEEK OR AS OFTEN AND SUFFICIENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF 4 INCHES. WATER SOD DURING THE HEAT OF THE DAY TO PREVENT WILTING.
  - (B) AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT.
  - (C) DO NOT MOW UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN 1/2 OF THE GRASS LEAF MUST BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. MAINTAIN A GRASS HEIGHT OF AT LEAST 3 INCHES UNLESS OTHERWISE SPECIFIED.
- D. NOTE: USE OF THIS INFORMATION DOES NOT PRECLUDE MEETING ALL OF THE REQUIREMENTS OF THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL B-4 VEGETATIVE STABILIZATION.

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

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

FOR STOCKPILE AREA, MATERIALS TO BE STOCKPILED AT A MAXIMUM HEIGHT OF 20 FT AND A MAXIMUM 2:1 SLOPE.



IN CHANNEL HAUL ROAD/ BASE FLOW DIVERSION

NOT TO SCALE

BASE FLOW DIVERSION NOTES:

1. INSTALL A 6" PERFORATED FLEXIBLE DIVERSION PIPE ALONG THE EXISTING CHANNEL THALWEG FROM THE UPSTREAM END OF THE WORK AREA TO THE DOWNSTREAM LIMIT, ENSURING THAT DIVERSION PIPE DISCHARGES TO A STABLE SURFACE.
2. FOR LOCATIONS THAT BEGIN AT A STORM DRAIN OUTFALL, INSERT THE DIVERSION PIPE APPROXIMATELY 5' INTO THE STORM DRAIN PIPE IF POSSIBLE. HEIGHT OF PIPE ABOVE STREAMBED MAY ELIMINATE THIS.
3. CAP THE UPSTREAM END OF THE PIPE WITH A PERFORATED END CAP.
4. IF NEEDED, SECURE ENTIRE LENGTH OF DIVERSION PIPE EVERY 15 FT WITH SANDBAGS, STAKES AND WIRE TIES TO KEEP PIPE IN PLACE AS FILL IS INSTALLED ABOVE IT. FOR THE LENGTH OF PIPE INSERTED INTO A STORM DRAIN PIPE, SECURE WITH SANDBAGS ALONG ENTIRE LENGTH OF INSERTED PIPE.
5. INSTALL UP AND DOWNSTREAM DIKES USING SANDBAGS OR BOULDERS. BEGIN INSTALLING GRAVEL SEAM, FILLING OVERTOP THE DIVERSION PIPE. KEEP DIVERSION PIPE ABOVE UPSTREAM DIKE EXPOSED TO ALLOW PONDED WATER TO CONTINUOUSLY DRAIN.
6. APPROXIMATELY EVERY 200 TO 300 FT OF CHANNEL, INSTALL A 24" PERFORATED HDPE PIPE VERTICALLY FROM BELOW GRAVEL SEAM TO A MIN OF 24" ABOVE FLOODPLAIN GRADE ALONG THE BANK TO FUNCTION AS A REMOVABLE PUMPING STATION. REMOVABLE PUMPING STATION SHALL BE USED AS SUMP PIT FOR DEWATERING PURPOSES AS NEEDED.
7. INSTALL 6 INCHES OF WOODCHIPS AS SURFACE OF HAUL ROAD, TYPICALLY LOCATED WITHIN 0.5' OF EXISTING TOP OF BANK.
8. CONTRACTOR SHALL ACTIVELY MAINTAIN DIVERSION PIPE AND IN-CHANNEL HAUL ROAD DURING DURATION OF ITS USE.
9. A STREAM PUMP AROUND SHALL BE USED IN TANDEM WITH DIVERSION PIPE WHEN NECESSARY TO MAINTAIN A DRY WORK AREA.
10. WHEN DIVERSION PIPE AND GRAVEL SEAM ARE WITHIN 3' OF THE FINISHED SURFACE, DIVERSION PIPE SHALL BE REMOVED AND GRAVEL SEAM INTERRUPTED TO RESTORE FLOW TO SURFACE. WHEN DIVERSION PIPE AND GRAVEL SEAM ARE GREATER THAN 3' FROM THE FINISHED SURFACE, DIVERSION PIPE MAY REMAIN BURIED. CONTRACTOR SHALL INTERRUPT PREFERENTIAL FLOW ALONG GRAVEL SEAM TO MAXIMUM EXTENT PRACTICABLE AND ENSURE PIPE REMAINS BURIED.



TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR



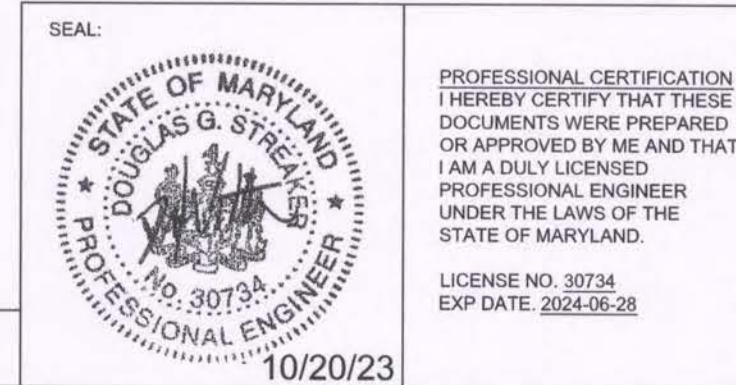
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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGES COUNTY

ELECTION DISTRICT 9

Jeff Darlan 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED Frank L. Galosi 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: NTS BY: GB CHECK: DS



PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP DATE: 2024-06-28

DWG/FSC: 46 OF 73


TITLE:

EROSION AND SEDIMENT CONTROL DETAILS

EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT



**PLANTING LEGEND - TCP**

-  WOODLAND REFORESTATION AREA (WRA): PATUXENT HEADWATER SWAMP FOREST
-  WOODLAND REFORESTATION AREA (WRA): PATUXENT MESIC FOREST
-  NATIVE TURF ESTABLISHMENT
-  REFORESTATION/AFFORESTATION SIGN

NOTE: NO SPECIFIC PLANTING SCHEDULE IS PROPOSED WITHIN THE HANDWORK AREAS. L.O.W. AREAS SHALL BE SUPPLEMENTED AT THE DIRECTION OF THE DESIGNATED SPECIALIST WITH MD COASTAL PLAIN RIPARIAN MIX - ERNMX - 732 WORKED INTO THE UPPER LAYER OF EXISTING GROUND.

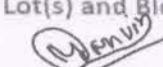


MATCHLINE - SHEET 48

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY


The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.


Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
 Case Number: **COM-2023-02230**  
 Case Type: **CIP WQ**  
 Issuance Date: **12/15/2023**  
 Address: **00000 HAWKINS DR AQUASCO, Maryland 20608**  
 Lot(s) and Block(s):

 **Tanvir Bhuiyan**

- Conditions of Approval**
- The above approval is conditioned upon the following:
- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
  - Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
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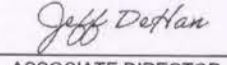



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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

	12/18/2023		
ASSOCIATE DIRECTOR	DATE		
	12/18/2023		
SECTION HEAD	DATE		
PROJECT MANAGER	CONTRACT NO.	C.I.P.	
PROJECT NO.: 22025.01	SCALE: 1" = 20'	BY: GB	CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

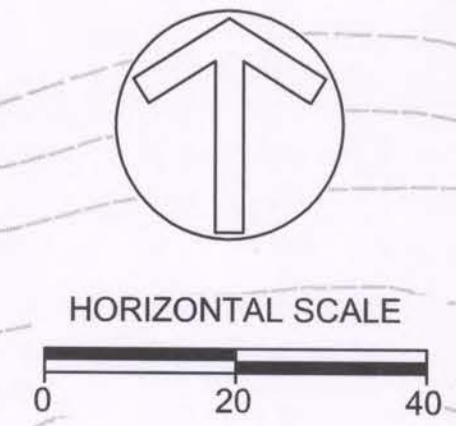
  
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DWG/FSC: 47 OF 73

TITLE: **LANDSCAPE PLAN**

PROFESSIONAL CERTIFICATION  
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 LICENSE NO. 30734  
 EXP DATE: 2024-06-28

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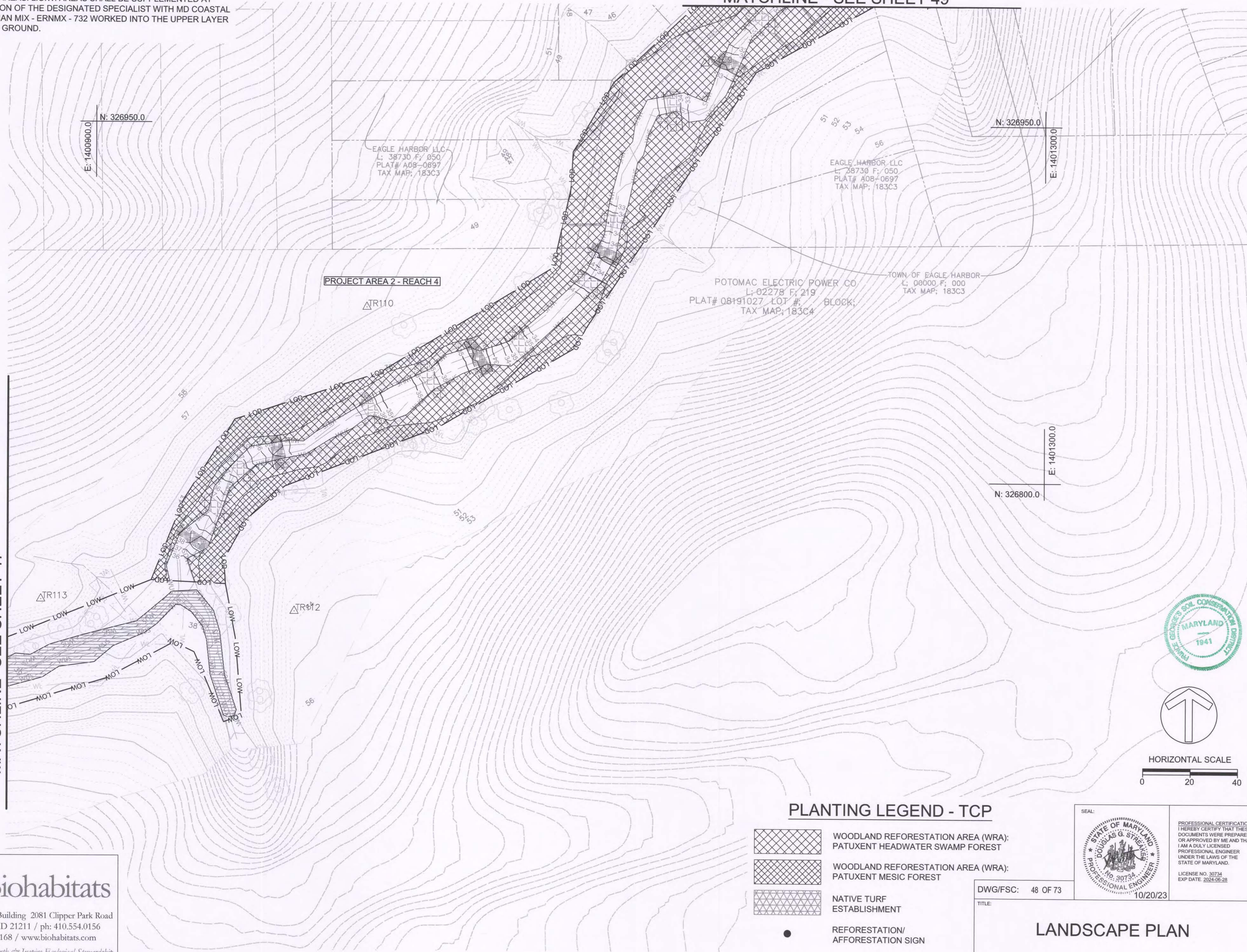




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MATCHLINE - SEE SHEET 49

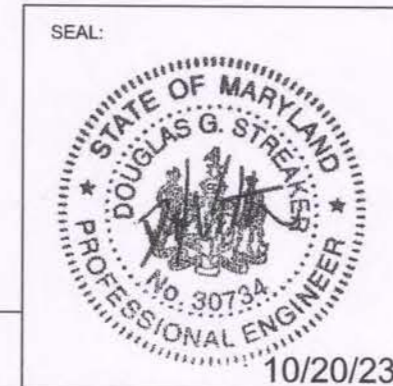
MATCHLINE - SEE SHEET 47



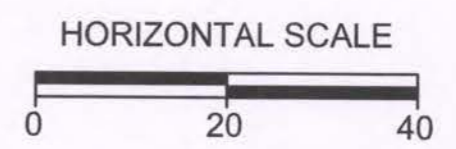
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-  NATIVE TURF ESTABLISHMENT
-  REFORESTATION/AFFORESTATION SIGN



DWG/FSC: 48 OF 73  
 TITLE: LANDSCAPE PLAN



Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
 Case Number: 22025.01  
 Case Type: CIP WQ  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):  
 Tanvir Bhuiyan

- Conditions of Approval**
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**GreenVest**  
 VISION - PERFORMANCE - RESULTS

**TOWN OF EAGLE HARBOR**  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR



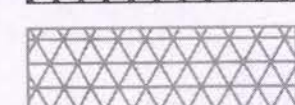

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
 ELECTION DISTRICT 9

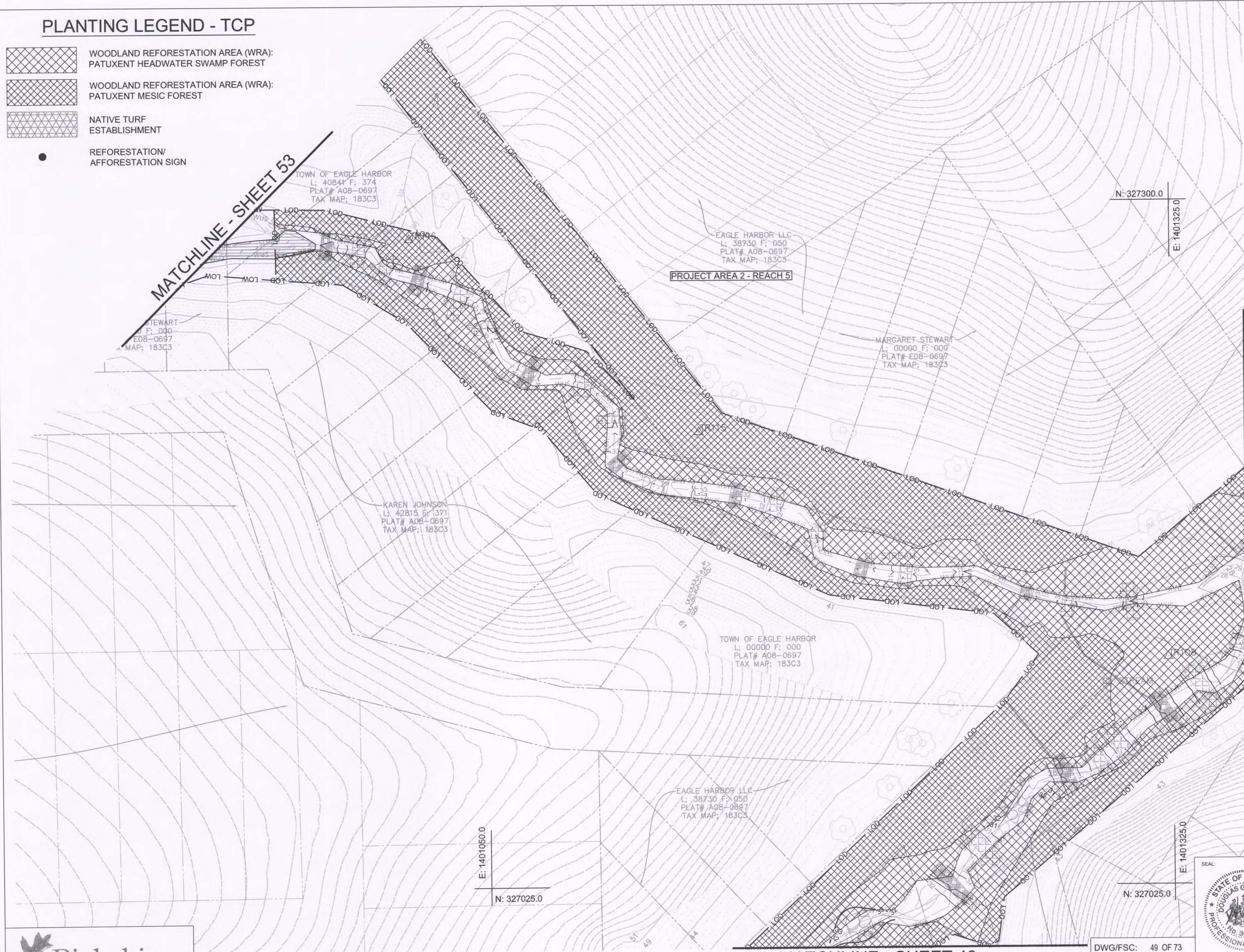
<i>Jeff Duffin</i> ASSOCIATE DIRECTOR	12/18/2023 DATE
<i>Frank L. Galosi</i> SECTION HEAD	12/18/2023 DATE
PROJECT MANAGER	CONTRACT NO.
PROJECT NO.: 22025.01	SCALE: 1" = 20'
BY: GB	CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**



**PLANTING LEGEND - TCP**

-  WOODLAND REFORESTATION AREA (WRA): PATUXENT HEADWATER SWAMP FOREST
-  WOODLAND REFORESTATION AREA (WRA): PATUXENT MESIC FOREST
-  NATIVE TURF ESTABLISHMENT
-  REFORESTATION/AFFORESTATION SIGN



MATCHLINE - SHEET 50

MATCHLINE - SHEET 53

MATCHLINE - SHEET 48

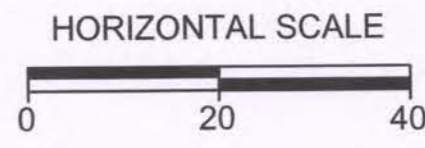
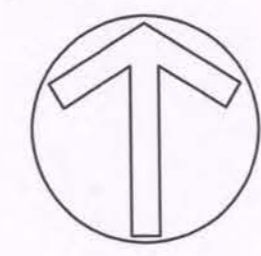
E: 1401050.0  
N: 327025.0

N: 327300.0  
E: 1401325.0

E: 1401325.0  
N: 327025.0

DWG/FSC: 49 OF 73  
TITLE:

**LANDSCAPE PLAN**



PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 30734  
EXP. DATE: 2024-06-28

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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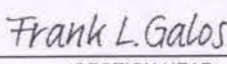
Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
Case Number: 22025.01  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
 **Tanvir Bhuiyan** ENVIRONMENT

- Conditions of Approval**
- The above approval is conditioned upon the following:
- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
  - Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
  - This approval does NOT represent a permit to construct.



**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
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NOAH E. WATERS, PHD, MAYOR

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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

 JEFF DURLAN ASSOCIATE DIRECTOR		12/18/2023 DATE
 FRANK L. GALOSI SECTION HEAD		12/18/2023 DATE
PROJECT MANAGER		CONTRACT NO.
PROJECT NO.: 22025.01	SCALE: 1" = 20'	BY: GB
		CHECK: DS





**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

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

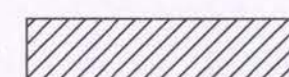
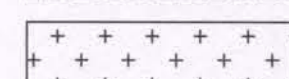


NOTE: NO SPECIFIC PLANTING SCHEDULE IS PROPOSED WITHIN THE HANDWORK AREAS. L.O.W. AREAS SHALL BE SUPPLEMENTED AT THE DIRECTION OF THE DESIGNATED SPECIALIST WITH MD COASTAL PLAIN RIPARIAN MIX - ERNMX - 732 WORKED INTO THE UPPER LAYER OF EXISTING GROUND.



**PLANTING LEGEND - TCP**

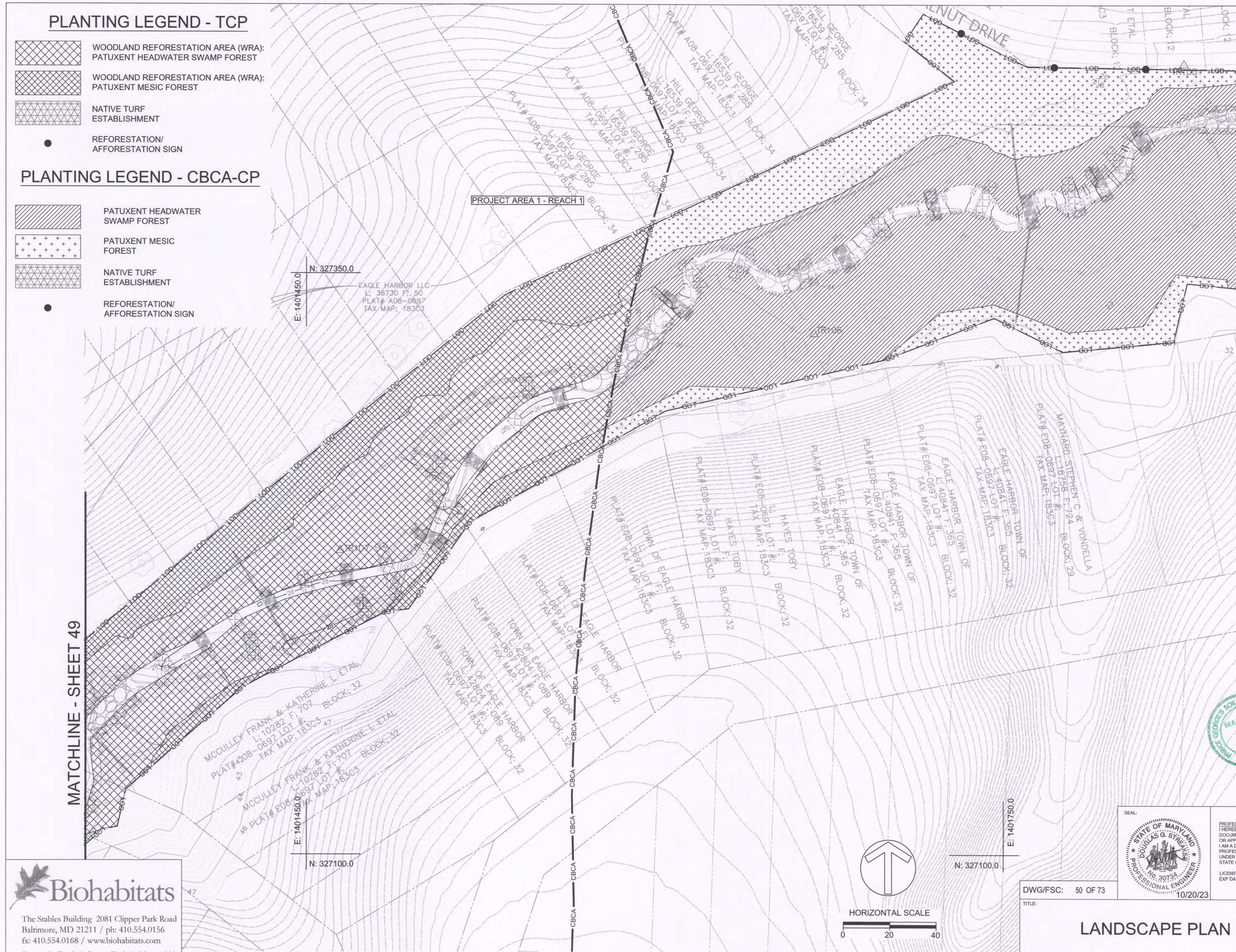
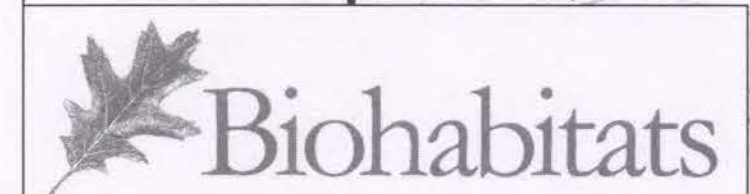
-  WOODLAND REFORESTATION AREA (WRA): PATUXENT HEADWATER SWAMP FOREST
-  WOODLAND REFORESTATION AREA (WRA): PATUXENT MESIC FOREST
-  NATIVE TURF ESTABLISHMENT
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**PLANTING LEGEND - CBCA-CP**

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-  PATUXENT MESIC FOREST
-  NATIVE TURF ESTABLISHMENT
-  REFORESTATION/AFFORESTATION SIGN

MATCHLINE - SHEET 49

MATCHLINE - SHEET 51

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

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY


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Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
 Case Number: **CPM19202230**  
 Case Type: **CIP WQ**  
 Issuance Date: **12/15/2023**  
 Address: **00000 HAWKINS DR AQUASCO, Maryland 20608**  
 Lot(s) and Block(s):

 **Tanvir Bhuiyan** ENVIRONMENT

- Conditions of Approval**
- The above approval is conditioned upon the following:
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 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

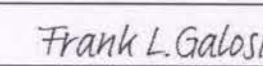
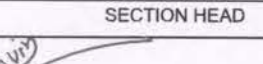
PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

SEAL: 

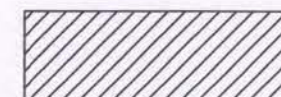
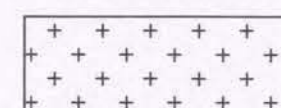


PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP DATE: 2024-06-28  
 10/20/23

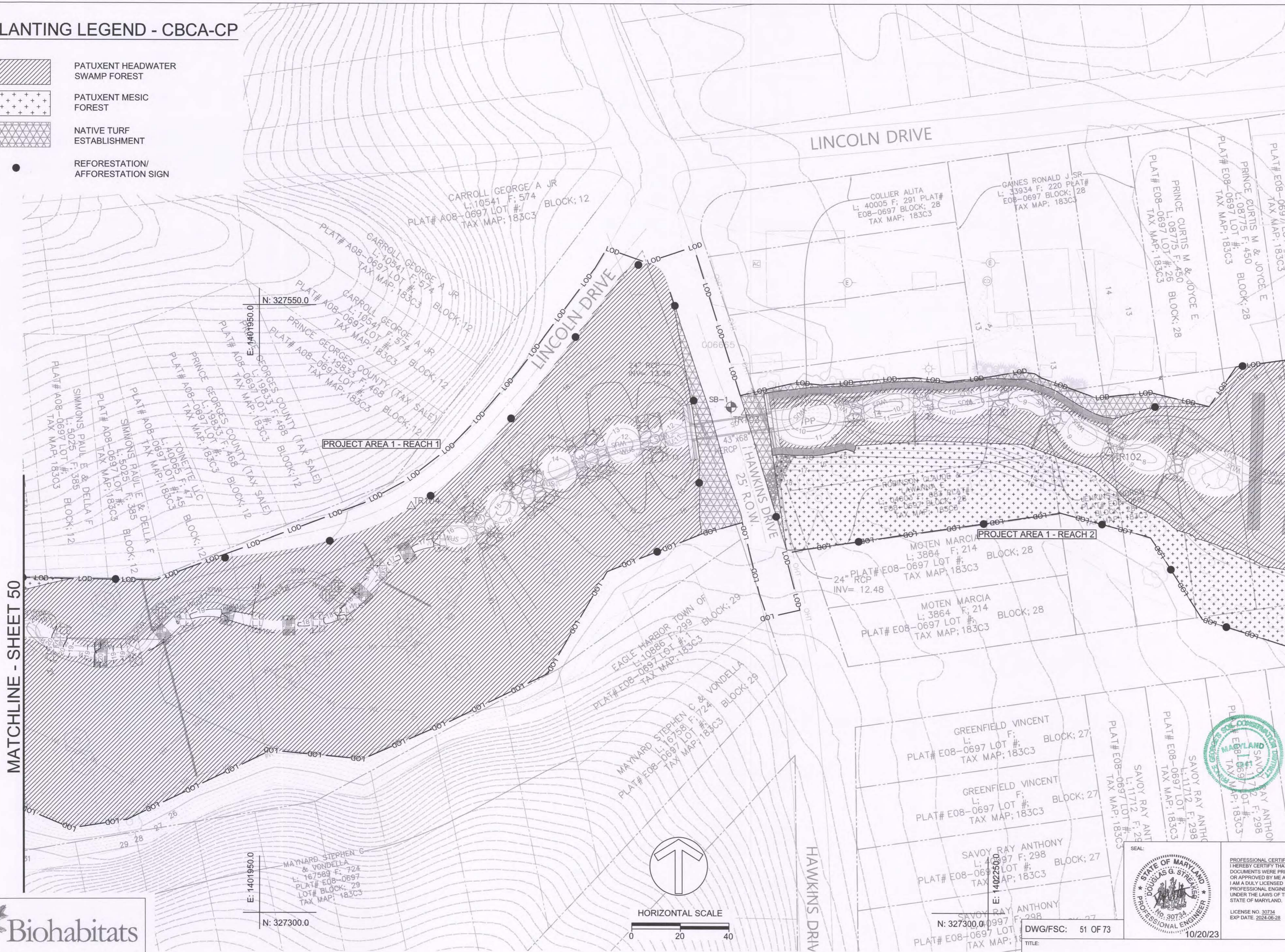
APPROVED		12/18/2023
	ASSOCIATE DIRECTOR	DATE
		12/18/2023
	SECTION HEAD	DATE
PROJECT NO.:	22025.01	SCALE: 1" = 20'
BY:	GB	CHECK: DS

DWG/FSC: 50 OF 73  
 TITLE: **LANDSCAPE PLAN**



**PLANTING LEGEND - CBCA-CP**

-  PATUXENT HEADWATER SWAMP FOREST
-  PATUXENT MESIC FOREST
-  NATIVE TURF ESTABLISHMENT
-  REFORESTATION/AFFORESTATION SIGN



MATCHLINE - SHEET 52

MATCHLINE - SHEET 50

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Number: **22025.01**  
Case Type: **CIP WQ**  
Issuance Date: **12/15/2023**  
Address: **00000 HAWKINS DR AQUASCO, Maryland 20608**  
Lot(s) and Block(s):  
**Tanvir Bhuiyan**

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NOAH E. WATERS, PHD, MAYOR

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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
ELECTION DISTRICT 9

APPROVED: *Jeff Deffen* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER: *Tanvir Bhuiyan* CONTRACT NO.: 22025.01 C.I.P. PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS



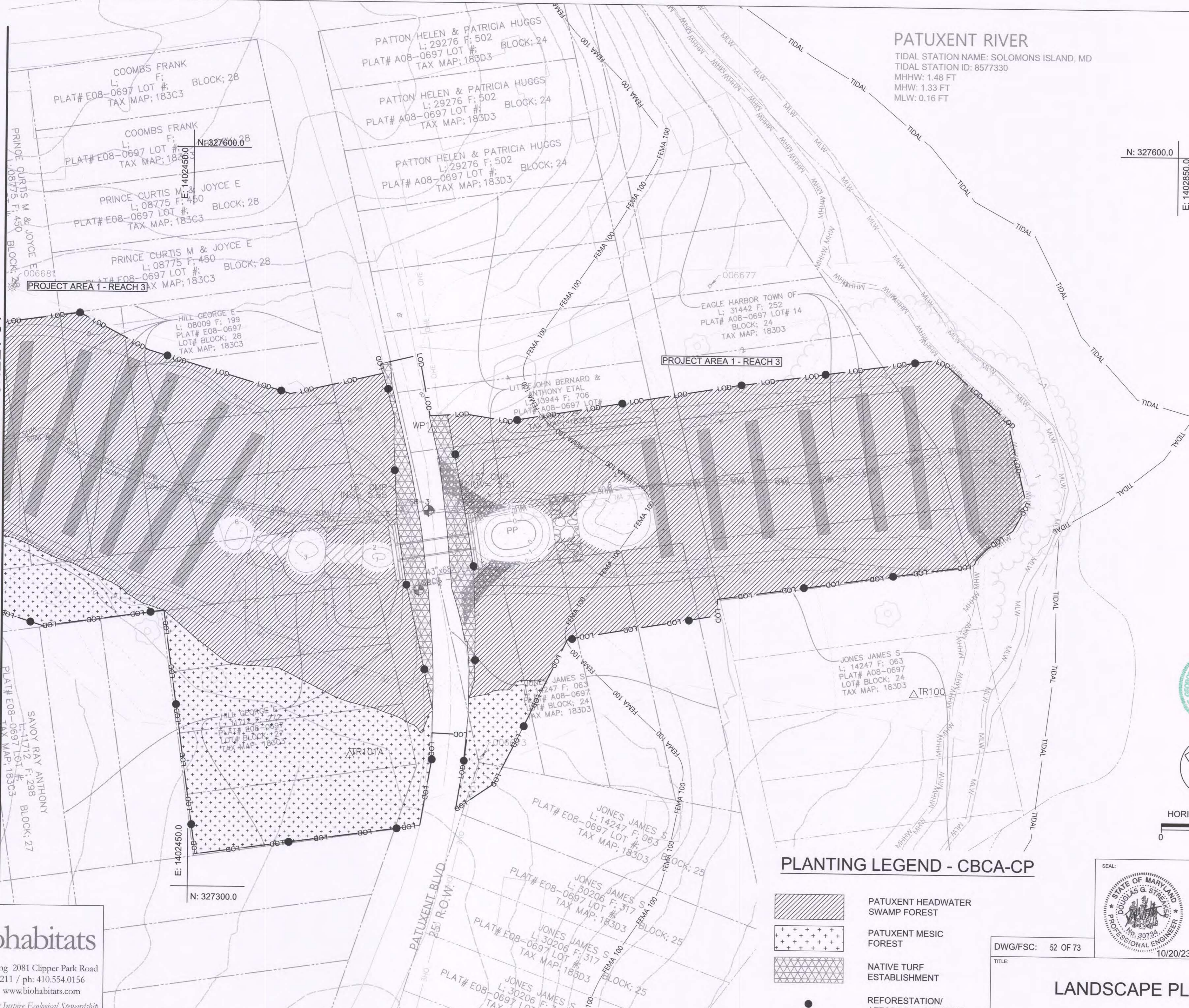
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LICENSE NO. 30734  
EXP. DATE: 10/20/23

**LANDSCAPE PLAN**

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




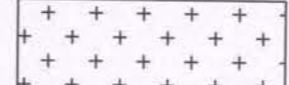


MATCHLINE - SHEET 51



**PATUXENT RIVER**  
TIDAL STATION NAME: SOLOMONS ISLAND, MD  
TIDAL STATION ID: 8577330  
MHHW: 1.48 FT  
MHW: 1.33 FT  
MLW: 0.16 FT

N: 327600.0  
E: 1402850.0

**PLANTING LEGEND - CBCA-CP**

-  PATUXENT HEADWATER SWAMP FOREST
-  PATUXENT MESIC FOREST
-  NATIVE TURF ESTABLISHMENT
-  REFORESTATION/AFFORESTATION SIGN



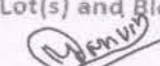
DWG/FSC: 52 OF 73  
TITLE:

**LANDSCAPE PLAN**

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
Case Number: 2023-0001  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):

 **Tanvir Bhuiyan**

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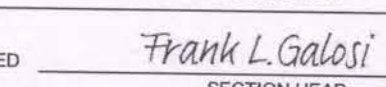


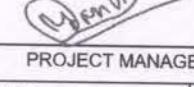
**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

APPROVED:  **Frank L. Galosi** 12/18/2023  
ASSOCIATE DIRECTOR DATE

PROJECT MANAGER:  **Douglas G. Strey** 12/18/2023  
SECTION HEAD DATE

PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

**Biohabitats**

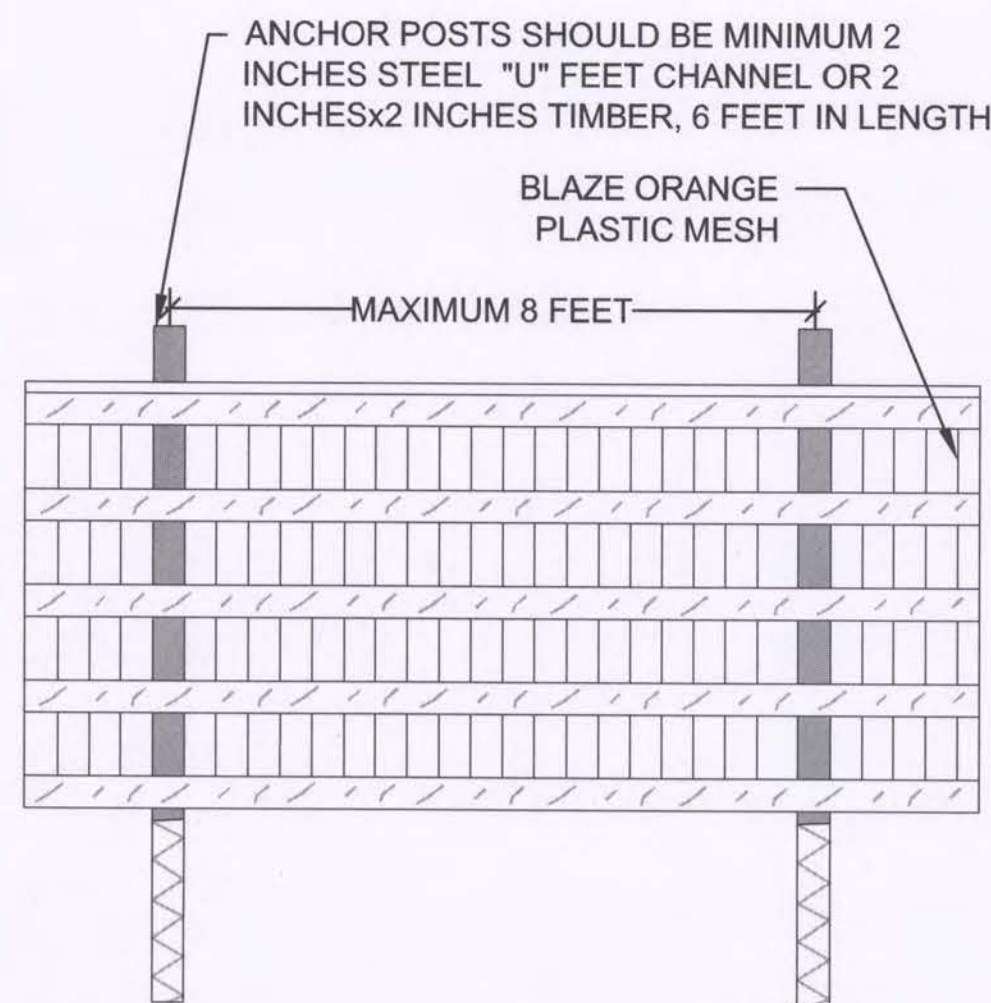
The Stables Building 2081 Clipper Park Road  
Baltimore, MD 21211 / ph: 410.554.0156  
fx: 410.554.0168 / www.biohabitats.com

Restore the Earth & Inspire Ecological Stewardship









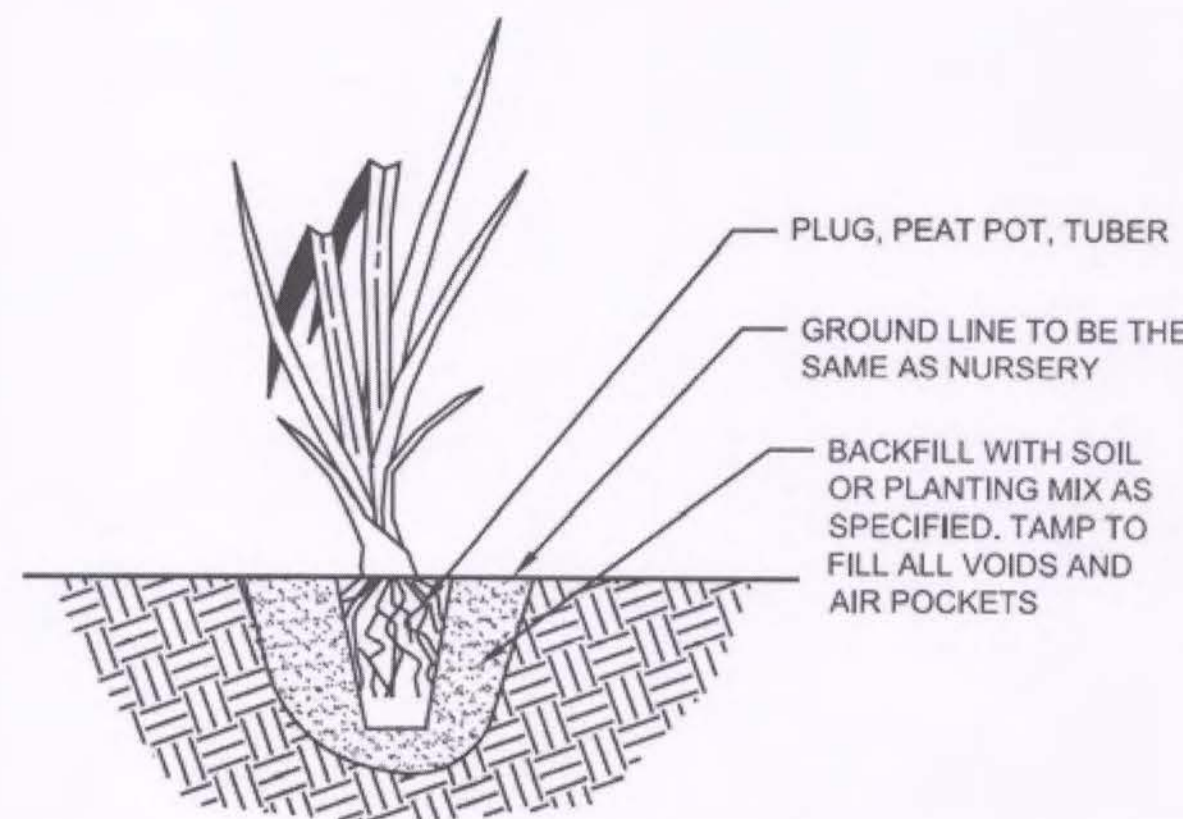
ANCHOR POSTS MUST BE INSTALLED TO A DEPTH OF NO LESS THAN 1/3 OF THE TOTAL HEIGHT OF POST.

NOTES:

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

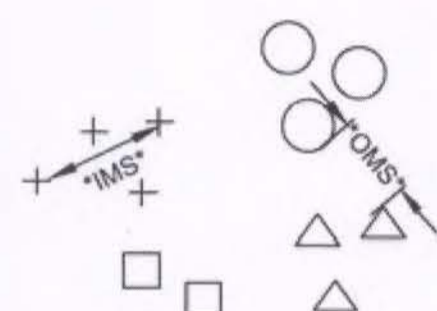
**TREE PROTECTION FENCE**

NOT TO SCALE



**HERBACEOUS PLANTING - PLUGS**

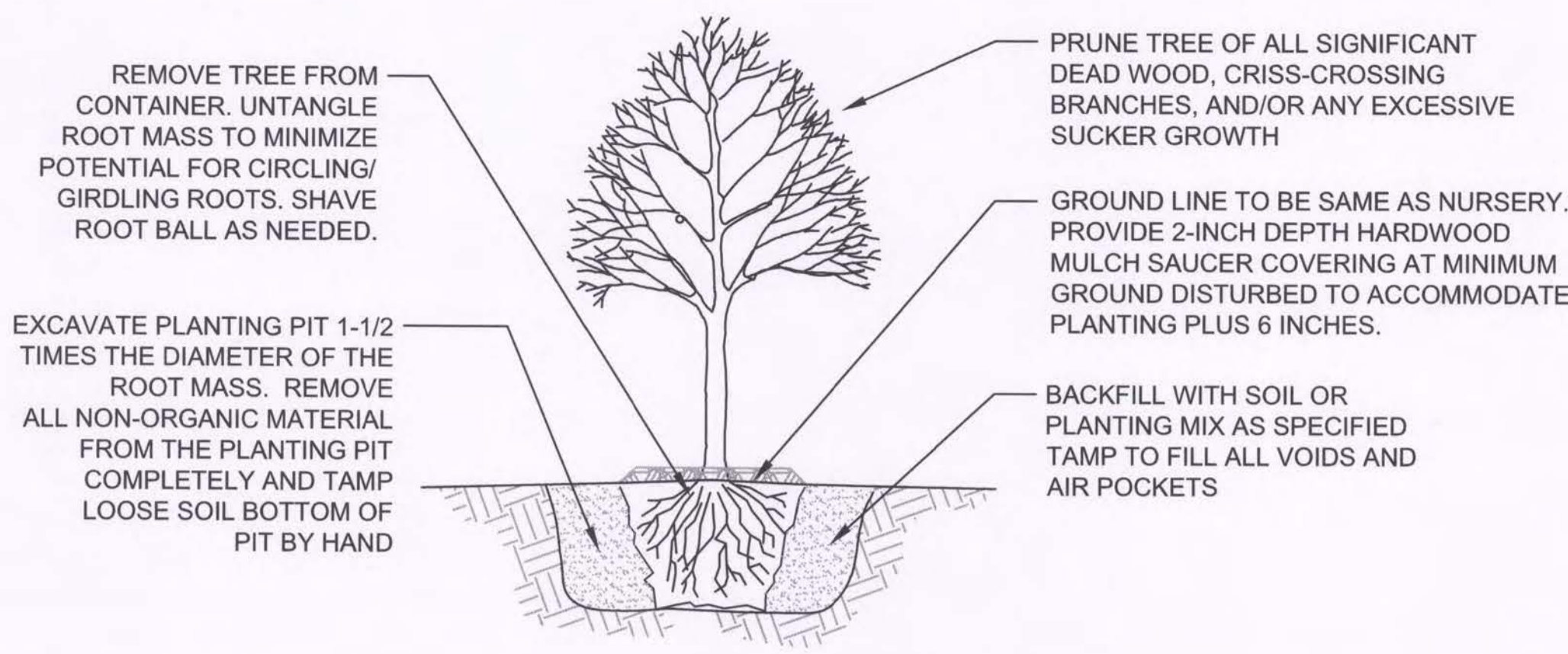
NOT TO SCALE



NOTE: CLUSTERS SHALL CONTAIN AT LEAST 3 INDIVIDUALS BUT NO MORE THAN 11.  
 OMS- AN OVERALL MINIMUM SPACING DISTANCE OMS IS ASSIGNED TO THE PLANTING CONFIGURATION (SEE PLANT SCHEDULE)  
 IMS- AN INDIVIDUAL MINIMUM SPACING DISTANCES IMS IS ASSIGNED TO EACH INDIVIDUAL SPECIES (SEE PLANT SCHEDULE)  
 EACH SYMBOL INDICATES A DIFFERENT SPECIES

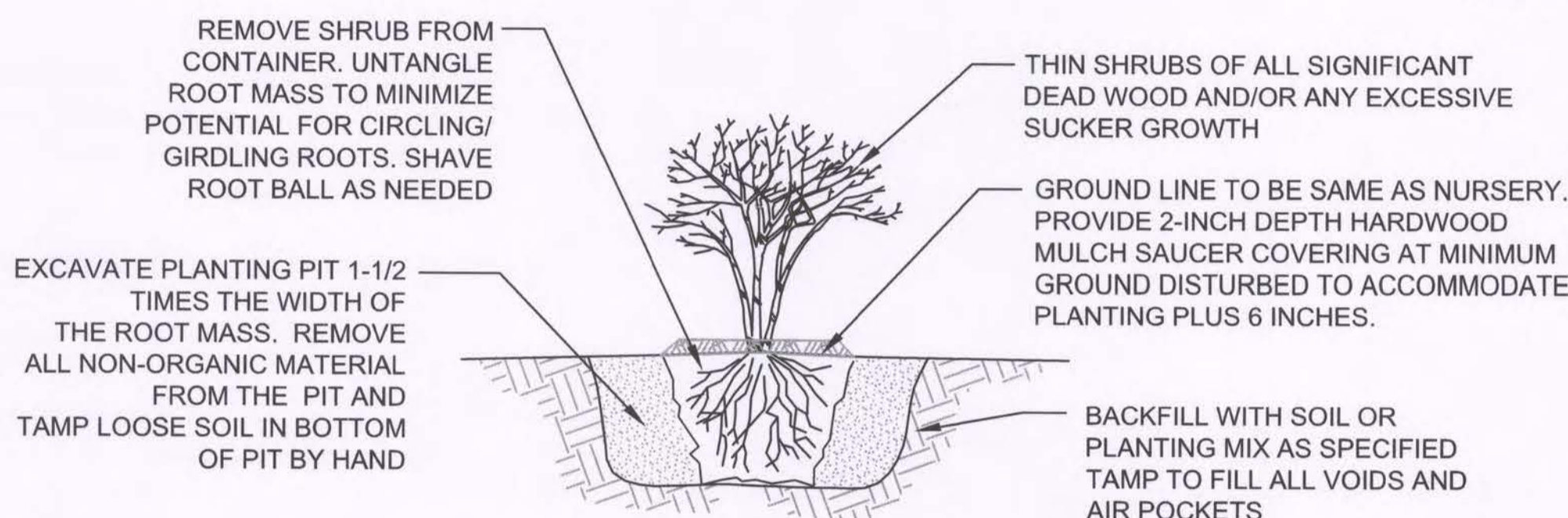
**PLANT SPACING - CLUSTER PLAN VIEW**

NOT TO SCALE



**TREE PLANTING - CONTAINER GROWN**

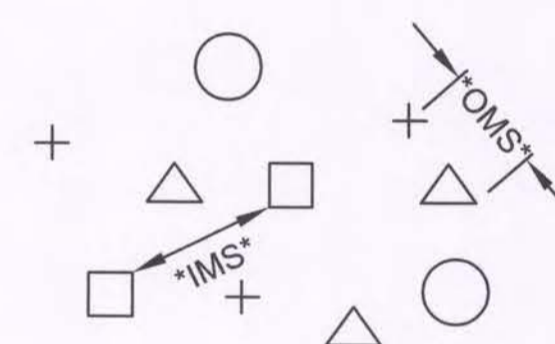
NOT TO SCALE



**SHRUB PLANTING - CONTAINER GROWN**

NOTE: SHRUBS TO BE PLANTED IN CLUSTERS OF THREE

NOT TO SCALE



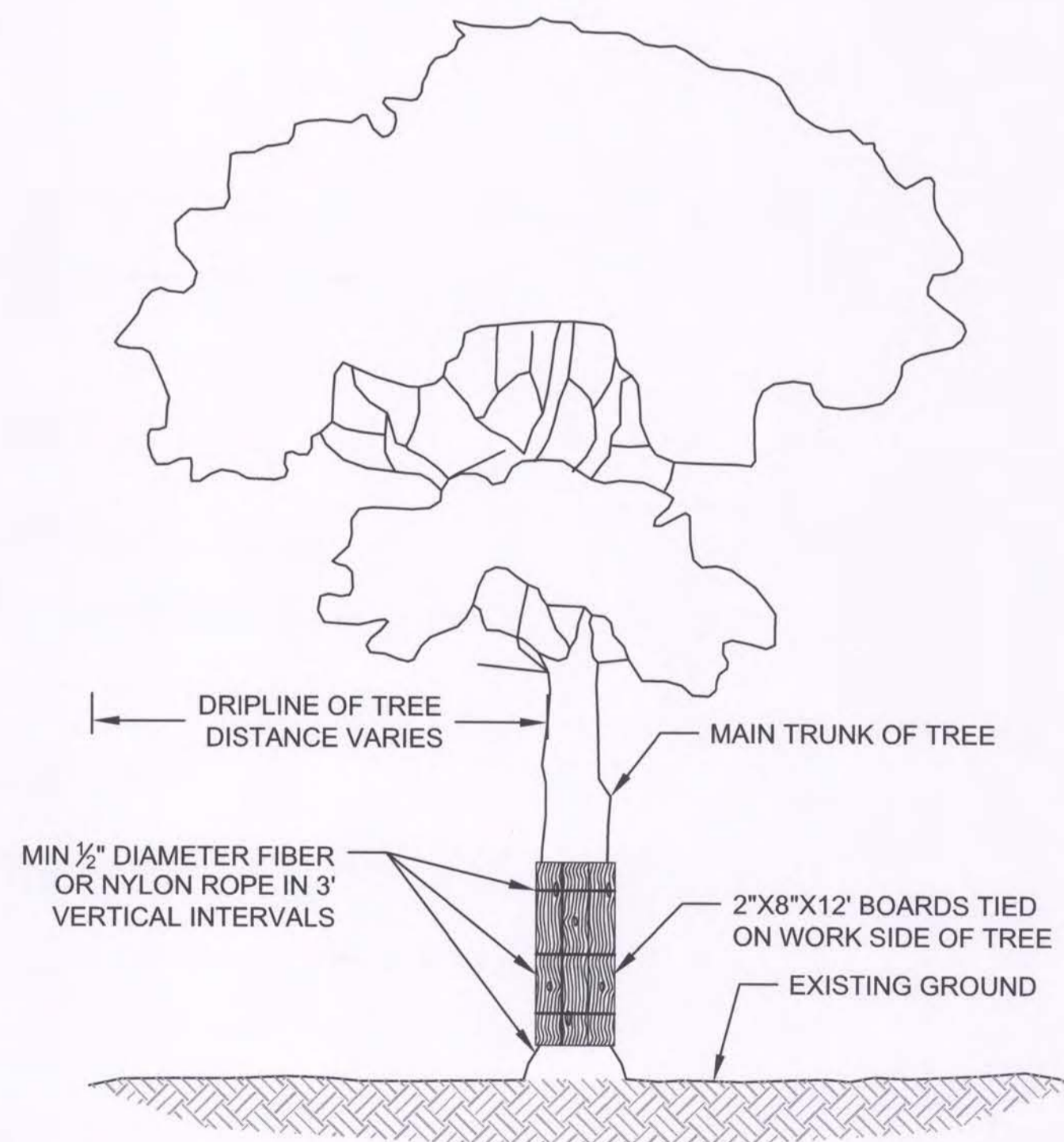
OMS- AN OVERALL MINIMUM SPACING DISTANCE \*OMS\* IS ASSIGNED TO THE PLANTING CONFIGURATION \*SEE PLANT SCHEDULE\*  
 IMS- AN INDIVIDUAL MINIMUM SPACING DISTANCES \*IMS\* IS ASSIGNED TO EACH INDIVIDUAL SPECIES \*SEE PLANT SCHEDULE\*

**PLANT SPACING - RANDOM PLAN VIEW**

NOTE: EACH SYMBOL INDICATES A DIFFERENT SPECIES  
 NOT TO SCALE

**GENERAL TREE PROTECTION AND REMOVAL NOTES**

1. NON-SPECIMEN TREES TO BE HARVESTED FOR STREAM AND FLOODPLAIN RESTORATION STRUCTURES OR GRADING/CONSTRUCTION ACCESS SHALL BE DETERMINED IN THE FIELD BY THE DESIGNATED SPECIALIST.
2. SPECIMEN TREES IDENTIFIED AS NOT TO REMAIN ARE EITHER DEAD, DAMAGED, LEANING OR ARE UNAVOIDABLE TO MAINTAIN CONSTRUCTION ACCESS AND ACHIEVE PROJECT PURPOSE.
3. ALL TREES HARVESTING SHALL BE DONE IN A MANNER TO MAXIMIZE THEIR USAGE IN THE STRUCTURES (IE MAINTAIN SPECIFIED TRUNK LENGTHS, ROOT WADS, ETC) AND TO MINIMIZE NEGATIVE IMPACTS TO RESIDUAL STANDING TREES, SHRUBS AND WETLANDS. TREE FELLING TO BE DONE IN ACCORDANCE WITH OSHA LOGGING STANDARD, 29 CFR 1910.266.
4. PROTECTION MEASURES (TREE PLANKING OR TREE PROTECTION FENCE) FOR ALL TREES TO REMAIN SHALL BE DETERMINED IN THE FIELD BY THE DESIGNATED SPECIALIST.

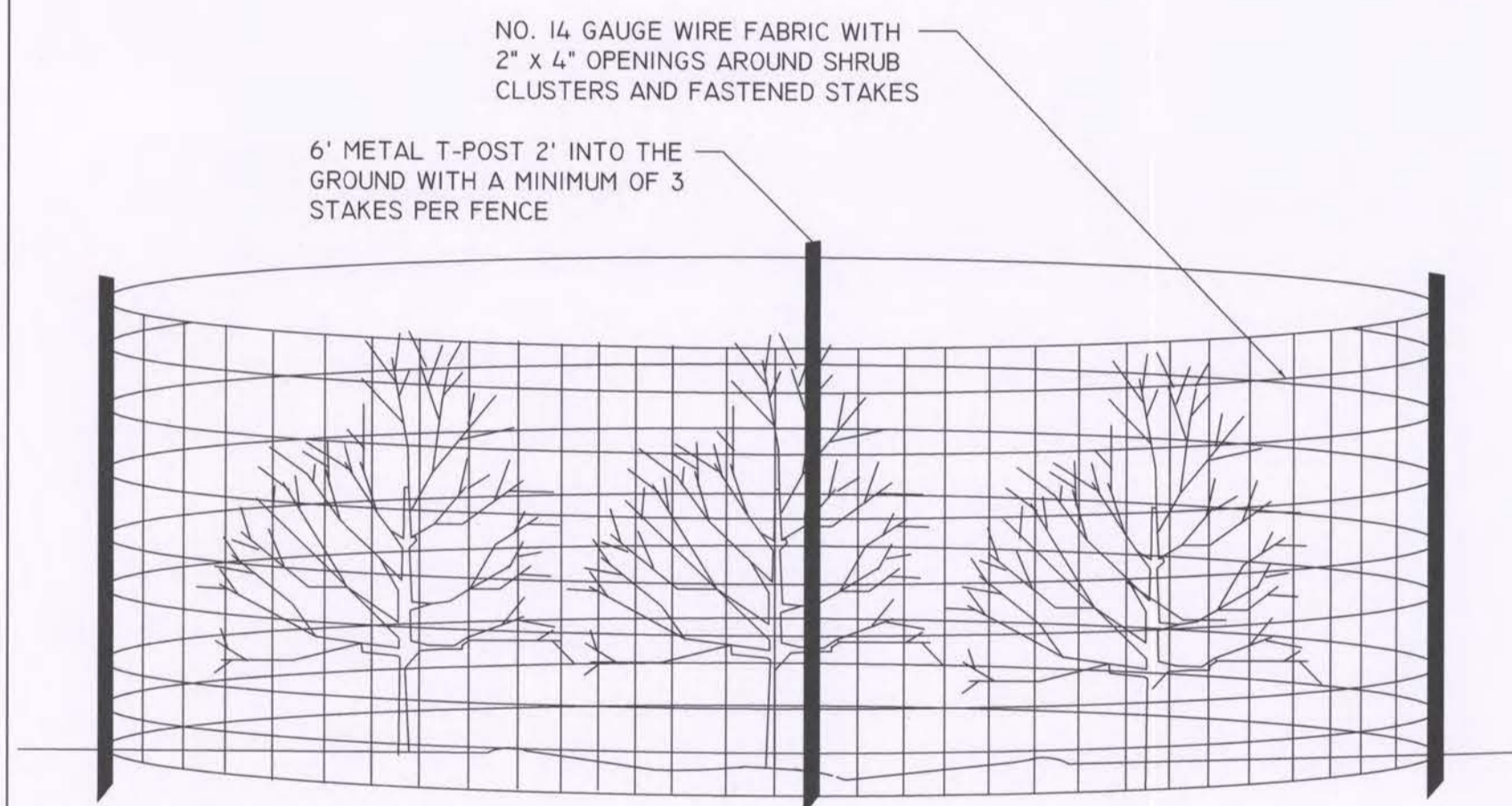


NOTES:

1. TIE SUFFICIENT 2"x8"x12" BOARDS AROUND MAIN TRUNK OF TREE WITH 1/2" DIAMETER ROPE (FIBER OR NYLON) TO PROTECT ALL AREAS EXPOSED TO CONSTRUCTION.
2. INSTALL WIRE EYE BOLTS WITH MINIMUM INNER DIAMETER OF 5/8" AND MINIMUM LENGTH OF 4" FIRMLY IN EACH PLANK WHERE FIBER OR NYLON ROPES CROSS OVER PLANKS.
3. WHERE SIGNIFICANT TREE BRANCHES EXIST WHICH PREVENT PLANK INSTALLATION, PLANKING SHALL EXTEND TO THE ELEVATION OF THE LOWEST BRANCH.

**TREE PLANKING**

NOT TO SCALE



NOTES:

1. THIS DETAIL IS TO BE USED FOR SHRUB CLUSTERS OUTSIDE OF THE DEER PROTECTION FENCE. IN ADDITION, IT WILL BE USED FOR EVERGREEN TREES OR DECIDUOUS TREES WITH BRANCHES LOWER THAN 4' IN HEIGHT.
2. HEIGHT OF FENCE SHALL BE 5 FEET MINIMUM WITH A MAXIMUM DIAMETER OF 10 FEET.
3. FENCE SHALL BE FASTENED TO STAKE WITH 3 (MIN.) CABLE TIE EVENLY SPACED WITH A 6" (MIN.) ABOVE THE GROUND.
4. FENCE SHALL SURROUND ALL SHRUBS WITH A 1 FOOT SPACING FROM THE OUTSIDE OF THE PLANT.
5. STAKES SHALL BE PLACED AT A MAXIMUM 5 FOOT SPACING.
6. FENCE TO BE REMOVED AT DIRECTION OF CERTIFIED ARBORIST/SCIENTIST.
7. HARDWOOD MULCH SHALL BE PLACED TO 2-3 INCH DEPTH WITHIN FENCING.

**TREE AND SHRUB CLUSTER FENCING**

NOT TO SCALE

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

10/17/2023 E:\Projects\19024.01 Eagle Harbor Stream and Shoreline Resiliency\CAD\Plans\dt01ch.dwg

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Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
 Case Number: 22025.01  
 Case Type: CIP WQ  
 Issuance Date: 12/15/2023  
 Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):

*Tanvir Bhuiyan*  
 ENVIRONMENT

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**GreenVest**  
 VISION - PERFORMANCE - RESULTS

TOWN OF EAGLE HARBOR  
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 NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

*Jeff Duffan* 12/18/2023  
 ASSOCIATE DIRECTOR DATE

APPROVED *Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

DWG/FSC: 54 OF 73

SEAL:

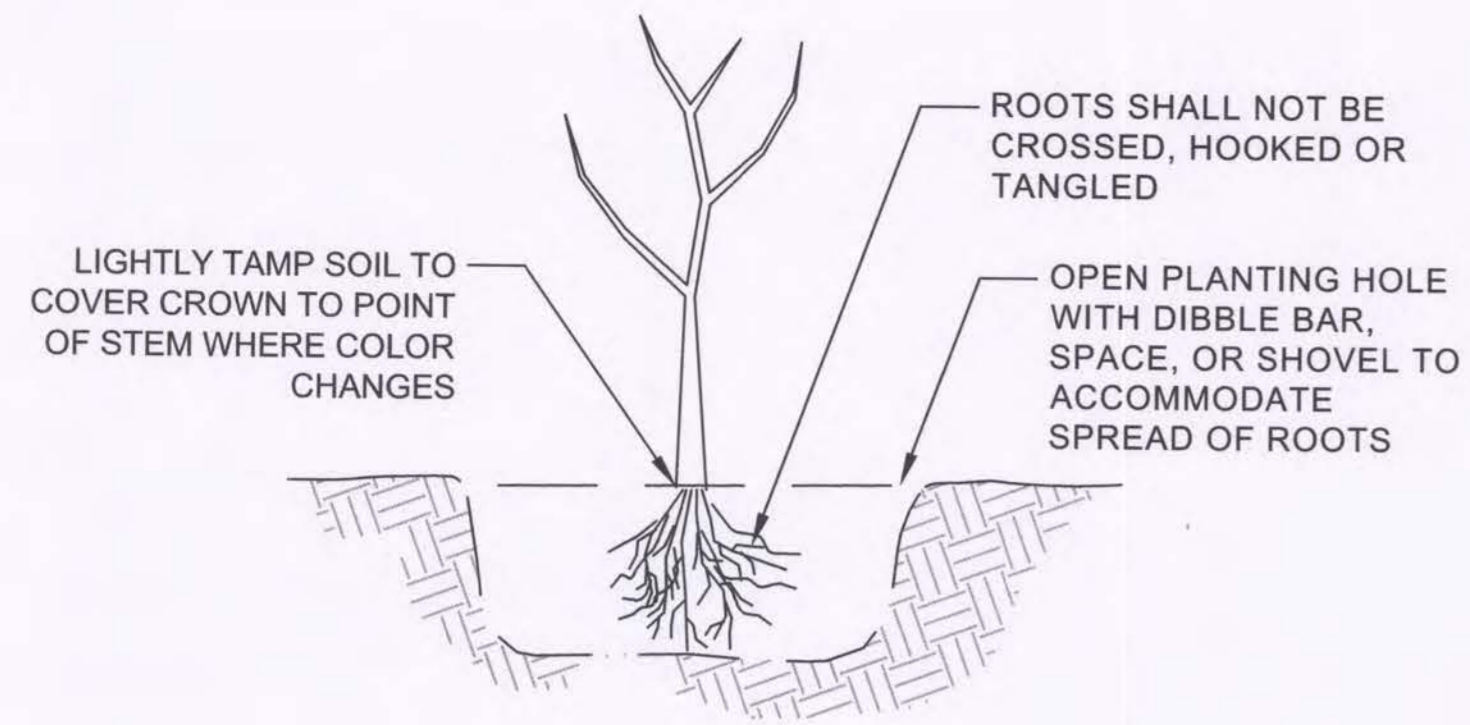
PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 30734  
 EXP. DATE: 2024-06-28

DATE: 10/20/23

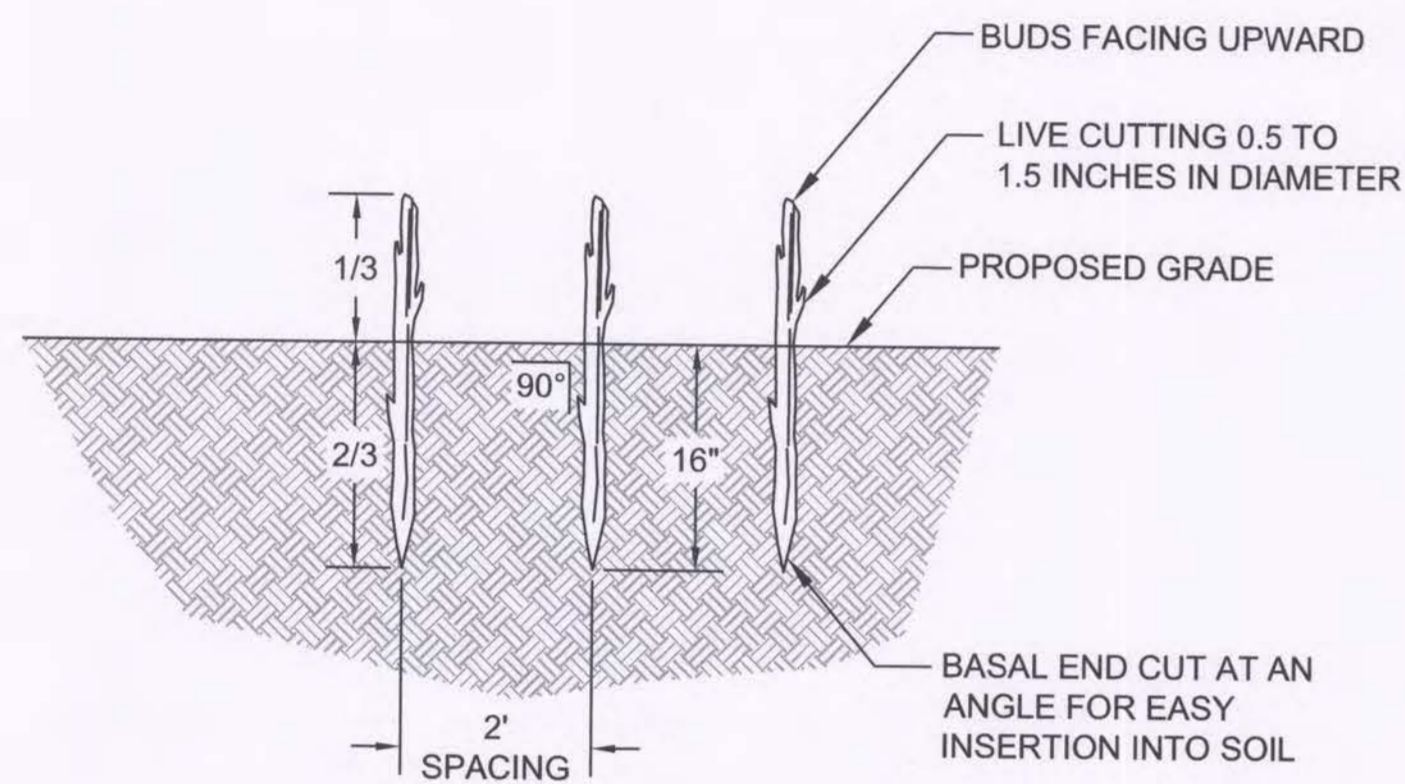
TITLE: **LANDSCAPE PLAN DETAILS**

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

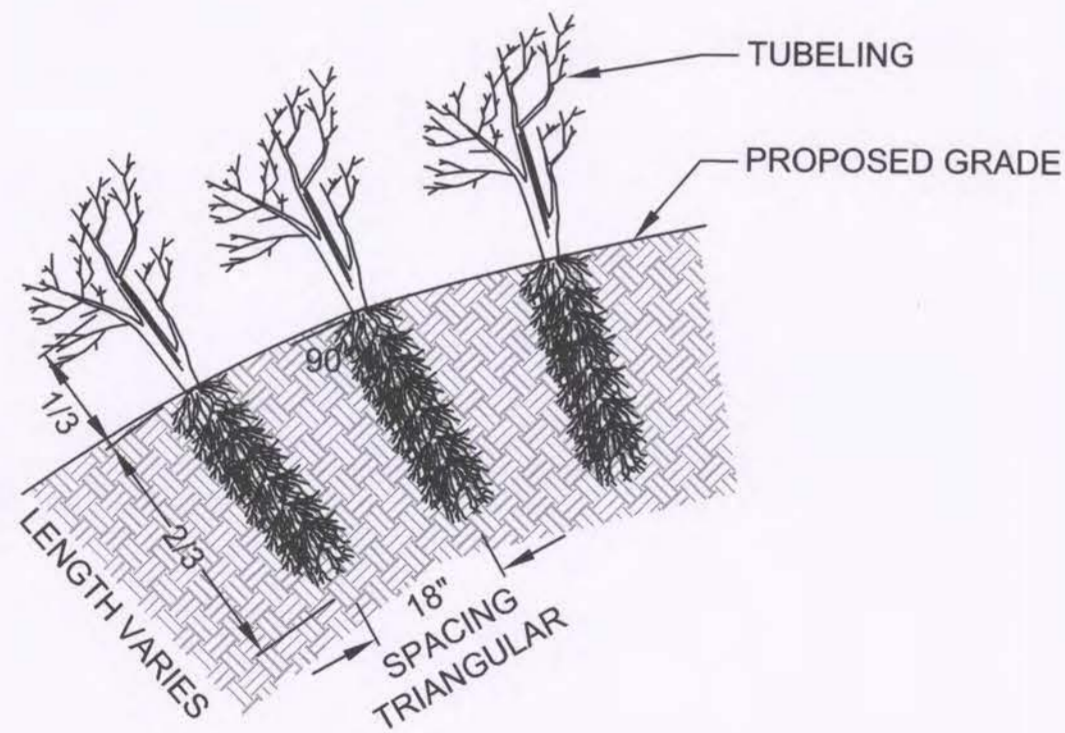




**TREE AND SHRUB PLANTING  
BARE ROOT SEEDLING** NOT TO SCALE



NOTE: SPECIES NOTED IN PLANT SCHEDULE  
**LIVE STAKE INSTALLATION  
CROSS SECTION- TYPICAL** NOT TO SCALE



**TUBELING INSTALLATION  
CROSS SECTION- TYPICAL** NOT TO SCALE

**EXISTING TREE DATA TABLE**

TREE ID	SPECIES	SCIENTIFIC NAME	DBH	CONDITION	TREE ID	SPECIES	SCIENTIFIC NAME	DBH	CONDITION	TREE ID	SPECIES	SCIENTIFIC NAME	DBH	CONDITION
1	Weeping willow	Salix babylonica	22	Good	78	Tulip Poplar	Liriodendron tulipifera	10	Good	154	Tulip Poplar	Liriodendron tulipifera	60	Good
2	Weeping willow	Salix babylonica	28	Poor	79	American sycamore	Platanus occidentalis	18	Good	155	Tulip Poplar	Liriodendron tulipifera	36	Good
3	Black cherry	Prunus serotina	22	Fair	80	Tulip Poplar	Liriodendron tulipifera		Good	156	Tulip Poplar	Liriodendron tulipifera	31	Good
4	Black walnut	Juglans nigra	12	Good	81	Tulip Poplar	Liriodendron tulipifera	12	Good	157	American Beech	Fagus grandifolia	8	Good
5	Tulip Poplar	Liriodendron tulipifera	31	Good	82	American beech	Fagus grandifolia	12	Good	158	Tulip Poplar	Liriodendron tulipifera	29	Good
6	American sycamore	Platanus occidentalis	30	Good	83	Tulip Poplar	Liriodendron tulipifera	24	Good	159	American Beech	Fagus grandifolia	8	Good
7	Black walnut	Juglans nigra	11	Fair	84	American sycamore	Platanus occidentalis	22	Good	160	White Oak	Quercus alba	10	Good
8	American sycamore	Platanus occidentalis	26	Good	85	Tulip Poplar	Liriodendron tulipifera	10	Good	161	White Oak	Quercus alba	8	Good
9	Black walnut	Juglans nigra	15	Poor	86	American beech	Fagus grandifolia	16	Poor	162	Tulip Poplar	Liriodendron tulipifera	36	Good
10	Black cherry	Prunus serotina	15	Fair	87	Tulip Poplar	Liriodendron tulipifera	24	Good	163	Tulip Poplar	Liriodendron tulipifera	21	Good
11	Tulip Poplar	Liriodendron tulipifera	15	Poor	88	Tulip Poplar	Liriodendron tulipifera	8	Good	164	White Oak	Quercus alba	29	Good
12	Black locust	Robinia pseudoacacia	14	Poor	89	Tulip Poplar	Liriodendron tulipifera	8	Poor	165	American Beech	Fagus grandifolia	8	Good
13	Black cherry	Prunus serotina	13	Fair	90	Tulip Poplar	Liriodendron tulipifera	9	Good	166	Tulip Poplar	Liriodendron tulipifera	26	Good
14	Tulip Poplar	Liriodendron tulipifera	21	Good	91	Tulip Poplar	Liriodendron tulipifera	20	Good	167	American Beech	Fagus grandifolia	11	Good
15	Black walnut	Juglans nigra	15	Good	92	Tulip Poplar	Liriodendron tulipifera	14	Good	168	Tulip Poplar	Liriodendron tulipifera	19	Good
16	Tulip Poplar	Liriodendron tulipifera	22	Good	93	Tulip Poplar	Liriodendron tulipifera	12	Poor	169	Red Oak	Quercus rubra	13	Good
17	Black walnut	Juglans nigra	22	Fair	94	Tulip Poplar	Liriodendron tulipifera	12	Poor	170	Black Walnut	Juglans nigra	8	Good
18	Black cherry	Prunus serotina	12	Fair	95	Tulip Poplar	Liriodendron tulipifera	9	Good	171	Tulip Poplar	Liriodendron tulipifera	38	Good
19	Black cherry	Prunus serotina	11	Poor	96	Tulip Poplar	Liriodendron tulipifera	9	Good	172	Red Oak	Quercus rubra	9	Good
20	Tulip Poplar	Liriodendron tulipifera	48	Poor	97	American beech	Fagus grandifolia	18	Fair	173	Tulip Poplar	Liriodendron tulipifera	14	Good
21	Black cherry	Prunus serotina	24	Fair	98	Red maple	Acer rubrum	12	Fair	174	Tulip Poplar	Liriodendron tulipifera	30	Good
22	Black cherry	Prunus serotina	9	Fair	99	Red maple	Acer rubrum	11	Fair	175	Tulip Poplar	Liriodendron tulipifera	24	Good
23	Red maple	Acer rubrum	13	Good	100	Red maple	Acer rubrum	10	Fair	176	Tulip Poplar	Liriodendron tulipifera	30	Good
24	Red maple	Acer rubrum	31	Fair	101	Bitternut Hickory	Carya cordiformis	9	Good	177	American Beech	Fagus grandifolia	8	Good
25	Red oak	Quercus rubra	42	Fair	102	Bitternut Hickory	Carya cordiformis	12	Good	178	American Beech	Fagus grandifolia	11	Good
26	American sycamore	Platanus occidentalis	24	Good	103	Tulip Poplar	Liriodendron tulipifera	40	Good	179	Tulip Poplar	Liriodendron tulipifera	21	Good
27	American sycamore	Platanus occidentalis	38	Good	104	Tulip Poplar	Liriodendron tulipifera	37	Good	180	Tulip Poplar	Liriodendron tulipifera	21	Good
28	Tulip Poplar	Liriodendron tulipifera	32	Good	105	American sycamore	Platanus occidentalis	17	Good	181	Tulip Poplar	Liriodendron tulipifera	32	Good
29	Red maple	Acer rubrum	13	Good	106	Tulip Poplar	Liriodendron tulipifera	12	Good	182	Bitternut Hickory	Carya cordiformis	14	Good
30	Tulip Poplar	Liriodendron tulipifera	36	Good	107	Tulip Poplar	Liriodendron tulipifera	28	Good	183	Tulip Poplar	Liriodendron tulipifera	34	Good
31	Black oak	Quercus velutina	16	Fair	108	Red oak	Quercus rubra	6	Good	184	Red Maple	Acer rubrum	13	Good
32	Black walnut	Juglans nigra	14	Good	109	Tulip Poplar	Liriodendron tulipifera	13	Good	185	Tulip Poplar	Liriodendron tulipifera	25	Good
33	American sycamore	Platanus occidentalis	18	Good	110	Tulip Poplar	Liriodendron tulipifera	37	Good	186	Bitternut Hickory	Carya cordiformis	10	Good
34	American sycamore	Platanus occidentalis	24	Dead	111	Tulip Poplar	Liriodendron tulipifera	27	Good	187	White Oak	Quercus alba	25	Poor
35	American sycamore	Platanus occidentalis	24 / 19	Fair	112	Tulip Poplar	Liriodendron tulipifera	24 / 24	Good	188	Tulip Poplar	Liriodendron tulipifera	10	Good
36	American sycamore	Platanus occidentalis	22 / 24	Good	113	Tulip Poplar	Liriodendron tulipifera	12 / 12	Good	189	Tulip Poplar	Liriodendron tulipifera	14	Good
37	American sycamore	Platanus occidentalis	25	Fair	114	Tulip Poplar	Liriodendron tulipifera	26 / 10	Good	190	Tulip Poplar	Liriodendron tulipifera	23	Good
38	Tulip Poplar	Liriodendron tulipifera	30	Fair	115	White oak	Quercus alba	15	Good	191	Tulip Poplar	Liriodendron tulipifera	24	Good
39	Red maple	Acer rubrum	14	Good	116	Red oak	Quercus rubra	9	Good	192	American Sweetgum	Liquidambar styraciflua	8	Good
40	American sycamore	Platanus occidentalis	26	Good	117	Red oak	Quercus rubra	22	Fair	193	Tulip Poplar	Liriodendron tulipifera	25	Good
41	Red maple	Acer rubrum	14	Good	118	Bitternut Hickory	Carya cordiformis	10	Good	194	Tulip Poplar	Liriodendron tulipifera	17	Good
42	American sycamore	Platanus occidentalis	16	Good	119	Tulip Poplar	Liriodendron tulipifera	25	Good	195	American Sweetgum	Liquidambar styraciflua	14	Good
43	American sycamore	Platanus occidentalis	18	Fair	120	Red maple	Acer rubrum	10	Poor	196	Red Maple	Acer rubrum	12	Good
44	American sycamore	Platanus occidentalis	24	Fair	121	Bitternut Hickory	Carya cordiformis	10	Good	197	Tulip Poplar	Liriodendron tulipifera	19	Good
45	Tulip Poplar	Liriodendron tulipifera	31	Good	122	Tulip Poplar	Liriodendron tulipifera	32	Good	198	Tulip Poplar	Liriodendron tulipifera	13	Good
46	Red maple	Acer rubrum	12	Good	123	White oak	Quercus alba	15	Good	199	Tulip Poplar	Liriodendron tulipifera	20	Good
47	American sycamore	Platanus occidentalis	16	Fair	124	American sycamore	Platanus occidentalis	24	Poor	200	Red Maple	Acer rubrum	14	Fair
48	American sycamore	Platanus occidentalis	18	Good	125	Tulip Poplar	Liriodendron tulipifera	24 / 15	Fair	201	Tulip Poplar	Liriodendron tulipifera	20	Good
49	Red maple	Acer rubrum	20	Good	126	Tulip Poplar	Liriodendron tulipifera	18	Fair	202	Tulip Poplar	Liriodendron tulipifera	20	Good
50	Red maple	Acer rubrum	9	Good	127	Tulip Poplar	Liriodendron tulipifera	11	Poor	203	Tulip Poplar	Liriodendron tulipifera	14	Good
51	Red maple	Acer rubrum	8 / 8	Good	128	Red Maple	Acer rubrum	8	Good	204	Tulip Poplar	Liriodendron tulipifera	15	Good
52	American sycamore	Platanus occidentalis	20	Good	129	Tulip Poplar	Liriodendron tulipifera	39	Good	205	Tulip Poplar	Liriodendron tulipifera	38	Good
53	American sycamore	Platanus occidentalis	20	Good	130	American Sweetgum	Liquidambar styraciflua	8	Good	206	Tulip Poplar	Liriodendron tulipifera	12	Good
54	Red maple	Acer rubrum	27	Fair	131	Tulip Poplar	Liriodendron tulipifera	26	Good	207	American Sweetgum	Liquidambar styraciflua	12	Good
55	Red maple	Acer rubrum	18	Fair	132	Tulip Poplar	Liriodendron tulipifera	22	Good	208	American Sycamore	Platanus occidentalis	44	Good
56	Tulip Poplar	Liriodendron tulipifera	19	Good	133	Tulip Poplar	Liriodendron tulipifera	20	Good	209	Tulip Poplar	Liriodendron tulipifera	53	Good
57	Tulip Poplar	Liriodendron tulipifera	16	Good	134	Tulip Poplar	Liriodendron tulipifera	27	Good	210	Bitternut Hickory	Carya cordiformis	18	Good
58	American beech	Fagus grandifolia	15	Good	135	Tulip Poplar	Liriodendron tulipifera	28	Good	211	Bitternut Hickory	Carya cordiformis	9	Good
59	American sycamore	Platanus occidentalis	12	Good	136	Tulip Poplar	Liriodendron tulipifera	28	Good	212	Tulip Poplar	Liriodendron tulipifera	29	Good
60	Red maple	Acer rubrum	7	Good	137	American Sweetgum	Liquidambar styraciflua	14	Good	213	Tulip Poplar	Liriodendron tulipifera	28	Good
61	Red maple	Acer rubrum	25	Good	138	American Sweetgum	Liquidambar styraciflua	12	Fair	214	Tulip Poplar	Liriodendron tulipifera	33	Good
62	Red maple	Acer rubrum	15 / 15 / 15	Good	139	Tulip Poplar	Liriodendron tulipifera	23	Good	215	Tulip Poplar	Liriodendron tulipifera	30	Good
63	Tulip Poplar	Liriodendron tulipifera	12	Good	140	Tulip Poplar	Liriodendron tulipifera	21	Good	216	Tulip Poplar	Liriodendron tulipifera	30	Good
64	Tulip Poplar	Liriodendron tulipifera	24	Good	141	Tulip Poplar	Liriodendron tulipifera	28	Good	217	Tulip Poplar	Liriodendron tulipifera	32	Good
65	Tulip Poplar	Liriodendron tulipifera	8	Fair	142	Tulip Poplar	Liriodendron tulipifera	24	Good	218	Tulip Poplar	Liriodendron tulipifera	29	Good
66	Tulip Poplar	Liriodendron tulipifera	12	Good	143	Tulip Poplar	Liriodendron tulipifera	23	Good	219	American Beech	Fagus grandifolia	26	Good
67	Tulip Poplar	Liriodendron tulipifera	8	Good	144	Tulip Poplar	Liriodendron tulipifera	30	Good	220	Tulip Poplar	Liriodendron tulipifera	36	Good
68	Tulip Poplar	Liriodendron tulipifera	10	Good	145	Tulip Poplar	Liriodendron tulipifera	25	Good	221	Tulip Poplar	Liriodendron tulipifera	28	Good
69	American beech	Fagus grandifolia	19	Good	146	American Sycamore	Platanus occidentalis	14	Good	222	American Beech	Fagus grandifolia	25	Good
70	Tulip Poplar	Liriodendron tulipifera	42	Good	147	Tulip Poplar	Liriodendron tulipifera	24	Good	223	Tulip Poplar	Liriodendron tulipifera	23	Good
71	Tulip Poplar	Liriodendron tulipifera	14	Good	148	Tulip Poplar	Liriodendron tulipifera	32	Good	224	Tulip Poplar	Liriodendron tulipifera	42	Good
72	Tulip Poplar	Liriodendron tulipifera	12	Good	149	Tulip Poplar	Liriodendron tulipifera	27	Good	225	Tulip Poplar	Liriodendron tulipifera	24	Good
73	Tulip Poplar	Liriodendron tulipifera	18	Good	150	Tulip Poplar	Liriodendron tulipifera	36	Good	226	Tulip Poplar	Liriodendron tulipifera	25	Good
74	Tulip Poplar	Liriodendron tulipifera	12	Good	151	Tulip Poplar	Liriodendron tulipifera	26	Good	227	American Beech	Fagus grandifolia	15	Good
75	Tulip Poplar	Liriodendron tulipifera	15	Good	152	Tulip Poplar	Liriodendron tulipifera	54	Good	228	American Beech	Fagus grandifolia	17	Good
76	American sycamore	Platanus occidentalis	12	Good	153	Tulip Poplar	Liriodendron tulipifera	44	Good	229	Red Maple	Acer rubrum	12	Good
77	Red maple	Acer rubrum	12	Poor										

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
Case Number: **3659-2022-0**  
Case Type: **CIP WQ**  
Issuance Date: **12/15/2023**  
Address: **0000 HAWKINS DR AQUASCO, Maryland 20608**  
Lot(s) and Block(s):  
**Tanvir Bhuiyan** ENVIRONMENT

**Conditions of Approval**

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances) grading and permitting require further review.
- This approval does NOT represent a permit to construct.

**MARYLAND**  
1841  
**GreenVest**  
VISION · PERFORMANCE · RESULTS  
**MLS**

**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

**PRINCE GEORGE'S COUNTY MARYLAND**  
PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
ELECTION DISTRICT 9

*Jeff Duffan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

*Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 22025.01 SCALE: 1" = 20' BY: GB CHECK: DS

SEAL: **STATE OF MARYLAND**  
**DOUGLAS G. STREIBER**  
PROFESSIONAL ENGINEER  
NO. 30734  
10/20/23

PROFESSIONAL CERTIFICATION  
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. 30734  
EXP. DATE: 2024-06-28

DWG/FSC: 55 OF 73  
TITLE: **LANDSCAPE DETAILS AND TREE DATA TABLE**

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



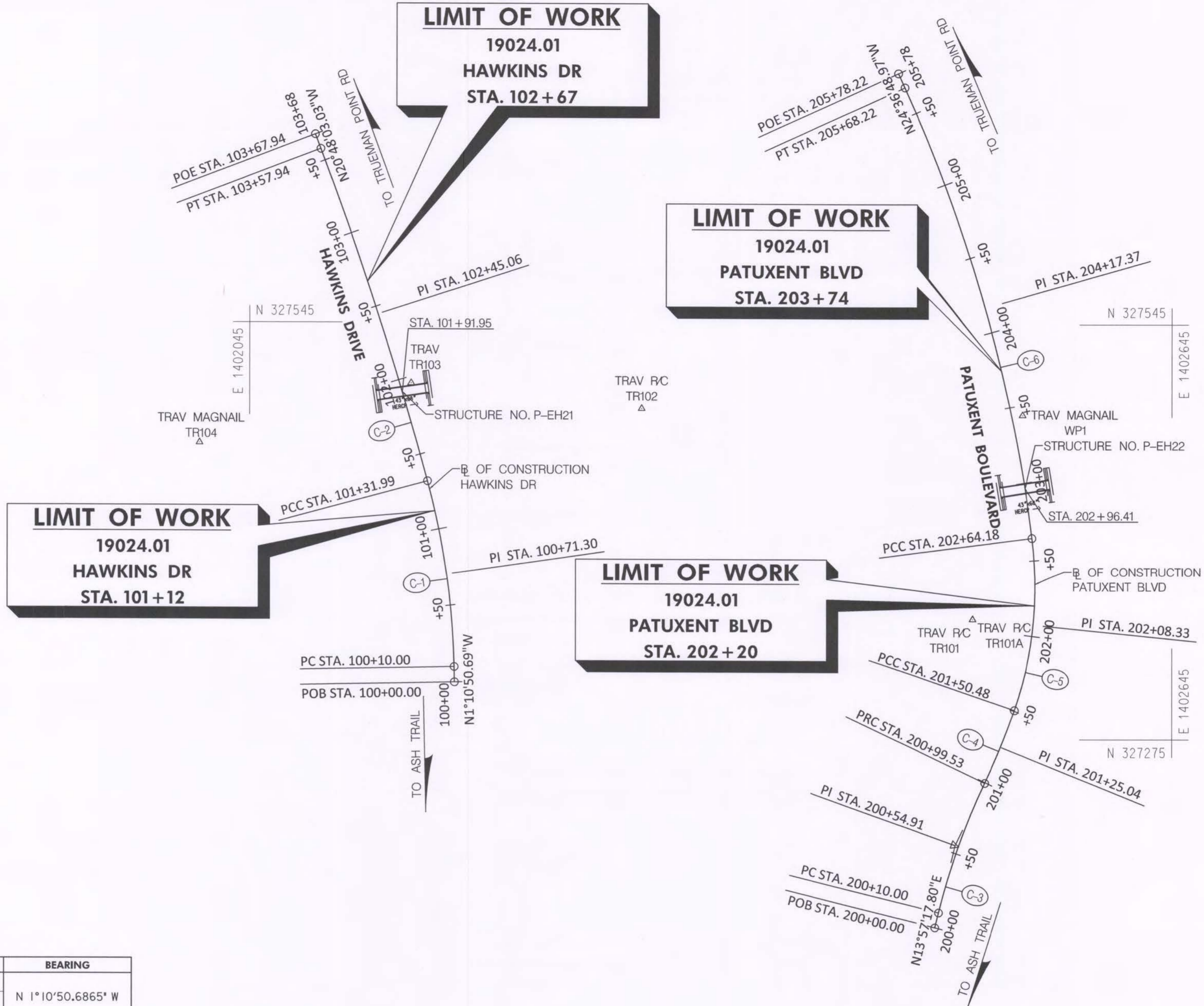




TRAVERSE POINTS			
POINT NO.	NORTHING	EASTING	ELEVATION
TRI00	327380.7495	1402744.4920	2.9063
TRI01	327353.5128	1402515.4943	10.6723
TRI01A	327353.5162	1402515.5230	10.7416
TRI02	327489.7137	1402300.0212	12.2552
TRI03	327505.7923	1402150.0360	17.2676
TRI04	327466.8777	1402012.4250	19.4104
TRI05	327439.9192	1401827.7750	24.4767
TRI06	327323.9326	1401668.4840	25.1806
TRI07	327230.5259	1401464.5750	28.0677
WPI	327486.1725	1402547.7716	7.5641

R OF CONSTRUCTION	CURVE	POINT NO.	STATION	NORTHING	EASTING	BEARING	
HAWKINS DR	C-1	POB	100+00.00	327311.9545	1402178.2136	N 1°10'50.6865" W	
		PC	100+10.00	327321.9524	1402178.0075		
		PI	100+71.30	327383.2391	1402176.7443		
	C-2	PCC	101+31.99	327442.4057	1402160.7137	N 15°09'35.4828" W	
		PI	102+45.06	327551.5380	1402131.1452		
		POE	103+57.94	327657.2354	1402090.9927		
PATUXENT BLVD	C-3	POB	200+00.00	327153.4959	1402491.0829	N 13°57'17.7975" E	
		PC	200+10.00	327163.2007	1402493.4945		
		PI	200+54.91	327206.7900	1402504.3261		
	C-4	PRC	200+99.53	327247.3784	1402523.5596	N 25°21'16.8013" E	
		PI	201+25.04	327270.4252	1402534.4806		
	C-5	PCC	201+50.48	327294.5688	1402542.6972	N 18°47'40.1202" E	
		PI	202+08.33	327349.3335	1402561.3347		
	C-6	PCC	202+64.18	327406.7186	1402554.0212	N 7°15'46.9552" W	
		PI	204+17.37	327558.6797	1402534.6541		
		POE	205+78.22	327697.9507	1402470.8509		
			POE	205+78.22	327707.0421	1402466.6859	N 24°36'48.9685" W

CURVE DATA							
CURVE	BASELINE	DELTA	Dc	RADIUS	TANGENT	LENGTH	EXTERNAL
C-1	HAWKINS DR	13°58'44.7964" LT.	11°27'32.9612"	500.00'	61.30'	121.99'	3.74'
C-2	HAWKINS DR	5°38'27.5499" LT.	2°29'47.5733"	2295.00'	113.07'	225.95'	2.78'
C-3	PATUXENT BLVD	11°23'59.0038" RT.	12°43'56.6236"	450.00'	44.91'	89.53'	2.24'
C-4	PATUXENT BLVD	6°33'36.6811" LT.	12°52'31.6419"	445.00'	25.50'	50.95'	0.73'
C-5	PATUXENT BLVD	26°03'27.0754" LT.	22°55'05.9225"	250.00'	57.85'	113.70'	6.61'
C-6	PATUXENT BLVD	17°21'02.0133" LT.	5°42'24.3034"	1004.00'	153.19'	304.04'	11.62'



Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 19024.01  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
Tanvir Bhuiyan

Conditions of Approval

The above approval is conditioned upon the following:

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- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPIE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

APPROVAL DATE: 12/05/2023  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE: [Signature]  
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0

**GreenVest**  
VISION · PERFORMANCE · RESULTS

**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: [Signature] 12/18/2023  
ASSOCIATE DIRECTOR DATE

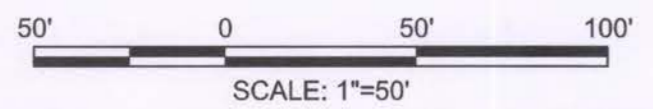
APPROVED: [Signature] 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER: [Signature] CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: 1"=50' BY: SHN CHECK: XZ

SEAL: [Professional Engineer Seal]  
PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 38713  
EXP DATE: 2024-08-21

DWG/FSC: 57 OF 73  
TITLE: ROADWAY GEOMETRIC LAYOUT

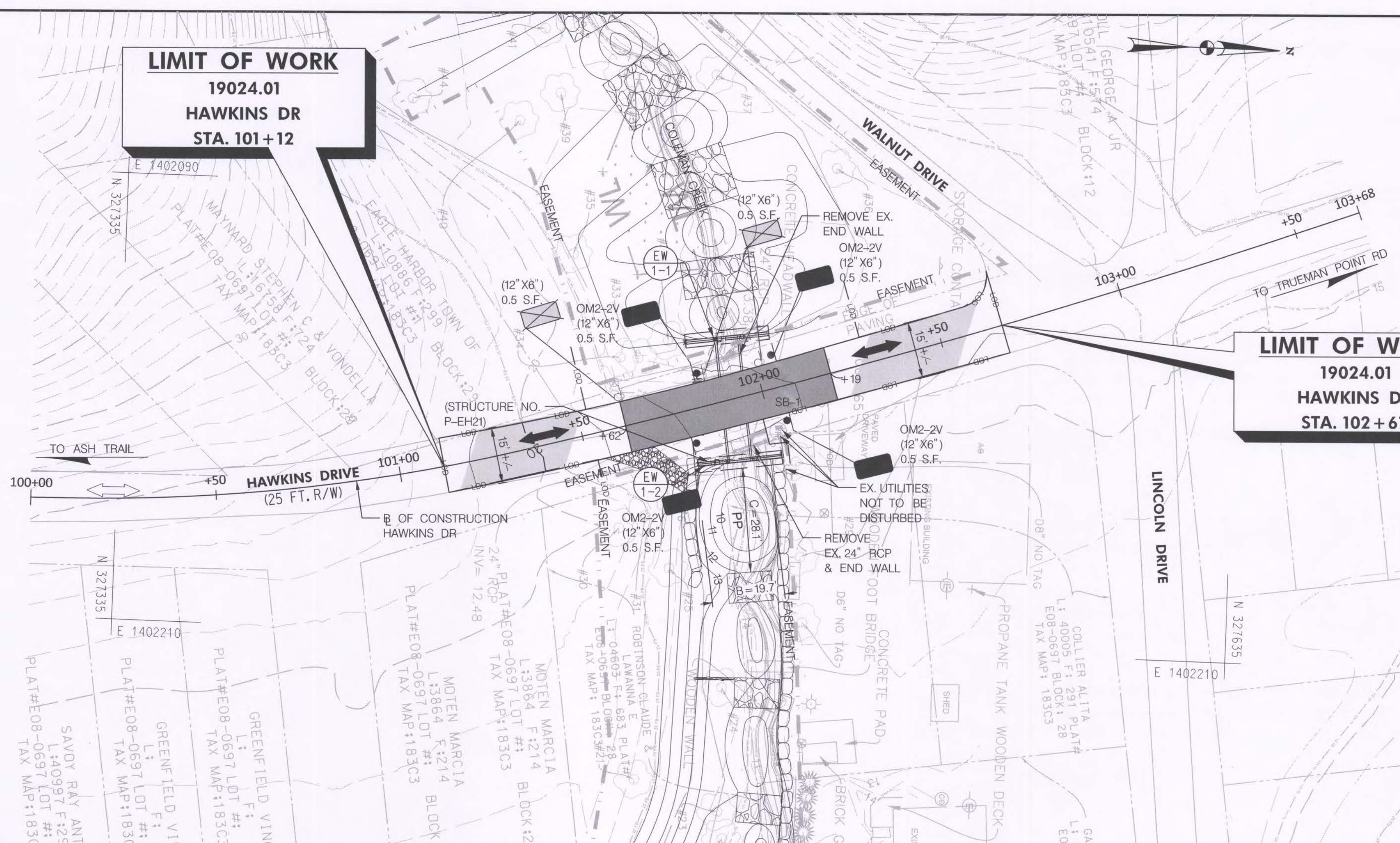
**ZEST LLC**  
Engineering Science Technology  
9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
EMAIL: ZEST.MD@ZESTLLC.COM





**LIMIT OF WORK**  
19024.01  
HAWKINS DR  
STA. 101+12

**LIMIT OF WORK**  
19024.01  
HAWKINS DR  
STA. 102+67



TOP SOIL, SEED, AND MULCH
170 SY HAWKINS DR - STATION 101+62 TO STATION 102+19 LT/RT
GEOSYNTHETIC STABILIZED SUBGRADE USING GRADED AGGREGATE BASE
240 CY HAWKINS DR - STATION 101+65 TO STATION 102+20, LT/RT
NOTES: 1. GRADED AGGREGATE BASE (GAB) TO BE USED AS A BACKFILL MATERIAL. 2. TENSAR TX-160 OR TX-140 GEORIDS OR OTHER APPROVED EQUAL GEOSYNTHETIC PRODUCT SHALL ONLY COVER THE EXCAVATION AREAS WITHIN HEADWALL AND CULVERT FOUNDATIONS.
NOTE: "EASEMENT" REFERS TO STREAM RESTORATION & MAINTENANCE ACCESS EASEMENT AS SHOWN IN THE DECLARATION OF COVENANTS DOCUMENTS.

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
Tanvir Bhuiyan

**Conditions of Approval**

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- This approval does NOT represent a permit to construct.

N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

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APPROVAL DATE: 12/05/2023  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE: *[Signature]*  
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0

STANDARD TYPE C ENDWALL HORIZONTAL ELLIPTICAL CONCRETE PIPE (STD. MD 355.02)

1 EA	HAWKINS DR - STATION 101+90 RT
1 EA	HAWKINS DR - STATION 101+94 LT

43 INCH X 68 INCH HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE, CLASS HE IV WITH RUBBER GASKET

34 LF	HAWKINS DR - STATION 101+89 RT TO STATION 101+94 LT
-------	---

FULL DEPTH PAVEMENT (SEE STD 300.18 MOD)

90 SY	HAWKINS DR - STATION 101+62 TO STATION 102+19
-------	---

2" MILL AND RESURFACE

80 SY	HAWKINS DR - STATION 101+12 TO STATION 101+62
81 SY	HAWKINS DR - STATION 102+19 TO STATION 102+67

PLUNGE POOL DESIGN/AS-BUILT LENGTHS

DIMENSION	HAWKINS DR MIN. LENGTH
B	19.7 FT
C	28.1 FT
D	19'
F	1.8 FT
050	9.5'

PLUNGE POOLS TO BE PROTECTED WITH CLASS I RIPRAP

SAW CUT EXISTING PAVING

15 LF	HAWKINS DR - STATION 101+12
15 LF	HAWKINS DR - STATION 101+62
15 LF	HAWKINS DR - STATION 102+19
25 LF	HAWKINS DR - STATION 102+67

4 FOOT HIGH CHAIN LINK FENCE

23 LF	HAWKINS DR - STATION 101+78 RT TO STATION 102+01 RT
23 LF	HAWKINS DR - STATION 101+83 LT TO STATION 102+06 LT

DRAINAGE STRUCTURE SCHEDULE

STRUCTURE ID	STANDARD STRUCTURE NO.	STRUCTURE DESCRIPTION	REMARKS	BASELINE	STATION	OFFSET	DOWNSTREAM INVERT DEPTH (FT)
EW 1-1	MD 355.02	STANDARD TYPE C ENDWALL HORIZONTAL ELLIPTICAL CONCRETE PIPE	43"x68" HERCP	HAWKINS DR	101+94	17' LT.	12.00
EW 1-2	MD 355.02	STANDARD TYPE C ENDWALL HORIZONTAL ELLIPTICAL CONCRETE PIPE	43"x68" HERCP	HAWKINS DR	101+90	17' RT.	11.66

DRAINAGE PIPE SCHEDULE

UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	PIPE SIZE	PIPE MATERIAL	UPSTREAM INVERT (FT)	DOWNSTREAM INVERT (FT)	PIPE PROFILE LENGTH (LF)
EW 1-1	EW 1-2	43"x68"	HERCP	12.00	11.66	34.00

REMOVE EXISTING GROUND MOUNTED SIGNS AND SUPPORTS

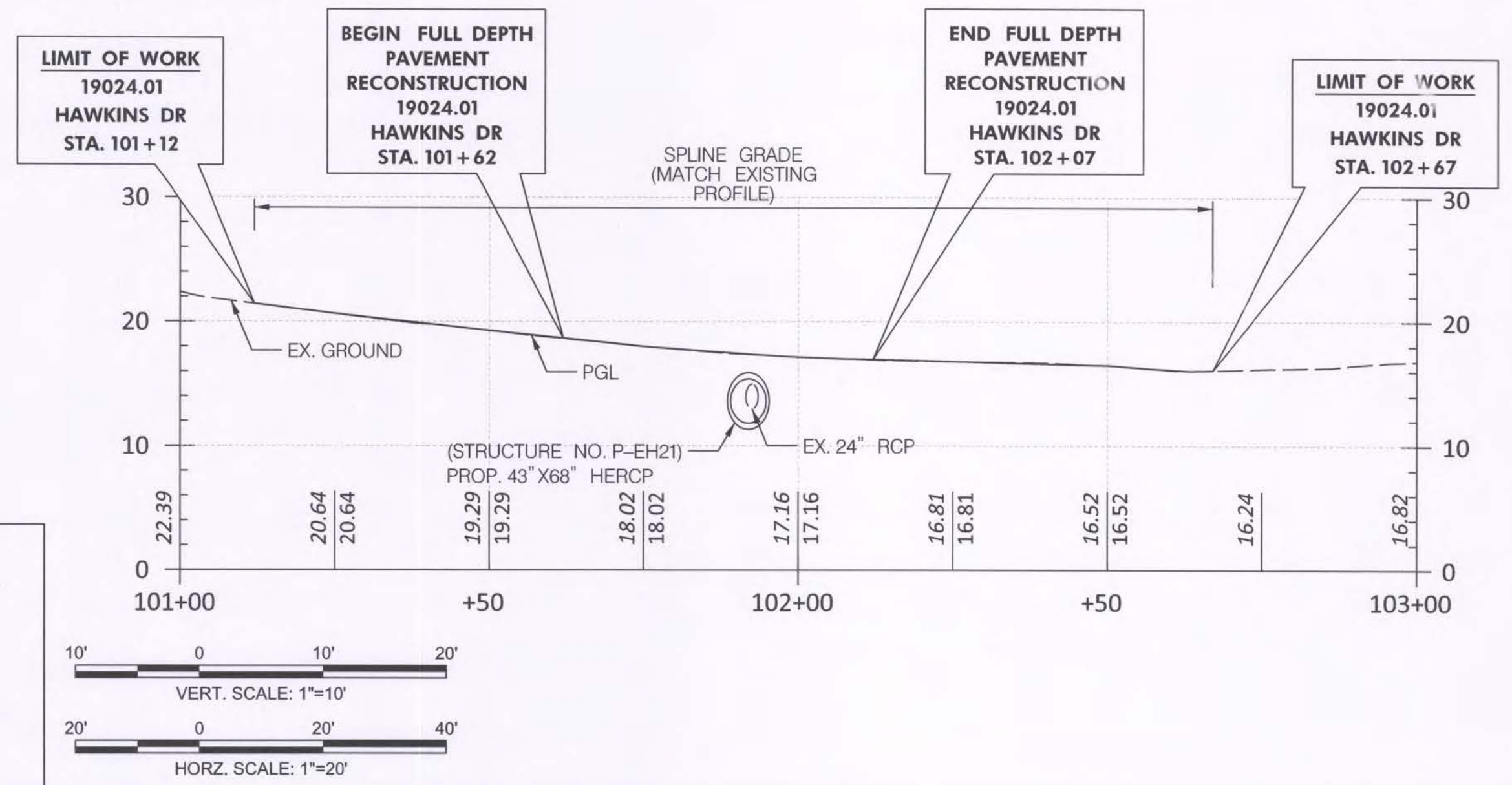
0.5 SF	HAWKINS DR - STATION 101+63 LT
0.5 SF	HAWKINS DR - STATION 101+86 LT
0.5 SF	HAWKINS DR - STATION 102+02 LT

INSTALL OBJECT MARKER

1 EA	HAWKINS DR - STATION 101+79 RT
1 EA	HAWKINS DR - STATION 101+84 LT
1 EA	HAWKINS DR - STATION 102+04 RT
1 EA	HAWKINS DR - STATION 102+05 LT

GALVANIZED U-SHAPE STEEL CHANNEL SIGN SUPPORTS

1 EA	HAWKINS DR - STATION 101+79 RT
1 EA	HAWKINS DR - STATION 101+84 LT
1 EA	HAWKINS DR - STATION 102+04 RT
1 EA	HAWKINS DR - STATION 102+05 LT



**ZEST LLC**  
Engineering Science Technology  
9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
EMAIL: ZEST.MD@ZESTLLC.COM

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LICENSE NO. 38743  
EXP. DATE: 2024-08-21

SEAL: *[Professional Seal]*

TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: *[Signature]* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *[Signature]* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: AS SHOWN BY: SHN CHECK: XZ

DWG/FSC: 58 OF 73

**ROADWAY PLAN AND PROFILE**

BY: PO-YU



INSTALL OBJECT MARKER	
IEA	PATUXENT BLVD - STATION 202+86 LT
IEA	PATUXENT BLVD - STATION 202+86 RT
IEA	PATUXENT BLVD - STATION 203+18 LT
IEA	PATUXENT BLVD - STATION 203+16 RT

GALVANIZED U-SHAPE STEEL CHANNEL SIGN SUPPORTS	
IEA	PATUXENT BLVD - STATION 202+86 LT
IEA	PATUXENT BLVD - STATION 202+86 RT
IEA	PATUXENT BLVD - STATION 203+18 LT
IEA	PATUXENT BLVD - STATION 203+16 RT

**LIMIT OF WORK**  
19024.01  
PATUXENT BLVD  
STA. 202 + 20

**LIMIT OF WORK**  
19024.01  
PATUXENT BLVD  
STA. 203 + 74

RELOCATE EXISTING GROUND MOUNTED SIGN ONTO NEW SUPPORT	
IEA	PATUXENT BLVD - STATION 203+18 LT
EXISTING COLEMAN CREEK SIGN TO BE REMOVED AND RELOCATED ABOVE PROPOSED OM-3R	

NOTE:  
'EASEMENT' REFERS TO STREAM RESTORATION & MAINTENANCE ACCESS EASEMENT AS SHOWN IN THE DECLARATION OF COVENANTS DOCUMENTS.

STANDARD TYPE C ENDWALL HORIZONTAL ELLIPTICAL CONCRETE PIPE (STD. MD 355.02)	
IEA	PATUXENT BLVD - STATION 202+96 LT
IEA	PATUXENT BLVD - STATION 202+96 RT

FULL DEPTH PAVEMENT (SEE STD 300.18 MOD)	
88 SY	PATUXENT BLVD - STATION 202+70 TO STATION 203+24

43 INCH X 68 INCH HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE, CLASS HE IV WITH RUBBER GASKET	
32 LF	PATUXENT BLVD - STATION 202+96 LT TO STATION 202+96 RT

2" MILL AND RESURFACE	
89 SY	PATUXENT BLVD - STATION 202+20 TO STATION 202+70
80 SY	PATUXENT BLVD - STATION 203+24 TO STATION 203+74

SOIL BORING DATA					
ID	STATION	OFFSET	ELEV.	NORTHING	EASTING
SB-2	202+79.84	9.16' LT.	8.00'	327420.9314	1402542.8531
SB-3	203+11.35	0.48' LT.	8.00'	327453.2722	1402546.4845

DRAINAGE PIPE SCHEDULE						
UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	PIPE SIZE	PIPE MATERIAL	UPSTREAM INVERT (FT)	DOWNSTREAM INVERT (FT)	PIPE PROFILE LENGTH (LF)
EW 2-1	EW 2-2	43"X68"	HERCP	2.10	1.78	32.00

SAW CUT EXISTING PAVING	
16 LF	PATUXENT BLVD - STATION 202+20
16 LF	PATUXENT BLVD - STATION 202+70
14 LF	PATUXENT BLVD - STATION 203+24
17 LF	PATUXENT BLVD - STATION 203+74

DRAINAGE STRUCTURE SCHEDULE							
STRUCTURE ID	STANDARD STRUCTURE NO.	STRUCTURE DESCRIPTION	REMARKS	BASELINE	STATION	OFFSET	DOWNSTREAM INVERT DEPTH (FT)
EW 2-1	MD 355.02	STANDARD TYPE C ENDWALL HORIZONTAL ELLIPTICAL CONCRETE PIPE	43"X68" HERCP	PATUXENT BLVD	202+96	15' LT.	2.10
EW 2-2	MD 355.02	STANDARD TYPE C ENDWALL HORIZONTAL ELLIPTICAL CONCRETE PIPE	43"X68" HERCP	PATUXENT BLVD	202+96	15' RT.	1.78

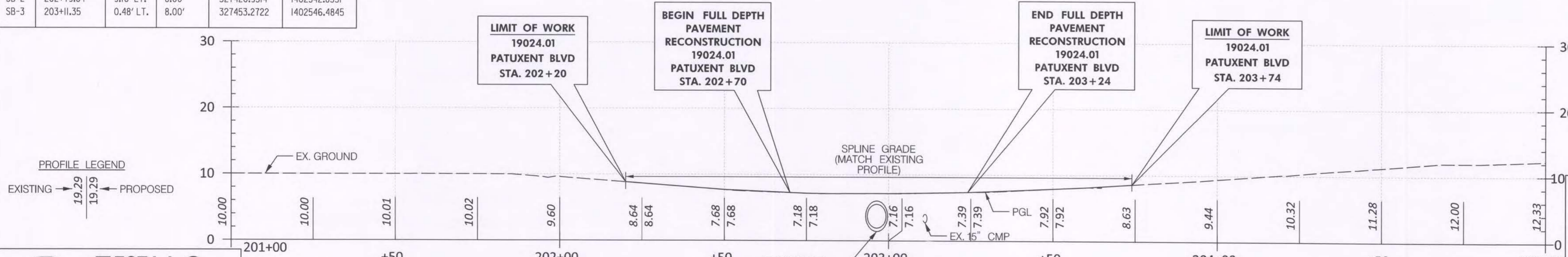
TOP SOIL, SEED, AND MULCH	
140 SY	PATUXENT BLVD - STATION 202+70 TO STATION 203+24

GEOSYNTHETIC STABILIZED SUBGRADE USING GRADED AGGREGATE BASE	
240 CY	PATUXENT BLVD - STATION 202+71 TO STATION 203+22, LT/RT

NOTES:  
1. GRADED AGGREGATE BASE (GAB) TO BE USED AS A BACKFILL MATERIAL.  
2. TENSAR TX-160 OR TX-140 GEOTEXTILES OR OTHER APPROVED EQUAL GEOSYNTHETIC PRODUCT SHALL ONLY COVER THE EXCAVATION AREAS WITHIN HEADWALL AND CULVERT FOUNDATIONS.

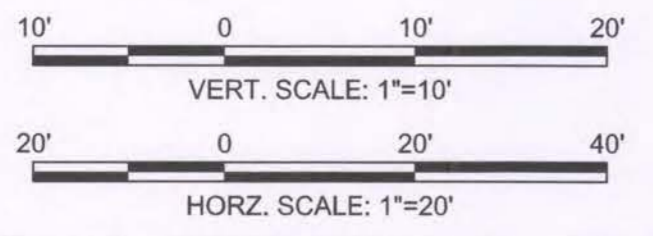
PLUNGE POOL DESIGN/AS-BUILT LENGTHS	
DIMENSION	PATUXENT BLVD MIN. LENGTH
B	26.5 FT
C	30.8 FT
D	19'
F	2.5 FT
D50	9.5'

PLUNGE POOLS TO BE PROTECTED WITH CLASS 1 RIPRAP



**ZEST LLC**  
Engineering  
Science  
Technology

9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
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LICENSE NO. 38713  
EXP. DATE: 2024-06-21

SEAL: [Professional Engineer Seal]

DWG/FSC: 59 OF 73  
TITLE:

**ROADWAY PLAN AND PROFILE**

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 0000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
Tanvir Bhuiyan

Conditions of Approval

The above approval is conditioned upon the following:

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N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.

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PRINCE GEORGE'S COUNTY, MD  
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APPROVAL DATE: 12/05/2023  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE: [Signature]  
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0

For Culvert Hydraulics only, see Note Z on Concept Sufficiency Approval.

**GreenVest**  
VISION - PERFORMANCE - RESULTS

**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

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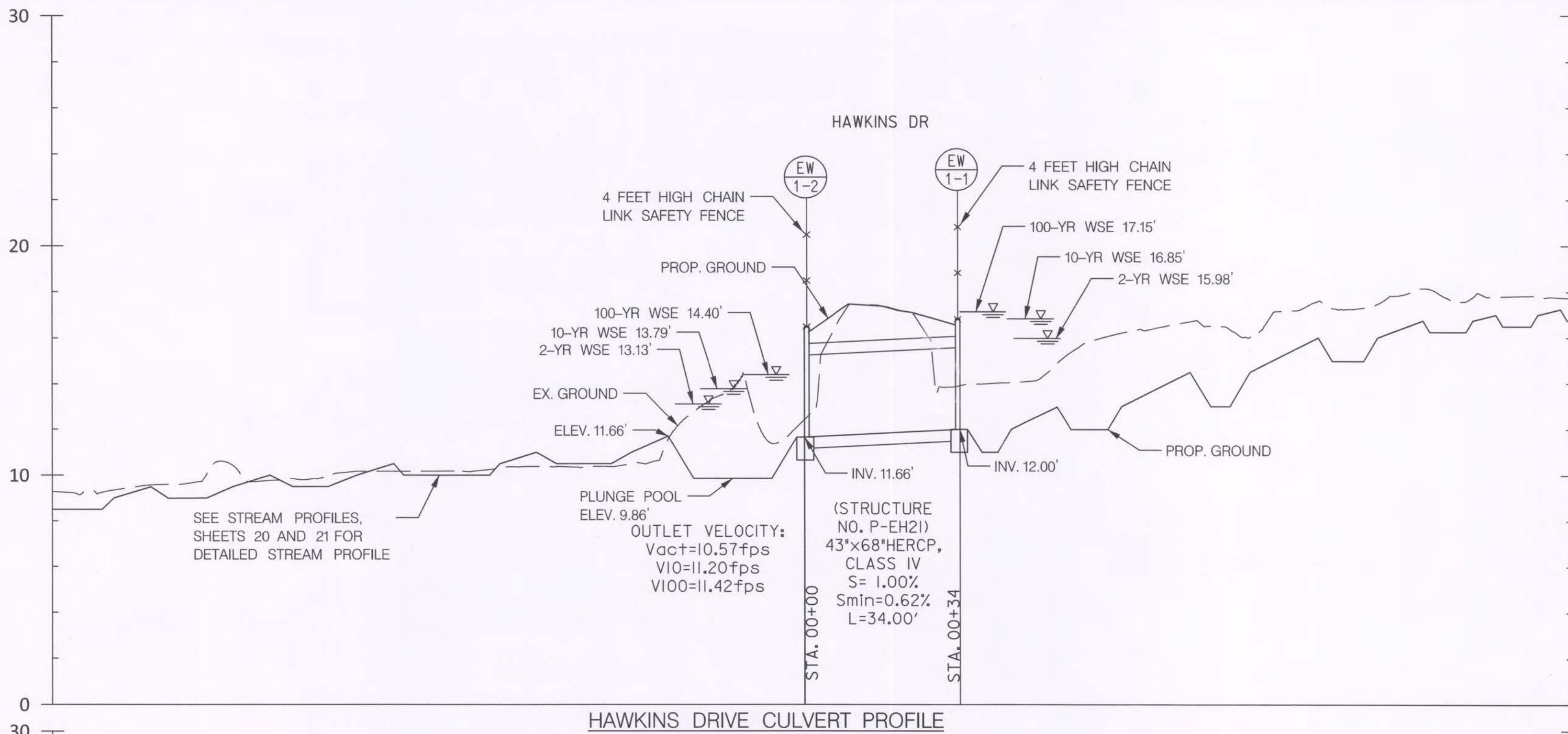
ELECTION DISTRICT 9

APPROVED: [Signatures]  
DATE: 12/18/2023

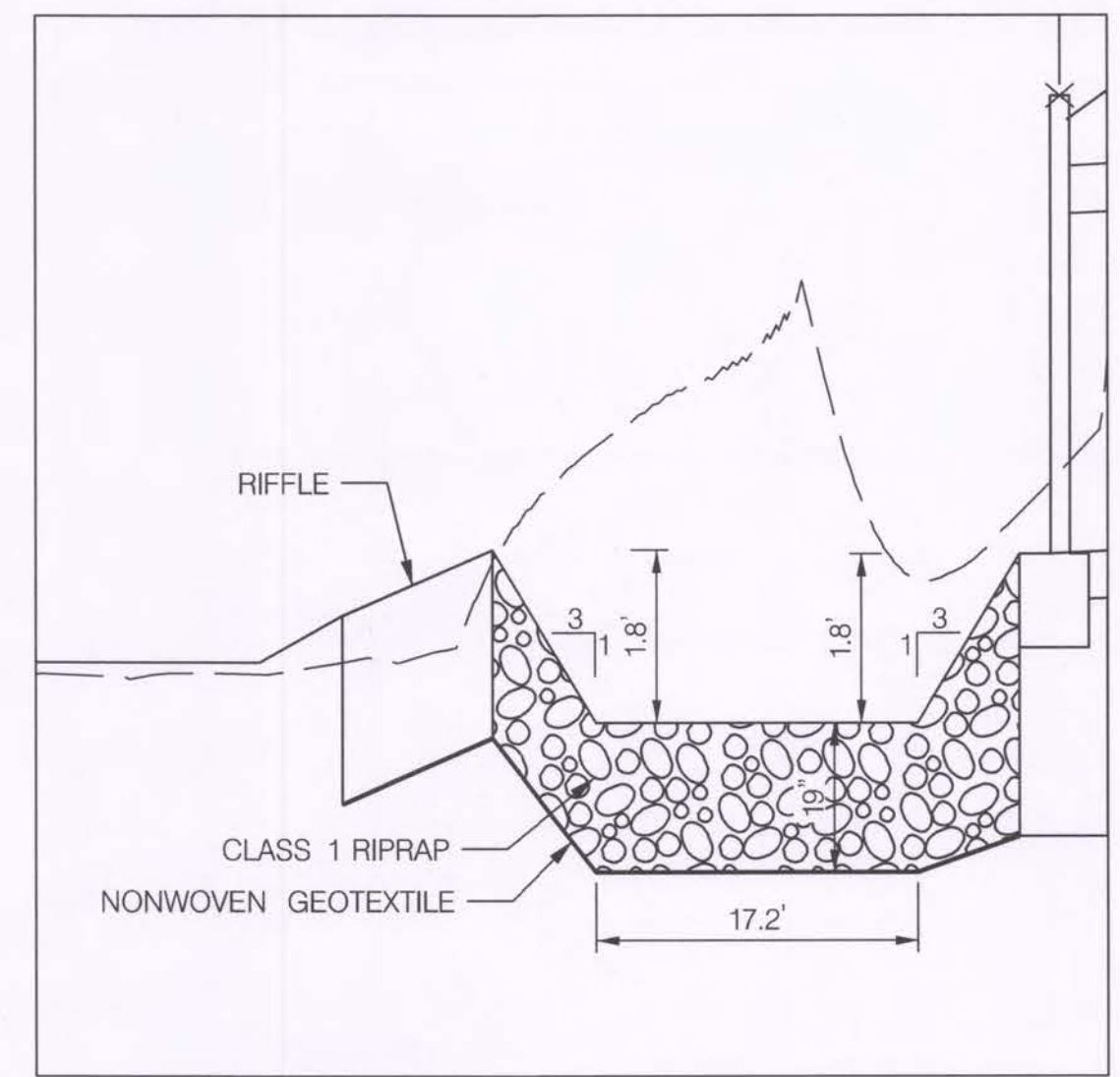
PROJECT MANAGER: [Signature]  
CONTRACT NO.:  
SCALE: AS SHOWN  
BY: SHN  
CHECK: XZ

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

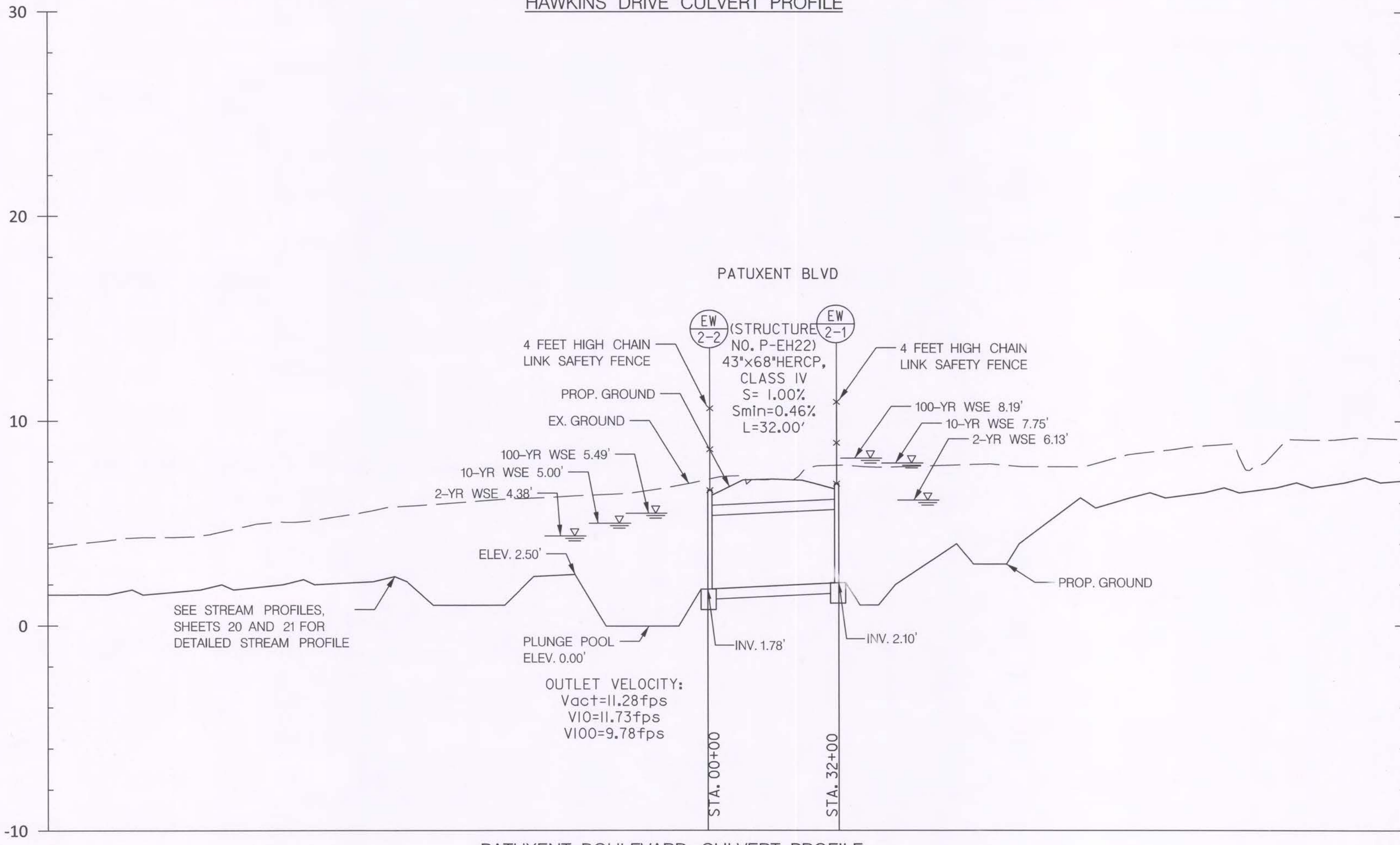




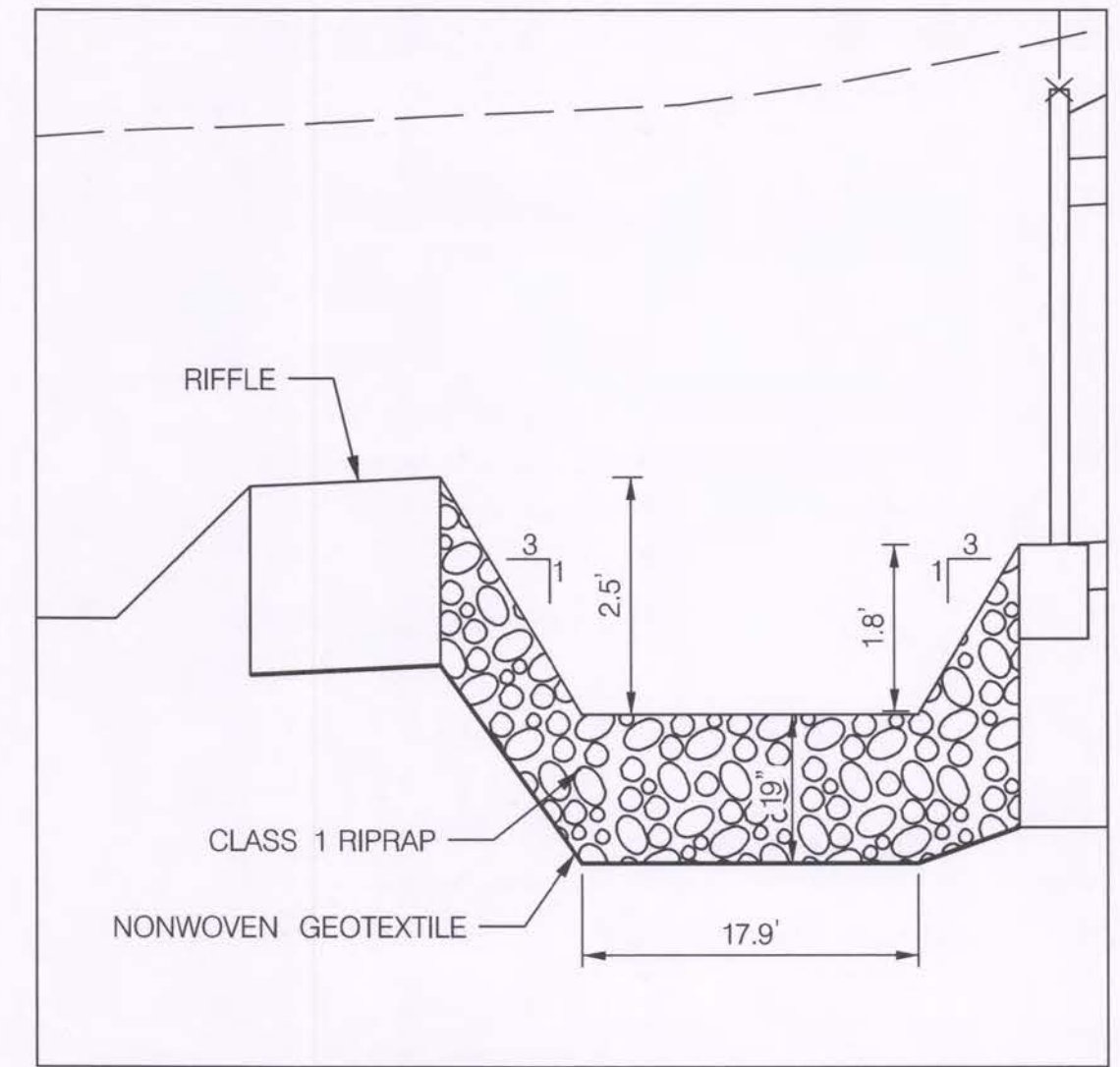
HAWKINS DRIVE CULVERT PROFILE



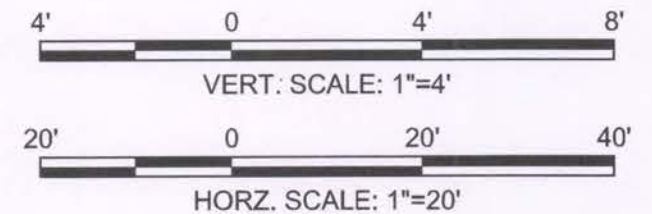
HAWKINS DRIVE PLUNGE POOL DETAIL  
N.T.S.



PATUXENT BOULEVARD CULVERT PROFILE



PATUXENT BOULEVARD PLUNGE POOL DETAIL  
N.T.S.



**ZEST LLC**  
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UNDER THE LAWS OF THE  
STATE OF MARYLAND.  
LICENSE NO.  
96219  
EXP. DATE  
2024-06-21

DWG/FSC: 60 OF 73

TITLE:  
**CULVERT  
PROFILES**

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
Case Number: **COMMUNITY RESILIENCY PROJECT**  
Case Type: **CIP WQ**  
Issuance Date: **12/15/2023**  
Address: **00000 HAWKINS DR AQUASCO, Maryland 20608**  
Lot(s) and Block(s):  
**Tanvir Bhuiyan**

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PRINCE GEORGE'S COUNTY, MD  
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12/05/2023  
APPROVAL DATE:  
PEER REVIEWER'S NAME: **BENJAMIN MOSIER**  
SIGNATURE: *B. Mosier*  
COMPANY NAME: **SOLTESZ**  
LICENSE NUMBER: **40806** For Culvert Hydraulics only, see Note Z  
PERMIT NUMBER: **38079-2022-0** on Concept Sufficiency Approval.



**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
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ELECTION DISTRICT 9

APPROVED: *Jeffrey Dushan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: AS SHOWN BY: PC CHECK: XZ

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

BY: ZEST LLC



**General Notes for Pipe Culvert**

**Specifications:**

Design - AASHTO LRFD Bridge Design Specifications (latest edition), The Prince George's County DPW&T " Specifications and Standards for Roadways and Bridges" (latest edition).

Construction - Maryland Department of Transportation State Highway Administration (MDOT SHA) Standard Specifications for Construction and Materials (latest edition)

**Design Loads:**

HL-93 with 2-inch future wearing surface.

**Design Reference:**

Concrete pipe design manual (latest edition), American Concrete Pipe Association.

**Fill Height:**

A minimum 2 feet of earth cover over the pipes is required.

**Materials for precast concrete pipe:**

Precast concrete pipe type shall be Class IV or V per ASTM C76. Class type I, II or III are not allowed. The shown pipe in this set of standards is round. They are also applicable to elliptical pipes with equivalent round pipe cross section.

**Materials for C.I.P. concrete:**

The headwall concrete shall be SHA Mix. No. 3 (3,500 psi) unless noted otherwise. Reinforcing steel shall conform to ASTM A615 grade 60. ONLY GRADE 60 CAN BE USED ON THE PROJECT. All rebars shall be epoxy coated. A minimum of 2-inch clear concrete cover to all reinforcement bars shall be provided unless noted otherwise. The contractor shall supply shop drawings to the County Engineer for review and approval. No material shall be ordered or fabricated until written approval is received for the proposed structure. Any changes to the enclosed details must be submitted to the County Engineer for review and approval.

**Chamfer:**

All exposed corners of all concrete structures shall be chamfered with 3/4"x3/4" milled chamfered strips unless noted otherwise.

**Pipe Joint:**

All concrete pipe joints shall be sealed in accordance with SHA Spec. Section 303.

**Structure Length:**

Culverts with 17 feet or more opening length measured in accordance with National Bridge Inspection Standards (NBIS) 23 CRF 650.305 shall be resized to provide a minimum length of 20 feet as measured along the centerline of the roadway, see Sheet M-3. Culvert is not allowed to have more than 3 cells.

**Criteria for Utility Line Crossing:**

Place utility line away from the structure, Minimum of 5 feet outside of the county structural components. This is the preferred option for new construction. For Details, see Sheet M-2.

**Stream Diversion:**

The designer shall prepare stream diversion plans as needed and submit to Soil Conservation District (SCD) for review and approval. State and Federal permits may be required

**Tables:**

The designer shall fill out the blank tables as applicable in this set of drawings and Hydrologic and Hydraulic Data Table on Sheet M-1.

**Right of Way/Easement:**

The Developer must provide R.O.W./drainage easement at least 10 feet outside of structure foundation and riprap for maintenance of structure (See Geometric Layout Sheet.)

**Bridge Number:**

The designer shall send request to DPW&T (Department of Public Works and Transportation) via DPIE to assign a bridge number to the new structure.

**Restrictions for Placing and Using Equipment on Existing or New Structure/or Storing Materials on/or Against Structures:**

There are restrictions on placing equipment on existing and new structure(s) and storing materials on/or against existing and new structure(s) elements. The limitations basically relate to loads that are beyond Maryland's legal vehicles and/or posted load limits (where applicable) and materials stockpiled on/or against structure's or structure's elements. For details of such restrictions see SHA Std Spec. Section TC 6.14 titled "RESTRICTIONS FOR PLACING AND USING EQUIPMENT ON STRUCTURES, OR STORING MATERIALS ON/OR AGAINST STRUCTURES" in the contract documents. In order to comply with this article, the contractor shall read section tc 6.14 prior to commencing any work on structure(s) in this contract. Vehicles shall not be allowed to cross over the culvert until a minimum of 3 feet of compacted fill has been placed over the culvert, or approved by the County Engineer.

**Foundation Requirements:**

Undercutting and backfilling with crusher run aggregate CR-6 or graded aggregate base GAB may be necessary in order to achieve the required factored bearing resistance. Geotechnical report must be submitted with the plans. The report shall be prepared by a Professional Geotechnical Engineer registered the State of Maryland per SHA PPM D-79-17(4). Compact the material that is in lower side zone to at least 95 percent of the maximum dry density per AASHTO T180. The report shall include foundation recommendation, required bearing capacity, and recommendation for undercut/backfill to achieve the required bearing capacity.

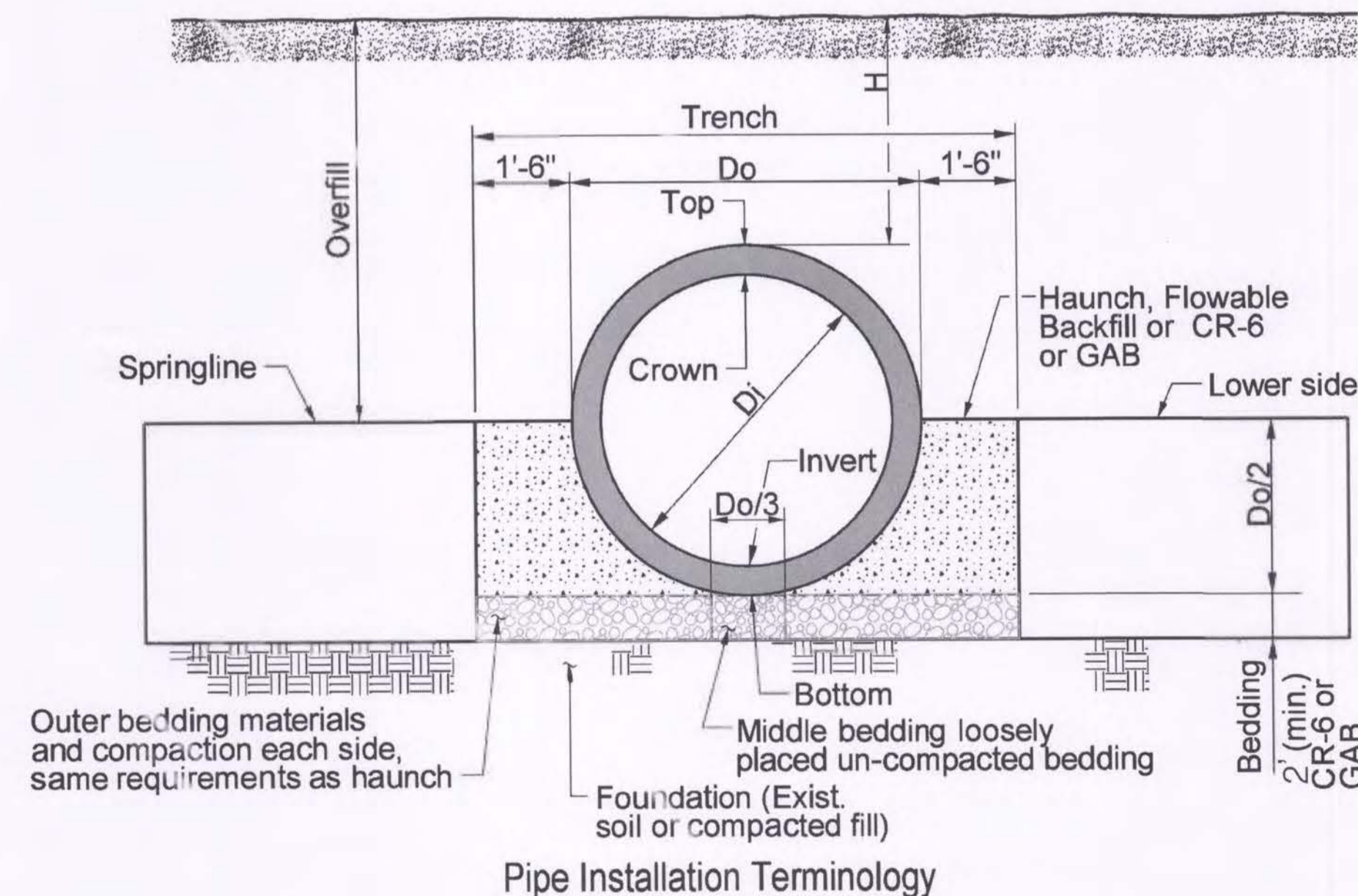
**Construction Sequence:**

The construction sequence is to place the bedding to grade; install the pipe to grade; compact the bedding outside of the middle-third of the pipe; and then place and compact the haunch area up to the springline of the pipe. The bedding outside the middle-third of the pipe may be compacted prior to placing the pipe.

**Load Rating:**

There are two methods for design of reinforced concrete pipe - indirect design and direct design methods. Indirect design method, using D-loads, is a widely used empirical method for selecting and specifying pipes. The specified D-load for a pipe is the minimum test load where cracks no more than 0.01 inch in width are generated in a three-edge bearing test. Direct design method follows the principles of strength of material and reinforced concrete design. Standard installation type 2 per AASHTO LRFD Specs. Section 12.10.2.1 is assumed for the design and load rating of pipes. It is preferred that pipes less than 72 inches in diameter be designed using indirect method. For larger diameter pipe, direct design might be more appropriate. When using indirect design method, if the rating vehicle induces D0.01 load lower than the specified pipe class capacity, its inventory and operating ratings can indicate the tons of the vehicle with a RF=1.0 for both inventory and operating rating. D-load to produce a 0.01 inch crack for Class IV and Class V reinforced concrete pipe is 2,000 and 3,000 pounds per linear foot per foot of inside diameter respectively.

Load rating analysis shall be performed per SHA PPM D-97-47(4) prior to the construction permit approval. During construction phase, if there is change in the site conditions then the load rating analysis shall be recalculated and resubmitted for County's approval prior to as-built approval and bond release.



Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
Tanvir Bhuiyan

Conditions of Approval

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPIE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

APPROVAL DATE: 12/05/2023  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE: [Signature]  
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0

GreenVest  
VISION - PERFORMANCE - RESULTS

TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: [Signature] 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: [Signature] 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: N/A BY: PC CHECK: XZ

DWG/FSC: 61 OF 73

SEAL: [Professional Engineer Seal]

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 38713  
EXP. DATE: 2024-09-21

TITLE: **CULVERT GENERAL NOTES**

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

ZEST LLC  
Engineering Science Technology

9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
EMAIL: ZEST.MD@ZESTLLC.COM



**PLUNGE POOL INSPECTION CHECKLIST  
FOR HAWKINS DR STRUCTURE NO. P-EH21**

DESCRIPTION OF STAGE	DPIE	PERMITEE
PRECONSTRUCTION MEETING: INSPECTION AND APPROVAL OF EACH PRACTICE IS REQUIRED AT THESE POINTS PRIOR TO PROCEEDING WITH THE NEXT STEP OF CONSTRUCTION. CONTACT THE DPIE SITE/ROAD INSPECTOR WITH TWENTY-FOUR (24) HOURS' NOTICE (DPIE TELEPHONE: 301-883-3800 OR THE AUTOMATED INSPECTION REQUEST SYSTEM AT 301-883-5390). THE DPIE SITE/ROAD INSPECTOR MAY WAIVE AN INSPECTION AND ALLOW THE PERMITEE PER A PRIOR WRITTEN SCHEDULED ARRANGEMENT. WORK COMPLETED WITHOUT DPIE APPROVAL MAY RESULT IN THE PERMITEE HAVING TO REMOVE AND RECONSTRUCT THE UNAPPROVED WORK. EACH OF THE STEPS MUST BE VERIFIED BY EITHER THE DPIE SITE/ROAD INSPECTOR AND/OR THE PERMITEE AND THE COMPLETED FORM SUBMITTED WITH THE AS-BUILT DRAWINGS.		
1. PRE-CONSTRUCTION MEETING		
2. SEDIMENT CONTROL INSTALLATION INCLUDING DEWATERING AND STREAM DIVERSION		
3. EXCAVATION FOR PLUNGE POOL CONFORMS TO APPROVED PLANS AND GEOTECHNICAL REPORT.		
4. SUBGRADE PREPARATION		
5. USE SPECIFIED CLASS 1 RIPRAP.		
6. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE.		
7. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.		
8. EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 6 INCHES BEYOND THE EDGE OF THE SCOUR HOLE.		
9. STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.		

DESCRIPTION OF STAGE	DPIE	PERMITEE
10. AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE.		
11. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.		
12. FINAL INSPECTION		

**NOTES:**

- PERMITEE TO SUPPLY DESIGN ENGINEER WITH DELIVERY TICKETS FOR ALL MATERIALS USED IN PLUNGE POOL CONSTRUCTION, FOR SUBMISSION WITH THE AS-BUILT PACKAGE.
- SEE CONSTRUCTION SPECIFICATIONS IN THIS PLAN FOR DETAILED REQUIREMENTS.
- A COPY OF THIS COMPLETED CHECKLIST MUST BE SUBMITTED AS PART OF THE PLUNGE POOL AS-BUILT PACKAGE.

**PLUNGE POOL AS-BUILT CERTIFICATION DATA TABLE  
FOR HAWKINS DR STRUCTURE NO. P-EH21**

MAY ONLY BE COMPLETED AND/OR CERTIFIED BY THE AS-BUILT INSPECTOR AS REQUIRED BY COMAR 26.17.02.10.

DOE CASE NUMBER: 38079-2022-0      PROJECT NUMBER: 19024.01

ACTIVITY	ADDITIONAL SUPPORTING DOCUMENTATION (SUBMIT ALL OF THE FOLLOWING WITH PLUNGE POOL AS-BUILT CERTIFICATION PACKAGE)	DATE(S) OF INSPECTION
PRIOR TO PLUNGE POOL EXCAVATION, OBSERVED ESC MEASURES ARE INSTALLED AROUND THE PLUNGE POOL OR CONFIRMED SURROUNDING AREA IS STABILIZED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED EXCAVATION OF PLUNGE POOL	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF GEOTEXTILE AND VERIFIED INSTALLATION PERFORMED AS SPECIFIED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF RIP RAP CLASS I	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> NOT APPLICABLE	
OBSERVED FINAL GRADING OF PLUNGE POOL	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	

FEATURE	DESIGN	AS-BUILT	DIFFERENCE
BOTTOM WIDTH (FT)	12.0		
BOTTOM LENGTH (FT)	17.2		
d <sub>50</sub> = THE MEDIAN STONE SIZE (IN)	0.5		
CULVERT SIZE (IN)	43"X68" HERCP		
B = PLUNGE POOL WIDTH (FT)	19.7		
C = PLUNGE POOL LENGTH (FT)	28.1		
D = 2 X d <sub>50</sub> = RIPRAP THICKNESS (IN)	1.0		
F = PLUNGE POOL DEPTH (FT)	1.8		
SIDE SLOPES (H:V)	3:1		

**PLUNGE POOL AS-BUILT CERTIFICATION**

"I HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT PLUNGE POOL SHOWN ON THE PLANS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS APPROVED BY PRINCE GEORGE'S COUNTY DEPARTMENT OF PERMITTING, INSPECTION AND ENFORCEMENT."

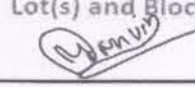

SIGNATURE: \_\_\_\_\_

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

MD. REG. NO.: \_\_\_\_\_

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 19024.01  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
 **Tanvir Bhuiyan**  


**Conditions of Approval**

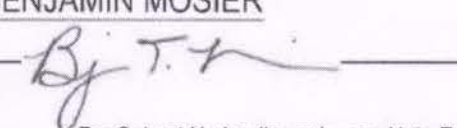
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- This approval does NOT represent a permit to construct.


N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.


DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

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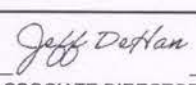

12/05/2023  
APPROVAL DATE:  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE:   
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0      For Culvert Hydraulics only, see Note Z on Concept Sufficiency Approval.




 TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

 PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

 12/18/2023  
ASSOCIATE DIRECTOR DATE  
APPROVED  12/18/2023  
SECTION HEAD DATE

PROJECT NO.: 19024.01    SCALE: N/A    BY: SHN    CHECK: XZ

SEAL:  PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38213 EXP. DATE: 2024-06-21

DWG/FSC: 62 OF 73

TITLE:

**PLUNGE POOL  
NOTES**

**EAGLE HARBOR STREAM  
RESTORATION AND  
COMMUNITY RESILIENCY  
PROJECT**

 **ZEST LLC**  
Engineering  
Science  
Technology  
9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
EMAIL: ZEST.MD@ZESTLLC.COM

BY: ZEST LLC -



**PLUNGE POOL INSPECTION CHECKLIST  
FOR PATUXENT BLVD STRUCTURE NO. P-EH22**

DESCRIPTION OF STAGE	DPIE	PERMITEE
PRECONSTRUCTION MEETING: INSPECTION AND APPROVAL OF EACH PRACTICE IS REQUIRED AT THESE POINTS PRIOR TO PROCEEDING WITH THE NEXT STEP OF CONSTRUCTION. CONTACT THE DPIE SITE/ROAD INSPECTOR WITH TWENTY-FOUR (24) HOURS' NOTICE (DPIE TELEPHONE: 301-883-3820 OR THE AUTOMATED INSPECTION REQUEST SYSTEM AT 301-883-5380). THE DPIE SITE/ROAD INSPECTOR MAY WAIVE AN INSPECTION AND ALLOW THE PERMITEE PER A PRIOR WRITTEN SCHEDULED ARRANGEMENT. WORK COMPLETED WITHOUT DPIE APPROVAL MAY RESULT IN THE PERMITEE HAVING TO REMOVE AND RECONSTRUCT THE UNAPPROVED WORK. EACH OF THE STEPS MUST BE VERIFIED BY EITHER THE DPIE SITE/ROAD INSPECTOR AND/OR THE PERMITEE AND THE COMPLETED FORM SUBMITTED WITH THE AS-BUILT DRAWINGS.		
1. PRE-CONSTRUCTION MEETING		
2. SEDIMENT CONTROL INSTALLATION INCLUDING DEWATERING AND STREAM DIVERSION		
3. EXCAVATION FOR PLUNGE POOL CONFORMS TO APPROVED PLANS AND GEOTECHNICAL REPORT.		
4. SUBGRADE PREPARATION.		
5. USE SPECIFIED CLASS 1 RIPRAP.		
6. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE.		
7. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.		
8. EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 8 INCHES BEYOND THE EDGE OF THE SCOUR HOLE.		
9. STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.		

DESCRIPTION OF STAGE	DPIE	PERMITEE
10. AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE.		
11. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.		
12. FINAL INSPECTION OF GRADING AND PERMANENT STABILIZATION CONFORMS TO APPROVED PLANS.		

**NOTES:**

- PERMITEE TO SUPPLY DESIGN ENGINEER WITH DELIVERY TICKETS FOR ALL MATERIALS USED IN PLUNGE POOL CONSTRUCTION, FOR SUBMISSION WITH THE AS-BUILT PACKAGE.
- SEE CONSTRUCTION SPECIFICATIONS IN THIS PLAN FOR DETAILED REQUIREMENTS.
- A COPY OF THIS COMPLETED CHECKLIST MUST BE SUBMITTED AS PART OF THE PLUNGE POOL AS-BUILT PACKAGE.

**PLUNGE POOL AS-BUILT CERTIFICATION DATA TABLE  
FOR PATUXENT BLVD STRUCTURE NO. P-EH22**

MAY ONLY BE COMPLETED AND/OR CERTIFIED BY THE AS-BUILT INSPECTOR AS REQUIRED BY COMAR 26.17.02.10.

DOE CASE NUMBER: 38079-2022-0      PROJECT NUMBER: 19024.01

ACTIVITY	ADDITIONAL SUPPORTING DOCUMENTATION (SUBMIT ALL OF THE FOLLOWING WITH PLUNGE POOL AS-BUILT CERTIFICATION PACKAGE)	DATE(S) OF INSPECTION
PRIOR TO PLUNGE POOL EXCAVATION, OBSERVED ESC MEASURES ARE INSTALLED AROUND THE PLUNGE POOL OR CONFIRMED SURROUNDING AREA IS STABILIZED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED EXCAVATION OF PLUNGE POOL	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF GEOTEXTILE AND VERIFIED INSTALLATION PERFORMED AS SPECIFIED	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	
OBSERVED INSTALLATION OF RIP RAP CLASS I	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS <input type="checkbox"/> NOT APPLICABLE	
OBSERVED FINAL GRADING OF PLUNGE POOL	<input type="checkbox"/> INSPECTION REPORT <input type="checkbox"/> PHOTOGRAPHS	

FEATURE	DESIGN	AS-BUILT	DIFFERENCE
BOTTOM WIDTH (FT)	11.3		
BOTTOM LENGTH (FT)	17.9		
d <sub>50</sub> = THE MEDIAN STONE SIZE (IN)	9.5		
CULVERT SIZE (IN)	43"x68" HERCP		
B = PLUNGE POOL WIDTH (FT)	26.5		
C = PLUNGE POOL LENGTH (FT)	30.8		
D = 2 X d <sub>50</sub> = RIPRAP THICKNESS (IN)	19		
F = PLUNGE POOL DEPTH (FT)	2.5		
SIDE SLOPES (H:V)	3:1		

**PLUNGE POOL AS-BUILT CERTIFICATION**

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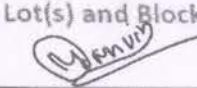

SIGNATURE: \_\_\_\_\_

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

MD. REG. NO.: \_\_\_\_\_

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 19024.01  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
 **Tanvir Bhuiyan**  


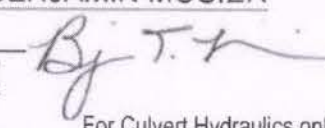
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N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.


DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

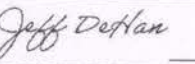
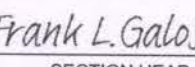
"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPIE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

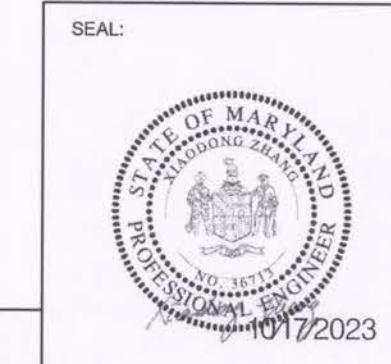
12/05/2023  
APPROVAL DATE: \_\_\_\_\_  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE:   
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0      For Culvert Hydraulics only, see Note Z on Concept Sufficiency Approval.



 TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

 PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9  
 12/18/2023  
ASSOCIATE DIRECTOR DATE  
APPROVED  12/18/2023  
SECTION HEAD DATE  
PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: N/A BY: SHN CHECK: XZ



DWG/FSC: 63 OF 73

TITLE:

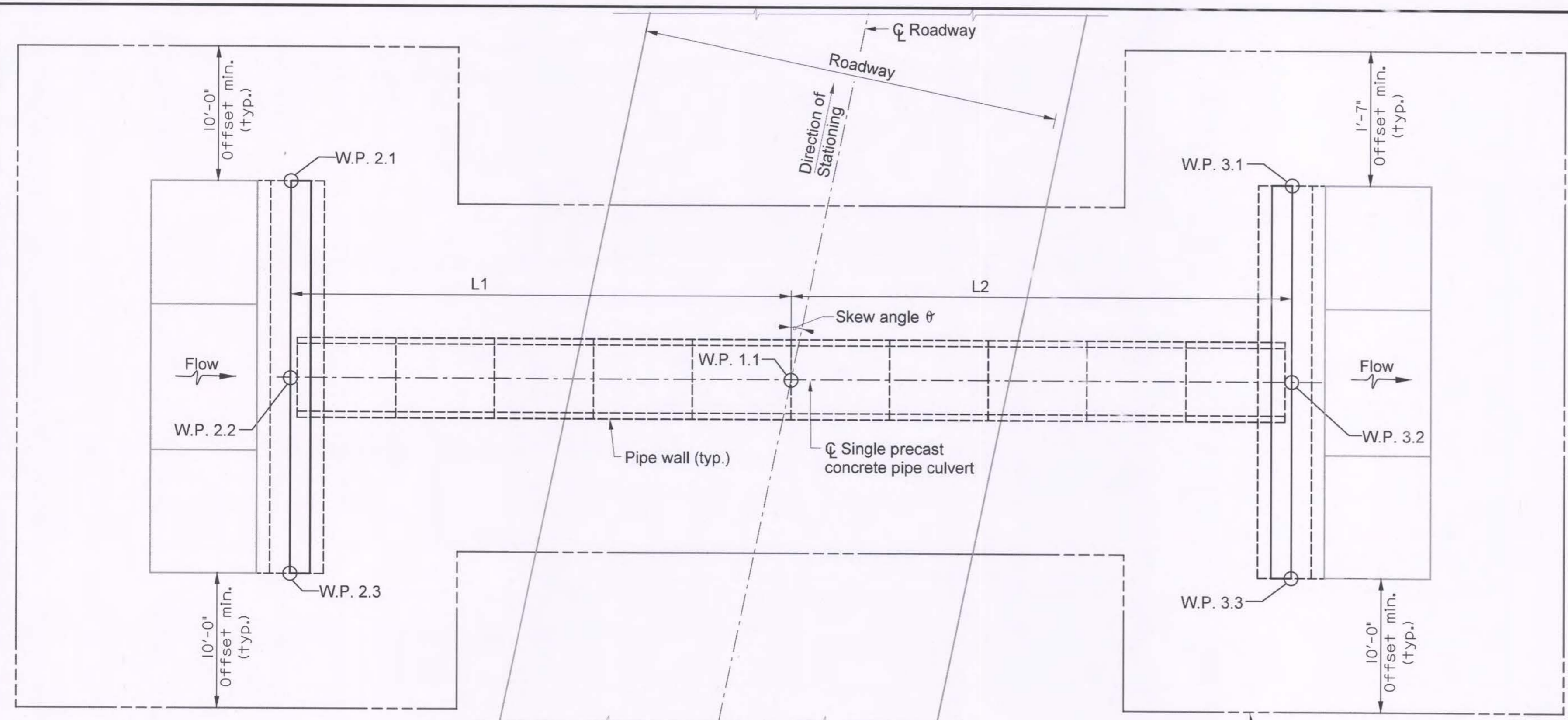
**PLUNGE POOL  
NOTES**

**EAGLE HARBOR STREAM  
RESTORATION AND  
COMMUNITY RESILIENCY  
PROJECT**

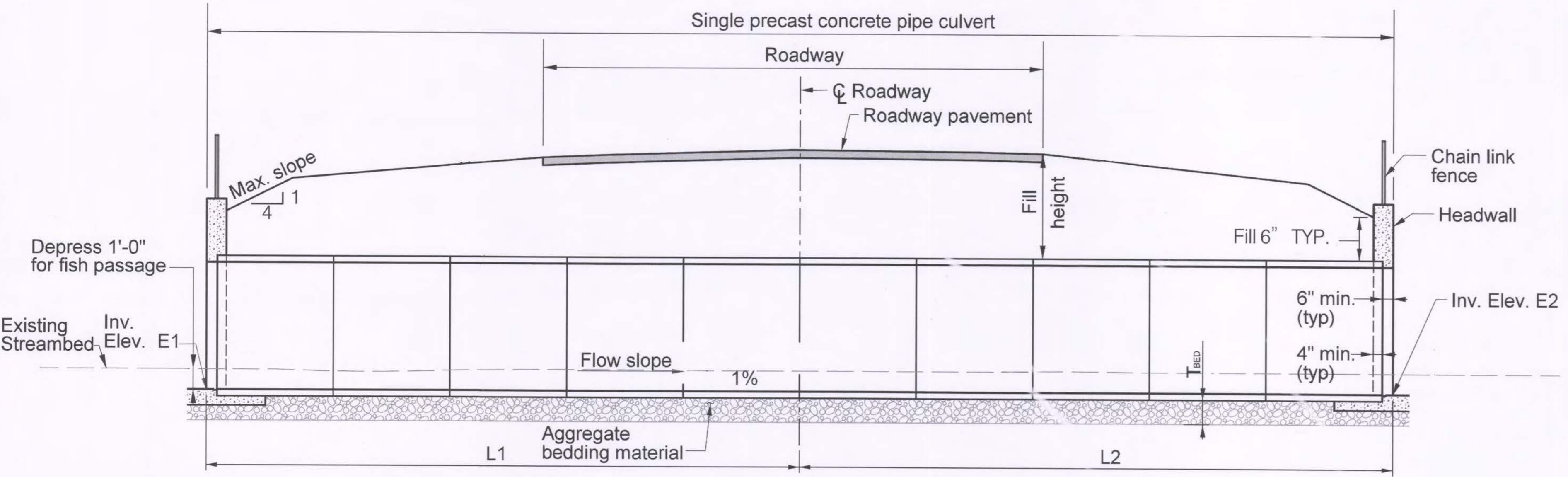
 **ZEST LLC**  
Engineering  
Science  
Technology  
9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
EMAIL: ZEST.MD@ZESTLLC.COM

BY: ZEST LLC





GEOMETRIC LAYOUT FOR CULVERT CROSSING HAWKINS DR  
SCALE: N.T.S.



LONGITUDINAL SECTION FOR CULVERT CROSSING HAWKINS DR\*  
SCALE: N.T.S.

\* INFORMATION IS FOR DPW&T REVIEW ONLY. NOT FOR CONSTRUCTION.

Point	Station	Offset	North	East
W.P. 1.1	101+92	0' RT.	327500.0634	1402144.2804
W.P. 2.1	102+06	15' LT.	327508.8413	1402125.9228
W.P. 2.2	101+94	17' LT.	327497.6264	1402127.5570
W.P. 2.3	101+83	18' LT.	327486.4115	1402129.1913
W.P. 3.1	102+01	19' RT.	327513.7441	1402159.5674
W.P. 3.2	101+89	17' RT.	327502.5293	1402161.2017
W.P. 3.3	101+78	15' RT.	327491.3144	1402162.8360

Prince George's County Maryland  
Department of the Environment (DoE)  
APPROVED PLAN SET  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

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Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 19024.01  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
Tanvir Bhuiyan

Conditions of Approval

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPIE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

APPROVAL DATE: 12/05/2023  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE: *B. Mosier*  
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0 For Culvert Hydraulics only, see Note Z on Concept Sufficiency Approval.

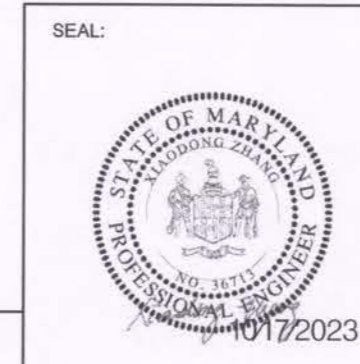
**GreenVest**  
VISION - PERFORMANCE - RESULTS

**MLS**

TOWN OF EAGLE HARBOR, INCORPORATED 1929  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9



PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 36713  
EXP. DATE: 06-21-2024

APPROVED: *Jeff Duffin* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER: *Benjamin Mosier* CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: N/A BY: PC CHECK: XZ

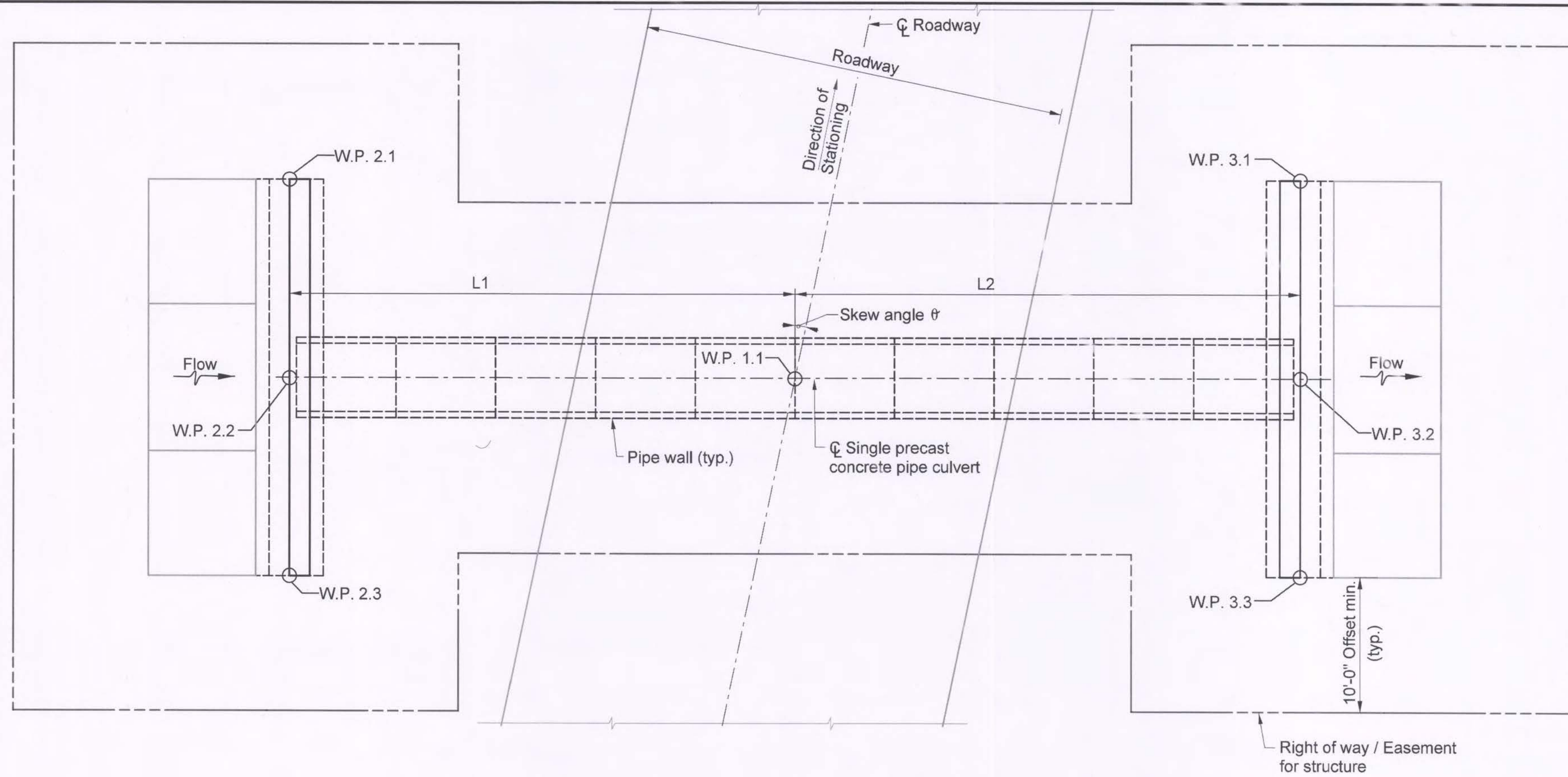
DWG/FSC: 64 OF 73  
TITLE: CULVERT PLAN, ELEVATION, & GEOMETRIC LAYOUT

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

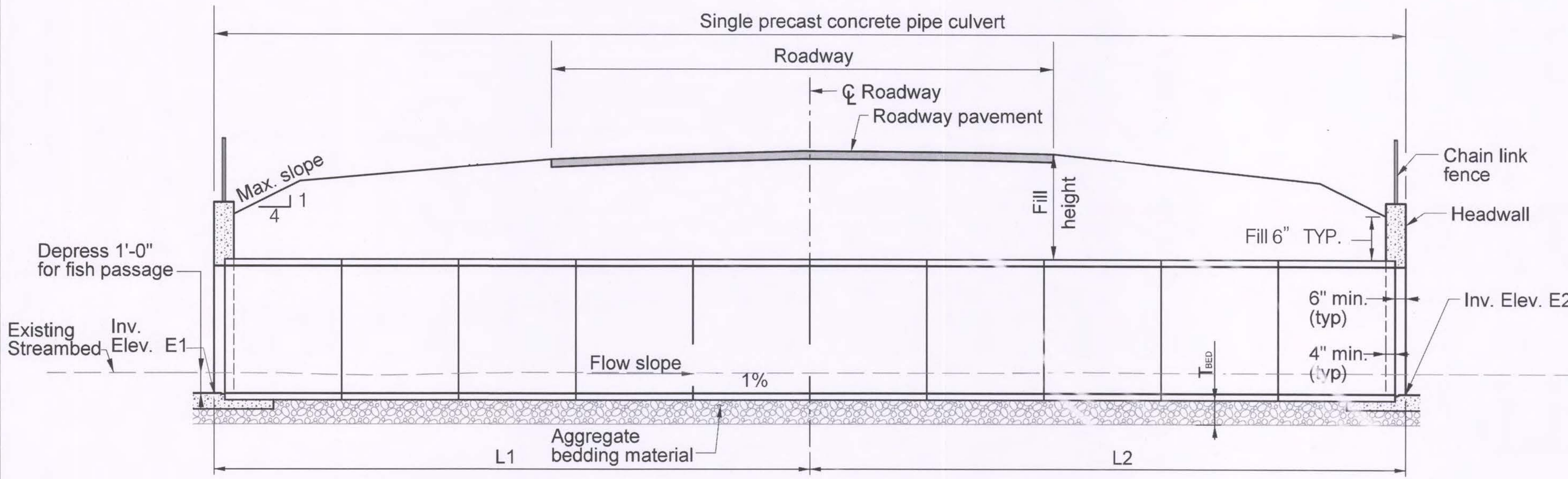
Culvert Length L1	Culvert Length L2	Skew $\theta$	Riprap Class		Riprap L3	Riprap L4	Inside Dia. Di	Bedding Materials Thickness $T_{BED}$	Inv. Elev. E1	Inv. Elev. E2
			Upstream	Downstream						
16.9'	17.1'	8.37°	N/A	I	N/A	N/A	43" X68"	2'	12.00'	11.66'

**ZEST LLC**  
Engineering Science Technology  
9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
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GEOMETRIC LAYOUT FOR CULVERT CROSSING PATUXENT BLVD  
SCALE: N.T.S.



LONGITUDINAL SECTION FOR CULVERT CROSSING PATUXENT BLVD\*  
SCALE: N.T.S.

\* INFORMATION IS FOR DPW&T REVIEW ONLY. NOT FOR CONSTRUCTION.

Culvert Dimension Table										
Culvert Length L1	Culvert Length L2	Skew $\theta$	Riprap Class		Riprap L3	Riprap L4	Inside Dia. Di	Bedding Materials Thickness T <sub>BED</sub>	Inv. Elev. E1	Inv. Elev. E2
			Upstream	Downstream						
16'	16'	0°	NA	I	NA	NA	43" X68"	2'	2.10'	1.78'

Working Point Table				
Point	Station	Offset	North	East
W.P. 1.1	202 + 96	0' RT.	327438.6209	1402549.4338
W.P. 2.1	203 + 08	16' LT.	327447.2730	1402531.8387
W.P. 2.2	202 + 96	16' LT.	327436.0831	1402533.6363
W.P. 2.3	202 + 85	16' LT.	327424.8932	1402535.4339
W.P. 3.1	203 + 08	16' RT.	327452.3485	1402563.4336
W.P. 3.2	202 + 96	16' RT.	327441.1587	1402565.2312
W.P. 3.3	202 + 85	16' RT.	327429.9688	1402567.0288

Prince George's County Maryland  
Department of the Environment (DoE)  
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Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):

Tanvir Bhuiyan

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SIGNATURE: *B. Mosier*  
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0

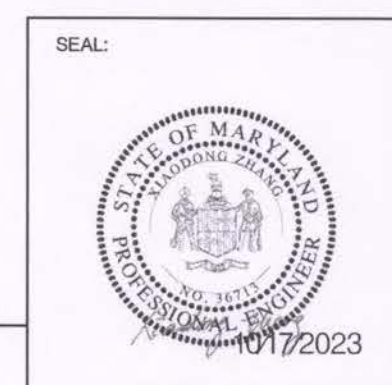


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ELECTION DISTRICT 9



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LICENSE NO. 38713  
EXP. DATE: 2024-06-21

APPROVED: *Jeff Dufan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: N/A BY: PC CHECK: XZ

DWG/FSC: 65 OF 73  
TITLE: CULVERT PLAN, ELEVATION, & GEOMETRIC LAYOUT

EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT

ZEST LLC  
Engineering Science Technology  
9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
EMAIL: ZEST.MD@ZESTLLC.COM







HYDROLOGIC DATA FOR CULVERT  
CROSSING PATUXENT BLVD

I. Source: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Prepared by:  SHA  Consultant: BIOHABITATS INC Date: 04/20/2023  
File location: \_\_\_\_\_

II. Drainage Area: Acres 5.03 Square Miles 0.01

III. Method(S) Of Analysis:  
Usgs Gage Data Analysis  
Gaging station No. \_\_\_\_\_  
Location \_\_\_\_\_  
Drainage area \_\_\_\_\_  
Years of continuous record \_\_\_\_\_  
USGS Regression equations \_\_\_\_\_  
Reference:  
X SCS TR - 20 Method - version used (Date) VERSION 3.20  
RCN (Existing-Homogeneous Watershed)<sup>1</sup> \_\_\_\_\_  
RCN (Ultimate Homogeneous Watershed)<sup>1</sup> 60.4  
Tc (Homogeneous Watershed)<sup>2,4,6</sup> \_\_\_\_\_  
FEMA base flood (100-year) discharge (CFS) Method used by FEMA \_\_\_\_\_  
Other (Describe) \_\_\_\_\_

Has flood routing been used in determining flood discharges? Yes \_\_\_\_\_ No \_\_\_\_\_

Method Selected \_\_\_\_\_

IV. Computed flood discharges

Return period (Years)	Flood discharge (CFS)	
	Based on existing watershed development	Based on ultimate watershed development
2		106.06
10		229.02
100		394.50

V. Historic floods

Year	Magnitude (CFS)	High water elevation	Where measured	Source of Data

VI. Stream Morphology

Stream Type C5c Valley Type \_\_\_\_\_  
Stream Bed Material: Description D16 0.2 mm D50 0.35 mm D84 0.59 mm  
Bank full characteristics:  
Q 9.1 cfs Area 4.2 sf Width 5' Depth 0.5'  
Slope 0.96% Mannings "n" Value 0.014 Sinuosity 1

VII. Tidal Flows

100-Year storm tide elevation (FT) \_\_\_\_\_ Maximum discharge (CFS) \_\_\_\_\_  
500-Year storm tide elevation (FT) \_\_\_\_\_ Maximum discharge (CFS) \_\_\_\_\_  
Source of information \_\_\_\_\_  
Design Discharge (CFS) \_\_\_\_\_ Return Period \_\_\_\_\_ Years Tidal period (Hrs) \_\_\_\_\_  
How Determined? (Explain) \_\_\_\_\_  
Water surface-elevation for design condition (FT) (if tidal flow governs hydraulic design) \_\_\_\_\_

VIII. Comments:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

HYDRAULIC DATA FOR CULVERT CROSSING PATUXENT BLVD

I. Source: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Prepared by:  SHA  Consultant: BIOHABITATS INC Date: 04/20/2023  
File location: \_\_\_\_\_ Item 71 Rating  
Method(s) of analysis: HEC-RAS

II. Hydraulic Data

Flow Conditions <sup>3</sup>	Channel Cross-Section	Structure waterway area <sup>4</sup>	Energy Slope <sup>4</sup>	Water Surface Elevation <sup>4</sup>	Channel <sup>5</sup>				Left overbank looking downstream <sup>5</sup>				Right overbank looking downstream <sup>5</sup>				Discharge over road	
					Q	W	V*	D*	Q	W	V	D	Q	W	V	D		
Q <sub>10</sub> Describe _____	Approach <sup>8</sup> (Describe location below) Upstream at structure																	
	Downstream at structure																	
Q <sub>100</sub> Describe _____	Approach <sup>8</sup> (Describe location below) Upstream at structure	15.95	1%	8.19	159.87	5.67	5.85	6.35										234.13
	Downstream at structure	15.95	1%	5.49	159.87	5.67	8.35	2.99										234.13
Q <sub>Overtopping or other discharge</sub> Describe Q <sub>2</sub>	Approach <sup>8</sup> (Describe location below) Upstream at structure	15.95	1%	6.13	106.06	5.67	5.70	2.80										
	Downstream at structure	15.95	1%	4.38	106.06	5.67	7.75	1.88										

\*VELOCITY & DEPTH ARE MAXIMUM VALUE READ FROM HEC-RAS 2D MODEL.

III. Bridge scour data

A. Scour evaluation study Title: \_\_\_\_\_  
Prepared by:  SHA  Consultant: \_\_\_\_\_ Date: \_\_\_\_\_  
File location: \_\_\_\_\_ Item 113 Rating<sup>2</sup>

B. Scour estimates:

Design conditions (Describe special conditions such as overtopping, low tailwater, influence of confluences, etc.)	Flood Discharge Return Period (Years)	Flood Discharge Magnitude (CFS)	Long Term Degradation/Aggradation (FT)	Contraction <sup>9</sup> Scour depth (Looking downstream) (FT)			Channel bed load (Describe)	Type of Scour (live bed/clear water)
				LT	MAN	RT		
Design Flood for scour								
Check Flood for scour								
Other								

Total Scour: Estimated total scour at substructure/channel elements (includes long term degradation/aggradation plus contraction scour, plus local scour)

Location of channel or substructure element	Elevation of bottom of stream channel bed or scour hole (FT) <sup>10</sup>		Scour counter measures
	Design flood (100-Yr)	Check flood (500-Yr)	
Channel Thalweg			<input type="checkbox"/> Existing <input type="checkbox"/> New
Abutment			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			
Pier No.			

Notes:  
Blank spaces indicate that data is not available or is not applicable.  
1. Parameters computed assuming the watershed is homogeneous without subdivisions.  
2. Item 71 rating and item 113 rating refer to federal bridge inventory items.  
3. Record flow conditions used in analysis: discharge (Q), tailwater condition and how selected, etc. (for depressed culverts, indicate under comments the assumptions made as to whether sediment will remain during floods).  
4. For culverts, use these three columns to record:  
• Depth of flow at culvert inlet and outlet  
• Water-surface elevation at culvert inlet and outlet  
• Energy slope for culvert barrel  
5. Symbols used:  
Q = Flow or discharge (CFS)  
W = Channel width or floodplain width (FT)  
V = Flow velocity (FPS)  
D = Depth of flow (FT)  
6. For culverts, record outlet velocity here.  
7. For culverts, record tailwater depth here.  
8. Approach section should be selected as per guidance in abscur users manual.  
9. Enter contraction scour depths only (approximate line 121 in abscur output) - not abutment scour.  
10. If scour resistant bedrock controls scour, enter bedrock Elevation and note this condition under comments.  
11. Record incipient overtopping discharge (Q) and recurrence interval.  
12. Record clearance between water surface elevation and low chord for design discharge.  
13. Record total flow area under structure (Downstream end) for 100 & 500 year floods.

IV. Roadway and structure data

Item	Existing structure	Proposed structure
Name of waterway	PATUXENT RIVER	
Date built	N/A	2023
Overtopping elevation	7.12'	7.12'
Overtopping location (Describe)	PATUXENT BLVD	PATUXENT BLVD
Incipient Overtopping flow condition <sup>11</sup> (Overtopping Q < 100 Yr flood)	4.10 cfs	134.33 cfs
FREEBOARD <sup>12</sup>	N/A	2'
Total structure waterway area <sup>13</sup>	1.23 sf	15.95 sf
Structure description <sup>14</sup>	15", 1, 25.75'	43" x 88", 1, 32'
Inlet treatment <sup>15</sup>	N/A	N/A
Outlet treatment <sup>15</sup>	RIPRAP	PLUNGE POOL
Mannings "N" Value <sup>16</sup>	0.024	0.013

V. Survey book numbers

Reference datum for elevations \_\_\_\_\_

VI. Flood plain management data

Date of flood insurance study 09/16/2016 Community panel No. 24033C0458E  
Project location (Check below):  
 Beyond fema program limits (Not in "A" Hazard zone)  
 Fema hazard zone "A"; No base flood elevations established  
 Fema hazard zone "A-2"; base flood elevations established  
Regulatory floodway YES \_\_\_\_\_ NO \_\_\_\_\_  
Maximum change in water surface elevation upstream of Bridge due to highway project (Max. backwater) \_\_\_\_\_ FT.  
Location of max. backwater from Upstream face of bridge \_\_\_\_\_ FT.  
Describe type of study done to determine consistency With NFIP Standards \_\_\_\_\_  
Date community acknowledgement form issued: \_\_\_\_\_  
Is the project consistent with the code of federal regulations, Part 650 A, Location and hydraulic design of encroachments on Flood plains (23 CFR 650 A). Y/N \_\_\_\_\_  
Is the project consistent with the annotated Code of Maryland (Comar 08.05.03)? Y/N \_\_\_\_\_

VII. Comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Prince George's County Maryland  
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APPROVED PLAN SET  
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Case Number: 38079-2022-0  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
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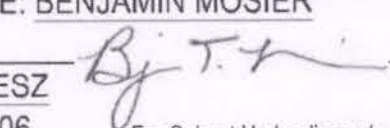
  
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PRINCE GEORGE'S COUNTY, MD  
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PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE:   
COMPANY NAME: SOLTESZ  
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For Culvert Hydraulics only, see Note Z on Concept Sufficiency Approval.


 

 TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

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PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

APPROVED:  Frank L. Galosi 12/18/2023  
SECTION HEAD DATE  
PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: N/A BY: PC CHECK: XZ

SEAL:  PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36713 EXP. DATE: 2024-06-21

DWG/FSC: 67 OF 73  
TITLE: HYDROLOGIC & HYDRAULIC DATA

 ZEST LLC  
Engineering Science Technology  
9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
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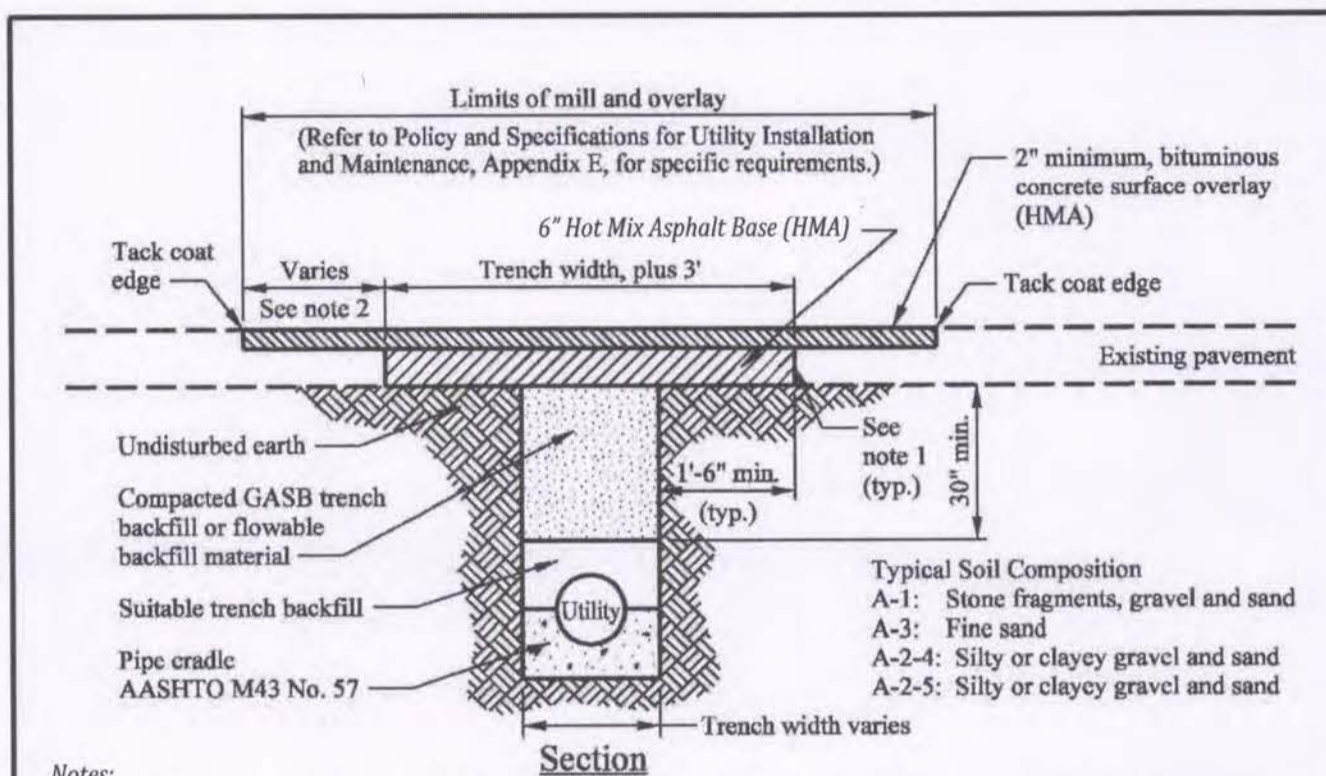


**GENERAL STORM DRAIN, PAVING, AND UTILITY NOTES**

- 1) VISIBLE ABOVE GROUND UTILITIES HAVE BEEN PROVIDED VIA TOPOGRAPHIC SURVEY. SUBSURFACE UTILITY LOCATIONS AND ELEVATIONS ARE APPROXIMATE AND TAKEN FROM BEST AVAILABLE PLANS, RECORDS, AND/OR FIELD RECONNAISSANCE PERFORMED BY AB CONSULTANTS. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO LOCATE AND PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- 2) ALL STORM DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE STORMWATER MANAGEMENT STANDARDS AND SPECIFICATIONS OF PRINCE GEORGE'S COUNTY DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION.
- 3) FOR TYPES OF STORM DRAIN STRUCTURES, REFER TO THE LATEST STANDARD DETAILS OF PRINCE GEORGE'S COUNTY DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION, UNLESS OTHERWISE NOTED.
- 4) ALL ROADWAY CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING: THE DPW&T SPECIFICATIONS AND STANDARDS FOR ROADWAYS AND BRIDGES; THE PRINCE GEORGE'S COUNTY CODE, SUBTITLE 23, ROAD ORDINANCE; AND THE PRINCE GEORGE'S COUNTY POLICY AND SPECIFICATION FOR UTILITY INSTALLATION AND MAINTENANCE.
- 5) THE CONTRACTOR SHALL NOTIFY MISS UTILITY AT 1-800-257-7777 A MINIMUM OF FORTY-EIGHT (48) HOURS BEFORE STARTING WORK. ALL EXISTING UTILITIES MUST BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION.
- 6) PRIOR TO STARTING ANY WORK SHOWN ON THIS PLAN, THE PERMITTEE SHALL ARRANGE A PRE-CONSTRUCTION MEETING WITH THE DPW&T INSPECTOR BY CALLING (301) 883-5730 A MINIMUM OF FORTY-EIGHT (48) HOURS BEFORE STARTING WORK.
- 7) IN ACCORDANCE WITH SECTION 23-128, THE COUNTY'S ROAD ORDINANCE, A PROJECT SIGN SHALL BE POSTED PROMINENTLY DESCRIBING THE FOLLOWING:
  - SUBDIVISION NAME (AS SHOWN ON PERMIT APPLICATION)
  - OWNER/PERMITTEE NAME
  - OWNER/PERMITTEE ADDRESS AND PHONE
  - DPW&T PERMIT NUMBER
- 8) ALL ELEVATIONS SHOWN ON THIS PLAN ARE IN ACCORDANCE WITH THE FOLLOWING:
  - HORIZONTAL-MARYLAND COORDINATE SYSTEM (STATE PLANE GRID) BASED ON NORTH AMERICAN DATUM OF 1983 (NAD 83);
  - VERTICAL-NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

**NOTE FOR ALL STANDARDS:**

THE DESIGNER MUST USE THE MOST CURRENT VERSION STANDARDS



**Notes:**

1. Existing pavement shall be milled or saw cut full depth where the limits of mill and overlay meet the existing pavement.
2. For longitudinal and transverse cuts, the limits of the mill and overlay shall be in accordance with the Policy and Specification for Utility Installation and Maintenance, Attachment 2 and 3, for specific requirements.
3. When the distance from the edge of the existing pavement to the edge of new asphalt base is 3 feet or less, the existing pavement shall be removed and replaced to the edge.
4. For transverse cuts, perimeter milling with a minimum width of 12" shall be required.
5. All milling shall be 2" minimum depth.
6. Hot Mix Asphalt (HMA) base and surface overlay mix design to be in accordance with classification of roadway, (see Category 100 for details)
7. Hot Mix Asphalt (HMA) surface shall be placed to a depth equal to 2". Hot Mix Asphalt (HMA) base shall be a depth equal to 6". All Hot Mix Asphalt (HMA) shall be compacted to an in-place density of 92 to 97 percent of the maximum specific gravity.
8. The top two-and-one-half (2 1/2) feet of all trench backfill beneath the pavement layer shall be compacted Graded Aggregate Subbase (GASB) to 95% of the maximum dry density per AASHTO Designation T-99. Prior to and during compaction, moisture of fill material shall be maintained within 2% of optimum. The fill shall be placed and compacted in horizontal layers not to exceed 8" in thickness (loose). GASB shall conform to the requirements of the latest edition MSHA Standard Specifications for Construction and Materials manual. Flowable fill material may also be used when approved by the Department.
9. Suitable trench backfill below the top two-and-one-half (2 1/2) feet down to five (5) feet deep shall be placed in horizontal layers not to exceed 8 inches (loose) and compacted to at least 92% of maximum dry density per AASHTO Designation T-99. Moisture content shall be maintained within 2% optimum.
10. Trench backfill below five (5) feet deep shall be placed and compacted in layers not to exceed 1 foot in thickness (loose).
11. All compaction work shall be performed using suitable equipment such as sheepfoot rollers or pneumatic and/or vibratory plate type compaction equipment. Backfill material shall be placed evenly around the structure and shall be free of boulders, frozen lumps or foreign matter that could cause hard spots or decompose creating voids.
12. Where cave-ins under existing asphalt pavement occur, the existing pavement shall be saw-cut 18 inches beyond the limit of the cave-in.
13. Use an independent testing lab to verify compaction.

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

DIRECTOR DATE

REVISION DATE: APPROVED BY:

**DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION**  
Prince George's County, MD

**Utility Patch in Flexible Asphalt Pavement**

300.18 MOD

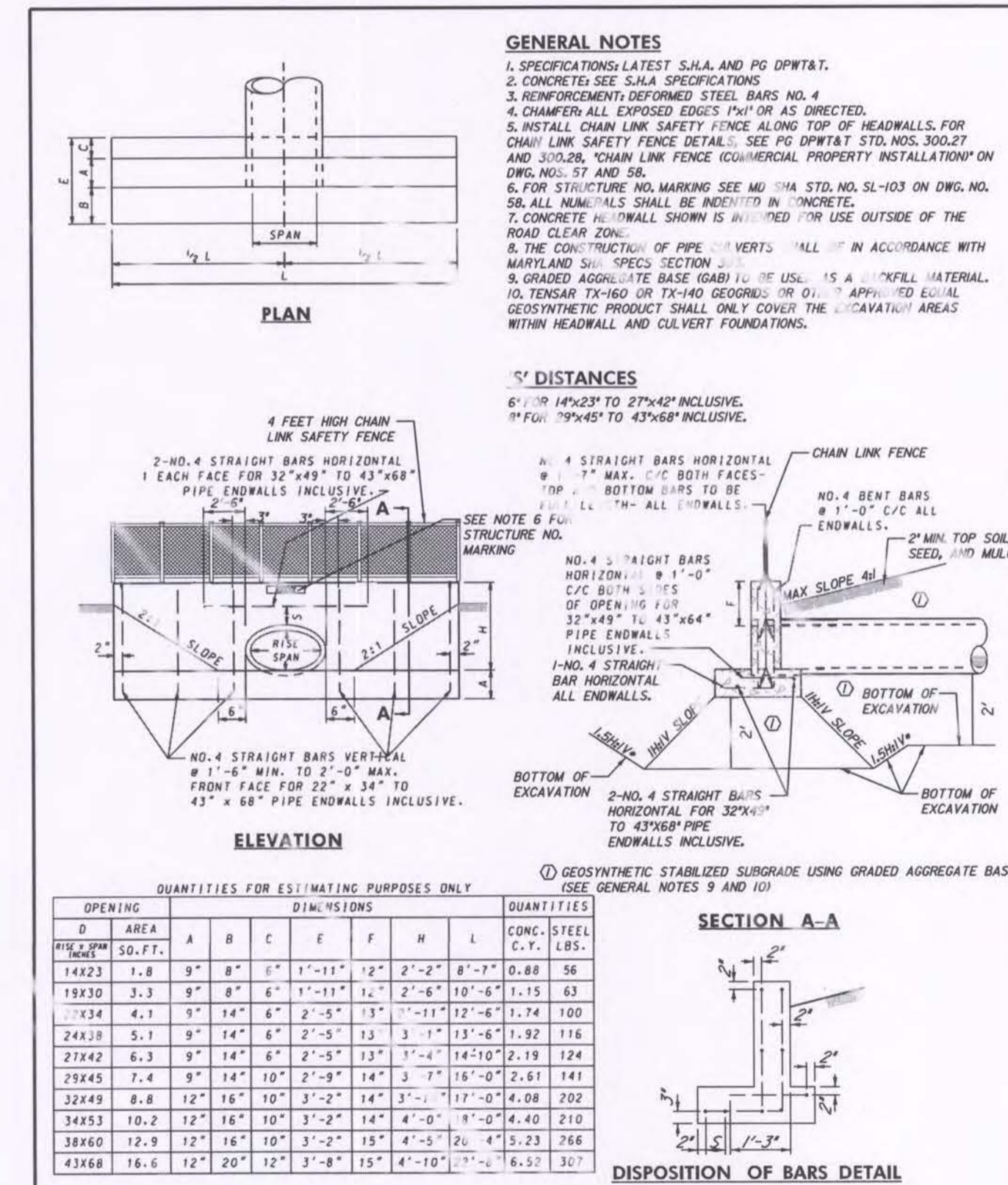
Revision 03/14/12 Specifications and Standards for Roadways and Bridges Section III - 63.

**ZEST LLC**  
Engineering  
Science  
Technology

9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
EMAIL: ZEST\_MD@ZESTLLC.COM

- 9) TEMPORARY TRAFFIC CONTROL AND PERMANENT TRAFFIC SIGNS SHALL CONFORM TO THE LATEST EDITION OF THE FEDERAL HIGHWAY ADMINISTRATION'S MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- 10) IT SHALL BE THE RESPONSIBILITY OF THE PERMITTEE TO ARRANGE FOR THE ADJUSTMENT OR RELOCATION OF ALL UTILITIES.
- 11) THE CONTRACTOR SHALL CONFIRM EXISTING UTILITY LOCATION AND ELEVATION AT ALL LOCATION(S) WHERE PROPOSED WORK CROSSES THE EXISTING UTILITIES. THE ENGINEER IS TO BE NOTIFIED OF THIS INFORMATION IN ADVANCE OF CONSTRUCTION AND IF THERE ARE ANY CONFLICTS WITH PROPOSED WORK.
- 12) CONTRACTOR SHALL EXERCISE CARE WHEN DIGGING ADJACENT TO AND CROSSING THE UTILITIES TO ENSURE THAT THESE AND ALL UTILITIES ARE PROTECTED FROM DAMAGE DURING CONSTRUCTION. ANY DAMAGE TO THE UTILITIES IS THE CONTRACTOR'S RESPONSIBILITY.
- 13) ANY EXISTING UTILITIES NOT IMPACTED BY PROPOSED WORK ARE TO BE PROTECTED AND TO REMAIN IN SERVICE.
- 14) ALL UNSUITABLE MATERIAL MUST BE REMOVED AND REPLACED WITH SUITABLE MATERIAL TO A DEPTH AS DIRECTED BY THE GEOTECHNICAL ENGINEER, THE DISTRICT INSPECTOR, AND/OR THE DEPARTMENT'S ENGINEER.
- 15) EXCAVATION AND PLACEMENT OF FILL MATERIAL SHALL BE PERFORMED UNDER THE SUPERVISION OF A MARYLAND-LICENSED ENGINEER.
- 16) THE PERMITTEE WILL BE REQUIRED TO FURNISH COMPACTION REPORTS CERTIFIED BY A MARYLAND-LICENSED ENGINEER ON EACH LAYER OF FILL MATERIAL PRIOR TO PLACING SUBSEQUENT LAYERS.
- 17) DURING THE PLACEMENT OF A STANDARD PAVEMENT SECTION, NO PAVEMENT COURSE OR STONE LIFT SHALL BE PLACED UNTIL THE UNDERLYING COURSE OR SUBGRADE IS APPROVED BY THE DPW&T INSPECTOR. THE APPROVAL SHALL EXPIRE IF TRAFFIC OR INCLEMENT WEATHER AFFECTS THE SITE PRIOR TO PAVING.
- 18) AS SOON AS THE ASPHALT BASE COURSE IS APPROVED, THE INTERMEDIATE ASPHALT COURSE SHALL BE PLACED IMMEDIATELY OVER IT TO FORM A PROTECTIVE SEAL.
- 19) SAW CUT AND MILL A 2-INCH DEEP, 10-FOOT-WIDE NOTCH AT EXISTING EDGE OF PAVEMENT WHERE IT IS NECESSARY TO CONNECT TO OR TO EXTEND AN EXISTING ROAD. OVERLAY AT POINT OF TIE-IN TO ENSURE A SMOOTH TRANSITION AND POSITIVE DRAINAGE.
- 20) PAVEMENT CORING OF ALL PAVEMENT COURSES WILL BE REQUIRED OF THE PERMITTEE USING THE FOLLOWING PROCESS:
  - 48 HOURS PRIOR TO CORING, PERMITTEE CONTACTS INSPECTOR REQUESTING DEMARCATION OF CORE LOCATIONS AND PROVIDING PAVING INFORMATION NEEDED FOR THE DPW&T CORE TESTING REQUEST (CTR) FORM.
  - INSPECTOR RANDOMLY SELECTS AND MARKS CORE LOCATIONS. INSPECTOR WILL INITIAL EACH CORE WITH KEEL MARKER AND THEN MARK WITH SPRAY PAINT TO ENSURE THAT THE CORE THAT GOES TO THE LAB HAS COME FROM THE SELECTED LOCATION. NOTE THAT THE LOCATION OF CORES OR CORING OF THE PAVEMENT IS PERMITTED ON THE SAME DAY THAT THE PAVING HAS OCCURRED.
  - AFTER CORING, INSPECTOR VERIFIES THAT CORED LOCATIONS ARE THE SAME AS MARKED (DOES NOT ABSOLUTELY HAVE TO BE PRESENT TO WITNESS).
  - PERMITTEE DELIVERS CORES TO THE MATERIALS LAB WITHIN 24 HOURS FROM PAVING. NOTE: THE PERMITTEE MAY SUBMIT CORES TO A COUNTY PRE-APPROVED PRIVATE MATERIALS LAB FOR ANALYSIS. RESULTS ARE THEN SUBMITTED DIRECTLY TO THE COUNTY MATERIALS LAB.
  - COUNTY MATERIALS LAB PERFORMS ANALYSIS. THE PERMITTEE MAY USE AN ACCREDITED PRIVATE LAB TO PERFORM THE ANALYSIS.
  - COUNTY MATERIALS LAB PROVIDES RESULTS TO INSPECTOR AND MAILED TO PERMITTEE.

- 21) PERMITTEE SHALL SUBMIT PROPERTY CORNER CERTIFICATIONS AND UTILIZE METAL PROPERTY MARKERS PER PRINCE GEORGE'S COUNTY CODE, SECTION 24-120, PRIOR TO ACCEPTANCE OF STREETS.
- 22) WASHINGTON SUBURBAN SANITARY COMMISSION 200 FOOT SHEET NO.:
- 23) DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION STORMWATER CONCEPT APPROVAL NUMBER:



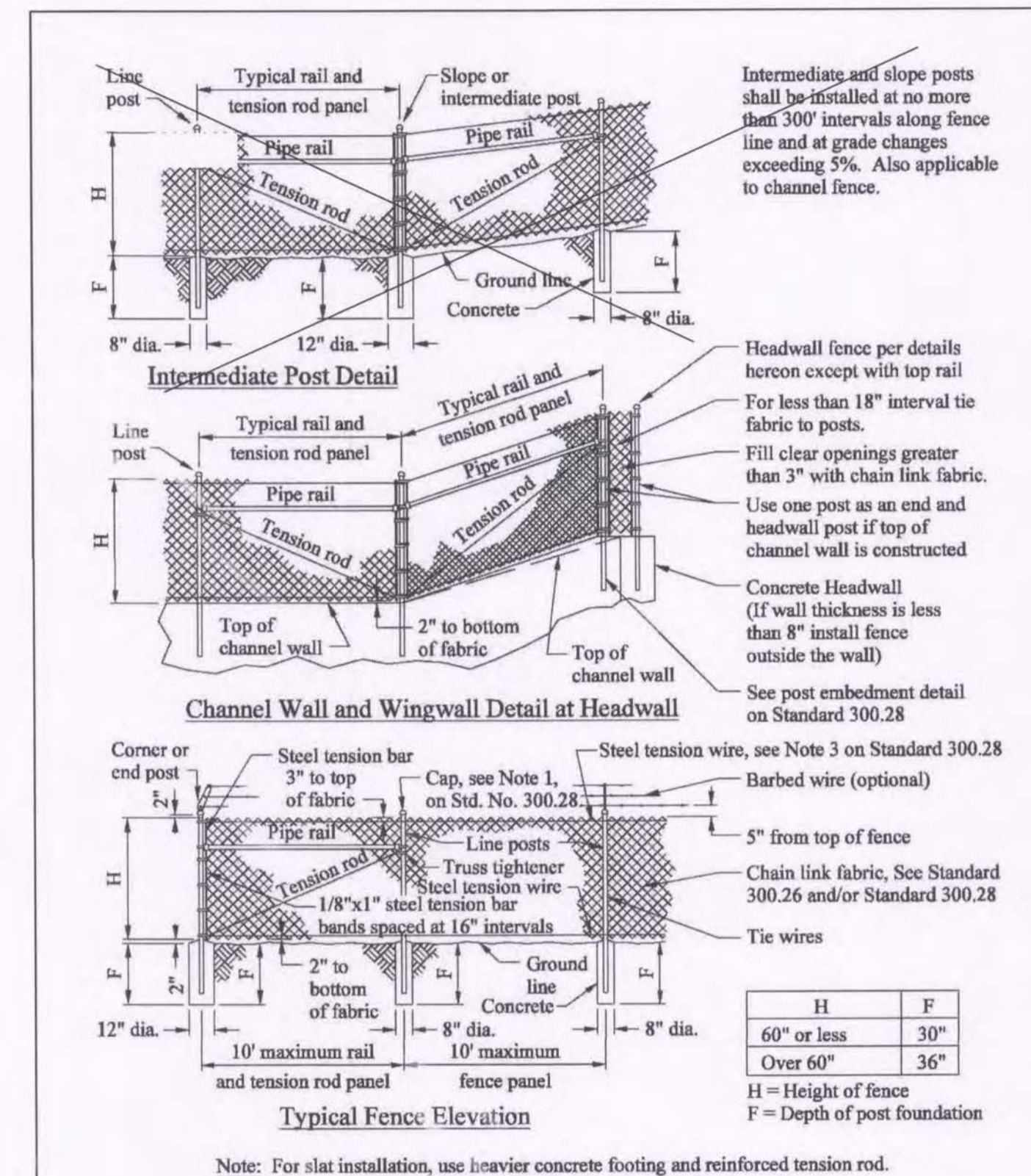
\* USE TRENCH BOX OR OTHER PROTECTION METHODS TO PROTECT THE SOIL FROM CAVE-IN, WHERE THE MAXIMUM ALLOWABLE SIDE SLOPES FOR UNSUPPORTED/FREE-STANDING SHORT-TERM EXCAVATION OF 1.5 HORIZONTAL TO 1 VERTICAL (1.5H:1V OR 34 DEG) CANNOT BE PROVIDED.

- 24) SEDIMENT CONTROL APPROVAL NUMBER: \_\_\_\_\_
- 25) PRELIMINARY PLAN APPROVAL NUMBER: \_\_\_\_\_
- 26) RECORD PLAT RECORDING NUMBER: \_\_\_\_\_
- 27) APPROVED STREET GRADE ESTABLISHMENT INFORMATION:

ORIGINAL STREET NAME	APPROVAL NUMBER

28) AT THE TIME OF PERMIT RELEASE, THE FOLLOWING MINIMUM SUBMITTAL REQUIREMENTS WHERE APPLICABLE SHALL APPLY:

- WASHINGTON SUBURBAN SANITARY COMMISSION PAVING CLEARANCE CERTIFICATION;
  - BITUMINOUS CONCRETE CORE CERTIFICATIONS, ALL PAVEMENT COURSES;
  - PROPERTY MARKER CERTIFICATION;
  - DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION LETTER APPROVING STORM DRAIN AS-BUILT;
  - TREE APPROVAL AND TREE BOND POSTED, IF NECESSARY;
  - STREET LIGHT PROOF OF PAYMENT (MUST BE ACCOMPANIED BY A MEMORANDUM FROM DPW&T'S TRAFFIC SAFETY DIVISION ACCEPTING THE PROOF OF PAYMENT); AND
  - PROOF STATEMENT THAT ALL FINANCIAL MATTERS HAVE BEEN SETTLED.
- 29) THE PERMITTEE IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL TRAFFIC SIGNS FOR ROADWAY IMPROVEMENTS ON SUBDIVISION ACCESS ROADS WHICH INCLUDE ARTERIAL, COLLECTOR, INDUSTRIAL, AND ANY NECESSARY OFFSITE CONDITIONS WHICH REQUIRE ROADWAY IMPROVEMENTS. THE DESIGN AND/OR CONSTRUCTION DRAWINGS SHALL BE INCLUDED ALONG WITH THE PERMIT PLANS, AND SHALL BE REVIEWED THE DEPARTMENT'S TRAFFIC SAFETY DIVISION PRIOR TO PERMIT ISSUANCE.
- 30) THE PERMITTEE IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL TRAFFIC MARKINGS, TRAFFIC SIGNALS, IF REQUIRED, AND PAYMENT OF FEE FOR STREET NAME SIGNS ON INTERNAL SUBDIVISION STREETS. TRAFFIC SIGNS WILL BE FURNISHED AND INSTALLED BY COUNTY FORCES.



APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

DIRECTOR DATE

REVISION DATE: APPROVED BY:

**DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION**  
Prince George's County, MD

**Chain Link Fence (Commercial Property Installation) - Part I**

STD. 300.27

Revision 03/14/12 Specifications and Standards for Roadways and Bridges Section III - 72

SEAL: \_\_\_\_\_

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 38713  
EXP. DATE: 2024-06-01

DWG/FSC: 68 OF 73

TITLE: **STORM DRAIN, PAVING, AND UTILITY NOTES & DETAILS**

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

Case Type: **CIP WO**

Issuance Date: **12/15/2023**

Address: **00000 HAWKINS DR AQUASCO, Maryland 20608**

Lot(s) and Block(s): \_\_\_\_\_

**Tanvir Bhuiyan**

- Conditions of Approval**
- The above approval is conditioned upon the following:
- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
  - Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
  - This approval does NOT represent a permit to construct.

N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.

**DEPARTMENT OF THE ENVIRONMENT (DoE)**  
PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPW&T'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

APPROVAL DATE: **12/05/2023**

PEER REVIEWER'S NAME: **BENJAMIN MOSIER**

SIGNATURE: \_\_\_\_\_

COMPANY NAME: **SOLTESZ**

LICENSE NUMBER: **40806**

PERMIT NUMBER: **38079-2022-0**

For Culvert Hydraulics only, see Note Z on Concept Sufficiency Approval.

**GreenVest**  
VISION - PERFORMANCE - RESULTS

**TOWN OF EAGLE HARBOR**  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

ASSOCIATE DIRECTOR DATE

APPROVED: **Frank L. Galosi** DATE: **12/18/2023**

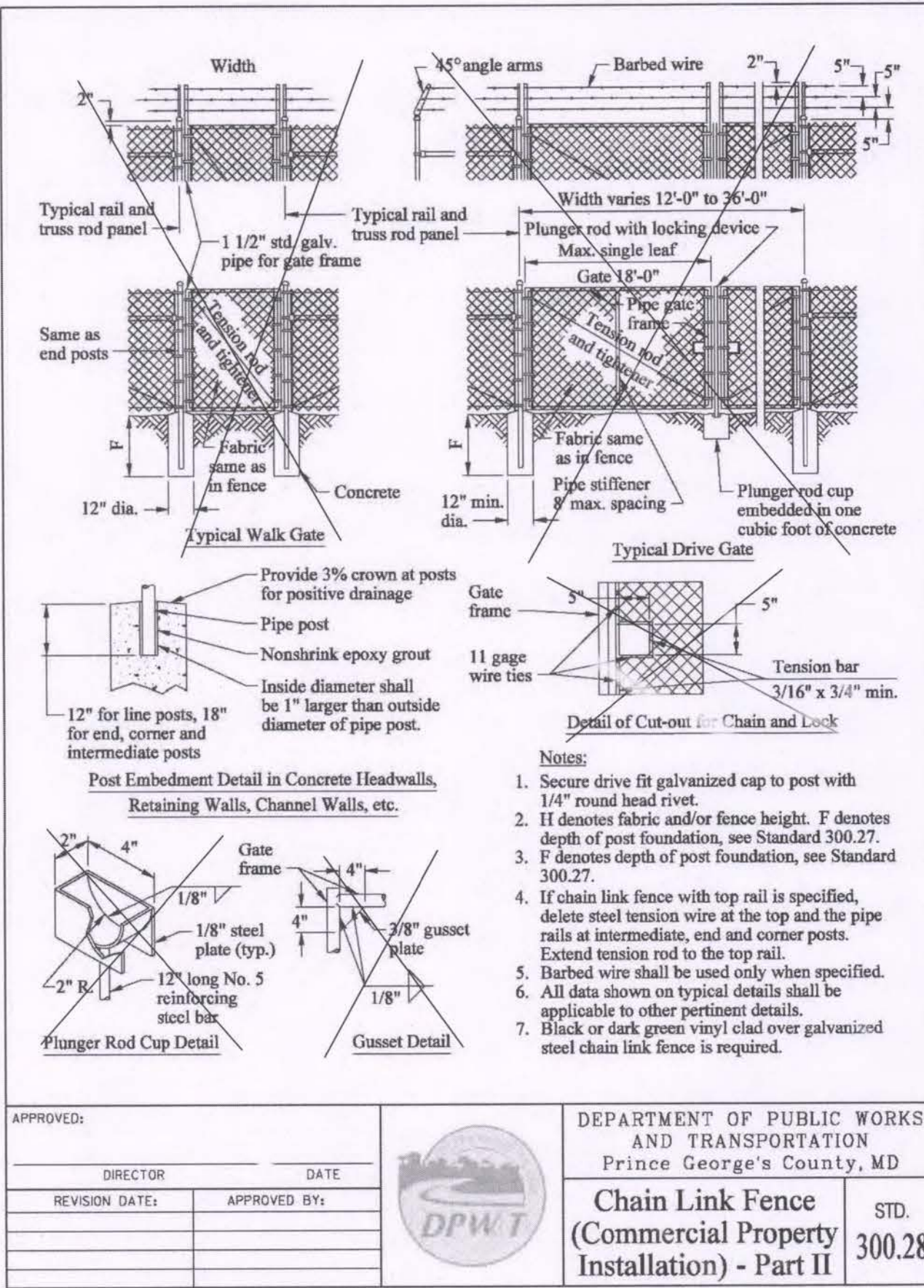
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.

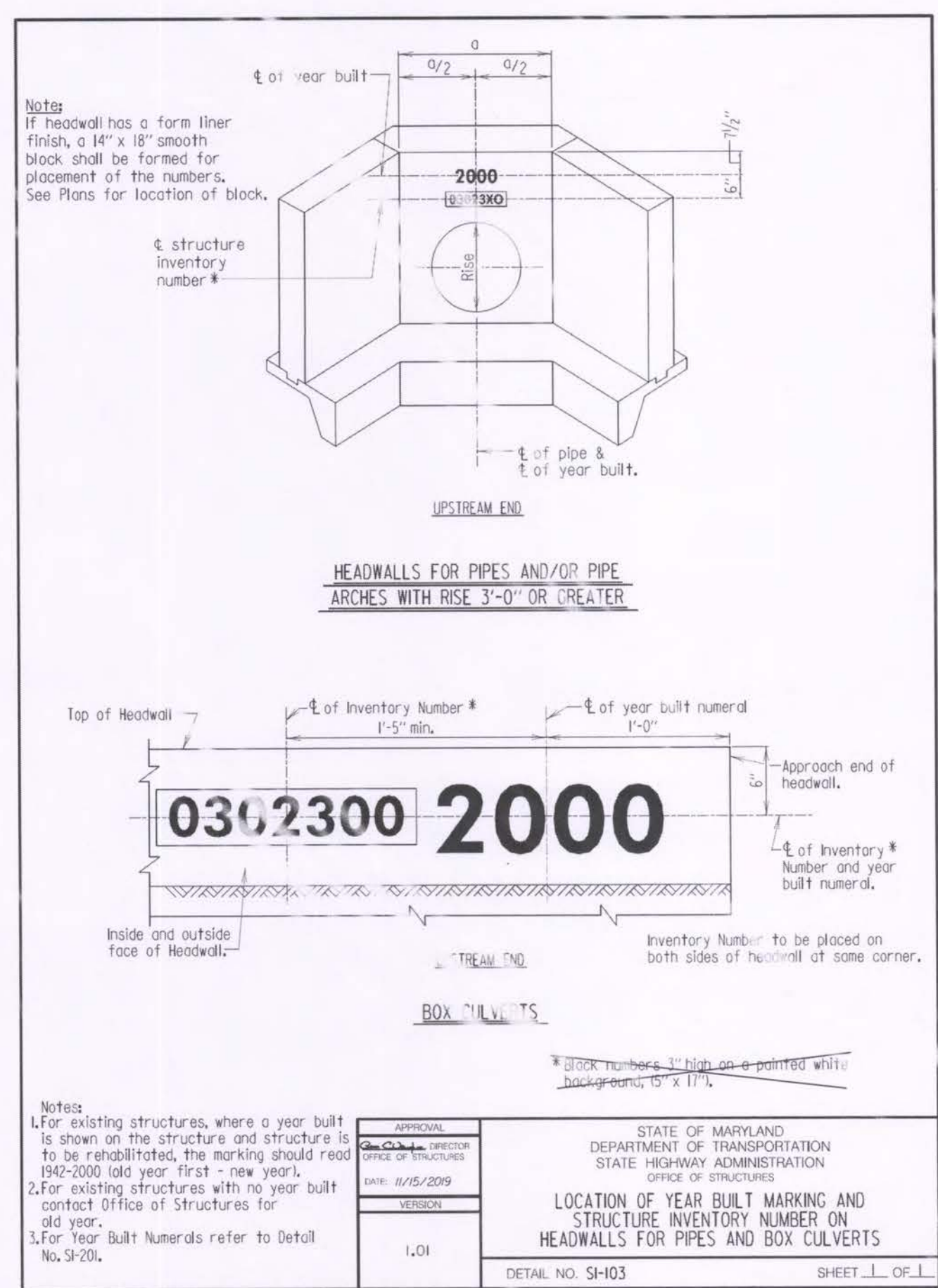
PROJECT NO.: 19024.01 SCALE: N/A BY: SHN CHECK: XZ

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**





Revision 03/14/12 Specifications and Standards for Roadways and Bridges Section III - 73  
 ALL CHAIN LINK FABRIC AND POST SHALL BE BLACK VINYL COATED.



\* 3' HIGH STRUCTURE INVENTORY NUMBER TO BE INDENTED INTO CONCRETE (UNPAINTED).

**ZEST LLC**  
 Engineering  
 Science  
 Technology

9111 EDMONSTON RD, STE 407A  
 GREENBELT, MARYLAND 20770  
 PHONE: 240-280-1570  
 EMAIL: ZEST.MD@ZESTLLC.COM

DWG/FSC: 69 OF 73  
 TITLE: **STORM DRAIN, PAVING, AND UTILITY NOTES & DETAILS**

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
 Case Number: 38079-2022-0  
 Case Type: CIP WQ  
 Issuance Date: 12/15/2023  
 Address: 0000 HAWKINS DR AQUASCO, Maryland 20608  
 Lot(s) and Block(s):

**Tanvir Bhuiyan**

- Conditions of Approval**
- The above approval is conditioned upon the following:
- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
  - Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
  - This approval does NOT represent a permit to construct.
- N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
 PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPIE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

APPROVAL DATE: **12/05/2023**  
 PEER REVIEWER'S NAME: **BENJAMIN MOSIER**  
 SIGNATURE: *[Signature]*  
 COMPANY NAME: **SOLTESZ**  
 LICENSE NUMBER: **40806**  
 PERMIT NUMBER: **38079-2022-0**



TOWN OF EAGLE HARBOR  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
 NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

APPROVED: *[Signature]* 12/18/2023  
 ASSOCIATE DIRECTOR DATE

APPROVED: *[Signature]* 12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 19024.01 SCALE: N/A BY: SHN CHECK: XZ

SEAL: *[Professional Engineer Seal]*  
 PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 36713  
 EXP DATE: 2024-08-21





Project No. 2022387-00		LOG OF BOREHOLE SB-1		Sheet 1 of 1	
CLIENT: GreenVest		PROJECT: Town of Eagle Harbor Culvert Replc			
ARCHITECT/ENGINEER:		SITE: Prince George's County, Maryland			
		PRINCE GEORGE'S COUNTY, MARYLAND			
		SAMPLER TESTS			
		TESTS			
SURFACE ELEV.: 17.0 ft.		GRAPHIC LOG			
0.9 5" Asphalt		DEPTH (FT)			
0.9 6" Gravel Base		BLOWS/FT			
Moist, Medium Dense, Brown and Dark Brown, SILTY SAND (SM), with gravel		N-VALUE			
3.5 Moist to Wet, Very Loose, Brown and Gray, SILTY SAND (SM)		NUMBER			
8.0 Wet, Very Soft, Gray, SANDY CLAY (CL)		TYPE			
12.0 Wet, Tan, Very Loose to Loose, SANDY SILT (ML)		IN RECOVERED IN. DRIVEN			
20.0 End of Boring @ 20 ft		MOISTURE (%)			
Borehole was backfilled after water level reading		% PASSING #200 SIEVE			
WATER LEVEL OBSERVATIONS		REMARKS/ADDITIONAL DATA			
WL 11.5 @ Drilling					
WL 8 @ 0 hr					
AB Consultants, Inc.		STARTED: 8/31/22 FINISHED: 8/31/22			
9450 Annapolis Road		DRILL CO: ABC DRILL RIG: B-61			
Lanham, MD 20706		DRILLER: DL ASST DRILLER:			
Phone: 301-306-3091		LOGGED BY: APPROVED:			
Fax: 301-306-3092					

Project No. 2022387-00		LOG OF BOREHOLE SB-2		Sheet 1 of 1	
CLIENT: GreenVest		PROJECT: Town of Eagle Harbor Culvert Replc			
ARCHITECT/ENGINEER:		SITE: Prince George's County, Maryland			
		PRINCE GEORGE'S COUNTY, MARYLAND			
		SAMPLER TESTS			
		TESTS			
SURFACE ELEV.: 8.0 ft.		GRAPHIC LOG			
0.2 2" Topsoil		DEPTH (FT)			
3.0 Moist, Very Loose, Brown and Gray, SILTY SAND (SM), with gravel and trace of clay		BLOWS/FT			
5.0 Moist to Wet, Very Loose, Brown and Gray, SILTY SAND (SM), with gravel and trace of clay		N-VALUE			
13.0 Wet, Black and Dark Brown, Very Loose, SANDY SILT (ML), with peats, organic and woods		NUMBER			
16.0 Wet, Very Loose, Dark Brown, SILTY SAND (SM)		TYPE			
20.0 End of Boring @ 20 ft		IN RECOVERED IN. DRIVEN			
Borehole was backfilled after water level reading		MOISTURE (%)			
WATER LEVEL OBSERVATIONS		% PASSING #200 SIEVE			
WL 6 @ Drilling		REMARKS/ADDITIONAL DATA			
WL 5 @ 0 hr					
AB Consultants, Inc.		STARTED: 8/31/22 FINISHED: 8/31/22			
9450 Annapolis Road		DRILL CO: ABC DRILL RIG: B-61			
Lanham, MD 20706		DRILLER: DL ASST DRILLER:			
Phone: 301-306-3091		LOGGED BY: APPROVED:			
Fax: 301-306-3092					

Project No. 2022387-00		LOG OF BOREHOLE SB-3		Sheet 1 of 1	
CLIENT: GreenVest		PROJECT: Town of Eagle Harbor Culvert Replc			
ARCHITECT/ENGINEER:		SITE: Prince George's County, Maryland			
		PRINCE GEORGE'S COUNTY, MARYLAND			
		SAMPLER TESTS			
		TESTS			
SURFACE ELEV.: 8.0 ft.		GRAPHIC LOG			
1.3 9.5" Asphalt		DEPTH (FT)			
1.3 6" Gravel Base		BLOWS/FT			
Moist to Wet, Medium Dense to Very Loose, Brown, SILTY SAND (SM)		N-VALUE			
14.0 Wet, Dark Brown PEAT (PT)		NUMBER			
16.0 Wet, Dark Brown, Medium Dense, SILTY SAND (SM), with peats and organics		TYPE			
20.0 End of Boring @ 20 ft		IN RECOVERED IN. DRIVEN			
Borehole was backfilled after water level reading		MOISTURE (%)			
WATER LEVEL OBSERVATIONS		% PASSING #200 SIEVE			
WL 6 @ Drilling		REMARKS/ADDITIONAL DATA			
WL 5.5 @ 0 hr					
AB Consultants, Inc.		STARTED: 8/31/22 FINISHED: 8/31/22			
9450 Annapolis Road		DRILL CO: ABC DRILL RIG: B-61			
Lanham, MD 20706		DRILLER: DL ASST DRILLER:			
Phone: 301-306-3091		LOGGED BY: APPROVED:			
Fax: 301-306-3092					

Prince George's County Maryland  
Department of the Environment (DoE)  
**APPROVED PLAN SET**  
SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT  
Case Number: 2022-0000  
Case Type: CIP WQ  
Issuance Date: 12/15/2023  
Address: 00000 HAWKINS DR AQUASCO, Maryland 20608  
Lot(s) and Block(s):  
**Tanvir Bhuiyan**

**Conditions of Approval**

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPIE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

APPROVAL DATE: 12/05/2023  
PEER REVIEWER'S NAME: BENJAMIN MOSIER  
SIGNATURE: *B. Mosier*  
COMPANY NAME: SOLTESZ  
LICENSE NUMBER: 40806  
PERMIT NUMBER: 38079-2022-0

For Culvert Hydraulics only, see Note Z on Concept Sufficiency Approval.



TOWN OF EAGLE HARBOR  
23308 HAWKINS DR  
AQUASCO, MD 20608  
PHONE: 301-888-2410  
NOAH E. WATERS, PHD, MAYOR

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).  
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

APPROVED: *Jeff DeHlan* 12/18/2023  
ASSOCIATE DIRECTOR DATE

APPROVED: *Frank L. Galosi* 12/18/2023  
SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
PROJECT NO.: 19024.01 SCALE: N/A BY: SHN CHECK: XZ

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
LICENSE NO. 36713  
EXP. DATE: 2028-06-21

DWG/FSC: 70 OF 73  
TITLE: SOIL BORING DATA

BY: ZEST LLC -   
**ZEST LLC**  
Engineering Science Technology  
9111 EDMONSTON RD, STE 407A  
GREENBELT, MARYLAND 20770  
PHONE: 240-280-1570  
EMAIL: ZEST.MD@ZESTLLC.COM



**5.0 CONCLUSION AND RECOMMENDATIONS**

Details of proposed structures were not available during this report. Based on the preliminary information provided by GreenVest LLC., existing 24" RCP (@ Hawkins Drive) and 15" CMP (@ Patuxent Boulevard) structures will be replaced with a larger size culverts and headwalls. Anticipated upstream and downstream invert elevations as shown in the Table 2 below. The encountered subsoils at the anticipated invert elevations and foundation recommendations are discussed hereunder.

Culvert Location	Soil Boring No.'s	Approximate Roadway Elevation	Upstream Invert Elevation	Downstream Invert Elevation
Hawkins Drive	SB-1	17	13	12
Patuxent Boulevard	SB-2 & SB-3	8	4	3.5

**5.1 Culvert Foundations**

The bottoms of the proposed culverts are approximately 4 feet below existing roadway grade elevations. Based on the soil boring information, the proposed culverts subgrade are anticipated to be founded on natural soils and the engineering properties for each borehole are summarized in the table below. The soil parameters utilized for the analysis were based on laboratory results, empirical correlation between the SPT and laboratory data, and published information.

AB CONSULTANTS, INC.

backfill, respectively, per vertical foot of wall. These recommended values assume a level backfill behind the walls and do not include the influence of any surcharge loads. The wall design should also account for any surcharge loads within a 45-degree slope from the base of the wall.

**5.2 Excavation Support**

Excavations are anticipated to be open cut or will require temporary support. All excavations should be performed in accordance with the latest Occupational Safety and Health Administration (OSHA) requirements. Sloping and benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer. The OSHA soil classification system categorizes soil and rock deposits in hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability as follows:

- **Stable Rock** is natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.
- **Type A Soils** are cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater.
- **Type B Soils** are cohesive soils with an unconfined compressive strength greater than 0.5 tsf, but less than 1.5 tsf; or granular cohesionless soils; or previously disturbed soils unless otherwise classified as Type C.
- **Type C Soils** are cohesive soils with an unconfined compressive strength of 0.5 tsf or less.

Based on the field and laboratory test results, sandy soil was generally encountered at the site. Due to the general nature of sandy soils, they are categorized as Type C soils in accordance with the OSHA soil classification system. The maximum allowable side slopes for unsupported/free-standing short-term excavation less than 20 feet deep in Type C soils is 1.5 horizontal to 1 vertical (1.5H:1V or 34 degrees).

**5.3 Compaction Requirements**

All backfill material should consist of approved material conforming to the requirements under Section 6.4 of this report. Fills should be compacted to a minimum 92% maximum Modified Proctor dry density (ASTM D1557), with a moisture content range of ±2% of its optimum. Fill should be placed in nominal 10-inch thick loose lifts.

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Culvert Location	Boring No.	Range Invert Elevation (ft)	Sample Description	N-Value Range	Range of Effective Unit Weight, $\gamma$ (pcf)	Range of Friction Angle, $\phi$ (deg.)
Hawkins Drive	SB-1	12 to 13	Silty Sand (Stratum 1)	2	105-110	24 - 28
Patuxent Boulevard	SB-2	3.5 to 4	Silty Sand (Stratum 1)	2	105-110	24 - 28
	SB-3	3.5 to 4	Silty Sand (Stratum 1)	2 - 4	105-110	24 - 28

**5.1.1 Foundation System**

Based on the encountered soils at the project site, a shallow foundation system is considered suitable. Assuming the bottom of the culverts is 12 inches below the given invert, the allowable bearing capacities at the bottom of the culverts are estimated as follows:

- At Hawkins Drive, the bottom of the proposed culvert is estimated to range from 4- to 5- feet below existing roadway grade and will be founded on Stratum 1. Very loose soil was encountered at the anticipated foundation depth and extends to completion depth of the boring and these loose materials are considered inadequate to support the anticipated loading from the culvert and subsequent fill operation. As such, subgrade material shall be undercut a minimum of 2 feet below the bottom of the culvert, replaced and compacted with suitable backfill materials such as graded aggregate or approved selected backfill material which meets County and/or design requirements. An allowable bearing strength of 1,500 psf may be used with the compacted backfills. Geo-synthetic products may be considered in conjunction with the cut and fill operation for subgrade improvement. Due to high groundwater table encountered in the study area, dewatering will be necessary to reach the planned bottom of the undercut.
- At Patuxent Boulevard, the bottom of the proposed culvert is estimated to range from 4- to 5- feet below existing roadway grade and will be founded on Stratum 1. Similarly, a very loose soil was encountered at this anticipated foundation depth and extends to completion depth of the boring and these loose materials are considered inadequate to support the anticipated loading from the culvert and

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Each lift of fill should be properly compacted, tested and approved prior to placing subsequent lifts.

**5.4 Suitable Fill Material**

Fill and backfill material should be free of organics, debris and/or rock fragments in excess of 3 inches, in any dimension. In the top 18 inches of fill, the maximum particle size should be limited to approximately 1.5 inches. In accordance with ASTM D2487 classifications, imported select fill should consist of silty gravel (GM), clayey gravel (GC), gravelly sand (SP), silty sand (SM), clayey sand (SC), or low-plasticity sandy clay (CL) with a liquid limit and plasticity index of less than 40 and 15 respectively, or an approved alternate.

**5.5 Construction Considerations**

Positive surface drainage should be established at the start of work, be maintained during construction and following completion of the project to prevent surface water ponding and subsequent saturation of subgrade soils. Prolonged exposure or saturation of subgrade soils by ponding or runoff water may result in significant changes in strength and compressibility characteristics. Saturated subgrade soils should be excavated and replaced with suitable materials. During site preparation, surface runoff should be directed away from the construction areas. Any seepage into the construction excavation could be controlled by pumping from sump pits.

Groundwater is anticipated. A temporary well point system, or other suitable means, may be utilized to lower the water level in the excavations. To allow construction in the dry and to maintain a stable excavation bottom, the dewatering system should maintain the groundwater level within the excavation a minimum of 2 feet below the bottom of the proposed structure. The excavation must comply with all local, state and federal requirements for worker safety.

**6.0 GENERAL COMMENTS**

The soil classifications presented in this report are based upon the data obtained from the soil borings performed at indicated locations and from any other information discussed in this report. This report does not reflect any variations that may occur across the site. The nature and extent of such variations may not become evident until

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subsequent fill operation. As such, subgrade material shall be undercut a minimum of 2 feet below the bottom of the culvert, replaced and compacted with suitable backfill materials such as graded aggregate or approved selected backfill material which meets County and/or design requirements. An allowable bearing strength of 1,500 psf may be used with the compacted backfills. Geo-synthetic products may be considered in conjunction with the cut and fill operation for subgrade improvement. Due to high groundwater encountered in the study area, dewatering will be necessary to reach the planned bottom of the undercut.

Stream sediment and unsuitable materials may be encountered during the culvert approach construction operation and subgrade improvements may be required. Removing sediments and undercutting any poor subgrade material is anticipated.

The recommended bearing values shown above and discussed in the following sections are based on a minimum factor of safety of 2.5 with respect to measured shear strength of natural soils and/or anticipated shear strength of properly compacted select fill. Settlement of foundations proportioned based on these allowable pressures should be within tolerable limits for the structure.

Due to the general nature of the existing subsoils, the bearing capacity at the final footing elevations should be verified in the field by the geotechnical engineer to ensure the bearing capacity at the bottom of each footing excavation is adequate for the design loads.

**5.1.2 Head/Wing Walls**

The construction of new head walls and/or end walls are anticipated on this project. It is assumed that the bottom of the footings will be 2 feet below the invert. As such, footings for the head and end walls are assumed to be at Elev. 11 and 3 at Hawkins Drive and Patuxent Boulevard, respectively. Loose material was encountered at the anticipated footing depth and continued to completion depth of the borings. This unsuitable material shall be undercut, replaced and compacted with suitable backfill materials. A maximum net allowable soil bearing pressure of 1,500 psf may be used with the compacted backfills.

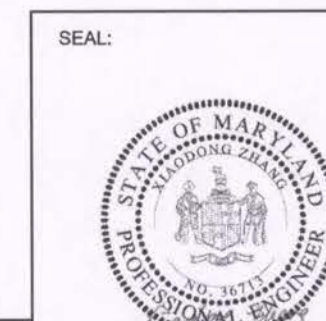
Provided minor wall rotation occurs (active condition), the design lateral earth pressures should be 50 psf and 40 psf equivalent fluid pressures for cohesive and granular

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construction. If variations do occur, the conclusion and recommendations of this report should then be reviewed by an ABC geotechnical engineer in light of the new information.

This report has been prepared for the exclusive use of our client for the specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are intended or made. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions of this report modified or verified in writing by the ABC geotechnical engineer of record.

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PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 38713  
 EXP. DATE 2024-08-21

DWG/FSC: 71 OF 73

TITLE:  
**GEOTECHNICAL RECOMMENDATIONS**

Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

Case Name: **EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**  
 Case Number: **COM-INDV-RES-19-026725**  
 Case Type: **CIP WQ**  
 Issuance Date: **12/15/2023**  
 Address: **00000 HAWKINS DR AQUASCO, Maryland 20608**  
 Lot(s) and Block(s):

*Tanvir Bhuiyan*  
 ENVIRONMENT

**Conditions of Approval**

The above approval is conditioned upon the following:

- This approval includes plan approval by DoE for storm drain and stormwater management systems and Flood Control Projects ONLY.
- Roadway systems (paving, sidewalk, curb/gutter, pavement marking, signage, signals and other roadway appurtenances), grading and permitting require further review.
- This approval does NOT represent a permit to construct.

N.B.: The culvert and roadway plans have been reviewed and formally approved by the Department of Public Works & Transportation (DPW&T), Prince George's County, MD.

DEPARTMENT OF THE ENVIRONMENT (DoE)  
 PRINCE GEORGE'S COUNTY, MD  
**PEER REVIEW APPROVAL STAMP**

"I HEREBY CERTIFY THAT I HAVE SUCCESSFULLY COMPLETED PARTICIPATION IN DPIE'S PEER REVIEW PROGRAM. I HAVE REVIEWED THESE PLANS IN DETAIL AND THEY ARE IN CONFORMANCE WITH THE COUNTY'S CODE, GENERAL SPECIFICATIONS, AND STANDARDS."

12/05/2023

APPROVAL DATE:  
 PEER REVIEWER'S NAME: **BENJAMIN MOSIER**  
 SIGNATURE: *Bj. Mosier*  
 COMPANY NAME: **SOLTESZ**  
 LICENSE NUMBER: **40806**  
 PERMIT NUMBER: **38079-2022-0**

For Culvert Hydraulics only, see Note Z on Concept Sufficiency Approval.



TOWN OF EAGLE HARBOR  
 23308 HAWKINS DR  
 AQUASCO, MD 20608  
 PHONE: 301-888-2410  
**NOAH E. WATERS, PHD, MAYOR**

PROJECT AREA 1 OF THIS PROJECT FOR THE TOWN OF EAGLE HARBOR IS BEING FUNDED BY THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, COASTAL RESILIENCY PROGRAM (CRP).

PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

*Jeff Duffan* 12/18/2023  
 ASSOCIATE DIRECTOR DATE

*Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 19024.01 SCALE: N/A BY: SHN CHECK: XZ

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

**ZEST LLC**  
 Engineering Science Technology

9111 EDMONSTON RD, STE 407A  
 GREENBELT, MARYLAND 20770  
 PHONE: 240-280-1570  
 EMAIL: ZEST\_MD@ZESTLLC.COM



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 NOAH E. WATERS, PHD, MAYOR

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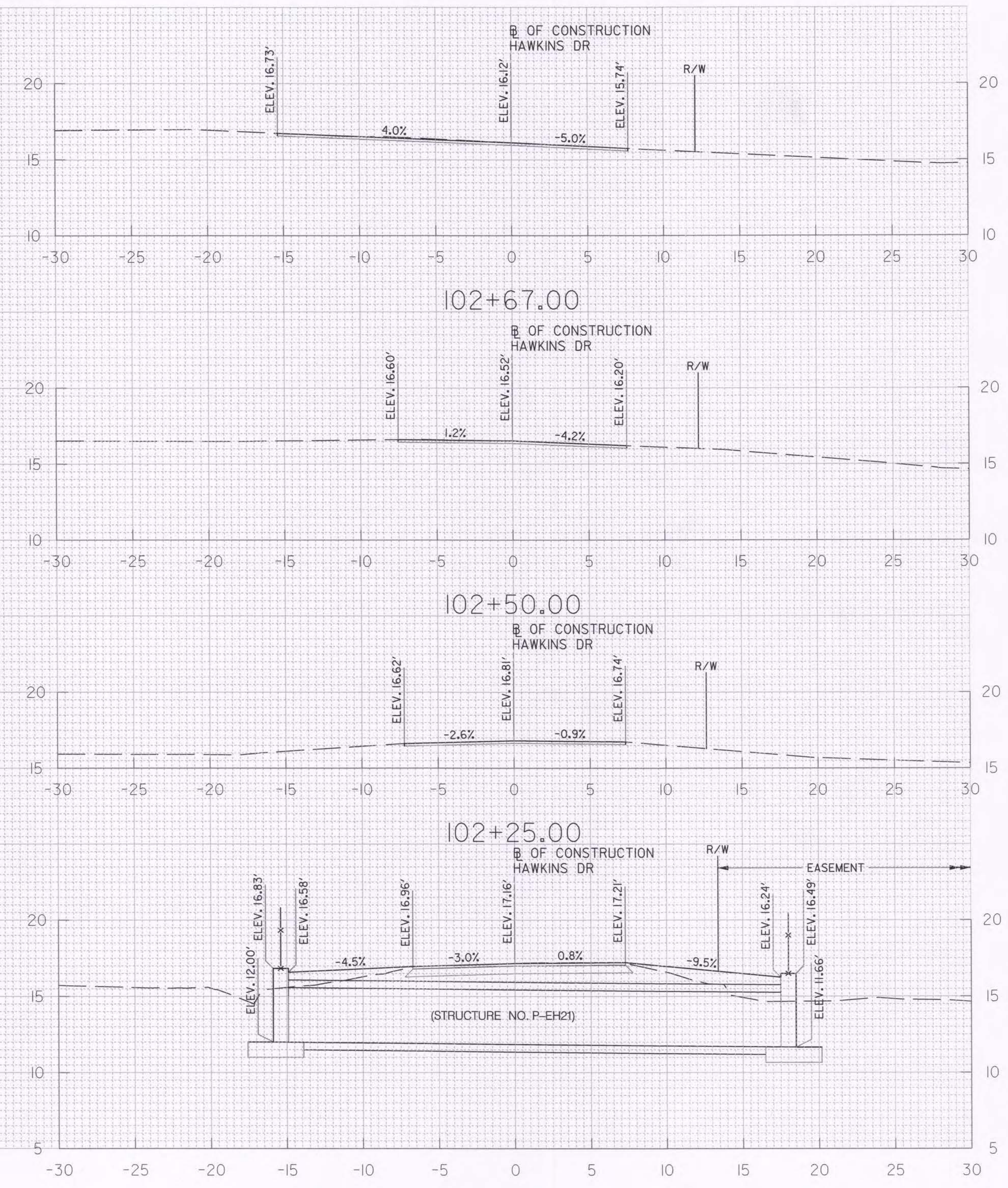
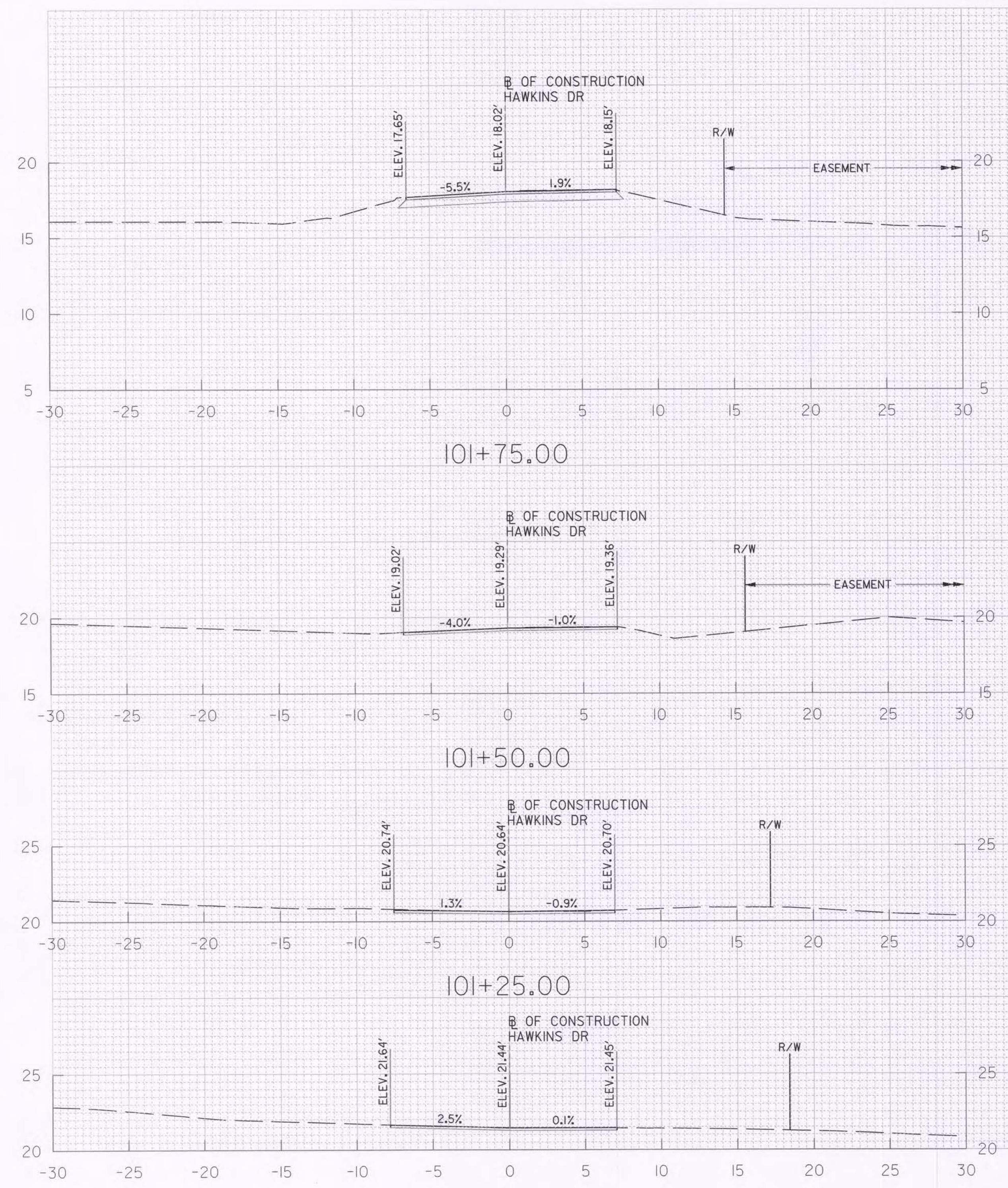
PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY

ELECTION DISTRICT 9

*Jeff DeHaven* 12/18/2023  
 ASSOCIATE DIRECTOR DATE

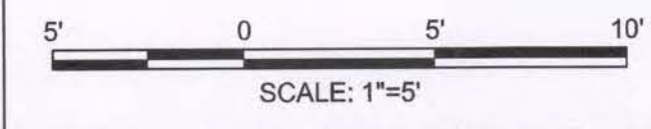
APPROVED *Frank L. Galosi* 12/18/2023  
 SECTION HEAD DATE

PROJECT MANAGER CONTRACT NO. C.I.P.  
 PROJECT NO.: 19024.01 SCALE: 1"=5' BY: SHN CHECK: XZ

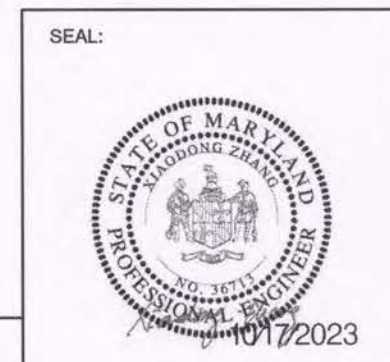


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DWG/FSC: 72 OF 73

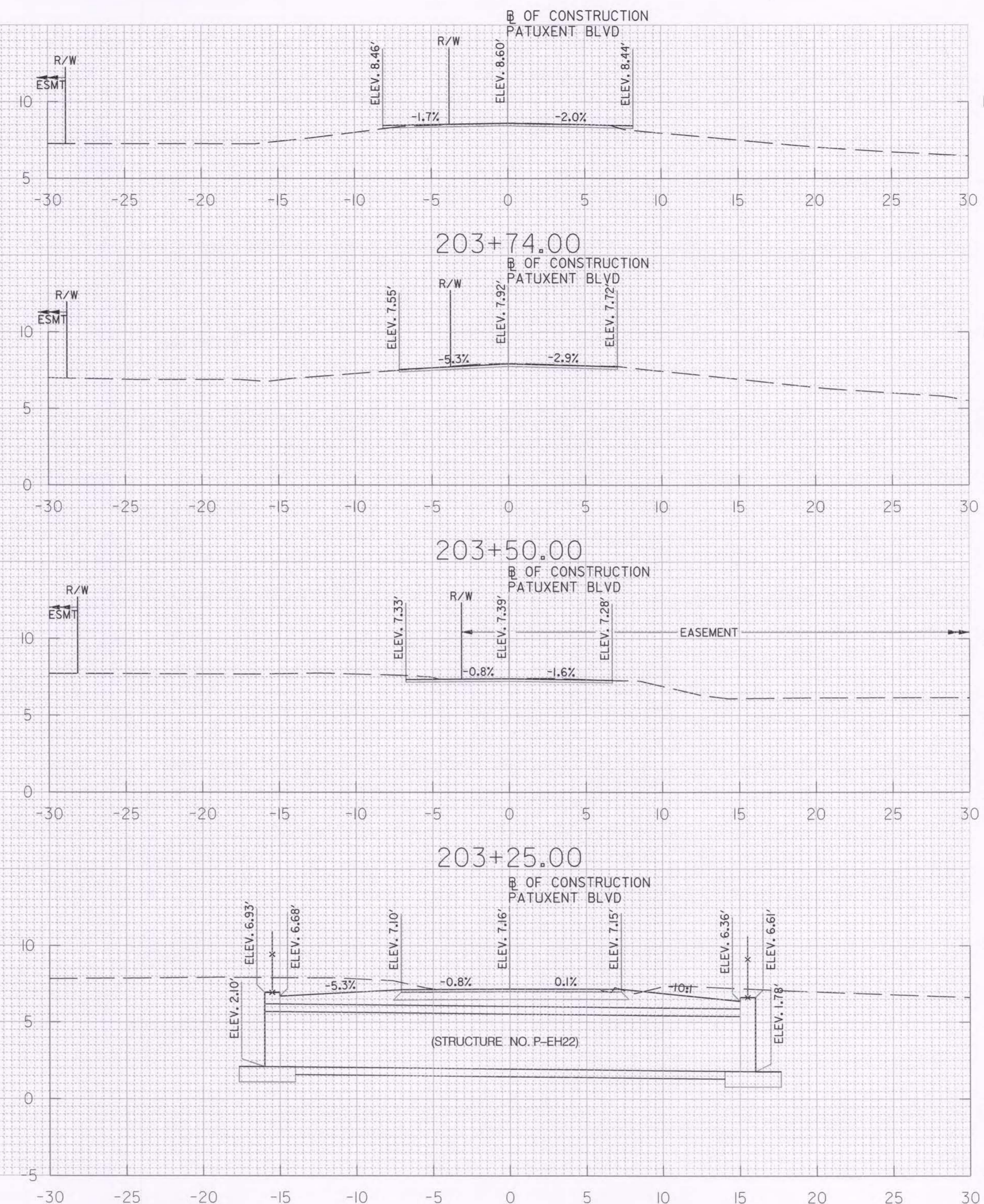
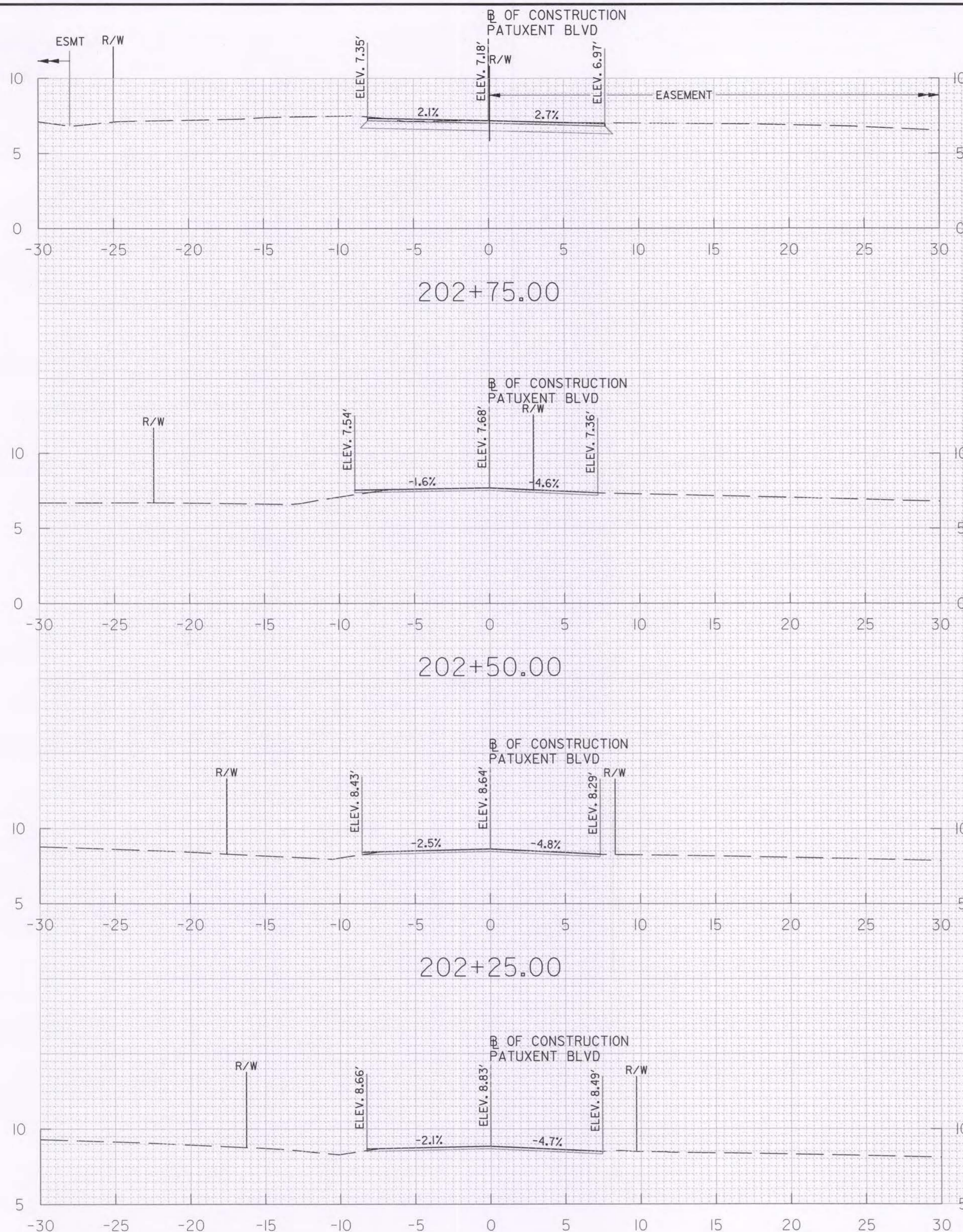


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 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 36719  
 EXP. DATE: 2024-08-21

**ROADWAY  
 CROSS SECTIONS  
 101+12.00 TO 102+67.00**

**EAGLE HARBOR STREAM  
 RESTORATION AND  
 COMMUNITY RESILIENCY  
 PROJECT**





Prince George's County Maryland  
 Department of the Environment (DoE)  
**APPROVED PLAN SET**  
 SD-SWM & FLOOD CONTROL PROJECTS (CIP) ONLY

The Department of the Environment has completed a review of this document for code compliance. As required by State Code, the design professional(s) responsible for the preparation and content of this document must provide a record copy of these documents with their original seal, signature and date.

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 Case Type: **CIP WQ**  
 Issuance Date: **12/15/2023**  
 Address: **0000 HAWKINS DR AQUASCO, Maryland 20608**  
 Lot(s) and Block(s):  
*Tanvir Bhuiyan* ENVIRONMENT

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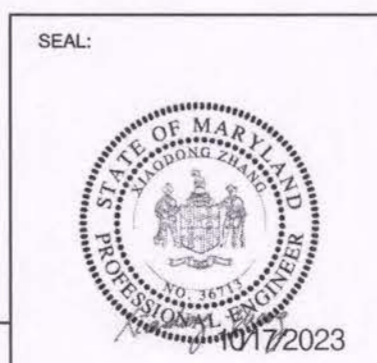


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 PROJECT AREA 2 OF THIS PROJECT FOR GREENVEST LLC IS BEING FUNDED BY PRINCE GEORGE'S COUNTY  
 ELECTION DISTRICT 9

<i>Jeff Duffan</i>	12/18/2023
ASSOCIATE DIRECTOR	DATE
<i>Frank L. Galosi</i>	12/18/2023
SECTION HEAD	DATE
<i>Tanvir Bhuiyan</i>	
PROJECT MANAGER	CONTRACT NO.
PROJECT NO.: 19024.01	SCALE: 1"=5'
BY: SHN	CHECK: XZ



PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 38723  
 EXP. DATE: 2024-06-21

DWG/FSC: 73 OF 73

**ROADWAY CROSS SECTIONS**  
**202 + 20.00 TO 203 + 74.00**

**EAGLE HARBOR STREAM RESTORATION AND COMMUNITY RESILIENCY PROJECT**

**ZEST LLC**  
 Engineering Science Technology  
 9111 EDMONSTON RD, STE 407A  
 GREENBELT, MARYLAND 20770  
 PHONE: 240-280-1570  
 EMAIL: ZEST.MD@ZESTLLC.COM

