

Maryland Transportation Authority

I-895 TMDL STREAM RESTORATION PROJECT BALTIMORE COUNTY, MD

CONTRACT NO.: HT-3012-0000

AASHTO DESIGN CRITERIA

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE 2011 EDITION OF AASHTO'S "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."

NOTE TO CONTRACTOR: EROSION AND SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.

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STANDARDS AND SPECIFICATIONS

THIS PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MARYLAND STATE HIGHWAY ADMINISTRATIONS "STANDARDS FOR HIGHWAY AND INCIDENTAL CONSTRUCTION", THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATIONS "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, JULY 2018" AND ALL REVISIONS THEREOF, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND AS SPECIFIED IN THE CONTRACT DOCUMENTS.

COMPLETENESS OF DOCUMENTS

THE MARYLAND TRANSPORTATION AUTHORITY SHALL ONLY BE RESPONSIBLE FOR THE COMPLETENESS OF DOCUMENTS OBTAINED DIRECTLY FROM EMARYLAND MARKETPLACE. ALL RELEVANT DOCUMENTS REQUIRED FOR BIDDING PROJECTS ARE POSTED ON AND ARE DOWNLOADABLE FROM EMARYLAND MARKETPLACE.

RIGHT OF WAY

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

UTILITIES

THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE OF THE ACCURACY OF SAID LOCATIONS. NOTIFICATION TO "MISS UTILITY", 1.800.257.7777, SHALL BE GIVEN 72 HOURS (THREE FULL WORKING DAYS) IN ADVANCE OF WORKING IN THE AREA OF THE SPECIFIC AFFECTED UTILITY. THE NOTIFICATION TO "MISS UTILITY" IS REQUIRED WHENEVER ANY EXCAVATING OR SIMILAR WORK IS TO BE PERFORMED.

NOTIFICATION TO BILL PROSS, THE MDTA UTILITIES COORDINATOR (410.537.7829), SHALL BE GIVEN 72 HOURS (THREE FULL WORKING DAYS) IN ADVANCE OF WORKING IN THE AREA OF MDTA UTILITIES.

ENVIRONMENTAL INFORMATION

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

THE GRADING LIMITS SHOWN ON THE PLANS SHALL NOT BE EXCEEDED. ANY CHANGES IN THE SEDIMENT CONTROL PLAN, THE STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES (BMP'S) OR OTHER SEGMENT OF WORK MUST BE REVIEWED AND APPROVED BY MDTA ENVIRONMENTAL DIVISION AND MARYLAND DEPARTMENT OF ENVIRONMENT, SEDIMENT AND STORMWATER PLAN REVIEW DIVISION.

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

ADA COMPLIANCE

THE DESIGN OF THIS PROJECT HAS INCORPORATED FACILITIES IN COMPLIANCE WITH THE STATE AND FEDERAL LEGISLATION.

OWNERS / DEVELOPERS CERTIFICATION :

I/WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT. I/WE HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY APPROPRIATE INSPECTION AND ENFORCEMENT AUTHORITY OR THE STATE OF MARYLAND, DEPARTMENT OF THE ENVIRONMENT. I/WE HEREBY CERTIFY THAT STORMWATER MANAGEMENT FACILITIES WILL BE MAINTAINED IN ACCORDANCE WITH APPROVED PLANS.

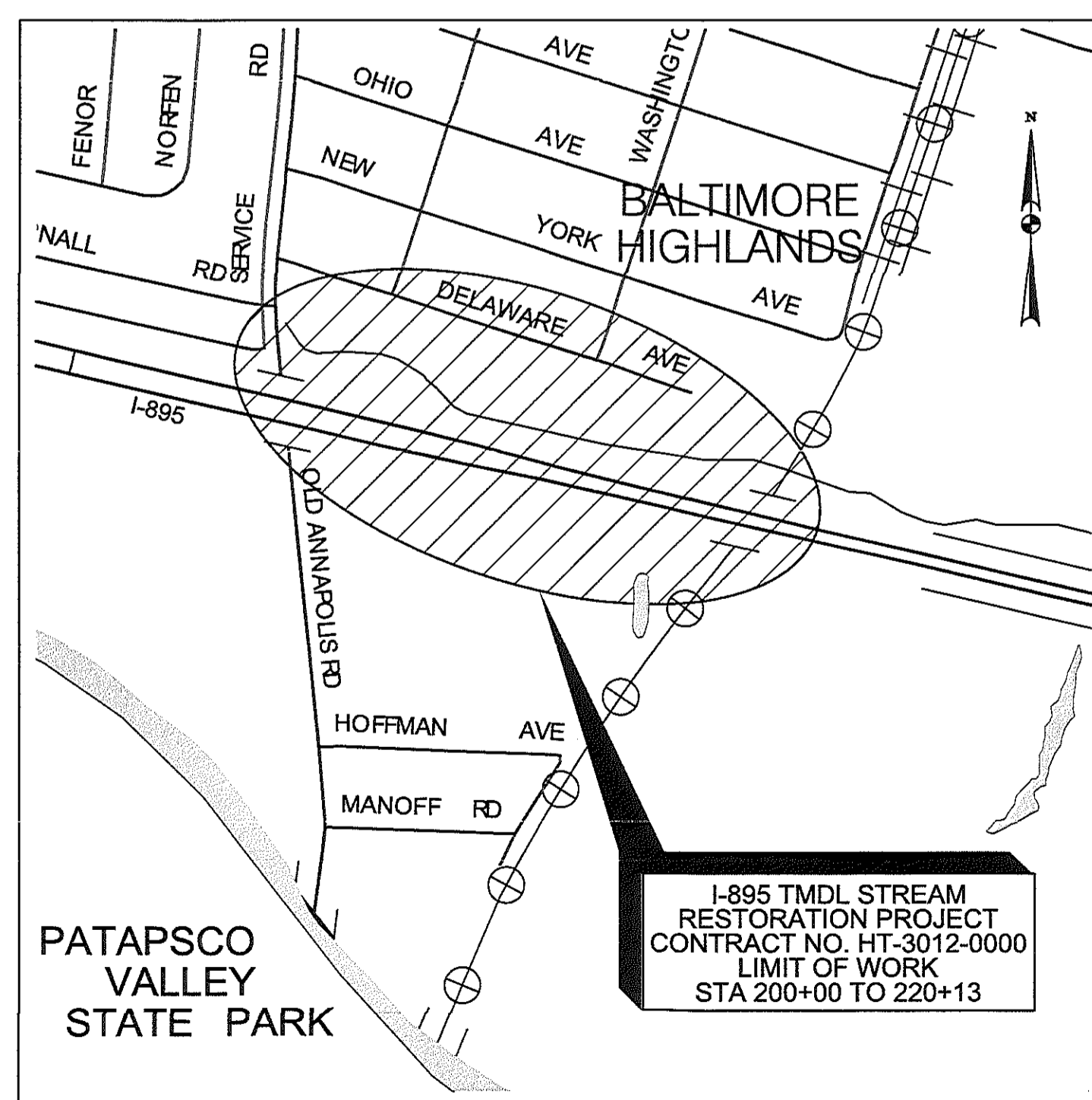
2/17/2019
DATE
RPE 013058
RESPONSIBLE PERSONNEL CERTIFICATION NO.

Peter Mathejats
OWNER / DEVELOPER SIGNATURE
Peter Mathejats, PE
Environmental Manager
PRINTED NAME AND TITLE

ADVERTISEMENT
JUNE 3, 2019
DATE

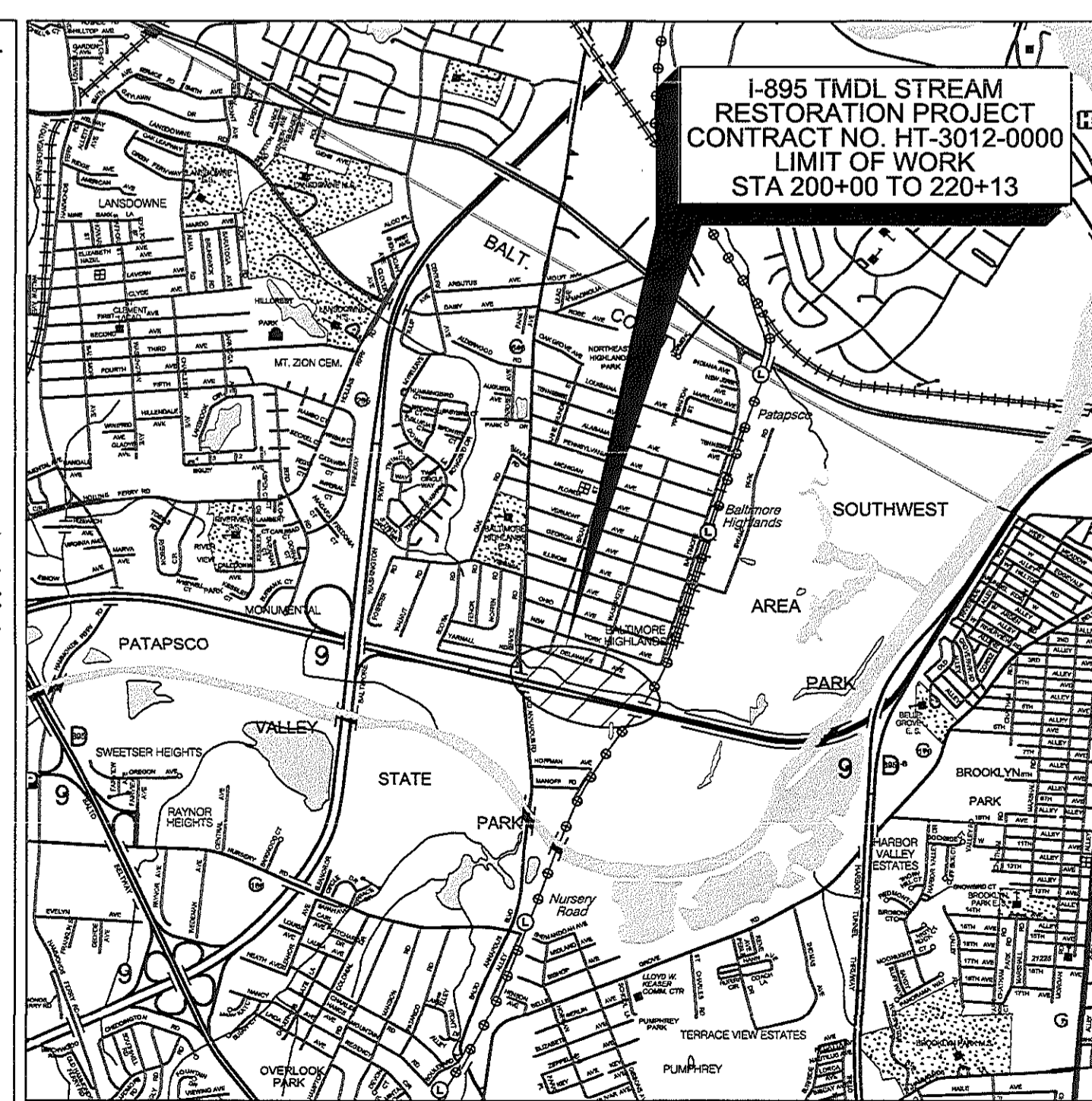
MDE No. 18-SF-0102

| ADDENDA | MARYLAND TRANSPORTATION AUTHORITY |
|---------|---|
| | RECOMMENDED FOR APPROVAL <i>[Signature]</i> DIRECTOR OF ENGINEERING, OFFICE OF ENGINEERING AND CONSTRUCTION DATE: 04/17/2019 |
| | APPROVED <i>[Signature]</i> CHIEF ENGINEER, OFFICE OF ENGINEERING AND CONSTRUCTION DATE: 4/22/19 |



LOCATION MAP
SCALE: 1"=500'

HORIZONTAL DATUM NAD 83 / 91
VERTICAL DATUM NAVD 88



VICINITY MAP
SCALE: 1"=2000'

PROJECT LENGTH
1,750 FEET

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. 31183, EXPIRATION DATE: 1/13/2021

ABBREVIATIONS

GENERAL NOTES

| | | |
|---|--|--|
| A.A.S.H.T.O..... AMERICAN ASSOCIATION OF STATE HIGHWAY TRANSPORTATION OFFICIALS | HMA..... HOT MIX ASPHALT | R.F..... ROCK FRAGMENTS |
| ADT..... AVERAGE DAILY TRAFFIC | HP..... HIGH POINT | RT..... RIGHT |
| AHD..... AHEAD | IN..... INCH | R/W...or...R/W..... RIGHT OF WAY |
| APPROX..... APPROXIMATE | I.S.T..... INLET SEDIMENT TRAP | R.C.P..... REINFORCED CEMENT PIPE |
| B...or...B/L..... BASELINE | INV..... INVERT | R.C.C.P..... REINFORCED CEMENT CONCRETE PIPE |
| BK..... BACK /BOOK | JB..... JUNCTION BOX | R.Q.D..... ROCK QUALITY DESIGNATION |
| BIT..... BITUMINOUS | K..... K INLET | R.M..... ROOTMAT |
| B.C..... BITUMINOUS CONCRETE | L..... LENGTH | RMP..... RAISED PAVEMENT MARKING |
| B.M..... BENCH MARK | L.F..... LINEAR FEET | S..... SOUTH |
| BOT..... BOTTOM | L.L..... LIQUID LIMIT | SAN..... SANITARY SEWER |
| C.C..... CENTER OF CURVE | LOD..... LIMIT OF DISTURBANCE | SB...or...S/B..... SOUTHBOUND |
| CATV..... CABLE TELEVISION | LP..... LOW POINT | S.D..... STORM DRAIN |
| C.B.R..... CALIFORNIA BEARING RATIO | L.P..... LIGHT POLE | S.D.D..... SURFACE DRAIN DITCH |
| C...or...C/L..... CENTERLINE | LT..... LEFT | SE..... SUPER ELEVATION |
| CL..... CLASS | MAC..... MACADAM | SF..... SILT FENCE |
| CLF..... CHAINLINK FENCE | M.C..... MOISTURE CONTENT | S.F..... SQUARE FEET |
| CMP..... CORRUGATED METAL PIPE | MAX..... MAXIMUM | SH.T..... SHEET |
| C.O..... CLEANOUT | M.D.D..... MAXIMUM DRY CONTENT | S.P.P..... STRUCTURAL PLATE PIPE |
| COMB..... COMBINATION | MOD..... MODIFIED | S.P.T..... STANDARD PENETRATION TESTING |
| CONC..... CONCRETE | MIN..... MINIMUM | SSD..... STOPPING SIGHT DISTANCE |
| CONSTR..... CONSTRUCTION | MUTCD..... MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES | SSE..... SUPER SILT FENCE |
| COR..... CORNER | N..... NORTH | STD..... STANDARD |
| CORR..... CORRECTION | N.B..... NORTHBOUND | STA..... STATION |
| DC..... DEGREE OF CURVE | N.E..... NORTHEAST | SO..... SINGLE OPENING |
| D.H.V..... DESIGN HOURLY VOLUME | N.P..... NON-PLASTIC | S.Y..... SQUARE YARDS |
| D.I..... DROP INLET | O.C..... ON CENTER | SWM..... STORMWATER MANAGEMENT |
| DIA..... DIAMETER | OHE..... OVERHEAD ELECTRIC | T..... TANGENT |
| D.O..... DOUBLE OPENING | O.M..... OPTIMUM MOISTURE | T..... TELEPHONE |
| E..... EAST | PAV.T..... PAVEMENT | T.C..... TOP OF COVER |
| E..... ELECTRIC | P.C..... POINT OF CURVATURE | I.G..... TOP OF GRATE |
| E..... EXTERNAL DISTANCE | P.C.C..... POINT OF COMPOUND CURVATURE | I...or...TL..... TRAVERSE LINE |
| EA..... EACH | P.C..... POINT OF CROWN | T.M..... TOP OF MANHOLE |
| E.B..... EASTBOUND | PGE..... PROFILE GRADE ELEVATION | TRAV..... TRAVERSE |
| ELEV..... ELEVATION | P.G.E..... PROFILE GROUND ELEVATION | IS..... TEMPORARY SWALE |
| E.R.C.C.P..... ELLIPTICAL REINFORCED CEMENT CONCRETE PIPE | P.G.L..... PROFILE GRADE LINE | I.S.G..... TOP OF SLAB |
| ES..... END SECTION | P.G.L..... PROFILE GROUND LINE | I.S..... TOPSOIL |
| EX...or...EXIST..... EXISTING | PR..... POINT OF ROTATION | IYP..... TYPICAL |
| FT..... FEET | P.I..... PLASTICITY INDEX | U.D..... UNDER DRAIN |
| FF..... FINISHED FLOOR | P.I..... POINT OF INTERSECTION | U.G..... UNDERGROUND |
| F...or...FL..... FLOWLINE | P.O.C..... POINT ON CURVE | U.P..... UTILITY POLE |
| F.B.D..... FLAT BOTTOM DITCH | P.Q.T..... POINT ON TANGENT | U.S.D.A..... UNITED STATES DEPARTMENT OF AGRICULTURE |
| F.H..... FIRE HYDRANT | PR...OR...PROP..... PROPOSED | VCL..... VERTICAL CLEARANCE |
| FWD..... FORWARD | P.R.C..... POINT OF REVERSE CURVE | V.C.L..... VERTICAL CURVE LENGTH |
| G..... GAS | PT..... POINT | W..... WATER |
| G.V..... GAS VALVE | P.T..... POINT OF TANGENCY | W..... WEST |
| H.B..... HANDBOX | P.V.C..... POINT OF VERTICAL CURVE | W.B..... WESTBOUND |
| H.D.P..... HIGH DENSITY POLYETHYLENE | PVC..... POLYVINYL CHLORIDE | WB..... WETLAND BUFFER |
| HDWL..... HEADWALL | P.V.I..... POINT OF VERTICAL INTERSECTION | WM..... WATER METER |
| H.E.R.C.P..... HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE | P.V.R.C..... POINT OF VERTICAL REVERSE CURVE | W.S..... WRAPPED STEEL |
| | P.V.T..... POINT OF VERTICAL TANGENCY | W.U.S..... WATERS OF THE UNITED STATES |
| | R..... RADIUS | W.V..... WATER VALVE |

- ALL WORK ON THE PROJECT SHALL BE DONE IN ACCORDANCE WITH BOTH MSHA AND THE PROJECT SPECIFICATIONS AND WHERE REFERENCED IS MADE, THE REQUIREMENTS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION'S SPECIFICATIONS ENTITLED: "2018 MDOT SHA STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS", DATED JULY 2018 AND REVISIONS THEREOF OR ADDITIONS THERETO, AND THE TECHNICAL SPECIFICATIONS.
- STANDARDS FOR THIS CONTRACT SHALL BE THOSE OF THE MARYLAND STATE HIGHWAY ADMINISTRATION. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO HAVE IN HIS POSSESSION THE MARYLAND SHA "BOOK OF STANDARDS, HIGHWAY AND INCIDENTAL STRUCTURES" WITH THE LATEST UP-TO-DATE MSHA STANDARDS AS OF THE DATE OF ADVERTISEMENT OF THIS PROJECT.
- THE PROJECT IS ORIENTED TO CONFORM TO THE MARYLAND STATE PLANE COORDINATE SYSTEM, NAD 8391. THE LOCATION AND ELEVATION OF BENCHMARKS ARE SHOWN ON THE PLANS. ALL ELEVATIONS ARE IN FEET AND ARE BASED ON THE U.S. COAST AND GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1988 (NAVD 88). THE CONTRACTOR, IN THE CONSTRUCTION-ALIGNMENT PROCESS AND FOR ALL SURVEY OPERATIONS, SHALL USE ONLY BENCHMARKS NOTED AS "NAD 83-91" (HORIZONTAL DATUM) AND "NAVD 88" (VERTICAL DATUM) ON THE CONSTRUCTION PLANS AND IN THE CONSTRUCTION STAKEOUT INFORMATION FOR HORIZONTAL AND VERTICAL LAYOUT. CONTROL POINTS NOT LISTED AS SUCH SHALL BE USED ONLY UPON PRIOR APPROVAL FROM THE MARYLAND TRANSPORTATION AUTHORITY.
- THE CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 1-800-257-7777 AND JEFF ALTER, CHIEF FACILITY MAINTENANCE OFFICER AT THE MARYLAND TRANSPORTATION AUTHORITY AT 410-537-1315, 72 HOURS PRIOR TO EXCAVATION FOR MARKING AND LOCATION OF UTILITIES.
- ALL EXISTING STORM DRAIN STRUCTURES, SEWER MANHOLES, VALVE BOXES VAULTS, ETC. SHALL BE ADJUSTED BY THE CONTRACTOR TO MEET THE FINISHED GRADE ELEVATION, UNLESS THESE APPURTENANCES ARE ABANDONED OR REMOVED UNDER THIS CONTRACT.
- THE EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ON THESE PLANS ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ALL UTILITY OWNERS SHALL BE NOTIFIED A MINIMUM OF 60 DAYS IN ADVANCE OF CONSTRUCTION. THE CONTRACTOR SHALL SEE IFB FOR FURTHER UTILITY STATEMENT.
- THE LOCATION AND LENGTH OF PROPOSED PIPE AND DRAINAGE STRUCTURES SHALL BE VERIFIED BY THE CONTRACTOR BEFORE ORDERING.
- ALL INVERT ELEVATIONS ARE APPROXIMATE. INVERT ELEVATIONS OF INLETS AND PIPES MAY BE MODIFIED AS DIRECTED BY THE ENGINEER TO MEET CONDITIONS ENCOUNTERED DURING INSTALLATION OF DRAINAGE STRUCTURES. ALL PIPES AND DITCHES SHALL BE CONSTRUCTED ON A UNIFORM GRADE BETWEEN INVERT ELEVATIONS NOTED ON THE PLANS, UNLESS INDICATED OTHERWISE ON THE PLANS OR DETAILS OR AS DIRECTED BY THE ENGINEER.
- LANDSCAPING: UNLESS OTHERWISE NOTED, THE CONTRACTOR IS TO USE 2" TOPSOIL ALL GRADED AREAS THAT HAS A SLOPE OF 3:1 OR STEEPER. FOR ALL OTHER GRADED AREAS, 4" TOPSOIL SHOULD BE USED UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL PROTECT AND NOT INTERRUPT EXISTING UTILITY SERVICES UNLESS OTHERWISE NOTED ON THE PLANS OR AUTHORIZED BY THE ENGINEER. SEE UTILITY STATEMENT.
- THE CONTRACTOR SHALL SUBMIT MISS UTILITY TICKETS AND SCOUT WORK SITES AS A FIRST ORDER OF BUSINESS. THE SITES SHALL BE PRIORITIZED IN ACCORDANCE WITH THE CONTRACTOR'S INTENDED SCHEDULE OF CONSTRUCTION. THE CONTRACTOR IS TO BE AWARE THAT COMPANIES SUCH AS BGE REQUIRE A MINIMUM OF NINETY (90-90) DAYS TO RESOLVE UTILITY CONFLICTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON DETERMINATION OF ANY UTILITY IMPACTS. REPAIRS TO UTILITIES, FACILITIES, AND/OR PROPERTY AS A RESULT OF THE CONTRACTOR'S NEGLIGENCE OR MEANS AND METHODS SHALL BE AT THE CONTRACTOR'S EXPENSE.
- MATERIAL REMOVED DURING CONSTRUCTION SHALL BECOME THE CONTRACTOR'S PROPERTY UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIAL PROVISIONS. ALL EXCAVATED ROADWAY MATERIALS, INCLUDING EXISTING PAVEMENT, SIDEWALKS, OR COMBINATION CURB AND GUTTER, DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR USE IN EMBANKMENTS SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF IN AN APPROVED LOCATION.
- SAW CUTS WILL NOT BE MEASURED BUT WILL BE INCIDENTAL TO OTHER RELATED ITEMS.
- THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE SAFETY OF THE PUBLIC AND ALL WORKERS IS MAINTAINED AT ALL TIMES THROUGHOUT THE TERM OF THE CONTRACT. MOTORISTS SHALL BE GUIDED IN A CLEAR AND POSITIVE MANNER WHILE APPROACHING AND PASSING THROUGH CONSTRUCTION WORK /EQUIPMENT AREAS.
- ALL CHAIN LINK FENCE AND GATES SHALL BE BONDED ALUMINUM COATED FABRIC UTILIZING GALVANIZED STEEL OR GALVANIZED BONDED ALUMINUM COATED STEEL LINE POSTS AND FITTINGS. FENCE POSTS AND FENCING SHALL NOT BE INSTALLED WITHIN STREAM CHANNELS OR ACROSS ANY STREAM CHANNELS THAT MAY BLOCK OR OBSTRUCT THE FLOW OF THE STREAM.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY DIMENSIONS AND ELEVATIONS AFFECTING ALL WORK IN THE FIELD. NO SEPARATE OR ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THIS WORK.
- ALL ROADS, STRUCTURES, PIPES, CURBS, INLETS, ETC. THAT ARE TO REMAIN IN PLACE SHALL BE PROTECTED FROM DAMAGE THROUGHOUT THE DURATION OF THE CONTRACT. ANY DAMAGE TO EXISTING STRUCTURES AND/OR FEATURES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSES IN A MANNER APPROVED BY THE ENGINEER.
- THE MARYLAND TRANSPORTATION AUTHORITY DOES NOT WARRANT THE CORRECTNESS OF THE TOPOGRAPHIC OR UTILITY DATA PRESENTED HEREIN AND IS NOT RESPONSIBLE FOR ANY CONCLUSIONS DRAWN FROM THEM.
- DURING EXCAVATION, ANY PETROLEUM IMPACTED SOILS OR OTHER HAZARDOUS MATERIALS ENCOUNTERED WILL REQUIRE THAT THE ENGINEER AND THE OFFICE OF ENVIRONMENT SAFETY AND RISK MANAGEMENT BE NOTIFIED. WHILE THE CONTRACTOR WILL BE RESPONSIBLE FOR PROCURING DISPOSAL, ONLY OESRM PERSONEL WILL BE RESPONSIBLE FOR THE SIGNING OF MANIFESTS AND THE RELEASING OF WASTE TO THE WASTED HAULER.
- THE MAJORITY OF THE LIMITS OF DISTURBANCE FOR THIS PROJECT ARE WITHIN THE 100-YEAR FLOODPLAIN. CONTRACTOR TO REVIEW AND ADHERE TO THE FLOODPLAIN ACTION AND PROTECTION PLAN PROVIDED IN THE SPECIFICATIONS FOR THIS PROJECT.

CONVENTIONAL SIGNS

| | | | |
|--|--------------------------------|---|------------------------|
| INLET PROTECTION | BURIED GAS LINES | TREES-CRITICAL ROOT ZONE/ NUMBER/DBH/TYPE | STREAM WIDTH |
| SILT FENCE | BURIED WATER LINES | FOREST BUFFER | TEMPORARY STAGING AREA |
| SUPER SILT FENCE | OHE WIRES | EXISTING TREE LINE | |
| SANDBAGS | EXISTING CHAIN LINK FENCE | DITCH-FLOW LINE | |
| STABILIZED CONSTRUCTION ENTRANCE | PROPOSED CHAIN LINK FENCE | DRAINAGE AREA BOUNDARY | |
| REMOVABLE PUMPING STATIONS/SUMP PIT | EXISTING CURB OR CURB & GUTTER | 1,000-FT. CRITICAL AREA BOUNDARY | |
| PORTABLE SEDIMENTATION TANK | TEMPORARY BRIDGE | EXPANDED 100-FT CRITICAL AREA BOUNDARY | |
| LIMIT OF DISTURBANCE | RIGHT OF WAY LINE | TEMPORARY ORANGE CONSTRUCTION FENCE FOR TREE PROTECTION | |
| ELECTRICAL HAND BOX - SIGNALS | PROPERTY LINE | EXISTING FLOODPLAIN BOUNDARY | |
| EXISTING TRAFFIC LIGHT POLE | EXISTING ROADWAY EDGE | SANITARY SEWER LINE | |
| EXISTING ELECTRICITY POLE | EXISTING TRAFFIC BARRIER | LOG SILLS | |
| EXISTING SIGN | PROPOSED TRAFFIC BARRIER | ROCK CROSS VANE | |
| EXISTING WATER METER/MANHOLE | EXISTING CONTOURS | LOG VANE | |
| EXISTING FIRE HYDRANT | PROPOSED CONTOURS | FLOODPLAIN MICROTOPOGRAPHY | |
| EXISTING ELECTRICITY MANHOLE | TEST HOLE, SOIL BORING | ACCESS ROAD WITH HARDWOOD CONSTRUCTION MATS | |
| EXISTING TELECOMMUNICATION MANHOLE | BASE OR SURVEY LINE | | |
| EXISTING STORM DRAIN INLET | RIP-RAP | | |
| EXISTING STORM DRAIN MANHOLE | SANITARY SEWER MANHOLE | | |
| EXISTING CULVERT/PIPE | TEMPORARY MULCH ACCESS ROAD | | |
| BURIED ELECTRICITY LINES | WATERS OF THE US | | |
| BURIED TELECOMMUNICATION/CABLE TV CABLES | WETLANDS, WITH BUFFER | | |
| BURIED FIBER OPTIC CABLES | | | |

FILE: Q:\2015\181777_003_1-895_Mile_Marker_Stream_Restoration\CADD\p65-N001-1-895.dgn
DATE: Thur, 28, 2019 AT 03:54 PM



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. 31183
EXPIRATION DATE: 1/13/2021

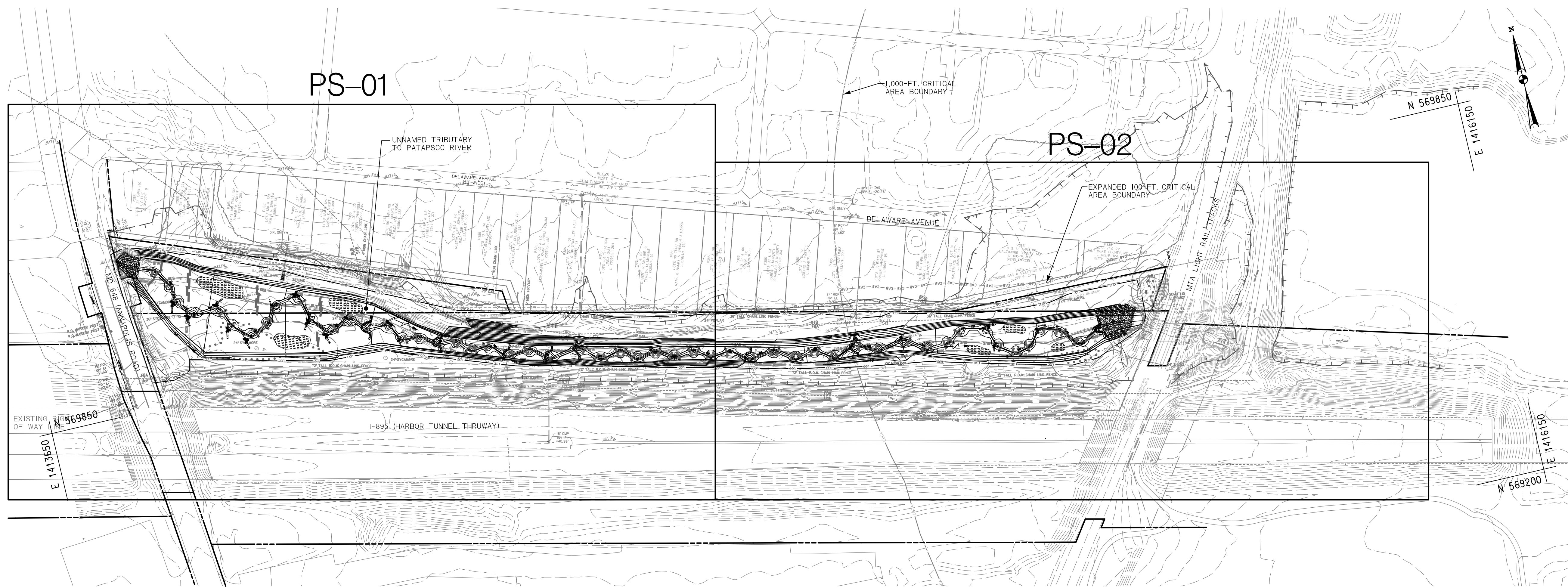


MARYLAND TRANSPORTATION AUTHORITY
Engineering Division

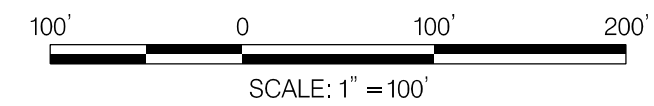
| ADDENDUMS & REVISIONS | | | |
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| NO. | DESCRIPTION | BY | DATE |
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|---|----------|----------|-----------|------------|----------|
| MARYLAND TRANSPORTATION AUTHORITY ENGINEERING DIVISION 1-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY STREAM RESTORATION PROJECT GENERAL NOTES AND ABBREVIATIONS | | | | | |
| DESIGNED BY | MARG/PVC | DRAWN BY | JMB | CHECKED BY | MARG/JSK |
| CONST. REVIEW BY | JSK | DATE | MAY, 2019 | SCALE | N.T.S. |

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|------------------------------|
| CONTRACT NO. HT-3012-0000 |
| DRAWING NO. GN-01 |
| SHEET NO. 2 OF 26 |



PLAN



FILE: Q:\2015\181777_003_I-895_TMDL_Stream_Re\CADD\PKM-001_895_STREAM_RESTORATION.dgn
 DATE: Tuesday, February 05, 2019 AT 12:35 PM 12:35 PM



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. 31183
 EXPIRATION DATE: 1/13/2021



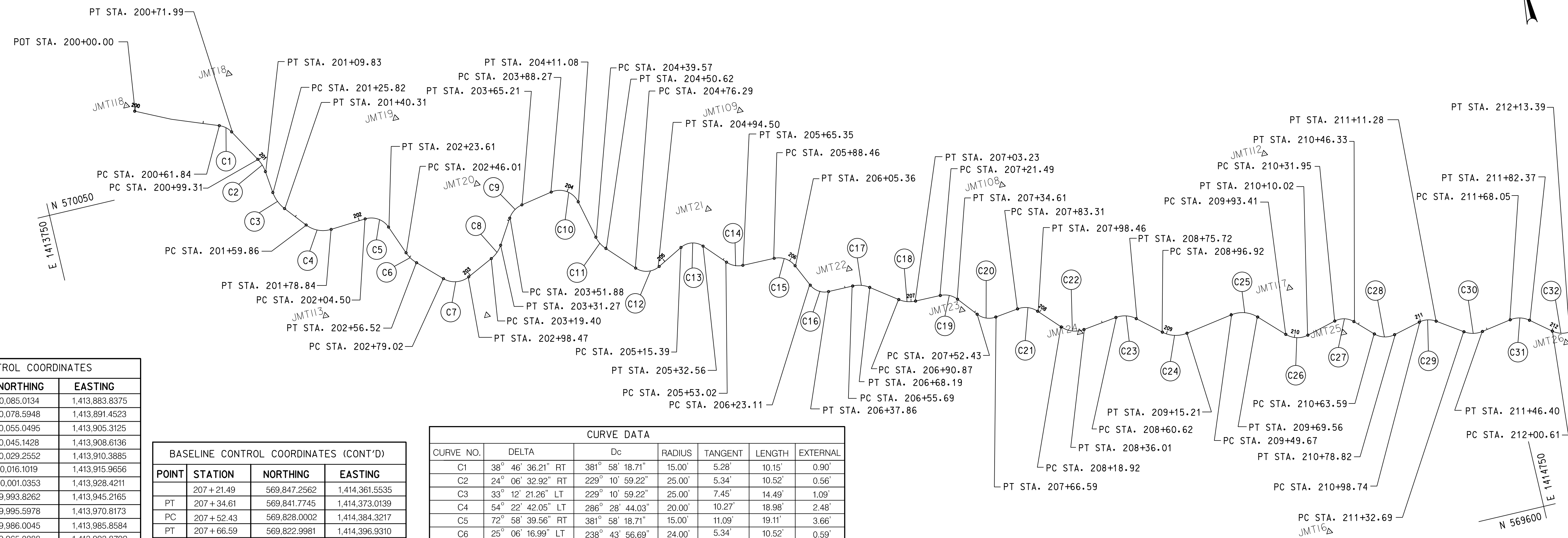
MARYLAND TRANSPORTATION AUTHORITY
 Engineering Division

| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
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| MARYLAND TRANSPORTATION AUTHORITY | | |
| ENGINEERING DIVISION | | |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | |
| STREAM RESTORATION PROJECT | | |
| KEY MAP | | |
| DESIGNED BY | MRG/PVC | DRAWN BY |
| CONST. REVIEW BY | JSK | DATE |
| | | MAY, 2019 |
| CHECKED BY | MRG/JSK | SCALE |
| | | 1" = 100' |

| |
|------------------------------|
| CONTRACT NO. HT-3012-0000 |
| DRAWING NO. KM-01 |
| SHEET NO. 3 OF 26 |

FILE: G:\2015\181777_003_1-895_TMDL_Stream_Re-CADD\p65-POOL-1895_STREAM_RESTORATION.dgn
DATE: Monday, December 17, 2018 AT 11:45 AM



BASELINE CONTROL COORDINATES

| POINT | STATION | NORTHING | EASTING |
|-------|-----------|--------------|----------------|
| PC | 200+61.84 | 570,085.0134 | 1,413,883.8375 |
| PT | 200+71.99 | 570,078.5948 | 1,413,891.4523 |
| PC | 200+99.31 | 570,055.0495 | 1,413,905.3125 |
| PT | 201+09.83 | 570,045.1428 | 1,413,908.6136 |
| PC | 201+25.82 | 570,029.2552 | 1,413,910.3885 |
| PT | 201+40.31 | 570,016.1019 | 1,413,915.9656 |
| PC | 201+59.86 | 570,001.0353 | 1,413,928.4211 |
| PT | 201+78.84 | 569,993.8262 | 1,413,945.2165 |
| PC | 202+04.50 | 569,995.5978 | 1,413,970.8173 |
| PT | 202+23.61 | 569,986.0045 | 1,413,985.8584 |
| PC | 202+46.01 | 569,965.0888 | 1,413,993.8792 |
| PT | 202+56.52 | 569,956.3931 | 1,413,999.6421 |
| PC | 202+79.02 | 569,940.7912 | 1,414,015.8468 |
| PT | 202+98.47 | 569,937.9072 | 1,414,033.8976 |
| PC | 203+19.40 | 569,946.9999 | 1,414,052.7409 |
| PT | 203+31.27 | 569,954.8368 | 1,414,061.4558 |
| PC | 203+51.88 | 569,972.3417 | 1,414,072.3233 |
| PT | 203+65.21 | 569,979.6377 | 1,414,083.0171 |
| PC | 203+88.27 | 569,983.8166 | 1,414,105.6942 |
| PT | 204+11.08 | 569,972.5173 | 1,414,123.0099 |
| PC | 204+39.57 | 569,944.7865 | 1,414,129.5684 |
| PT | 204+50.62 | 569,935.1772 | 1,414,134.7597 |
| PC | 204+76.29 | 569,916.5441 | 1,414,152.4122 |
| PT | 204+94.50 | 569,913.8101 | 1,414,169.1458 |
| PC | 205+15.39 | 569,923.6149 | 1,414,187.5941 |
| PT | 205+32.56 | 569,920.8922 | 1,414,203.3034 |
| PC | 205+53.02 | 569,905.7706 | 1,414,217.0849 |
| PT | 205+65.35 | 569,900.8752 | 1,414,228.0298 |
| PC | 205+88.46 | 569,900.6570 | 1,414,251.1389 |
| PT | 206+05.36 | 569,891.9722 | 1,414,264.6035 |
| PC | 206+23.11 | 569,875.8775 | 1,414,272.0728 |
| PT | 206+37.86 | 569,868.3501 | 1,414,283.8435 |
| PC | 206+55.69 | 569,868.3208 | 1,414,301.6769 |
| PT | 206+68.19 | 569,864.5192 | 1,414,313.3749 |
| PC | 206+90.87 | 569,851.2193 | 1,414,331.7398 |
| PT | 207+03.23 | 569,847.4184 | 1,414,343.2930 |

BASELINE CONTROL COORDINATES (CONT'D)

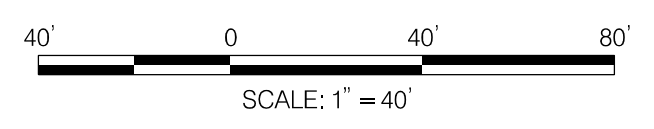
| POINT | STATION | NORTHING | EASTING |
|-------|-----------|--------------|----------------|
| PT | 207+21.49 | 569,847.2562 | 1,414,361.5535 |
| PT | 207+34.61 | 569,841.7745 | 1,414,373.0139 |
| PC | 207+52.43 | 569,828.0002 | 1,414,384.3217 |
| PT | 207+66.59 | 569,822.9981 | 1,414,396.9310 |
| PC | 207+83.31 | 569,825.1348 | 1,414,413.5201 |
| PT | 207+98.46 | 569,820.1975 | 1,414,427.2474 |
| PC | 208+18.92 | 569,805.2601 | 1,414,441.2238 |
| PT | 208+36.01 | 569,799.7128 | 1,414,456.7211 |
| PC | 208+60.62 | 569,802.9299 | 1,414,481.1139 |
| PT | 208+75.72 | 569,798.7615 | 1,414,495.1695 |
| PC | 208+96.92 | 569,784.9753 | 1,414,511.2825 |
| PT | 209+15.21 | 569,780.2104 | 1,414,528.3432 |
| PC | 209+49.67 | 569,785.8032 | 1,414,562.3456 |
| PT | 209+69.56 | 569,779.9464 | 1,414,580.5877 |
| PC | 209+93.41 | 569,763.1011 | 1,414,597.4681 |
| PT | 210+10.02 | 569,758.9379 | 1,414,612.7823 |
| PC | 210+31.95 | 569,764.4388 | 1,414,634.0178 |
| PT | 210+46.33 | 569,760.9019 | 1,414,647.3105 |
| PC | 210+63.59 | 569,748.8438 | 1,414,659.6568 |
| PT | 210+78.82 | 569,745.0102 | 1,414,673.7248 |
| PC | 210+98.74 | 569,749.7759 | 1,414,693.0734 |
| PT | 211+11.28 | 569,747.6411 | 1,414,705.0570 |
| PC | 211+32.69 | 569,735.6543 | 1,414,722.8026 |
| PT | 211+46.40 | 569,732.8222 | 1,414,735.8797 |
| PC | 211+68.05 | 569,736.4331 | 1,414,757.2297 |
| PT | 211+82.37 | 569,732.9452 | 1,414,770.6853 |
| PC | 212+00.61 | 569,721.5535 | 1,414,784.9229 |
| PT | 212+13.39 | 569,718.1701 | 1,414,796.9013 |

CURVE DATA

| CURVE NO. | DELTA | Dc | RADIUS | TANGENT | LENGTH | EXTERNAL |
|-----------|-------------------|-----------------|--------|---------|--------|----------|
| C1 | 38° 46' 36.21" RT | 381' 58" 18.71" | 15.00' | 5.28' | 10.15' | 0.90' |
| C2 | 24° 06' 32.92" RT | 229° 10' 59.22" | 25.00' | 5.34' | 10.52' | 0.56' |
| C3 | 33° 12' 21.26" LT | 229° 10' 59.22" | 25.00' | 7.45' | 14.49' | 1.09' |
| C4 | 54° 22' 42.05" LT | 286° 28' 44.03" | 20.00' | 10.27' | 18.98' | 2.48' |
| C5 | 72° 58' 39.56" RT | 381° 58' 18.71" | 15.00' | 11.09' | 19.11' | 3.66' |
| C6 | 25° 06' 16.99" LT | 238° 43' 56.69" | 24.00' | 5.34' | 10.52' | 0.59' |
| C7 | 69° 40' 24.77" LT | 358° 05' 55.04" | 16.00' | 11.14' | 19.46' | 3.49' |
| C8 | 32° 24' 28.18" LT | 272° 50' 13.36" | 21.00' | 6.10' | 11.88' | 0.87' |
| C9 | 47° 43' 33.73" RT | 358° 05' 55.04" | 16.00' | 7.08' | 13.33' | 1.50' |
| C10 | 87° 08' 04.87" RT | 381° 58' 18.71" | 15.00' | 14.27' | 22.81' | 5.70' |
| C11 | 30° 08' 44.10" LT | 272° 50' 13.36" | 21.00' | 5.66' | 11.05' | 0.75' |
| C12 | 74° 32' 14.84" LT | 409° 15' 20.04" | 14.00' | 10.65' | 18.21' | 3.59' |
| C13 | 75° 38' 38.99" RT | 440° 44' 12.36" | 13.00' | 10.09' | 17.16' | 3.46' |
| C14 | 47° 06' 49.48" LT | 381° 58' 18.71" | 15.00' | 6.54' | 12.33' | 1.36' |
| C15 | 64° 33' 49.13" RT | 381° 58' 18.71" | 15.00' | 9.48' | 16.90' | 2.74' |
| C16 | 65° 00' 37.80" LT | 440° 44' 12.36" | 13.00' | 8.28' | 14.75' | 2.41' |
| C17 | 35° 49' 04.51" RT | 286° 28' 44.03" | 20.00' | 6.46' | 12.50' | 1.02' |
| C18 | 35° 24' 10.54" LT | 286° 28' 44.03" | 20.00' | 6.38' | 12.36' | 0.99' |
| C19 | 50° 06' 25.77" RT | 381° 58' 18.71" | 15.00' | 7.01' | 13.12' | 1.56' |
| C20 | 57° 57' 20.60" LT | 409° 15' 20.04" | 14.00' | 7.75' | 14.16' | 2.00' |
| C21 | 54° 14' 35.15" RT | 358° 05' 55.04" | 16.00' | 8.20' | 15.15' | 1.98' |
| C22 | 54° 25' 00.74" LT | 318° 18' 35.59" | 18.00' | 9.25' | 17.10' | 2.24' |
| C23 | 48° 03' 47.82" RT | 318° 18' 35.59" | 18.00' | 8.03' | 15.10' | 1.71' |
| C24 | 49° 53' 26.15" LT | 272° 50' 13.36" | 21.00' | 9.77' | 18.29' | 2.16' |
| C25 | 54° 16' 50.97" RT | 272° 50' 13.36" | 21.00' | 10.76' | 19.89' | 2.60' |
| C26 | 59° 27' 47.39" LT | 358° 05' 55.04" | 16.00' | 9.14' | 16.61' | 2.43' |
| C27 | 58° 50' 46.52" RT | 409° 15' 20.04" | 14.00' | 7.90' | 14.38' | 2.07' |
| C28 | 58° 09' 37.07" LT | 381° 58' 18.71" | 15.00' | 8.34' | 15.23' | 2.16' |
| C29 | 47° 52' 31.03" RT | 381° 58' 18.71" | 15.00' | 6.66' | 12.53' | 1.41' |
| C30 | 43° 38' 15.52" LT | 318° 18' 35.59" | 18.00' | 7.21' | 13.71' | 1.39' |
| C31 | 48° 15' 46.25" RT | 337° 02' 02.39" | 17.00' | 7.62' | 14.32' | 1.63' |
| C32 | 45° 46' 51.44" LT | 358° 05' 55.04" | 16.00' | 6.76' | 12.78' | 1.37' |

JMT SURVEY TRAVERSE COORDINATE TABLE

| POINT | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|--------|-------------|--------------|-----------|--------------------------------|
| JMT100 | 570200.0932 | 1414160.2475 | 39.284 | TRAV,MAG. NAIL |
| JMT101 | 570155.2524 | 1414301.2283 | 39.366 | TRAV,MAG. NAIL |
| JMT102 | 570092.0453 | 1414488.9586 | 34.321 | TRAV,MAG. NAIL |
| JMT107 | 570104.8684 | 1414449.1238 | 35.787 | TRAV,MAG. NAIL |
| JMT108 | 569914.4934 | 1414423.0776 | 31.892 | TRAV,R&C |
| JMT109 | 570009.9230 | 1414251.4692 | 32.182 | TRAV.8" SPIKE |
| JMT111 | 570039.2643 | 1414656.7841 | 29.586 | TRAV,MAG. NAIL |
| JMT112 | 569893.3106 | 1414612.1613 | 23.122 | TRAV,MAG. NAIL |
| JMT113 | 569934.1044 | 1413927.1769 | 15.659 | TRAV,R&C FLY |
| JMT117 | 569794.9884 | 1414607.7450 | 14.730 | TRAV,H&T FLY |
| JMT118 | 570114.2537 | 1413821.9440 | 22.530 | TRAV,R&C FLY |
| JMT114 | 570146.2853 | 1414332.4122 | 39.092 | TRAV, |
| JMT16 | 569617.5276 | 1414595.5473 | 47.964 | TRAV, |
| JMT18 | 570119.7179 | 1413899.0867 | 18.744 | TRAV, |
| JMT19 | 570061.2073 | 1414008.7274 | 17.234 | TRAV,R&C |
| JMT20 | 570001.6848 | 1414054.9315 | 11.299 | TRAV,R&C |
| JMT21 | 569945.9719 | 1414212.9558 | 10.816 | TRAV,R&C |
| JMT22 | 569880.8204 | 1414301.9108 | 9.942 | TRAV,R&C |
| JMT23 | 569833.4716 | 1414374.3789 | 9.288 | TRAV,HR:2.4 (2.4 + 0.0 Offset) |
| JMT24 | 569798.4177 | 1414453.4328 | 8.847 | TRAV,R&C |
| JMT25 | 569754.6728 | 1414638.2687 | 8.185 | TRAV,R&C |
| JMT26 | 569711.2188 | 1414792.8964 | 9.837 | TRAV,R&C |



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. 31183
EXPIRATION DATE: 1/13/2021

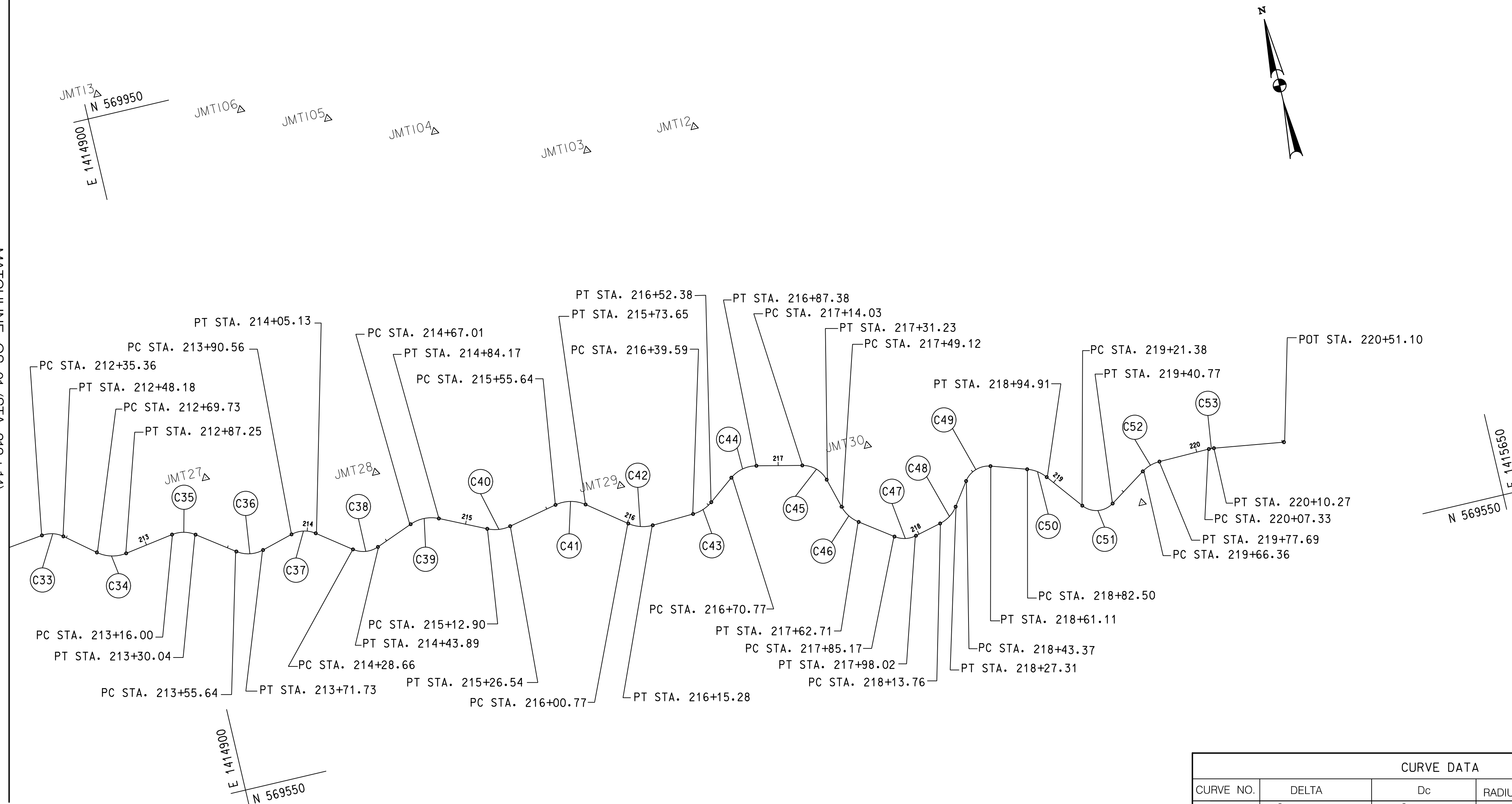


| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
| | | | |
| | | | |
| | | | |
| | | | |

| MARYLAND TRANSPORTATION AUTHORITY | | | |
|--|--------------|-------------|--------------|
| ENGINEERING DIVISION | | | |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | |
| STREAM RESTORATION PROJECT | | | |
| STREAM RESTORATION GEOMETRY PLAN | | | |
| DESIGNED BY | MRG/PVC | DRAWN BY | JMB |
| CONST. REVIEW BY | JSK | DATE | MAY, 2019 |
| CHECKED BY | MRG/JSK | SCALE | 1"=40' |
| CONTRACT NO. | HT-3012-0000 | DRAWING NO. | GS-01 |
| SHEET NO. | 4 | OF | 26 |

FILE: Q:\2015\17177_003_1-895_TMDL_Stream_Re\CADD\p65-p002_1895_STREAM RESTORATION.dgn
 DATE: Monday, December 17, 2018 AT 11:48 AM

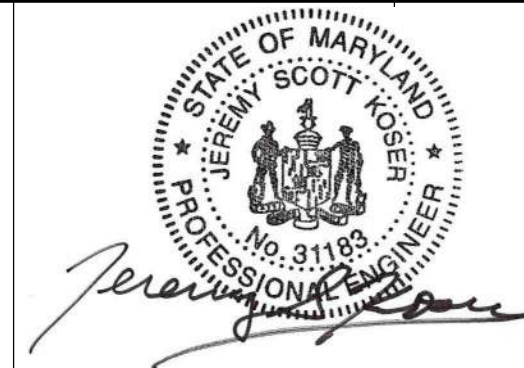
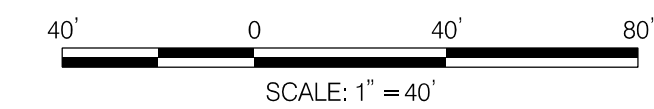
MATCHLINE GS-01 (STA. 212 + 14)



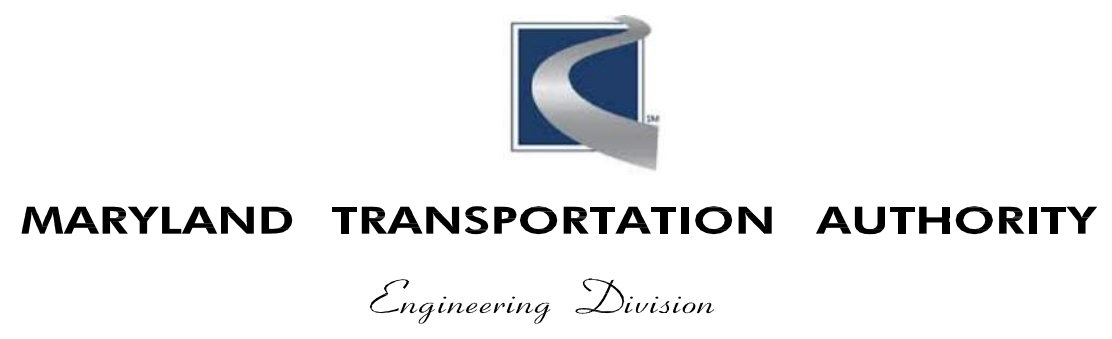
| BASELINE CONTROL COORDINATES | | | |
|------------------------------|-----------|--------------|----------------|
| POINT | STATION | NORTHING | EASTING |
| PC | 212+35.36 | 569,720.8916 | 1,414,818.6968 |
| PT | 212+48.18 | 569,717.4828 | 1,414,830.7067 |
| PC | 212+69.73 | 569,703.9801 | 1,414,847.4957 |
| PT | 212+87.25 | 569,699.6033 | 1,414,863.9443 |
| PC | 213+16.00 | 569,704.1042 | 1,414,892.3399 |
| PT | 213+30.04 | 569,700.9479 | 1,414,905.6557 |
| PC | 213+55.64 | 569,686.0199 | 1,414,926.4480 |
| PT | 213+71.73 | 569,683.2998 | 1,414,941.7686 |
| PC | 213+90.56 | 569,688.3459 | 1,414,959.9136 |
| PT | 214+05.13 | 569,685.7737 | 1,414,973.7432 |
| PC | 214+28.66 | 569,671.7384 | 1,414,992.6322 |
| PT | 214+43.89 | 569,669.8290 | 1,415,007.0930 |
| PC | 214+67.01 | 569,678.3297 | 1,415,028.5968 |
| PT | 214+84.17 | 569,677.7968 | 1,415,045.2687 |
| PC | 215+12.90 | 569,665.5489 | 1,415,071.2601 |
| PT | 215+26.54 | 569,664.0030 | 1,415,084.5720 |
| PC | 215+55.64 | 569,670.0447 | 1,415,113.0357 |
| PT | 215+73.65 | 569,666.2381 | 1,415,130.0811 |
| PC | 216+00.77 | 569,649.8543 | 1,415,151.6967 |
| PT | 216+15.28 | 569,645.6087 | 1,415,165.2647 |
| PC | 216+39.59 | 569,646.6307 | 1,415,189.5534 |
| PT | 216+52.38 | 569,650.9106 | 1,415,201.4009 |
| PC | 216+70.77 | 569,662.0614 | 1,415,216.0301 |
| PT | 216+87.38 | 569,665.4817 | 1,415,231.7430 |
| PC | 217+14.03 | 569,659.5972 | 1,415,257.7374 |
| PT | 217+31.23 | 569,648.3062 | 1,415,269.6122 |
| PC | 217+49.12 | 569,631.0854 | 1,415,274.4341 |
| PT | 217+62.71 | 569,620.1792 | 1,415,282.1027 |
| PC | 217+85.17 | 569,607.1643 | 1,415,300.4044 |
| PT | 217+98.02 | 569,604.8142 | 1,415,312.6454 |
| PC | 218+13.76 | 569,608.5376 | 1,415,327.9399 |
| PT | 218+27.31 | 569,615.9786 | 1,415,338.9236 |
| PC | 218+43.37 | 569,629.0585 | 1,415,348.2361 |
| PT | 218+61.11 | 569,634.2487 | 1,415,363.9818 |
| PC | 218+82.50 | 569,627.6175 | 1,415,384.3143 |
| PT | 218+94.91 | 569,620.6001 | 1,415,394.3365 |
| PC | 219+21.38 | 569,599.7661 | 1,415,410.6518 |
| PT | 219+40.77 | 569,596.9440 | 1,415,428.0670 |
| PC | 219+66.36 | 569,611.0815 | 1,415,449.4051 |
| PT | 219+77.69 | 569,614.4053 | 1,415,460.0759 |
| PC | 220+07.33 | 569,614.9621 | 1,415,489.7112 |
| PT | 220+10.27 | 569,614.7775 | 1,415,492.6426 |

| CURVE DATA | | | | | | |
|------------|-------------------|-----------------|--------|---------|--------|----------|
| CURVE NO. | DELTA | Dc | RADIUS | TANGENT | LENGTH | EXTERNAL |
| C33 | 45° 55' 32.52" RT | 358° 05' 55.04" | 16.00' | 6.78' | 12.82' | 1.38' |
| C34 | 47° 48' 54.76" LT | 272° 50' 13.36" | 21.00' | 9.31' | 17.53' | 1.97' |
| C35 | 44° 41' 01.46" RT | 318° 18' 35.59" | 18.00' | 7.40' | 14.04' | 1.46' |
| C36 | 51° 13' 05.34" LT | 318° 18' 35.59" | 18.00' | 8.63' | 16.09' | 1.96' |
| C37 | 52° 09' 18.39" RT | 358° 05' 55.04" | 16.00' | 7.83' | 14.56' | 1.81' |
| C38 | 58° 10' 59.93" LT | 381° 58' 18.71" | 15.00' | 8.35' | 15.23' | 2.17' |
| C39 | 46° 48' 02.76" RT | 272° 50' 13.36" | 21.00' | 9.09' | 17.15' | 1.88' |
| C40 | 37° 12' 53.38" LT | 272° 50' 13.36" | 21.00' | 7.07' | 13.64' | 1.16' |
| C41 | 49° 08' 39.86" RT | 272° 50' 13.36" | 21.00' | 9.60' | 18.01' | 2.09' |
| C42 | 39° 34' 12.71" LT | 272° 50' 13.36" | 21.00' | 7.55' | 14.50' | 1.32' |
| C43 | 34° 54' 22.72" LT | 272° 50' 13.36" | 21.00' | 6.60' | 12.79' | 1.01' |
| C44 | 50° 04' 16.03" RT | 301° 33' 24.24" | 19.00' | 8.87' | 16.60' | 1.97' |
| C45 | 61° 36' 06.96" RT | 358° 05' 55.04" | 16.00' | 9.54' | 17.20' | 2.63' |
| C46 | 38° 56' 22.40" LT | 286° 28' 44.03" | 20.00' | 7.07' | 13.59' | 1.21' |
| C47 | 49° 06' 00.09" LT | 381° 58' 18.71" | 15.00' | 6.85' | 12.85' | 1.49' |
| C48 | 40° 52' 04.27" LT | 301° 33' 24.24" | 19.00' | 7.08' | 13.55' | 1.28' |
| C49 | 72° 36' 47.43" RT | 409° 15' 20.04" | 14.00' | 10.29' | 17.74' | 3.37' |
| C50 | 33° 52' 19.30" RT | 272° 50' 13.36" | 21.00' | 6.39' | 12.41' | 0.95' |
| C51 | 85° 27' 41.07" LT | 440° 44' 12.36" | 13.00' | 12.01' | 19.39' | 4.70' |
| C52 | 32° 27' 00.13" RT | 286° 28' 44.03" | 20.00' | 5.82' | 11.33' | 0.83' |
| C53 | 9° 21' 34.53" RT | 318° 18' 35.59" | 18.00' | 1.47' | 2.94' | 0.06' |

| JMT SURVEY TRAVERSE COORDINATE TABLE | | | | |
|--------------------------------------|-------------|--------------|-----------|----------------|
| POINT | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| JMT103 | 569866.0928 | 1415177.8018 | 25.775 | TRAV,MAG, NAIL |
| JMT104 | 569896.8666 | 1415094.2724 | 23.883 | TRAV,MAG, NAIL |
| JMT105 | 569918.4156 | 1415035.5815 | 24.771 | TRAV,MAG, NAIL |
| JMT106 | 569934.9324 | 1414987.5090 | 26.352 | TRAV,MAG, NAIL |
| JMT12 | 569865.1773 | 1415241.5996 | 24.838 | TRAV, |
| JMT13 | 569962.6964 | 1414908.4122 | 28.527 | TRAV, |
| JMT27 | 569731.6335 | 1414918.8283 | 12.243 | TRAV,R&C |
| JMT28 | 569712.0951 | 1415015.7202 | 11.274 | TRAV,R&C |
| JMT29 | 569672.2063 | 1415152.4300 | 9.176 | TRAV,R&C |
| JMT30 | 569662.1132 | 1415297.2357 | 10.157 | TRAV,R&C |

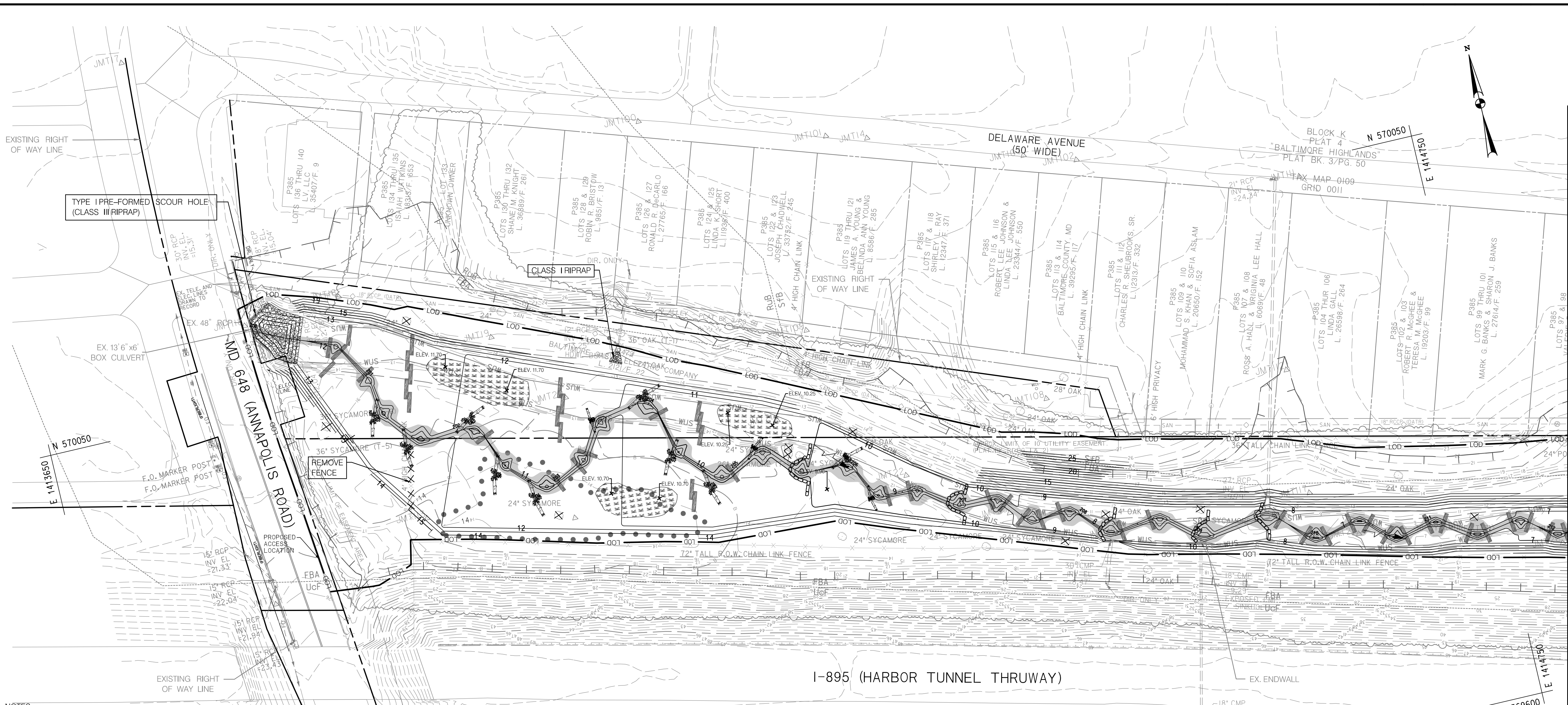


PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND
 LICENSE NO. 31183
 EXPIRATION DATE: 1/13/2021



| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
| | | | |
| | | | |
| | | | |
| | | | |

| MARYLAND TRANSPORTATION AUTHORITY | | | CONTRACT NO. |
|--|----------|----------|--------------|
| ENGINEERING DIVISION | | | HT-3012-0000 |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | DRAWING NO. |
| STREAM RESTORATION PROJECT | | | GS-02 |
| STREAM RESTORATION GEOMETRY PLAN | | | SHEET NO. |
| DESIGNED BY | MARG/PVC | DRAWN BY | JMB |
| CONST. REVIEW BY | JSK | DATE | MAY, 2019 |
| CHECKED BY | MARG/JSK | SCALE | 1"=40' |
| | | | 5 OF 26 |



I-895 (HARBOR TUNNEL THRUWAY)
PLAN

- NOTES:**
- SEE THE PROFILE (SHEET PR-01) FOR THE PROPOSED ELEVATIONS OF THE IN-CHANNEL LOG SILLS. ALL IN-CHANNEL LOG SILLS WILL BE PLACED PERPENDICULAR TO STREAM CHANNEL.
 - STATIONS AND OFFSETS FOR FLOODPLAIN LOG SILLS ARE TO THE CENTER OF SILL STRUCTURE. TOP OF FLOODPLAIN LOG SILLS WILL BE SET AT THE PROPOSED FLOODPLAIN ELEVATION.
 - SEE THE TYPICAL SECTIONS (SHEET TS-01) FOR DIMENSION OF THE PROPOSED CHANNEL.
 - SEE SHEET DE-03 FOR THE IN-CHANNEL AND FLOODPLAIN LOG SILL DETAILS.
 - CENTER OF IN-CHANNEL LOG SILLS IS THE BASELINE. TOP OF IN-CHANNEL LOG SILLS SHALL BE PLACED FLUSH WITH THE PROPOSED STREAMBED ELEVATION.
 - CENTER OF ROCK CROSS VANES IS THE BASELINE. TOP OF ROCK CROSS VANES SHALL BE PLACED FLUSH WITH THE PROPOSED STREAMBED ELEVATION.
 - AN ADJACENT PROJECT INVOLVING THE SLIPLINING OF CULVERTS THAT OUTFALL INTO THE SOUTHERN EDGE OF THE PROJECT AREA FROM I-895 MAY OCCUR CONCURRENTLY TO THIS PROJECT. THE CONTRACTOR SHALL COORDINATE AS NEEDED WITH MDTA AND MDTA'S CONTRACTOR PERFORMING THE SLIPLINING WORK ON AN ADJACENT PROJECT.
 - A MAXIMUM OF TWO (2) LOGS ARE TO BE USED FOR EACH LOG VANE.
 - PER STANDARD SPECIFICATIONS, THE COST OF FENCE REMOVAL IS INCIDENTAL TO CLEARING AND GRUBBING.

| * IN-CHANNEL LOG SILL | | | | | |
|-----------------------|-------------|-----------|-------------|-----------|-------------|
| STATION | LENGTH (FT) | STATION | LENGTH (FT) | STATION | LENGTH (FT) |
| 200+61.82 | 16 | 207+21.48 | 16 | 210+46.33 | 16 |
| 200+72.00 | 16 | 207+34.61 | 16 | 210+63.59 | 16 |
| 200+99.31 | 16 | 207+52.43 | 16 | 210+80.07 | 16 |
| 202+23.61 | 16 | 207+66.79 | 16 | 210+98.74 | 16 |
| 202+98.47 | 16 | 207+83.31 | 16 | 211+11.28 | 16 |
| 203+19.40 | 16 | 208+36.01 | 16 | 211+32.70 | 16 |
| 203+31.27 | 16 | 208+60.62 | 16 | 211+46.40 | 16 |
| 204+11.08 | 16 | 209+69.56 | 16 | 211+68.05 | 16 |
| 204+94.50 | 16 | 209+93.41 | 16 | 211+82.37 | 16 |
| 206+37.86 | 16 | 210+10.01 | 16 | 212+00.61 | 16 |
| 206+55.69 | 16 | 210+31.95 | 16 | 212+13.38 | 16 |

* SEE NOTE 5 THIS SHEET.

| FURNISHED STREAMBED GRAVEL | | |
|----------------------------|--------------------|---------------|
| TYPE | AVERAGE WIDTH (FT) | QUANTITY (SY) |
| I | 16 | 1249 |

| STATION | LOG VANE | | | |
|-----------|--|-------|-------|-------|
| | DIMENSIONS AND CRITICAL ELEVATIONS, SEE DETAILS (FEET) | | | |
| | L | NOTES | A | B |
| 201+26.00 | 30 | RIGHT | 11.41 | 12.36 |
| 201+60.00 | 30 | RIGHT | 11.23 | 12.18 |
| 202+05.00 | 30 | LEFT | 10.98 | 11.93 |
| 202+46.00 | 30 | RIGHT | 10.77 | 11.72 |
| 202+79.00 | 30 | RIGHT | 10.56 | 11.51 |
| 203+52.00 | 20 | LEFT | 10.17 | 11.12 |
| 203+88.00 | 30 | LEFT | 9.95 | 10.90 |
| 204+40.00 | 30 | RIGHT | 9.68 | 10.63 |
| 204+76.00 | 30 | RIGHT | 9.43 | 10.38 |
| 205+15.00 | 20 | LEFT | 9.24 | 10.19 |
| 205+88.00 | 30 | LEFT | 8.83 | 9.78 |
| 206+23.00 | 20 | RIGHT | 8.66 | 9.61 |

| * FLOODPLAIN LOG SILL | | | | | |
|-----------------------|-----------|-------------|-----------|-----------|-------------|
| STATION | OFFSET | LENGTH (FT) | STATION | OFFSET | LENGTH (FT) |
| 200+69.84 | 12.74, LT | 16 | 203+51.75 | 31.56, LT | 16 |
| 200+75.22 | 9.14, RT | 16 | 203+55.32 | 32.09, LT | 16 |
| 201+02.38 | 43.50, LT | 16 | 203+58.08 | 41.31, LT | 16 |
| 201+05.72 | 33.77, LT | 16 | 204+23.26 | 28.92, LT | 16 |
| 201+10.97 | 31.77, LT | 16 | 204+31.32 | 26.30, LT | 16 |
| 201+20.81 | 24.65, LT | 16 | 204+52.59 | 21.53, LT | 16 |
| 201+44.27 | 20.55, LT | 16 | 204+70.03 | 18.02, RT | 16 |
| 203+40.33 | 25.49, LT | 16 | 204+76.56 | 24.86, RT | 16 |

* SEE NOTE 2 THIS SHEET.

| BOTTOM CUTOFF WALL | | | | | |
|--------------------|-------|-----|----|-----|---------------|
| STATION | CLASS | L | W | D | QUANTITY (LF) |
| 203+89 | I | 10' | 1' | 36" | 10 |
| 200+38 | III | 37' | 2' | 48" | 37 |

| * ROCK CROSS VANE STRUCTURE | | | | | | | | | | |
|-----------------------------|--------|---------------|----------|----------|----------|-----|-----|-----|-----|-----|
| STATION | OFFSET | QUANTITY (LF) | ELEV 'A' | ELEV 'B' | ELEV 'C' | L1 | L2 | L3 | L4 | L5 |
| 205+52.00 | 0+00' | 59 | 10.00 | 9.05 | 10.00 | 14' | 7' | 14' | 8' | 8' |
| 206+91.00 | 0+00' | 48 | 9.23 | 8.28 | 9.23 | 17' | 9' | 14' | 4' | 4' |
| 208+18.00 | 0+00' | 37 | 8.65 | 7.70 | 8.65 | 8' | 10' | 9' | NA | 10' |
| 208+96.00 | 0+00' | 34 | 8.28 | 7.33 | 8.28 | 5' | 10' | 11' | NA | 8' |
| 209+49.00 | 0+00' | 39 | 8.01 | 7.06 | 8.01 | 12' | 5' | 5' | 10' | 7' |

* SEE NOTE 6 THIS SHEET.

| RIPRAP SLOPE AND CHANNEL PROTECTION SCHEDULE | | | | | | |
|--|-------|-----|-------|-----|------------|---------------|
| STATION | CLASS | L | W | D | FABRIC | QUANTITY (SY) |
| 203+89 | I | 8' | 10' | 19" | CLASS 'SE' | 6 |
| 200+00 | III | 38' | 10.5' | 36" | CLASS 'SE' | 143 |

FILE: Q:\2015\181777_003_I-895_TMDL_Stream_Restoration_Re\CADD\PSR-01_I895_STREAM_RESTORATION.dgn
 DATE: Thursday, March 14, 2019 AT 11:55 AM

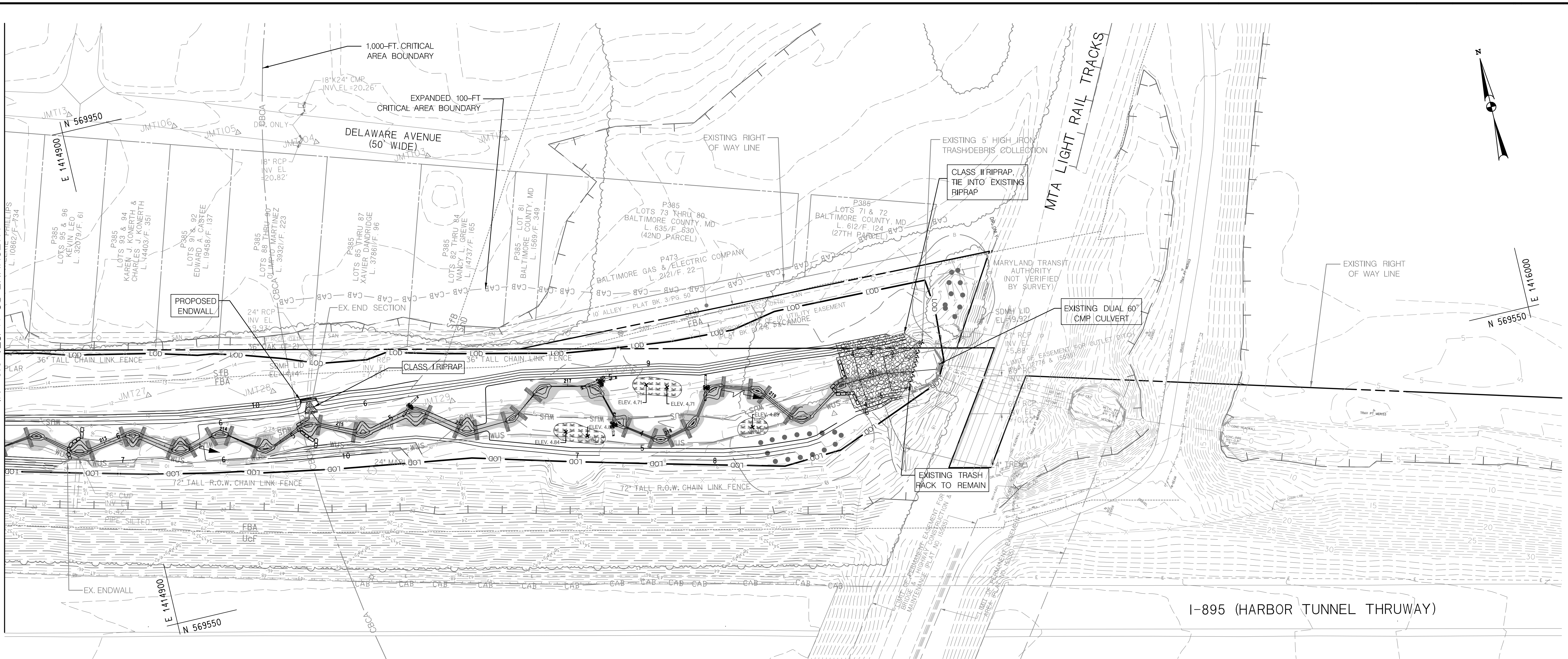


PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND
 LICENSE NO. 31183
 EXPIRATION DATE: 1/13/2021

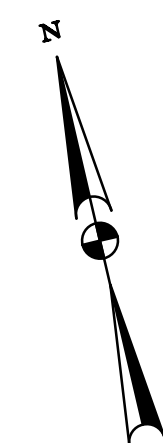


| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
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| | | | |
|--|---------|------------|------------------------------|
| MARYLAND TRANSPORTATION AUTHORITY | | | CONTRACT NO. HT-3012-0000 |
| ENGINEERING DIVISION | | | DRAWING NO. PS-01 |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | SHEET NO. |
| STREAM RESTORATION PROJECT | | | 6 OF 26 |
| STREAM RESTORATION PLAN | | | |
| DESIGNED BY | MRG/PVC | DRAWN BY | JMB |
| CONST. REVIEW BY | JSK | CHECKED BY | MRG/JSK |
| | | DATE | MAY, 2019 |
| | | SCALE | 1"=40' |



MATCHLINE PS-01 (STA. 212 + 14)



PLAN

- NOTES:**
- SEE THE PROFILE FOR THE PROPOSED ELEVATIONS OF THE IN-CHANNEL LOG SILLS. ALL IN-CHANNEL LOG SILLS WILL BE PLACED PERPENDICULAR TO STREAM CHANNEL.
 - SEE THE TYPICAL SECTIONS FOR DIMENSIONS OF ALL PROPOSED CHANNELS.
 - SEE SHEET DE-03 FOR THE IN-CHANNEL AND FLOODPLAIN LOG SILL DETAILS.
 - CENTER OF IN-CHANNEL LOG SILLS IS THE BASELINE TOP OF IN-CHANNEL LOG SILLS SHALL BE PLACED FLUSH WITH THE PROPOSED STREAMBED ELEVATION.
 - CENTER OF ROCK CROSS VANES IS THE BASELINE TOP OF ROCK CROSS VANES SHALL BE PLACED FLUSH WITH THE PROPOSED STREAMBED ELEVATION.
 - AN ADJACENT PROJECT INVOLVING THE SPLITTING OF CULVERTS THAT OUTFALL INTO THE SOUTHERN EDGE OF THE PROJECT AREA FROM I-95 MAY OCCUR CONCURRENTLY TO THIS PROJECT. THE CONTRACTOR SHALL COORDINATE, AS NEEDED WITH MDTA AND MDTA'S CONTRACTOR PERFORMING THE SPLITTING WORK ON AN ADJACENT PROJECT.
 - A MAXIMUM OF TWO (2) LOGS ARE TO BE USED FOR EACH LOG VANE.
 - CONTRACTOR IS TO CONFIRM THE TIE-IN ELEVATION IN THE FIELD WITH THE DESIGNATED SPECIALIST.

| * IN-CHANNEL LOG SILL | | | |
|-----------------------|-------------|-----------|-------------|
| STATION | LENGTH (FT) | STATION | LENGTH (FT) |
| 212+35.34 | 16 | 216+15.28 | 16 |
| 212+87.25 | 16 | 216+39.59 | 16 |
| 213+16.00 | 16 | 216+52.38 | 16 |
| 213+30.04 | 16 | 216+70.77 | 16 |
| 213+55.64 | 16 | 217+62.71 | 16 |
| 213+71.82 | 16 | 217+85.17 | 16 |
| 213+90.65 | 16 | 217+98.02 | 16 |
| 214+05.12 | 16 | 218+13.76 | 16 |
| 214+28.67 | 16 | 218+61.12 | 16 |
| 214+84.17 | 16 | 218+82.51 | 16 |
| 215+12.90 | 16 | 218+94.91 | 16 |
| 215+73.65 | 16 | 219+21.40 | 16 |
| 216+00.77 | 16 | | |

* SEE NOTE 4 THIS SHEET.

| LOG VANE | | | |
|-----------|--|-------|-----------|
| STATION | DIMENSIONS AND CRITICAL ELEVATIONS, SEE DETAILS (FEET) | | |
| | L | NOTES | A B |
| 215+55.60 | 20 | LEFT | 4.15 4.80 |
| 217+13.00 | 30 | LEFT | 3.89 4.84 |
| 217+48.00 | 20 | RIGHT | 3.84 4.79 |
| 218+42.00 | 20 | LEFT | 3.69 4.64 |

| IMPORTED STREAMBED UNDERLAYMENT | | |
|---------------------------------|--------------------|---------------|
| TYPE | AVERAGE WIDTH (FT) | QUANTITY (SY) |
| I | 16 | 906 |

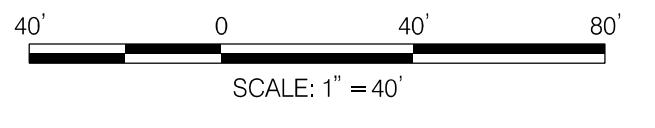
| * ROCK CROSS VANE STRUCTURE | | | | | | | | | | |
|-----------------------------|--------|---------------|----------|----------|----------|-----|----|-----|-----|-----|
| STATION | OFFSET | QUANTITY (LF) | ELEV 'A' | ELEV 'B' | ELEV 'C' | L1 | L2 | L3 | L4 | L5 |
| 212+69.00 | 0+00' | 28 | 6.51 | 5.56 | 6.51 | 6' | 6' | 16' | NA | NA |
| 214+66.00 | 0+00' | 29 | 5.56 | 4.61 | 5.56 | 14' | 5' | 10' | NA | NA |
| 219+65.00 | 0+00' | 56 | 4.44 | 3.49 | 4.44 | 11' | 8' | 15' | 11' | 11' |

* SEE NOTE 5 THIS SHEET.

| DRAINAGE STRUCTURE SCHEDULE (PROPOSED ENDWALL) | | | |
|--|------------|--|---------------|
| STA. | OFFSET | TYPE | QUANTITY (EA) |
| 214+77.54 | 19.52' LT. | STANDARD TYPE 'C' ENDWALL FOR 27" PIPE | 1 |

| RIPRAP SLOPE AND CHANNEL PROTECTION SCHEDULE | | | | | | |
|--|-------|------|-----|-----|------------|---------------|
| STATION | CLASS | L | W | D | FABRIC | QUANTITY (SY) |
| 214+78 | I | 8.5' | 10' | 19" | CLASS 'SE' | 6 |
| 219+92 | II | 54' | 57' | 32" | CLASS 'SE' | 313 |

| BOTTOM CUTOFF WALL | | | | | |
|--------------------|-------|-----|----|-----|---------------|
| STATION | CLASS | L | W | D | QUANTITY (LF) |
| 214+78 | I | 10' | 1' | 36" | 10 |



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 LICENSE NO. 31183
 EXPIRATION DATE: 1/13/2021



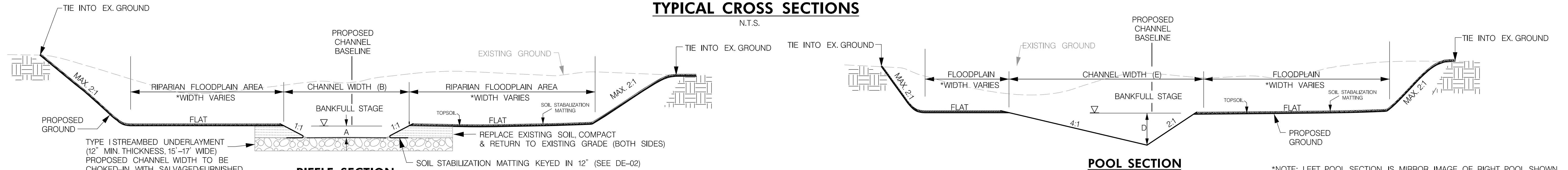
| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
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| MARYLAND TRANSPORTATION AUTHORITY | | | |
|--|---------|----------|-----------|
| ENGINEERING DIVISION | | | |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | |
| STREAM RESTORATION PROJECT | | | |
| STREAM RESTORATION PLAN | | | |
| DESIGNED BY | MRG/PVC | DRAWN BY | JMB |
| CONST. REVIEW BY | JSK | DATE | MAY, 2019 |
| CHECKED BY | MRG/JSK | SCALE | 1"=40' |

| | |
|--------------|--------------|
| CONTRACT NO. | HT-3012-0000 |
| DRAWING NO. | PS-02 |
| SHEET NO. | 7 OF 26 |

TYPICAL CROSS SECTIONS

N.T.S.



RIFFLE SECTION

N.T.S.

STA. 200+50 TO STA. 207+00 (REACH 1)
STA. 207+00 TO STA. 215+73 (REACH 2)
STA. 215+73 TO STA. 219+77 (REACH 3)

| RIFFLE DIMENSION TABLE | | |
|------------------------|-------------------|-------|
| BANKFULL DEPTH (A) | CHANNEL WIDTH (B) | REACH |
| 0.95' | 5' - 7' | 1 |
| 0.95' | 5' - 7' | 2 |
| 0.95' | 5' - 7' | 3 |

NOTES:

1. POOL CROSS-SECTION REPRESENTS THE MAXIMUM POOL CONDITION. POOL CROSS-SECTION WILL NEED TO TRANSITION INTO RIFFLE CROSS-SECTION, AS SHOWN ON PROFILE.
2. THE FLOODPLAIN AREAS SHOWN AS FLAT ON THE TYPICAL SECTIONS, WILL ACTUALLY CONTAINED VARIED MICROTOPOGRAPHY TO BE CREATED DURING CONSTRUCTION UNDER THE GUIDANCE OF THE DESIGNATED SPECIALIST.
3. THE IMPORTED GRAVEL UNDERLAYMENT SHALL BE OF APPROPRIATE NATURAL COLOR (EG. BROWN GRAY, DARK GRAY, DARK BROWN). WHITE STONE WILL NOT BE ACCEPTABLE.
4. EXCAVATION REQUIRED FOR THE INSTALLATION OF UNDERLAYMENT MATERIALS IS INCIDENTAL TO THE COST OF THE UNDERLAYMENT.
5. SEE LANDSCAPE PLANS FOR PLACEMENT OF TOPSOIL.

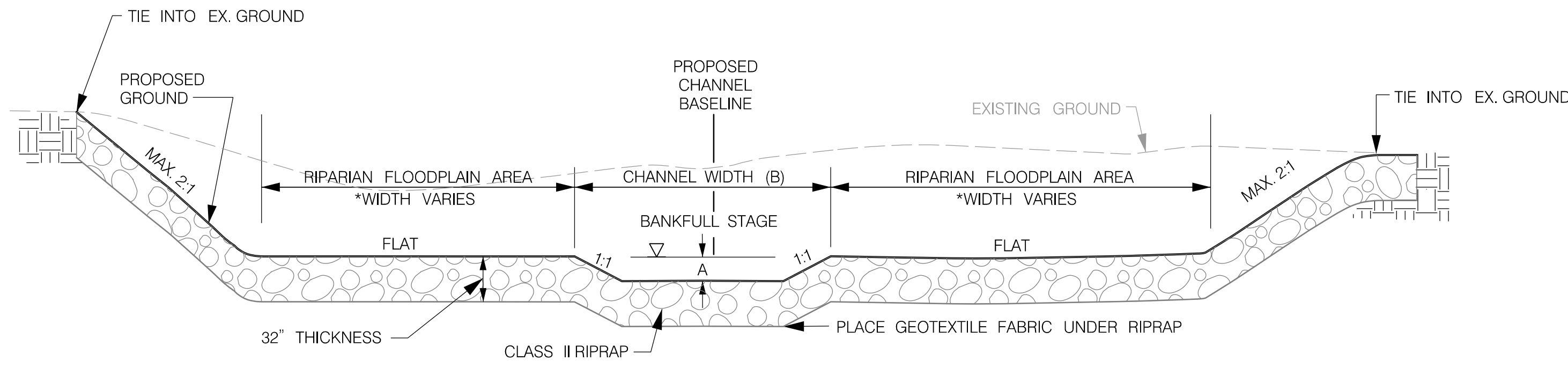
POOL SECTION

N.T.S.

STA. 200+50 TO STA. 207+00 (REACH 1)
STA. 207+00 TO STA. 215+73 (REACH 2)
STA. 215+73 TO STA. 219+77 (REACH 3)

| POOL DIMENSION TABLE | | |
|----------------------|-------------------|-------|
| BANKFULL DEPTH (D) | CHANNEL WIDTH (E) | REACH |
| 2.55' - 2.95' | 15.3' - 17.7' | 1 |
| 2.95' - 3.0' | 17.7' - 18' | 2 |
| 2.95' | 16' - 17.7' | 3 |

*NOTE: LEFT POOL SECTION IS MIRROR IMAGE OF RIGHT POOL SHOWN.



RIFFLE SECTION

STA. 219+77 TO STA. 220+30 (REACH 4)

| RIFFLE DIMENSION TABLE | | |
|------------------------|-------------------|-------|
| BANKFULL DEPTH (A) | CHANNEL WIDTH (B) | REACH |
| 0.95' | 5' - 7' | 4 |

| EARTHWORK SUMMARY TABLE | |
|--|----------|
| TOTAL CUT | 9,200 CY |
| COMMON BORROW FOR EROSION SEDIMENT CONTROL | 1950 CY |
| EXCAVATION FOR UNDERLAYMENT* | 718 CY |
| EXCAVATION FOR SCOUR HOLE CLASS III RIPRAP* | 183 CY |
| EXCAVATION FOR CLASS I RIPRAP OUTLET PROTECTION* | 7 CY |
| EXCAVATION FOR CLASS II RIPRAP SLOPE PROTECTION* | 278 CY |
| EXCAVATION FOR 2" THICK TOPSOIL* | 232 CY |
| EXCAVATION FOR 4" THICK TOPSOIL* | 834 CY |

*EXCAVATION COSTS ARE INCIDENTAL FOR EACH ITEM LISTED

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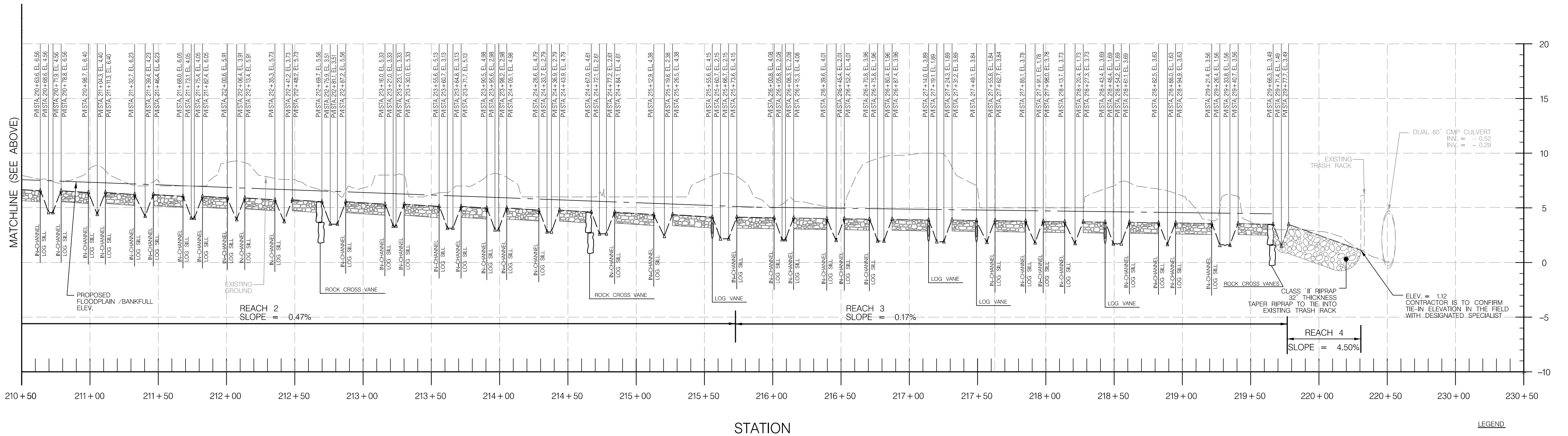
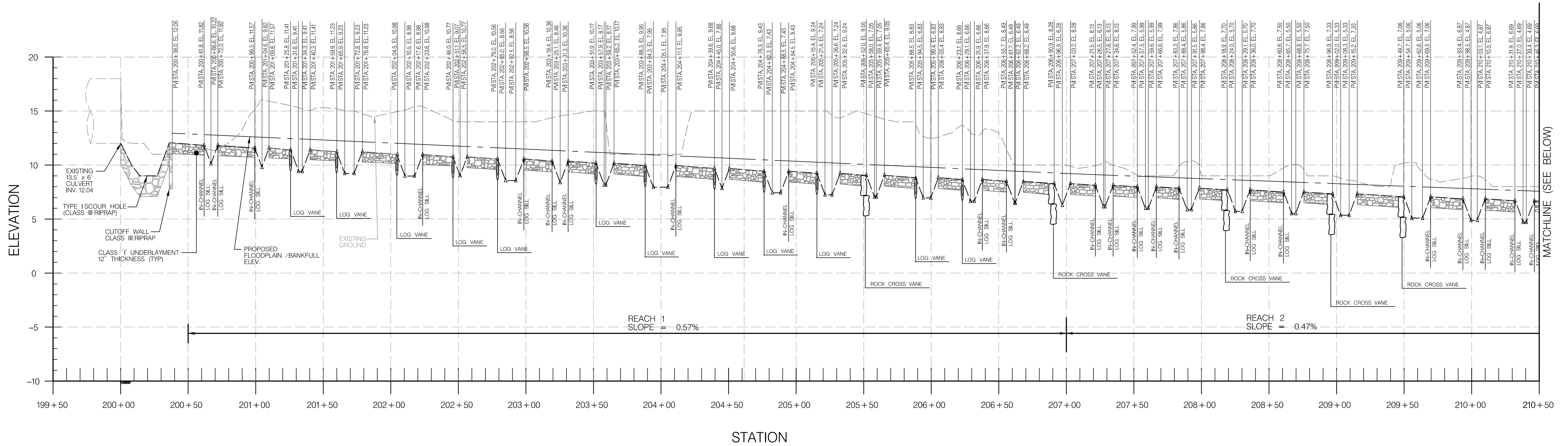
PROFESSIONAL CERTIFICATION
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MARYLAND TRANSPORTATION AUTHORITY
 Engineering Division

| ADDENDUMS & REVISIONS | | | |
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| MARYLAND TRANSPORTATION AUTHORITY | | | CONTRACT NO. |
|--|----------------|--------------------|--------------|
| ENGINEERING DIVISION | | | HT-3012-0000 |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | DRAWING NO. |
| STREAM RESTORATION PROJECT | | | TS-01 |
| TYPICAL SECTIONS | | | SHEET NO. |
| DESIGNED BY MRG/PVC | DRAWN BY JMB | CHECKED BY MRG/JSK | 8 OF 26 |
| CONST. REVIEW BY JSK | DATE MAY, 2019 | SCALE N.T.S. | |



SCALE: HOR. 1" = 40'
 VERT. 1" = 5'

LEGEND
 EXISTING GROUND ---
 FLOODPLAIN/BANKFULL ELEV. ---
 PROPOSED GROUND ---



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MARYLAND TRANSPORTATION AUTHORITY
 Engineering Division

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|--|---------|----------|-----------------------------|
| MARYLAND TRANSPORTATION AUTHORITY | | | |
| ENGINEERING DIVISION | | | |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | |
| STREAM RESTORATION PROJECT | | | |
| STREAM RESTORATION PROFILE | | | |
| DESIGNED BY | MRG/PVC | DRAWN BY | JMB |
| CONST. REVIEW BY | JSK | DATE | MAY, 2019 |
| CHECKED BY | MRG/JSK | SCALE | |
| CONTRACT NO. HT-3012-0000 | | | DRAWING NO. PR-01 |
| SHEET NO. 9 OF 26 | | | |

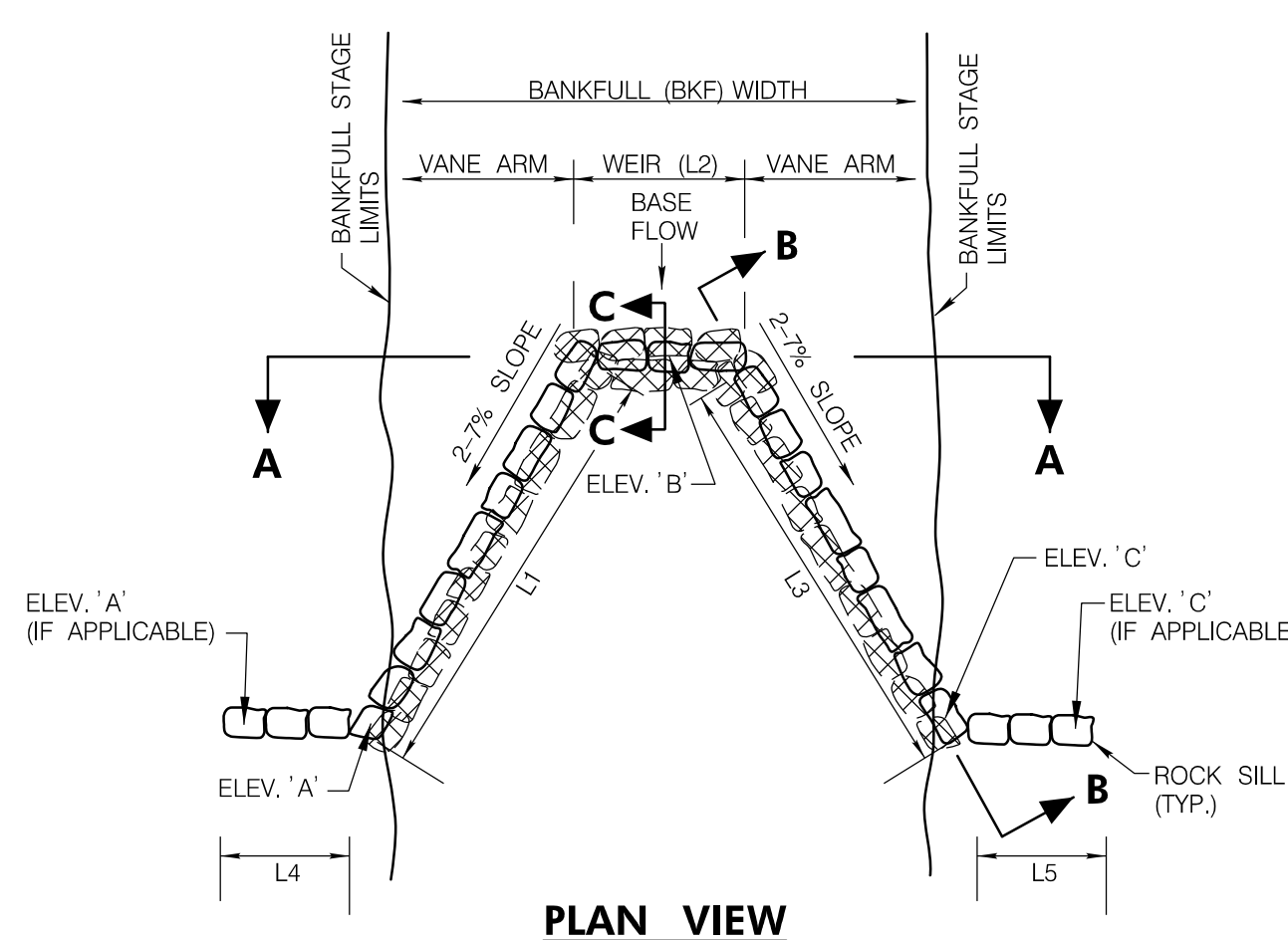
ROCK CROSS VANE STRUCTURE CONSTRUCTION DETAILS

N.T.S.

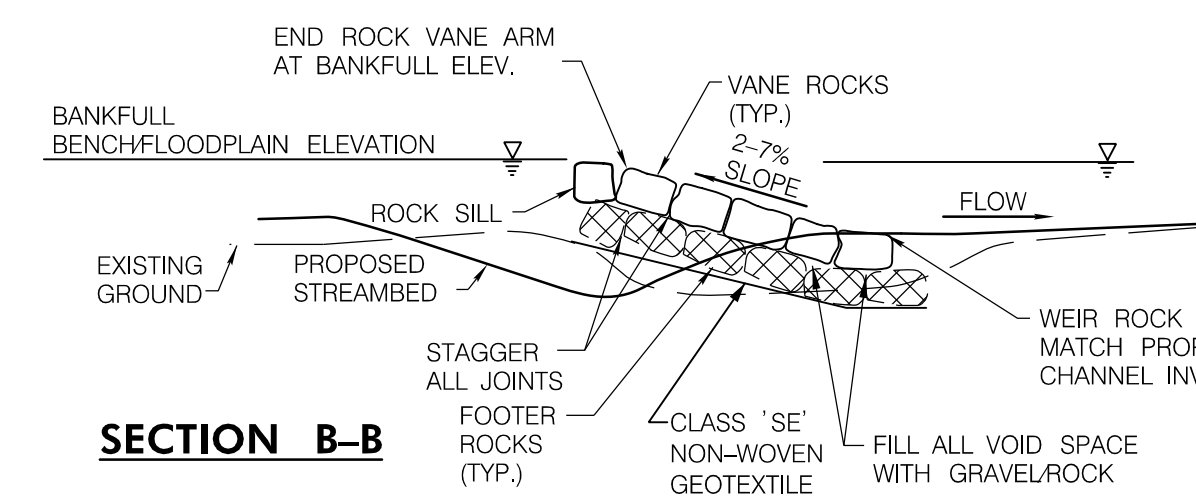
ROCK CROSS VANE STRUCTURE DETAILS

CONSTRUCTION PROCEDURES FOR ROCK CROSS VANE STRUCTURES

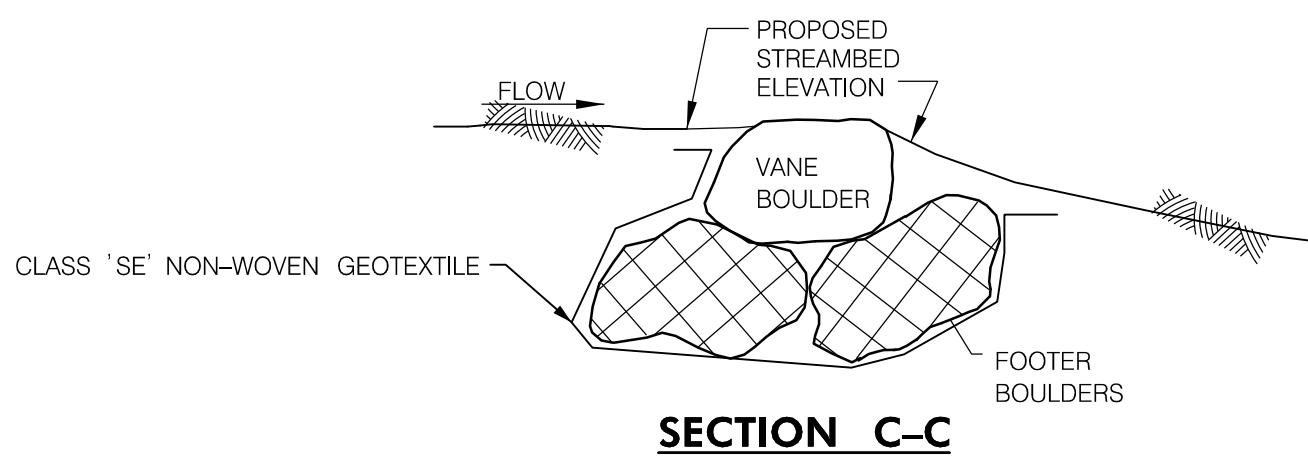
- CUT A TRENCH FOR THE GRADE CONTROL VANE ARM FROM THE OUTWARD LIMIT OF THE STRUCTURE EXTENDING INTO THE STREAM AT THE SPECIFIED ANGLE UPSTREAM (AT LEAST TWO PERCENT (2%). FIRST PLACE THE BOTTOM MOST FOOTER BOULDERS ON EXISTING GROUND & WORKING HIGHER, PLACE SECOND ROW OF FOOTER BOULDERS AND THEN PLACE VANE ROCKS TO ACHIEVE THE CORRECT PROPOSED ELEVATION OF EACH STRUCTURE. EXCAVATION OF THE TRENCH SHALL BE CONDUCTED IN CONJUNCTION WITH THE PLACEMENT OF THE FOOTER AND THE VANE ROCKS TO ACHIEVE PROPER ELEVATIONS AT THE TOP OF THE VANE ROCKS.
- FOOTER ROCKS SHALL BE PLACED IN THE EXCAVATED TRENCH SUCH THAT THEY BUTT AGAINST ONE ANOTHER WHICH WILL ALLOW THE VANE ROCKS TO INTERLOCK WITH THE FOOTER ROCKS. ADDITIONAL FOOTER ROCKS MAY BE REQUIRED FOR PLACEMENT OF THE VANE ROCKS TO ACHIEVE THE PROPOSED ELEVATION.
- THE DEPTH OF EXCAVATION SHALL BE TO THE DEPTH OF THE DEEPEST FOOTER ROCK. THE WIDTH OF EXCAVATION IN THE DIRECTION OF FLOW SHALL ONLY BE THE WIDTH OF THE ROCKS.
- THE VANE ROCKS SHALL BE PLACED ON TOP OF THE FOOTER ROCKS SUCH THAT THEY ARE CONTINUOUS, STAGGERED OVER THE TWO (2) ADJACENT FOOTER ROCKS, AND PLACED SKEWED UPSTREAM OF THE FOOTER ROCKS.
- THE ENGINEER RESERVES THE RIGHT TO ADJUST THE ANGLE OR ELEVATION OF THE PROPOSED STRUCTURE IN THE FIELD TO MEET THE SITE CONDITIONS.



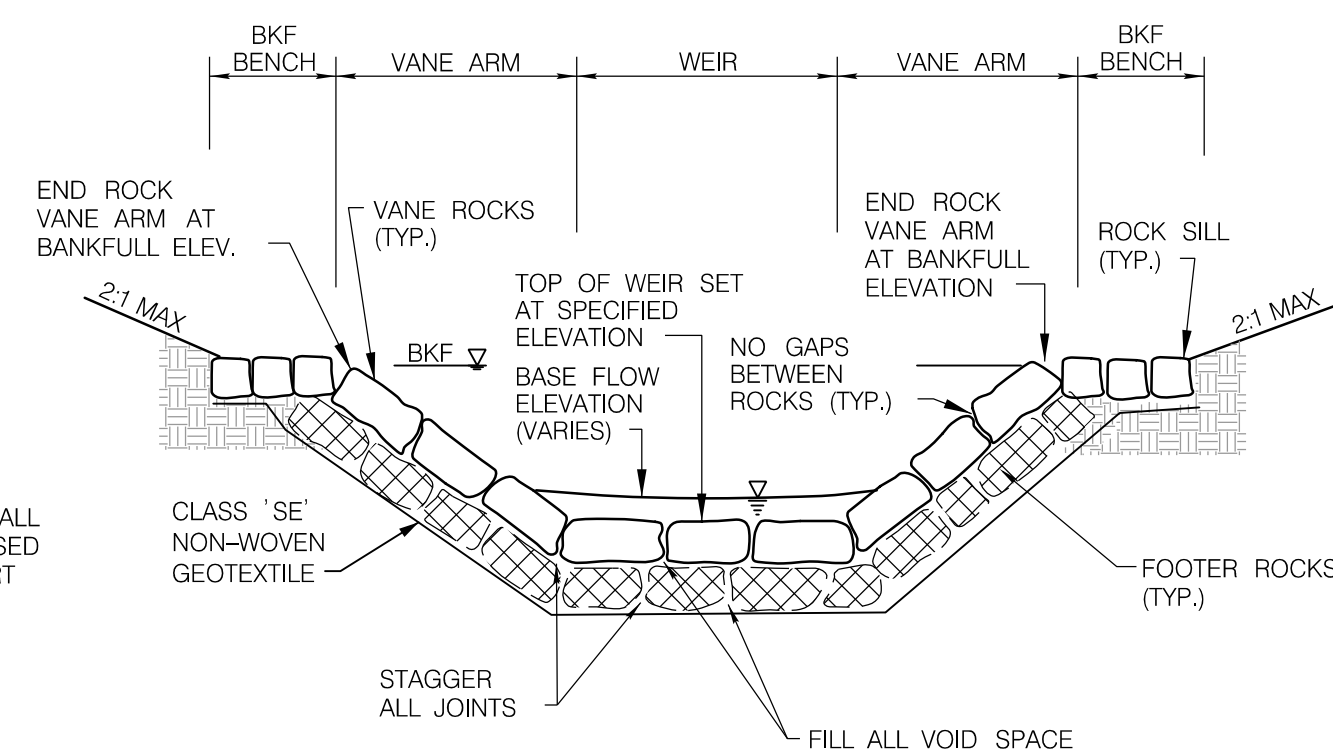
PLAN VIEW



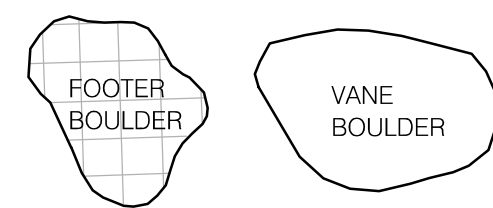
SECTION B-B



SECTION C-C



SECTION A-A



VANE AND FOOTER BOULDERS SHALL HAVE A MINIMUM INTERMEDIATE AXIS DIMENSION OF 2.0' (24"). MINIMUM SIZE OF THE BOULDERS WILL BE 2.5'x2.0'x3.0'.

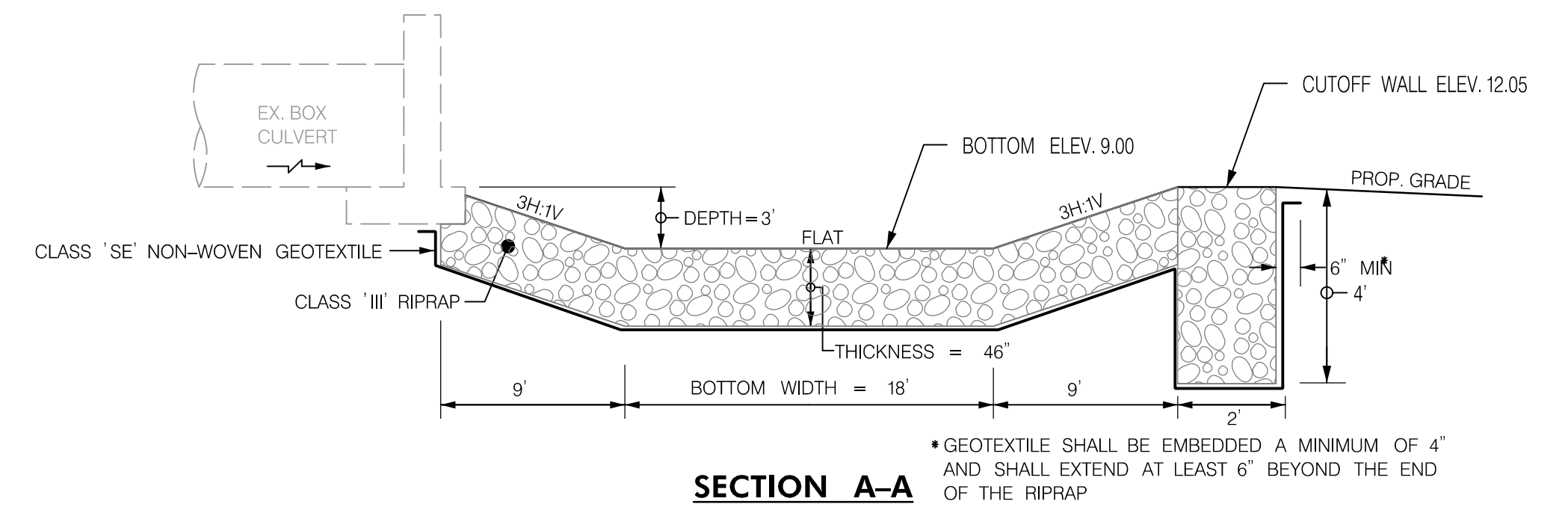
SILL STONES SHALL HAVE A MINIMUM INTERMEDIATE AXIS DIMENSION OF 1.5' (18"). MINIMUM SIZE OF THE SILL ROCKS WILL BE 2.0'x1.5'x2.0'.

ALL BOULDERS USED SHALL HAVE A MINIMUM DENSITY OF 160 POUNDS PER CUBIC FOOT.

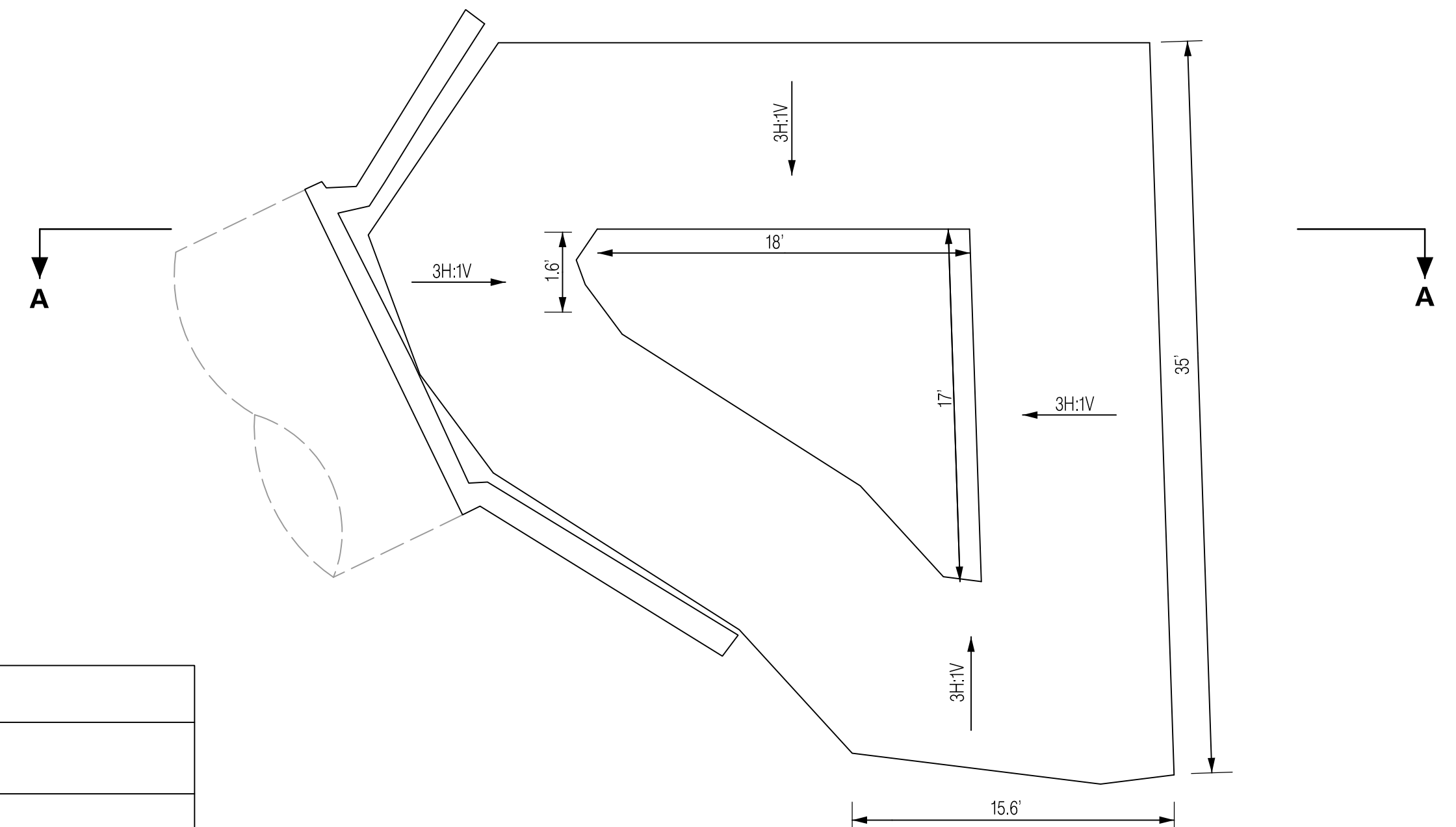
BOULDER DETAIL

TYPE I PRE-FORMED SCOUR HOLE

N.T.S.



SECTION A-A



ROCK SIZING SCHEDULE

(SEE SPECIFICATIONS FOR DETAILED DESCRIPTIONS AND TOLERANCES OF FURNISHED AND SALVAGED STONE/ROCK MATERIALS)

| TYPE | MINIMUM LENGTH | MINIMUM WIDTH | MINIMUM HEIGHT | TYPICAL SHAPE | TYPICAL USAGES |
|--|---|---------------|----------------|---------------|---|
| STRUCTURE CREST STONES / FOOTER STONES / FOUNDATION STONES / IMBRICATED RIPRAP | 30" | 24" | 18" | TABULAR | VANE STRUCTURES, ROCK TOW, IMBRICATED RIPRAP |
| SILL STONES | 24" | 18" | 12" | TABULAR | VANE STRUCTURES |
| SALVAGED CHANNEL BED MATERIAL | VARIES | | | VARIES | CHOKING IN MATERIAL FOR CHANNEL BED, BACKFILL |
| FURNISHED CHANNEL BED MATERIAL | SEE SPECIFICATIONS FOR PARTICLE SIZE DISTRIBUTION | | | MIXED | CHOKING IN MATERIAL FOR CHANNEL BED, BACKFILL |
| CLASS I RIPRAP UNDERLAYMENT | SEE MDE 2011 E&S SPECIFICATIONS, TABLE H.2 | | | ANGULAR | ALL CHANNEL BED LOCATION, 1' THICKNESS AT NOTED WIDTHS, AND UNDER 6" FURNISHED TOPSOIL ON PROPOSED STREAM BANKS |
| CLASS I, II, III RIPRAP | SEE MDE 2011 E&S SPECIFICATIONS, TABLE H.2 | | | ANGULAR | OUTFALL PROTECTION, SLOPE AND CHANNEL PROTECTION, MISC. USES AS NOTED |

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DATE: Thursday, March 14, 2019 AT 12:20 PM 12:20 PM



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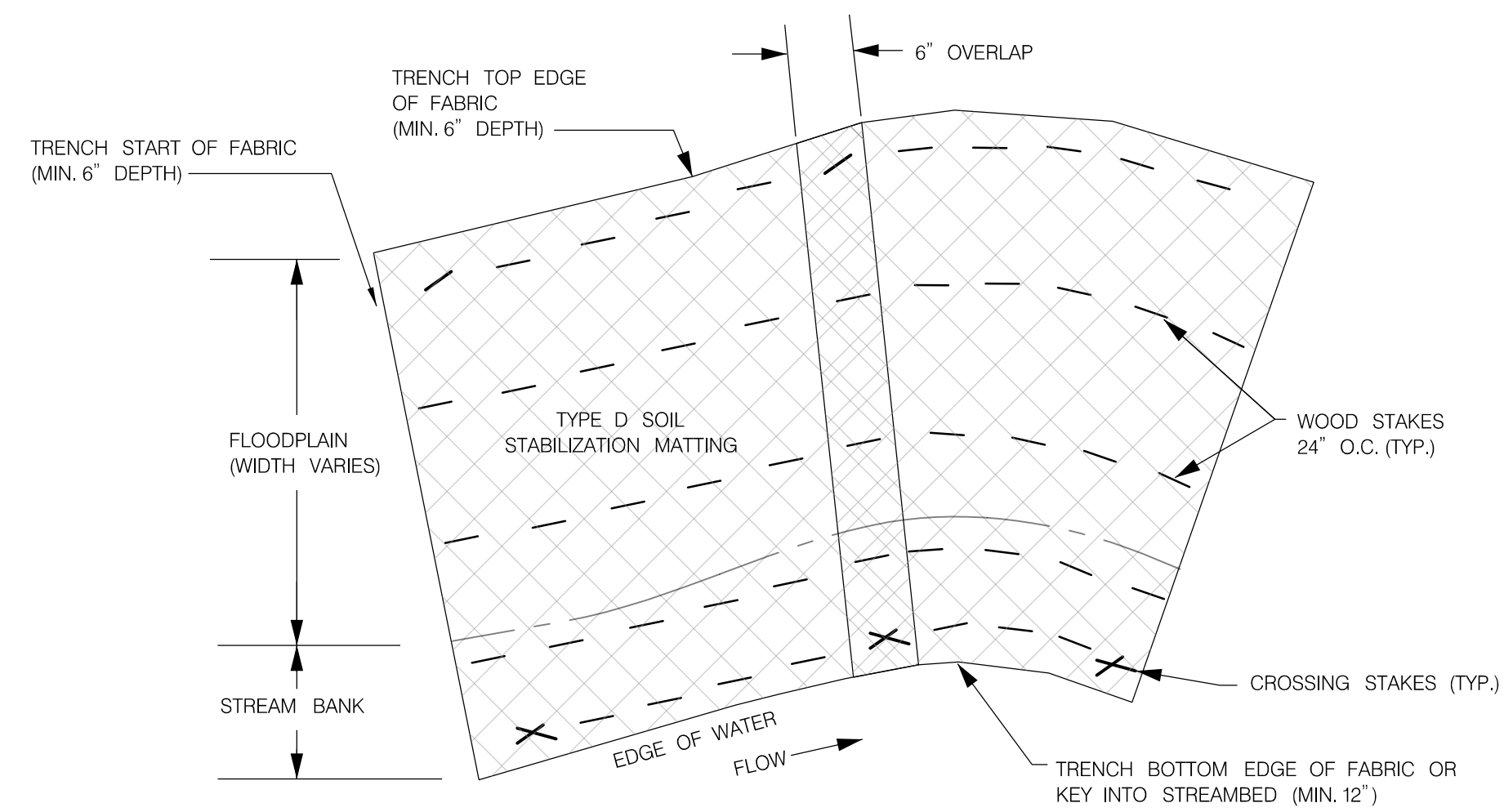
Engineering Division

| ADDENDUMS & REVISIONS | | | |
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| NO. | DESCRIPTION | BY | DATE |
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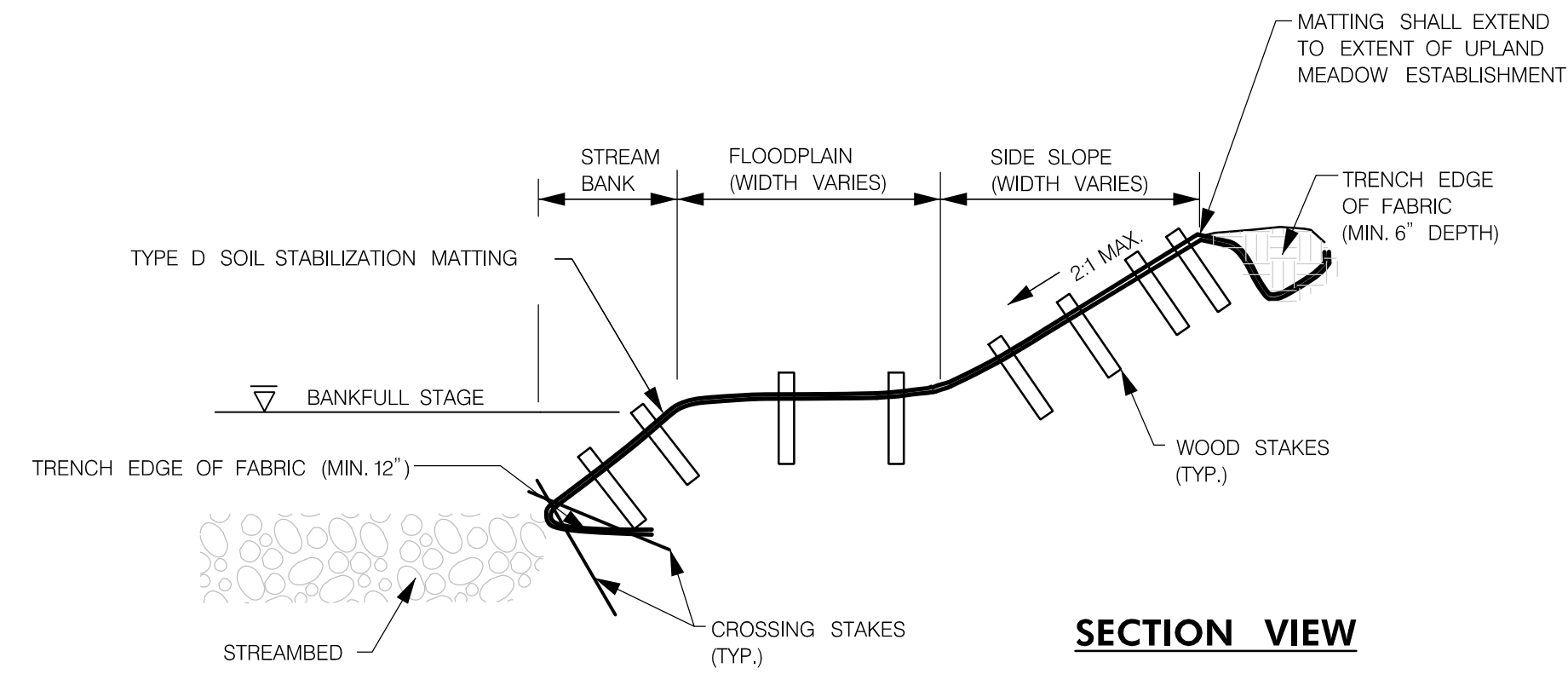
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|--|-----------------|---------------------|------------------------------|
| MARYLAND TRANSPORTATION AUTHORITY ENGINEERING DIVISION 1-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY STREAM RESTORATION PROJECT STREAM RESTORATION DETAILS | | | CONTRACT NO. HT-3012-0000 |
| DESIGNED BY: MRG/PVC | DRAWN BY: JMB | CHECKED BY: MRG/JSK | DRAWING NO. DE-01 |
| CONST. REVIEW BY: JSK | DATE: MAY, 2019 | SCALE: N.T.S. | SHEET NO. 10 OF 26 |

STREAMBANK/FLOODPLAIN STABILIZATION DETAILS

N.T.S.



PLAN VIEW



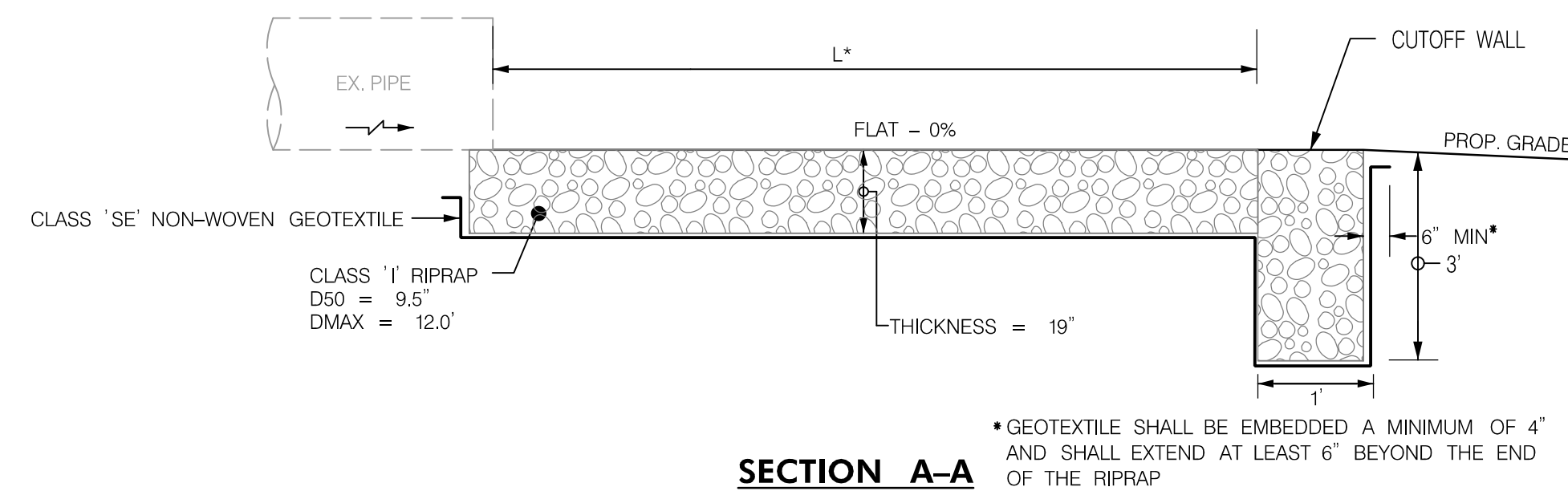
SECTION VIEW

NOTES:

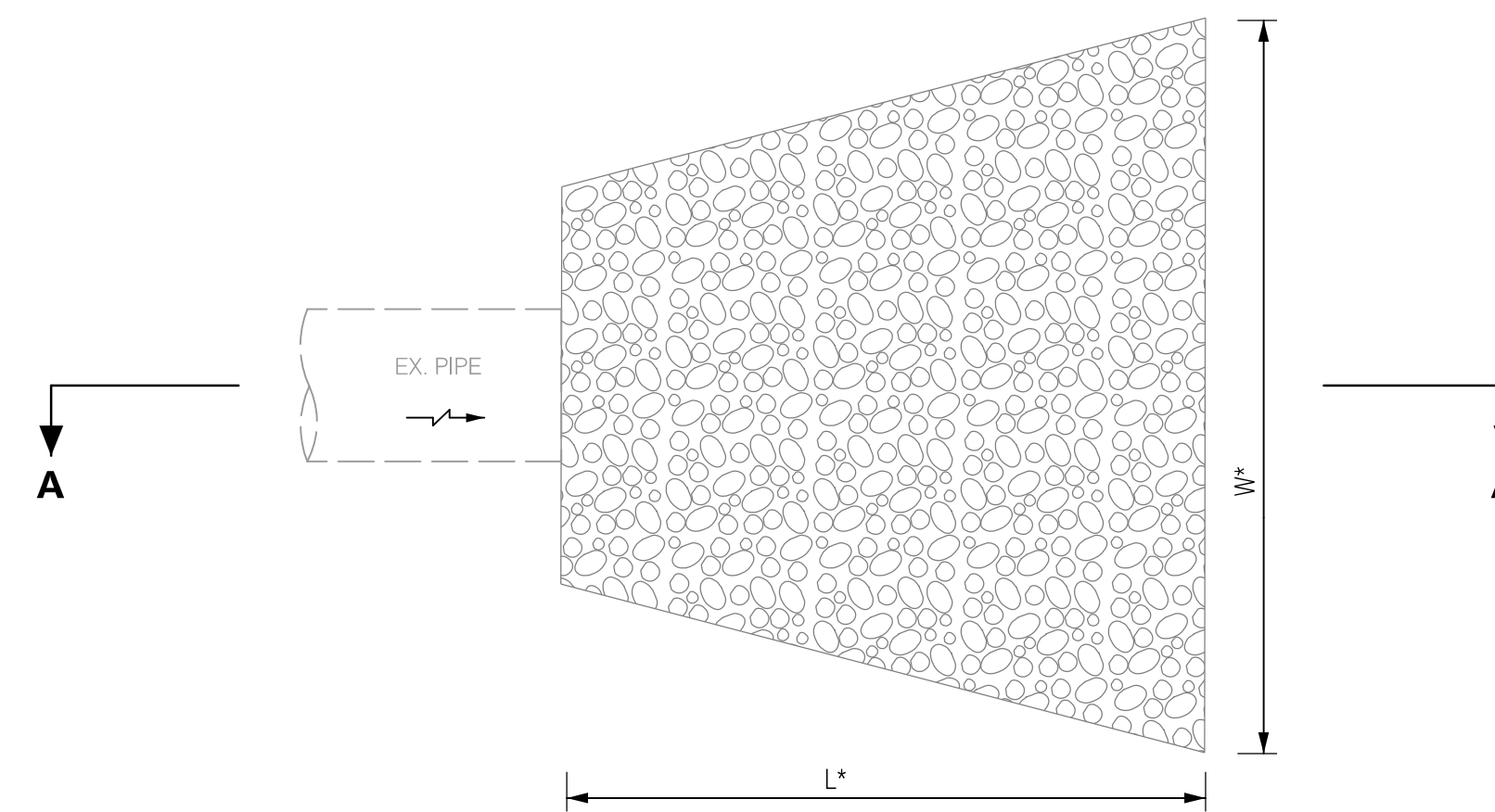
- TYPE D SOIL STABILIZATION MATTING (SSM) SHALL BE OVERLAPPED 'SHINGLE' STYLE OR PERPENDICULAR TO THE CHANNEL, WITH THE UPSTREAM SECTION OF MATTING OVERLAPPING THE NEXT DOWNSTREAM SECTION OF MATTING.
- SPECIFIED SEED MIX SHALL BE APPLIED FIRST AND IMMEDIATELY COVERED WITH THE SSM.
- THE SSM SHALL BE 100 PERCENT BIODEGRADABLE COIR FIBER MATTING.
- THE SSM SHALL CONFORM TO THE SPECIFICATIONS.
- WOOD CROSSING STAKES SHALL BE UTILIZED TO SECURE ENDS OF THE SSM WHERE IT IS NOT FEASIBLE TO TRENCH OR KEY-IN THE END OF THE FABRIC.
- WOOD STAKES SHALL BE UNTREATED HARDWOOD OR SOUTHERN YELLOW PINE WITH A SAW-FORMED POINT ON ONE END, 1 INCH BY 2 INCHES IN SIZE AND A MINIMUM OF 18 INCHES IN LENGTH.
- STAPLES ARE NOT AN ACCEPTABLE SUBSTITUTE FOR STAKES.
- IN THE EVENT OF LOSS OF FABRIC PRIOR TO GROWTH OF VEGETATION, THE CONTRACTOR SHALL INSTALL NEW SEED AND TOPSOIL TO PROPOSED FINISHED GRADE AND RE-MAT AREAS AT NO ADDITIONAL COST TO THE AUTHORITY.

CLASS I RIPRAP SLOPE AND CHANNEL PROTECTION

N.T.S.

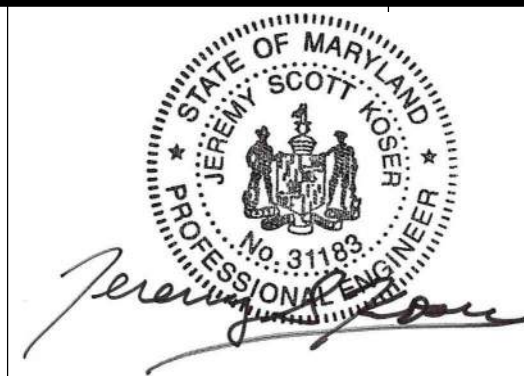


SECTION A-A



PLAN

FILE: Q:\2015\181777_003_1-895_TMDL_Stream_Restoration_Re\CADD\p02-1895_STREAM RESTORATION.dgn
 DATE: Thursday, March 14, 2019 AT 01:43 PM 01:43 PM



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. 31183
 EXPIRATION DATE: 1/13/2021



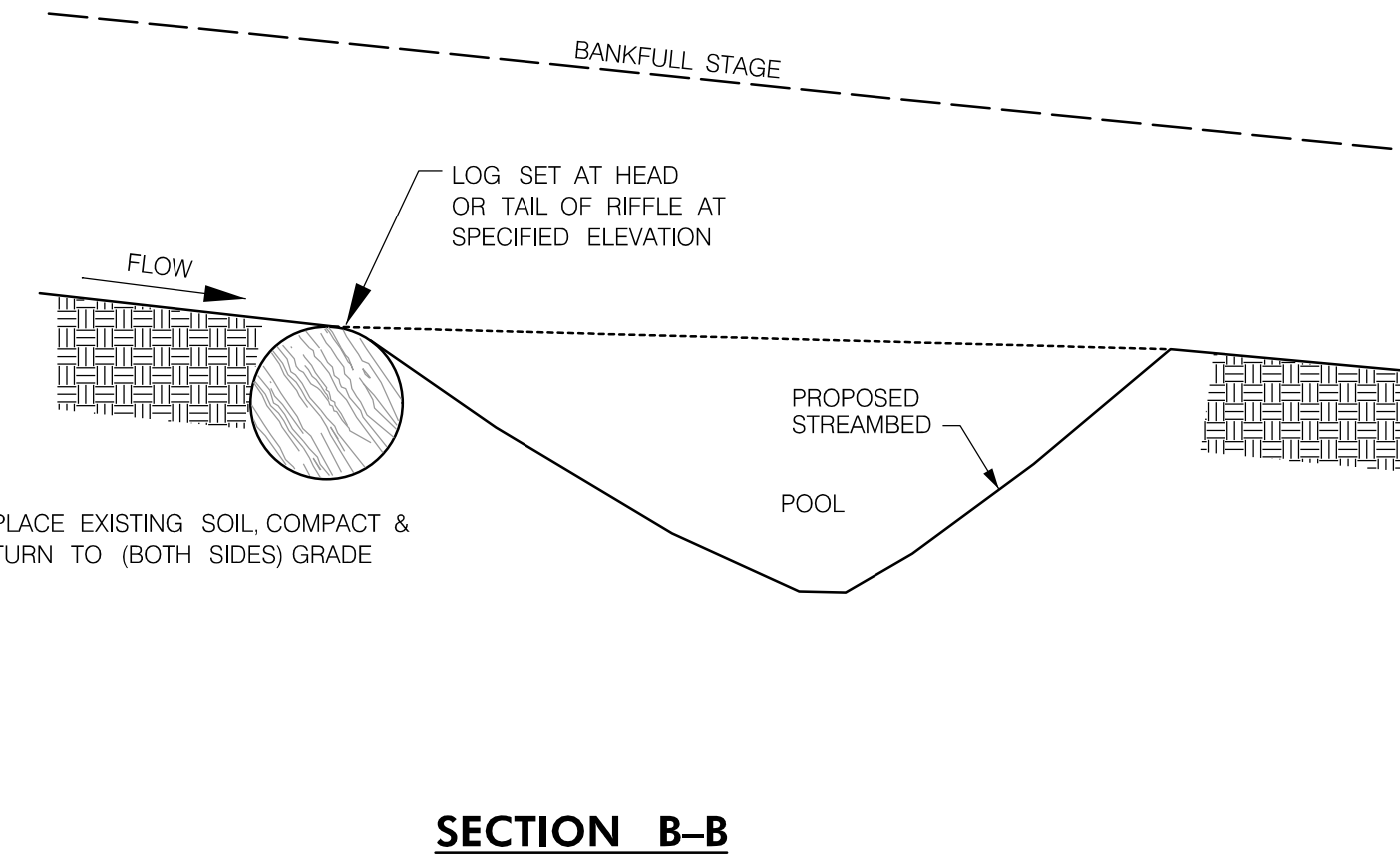
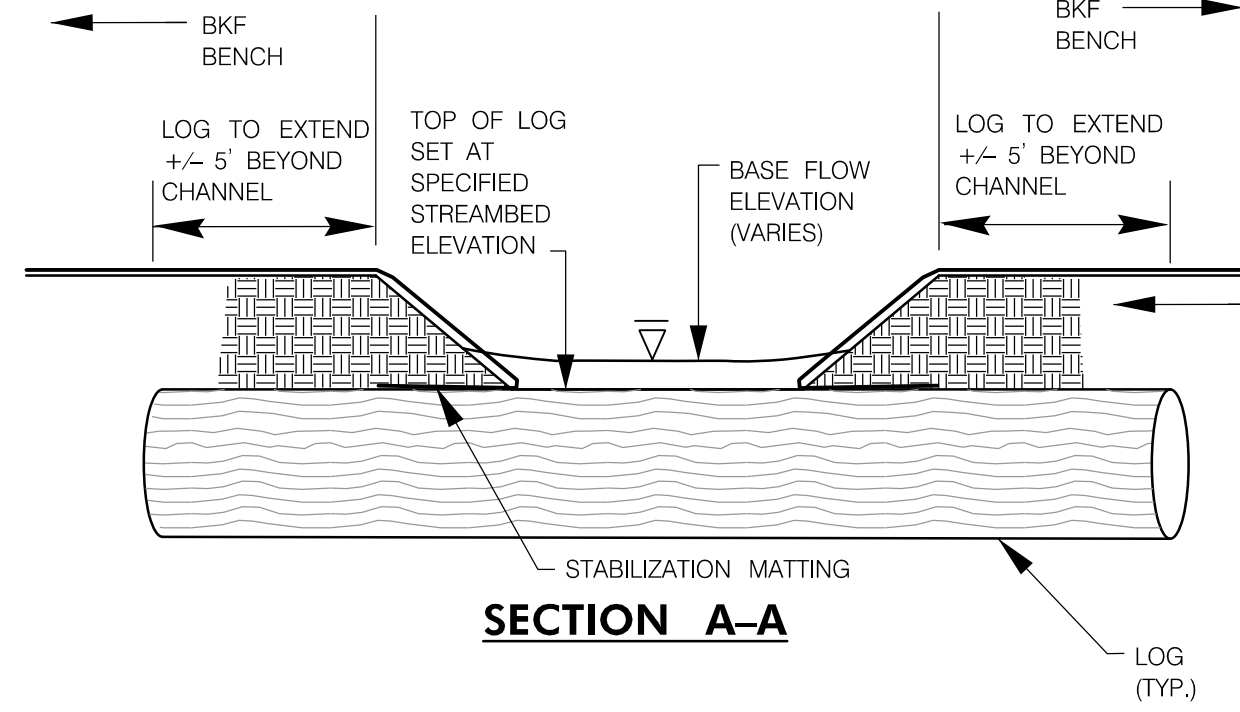
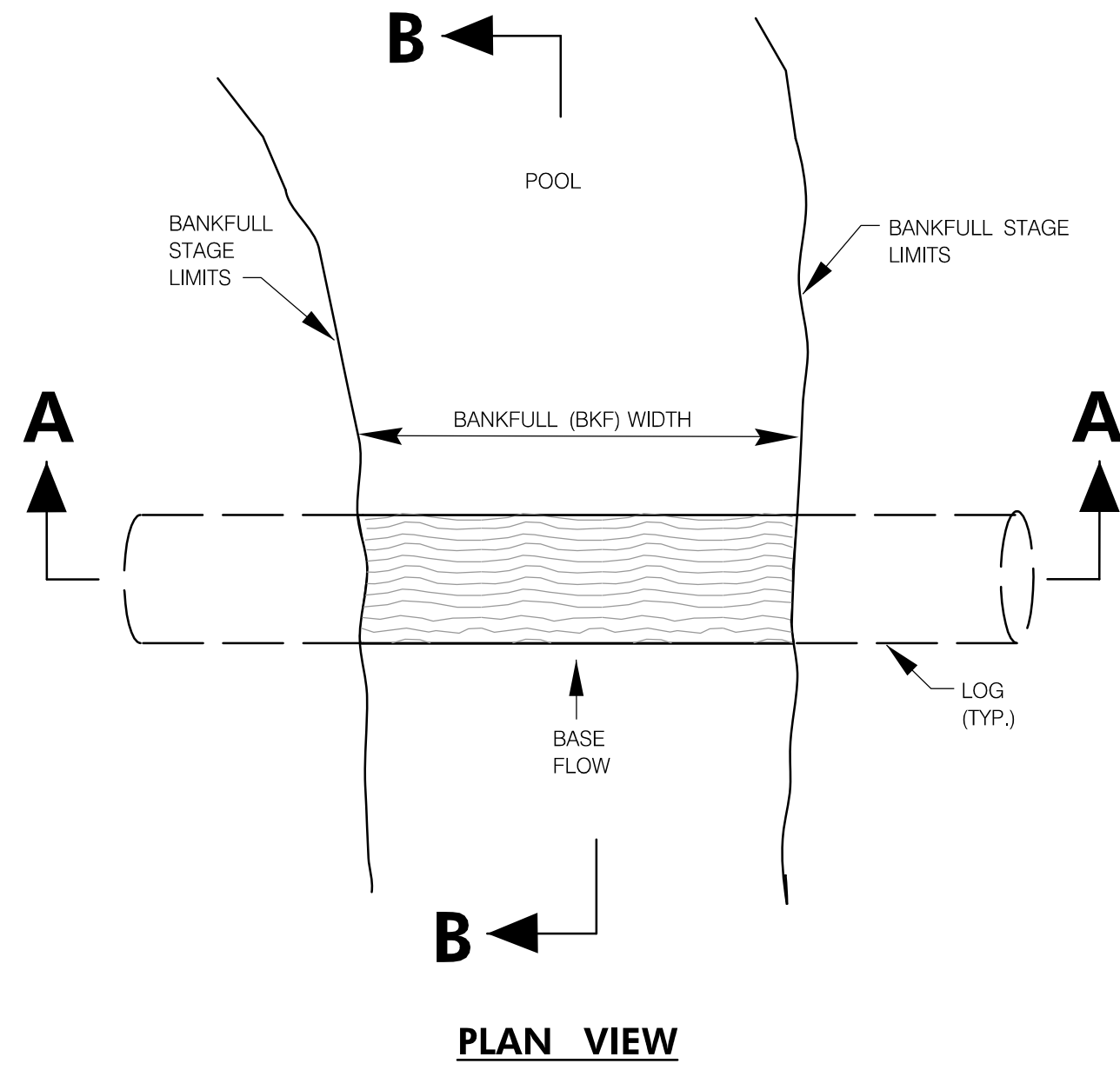
MARYLAND TRANSPORTATION AUTHORITY
 Engineering Division

| ADDENDUMS & REVISIONS | | | |
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| MARYLAND TRANSPORTATION AUTHORITY | | | CONTRACT NO. HT-3012-0000 |
| ENGINEERING DIVISION 1-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY STREAM RESTORATION PROJECT STREAM RESTORATION DETAILS | | | DRAWING NO. DE-02 |
| DESIGNED BY MRG/PVC | DRAWN BY JMB | CHECKED BY MRG/JSK | SHEET NO. |
| CONST. REVIEW BY JSK | DATE MAY, 2019 | SCALE N.T.S. | 11 OF 26 |

IN-CHANNEL LOG SILL PLACEMENT DETAILS

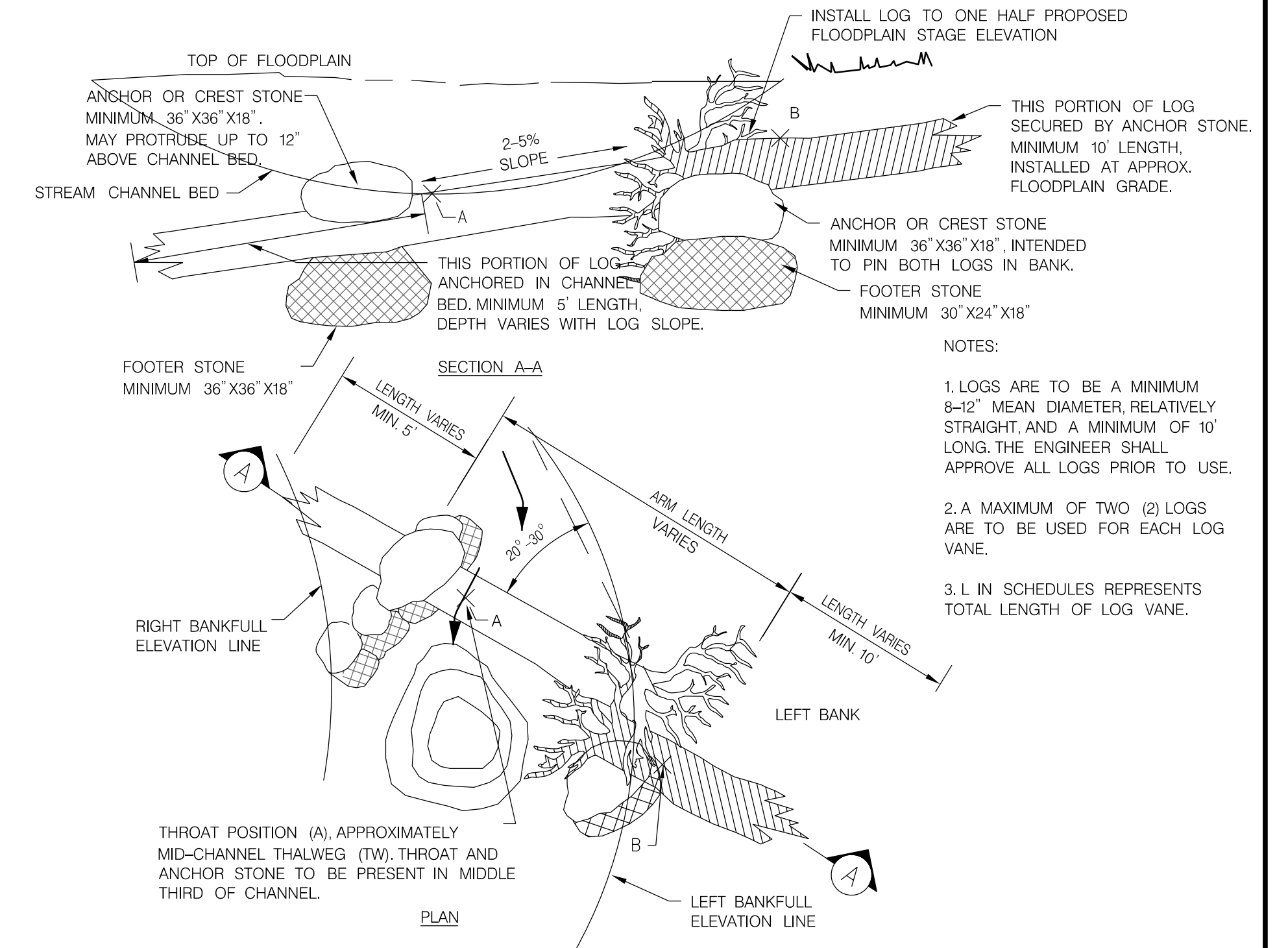
N.T.S.



- NOTES:
- BURIED LOGS SHALL HAVE A MINIMUM DIAMETER OF 12".
 - TOP OF THE LOG SHALL BE FLUSH WITH THE PROPOSED STREAMBED ELEVATION.
 - SEE PLAN FOR LOCATIONS AND PROFILE FOR SPECIFIED TOP ELEVATIONS.

LOG VANE

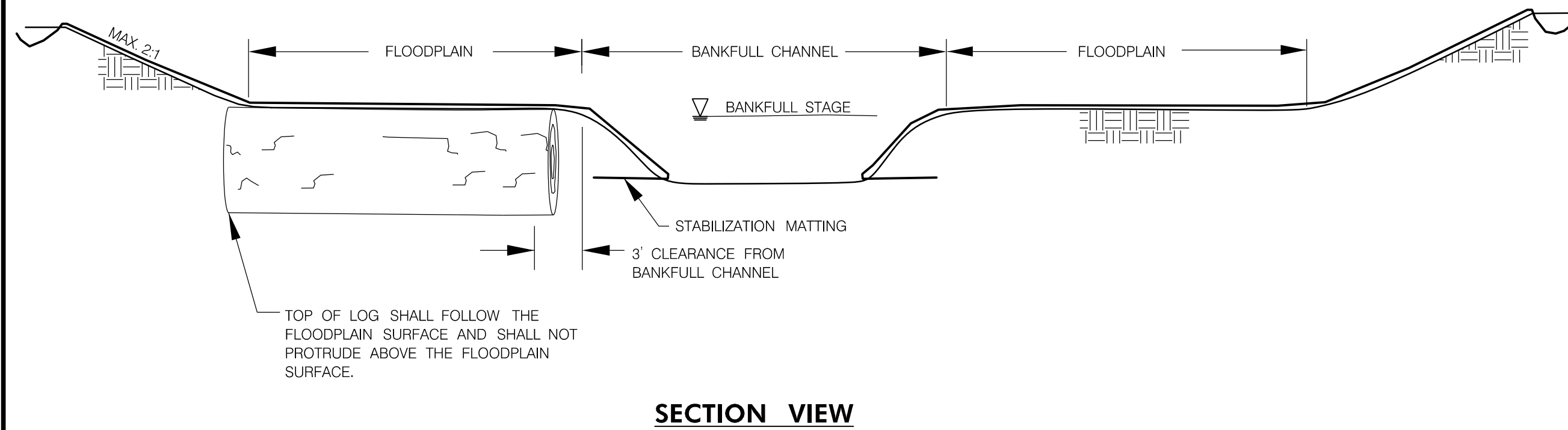
N.T.S.



- NOTES:
- LOGS ARE TO BE A MINIMUM 8-12" MEAN DIAMETER, RELATIVELY STRAIGHT, AND A MINIMUM OF 10' LONG. THE ENGINEER SHALL APPROVE ALL LOGS PRIOR TO USE.
 - A MAXIMUM OF TWO (2) LOGS ARE TO BE USED FOR EACH LOG VANE.
 - L IN SCHEDULES REPRESENTS TOTAL LENGTH OF LOG VANE.

FLOODPLAIN LOG SILL PLACEMENT DETAIL

N.T.S.



- NOTES:
- BURIED FLOODPLAIN LOGS SHALL HAVE A MINIMUM DIAMETER OF 12".
 - TOP OF FLOODPLAIN LOGS WILL BE SET AT THE ELEVATION OF THE PROPOSED FLOODPLAIN.
 - BRANCHES AND OTHER IREEGULARITIES MAY PROTRUDE ABOVE THE FLOODPLAIN SURFACE.
 - LOCATIONS OF BURIED LOGS SPECIFIED ON THE PLAN SHEETS IS TO BE APPROXIMATE CENTER POINT OF THE LOG.
 - THE ANGLES OF THE LOGS SHOWN ON THE PLANS MAY VARY FROM WHAT IS ACTUALLY DEPICTED BASED ON LOCAL SITE CONDITIONS AND DIAMETER AND LENGTH OF LOGS AVAILABLE.
 - IF ONE SINGLE LOG OF THE REQUIRED LENGTH IS NOT AVAILABLE, MULTIPLE LOGS MAY BE SUBSTITUTED AND PLACED IN STAGGERED FASHION WITH A MINIMUM OVERLAP OF 12".

FILE: Q:\2015\17177_003_1-895_TMDL_Stream_Re\CADD\pde-p003_1895_STREAM RESTORATION.dgn
DATE: Monday, December 17, 2018 AT 02:33 PM 02:33 PM



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. 31183
EXPIRATION DATE: 1/13/2021



MARYLAND TRANSPORTATION AUTHORITY
Engineering Division

| ADDENDUMS & REVISIONS | | | |
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| NO. | DESCRIPTION | BY | DATE |
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| MARYLAND TRANSPORTATION AUTHORITY ENGINEERING DIVISION 1-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY STREAM RESTORATION PROJECT STREAM RESTORATION DETAILS | | | CONTRACT NO. HT-3012-0000 |
| DESIGNED BY <u>MRG/PVC</u> DRAWN BY <u>JMB</u> CHECKED BY <u>MRG/JSK</u> | | | DRAWING NO. DE-03 |
| CONST. REVIEW BY <u>JSK</u> DATE <u>MAY, 2019</u> SCALE <u>N.T.S.</u> | | | SHEET NO. 12 OF 26 |

| ORANGE CONSTRUCTION FENCE | | | | | | |
|---------------------------|------------|---------|----------|--------|----------------|-------------|
| OCF # | BEGIN STA. | OFFSET | END STA. | OFFSET | STA. OF CENTER | LENGTH (LF) |
| 1-1 | 202+86 | 120' LT | 212+2 | 73' LT | NA | 792 |

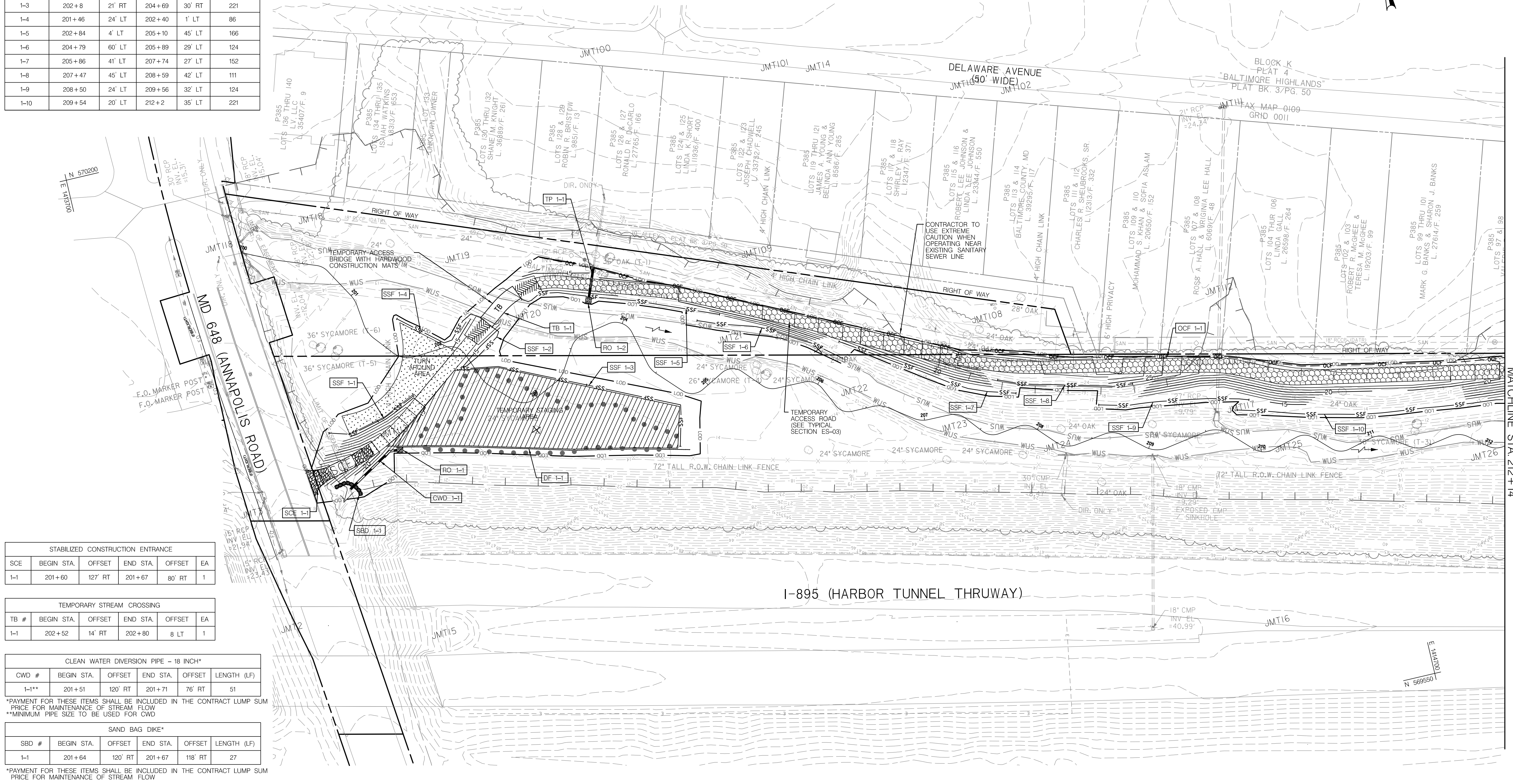
| TEMPORARY ACCESS CULVERT | | | | | | |
|--------------------------|------------|--------|----------|--------|-------------|---|
| TP # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) | TYPE |
| 1-1 | 203+65 | 37' LT | 203+62 | 15' LT | 23 | 12 INCH CORRUGATED POLYETHYLENE PIPE CONNECTION, TYPE S |

| DIVERSION FENCE | | | | | |
|-----------------|------------|--------|----------|--------|-------------|
| DF # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 1-1 | 201+71 | 74' RT | 204+84 | 46' RT | 241 |

| SUPER SILT FENCE | | | | | |
|------------------|------------|--------|----------|--------|-------------|
| SSF # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 1-1 | 201+58 | 84' RT | 201+75 | 32' RT | 79 |
| 1-2 | 202+11 | 21' RT | 202+67 | 20' RT | 48 |
| 1-3 | 202+8 | 21' RT | 204+69 | 30' RT | 221 |
| 1-4 | 201+46 | 24' LT | 202+40 | 1' LT | 86 |
| 1-5 | 202+84 | 4' LT | 205+10 | 45' LT | 166 |
| 1-6 | 204+79 | 60' LT | 205+89 | 29' LT | 124 |
| 1-7 | 205+86 | 41' LT | 207+74 | 27' LT | 152 |
| 1-8 | 207+47 | 45' LT | 208+59 | 42' LT | 111 |
| 1-9 | 208+50 | 24' LT | 209+56 | 32' LT | 124 |
| 1-10 | 209+54 | 20' LT | 212+2 | 35' LT | 221 |

| TEMPORARY ACCESS ROAD | | | | | | |
|----------------------------|------------|--------|-----------|--------|---------------|----------------------|
| TYPE | BEGIN STA. | OFFSET | END STA. | OFFSET | QUANTITY (SY) | NOTE |
| MULCH | 201+66.79 | 80' RT | 202+19.57 | 12' LT | 397 | SEE DETAILS ON ES-03 |
| HARDWOOD CONSTRUCTION MATS | 203+61.46 | 55' LT | 212+34.72 | 60' LT | 981 | |

| RIPRAP SLOPE AND CHANNEL PROTECTION | | | | | | | |
|-------------------------------------|----------------|------------------|-------|----|----|-----|---------------|
| RO # | STA. OF CENTER | OFFSET OF CENTER | CLASS | L | W | D | QUANTITY (SY) |
| 1-1 | 201+72 | 76' RT | I | 5' | 5' | 19" | 3 |
| 1-2 | 203+31 | 24.3' RT | I | 5' | 5' | 19" | 3 |



| STABILIZED CONSTRUCTION ENTRANCE | | | | | |
|----------------------------------|------------|---------|----------|--------|----|
| SCE | BEGIN STA. | OFFSET | END STA. | OFFSET | EA |
| 1-1 | 201+60 | 127' RT | 201+67 | 80' RT | 1 |

| TEMPORARY STREAM CROSSING | | | | | |
|---------------------------|------------|--------|----------|--------|----|
| TB # | BEGIN STA. | OFFSET | END STA. | OFFSET | EA |
| 1-1 | 202+52 | 14' RT | 202+80 | 8' LT | 1 |

| CLEAN WATER DIVERSION PIPE - 18 INCH* | | | | | |
|---------------------------------------|------------|---------|----------|--------|-------------|
| CWD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 1-1** | 201+51 | 120' RT | 201+71 | 76' RT | 51 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW
 **MINIMUM PIPE SIZE TO BE USED FOR CWD

| SAND BAG DIKE* | | | | | |
|----------------|------------|---------|----------|---------|-------------|
| SBD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 1-1 | 201+64 | 120' RT | 201+67 | 118' RT | 27 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW



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 LICENSE NO. 31183
 EXPIRATION DATE: 1/13/2021



| ADDENDUMS & REVISIONS | | | |
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| NO. | DESCRIPTION | BY | DATE |
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MARYLAND TRANSPORTATION AUTHORITY
 ENGINEERING DIVISION
 I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY
 STREAM RESTORATION PROJECT
 EROSION AND SEDIMENT CONTROL PLAN PHASE I

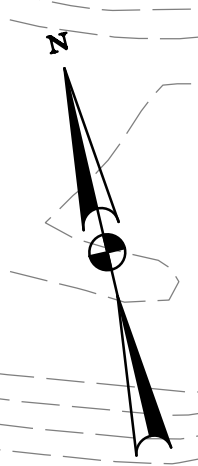
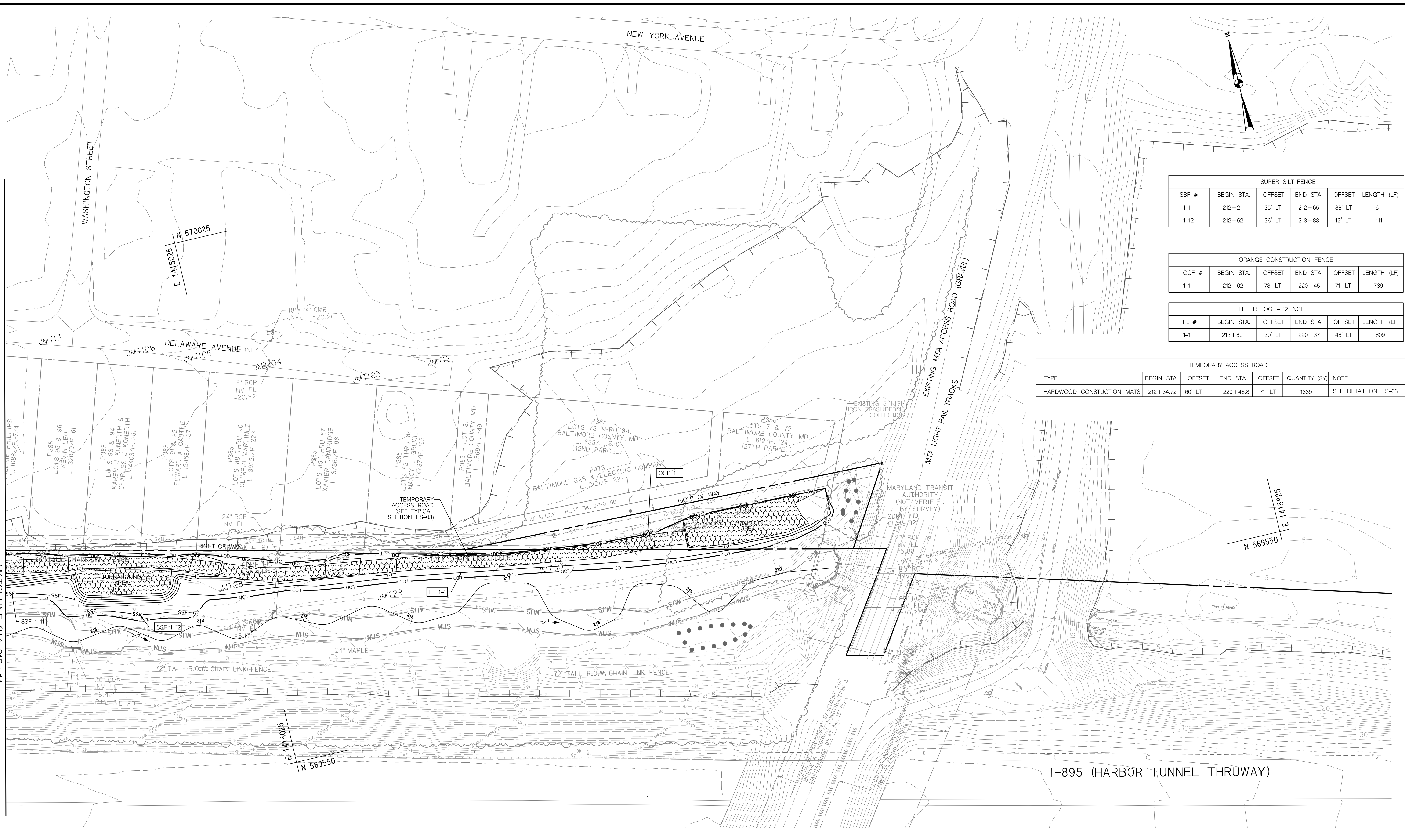
DESIGNED BY: MRG/PVC DRAWN BY: JMB CHECKED BY: MRG/JSK
 CONST. REVIEW BY: JSK DATE: MAY, 2019 SCALE: 1" = 40'

CONTRACT NO. HT-3012-0000
 DRAWING NO. **EP-01**
 SHEET NO. 13 OF 26

FILE: Q:\2015\181777_003_I-895_TMDL_Stream_Re\CADD\pdp-001_I895_Stream_Restoration - PHASE I.dgn
 DATE: Thur-sday, March 28, 2019 AT 02:28 PM 02:28 PM

MATCHLINE STA. 212+14

FILE: Q:\2015\151777\003_I-895_TMDL_Stream_Re\CAD\pdp-0002_1895_STREAM RESTORATION - PHASE 1.dgn
 DATE: Thursday, March 28, 2019 AT 02:27 PM 02:27 PM



| SUPER SILT FENCE | | | | | |
|------------------|------------|--------|----------|--------|-------------|
| SSF # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 1-11 | 212+2 | 35' LT | 212+65 | 38' LT | 61 |
| 1-12 | 212+62 | 26' LT | 213+83 | 12' LT | 111 |

| ORANGE CONSTRUCTION FENCE | | | | | |
|---------------------------|------------|--------|----------|--------|-------------|
| OCF # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 1-1 | 212+02 | 73' LT | 220+45 | 71' LT | 739 |

| FILTER LOG - 12 INCH | | | | | |
|----------------------|------------|--------|----------|--------|-------------|
| FL # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 1-1 | 213+80 | 30' LT | 220+37 | 48' LT | 609 |

| TEMPORARY ACCESS ROAD | | | | | | |
|----------------------------|------------|--------|----------|--------|---------------|---------------------|
| TYPE | BEGIN STA. | OFFSET | END STA. | OFFSET | QUANTITY (SY) | NOTE |
| HARDWOOD CONSTRUCTION MATS | 212+34.72 | 60' LT | 220+46.8 | 71' LT | 1339 | SEE DETAIL ON ES-03 |

MATCHLINE STA. 212 + 14



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 LICENSE NO. 31183
 EXPIRATION DATE: 1/13/2021



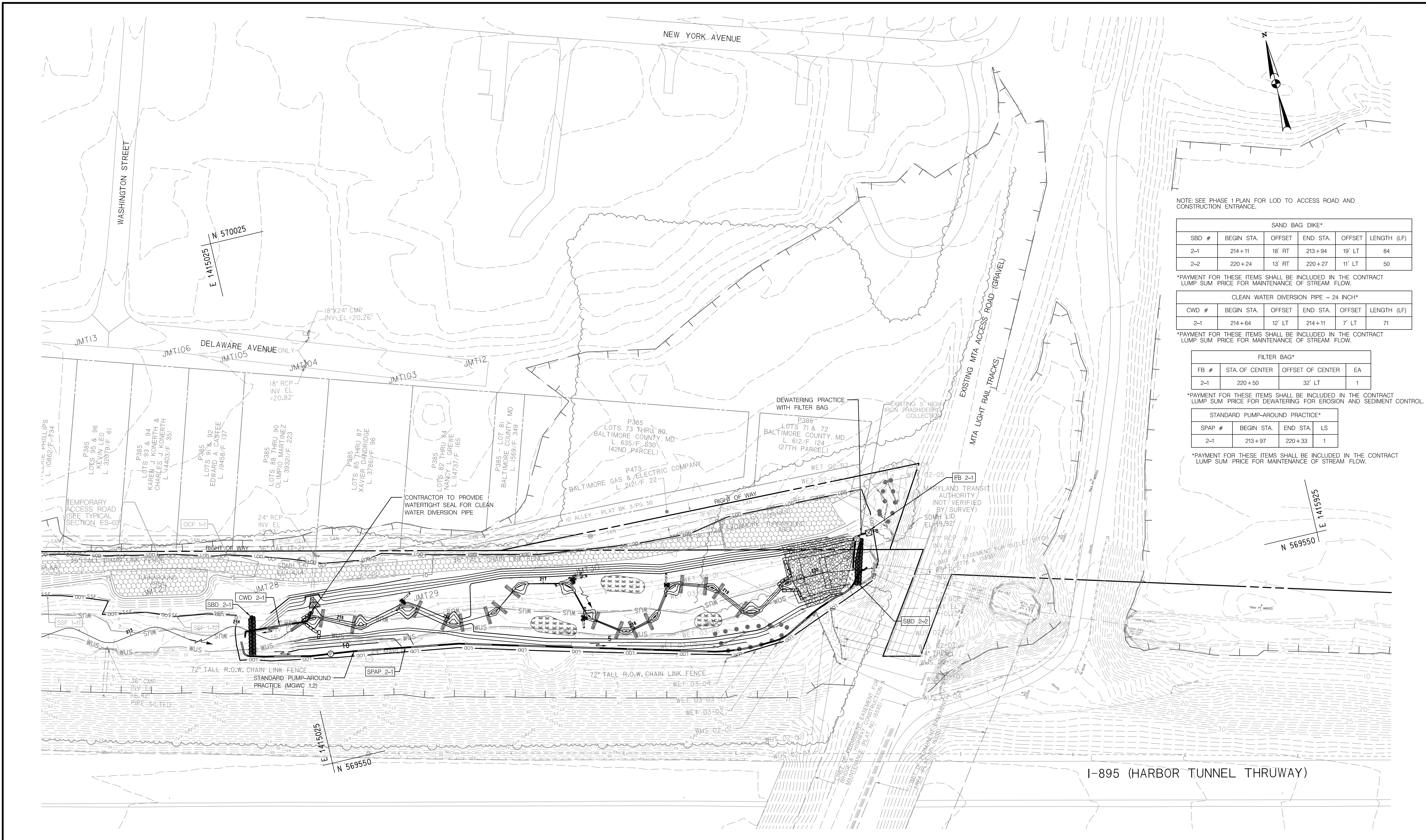
| ADDENDUMS & REVISIONS | | | |
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| NO. | DESCRIPTION | BY | DATE |
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MARYLAND TRANSPORTATION AUTHORITY
 ENGINEERING DIVISION
 I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY
 STREAM RESTORATION PROJECT
 EROSION AND SEDIMENT CONTROL PLAN PHASE I

DESIGNED BY: MRG/PVC DRAWN BY: JMB CHECKED BY: MRG/JSK
 CONST. REVIEW BY: JSK DATE: MAY, 2019 SCALE: 1" = 40'

CONTRACT NO. HT-3012-0000
 DRAWING NO. **EP-02**
 SHEET NO. 14 OF 26

FILE: Q:\2015\181777_003_I-895_TMDL_Stream_Restoration_Re\CADD\pEP-0003_1895_Stream_Restoration - PHASE 2.dgn
 DATE: Thursday, March 28, 2019 AT 02:24 PM



NOTE: SEE PHASE 1 PLAN FOR LOD TO ACCESS ROAD AND CONSTRUCTION ENTRANCE.

| SAND BAG DIKE* | | | | | |
|----------------|------------|--------|----------|--------|-------------|
| SBD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 2-1 | 214+11 | 18' RT | 213+94 | 19' LT | 84 |
| 2-2 | 220+24 | 13' RT | 220+27 | 11' LT | 50 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.

| CLEAN WATER DIVERSION PIPE - 24 INCH* | | | | | |
|---------------------------------------|------------|--------|----------|--------|-------------|
| CWD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 2-1 | 214+64 | 12' LT | 214+11 | 7' LT | 71 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.

| FILTER BAG* | | | |
|-------------|----------------|------------------|----|
| FB # | STA. OF CENTER | OFFSET OF CENTER | EA |
| 2-1 | 220+50 | 32' LT | 1 |

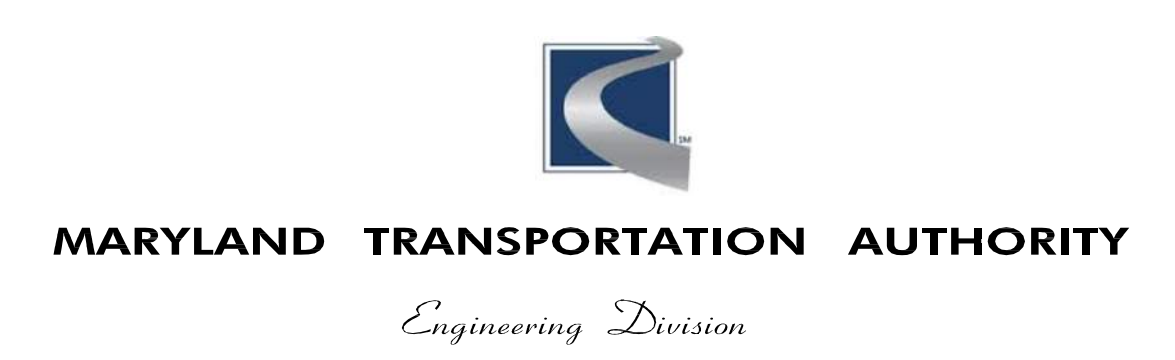
*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR DEWATERING FOR EROSION AND SEDIMENT CONTROL.

| STANDARD PUMP-AROUND PRACTICE* | | | |
|--------------------------------|------------|----------|----|
| SPAP # | BEGIN STA. | END STA. | LS |
| 2-1 | 213+97 | 220+33 | 1 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.



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 LICENSE NO. 31183
 EXPIRATION DATE: 1/13/2021



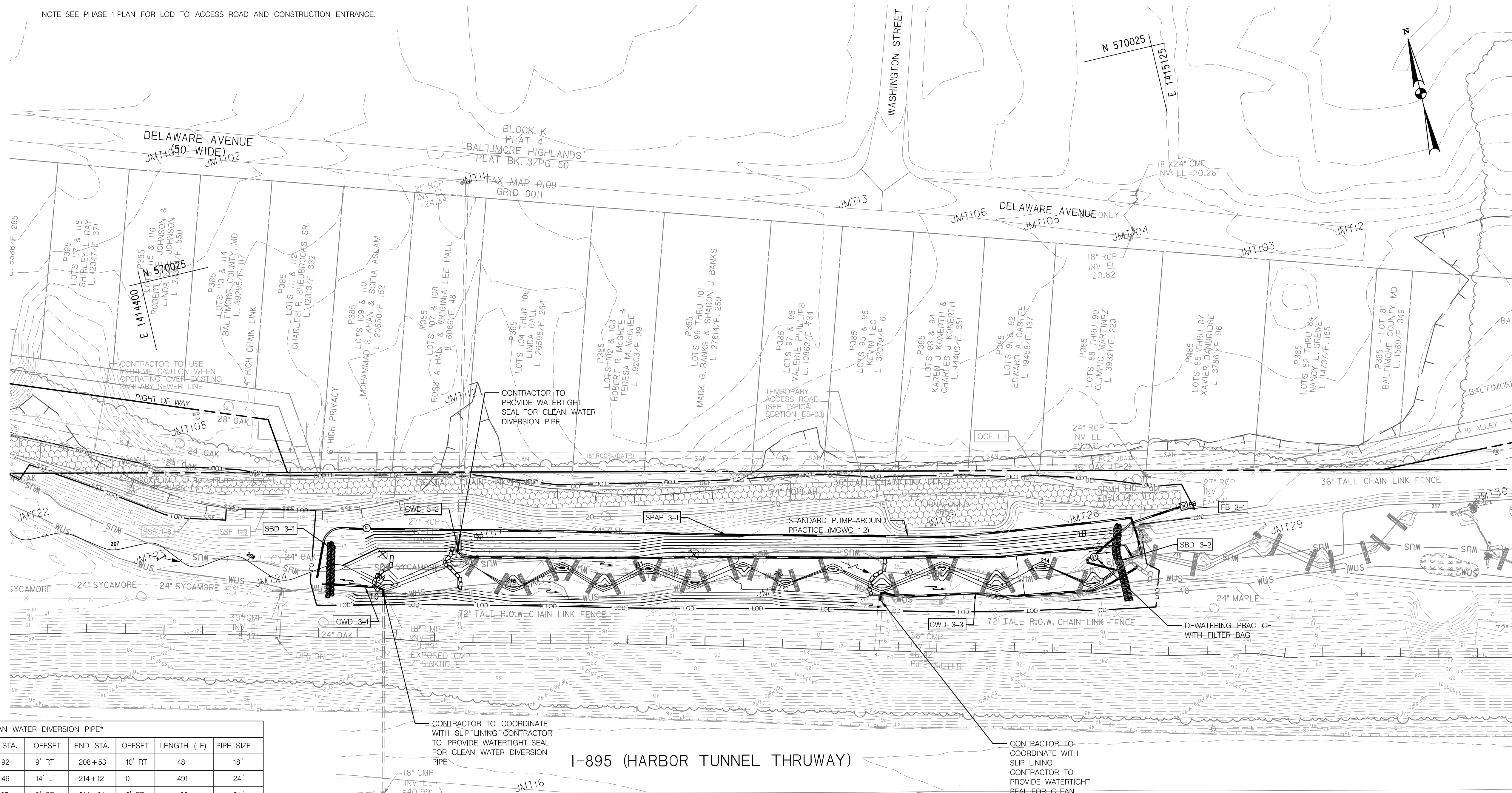
| ADDENDUMS & REVISIONS | | | |
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| NO. | DESCRIPTION | BY | DATE |
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MARYLAND TRANSPORTATION AUTHORITY
 ENGINEERING DIVISION
 I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY
 STREAM RESTORATION PROJECT
 EROSION AND SEDIMENT CONTROL PLAN PHASE 2

DESIGNED BY: MRG/PVC DRAWN BY: JMB CHECKED BY: MRG/JSK
 CONST. REVIEW BY: JSK DATE: MAY, 2019 SCALE: 1" = 40'

CONTRACT NO. HT-3012-0000
 DRAWING NO. **EP-03**
 SHEET NO. 15 OF 26

NOTE: SEE PHASE 1 PLAN FOR LOD TO ACCESS ROAD AND CONSTRUCTION ENTRANCE.



CLEAN WATER DIVERSION PIPE*

| CWD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) | PIPE SIZE |
|-------|------------|--------|----------|--------|-------------|-----------|
| 3-1 | 208+92 | 9' RT | 208+53 | 10' RT | 48 | 18" |
| 3-2 | 209+46 | 14' LT | 214+12 | 0 | 491 | 24" |
| 3-3 | 212+65 | 9' RT | 214+64 | 2' RT | 198 | 24" |

SAND BAG DIKE*

| SBD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
|-------|------------|--------|----------|--------|-------------|
| 3-1 | 208+40 | 26' RT | 208+53 | 17' LT | 91 |
| 3-2 | 214+38 | 22' LT | 214+57 | 26' RT | 110 |

FILTER BAG

| FB # | STA. OF CENTER | OFFSET OF CENTER | EA |
|------|----------------|------------------|----|
| 3-1 | 214+39 | 7' LT | 1 |

STANDARD PUMP-AROUND PRACTICE*

| SPAP # | BEGIN STA. | END STA. | LS |
|--------|------------|----------|----|
| 3-1 | 208+39 | 214+75 | 1 |

I-895 (HARBOR TUNNEL THRUWAY)

FILE: Q:\2015\151777_003_I-895_TMD_Stream_Re\CAD\pdp-0004_1895_Stream_Restoration - PHASE 3.dgn DATE: Thursday, March 28, 2019 AT 02:15 PM 02:15 PM

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. 31183
 EXPIRATION DATE: 1/13/2021

MARYLAND TRANSPORTATION AUTHORITY
 Engineering Division

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MARYLAND TRANSPORTATION AUTHORITY
 ENGINEERING DIVISION
 I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY
 STREAM RESTORATION PROJECT
 EROSION AND SEDIMENT CONTROL PLAN PHASE 3

DESIGNED BY: MRG/PVC DRAWN BY: JMB CHECKED BY: MRG/JSK
 CONST. REVIEW BY: JSK DATE: MAY, 2019 SCALE: 1" = 40'

CONTRACT NO. HT-3012-0000
 DRAWING NO. **EP-04**
 SHEET NO. 16 OF 26

FILE: Q:\2015\181777_003_1-895_TMDL_Stream_Re\CADD\pdp-0005.1895_Stream_Restoration - PHASE 4.dgn
 DATE: Thursday, March 28, 2019 AT 02:17 PM 02:17 PM



PROFESSIONAL CERTIFICATION
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 LICENSE NO. 31183
 EXPIRATION DATE: 1/13/2021

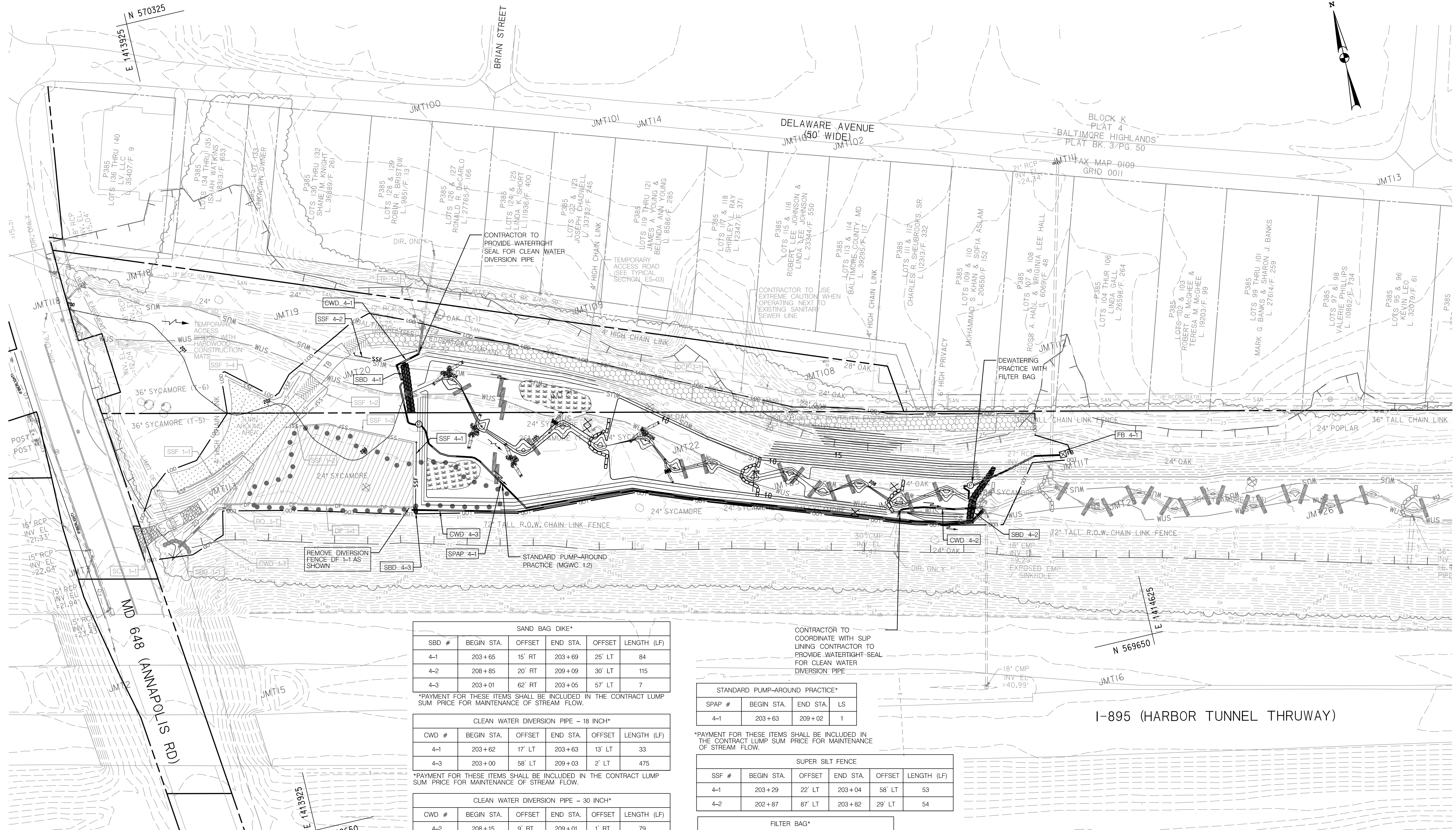


| ADDENDUMS & REVISIONS | | | |
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| NO. | DESCRIPTION | BY | DATE |
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MARYLAND TRANSPORTATION AUTHORITY
 ENGINEERING DIVISION
 I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY
 STREAM RESTORATION PROJECT
 EROSION AND SEDIMENT CONTROL PLAN PHASE 4

DESIGNED BY: MRG/PVC
 DRAWN BY: JMB
 CHECKED BY: MRG/JSK
 CONST. REVIEW BY: JSK
 DATE: MAY, 2019
 SCALE: 1" = 40'

CONTRACT NO. HT-3012-0000
 DRAWING NO. **EP-05**
 SHEET NO. 17 OF 26



SAND BAG DIKE*

| SBD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
|-------|------------|--------|----------|--------|-------------|
| 4-1 | 203+65 | 15' RT | 203+69 | 25' LT | 84 |
| 4-2 | 208+85 | 20' RT | 209+09 | 30' LT | 115 |
| 4-3 | 203+01 | 62' RT | 203+05 | 57' LT | 7 |

CLEAN WATER DIVERSION PIPE - 18 INCH*

| CWD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
|-------|------------|--------|----------|--------|-------------|
| 4-1 | 203+62 | 17' LT | 203+63 | 13' LT | 33 |
| 4-3 | 203+00 | 58' LT | 209+03 | 2' LT | 475 |

CLEAN WATER DIVERSION PIPE - 30 INCH*

| CWD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
|-------|------------|--------|----------|--------|-------------|
| 4-2 | 208+15 | 9' RT | 209+01 | 1' RT | 79 |

STANDARD PUMP-AROUND PRACTICE*

| SPAP # | BEGIN STA. | END STA. | LS |
|--------|------------|----------|----|
| 4-1 | 203+63 | 209+02 | 1 |

SUPER SILT FENCE

| SSF # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
|-------|------------|--------|----------|--------|-------------|
| 4-1 | 203+29 | 22' LT | 203+04 | 58' LT | 53 |
| 4-2 | 202+87 | 87' LT | 203+82 | 29' LT | 54 |

FILTER BAG*

| FB # | STA. OF CENTER | OFFSET OF CENTER | EA |
|------|----------------|------------------|----|
| 4-1 | 209+15 | 12' LT | 1 |

CONTRACTOR TO COORDINATE WITH SLIP LINING CONTRACTOR TO PROVIDE WATERTIGHT SEAL FOR CLEAN WATER DIVERSION PIPE

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR DEWATERING FOR EROSION AND SEDIMENT CONTROL.

FILE: Q:\2015\151777_003_I-895_TMDL_Stream_Re\CADD\pdp-0006_1895_Stream_Restoration - PHASE 5.dgn
 DATE: Thurs-sdy, March 28, 2019 AT 02:19 PM 02:19 PM



| SUPER SILT FENCE | | | | | |
|------------------|------------|--------|----------|--------|-------------|
| SBD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 5-1 | 200+42 | 22' LT | 202+77 | 20' LT | 182 |
| 5-2 | 200+42 | 23' RT | 201+46 | 24' LT | 149 |

| SAND BAG DIKE* | | | | | |
|----------------|------------|--------|----------|--------|-------------|
| SBD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 5-1 | 200+00 | 8' RT | 200+03 | 6' RT | 16 |
| 5-2 | 200+42 | 23' RT | 200+42 | 22' LT | 98 |
| 5-3 | 200+03 | 15' LT | 200+05 | 25' LT | 10 |
| 5-4 | 203+23 | 20' RT | 203+93 | 21' LT | 118 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.

| CLEAN WATER DIVERSION PIPE - 18 INCH* | | | | | |
|---------------------------------------|------------|--------|----------|--------|-------------|
| CWD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 5-1 | 200+02 | 20' LT | 203+94 | 1' LT | 323 |
| 5-2 | 203+83 | 27' LT | 203+91 | 1' LT | 28 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.

| STANDARD PUMP-AROUND PRACTICE* | | | | |
|--------------------------------|------------|----------|----|--|
| SPAP # | BEGIN STA. | END STA. | LS | |
| 5-1 | 200+00 | 203+95 | 1 | |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.

| TEMPORARY ACCESS ROAD | | | | | | |
|-----------------------|------------|--------|----------|--------|---------------|---------------------|
| TYPE | BEGIN STA. | OFFSET | END STA. | OFFSET | QUANTITY (SY) | NOTE |
| MULCH | 201+66.79 | 80' RT | 200+50 | 62' RT | 218 | SEE DETAIL ON ES-03 |

| FILTER BAG* | | | |
|-------------|----------------|------------------|----|
| FB # | STA. OF CENTER | OFFSET OF CENTER | EA |
| 5-1 | 201+14 | 9' RT | 1 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR DEWATERING FOR EROSION AND SEDIMENT CONTROL.



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. 31183
 EXPIRATION DATE: 1/13/2021

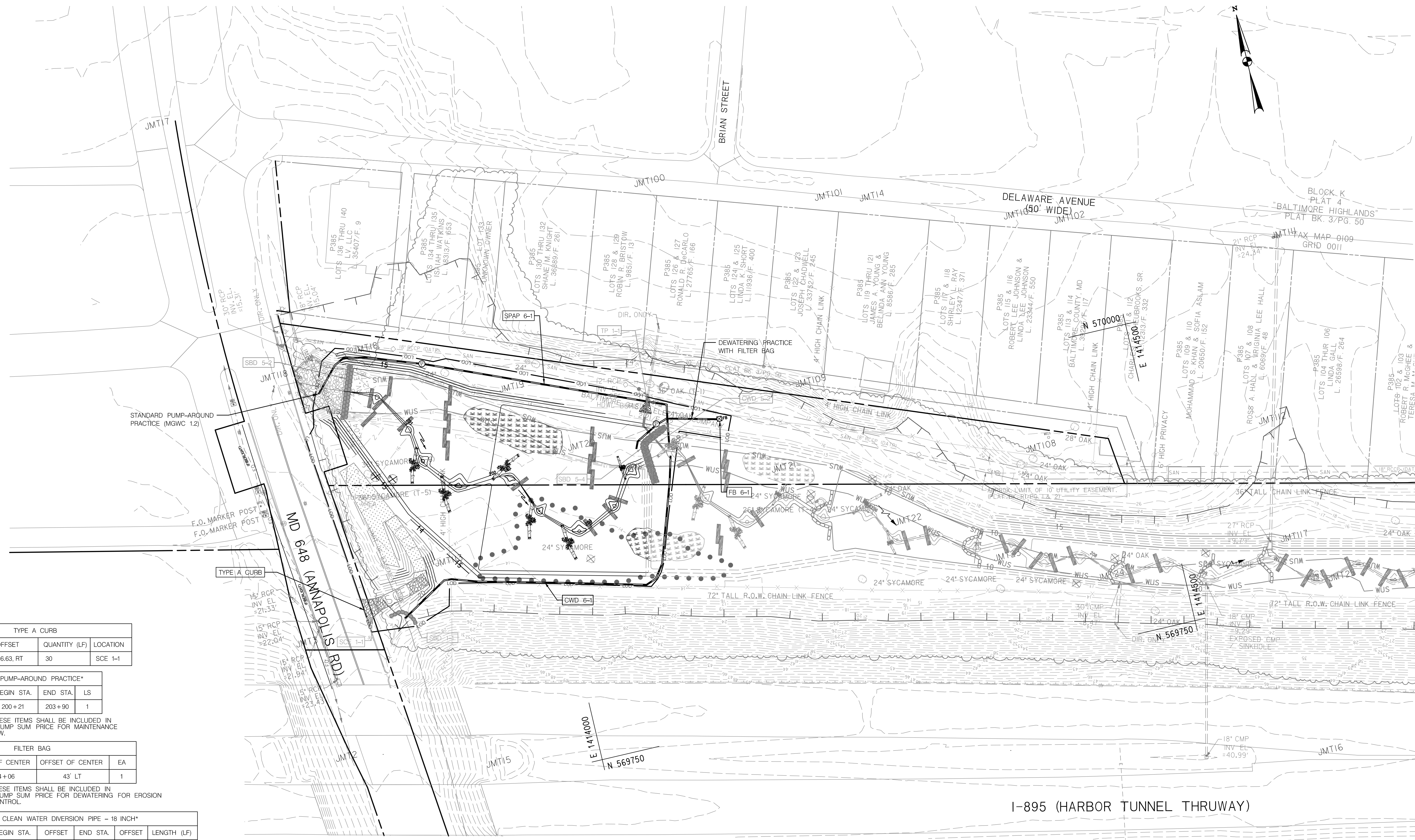


| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
| | | | |

| MARYLAND TRANSPORTATION AUTHORITY | | | |
|--|---------|----------|-----------|
| ENGINEERING DIVISION | | | |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | |
| STREAM RESTORATION PROJECT | | | |
| EROSION AND SEDIMENT CONTROL PLAN PHASE 5 | | | |
| DESIGNED BY | MRG/PVC | DRAWN BY | JMB |
| CHECKED BY | MRG/JSK | DATE | MAY, 2019 |
| CONST. REVIEW BY | JSK | SCALE | 1" = 40' |

| |
|------------------------------|
| CONTRACT NO. HT-3012-0000 |
| DRAWING NO. EP-06 |
| SHEET NO. 18 OF 26 |

FILE: Q:\2015\181777_003_1-895_TMDL_Stream_Re\CADD\PEP-0007_1895_STREAM RESTORATION - PHASE 6.dgn
 DATE: Thu, 28 Mar 2019 AT 02:22 PM 02:22 PM



| TYPE A CURB | | | |
|-------------|-----------|---------------|----------|
| STATION | OFFSET | QUANTITY (LF) | LOCATION |
| 201+61.33 | 126.63 RT | 30 | SCE 1-1 |

| STANDARD PUMP-AROUND PRACTICE* | | | |
|--------------------------------|------------|----------|----|
| SPAP # | BEGIN STA. | END STA. | LS |
| 6-1 | 200+21 | 203+90 | 1 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.

| FILTER BAG | | | |
|------------|----------------|------------------|----|
| FB # | STA. OF CENTER | OFFSET OF CENTER | EA |
| 6-1 | 204+06 | 43' LT | 1 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR DEWATERING FOR EROSION AND SEDIMENT CONTROL.

| CLEAN WATER DIVERSION PIPE - 18 INCH* | | | | | |
|---------------------------------------|------------|---------|----------|--------|-------------|
| CWD # | BEGIN STA. | OFFSET | END STA. | OFFSET | LENGTH (LF) |
| 6-1 | 201+51 | 120' RT | 203+95 | 3' RT | 322 |

*PAYMENT FOR THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR MAINTENANCE OF STREAM FLOW.



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. 31189
 EXPIRATION DATE: 1/13/2021



| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
| | | | |

MARYLAND TRANSPORTATION AUTHORITY
 ENGINEERING DIVISION
 I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY
 STREAM RESTORATION PROJECT
 EROSION AND SEDIMENT CONTROL PLAN PHASE 6

DESIGNED BY: MRG/PVC DRAWN BY: JMB CHECKED BY: MRG/JSK
 CONST. REVIEW BY: JSK DATE: MAY, 2019 SCALE: 1" = 40'

| |
|------------------------------|
| CONTRACT NO. HT-3012-0000 |
| DRAWING NO. EP-07 |
| SHEET NO. 19 OF 26 |

Maryland Department of the Environment
STANDARD EROSION AND SEDIMENT CONTROL NOTES

MDE REQUIRES THAT THESE NOTES, IN THEIR ENTIRETY, BE INCLUDED ON THE EROSION AND SEDIMENT CONTROL PLAN. IT IS RECOGNIZED THAT NOT EVERY NOTE MAY APPLY TO ALL PROJECTS. THE REQUIREMENTS OF ANY INDIVIDUAL NOTE NOT APPLICABLE TO THE SUBJECT PROJECT IS NOT BINDING UPON THE APPLICANT OR THE APPLICANT'S CONTRACTOR.

A. EROSION AND SEDIMENT CONTROL GENERAL NOTES

- 1. THE CONTRACTOR SHALL NOTIFY MDE AT (410) 537-3510 SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY AND, UNLESS WAIVED BY MDE, SHALL BE REQUIRED TO HOLD A PRE-CONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES AND A REPRESENTATIVE OF MDE.
2. THE CONTRACTOR SHALL NOTIFY MDE IN WRITING AND BY TELEPHONE AT THE FOLLOWING POINTS:
A. THE REQUIRED PRE-CONSTRUCTION MEETING.
B. FOLLOWING INSTALLATION OF SEDIMENT CONTROL MEASURES.
C. DURING THE INSTALLATION OF SEDIMENT BASINS (TO BE CONVERTED TO PERMANENT STORMWATER MANAGEMENT STRUCTURES) AT THE REQUIRED INSPECTION POINTS (SEE INSPECTION CHECKLIST ON PLAN). NOTIFICATION PRIOR TO COMMENCING CONSTRUCTION OF EACH STEP IS MANDATORY.
D. PRIOR TO REMOVAL OR MODIFICATION OF ANY SEDIMENT CONTROL STRUCTURE(S).
E. PRIOR TO REMOVAL OF ALL SEDIMENT CONTROL DEVICES.
F. PRIOR TO FINAL ACCEPTANCE.
3. THE PLAN APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, DAILY LOG BOOKS, AND TEST REPORTS SHALL BE AVAILABLE AT THE SITE FOR INSPECTION BY DULY AUTHORIZED OFFICIALS OF MDE AND THE AGENCY RESPONSIBLE FOR THE PROJECT.
4. THE CONTRACTOR SHALL CONSTRUCT ALL EROSION AND SEDIMENT CONTROL MEASURES PER THE APPROVED PLAN AND CONSTRUCTION SEQUENCE AND SHALL HAVE THEM INSPECTED AND APPROVED BY THE MDE INSPECTOR PRIOR TO BEGINNING ANY OTHER LAND DISTURBANCES.
5. THE MDE INSPECTOR HAS THE OPTION OF REQUIRING ADDITIONAL SAFETY OR SEDIMENT CONTROL MEASURES, IF DEEMED NECESSARY.
6. THE CONTRACTOR SHALL PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO PREVENT THE DEPOSITION OF MATERIALS ONTO PUBLIC ROADS.
7. THE CONTRACTOR SHALL INSPECT DAILY AND MAINTAIN CONTINUOUSLY IN AN EFFECTIVE OPERATING CONDITION ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL SUCH TIME AS THEY ARE REMOVED WITH PRIOR PERMISSION FROM THE MDE INSPECTOR.
8. EROSION AND SEDIMENT CONTROL FOR UTILITY CONSTRUCTION SHALL BE PROVIDED IN ACCORDANCE WITH APPROVED PLANS.
9. ALL WATER REMOVED FROM EXCAVATED AREAS SHALL BE PASSED THROUGH AN MDE APPROVED DEWATERING PRACTICE OR PUMPED TO A SEDIMENT TRAP OR BASIN PRIOR TO DISCHARGE TO A FUNCTIONAL STORM DRAIN SYSTEM OR TO STABLE GROUND SURFACE.
10. CONCRETE WASHOUT STRUCTURES SHALL BE USED WHEN CONCRETE TRUCKS, DRUMS, PUMPS, CHUTES, OR OTHER EQUIPMENT IS RINSED OR CLEANED ON-SITE.
11. CONSTRUCTION ACTIVITIES PRODUCING DUST SHALL IMPLEMENT CONTROL MEASURES TO AVOID THE SUSPENSION OF DUST PARTICLES AND/OR PREVENT DUST FROM BLOWING OFF-SITE OR TO AREAS WITHOUT TREATMENT.
12. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
A. THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND
B. SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
13. VEGETATIVE STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
14. WHEN SEEDING, ALL DISTURBED AREAS WITH SLOPES FLATTER THAN 2:1 SHALL BE STABILIZED WITH 4 INCHES OF TOPSOIL, SEED, AND MULCH.
15. ALL SEDIMENT BASINS, TRAP EMBANKMENTS AND SLOPES, PERIMETER DIKES, SWALES AND ALL DISTURBED SLOPES STEEPER THAN OR EQUAL TO 3:1 SHALL BE STABILIZED WITH SEED AND ANCHORED STRAW MULCH, SOD, OR OTHER APPROVED STABILIZATION MEASURES.
16. PERMANENT SWALES OR OTHER POINTS OF CONCENTRATED WATER FLOW SHALL BE STABILIZED WITH SEED AND AN APPROVED EROSION CONTROL MATTING, SOD, RIPRAP, OR OTHER APPROVED STABILIZATION MEASURES.
17. FOR STOCKPILE SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1), THE CONTRACTOR SHALL APPLY SEED AND ANCHORED STRAW MULCH, SOD, OR OTHER APPROVED STABILIZATION MEASURES TO THE FACE OF THE STOCKPILE WITHIN THREE (3) CALENDAR DAYS OF ACTIVITY HAVING CEASED ON THE RESPECTIVE FACE.

- 18. FOR FINISHED GRADING, THE CONTRACTOR SHALL PROVIDE ADEQUATE GRADIENTS TO PREVENT WATER FROM PONDING FOR MORE THAN TWENTY-FOUR (24) HOURS AFTER THE END OF A RAINFALL EVENT.
19. WHERE DEEMED APPROPRIATE BY THE ENGINEER OR INSPECTOR, SEDIMENT BASINS AND TRAPS MAY NEED TO BE SURROUNDED WITH AN APPROVED SAFETY FENCE.
20. ALL SEDIMENT TRAP DEPTH DIMENSIONS ARE RELATIVE TO THE OUTLET ELEVATION.
21. SEDIMENT SHALL BE REMOVED AND THE TRAP OR BASIN RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE QUARTER OF THE TOTAL DEPTH OF THE TRAP OR BASIN.
22. SEDIMENT REMOVED FROM TRAPS (AND BASINS) SHALL BE PLACED AND STABILIZED IN APPROVED AREAS.
23. PRIOR TO REMOVAL OF SEDIMENT CONTROL MEASURES, THE CONTRACTOR SHALL STABILIZE AND HAVE ESTABLISHED PERMANENT STABILIZATION FOR ALL CONTRIBUTORY DISTURBED AREAS.
24. TEMPORARY SEDIMENT CONTROL DEVICES SHALL BE REMOVED WITH PERMISSION OF THE MDE INSPECTOR WITHIN THIRTY (30) CALENDAR DAYS FOLLOWING ESTABLISHMENT OF PERMANENT STABILIZATION.
25. OFF-SITE SPOIL OR BORROW AREAS ON STATE OR FEDERAL PROPERTY SHALL HAVE PRIOR APPROVAL BY MDE AND OTHER APPLICABLE STATE, FEDERAL, AND LOCAL AGENCIES.
26. SITE INFORMATION:
A. AREA DISTURBED 4.48 ACRES
B. TOTAL CUT 9,200 CUBIC YARDS
C. TOTAL FILL 1,850 CUBIC YARDS
D. OFF-SITE WASTE / BORROW AREA LOCATION N/A

B. STANDARD STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

C. OWNER'S/DEVELOPER'S CERTIFICATION

I / WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION, AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT.
DATE: 5/1/19
OWNER/DEVELOPER SIGNATURE: Peter Matzgar, PE
PRINTED NAME AND TITLE: Environment Manager

SEQUENCE OF CONSTRUCTION (ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THESE NOTES)

- 1. THE CONTRACTOR SHALL NOTIFY MDE AT (410) 537-3510 SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY AND, UNLESS WAIVED BY MDE, SHALL BE REQUIRED TO HOLD A PRE-CONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES AND A REPRESENTATIVE OF MDE.
2. PERFORM CONSTRUCTION STAKEOUT. IF APPLICABLE, ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMIT OF DISTURBANCE.
3. THE STREAM WORK IS DIVIDED INTO 6 PHASES AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS.
4. WORK WILL NEED TO BE COMPLETED IN THE PHASE THAT CORRESPONDS TO THE STATION RANGE OF WHERE THE WORK AREA IS LOCATED.
5. CONTRACTOR IS NOT TO IMPACT WORK THAT HAS BEEN COMPLETED IN PREVIOUS PHASES.

- PHASE 1
1. INSTALL STABILIZED CONSTRUCTION ENTRANCE SCE 1-1 AS INDICATED ON PLANS.
2. CLEAR AND GRUB WORK AREA IN PREPARATION OF INSTALLING PHASE 1 EROSION AND SEDIMENT CONTROL DEVICES.
3. INSTALL CLEAN WATER DIVERSION CWD 1-1 WITH SAND BAG DIKE SBD 1-1, ROCK OUTLET PROTECTION RO 1-1, AND DIVERSION FENCE DF 1-1 AS INDICATED ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.
4. INSTALL TEMPORARY PIPE TP 1-1 AND ROCK OUTLET PROTECTION RO 1-2 AS SHOWN ON PLANS.
5. WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR'S PERMISSION, GRADE AND INSTALL THE TEMPORARY ACCESS ROAD AND TIMBER MAT SURFACE.
6. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED AND WITH THE PERMISSION OF THE EROSION AND SEDIMENT CONTROL INSPECTOR, REMOVE FILTER LOG FL 1-1 AND PROCEED TO PHASE 2 OF CONSTRUCTION.

- PHASE 2
1. CLEAR AND GRUB WORK AREA IN PREPARATION FOR THE INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS AND PHASE 2 CONSTRUCTION.
2. INSTALL PUMP-AROUND SYSTEM SPAP 2-1 PER PUMP AROUND PRACTICE STANDARD MGWC 1.2 OR AS DIRECTED BY THE EROSION AND SEDIMENT CONTROL INSPECTOR.
3. WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR'S PERMISSION, PERFORM STREAM GRADING AND RESTORATION WORK FROM STA. 214+41 TO STA. 220+30.
4. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED AND WITH THE PERMISSION OF THE EROSION AND SEDIMENT CONTROL INSPECTOR REMOVE THE PUMP AROUND SYSTEM SPAP 2-1.
5. WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR'S PERMISSION, PERFORM STREAM GRADING AND RESTORATION WORK FROM STA. 208+73 TO STA. 214+41.

- PHASE 3
1. CLEAR AND GRUB WORK AREA IN PREPARATION FOR THE INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS AND PHASE 3 CONSTRUCTION.
2. INSTALL PUMP-AROUND SYSTEM SPAP 3-1 PER PUMP AROUND PRACTICE STANDARD MGWC 1.2 OR AS DIRECTED BY THE EROSION AND SEDIMENT CONTROL INSPECTOR.
3. WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR'S PERMISSION, PERFORM STREAM GRADING AND RESTORATION WORK FROM STA. 208+73 TO STA. 214+41.
4. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED AND WITH THE PERMISSION OF THE EROSION AND SEDIMENT CONTROL INSPECTOR REMOVE THE PUMP AROUND SYSTEM SPAP 3-1.

- PHASE 4
1. CLEAR AND GRUB WORK AREA IN PREPARATION FOR THE INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS AND PHASE 4 CONSTRUCTION.
2. DECONSTRUCT PORTION OF TEMPORARY STAGING AREA, SSF 1-3, AND DF 1-1 TO THE LIMITS SHOWN ON THE PLAN.
3. WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR'S PERMISSION, PERFORM STREAM GRADING AND RESTORATION WORK FROM STA. 203+70 TO STA. 208+73.
4. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED AND WITH THE PERMISSION OF THE EROSION AND SEDIMENT CONTROL INSPECTOR REMOVE THE PUMP AROUND SYSTEM SPAP 4-1.

- PHASE 5
1. CLEAR AND GRUB WORK AREA IN PREPARATION FOR THE INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS AND PHASE 5 CONSTRUCTION.
2. REMOVE PORTION OF SSF 1-1 TO THE LIMITS SHOWN ON THE PLAN.
3. WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR'S PERMISSION, GRADE AND INSTALL THE TEMPORARY ACCESS ROAD AND TIMBER MAT SURFACE.
4. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED AND WITH THE PERMISSION OF THE EROSION AND SEDIMENT CONTROL INSPECTOR REMOVE THE PUMP AROUND SYSTEM SPAP 5-1.
5. WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR'S PERMISSION, PERFORM STREAM GRADING AND RESTORATION WORK FROM STA. 200+38 TO STA. 203+70.

- PHASE 6
1. CLEAR AND GRUB WORK AREA IN PREPARATION FOR THE INSTALLATION OF THE EROSION AND SEDIMENT CONTROLS AND PHASE 5 CONSTRUCTION.
2. INSTALL PUMP-AROUND SYSTEM SPAP 6-1 PER PUMP AROUND PRACTICE STANDARD MGWC 1.2 OR AS DIRECTED BY THE EROSION AND SEDIMENT CONTROL INSPECTOR.
3. WITH THE EROSION AND SEDIMENT CONTROL INSPECTOR'S PERMISSION, PERFORM STREAM GRADING AND RESTORATION WORK FROM STA. 200+38 TO STA. 203+70.
4. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED AND WITH THE PERMISSION OF THE EROSION AND SEDIMENT CONTROL INSPECTOR REMOVE ALL REMAINING EROSION AND SEDIMENT CONTROLS EXCEPT SCE 1-1 WHICH WILL BE UTILIZED FOR LANDSCAPING ACTIVITIES.
5. STABILIZE ALL DISTURBED AREAS WITH SEED AND MULCH OR PER THE LANDSCAPE PLANS AS PERMANENT STABILIZATION.
6. INSTALL PROPOSED PLANTINGS AND SEEDINGS PER THE LANDSCAPING PLANS AT THE END OF PHASE 6 ONCE ALL AREAS ARE STABILIZED.
7. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED AND WITH THE PERMISSION OF THE EROSION AND SEDIMENT CONTROL INSPECTOR REMOVE SCE 1-1 AND INSTALL TYPE A CURB.

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

- 1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF THE NONTIDAL WETLAND, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
3. DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4. 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.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6. RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ANNUAL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLLIUM MULTIFLORUM), MILLET (SETIARIA ITALICA), BARLEY (HORDEUM SP.), OATS (Avena sp.), AND/OR RYE (SECALIS CEREBEALIS).
8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:
USE 1: WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11. CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

FILE: 01-2015151777-003-1-895_TMDL_Stream_Re-CADD\NRES-1001.dwg DATE: Monday, Apr 11 23, 2019 AT 04:00 PM 04:00 PM



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. 31183
EXPIRATION DATE: 1/13/2021

DESIGN CERTIFICATION
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II INCLUDING SUPPLEMENTS, THE ENVIRONMENT ARTICLE SECTIONS 4-101 THROUGH 116 AND SECTIONS 4-201 AND 215, AND THE CODE OF MARYLAND REGULATIONS (COMAR) 26.7.01 AND COMAR 26.17.02 FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT, RESPECTIVELY.
DATE: 1/13/2021 DESIGNER'S SIGNATURE: Jeremy S. Koser
M.D. REGISTRATION NO. 31183 PRINTED NAME: JEREMY S. KOSER
(PE) R.L.S., R.L.A., OR R.A. (CIRCLE ONE)

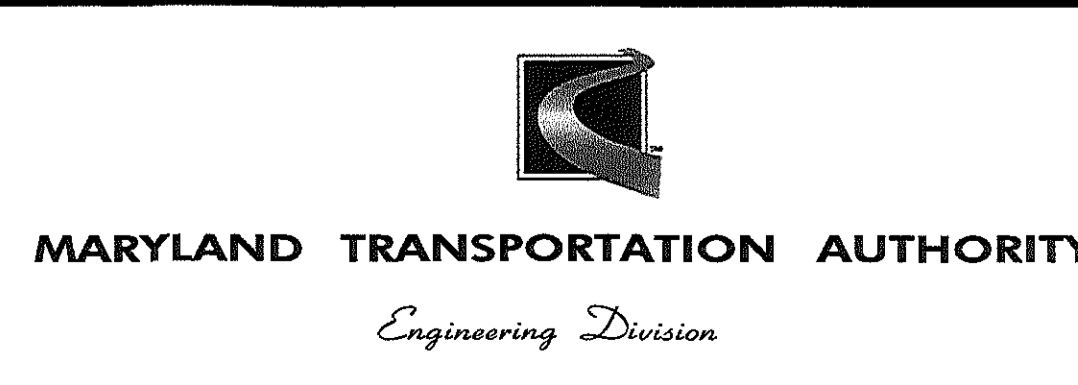


Table with 3 columns: NO., DESCRIPTION, BY, DATE. Contains 6 empty rows for addendums and revisions.

MARYLAND TRANSPORTATION AUTHORITY
ENGINEERING DIVISION
I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY
STREAM RESTORATION PROJECT
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
DESIGNED BY MRG/PVC DRAWN BY JMB CHECKED BY MRG/JSK
CONST. REVIEW BY JSK DATE MAY, 2019 SCALE N.T.S.

CONTRACT NO. HT-3012-0000
DRAWING NO. ES-01
SHEET NO. 20 OF 26

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

DEFINITION
USING VEGETATION AS COVER TO PROTECT EXPOSED SOIL FROM EROSION.

PURPOSE
TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL.

CONDITIONS WHERE PRACTICE APPLIES
ON ALL DISTURBED AREAS NOT STABILIZED BY OTHER METHODS. THIS SPECIFICATION IS DIVIDED INTO SECTIONS ON INCREMENTAL STABILIZATION; SOIL PREPARATION, SOIL AMENDMENTS AND TOPSOILING; SEEDING AND MULCHING; TEMPORARY STABILIZATION, AND PERMANENT STABILIZATION.

EFFECTS ON WATER QUALITY AND QUANTITY
STABILIZATION PRACTICES ARE USED TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL. WHEN SOIL IS STABILIZED WITH VEGETATION, THE SOIL IS LESS LIKELY TO ERODE AND MORE LIKELY TO ALLOW INFILTRATION OF RAINFALL, THEREBY REDUCING SEDIMENT LOADS AND RUNOFF TO DOWNSTREAM AREAS.

PLANTING VEGETATION IN DISTURBED AREAS WILL HAVE AN EFFECT ON THE WATER BUDGET, ESPECIALLY ON VOLUMES AND RATES OF RUNOFF, INFILTRATION, EVAPORATION, TRANSPARATION, PERCOLATION AND GROUNDWATER RECHARGE. OVER TIME, VEGETATION WILL INCREASE ORGANIC MATTER CONTENT AND IMPROVE THE WATER HOLDING CAPACITY OF THE SOIL AND SUBSEQUENT PLANT GROWTH.

VEGETATION WILL HELP REDUCE THE MOVEMENT OF SEDIMENT, NUTRIENTS AND OTHER CHEMICALS CARRIED BY RUNOFF TO RECEIVING WATERS. PLANTS WILL ALSO HELP PROTECT GROUNDWATER SUPPLIES BY ASSIMILATING THOSE SUBSTANCES PRESENT WITHIN THE ROOT ZONE.

SEDIMENT CONTROL PRACTICES MUST REMAIN IN PLACE DURING GRADING, SEEDBED PREPARATION, SEEDING, MULCHING AND VEGETATIVE ESTABLISHMENT.

ADEQUATE VEGETATIVE ESTABLISHMENT

INSPECT SEEDED AREAS FOR VEGETATIVE ESTABLISHMENT AND MAKE NECESSARY REPAIRS, REPLACEMENTS AND RESEEDINGS WITHIN THE PLANTING SEASON.

- ADEQUATE VEGETATIVE STABILIZATION REQUIRES 95 PERCENT GROUNDCOVER.
- IF AN AREA HAS LESS THAN 40 PERCENT GROUNDCOVER, RESTABILIZE FOLLOWING THE ORIGINAL RECOMMENDATIONS FOR LIME, FERTILIZER, SEEDBED PREPARATION AND SEEDING.
- IF AN AREA HAS BETWEEN 40 AND 94 PERCENT GROUNDCOVER, OVER-SEED AND FERTILIZE USING HALF THE RATES ORIGINALLY SPECIFIED.
- MAINTENANCE FERTILIZER RATES FOR PERMANENT SEEDING ARE SHOWN IN TABLE B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

DEFINITION
ESTABLISHMENT OF VEGETATIVE COVER ON CUT AND FILL SLOPES

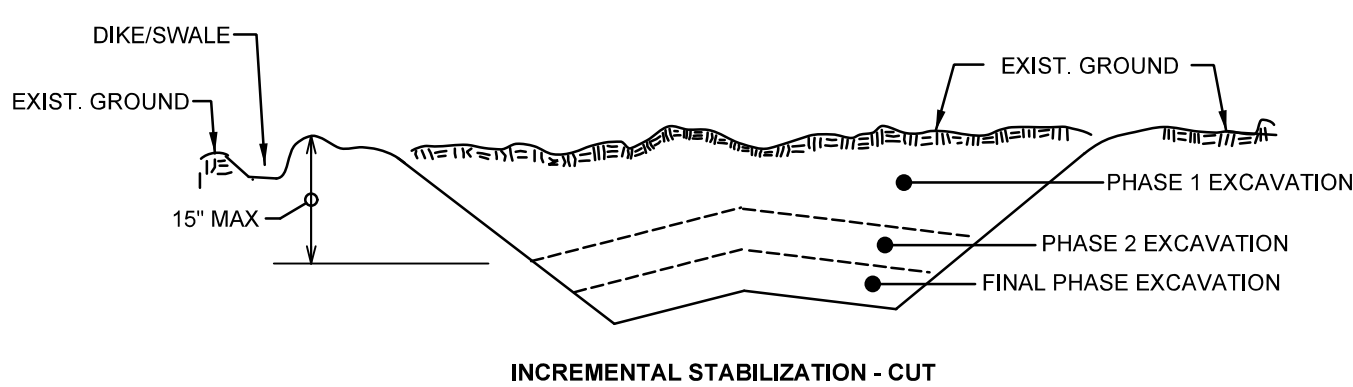
PURPOSE
TO PROVIDE TIMELY VEGETATIVE COVER ON CUT AND FILL SLOPES AS WORK PROGRESSES

CONDITIONS WHERE PRACTICE APPLIES
ANY CUT OR FILL SLOPE GREATER THAN 15 FEET IN HEIGHT. THIS PRACTICE ALSO APPLIES TO STOCKPILES.

CRITERIA

- INCREMENTAL STABILIZATION - 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.
 - CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.1)
 - CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO CONVEY RUNOFF AROUND THE EXCAVATION.
 - PERFORM PHASE 1 EXCAVATION, PREPARE SEEDBED AND STABILIZE.
 - PERFORM PHASE 2 EXCAVATION, PREPARE SEEDBED AND STABILIZE. OVERSEED PHASE 1 AREAS AS NECESSARY
 - PERFORM FINAL PHASE EXCAVATION, PREPARE SEEDBED AND STABILIZE. OVERSEED PREVIOUSLY SEEDED AREAS AS NECESSARY.

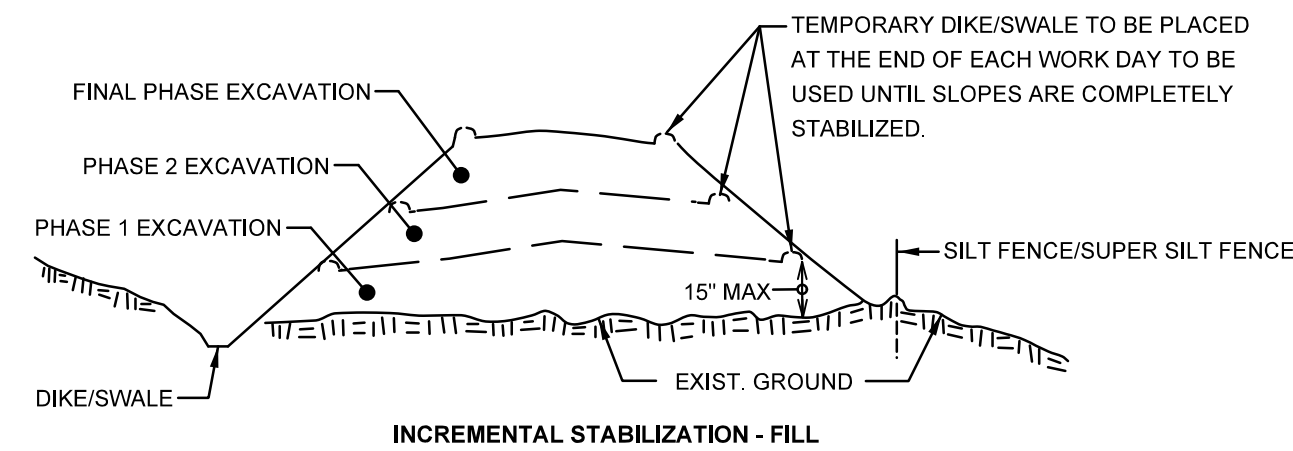
NOTE: ONCE EXCAVATION HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION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



- INCREMENTAL STABILIZATION - FILL SLOPES**
 - CONSTRUCT AND STABILIZE FILL SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL SLOPES AS THE WORK PROGRESSES.
 - 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 WORKING DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
 - CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.2):
 - CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO DIVERT RUNOFF AROUND THE FILL. CONSTRUCT SILT FENCE ON LOW SIDE OF FILL UNLESS OTHER METHODS SHOWN ON THE PLANS ADDRESS THIS AREA.
 - AT THE END OF EACH WORKING DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.

- INCREMENTAL STABILIZATION - FILL SLOPES (CONTINUED)**
 - PLACE PHASE 1 FILL, PREPARE SEEDBED AND STABILIZE.
 - PLACE PHASE 2 FILL, PREPARE SEEDBED AND STABILIZE.
 - PLACE FINAL PHASE FILL, PREPARE SEEDBED AND STABILIZE. OVERSEED PREVIOUSLY AREAS AS NECESSARY.

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.



B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING AND SOIL AMENDMENTS

DEFINITION
THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION.

PURPOSE
TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES
WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

CRITERIA

- SOIL PREPARATION**
 - TEMPORARY STABILIZATION**
 - 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 LOOSEND, 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.
 - APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
 - INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
 - PERMANENT STABILIZATION**
 - A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
 - SOIL pH BETWEEN 6.0 AND 7.0.
 - SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (ppm).
 - 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.
 - SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
 - SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
 - APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
 - GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THE SCARIFIED OR OTHERWISE LOOSEND TO A DEPTH OF 3 TO 5 INCHES.
 - APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
 - MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.
- TOPSOILING**
 - 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.
 - 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.
 - TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
 - THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
 - 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.

- THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
- THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
- AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
- TOPSOIL SPECIFICATIONS: SOILS TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
 - TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH OR OTHER MATERIALS LARGER THAN 1 1/2 INCHES IN DIAMETER.
 - TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE OR OTHERS AS SPECIFIED.
 - 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.
- TOPSOIL APPLICATION
 - EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
 - UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
 - TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDING PREPARATION.
- SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
 - 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 ANALYSES. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSIS.
 - 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.
 - 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.
 - 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.
 - 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-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

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

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

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

CRITERIA

- SEEDING**
 - SPECIFICATIONS**
 - ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
 - MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
 - INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
 - 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.
 - APPLICATION**
 - DRY SEEDING:** THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
 - 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.
 - APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
- APPLICATION**
 - APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
 - 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.
 - WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1600 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.
 - ANCHORING
 - PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THAT MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
 - A MULCHING 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.
 - 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.
 - SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
 - LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEETWIDE AND 300 TO 3,000 FEET LONG.

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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. 31183
EXPIRATION DATE: 1/13/2021



MARYLAND TRANSPORTATION AUTHORITY
Engineering Division

| ADDENDUMS & REVISIONS | | | |
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| MARYLAND TRANSPORTATION AUTHORITY | | | CONTRACT NO. HT-3012-0000 |
| ENGINEERING DIVISION 1-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY STREAM RESTORATION PROJECT EROSION AND SEDIMENT CONTROL NOTES AND DETAILS | | | DRAWING NO. ES-02 |
| DESIGNED BY <u>MRG/PVC</u> | DRAWN BY <u>JMB</u> | CHECKED BY <u>MRG/JSK</u> | SHEET NO. |
| CONST. REVIEW BY <u>JSK</u> | DATE <u>MAY, 2019</u> | SCALE <u>N.T.S.</u> | 21 OF 26 |

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

DEFINITION
TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

PURPOSE
TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES
EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

CRITERIA

1. SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.1 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.1 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.
2. FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.
3. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONE AS PRESCRIBED IN SECTION B-4-3.1.d AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

TEMPORARY SEEDING SUMMARY

| HARDINESS ZONE: 7a SEED MIXTURE: N/A | | | | | |
|---|----------------------------|----------------------------------|---------------------|-------------------------------|-------------------------------|
| SPECIES | APPLICATION RATE (LBS/AC.) | SEEDING DATE | SEEDING DEPTH (IN.) | FERTILIZER RATE (10-20-20) | LIME RATE |
| ANNUAL RYEGRASS | 40 | 02-15 TO 04-30 08-15 TO 11-30 | 1.0 | 436 LB/AC (10 LB/1,000 SF) | 2 TON/AC. (90 LB/1,000 SF) |
| FOXTAIL MILLET | 30 | 05-01 TO 08-14 | 0.5 | | |
| PEARL MILLET | 20 | 05-01 TO 08-14 | 0.5 | | |

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

DEFINITION
TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

PURPOSE
TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES
EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

CRITERIA

A. SEED MIXTURES

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 THE SITE CONDITION OR PURPOSE FOUND ON TABLE B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
 - B. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BANKS OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 - CRITICAL AREA PLANTING.
 - C. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL 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 (150 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 RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
- B. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
 - i. KENTUCKY BLUEGRASS / FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 POUNDS PER 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 KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
 - iii. TALL FESCUE / KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES: CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT. 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, INTENSELY 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 #2 TO 3 POUNDS PER 1,000 SQUARE FEET.

NOTES:
SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND".

PURPOSE
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 GENERIC LINE.

C. IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES

WESTERN MARYLAND: MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5b, 6a)

CENTRAL MARYLAND: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6b)

SOUTHERN MARYLAND, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7a, 7b)

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

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

PERMANENT SEEDING SUMMARY

| HARDINESS ZONE: 7a SEED MIXTURE: 6 | | | | | | | |
|---------------------------------------|----------------------------|----------------------------------|---------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|
| SPECIES | APPLICATION RATE (LBS/AC.) | SEEDING DATE | SEEDING DEPTH (IN.) | FERTILIZER RATE (10-20-20) | | | LIME RATE |
| | | | | N | P ₂ O ₅ | K ₂ O | |
| TALL FESCUE | 40 | 02-15 TO 04-30 08-15 TO 10-31 | 0.25 TO 0.5 | 45 LB/AC (1 LB/ 1,000 SF) | 90 LB/AC (2 LB/ 1,000 SF) | 90 LB/AC (2 LB/ 1,000 SF) | 2 TON/AC (90 LB/ 1,000 SF) |
| PERENNIAL RYEGRASS | 25 | 02-15 TO 04-30 08-15 TO 10-31 | 0.25 TO 0.5 | | | | |
| BIRDSFOOT TREFOIL | 8 | 02-15 TO 04-30 08-15 TO 10-31 | 0.25 TO 0.5 | | | | |

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

1. GENERAL SPECIFICATIONS
 - A. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
 - B. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4 INCH, PLUS OR MINUS 1/8 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 ITS INSTALLATION.
2. SOD INSTALLATION
 - A. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD.
 - B. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.
 - C. WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO PREVENT SLIPPAGE ON SLOPES. ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.
 - D. WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING, AND IRRIGATING FOR ANY PIECE OF SOD WITH 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.

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

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

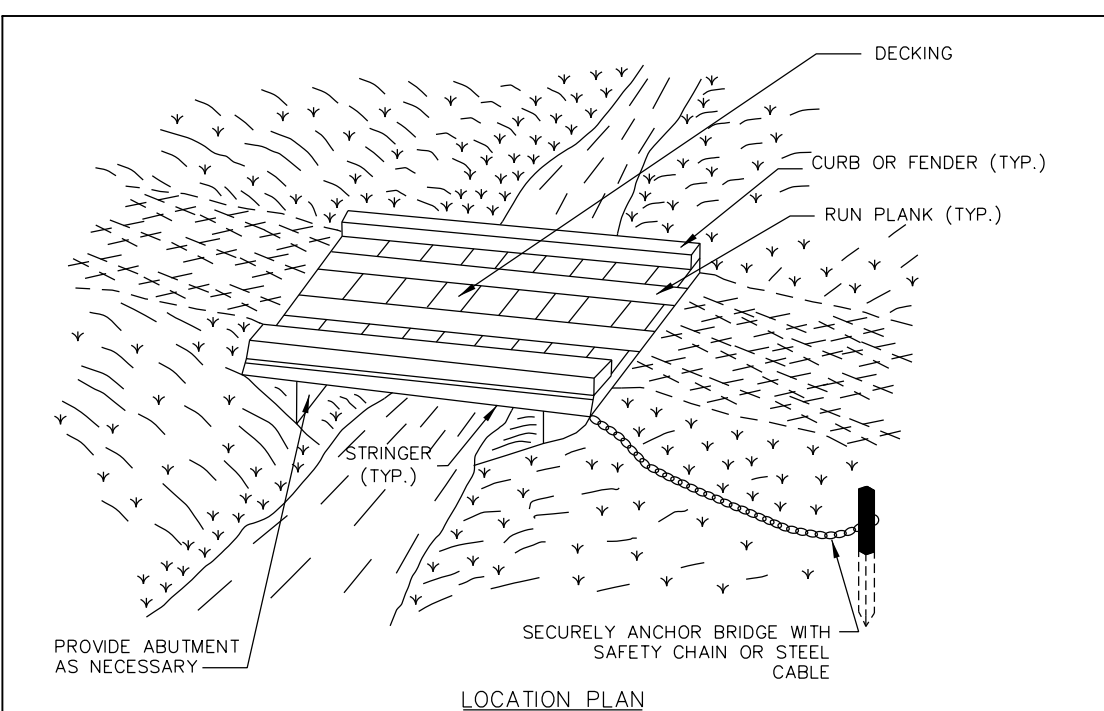
PURPOSE
TO PROVIDE A DESIGNATED LOCATION FOR THE TEMPORARY STORAGE OF SOIL THAT CONTROLS THE POTENTIAL FOR EROSION, SEDIMENTATION AND CHANGES TO DRAINAGE PATTERNS.

CONDITIONS WHERE PRACTICE APPLIES
STOCKPILE AREAS ARE UTILIZED WHEN IT IS NECESSARY TO SALVAGE AND STORE SOIL FOR LATER USE.

CRITERIA

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

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

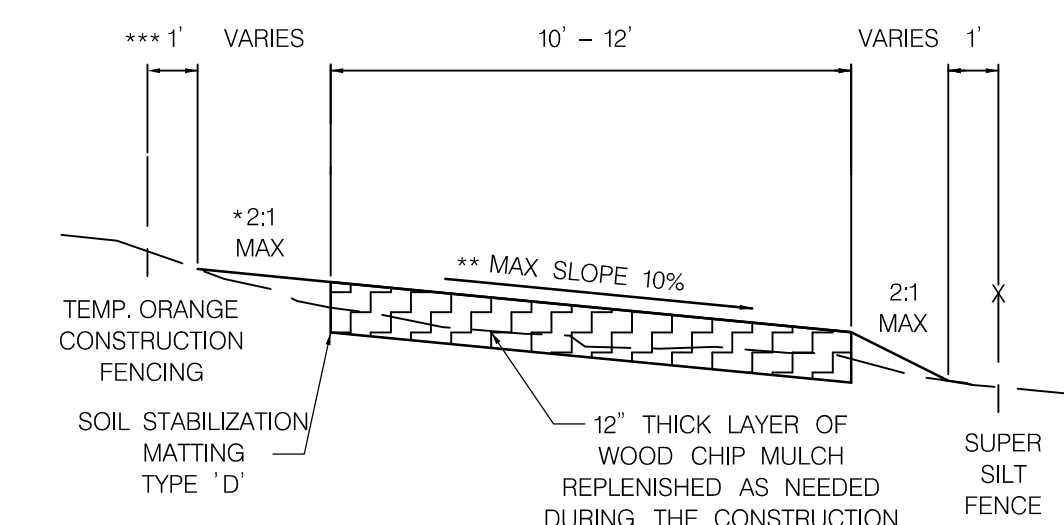


NOTE:
TIME OF YEAR RESTRICTIONS DO NOT APPLY TO THE CONSTRUCTION OR REMOVAL OF A TEMPORARY ACCESS BRIDGE UNLESS THERE IS DISTURBANCE TO THE STREAM CHANNEL.

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TEMPORARY BRIDGE STRUCTURE AT OR ABOVE THE BANK ELEVATION TO PREVENT IMPACTS FROM FLOATING MATERIALS AND DEBRIS.
2. PLACE ABUTMENTS PARALLEL TO, AND ON, STABLE BANKS.
3. CONSTRUCT BRIDGE TO SPAN ENTIRE CHANNEL UNLESS OTHERWISE INDICATED ON APPROVED PLAN.
4. USE STRINGERS CONSISTING OF LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
5. SELECT DECKING MATERIALS TO PROVIDE SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. PLACE ALL DECKING MEMBERS PERPENDICULAR TO THE STRINGERS, BUTT TIGHTLY, AND SECURELY FASTEN. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY BELOW.
6. SECURELY FASTEN OPTIONAL RUN PLANKING FOR THE LENGTH OF THE SPAN. PROVIDE A RUN PLANK FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
7. INSTALL CURBS THE ENTIRE LENGTH OF THE OUTER SIDES OF THE DECK TO PREVENT SEDIMENT FROM ENTERING THE STREAM CHANNEL.
8. ANCHOR BRIDGE SECURELY AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL POSTS. ANCHOR MUST BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
9. AREAS DISTURBED DURING BRIDGE INSTALLATION AND/OR REMOVAL MUST NOT BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
10. STABILIZE APPROACH TO BRIDGE AND KEEP FREE OF EROSION. CLEAN SEDIMENT FROM DECKING AND CURBS DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. ENSURE THAT DECKING AND CURBS REMAIN TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY BRIDGE. MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
11. AFTER THE TEMPORARY CROSSING IS NO LONGER NEEDED, REMOVE IT WITHIN 14 CALENDAR DAYS. IF SUBJECT TO THE USE DESIGNATION CLOSURE, REMOVE AT THE END OF CLOSURE PERIOD. PROTECT STREAM BANKS DURING BRIDGE REMOVAL AND STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MATTING. ACCOMPLISH REMOVAL OF THE BRIDGE AND CLEAN UP OF THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL. STORE ALL REMOVED MATERIALS IN AN APPROVED STAGING AREA.

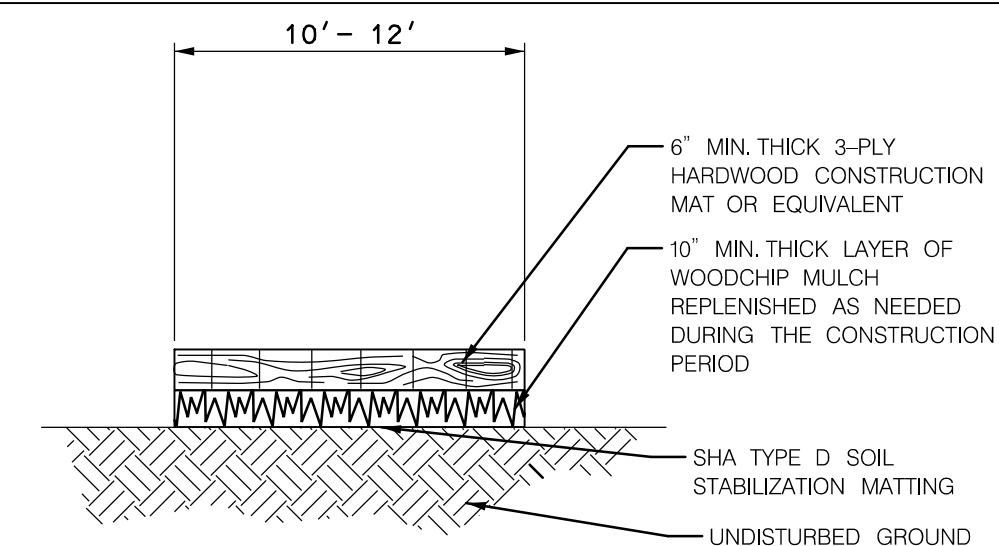
TEMPORARY ACCESS ROAD DETAIL
N.T.S.



**TYPICAL SECTION
TEMPORARY ACCESS ROAD
FROM MD 648 TO PROJECT LIMIT
NOT TO SCALE**

1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AND INSPECTOR AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER AND SEDIMENT CONTROL INSPECTOR.
2. NATURAL FIBER MATTING MAY BE ALTERED IN DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
3. CONTRACTOR SHALL MAINTAIN MULCH MATTING THROUGHOUT CONSTRUCTION PERIOD. AFTER COMPLETION OF THE PROJECT, MULCH CAN REMAIN IN PLACE AT A MAXIMUM DEPTH OF 2".
4. SCARIFICATION OF COMPACTED MULCH TO OCCUR UPON REMOVAL OF HAUL ROAD, AT DIRECTION OF THE ENGINEER.
5. THE HAUL ROAD IS DESIGNED TO PREVENT COMPACTION OF EXISTING SOILS USING LOW PRESSURE EQUIPMENT. IF THE CONTRACTOR INTENDS TO USE ANY EQUIPMENT WITH HIGHER LOADS, ADDITIONAL PROTECTION MEASURES MUST BE PROVIDED, AT NO ADDITIONAL COST, AND THOSE MEASURES MUST BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.

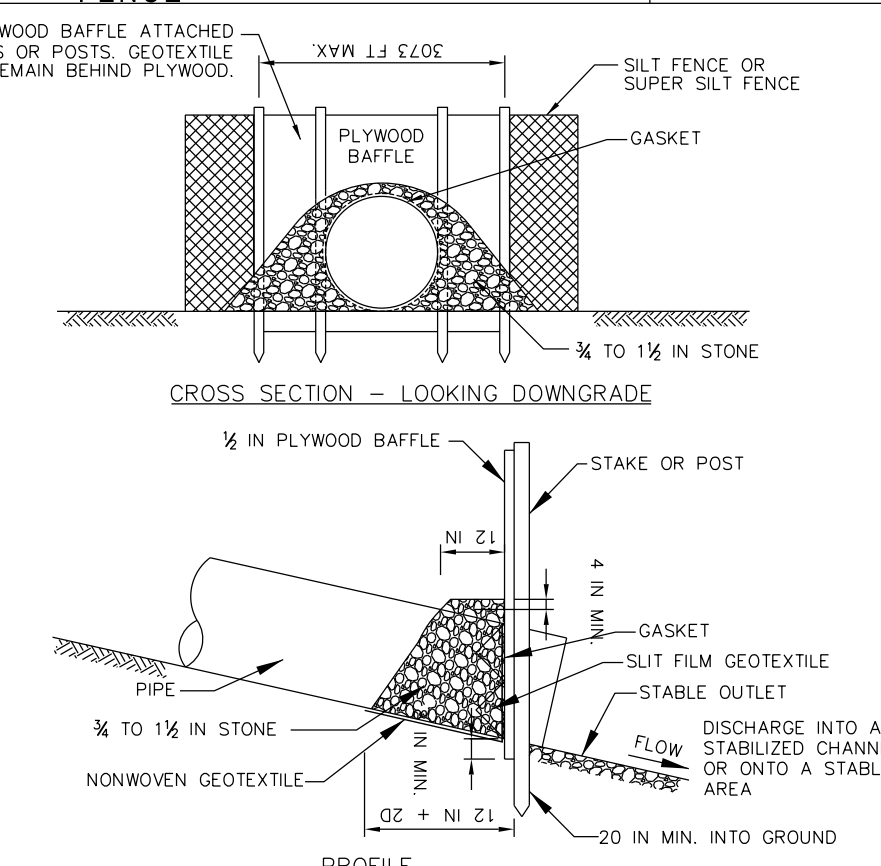
* CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE
** 6% MAX IS DESIRABLE. CONTRACTORS DISCRETION CAN ALLOW 10% MAX DEPENDING ON TYPE OF EQUIPMENT BEING USED.
*** OFFSET CANNOT EXCEED RIGHT OF WAY



1. HARDWOOD MATS TO BE INSTALLED AS INDICATED ON CONTRACT DOCUMENTS.
2. ACCESS ROUTES TO BE VERIFIED BY THE ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
3. NATURAL FIBER MATTING SHALL BE PLACED WITH SEAMS PARALLEL TO THE FLOW OF TRAFFIC. OVERLAP FABRIC BY 18" MIN. AT SEAMS.
4. CONTRACTOR SHALL MAINTAIN MULCH MAT THROUGHOUT CONSTRUCTION PERIOD.

HARDWOOD CONSTRUCTION MAT TYPICAL SECTION
NOT TO SCALE

DETAIL E-4 CLEAR WATER PIPE THROUGH SILT FENCE OR SUPER SILT FENCE



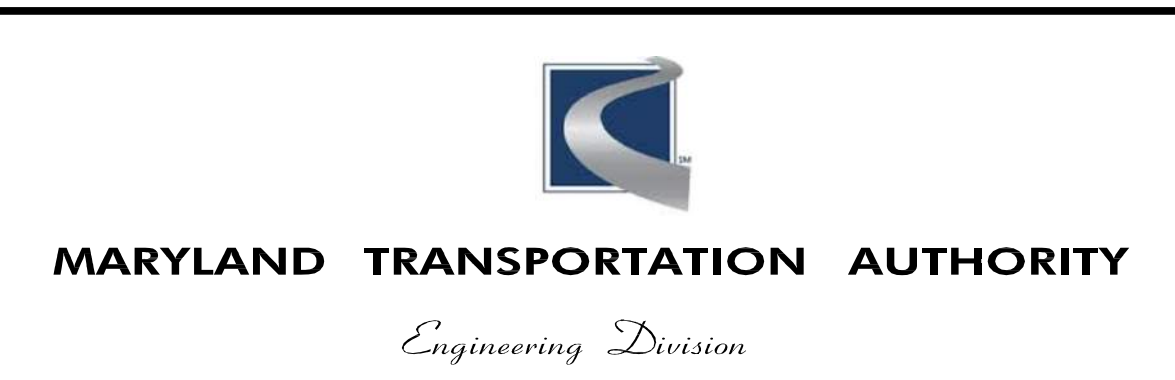
CONSTRUCTION SPECIFICATIONS

1. INSTALL SILT FENCE OR SUPER SILT FENCE IN ACCORDANCE WITH DETAIL E-1 OR DETAIL E-2.
2. AT THE PIPE LOCATION, CUT AND PULL BACK THE WOVEN SLIT FILM GEOTEXTILE AND CHAIN LINK FENCING. SECURE GEOTEXTILE TO PIPE WITH GASKET. INSTALL ADDITIONAL STAKES OR POSTS IF NECESSARY TO ACCOMMODATE THE INSTALLATION OF THE BAFFLE BOARD.
3. ENTRENCH 1/2 INCH PLYWOOD BAFFLE A MINIMUM OF 8 INCHES AND SECURE TO THE UPGRADE SIDE OF THE FENCE STAKES OR POSTS. BAFFLE SHOULD BE AT LEAST THE HEIGHT OF THE FENCE.
4. PLACE 3/4 TO 1 1/2 INCH STONE OR EQUIVALENT RECYCLED CONCRETE BEHIND THE PLYWOOD BAFFLE ON NONWOVEN GEOTEXTILE AND EXTEND 12 INCH MIN. ALONG TOP OF PIPE AND TO A HEIGHT OF 4 INCHES ABOVE THE TOP OF PIPE.
5. USE NONWOVEN AND WOVEN SLIT FILM GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
6. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN SEDIMENT REACHES 6 INCHES IN HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL BAFFLE, CHAIN LINK, AND GEOTEXTILE. REPLACE STONE IF DISPLACED. KEEP POINT OF DISCHARGE FREE OF EROSION.

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



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. 31183
EXPIRATION DATE: 1/13/2021

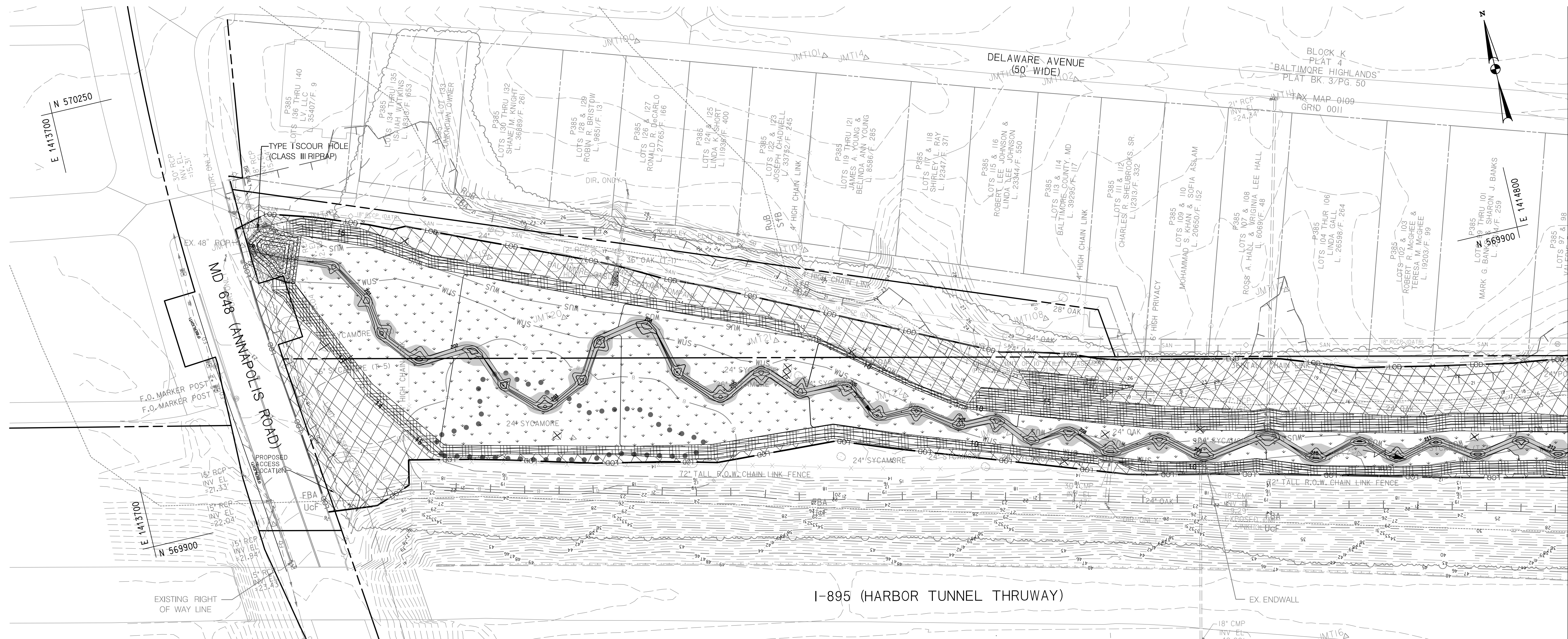


| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
| | | | |
| | | | |

| MARYLAND TRANSPORTATION AUTHORITY ENGINEERING DIVISION I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY STREAM RESTORATION PROJECT EROSION AND SEDIMENT CONTROL NOTES AND DETAILS | | | |
|---|---------|----------|-----------|
| DESIGNED BY | MRG/PVC | DRAWN BY | JMB |
| CONST. REVIEW BY | JSK | DATE | MAY, 2019 |
| CHECKED BY | MRG/JSK | SCALE | N.T.S. |

| |
|------------------------------|
| CONTRACT NO. HT-3012-0000 |
| DRAWING NO. ES-03 |
| SHEET NO. 22 OF 26 |

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PLAN

LEGEND

- SHA LOWLAND MEADOW ESTABLISHMENT/WETLAND TREE PLANTINGS 4" TOPSOIL
- SHA UPLAND MEADOW ESTABLISHMENT/UPLAND TREE PLANTINGS 4" TOPSOIL
- SHA UPLAND MEADOW ESTABLISHMENT/UPLAND TREE PLANTINGS 2" TOPSOIL
- PROPOSED STREAM CHANNEL (NO PLANTING/SEEDING)
- TREE TO BE REMOVED

| WETLAND TREE PLANTING SCHEDULE (THIS SHEET) | | | | | | |
|---|-----|------------------------------|-------------------|---------|-------------|-----------------|
| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | SIZE | CONT. CLASS | SPACING/REMARKS |
| 73 | AS | <i>Acer saccharinum</i> | Silver Maple | 1" cal. | #7 | 12' o.c. |
| 73 | BN | <i>Betula nigra</i> | River Birch | 1" cal. | #7 | 12' o.c. |
| 73 | PO | <i>Platanus occidentalis</i> | American Sycamore | 1" cal. | #7 | 12' o.c. |
| 74 | QP | <i>Quercus palustris</i> | Pin Oak | 1" cal. | #7 | 12' o.c. |
| 74 | SN | <i>Salix nigra</i> | Black Willow* | 1" cal. | #7 | 12' o.c. |

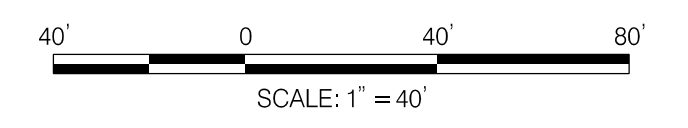
*PLACE ON OUTSIDE OF CHANNEL MEANDERS

| UPLAND TREE PLANTING SCHEDULE (THIS SHEET) | | | | | | |
|--|-----|--------------------------|----------------|---------|-------------|-----------------|
| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | SIZE | CONT. CLASS | SPACING/REMARKS |
| 146 | AR | <i>Acer rubrum</i> | Red Maple | 1" cal. | #7 | 12' o.c. |
| 146 | AS | <i>Acer saccharum</i> | Sugar Maple | 1" cal. | #7 | 12' o.c. |
| 146 | CC | <i>Cercis canadensis</i> | Eastern Redbud | 1" cal. | #7 | 12' o.c. |

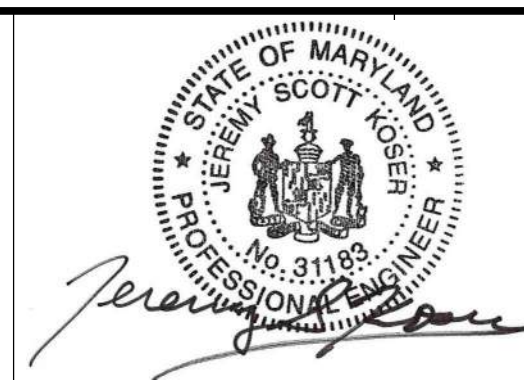
| MATTING SCHEDULE (THIS SHEET) | |
|-------------------------------------|-------------------|
| TYPE | SQUARE YARDS (SY) |
| TYPE 'D' SOIL STABILIZATION MATTING | 12,876 |

| SEED MIX SCHEDULE (THIS SHEET) | | |
|--------------------------------|-------------------|------------------|
| SEED MIX | SQUARE YARDS (SY) | SQUARE FEET (FT) |
| LOWLAND MEADOW ESTABLISHMENT | 5,868 | 52,812 |
| UPLAND MEADOW ESTABLISHMENT | 7,008 | 63,075 |

NOTES:
SEE SHEET LS-03 FOR THE LANDSCAPING NOTES AND DETAILS.



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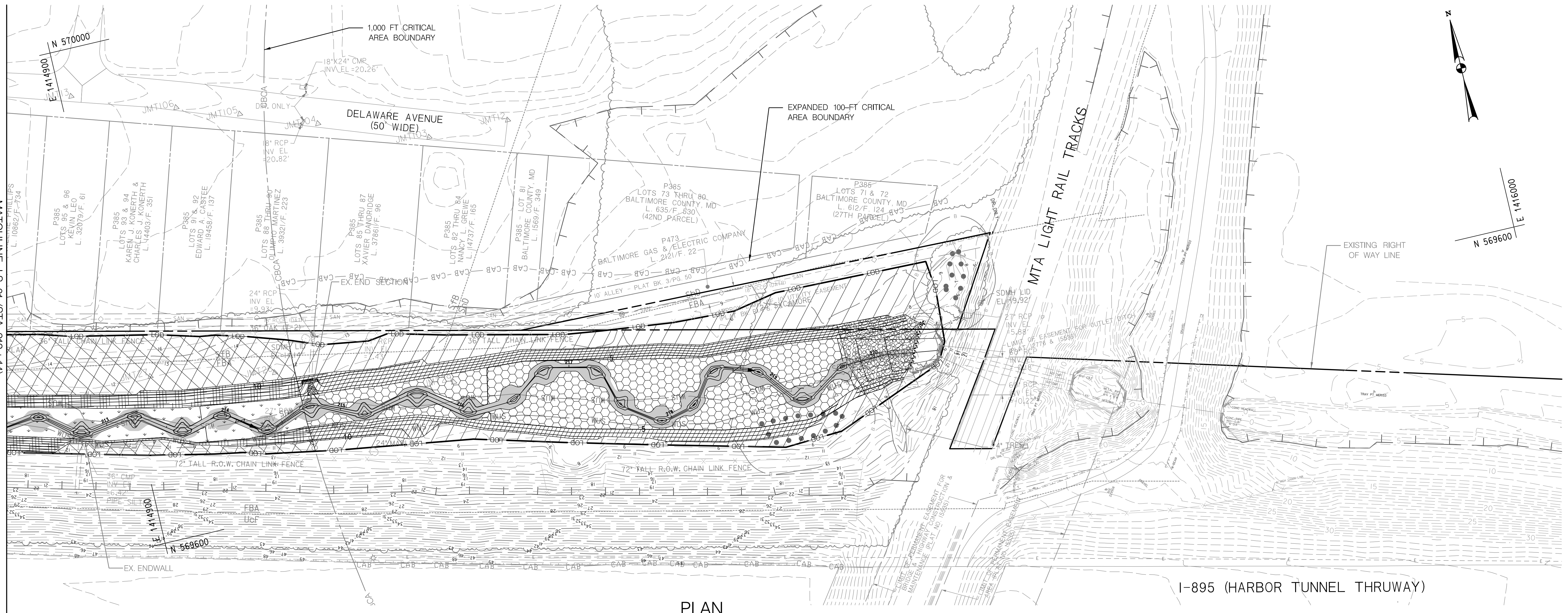


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LICENSE NO. 31183
EXPIRATION DATE: 1/13/2021



| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
| | | | |

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| MARYLAND TRANSPORTATION AUTHORITY | | | CONTRACT NO. HT-3012-0000 |
| ENGINEERING DIVISION | | | DRAWING NO. LS-01 |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | SHEET NO. |
| STREAM RESTORATION PROJECT | | | 23 OF 26 |
| LANDSCAPE PLAN | | | |
| DESIGNED BY MRG/PVC | DRAWN BY JMB | CHECKED BY MRG/JSK | |
| CONST. REVIEW BY JSK | DATE MAY, 2019 | SCALE 1"=40' | |



PLAN

LEGEND

| | |
|--|---|
| | SHA LOWLAND MEADOW ESTABLISHMENT/WETLAND TREE PLANTINGS WITH 4' TOPSOIL |
| | SHA UPLAND MEADOW ESTABLISHMENT/UPLAND TREE PLANTINGS WITH 4' TOPSOIL |
| | CRITICAL AREA SHA LOWLAND MEADOW ESTABLISHMENT/WETLAND TREE AND SHRUB CLUSTER PLANTINGS WITH 4' TOPSOIL |
| | CRITICAL AREA SHA UPLAND MEADOW ESTABLISHMENT/UPLAND TREE AND SHRUB CLUSTER PLANTINGS WITH 4' TOPSOIL |
| | CRITICAL AREA SHA UPLAND MEADOW ESTABLISHMENT/UPLAND TREE AND SHRUB CLUSTER PLANTINGS WITH 2' TOPSOIL |
| | SHA UPLAND MEADOW ESTABLISHMENT/UPLAND TREE PLANTINGS WITH 2' TOPSOIL |
| | PROPOSED STREAM CHANNEL (NO PLANTING/SEEDING) |
| | TREE TO BE REMOVED |

WETLAND TREE PLANTING SCHEDULE (THIS SHEET)

| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | SIZE | CONT. CLASS | SPACING/REMARKS |
|----------|-----|------------------------------|-------------------|---------|-------------|-----------------|
| 6 | AS | <i>Acer saccharinum</i> | Silver Maple | 1" cal. | #7 | 12' o.c. |
| 6 | BN | <i>Betula nigra</i> | River Birch | 1" cal. | #7 | 12' o.c. |
| 6 | PO | <i>Platanus occidentalis</i> | American Sycamore | 1" cal. | #7 | 12' o.c. |
| 6 | QP | <i>Quercus palustris</i> | Pin Oak | 1" cal. | #7 | 12' o.c. |
| 7 | SN | <i>Salix nigra</i> | Black Willow* | 1" cal. | #7 | 12' o.c. |

*PLACE ON OUTSIDE OF CHANNEL MEANDERS

UPLAND TREE PLANTING SCHEDULE (THIS SHEET)

| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | SIZE | CONT. CLASS | SPACING/REMARKS |
|----------|-----|--------------------------|----------------|---------|-------------|-----------------|
| 36 | AR | <i>Acer rubrum</i> | Red Maple | 1" cal. | #7 | 12' o.c. |
| 37 | AS | <i>Acer saccharum</i> | Sugar Maple | 1" cal. | #7 | 12' o.c. |
| 36 | CC | <i>Cercis canadensis</i> | Eastern Redbud | 1" cal. | #7 | 12' o.c. |

CRITICAL AREA UPLAND SMALL SHRUB PLANTING SCHEDULE (THIS SHEET)

| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | HEIGHT (FT) | CONT. CLASS | SPACING/REMARKS* |
|----------|-------|-----------------------------|--------------------|-------------|-------------|------------------|
| 348 | VIDE | <i>Viburnum dentatum</i> | Southern Arrowwood | 1.5 | #1 | 3'-5' o.c. |
| 348 | ARME6 | <i>Aronia melanocarpa</i> | Black Chokeberry | 1.5 | #1 | 3'-5' o.c. |
| 348 | VIPR | <i>Viburnum prunifolium</i> | Blackhaw | 1.5 | #1 | 3'-5' o.c. |

*SEE NOTE 2 ON THIS SHEET.

CRITICAL AREA WETLAND TREE PLANTING SCHEDULE (THIS SHEET)

| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | SIZE | CONT. CLASS | SPACING/REMARKS |
|----------|-----|------------------------------|-------------------|---------|-------------|-----------------|
| 20 | AS | <i>Acer saccharinum</i> | Silver Maple | 1" cal. | #7 | 12' o.c. |
| 20 | BN | <i>Betula nigra</i> | River Birch | 1" cal. | #7 | 12' o.c. |
| 20 | PO | <i>Platanus occidentalis</i> | American Sycamore | 1" cal. | #7 | 12' o.c. |
| 20 | QP | <i>Quercus palustris</i> | Pin Oak | 1" cal. | #7 | 12' o.c. |
| 21 | SN | <i>Salix nigra</i> | Black Willow* | 1" cal. | #7 | 12' o.c. |

*PLACE ON OUTSIDE OF CHANNEL MEANDERS

CRITICAL AREA UPLAND TREE PLANTING SCHEDULE (THIS SHEET)

| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | SIZE | CONT. CLASS | SPACING/REMARKS |
|----------|-----|--------------------------|----------------|---------|-------------|-----------------|
| 58 | AR | <i>Acer rubrum</i> | Red Maple | 1" cal. | #7 | 12' o.c. |
| 58 | AS | <i>Acer saccharum</i> | Sugar Maple | 1" cal. | #7 | 12' o.c. |
| 58 | CC | <i>Cercis canadensis</i> | Eastern Redbud | 1" cal. | #7 | 12' o.c. |

CRITICAL AREA WETLAND SMALL SHRUB PLANTING SCHEDULE (THIS SHEET)

| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | HEIGHT (FT) | CONT. CLASS | SPACING/REMARKS* |
|----------|-------|-----------------------------|--------------------|-------------|-------------|------------------|
| 202 | LIBE3 | <i>Lindera benzoin</i> | Northern Spicebush | 1.5 | #1 | 3'-5' o.c. |
| 202 | VACO | <i>Vaccinium corymbosum</i> | Highbush Blueberry | 1.5 | #1 | 3'-5' o.c. |
| 202 | ILVE | <i>Ilex verticillata</i> | Common Winterberry | 1.5 | #1 | 3'-5' o.c. |

*SEE NOTE 2 ON THIS SHEET.

SEED MIX SCHEDULE (THIS SHEET)

| SEED MIX | SQUARE YARDS (SY) | SQUARE FEET (FT) |
|----------------------------------|-------------------|------------------|
| SHA LOWLAND MEADOW ESTABLISHMENT | 504 | 4,531 |
| SHA UPLAND MEADOW ESTABLISHMENT | 1,757 | 15,806 |

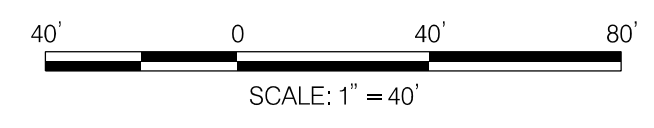
CRITICAL AREA SEED MIX SCHEDULE (THIS SHEET)

| SEED MIX | SQUARE YARDS (SY) | SQUARE FEET (FT) |
|-----------------------------|-------------------|------------------|
| LOWLAND AND UPLAND SEED MIX | 4,403 | 39,625 |

MATTING SCHEDULE (THIS SHEET)

| TYPE | SQUARE YARDS (SY) |
|-------------------------------------|-------------------|
| TYPE 'D' SOIL STABILIZATION MATTING | 6,669 |

- NOTES:**
- SEE SHEET LS-03 FOR THE LANDSCAPING NOTES AND DETAILS.
 - CRITICAL AREA SHRUBS TO BE PLANTED IN CLUSTERS OF 6 AROUND CRITICAL AREA TREES. (SEE LS-03 FOR CLUSTER PLANTING DETAIL)



FILE: Q:\2015\161777_003_I-895_TMDL_Stream_Re-CADD\pds-002_I895_STREAM RESTORATION.dgn
 DATE: Tuesday, February 05, 2019 AT 02:29 PM 02:29 PM



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. 31183
 EXPIRATION DATE: 1/13/2021



ADDENDUMS & REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|-----|-------------|----|------|
| | | | |

MARYLAND TRANSPORTATION AUTHORITY
 ENGINEERING DIVISION
 I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY
 STREAM RESTORATION PROJECT
 LANDSCAPE PLAN

| | | | | | |
|------------------|---------|----------|-----------|------------|---------|
| DESIGNED BY | MRG/PVC | DRAWN BY | JMB | CHECKED BY | MRG/JSK |
| CONST. REVIEW BY | JSK | DATE | MAY, 2019 | SCALE | 1"=40' |

| |
|------------------------------|
| CONTRACT NO. HT-3012-0000 |
| DRAWING NO. LS-02 |
| SHEET NO. 24 OF 26 |

MASTER PLANTING SCHEDULE

| WETLAND TREE PLANTING SCHEDULE (TOTAL*) | | | | | | |
|---|-----|------------------------------|-------------------|---------|-------------|-----------------|
| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | SIZE | CONT. CLASS | SPACING/REMARKS |
| 99 | AS | <i>Acer saccharinum</i> | Silver Maple | 1" cal. | #7 | 12' o.c. |
| 99 | BN | <i>Betula nigra</i> | River Birch | 1" cal. | #7 | 12' o.c. |
| 99 | PO | <i>Platanus occidentalis</i> | American Sycamore | 1" cal. | #7 | 12' o.c. |
| 100 | QP | <i>Quercus palustris</i> | Pin Oak | 1" cal. | #7 | 12' o.c. |
| 102 | SN | <i>Salix nigra</i> | Black Willow* | 1" cal. | #7 | 12' o.c. |

*CRITICAL AREA WETLAND TREES INCLUDED TOTAL.
**PLACE ON OUTSIDE OF CHANNEL MEANDERS.

| UPLAND TREE PLANTING SCHEDULE (TOTAL*) | | | | | | |
|--|-----|--------------------------|----------------|---------|-------------|-----------------|
| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | SIZE | CONT. CLASS | SPACING/REMARKS |
| 240 | AR | <i>Acer rubrum</i> | Red Maple | 1" cal. | #7 | 12' o.c. |
| 241 | AS | <i>Acer saccharum</i> | Sugar Maple | 1" cal. | #7 | 12' o.c. |
| 240 | CC | <i>Cercis canadensis</i> | Eastern Redbud | 1" cal. | #7 | 12' o.c. |

*CRITICAL AREA UPLAND TREES INCLUDED IN TOTAL.

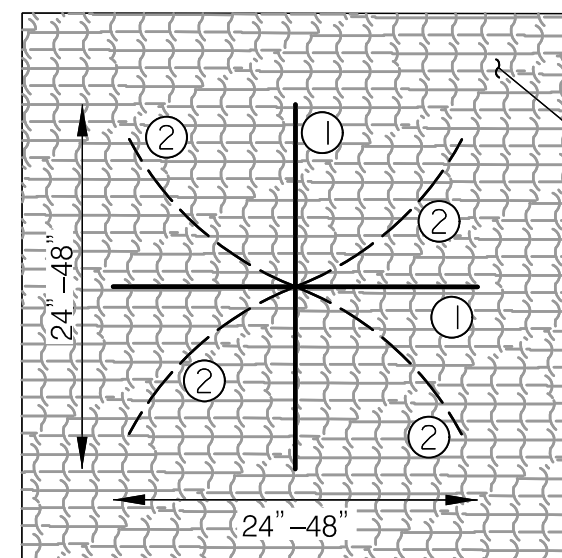
| MEADOW ESTABLISHMENT SCHEDULE (TOTAL) | | |
|---|-------------------|------------------|
| SEED MIX | SQUARE YARDS (SY) | SQUARE FEET (FT) |
| SHA LOWLAND MEADOW ESTABLISHMENT | 6,372 | 57,343 |
| SHA UPLAND MEADOW ESTABLISHMENT | 8,765 | 78,881 |
| CRITICAL AREA LOWLAND AND UPLAND MEADOW ESTABLISHMENT | 4,403 | 39,625 |

| MATTING SCHEDULE (TOTAL) | |
|-------------------------------------|-------------------|
| TYPE | SQUARE YARDS (SY) |
| TYPE 'D' SOIL STABILIZATION MATTING | 19,545 |

| CRITICAL AREA UPLAND SMALL SHRUB PLANTING SCHEDULE (TOTAL) | | | | | | |
|--|-------|-----------------------------|--------------------|-------------|-------------|-----------------|
| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | HEIGHT (FT) | CONT. CLASS | SPACING/REMARKS |
| 348 | VIDE | <i>Viburnum dentatum</i> | Southern Arrowwood | 1.5 | #1 | 3'-5' o.c. |
| 348 | ARME6 | <i>Aronia melanocarpa</i> | Black Chokeberry | 1.5 | #1 | 3'-5' o.c. |
| 348 | VIPR | <i>Viburnum prunifolium</i> | Blackhaw | 1.5 | #1 | 3'-5' o.c. |

| CRITICAL AREA WETLAND SMALL SHRUB PLANTING SCHEDULE (TOTAL) | | | | | | |
|---|-------|-----------------------------|--------------------|-------------|-------------|-----------------|
| QUANTITY | KEY | BOTANICAL NAME | COMMON NAME | HEIGHT (FT) | CONT. CLASS | SPACING/REMARKS |
| 202 | LIBE3 | <i>Lindera benzoin</i> | Northern Spicebush | 1.5 | #1 | 3'-5' o.c. |
| 202 | VACO | <i>Vaccinium corymbosum</i> | Highbush Blueberry | 1.5 | #1 | 3'-5' o.c. |
| 202 | ILVE | <i>Ilex verticillata</i> | Common Winterberry | 1.5 | #1 | 3'-5' o.c. |

TREE & SHRUB INSTALLATION THROUGH SOIL STABILIZATION MATTING



- MAKE CUT WITH SHARP KNIFE THROUGH SOIL STABILIZATION MATTING - SEE SOLID LINE IN DIAGRAM. NOTE THAT ALL CUTS IN THE MATTING SHALL BE A MINIMUM OF 2 FEET CLEAR OF ALL MATTING SEAMS, OVERLAPS AND EDGES.
- TEMPORARILY PIN BACK MATTING WITH 4 STAPLES TO INSTALL TREE OR SHRUB - SEE DASHED LINE IN DIAGRAM.
- INSTALL PLANT THROUGH PINNED BACK MATTING. INSTALL PLANT AT PROPER GRADE TO GROUND PLANE.
- REMOVE 4 STAPLES PLACED IN STEP 2 ABOVE THAT WERE USED TO TEMPORARILY PIN BACK THE MATTING DURING ROOT BALL INSTALLATION.
- PLACE 4 STAPLES IN EACH OF FOUR CUT SECTIONS TO WELL ANCHOR SOIL STABILIZATION MATTING BACK OVER TOP OF THE ROOT BALL.
- FOR TREE INSTALLATIONS, INSTALL TREE STAKES THROUGH MATTING, ONCE RE-ANCHORED OVER ROOT BALL.

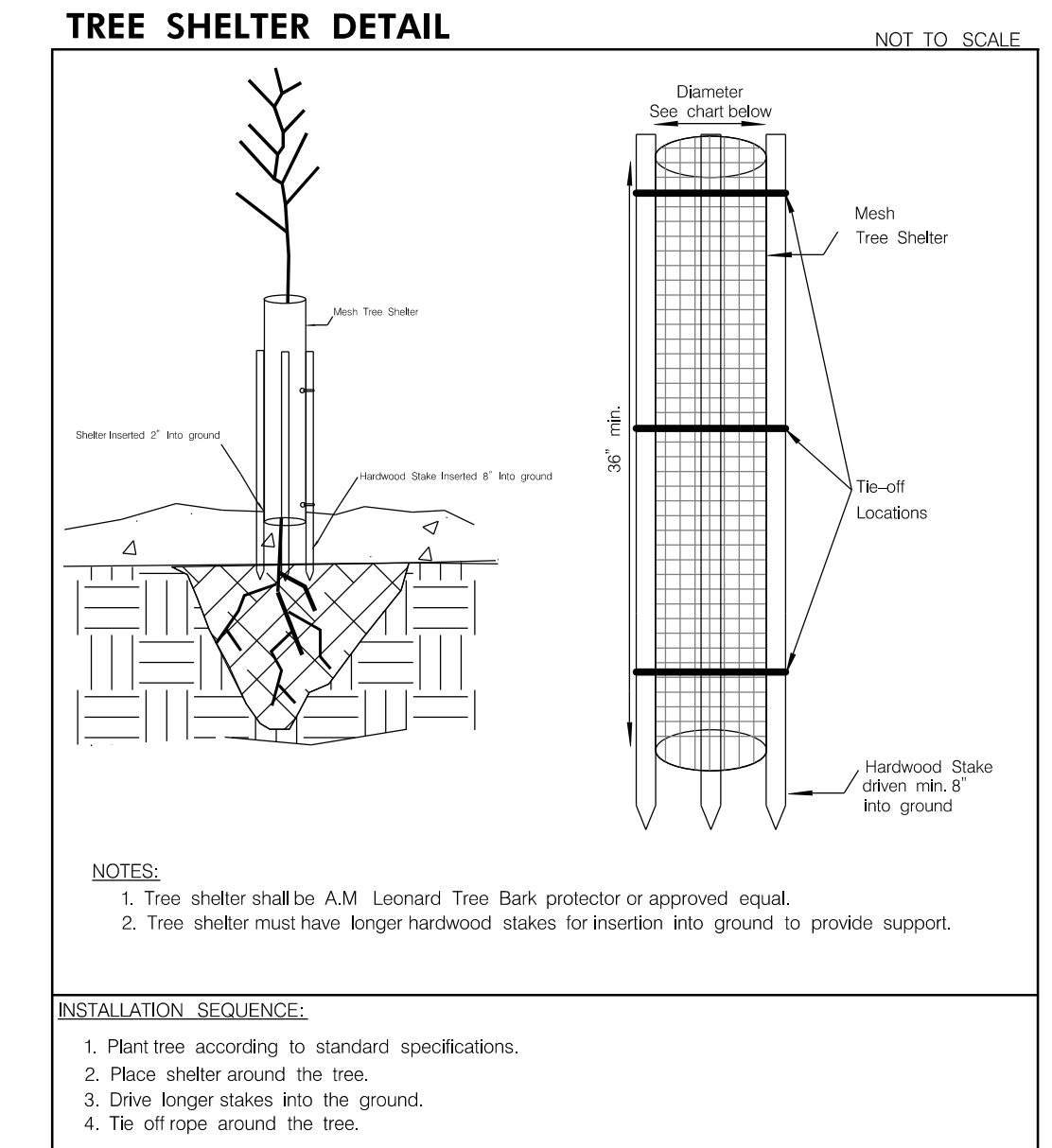
| LOWLAND SEED MIX | |
|--|-----------------------|
| SEED MIX | PERCENT (%) BY WEIGHT |
| Panicum clandestinum /Deertongue | 20.6 |
| Elymus riparius /Riverbank Wildrye, PA Ecotype | 20.0 |
| Andropogon gerardii/Big Bluestem | 10.0 |
| Carex lurida /Lurid (Shallow) Sedge, PA Ecotype | 10.0 |
| Carex vulpinoidea /Fox Sedge | 10.0 |
| Carex scoparia /Blunt Broom Sedge, PA Ecotype | 8.0 |
| Panicum virgatum /Switchgrass | 8.0 |
| Verbena hastata /Blue Vervain, PA Ecotype | 4.0 |
| Juncus effusus /Soft Rush | 3.0 |
| Asclepias incarnata /Swamp Milkweed, PA Ecotype | 1.0 |
| Aster novae-angliae /New England Aster, PA Ecotype | 1.0 |
| Desmodium paniculatum /Panicleleaf Ticktrefoil, PA Ecotype | 1.0 |
| Eupatorium fistulosum /Joe Pye Weed, PA Ecotype | 1.0 |
| Eupatorium perfoliatum /Boneset, PA Ecotype | 0.7 |
| Helenium autumnale /Common Sneezeweed, PA Ecotype | 0.5 |
| Monarda fistulosa /Wild Bergamot, PA Ecotype | 0.5 |
| Vernonia noveboracensis /New York Ironweed, PA Ecotype | 0.5 |
| Mimulus ringens /Square Stemmed Monkeyflower, PA Ecotype | 0.2 |

*APPLIED AT 20 LBS/ACRE

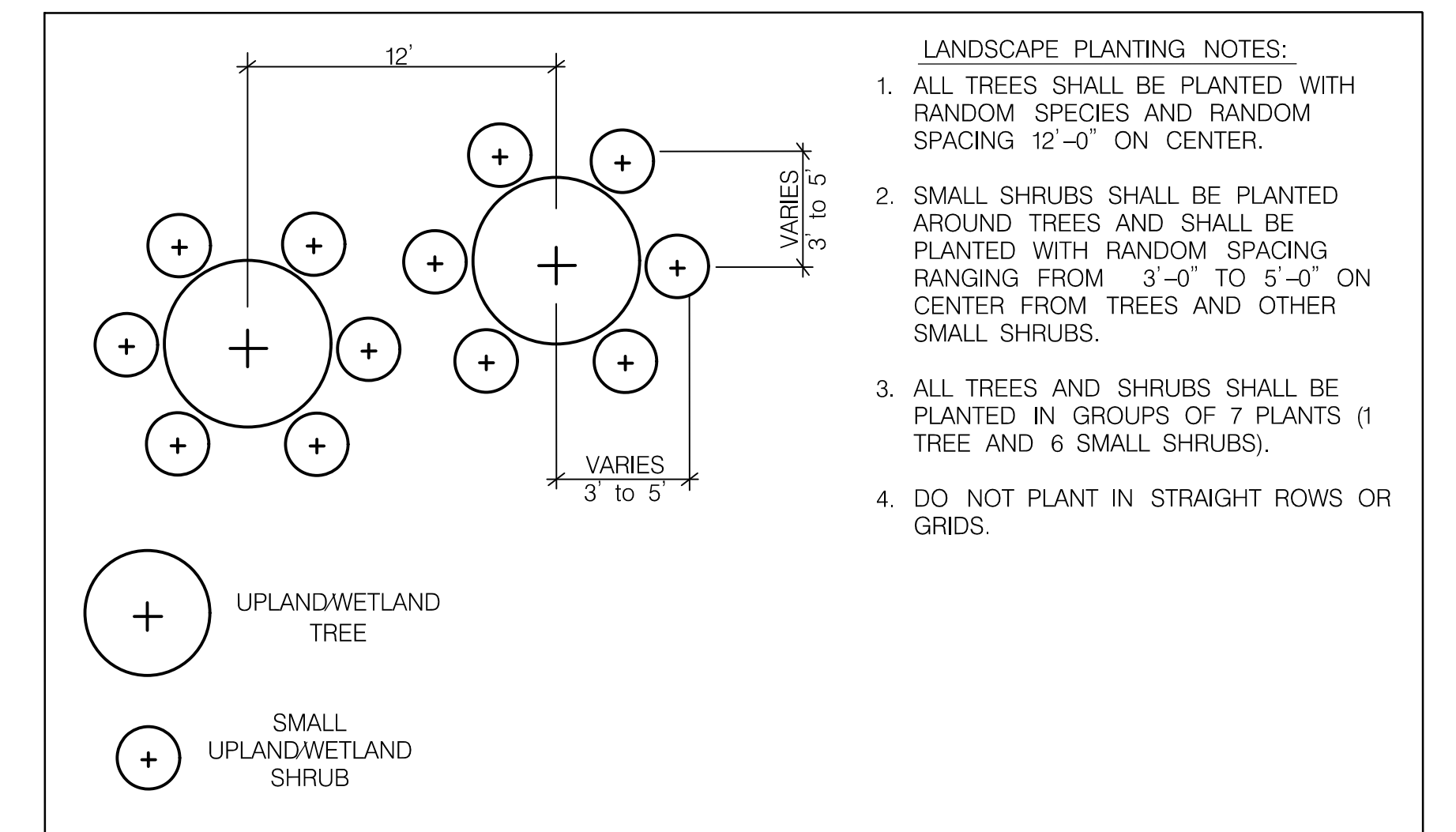
| UPLAND SEED MIX | |
|--|-----------------------|
| SEED MIX | PERCENT (%) BY WEIGHT |
| Sorghastrum nutans /Indiangrass, PA Ecotype | 53.0 |
| Elymus virginicus /Virginia Wildrye, PA Ecotype | 15.0 |
| Tridens flavus /Purpletop, VA Ecotype | 8.0 |
| Andropogon gerardii/Big Bluestem | 5.0 |
| Chamaecrista fasciculata /Partridge Pea, PA Ecotype | 5.0 |
| Rudbeckia hirta /Blackeyed Susan, NC Ecotype | 3.0 |
| Lespedeza virginica /Slender Lespedeza, VA Ecotype | 2.0 |
| Asclepias syriaca /Common Milkweed, PA Ecotype | 1.0 |
| Aster novae-angliae /New England Aster, PA Ecotype | 1.0 |
| Aster sagittifolius /Arrowleaf (Sagittate) Aster, PA Ecotype | 1.0 |
| Heliopsis helianthoides /Oxeye Sunflower, PA Ecotype | 1.0 |
| Penstemon digitalis /Tall White Beardtongue, PA Ecotype | 1.0 |
| Penstemon hirsutus /Hairy Beardtongue | 1.0 |
| Senna hebecarpa /Wild Senna, VA & WV Ecotype | 1.0 |
| Solidago juncea /Early Goldenrod, VA Ecotype | 1.0 |
| Monarda fistulosa /Wild Bergamot, PA Ecotype | 0.8 |
| Pycnanthemum tenuifolium /Narrowleaf Mountainmint | 0.3 |

*APPLIED AT 20 LBS/ACRE

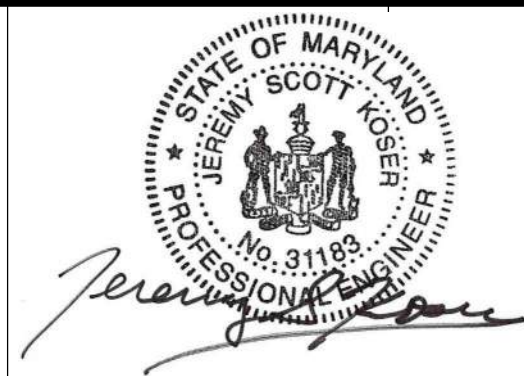
| For Critical Area Commission Information Only | | |
|--|-------------------------------|------------------|
| Critical Area Mitigation Cluster Planting and Seeding | | |
| Proposed Restoration | Credit Ratio | Proposed Credits |
| 275 clusters (1" Caliper trees with 6 small shrubs per tree) | 1 cluster = 3 credits | 825 |
| 39,625 SF of seeding (lowland and upland seed mix) | 500 SF of seed mix = 1 credit | 79 |
| Total Proposed Credits | | 904 |
| Total Critical Area Expanded Buffer Mitigation Credits Required = 797 Credits | | |
| 39,856 SF (ground disturbance) + 39,856 SF (vegetative clearing) = 79,712 SF | | |
| 79,712 SF/ 100= 797 | | |



CRITICAL AREA CLUSTER PLANTING LAYOUT DETAIL



FILE: Q:\2015\181777-003-1-895-TMDL-Stream-Re\CADD\PLS-003-1895-STREAM RESTORATION.dgn
DATE: Tuesday, December 18, 2018 AT 02:27 PM 02:27 PM



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. 31183
EXPIRATION DATE: 1/13/2021

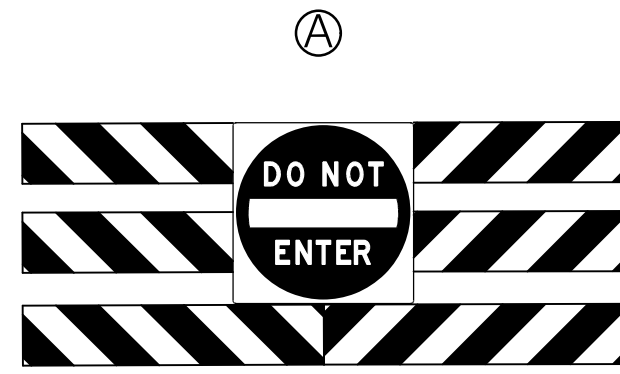


MARYLAND TRANSPORTATION AUTHORITY

Engineering Division

| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
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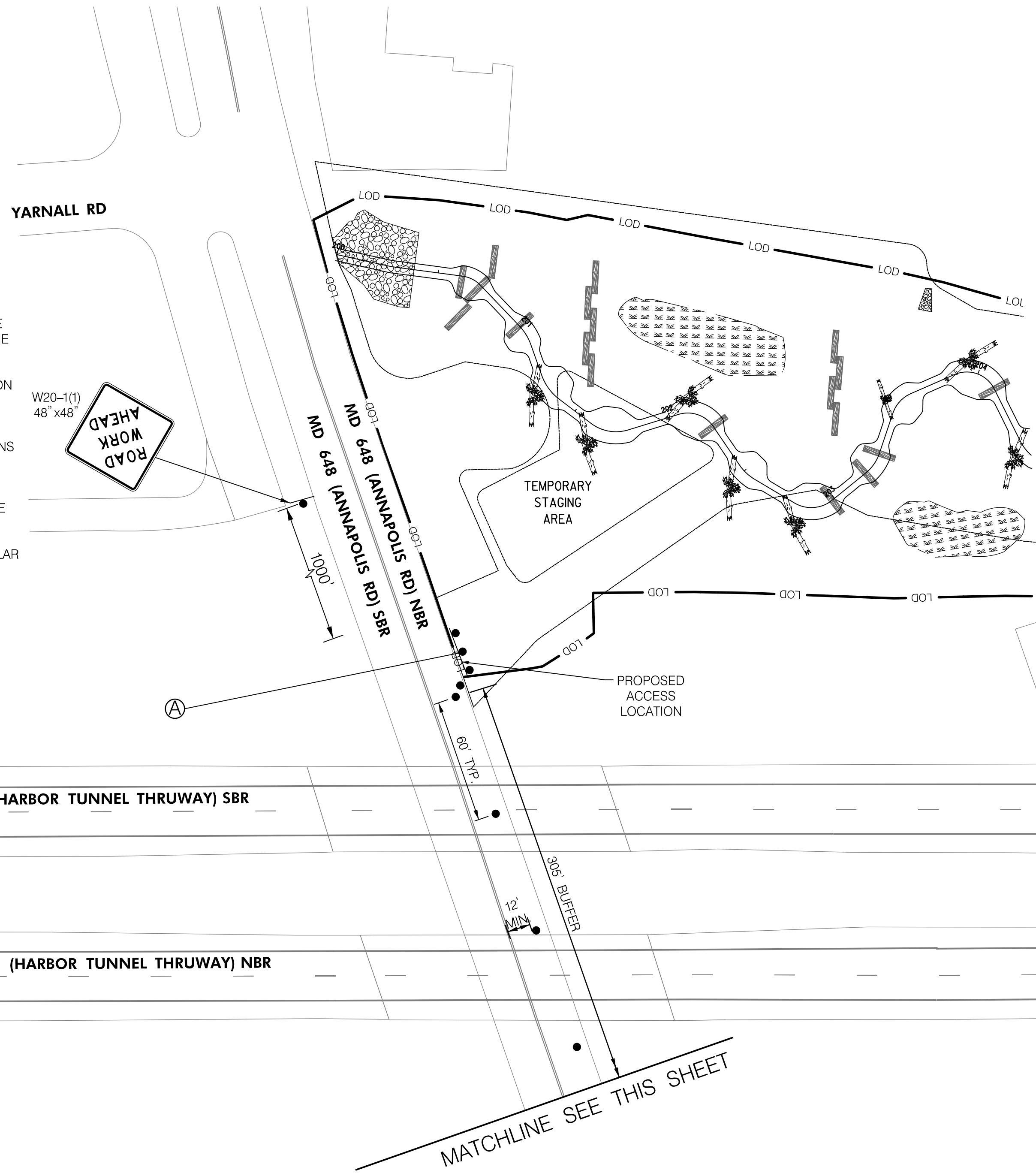
| MARYLAND TRANSPORTATION AUTHORITY | | | CONTRACT NO. |
|--|----------------|--------------------|--------------|
| ENGINEERING DIVISION | | | HT-3012-0000 |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | | DRAWING NO. |
| STREAM RESTORATION PROJECT | | | LS-03 |
| LANDSCAPING NOTES AND DETAILS | | | SHEET NO. |
| DESIGNED BY MRG/PVC | DRAWN BY JMB | CHECKED BY MRG/JSK | 25 OF 26 |
| CONST. REVIEW BY JSK | DATE MAY, 2019 | SCALE N.T.S. | |



R5-1 (36" x 36") PLACED ON A TYPE III BARRICADE. STRIPES TO SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE. PLACE ACROSS TEMPORARY ACCESS LOCATION DURING NON-WORK HOURS.

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2011 MDMUTC AND SUBSEQUENT REVISIONS ADOPTED BY THE STATE OF MARYLAND.
2. REFER TO TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION MD 104.02-02 FROM THE MDSA BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES.
3. NO WORK SHALL BEGIN UNTIL ALL ADVANCED WARNING SIGNS AND BARRICADES ARE IN PLACE AND OPERATIONAL FOR CONSTRUCTION.
4. ALL EXISTING SIGNS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION UNLESS A CHANGE IS SHOWN ON THE PLAN AND/OR AS DIRECTED BY THE PROJECT ENGINEER. SIGNS THAT ARE NOT APPLICABLE FOR A PARTICULAR STAGE SHALL BE REMOVED OR COMPLETELY COVERED WITH NON- TRANSPARENT MATERIAL.
5. REFER TO MD STD. NOS. 104.00-06 – 104.00-08, SECTION 4.0 SIGNS, AND MD STD. NOS. 104.01-17A – 104.01-17D FOR TEMPORARY SIGNS AND SUPPORTS.



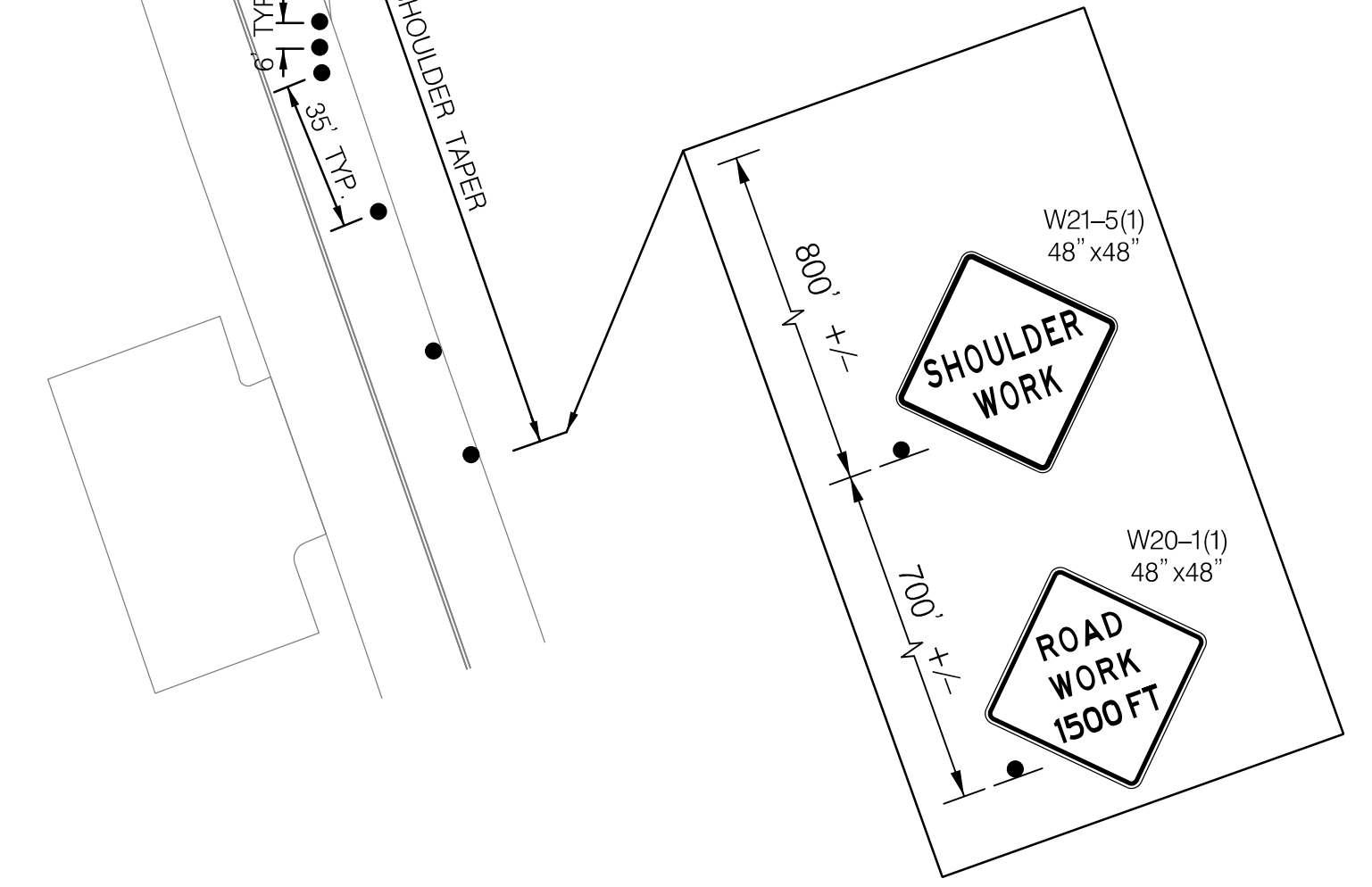
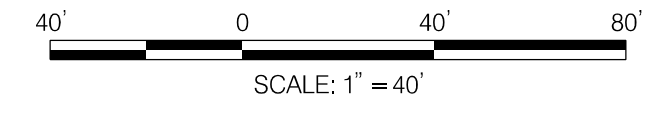
MATCHLINE SEE THIS SHEET

MATCHLINE SEE THIS SHEET

I-895 (HARBOR TUNNEL THRUWAY) SBR
I-895 (HARBOR TUNNEL THRUWAY) NBR

LEGEND

- SIGN POST – ●
- TYPE III BARRICADE – ●●●
- PROPOSED SIGN –
- DRUM – ●



FILE: Q:\2015\151777_003_I-895_Stream_Re\CADD\pMT-001_895_STREAM RESTORATION.dgn DATE: Friday, December 14, 2018 AT 02:45 PM 02:45 PM



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. 31183
EXPIRATION DATE: 1/13/2021



| ADDENDUMS & REVISIONS | | | |
|-----------------------|-------------|----|------|
| NO. | DESCRIPTION | BY | DATE |
| | | | |
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| | | |
|--|--------|------------|
| MARYLAND TRANSPORTATION AUTHORITY | | |
| ENGINEERING DIVISION | | |
| I-895 MILE MARKER 5.2 UNNAMED PATAPSCO RIVER TRIBUTARY | | |
| STREAM RESTORATION PROJECT | | |
| MAINTENANCE OF TRAFFIC PLAN | | |
| DESIGNED BY | AEZ | CHECKED BY |
| CONST. REVIEW BY | | GAB |
| DRAWN BY | AEZ | DATE |
| | | MAY, 2019 |
| SCALE | 1"=40' | |

| |
|------------------------------|
| CONTRACT NO. HT-3012-0000 |
| DRAWING NO. MT-01 |
| SHEET NO. 26 OF 26 |