



# Maryland Transportation Authority

## I-95 ETL NORTHBOUND EXTENSION PHASE II - LILLY RUN STREAM RESTORATION HARFORD COUNTY, MD

### CONTRACT NO.: KH-30XX

#### 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 ADMINISTRATION'S "STANDARDS FOR HIGHWAY AND INCIDENTAL CONSTRUCTION", THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION'S "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.

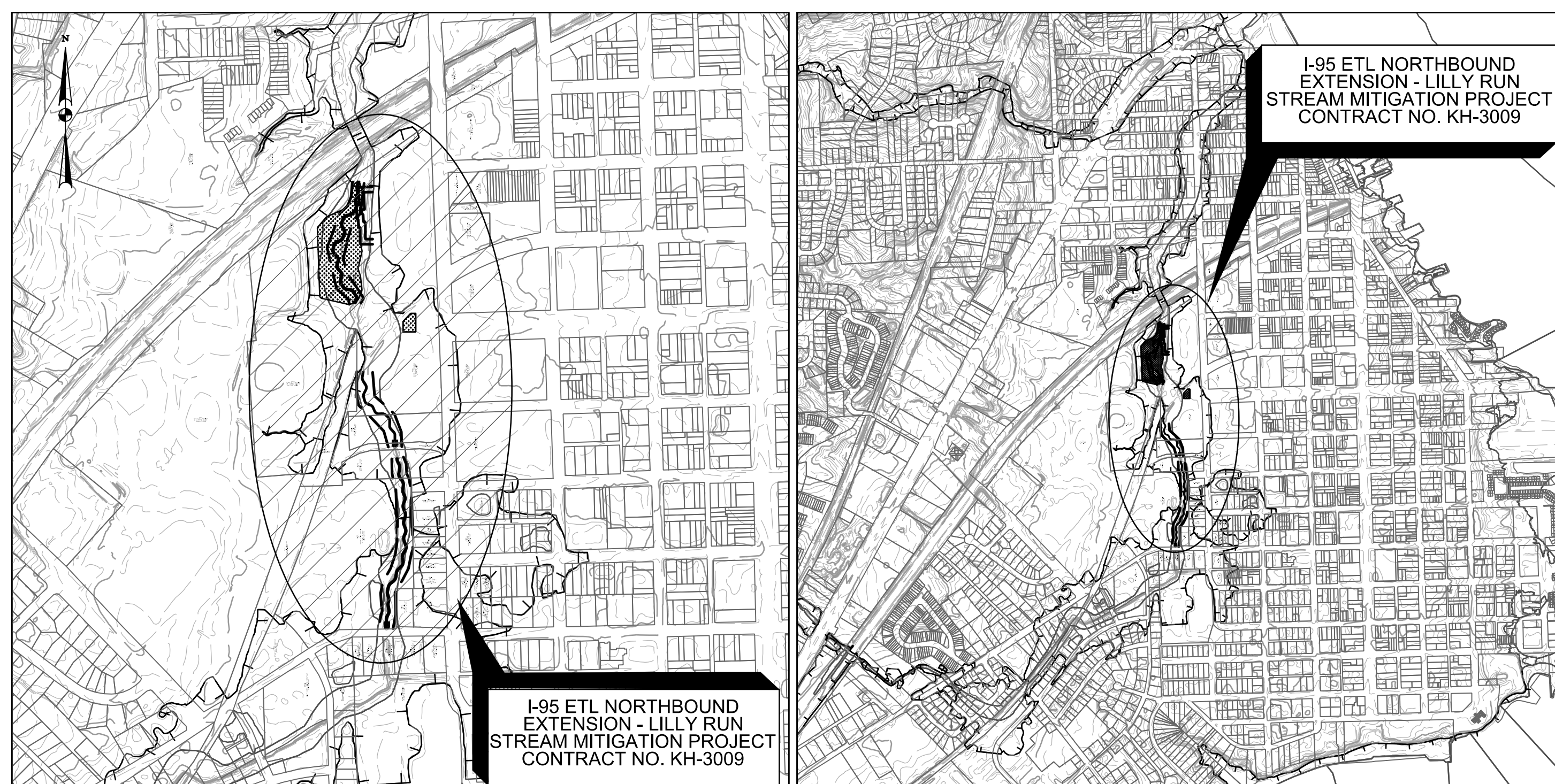
DATE \_\_\_\_\_ OWNER /DEVELOPER SIGNATURE \_\_\_\_\_

RESPONSIBLE PERSONNEL CERTIFICATION NO. \_\_\_\_\_ PRINTED NAME AND TITLE \_\_\_\_\_

**PRELIMINARY  
NOT FOR CONSTRUCTION**

MDE No. \_\_\_\_\_

ADDENDA	<b>MARYLAND TRANSPORTATION AUTHORITY</b>
	RECOMMENDED FOR APPROVAL
	DIRECTOR OF ENGINEERING, OFFICE OF ENGINEERING AND CONSTRUCTION      DATE _____
	APPROVED
	CHIEF ENGINEER, OFFICE OF ENGINEERING AND CONSTRUCTION      DATE _____



**LOCATION MAP**  
SCALE : 1"=500'

HORIZONTAL DATUM	NAD 83 / 91
VERTICAL DATUM	NAVD 88

**VICINITY MAP**  
SCALE : 1"=1000'

PROJECT LENGTH  
2,058 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. \_\_\_\_\_, EXPIRATION DATE: \_\_\_\_\_.

ABBREVIATIONS

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	RW..... RIGHT OF WAY
APPROX..... APPROXIMATE	I.S.T..... INLET SEDIMENT TRAP	R.C.P..... REINFORCED CEMENT PIPE
B..... BASELINE	INV..... INVERT	R.C.C.P..... REINFORCED CEMENT CONCRETE PIPE
BK..... BACK /BOOK	J.B..... 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..... 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..... CENTERLINE	LT..... LEFT	SE..... SUPER ELEVATION
CL..... CLASS	MAC..... MACADAM	SF..... SILT FENCE
CLF..... CHAINLINK FENCE	M.C..... MOISTURE CONTENT	S.E..... SQUARE FEET
CMF..... CORRUGATED METAL PIPE	MAX..... MAXIMUM	SHT..... 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	PAY.T..... PAVEMENT	T.C..... TOP OF COVER
E..... ELECTRIC	P.C..... POINT OF CURVATURE	T.G..... TOP OF GRATE
E..... EXTERNAL DISTANCE	P.C.C..... POINT OF COMPOUND CURVATURE	T.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	TS..... TEMPORARY SWALE
E.R.C.C.P..... ELLIPTICAL REINFORCED CEMENT CONCRETE PIPE	P.G.L..... PROFILE GRADE LINE	T.S..... TOP OF SLAB
ES..... END SECTION	P.G.L..... PROFILE GROUND LINE	T.S..... TOPSOIL
EX..... EXISTING	PR..... POINT OF ROTATION	TYP..... TYPICAL
EX.or.EXIST..... EXISTING	P.I..... PLASTICITY INDEX	U.D..... UNDER DRAIN
FT..... FEET	P.I..... POINT OF INTERSECTION	U.G..... UNDERGROUND
FF..... FINISHED FLOOR	P.O.C..... POINT ON CURVE	U.P..... UTILITY POLE
F.or.FL..... FLOWLINE	P.O.T..... POINT ON TANGENT	U.S.D.A..... UNITED STATES DEPARTMENT OF AGRICULTURE
F.B.D..... FLAT BOTTOM DITCH	PR.or.PROP..... PROPOSED	VCL..... VERTICAL CLEARANCE
F.H..... FIRE HYDRANT	P.R.C..... POINT OF REVERSE CURVE	V.C.L..... VERTICAL CURVE LENGTH
FWD..... FORWARD	PT..... POINT	W..... WATER
G..... GAS	P.T..... POINT OF TANGENCY	W..... WEST
G.V..... GAS VALVE	P.V.C..... POINT OF VERTICAL CURVE	W.B..... WESTBOUND
H.B..... HANDBOX	PVC..... POLYVINYL CHLORIDE	WB..... WETLAND BUFFER
H.D.P..... HIGH DENSITY POLYETHYLENE	P.V.I..... POINT OF VERTICAL INTERSECTION	WM..... WATER METER
HDWL..... HEADWALL	P.V.R.C..... POINT OF VERTICAL REVERSE CURVE	W.S..... WRAPPED STEEL
H.E.R.C.P..... HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE	P.V.T..... POINT OF VERTICAL TANGENCY	W.U.S..... WATERS OF THE UNITED STATES
	R..... RADIUS	W.V..... WATER VALVE

GENERAL NOTES

- ALL WORK ON THE PROJECT SHALL BE DONE IN ACCORDANCE WITH BOTH MDSHA AND THE PROJECT SPECIFICATIONS AND WHERE REFERENCED IS MADE, THE REQUIREMENTS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION'S SPECIFICATIONS ENTITLED: "2018 MDT 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 (60-90) 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 ENVIRONMENTAL 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

EXISTING CONTOURS	OHE WIRES	UPLAND PLANTING AREAS
PROPOSED CONTOURS	EXISTING CHAIN LINK FENCE	LOWLAND PLANTING AREAS
LIMIT OF DISTURBANCE	EXISTING CURB OR CURB & GUTTER	EXISTING STREAM
STABILIZED CONSTRUCTION ENTRANCE	TEST HOLE, SOIL BORING	APPROXIMATE TOP OF FLOODPLAIN CUT
RIGHT OF WAY LINE	BASE OR SURVEY LINE	PROPOSED WETLAND FEATURE
PROPERTY LINE	SANITARY SEWER MANHOLE	25 FOOT MITIGATION BUFFER
ELECTRICAL HAND BOX - SIGNALS	ACCESS ROAD	
EXISTING TRAFFIC LIGHT POLE	WATERS OF THE US	
EXISTING ELECTRICITY POLE	WETLANDS, WITH BUFFER	
EXISTING SIGN	EXISTING FLOODPLAIN BOUNDARY	
EXISTING WATER METER/MANHOLE	SANITARY SEWER LINE	
EXISTING FIRE HYDRANT	TREES CRITICAL ROOT ZONE/ NUMBER/DBH/TYPE	
EXISTING ELECTRICITY MANHOLE	FOREST BUFFER	
EXISTING TELECOMMUNICATION MANHOLE	EXISTING TREE LINE	
EXISTING STORM DRAIN INLET	DITCH/FLOW LINE	
EXISTING STORM DRAIN MANHOLE	DRAINAGE AREA BOUNDARY	
EXISTING CULVERT/PIPE	STREAM WIDTH	
BURIED ELECTRICITY LINES	FLOODPLAIN MICROTOPOGRAPHY	
BURIED TELECOMMUNICATION/CABLE TV CABLES	LOG SILLS	
BURIED FIBER OPTIC CABLES	LOG VANE	
EXISTING ROADWAY EDGE	RIP-RAP	

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



PRELIMINARY  
NOT FOR  
CONSTRUCTION



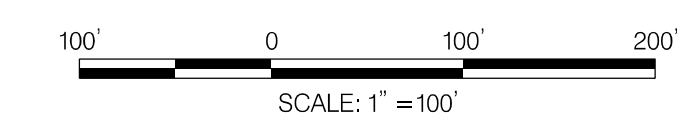
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION

GENERAL NOTES AND ABBREVIATIONS

DESIGNED BY	KNH	DRAWN BY	KNH	CHECKED BY	JM
CONST. REVIEW BY		DATE	JULY 2019	SCALE	N.T.S.

CONTRACT NO. KH-30XX
DRAWING NO. <b>GN-01</b>
SHEET NO. 2 OF 18



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88



**PRELIMINARY  
 NOT FOR  
 CONSTRUCTION**



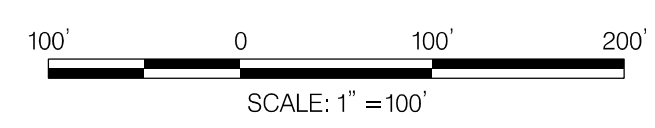
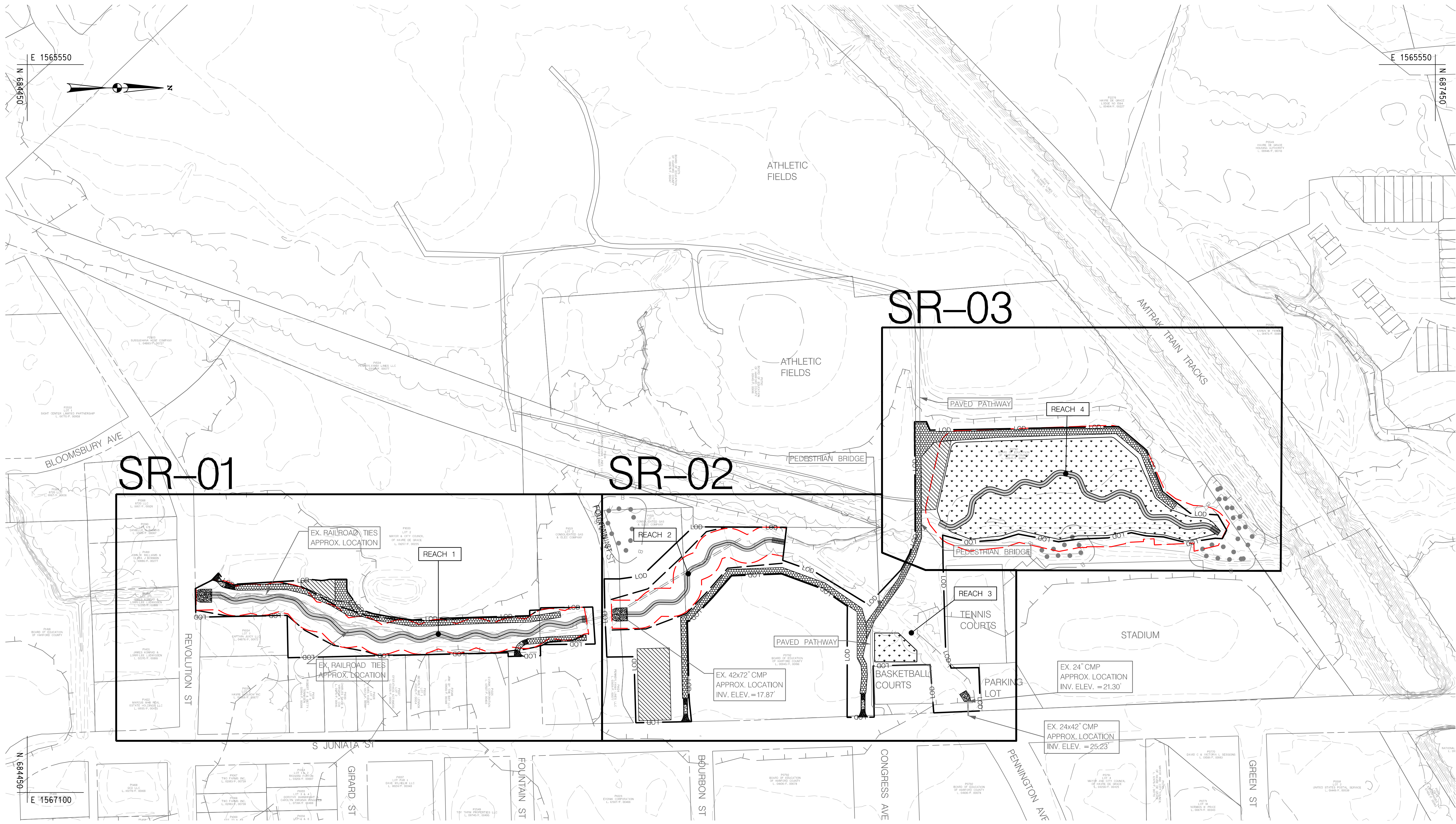
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
 LILLY RUN STREAM RESTORATION**

**EXISTING CONDITIONS MAP**

DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM  
 CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE 1"=100'

CONTRACT NO.  
 KH-30XX  
 DRAWING NO.  
**EC-01**  
 SHEET NO.  
 3 OF 18



HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



**PRELIMINARY  
NOT FOR  
CONSTRUCTION**



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**

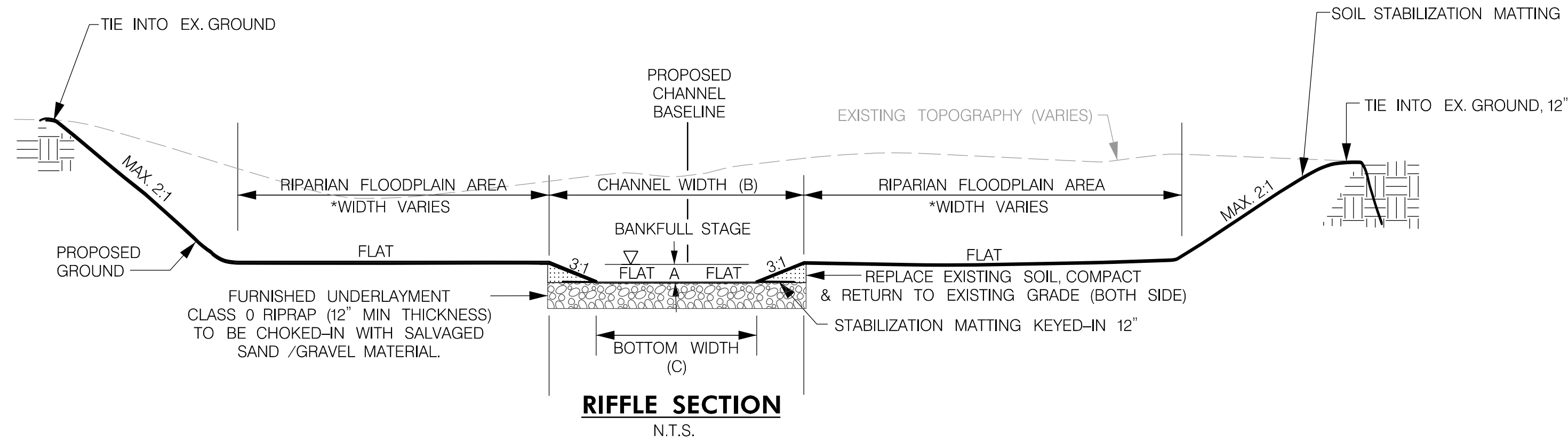
CONTRACT NO.  
KH-30XX  
DRAWING NO.  
**KM-01**

**KEY MAP**

DESIGNED BY <u>KNH</u>	DRAWN BY <u>KNH</u>	CHECKED BY <u>JM</u>	SHEET NO.
CONST. REVIEW BY	DATE <u>JULY 2019</u>	SCALE <u>1"=100'</u>	4 OF 18

### TYPICAL CROSS SECTION

N.T.S.



### RIFFLE SECTION

N.T.S.

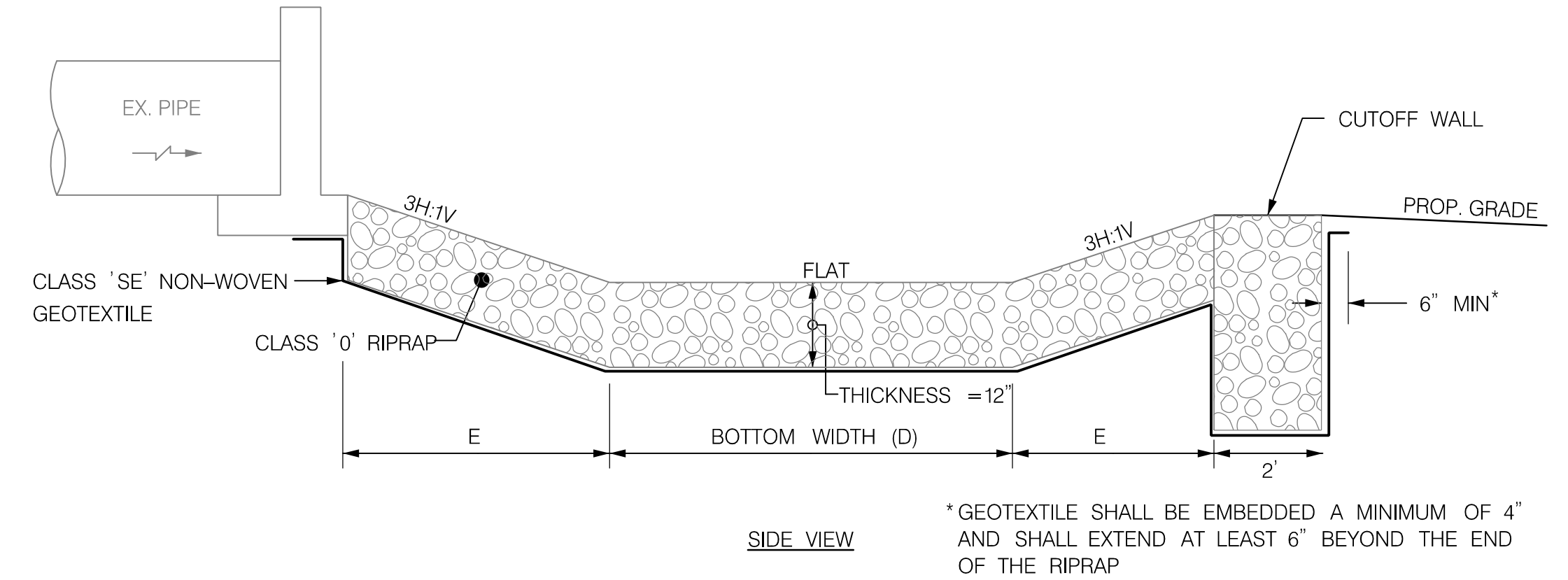
RIFFLE DIMENSION TABLE			
BANKFULL DEPTH (A)	CHANNEL WIDTH (B)	BOTTOM WIDTH (C)	REACH
1.50'	13'	4'	1
1.00'	10'	4'	2
1.00'	11'	5'	4

**NOTES:**

1. THE FLOODPLAIN AREAS SHOWN AS FLAT ON THE TYPICAL SECTIONS, WILL ACTUALLY CONTAIN VARIED MICROTOPOGRAPHY TO BE CREATED DURING CONSTRUCTION UNDER THE GUIDANCE OF THE ON-SITE ENGINEER. MICROTOPOGRAPHY VARIATIONS SHOULD BE UP TO 0.50 FEET FROM DESIGNED ELEVATION WITH NO MORE THAN 25% OF EACH WETLAND CELL REMAINING AT DESIGN ELEVATIONS.
2. THE IMPORTED GRAVEL UNDERLAYMENT SHALL BE OF APPROPRIATE NATURAL COLOR (e.g. BROWN GRAY, DARK GRAY, DARK BROWN). WHITE STONE WILL NOT BE ACCEPTABLE.
3. THE IMPORTED GRAVEL UNDERLAYMENT SHALL BE CHOKED IN WITH EXISTING STREAMBED AND SAND /GRAVEL MATERIAL TO FILL ALL VOID SPACES.
4. SEE DE-01 FOR STABILIZATION MATTING DETAIL.
5. 6 INCHES OF FURNISHED TOPSOIL SHALL BE INSTALLED WITHIN THE RIPARIAN FLOODPLAIN AREA. TOPSOIL SHOULD BE SALVAGED WHEN ACCEPTABLE. THE SITE SHOULD BE GRADED TO BELOW 6 INCHES OF FINAL GRADE, THEN 6 INCHES OF TOPSOIL SPREAD OVER THE SITE.
6. THE SURFACE OF THE SOIL MUST NOT BE COMPACTED TO THE EXTENT THAT IT LIMITS PLANT ESTABLISHMENT AND MICROBIAL ACTIVITY. UPON COMPLETION OF INITIAL GRADE (BEFORE ADDING TOPSOIL), THE SOIL MUST BE DISLIKED OR CHISEL PLOWED TO A DEPTH OF AT LEAST 8 INCHES.
7. WOODY DEBRIS LOCATED WITHIN RIPARIAN FLOODPLAIN AREA SHOULD BE ADDED, AT A MINIMUM RATE OF THREE DUMP TRUCK LOADS PER ACRE. THIS MAY INCLUDE A COMBINATION OF LOGS, BRUSH PILES, OVERTURNED STUMPS, ETC.

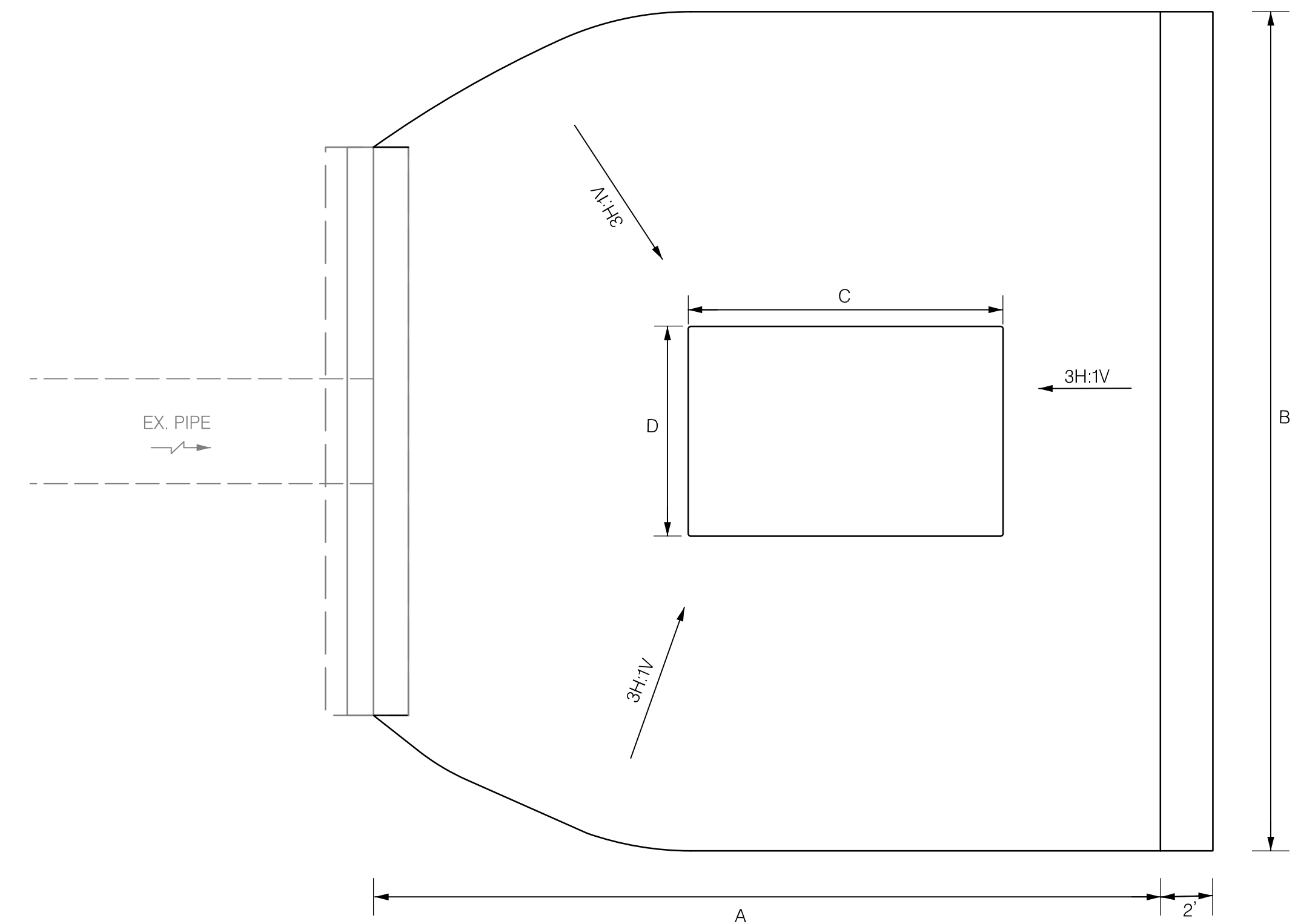
### SCOUR HOLE DETAIL

N.T.S.



SIDE VIEW

\*GEOTEXTILE SHALL BE EMBEDDED A MINIMUM OF 4" AND SHALL EXTEND AT LEAST 6" BEYOND THE END OF THE RIPRAP



SCOUR HOLE DIMENSION TABLE					
	A	B	C	D	E
REACH 1	*	*	*	*	*
REACH 2	31.5'	28'	10.5'	7'	10.5'
REACH 3	18'	16'	6'	4'	6'

\*REACH 1 SCOUR HOLE TO BE SIZED WHEN EXISTING PIPE SIZE IS OBTAINED.

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



**PRELIMINARY  
NOT FOR  
CONSTRUCTION**



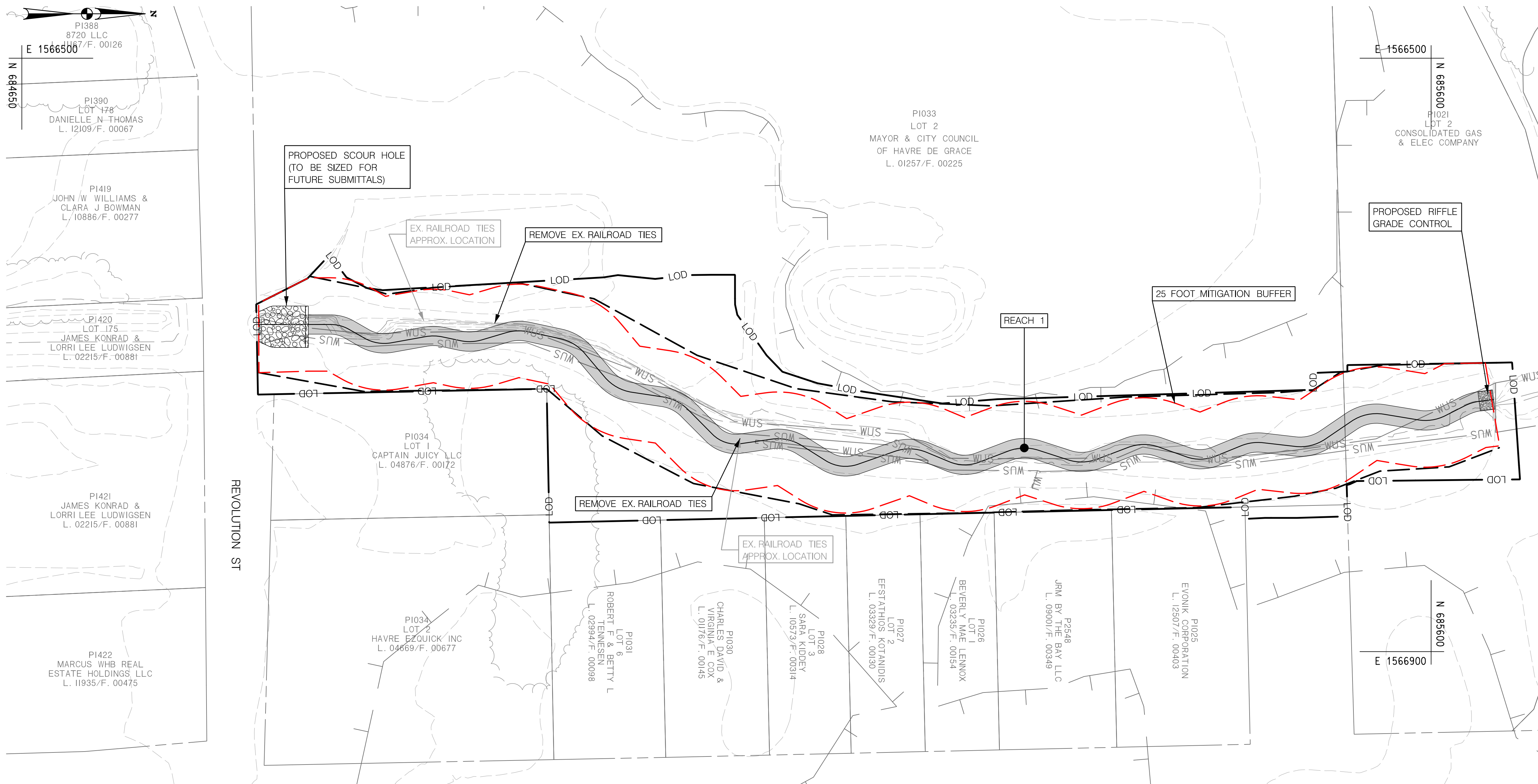
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**

**TYPICAL SECTIONS**

DESIGNED BY KNH DRAWN BY KNH CHECKED BY JM  
CONST. REVIEW BY \_\_\_\_\_ DATE JULY 2019 SCALE N.T.S.

CONTRACT NO.  
KH-30XX  
DRAWING NO.  
**TS-01**  
SHEET NO.  
5 OF 18



**NOTE:**

1. ENTIRE PROFILE TO HAVE MINIMUM OF 1-FOOT FURNISHED UNDERLAYMENT (CLASS 'O' RIPRAP) AND CHANNEL SAND /GRAVEL.
2. ALL BORDERS TO BE MARKED WITH A METAL POST AND SIGN AT A MINIMUM OF 50 FEET DESIGNATING THE AREA FOR CONSERVATION.



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88



**PRELIMINARY  
 NOT FOR  
 CONSTRUCTION**



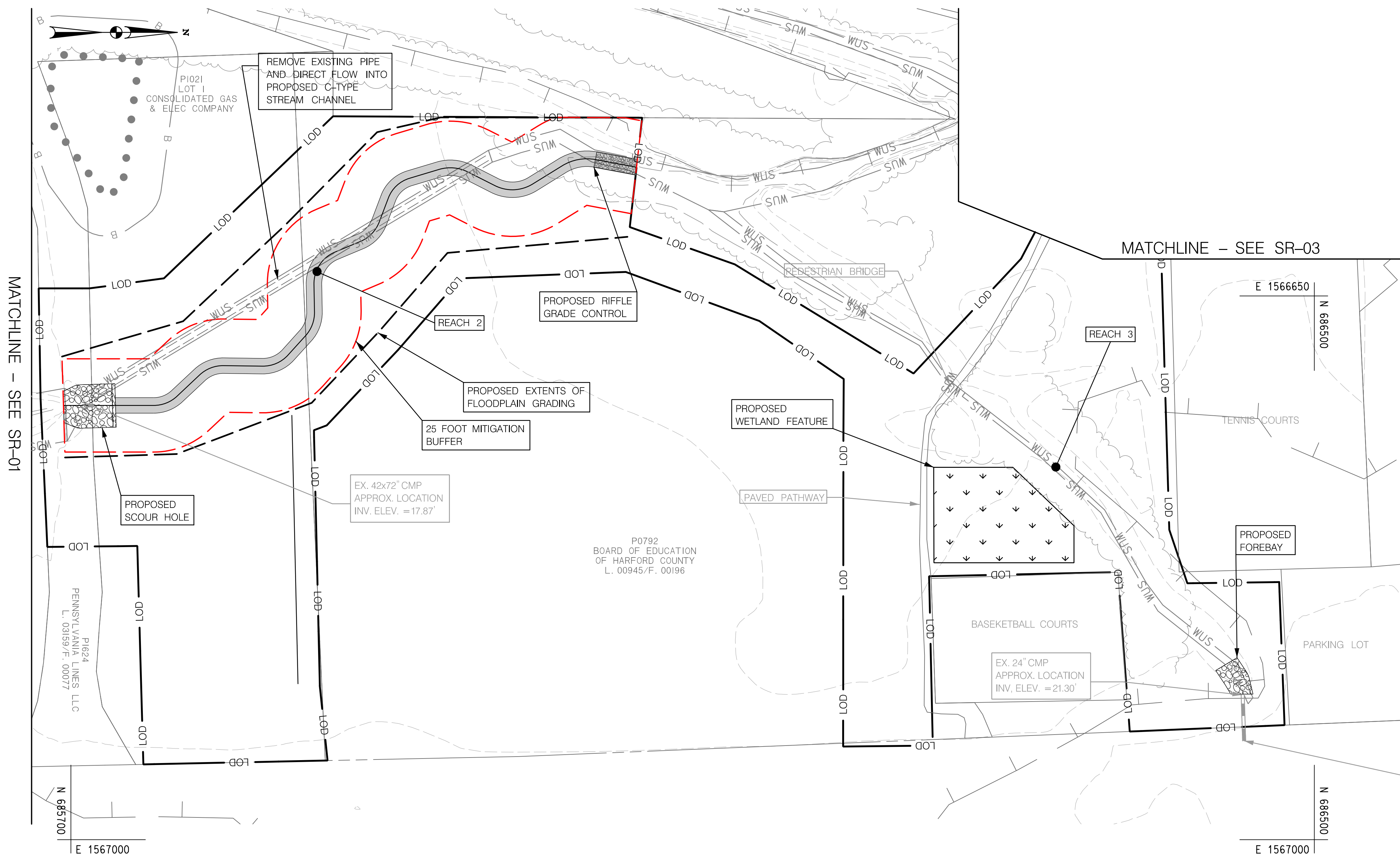
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
 LILLY RUN STREAM RESTORATION**

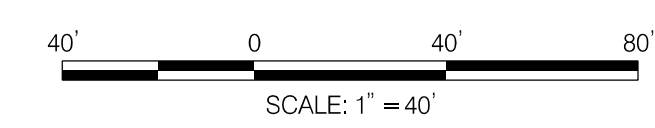
**STREAM RESTORATION PLAN**

DESIGNED BY KNH DRAWN BY KNH CHECKED BY JM  
 CONST. REVIEW BY   DATE JULY 2019 SCALE 1"=40'

CONTRACT NO.  
 KH-30XX  
 DRAWING NO.  
**SR-01**  
 SHEET NO.  
 6 OF 18



- NOTE:
1. ENTIRE PROFILE TO HAVE MINIMUM OF 1-FOOT FURNISHED UNDERLAYMENT (CLASS '0' RIPRAP) AND CHANNEL SAND /GRAVEL.
  2. ALL BORDERS TO BE MARKED WITH A METAL POST AND SIGN AT A MINIMUM OF 50 FEET DESIGNATING THE AREA FOR CONSERVATION.



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88



**PRELIMINARY  
 NOT FOR  
 CONSTRUCTION**



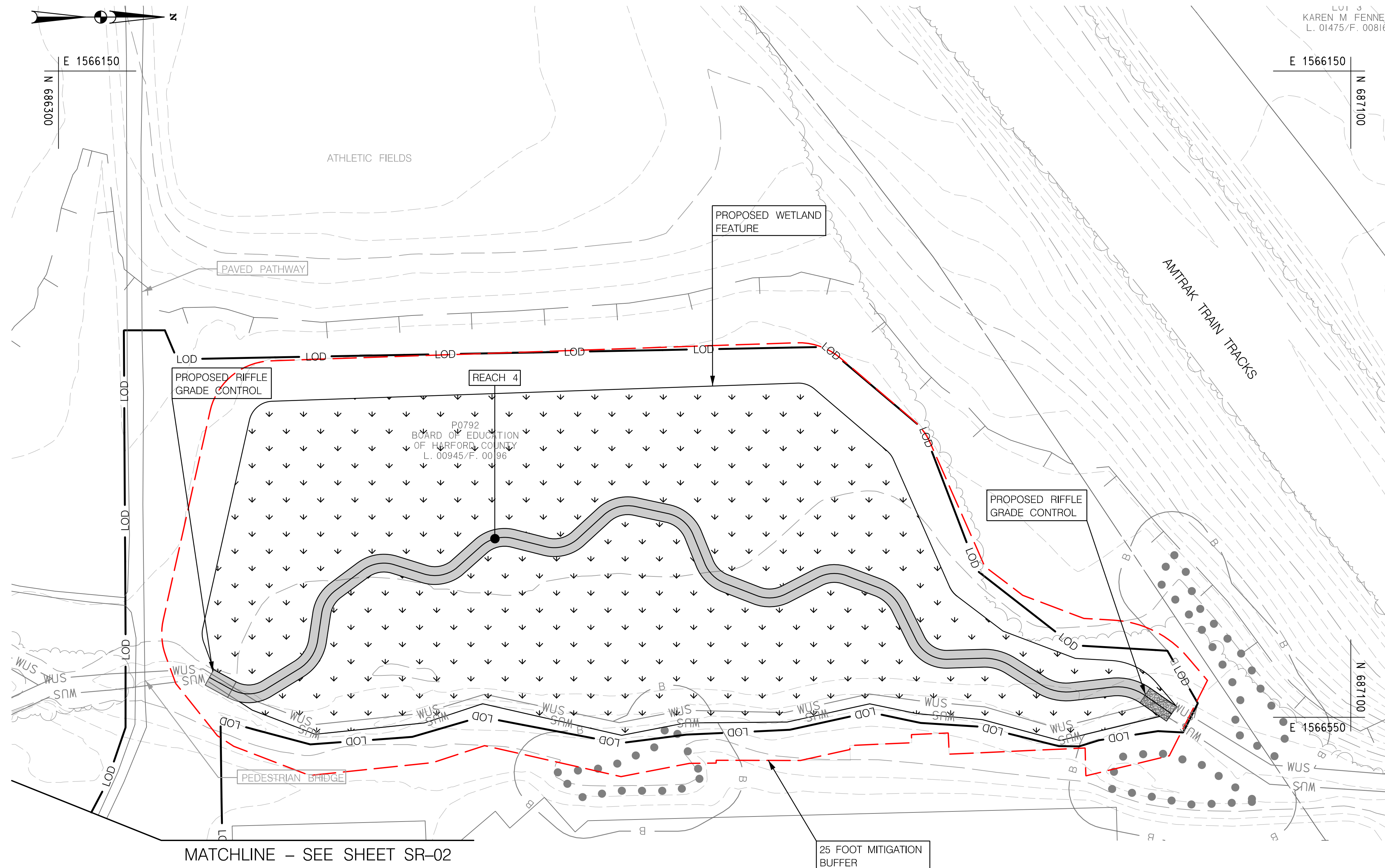
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
 LILLY RUN STREAM RESTORATION**

**STREAM RESTORATION PLAN**

DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM  
 CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE 1"=40'

CONTRACT NO.  
 KH-30XX  
 DRAWING NO.  
**SR-02**  
 SHEET NO.  
 7 OF 18



LVI 3  
KAREN M FENNEF  
L. 01475/F. 00816

**NOTE:**

1. ENTIRE PROFILE TO HAVE MINIMUM OF 1-FOOT FURNISHED UNDERLAYMENT (CLASS '0' RIPRAP) AND CHANNEL SAND /GRAVEL.
2. FLOW TO BE DIRECTED TO PROPOSED CHANNEL AND EXISTING CHANNEL IS TO BE GRADED TO THE PROPOSED FLOODPLAIN ELEVATION.
3. ALL BORDERS TO BE MARKED WITH A METAL POST AND SIGN AT A MINIMUM OF 50 FEET DESIGNATING THE AREA FOR CONSERVATION.

MATCHLINE – SEE SHEET SR-02

25 FOOT MITIGATION BUFFER



HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



**PRELIMINARY  
NOT FOR  
CONSTRUCTION**



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**

**STREAM RESTORATION PLAN**

CONTRACT NO.  
KH-30XX  
DRAWING NO.  
**SR-03**

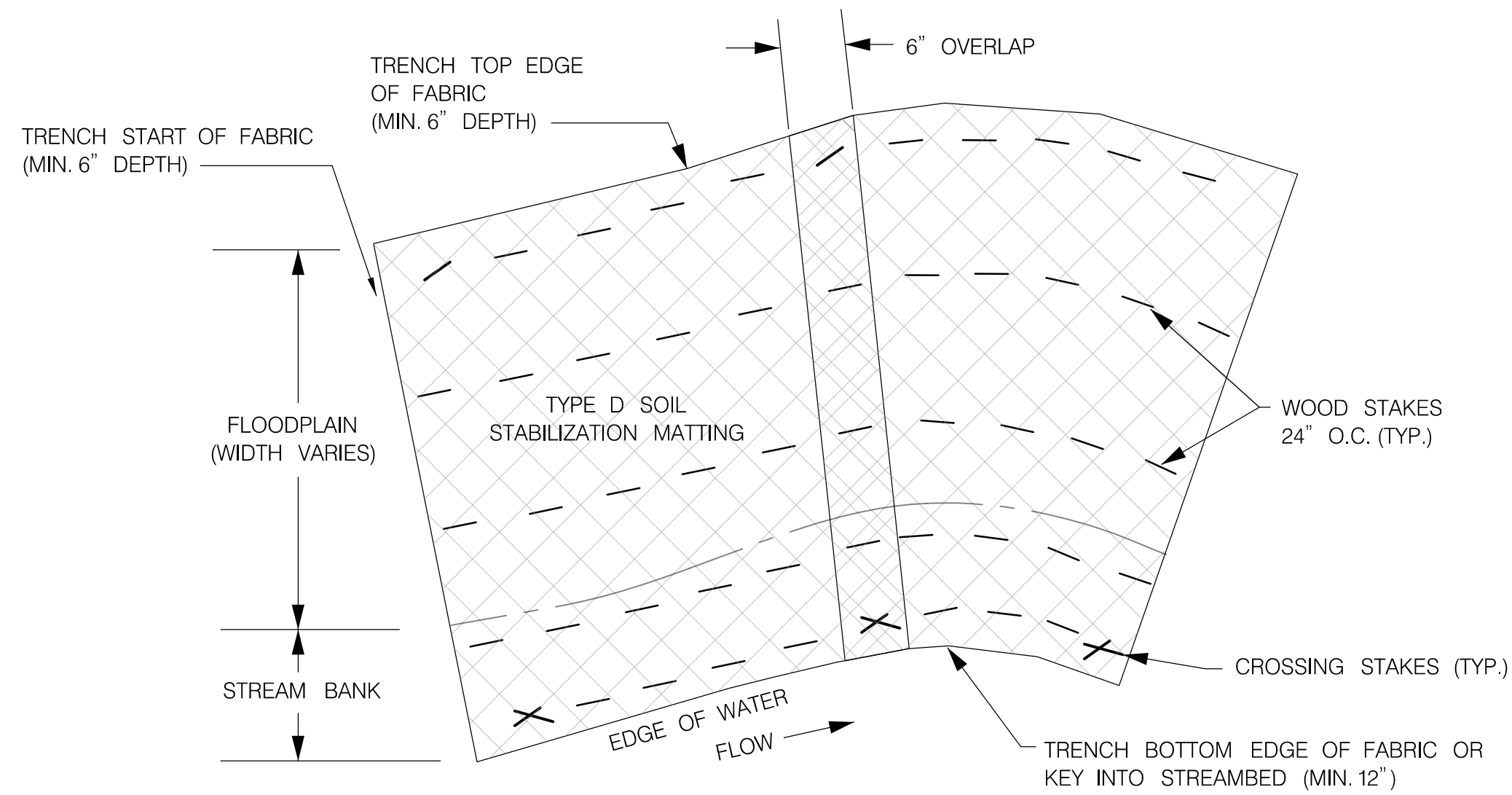
DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM  
CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE 1"=40'

SHEET NO.  
8 OF 18

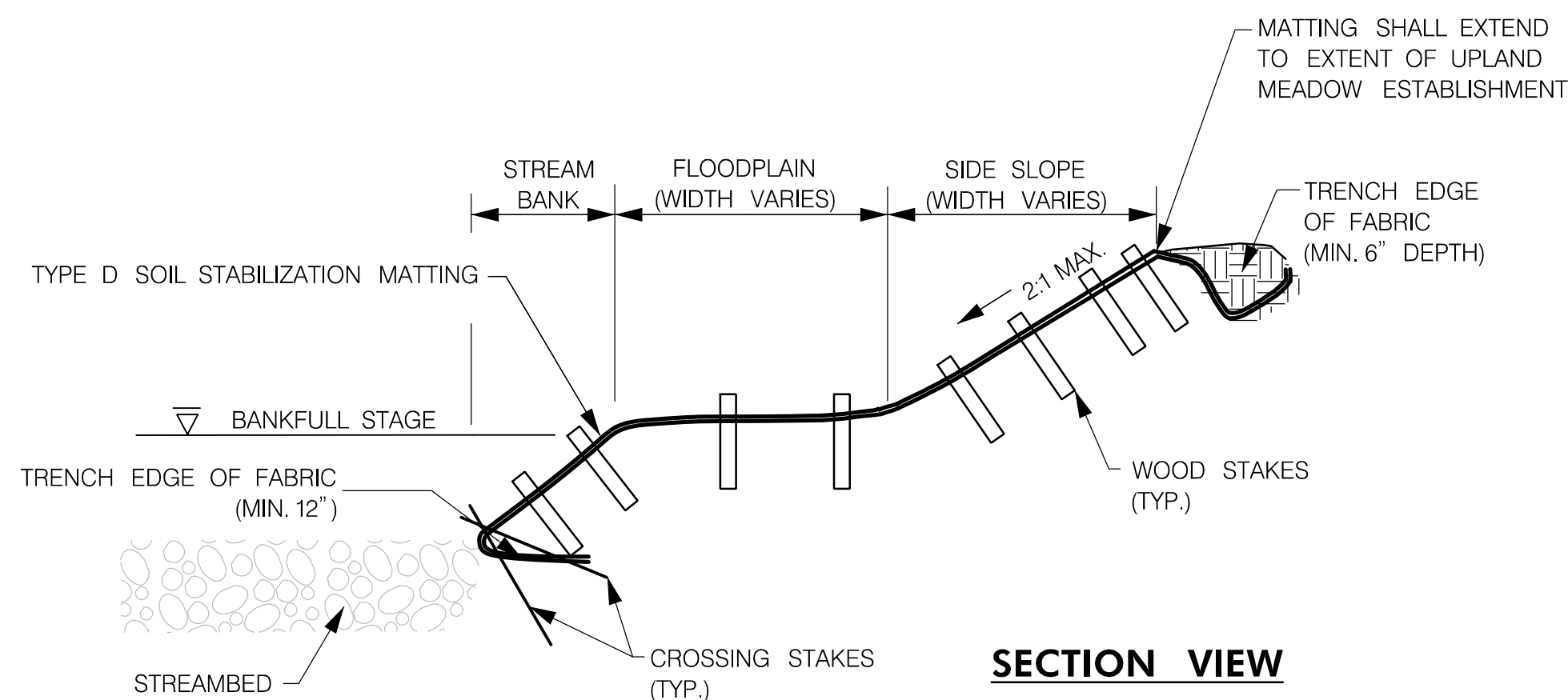


# STREAMBANK/FLOODPLAIN STABILIZATION DETAILS

N.T.S.



**PLAN VIEW**



**SECTION VIEW**

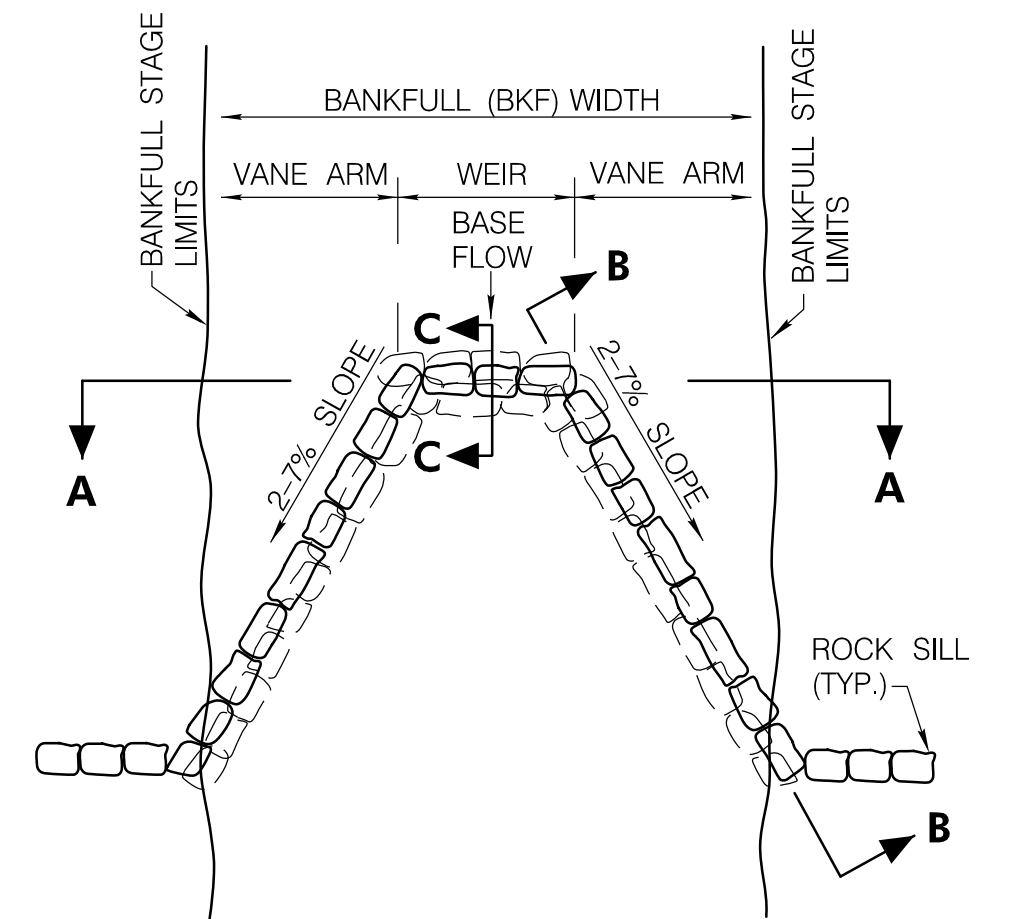
- NOTES:**
- TYPE D SOIL STABILIZATION MATTING (SSM) SHALL BE OVERLAPPED 'SHINGLE' STYLE OR PERPENDICULAR TO THE CHANNEL, WITH THE UPSTREAM SECTION OF MATTING OVERLAPPING THE NEXT DOWNSTREAM SECTION OF MATTING.
  - SPECIFIED SEED MIX SHALL BE APPLIED FIRST AND IMMEDIATELY COVERED WITH THE SSM.
  - THE SSM SHALL BE 100 PERCENT BIODEGRADABLE COIR FIBER MATTING.
  - THE SSM SHALL CONFORM TO MDOT SHA SPECIFICATIONS FOR TYPE D MATTING.
  - 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 SOFTWOOD WITH A SAW-FORMED POINT ON ONE END, 1 INCH BY 2 INCHES IN SIZE AND A MINIMUM OF 18 INCHES IN LENGTH, OR OTHERS AS APPROVED BY THE ENGINEER.
  - 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.

# ROCK STRUCTURE CONSTRUCTION DETAILS

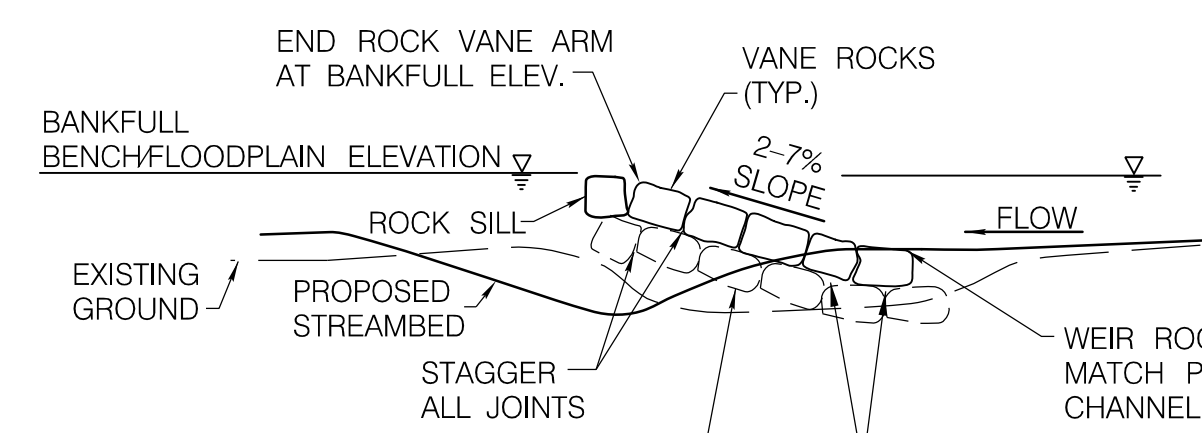
N.T.S.

## GRADE CONTROL CROSS VANE DETAILS

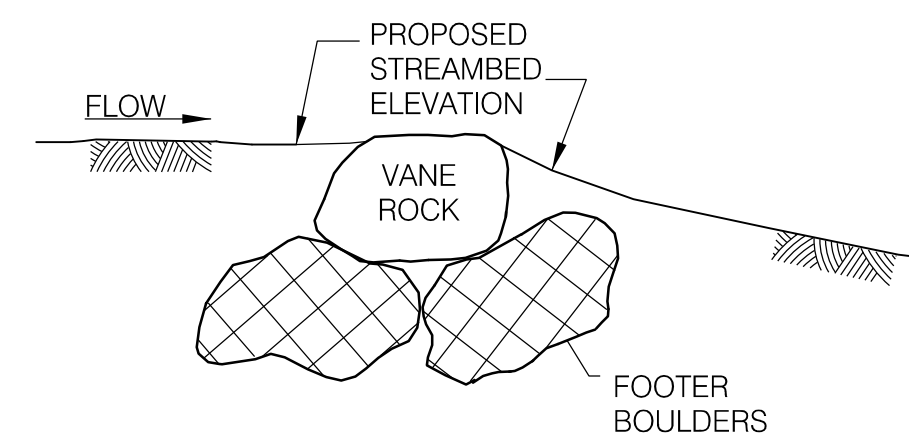
CONSTRUCTION PROCEDURES FOR ROCK STRUCTURES



**PLAN VIEW**

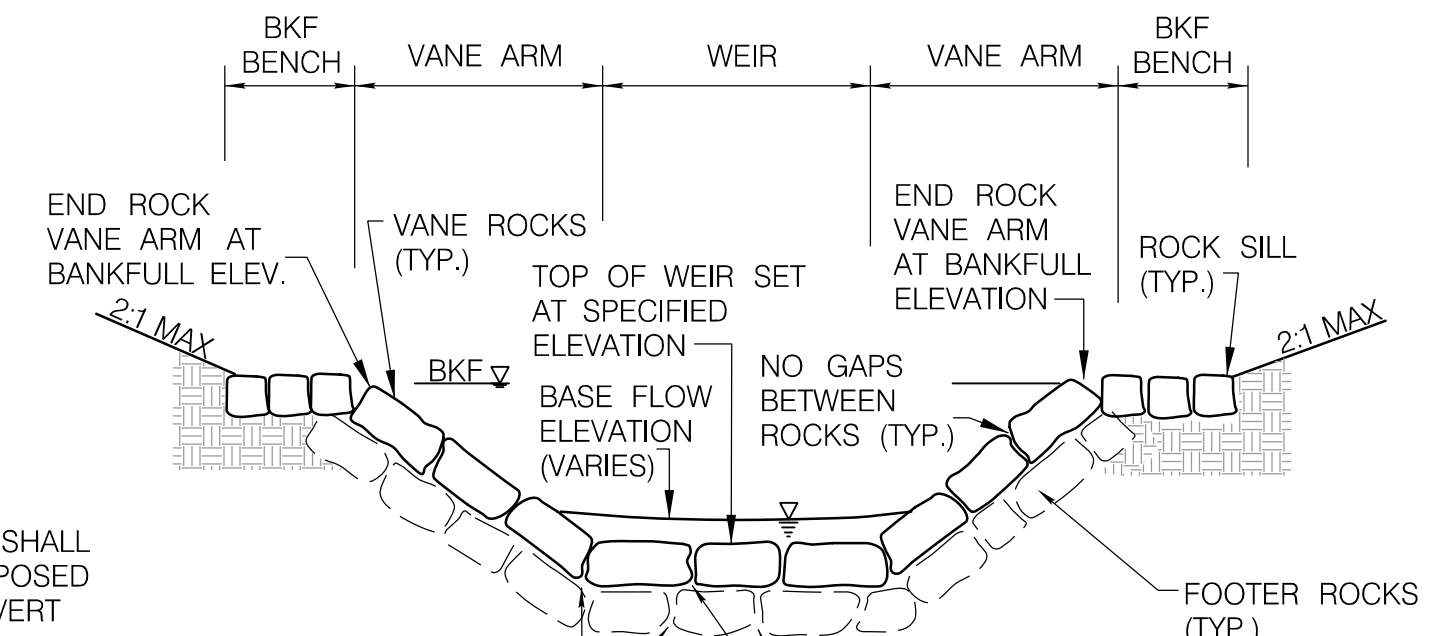


**SECTION B-B**

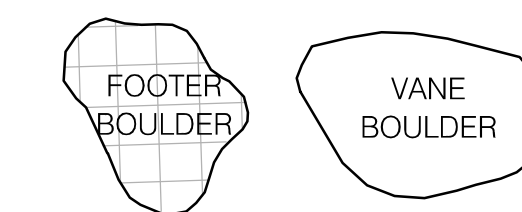


**SECTION C-C**

- 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.



**SECTION A-A**



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

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

ALL BOULDERS USED SHALL HAVE A MINIMUM DENSITY OF 170 POUNDS PER CUBIC FOOT.

## BOULDER DETAIL

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



**PRELIMINARY  
NOT FOR  
CONSTRUCTION**



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**

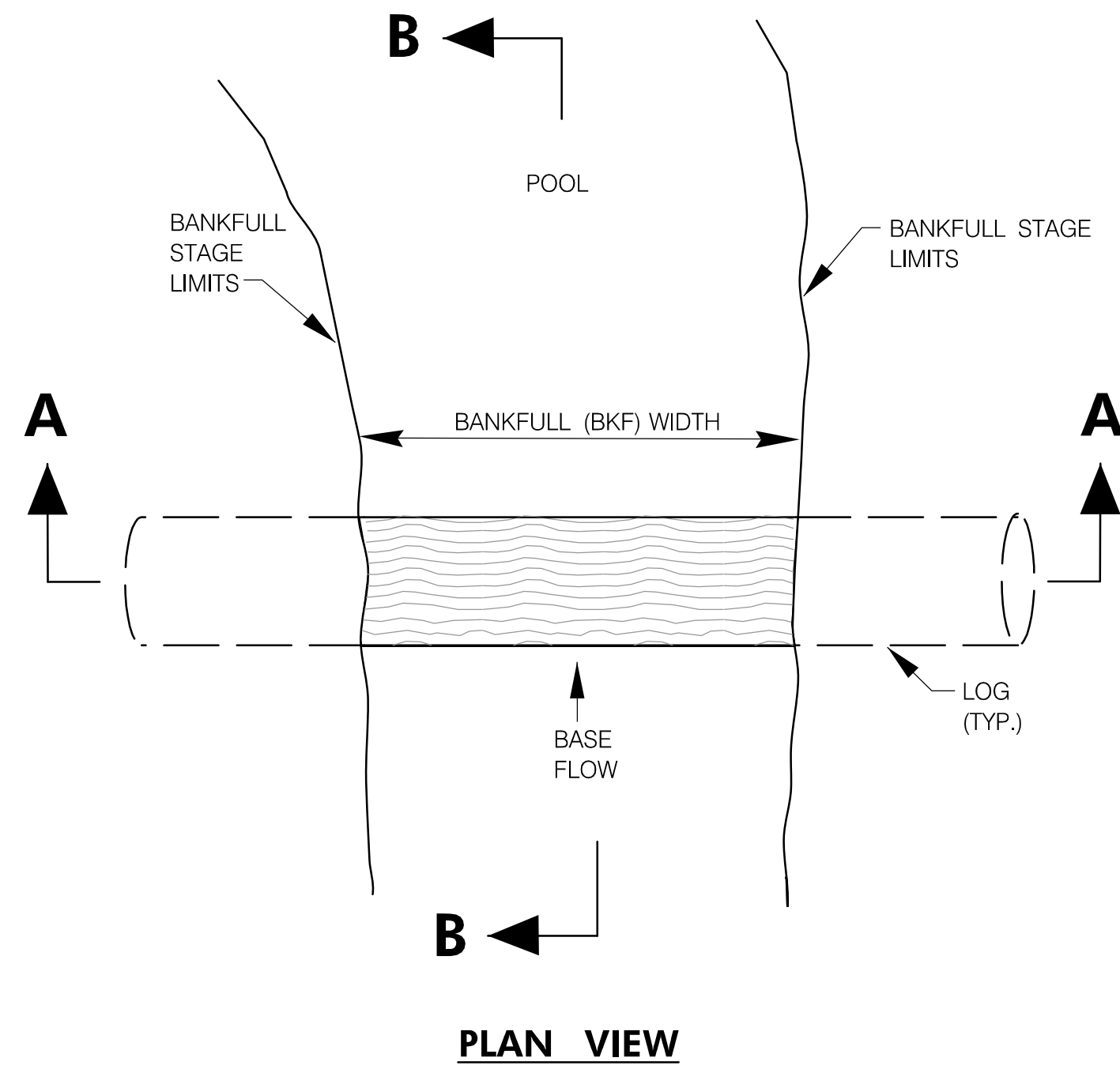
**STREAM RESTORATION DETAILS**

DESIGNED BY KNH DRAWN BY KNH CHECKED BY JM  
CONST. REVIEW BY \_\_\_\_\_ DATE JULY 2019 SCALE N.T.S.

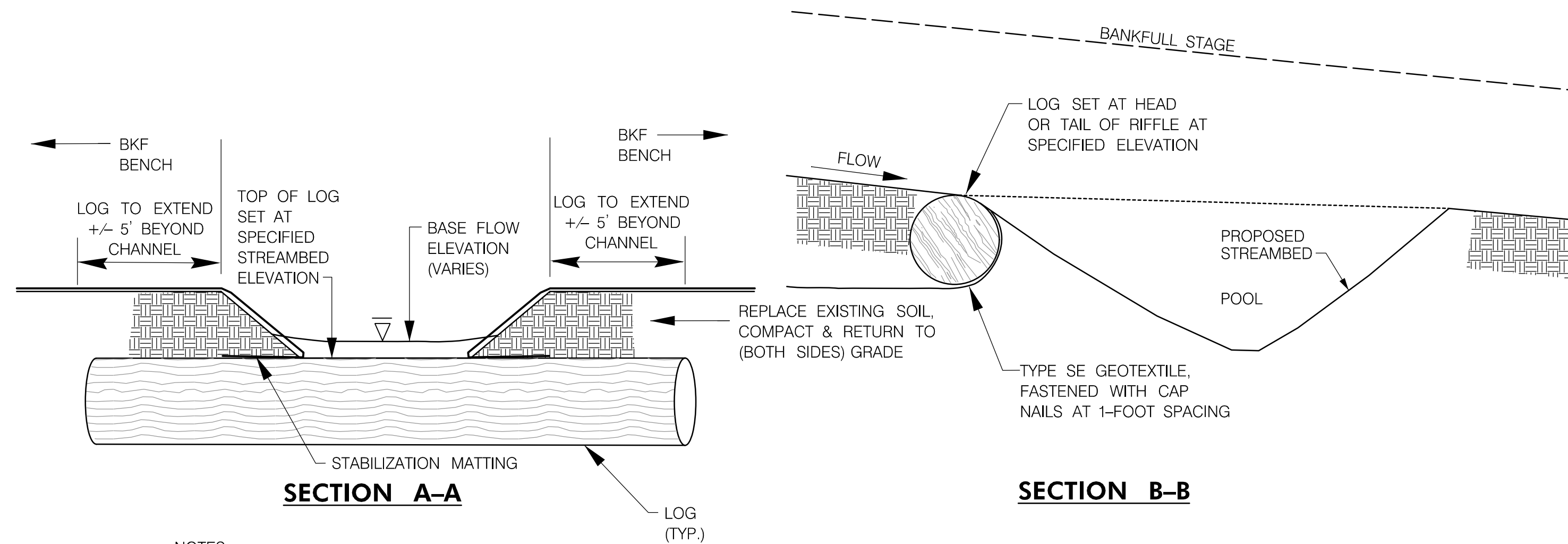
CONTRACT NO.  
KH-30XX  
DRAWING NO.  
**DE-01**  
SHEET NO.  
9 OF 18

## IN-CHANNEL LOG SILL PLACEMENT DETAILS

N.T.S.



**PLAN VIEW**



**SECTION A-A**

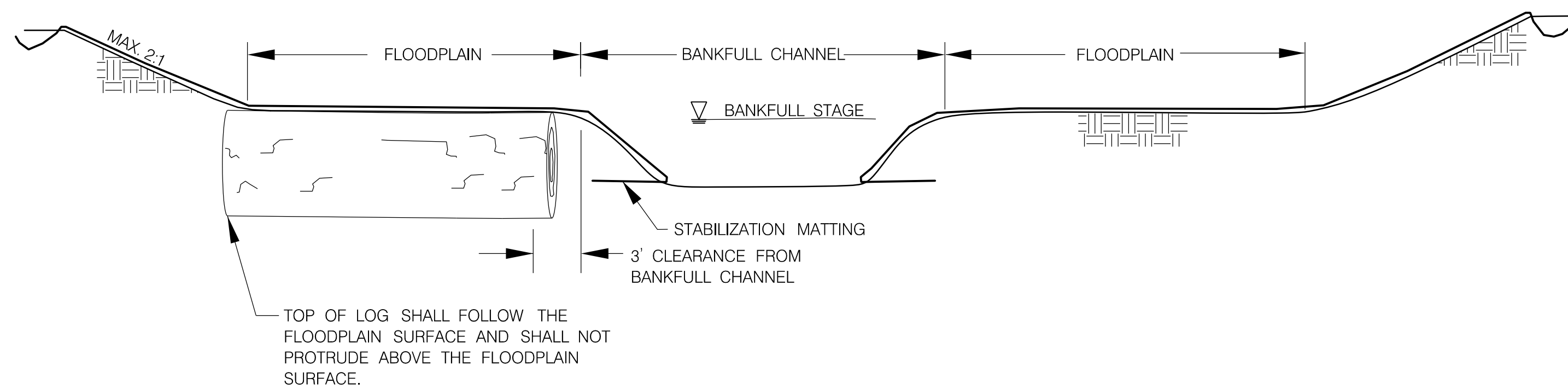
**SECTION B-B**

**NOTES:**

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

## FLOODPLAIN LOG SILL PLACEMENT DETAIL

N.T.S.



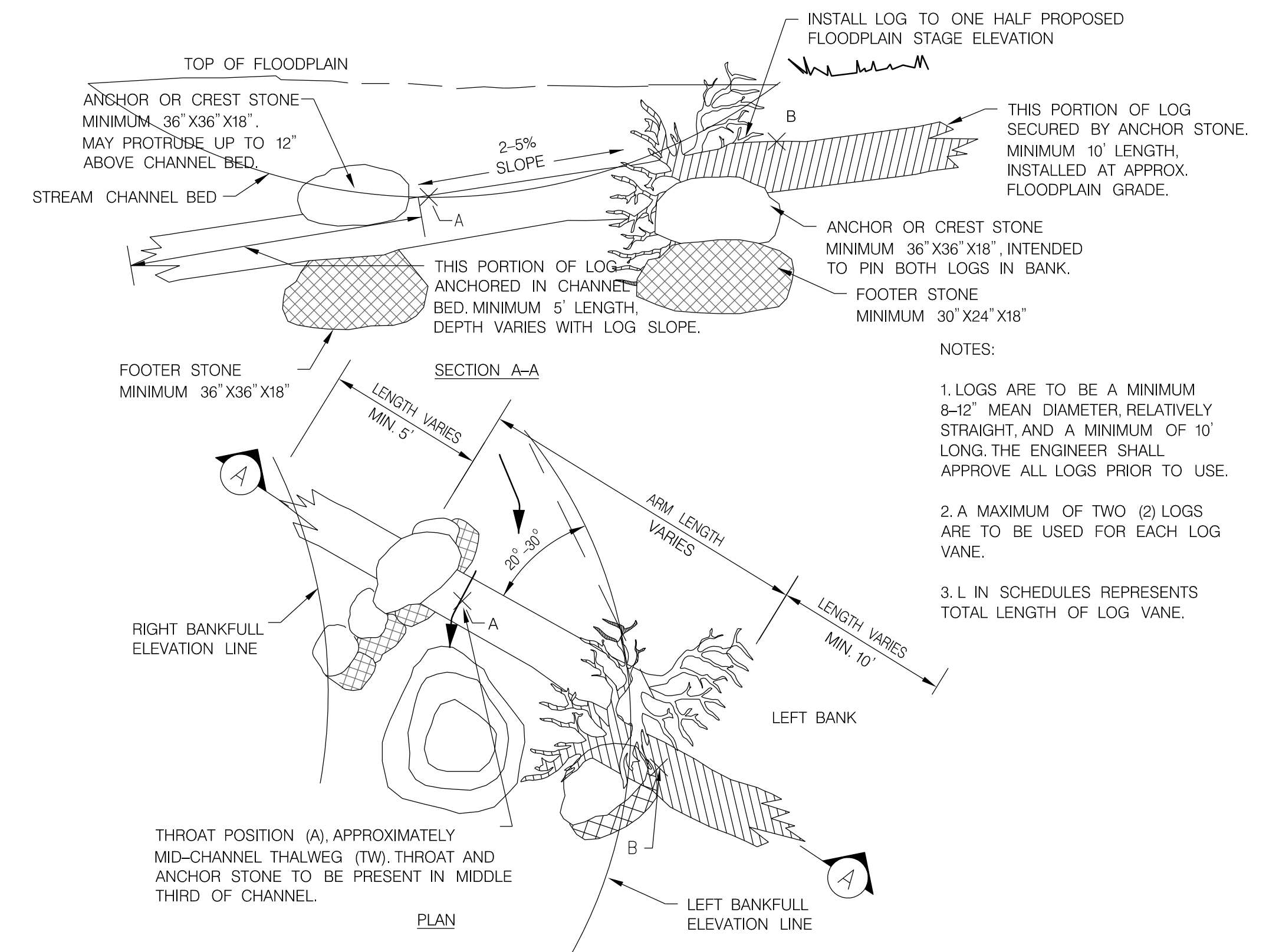
**SECTION VIEW**

**NOTES:**

1. BURIED FLOODPLAIN LOGS SHALL HAVE A MINIMUM DIAMETER OF 12".
2. TOP OF FLOODPLAIN LOGS WILL BE SET AT THE ELEVATION OF THE PROPOSED FLOODPLAIN.
3. BRANCHES AND OTHER IREEGULARITIES MAY PROTRUDE ABOVE THE FLOODPLAIN SURFACE.
4. LOCATIONS OF BURIED LOGS SPECIFIED ON THE PLAN SHEETS IS TO BE APPROXIMATE CENTER POINT OF THE LOG.
5. 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.
6. 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".

## LOG VANE

N.T.S.



**NOTES:**

1. 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.
2. A MAXIMUM OF TWO (2) LOGS ARE TO BE USED FOR EACH LOG VANE.
3. L IN SCHEDULES REPRESENTS TOTAL LENGTH OF LOG VANE.

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



**PRELIMINARY  
NOT FOR  
CONSTRUCTION**



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**

**STREAM RESTORATION DETAILS**

CONTRACT NO.  
KH-30XX  
DRAWING NO.  
**DE-02**

DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM  
CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE N.T.S.

SHEET NO.  
10 OF 18

P1388  
8720 LLC  
E 1566500  
N 684650

P1390  
LOT 176  
DANIELLE N THOMAS  
L. 12109/F. 00067

P1419  
JOHN W WILLIAMS &  
CLARA J BOWMAN  
L. 10886/F. 00277

P1420  
LOT 175  
JAMES KONRAD &  
LORRI LEE LUDWIGSEN  
L. 02215/F. 00881

P1421  
JAMES KONRAD &  
LORRI LEE LUDWIGSEN  
L. 02215/F. 00881

P1422  
MARCUS WHB REAL  
ESTATE HOLDINGS LLC  
L. 11935/F. 00475

STABILIZED CONSTRUCTION  
ENTRANCE

TURN-AROUND AREA

TEMPORARY OUTFALL  
CROSSING

TEMPORARY STAGING AREA

REMOVE EX. RAILROAD TIES

EX. RAILROAD TIES  
APPROX. LOCATION

P1033  
LOT 2  
MAYOR & CITY COUNCIL  
OF HAVRE DE GRACE  
L. 01257/F. 00225

E 1566500  
N 685600  
P1021  
LOT 2  
CONSOLIDATED GAS  
& ELEC COMPANY

REACH 1

ACCESS ROAD

25 FOOT MITIGATION BUFFER

REVOLUTION ST

P1034  
LOT 1  
CAPTAIN JUICY LLC  
L. 04876/F. 00172

P1036  
LOT 6  
ROBERT E & BETTY L  
TENNESSEN  
L. 02984/F. 00098

P1030  
CHARLES DAVID &  
VIRGINIA E COX  
L. 01767/F. 00145

P1028  
LOT 3  
SARA KIDDEY  
L. 10573/F. 00314

P1027  
LOT 2  
EFSTATHIOS KOTANDIS  
L. 03329/F. 00130

P1026  
LOT 1  
BEVERLY MAE LENNOX  
L. 05233/F. 00134

P2548  
JRM BY THE BAY LLC  
L. 09001/F. 00349

P1025  
EVONIK CORPORATION  
L. 12507/F. 00403

P1034  
LOT 2  
HAVRE EQUICK INC  
L. 04669/F. 00677

STABILIZED CONSTRUCTION  
ENTRANCE

N 685600  
E 1566900

MATCHLINE - SEE ES-02

40' 0 40' 80'  
SCALE: 1"=40'

HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



PRELIMINARY  
NOT FOR  
CONSTRUCTION



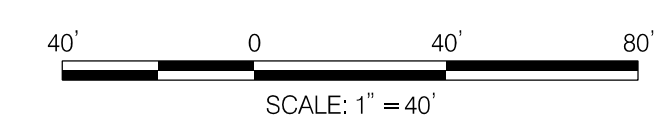
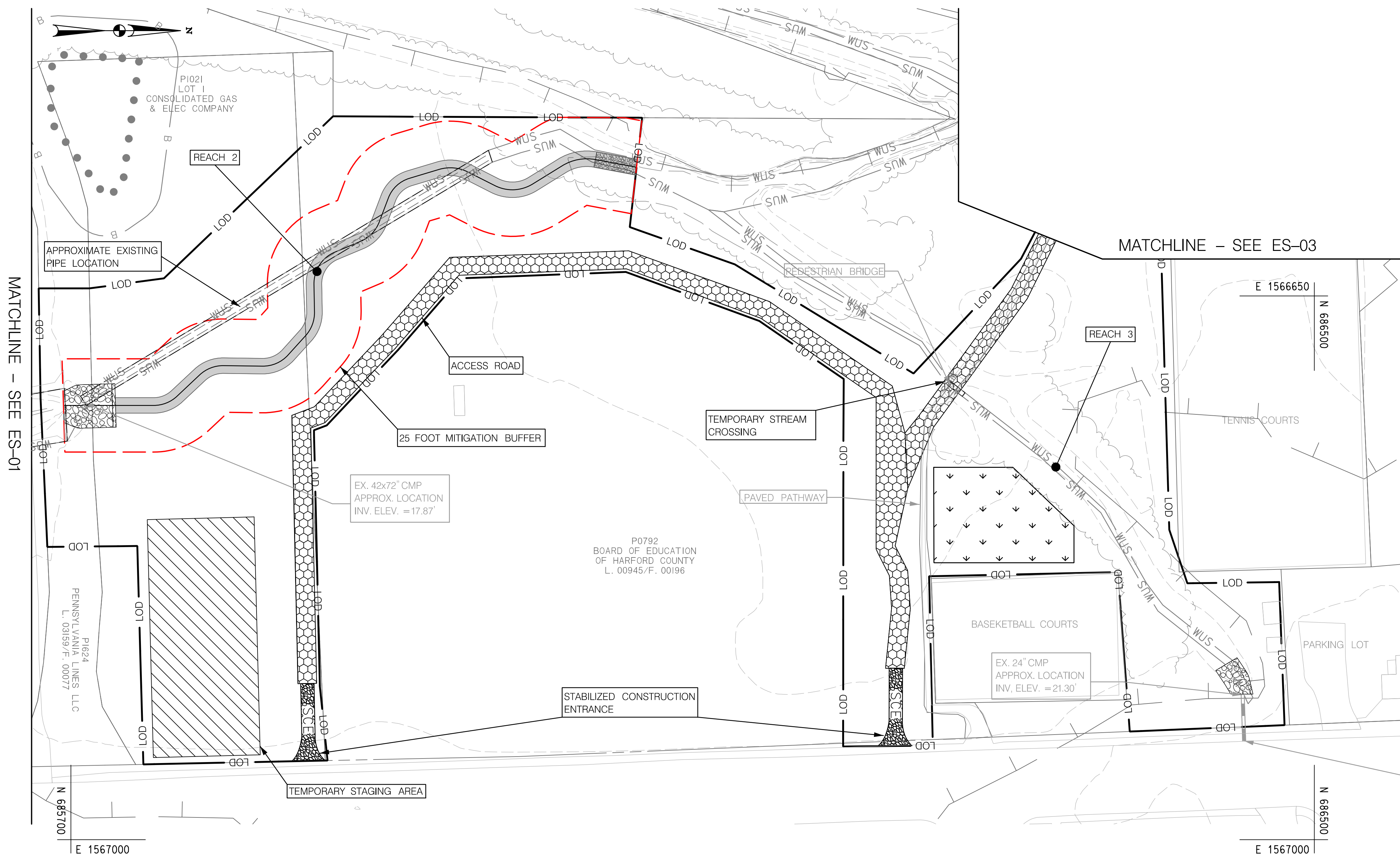
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**

**EROSION AND SEDIMENT CONTROL PLAN**

DESIGNED BY KNH DRAWN BY KNH CHECKED BY JM  
 CONST. REVIEW BY   DATE JULY 2019 SCALE 1"=40'

CONTRACT NO.  
KH-30XX  
DRAWING NO.  
**ES-01**  
SHEET NO.  
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HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88



**PRELIMINARY  
 NOT FOR  
 CONSTRUCTION**



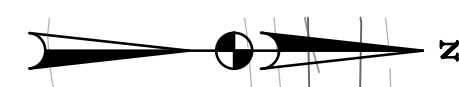
ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
 LILLY RUN STREAM RESTORATION**

**EROSION AND SEDIMENT CONTROL PLAN**

DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM  
 CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE 1"=40'

CONTRACT NO.  
 KH-30XX  
 DRAWING NO.  
**ES-02**  
 SHEET NO.  
 12 OF 18



LVI 3  
KAREN M FENNEF  
L. 01475/F. 00816

E 1566150  
N 687100

E 1566150  
N 687100

ATHLETIC FIELDS

AMTRAK TRAIN TRACKS

PAVED PATHWAY

ACCESS ROAD

TEMPORARY STAGING AREA

TEMPORARY STREAM CROSSING

PEDESTRIAN BRIDGE

25 FOOT MITIGATION BUFFER

MATCHLINE - SEE SHEET ES-02

P0792  
BOARD OF EDUCATION  
OF HARFORD COUNTY  
L. 00945/F. 00196

BEACH A

E 1566550  
N 687100



HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



**PRELIMINARY  
NOT FOR  
CONSTRUCTION**



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**  
**EROSION AND SEDIMENT CONTROL PLAN**

CONTRACT NO.  
KH-30XX  
DRAWING NO.  
**ES-03**

DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM  
CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE 1"=40'

SHEET NO.  
13 OF 18

**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. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO 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. ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOLA SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:  
 USE I WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
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.

HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88



**PRELIMINARY  
 NOT FOR  
 CONSTRUCTION**



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
 LILLY RUN STREAM RESTORATION**  
  
**EROSION AND SEDIMENT CONTROL NOTES**

CONTRACT NO.  
 KH-30XX  
 DRAWING NO.  
**EN-01**

DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM  
 CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE N.T.S.

SHEET NO.  
 14 OF 18

P1388  
8720 LLC  
E 1566500  
N 684650

P1390  
LOT 178  
DANIELLE N THOMAS  
L. 12109/F. 00067

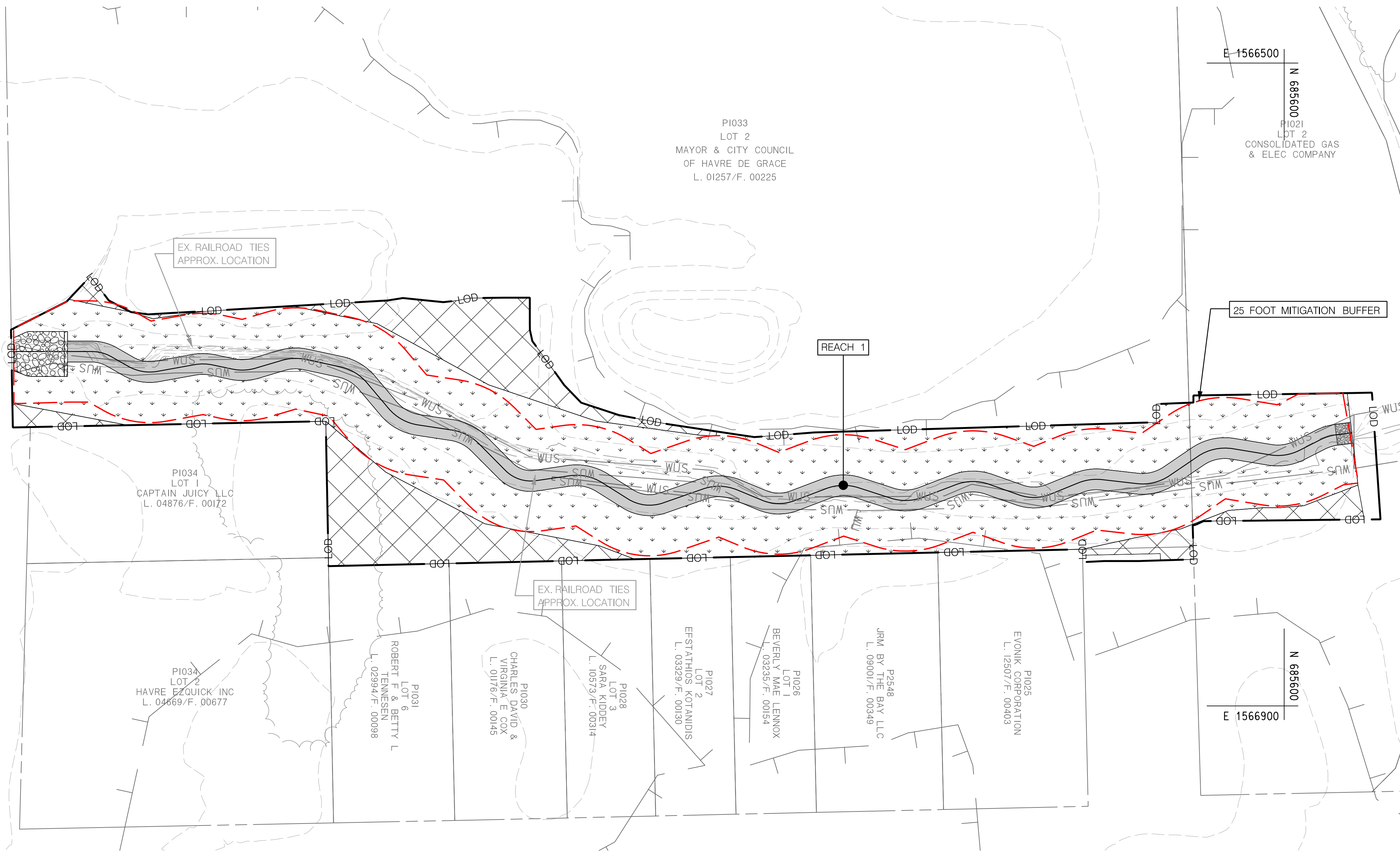
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JOHN W WILLIAMS &  
CLARA J BOWMAN  
L. 10886/F. 00277

P1420  
LOT 175  
JAMES KONRAD &  
LORRI LEE LUDWIGSEN  
L. 02215/F. 00881

P1421  
JAMES KONRAD &  
LORRI LEE LUDWIGSEN  
L. 02215/F. 00881

P1422  
MARCUS WHB REAL  
ESTATE HOLDINGS LLC  
L. 11935/F. 00475

REVOLUTION ST



E 1566500  
N 685600  
P1021  
LOT 2  
CONSOLIDATED GAS  
& ELEC COMPANY

P1034  
LOT 1  
CAPTAIN JUICY LLC  
L. 04876/F. 00172

P1034  
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HAVRE EQUICK INC  
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P1030  
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VIRGINIA E COX  
L. 01176/F. 00145

P1028  
SARA KIDDEY  
L. 10573/F. 00314

P1027  
LOT 2  
EFSTATHIOS KOTANDIS  
L. 03329/F. 00130

P1026  
BEVERLY MAE LENNOX  
L. 03235/F. 00194


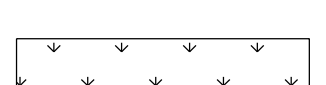
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JRM BY THE BAY LLC  
L. 09001/F. 00349

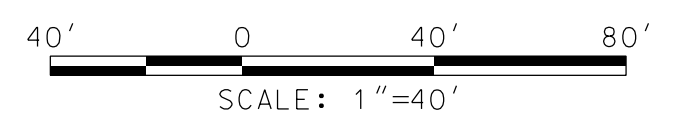
P1025  
EVONIK CORPORATION  
L. 12507/F. 00403

N 685600  
E 1566900

MATCHLINE - SEE LS-02

LEGEND

-  UPLAND PLANTING AREA
-  LOWLAND PLANTING AREA



HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



**PRELIMINARY  
NOT FOR  
CONSTRUCTION**



ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**

**LANDSCAPING PLAN**

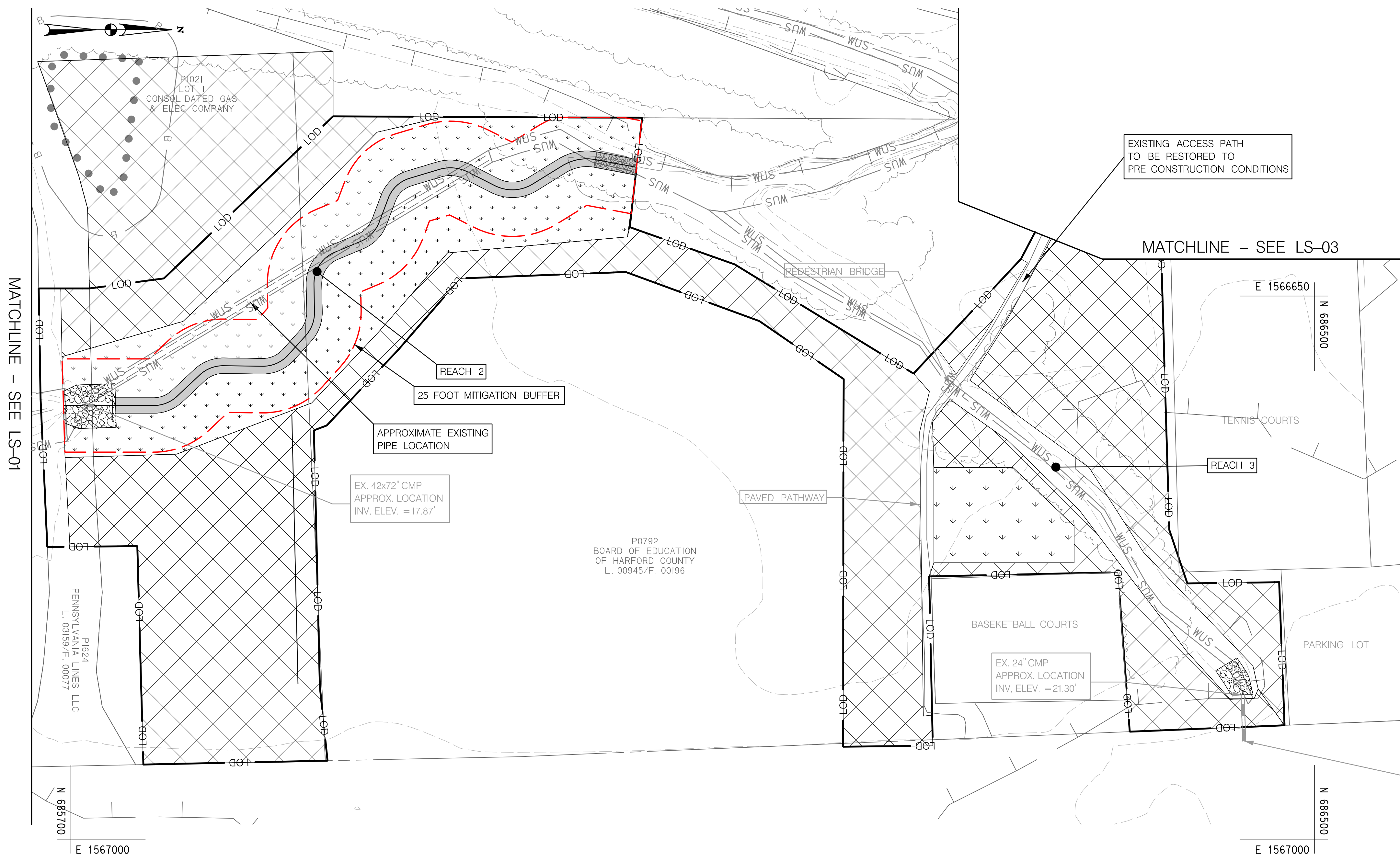
DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM

CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE 1"=40'

CONTRACT NO.  
KH-30XX

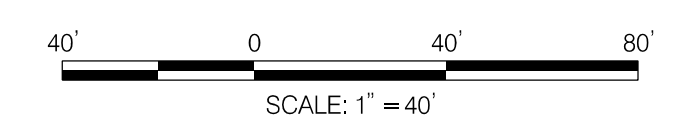
DRAWING NO.  
**LS-01**

SHEET NO.  
15 OF 18



LEGEND

- UPLAND PLANTING AREA
- LOWLAND PLANTING AREA



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88



**PRELIMINARY  
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ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
 LILLY RUN STREAM RESTORATION**

**LANDSCAPING PLAN**

DESIGNED BY KNH    DRAWN BY KNH    CHECKED BY JM

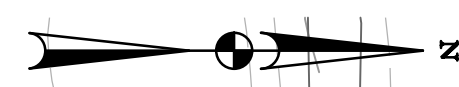
CONST. REVIEW BY \_\_\_\_\_    DATE JULY 2019    SCALE 1"=40'

CONTRACT NO.  
KH-30XX

DRAWING NO.  
**LS-02**

SHEET NO.  
16 OF 18





LVI 3  
KAREN M FENNEF  
L. 01475/F. 00816

E 1566150  
N 686300

E 1566150  
N 687100

ATHLETIC FIELDS

EXISTING ACCESS PATH  
TO BE RESTORED TO  
PRE-CONSTRUCTION CONDITIONS

PAVED PATHWAY

REACH 4

AMTRAK TRAIN TRACKS

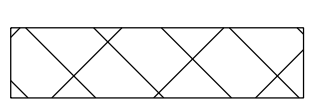
P0792  
BOARD OF EDUCATION  
OF HARFORD COUNTY  
L. 00945/F. 0096

PEDESTRIAN BRIDGE

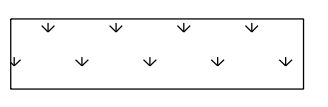
25 FOOT MITIGATION BUFFER

MATCHLINE - SEE SHEET LS-02

LEGEND



UPLAND PLANTING AREA



LOWLAND PLANTING AREA



HORIZONTAL DATUM NAD 83/91  
VERTICAL DATUM NAVD 88



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ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II -  
LILLY RUN STREAM RESTORATION**

CONTRACT NO.  
KH-30XX

**LANDSCAPING PLAN**

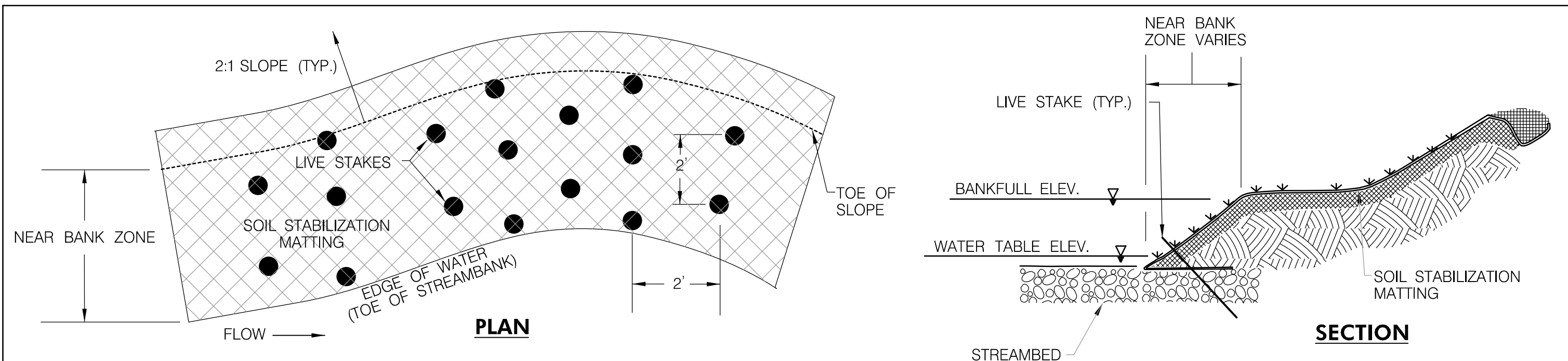
DRAWING NO.  
**LS-03**

DESIGNED BY KNH      DRAWN BY KNH      CHECKED BY JM  
CONST. REVIEW BY \_\_\_\_\_      DATE JULY 2019      SCALE 1"=40'

SHEET NO.  
17 OF 18

**LIVE STAKE PLANTING DETAIL**

NOT TO SCALE



**LIVE STAKE PLANTING SCHEDULE**

SCIENTIFIC /COMMON NAME	WETLAND INDICATOR	LENGTH /SIZE
VIBURNUM DENTATUM /ARROWOOD	FAC	2'-4'
CORNUS AMOMUM /SILKY DOGWOOD	FACW	2'-4'
SALIX EXIGUA /SANDBAR WILLOW	OBL	2'-4'
SALIX SERICEA/SILKY WILLOW	FACW	2'-4'
CORNUS SERICEA /REDOSIER DOGWOOD	FACW	2'-4'
CEPHALANTHUS OCCIDENTALIS /BUTTONBUSH	OBL	2'-4'

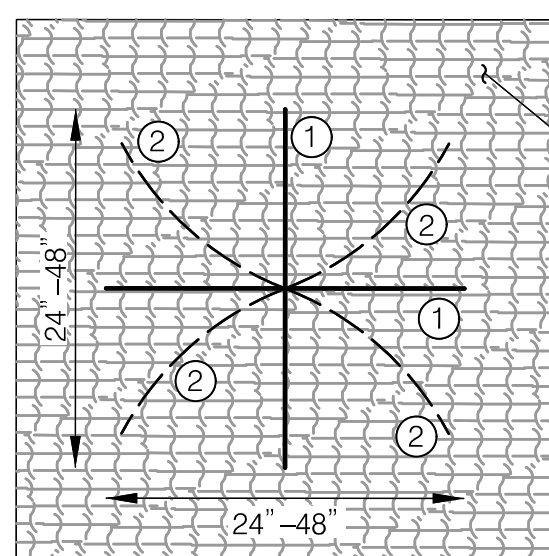
\*NOTE:  
 1. LIVE STAKES SHALL BE STAKED THROUGH MATTING AND EXTEND INTO THE WATER TABLE.  
 2. IN AREAS WHERE IMPORTED GRAVEL UNDERLAYMENT IS INSTALLED, LIVE STAKES SHALL EXTEND THROUGH THE UNDERLAYMENT AND INTO THE UNDERLYING SOIL.  
 3. LIVE STAKES SHALL BE STAKED WITHIN ENTIRE NEAR BANK ZONE ALONG THE PROPOSED CHANNEL INCLUDING LIVE FASCINE AREAS.  
 SPRING PLANTING SEASON: FEBRUARY 1 - JUNE 30  
 FALL PLANTING SEASON: AUGUST 1 - DECEMBER 31

**WETLAND TREE PLANTING SCHEDULE**

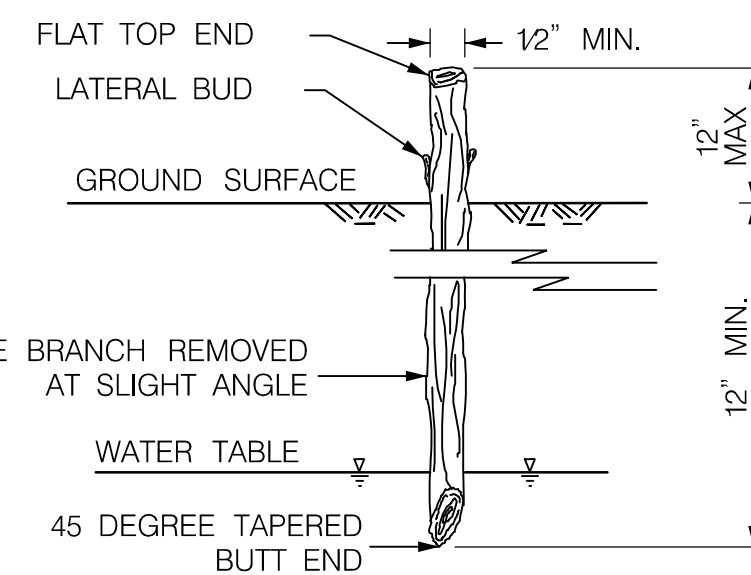
KEY	BOTANICAL NAME	COMMON NAME	SIZE	CONT. CLASS	SPACING/REMARKS
QP	<i>Quercus Phellos</i>	Swamp Willow Oak	1" cal.	#7	12' o.c.
PO	<i>Platanus occidentalis</i>	American Sycamore	1" cal.	#7	12' o.c.
QP	<i>Quercus palustris</i>	Pin Oak	1" cal.	#7	12' o.c.
BN	<i>Betula nigra</i>	River Birch	1" cal.	#7	12' o.c.

\*\*PLACE ON OUTSIDE OF CHANNEL MEANDERS.

**TREE & SHRUB INSTALLATION THROUGH SOIL STABILIZATION MATTING**



- MAKE CUT WITH SHARP KNIFE THROUGH SOIL STABILIZATION MATTING - SEE SOLID LINE IN DIAGRAM ABOVE. 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 ABOVE.
- 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.



**LIVE STAKE DETAIL**  
N.T.S.

**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
Helianthus 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

NOTE:

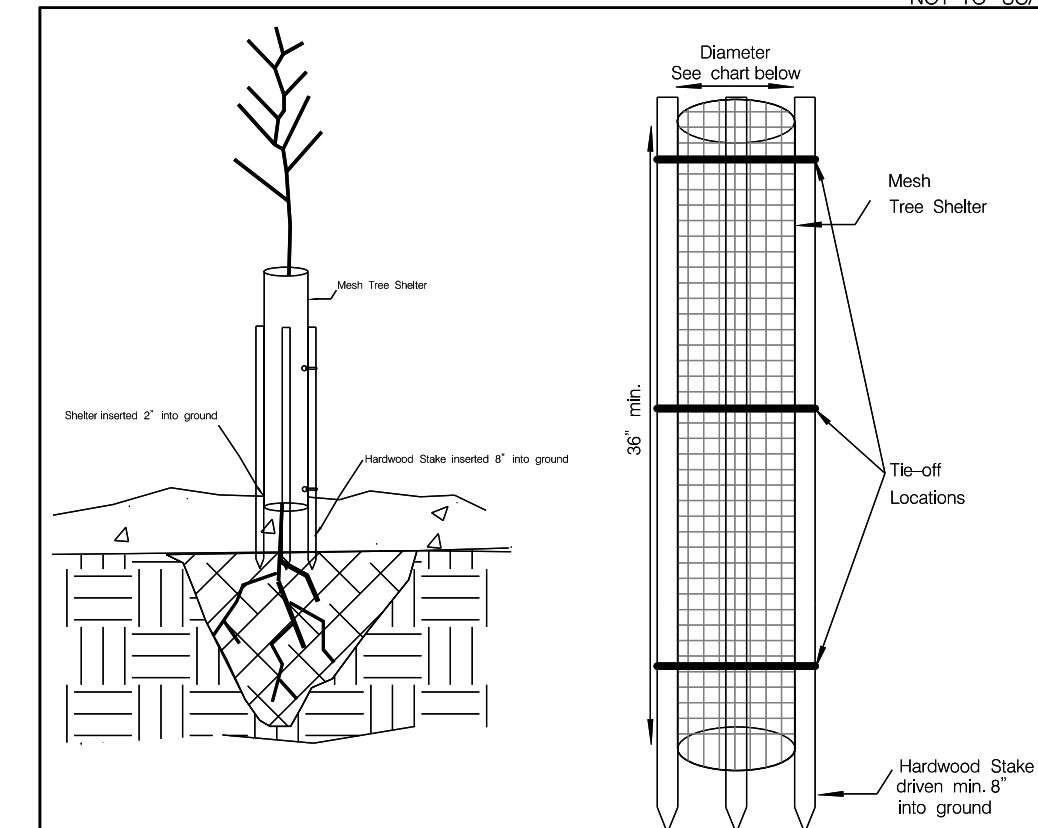
- PLACE TOPSOIL TO A DEPTH OF AT LEAST 6 INCHES. SALVAGE TOPSOIL WHERE POSSIBLE. SALVAGED TOPSOIL SHOULD BE FREE OF INVASIVE PLANT SPECIES. SITE SHOULD BE GRADED TO BELOW 6 INCHES OF FINAL GRADE, THEN 6 INCHES TOPSOIL SPREAD OVER THE SITE.
- SOIL AND SUBSTRATE MUST MEET A MINIMUM OF 60 CY OF ORGANIC MATTER PER ACRE.

**SEED MIX SCHEDULE**

SEED MIX	AREA
UPLAND SEED MIX	3.44 AC
LOWLAND SEED MIX	3.94 AC

**TREE SHELTER DETAIL**

NOT TO SCALE



- NOTES:
- Tree shelter shall be A.M. Leonard Tree Bark protector or approved equal.
  - Tree shelter must have longer hardwood stakes for insertion into ground to provide support.

**INSTALLATION SEQUENCE:**

- Plant tree according to standard specifications.
- Place shelter around the tree.
- Drive longer stakes into the ground.
- Tie off rope around the tree.

HORIZONTAL DATUM NAD 83/91  
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ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**I-95 ETL NORTHBOUND EXTENSION PHASE II - LILLY RUN STREAM RESTORATION**

**STREAM RESTORATION LANDSCAPING DETAILS**

DESIGNED BY KNH DRAWN BY KNH CHECKED BY JM  
 CONST. REVIEW BY   DATE JULY 2019 SCALE N.T.S.

CONTRACT NO. KH-30XX  
 DRAWING NO. **LD-01**  
 SHEET NO. 17 OF 18