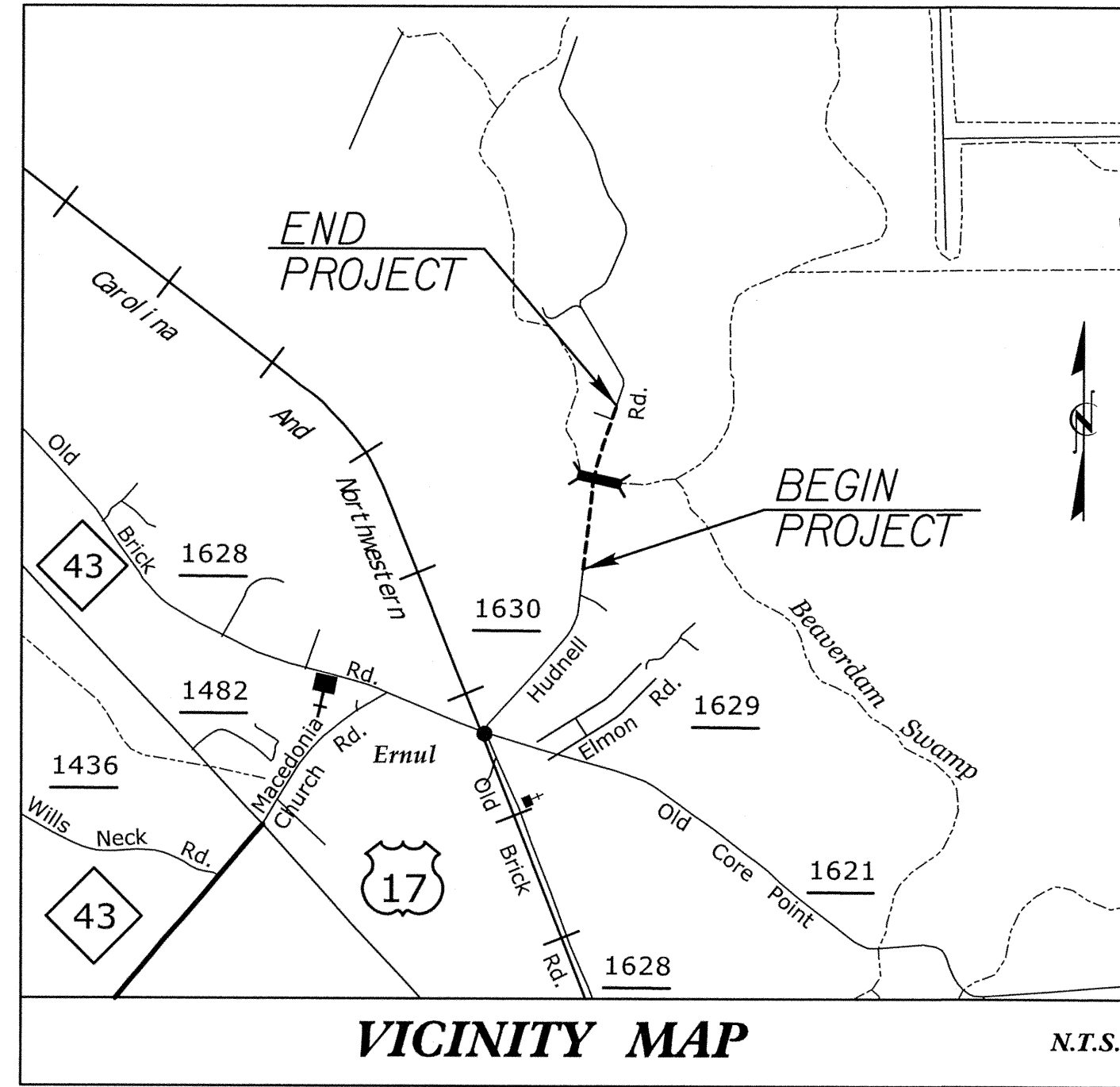


TIP PROJECT: 17BP.2.R.11



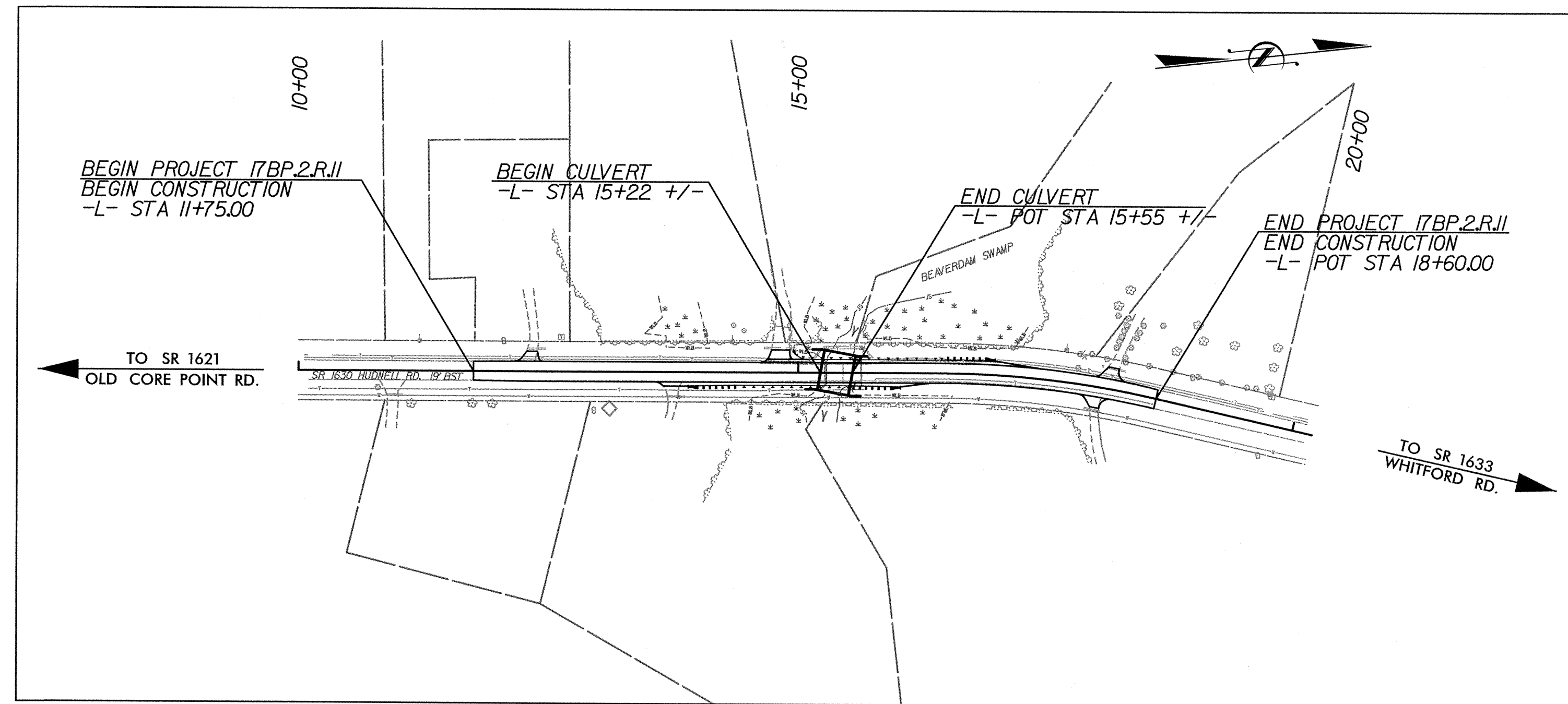
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN COUNTY

**LOCATION: BRIDGE NO.027 OVER BEAVERDAM SWAMP
ON SR 1630 (HUDNELL RD.)**

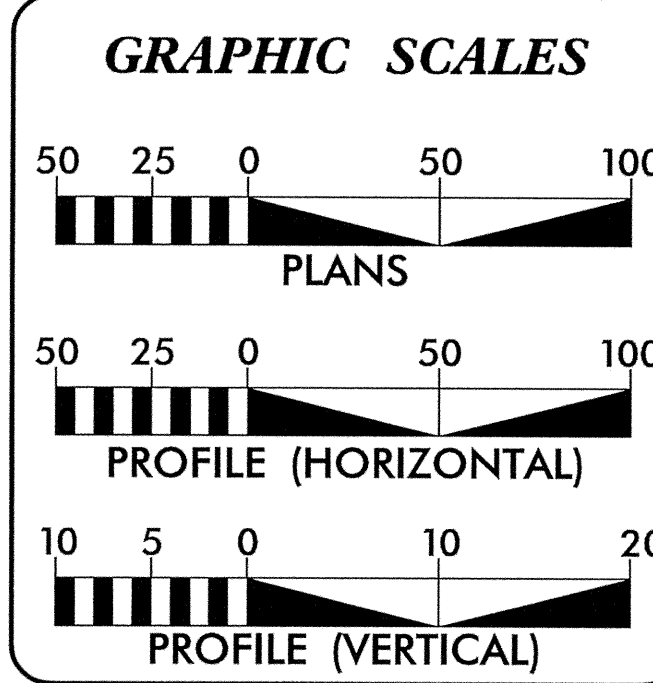
TYPE OF WORK: GRADING, PAVING, DRAINAGE & CULVERT

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	17BP.2.R.11	1	X
STATE PROJ. NO.	DESCRIPTION		
17BP.2.R.11	CONST		



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

CONTRACT:



DESIGN DATA

ADT 2000 = 190
ADT 2035 = 280
DHV = 10%
D = 60%
T = 6% *
V = 50 MPH
* TTST 2% DUAL 4%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT 17BP.2.R.11 =	0.124 MI.
LENGTH OF STRUCTURE TIP PROJECT 17BP.2.R.11 =	0.006 MI.
TOTAL LENGTH OF TIP PROJECT 17BP.2.R.11 =	0.130 MI.

Prepared In the Office of:

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 13, 2012

LETTING DATE:
SEPTEMBER 20, 2013

ENRICO A. ROQUE, P.E.
PROJECT ENGINEER

ANTHONY THOMPSON, P.E.
PROJECT DESIGNER

MARIA ROGERSON, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

James A. Byrd, P.E. 7/19/13
Signature: [Signature]

Maria C. Rogerson, P.E. 7/19/13
Signature: [Signature]

Professional Engineer Seal 15764

Professional Engineer Seal 19824

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER P.E.

*****DATE*****
*****SYSTEM*****
*****D/C*****

GENERAL NOTES: 2012 SPECIFICATIONS
 EFFECTIVE: 01-17-2012
 REVISED: 07-30-2012

GRADE LINE:
 GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

Power - Progress Energy

Phone - CenturyLink

Water - Craven County

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
I-A	INDEX OF SHEETS, GENERAL NOTES & LIST OF STANDARDS
I-B	SYMBOLOLOGY SHEET
2	TYPICAL SECTION SHEET
2A	DETOUR PLAN & PROFILE SHEET
3	EARTHWORK, PAVEMENT REMOVAL, & ROW SUMMARY
4	PLAN & PROFILE SHEET
TMP-1 THRU TMP-4	TRAFFIC CONTROL PLANS
EC-1 THRU EC-8	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
P-1 THRU P-2	PERMIT DRAWING
X-1 THRU X-6	-L- CROSS SECTION SHEETS
UO-1 THRU UO-2	UTILITIES BY OTHERS

2012 ROADWAY ENGLISH STANDARD DRAWINGS
 EFF. 01-17-2012
 REV. 10-30-2012

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I

REVISIONS













Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering












STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

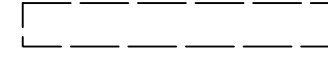









BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	_____ 
Property Corner	_____ 
Property Monument	_____ 
Parcel/Sequence Number	_____ 
Existing Fence Line	_____ 
Proposed Woven Wire Fence	_____ 
Proposed Chain Link Fence	_____ 
Proposed Barbed Wire Fence	_____ 
Existing Wetland Boundary	_____ 
Proposed Wetland Boundary	_____ 
Existing Endangered Animal Boundary	_____ 
Existing Endangered Plant Boundary	_____ 

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	_____ 
Sign	_____ 
Well	_____ 
Small Mine	_____ 
Foundation	_____ 
Area Outline	_____ 
Cemetery	_____ 
Building	_____ 
School	_____ 
Church	_____ 
Dam	_____ 














HYDROLOGY:

Stream or Body of Water	_____
Hydro, Pool or Reservoir	_____ 
Jurisdictional Stream	_____ 
Buffer Zone 1	_____ 
Buffer Zone 2	_____ 
Flow Arrow	_____ 
Disappearing Stream	_____ 
Spring	_____ 
Wetland	_____ 
Proposed Lateral, Tail, Head Ditch	_____ 
False Sump	_____ 

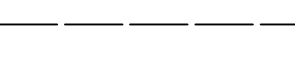
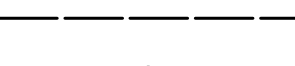





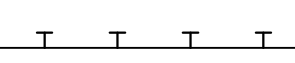
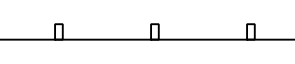
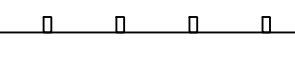



RAILROADS:

Standard Gauge	_____ 
RR Signal Milepost	_____ 
Switch	_____ 
RR Abandoned	_____ 
RR Dismantled	_____ 

RIGHT OF WAY:

Baseline Control Point	_____ 
Existing Right of Way Marker	_____ 
Existing Right of Way Line	_____ 
Proposed Right of Way Line	_____ 
Proposed Right of Way Line with Iron Pin and Cap Marker	_____ 
Proposed Right of Way Line with Concrete or Granite Marker	_____ 
Existing Control of Access	_____ 
Proposed Control of Access	_____ 
Existing Easement Line	_____ 
Proposed Temporary Construction Easement	_____ 
Proposed Temporary Drainage Easement	_____ 
Proposed Permanent Drainage Easement	_____ 
Proposed Permanent Utility Easement	_____ 

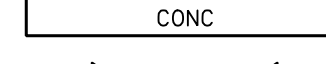

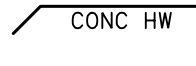
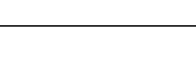


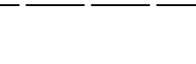


ROADS AND RELATED FEATURES:

Existing Edge of Pavement	_____ 
Existing Curb	_____ 
Proposed Slope Stakes Cut	_____ 
Proposed Slope Stakes Fill	_____ 
Proposed Wheel Chair Ramp	_____ 
Proposed Wheel Chair Ramp Curb Cut	_____ 
Curb Cut for Future Wheel Chair Ramp	_____ 
Existing Metal Guardrail	_____ 
Proposed Guardrail	_____ 
Existing Cable Guiderail	_____ 
Proposed Cable Guiderail	_____ 
Equality Symbol	_____ 
Pavement Removal	_____ 












VEGETATION:

Single Tree	_____ 
Single Shrub	_____ 
Hedge	_____ 
Woods Line	_____ 
Orchard	_____ 
Vineyard	_____ 














EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	_____ 
Bridge Wing Wall, Head Wall and End Wall	_____ 
MINOR:	
Head and End Wall	_____ 
Pipe Culvert	_____ 
Footbridge	_____ 
Drainage Box: Catch Basin, DI or JB	_____ 
Paved Ditch Gutter	_____ 
Storm Sewer Manhole	_____ 
Storm Sewer	_____ 








UTILITIES:

POWER:	
Existing Power Pole	_____ 
Proposed Power Pole	_____ 
Existing Joint Use Pole	_____ 
Proposed Joint Use Pole	_____ 
Power Manhole	_____ 
Power Line Tower	_____ 
Power Transformer	_____ 
U/G Power Cable Hand Hole	_____ 
H-Frame Pole	_____ 
Recorded U/G Power Line	_____ 
Designated U/G Power Line (S.U.E.*)	_____ 









TELEPHONE:

Existing Telephone Pole	_____ 
Proposed Telephone Pole	_____ 
Telephone Manhole	_____ 
Telephone Booth	_____ 
Telephone Pedestal	_____ 
Telephone Cell Tower	_____ 
U/G Telephone Cable Hand Hole	_____ 
Recorded U/G Telephone Cable	_____ 
Designated U/G Telephone Cable (S.U.E.*)	_____ 
Recorded U/G Telephone Conduit	_____ 
Designated U/G Telephone Conduit (S.U.E.*)	_____ 
Recorded U/G Fiber Optics Cable	_____ 
Designated U/G Fiber Optics Cable (S.U.E.*)	_____ 






WATER:

Water Manhole	_____ 
Water Meter	_____ 
Water Valve	_____ 
Water Hydrant	_____ 
Recorded U/G Water Line	_____ 
Designated U/G Water Line (S.U.E.*)	_____ 
Above Ground Water Line	_____ 







TV:

TV Satellite Dish	_____ 
TV Pedestal	_____ 
TV Tower	_____ 
U/G TV Cable Hand Hole	_____ 
Recorded U/G TV Cable	_____ 
Designated U/G TV Cable (S.U.E.*)	_____ 
Recorded U/G Fiber Optic Cable	_____ 
Designated U/G Fiber Optic Cable (S.U.E.*)	_____ 











GAS:

Gas Valve	_____ 
Gas Meter	_____ 
Recorded U/G Gas Line	_____ 
Designated U/G Gas Line (S.U.E.*)	_____ 
Above Ground Gas Line	_____ 

SANITARY SEWER:

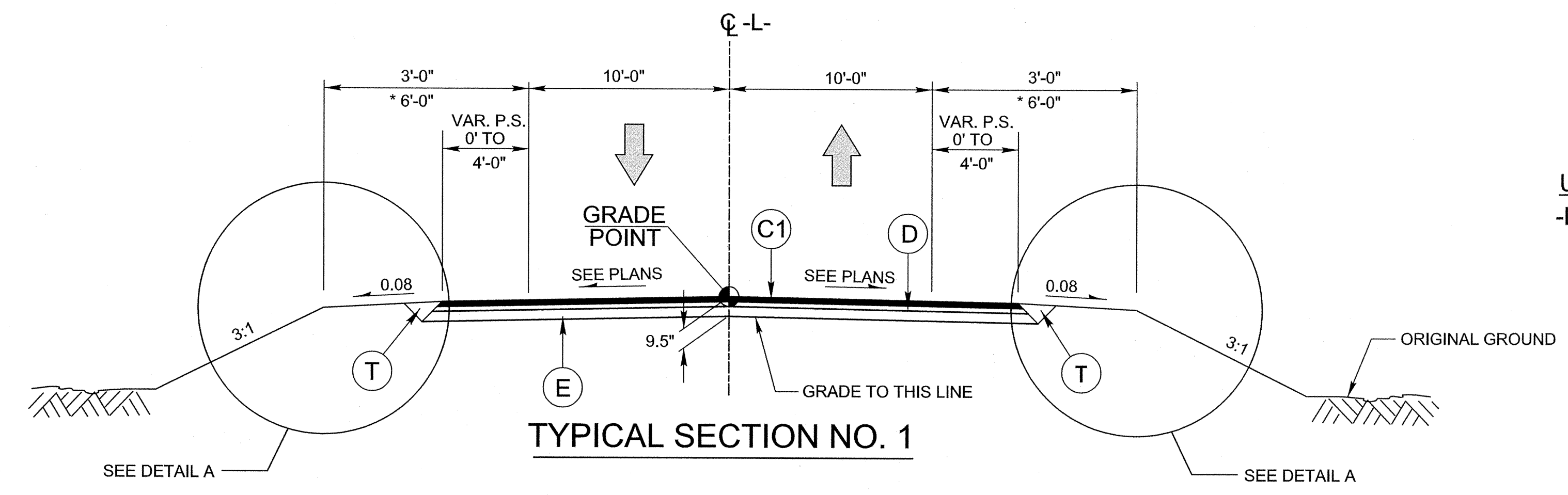
Sanitary Sewer Manhole	_____ 
Sanitary Sewer Cleanout	_____ 
U/G Sanitary Sewer Line	_____ 
Above Ground Sanitary Sewer	_____ 
Recorded SS Forced Main Line	_____ 
Designated SS Forced Main Line (S.U.E.*)	_____ 

MISCELLANEOUS:

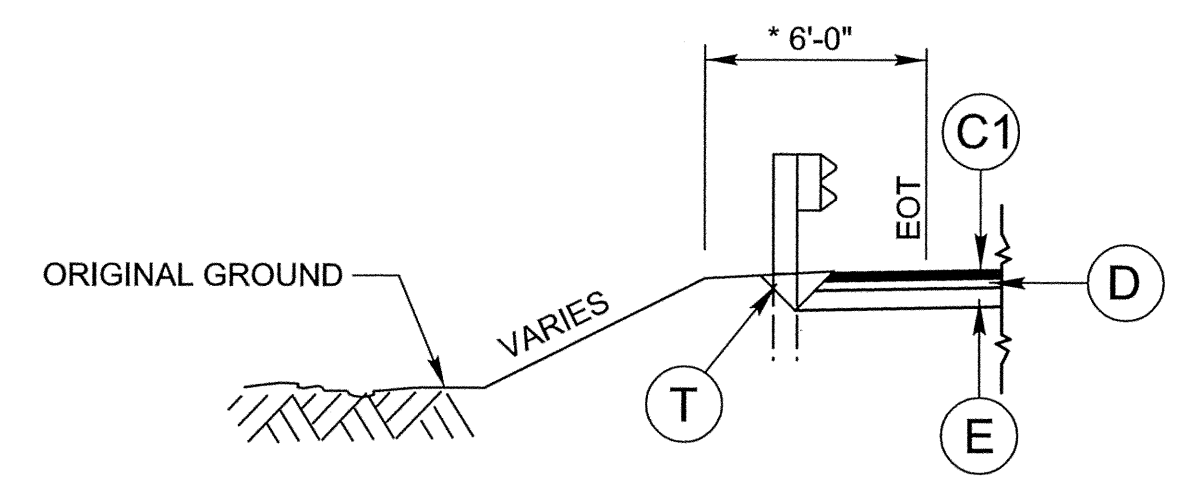
Utility Pole	_____ 
Utility Pole with Base	_____ 
Utility Located Object	_____ 
Utility Traffic Signal Box	_____ 
Utility Unknown U/G Line	_____ 
U/G Tank; Water, Gas, Oil	_____ 
A/G Tank; Water, Gas, Oil	_____ 
U/G Test Hole (S.U.E.*)	_____ 
Abandoned According to Utility Records	_____ 
End of Information	_____ 

PAVEMENT SCHEDULE	
C	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD IN ONE LAYER.
C1	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 220 LBS. PER SQ. YARD IN ONE LAYER.
D	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D1	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E1	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER INCH DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL)

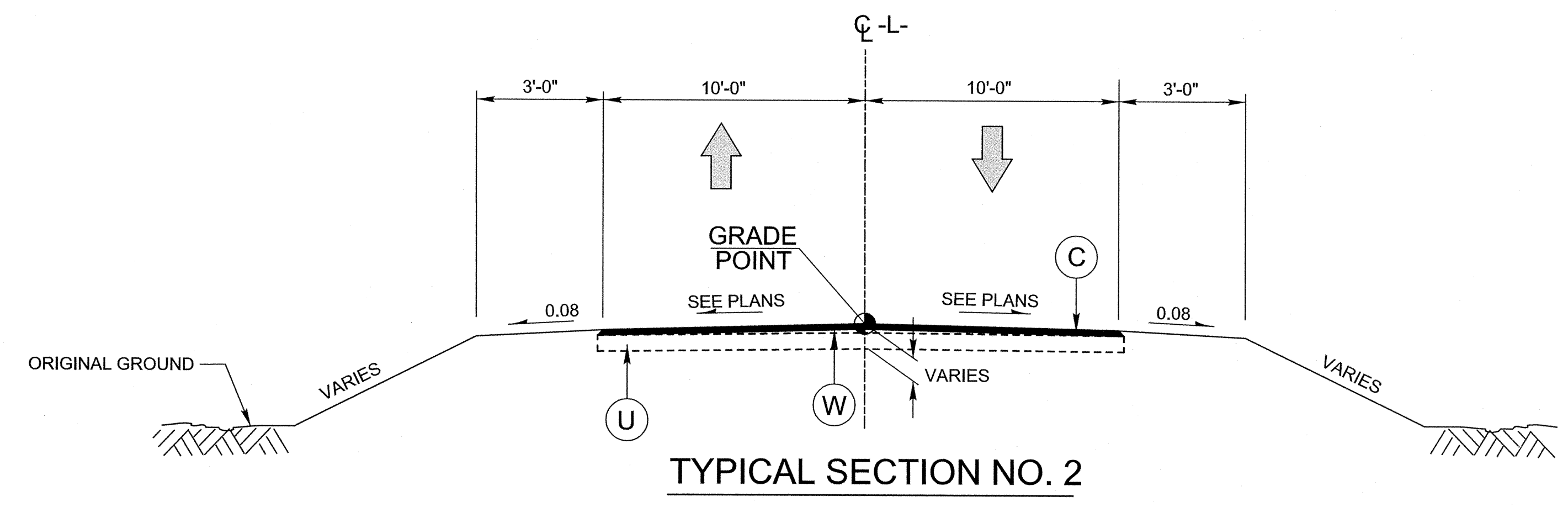
ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



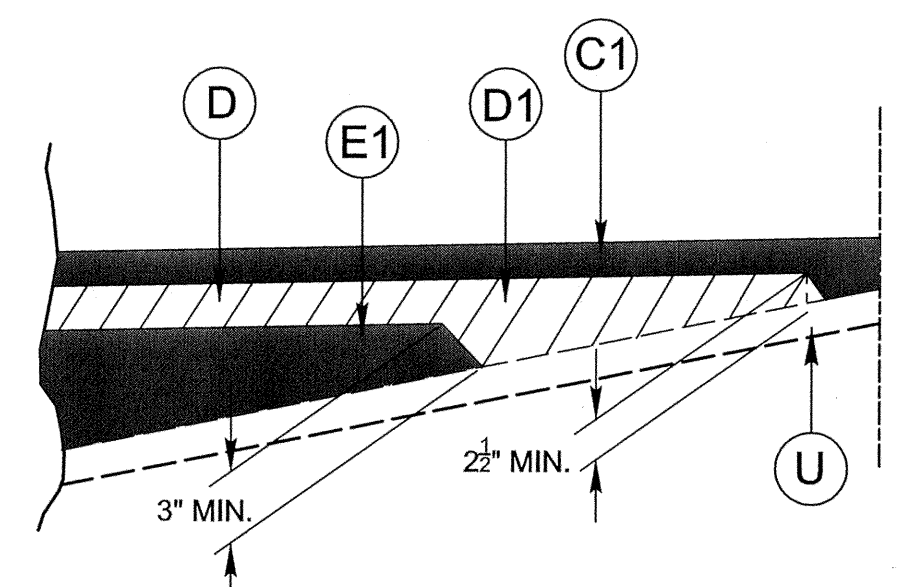
USE TYPICAL SECTION NO. 1 FROM:
 -L- STA. 13+75.00 TO -L- STA. 17+25.00



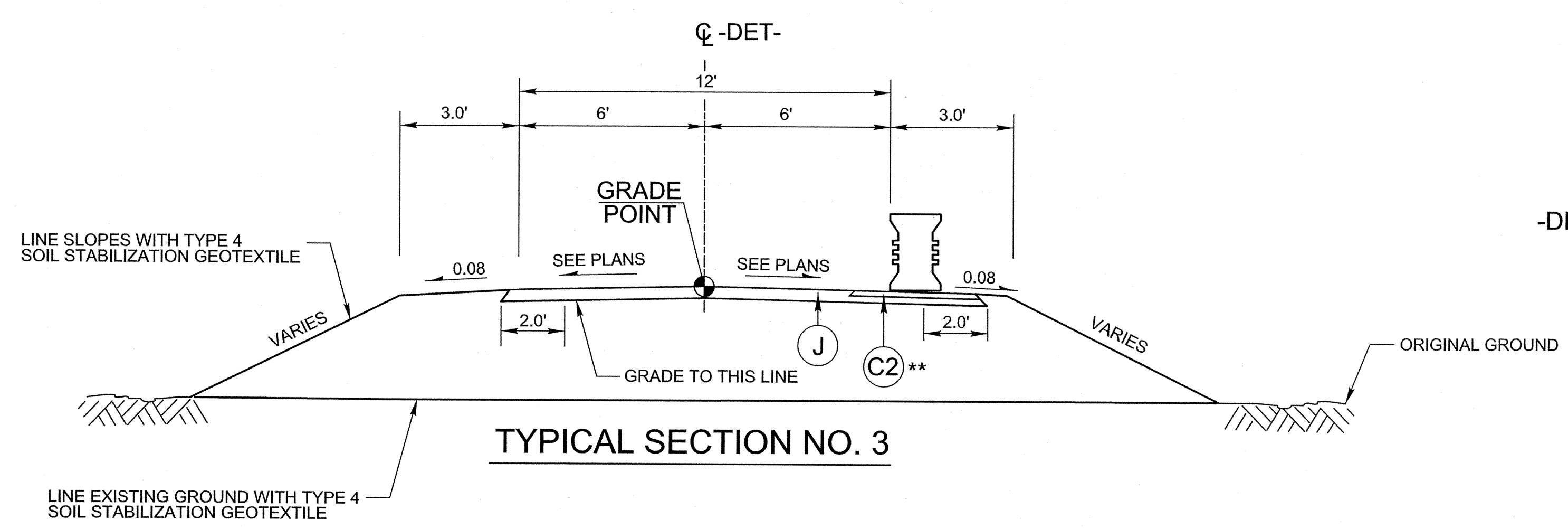
DETAIL A
 GUARDRAIL LOCATIONS
 -L- STA. 13+90.00 TO -L- STA. 16+02.50 RT
 -L- STA. 14+95.00 TO -L- STA. 16+96.50 LT



USE TYPICAL SECTION NO. 2 FROM:
 -L- STA. 11+75.00 TO -L- STA. 13+75.00
 -L- STA. 17+25.00 TO -L- STA. 18+60.00



DETAIL SHOWING METHOD OF WEDGING
 SEE TYPICAL SECTIONS



USE TYPICAL SECTION NO. 3 FROM:
 -DET- STA. 11+75.00 TO -DET- STA. 18+67.50

NOTES: * SHOULDER WIDTH INCREASED 3' WITH THE USE OF GUARDRAIL
 ** PLACE A 2" MINIMUM THICKNESS 4' WIDE ASPHALT STRIP UNDER WATER FILLED BARRIER.

REVISIONS

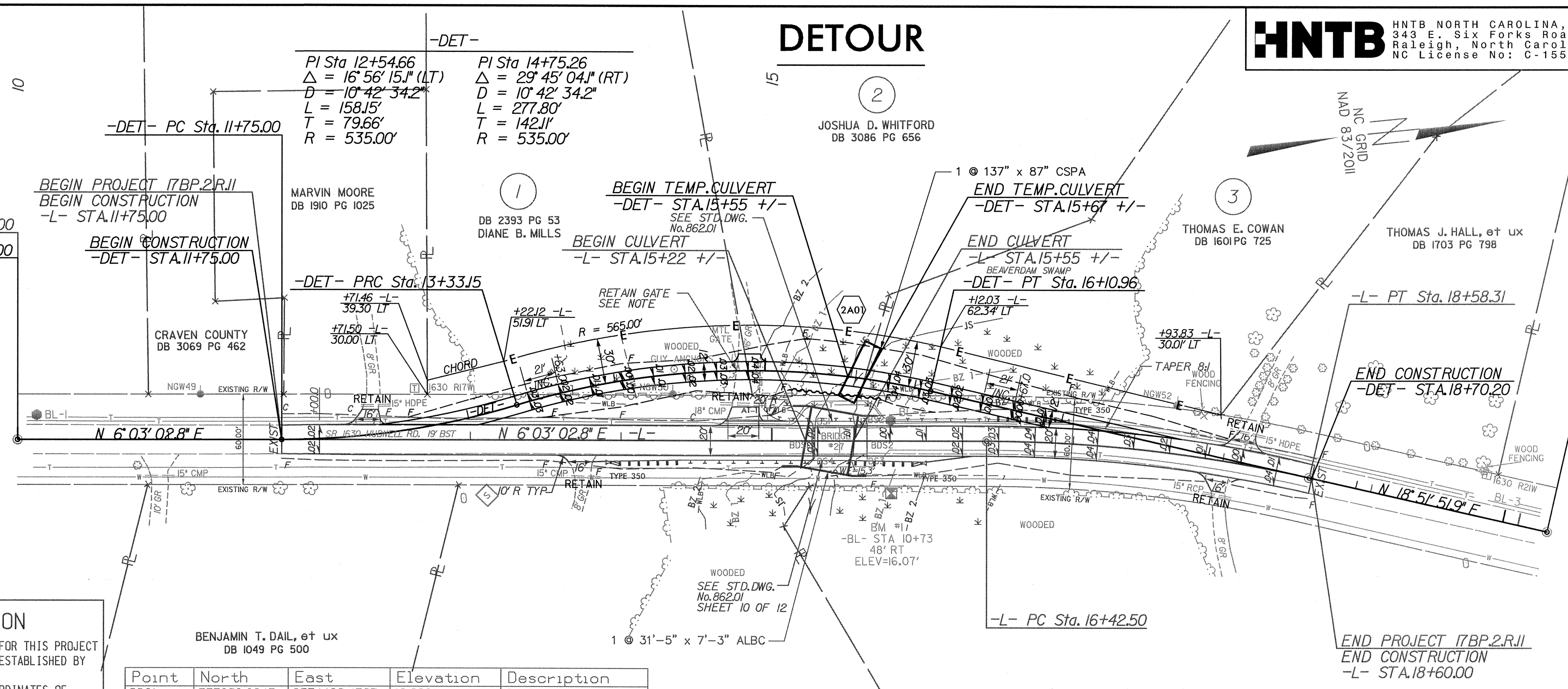
\$\$\$DATE\$\$\$
 \$\$\$SYSTEM\$\$\$
 \$\$\$DCN\$\$\$

DETOUR

-L-
 PI Sta 17+50.86
 $\Delta = 12^\circ 48' 49.0''$ (RT)
 $D = 5^\circ 56' 14.6''$
 $L = 215.81'$
 $T = 108.36'$
 $R = 965.00'$

-DET-
 PI Sta 12+54.66
 $\Delta = 16^\circ 56' 15.1''$ (LT)
 $D = 10^\circ 42' 34.2''$
 $L = 158.15'$
 $T = 79.66'$
 $R = 535.00'$

PI Sta 14+75.26
 $\Delta = 29^\circ 45' 04.1''$ (RT)
 $D = 10^\circ 42' 34.2''$
 $L = 277.80'$
 $T = 142.11'$
 $R = 535.00'$



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BL-2"

WITH NAD 83/2011 STATE PLANE GRID COORDINATES OF NORTHING: 555360.174(±) EASTING: 2574412.544(±) ELEVATION: 15.754(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987764

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-2" TO -L- STATION 10+00.00 IS S 4°41'47.44" W 578.98'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Point	North	East	Elevation	Description
BDS1	555306.8945	2574420.4507	16.3621	CL SHOT @ DECK END
BDS2	555343.6073	2574424.7536	16.4861	CL SHOT @ DECK END
BS1	555309.0948	2574411.2677	14.5881	BRIDGE SEAT #1
BS2	555343.3264	2574414.5916	14.6597	BRIDGE SEAT #2
BS3	555341.3099	2574433.7789	14.6881	BRIDGE SEAT #3
BS4	555307.1982	2574430.4836	14.6203	BRIDGE SEAT #4

Point	North	East	Elevation	Station	Description
1	554797.3850	2574350.1990	21.3520	5+00.00	BL-1
2	555360.1740	2574412.5440	15.7540	10+66.23	BL-2
3	555744.9031	2574503.0472	18.4940	14+61.46	BL-3
BM1	555355.5131	2574460.6902	16.0720	10+72.72	RR SPIKE SET IN 13' GUM TREE

CENTERLINE COORDINATE LIST

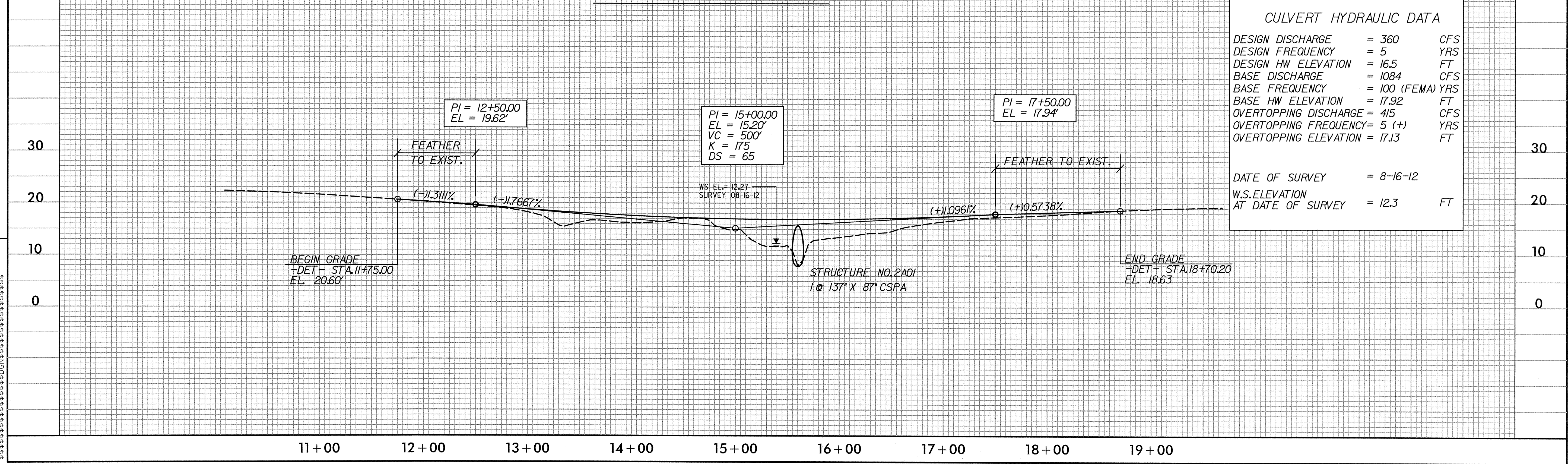
POINT	-L- STATION	NORTHING	EASTING
POT	10+00.00	554783.1401	2574365.1386
BEG	11+75.00	554957.1652	2574383.5853
PC	16+42.50	555422.0630	2574432.8647
PT	18+58.31	555632.3554	2574479.3222
END	18+60.00	555633.9502	2574479.8671
POT	20+19.86	555785.2202	2574531.5534

ERNEST M. SHEPARD, JR., et ux
 DB 1070 PG 1014

NOTES: CONTRACTOR TO TAKE SPECIAL CARE INSTALLING THE GUARDRAIL POSTS IN THE VICINITY OF THE PROPOSED CULVERT, SO AS NOT TO DAMAGE THE CULVERT DURING INSTALLATION.

CONTRACTOR TO RELOCATE GATE TO PARCELS No. 1 & 2 DURING DETOUR CONSTRUCTION, AND THEN RETURN IT TO ITS ORIGINAL LOCATION ONCE MAINLINE CONSTRUCTION IS COMPLETE.

DETOUR - PROFILE



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 360	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 16.5	FT
BASE DISCHARGE	= 1084	CFS
BASE FREQUENCY	= 100 (FEMA)	YRS
BASE HW ELEVATION	= 17.92	FT
OVERTOPPING DISCHARGE	= 415	CFS
OVERTOPPING FREQUENCY	= 5 (+)	YRS
OVERTOPPING ELEVATION	= 17.13	FT

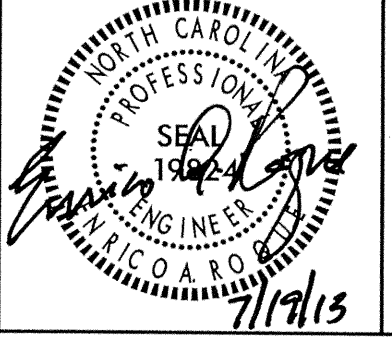
DATE OF SURVEY = 8-16-12
 W.S. ELEVATION AT DATE OF SURVEY = 12.3 FT

REVISIONS

\$\$\$\$DATE\$\$\$\$
 \$\$\$SYSTEM\$\$\$\$
 \$\$\$DCM\$\$\$\$

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.11	3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
	

ROW AREA DATA SUMMARY

PARCEL NO.	PROPERTY OWNERS NAMES	TOTAL ACREAGE	AREA TAKEN (SQ. FT.)	AREA REMAINING RT.	AREA REMAINING LT.	CONST. EASE.	PERM. DRAIN. EASE.	TEMP. DRAIN. EASE.
1	DIANE B. MILLS	-				6920.9		
2	JOSHUA D. WHITFORD	-				3633.5		
3	THOMAS E. COWAN	-				4275.2		

PAVEMENT REMOVAL SUMMARY IN SQUARE YARDS

LOCATION	REMOVAL OF ASPHALT PAVEMENT	BREAKING OF ASPHALT PAVEMENT
-L- STA. 13+75 TO 15+27	309	
-L- STA. 15+63 TO 16+75	221	
-DET- STA. 12+75 TO 17+20	167	
GRAND TOTAL	697	
SAY	700	

DRAINAGE SUMMARY

STATION	LOCATION (L, RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS VI R.C. PIPE (UNLESS NOTED OTHERWISE)			QUANTITIES FOR DRAINAGE STRUCTURES		TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B')			SIDE DRAIN PIPE	GRADED D.L., TYPE 'B' STD. 840.36	T.B.D.I. FRAME AND GRATE STD. 840.37	137" x 87" CORRUGATED STEEL PIPE ARCH (CSPA)	REMARKS
		FROM	TO					15"	18"	24"	PER EACH (0 THRU 5.0')	A	B	15"	18"					
-DET- 15+60.00	CL	2A01	OUT		7.85	6.38														
TOTAL																				40

SUMMARY OF EARTHWORK IN CUBIC YARDS

STATION	STATION	UNCLASSIFIED EXCAVATION	EMBANK. +%	BORROW	WASTE
-L- STA. 11+75.00	-L- STA. 18+60.00	599	236		363
-DET- STA. 12+40.83	-DET- STA. 17+80.13	10	1122	1112	
PROJECT SUBTOTAL		609	1358	1112	
WASTE TO REPLACE BORROW				0	
DETOUR REMOVAL		-10	-1122	-1112	
PROJECT TOTAL		599	236		363
GRAND TOTALS:		599			363
SAY:		600			370

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS				
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	TYPE 350 (TL-3)	XIII	CAT-1	III	BIC	AT-1	EA	G	NG								
-L-	13+90.00	16+02.50	RT	212.5			13+90.00	16+02.50	3	6	50	50	1	1																				
-L-	14+95.00	16+96.50	LT	187.5	12.5		16+96.50	14+95.00	3	6	50	12.5	1	1																				
LESS ANCHOR DEDUCTIONS																																		
				TYPE 350, TL-3	3 @ 50.00'	=	150.0																											
				AT-1	1 @ 6.25'	=	6.25																											
			TOTAL				243.75	12.5																										
			SAY				250.0	12.5																										
(5 ADDITIONAL GUARDRAIL POST)																																		

REVISIONS

\$\$\$\$DATE\$\$\$\$
\$\$\$\$SYTIME\$\$\$\$
\$\$\$\$SDCN\$\$\$\$

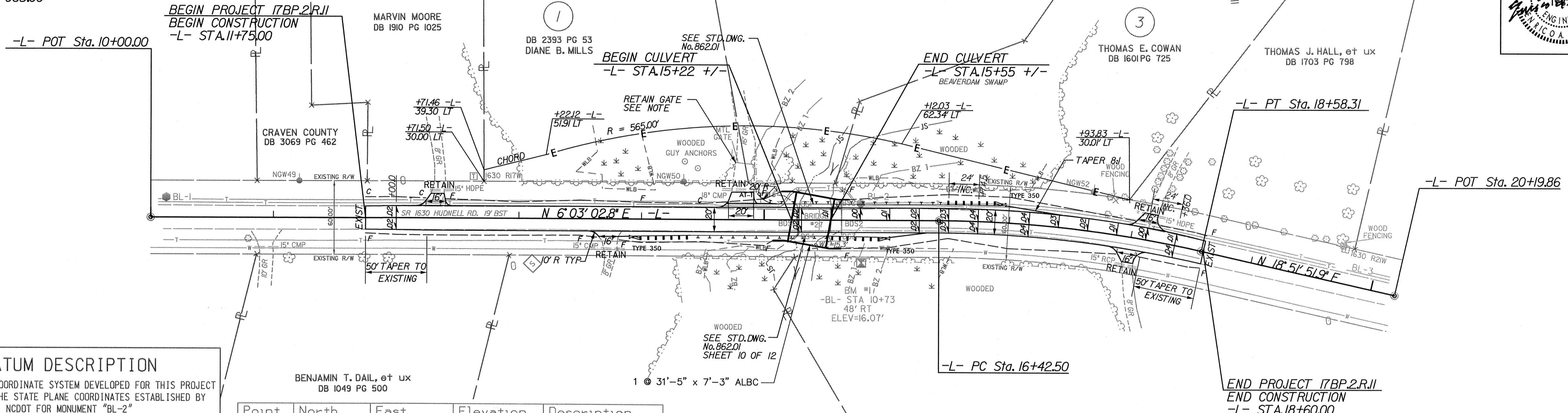
PLAN

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO. 17BP.2.R.II	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L-
PI Sta. 17+50.86
 $\Delta = 12^\circ 48' 49.0''$ (RT)
D = 5' 56" 14.6"
L = 215.81'
T = 108.36'
R = 965.00'

2
JOSHUA D. WHITFORD
DB 3086 PG 656



DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCOOT FOR MONUMENT "BL-2"
WITH NAD 83/2011 STATE PLANE GRID COORDINATES OF NORTHING: 555360.174(ft) EASTING: 2574412.544(ft) ELEVATION: 15.754(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987764
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ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

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BS4	555307.1982	2574430.4836	14.6203	BRIDGE SEAT #4

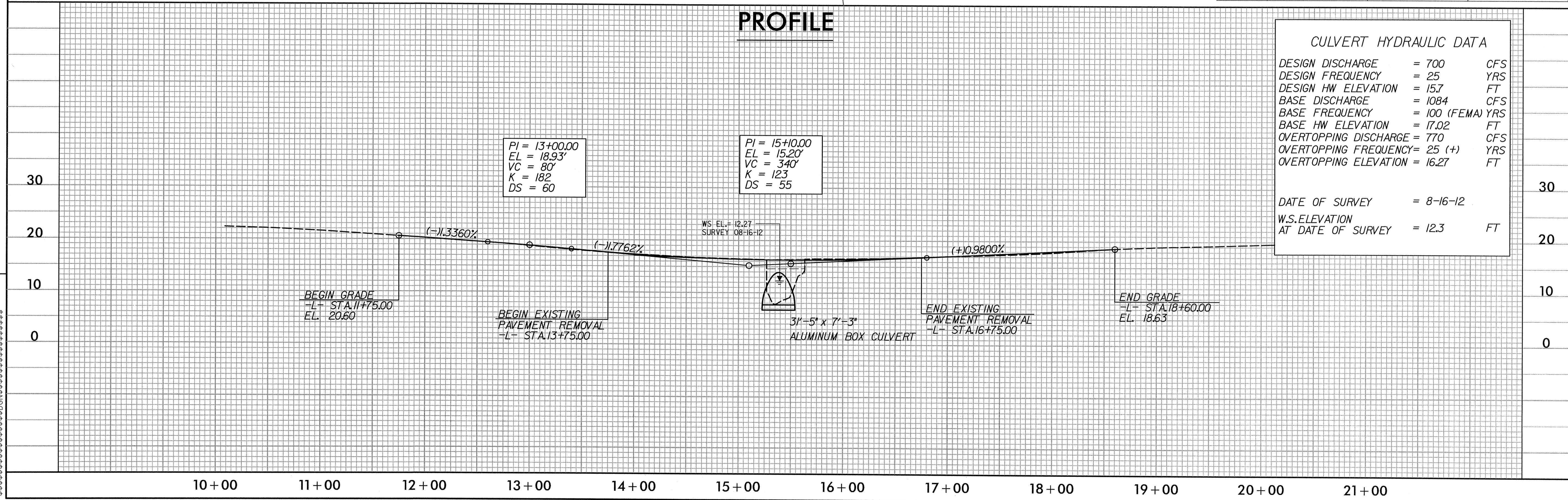
Point	North	East	Elevation	Station	Description
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2	555360.1740	2574412.5440	15.7540	10+66.23	BL-2
3	555744.9031	2574503.0472	18.4940	14+61.46	BL-3
BM1	555355.5131	2574460.6902	16.0720	10+72.72	RR SPIKE SET IN 13" GUM TREE

CENTERLINE COORDINATE LIST

POINT	-L- STATION	NORTHING	EASTING
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BEG	11+75.00	554957.1652	2574383.5853
PC	16+42.50	555422.0630	2574432.8647
PT	18+58.31	555632.3554	2574479.3222
END	18+60.00	555633.9502	2574479.8671
POT	20+19.86	555785.2202	2574531.5534

NOTES: CONTRACTOR TO TAKE SPECIAL CARE INSTALLING THE GUARDRAIL POSTS IN THE VICINITY OF THE PROPOSED CULVERT, SO AS NOT TO DAMAGE THE CULVERT DURING INSTALLATION.
CONTRACTOR TO RELOCATE GATE TO PARCELS No. 1 & 2 DURING DETOUR CONSTRUCTION AND THEN RETURN IT TO ITS ORIGINAL LOCATION ONCE MAINLINE CONSTRUCTION IS COMPLETE.

PROFILE



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 15.7	FT
BASE DISCHARGE	= 1084	CFS
BASE FREQUENCY	= 100 (FEMA)	YRS
BASE HW ELEVATION	= 17.02	FT
OVERTOPPING DISCHARGE	= 770	CFS
OVERTOPPING FREQUENCY	= 25 (+)	YRS
OVERTOPPING ELEVATION	= 16.27	FT

DATE OF SURVEY = 8-16-12
W.S. ELEVATION AT DATE OF SURVEY = 12.3 FT

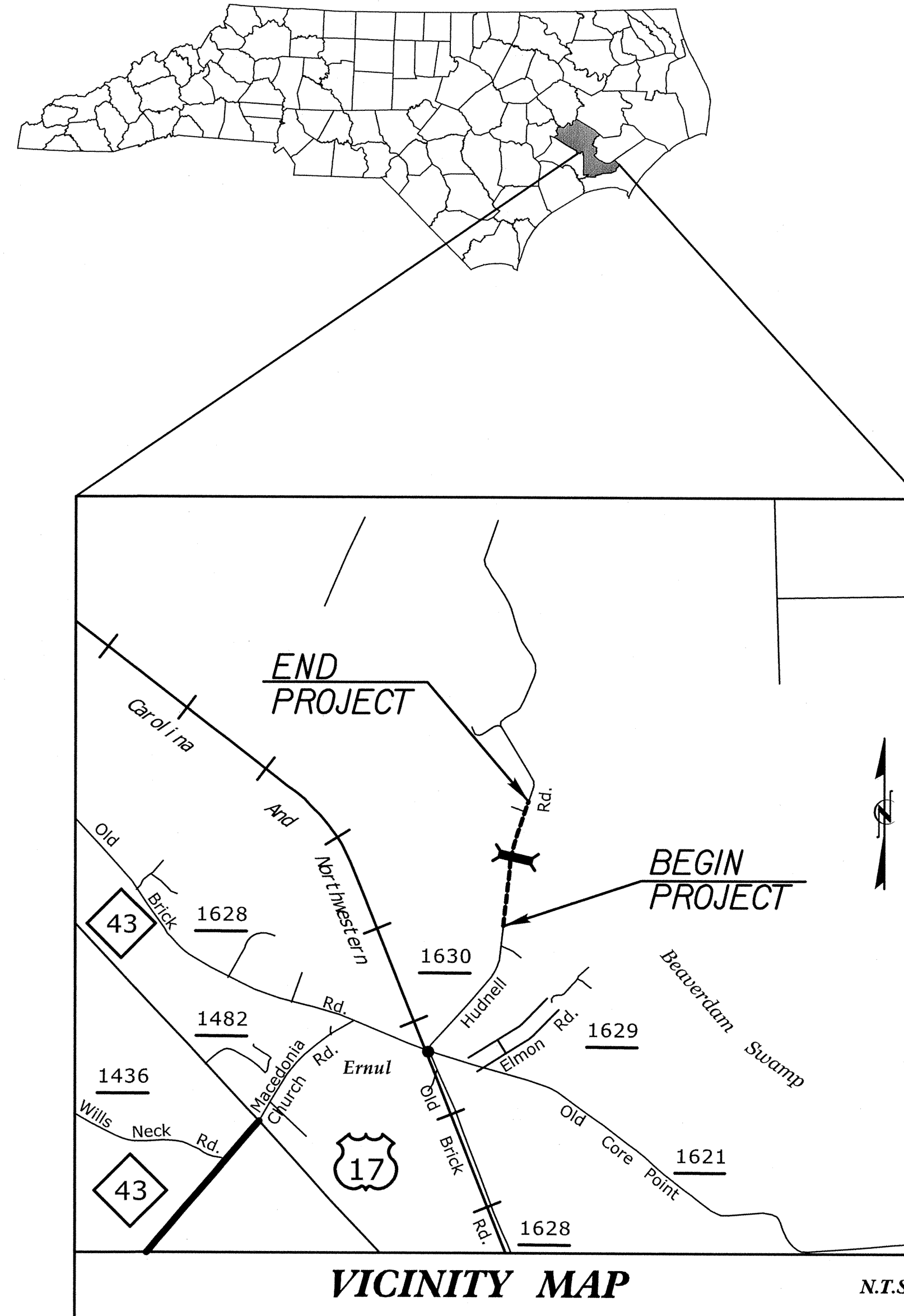
REVISIONS

DATE TIME

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

CRAVEN COUNTY

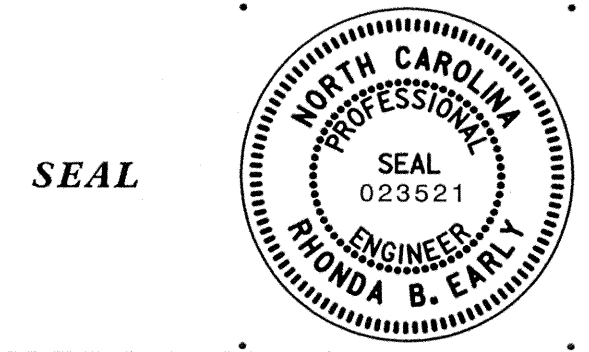


INDEX OF SHEETS	
SHEET NO.	TITLE
TMP-1	TITLE SHEET WITH VICINITY MAP AND INDEX OF SHEETS
TMP-2	LIST OF APPLICABLE ROADWAY, STANDARD DRAWINGS, AND LEGEND
TMP-2A	SHORING DATA
TMP-3	GENERAL NOTES AND PHASING
TMP-4	DETAILS

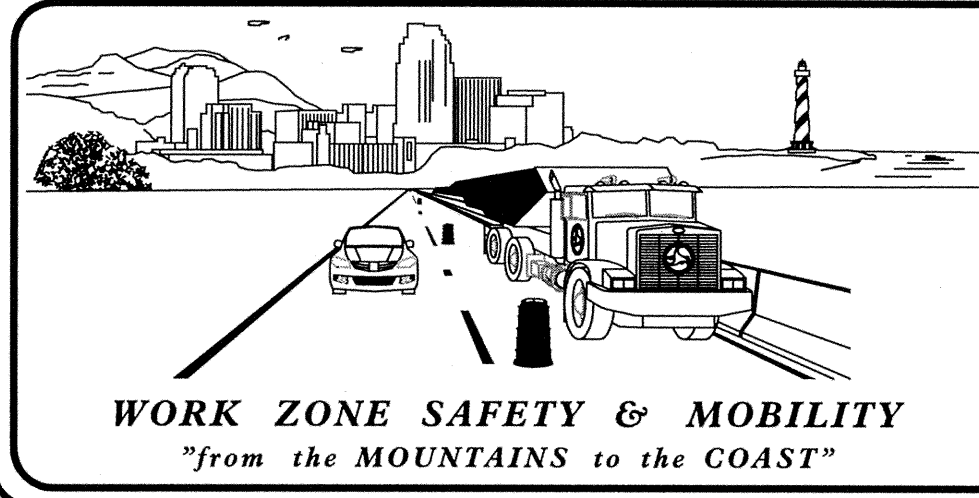
HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

R. B. EARLY, PE TRAFFIC CONTROL PROJECT ENGINEER
J. A. PHILLIPS TRAFFIC CONTROL DESIGN ENGINEER

APPROVED: *[Signature]*
DATE: 7.19.13

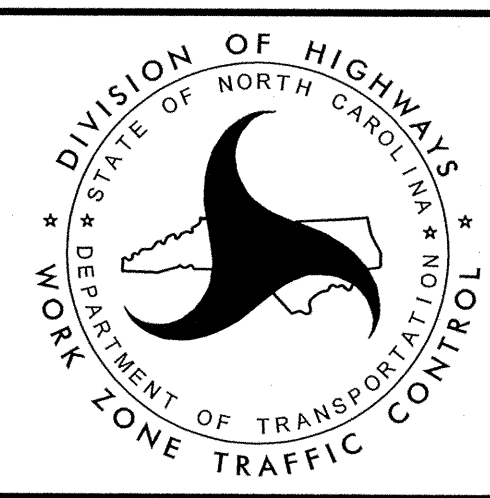


SEAL



N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

KATHERINE HITE, PE DIVISION TRAFFIC ENGINEER



10:34:57 AM
\\TCPL\BR27_TCP\01_T\He.dgn
\$\$\$USERNAME\$\$\$

SHEET NO.
TMP-1

17BP.2.R.11

TIP PROJECT:

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	TRUCK MOUNTED ATTENUATOR - DELINEATION
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL
- WEDGE / WIDEN (USING LANE CLOSURES)
- TEMPORARY PAVEMENT / GRADE

TEMPORARY AND FINAL PAVEMENT MARKING

SYMBOL	DESCRIPTION	PAY ITEM
PAVEMENT MARKING LINES		
PA	WHITE EDGELINE	PAINT (4")
PI	YELLOW DOUBLE CENTER LINE	

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

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REVISIONS

REVIEW:	_____
CONCUR:	_____
REVISE:	_____
VERIFY:	_____

HNTB HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO: C-1554

APPROVED: *[Signature]* DATE: 7-19-13

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
023521
RONDA B. EARLY

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

TRANSPORTATION
MANAGEMENT PLAN

**STANDARDS
& LEGENDS**

TEMPORARY SHORING NO. 1 AND 3

FOR TEMPORARY SHORING, AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

AT THE CONTRACTOR'S OPTION, USE STANDARD SHORING FOR TEMPORARY SHORING FROM STATION 15+15+/- -DET-, 10+/- FT RIGHT TO STATION 15+35+/- -DET-, 10+/- FT RIGHT, AND FROM STATION 15+65+/- -DET-, 10+/- FT RIGHT TO STATION 15+75+/- -DET-, 10+/- FT RIGHT. SEE STANDARD DRAWING NO. 1801.01 FOR STANDARD TEMPORARY SHORING AND 1801.02 FOR STANDARD TEMPORARY WALLS.

TEMPORARY SHORING NO. 2

FOR TEMPORARY SHORING, AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION 15+35+/- -DET-, 10+/- FT RIGHT TO STATION 15+65+/- -DET-, 10+/- FT. RIGHT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

FOR SOIL LAYER ABOVE ELEVATION 3 FT:
 UNIT WEIGHT (γ) = 100 LB/CF
 FRICTION ANGLE (ϕ) = 0 DEGREES
 COHESION (c) = 50 LB/SF
 GROUNDWATER ELEVATION = 14 FT

FOR SOIL LAYER BELOW ELEVATION 3 FT:
 UNIT WEIGHT (γ) = 120 LB/CF
 FRICTION ANGLE (ϕ) = 30 DEGREES
 COHESION (c) = 0 LB/SF
 GROUNDWATER ELEVATION = 14 FT

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 \$\$\$USERNAME\$\$\$

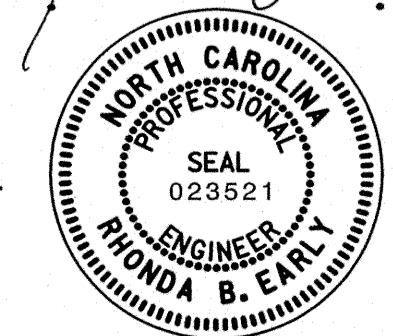
REVISIONS

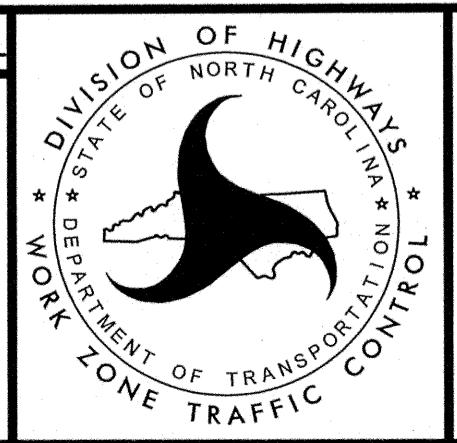
REVIEW:	_____
CONCUR:	_____
REVISE:	_____
VERIFY:	_____

TEMPORARY SHORING
 RECOMMENDATIONS LETTER
 ORIGINALLY ISSUED AND SEALED BY:

 MAJID KHAZAEI
 N.C. P.E. 036278
 ON 07-26-13

APPROVED: *[Signature]* DATE: 7.30.13

 SEAL




TRANSPORTATION
 MANAGEMENT PLAN

 SHORING DATA

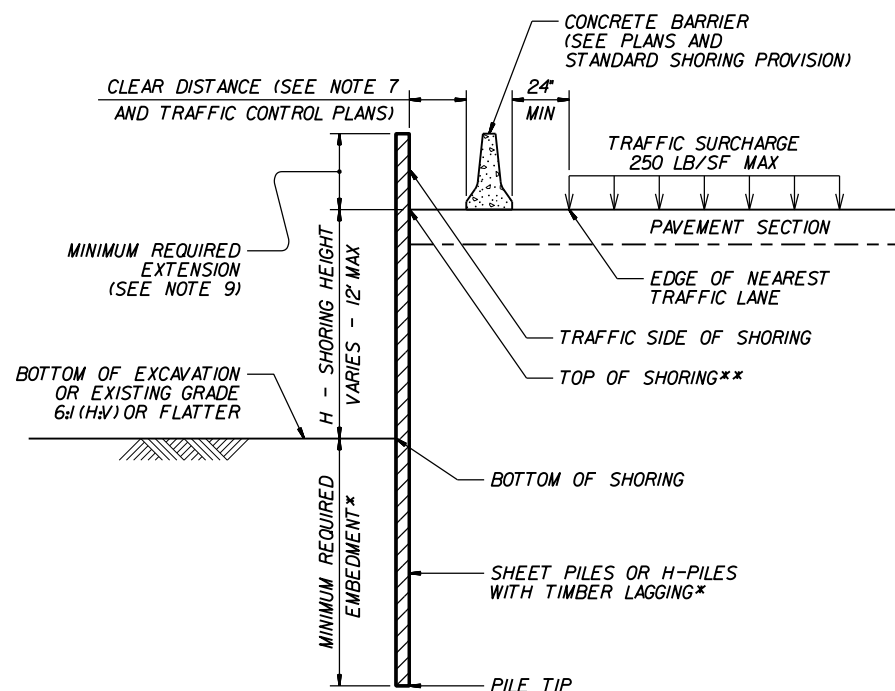
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5	
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5	

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

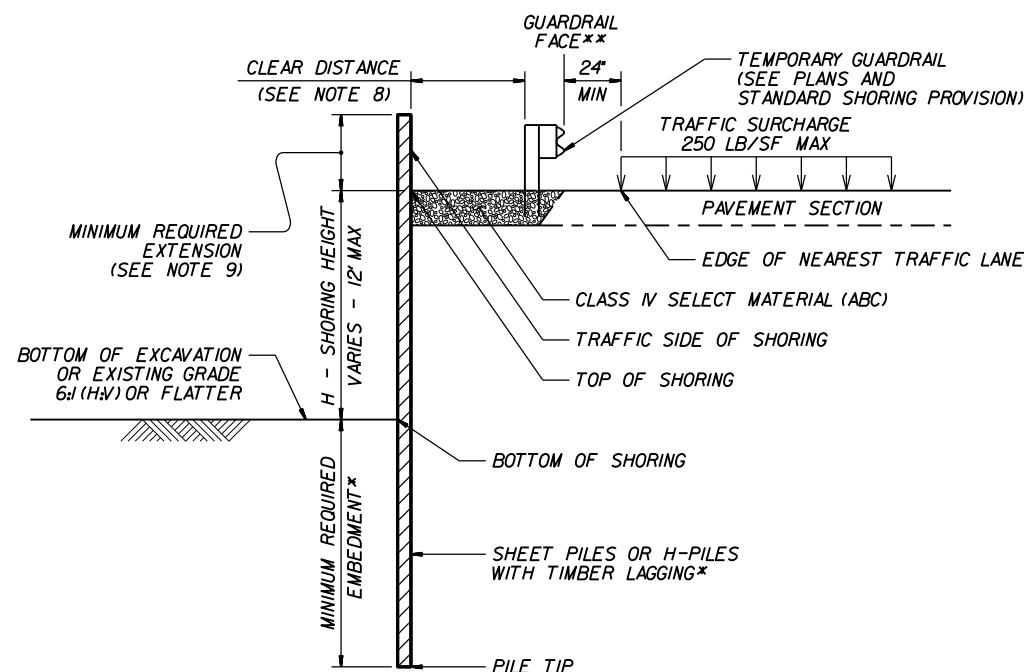
*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

NOTES:

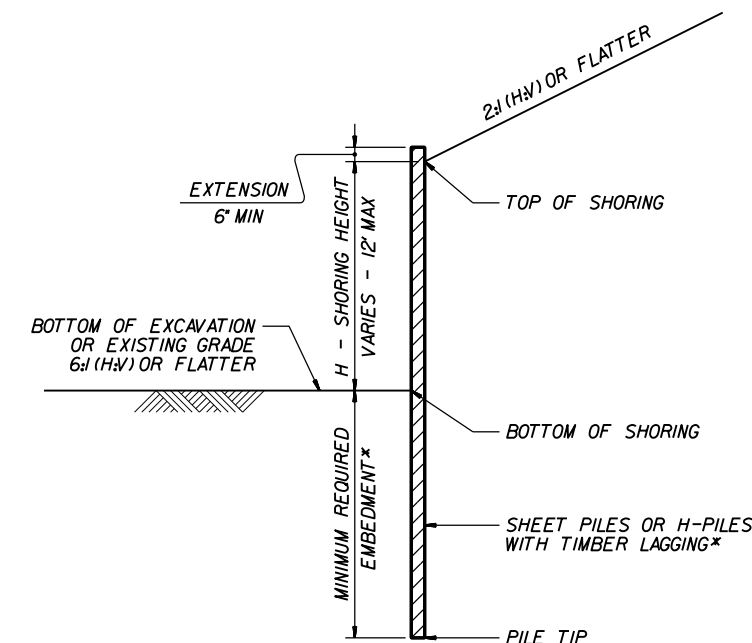
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ LB/CF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ LB/SF
- DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EXTENSION IS 6' FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32' FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
- SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



CONCRETE BARRIER
**TOP OF SHORING =
EDGE OF PAVEMENT

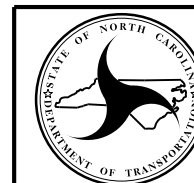


TEMPORARY GUARDRAIL
**GUARDRAIL FACE =
EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING
(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING
(SURCHARGE CASE)
*SEE TABLE ABOVE.



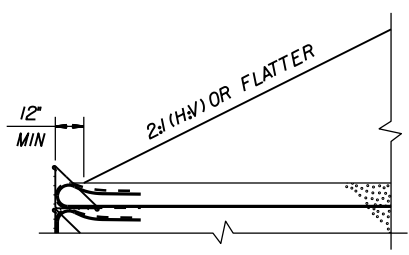
GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.01

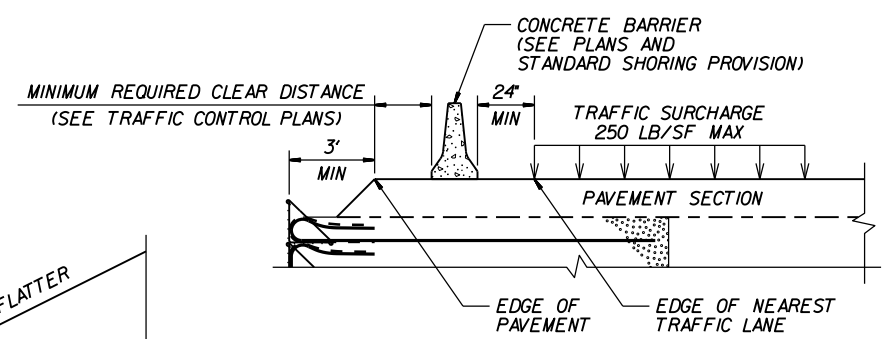
STANDARD TEMPORARY SHORING

DATE: 11-19-13

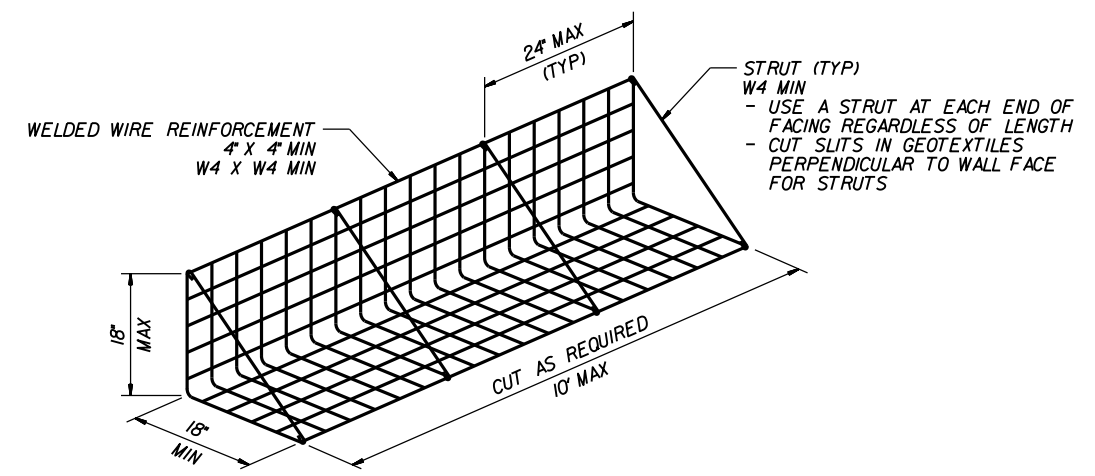
PROJECT REFERENCE NO. 17BP_2.R.11		SHEET TMP_2C
GEOTECHNICAL ENGINEER	ENGINEER	
SIGNATURE	DATE	SIGNATURE



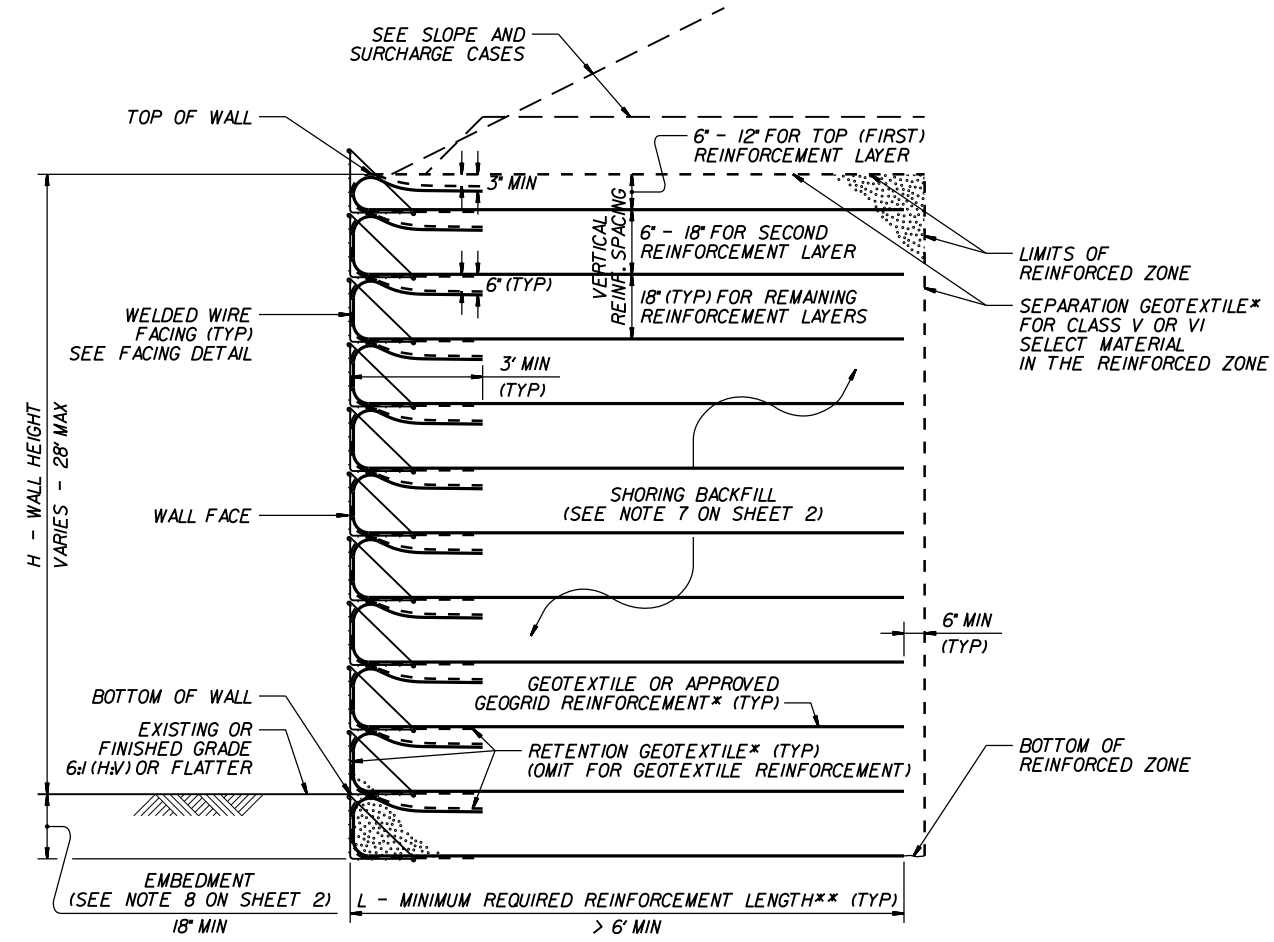
SLOPE CASE



SURCHARGE CASE

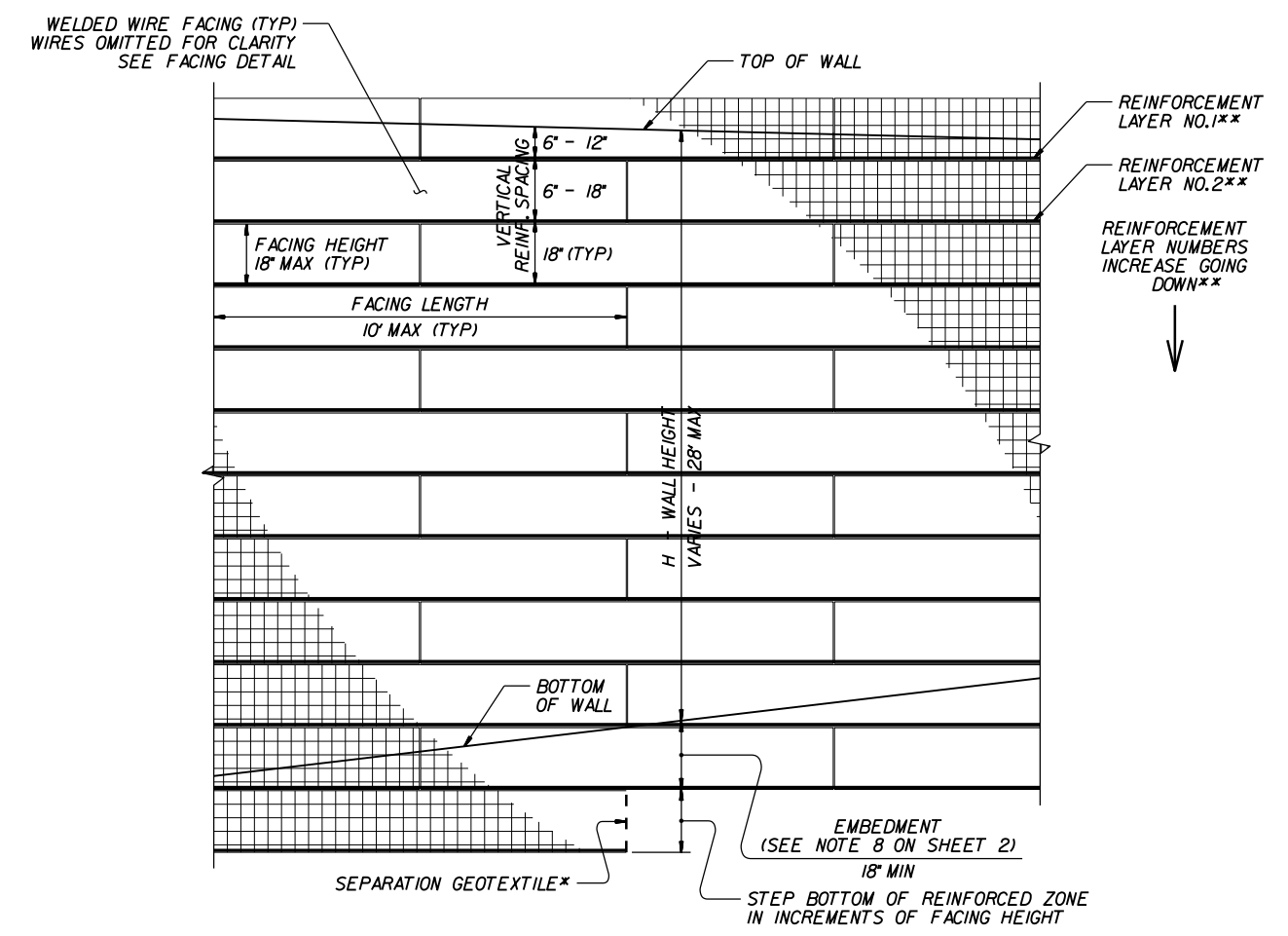


FACING DETAIL



STANDARD TEMPORARY WALL

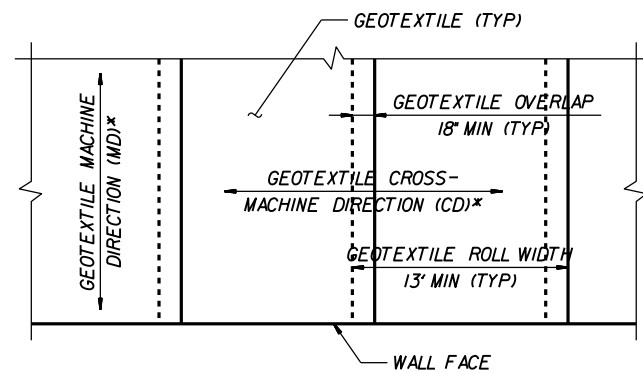
(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
 *SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.



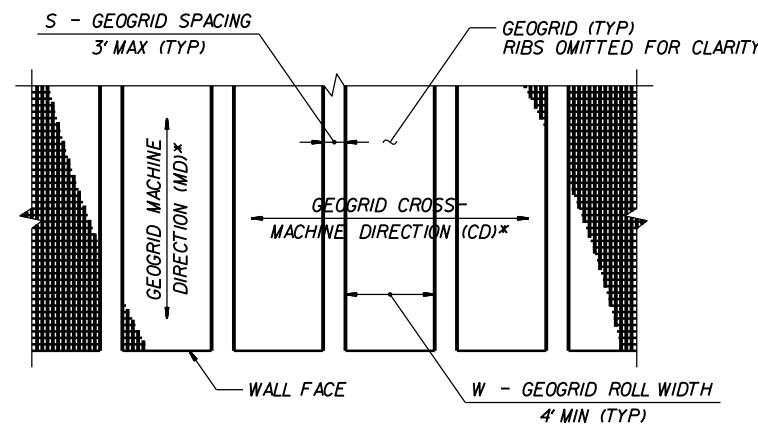
STANDARD TEMPORARY WALL - PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.

<p>GEOTECHNICAL ENGINEERING UNIT STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH</p>	STANDARD DRAWING NO. 1801.02
	<p>STANDARD TEMPORARY WALL Sheet 1 of 3</p> <p>DATE: 11-20-12</p>



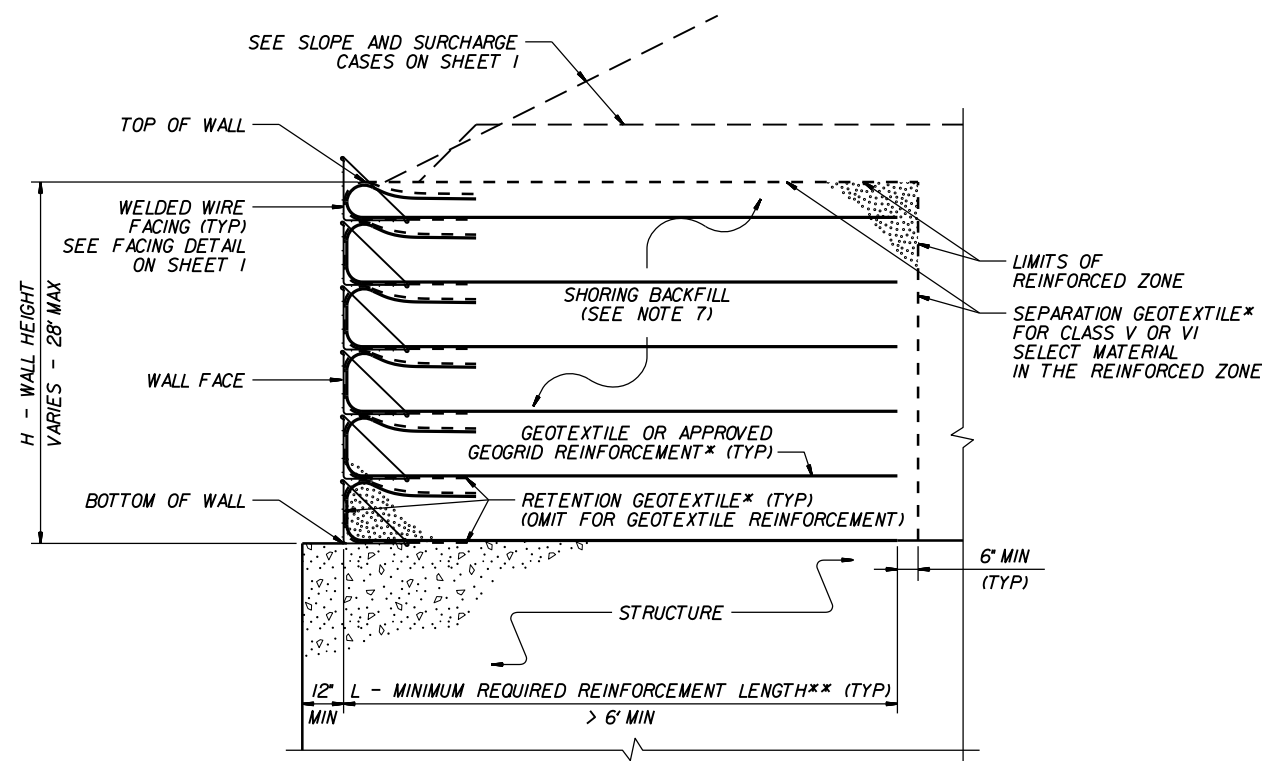
GEOTEXTILE PLACEMENT
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



GEOGRID PLACEMENT
(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT - $\frac{W}{W+S} \times 100 \geq 80\%$, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

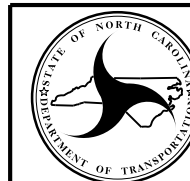
*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ LB/CF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ LB/SF
- DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
- DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
- EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- GEOGRIDS ARE APPROVED FOR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) BASED ON MATERIAL TYPE. FOR DETAILS OF APPROVED GEOGRIDS AND SHORT-TERM DESIGN STRENGTHS, SEE www.ncdot.org/doh/operations/materials/soils/gep.html DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
- AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH THE FOLLOWING CONDITIONS OCCUR:
- W (REINFORCEMENT ROLL WIDTH) $> L$ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
- REINFORCEMENT STRENGTH IN CD \geq MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
- SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION.
- DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
- FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
- DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
- CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
- FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
- FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL
Sheet 2 of 3

DATE: 11-20-12

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
SLOPE CASE	> 0	CLASS II, TYPE I, CLASS III, CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27	
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	
		A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20	
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19	

L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)
(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD
(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL
Sheet 3 of 3

DATE: 11-20-12

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS, OR RESULT IN DUPLICATE, OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING OR REMOVAL OF DEVICES, AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
- C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAINS WITHIN THE CLOSED TRAVEL LANE.
- D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAINS WITHIN THE CLOSED TRAVEL LANE.
- E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY RAMP OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.
- F) DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON -L- (SR 1630).

PAVEMENT EDGE DROP OFF REQUIREMENTS

- G) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

 BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

 BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

 BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.
- H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 350' IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

- I) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- J) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- K) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- L) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 350' IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

- M) DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

TRAFFIC CONTROL DEVICES

- N) WHEN LANE CLOSURES ARE NOT IN EFFECT, SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPENED TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- O) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

- P) STATE FORCES WILL INSTALL TEMPORARY AND PERMANENT PAVEMENT MARKING.
- Q) STATE FORCES WILL COMPLETE PAVEMENT MARKING REMOVAL.

MISCELLANEOUS

- R) PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) AND RESPECTIVELY IN ADVANCE OF THE UNPAVED AREA.

PHASING

NOTE: COMPLETE ANY PROPOSED WIDENING IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANE.

PHASE I

- STEP 1: INSTALL ADVANCED WORK ZONE WARNING SIGNS ON -L- (SR 1630) AS SHOWN ON ROADWAY STANDARD DRAWING 1101.01 (SHEET 3 OF 3).
- STEP 2: USING ROADWAY STANDARD DRAWING 1101.02 (SHEET 1 OF 15) AS NEEDED, CONSTRUCT -DET- AS SHOWN ON ROADWAY PLANS. TEMPORARY SHORING & TEMPORARY CULVERT ARE REQUIRED. (SEE TMP-4)
- STEP 3: PLACE WATER-FILLED BARRIER AND SHIFT TRAFFIC INTO A ONE-LANE, ONE-WAY PATTERN ON -DET-. (SEE TMP-4) DIVISION INSTALLED TEMPORARY PORTABLE SIGNAL, SIGNS & MARKING MUST BE IN PLACE AND ACTIVATED PRIOR TO SHIFTING TRAFFIC - COORDINATE WITH ENGINEER.
- STEP 4: AWAY FROM TRAFFIC, BEGIN CONSTRUCTION OF -L- AND PROPOSED CULVERT FROM STA 13+23+/- TO STA 16+68+/- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE. (SEE TMP-4)
- STEP 5: USING ROADWAY STANDARD DRAWING 1101.02 (SHEET 1 OF 15), WEDGE & WIDEN -L- FROM STA 11+75+/- TO STA 13+23+/- AND FROM STA 16+68 +/- TO STA 18+60+/- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE. COMPLETE WORK BEGUN IN STEP 4. (SEE TMP-4)
- STEP 6: SHIFT TRAFFIC TO NEW ALIGNMENT (FINAL PATTERN). USE TMA TO PROTECT TRAFFIC FROM UNFINISHED GUARDRAIL LEFT OF -L- AT STA 16+50+/- . USING ROADWAY STANDARD DRAWING 1101.02 (SHEET 1 OF 15), COMPLETE INSTALLATION OF GUARDRAIL AND ANCHOR. (COORDINATE REMOVAL OF TEMPORARY SIGNAL, SIGNS & MARKING WITH ENGINEER.)

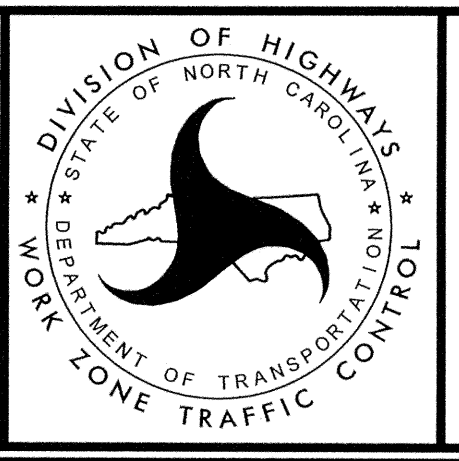
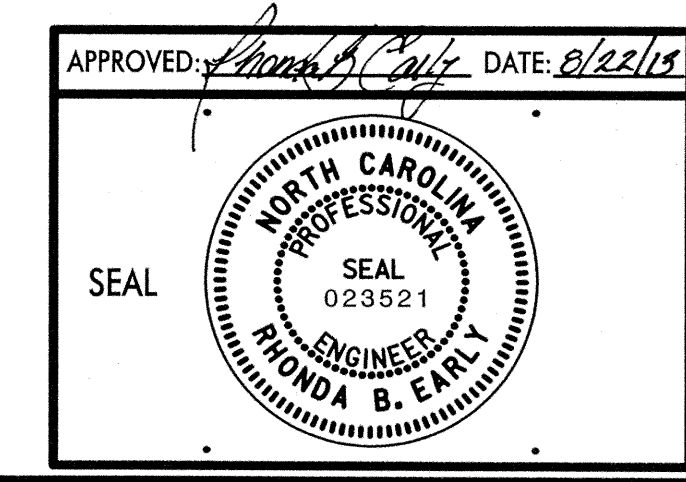
PHASE II

- STEP 1: USING ROADWAY STANDARD DRAWING 1101.02 (SHEET 1 OF 15) AND FLAGGERS, WITH TRAFFIC SHIFTED TO THE NEW ALIGNMENT, REMOVE TEMPORARY DETOUR AND CULVERT.
- STEP 2: USING ROADWAY STANDARD DRAWING 1101.02 (SHEET 1 OF 15) AND FLAGGERS, PLACE THE FINAL LAYER OF SURFACE COURSE ON -L- FROM STA 11+75+/- TO STA 18+60+/- . (DIVISION TO PLACE FINAL MARKINGS.)

REVISIONS

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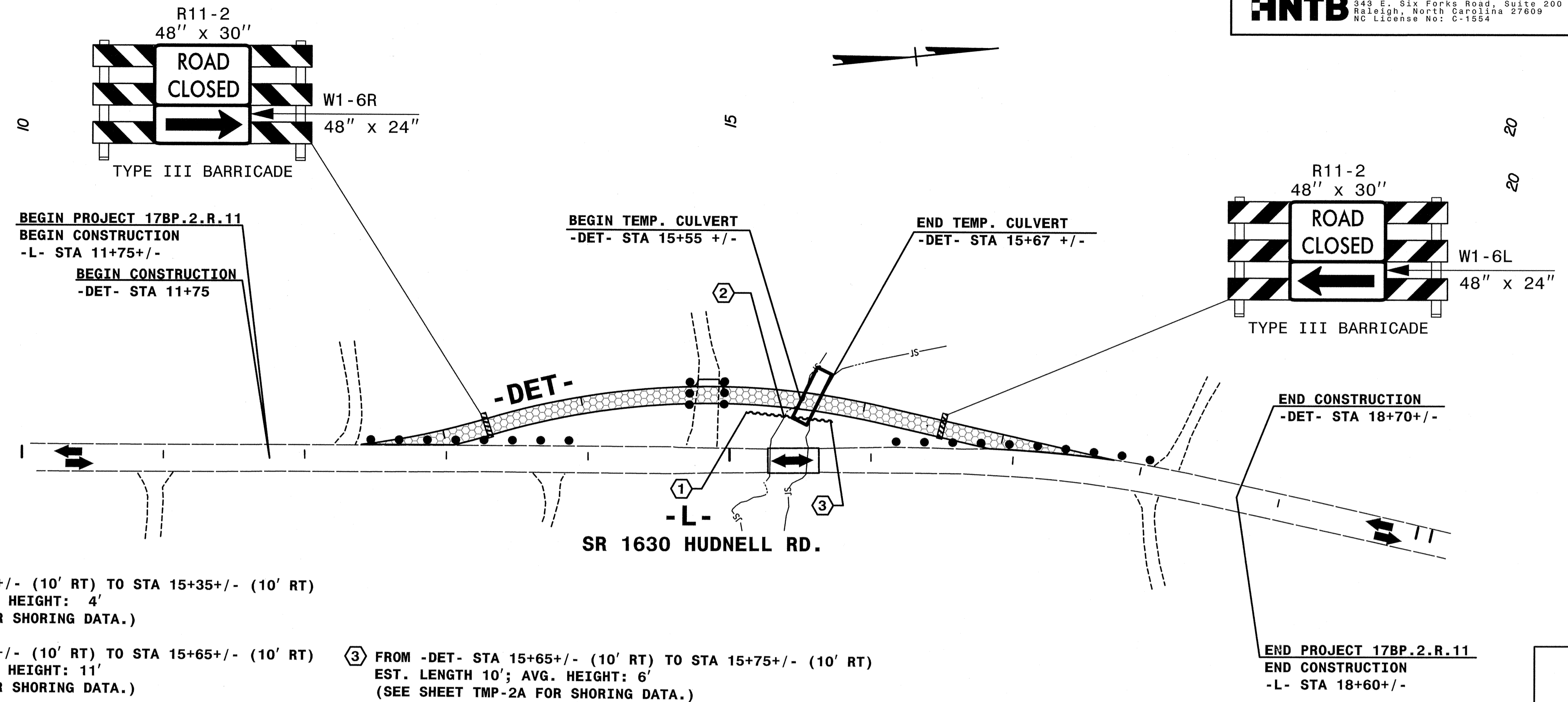
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CONCUR:	_____
REVISE:	_____
VERIFY:	_____



TRANSPORTATION
MANAGEMENT PLAN

**GENERAL NOTES
AND PHASING**

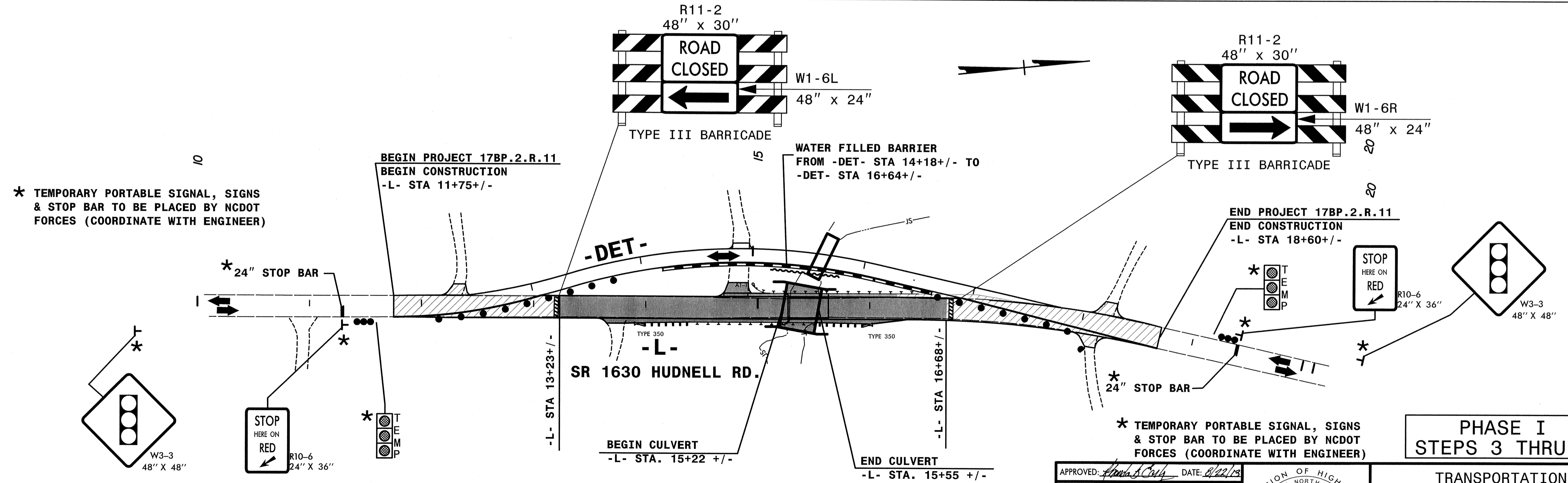
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TEMPORARY SHORING

- ① FROM -DET- STA 15+15+/- (10' RT) TO STA 15+35+/- (10' RT)
EST. LENGTH 20'; AVG. HEIGHT: 4'
(SEE SHEET TMP-2A FOR SHORING DATA.)
- ② FROM -DET- STA 15+35+/- (10' RT) TO STA 15+65+/- (10' RT)
EST. LENGTH 30'; AVG. HEIGHT: 11'
(SEE SHEET TMP-2A FOR SHORING DATA.)
- ③ FROM -DET- STA 15+65+/- (10' RT) TO STA 15+75+/- (10' RT)
EST. LENGTH 10'; AVG. HEIGHT: 6'
(SEE SHEET TMP-2A FOR SHORING DATA.)

**PHASE I
STEP 2**



* TEMPORARY PORTABLE SIGNAL, SIGNS & STOP BAR TO BE PLACED BY NCDOT FORCES (COORDINATE WITH ENGINEER)

* TEMPORARY PORTABLE SIGNAL, SIGNS & STOP BAR TO BE PLACED BY NCDOT FORCES (COORDINATE WITH ENGINEER)

**PHASE I
STEPS 3 THRU 5**

REVISIONS

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QA/QC STAGE:

REVIEW: _____
CONCUR: _____
REVISE: _____
VERIFY: _____

APPROVED: *[Signature]* DATE: 8/22/03

SEAL

**NORTH CAROLINA
PROFESSIONAL
ENGINEER
FRONDA B. EARLY**

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

TRANSPORTATION
MANAGEMENT PLAN

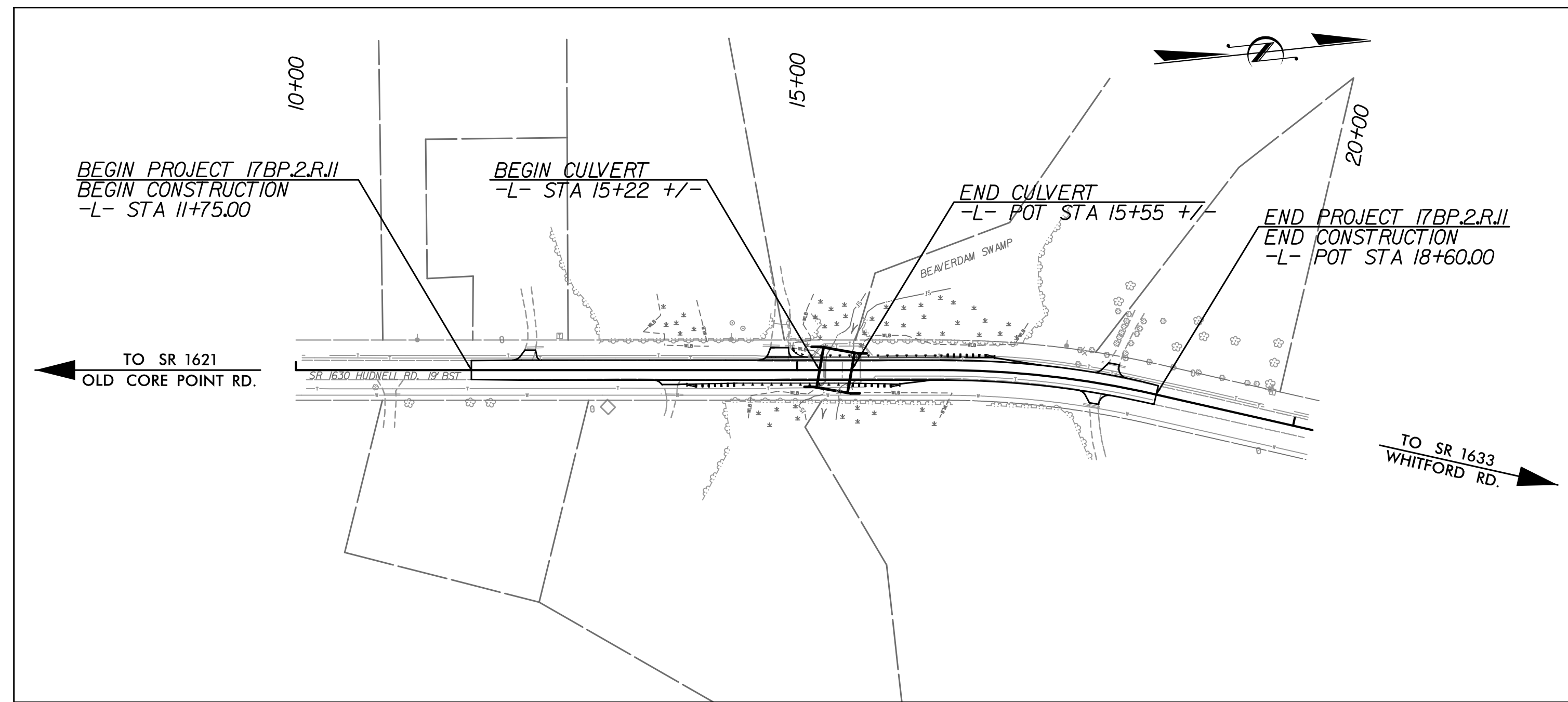
**PHASE I
DETAILS**

TIP PROJECT: 17BP.2.R.11

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
**PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL**

**LOCATION: BRIDGE NO. 027 OVER BEAVERDAM SWAMP
ON SR 1630 (HUDNELL RD.)**

TYPE OF WORK: GRADING, PAVING, DRAINAGE & CULVERT



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.2.R.11	EC-1	8
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	
1630.05	Temporary Diversion	
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
	Temporary Rock Silt Check Type-B	
	Wattle/Coir Fiber Wattle	
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	
1632.02	Type B	
1632.03	Type C	
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT
Refer To E. C. Special Provisions for Special Considerations.

GRAPHIC SCALE

0

PLANS

0

PROFILE (HORIZONTAL)

0

PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared in the Office of:

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2012 STANDARD SPECIFICATIONS

BENTON R. CARROLL
EROSION CONTROL
LEVEL III-A
CERTIFICATION #3180

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

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###USERNAME###

COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

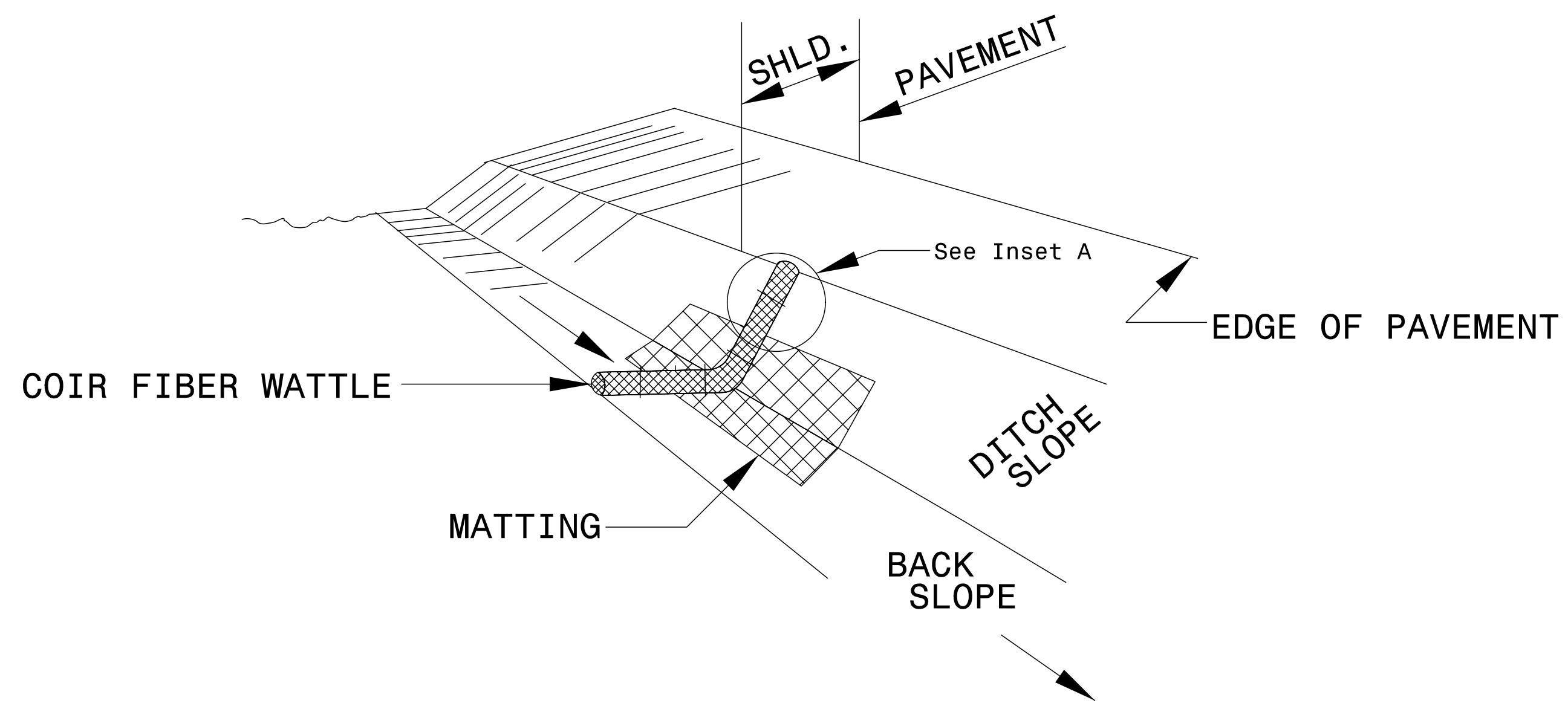
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

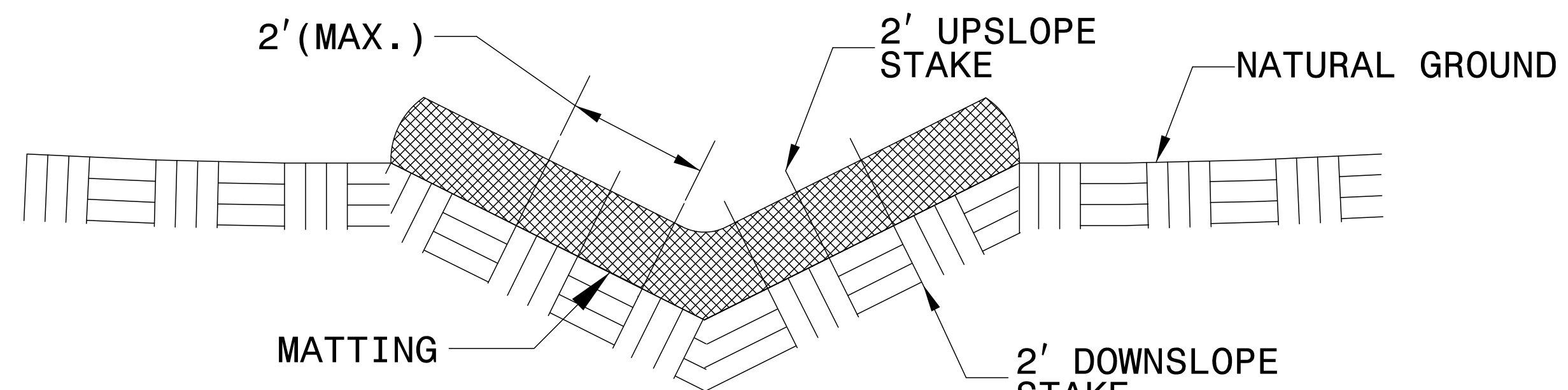
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

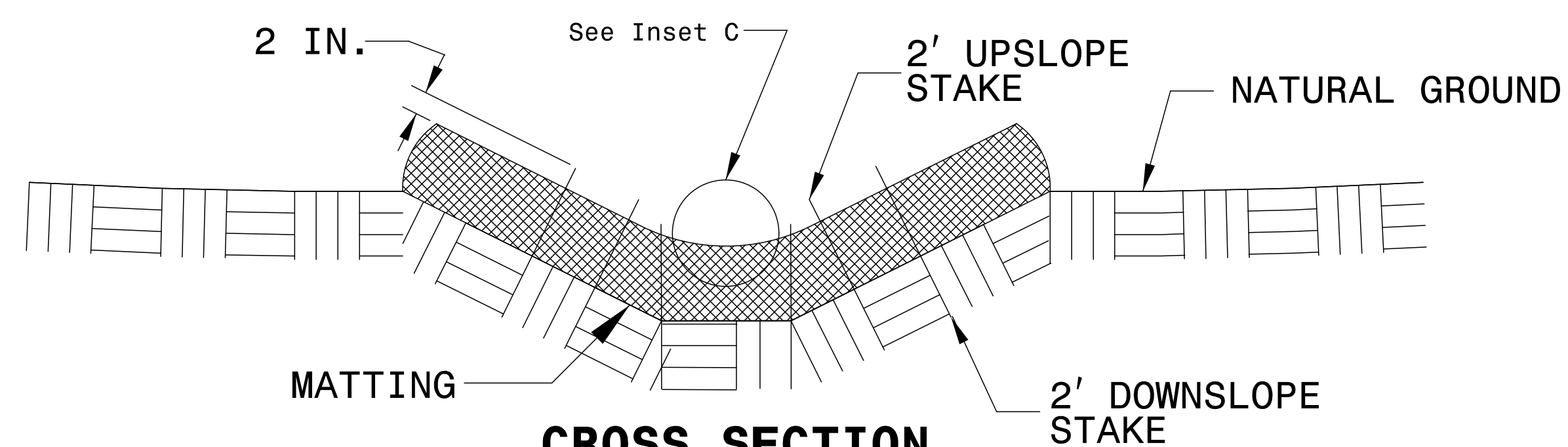
INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



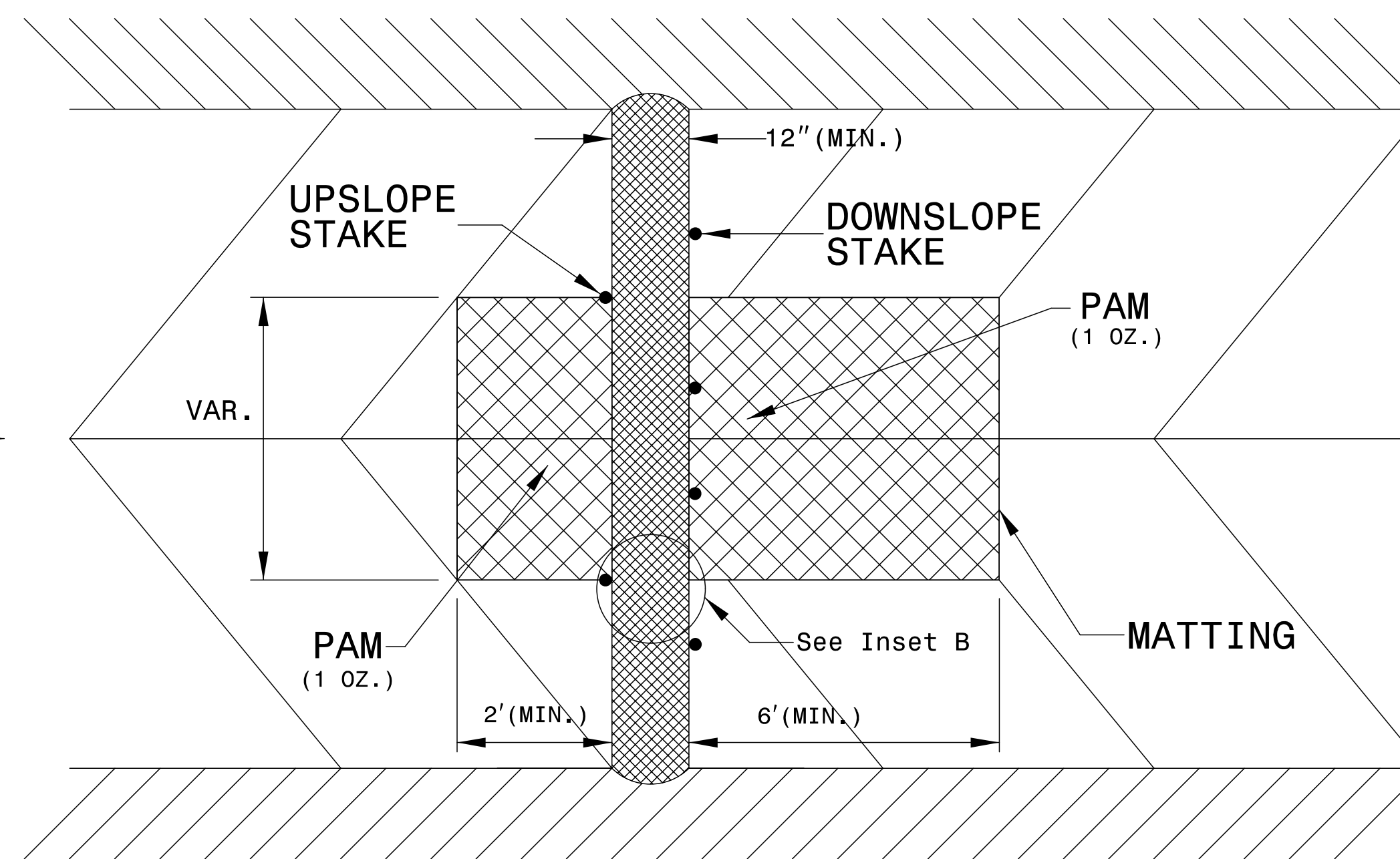
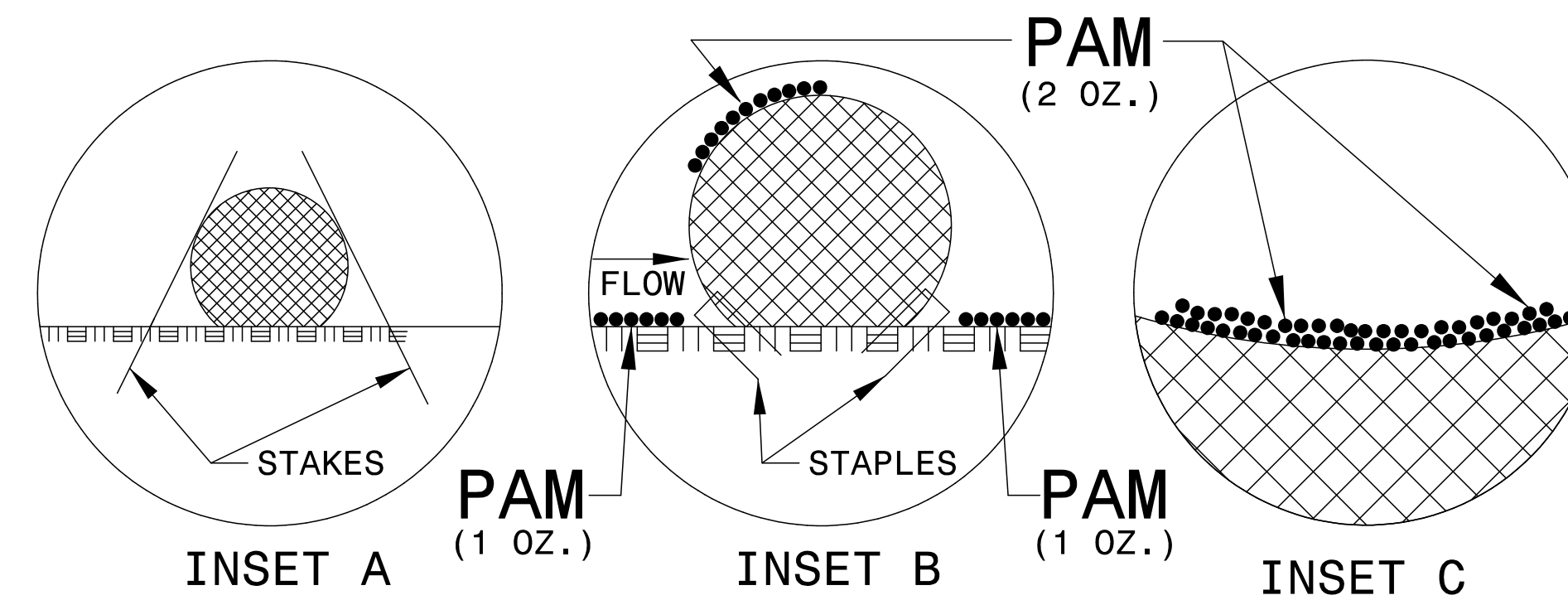
ISOMETRIC VIEW



**CROSS SECTION
VEE DITCH**

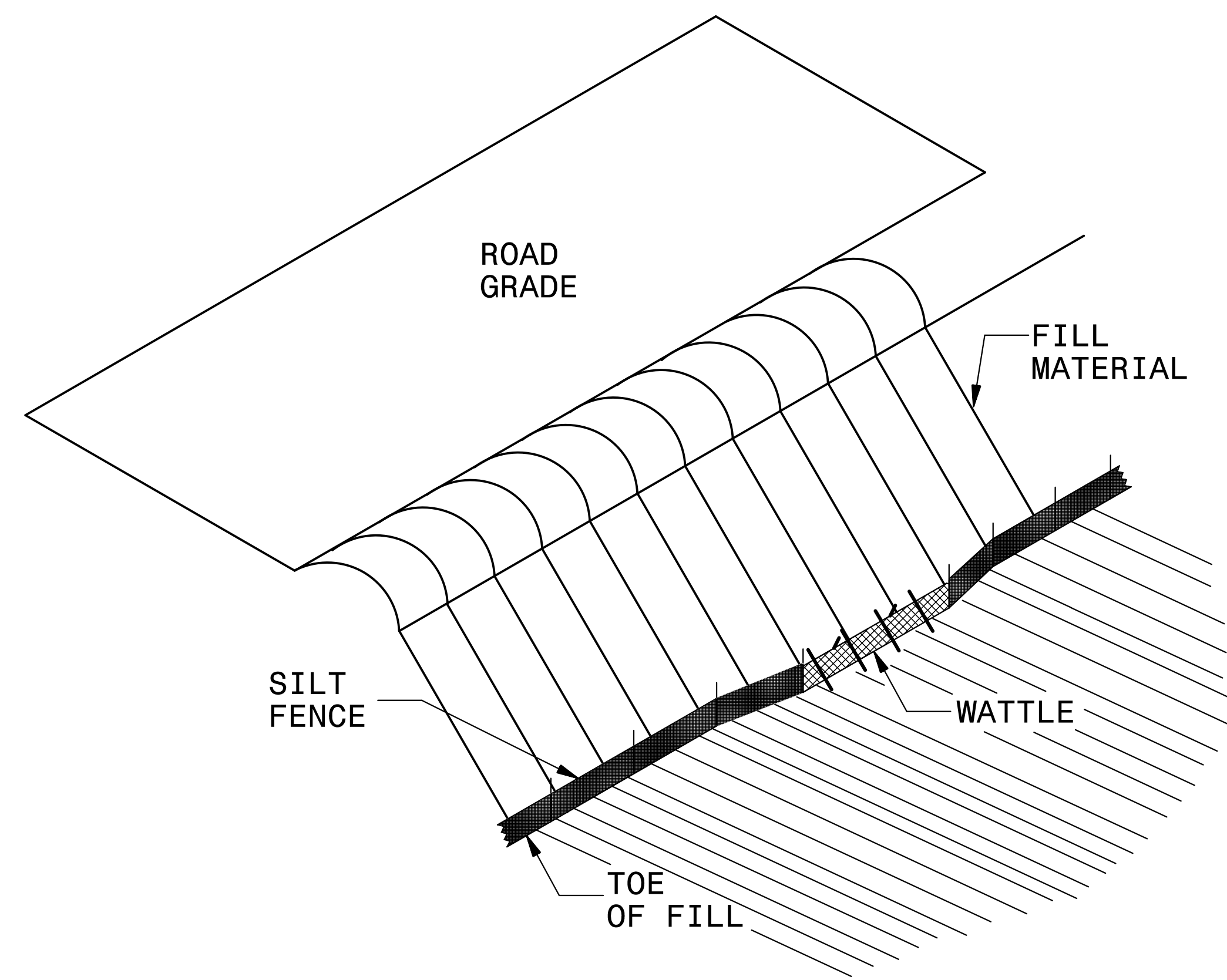


**CROSS SECTION
TRAPEZOIDAL DITCH**

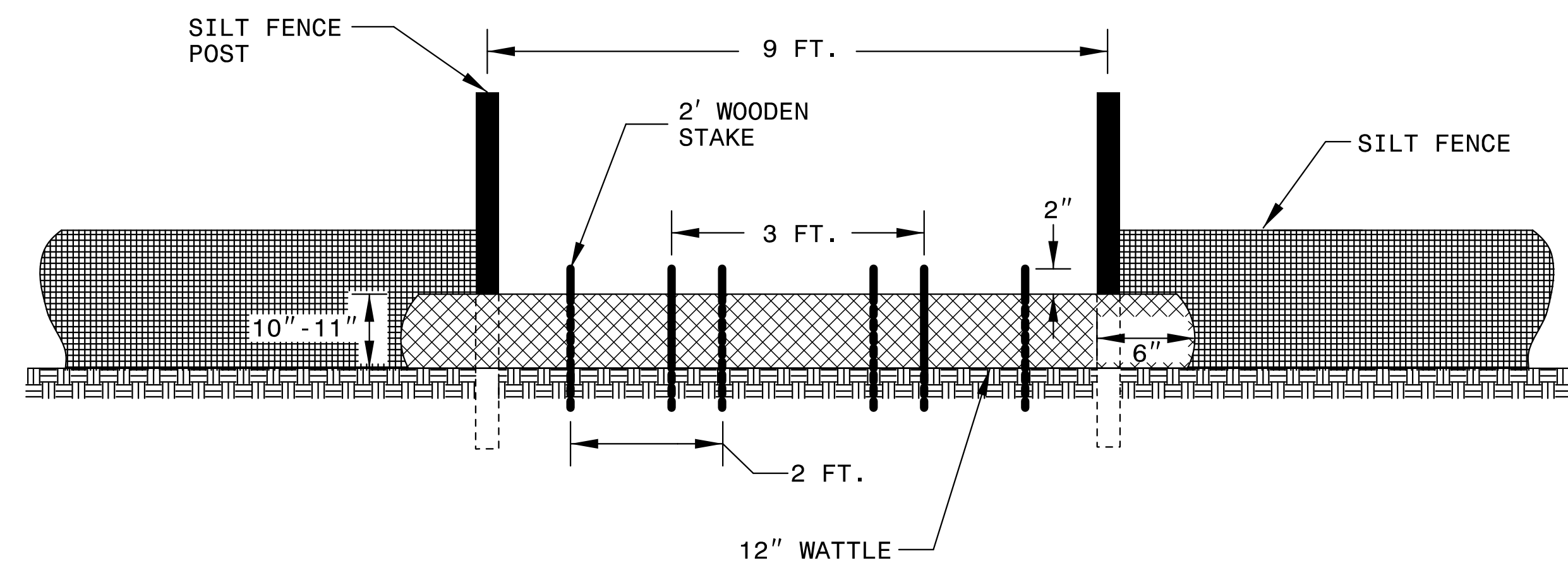


TOP VIEW

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW



VIEW FROM SLOPE

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

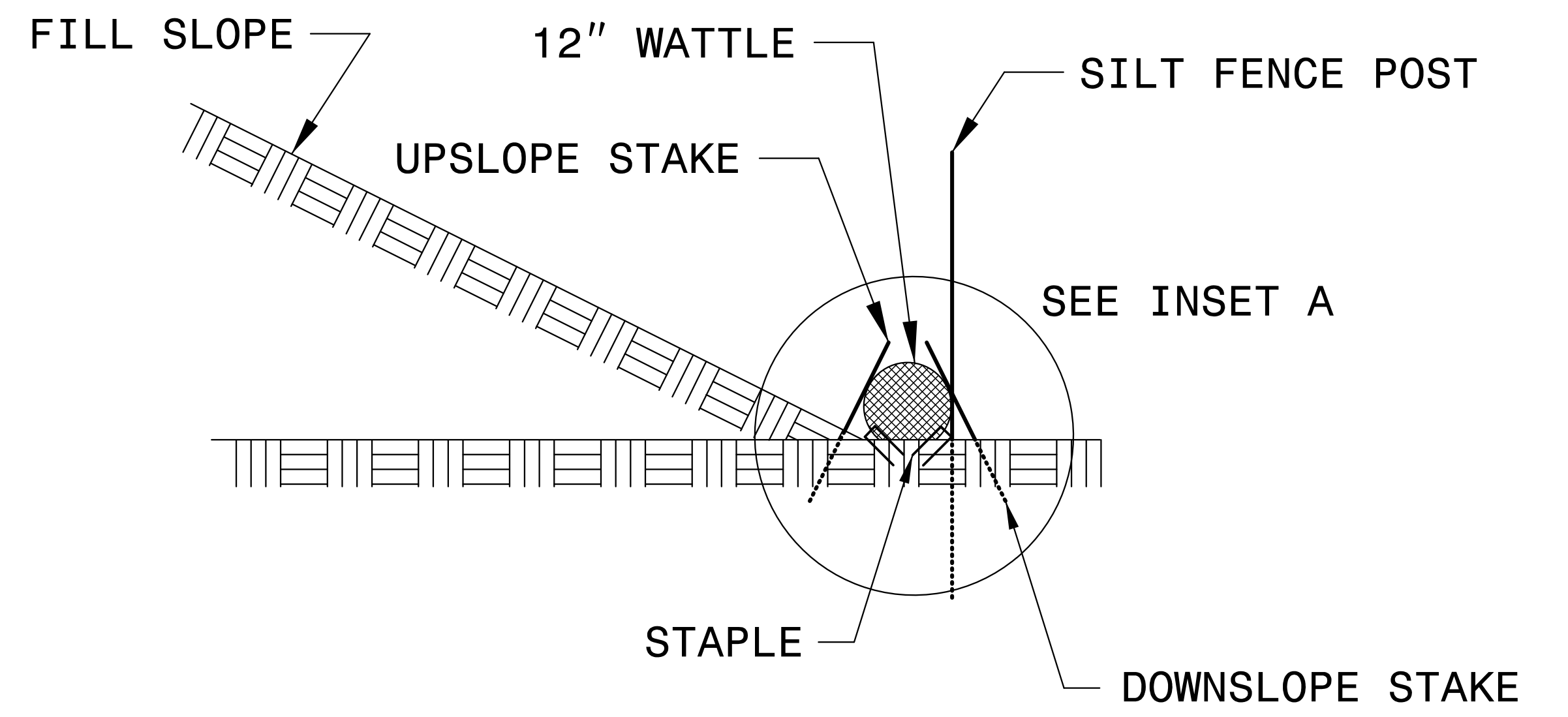
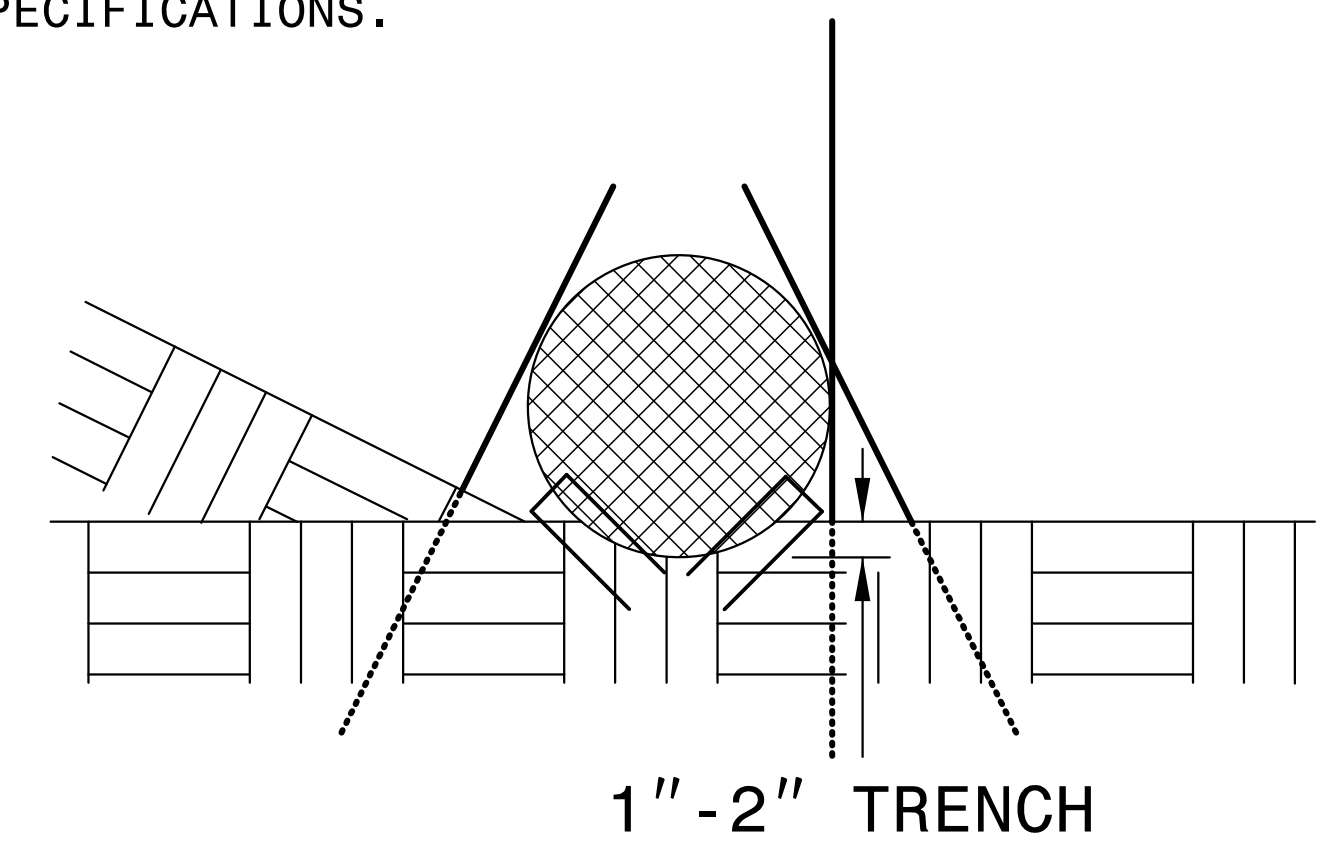
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

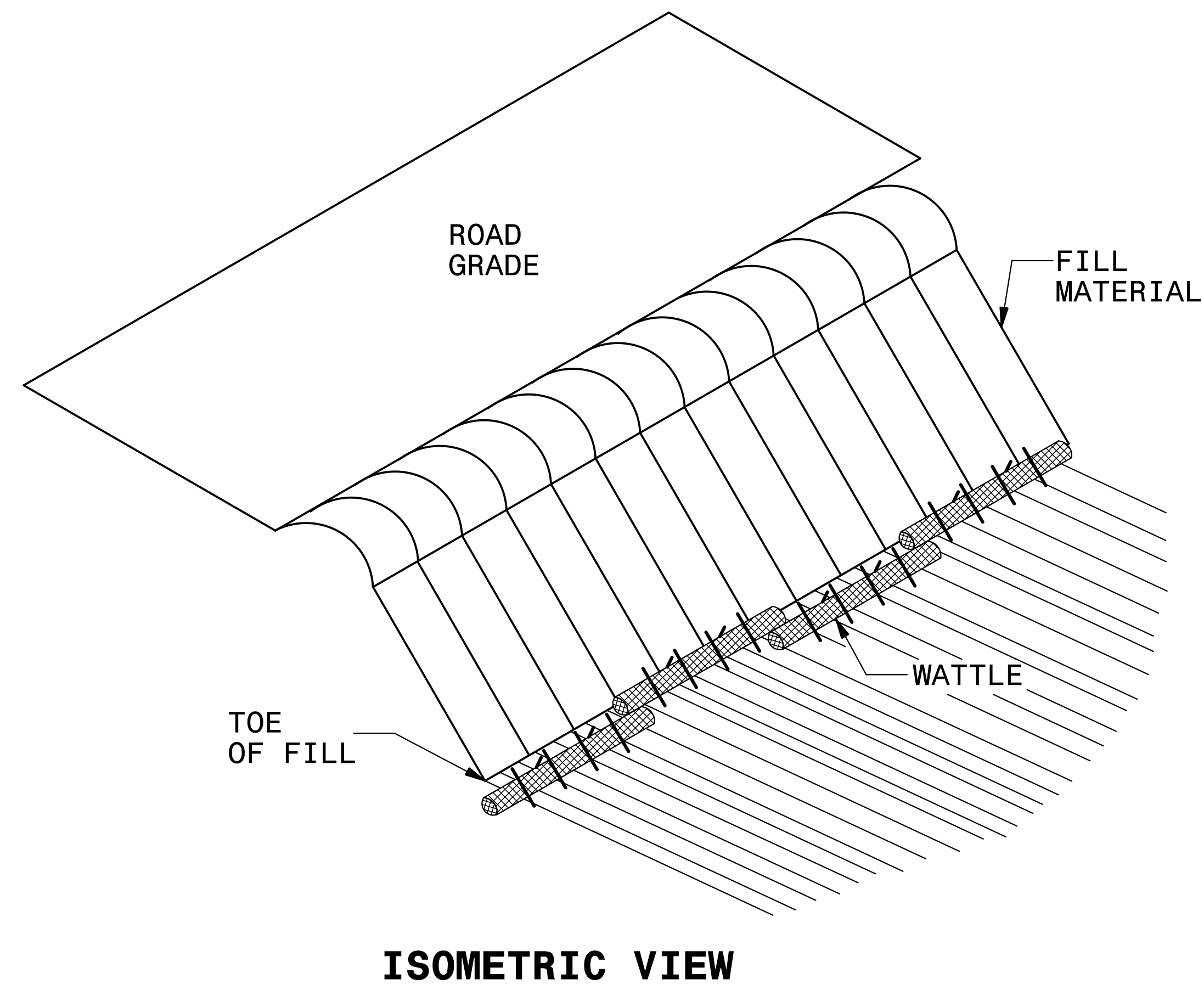
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A



SIDE VIEW

COIR FIBER WATTLE BARRIER DETAIL



NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLES ON TOE OF SLOPE.

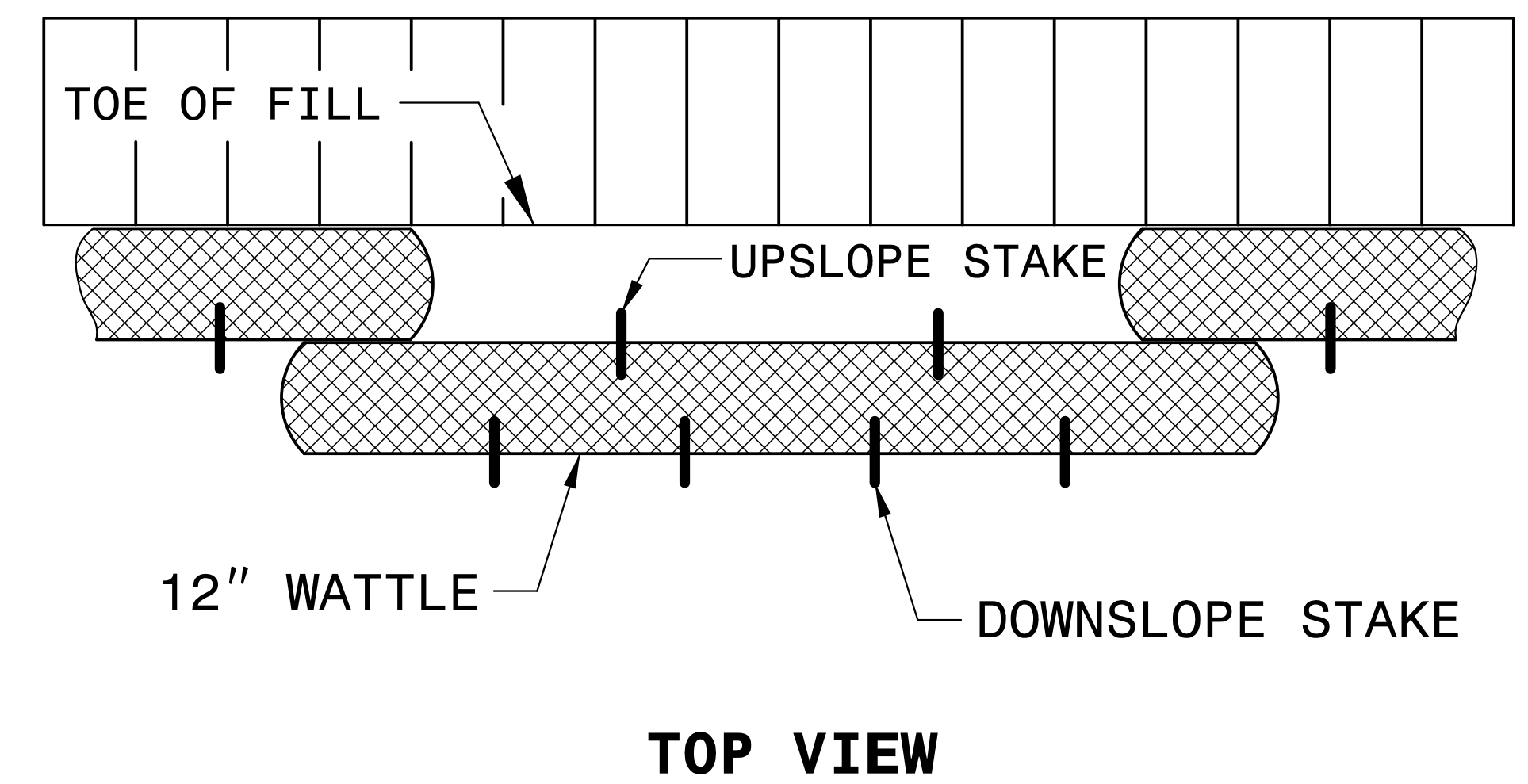
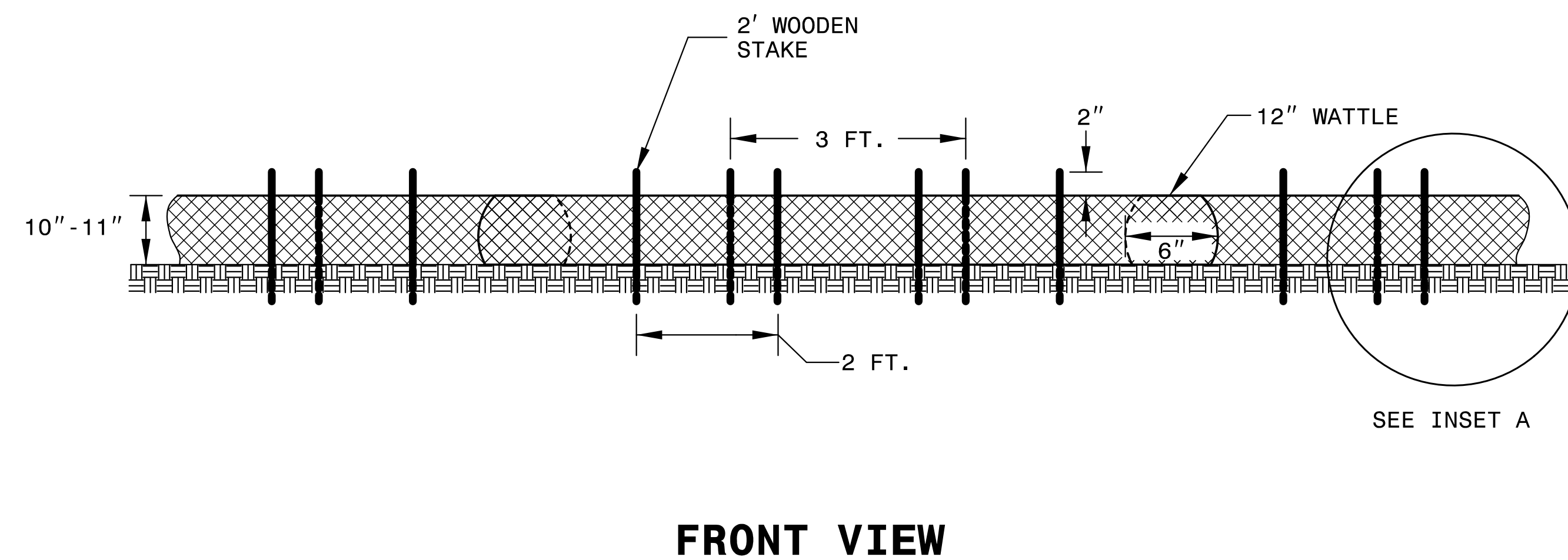
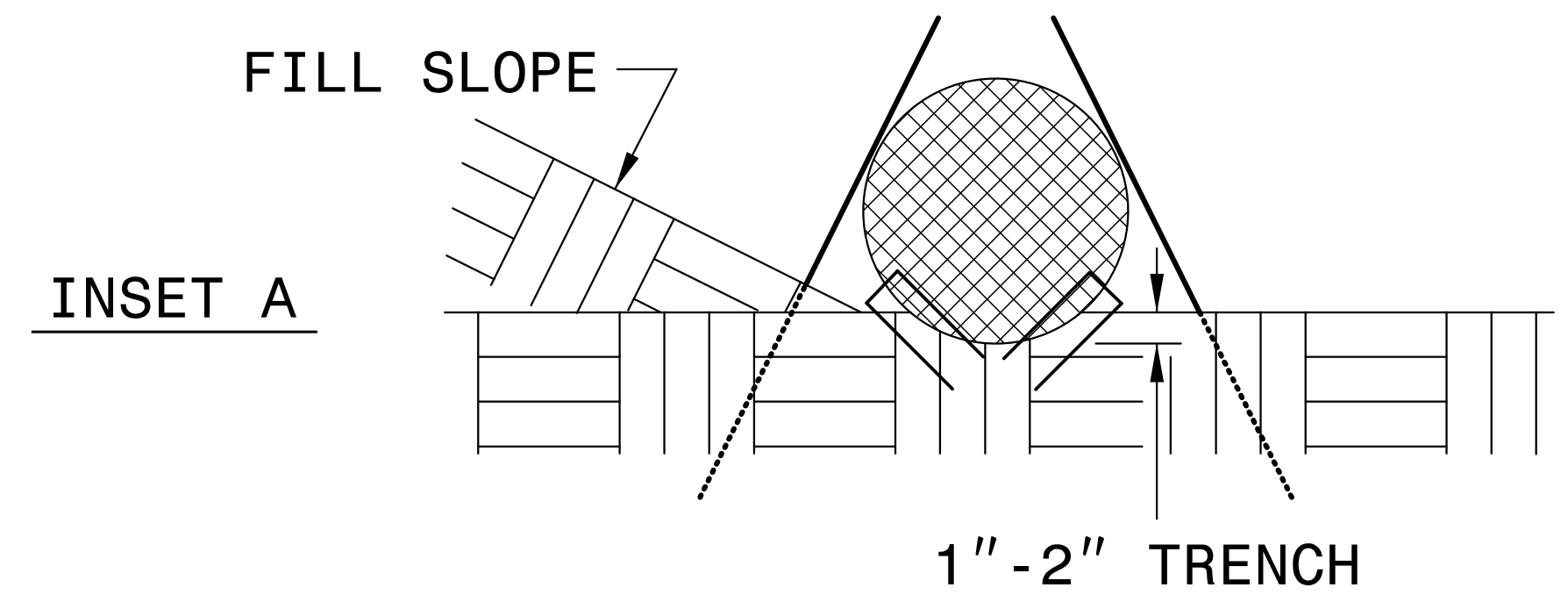
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 20 FT.



DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

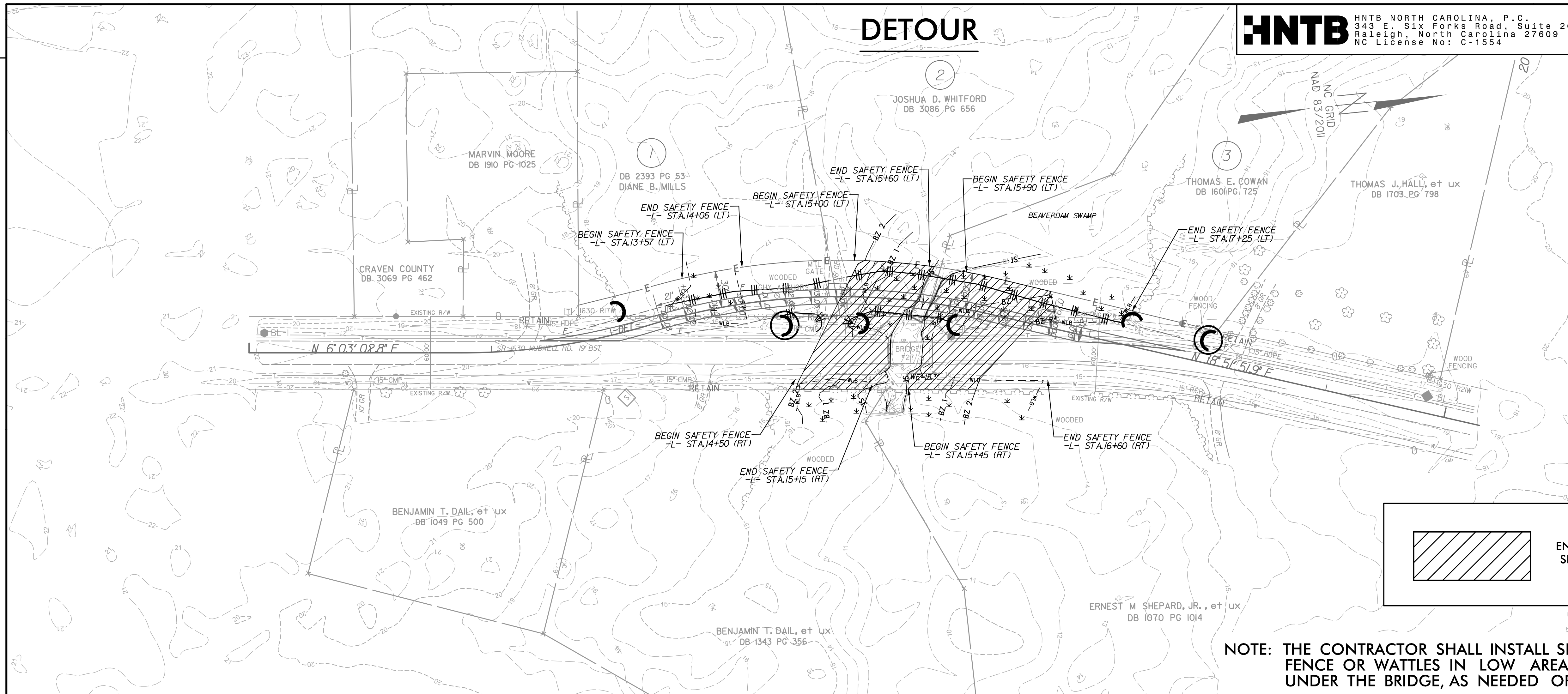
DETOUR



HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.11	EC-6
RW SHEET NO.	

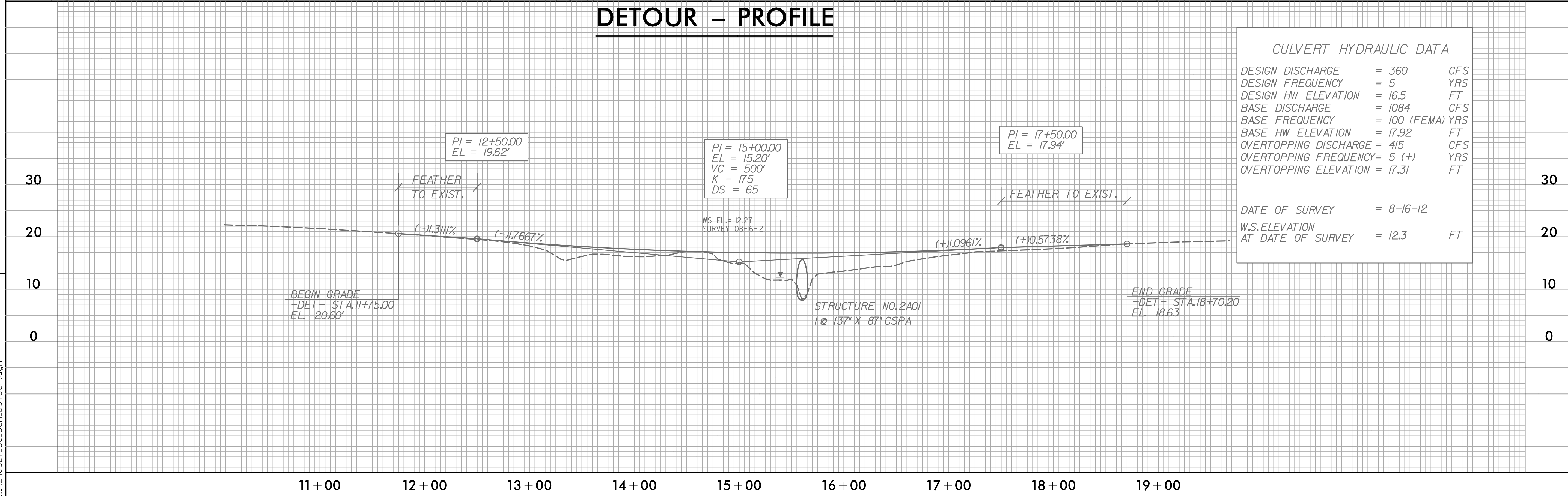
BENTON R. CARROLL
EROSION CONTROL
LEVEL III-A
CERTIFICATION #3180



ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE: THE CONTRACTOR SHALL INSTALL SPECIAL SEDIMENT CONTROL FENCE OR WATTLES IN LOW AREAS OF SILT FENCE AND UNDER THE BRIDGE, AS NEEDED OR DIRECTED BY THE ENGINEER.

DETOUR - PROFILE



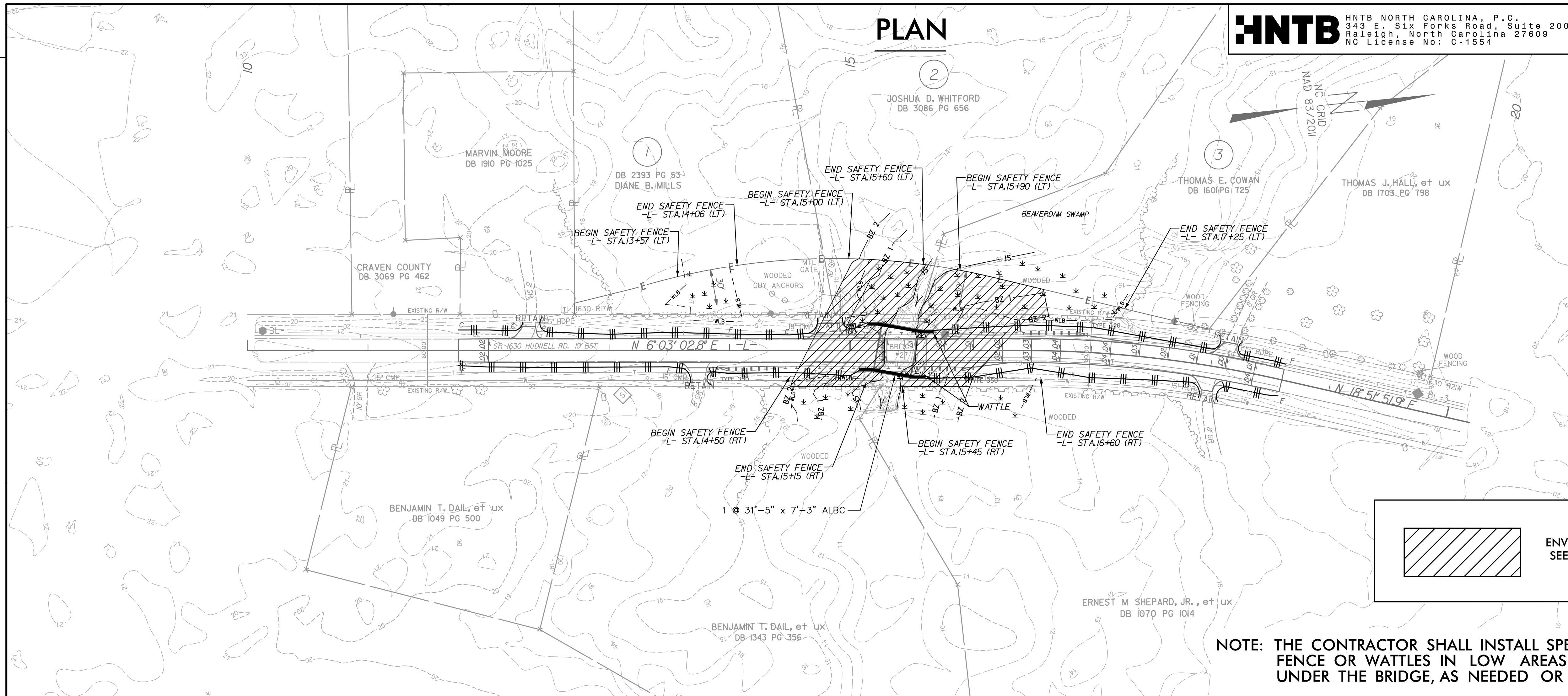
CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 360	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 16.5	FT
BASE DISCHARGE	= 1084	CFS
BASE FREQUENCY	= 100 (FEMA)	YRS
BASE HW ELEVATION	= 17.92	FT
OVERTOPPING DISCHARGE	= 415	CFS
OVERTOPPING FREQUENCY	= 5 (+)	YRS
OVERTOPPING ELEVATION	= 17.31	FT
DATE OF SURVEY	= 8-16-12	
W.S.ELEVATION AT DATE OF SURVEY	= 12.3	FT

REVISIONS

6/18/2013 11:42:46 AM ...240021.ec.psh_Detour.dgn

**BENTON R. CARROLL
 EROSION CONTROL
 LEVEL III-A
 CERTIFICATION #3180**

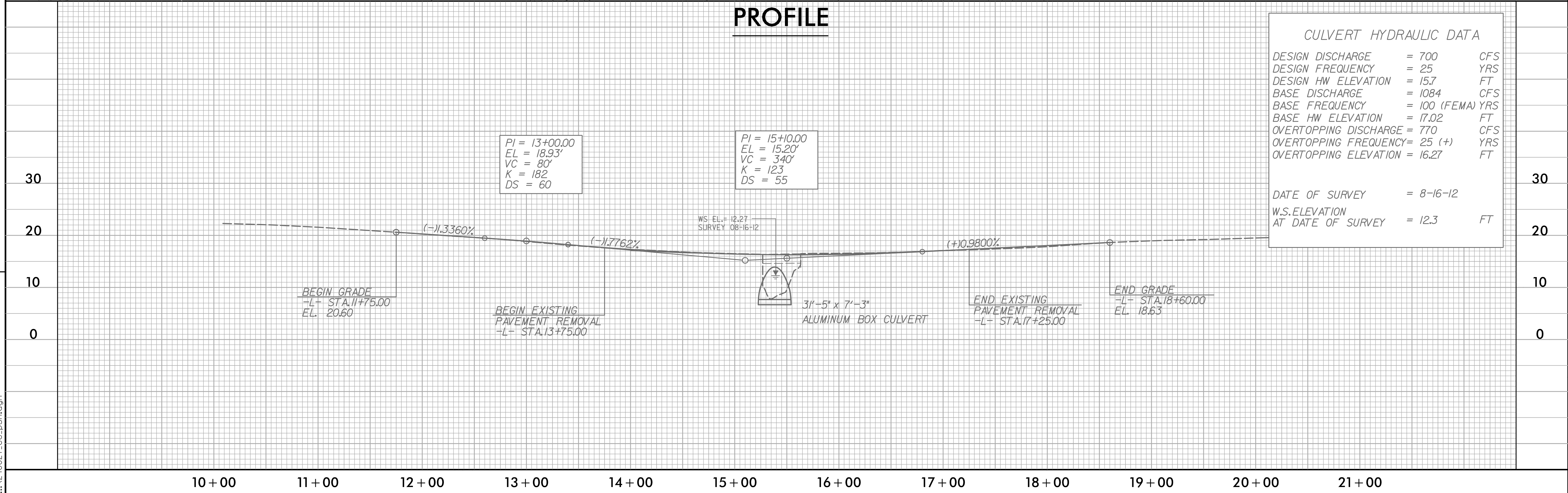
PLAN



 ENVIRONMENTALLY SENSITIVE AREA
 SEE PROJECT SPECIAL PROVISIONS

NOTE: THE CONTRACTOR SHALL INSTALL SPECIAL SEDIMENT CONTROL FENCE OR WATTLES IN LOW AREAS OF SILT FENCE AND UNDER THE BRIDGE, AS NEEDED OR DIRECTED BY THE ENGINEER.

PROFILE



CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 15.7	FT
BASE DISCHARGE	= 1084	CFS
BASE FREQUENCY	= 100 (FEMA)	YRS
BASE HW ELEVATION	= 17.02	FT
OVERTOPPING DISCHARGE	= 770	CFS
OVERTOPPING FREQUENCY	= 25 (+)	YRS
OVERTOPPING ELEVATION	= 16.27	FT
DATE OF SURVEY = 8-16-12		
W.S. ELEVATION AT DATE OF SURVEY = 12.3 FT		

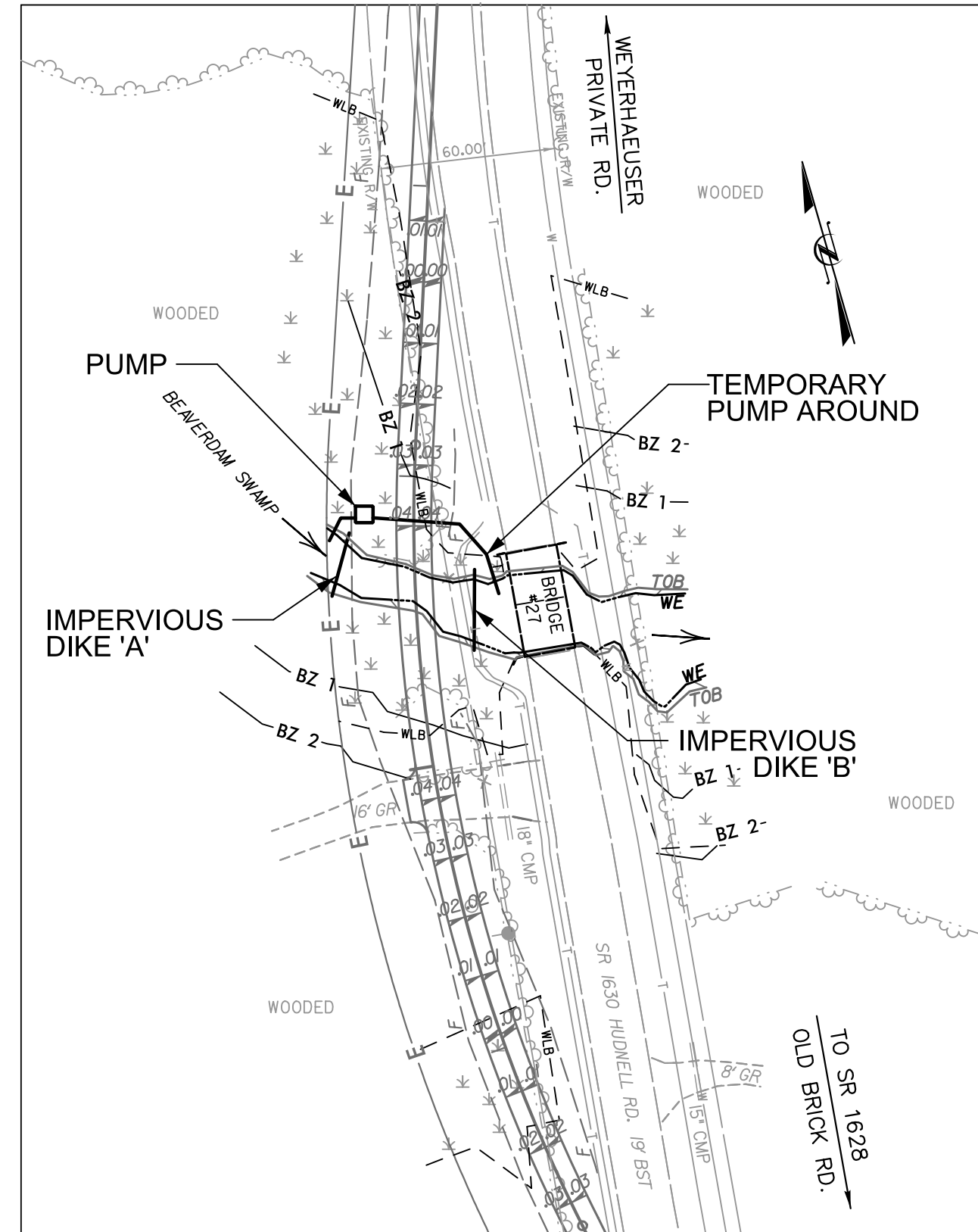
REVISIONS

17BP.2.R.11 CULVERT PHASING BEAVERDAM SWAMP CRAVEN COUNTY

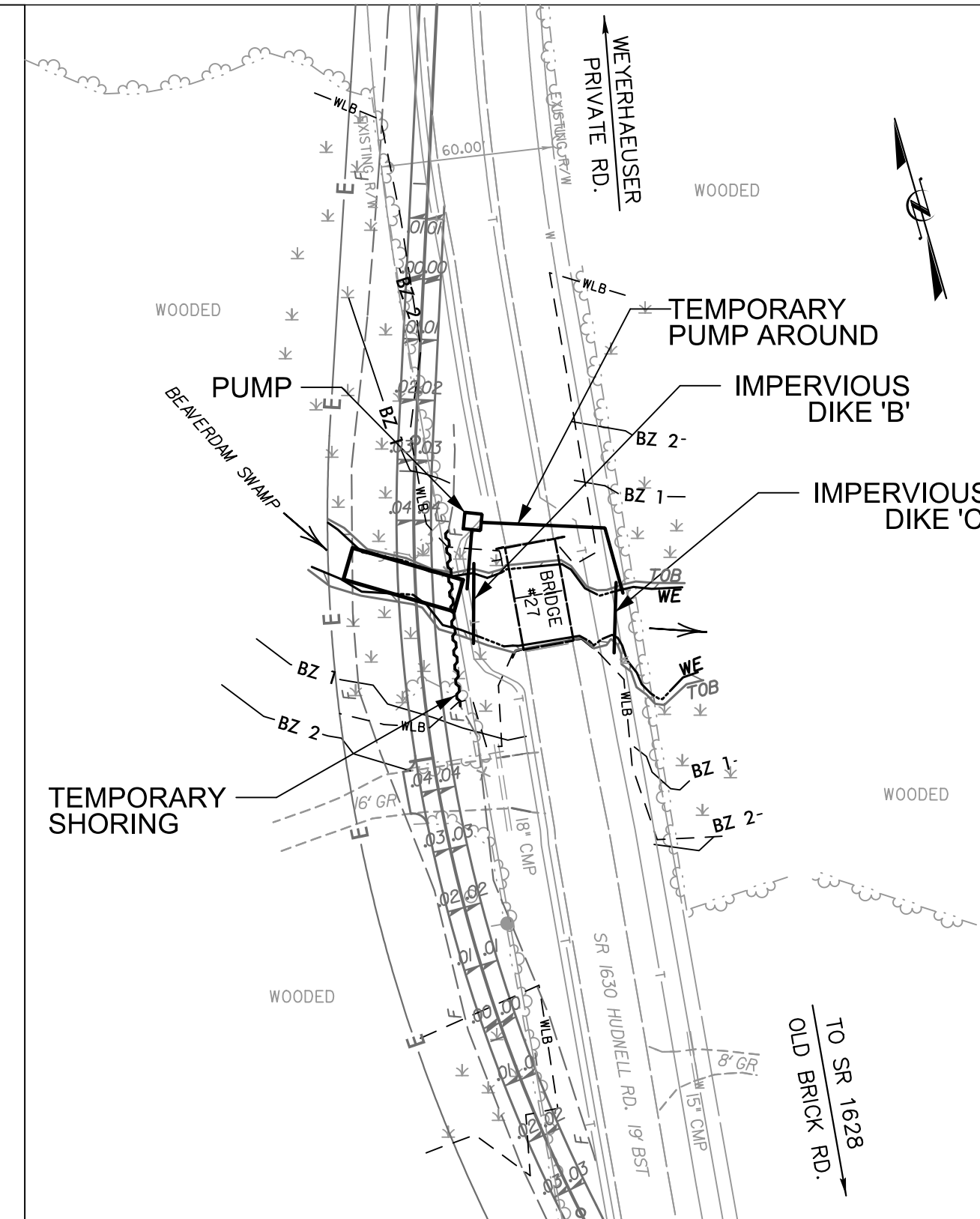
HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
17BP.2.R.11	EC-8
RW SHEET NO.	

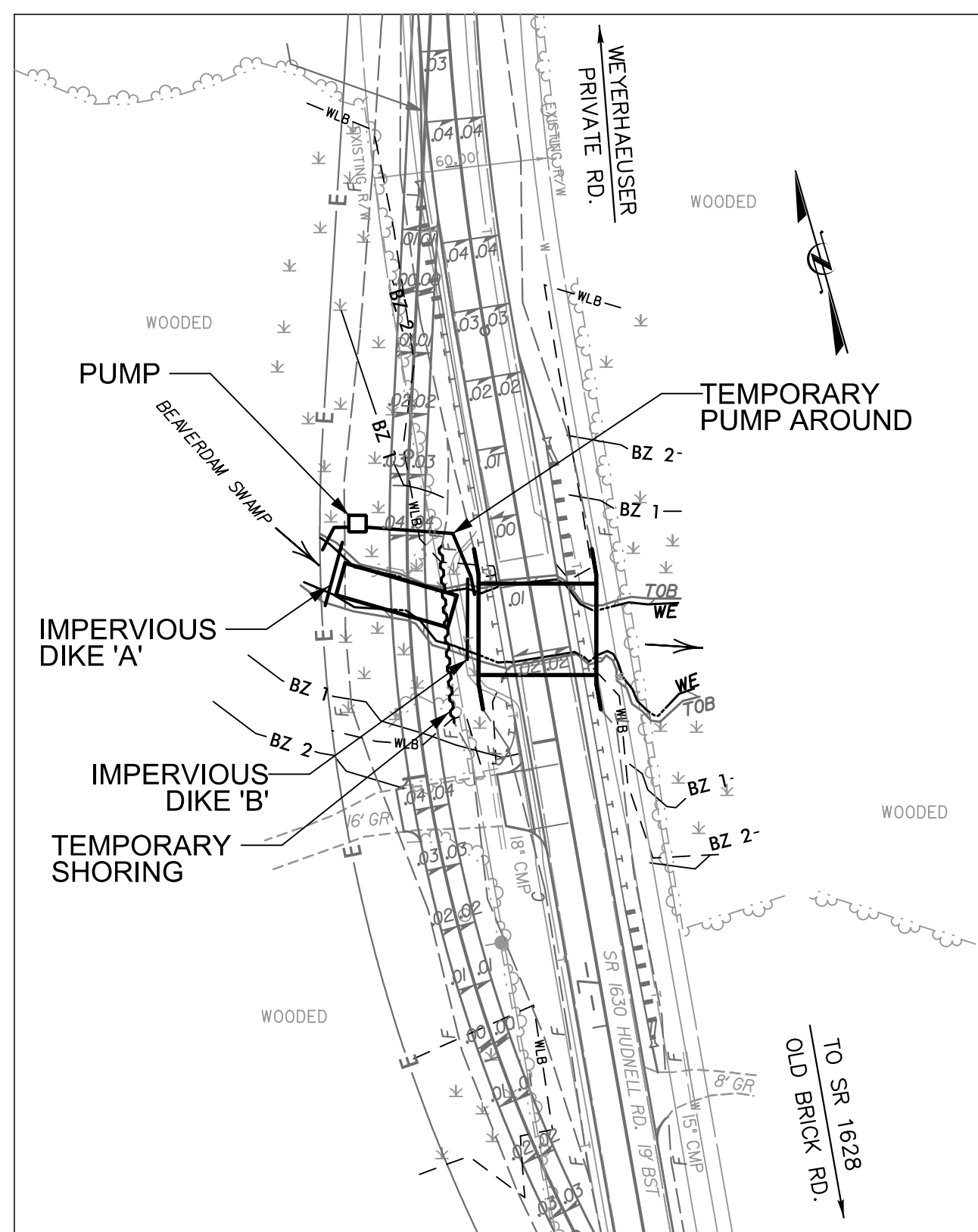
BENTON R. CARROLL E.I.
EROSION CONTROL
LEVEL III-A
CERTIFICATION #3180



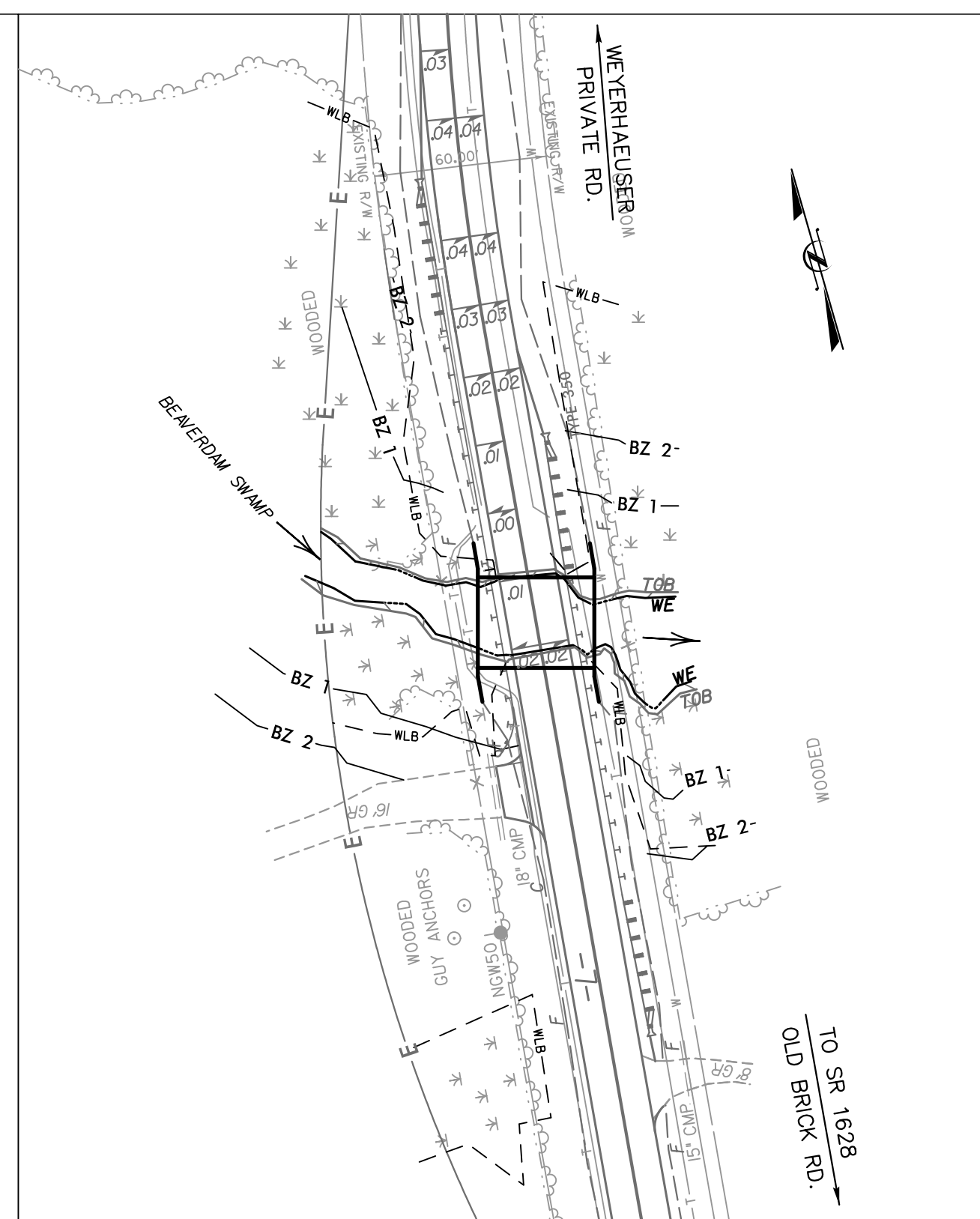
- PHASE I**
1. INSTALL IMPERVIOUS DIKES A & B AS SHOWN. IMPERVIOUS DIKE B SHOULD BE INSTALLED TO A MAXIMUM ELEVATION OF 14.0 FT.
 2. INSTALL PIPE AND PUMP. THEN PUMP BEAVERDAM SWAMP AROUND CONSTRUCTION AREA.
 3. DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S).
 4. INSTALL 1 @ 137" x 87" CSPA AND TEMPORARY SHORING.
 5. REMOVE THE TEMPORARY PUMP AROUND AND IMPERVIOUS DIKE A. CONSTRUCT DETOUR AND SHIFT TRAFFIC.



- PHASE II**
1. INSTALL IMPERVIOUS DIKE C AS SHOWN.
 2. INSTALL PIPE AND PUMP. THEN PUMP BEAVERDAM SWAMP AROUND CONSTRUCTION AREA.
 3. DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S).
 4. REMOVE EXISTING BRIDGE AND INSTALL 1 @ 31' - 5" X 7' - 3" ALBC
 5. REMOVE THE TEMPORARY PUMP AROUND AND IMPERVIOUS DIKE C. CONSTRUCT PROPOSED ROADWAY AND SHIFT TRAFFIC.



- PHASE III**
1. REINSTALL IMPERVIOUS DIKE A AS SHOWN.
 2. INSTALL PIPE AND PUMP. THEN PUMP BEAVERDAM SWAMP AROUND CONSTRUCTION AREA.
 3. DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S).
 4. REMOVE 1 @ 137" x 87" CSPA AND TEMPORARY SHORING.
 5. REMOVE THE TEMPORARY PUMP AROUND, IMPERVIOUS DIKES A & B.



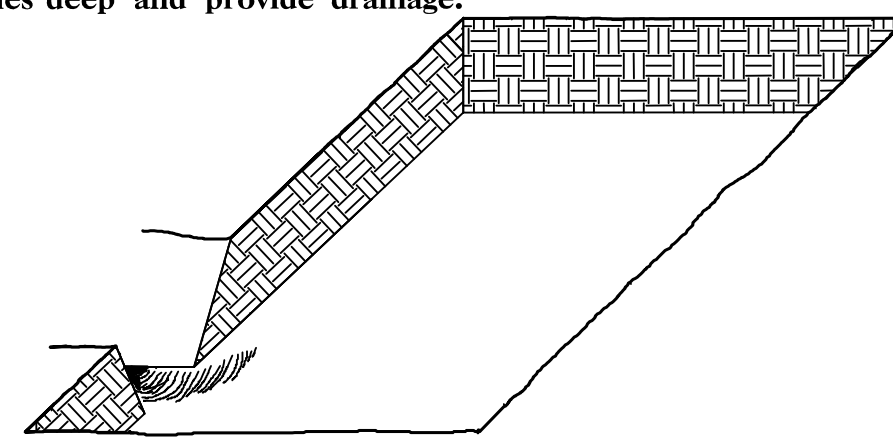
- PHASE IV**
1. REMOVE ALL TEMPORARY DETOUR EMBANKMENT, TYPE 4 GEOTEXTILE FABRIC AND EROSION CONTROL MEASURES ASSOCIATED WITH THE TEMPORARY DETOUR.

PLANTING DETAILS

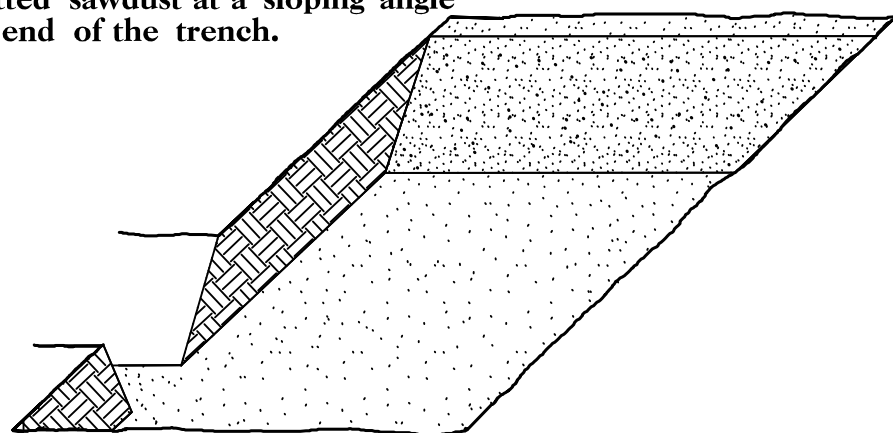
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

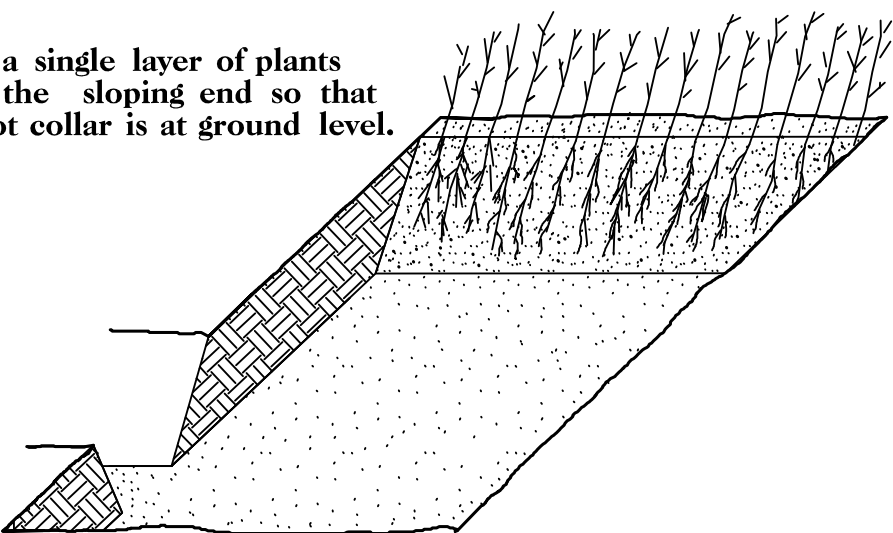
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



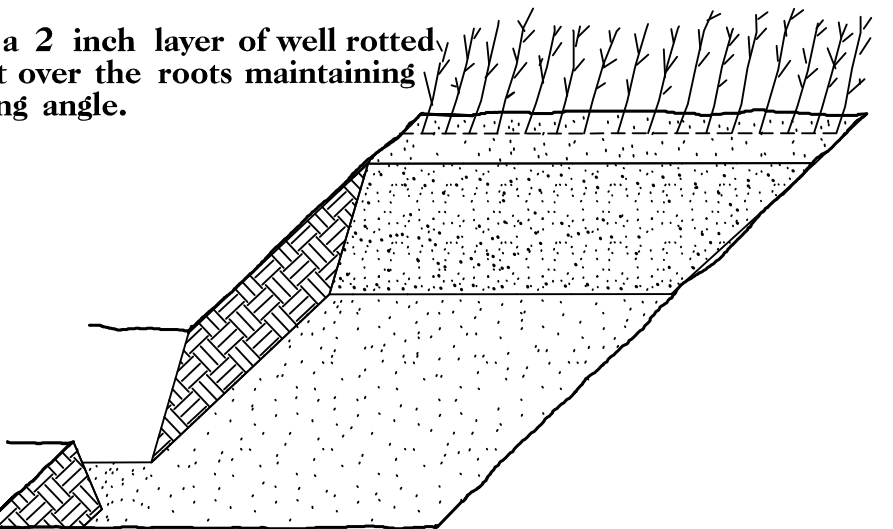
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

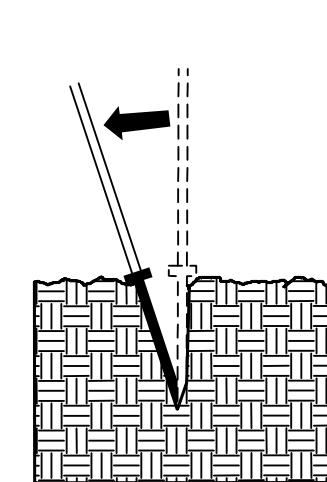


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

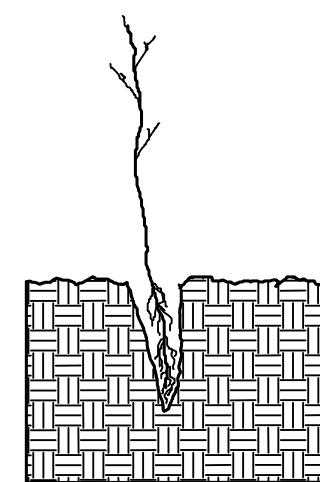


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

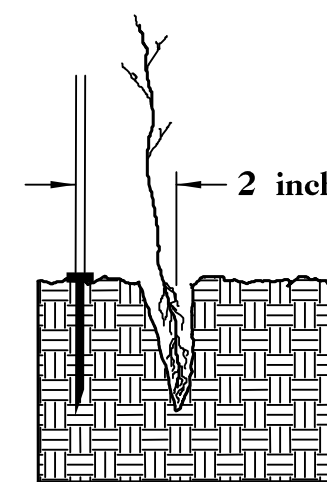
DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



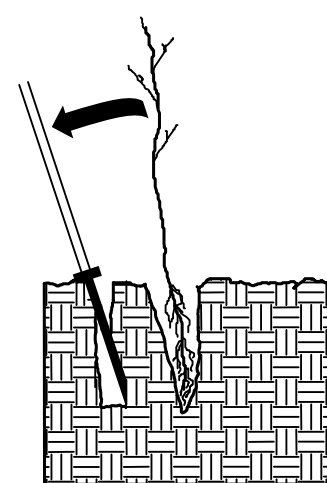
1. Insert planting bar as shown and pull handle toward planter.



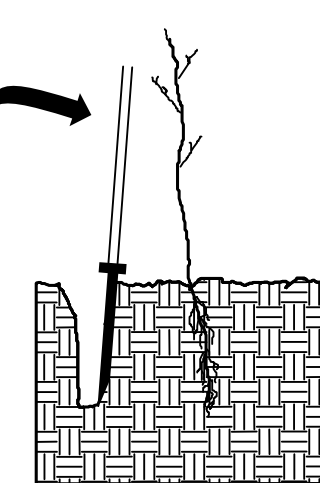
2. Remove planting bar and place seedling at correct depth.



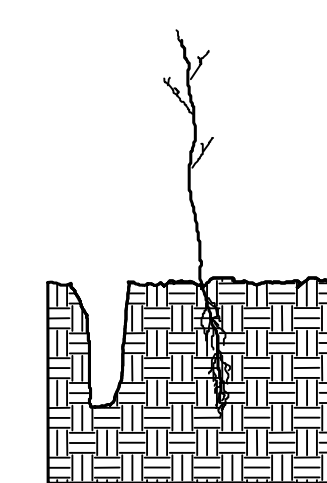
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



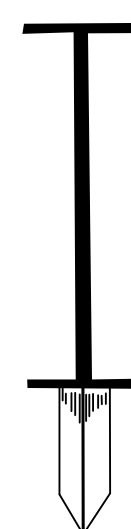
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

- TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

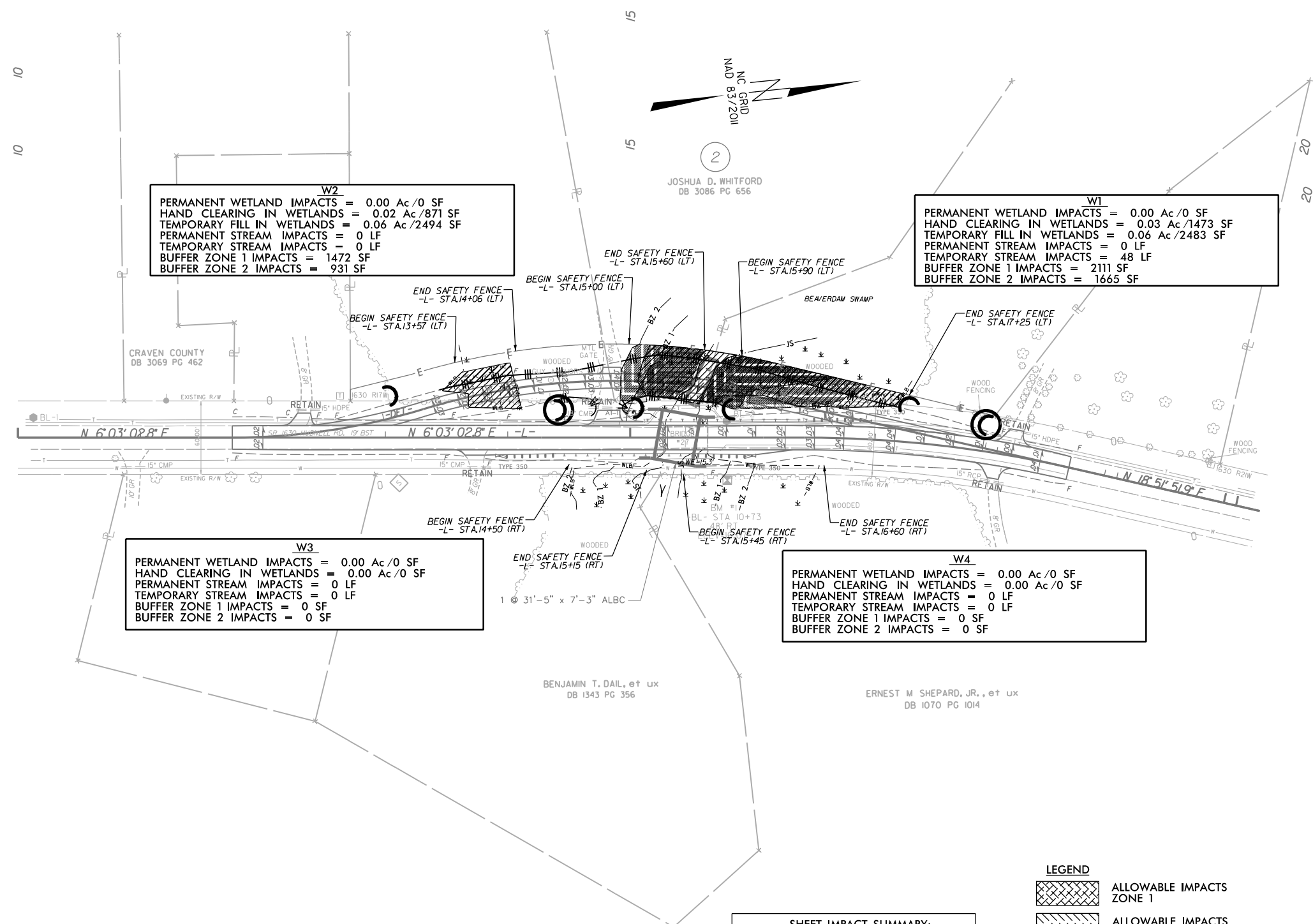
REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in - 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in - 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT



W2
PERMANENT WETLAND IMPACTS = 0.00 Ac / 0 SF
HAND CLEARING IN WETLANDS = 0.02 Ac / 871 SF
TEMPORARY FILL IN WETLANDS = 0.06 Ac / 2494 SF
PERMANENT STREAM IMPACTS = 0 LF
TEMPORARY STREAM IMPACTS = 0 LF
BUFFER ZONE 1 IMPACTS = 1472 SF
BUFFER ZONE 2 IMPACTS = 931 SF

W1
PERMANENT WETLAND IMPACTS = 0.00 Ac / 0 SF
HAND CLEARING IN WETLANDS = 0.03 Ac / 1473 SF
TEMPORARY FILL IN WETLANDS = 0.06 Ac / 2483 SF
PERMANENT STREAM IMPACTS = 0 LF
TEMPORARY STREAM IMPACTS = 48 LF
BUFFER ZONE 1 IMPACTS = 2111 SF
BUFFER ZONE 2 IMPACTS = 1665 SF

W3
PERMANENT WETLAND IMPACTS = 0.00 Ac / 0 SF
HAND CLEARING IN WETLANDS = 0.00 Ac / 0 SF
PERMANENT STREAM IMPACTS = 0 LF
TEMPORARY STREAM IMPACTS = 0 LF
BUFFER ZONE 1 IMPACTS = 0 SF
BUFFER ZONE 2 IMPACTS = 0 SF

W4
PERMANENT WETLAND IMPACTS = 0.00 Ac / 0 SF
HAND CLEARING IN WETLANDS = 0.00 Ac / 0 SF
PERMANENT STREAM IMPACTS = 0 LF
TEMPORARY STREAM IMPACTS = 0 LF
BUFFER ZONE 1 IMPACTS = 0 SF
BUFFER ZONE 2 IMPACTS = 0 SF

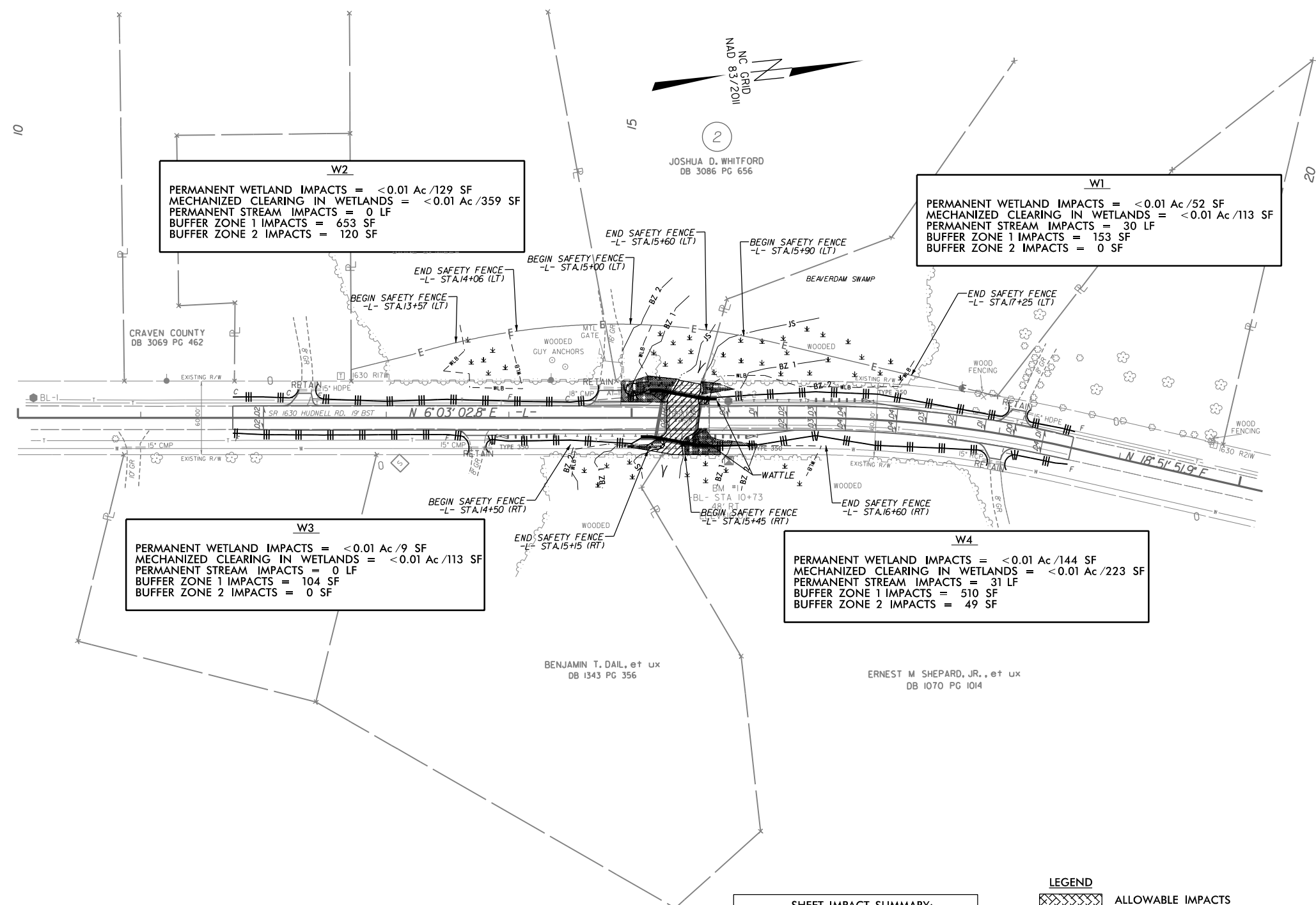
SHEET IMPACT SUMMARY:
404 WETLAND IMPACTS = 0.17 AC
STREAM IMPACTS = 48 LF
BUFFER ZONE 1 IMPACT = 3583 SQ. FT.
BUFFER ZONE 2 IMPACT = 2596 SQ. FT.

- LEGEND**
- ALLOWABLE IMPACTS ZONE 1
 - ALLOWABLE IMPACTS ZONE 2
 - DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 - DENOTES IMPACTS IN SURFACE WATER
 - DENOTES TEMPORARY FILL IN WETLAND
 - DENOTES HAND CLEARING

NCDOT
17BP.2.R.11 CRAVEN COUNTY
REPLACE BRIDGE NO. 0027
SR 1630 (HUDNELL RD.)
OVER BEAVERDAM SWAMP
BETWEEN SR 1621
AND SR 1633

SCALE: 1" = 50'
JULY 29, 2013
FOR PERMITTING ONLY:
NOT FOR CONSTRUCTION

5/14/99



W2
 PERMANENT WETLAND IMPACTS = <0.01 Ac /129 SF
 MECHANIZED CLEARING IN WETLANDS = <0.01 Ac /359 SF
 PERMANENT STREAM IMPACTS = 0 LF
 BUFFER ZONE 1 IMPACTS = 653 SF
 BUFFER ZONE 2 IMPACTS = 120 SF

W1
 PERMANENT WETLAND IMPACTS = <0.01 Ac /52 SF
 MECHANIZED CLEARING IN WETLANDS = <0.01 Ac /113 SF
 PERMANENT STREAM IMPACTS = 30 LF
 BUFFER ZONE 1 IMPACTS = 153 SF
 BUFFER ZONE 2 IMPACTS = 0 SF

W3
 PERMANENT WETLAND IMPACTS = <0.01 Ac /9 SF
 MECHANIZED CLEARING IN WETLANDS = <0.01 Ac /113 SF
 PERMANENT STREAM IMPACTS = 0 LF
 BUFFER ZONE 1 IMPACTS = 104 SF
 BUFFER ZONE 2 IMPACTS = 0 SF

W4
 PERMANENT WETLAND IMPACTS = <0.01 Ac /144 SF
 MECHANIZED CLEARING IN WETLANDS = <0.01 Ac /223 SF
 PERMANENT STREAM IMPACTS = 31 LF
 BUFFER ZONE 1 IMPACTS = 510 SF
 BUFFER ZONE 2 IMPACTS = 49 SF

SHEET IMPACT SUMMARY:
 404 WETLAND IMPACTS = 0.03 AC
 STREAM IMPACTS = 61 LF
 BUFFER ZONE 1 IMPACT = 1420 SQ. FT.
 BUFFER ZONE 2 IMPACT = 169 SQ. FT.

TOTAL IMPACT SUMMARY:
 404 WETLAND IMPACTS = 0.20 AC
 STREAM IMPACTS = 109 LF
 BUFFER ZONE 1 IMPACT = 5003 SQ. FT.
 BUFFER ZONE 2 IMPACT = 2765 SQ. FT.

- LEGEND**
- ALLOWABLE IMPACTS ZONE 1
 - ALLOWABLE IMPACTS ZONE 2
 - DENOTES IMPACTS IN SURFACE WATER
 - DENOTES FILL IN WETLAND
 - DENOTES MECHANIZED CLEARING

NCDOT
 17BP.2.R.11 CRAVEN COUNTY
 REPLACE BRIDGE NO. 0027
 SR 1630 (HUDNELL RD.)
 OVER BEAVERDAM SWAMP
 BETWEEN SR 1621
 AND SR 1633

SCALE: 1" = 50'
 JULY 29, 2013
 FOR PERMITTING ONLY:
 NOT FOR CONSTRUCTION

5/14/99

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

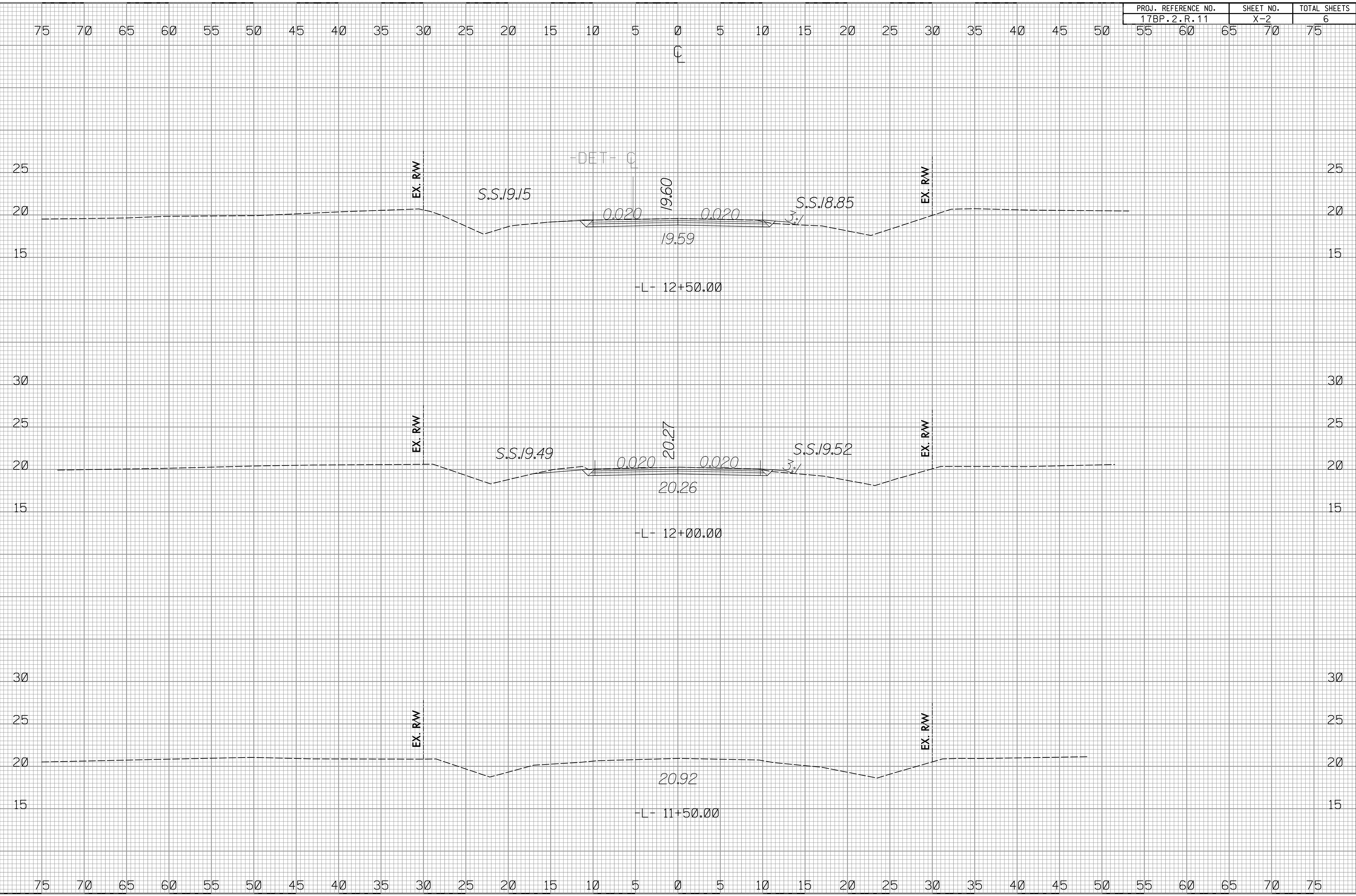
CROSS-SECTION SUMMARY
IN CUBIC YARDS

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

STATION	UNCLASSIFIED EXCAVATION	EMBANK.	UNDERCUT
-L- STA. 11+50.00	0	0	0
-L- STA. 12+00.00	17	1	0
-L- STA. 12+50.00	33	1	0
-L- STA. 13+00.00	30	1	0
-L- STA. 13+50.00	29	2	0
-L- STA. 14+00.00	32	3	0
-L- STA. 14+50.00	37	3	0
-L- STA. 15+00.00	38	4	0
-L- STA. 15+50.00	97	88	0
-L- STA. 16+00.00	151	64	0
-L- STA. 16+50.00	38	7	0
-L- STA. 17+00.00	32	10	0
-L- STA. 17+50.00	25	12	0
-L- STA. 18+00.00	23	7	0
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-L- STA. 19+00.00	0	0	0

02/03/98

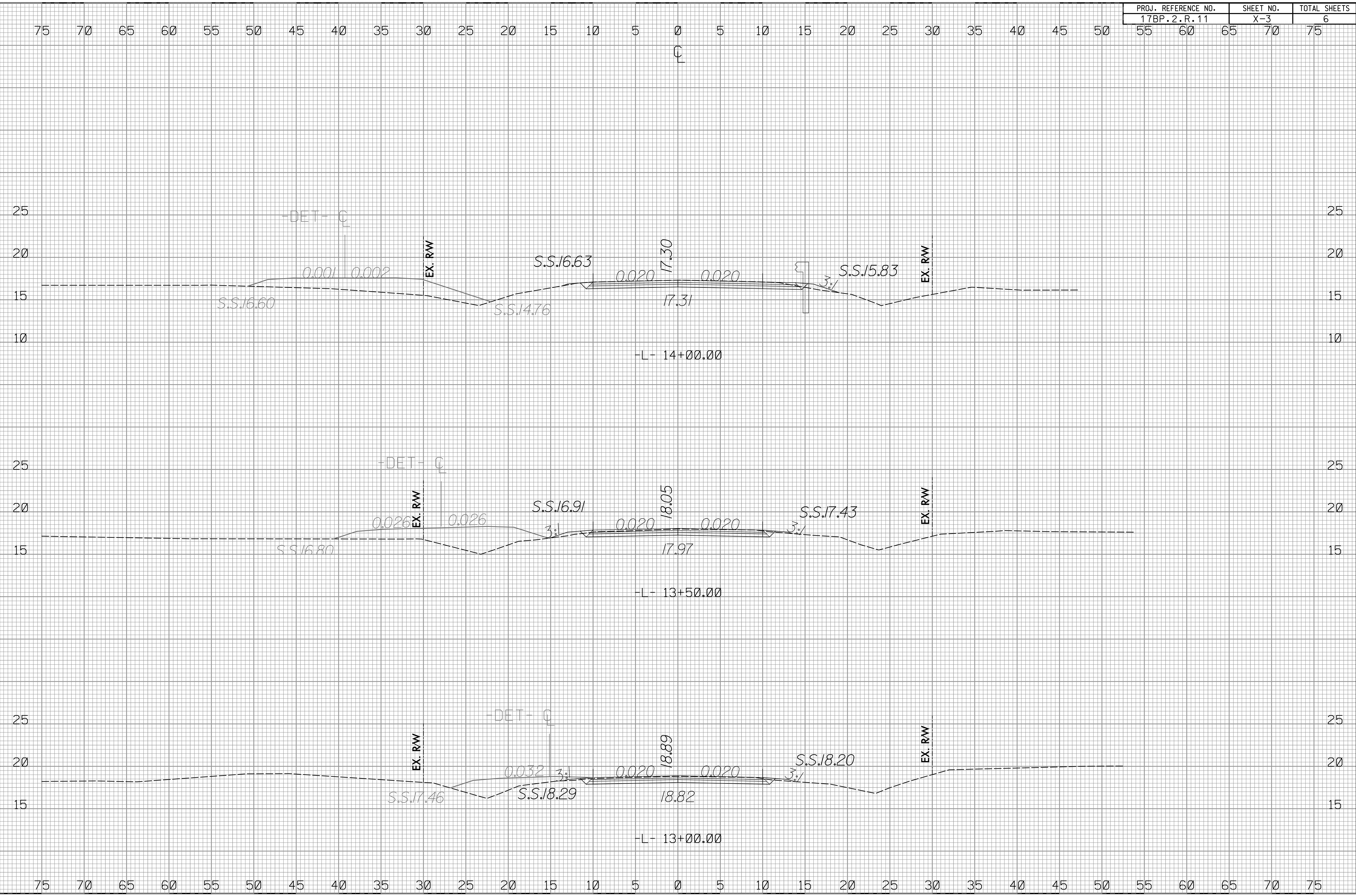
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
17BP.2.R.11	X-2	6



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02/03/98

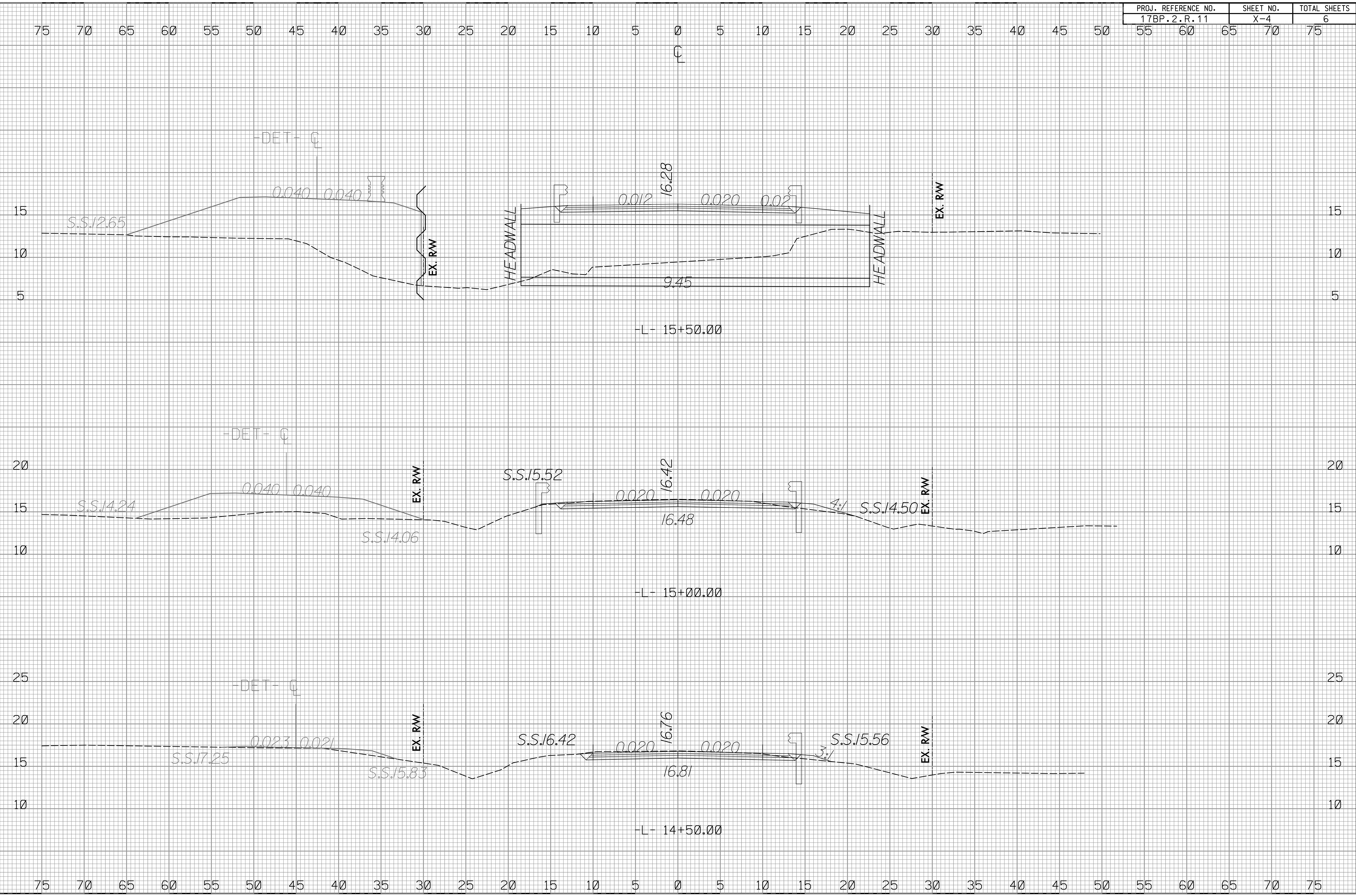
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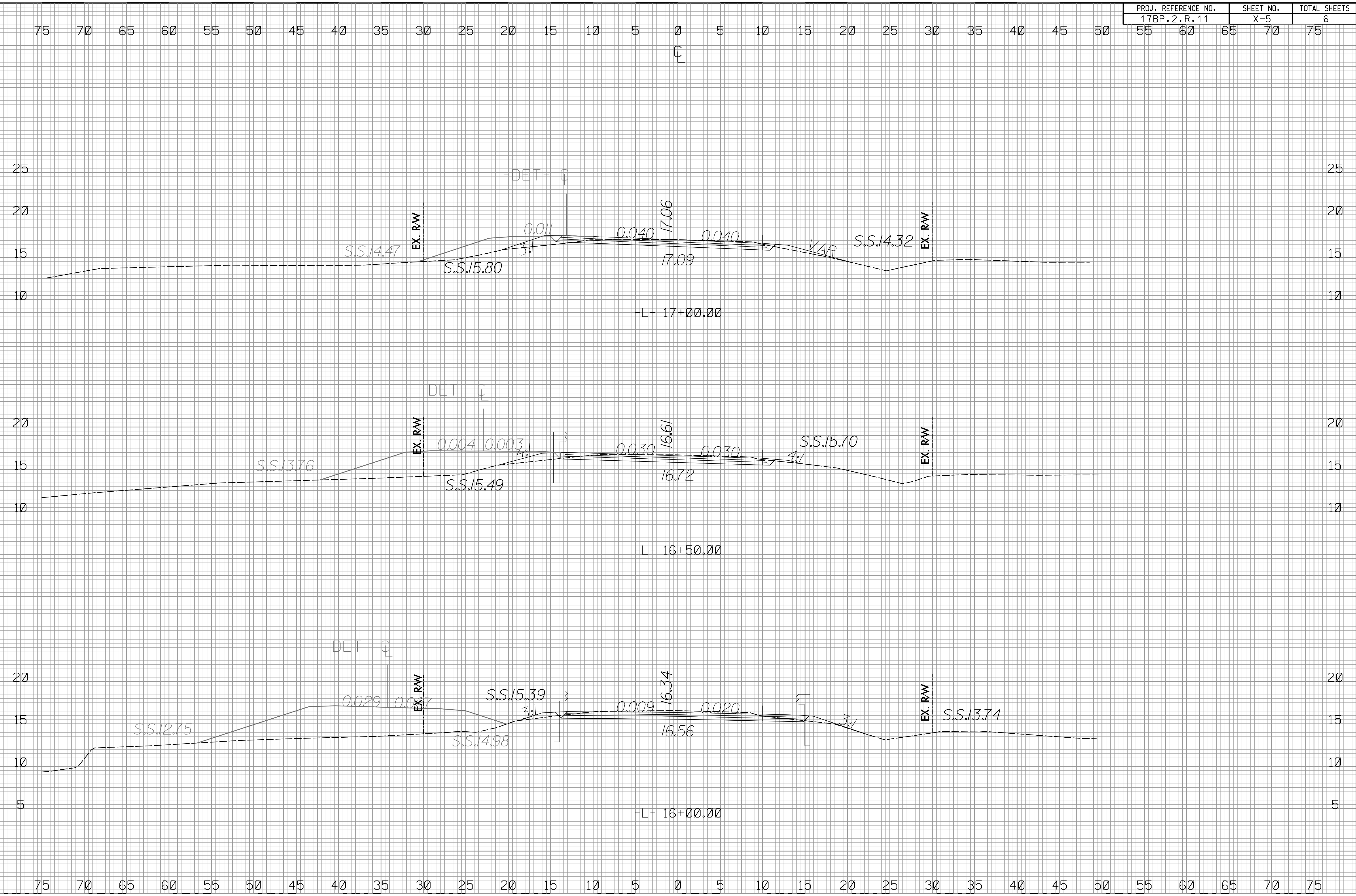
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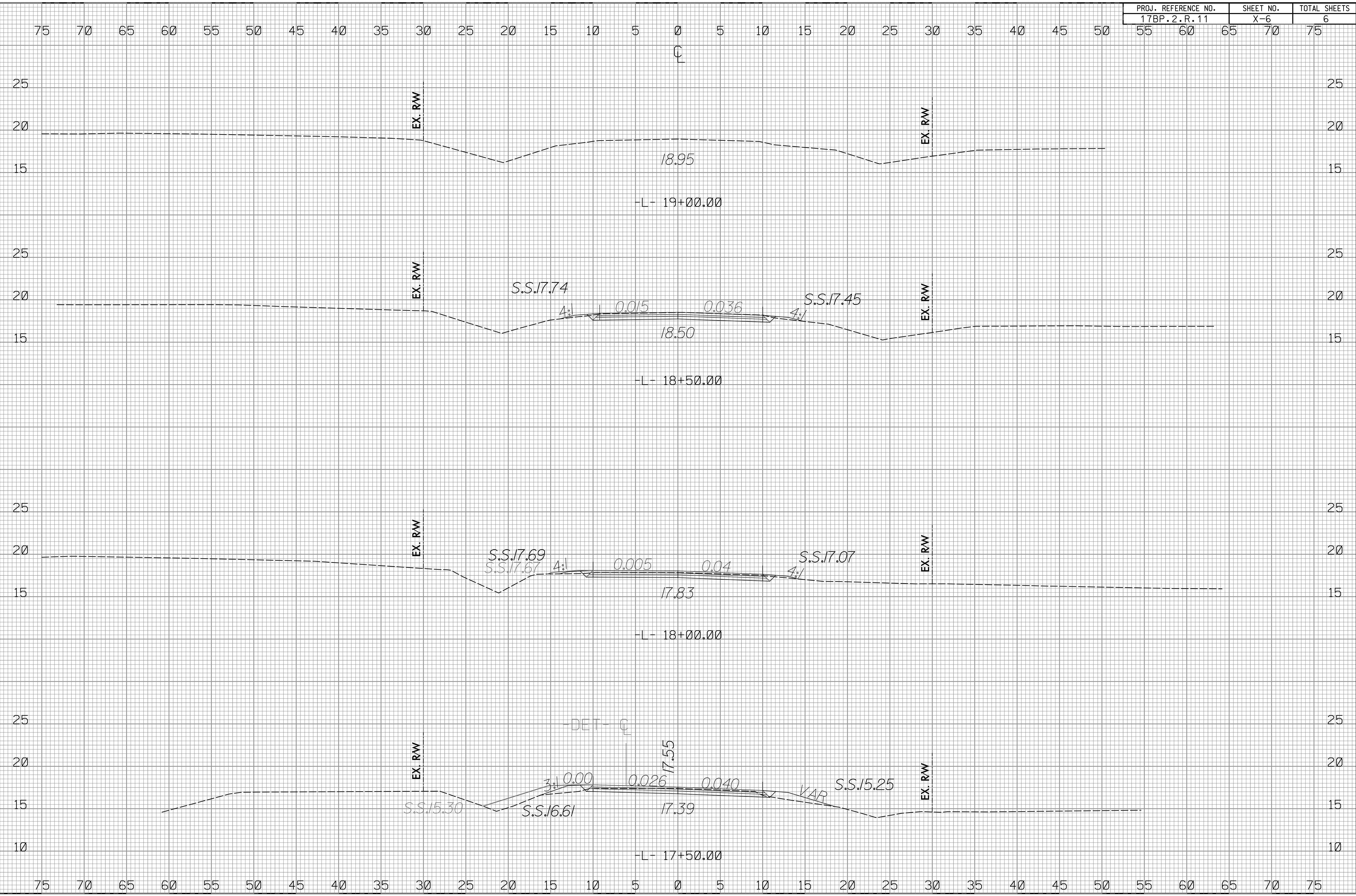
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02/03/98

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17BP.2.R.11	X-6	6



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09/28/09

TIP PROJECT: 17BP.2.R.11

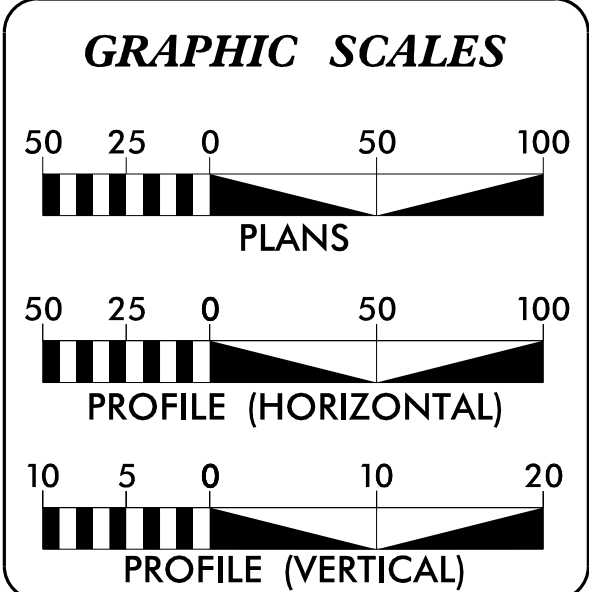
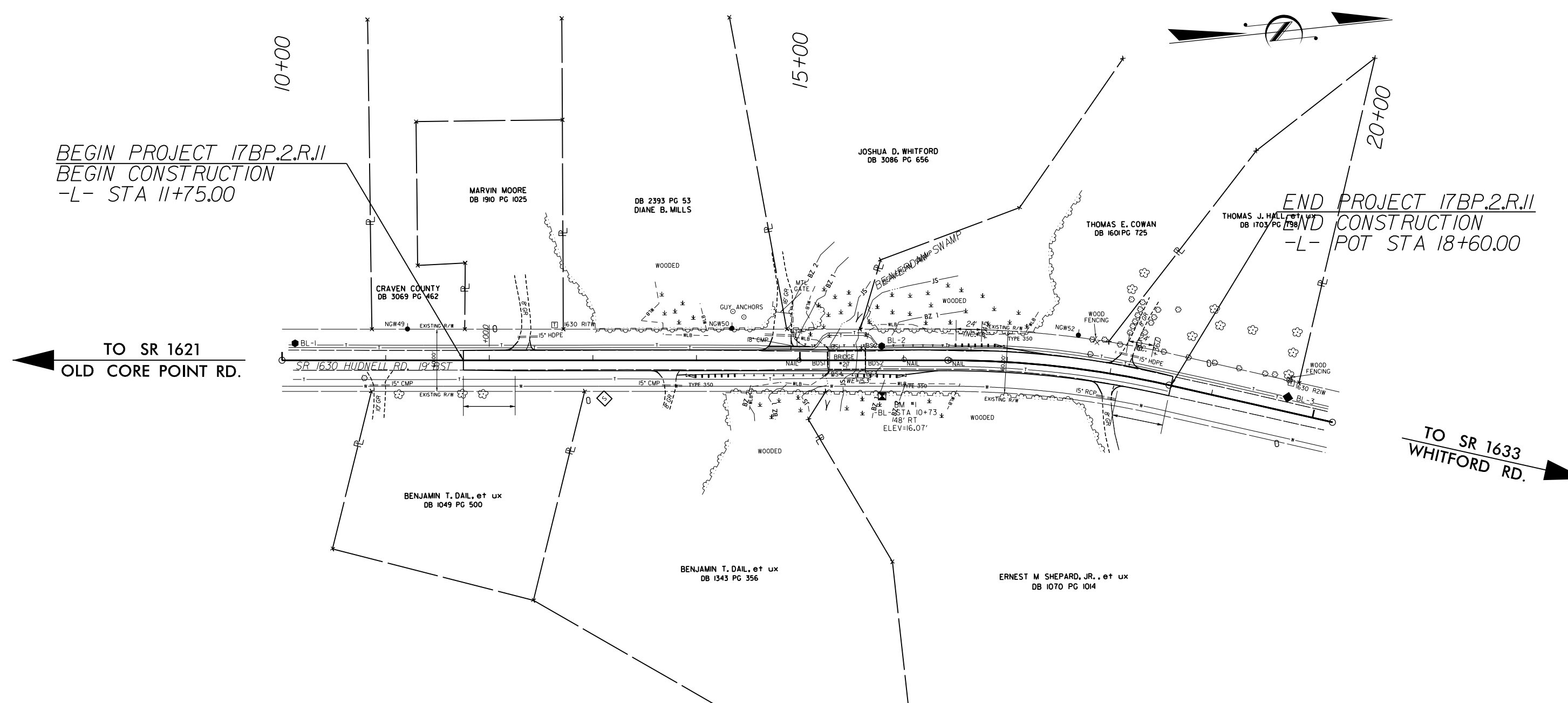
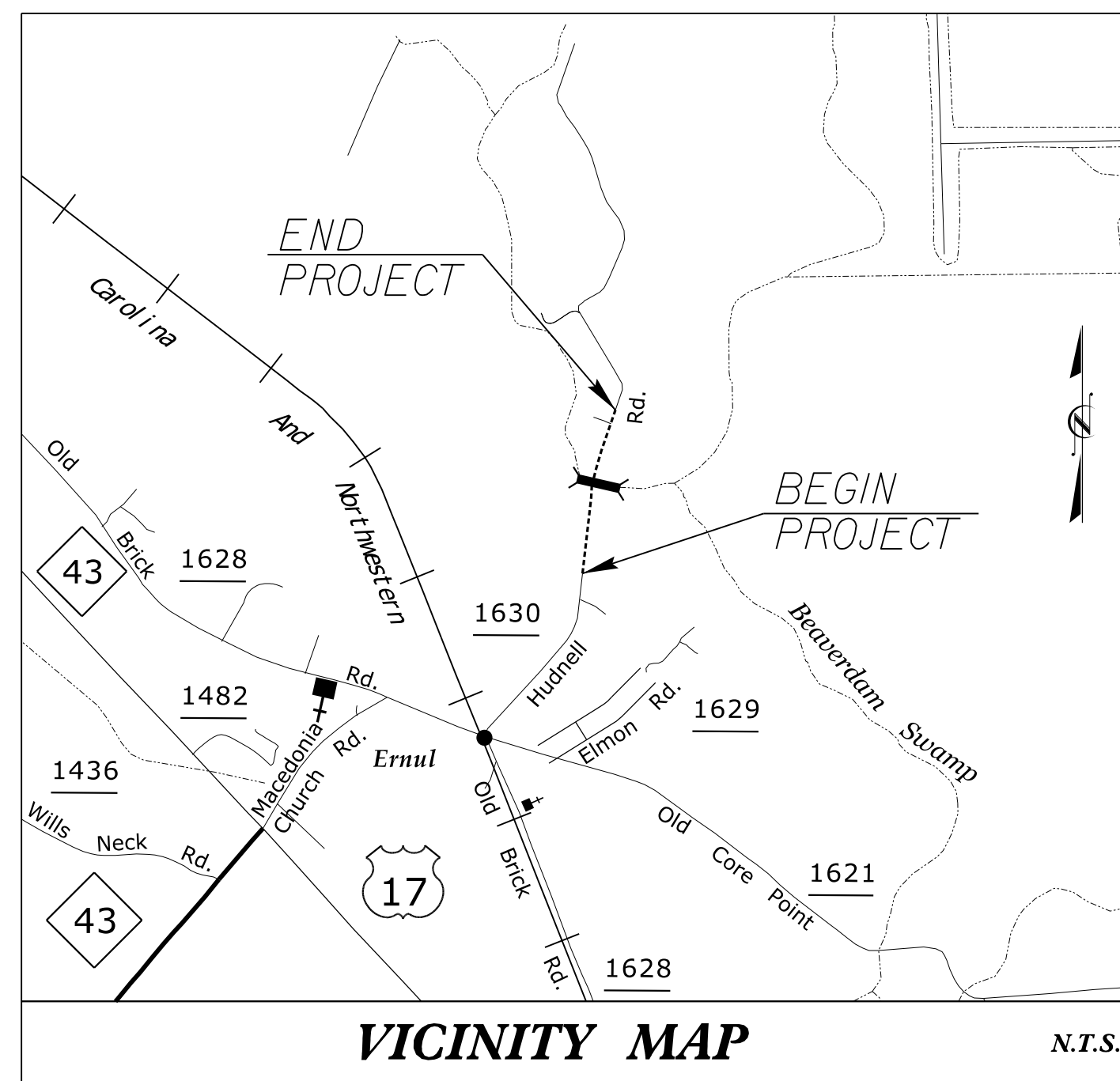
T.I.P. NO.	SHEET NO.
17BP.2.R.11	UO-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS
CRAVEN COUNTY**

**LOCATION: BRIDGE NO. 027 ON SR 1630 (HUDNELL RD.)
OVER BEAVERDAM SWAMP**

TYPE OF WORK: UTILITY BY OTHERS RELOCATION



INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	PLAN SHEET

UTILITY OWNERS ON PROJECT

(1) Progress Energy
(2) Century Link

UTILITY DESIGN BY:
MA Engineering
CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919 297 0220 Fax: 919 297 0221

NCDOT PROJECT ENGINEER:
MARIA ROGERSON, P.E.

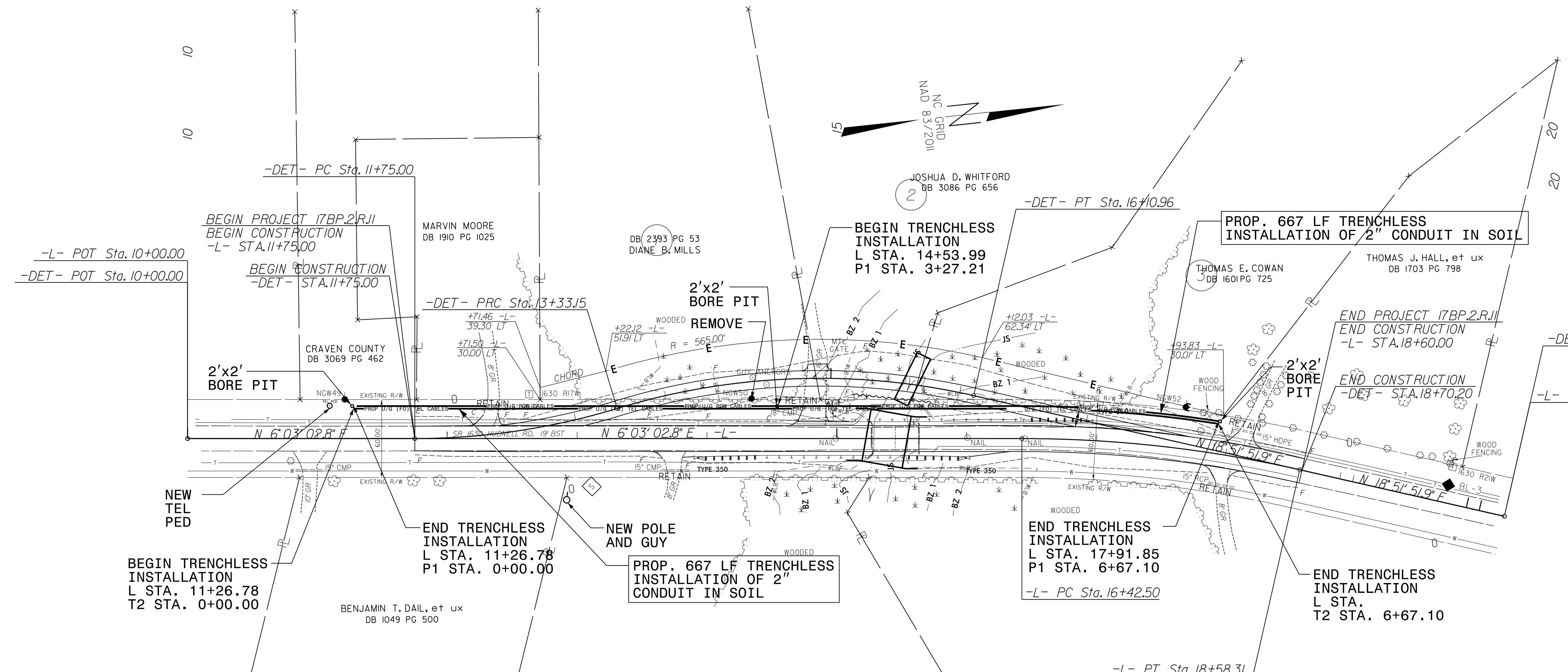
PREPARED FOR:
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION BRIDGE PROGRAM

5/30/2013 10:05:10 AM I:\4633 AM P:\0696\014\3600\Craven_27\Utilities\240027_UO-01_tsh.dgn

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

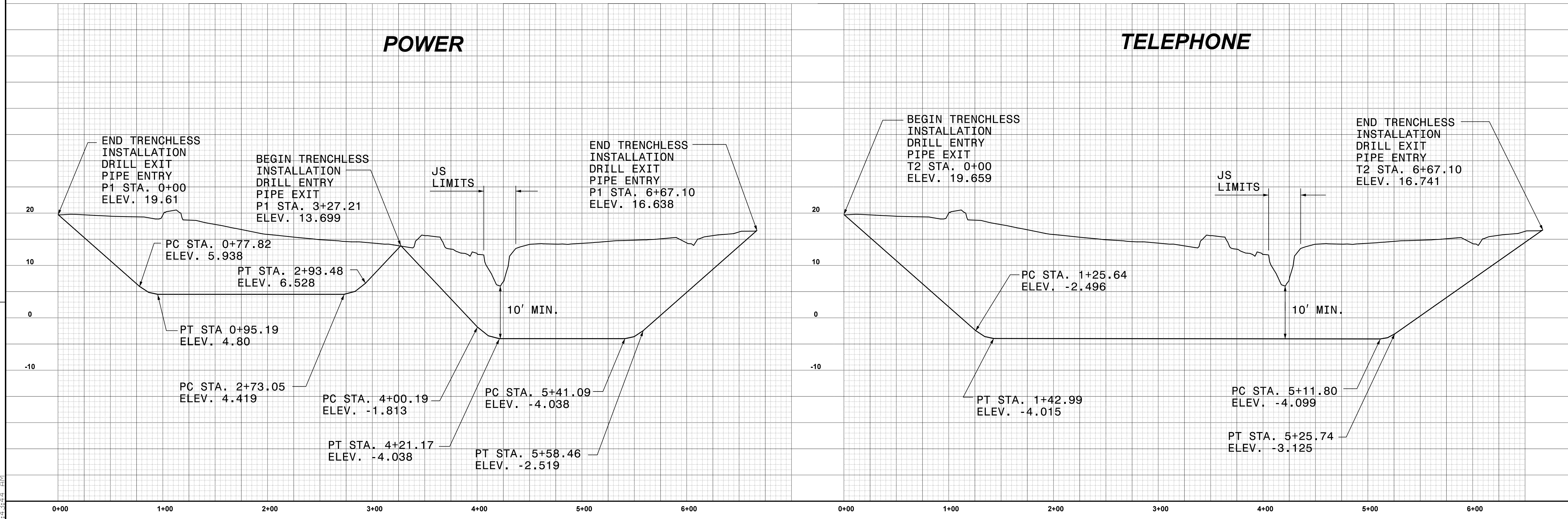
MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 137, Cary, N. C. 27511



SCALE:
1" = 50' PLAN
1" = 50' HORIZ. PFL
1" = 10' VERT. PFL

POWER

TELEPHONE



REVISIONS
 8/17/99
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