

ROADWAY DESIGN
ENGINEER

WARDINGTH CAROL

SEAL
19724

BURKE

BURKE

M A Engineering Consultants, Inc.

598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221

GENERAL NOTES:

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED 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 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. 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 STD. NO. 560.01.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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:

WATER - UNION COUNTY

TELEPHONE - WINDSTREAM

POWER - UNION POWER

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

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 Superelevation - Two Lane Pavement DIVISION 3 - PIPE CULVERTS 300.01 Method of Pipe Installation DIVISION 4 - MAJOR STRUCTURES 422.11 Reinforced Bridge Approach Fills - Sub Regional Tier DIVISION 5 - SUBGRADE, BASES AND SHOULDERS 560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I DIVISION 8 - INCIDENTALS 840.00 Concrete Base Pad for Drainage Structures 840.29 Frames and Narrow Slot Flat Grates 840.35 Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates 840.46 Traffic Bearing Precast Drainage Structure 840.66 Drainage Structure Steps 846.01 Concrete Curb, Gutter and Curb & Gutter 846.04 Drop Inlet Installation in Shoulder Berm Gutter Guardrail Placement 862.02 Guardrail Installation

862.03 Structure Anchor Units (Details in Lieu of Standard Drawing as March 2013 Letting)

876.01 Rip Rap in Channels
876.02 Guide for Rip Rap at Pipe Outlets

DIVISION 11 — WORK ZONE TRAFFIC CONTROL
1101.02 Temporary Lane Closures
1101.03 Temporary Road Closures
1101.11 Traffic Control Design Tables
1110.01 Stationary Work Zone Signs
1145.01 Barricades — Type III
1261.01 Guardrail and Barrier Delineator Spacing
1261.02 Guardrail and Barrier Delineator Types
1262.01 Guardrail End Delineation

INDEX OF SHEETS

SHEET NUMBER	SHEET
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1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
3-A	SUMMARIES OF EARTHWORK, DRAINAGE AND GUARDRAIL
4	PLAN AND PROFILE SHEET
TCP-1	TRAFFIC CONTROL PLAN - DETOUR ROUTE
EC-1 THRU EC-4	EROSION CONTROL PLANS
UC-1 THRU UC-4	UTILITY CONSTRUCTION PLANS
X-1 THRU X-3	CROSS-SECTIONS
S-1 THRU S-17	STRUCTURE PLANS

Roadway\Proj\89@139_rdy_ndx_1A.dgn 7:26 PM

PROJECT REFERENCE NO.	
17BP.10.R.22	

SHEET NO.

*S.U.E. = Subsurface Utility Engineering

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:			
State Line —			
County Line		RAILROADS:	
Township Line		Standard Gauge	CSX TRANSPORTATION
City Line		RR Signal Milepost	MILEPOST 35
Reservation Line		Switch -	SWITCH
Property Line		RR Abandoned	
Existing Iron Pin	O	RR Dismantled	
Property Corner	×	RIGHT OF WAY:	
Property Monument	ECM	Baseline Control Point	
Parcel/Sequence Number	(23)	Existing Right of Way Marker	\triangle
Existing Fence Line		Existing Right of Way Line	
Proposed Woven Wire Fence		Proposed Right of Way Line ————	
Proposed Chain Link Fence		Proposed Right of Way Line with	
Proposed Barbed Wire Fence	_ 	Iron Pin and Cap Marker	W
Existing Wetland Boundary	wlb	Proposed Right of Way Line with Concrete or Granite RW Marker	R
Proposed Wetland Boundary		Proposed Control of Access Line with	
Existing Endangered Animal Boundary —		Concrete C/A Marker	
Existing Endangered Plant Boundary ———		Existing Control of Access	(\bar{c})
Known Soil Contamination: Area or Site —		Proposed Control of Access —————	
Potential Soil Contamination: Area or Site —		Existing Easement Line ——————	——E——
BUILDINGS AND OTHER CULT		Proposed Temporary Construction Easement –	——Е——
		Proposed Temporary Drainage Easement —	TDE
Gas Pump Vent or U/G Tank Cap Sign		Proposed Permanent Drainage Easement —	PDE
Well —	- S	Proposed Permanent Drainage / Utility Easemen	ntDUE
Small Mine		Proposed Permanent Utility Easement ———	PUE
Foundation —		Proposed Temporary Utility Easement ———	TUE
		Proposed Aerial Utility Easement ————	AUE
Area Outline — — — — — — — — — — — — — — — — — — —		Proposed Permanent Easement with	
		Iron Pin and Cap Marker	
Building —		ROADS AND RELATED FEATUR	ES:
School	+	Existing Edge of Pavement	
Church		Existing Curb	
Dam —		Proposed Slope Stakes Cut	
HYDROLOGY:		Proposed Slope Stakes Fill	<u>F</u>
Stream or Body of Water —		Proposed Curb Ramp	CR
Hydro, Pool or Reservoir —	- [Existing Metal Guardrail —	
Jurisdictional Stream	- —Js———	Proposed Guardrail —	
Buffer Zone 1		Existing Cable Guiderail ————	<u>n</u> n
Buffer Zone 2	BZ 2	Proposed Cable Guiderail	
Flow Arrow	<	Equality Symbol ————	
Disappearing Stream —		Pavement Removal	
Spring —		VEGETATION:	
Wetland —		Single Tree	슌
Proposed Lateral, Tail, Head Ditch	← FLOW	Single Tree Single Shrub	
False Sump		Hedge —	
		Woods Line —	
		TTOOGS EITIO	

Orchard —	음 음 음 S
Vineyard ————————————————————————————————————	Vineyard
EXISTING STRUCTURES:	
MAJOR:	
Bridge, Tunnel or Box Culvert ————	CONC
Bridge Wing Wall, Head Wall and End Wall –) CONC WW (
MINOR:	
Head and End Wall —	CONC HW
Pipe Culvert —	
Footbridge	
Drainage Box: Catch Basin, DI or JB	СВ
Paved Ditch Gutter	
Storm Sewer Manhole	(\$)
Storm Sewer —	s
UTILITIES:	
POWER:	
Existing Power Pole —	•
Proposed Power Pole	6
Existing Joint Use Pole	-
Proposed Joint Use Pole	-6-
Power Manhole —	P
Power Line Tower —	\boxtimes
Power Transformer —	
U/G Power Cable Hand Hole —	
H-Frame Pole	•
Recorded U/G Power Line	р
Designated U/G Power Line (S.U.E.*)	
TELEPHONE:	
Existing Telephone Pole	-
Proposed Telephone Pole ————————————————————————————————————	-0-
Telephone Manhole	\bigcirc
Telephone Booth —	3
Telephone Pedestal —————	
Telephone Cell Tower ————————————————————————————————————	, ,
U/G Telephone Cable Hand Hole —	
Recorded U/G Telephone Cable ————	т
Designated U/G Telephone Cable (S.U.E.*)—	
Recorded U/G Telephone Conduit	тс
Designated U/G Telephone Conduit (S.U.E.*)	
Recorded U/G Fiber Optics Cable ———	т го

VATER:	
Water Manhole —	W
Water Meter —	0
Water Valve —	
Water Hydrant —	⋄
Recorded U/G Water Line ————	w
Designated U/G Water Line (S.U.E.*)	
Above Ground Water Line —	
V:	
TV Satellite Dish —————	\bowtie
TV Pedestal ————————————————————————————————————	
TV Tower —	\otimes
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.*)	
besignated of the Opine Cable (3.0.L.)	
SAS:	
Gas Valve —	\Diamond
Gas Meter —	\Diamond
Recorded U/G Gas Line ————	•
Designated U/G Gas Line (S.U.E.*)	
Above Ground Gas Line (3.0.E.*)	
Above Ground Gas Line	
ANITARY SEWER:	
Sanitary Sewer Manhole	•
Sanitary Sewer Mannole Sanitary Sewer Cleanout ——————	22
U/G Sanitary Sewer Line —	100
Above Ground Sanitary Sewer —	
Recorded SS Forced Main Line—	-
Designated SS Forced Main Line (S.U.E.*) —	
Designated 33 Forced Main Line (3.0.E.) —	— — — FSS — — —
ALCCELL AND COLLE	
AISCELLANEOUS:	-27
Utility Pole ————————————————————————————————————	• -
Utility Pole with Base ————————————————————————————————————	
Utility Located Object —	
Utility Traffic Signal Box —	
Utility Unknown U/G Line —————	
U/G Tank; Water, Gas, Oil —————	
Underground Storage Tank, Approx. Loc. ——	
A/G Tank; Water, Gas, Oil —————	1
Geoenvironmental Boring ————————————————————————————————————	•
U/G Test Hole (S.U.E.*) —	
Abandoned According to Utility Records —	AATUR
End of Information ————————	FOL

SURVEY CONTROL SHEET PRELIMINARY PLANS

DATUM DESCRIPTION BL THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT DESC. OFFSET POINT NORTH EAST ELEVATION L STATION IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BL-2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF 406070.3307 OUTSIDE PROJECT LIMITS B5133-1 1540484.5673 604.26 NORTHING: 406280.444(ft) EASTING: 1541373.939(ft) ELEVATION: 594.850(ft) 406243.0800 1541195.6590 598.99 13+29.48 12.63 RT BL-1 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT BL-2 406280.4440 1541373.9390 594.85 15+11.63 12.55 RT (GROUND TO GRID) IS: 0.999872 BL-3 OUTSIDE PROJECT LIMITS 406332.8850 1541640.9129 596.48 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-2" TO -L- STATION 10+00.00 IS S79°35′42.2″W 511.79 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88 NAD 83/NSRS 2007

TO NC 207 (WOLF POND RD.)

SR 2125 JACK DAVIS RD -

-L- POT STA.15+30.99 \

BEGIN BRIDGE

TO SR 2130

(ARMFIELD MILL RD.)

BL-3

END WBS PROJECT 17BP.10.R.22

-L- POT Sta. 17 + 00.00

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

END BRIDGE

-L- POT STA.15+80.99

THE FILES TO BE FOUND ARE AS FOLLOWS: 890139_LS_CONTROL.TXT

- 2. SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- 3. PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 POSITIONS ESTABLISHED USING NCGS REAL TIME KINEMATIC NETWORK (VRS)

 MONUMENTS USED OR SET FOR PROJECT CONTROL BY THE NCDOT
 LOCATION AND SURVEYS UNIT:
- INDICATES GEODETIC CONTROL MONUMENTS FOR HORIZONTAL CONTROL
- INDICATES BASELINE MONUMENTS FOR HORIZONTAL PROJECT CONTROL
- INDICATES BENCHMARKS FOR VERTICAL PROJECT CONTROL

BEGIN WBS PROJECT 17BP.10.R.22
-L- POT Sta. 11 + 00.00

TYPE	STATION	NORTH	EAST
POT	10+00.00	406188.0135	1540870.5691
POT	17+28.37	406337.0849	1541583.5182

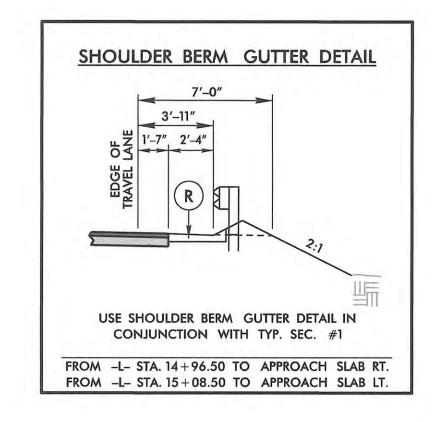
ROW MARKER

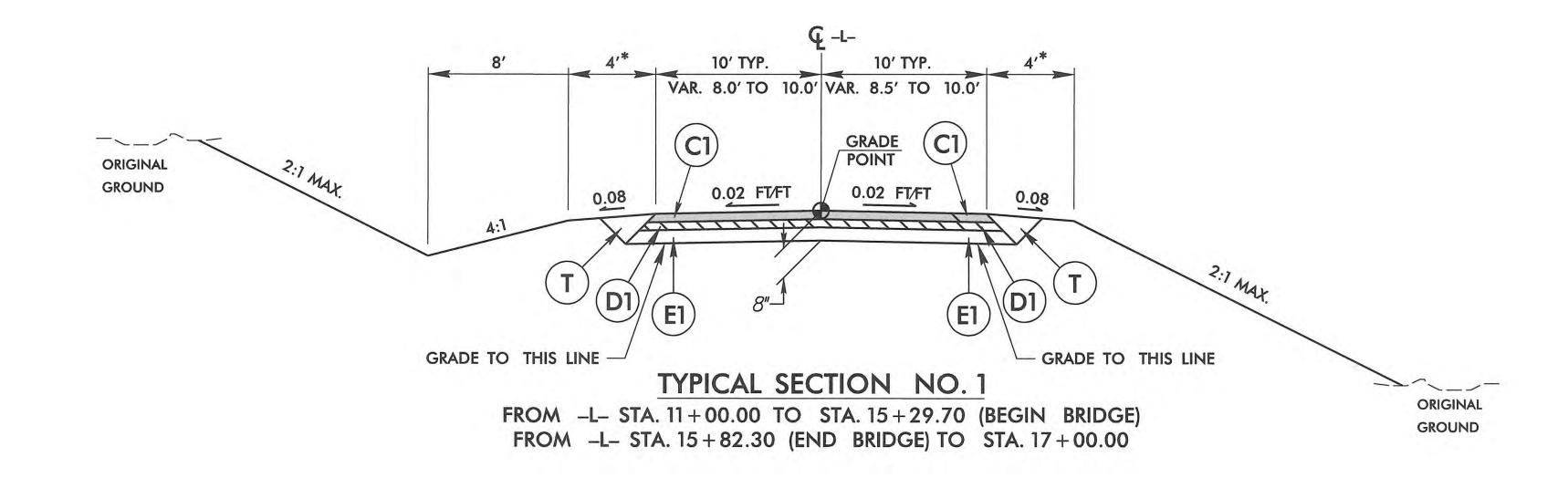
ALIGN	STATION	OFFSET	NORTH	EAST	
	14+50.00	-29.40	406308.8872	1541305.0271	
	15+25.00	-50.00	406344.4043	1541374.2227	
1_	16+00.00	-50.00	406359.7542	1541447.6351	
	16+00.00	-29.72	406339.9053	1541451.7853	

NOTE: DRAWING NOT TO SCALE

	PAVEMENT SCHEDULE
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168.0 Lbs PER SQUARE YARD.
D1	PROP. APPROX. 3.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.5B, AT AN AVERAGE RATE OF 399.0 Lbs PER SQUARE YARD.
E1	PROP. APPROX. 3.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 Lbs PER SQUARE YARD.
R	CONCRETE SHOULDER BERM GUTTER
Т	EARTH MATERIAL

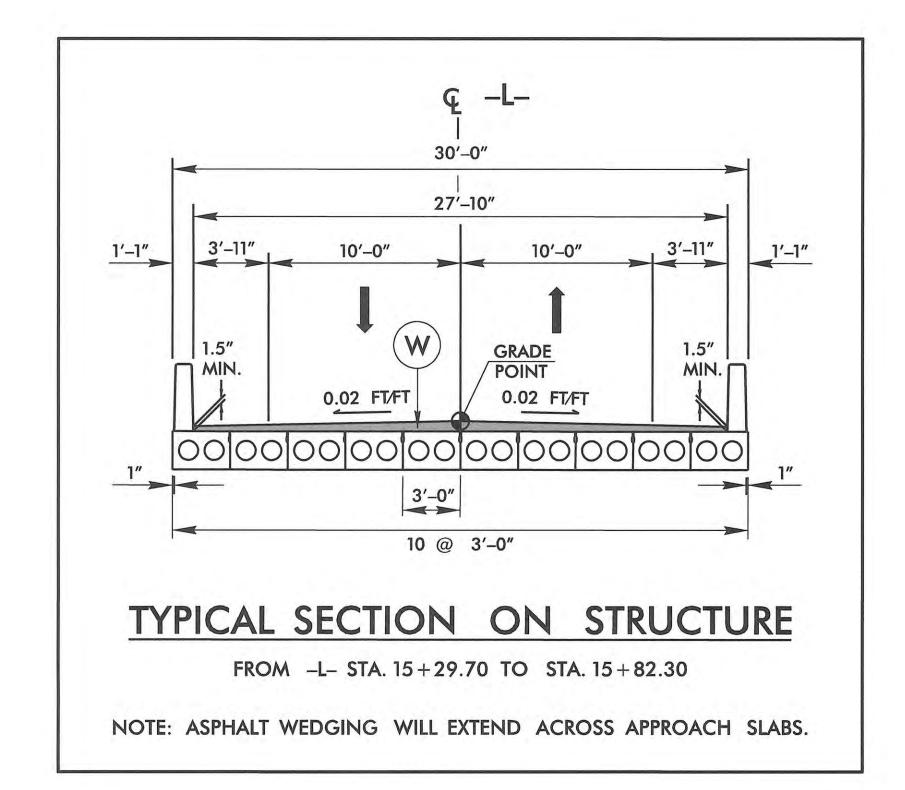
PAVEMENT EDGE SLOPES AND TRENCH SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.





NOTES

* - 7' WITH GUARDRAIL (FACE GR MIN. 4' FROM EOP)



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17BP.10.R.22 2

RW SHEET NO.

ROADWAY DESIGN PAVEMENT DESIGN ENGINEER

ENGINEER ENGINEER

SHEET NO.

ROADWAY DESIGN
ENGINEER
ENGINEER
ENGINEER

PAVEMENT DESIGN
ENGINEER

PAVEMENT DESIGN
PROVIDED BY NCDOT

PROJECT REFERENCE NO.

INE BOOK AND THE PROPERTY OF T

M A Engineering Consultants, Inc.

598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221

COMPUTED BY:	DBE	DATE:	3–19–2013
CHECKED BY:	RWP	DATE:	7-1-2013

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BP.10.R.22	3
M A Engi Consulta	ineering ints, Inc.
598 East Chatham Street Suite 13	7 Cary, NC 27511

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+15%	BORROW	WASTE
-L- 11+00.00 TO 15+29.70 (END BRIDGE FILL)	2396		8	0	2388
-L- 15+82.30 (BEGIN BRIDGE FILL) TO 17+00.00	9		16	7	0
TOTAL	2405		24	7	2388
WASTE TO REPLACE BORROW				_7	-7
PROJECT TOTAL	2405		24	0	2371
ESTIMATED 5% TO REPLACE TOPSOIL ON BORROW PIT					
GRAND TOTAL	2405		24		2371
SAY	2410				2380

APPROXIMATE QUANTITIES ONLY. CLEARING AND GRUBBING, UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

SUMMARY OF PAVEMENT REMOVAL IN SQUARE YARDS

LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	CONCRETE REMOVAL	CONCRETE BREAK-UP
-L- STA. 11+00 TO 15+50.10	852			
L STA. 15+69.90 TO 17+00	236			
GRAND TOTAL	1,088			
SAY	1,090			

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	N (LT,RT, OR CL)	STRUCTURE NO.	ATION	LEVATION	LEVATION	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)	C.S. PIPE (UNLESS NOTED OTHRWISE)			CLASS (UNLESS OT	LASS III R.C. PIPE S OTHERWISE NOTED)				STD. 838.01, OR STD. 838.80 (UNIESS NOTED OTHERWISE) TI APPLIES STRUCK AND APPLIES STRUCK		(A' + (1.3 X COL.'B') D. 840.02	A	RAME, GRATES AND HOOD NDARD 840.03	D. 840.15	.17 OR 840.26 .18 OR 840.27	.19 OR 840.28 TE STD. 840.22	GRATES STD. 840.22 GRATE STD. 840.24	TWO GRATES STD. 840.24	I TWO GRATES STD. 840.29	D. & SIZE C.Y. STD 840.72 JG. C.Y. STD. 840.71	C.B. N.D.I. D.I. G.D.I. G.D.I. (I	ABBREVIATIONS CATCH BASIN NARROW DROP INLET DROP INLET GRATED DROP INLET (S.) GRATED DROP INLET (NARROW SLOT)		
SIZE	ГОСАТІО		TOP ELEV	INVERT E	INVERT E	12" 15" 18" 24" 30" 36" 42" 48"	12" 15" 18" 24"	30"	36"	42"	48"	12" 15" 18" 24	4" 30" 36" 42" 4	8" =	PIPE	al C	CU. YDS.	4RU 5.0')	S			OR STD	STD. 840 STD. 840	STD. 840	ME WITH	ME WITH OR 84(VME WITH	BOWS NG S CL. "B"	J.B. 上、 M.H. ヹ T.B.D.I.	JUNCTION BOX MANHOLE TRAFFIC BEARING DROP INLET
THICKNESS OR GAUGE		FROM					.064	620.	.079	.109	.109			SIDE DRAIN		SIDE DRAIN	C.S.P.	EACH (0' TH THRU 10.0'	AND ABOY	TY	PE OF GRATE	STD. 840.14 FRAME & G	I. TYPE "A" I. TYPE "B"	I. TYPE "D"	.I. FRAME W	I. (N.S.) FRA STD. 840.31	I. (N.S.) FRZ	R. STEEL ELE AC. COLLARS AC. & BRICK	REMOVAL L	TRAFFIC BEARING JUNCTION BO
														15″ S	30	24"		PER	10.0' C.B.	E	F G	D.I. D.I.	G.D.	G.D.	G.D	G.D.	G.D.		PIPE	REMARKS
L 15+00	RT	401	593.9	591.1														1									1 1		22 REM. 12	CMP @ -L- 16+00 RT
		401 402		591.1	590.1							28																		
-L- 15+12	LT	402	593.9	590.1														1									1 1			
		402 OUT		590.1	589.8							24																		
_L- 12+47	LT	404												32															22	
_L- 14+20	LT	405												28															24	
TOTALS												52		60				2									2 2		68	

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.

TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.

FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.

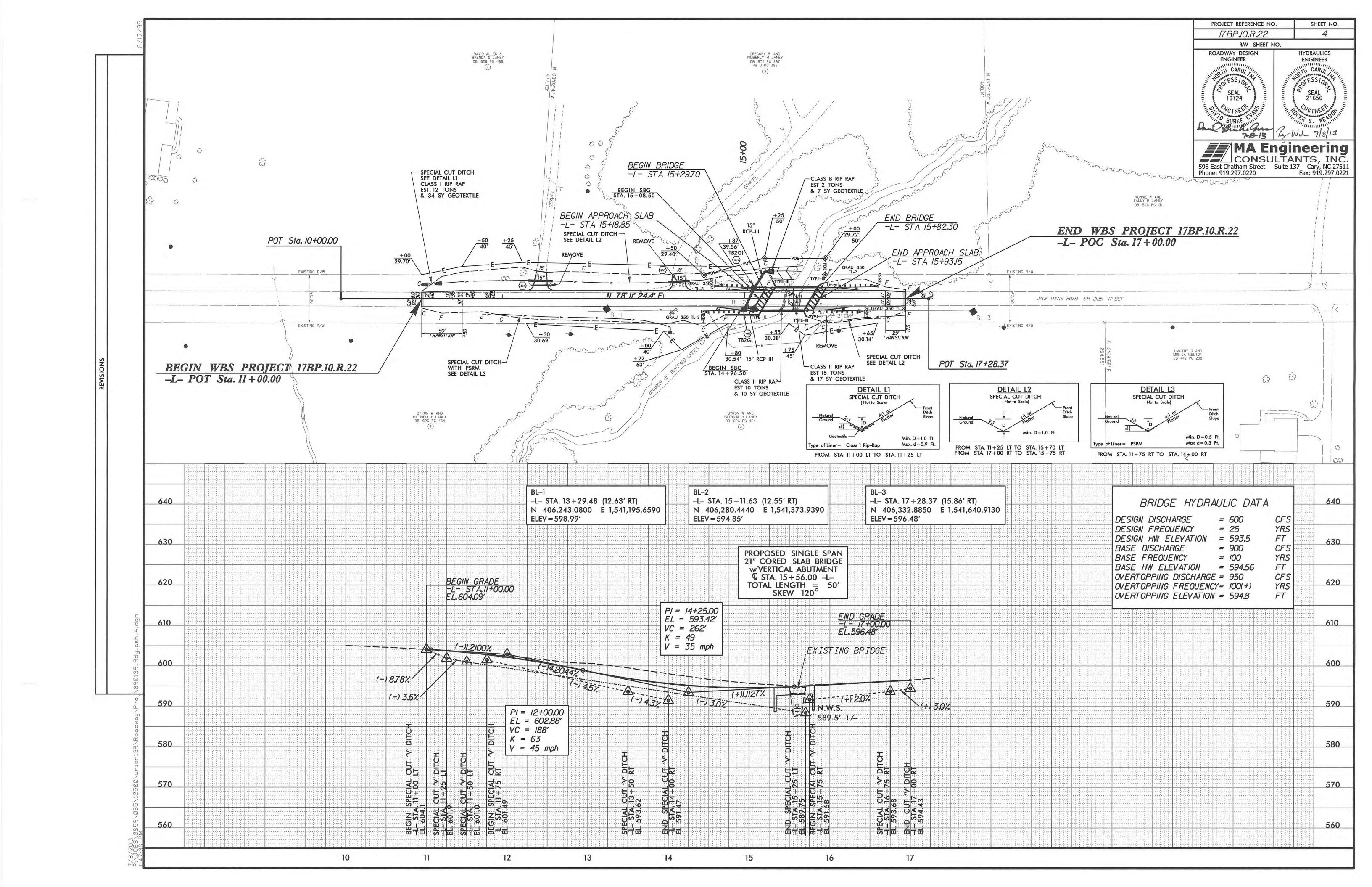
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.

G = GATING IMPACT ATTENUATOR TYPE 350

NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

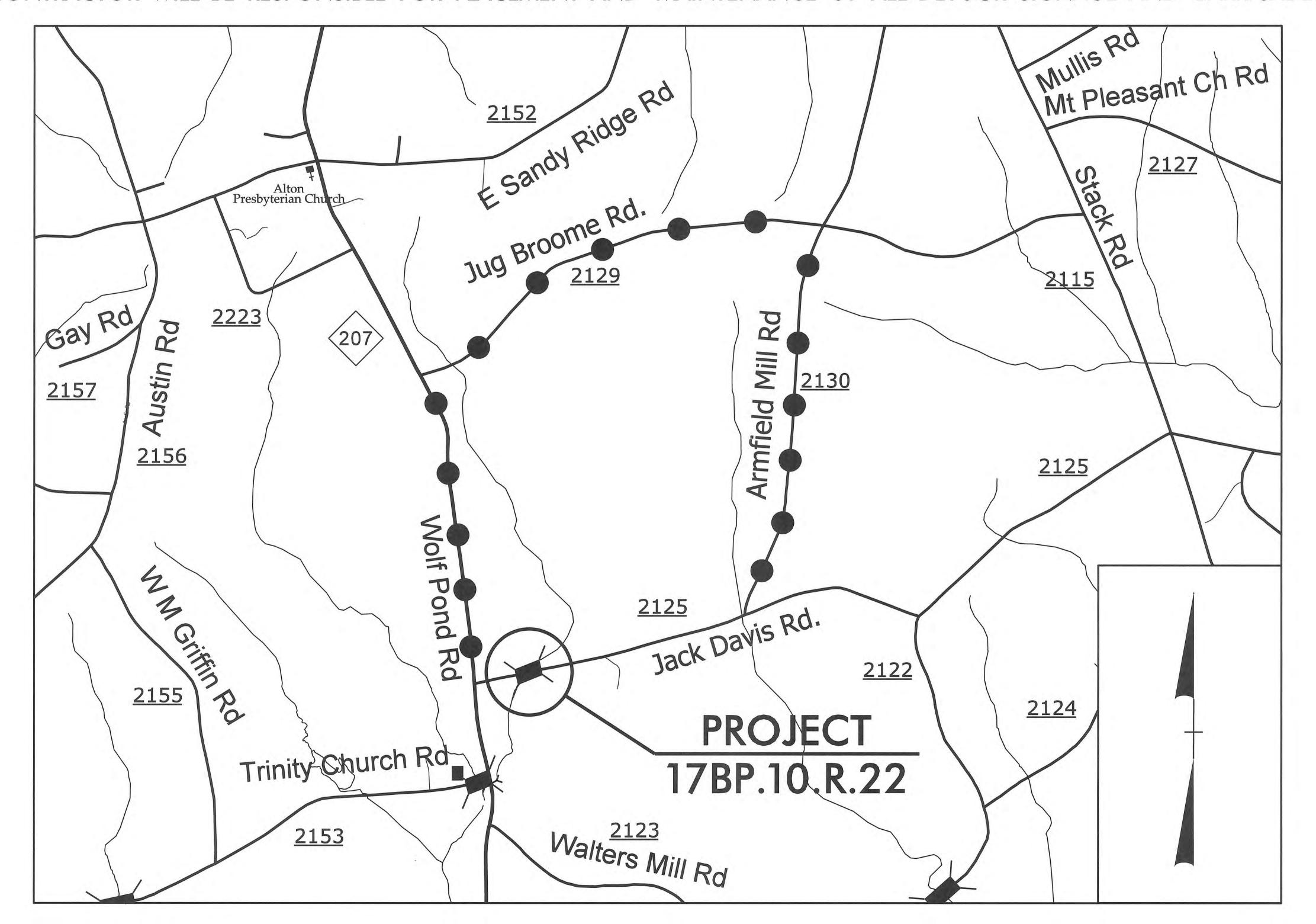
NG = NO	N-GATING IMPACT	ATTENUATOR TYPE 35	50										in a section of											was a second	4			
SURVEY	DEC STA	END STA	LOCATION		LENGTH		WARRA	ANT POINT	"N" DIST.	TOTAL	FLARE	LENGTH	٧	W				A	ANCHORS				IMPACT ATTENUAT TYPE 35	OR SIN		EMOVE	REMOVE AND STOCKPILE	
LINE	BEG. STA.	END STA.	LOCATION	STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END	FROM E.O.L.	SHOUL. WIDTH	APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	ΧI	GRAU 350 TL-3	M-350	TYPE III	CAT-1	VI BIC	AT-1	EA G	GUAR	DRAIL GU	ARDRAIL	EXISTING GUARDRAIL	REMARKS
-L-	14+62.89	15+39.18	LT	75.00			15+35.00		4	7	50.00			1			1		1									The state of the s
-L-	14+46.45	15+21.45	RT	75.00			14+75.73		4	7		50.00	1				1		1									
-L-	15+90.50	16+65.50	LT	75.00				15+96.53	4	7	50.00	Commence of the second	1				1		1	A transfer of the part to provide the Contract to and		100 Table 100 Ta		A PARAMETER AND THE PARAMETER				
-L-	15+74.06	16+49.06	RT	75.00				15 + 76.49	4	7		50.00		1			1		1									
			TOTAL:	300.00													4		4									
		тот	AL ANCHOR LENGTH:	275.00																								
		TOTAL	GUARDRAIL LENGTH:	25.00	NAME OF THE PERSON OF THE PERS				i i																			
		110000 4000 154 165 00 10 10	SAY:	25.00			Communication of the Communica																					

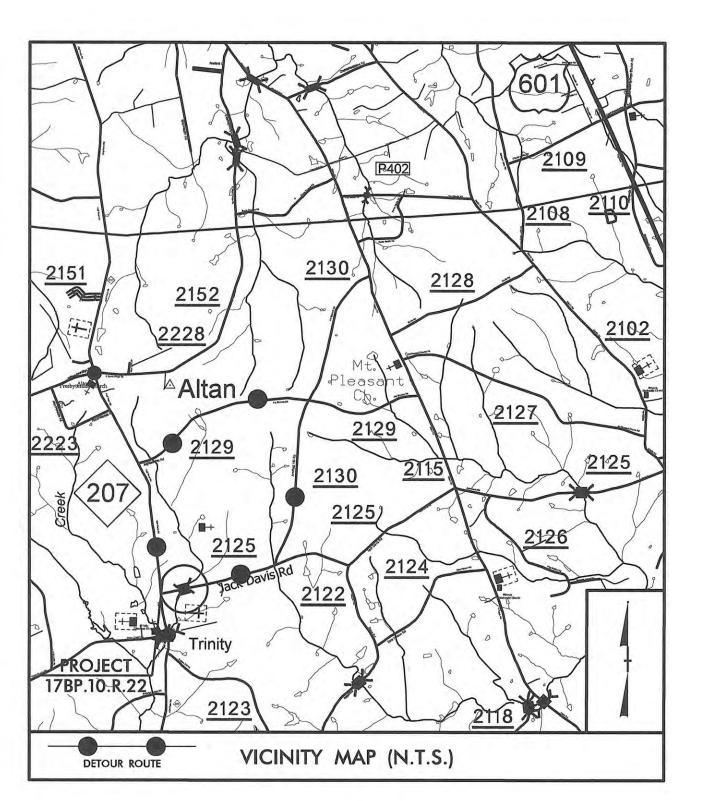


PROJECT REFERENCE NO.	SHEET NO.
17BP.10.R.22	TCP-I
M A Engi Consulta	
598 East Chatham Street Suite 133 Phone: 919.297.0220 F	7 Cary, NC 27511 ax: 919.297.0221

DETOUR ROUTE -

USE STD. DWG. NO. 1101.03 (SHEET 1 OF 9) FOR TEMPORARY ROAD CLOSURE (CLOSURE BEYOND DETOUR POINT). CONTRACTOR WILL BE RESPONSIBLE FOR PLACEMENT AND MAINTENANCE OF ALL DETOUR SIGNAGE AND BARRICADES.





STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PLAN FOR PROPOSED HIGHWAY EROSION CONTROL

UNION COUNTY

LOCATION: BRIDGE #139 ON SR 2125 (JACK DAVIS RD.) OVER BUFFALO CREEK

TYPE OF WORK: EROSION CONTROL





Wattle / Coir Fiber Wattle with Polyacrylamide (PAM) 1634.01 Temporary Rock Sediment Dam Type-A. Temporary Rock Sediment Dam Type-B...

Rock Pipe Inlet Sediment Trap Type-A... Rock Pipe Inlet Sediment Trap Type-B. 1630.04 Stilling Basin 1630.06 Special Stilling Basin. Rock Inlet Sediment Trap: Type A. 1632.01 1632.02 Type B. 1632.03 Type C. Skimmer Basin. Tiered Skimmer Basin.

Infiltration Basin.

STATE PROJ. NO.

Temporary Silt Ditch

Temporary Diversion Temporary Silt Fence.

Silt Basin Type B.

Special Sediment Control Fence ..

Temporary Berms and Slope Drains

Temporary Rock Silt Check Type-A.

1633.02 Temporary Rock Silt Check Type-B.

Wattle / Coir Fiber Wattle.

Temporary Rock Silt Check Type A with Matting and Polyacrylamide (PAM)

TO SR 2130 (ARMFIELD MILL RD.)

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

ROGER WEADON, P.E. LEVEL IIIA NAME

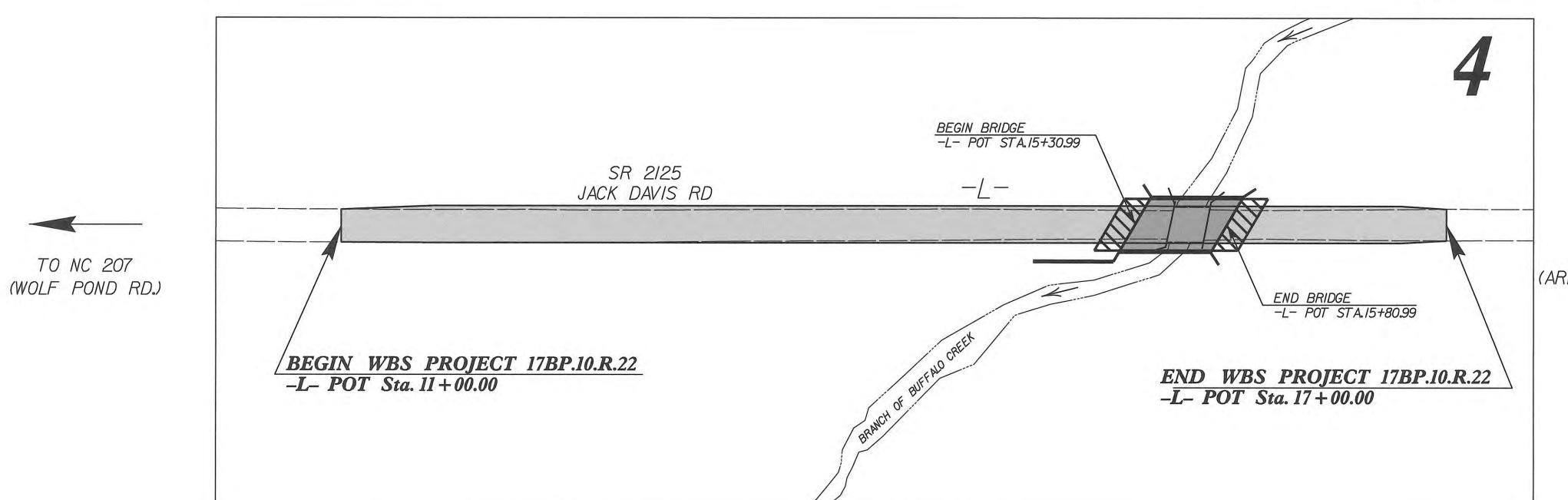
17BP.10.R.22

EROSION AND SEDIMENT CONTROL MEASURES

F. A. PROJ. NO.

(xxx)

LEVEL IIIA CERTIFICATION NO.



GRAPHIC SCALE

> PLANS

PROFILE (HORIZONTAL)

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:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St. Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

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 revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01 Railroad Erosion Control Detail 1605.01 Temporary Silt Fence 1606.01 Special Sediment Control Fence 1607.01 Gravel Construction Entrance

1622.01 Temporary Berms and Slope Drains 1630.01 Riser Basin

1630.02 Silt Basin Type B 1630.03 Temporary Silt Ditch 1630.04 Stilling Basin 1630.05 Temporary Diversion 1630.06 Special Stilling Basin

1631.01 Matting Installation

1632.01 Rock Inlet Sediment Trap Type A 1632.02 Rock Inlet Sediment Trap Type B 1632.03 Rock Inlet Sediment Trap Type C 1633.01 Temporary Rock Silt Check Type A 1633.02 Temporary Rock Silt Check Type B 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
1640.01 Coir Fiber Baffle

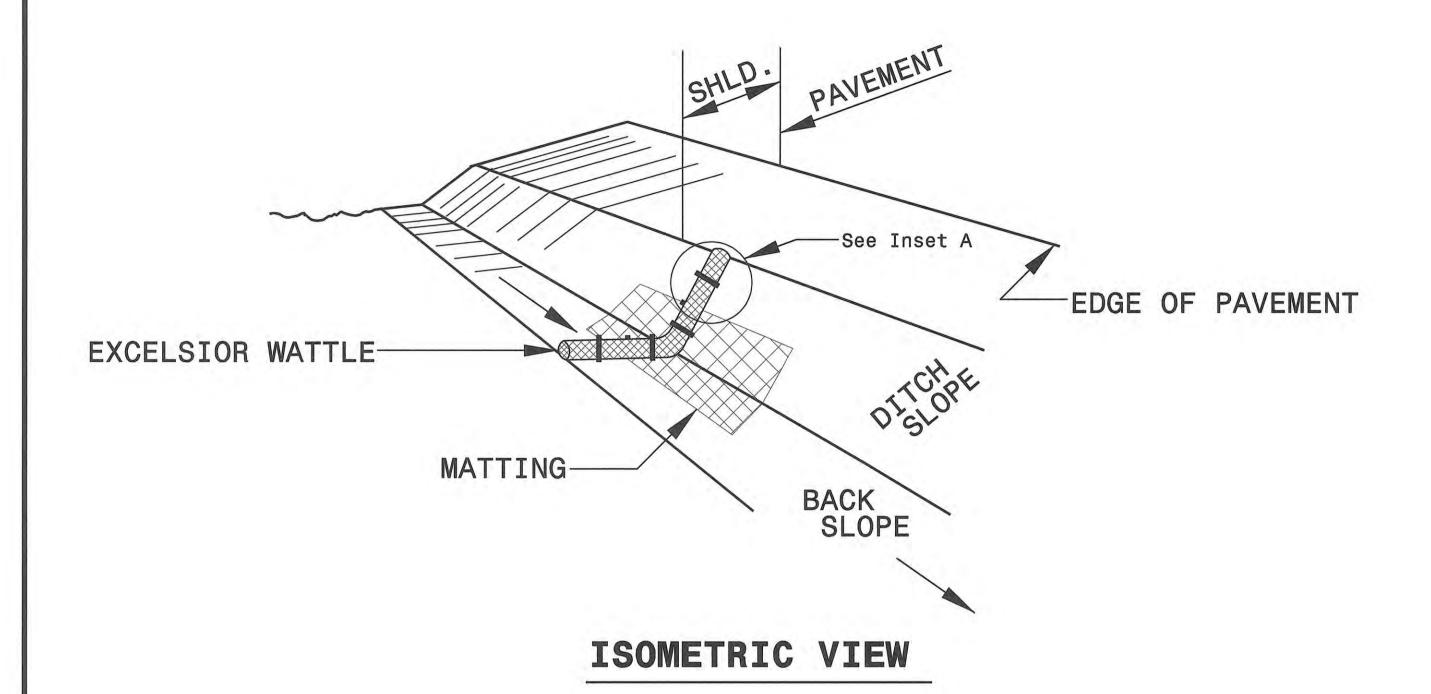
1645.01 Temporary Stream Crossing

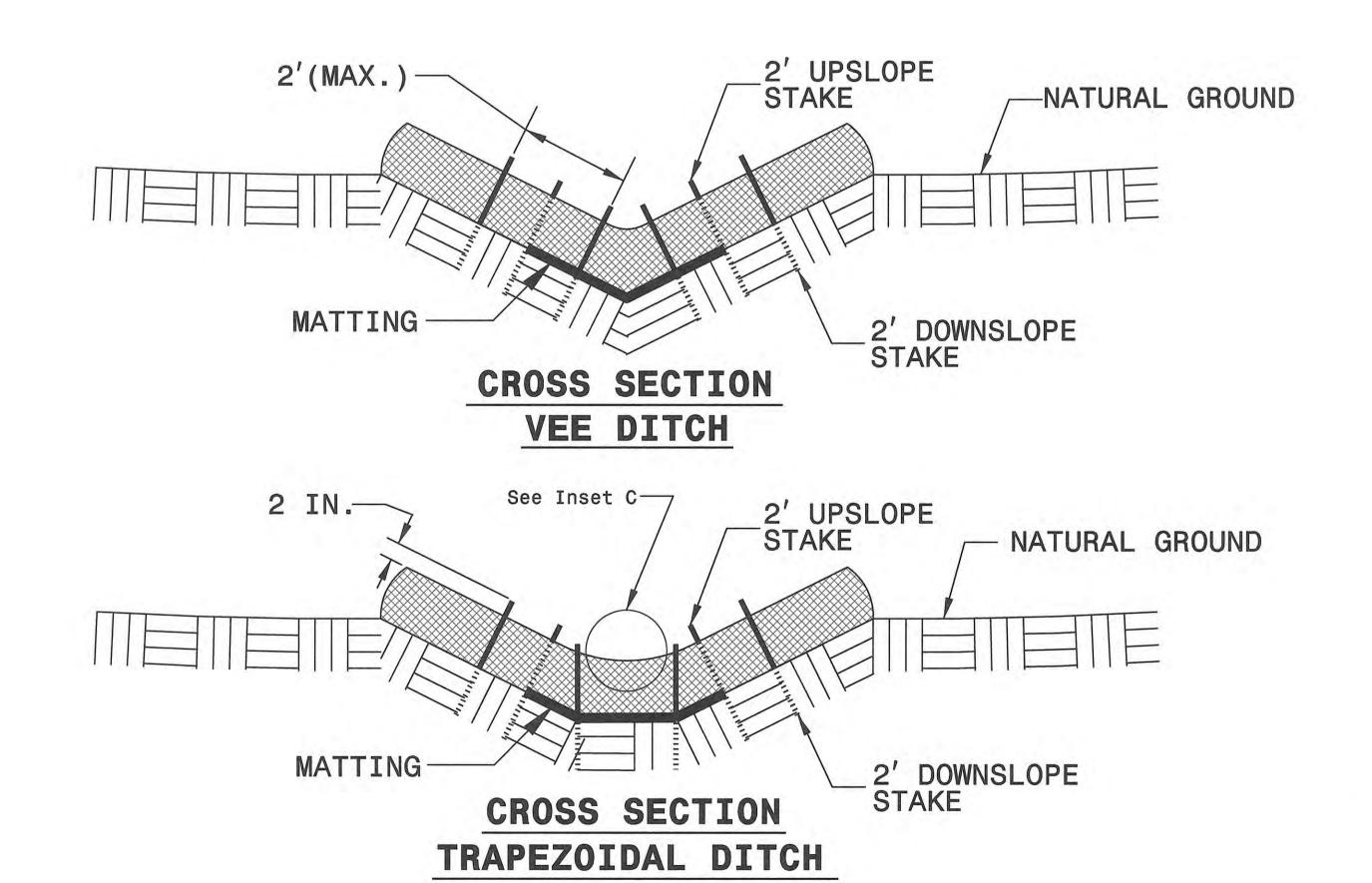
PROJECT REFERENCE NO. SHEET NO.

17BP.10.R.22 EC-2

RW SHEET NO.

WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL





NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR 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.

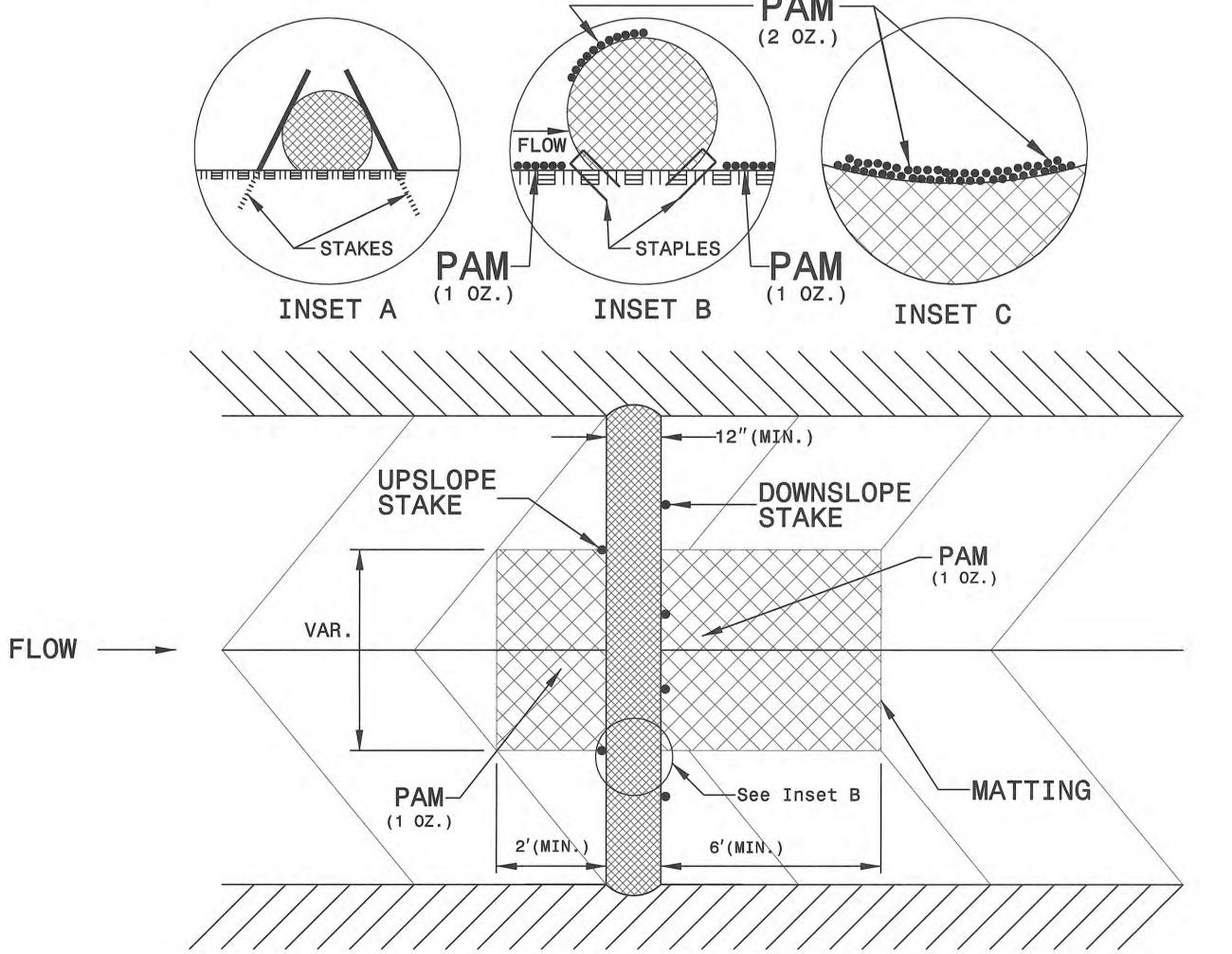
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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 MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



TOP VIEW

\$\EC\89@139_EC_psh2.dgr

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
17BP.10.R.22	EC-3
M A Engi Consulta	nts, Inc.
598 East Chatham Street Suite 137 Phone: 919.297.0220 F	7 Cary, NC 27511 ax: 919.297.0221

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL PERMANENT SOIL REINFORCEMENT MAT

	WINITING			0011221		I EIWIMIEN SOIL REINFORCEWEN WINI							
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)	CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)		
4	L	1125	1525	LT	225	4	L	1175	1400	RT	80		
4		1700	1575	RT	75								
			SU	BTOTAL	300				SU	BTOTAL	80		
MISCELLANEOL	US MATTING TO BE INST	ALLED AS DIRE	CTED BY THE	ENGINEER	1875			ADDITIONAL	PSRM TO BE	INSTALLED	O		
				TOTAL	2175					TOTAL	80		
				SAY	2175					SAY	80		
	= 1												

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. SHEET NO.

17BPJO.R.22

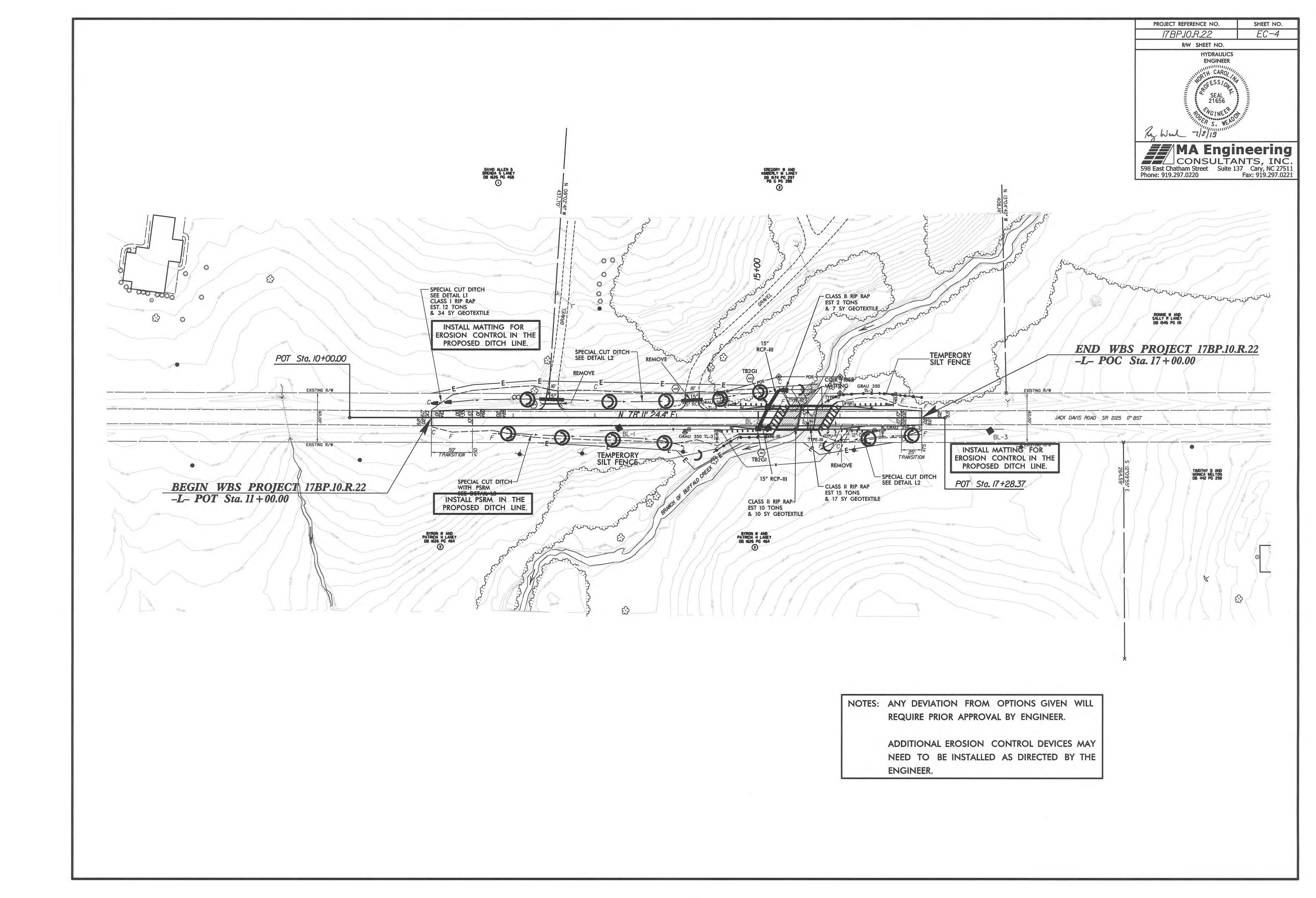
MA Engineering
Consultants, Inc.

598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220

Fax: 919.297.0221

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
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.



2130 VICINITY MAP (N.T.S.) STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS UNION COUNTY

LOCATION: BRIDGE NO. 139 ON SR 2125 (JACK DAVIS RD.) OVER BUFFALO CREEK

TYPE OF WORK: WATER LINE RELOCATION



T.I.P. NO.

17BP.10.R.22

SHEET NO.

UC-1

END WBS PROJECT 17BP.10.R.22
-L- PQC/ Sta. 17 + 00.00 SR 2125 JACK DAVIS RD TO NC 207 (WOLF POND RD.) BEGIN WBS PROJECT 17BP.10.R.22
-L- POC Sta. 11 + 00.00

TO SR 2130 (ARMFIELD MILL RD.)

GRAPHIC SCALES PROFILE (HORIZONTAL)

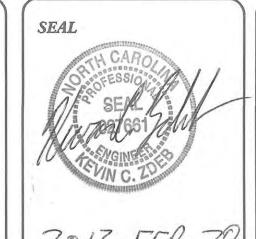
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO. UC-1 UC-2UC-3UC-3A THRU UC-3C

DESCRIPTION TITLE SHEET UTILITY SYMBOLOGY **NOTES** PROJECT DETAILS UTILITY CONSTRUCTION SHEETS WATER AND SEWER OWNERS ON PROJECT

(1) UNION COUNTY PUBLIC WORKS (WATER)



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: GARLAND HAYWOOD, P.E. PREPARED FOR: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES UNIT RALEIGH, NC

STATE OF NORTH CAROLINA

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown) 111/4 Degree Bend 22½ Degree Bend 45 Degree Bend 90 Degree Bend Plug Cross-Reducer Gate Valve... Butterfly Valve Tapping Valve ----Line Stop Line Stop with Bypass Blow Off Fire Hydrant Relocate Fire Hydrant REM FH Remove Fire Hydrant Water Meter .. Relocate Water Meter Remove Water Meter Water Pump Station RPZ Backflow Preventer DCV Backflow Preventer Relocate RPZ Backflow Preventer Relocate DCV Backflow Preventer --PROPOSED SEWER SYMBOLS Gravity Sewer Line ... (Sized as Shown) Force Main Sewer Line .. (Sized as Shown) Manhole (Sized per Note) Sewer Pump Station

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

Power Pole 6	Thrust Block
Telephone Pole	Air Release Valve
Joint Use Pole	Utility Vault
Telephone Pedestal	Concrete Pier
Utility Line by Others	Steel Pier
Trenchless Installation	Plan Note
Encasement by Open Cut	Pay Item Note
Encasement	PAY II

	EXISTING	UTILITIES SYMBOLS	
Power Pole	- •	*Underground Power Line	
Telephone Pole	•-	*Underground Telephone Cable	
Joint Use Pole		*Underground Telephone Conduit	
Jtility Pole	•	*Underground Fiber Optics Telephone Cable ————— TF	70-
Jtility Pole with Base	- 🗔	*Underground TV Cable	
H-Frame Pole	- • • •	*Underground Fiber Optics TV Cable	70-
Power Transmission Line Tower	- 🖂	*Underground Gas Pipeline	
Vater Manhole	- (Aboveground Gas Pipeline	Gas
ower Manhole	- ®	*Underground Water Line	
elephone Manhole	- ⑦	Aboveground Water Line	Water
anitary Sewer Manhole	- (*Underground Gravity Sanitary Sewer Liness	
land Hole for Cable	- H _H	Aboveground Gravity Sanitary Sewer Line A/G Sanīt	tary Sewer
ower Transformer	· M	*Underground SS Forced Main Line	s
elephone Pedestal	· I	Underground Unknown Utility Line	TL
CATV Pedestal	· C	SUE Test Hole ········	
as Valve	· •	Water Meter	
as Meter	- •	Water Valve ····································	
ocated Miscellaneous Utility Object	- ⊙	Fire Hydrant	
bandoned According to Utility Records	AATUR	Sanitary Sewer Cleanout	
nd of Information	E.O.I.		

*For Existing Utilities
Utility Line Drawn from Record(Type as Shown)
Designated Utility Line(Type as Shown)

UTILITY CONSTRUCTION

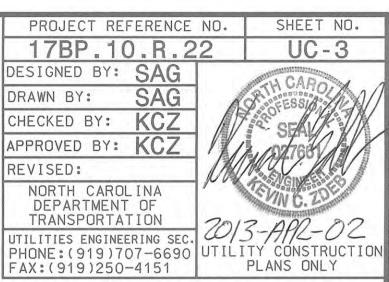
GENERAL NOTES:

- 1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
- 2. THE EXISTING UTILITIES BELONG TO UNION COUNTY PUBLIC WORKS UTILITY: 8" WATER LINE CONTACT: LARRY DAVIS PHONE: 704-296-4219
- 3. ALL WATER LINES TO BE INSTALLED
 WITHIN COMPLIANCE OF THE RULES AND
 REGULATIONS OF THE NORTH CAROLINA
 DEPARTMENT OF ENVIRONMENTAL AND NATURAL
 RESOURCES, DIVISION OF ENVIRONMENTAL
 HEALTH. ALL SEWER LINES TO BE INSTALLED
 WITHIN COMPLIANCE OF THE RULES AND
 REGULATIONS OF THE NORTH CAROLINA
 DEPARTMENT OF ENVIRONMENT AND NATURAL
 RESOURCES, DIVISION OF WATER QUALITY.
 PERFORM ALL WORK IN ACCORDANCE WITH THE
 APPLICABLE PLUMBING CODES.
- 4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
- 5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPROTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

- 6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITONAL COST TO THE DEPARTMENT.
- 7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
- 8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
- 9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, "SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

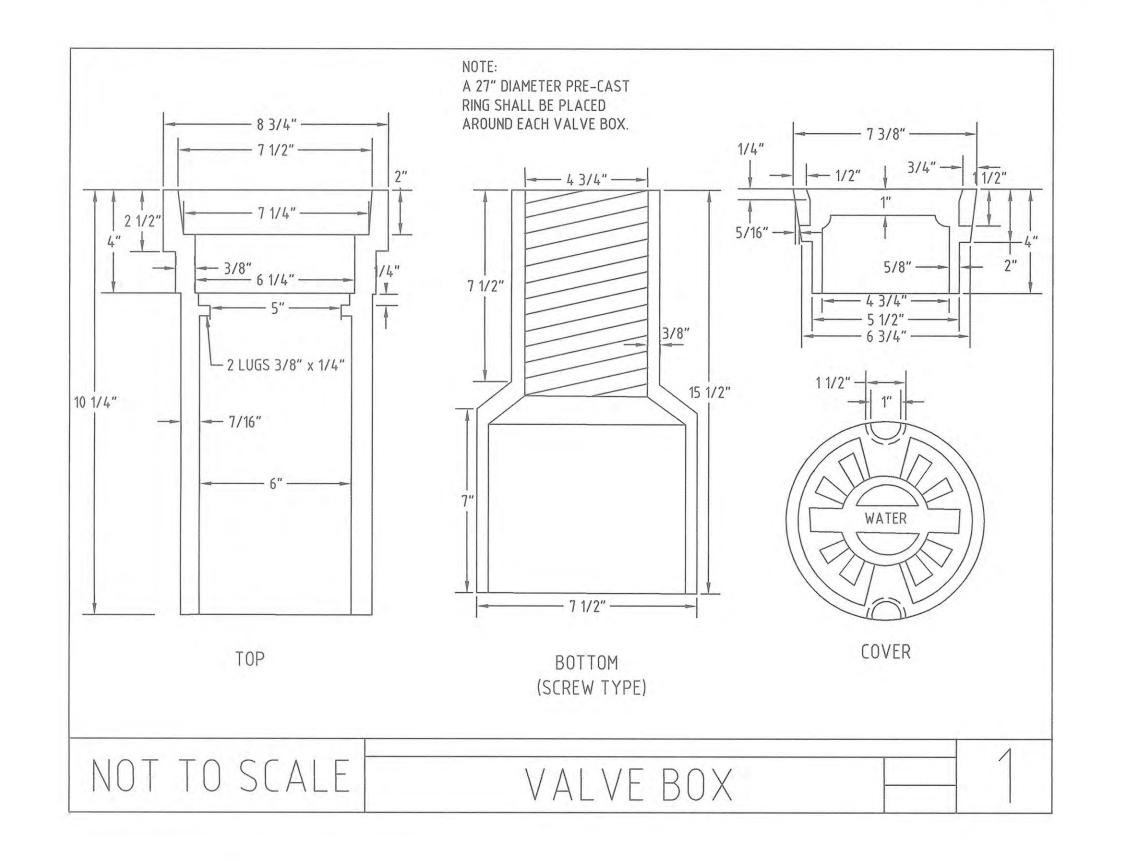
- 1. ALL PROPOSED 8 INCH WATER LINE SHALL BE DUCTILE IRON RESTRAINT JOINT WITH PRESSURE CLASS 350.
- 2. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE PATH DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.
- 3. ALL WATER LINE FITTINGS SHALL BE DUCTILE IRON MANUFACTURED IN ACCORDANCE WITH ANSI/AWWA C110/A21.10 AND BE OF RESTRAINED JOINT CONSTRUCTION.
- 4. ALL PROPOSED FITTINGS (BENDS, TEES, CROSSES, REDUCERS, PLUGS, ETC.) SHALL BE ADEQUATELY RESTRAINED BY RESTRAINED JOINT CONSTRUCTION AND/OR CAST IN PLACE CONCRETE THRUST BLOCKS AS DETAILED ON THESE DRAWINGS, OR AS DIRECTED BY THE RESIDENT ENGINEER.

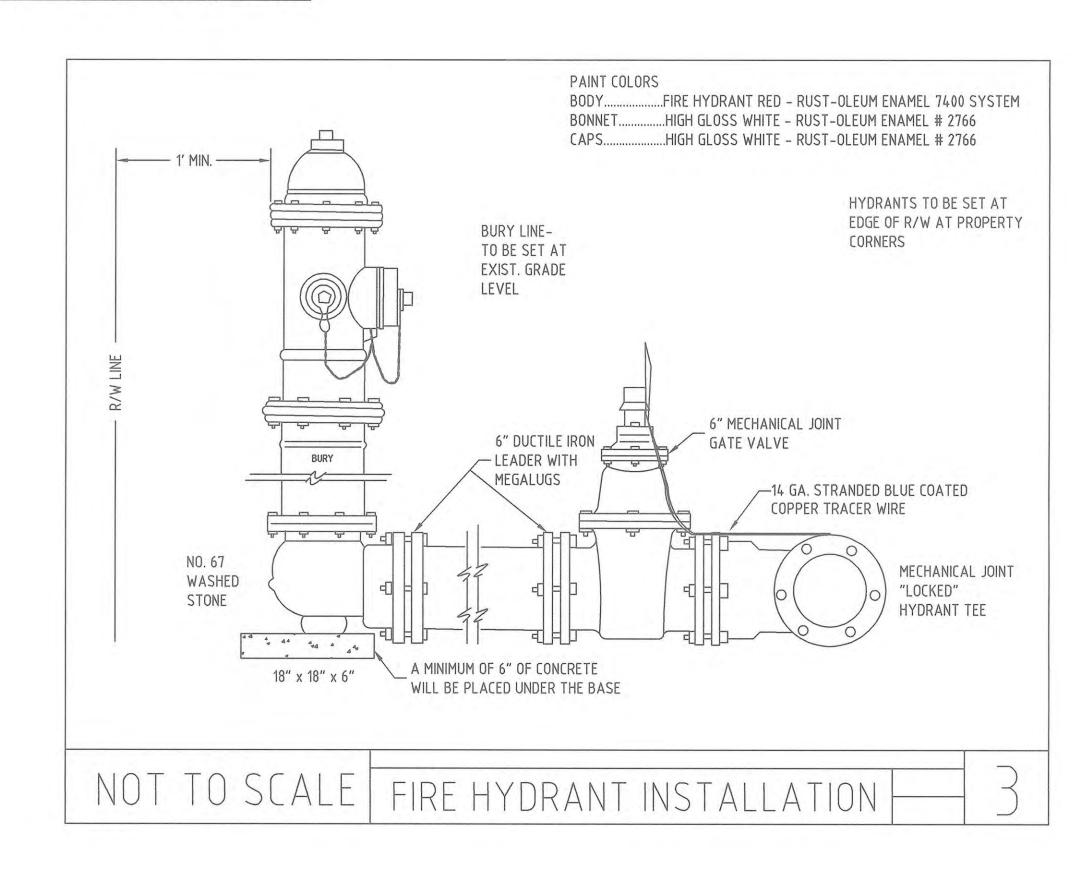


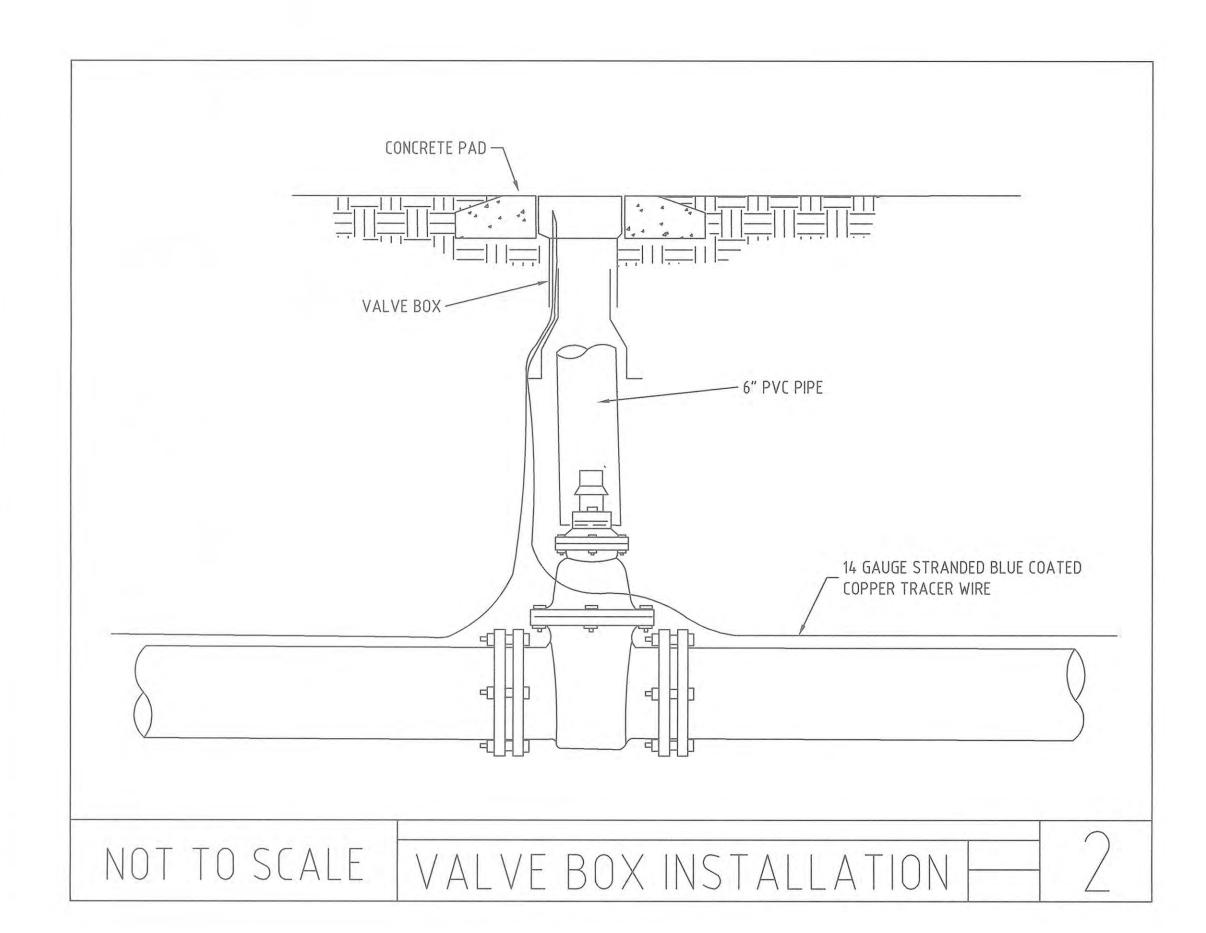
UTILITY CONSTRUCTION

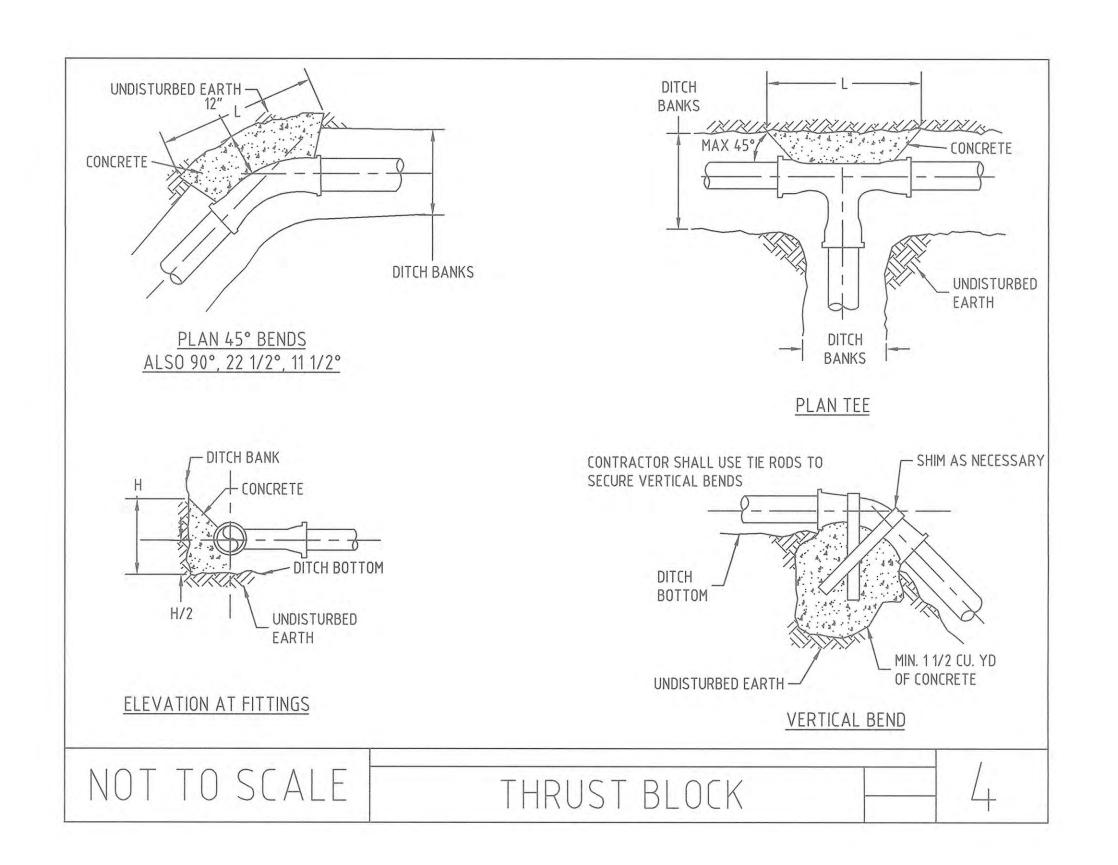


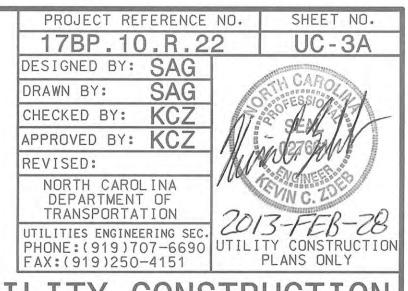
PROJECT DETAILS











UTILITY CONSTRUCTION

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CONSULTANTS, INC.
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BASED ON TEST PRESSURE OF 200 P.S.I. VERTICAL RESTRAINT HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET) (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)*** PIPE RESTRAINING RODS DEGREE OF BEND ALLOWABLE SOIL BEARING (PSF) SIZE NO.REQ'D DIA. 111/4° 22 1/2° 45° SIZE OF BEND THRUST * 1000 2000 3000 4000 5000 6000 7000 8000 2 1/2" 0.25 0.50 0.75 2 1/2" 0.50 1.0 1.75 2 5/8" 0.75 1.50 3.0 2 3/4" 1.25 2.25 4.50 7/8" | 1.75 | 3.25 | 6.50 4 5/8" 2.25 4.50 8.75 16" 4 3/4" 3.0 6.0 II.50 **INCLUDES 1.50 SAFETY FACTOR * INCLUDES 1.25 SAFETY FACTOR GENERAL NOTES: I. CONCRETE SHALL BE CLASS "B". 2. CONCRETE SHALL NOT CONTACT BOLTS ENDS OF MECHANICAL JOINT FITTINGS. 3. CONSULT WITH ENGINEER FOR CONCRETE REQUIREMENTS ON MAINS LARGER THAN 16 INCHES. (FOR VERTICAL & HORIZONTAL BENDS) 4. ALLOWABLE SOIL BEARING SHALL BE DETERMINED BY THE ENGINEER. REVISIONS DESCRIPTION NO. DATE SHEET 2 OF 2 THRUST RESTRAINT FOR WATER MAINS STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS RALEIGH, N.C.

FITTING	REQUIRED RESTRAINED LENGTH (FT) OF BARE D.I. PIPE BY DEPTH OF COVER											
HORIZONTAL BENDS	3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT				
8 INCH DIA - 11.25 DEG	3	3	2	2	2	2	2	2				
8 INCH DIA - 22.5 DEG	7	6	5	5	4	4	3	3				
8 INCH DIA - 45 DEG	14	12	10	9	8	8	7	7				
8 INCH DIA - 90 DEG	33	29	25	23	20	19	17	16				
VERTICAL DOWN BENDS	3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT				
8 INCH DIA - 11.25 DEG	10	8	7	6	6	5	5	5				
8 INCH DIA - 22.5 DEG	19	17	15	13	12	11	10	9				
8 INCH DIA - 45 DEG	40	35	30	27	25	22	21	19				
VERTICAL UP BENDS	3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT				
8 INCH DIA - 11.25 DEG	3	3	2	2	2	2	2	2				
8 INCH DIA - 11.25 DEG	7	6	5	5	4	4	3	3				
			-	9		-	7	7				
8 INCH DIA - 45 DEG	14	12	10	9	8	8	/	7				
DEAD ENDS / VALVES	3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT				
8 INCH DIA	65	59	54	50	46	43	40	38				

ASSUMPTIONS

LAYING CONDITION = TYPE 4

DESIGN PRESSURE = 200 PSI (TEST PRESSURE)

SOIL DESIGNATION = GC = COHESIVE-GRANULAR SAFETY FACTOR = 1.5

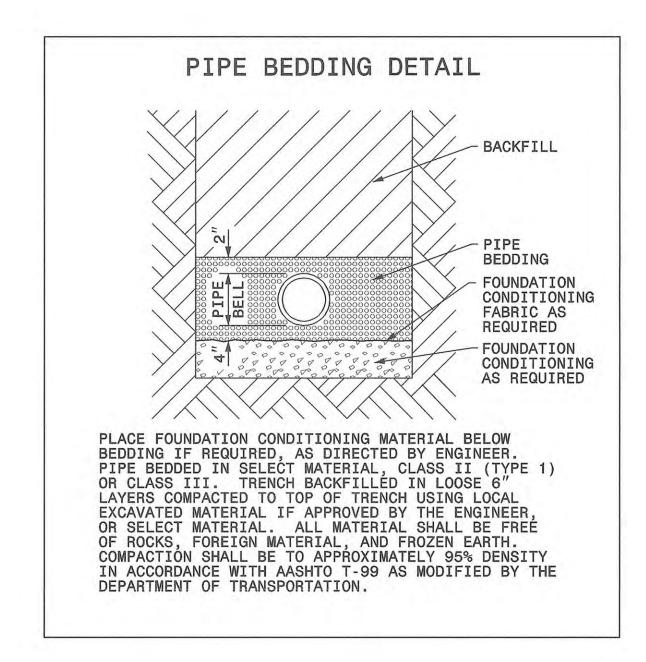
NOTES

- 1. RESTRAINED LENGTH IS MEASURED FROM THE CENTER OF THE BEND AS FOLLOWS:
- A. HORIZONTAL AND VERTICAL BENDS: ALONG EACH SIDE OF BEND.
- B. HORIZONTAL AND VERTICAL BENDS OFFSET OR COMBINED: ALONG THE OUTER SIDE OF EACH BEND.

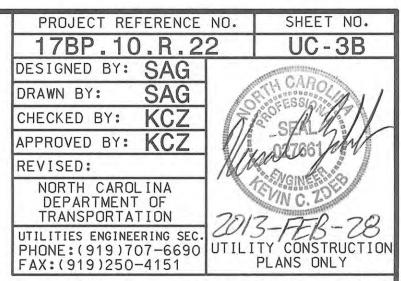
 ALL PIPE BETWEEN THE TWO BENDS SHALL BE RESTRAINED JOINT WHEN THE DISTANCE BETWEEN THEM IS

 EQUAL TO OR LESS THAN THE REQUIRED RESTRAINED LENGTH. WHEN THE DISTANCE BETWEEN BENDS IS
- LESS THAN REQUIRED, THE BALANCE OF THE REQUIRED RESTRAINED LENGTH SHALL BE ADDED ON TO THE LENGTH ALONG THE OUTSIDE OF EACH BEND RESPECTIVELY TO MAKE UP FOR THE DEFICIENCY IN THAT DIRECTION. HORIZONTAL BEND EXAMPLE...
- INSTALL A 8 INCH 45 DEG BEND AND A 22.5 DEG BEND WITH 10 FEET BETWEEN BENDS AND 4 FEET OF COVER. THE CONTRACTOR SHALL PROVIDE AN ADDITIONAL 1 FOOT OF RESTRAINED LENGTH BEYOND THE 45 DEGREE BEND (FOR A TOTAL OF 13 FEET) AND AN ADDITIONAL 7 FEET OF RESTRAINED LENGTH BEYOND THE 22.5 DEGREE BEND (FOR A TOTAL OF 13 FEET).
- 2. WHEN IT IS NOT POSSIBLE TO INSTALL THE RESTRAINED LENGTHS AS NOTED BY THIS TABLE, THE CONTRACTOR SHALL INSTALL THE APPROPRIATE CONCRETE THRUST RESTRAINTS AS PER THE DETAILS HEREIN.

PROJECT DETAILS

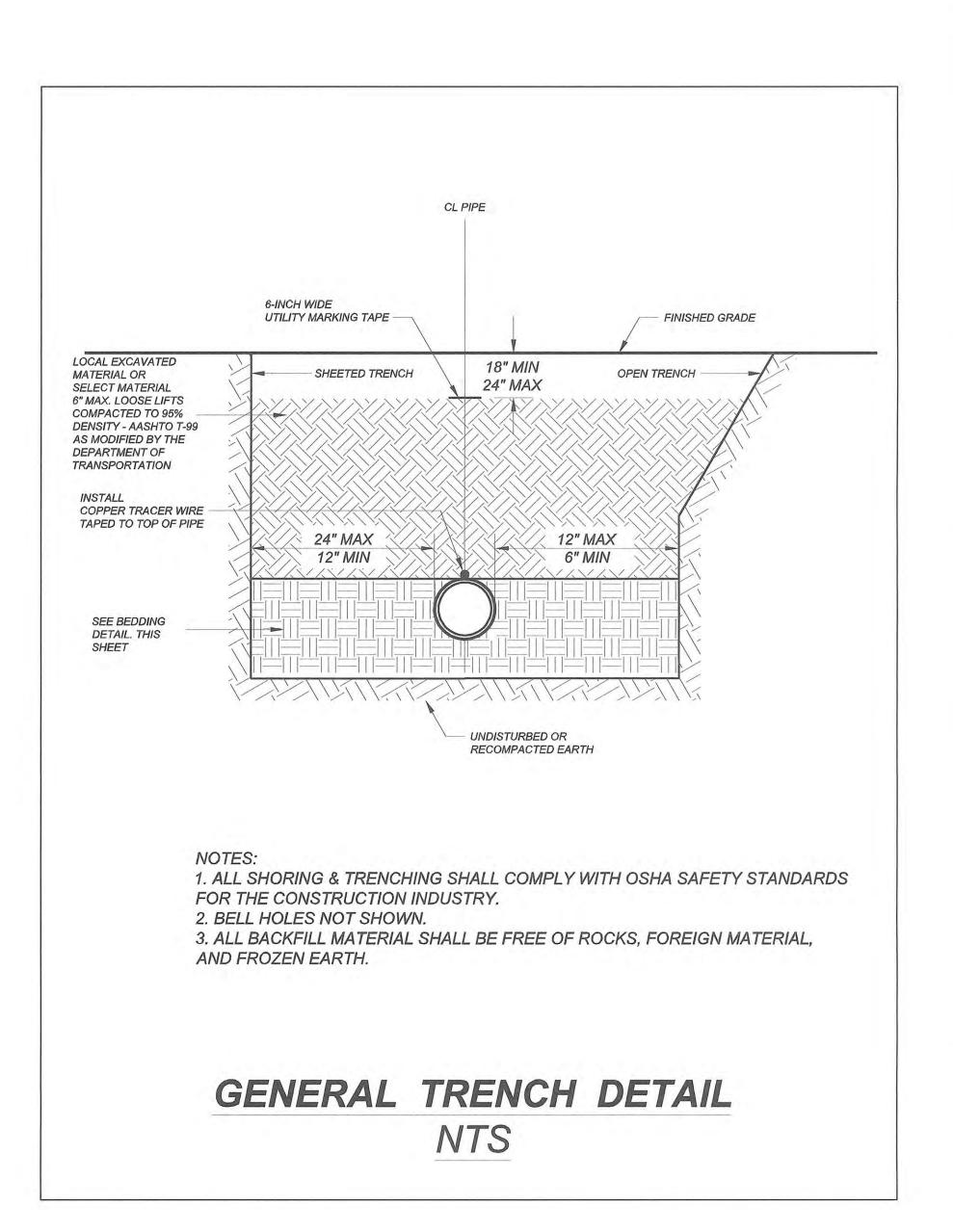


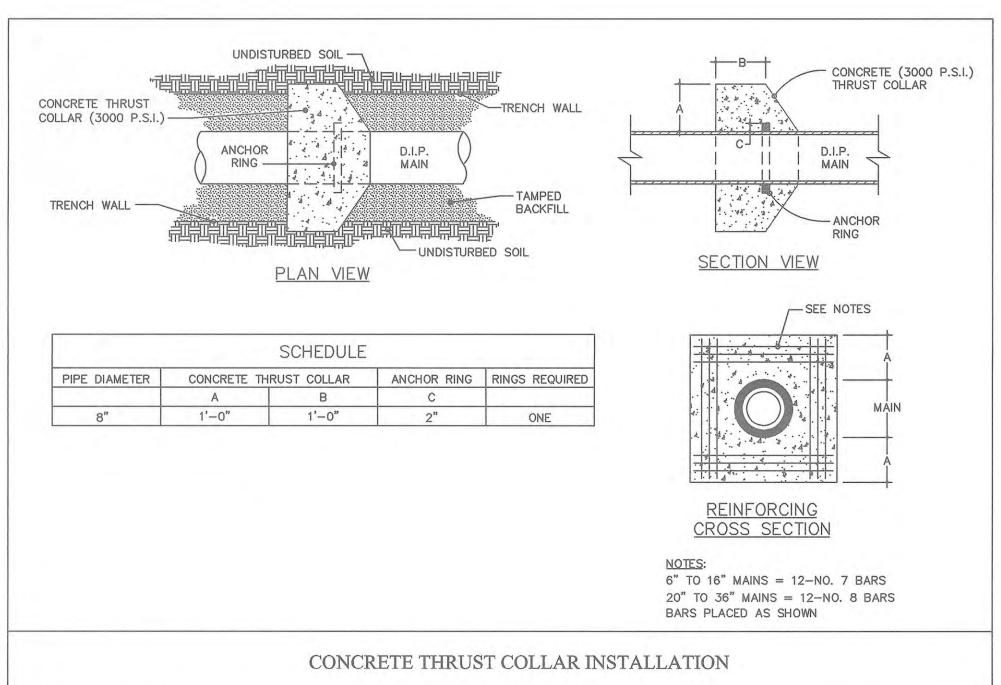
	MAXIMUM TRI AT TOP (
NOMINAL	T0511011 1170711	NOMINAL	T051/01/ 1/707/
PIPE SIZE	TRENCH WIDTH	PIPE SIZE	TRENCH WIDTH
(INCHES)	(INCHES)	(INCHES)	(INCHES)
4	28	20	44
6	3Ø	24	48
8	32	3Ø	54
10	34	36	60
12	36	42	66
14	38	48	72
16	4Ø	54	78
18	42		



UTILITY CONSTRUCTION

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54' RESTRAINT JT. PIPE (DIP)

_TAPPING VALVE

TAPPING SLEEVE

_RESTRAINT

(DIP)

JOINT PIPE

EXISTING WATER MAIN

CONCRETE THRUST

COLLAR. SEE DETAIL

PLUG TO BE RESTRAINED —

TO CONCRETE THRUST

COLLAR. SEE DEAD END

DETAIL THIS SHEET.

EDGE OF PAVEMENT OR BACK OF CURB.

THIS SHEET.

3/4" CORP. STOP

PROPOSED LINE

LINE TO

ABANDONED

NOTE: ALL WATERMAINS ALONG EXISTING DOT ROADS MUST BE A MINIMUM DISTANCE OF A 1/1 RATIO OFF

NOT TO SCALE WATERMAIN RELOCATION FOR SMALL WATERMAINS

54' RESTRAINT JT. PIPE (DIP)

3/4" CORP. STOP ¬

PROPOSED LINE-

TAPPING SLEEVE

LINE TO

ABANDONED

90° ELBOW-\

T RESTRAINT

EXISTING WATER MAIN—

CONCRETE THRUST

► PLUG TO BE RESTRAINED

THIS SHEET.

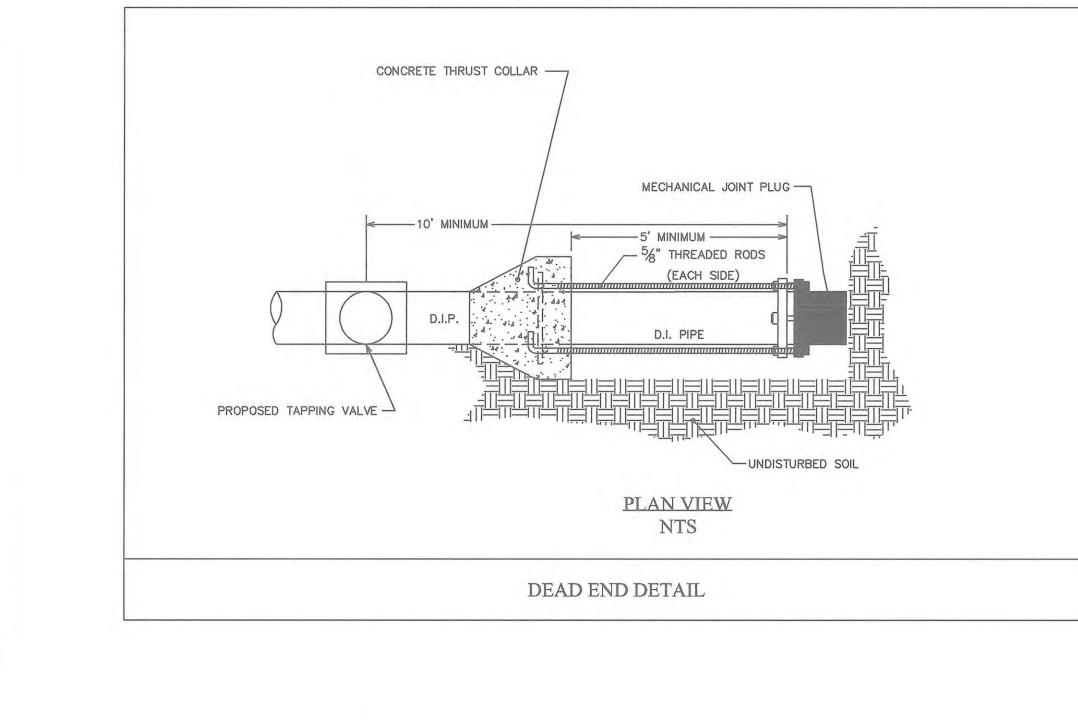
TO CONCRETE THRUST COLLAR. SEE DEAD END

DETAIL THIS SHEET.

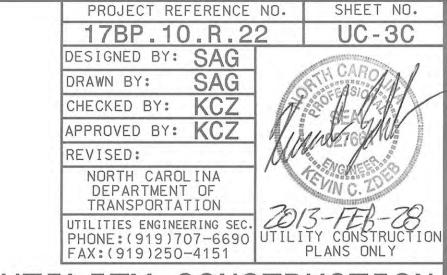
COLLAR. SEE DETAIL

JOINT PIPE

TAPPING VALVE-

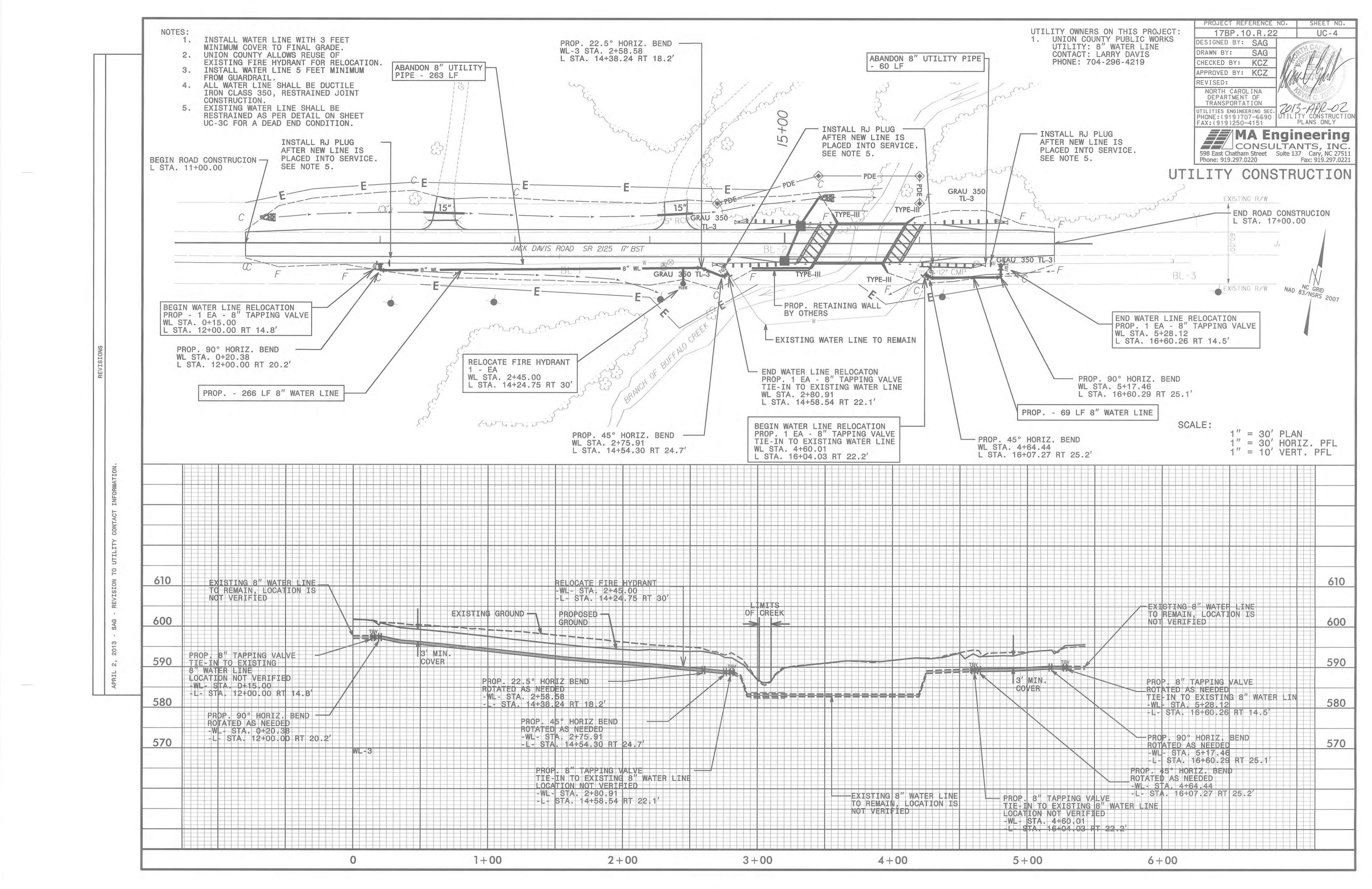


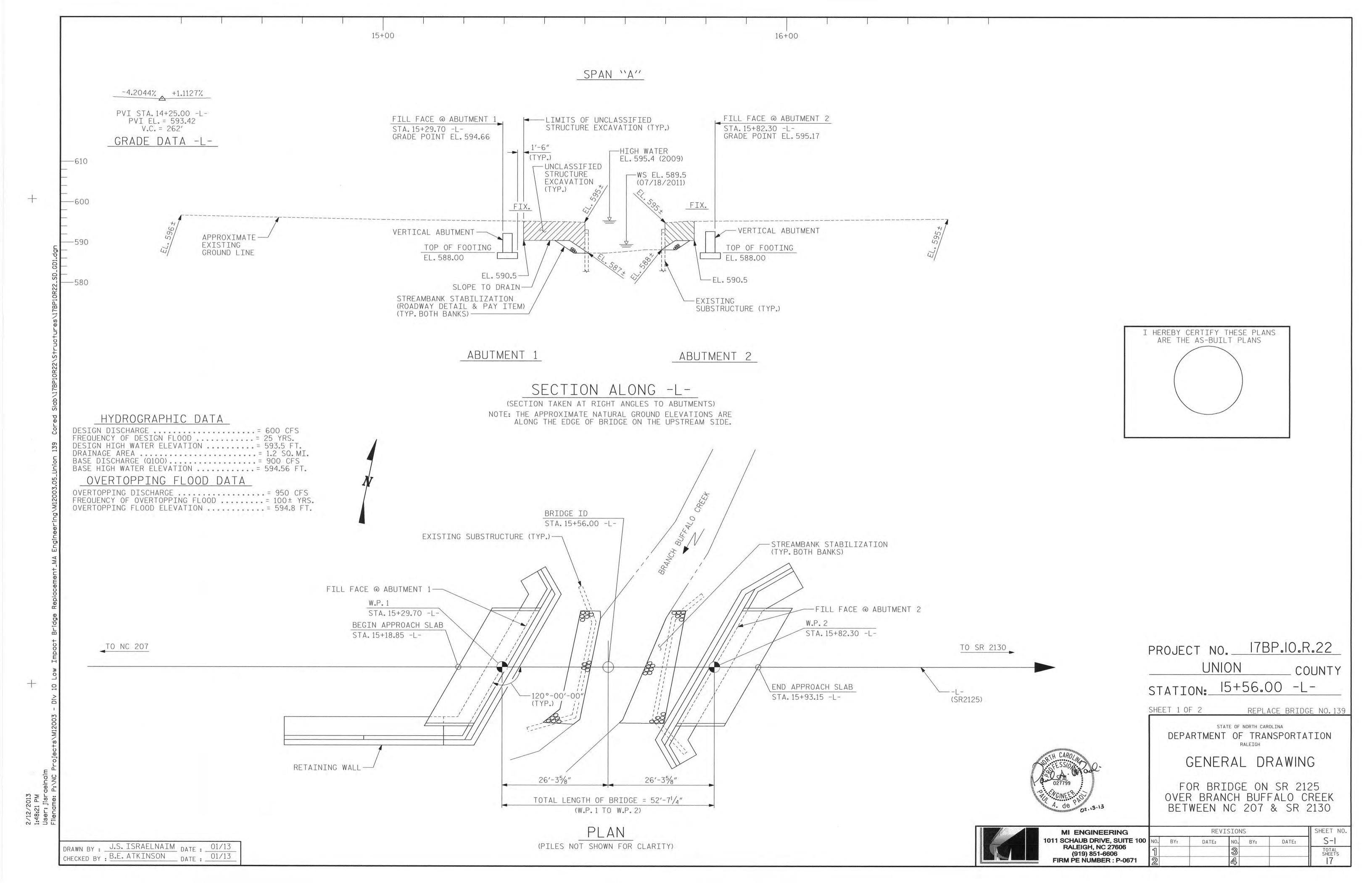
PROJECT DETAILS

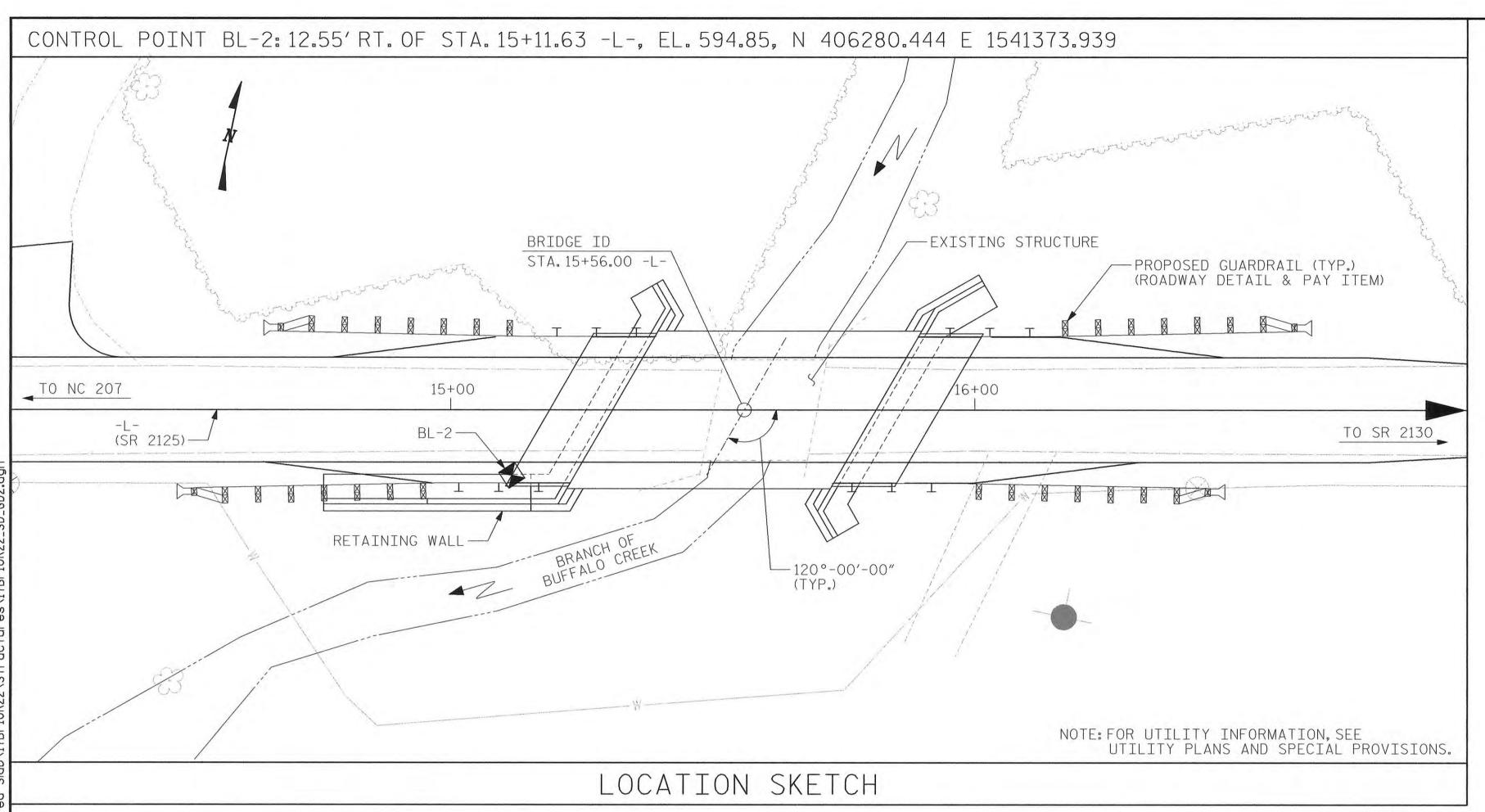


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NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

THE EXISTING STRUCTURE CONSISTING OF ONE (1) SPAN @ 20'-6", WITH TIMBER DECK ON TIMBER JOISTS AND A CLEAR ROADWAY WIDTH OF 19'-2" ON TIMBER CAPS WITH TIMBER POSTS AND SILLS AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS TO NOT ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT. EACH SIDE OF THE CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON THE DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

ASPHALT WEARING SURFACE IS INCLUDED IN THE ROADWAY QUANTITY. SEE ROADWAY QUANTITIES.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES".

FOR FORMWORK AND FALSEWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE SCOUR CRITICAL ELEVATION FOR ABUTMENTS No.1 AND 2 IS THE BOTTOM OF FOOTING ELEVATION. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SPREAD FOOTINGS AT ABUTMENTS No. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 4 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 9 TSF JUST BEFORE PLACING CONCRETE.

TO PROVIDE PROTECTION FROM POSSIBLE SCOUR, DO NOT CONSTRUCT SPREAD FOOTINGS AT ABUTMENTS No. 1 AND 2 AT AN ELEVATION HIGHER THAN SHOWN ON PLANS.

KEY IN SPREAD FOOTINGS AT ABUTMENTS No.1 AND 2 AT LEAST 12" INTO ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.

		TOTA	L BIL	L OF	MATERI	[AL			
	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS		VERTICAL CONCRETE BARRIER RAIL		PRE:	0" x 1'-9" STRESSED NCRETE ED SLABS
	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LIN. FT.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE						100.29	LUMP SUM	10	500.00
ABUTMENT 1		LUMP SUM	44.6		4258				
ABUTMENT 2		LUMP SUM	52.3		4921				
RETAINING WALL		LUMP SUM	30.2		2854				
TOTAL	LUMP SUM	LUMP SUM	127.1	LUMP SUM	12033	100.29	LUMP SUM	10	500.00

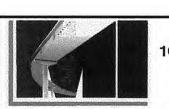
CAROL WARREN

SHEET 2 OF 2

DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 2125 OVER BRANCH BUFFALO CREEK BETWEEN NC 207 & SR 2130



MI ENGINEERING 011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671

			REV	ISION	S		SHEET NO
0	NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
	1			3			TOTAL SHEETS
	2			4			17

DRAWN BY: J.S. ISRAELNAIM DATE: 01/13
CHECKED BY: B.E. ATKINSON DATE: 01/13

Div 10 Low Impact Bridge Replacem

28 PM : Jisraelnaim

										STRE	ENGTH	I LIN	MIT S	TATE				SERVICE III LIMIT STATE						
										MOMENT					SHEAR						MOMENT			
LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (f+)	COMMENT NUMBER
		HL-93(Inv)	N/A	1	1.35		1.75	0.25	1.74	50′	EL	24.423	0.656	1.35	50′	EL	9.769	0.80	0.25	1.59	50′	EL	24.423	
DESIGN		HL-93(0pr)	N/A		1.75		1.35	0.25	2.25	50′	EL	24.423	0.656	1.75	50′	EL	9.769	N/A						
LOAD RATING		HS-20(Inv)	36.000	2	1.586	57.108	1.75	0.25	2.15	50′	EL	24.423	0.656	1.59	50′	EL	9.769	0.80	0.25	1.97	50′	EL	24.423	
MATERIO	-	HS-20(0pr)	36.000		2.056	74.028	1.35	0.25	2.79	50′	EL	24.423	0.656	2.06	50′	EL	9.769	N/A						
		SNSH	13.500	14-11	4.009	54.117	1.4	0.25	5.47	50′	EL	24.423	0.656	4.31	50′	EL	9.769	0.80	0.25	4.01	50′	EL	24.423	
		SNGARBS2	20.000		3.168	63.352	1.4	0.25	4.32	50′	EL	24.423	0.656	3.19	50′	EL	9.769	0.80	0.25	3.17	50′	EL	24.423	Liver of the state
		SNAGRIS2	22.000		3.009	66.192	1.4	0.25	4.18	50′	EL	19.538	0.656	3.01	50′	EL	9.769	0.80	0.25	3.07	50′	EL	24.423	
	>S	SNCOTTS3	27.250		2	54.493	1.4	0.25	2.73	50′	EL	24.423	0.656	2.16	50′	EL	9.769	0.80	0.25	2.00	50′	EL	24.423	
		SNAGGRS4	34.925		1.739	60.742	1.4	0.25	2.37	50′	EL	24.423	0.656	1.88	50′	EL	9.769	0.80	0.25	1.74	50′	EL	24.423	
		SNS5A	35.550	- 25	1.696	60.292	1.4	0.25	2.31	50′	EL	24.423	0.656	1.96	50′	EL	9.769	0.80	0.25	1.70	50′	EL	24.423	
		SNS6A	39.950		1.586	63.364	1.4	0.25	2,16	50′	EL	24.423	0.656	1.82	50′	EL	9.769	0.80	0.25	1.59	50′	EL	24.423	
LEGAL		SNS7B	42.000		1.512	63.487	1.4	0.25	2.06	50′	EL	24.423	0.656	1.85	50′	EL	9.769	0.80	0.25	1.51	50′	EL	24.423	
LOAD RATING		TNAGRIT3	33.000		1.943	64.127	1.4	0.25	2.65	50′	EL	24.423	0.656	2.14	50′	EL	9.769	0.80	0.25	1.94	50′	EL	24.423	
MATINO		TNT4A	33.075		1.96	64.837	1.4	0.25	2.67	50′	EL	24.423	0.656	2.04	50′	EL	9.769	0.80	0.25	1.96	50′	EL	24.423	
		TNT6A	41.600	14-1	1.633	67.938	1.4	0.25	2.23	50′	EL	24.423	0.656	2	50′	EL	9.769	0.80	0.25	1.63	50′	EL	24.423	
	ST	TNT7A	42.000		1.658	69.634	1.4	0.25	2.26	50′	EL	24.423	0.656	1.86	50′	EL	9.769	0.80	0.25	1.66	50′	EL	24.423	
		TNT7B	42.000	4=	1.728	72.595	1.4	0.25	2.36	50′	EL	24.423	0.656	1.76	50′	EL	9.769	0.80	0.25	1.73	50′	EL	24.423	
		TNAGRIT4	43.000		1.64	70.537	1.4	0.25	2.24	50′	EL	24.423	0.656	1.69	50′	EL	9.769	0.80	0.25	1.64	50′	EL	24.423	
		TNAGT5A	45.000		1.532	68.95	1.4	0.25	2.09	50′	EL	24.423	0.656	1.75	50′	EL	9.769	0.80	0.25	1.53	50′	EL	24.423	
		TNAGT5B	45.000	3	1.501	67.548	1.4	0.25	2.05	50′	EL	24.423	0.656	1.6	1.6 50' EL 9.769 0.80	0.80	0.25	1.50	50′	EL	24.423			

 $52'-7\frac{1}{4}$ " (W.P. TO W.P.) 48'-101/8" (BRG. TO BRG.)

LRFR SUMMARY FOR SPAN 'A'

ASSEMBLED BY : J.S. ISRAELNAIM CHECKED BY : B.E. ATKINSON DATE: 01/13 DATE: 01/13

DRAWN BY: CVC 6/10 CHECKED BY : DNS 6/10 LOAD FACTORS:

LIMIT STATE YDC YDW DESIGN LOAD RATING FACTORS STRENGTH I 1.25 1.50 SERVICE III 1.00 1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

(#) CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER

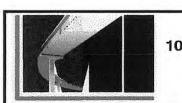
PROJECT NO. 17BP.10.R.22 UNION COUNTY

STATION: 15+56.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD

LRFR SUMMARY FOR 50' CORED SLAB UNIT 120° SKEW

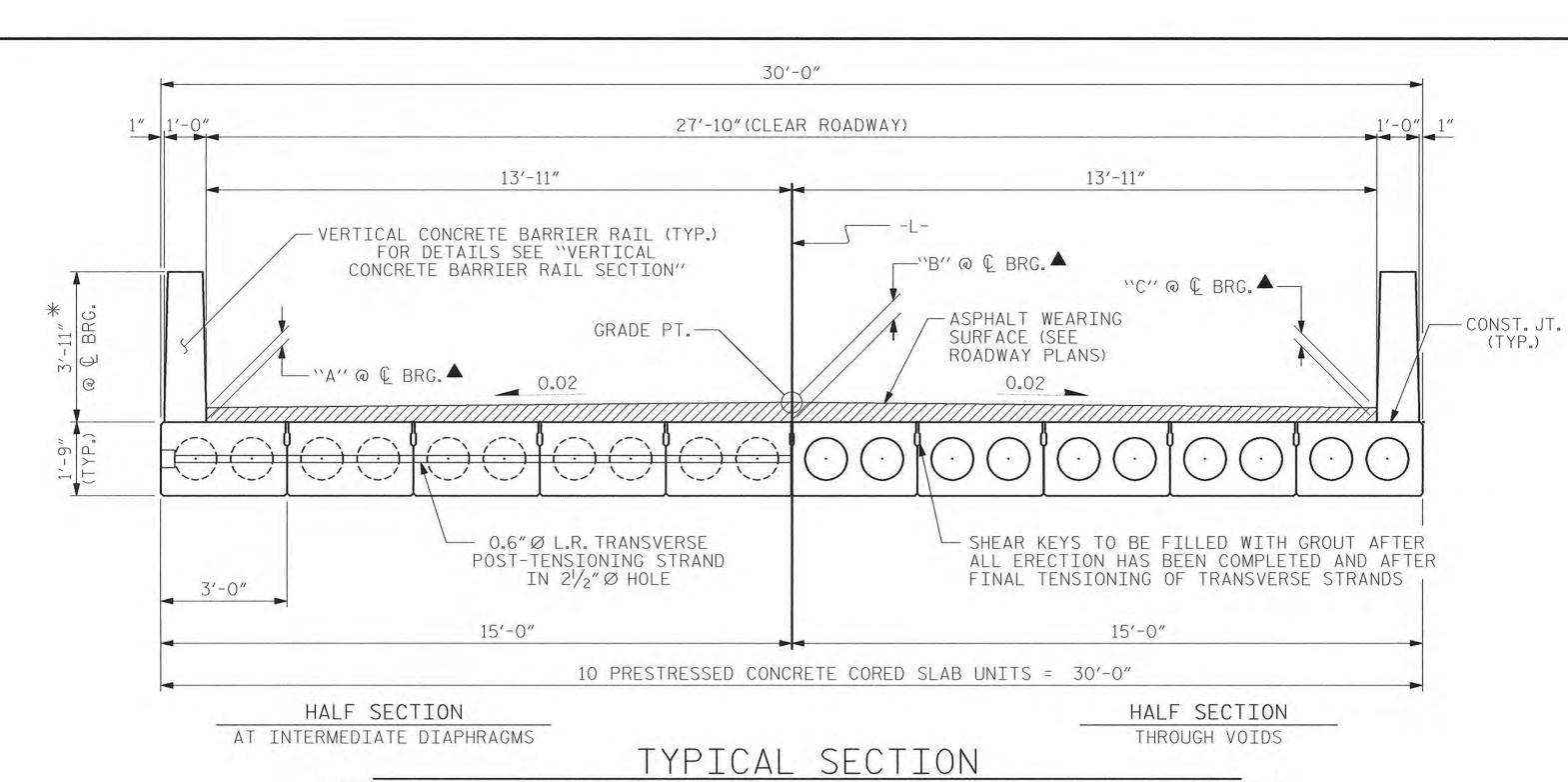
(NON-INTERSTATE TRAFFIC)



MI ENGINEERING

1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

REVISIONS S-3 DATE: NO. BY: DATE: TOTAL SHEETS



#4 \\B'' --r12" Ø VOIDS € *** └ 4 SPA. └ 2 SPA. @ 2"CTS. @ 2"CTS. @ 2"CTS. INTERIOR SLAB SECTION (50' UNIT) (19 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

1'-4'' 33/8" CL. 12" Ø VOIDS-

> EXT. SLAB SECTION (FOR PRESTRESSED STRAND LAYOUT, SEE

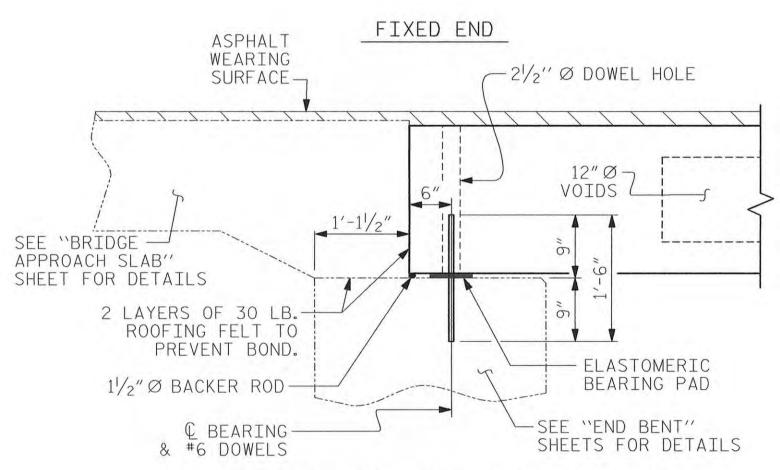
INTERIOR SLAB SECTION.)

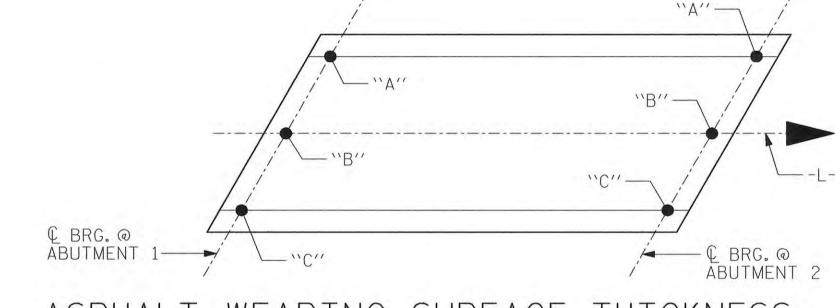
BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

* THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

▲ SEE "ASPHALT WEARING SURFACE THICKNESS" DETAIL.

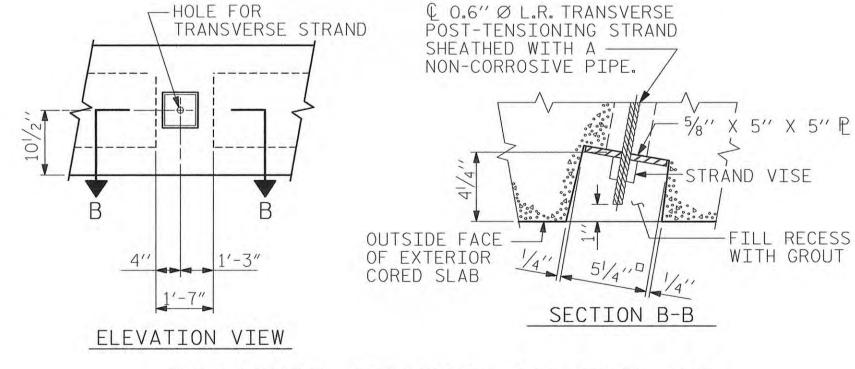




ASPHALT WEARING SURFACE THICKNESS FOR SPAN "A"

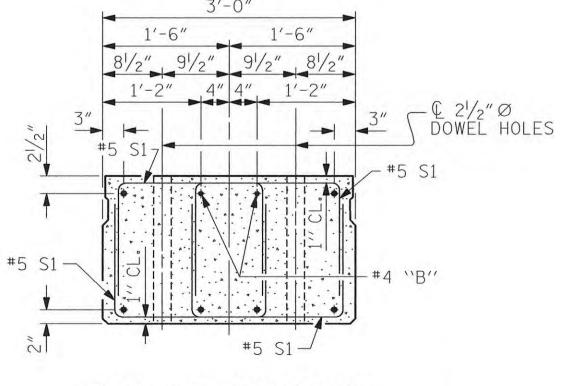
LOCATION	(LT. GUTTER)	``B'' (-L-)	(RT. GUTTER)	
© BRG. @ ABUTMENT 1	4"	711/16"	311/16"	
© BRG. @ ABUTMENT 2	47/8"	7"	35/8"	

SECTION AT ABUTMENT



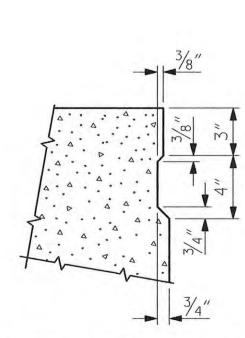
GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS

ASSEMBLED BY : J.S. ISRAELNAIM DATE : 01/13 CHECKED BY: B.E. ATKINSON DATE: 01/13 DRAWN BY: DGE 5/09 CHECKED BY : BCH 6/09



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.





MI ENGINEERING 11 SCHAUB DRIVE, SUITE 100 NO. RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671

PROJECT NO. 17BP.10.R.22 UNION COUNTY STATION: 15+56.00 -L-

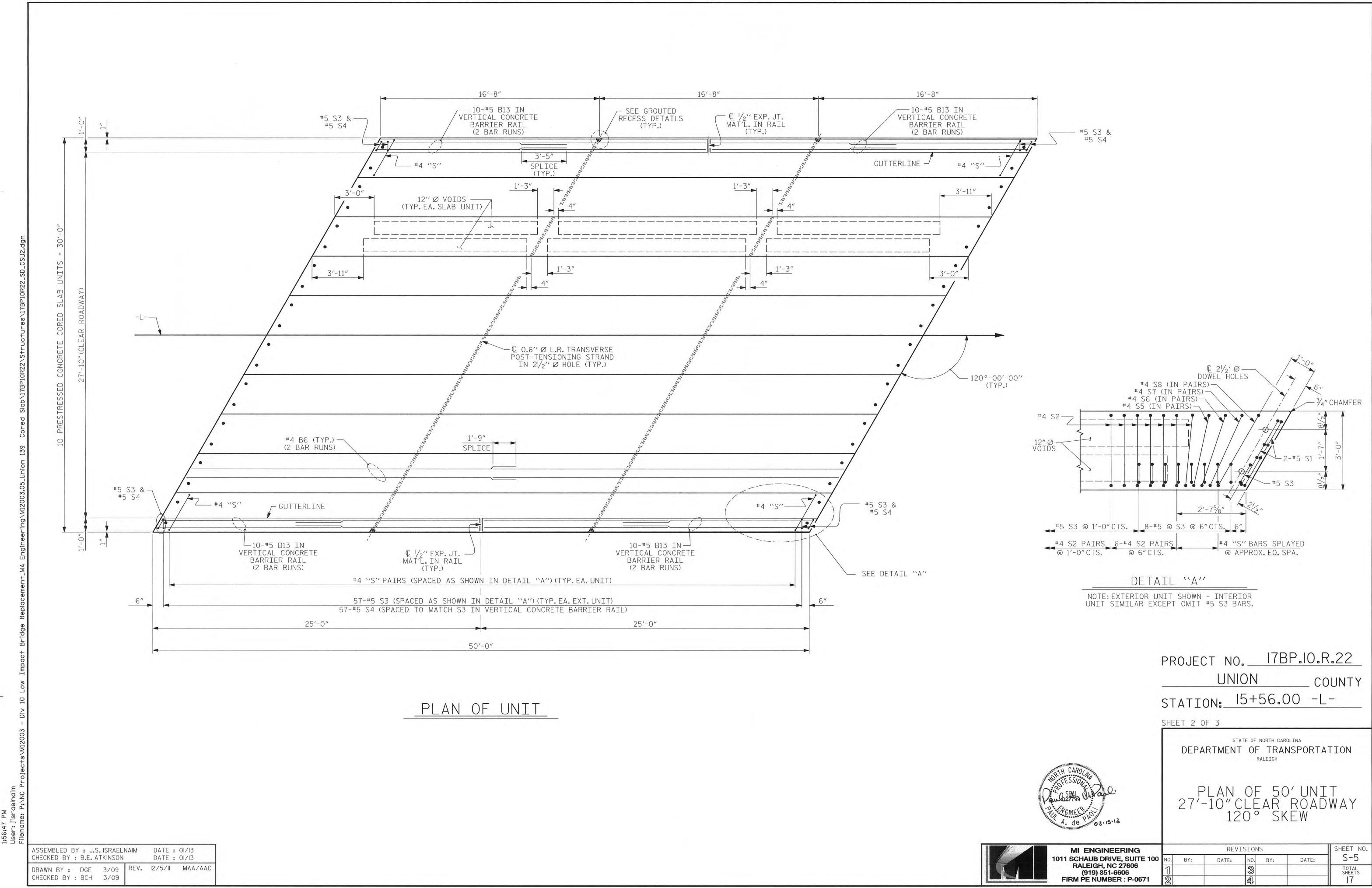
SHEET 1 OF 3

DEPARTMENT OF TRANSPORTATION STANDARD 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 120° SKEW

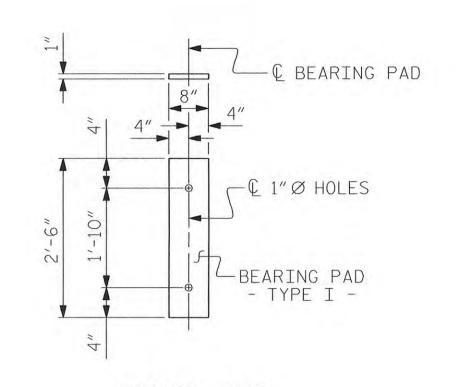
STATE OF NORTH CAROLINA

SHEET NO REVISIONS S-4 BY: DATE: NO. BY: TOTAL SHEETS

STD. NO. 21" PCS2_30_120S



STD. NO. 21" PCS_30_120S_50L



FIXED END (TYPE I - 20 REQ'D)

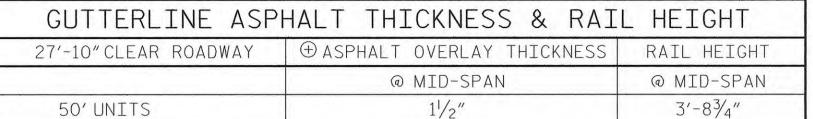
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

-#5 S4

(TYP.)

2"CL. MIN.



⊕ INLUDES IMPACT OF SAG VERTICAL CURVE.

GROUT-

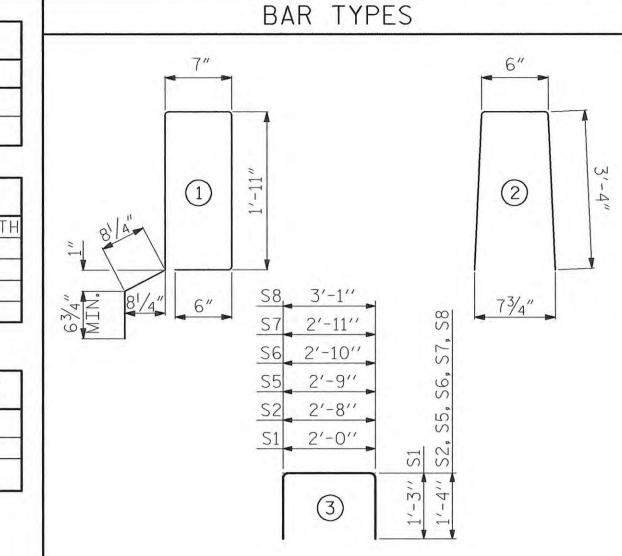
SECTION T-T

AT OPEN JOINT AT BENT

GRADE 270 S	TRANDS
- Martine State - Control of the State - Cont	0.6″Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS.PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

CORED	SLABS	S REQ	UIRED
	NUMBER	LENGTH	TOTAL LENGTH
50' UNIT			
EXTERIOR C.S.	2	50'-0"	100'-0"
INTERIOR C.S.	8	50'-0"	400'-0"
TOTAL	10		500'-0"

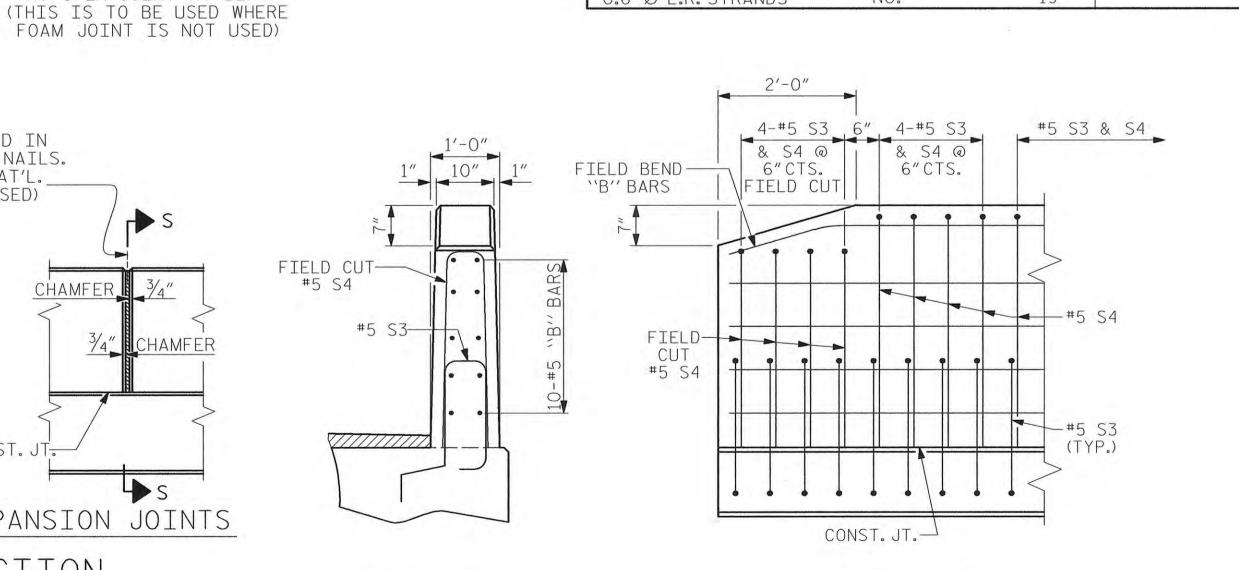
CONCRETE	RELEASE	STRENGTH
UNIT		PSI
50' UNITS		4900



ALL BAR DIMENSIONS ARE OUT TO OUT

BI	ILL OF MATERIAL FOR VERTI	CAL CONC	RETE	BARR	RIER R	AIL
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	50' UNIT					
∗ B13	80	80	#5	STR	14'-3"	1189
* S4	118	118	#5	2	7'-2"	882
∗ EPOX	Y COATED REINFORCING STEEL			LBS.		2071
CLASS	AA CONCRETE			CU.YDS.	,	13.5
TOTAL	VERTICAL CONCRETE BARRIER RAIL			LN. FT.		100.29

				EXTERIO	OR UNIT	INTERIOR UNIT		
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	
В6	4	#4	STR	25′-8″	69	25′-8″	69	
S1	8	#5	3	4'-6"	38	4'-6"	38	
S2	102	#4	3	5'-4"	363	5'-4"	363	
* S3	59	#5	1	6'-2"	379			
S5	4	#4	3	5′-5″	14	5′-5″	14	
S6	4	#4	3	5'-6"	15	5'-6"	15	
S7	4	#4	3	5'-7"	15	5'-7"	15	
S8	4	#4	3	5′-9″	15	5'-9"	15	
REINF	ORCING S	STEEL	LBS) .	529		529	
the state of the s	XY COATE NFORCING		LBS		379			
	P.S.I. CON		CU. YDS		7.3		7.3	



END VIEW

SIDE VIEW

END OF RAIL DETAILS

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 21/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, $\frac{1}{2}$ " IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

DEAD LOAD DEFLECTION AN	ND CAMBER
	3'-0" × 1'-9"
50' CORED SLAB UNIT	0.6″∅ L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	21/2"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD***	1/4″ ♦
FINAL CAMBER	21/4"

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. 17BP.10.R.22 UNION COUNTY STATION: 15+56.00 -L-

SHEET 3 OF 3



MI ENGINEERING

I SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD 3'-0" X 1'-9" PRESTRESSÉD CONCRETE CORED SLAB UNIT 120° · SKEW

SHEET NO REVISIONS S-6 DATE: NO. BY: TOTAL

(919) 851-6606 FIRM PE NUMBER : P-0671

STD. NO. 21" PCS3_30_120S

ASSEMBLED BY : J.S. ISRAELNAIM DATE : 01/13 CHECKED BY : B.E. ATKINSON DATE: 01/13 MAA/AAC DRAWN BY: DGE 5/09 CHECKED BY : BCH 6/09

CONST. JT. ---

VARIES THICKNE

#5 S3 (SEE "PLAN OF

UNIT" FOR SPACING)

VERTICAL CONCRETE BARRIER RAIL SECTION

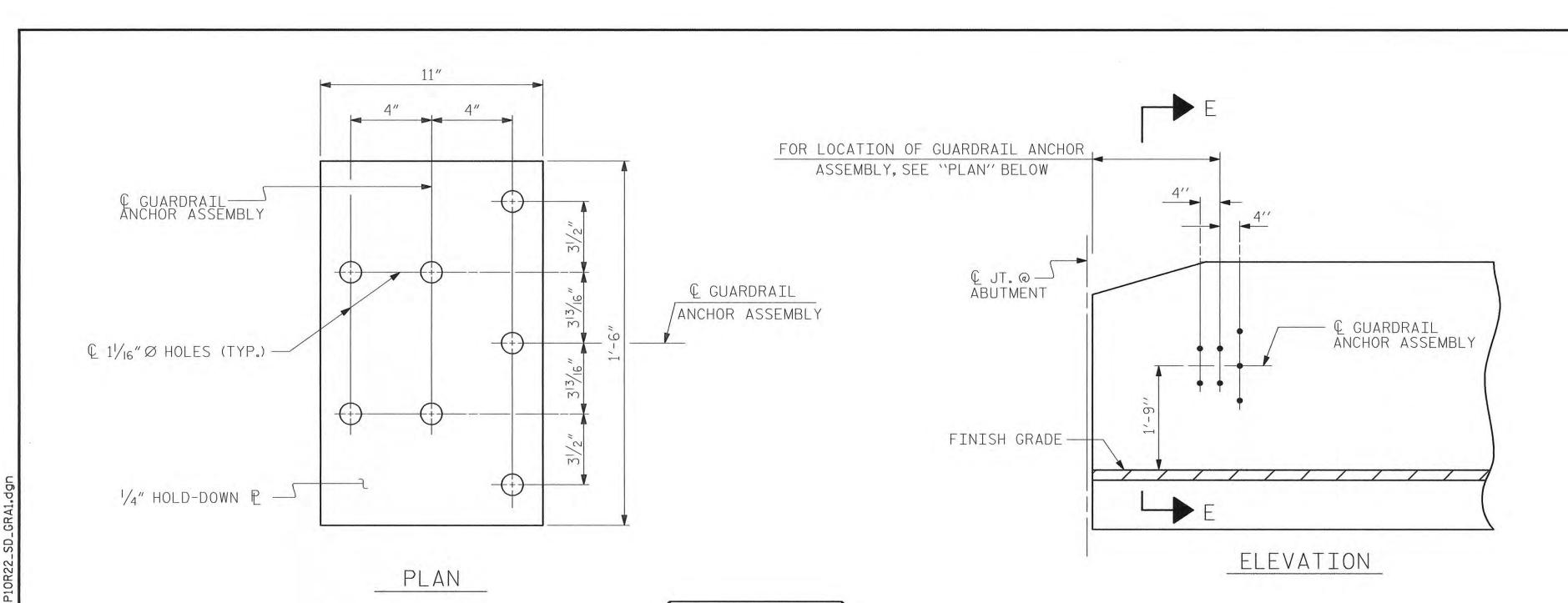
SECTION S-S

AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

© 1/2"EXP.JT.MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP.JT.MAT'L.__ WHEN SLIP FORM IS USED)

CONST. J7

ELEVATION AT EXPANSION JOINTS



NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A $1/4^{\prime\prime}$ HOLD DOWN PLATE AND 7 - $1/8^{\prime\prime}$ Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE $\frac{7}{8}$ " \alpha GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

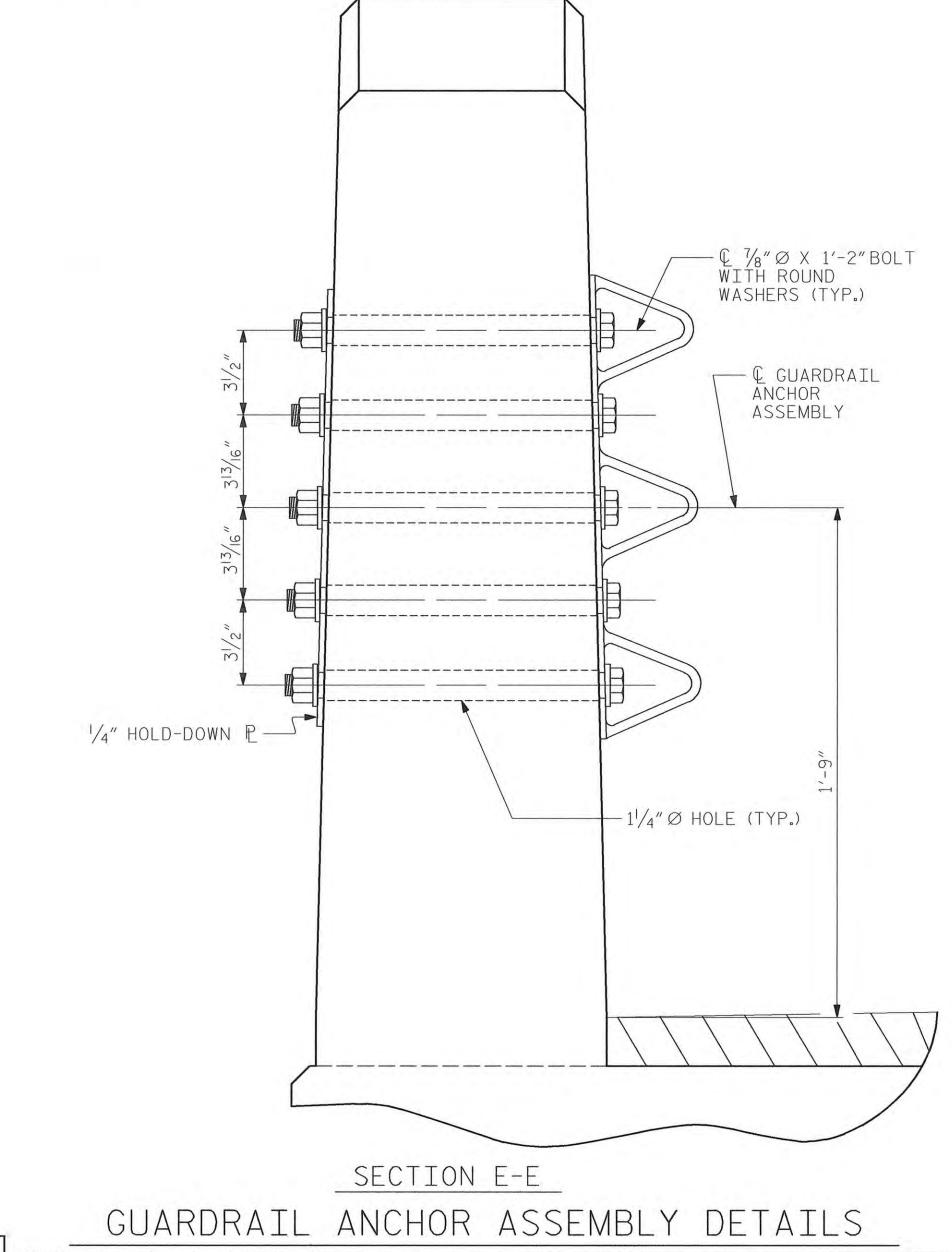
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

THE 1 $\frac{1}{4}$ " Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

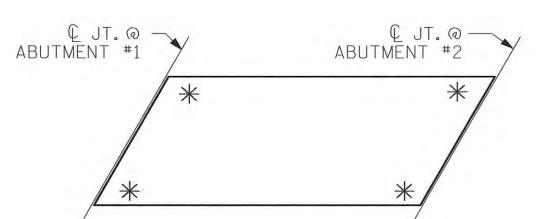


Q JT. @ — ABUTMENT 1'-10" C GUARDRAIL ANCHOR ASSEMBLY ℚ GUARDRAIL ANCHOR ASSEMBLY

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

ABUTMENT #1 SHOWN, ABUTMENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

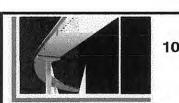
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.10.R.22 UNION _ COUNTY STATION: 15+56.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STANDARD BARRIER RAIL

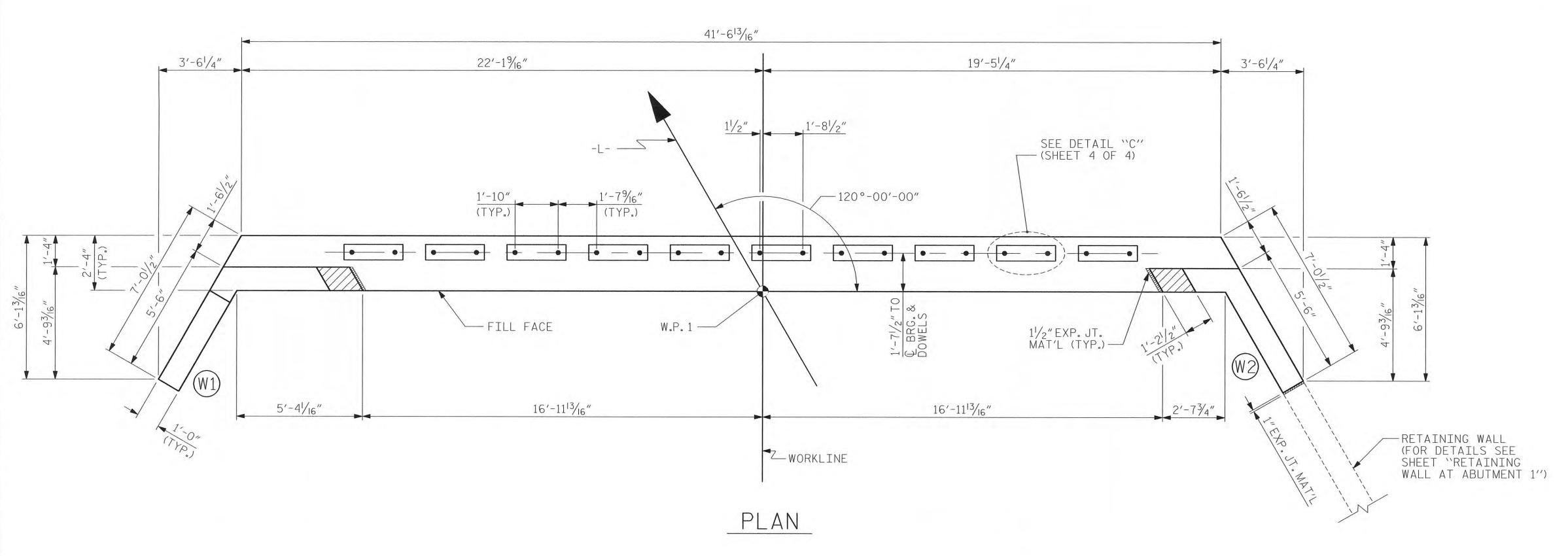


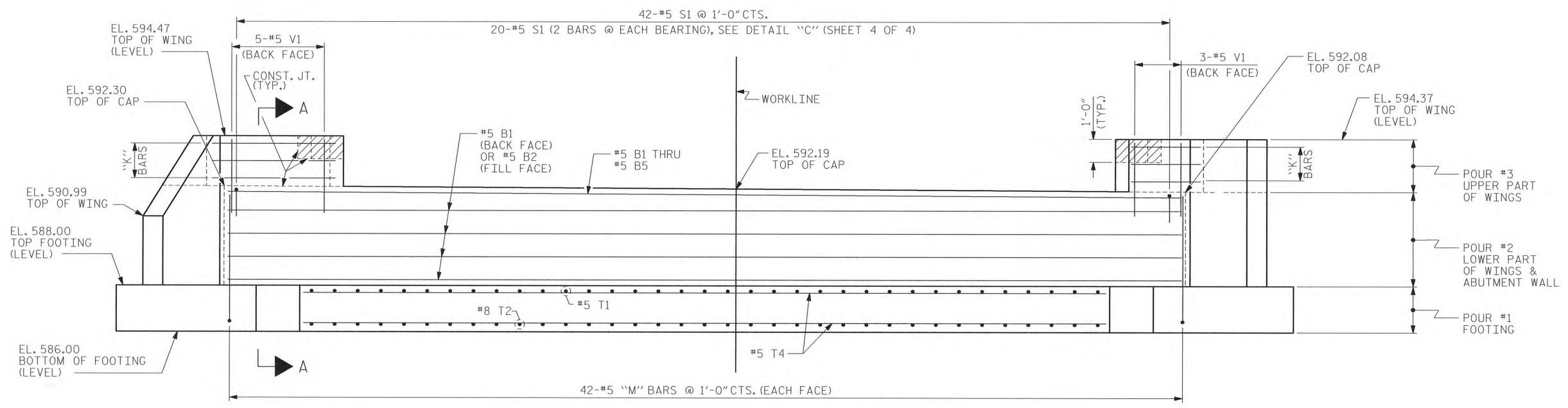
MI ENGINEERING 11 SCHAUB DRIVE, SUITE 100 NO. RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671

REVISIONS S-7 BY: NO. BY: DATE: DATE:

STD. NO. GRA3 (SHT 2)

ASSEMBLED BY : J.S. ISRAELNAIM DATE : 01/13 CHECKED BY : B.E. ATKINSON DATE: 01/13 DRAWN BY: MAA 5/10 REV. IO/I/II MAA/GM CHECKED BY : GM 5/10





ELEVATION



PROJECT NO. 17BP.10.R.22 UNION _ COUNTY STATION: 15+56.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SUBSTRUCTURE ABUTMENT NO. I

MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 NO. RALEIGH, NC 27606 (919) 851-6606 1 2

REVISIONS SHEET NO. S-8 NO. BY: BY: DATE: DATE: TOTAL SHEETS

DRAWN BY: J.S. ISRAELNAIM DATE: 01/13 CHECKED BY: P.A. de PAOLI DATE: 01/13

#5 S1 BARS IN CAP MAY BE SHIFTED AS

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR WING DETAILS, SEE SHEET 3 OF 4

NECESSARY TO CLEAR DOWELS.

NOTES

NOTES THE "T" BARS MAY BE SHIFTED AS NECESSARY TO CLEAR THE "M" BARS 3'-10 1/8" 1'-01/4" RETAINING WALL
(FOR DETAILS SEE
SHEET "RETAINING
WALL AT ABUTMENT 1") PROJECT NO. 17BP.10.R.22 UNION COUNTY STATION: 15+56.00 -L-SHEET 2 OF 4 STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
RALEIGH SUBSTRUCTURE ABUTMENT NO. I MI ENGINEERING

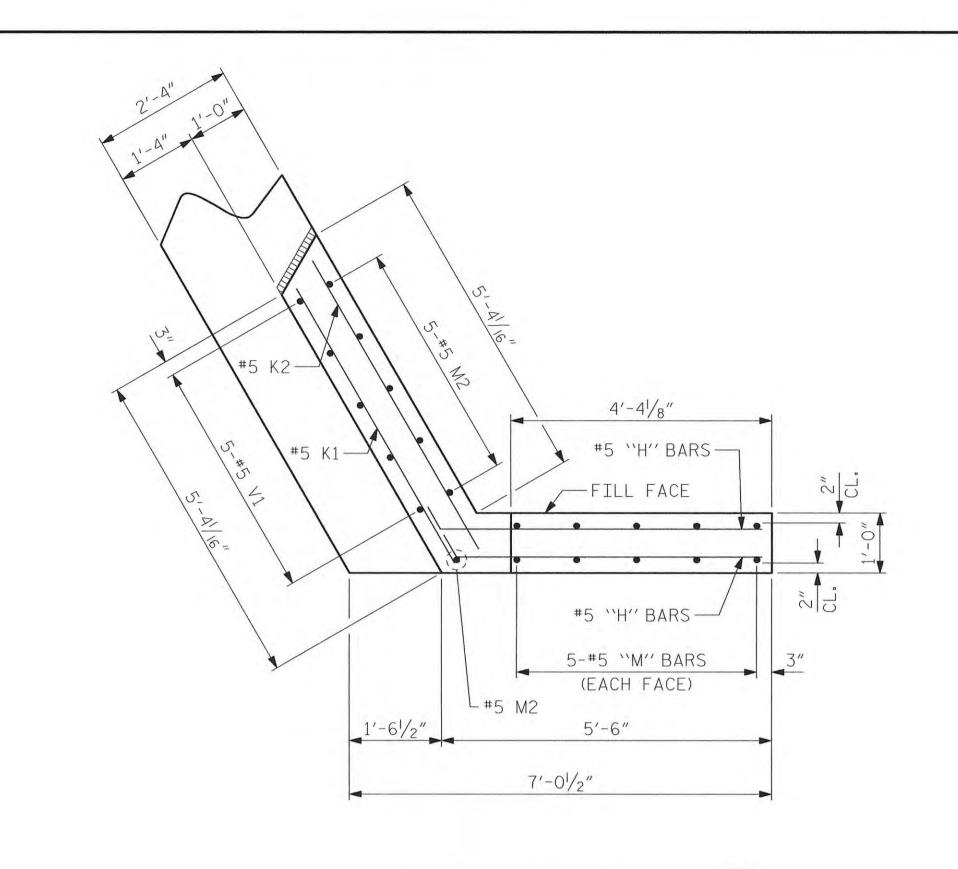
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671 SHEET NO. S-9 REVISIONS NO. BY: DATE: DATE: TOTAL SHEETS

3'-10 1/8" 43'-15/16" 22'-10^{|3}/_{|6}" 20'-21/2" 43-#5 T1 @ 1'-0"CTS.(TOP) & 43-#8 T2 @ 1'-0"CTS.(BOTTOM) 1'-11/16" 42-#5 M1 @ 1'-0"CTS. 21 SPA. @ 1'-0" 19 SPA. @ 1'-0" -120°-00′-00″ FILL FACE W.P.1 -5-#5 M2 @ 1'-0" 1'-0" 34-#5 M1 @ 1'-0" 18′-105/16″ 16'-2" 35′-05/16″

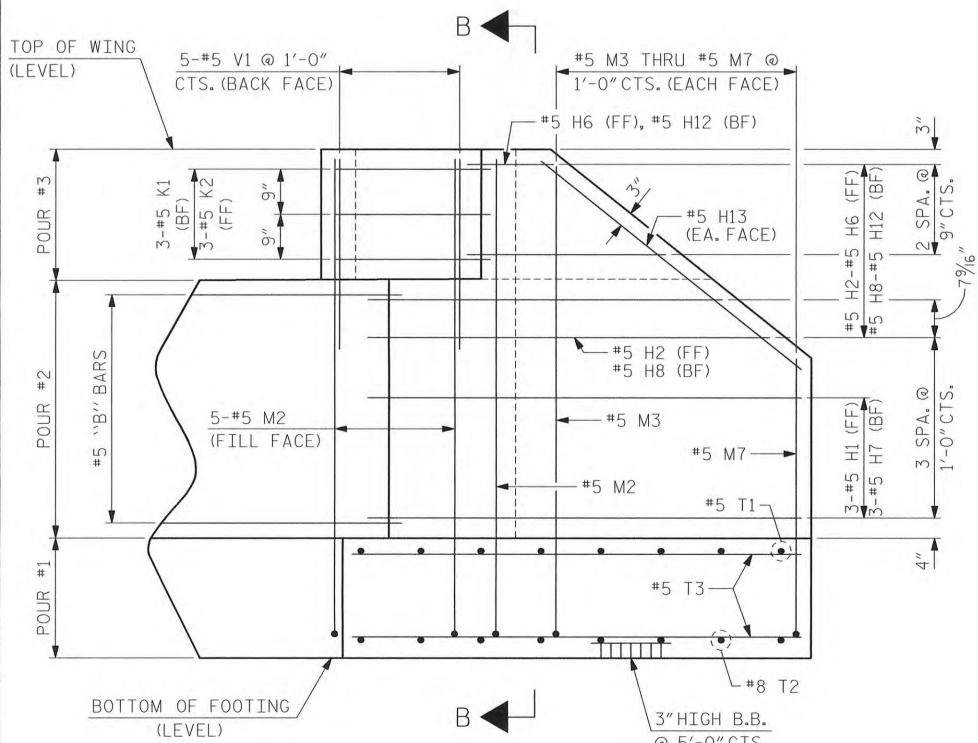
PLAN OF FOOTING

38 PM :jisraelnaim

DRAWN BY: J.S. ISRAELNAIM DATE: 01/13 CHECKED BY: P.A. de PAOLI DATE: 01/13

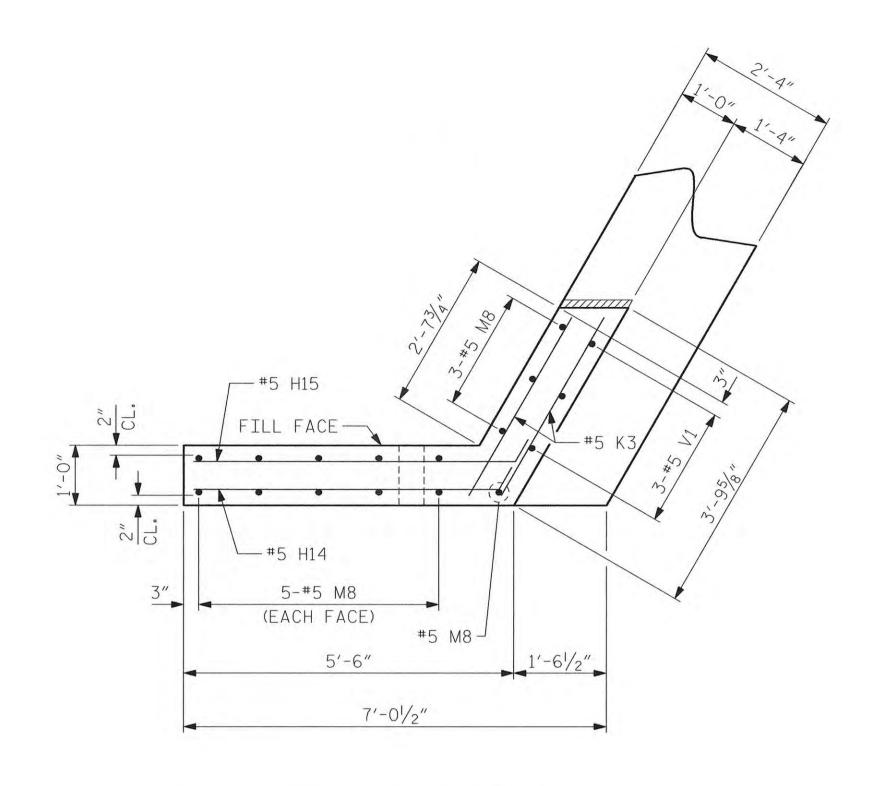


PLAN OF WING (W1)

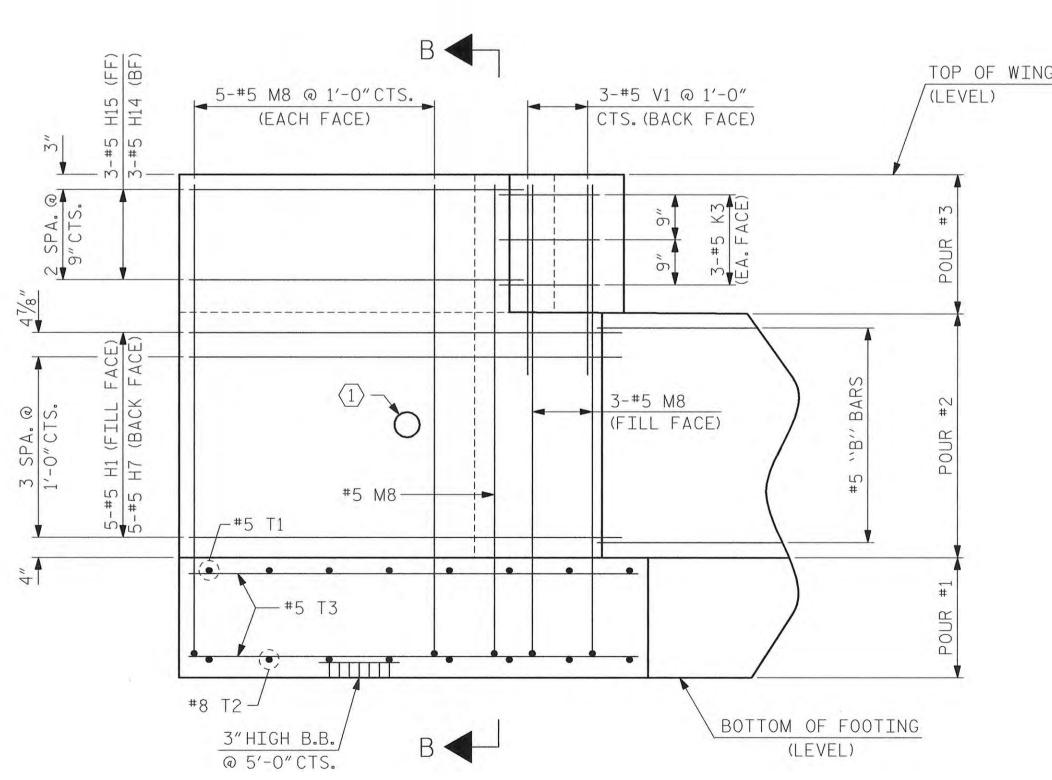


ELEVATION OF WING (W1)

DRAWN BY: J.S. ISRAELNAIM DATE: 01/13
CHECKED BY: P.A. de PAOLI DATE: 01/13

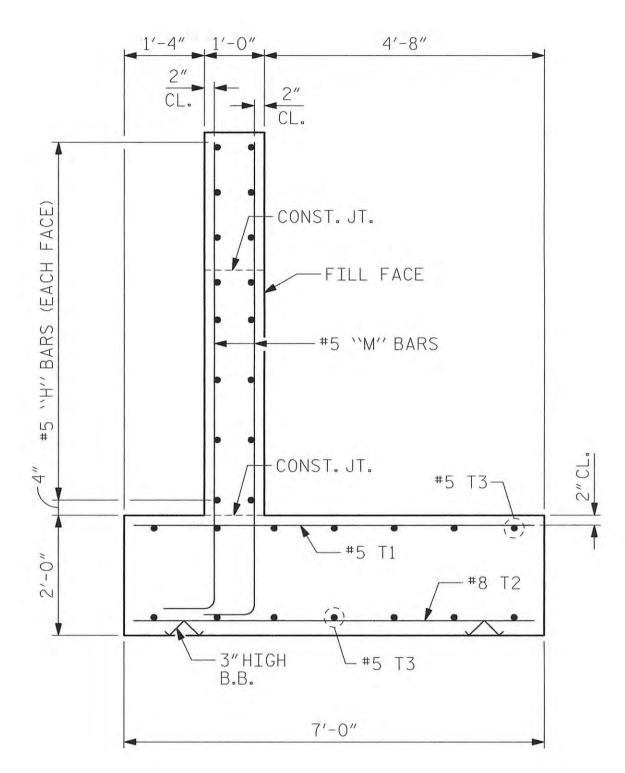


PLAN OF WING (W2)



ELEVATION OF WING (W2)

5"Ø HOLE FOR DRAIN PIPE.FIELD VERIFY LOCATION. SEE "BRIDGE APPROACH SLAB" SHEET.



SECTION B-B

PROJECT NO. 17BP.10.R.22 UNION COUNTY

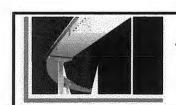
STATION: 15+56.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SUBSTRUCTURE

ABUTMENT NO. I WING DETAILS



MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671

REVISIONS NO. BY: BY: DATE: DATE:

SHEET NO S-I0 TOTAL SHEETS

TOP OF WING (LEVEL)

@ 5'-0"CTS.

BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

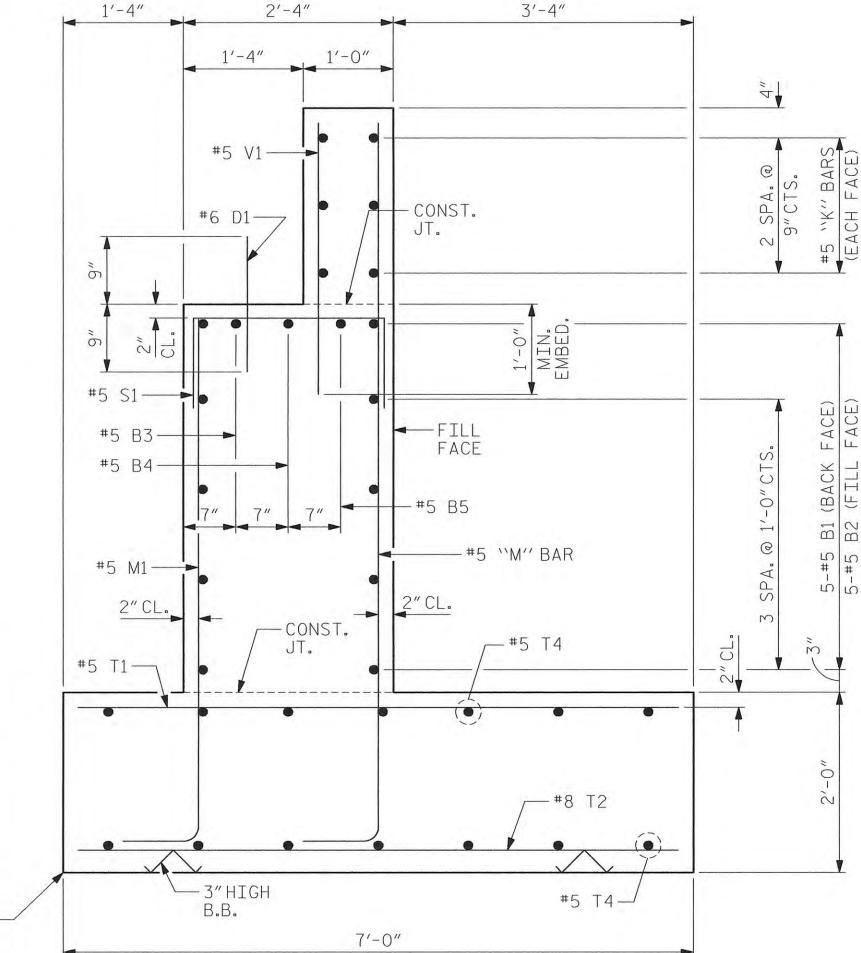
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETER-MINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT ABUTMENT 1

- C CORED SLAB UNIT 2'-6" 1'-3" 1'-3" - #6 D1 DOWELS TO PROJECT © BEARING -9" ABOVE CAP (TYP.) -2 ADDITIONIAL #5 S1 AT EACH BEARING 1" X 8" X 2'-6" ELASTOMERIC BRG. - FILL FACE PAD (TYPE I) (TYP.) ——

DETAIL C



SECTION A-A

DRAWN BY: J.S. ISRAELNAIM DATE: 01/13
CHECKED BY: P.A. de PAOLI DATE: 01/13

BOTTOM OF FOOTING EL. 586.00 (LEVEL)

5-#5 B1 (BACK FACE 5-#5 B2 (FILL FACE

1 B5 1 #5 STR 1 43'-2" 45 D1 20 #6 STR 1'-6" 45 H1 8 #5 7'-0" 7'-8" 64 H2 #5 6'-5" 7'-1" #5 H3 5'-8" 6'-4" H4 #5 3'-2" 3'-10" H5 #5 2'-3" 2'-11" H6 #5 1'-3" 1'-11" H7 8 #5 6'-8" 7'-4" 61 H8 #5 6'-2" 6'-10" H9 #5 5'-4" 6'-0" DIM. ''A'' #5 H10 2'-10" 3'-6" H11 #5 1'-11" 2'-7" H12 #5 1'-0" 1'-8" H13 #5 STR 5'-6" H14 #5 2 5'-2" 5'-10" 18 H15 3 #5 2 5'-5" 6'-1" 19 K1 3 #5 STR 5'-2" 16 K2 #5 STR 5'-6" 17 2'-0" K3 6 #5 STR 3'-4" 21 M1 78 #5 5'-6" 6'-4" 515 M2 55 #5 7'-11" 8'-9" M3 #5 7'-9" 8'-7" 18 M4 #5 6'-11" 7'-9" 16 M5 #5 6'-2" 7'-0" 15 M6 #5 5'-4" 6'-2" 13 M7 #5 4'-7" 5'-5" M8 | 14 #5 127 7'-10" 8'-8" ALL BAR DIMENSIONS ARE OUT TO OUT. S1 62 #5 4'-0" 259 CLASS A CONCRETE BREAKDOWN (FOR ABUTMENT NO. 1) 59 #5 STR 6'-8" 410 T2 59 1050 #8 STR 6'-8" POUR #1 FOOTING 26.3 C.Y. T3 28 #5 STR 7'-7" 221 T4 | 14 | #5 | STR 43'-1" 629 POUR #2 LOWER PART OF 16.9 C.Y. WINGS & WALL V1 8 #5 STR POUR #3 UPPER PART OF WINGS 1.4 C.Y. TOTAL CLASS A CONCRETE 44.6 C.Y.

B1 5

5

B2

B3

B4

----- BAR TYPES -----

DIM. "A"

PROJECT NO. 17BP.10.R.22 UNION _ COUNTY STATION: 15+56.00 -L-

BILL OF MATERIAL

FOR ABUTMENT NO.

BAR | NO. | SIZE | TYPE | DIM. "A" | LENGTH | WEIGH

41'-5"

43'-6"

41'-9"

42'-6"

227

44

44

4,258

#5 STR

#5 STR

#5 STR

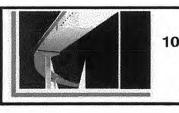
#5 STR

SHEET 4 OF 4

REINFORCING STEEL

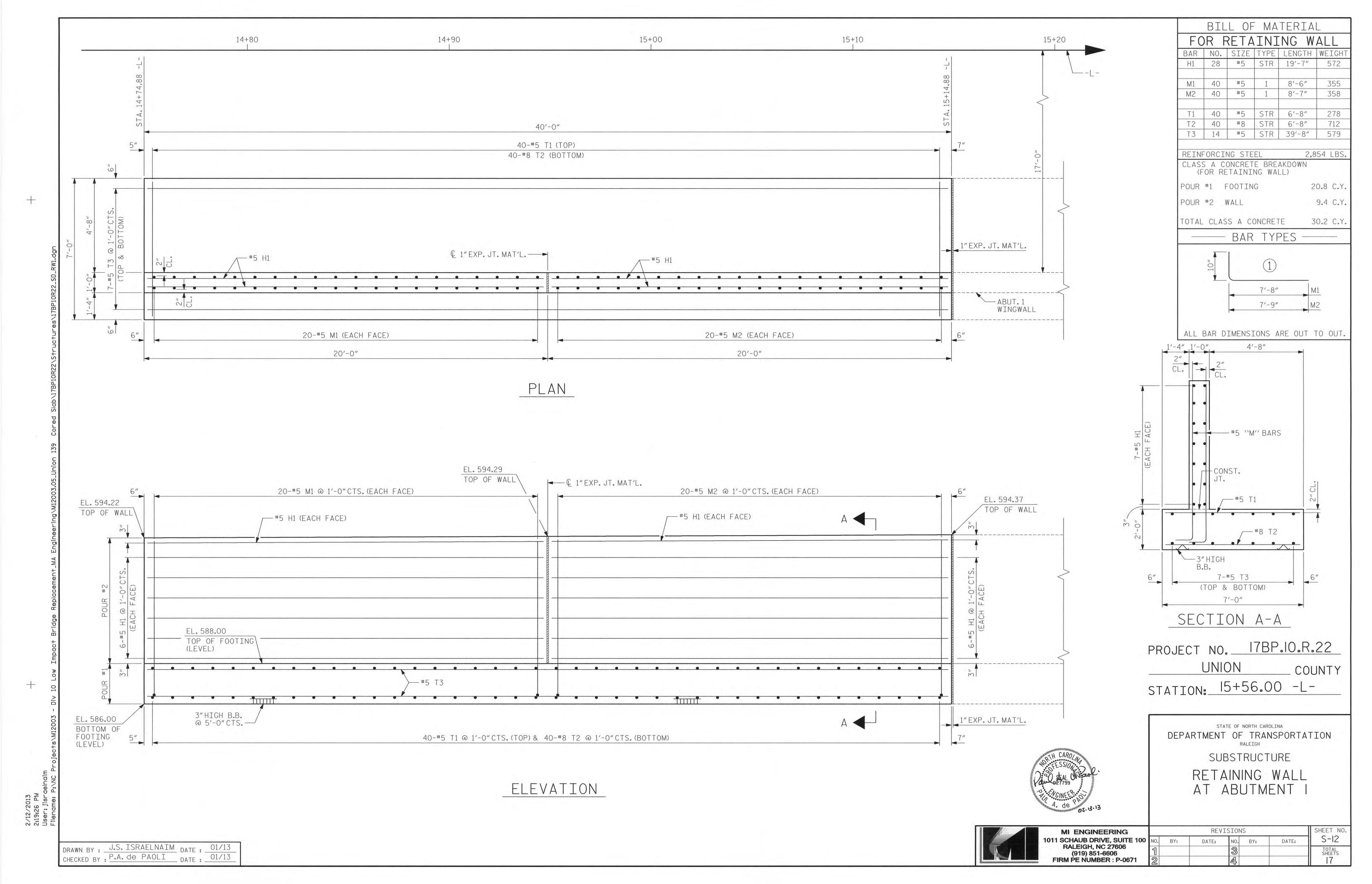
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SUBSTRUCTURE

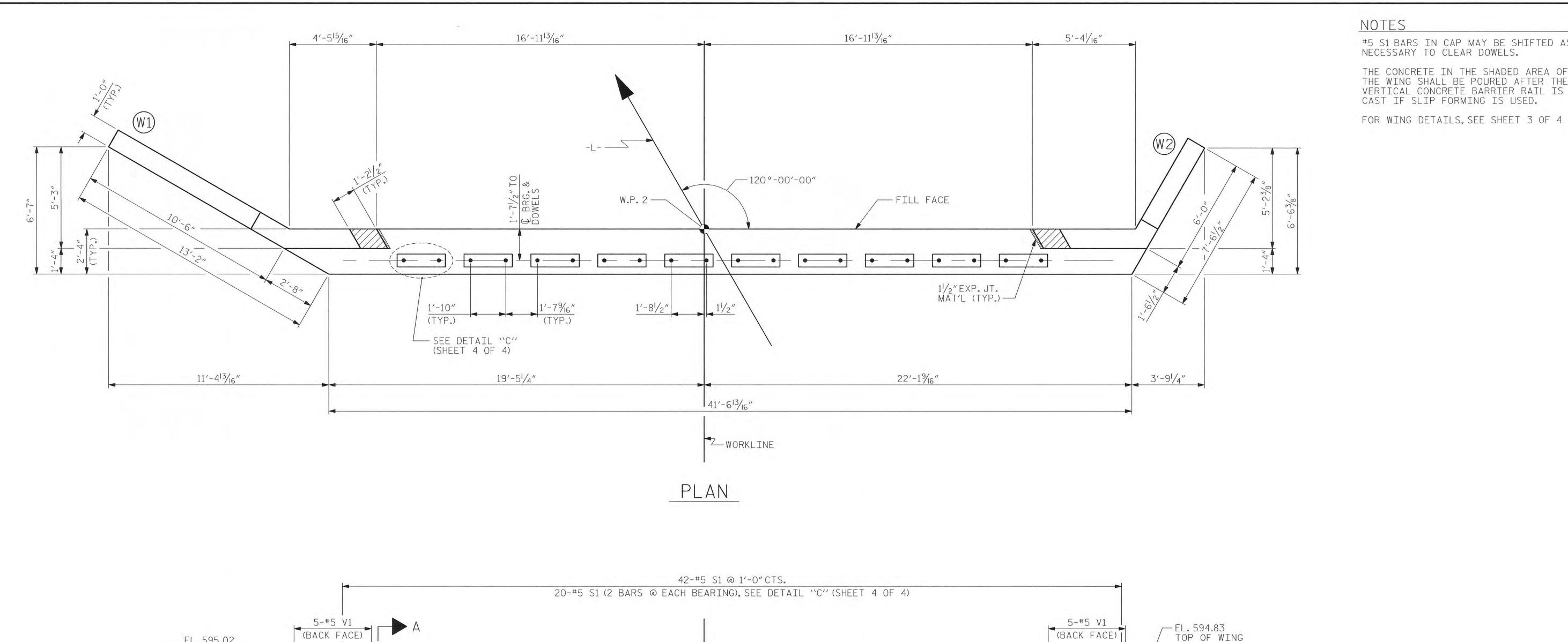
ABUTMENT NO. I DETAILS

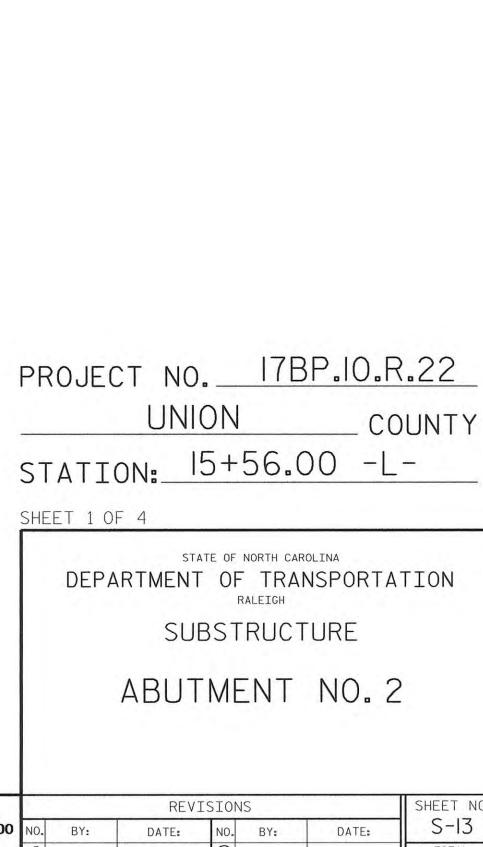


MI ENGINEERING 011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671

	SHEET NO.				
BY:	DATE:	NO.	BY:	DATE:	S-II
		3			TOTAL SHEETS
2		4			17







#5 S1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE

VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

TOP OF CAP CONST. JT.7 EL.591.13 TOP OF WING - EL.588.00 TOP FOOTING (LEVEL) — EL. 586.00 BOTTOM OF FOOTING (LEVEL)

EL.594.83 TOP OF WING

42-#5 "M" BARS @ 1'-0"CTS. (EACH FACE)

~Z_WORKLINE

EL.592.73 TOP OF CAP

#5 T4—

#5 B1 THRU #5 B5

ELEVATION

DRAWN BY: J.S. ISRAELNAIM DATE: 01/13
CHECKED BY: P.A. de PAOLI DATE: 01/13

POUR #3
UPPER PART
OF WINGS

POUR #1 FOOTING —

EL.591.60 TOP OF WING —

POUR #2
LOWER PART
OF WINGS &
ABUTMENT WALL

EL.595.02 TOP OF WING

(LEVEL) ----

EL.592.83

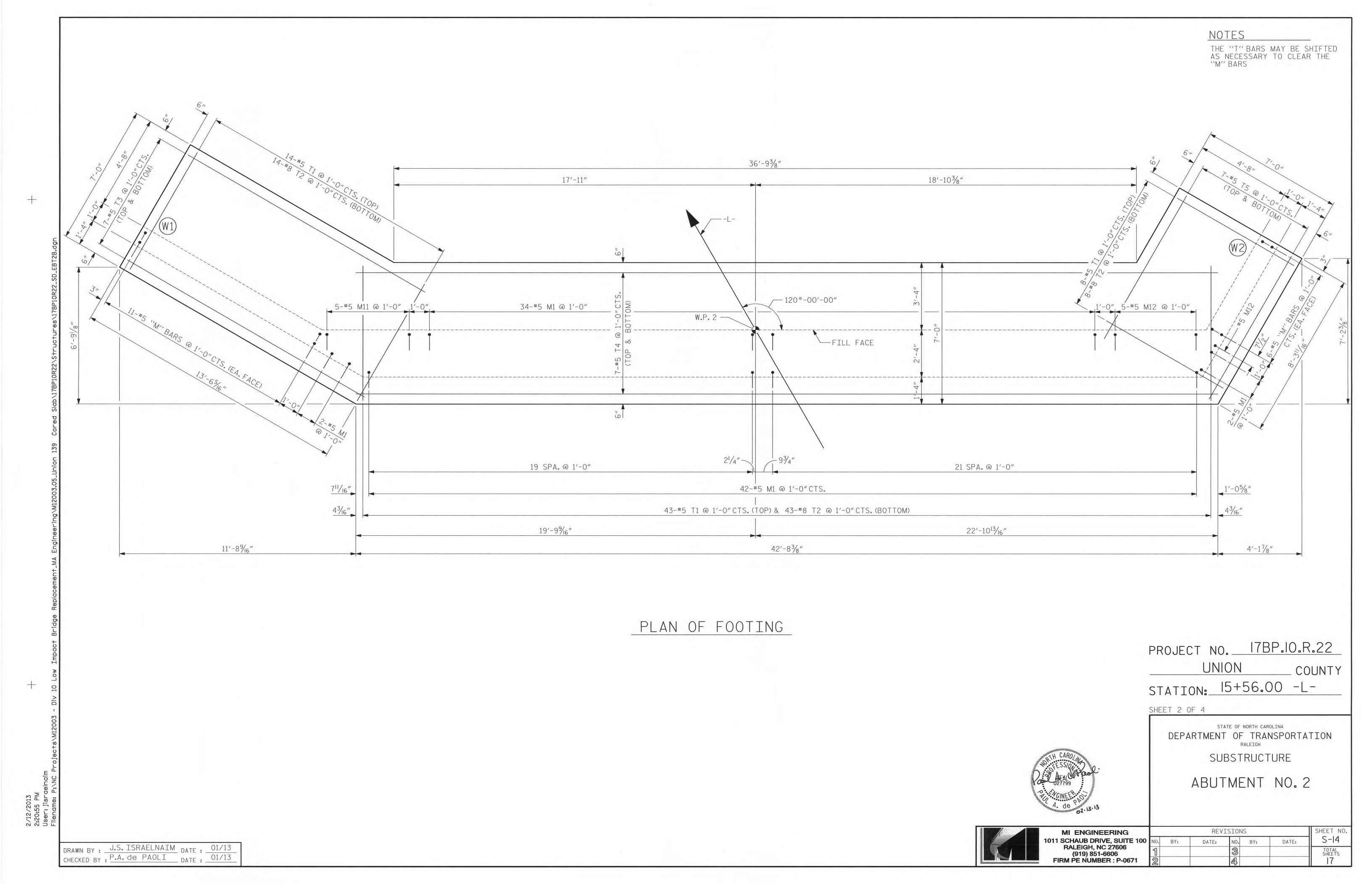
A

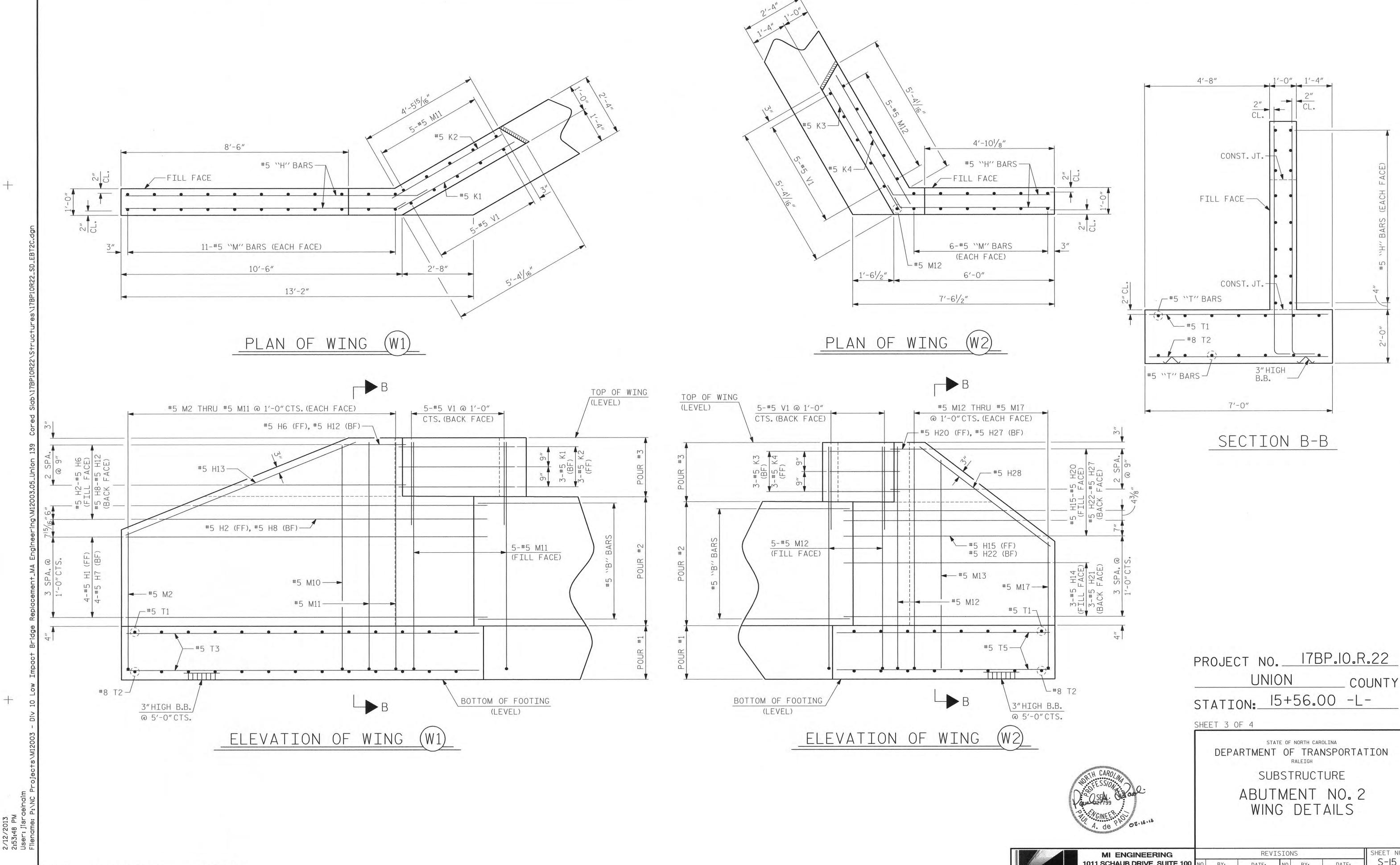
--- #5 B1 (BACK FACE)

OR #5 B2 (FILL FACE)

MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

SHEET NO S-13 TOTAL SHEETS





DRAWN BY: J.S. ISRAELNAIM DATE: 01/13
CHECKED BY: P.A. de PAOLI DATE: 01/13

1011 S

MI ENGINEERING

1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

REVISIONS

NO. BY: DATE: NO. BY: DATE: S-15

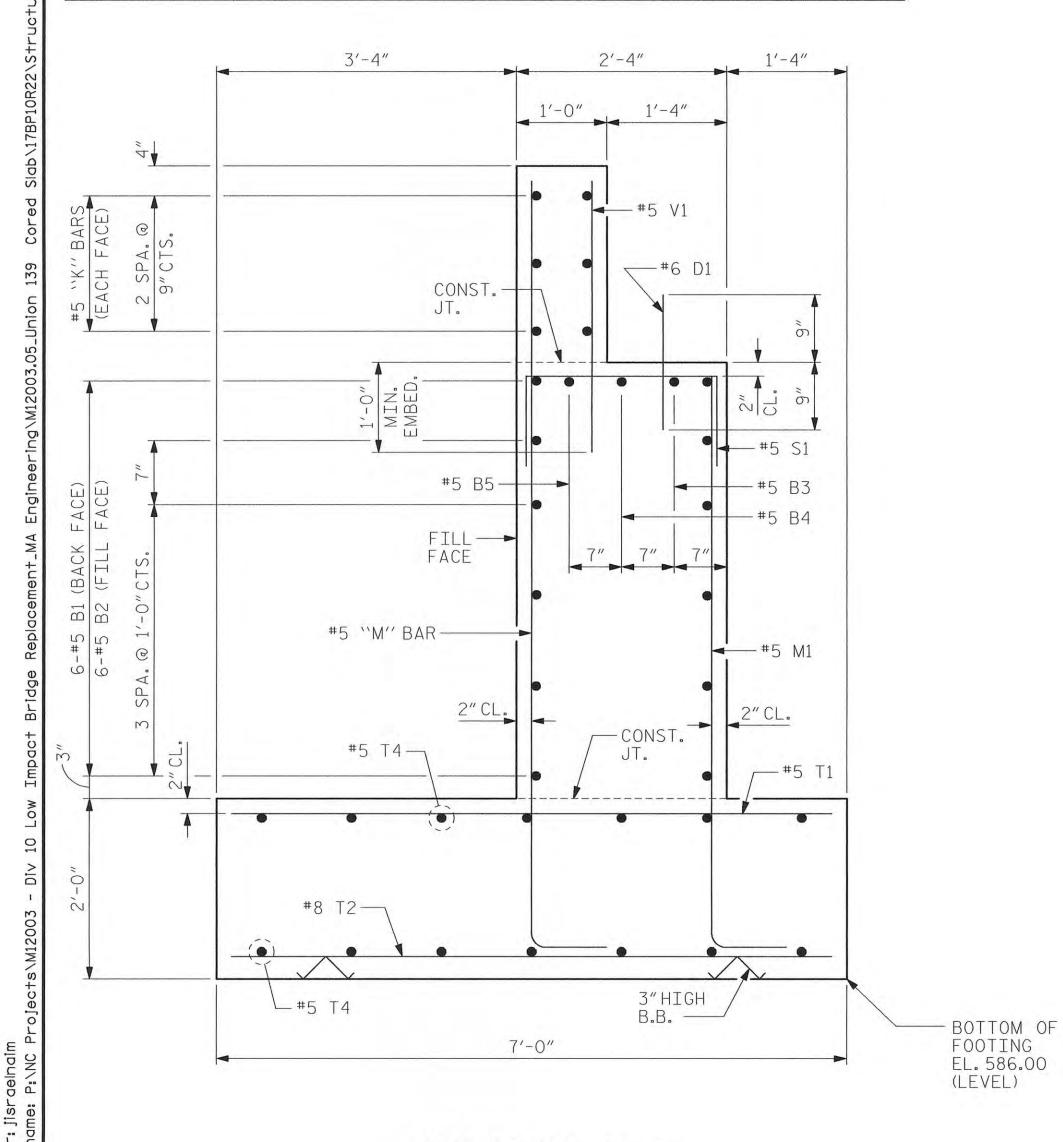
1 3 TOTAL SHEETS
17

BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETER-MINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT ABUTMENT 2



SECTION A-A

DRAWN BY: J.S. ISRAELNAIM DATE: 01/13
CHECKED BY: P.A. de PAOLI DATE: 01/13

BAR TYPES DIM. "A" DIM. "A" DIM. "A"

	2'-0"	
	(4)	

		_	_					
	H7	4	#5	3	12'-11"	13'-7"	57	M10
	Н8	1	#5	3	11'-7"	12'-3"	13	M11
67/8"	Н9	1	#5	3	10'-4"	11'-0"	11	M12
	H10	1	#5	3	5'-9"	6′-5″	7	M13
(3)	H11	1	#5	3	3′-10″	4'-6"	5	M14
4	H12	1	#5	3	2'-0"	2'-8"	3	M15
8" /	H13	2	#5	STR		9'-2"	19	M16
DIM. "A"	H14	3	#5	2	7′-6″	8'-2"	26	M17
	H15	1	#5	2	7'-1"	7′-9″	8	
	H16	1	#5	2	6'-4"	7'-0"	7	S1
	H17	1	#5	2	5′-10″	6'-6"	7	
2/ 2//	H18	1	#5	2	3'-3"	3'-11"	4	T1
2′-0″	H19	1	#5	2	2'-3"	2'-11"	3	T2
	H20	1	#5	2	1'-3"	1'-11"	2	T3
A	H21	3	#5	2	7'-3"	7'-11"	25	T4
i	H22	1	#5	2	6'-10"	7′-6″	8	T5
<u>*</u> 0 (4)	H23	1	#5	2	6'-1"	6'-9"	7	
	H24	1	#5	2	5'-7"	6'-3"	7	V1
	H25	1	#5	2	3'-0"	3'-8"	4	
	H26	1	#5	2	2'-0"	2'-8"	3	
	H27	1	#5	2	1'-0"	1'-8"	2	
ALL BAR DIMENSIONS ARE OUT TO OUT.	H28	2	#5	STR	-	6'-0"	13	REIN
			Market Brown					CLAS
								CL

13'-9"

12'-5"

11'-2"

6'-7"

4'-9"

2'-10"

BAR NO. SIZE TYPE DIM. "A"

STR

STR

STR

STR

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#6 STR

B2

B3

B4

H2

H3

H4

H5

D1 20

BILL OF MATERIAL

260

286

44

46

47

45

60

14

12

6

LENGTH

41'-6"

45'-9"

42'-3"

43'-8"

45'-0"

1'-6"

14'-5"

7'-3"

5'-5"

3'-6"

FOR ABUTMENT NO. 2

K2

K3

K4

M2

M3

M4

M5

M6

M7

M8

M9

M1 80

| WEIGHT | BAR | NO. | SIZE | TYPE | DIM. "A" |

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#5

#8 STR

#5 STR

STR

STR

65

65

14

14

14

STR

STR

STR

5'-1"

5'-6"

5'-11"

6'-4"

6'-9"

7'-1"

7'-6"

8'-4"

8'-5"

8'-3"

7'-9"

7'-0"

6'-3"

5'-5"

4'-8"

LENGTH WEIGH

16

15

16

17

570

12

13

14

15

16

17

17

18

19

87

76

18

16

15

13

11

259

1157

196 623

118

32

5'-0"

4'-9"

5'-2"

5'-6"

6'-10"

5'-11"

6'-4"

6'-9"

7'-2"

7'-7"

7'-11"

8'-4"

8'-9"

9'-2"

9'-3"

9'-1"

8'-7"

7'-10"

7'-1"

6'-3"

5'-6"

4'-0"

6'-8"

6'-8"

13'-5"

42'-8"

8'-1"

3'-1"

4,921 INFORCING STEEL CLASS A CONCRETE BREAKDOWN (FOR ABUTMENT NO. 2) 30.4 C.Y. POUR #1 FOOTING POUR #2 LOWER PART OF 20.5 C.Y. WINGS & WALL POUR #3 UPPER PART OF 1.4 C.Y. WINGS 52.3 C.Y TOTAL CLASS A CONCRETE

1" X 8" X 2'-6" ELASTOMERIC BRG. 11" 11" / PAD (TYPE I) (TYP.) — FILL FACE 6" -2 ADDITIONAL #5 S1 AT EACH BEARING © BEARING -#6 D1 DOWELS TO PROJECT 9" ABOVE CAP /1'-3" 2'-6" € CORED SLAB UNIT

DETAIL C



PROJECT NO. 17BP.10.R.22 UNION COUNTY STATION: 15+56.00 -L-

SHEET 4 OF 4

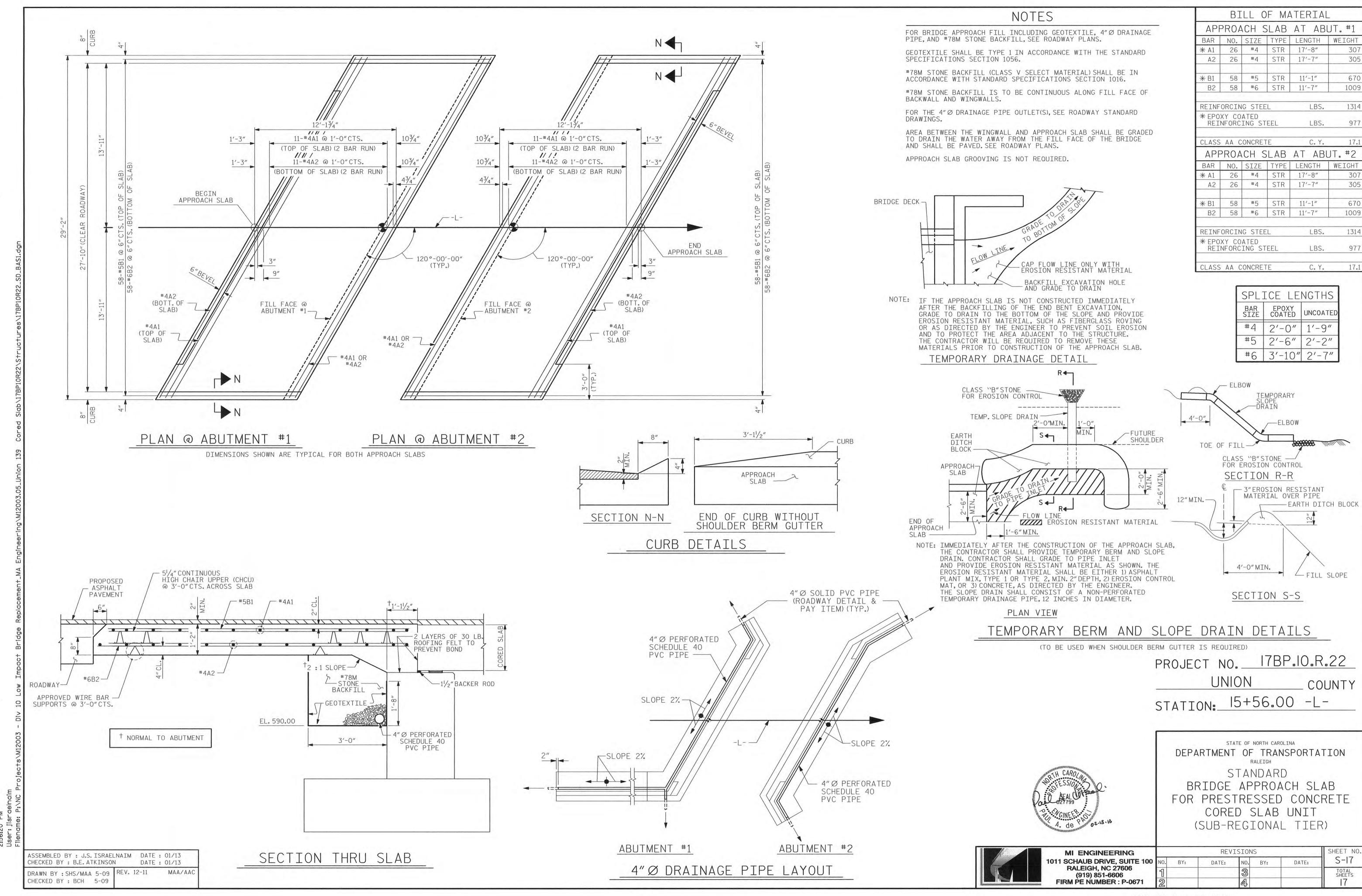
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SUBSTRUCTURE

ABUTMENT NO. 2 DETAILS



MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671

REVISIONS SHEET NO S-16 NO. BY: DATE: BY: DATE: TOTAL SHEETS



STANDARD NOTES

DESIGN DATA:

---- A.A.S.H.T.O. (CURRENT) SPECIFICATIONS LIVE LOAD ---- SEE PLANS IMPACT ALLOWANCE ---- SEE A.A.S.H.T.O. STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36 - 20,000 LBS. PER SQ. IN. - AASHTO M270 GRADE 50W - 27,000 LBS. PER SQ. IN. - AASHTO M270 GRADE 50 - 27,000 LBS. PER SQ. IN. REINFORCING STEEL IN TENSION GRADE 60 -- 24,000 LBS. PER SQ. IN. CONCRETE IN COMPRESSION ---- 1,200 LBS. PER SQ. IN. CONCRETE IN SHEAR ---- SEE A.A.S.H.T.O, STRUCTURAL TIMBER - TREATED OR UNTREATED - EXTREME FIBER STRESS ---- 1,800 LBS. PER SQ. IN.

MATERIAL AND WORKMANSHIP:

EQUIVALENT FLUID PRESSURE OF EARTH - - - - -

COMPRESSION PERPENDICULAR TO GRAIN

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N.C. DEPARTMENT OF TRANSPORTATION.

OF TIMBER ----

375 LBS. PER SQ. IN.

(MINIMUM)

30 LBS. PER CU. FT.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12"INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT,

ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS.

SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2"OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

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