

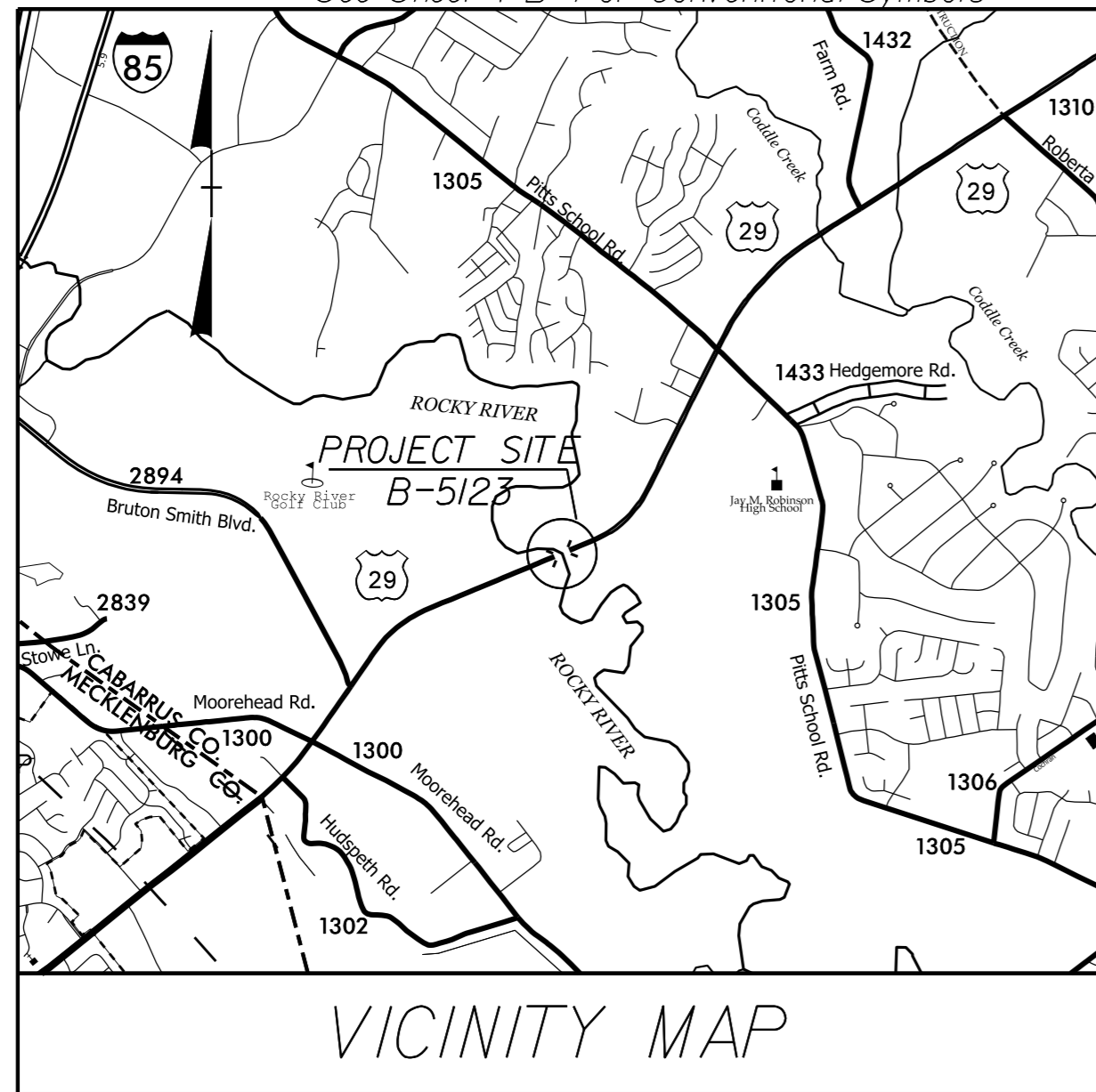
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09/08/99

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols



VICINITY MAP

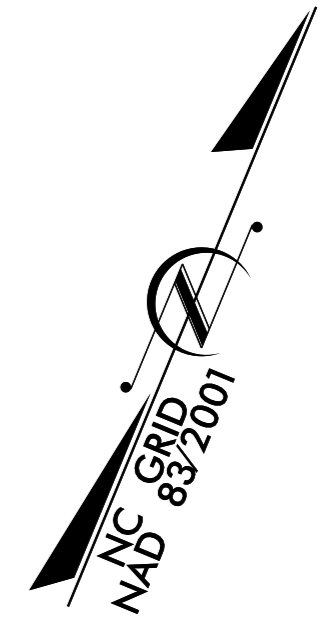
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CABARRUS COUNTY**

**LOCATION: BRIDGES #14 AND #19 OVER ROCKY RIVER  
AND ACCESS RD ON US 29**

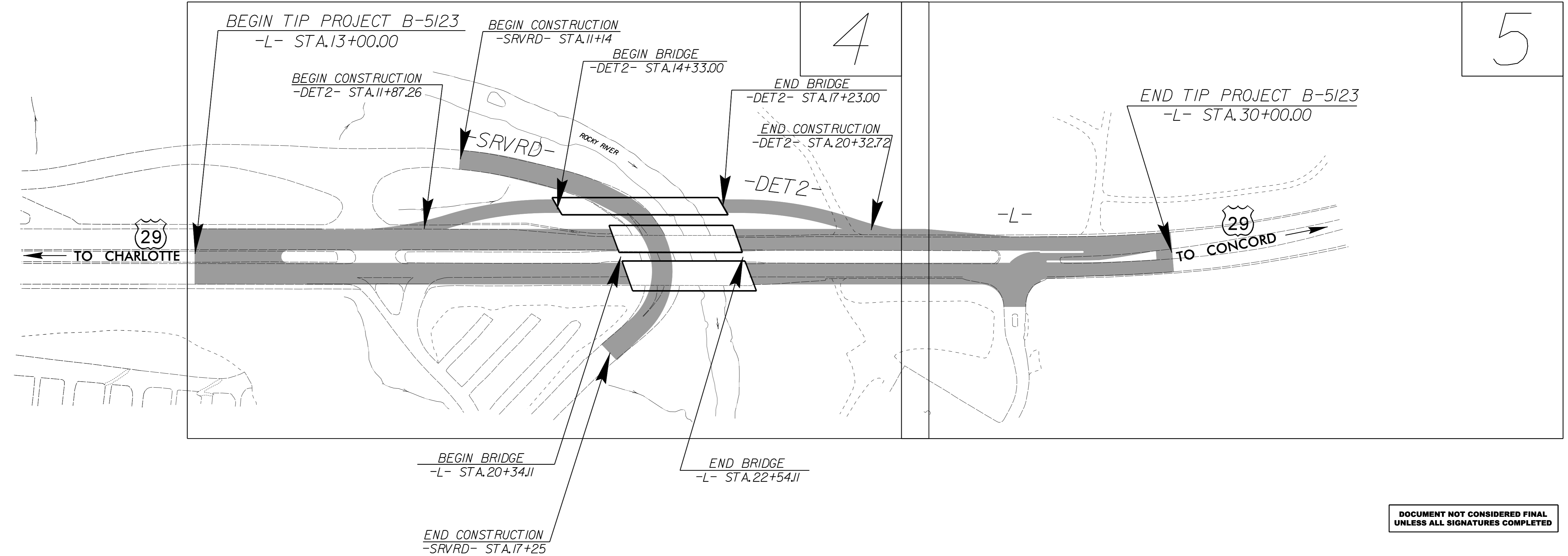
**TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-5123</b>	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42265.1.1	BRSTP-0029(42)	P.E.	
42265.2.1	BRSTP-0029(42)	ROW, UTIL.	
42265.3.1		CONST.	

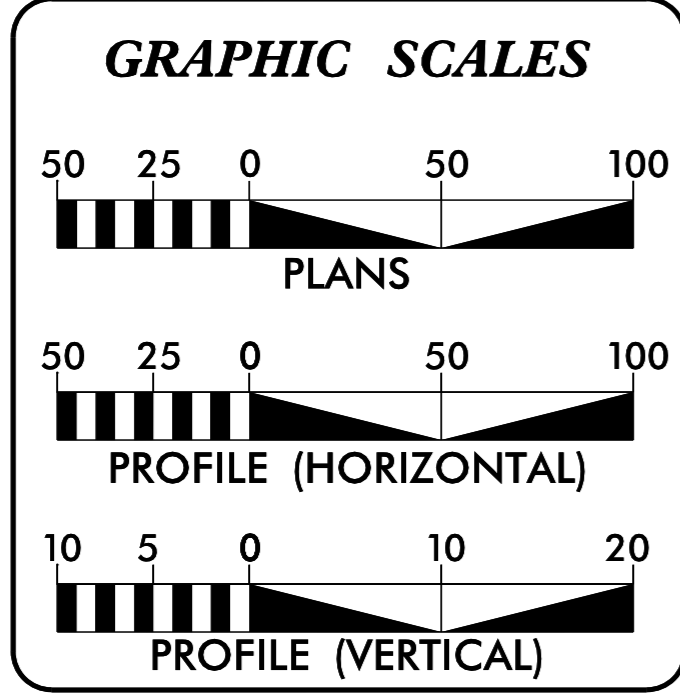


**TIP PROJECT: B-5123**

**CONTRACT: C203722**



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2016 =	32,300
ADT 2036 =	50,300
DHV =	11 %
D =	65 %
T =	5 % *
V =	50 MPH
* TTST =	2% DUAL 3%
FUNC CLASS =	MAJOR ARTERIAL
REGIONAL TIER	

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-5123 =	0.280 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5123 =	0.042 MILES
TOTAL LENGTH OF TIP PROJECT B-5123 =	0.322 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS	
<b>RIGHT OF WAY DATE:</b> APRIL 29, 2015	<b>G.E. BREW, PE</b> PROJECT ENGINEER
<b>LETTING DATE:</b> APRIL 19, 2016	<b>THAD F. DUNCAN, PE</b> PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

DocuSigned by:  
*Charles Hoffman* 2/9/2016 P.E.

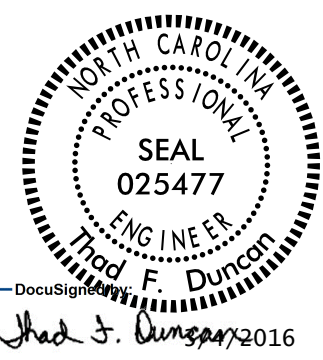
**ROADWAY DESIGN ENGINEER**

DocuSigned by:  
*Gregory Brew* 2/9/2016 P.E.

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER

09-FEB-2016 10:42  
R:\Roadway\Proj\B-5123-Rdy-fsh.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
B-5123	1A
ROADWAY DESIGN ENGINEER	
	
DocuSign Chad F. Dunbar 2016	
<b>DOCUMENT NOT CONSIDERED FINAL          UNLESS ALL SIGNATURES COMPLETED</b>	

EFF. 01-17-2012  
REV. 10-30-2012

SHEET NUMBER	SHEET DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-2	SURVEY CONTROL SHEETS
2A-1 THRU 2A-4	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	CONCRETE MULTIPURPOSE PATH SLOPE TRANSITION DETAIL
2B-2	ISLAND DETAIL
2B-3	CROSSOVER ALIGNMENT DETAIL
2C-1	STRUCTURE ANCHOR UNIT TYPE III DETAIL
2C-2	STRUCTURE ANCHOR UNIT TYPE B-77 DETAIL
2C-3	CONCRETE BRIDGE SIDEWALK APPROACH DETAIL
2C-4	WOOD RUB RAIL DETAIL
2C-5	CURB RAMP DETAIL
2C-6	GUARDRAIL ANCHOR UNIT TYPE B-77 SHOP CURVED DETAIL
2G-1	STANDARD TEMPORARY SHORING DETAIL
2G-2 THRU 2G-4	STANDARD TEMPORARY WALL DETAILS
3B-1	SUMMARY OF EARTHWORK, SUMMARY OF REMOVAL AND BREAKING OF EXISTING PAVEMENT, FENCE SUMMARY AND GUARDRAIL SUMMARY
3D-1 THRU 3D-2	DRAINAGE SUMMARY SHEETS
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 7	PLAN AND PROFILE SHEETS
TMP-1 THRU TMP-21	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-9	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-5	SIGNING PLANS
UC-1 THRU UC-6	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-5	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION INDEX AND SUMMARY SHEET
X-1 THRU X-13	CROSS-SECTIONS
S-1 THRU S-74	STRUCTURE PLANS

**GENERAL NOTES:**

2012 SPECIFICATIONS  
EFFECTIVE: 01-17-2012  
REVISED: 10-31-2014

**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 11.

**SUPERELEVATION:**

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

**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 900 MM RADIUS OR RADIUS AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

**STREET TURNOUT:**

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADIUS NOTED ON PLANS.

**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.

**END BENTS:**

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

**UTILITIES:**

UTILITY OWNERS ON THIS PROJECT ARE :

CITY OF CONCORD POWER, MCI COMMUNICATIONS, WINDSTREAM COMMUNICATIONS  
TIME WARNER COMMUNICATIONS, PSNC GAS, DUKE POWER

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

**RIGHT-OF-WAY MARKERS:**

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

**CURB RAMPS**

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.  
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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
<b>DIVISION 2 - EARTHWORK</b>	
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
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.10	Reinforced Bridge Approach Fills
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
<b>DIVISION 6 - ASPHALT BASES AND PAVEMENTS</b>	
654.01	Pavement Repairs
<b>DIVISION 8 - INCIDENTALS</b>	
806.01	Concrete Right-of-Way Marker
805.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.45	Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.01	Concrete Paved Ditches
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units (Beg. March 2013 Letting use detail in lieu of Standard)
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

B/17/99

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# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

## CONVENTIONAL PLAN SHEET SYMBOLS

*Note: Not to Scale*      \*S.U.E. = *Subsurface Utility Engineering*

04/05/15

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	----->
Property Monument	□ ECM
Parcel/Sequence Number	(123)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB
Existing Historic Property Boundary	----- HPB
Known Contamination Area: Soil	☠ ☠
Potential Contamination Area: Soil	☠ ☠
Known Contamination Area: Water	☠ ☠
Potential Contamination Area: Water	☠ ☠
Contaminated Site: Known or Potential	☠ ?

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	----- JS
Buffer Zone 1	----- BZ 1
Buffer Zone 2	----- BZ 2
Flow Arrow	←
Disappearing Stream	----->
Spring	○
Wetland	-----
Proposed Lateral, Tail, Head Ditch	----- FLOW
False Sump	▽

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ 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	----- R/W
Proposed Right of Way Line with Iron Pin and Cap Marker	----- R/W ▲
Proposed Right of Way Line with Concrete or Granite R/W Marker	----- R/W ▲
Proposed Control of Access Line with Concrete C/A Marker	----- C/A
Existing Control of Access	----- C/A
Proposed Control of Access	----- C/A
Existing Easement Line	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Drainage / Utility Easement	----- DUE
Proposed Permanent Utility Easement	----- PUE
Proposed Temporary Utility Easement	----- TUE
Proposed Aerial Utility Easement	----- AUE
Proposed Permanent Easement with Iron Pin and Cap Marker	----- ◆

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- C
Proposed Slope Stakes Fill	----- F
Proposed Curb Ramp	----- CR
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	□ 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	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○ S
Storm Sewer	----- S

### 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	●
U/G Power Line LOS B (S.U.E.*)	----- P
U/G Power Line LOS C (S.U.E.*)	----- P
U/G Power Line LOS D (S.U.E.*)	----- P

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	□
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	○
U/G Telephone Cable LOS B (S.U.E.*)	----- T
U/G Telephone Cable LOS C (S.U.E.*)	----- T
U/G Telephone Cable LOS D (S.U.E.*)	----- T
U/G Telephone Conduit LOS B (S.U.E.*)	----- TC
U/G Telephone Conduit LOS C (S.U.E.*)	----- TC
U/G Telephone Conduit LOS D (S.U.E.*)	----- TC
U/G Fiber Optics Cable LOS B (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS C (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS D (S.U.E.*)	----- T FO

### WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	----- A/G Water

### TV:

TV Pedestal	□
TV Tower	⊗
U/G TV Cable Hand Hole	○
U/G TV Cable LOS B (S.U.E.*)	----- TV
U/G TV Cable LOS C (S.U.E.*)	----- TV
U/G TV Cable LOS D (S.U.E.*)	----- TV
U/G Fiber Optic Cable LOS B (S.U.E.*)	----- TV FO
U/G Fiber Optic Cable LOS C (S.U.E.*)	----- TV FO
U/G Fiber Optic Cable LOS D (S.U.E.*)	----- TV FO

### GAS:

Gas Valve	◇
Gas Meter	◇
U/G Gas Line LOS B (S.U.E.*)	----- G
U/G Gas Line LOS C (S.U.E.*)	----- G
U/G Gas Line LOS D (S.U.E.*)	----- G
Above Ground Gas Line	----- A/G Gas

### SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
SS Forced Main Line LOS B (S.U.E.*)	----- FSS
SS Forced Main Line LOS C (S.U.E.*)	----- FSS
SS Forced Main Line LOS D (S.U.E.*)	----- FSS

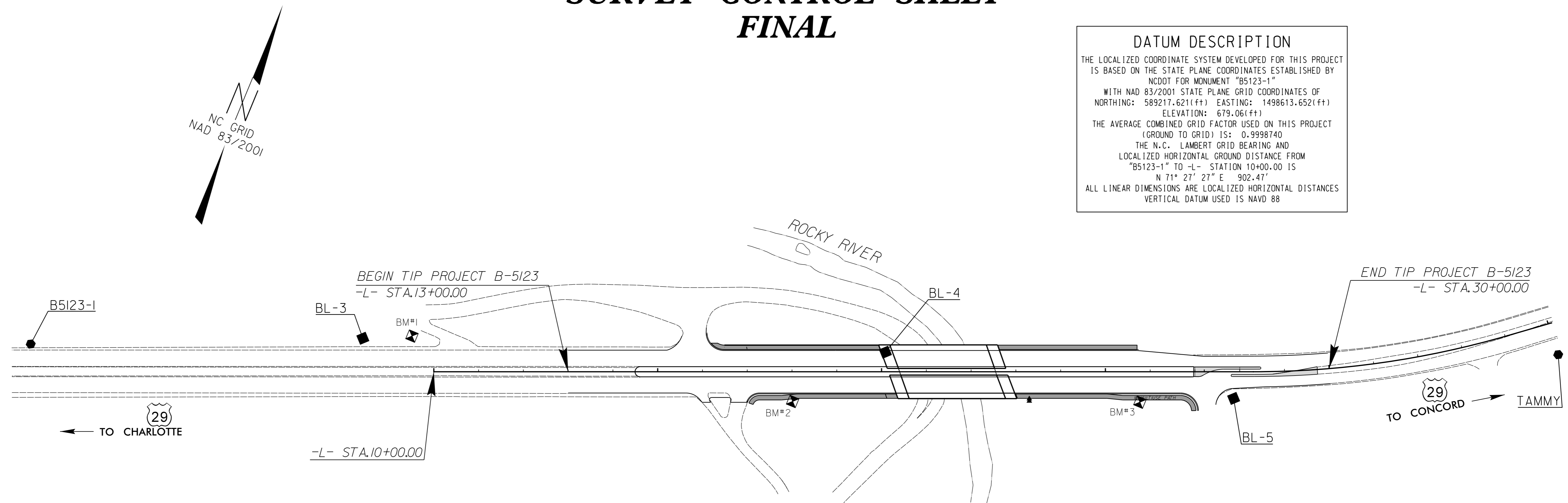
### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line LOS B (S.U.E.*)	----- ?UTL
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	□ UST
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

# SURVEY CONTROL SHEET FINAL

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5123-1" WITH NAD 83/2001 STATE PLANE GRID COORDINATES OF NORTHING: 589217.621(ft) EASTING: 1498613.652(ft) ELEVATION: 679.06(ft). THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998740. THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5123-1" TO -L- STATION 10+00.00 IS N 71° 27' 27" E 902.47'. ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES. VERTICAL DATUM USED IS NAVD 88.



BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	B5123-1		589217.6210	1498613.6520	679.06	OUTSIDE PROJECT LIMITS	
3	BL-3		589513.0960	1499294.1040	644.73	OUTSIDE PROJECT LIMITS	
4	BL-4		589930.5520	1500384.4430	585.73	20+08.49	43.67 LT
5	BL-5		590132.5380	1501142.5960	587.41	27+86.27	59.57 RT
2	TAMMY		590500.1490	1501775.1080	591.04	35+02.61	72.17 RT

\*\*\*\*\*

BM1 ELEVATION = 639.20  
 N 589560 E 1499394  
 L STATION 10+00  
 N 53°55'32" W DIST 93  
 RR SPIKE IN BASE OF POWER POLE

\*\*\*\*\*

\*\*\*\*\*

BM2 ELEVATION = 587.42  
 N 589750 E 1500235  
 L STATION 18+01 66 RIGHT  
 RR SPIKE IN BASE OF POWER POLE

\*\*\*\*\*

\*\*\*\*\*

BM3 ELEVATION = 589.94  
 N 590045 E 1500953  
 L STATION 25+77 68 RIGHT  
 RR SPIKE IN BASE OF POWER POLE

\*\*\*\*\*

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	589504.6156	1499469.2733
PC	28+30.27	590204.4048	1501160.4828
PT	34+05.76	590496.0427	1501654.3927
POT	35+08.11	590559.9539	1501734.3322

SRVRD			
TYPE	STATION	NORTH	EAST
POT	10+00.00	589912.5479	1500001.4673
PC	10+65.08	589936.4038	1500062.0180
PT	12+12.39	589974.4764	1500203.9972
PC	12+95.51	589986.7885	1500286.1974
PT	13+77.22	589989.3921	1500367.6862
PC	14+07.86	589986.7970	1500398.2161
PT	16+55.28	589804.5875	1500506.0551
POT	18+90.29	589589.7390	1500410.8296

**NOTES:**

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: [HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION](https://connect.ncdot.gov/resources/location)

THE FILES TO BE FOUND ARE AS FOLLOWS:  
 B5123\_LS\_CONTROL.TXT  
 B5123\_LS\_LOCAL.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, UTILIZING THE NCGS RTN SYSTEM (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 CONTROL

NOTE: DRAWING NOT TO SCALE

# SURVEY CONTROL SHEET FINAL

## ROW MARKER (IRON PIN AND CAP)

ALIGN	STATION	OFFSET	NORTH	EAST
L	19+35.00	-78.40	589934.5529	1500303.2555
L	19+35.00	-130.00	589982.2278	1500283.5286
L	19+92.00	81.53	589808.5672	1500417.0728
L	19+92.00	135.00	589759.1557	1500437.5183
L	22+80.00	-130.00	590114.1357	1500602.3158
L	22+80.00	-67.50	590056.3844	1500626.2122
L	23+15.00	135.00	589882.6521	1500735.9771
L	23+15.00	65.50	589946.8716	1500709.4043
L	26+97.00	-67.50	590215.8209	1501011.5289
L	26+97.00	-59.34	590208.2765	1501014.6507
L	28+30.00	60.50	590148.4008	1501183.3621
L	28+30.00	65.50	590143.7776	1501185.2752

## PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	16+79.00	-78.74	589836.9817	1500066.5786
L	16+79.00	-115.00	589870.4880	1500052.7143
L	17+24.00	81.40	589706.2189	1500169.3858
L	17+64.00	81.52	589721.4022	1500206.3923
L	17+75.00	-123.00	589914.5850	1500138.3616
L	17+75.00	-78.45	589873.4217	1500155.3942
L	18+17.00	135.00	589692.2459	1500275.8146
L	18+17.00	81.67	589741.5201	1500255.4259
L	18+25.00	-123.00	589933.7021	1500184.5626
L	18+25.00	-78.30	589892.4008	1500201.6523
L	18+50.00	135.00	589704.8632	1500306.3073
L	18+60.00	147.00	589697.5984	1500320.1356
L	18+74.00	135.00	589714.0394	1500328.4838
L	22+63.00	-151.00	590127.0403	1500578.5783
L	22+63.00	-160.00	590135.3565	1500575.1372
L	22+84.00	-153.00	590136.9176	1500597.2180
L	22+84.00	-148.00	590132.2975	1500599.1297
L	23+73.00	104.00	589933.4726	1500777.7177
L	24+76.00	-67.50	590131.3234	1500807.3203
L	24+76.00	-115.00	590175.2144	1500789.1590
L	25+13.00	82.00	590007.3289	1500898.6691
L	25+13.00	91.00	589999.0127	1500902.1102
L	25+82.00	136.00	589983.8133	1500983.0730
L	25+82.00	149.00	589971.8011	1500988.0435
L	26+01.00	136.00	589991.0778	1501000.6294
L	26+01.00	148.00	589979.9896	1501005.2175
L	26+53.00	79.00	590063.6288	1501026.8851
L	26+75.00	65.50	590084.5146	1501042.0519
L	29+52.00	60.11	590200.2032	1501297.7600
L	29+53.00	88.00	590175.5671	1501310.8811
L	29+70.00	60.06	590208.4101	1501314.3737
L	29+70.00	85.00	590186.0736	1501325.4632

## PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
SRVRD	11+04.00	-43.00	589990.4562	1500085.2939
SRVRD	11+23.00	-50.00	590003.1734	1500102.6643
SRVRD	11+27.00	17.00	589939.9870	1500125.3194
SRVRD	11+47.00	10.00	589951.8652	1500142.3905
SRVRD	18+55.00	-48.00	589602.5487	1500469.0106
SRVRD	18+61.00	111.00	589661.4909	1500321.2174
SRVRD	18+75.00	-50.00	589583.4538	1500462.7349
SRVRD	18+90.00	105.00	589632.5471	1500314.9518

### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5123-1" WITH NAD 83/2001 STATE PLANE GRID COORDINATES OF NORTHING: 589217.621(ft) EASTING: 1498613.652(ft) ELEVATION: 679.06(ft). THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998740. THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5123-1" TO -L- STATION 10+00.00 IS N 71° 27' 27" E 902.47'. ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES. VERTICAL DATUM USED IS NAVD 88.

### NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: [HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION](https://connect.ncdot.gov/resources/location). THE FILES TO BE FOUND ARE AS FOLLOWS:  
B5123\_LS\_CONTROL.TXT  
B5123\_LS\_LOCAL.TXT
2. SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

8/17/99

REVISIONS

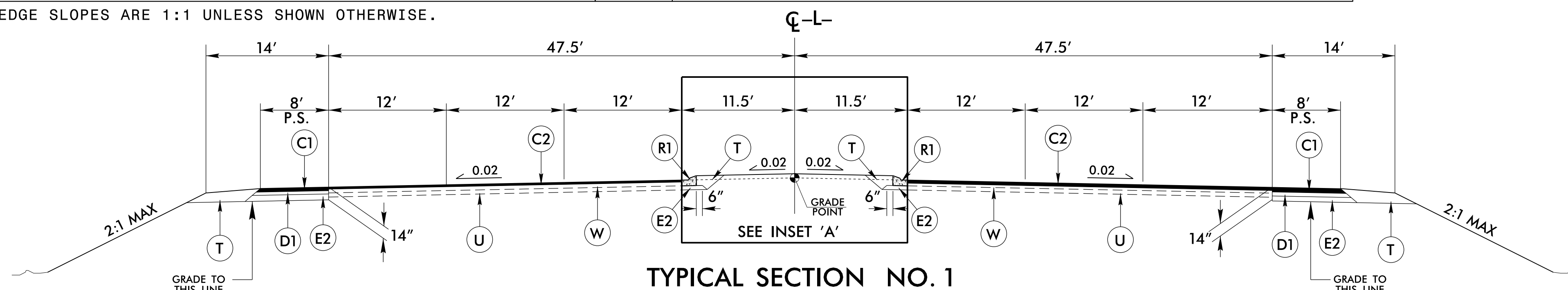
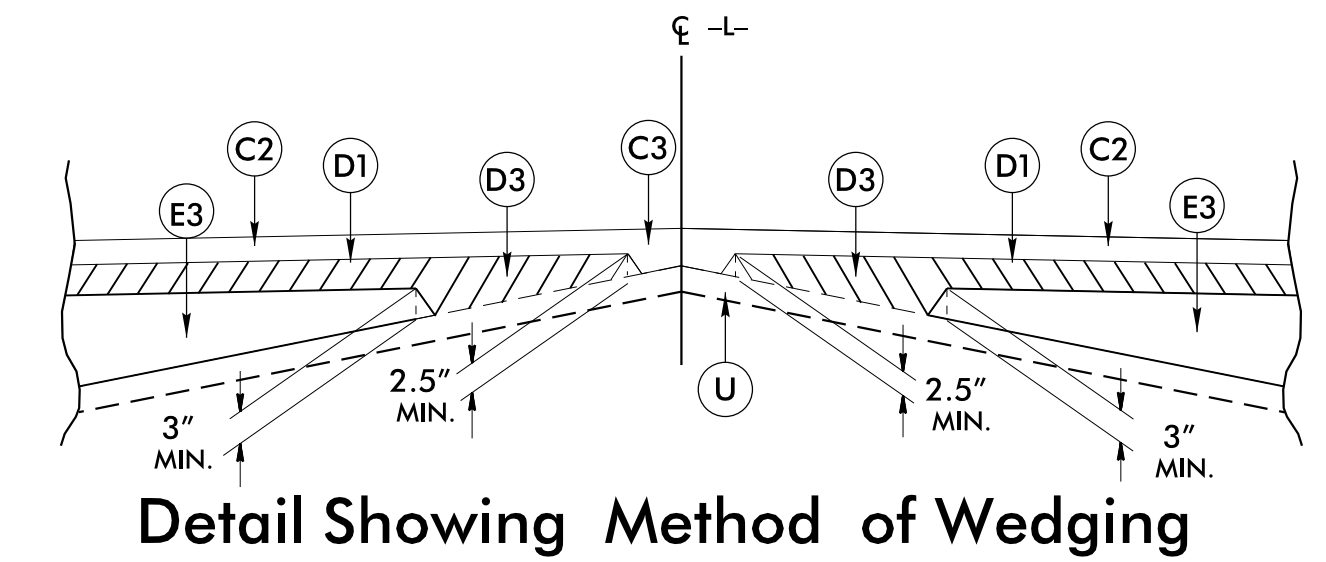
# PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	PROP. 6" AGGREGATE BASE COURSE.
C2	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YARD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	R1	1'-6" CONCRETE CURB AND GUTTER.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R2	2'-6" CONCRETE CURB AND GUTTER.
D2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R3	CONCRETE SHOULDER BERM GUTTER
D3	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.	R4	5" CONCRETE MONOLITHIC ISLAND.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	S	4" CONCRETE MULTIUSE PATH.
E2	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	T	EARTH MATERIAL.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.	U	EXISTING PAVEMENT.
J1	PROP. 8" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

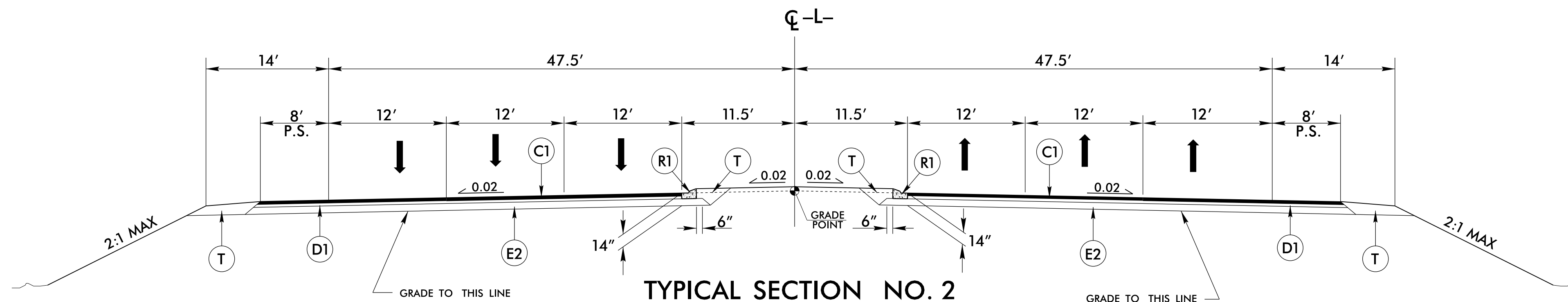
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO. B-5123	SHEET NO. 2A-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



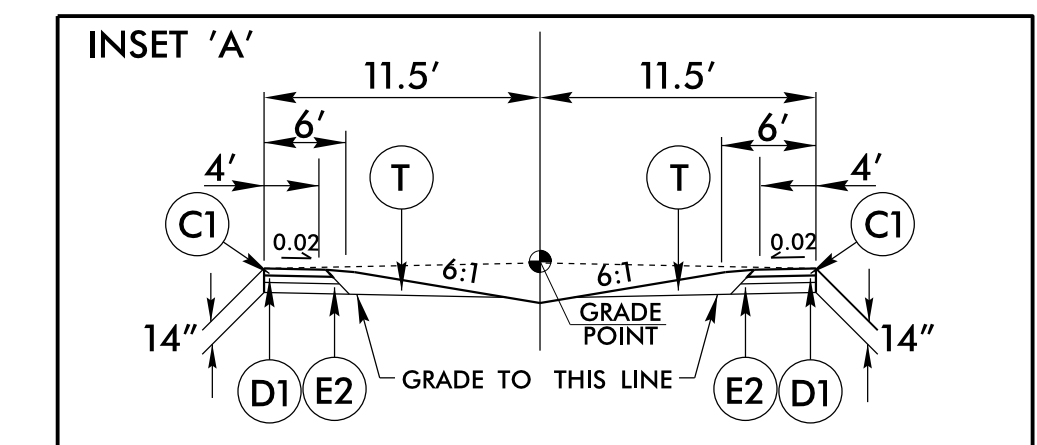
TYPICAL SECTION NO. 1

\* TRANSITION FROM EXISTING TO TYPICAL SECTION NO.1 FROM -L- STA. 13+00.00 TO -L- STA. 13+79.28  
-L- STA. 13+79.28 TO STA. 15+50.00



TYPICAL SECTION NO. 2

-L- STA. 15+50.00 TO -L- STA. 16+50.00



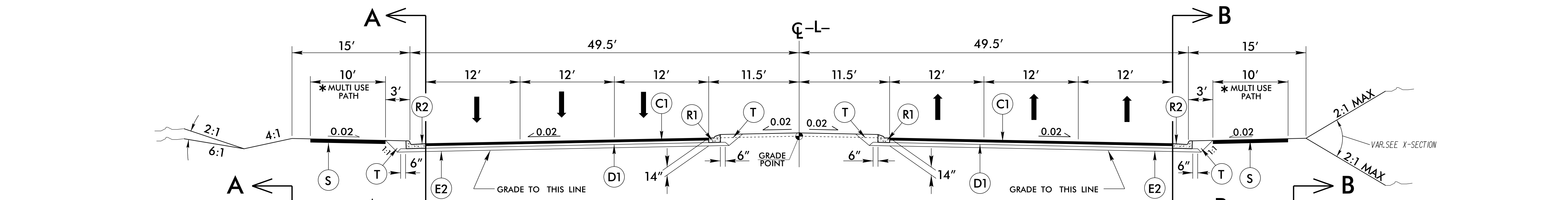
USE INSET 'A' IN CONJUNCTION WITH TYP. SECT. NO. 1  
\*-L- STA. 13+00.00 TO -L- STA. 13+79.28 (MEDIAN TRANSITION)

04-FEB-2016 12:32 P.-5123-Rdy.-typ.dgn  
9:58 AM C:\PROJECTS\B-5123

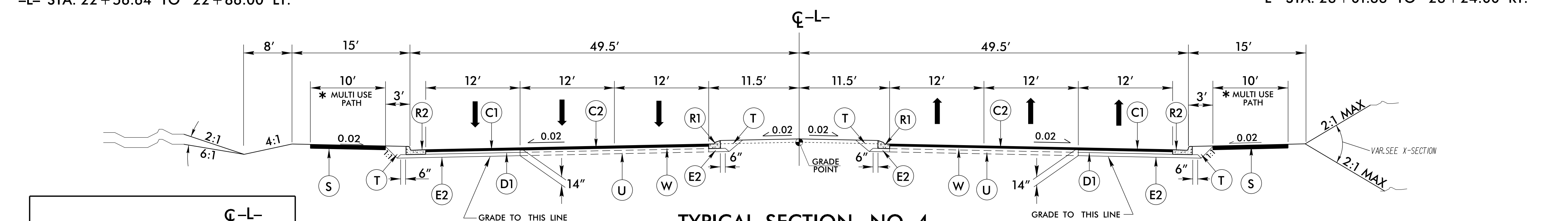
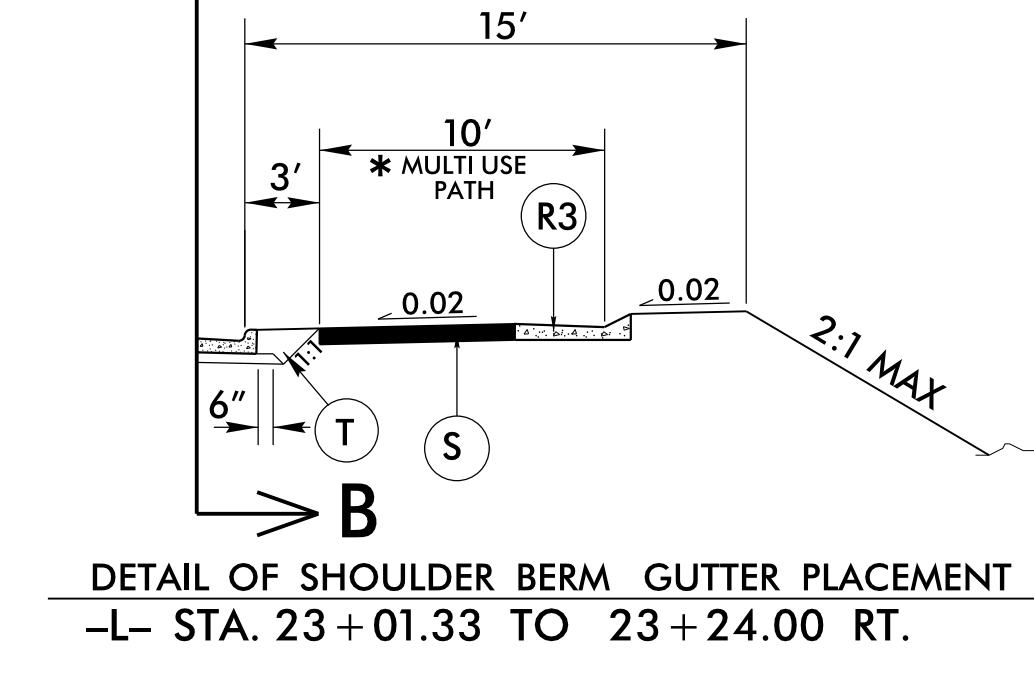
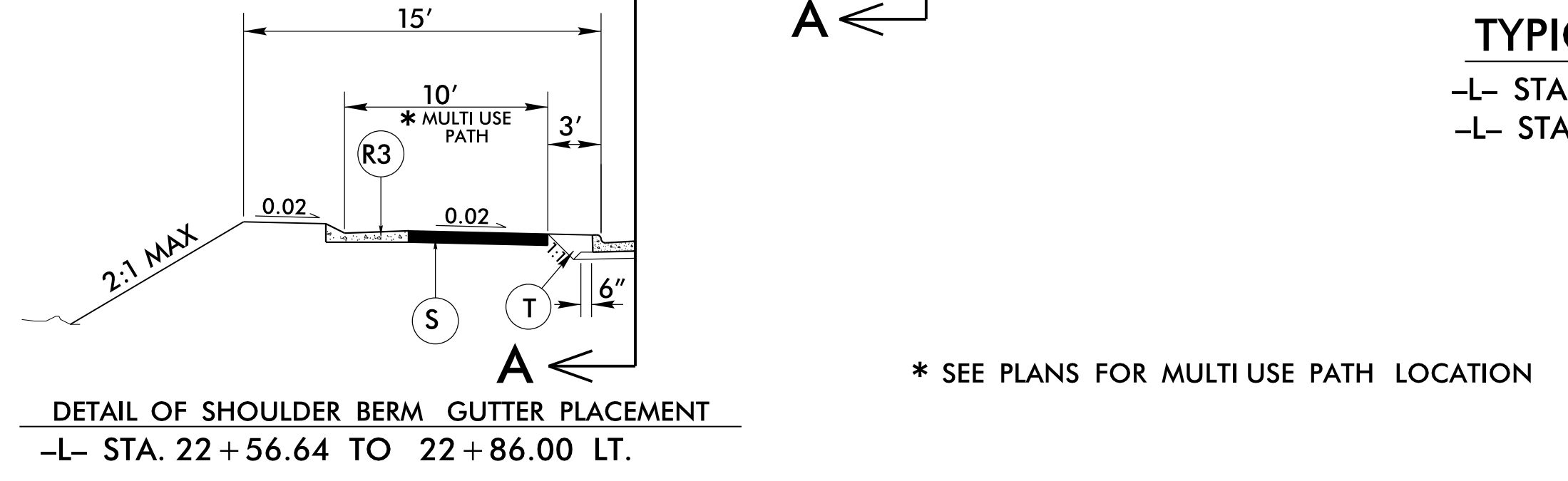
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

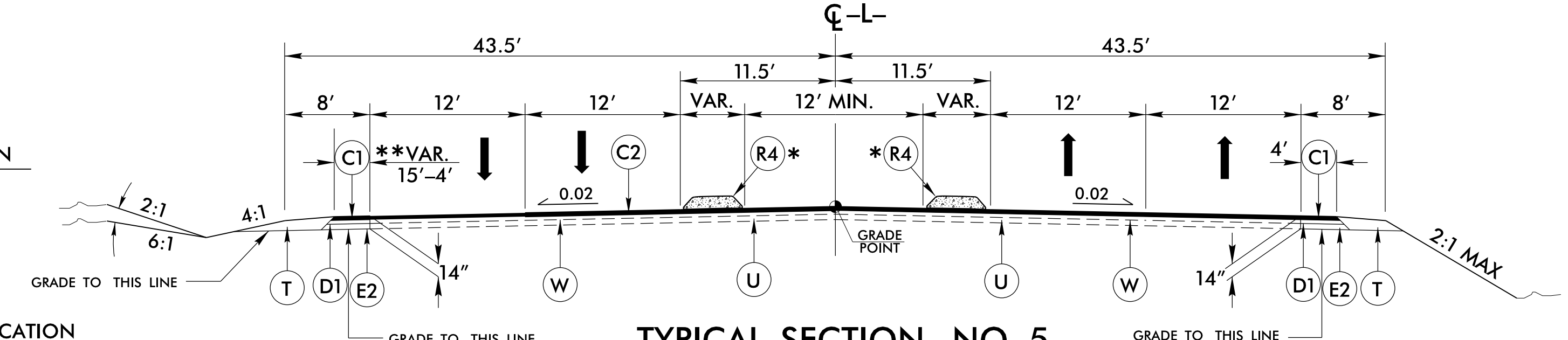
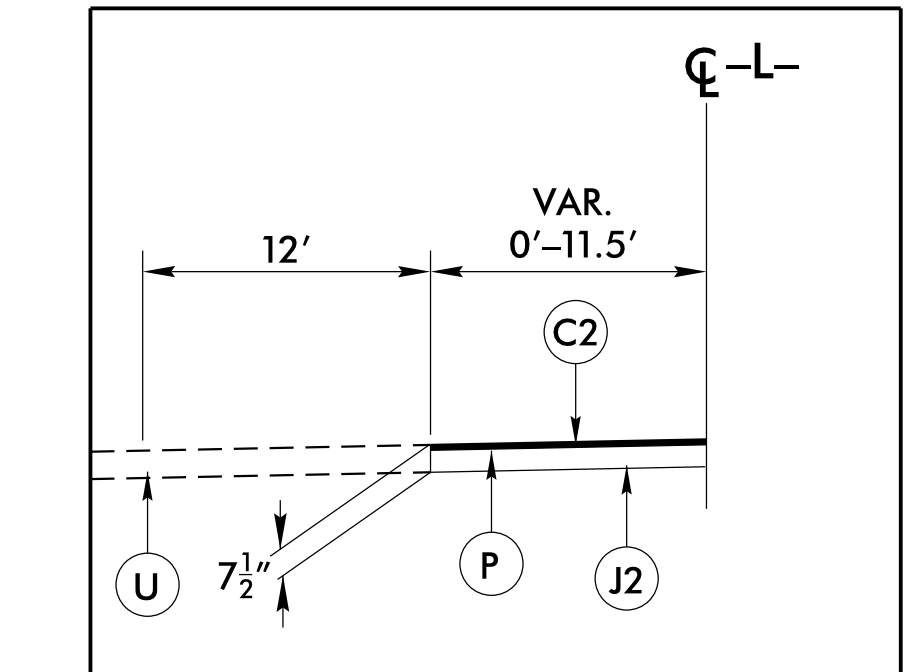
C1	3" S9.5B
C2	1 1/2" S9.5B
C3	VAR. S9.5B
D1	4" I19.0B
D2	2 1/2" I19.0B
D3	VAR. I19.0B
E1	5" B25.0B
E2	7" B25.0B
E3	VAR. B25.0B
J1	8" ABC
J2	6" ABC
P	PRIME COAT
R1	1"-6" C & G
R2	2'-6" C & G
R3	CONC. SHOULDER BERM GUTTER
R4	5" CONC. ISLAND
S	4" CONC. MUTLIUSE PATH
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING



**TYPICAL SECTION NO. 3**  
 -L- STA. 16+50.00 TO -L- STA. 20+34.11 (BEGIN BRIDGE)  
 -L- STA. 22+54.11 (END BRIDGE) TO -L- STA. 25+50.00

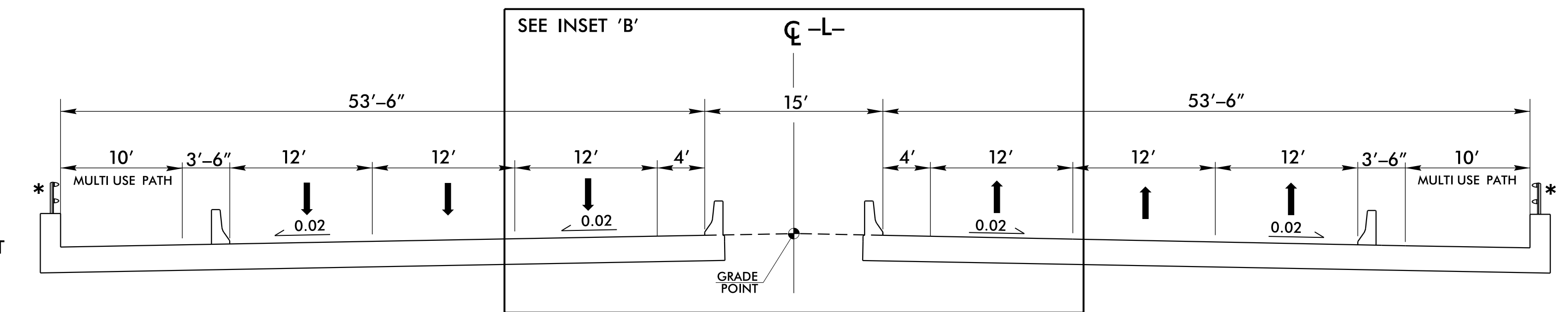


**TYPICAL SECTION NO. 4**  
 -L- STA. 25+50.00 TO -L- STA. 26+97.25

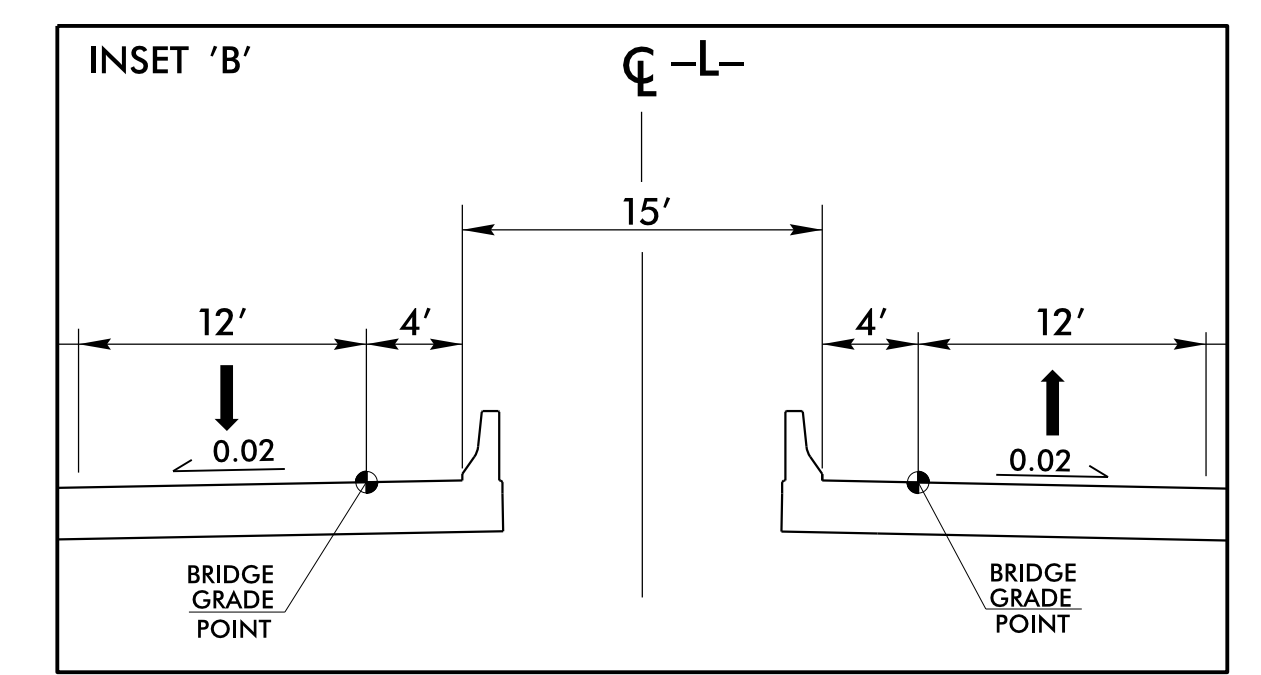


**TYPICAL SECTION NO. 5**  
 -L- STA. 26+97.25 TO -L- STA. 30+00.00

\* SEE PLANS FOR ISLAND LOCATION  
 \*\* SEE PLANS FOR PAVED SHOULDER TRANSITION



**BRIDGE SECTION**  
 -L- STA. 20+34.11 (BEGIN BRIDGE) TO  
 -L- STA. 22+54.11 (END BRIDGE)



GRADE POINT SHOWN AT MEDIAN EDGE OF TRAVEL  
 SEE SHEET 6 FOR GRADE INSET  
 -L- STA. 20+34.11 (BEGIN BRIDGE) TO  
 -L- STA. 22+54.11 (END BRIDGE)

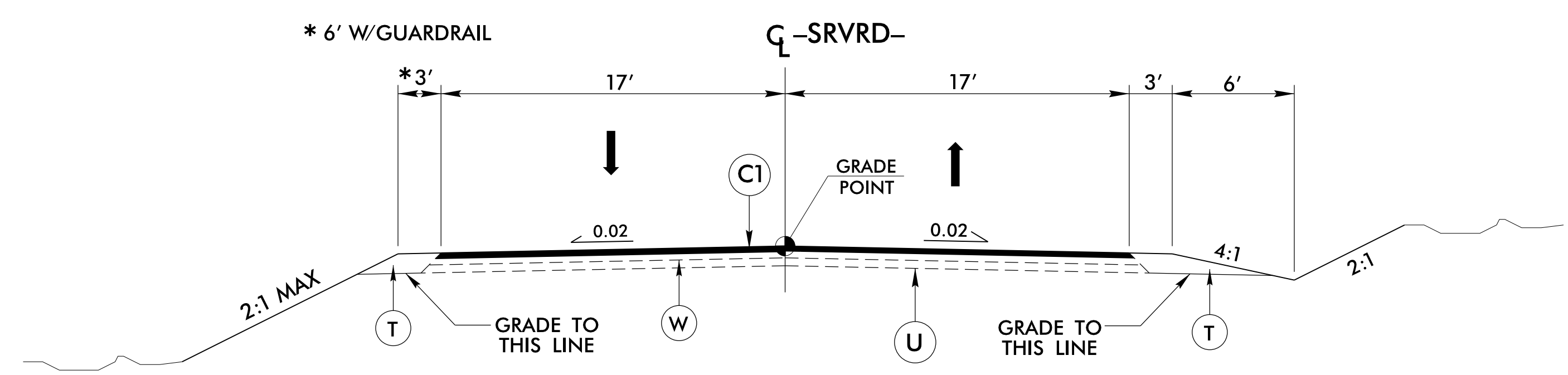
REVISIONS

8/17/99

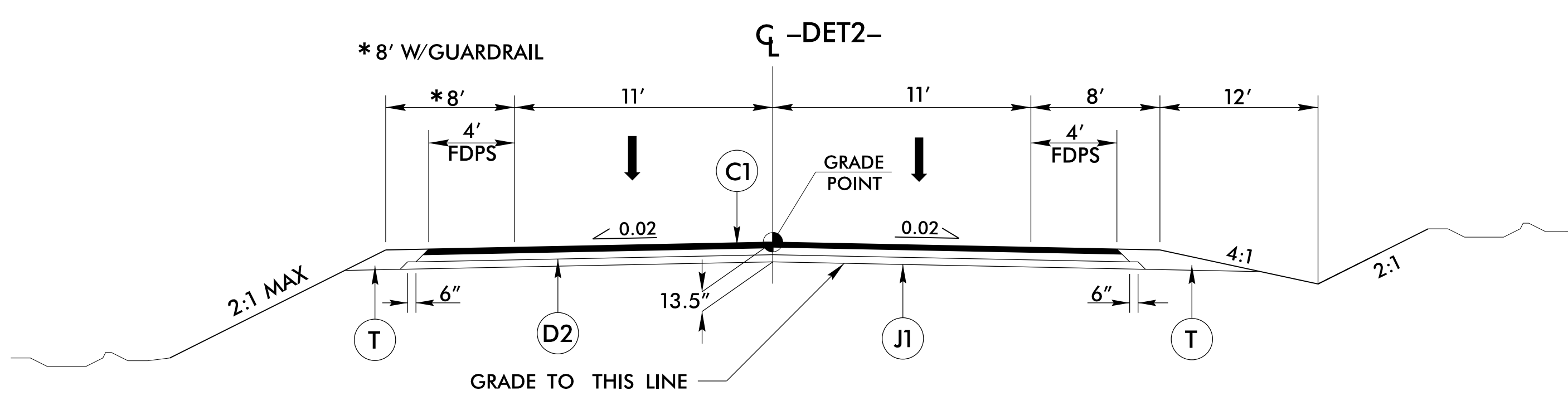
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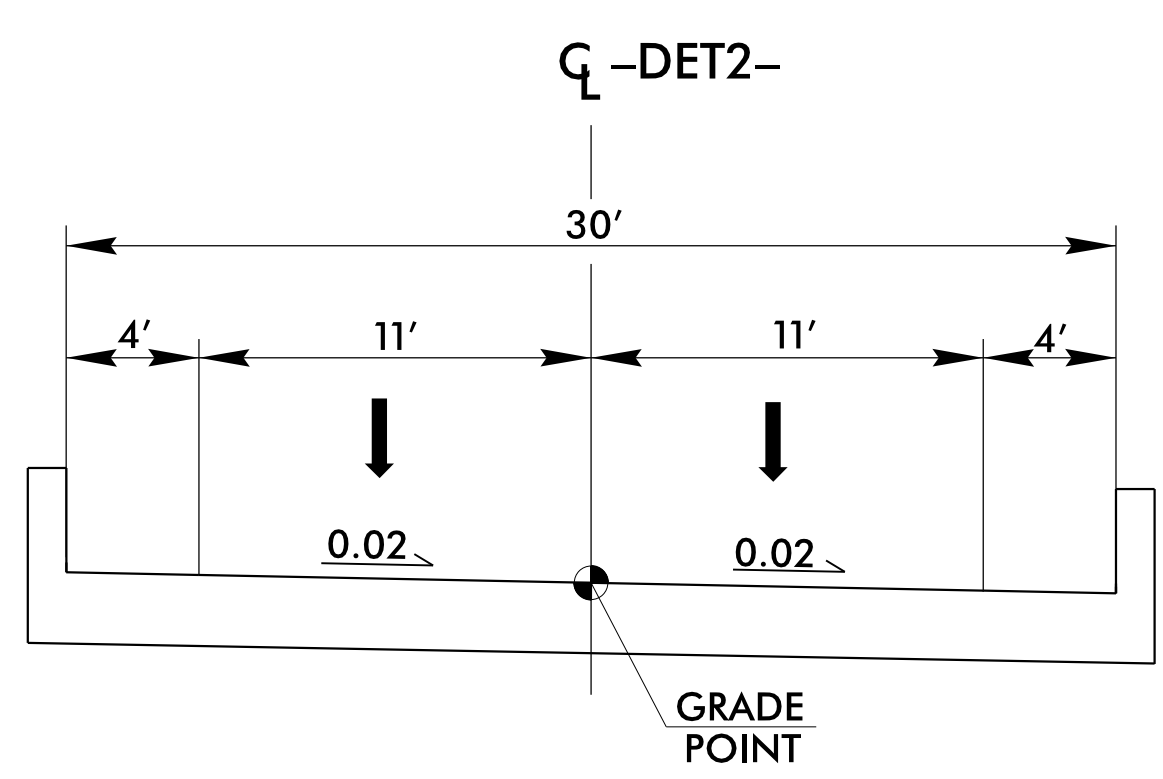
REVISIONS



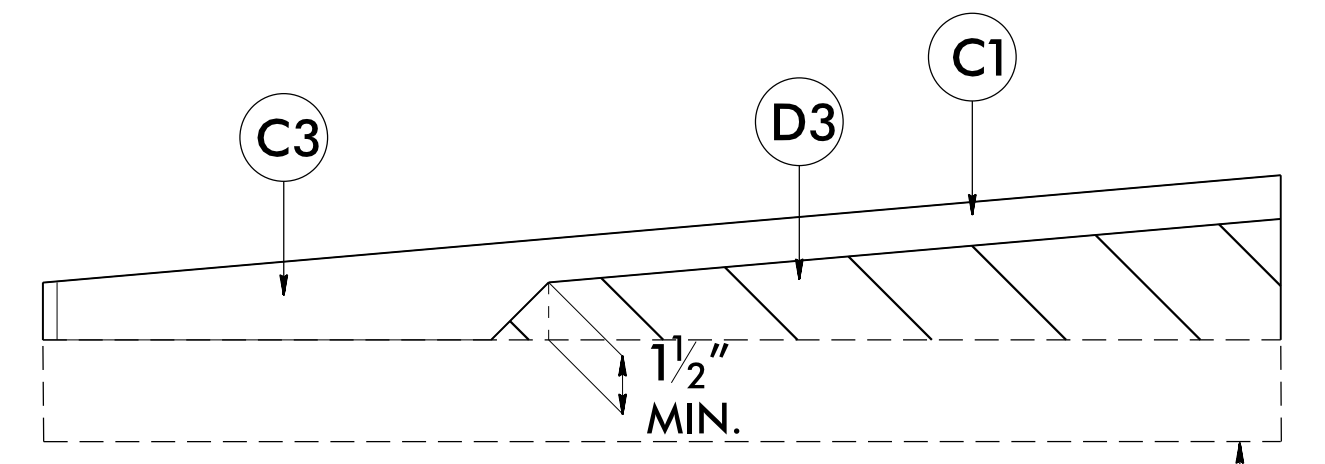
**TYPICAL SECTION NO. 6**  
 -SRVRD- STA. 11+14.00 TO -SRVRD- STA. 17+25.00



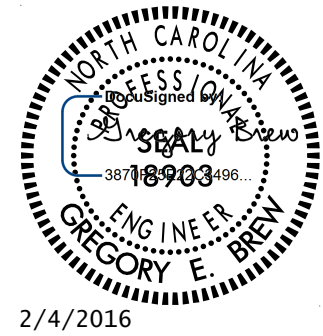
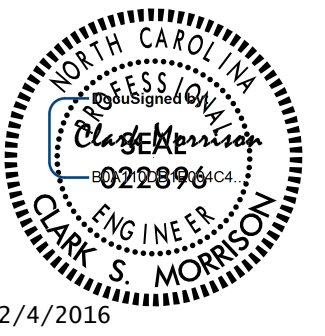
**TYPICAL SECTION NO. 7**  
 -DET2- STA. 11+87.26 TO -DET2- STA. 14+33.00 (BEGIN BRIDGE)  
 -DET2- STA. 17+23.00 (END BRIDGE) TO -DET2- STA. 20+32.72



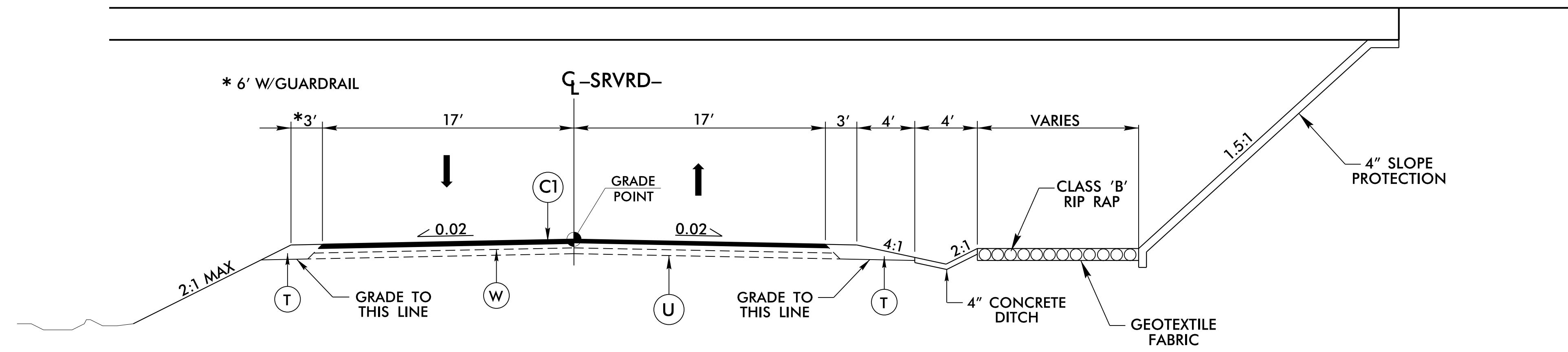
**DETOUR BRIDGE SECTION**  
 -DET2- STA. 14+33.00 (BEGIN BRIDGE) TO  
 -DET2- STA. 17+23.00 (END BRIDGE)



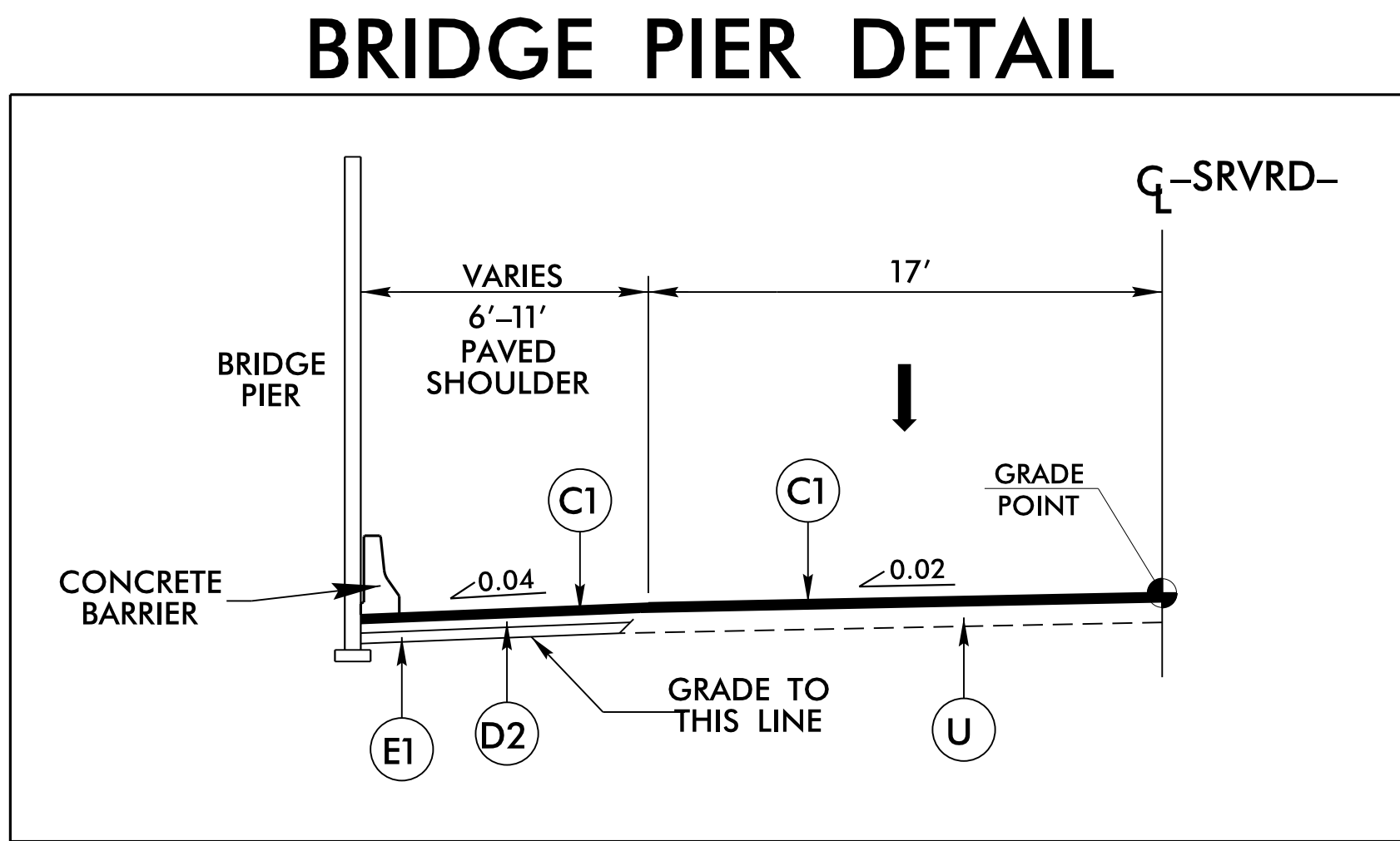
**Detail Showing Method of Wedging U**  
 USE WITH TYPICAL SECTION NO. 6

PROJECT REFERENCE NO. B-5123	SHEET NO. 2A-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER  GREGORY E. MORRIS 2/4/2016	HYDRAULICS ENGINEER  CLARK S. MORRISON 2/4/2016
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	1 1/2" S9.5B
C3	VAR. S9.5B
D1	4" I19.0B
D2	2 1/2" I19.0B
D3	VAR. I19.0B
E1	5" B25.0B
E2	7" B25.0B
E3	VAR. B25.0B
J1	8" ABC
J2	6" ABC
P	PRIME COAT
R1	1"-6" C & G
R2	2'-6" C & G
R3	CONC. SHOULDER BERM GUTTER
R4	5" CONC. ISLAND
S	4" CONC. MUTLIUSE PATH
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

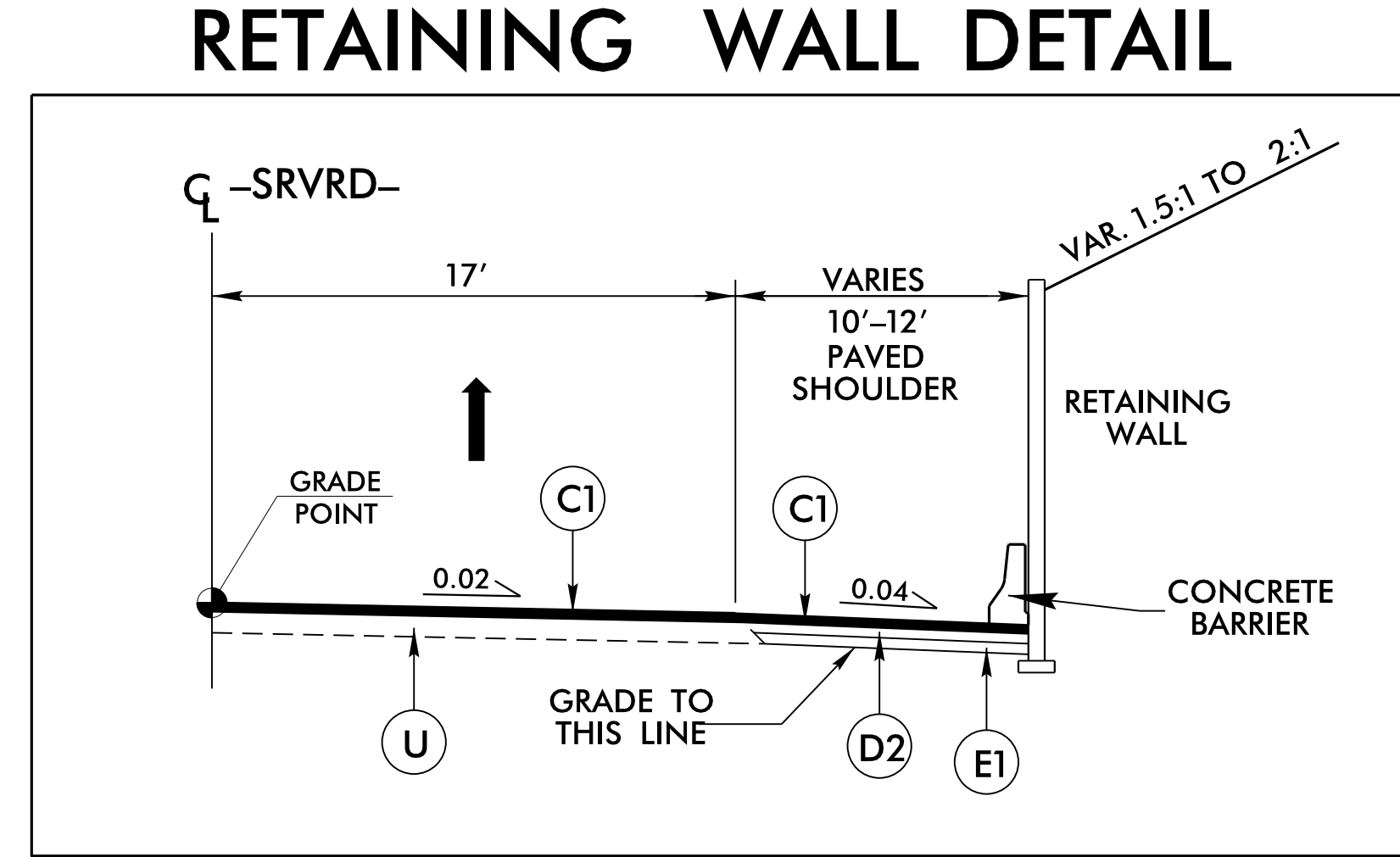
PROJECT REFERENCE NO. B-5123	SHEET NO. 2A-4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER SEAL 025477 Derek F. Dunbar 3/2/2016	HYDRAULICS ENGINEER SEAL 022896 Clark Morrison 3/2/2016
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	1½" S9.5B
C3	VAR. S9.5B
D1	4" I19.0B
D2	2½" I19.0B
D3	VAR. I19.0B
E1	5" B25.0B
E2	7" B25.0B
E3	VAR. B25.0B
J1	8" ABC
J2	6" ABC
P	PRIME COAT
R1	1"-6" C & G
R2	2'-6" C & G
R3	CONC. SHOULDER BERM GUTTER
R4	5" CONC. ISLAND
S	4" CONC. MUTLIUSE PATH
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING



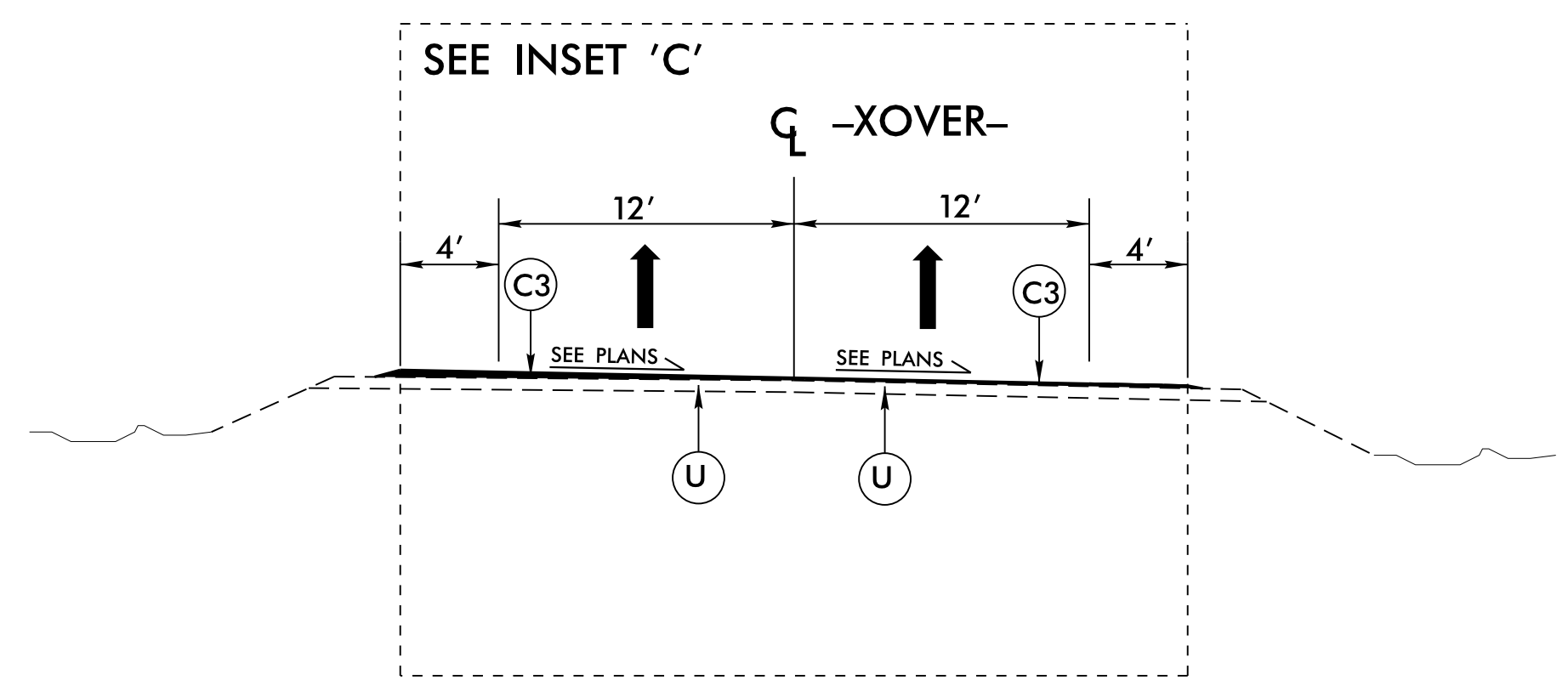
**DETAIL OF RIP RAP UNDER BRIDGE**  
-SRVRD- STA. 14+18.00 TO -SRVRD- STA. 15+90.00 RT.  
(USE WITH TYPICAL SECTION NO. 6)



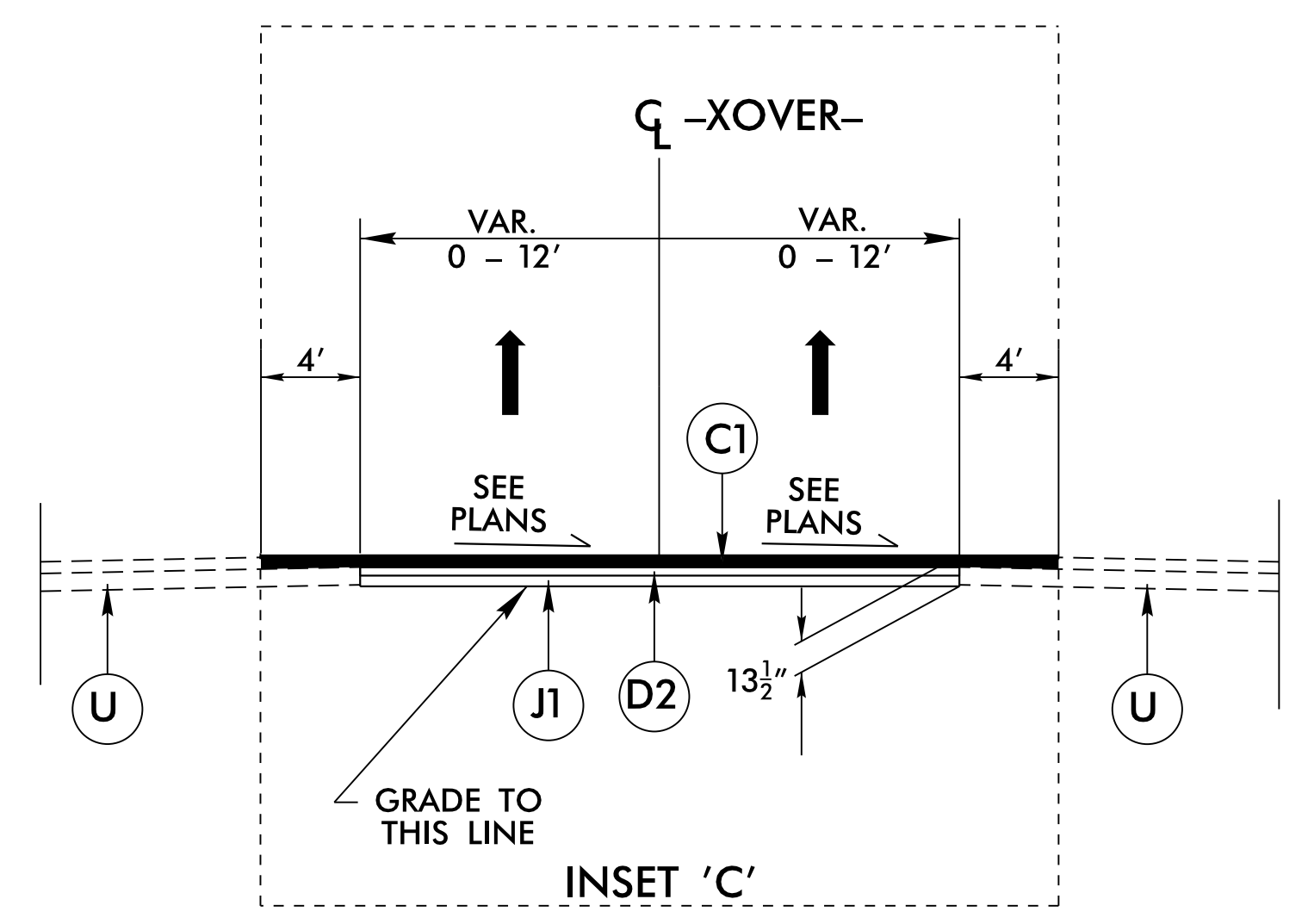
**BRIDGE PIER DETAIL**  
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 6  
-SRVRD- STA. 14+73.20 LT TO -SRVRD- STA. 15+26.17 LT



**RETAINING WALL DETAIL**  
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 6  
-SRVRD- STA. 13+06.78 RT TO -SRVRD- STA. 14+11.13 RT



**TEMPORARY MEDIAN CROSSOVER**  
-L- STA. 14+00.00 TO -L- STA. 18+30.44  
-L- STA. 23+52.32 TO -L- STA. 28+38.37



USE INSET 'C' IN CONJUNCTION  
WITH TEMPORARY MEDIAN CROSSOVER

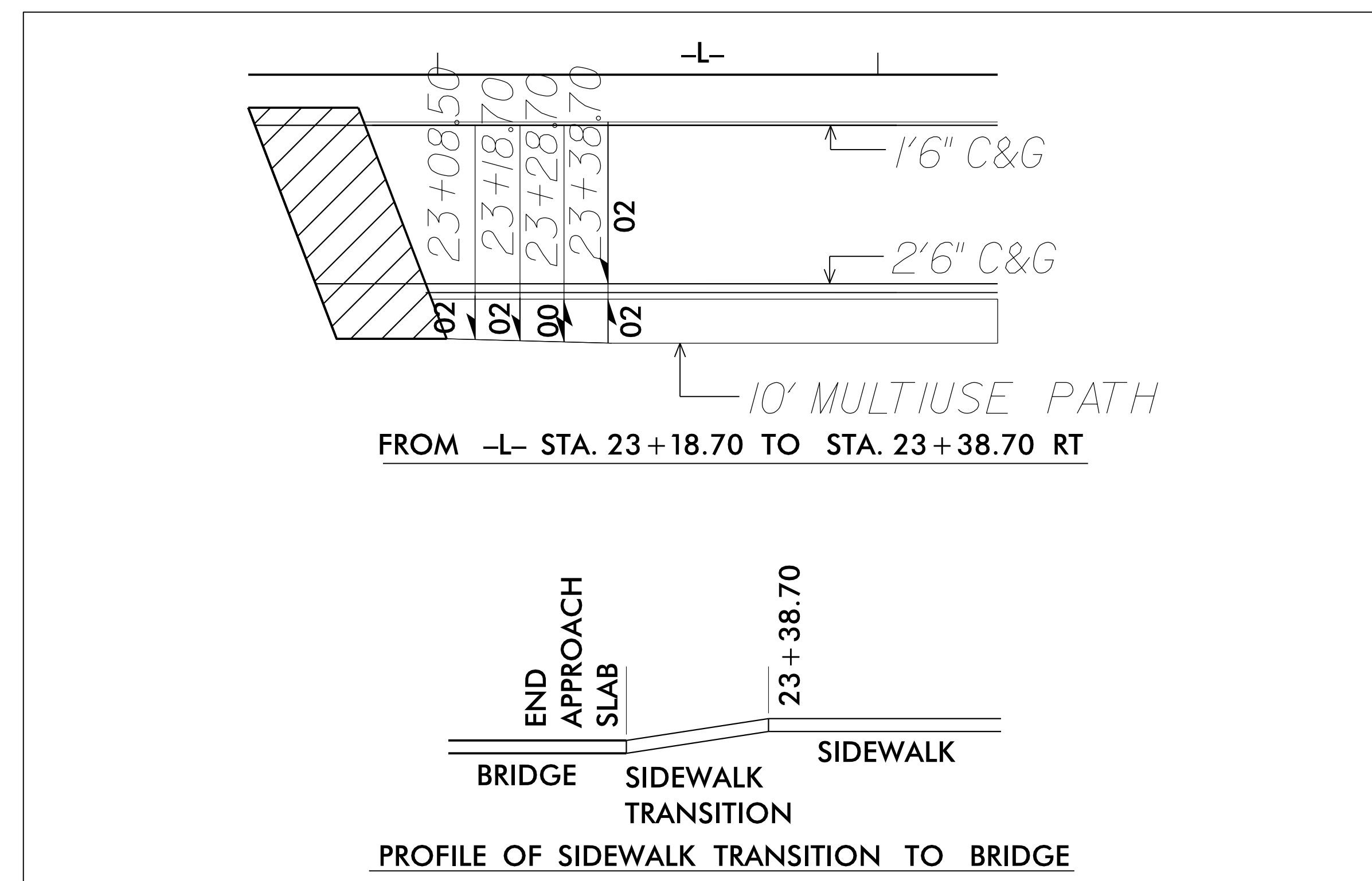
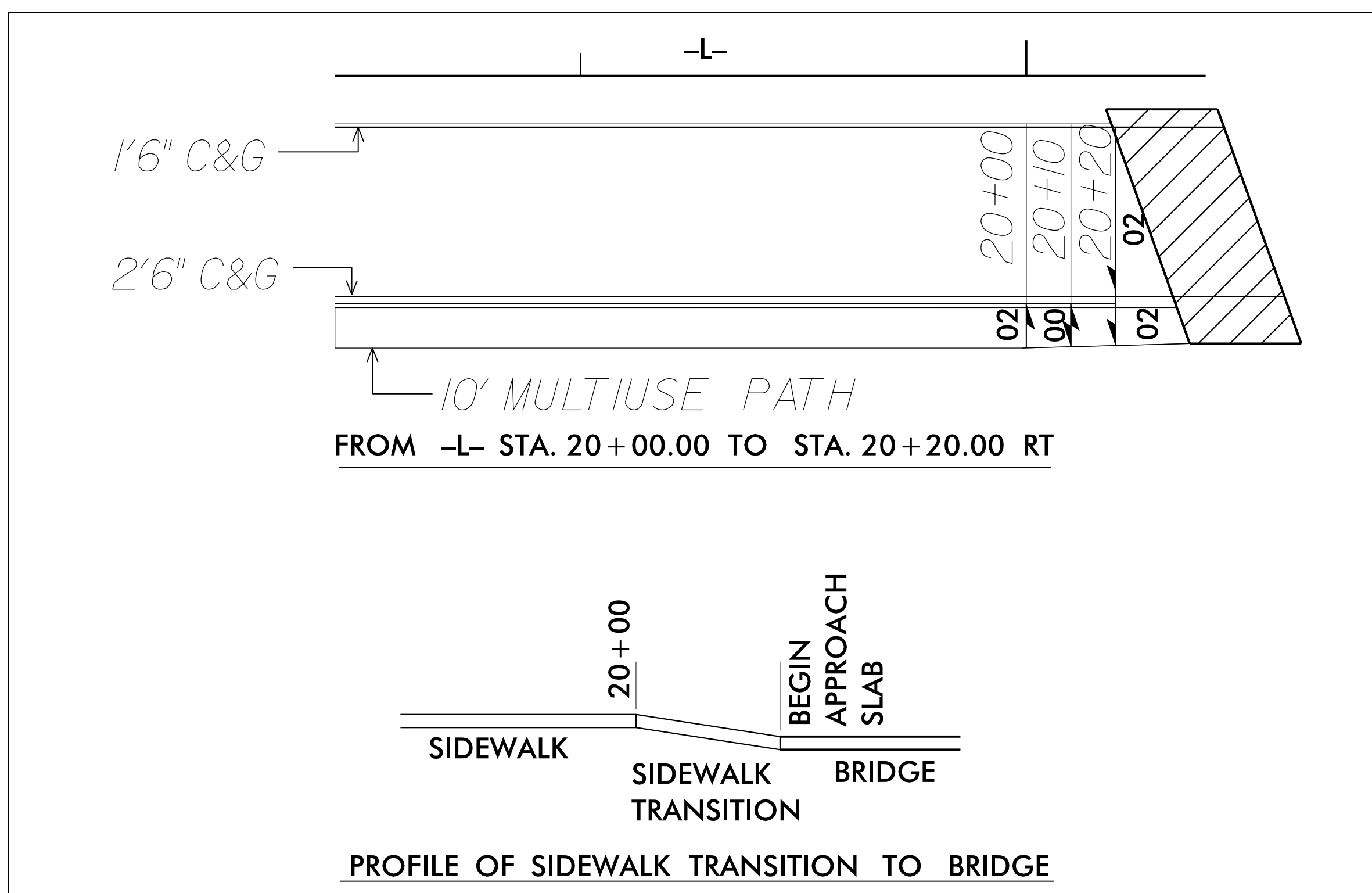
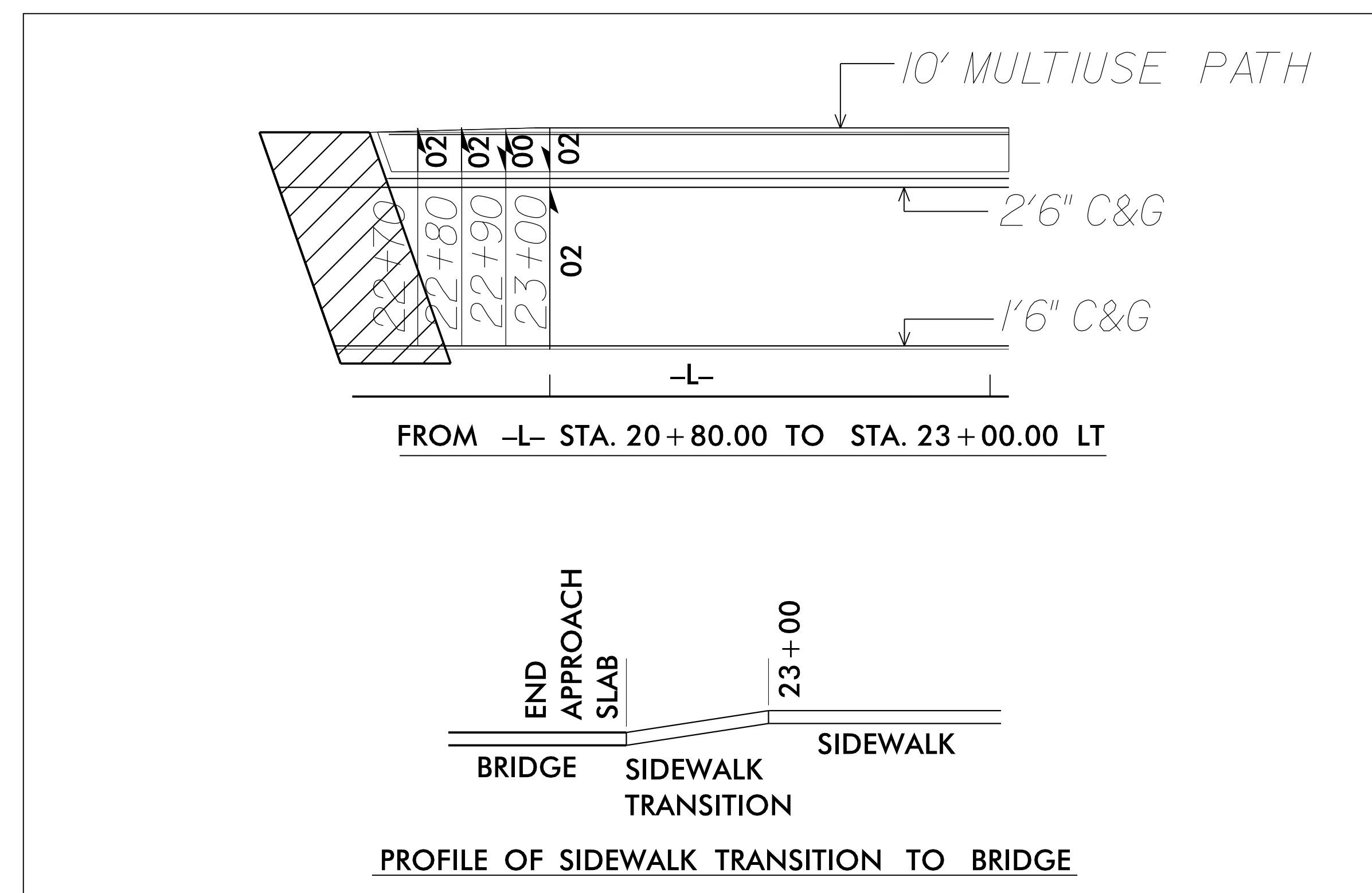
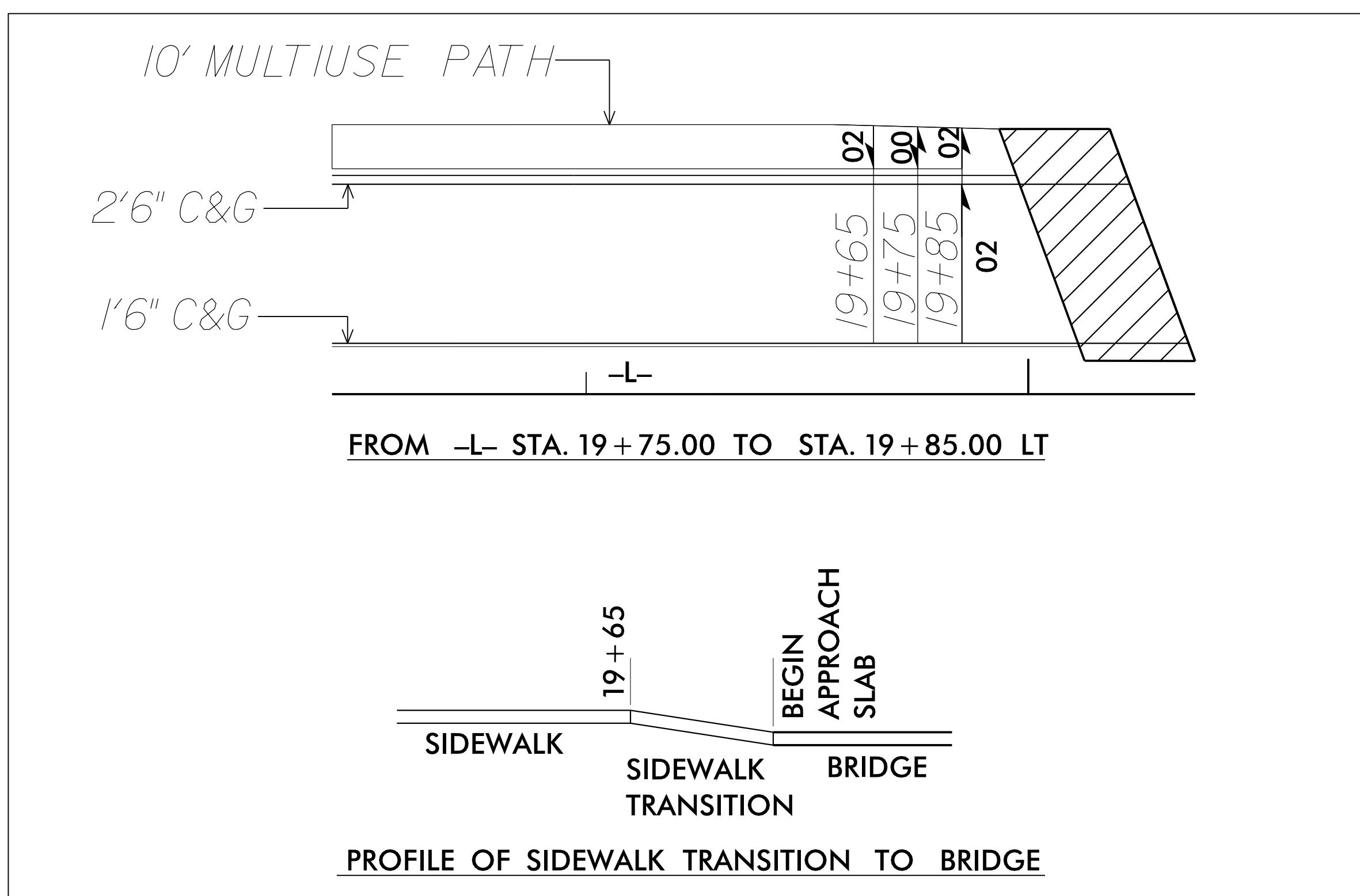
REVISIONS

8/17/99

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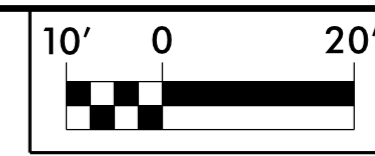
PROJECT REFERENCE NO. B-5123	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
2/3/2016	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

# CONCRETE MULTIPURPOSE PATH SLOPE TRANSITION DETAILS



5/14/99

# ISLAND DETAIL



SCALE

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2B-2

ROADWAY DESIGN ENGINEER

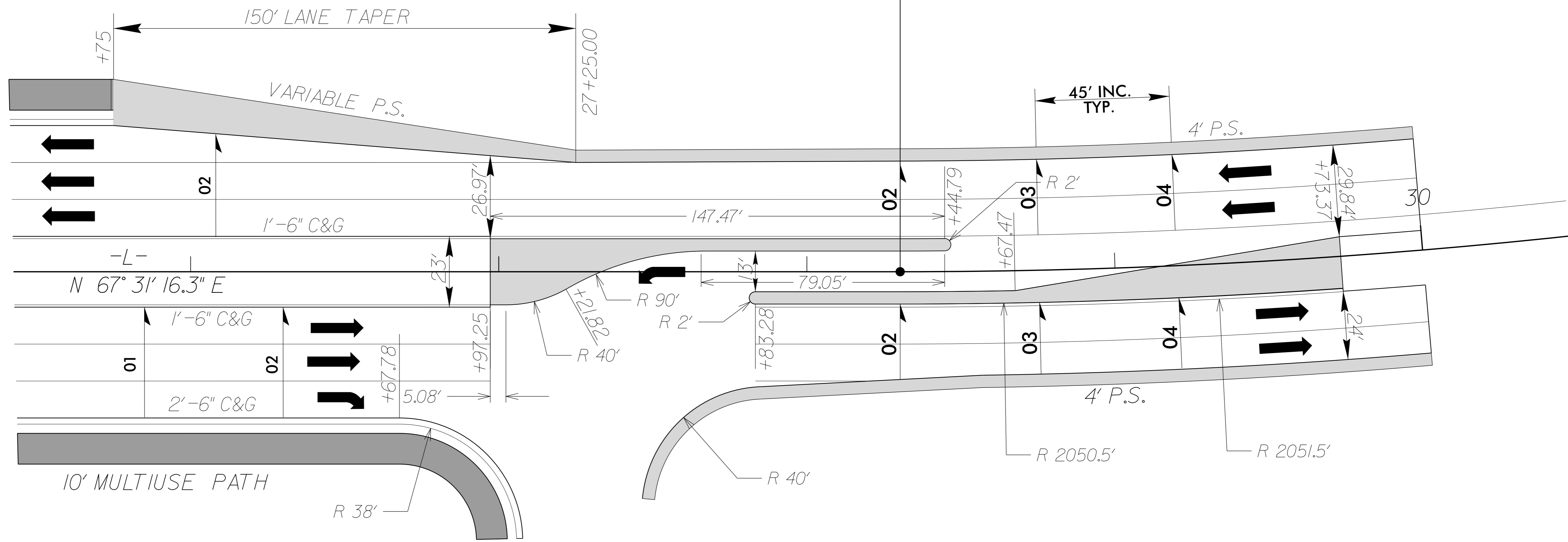
2/3/2016

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

SEE SHEET 5 FOR PLANS

NC GRID  
NAD 832001

-L- PC Sta. 28+30.27

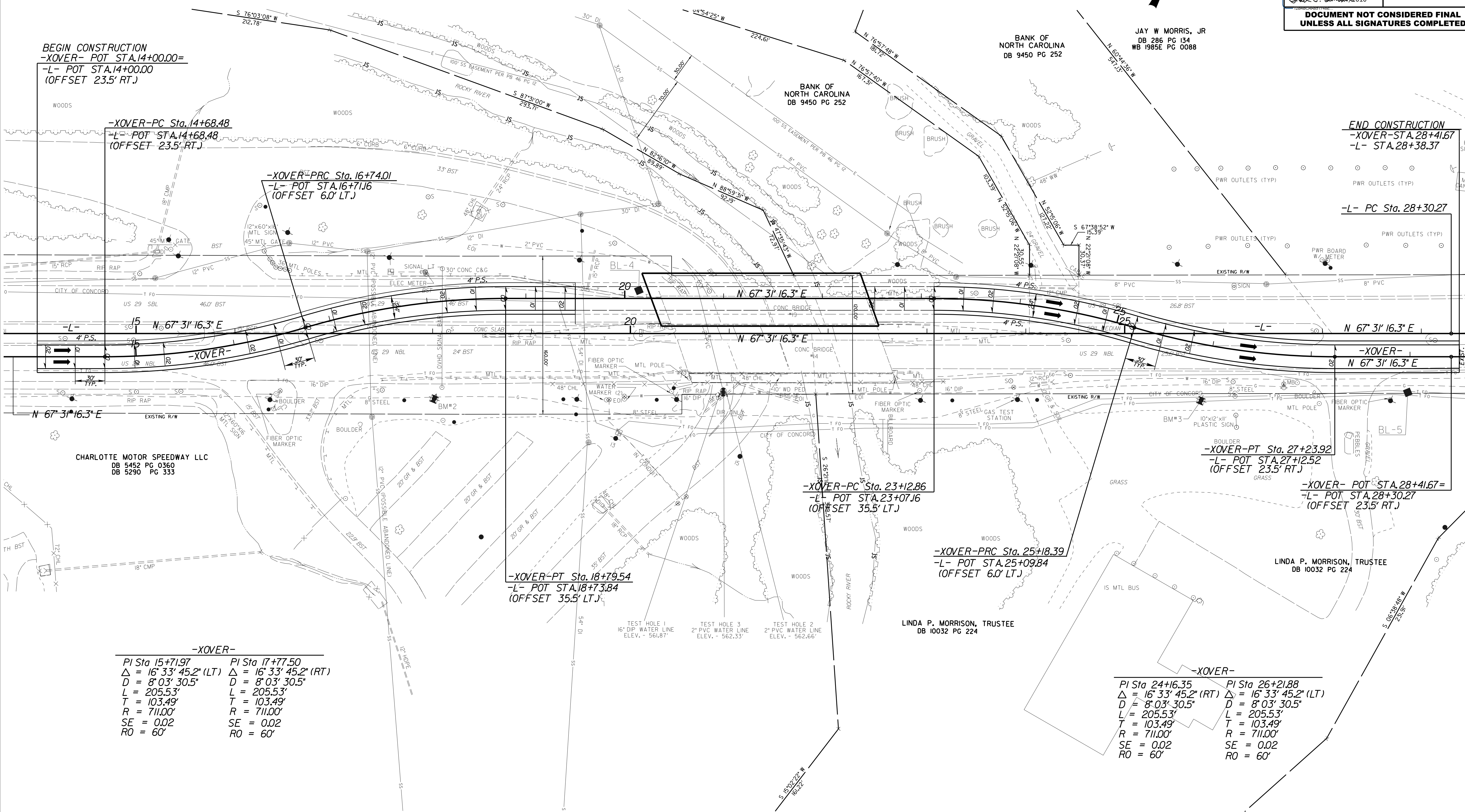
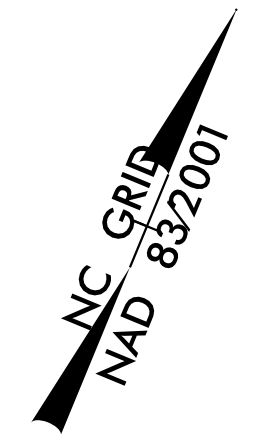


-L-

PI Sta 31+19.94  
 $\Delta = 16^\circ 09' 48.0''$  (LT)  
 $D = 2^\circ 48' 31.0''$   
 $L = 575.49'$   
 $T = 289.67'$   
 $R = 2,040.00'$   
 $SE = 0.04$

# \* CROSSOVER ALIGNMENT DETAIL

## CROSSOVER DESIGN SPEED = 45 MPH



-XOVER-

PI Sta 24+16.35	PI Sta 26+21.88
$\Delta = 16' 33' 45.2''$ (RT)	$\Delta = 16' 33' 45.2''$ (LT)
D = 8' 03' 30.5"	D = 8' 03' 30.5"
L = 205.53'	L = 205.53'
T = 103.49'	T = 103.49'
R = 711.00'	R = 711.00'
SE = 0.02	SE = 0.02
RO = 60'	RO = 60'

\* SEE TMP PLANS  
PHASE 3 DETOUR PATTERN

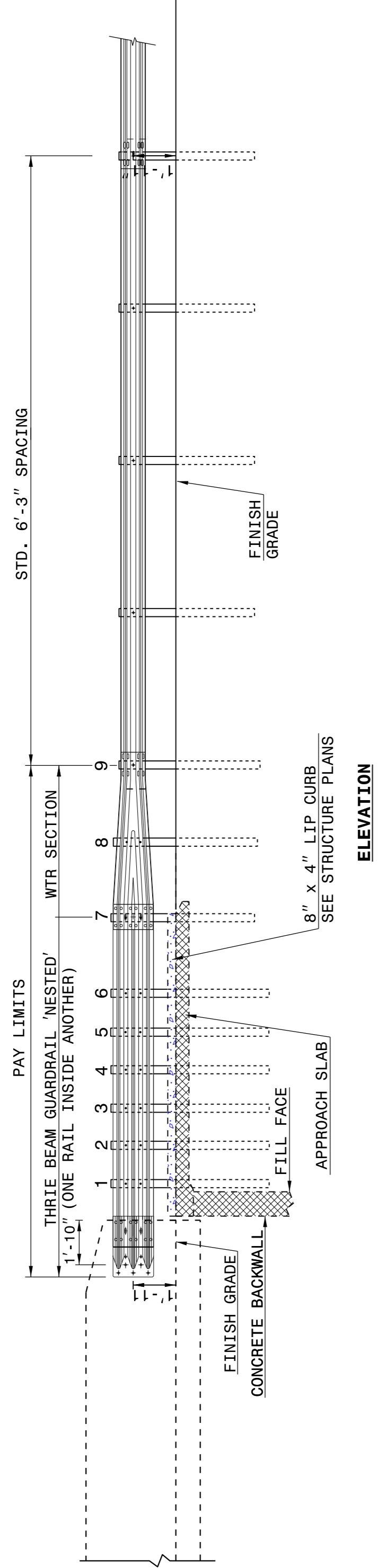
\$\$\$\$\$  
 C:\TEMP\UNRESOLVED\UNRESOLVED\UNRESOLVED\UNRESOLVED\UNRESOLVED  
 UNRESOLVED\UNRESOLVED\UNRESOLVED\UNRESOLVED  
 UNRESOLVED\UNRESOLVED\UNRESOLVED

STATE OF  
 NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

STATE OF  
 NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

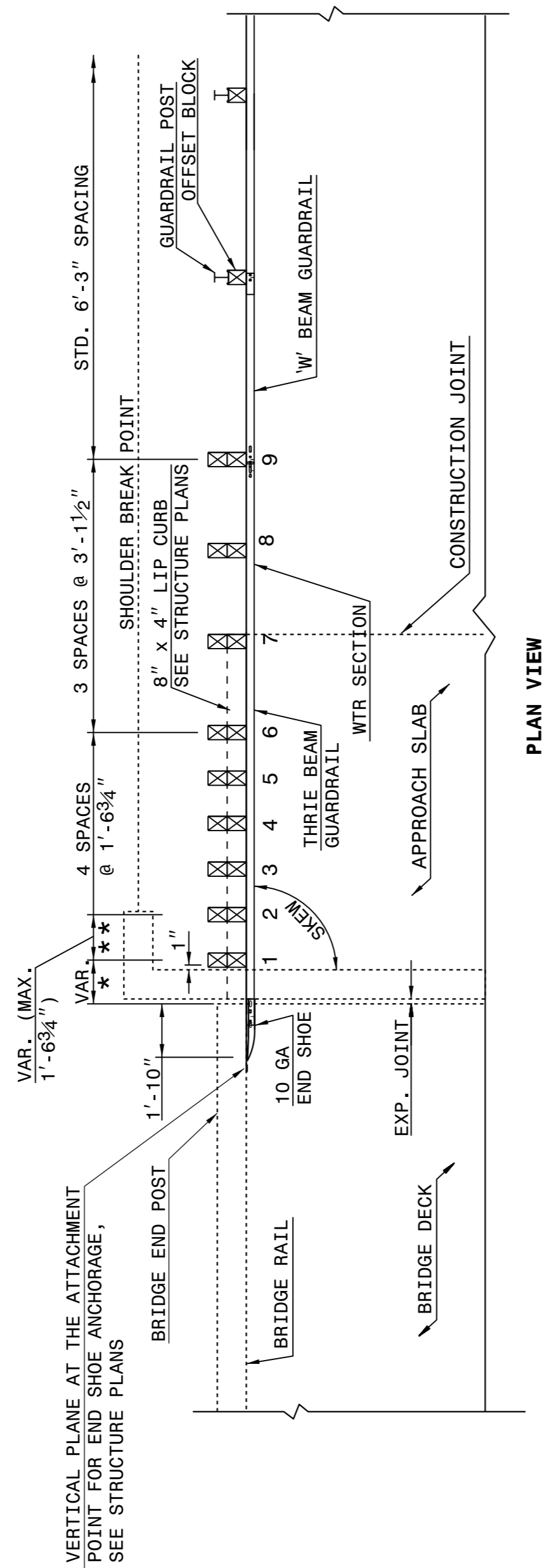
ENGLISH DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
 GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
 RAIL ON BRIDGE - SUB REGIONAL TIER

ENGLISH DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
 GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
 RAIL ON BRIDGE - SUB REGIONAL TIER



ELEVATION

- NOTE:**  
 \*\*POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.  
 \*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2". IF CONCRETE BACKWALL IS NOT PRESENT.  
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.  
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).  
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.  
 -SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

**GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
 RAIL ON BRIDGE - SUB REGIONAL TIER**

SHEET 2 OF 7  
**862d03**

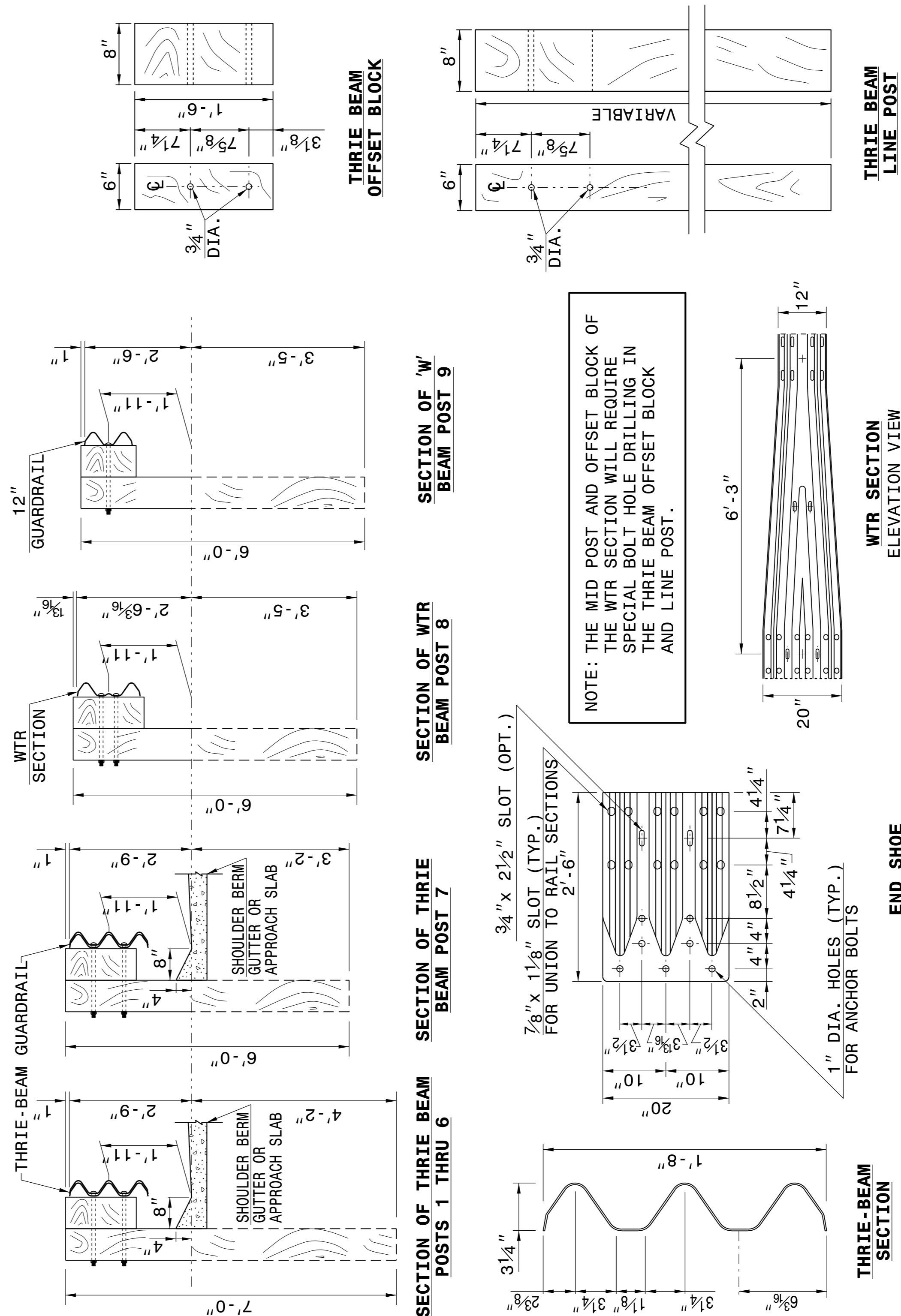
SHEET 2 OF 7  
**862d03**

STATE OF  
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 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

STATE OF  
 NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
 GUARDRAIL ANCHOR UNIT, TYPE III

ENGLISH DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
 GUARDRAIL ANCHOR UNIT, TYPE III



THRIE-BEAM SECTION

END SHOE

SECTION OF THRIE BEAM POSTS 1 THRU 6

SECTION OF WTR BEAM POST 8

SECTION OF 'W' BEAM POST 9

THRIE BEAM OFFSET BLOCK

THRIE BEAM LINE POST

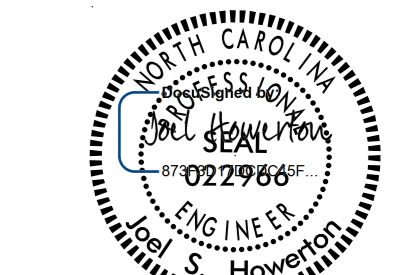
SHEET 3 OF 7  
**862d03**

SHEET 3 OF 7  
**862d03**

**CONTRACT STANDARDS  
 AND DEVELOPMENT UNIT**  
 Office 919-707-6950 FAX 919-250-4119

**SEE TITLE BLOCK**

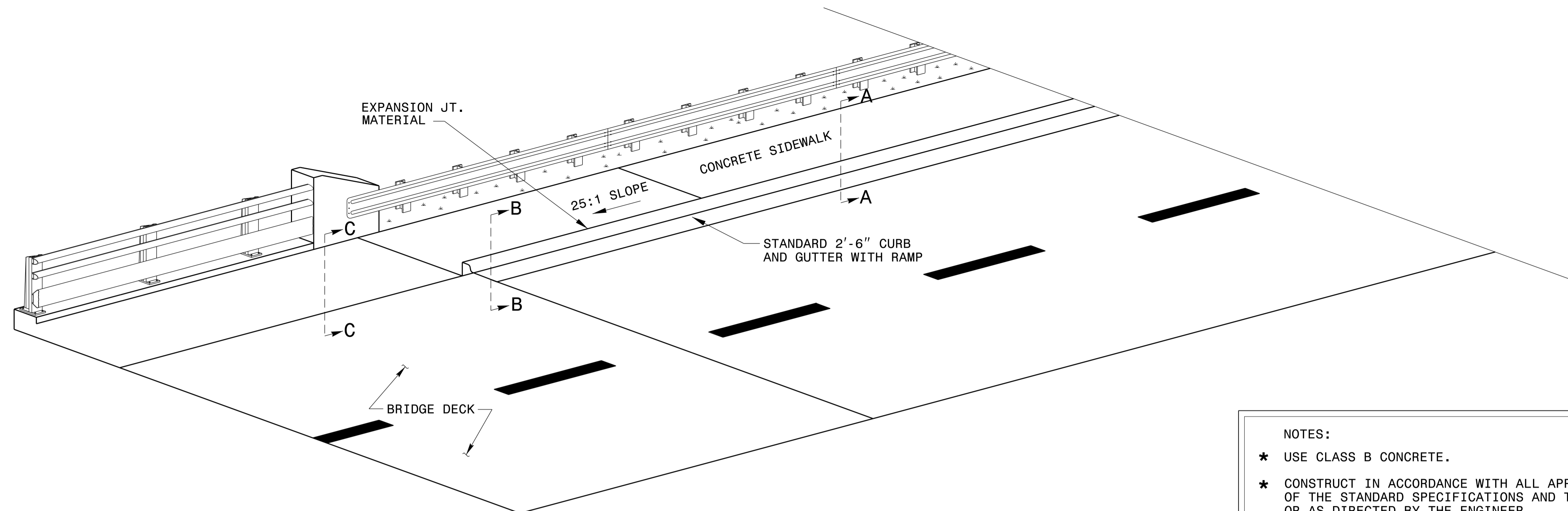
ORIGINAL BY: J. HOWERTON DATE: 06-22-12  
 MODIFIED BY: DATE:  
 CHECKED BY: DATE:  
 FILE SPEC.: DATE:



2/4/2016

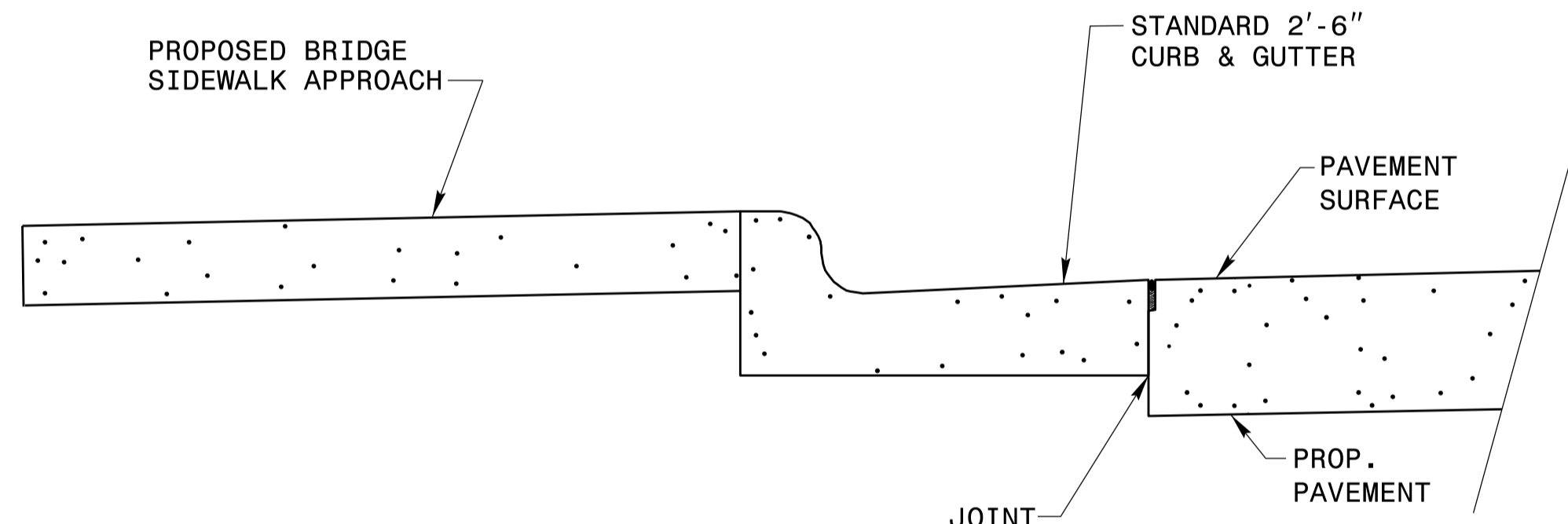
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED



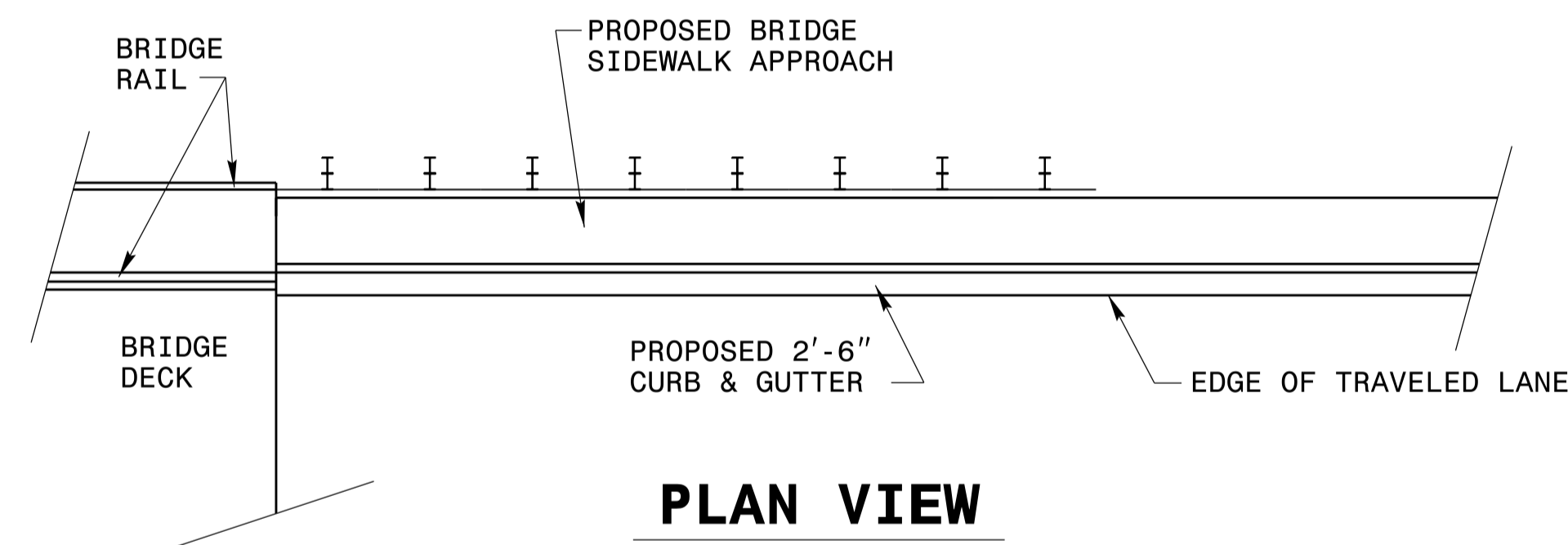


**DETAIL OF PROPOSED CONCRETE BRIDGE SIDEWALK APPROACH**

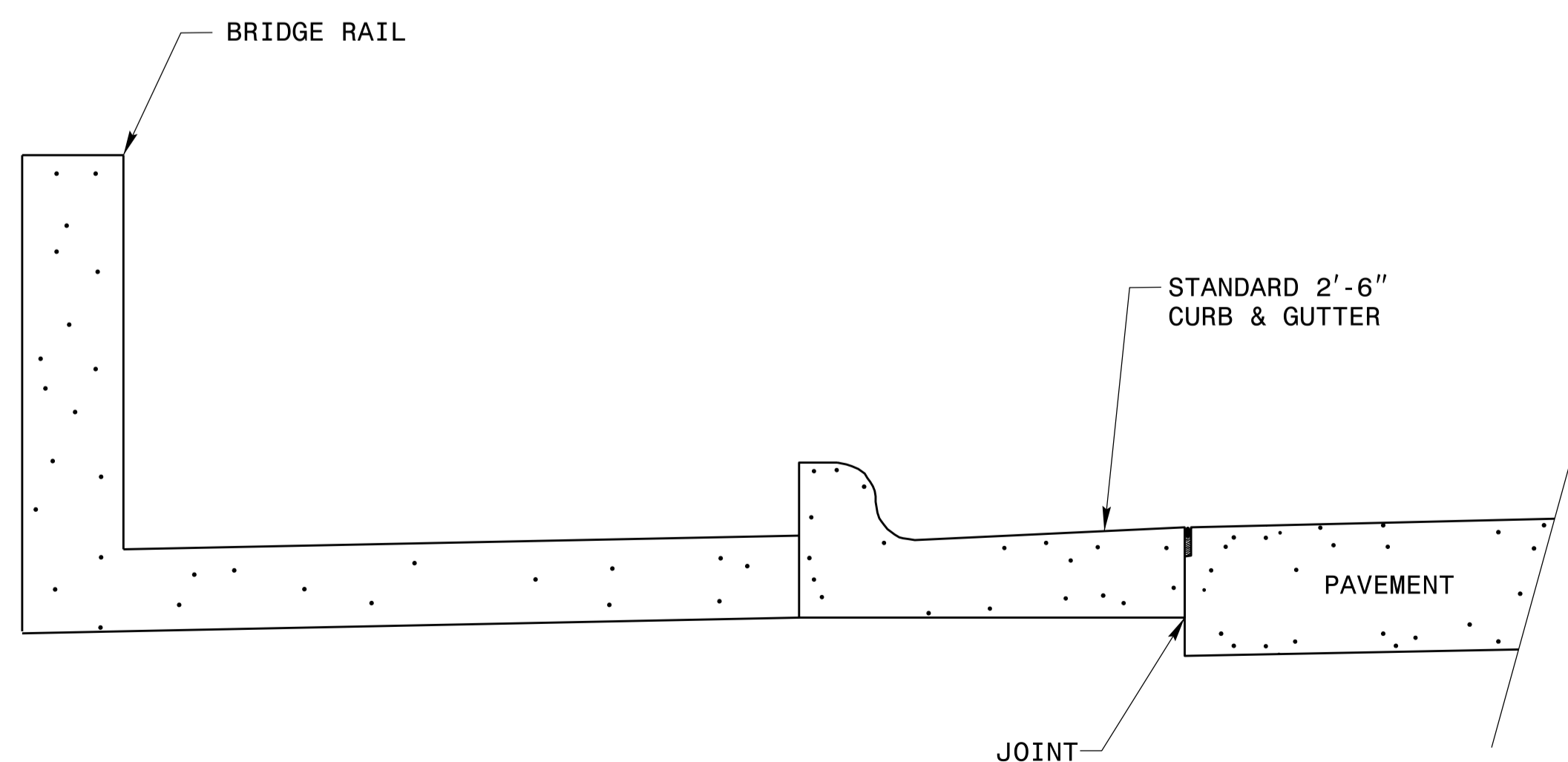
- NOTES:
- \* USE CLASS B CONCRETE.
  - \* CONSTRUCT IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE ROADWAY DRAWINGS OR AS DIRECTED BY THE ENGINEER.
  - \* SEE ROADWAY PLANS FOR GUARDRAIL PLACEMENT.
  - \* GUARDRAIL AND BARRIER ADJACENT TO TRAVEL LANE REMOVED FOR CLARITY.



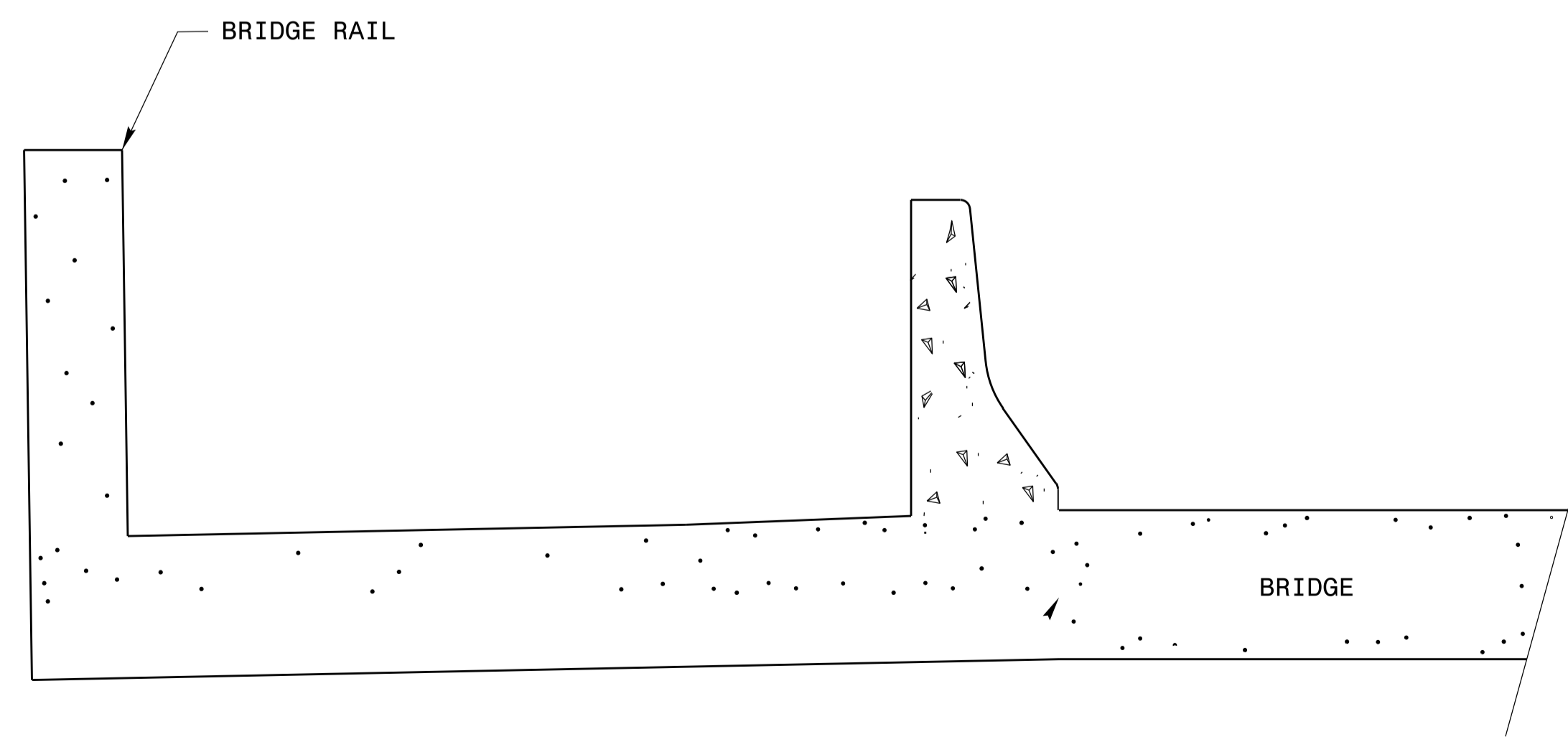
**SECTION A-A**



**PLAN VIEW**



**SECTION B-B**



**SECTION C-C**



2/4/2016

DOCUMENT NOT CONSIDERED FINAL  
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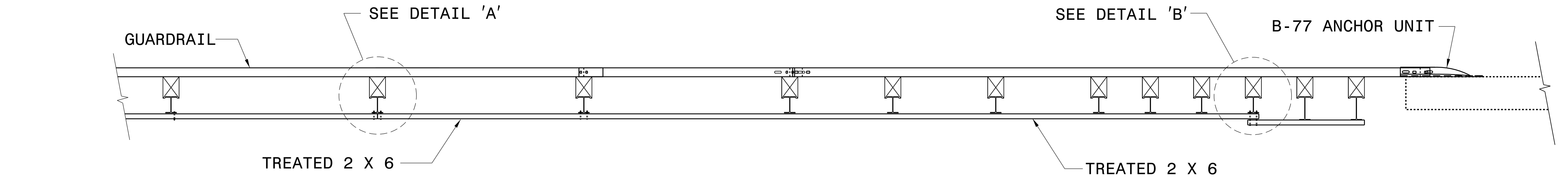
CONTRACT STANDARDS & DEVELOPMENT UNIT  
STANDARDS AND SPECIAL DESIGN  
Office 919-707-6950 FAX 919-250-4119

**DETAIL OF CONCRETE BRIDGE SIDEWALK APPROACH**

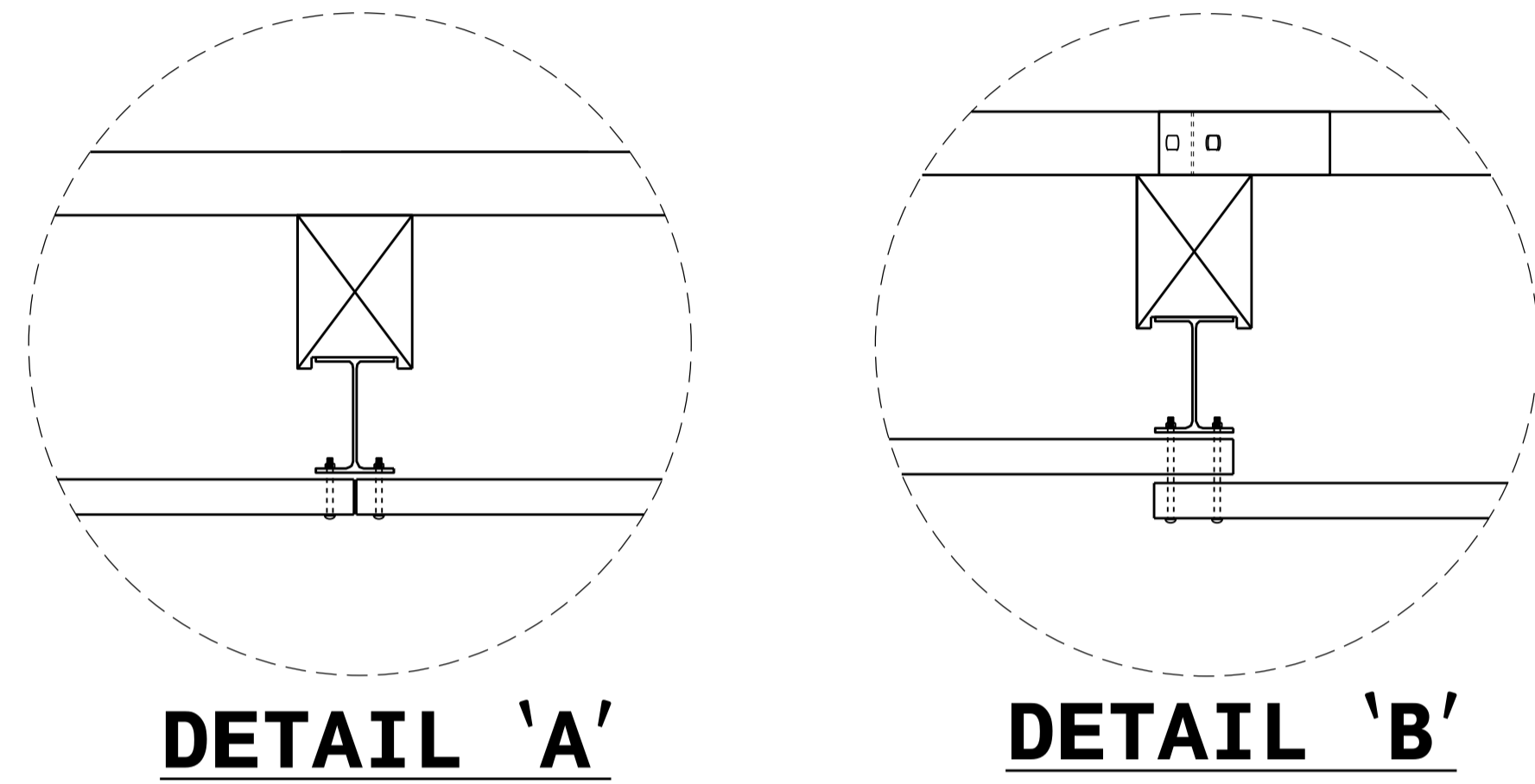
ORIGINAL BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 MODIFIED BY: rnbritt DATE: 02-02-16  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 FILE SPEC.: details/nbritt/english/misc/b5123sidewalkapproach.dgn

6/10/2016 11:58:58 AM C:\Users\rnbritt\OneDrive\Documents\2016\B-5123\2C-3\2C-3.dwg





**PLAN**

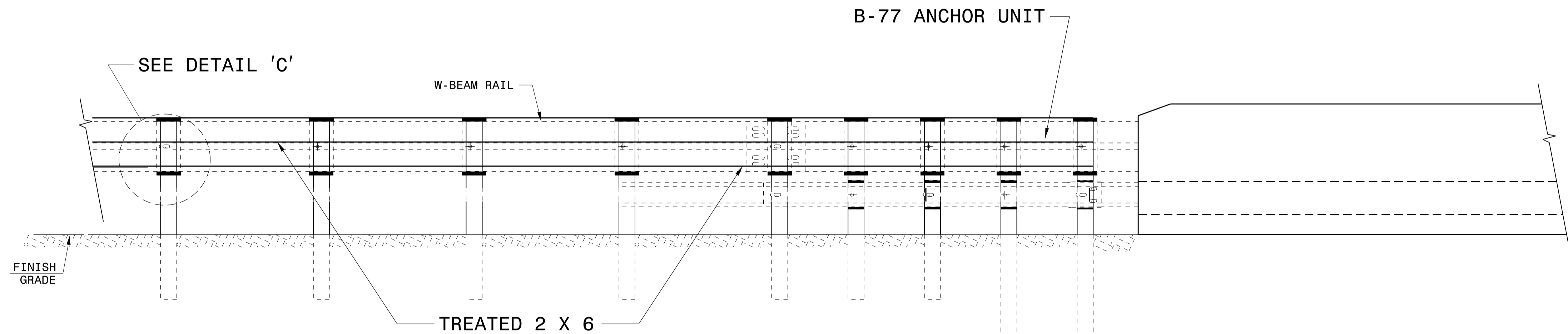


**DETAIL 'A'**

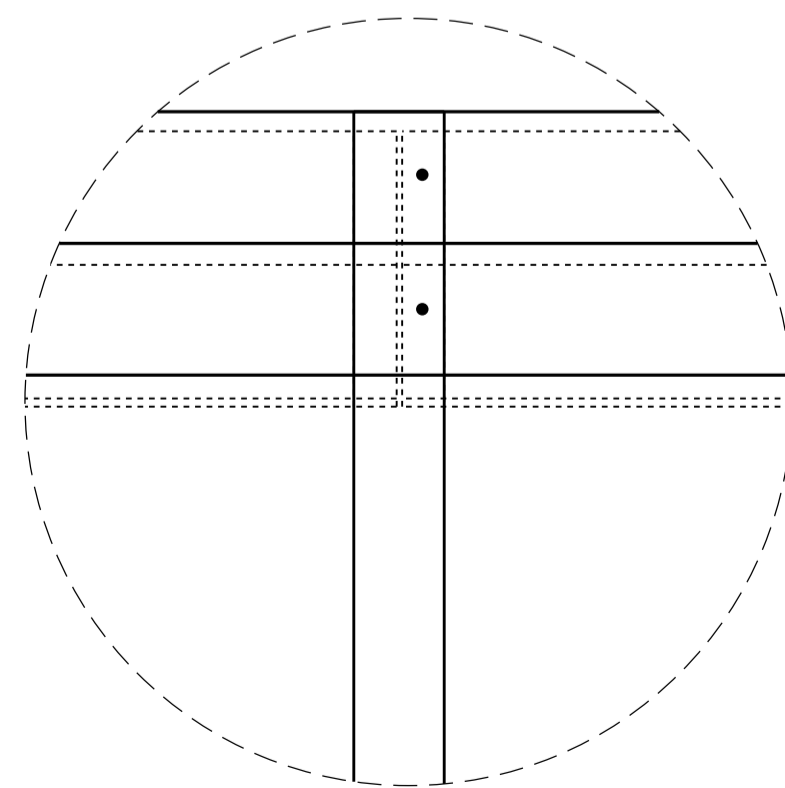
**DETAIL 'B'**

**NOTES:**

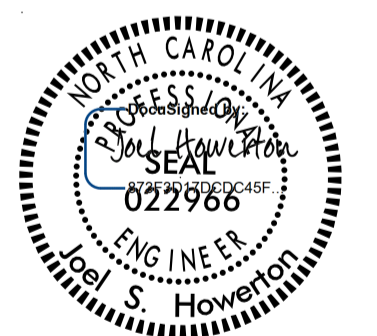
1. USE #2 SYP TREATED 2 X 6 FOR WOOD RAIL.
2. USE GUARDRAIL BOLTS TO FASTEN WOOD RAIL TO GUARDRAIL POSTS. SEE ROADWAY STD.NO.862.02.
3. THE MOUNTING HEIGHT OF THE WOODRAIL TO BE DETERMINED IN THE FIELD.
4. PLACE THE TREATED 2 X 6 WOODRAIL AS DIRECTED BY THE ENGINEER.



**ELEVATION**



**DETAIL 'C'**



2/4/2016

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UNLESS ALL SIGNATURES COMPLETED

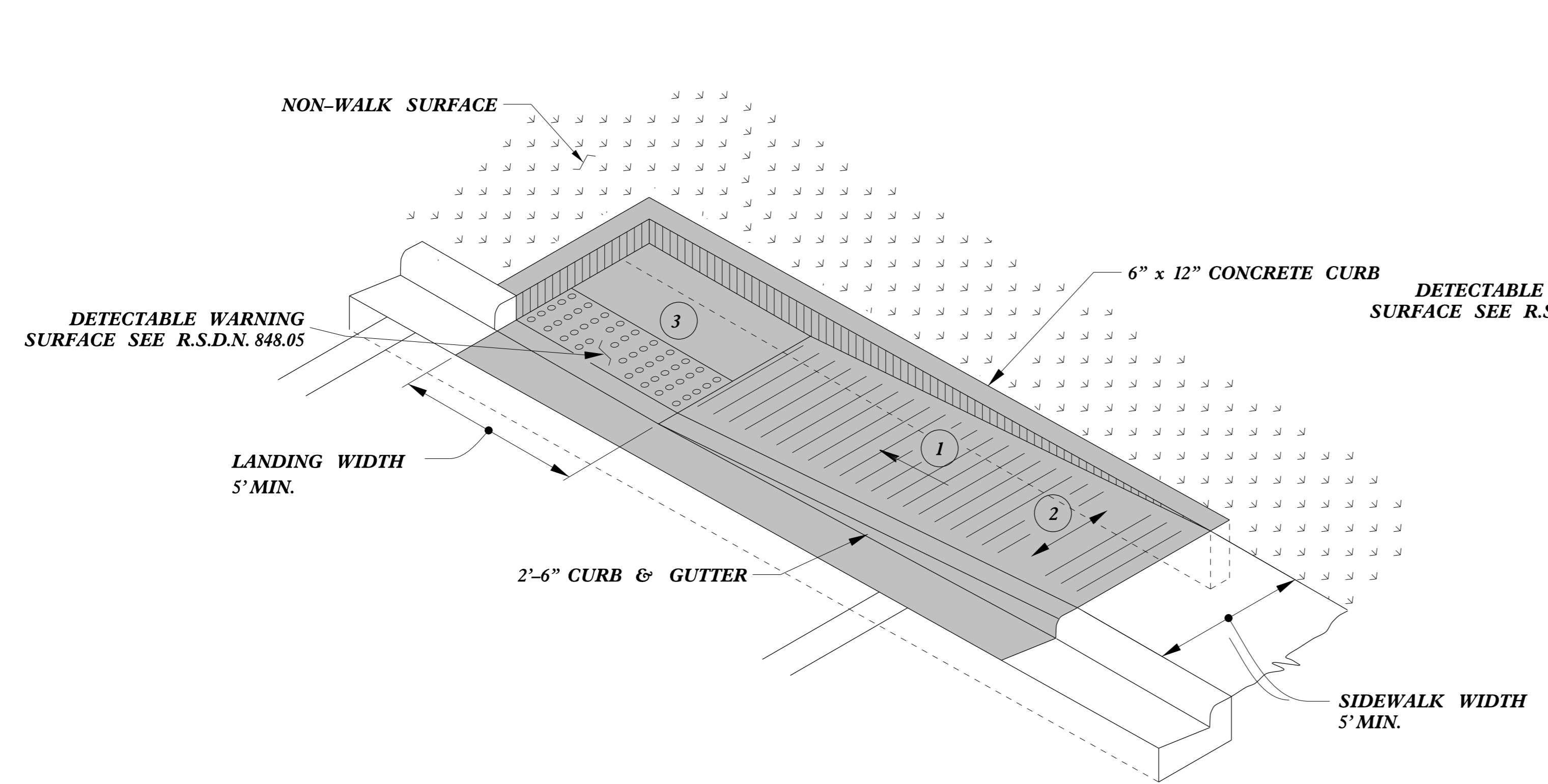
CONTRACT STANDARDS AND DEVELOPMENT UNIT  
PLANS AND STANDARDS SECTION  
Office 919-707-6950 FAX 919-250-4119

**DETAIL OF  
WOOD RUB RAIL**

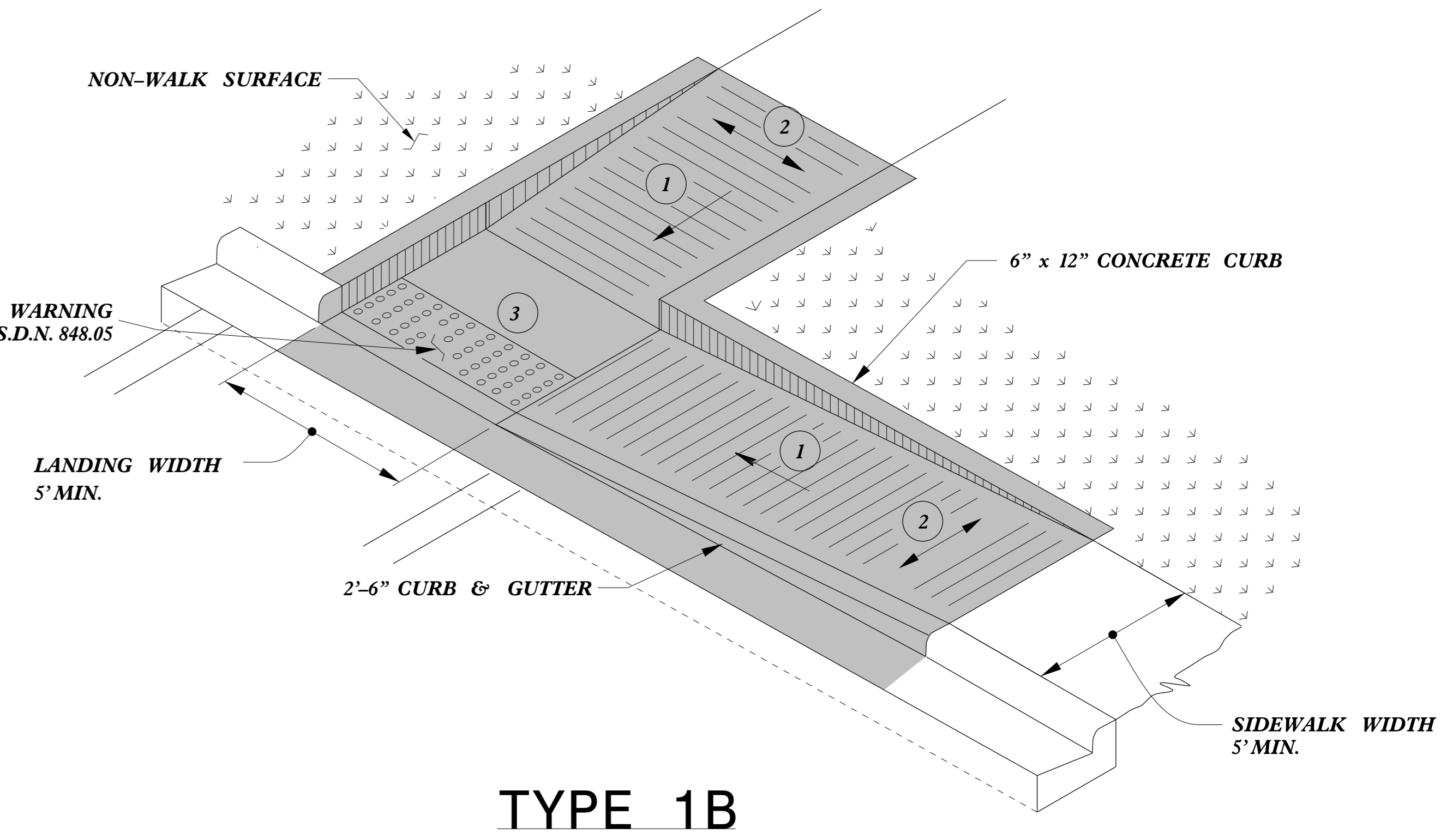
ORIGINAL BY: STD.862	DATE: 1-25-12
MODIFIED BY: rnbritt	DATE: 02-03-2016
CHECKED BY:	DATE:
FILE SPEC.: :details/rb/eng/lish/bridge/b5123_sidewalk_approach.dgn	

\$\$\$\$SYTIME\$\$\$\$  
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 \$\$\$DU\$\$\$\$  
 \$\$\$SERNAME\$\$\$\$  
 \$\$\$

5/14/99



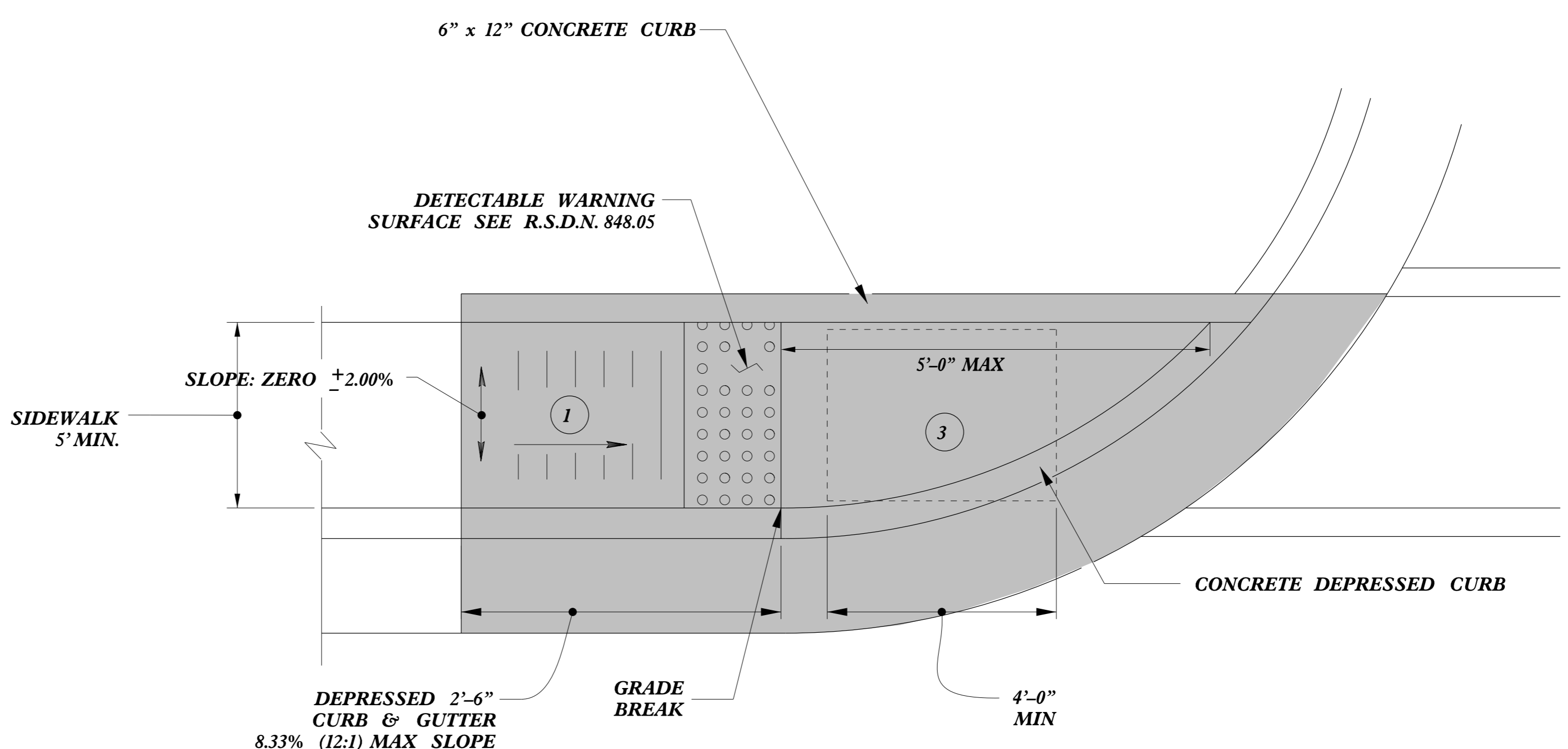
**TYPE 1A**



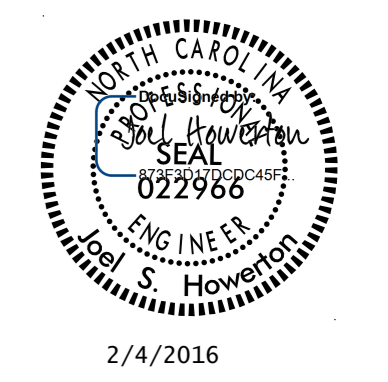
**TYPE 1B**

**PAY LIMITS FOR 1 CURB RAMP**

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



**TYPE 1**



2/4/2016

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<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950	FAX 919-250-4119
<b>CURB RAMPS</b>	
Directional Ramps	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC: stds/2012CurbRamp/CurbRampDetails.dgn	

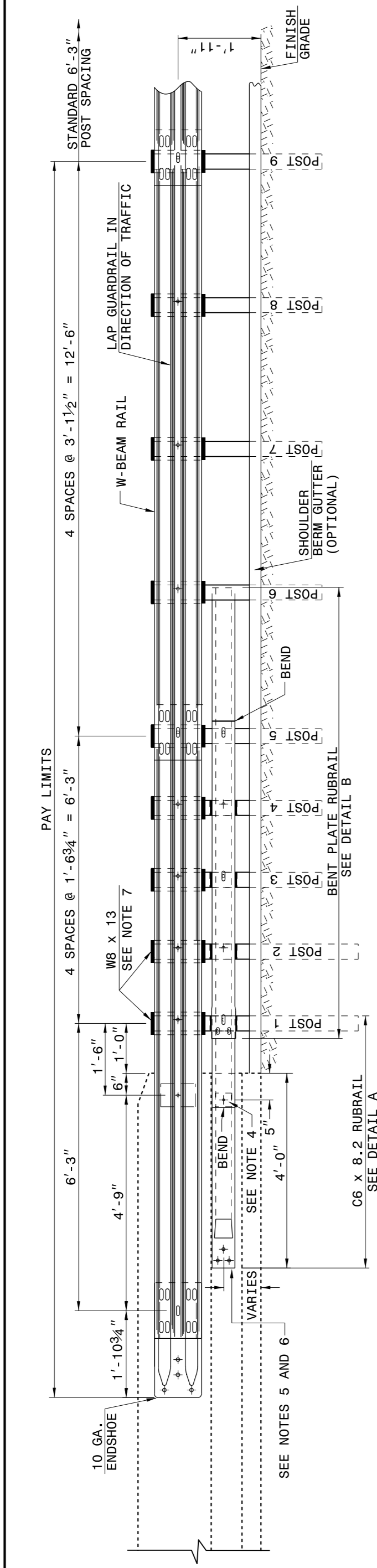
REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

C:\P\2012\STDS\2012CurbRamp\CurbRampDetails.dgn

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DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL ANCHOR UNIT  
TYPE B-77 SHOP CURVED**

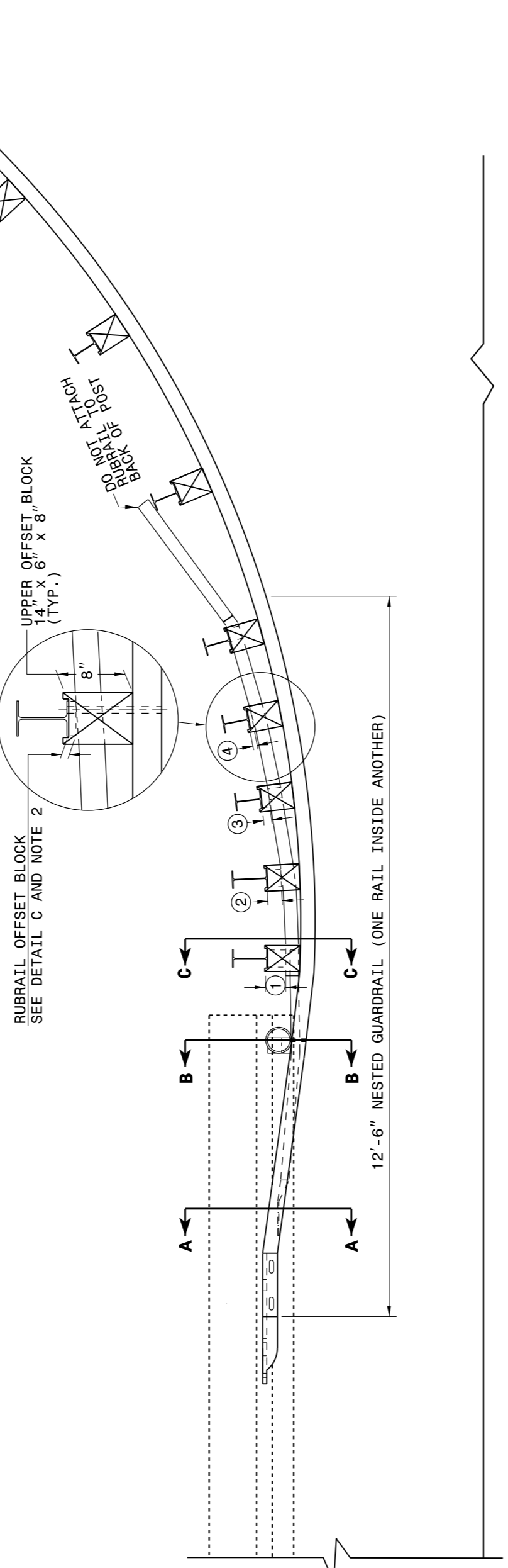
SHEET 1 OF 2  
**B-77SC**



**ELEVATION**

SEE ROADWAY PLANS FOR END TREATMENT

- GENERAL NOTES:**
- POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL. RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH 3/8" BUTT WASHERS. RUBRAIL BLOCKOUTS LOCATED ON POST 5 ARE SECURED WITH 5/8" BUTT WASHERS. RUBRAIL IS FLARED BACK OF POSTS AND NOT SECURED WITH STEEL SPACER TUBE. STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER X 9' LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH 5/8" X 1 1/4" LONG BUTT WASHERS AND RECTANGULAR PLATE WASHER.
  - SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE 3/8" X 3" LAG BOLT WITH FLAT WASHER. FINISH GRADE TO BE MAINTAINED AT TOP OF THE BARRIER OR BRIDGE RAIL.
  - ANCHORAGE:
    - AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, RUBRAIL SHALL BE ANCHORED USING THREE 5/8" X 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROJECTION FOR BOLTS SHALL BE 1/2".
    - AT NEW BRIDGE RAIL, THE W-BEAM END SHOE SHALL BE ANCHORED USING A 4 BOLT WELD DOWN PLATE. A 4 BOLT INSERT ASSEMBLY IS REQUIRED TO PRECAST REINFORCED CONCRETE BARRIER (SEE STANDARD 682.04). THE W-BEAM END SHOE SHALL BE INSTALLED BEHIND THE NESTED W-BEAM ELEMENTS.
    - AT NEW BRIDGE RAIL, THE W-BEAM END SHOE AND RUBRAIL SHALL BE ANCHORED AS DETAILED ON THE STRUCTURE PLANS.
  - POSTS 1 AND 2 ARE W8 X 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 X 8.5.



**PLAN**

**GUARDRAIL ANCHOR UNIT TYPE B-77**

SHEET 1 OF 2  
**B-77SC**

STATE OF  
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RALEIGH, N.C.

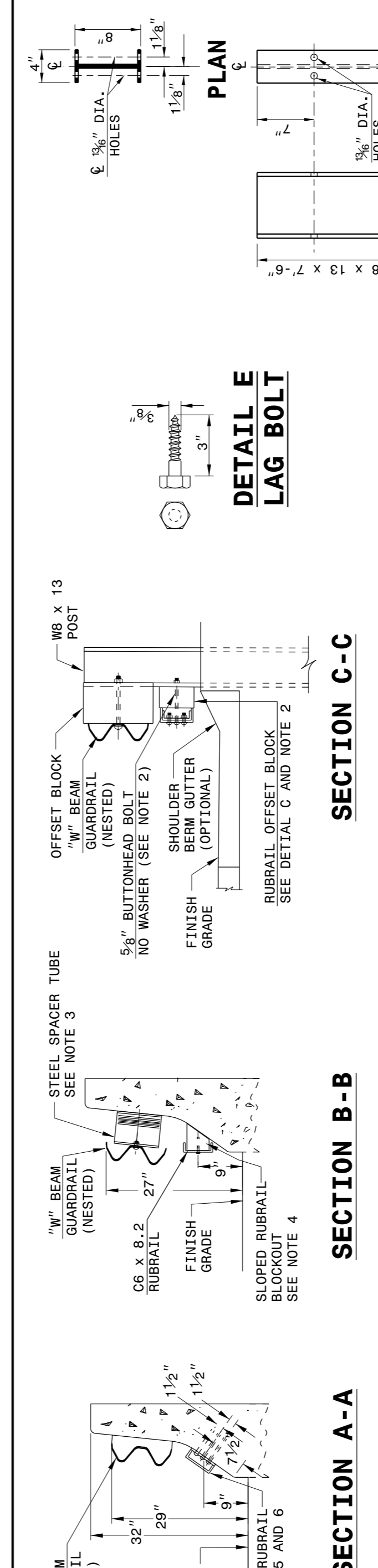
ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL ANCHOR UNIT  
TYPE B-77 SHOP CURVED**

SHEET 1 OF 2  
**B-77SC**

STATE OF  
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL ANCHOR UNIT  
TYPE B-77 SHOP CURVED**

SHEET 2 OF 2  
**B-77SC**



**SECTION A-A**

**SECTION B-B**

**SECTION C-C**

**SECTION D-D**

**DETAIL E  
LAG BOLT**

**DETAIL C  
RUBRAIL BLOCKOUT**

**DETAIL D  
SLOPED RUBRAIL BLOCKOUT**

**DETAIL F STEEL POST  
W8 X 13 X 7'-6"**

POST	THICKNESS	BOLT LENGTH
(1)	4.4"	9"
(2)	3.4"	5"
(3)	2"	6"
(4)	1"	3"

\* BOLTS FOR POSTS 2 AND 4 ARE USED TO ATTACH BLOCK TO POST. RUBRAIL NOT ATTACHED TO BLOCK.

**FRONT**

**FRONT**

**FRONT**

**PLAN**

**PLAN**

**PLAN**

**ELEVATION**

**ELEVATION**

**ELEVATION**

**DETAIL A  
C6 X 8.2 RUBRAIL**

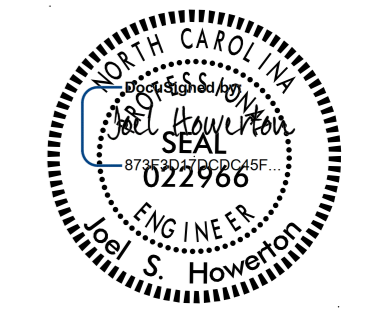
**DETAIL B  
BENT PLATE RUBRAIL**

**DETAIL B  
BENT PLATE RUBRAIL**

PROJECT SERVICES UNIT  
STANDARDS AND SPECIAL DESIGN  
Office 919-250-4128 FAX 919-250-4119

**SEE PLATE FOR TITLE**

ORIGINAL BY: E.E. WARD DATE: 06-04-04  
MODIFIED BY: DATE:  
CHECKED BY: DATE:  
FILE SPEC. :miscguardrail/NCHRP350approved/B-77.dgn



2/24/2016

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\$\$\$\$\$CUSTIME\$\$\$\$\$  
\$\$\$\$\$SECTION\$\$\$\$\$  
\$\$\$\$\$USERNAME\$\$\$\$\$

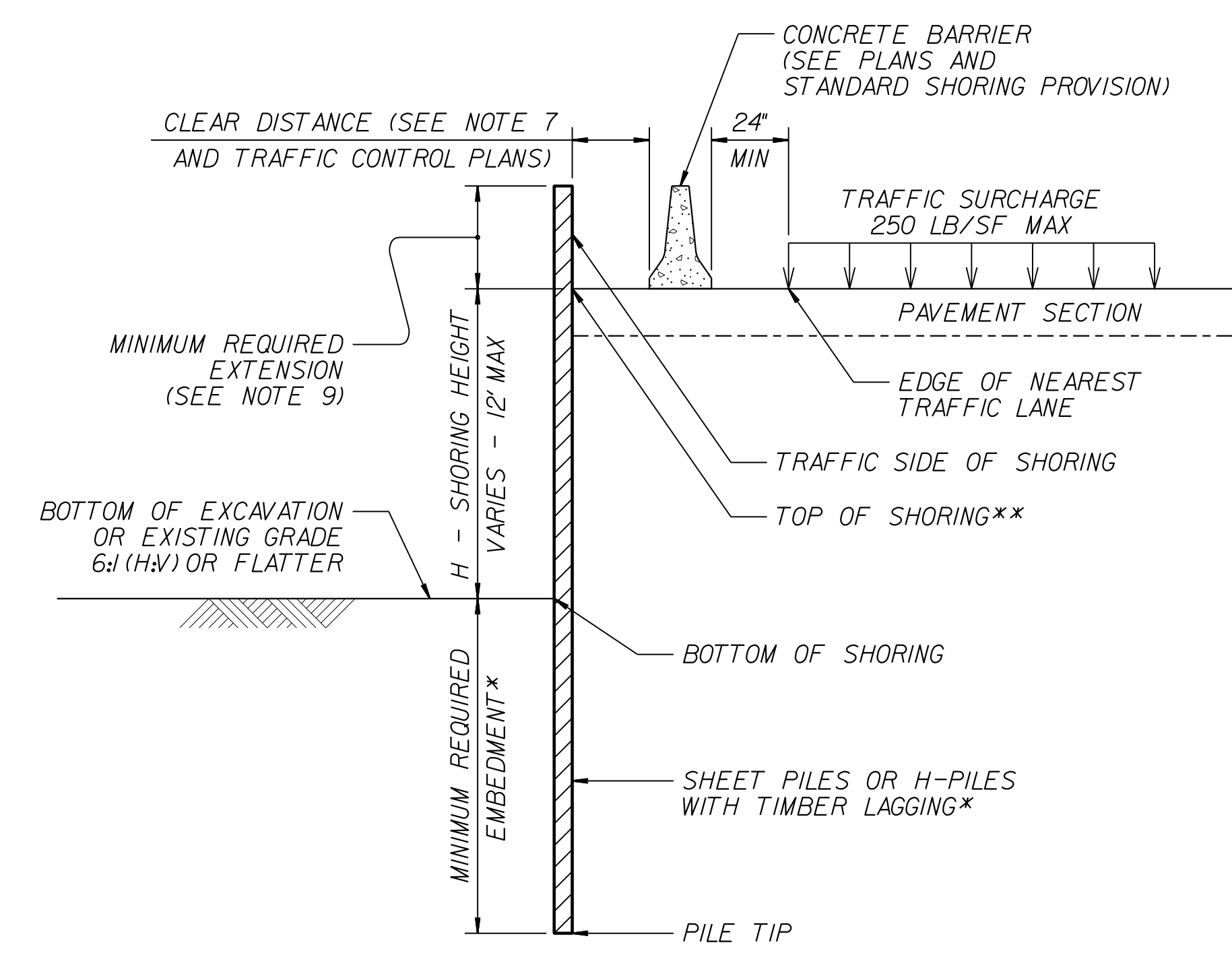
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /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**

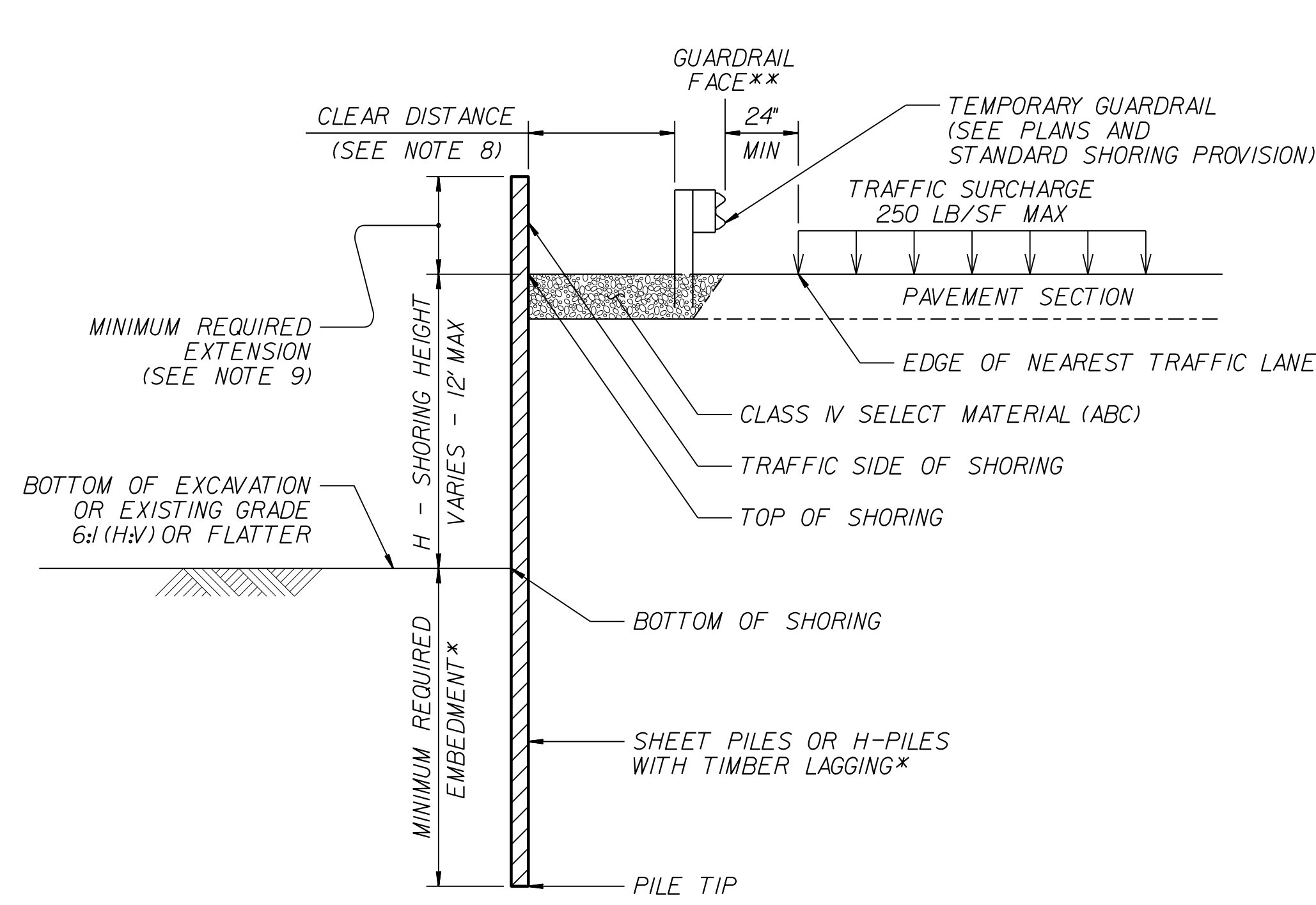
\*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

**NOTES:**

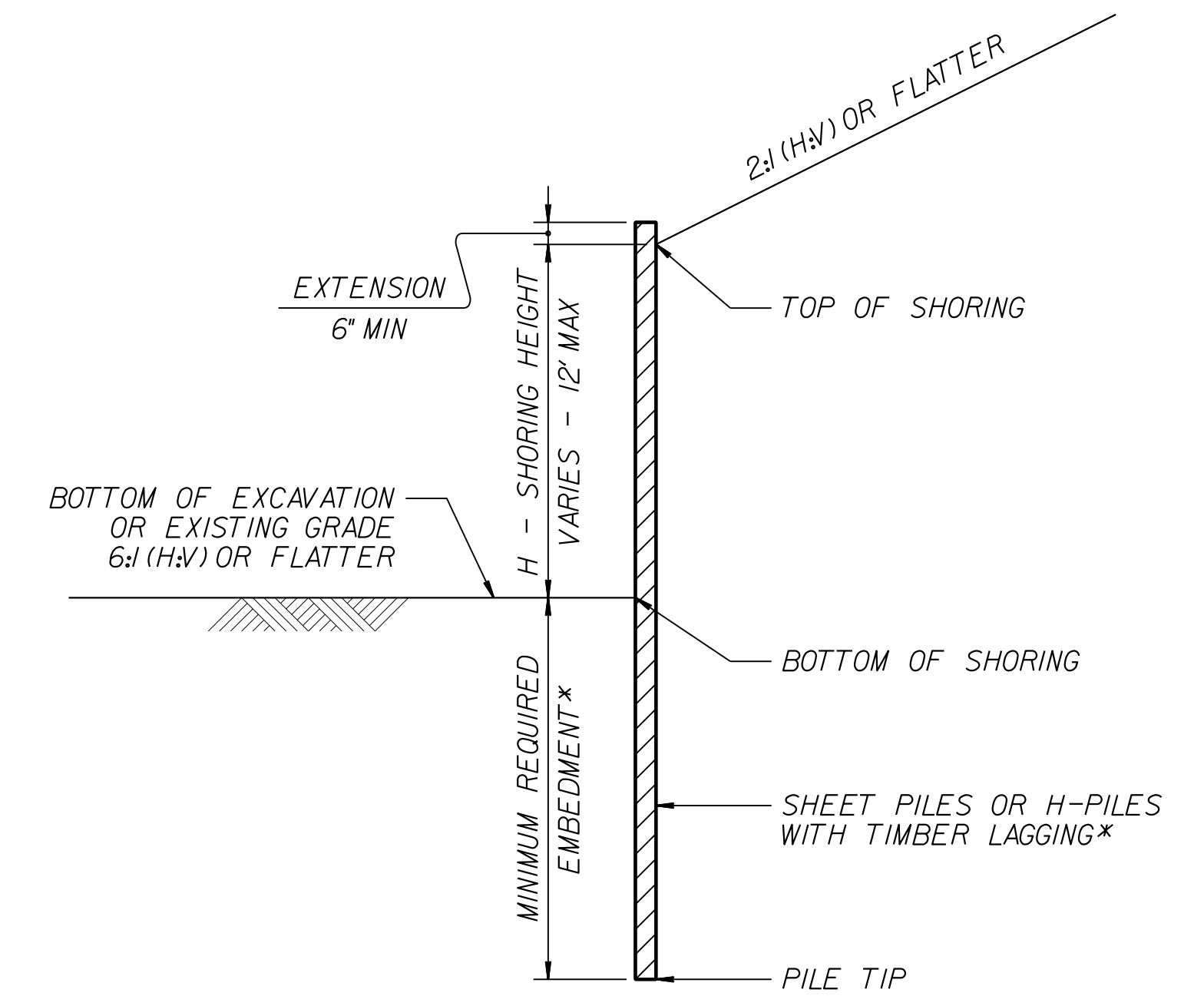
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  LB/CF  
FRICTION ANGLE,  $\phi = 30$  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](http://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

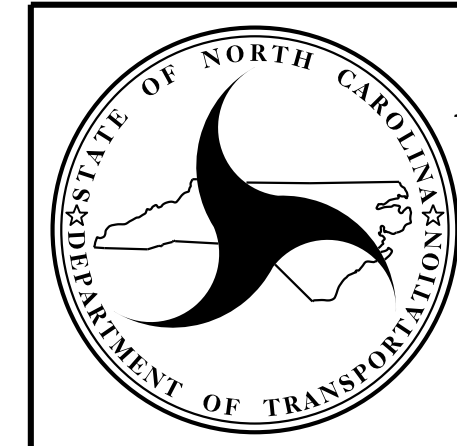


**TEMPORARY GUARDRAIL**  
\*\*GUARDRAIL FACE =  
EDGE OF PAVEMENT



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

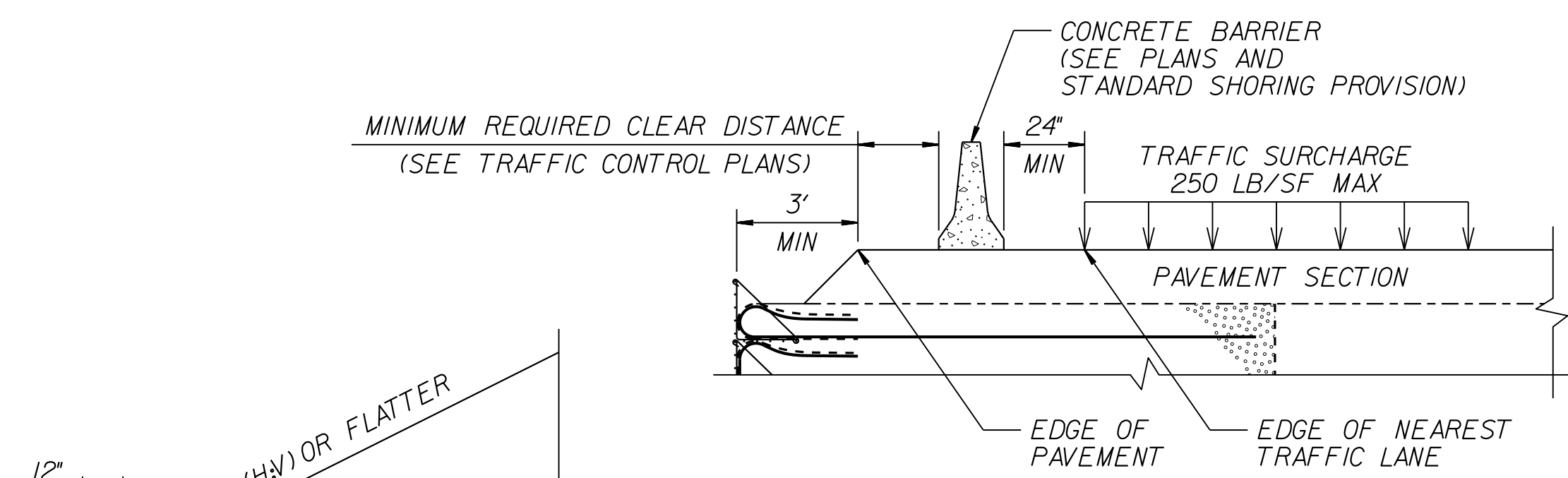
**STANDARD TEMPORARY SHORING**  
(SURCHARGE CASE)  
\*SEE TABLE ABOVE.



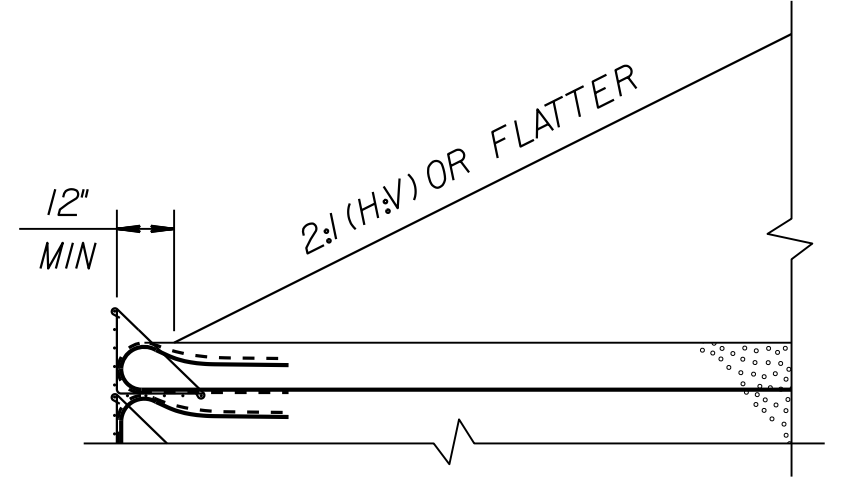
NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
  
**GEOTECHNICAL  
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.01

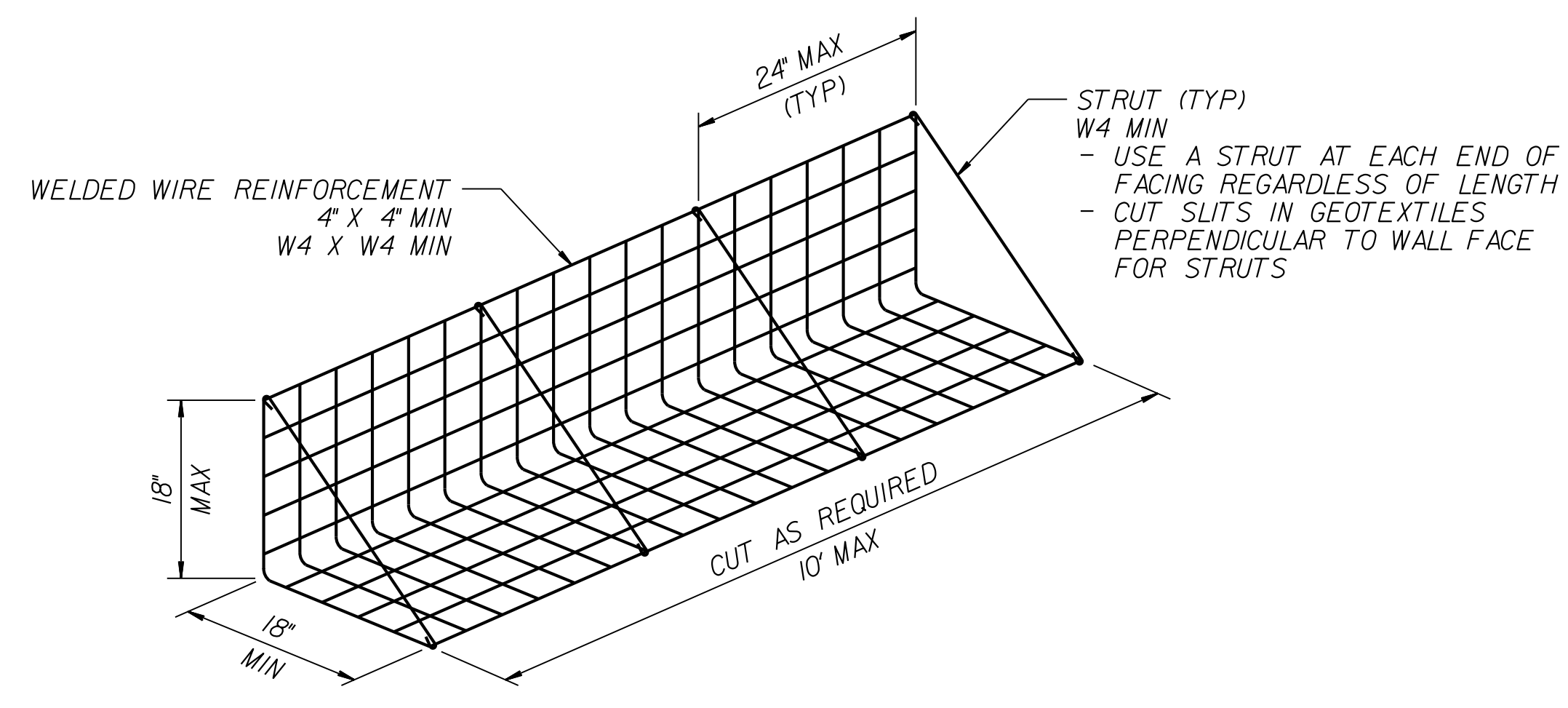
STANDARD  
TEMPORARY SHORING



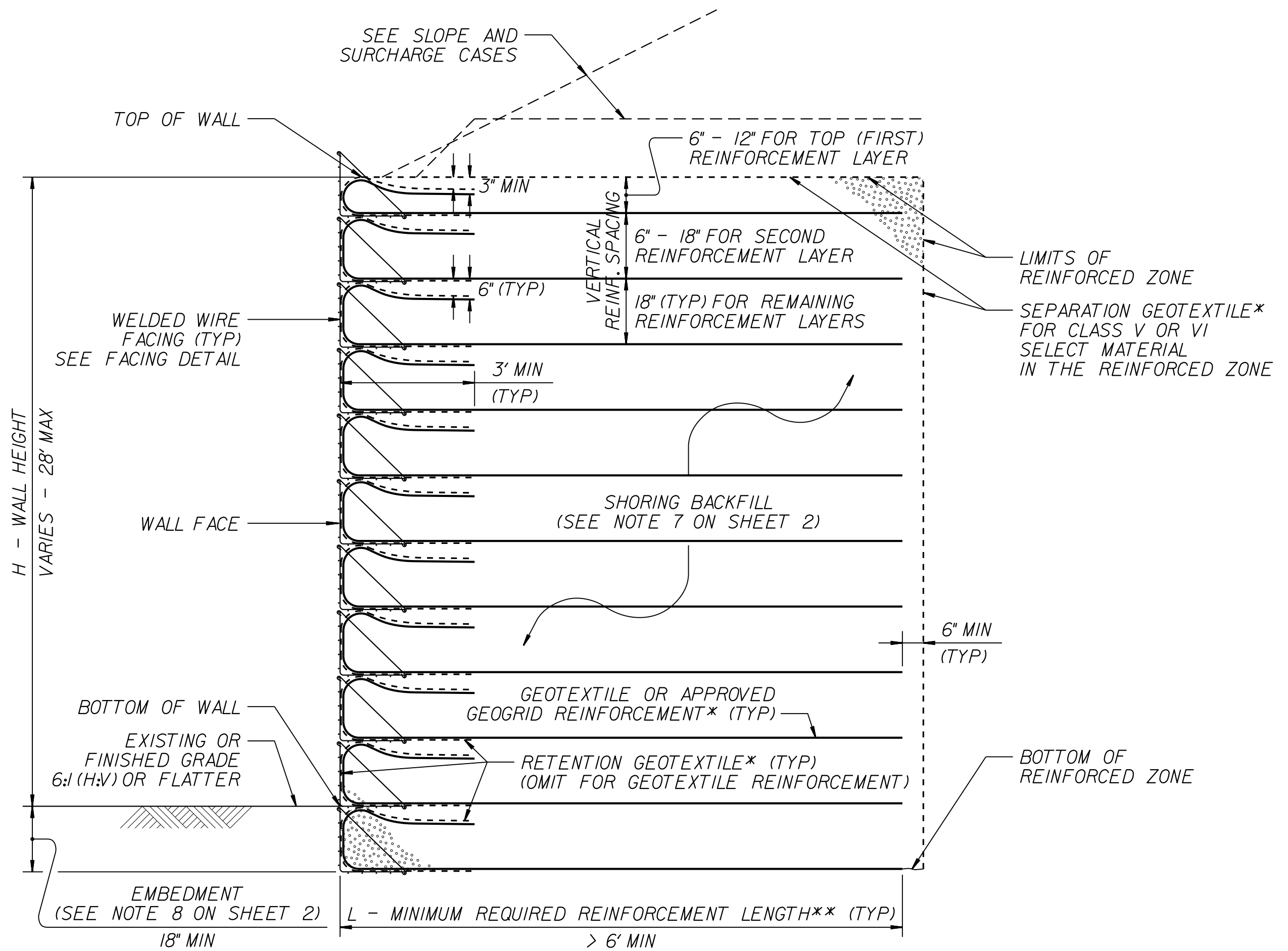
**SURCHARGE CASE**



**SLOPE CASE**

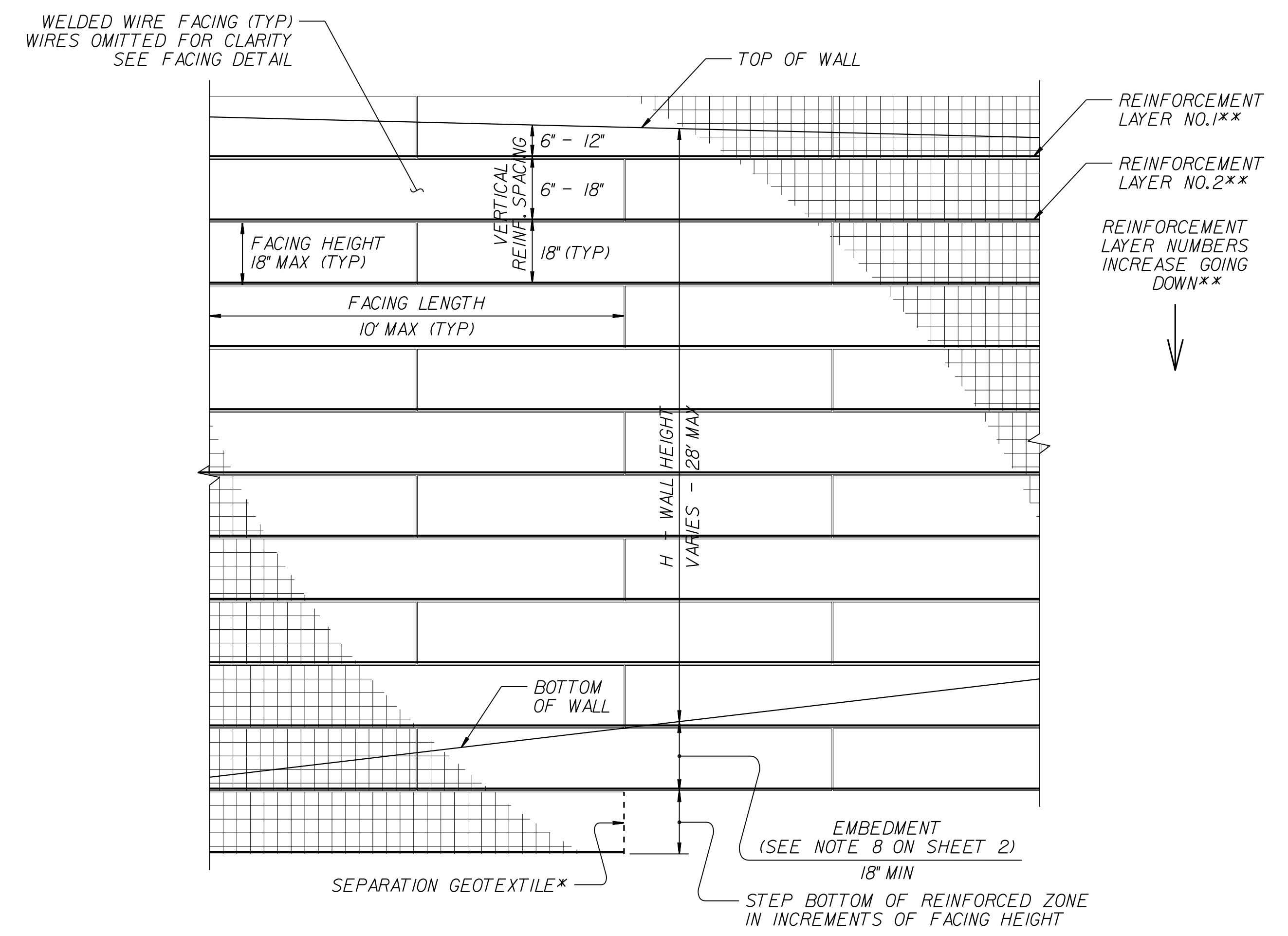


**FACING DETAIL**



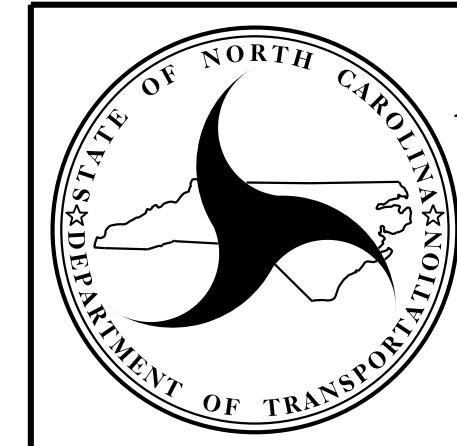
**STANDARD TEMPORARY WALL**

(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**

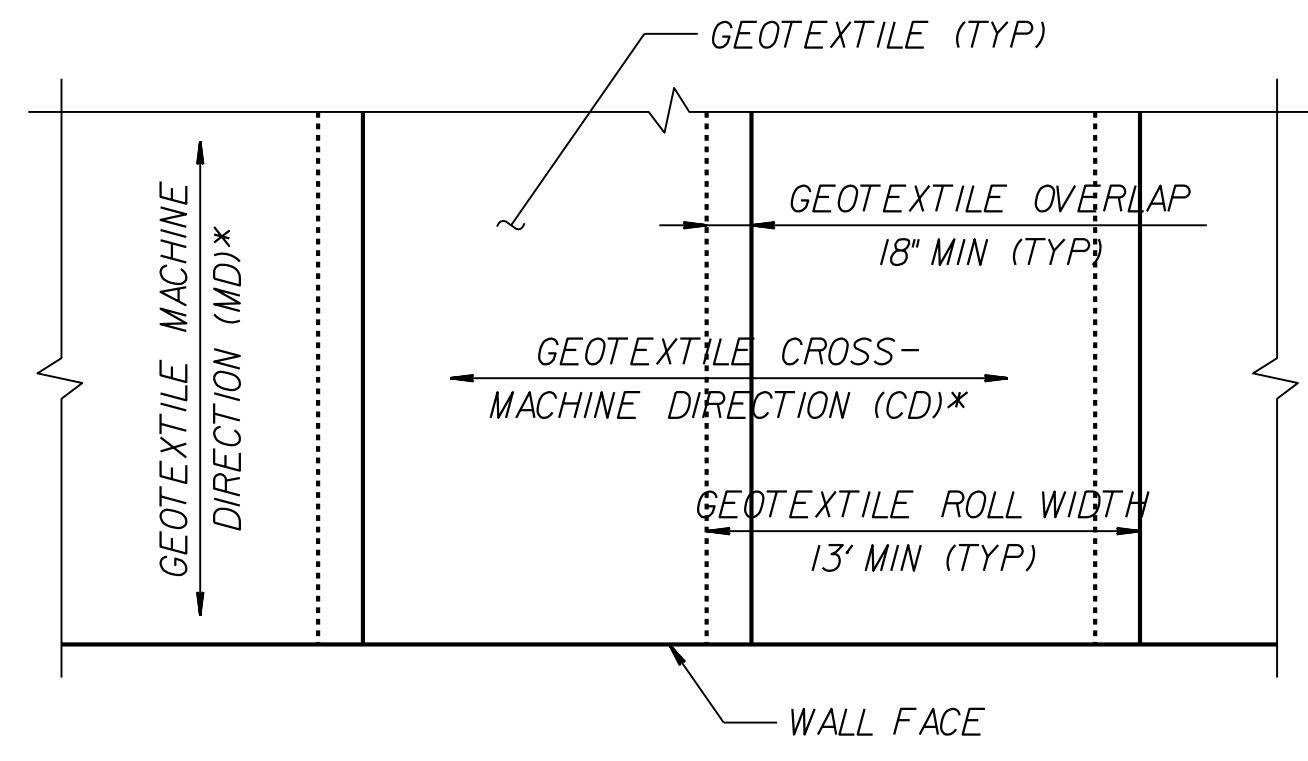
\*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 3.



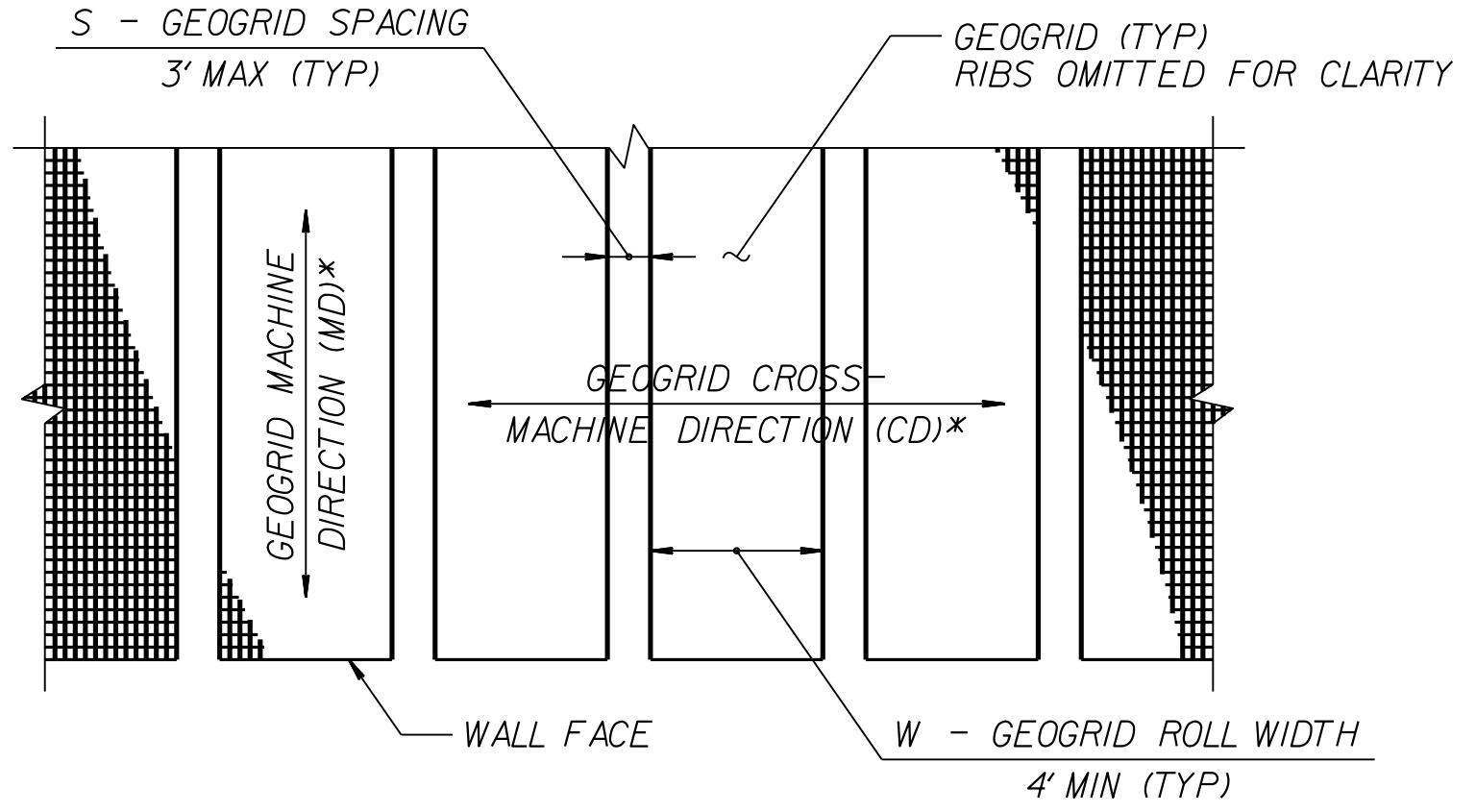
NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
**GEOTECHNICAL  
 ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02

STANDARD  
 TEMPORARY WALL  
 SHEET 1 OF 3

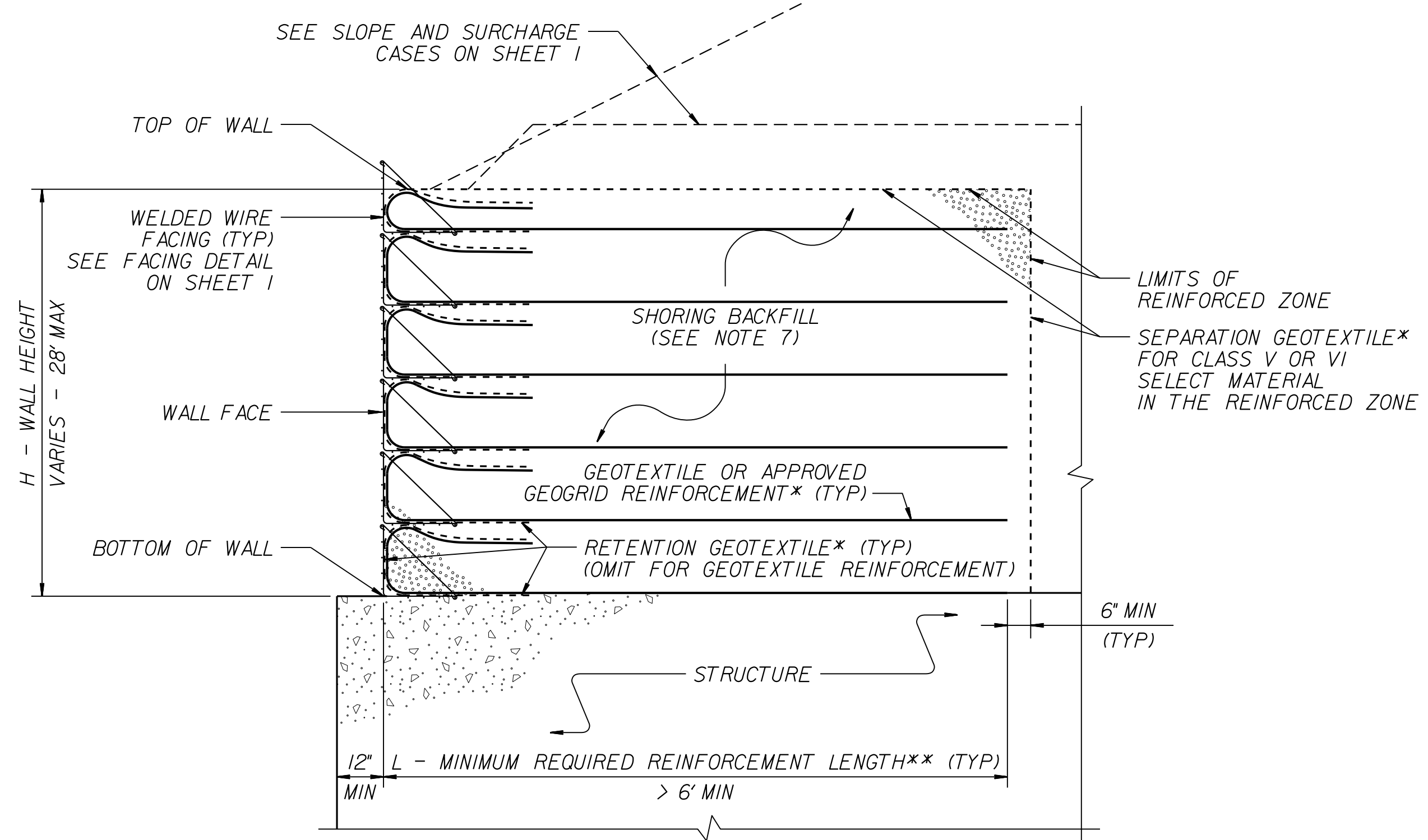


**GEOTEXTILE PLACEMENT**  
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



**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.



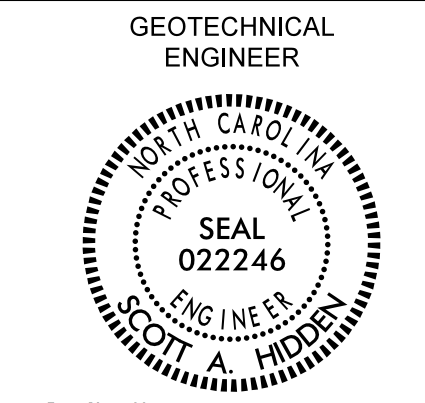
**TEMPORARY WALL ON STRUCTURE DETAIL**  
\*SEE GEOSYNTHETIC PLACEMENT DETAILS.  
\*\*SEE REINFORCEMENT TABLES ON SHEET 3.

**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 TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: [connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx](http://connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx)  
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

- IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
- 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 OF THE FOLLOWING CONDITIONS OCCUR:  
-  $W$  (REINFORCEMENT ROLL WIDTH)  $\geq$  (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. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: [connect.ncdot.gov/resources/Geological/Pages/Geotech\\_Forms\\_Details.aspx](http://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx)
  - 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.

<b>PROJECT REFERENCE NO.</b> B-5123	<b>SHEET NO.</b> 2G-4
 GEOTECHNICAL ENGINEER ENGINEER	ENGINEER  DATE: 1/21/2016 SIGNATURE: _____
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

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	
		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	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	CLASS V OR CLASS VI SELECT MATERIAL	6	6	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.

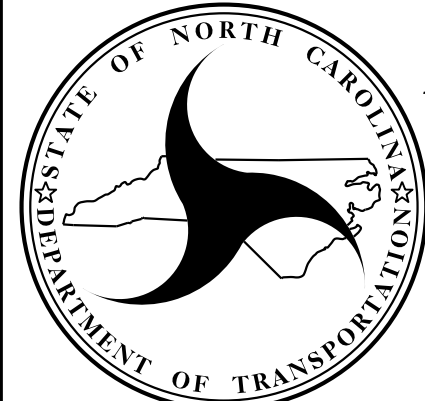
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	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.



**NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
  
**GEOTECHNICAL**  
**ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02

STANDARD  
TEMPORARY WALL  
SHEET 3 OF 3

DATE: 11-19-13





RD266183

COMPUTED BY: JMB DATE: 2/13/15  
CHECKED BY: AKW DATE: 12/17/2015

PROJECT NO. B-5123 SHEET NO. 3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.  
See "Standard Specifications For Roads and Structures, Section 300-5".

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

Table with columns: LINE & STATION, SIZE, THICKNESS OR GAUGE, OFFSET, STRUCTURE NUMBER, TOP ELEVATION, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC), C. S. PIPE (0.064" THICK), R. C. PIPE CLASS IV, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, PIPE REMOVAL, and REMARKS. Includes a SHEET TOTALS row at the bottom.

SHEET TOTALS

120 248 1224 24 24 5.0 18 8 10 1 3 1 1 1 4 4 8 2 28



COMPUTED BY: KDA      DATE : 12/15/2015  
 CHECKED BY: TFD      DATE : 1/12/2016

PROJECT NO.      SHEET NO.  
 B-5123              3G-1

**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
					300	540	600		
					300	540	600		

\*ASU = Aggregate Subgrade

\*AST = Aggregate Stabilization

\*Total square yards of Geotextile for Soil Stabilization is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.



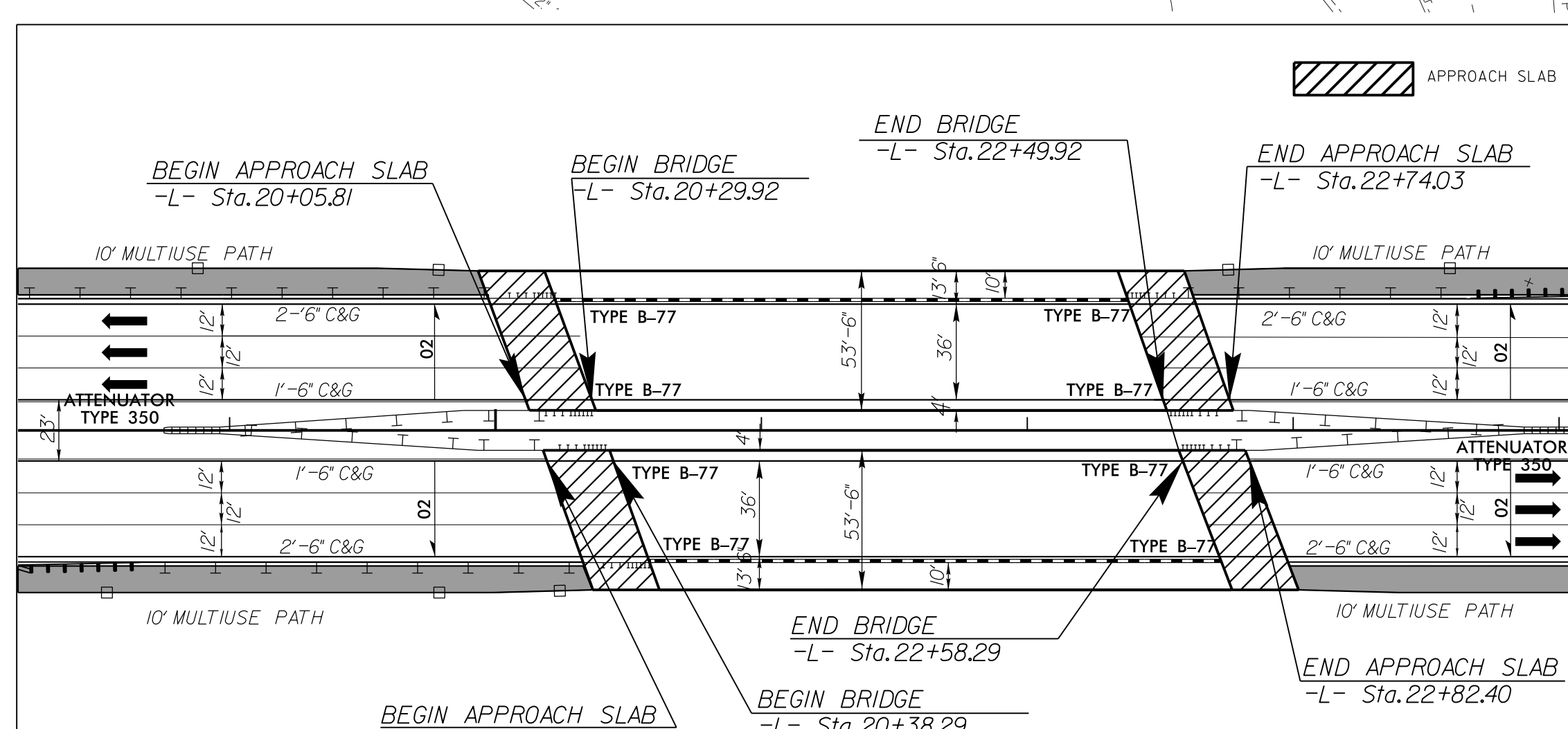
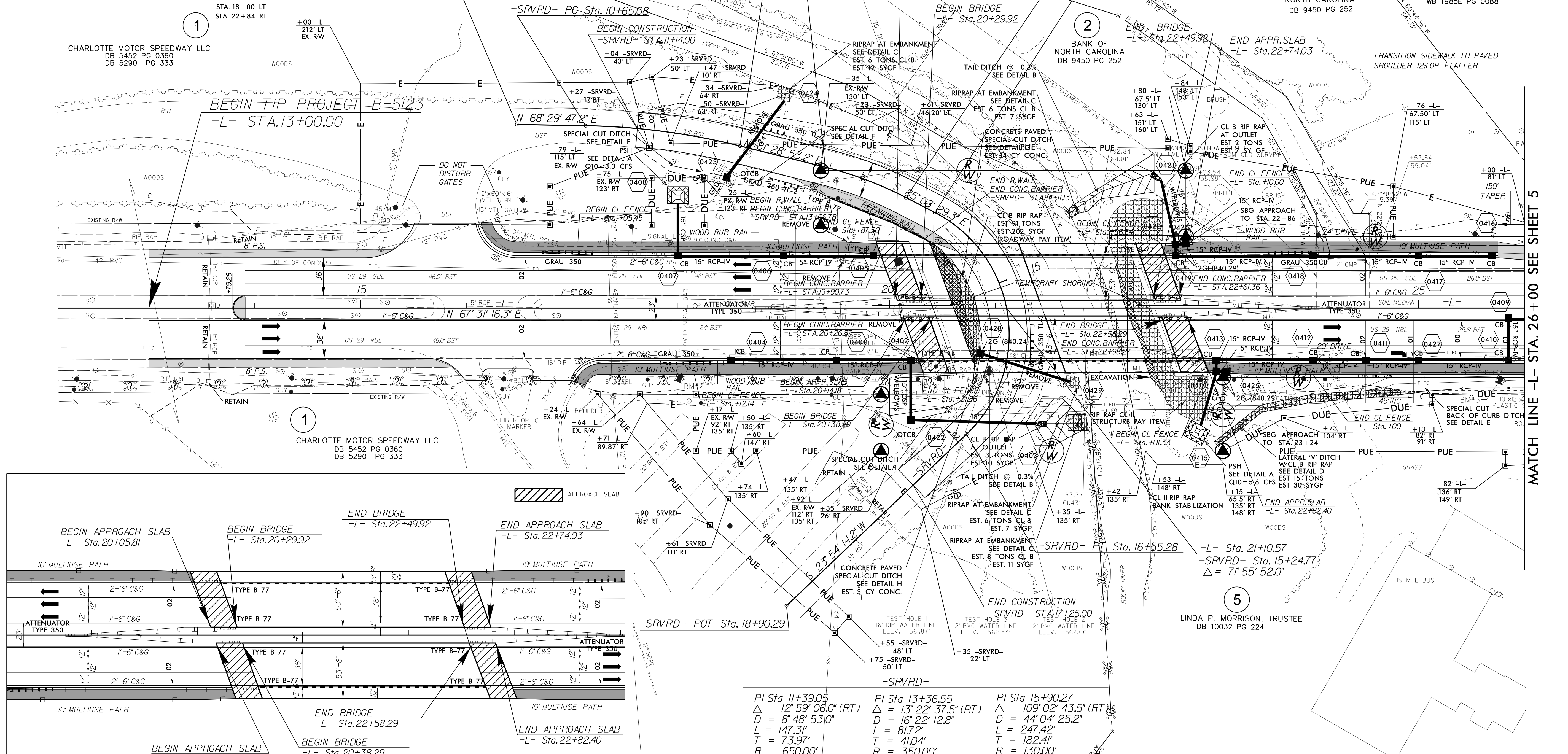
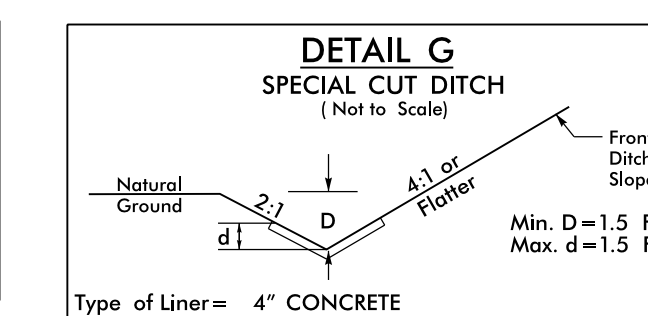
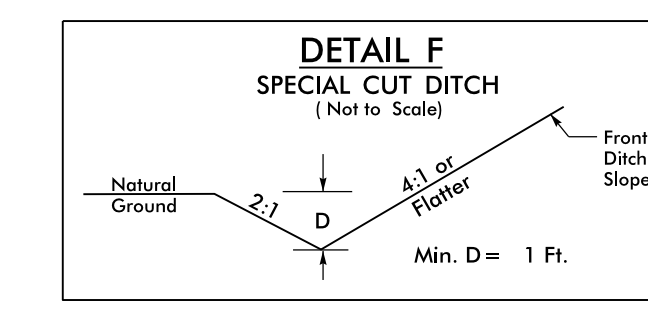
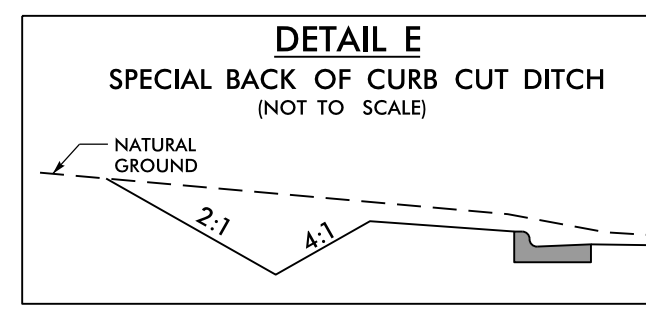
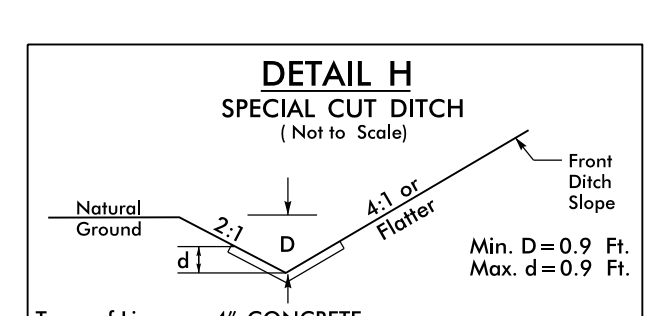
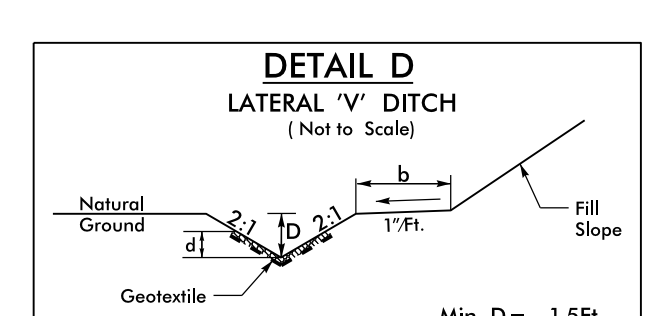
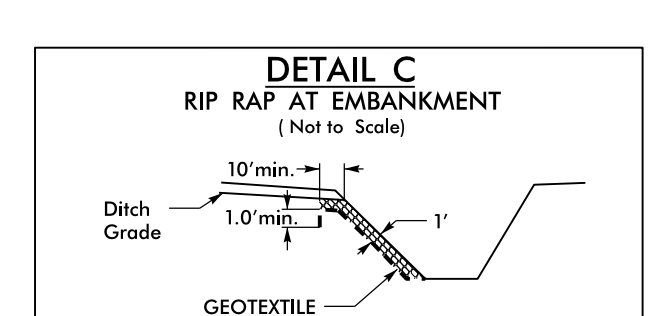
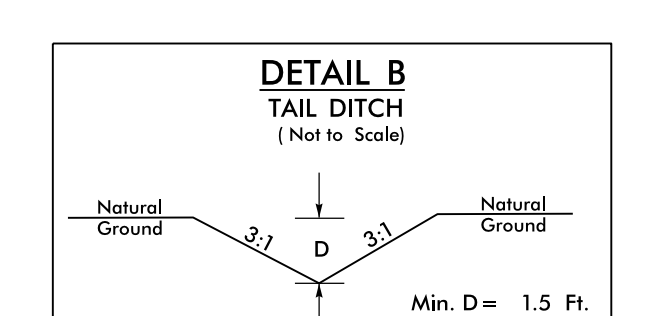
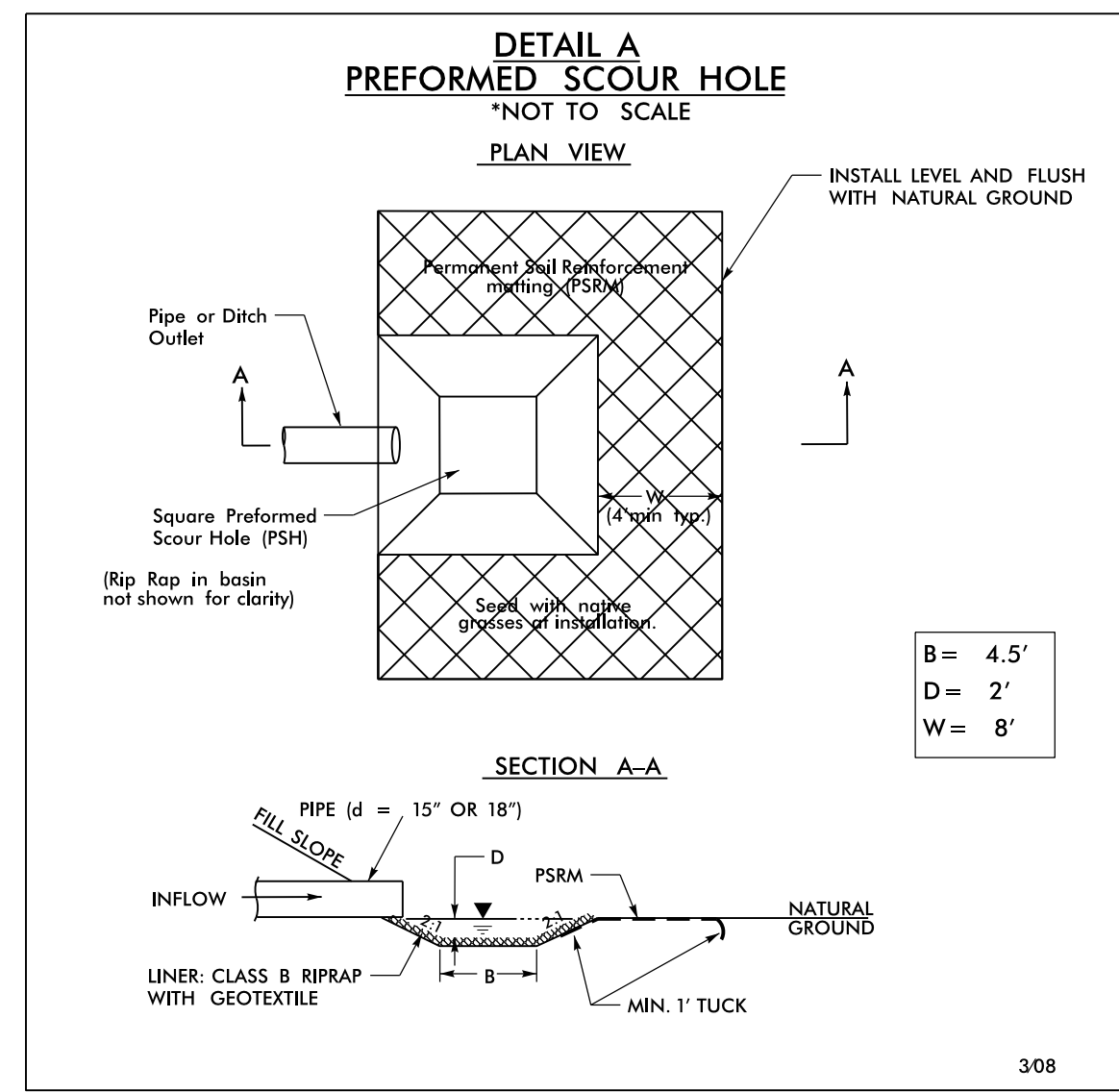
FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-74

SEE TRAFFIC MANAGEMENT PLANS FOR SHORING DETAILS

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

FOR -L- PROFILE SEE SHEET 6

FOR -SRVRD- PROFILE SEE SHEET 7



PI Sta 11+39.05 Δ = 12' 59" 06.0" (RT) D = 8' 48" 53.0" L = 147.31' T = 73.97' R = 650.00' SE = .02	PI Sta 13+36.55 Δ = 13' 22" 37.5" (RT) D = 16' 22" 12.8" L = 81.72' T = 41.04' R = 350.00' SE = .02	PI Sta 15+90.27 Δ = 109' 02" 43.5" (RT) D = 44' 04" 25.2" L = 247.42' T = 182.41' R = 130.00' SE = .02
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8/17/99

REVISIONS

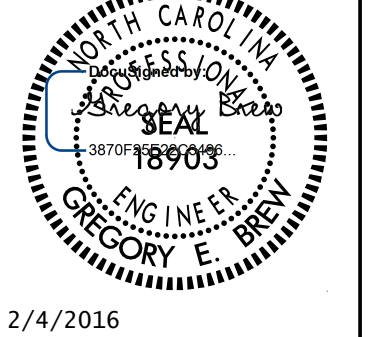
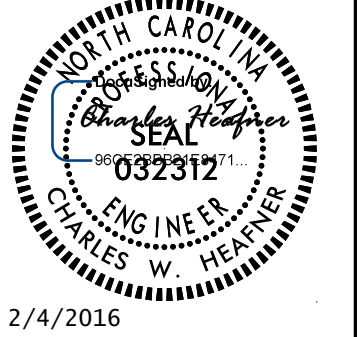
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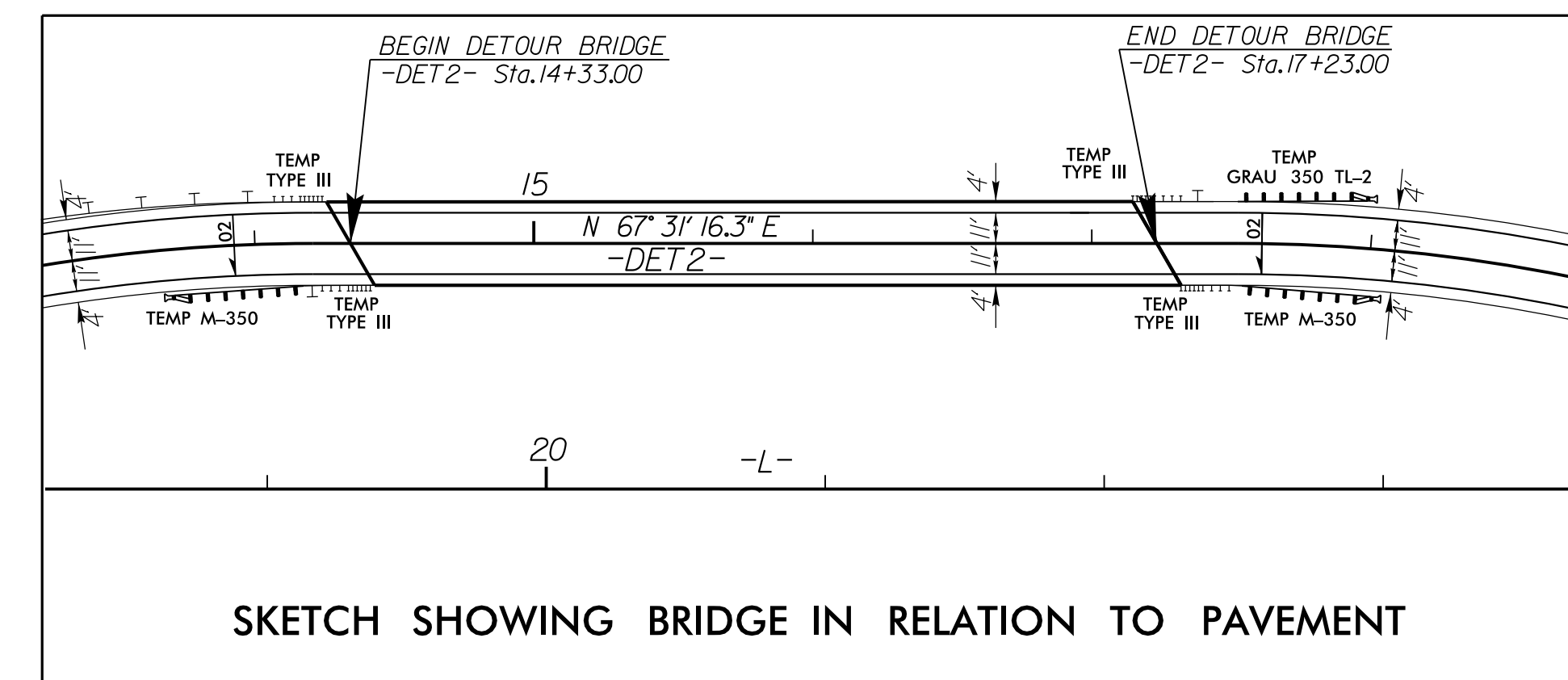
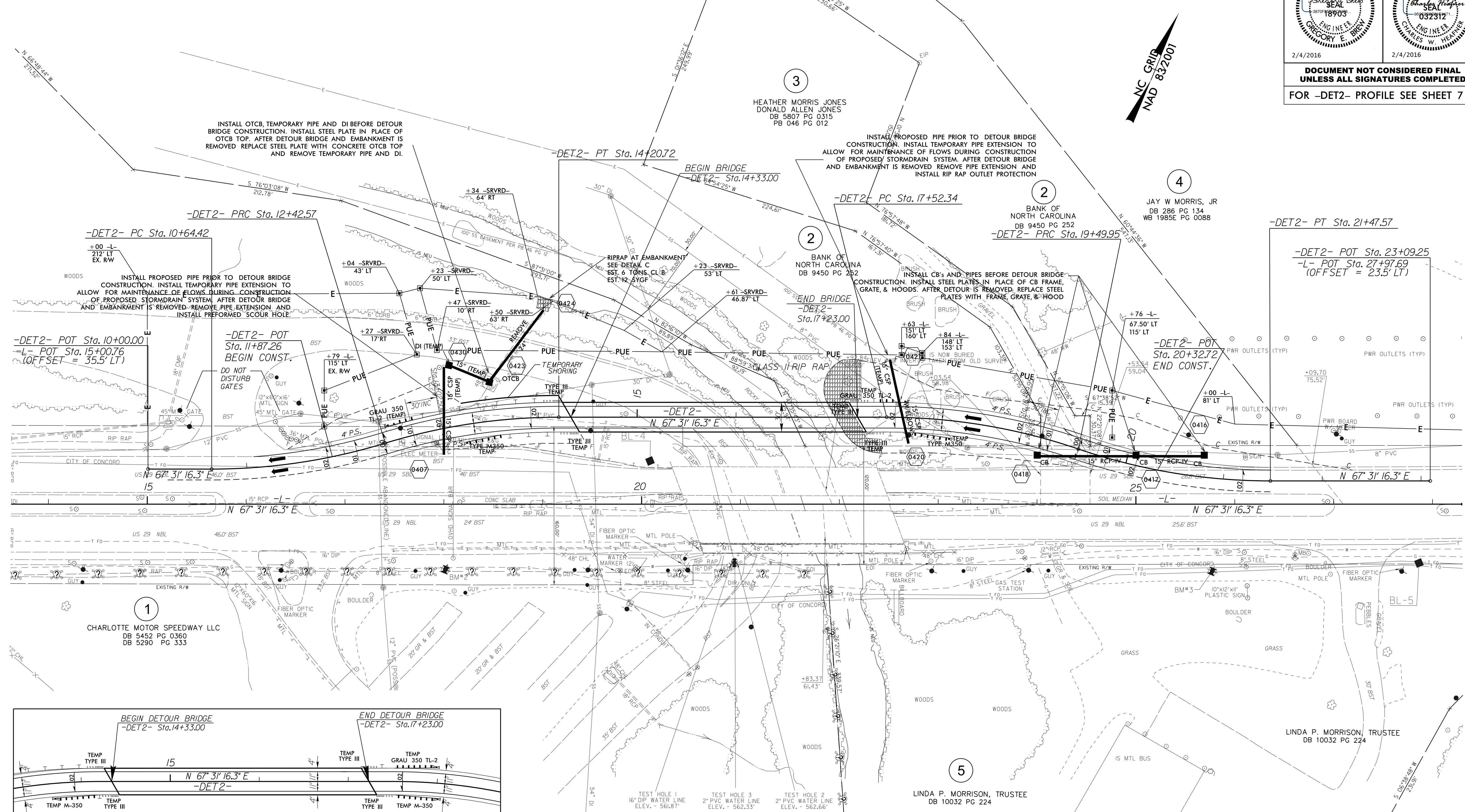
MATCH LINE -L- STA. 26 + 00 SEE SHEET 5

8/17/19

DETOUR DESIGN SPEED = 45 MPH

USE THIS SHEET FOR DETOUR CONSTRUCTION ONLY  
SEE TRAFFIC MANAGEMENT PLANS FOR SHORING DETAILS



PROJECT REFERENCE NO. B-5123	SHEET NO. 4-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
2/4/2016	2/4/2016
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
FOR -DET2- PROFILE SEE SHEET 7	



PI Sta 11+54.16 Δ = 17° 00' 43.0" (LT) D = 9' 32' 57.5" L = 178.15' T = 89.73' R = 600.00' SE = 0.02 R = 60°	PI Sta 13+32.31 Δ = 17° 00' 43.0" (RT) D = 9' 32' 57.5" L = 178.15' T = 89.73' R = 600.00' SE = 0.02 R = 60°	PI Sta 18+52.05 Δ = 18° 52' 15.1" (RT) D = 9' 32' 57.5" L = 197.62' T = 99.71' R = 600.00' SE = 0.02 R = 60°	PI Sta 20+49.66 Δ = 18° 52' 15.1" (LT) D = 9' 32' 57.5" L = 197.62' T = 99.71' R = 600.00' SE = 0.02 R = 60°
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REVISIONS

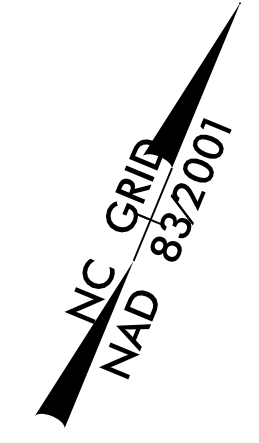
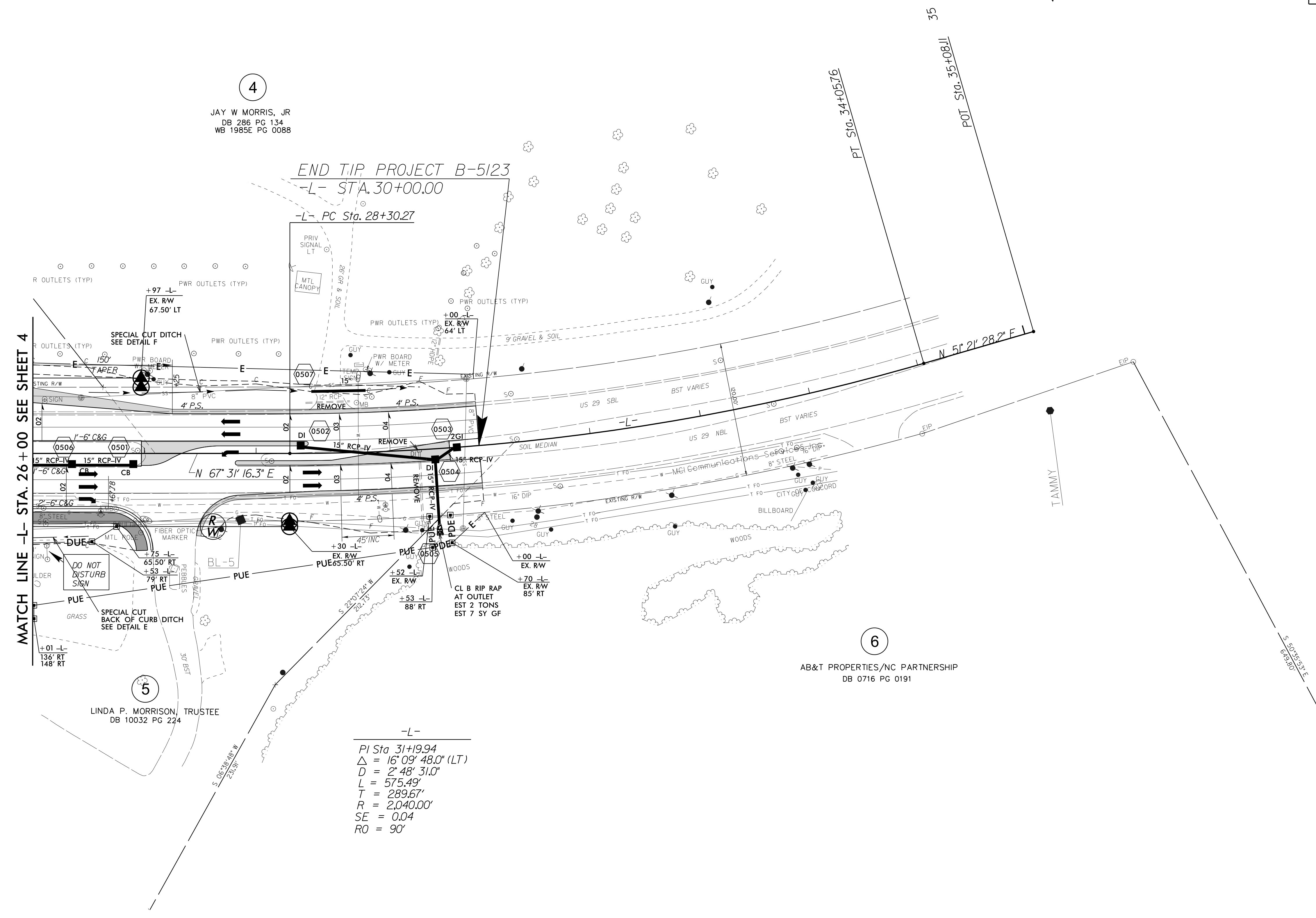
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3:38:50 PM

PROJECT REFERENCE NO. B-5123	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
2/3/2016	2/3/2016
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
FOR -L- PROFILE SEE SHEET 6	

8/17/99

REVISIONS

01-FEB-2016 09:17 AB-B-5123-Rdy-psht5.dgn  
3:38:50 PM C:\P\RYAN\B-5123



4  
JAY W. MORRIS, JR.  
DB 286 PG 134  
WB 1985E PG 0088

5  
LINDA P. MORRISON, TRUSTEE  
DB 10032 PG 224

6  
AB&T PROPERTIES/NC PARTNERSHIP  
DB 0716 PG 0191

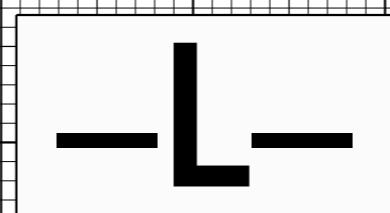
-L-  
PI Sta 31+19.94  
Δ = 16° 09' 48.0" (LT)  
D = 2° 48' 31.0"  
L = 575.49'  
T = 289.67'  
R = 2,040.00'  
SE = 0.04  
RO = 90'

5/28/99

### DITCH LEGEND

640 LEFT DITCH - - - - -  
630 RIGHT DITCH - - - - -

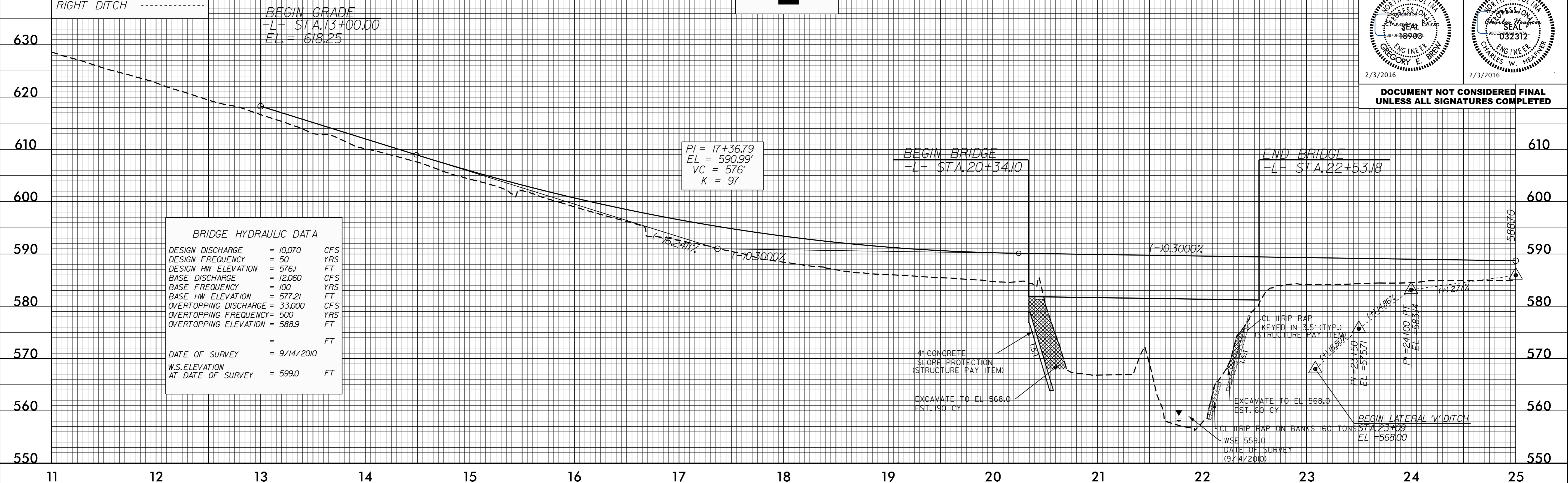
BM #2 RR SPIKE IN BASE OF POWER POLE  
-L- STA.18+01.44, 66.38' RT.  
ELEV. 587.42



FOR -L- PLAN VIEW SEE SHEETS 4 & 5  
FOR STRUCTURE PLANS SEE SHEETS  
S-1 THRU S-74

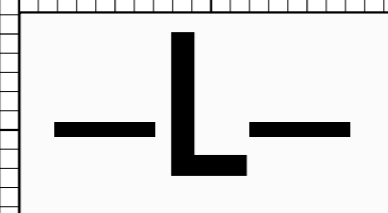
PROJECT REFERENCE NO. B-5123	SHEET NO. 6
ROADWAY DESIGN ENGINEER GREGORY E. BERRY	HYDRAULICS ENGINEER CHARLES W. HARTER
2/3/2016	2/3/2016

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

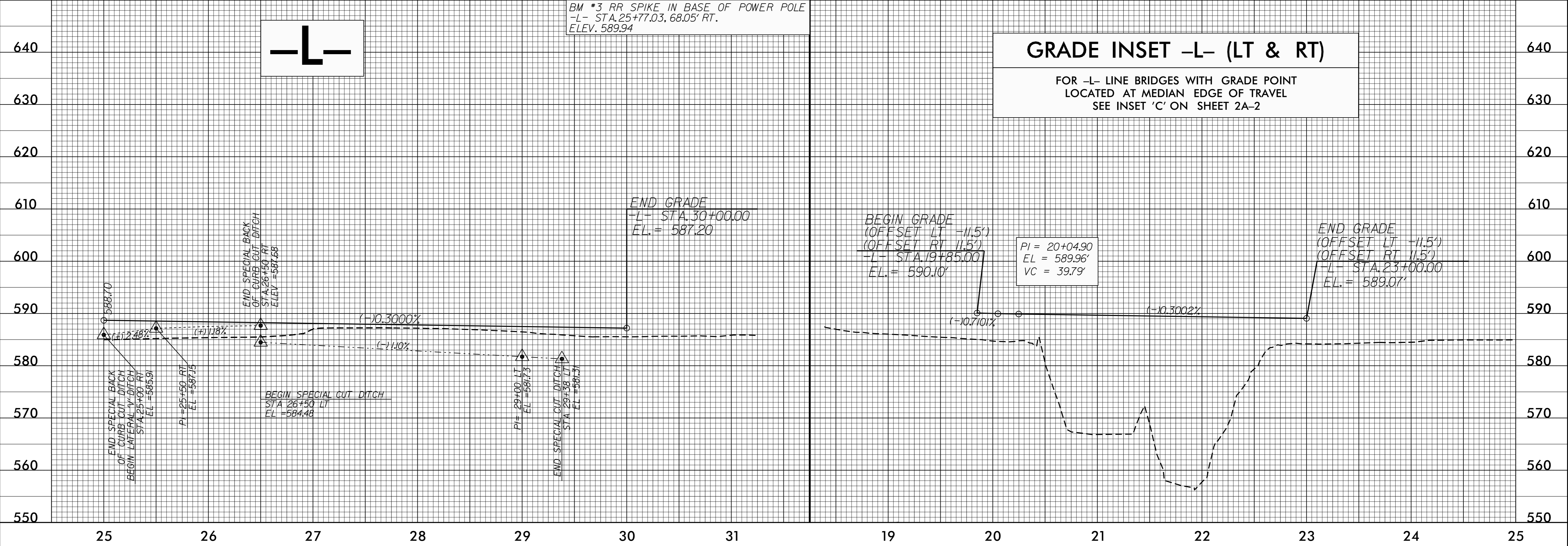


BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 10.070 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 576.1 FT
BASE DISCHARGE	= 12.060 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 577.21 FT
OVERTOPPING DISCHARGE	= 33.000 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 588.9 FT
DATE OF SURVEY	= 9/14/2010
W.S. ELEVATION AT DATE OF SURVEY	= 599.0 FT

BM #3 RR SPIKE IN BASE OF POWER POLE  
-L- STA.25+77.03, 68.05' RT.  
ELEV. 589.94



**GRADE INSET -L- (LT & RT)**  
FOR -L- LINE BRIDGES WITH GRADE POINT  
LOCATED AT MEDIAN EDGE OF TRAVEL  
SEE INSET 'C' ON SHEET 2A-2



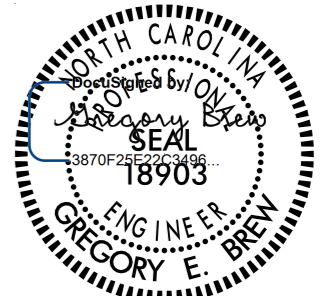

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5/28/99

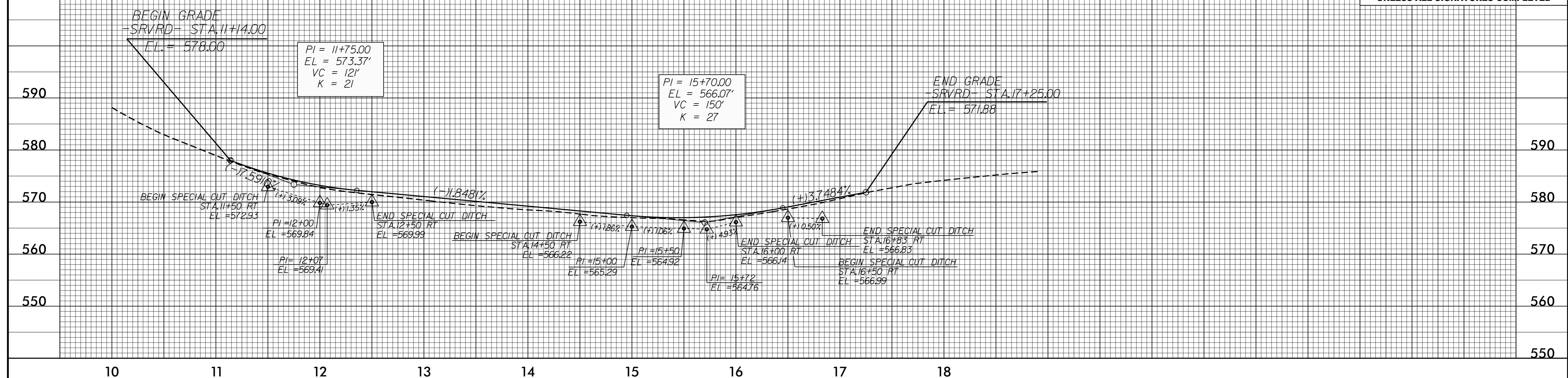
DITCH LEGEND	
LEFT DITCH	-----
RIGHT DITCH	-----

FOR -SRVRD- PLAN VIEW SEE SHEET 4

PROJECT REFERENCE NO. B-5123	SHEET NO. 7
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
2/3/2016	2/3/2016

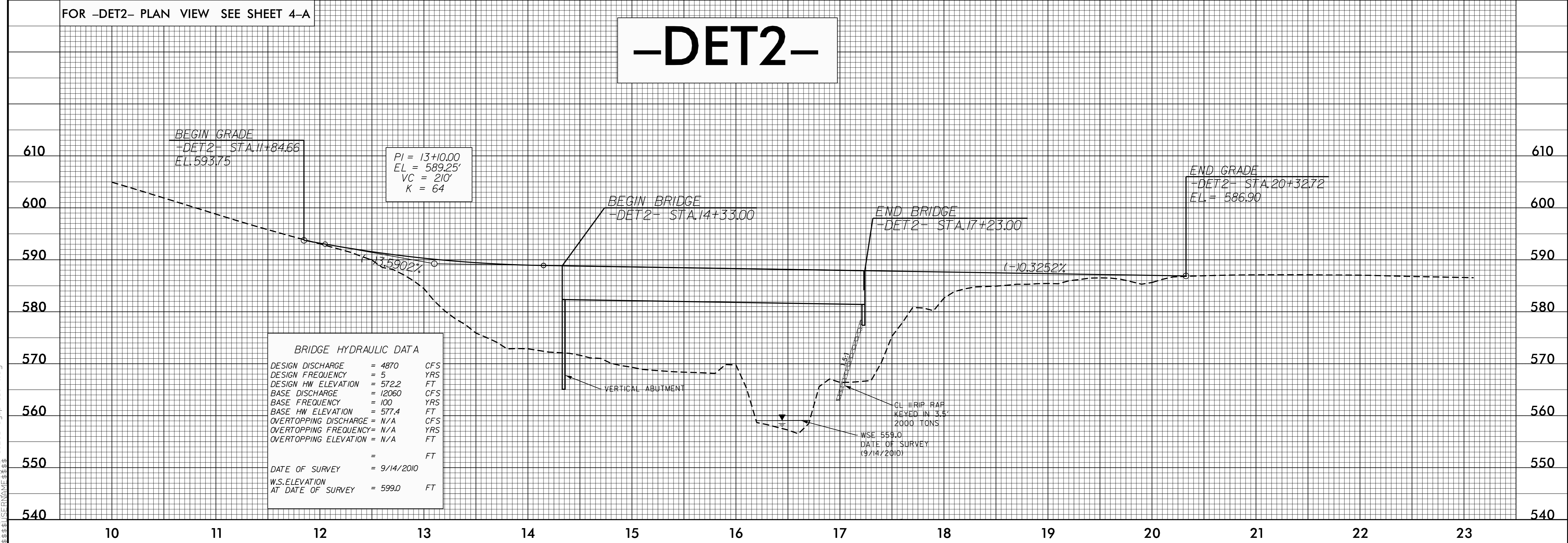
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

# -SRVRD-



FOR -DET2- PLAN VIEW SEE SHEET 4-A

# -DET2-



BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 4870	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 572.2	FT
BASE DISCHARGE	= 12060	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 577.4	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= N/A	YRS
OVERTOPPING ELEVATION	= N/A	FT
	=	FT
DATE OF SURVEY	= 9/14/2010	
W.S. ELEVATION AT DATE OF SURVEY	= 599.0	FT

Q:\JAN-2016\5123\B-5123-Rdwy-pl-sh.dgn  
5/28/99 GREGORY E. BRUM