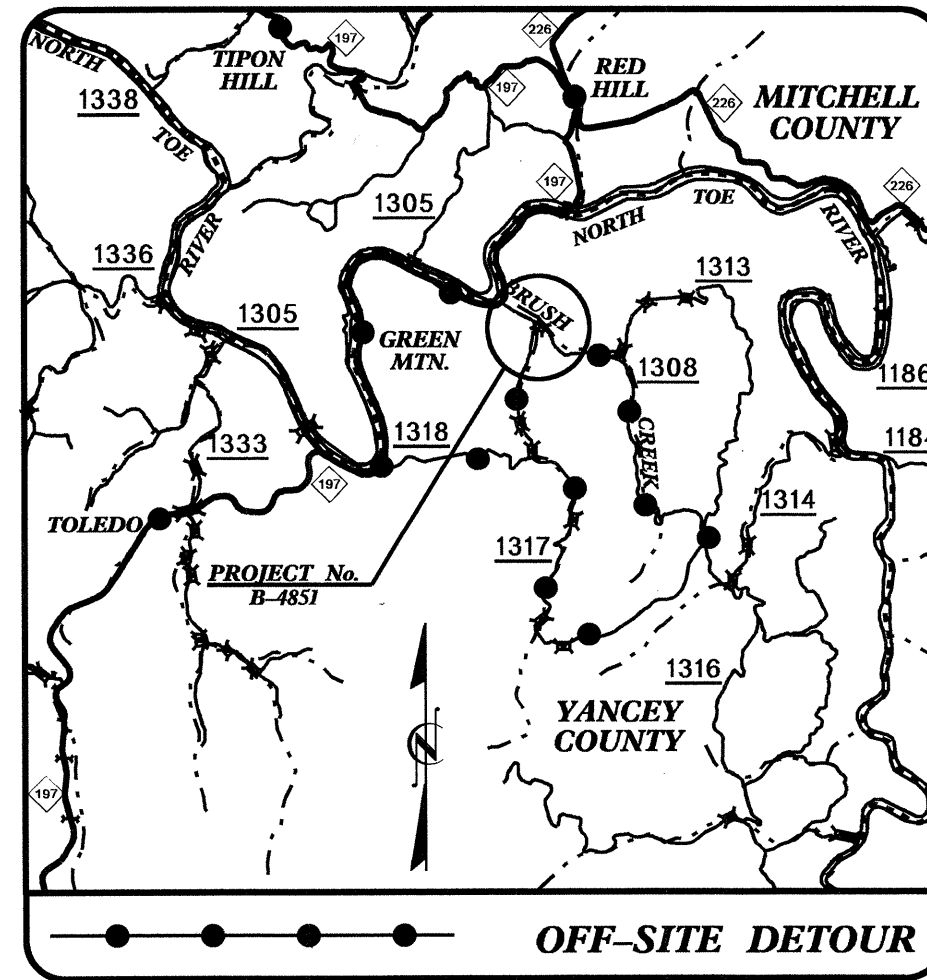


09/08/99

CONTRACT No.: C202781 TIP PROJECT NO.: B-4851

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

YANCEY COUNTY

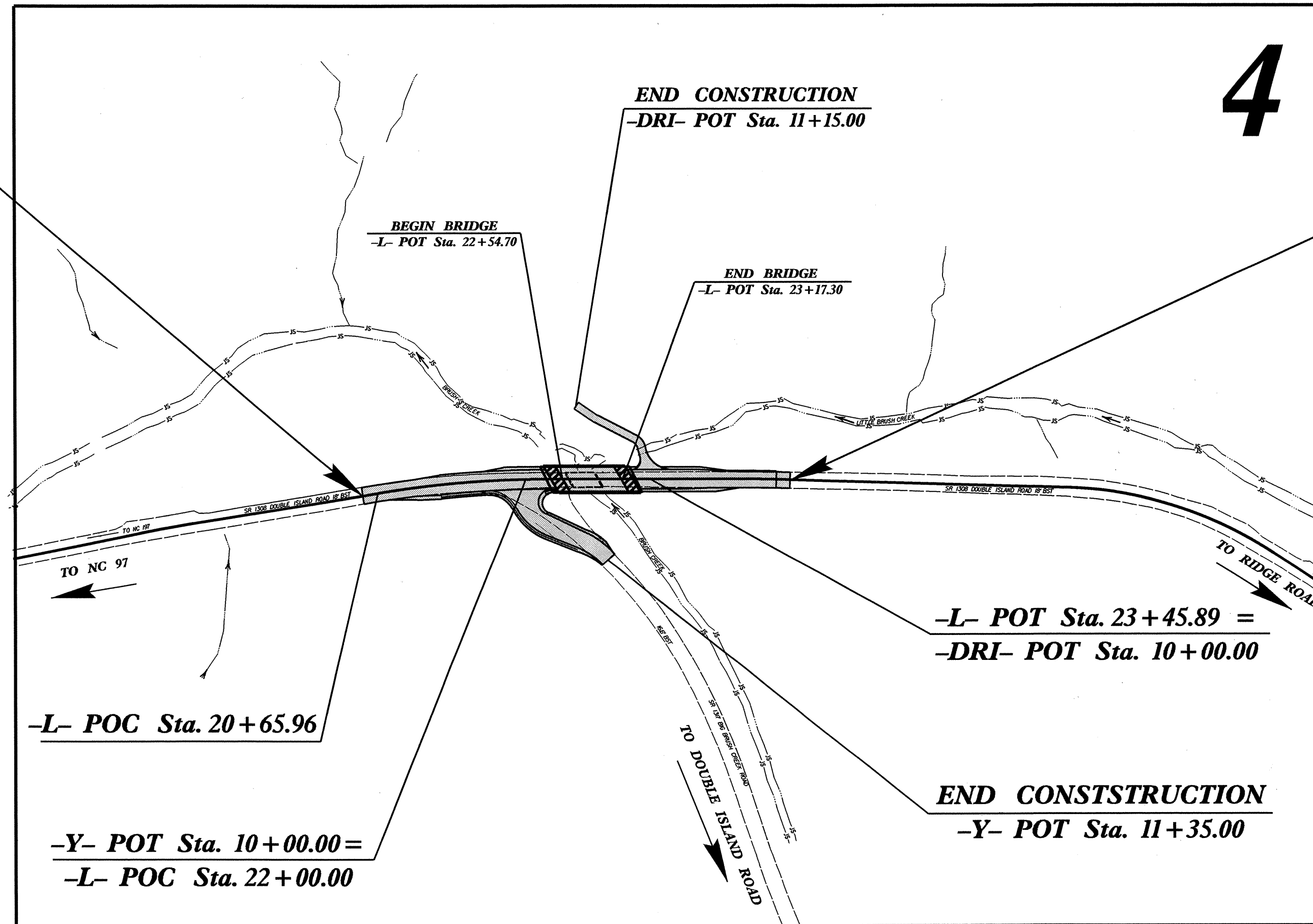
LOCATION: REPLACE BRIDGE No. 31 OVER BRUSH CREEK
ON SR 1308 (DOUBLE ISLAND ROAD).

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4851	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38621.1.1	BRZ-1308(6)	PE	
38621.2.1	BRZ-1308(6)	R/W, UTILITIES	
17BP.13.R.106		CONSTRUCTION	



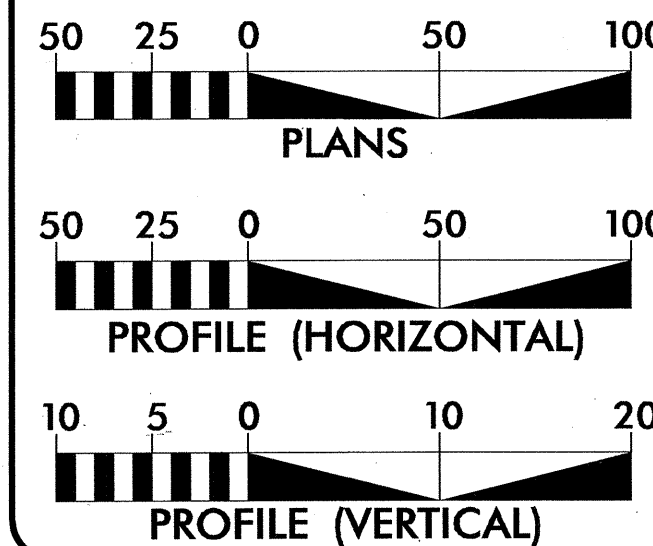
BEGIN PROJECT B-4851
-L- POT Sta. 20+50.00



4

END PROJECT B-4851
-L- PT Sta. 24+89.06

GRAPHIC SCALES



DESIGN DATA

ADT 2010 = 665
 ADT 2035 = 1,200
 DHV = 11 %
 D = 65 %
 T = 7 % *
 V = 45 MPH
 * TTST = 6% DUAL 1%
 FUNC. CLASS. = LOCAL
 SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT TIP No. B-4851 = 0.071 MILES.
 LENGTH OF STRUCTURE PROJECT TIP No. B-4851 = 0.012 MILES.
 TOTAL LENGTH OF PROJECT No. B-4851 = 0.083 MILES.

Prepared in the Office of:
DIVISION OF HIGHWAYS

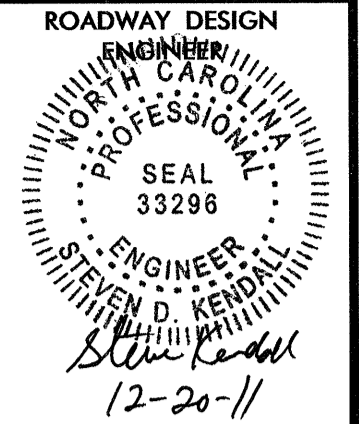
1000 Birch Ridge Dr., Raleigh NC, 27610
 2012 STANDARD SPECIFICATIONS
 RIGHT OF WAY DATE: FEBRUARY 15, 2011
 LETTING DATE: FEBRUARY 21, 2012
 JIMMY GOODNIGHT, PE
 PROJECT ENGINEER
 STEVE KENDALL, PE
 PROJECT DESIGN ENGINEER

HYDRAULIC ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 19775
 RAY D. ZIMMERMAN
 P.E. 30 NOV 2011
 ROADWAY DESIGN ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL 33296
 STEVEN D. KENDALL
 P.E. 11-30-11

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA
 STATE HIGHWAY DESIGN ENGINEER

28-NOV-2011 10:53
R:\Roadway\Proj\Nb-4851_rdy_tsh.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



**2012 ROADWAY ENGLISH
STANDARD DRAWINGS**

EFF. 01-17-12

GENERAL NOTES

2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 11-01-12

INDEX OF SHEETS

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
225.06	Method of Obtaining Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
300.10	Driveway Pipe Placement
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 6 - SUBGRADE, BASES AND SHOULDERS	
654.01	Pavement Repair
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Markers
806.02	Granite Right-of-Way Markers
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad (Shoulder Drains)
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter, and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

GRADE LINE:

GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. No. 225.04 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.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 815.01 AT LOCATIONS DIRECTED BY THE ENGINEER.

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.

END BENTS:

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

ROCK:

ROCK IS ANTICIPATED BETWEEN -Y- STA. 10+12.50 TO 11+35.00. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE:
French Broad EMC - Distribution
Frontier Communication - Telephone

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.

SHEET No.

SHEET

1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C & 1-D	SURVEY CONTROL SHEET
2 & 2-A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, STRUCTURE TYPICAL SECTION, AND SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP.
2-B	DETAIL OF REINFORCED CONCRETE ENDWALL FOR 84" DIAMETER PIPE W/90° SKEW
2-C	DETAIL FOR MODIFIED CONCRETE FLUME.
3	SUMMARY OF QUANTITIES:
3-A	DRAINAGE SUMMARY, EARTHWORK SUMMARY, GUARDRAIL SUMMARY, EXPRESSWAY GUTTER SUMMARY, ASPHALT PAVEMENT REMOVAL SUMMARY, SHOULDER BERM GUTTER SUMMARY
4	PLAN SHEETS
5	PROFILE SHEETS
TMP-1 THRU TMP-3A	TRANSPORTATION MANAGEMENT PLANS
SD-1 & SD-2	SIGN DESIGN PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORSTATION PLANS
UO-1 & UO-2	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION INDEX OF SHEETS
X-1A	CROSS-SECTION SUMMARY SHEETS
X-2 THRU X-20	CROSS-SECTIONS
S-1 THRU S-15	STRUCTURE PLANS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○
Property Corner	⊠
Property Monument	⊠
Parcel/Sequence Number	⑩
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---

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	⊠
Jurisdictional Stream	---JS---
Buffer Zone 1	---BZ 1---
Buffer Zone 2	---BZ 2---
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	---WLB---
Proposed Lateral, Tail, Head Ditch	---FLM---
False Sump	⊠

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	⊠
Switch	⊠
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◇
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	⊠
Proposed Control of Access	⊠
Existing Easement Line	---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	---PUJ---
Proposed Temporary Utility Easement	---TUE---
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 Wheel Chair Ramp	⊠
Existing Metal Guardrail	---T---
Proposed Guardrail	---T---
Existing Cable Guiderail	---P---
Proposed Cable Guiderail	---P---
Equality Symbol	⊠
Pavement Removal	⊠

VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	-----
Woods Line	-----
Orchard	⊠
Vineyard	⊠

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊠
Telephone Booth	⊠
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	⊠
Recorded U/G Telephone Cable	---T---
Designated U/G Telephone Cable (S.U.E.*)	---T---
Recorded U/G Telephone Conduit	---TC---
Designated U/G Telephone Conduit (S.U.E.*)	---TC---
Recorded U/G Fiber Optics Cable	---TF0---
Designated U/G Fiber Optics Cable (S.U.E.*)	---TF0---

WATER:

Water Manhole	⊠
Water Meter	⊠
Water Valve	⊠
Water Hydrant	⊠
Recorded U/G Water Line	---W---
Designated U/G Water Line (S.U.E.*)	---W---
Above Ground Water Line	---A/G Water---

TV:

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

GAS:

Gas Valve	◇
Gas Meter	⊠
Recorded U/G Gas Line	---G---
Designated U/G Gas Line (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---
Recorded SS Forced Main Line	---FSS---
Designated SS Forced Main Line (S.U.E.*)	---FSS---

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	⊠
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line	---UTL---
U/G Tank; Water, Gas, Oil	⊠
AG Tank; Water, Gas, Oil	⊠
U/G Test Hole (S.U.E.*)	⊠
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

SURVEY CONTROL SHEET B-4851

Design Alignments

RW Markers

-L-

TYPE	STATION	NORTH	EAST
PC	10+00.00	836214.1137	1042980.1983
PT	11+63.62	836104.4795	1043101.1496
PC	13+43.27	836000.1671	1043247.4222
PT	16+51.28	835848.2443	1043514.7282
PC	18+16.97	835781.5685	1043666.4096
PT	18+74.22	835757.5339	1043718.3712
PC	20+65.96	835673.7328	1043890.8288
PT	22+38.32	835586.1554	1044039.0645
PC	24+39.09	835470.3321	1044203.0547
PT	24+89.06	835440.9110	1044243.4383
PC	27+74.53	835269.4380	1044471.6788
PT	29+99.73	835091.8522	1044605.2804
POT	31+50.87	834950.5849	1044659.0183

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
-L-	20+97.00	-25.00	835681.9166	1043930.1237
-L-	20+65.96	-15.32	835687.5160	1043897.5251
-L-	22+38.32	-25.00	835606.5757	1044053.4870
-L-	22+90.00	-25.00	835576.7639	1044095.6965
-L-	23+55.00	-43.00	835553.9680	1044159.1737
-L-	23+55.00	-25.00	835539.2654	1044148.7895
-L-	24+39.09	-25.00	835490.7538	1044217.4754
-L-	24+39.09	-14.11	835481.8591	1044211.1916
-L-	20+65.96	14.68	835660.5307	1043884.4124
-L-	20+65.96	25.00	835651.2474	1043879.9014
-L-	21+80.00	25.00	835597.2928	1043977.2454
-L-	22+87.46	25.00	835537.3862	1044064.7801
-L-	24+39.09	25.00	835449.9118	1044188.6322
-L-	24+39.09	15.89	835457.3514	1044193.8857

Y

TYPE	STATION	NORTH	EAST
POT	10+00.00	835607.6940	1044007.3679
PC	10+36.19	835571.5073	1044007.2896
PT	10+63.20	835545.7763	1044014.3539
PC	11+00.76	835513.5224	1044033.6022
PT	11+34.15	835482.3082	1044044.6593
PC	11+66.00	835450.6740	1044048.4045
PT	12+48.02	835368.8074	1044049.6587
POT	12+80.00	835336.9515	1044046.8736

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y	10+55.00	118.00	835510.0059	1043900.9090
Y	10+83.00	86.00	835484.7000	1043950.6527
Y	11+34.15	30.96	835478.6677	1044013.9096

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)

THE FILES TO BE FOUND ARE AS FOLLOWS:

B4851_LS_CONTROL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4851-2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 832331.6719(±) EASTING: 1043558.0212(±) ELEVATION: 2246.05(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99985346 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4851-2" TO -L- STATION 20+65.96 IS N 05° 41' 13" E 3358.59' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

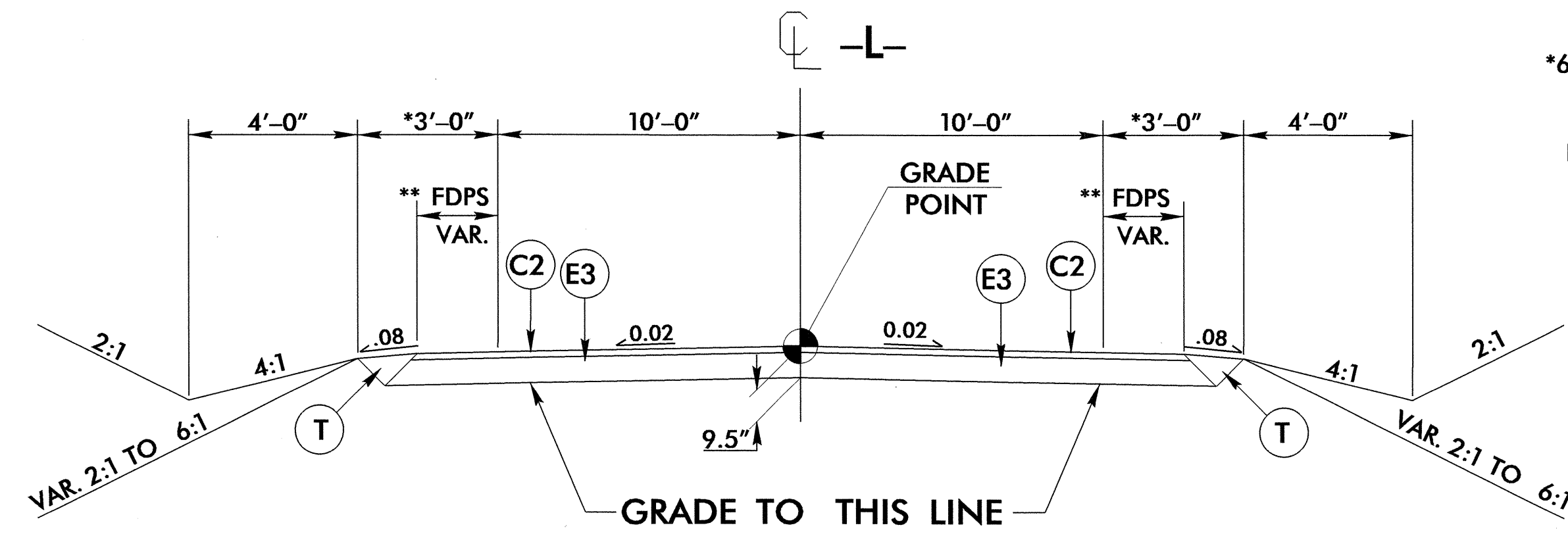
6/2/99

PROJECT REFERENCE NO. B-4851	SHEET NO. 2

PAVEMENT SCHEDULE FINAL PAVEMENT DESIGN			
C1	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.	E3	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.
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	PROPOSED EXPRESSWAY GUTTER.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
E2	PROP. APPROX. 4 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.

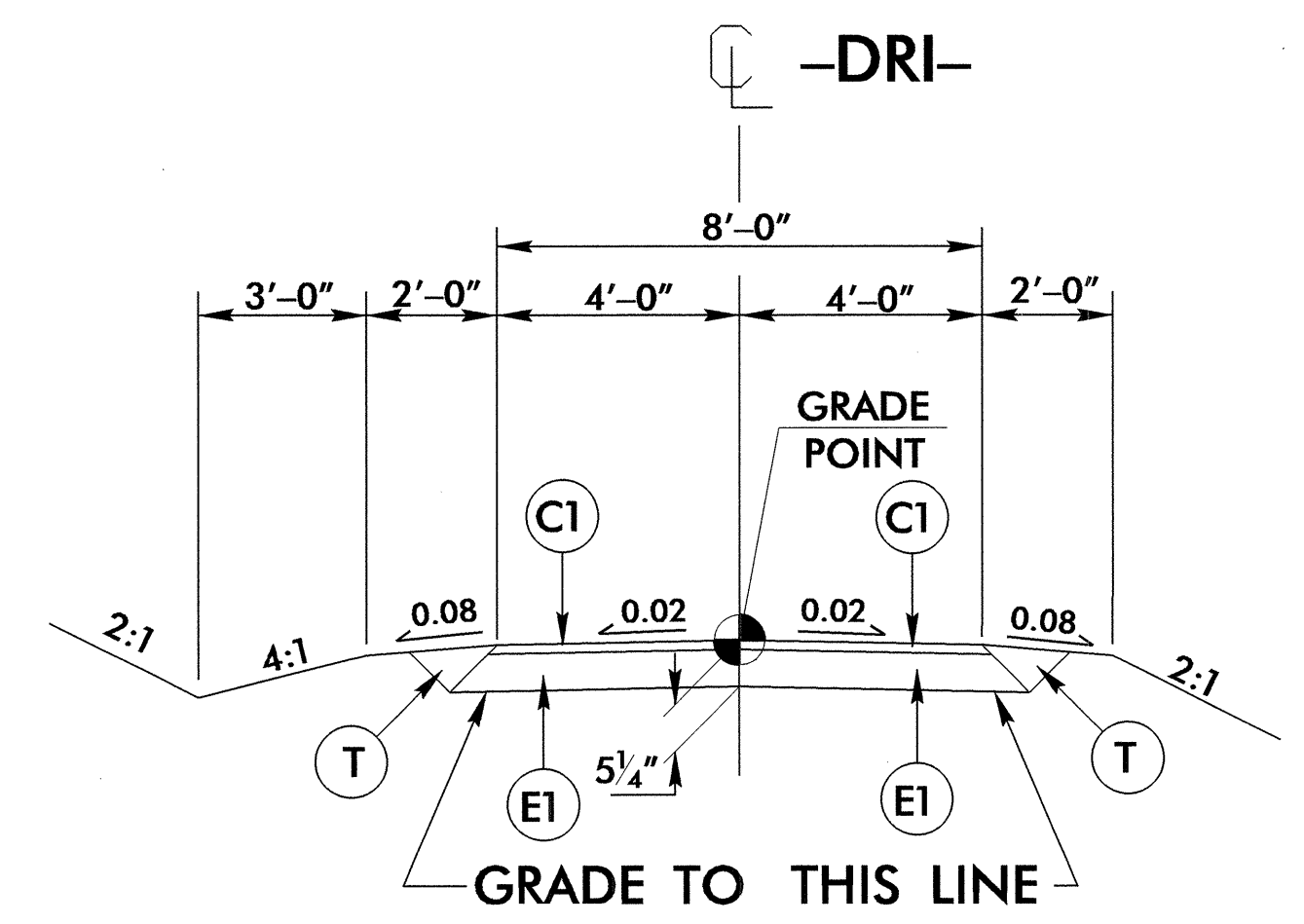
RESURFACE
 -L- Sta. 24+30.00 to Sta. 24+89.06
 WITH 1 1/4" OF SF9.5A

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



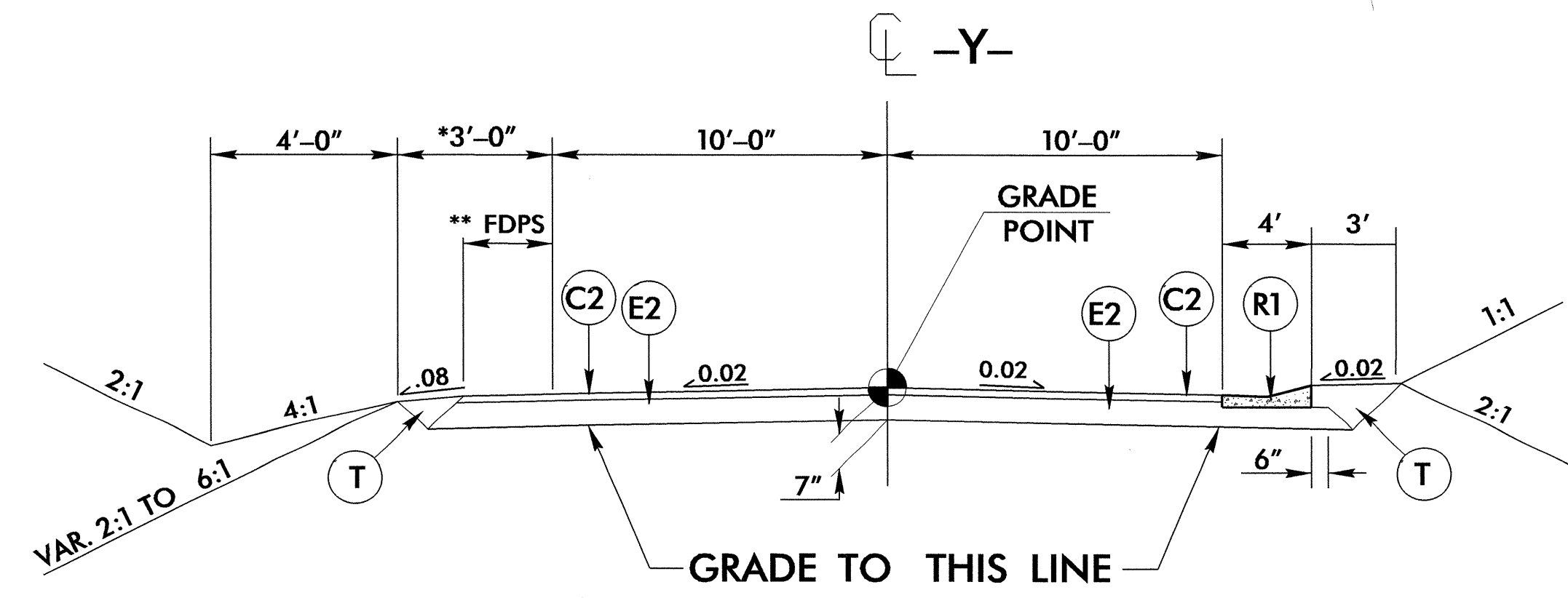
TYPICAL SECTION NO. 1

-L- Sta. 20+50.00 to Sta. 22+54.70 (BEGIN BRIDGE)
 -L- Sta. 23+17.30 (END BRIDGE) to Sta. 24+30.00



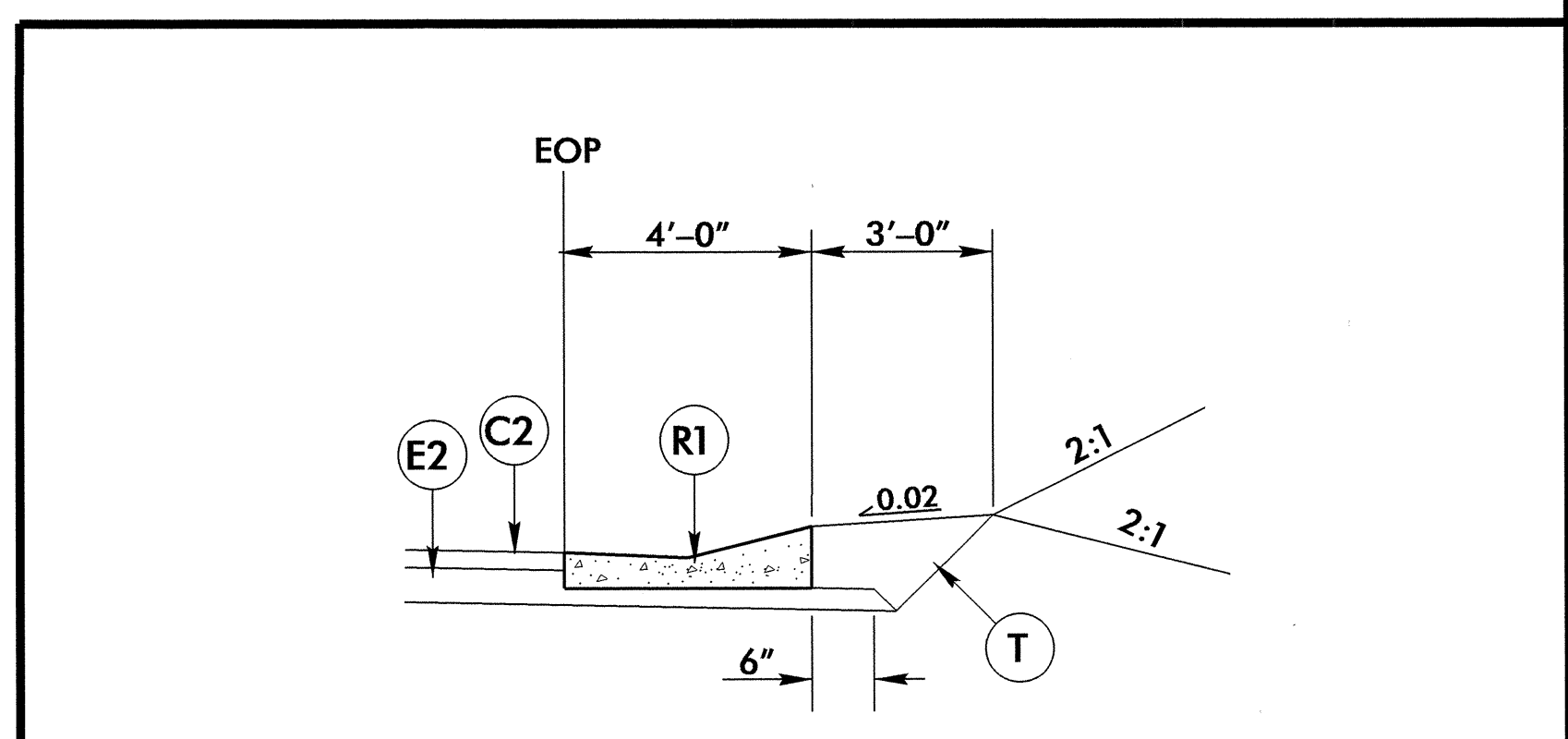
TYPICAL SECTION NO. 3

-DW1- Sta. 10+12.50 to Sta. 11+15.00



TYPICAL SECTION NO. 2

-Y- Sta. 10+12.50 to Sta. 11+35.00

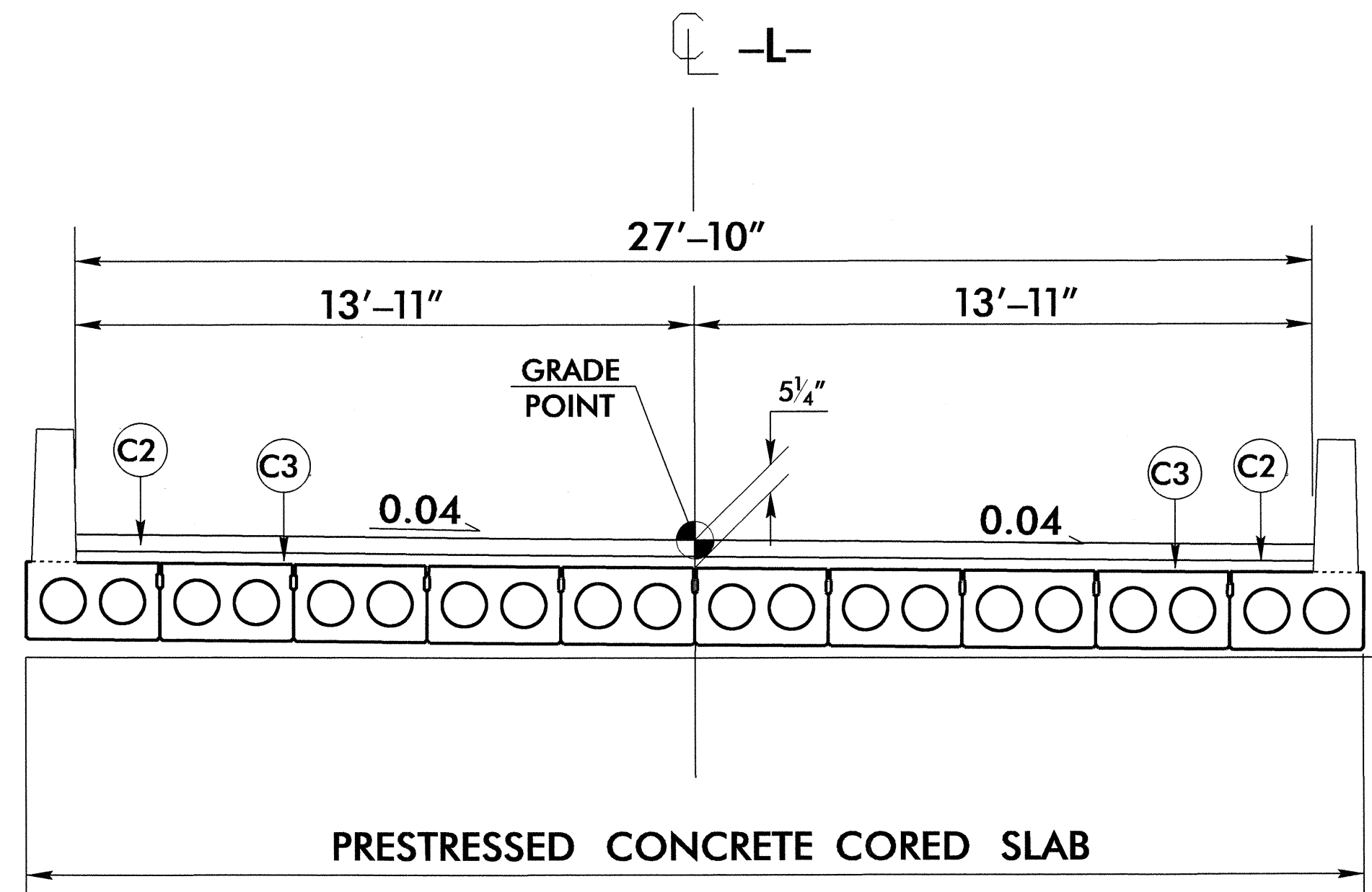


USE IN CONJUNCTION WITH TYPICAL SECTION No. 1
 -L- Sta. 21+30.00 to -Y- Sta. 11+00.52 RT.

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STRUCTURE TYPICAL SECTIONS



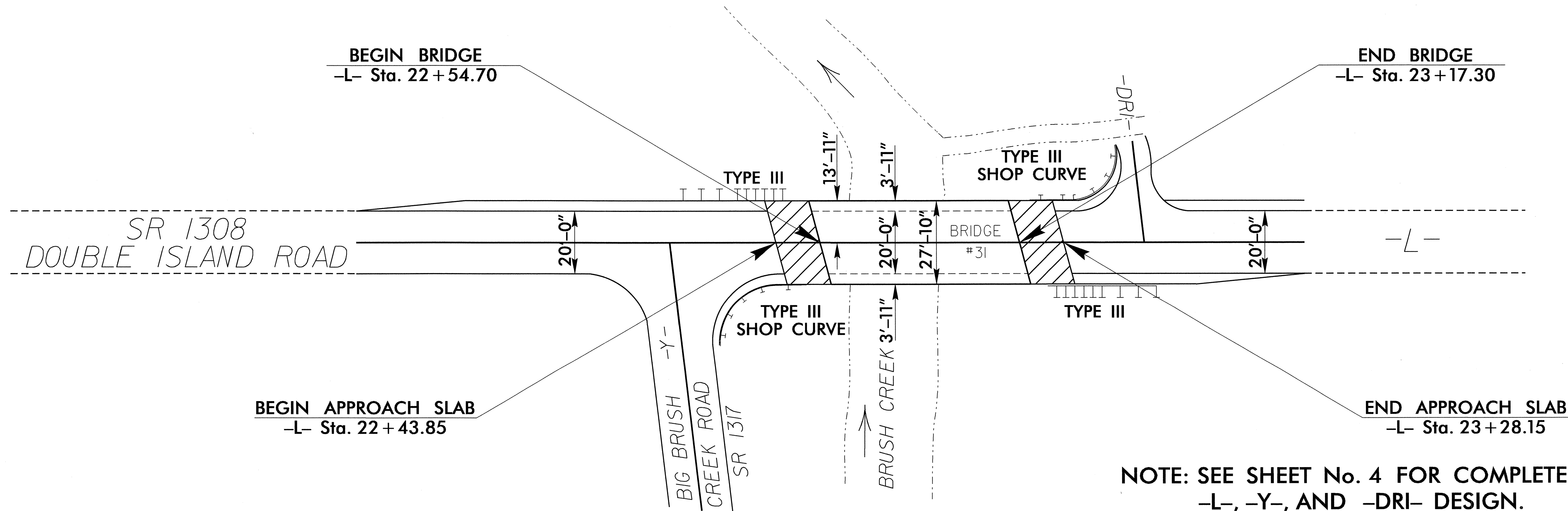
TYPICAL SECTION NO. A

DESIGN DATA

ADT 2010 = 665
ADT 2035 = 1,200
DHV = 11 %
D = 65 %
T = 7 % *
V = 45 MPH
* TTST 1% DUAL 6%
FUNCTIONAL CLASSIFICATION = LOCAL SUB-REGIONAL TIER

★ BRIDGE RAIL TO BE DETERMINED BY STRUCTURE DESIGN UNIT

SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP



NOTE: SEE SHEET No. 4 FOR COMPLETE -L-, -Y-, AND -DRI- DESIGN.

5/28/99

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

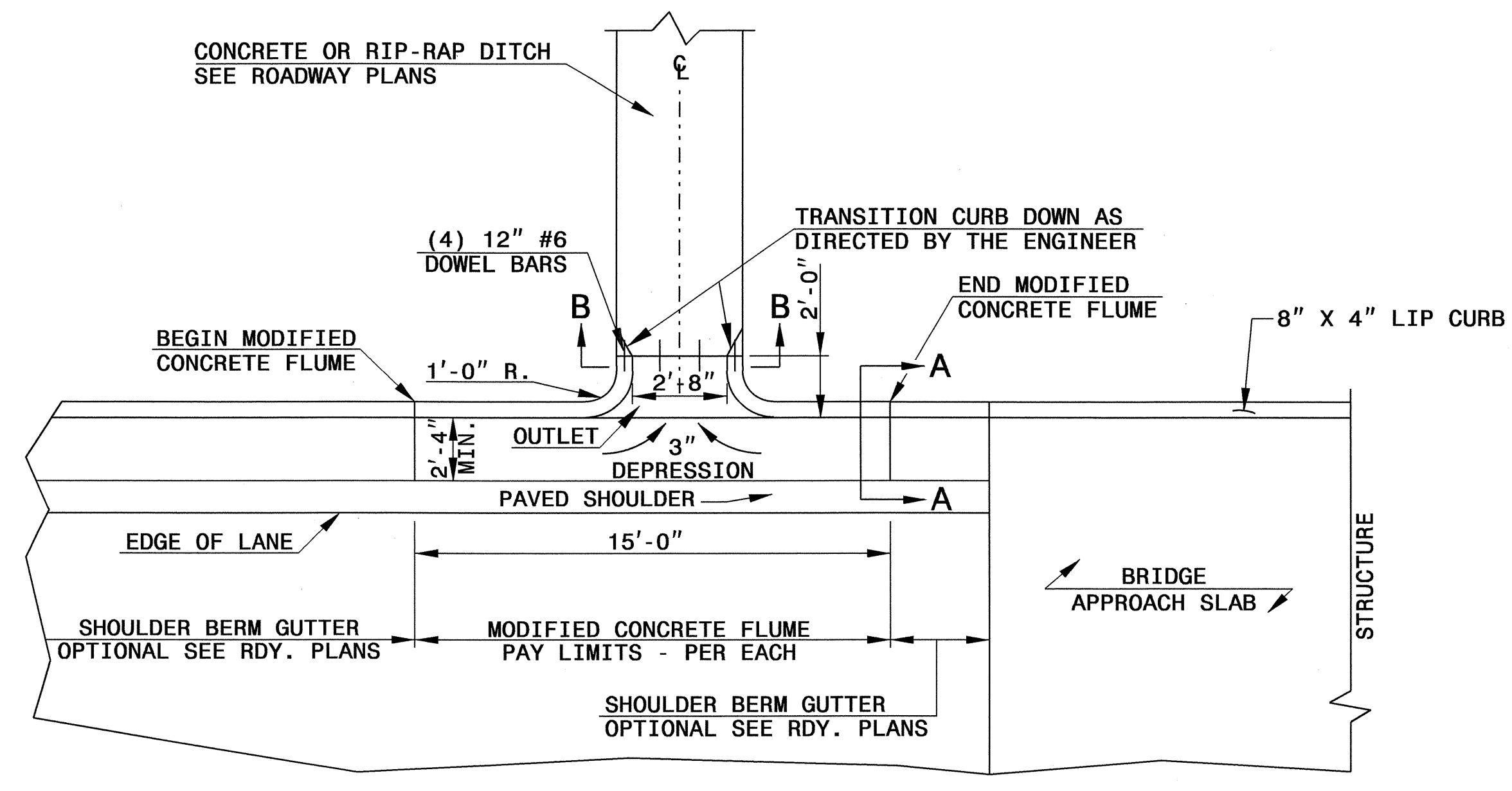
ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH

SHEET 1 OF 1
MODFLMDTCH

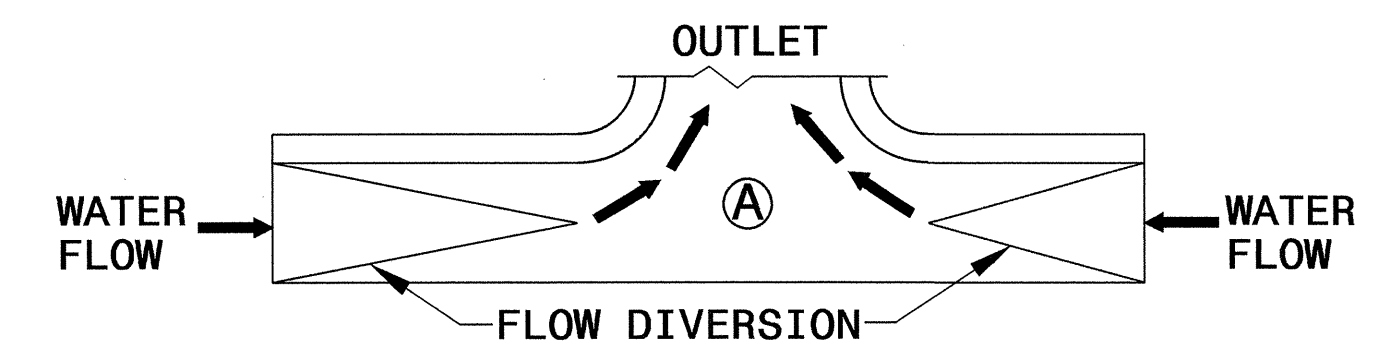
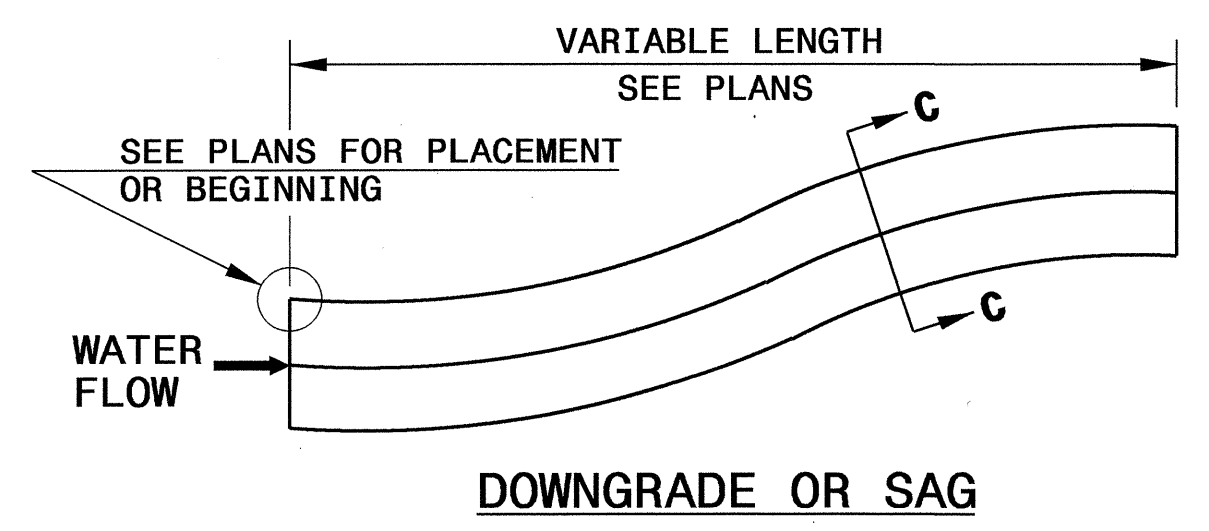
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH

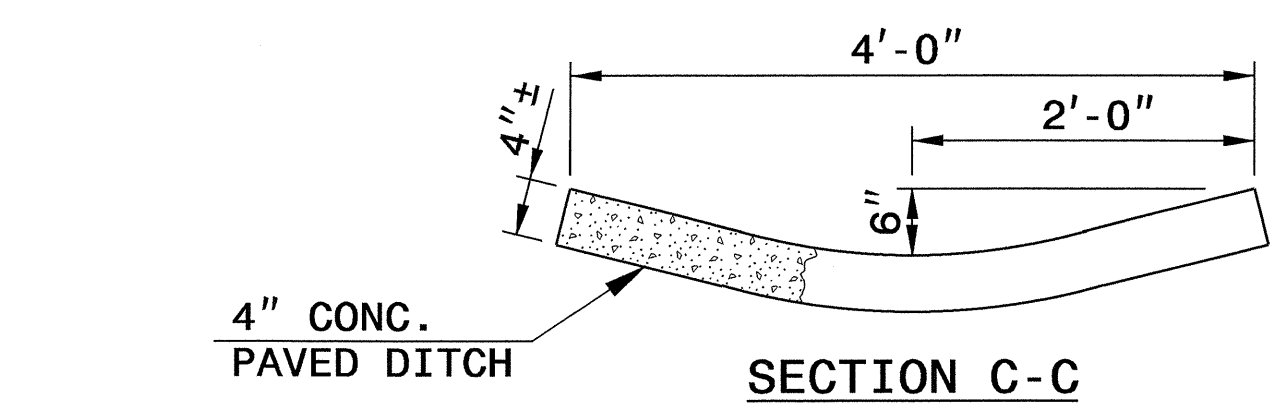
SHEET 1 OF 1
MODFLMDTCH



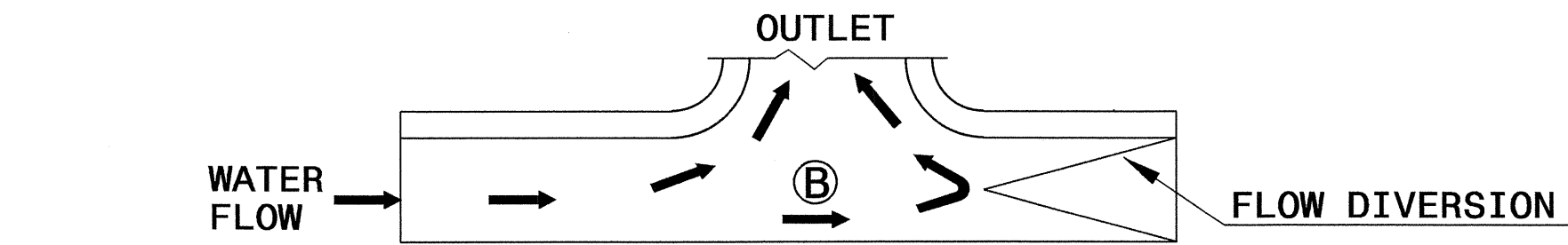
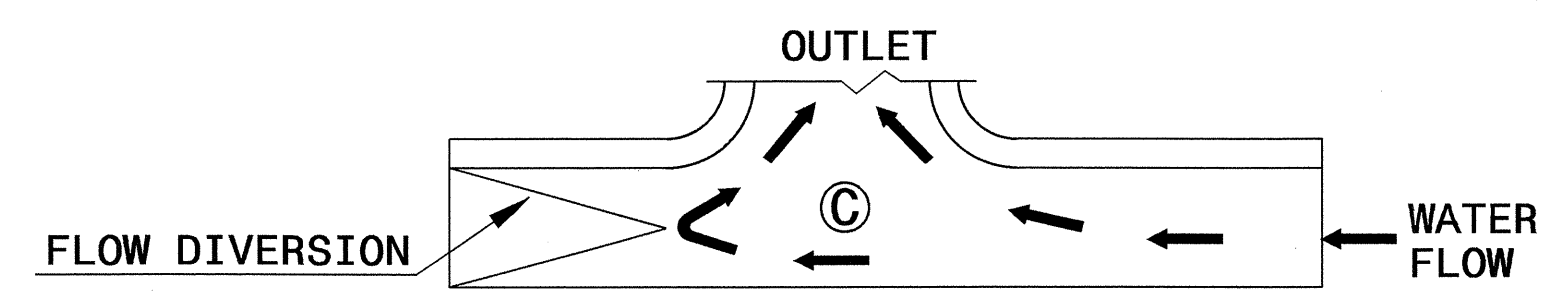
PLAN VIEW



SAG

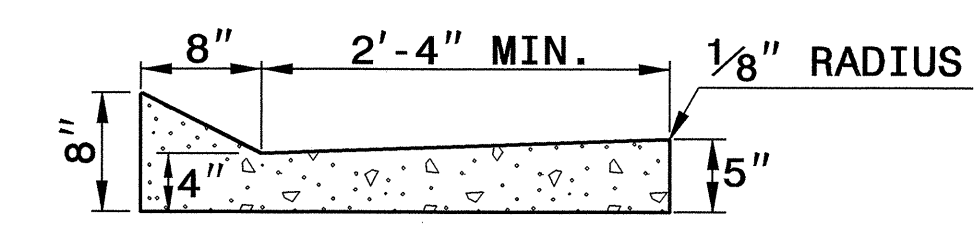


SECTION C-C

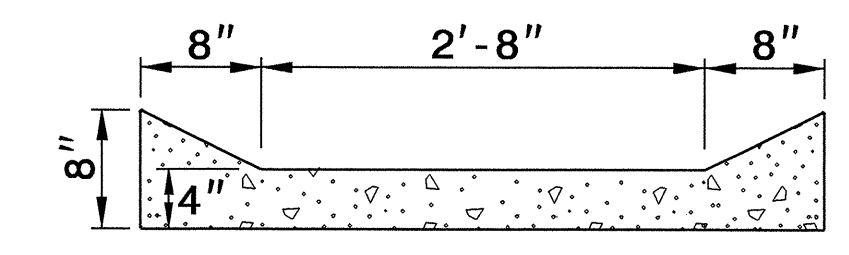


DOWN GRADE

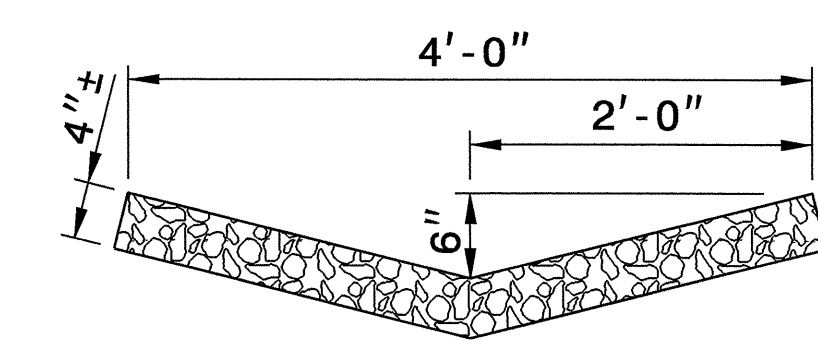
FLOW DIVERSION EXAMPLES



SECTION A-A



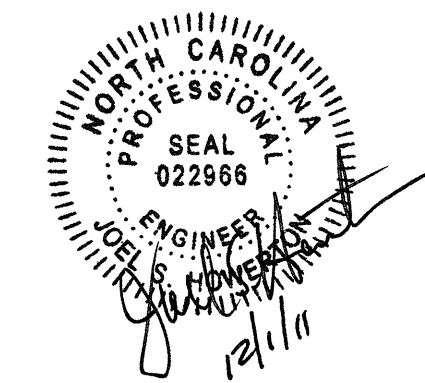
SECTION B-B



RIP-RAP LINED DITCH

NOTES:

- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDER BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
- CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
- CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
- CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18" PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
- MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.

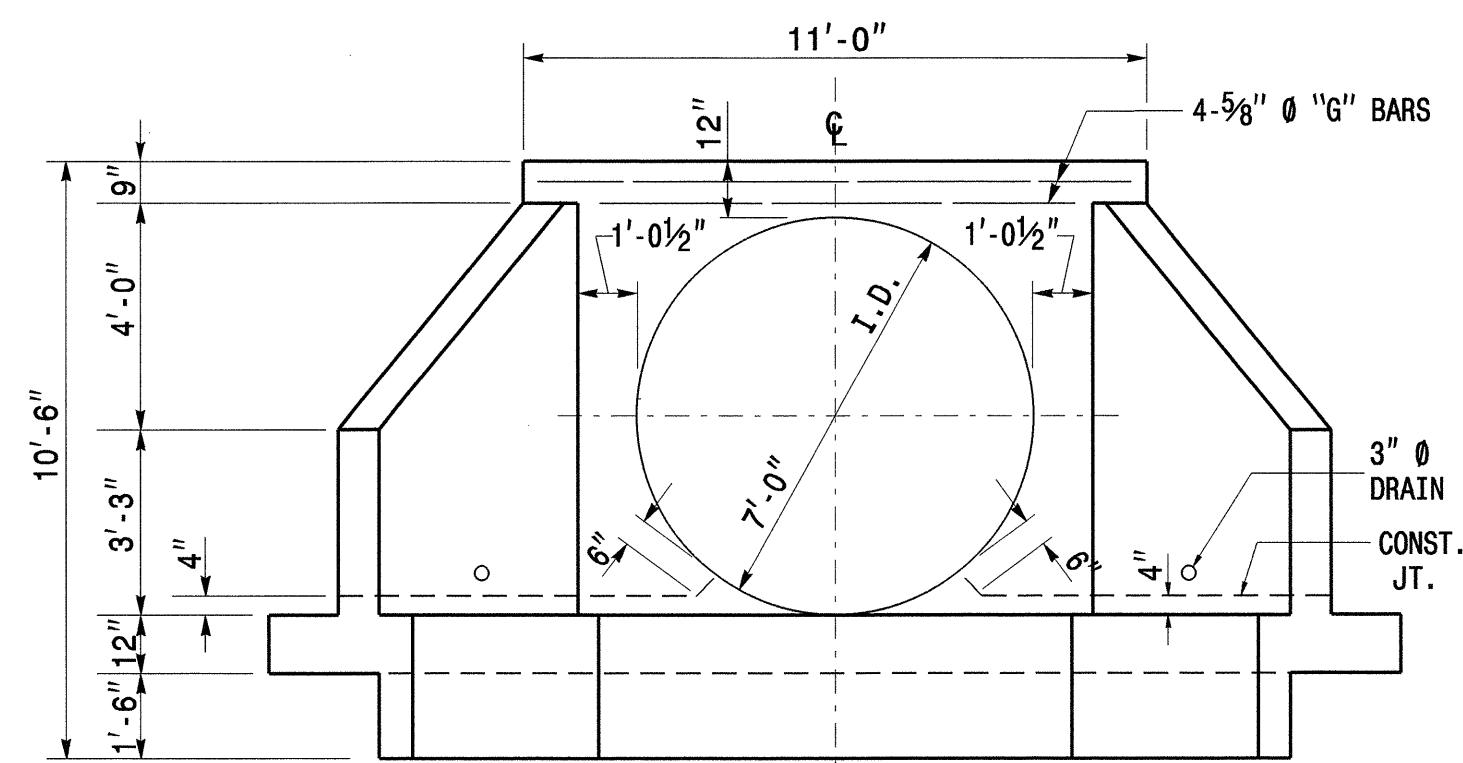


CONTRACT STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

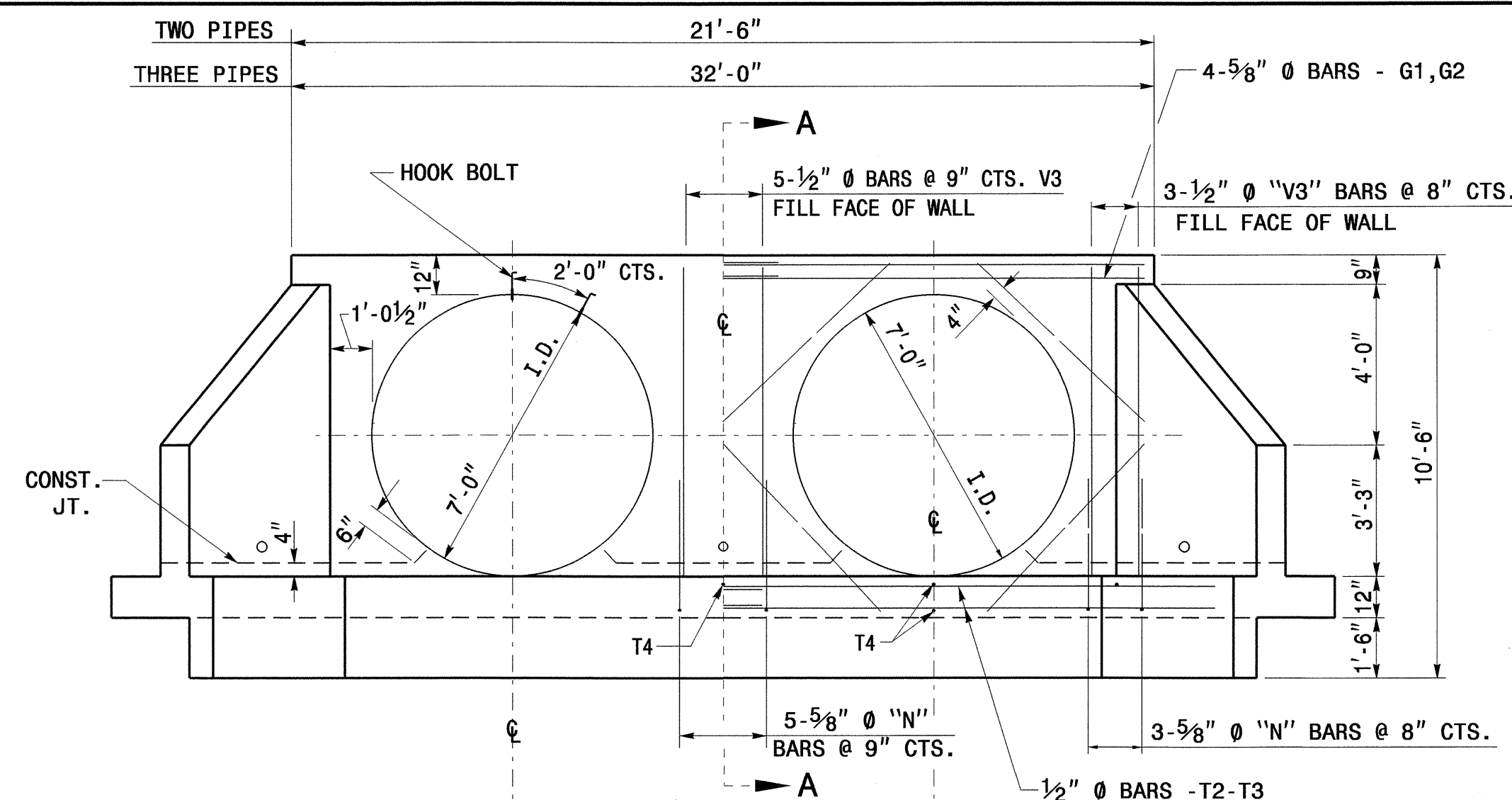
SEE PLATE FOR TITLE

ORIGINAL BY: E.E. Ward DATE: Apr. 2002
MODIFIED BY: E.E. Ward DATE: July 2004
CHECKED BY: *[Signature]* DATE: 9/6/11
FILE SPEC.: *[Path]*

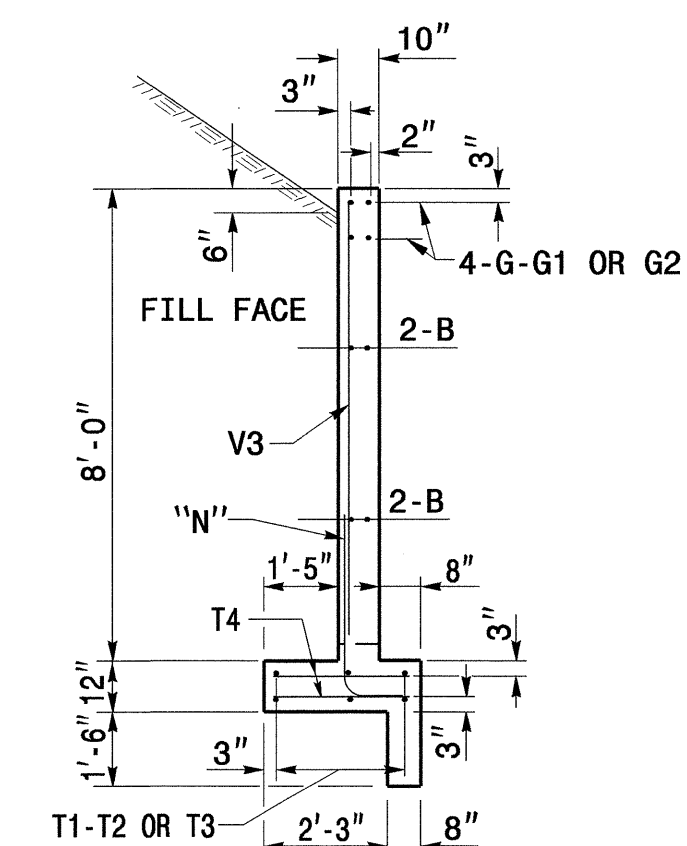
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END ELEVATION



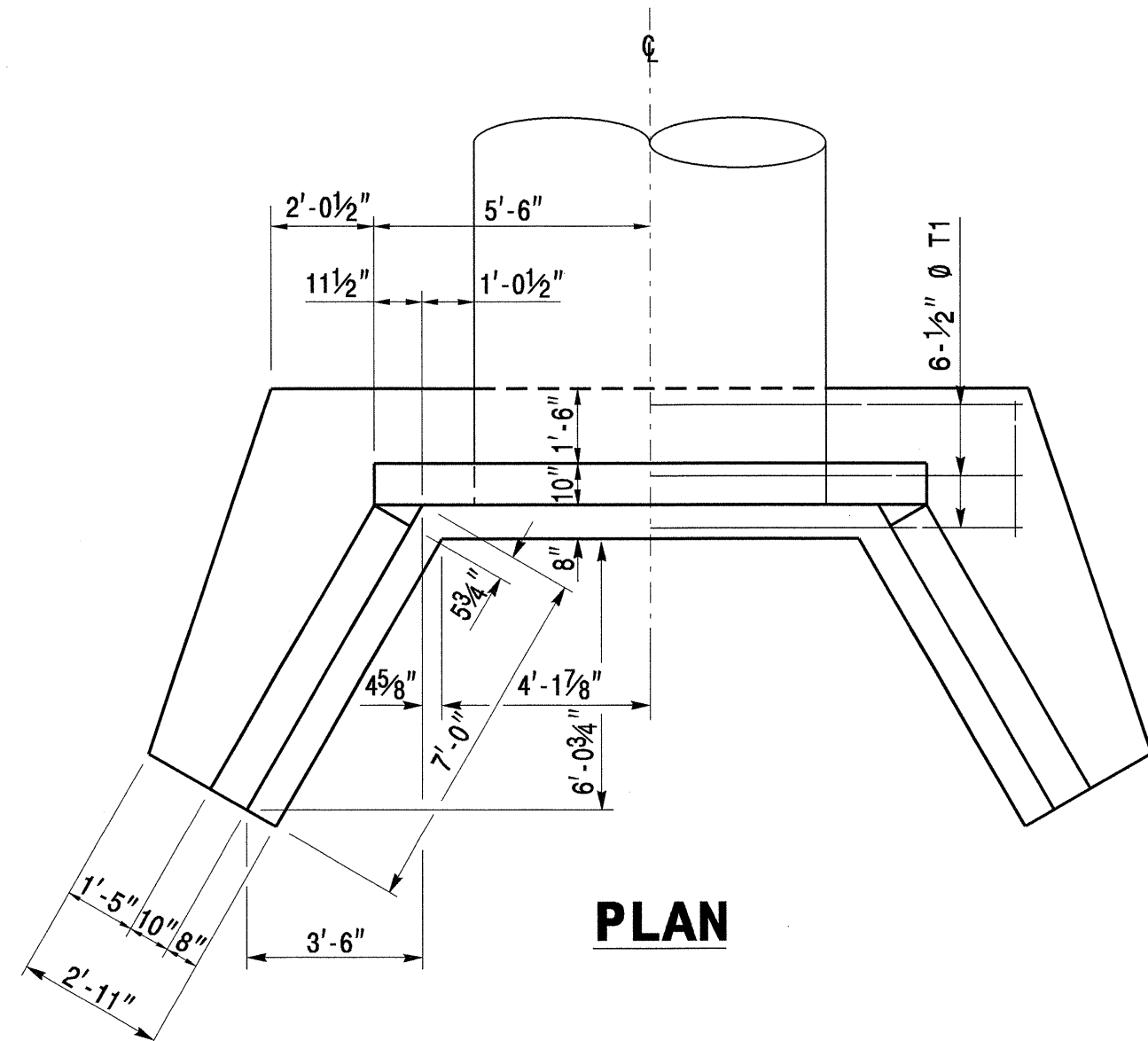
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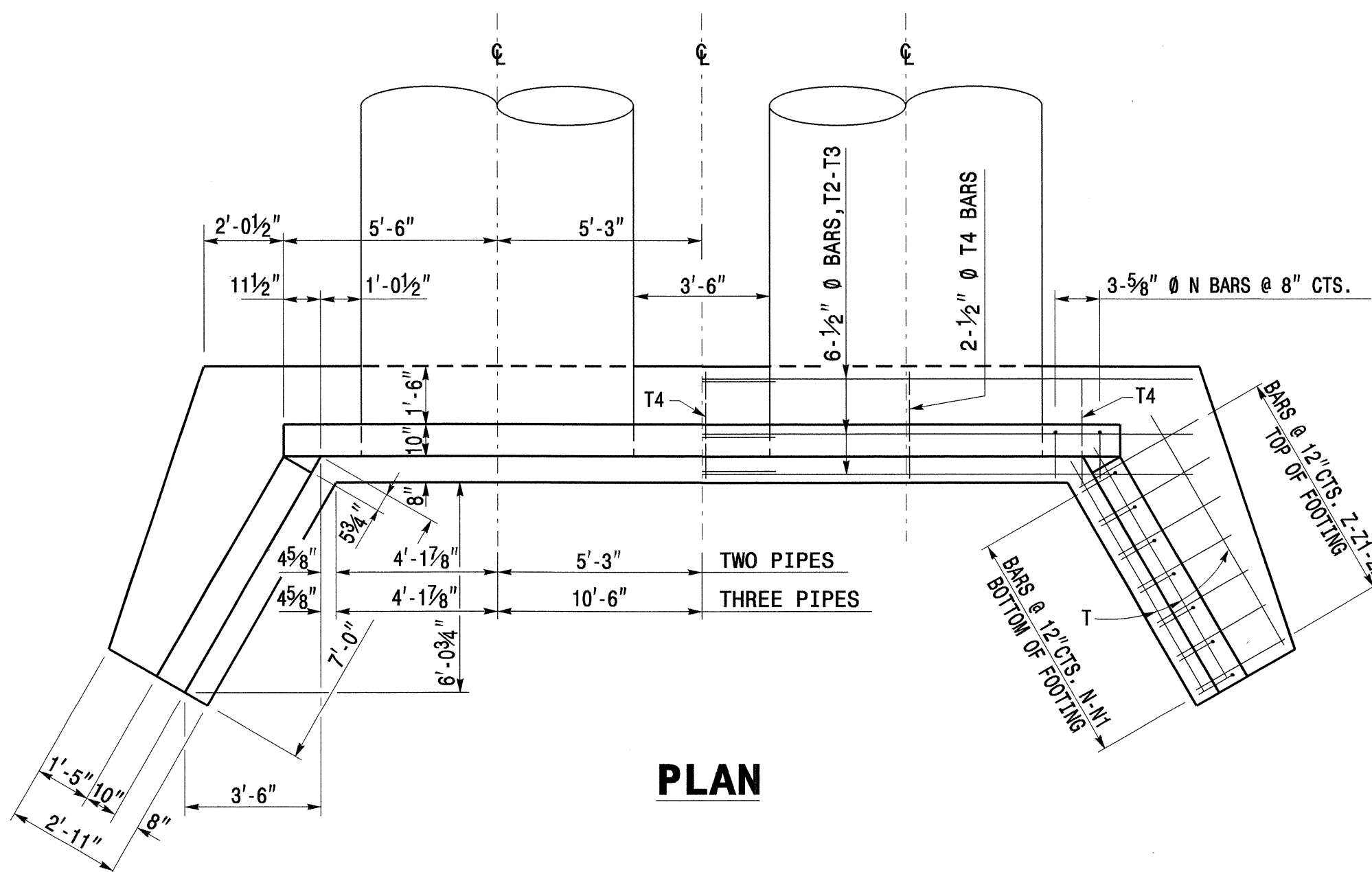
SECTION A-A FOR ALL ENDWALLS

NOTES:

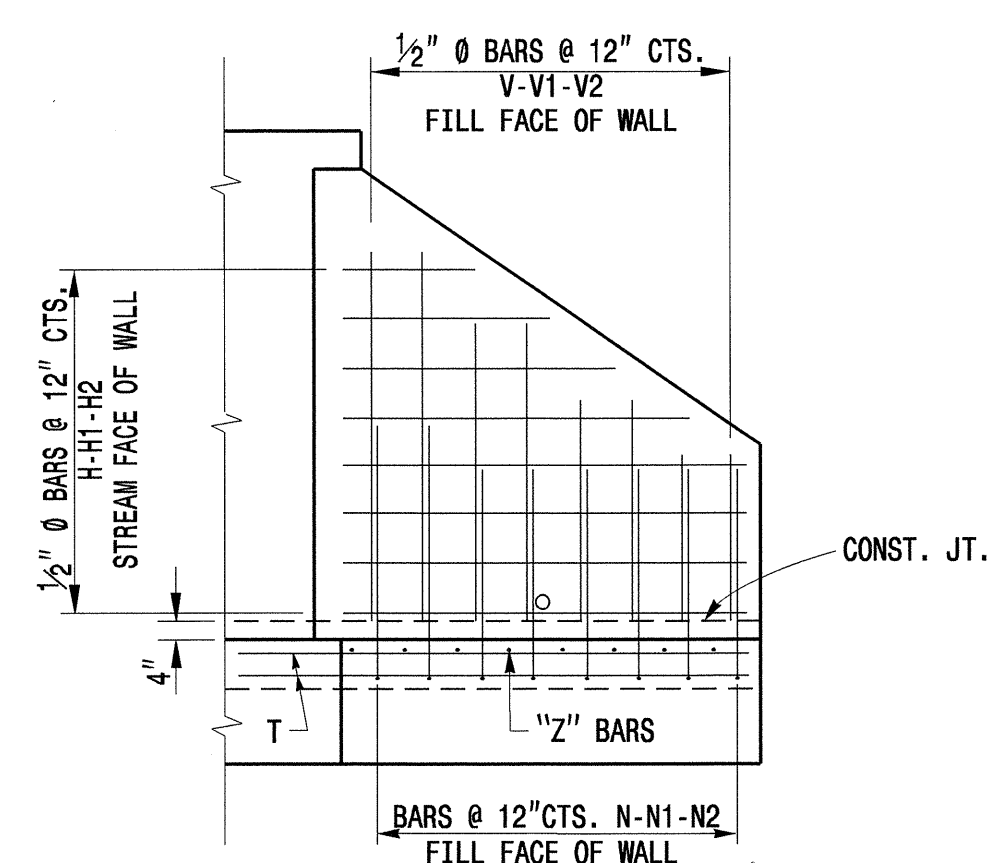
- ALL CONCRETE TO BE CLASS "A".
- ALL REINFORCING STEEL SHALL BE ASTM A615-GRADE 60.
- ALL REINFORCING STEEL SHALL BE DEFORMED BARS. WHERE SPLICING OF REINFORCEMENT IS NECESSARY, BARS ARE TO BE LAPPED 45 DIAMETERS. ALL DIMENSIONS RELATIVE TO REINFORCEMENT ARE TO CENTERS OF BARS.
- THE FOOTING, CURTAIN WALL AND 4" OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. THE REMAINING WALL SHALL THEN BE POURED IN ONE OPERATION.
- ALL EXPOSED CORNERS ARE TO BE CHAMFERED 1".
- 3" DIAMETER DRAINS SHALL BE PLACED IN WALL AS SHOWN AND BE 6" ABOVE NORMAL FLOW LINE.
- ALL MATERIAL AND WORKMANSHIP AS PER N.C. DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.



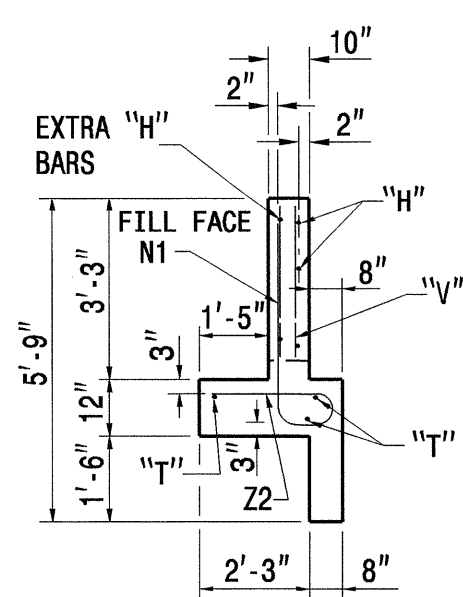
PLAN



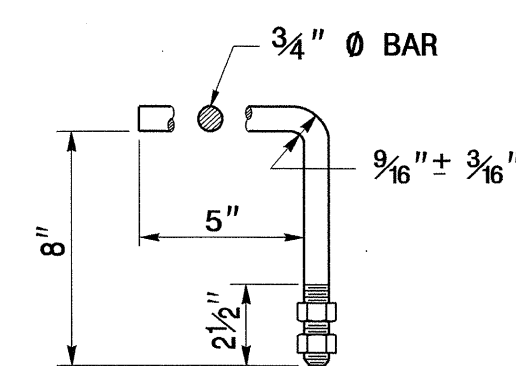
PLAN



ELEVATION OF WING SHOWING REINFORCEMENT

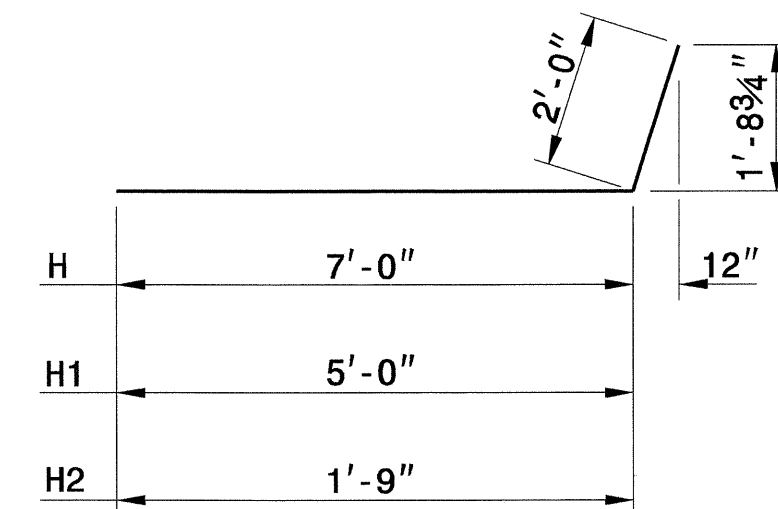


END OF WING

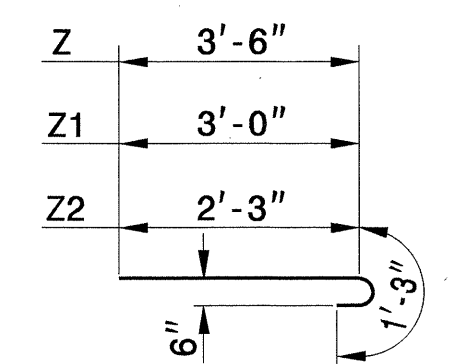


HOOK BOLT

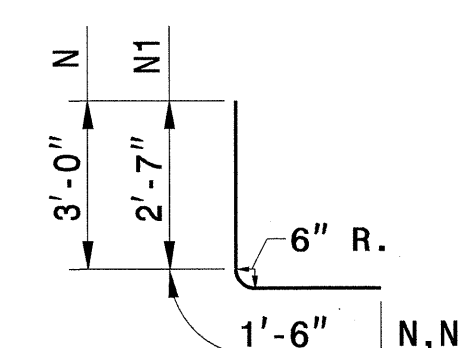
HOOK BOLTS (ANCHORS) SHALL BE CONSTRUCTED AT 2'-0" CTS. ALONG THE CIRCUMFERENCE OF THE 7'-0" CSPA. THE HOOK BOLTS SHALL BE EMBEDDED IN THE CONCRETE ENDWALL 8" IN DEPTH. THE GALVANIZED 3/4" DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.



BARS H-H1-H2



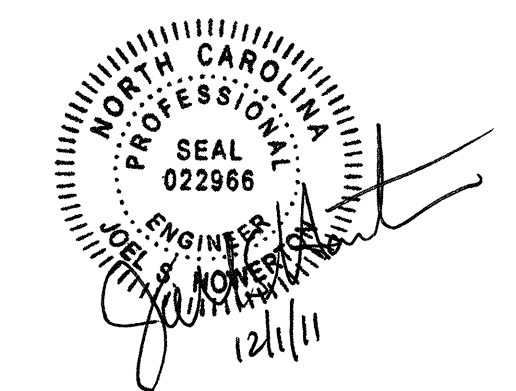
BARS Z-Z1-Z2



BARS N-N1

BILL OF MATERIAL FOR ONE ENDWALL

REINFORCING STEEL	1 PIPE	2 PIPES	3 PIPES
B #4	8	16	24
G #5	4	-	-
G1 #5	-	8	98
G2 #5	-	-	8
H #4	10	10	10
H1 #4	6	6	6
H2 #4	4	4	4
N #5	10	15	20
N1 #4	10	27	10
T #4	6	6	6
T1 #4	6	-	-
T2 #4	-	12	110
T3 #4	-	-	12
T4 #4	4	7	13
V #4	6	6	6
V1 #4	6	6	6
V2 #4	8	8	8
V3 #4	6	11	16
Z #5	4	4	4
Z1 #4	4	4	4
Z2 #4	6	6	6
TOTAL REINF. STEEL (lbs.)	473	662	834
CLASS "A" CONC. (cu. yds.)	7.9	10.8	13.8



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DETAIL OF REINFORCED CONCRETE ENDWALL FOR 84" DIAMETER PIPE - 90° SKEW

ORIGINAL BY: R.S.WICKER DATE: 6-46
MODIFIED BY: R.E.D. & T.S.S. DATE: 6-96 & 5-00
CHECKED BY: [Signature] DATE: 9/20/11
FILE SPEC.: details/nbritt/english/hydro/endwall190sk.dgn

***** DON'T SCALE *****

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202781

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION	207000000-N	815	1	EA	SUBDRAIN PIPE OUTLET	481000000-E	1205	4,000	LF	PAINT PAVEMENT MARKING LINES (4")
000800000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING	207700000-E	815	6	LF	6" OUTLET PIPE	600000000-E	1605	1,300	LF	TEMPORARY SILT FENCE
003000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ***** (22+85.00)	222000000-E	838	8	CY	REINFORCED ENDWALLS	600600000-E	1610	290	TON	STONE FOR EROSION CONTROL, CLASS A
004300000-N	226	Lump Sum		GRADING	228600000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES	600900000-E	1610	110	TON	STONE FOR EROSION CONTROL, CLASS B
005700000-E	226	200	CY	UNDERCUT EXCAVATION	235420000-N	840	1	EA	FRAME WITH GRATE, STD 840.24	601200000-E	1610	100	TON	SEDIMENT CONTROL STONE
013400000-E	240	110	CY	DRAINAGE DITCH EXCAVATION	235500000-N	840	1	EA	FRAME WITH GRATE, STD 840.29	601500000-E	1615	1	ACR	TEMPORARY MULCHING
019500000-E	265	100	CY	SELECT GRANULAR MATERIAL	255600000-E	846	20	LF	SHOULDER BERM GUTTER	601800000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
019600000-E	270	200	SY	GEOTEXTILE FOR SOIL STABILIZATION	257000000-E	846	170	LF	CONCRETE EXPRESSWAY GUTTER	602100000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
031800000-E	300	10	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	303000000-E	862	125	LF	STEEL BM GUARDRAIL	602400000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
032000000-E	300	30	SY	FOUNDATION CONDITIONING GEOTEXTILE	304500000-E	862	60	LF	STEEL BM GUARDRAIL, SHOP CURVED	602900000-E	SP	900	LF	SAFETY FENCE
033530000-E	305	24	LF	18" DRAINAGE PIPE	315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	603000000-E	1630	100	CY	SILT EXCAVATION
057600000-E	310	40	LF	*** CS PIPE CULVERTS, ***** THICK (84", 0.168")	316500000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** (350 TL-2)	603600000-E	1631	3,000	SY	MATTING FOR EROSION CONTROL
099500000-E	340	40	LF	PIPE REMOVAL	319500000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1	603800000-E	SP	135	SY	PERMANENT SOIL REINFORCEMENT MAT
109950000-E	505	100	CY	SHALLOW UNDERCUT	321500000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	604200000-E	1632	350	LF	1/4" HARDWARE CLOTH
109970000-E	505	100	TON	CLASS IV SUBGRADE STABILIZATION	362800000-E	876	30	TON	RIP RAP, CLASS I	604800000-E	SP	50	SY	FLOATING TURBIDITY CURTAIN
122000000-E	545	50	TON	INCIDENTAL STONE BASE	365600000-E	876	680	SY	GEOTEXTILE FOR DRAINAGE	607102000-E	SP	20	LB	POLYACRYLAMIDE (PAM)
148900000-E	610	475	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	407200000-E	903	4	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	608400000-E	1660	1.5	ACR	SEEDING & MULCHING
152500000-E	610	260	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	410200000-N	904	1	EA	SIGN ERECTION, TYPE E	608700000-E	1660	0.5	ACR	MOWING
157500000-E	620	40	TON	ASPHALT BINDER FOR PLANT MIX	415500000-N	907	7	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
169300000-E	654	25	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	440000000-E	1110	898	SF	WORK ZONE SIGNS (STATIONARY)	609200000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
200000000-N	806	27	EA	RIGHT OF WAY MARKERS	440500000-E	1110	192	SF	WORK ZONE SIGNS (PORTABLE)	609600000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
202200000-E	815	22.4	CY	SUBDRAIN EXCAVATION	441000000-E	1110	172	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	610800000-E	1665	0.5	TON	FERTILIZER TOPDRESSING
203300000-E	815	16.8	CY	SUBDRAIN FINE AGGREGATE	444500000-E	1145	96	LF	BARRICADES (TYPE III)	611450000-N	1667	10	MHR	SPECIALIZED HAND MOWING
204400000-E	815	100	LF	6" PERFORATED SUBDRAIN PIPE	465000000-N	1251	100	EA	TEMPORARY RAISED PAVEMENT MARKERS	611700000-N	SP	16	EA	RESPONSE FOR EROSION CONTROL
										612300000-E	1670	0.1	ACR	REFORESTATION

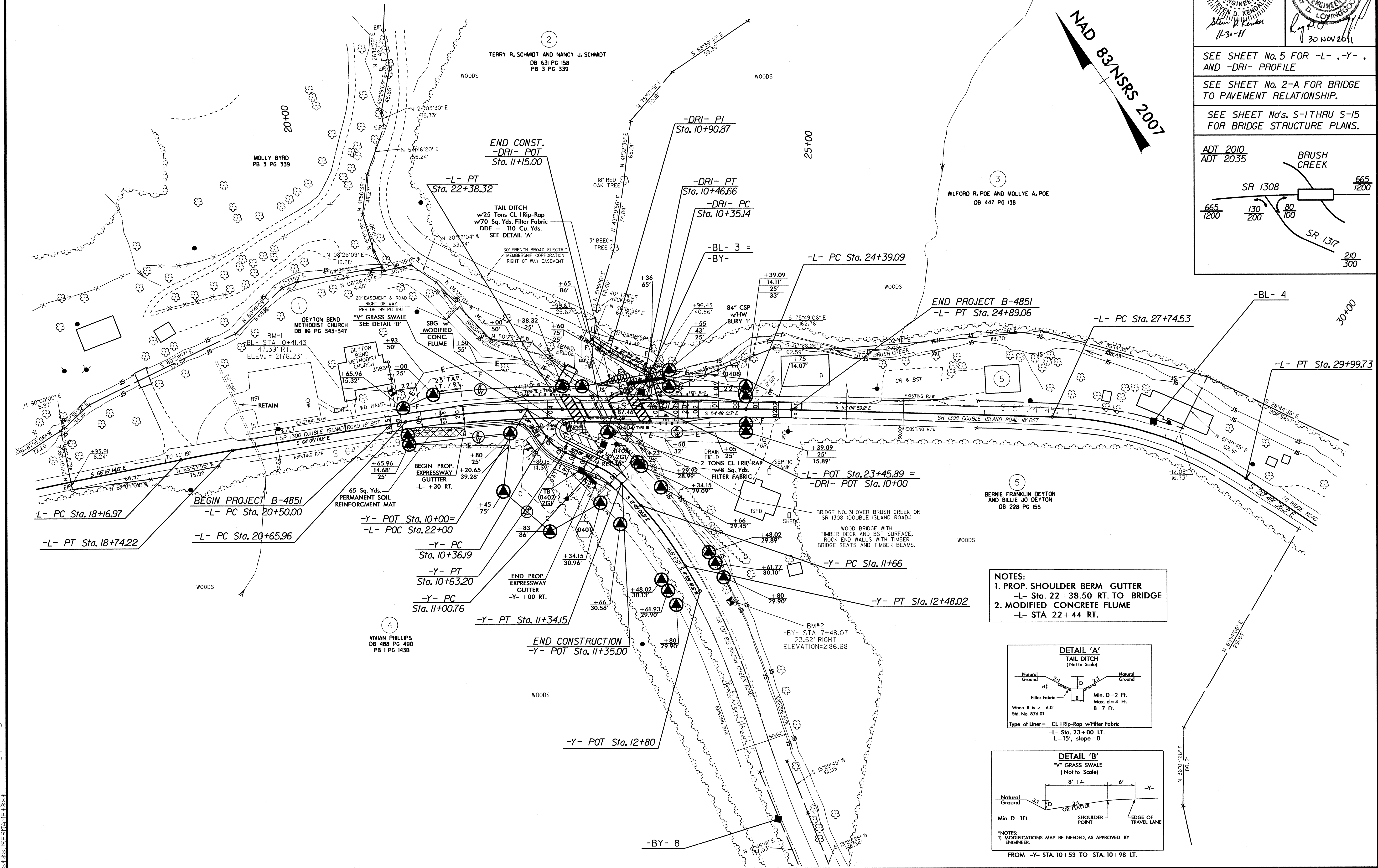
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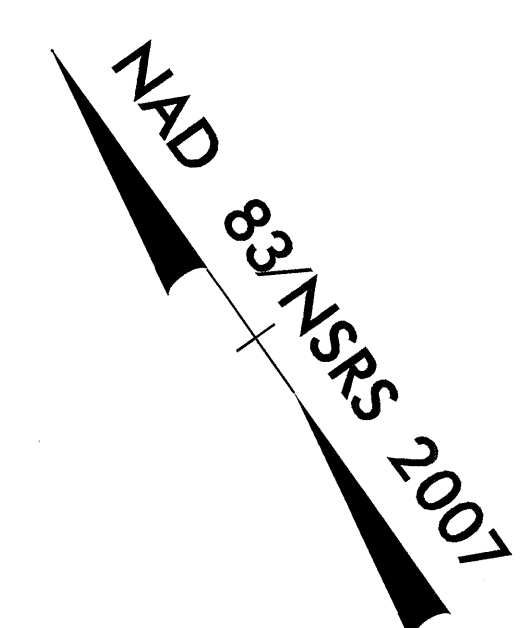
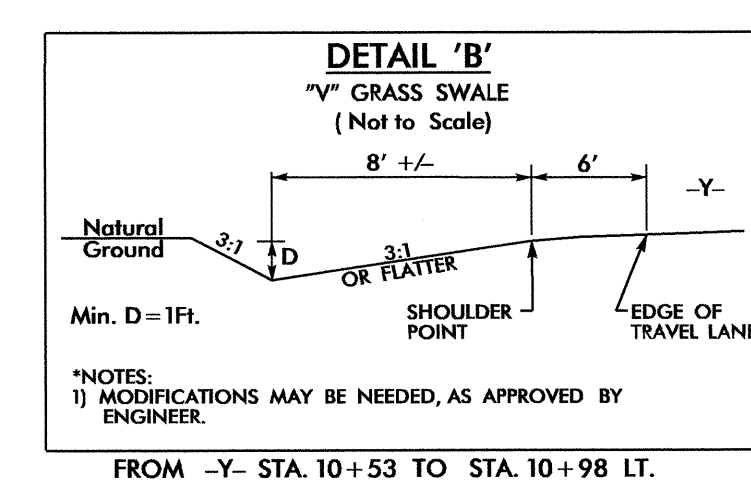
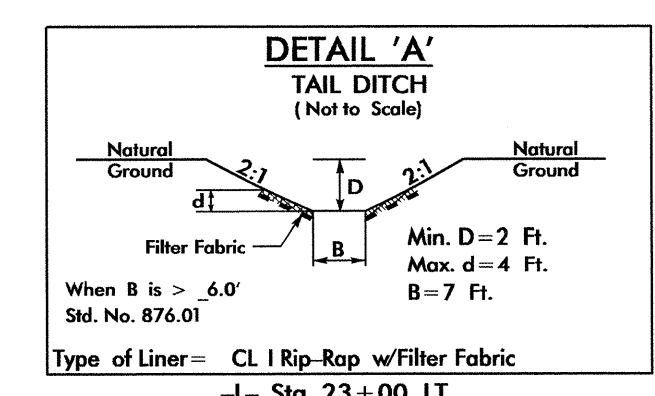
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-L-				-Y-			-DRI-		
PI Sta 18+45.60	PI Sta 21+52.33	PI Sta 24+64.08	PI Sta 28+90.20	PI Sta 12+07.16	PI Sta 10+50.03	PI Sta 11+17.73	PI Sta 10+41.25		
$\Delta = 2' 11' 13.0"$ (RT)	$\Delta = 9' 19' 00.0"$ (RT)	$\Delta = 1' 41' 02.5"$ (RT)	$\Delta = 32' 15' 22.9"$ (RT)	$\Delta = 11' 44' 54.5"$ (RT)	$\Delta = 30' 57' 05.9"$ (LT)	$\Delta = 25' 30' 28.7"$ (RT)	$\Delta = 47' 07' 51.6"$ (LT)		
D = 3' 49' 11.0"	D = 5' 24' 18.9"	D = 3' 22' 13.2"	D = 14' 19' 26.2"	D = 14' 19' 26.2"	D = 114' 35' 29.6"	D = 76' 23' 39.7"	D = 409' 15' 20.0"		
L = 57.25'	L = 172.36'	L = 49.97'	L = 225.19'	L = 82.02'	L = 27.01'	L = 33.39'	L = 11.52'		
T = 28.63'	T = 86.37'	T = 24.98'	T = 115.67'	T = 41.5'	T = 13.84'	T = 16.98'	T = 6.11'		
R = 1,500.00'	R = 1,060.00'	R = 1,700.00'	R = 400.00'	R = 400.00'	R = 50.00'	R = 75.00'	R = 14.00'		

PROJECT REFERENCE NO. B-4851	SHEET NO. 4
RAW SHEET NO.	
ROADWAY DESIGN PROFESSIONAL SEAL 33296 STEVEN D. KENDRICK 11-30-11	HYDRAULICS PROFESSIONAL SEAL 19775 R. D. LOVINGGOOD 30 NOV 2011
SEE SHEET No. 5 FOR -L-, -Y-, AND -DRI- PROFILE	
SEE SHEET No. 2-A FOR BRIDGE TO PAVEMENT RELATIONSHIP.	
SEE SHEET No's. S-1 THRU S-15 FOR BRIDGE STRUCTURE PLANS.	
ADT 2010 ADT 2035	



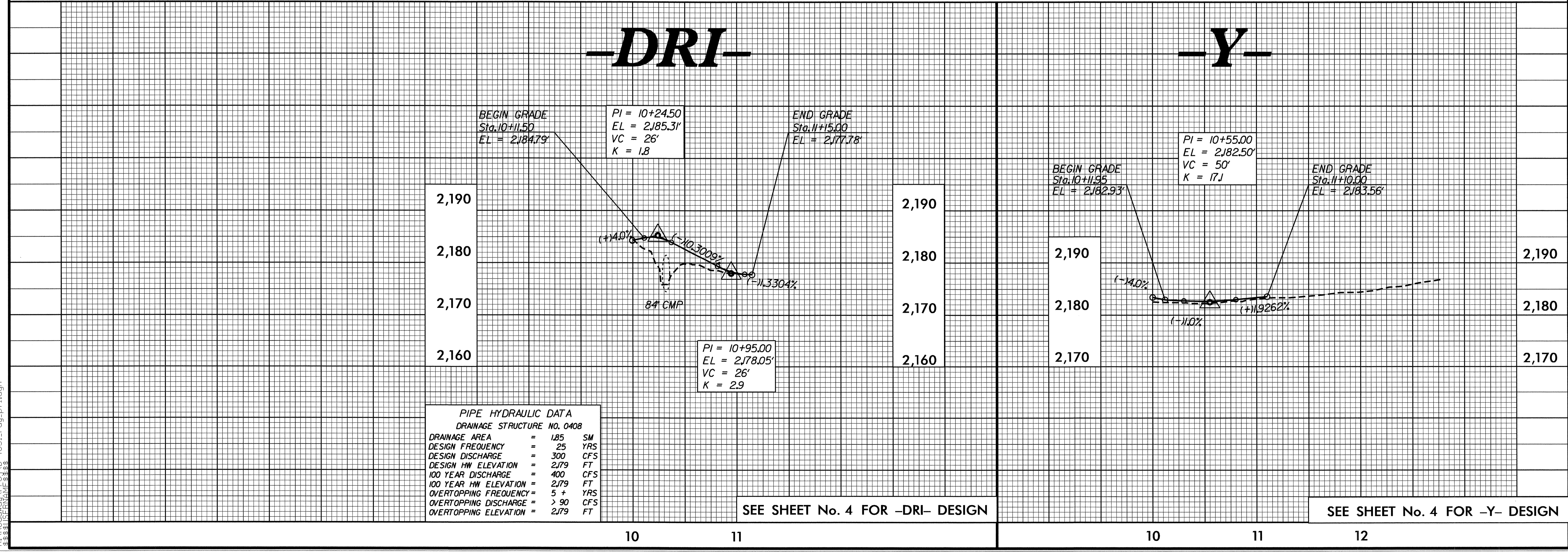
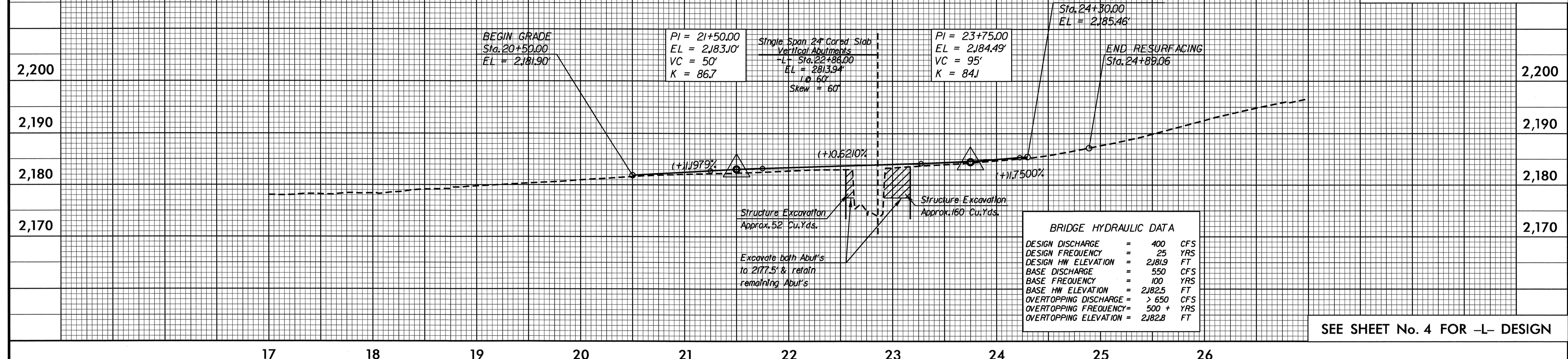
NOTES:
 1. PROP. SHOULDER BERM GUTTER
 -L- Sta. 22+38.50 RT. TO BRIDGE
 2. MODIFIED CONCRETE FLUME
 -L- STA 22+44 RT.



5/28/99

PROJECT REFERENCE NO. B-4851	SHEET NO. 5
ROADWAY DESIGN NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33296 STEVEN D. KENDALL 11-30-11	HYDRAULICS NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19778 RAY D. LOYNGOOD 30 NOV 2011

SEE SHEET No. 1-C FOR BENCH MARKS



25-OCT-2011 09:02
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