

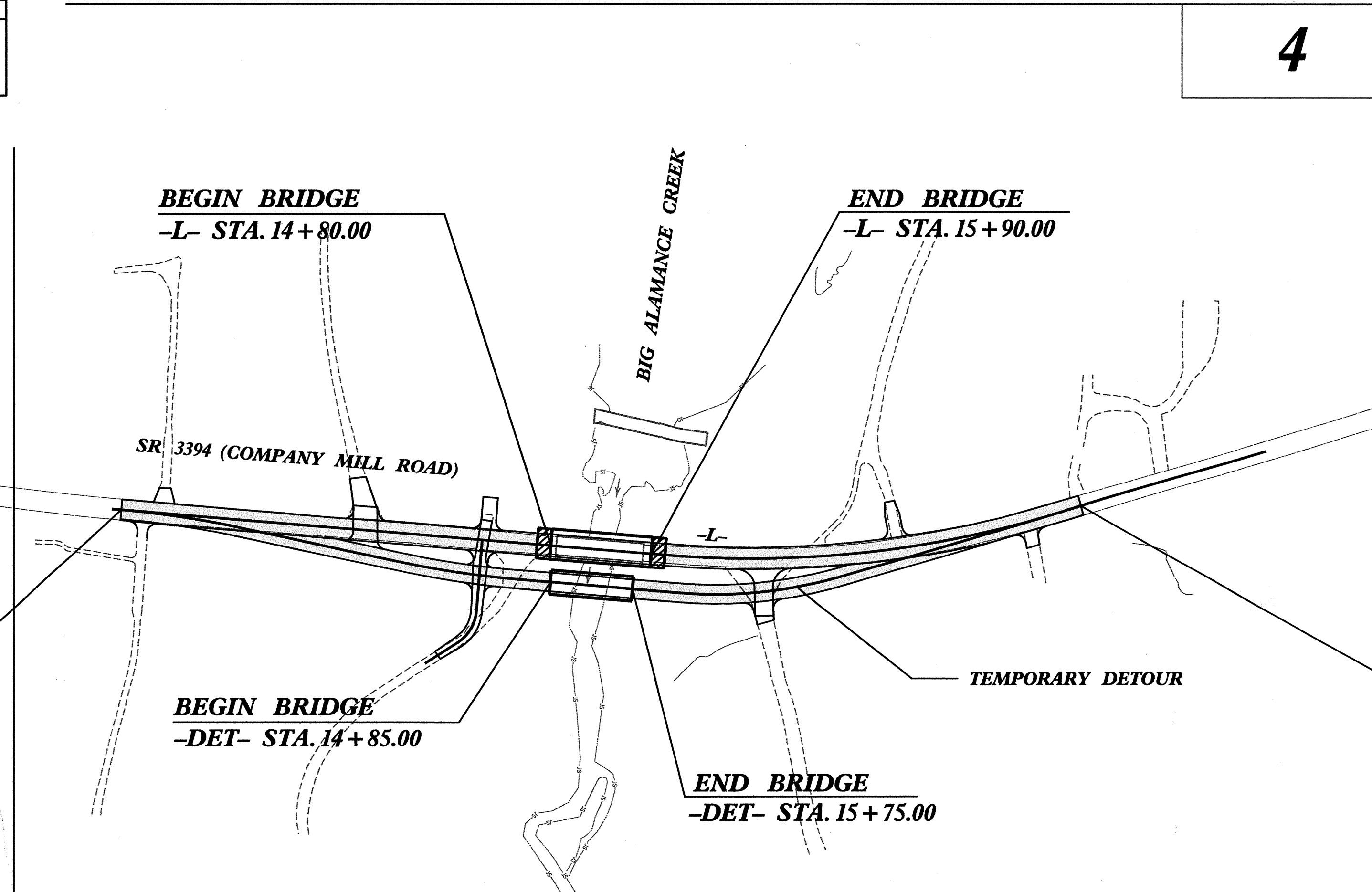
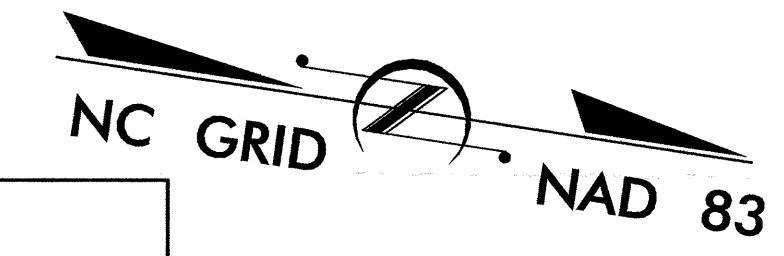
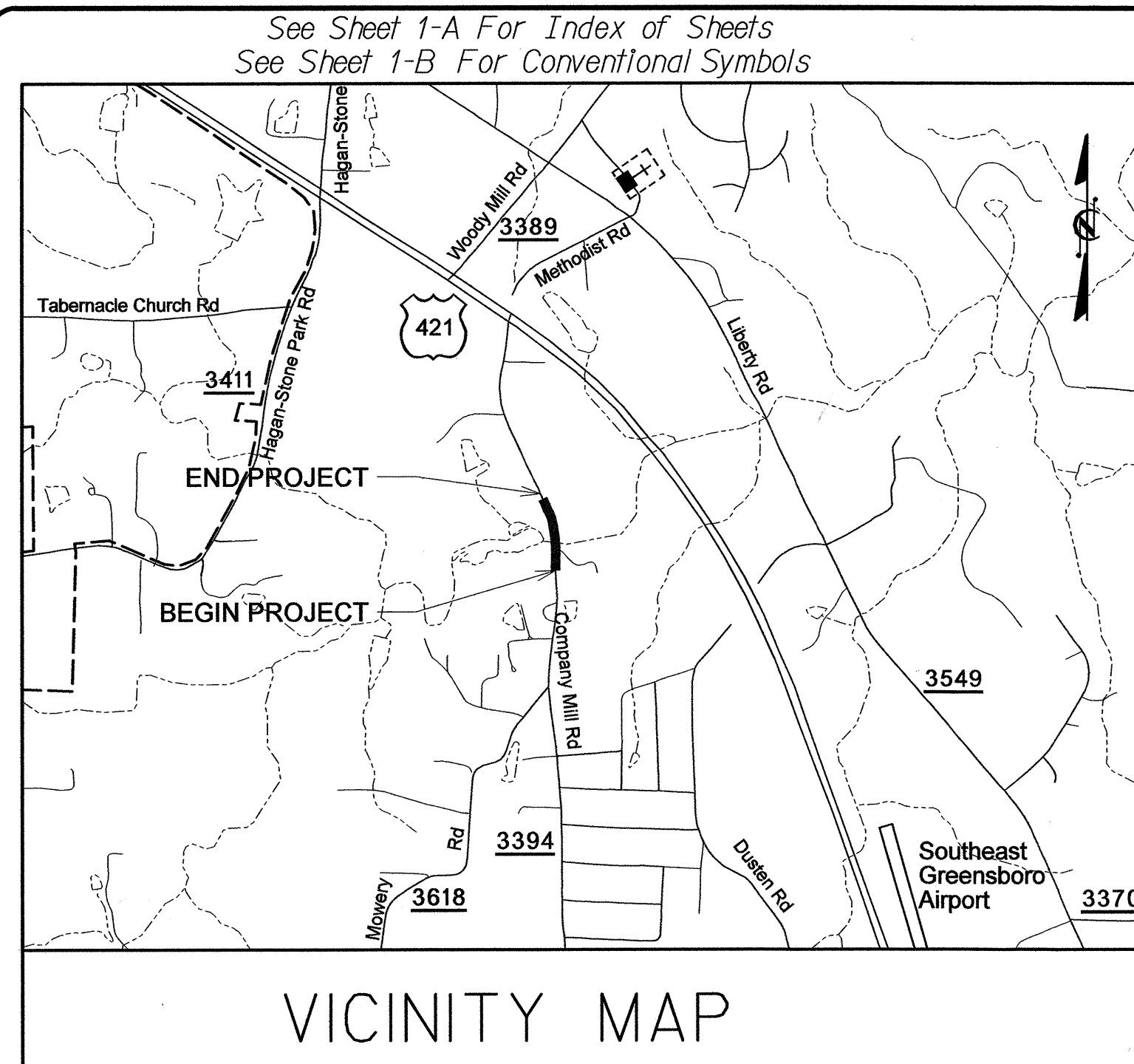
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4131	1	
WBS PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33484.1.1	BRZ-3394(1)	P.E.	
33484.2.1	BRZ-3394(1)	R/W & UTILS.	
33484.3.1	BRZ-3394(1)	CONST.	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**GUILFORD COUNTY**

**LOCATION: BRIDGE NO. 11 OVER BIG ALAMANCE CREEK ON  
SR 3394 (COMPANY MILL ROAD)**

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



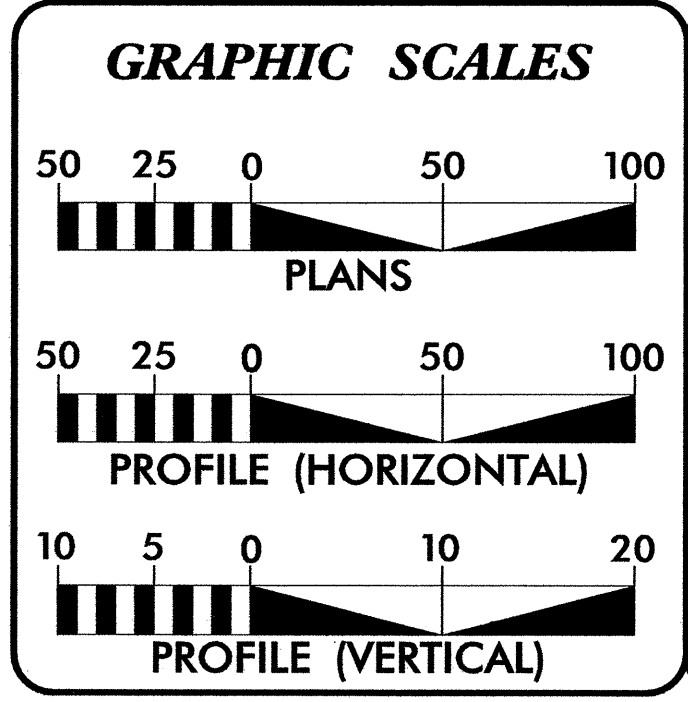
**BEGIN TIP PROJECT B-4131  
-L- STA. 10+10.00**

**END TIP PROJECT B-4131  
-L- STA. 20+65.00**

\*\* DESIGN EXCEPTION FOR VERTICAL ALIGNMENT AND VERTICAL STOPPING SIGHT DISTANCE REQUIRED.

NCDOT CONTACT: CATHY HOUSER, P.E.  
ROADWAY DESIGN - ENGINEERING COORDINATION

CONTRACT: C201770 TIP PROJECT: B-4131



**DESIGN DATA (RURAL MINOR COLLECTOR)**

ADT 2008 =	3200
ADT 2028 =	5300
DHV =	12 %
D =	65 %
T =	4 % *
** V =	50 MPH
* TTST 1%	DUAL 3%

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4131	=	0.179 MI.
LENGTH STRUCTURE TIP PROJECT B-4131	=	0.021 MI.
TOTAL LENGTH OF TIP PROJECT B-4131	=	0.200 MI.

Prepared in the Office of:  
**KO & ASSOCIATES, P.C.**  
Consulting Engineers  
5121 Kingdom Way, Suite 100, Raleigh NC 27607  
(919) 851-6066

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 5, 2006

LETTING DATE: FEBRUARY 19, 2008

BRIAN A. WILES, P.E.  
PROJECT ENGINEER

MICHAEL A. YOUNG, P.E.  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

Professional Engineer Seal: SEAL 19732, STARCHEN FUH, 1-07-07

**ROADWAY DESIGN ENGINEER**

Professional Engineer Seal: SEAL 16689, BRIAN ALLEN WILES

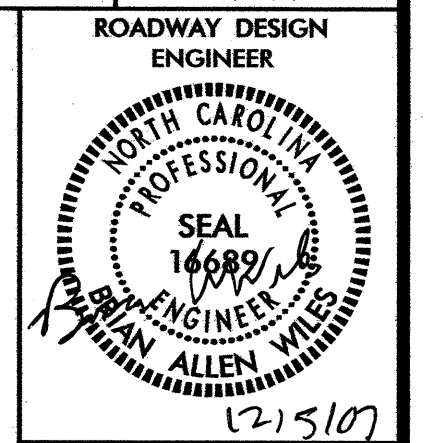
SIGNATURE: [Signature]

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER

11/7/2007 R:\Roadway\Proj\B4131\RDY\_tsh.dgn Ko & Associates, P.C.

8/17/99



# INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	Title Sheet
1-A	Index of Sheets, General Notes and List of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheet
2	Typical Sections No. 1 & 2, Wedging Detail and Pavement Schedule
2-A	Typical Sections No. 3, 4 & 5
2-B	Plan Sheet for Temporary Detour
2-C	Anchorage for Frames Detail
3	Summary of Quantities
3-A	List of Pipes, Endwalls, Etc. (for Pipes 48" and Under), Guardrail Summary and Temporary Guardrail Summary
3-B	Summary of Earthwork
3-C	Summary of Pavement Removal
4	Plan Sheet
5 and 6	Profile Sheets
TCP-1 thru TCP-9	Traffic Control Plans
PM-1	Pavement Marking Plan
EC-1 thru EC-6	Erosion Control Plans
RF-1	Reforestation Plans
UO-1 thru UO-2	Utility by Others
X-1	Cross Section Summary Sheet
X-2 thru X-9	Cross Sections
S-1 thru S-22	Structure Plans

# GENERAL NOTES:

**GENERAL NOTES:** 2006 SPECIFICATIONS  
EFFECTIVE: 07-18-06  
REVISED: 07-18-06

**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 III.

**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.

**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.

**UNDERDRAINS:**

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 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.

**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 AT&T, Duke Energy, Time Warner and City of Greensboro.

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 CONTRACT.

# 2006 ROADWAY STANDARD DRAWINGS

EFF. 07-18-06  
REV. 01-02-07

## 2006 ROADWAY STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
<b>DIVISION 2 - EARTHWORK</b>	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superlevation - Two Lane Pavement
<b>DIVISION 3 - PIPE CULVERTS</b>	
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 Superelevated Curve - Method I
<b>DIVISION 8 - INCIDENTALS</b>	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
840.71	Concrete and Brick Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drainage Installation in Shoulder Berm 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
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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3/15/06

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	○ EIP
Property Corner	_____
Property Monument	□ EDM
Parcel/Sequence Number	②③
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	_____
Proposed Lateral, Tail, Head Ditch	_____
False Sump	_____

**RAILROADS:**

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

**RIGHT OF WAY:**

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

**ROADS AND RELATED FEATURES:**

Existing Edge of Pavement	_____
Existing Curb	_____
Proposed Slope Stakes Cut	-C-
Proposed Slope Stakes Fill	-F-
Proposed Wheel Chair Ramp	○ WCR
Proposed Wheel Chair Ramp Curb Cut	○ WCC
Curb Cut for Future Wheel Chair Ramp	○ CCFR
Existing Metal Guardrail	_____
Proposed Guardrail	_____
Existing Cable Guiderail	_____
Proposed Cable Guiderail	_____
Equality Symbol	⊗
Pavement Removal	_____

**VEGETATION:**

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

**EXISTING STRUCTURES:**

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

**UTILITIES:**

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

**TELEPHONE:**

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

**WATER:**

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

**TV:**

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

**GAS:**

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

**SANITARY SEWER:**

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

**MISCELLANEOUS:**

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

# B-4131 SURVEY CONTROL SHEET

12/01/2005

NCDOT GPS  
STATION "B4131-1"  
N = 805184.2530  
E = 1791981.8260

NCDOT GPS  
STATION "B4131-2"  
N = 804701.2590  
E = 1792115.1830

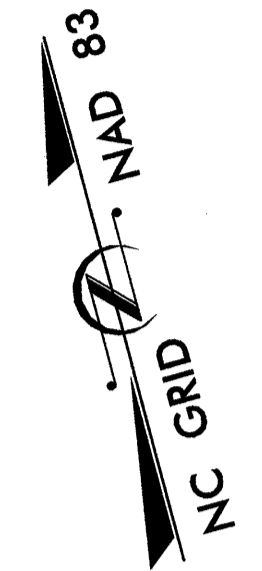
NCDOT BASELINE  
STATION "BL-3"  
N = 804091.4270  
E = 1792358.0960

NCDOT BASELINE  
STATION "BL-4"  
N = 803634.5650  
E = 1792602.1770

NCDOT BASELINE  
STATION "BL-5"  
N = 803201.6980  
E = 1792672.6320

NCDOT BASELINE  
STATION "BL-6"  
N = 802806.3780  
E = 1792697.6440

NCDOT BASELINE  
STATION "BL-7"  
N = 802508.5090  
E = 1792707.3410



**END STATE PROJECT B-4131**  
-L- STA. 20+65.00

**BEGIN STATE PROJECT B-4131**  
-L- STA. 10+10.00

BMI  
ELEVATION = 652.71

BIG ALAMANCE CREEK

SR 3398  
COMPANY MILITARY RD

TO SR3618  
MOWERY RD

### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4131-2"  
WITH NAD 83 STATE PLANE GRID COORDINATES OF  
NORTHING: 804701.2590(ft) EASTING: 1792115.1830(ft)  
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991893  
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4131-2" TO -L- STA 10+10 IS  
S 16° 15' 51.8" E 2,043.87'  
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

### NOTES

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTP://WWW.NCDOT.ORG/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/preconstruct/highway/location/project/)  
THE FILES TO BE FOUND ARE AS FOLLOWS:  
*b4131\_ls\_control\_051201.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)

### BASELINE DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
7	BL-7	802508.5090	1792707.3410	693.42	OUTSIDE PROJECT LIMITS	
6	BL-6	802806.3780	1792697.6440	676.86	10+76.37	14.52 RT
5	BL-5	803201.6980	1792672.6320	649.00	14+72.47	16.08 RT
4	BL-4	803634.5650	1792602.1770	662.20	19+08.75	14.61 RT
3	BL-3	804091.4270	1792358.0960	696.85	OUTSIDE PROJECT LIMITS	
2	B4131-2	804701.2590	1792115.1830	722.30	OUTSIDE PROJECT LIMITS	
1	B4131-1	805184.2530	1791981.8260	719.35	OUTSIDE PROJECT LIMITS	

### BENCHMARK DATA

BMI ELEVATION = 652.71  
N 803538 E 1792831  
L STATION 17+69 210 RIGHT  
RAILROAD SPIKE IN POLE

NOTE: DRAWING NOT TO SCALE

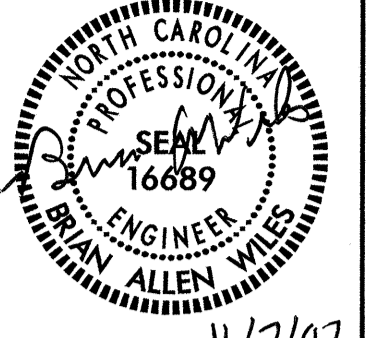
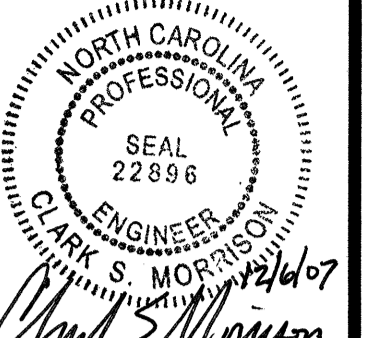
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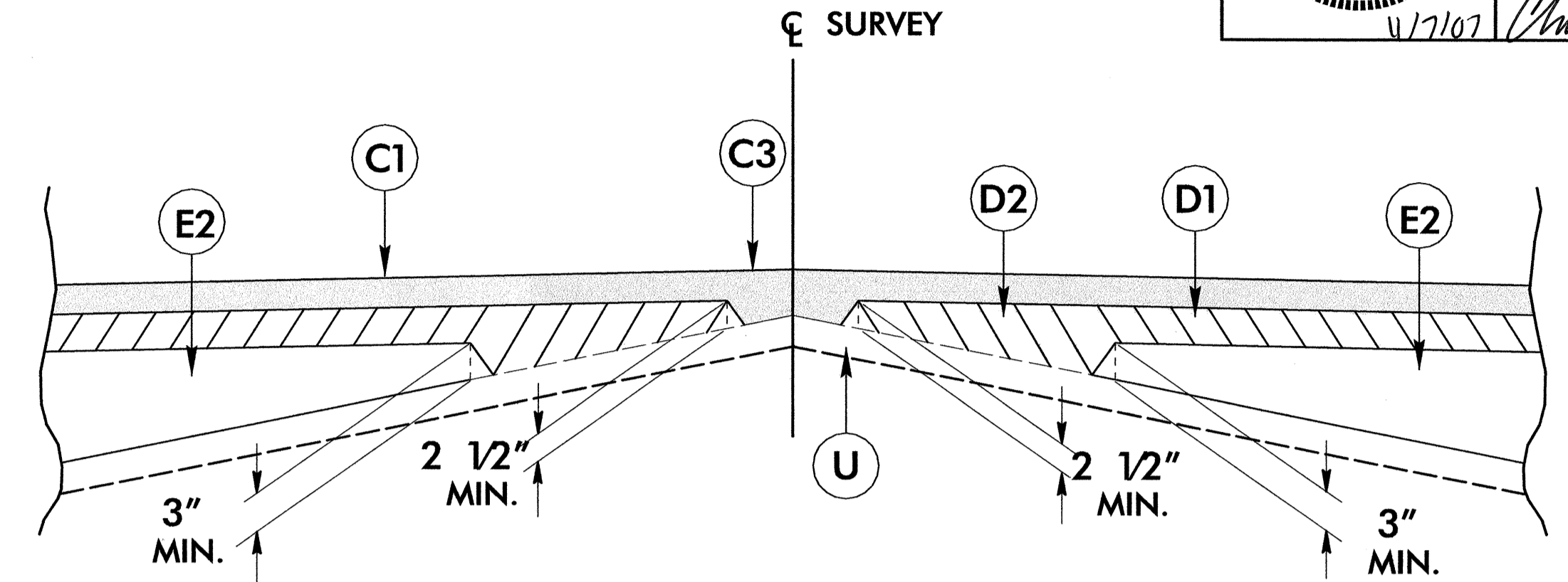
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 11/7/2007  
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## PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	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.
C2	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.	J	PROP. 8" AGGREGATE BASE COURSE.
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 1 1/2" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D2	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.	W	VARIABLE DEPTH ASPHALT PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.	

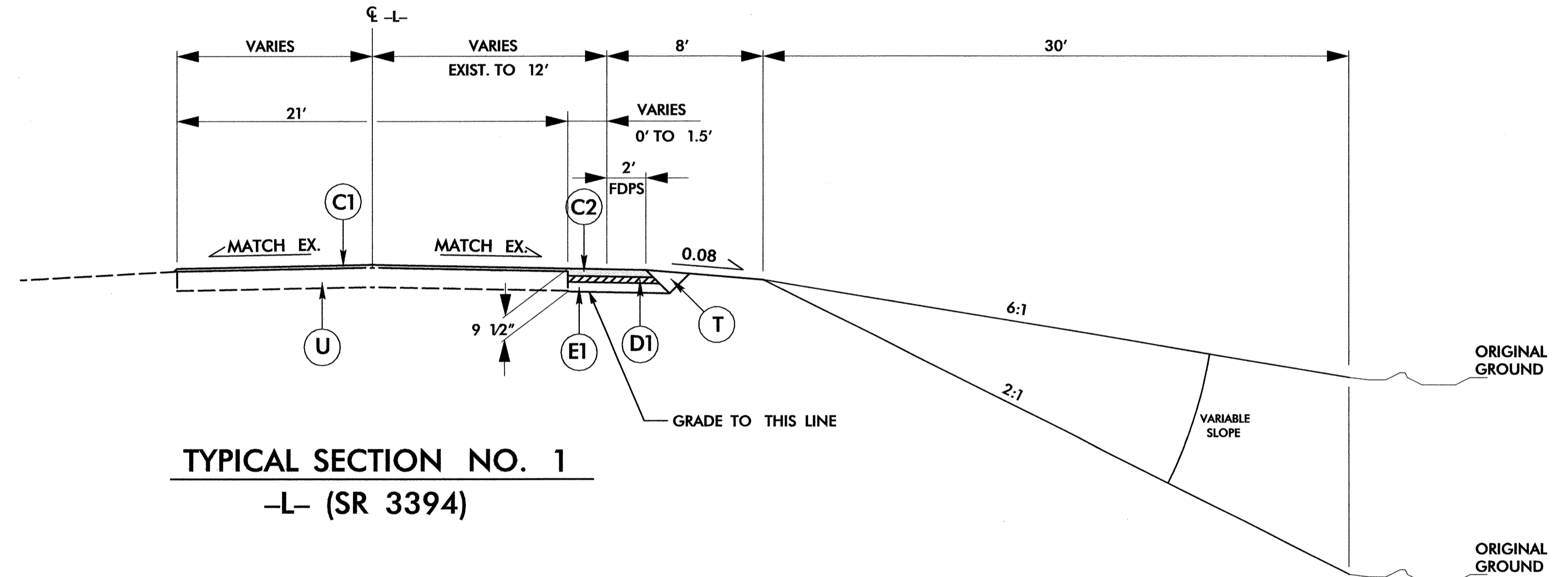
**KO & ASSOCIATES, P.C.**  
 Consulting Engineers  
 5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607  
 (919) 851-6066

PROJECT REFERENCE NO. B-4131	SHEET NO. 2
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 



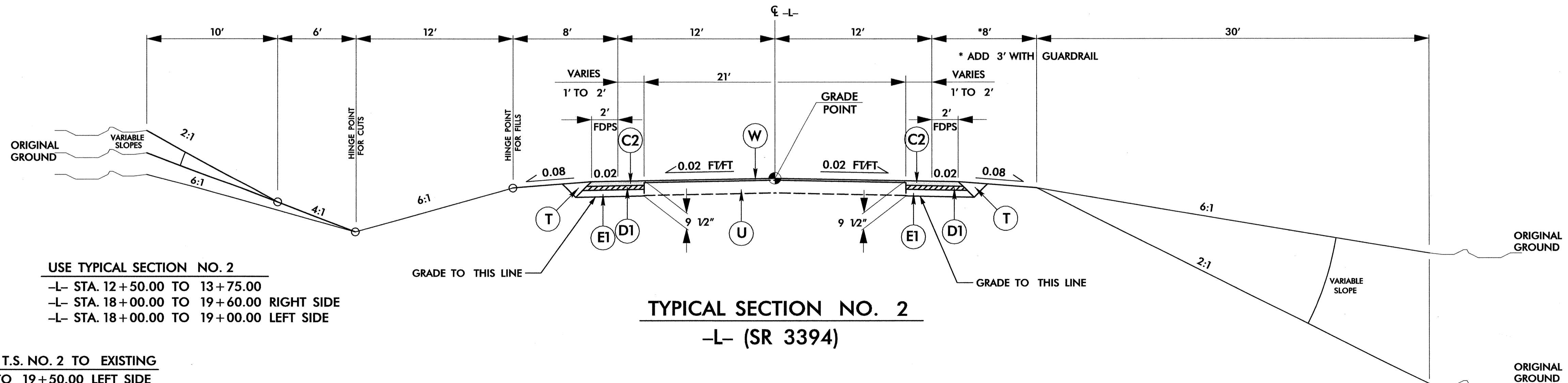
**Detail Showing Method of Wedging**

**TRANSITION FROM EXISTING TO T.S. NO. 1**  
 -L- STA. 10+10.00 TO 10+60.00



**USE TYPICAL SECTION NO. 1**  
 -L- STA. 10+60.00 TO 12+50.00

**TYPICAL SECTION NO. 1**  
 -L- (SR 3394)



**USE TYPICAL SECTION NO. 2**  
 -L- STA. 12+50.00 TO 13+75.00  
 -L- STA. 18+00.00 TO 19+60.00 RIGHT SIDE  
 -L- STA. 18+00.00 TO 19+00.00 LEFT SIDE

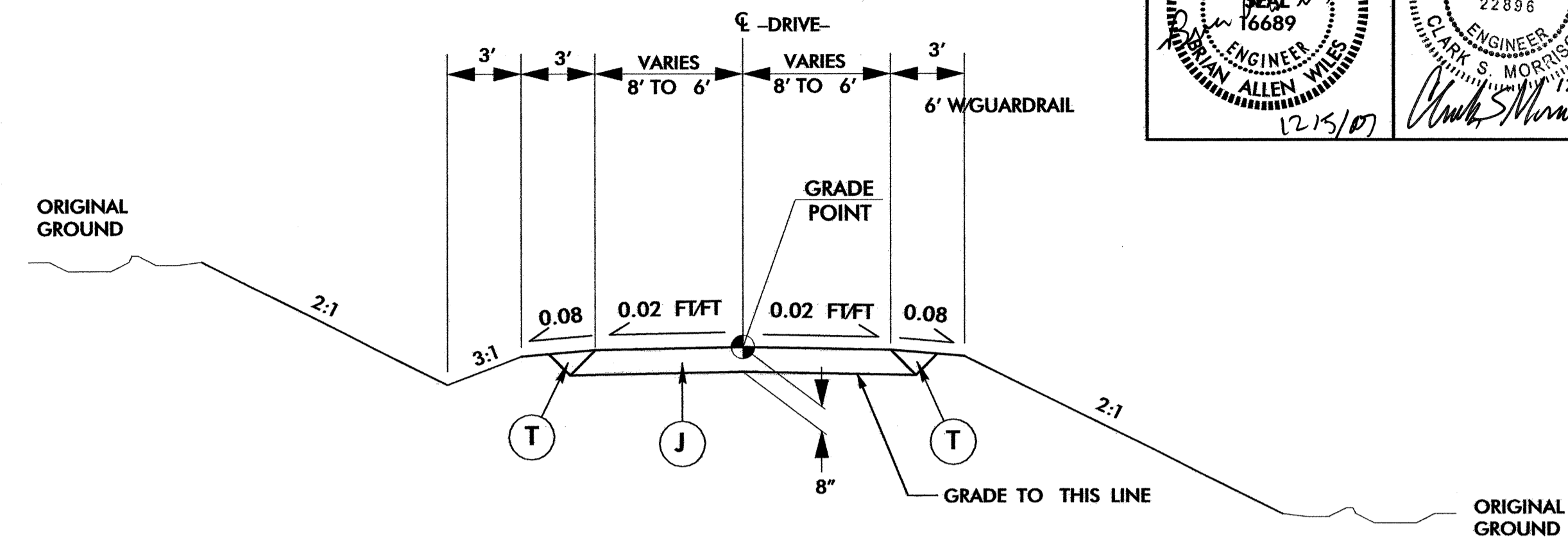
**TYPICAL SECTION NO. 2**  
 -L- (SR 3394)

**TRANSITION FROM T.S. NO. 2 TO EXISTING**  
 -L- STA. 19+00.00 TO 19+50.00 LEFT SIDE  
 -L- STA. 19+60.00 TO 20+65.00 RIGHT SIDE

## PAVEMENT SCHEDULE

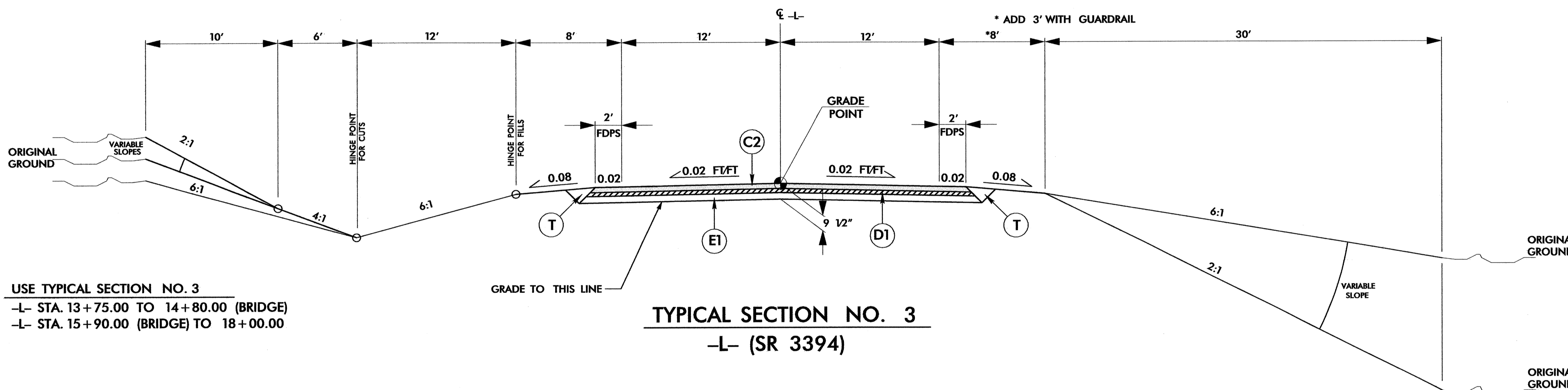
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C2	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.	J	PROP. 8" AGGREGATE BASE COURSE.
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 1½" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D2	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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.		

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



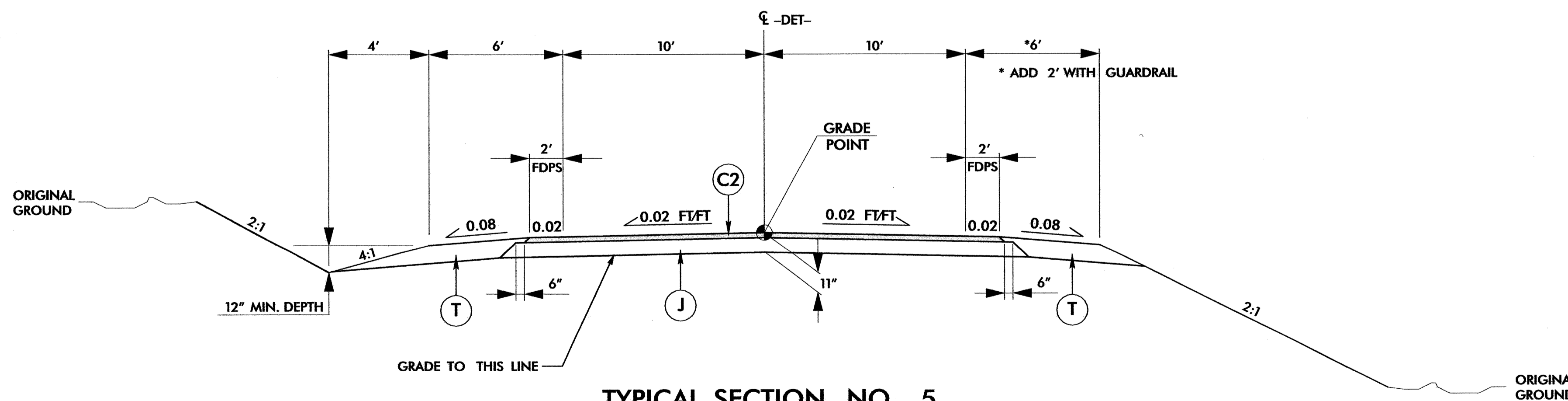
**TYPICAL SECTION NO. 4**  
 -DRIVE-

USE TYPICAL SECTION NO. 4  
 -DRIVE- STA. 10+14.00 TO 11+45.00



USE TYPICAL SECTION NO. 3  
 -L- STA. 13+75.00 TO 14+80.00 (BRIDGE)  
 -L- STA. 15+90.00 (BRIDGE) TO 18+00.00

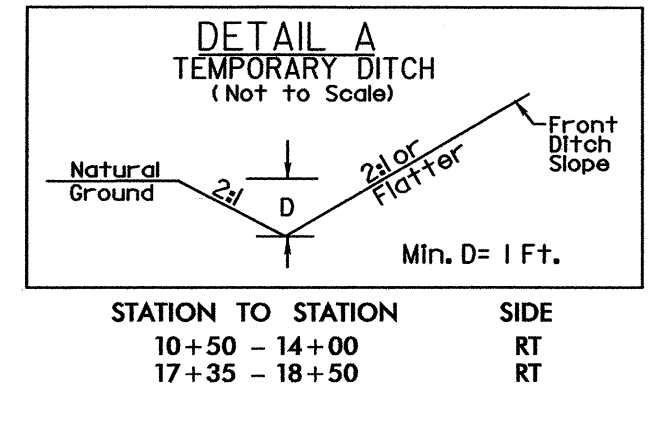
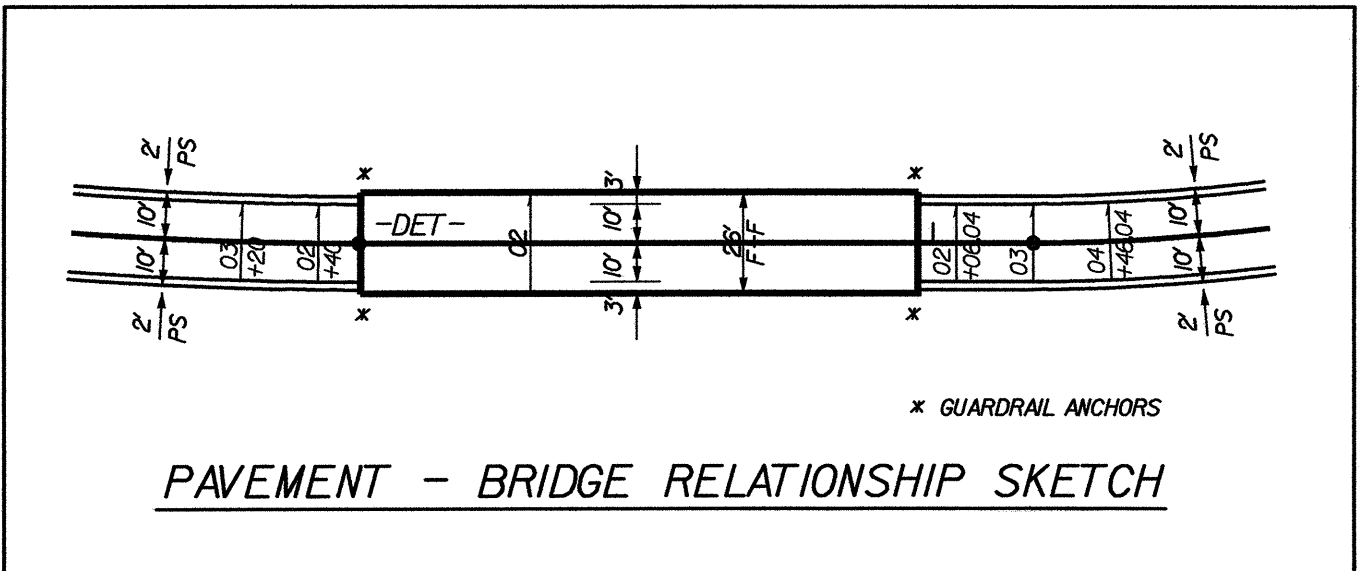
**TYPICAL SECTION NO. 3**  
 -L- (SR 3394)



USE TYPICAL SECTION NO. 5  
 -DET- STA. 11+56.69 TO 14+85.00 (BRIDGE)  
 -DET- STA. 15+75.00 (BRIDGE) TO 18+81.91

**TYPICAL SECTION NO. 5**  
 -DET- (TEMP. DETOUR)

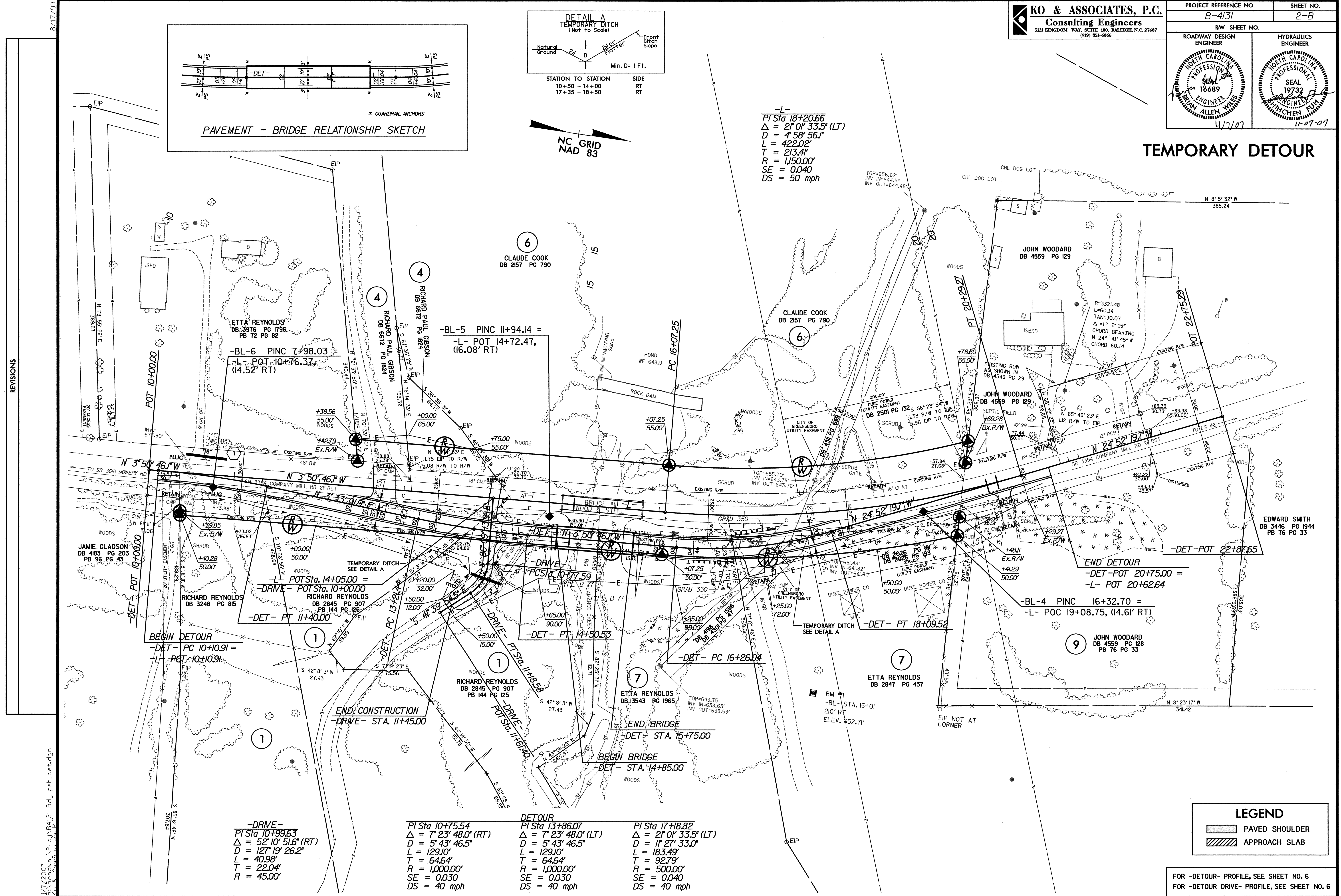
6/2/09  
 12/3/2007  
 R:\Roadway\Proj\B4131\_Rdy.tup.dgn  
 KO & Associates, P.C.



NC GRID  
 NAD 83

-L-  
 PI Sta 18+20.66  
 $\Delta = 2^\circ 01' 33.5''$  (LT)  
 $D = 4' 58' 56.1''$   
 $L = 422.02'$   
 $T = 213.41'$   
 $R = 1150.00'$   
 $SE = 0.040$   
 $DS = 50$  mph

**TEMPORARY DETOUR**

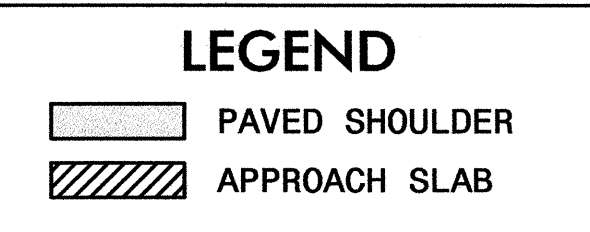


-DRIVE-  
 PI Sta 10+99.63  
 $\Delta = 52^\circ 10' 51.6''$  (RT)  
 $D = 127' 19' 26.2''$   
 $L = 40.98'$   
 $T = 22.04'$   
 $R = 45.00'$

DETOUR  
 PI Sta 10+75.54  
 $\Delta = 7^\circ 23' 48.0''$  (RT)  
 $D = 5' 43' 46.5''$   
 $L = 129.10'$   
 $T = 64.64'$   
 $R = 1,000.00'$   
 $SE = 0.030$   
 $DS = 40$  mph

DETOUR  
 PI Sta 13+86.07  
 $\Delta = 7^\circ 23' 48.0''$  (LT)  
 $D = 5' 43' 46.5''$   
 $L = 129.10'$   
 $T = 64.64'$   
 $R = 1,000.00'$   
 $SE = 0.030$   
 $DS = 40$  mph

DETOUR  
 PI Sta 17+18.82  
 $\Delta = 2^\circ 01' 33.5''$  (LT)  
 $D = 11' 27' 33.0''$   
 $L = 183.49'$   
 $T = 92.79'$   
 $R = 500.00'$   
 $SE = 0.040$   
 $DS = 40$  mph



FOR -DETOUR- PROFILE, SEE SHEET NO. 6  
 FOR -DETOUR DRIVE- PROFILE, SEE SHEET NO. 6

REVISIONS

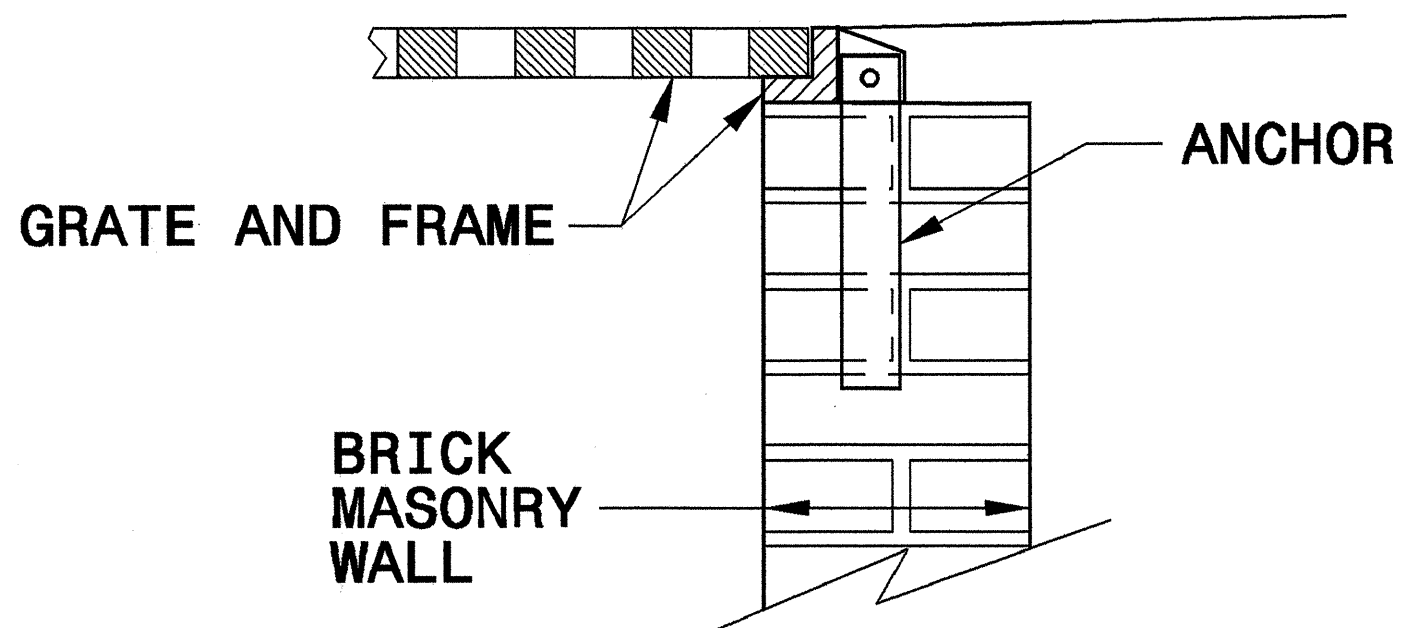
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11/7/2007  
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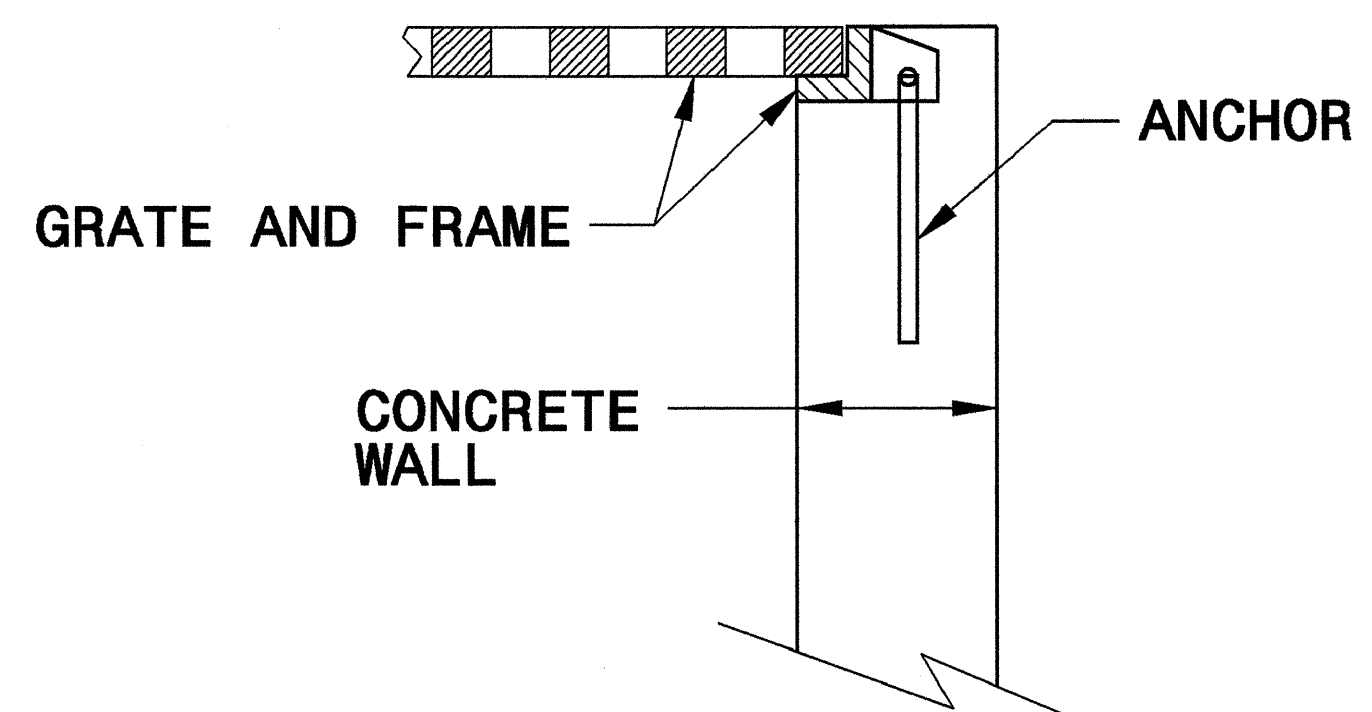
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**ANCHORAGE FOR FRAMES**  
BRICK/CONCRETE/PRECAST CONCRETE

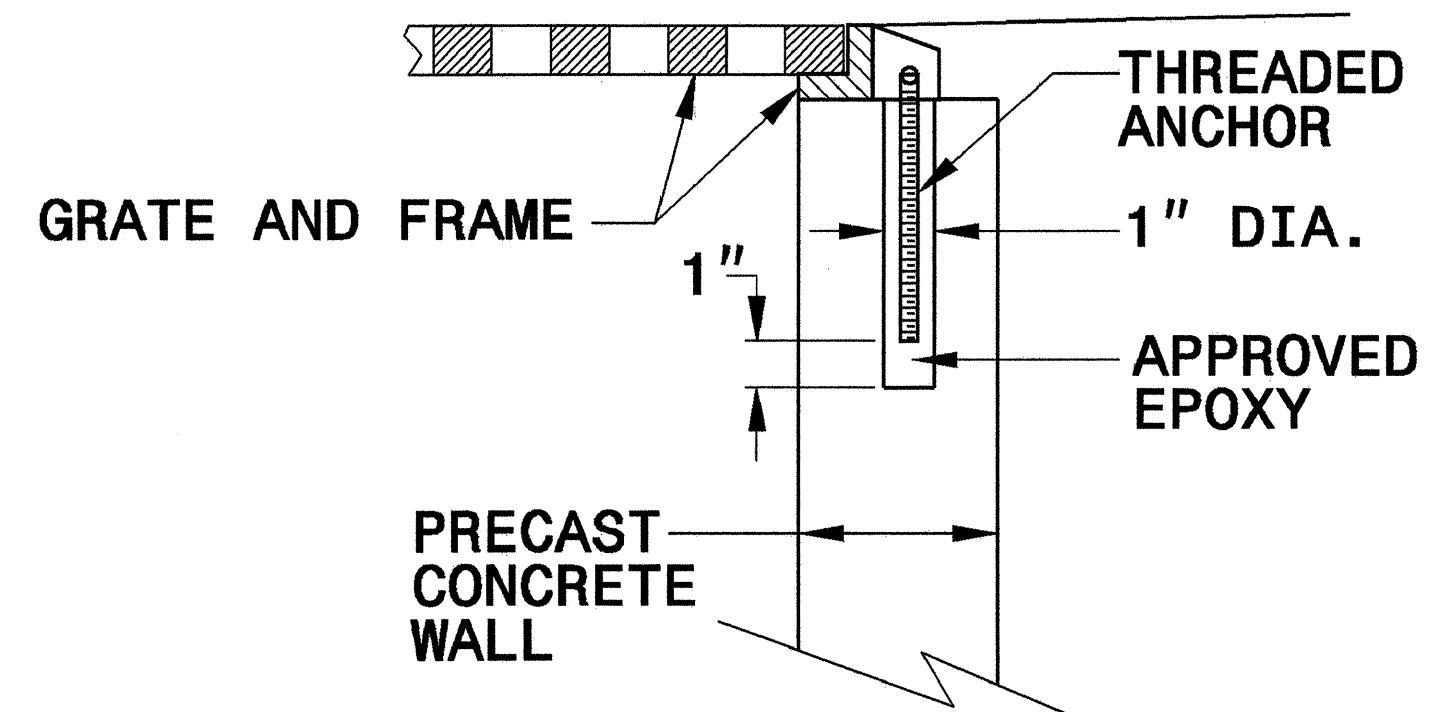
SHEET 1 OF 1  
**840D25**



**BRICK MASONRY CONSTRUCTION**



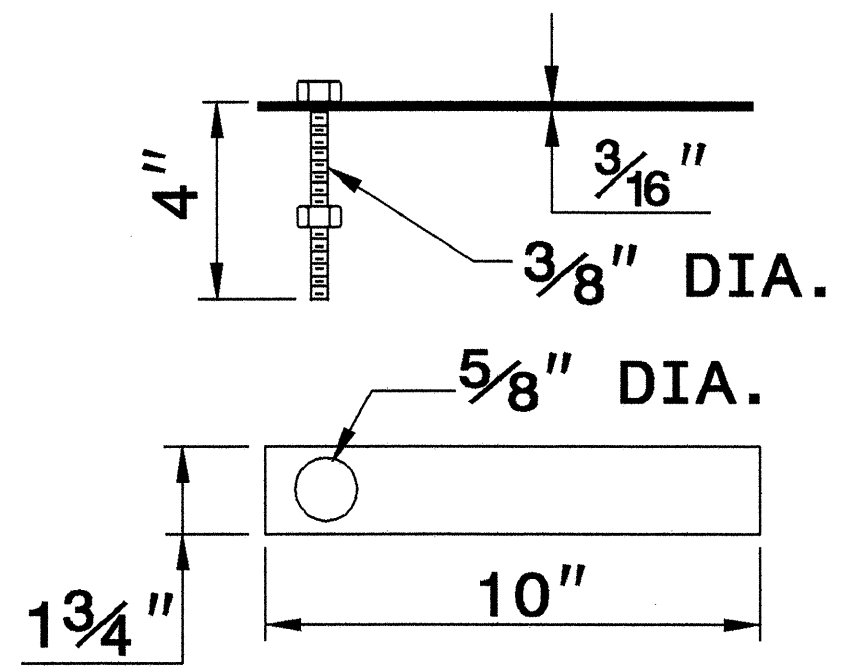
**CONCRETE CONSTRUCTION**



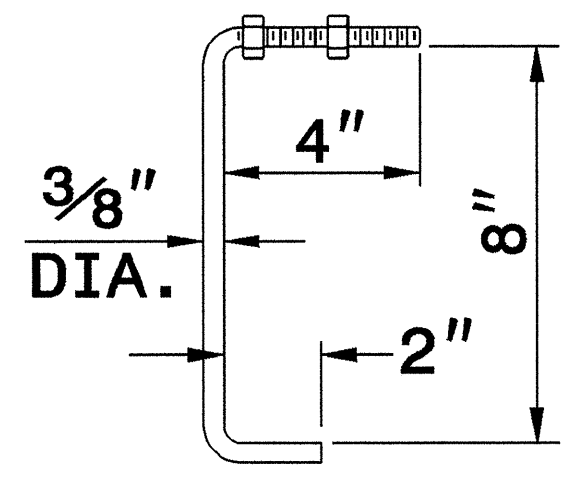
**PRECAST CONCRETE CONSTRUCTION**

**DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET**

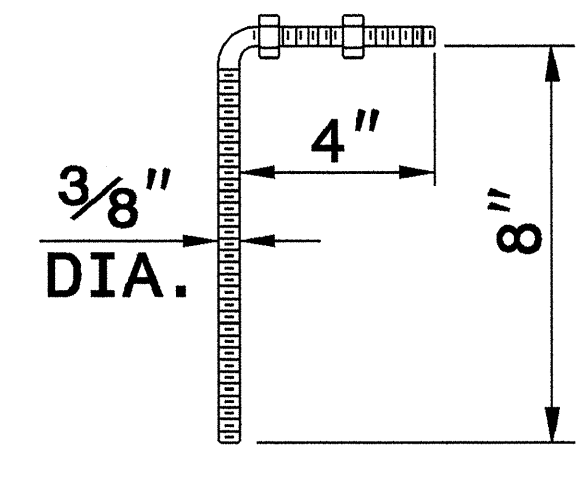
NOTE:  
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



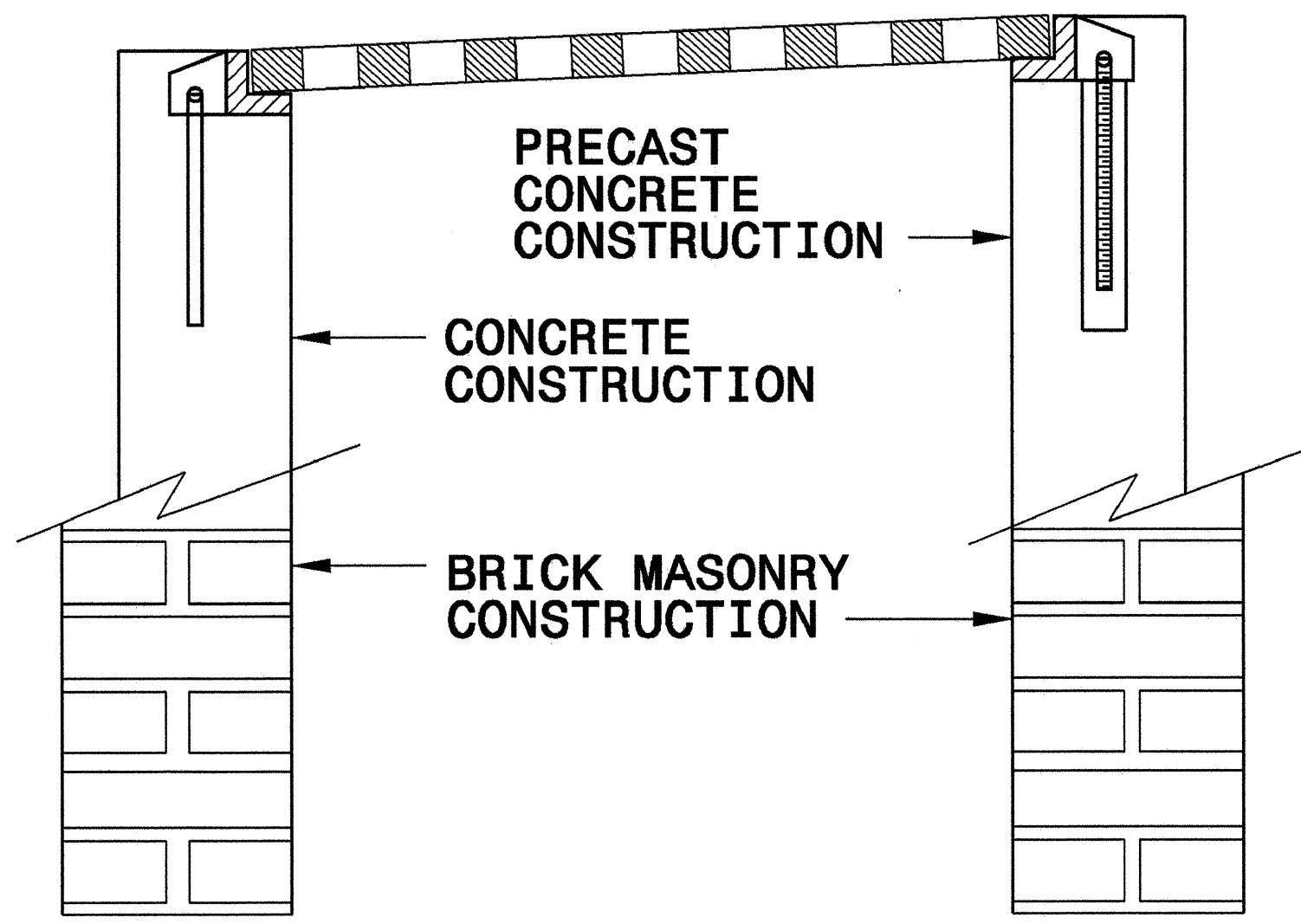
**MASONRY ANCHOR**  
3/8" DIA. BOLT WITH PLATE



**CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



**PRECAST CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



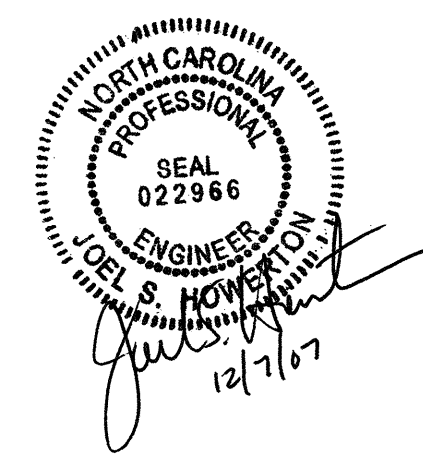
**FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS**

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

ENGLISH DETAIL DRAWING FOR  
**ANCHORAGE FOR FRAMES**  
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1  
**840D25**

27 SEP 2006 08:59 C:\projects\Special Details\ward\stds\06\stds to Special Details\840D25 Anchorage for Frames\0840d25.dgn eroward A1 10222263



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

**SEE PLATE FOR TITLE**

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06  
MODIFIED BY: E.E. WARD DATE: 9/25/06  
CHECKED BY: DATE:  
FILE SPEC.:



6/14/09  
 K:\7\2007  
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 Co. & Associates, B.C.

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  
 ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201770

ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (15+35.00)
004300000-N	226	Lump Sum		GRADING
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB- BING
005700000-E	226	500	CY	UNDERCUT EXCAVATION
008000000-E	SP	50	TON	CLASS IV SUBGRADE STABILIZA- TION
013400000-E	240	40	CY	DRAINAGE DITCH EXCAVATION
019500000-E	265	500	CY	SELECT GRANULAR MATERIAL
019600000-E	270	500	SY	FABRIC FOR SOIL STABILIZATION
031800000-E	300	30	TON	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRS
034300000-E	310	24	LF	15" SIDE DRAIN PIPE
034400000-E	310	188	LF	18" SIDE DRAIN PIPE
034500000-E	310	40	LF	24" SIDE DRAIN PIPE
070800000-E	310	28	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
099500000-E	340	148	LF	PIPE REMOVAL
112100000-E	520	1,056	TON	AGGREGATE BASE COURSE
122000000-E	545	200	TON	INCIDENTAL STONE BASE
148900000-E	610	450	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
149800000-E	610	250	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B
151900000-E	610	800	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
156000000-E	620	80	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
200000000-N	806	10	EA	RIGHT OF WAY MARKERS
202200000-E	815	25	CY	SUBDRAIN EXCAVATION
203300000-E	815	20	CY	SUBDRAIN FINE AGGREGATE
204400000-E	815	100	LF	6" PERFORATED SUBDRAIN PIPE
205500000-E	815	3	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
206600000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
207700000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
226400000-E	840	0.1	CY	PIPE PLUGS
228600000-N	840	1	EA	MASONRY DRAINAGE STRUCTURES
230800000-E	840	1	LF	MASONRY DRAINAGE STRUCTURES
236700000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
255600000-E	846	23	LF	SHOULDER BERM GUTTER
283000000-N	858	1	EA	ADJUSTMENT OF MANHOLES
303000000-E	862	275	LF	STEEL BM GUARDRAIL
304500000-E	862	150	LF	STEEL BM GUARDRAIL, SHOP CURVED
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
319500000-N	862	3	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
327000000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
331700000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
338000000-E	862	275	LF	TEMPORARY STEEL BM GUARDRAIL
338200000-E	862	100	LF	TEMPORARY STEEL BM GUARDRAIL (SHOP CURVED)
338700000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (AT-1)
338700000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (B-77)
338910000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
362800000-E	876	30	TON	RIP RAP, CLASS 1
364900000-E	876	80	TON	RIP RAP, CLASS B
365600000-E	876	425	SY	FILTER FABRIC FOR DRAINAGE

ItemNumber	Sec #	Quantity	Unit	Description
440000000-E	1110	48	SF	WORK ZONE SIGNS (STATIONARY)
440500000-E	1110	96	SF	WORK ZONE SIGNS (PORTABLE)
441000000-E	1110	92	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
443000000-N	1130	50	EA	DRUMS
443500000-N	1135	50	EA	CONES
444500000-E	1145	64	LF	BARRICADES (TYPE III)
445000000-N	1150	640	HR	FLAGGER
465000000-N	1251	136	EA	TEMPORARY RAISED PAVEMENT MARKERS
481000000-E	1205	30,048	LF	PAINT PAVEMENT MARKING LINES (4")
490000000-N	1251	13	EA	PERMANENT RAISED PAVEMENT MARKERS
600000000-E	1605	3,230	LF	TEMPORARY SILT FENCE
600600000-E	1610	105	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	785	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	215	TON	SEDIMENT CONTROL STONE
601500000-E	1615	1.5	ACR	TEMPORARY MULCHING
601800000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
602100000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEED- ING
602400000-E	1622	90	LF	TEMPORARY SLOPE DRAINS
602700000-N	1622	3	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
602900000-E	SP	300	LF	SAFETY FENCE
603000000-E	1630	2,800	CY	SILT EXCAVATION
603600000-E	1631	600	SY	MATTING FOR EROSION CONTROL
603800000-E	SP	1,385	SY	PERMANENT SOIL REINFORCEMENT MAT
604200000-E	1632	50	LF	1/4" HARDWARE CLOTH
6071030000-E	SP	600	LF	COIR FIBER BAFFLES
608400000-E	1660	2	ACR	SEEDING & MULCHING
608700000-E	1660	1	ACR	MOWING
609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
609600000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
610800000-E	1665	1.5	TON	FERTILIZER TOPDRESSING
611400000-N	SP	2	HR	SPECIALIZED HAND MOWING
611700000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL
612300000-E	1670	0.25	ACR	REFORESTATION



DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA  
**SUMMARY OF EARTHWORK**  
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
<b>SUMMARY NO. 1</b>					
-L- 10+10 TO 14+85 RIGHT (DETOUR)	141		1718	1577	
DRIVE 10+51.07 TO 11+45	0		409	409	
<b>TOTAL SUMMARY NO. 1</b>	141		2127	1986	
<b>SUMMARY NO. 2</b>					
-L- 15+75 TO 20+65 RIGHT (DETOUR)	119		1603	1484	
<b>TOTAL SUMMARY NO. 2</b>	119		1603	1484	
<b>SUB-TOTAL SUMMARY NOS. 1 &amp; 2</b>	260		3730	3470	
EST. BORROW FOR SHOULDER CONST.			242	242	
EST. BORROW IN LIEU OF WASTE					
<b>DETOUR TOTALS</b>	260		3972	3712	
<b>SUMMARY NO. 3</b>					
-L- 10+10 TO 14+80	424		664	240	
<b>TOTAL SUMMARY NO. 3</b>	424		664	240	
<b>SUMMARY NO. 4</b>					
-L- 15+90 TO 20+65	212		1787	1575	
<b>TOTAL SUMMARY NO. 4</b>	212		1787	1575	
<b>SUB-TOTAL SUMMARY NOS. 3 &amp; 4</b>	636		2451	1815	
<b>-L- TOTALS</b>	636		2451	1815	
<b>SUMMARY NO. 5</b>					
-L- 10+10 TO 14+80 RIGHT & DETOUR REMOVAL 10+10 TO 14+85	1430		70		1360
REMOVE DRIVE 10+14 TO 11+45	386		0		386
<b>TOTAL SUMMARY NO. 5</b>	1816		70		1746
<b>SUMMARY NO. 6</b>					
-L- 15+90 TO 20+65 RIGHT & DETOUR REMOVAL 15+85 TO 20+65	1240		173		1067
<b>TOTAL SUMMARY NO. 6</b>	1240		173		1067
<b>SUB-TOTAL SUMMARY NOS. 5 &amp; 6</b>	3056		243		2813
EST. WASTE IN LIEU OF BORROW					
<b>DETOUR REMOVAL TOTALS</b>	3056		243		2813
<b>PROJECT TOTALS</b>	3952		6666	5527	2813
EST. 5% REPLACE TOPSOIL ON BORROW PITS				276	
<b>GRAND TOTALS</b>	3952		6666	5803	2813
<b>SAY</b>	4000			5850	

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

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

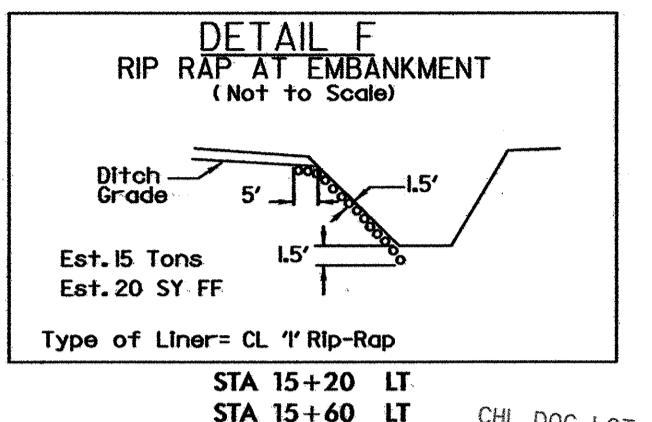
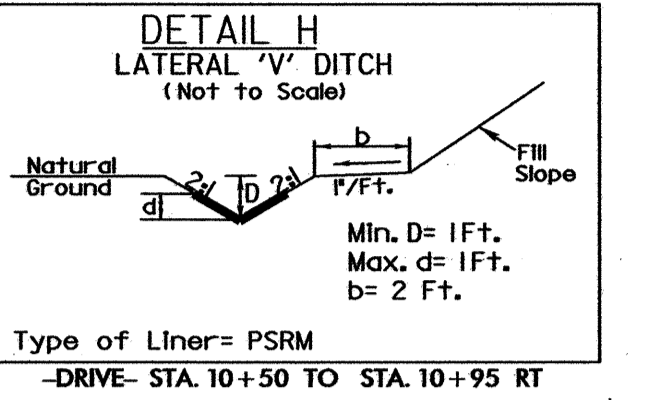
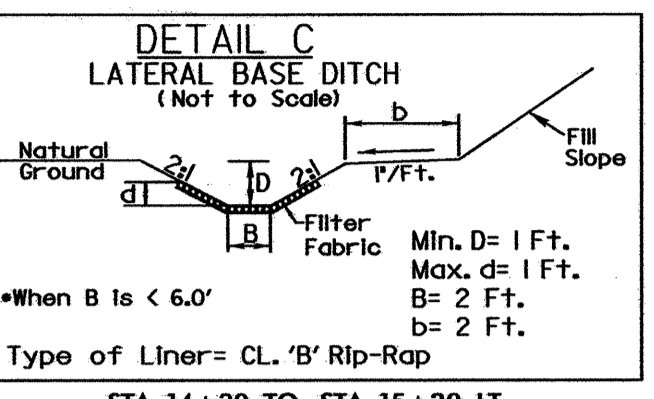
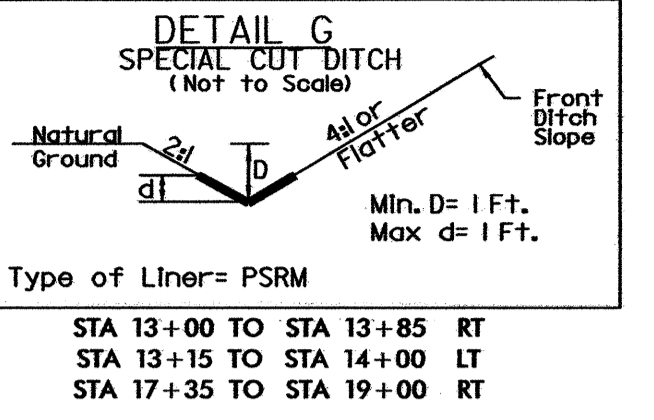
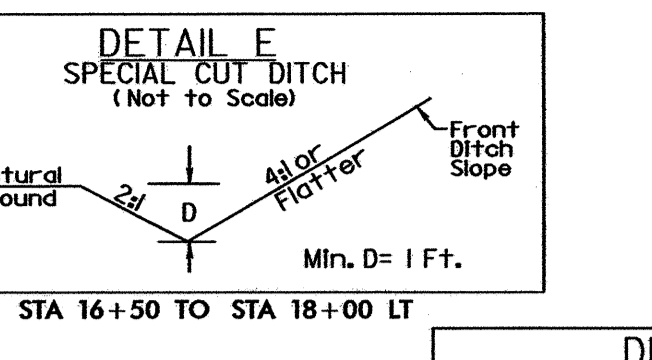
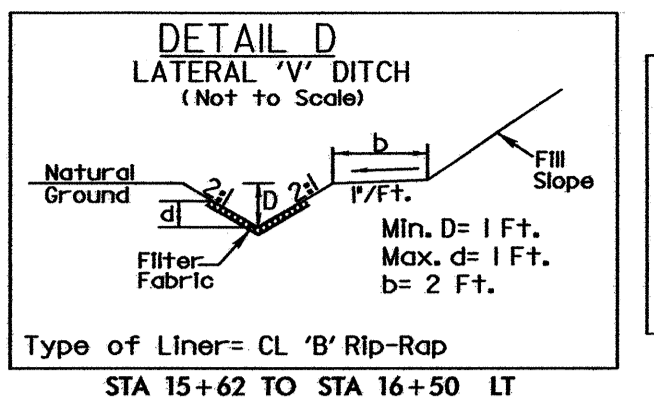
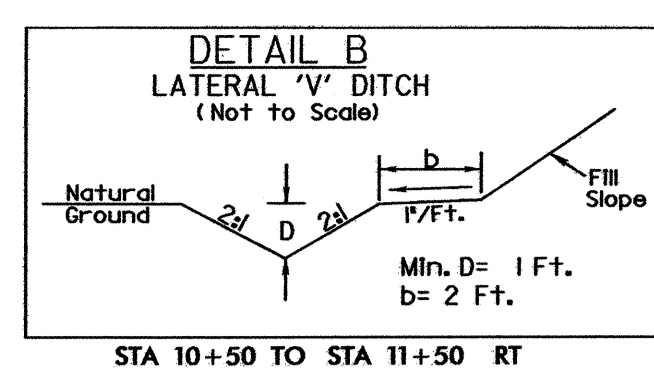
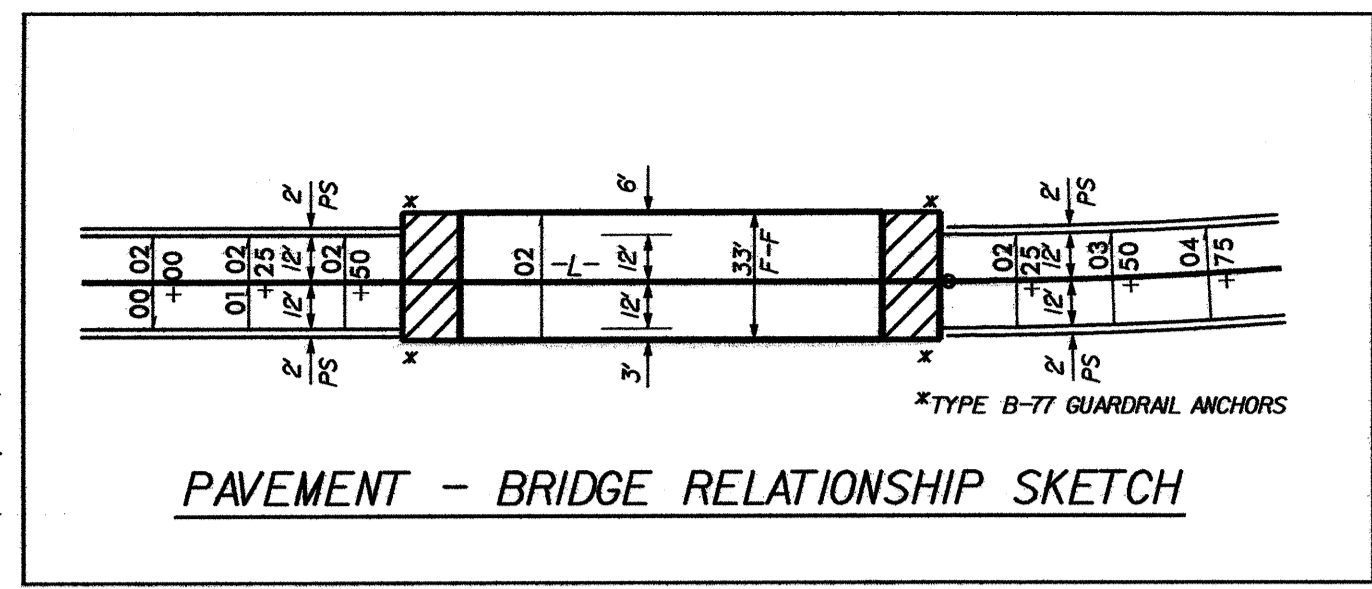
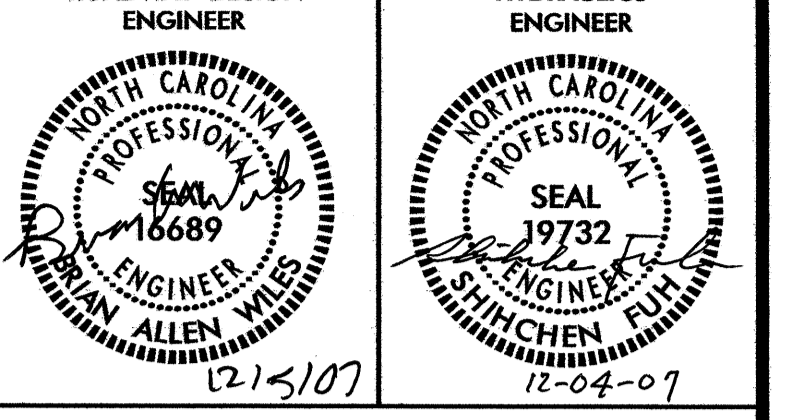
ESTIMATE DRAINAGE DITCH EXCAVATION = 40 C.Y.  
 ESTIMATE UNDERCUT = 500 C.Y.  
 ESTIMATE SELECT GRANULAR MATERIAL = 500 C.Y.  
 ESTIMATE CLASS IV SUBGRADE STABILIZATION MATERIAL = 50 TONS

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**SUMMARY OF  
 PAVEMENT REMOVAL**  
 IN SQUARE YARDS

LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP
-L- 13+75 TO -L- 14+25	111	
-L- 14+25 TO -L- 14+90		144
-L- 15+70 TO -L- 17+50		410
-L- 17+50 TO -L- 18+00	114	
-DET- 10+80 TO -DET- 12+75	260	
-DET- 12+75 TO -DET- 14+85	560	
-DET- 15+75 TO -DET- 18+10	627	
-DET- 18+10 TO -DET- 19+73	217	
<b>TOTAL</b>	<b>1889</b>	<b>554</b>
<b>SAY</b>	<b>1890</b>	<b>560</b>

8/17/99

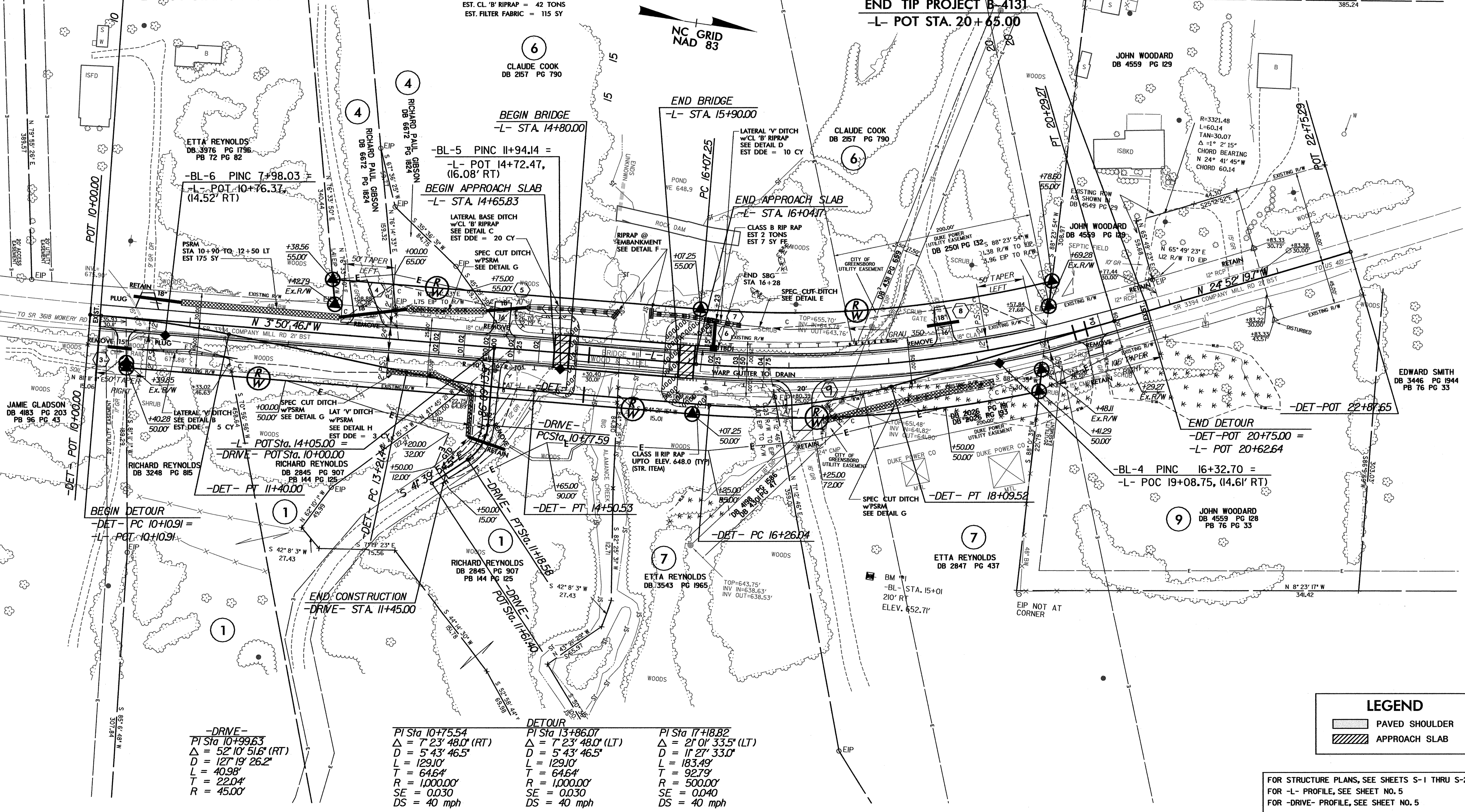


REVISIONS

BEGIN TIP PROJECT B-4131  
-L- POT STA. 10+10.00

END TIP PROJECT B-4131  
-L- POT STA. 20+65.00

NC GRID  
NAD 83



JAMIE GLADSON  
DB 4183 PG 203  
PB 96 PG 43

RICHARD REYNOLDS  
DB 2845 PG 907  
PB 144 PG 125

RICHARD REYNOLDS  
DB 2845 PG 907  
PB 144 PG 125

ETTA REYNOLDS  
DB 3543 PG 1965

ETTA REYNOLDS  
DB 2847 PG 437

JOHN WOODARD  
DB 4559 PG 128  
PB 76 PG 33

EDWARD SMITH  
DB 3446 PG 1944  
PB 76 PG 33

**LEGEND**

- PAVED SHOULDER
- APPROACH SLAB

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-22  
FOR -L- PROFILE, SEE SHEET NO. 5  
FOR -DRIVE- PROFILE, SEE SHEET NO. 5

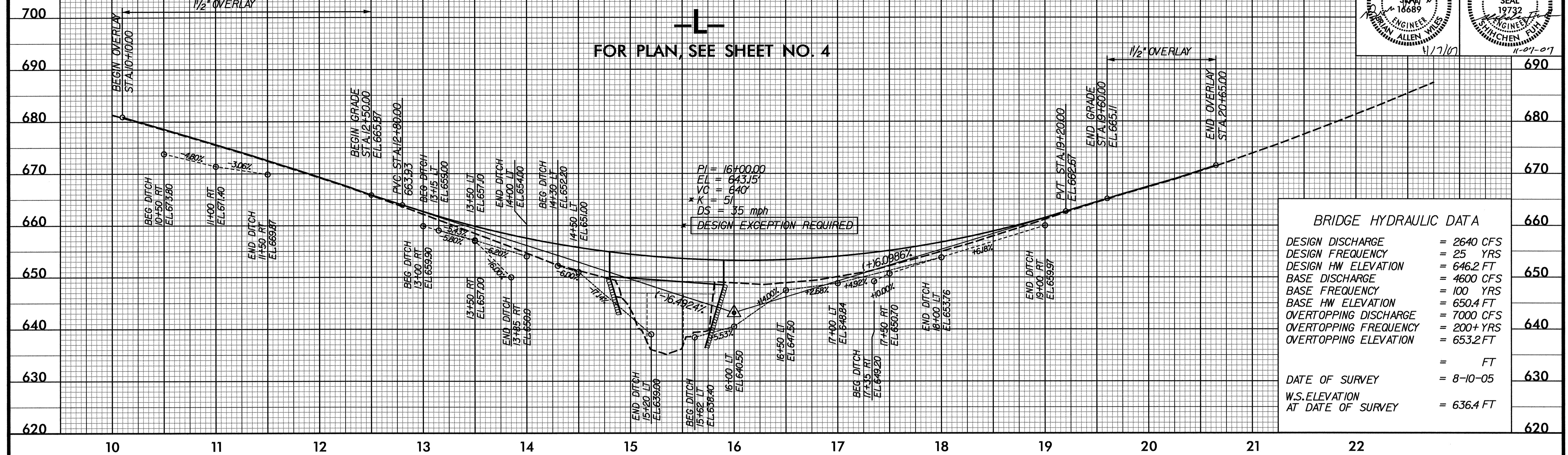
12/3/2007  
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5/28/99

B.M. #1 EL = 652.71'  
RR SPIKE IN IN POLE  
210' RT OF -BL- STA 15+01  
210' RT OF -L- STA 17+69

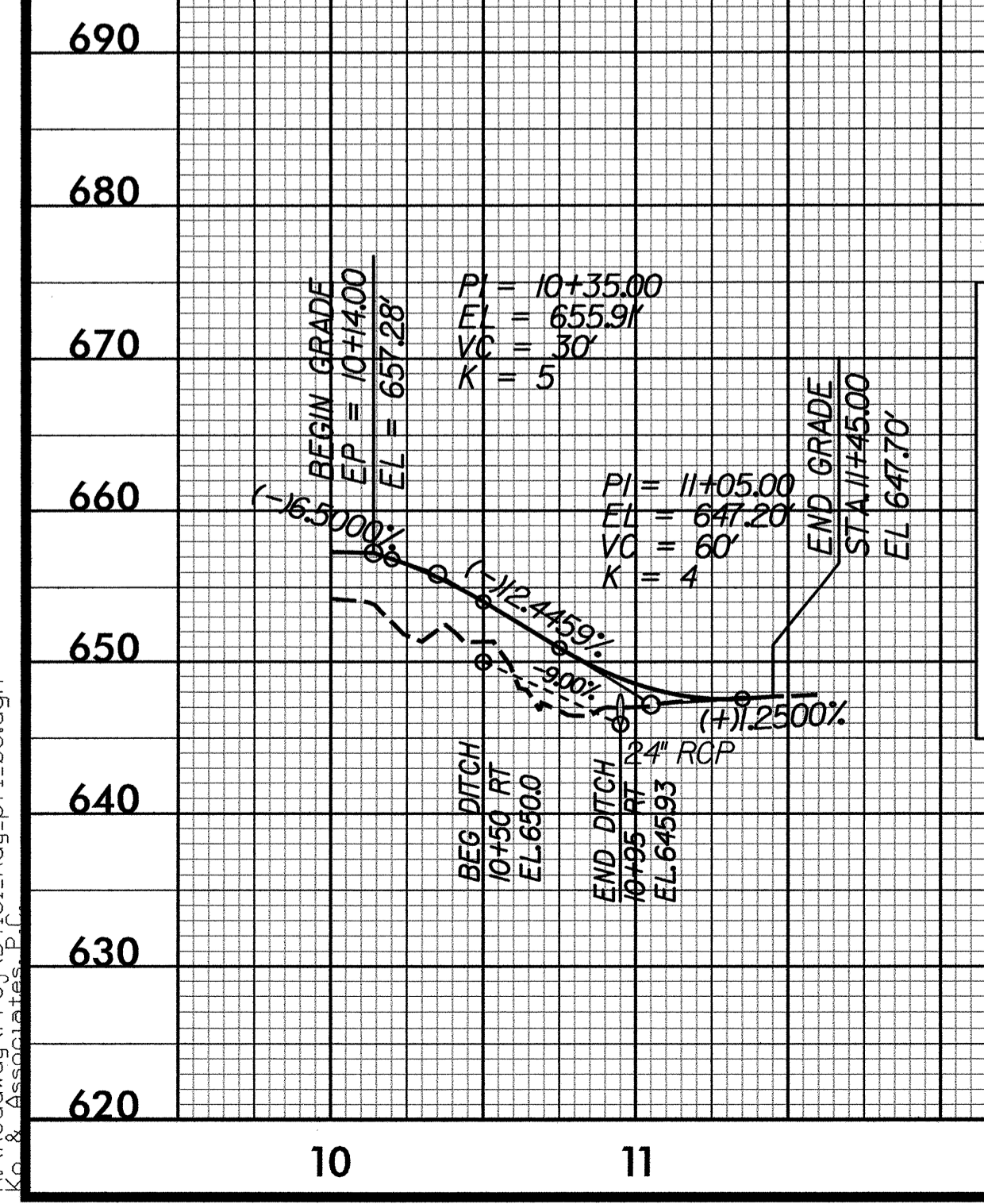
**KO & ASSOCIATES, P.C.**  
Consulting Engineers  
5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607  
(919) 851-6066

PROJECT REFERENCE NO. B-4131	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 2640 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 646.2 FT
BASE DISCHARGE	= 4600 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 650.4 FT
OVERTOPPING DISCHARGE	= 7000 CFS
OVERTOPPING FREQUENCY	= 200+ YRS
OVERTOPPING ELEVATION	= 653.2 FT
	= FT
DATE OF SURVEY	= 8-10-05
W.S. ELEVATION AT DATE OF SURVEY	= 636.4 FT

**-DRIVE-**  
FOR PLAN, SEE SHEET NO. 4

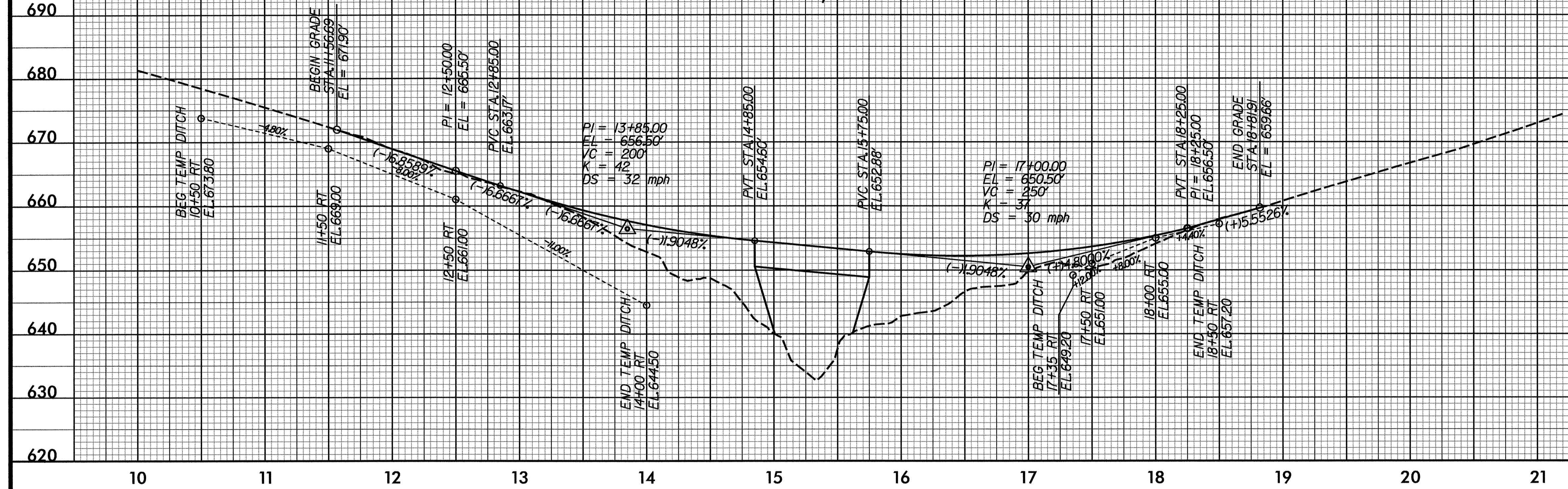


PIPE HYDRAULIC DATA	
STA -DRIVE- 10+95	
DRAINAGE AREA	= 15 AC
DESIGN FREQUENCY	= 5 YRS
DESIGN DISCHARGE	= 8 CFS
DESIGN HW ELEVATION	= 647.5 FT
100 YEAR DISCHARGE	= 26 CFS
100 YEAR HW ELEVATION	= 649.5 FT
OVERTOPPING FREQUENCY	= 5 YRS
OVERTOPPING DISCHARGE	= 8 CFS
OVERTOPPING ELEVATION	= 647.5 FT

1/7/2007  
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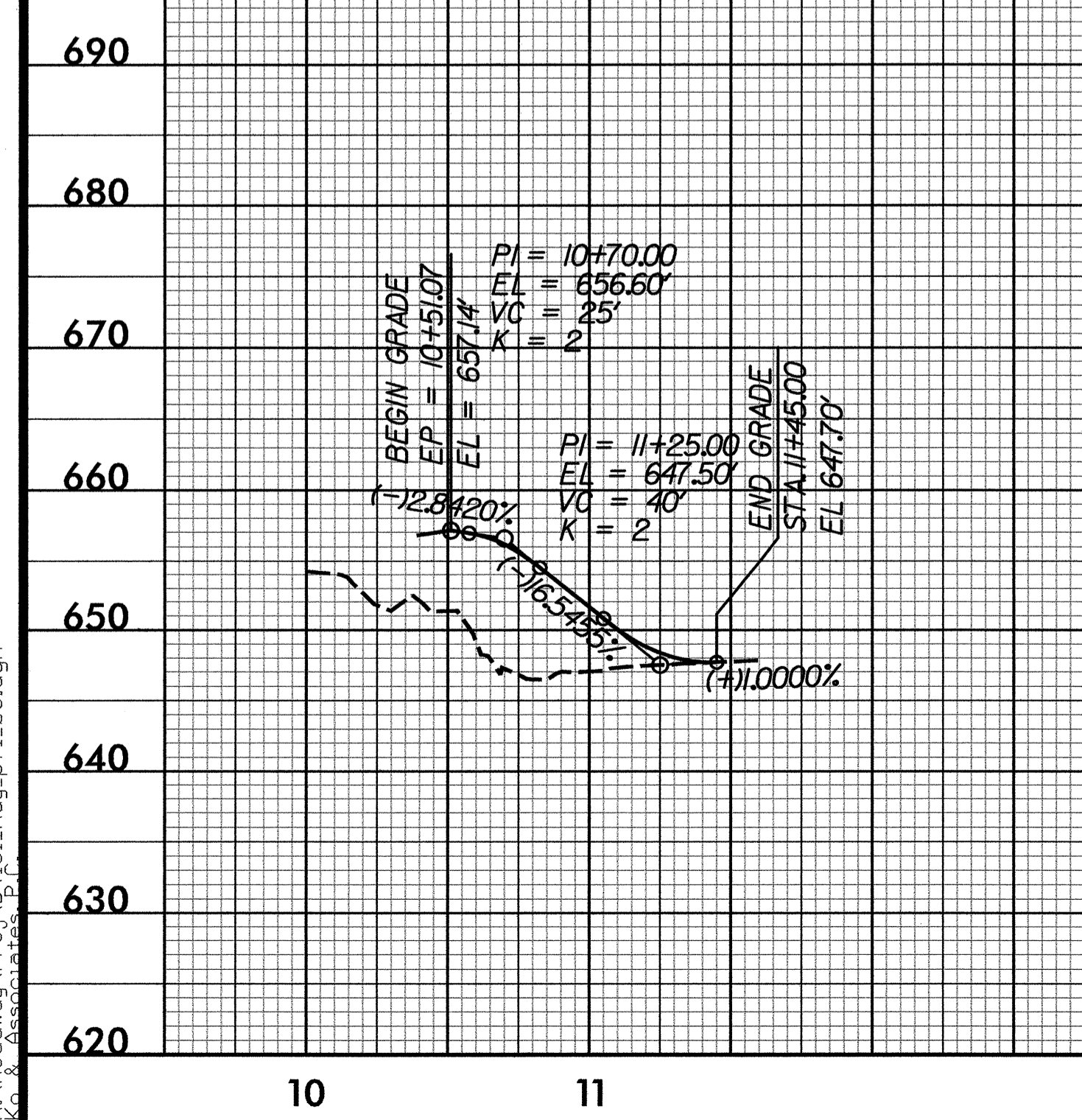
5/28/99

**-DETOUR-**  
 FOR PLAN, SEE SHEET NO. 2-B



BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 1100 CFS
DESIGN FREQUENCY	= 5 YRS
DESIGN HW ELEVATION	= 641.8 FT
BASE DISCHARGE	= N/A CFS
BASE FREQUENCY	= N/A YRS
BASE HW ELEVATION	= N/A FT
OVERTOPPING DISCHARGE	= N/A CFS
OVERTOPPING FREQUENCY	= N/A YRS
OVERTOPPING ELEVATION	= N/A FT
	= FT
DATE OF SURVEY	= 8-10-05
W.S. ELEVATION AT DATE OF SURVEY	= 635.8 FT

**-DRIVE DETOUR-**  
 FOR PLAN, SEE SHEET NO. 2-B



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