

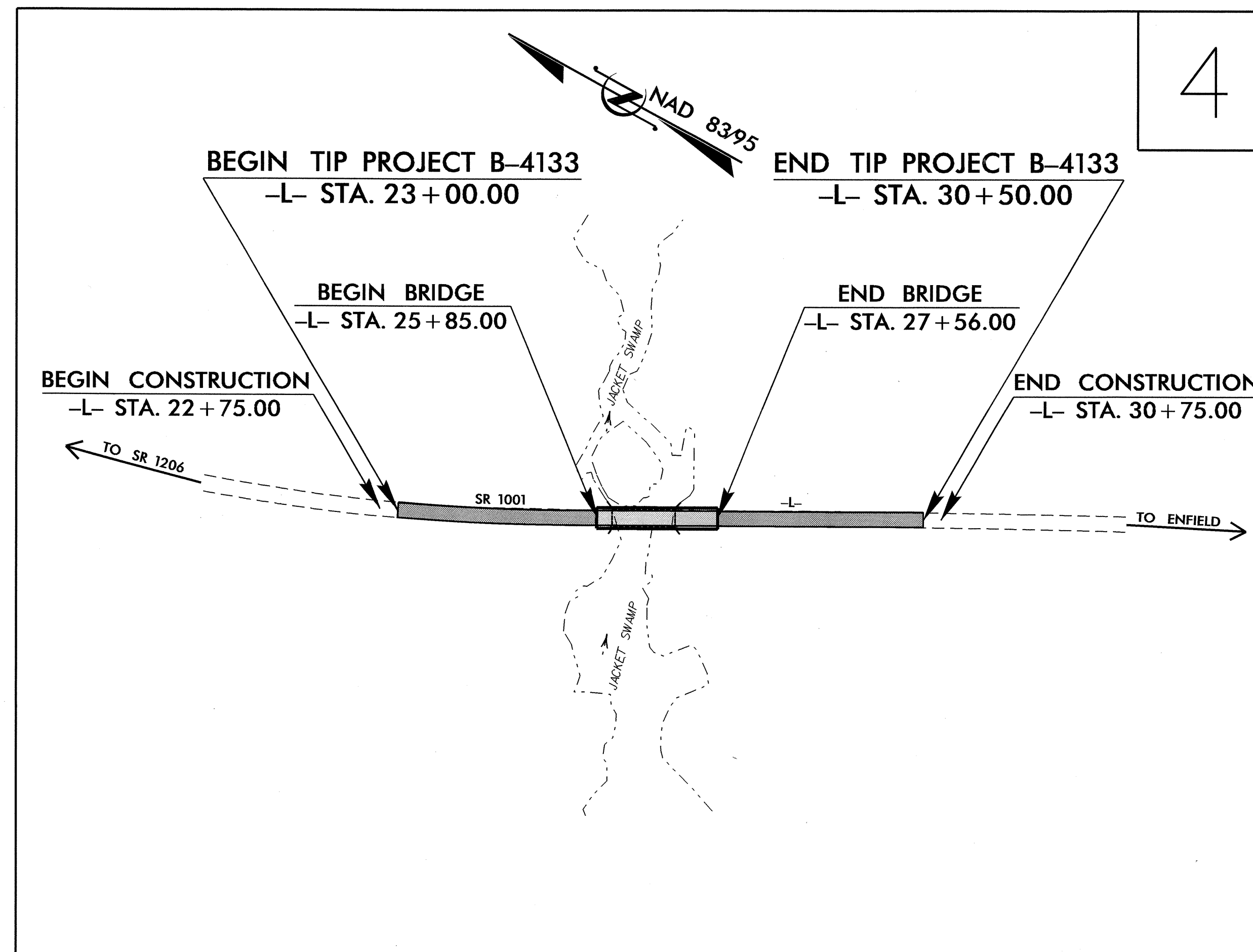
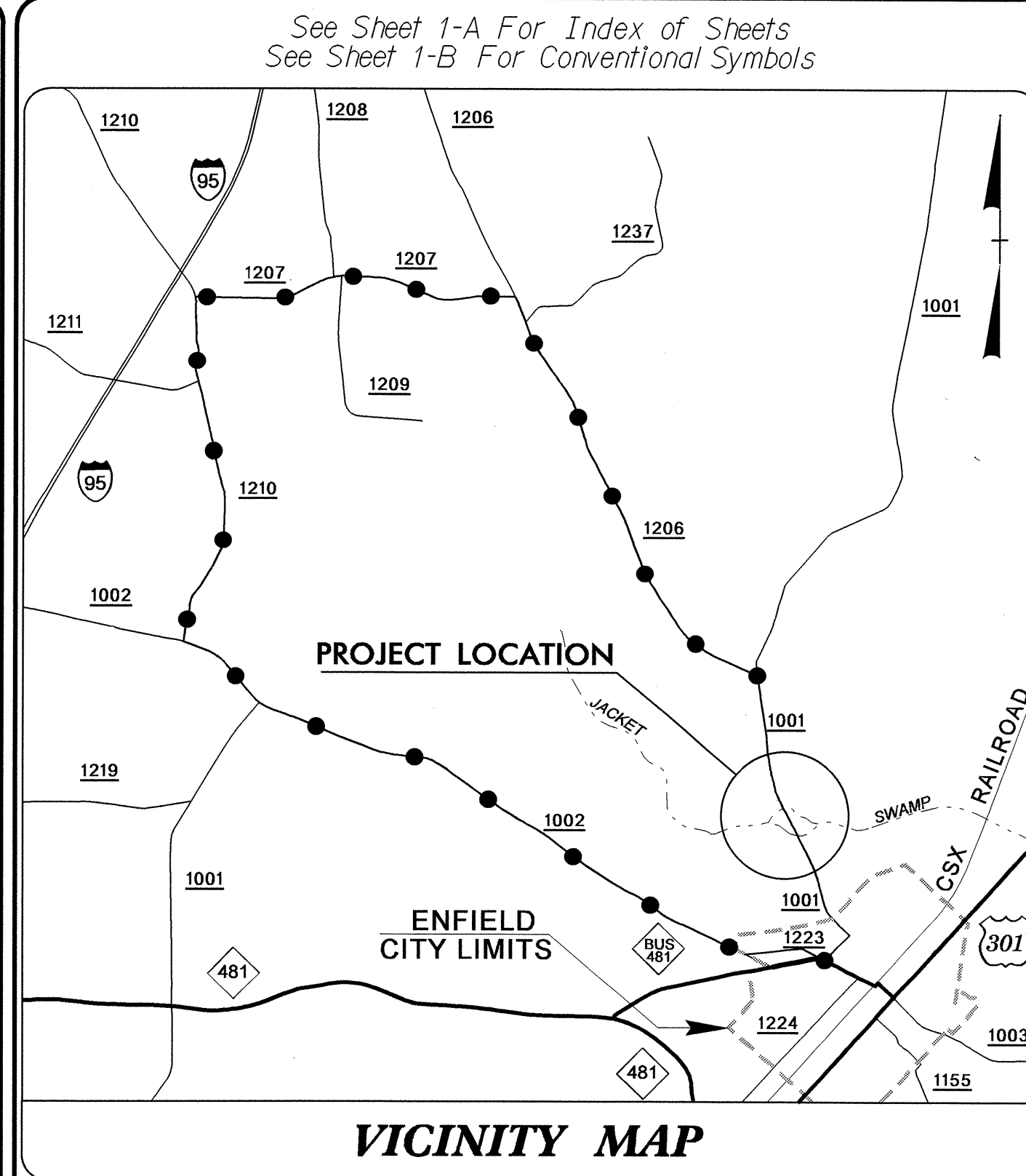
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4133	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33486.1.1	BRSTP-1001(26)	PE	
33486.2.1	BRSTP-1001(26)	RW, UTIL.	
33486.3.1	BRSTP-1001(26)	CONST.	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**HALIFAX COUNTY**

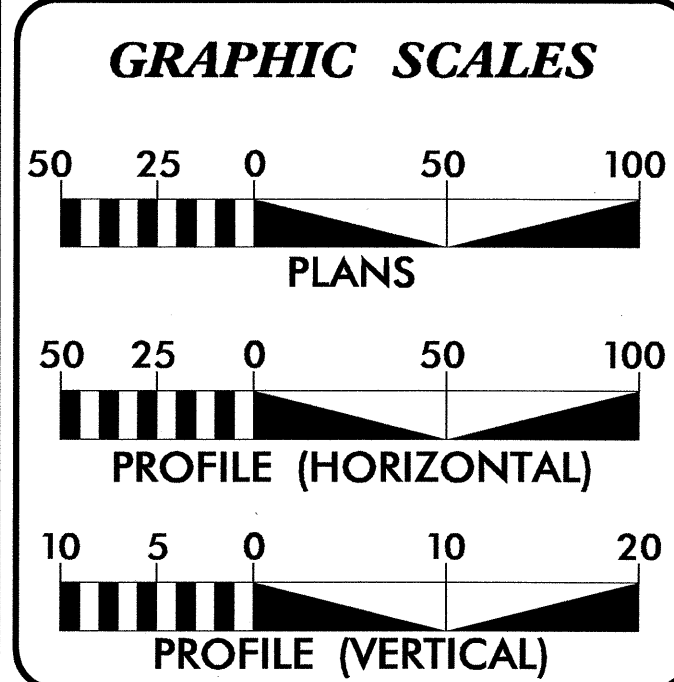
LOCATION: BRIDGE NO. 11 OVER JACKET SWAMP ON SR 1001 (JUSTICE BRANCH ROAD)

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



TIP PROJECT: B-4133

CONTRACT: C202437



DESIGN DATA

ADT 2009 =	775 VPD
ADT 2030 =	1300 VPD
DHV =	11 %
D =	60 %
T =	7 % *
V =	60 MPH
* TTST 3 % DUAL 4 %	
FUNC. CLASS = COLLECTOR	
SUB-REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4133	=	0.110 MI
LENGTH STRUCTURE TIP PROJECT B-4133	=	0.032 MI
TOTAL LENGTH TIP PROJECT B-4133	=	0.142 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	JAMES A. SPEER, P.E. PROJECT ENGINEER
LETTING DATE:	NYA K. BOAYUE, P.E. PROJECT DESIGN ENGINEER

RIGHT OF WAY DATE: JULY 14, 2009  
LETTING DATE: AUGUST 16, 2011

HYDRAULICS ENGINEER

SIGNATURE: *Matthew L. Cook* 5/24/11 P.E.

ROADWAY DESIGN ENGINEER

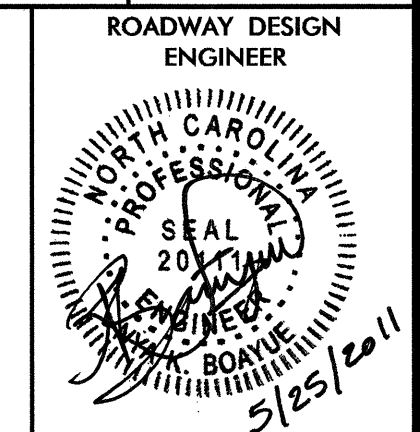
SIGNATURE: *NYA K. Boayue* 5/20/2011 P.E.

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

*Art McMiller*  
STATE HIGHWAY DESIGN ENGINEER P.E.

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**INDEX OF SHEETS**

PROJECT REFERENCE NO.	SHEET NO.
B-4133	1-A



INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2	TYPICAL SECTIONS AND PAVEMENT SCHEDULE
2-A	ANCHORAGE OF FRAME FOR GRATED DROP INLET
2-B THRU 2-C	METHOD OF PIPE INSTALLATION
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-2	TRANSPORTATION MANAGEMENT PLANS
SD-1	SIGN DESIGN
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
RF-1	REFORESTATION DETAIL SHEET
EC-1 THRU EC-4	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-2	SIGNING PLANS
X-1A	CROSS-SECTION SUMMARY
X-1 THRU X-4	CROSS-SECTIONS
S-1 THRU S-19	STRUCTURE PLANS

GENERAL NOTES: 2006 SPECIFICATIONS  
EFFECTIVE: 07-18-06  
REVISED: 07-30-08

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.

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:  
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 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 July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.25	Anchorage for Frames - Brick or Concrete (Beg. January 2007 Let Use Detail in Lieu of Standard)
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
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units

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

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	(123)
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

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

### RAILROADS:

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

### RIGHT OF WAY:

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

### ROADS AND RELATED FEATURES:

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

### VEGETATION:

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

### EXISTING STRUCTURES:

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

### UTILITIES:

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

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

### MISCELLANEOUS:

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



6/27/99

# SURVEY CONTROL SHEET B-4133

PROJECT REFERENCE NO.	SHEET NO.
B-4133	1-C
Location and Surveys	

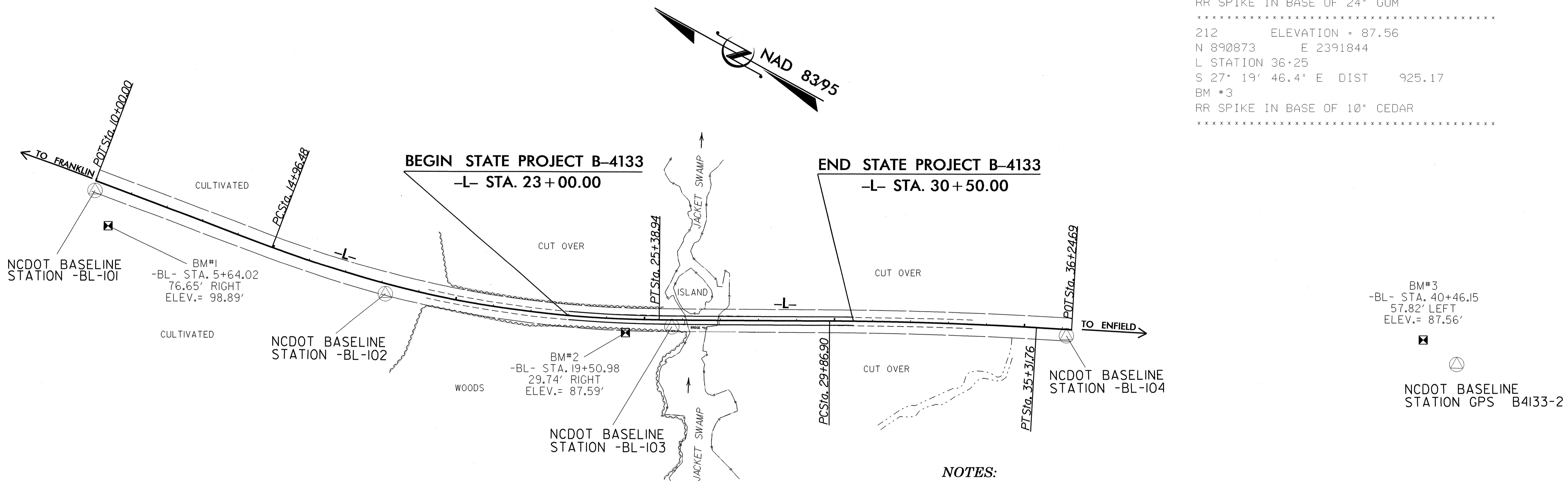
### BASELINE CONTROL DATA

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101		894121.7350	2390494.7230	95.27	10+07.16	24.68 RT
102	BL-102		893320.9080	2390625.7030	91.37	18+16.27	25.84 RT
103	BL-103		892619.6920	2390916.1320	86.29	25+71.94	17.05 RT
104	BL-104		891700.2220	2391398.7500	85.43	36+11.41	16.39 RT
2	GPS B4133-2		890765.0780	2391830.3830	86.38	OUT OF PROJECT LIMITS	

### BENCHMARK DATA

```

*****
210      ELEVATION = 98.89
N 894046      E 2390429
L STATION 10+73 100 RIGHT
BM #1
RR SPIKE IN BASE OF 24" WILD CHERRY
*****
211      ELEVATION = 87.59
N 892719      E 2390843
L STATION 24+51 35 RIGHT
BM #2
RR SPIKE IN BASE OF 24" GUM
*****
212      ELEVATION = 87.56
N 890873      E 2391844
L STATION 36+25
S 27° 19' 46.4" E DIST 925.17
BM #3
RR SPIKE IN BASE OF 10" CEDAR
*****
    
```



**NOTES:**

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)

THE FILES TO BE FOUND ARE AS FOLLOWS:  
 B4133\_LS\_CONTROL\_071203.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 "GPS B4133-2"

WITH NAD 83/95 STATE PLANE GRID COORDINATES OF  
 NORTHING: 890765.0787(++) EASTING: 2391830.3837(++)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00000727

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS B4133-2" TO -L- STATION 23+00.00 IS  
 N 25°51'49" W 2340.328

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

NOTE: DRAWING NOT TO SCALE

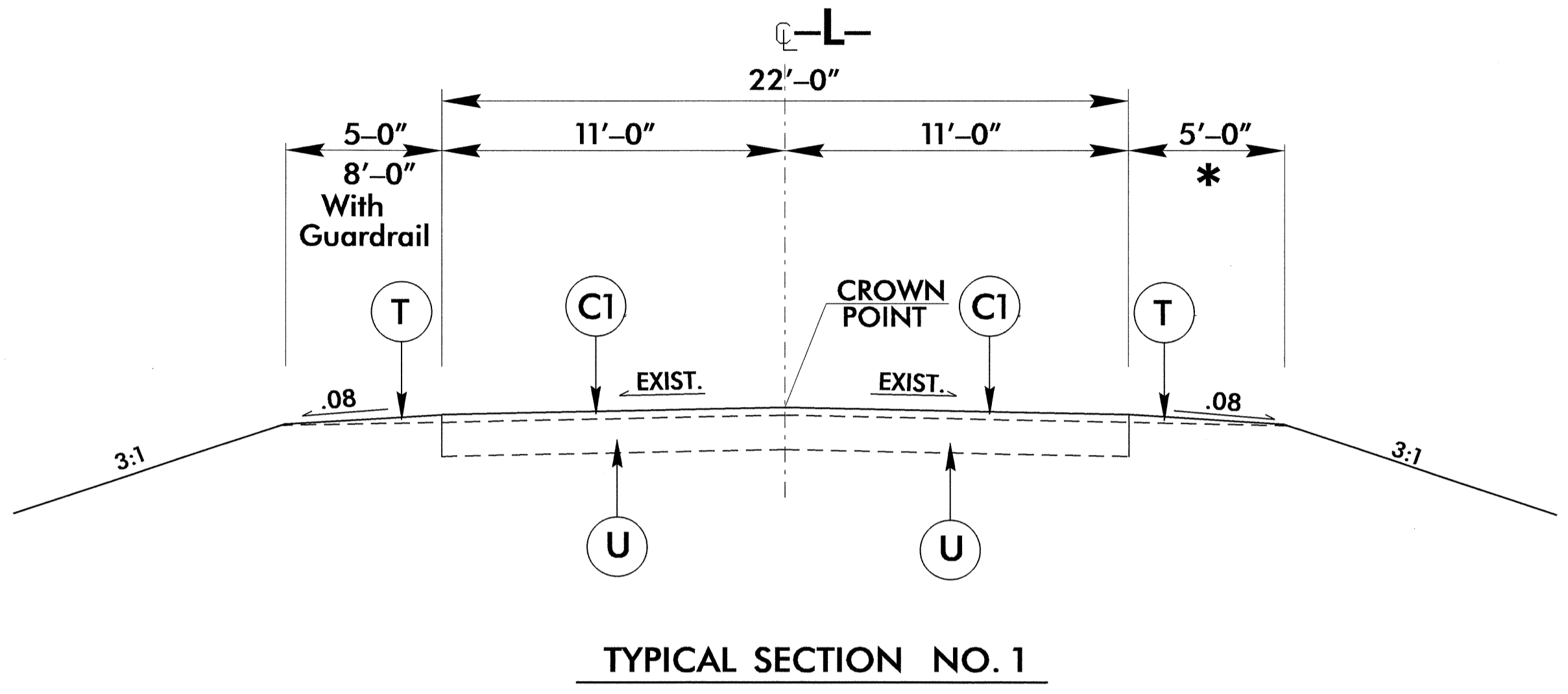
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6/2/99

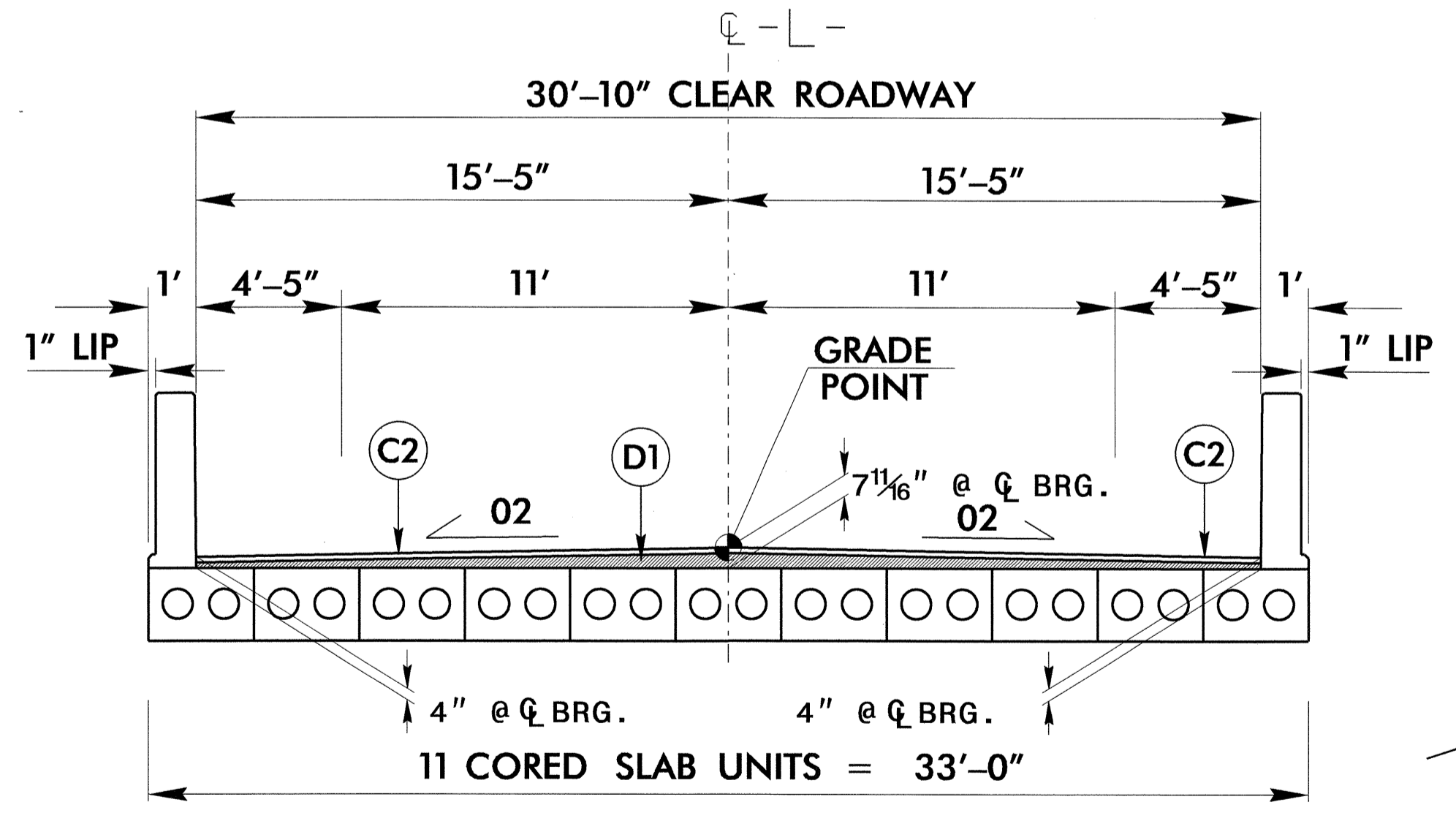
PROJECT REFERENCE NO. <b>B-4133</b>	SHEET NO. <b>2</b>
ROADWAY DESIGN ENGINEER <i>[Signature]</i> 5/20/2011	PAYEMENT DESIGN ENGINEER <i>[Signature]</i> 5/23/11

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C3	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.
D1	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/4" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.

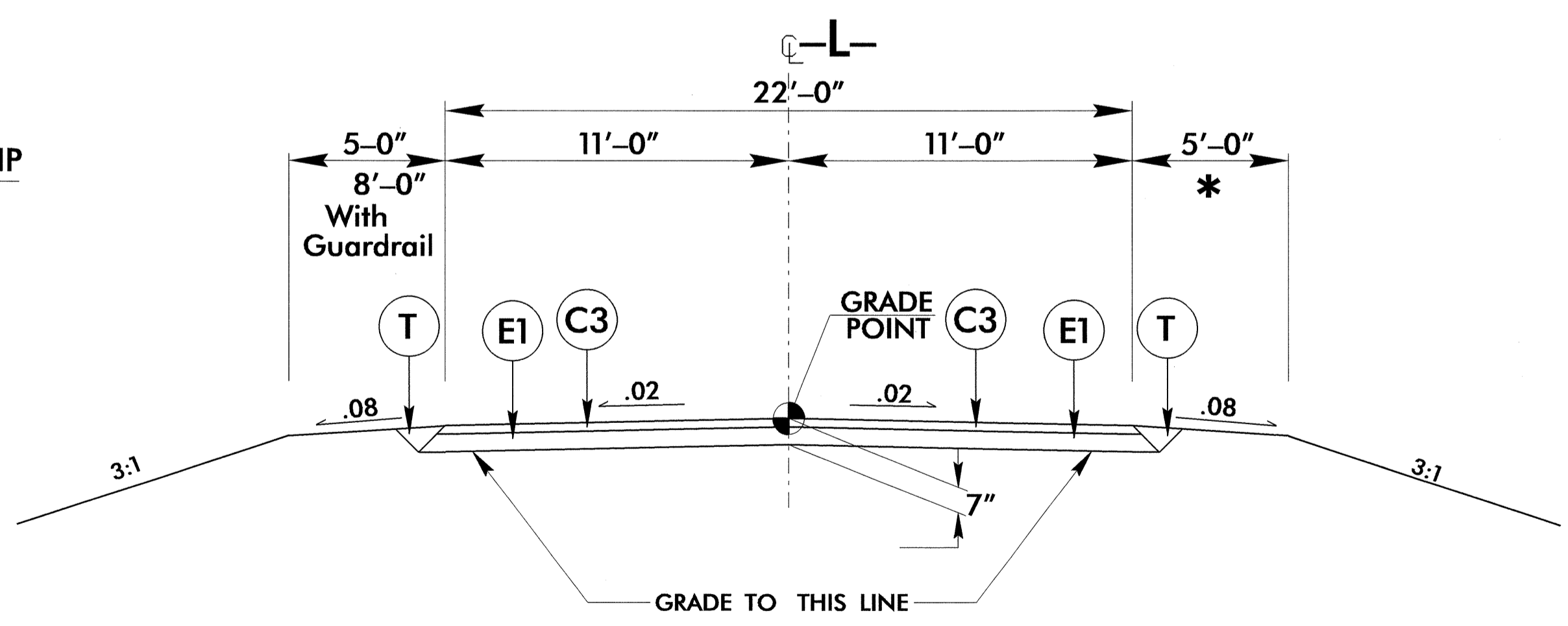
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



USE TYPICAL SECTION NO. 1  
 -L- STA. 23+00.00 to -L- STA. 24+00.00  
 -L- STA. 29+00.00 to -L- STA. 30+50.00



BEGIN BRIDGE -L- STA. 25+85.00 TO END BRIDGE -L- STA. 27+56.00



USE TYPICAL SECTION NO. 2  
 -L- STA. 24+00.00 TO -L- STA. 25+85.00(BEG. BRIDGE)  
 -L- STA. 27+56.00(END BRIDGE) TO -L- STA. 29+00.00

\* NOTE: INSTALL SHOULDER BERM GUTTER AS FOLLOWS:  
 -L- STA. 25+09.00 TO -L- STA. 25+74.00 LT/RT  
 -L- STA. 27+67.00 TO -L- STA. 27+92.00 LT/RT  
 APPLY FULL DEPTH PAVEMENT UP TO THE SHOULDER BERM GUTTER  
 SEE ROADWAY STD. DRWG. 846.03

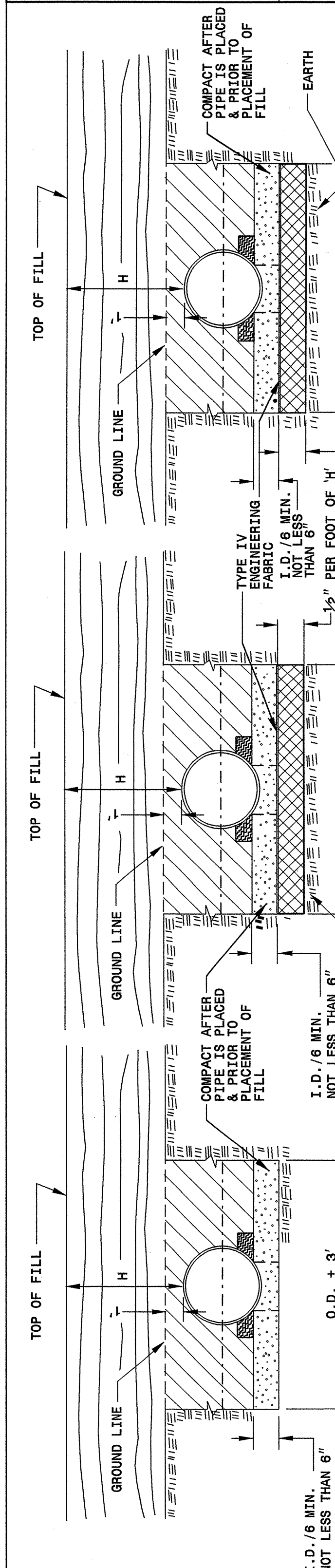
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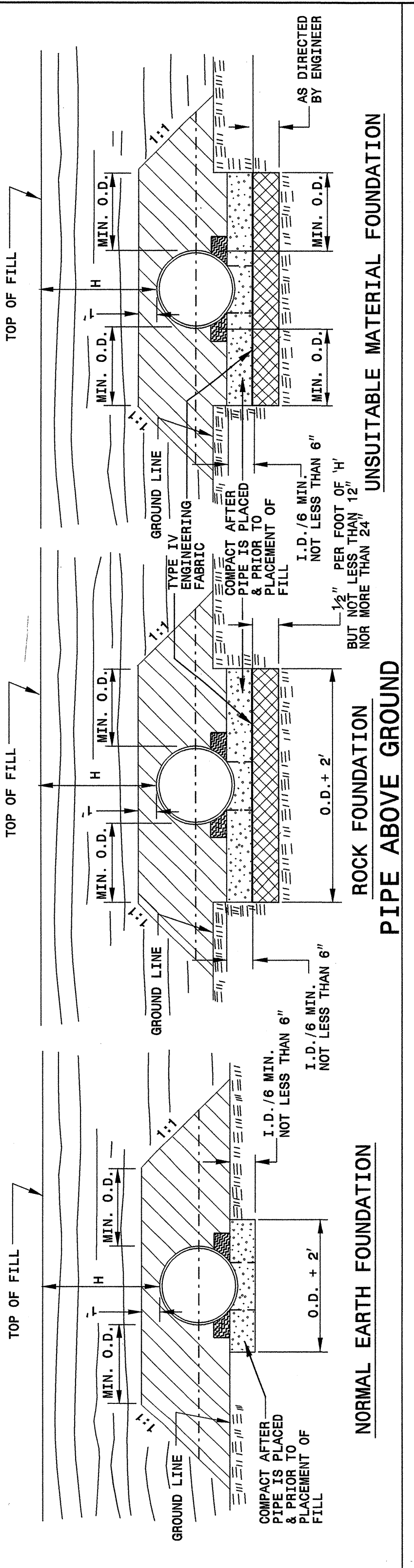


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 jhower-ton AT PS237501

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



ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FLEXIBLE PIPE

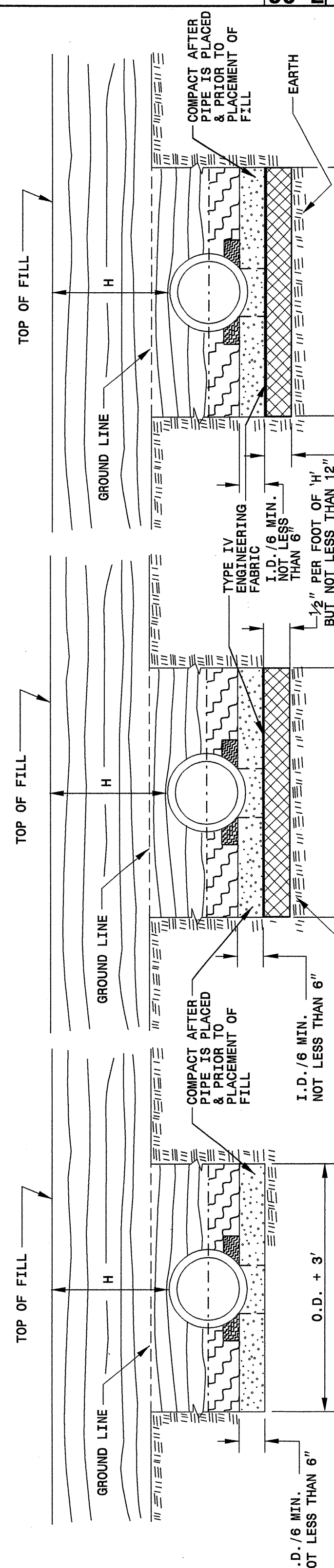


GENERAL NOTES:  
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.  
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.  
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.  
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.  
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTON.  
 DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.  
 --- SPRINGLINE OF PIPE  
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.  
 APPROVED SUITABLE LOCAL MATERIAL.  
 UNDISTURBED EARTH MATERIAL  
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

SHEET 1 OF 3  
**300D01**

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.



GENERAL NOTES:  
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.  
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.  
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.  
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.  
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTON.  
 DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.  
 --- SPRINGLINE OF PIPE  
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 BELOW SPRINGLINE.  
 APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.  
 UNDISTURBED EARTH MATERIAL  
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 RIGID PIPE

SHEET 2 OF 3  
**300D01**

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

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: KKempf DATE: 5-15-09  
 MODIFIED BY: DATE: 7/23/09  
 CHECKED BY: DATE: 7/23/09  
 FILE SPEC: erward/stds/stdstodetails/30001/0300d01.dgn



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

7-06

ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FILL HEIGHT TABLES

SHEET 3 OF 3  
**300D01**

**FLEXIBLE PIPE**

Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **			
Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)	
		(Ga) 16	14 12 10 8
12	12	204	256
15	12	162	204
18	12	135	169
21	12	115	145
24	12	100	126
30	12	79	100
36	12	65	83
42	12	55	70
48	12	48	61
54	12	44	54
60	12	40	49
66	12	37	45
72	12	34	41
78	12	32	38
84	12	30	35

HDPE - \* (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"  
 \* (Maximum fill) 20' for pipe diameters ≤ 24"  
 17' for pipe diameters ≥ 30" and ≤ 60"

PVC - \* (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"  
 \* (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

\* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

**RIGID PIPE**

RCP - \* (Minimum fill) 1' for Class IV & CLASS V  
 2' for Class III & Class II

\* (Maximum fill) 10' - Class II pipe  
 20' - Class III pipe  
 30' - Class IV pipe  
 40' - Class V pipe

(For fills > 40' & < 80' use LRFD Direct Design Method)

\* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **			
Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)	
		(Ga) 16	14 12 10 8
12	12	123	155
15	12	98	123
18	12	81	102
21	12	69	87
24	12	60	76
27	12	57	71
30	12	54	66
36	12	50	60
42	12	48	57
48	12	46	54
54	12	44	51
60	12	42	48
66	12	41	47
72	12	40	46

\*\* FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS  
 GSP - AASHTO M86  
 CAAP - AASHTO M196  
 HDPE - AASHTO M294  
 PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS  
 1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS  
 RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS  
 1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

7-06

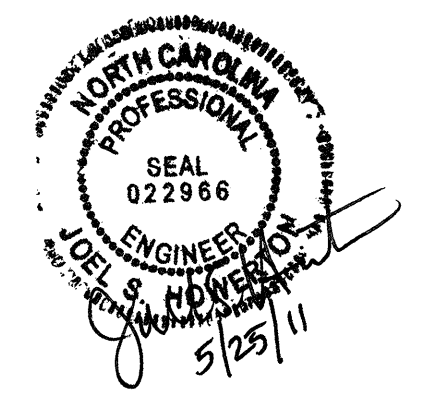
ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FILL HEIGHT TABLES

SHEET 3 OF 3  
**300D01**

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: K Kempf DATE: 5-15-09  
 MODIFIED BY: DATE: \_\_\_\_\_  
 CHECKED BY: *[Signature]* DATE: 7/29/09  
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**SUMMARY OF QUANTITIES**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202437

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (26+70.50 -L-)
0036000000-E	225	200	CY	UNDERCUT EXCAVATION
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0195000000-E	SP	200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	100	SY	FABRIC FOR SOIL STABILIZATION
0318000000-E	SP	12	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0320000000-E	SP	40	SY	FOUNDATION CONDITIONING FABRIC
0335200000-E	SP	44	LF	15" DRAINAGE PIPE
0448200000-E	SP	56	LF	15" RC PIPE CULVERTS, CLASS IV
1489000000-E	610	200	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	165	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1525000000-E	610	205	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1575000000-E	SP	35	TON	ASPHALT BINDER FOR PLANT MIX
2000000000-N	806	10	EA	RIGHT OF WAY MARKERS
2022000000-E	SP	22.4	CY	SUBDRAIN EXCAVATION
2033000000-E	SP	16.8	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	SP	100	LF	6" PERFORATED SUBDRAIN PIPE
2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS
2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)
2286000000-N	840	4	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	4	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	180	LF	SHOULDER BERM GUTTER
3030000000-E	862	600	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS

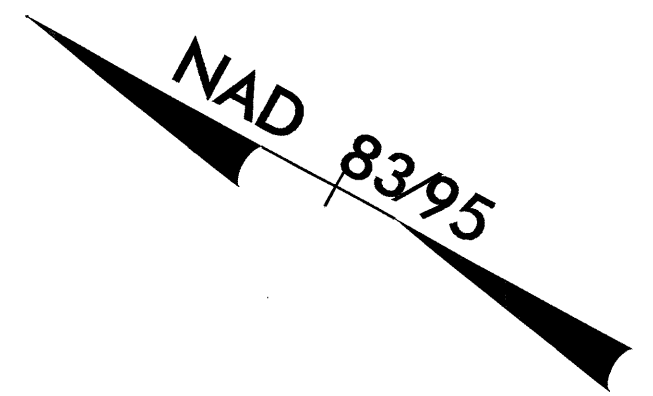
ItemNumber	Sec #	Quantity	Unit	Description
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3656000000-E	876	1,050	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	2	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4155000000-N	907	3	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4158000000-N	907	3	EA	DISPOSAL OF SIGN SYSTEM, WOOD
4400000000-E	1110	460	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	94	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4445000000-E	1145	64	LF	BARRICADES (TYPE III)
4810000000-E	1205	5,998	LF	PAINT PAVEMENT MARKING LINES (4")
6000000000-E	1605	1,200	LF	TEMPORARY SILT FENCE
6006000000-E	1610	225	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	5	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	430	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	1,000	LF	SAFETY FENCE
6030000000-E	1630	100	CY	SILT EXCAVATION
6036000000-E	1631	1,700	SY	MATTING FOR EROSION CONTROL
6042000000-E	1632	1,300	LF	1/4" HARDWARE CLOTH
6048000000-E	SP	100	SY	FLOATING TURBIDITY CURTAIN
6070000000-N	SP	8	EA	SPECIAL STILLING BASINS

ItemNumber	Sec #	Quantity	Unit	Description
6084000000-E	1660	1.5	ACR	SEEDING & MULCHING
6087000000-E	1660	1.5	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	0.75	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.1	ACR	REFORESTATION

5/28/09

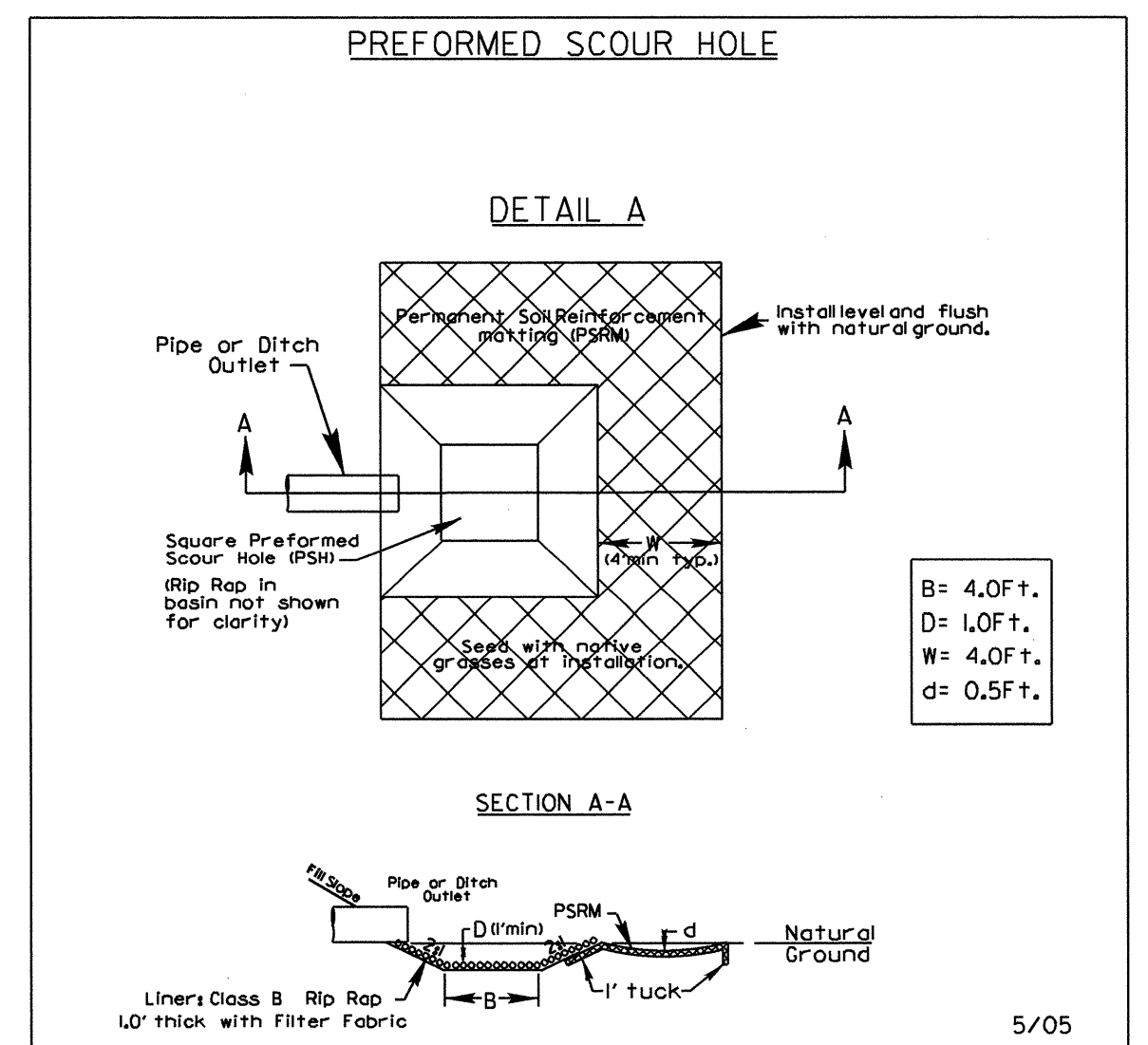
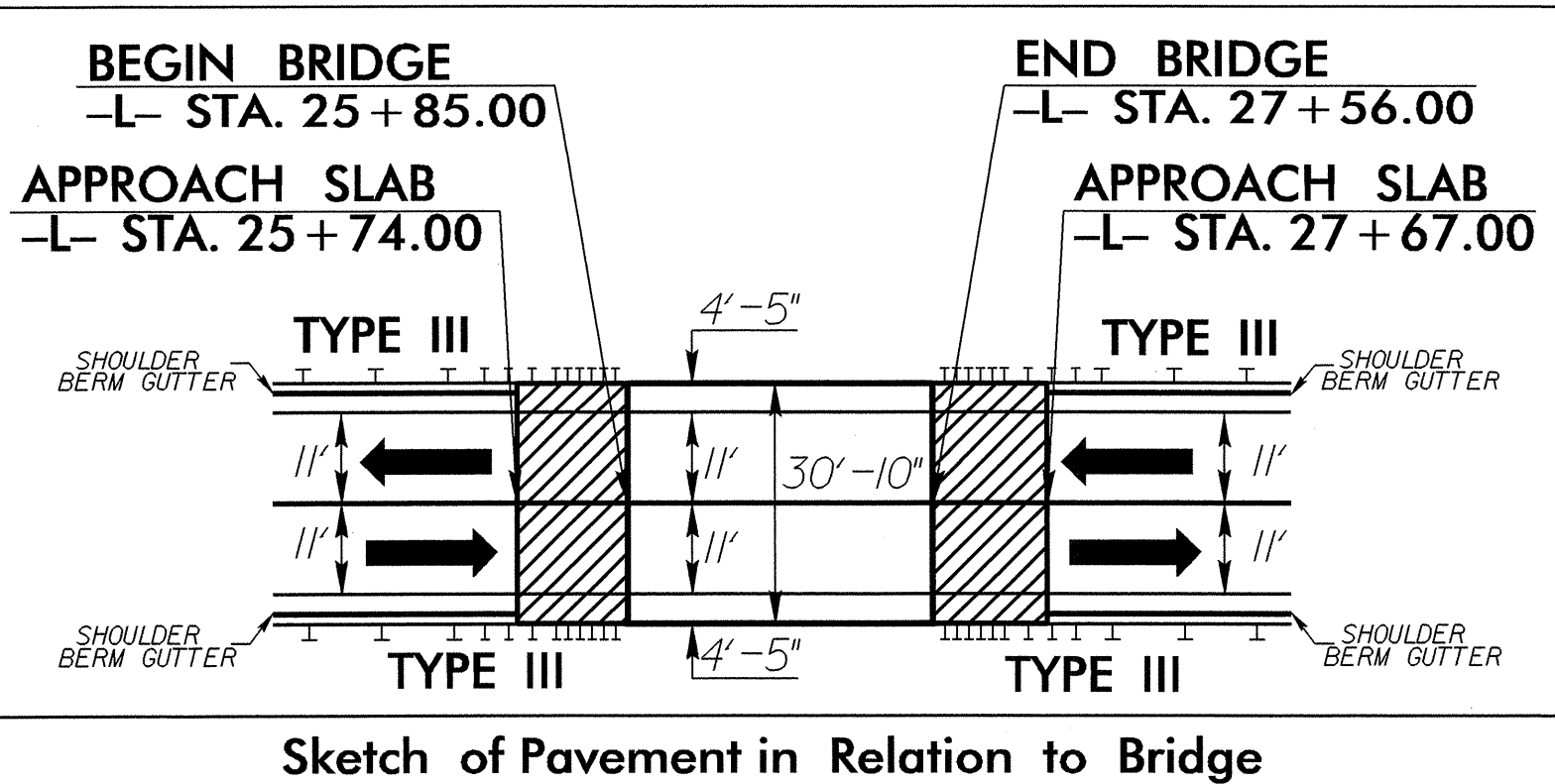
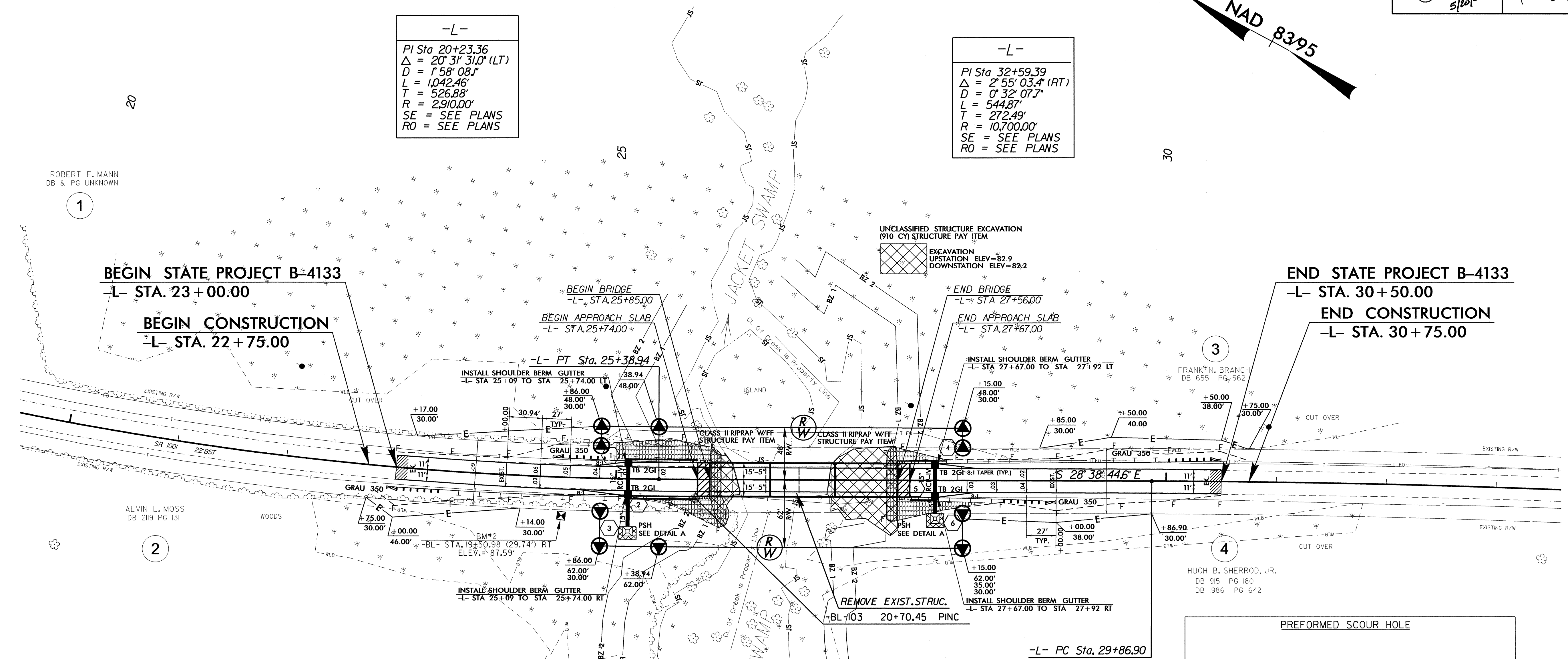
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-L-  
 PI Sta 20+23.36  
 $\Delta = 20^\circ 31' 31.0''$  (LT)  
 $D = 1' 58' 08.1''$   
 $L = 1,042.46'$   
 $T = 526.88'$   
 $R = 2,910.00'$   
 SE = SEE PLANS  
 RO = SEE PLANS

-L-  
 PI Sta 32+59.39  
 $\Delta = 2^\circ 55' 03.4''$  (RT)  
 $D = 0' 32' 07.7''$   
 $L = 544.87'$   
 $T = 272.49'$   
 $R = 10,700.00'$   
 SE = SEE PLANS  
 RO = SEE PLANS



NOTE: SEE SHEET NO. 5 FOR -L- PROFILE  
 SEE SHEETS S-1 THRU S-19 FOR STRUCTURE PLANS

8/17/99  
 REVISIONS  
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 5/20/11



5/14/09

PROJECT REFERENCE NO. <b>B-4133</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 2300	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 85.6	FT
BASE DISCHARGE	= 3510	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 87.5	FT
OVERTOPPING DISCHARGE	= 3650	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 85.8	FT
NORMAL WATER SURFACE ELEVATION	= 78.3	FT
DATE OF SURVEY	= 09/07	
W.S. ELEVATION AT DATE OF SURVEY	= 78.3	FT

**-L-**

**END RESURFACING  
BEGIN GRADE  
-L- STA. 24+00.00  
EL. = 87.30'**

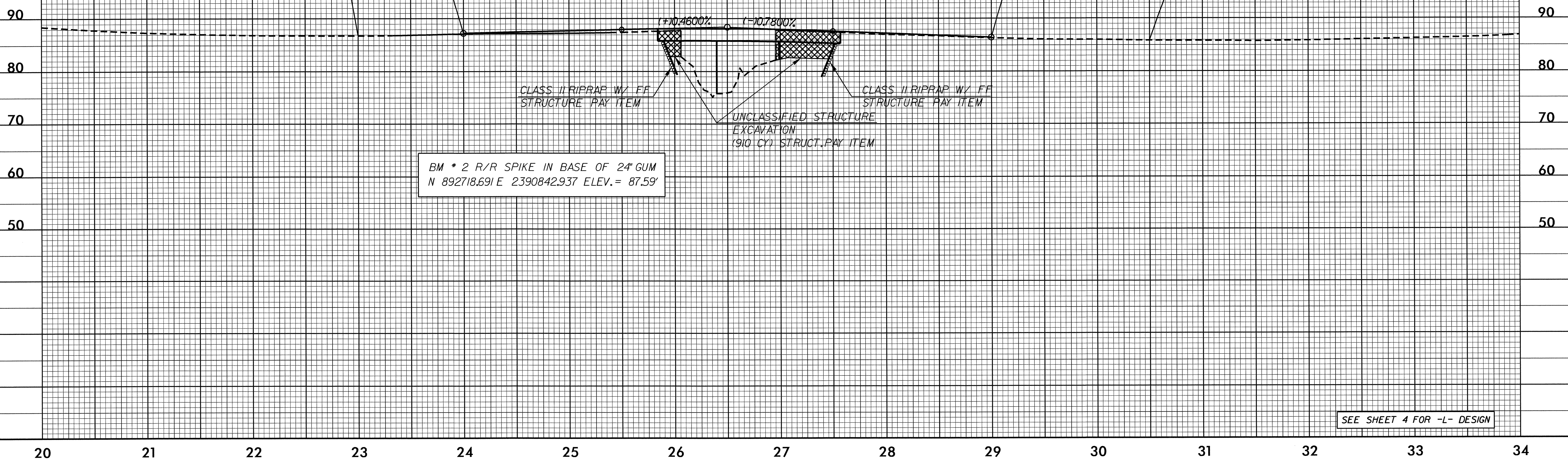
**BEGIN RESURFACING  
-L- STA. 23+00.00  
EL. = 86.90'**

**PI = 26+50.00  
EL = 88.45'  
VC = 200'  
K = 161**

**BEGIN RESURFACING  
END GRADE  
-L- STA. 29+00.00  
EL. = 86.50'**

**END RESURFACING  
-L- STA. 30+50.00  
EL. = 85.97'**

BRIDGE  $\bar{C}$  STA. 26+70.50 -L-  
ELEV. = 88.09  
SKEW = 90°  
PROPOSED (1 @ 55'-0"; 1 @ 59'-0"; 1 @ 57'-0"); 2" PRESTRESSED  
CONCRETE CORED SLAB; OAL = 17' - 0"



SEE SHEET 4 FOR -L- DESIGN

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