

09/08/09

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4622	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33801.1.1	BRSTP-65 (4)	P.E.	
33801.2.1	BRSTP-65 (4)	RW & UTIL	
33801.3.STI	STM-0065 (7)	CONST.	

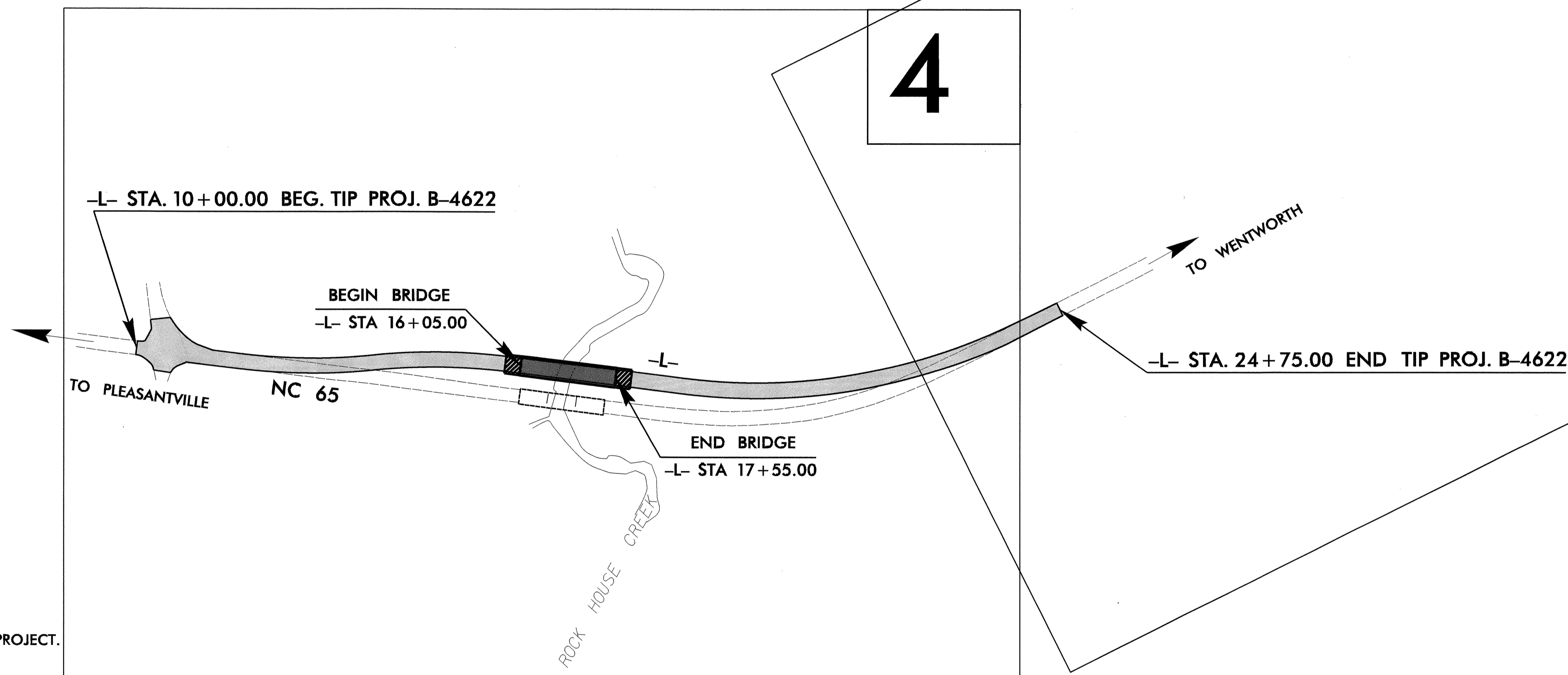
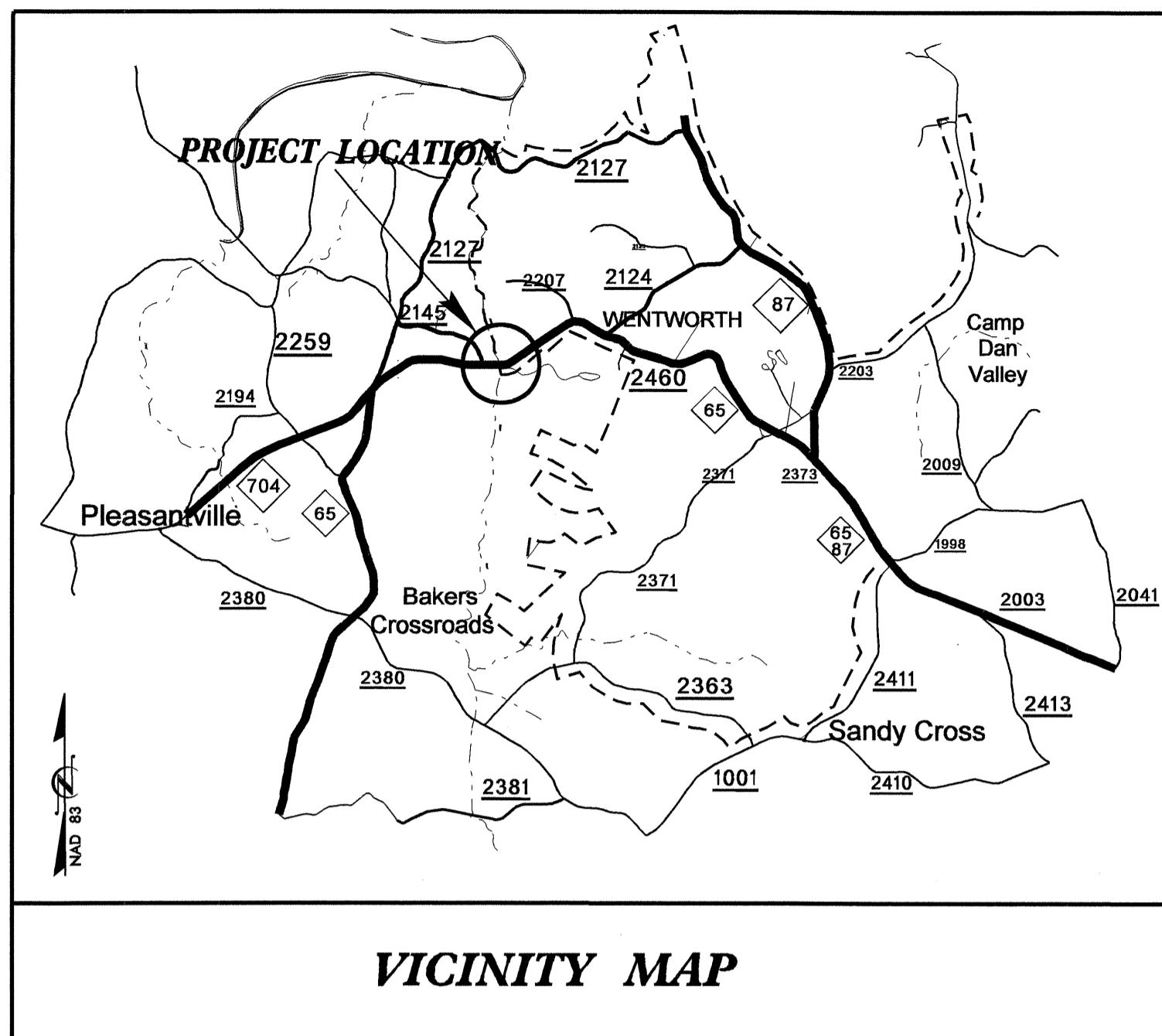
ROCKINGHAM COUNTY

LOCATION: REPLACEMENT OF BRIDGE NO. 54 ON NC 65
OVER ROCK HOUSE CREEK

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

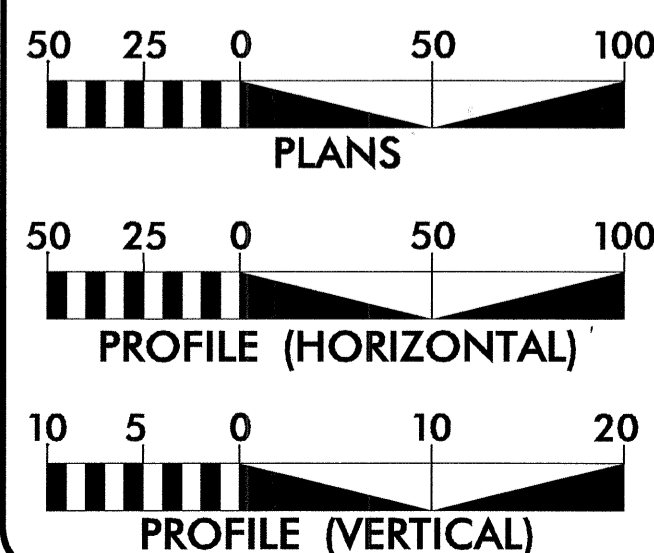
TIP PROJECT: B-4622

CONTRACT: C202263



THIS IS NOT A CONTROLLED ACCESS PROJECT.

GRAPHIC SCALES



DESIGN DATA

ADT 2007 = 6800
 ADT 2030 = 14000
 DHV = 13 %
 D = 60 %
 T = 3 % *
 V = 50 MPH
 * TTST 1 DUAL 2

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4622 = 0.251 MILE
 LENGTH STRUCTURE TIP PROJECT B-4622 = 0.028 MILE
 TOTAL LENGTH TIP PROJECT B-4622 = 0.279 MILE

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

2006 STANDARD SPECIFICATIONS
 RIGHT OF WAY DATE:
 DECEMBER 29, 2008

LETTING DATE:
 DECEMBER 15, 2009

JIMMY GOODNIGHT, PE
 PROJECT ENGINEER

TIM GOINS
 PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Professional Engineer Seal for James R. Goodnight, Jr., No. 31986, State of North Carolina, expires 12/28/09.

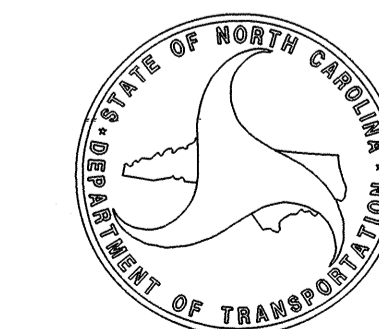
Professional Engineer Seal for James R. Goodnight, Jr., No. 14493, State of North Carolina, expires 12/28/09.

SIGNATURE: [Signature]

ROADWAY DESIGN ENGINEER

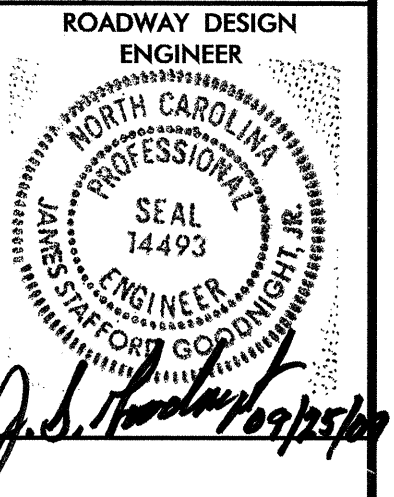
SIGNATURE: [Signature]

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA



STATE HIGHWAY DESIGN ENGINEER

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 R:\Roadway\Proj\B4622-rdy-tsh.dgn
 \$\$\$USERNAME\$\$\$



INDEX OF SHEETS

SHEET NUMBER	SHEET
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2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
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2-B THRU 2-C	METHOD OF PIPE INSTALLATION
3	SUMMARY OF QUANTITIES
3A THRU 3-B	SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, ASPHALT PAVEMENT REMOVAL SUMMARY, AND PARCEL INDEX
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S-1 THRU S-24	STRUCTURE PLANS

GENERAL NOTES:

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

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 11.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND 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.

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 Bell South -Telephone

Duke Energy - Power

Time Warner Cable - cable-TV

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	
200.02	Method of Clearing - Method 11
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
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 Super-elevated Curve - Method 1
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & 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
876.04	Drainage Ditches with Class 'B' Rip Rap

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	ECM
Parcel/Sequence Number	(123)
Existing Fence Line	---x---x---x---
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	---WLB---
Proposed Wetland Boundary	---WLB---
Existing Endangered Animal Boundary	---EAB---
Existing Endangered Plant Boundary	---EPB---

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or UG 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	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	---C---
Proposed Slope Stakes Fill	---F---
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	⊕
UG 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	⊕
UG 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	⊕
UG 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	⊕
UG Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
Recorded SS Forced Main Line	-----
Designated SS Forced Main Line (S.U.E.*)	-----

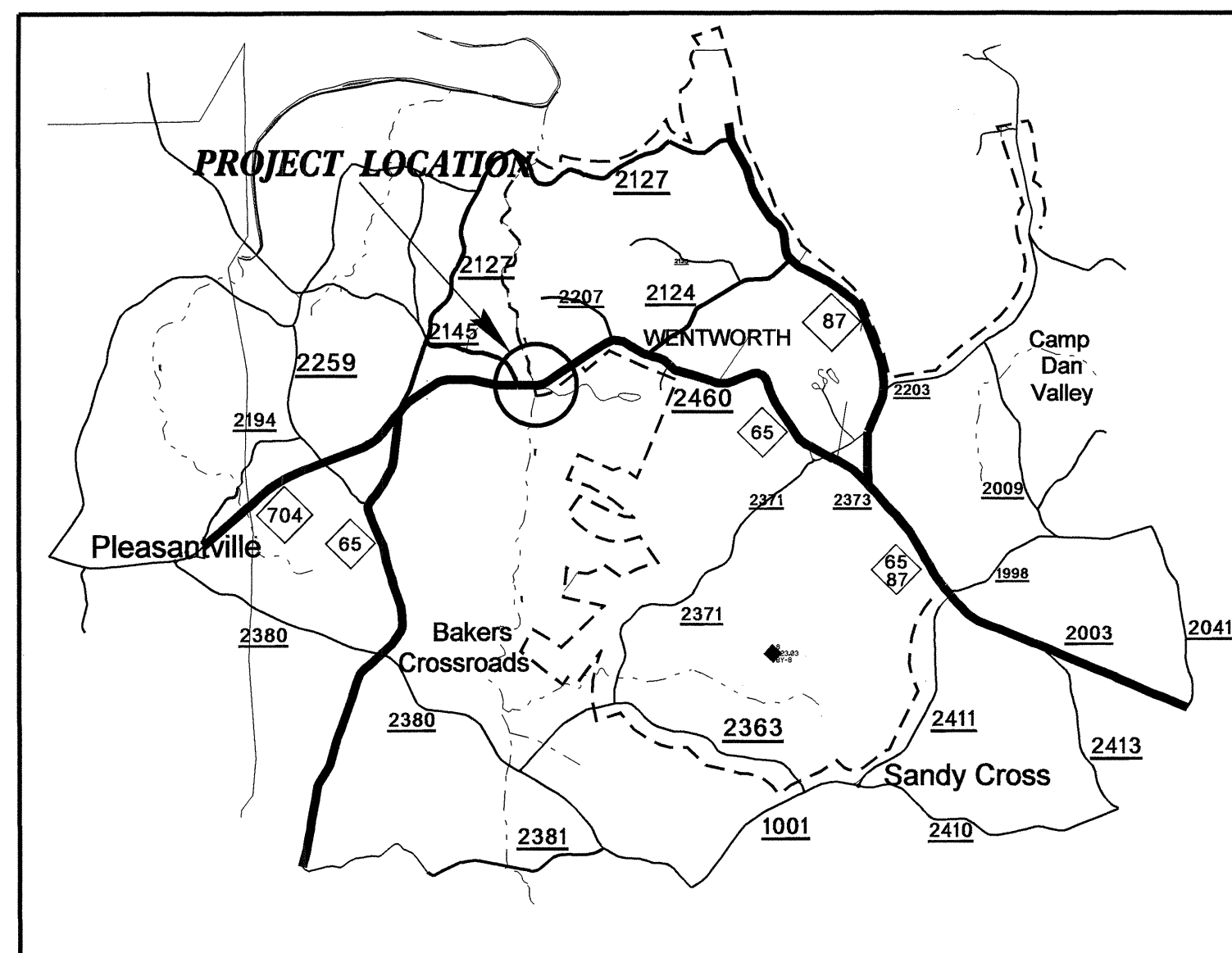
MISCELLANEOUS:

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

12/01/2005

PROJECT REFERENCE NO.	SHEET NO.
33801.1.1	1C
Location and Surveys	

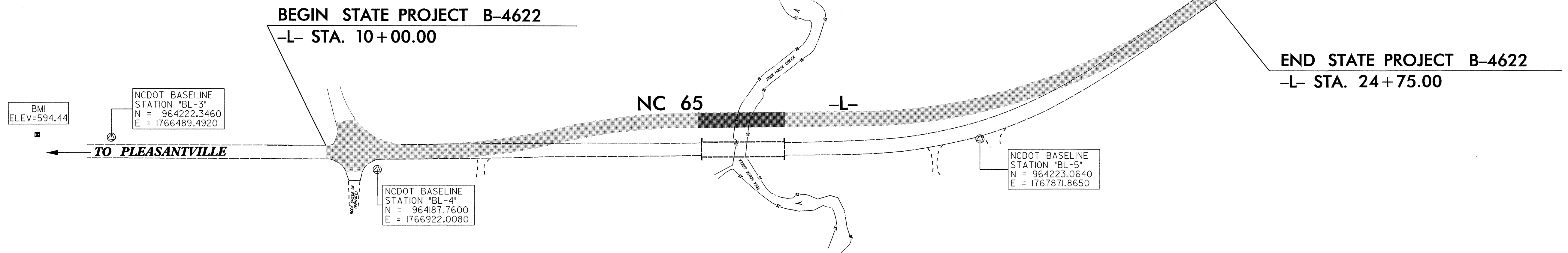
B-4622 SURVEY CONTROL SHEET



VICINITY MAP



NCDOT BASELINE STATION "BL-6"
N = 964719.6490
E = 1768614.9280



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4622-1"

WITH NAD 83/2001 STATE PLANE GRID COORDINATES OF NORTHING: 965108.539(ft) EASTING: 1769244.234(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00004625

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4622-1" TO -L- STATION 10+00.00 IS
S69°27'50"W 2571.38

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

BENCHMARK DATA

 BM1 ELEVATION = 594.44
 N 964235 E 1766371
 L STATION 10+00
 N 86° 29' 41.2" W DIST 466.14
 R/R SPIKE IN BASE OF 30" OAK.

 BM2 ELEVATION = 664.50
 N 965212 E 1769519
 L STATION 29+27
 N 60° 39' 20.6" E DIST 1013.34
 R/R SPIKE IN BASE OF 48" POPLAR.

 BM3 ELEVATION = 637.59
 N 965215 E 1766363
 L STATION 10+00
 N 25° 08' 22.5" W DIST 1114.02
 R/R SPIKE IN BASE OF 30" PIN OAK.

BASELINE DATA

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3		BL-3	964222.3460	1766489.4920	585.73	OUTSIDE PROJECT LIMITS	
4		BL-4	964187.7600	1766922.0080	581.18	10+85.59	19.06 RT
5		BL-5	964223.0640	1767871.8650	573.04	20+30.16	56.17 RT
6		BL-6	964719.6490	1768614.9280	631.14	29+12.09	15.25 LT
1		GPS-1	965108.5390	1769244.2340	670.02	OUTSIDE PROJECT LIMITS	
2		GPS-2	965741.2270	1770239.3860	698.41	OUTSIDE PROJECT LIMITS	

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:
b4622_ls_control_080807.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)

NOTE: DRAWING NOT TO SCALE

30-JUL-2009 14:23:4622.1s.1c.080807.dgn

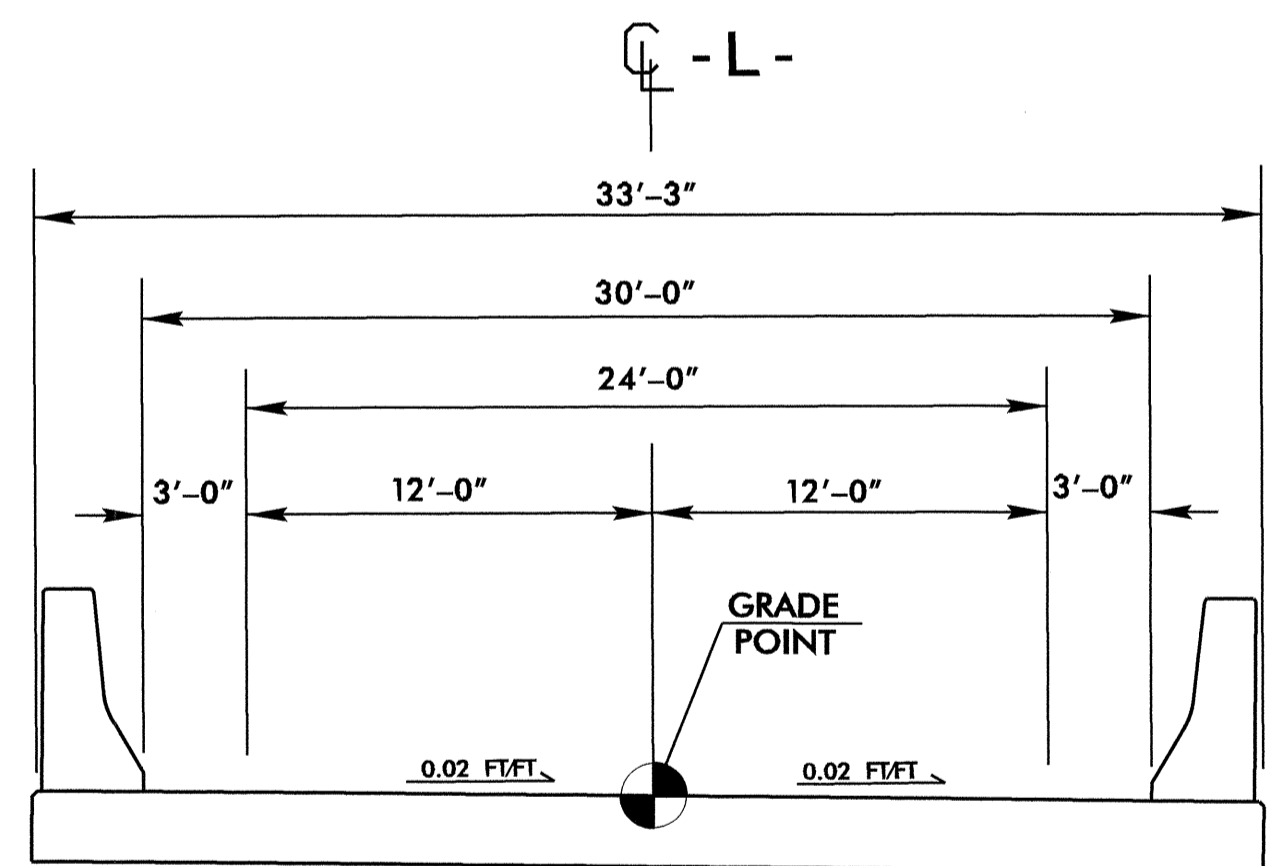
6/2/99

PROJECT REFERENCE NO. B-4622	SHEET NO. 2
ROADWAY DESIGN ENGINEER SEAL 14493 NORTH CAROLINA PROFESSIONAL ENGINEERS	PAVEMENT DESIGN ENGINEER SEAL 22896 NORTH CAROLINA PROFESSIONAL ENGINEERS CLARK S. MORRISON

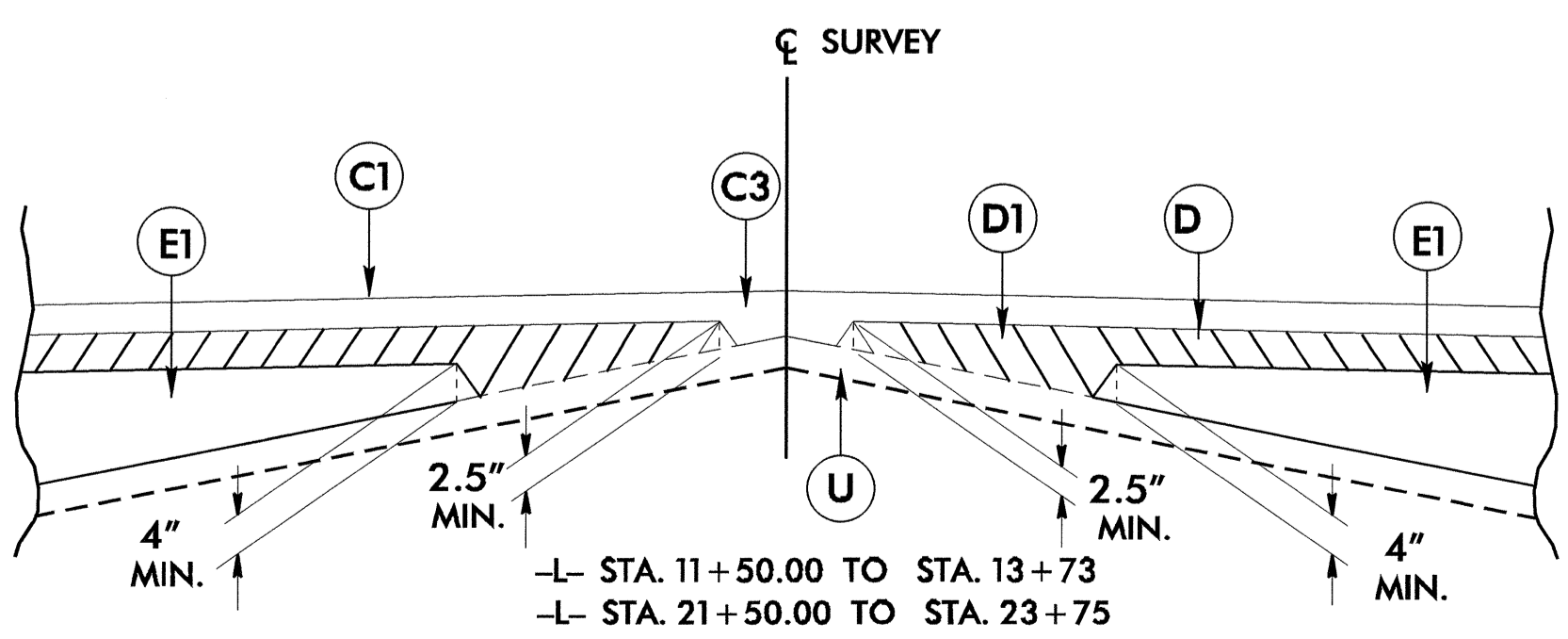
PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF 2 LAYERS.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
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 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	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.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING.

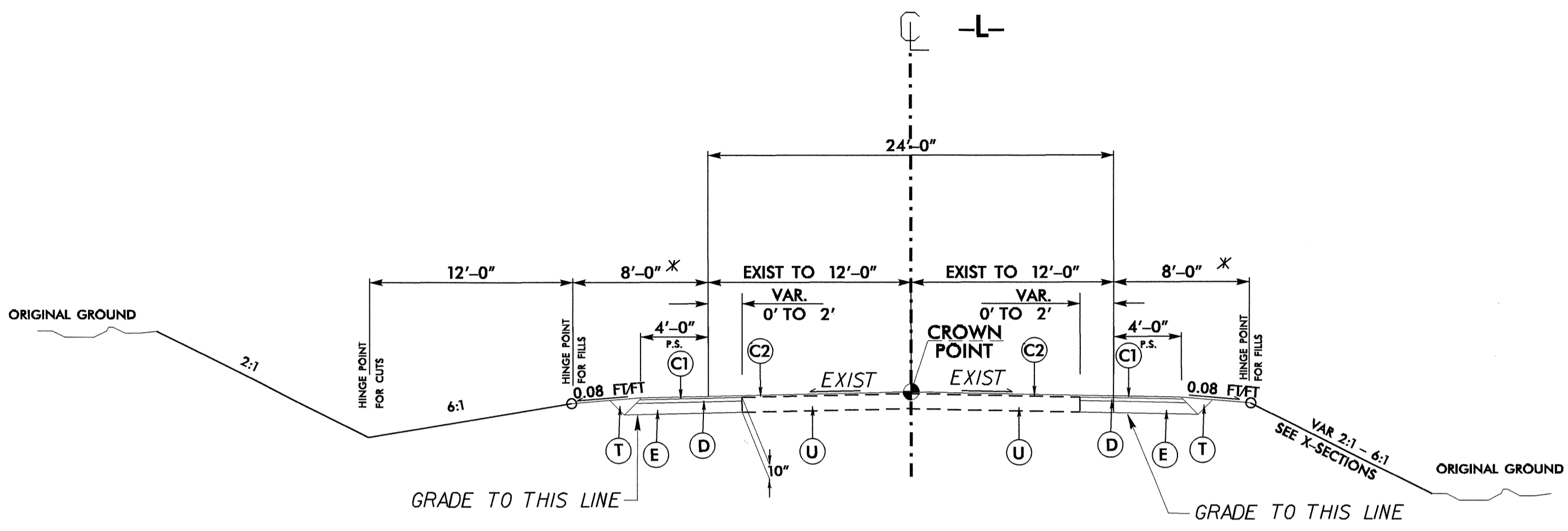
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN



TYPICAL SECTION ON STRUCTURE
-L- 16+05.00 TO 17+55.00



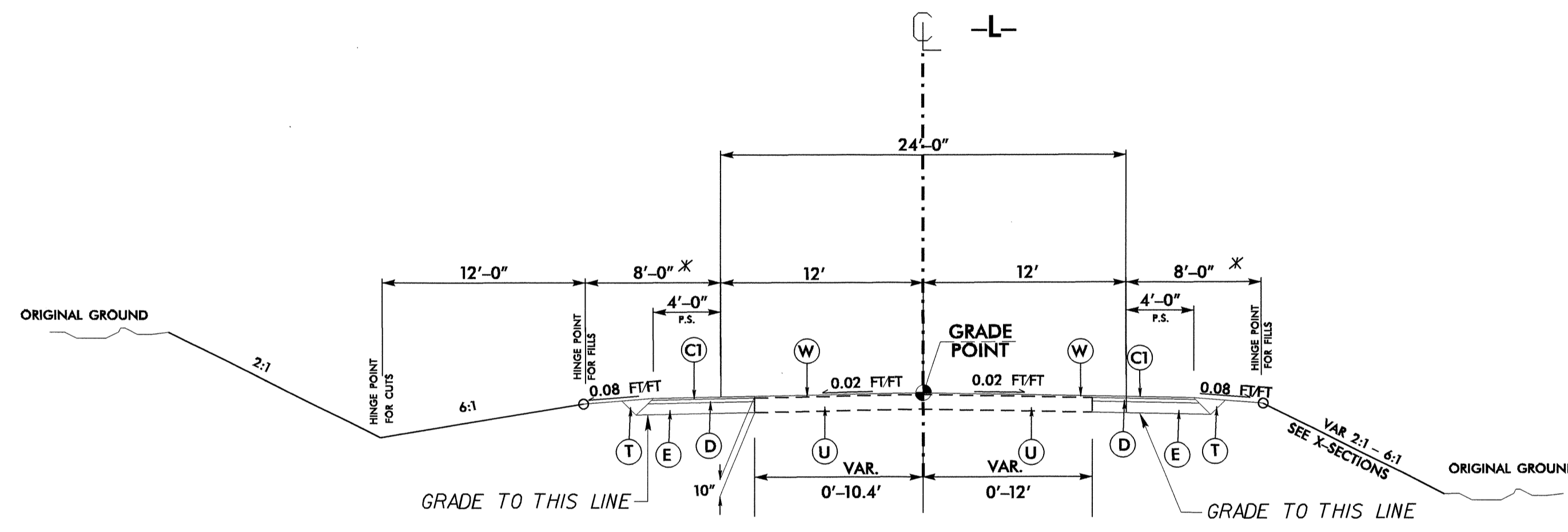
Detail Showing Method of Wedging



TYPICAL SECTION NO. 1

* ADD 3'-0" W/GUARDRAIL

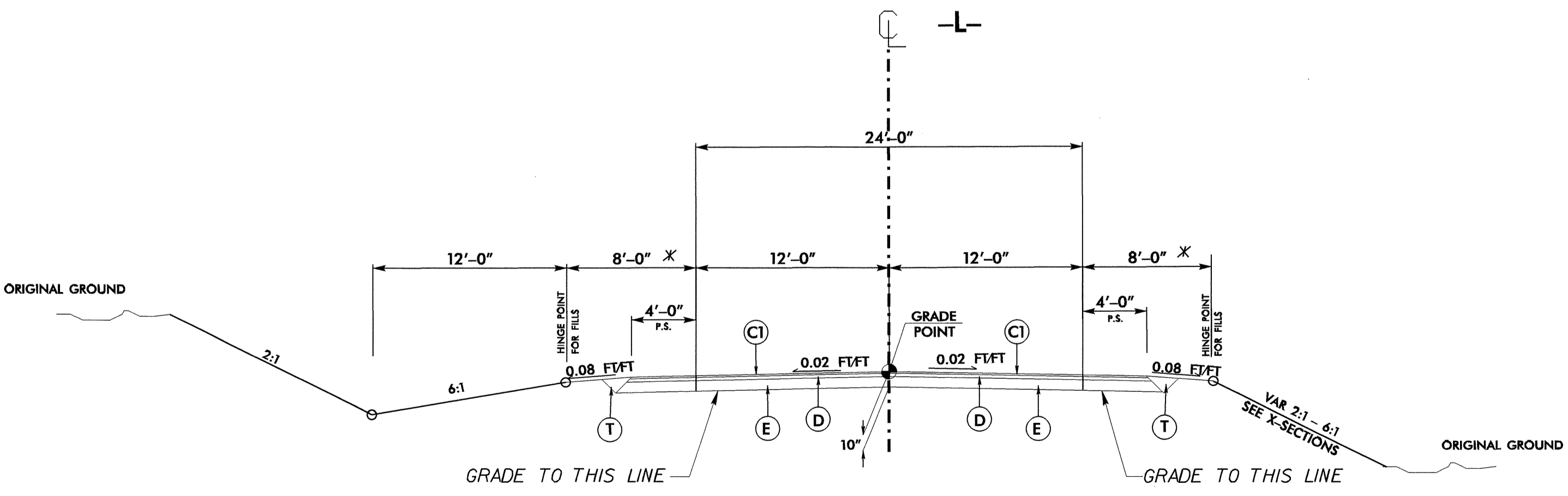
USE TYPICAL SECTION NO. 1
-L- STA. 10+00.00 TO -L- STA. 11+50.00
-L- STA. 23+75.00 TO -L- STA. 24+75.00



TYPICAL SECTION NO. 2

* ADD 3'-0" W/GUARDRAIL

USE TYPICAL SECTION NO. 2
-L- STA. 11+50.00 TO STA. 13+73
-L- STA. 21+50.00 TO STA. 23+75



TYPICAL SECTION NO. 3

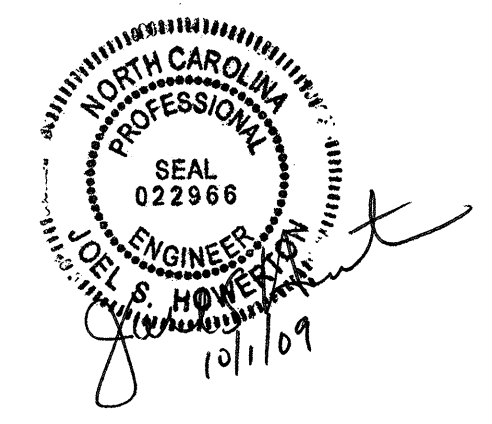
* ADD 3'-0" W/GUARDRAIL
* IN GUARDRAIL LOCATION, EXTEND FULL DEPTH PAVED SHOULDER TO GUARDRAIL.

USE TYPICAL SECTION NO. 3
-L- STA. 13+73 TO STA. 16+05 (BEGIN BRIDGE)
-L- STA. 17+55.00 (END BRIDGE) TO -L- STA. 21+50.00

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<p>STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.</p> <p>7-06</p>	<p>ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION FLEXIBLE PIPE</p>	<p>STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.</p> <p>ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION FLEXIBLE PIPE</p> <p>7-06</p>
<p>GENERAL NOTES:</p> <p>I. D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.</p> <p>O. D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.</p> <p>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.</p> <p>--- SPRINGLINE OF PIPE</p> <p>SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.</p> <p>APPROVED SUITABLE LOCAL MATERIAL.</p> <p>UNDISTURBED EARTH MATERIAL</p> <p>SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.</p> <p>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.</p>		
SHEET 1 OF 3	300D01	SHEET 1 OF 3

<p>STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.</p> <p>7-06</p>	<p>ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION RIGID PIPE</p>	<p>STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.</p> <p>ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION RIGID PIPE</p> <p>7-06</p>
<p>GENERAL NOTES:</p> <p>I. D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.</p> <p>O. D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.</p> <p>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.</p> <p>--- SPRINGLINE OF PIPE</p> <p>SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.</p> <p>APPROVED SUITABLE LOCAL MATERIAL.</p> <p>UNDISTURBED EARTH MATERIAL</p> <p>SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.</p> <p>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.</p>		
SHEET 2 OF 3	300D01	SHEET 2 OF 3



**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: J. S. Howard	DATE: 7/20/09
CHECKED BY: J. S. Howard	DATE: 7/20/09
FILE SPEC: erickward/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

FLEXIBLE PIPE

Round Corrugated Steel Pipe
2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum cover (Ga)	16	14	12	10	8
12	12	204	256				
15	12	162	204				
18	12	135	169	239			
21	12	115	145	204			
24	12	100	126	178			
30	12	79	100	142			
36	12	65	83	117	152		
42	12	55	70	100	130	160	
48	12	48	61	87	113	139	
54	12	44	54	77	100	123	
60	12	40	50	69	90	111	
66	12	37	47	64	81	100	
72	12	34	44	61	74	91	
78	12	32	42	59	69	81	
84	12	30	40	57	66	77	89

Round Corrugated Aluminum Pipe
2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum cover (Ga)	16	14	12	10	8
12	12	123	155	218	281	344	
15	12	98	123	174	224	275	
18	12	81	102	144	187	228	
21	12	69	87	123	160	195	
24	12	60	76	108	139	171	
27	12	55	67	95	123	151	
30	12	50	60	85	111	136	
36	12	42	50	71	92	113	
42	12	36	50	60	78	96	
48	12	32	46	52	68	84	
54	12	29	46	50	62	74	
60	12	27	46	50	62	74	
66	12	26	46	50	62	74	
72	12	25	46	50	62	74	

- 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 LRF Direct Design Method)

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

ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

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

7-06

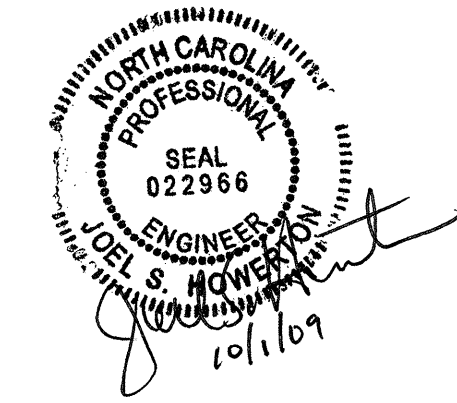
SHEET 3 OF 3 300D01

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: KKempf DATE: 5-15-09
 MODIFIED BY: *Joel S. Howerton* DATE: *7/30/09*
 CHECKED BY: *Joel S. Howerton* DATE: *7/30/09*
 FILE SPEC: *ericward/stds/stdstodetails/30001/0300d01.dgn*

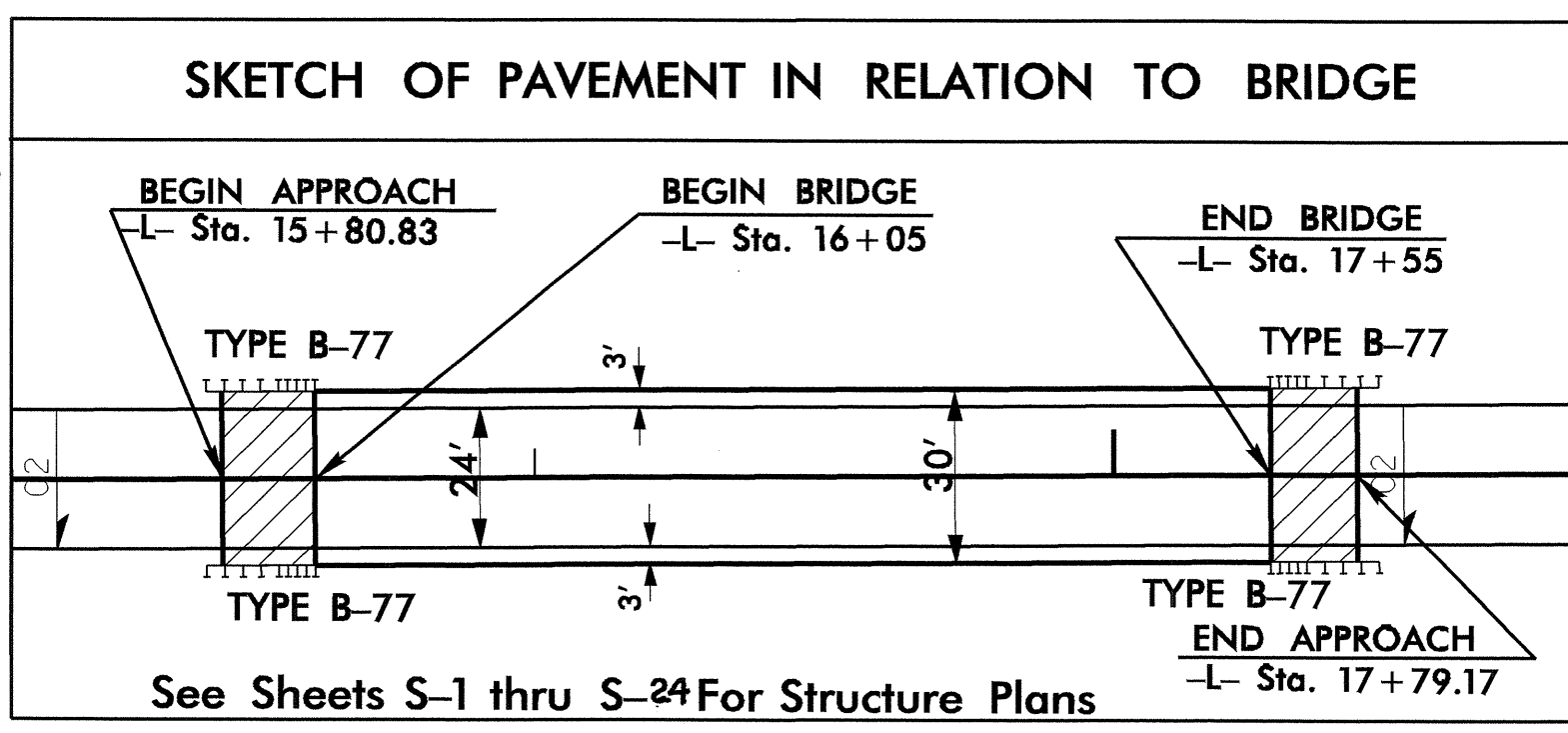
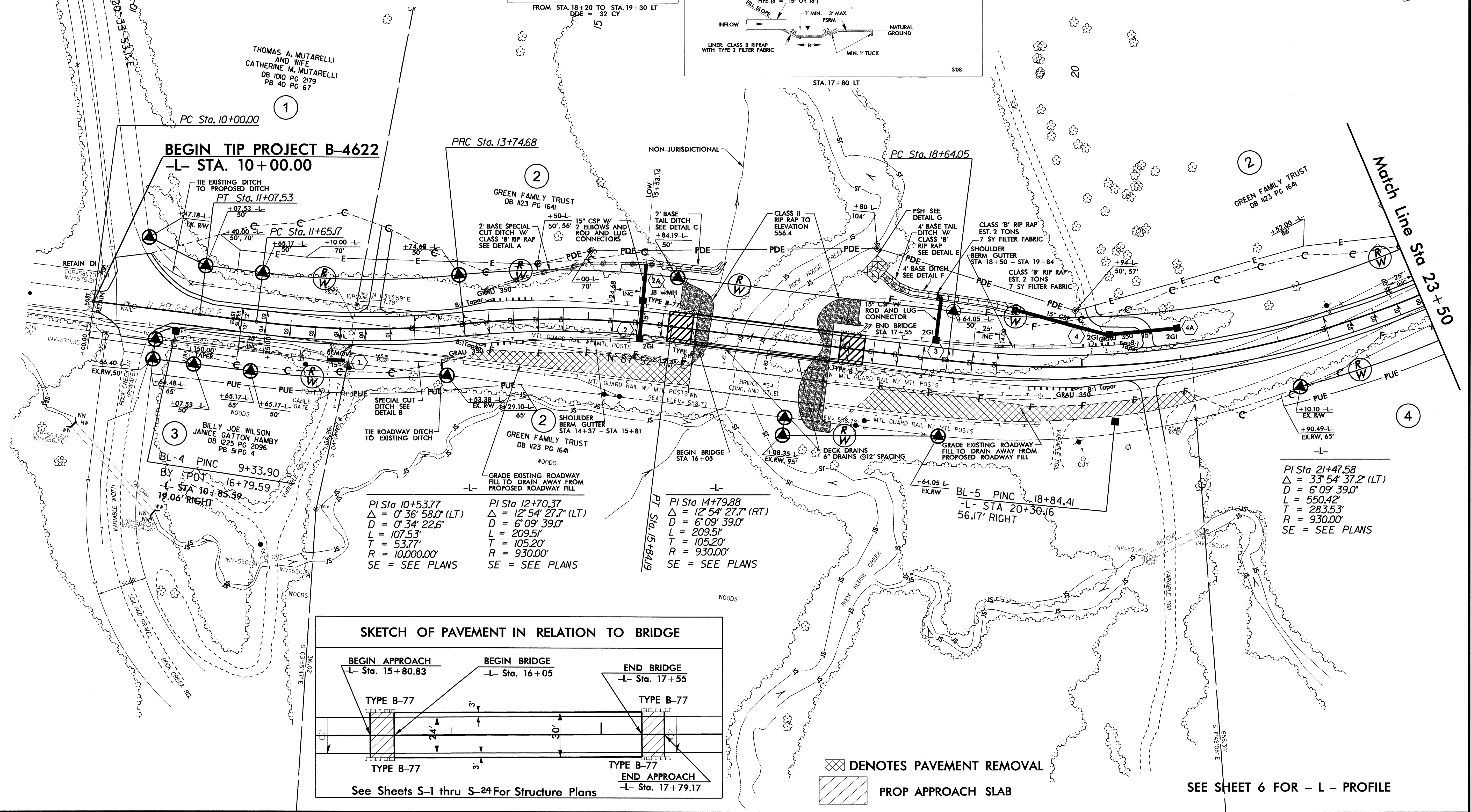
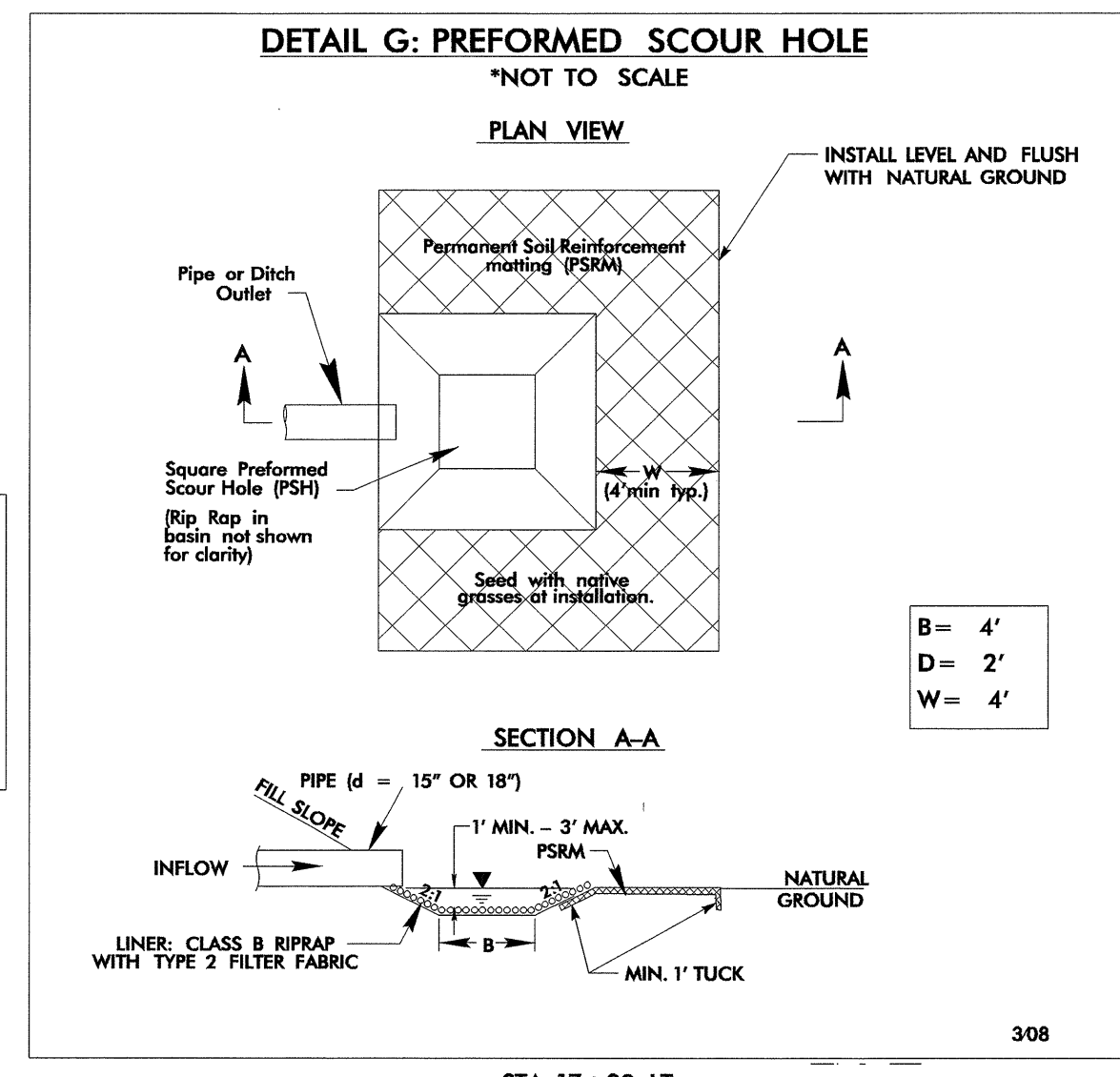
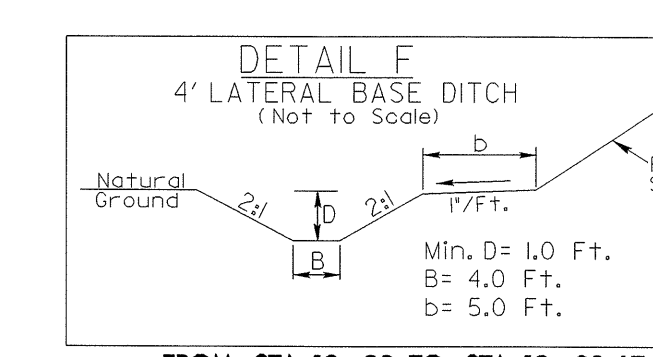
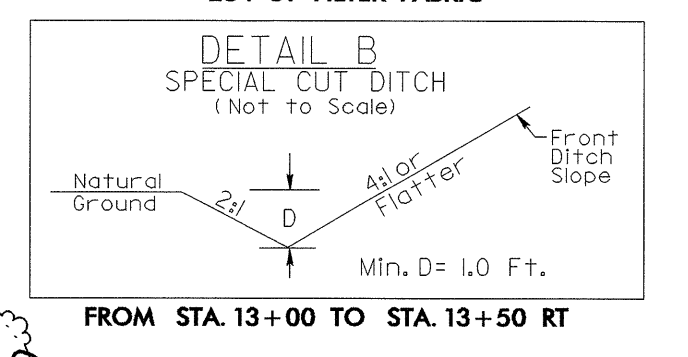
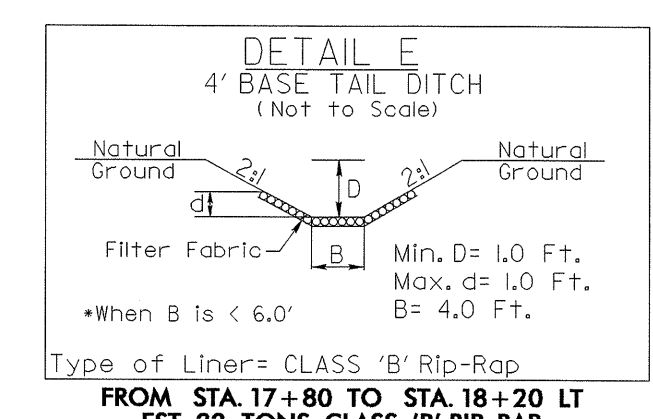
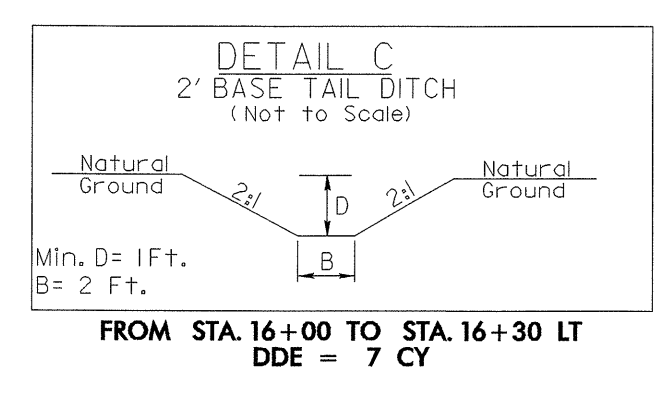
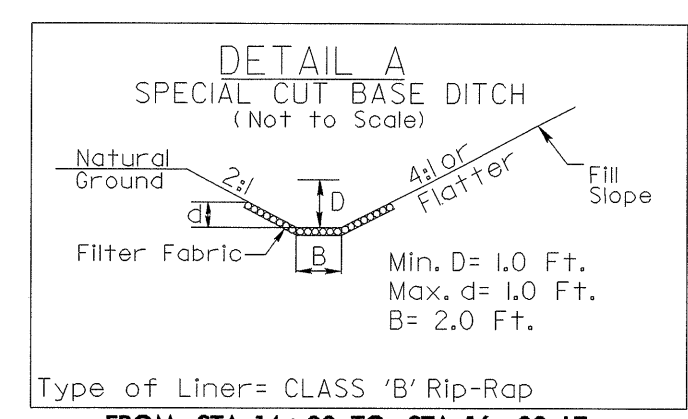



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

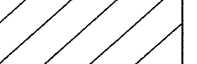
SUMMARY OF QUANTITIES

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION	415500000-N	907	21	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
002200000-E	225	10,500	CY	UNCLASSIFIED EXCAVATION	440000000-E	1110	685	SF	WORK ZONE SIGNS (STATIONARY)
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (16+80 -L-)	440500000-E	1110	128	SF	WORK ZONE SIGNS (PORTABLE)
003600000-E	225	400	CY	UNDERCUT EXCAVATION	441000000-E	1110	156	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING	443000000-N	1130	66	EA	DRUMS
006300000-N	SP	Lump Sum		GRADING	443500000-N	1135	51	EA	CONES
013400000-E	240	52	CY	DRAINAGE DITCH EXCAVATION	444500000-E	1145	128	LF	BARRICADES (TYPE III)
019500000-E	265	400	CY	SELECT GRANULAR MATERIAL	445500000-N	1150	450	MD	FLAGGER
019600000-E	270	400	SY	FABRIC FOR SOIL STABILIZATION	448000000-N	1165	1	EA	TMA
031800000-E	300	40	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	465000000-N	1251	17	EA	TEMPORARY RAISED PAVEMENT MARKERS
032000000-E	SP	110	SY	FOUNDATION CONDITIONING FABRIC	468500000-E	1205	5,642	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
034300000-E	310	20	LF	15" SIDE DRAIN PIPE	468600000-E	1205	2,605	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
036600000-E	310	104	LF	15" RC PIPE CULVERTS, CLASS III	471000000-E	1205	44	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
037200000-E	310	12	LF	18" RC PIPE CULVERTS, CLASS III	477000000-E	1205	450	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (4")
070800000-E	310	172	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK	481000000-E	1205	11,368	LF	PAINT PAVEMENT MARKING LINES (4")
071400000-E	310	16	LF	18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK	485000000-E	1205	1,480	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
080600000-E	310	4	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK	490500000-N	1253	17	EA	SNOWFLOWABLE PAVEMENT MARKERS
099500000-E	340	20	LF	PIPE REMOVAL	600000000-E	1605	2,000	LF	TEMPORARY SILT FENCE
122000000-E	545	500	TON	INCIDENTAL STONE BASE	600600000-E	1610	275	TON	STONE FOR EROSION CONTROL, CLASS A
148900000-E	610	980	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	600900000-E	1610	250	TON	STONE FOR EROSION CONTROL, CLASS B
149800000-E	610	720	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B	601200000-E	1610	275	TON	SEDIMENT CONTROL STONE
151900000-E	610	680	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	601500000-E	1615	3.5	ACR	TEMPORARY MULCHING
156000000-E	620	120	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	601800000-E	1620	150	LB	SEED FOR TEMPORARY SEEDING
200000000-N	806	21	EA	RIGHT OF WAY MARKERS	602100000-E	1620	2.5	TON	FERTILIZER FOR TEMPORARY SEEDING
202200000-E	815	22.4	CY	SUBDRAIN EXCAVATION	602400000-E	1622	400	LF	TEMPORARY SLOPE DRAINS
203300000-E	815	16.8	CY	SUBDRAIN FINE AGGREGATE	602700000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
204400000-E	815	100	LF	6" PERFORATED SUBDRAIN PIPE	602900000-E	SP	1,200	LF	SAFETY FENCE
205500000-E	815	3	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS	603000000-E	1630	825	CY	SILT EXCAVATION
206600000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET	603600000-E	1631	9,000	SY	MATTING FOR EROSION CONTROL
207700000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)	603700000-E	SP	30	SY	COIR FIBER MAT
225300000-E	840	0.5	CY	PIPE COLLARS	603800000-E	SP	2,000	SY	PERMANENT SOIL REINFORCEMENT MAT
228600000-N	840	6	EA	MASONRY DRAINAGE STRUCTURES	604200000-E	1632	1,100	LF	1/4" HARDWARE CLOTH
236420000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.20	607101000-E	SP	180	LF	WATTLE
236500000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.22	607102000-E	SP	45	LB	POLYACRYLAMIDE (PAM)
239600000-N	840	2	EA	FRAME WITH COVER, STD 840.54	607103000-E	SP	250	LF	COIR FIBER BAFFLES
255600000-E	846	280	LF	SHOULDER BERM GUTTER	607105000-E	SP	3	EA	*** SKIMMER (1-1/2")
303000000-E	862	687.5	LF	STEEL BM GUARDRAIL	608400000-E	1660	5	ACR	SEEDING & MULCHING
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	608700000-E	1660	1.5	ACR	MOWING
327000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
331700000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77	609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
334500000-E	864	243.75	LF	REMOVE & RESET EXISTING GUARDRAIL	609600000-E	1662	75	LB	SEED FOR SUPPLEMENTAL SEEDING
336000000-E	863	900	LF	REMOVE EXISTING GUARDRAIL	610800000-E	1665	1.75	TON	FERTILIZER TOPDRESSING
338910000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY	611450000-N	SP	5	MHR	SPECIALIZED HAND MOWING
364900000-E	876	125	TON	RIP RAP, CLASS B	611700000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
365600000-E	876	1,100	SY	FILTER FABRIC FOR DRAINAGE					
365900000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON					
407200000-E	903	392	LF	SUPPORTS, 3-LB STEEL U-CHANNEL					
409600000-N	904	2	EA	SIGN ERECTION, TYPE D					
410200000-N	904	11	EA	SIGN ERECTION, TYPE E					

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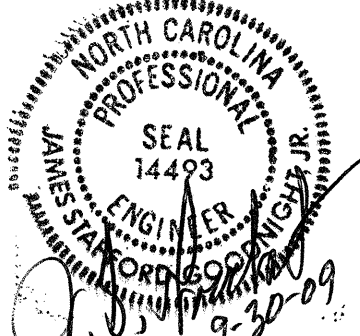
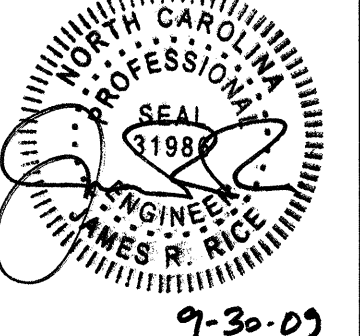
 DENOTES PAVEMENT REMOVAL

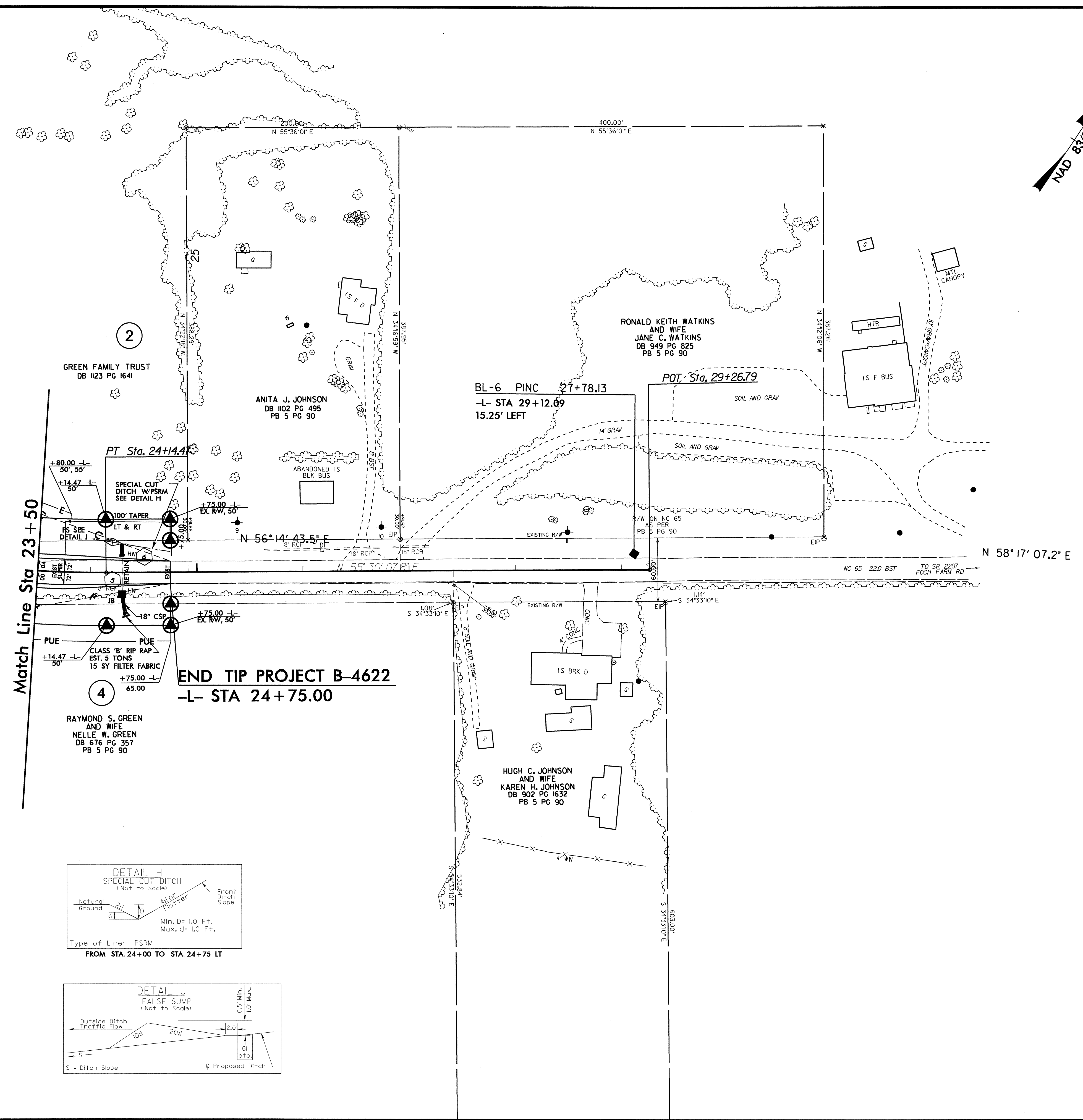
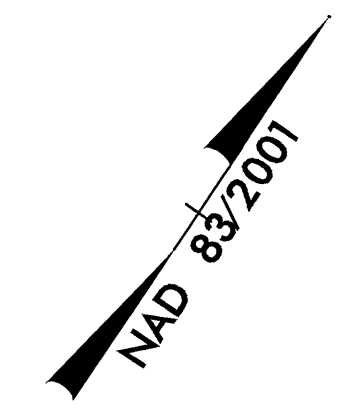
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SEE SHEET 6 FOR - L - PROFILE

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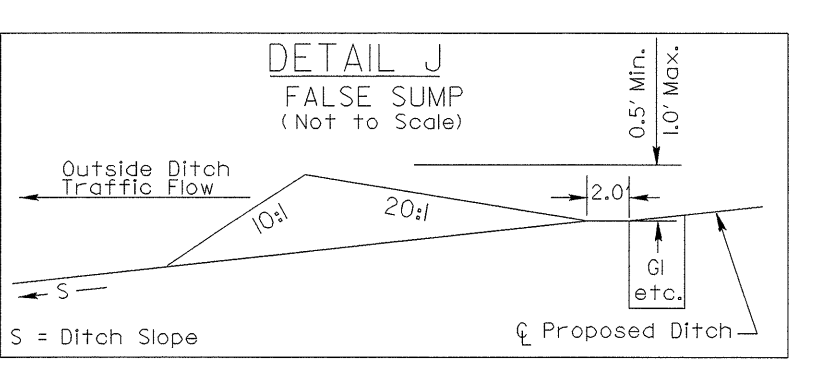
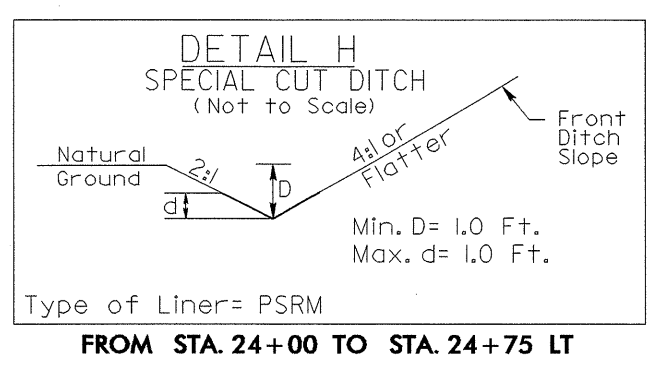
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 



Match Line Sta 23+50

Match Line Sta 24+50

GPS B4622-1 PINC 35+17.90



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5/28/99

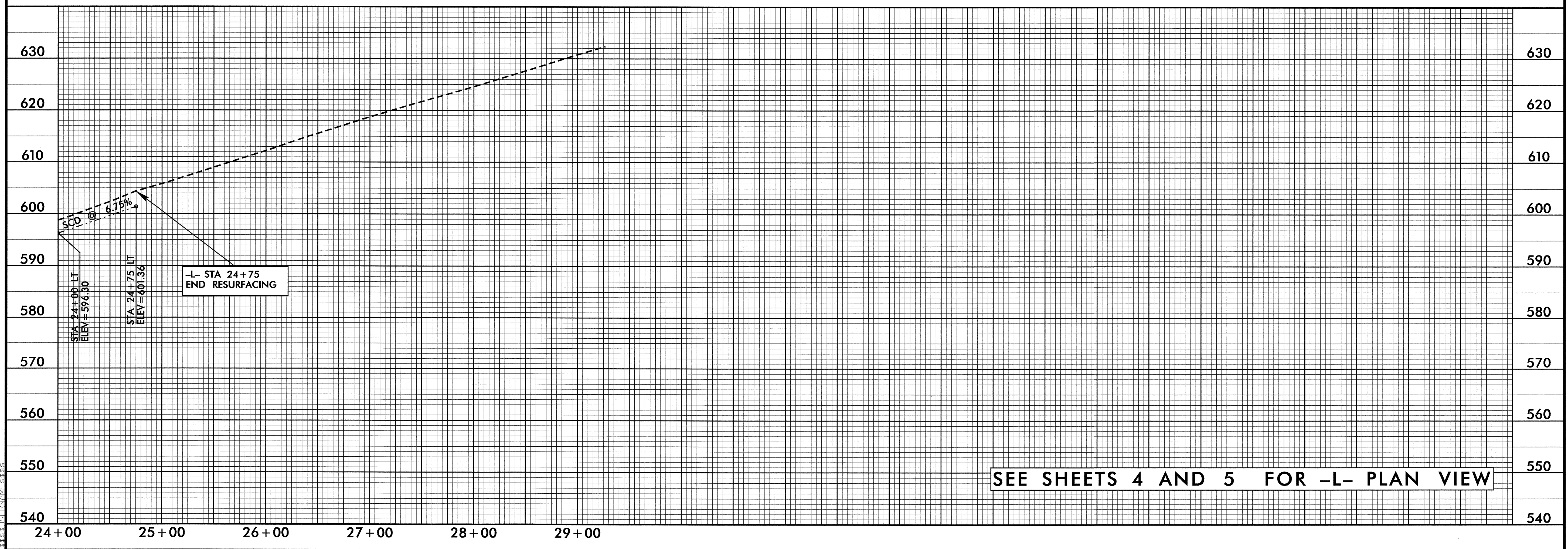
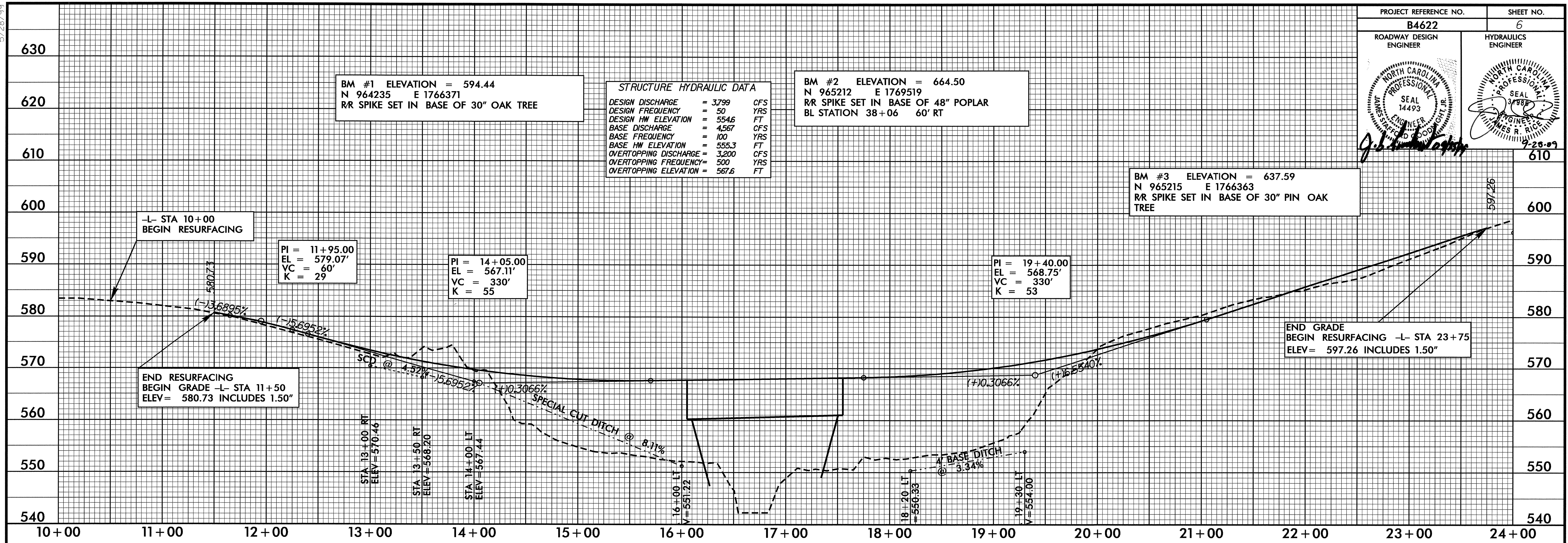
PROJECT REFERENCE NO. B4622		SHEET NO. 6	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

BM #1 ELEVATION = 594.44
 N 964235 E 1766371
 RR SPIKE SET IN BASE OF 30" OAK TREE

STRUCTURE HYDRAULIC DATA
 DESIGN DISCHARGE = 3,799 CFS
 DESIGN FREQUENCY = 50 YRS
 DESIGN HW ELEVATION = 5546 FT
 DESIGN DISCHARGE = 4,567 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 5553 FT
 OVERTOPPING DISCHARGE = 3,200 CFS
 OVERTOPPING FREQUENCY = 500 YRS
 OVERTOPPING ELEVATION = 567.6 FT

BM #2 ELEVATION = 664.50
 N 965212 E 1769519
 RR SPIKE SET IN BASE OF 48" POPLAR
 BL STATION 38+06 60' RT

BM #3 ELEVATION = 637.59
 N 965215 E 1766363
 RR SPIKE SET IN BASE OF 30" PIN OAK TREE



SEE SHEETS 4 AND 5 FOR -L- PLAN VIEW

20-JUL-2009 14:25 4622_rdy.pfl106.dgn