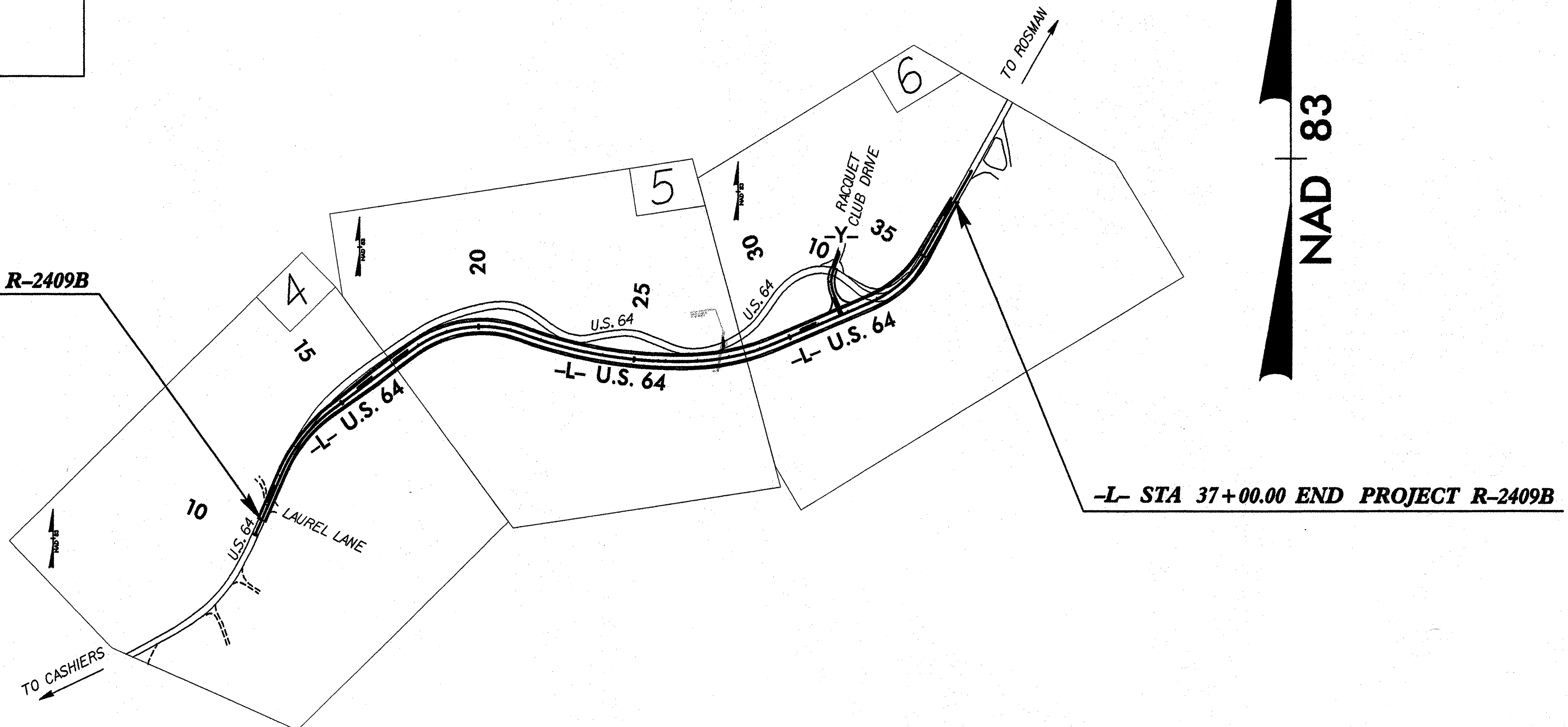
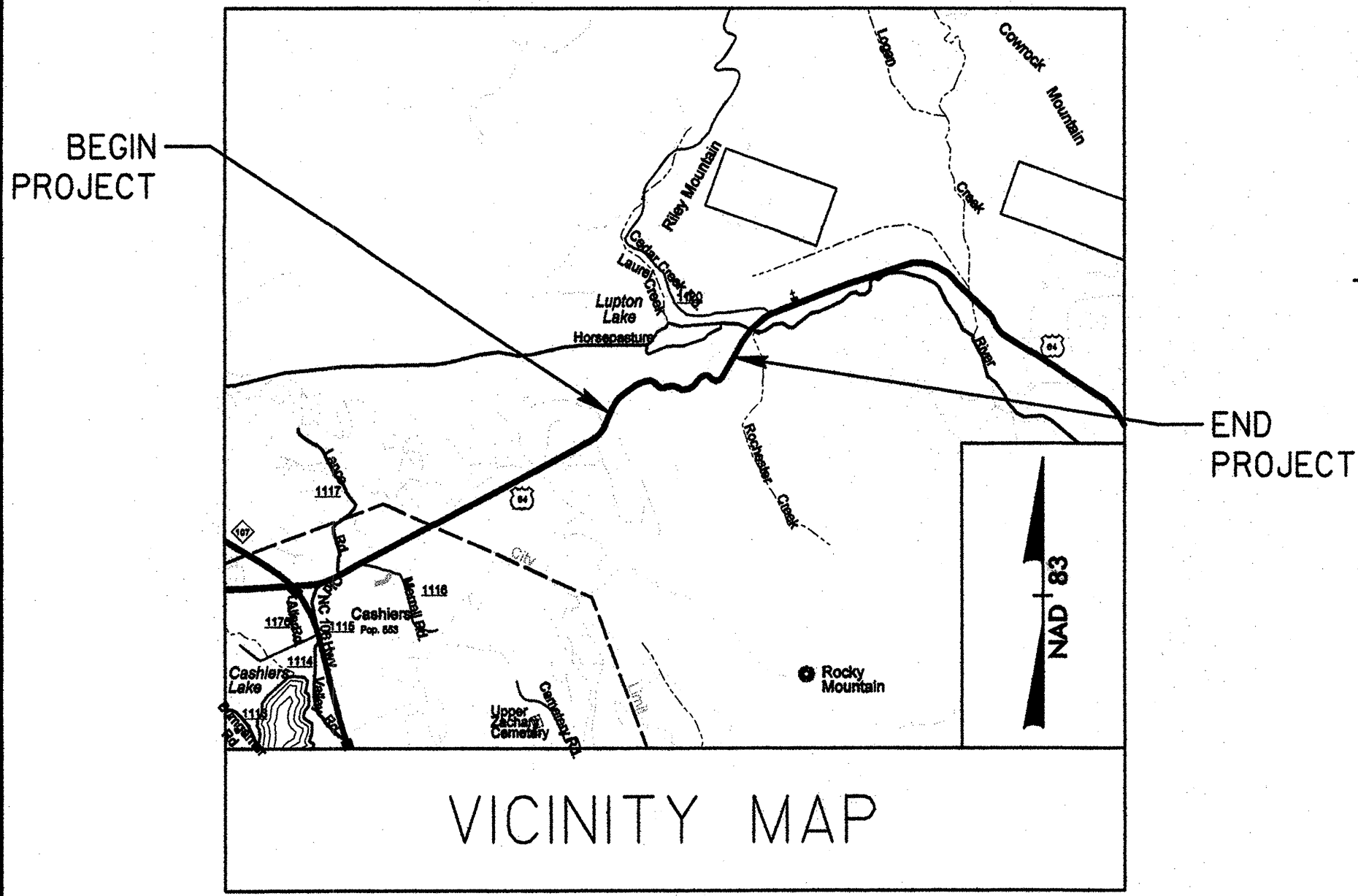


STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2409B	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34428.1.1		P.E.	
34428.2.1		R.O.W.	
34428.3.3		CONSTRUCTION	

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  
**JACKSON COUNTY**

**LOCATION:** U.S. 64, East of Cashiers  
**TYPE OF WORK:** Grading, Pavement, Drainage, and Guardrail

See Sheet 1-A For Index of Sheets



-L- STA 10+50.00 BEGIN PROJECT R-2409B

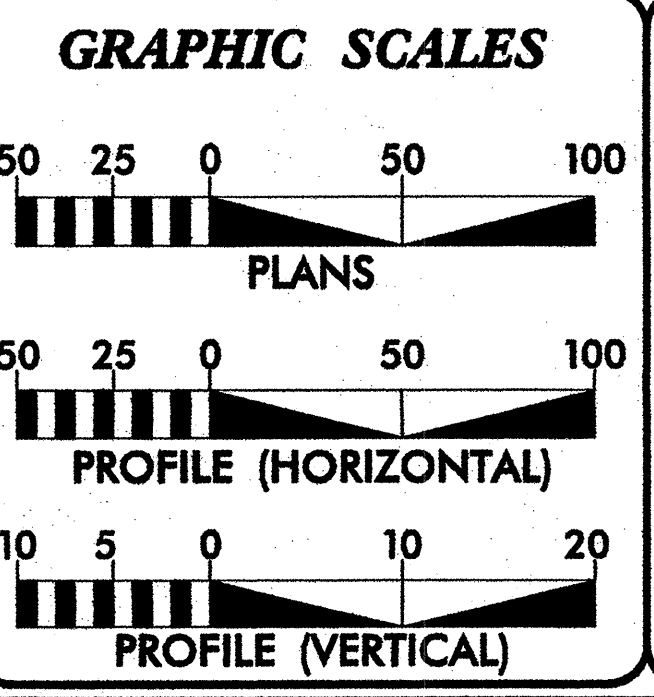
-L- STA 37+00.00 END PROJECT R-2409B

DESIGN EXCEPTION REQUIRED IN MULTIPLE LOCATIONS FOR GUARDRAIL OFFSETS.  
 NCDOT CONTACT: PAUL WHITE, P.E., DIVISION DESIGN ENGINEER

**V&M**  
 Vaughn & Melton  
 Consulting Engineers

Middlesboro, Kentucky 606-248-6600  
 Greeneville, Tennessee 423-639-0271  
 Asheville, North Carolina 828-253-2756

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**DESIGN DATA**

ADT 2005 =	>6,000
ADT 2015 =	
T =	% *
V =	35 MPH
* (% DUAL + % TTST)	

**PROJECT LENGTH**

LENGTH ROADWAY PROJECT R-2409B =	0.502 MI
TOTAL LENGTH PROJECT R-2409B =	0.502 MI

Plans Prepared for:

**DIVISION OF HIGHWAYS**  
 DIVISION 14 - 253 WEBSTER RD., SYLVA NC, 28779

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: FY 2005

LETTING DATE: SEPTEMBER 19, 2006

REECE SCHULER, PE  
 PROJECT ENGINEER

DAVID JORDAN, PE  
 PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

4-18-06

*[Signature]*

SIGNATURE: ROADWAY DESIGN ENGINEER

4/18/06

*[Signature]*

SIGNATURE:

**DIVISION OF HIGHWAYS**  
 STATE OF NORTH CAROLINA

*[Signature]* P.E.  
 STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION

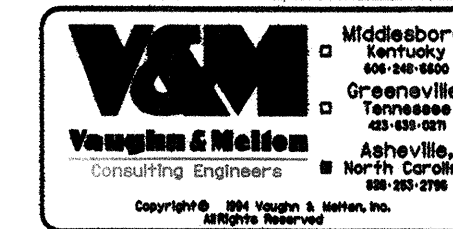
APPROVED  
 DIVISION ADMINISTRATOR

DATE

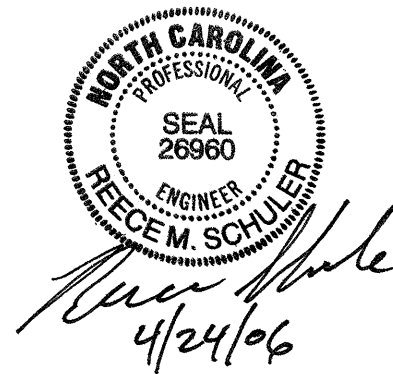
TIP PROJECT: R-2409B

CONTRACT: C201578

\$\$\$\$\$ SYSTEM \$\$\$\$\$\$ DGN \$\$\$\$\$\$ USERNAME \$\$\$\$\$\$



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



**SHEET NUMBER SHEET**

1	TITLE SHEET
1-A	INDEX OF SHEETS AND LIST OF STANDARDS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL
2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2A THRU 2D	DETAILS OF GUARDRAIL INSTALLATION
2-E	DETAILS OF EXTRA LENGTH GUARDRAIL POST
2-F	DETAILS OF PRE-SPLITTING AND BENCHES IN CUTS
2-G	DETAILS OF HORIZONTAL DRAINS
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF ROW AREA, PAVEMENT REMOVAL, PIPES, DROP INLETS, AND GUARDRAIL
3-B	SUMMARY OF EARTHWORK
4 THRU 6	PLAN SHEETS
7 THRU 9	PROFILE SHEETS
TCP-1 THRU TCP-10	TRAFFIC CONTROL PLANS
PM-1 THRU PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
X-1A THRU X-44	CROSS SECTIONS

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.

ASPHALT AND EARTH SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

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.

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.

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

UTILITY OWNERS ON THIS PROJECT ARE: BELL SOUTH, DUKE POWER, AND NORTHLAND CABLE TV.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

**ROADWAY ENGLISH STANDARD DRAWINGS**

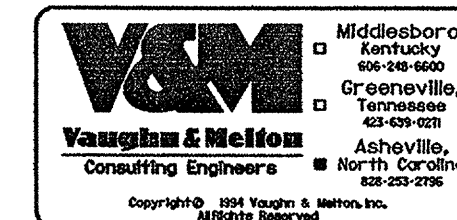
STD. NO.	TITLE
200.02	METHOD OF CLEARING - METHOD II
225.02	GUIDE FOR GRADING SUBGRADE - SECONDARY AND LOCAL
225.04	METHOD OF OBTAINING SUPERELEVATION - TWO LANE PAVEMENT
300.01	METHOD OF PIPE INSTALLATION - METHOD 'A'
560.01	METHOD OF SHOULDER CONSTRUCTION - HIGH SIDE OF SUPERELEVATED CURVE - METHOD I
815.03	PIPE UNDERDRAIN AND BLIND DRAIN
840.00	CONCRETE BASE PAD FOR DRAINAGE STRUCTURES
840.17	CONCRETE MEDIAN DROP INLET TYPE A - 12" THRU 72" PIPE
840.24	FRAMES AND NARROW SLOT SAG GRATES
840.26	BRICK MEDIAN DROP INLET TYPE A - 12" THRU 72" PIPE
840.25	ANCHORAGE FOR FRAMES - BRICK OR CONCRETE
840.45	PRECAST DRAINAGE STRUCTURE
840.66	DRAINAGE STRUCTURE STEPS
840.72	PIPE COLLAR
862.01	GUARDRAIL PLACEMENT
876.02	GUIDE FOR RIP RAP AT PIPE OUTLETS
876.03	DRAINAGE DITCHES WITH CLASS 'A' RIP RAP
876.04	DRAINAGE DITCHES WITH CLASS 'B' RIP RAP

**GENERAL NOTES**

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

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





STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

\*S.U.E = SUBSURFACE UTILITY ENGINEER

ROADS & RELATED ITEMS

Edge of Pavement	-----
Curb	-----
Prop. Slope Stakes Cut	-----C-----
Prop. Slope Stakes Fill	-----F-----
Prop. Woven Wire Fence	○-----○
Prop. Chain Link Fence	□-----□
Prop. Barbed Wire Fence	◇-----◇
Prop. Wheelchair Ramp	○-----○ WCR
Curb Cut for Future Wheelchair Ramp	○-----○ CCFR
Exist. Guardrail	-----
Prop. Guardrail	-----
Equality Symbol	⊕
Pavement Removal	XXXXXX

RIGHT OF WAY

Baseline Control Point	◆
Existing Right of Way Marker	△
Exist. Right of Way Line w/Marker	-----△-----
Prop. Right of Way Line with Proposed R/W Marker (Iron Pin & Cap)	-----▲-----
Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker	-----▲-----
Exist. Control of Access Line	-----C-----
Prop. Control of Access Line	-----C-----
Exist. Easement Line	-----E-----
Prop. Temp. Construction Easement Line	-----E-----
Prop. Temp. Drainage Easement Line	-----TDE-----
Prop. Perm. Drainage Easement Line	-----PDE-----

HYDROLOGY

Stream or Body of Water	-----
River Basin Buffer	-----RBB-----
Flow Arrow	----->-----
Disappearing Stream	----->-----
Spring	○-----
Swamp Marsh	-----
Shoreline	-----
Falls, Rapids	-----
Prop Lateral, Tail, Head Ditches	-----

STRUCTURES

MAJOR	
Bridge, Tunnel, or Box Culvert	-----CONC-----
Bridge Wing Wall, Head Wall and End Wall	-----CONC WW-----

MINOR	
Head & End Wall	-----CONC HW-----
Pipe Culvert	-----
Footbridge	-----
Drainage Boxes	□-----CB-----
Paved Ditch Gutter	-----

UTILITIES

Exist. Pole	•
Exist. Power Pole	•
Prop. Power Pole	○
Exist. Telephone Pole	•
Prop. Telephone Pole	○
Exist. Joint Use Pole	•
Prop. Joint Use Pole	○
Telephone Pedestal	□
U/G Telephone Cable Hand Hold	□
Cable TV Pedestal	□
U/G TV Cable Hand Hold	□
U/G Power Cable Hand Hold	□
Hydrant	⊕
Satellite Dish	⊕
Exist. Water Valve	⊕
Sewer Clean Out	⊕
Power Manhole	⊕
Telephone Booth	⊕
Cellular Telephone Tower	⊕
Water Manhole	⊕
Light Pole	⊕
H-Frame Pole	⊕
Power Line Tower	⊕
Pole with Base	⊕
Gas Valve	⊕
Gas Meter	⊕
Telephone Manhole	⊕
Power Transformer	⊕
Sanitary Sewer Manhole	⊕
Storm Sewer Manhole	⊕
Tank; Water, Gas, Oil	⊕
Water Tank With Legs	⊕
Traffic Signal Junction Box	⊕
Fiber Optic Splice Box	⊕
Television or Radio Tower	⊕
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	-----TS-----

Recorded Water Line	-----W-----
Designated Water Line (S.U.E.*)	-----W-----
Sanitary Sewer	-----SS-----
Recorded Sanitary Sewer Force Main	-----FSS-----
Designated Sanitary Sewer Force Main(S.U.E.*)	-----FSS-----
Recorded Gas Line	-----G-----
Designated Gas Line (S.U.E.*)	-----G-----
Storm Sewer	-----S-----
Recorded Power Line	-----P-----
Designated Power Line (S.U.E.*)	-----P-----
Recorded Telephone Cable	-----T-----
Designated Telephone Cable (S.U.E.*)	-----T-----
Recorded U/G Telephone Conduit	-----TC-----
Designated U/G Telephone Conduit (S.U.E.*)	-----TC-----
Unknown Utility (S.U.E.*)	-----?UTL-----
Recorded Television Cable	-----TV-----
Designated Television Cable (S.U.E.*)	-----TV-----
Recorded Fiber Optics Cable	-----FO-----
Designated Fiber Optics Cable (S.U.E.*)	-----FO-----
Exist. Water Meter	○
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to U/G Record	ATTUR
End of Information	E.O.I.

BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	PL
Exist. Iron Pin	EIP
Property Corner	+
Property Monument	ECM
Property Number	123
Parcel Number	6
Fence Line	-----X-----
Existing Wetland Boundaries	-----WLB-----
High Quality Wetland Boundary	-----HQ WLB-----
Medium Quality Wetland Boundaries	-----MQ WLB-----
Low Quality Wetland Boundaries	-----LQ WLB-----
Proposed Wetland Boundaries	-----WLB-----
Existing Endangered Animal Boundaries	-----EAB-----
Existing Endangered Plant Boundaries	-----EPB-----

BUILDINGS & OTHER CULTURE

Buildings	-----
Foundations	-----
Area Outline	-----
Gate	-----
Gas Pump Vent or U/G Tank Cap	-----
Church	-----
School	-----
Park	-----
Cemetery	-----
Dam	-----
Sign	-----
Well	-----
Small Mine	-----
Swimming Pool	-----

TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	R/W
Guard Post	OGP
Paved Walk	-----
Bridge	-----
Box Culvert or Tunnel	-----
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	-----

VEGETATION

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

RAILROADS

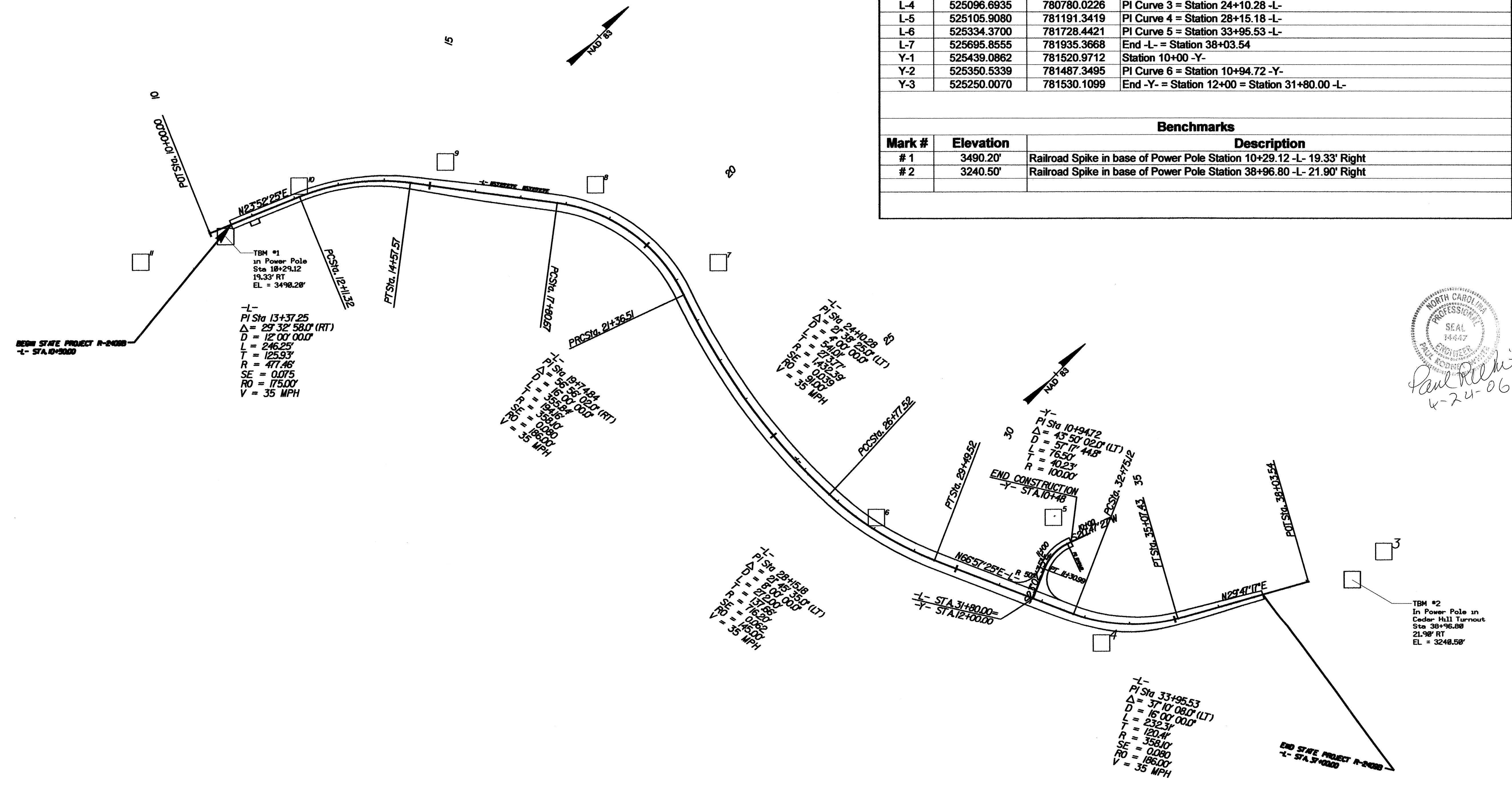
Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----

8/17/99

R-2409b Control Points			
Point #	N	E	Description
3	525857.8310	782007.7946	Along Existing US 64 Station 39+80.10 -L- 17.61' Right
4	525282.2184	781707.1260	Along Existing US 64 Station 33+46.53 -L- 47.69' Right
5	525408.2683	781438.9498	Along Existing US 64 Station 31+58.06 -L- 181.32' Left
6	525138.6601	781161.8342	Along Existing US 64 Station 27+90.78 -L- 24.78' Right
7	525295.6593	780.528.3375	Along Existing US 64 Station 21+11.94 -L- 100.06' Left
8	525230.4842	780217.8144	Along Existing US 64 Station 18+48.01 -L- 57.65' Left
9	525037.1545	779949.0622	Along Existing US 64 Station 15+27.36 -L- 55.21' Left
10	524777.0139	779756.8961	Along Existing US 64 Station 12+18.74 -L- 22.01' Left
11	524416.9688	779624.8148	Along Existing US 64 Station 8+36.38 -L- 2.99' Right
Lupton	526516.9685	782626.1253	NCGS Station To east of Project at Intersection with Cedar Creek Road
Riley	527065.7677	784307.5361	NCGS Station 0.35 mile East of Station Lupton

Alignment Control Data			
Point #	N	E	Description
L-1	524567.7945	779688.3020	Station 10+00 -L-
L-2	524876.1890	779824.7937	PI Curve 1 = Station 13+37.25 -L-
L-3	525259.4712	780341.3178	PI Curve 2 = Station 19+74.84 -L-
L-4	525096.6935	780780.0226	PI Curve 3 = Station 24+10.28 -L-
L-5	525105.9080	781191.3419	PI Curve 4 = Station 28+15.18 -L-
L-6	525334.3700	781728.4421	PI Curve 5 = Station 33+95.53 -L-
L-7	525695.8555	781935.3668	End -L- = Station 38+03.54
Y-1	525439.0862	781520.9712	Station 10+00 -Y-
Y-2	525350.5339	781487.3495	PI Curve 6 = Station 10+94.72 -Y-
Y-3	525250.0070	781530.1099	End -Y- = Station 12+00 = Station 31+80.00 -L-

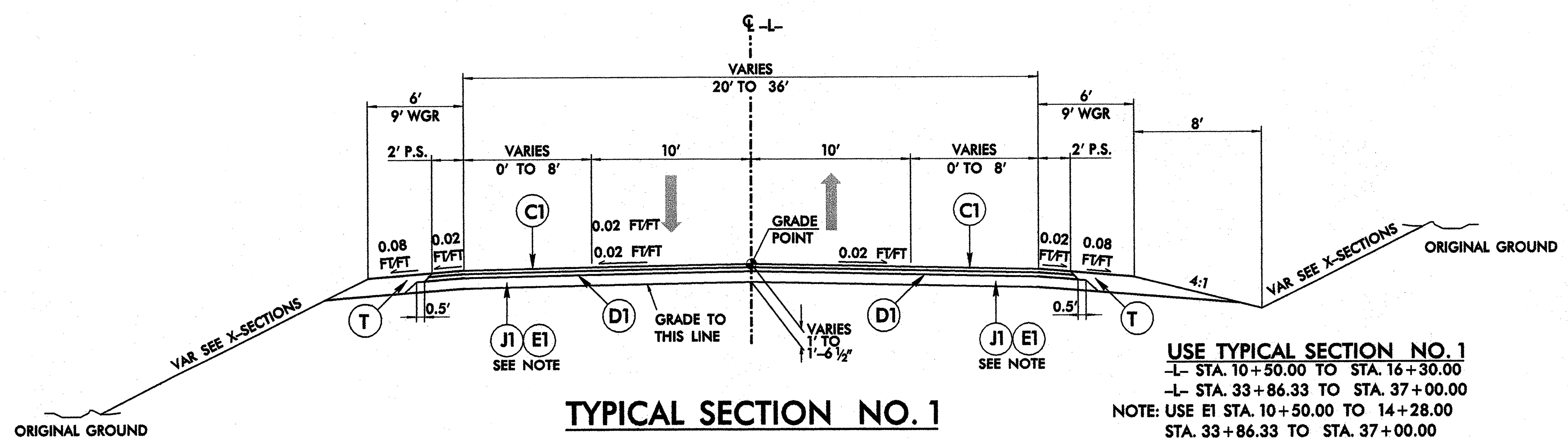
Benchmarks		
Mark #	Elevation	Description
# 1	3490.20'	Railroad Spike in base of Power Pole Station 10+29.12 -L- 19.33' Right
# 2	3240.50'	Railroad Spike in base of Power Pole Station 38+96.80 -L- 21.90' Right



Paul R. White  
 4-24-06

TBM #2  
 In Power Pole in  
 Cedar Hill Turnout  
 Sta 38+96.80  
 21.90' RT  
 EL = 3240.50'



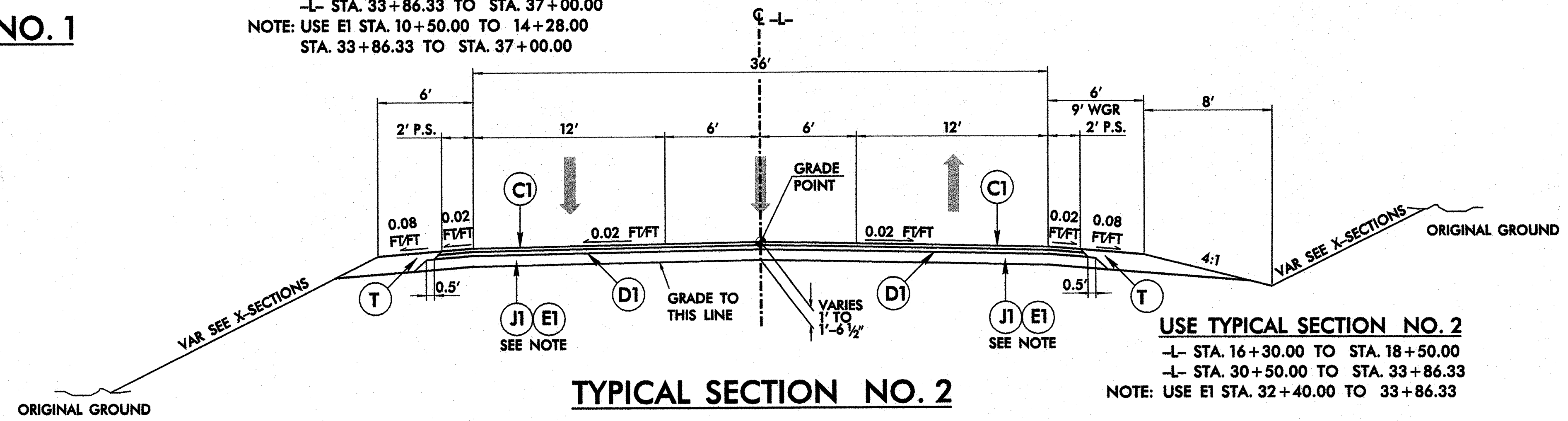


**TYPICAL SECTION NO. 1**

**USE TYPICAL SECTION NO. 1**  
 -L- STA. 10+50.00 TO STA. 16+30.00  
 -L- STA. 33+86.33 TO STA. 37+00.00  
 NOTE: USE E1 STA. 10+50.00 TO 14+28.00  
 STA. 33+86.33 TO STA. 37+00.00

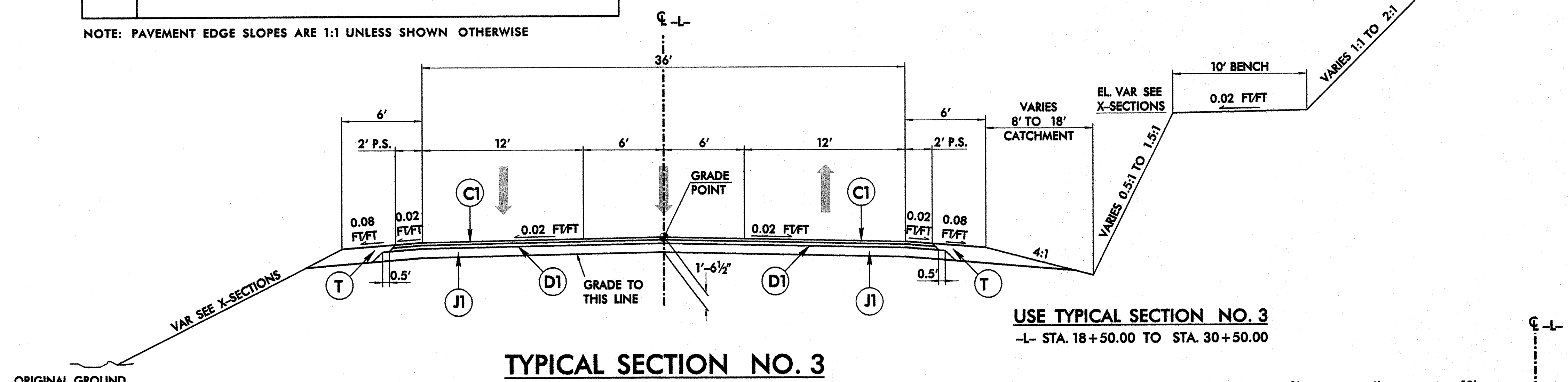
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
D1	PROP. APPROX. 3½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
E1	PROP. APPROX. 5-1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
J1	PROP. 12" AGGREGATE BASE COURSE.
J2	PROP. 6" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.

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



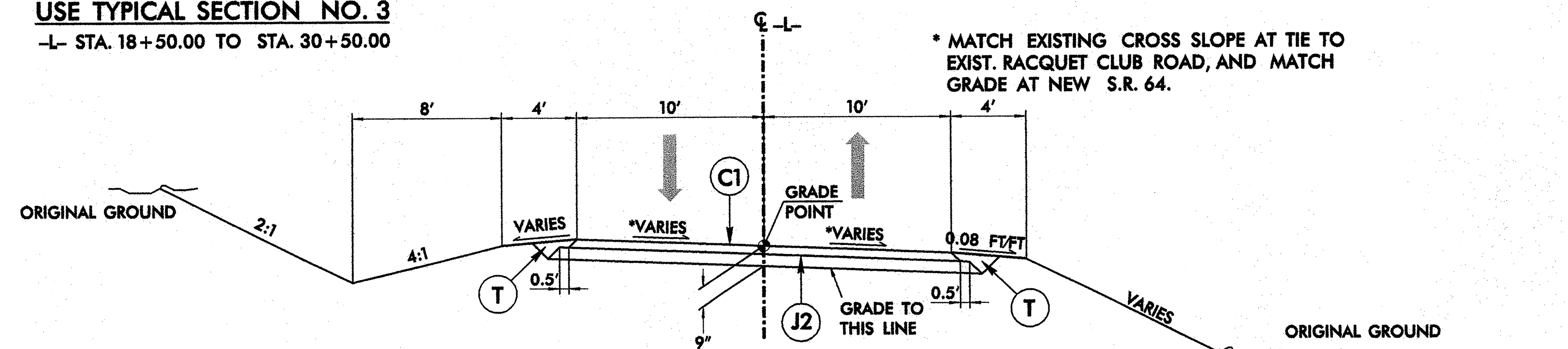
**TYPICAL SECTION NO. 2**

**USE TYPICAL SECTION NO. 2**  
 -L- STA. 16+30.00 TO STA. 18+50.00  
 -L- STA. 30+50.00 TO STA. 33+86.33  
 NOTE: USE E1 STA. 32+40.00 TO 33+86.33



**TYPICAL SECTION NO. 3**

**USE TYPICAL SECTION NO. 3**  
 -L- STA. 18+50.00 TO STA. 30+50.00



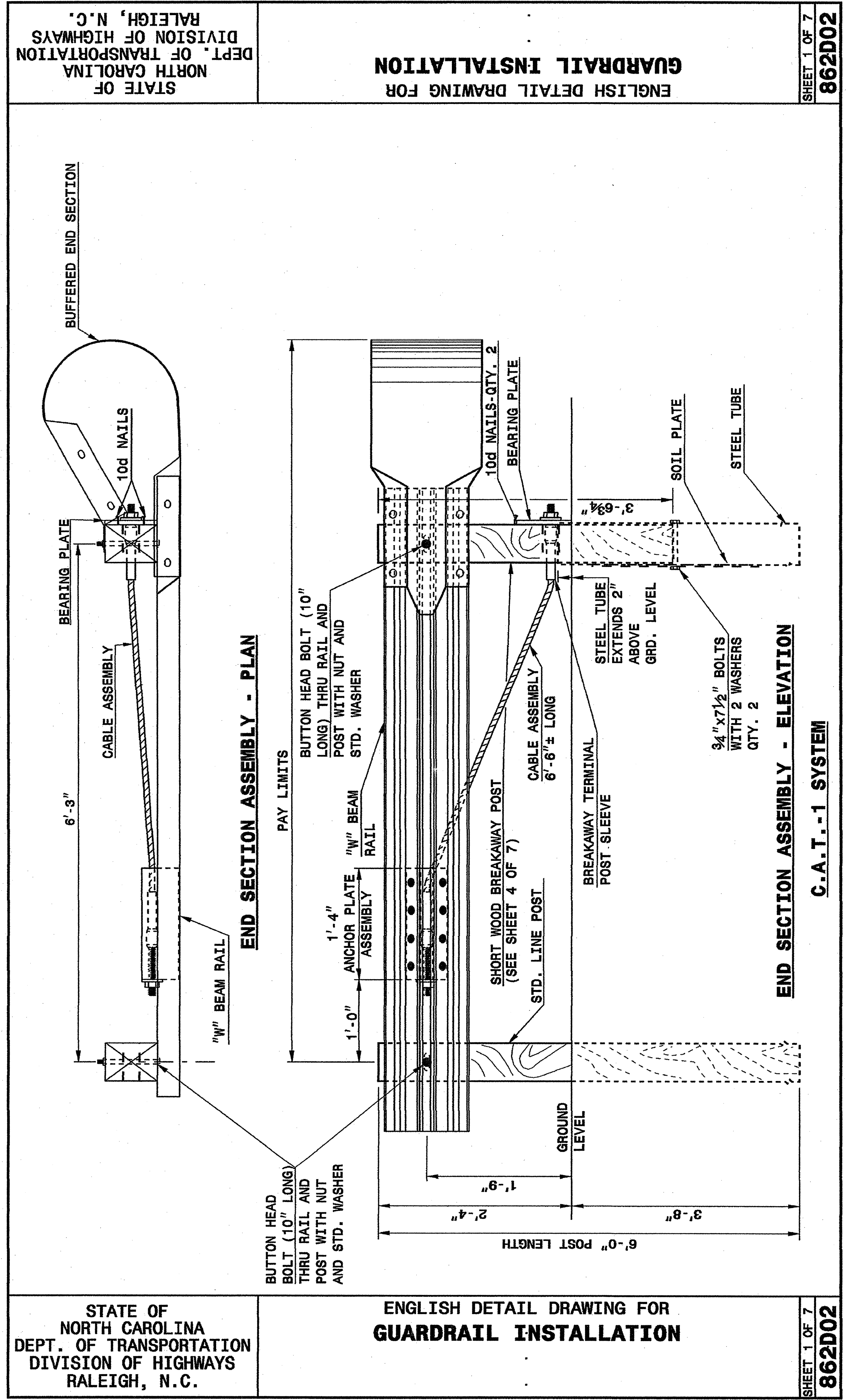
**TYPICAL SECTION NO. 4**

**USE TYPICAL SECTION NO. 4**  
 -Y- STA. 10+48.00 TO STA. 11+82.00  
 AND PAVEMENT DESIGN FOR TIE TO NATURE VIEW LANE

\* MATCH EXISTING CROSS SLOPE AT TIE TO EXIST. RACQUET CLUB ROAD, AND MATCH GRADE AT NEW S.R. 64.

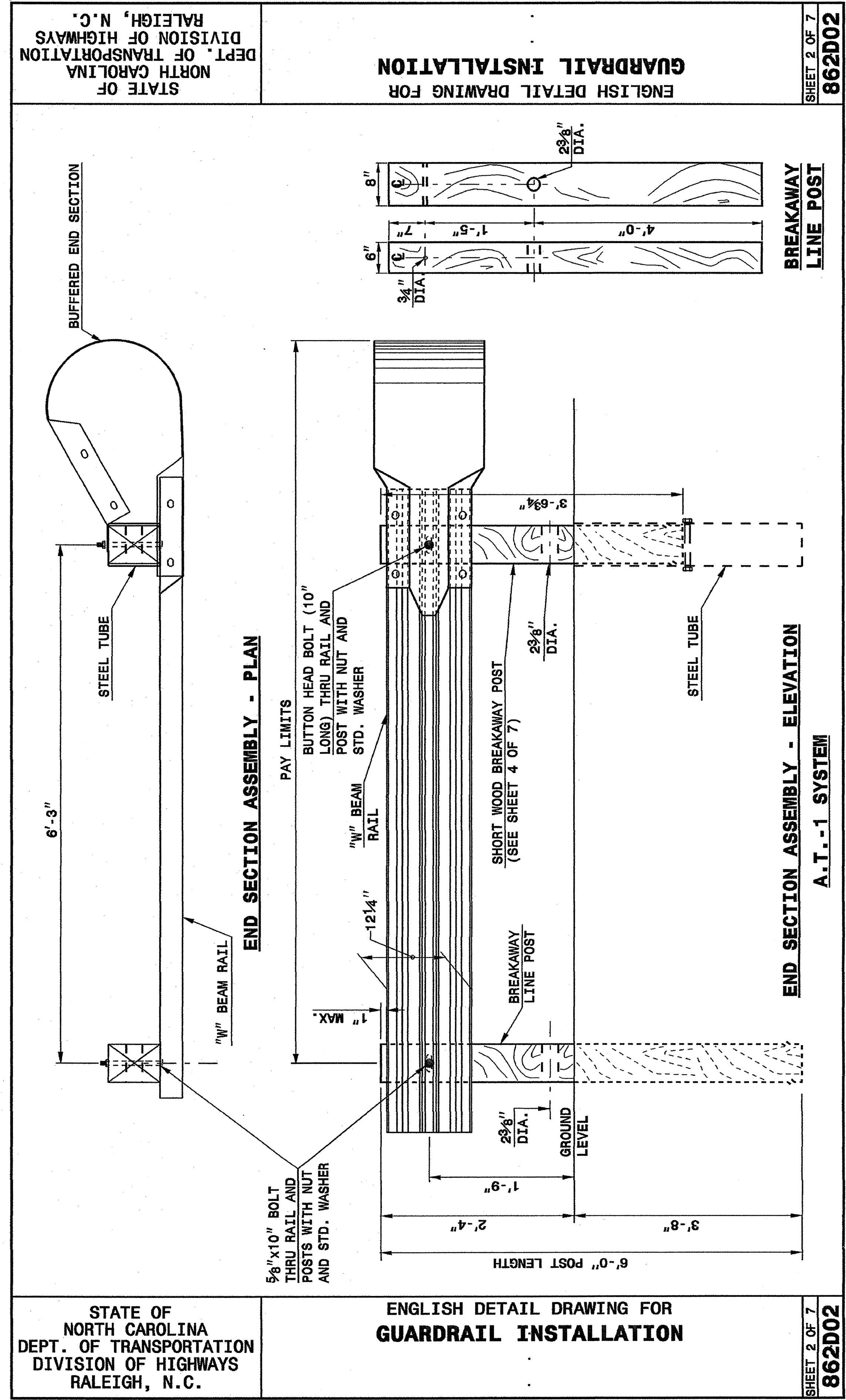
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STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**



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

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**



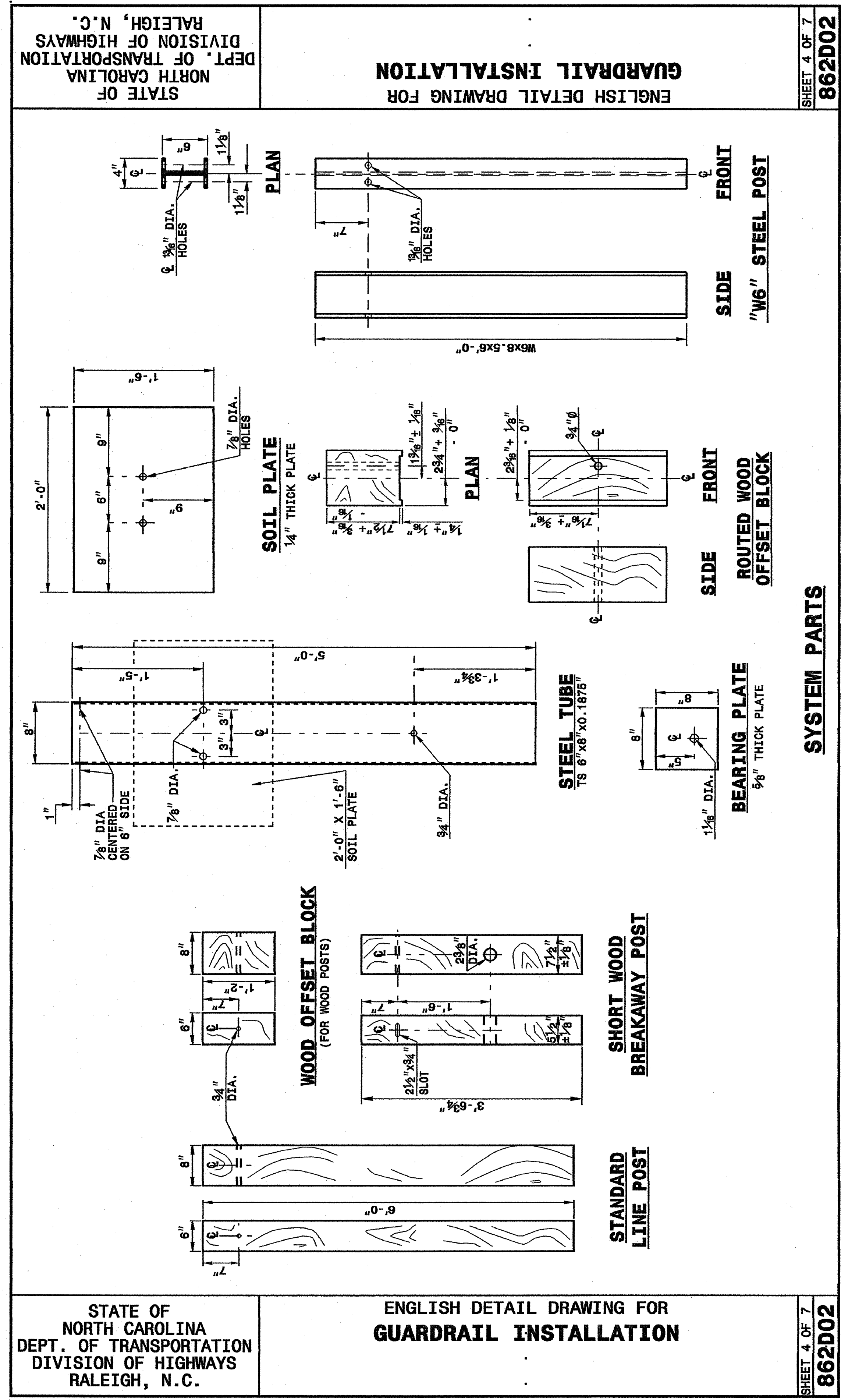
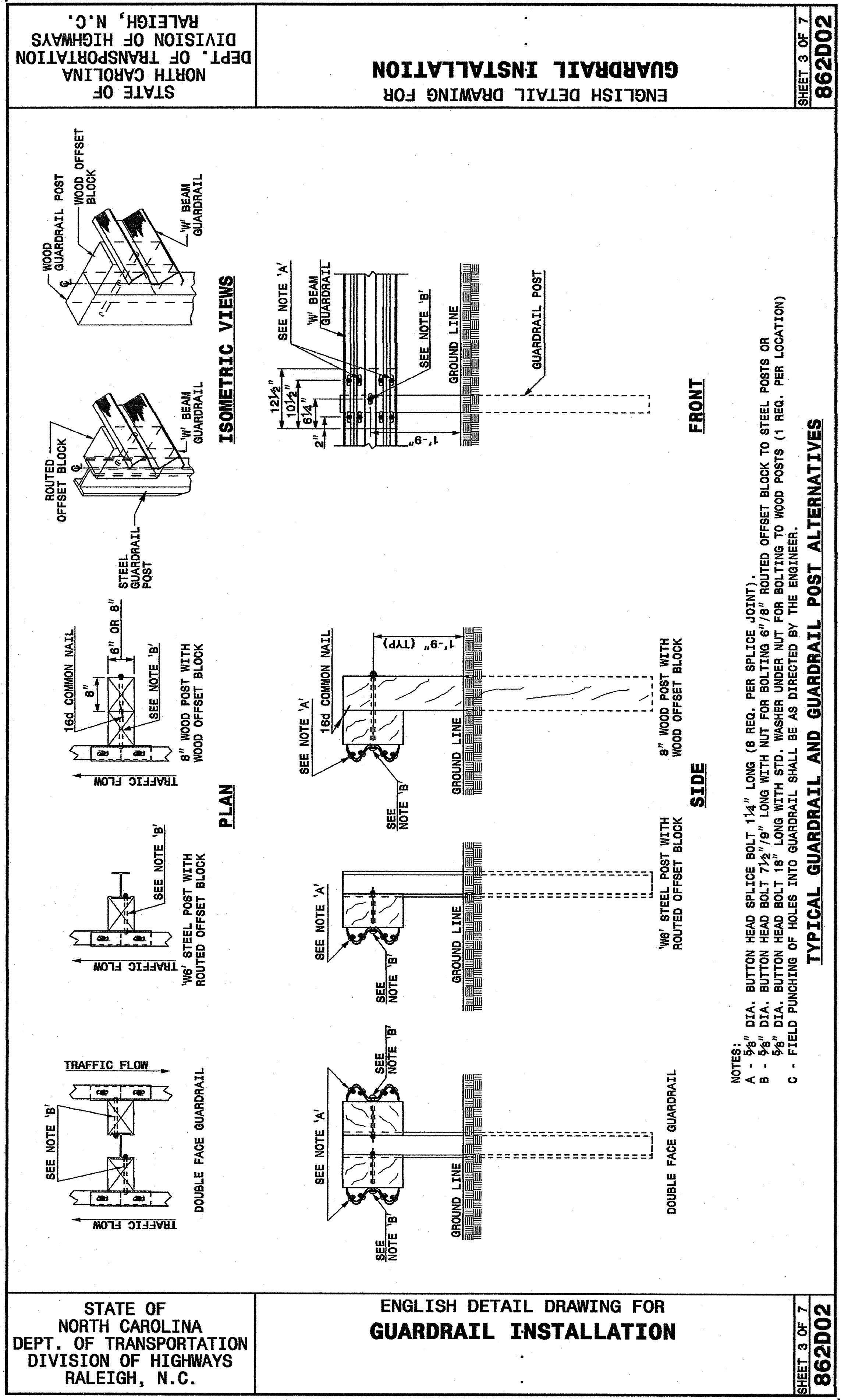
**PROJECT SERVICES UNIT**  
STANDARDS AND SPECIAL DESIGN  
Office 919-250-4128 FAX 919-250-4119

**SEE PLATE FOR TITLE**

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MODIFIED BY: E.E. WARD DATE: 02-09-03  
CHECKED BY: DATE:  
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 ericward AT 05212260



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

SEE PLATE FOR TITLE

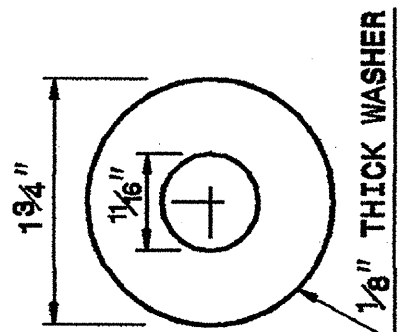
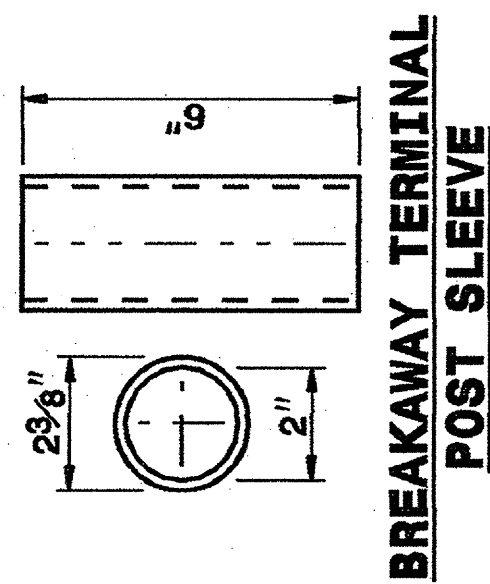
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STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

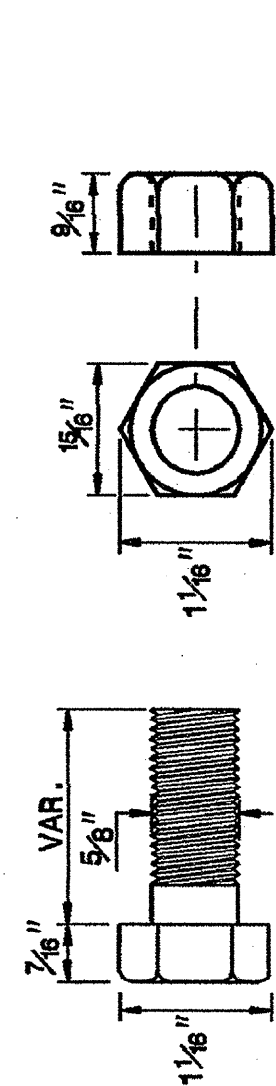
ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 5 OF 7  
**862D02**

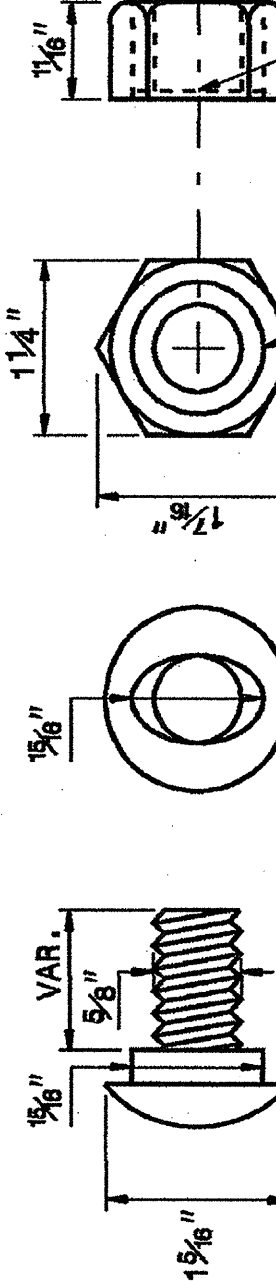


**DETAIL OF STANDARD WASHER**

STANDARD WASHER: TYPICAL USE UNDER NUT WITH WOOD POST



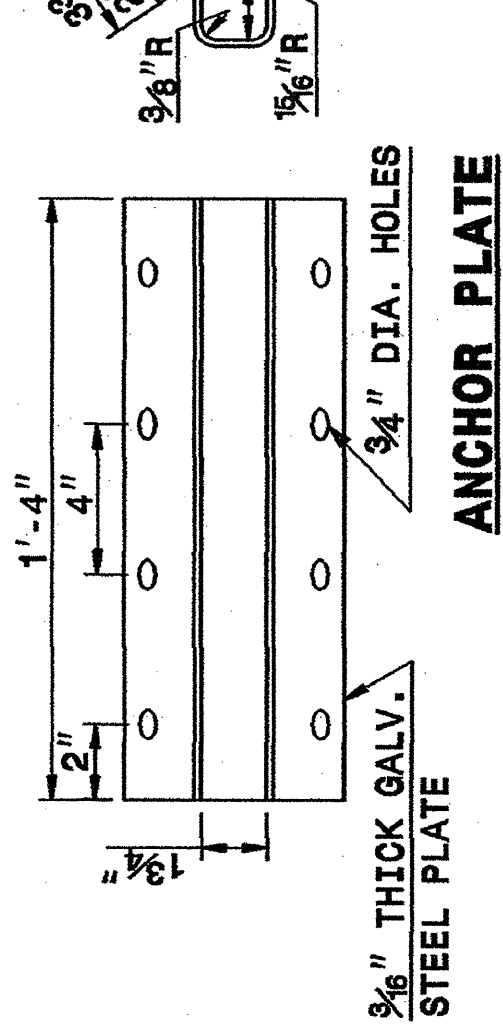
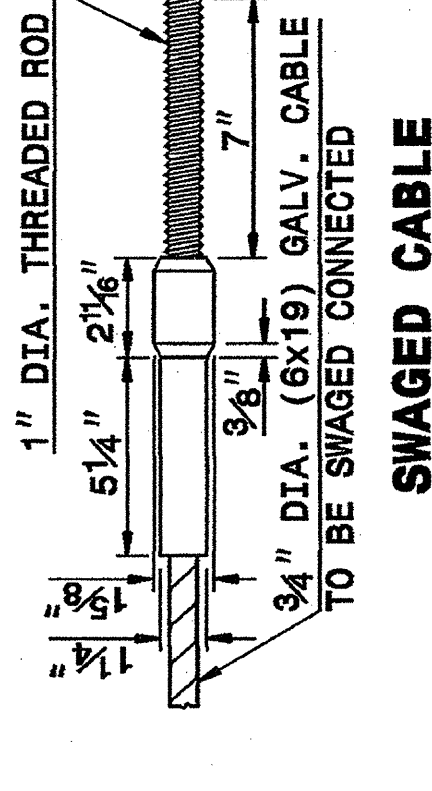
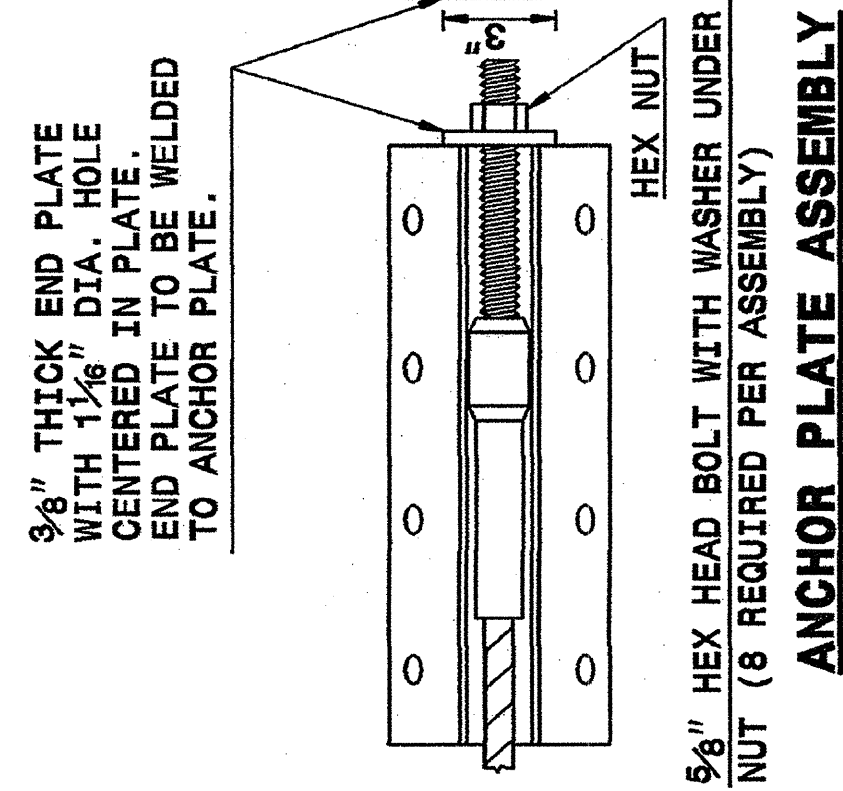
**DETAIL OF STANDARD HEX BOLT AND NUT**



**DETAIL OF BUTTON HEAD BOLT AND NUT**



**SYSTEM PARTS**



**ANCHOR PLATE**

**SYSTEM PARTS**

SHEET 5 OF 7  
**862D02**

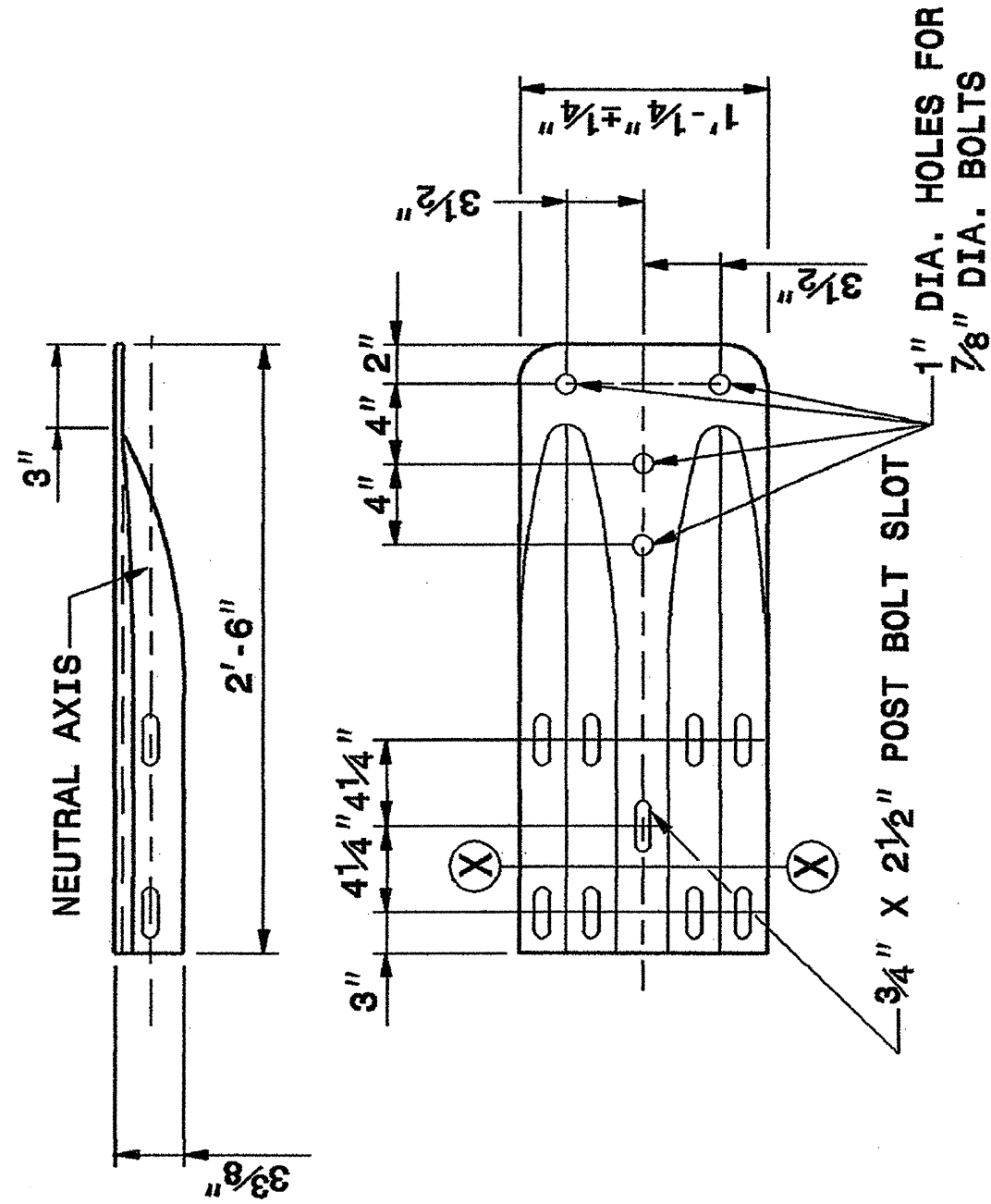
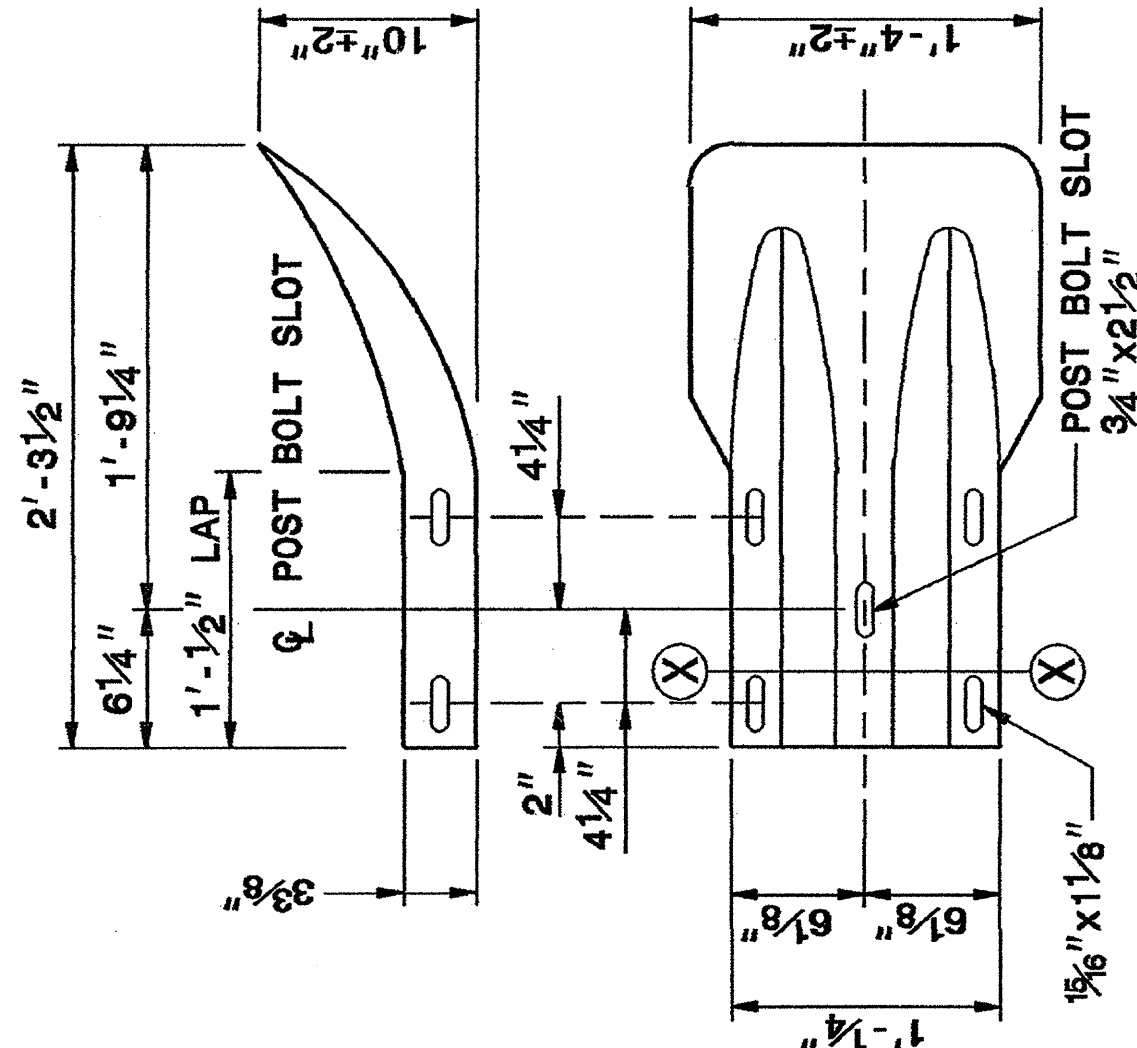
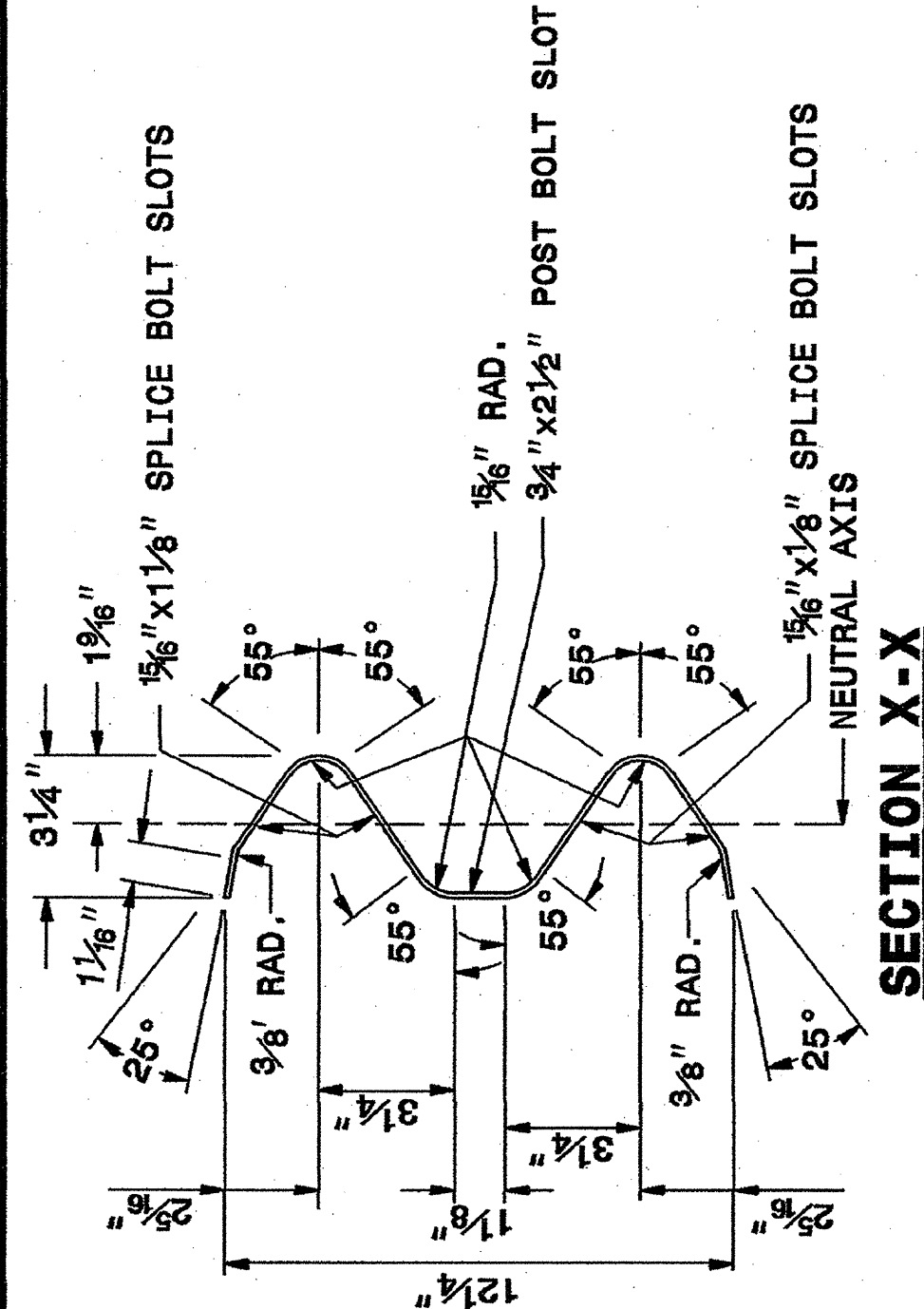
STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

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

ENGLISH DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 7  
**862D02**

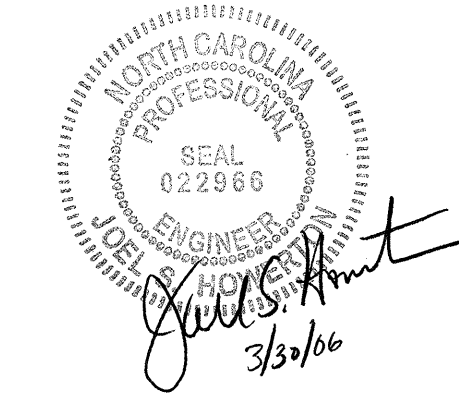


**SYSTEM PARTS - GENERAL USE**

**SYSTEM PARTS - GENERAL USE**

**SEE PLATE FOR TITLE**

ORIGINAL BY: 2002 STD.862.02 DATE:  
 MODIFIED BY: E.E. WARD DATE: 02-09-03  
 CHECKED BY: DATE:  
 FILE SPEC.: /usr/stds/02todetail/english/86202/862d02.dgn



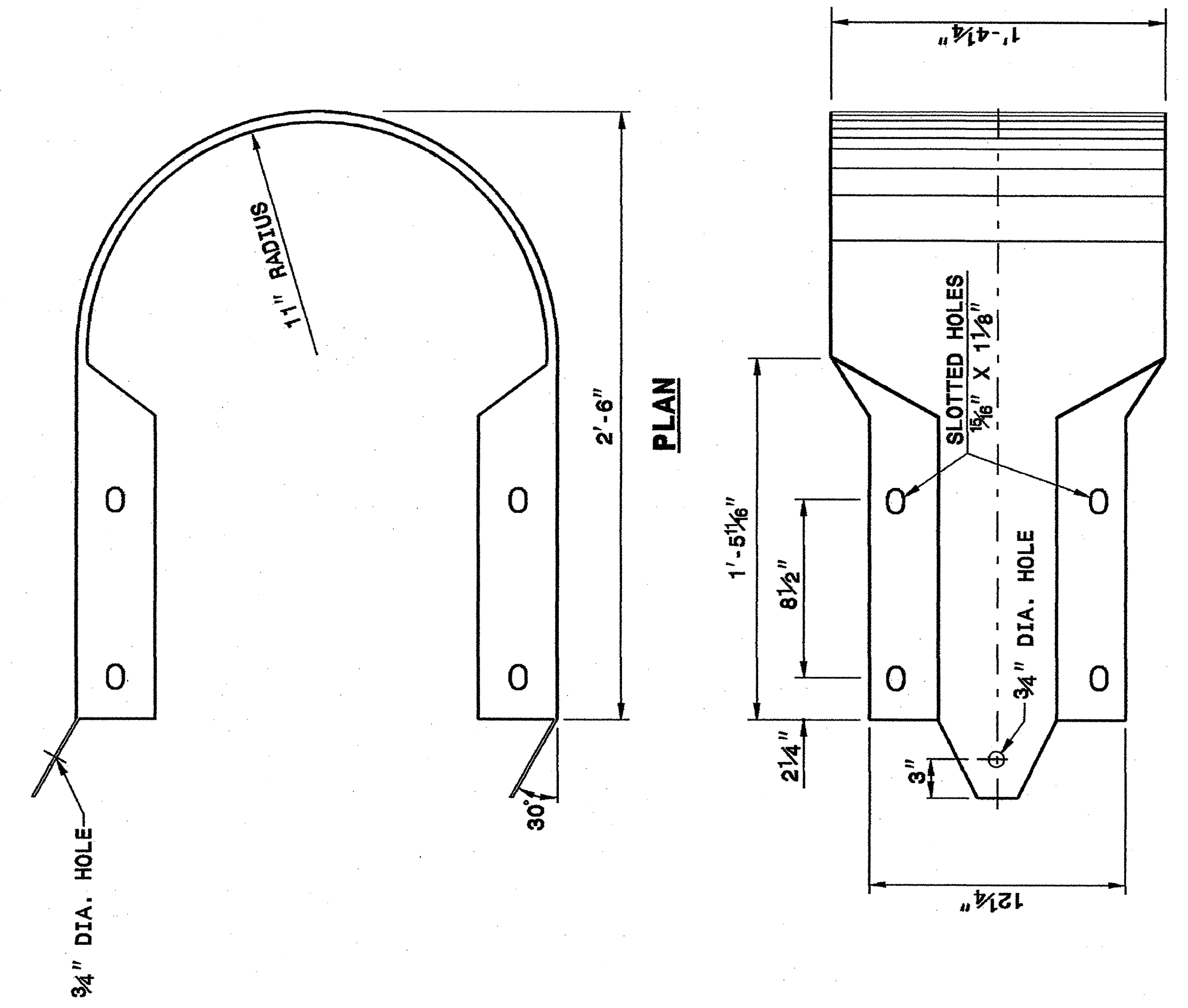
PROJECT SERVICES UNIT  
 STANDARDS AND SPECIAL DESIGN  
 Office 919-250-4128 FAX 919-250-4119



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

ENGLISH DETAIL DRAWING FOR  
GUARDRAIL INSTALLATION

SHEET 7 OF 7  
862D02

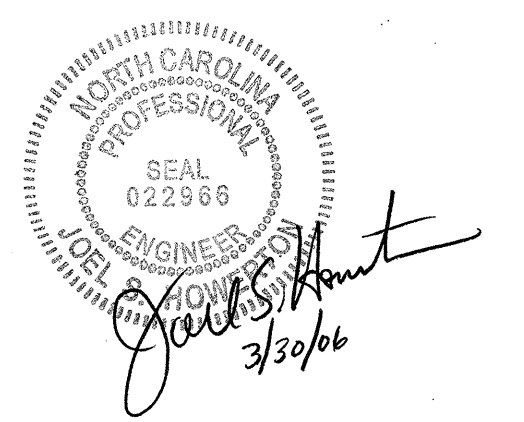


ELEVATION  
BUFFERED END SECTION

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

ENGLISH DETAIL DRAWING FOR  
GUARDRAIL INSTALLATION

SHEET 7 OF 7  
862D02



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

SEE PLATE FOR TITLE

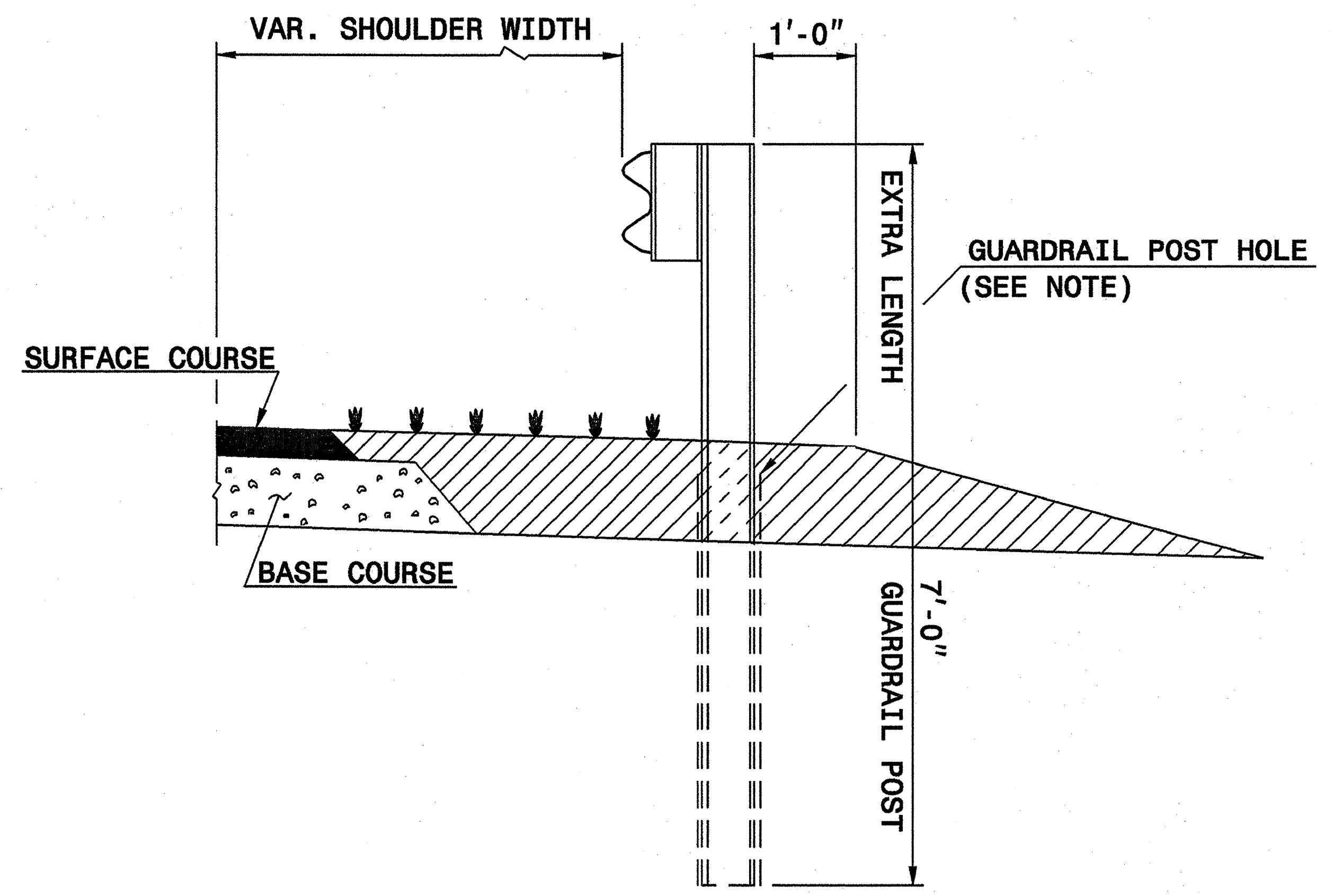
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STATE OF  
NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
GUARDRAIL PLACEMENT FOR 1' SHOULDER  
BREAK POINT BEHIND GUARDRAIL POST

SHEET 1 OF 1  
**7'GRPOST**



**FLEXIBLE PAVED SHOULDER**



 EARTH MATERIAL

- NOTE:**
- 1) USE EXTRA LENGTH GUARDRAIL POST - 7'- 0" TYPICAL
  - 2) SEE ROADWAY PLANS FOR LOCATION
  - 3) REFER TO 862D01 FOR GUARDRAIL PLACEMENT DETAILS

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

ENGLISH DETAIL DRAWING FOR  
GUARDRAIL PLACEMENT FOR 1' SHOULDER  
BREAK POINT BEHIND GUARDRAIL POST

SHEET 1 OF 1  
**7'GRPOST**

  
*John R. Hunt*  
 2/24/06

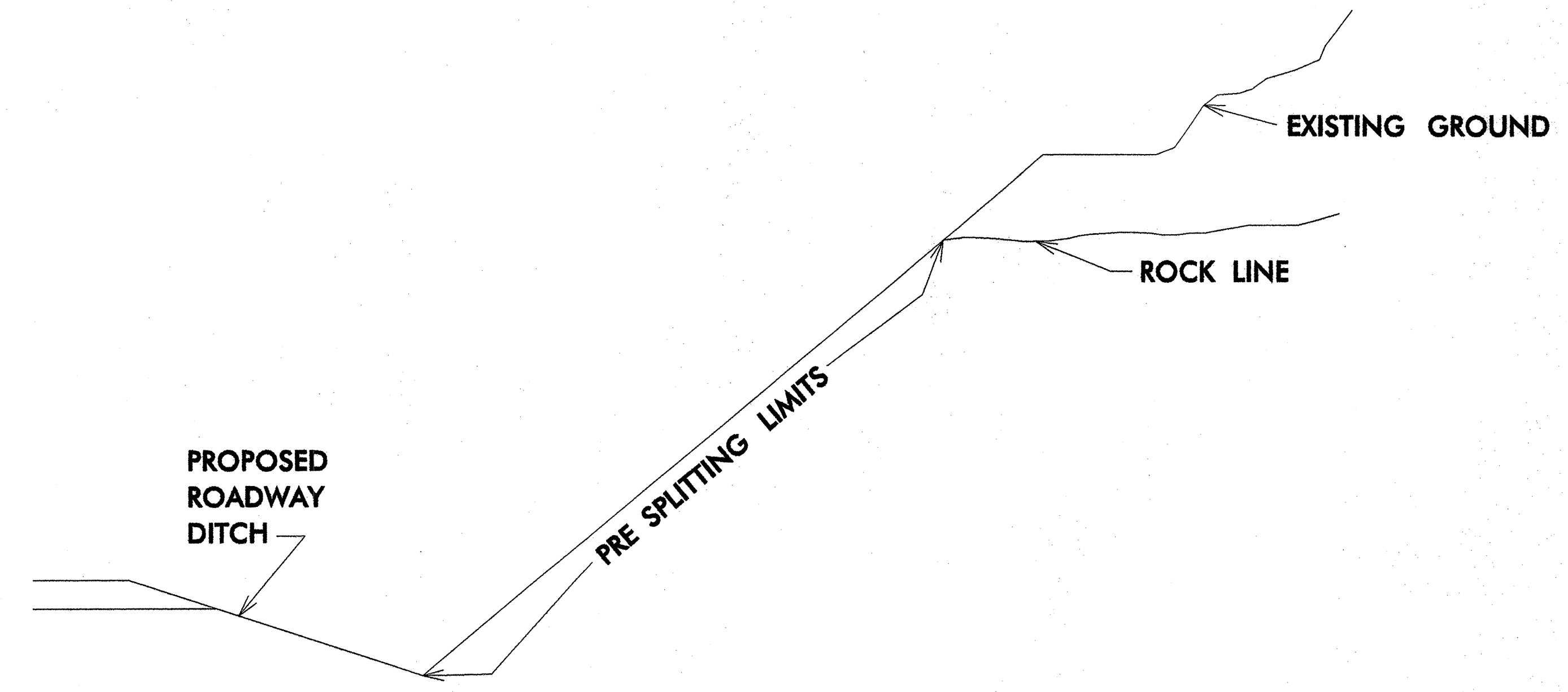
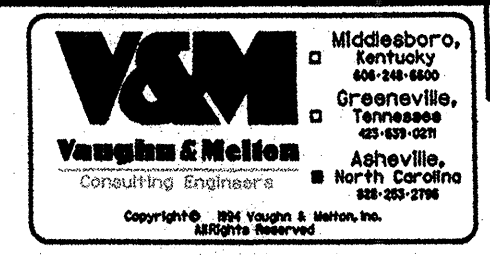
**PROJECT SERVICES UNIT  
STANDARDS AND SPECIAL DESIGN**  
Office 919-250-4128 FAX 919-250-4119

**SEE PLATE FOR TITLE**

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CHECKED BY:	DATE:
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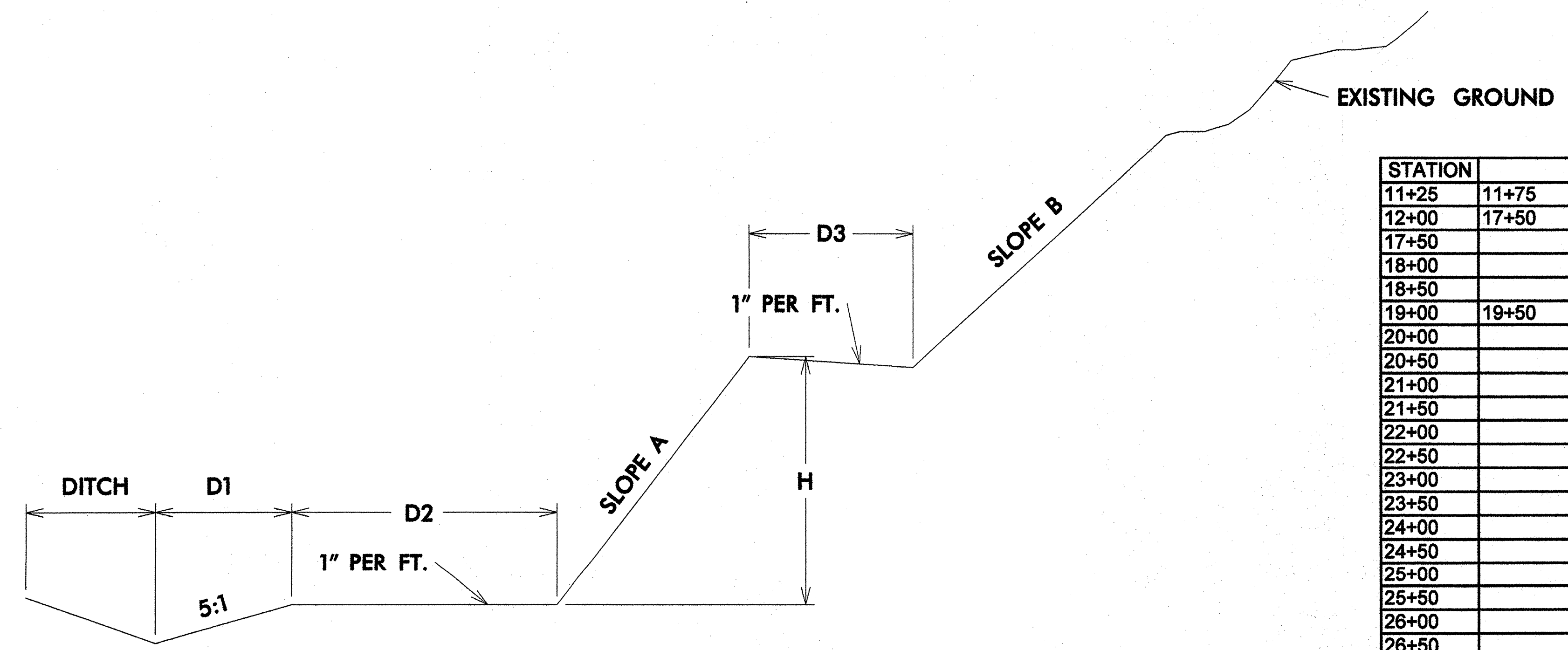
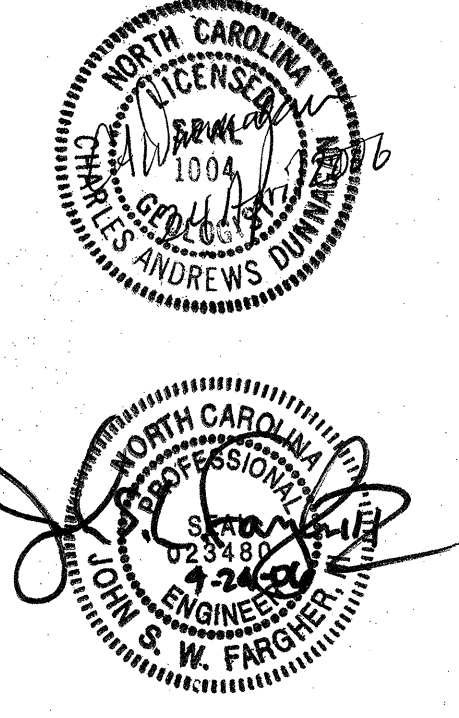
I:\MAR-2006\_09e06... \stand\862stds\862d0105.dgn  
 erlward A1 15222233





DETAIL SHOWING LIMITS & LOCATIONS OF PRE-SPLITTING ROCK CUTS

STATION	LOCATION	SLOPE	CATCHMENT BASIN
11+25	11+75	LT	2:1
12+00	17+50	RT	1:1 TO
17+50	18+00	RT	1:1 TO 0.75:1
18+00	18+50	RT	0.75:1 TO 0.5:1
18+50		RT	0.5:1 to elev 3445.0 with 1:1 slope above
19+00	19+50	RT	0.5:1 TO 1:1
20+00		RT	0.5:1 TO 1:1
20+50		RT	0.5:1 TO 1:1
21+00		RT	0.5:1 TO 1:1
21+50		RT	0.5:1 TO 1:1
22+00		RT	0.5:1 TO 1:1
22+50		RT	0.5:1 TO 1:1
23+00		RT	0.5:1 TO 1:1
23+50		RT	0.5:1 TO 1:1
23+75	30+00	LT	0.5:1 TO 1:1
24+00		RT	0.5:1 TO 1:1
24+50		RT	0.5:1 TO 1:1
25+00		RT	0.5:1 TO 1:1
25+50		RT	0.5:1 TO 1:1
26+00		RT	0.5:1 TO 1:1
26+50		RT	0.5:1 TO 1:1
27+00		RT	0.5:1 TO 1:1
27+50		RT	0.5:1 TO 1:1
28+00		RT	0.5:1 TO 1:1
28+50		RT	0.5:1 TO 1:1
29+00		RT	0.5:1 TO 1:1
29+50	30+00	RT	0.5:1 TO 1:1
30+00	30+50	LT	1:1 TO 1.5:1
30+00	30+50	RT	0.5:1 TO 1:1 1.5:1
30+50	31+00	LT	1.5:1 TO 2:1
30+50	31+00	RT	1:1 TO 1.5:1 2:1
31+00		LT	2:1
31+00	31+50	RT	1.5:1 TO 2:1
31+50		RT	2:1

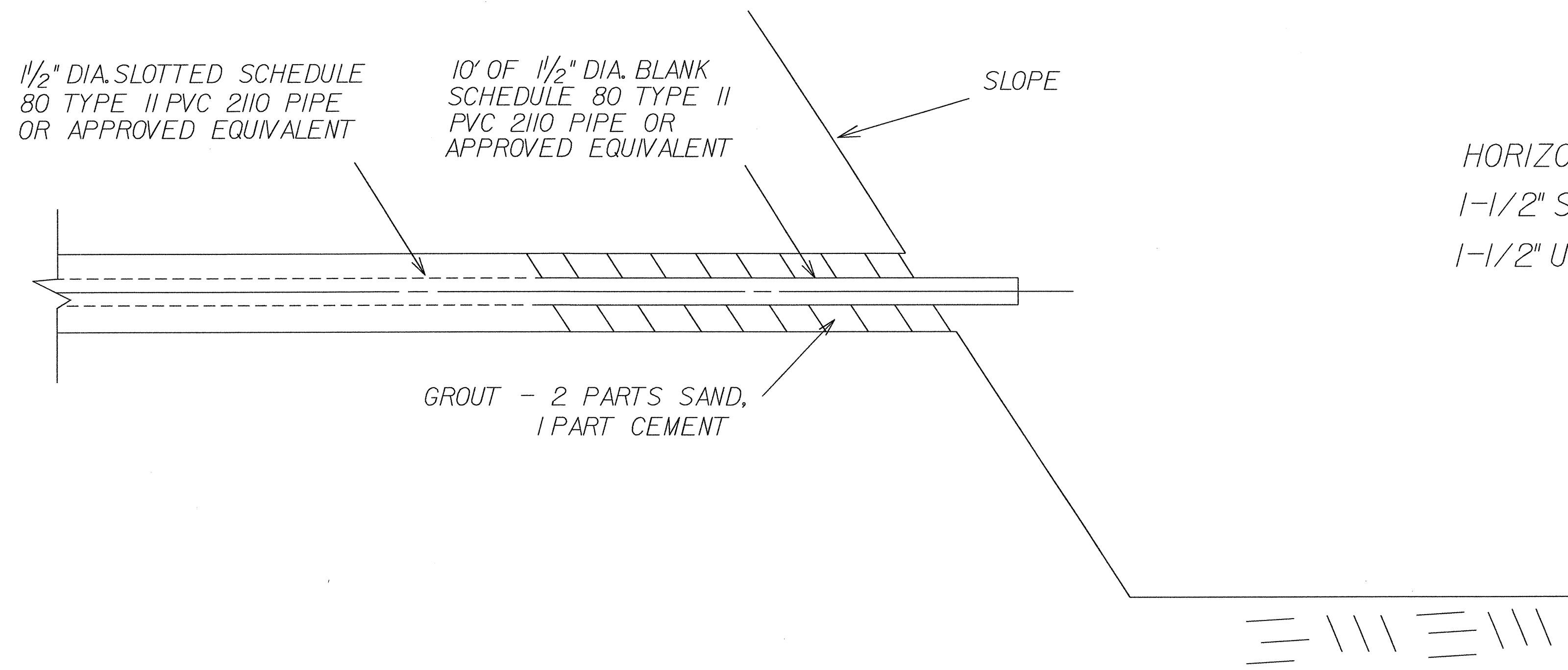


DETAIL SHOWING CONSTRUCTION & LOCATION OF BENCHES IN CUTS

STATION	LINE	LOC	D1	D2	D3	A	B	H
11+25	11+75	L LT	0'	0'	0'	2:1	2:1	VARIES
12+00	17+50	L RT	0'	0'	0'	1:1	1:1	VARIES
17+50		L RT	0'	0'	0'	1:1	1:1	VARIES
18+00		L RT	0'	0'	0'	0.75:1	0.75:1	VARIES
18+50		L RT	0'	10'	10'	0.50:1	1:1	31'+/-
19+00	19+50	L RT	0'	10'	10'	0.50:1	1:1	38'-42'+/-
20+00		L RT	0'	14'	10'	0.50:1	1:1	51.6'+/-
20+50		L RT	0'	18'	10'	0.50:1	1:1	38.5'+/-
21+00		L RT	0'	14'	10'	0.50:1	1:1	59.5'+/-
21+50		L RT	0'	14'	10'	0.50:1	1:1	53.3'+/-
22+00		L RT	0'	14'	10'	0.50:1	1:1	47.2'+/-
22+50		L RT	0'	14'	10'	0.50:1	1:1	31.2'+/-
23+00		L RT	0'	14'	10'	0.50:1	1:1	25.6'+/-
23+50		L RT	0'	10'	10'	0.50:1	1:1	29'+/-
24+00		L RT	0'	18'	10'	0.50:1	1:1	55.3'+/-
24+50		L RT	0'	14'	10'	0.50:1	1:1	53.7'+/-
25+00		L RT	0'	18'	10'	0.50:1	1:1	74'+/-
25+50		L RT	0'	18'	10'	0.50:1	1:1	68.4'+/-
26+00		L RT	0'	14'	10'	0.50:1	1:1	51.8'+/-
26+50		L RT	0'	10'	10'	0.50:1	1:1	35.4'+/-
27+00		L RT	0'	10'	10'	0.50:1	1:1	34.5'+/-
27+50		L RT	0'	10'	10'	0.50:1	1:1	19.1'+/-
28+00		L RT	0'	10'	10'	0.50:1	1:1	18.8'+/-
28+50		L RT	0'	10'	10'	0.50:1	1:1	28.4'+/-
29+00		L RT	0'	10'	10'	0.50:1	1:1	18.1'+/-
29+50	30+00	L RT	0'	10'	10'	0.50:1	1:1	23'-28'
31+00		L RT	0'	0'	10'	1.5:1	2:1	33.2'+/-

DATE PLOTTED: 5/28/99  
 PLOT SCALE: AS SHOWN  
 PLOT BY: JCF/MSH  
 CHECKED BY: JCF/MSH  
 DATE: 5/28/99

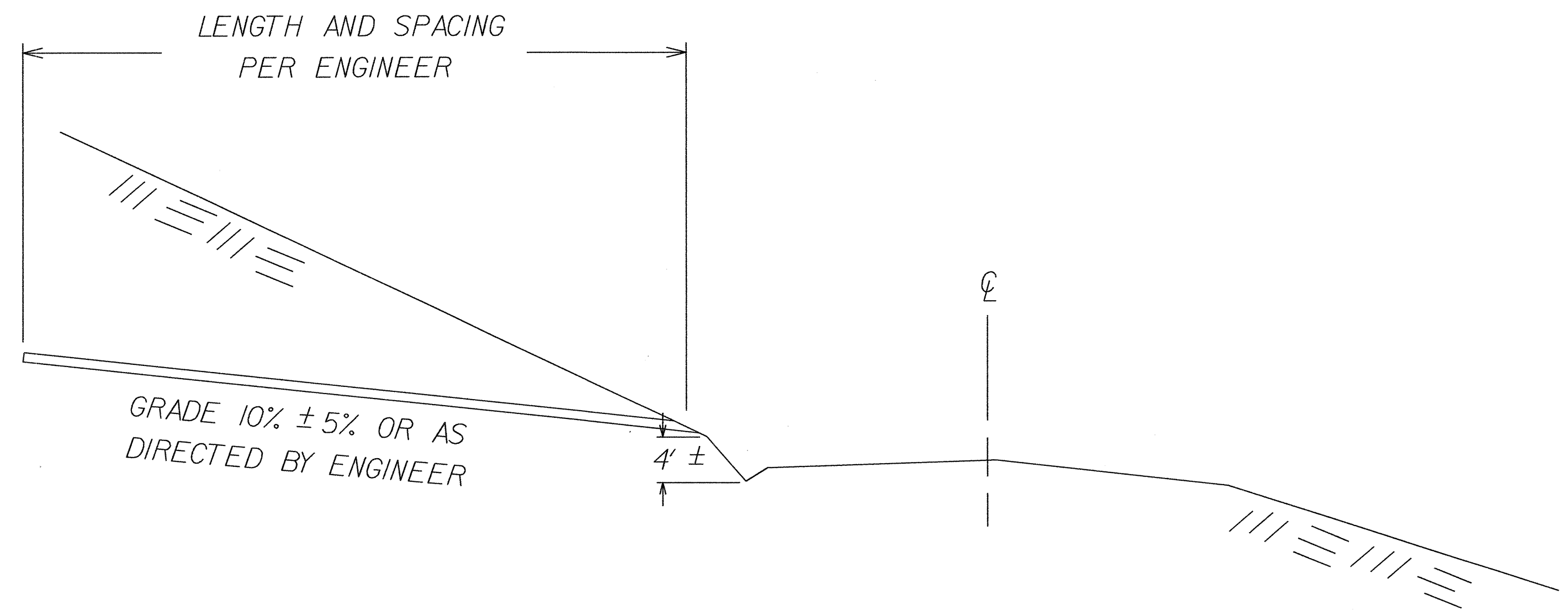
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2409B	2-G	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION



DETAIL OF HORIZONTAL DRAINS  
N.T.S.

QUANTITIES

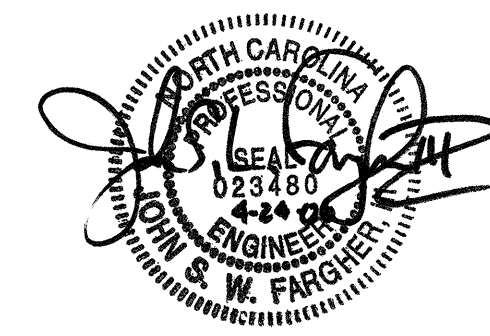
HORIZONTAL DRAIN BOREHOLE	500 LF
1-1/2" SLOTTED PVC 2110 PIPE, TYPE II	400 LF
1-1/2" UNSLOTTED PVC 2110 PIPE, TYPE II	100 LF



TYPICAL CROSS SECTION  
N.T.S.

LOCATIONS TO BE DETERMINED BY ENGINEER

PROJECT R-2409B  
JACKSON-TRANSYLVANIA COUNTY  
STATION



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
HORIZONTAL DRAINS



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201578

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0001000000-E	200	Lump Sum		CLEARING & GRUBBING . ACRE(S)
0008000000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0022000000-E	225	251,000	CY	UNCLASSIFIED EXCAVATION
0036000000-E	225	100	CY	UNDERCUT EXCAVATION
0080000000-E	SP	500	TON	CLASS IV SUBGRADE STABILIZATION (IV)
0098000000-E	228	33,000	SY	PRE-SPLITTING OF ROCK
0134000000-E	240	65	CY	DRAINAGE DITCH EXCAVATION
0156000000-E	250	6,700	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0192000000-N	260	3	HR	PROOF ROLLING
0195000000-E	265	500	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	500	SY	FABRIC FOR SOIL STABILIZATION
0318000000-E	300	30	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0343000000-E	310	88	LF	15" SIDE DRAIN PIPE
0366000000-E	310	84	LF	15" RC PIPE CULVERTS, CLASS III
0378000000-E	310	184	LF	24" RC PIPE CULVERTS, CLASS III
0986000000-E	SP	400	LF	GENERIC PIPE ITEM 1-1/2" SLOTTED PVC 2110 PIPE, TYPE II
0986000000-E	SP	100	LF	GENERIC PIPE ITEM 1-1/2" UNSLOTTED PVC 2110 PIPE, TYPE II
0986000000-E	SP	500	LF	GENERIC PIPE ITEM HORIZONTAL DRAIN BOREHOLE
0986000000-E	SP	4,200	LF	GENERIC PIPE ITEM WEEP HOLES
0995000000-E	340	197	LF	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1121000000-E	520	9,400	TON	AGGREGATE BASE COURSE

ItemNumber	Sec #	Quantity	Unit	Description
1220000000-E	545	500	TON	INCIDENTAL STONE BASE
1231000000-E	560	2,002	CY	SHOULDER BORROW
1275000000-E	600	4,305	GAL	PRIME COAT
1297000000-E	607	2,253	SY	MILLING ASPHALT PAVEMENT, **** DEPTH (12")
1330000000-E	607	200	SY	INCIDENTAL MILLING
1489000000-E	610	922	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	2,150	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1523000000-E	610	2,050	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1560000000-E	620	142	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-E	620	123	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-E	654	25	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2022000000-E	815	336	CY	SUBDRAIN EXCAVATION
2033000000-E	815	168	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	1,000	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	30	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	2	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	12	LF	6" OUTLET PIPE (SUBDRAINS)
2253000000-E	840	1,105	CY	PIPE COLLARS
2286000000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES
2354200000-N	840	2	EA	FRAME WITH GRATE, STD 840.24
2366000000-N	840	6	EA	FRAME WITH TWO GRATES, STD 840.24
3030000000-E	862	425	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3210000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1

ItemNumber	Sec #	Quantity	Unit	Description
3270000000-N	SP	6	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3360000000-E	863	2,200	LF	REMOVE EXISTING GUARDRAIL
3628000000-E	876	50	TON	PLAIN RIP RAP, CLASS I
3642000000-E	876	500	TON	PLAIN RIP RAP, CLASS A
3649000000-E	876	94	TON	PLAIN RIP RAP, CLASS B
3656000000-E	876	2,475	SY	FILTER FABRIC FOR DRAINAGE
4412000000-E	SP	232	SF	WORK ZONE SIGNS (STATIONARY)
4412100000-E	SP	144	SF	WORK ZONE SIGNS (PORTABLE)
4430000000-N	1130	36	EA	DRUMS
4446100000-E	SP	128	LF	BARRICADES (TYPE III)
4450000000-N	1150	35	HR	FLAGGER
4485000000-E	1170	2,663	LF	PORTABLE CONCRETE BARRIER
4500000000-E	1170	1,112.5	LF	RESET PORTABLE CONCRETE BARRIER
4650000000-N	1251	150	EA	TEMPORARY RAISED PAVEMENT MARKERS
4810000000-E	1205	22,092	LF	PAINT PAVEMENT MARKING LINES (4")
4835000000-E	1205	16	LF	PAINT PAVEMENT MARKING LINES (24")
4847000000-E	SP	8,762	LF	POLYUREA PAVEMENT MARKING LINES (4")
4847140000-E	SP	16	LF	POLYUREA PAVEMENT MARKING LINES (24")
4847220000-N	SP	5	EA	POLYUREA PAVEMENT MARKING SYMBOL
4850000000-E	1205	6,000	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4905000000-N	1253	112	EA	SNOWPLOWABLE PAVEMENT MARKERS
6000000000-E	1605	3,000	LF	TEMPORARY SILT FENCE
6006000000-E	1610	17	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	490	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	50	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1	ACR	TEMPORARY MULCHING
6018000000-E	1620	200	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.1	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	600	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	6	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6030000000-E	1630	100	CY	SILT EXCAVATION
6036000000-E	1631	5,000	SY	MATting FOR EROSION CONTROL
6042000000-E	1632	50	LF	1/4" HARDWARE CLOTH
6084000000-E	1660	4.4	ACR	SEEDING & MULCHING
6108000000-E	1665	0.1	TON	FERTILIZER TOPDRESSING

5/28/99

1-1/2" SLOTTED PVC 2110 PIPE, TYPE II





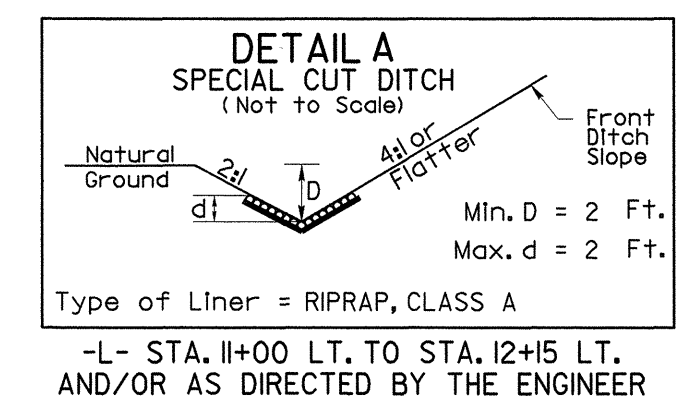
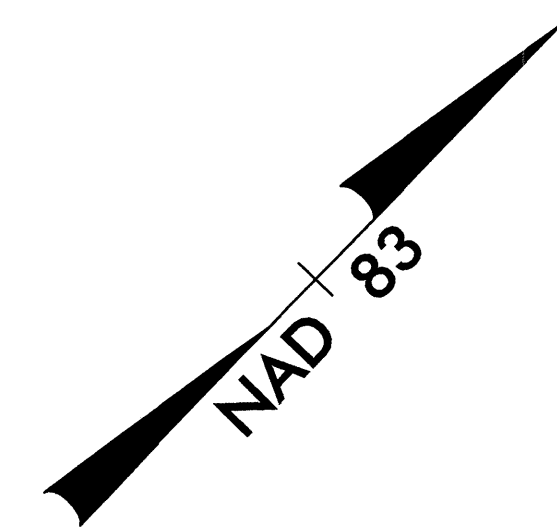
DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA

**SUMMARY OF EARTHWORK**  
 IN CUBIC YARDS

LOCATION	TOTAL UNCLASSIFIED EXCAVATION	UNDERCUT EXCAVATION	EMBT + %	BORROW	WASTE
-L- STA. 10+50 TO STA. 37+00	244,436		552		243,884
-Y- STA. 10+48 TO STA. 11+82	6,520		0		6,520
TOTAL	250,956		552		250,404
LOSS DUE TO CLEARING AND GRUBBING	75				75
ADJUSTMENT FOR ROCK SWELL					29,555
PROJECT TOTAL	250,881		552		279,884
SAY	251,000				
EST. DDE = 65 CY					
UNDERCUT = 100 CY					
EST. SHOULDER BORROW = 2,002 CY					
PAVEMENT STRUCTURE VOLUME = 4,430 CY					

SYSTEMS DOWN  
 6/18/06

FOR -L- LINE PROFILE SEE SHEET 7



**DATUM DESCRIPTION**

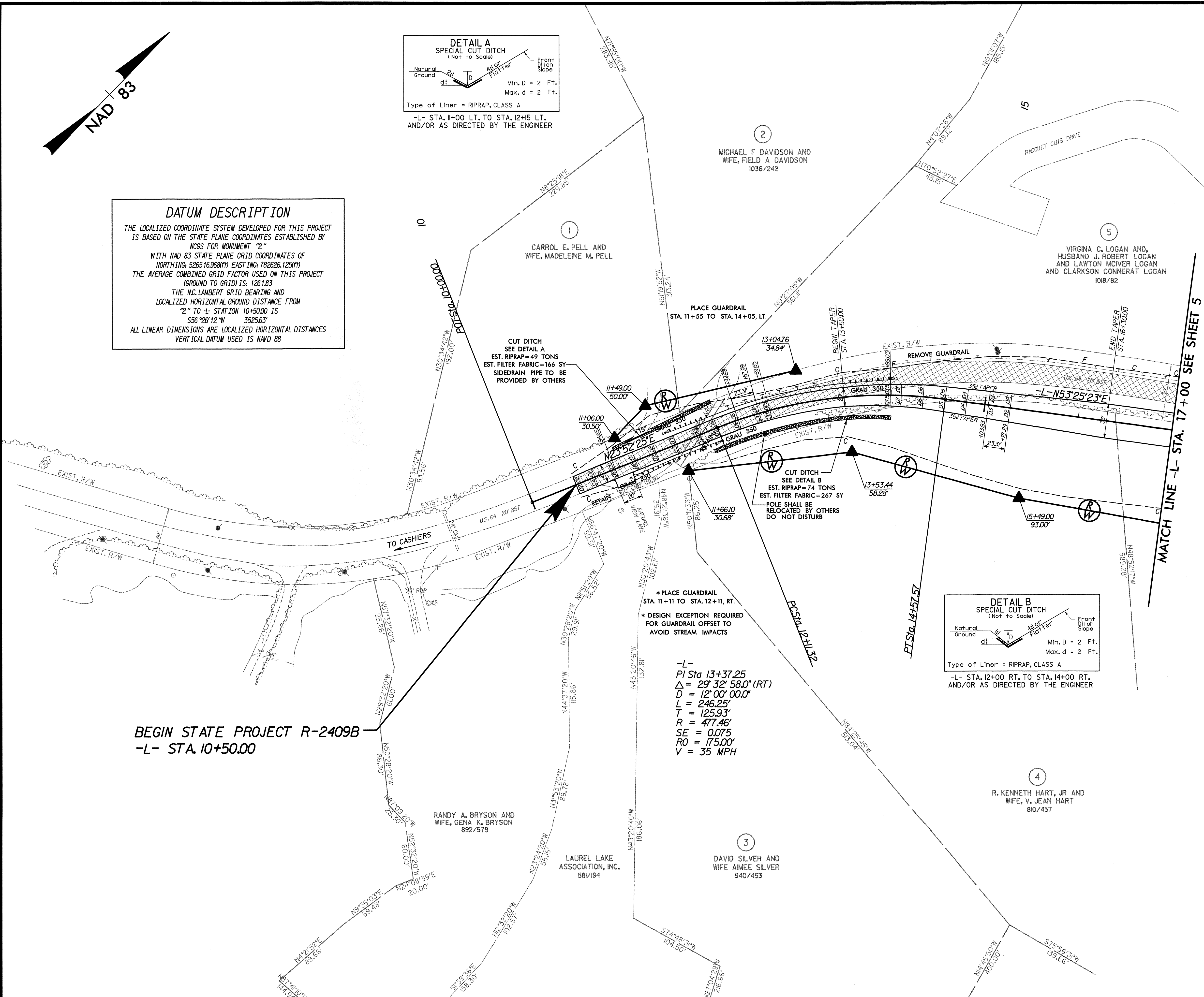
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCOS FOR MONUMENT "2"

WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 526516.968(11), EASTING: 782626.125(11)  
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.26183

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "2" TO -L- STATION 10+50.00 IS  
S56°28'12"W 3525.63'

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

REVISIONS

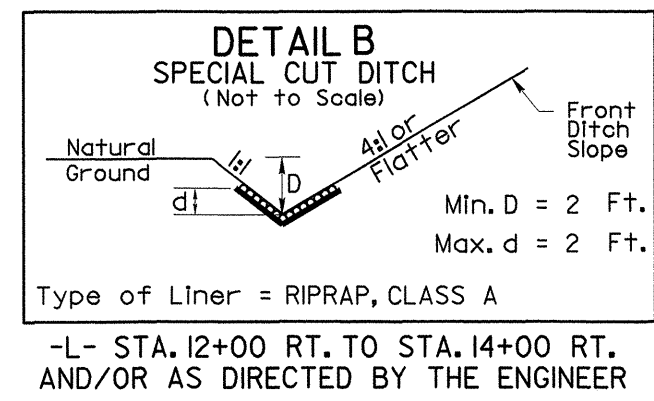


BEGIN STATE PROJECT R-2409B  
-L- STA. 10+50.00

\* PLACE GUARDRAIL  
STA. 11+11 TO STA. 12+11, RT.

\* DESIGN EXCEPTION REQUIRED  
FOR GUARDRAIL OFFSET TO  
AVOID STREAM IMPACTS

-L-  
PI Sta 13+37.25  
 $\Delta = 29^\circ 32' 58.0''$  (RT)  
D = 12' 00' 00.0"  
L = 246.25'  
T = 125.93'  
R = 477.46'  
SE = 0.075  
RO = 175.00'  
V = 35 MPH

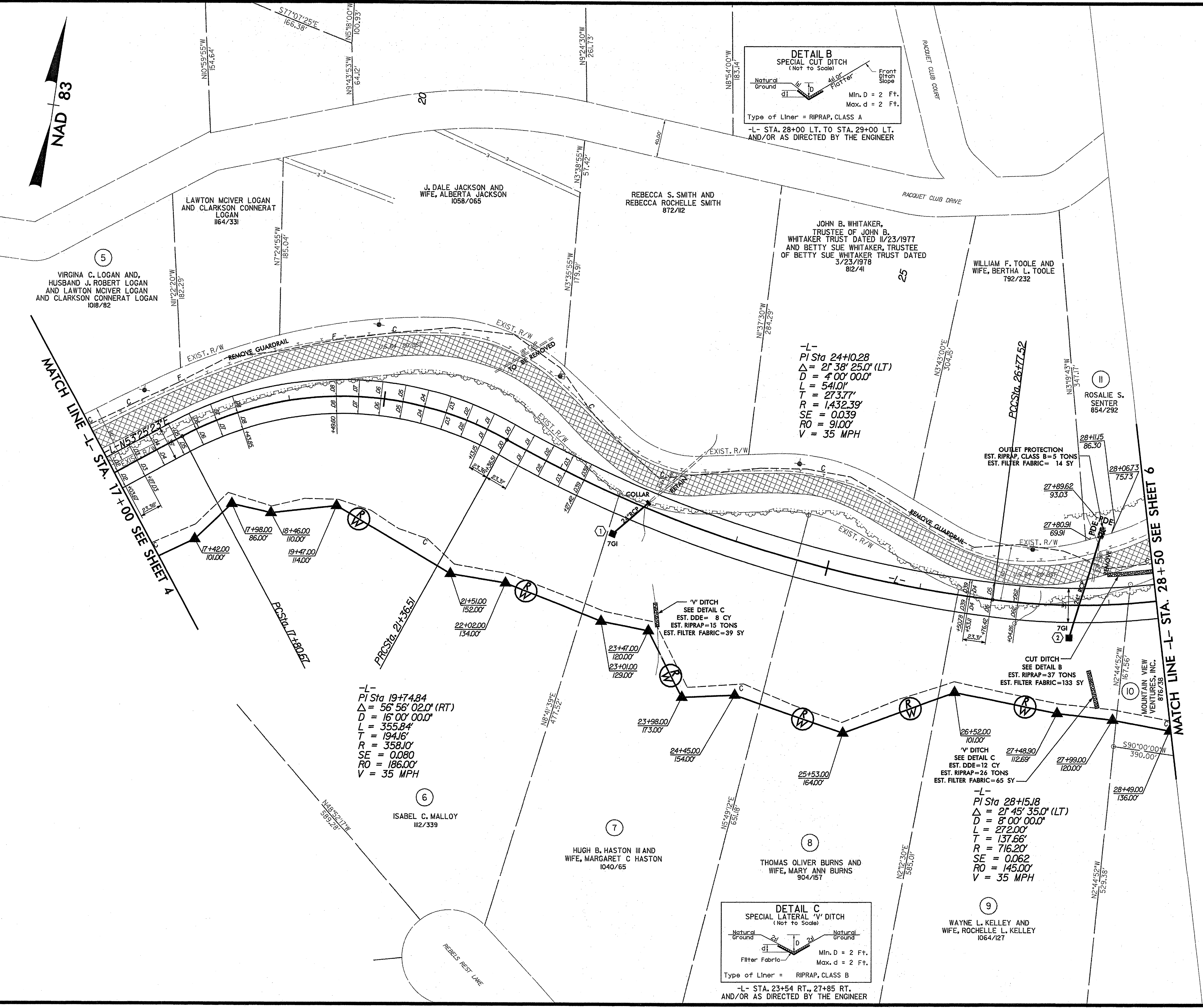
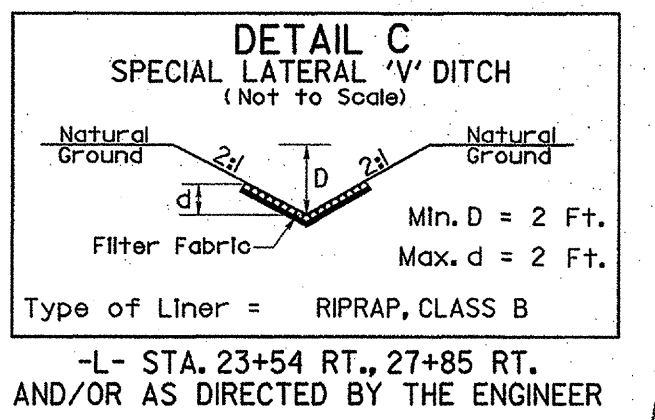
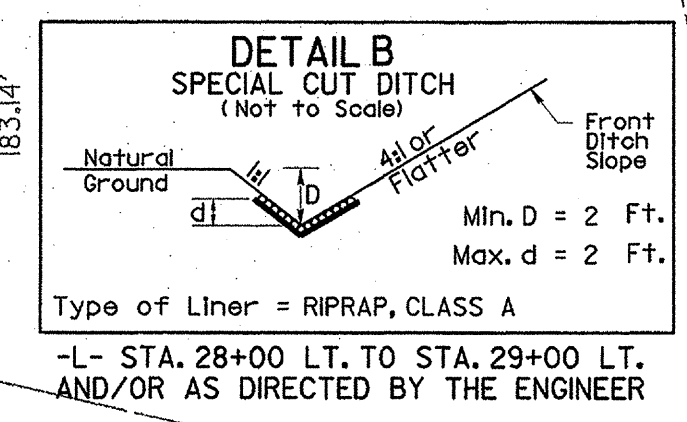
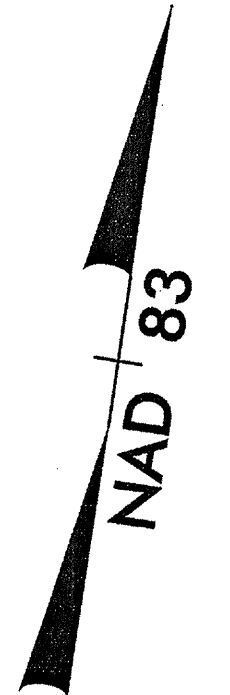


NOTE:  
UTILITY CONFLICTS AT THE BEGINNING AND END OF PROJECT SHALL BE TEMPORARILY RESOLVED AND THE LINES/POLES SHALL BE RECONSTRUCTED AFTER COMPLETION OF THE PROJECT. POLES NOTED ON THE SHEETS SHALL NOT BE DISTURBED BY THE CONTRACTOR.





FOR -L- LINE PROFILE SEE SHEET 8



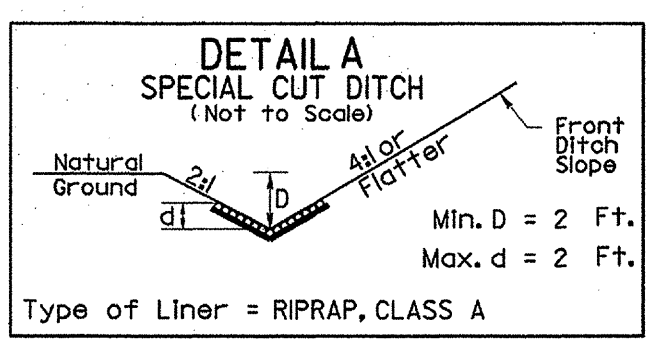
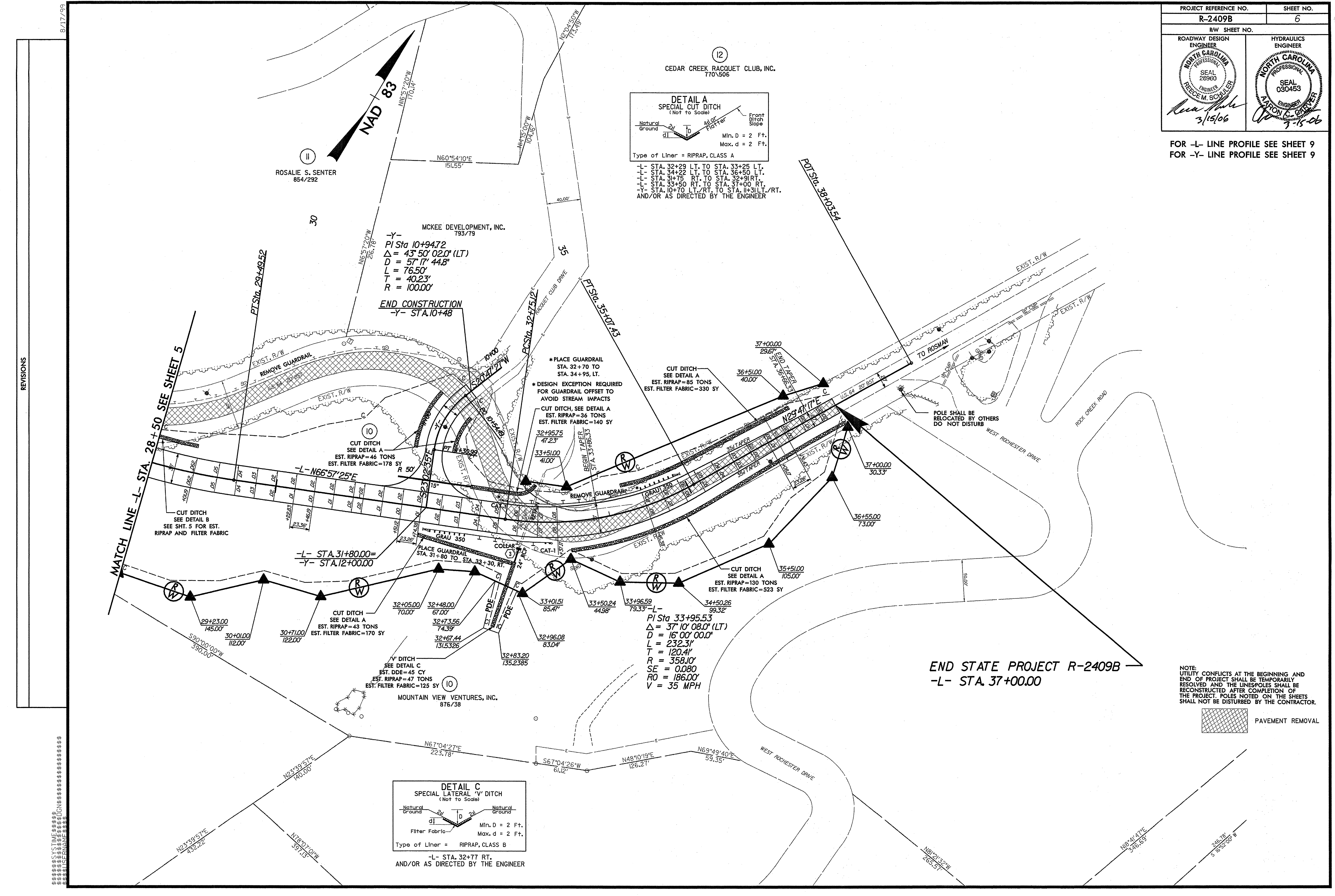
NOTE:  
UTILITY CONFLICTS AT THE BEGINNING AND END OF PROJECT SHALL BE TEMPORARILY RESOLVED AND THE LINES/POLES SHALL BE RECONSTRUCTED AFTER COMPLETION OF THE PROJECT. POLES NOTED ON THE SHEETS SHALL NOT BE DISTURBED BY THE CONTRACTOR.



REVISIONS

8/17/99

FOR -L- LINE PROFILE SEE SHEET 9  
FOR -Y- LINE PROFILE SEE SHEET 9

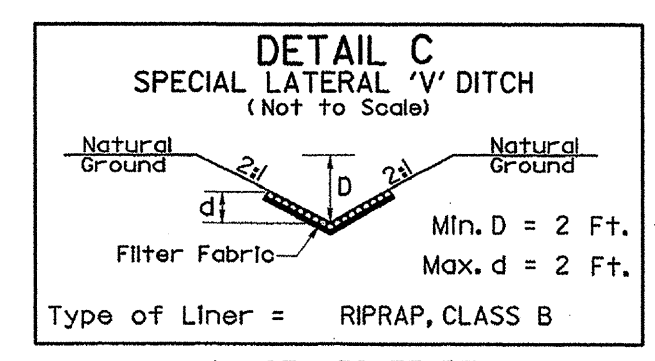


MCKEE DEVELOPMENT, INC.  
793/19

-Y-  
PI Sta 10+94.72  
 $\Delta = 43^\circ 50' 02.0''$  (LT)  
D = 57' 17" 44.8"  
L = 76.50'  
T = 40.23'  
R = 100.00'

**END CONSTRUCTION**  
-Y- STA. 10+48

PI Sta 33+95.53  
 $\Delta = 37^\circ 10' 08.0''$  (LT)  
D = 16' 00" 00.0"  
L = 232.31'  
T = 120.41'  
R = 358.10'  
SE = 0.080  
RO = 186.00'  
V = 35 MPH



NOTE:  
UTILITY CONFLICTS AT THE BEGINNING AND  
END OF PROJECT SHALL BE TEMPORARILY  
RESOLVED AND THE LINES/POLES SHALL BE  
RECONSTRUCTED AFTER COMPLETION OF  
THE PROJECT. POLES NOTED ON THE SHEETS  
SHALL NOT BE DISTURBED BY THE CONTRACTOR.



REVISIONS

8/17/99

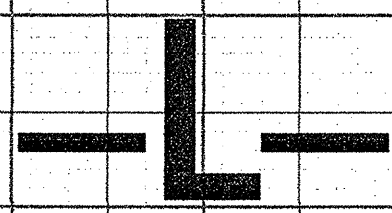
SYSTEMS  
SERVICES



5/14/05

3560  
3550  
3540  
3530  
3520  
3510  
3500  
3490  
3480  
3470  
3460  
3450  
3440  
3430  
3420  
3410  
3400  
3390  
3380  
3370  
3360

PROJECT REFERENCE NO. <b>R-2409B</b>	SHEET NO. <b>7</b>
ROADWAY DESIGN ENGINEER <b>FRANCE M. SCHULER</b> SEAL 26960 10/5/05	HYDRAULICS ENGINEER <b>ALAN R. CARTER</b> SEAL 030453 2-1-06



STA. 10+50.00 -L- BEGIN GRADE  
ELEV. 3,488.51

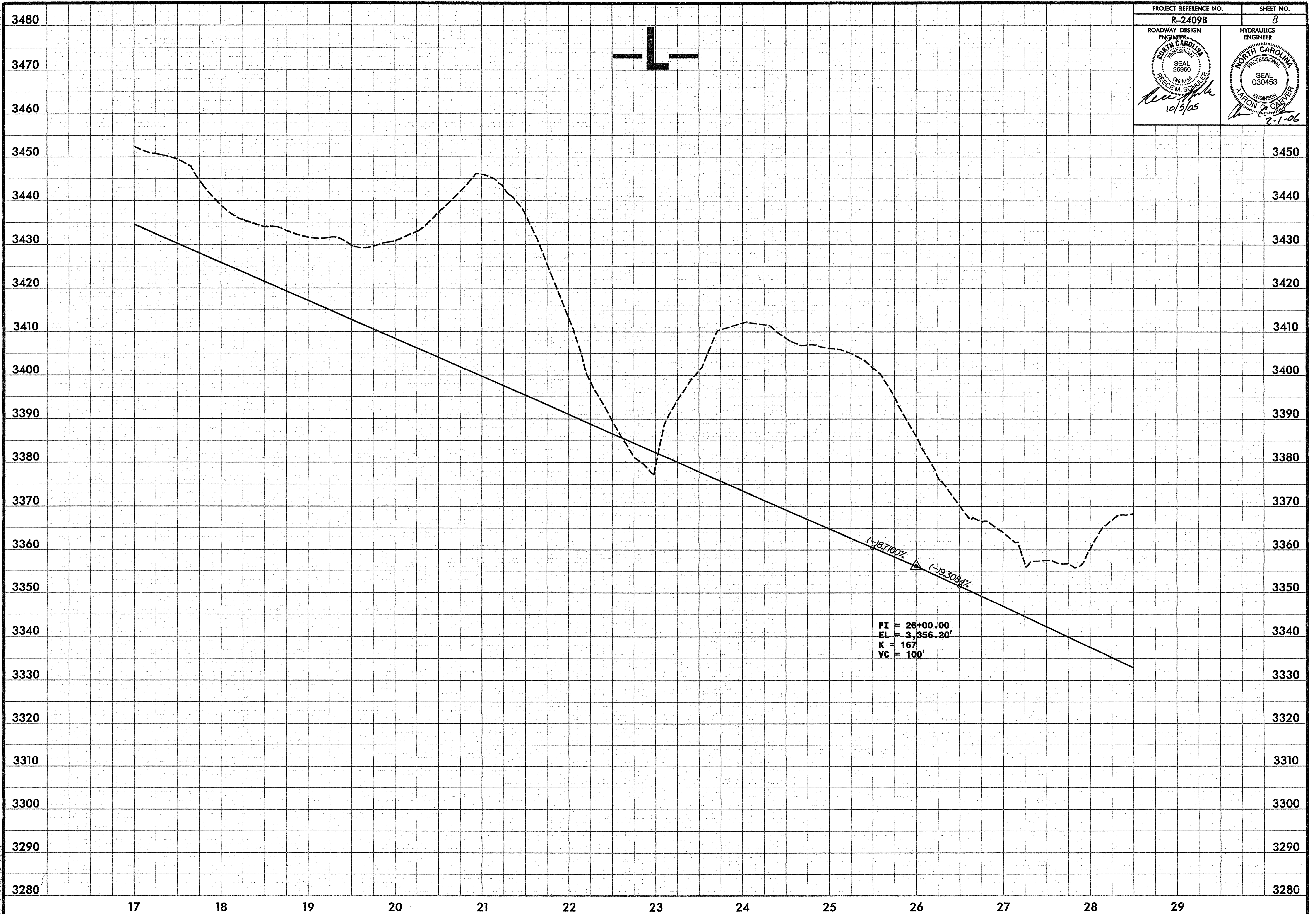
PI = 13+00.00  
EL = 3,469.43'  
K = 93  
VC = 100'

-1.6332%  
-1.67100%

3530  
3520  
3510  
3500  
3490  
3480  
3470  
3460  
3450  
3440  
3430  
3420  
3410  
3400  
3390  
3380  
3370  
3360

10 11 12 13 14 15 16 17

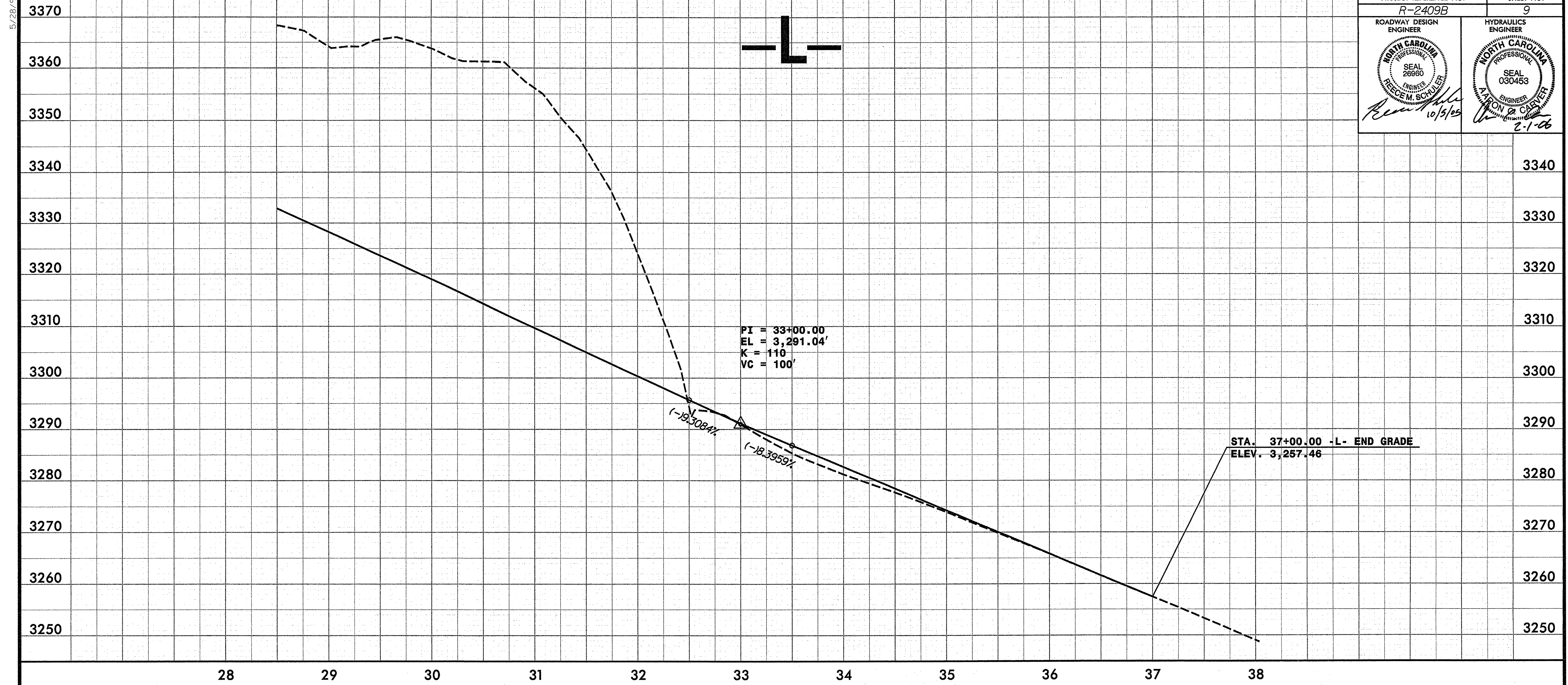




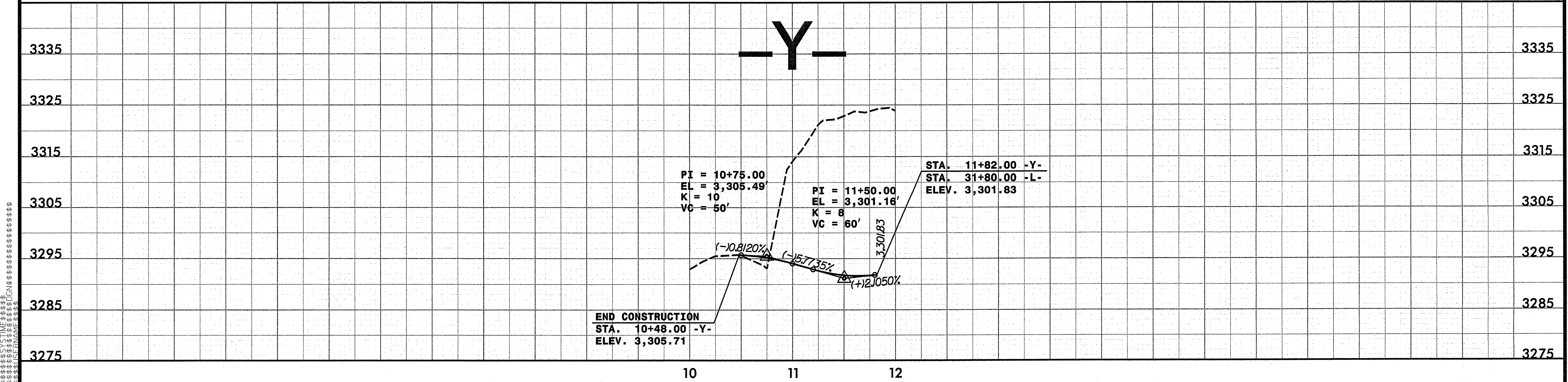
5/14/06



5/28/99



PROJECT REFERENCE NO. R-2409B	SHEET NO. 9
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 26960 WESLEY M. SCHLEIER 10/5/05	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 030453 J. W. CONNOR & COMPANY, INC. 2.1.06



5/28/99