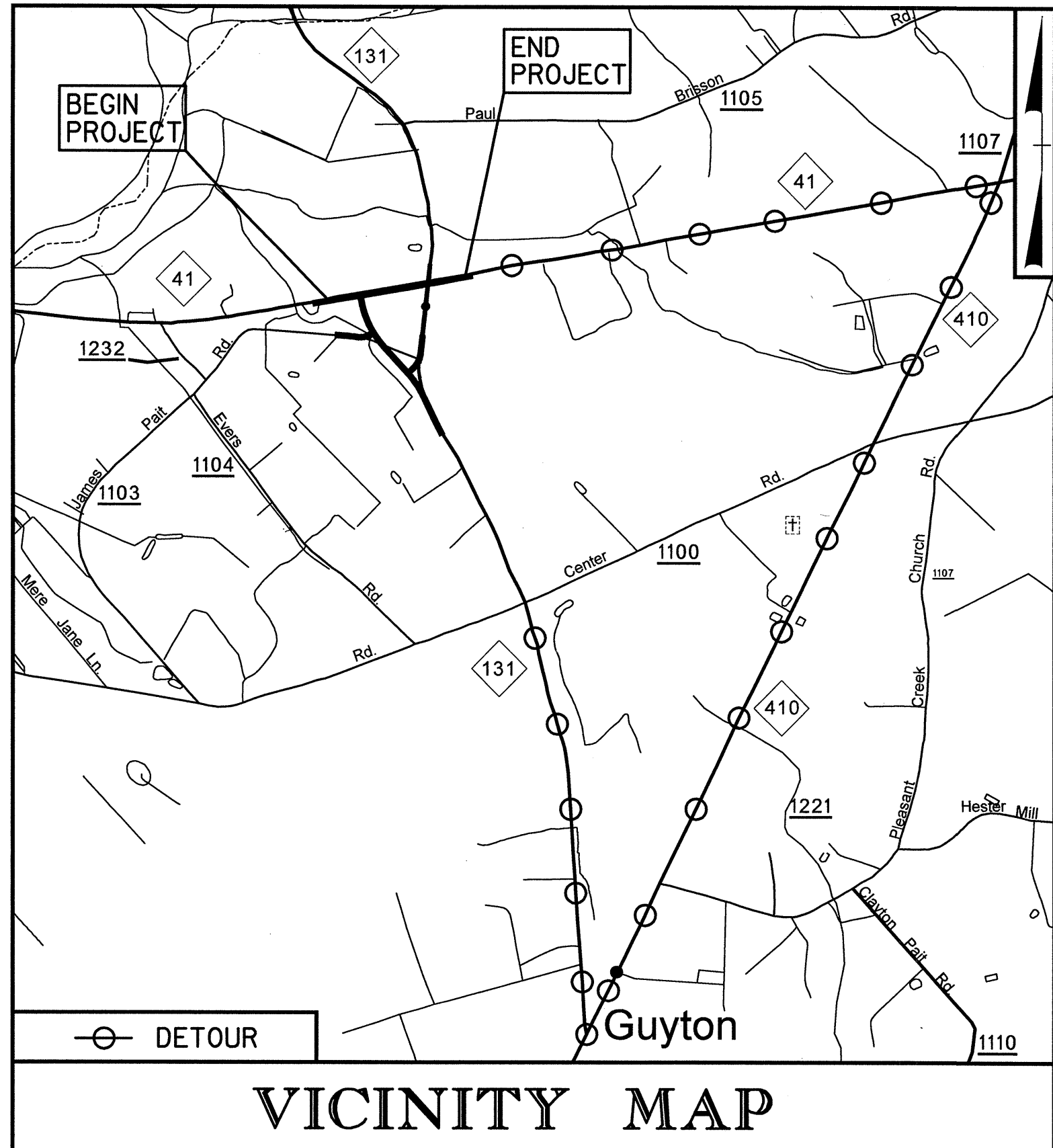


TIP PROJECT: W-5121

CONTRACT: C202614

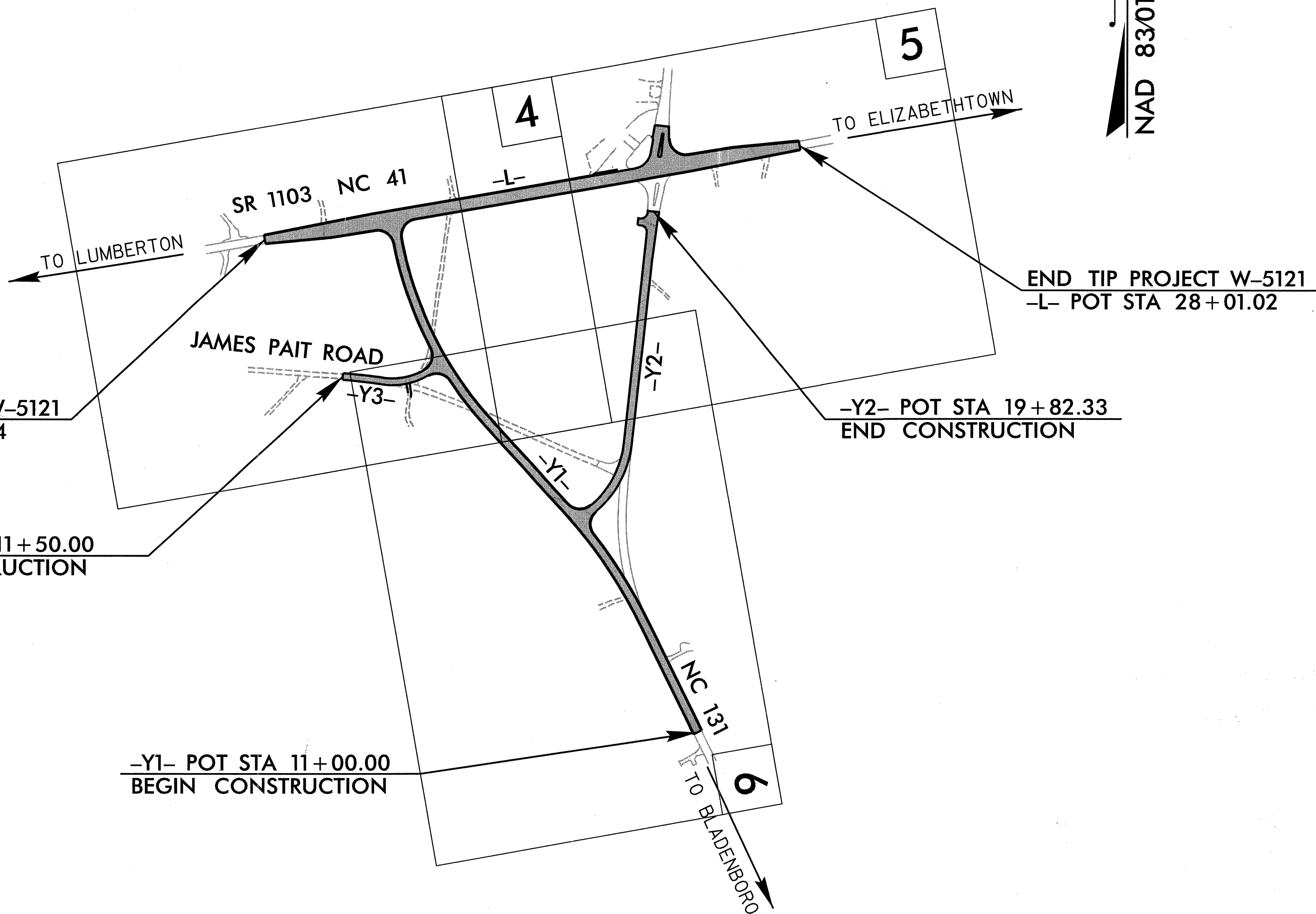
SEE SHEET I-B FOR CONVENTIONAL SYMBOLS



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
BLADEN COUNTY

LOCATION: NC 131 AT NC 41

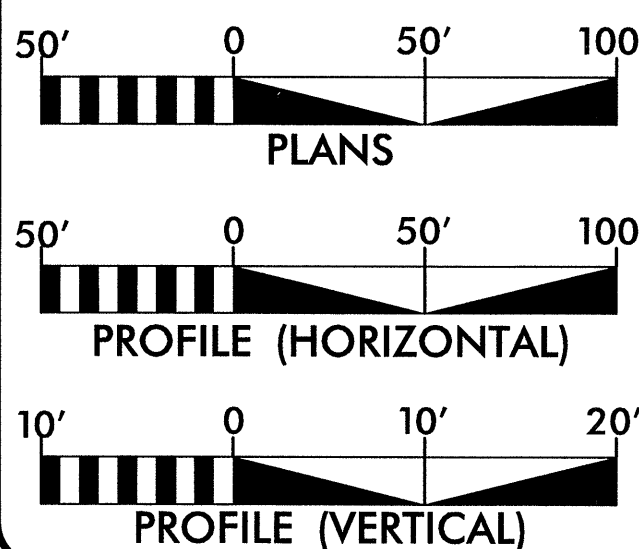
TYPE OF WORK: WIDENING, GRADING, PAVING, DRAINAGE,
SIGNING, AND REMOVAL OF FLASHING SIGNAL



NAD 8301 NC GRID

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5121	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
41885.1.1	STPHRR-004(28)	P.E.	
41885.2.1	STP-004(28)	R/W & UTIL.	
41885.3.1	STP-004(28)	CONSTR.	

GRAPHIC SCALES



DESIGN DATA

-L-
DS = 60 MPH

REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT W-5121 = 0.308 MILE
TOTAL LENGTH TIP PROJECT W-5121 = 0.308 MILE

ARCADIS

611 W. North Carolina St.
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448 License #C-1869

2006 STANDARD SPECIFICATIONS

WAZ ENGINEERING, P.C.

112 N. Main Street
Holly Springs, NC 27540
License #C-2826

ARCADIS CONTACT:

RW DATE:
7/26/09

LETTING DATE:
10/19/10

STEVE SMALLWOOD, P.E.
PROJECT ENGINEER

HYDRAULICS ENGINEER

Professional Seal for Andrew W. Howland, License #C-2826

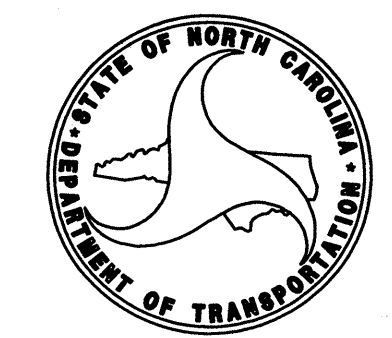
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

Professional Seal for Steven T. Smallwood, License #C-2826

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



STATE HIGHWAY DESIGN ENGINEER

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

Table listing symbols for boundaries and property: State Line, County Line, Township Line, City Line, Reservation Line, Property Line, Existing Iron Pin, Property Corner, Parcel/Sequence Number, 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:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for railroads: Standard Gauge, RR Signal Milepost, Switch, RR Abandoned, RR Dismantled.

RIGHT OF WAY:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for gas: Gas Valve, Gas Meter, Recorded U/G Gas Line, Designated U/G Gas Line (S.U.E.*), Above Ground Gas Line.

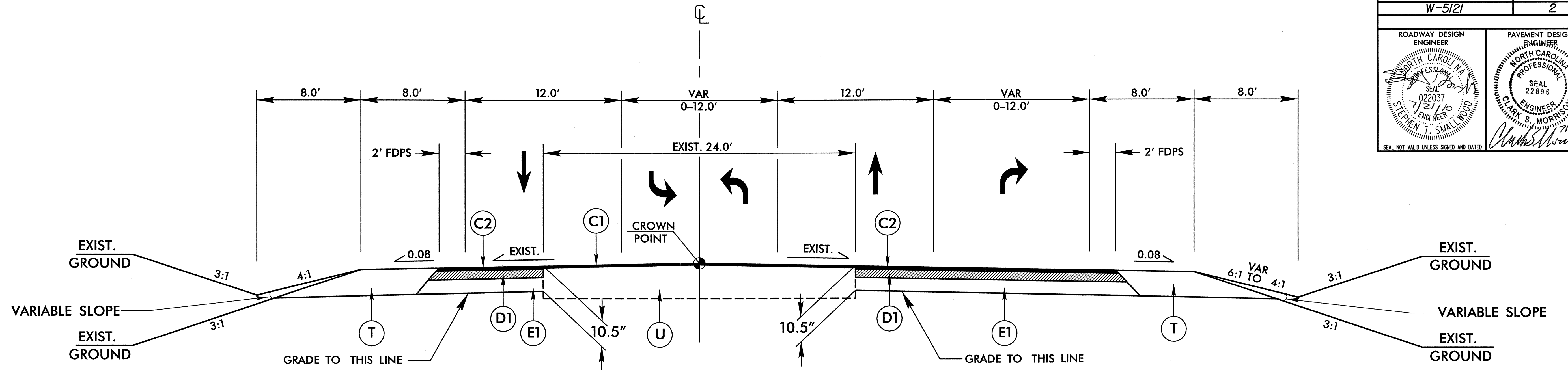
SANITARY SEWER:

Table listing symbols for 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:

Table listing symbols for 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, End of Information.

PROJECT REFERENCE NO. W-5121	SHEET NO. 2
ROADWAY DESIGN ENGINEER SEAL 022037 7/21/10 STEPHEN T. SMALL	PAVEMENT DESIGN ENGINEER SEAL 22896 7/26/10 CLARK S. MORRISON



TYPICAL SECTION NO. 1

STA. 11+76.34 TO STA. 28+01.00 -L-

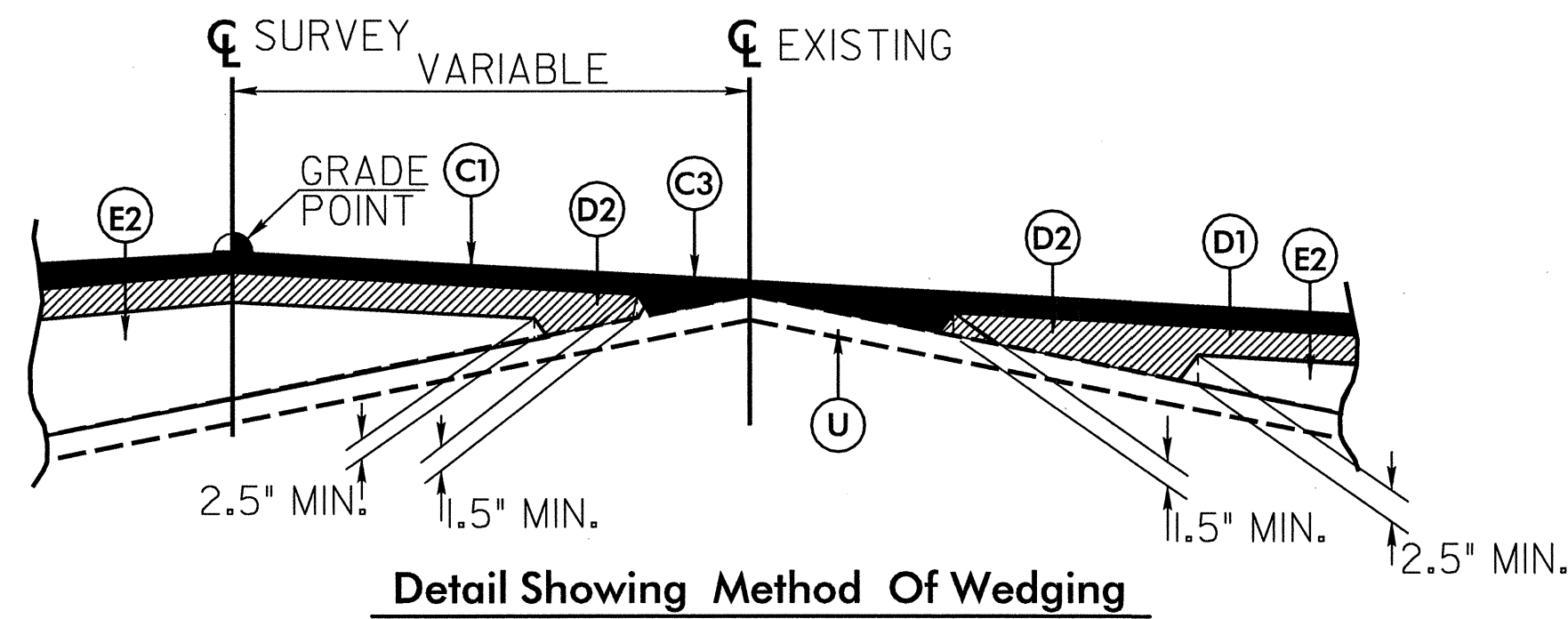
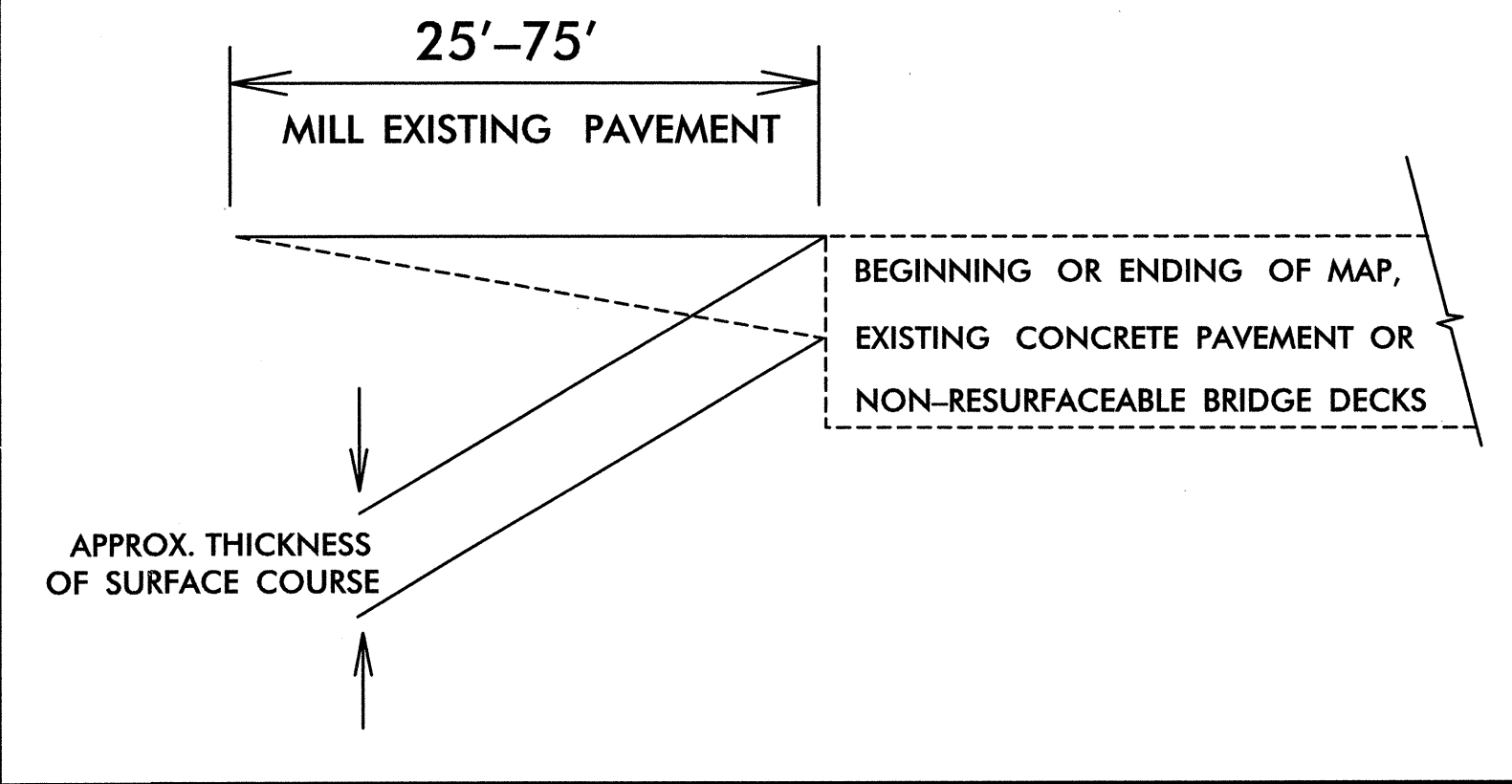
MILLING AT PAVEMENT TIE-INS

NOTES TO CONTRACTOR

For surface mixes over 1" in thickness, mill the existing pavement in accordance with the following sketch as directed by the Engineer.

Locations shall include ties into existing concrete pavement, at bridge approaches where the bridge will not be resurfaced, and at the beginning and ending point of each resurfacing map.

Perform the work in accordance with Section 607 of the January 2006 North Carolina Department of Transportation Standard Specifications for Roads and Structures. Resurfacing will be accomplished at the same time as the milling operation.



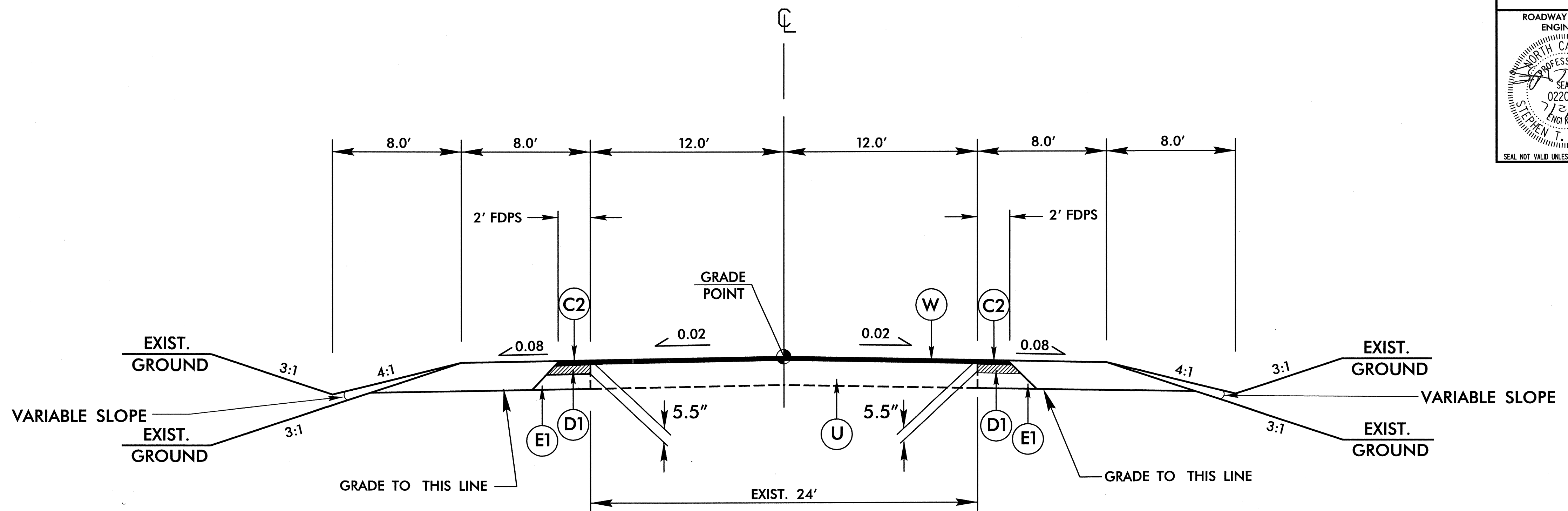
CODE	PAVEMENT SCHEDULE
C1	PROP. APPROX. 1.5" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3.0" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONC. SURFACE 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 LESS THAN 1.5" OR GREATER THAN 2".
D1	PROP. APPROX. 2.5" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED LESS THAN 2.5" OR GREATER THAN 4".
E1	PROP. APPROX. 5.0" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED LESS THAN 3" OR GREATER THAN 5.5".
J	10" AGGREGATE BASE COURSE
P	PRIME COAT
U	EXISTING PAVEMENT
T	EARTH MATERIAL
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

5/14/99
 TYPICAL SECTION NO. 1
 STA. 11+76.34 TO STA. 28+01.00 -L-

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5/14/99

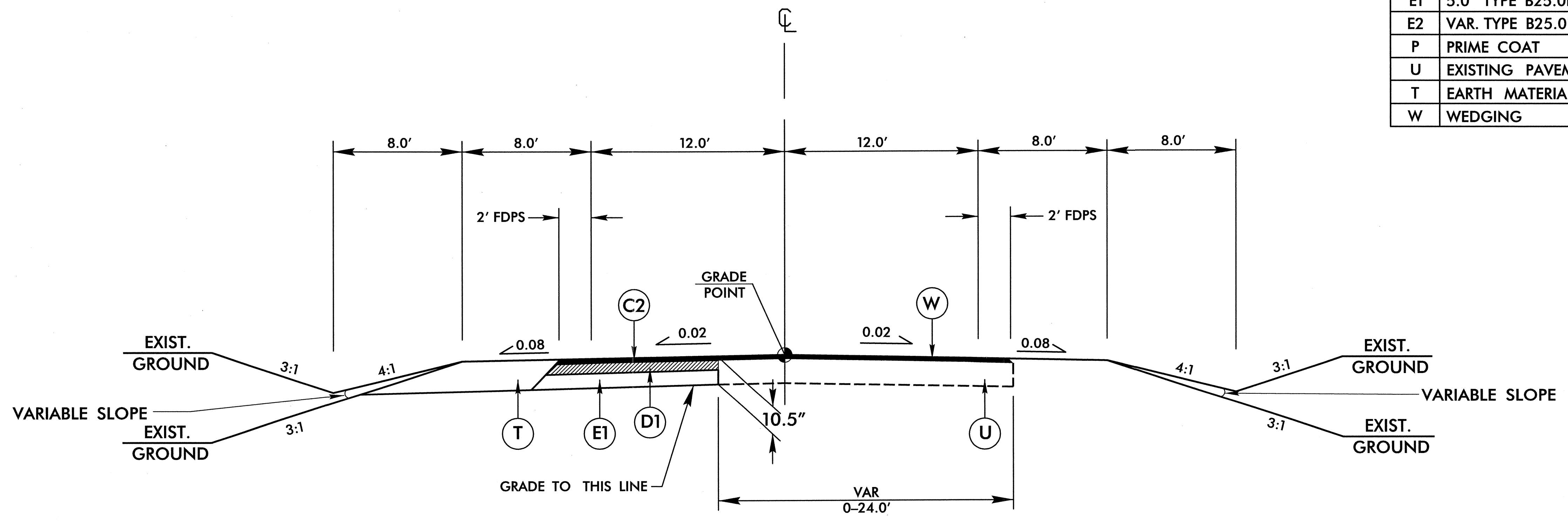
PROJECT REFERENCE NO. W-5121	SHEET NO. 2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER STEPHEN T. SMALL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022037 7/31/00	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 1/30/00



TYPICAL SECTION NO. 2

STA. 11+00.00 TO STA. 14+69.46 -Y1-

PAVEMENT SCHEDULE	
C1	1.5" TYPE S9.5B
C2	3.0" TYPE S9.5B
C3	VAR. TYPE S9.5B
D1	2.5" TYPE 119.0B
D2	VAR. TYPE 119.0B
E1	5.0" TYPE B25.0B
E2	VAR. TYPE B25.0B
P	PRIME COAT
U	EXISTING PAVEMENT
T	EARTH MATERIAL
W	WEDGING



TYPICAL SECTION NO. 3

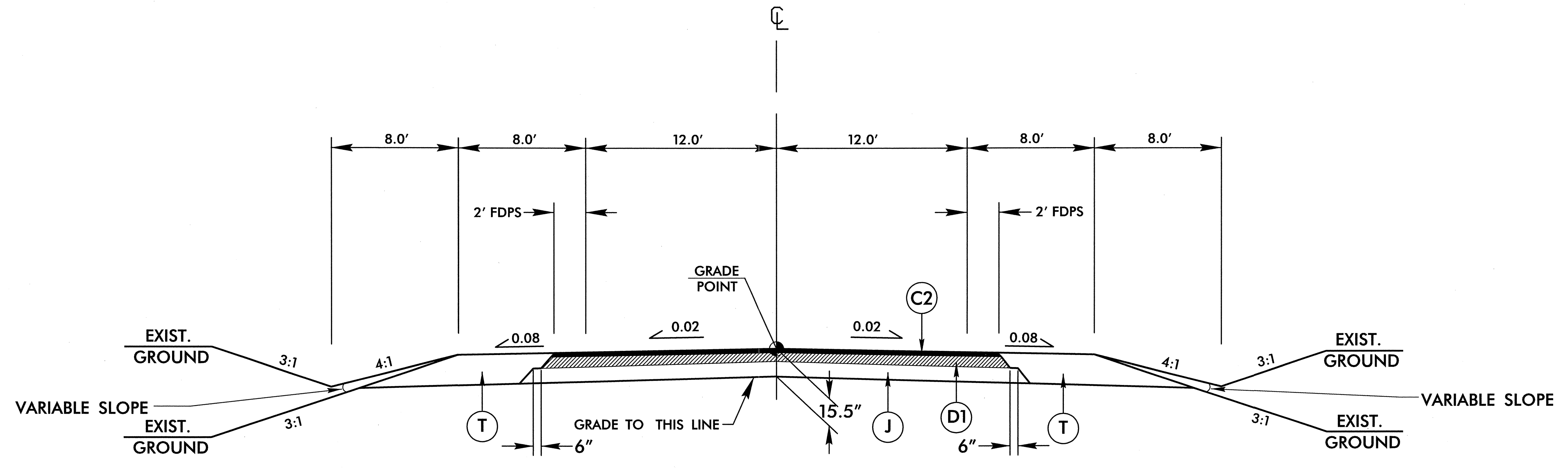
STA. 14+69.46 TO STA. 16+05.00 -Y1-

SYSTEMS DESIGN
 CONSULTANTS
 INC.
 1000 W. GARDNER ST.
 RAYLEIGH, NC 27601
 TEL: 919-851-1000
 FAX: 919-851-1001
 WWW: WWW.SDCI.COM

C:\pavement\0303\W5121.RD7 TYP.DWG 7/27/2010 3:14:09 PM

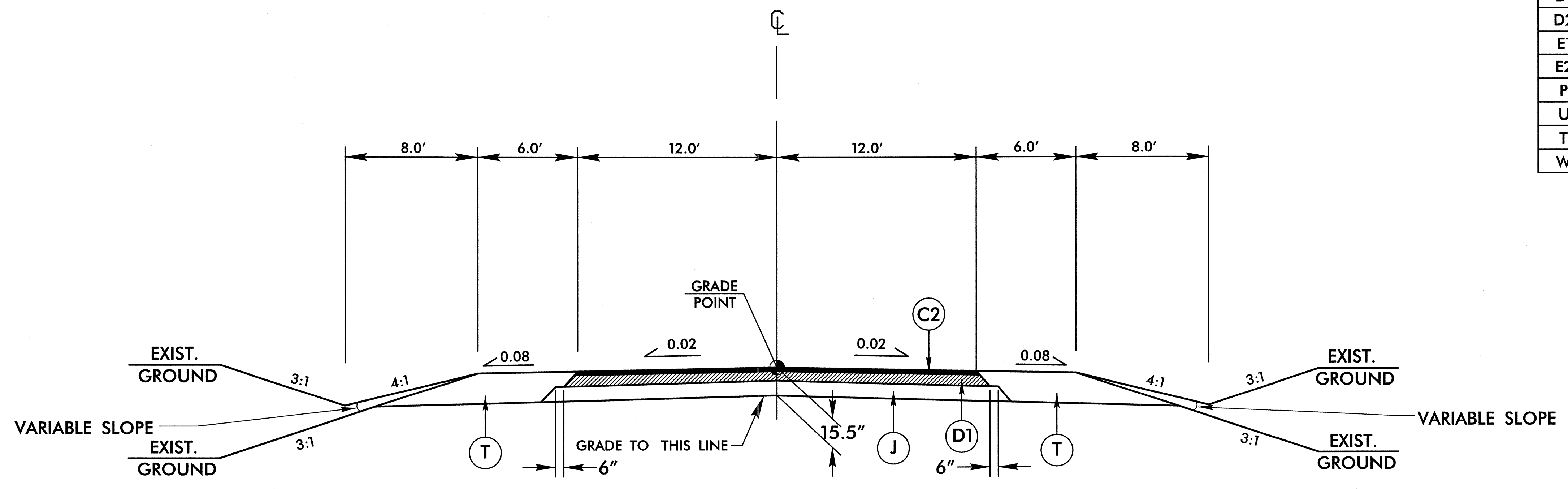
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PROJECT REFERENCE NO. W-5121	SHEET NO. 2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER STEPHEN T. SMALL SEAL 022037 7/21/10	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 7/30/10



TYPICAL SECTION NO. 4
STA. 16+05.00 TO STA. 28+60.00 -Y1-

PAVEMENT SCHEDULE	
C1	1.5" TYPE S9.5B
C2	3.0" TYPE S9.5B
C3	VAR. TYPE S9.5B
D1	2.5" TYPE 119.0B
D2	VAR. TYPE 119.0B
E1	5.0" TYPE B25.0B
E2	VAR. TYPE B25.0B
P	PRIME COAT
U	EXISTING PAVEMENT
T	EARTH MATERIAL
W	WEDGING



TYPICAL SECTION NO. 5
STA. 10+58.00 TO STA. 11+72.00 -Y2-

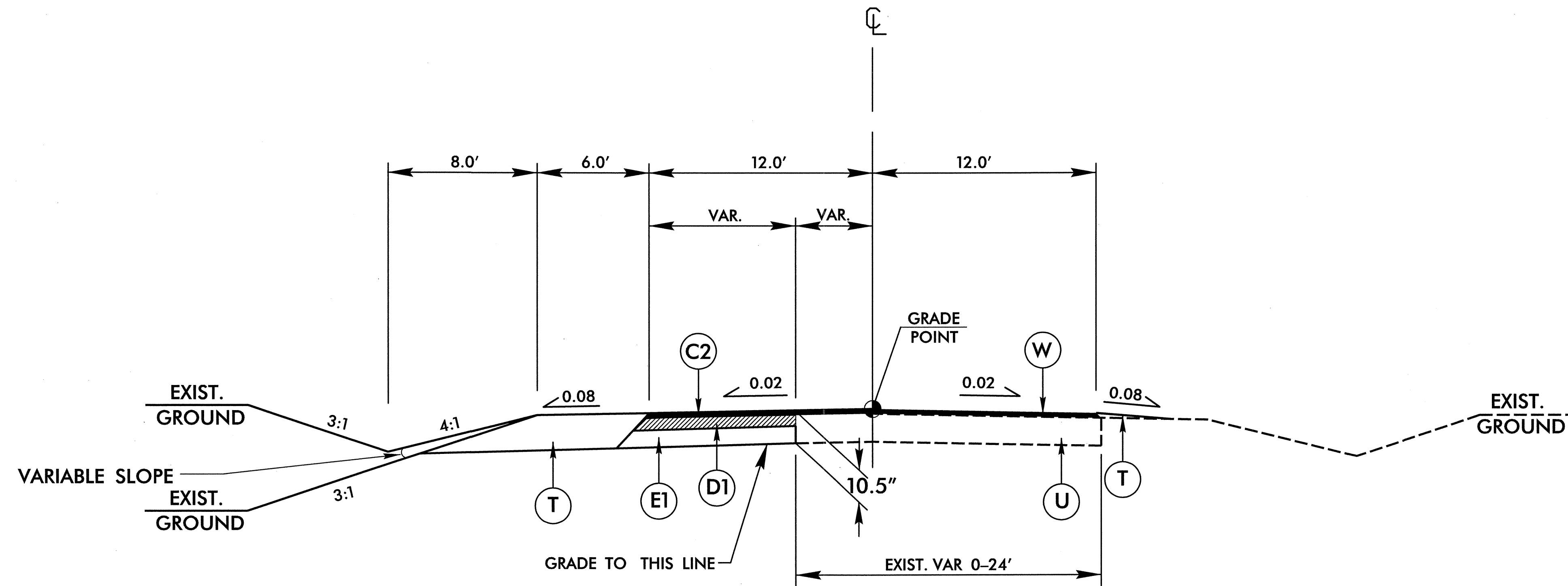
SYSTEMS DESIGN
 CONSULTANTS
 INC.

7/21/2010 3:14:09 PM

5/14/99

PROJECT REFERENCE NO. W-5121	SHEET NO. 2C
RW SHEET NO.	
ROADWAY DESIGN ENGINEER STEPHEN T. SMALL 7/2/10 022037 NORTH CAROLINA PROFESSIONAL ENGINEER	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON 7/30/10 22896 NORTH CAROLINA PROFESSIONAL ENGINEER

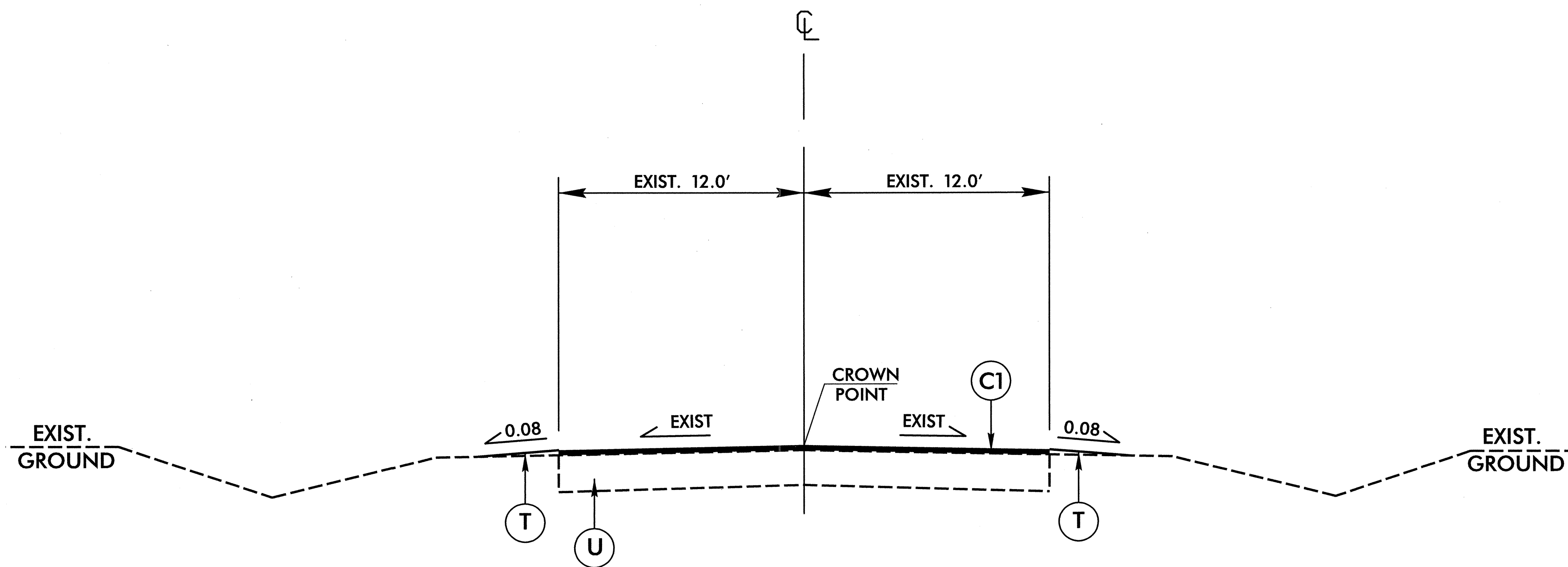
SEAL NOT VALID UNLESS SIGNED AND DATED



TYPICAL SECTION NO. 6

STA. 11+72.00 TO STA. 14+00.00 -Y2-

PAVEMENT SCHEDULE	
C1	1.5" TYPE S9.5B
C2	3.0" TYPE S9.5B
C3	VAR. TYPE S9.5B
D1	2.5" TYPE 119.0B
D2	VAR. TYPE 119.0B
E1	5.0" TYPE B25.0B
E2	VAR. TYPE B25.0B
P	PRIME COAT
U	EXISTING PAVEMENT
T	EARTH MATERIAL
W	WEDGING



TYPICAL SECTION NO. 7

STA. 14+00.00 TO STA. 19+82.33 -Y2-

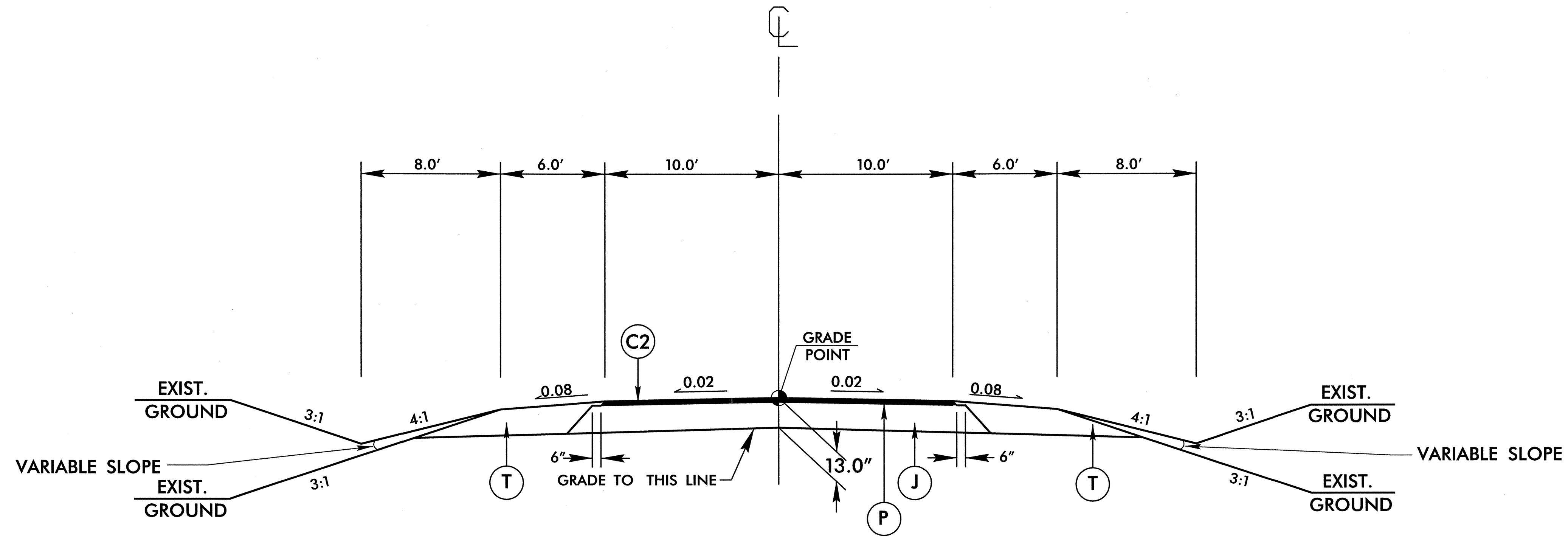
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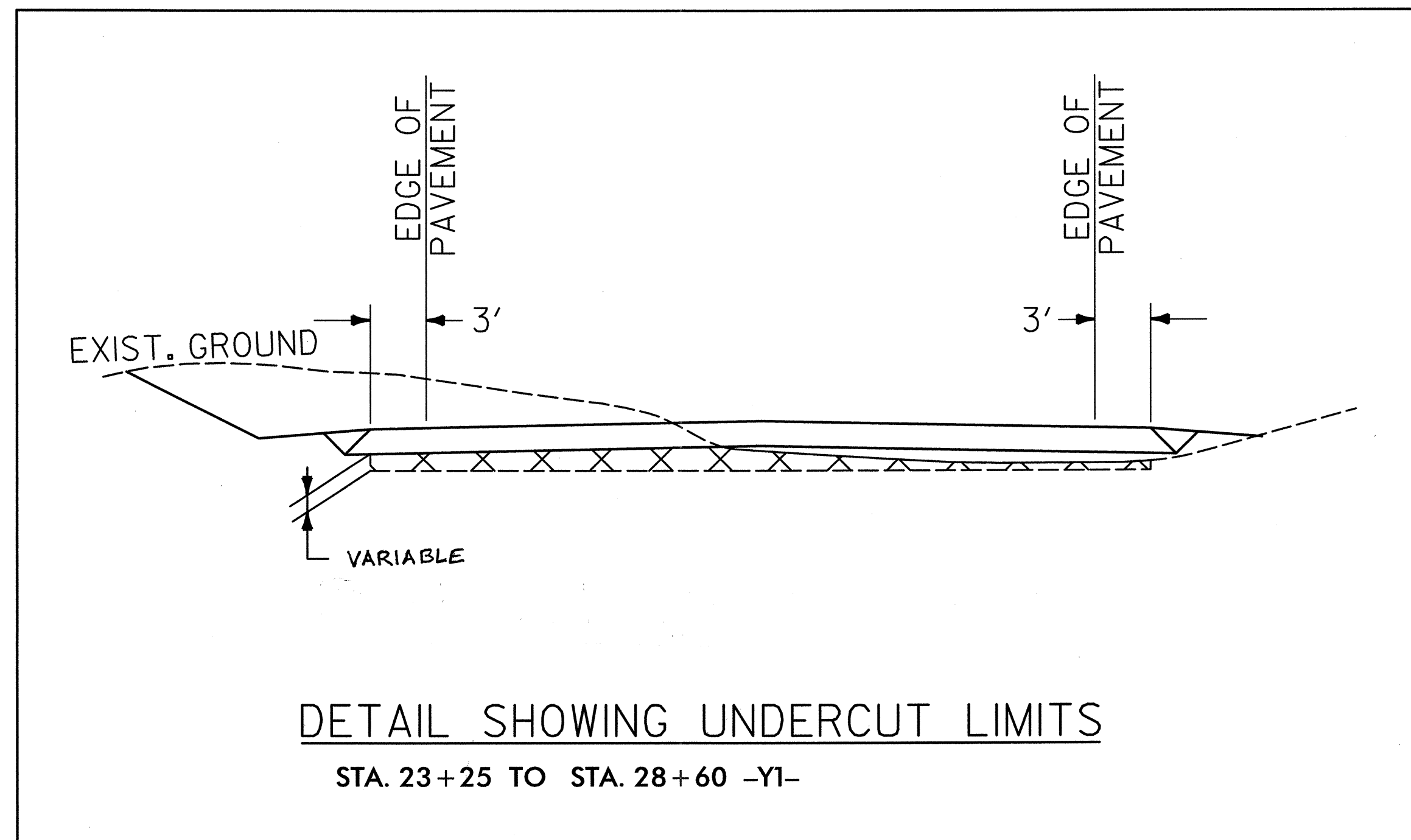
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PROJECT REFERENCE NO. W-5121	SHEET NO. 2D
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022037 7/12/10 STEPHEN T. SMALLWOOD	PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22896 CLARK S. MORRISON 1/3/10

SEAL NOT VALID UNLESS SIGNED AND DATED



TYPICAL SECTION NO. 8
STA. 11+50.00 TO STA. 14+08.00 -Y3-



DETAIL SHOWING UNDERCUT LIMITS
STA. 23+25 TO STA. 28+60 -Y1-

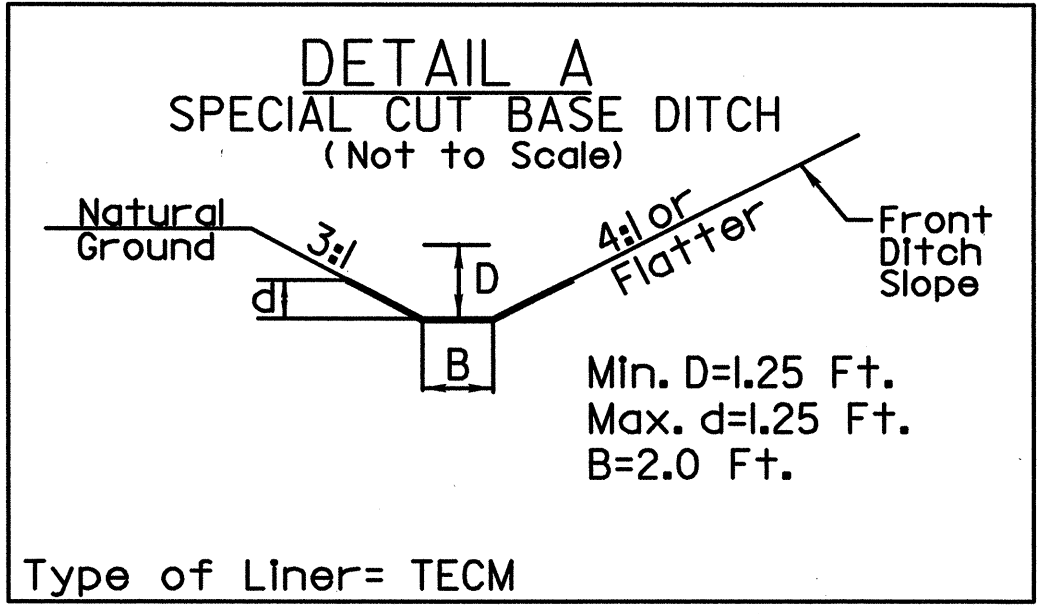
PAVEMENT SCHEDULE	
C1	1.5" TYPE S9.5B
C2	3.0" TYPE S9.5B
C3	VAR. TYPE S9.5B
D1	2.5" TYPE 119.0B
D2	VAR. TYPE 119.0B
E1	5.0" TYPE B25.0B
E2	VAR. TYPE B25.0B
P	PRIME COAT
U	EXISTING PAVEMENT
T	EARTH MATERIAL
W	WEDGING

SYSTEMS DESIGN
 1000 W. HARRIS STREET
 RAYLEIGH, NC 27601
 TEL: 919.487.1000
 FAX: 919.487.1001
 WWW.SDINC.COM

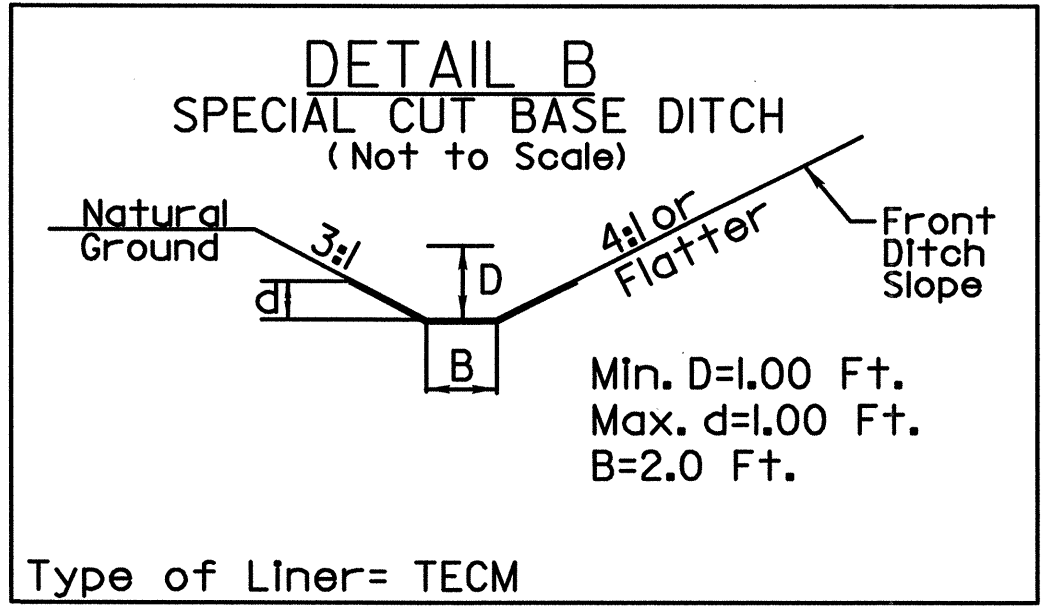
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5/14/99

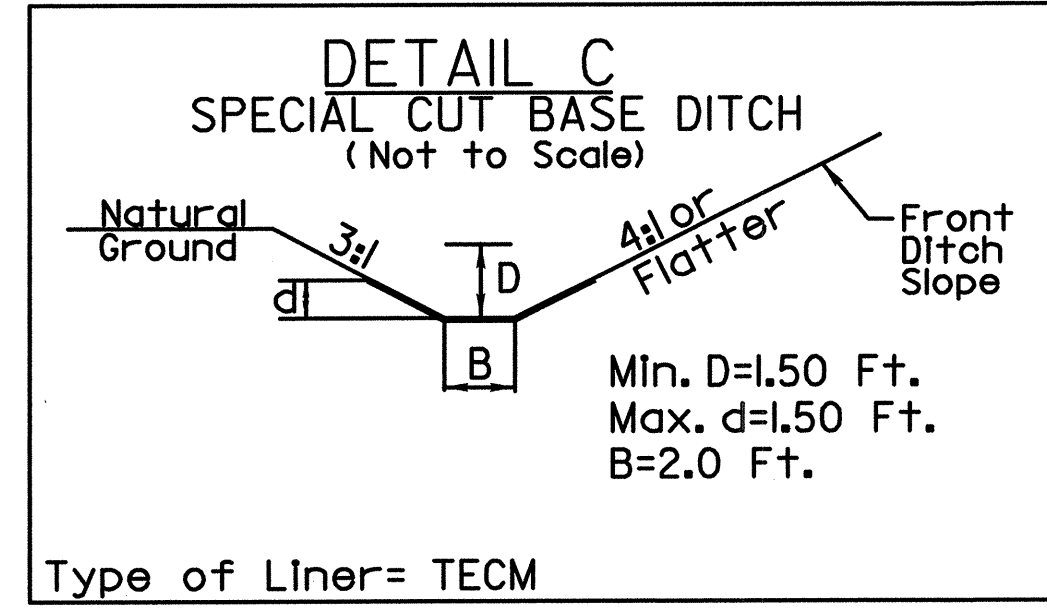
PROJECT REFERENCE NO. W-5121	SHEET NO. 2E
EROSION CONTROL ENGINEER	



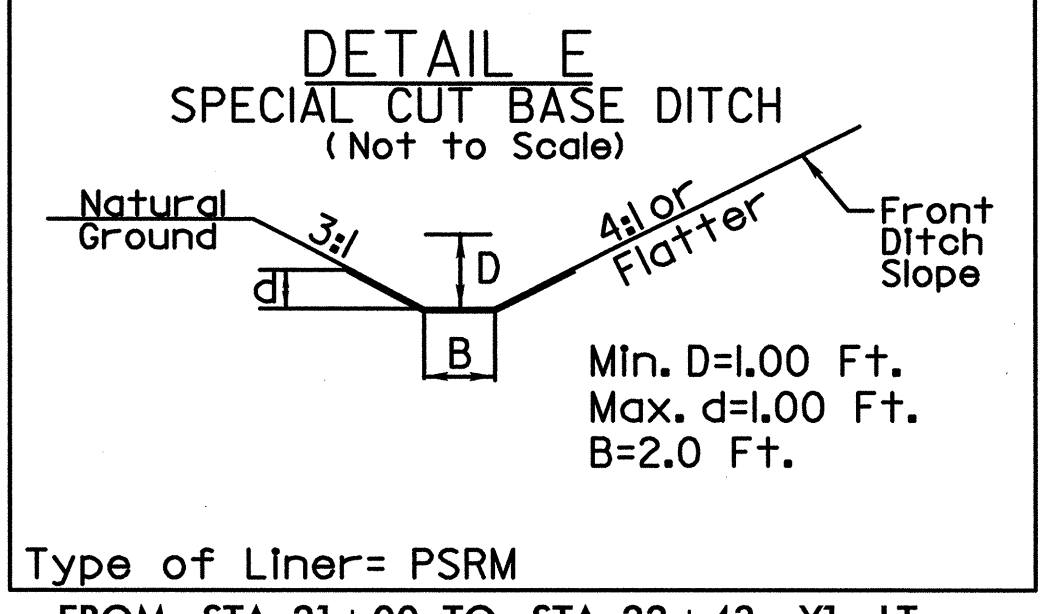
FROM STA. 16+12 TO STA. 17+50 -L- RT



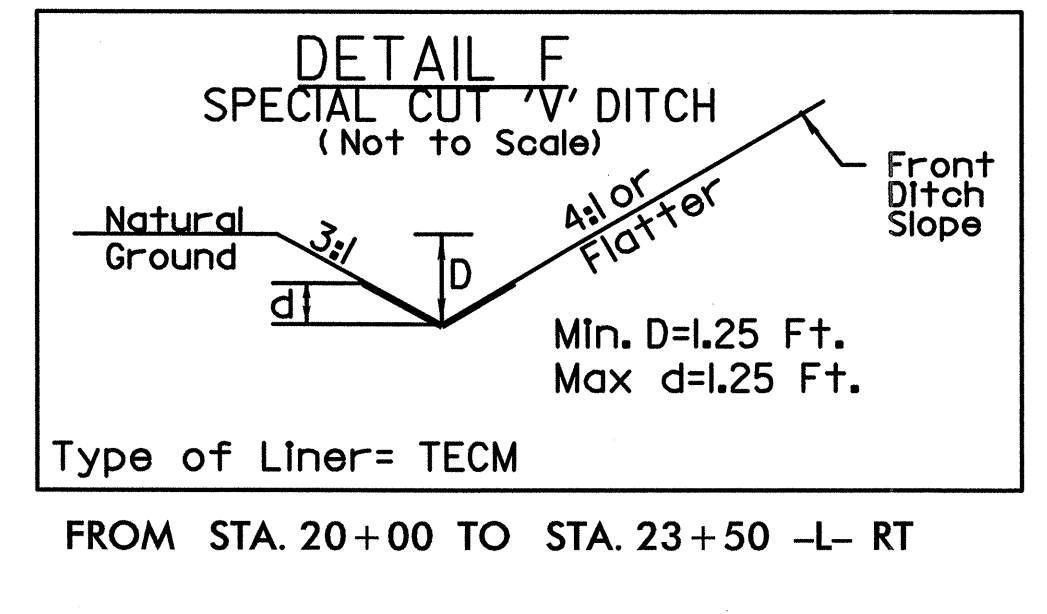
FROM STA. 11+50 TO STA. 15+00 -L- LT
FROM STA. 16+00 TO STA. 21+00 -Y1- LT



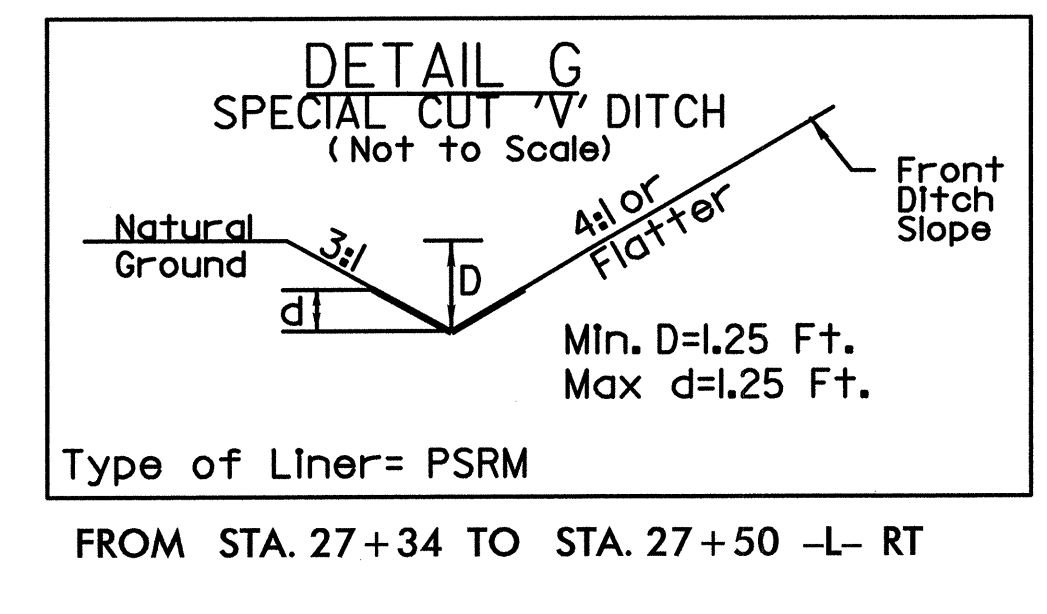
FROM STA. 26+13 TO STA. 26+88 -L- LT



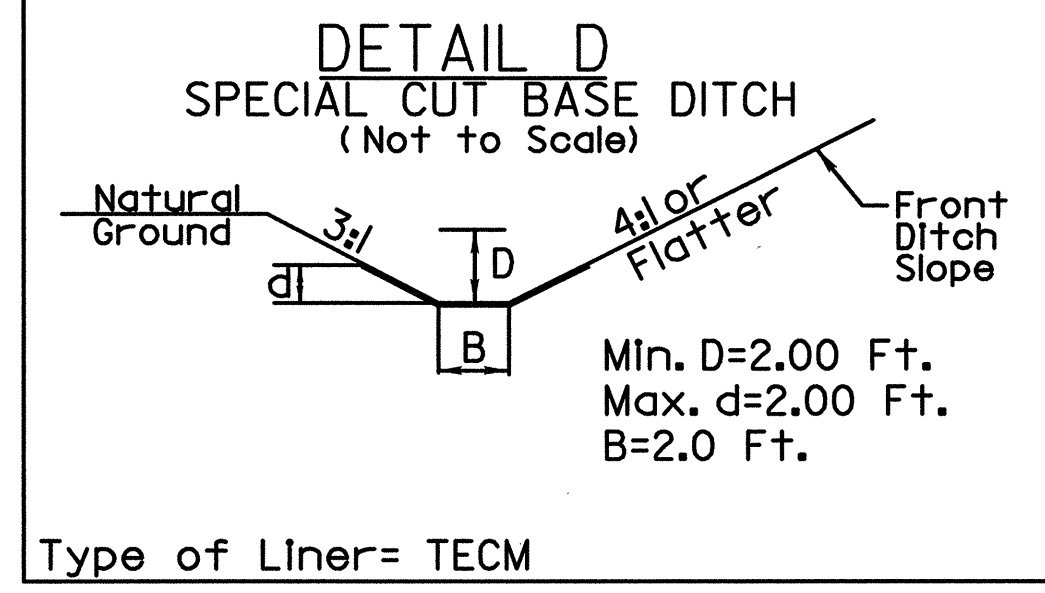
FROM STA. 21+00 TO STA. 22+43 -Y1- LT



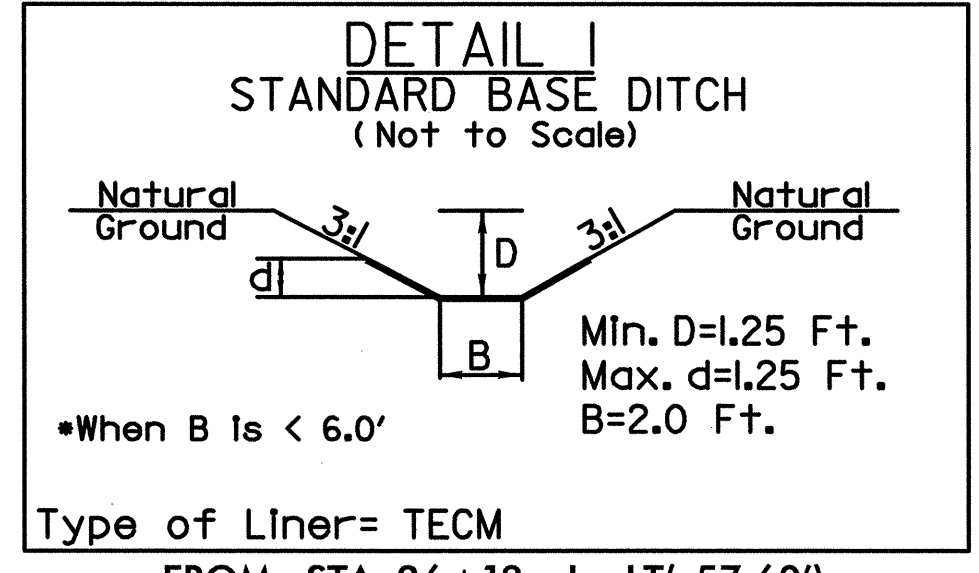
FROM STA. 20+00 TO STA. 23+50 -L- RT



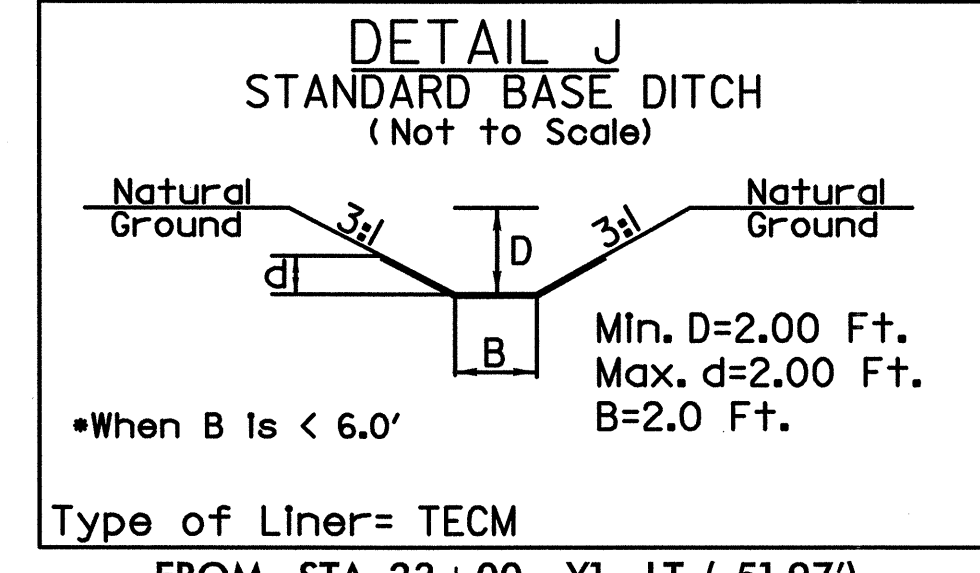
FROM STA. 27+34 TO STA. 27+50 -L- RT



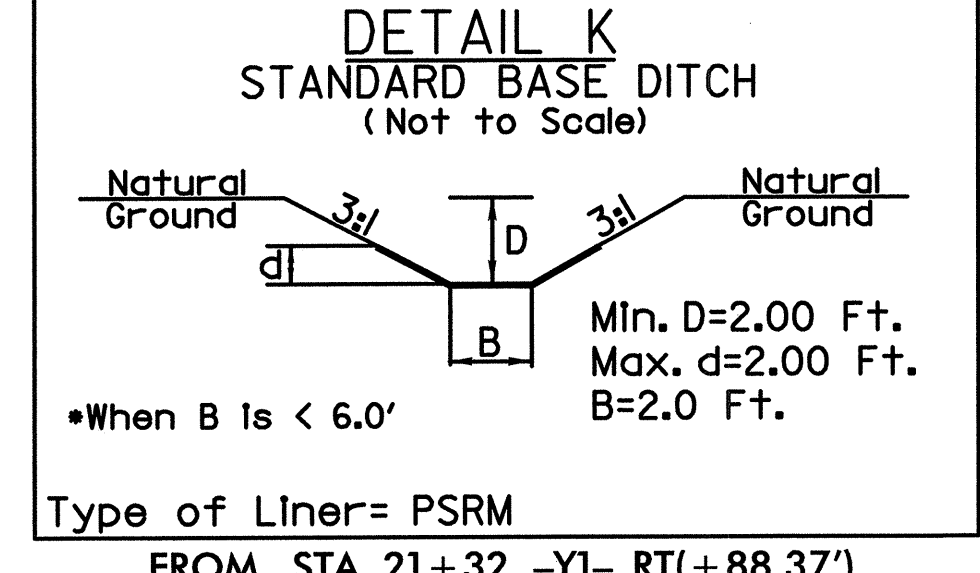
FROM STA. 11+50 TO STA. 15+18 -L- RT
FROM STA. 22+43 TO STA. 23+00 -Y1- LT



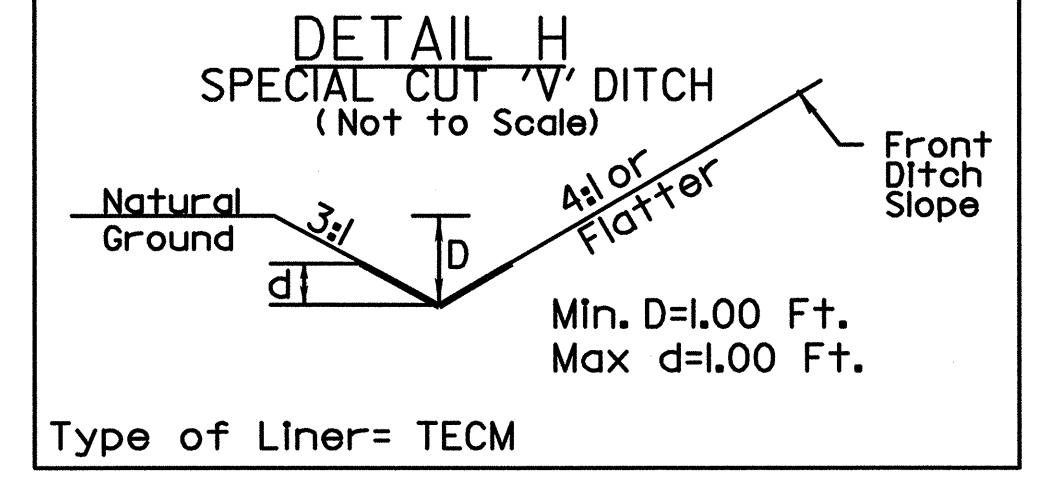
FROM STA. 26+13 -L- LT(-57.60')
TO STA. 25+68 -L- LT(-98.90')



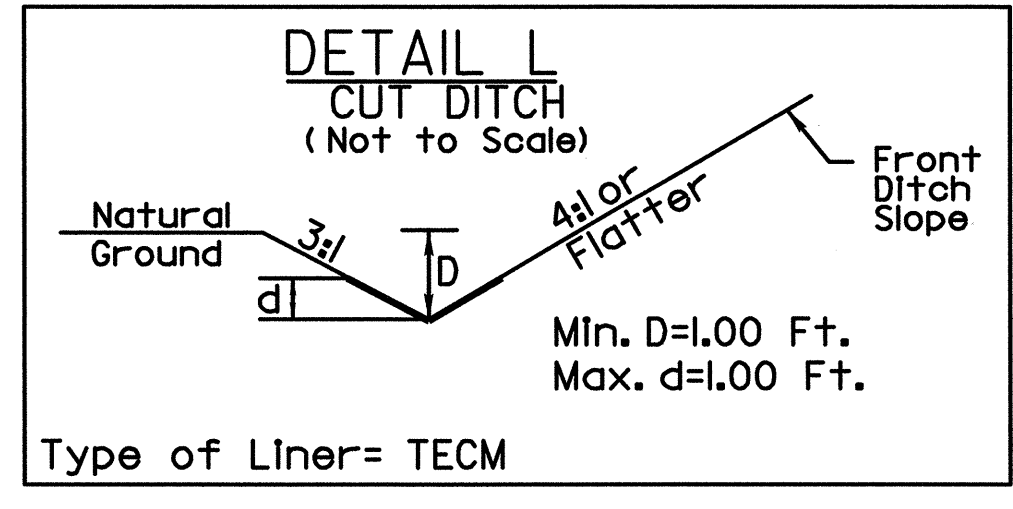
FROM STA. 23+00 -Y1- LT (-51.97')
TO STA. 13+76 -Y3- RT (+67.61')
FROM STA. 13+76 -Y3- (+67.61')
TO STA. 13+68 -Y3- (+34.88')



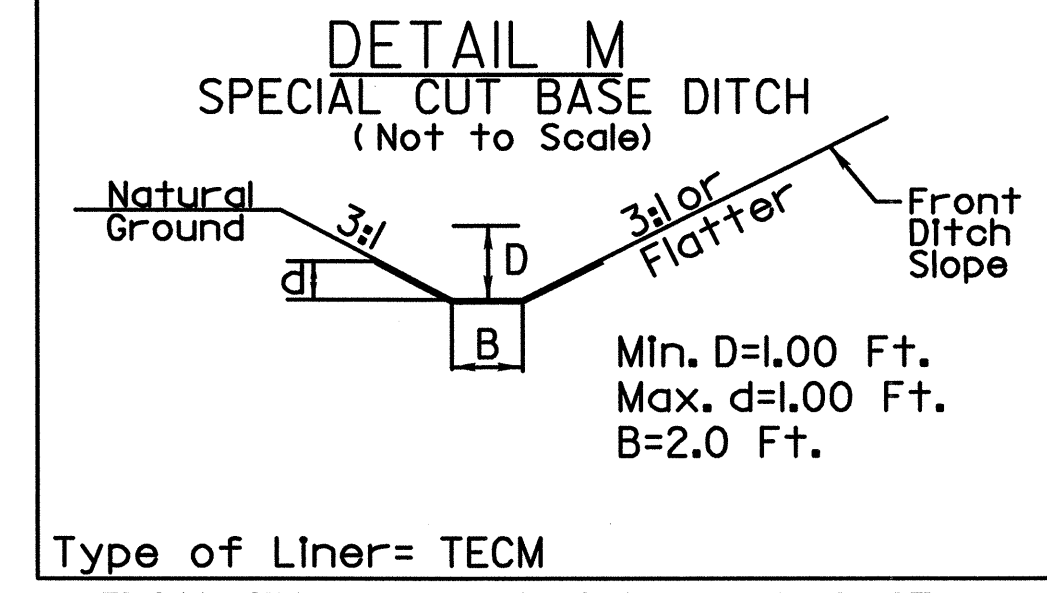
FROM STA. 21+32 -Y1- RT(+88.37')
TO STA. 22+02 -Y1- RT(+47.38')



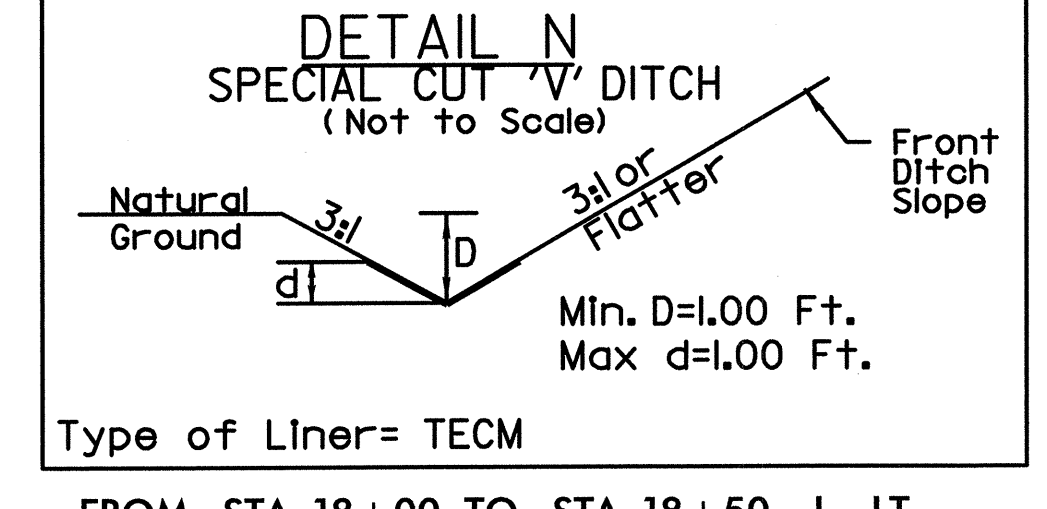
FROM STA. 18+50 TO STA. 21+50 -L- LT
FROM STA. 24+56 TO STA. 26+00 -L- LT
FROM STA. 26+88 TO STA. 28+50 -L- LT
FROM STA. 23+50 TO STA. 24+00 -L- RT
FROM STA. 25+00 TO STA. 25+20 -L- RT
FROM STA. 25+50 TO STA. 27+34 -L- RT
FROM STA. 12+00 TO STA. 16+00 -Y1- LT
FROM STA. 24+78 TO STA. 28+62 -Y1- LT
FROM STA. 11+00 TO STA. 17+93 -Y1- RT
FROM STA. 19+00 TO STA. 22+02 -Y1- RT
FROM STA. 22+02 TO STA. 23+00 -Y1- RT
FROM STA. 26+50 TO STA. 28+71 -Y1- RT
FROM STA. 10+50 TO STA. 12+28 -Y2- LT
FROM STA. 12+28 TO STA. 14+00 -Y2- LT
FROM STA. 19+00 TO STA. 20+50 -Y2- LT
FROM STA. 10+50 TO STA. 11+80 -Y2- RT
FROM STA. 11+80 TO STA. 14+00 -Y2- RT
FROM STA. 20+50 TO STA. 20+84 -Y2- RT
FROM STA. 09+50 TO STA. 11+50 -Y3- LT
FROM STA. 10+50 TO STA. 11+50 -Y3- RT
FROM STA. 12+50 TO STA. 13+30 -Y3- RT



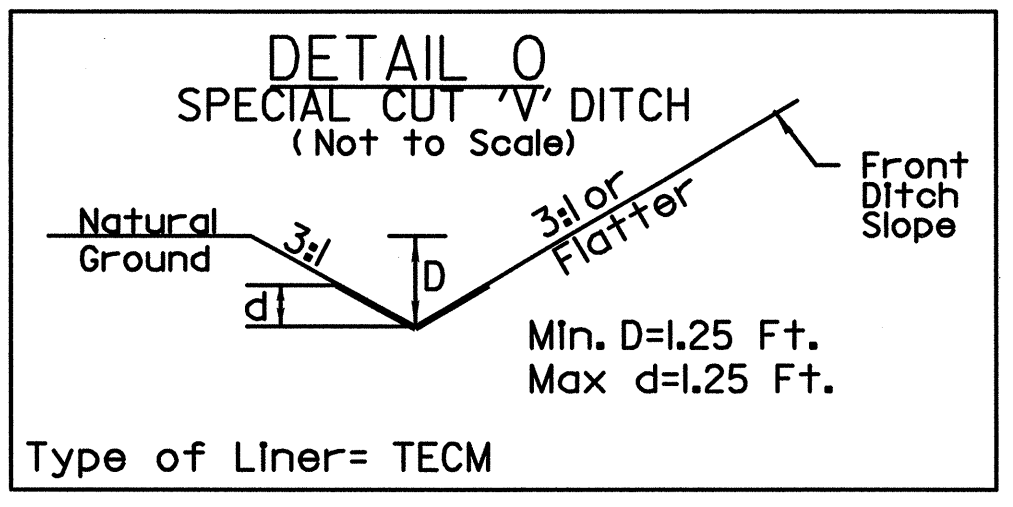
FROM STA. 11+50 TO STA. 12+00 -Y1- LT
FROM STA. 23+00 TO STA. 26+50 -Y1- RT
FROM STA. 11+50 TO STA. 13+00 -Y3- LT
FROM STA. 11+50 TO STA. 12+50 -Y3- RT



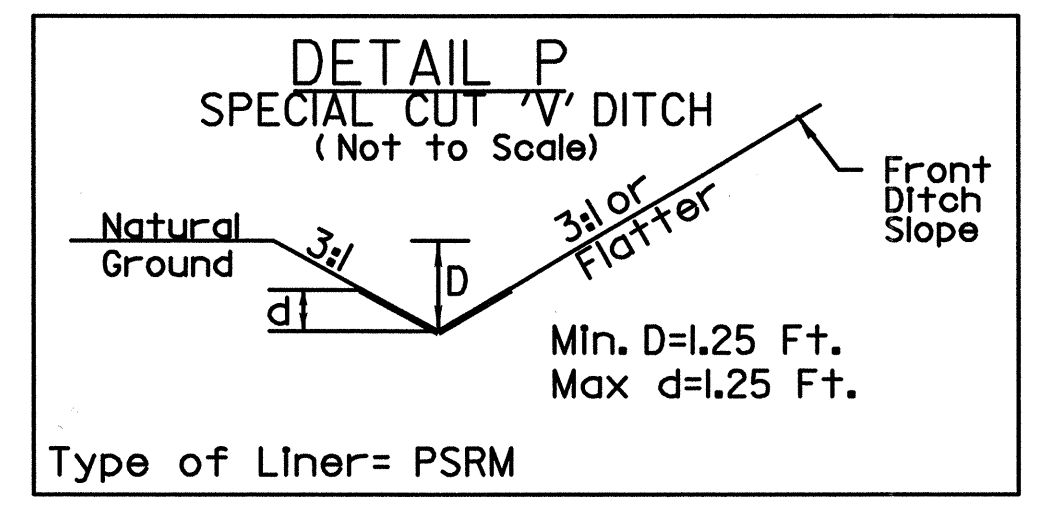
FROM STA. 15+00 TO STA. 18+00 -L- LT



FROM STA. 18+00 TO STA. 18+50 -L- LT
FROM STA. 24+58 TO STA. 25+00 -L- RT



FROM STA. 19+50 TO STA. 20+00 -L- RT



FROM STA. 24+00 TO STA. 24+58 -L- RT

STIMESHEET CONTROL

7/27/2010 3:14:12 PM

30-JUL-2009 08:48
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 jpowerton

5/14/99

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

7-06

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

FLEXIBLE PIPE

SHEET 1 OF 3
300D01

**NORMAL EARTH FOUNDATION
PIPE IN TRENCH**

**ROCK FOUNDATION
PIPE IN TRENCH**

**UNSUITABLE MATERIAL FOUNDATION
PIPE ABOVE GROUND**

**ROCK FOUNDATION
PIPE ABOVE GROUND**

**UNSUITABLE MATERIAL FOUNDATION
PIPE ABOVE GROUND**

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 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

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.

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

7-06

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

RIGID PIPE

SHEET 2 OF 3
300D01

**NORMAL EARTH FOUNDATION
PIPE IN TRENCH**

**ROCK FOUNDATION
PIPE IN TRENCH**

**UNSUITABLE MATERIAL FOUNDATION
PIPE ABOVE GROUND**

**ROCK FOUNDATION
PIPE ABOVE GROUND**

**UNSUITABLE MATERIAL FOUNDATION
PIPE ABOVE GROUND**

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 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

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.

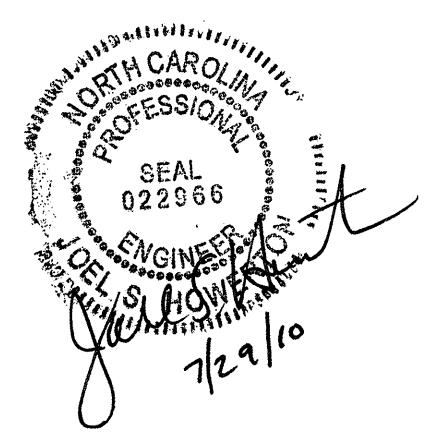
--- UNDISTURBED EARTH MATERIAL

--- SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

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

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ORIGINAL BY: K Kempf DATE: 5-15-09
 MODIFIED BY: [Signature] DATE: 7/29/09
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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

Diameter (Inches)	Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **				
	Minimum cover (Inches)	(Ga)	16	14	12
12	12	204	256	14	10
15	12	162	204	12	8
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
48	12	48	61	87	113
54	12	44	54	77	100
60	12	40	54	69	90
66	12	37	54	61	81
72	12	34	54	54	74
78	12	31	54	47	67
84	12	28	54	40	60

- HDPE - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"
- * (Maximum fill) 20' for pipe diameters ≤ 24" and ≤ 60"
- 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 LFRD Direct Design Method)

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

Diameter (Inches)	Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **				
	Minimum cover (Inches)	(Ga)	16	14	12
12	12	123	155	218	281
15	12	98	123	174	224
18	12	81	102	144	187
21	12	69	87	123	160
24	12	60	76	108	139
27	12	67	95	123	151
30	12	60	85	111	136
36	12	50	71	92	113
42	12	46	60	78	96
48	12	42	52	68	84
54	12	40	46	50	74
60	12	37	46	50	62
66	12	34	46	50	51
72	12	31	46	50	41

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- CSP - AASHTO M36
- CAAP - AASHTO M196
- HDPE - AASHTO M294
- PVC - ASTM F949 or AASHTO M304

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

STATE OF NORTH CAROLINA
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 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: Kkempf DATE: 6-15-09
 MODIFIED BY: [Signature] DATE: 7/30/09
 CHECKED BY: [Signature] DATE: 7/30/09
 FILE SPEC: /ericgard/stds/stdstodetails/30001/0300d01.dgn



STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

Table with columns: ItemNumber, Sec #, Quantity, Unit, Description. Lists various construction items like MOBILIZATION, CONSTRUCTION SURVEYING, UNDERCUT EXCAVATION, etc.

Table with columns: ItemNumber, Sec #, Quantity, Unit, Description. Lists various construction items like CONES, BARRICADES (TYPE III), FLAGGER, etc.

Vertical text on the left margin: STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

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

Location			Uncl Excavation	Undercut	Embt+%	Borrow	Waste
SUMMARY #1							
-L-							
11+76.34	TO	28+00.00	2238	0	1279	0	960
TOTAL SUMMARY #1			2238	0	1279	0	960
SUMMARY #2							
-Y1-							
11+00.00	TO	28+85.00	2608	1847	6206	4117	2366
-Y2-							
10+12.00	TO	19+50.00	667	0	1461	794	0
-Y2-							
TURN-AROUND	TO		26	0	7	0	19
-Y3-							
10+00.00	TO	14+53.00	306	0	1064	758	0
TOTAL SUMMARY #2			3608	1847	8738	5669	2386
TOTAL SUMMARY #1,2			5846	1847	10016	5669	3346
EST. SHOULDER MATERIAL					6250	6250	
EST. SELECT GRANULAR MATERIAL, CLASS III					-2309	-2309	
LOSS DUE TO CLEAR. & GRUB.			-100			100	
WASTE TO REPLACE BORROW			0		0	-979	-979
PROJECT TOTALS			5746	1847	13958	8731	2366
EST. TO REPLACE TOPSOIL FOR BORROW PIT						437	
GRAND TOTALS			5746	1847	0	9167	2366
SAY			6000	2200		10000	

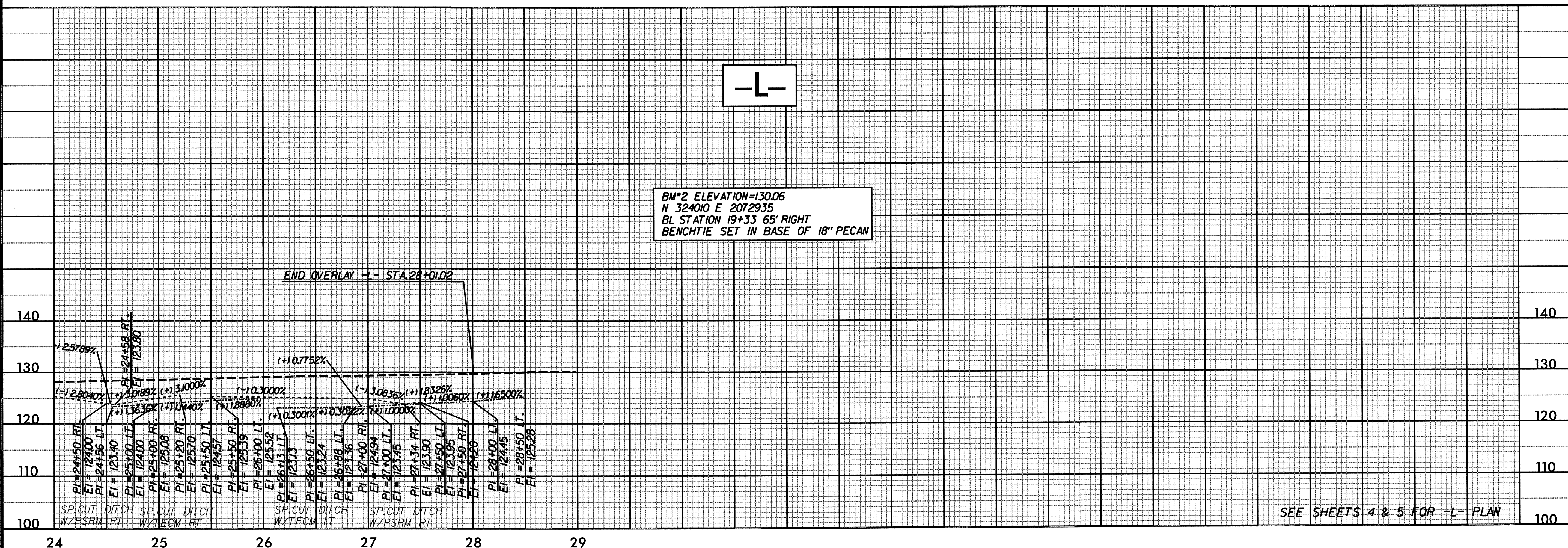
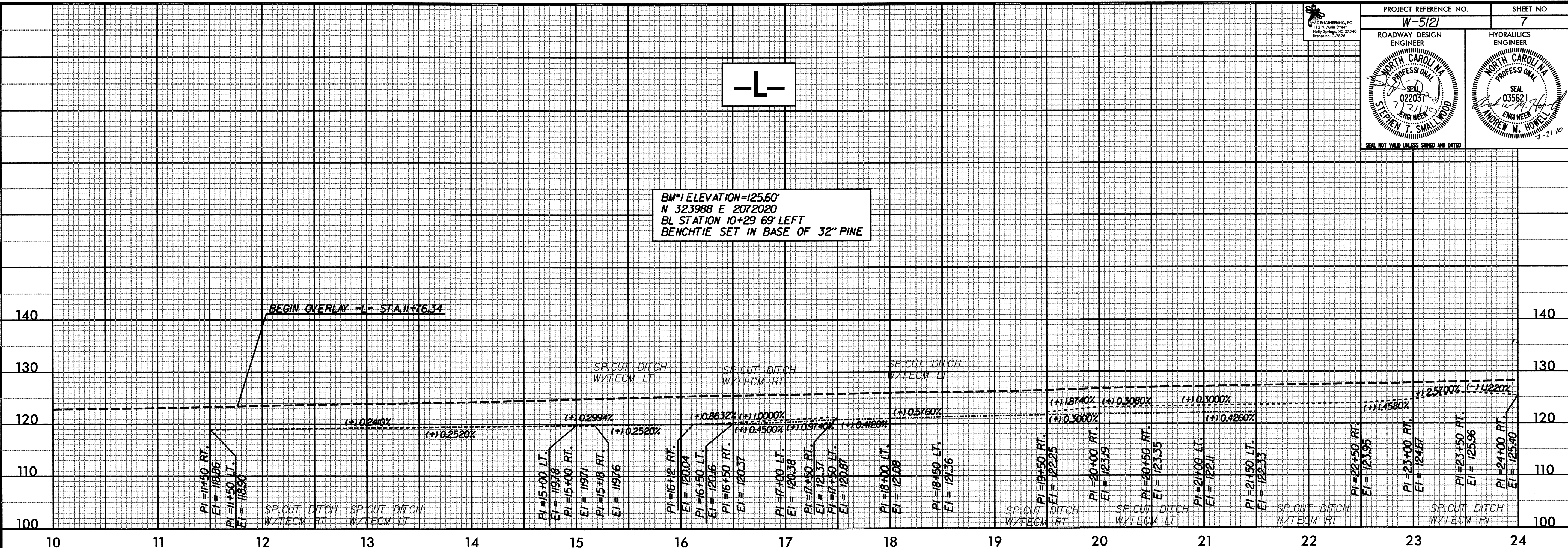
Estimated Shallow Undercut = 250 CY
Estimated DDE = 170 CY

Earthwork quantities are calculated by Division 6.
These earthwork quantities are based in part on the subsurface data provided by the Geotechnical Engineering Unit.

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading"

5/28/99
SYSTEMS DESIGN ENGINEERING

5/28/99



SEE SHEETS 4 & 5 FOR -L- PLAN

SYSTEMS DESIGN

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