

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	30000.14.3	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
41797		PE	
30000.14.3		CONST.	

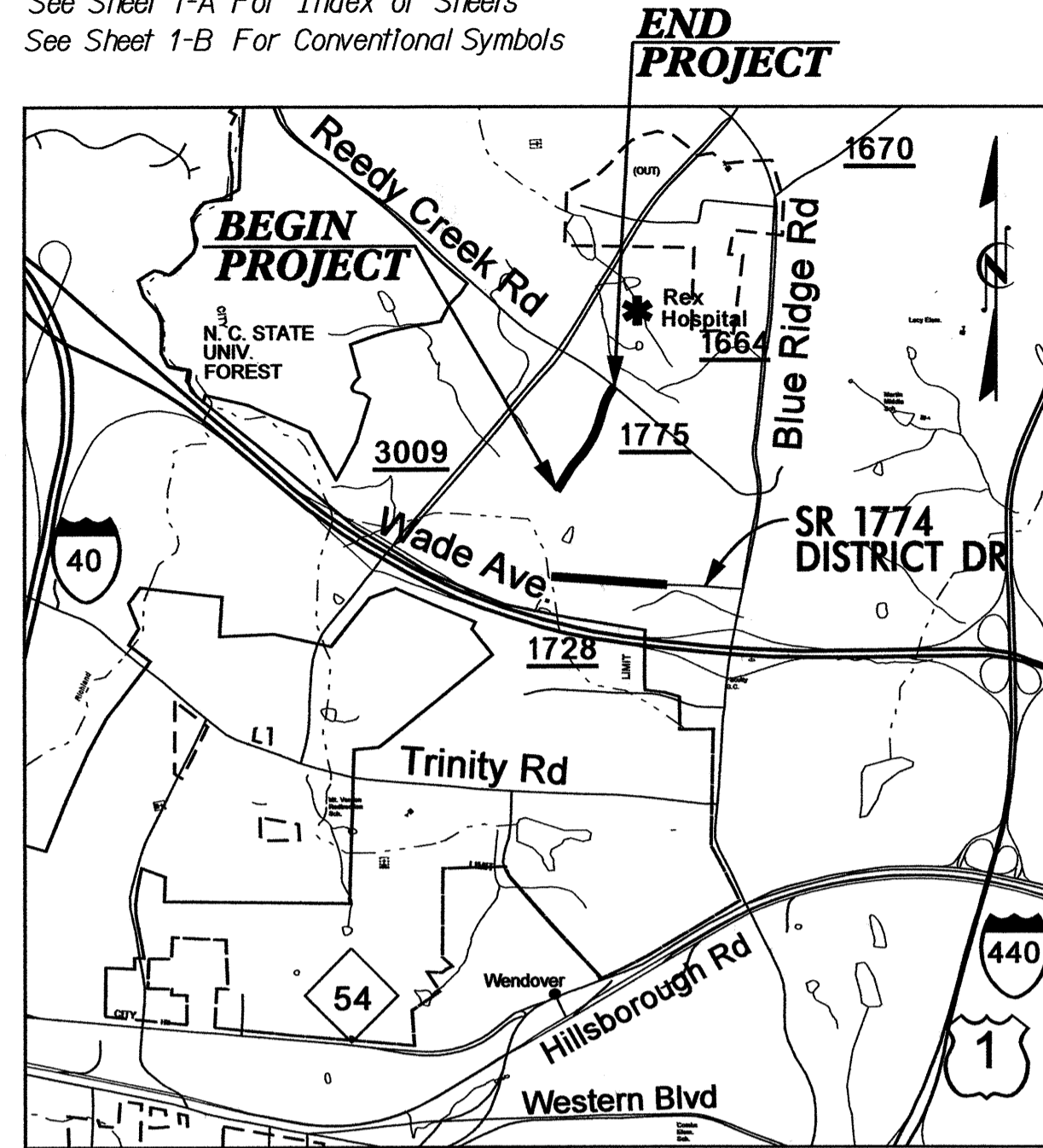
STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

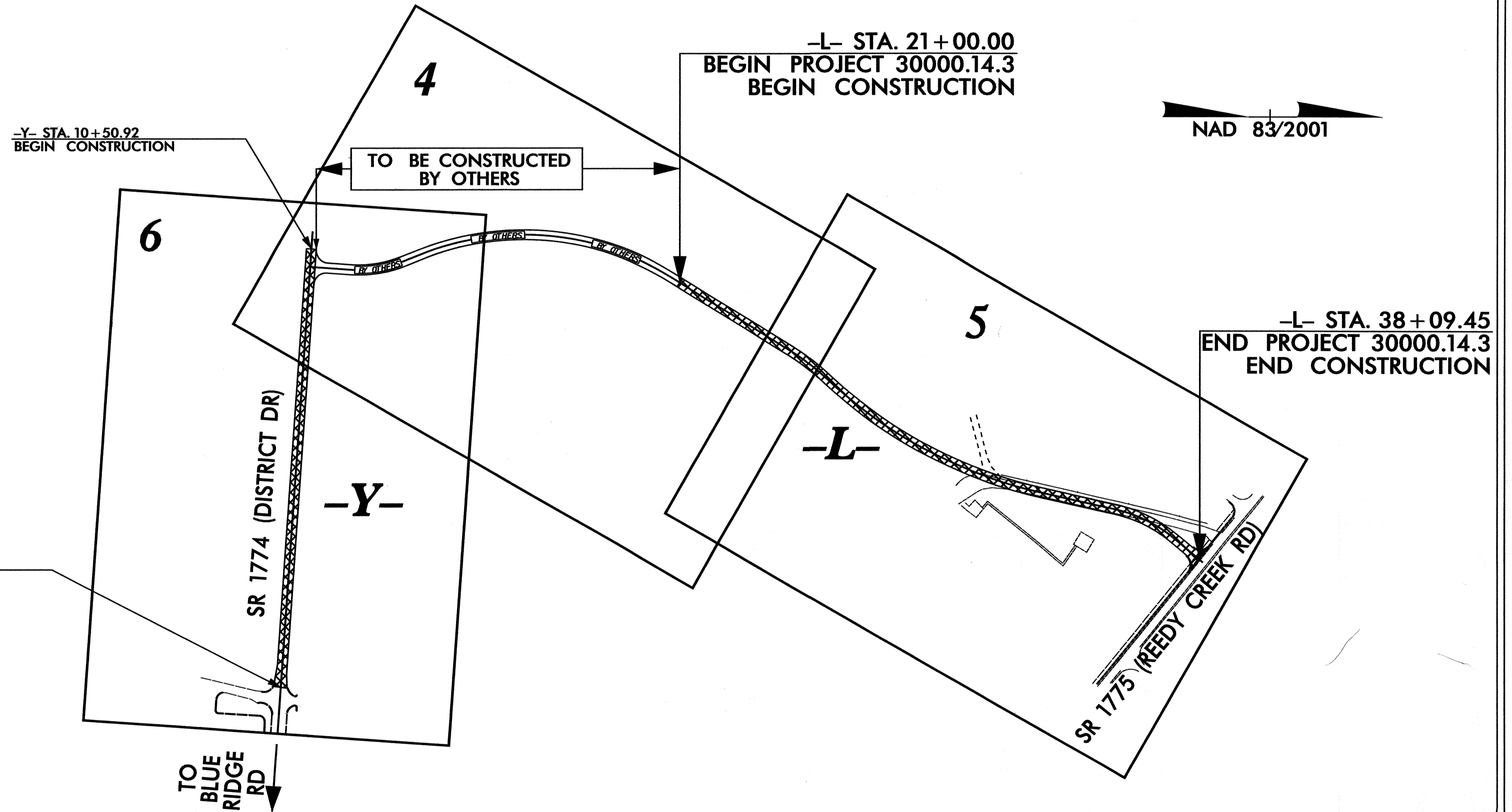
**WAKE COUNTY**

**LOCATION: EXTENSION OF SR 1774 (DISTRICT DR) AND ACCESS ROAD FOR STATEWIDE TRANSPORTATION OPERATIONS CENTER / NORTH CAROLINA NATIONAL GUARD**  
**TYPE OF WORK: GRADING, PAVING, AND DRAINAGE.**

See Sheet 1-A For Index of Sheets  
 See Sheet 1-B For Conventional Symbols

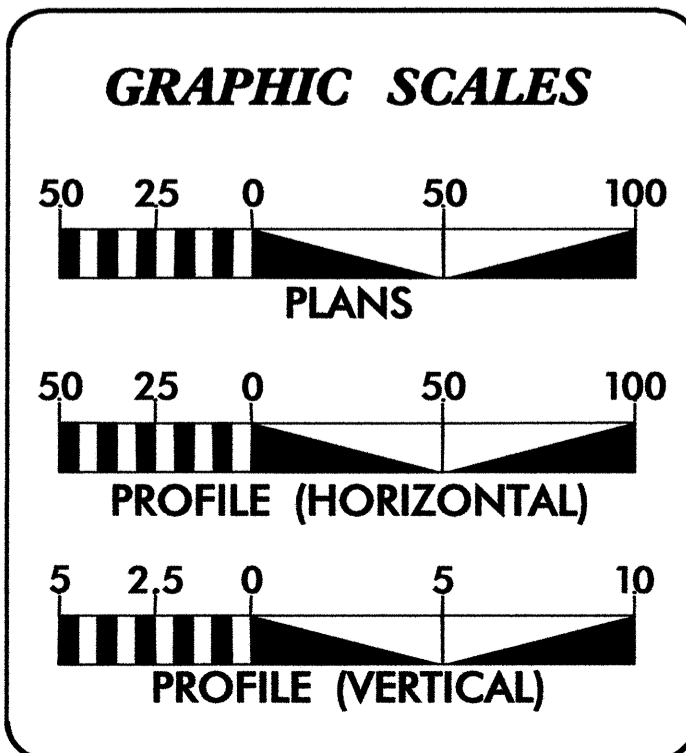


**VICINITY MAP SHOWING LOCATION OF PROJECT 30000.14.3**



**PROJECT: 30000.14.3 CONTRACT: C202461**

14-SEP-2009 17:07  
 tech\div\p\proj\cadd\41797\_d5dcd-tsh\_080602.dgn  
 At: D:\CADD-246178



**DESIGN DATA**

ADT 2009 =	3500
ADT 2029 =	7000
D =	3 %
T =	2 %
V =	35 MPH

**PROJECT LENGTH**

*Length Roadway Project 30000.14.3 = 0.562 Miles*

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
 2612 N. Duke St., Durham, NC 27704

2006 STANDARD SPECIFICATIONS

**BEN UPSHAW, P.E.**  
 PROJECT ENGINEER

**SUNIL PATEL**  
 PROJECT DESIGN ENGINEER

LETTING DATE:  
 12/15/2009

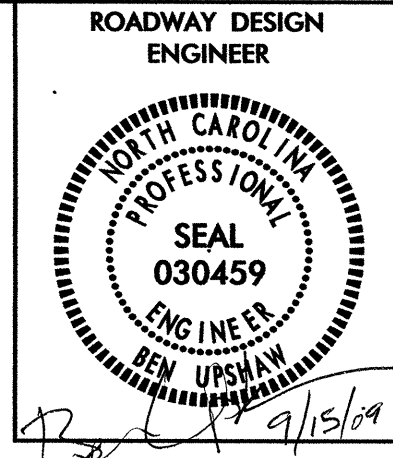
**DIVISION DESIGN ENGINEER**

*[Signature]* 9/15/09 P.E.

**DIVISION OF HIGHWAYS**  
 STATE OF NORTH CAROLINA

**FIFTH DIVISION**  
 J. WALLY BOWMAN, P.E.  
 DIVISION ENGINEER

8/17/99



SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	CENTERLINE COORDINATE LIST
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, KEY-IN DETAIL, AND WEDGING DETAIL
2-A	DITCH DETAILS
2-B THRU 2-C	PIPE INSTALLATION DETAILS
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4 THRU 6	PLAN SHEETS
7 THRU 9	PROFILE SHEETS
TCP-1 THRU TCP-3	TRAFFIC CONTROL PLANS
PM-1 THRU PM-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-9	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
UC-1 THRU UC-3	UTILITY CONSTRUCTION PLANS
X-0 THRU X-22	CROSS-SECTIONS
S-1 THRU S-2	STRUCTURE PLANS

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

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

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

SUPERELEVATION: ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

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

SIDE ROADS: THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

UNDERDRAINS: UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL: THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

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

SUBSURFACE PLANS: NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES: UTILITY OWNERS ON THIS PROJECT ARE CITY OF RALEIGH (WATER AND SEWER) AND PROGRESS ENERGY (POWER)  
  
 ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

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

WHEELCHAIR RAMPS: WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. 848.05.

ROADWAY STANDARD DRAWINGS REV. JULY 2008

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JULY 2006 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
840.34	Traffic Bearing Junction Box
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
848.01	Concrete Sidewalk
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
DIVISION 3 - PIPE CULVERTS	
300.03	Method of Structural Plate Pipe and Pipe Arch Installation - Method 'A'

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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	○ EP
Property Corner	-----
Property Monument	□ EDM
Parcel/Sequence Number	(23)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
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	----- WLB
Proposed Lateral, Tail, Head Ditch	----- FLD
False Sump	-----

### RAILROADS:

Standard Gauge	----- CSX TRANSPORTATION
RR Signal Milepost	○ MILEPOST 35
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	----- RW
Proposed Right of Way Line with Iron Pin and Cap Marker	----- RW
Proposed Right of Way Line with Concrete or Granite Marker	----- RW
Existing Control of Access	○ CA
Proposed Control of Access	○ CA
Existing Easement Line	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Utility Easement	----- PUE

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- C
Proposed Slope Stakes Fill	----- F
Proposed Wheel Chair Ramp	----- WCR
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	----- Vineyard

### EXISTING STRUCTURES:

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

### UTILITIES:

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

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

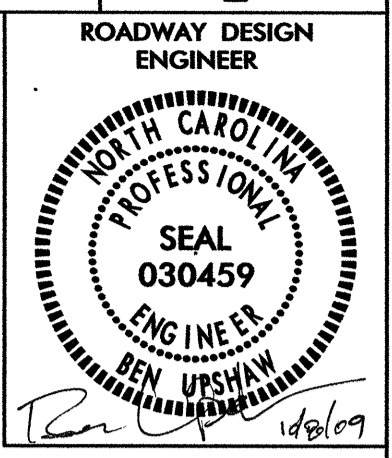
### MISCELLANEOUS:

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

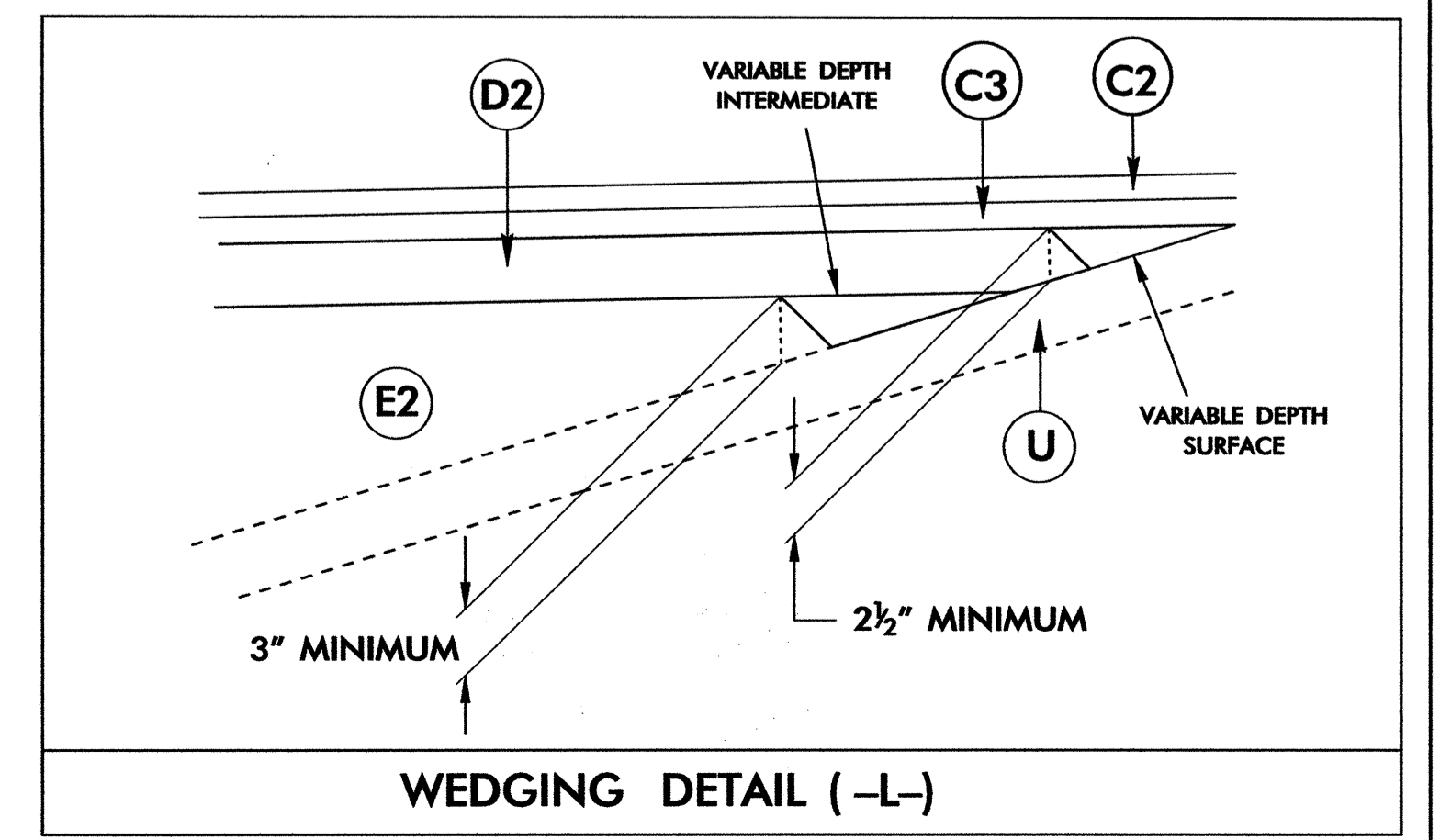
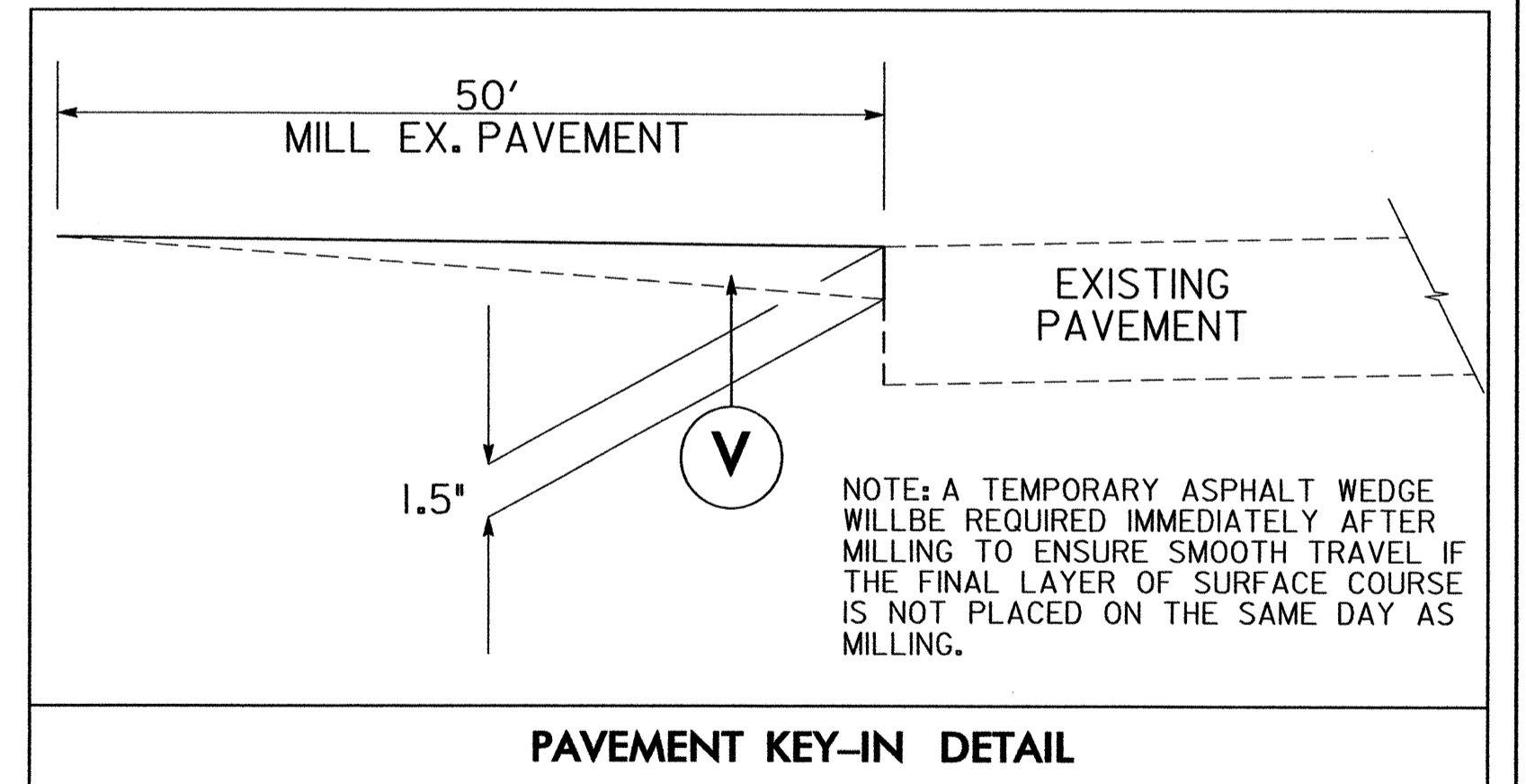
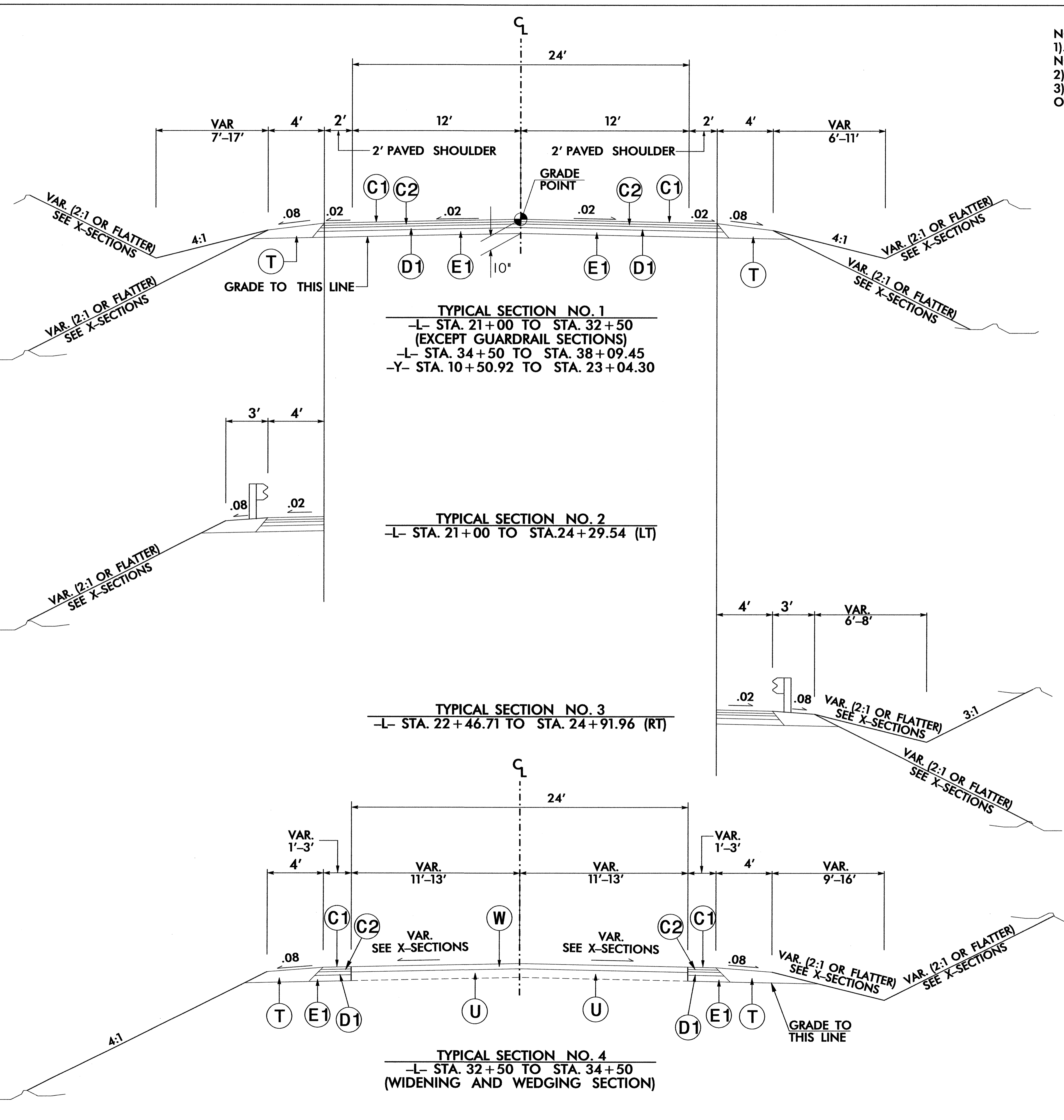
***CENTERLINE COORDINATE LIST***

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	21+00.00	749692.7643	2084539.0511
2	L	22+00.00	749777.9783	2084591.3825
3	L	23+00.00	749863.1922	2084643.7140
4	L	24+00.00	749948.4062	2084696.0454
5	L	25+00.00	750033.0954	2084749.1979
6	L	26+00.00	750110.8082	2084811.9838
7	L	27+00.00	750186.1000	2084877.7593
8	L	28+00.00	750266.1309	2084937.6786
9	L	29+00.00	750350.4466	2084991.4013
10	L	30+00.00	750438.5684	2085038.6222
11	L	31+00.00	750529.9959	2085079.0732
12	L	32+00.00	750624.2099	2085112.5245
13	L	33+00.00	750720.6753	2085138.7863
14	L	34+00.00	750818.2428	2085160.7085
15	L	35+00.00	750915.8183	2085182.5947
16	L	36+00.00	751011.3741	2085211.4019
17	L	37+00.00	751097.1461	2085262.3055
18	L	38+00.00	751174.7297	2085325.3977
19	L	38+24.16	751193.4601	2085340.6631
20	Y	10+00.00	748639.9231	2084393.4456
21	Y	11+00.00	748632.9485	2084493.2021
22	Y	12+00.00	748625.9739	2084592.9586
23	Y	13+00.00	748618.9993	2084692.7150
24	Y	14+00.00	748612.0247	2084792.4715
25	Y	15+00.00	748605.0501	2084892.2280
26	Y	16+00.00	748598.0755	2084991.9845
27	Y	17+00.00	748591.1009	2085091.7410
28	Y	18+00.00	748584.1263	2085191.4974
29	Y	19+00.00	748577.1517	2085291.2539
30	Y	20+00.00	748570.1771	2085391.0104
31	Y	21+00.00	748563.2025	2085490.7669
32	Y	22+00.00	748556.2278	2085590.5233
33	Y	23+00.00	748549.2532	2085690.2798
34	Y	24+00.00	748542.2786	2085790.0363



NOTES:  
 1). THE PORTION OF EACH EXISTING PAVED SHOULDER THAT IS NOT FULL DEPTH IS TO BE REMOVED AND PAVED TO FULL DEPTH.  
 2). PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.  
 3). FINAL LAYER OF SURFACE COURSE (C1) IS TO BE PLACED BY OTHERS UNDER A SEPARATE CONTRACT.

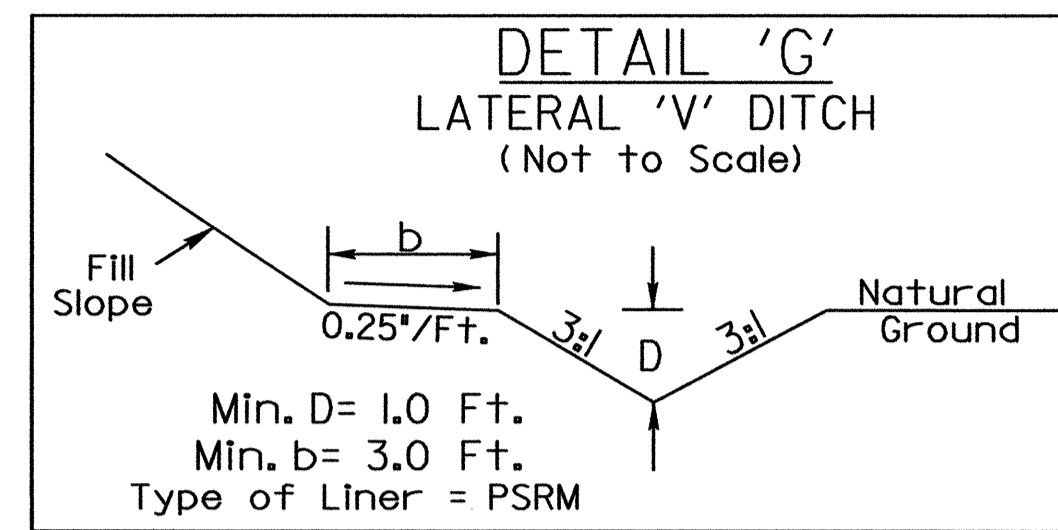
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. (BY OTHERS)
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2.5" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 3" IN DEPTH.
E1	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	0"-1.5" MILLING.
W	WEDGING.



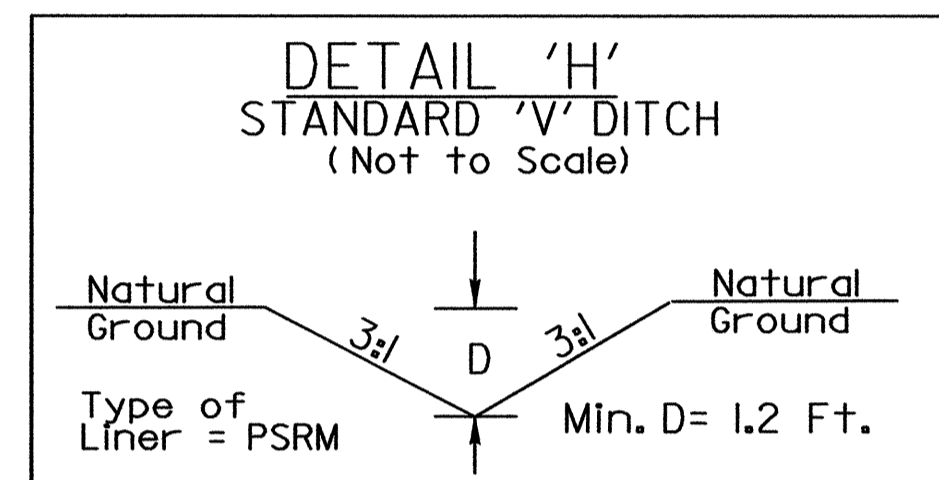
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PROJECT REFERENCE NO. 3000014.3	SHEET NO. 2-A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

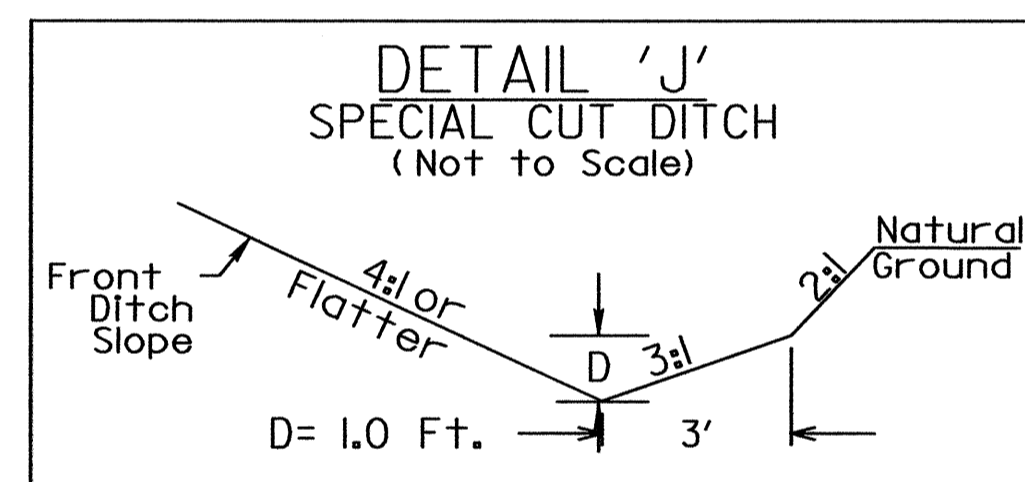
# DITCH DETAILS



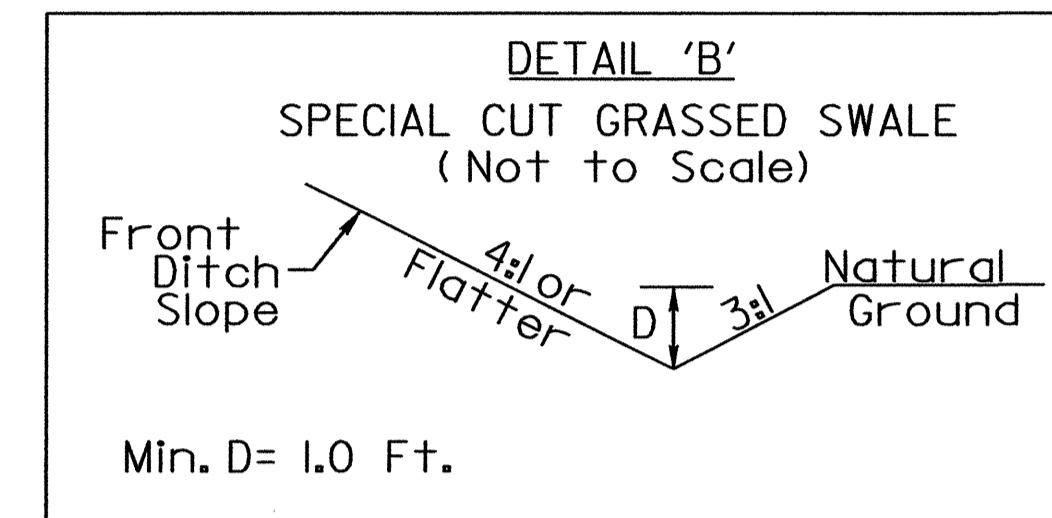
FROM -L- STA. 22+84 TO STA. 23+55 RT.



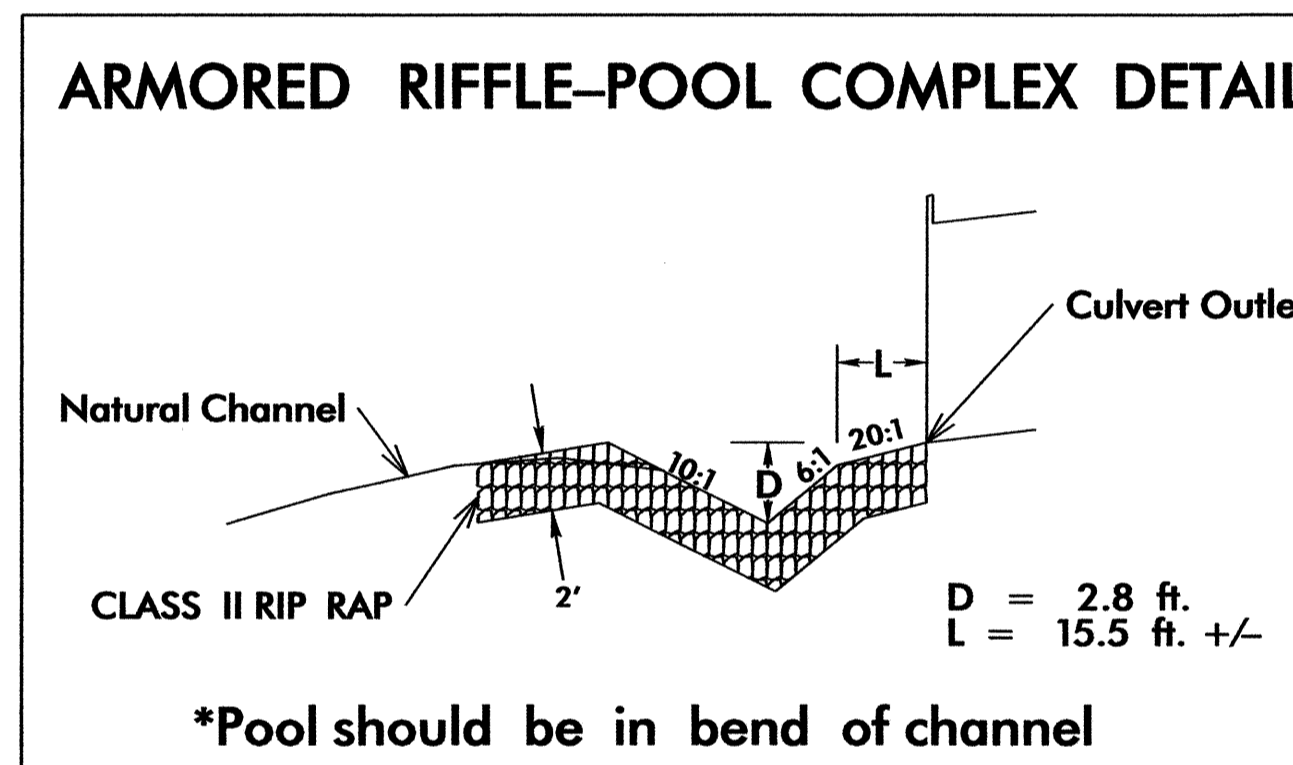
FROM -L- STA. 23+90 TO STA. 24+40 RT.



FROM -L- STA. 25+50 TO STA. 27+00 LT.



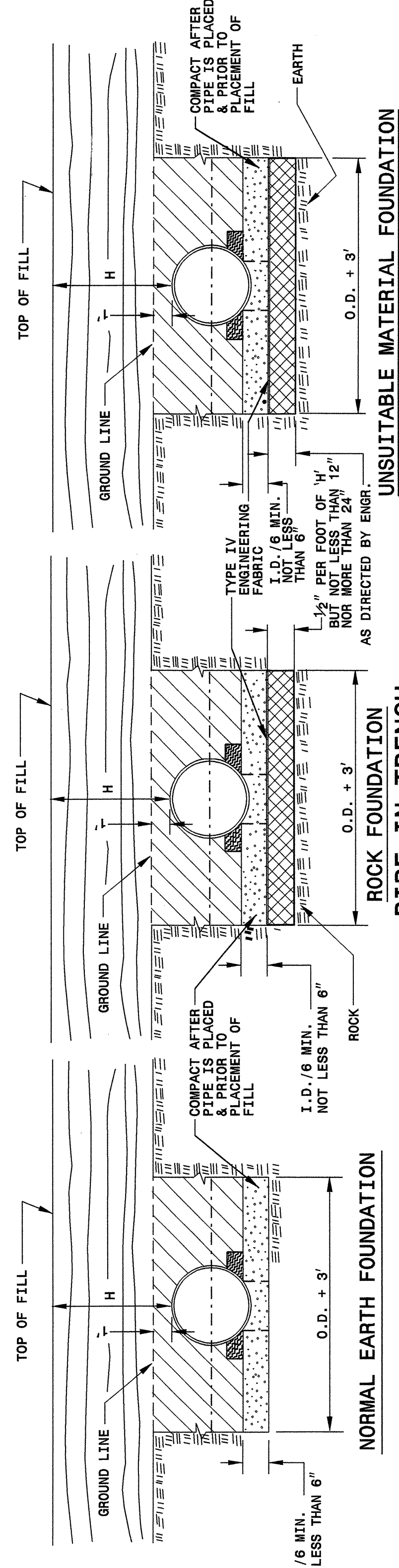
FROM -L- STA. 21+00 TO STA. 21+50 RT.  
FROM -L- STA. 24+40 TO STA. 25+00 RT.  
FROM -L- STA. 24+50 TO STA. 25+50 LT.



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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

FLEXIBLE PIPE

SHEET 1 OF 3  
 300D01

STATE OF  
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 RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR  
 METHOD OF PIPE INSTALLATION

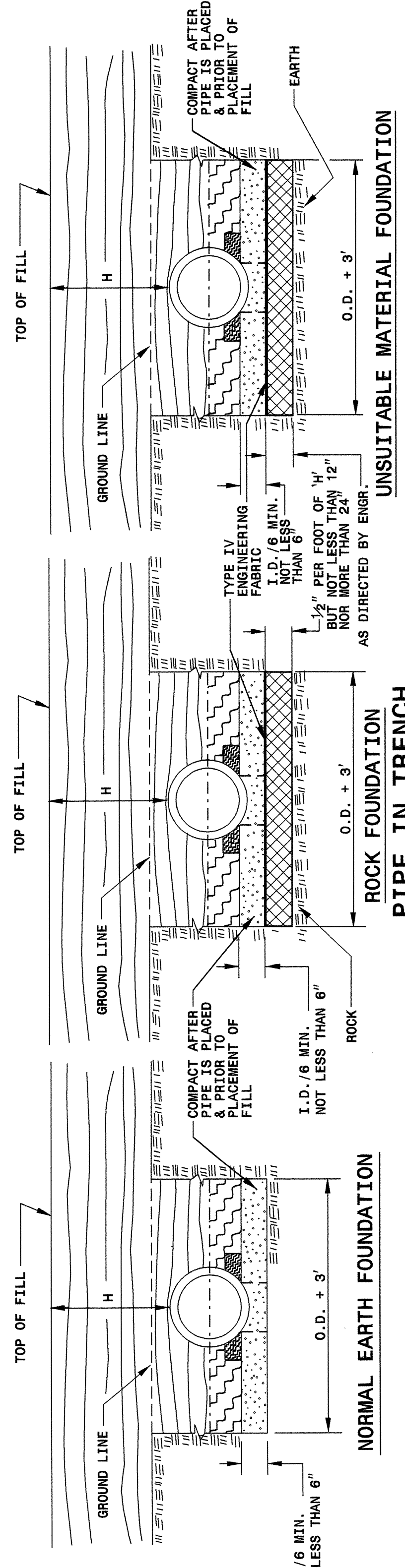
FLEXIBLE PIPE

SHEET 1 OF 3  
 300D01

**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.

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7-06



ENGLISH DETAIL DRAWING FOR  
 METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3  
 300D01

STATE OF  
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 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR  
 METHOD OF PIPE INSTALLATION

RIGID PIPE

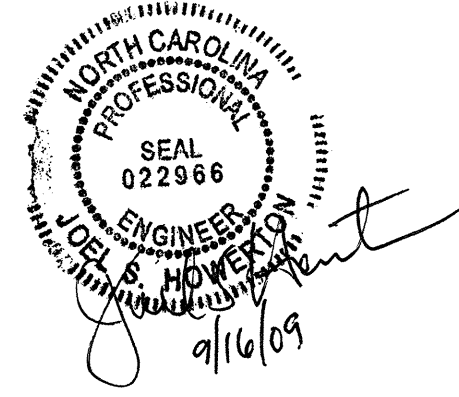
SHEET 2 OF 3  
 300D01

**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

SEE PLATE FOR TITLE

ORIGINAL BY: K Kempf DATE: 5-15-09  
 MODIFIED BY: DATE:  
 CHECKED BY: DATE: 7/30/09  
 FILE SPEC: ericward/stds/stdstdetails/30001/0300d01.dgn



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

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 Height of Cover (feet)			
		(Ga) 16	14	12	10
12	12	204	256	14	8
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
48	12	48	61	87	113
54	12	42	54	77	100
60	12	36	48	69	90
66	12	30	42	61	81
72	12	24	36	54	74
78	12	18	30	48	66
84	12	12	24	42	60

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

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)			
		(Ga) 16	14	12	10
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	55	67	95	123
30	12	50	60	85	111
36	12	42	50	71	92
42	12	36	42	60	78
48	12	30	36	52	68
54	12	24	30	46	60
60	12	18	24	40	50
66	12	12	18	34	41
72	12	12	12	28	34

\*\* 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 LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

**RIGID PIPE**

- RCP - \* (Minimum fill) 1' for Class IV & CLASS V
- 2' for Class III & Class II
- \* (Maximum fill) 10' - Class II pipe
- 20' - Class III pipe
- 30' - Class IV pipe
- 40' - Class V pipe

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

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

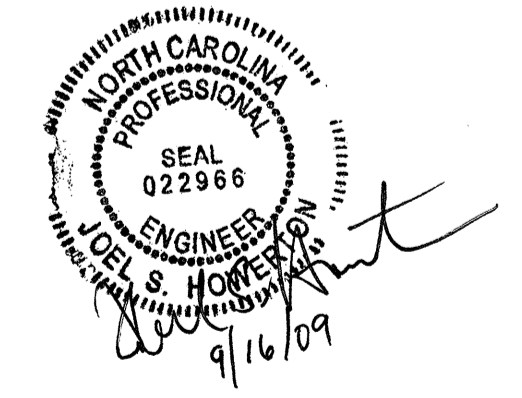
SHEET 3 OF 3  
**300D01**

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: *Joe S. Howerton* DATE: *7/30/09*  
 CHECKED BY: *Joe S. Howerton* DATE: *7/30/09*  
 FILE SPEC: /enward/stds/stdstodetails/30001/0300d01.dgn





STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202461

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0036000000-E	225	2,100	CY	UNDERCUT EXCAVATION
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0134000000-E	240	50	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	2,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	1,500	SY	FABRIC FOR SOIL STABILIZATION
0255000000-E	SP	450	TON	GENERIC GRADING ITEM CLASS IV SELECT MATERIAL
0318000000-E	300	30	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0320000000-E	SP	70	SY	FOUNDATION CONDITIONING FABRIC
0366000000-E	310	24	LF	15" RC PIPE CULVERTS, CLASS III
0378000000-E	310	76	LF	24" RC PIPE CULVERTS, CLASS III
0390000000-E	310	20	LF	36" RC PIPE CULVERTS, CLASS III
0402000000-E	310	80	LF	48" RC PIPE CULVERTS, CLASS III
0938000000-E	320	96	LF	*** X *** CS STRUCTURAL PLATE PIPE ARCH, ** GAUGE (142" X 91", 10)
1077000000-E	SP	10	TON	#57 STONE
1220000000-E	545	150	TON	INCIDENTAL STONE BASE
1308000000-E	607	185	SY	MILLING ASPHALT PAVEMENT, **** TO ***** DEPTH (0" TO 1-1/2")
1489000000-E	610	2,580	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	1,400	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	815	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-E	620	230	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
2022000000-E	815	40	CY	SUBDRAIN EXCAVATION
2033000000-E	815	30	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	175	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	6	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
2253000000-E	840	1.2	CY	PIPE COLLARS
2286000000-N	840	1	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	1.4	LF	MASONRY DRAINAGE STRUCTURES
2396000000-N	840	1	EA	FRAME WITH COVER, STD 840.54
2549000000-E	846	150	LF	2'-6" CONCRETE CURB & GUTTER
2591000000-E	848	70	SY	4" CONCRETE SIDEWALK
2605000000-N	848	2	EA	CONCRETE WHEELCHAIR RAMPS
3030000000-E	862	487.5	LF	STEEL BM GUARDRAIL
3045000000-E	862	50	LF	STEEL BM GUARDRAIL, SHOP CURVED
3105000000-N	862	3	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3270000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3628000000-E	876	26	TON	RIP RAP, CLASS I
3635000000-E	876	475	TON	RIP RAP, CLASS II
3656000000-E	876	795	SY	FILTER FABRIC FOR DRAINAGE
4400000000-E	1110	48	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	80	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	20	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4435000000-N	1135	60	EA	CONES
4445000000-E	1145	48	LF	BARRICADES (TYPE III)

ItemNumber	Sec #	Quantity	Unit	Description
4686000000-E	1205	317	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4721000000-E	1205	8	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4725000000-E	1205	4	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4810000000-E	1205	11,944	LF	PAINT PAVEMENT MARKING LINES (4")
4835000000-E	1205	25	LF	PAINT PAVEMENT MARKING LINES (24")
4900000000-N	1251	2	EA	PERMANENT RAISED PAVEMENT MARKERS
5691500000-E	1520	554	LF	12" SANITARY GRAVITY SEWER
5775000000-E	1525	2	EA	4' DIA UTILITY MANHOLE
5781000000-E	1525	4.7	LF	UTILITY MANHOLE WALL, 4' DIA
5804000000-E	1530	556	LF	ABANDON 12" UTILITY PIPE
5816000000-N	1530	1	EA	ABANDON UTILITY MANHOLE
6000000000-E	1605	1,700	LF	TEMPORARY SILT FENCE
6006000000-E	1610	135	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	305	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	135	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	11	ACR	TEMPORARY MULCHING
6018000000-E	1620	300	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	2.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	100	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	2	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	1,200	LF	SAFETY FENCE
6030000000-E	1630	1,600	CY	SILT EXCAVATION
6036000000-E	1631	6,150	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	50	SY	COIR FIBER MAT
6038000000-E	SP	3,005	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	50	LF	1/4" HARDWARE CLOTH
6046000000-E	SP	20	LF	TEMPORARY PIPE FOR STREAM CROSSING
6070000000-N	SP	4	EA	SPECIAL STILLING BASINS
6071030000-E	SP	650	LF	COIR FIBER BAFFLES
6071050000-E	SP	8	EA	*** SKIMMER (1-1/2")
6084000000-E	1660	12	ACR	SEEDING & MULCHING
6087000000-E	1660	5	ACR	MOWING
6090000000-E	1661	100	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	200	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	5.5	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	5	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.25	ACR	REFORESTATION
8070000000-E	410	25	CY	FOUNDATION EXCAVATION
8196000000-E	420	32	CY	CLASS A CONCRETE (CULVERT)
8245000000-E	425	2,581	LB	REINFORCING STEEL (CULVERT)
8594000000-E	876	20	TON	RIP RAP, CLASS B

5/28/99

27-AUG-2009 09:48  
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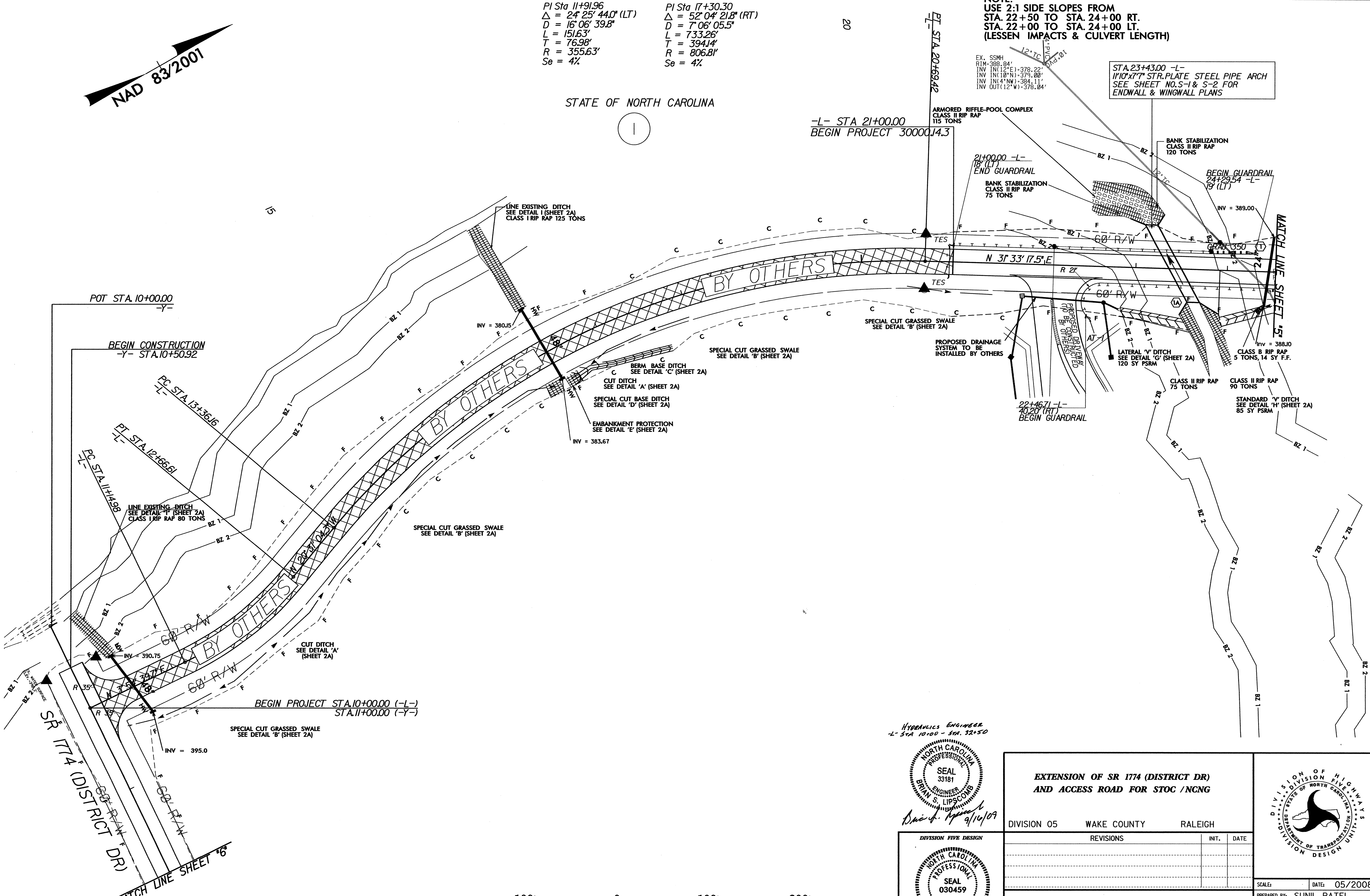
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 $\Delta = 24^\circ 25' 44.0''$  (LT)  
 $D = 16^\circ 06' 39.8''$   
 $L = 151.63'$   
 $T = 76.98'$   
 $R = 355.63'$   
 $Se = 4\%$

PI Sta 17+30.30  
 $\Delta = 52^\circ 04' 21.8''$  (RT)  
 $D = 7^\circ 06' 05.5''$   
 $L = 733.26'$   
 $T = 394.14'$   
 $R = 806.81'$   
 $Se = 4\%$



STATE OF NORTH CAROLINA

NOTE:  
 USE 2:1 SIDE SLOPES FROM  
 STA. 22+50 TO STA. 24+00 RT.  
 STA. 22+00 TO STA. 24+00 LT.  
 (LESSEN IMPACTS & CULVERT LENGTH)



POT STA. 10+00.00  
 -Y-

BEGIN CONSTRUCTION  
 -Y- STA. 10+50.92

PC STA. 13+36.16

PT STA. 12+66.61

PC STA. 11+49.8

LINE EXISTING DITCH  
 SEE DETAIL 'F' (SHEET 2A)  
 CLASS I RIP RAP 80 TONS

SR 1774 (DISTRICT DR)

MATCH LINE SHEET '6'

BEGIN PROJECT STA. 10+00.00 (-L-)  
 STA. 11+00.00 (-Y-)

SPECIAL CUT GRASSSED SWALE  
 SEE DETAIL 'B' (SHEET 2A)

LINE EXISTING DITCH  
 SEE DETAIL 'I' (SHEET 2A)  
 CLASS I RIP RAP 125 TONS

INV = 380.15

BERM BASE DITCH  
 SEE DETAIL 'C' (SHEET 2A)

CUT DITCH  
 SEE DETAIL 'A' (SHEET 2A)

SPECIAL CUT BASE DITCH  
 SEE DETAIL 'D' (SHEET 2A)

EMBANKMENT PROTECTION  
 SEE DETAIL 'E' (SHEET 2A)  
 INV = 383.67

SPECIAL CUT GRASSSED SWALE  
 SEE DETAIL 'B' (SHEET 2A)

CUT DITCH  
 SEE DETAIL 'A' (SHEET 2A)  
 INV = 390.75

INV = 395.0

-L- STA 21+00.00  
 BEGIN PROJECT 30000J4.3

21+00.00 -L-  
 18' (LT)  
 END GUARDRAIL

BANK STABILIZATION  
 CLASS II RIP RAP  
 75 TONS

SPECIAL CUT GRASSSED SWALE  
 SEE DETAIL 'B' (SHEET 2A)

PROPOSED DRAINAGE  
 SYSTEM TO BE  
 INSTALLED BY OTHERS

22+46.71 -L-  
 40.20 (RT)  
 BEGIN GUARDRAIL

STA. 23+43.00 -L-  
 11'0"X7'7" STR. PLATE STEEL PIPE ARCH  
 SEE SHEET NO. S-1 & S-2 FOR  
 ENDWALL & WINGWALL PLANS

BANK STABILIZATION  
 CLASS II RIP RAP  
 120 TONS

BEGIN GUARDRAIL  
 24+29.54 -L-  
 19' (LT)

INV = 389.00

CLASS II RIP RAP  
 75 TONS

CLASS II RIP RAP  
 90 TONS

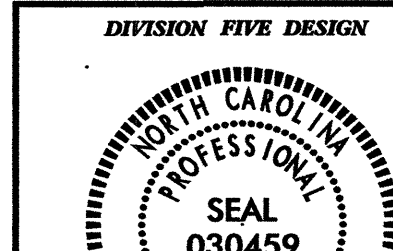
CLASS B RIP RAP  
 5 TONS, 14 SY F.F.

STANDARD 'Y' DITCH  
 SEE DETAIL 'H' (SHEET 2A)  
 85 SY PSRM

HYDRAULICS ENGINEER  
 L- STA 10+00 - STA. 32+50



Signature of Brian S. Lipscomb dated 9/14/09



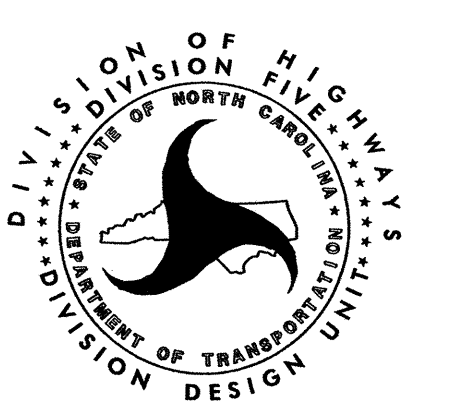
Signature of Ben Upshaw dated 9/13/09

EXTENSION OF SR 1774 (DISTRICT DR)  
 AND ACCESS ROAD FOR STOC / NCNG

DIVISION 05 WAKE COUNTY RALEIGH

REVISIONS	INIT.	DATE

N.C. DEPARTMENT of TRANSPORTATION  
 DIVISION of HIGHWAYS  
 DIVISION FIVE DESIGN UNIT



SCALE: DATE: 05/2008

PREPARED BY: SUNIL PATEL  
 REVIEWED BY: BEN UPSHAW  
 REVIEWED BY:

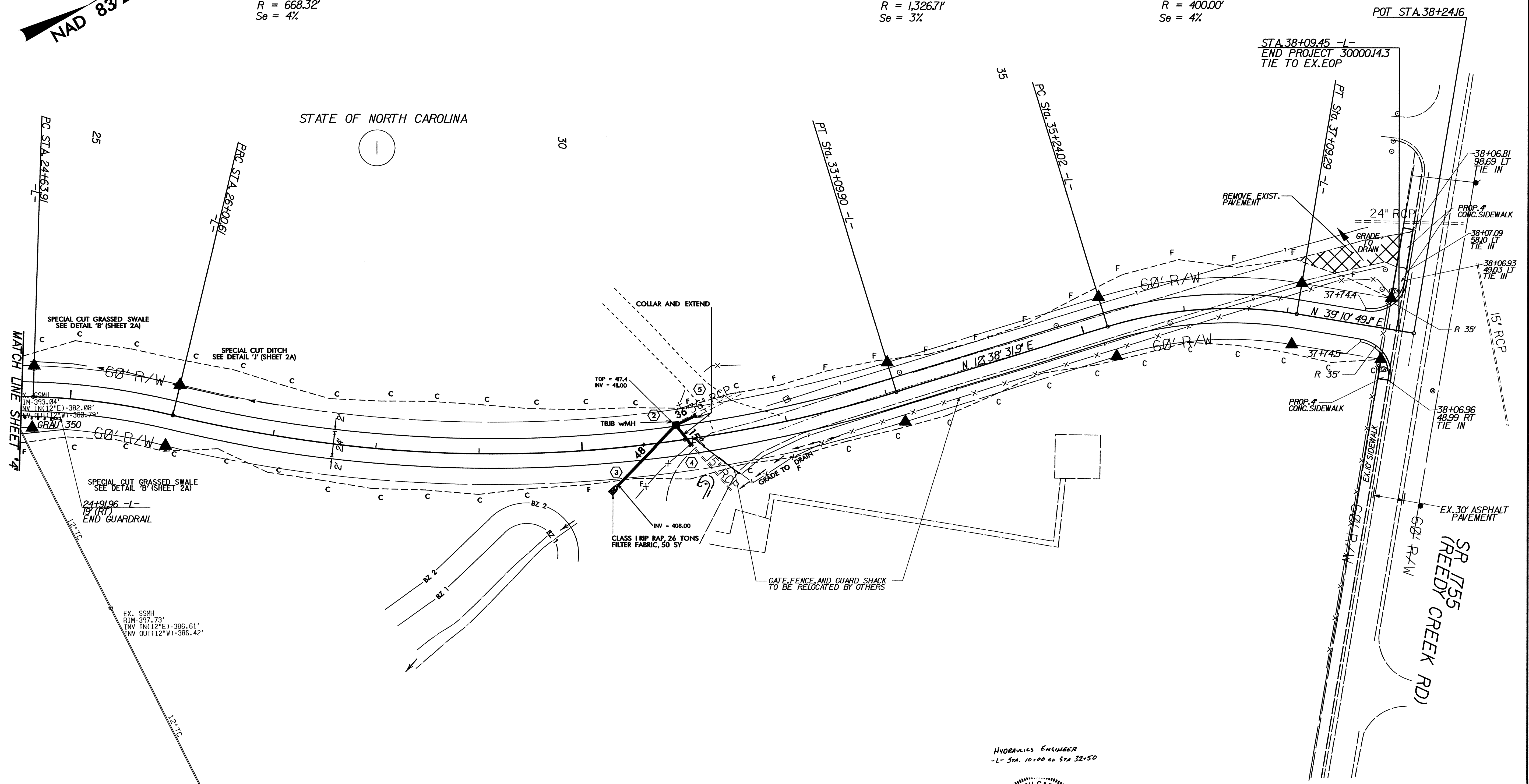




PI Sta 25+32.50  
 $\Delta = 11' 43'' 09.2''$  (RT)  
 $D = 8' 34'' 23.2''$   
 $L = 136.70'$   
 $T = 68.59'$   
 $R = 668.32'$   
 $Se = 4\%$

PI Sta 32+05.17  
 $\Delta = 9' 03'' 53.6''$  (LT)  
 $D = 4' 19'' 07.1''$   
 $L = 709.29'$   
 $T = 105.17'$   
 $R = 1,326.71'$   
 $Se = 3\%$

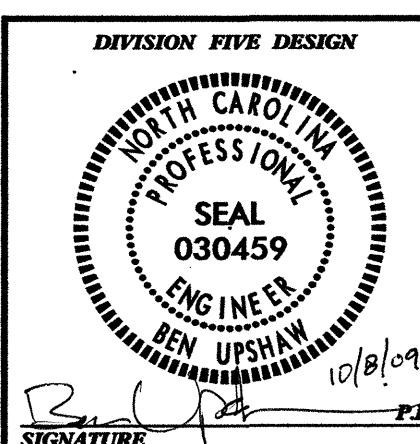
PI Sta 36+18.34  
 $\Delta = 26' 32'' 17.3''$  (RT)  
 $D = 14' 19'' 26.2''$   
 $L = 185.27'$   
 $T = 94.33'$   
 $R = 400.00'$   
 $Se = 4\%$



MATCH LINE SHEET 2A

MATCH LINE SHEET 2B

HYDRAULICS ENGINEER  
 -L- STA. 10+00 to STA 32+50



<b>EXTENSION OF SR 1774 (DISTRICT DR) AND ACCESS ROAD FOR STOC /NCNG</b>		
DIVISION 05	WAKE COUNTY	RALEIGH
REVISIONS	INIT.	DATE
<b>N.C. DEPARTMENT of TRANSPORTATION          DIVISION of HIGHWAYS          DIVISION FIVE DESIGN UNIT</b>		

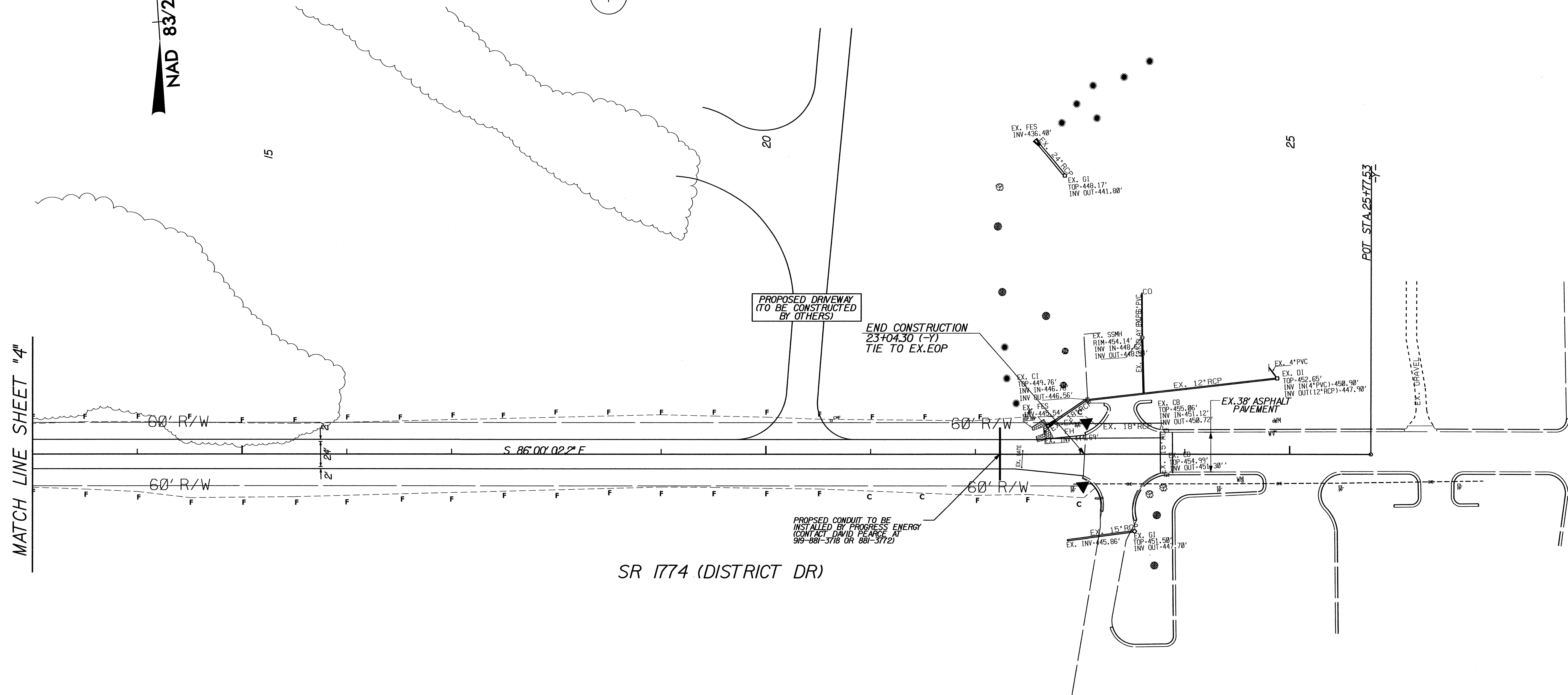
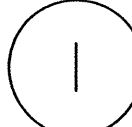
SCALE: \_\_\_\_\_ DATE: 05/2008

PREPARED BY: SUNIL PATEL  
 REVIEWED BY: BEN UPSHAW



NAD 83/2001

STATE OF NORTH CAROLINA



MATCH LINE SHEET "4"

SR 1774 (DISTRICT DR)



**EXTENSION OF SR 1774 (DISTRICT DR)  
AND ACCESS ROAD FOR STOC / NCNG**

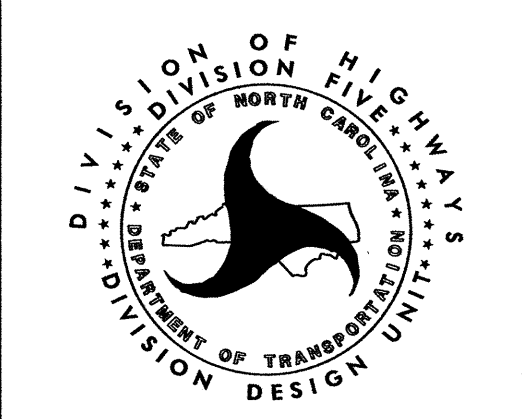
DIVISION 05 WAKE COUNTY RALEIGH

REVISIONS	INIT.	DATE

SCALE: DATE: 05/2008

PREPARED BY: SUNIL PATEL  
REVIEWED BY: BEN UPSHAW

**N.C. DEPARTMENT of TRANSPORTATION  
DIVISION of HIGHWAYS  
DIVISION FIVE DESIGN UNIT**



DIVISION FIVE DESIGN

PROFESSIONAL SEAL  
030459  
ENGINEER  
BEN UPSHAW  
9/15/09  
SIGNATURE

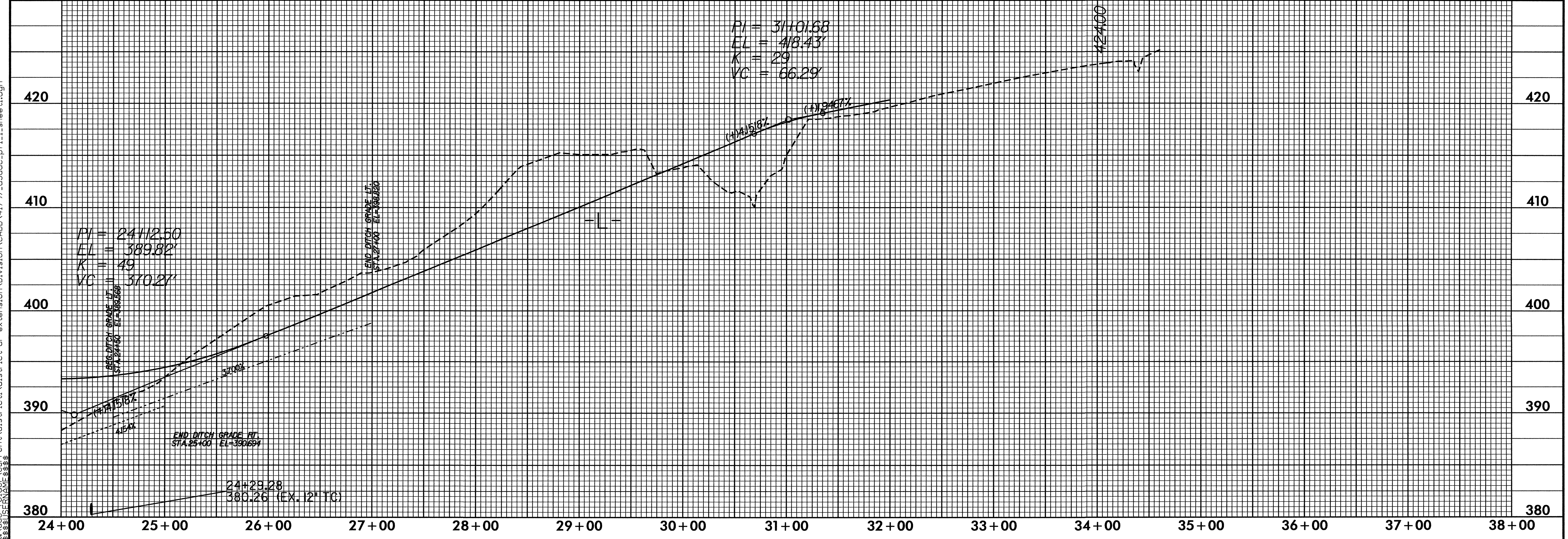
PI = 11+26.06  
 SSD = 281.5'  
 EL = 403.28'  
 K = 29  
 VC = 152.45'

PI = 19+80.16  
 SSD = 250.4'  
 EL = 404.54'  
 K = 29  
 VC = 238.70'

PI = 16+33.32  
 EL = 387.80'  
 K = 49  
 VC = 386.03'

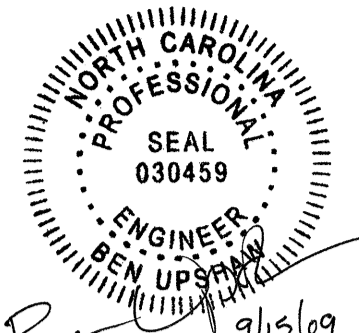

PI = 31+01.68  
 EL = 418.43'  
 K = 29  
 VC = 66.29'

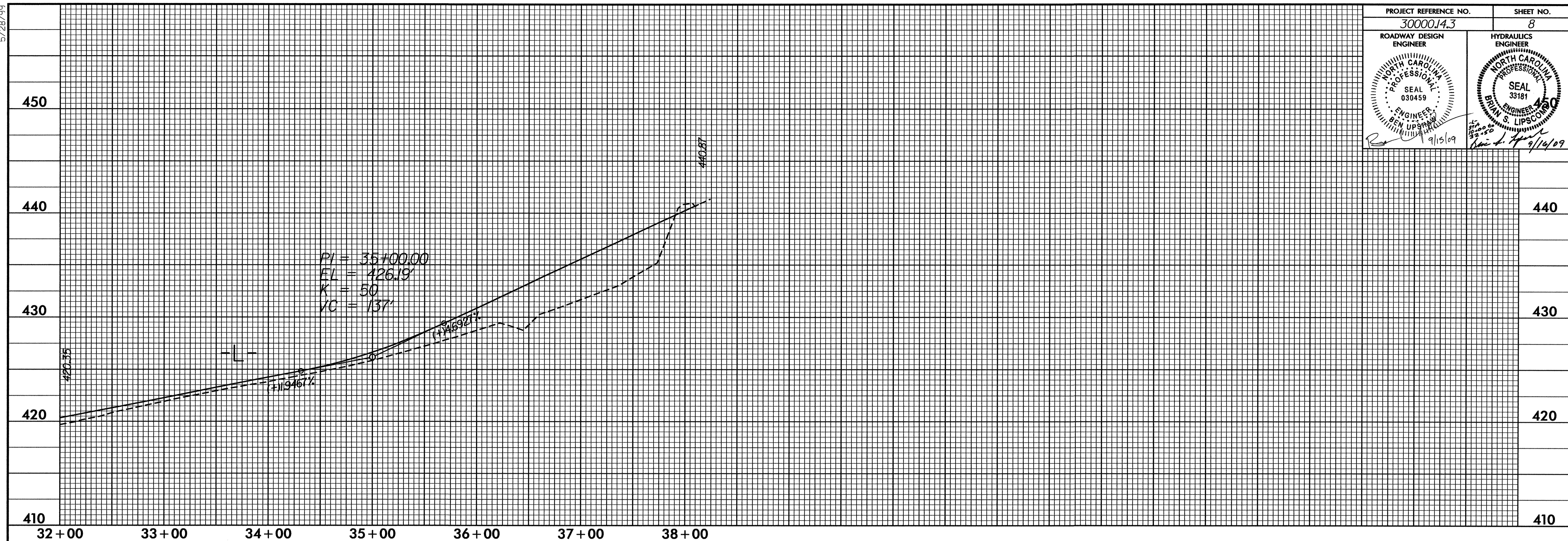
PI = 24+12.50  
 EL = 389.82'  
 K = 49  
 VC = 370.21'



5/28/09  
 25-AUG-2009 14:18  
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 \$\$\$USERNAME\$\$\$

5/28/99

PROJECT REFERENCE NO. 3000.14.3	SHEET NO. 8
ROADWAY DESIGN ENGINEER BEN UPSON 9/13/09	HYDRAULICS ENGINEER BRIAN S. LIPSCOMB 9/16/09
	



25-AUG-2009 14:24  
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5/14/99  
25-AUG-2009 14:25  
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\$\$\$\$\$ ISTRNAMF \$\$\$

PROJECT REFERENCE NO. 300014.3	SHEET NO. 9
ROADWAY DESIGN ENGINEER	
