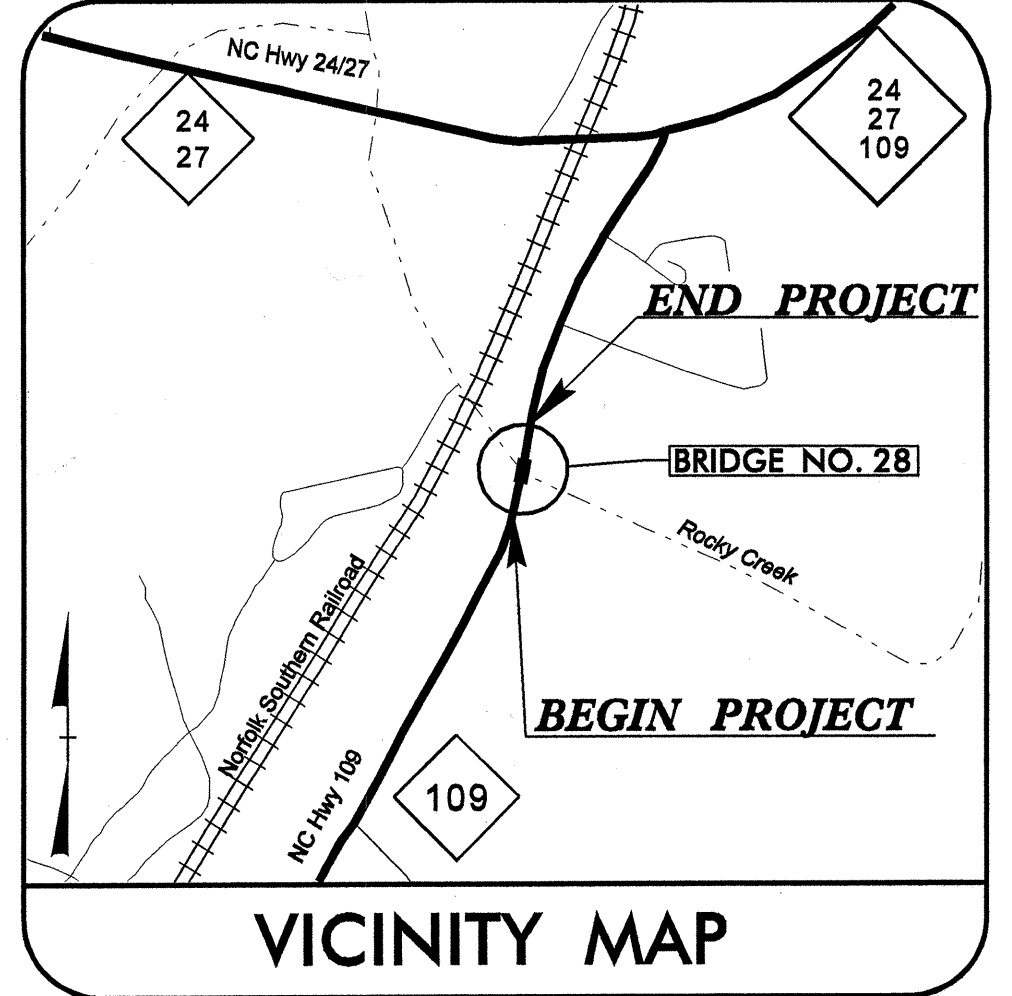


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 09/08/09
 peaucclair AT LPA30660

TIP PROJECT: B-4204
CONTRACT: C202327

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



VICINITY MAP

** DESIGN EXCEPTION REQUIRED FOR VERTICAL CURVE K VALUE AND VERTICAL STOPPING SIGHT DISTANCE.

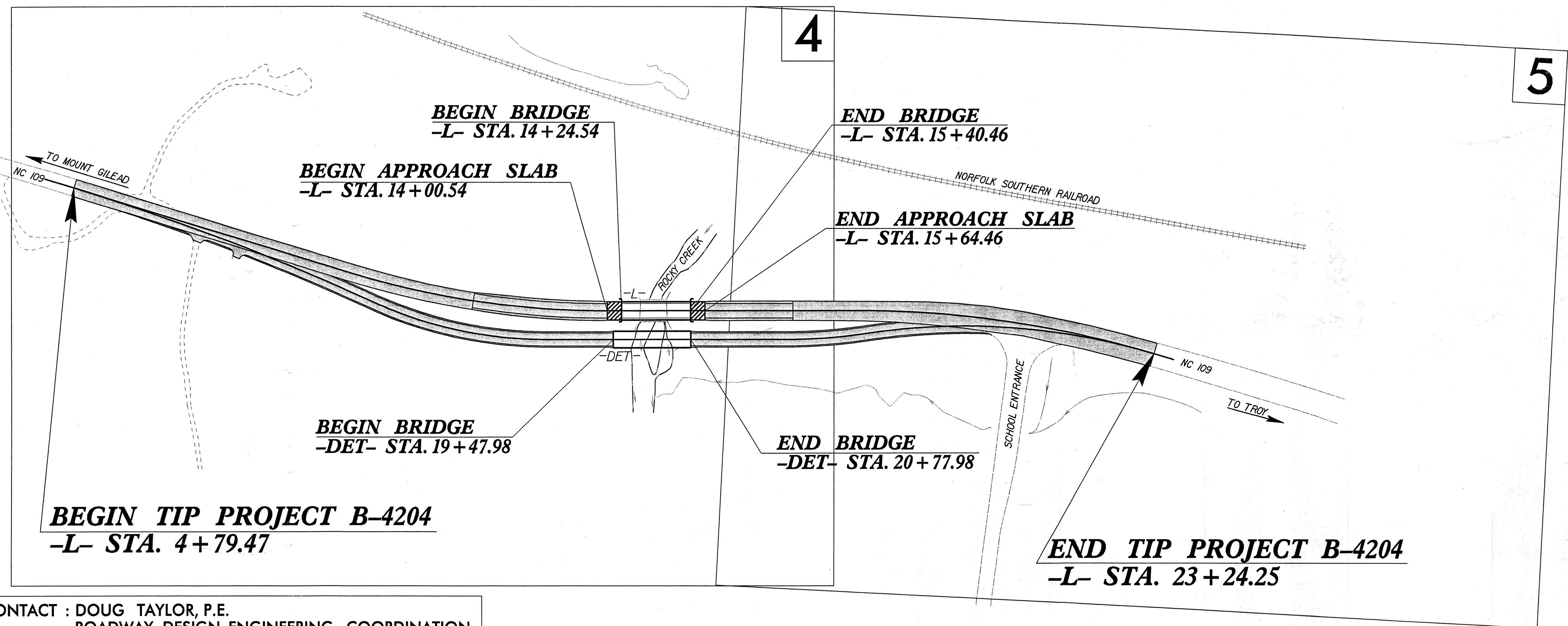
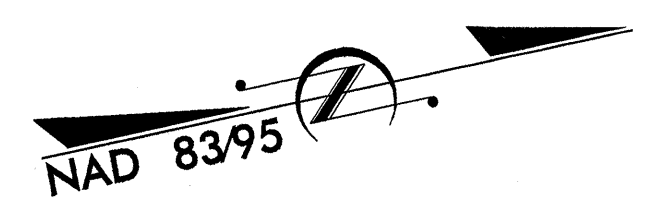
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MONTGOMERY COUNTY

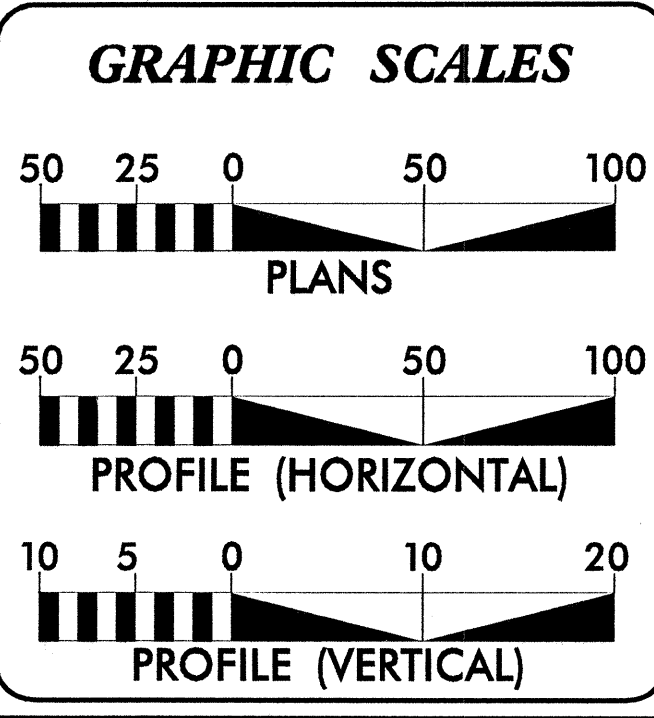
LOCATION: BRIDGE NO. 28 OVER ROCKY CREEK ON NC 109

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4204	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33551.1.1	BRSTP-109 (10)	PE	
33551.2.1	BRSTP-109 (10)	RW+UTIL.	
33551.3.1	BRSTP-109 (10)	CONST.	



NCDOT CONTACT : DOUG TAYLOR, P.E.
ROADWAY DESIGN-ENGINEERING COORDINATION



DESIGN DATA

ADT 2010 =	8,563
ADT 2030 =	13,600
DHV =	12 %
D =	60 %
T =	7 % *
**V =	60 MPH
* TTST 4% DUAL 3%	
FUNC. CLASS =	RURAL MAJOR COLLECTOR

PROJECT LENGTH

Length Roadway Tip Project B-4204 =	0.327 Miles
Length Structure Tip Project B-4204 =	0.022 Miles
Total Length Tip Project B-4204 =	0.349 Miles

Prepared in the Office of:
THE LPA GROUP TRANSPORTATION CONSULTANTS
 THE LPA GROUP of North Carolina, p.a.
 5000 Falls of Neuse Rd., Suite 304
 Raleigh, North Carolina 27609

RIGHT OF WAY DATE: APRIL 18, 2008

LETTING DATE: FEBRUARY 16, 2010

Paul E. Auclair, P.E.
PROJECT ENGINEER

Jody L. Cole
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

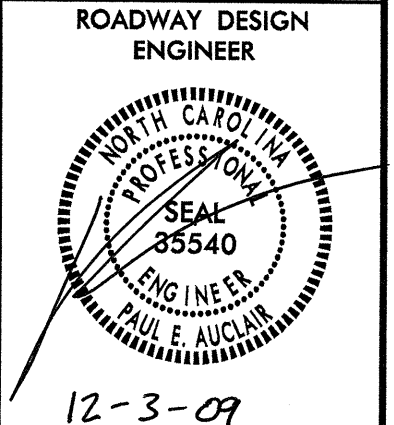
11/09/08
 SIGNATURE: [Signature]
 P.E.

ROADWAY DESIGN ENGINEER

11-9-09
 SIGNATURE: [Signature]
 P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

at miller
P.E.
STATE HIGHWAY DESIGN ENGINEER



8/17/99
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 P:\Projects\NC001\Bridges\Group 46 Final Design\B4204_rdy_psh01A.dgn

SHEET NUMBER	SHEET	2006 ROADWAY ENGLISH STANDARD DRAWINGS	EFF. 07-18-06 REV. 01-02-07
1	TITLE SHEET	The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:	
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS		
1-B	CONVENTIONAL SYMBOLS	STD. NO. TITLE	
1-C	SURVEY CONTROL SHEET	DIVISION 2 - EARTHWORK	
2 THRU 2A	PAVEMENT SCHEDULE, AND TYPICAL SECTIONS	200.03 Method of Clearing - Method III	
2B THRU 2C	DETOUR PLAN AND PROFILE	225.02 Guide for Grading Subgrade - Secondary and Local	
2D	ANCHORAGE FOR FRAMES DETAIL	225.04 Method of Obtaining Superelevation - Two Lane Pavement	
2E THRU 2F	METHOD OF PIPE INSTALLATION DETAILS	DIVISION 3 - PIPE CULVERTS	
3	SUMMARY OF QUANTITIES	310.10 Driveway Pipe Construction	
3A	EARTHWORK SUMMARY, PARCEL INDEX, AND PAVEMENT REMOVAL SUMMARY	DIVISION 4 - MAJOR STRUCTURES	
3B	SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, AND SUMMARY OF TEMPORARY GUARDRAIL	422.10 Reinforced Bridge Approach Fills	
4 THRU 5	PLAN AND PROFILE SHEETS	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
TCP-1 THRU TCP-6	TRAFFIC CONTROL PLANS	560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I	
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS	DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
EC-1 THRU EC-9	EROSION CONTROL PLANS	654.01 Pavement Repairs	
RF-1	REFORESTATION PLAN	DIVISION 8 - INCIDENTALS	
SIGN-1 THRU SIGN-4	SIGNING PLANS	806.01 Concrete Right-of-Way Marker	
SIG-1 THRU SIG-3	SIGNAL PLANS	806.02 Granite Right-of-Way Marker	
UO-1 THRU UO-3	UTILITIES PLANS	815.03 Pipe Underdrain and Blind Drain	
X-1A	CROSS SECTION SUMMARY SHEET	840.00 Concrete Base Pad for Drainage Structures	
X-1 THRU X-13	CROSS-SECTIONS	840.29 Frames and Narrow Slot Flat Grates	
S-1 THRU S-21	STRUCTURE PLANS	840.34 Traffic Bearing Junction Box - for Use with Pipes 42" and Under	
		840.35 Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates	
		840.46 Traffic Bearing Precast Drainage Structure	
		840.54 Manhole Frame and Cover	
		840.66 Drainage Structure Steps	
		846.01 Concrete Curb, Gutter and Curb & Gutter	
		846.04 Drop Inlet Installation in Shoulder Berm Gutter	
		862.01 Guardrail Placement	
		862.02 Guardrail Installation	
		862.03 Structure Anchor Units	
		862.04 Anchoring End of Guardrail - B-77 and B-83 Anchor Units	
		876.01 Rip Rap in Channels	
		876.02 Guide for Rip Rap at Pipe Outlets	
		876.04 Drainage Ditches with Class 'B' Rip Rap	

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

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

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

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

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

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.

END BENTS:
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE Randolph EMC, Embarq, Town of Troy, Montgomery County
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○
Property Corner	✕
Property Monument	□
Parcel/Sequence Number	(23)
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

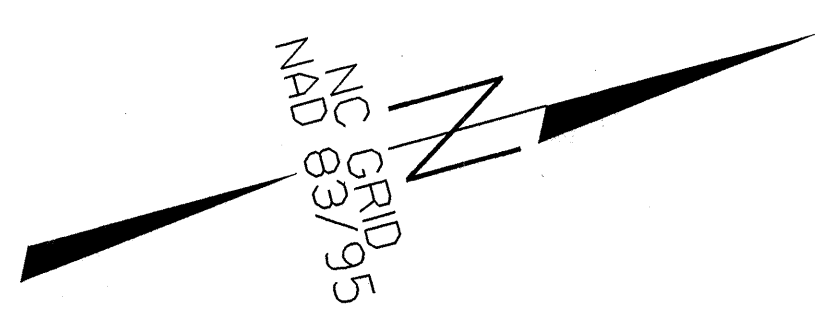
MISCELLANEOUS:

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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B4204	IC
Location and Surveys	

SURVEY CONTROL SHEET B4204



-L- STA. 4+79.47 BEGIN TIP PROJECT B-4204
LOCALIZED PROJECT COORDINATES
 N = 570980.1552
 E = 1717018.2009

NC DOT BASELINE STATION "BL-161"
LOCALIZED PROJECT COORDINATES
 N = 571368.1690
 E = 1717880.8940

NC DOT BASELINE STATION "BL-160"
LOCALIZED PROJECT COORDINATES
 N = 570918.5180
 E = 1718968.1880

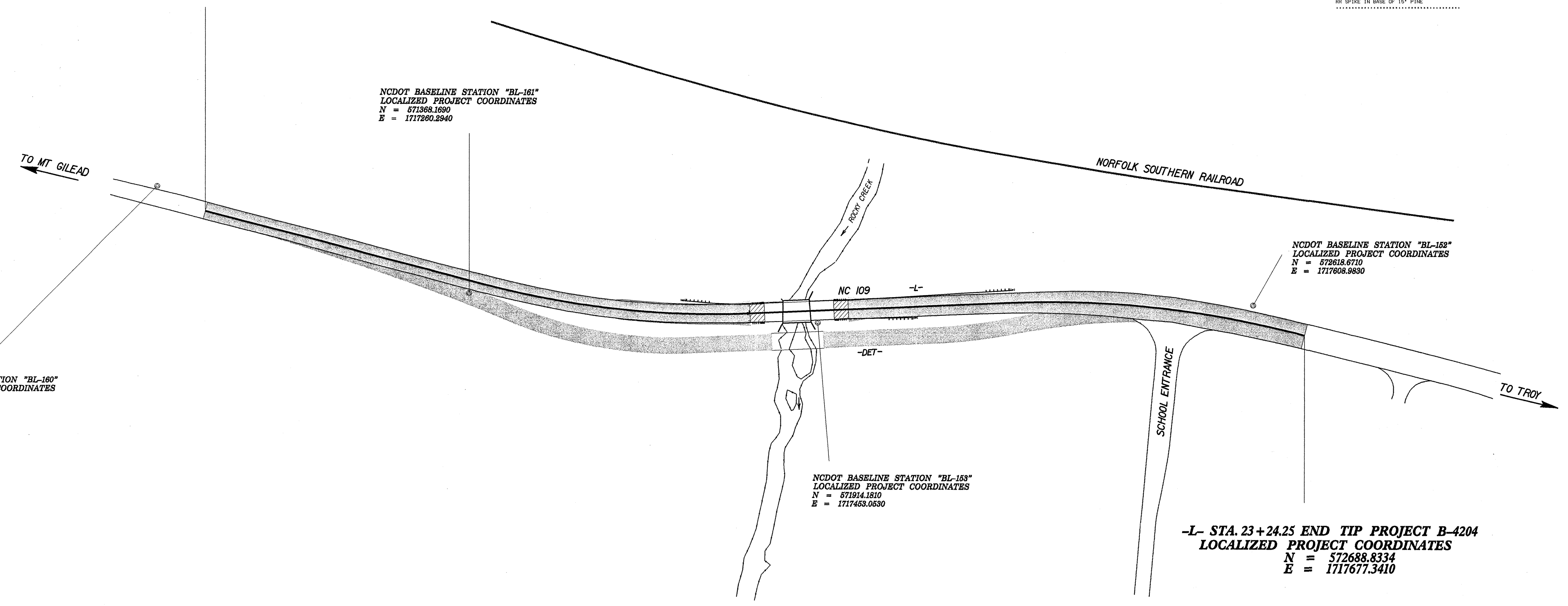
NC DOT BASELINE STATION "BL-163"
LOCALIZED PROJECT COORDINATES
 N = 571914.1810
 E = 1717468.0630

NC DOT BASELINE STATION "BL-162"
LOCALIZED PROJECT COORDINATES
 N = 572618.6710
 E = 1717608.9830

NC DOT BASELINE STATION "BL-131"
LOCALIZED PROJECT COORDINATES
 N = 573195.6880
 E = 1718014.3000

-L- STA. 23+24.25 END TIP PROJECT B-4204
LOCALIZED PROJECT COORDINATES
 N = 572688.8334
 E = 1717677.3410

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL-160		570918.5180	1718968.1880	508.30		OUTSIDE PROJECT LIMITS
BL-161		571368.1690	1717880.8940	508.30	14+36.25	30.25 RT
BL-162		572618.6710	1717608.9830	475.89	15+12.43	19.43 RT
BL-163		571914.1810	1717468.0630	496.32	23+21.16	30.86 LT
BL-131		573195.6880	1718014.3000	518.07		OUTSIDE PROJECT LIMITS



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NC DOT FOR MONUMENT "R2527-6" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 569291.861(fft) EASTING: 1702362.009(fft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999852338 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2527-6" TO -L- STATION 4+79.47 IS N 83 25 44.0 E 14753.111' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 B4204_LS_CONTROL_070703.TXT
 SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
 © INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NC DOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

NOTE: DRAWING NOT TO SCALE

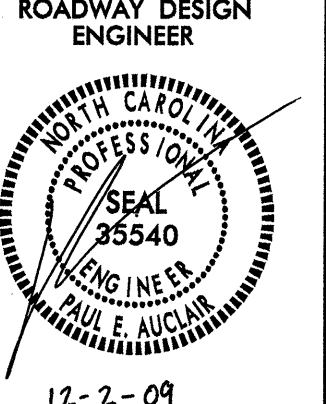
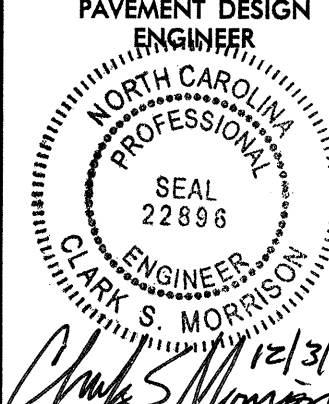
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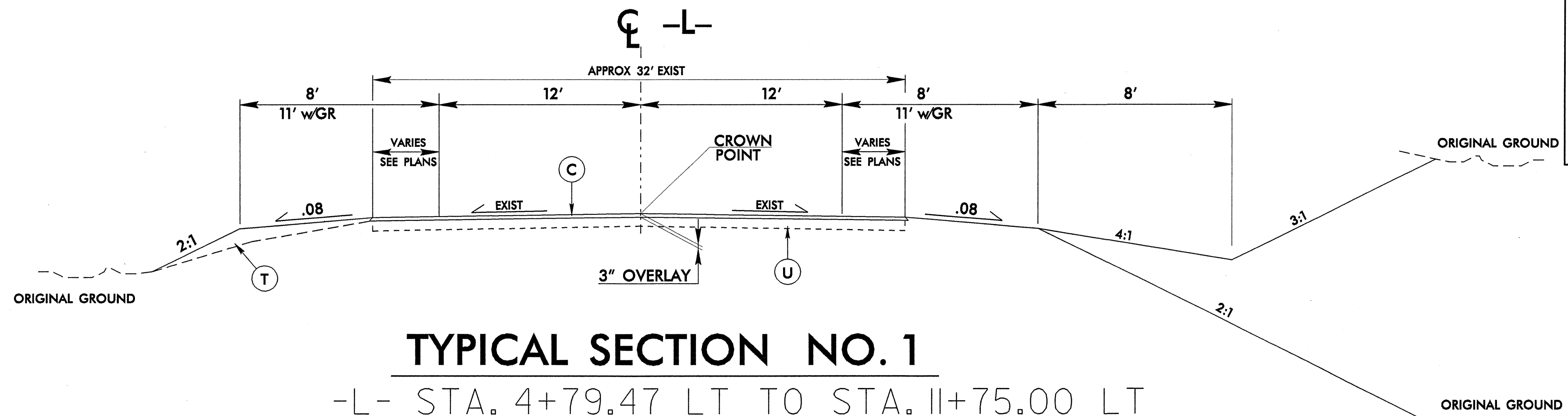
6/22/99

PAVEMENT SCHEDULE

C	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL
U	EXISTING PAVEMENT

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

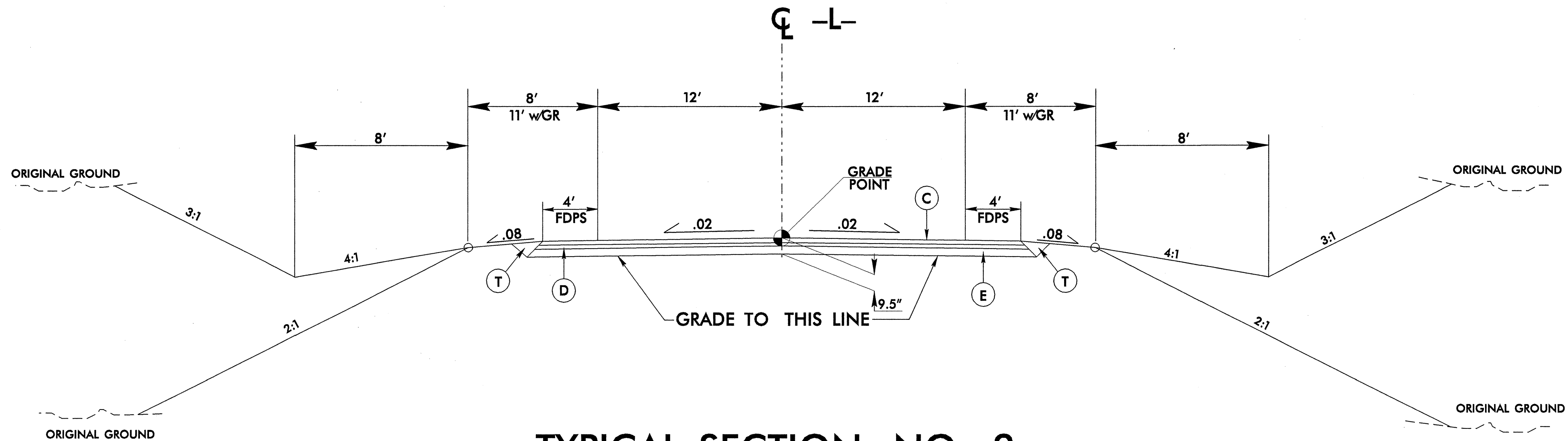
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ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
12-2-09	12/3/09



TYPICAL SECTION NO. 1

- L- STA. 4+79.47 LT TO STA. 11+75.00 LT
- L- STA. 4+79.47 RT TO STA. 6+25.00 RT
- L- STA. 6+25.00 RT TO STA. 11+75.00 RT*
- L- STA. 17+12.00 LT TO STA. 18+50.00 LT*
- L- STA. 18+50.00 LT TO STA. 23+24.25 LT
- L- STA. 17+12.00 RT TO STA. 20+40.00 RT*
- L- STA. 20+40.00 RT TO STA. 23+24.25 RT

* DENOTES LIMITS OF SHOULDER WORK (SEE CROSS-SECTIONS)



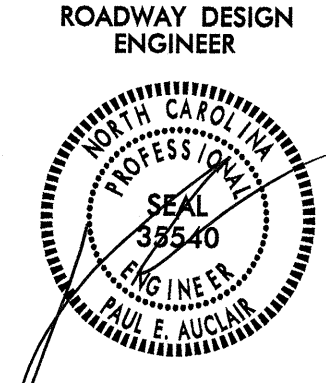
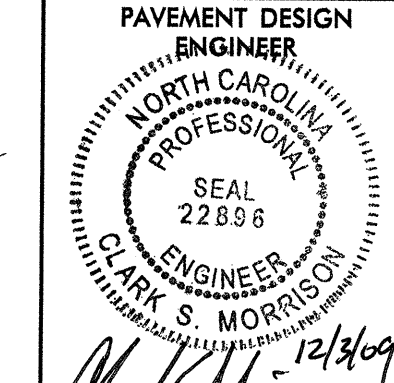
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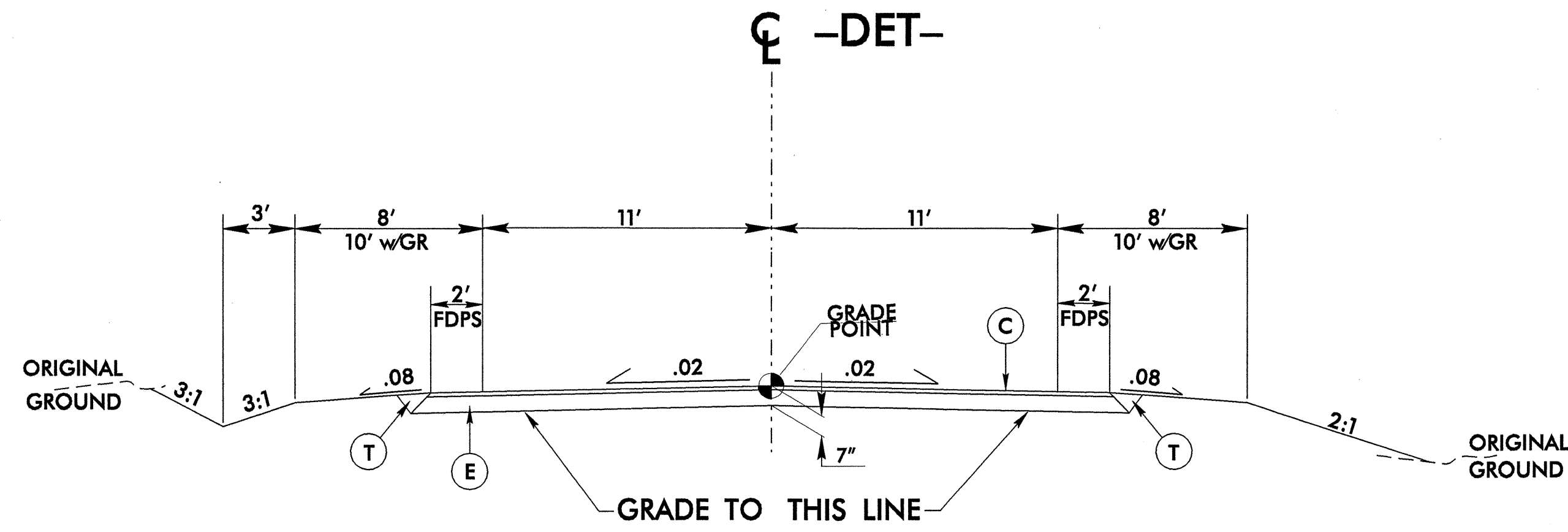
- L- STA. 11+75.00 TO STA. 14+24.54 (BEGIN BRIDGE)
- L- STA. 15+40.46 (END BRIDGE) TO 17+12.00

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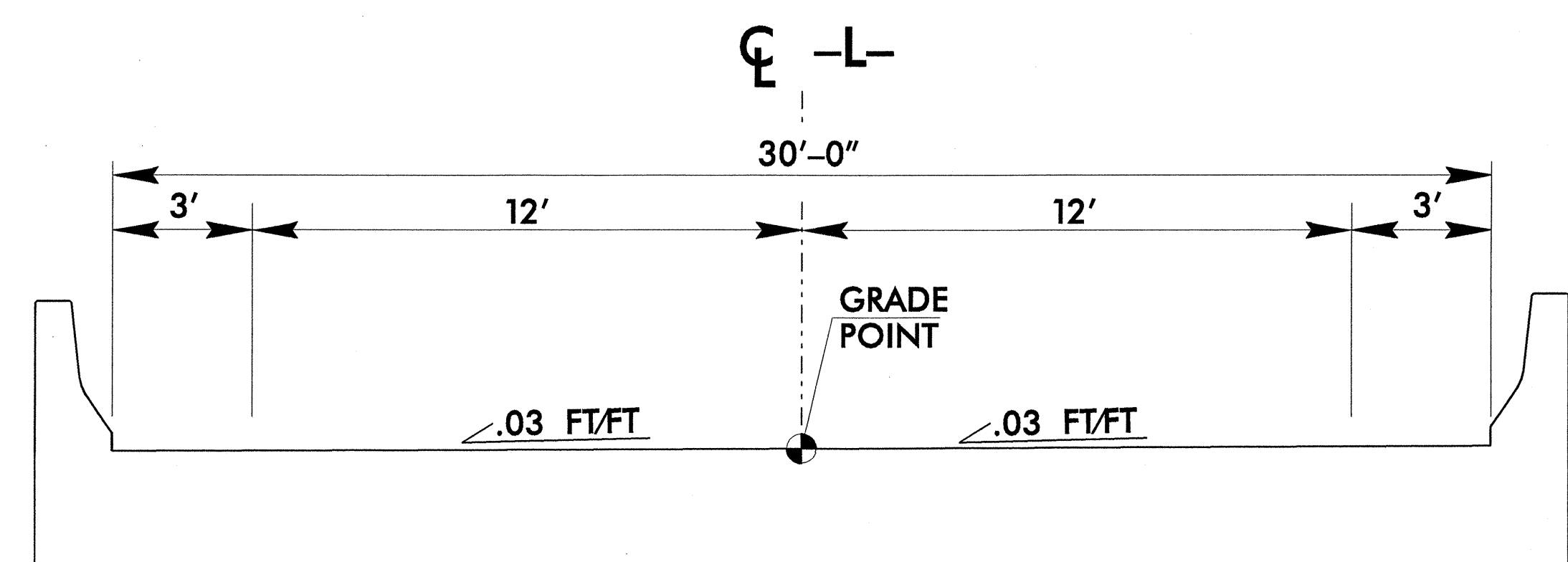
PAVEMENT SCHEDULE	
C	3" S9.5B
D	2 1/2" I19.0B
E	4" B25.0B
T	EARTH MATERIAL
U	EXIST. PAVEMENT

PROJECT REFERENCE NO. B-4204	SHEET NO. 2A
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
11-9-09	12/8/09



TYPICAL SECTION NO. 3

-DET- STA. 13+39.79 TO STA. 19+47.98 (BEGIN BRIDGE)
 -DET- STA. 20+77.98 (END BRIDGE) TO 25+08.30



TYPICAL SECTION NO. 4

-L- STA. 14+24.54 (BEGIN BRIDGE) TO STA. 15+40.46 (END BRIDGE)

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

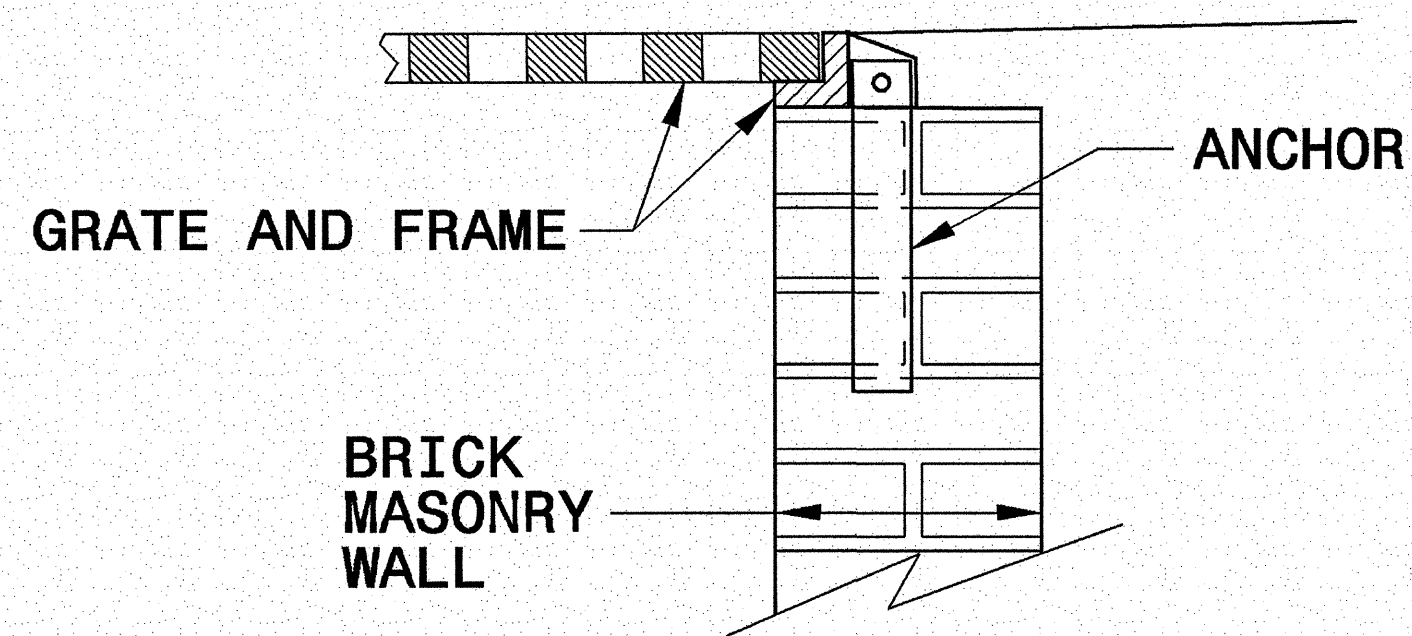
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25

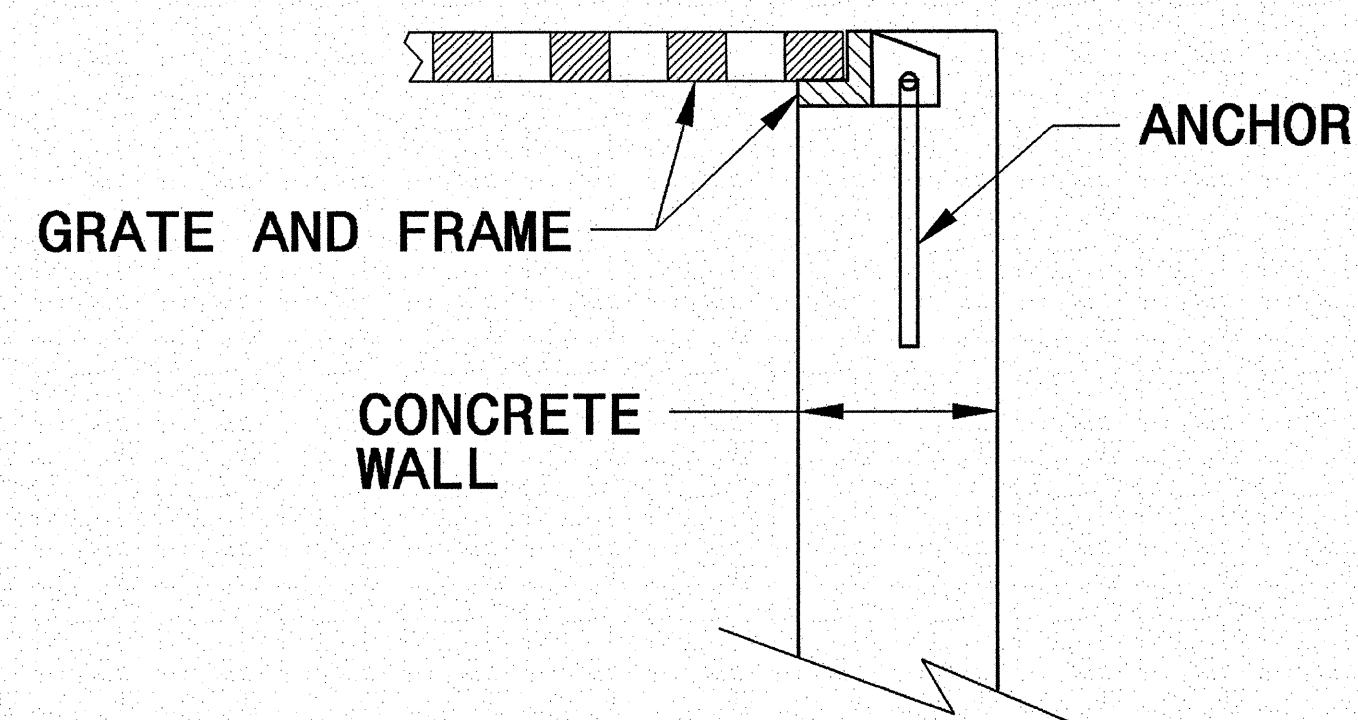
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

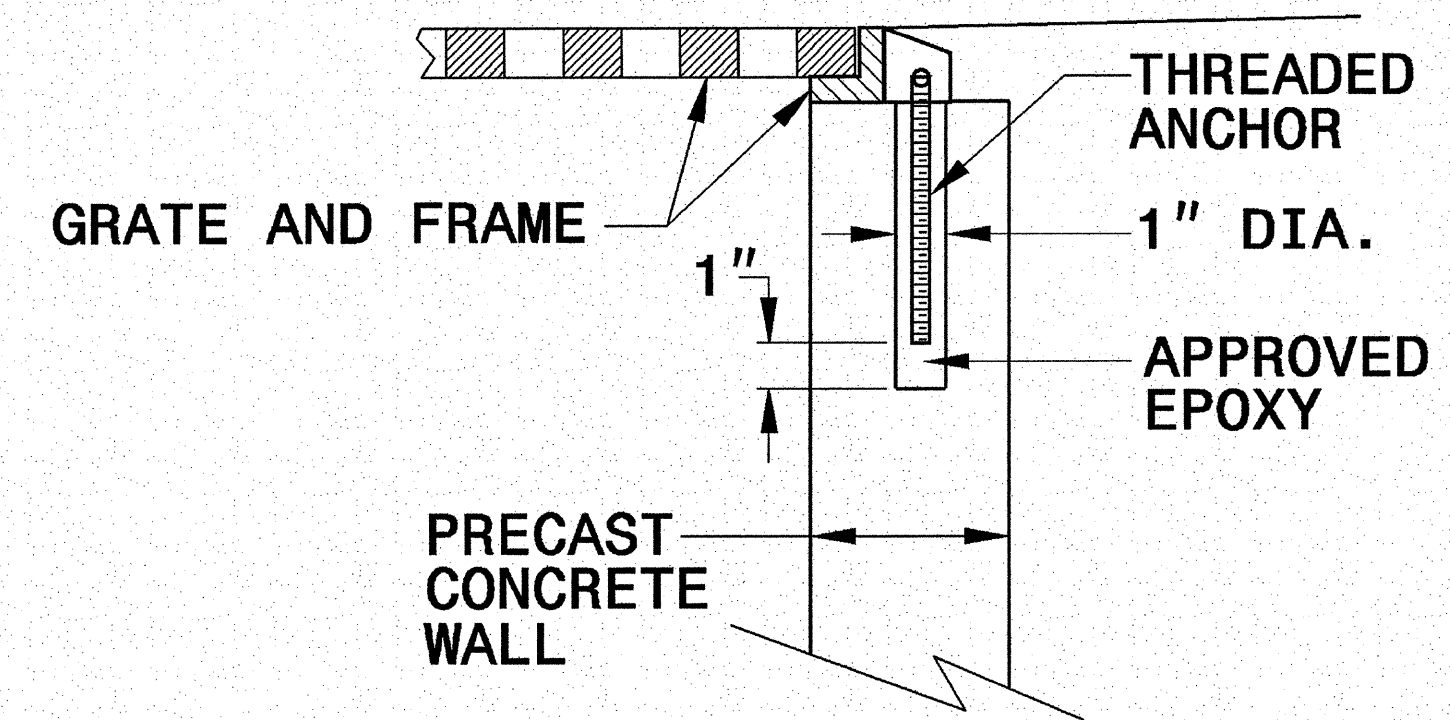
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



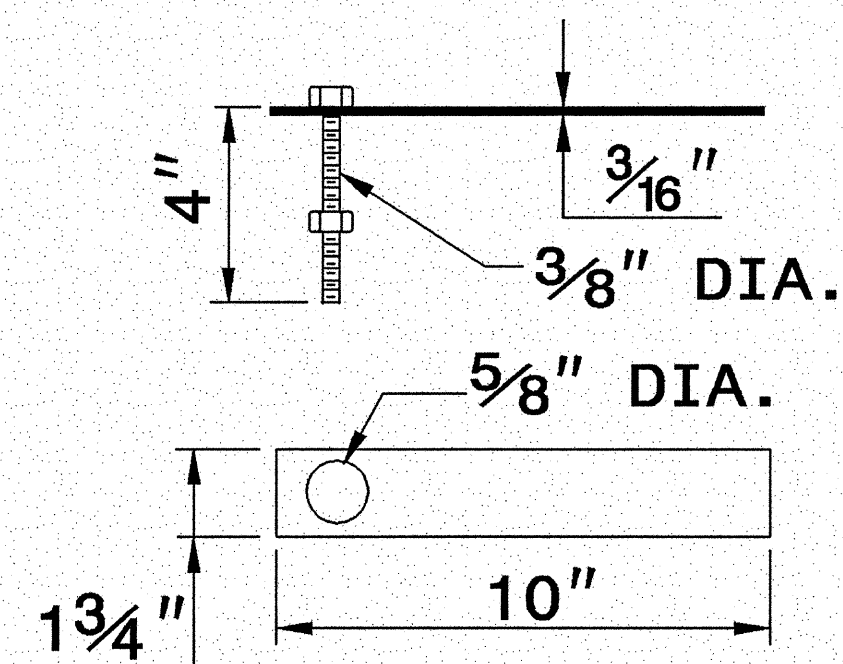
CONCRETE CONSTRUCTION



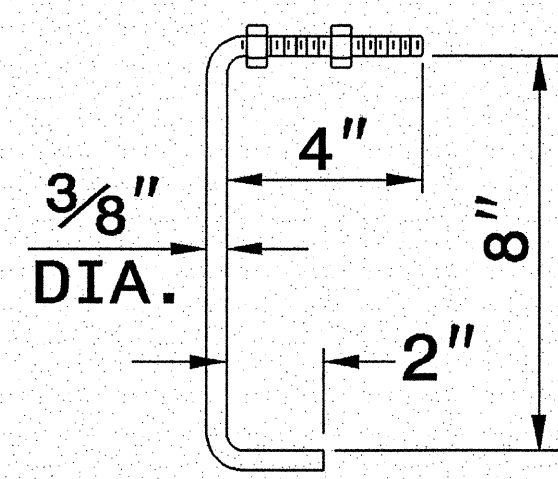
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

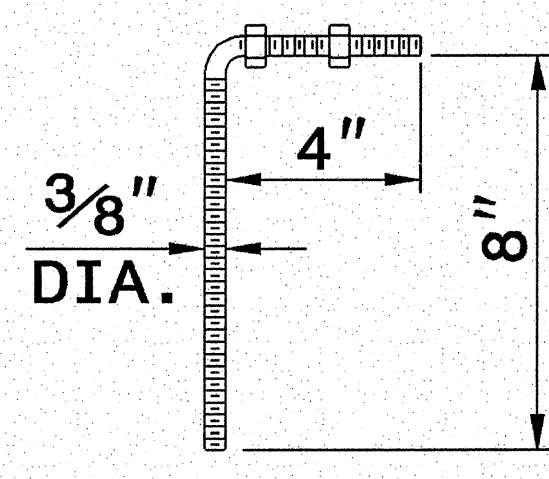
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



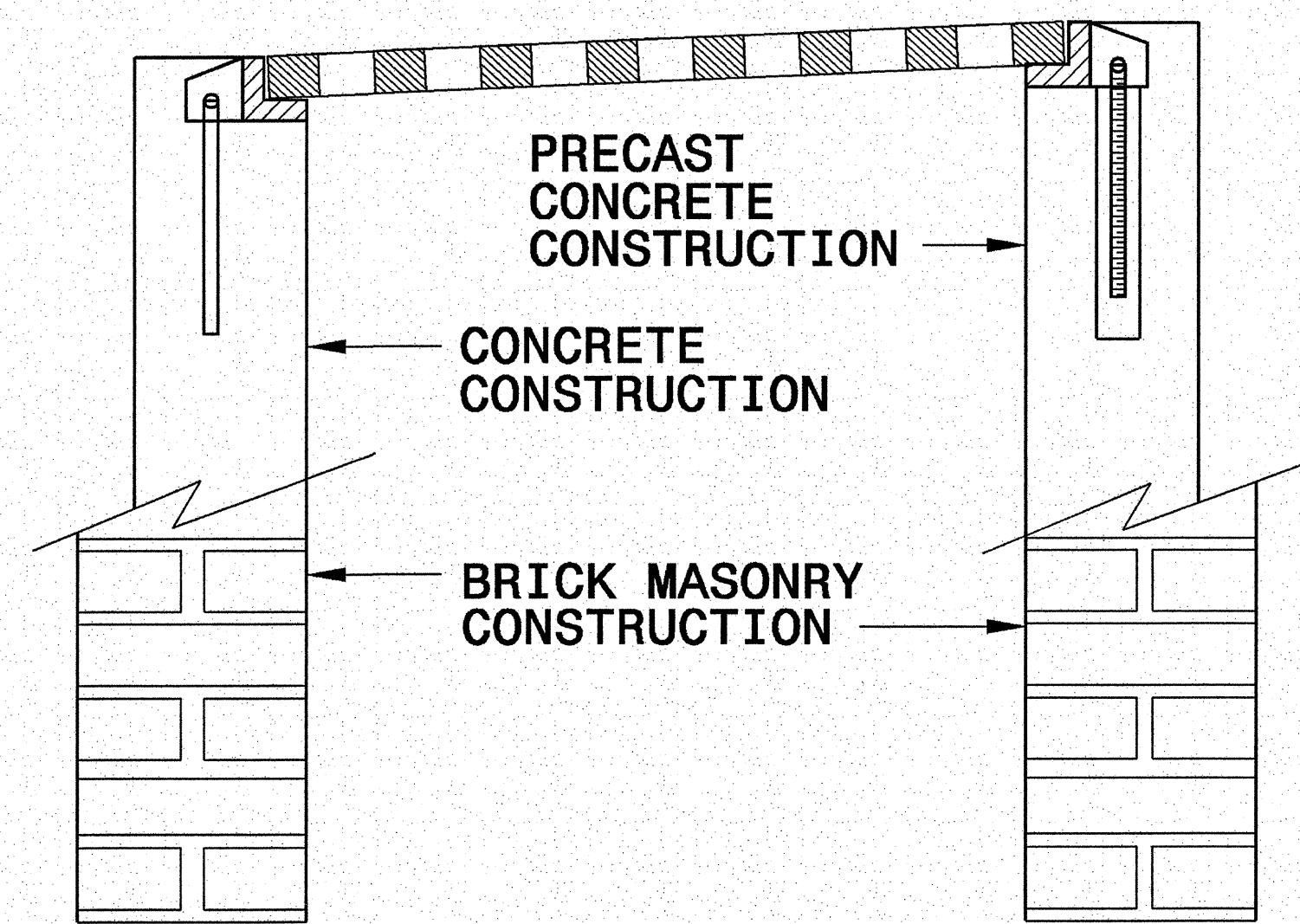
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



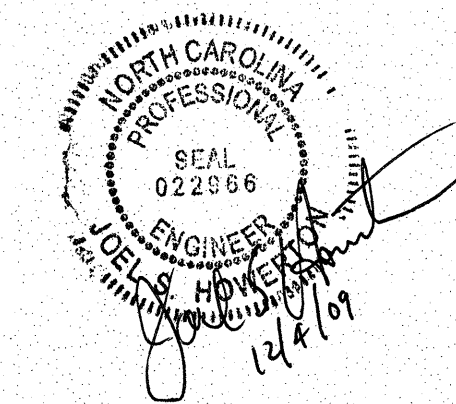
CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS



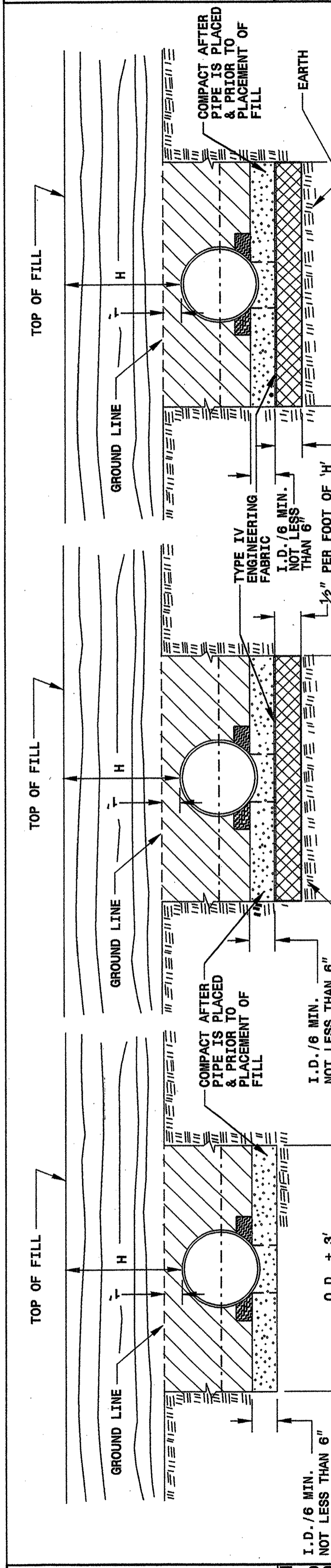
**PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

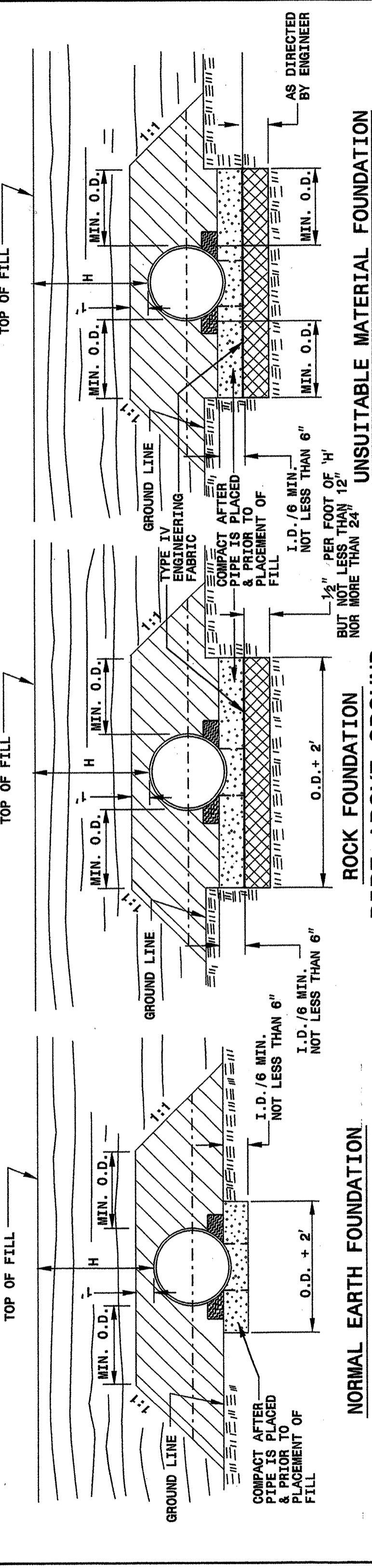
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MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE: FILE SPEC.:

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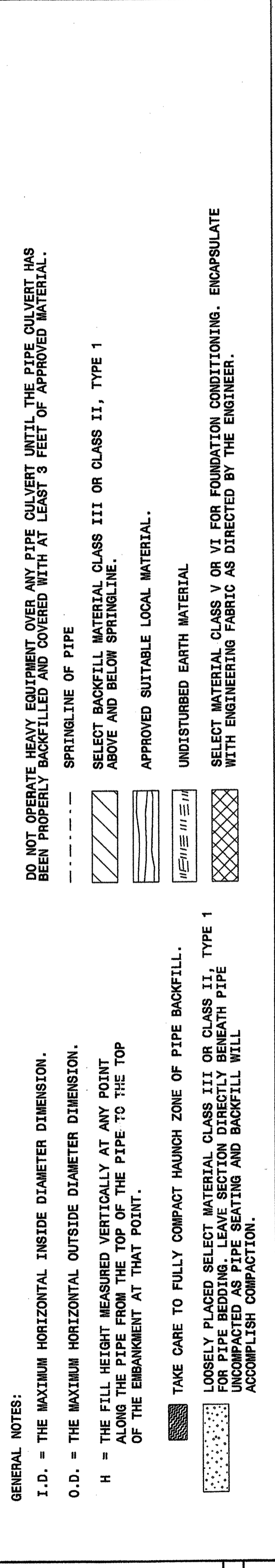
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.



ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION
 FLEXIBLE PIPE



GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.



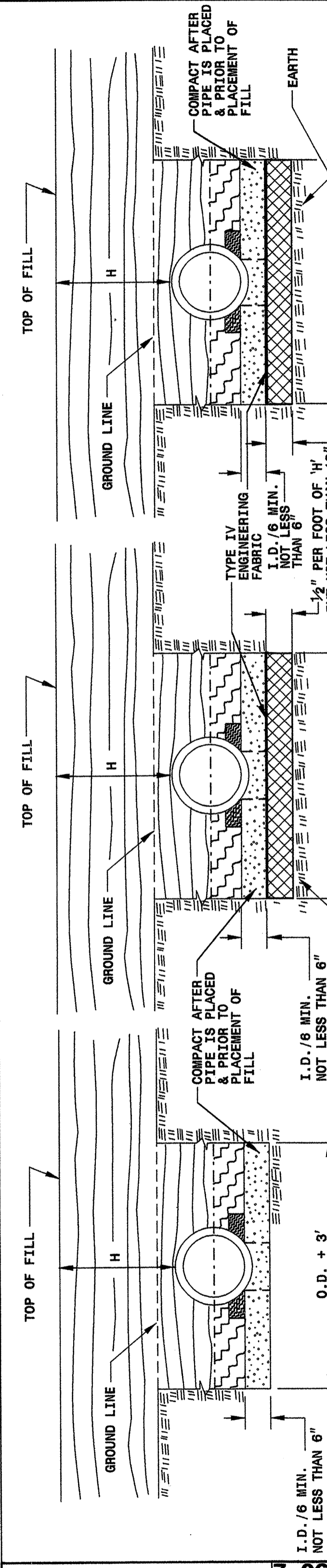
SHEET 1 OF 3
 300D01

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

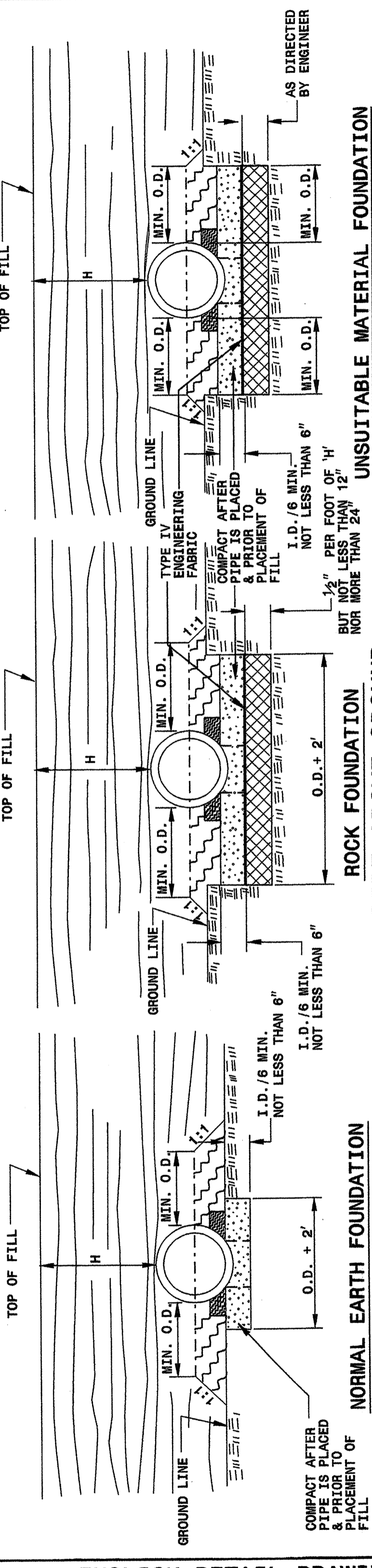
ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION
 FLEXIBLE PIPE

SHEET 1 OF 3
 300D01

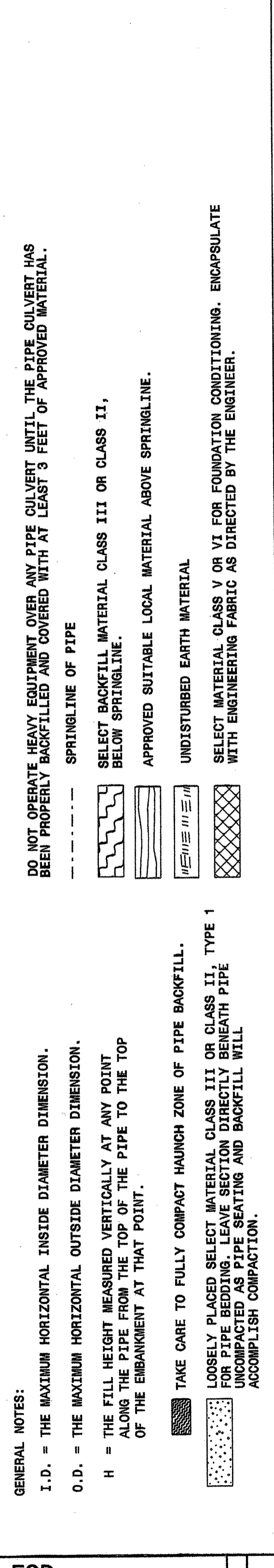
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.



ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION
 RIGID PIPE



GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.



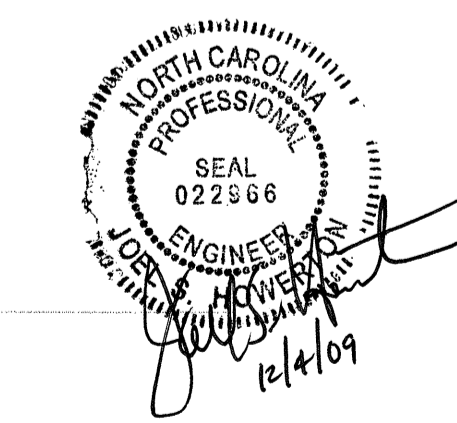
SHEET 2 OF 3
 300D01

SHEET 2 OF 3
 300D01

PROJECT SERVICES UNIT
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 Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
 MODIFIED BY: [Signature] DATE: [Blank]
 CHECKED BY: [Signature] DATE: 7/20/09
 FILE SPEC: [Blank]



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

7-06

ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3
 300D01

FLEXIBLE PIPE

Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **						
Diameter (Inches)	Minimum cover (Inches)	(Ga) 16	14	12	10	8
12	12	204	256			
15	12	162	204			
18	12	135	169	239		
21	12	115	145	204		
24	12	100	128	178		
30	12	79	100	142		
36	12	65	83	117	152	
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **						
Diameter (Inches)	Minimum cover (Inches)	(Ga) 16	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	76	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	50	74
66	12				50	62
72	12					51
	12					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 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.

7-06

ENGLISH DETAIL DRAWING FOR
 METHOD OF PIPE INSTALLATION

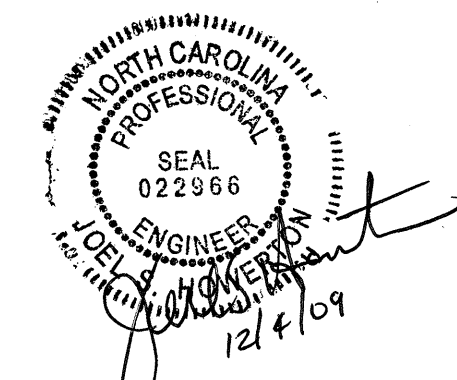
FILL HEIGHT TABLES

SHEET 3 OF 3
 300D01

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

SEE PLATE FOR TITLE

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



DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
PHASE I					
-DET- 10+00.00 TO 19+47.98 (BEGIN BRIDGE)	668		402		266
-DET- 20+77.98 (END BRIDGE) TO 28+60.22	260		1,969	1,709	
SUBTOTAL	928		2,371	1,709	266
PHASE II					
-L- 6+25.00 TO 14+24.54 (BEGIN BRIDGE)	128		154	26	
-L- 15+40.46 (END BRIDGE) TO 20+40.00	222		106		116
SUBTOTAL	350		260	26	116
PHASE III (-L- /W-DET- REMOVAL)					
-L- 5+62.39 TO 14+10.63 (BEGIN BRIDGE)	534		496		38
-L- 15+40.63 (END BRIDGE) TO 20+50.00	1,848		271		1,577
SUBTOTAL	2,382		767		1,615
PROJECT SUBTOTAL	3,660		3,398	1,735	1,997
EARTH WASTE TO REPLACE BORROW				-292	-292
LOSS DUE TO CLEAR. & GRUB.	-500			500	
PROJECT TOTALS	3,160		3,398	1,943	1,705
EST. 5% FOR REPLACING TOPSOIL ON ON BORROW PIT					
				97	
GRAND TOTALS	3,160			2,040	
SAY	3,250			2,100	

EST. DDE = 440 C.Y.
 EST. SELECT GRANULAR MATERIAL = 1000 C.Y.
 EST. UNDERCUT EXCAVATION = 1500 C.Y.
 EST. CLASS IV SUBGRADE STABILIZATION = 1000 TONS

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

PARCEL INDEX

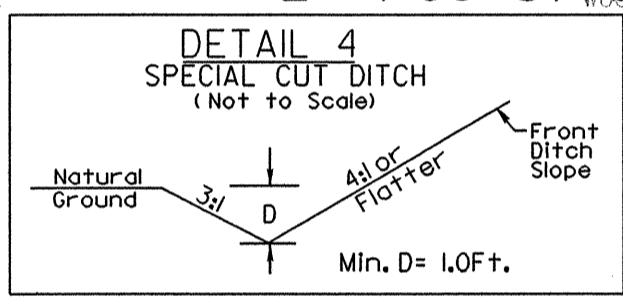
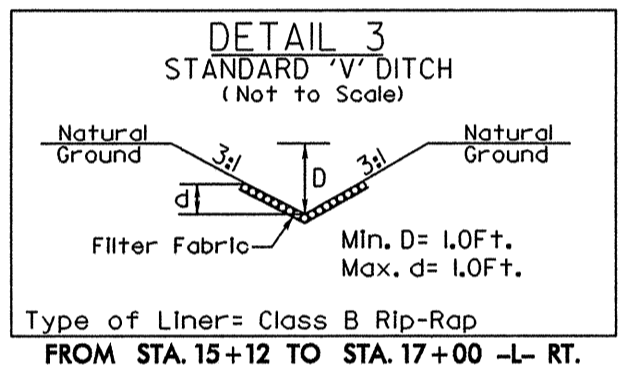
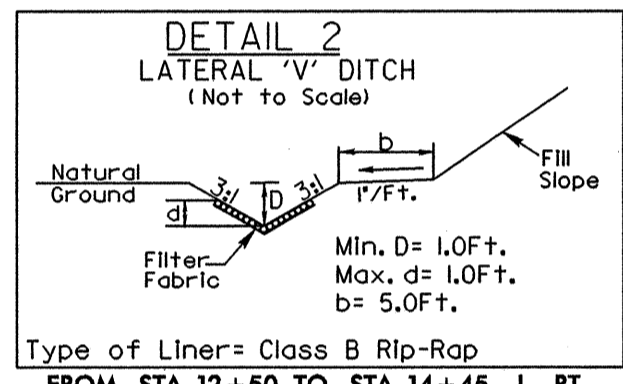
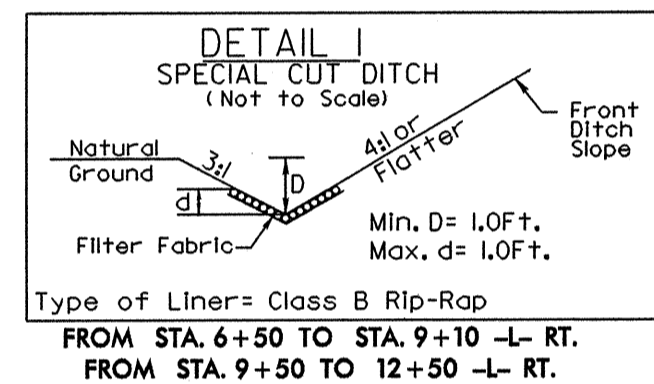
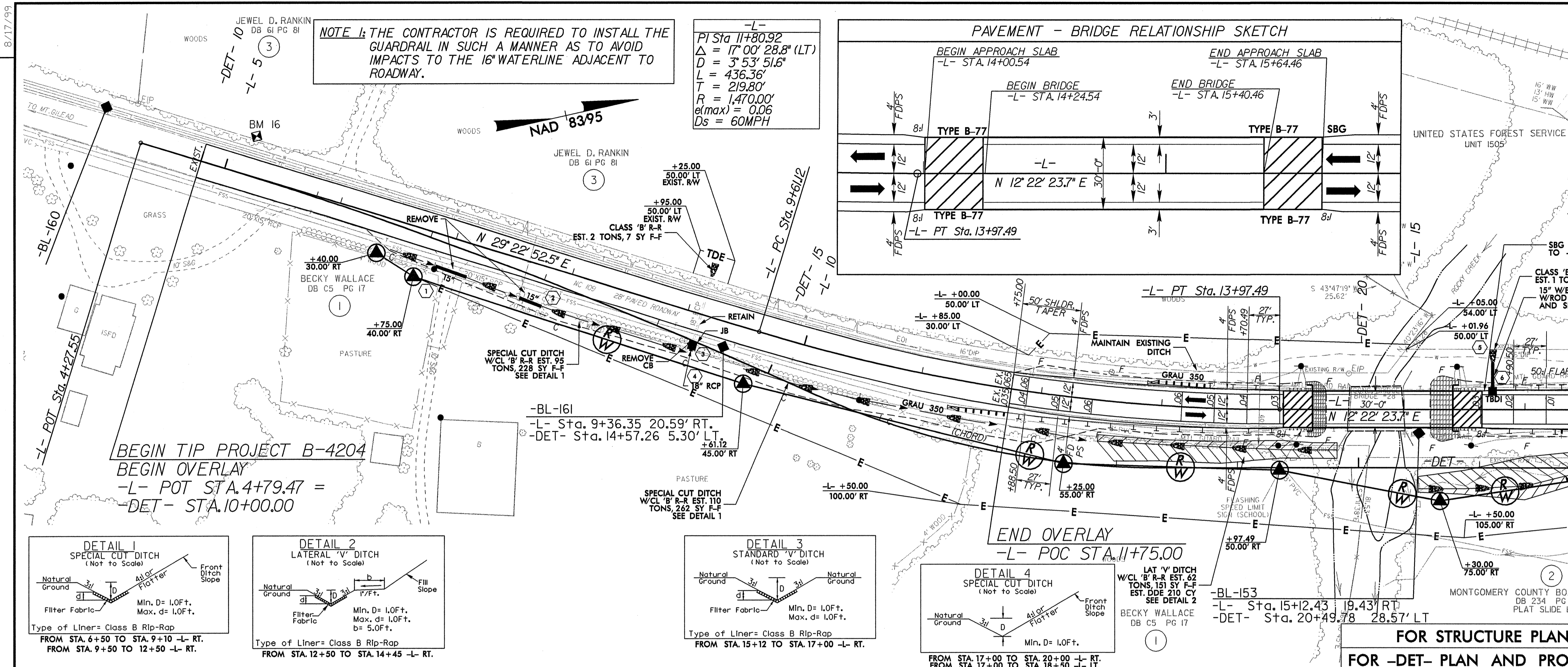
PARCEL NO.	PROPERTY OWNER	SHEET NO.
1	BECKY WALLACE	4
2	MONTGOMERY COUNTY BOARD OF EDUCATION	4+5
3	JEWEL D. RANKIN	4

SUMMARY OF PAVEMENT REMOVAL
 IN SQUARE YARDS

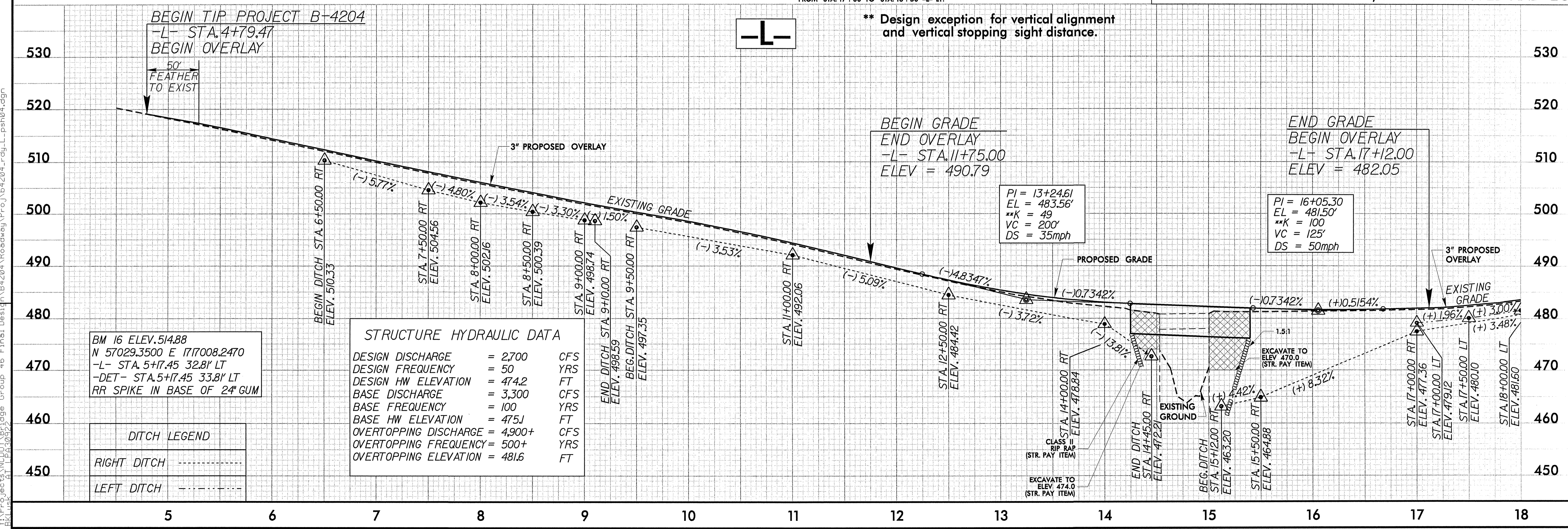
LOCATION	ASPHALT REMOVAL
-L- 11+75.00 TO 14+55.63	938.55
-L- 15+00.26 TO 17+12.00	734.03
-DET- 10+83.19 TO 14+71.28	450.00
-DET- 14+71.28 TO 19+39.98	1354.02
-DET- 19+39.98 TO 19+47.98	24.00
-DET- 20+77+98 TO 20+85.98	24.00
-DET- 20+85.98 TO 24+22.02	970.78
-DET- 24+22.02 TO 225+84.44	248.56
TOTAL	4,743.94
SAY	4,750

NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

5/9/06
 0:\DEC-2009\116061\Bridges Group 46 Final Design\B4204\Roadway\Proj\B4204_rdy_psh03A.dgn



FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-21
FOR -DET- PLAN AND PROFILE, SEE SHEET NO. 2B AND 2C



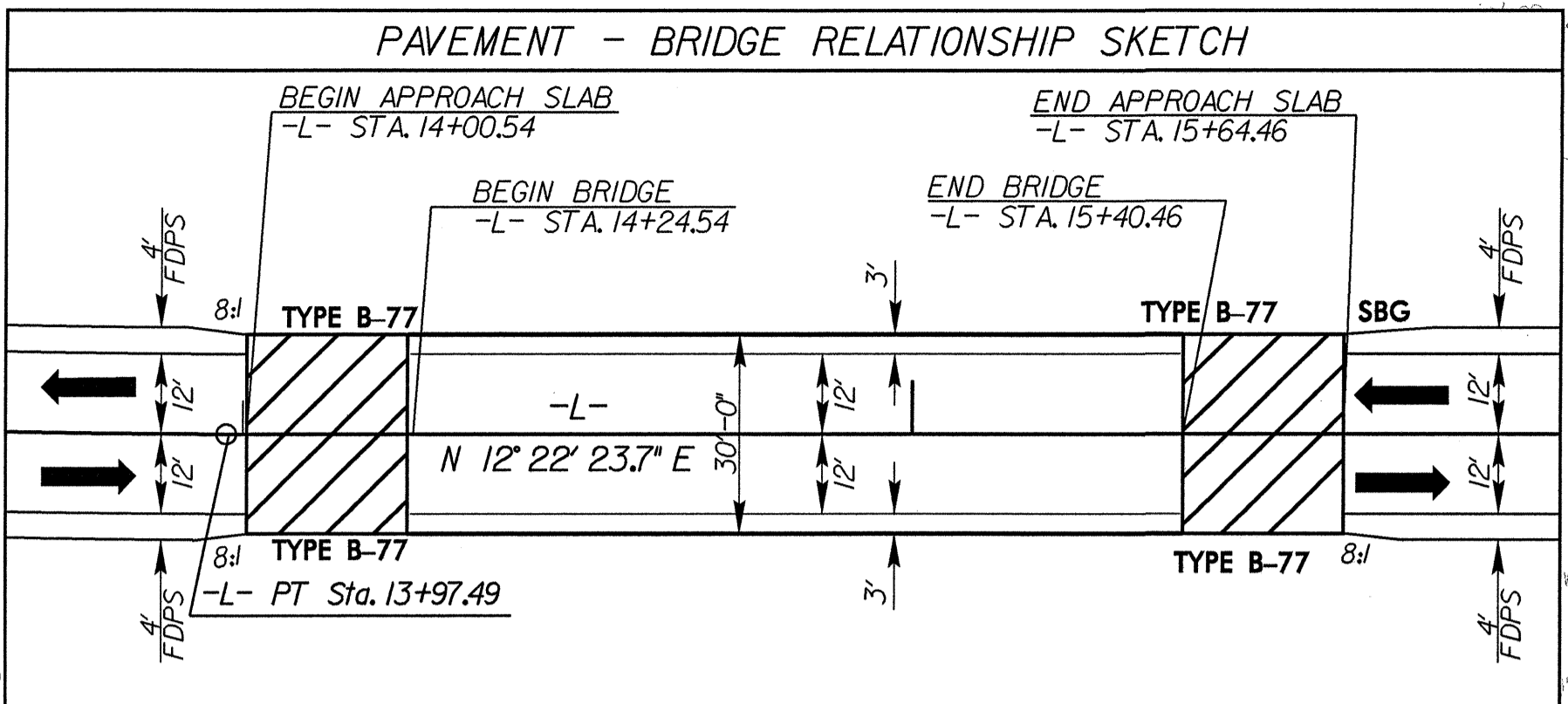
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REVISIONS

MATCH LINE -L- STA. 18+00 SEE SHEET 5

NOTE 1: THE CONTRACTOR IS REQUIRED TO INSTALL THE GUARDRAIL IN SUCH A MANNER AS TO AVOID IMPACTS TO THE 16" WATERLINE ADJACENT TO ROADWAY.

-L-
PI Sta 11+80.92
Δ = 17° 00' 28.8" (LT)
D = 3' 53" 51.6"
L = 436.36'
T = 219.80'
R = 1,470.00'
e(max) = 0.06
Ds = 60MPH



BEGIN TIP PROJECT B-4204
BEGIN OVERLAY
-L- POT STA. 4+79.47 =
-DET- STA. 10+00.00

END OVERLAY
-L- POC STA. 11+75.00

BEGIN OVERLAY
-L- STA. 17+12.00

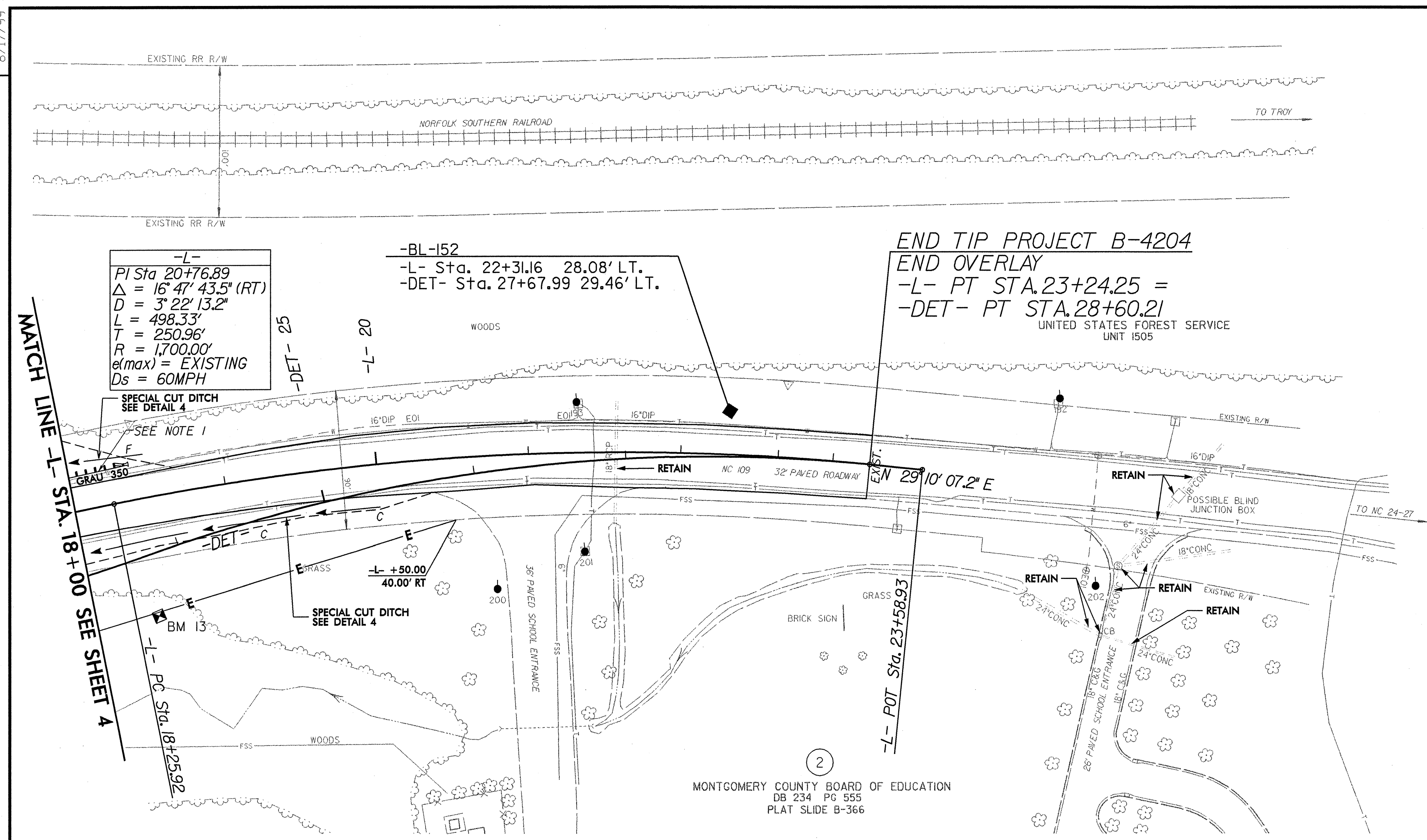
** Design exception for vertical alignment and vertical stopping sight distance.

BM 16 ELEV. 514.88
N 57° 02' 35.00" E 1717008.2470
-L- STA. 5+17.45 32.81' LT
-DET- STA. 5+17.45 33.81' LT
RR SPIKE IN BASE OF 24" GUM

PI = 13+24.61
EL = 483.56'
**K = 49
VC = 200'
DS = 35mph

PI = 16+05.30
EL = 481.50'
**K = 100
VC = 125'
DS = 50mph

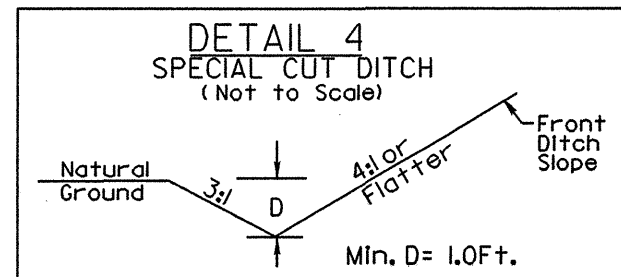
NOTE 1: THE CONTRACTOR IS REQUIRED TO INSTALL THE GUARDRAIL IN SUCH A MANNER AS TO AVOID IMPACTS TO THE 16" WATERLINE ADJACENT TO ROADWAY.



-L-
PI Sta. 20+76.89
 $\Delta = 16' 47' 43.5''$ (RT)
 $D = 3' 22' 13.2''$
 $L = 498.33'$
 $T = 250.96'$
 $R = 1,700.00'$
 $e(\max) = \text{EXISTING}$
 $D_s = 60\text{MPH}$

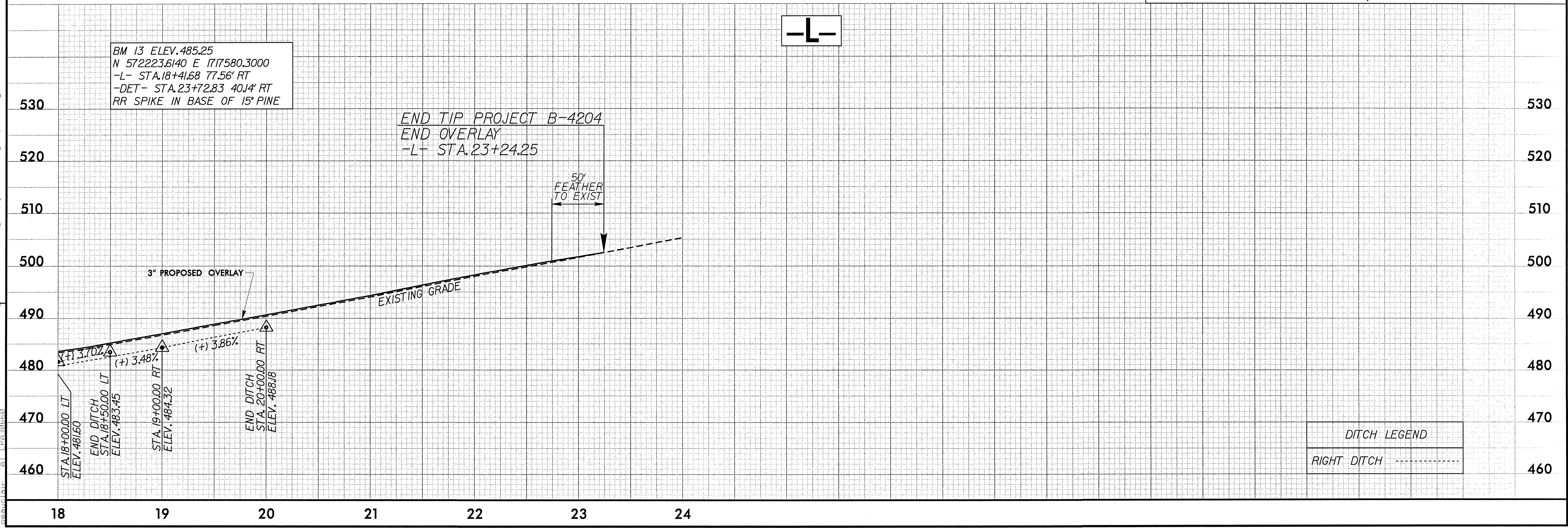
-BL-152
-L- Sta. 22+31.16 28.08' LT.
-DET- Sta. 27+67.99 29.46' LT.

END TIP PROJECT B-4204
END OVERLAY
-L- PT STA. 23+24.25 =
-DET- PT STA. 28+60.21
UNITED STATES FOREST SERVICE
UNIT 1505



FROM STA. 17+00 TO STA. 20+00 -L- RT.
FROM STA. 17+00 TO STA. 18+50 -L- LT.

FOR -DET- PLAN AND PROFILE, SEE SHEET NO. 2B AND 2C



BM 13 ELEV. 485.25
N 572223.6140 E 1717580.3000
-L- STA. 18+41.68 77.56' RT
-DET- STA. 23+72.83 40.14' RT
RR SPIKE IN BASE OF 15' PINE

END TIP PROJECT B-4204
END OVERLAY
-L- STA. 23+24.25

DITCH LEGEND	
RIGHT DITCH	-----

REVISIONS

03 NOV 2009 10:56:03 18:00:00 46 Final Design B4204\Roadway\Pro\B4204_rdy.L_psh05.dgn