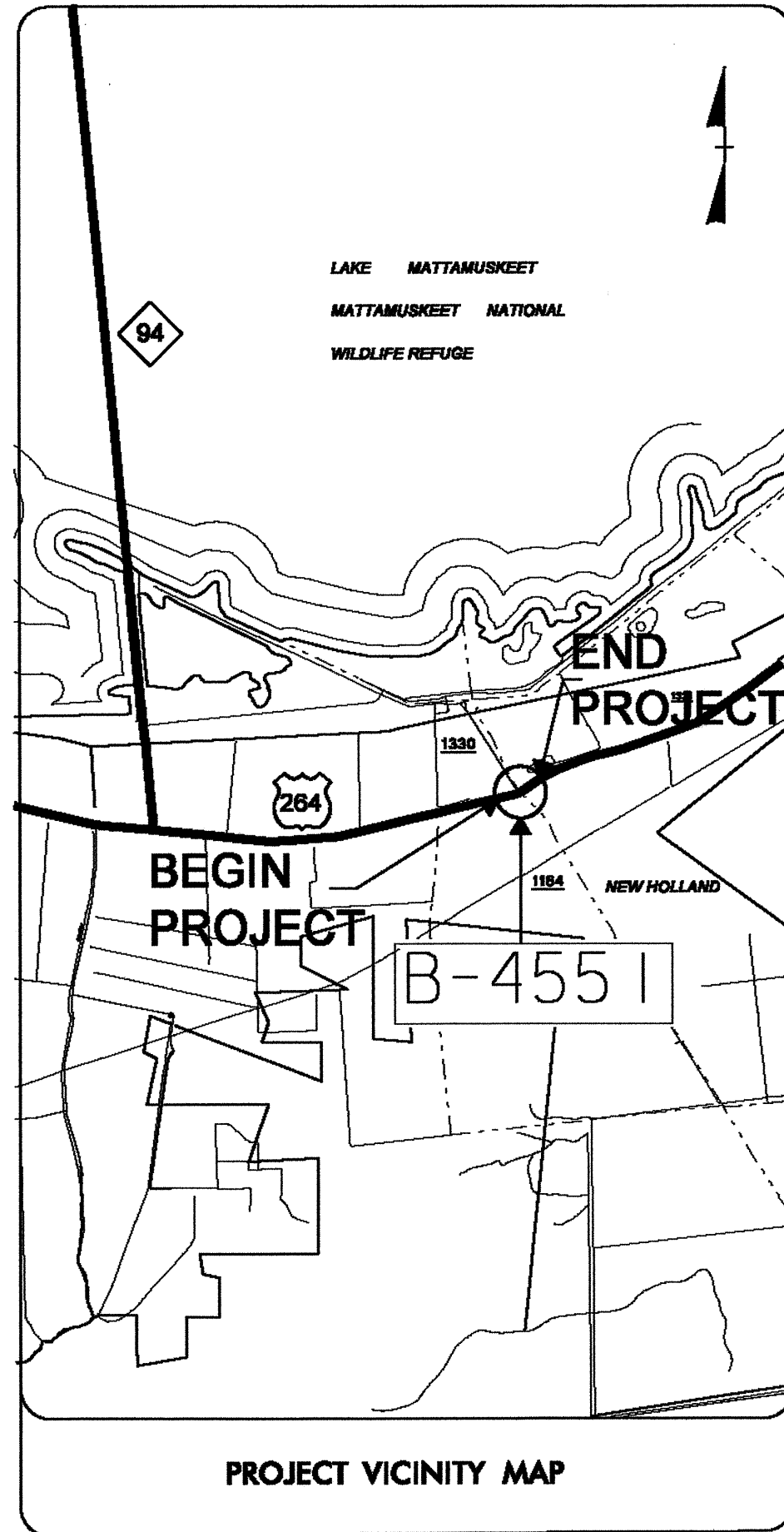


09/08/99
01-NOV-2011 11:32
B:\B4551\Roadway\Proj\B4551-L.Rdy_t.sh.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

TIP PROJECT: B-4551

CONTRACT: C202910

See Sheet 1-A For Index of Sheets



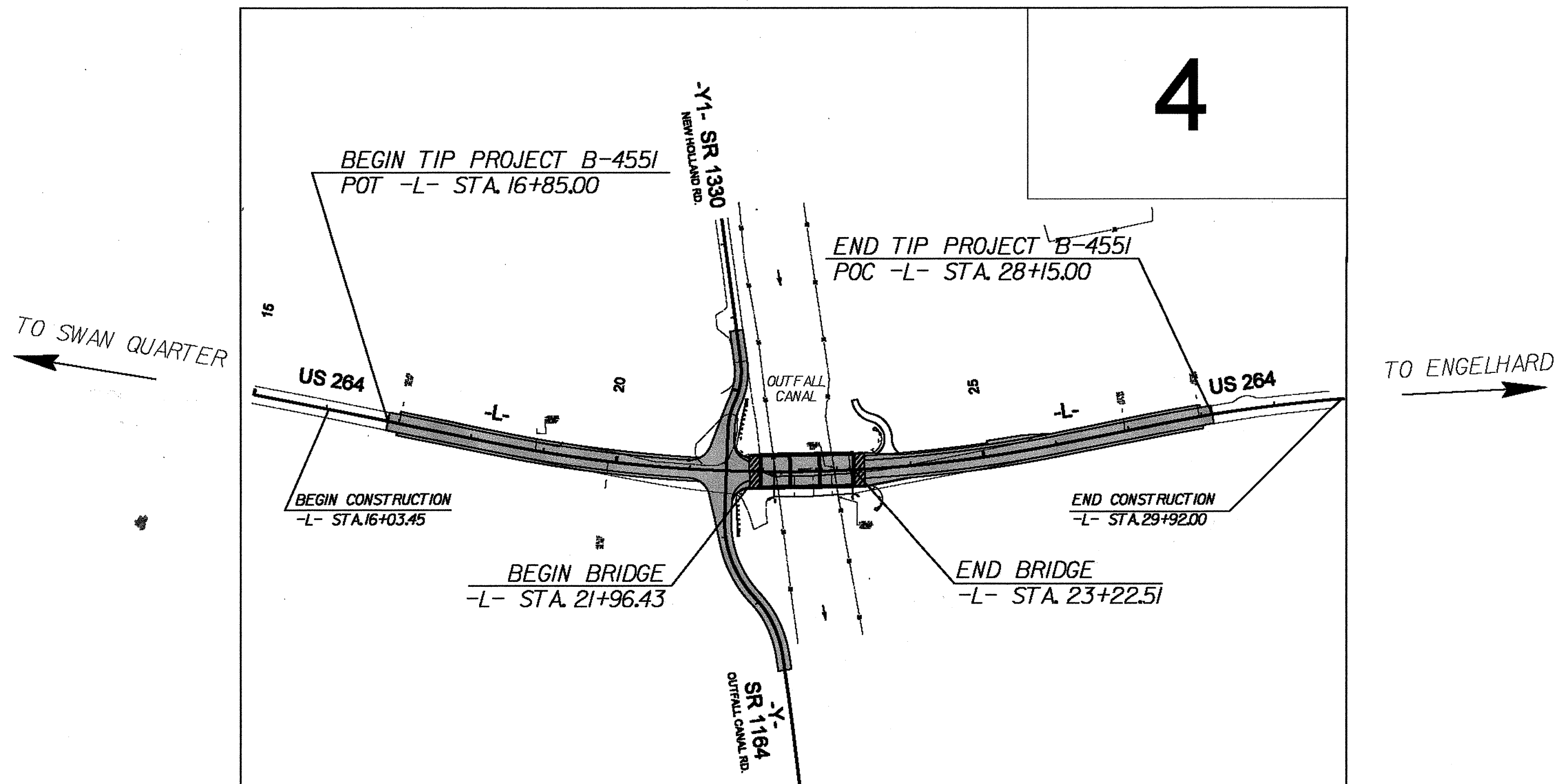
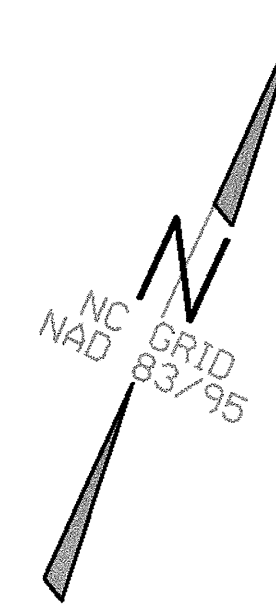
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HYDE COUNTY

LOCATION: BRIDGE NO. 45 OVER A CANAL ON US 264

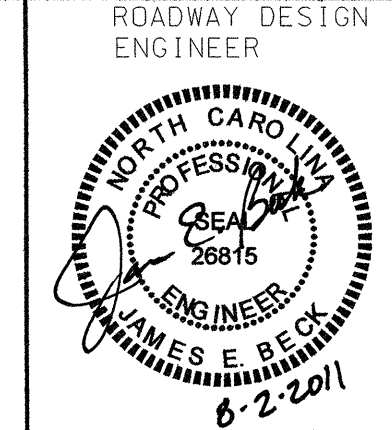
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4551	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33764.1.1	BRSTP-0264(23)	P.E.	
33764.2.1	BRSTP-0264(23)	RW & UTILITY	
33764.3.1	BRSTP-0264(23)	CONST.	



NCDOT Contact: Brenda L. Moore , PE
Roadway Design-Engineering Coordination

<p>GRAPHIC SCALES</p> <p>50 25 0 50 100 PLANS</p> <p>50 25 0 50 100 PROFILE (HORIZONTAL)</p> <p>10 5 0 10 20 PROFILE (VERTICAL)</p>	<p>DESIGN DATA</p> <p>ADT 2011 = 2790 ADT 2031 = 4170 DHV = 10 % D = 60 % T = 5% (TTST 2%, DUAL 3%) V = 60 MPH</p> <p>DESIGN EXCEPTION SUPERELEVATION RATE = e_{max} 4%</p> <p>FUNC CLASS = MINOR ARTERIAL REGIONAL TIER</p>	<p>PROJECT LENGTH</p> <p>LENGTH ROADWAY TIP PROJECT B-4551 = 0.190 MILE LENGTH STRUCTURE TIP PROJECT B-4551 = 0.024 MILE TOTAL LENGTH TIP PROJECT B-4551 = 0.214 MILE</p>	<p>Prepared in the Office of DYER, RIDDLE, MILLS & PRECOURT, INC. (DRMP) 5950 FAIRVIEW RD., SUITE 320 28210 CHARLOTTE, NORTH CAROLINA (704) 332-2289 NC LICENSE NO. C-2213</p> <p>2006 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: AUGUST 20, 2009</p> <p>LETTING DATE: January 17, 2012</p> <p>James E. Beck, PE PROJECT ENGINEER</p> <p>Garrett S. McCaffety, EI PROJECT DESIGN ENGINEER</p>	<p>HYDRAULICS ENGINEER</p> <p>Signature: <i>Ray W. ...</i> 11/2/11</p> <p>ROADWAY DESIGN ENGINEER</p> <p>Signature: <i>James E. Beck</i> 11/1/2011</p>	<p>DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA</p> <p>STATE HIGHWAY DESIGN ENGINEER</p>
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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2 THRU 2-C	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND TEMPORARY PAVEMENT DETAIL
2-D THRU 2-E	METHOD OF PIPE INSTALLATION
2-F	ANCHORAGE FOR FRAMES AND GRATES
2-G	STANDARD TEMPORARY SHORING
2-H	EMBANKMENT MONITORING DETAIL
2-I	GROUND IMPROVEMENT WITH FABRIC AND SURCHARGE
2-J	DETAIL OF GUARDRAIL ANCHOR UNIT TYPE III MODIFIED
3	SUMMARY OF QUANTITIES
3A	SUMMARY OF EARTHWORK, ASPHALT PAVEMENT REMOVAL SUMMARY, AND SUMMARY OF GUARDRAIL
3B	SUMMARY OF DRAINAGE QUANTITIES
4	PLAN SHEET
5 THRU 6	PROFILE SHEETS
TMP-1 THRU TMP-6	TRANSPORTATION MANAGEMENT PLANS
PM-1 THRU PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-4	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
UC-1 THRU UC-2	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS
X-1 THRU X-8	CROSS-SECTIONS
S-1 THRU S-30	STRUCTURE PLANS

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 II.

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.

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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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 Hyde County Water,
 Embarq,
 Tideland Electric Membership Cooperative

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.

2006 ROADWAY ENGLISH STANDARD DRAWINGS
 The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superlevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
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
876.02	Guide for Rip Rap at Pipe Outlets

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

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	○ EIP
Property Corner	→
Property Monument	□ ECM
Parcel/Sequence Number	(123)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Known Soil Contamination: Boundary or Site	☠ ☠
Potential Soil Contamination: Boundary or Site	☠ ?

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	↓
Proposed Lateral, Tail, Head Ditch	→ FLM
False Sump	◇

RAILROADS:

Standard Gauge	_____
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	○
Proposed Control of Access	○
Existing Easement Line	-E-
Proposed Temporary Construction Easement	-E-
Proposed Temporary Drainage Easement	-TDE-
Proposed Permanent Drainage Easement	-PDE-
Proposed Permanent Drainage / Utility Easement	-DUE-
Proposed Permanent Utility Easement	-PUE-
Proposed Temporary Utility Easement	-TUE-
Proposed Aerial Utility Easement	-AUE-

ROADS AND RELATED FEATURES:

Proposed Permanent Easement with Iron Pin and Cap Marker	◆
Existing Edge of Pavement	_____
Existing Curb	_____
Proposed Slope Stakes Cut	-C-
Proposed Slope Stakes Fill	-F-
Proposed Curb Ramp	○ CR
Curb Cut Future Ramp	○ CCFR
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	_____

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	_____
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	○ T
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	○ W
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	_____

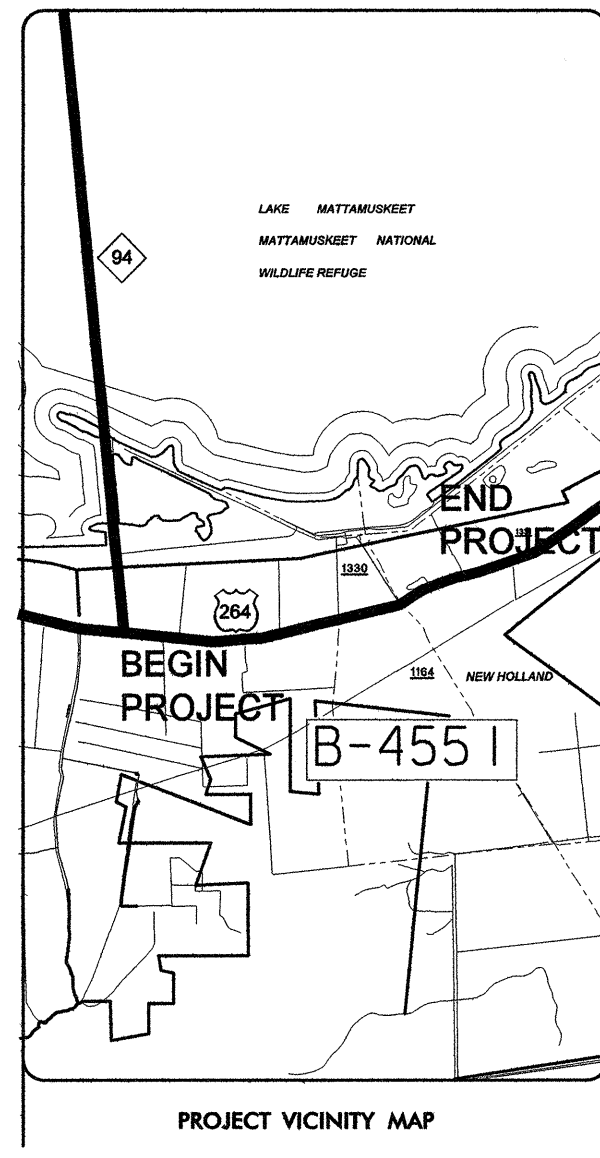
SANITARY SEWER:

Sanitary Sewer Manhole	○ SS
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:

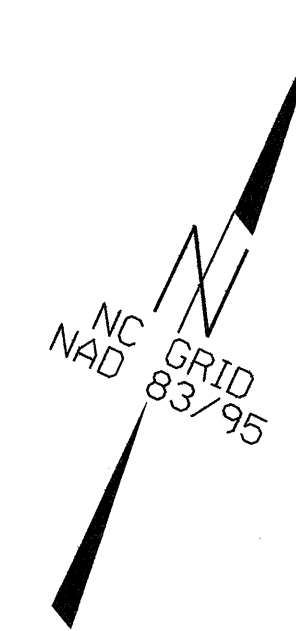
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line	_____
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	□ UST
AG Tank; Water, Gas, Oil	□
Geoenvironmental Boring	○
U/G Test Hole (S.U.E.*)	○
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

SURVEY CONTROL SHEET B-4551



CONTROL DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
B45511	(B5551-1)	627808.4680	2840864.2620	2.21	OUTSIDE PROJECT LIMITS	
B45512	(B4551-2)	628122.2410	2842183.3900	2.52	OUTSIDE PROJECT LIMITS	
BL3	(BL-3)	628371.0850	2843037.3420	6.82	23+32.07	33.73 RT
BL4	(BL-4)	628760.9320	2843544.8990	2.79	29+66.52	17.90 LT



⊕
NCDOT GPS STATION "B4551-1"
LOCALIZED PROJECT COORDINATES
N = 627,808.4680
E = 2,840,864.2620

STA 16+85.00 -L- BEGIN TIP PROJECT B-4551
LOCALIZED PROJECT COORDINATES
N = 628,193.5388
E = 2,842,411.0908

STA 28+15.00 -L- BEGIN TIP PROJECT B-4551
LOCALIZED PROJECT COORDINATES
N = 628,665.6600
E = 2,843,425.0074

⊕
NCDOT GPS STATION "B4551-2"
LOCALIZED PROJECT COORDINATES
N = 628,122.2410
E = 2,842,183.3900

⊕
NCDOT BASELINE STATION "BL-3"
LOCALIZED PROJECT COORDINATES
N = 628,371.0850
E = 2,843,037.3420

⊕
NCDOT BASELINE STATION "BL-4"
LOCALIZED PROJECT COORDINATES
N = 628,760.9320
E = 2,843,544.8990

BENCHMARK DATA

BM10 ELEVATION = 5.37
N 628431 E 2842873
L STATION 22+09 92 LEFT
RR SPIKE IN BASE 24 INCH PINE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4551-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 627808.469(ft) EASTING: 2840864.263(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988399 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4551-1" TO -L- STATION 16+85.00 IS N 76°01'15" E 1.594.04' 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 [HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT) FILE: b4551_ls_control_081218.txt

SITE CALIBRATION PARAMETERS HAVE NOT BEEN DETERMINED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

⊕ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT. PROJECT CONTROL ESTABLISHED UTILIZING GLOBAL POSITIONING SYSTEM NETWORK FOR GPS "B4551-1" ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

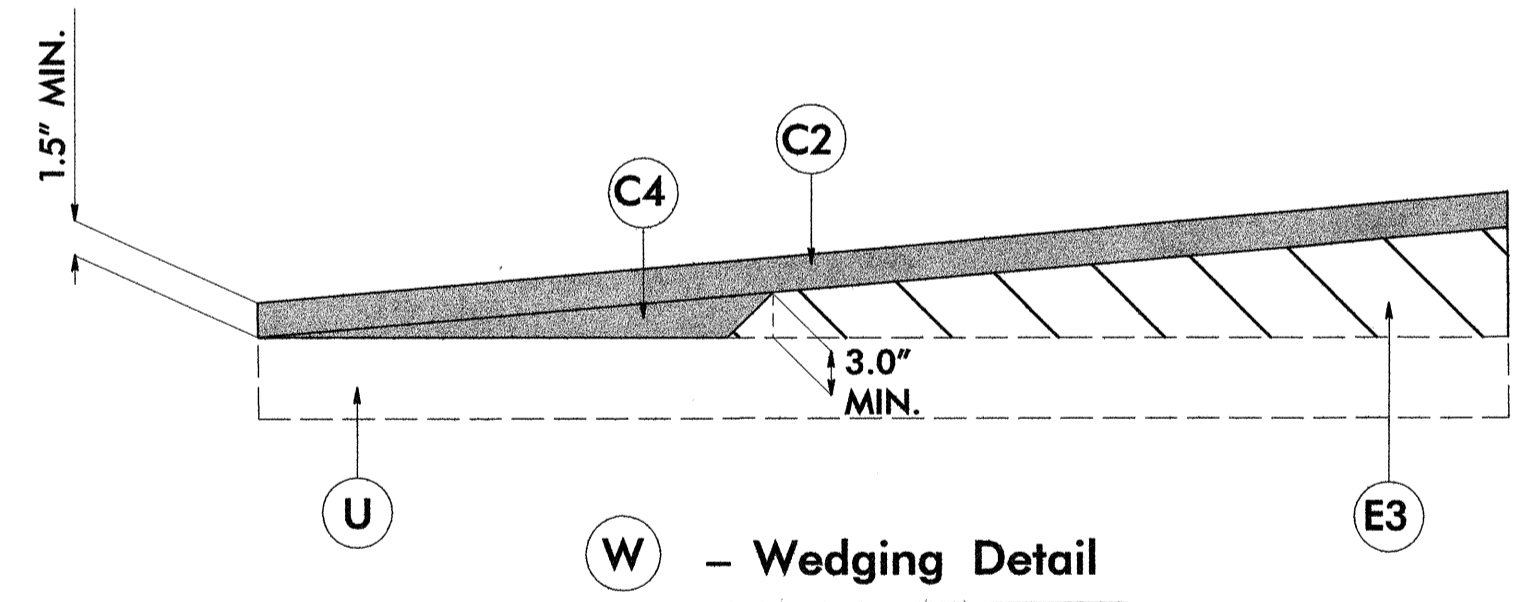
NOTE: DRAWING NOT TO SCALE

6/2/09

PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	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 LESS THAN 1.5" IN DEPTH OR GREATER THAN 2.0" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 5.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
J1	6" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING. (SEE WEDGING DETAIL, THIS SHEET)

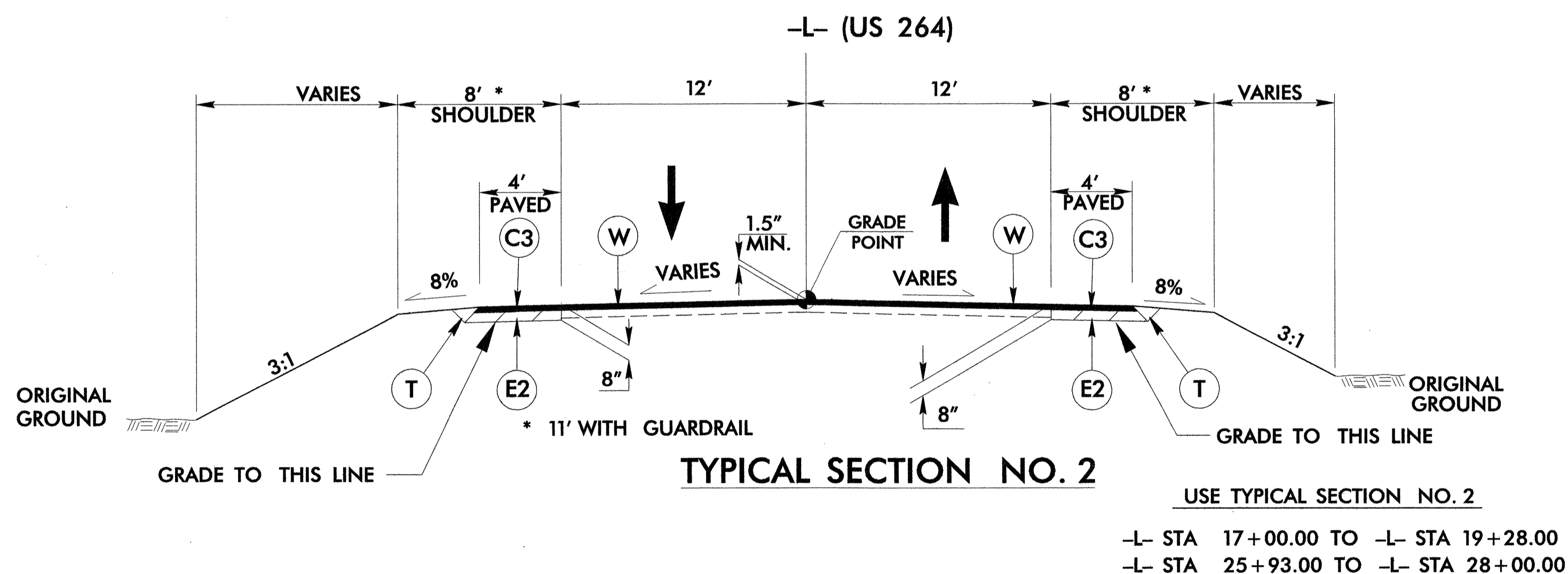
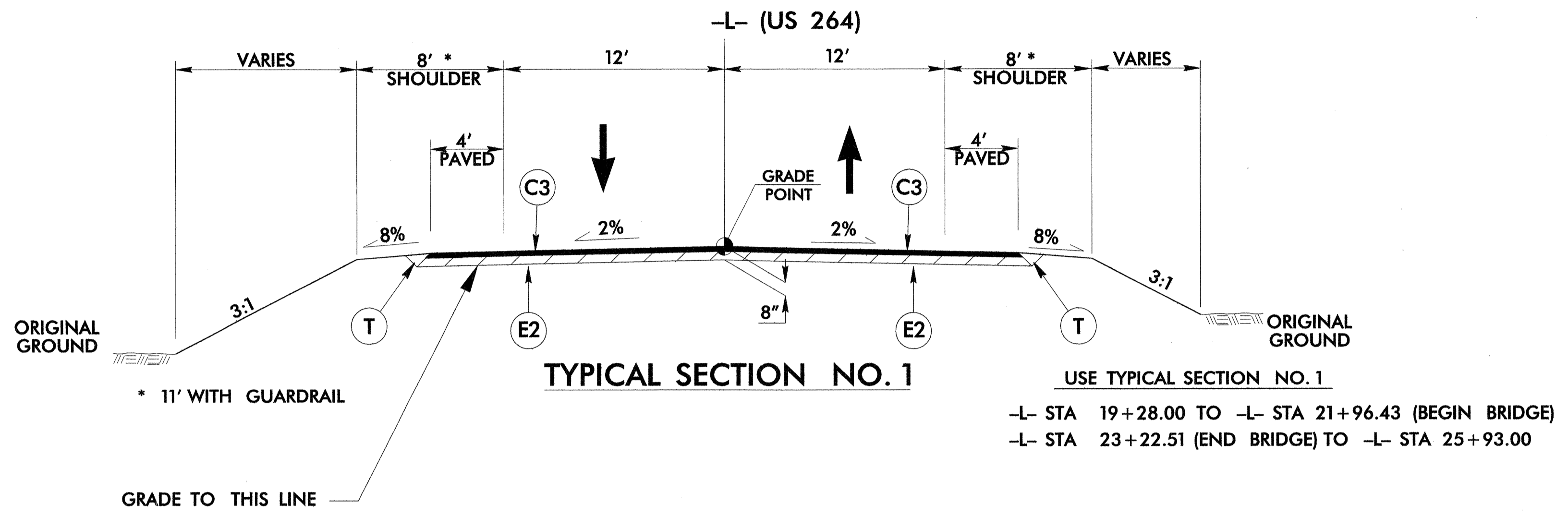
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING (INCLUDES FEATHERING)
 -L- STA 16+85.00 (BEGIN PROJECT) TO -L- STA 17+00.00

TRANSITION FROM TYPICAL SECTION NO. 2 TO EXISTING (INCLUDES FEATHERING)
 -L- STA 28+00.00 TO -L- STA 28+15.00 (END PROJECT)

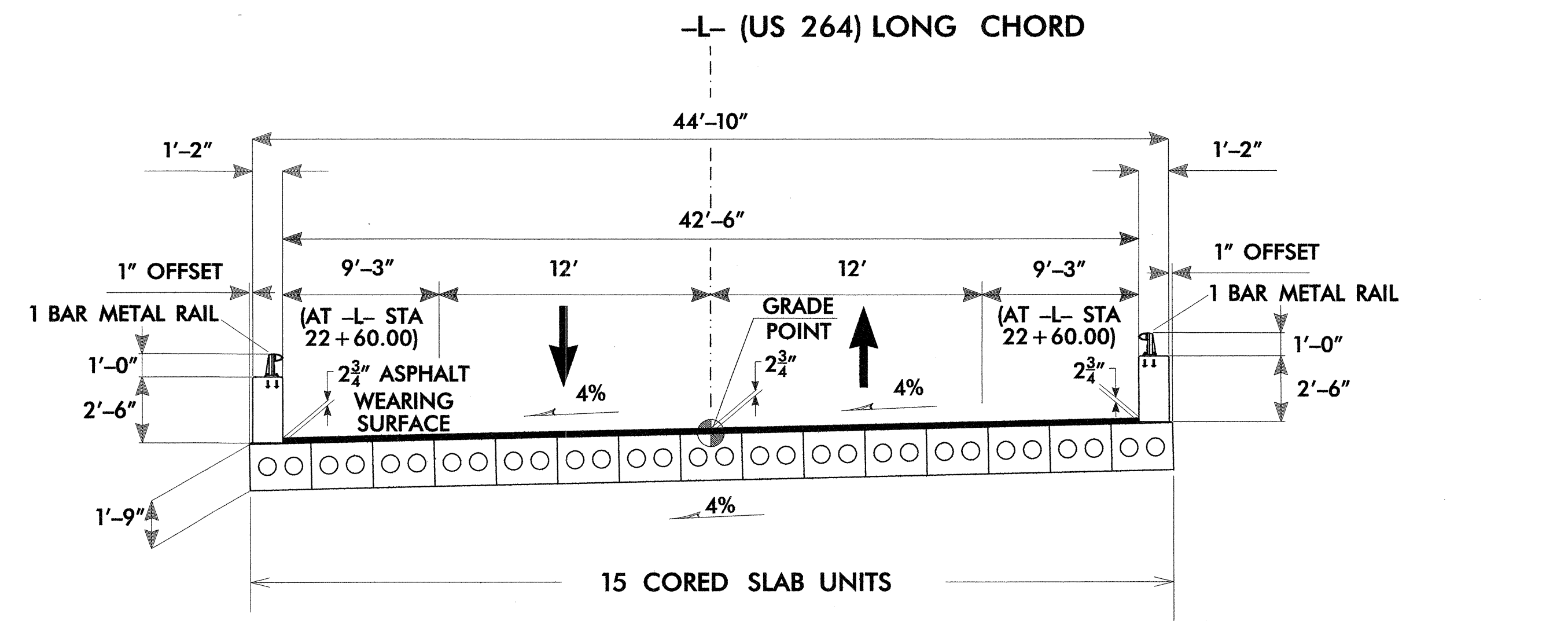
PROJECT REFERENCE NO. B-4551	SHEET NO. 2
ROADWAY DESIGN ENGINEER JAMES E. BECK SEAL 28875 7/26/2011	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22886 7/26/2011



P:\Roadwork\Proj\B4551\rdy_typ.dgn
 10/2/09 11:41 AM

6/2/09

PROJECT REFERENCE NO. B-4551	SHEET NO. 2-A
ROADWAY DESIGN ENGINEER JAMES E. BECK 26815 7/24/2011	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON 22898 7/24/11

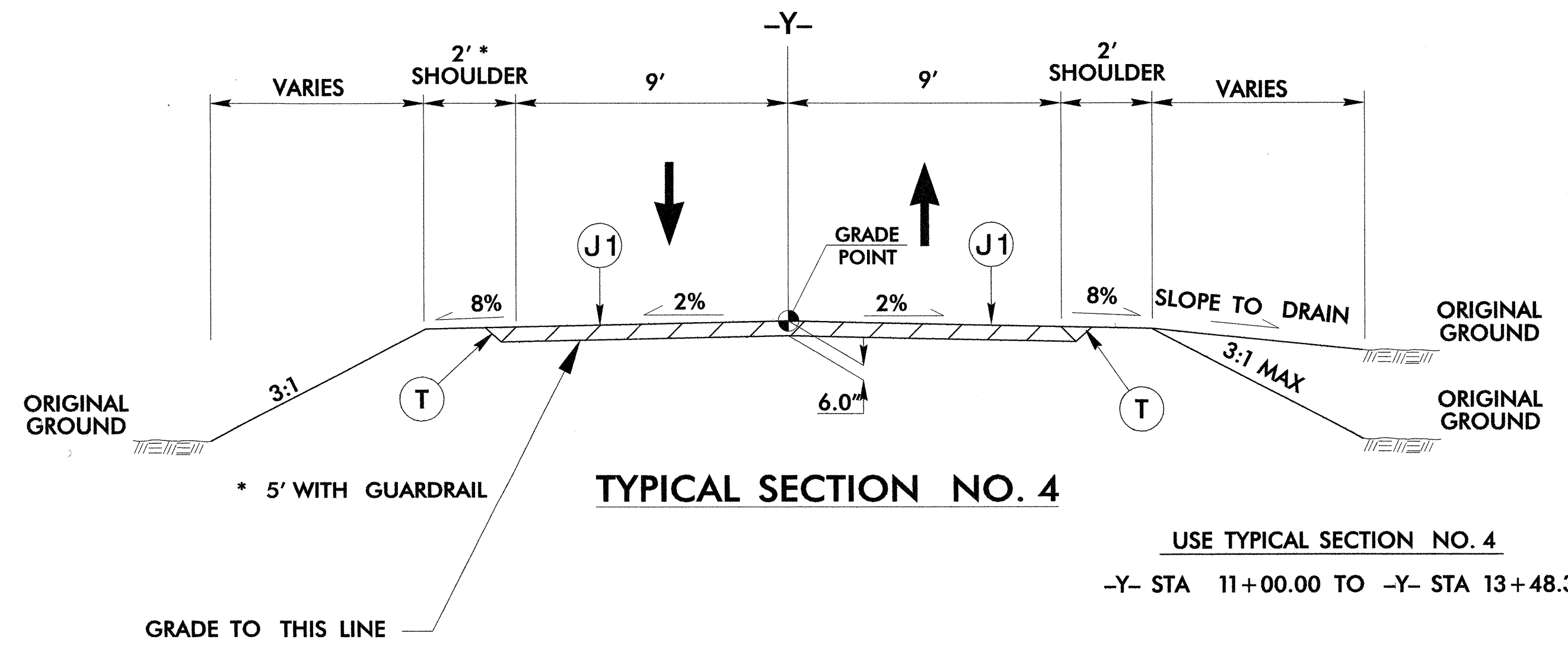


TYPICAL SECTION NO. 3

(NOTE: BRIDGE IS CENTERED ON THE LONG CHORD BETWEEN -L- STA 21+96.43 AND -L- STA 23+22.51 AND IS PARALLEL TO THE TANGENT TO THE -L- CURVE AT -L- STA 22+59.47)

USE TYPICAL SECTION NO. 3
-L- STA 21+96.43 (BEGIN BRIDGE)
TO -L- STA 23+22.51 (END BRIDGE)

PAVEMENT SCHEDULE	
C1	2.5" SF9.5A
C2	1.5" S9.5B
C3	3.0" TYPE S9.5B
C4	VAR. DEPTH S9.5B
E1	4.0" B25.0B
E2	5.0" B25.0B
E3	VAR. DEPTH TYPE B25.0B
J1	6" A.B.C.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING



TYPICAL SECTION NO. 4

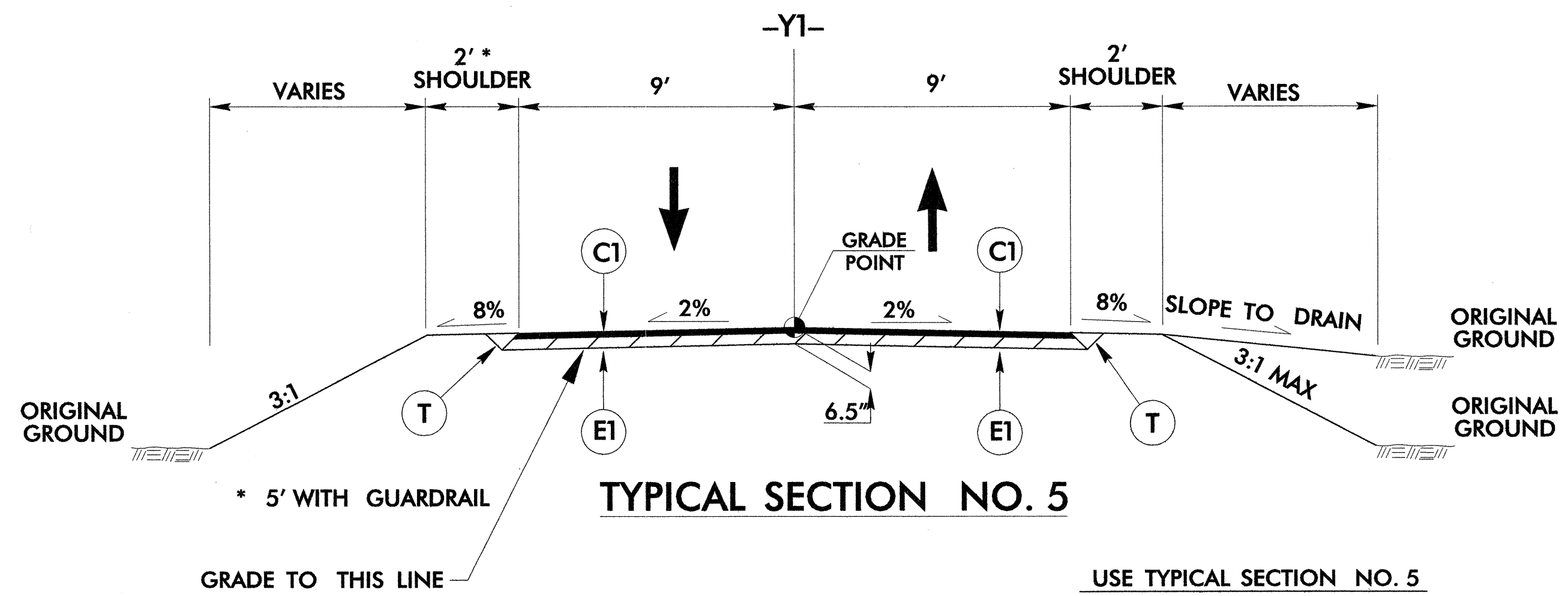
USE TYPICAL SECTION NO. 4
-Y- STA 11+00.00 TO -Y- STA 13+48.38

F:\Rogdwy\Proj\B4551\rdy-tyr.dgn
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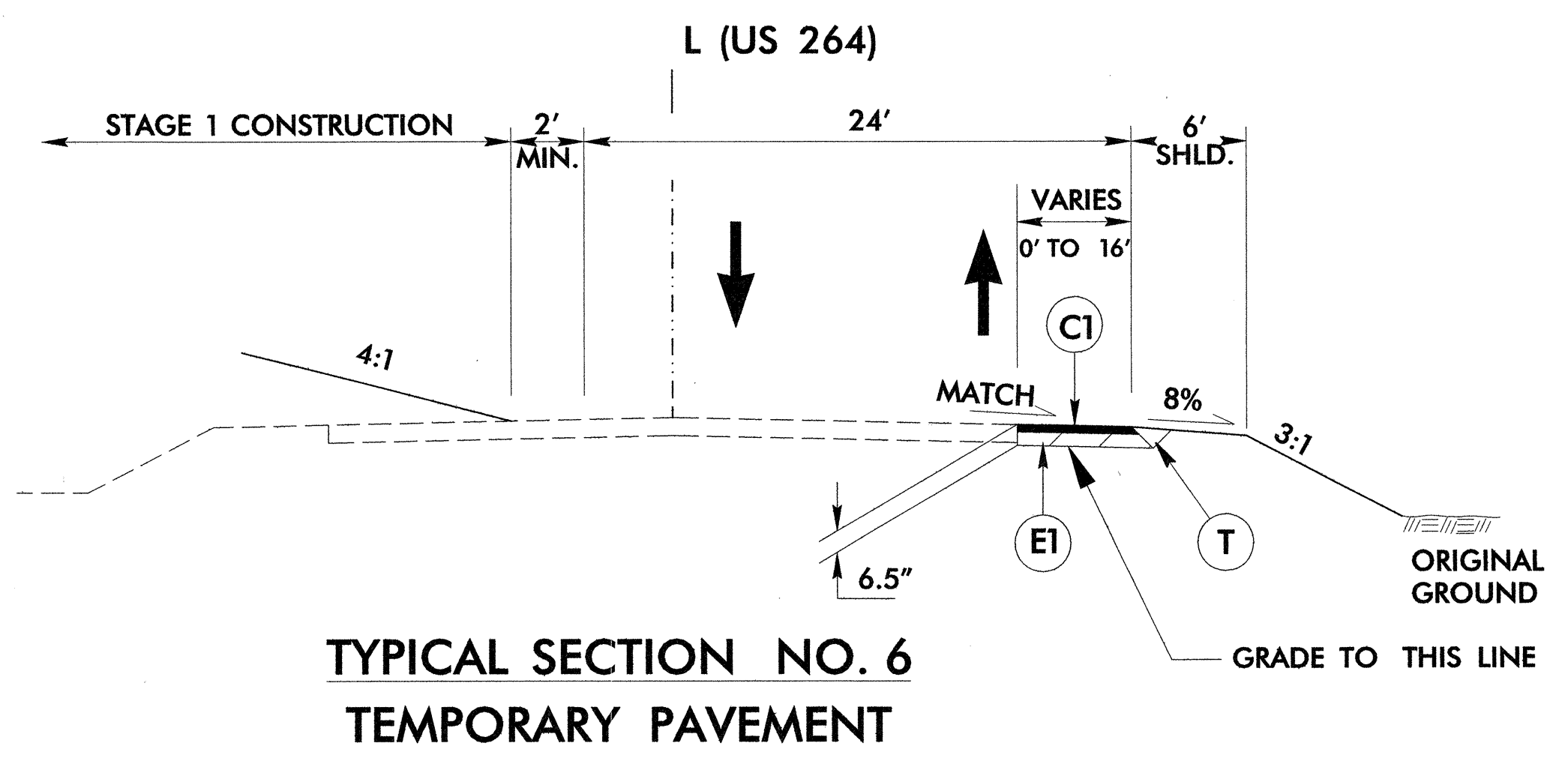
6/2/99

PROJECT REFERENCE NO. B-4551	SHEET NO. 2-B
ROADWAY DESIGN ENGINEER JAMES E. BECK 7/20/2011	PAVEMENT DESIGN ENGINEER CLYDE S. MORRISON 7/24/11

DRMP
ENGINEERS · PLANNERS · SCIENTISTS
DYER, RIDGLE, MILLS & PRECOURT, INC.
5950 FAIRVIEW RD., SUITE 320
CHARLOTTE, NORTH CAROLINA 28210
(704) 332-2289
NC LICENSE NO. C-2213



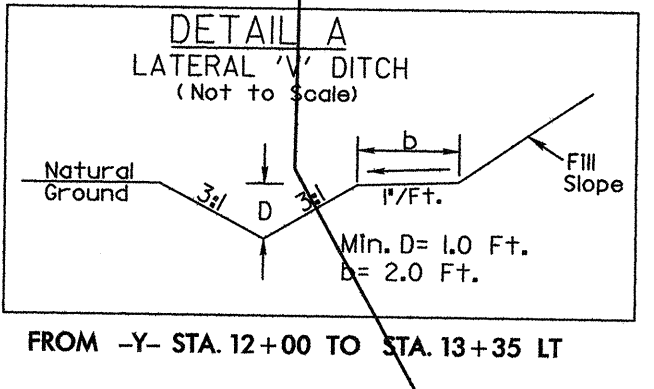
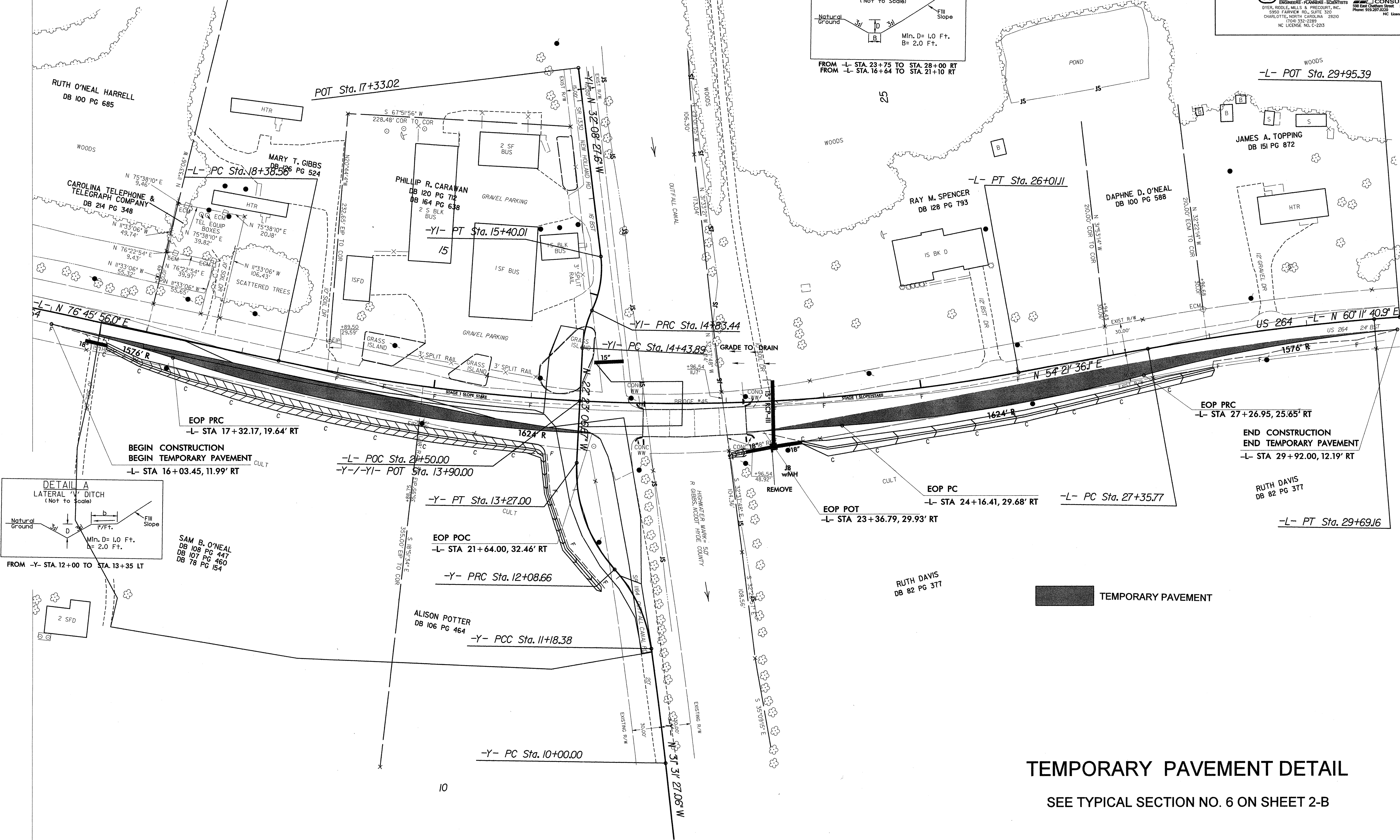
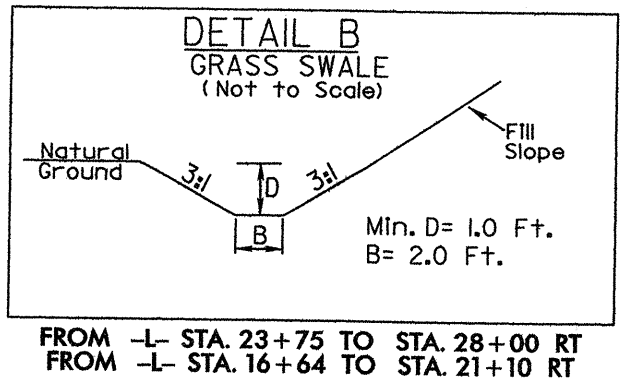
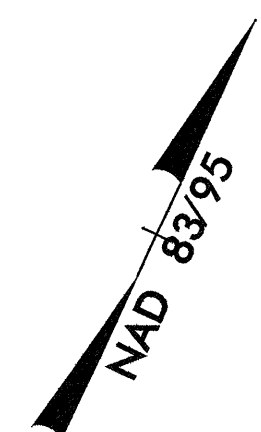
PAVEMENT SCHEDULE	
C1	2.5" SF9.5A
C2	1.5" S9.5B
C3	3.0" TYPE S9.5B
C4	VAR. DEPTH S9.5B
E1	4.0" B25.0B
E2	5.0" B25.0B
E3	VAR. DEPTH TYPE B25.0B
J1	6" A.B.C.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING



R:\0909\0909\Proj\B4551_rdy_typ.dgn
 10/25/2011 10:52:01 AM

8/17/99

PROJECT REFERENCE NO. B-4551		SHEET NO. 2-C	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	



TEMPORARY PAVEMENT DETAIL
SEE TYPICAL SECTION NO. 6 ON SHEET 2-B

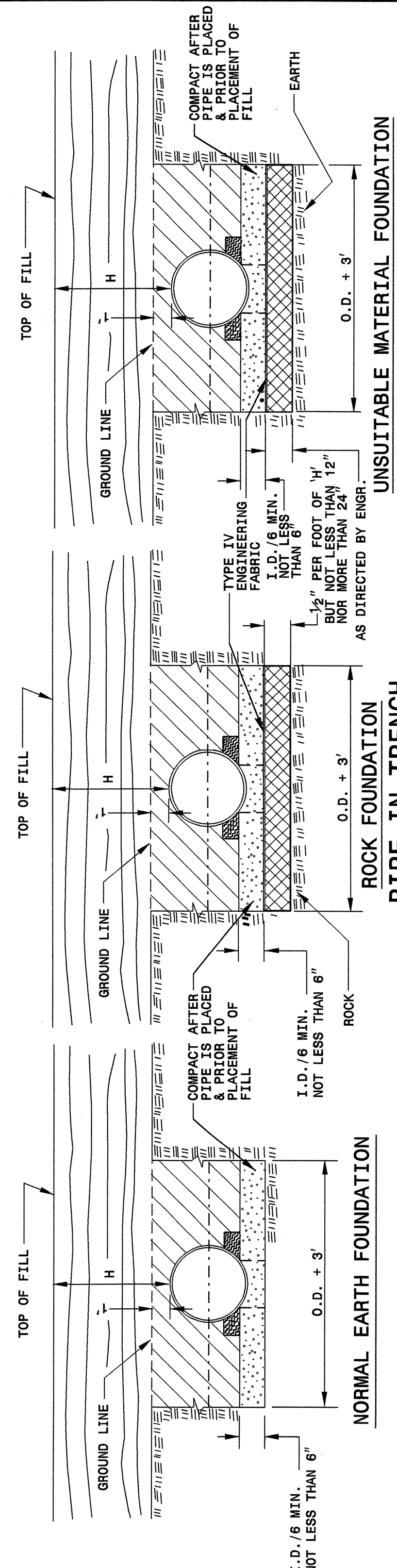
REVISIONS

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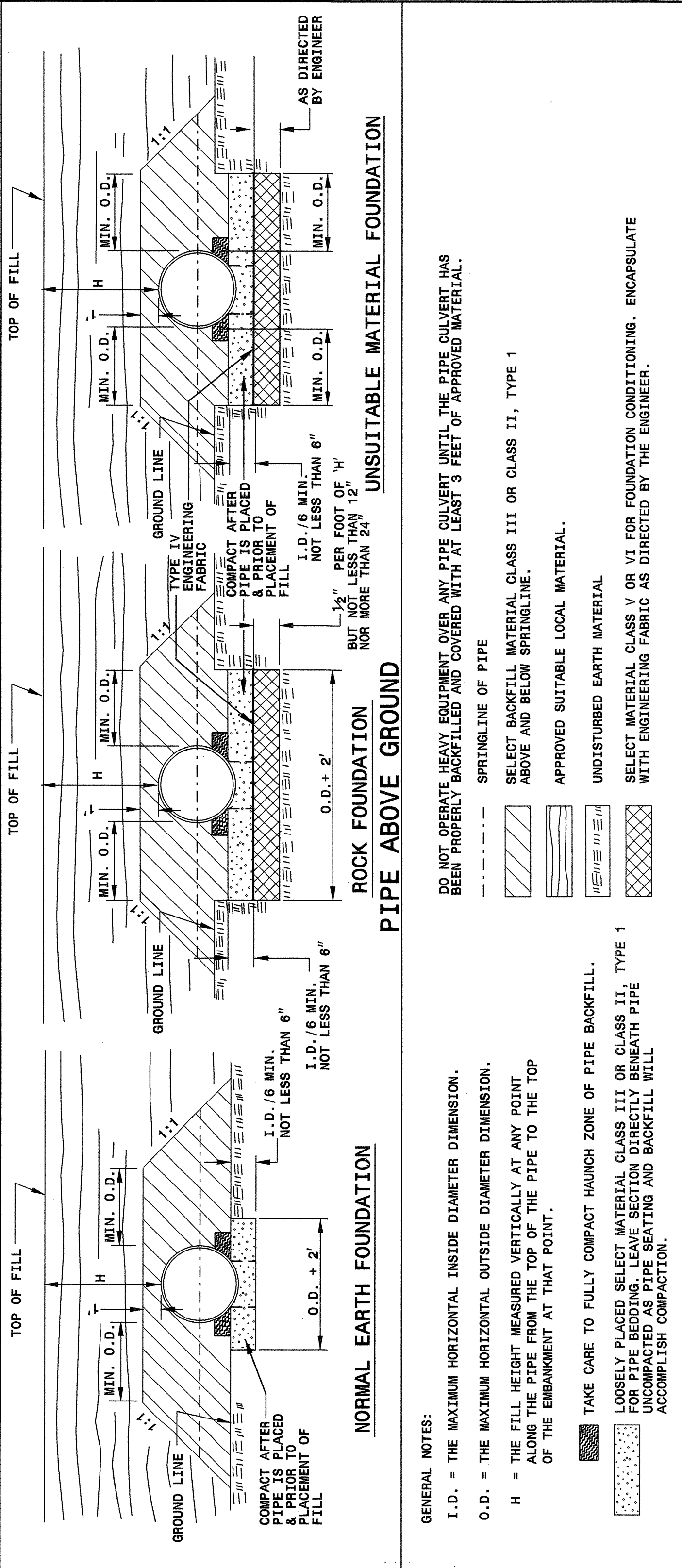
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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



ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION FLEXIBLE PIPE

ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION FLEXIBLE PIPE

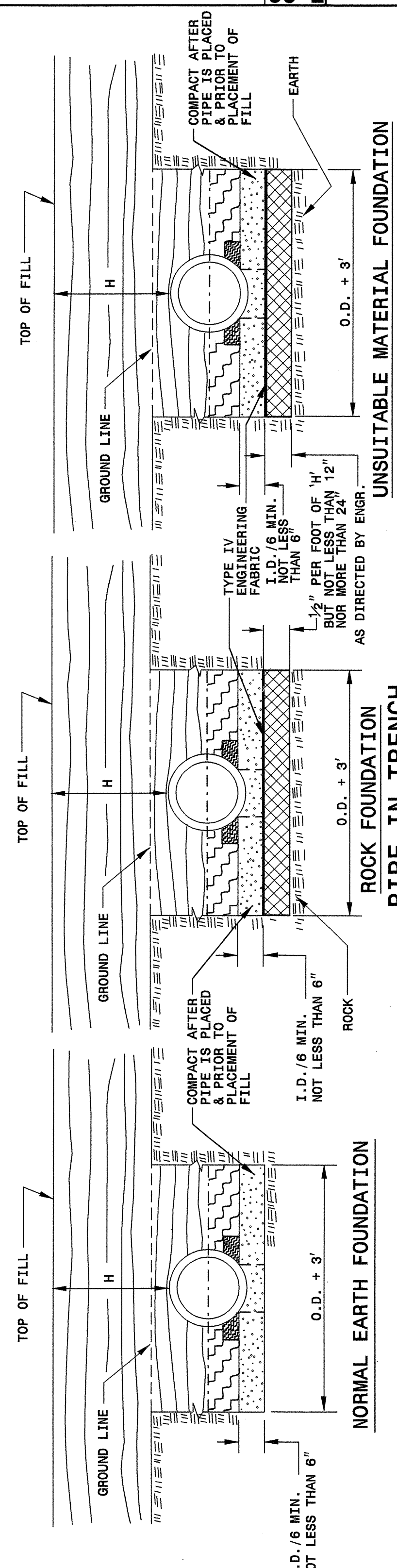


GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
 TAKE CARE TO FULLY COMPACT HAUNCH 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 COMPACTATION.
 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.

SHEET 1 OF 3 300D01

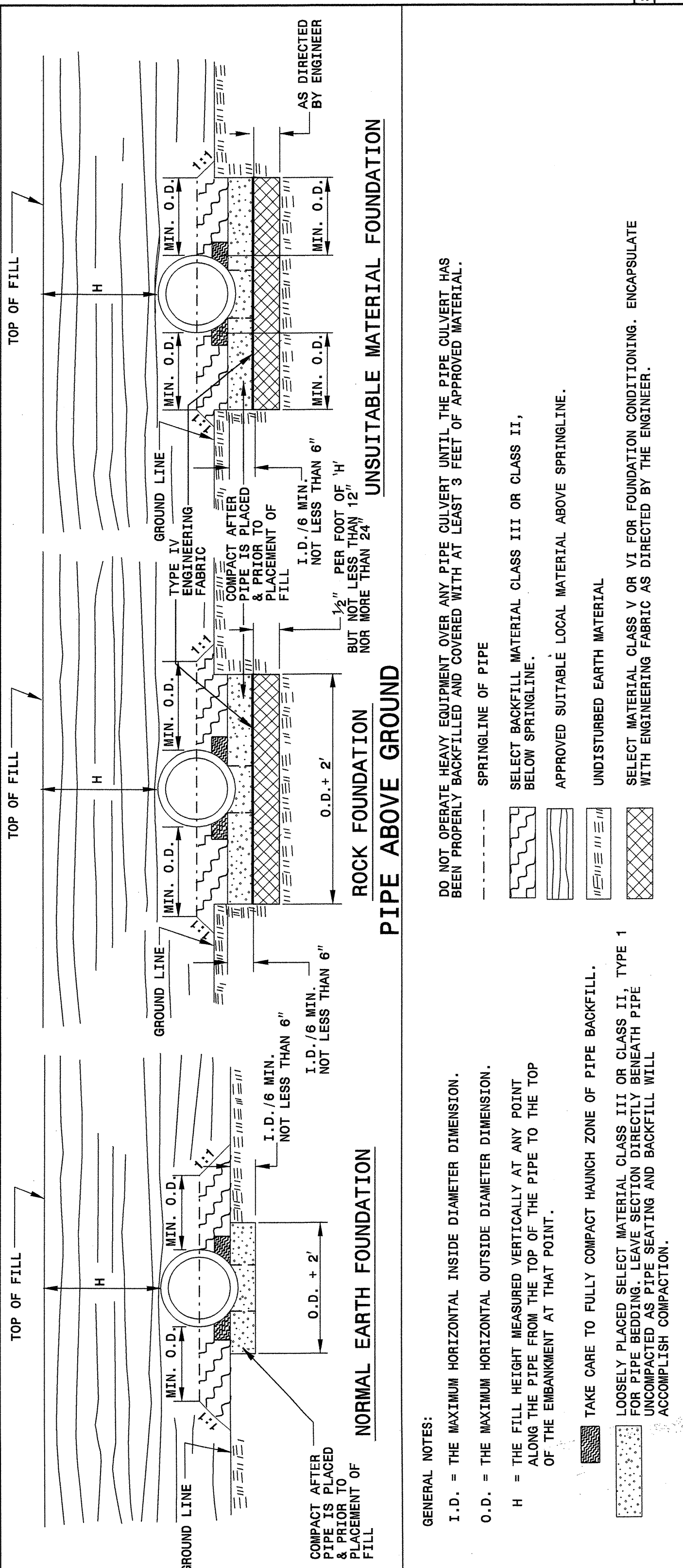
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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



ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION RIGID PIPE

ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION RIGID PIPE



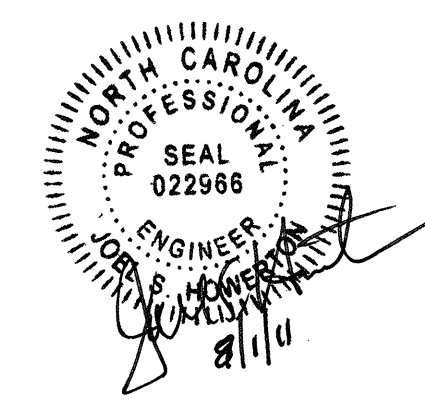
GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
 TAKE CARE TO FULLY COMPACT HAUNCH 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 COMPACTATION.
 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 ABOVE SPRINGLINE.
 UNDISTURBED EARTH MATERIAL
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

SHEET 2 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: [Signature] DATE: [Blank]
 CHECKED BY: [Signature] DATE: 7/23/09
 FILE SPEC: /proj/ward/stds/stdstodetail/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

SHEET 3 OF 3
300D01

FLEXIBLE PIPE

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

Diameter (inches)	Minimum cover (inches)		Maximum Height of Cover (feet)	
	12	14	10	8
12	12	204	266	
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
42	12	55	70	100
48	12	48	61	87
54	12	42	54	77
60	12	37	47	69
66	12	32	40	61
72	12	27	34	53
78	12	22	28	45
84	12	17	22	37

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

Diameter (inches)	Minimum cover (inches)		Maximum Height of Cover (feet)	
	12	14	10	8
12	12	123	155	218
15	12	98	123	174
18	12	81	102	144
21	12	69	87	123
24	12	60	76	108
27	12	53	67	95
30	12	47	60	85
36	12	40	50	71
42	12	35	44	60
48	12	30	38	52
54	12	26	33	46
60	12	22	28	40
66	12	18	23	34
72	12	14	18	27

HDPE - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"
 * (Maximum fill) 20' for pipe diameters ≤ 24"
 17' for pipe diameters ≥ 30" and ≤ 60"

PVC - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"
 * (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

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

RIGID PIPE

RCP - * (Minimum fill) 1' for Class IV & Class V
 2' for Class III & Class II

* (Maximum fill) 10' - Class II pipe
 20' - Class III pipe
 30' - Class IV pipe
 40' - Class V pipe

(For fills > 40' & < 80' use 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.

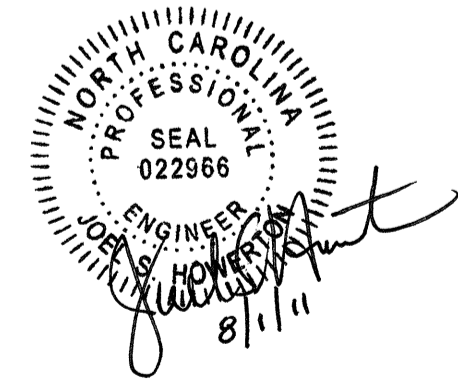
ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

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: DATE:
 CHECKED BY: DATE: 7/30/09
 FILE SPEC: 919-250-4128/stdstdodetails/300d01/0300d01.dgn



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

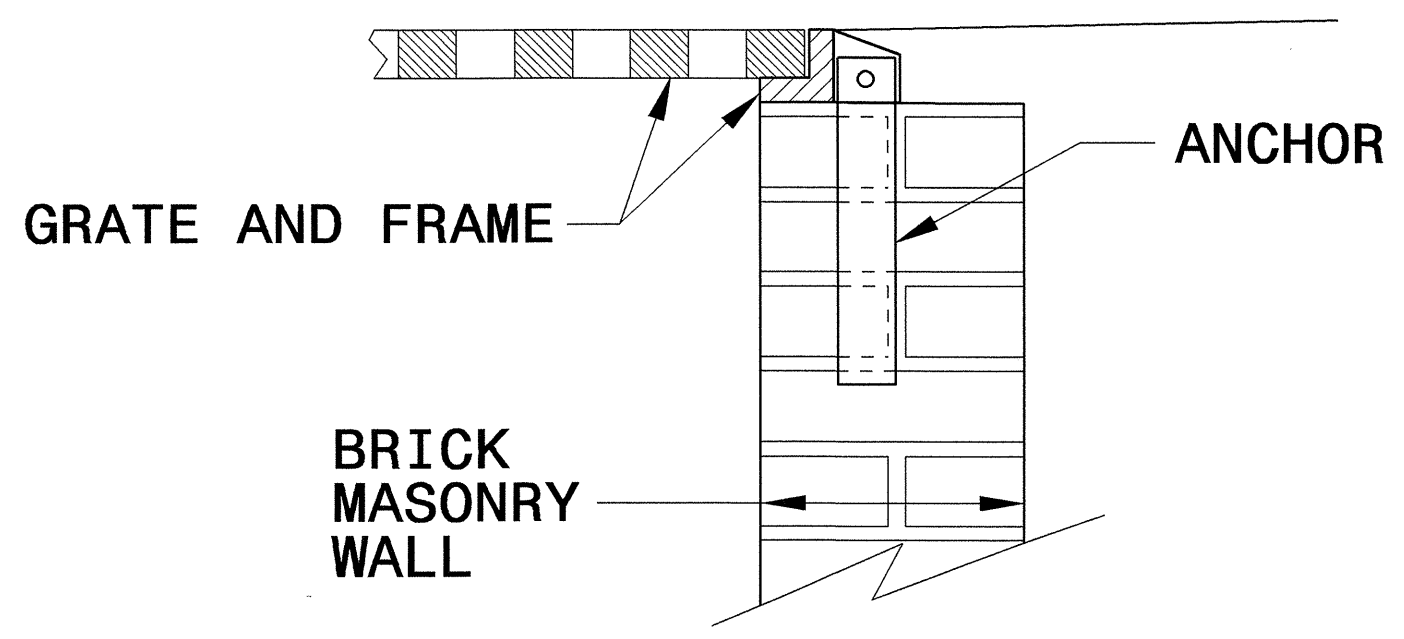
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25

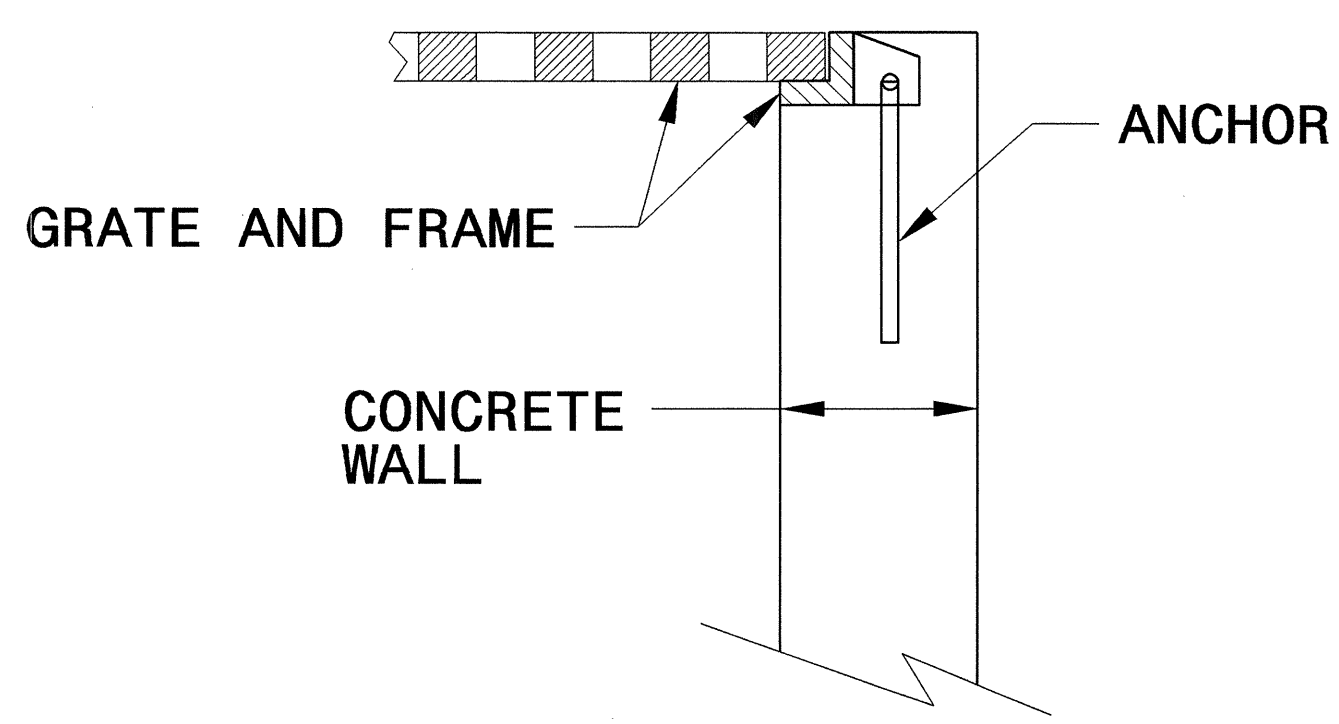
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

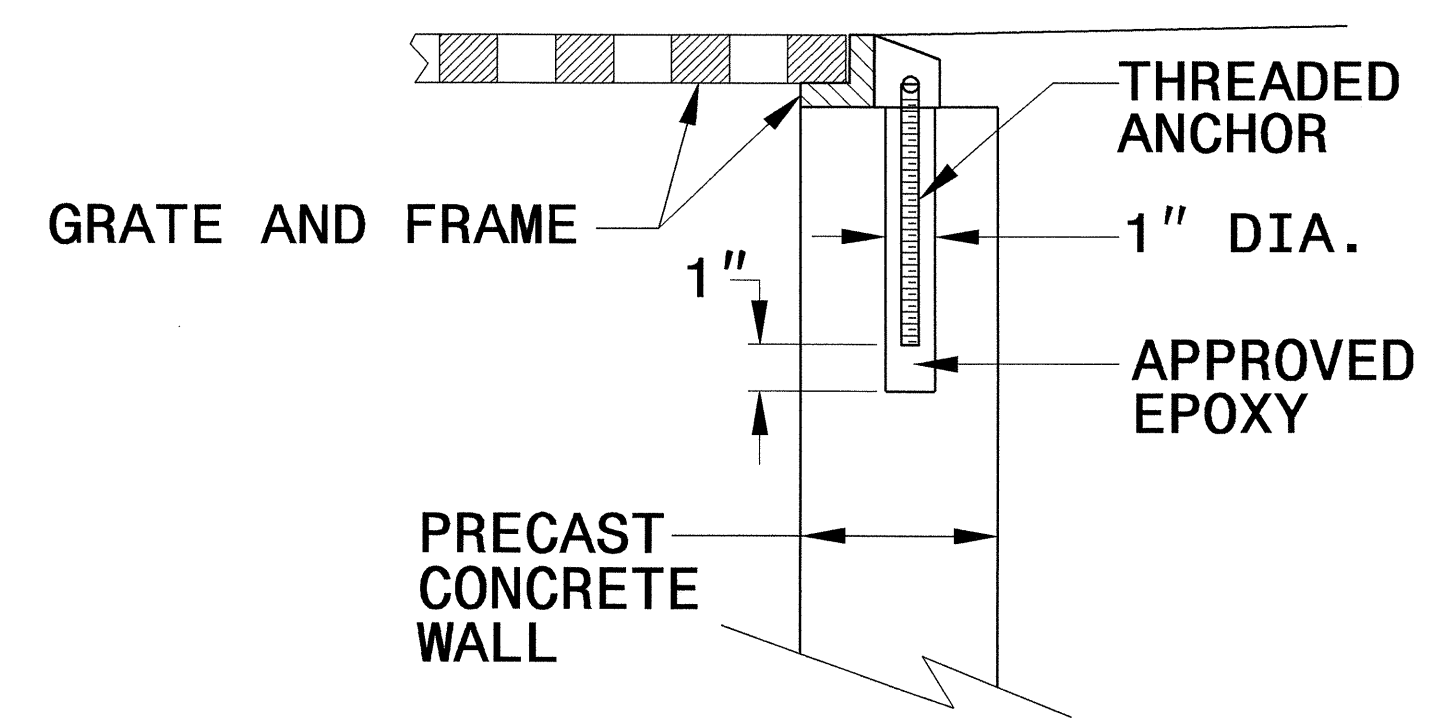
SHEET 1 OF 1
840D25



**BRICK MASONRY
CONSTRUCTION**



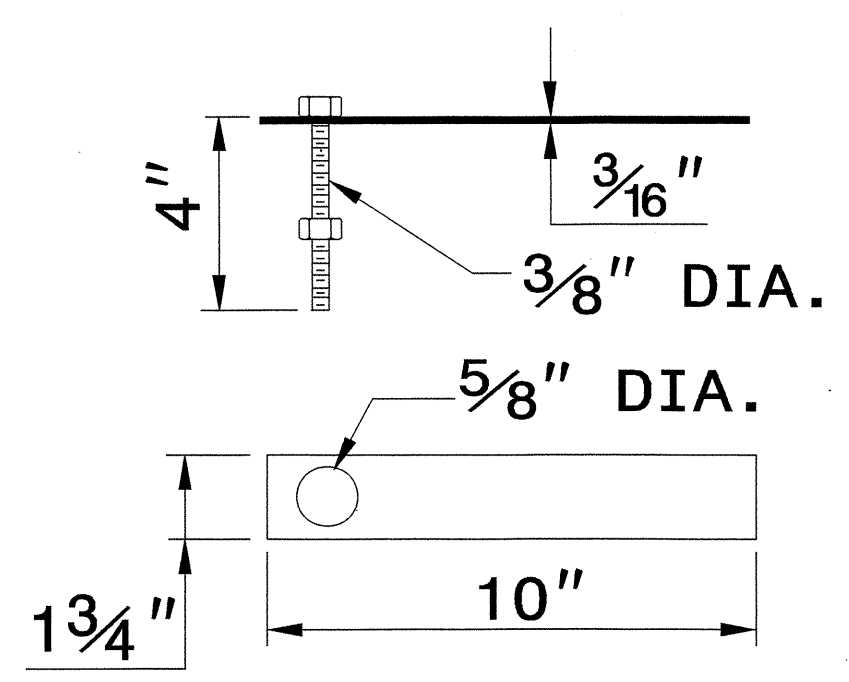
**CONCRETE
CONSTRUCTION**



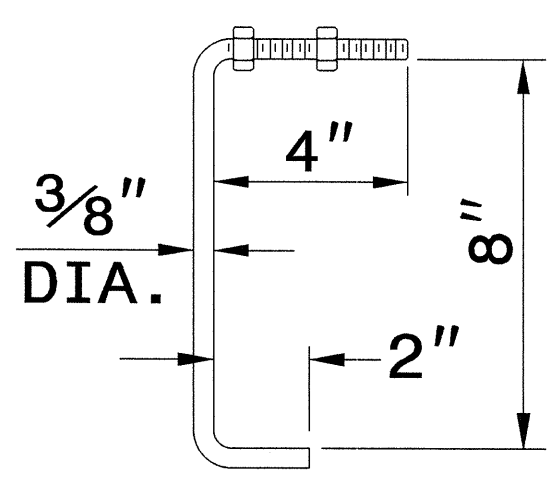
**PRECAST CONCRETE
CONSTRUCTION**

**DETAIL SHOWING ANCHORAGE OF
FRAME FOR GRATED DROP INLET**

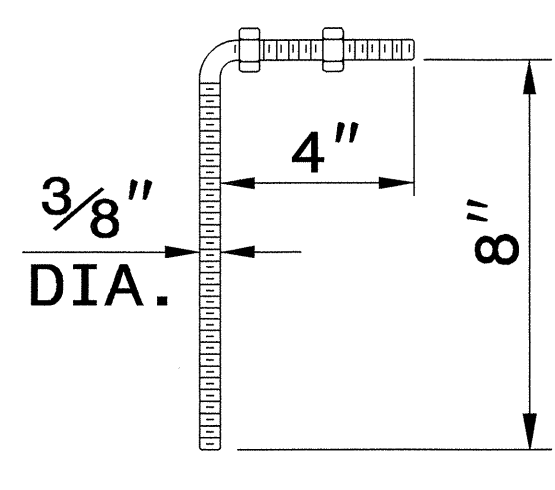
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL
OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



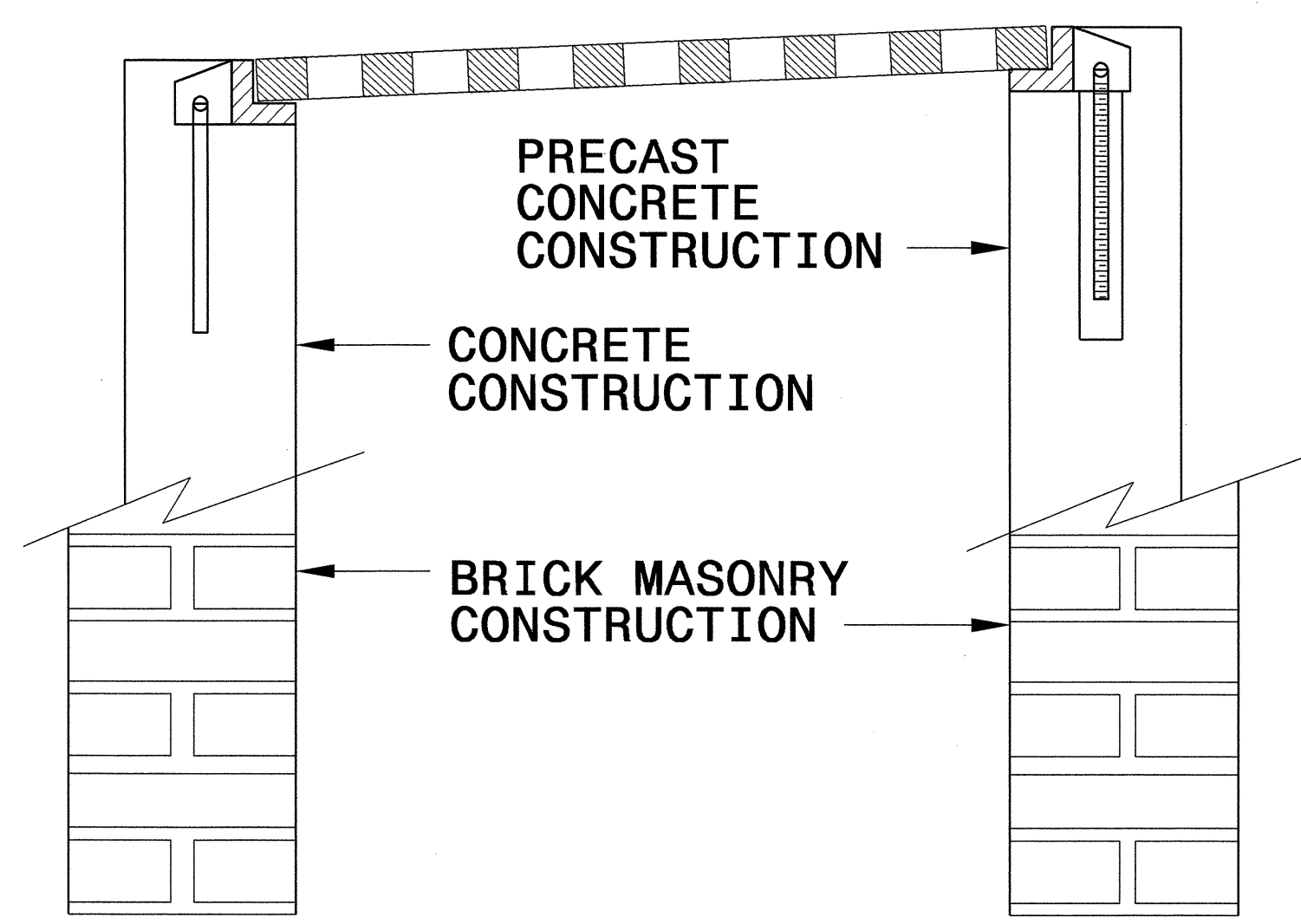
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



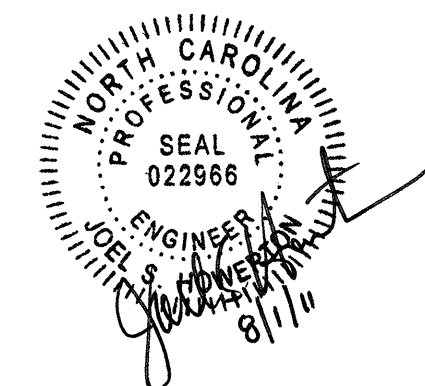
CONCRETE ANCHOR
3/8" DIA. BENT BAR



**PRECAST
CONCRETE ANCHOR**
3/8" DIA. BENT BAR



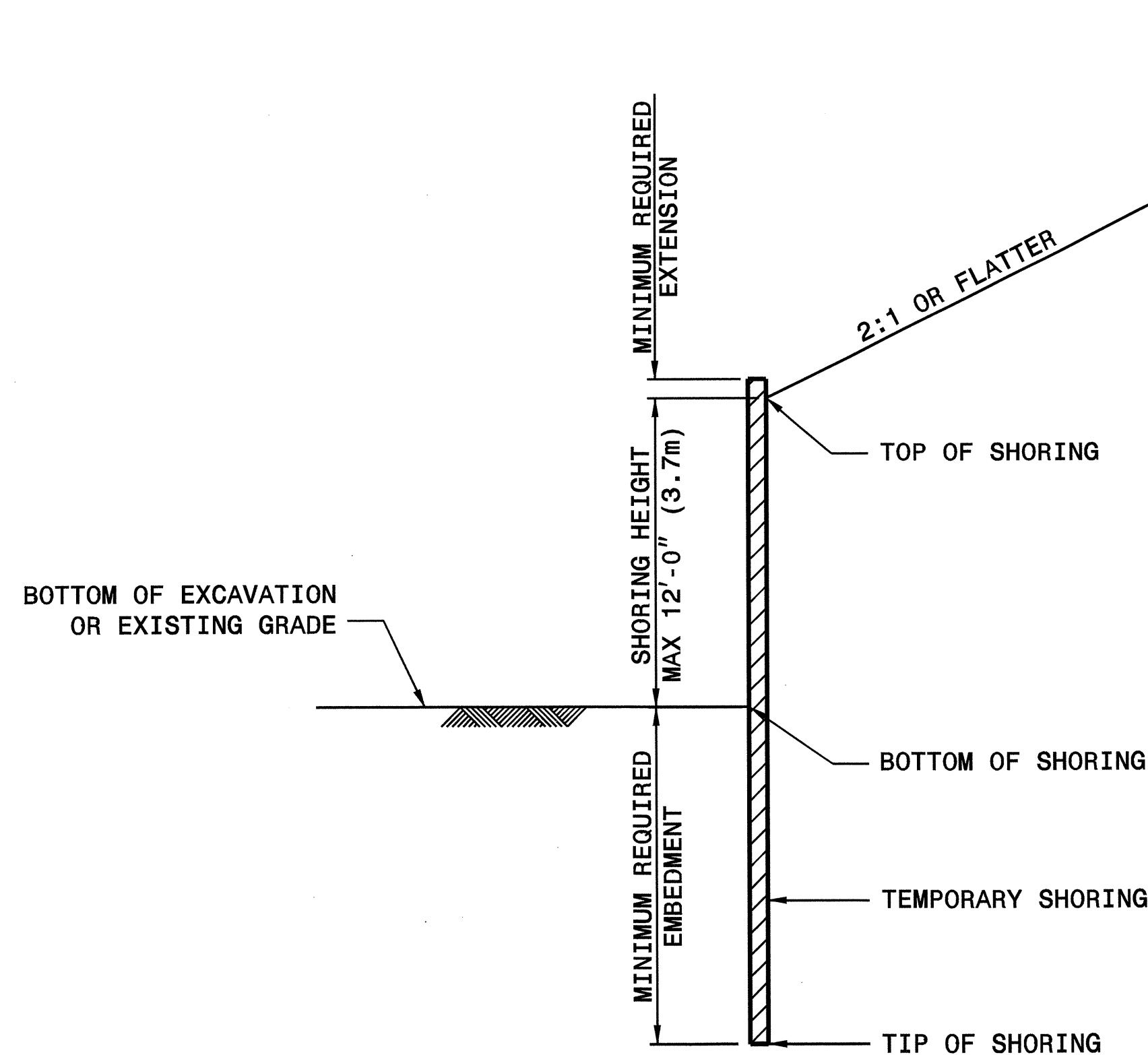
**FRAME AND GRATE INSTALLATION
FOR NORMAL CROWN AND
SUPERELEVATED SECTIONS**



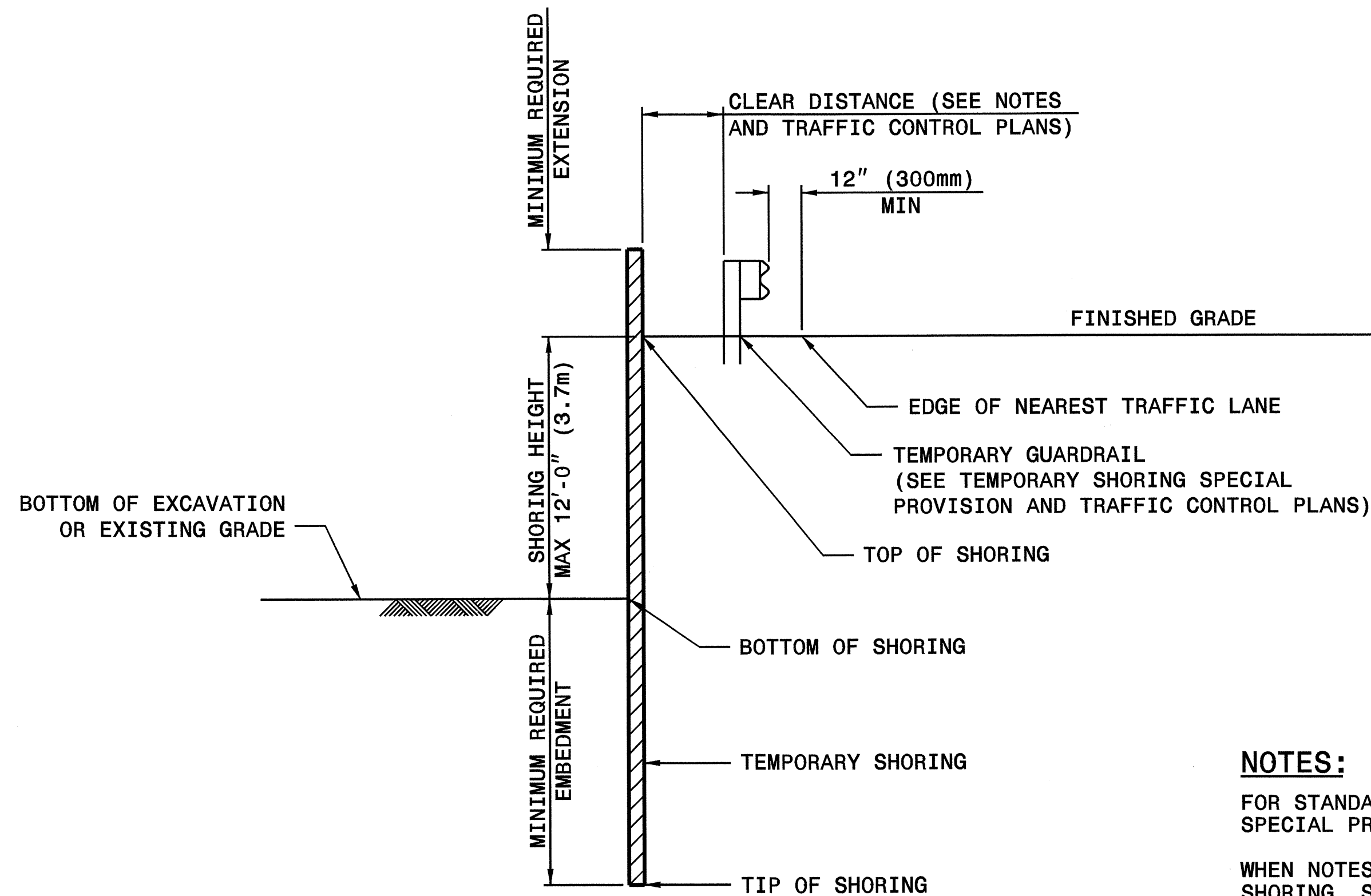
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE:
FILE SPEC.:



SLOPE CASE



SURCHARGE CASE

NOTES:

- FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.
- WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING, STANDARD TEMPORARY SHORING IS OPTIONAL.
- SUBMIT "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 14 DAYS BEFORE BEGINNING SHORING CONSTRUCTION. UP TO THREE LOCATIONS MAY BE INCLUDED ON EACH SELECTION FORM.

- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING CONDITIONS:
- 1) MAXIMUM SHORING HEIGHT IS 12'-0" (3.7m).
 - 2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
 - 3) BOTTOM OF EXCAVATION OR EXISTING GRADE IN FRONT OF SHORING IS 6:1 (H:V) SLOPE OR FLATTER.
 - 4) H PILE SPACING IS 6'-0" (1.8m).
 - 5) H PILE EMBEDMENT DEPTHS ARE FOR DRIVEN PILES.
 - 6) TIMBER LAGGING IS A MINIMUM OF 3" (75mm) THICK.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
 TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M³)
 FRICTION ANGLE = 30 DEGREES
 COHESION = 0 PSF (0 KPA)
 GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT WITHIN THE EMBEDMENT DEPTH.

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

IF THE CLEAR DISTANCE IS LESS THAN THE 3'-0", USE THE "SURCHARGE CASE WITH TRAFFIC IMPACT".

AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF THE SHORING. COLLECT AND DIRECT RUNOFF AWAY FROM SHORING.

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

GROUNDWATER CONDITION	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT						SURCHARGE CASE WITH TRAFFIC IMPACT					
	SHORING HEIGHT FT (m)	MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	H PILES WITH TIMBER LAGGING			MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	H PILES WITH TIMBER LAGGING			
				HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)			HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)	
GROUNDWATER ELEVATION BELOW TIP OF SHORING	< 6 (1.8)	7.5 (2.3)	3.0 (161)	8.0 (2.4)	8.0 (2.4)	8.0 (2.4)	11.0 (3.4)	10.0 (538)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	
	7 (2.1)	8.5 (2.6)	4.5 (242)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	12.0 (3.7)	12.0 (645)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	
	8 (2.4)	10.0 (3.0)	6.5 (349)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	12.5 (3.8)	14.0 (753)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)	
	9 (2.7)	11.0 (3.4)	9.5 (511)	--	12.0 (3.7)	12.0 (3.7)	13.5 (4.1)	16.5 (887)	--	12.5 (3.8)	12.5 (3.8)	
	10 (3.0)	12.5 (3.8)	13.0 (699)	--	--	13.5 (4.1)	14.0 (4.3)	19.5 (1048)	--	13.5 (4.1)	13.5 (4.1)	
	11 (3.4)	13.5 (4.1)	17.0 (914)	--	--	14.5 (4.4)	15.0 (4.6)	22.5 (1210)	--	--	14.5 (4.4)	
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND TIP OF SHORING	< 6 (1.8)	11.5 (3.5)	4.5 (242)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)	16.0 (4.9)	12.0 (645)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)	
	7 (2.1)	13.0 (4.0)	7.0 (376)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)	17.0 (5.2)	14.5 (780)	14.5 (4.4)	14.5 (4.4)	14.5 (4.4)	
	8 (2.4)	15.0 (4.6)	10.0 (538)	--	15.0 (4.6)	15.0 (4.6)	18.0 (5.5)	17.0 (914)	--	15.5 (4.7)	15.5 (4.7)	
	9 (2.7)	17.0 (5.2)	14.0 (753)	--	17.0 (5.2)	17.0 (5.2)	19.0 (5.8)	20.0 (1075)	--	17.0 (5.2)	17.0 (5.2)	
	10 (3.0)	18.5 (5.6)	19.5 (1048)	--	--	18.5 (5.6)	20.0 (6.1)	23.5 (1263)	--	--	18.5 (5.6)	
	11 (3.4)	20.5 (6.3)	26.0 (1398)	--	--	--	21.0 (6.4)	28.0 (1505)	--	--	20.0 (6.1)	
12 (3.7)	22.5 (6.9)	33.0 (1774)	--	--	--	22.0 (6.7)	33.0 (1774)	--	--	21.5 (6.6)		

NOTE: MINIMUM REQUIRED EXTENSION IS 6" (150mm) FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" (800 mm) FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".

PREPARED BY: J. PARK DATE: 05/2011
 REVIEWED BY: J. BATTS DATE: 05/2011

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

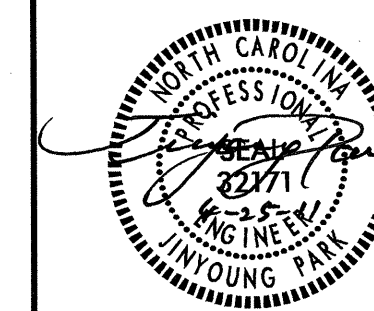
STANDARD TEMPORARY SHORING

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

GEOTECHNICAL ENGINEER

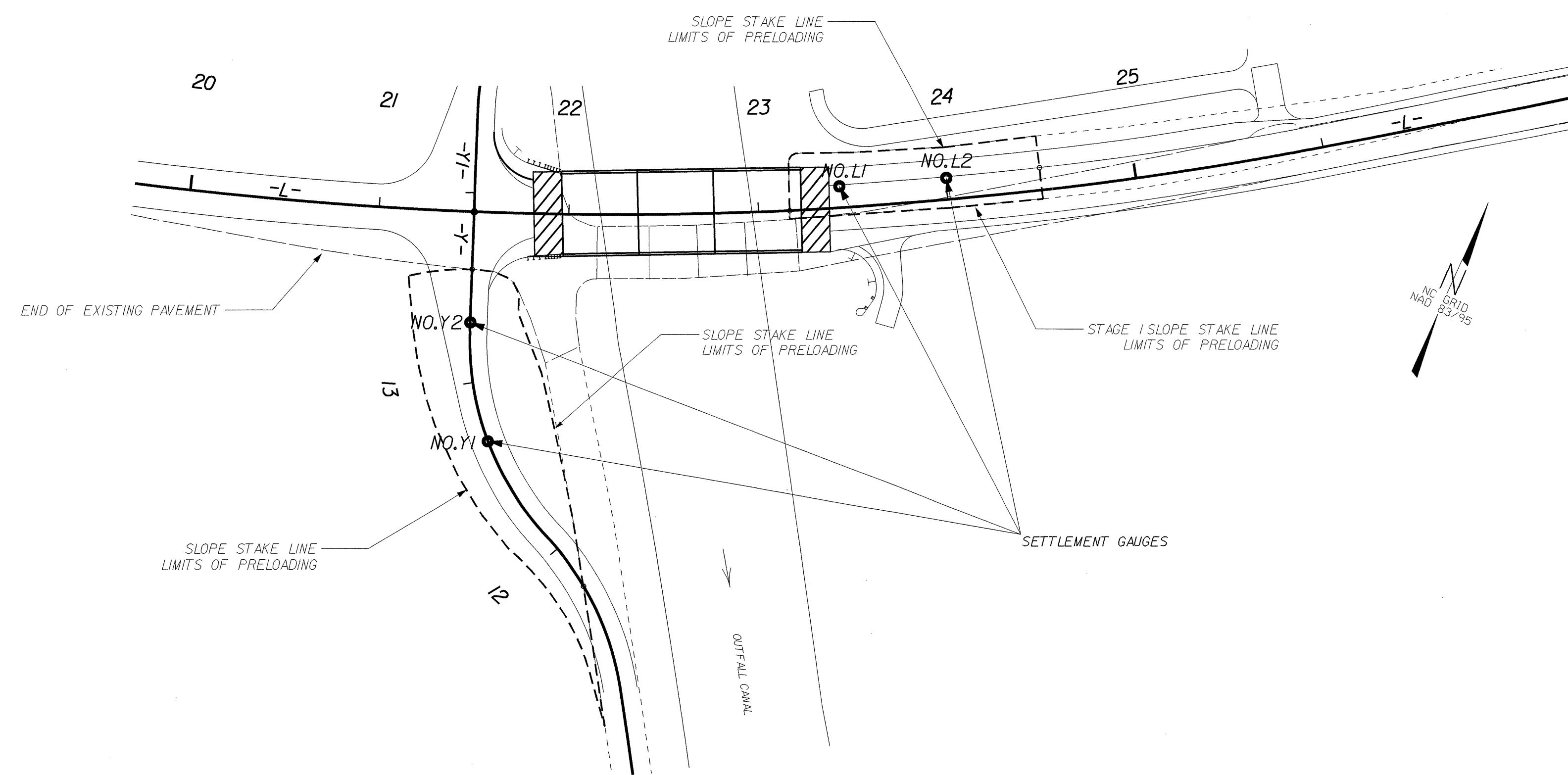
ENGINEER



SIGNATURE DATE SIGNATURE

SETTLEMENT GAUGE LOCATIONS

NOT TO SCALE



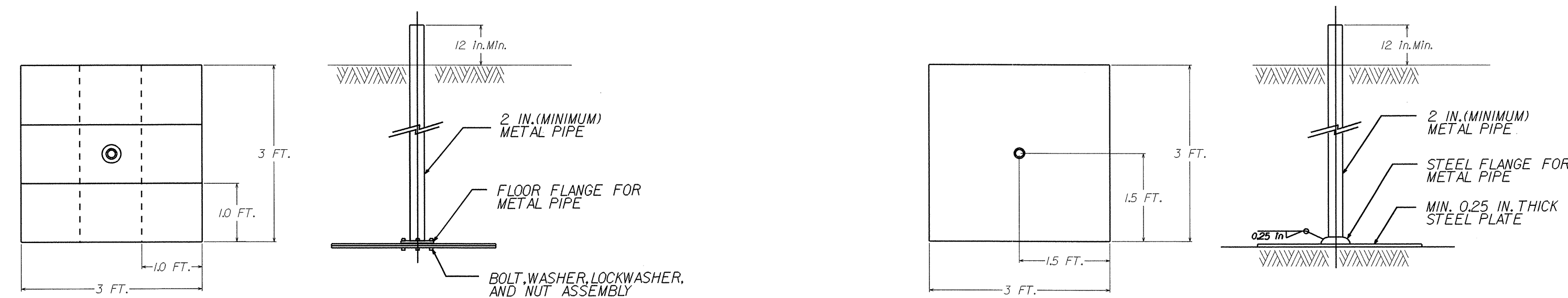
SETTLEMENT GAUGE LOCATIONS		
GAUGE NO.	STATION	OFFSET
L1	-L- 23 + 45.00 ±	10 FT. ±, LT
L2	-L- 24 + 00.00 ±	10 FT. ±, LT
Y1	-Y- 12 + 70.00 ±	0 FT ±
Y2	-Y- 13 + 30.00 ±	0 FT ±

NOTES

1. THE USE OF EITHER THE WOOD BASE OR THE STEEL BASE SETTLEMENT GAUGE SHALL BE THE CONTRACTOR'S OPTION.
2. SETTLEMENT GAUGES SHALL BE INSTALLED BEFORE ANY FILL IS PLACED.
3. SETTLEMENT GAUGE ELEVATIONS ARE TO BE DETERMINED AND RECORDED WEEKLY BY THE RESIDENT ENGINEER.
4. THE INITIAL ELEVATION OF THE SETTLEMENT GAUGE PLATE (AT TOP OF PLATE) SHALL BE DETERMINED AT THE TIME OF INSTALLATION ALONG WITH THE EMBANKMENT ELEVATION. WHEN NEW SECTIONS OF THE PIPE ARE ADDED, ELEVATIONS SHALL BE RECORDED AT THE TOP OF EXISTING PIPE AND AT THE TOP OF THE NEW PIPE. THIS IS TO TAKE INTO ACCOUNT INTERIM SETTLEMENT, VARIABLE PIPE LENGTHS, AND THREAD LENGTHS IN COUPLING.
5. RESULTS OF SETTLEMENT GAUGE READINGS SHALL BE FORWARDED TO MR. K.J. KIM, EASTERN REGIONAL GEOTECHNICAL MANAGER, WITHIN THREE DAYS.

SETTLEMENT GAUGE DETAILS

NOT TO SCALE



DETAIL OF WOOD BASE

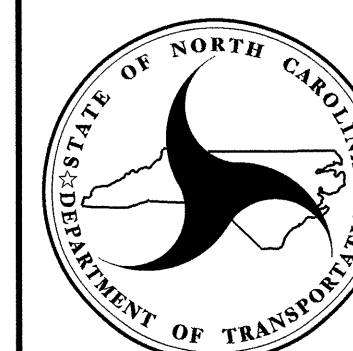
SIX - 1 IN. X 1 FT. X 3 FT. PLANKS OF LUMBER OR TWO PIECES 1 IN. X 3 FT. X 3 FT. EXTERIOR GRADE PLYWOOD SECURELY FASTENED AND THEN COATED WITH WOOD PRESERVATIVE

DETAIL OF STEEL BASE

SETTLEMENT GAUGE QUANTITIES	
EMBANKMENT SETTLEMENT GAUGES	4 EA.

GEOTECHNICAL ENGINEERING UNIT

- EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE



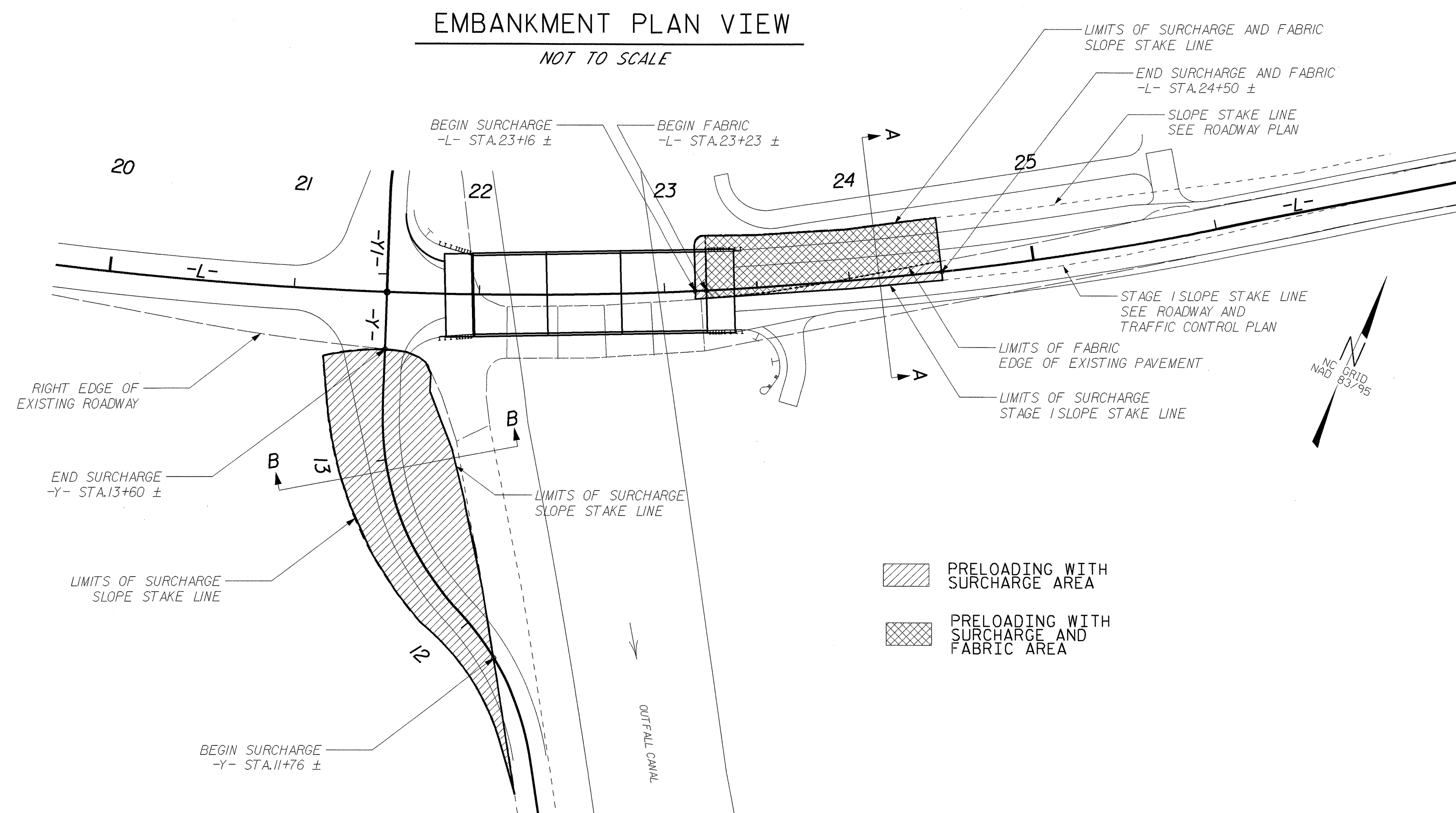
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

EMBANKMENT MONITORING DETAIL

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PREPARED BY: JYP	DATE: 03/2010
REVIEWED BY: JRB	DATE: 03/2010

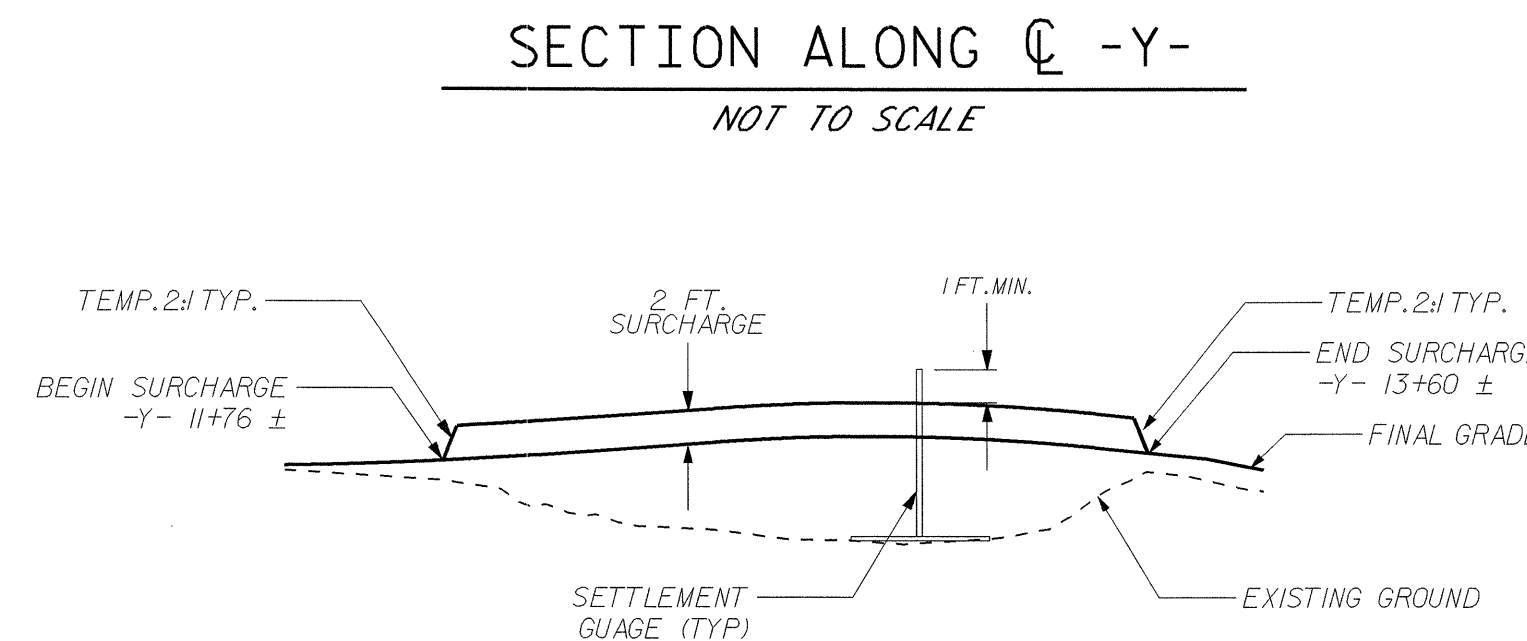
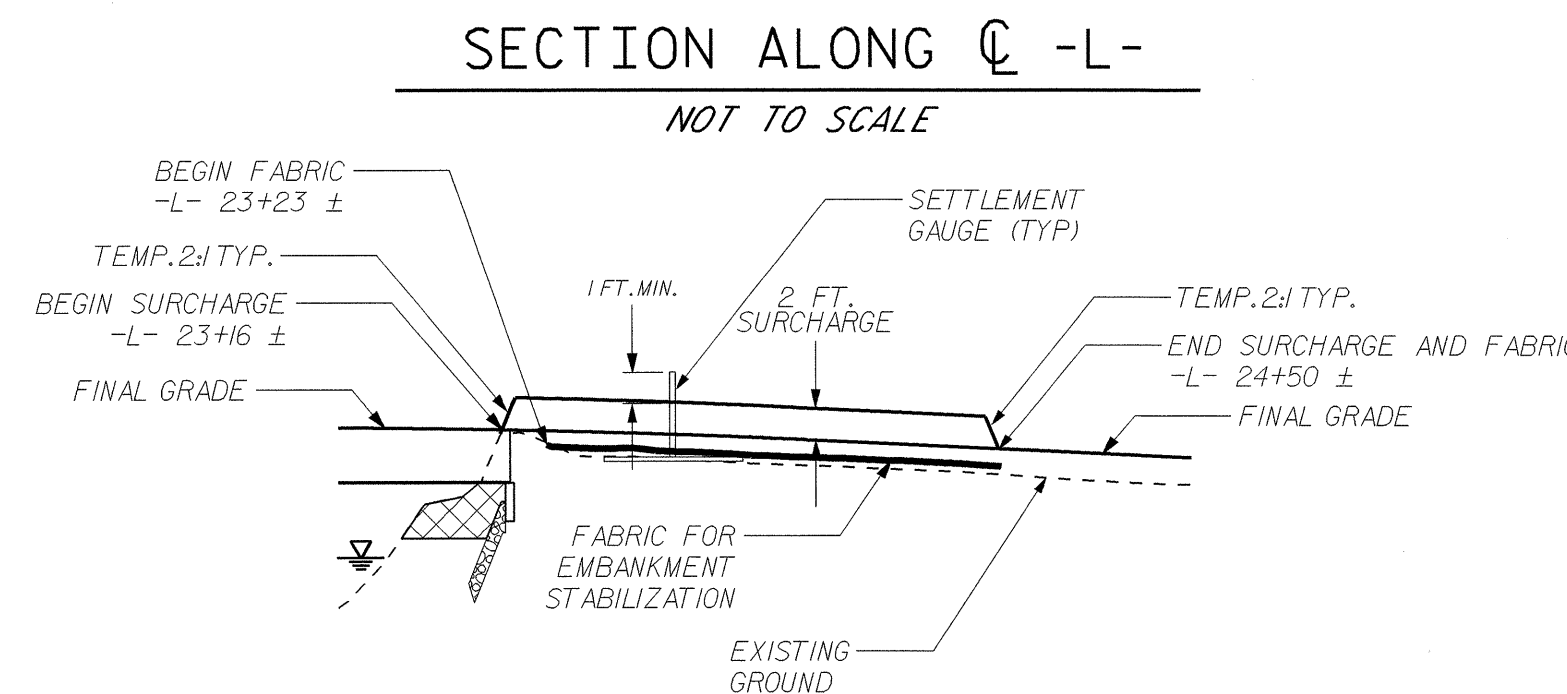


FABRIC FOR EMBANKMENT STABILIZATION		
LINE	Begin Station	End Station
-L-	23 + 23 ±	24 + 50 ±

PRELOADING WITH SURCHARGE				
LINE	STATIONS		MINIMUM SURCHARGE	MINIMUM WAITING PERIOD
	FROM	TO		
- L -	23 + 16 ±	24 + 50 ±	2.0 FT.	1 MONTH DURING STAGE 1
- Y -	11 + 76 ±	13 + 60 ±	2.0 FT.	1 MONTH DURING STAGE 1

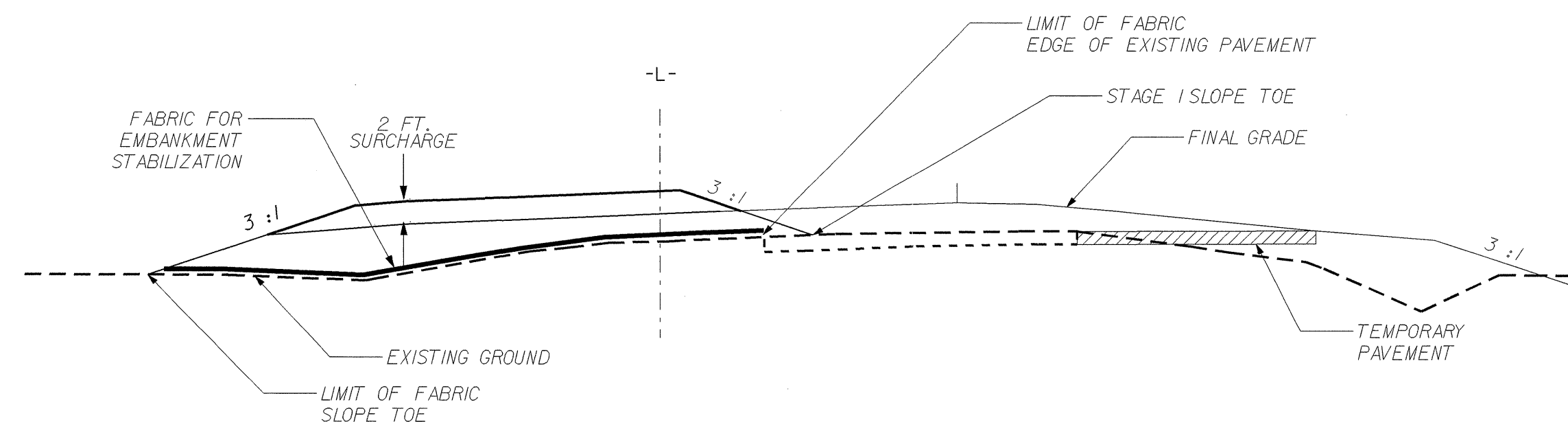
NOTES

- FABRIC FOR EMBANKMENT STABILIZATION SHALL BE PLACED AT THE LOCATIONS LISTED IN THE FABRIC FOR EMBANKMENT STABILIZATION TABLE.
- AT FABRIC LOCATIONS, ALL STUMPS SHALL BE CUT CLOSE TO THE GROUND AND/OR WATER SURFACE. GRUBBING IS NOT TO BE PERFORMED IN THE FABRIC PLACEMENT AREAS.
- MACHINE DIRECTION OF THE FABRIC SHALL BE PERPENDICULAR TO THE ROADWAY DIRECTION.
- SEE THE FABRIC FOR EMBANKMENT STABILIZATION SPECIAL PROVISION FOR DETAILED REQUIREMENTS OF MATERIALS AND CONSTRUCTION.
- INSTALL SURCHARGE MATERIAL AS SHOWN ON THE PLANS. SEE SURCHARGE PLACEMENT, MAINTENANCE AND REMOVAL SPECIAL PROVISION.
- MAINTAIN THE SURCHARGE OR EMBANKMENT ELEVATIONS THROUGHOUT THE WAITING PERIODS.
- FOR SETTLEMENT GAUGE, SEE EMBANKMENT MONITORING SPECIAL PROVISION AND EMBANKMENT MONITORING DETAIL SHEET.
- WAITING PERIOD BEGINS AFTER INSTALLING SURCHARGE OR EMBANKMENT.



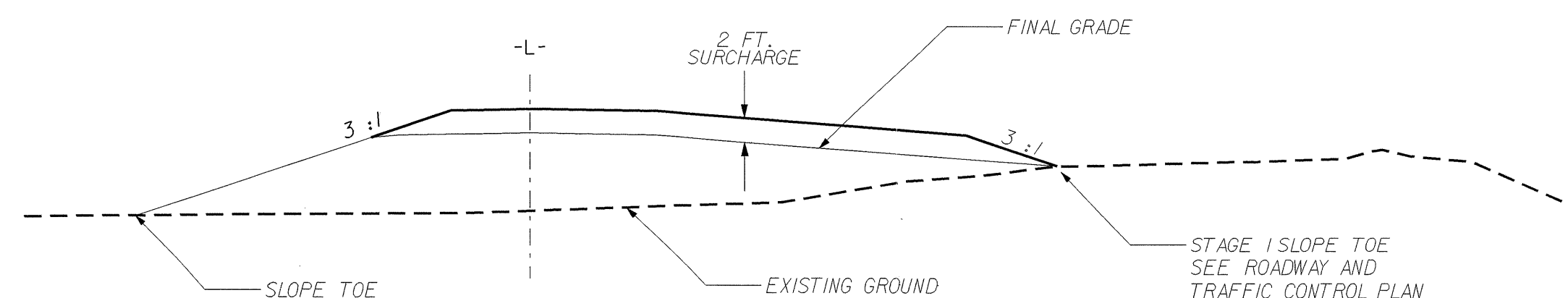
A-A CROSS SECTION

NOT TO SCALE



B-B CROSS SECTION

NOT TO SCALE



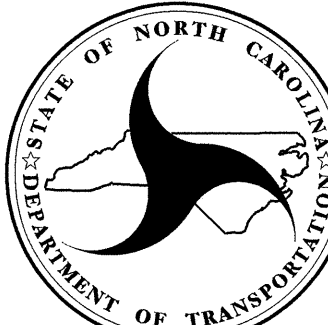
ESTIMATED QUANTITIES	
FABRIC FOR EMBANKMENT STABILIZATION	450 SY.
BORROW EXCAVATION	850 CY.
UNCLASSIFIED EXCAVATION	900 CY.

PREPARED BY: JYP DATE: 03/2010
 REVIEWED BY: JRB DATE: 03/2010

GEOTECHNICAL ENGINEERING UNIT

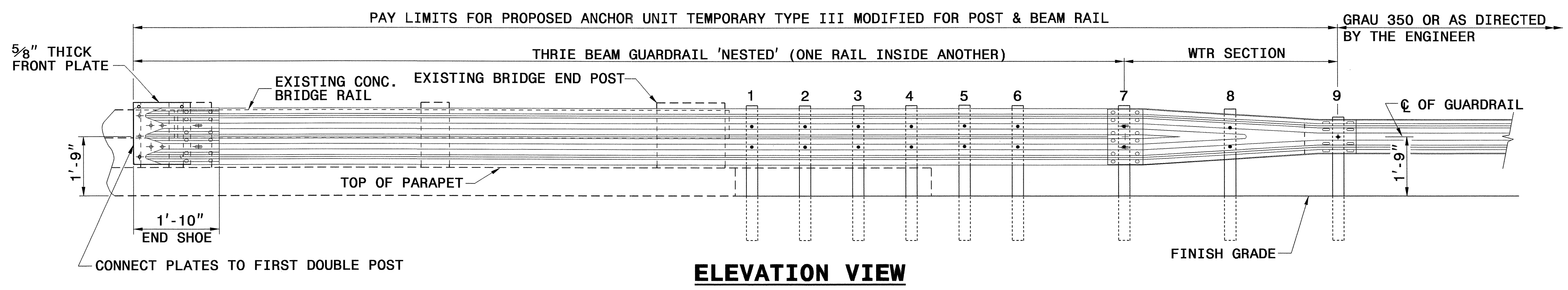
EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

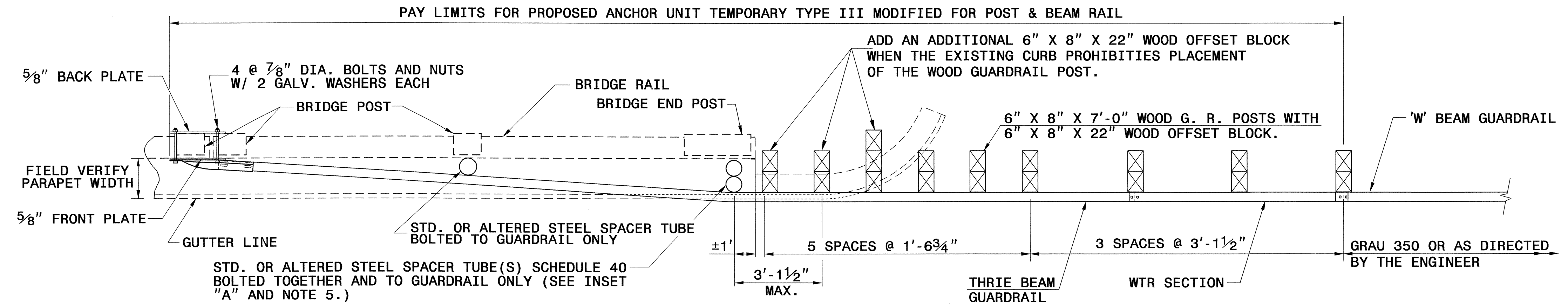


GROUND IMPROVEMENT WITH FABRIC AND SURCHARGE

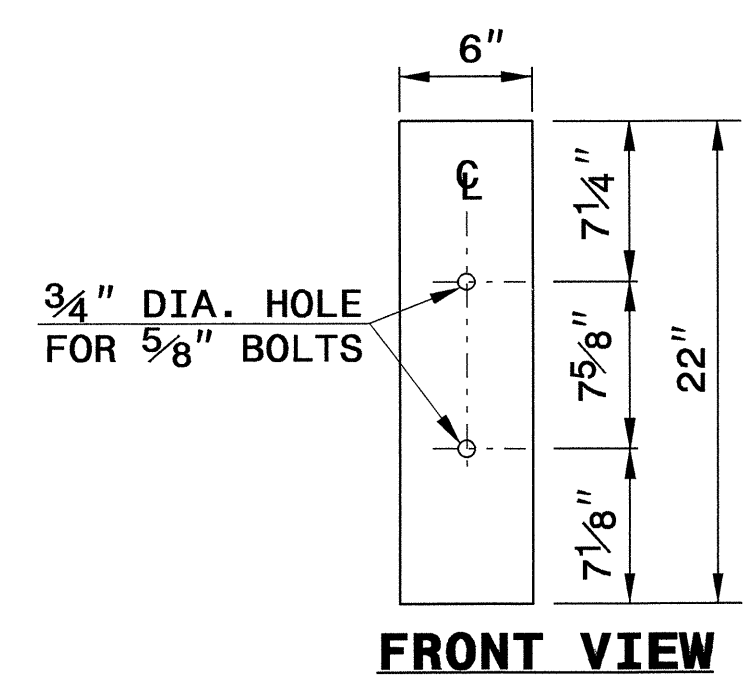
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		



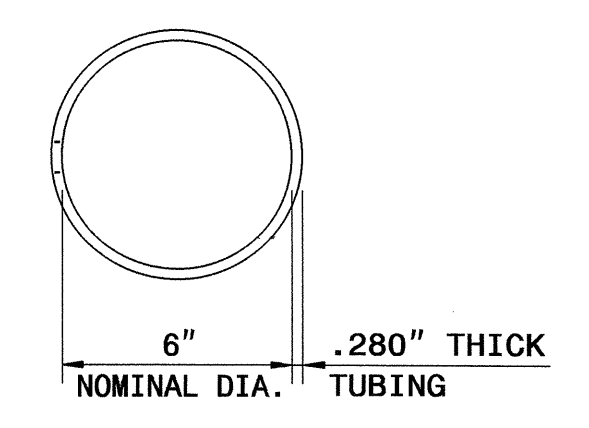
ELEVATION VIEW



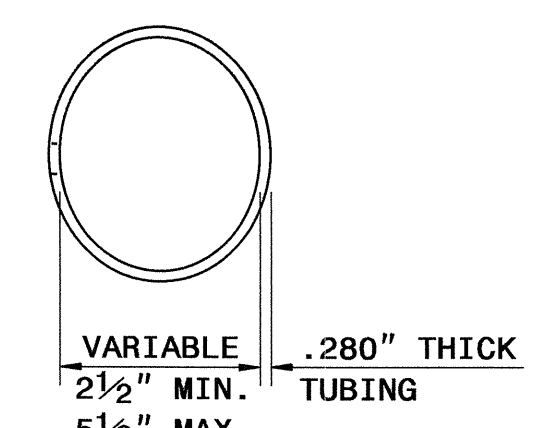
PLAN VIEW



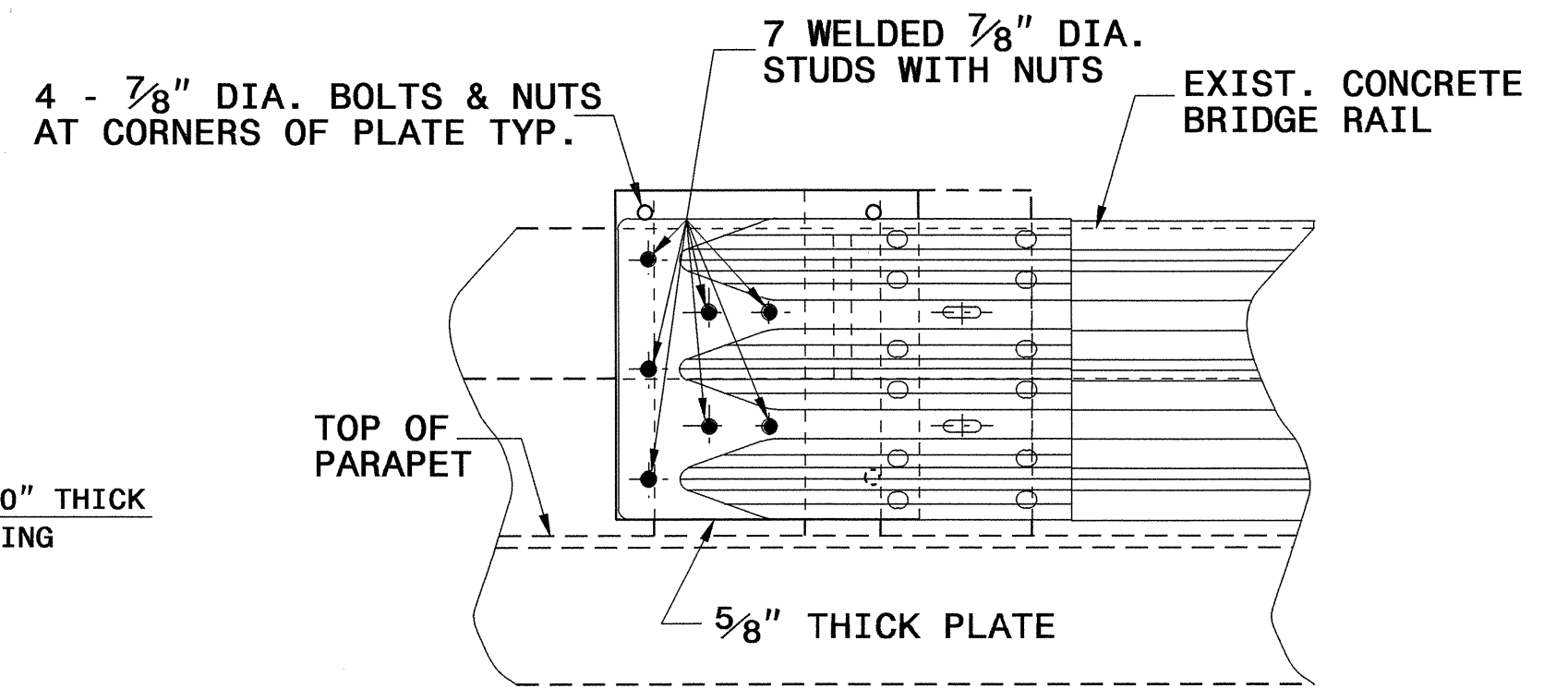
FRONT VIEW



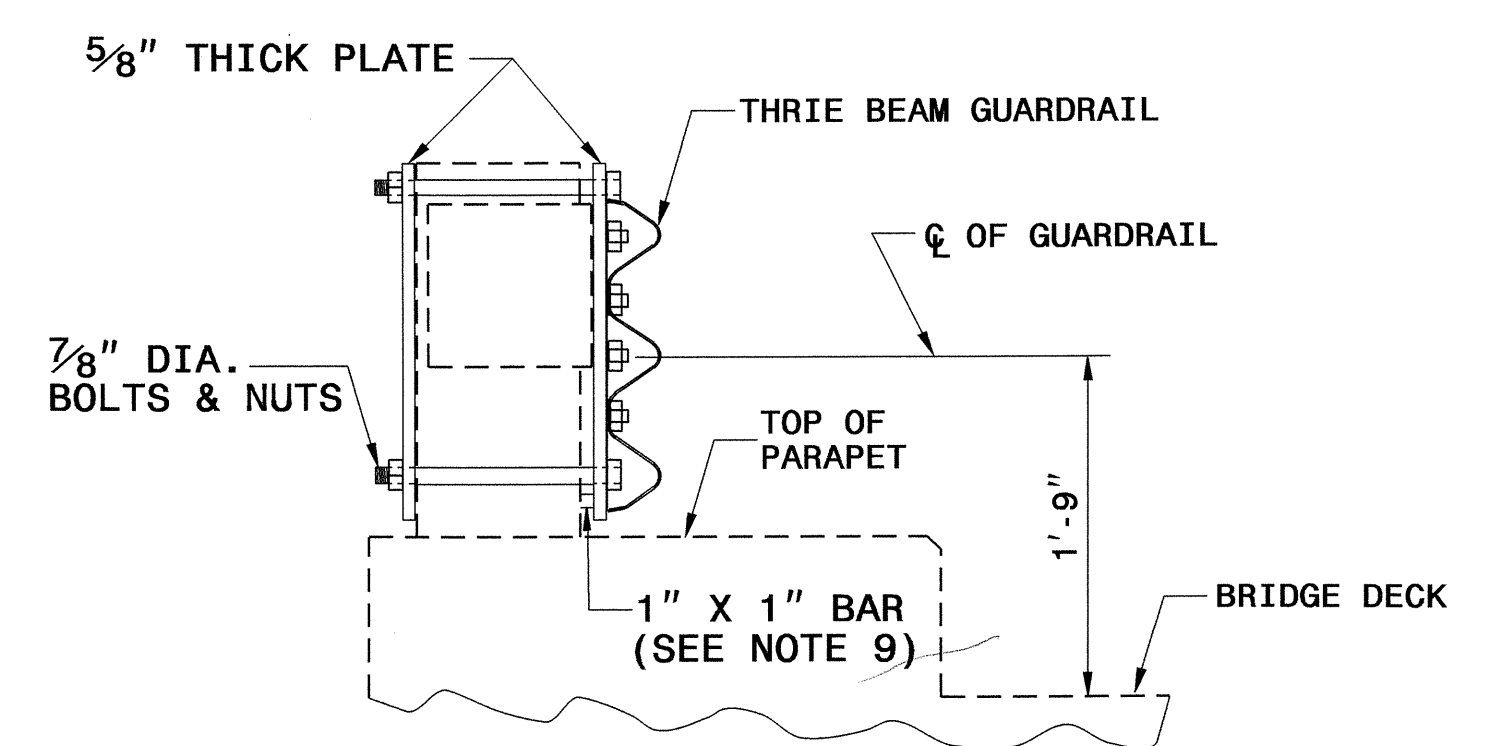
PLAN VIEW



**PLAN VIEW
INSET "A"**



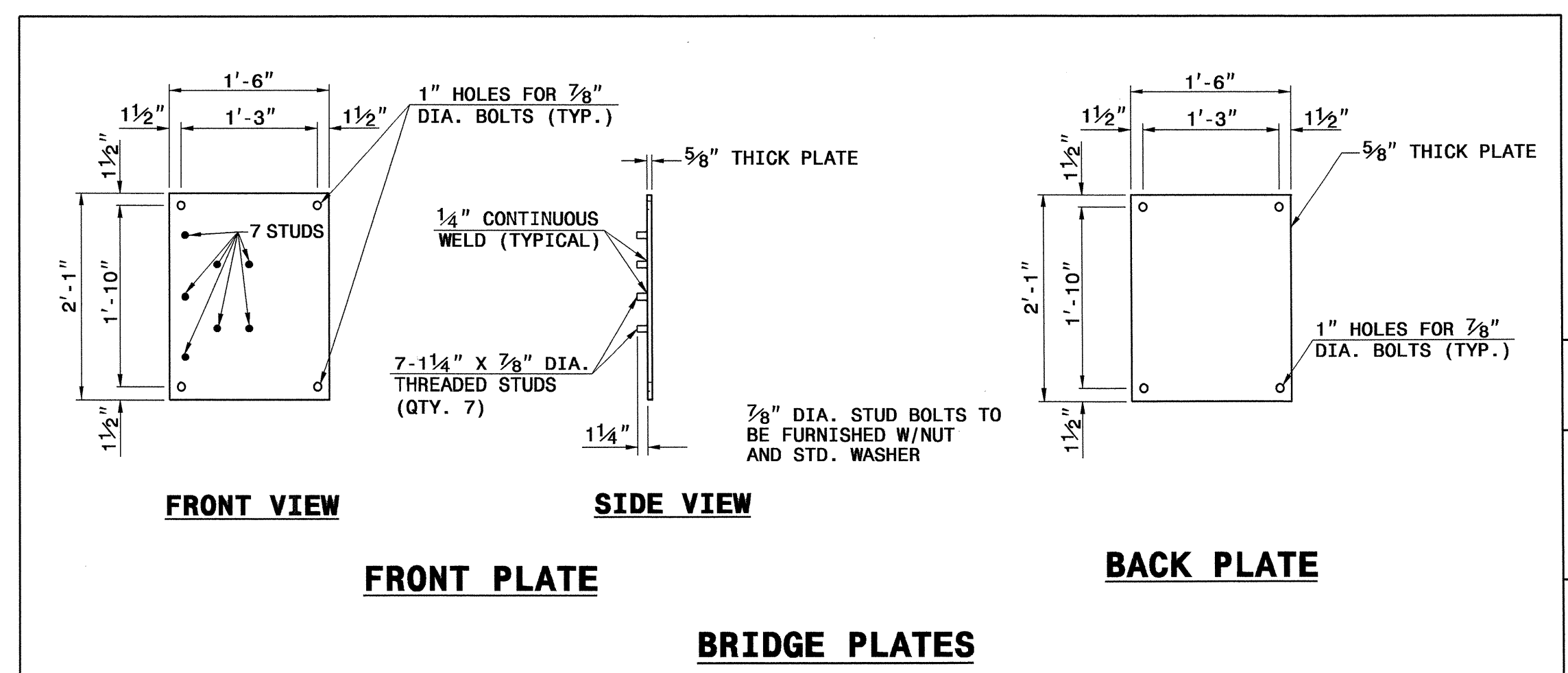
ELEVATION VIEW



SECTION VIEW

STEEL SPACER TUBE

- GENERAL NOTES:**
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
 2. TAP NUTS FOR THE 7/8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
 3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
 4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
 5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
 6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
 7. USE THIS DETAIL ONLY FOR BRIGES WITH POST AND BEAM TYPE RAIL.
 8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH 1/4" WELDS ALL AROUND.
 9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.
 10. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
 11. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 12. SEE ROADWAY STARDARD DRAWING 862.03 SHEET 4 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT



FRONT VIEW

SIDE VIEW

FRONT PLATE

BACK PLATE

BRIDGE PLATES



**CONTRACT STANDARDS
AND DEVELOPMENT UNIT**
Office 919-250-4128 FAX 919-250-4119

**GUARDRAIL ANCHOR UNIT
TEMPORARY
TYPE III MODIFIED**

ORIGINAL BY: E.E. WARD DATE: 01-03
 MODIFIED BY: E.E. WARD DATE: 02-04
 CHECKED BY: *[Signature]* DATE: 7/1/11
 FILE SPEC.: \\br\details\stand\bpii original.dgn

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202661

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION	1693000000-E	654	20	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	4430000000-N	1130	90	EA	DRUMS	6006000000-E	1610	350	TON	STONE FOR EROSION CONTROL, CLASS A
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING	2022000000-E	SP	22.4	CY	SUBDRAIN EXCAVATION	4445000000-E	1145	80	LF	BARRICADES (TYPE III)	6009000000-E	1610	100	TON	STONE FOR EROSION CONTROL, CLASS B
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (22+60.00)	2033000000-E	SP	16.8	CY	SUBDRAIN FINE AGGREGATE	4450000000-N	1150	960	HR	FLAGGER	6012000000-E	1610	70	TON	SEDIMENT CONTROL STONE
0043000000-N	226	Lump Sum		GRADING	2044000000-E	SP	100	LF	6" PERFORATED SUBDRAIN PIPE	4516000000-N	1180	15	EA	SKINNY DRUM	6015000000-E	1615	3	ACR	TEMPORARY MULCHING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING	2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS	4600000000-N	SP	4	EA	GENERIC TRAFFIC CONTROL ITEM WARNING FLAGS	6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
0057000000-E	226	400	CY	UNDERCUT EXCAVATION	2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)	4609000000-N	SP	270	DAY	GENERIC TRAFFIC CONTROL ITEM TEMPORARY TRAFFIC SIGNAL SYSTEM	6021000000-E	1620	1.5	TON	FERTILIZER FOR TEMPORARY SEEDING
0127000000-N	SP	4	EA	EMBANKMENT SETTLEMENT GAUGES	2286000000-N	840	3	EA	MASONRY DRAINAGE STRUCTURES	4650000000-N	1251	40	EA	TEMPORARY RAISED PAVEMENT MARKERS	6024000000-E	1622	600	LF	TEMPORARY SLOPE DRAINS
0134000000-E	240	20	CY	DRAINAGE DITCH EXCAVATION	2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29	4685000000-E	1205	2,565	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	6027000000-N	1622	12	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
0195000000-E	SP	400	CY	SELECT GRANULAR MATERIAL	2396000000-N	840	1	EA	FRAME WITH COVER, STD 840.54	4686000000-E	1205	2,532	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	6029000000-E	SP	900	LF	SAFETY FENCE
0196000000-E	270	500	SY	FABRIC FOR SOIL STABILIZATION	2556000000-E	846	50	LF	SHOULDER BERM GUTTER	4710000000-E	1205	44	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	6030000000-E	1630	270	CY	SILT EXCAVATION
0199000000-E	SP	699	SF	TEMPORARY SHORING	3030000000-E	862	75	LF	STEEL BM GUARDRAIL	4710000000-E	1205	44	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	6036000000-E	1631	1,865	SY	MATTING FOR EROSION CONTROL
0241000000-E	SP	450	SY	GENERIC GRADING ITEM FABRIC FOR EMBANKMENT STABILIZATION	3045000000-E	862	125	LF	STEEL BM GUARDRAIL, SHOP CURVED	4810000000-E	1205	15,500	LF	PAINT PAVEMENT MARKING LINES (4")	6037000000-E	SP	300	SY	COIR FIBER MAT
0318000000-E	SP	31	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	4835000000-E	1205	90	LF	PAINT PAVEMENT MARKING LINES (24")	6042000000-E	1632	250	LF	1/4" HARDWARE CLOTH
0320000000-E	SP	860	SY	FOUNDATION CONDITIONING FABRIC	3195000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1	4850000000-E	1205	4,234	LF	REMOVAL OF PAVEMENT MARKING LINES (4")	6048000000-E	SP	500	SY	FLOATING TURBIDITY CURTAIN
0335200000-E	SP	32	LF	15" DRAINAGE PIPE	3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	4870000000-E	1205	60	LF	REMOVAL OF PAVEMENT MARKING LINES (24")	6071010000-E	SP	450	LF	WATTLE
0335300000-E	SP	56	LF	18" DRAINAGE PIPE	3270000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	4900000000-N	1251	16	EA	PERMANENT RAISED PAVEMENT MARKERS	6071020000-E	SP	50	LB	POLYACRYLAMIDE (PAM)
0344000000-E	SP	24	LF	18" SIDE DRAIN PIPE	3380000000-E	862	512.5	LF	TEMPORARY STEEL BM GUARDRAIL	5325400000-E	1510	165	LF	4" WATER LINE	6071030000-E	SP	175	LF	COIR FIBER BAFFLE
0366000000-E	SP	68	LF	15" RC PIPE CULVERTS, CLASS III	3382000000-E	862	162.5	LF	TEMPORARY STEEL BM GUARDRAIL (SHOP CURVED)	5325600000-E	1510	97	LF	6" WATER LINE	6071050000-E	SP	2	EA	*** SKIMMER (1-1/2")
0995000000-E	340	42	LF	PIPE REMOVAL	3387000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (III MODIFIED)	5540000000-E	1515	2	EA	6" VALVE	6084000000-E	1660	3	ACR	SEEDING & MULCHING
1121000000-E	520	180	TON	AGGREGATE BASE COURSE	3389100000-N	SP	6	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY	5798000000-E	1530	235	LF	ABANDON *** UTILITY PIPE (4")	6087000000-E	1660	3	ACR	MOWING
1220000000-E	545	40	TON	INCIDENTAL STONE BASE	3649000000-E	876	5	TON	RIP RAP, CLASS B	5800000000-E	1530	18	LF	ABANDON 6" UTILITY PIPE	6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
1489000000-E	610	1,330	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	3656000000-E	876	714	SY	FILTER FABRIC FOR DRAINAGE	5815500000-N	1530	1	EA	REMOVE FIRE HYDRANT	6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
1519000000-E	610	830	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	4400000000-E	1110	244	SF	WORK ZONE SIGNS (STATIONARY)	6000000000-E	1605	2,100	LF	TEMPORARY SILT FENCE	6108000000-E	1665	2	TON	FERTILIZER TOPDRESSING
1525000000-E	610	80	TON	ASPHALT CONC SURFACE COURSE, TYPE SP9.5A	4405000000-E	1110	192	SF	WORK ZONE SIGNS (PORTABLE)					6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING	
1575000000-E	SP	115	TON	ASPHALT BINDER FOR PLANT MIX	4410000000-E	1110	40	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)					6117000000-N	SP	18	EA	RESPONSE FOR EROSION CONTROL	
														6123000000-E	1670	0.1	ACR	REFORESTATION	

5/28/99

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COMPUTED BY: GSM DATE: 8/3/2011
 CHECKED BY: JEB DATE: 8/3/2011

PROJECT NO. B-4551 SHEET NO. 3-A

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF PAVEMENT REMOVAL/BREAKING

SUMMARY OF EARTHWORK

Station	Station	TOTAL UNCLASS. EXCAV.	UNDERCUT	Embank. +%	Borrow	Waste
-L- 17+00.00	21+96.43 (BEG. BRIDGE)	229		982	753	0
SUBTOTAL:		229		982	753	0
-L- 23+22.51 (END BRIDGE)	28+00.00	212		1092	880	0
SUBTOTAL:		212		1092	880	0
-Y- 11+00.00	13+50.00	24		1218	1194	0
SUBTOTAL:		24		1218	1194	0
-Y1- 14+00.00	15+50.00	103		5	0	98
SUBTOTAL:		103		5	0	98
PLACE SURCHARGE (PER GEOTECH)					850	
REMOVE SURCHARGE (PER GEOTECH)		900				900
SUMMARIES SUBTOTAL:		1468		3297	3677	998
WASTE IN LIEU OF BORROW					-998	
PROJECT TOTALS:		1468		3297	2679	
EST. 5% FOR REPLACING TOP SOIL ON BORROW PITS					134	
GRAND TOTALS:		1468		2813		
SAY:		1470		2820		

LINE	STATION TO STATION	LOC	ASPHALT REMOVAL (SY)	ASPHALT BREAKING (SY)	CONCRETE REMOVAL (SY)	CONCRETE BREAKING (SY)
-L-	20+57 TO 21+25	RT	27.37			
-Y-	13+06 TO 13+68	RT	135.30			
-L-	16+03 TO 21+64	RT	577.65			
-L-	23+32 TO 29+92	RT	761.58			
-L-	19+29 TO 21+97	LT/RT		958.19		
-L-	23+23 TO 25+93	LT/RT		961.74		
GRAND TOTAL:			1501.90	1919.93		
SAY:			1510	1920		

TEMP. PAVEMENT

TEMP. PAVEMENT

EST. UNDERCUT = 400 CY (CONTINGENCY FROM GEOTECHNICAL REPORT)
 EST. SELECT GRANULAR MATERIAL = 400 CY (CONTINGENCY FROM GEOTECHNICAL REPORT)
 EST. FABRIC FOR SOIL STABILIZATION = 400 SY (CONTINGENCY FROM GEOTECHNICAL REPORT)
 EST. FABRIC FOR EMBANKMENT STABILIZATION = 450 SY (CONTINGENCY FROM GEOTECHNICAL REPORT)

DDE= 20 CY
 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. APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL AND BREAKUP OF EXISTING PAVEMENT WILL BE PAID AT THE LUMP SUM PRICE FOR "GRADING".

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

LINE	BEG. STA.	END STA.	LOC.	LENGTH			WARRANT POINT		"N" DIST FROM E.O.L.	TOTAL SHLDR WIDTH	FLARE LENGTH		W		TEMP. GIR LENGTH		ANCHORS					IMP. ATTN. TYPE 350			REMOVE EXISTING GRDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPR. END	TRAIL. END			APPR. END	TRAIL. END	APPR. END	TRAIL. END	STRAIGHT	SHOP CURVED	GRAU 350	TEMP III MOD	TEMP GRAU 350	III	AT-1	EA	G	NG		
-Y1-L-	-Y- 12+97.47	-L- 21+97.12	RT	75.00	25		21+97.12		9.25	2	50			1				1								
-Y1-L-	-Y1- 14+87.58	-L- 21+95.75	LT	87.50	25			21+95.75	9.25	2	50			1				1								
-L-	23+21.82	24+47.16	RT	50.00	37.5			23+21.82	9.25	11										1						LENGTH CONTROLLED BY EXIST. DRIVEWAY
-L-	23+23.19	25+52.52	LT	50.00	37.5		23+23.19		9.25	11										1	1					LENGTH CONTROLLED BY EXIST. DRIVEWAY
-Y1-L-	-Y- 12+80.35	-L- 22+14.99	RT						2	0	50			1				1	1							SEE TMP-5
-Y1-L-	-Y1- 14+59.56	-L- 22+14.71	LT						2	0	50			1				1	1							SEE TMP-5
-L-	-L- 23+19.87	-L- 24+55.00	RT						2	0	50			1				1	1							SEE TMP-5
-L-	-L- 24+55.00	-L- 25+00.00	LT						2	0	50			1				1	1							SEE TMP-5
-Y1-L-	-Y- 13+48.38	-L- 24+60.66	RT						2	0	50			1				312.5	75							SEE TMP-6
PROPOSED SUBTOTAL				262.50	125.00										TEMPORARY SUBTOTAL		812.50	162.50								

ANCHOR UNIT DEDUCTIONS			
GRAU 350	=	2 x 50	= -100.00
AT-1	=	2 x 6.25	= -12.50
TYPE III	=	4 x 18.75	= -75.00
TOTAL			75.00 125.00
SAY			75.00 125.00

ANCHOR UNIT DEDUCTIONS			
TEMP GRAU 350	=	6 x 50	= -300.00
TEMP TYPE III MOD	=	4	
TOTAL			512.50 162.50
SAY			512.50 162.50

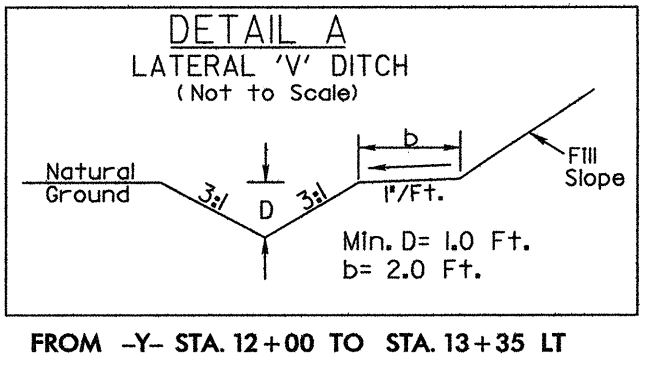
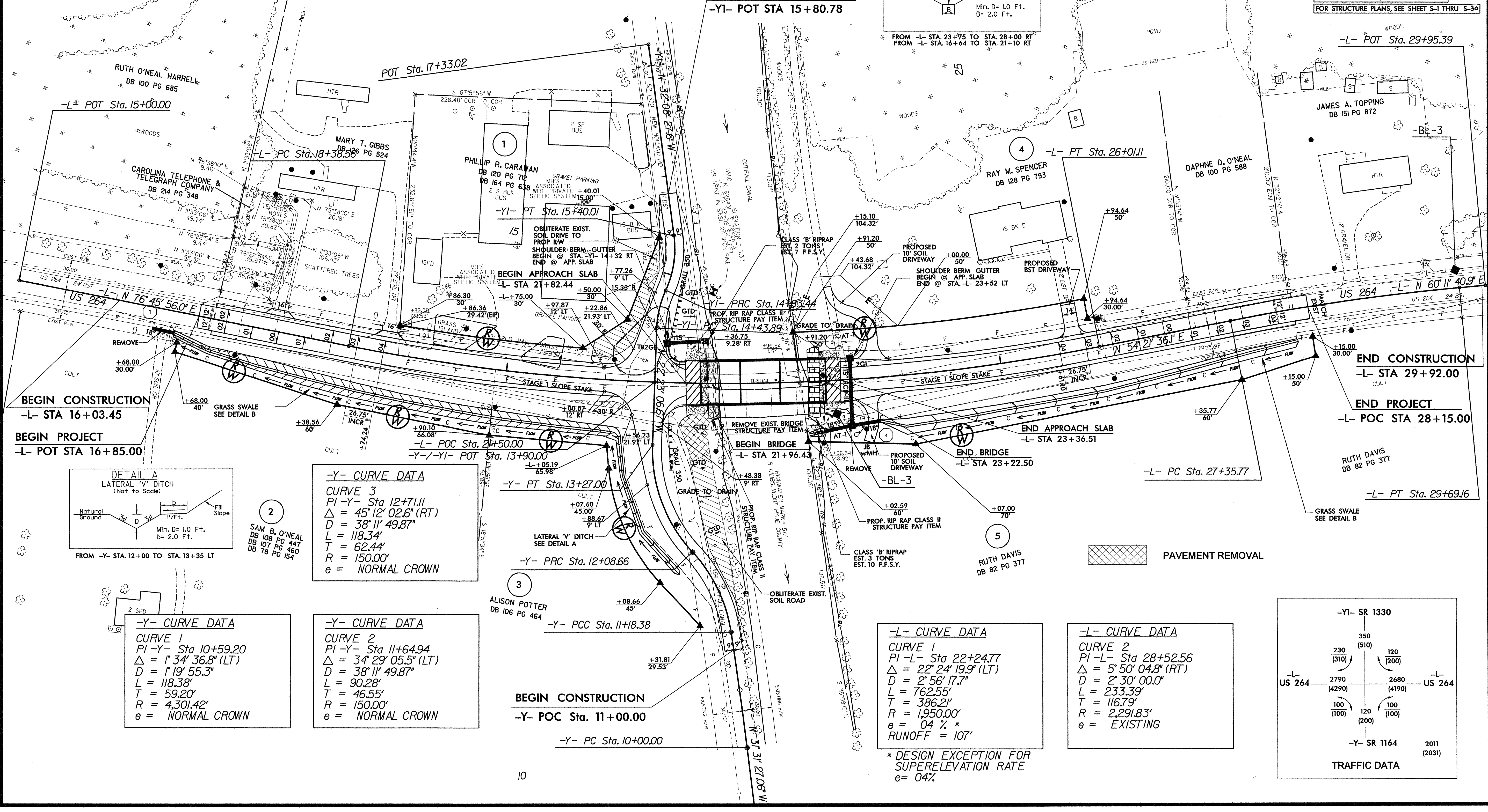
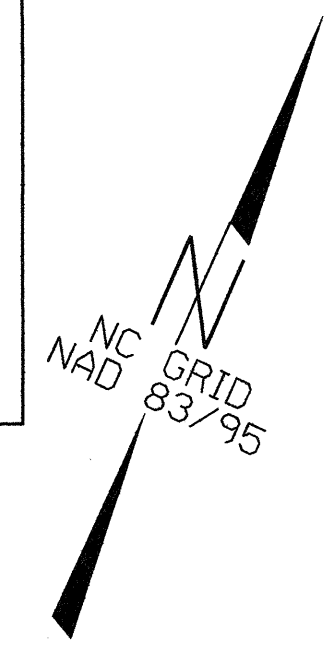
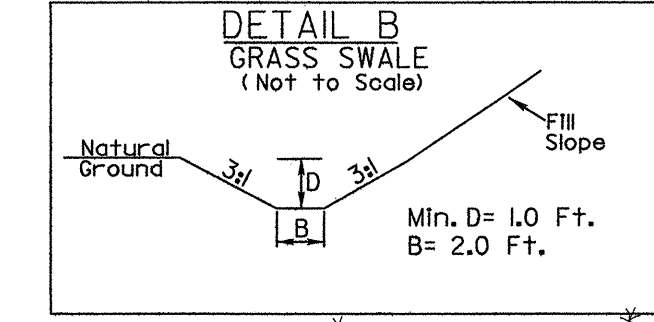
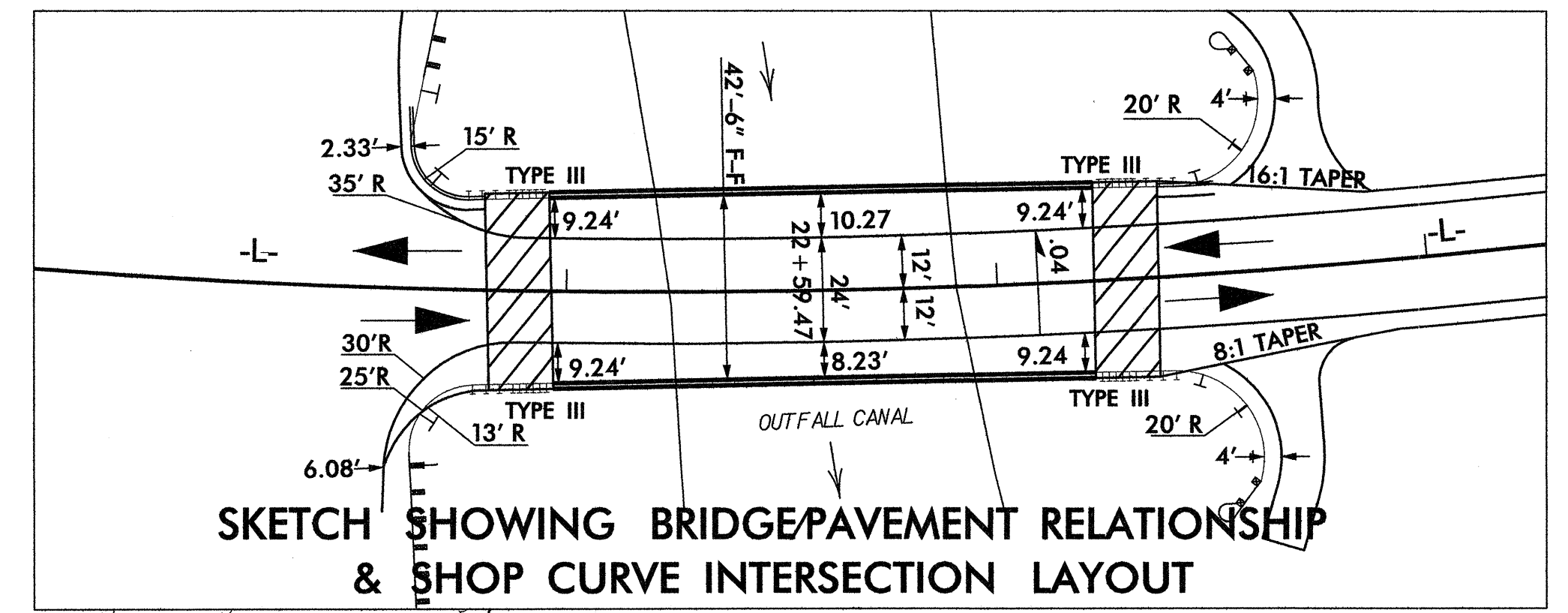
DRMP
 ENGINEERS • PLANNERS • SCIENTISTS
 DYER, RIDDLE, MILLS & PRECOURT, INC.
 5950 FAIRVIEW RD., S-320
 CHARLOTTE, NC 28210
 704-332-2289 NC LICENSE NO. C-2213

(5 ADDITIONAL GUARDRAIL POST)

FOR -L- PROFILE, SEE SHEET NO. 5
FOR -Y- PROFILE, SEE SHEET NO. 6
FOR -YI- PROFILE, SEE SHEET NO. 6
FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-30

-YI- CURVE DATA
CURVE 1
PI -YI- Sta 14+63.93
 $\Delta = 22^\circ 39' 32.5''$ (RT)
D = 57' 17" 44.8"
L = 39.55'
T = 20.04'
R = 100.00'
e = NORMAL CROWN

-YI- CURVE DATA
CURVE 2
PI -YI- Sta 15+12.51
 $\Delta = 32^\circ 24' 53.5''$ (LT)
D = 57' 17" 44.8"
L = 56.57'
T = 29.07'
R = 100.00'
e = NORMAL CROWN



-Y- CURVE DATA
CURVE 3
PI -Y- Sta 12+71.11
 $\Delta = 45^\circ 12' 02.6''$ (RT)
D = 38' 11" 49.87"
L = 118.34'
T = 62.44'
R = 150.00'
e = NORMAL CROWN

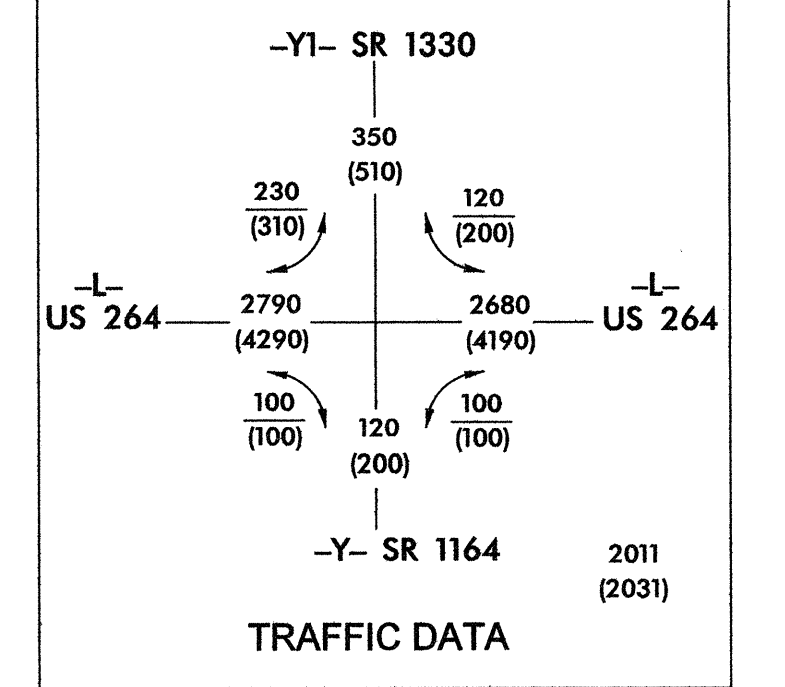
-Y- CURVE DATA
CURVE 1
PI -Y- Sta 10+59.20
 $\Delta = 1^\circ 34' 36.8''$ (LT)
D = 1' 19" 55.3"
L = 118.38'
T = 59.20'
R = 4,301.42'
e = NORMAL CROWN

-Y- CURVE DATA
CURVE 2
PI -Y- Sta 11+64.94
 $\Delta = 34^\circ 29' 05.5''$ (LT)
D = 38' 11" 49.87"
L = 90.28'
T = 46.55'
R = 150.00'
e = NORMAL CROWN

BEGIN CONSTRUCTION
-Y- POC Sta. 11+00.00
-Y- PC Sta. 10+00.00

-L- CURVE DATA
CURVE 1
PI -L- Sta 22+24.77
 $\Delta = 22^\circ 24' 19.9''$ (LT)
D = 2' 56" 17.7"
L = 762.55'
T = 386.21'
R = 1,950.00'
e = 0.4% *
RUNOFF = 107'

-L- CURVE DATA
CURVE 2
PI -L- Sta 28+52.56
 $\Delta = 5^\circ 50' 04.8''$ (RT)
D = 2' 30" 00.0"
L = 233.39'
T = 116.79'
R = 2,291.83'
e = EXISTING

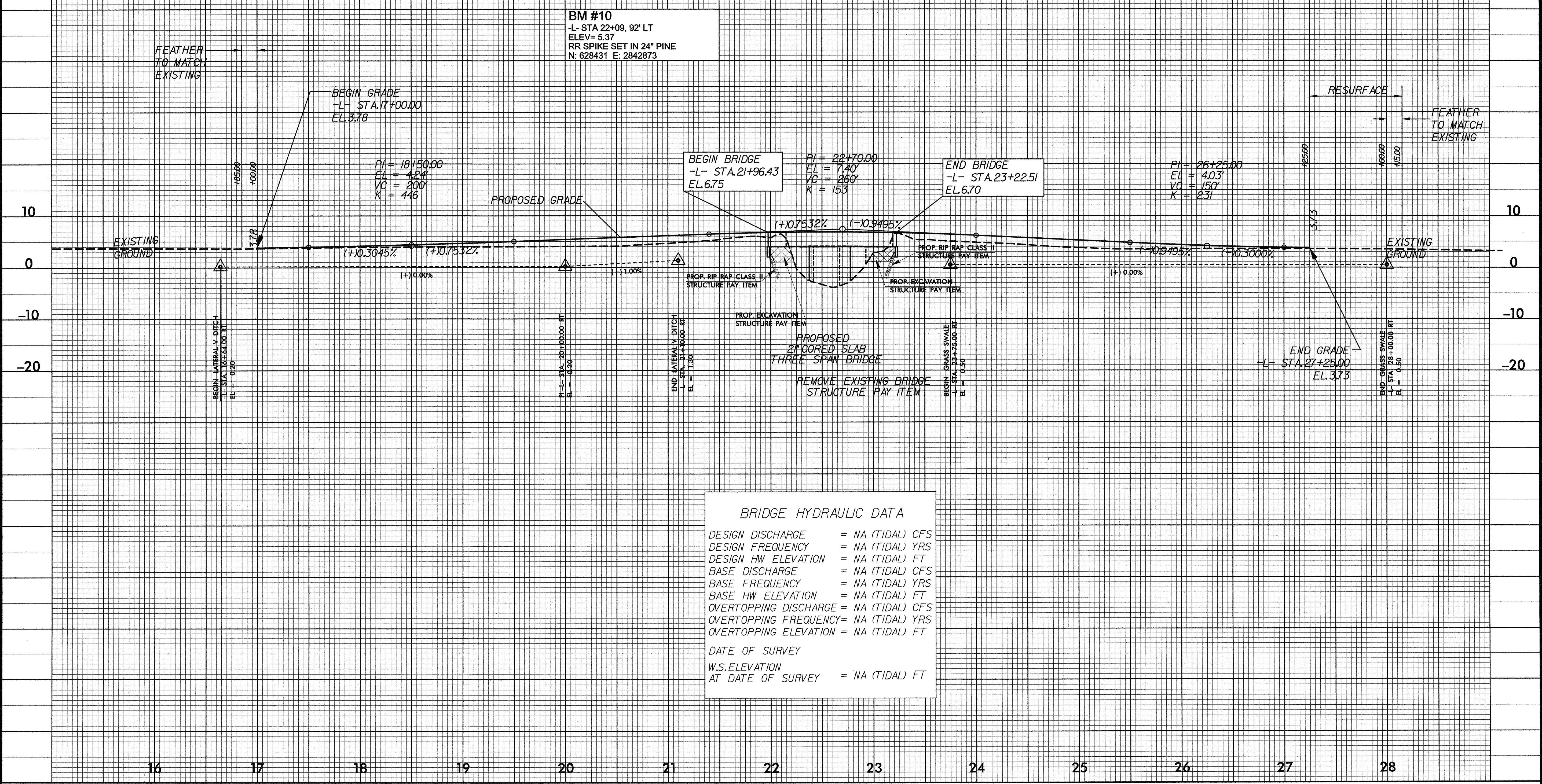


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5/14/99

PROJECT REFERENCE NO. B-4551	SHEET NO. 5
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
 DRMP ENGINEERING CONSULTANTS, INC. DYE, RIDGEL, MILLS & PRECOURT, INC. 3800 PARKER RD., SUITE 300 CHARLOTTE, NORTH CAROLINA 28203 (704) 382-2289 NC LICENSE NO. C-2225	
 MA Engineering CONSULTANTS, INC. 288 East Charlotte Street Suite 137 Charlotte, NC 28201 Phone: 919.297.0028 Fax: 919.297.0221 NC License No. R-0160	

-L-



BM #10
 -L- STA 22+09, 92' LT
 ELEV= 5.37
 RR SPIKE SET IN 24" PINE
 N: 628431 E: 2842873

BEGIN BRIDGE
 -L- STA. 21+96.43
 EL. 6.75

END BRIDGE
 -L- STA. 23+22.51
 EL. 6.70

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= NA (TIDAL) CFS
DESIGN FREQUENCY	= NA (TIDAL) YRS
DESIGN HW ELEVATION	= NA (TIDAL) FT
BASE DISCHARGE	= NA (TIDAL) CFS
BASE FREQUENCY	= NA (TIDAL) YRS
BASE HW ELEVATION	= NA (TIDAL) FT
OVERTOPPING DISCHARGE	= NA (TIDAL) CFS
OVERTOPPING FREQUENCY	= NA (TIDAL) YRS
OVERTOPPING ELEVATION	= NA (TIDAL) FT
DATE OF SURVEY	
W.S. ELEVATION AT DATE OF SURVEY	= NA (TIDAL) FT

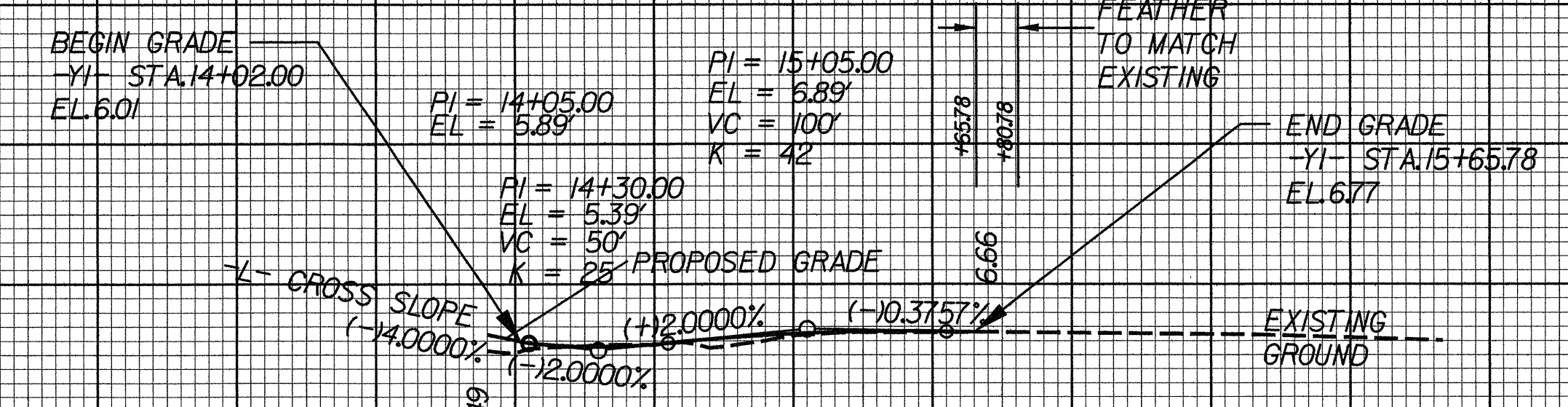
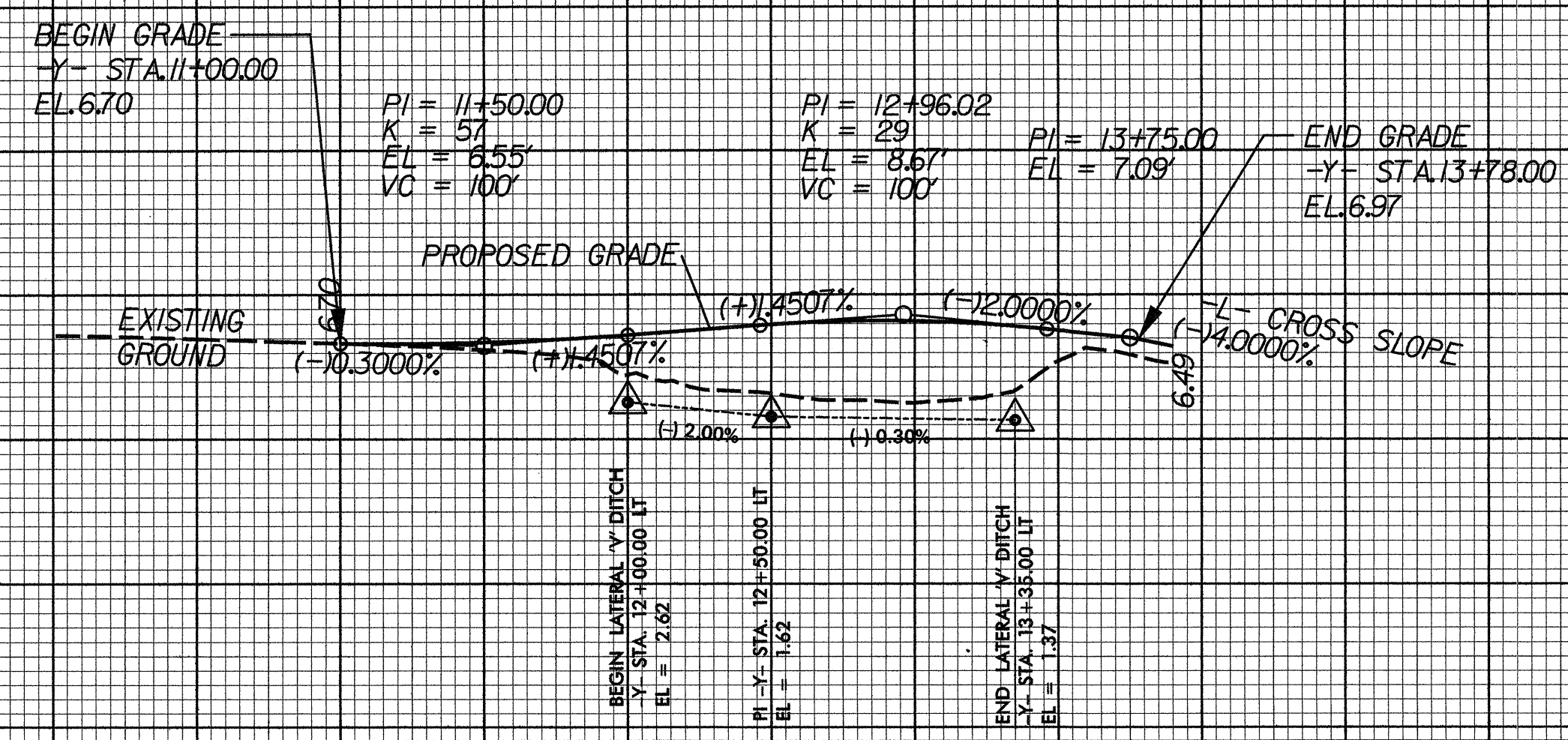
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5/27/08 AM

5/28/09

PROJECT REFERENCE NO. B-4551	SHEET NO. 6
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 28815 JAMES E. BECK 7/20/2011	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 21656 ROGER S. WOODON 7/20/11
DRMP ENGINEERS - PLANNERS - SCIENTISTS 10705 RIDDLE HILLS & PROSPECT, INC. 5950 FARVIEW RD., SUITE 300 CHARLOTTE, NORTH CAROLINA 28204 (704) 332-2293 NC LICENSE NO. C-2293	MA Engineering CONSULTANTS, INC. 590 East Chatham Street, Suite 137, Cary, NC 27511 Phone: 919-277-6200 Fax: 919-277-6222 NC License No. P-0160

-Y- SR 1164

-Y1- SR 1330



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