

09/08/09

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

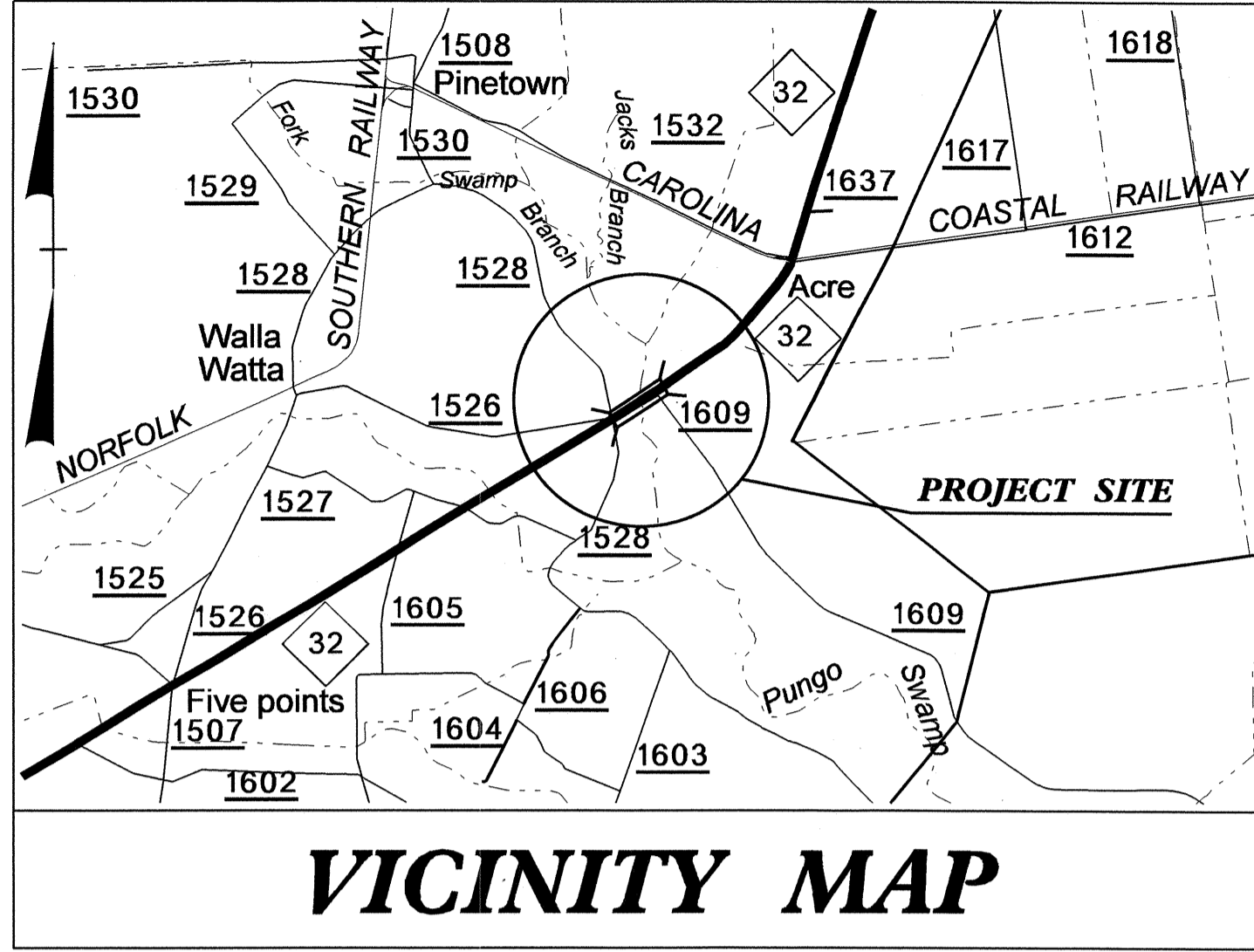
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BEAUFORT COUNTY

LOCATION: BRIDGE NO. 21 OVER PUNGO CREEK ON NC 32

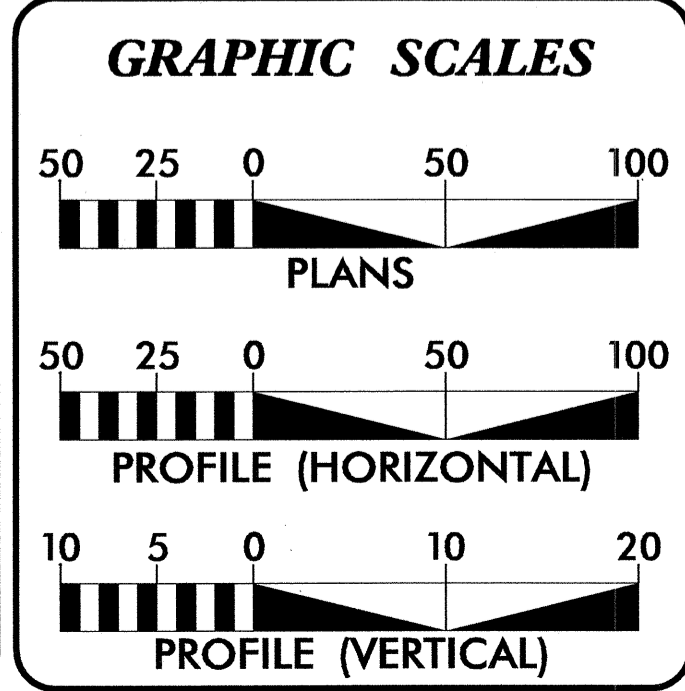
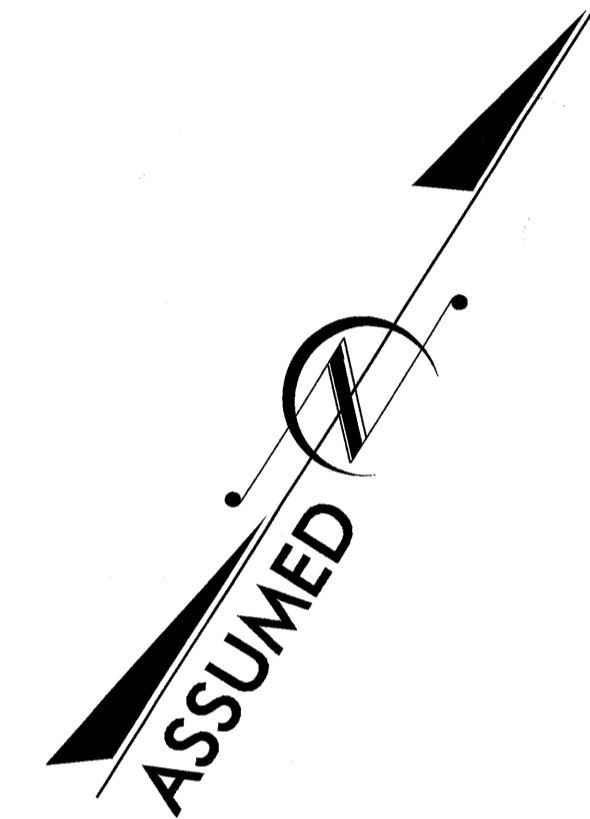
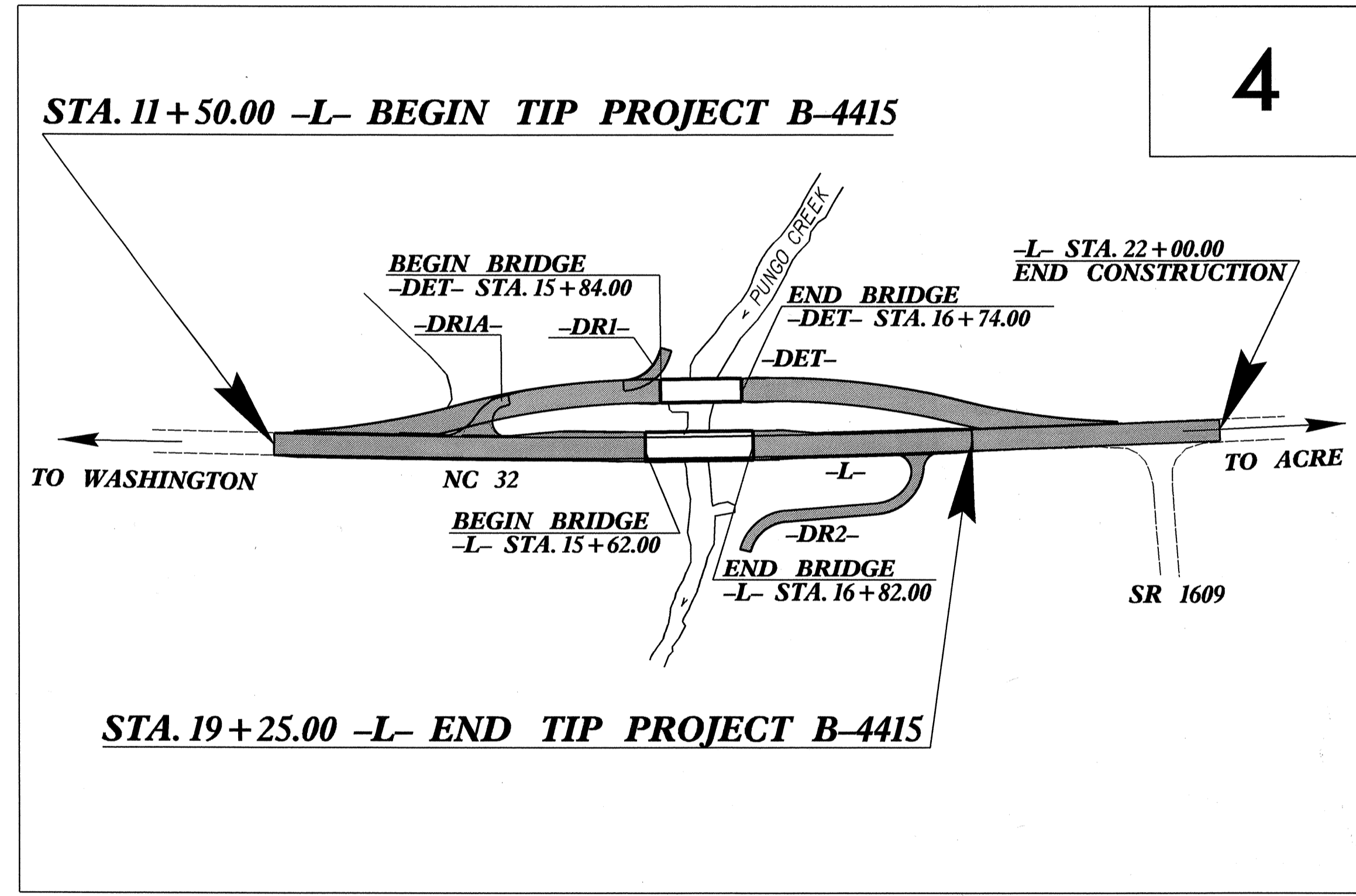
TYPE OF WORK: GRADING, DRAINAGE, PAVING,
AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4415	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
33691.1.1	BRSTP-32(5)	P.E.	
33691.2.1	BRSTP-32(5)	ROW, UTIL.	
33691.3.1	BRSTP-32(5)	CONST	



TIP PROJECT: B-4415

CONTRACT: C202727



DESIGN DATA

ADT 2011	=	3,981
ADT 2031	=	6,212
DHV	=	10 %
D	=	60 %
T	=	4 % *
V	=	60 MPH
V (DETOUR)	=	50 MPH
FUNC CLASS	=	RURAL MAJOR COLLECTOR
REGIONAL TIER	=	
* (TTST 1% + DUAL 3%)		

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4415	=	0.124 MILES
LENGTH OF STRUCTURE TIP PROJECT B-4415	=	0.023 MILES
TOTAL LENGTH OF TIP PROJECT B-4415	=	0.147 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 19, 2010	BRENDA MOORE, P.E. PROJECT ENGINEER
LETTING DATE: NOVEMBER 15, 2011	THAD F. DUNCAN, P.E. PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

W. Adam Carl
SIGNATURE

ROADWAY DESIGN ENGINEER

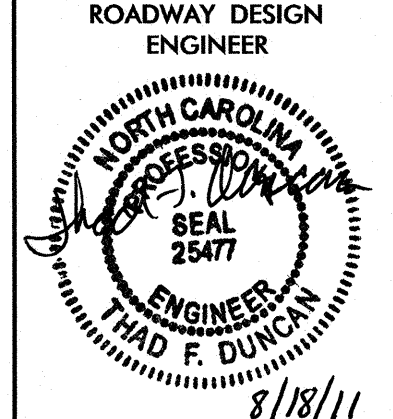
Thad F. Duncan
SIGNATURE

8/18/11

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Carl McMiller
STATE HIGHWAY DESIGN ENGINEER

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\$\$\$\$\$USERNAME\$\$\$\$\$



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-A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-B THRU 2-C	METHOD OF PIPE INSTALLATION DETAILS
2-D	ANCHORAGE FOR FRAMES
2-E	TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES
3-B	SUMMARY OF EARTHWORK, GUARDRAIL SUMMARY, AND SUMMARY OF EXISTING ASPHALT/CONCRETE PAVEMENT REMOVAL
4 THRU 5	PLAN SHEETS
6 THRU 7	PROFILE SHEETS
TMP-1 THRU TMP-6	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
UC-1 THRU UC-3	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY
X-1 THRU X-7	CROSS-SECTIONS
S-1 THRU S-24	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 III.

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

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

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

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

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

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

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

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 Tri County Telecom, Beaufort County Water, and Washington Electric Utilities
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	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 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 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
840.24	Frames and Narrow Slot Sag Grates
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
840.66	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

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

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	⊙
Well	⊙
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	▭
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 Drainage / Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary 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	A/G Water

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	A/G Gas

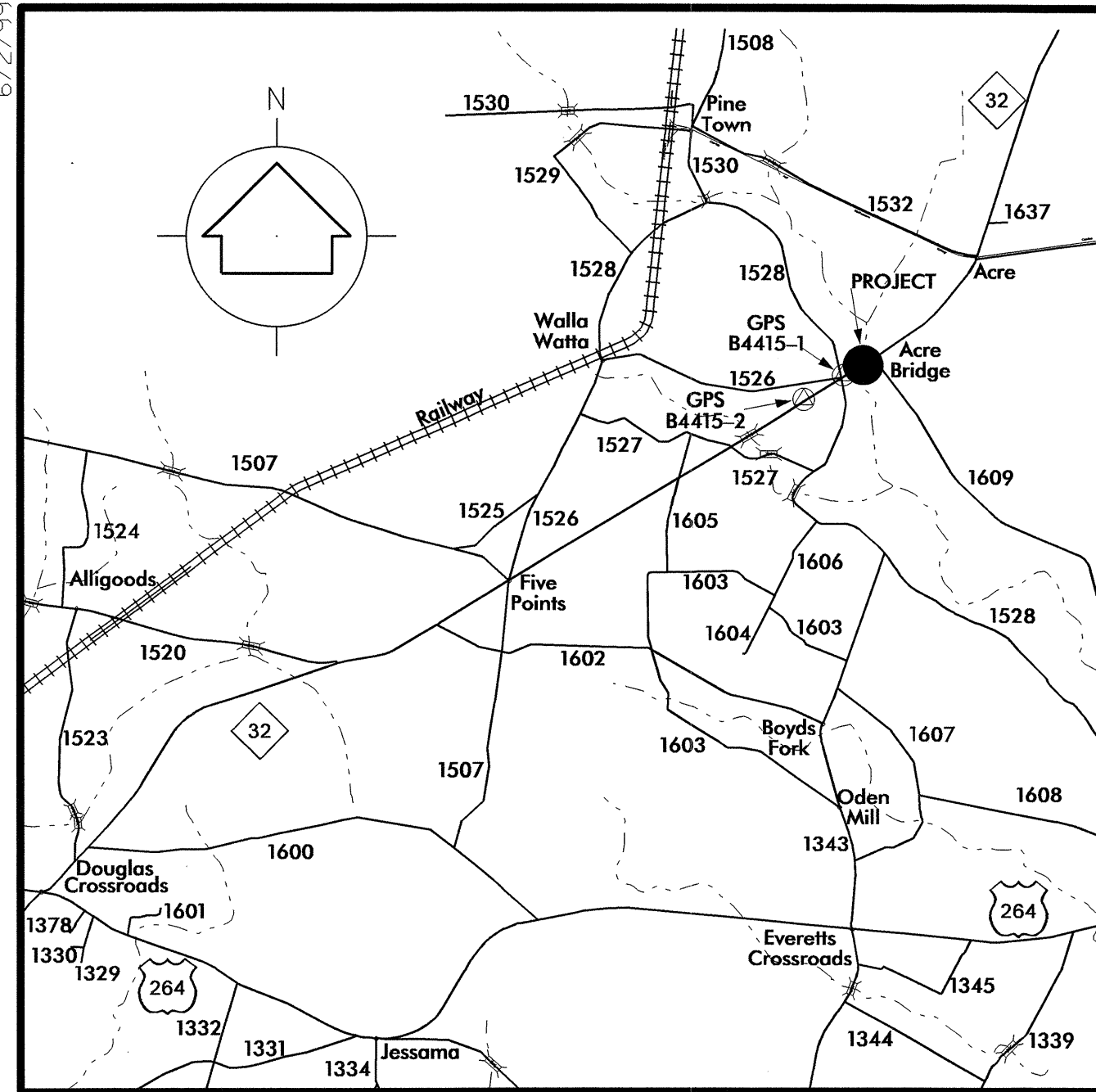
SANITARY SEWER:

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

MISCELLANEOUS:

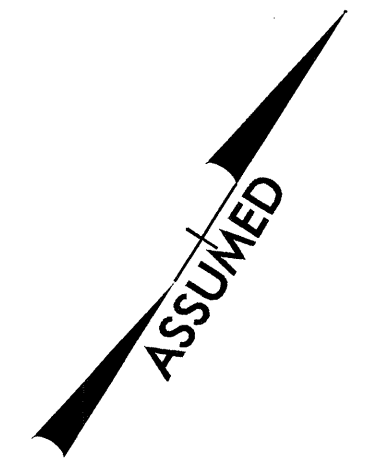
Utility Pole	●
Utility Pole with Base	⊕
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	▭
A/G Tank; Water, Gas, Oil	▭
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

SURVEY CONTROL SHEET B-4415



VICINITY MAP

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	674257.3270	2641907.5120	23.17	10+14.57	24.10 LT
2	BL-2	674555.1620	2642389.9470	21.18	15+82.25	24.85 LT
3	BL-3	674861.5190	2642857.1360	24.03	21+41.58	17.04 LT

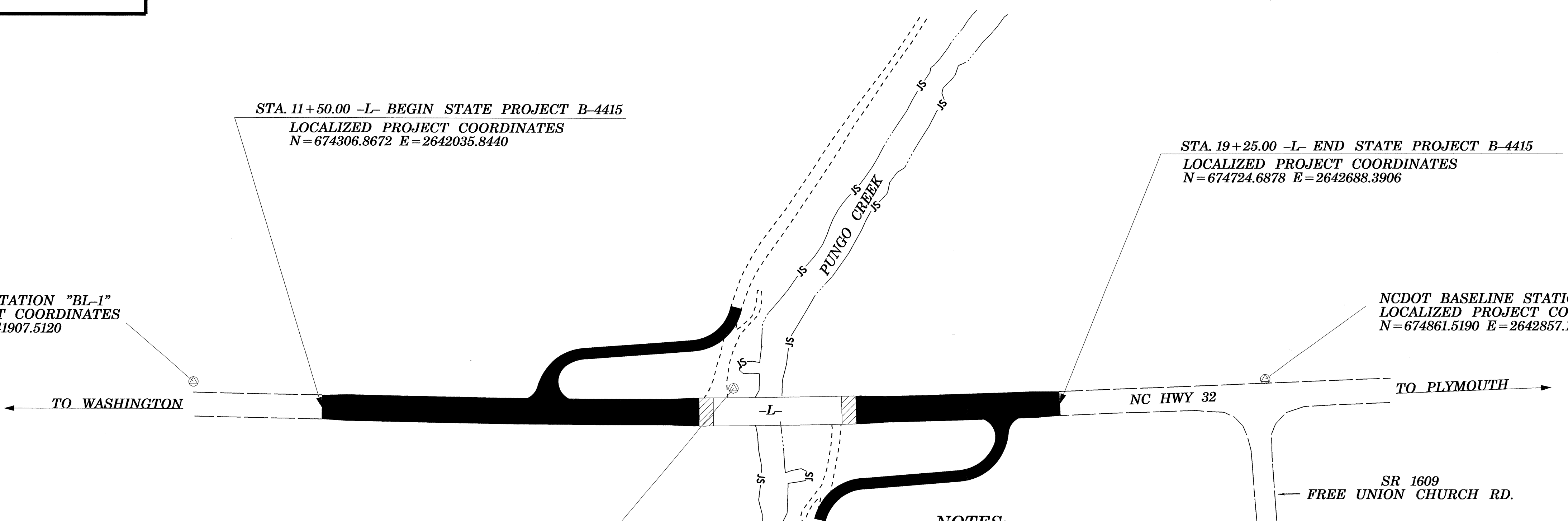


NCDOT BASELINE STATION "BL-1"
LOCALIZED PROJECT COORDINATES
N=674257.3270 E=2641907.5120

STA. 11+50.00 -L- BEGIN STATE PROJECT B-4415
LOCALIZED PROJECT COORDINATES
N=674306.8672 E=2642035.8440

STA. 19+25.00 -L- END STATE PROJECT B-4415
LOCALIZED PROJECT COORDINATES
N=674724.6878 E=2642688.3906

NCDOT BASELINE STATION "BL-3"
LOCALIZED PROJECT COORDINATES
N=674861.5190 E=2642857.1360



NCDOT BASELINE STATION "BL-2"
LOCALIZED PROJECT COORDINATES
N=674555.1620 E=2642389.9470

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
THE FILES TO BE FOUND ARE AS FOLLOWS:
B4415_LS_CONTROL_090312.TXT
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- ⊙ INDICATES CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING ASSUMED COORDINATES.

DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON ASSUMED COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BL-1"
NORTHING: 674257.327(fft) EASTING: 2641907.512(fft)
ELEVATION: 23.16(fft)
THE BEARING AND HORIZONTAL GROUND DISTANCE FROM "BL-1" TO -L- STATION 11+50.00 IS
N 68°53'30.6" E 137.56(fft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

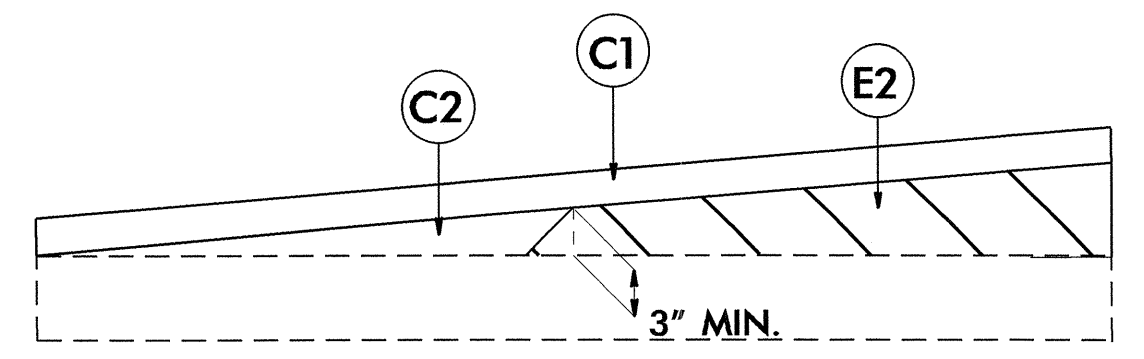
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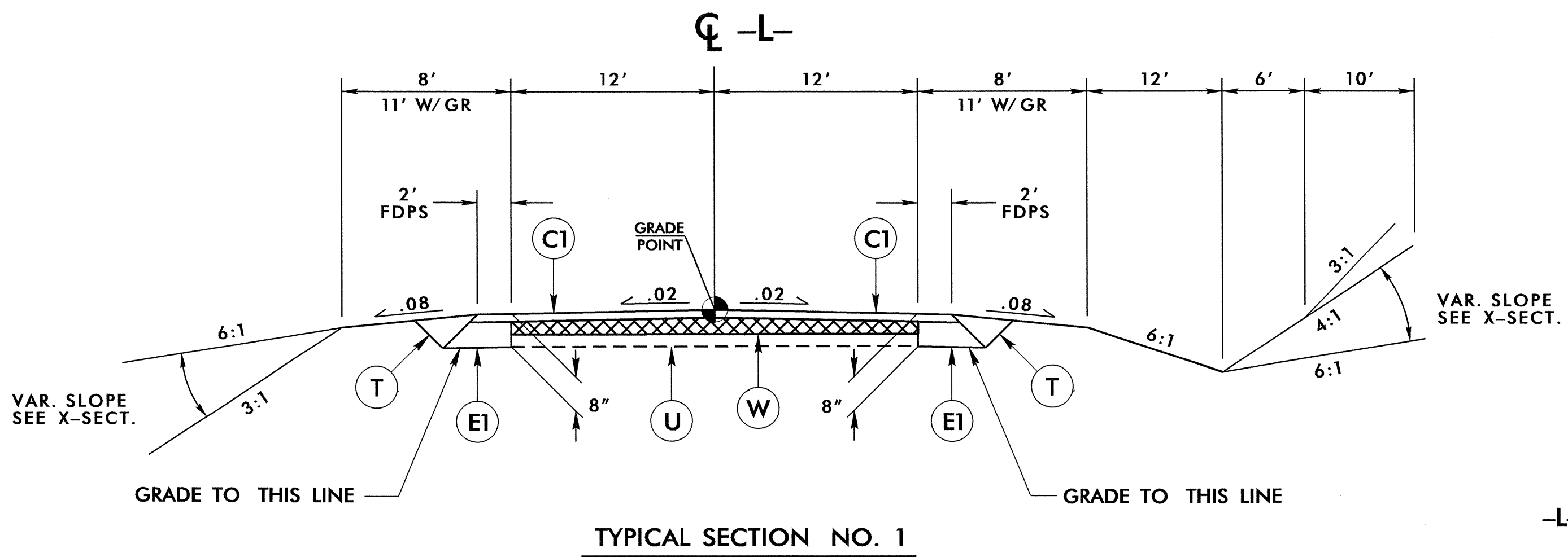
PROJECT REFERENCE NO. B-4415	SHEET NO. 2
ROADWAY DESIGN ENGINEER THAD F. DUNCAN 8/18/11	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON 8/17/11

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE.
P1	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT.

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

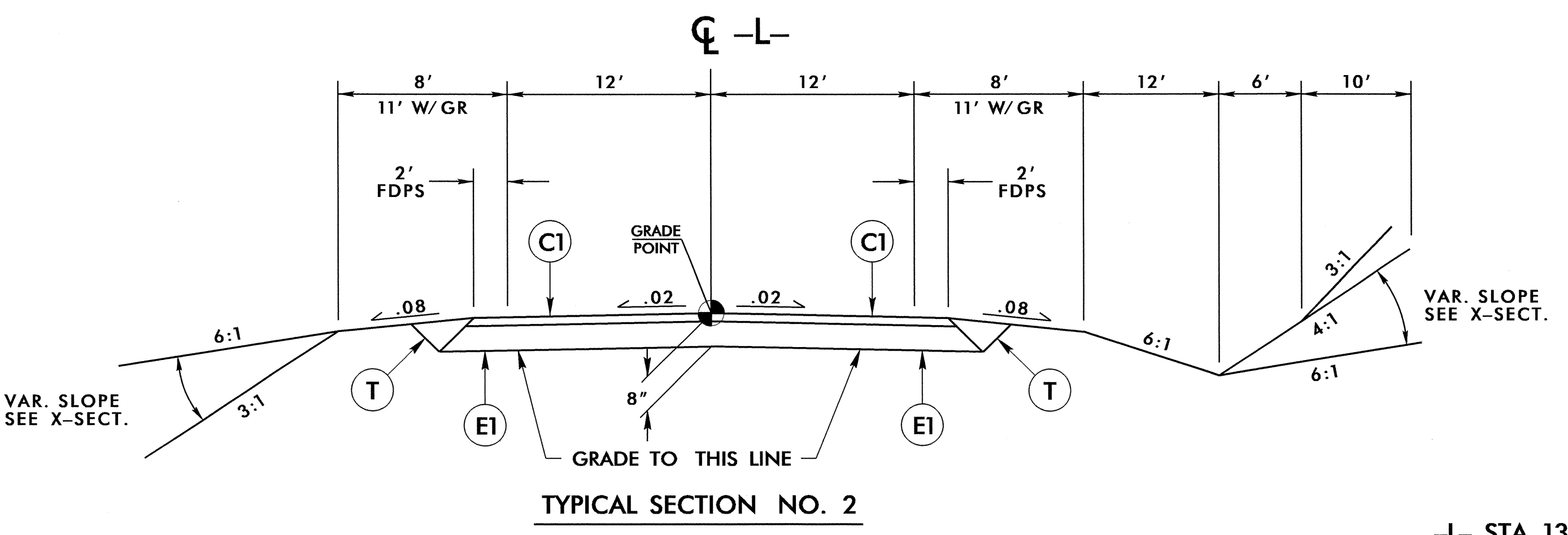


Wedging Detail For Resurfacing
Use With Typical Section No. 1



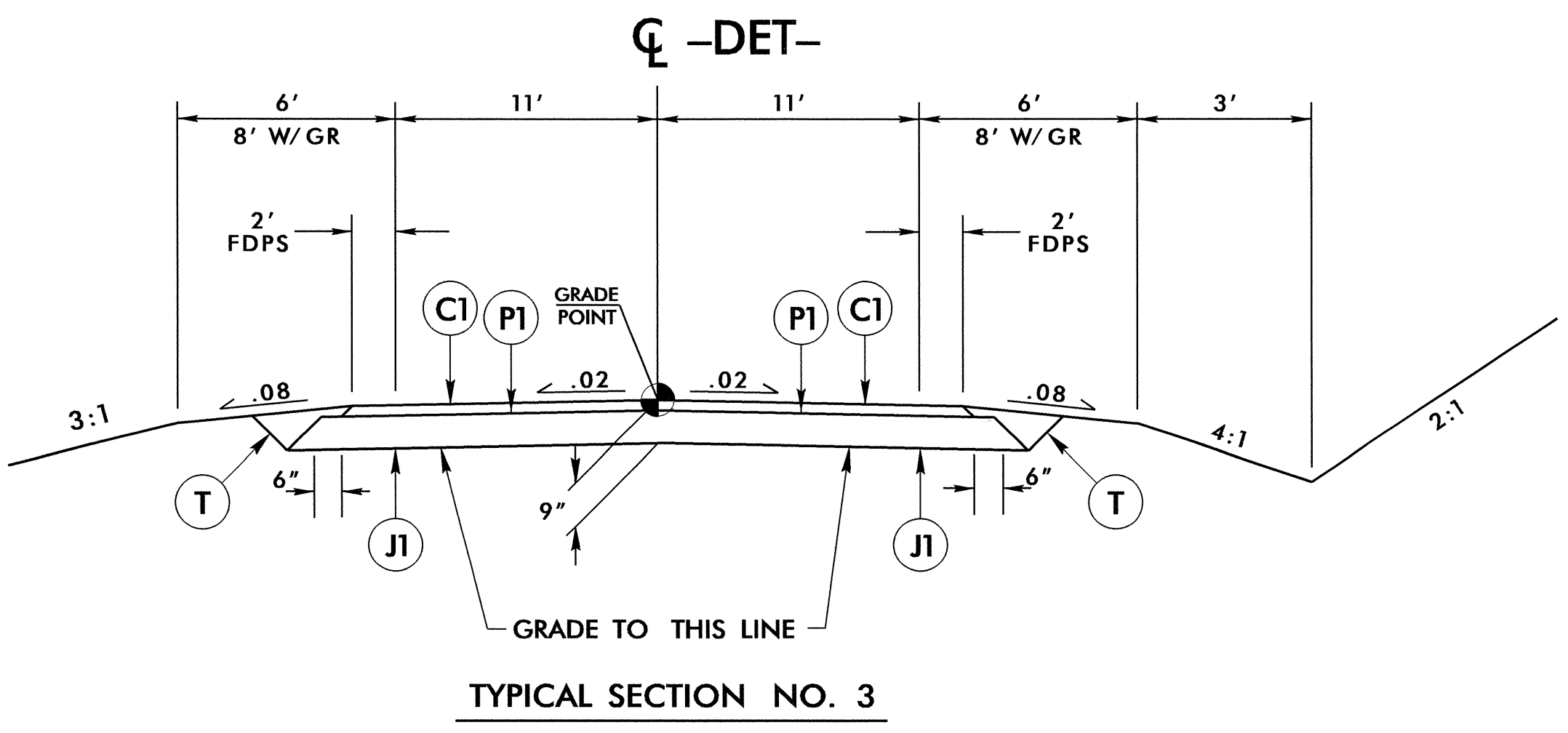
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 11+50.00 TO -L- STA. 13+30.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-L- STA. 13+30.00 TO -L- STA. 15+62.00 (BEGIN BRIDGE)
-L- STA. 16+82.00 (END BRIDGE) TO -L- STA. 19+25.00



TYPICAL SECTION NO. 3

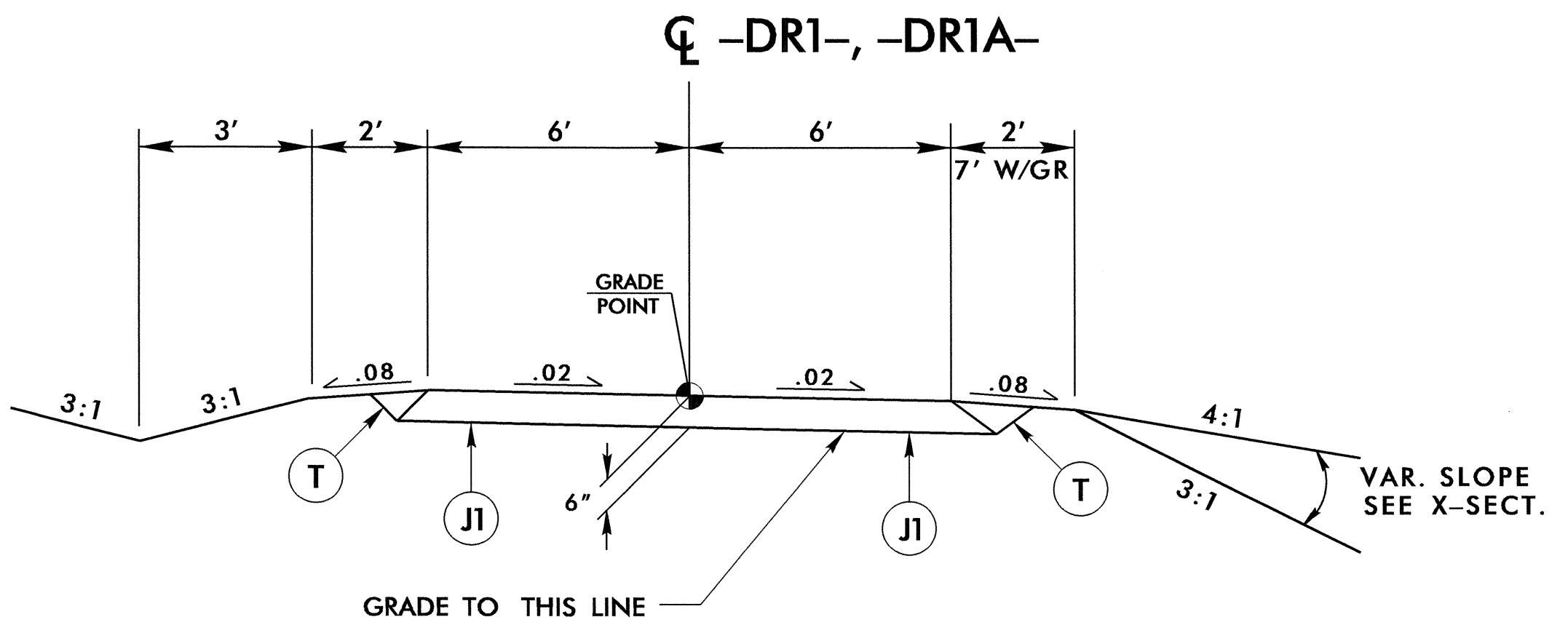
USE TYPICAL SECTION NO. 3
-DET- STA. 12+63.84 TO -DET- STA. 15+84.00 (BEGIN BRIDGE)
-DET- STA. 16+74.00 (END BRIDGE) TO -DET- STA. 20+02.87

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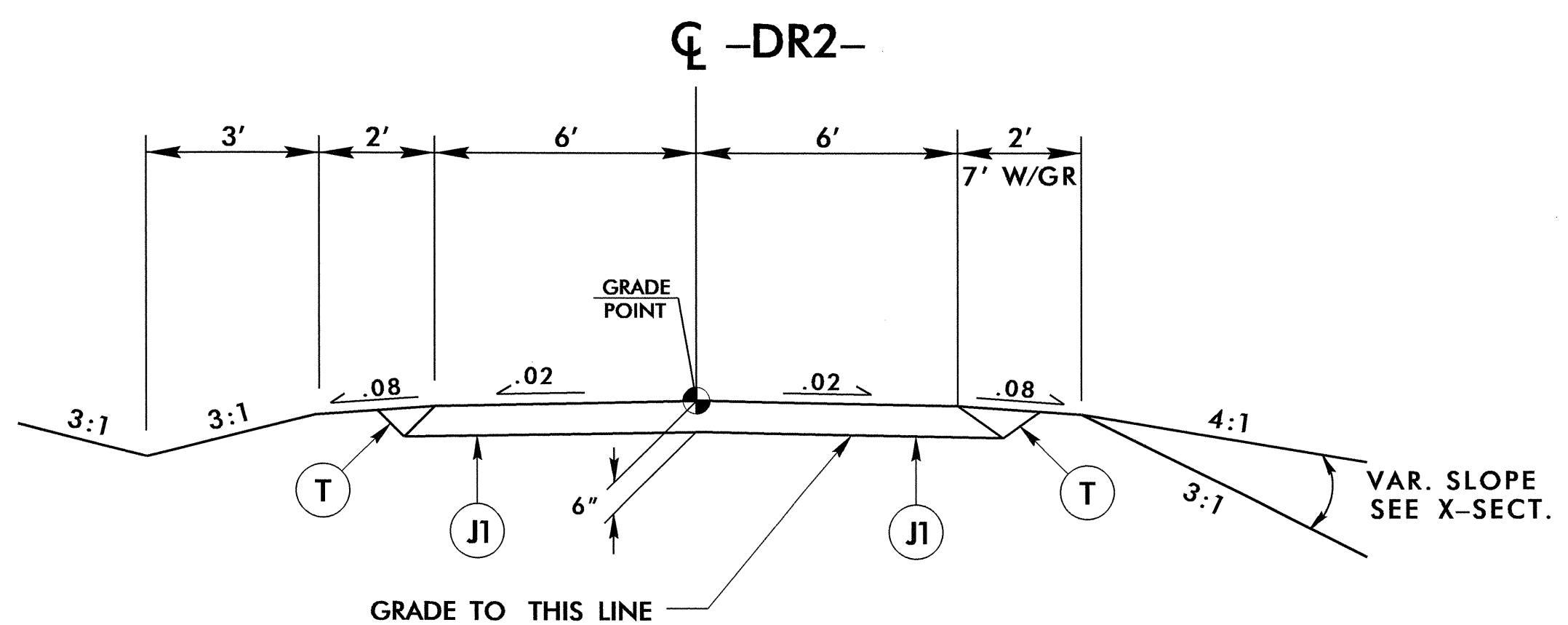
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ROADWAY DESIGN ENGINEER THAD F. DUNCAN SEAL 25477 8/18/11	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 8/17/11

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	3" S9.5B
J1	6" ABC
T	EARTH MATERIAL



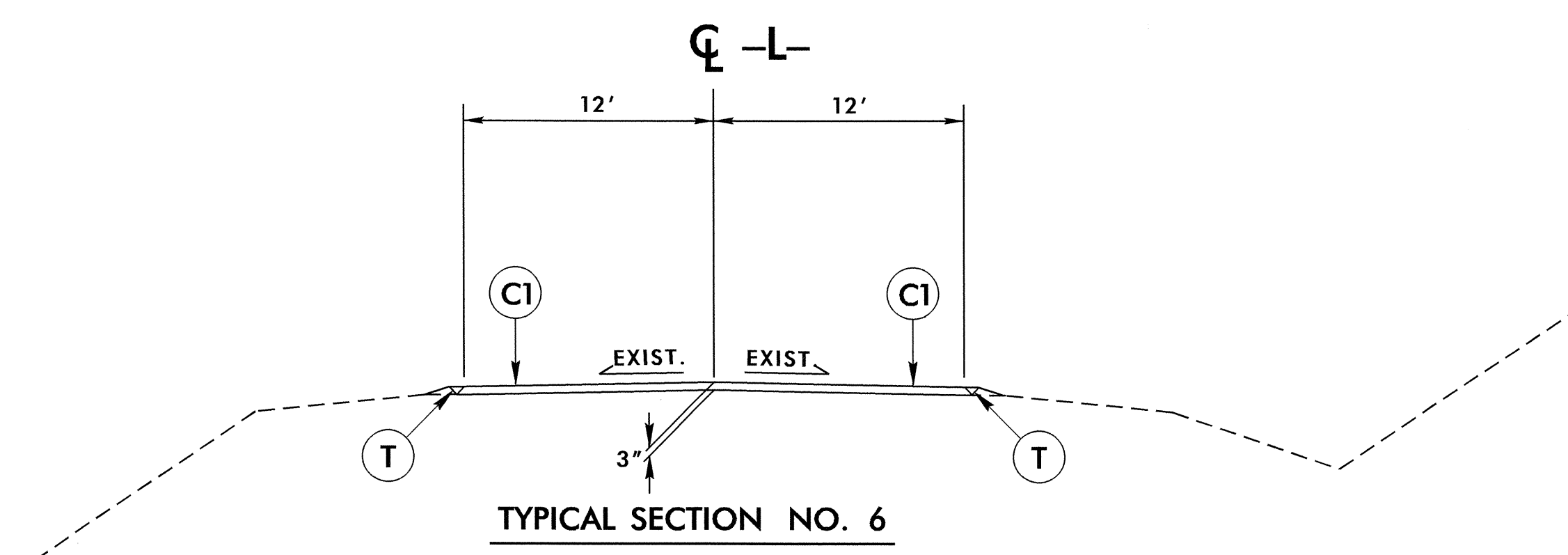
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
 USE GRASS ONLY
 -DR1- STA. 10+00.00 TO -DR1- STA. 10+45.00
 USE ABC
 -DR1- STA. 10+45.00 TO -DR1- STA. 10+66.54
 -DRIA- STA. 10+00.00 TO -DRIA- STA. 10+62.43



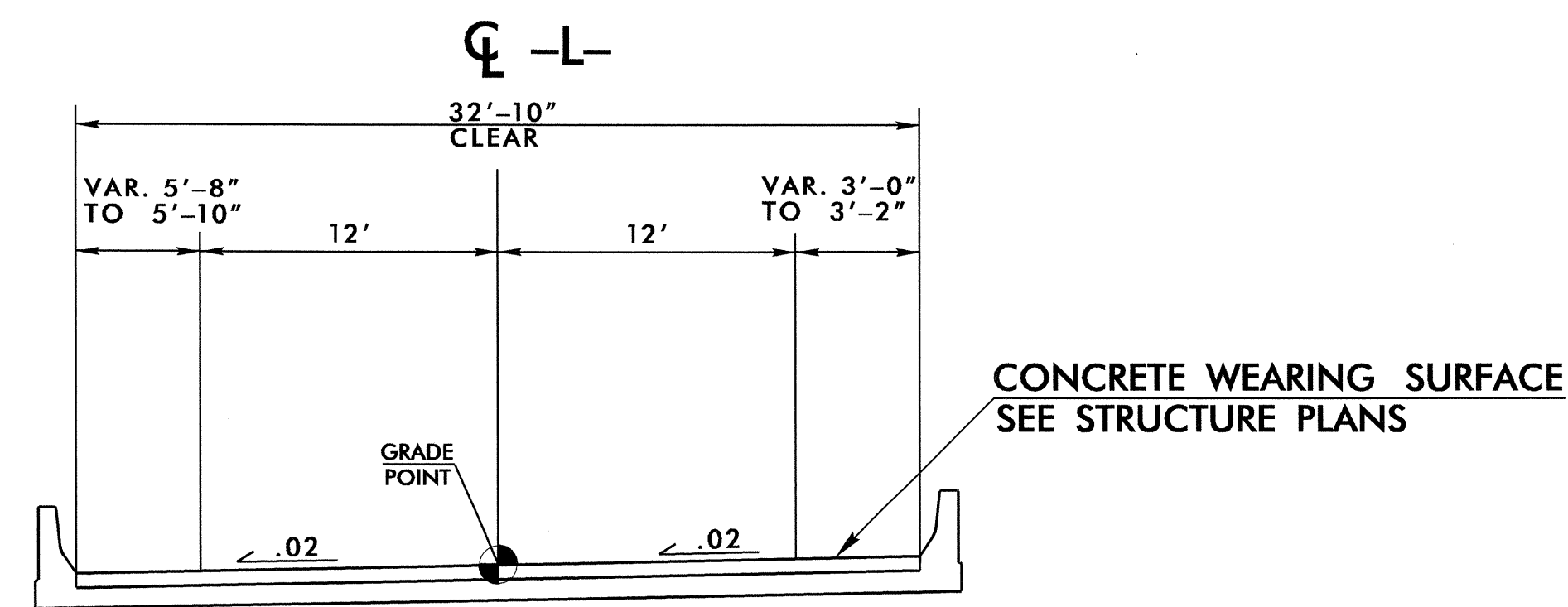
TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
 USE ABC
 -DR2- STA. 10+12.03 TO -DR2- STA. 12+25.00
 USE GRASS ONLY
 -DR2- STA. 12+25.00 TO -DR2- STA. 12+63.15



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
 -L- STA. 19+25.00 TO -L- STA. 22+00.00



BRIDGE TYPICAL SECTION NO. 1

USE BRIDGE TYPICAL SECTION NO. 1
 -L- STA. 15+62.00 TO -L- STA. 16+82.00

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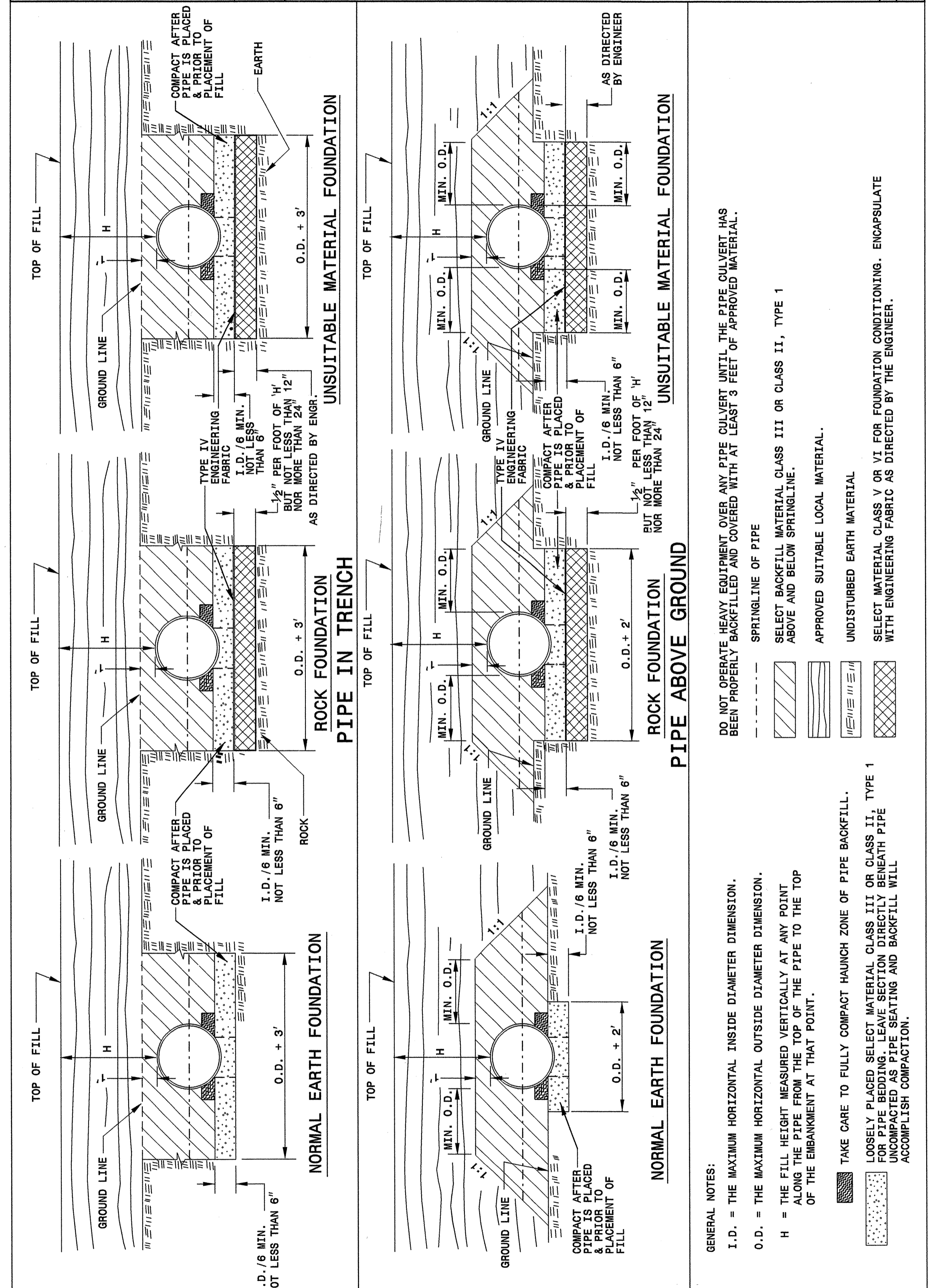
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3
300D01



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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3
300D01

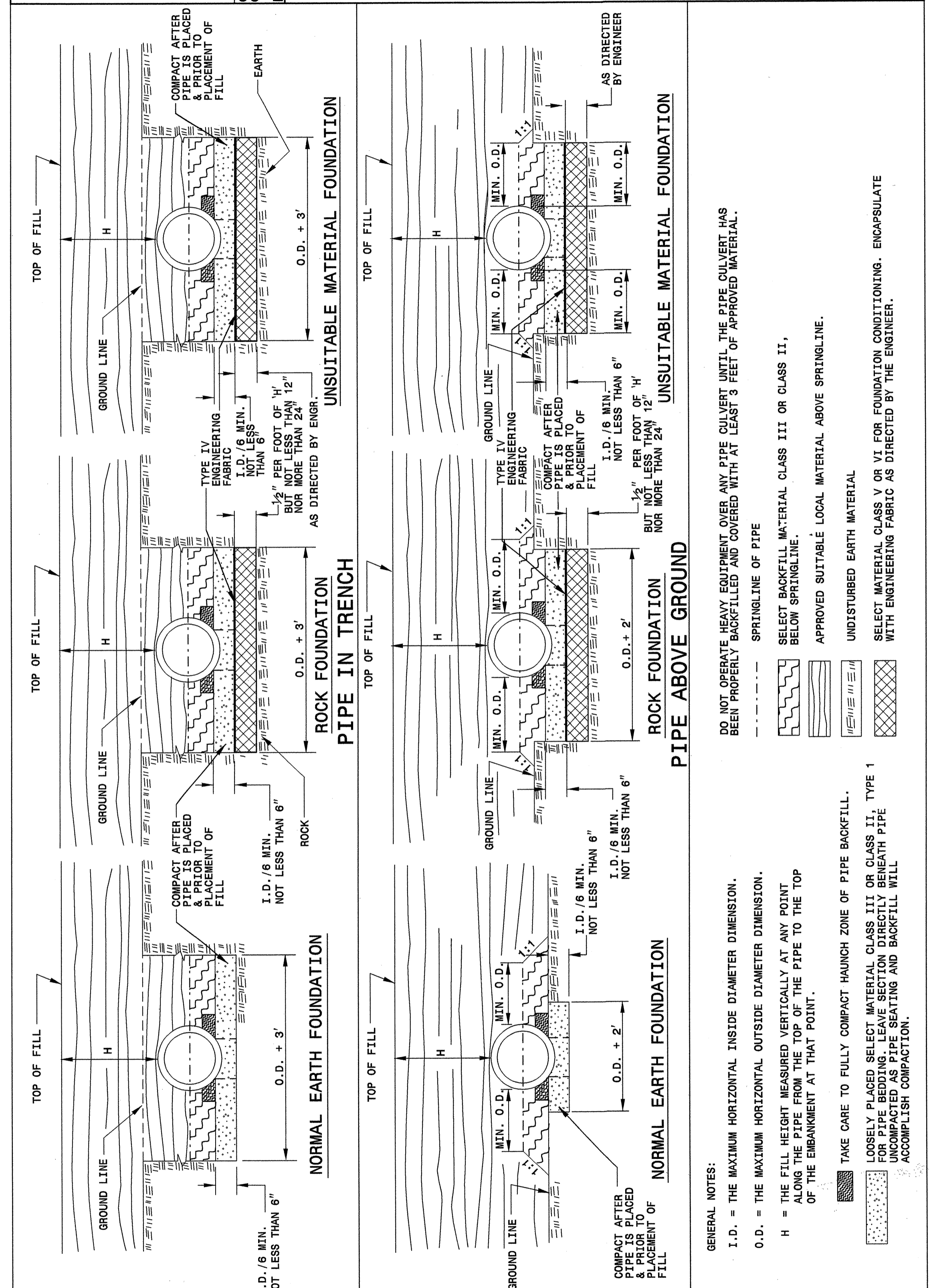
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3
300D01



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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

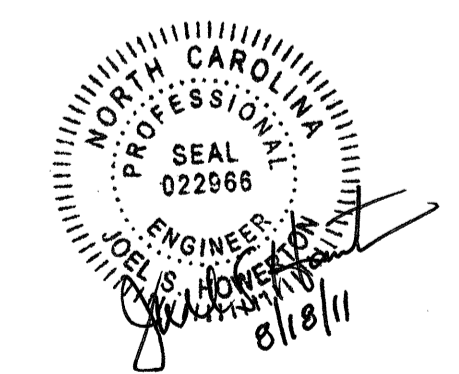
RIGID PIPE

SHEET 2 OF 3
300D01

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: 7/20/09
 FILE SPE/ericward/stds/stdstodetail/30001/0300d01.dgn



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)	Maximum cover (Ga) 16	Maximum Height of Cover (feet)
12	12	204	10 8
15	12	162	12
18	12	135	169
21	12	115	145
24	12	100	126
30	12	79	100
36	12	65	83
42	12	55	70
48	12	48	61
54	12	54	77
60	12	69	90
66	12		81
72	12		74
78	12		81
84	12		69

Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **			
Diameter (inches)	Minimum cover (inches)	Maximum cover (Ga) 16	Maximum Height of Cover (feet)
12	12	123	10 8
15	12	98	281
18	12	81	224
21	12	69	187
24	12	60	160
27	12	67	139
30	12	60	123
36	12	50	111
42	12	50	92
48	12	52	78
54	12	46	68
60	12		50
66	12		50
72	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

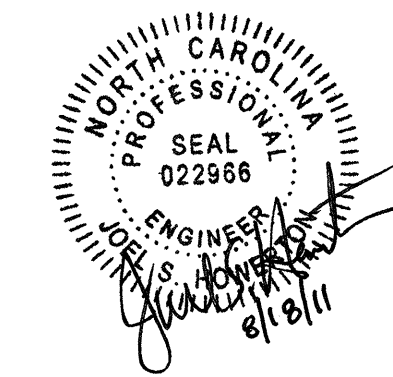
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

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: KKempf DATE: 5-15-09
 MODIFIED BY: [Signature] DATE: 7/30/09
 CHECKED BY: [Signature] DATE: 7/30/09
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STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

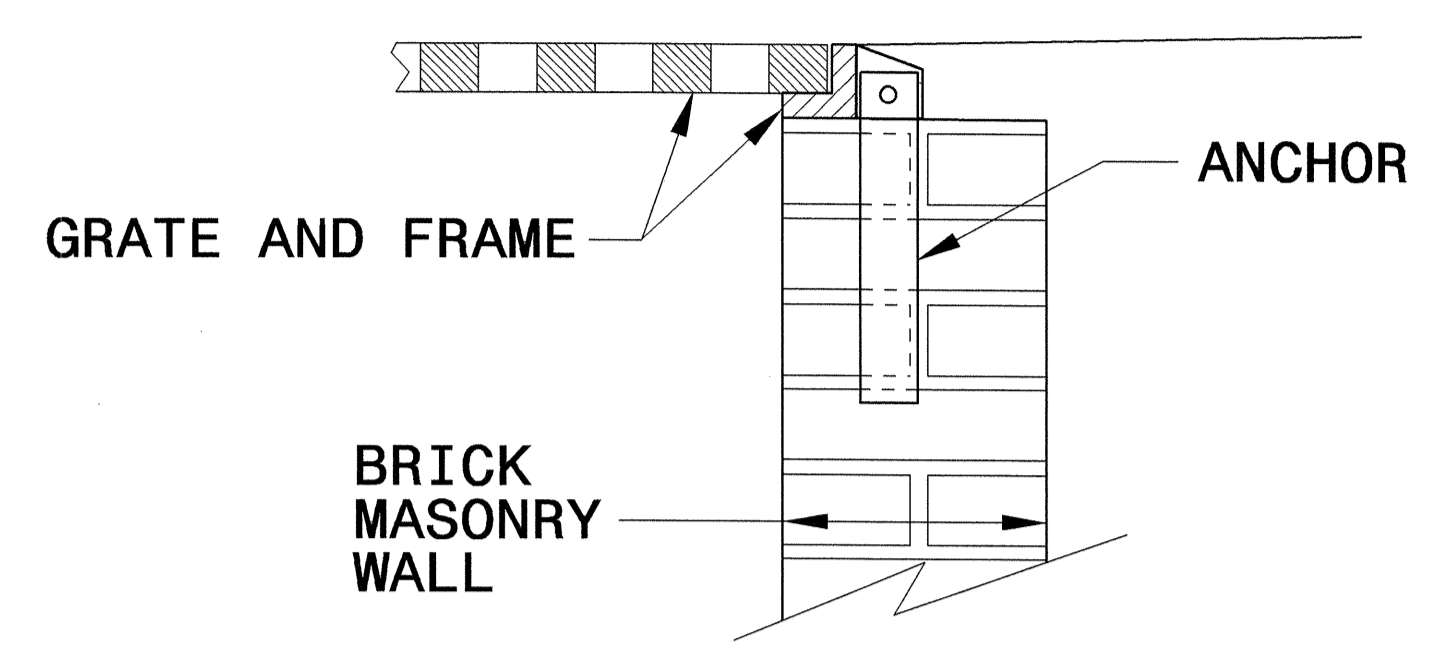
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25

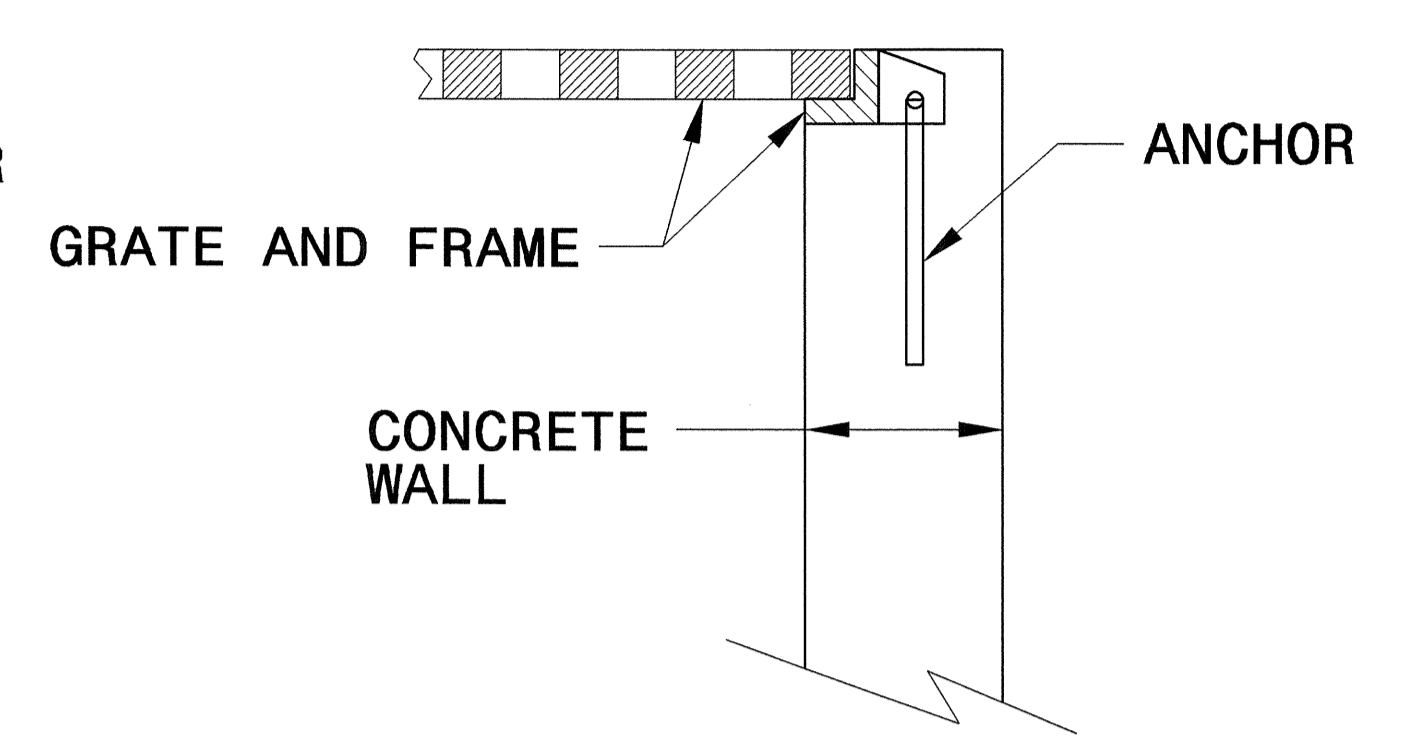
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

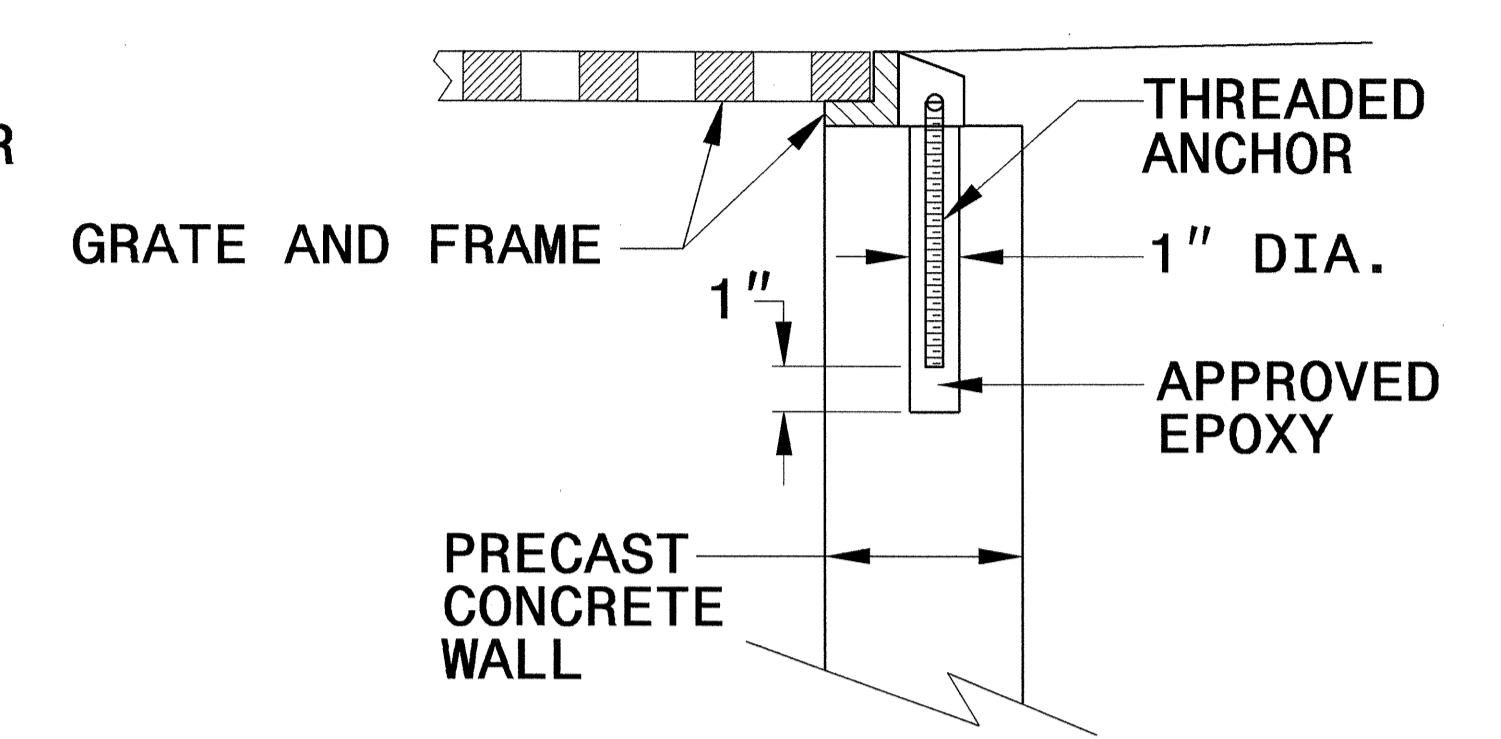
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



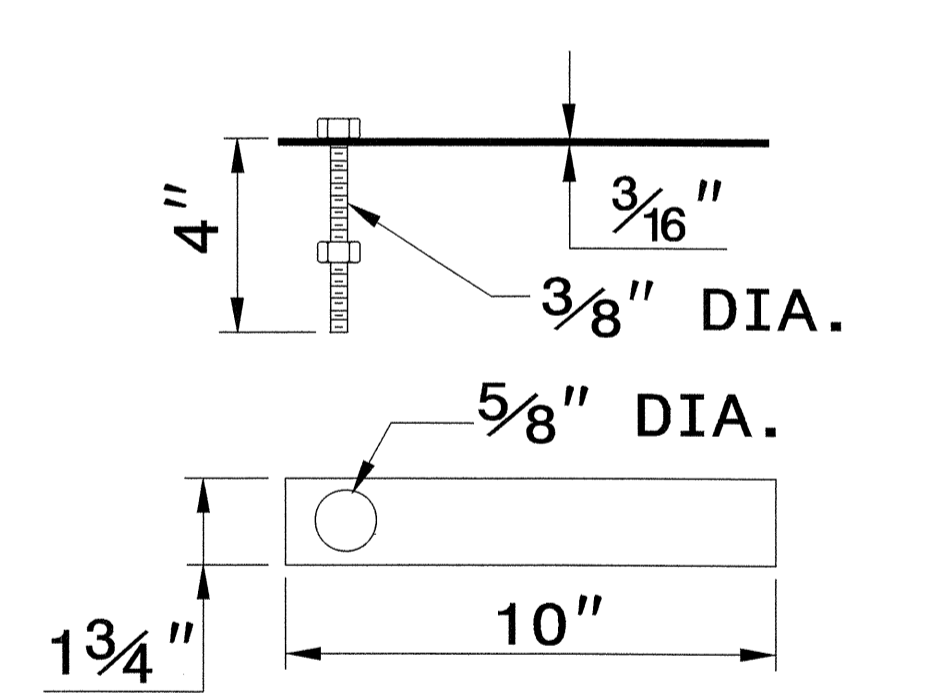
CONCRETE CONSTRUCTION



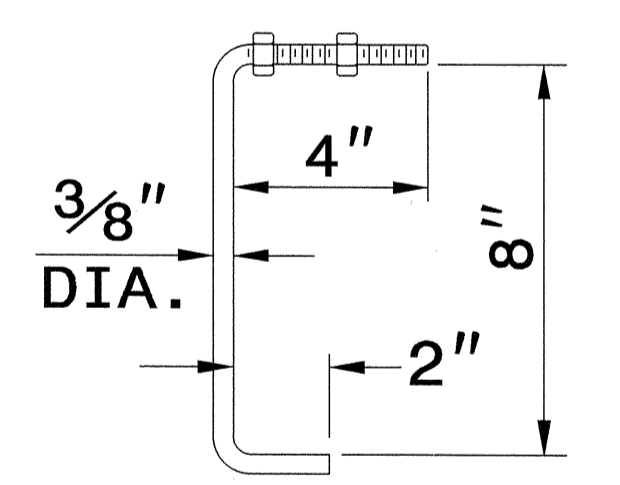
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

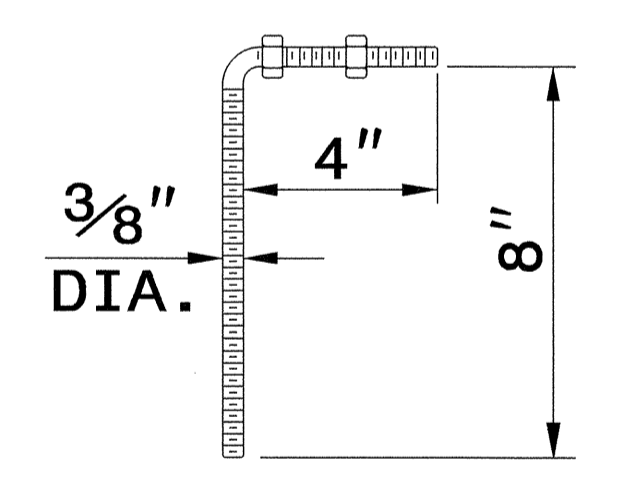
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



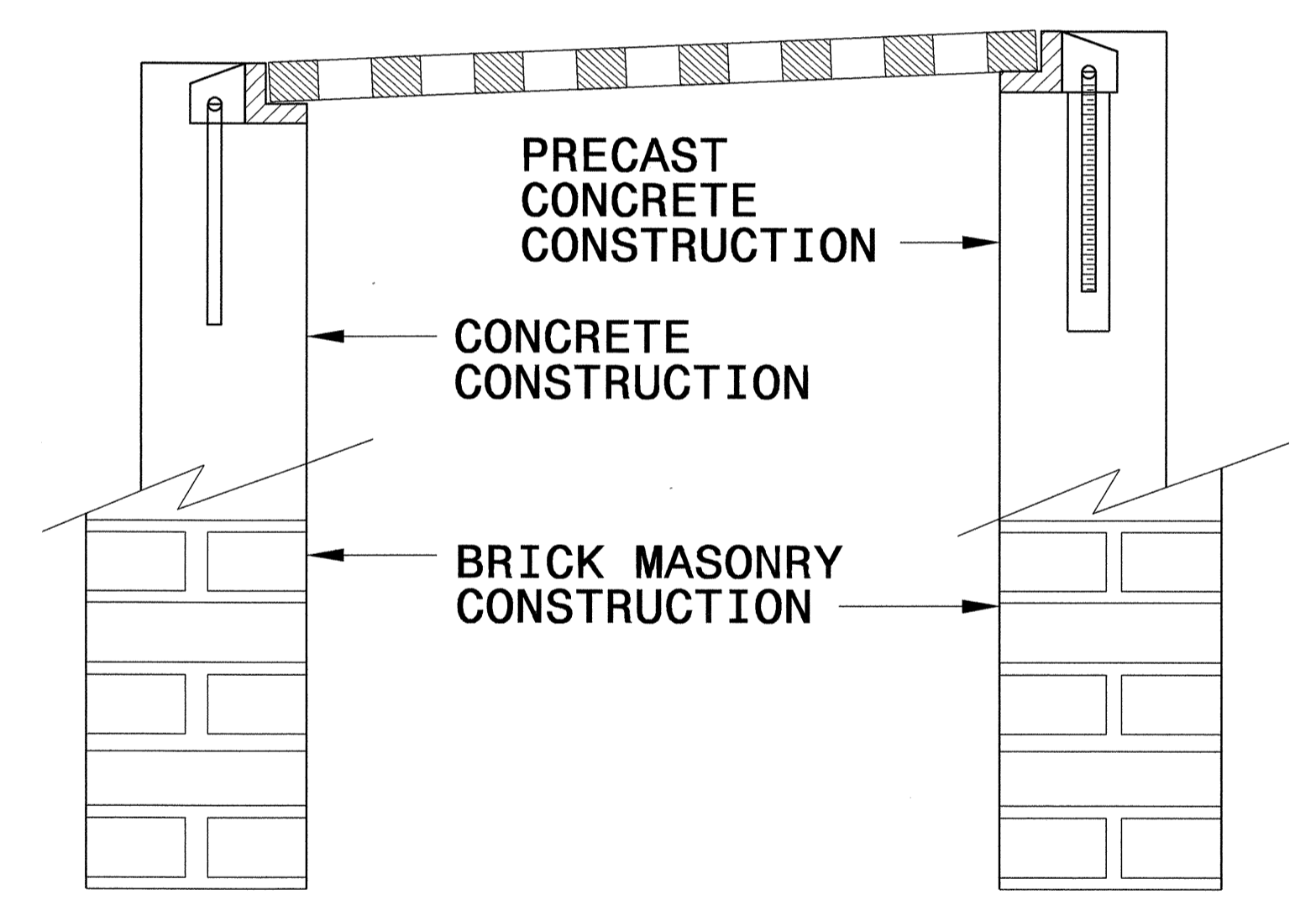
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



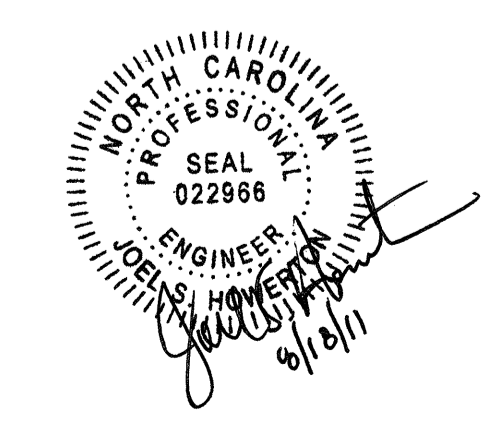
CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

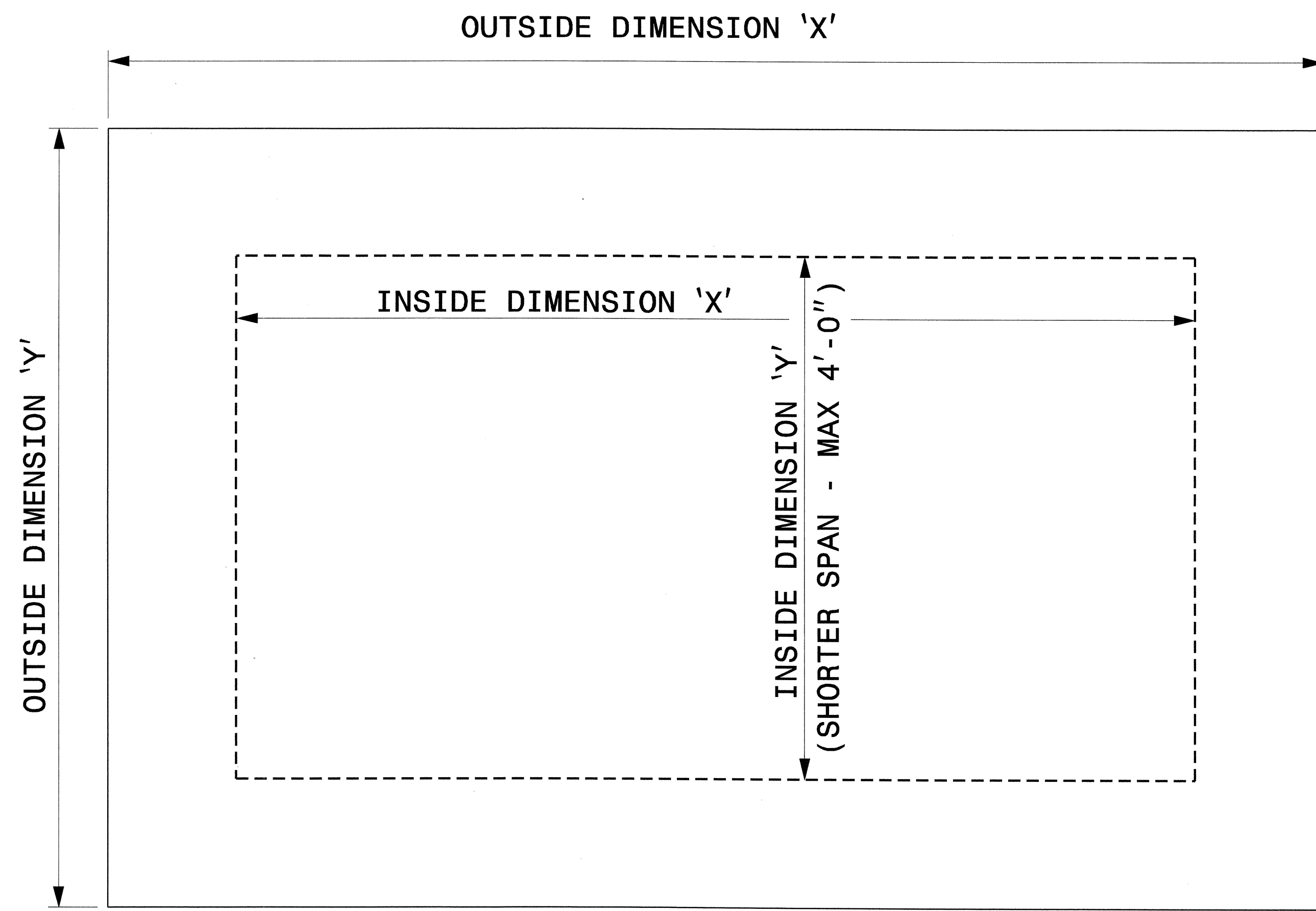


PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

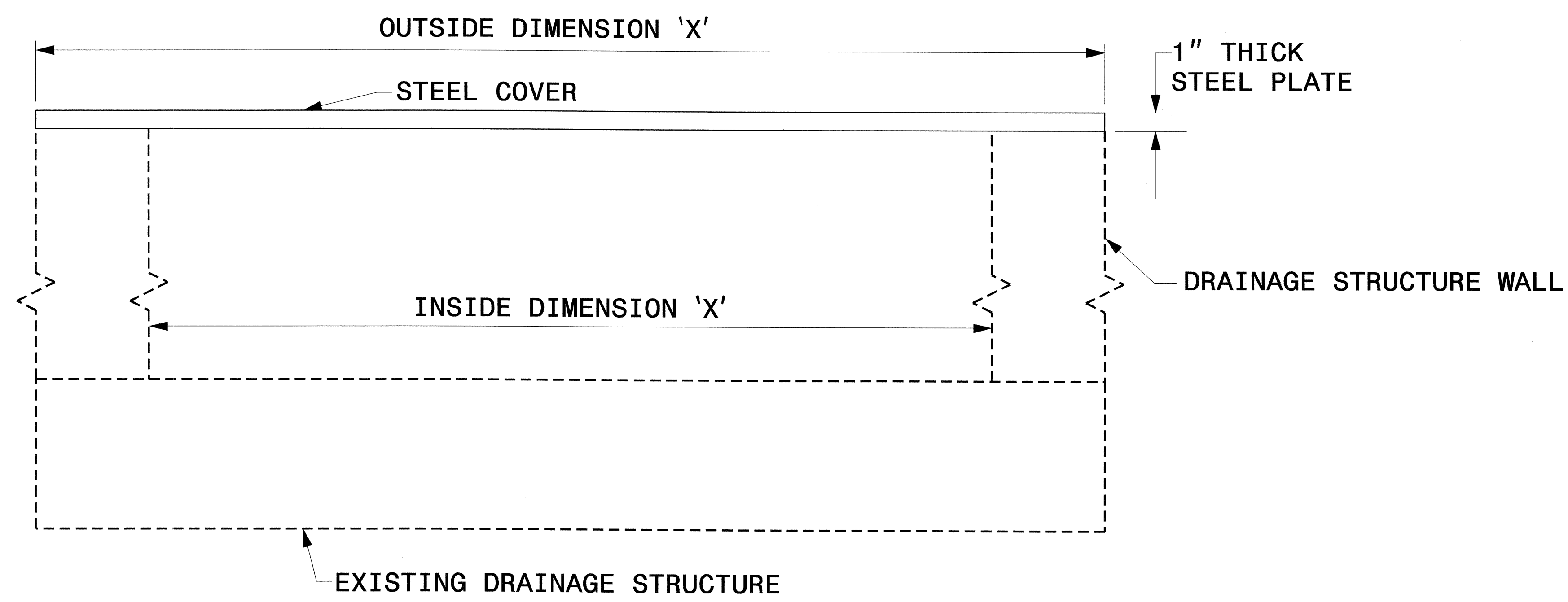
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MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE:
FILE SPEC.:

SYSTEMS
DESIGN
USER NAME



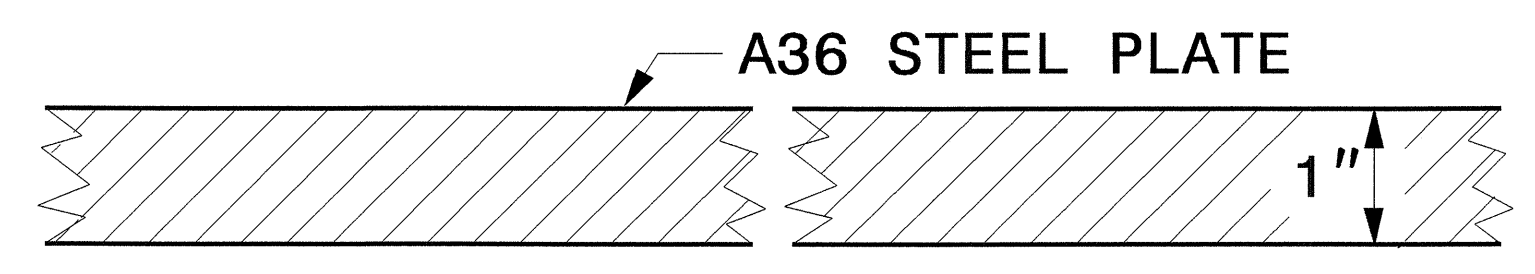
PLAN VIEWS



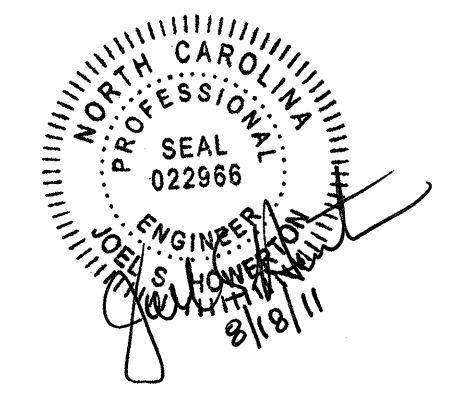
ELEVATION VIEWS

GENERAL NOTES:

- USE GRADE A36 STEEL
- STEEL COVERS ARE FOR TEMPORARY USE DURING PHASE CONSTRUCTION.
- PLACE FILL DIRECTLY OVER THE STEEL PLATES.
- SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
- QUANTITIES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



SECTION VIEW OF STEEL TOP PLATE



CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE

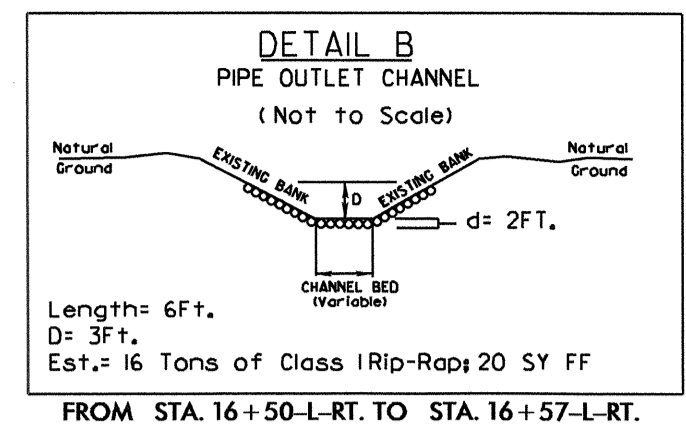
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16-AUG-2011 10:58
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 5/14/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUMMARY OF QUANTITIES

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION					
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING					
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (16+22)	4650000000-N	1251	151	EA	TEMPORARY RAISED PAVEMENT MARKERS
0043000000-N	226	Lump Sum		GRADING	4810000000-E	1205	31,686	LF	PAINT PAVEMENT MARKING LINES (4")
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB- BING	4850000000-E	1205	8,250	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
0057000000-E	226	300	CY	UNDERCUT EXCAVATION	5326200000-E	1510	870	LF	12" WATER LINE
0195000000-E	SP	300	CY	SELECT GRANULAR MATERIAL	5558000000-E	1515	2	EA	12" VALVE
0196000000-E	270	3,220	SY	FABRIC FOR SOIL STABILIZATION	5804000000-E	1530	866	LF	ABANDON 12" UTILITY PIPE
0318000000-E	SP	84	TON	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRS	5871700000-E	1550	693	LF	TRENCHLESS INSTALLATION OF 12" IN SOIL
0320000000-E	SP	190	SY	FOUNDATION CONDITIONING FABRIC	5871710000-E	1550	77	LF	TRENCHLESS INSTALLATION OF 12" NOT IN SOIL
0335200000-E	SP	40	LF	15" DRAINAGE PIPE	6000000000-E	1605	2,875	LF	TEMPORARY SILT FENCE
0335300000-E	SP	52	LF	18" DRAINAGE PIPE	6006000000-E	1610	360	TON	STONE FOR EROSION CONTROL, CLASS A
0335400000-E	SP	160	LF	24" DRAINAGE PIPE	6009000000-E	1610	275	TON	STONE FOR EROSION CONTROL, CLASS B
0335600000-E	SP	316	LF	36" DRAINAGE PIPE	6012000000-E	1610	300	TON	SEDIMENT CONTROL STONE
0335850000-E	SP	2	EA	*** DRAINAGE PIPE ELBOWS (15")	6015000000-E	1615	3	ACR	TEMPORARY MULCHING
0995000000-E	340	189	LF	PIPE REMOVAL	6018000000-E	1620	150	LB	SEED FOR TEMPORARY SEEDING
1110000000-E	510	400	TON	STABILIZER AGGREGATE	6021000000-E	1620	0.5	TON	FERTILIZER FOR TEMPORARY SEED- ING
1121000000-E	520	939	TON	AGGREGATE BASE COURSE	6024000000-E	1622	365	LF	TEMPORARY SLOPE DRAINS
1220000000-E	545	100	TON	INCIDENTAL STONE BASE	6027000000-N	1622	11	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
1275000000-E	600	683.2	GAL	PRIME COAT	6029000000-E	SP	200	LF	SAFETY FENCE
1489000000-E	610	440	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	6030000000-E	1630	460	CY	SILT EXCAVATION
1519000000-E	610	820	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	6036000000-E	1631	2,300	SY	MATting FOR EROSION CONTROL
1575000000-E	SP	70	TON	ASPHALT BINDER FOR PLANT MIX	6037000000-E	SP	10	SY	COIR FIBER MAT
2022000000-E	SP	22.4	CY	SUBDRAIN EXCAVATION	6042000000-E	1632	755	LF	1/4" HARDWARE CLOTH
2033000000-E	SP	16.8	CY	SUBDRAIN FINE AGGREGATE	6048000000-E	SP	200	SY	FLOATING TURBIDITY CURTAIN
2044000000-E	SP	100	LF	6" PERFORATED SUBDRAIN PIPE	6071012000-E	SP	150	LF	COIR FIBER WATTLE
2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS	6071020000-E	SP	40	LB	POLYACRYLAMIDE (PAM)
2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)					
2190000000-N	828	1	EA	TEMPORARY STEEL PLATE COVERS FOR MASONRY DRAINAGE STRUCTURE	6071030000-E	SP	115	LF	COIR FIBER BAFFLE
2286000000-N	840	5	EA	MASONRY DRAINAGE STRUCTURES	6084000000-E	1660	3	ACR	SEEDING & MULCHING
2308000000-E	840	2.02	LF	MASONRY DRAINAGE STRUCTURES	6087000000-E	1660	3	ACR	MOWING
2366000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.24	6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29	6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
2556000000-E	846	126	LF	SHOULDER BERM GUTTER	6096000000-E	1662	100	LB	SEED FOR SUPPLEMENTAL SEEDING
3030000000-E	862	600	LF	STEEL BM GUARDRAIL	6108000000-E	1665	3	TON	FERTILIZER TOPDRESSING
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
3317000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77	6123000000-E	1670	0.75	ACR	REFORESTATION
3380000000-E	862	325	LF	TEMPORARY STEEL BM GUARDRAIL					
3387000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (B-77)					
3389100000-N	SP	5	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY					
3628000000-E	876	60	TON	RIP RAP, CLASS I					
3656000000-E	876	520	SY	FILTER FABRIC FOR DRAINAGE					
3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON					
4400000000-E	1110	224	SF	WORK ZONE SIGNS (STATIONARY)					
4405000000-E	1110	96	SF	WORK ZONE SIGNS (PORTABLE)					
4410000000-E	1110	42	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)					
4430000000-N	1130	30	EA	DRUMS					
4445000000-E	1145	48	LF	BARRICADES (TYPE III)					
4455000000-N	1150	42	MD	FLAGGER					

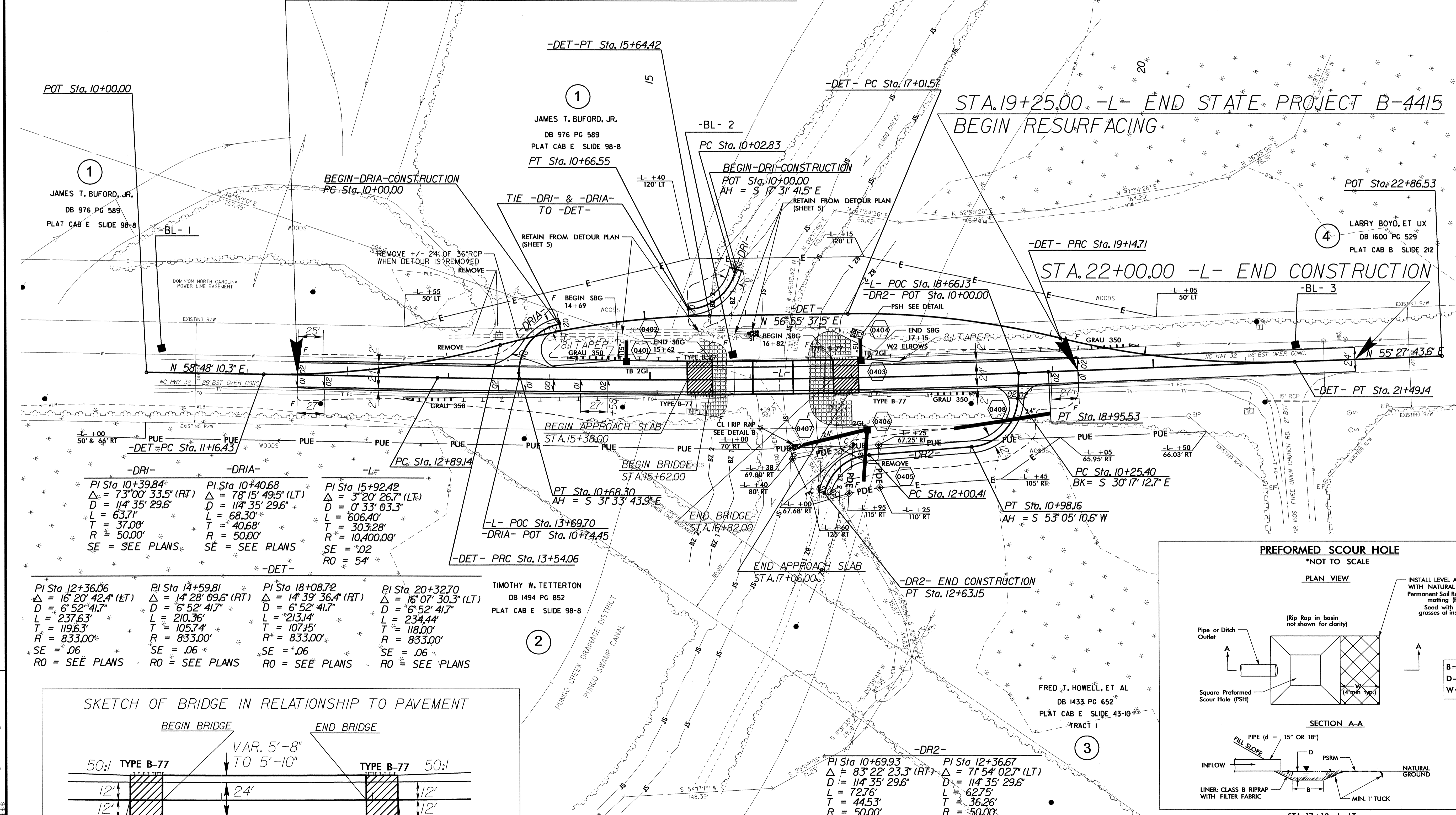
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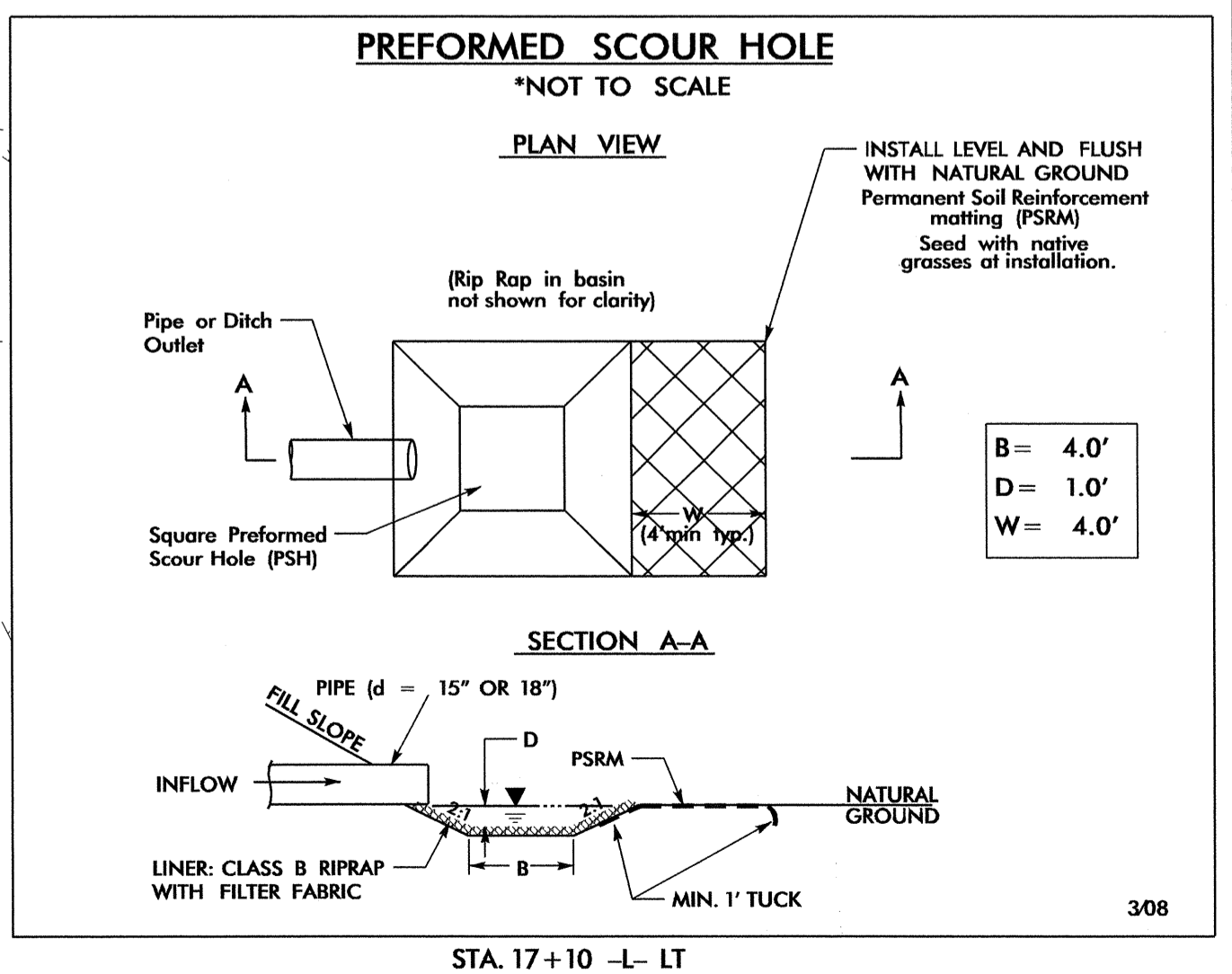
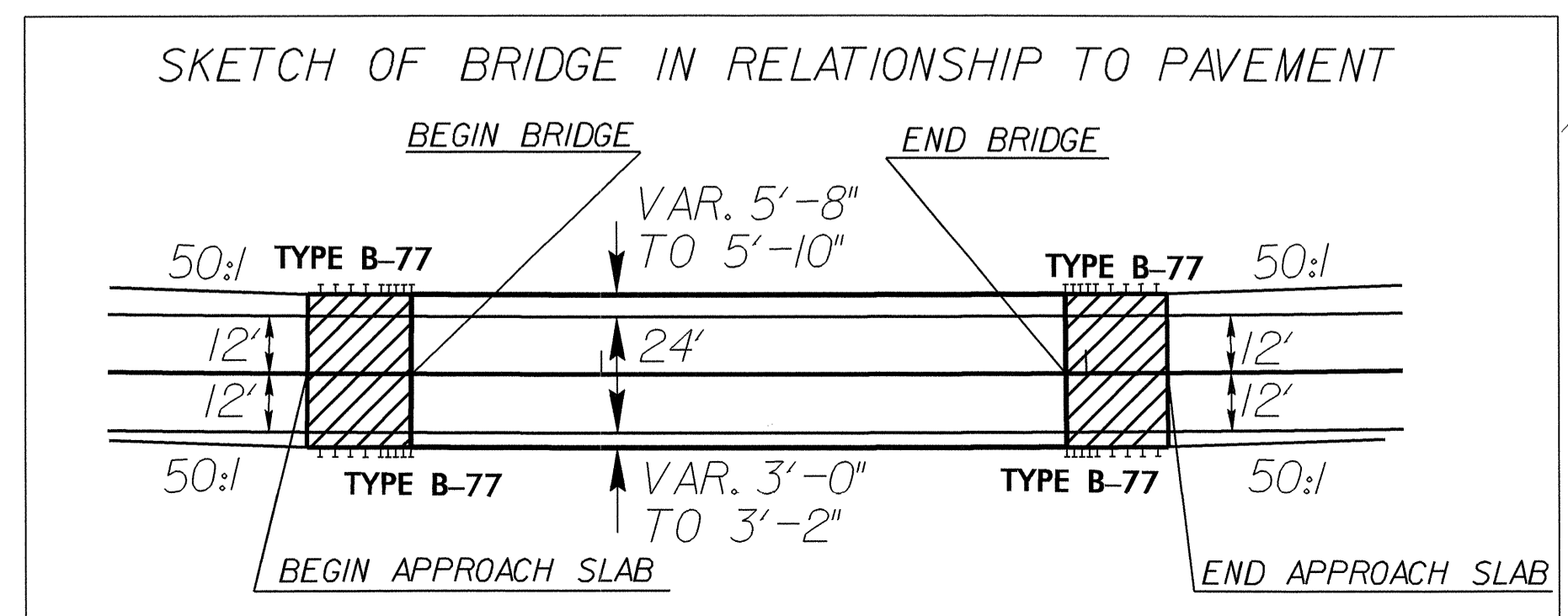
STA. 11+50.00 -L- BEGIN STATE PROJECT B-4415

STA. 19+25.00 -L- END STATE PROJECT B-4415
BEGIN RESURFACING

STA. 22+00.00 -L- END CONSTRUCTION



-DRI-		-DRIA-		-DET-	
PI Sta 10+39.84	PI Sta 10+40.68	PI Sta 15+92.42	PI Sta 20+32.70	PI Sta 10+69.93	PI Sta 12+36.67
$\Delta = 16' 20' 42.4''$ (RT)	$\Delta = 7' 3' 00' 33.5''$ (RT)	$\Delta = 14' 28' 09.6''$ (RT)	$\Delta = 14' 39' 36.4''$ (RT)	$\Delta = 83' 22' 23.3''$ (RT)	$\Delta = 71' 54' 02.7''$ (LT)
D = 6' 52' 41.7"	D = 11' 35' 29.6"	D = 6' 52' 41.7"	D = 6' 52' 41.7"	D = 11' 35' 29.6"	D = 11' 35' 29.6"
L = 237.63'	L = 63.71'	L = 210.36'	L = 234.44'	L = 72.76'	L = 62.75'
T = 119.63'	T = 37.00'	T = 105.74'	T = 107.15'	T = 44.53'	T = 36.26'
R = 833.00'	R = 50.00'	R = 833.00'	R = 833.00'	R = 50.00'	R = 50.00'
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RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS



FOR -L- PROFILE SEE SHEET 6
FOR -DRI-, -DRIA- & -DR2- PROFILE SEE SHEET 7
FOR -DET- PLAN VIEW SEE SHEET 5
FOR STRUCTURES SEE SHEET S10 S24

REVISIONS

8/17/09

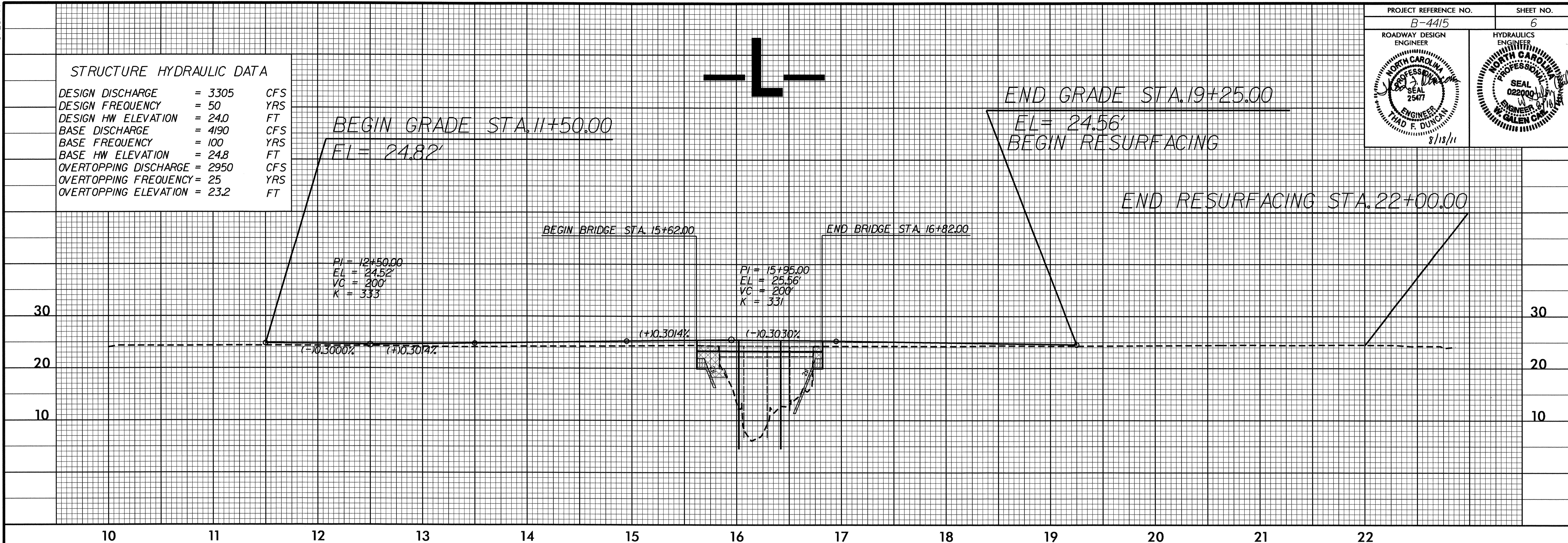
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5/28/11

PROJECT REFERENCE NO. B-4415	SHEET NO. 6
ROADWAY DESIGN ENGINEER THAD F. DUNNAN 8/18/11	HYDRAULICS ENGINEER W. GALEN CAMPBELL

STRUCTURE HYDRAULIC DATA

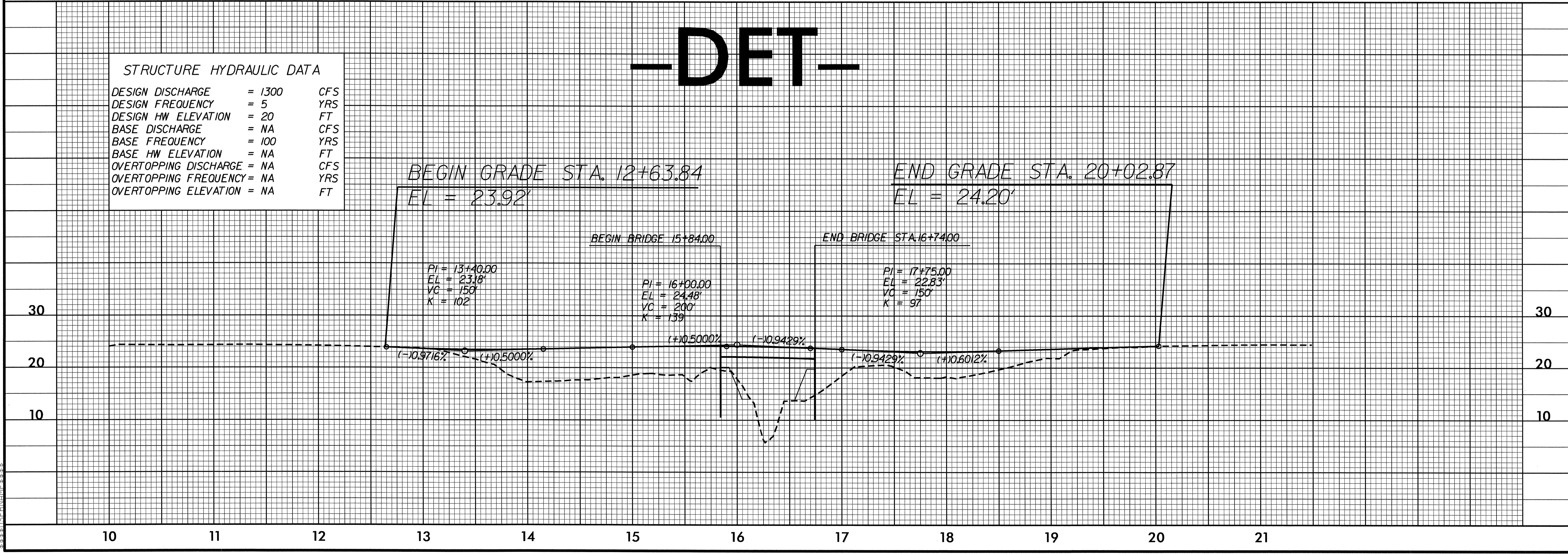
DESIGN DISCHARGE	= 3305	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 24.0	FT
BASE DISCHARGE	= 490	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 24.8	FT
OVERTOPPING DISCHARGE	= 2950	CFS
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING ELEVATION	= 23.2	FT



-DET-

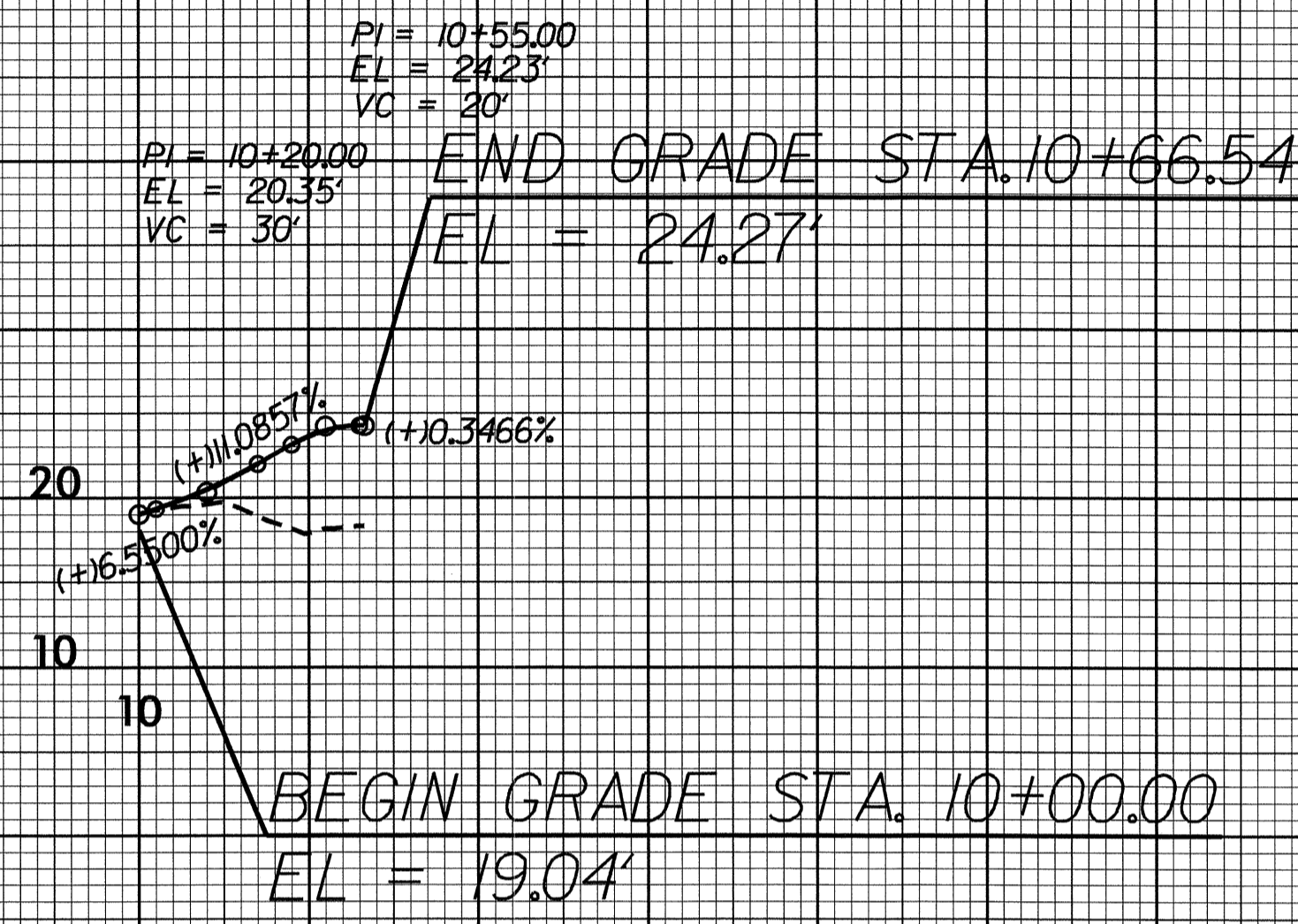
STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 1300	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 20	FT
BASE DISCHARGE	= NA	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= NA	FT
OVERTOPPING DISCHARGE	= NA	CFS
OVERTOPPING FREQUENCY	= NA	YRS
OVERTOPPING ELEVATION	= NA	FT

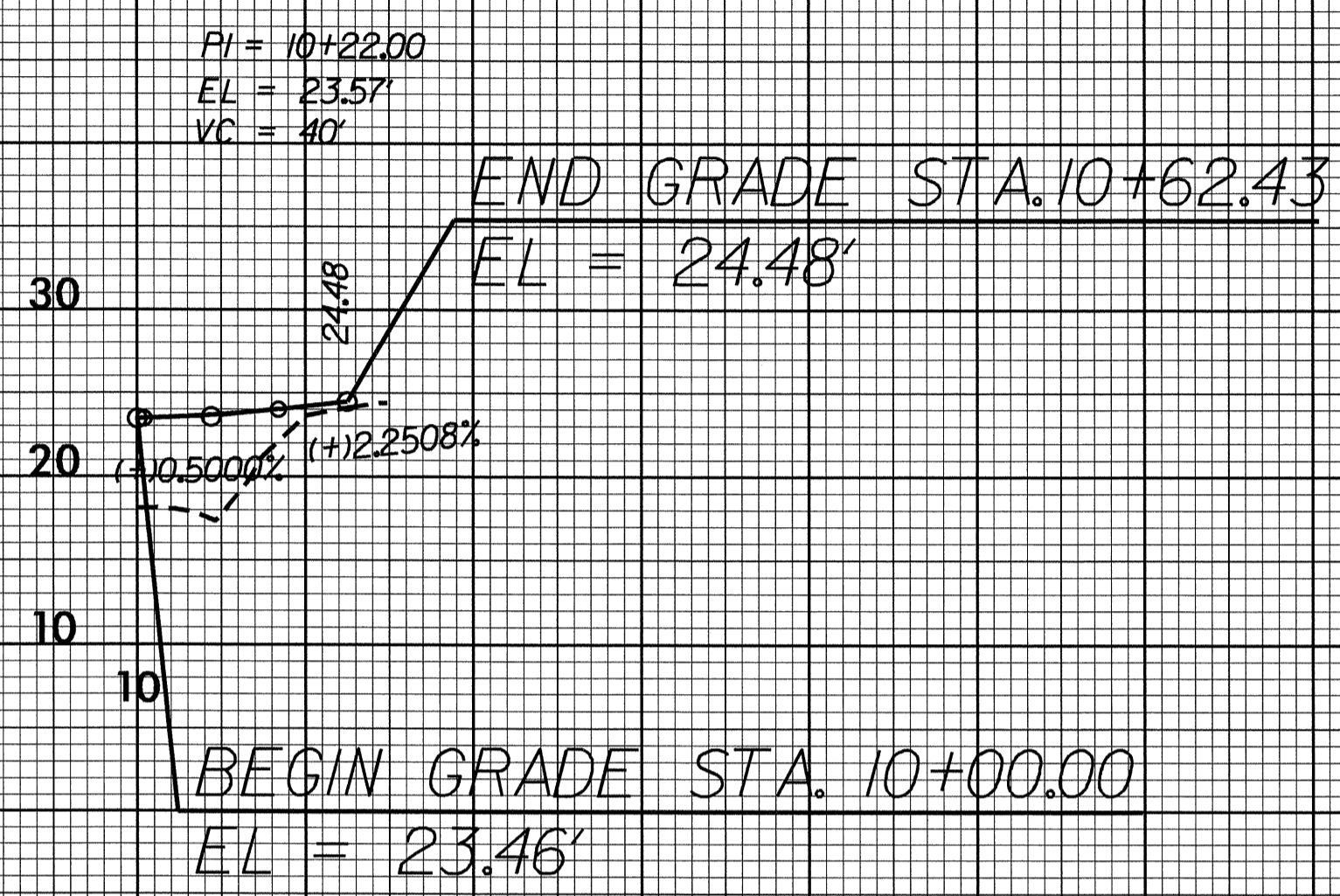


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-DR1-



-DR1A-



-DR2-

