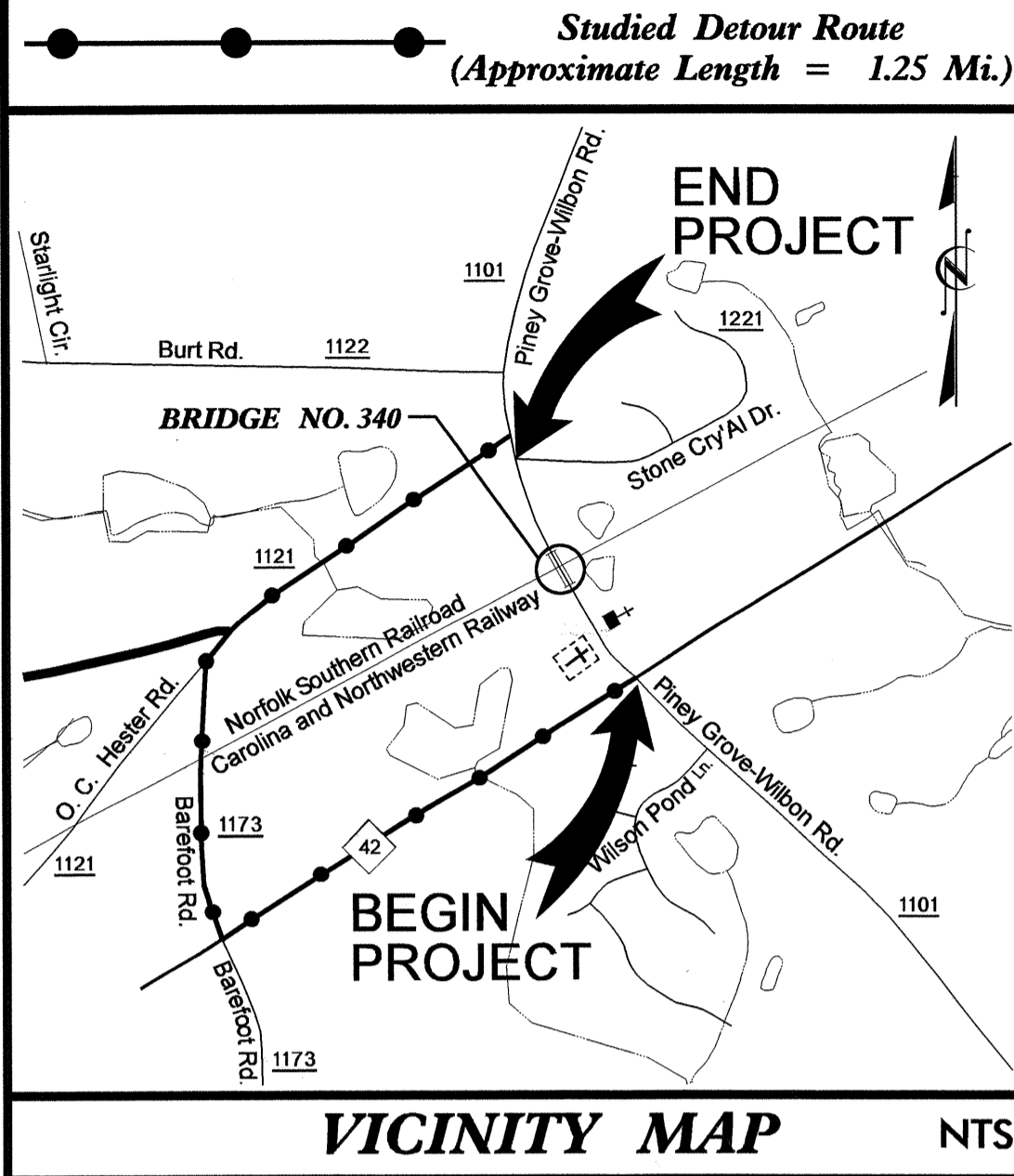


SEE 1-A FOR INDEX OF SHEETS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

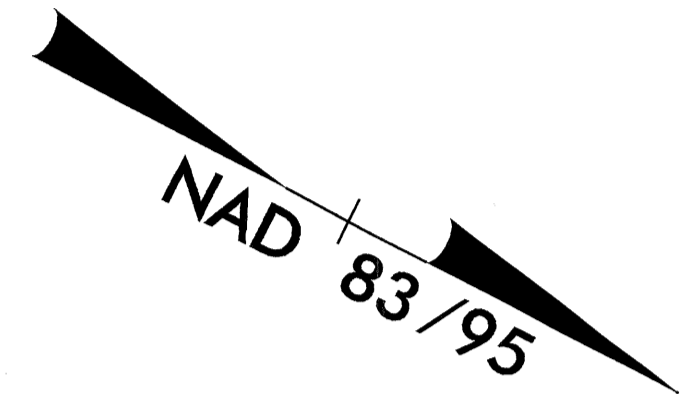
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4657	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33820.1.1	BRSTP-1101(9)	PE	
33820.2.1	BRSTP-1101(9)	ROW&UTILITIES	
33820.3.1	BRSTP-1101(9)	CONST.	

LEGEND

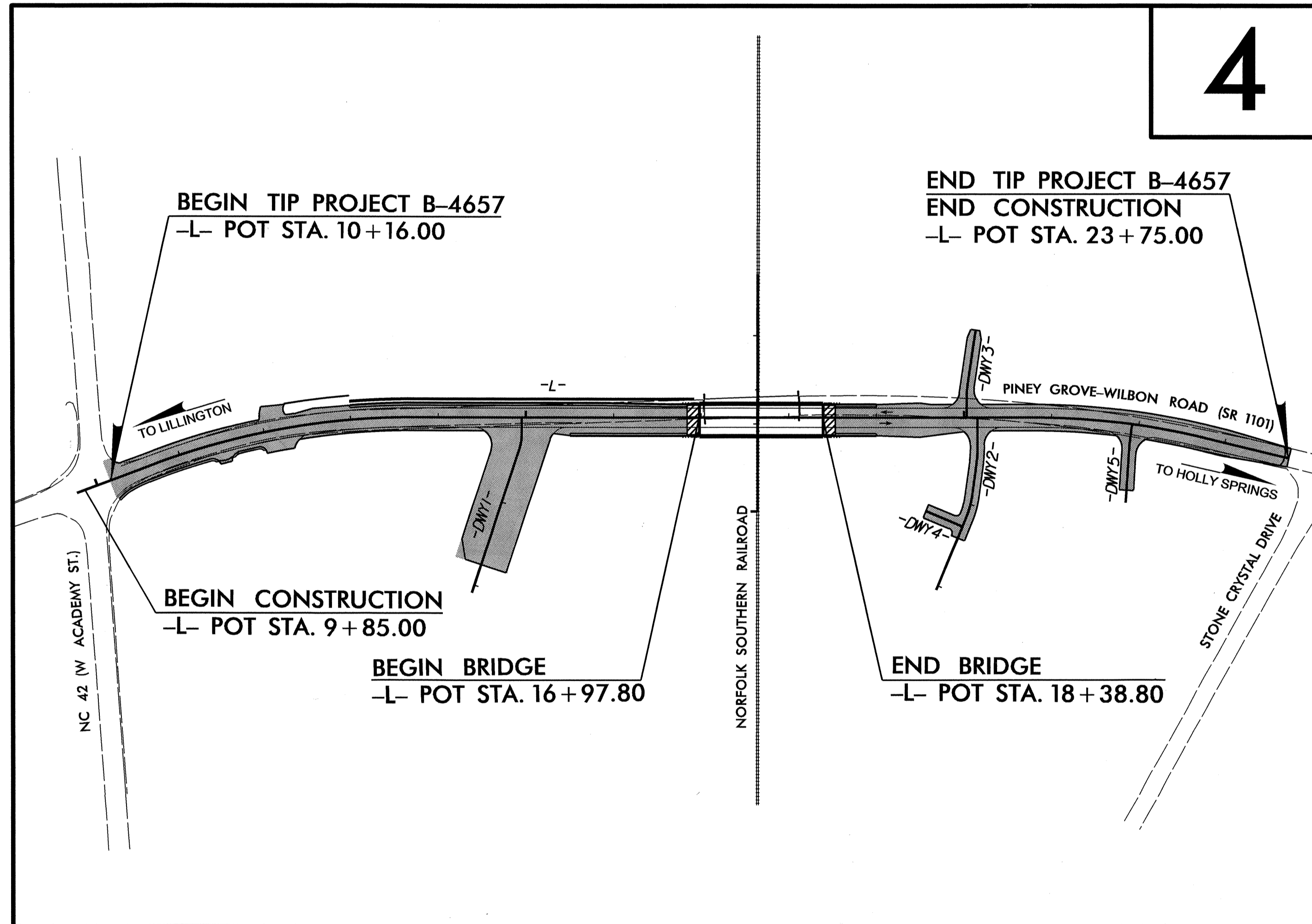


WAKE COUNTY

**LOCATION: BRIDGE NO. 340 OVER NORFOLK/SOUTHERN RAILROAD
ON SR 1101 (PINEY GROVE-WILBON ROAD)**
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS, AND STRUCTURES



100% PLANS



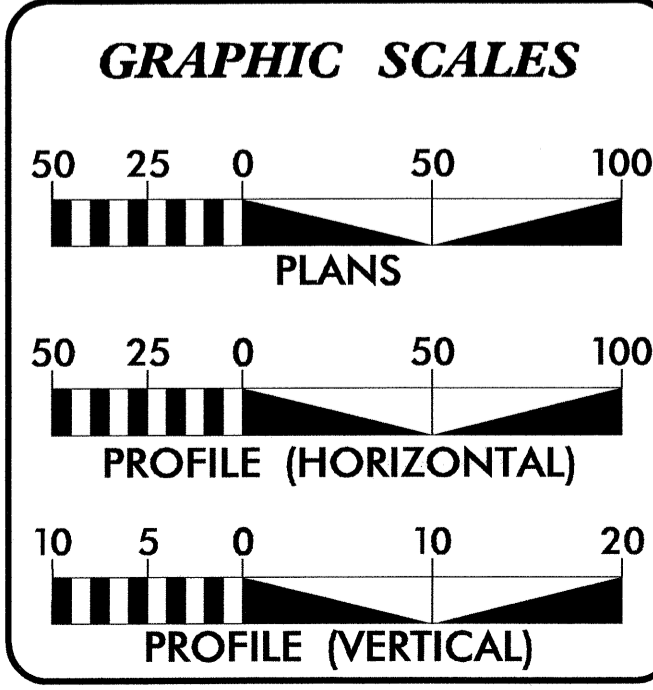
TIP PROJECT: B-4657

CONTRACT: C202733

REVISIONS

08-AUG-2011 12:27
R:\Roadway\Proj\B4657_rdy_tsh.dgn
\$TIME\$

NCDOT CONTACT: K. ZAK HAMIDI, PE ROADWAY DESIGN PROJECT ENGINEER



DESIGN DATA

ADT 2011 =	6,818
ADT 2031 =	11,364
DHV =	10 %
D =	60 %
T =	7% *
V =	50 MPH
* TTST	3% DUAL 4%
Functional Class.:	Rural Minor Collector
SUB REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY PROJECT B-4657	=	0.230 MILES
LENGTH STRUCTURES PROJECT B-4657	=	0.027 MILES
TOTAL LENGTH PROJECT B-4657	=	0.257 MILES

Prepared in the Office of:
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
October 16, 2009

LETTING DATE:
January 17, 2012

DEAN HATFIELD, PE
PROJECT ENGINEER

WILLIAM TILLITT, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Dean Hatfield
SIGNATURE

ROADWAY DESIGN ENGINEER

Dean Hatfield
SIGNATURE

SEAL 16003
NORTH CAROLINA PROFESSIONAL ENGINEER
DEAN D. HATFIELD
P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

Art McMiller
P.E.
STATE HIGHWAY DESIGN ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = *Subsurface Utility Engineering*

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	⑫
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: Area or Site	☠ ☠
Potential Soil Contamination: Area or Site	☠ ☠

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
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	▬
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	-----
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	-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:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-C-
Proposed Slope Stakes Fill	-F-
Proposed Curb Ramp	○ CR
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	○
Storm Sewer	-S-

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	-P-
Designated U/G Power Line (S.U.E.*)	-P-

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	-T-
Designated U/G Telephone Cable (S.U.E.*)	-T-
Recorded U/G Telephone Conduit	-TC-
Designated U/G Telephone Conduit (S.U.E.*)	-TC-
Recorded U/G Fiber Optics Cable	-T FO-
Designated U/G Fiber Optics Cable (S.U.E.*)	-T FO-

WATER:

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

TV:

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

GAS:

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

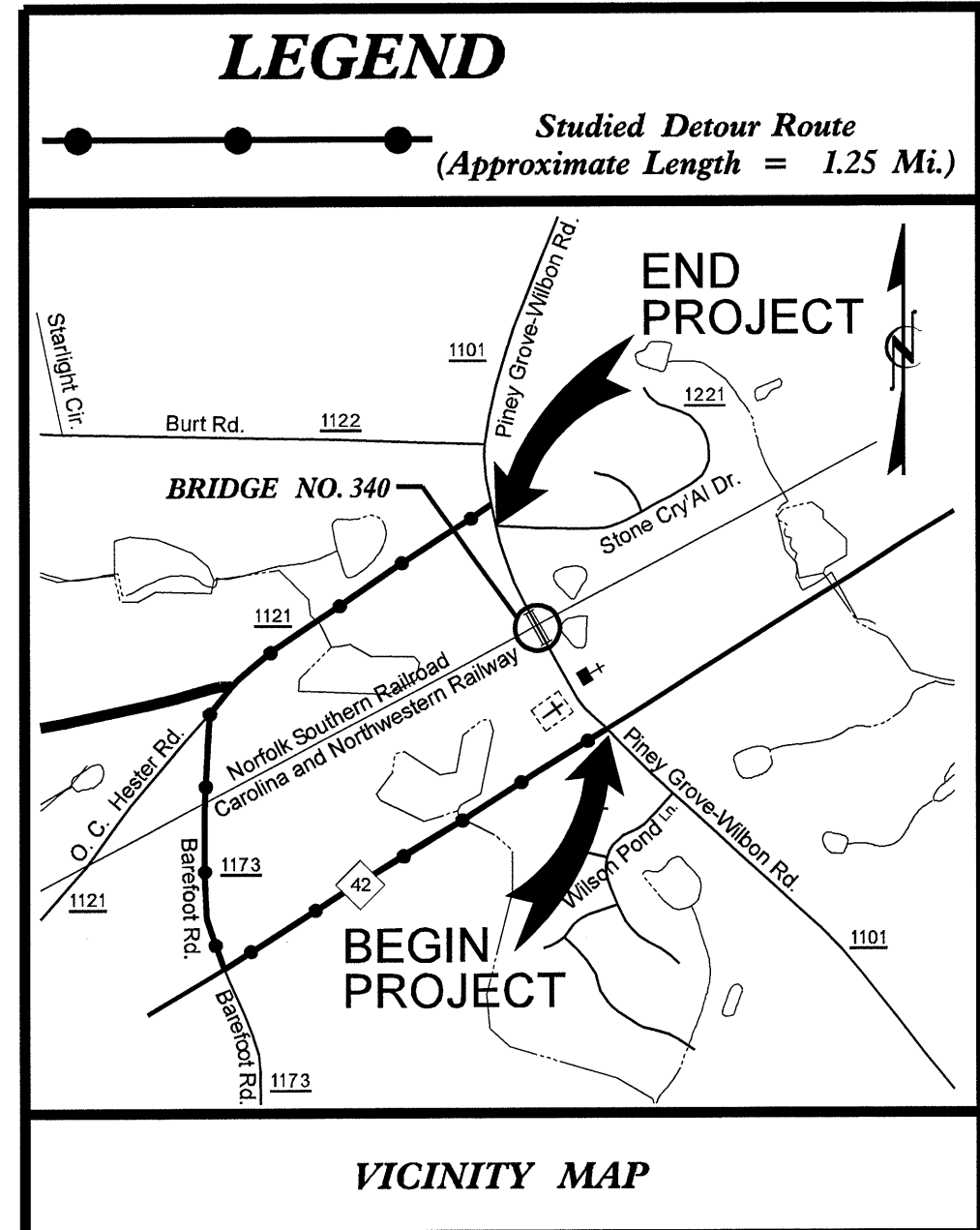
SANITARY SEWER:

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

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	-?U/L-
U/G Tank; Water, Gas, Oil	▭
Underground Storage Tank, Approx. Loc.	⊕
A/G 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.

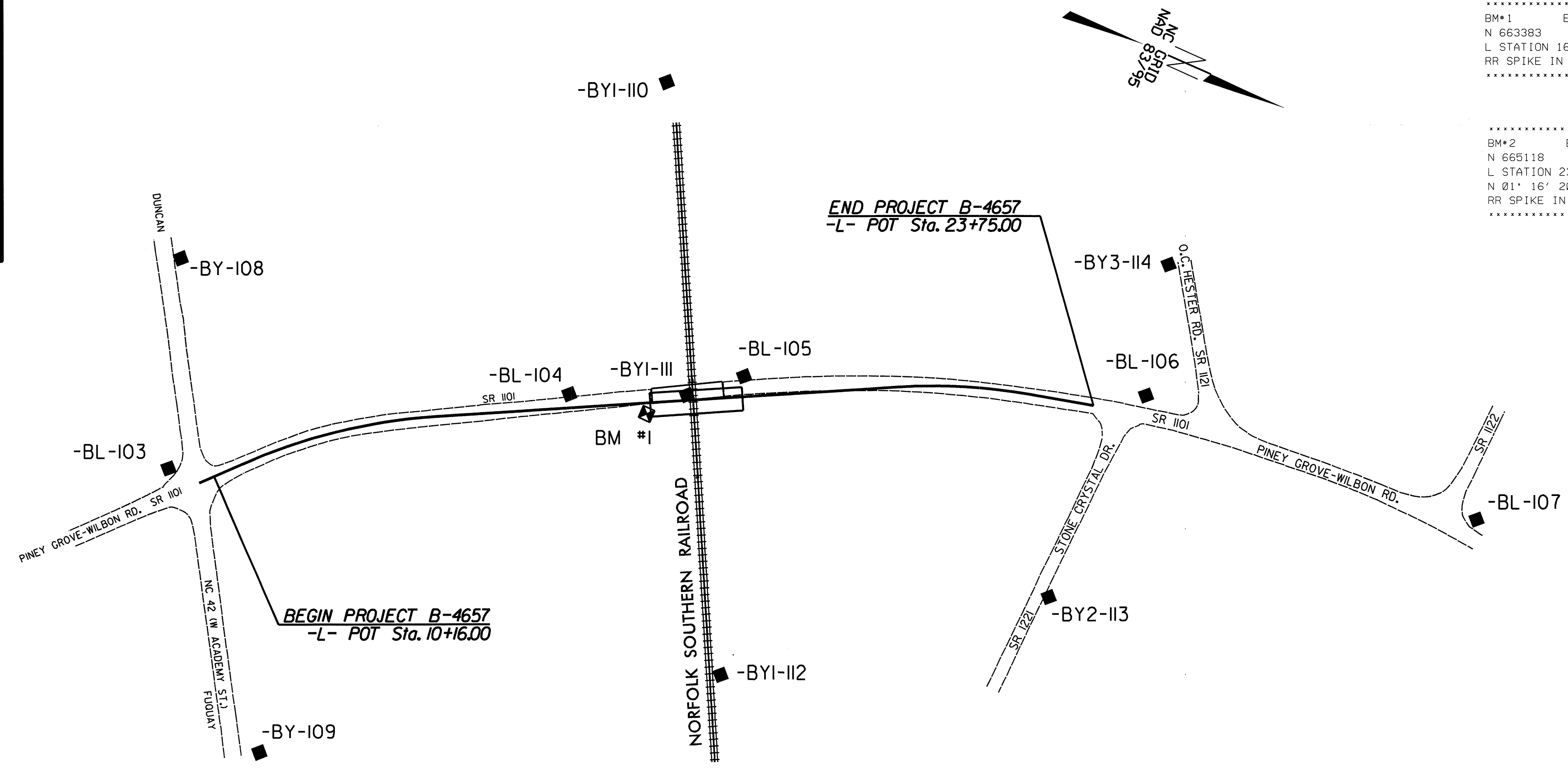
B-4657



SURVEY CONTROL SHEET B-4657

WAKE COUNTY

**LOCATION: BRIDGE NO. 340 OVER NORFOLK/SOUTHERN RAILROAD
ON SR 1101 (PINEY GROVE-WILBON ROAD)**



.....
 BM#1 ELEVATION = 463.46
 N 663383 E 2046516
 L STATION 16+93.16 RIGHT
 RR SPIKE IN 14' ELM

.....
 BM#2 ELEVATION = 479.80
 N 665118 E 2046249
 L STATION 23+84
 N 01' 16" 20' E DIST 1114
 RR SPIKE IN 18' PINE

NCDOT GPS STATION B4657-2
 LOCALIZED PROJECT COORDINATES:
 N = 665,209.267
 E = 2,046,346.114

NCDOT GPS STATION B4657-1
 LOCALIZED PROJECT COORDINATES:
 N = 666,964.171
 E = 2,047,076.811

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
102	B4657 BL-102	662504.2400	2047269.5730	448.21	OUTSIDE PROJECT LIMITS	
103	B4657 BL-103	662755.6370	2046886.7370	446.38	OUTSIDE PROJECT LIMITS	
104	B4657 BL-104	663264.0480	2046536.5110	463.00	15+78.63	20.98 LT
105	B4657 BL-105	663494.2360	2046483.2020	470.37	18+44.43	31.44 LT
106	B4657 BL-106	664061.5320	2046179.5200	473.02	OUTSIDE PROJECT LIMITS	
107	B4657 BL-107	664594.8210	2046143.6570	476.59	OUTSIDE PROJECT LIMITS	

BY POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
108	B4657 BY-108	662642.7420	2046590.1160	447.93	11+00.74	322.70 LT
A103	B4657 BY-109	662755.6370	2046886.7370	446.47	OUTSIDE PROJECT LIMITS	
109	B4657 BY-109	663092.6860	2047299.8470	434.90	OUTSIDE PROJECT LIMITS	

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
110	B4657 BY1-110	663204.6810	2046044.9550	449.50	17+55.55	483.42 LT
111	B4657 BY1-111	663426.8020	2046464.7110	445.12	17+56.08	8.52 LT
112	B4657 BY1-112	663642.5590	2046831.2500	439.60	17+75.82	416.35 RT

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
A106	B4657 BY2-113	664061.5320	2046179.5200	UNKNOWN	OUTSIDE PROJECT LIMITS	
113	B4657 BY2-113	664051.9950	2046517.0930	467.01	23+57.54	295.68 RT

BY3 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
114	B4657 BY3-114	664011.4080	2045984.9860	470.31	OUTSIDE PROJECT LIMITS	
B106	B4657 BY3-114	664061.5320	2046179.5200	UNKNOWN	OUTSIDE PROJECT LIMITS	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4657-2"
 WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
 NORTHING: 665209.267(ft) EASTING: 2046346.114(ft)
 ELEVATION: 473.95(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987120
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4657-2" TO -L- STATION 10+25.00 IS
 S 12°23'11.5" E 2441.84
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

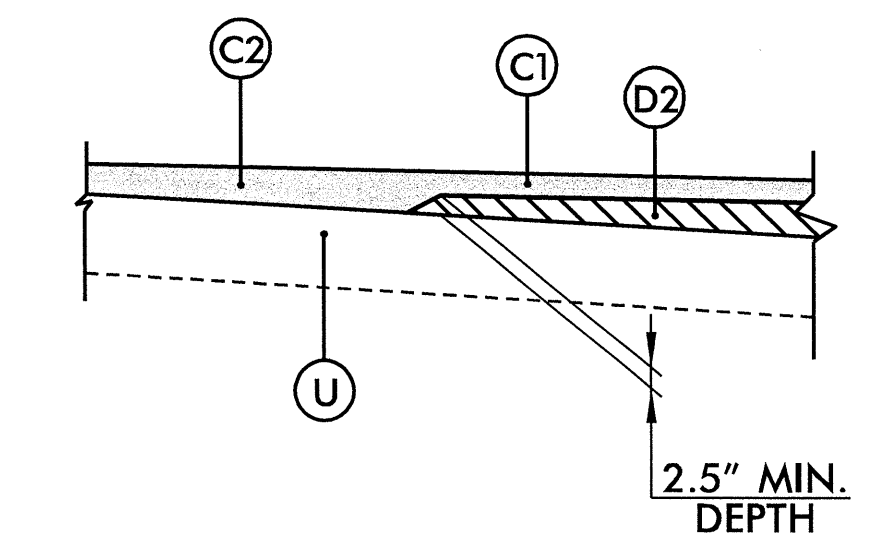
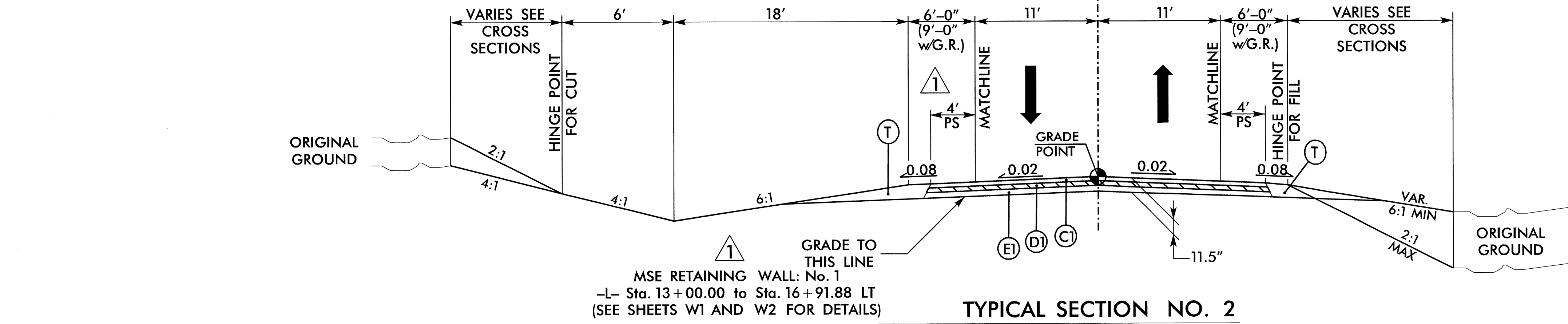
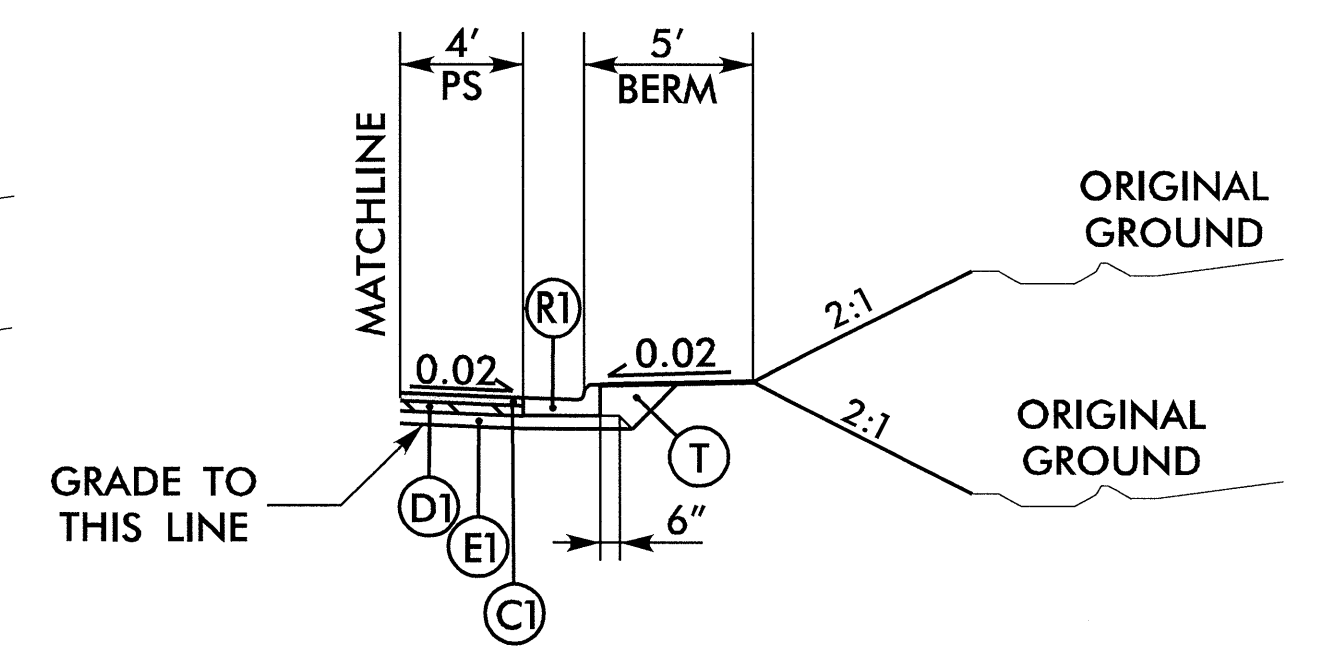
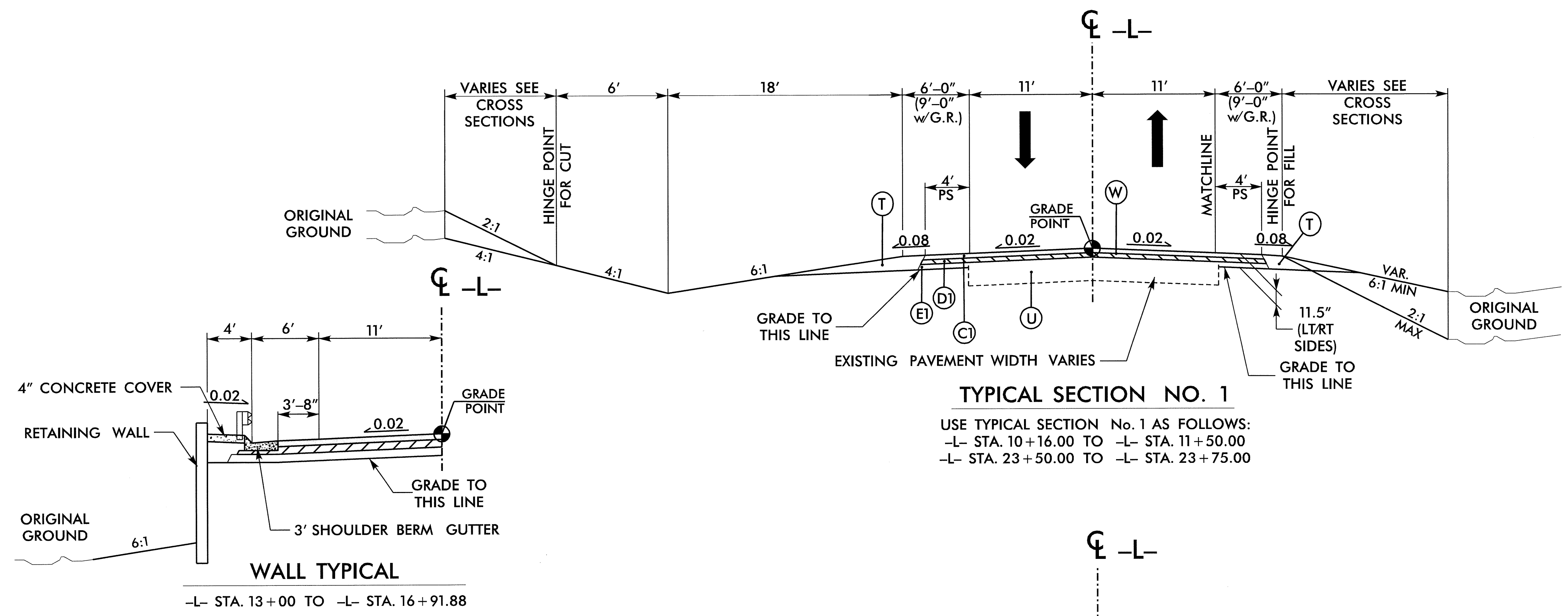
- NOTES:**
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 B4657_LS_CONTROL_090527.HTML
 SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- ⬡ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NOTE: DRAWING NOT TO SCALE

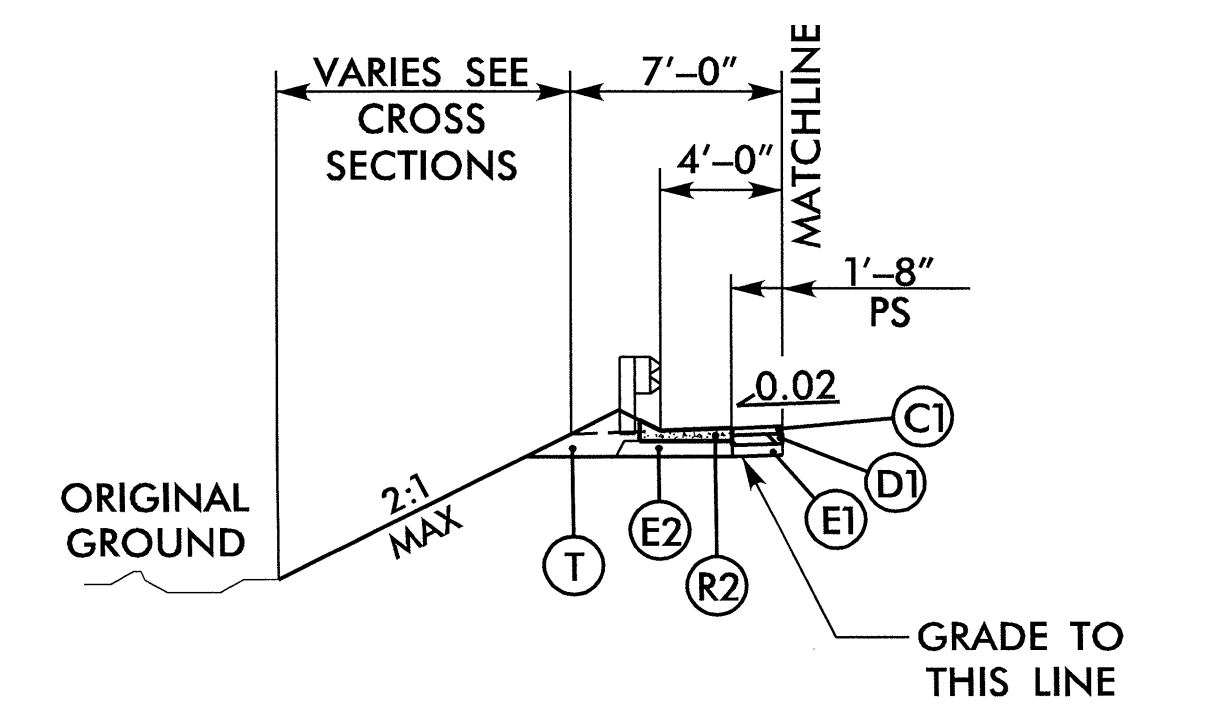
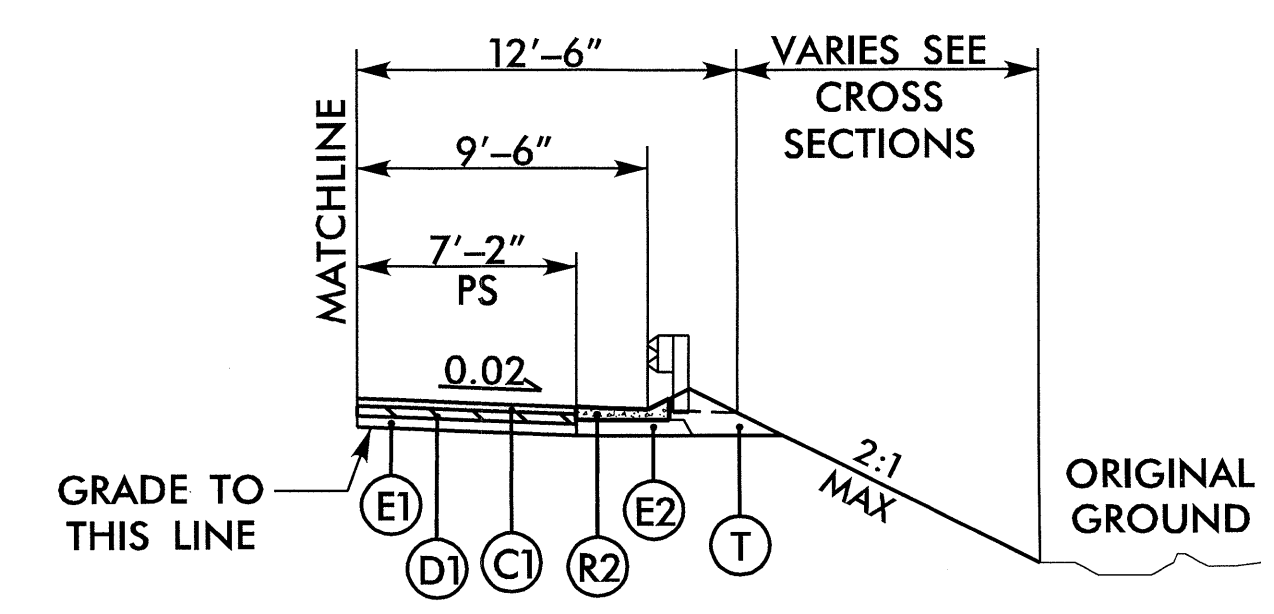
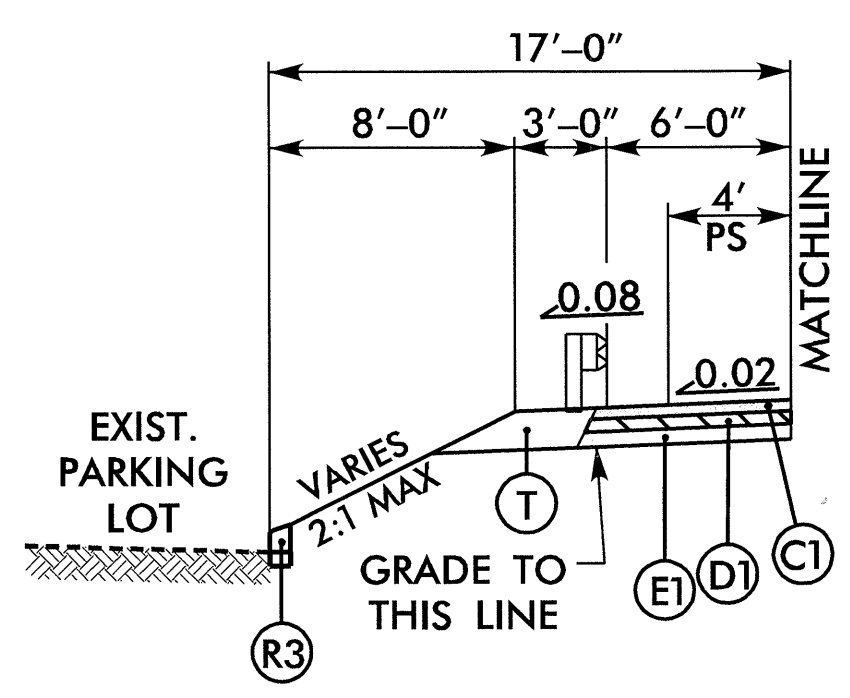
05/27/09
 8/22/2011
 *****DOWNS*****

NOT TO SCALE

PROJECT REFERENCE NO. B-4657	SHEET NO. 2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER



PAVEMENT SCHEDULE	
ITEM	DESCRIPTION
(C)	Prop. Approx 3.0" Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 168 lbs. Per sq. yard 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. yard Per 1" Depth, to be placed in layers not less than 1.5" or greater than 2" in depth.
(D)	Prop. Approx 4.0" Asphalt Concrete Intermediate Course, Type I19.0B, at an Average Rate of 456 lbs. Per sq. yard.
(D2)	Prop. Var. Depth Asphalt Concrete Intermediate Course, Type I19.0B, at an Average Rate of 114 lbs. Per sq. yard Per 1" Depth, to be placed in layers not less than 2.5" or greater than 4.0" in depth.
(E)	Prop. Approx 4.5" Asphalt Concrete Base Course, Type B25.0B, at an Average Rate of 513 lbs. Per sq. yard.
(E2)	Prop. Var. Depth Asphalt Concrete Base Course, Type B25.0B, at an Average Rate of 114 lbs. Per sq. yard Per 1" Depth, to be placed in layers not less than 4" or greater than 5.5" in depth.
(J)	Prop. Approx 6.0" Aggregate Base Course
(J2)	Prop. Approx 8.0" Aggregate Base Course
(P)	Proposed Prime Coat at a Rate of 0.35 gal./sq. yd.
(R)	2'-6" Concrete Curb and Gutter
(R2)	Concrete Shoulder Berm Gutter
(R3)	9" x 12" Concrete Curb
(T)	Earth Material
(U)	Existing Pavement
(W)	Var. Depth Asphalt Pavement

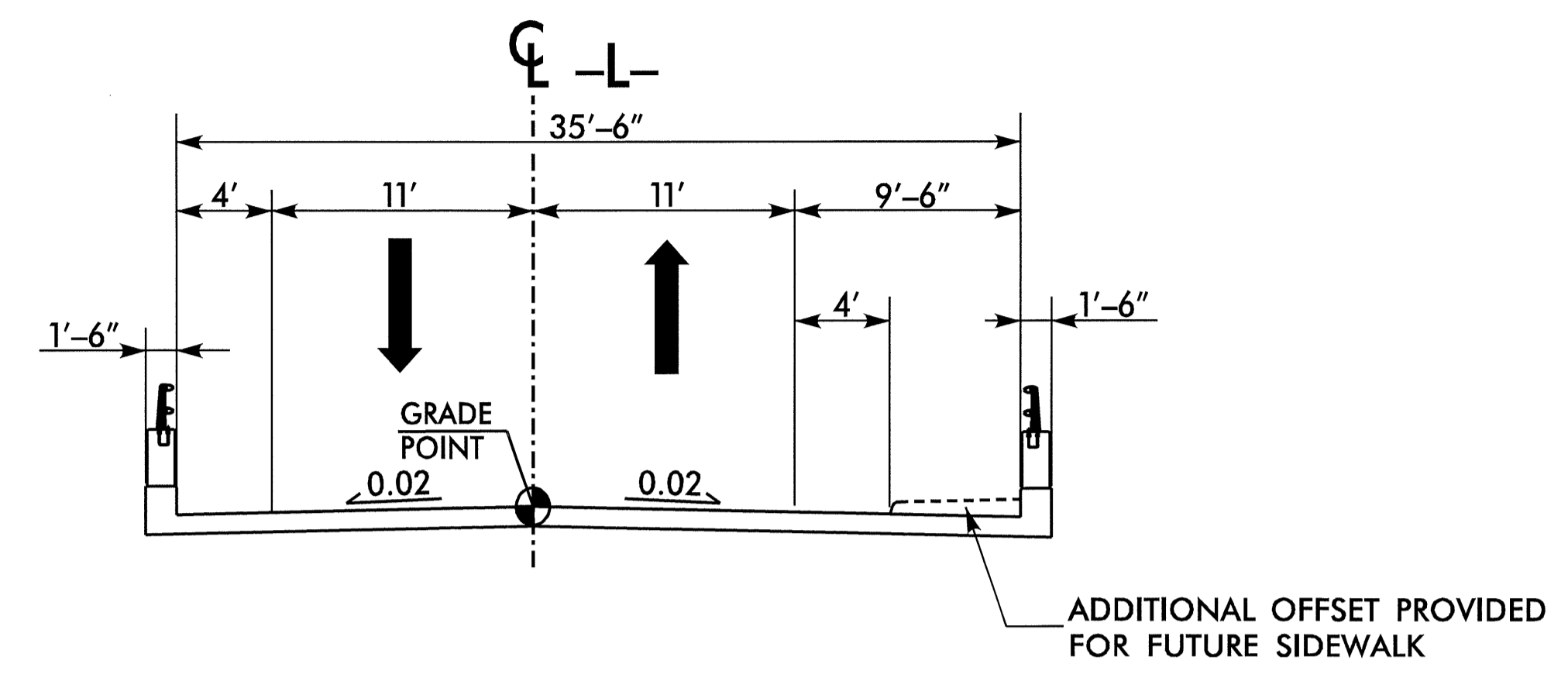


NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE INDICATED.

8/29/2011
 \$\$\$\$\$\$DGN\$\$\$\$\$\$
 9 TIMES

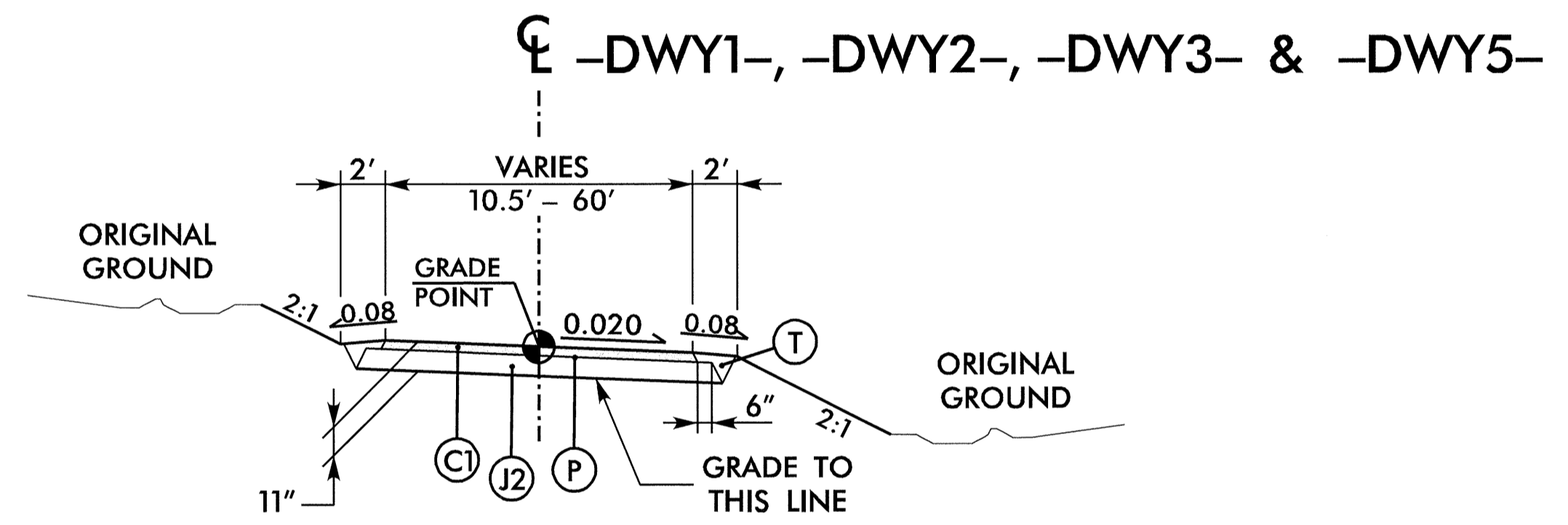
NOT TO SCALE

PROJECT REFERENCE NO. B-4657	SHEET NO. 2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER SEAL 10008 ANDREW D. HAFFIELD REGISTERED ENGINEER 8/23/2011	PAVEMENT DESIGN ENGINEER SEAL 22893 CLARK S. MORRISON REGISTERED ENGINEER 8/23/2011



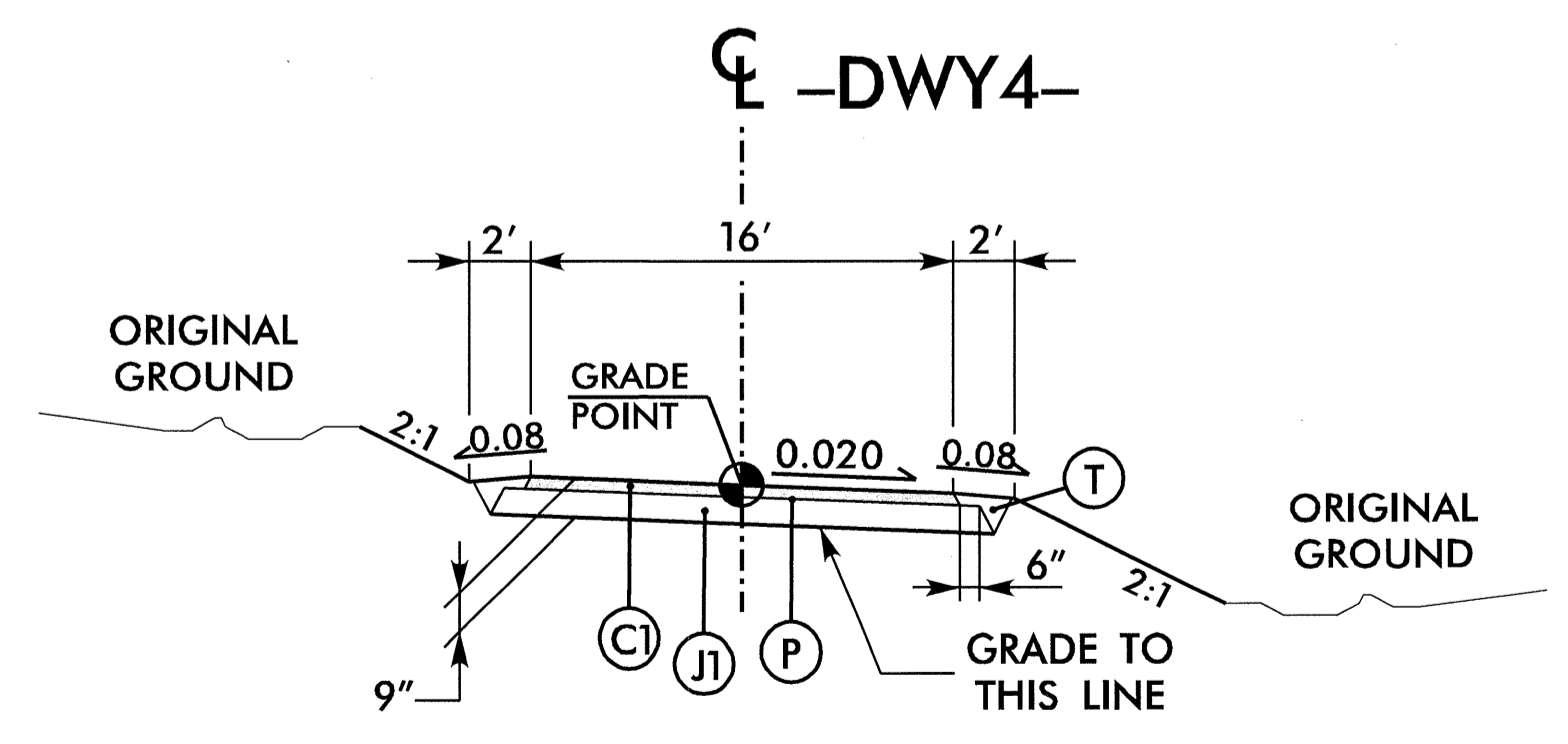
TYPICAL SECTION NO. 3 ON BRIDGE

USE TYPICAL SECTION No. 3 AS FOLLOWS:
-L- STA. 16+97.80 TO -L- STA. 18+38.80



TYPICAL SECTION NO. 4

USE TYPICAL SECTION No. 4 AS FOLLOWS:
-DWY1- STA. 10+15.00 TO -DWY1- STA. 11+75.00
-DWY2- STA. 10+15.00 TO -DWY2- STA. 11+40.00
-DWY3- STA. 10+15.00 TO -DWY3- STA. 11+00.00
-DWY5- STA. 10+15.00 TO -DWY5- STA. 10+75.00



TYPICAL SECTION NO. 5

USE TYPICAL SECTION No. 5 AS FOLLOWS:
-DWY4- STA. 10+08.00 TO -DWY4- STA. 10+45.00

C1	3.0" Type S9.5B
C2	Var. Type S9.5B
D1	4.0" Type I19.0B
D2	Var. Type I19.0B
E1	4.5" Type B25.0B
E2	Var. Type B25.0B
J1	6.0" ABC
J2	8.0" ABC
P	Prop Prime Coat
R1	2'-6" Curb & Gutter
R2	Conc. Shld. Berm Gutter
R3	Conc. 9"x12" Curb
T	Earth Material
U	Existing Pavement
W	Var. Depth Asphalt Pavement

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

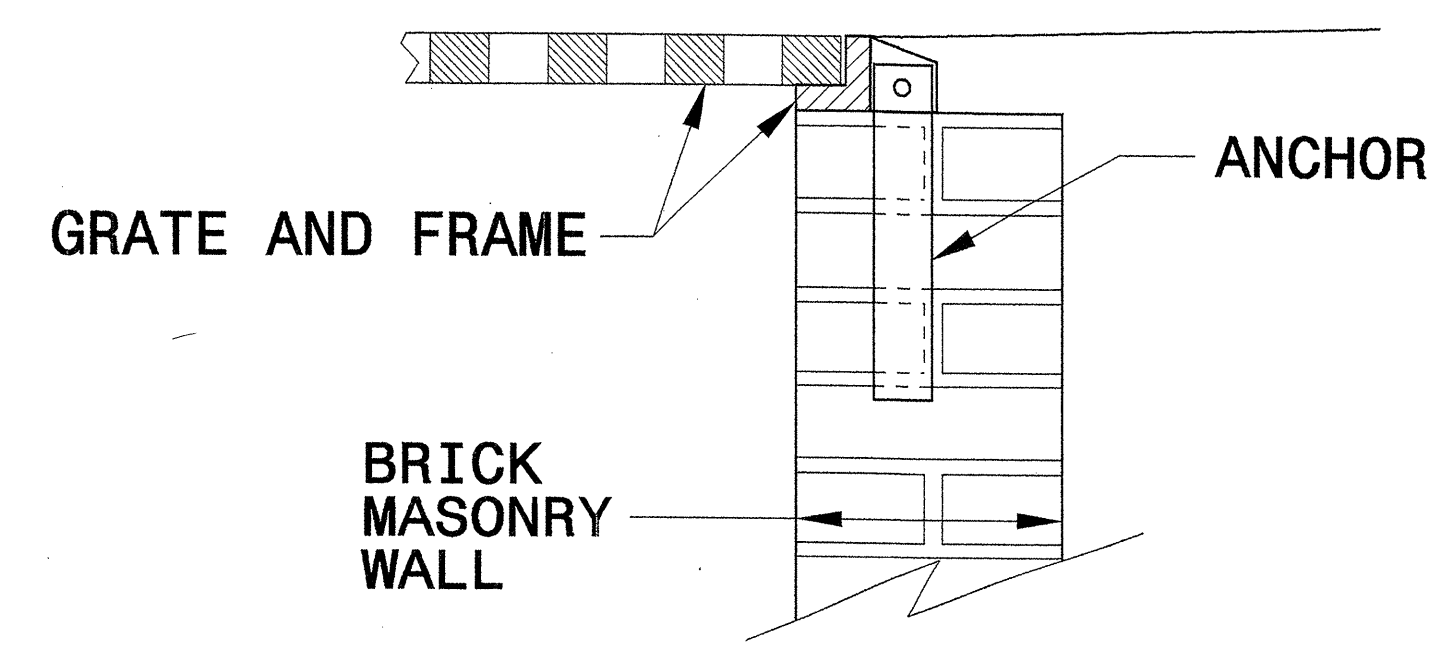
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

8/23/2011 8:58:58 AM 8 TIMES

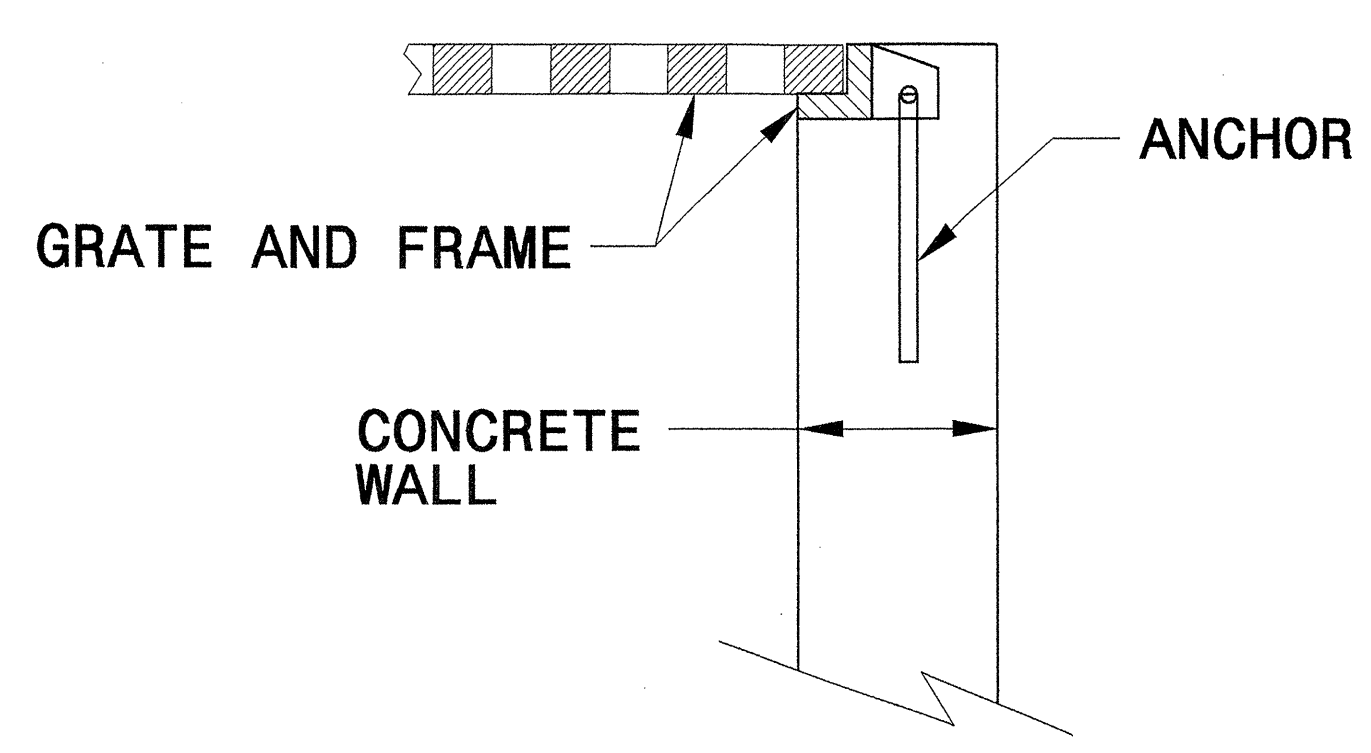
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

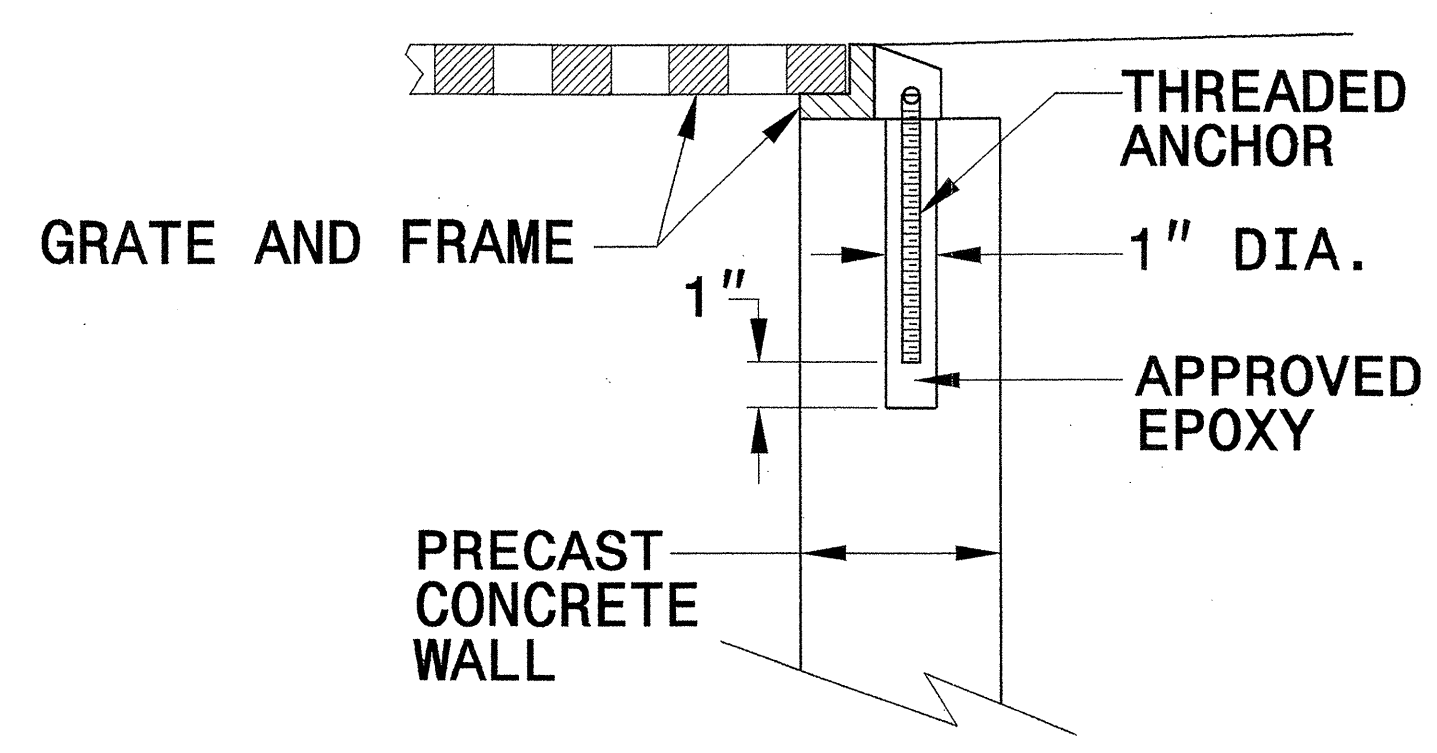
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



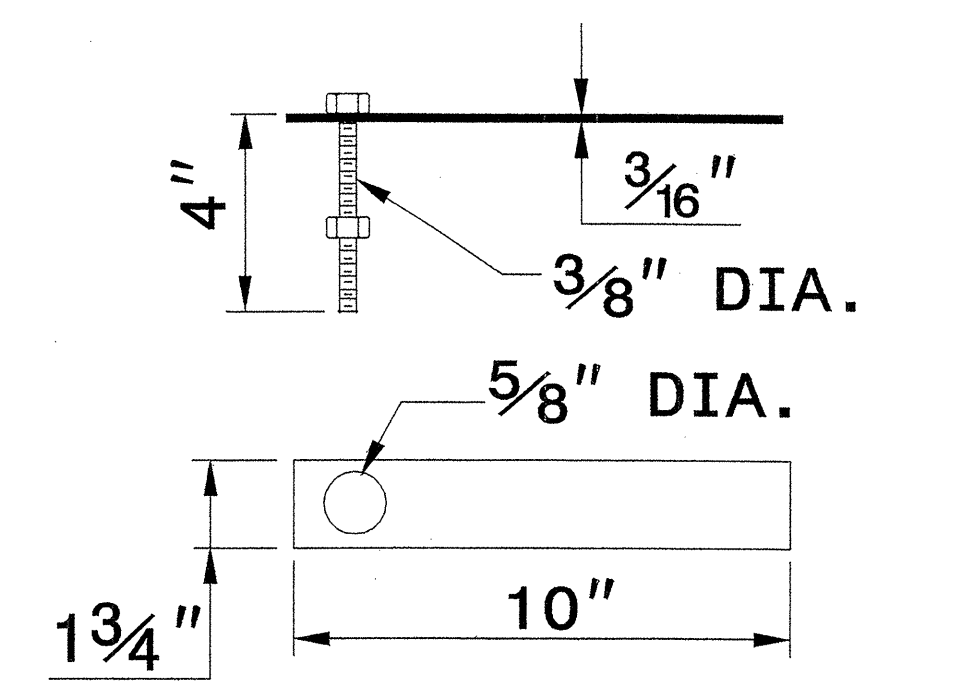
CONCRETE CONSTRUCTION



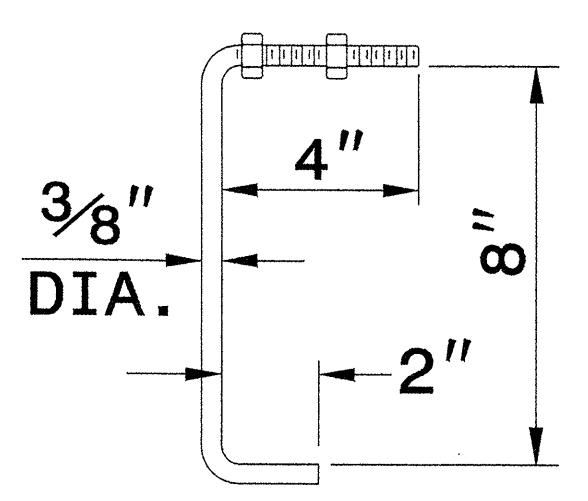
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

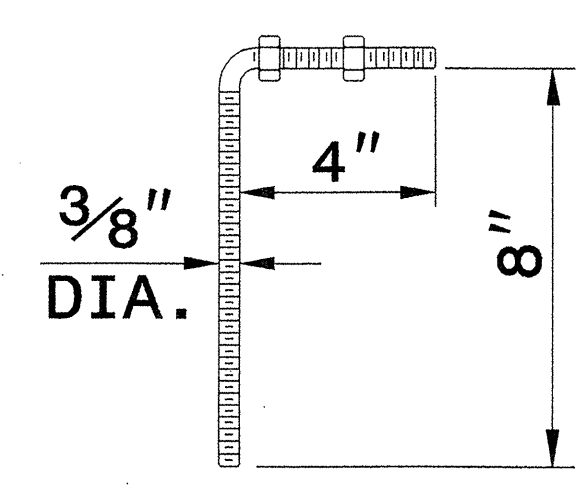
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



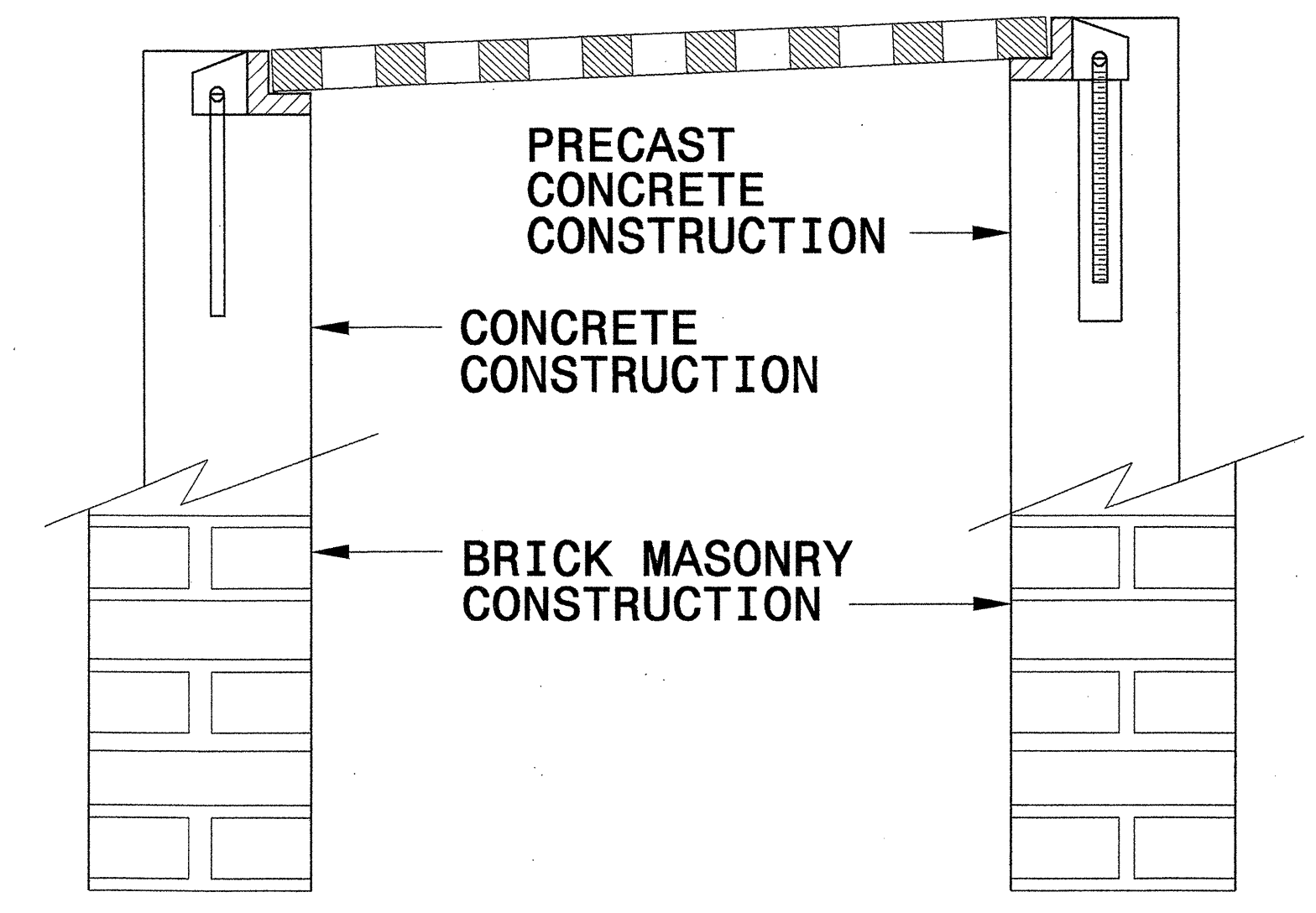
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



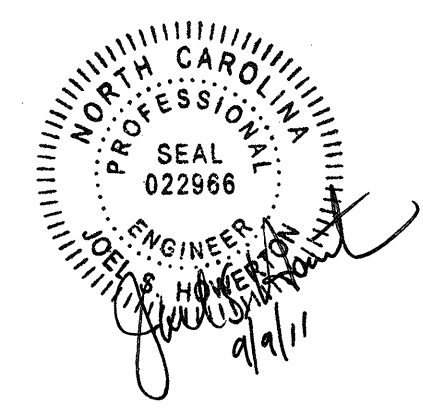
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$LOGON\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$



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

SEE PLATE FOR TITLE

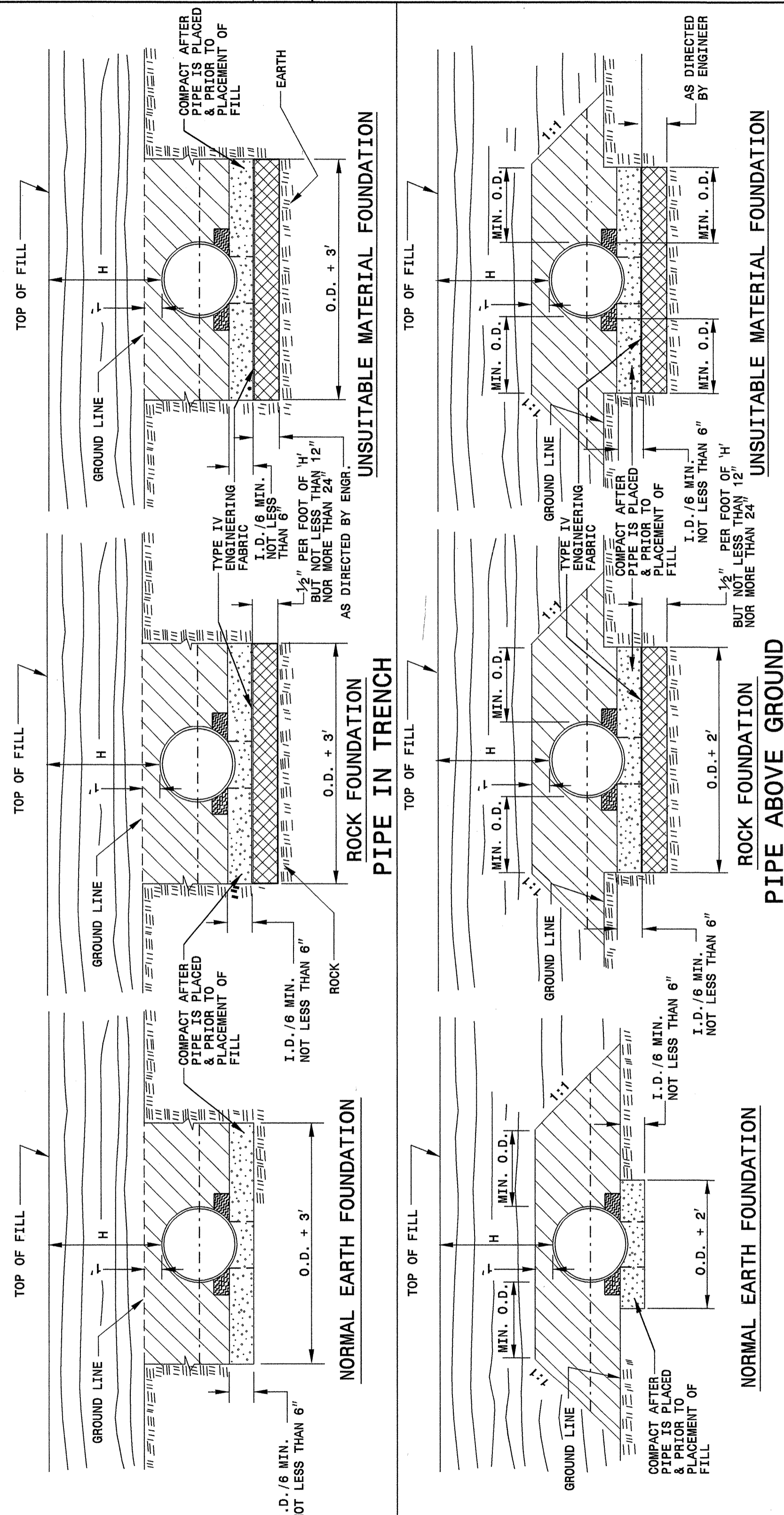
ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E. E. WARD DATE: 9/25/06
CHECKED BY: *[Signature]* DATE: 4/13/08
FILE SPEC: *[Signature]*

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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3
300D01



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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3
300D01

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

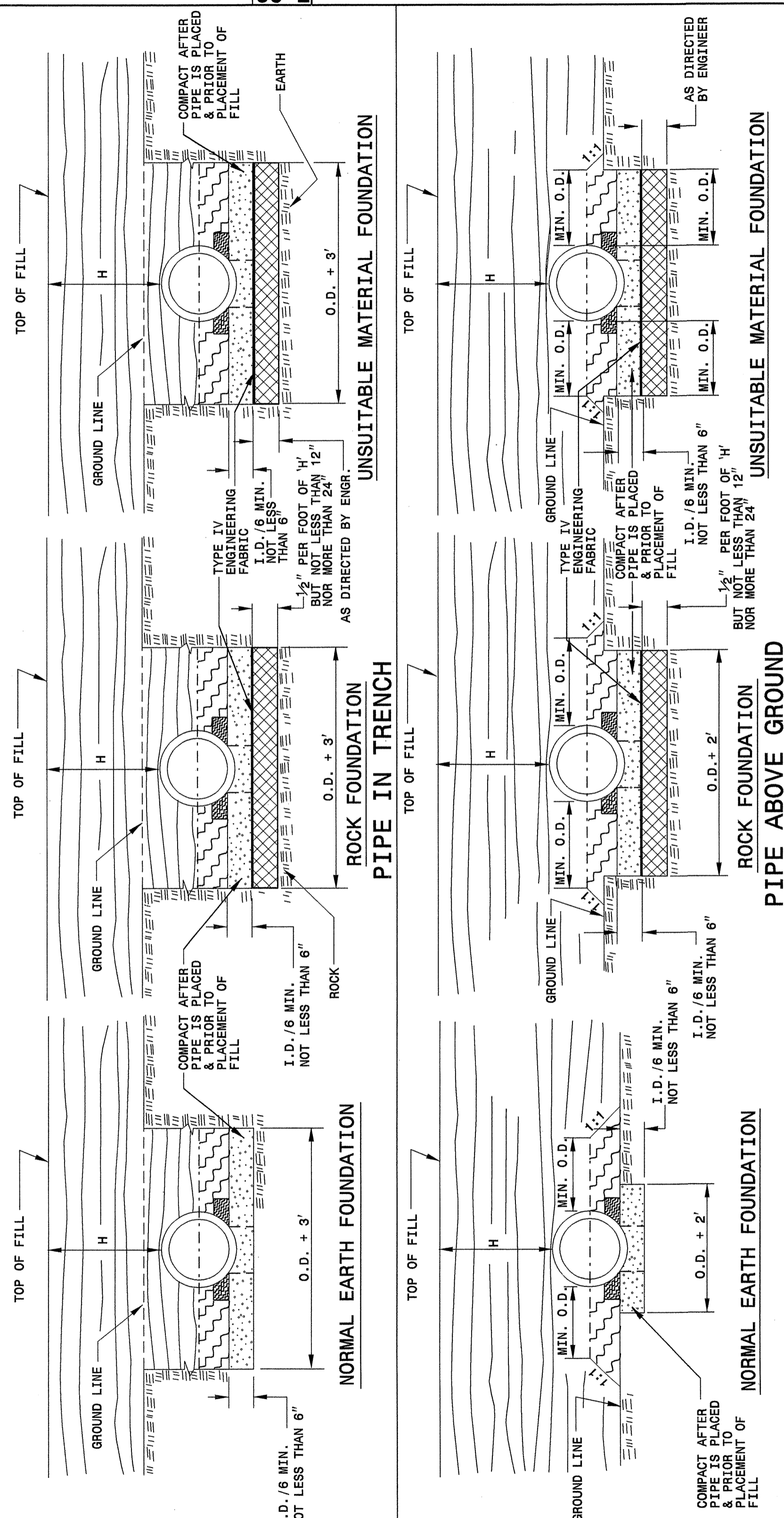
DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.
 SPRINGLINE OF PIPE
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.
 APPROVED SUITABLE LOCAL MATERIAL.
 UNDISTURBED EARTH MATERIAL
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

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

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.

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3
300D01

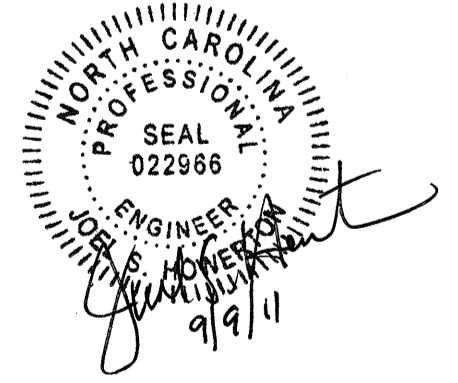
GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
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 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING; PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.
 SPRINGLINE OF PIPE
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, 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.

**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: 7/20/09
 CHECKED BY: *[Signature]* DATE: 7/20/09
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STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

FLEXIBLE PIPE

Diameter (inches)	Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **			
	Minimum cover (inches)	(Ga) 16	14	12
12	12	204	256	204
15	12	182	204	169
18	12	135	169	289
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	48	69
66	12	32	42	61
72	12	27	37	54
78	12	22	32	47
84	12	17	27	40

Diameter (inches)	Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **			
	Minimum cover (inches)	(Ga) 16	14	12
12	12	123	155	218
15	12	98	123	174
18	12	81	102	144
21	12	69	87	123
24	12	60	76	108
27	12	54	67	95
30	12	48	60	85
36	12	42	50	71
42	12	37	45	60
48	12	32	40	52
54	12	27	35	46
60	12	22	30	40
66	12	17	25	35
72	12	12	20	30

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- GSP - 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

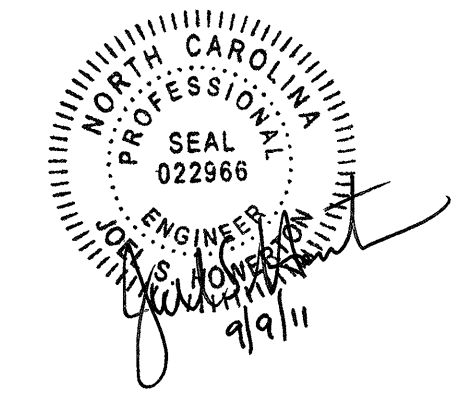
FILL HEIGHT TABLES

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: *John S. Hunt* DATE: *7/30/09*
 CHECKED BY: *John S. Hunt* DATE: *7/30/09*
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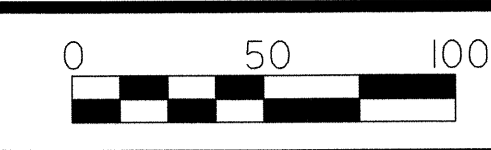
STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202733

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (17+68.30)
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0057000000-E	226	200	CY	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0106000000-E	230	19,400	CY	BORROW EXCAVATION
0134000000-E	240	20	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	SP	200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	200	SY	FABRIC FOR SOIL STABILIZATION
0318000000-E	SP	90	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0320000000-E	SP	260	SY	FOUNDATION CONDITIONING FABRIC
0335200000-E	SP	164	LF	15" DRAINAGE PIPE
0335400000-E	SP	80	LF	24" DRAINAGE PIPE
0366000000-E	SP	404	LF	15" RC PIPE CULVERTS, CLASS III
0378000000-E	SP	56	LF	24" RC PIPE CULVERTS, CLASS III
0582000000-E	SP	60	LF	15" CS PIPE CULVERTS, 0.064" THICK
0636000000-E	SP	4	EA	*** CS PIPE ELBOWS, ***** THICK (15", 0.064")
0995000000-E	340	244	LF	PIPE REMOVAL
1121000000-E	520	809	TON	AGGREGATE BASE COURSE
1220000000-E	545	200	TON	INCIDENTAL STONE BASE
1275000000-E	600	578	GAL	PRIME COAT
1330000000-E	607	290	SY	INCIDENTAL MILLING
1489000000-E	610	1,020	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	860	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	1,080	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1575000000-E	SP	155	TON	ASPHALT BINDER FOR PLANT MIX
1693000000-E	654	7	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	5	EA	RIGHT OF WAY MARKERS
2286000000-N	840	10	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	3.86	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.16
2366000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	7	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2535000000-E	846	80	LF	***X*** CONCRETE CURB (9" X 12")
2549000000-E	846	170	LF	2'-6" CONCRETE CURB & GUTTER
2556000000-E	846	614	LF	SHOULDER BERM GUTTER
2612000000-E	848	10	SY	6" CONCRETE DRIVEWAY
2627000000-E	852	140	SY	4" CONCRETE ISLAND COVERS
3030000000-E	862	220	LF	STEEL BM GUARDRAIL
3045000000-E	862	25	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	3	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3420000000-E	SP	380	LF	GENERIC GUARDRAIL ITEM STEEL BEAM GUARDRAIL WITH 8" POST
3649000000-E	876	10	TON	RIP RAP, CLASS B

ItemNumber	Sec #	Quantity	Unit	Description
3656000000-E	876	485	SY	FILTER FABRIC FOR DRAINAGE
4072000000-E	903	64	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4102000000-N	904	2	EA	SIGN ERECTION, TYPE E
4108000000-N	904	2	EA	SIGN ERECTION, TYPE F
4155000000-N	907	15	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4400000000-E	1110	328	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	192	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	52	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	50	EA	DRUMS
4435000000-N	1135	50	EA	CONES
4445000000-E	1145	96	LF	BARRICADES (TYPE III)
4450000000-N	1150	640	HR	FLAGGER
4516000000-N	1180	50	EA	SKINNY DRUM
4650000000-N	1251	22	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	2,428	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	2,428	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4710000000-E	1205	23	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4770000000-E	1205	564	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)
4810000000-E	1205	13,600	LF	PAINT PAVEMENT MARKING LINES (4")
4835000000-E	1205	96	LF	PAINT PAVEMENT MARKING LINES (24")
4870000000-E	1205	24	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4900000000-N	1251	18	EA	PERMANENT RAISED PAVEMENT MARKERS
5325200000-E	1510	93	LF	2" WATER LINE
5325600000-E	1510	130	LF	6" WATER LINE

ItemNumber	Sec #	Quantity	Unit	Description
5606000000-E	1515	1	EA	2" BLOW OFF
6000000000-E	1605	4,100	LF	TEMPORARY SILT FENCE
6006000000-E	1610	270	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	440	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	340	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	2.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	300	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	6	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	200	LF	SAFETY FENCE
6030000000-E	1630	700	CY	SILT EXCAVATION
6036000000-E	1631	4,000	SY	MATting FOR EROSION CONTROL
6042000000-E	1632	800	LF	1/4" HARDWARE CLOTH
6071030000-E	SP	300	LF	COIR FIBER BAFFLE
6084000000-E	1660	3.6	ACR	SEEDING & MULCHING
6087000000-E	1660	2.5	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	75	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	2.25	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	15	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	18	EA	RESPONSE FOR EROSION CONTROL
7060000000-E	1705	550	LF	SIGNAL CABLE
7120000000-E	1705	8	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7264000000-E	1710	270	LF	MESSENGER CABLE (3/8")
7288000000-E	1715	50	LF	PAVED TRENCHING (***** (1, 2"))
7300000000-E	1715	1,210	LF	UNPAVED TRENCHING (***** (1, 2"))
7324000000-N	1716	9	EA	JUNCTION BOX (STANDARD SIZE)
7360000000-N	1720	2	EA	WOOD POLE
7372000000-N	1721	8	EA	GUY ASSEMBLY
7408000000-E	1722	1	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	5	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	480	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	1,790	LF	LEAD-IN CABLE (***** (14-2))
7768000000-N	1751	1	EA	CONTROLLER WITH CABINET (TYPE 2070L, POLE MOUNTED)
7780000000-N	1751	4	EA	DETECTOR CARD (TYPE 2070L)
7948000000-N	SP	1	EA	TRAFFIC SIGNAL REMOVAL



GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS			IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS	
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TYPE 350	AT-1	TYPE-III	EA	G	NG					
-L-	12+51.00	16+97.80	LT	450			13+00.00	17+00.00	6	3.66															STA. 13+00 TO STA. 17+00 (8' POST)
-L-	15+50.00	16+97.80	RT	150	25		15+50.00	17+00.00	9.5	7.16															
-L-	18+38.80	19+50.00	LT	112.5			18+60.00	19+00.00	4	1.66	50			1											
-L-	18+38.80	19+50.00	RT	112.5			18+60.00	19+00.00	9.5	7.16					1										
SUBTOTAL				825	25											3	1	4							

DEDUCTIONS FOR ANCHORS		STRAIGHT	SHOP CURVED
AT-1	6.25		
GRAU-350 3 @ 50'	150		
TYPE-III 4 @ 18.75'	75		
PROJECT TOTALS		593.75	25
SAY		600	25
STEEL BEAM GUARDRAIL		220	
STEEL BEAM GUARDRAIL (w/8' POST)		380	

"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.
 G = GATING IMPACT ATTENUATOR TYPE 350
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

ADDITIONAL GUARDRAIL POST = 5EA.

SHOULDER BERM GUTTER SUMMARY

LINE	STATION	STATION	LOCATION	LENGTH
-L-	13+00	16+85	LT	385
-L-	15+50	16+85	RT	135
-L-	18+53	19+00	LT	47
-L-	18+53	19+00	RT	47
TOTAL				614
SAY				614

SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	YD ²
-L-	12+50	17+00	CL	1,000.00
-L-	18+05	22+00	CL	877.78
TOTAL				1,877.78
SAY				1,880

SUMMARY OF PAVEMENT REMOVAL

LINE	STATION	STATION	LOCATION	YD ²
-L-	12+00	12+50	CL	111.11
-L-	22+00	23+00	CL	222.22
TOTAL				333.33
SAY				340.00

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

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

SUMMARY OF EARTHWORK

STATION	UNCL. EXCAV.	UNDERCUT EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 10+00 TO 16+98.80 (Begin Bridge)	107	0	8,588	8,481	0
-L- 18+38.80 (End Bridge) TO 23+75	155	0	5,892	5,737	0
-DWY1- 10+00 TO 11+75	0	0	2,813	2,813	0
-DWY2- 10+00 TO 11+40	0	0	934	934	0
-DWY3- 10+00 TO 11+00	0	0	205	205	0
-DWY4- 10+00 TO 10+62	0	0	4	4	0
-DWY5- 10+00 TO 10+75	11	0	23	12	0
PROJECT SUBTOTALS	273	0	18,459	18,186	0
EST. SHOULDER MATERIAL			278	278	
PROJECT TOTAL	273	0	18,737	18,464	0
EST 5% TO REPLACE TOP SOIL ON BORROW PIT				923	
TOTALS	273		17,292	19,387	0
SAY	280			19,400	

* 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.

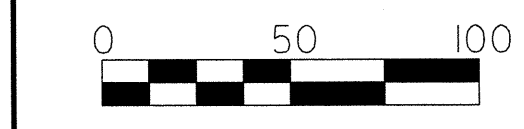
Drainage Ditch Excavation = 20 CY
 Contingency Undercut = 200 CY

REVISIONS

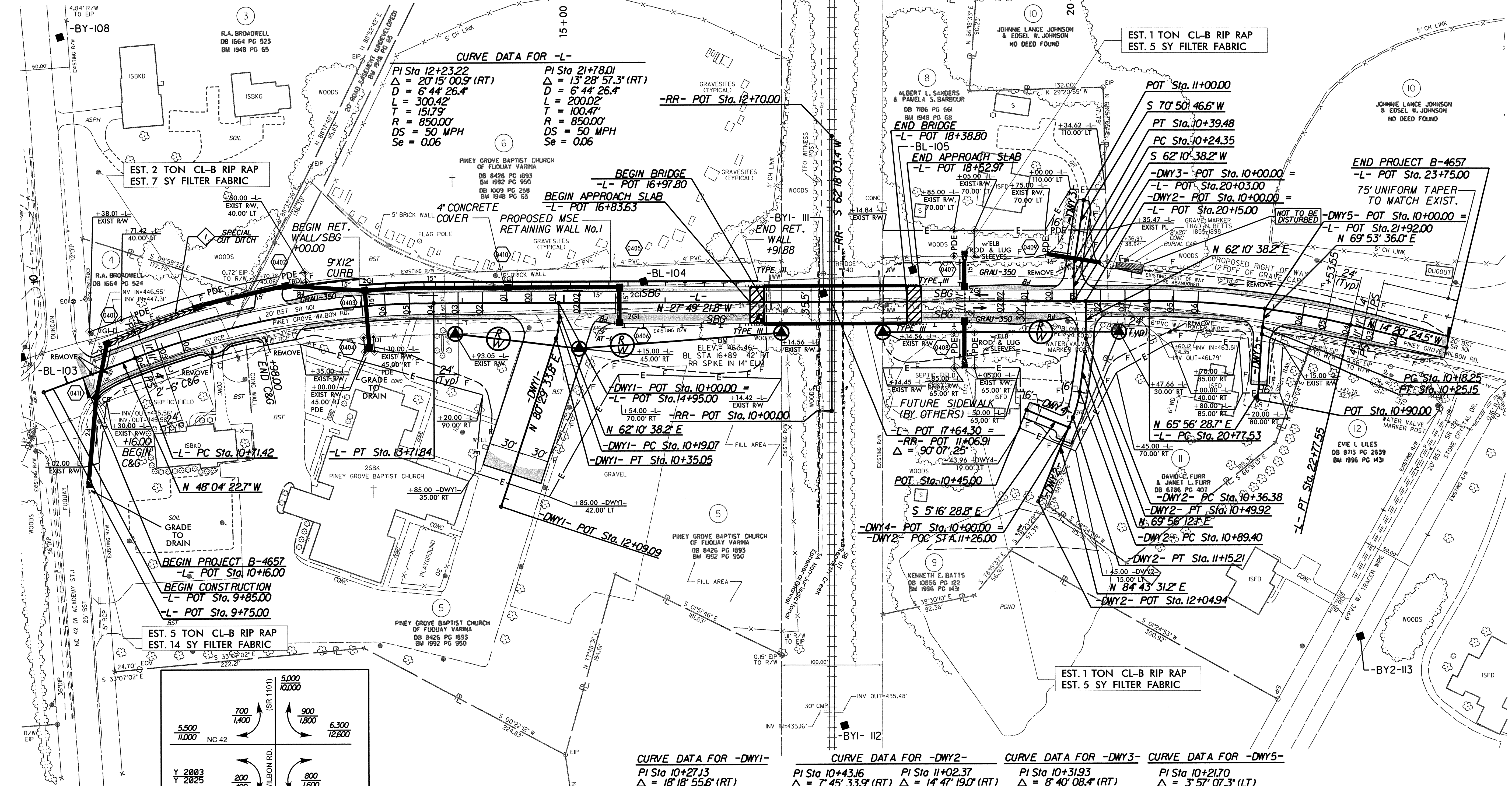
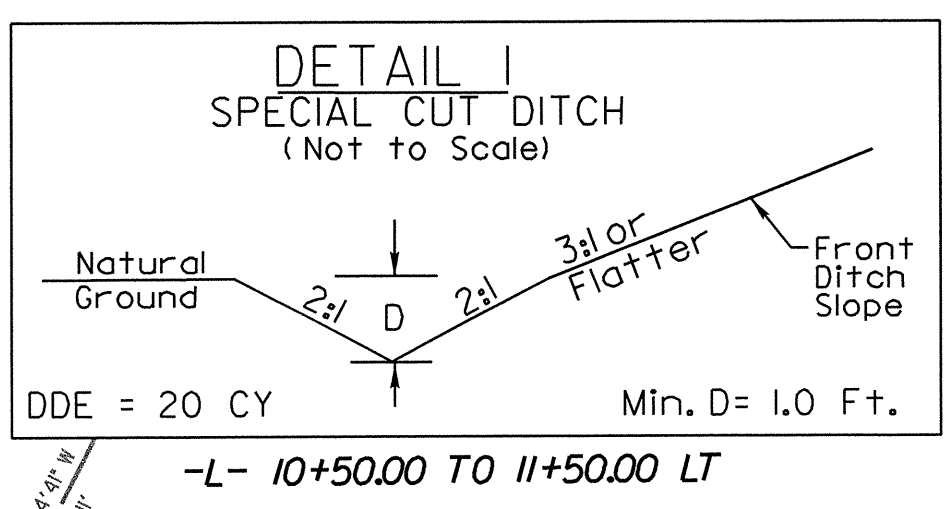
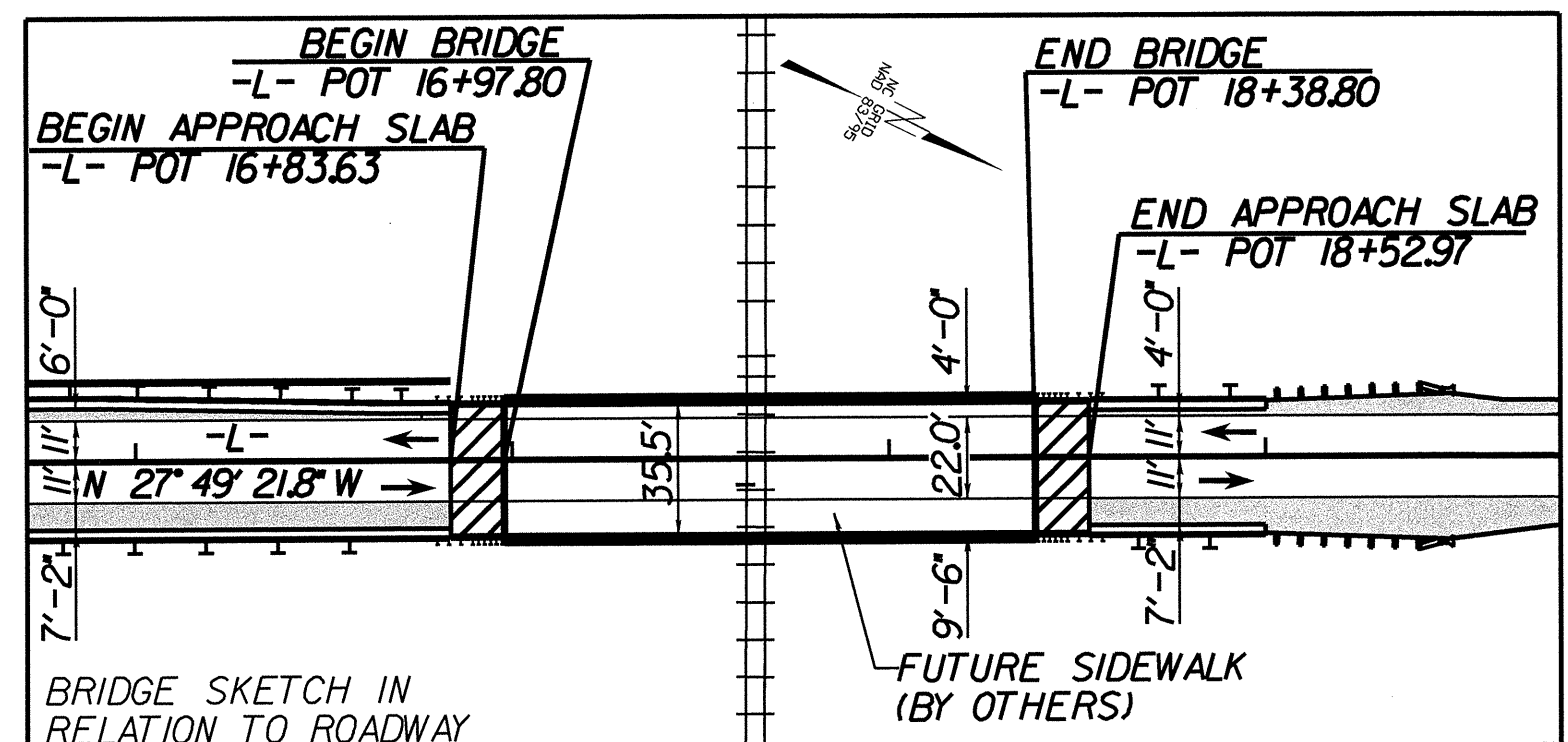
9/6/2011
 \$\$\$SYNCHRONIZATION\$\$\$
 \$\$\$TIME\$\$\$



THE LOUIS BERGER GROUP, Inc.
 1001 Wade Avenue, Suite 400
 Raleigh, North Carolina 27605



PROJECT REFERENCE NO. B-4657		SHEET NO. 4
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
REGISTERED ENGINEER 9/2/2011	REGISTERED ENGINEER 9/2/2011	



CURVE DATA FOR -L-

PI Sta 12+23.22	PI Sta 21+78.01
$\Delta = 20' 15' 00.9''$ (RT)	$\Delta = 13' 28' 57.3''$ (RT)
$D = 6' 44' 26.4''$	$D = 6' 44' 26.4''$
$L = 300.42'$	$L = 200.02'$
$T = 151.79'$	$T = 100.47'$
$R = 850.00'$	$R = 850.00'$
$DS = 50$ MPH	$DS = 50$ MPH
$Se = 0.06$	$Se = 0.06$

CURVE DATA FOR -DWHY1-

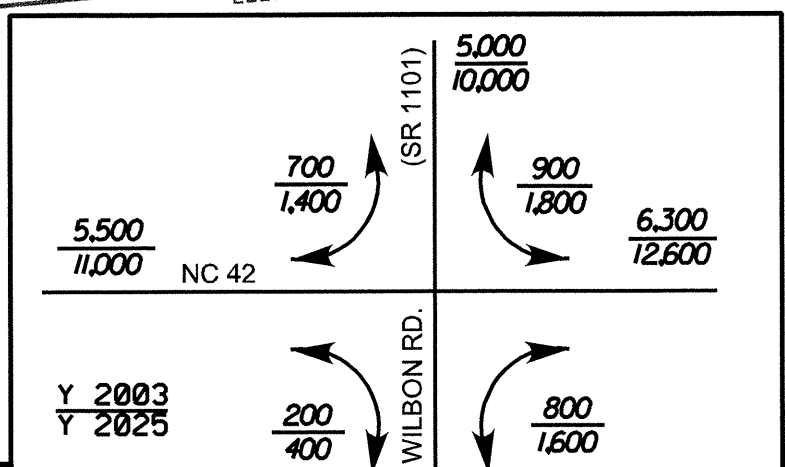
PI Sta 10+27.13	PI Sta 10+43.16
$\Delta = 18' 18' 55.6''$ (RT)	$\Delta = 7' 45' 33.9''$ (RT)
$D = 114' 35' 30.4''$	$D = 57' 17' 44.8''$
$L = 15.98'$	$L = 13.54'$
$T = 8.06'$	$T = 6.78'$
$R = 50.00'$	$R = 100.00'$

CURVE DATA FOR -DWHY2-

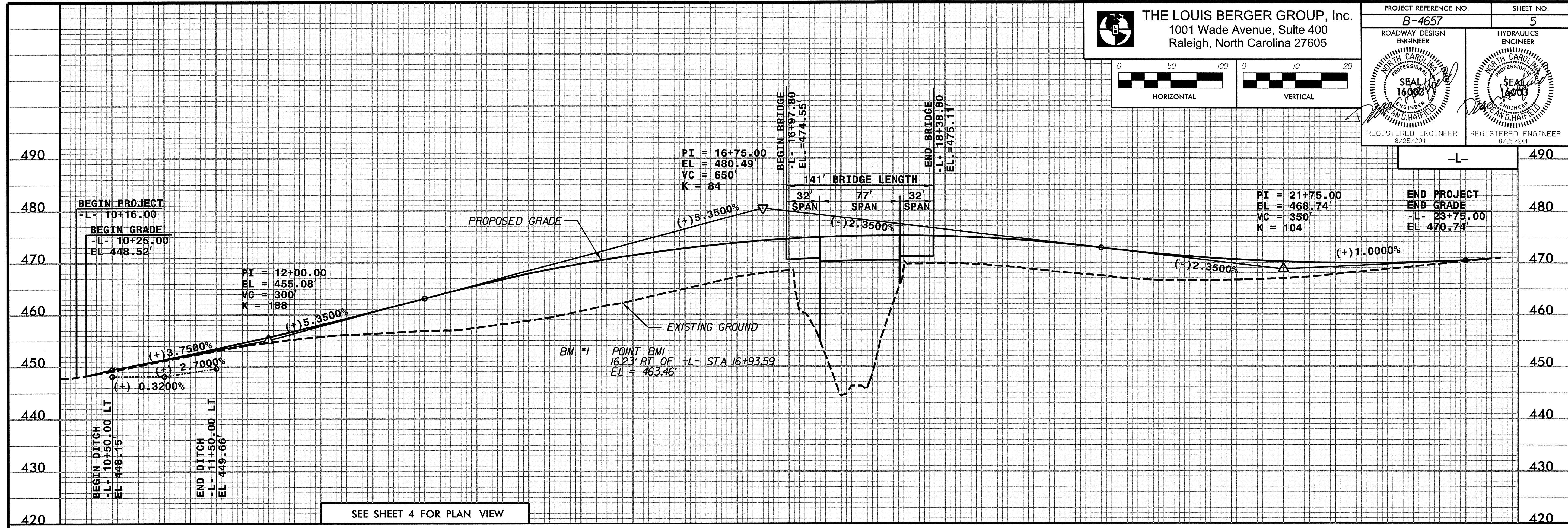
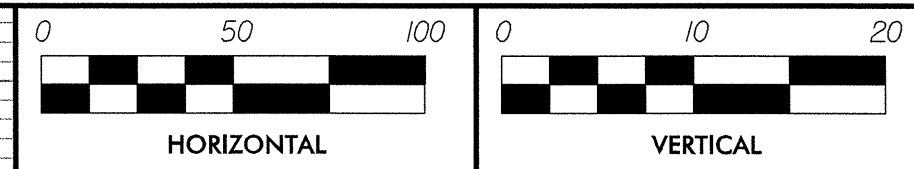
PI Sta 11+02.37	PI Sta 10+31.93
$\Delta = 14' 47' 19.0''$ (RT)	$\Delta = 8' 40' 08.4''$ (RT)
$D = 57' 17' 44.8''$	$D = 57' 17' 44.8''$
$L = 25.81'$	$L = 15.13'$
$T = 7.98'$	$T = 6.78'$
$R = 100.00'$	$R = 100.00'$

CURVE DATA FOR -DWHY3- CURVE DATA FOR -DWHY5-

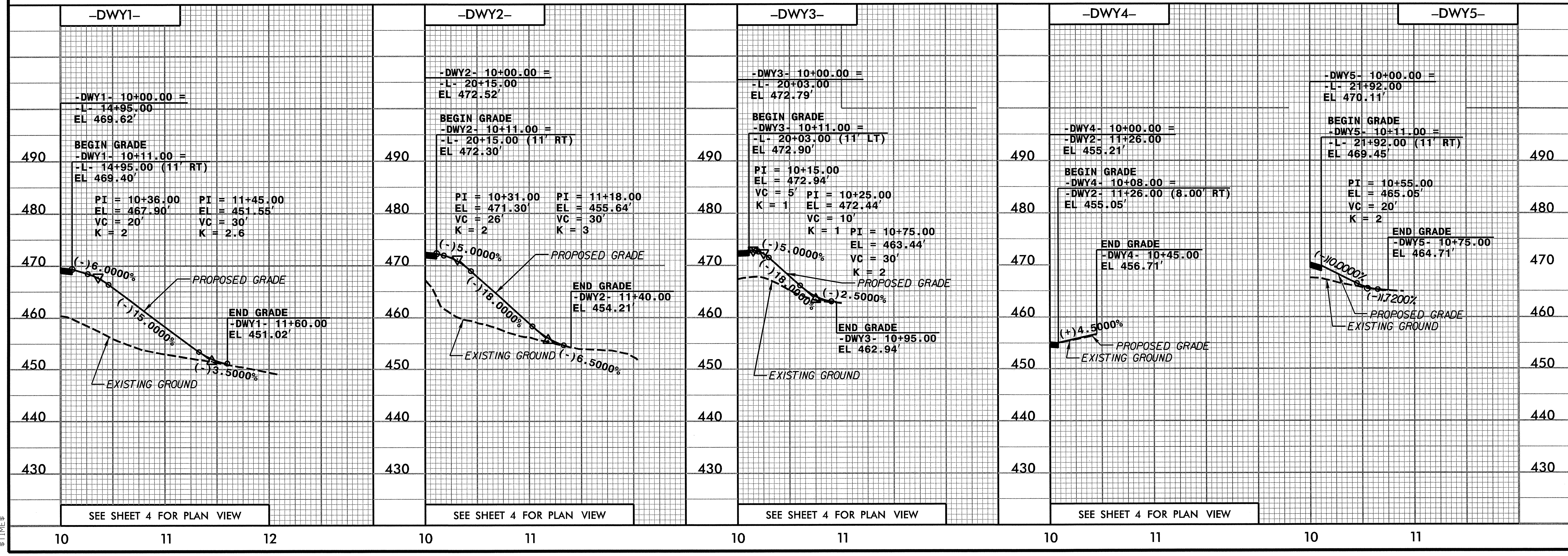
PI Sta 10+21.70	PI Sta 10+21.70
$\Delta = 3' 57' 07.3''$ (LT)	$\Delta = 3' 57' 07.3''$ (LT)
$D = 57' 17' 44.8''$	$D = 57' 17' 44.8''$
$L = 6.90'$	$L = 6.90'$
$T = 3.45'$	$T = 3.45'$
$R = 100.00'$	$R = 100.00'$



SEE SHEET 2B FOR WALL DETAILS
SEE SHEET 5 FOR PROFILES
SEE SHEETS S-1 THRU S-39
FOR STRUCTURE PLANS
SEE SHEETS W-1 AND W-2
FOR MSE RET. WALL #1



SEE SHEET 4 FOR PLAN VIEW



SEE SHEET 4 FOR PLAN VIEW

SEE SHEET 4 FOR PLAN VIEW

SEE SHEET 4 FOR PLAN VIEW

SEE SHEET 4 FOR PLAN VIEW

B/25/2011
 *****D*****
 *****T*****