

09/08/09

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

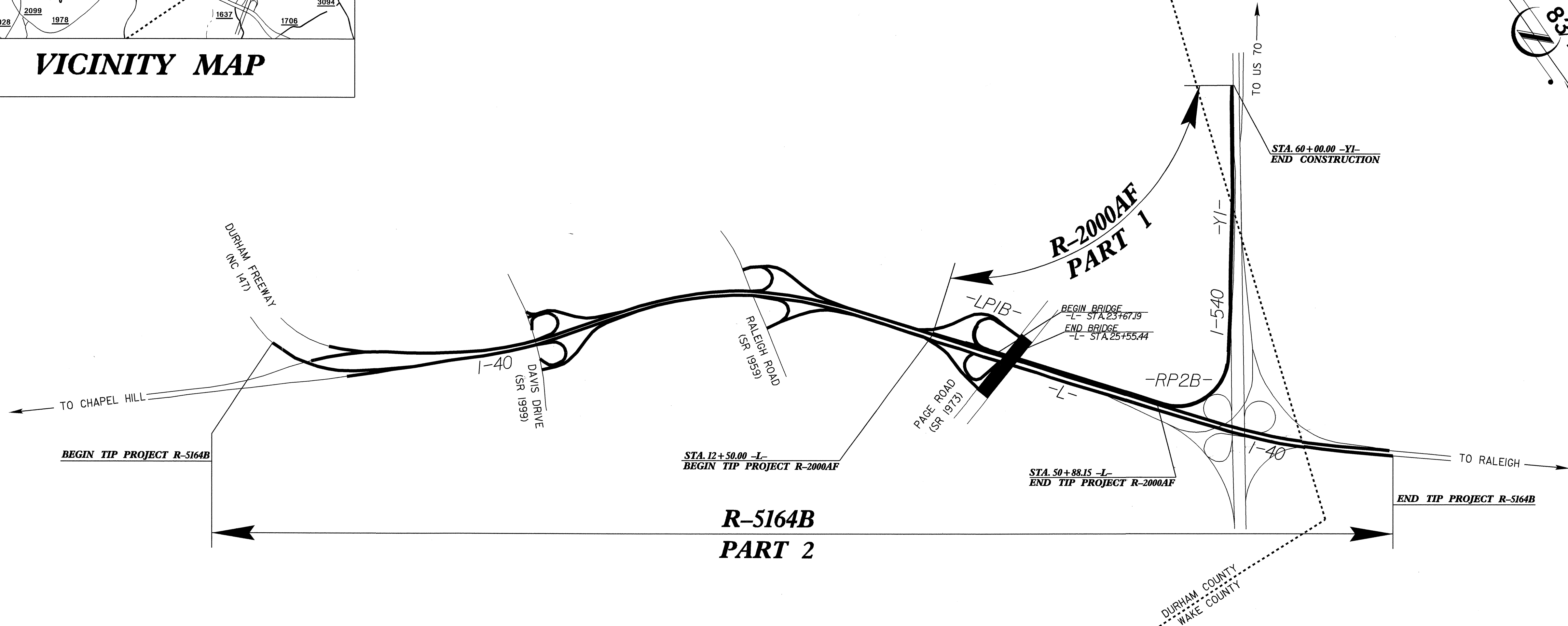
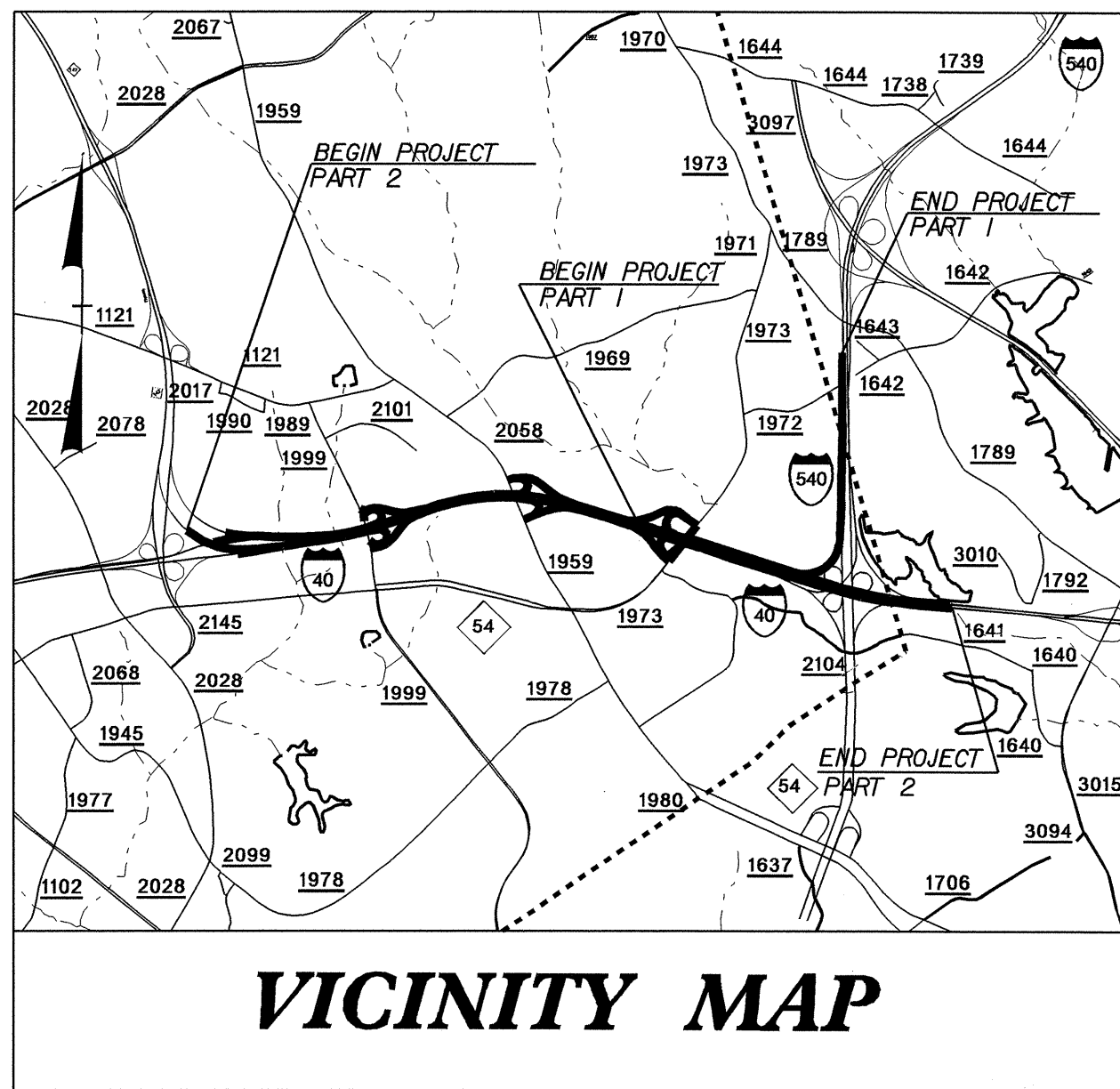
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2000AF/R-5164B	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34365.1.30	NHF-0540(13)	R-2000AF (PE)	
34365.2.31	NHF-0540(13)	R-2000AF (RW/UTL)	
34365.3.ST1	STM-0540(15)	R-2000AF (CONST)	
45158.3.ST2	STM-040-4(144)280	R-5164B (CONST)	

CONTRACT: C202277 TIP PROJECT: R-2000AF / R-5164B

WAKE & DURHAM COUNTIES

**LOCATION: NORTHERN WAKE FREEWAY INTERCHANGE IMPROVEMENTS
AT I-540 AND I-40 FROM NC 147 TO EAST OF I-540**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, WIDENING, MILLING &
RESURFACING, SIGNING, LIGHTING, AND STRUCTURE**



THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT R-2000AF/R-5164B = 3.524 MILES
 LENGTH STRUCTURES STATE PROJECT R-2000AF/R-5164B = 0.036 MILES
 TOTAL LENGTH STATE PROJECT R-2000AF/R-5164B = 3.560 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS

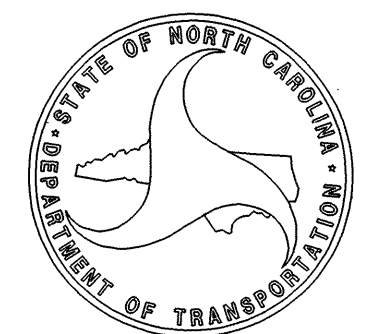
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 MARCH 20, 2009 (R-2000AF)

LETTING DATE:
 JANUARY 19, 2010

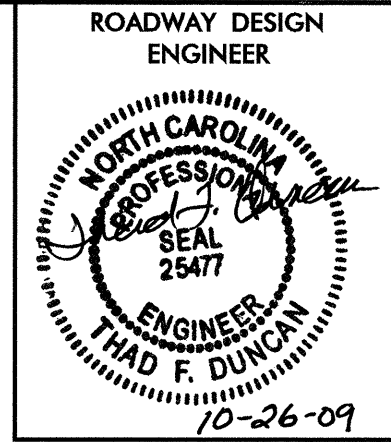
DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA



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STATE HIGHWAY DESIGN ENGINEER

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

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET (R-2000AF/R-5164B)
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2	SUMMARY OF QUANTITIES
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1-B THRU 1-C	SURVEY CONTROL SHEETS
2 THRU 2-A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, MILLING DETAIL, EXTRA LENGTH GUARDRAIL POST DETAIL, AND WEDGING DETAIL
2-B	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND SHALLOW UNDERCUT DETAIL
2-C	DETAIL OF ANCHORAGE FOR FRAMES
2D THRU 2-E	DETAIL OF METHOD OF PIPE INSTALLATION
2-F	DETAIL OF BRIDGE APPROACH FILLS WIDENING OF EXISTING STRUCTURE
2-G	DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO JUNCTION BOX
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3	SUMMARY OF DRAINAGE QUANTITIES
3-A	SUMMARY OF EARTHWORK, SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL, AND GUARDRAIL SUMMARY
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1	MAP
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GENERAL NOTES: 2006 SPECIFICATIONS EFFECTIVE: 07-18-06 REVISED: 07-30-08

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

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

SUPERELEVATION: ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 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. 560.02.

BERM DITCHES: BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS 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 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 1. Duke Energy 2. Progress Energy 3. AT&T ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED 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
225.05	Method of Obtaining Superelevation - Divided Highways
240.01	Guide for Berm Ditch Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.01	Guide for Paving Shoulders Under Bridges - Method I
654.01	Pavement Repairs
665.01	Milled Rumble Strips - Asphalt Pavements
DIVISION 8 - INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
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
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

8/17/99

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202277

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION					
000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING					
001000000-E	200	Lump Sum		CLEARING & GRUBBING... ACRE(S)					
000800000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING	281500000-N	858	1	EA	ADJUSTMENT OF DROP INLETS
002200000-E	225	43,500	CY	UNCLASSIFIED EXCAVATION	293800000-N	SP	3	EA	CONVERT EXISTING DROP INLET TO JUNCTION BOX WITH MANHOLE COVER
003000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ***** (24+61.31 L-)	303000000-E	862	3,900	LF	STEEL BM GUARDRAIL
003600000-E	225	2,124	CY	UNDERCUT EXCAVATION	315000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
008000000-E	SP	5,900	TON	CLASS IV SUBGRADE STABILIZATION	321000000-N	862	6	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
013400000-E	240	370	CY	DRAINAGE DITCH EXCAVATION	327000000-N	SP	6	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
014100000-E	240	340	LF	BERM DITCH CONSTRUCTION	328500000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE M-350
015600000-E	250	13,750	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT	331700000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
019500000-E	265	500	CY	SELECT GRANULAR MATERIAL	336000000-E	863	3,252	LF	REMOVE EXISTING GUARDRAIL
019600000-E	270	9,300	SY	FABRIC FOR SOIL STABILIZATION	350300000-E	866	1,980	LF	WOVEN WIRE FENCE, 47" FABRIC
019900000-E	SP	110	SF	TEMPORARY SHORING	350900000-E	866	130	EA	4" TIMBER FENCE POSTS, 7'-6" LONG
031800000-E	300	150	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	351500000-E	866	80	EA	5" TIMBER FENCE POSTS, 8'-0" LONG
032000000-E	SP	450	SY	FOUNDATION CONDITIONING FABRIC	362800000-E	876	265	TON	RIP RAP, CLASS I
038400000-E	310	12	LF	30" RC PIPE CULVERTS, CLASS III	364900000-E	876	3	TON	RIP RAP, CLASS B
070800000-E	310	56	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK	365600000-E	876	2,135	SY	FILTER FABRIC FOR DRAINAGE
080600000-E	310	6	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK	404800000-E	902	4	CY	REINFORCED CONCRETE SIGN FOUNDATIONS
099500000-E	340	122	LF	PIPE REMOVAL	405400000-E	902	2	CY	PLAIN CONCRETE SIGN FOUNDATIONS
101100000-N	500	Lump Sum		FINE GRADING	405700000-E	SP	60	CY	OVERHEAD FOOTING
111000000-E	510	500	TON	STABILIZER AGGREGATE	406000000-E	903	4,007	LB	SUPPORTS, BREAKAWAY STEEL BEAM
122000000-E	545	200	TON	INCIDENTAL STONE BASE	406600000-E	903	172	LB	SUPPORTS, SIMPLE STEEL BEAM
123100000-E	560	8,600	CY	SHOULDER BORROW	407200000-E	903	126	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
					407800000-E	903	1	EA	SUPPORTS, 2-LB STEEL U-CHANNEL
					408200000-E	903	45	LF	SUPPORTS, WOOD
					408210000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (10+00-CD-)
129700000-E	607	15,800	SY	MILLING ASPHALT PAVEMENT, **** DEPTH (1-1/2")	408210000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (10+00-RP2B-)
129700000-E	607	246,489	SY	MILLING ASPHALT PAVEMENT, **** DEPTH (2")	408210000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (25+70-L-)
129700000-E	607	29,236	SY	MILLING ASPHALT PAVEMENT, **** DEPTH (5")	408210000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ***** (36+00-L-)
133000000-E	607	510	SY	INCIDENTAL MILLING	409600000-N	904	1	EA	SIGN ERECTION, TYPE D
149100000-E	610	14,700	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C	410200000-N	904	2	EA	SIGN ERECTION, TYPE E
150300000-E	610	5,200	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	410800000-N	904	1	EA	SIGN ERECTION, TYPE F
150800000-E	610	5,172	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0D	410900000-N	904	9	EA	SIGN ERECTION, TYPE *** (OVERHEAD) (A)
152300000-E	610	12,958	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	410900000-N	904	5	EA	SIGN ERECTION, TYPE *** (OVERHEAD) (B)
152420000-E	610	24,941	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5D	411000000-N	904	7	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
156000000-E	620	880	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	411400000-N	904	1	EA	SIGN ERECTION, MILEMARKERS
156500000-E	620	1,021	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22	411610000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (A)
157000000-E	620	1,372	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 76-22	411610000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (B)
169300000-E	654	400	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	413800000-N	907	2	EA	DISPOSAL OF SUPPORT, STEEL BEAM
184000000-E	665	81,898	LF	MILLED RUMBLE STRIPS (ASPHALT CEMENT CONCRETE)	414900000-N	907	4	EA	DISPOSAL OF SIGN SYSTEM, OVERHEAD
225300000-E	840	1.56	CY	PIPE COLLARS	415200000-N	907	5	EA	DISPOSAL OF SIGN SYSTEM, STEEL BEAM
228600000-N	840	17	EA	MASONRY DRAINAGE STRUCTURES	415500000-N	907	5	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
230800000-E	840	8.3	LF	MASONRY DRAINAGE STRUCTURES	415700000-N	907	1	EA	STOCKPILE SIGN SYSTEM, WOOD
236420000-N	840	17	EA	FRAME WITH TWO GRATES, STD 840.20	440000000-E	1110	457	SF	WORK ZONE SIGNS (STATIONARY)
239600000-N	840	3	EA	FRAME WITH COVER, STD 840.54	440500000-E	1110	1,349	SF	WORK ZONE SIGNS (PORTABLE)
254900000-E	846	30	LF	2'-6" CONCRETE CURB & GUTTER	441000000-E	1110	188	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
255600000-E	846	2,150	LF	SHOULDER BERM GUTTER					
272400000-E	857	50	LF	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED					

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STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No. R-2000 AF, ETC. SHEET No. 2. (2 of 2)

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
5155000000-E	1409	50	LF	ELECTRICAL DUCT, TYPE BD, SIZE ***** (2")	5255000000-N	1413	Lump Sum		PORTABLE LIGHTING
5155000000-E	1409	150	LF	ELECTRICAL DUCT, TYPE BD, SIZE ***** (3")	5270000000-N	SP	1	EA	GENERIC LIGHTING ITEM 120' HIGH MOUNT STANDARD
5160000000-E	1409	200	LF	ELECTRICAL DUCT, TYPE JA, SIZE ***** (2")	5270000000-N	SP	5	EA	GENERIC LIGHTING ITEM 80' HIGH MOUNT STANDARD
5160000000-E	1409	40	LF	ELECTRICAL DUCT, TYPE JA, SIZE ***** (3")	5270000000-N	SP	1	EA	GENERIC LIGHTING ITEM LIGHT CONTROL EQUIPMENT, RW, 2 40/480V
5160000000-E	1409	40	LF	ELECTRICAL DUCT, TYPE JA, SIZE ***** (4")	5270000000-N	SP	1	EA	GENERIC LIGHTING ITEM RELOCATE CONTROL SYSTEM
5160000000-E	1409	50	LF	ELECTRICAL DUCT, TYPE JA, SIZE ***** (6")	6000000000-E	1605	18,500	LF	TEMPORARY SILT FENCE
5170000000-E	1410	265	LF	** #8 W/G FEEDER CIRCUIT (2)	6006000000-E	1610	1,000	TON	STONE FOR EROSION CONTROL, CLASS A
5175000000-E	1410	55	LF	** #6 W/G FEEDER CIRCUIT (2)	6009000000-E	1610	2,700	TON	STONE FOR EROSION CONTROL, CLASS B
5180000000-E	1410	210	LF	** #4 W/G FEEDER CIRCUIT (2)	6012000000-E	1610	1,350	TON	SEDIMENT CONTROL STONE
5205000000-E	1410	1,775	LF	** #8 W/G FEEDER CIRCUIT IN ***** CONDUIT (2, 1.5")	6015000000-E	1615	51	ACR	TEMPORARY MULCHING
5210000000-E	1410	1,530	LF	** #6 W/G FEEDER CIRCUIT IN ***** CONDUIT (2, 1.5")	6018000000-E	1620	950	LB	SEED FOR TEMPORARY SEEDING
5215000000-E	1410	620	LF	** #4 W/G FEEDER CIRCUIT IN ***** CONDUIT (2, 1.5")	6021000000-E	1620	4.75	TON	FERTILIZER FOR TEMPORARY SEEDING
5240000000-N	1411	9	EA	ELECTRICAL JUNCTION BOXES ***** (PC18)	6024000000-E	1622	2,100	LF	TEMPORARY SLOPE DRAINS
5240000000-N	1411	3	EA	ELECTRICAL JUNCTION BOXES ***** (PC30)	6027000000-N	1622	12	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
5240000000-N	1411	1	EA	ELECTRICAL JUNCTION BOXES ***** (PC36)	6029000000-E	SP	2,000	LF	SAFETY FENCE
5252000000-N	1412	8	EA	UNDERPASS LUMINARIES ***** (150W HPS)	6030000000-E	1630	5,800	CY	SILT EXCAVATION
5253000000-N	1412	Lump Sum		UNDERPASS CIRCUITRY AT ***** (UPL-1, PAGE ROAD)	6036000000-E	1631	60,000	SY	MATTING FOR EROSION CONTROL
					6037000000-E	SP	100	SY	COIR FIBER MAT
					6038000000-E	SP	1,650	SY	PERMANENT SOIL REINFORCEMENT MAT
					6042000000-E	1632	1,300	LF	1/4" HARDWARE CLOTH
					6071010000-E	SP	200	LF	WATTLE
					6071020000-E	SP	400	LB	POLYACRYLAMIDE (PAM)
					6071030000-E	SP	2,750	LF	COIR FIBER BAFFLES
					6071050000-E	SP	6	EA	*** SKIMMER (1-1/2")
					6084000000-E	1660	30	ACR	SEEDING & MULCHING
					6087000000-E	1660	34	ACR	MOWING
					6090000000-E	1661	400	LB	SEED FOR REPAIR SEEDING
					6093000000-E	1661	1.25	TON	FERTILIZER FOR REPAIR SEEDING
					6096000000-E	1662	700	LB	SEED FOR SUPPLEMENTAL SEEDING
					6108000000-E	1665	20.5	TON	FERTILIZER TOPDRESSING
					6114500000-N	SP	40	MHR	SPECIALIZED HAND MOWING
					6117000000-N	SP	36	EA	RESPONSE FOR EROSION CONTROL
					6123000000-E	1670	7	ACR	REFORESTATION
					7444000000-E	1725	2,675	LF	INDUCTIVE LOOP SAWCUT
					7456000000-E	1726	200	LF	LEAD-IN CABLE (***** (14-2)

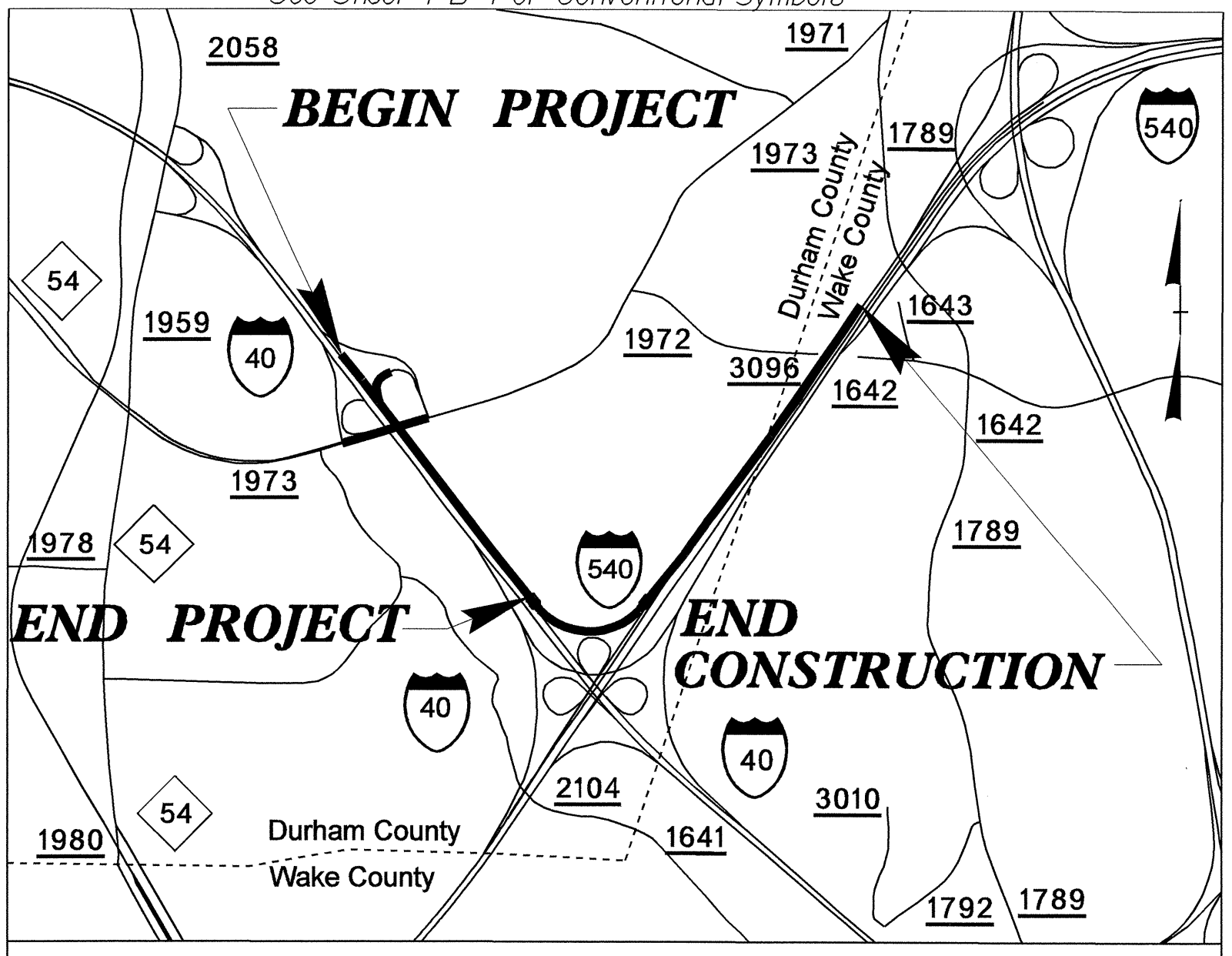
***** BEGIN SCHEDULE AA *****
***** (3 ALTERNATES) *****

0366000000-E	310	1,264	LF	15" RC PIPE CULVERTS, CLASS III
AA1				
*** OR ***				
0366000000-E	310	300	LF	15" RC PIPE CULVERTS, CLASS III
AA2				
0536000000-E	SP	964	LF	*** HDPE PIPE CULVERTS (15")
AA2				
*** OR ***				
0366000000-E	310	300	LF	15" RC PIPE CULVERTS, CLASS III
AA3				
0540000000-E	SP	964	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, *** THICK (15" *****)
AA3				

***** END SCHEDULE AA *****

09/08/09

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



VICINITY MAP

STA. 12+50.00 -L- BEGIN TIP PROJECT R-2000AF

STA. 50+88.15 -L- END TIP PROJECT R-2000AF

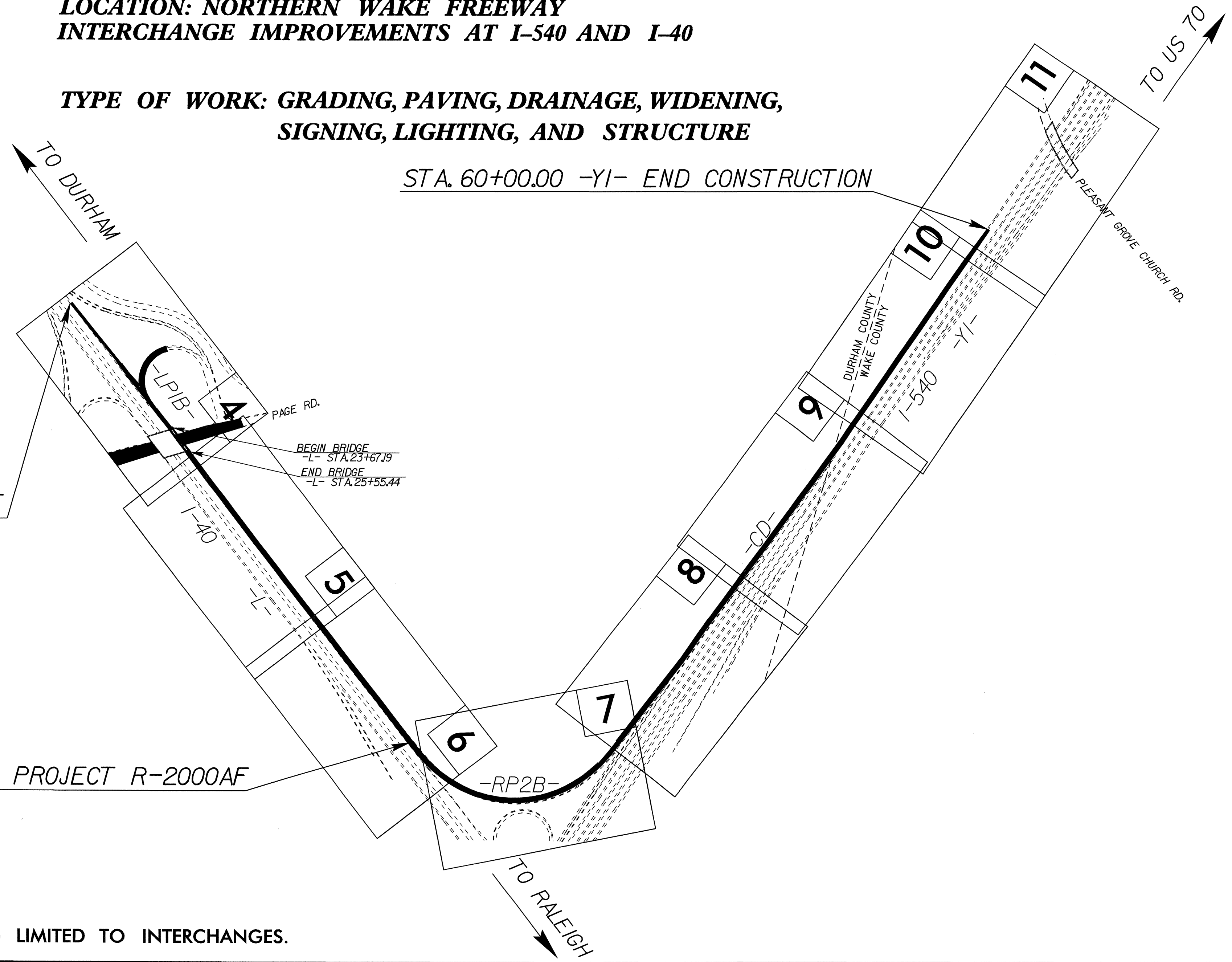
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

WAKE & DURHAM COUNTIES

**LOCATION: NORTHERN WAKE FREEWAY
INTERCHANGE IMPROVEMENTS AT I-540 AND I-40**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, WIDENING,
SIGNING, LIGHTING, AND STRUCTURE**

STA. 60+00.00 -YI- END CONSTRUCTION



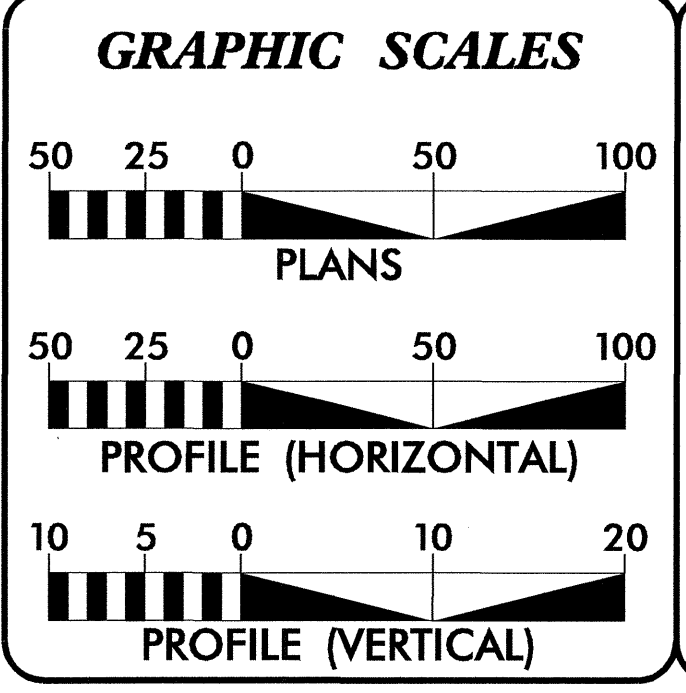
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
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STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34365.1.30	NHF-0540(13)	PE	
34365.2.31	NHF-0540(13)	ROW & UTIL.	
34365.3.ST1	STM-0540(15)	CONST.	

TIP PROJECT: R-2000AF

CONTRACT: C202277

NAD 83/NSRS 2007



DESIGN DATA

ADT 2010 =	172,900
ADT 2030 =	190,200
DHV =	11 %
D =	60 %
T =	12 % *
V =	70 MPH

* (TTST 6% + DUAL 6%)
FUNC CLASS - INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT R-2000AF	=	0.691 MILES
LENGTH STRUCTURES STATE PROJECT R-2000AF	=	0.036 MILES
TOTAL LENGTH STATE PROJECT R-2000AF	=	0.727 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 20, 2009

LETTING DATE:
JANUARY 19, 2010

BRENDA MOORE, P.E.
PROJECT ENGINEER

THAD F. DUNCAN, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER:
W. Halpin Cail
SEAL 022000

ROADWAY DESIGN ENGINEER:
Thad F. Duncan
SEAL 25477

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER

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Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	⊗
Foundation	▭
Area Outline	▭
Cemetery	▭ †
Building	▭
School	▭
Church	▭
Dam	▭

HYDROLOGY:

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

RAILROADS:

Standard Gauge	----- CSX TRANSPORTATION
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
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	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Utility Easement	----- PUE
Proposed Permanent Easement with Iron Pin and Cap Marker	-----

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

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

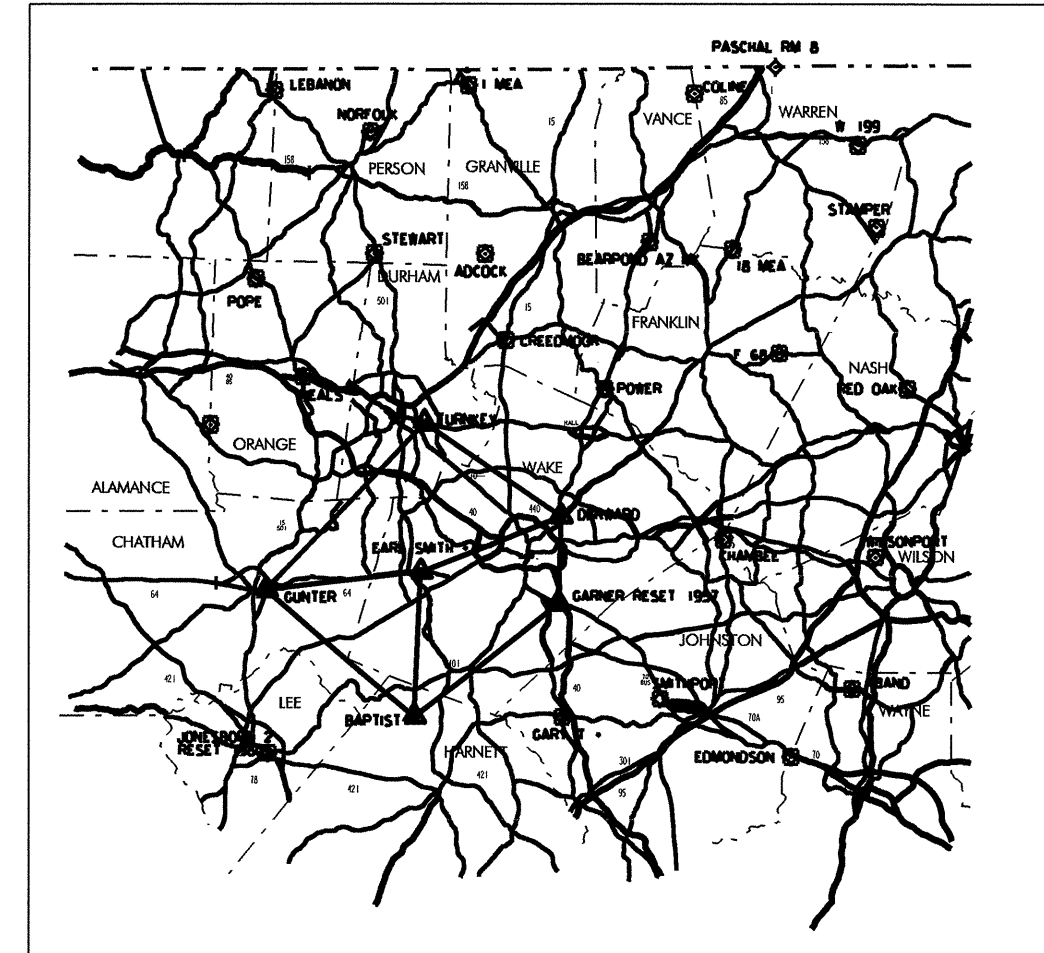
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊗
Utility Unknown U/G Line	----- ?UTL
U/G Tank; Water, Gas, Oil	▭
A/G Tank; Water, Gas, Oil	▭
U/G Test Hole (S.U.E.*)	⊗
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

SURVEY CONTROL SHEET R-2000-AF

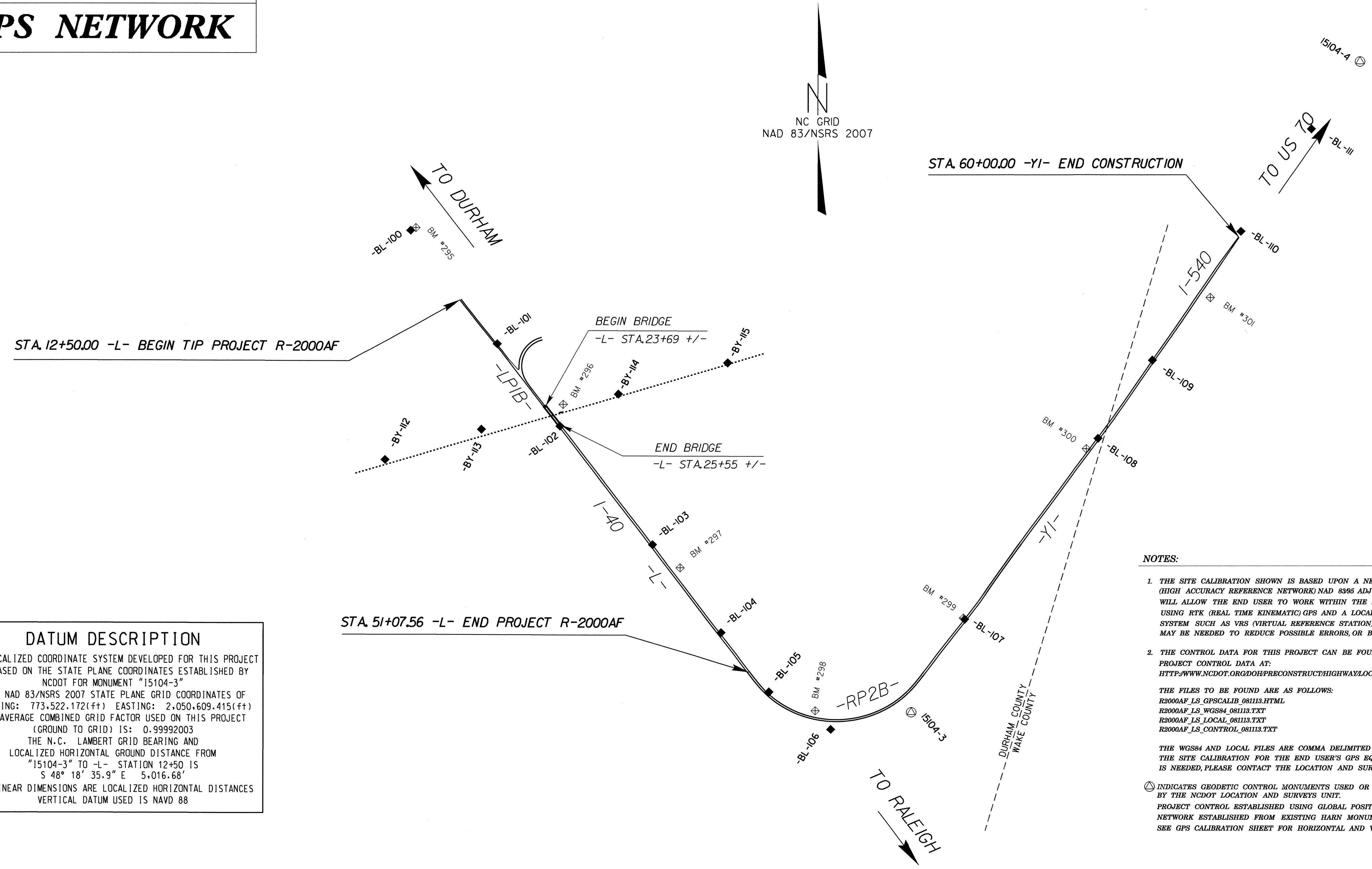
WAKE & DURHAM COUNTIES

NORTHERN WAKE FREEWAY
INTERCHANGE IMPROVEMENTS AT I-540 AND I-40

R-2000AF



GPS NETWORK



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "15104-3"

WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 773,522.172(±ft) EASTING: 2,050,609.415(±ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99992003

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "15104-3" TO -L- STATION 12+50 IS
S 48° 18' 35.9" E 5,016.68'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

- NOTES:**
1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/NSRS ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
 2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/doh/preconstruct/highway/location/project/)
- THE FILES TO BE FOUND ARE AS FOLLOWS:
R2000AF_LS_GPSCALIB_081113.HTML
R2000AF_LS_WGS84_081113.TXT
R2000AF_LS_LOCAL_081113.TXT
R2000AF_LS_CONTROL_081113.TXT
- THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. 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.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

22-OCT-2009 14:38 R:\projects\2000af_1s_ib.dgn

11/13/08k4

SURVEY CONTROL SHEET R-2000-AF

PROJECT REFERENCE NO.	SHEET NO.
R-2000-AF	1C
Location and Surveys	

GPS Calibration Report
 Project : R2000AF CALIBRATION
 TIP Number
 User name: greenDate & Time: 2:38:22 PM 10/23/2008
 Coordinate System: Projection from data collector (at ground)
 Zone from data collector
 Horizontal Datum (WGS 84)
 Vertical Datum Geoid Model G03NC
 Coordinate Units US survey feet
 Distance Units US survey feet
 Height Units US survey feet

LOCAL SITE INFORMATION
 Localized ground
 Latitude 35° 52' 30.81121"N
 Longitude 78° 49' 45.01392"W
 Site Scale Factor 1.0000799800
 Height 247.948sft

The North Carolina Department of Transportation uses a Localized Coordinate System which is very similar to North Carolina Zone 3200 from which it is derived. Please take care in utilizing these coordinates to eliminate confusion of the two systems. This file is to aid in the use of Real Time Kinematic (RTK) GPS during construction layout.

Datum Transformation Parameters
 Datum Transformation computation not requested

Updated Default Projection (Transverse Mercator) Definition
 Updated default projection not requested

Horizontal Adjustment Parameters
 Northing coordinate of rotation center 777912.147sft
 Easting coordinate of rotation center 2050033.982sft
 Rotation about the center point 0°00'01"
 Translation north 0.342sft
 Translation east -0.032sft
 Scale factor 1.00009042

Vertical Adjustment Parameters
 Northing coordinate of origin point 780077.842sft
 Easting coordinate of origin point 2055065.753sft
 Vertical separation at origin -0.010sft
 Slope north 5.292ppm
 Slope east -2.654ppm

Geoid Model Definition
 G03NC

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary	Point
Maximum error	15104-2 gps
Horizontal 0.097sft	15104-4 gps
Vertical 0.018sft	15104-2 gps
Three-dimensional 0.097sft	15104-2 gps

WGS84 Coordinates	Calculated point FOR DISPLAY ONLY	Local Coordinates
Point 15104-5 gps Latitude 35° 53' 35.55671"N Longitude 78° 48' 50.72275"W Height 283.341sft	Northing 780077.842sft Easting 2055065.753sft Elevation 388.038sft Horz error 0.056sft Vert error 0.015sft 3D error 0.058sft	Point 15104-5 Northing 780077.789sft Easting 2055065.734sft Elevation 388.023sft Utilized Horz and Vert Quality Control quality
Point 15104-4 gps Latitude 35° 53' 23.58142"N Longitude 78° 49' 00.37047"W Height 278.449sft	Northing 778865.304sft Easting 2054274.081sft Elevation 383.137sft Horz error 0.073sft Vert error 0.018sft 3D error 0.075sft	Point 15104-4 Northing 778865.357sft Easting 2054274.130sft Elevation 383.155sft Utilized Horz and Vert Quality Control quality
Point 15104-3 gps Latitude 35° 52' 30.81145"N Longitude 78° 49' 45.01368"W Height 247.951sft	Northing 773522.139sft Easting 2050609.439sft Elevation 352.589sft Horz error 0.041sft Vert error 0.003sft 3D error 0.041sft	Point 15104-3 Northing 773522.172sft Easting 2050609.415sft Elevation 352.586sft Utilized Horz and Vert Quality Control quality
Point 15104-2 gps Latitude 35° 53' 21.48814"N Longitude 78° 50' 45.79506"W Height 255.277sft	Northing 778638.909sft Easting 2045598.744sft Elevation 359.638sft Horz error 0.097sft Vert error 0.000sft 3D error 0.097sft	Point 15104-2 Northing 778638.871sft Easting 2045598.833sft Elevation 359.638sft Utilized Horz and Vert Quality Control quality
Point 15104-1 gps Latitude 35° 53' 19.71655"N Longitude 78° 50' 57.67066"W Height 290.467sft	Northing 778458.252sft Easting 2044621.734sft Elevation 394.795sft Horz error 0.097sft Vert error 0.000sft 3D error 0.097sft	Point 15104-1 Northing 778458.256sft Easting 2044621.637sft Elevation 394.795sft Utilized Horz and Vert Quality Control quality

BENCHMARK DATA

295 N 777484 L STATION 10+00 N 20°43' W DIST 456' RRS IN 14' PINE	ELEVATION - 386.87 E 2046549	299 N 774300 Y1 STATION 21+58 169 LEFT NE ANCHOR BOLT OF SIGN BASE	ELEVATION - 335.37 E 2051036
296 N 776042 L STATION 24+42 211 LEFT RRS IN 14' PINE	ELEVATION - 349.59 E 2047757	300 N 775683 Y1 STATION 38+66 124 LEFT E ANCHOR BOLT ON SIGN BASE	ELEVATION - 396.60 E 2052039
297 N 774705 L STATION 40+87 156 LEFT RRS IN 14' PINE	ELEVATION - 378.62 E 2048716	301 N 776928 L STATION 54+64 7' RIGHT W ANCHOR BOLT OF SIGN BASE IN MEDIAN	ELEVATION - 382.99 E 2053051
298 N 773533 L STATION 56+91 319 LEFT RRS IN 12' HICKORY	ELEVATION - 358.71 E 2049823		

BASELINE DATA

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
100	BL-100	777461.5208	2046505.4506	375.32	OUTSIDE PROJECT LIMITS	
101	BL-101	776539.7819	2047215.9971	374.15	17+17.95	85.16 LT
99	NOT SET	775979.3620	2047641.5557	UNKNOWN	24+21.62	80.77 LT
102	BL-102	775861.9725	2047730.6962	368.76	25+69.02	79.86 LT
103	BL-103	774890.9982	2048489.8716	359.24	38+01.51	89.59 LT
104	BL-104	774175.6672	2049051.9088	353.24	47+11.18	98.93 LT
105	BL-105	773690.8582	2049444.5016	347.94	53+34.82	114.52 LT
106	BL-106	773379.5913	2049949.5341	349.10	OUTSIDE PROJECT LIMITS	
3	15104-3	773522.1720	2050609.4150	352.59	OUTSIDE PROJECT LIMITS	
107	BL-107	774290.2934	2051045.2964	336.42	OUTSIDE PROJECT LIMITS	

BL

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
3	15104-3	773522.1720	2050609.4150	352.59	12+75.11	81.22 LT
107	BL-107	774290.2934	2051045.2964	336.42	21+55.11	156.06 LT
108	BL-108	775768.8107	2052133.4632	358.24	39+89.87	94.61 LT
109	BL-109	776414.6691	2052579.9340	371.00	47+75.02	91.57 LT
110	BL-110	777466.4109	2053300.2643	387.80	60+49.79	92.18 LT
4	15104-4	778864.9300	2054273.8370	383.15	OUTSIDE PROJECT LIMITS	

BY

POINT	DESC.	NORTH	EAST	ELEVATION	PAGE STATION	OFFSET
112	BY-112	775581.4791	2046299.6400	377.00	OUTSIDE PROJECT LIMITS	
113	BY-113	775832.6635	2047087.3649	358.00	OUTSIDE PROJECT LIMITS	
999	NOT SET	775979.3620	2047641.5557	UNKNOWN	12+63.59	39.05 RT
114	BY-114	778129.2296	2048207.7182	335.41	OUTSIDE PROJECT LIMITS	
115	BY-115	776388.4994	2049101.5322	332.33	OUTSIDE PROJECT LIMITS	

DATUM DESCRIPTION

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NOTES:

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THE FILES TO BE FOUND ARE AS FOLLOWS:

- R2000AF_LS_GPSCALIB_081113.HTML
- R2000AF_LS_WGS84_081113.TXT
- R2000AF_LS_LOCAL_081113.TXT
- R2000AF_LS_CONTROL_081113.TXT

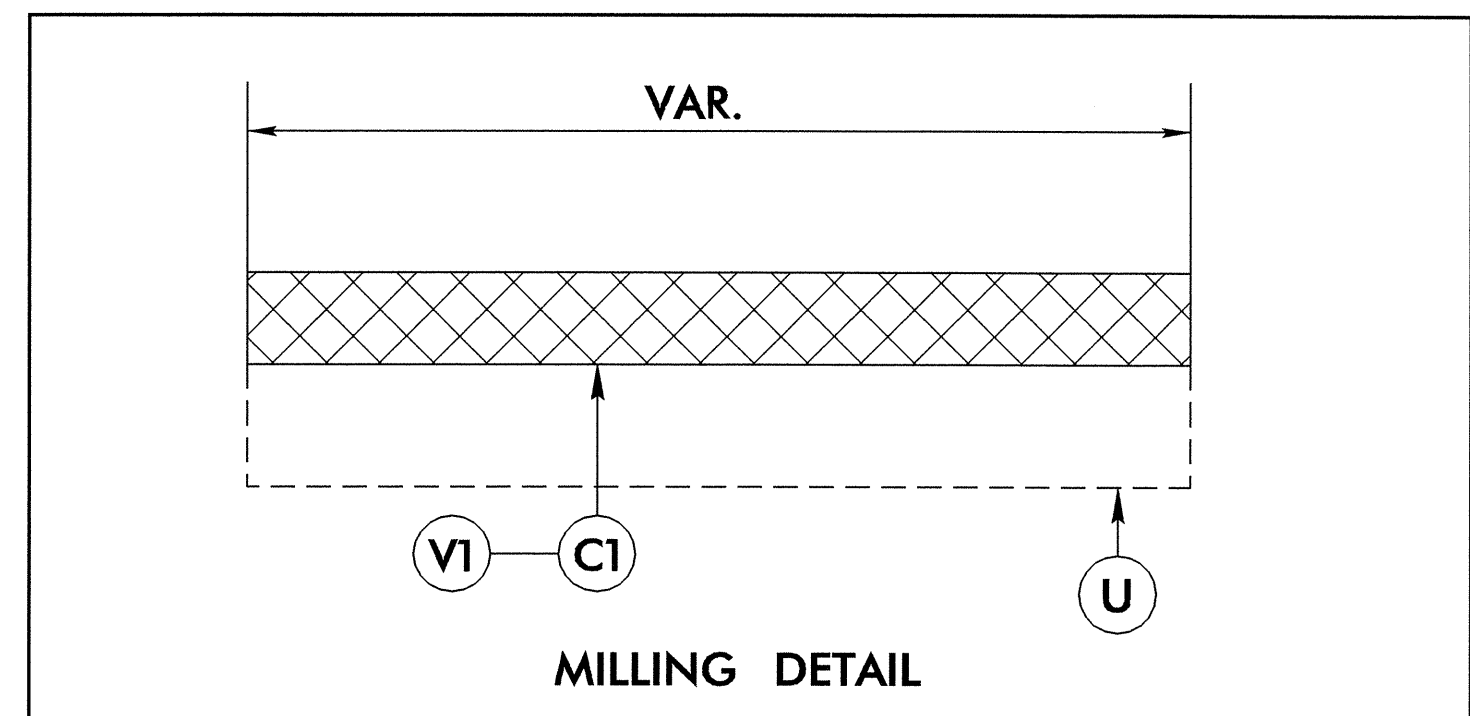
THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

© 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. NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION. SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

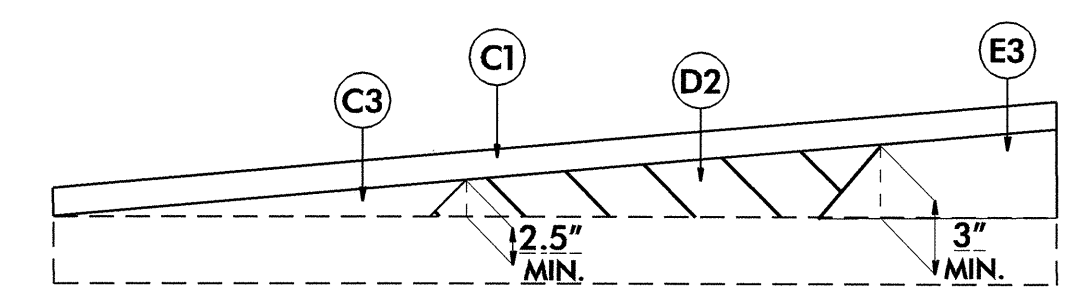
22-OCT-2009 14:40
I:\Roadwork\NCPOLY\2000af_1s_1c.dgn
11/13/08k4

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. APPROX. 11" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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 5½" IN DEPTH.
U	EXISTING PAVEMENT.
T	EARTH MATERIAL.
V1	MILLING ASPHALT PAVEMENT 1.5" DEPTH.
W	VARIABLE DEPTH ASPHALT PAVEMENT.

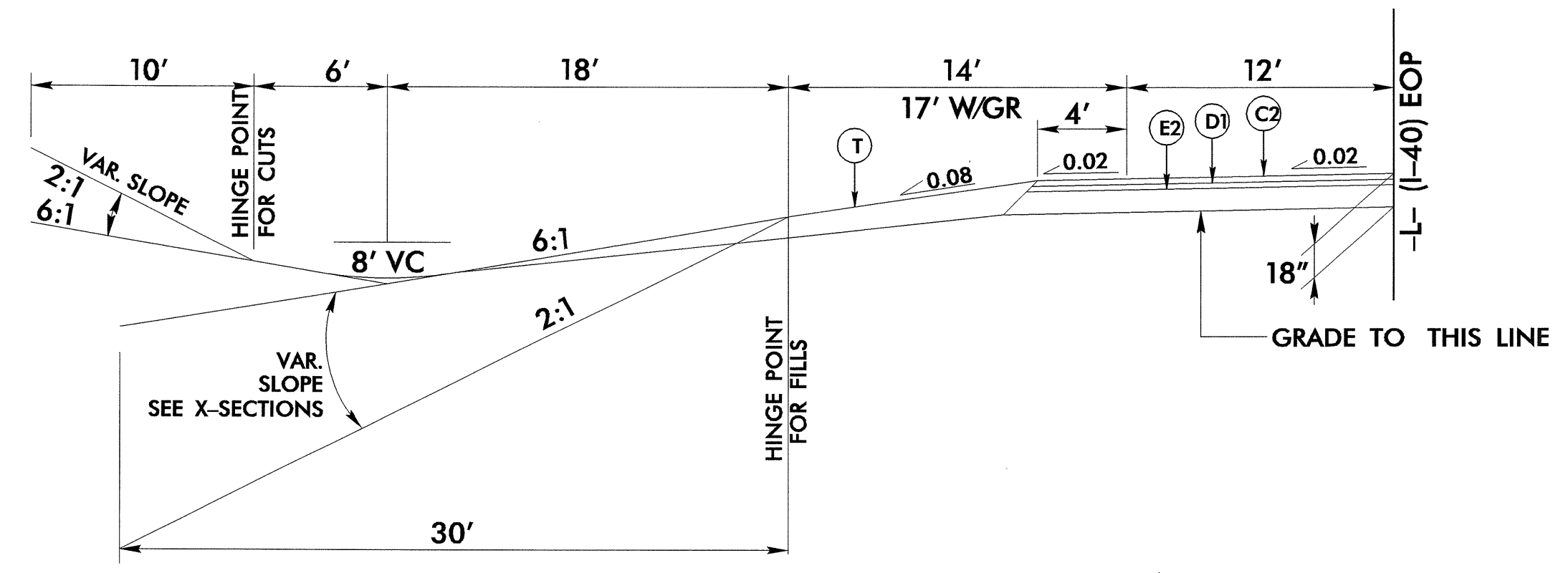
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



-LP1B- STA. 10+00 TO 12+04
 -RP2B- STA. 10+00 TO 18+50
 -CD- STA. 10+00 TO 15+00



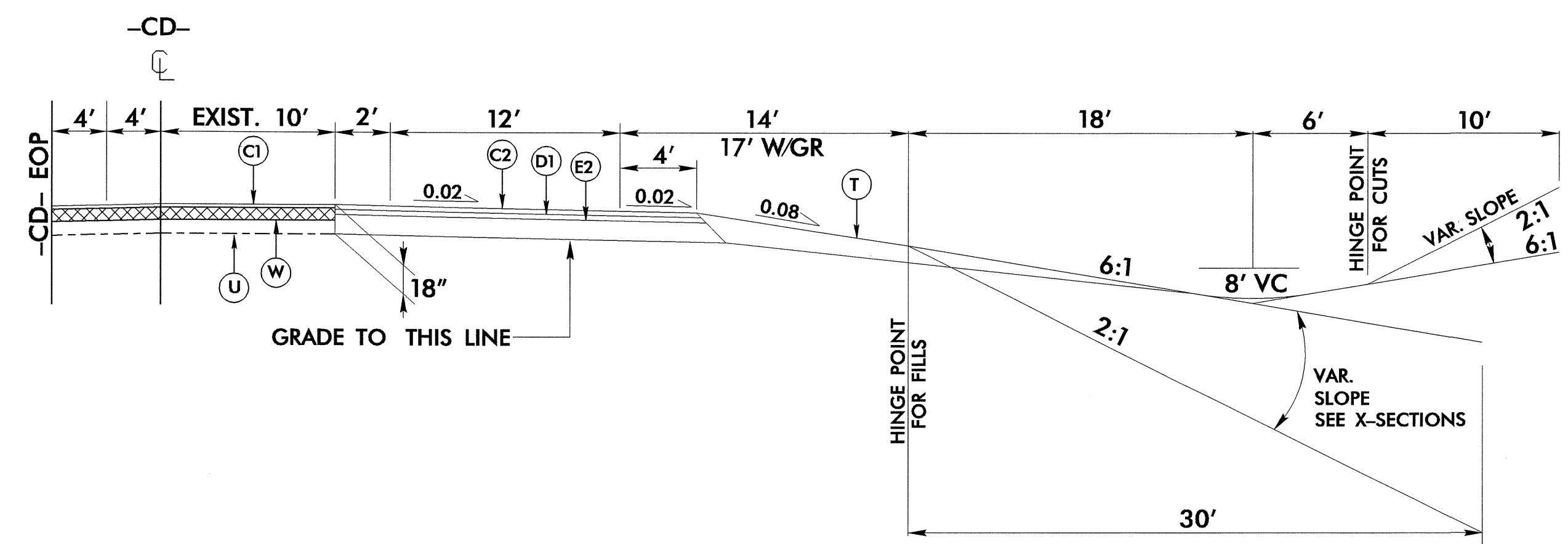
Wedging Detail For Resurfacing
 USE WITH TYPICAL SECTION NO. 2



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

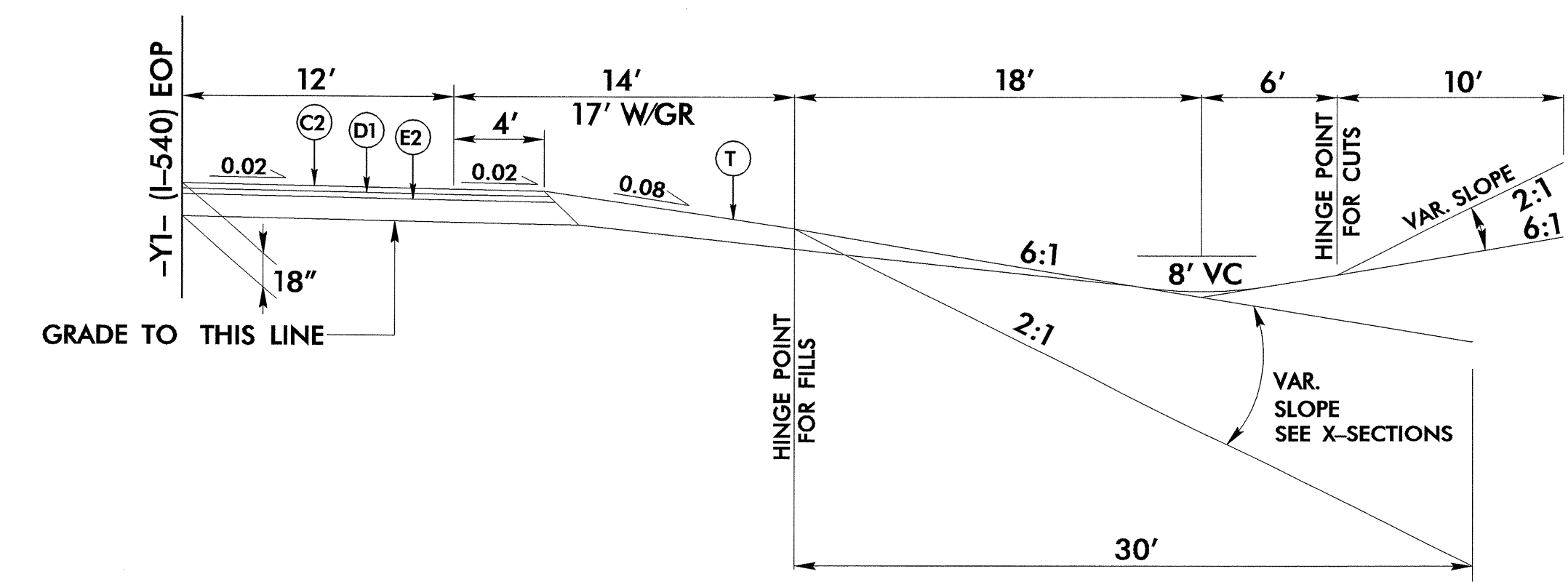
-L- STA. 12+50.00 TO 18+00.00 (TRANSITION FROM EXIST.)
 -L- STA. 18+00.00 TO 23+67.19 (BEGIN BRIDGE)
 -L- STA. 25+55.44 (END BRIDGE) TO 50+88.15
 *-L- STA. 12+50.00 TO 19+91.16 USE 10' PAVED SHLD.



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

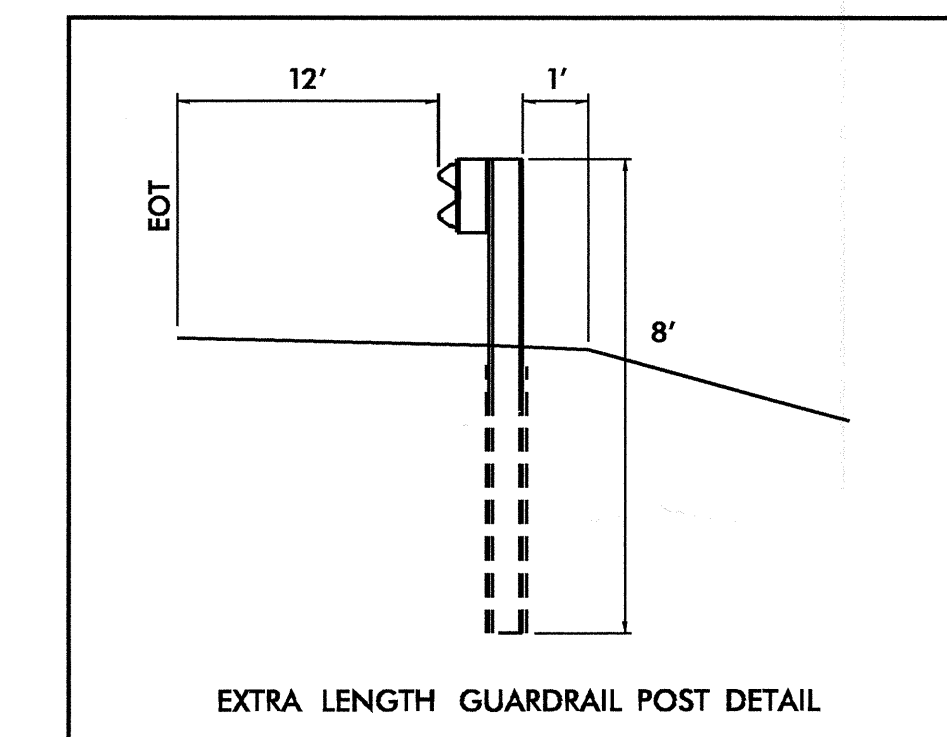
-CD- STA. 10+00.00 TO 36+79.71



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

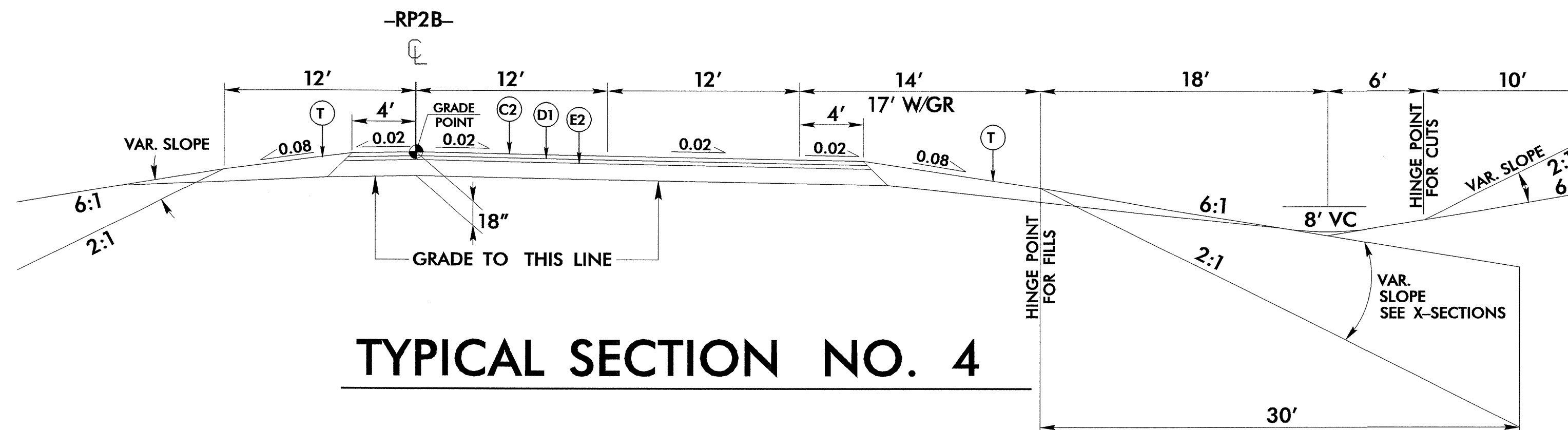
-Y1- STA. 42+07.84 TO 57+00.00
 -Y1- STA. 57+00.00 TO 60+00.00 (TAPER TO EXIST.)



-Y1- STA. 20+62.54 LT TO 23+43.79 LT

6/2/99
23-OCT-2009 08:17 2000af_rdy_tup.dgn

C1	1.5" S9.5C
C2	3" S9.5C
C3	VAR. S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E1	5" B25.0C
E2	11" B25.0C
E3	VAR. B25.0C
U	EXIST PAVEMENT
T	EARTH MATERIAL
W	WEDGING

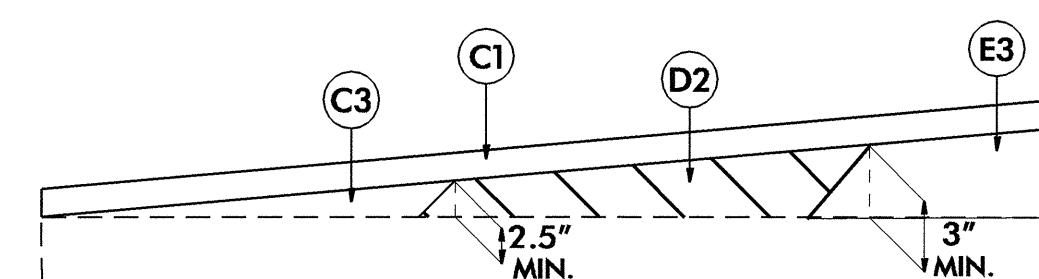


TYPICAL SECTION NO. 4

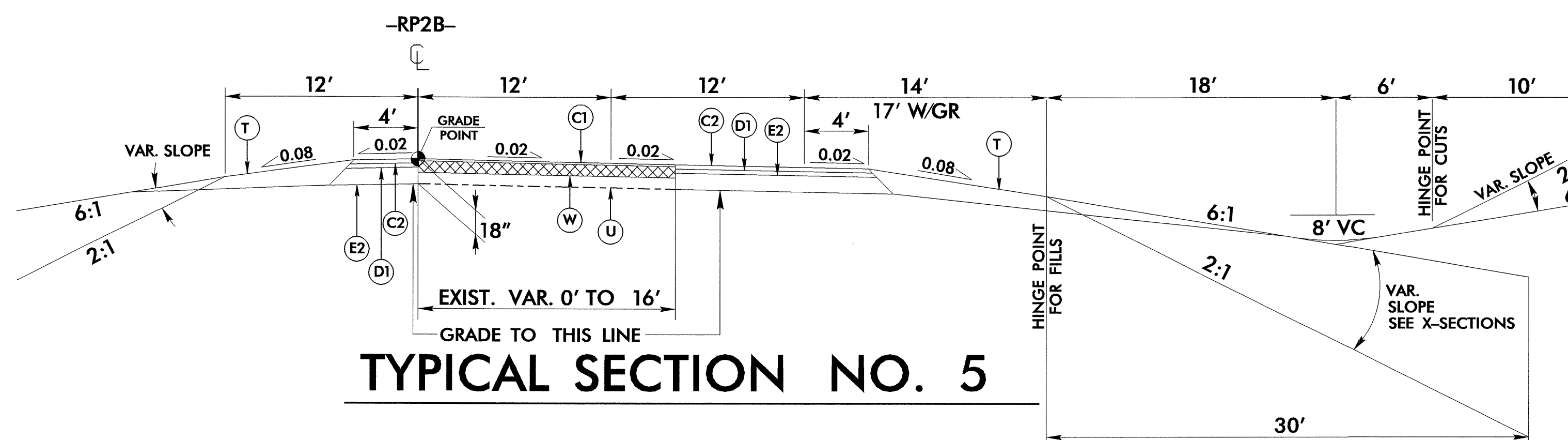
USE TYPICAL SECTION NO. 4

-RP2B- STA. 25+00.00 TO 28+50.00

-RP2B- STA. 30+04.00 TO 32+23.57



Wedging Detail For Resurfacing
USE WITH TYPICAL SECTION NO. 5 & NO. 6

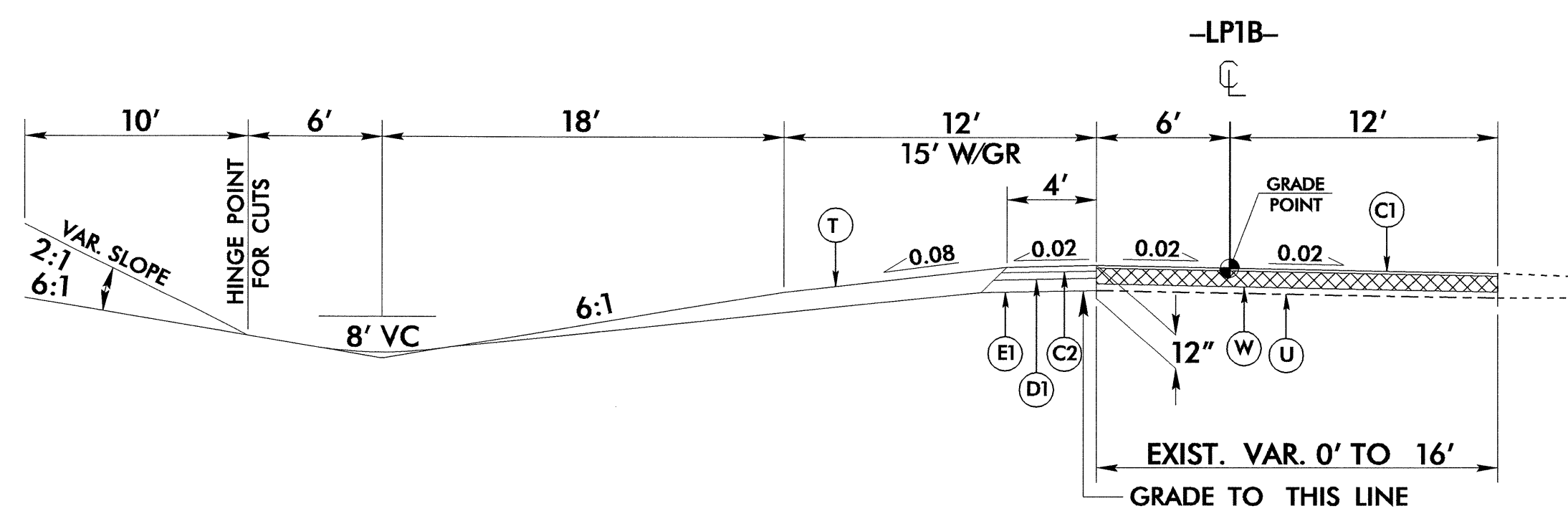


TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

-RP2B- STA. 10+00.00 TO 25+00.00

-RP2B- STA. 28+50.00 TO 30+04.00



TYPICAL SECTION NO. 6

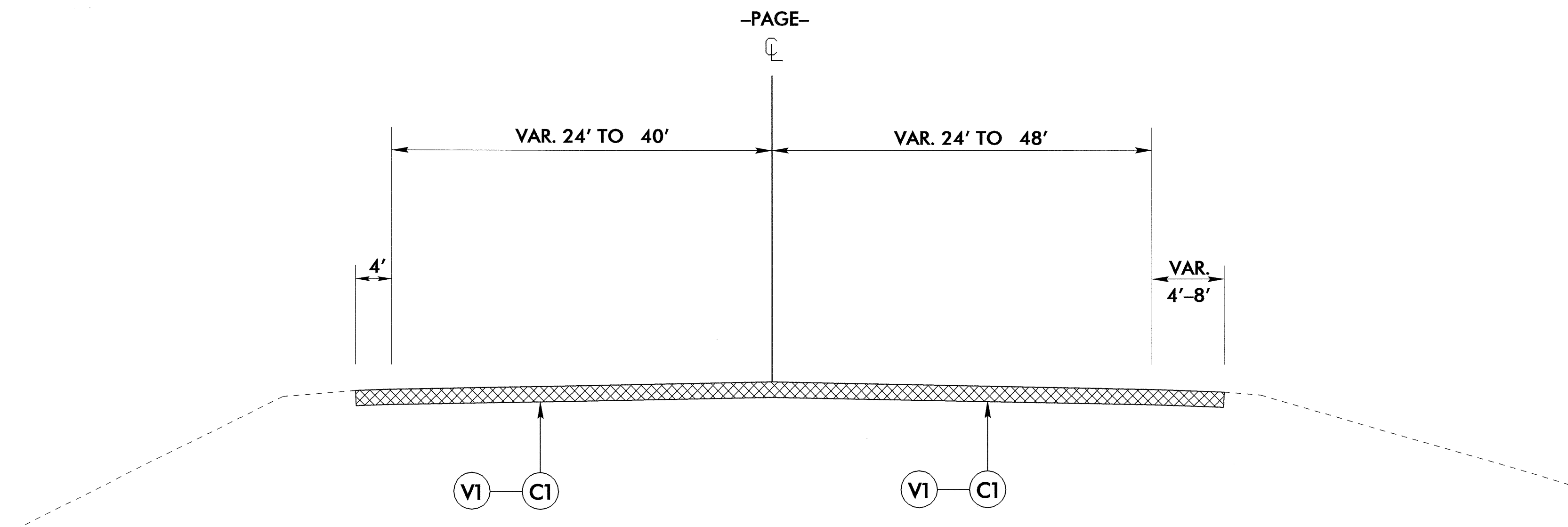
USE TYPICAL SECTION NO. 6

-LP1B- STA. 10+00.00 TO 15+36.00

6/2/09

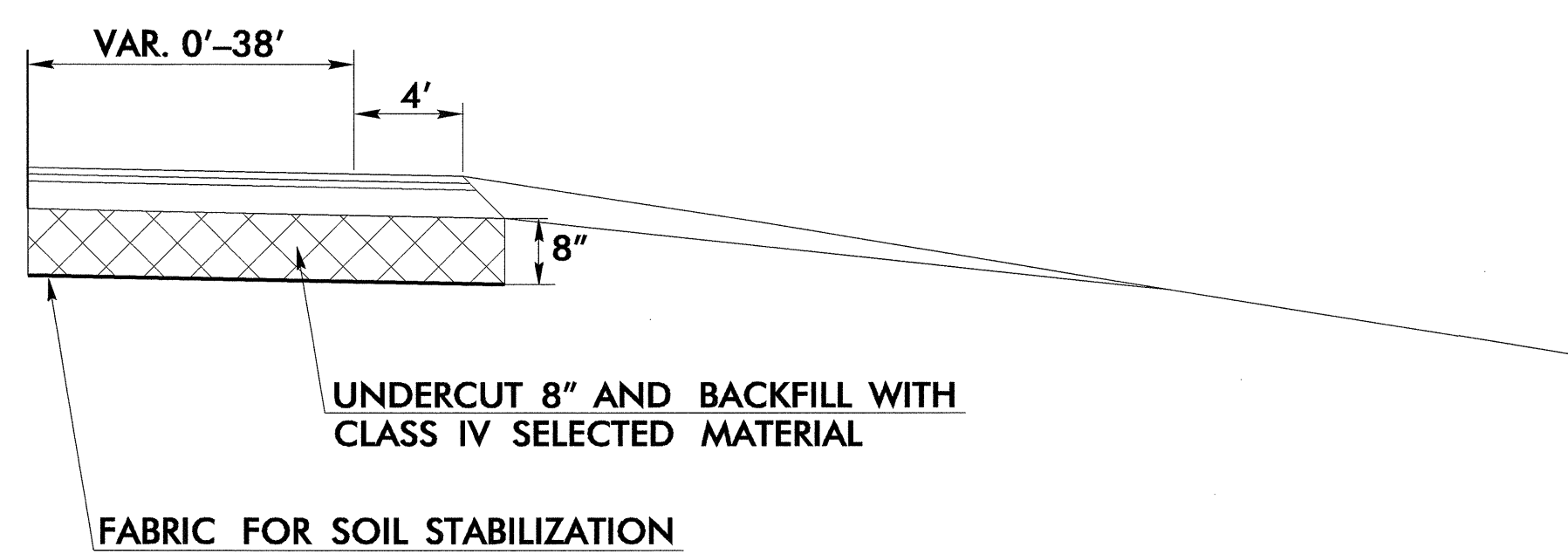
C1	1.5" S9.5C
V1	MILLING 1.5" DEPTH

PROJECT REFERENCE NO. R-2000AF	SHEET NO. 2-B
ROADWAY DESIGN ENGINEER THAD F. DUNCAN 10-26-09	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON 10/26/09



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7
-PAGE- STA. 8+29.00 TO 20+58.00



SHALLOW UNDERCUT DETAIL

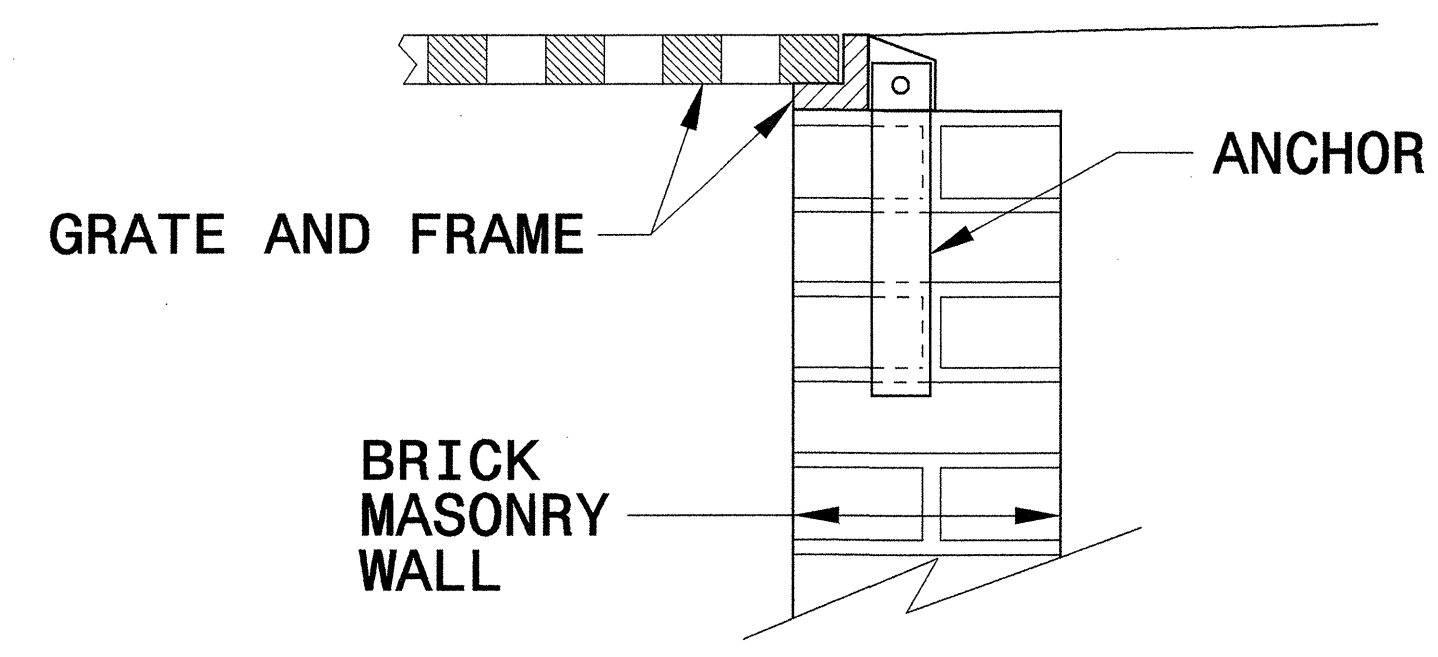
USE SHALLOW UNDERCUT DETAIL
-L- STA. 50+00.00 TO 51+07.00 LT.
-RP2B- STA. 10+00.00 TO 32+04.16 RT.
-RP2B- STA. 15+50.00 TO 29+0.00 LT.
-Y1- STA. 42+07.00 TO 60+00.00 LT.

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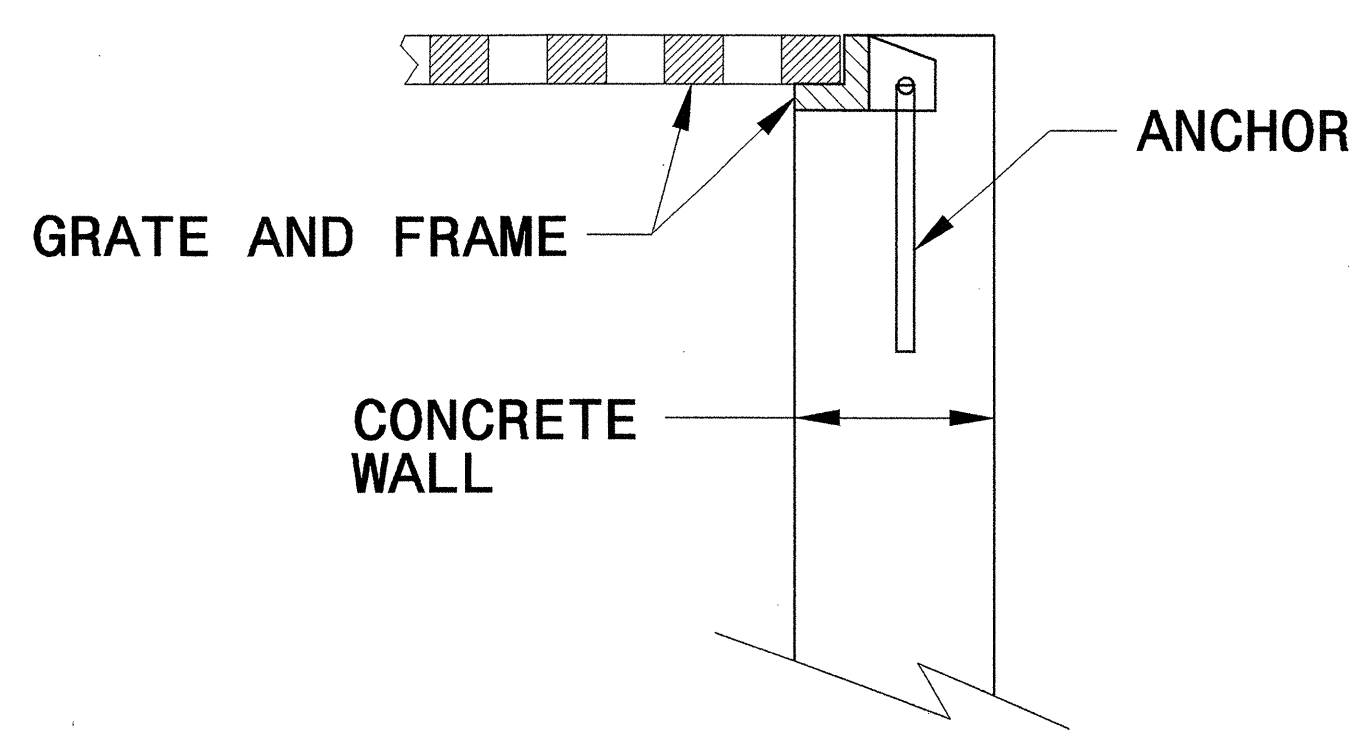
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

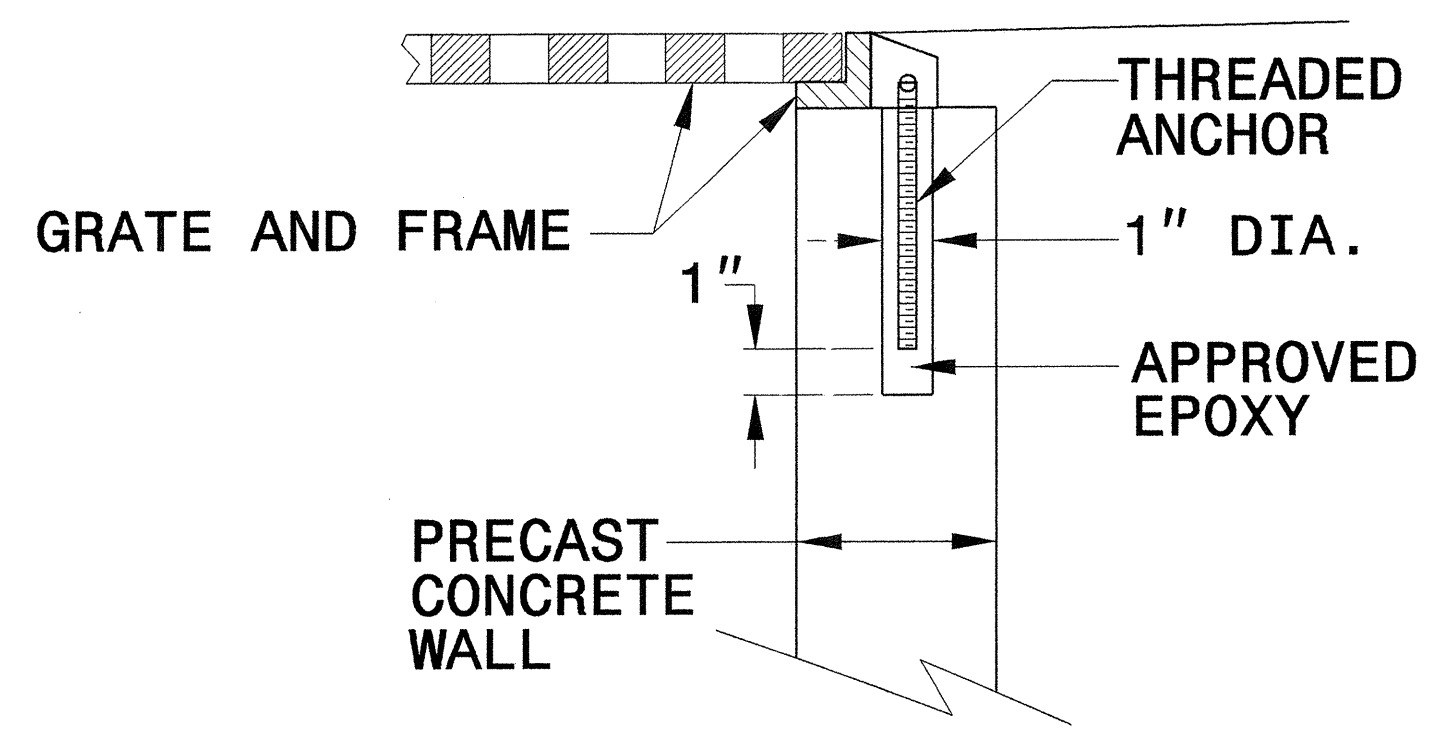
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



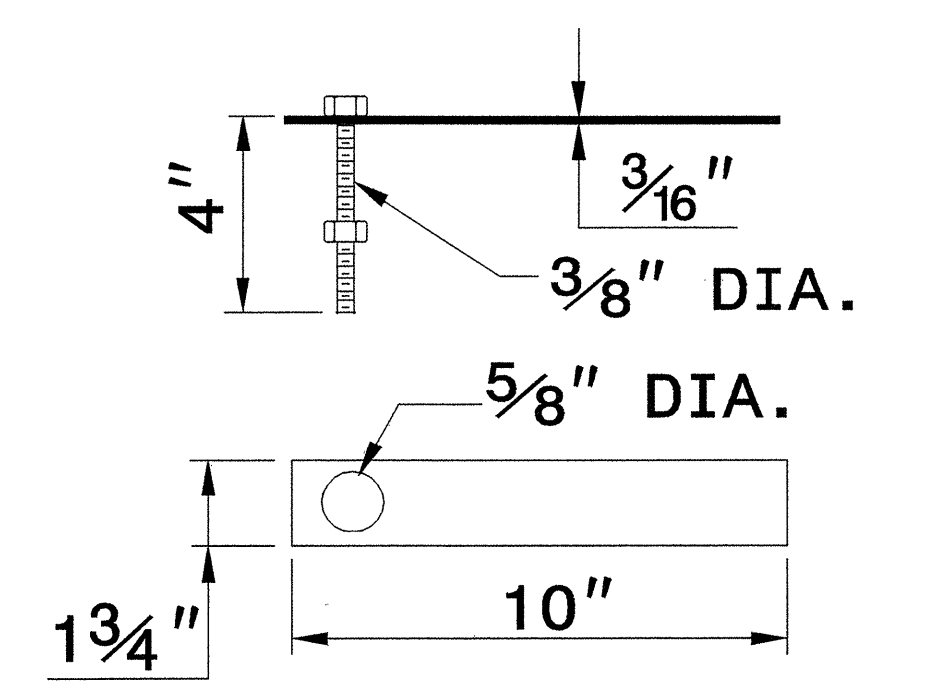
CONCRETE CONSTRUCTION



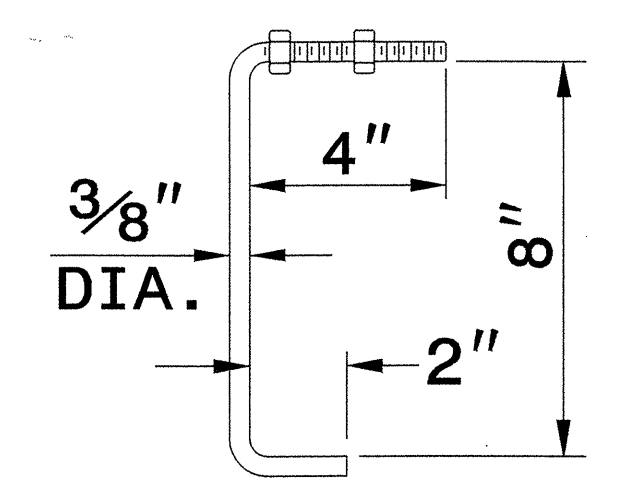
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

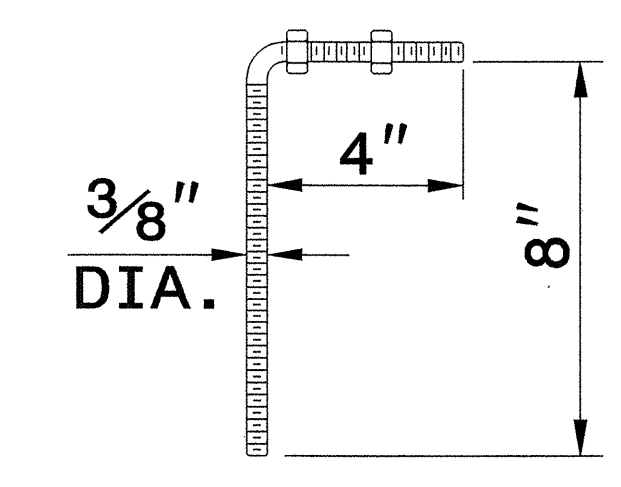
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



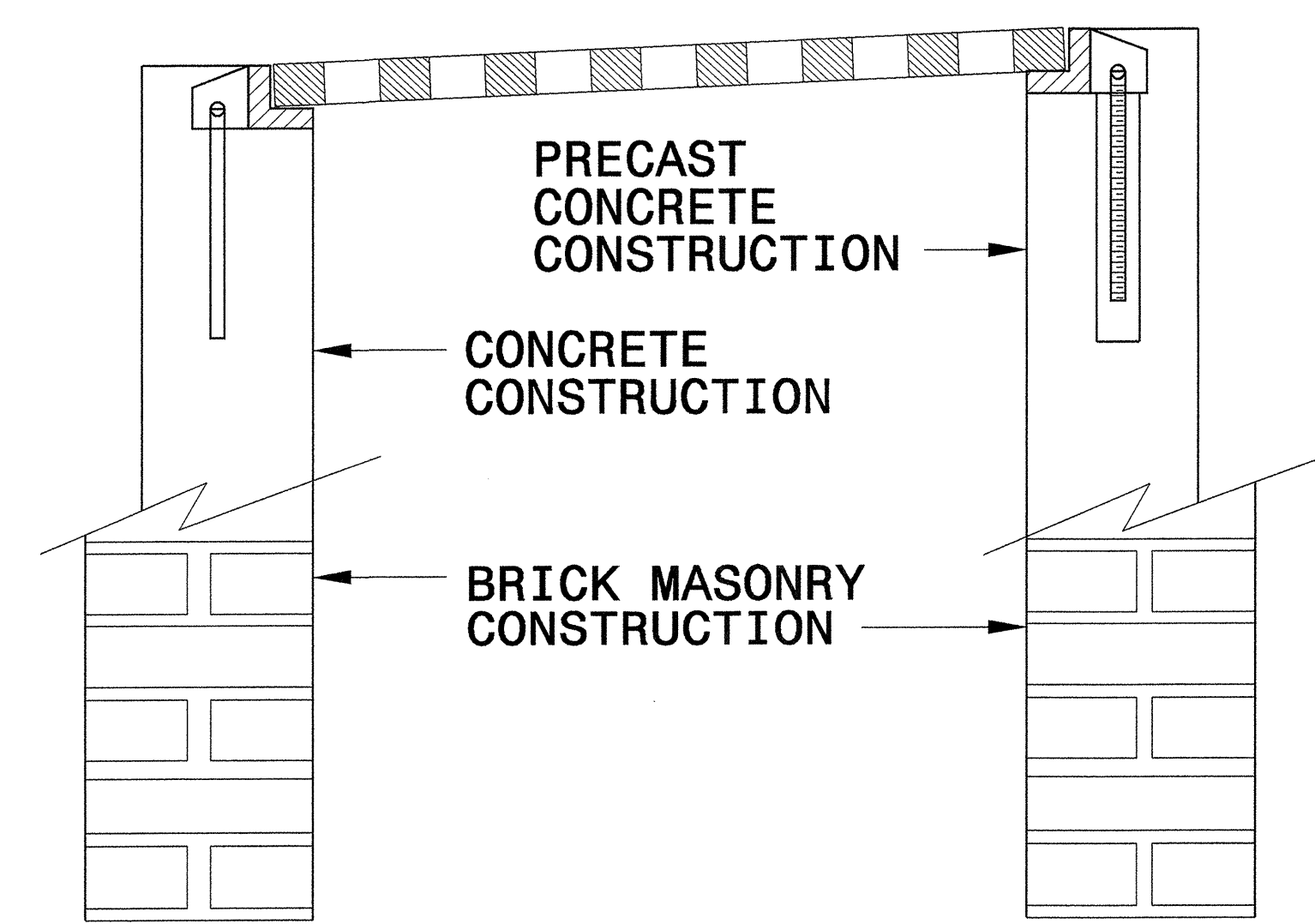
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR

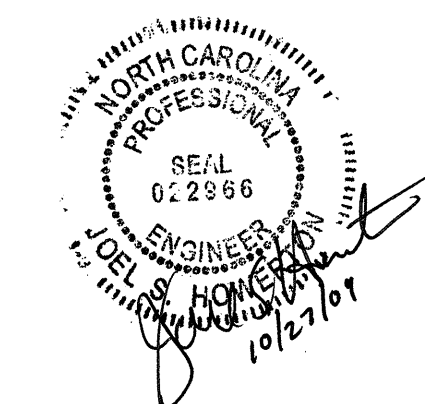


FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

STATE OF NORTH CAROLINA
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ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25



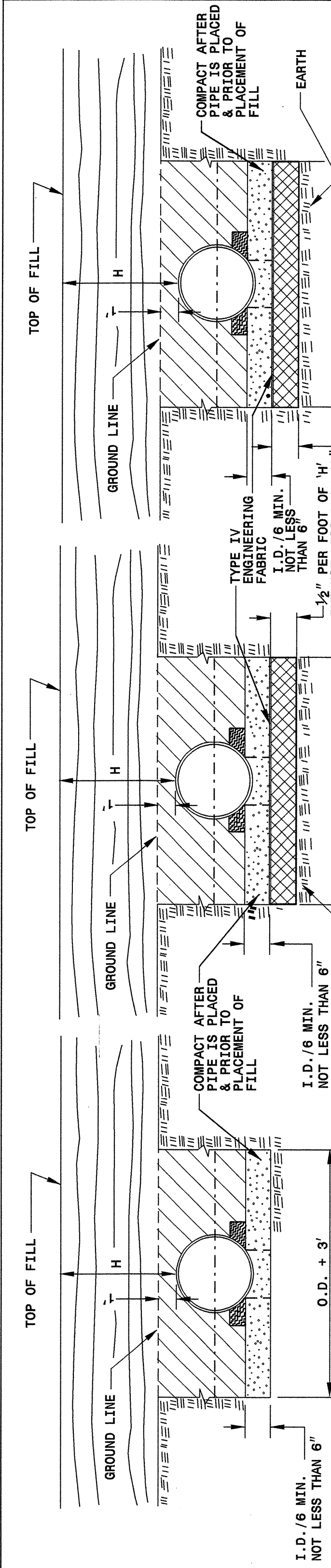
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

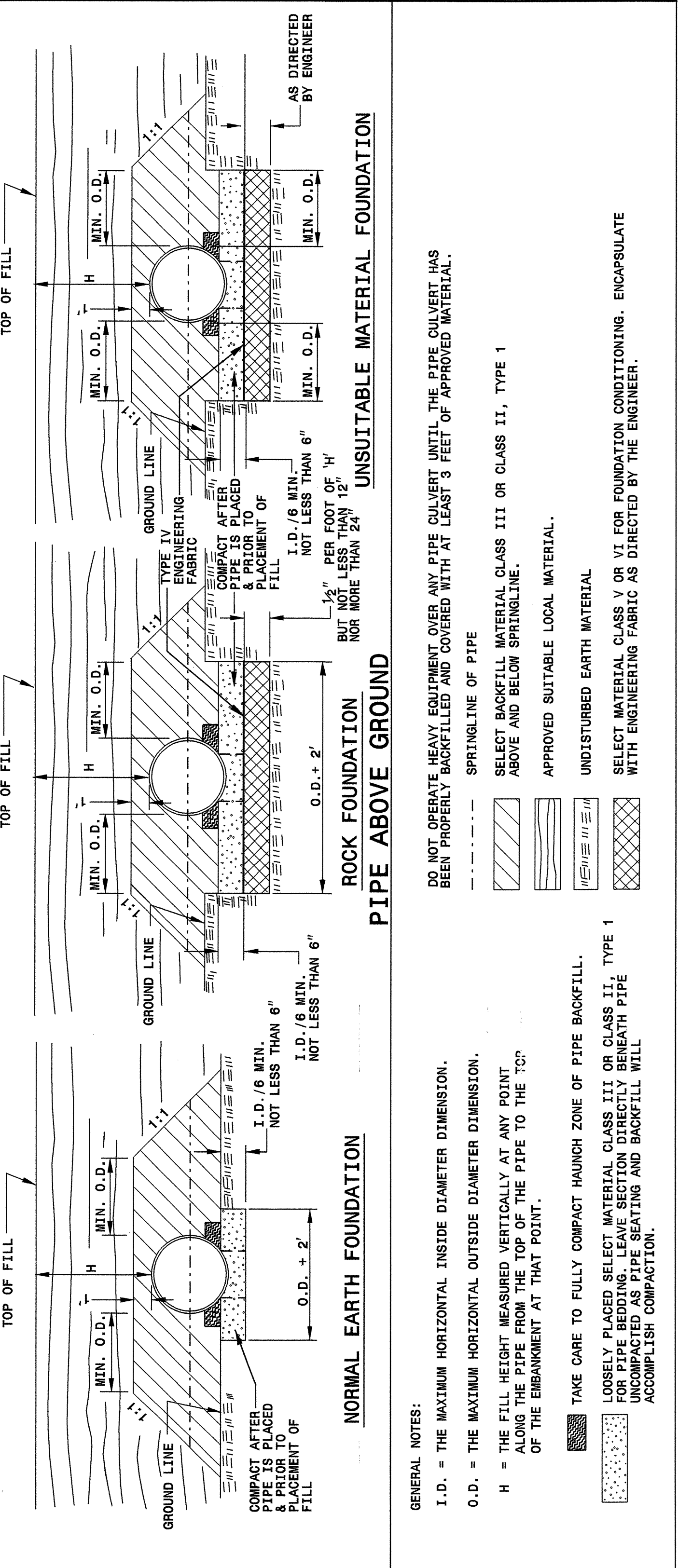
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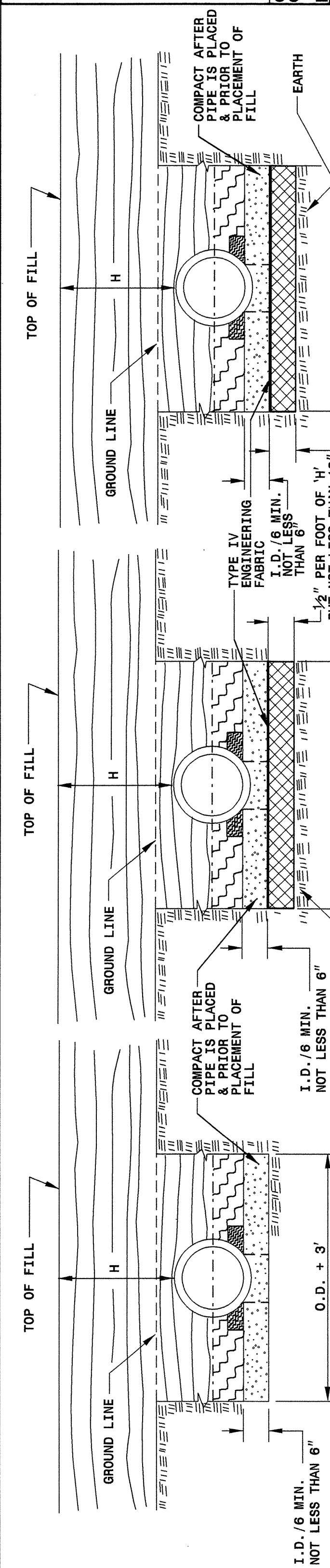


ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION FLEXIBLE PIPE



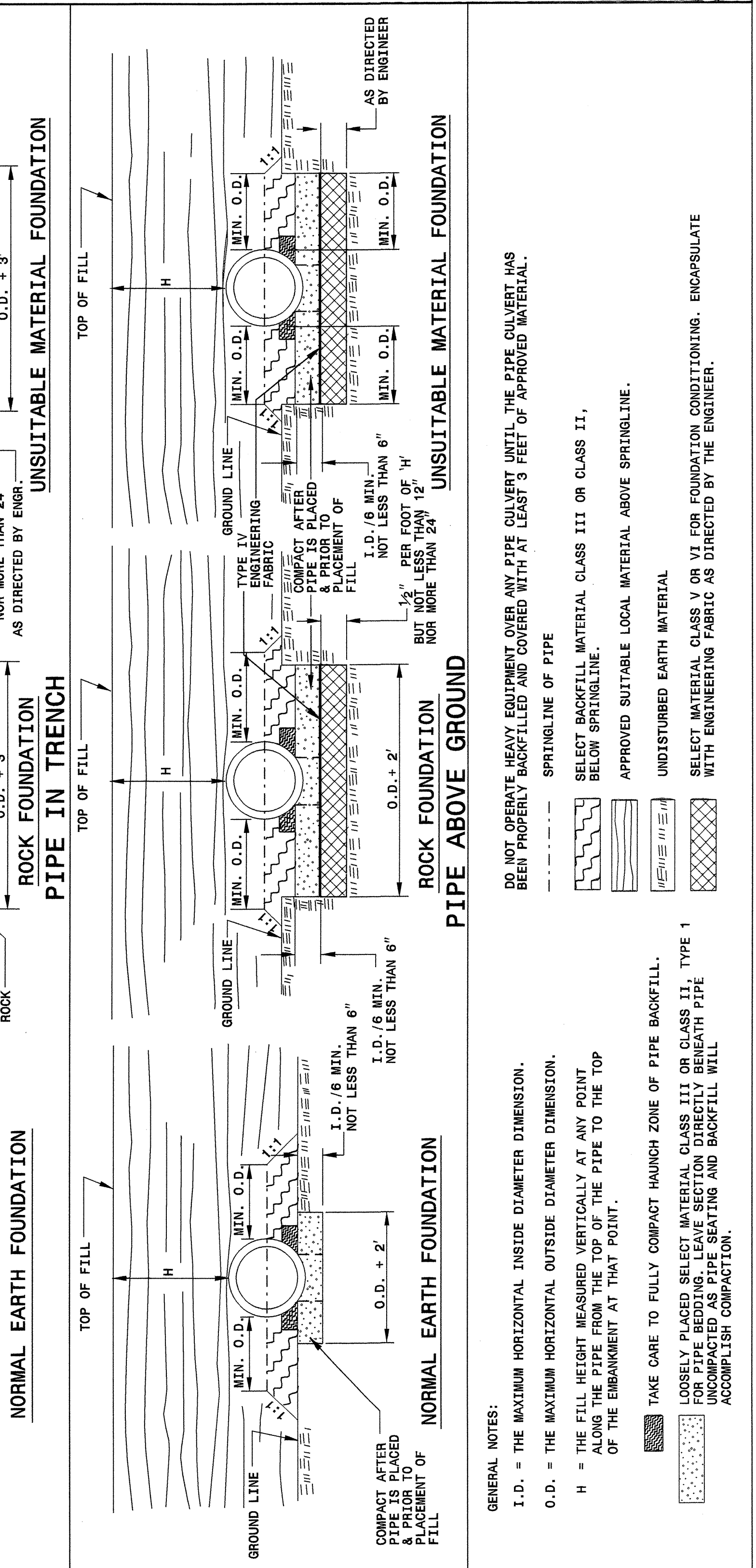
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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



ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION RIGID PIPE

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



ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION RIGID PIPE

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

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.

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.

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, 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.

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SEE PLATE FOR TITLE

ORIGINAL BY: K Kempf DATE: 5-15-09
 MODIFIED BY: DATE:
 CHECKED BY: DATE: 7/30/09
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5/14/99

FLEXIBLE PIPE

Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **				
Diameter (inches)	Minimum cover (inches)	Maximum cover (Ga)	Height of Cover (feet)	
12	12	204	14	10
15	12	162	204	8
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	44	54	77
60	12	40	49	70
66	12	36	44	64
72	12	32	40	59
78	12	28	36	54
84	12	24	32	50

Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **				
Diameter (inches)	Minimum cover (inches)	Maximum cover (Ga)	Height of Cover (feet)	
12	12	123	14	10
15	12	98	123	281
18	12	81	102	174
21	12	69	87	144
24	12	60	76	123
27	12	55	67	108
30	12	50	60	95
36	12	42	50	71
42	12	36	42	60
48	12	32	36	52
54	12	28	32	46
60	12	24	28	40
66	12	20	24	35
72	12	16	20	30
78	12	12	16	26
84	12	8	12	22

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ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FILL HEIGHT TABLES

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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FILL HEIGHT TABLES

** 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

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

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

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

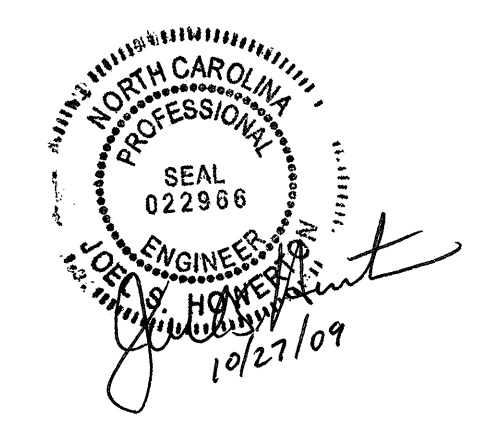
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300D01

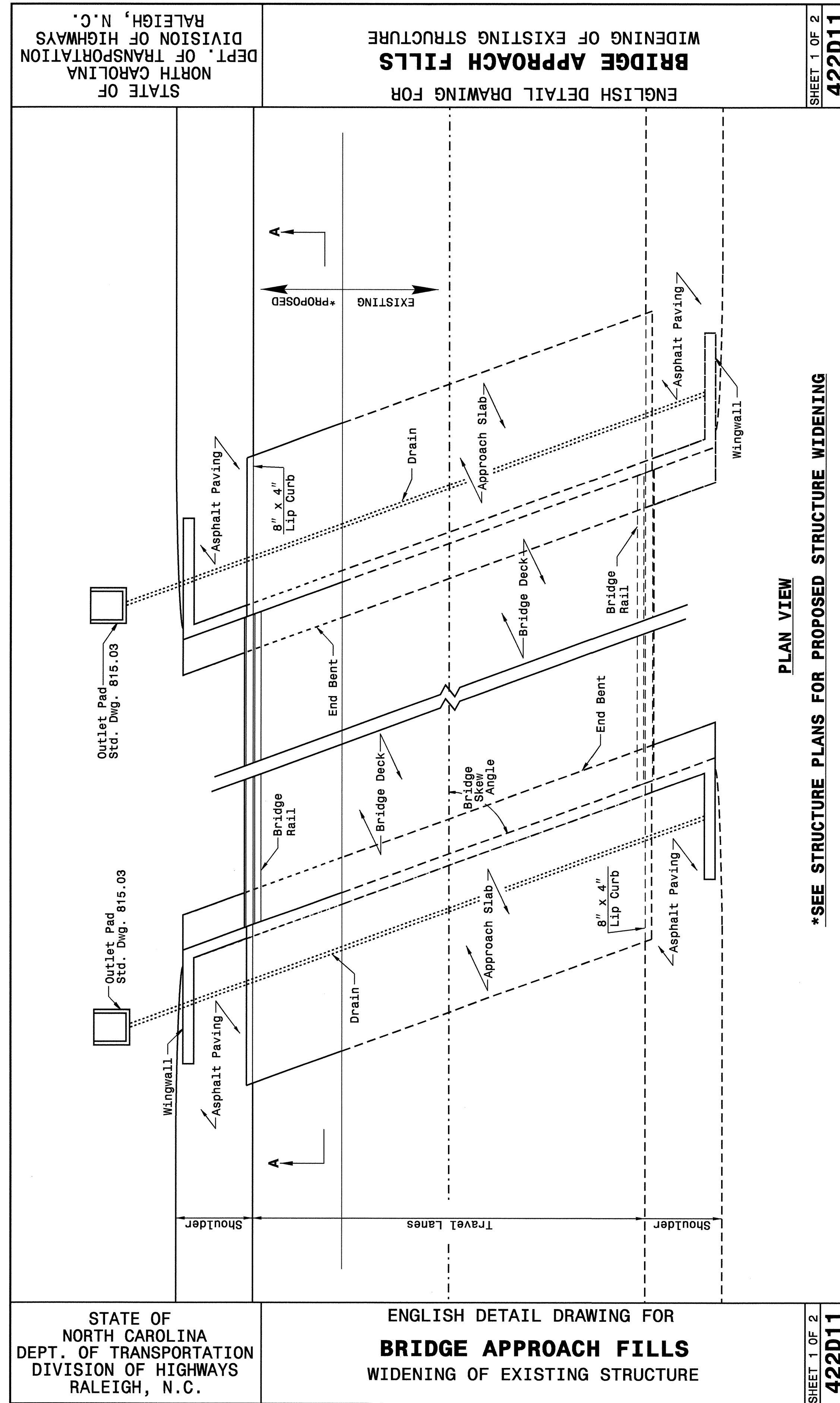
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SEE PLATE FOR TITLE

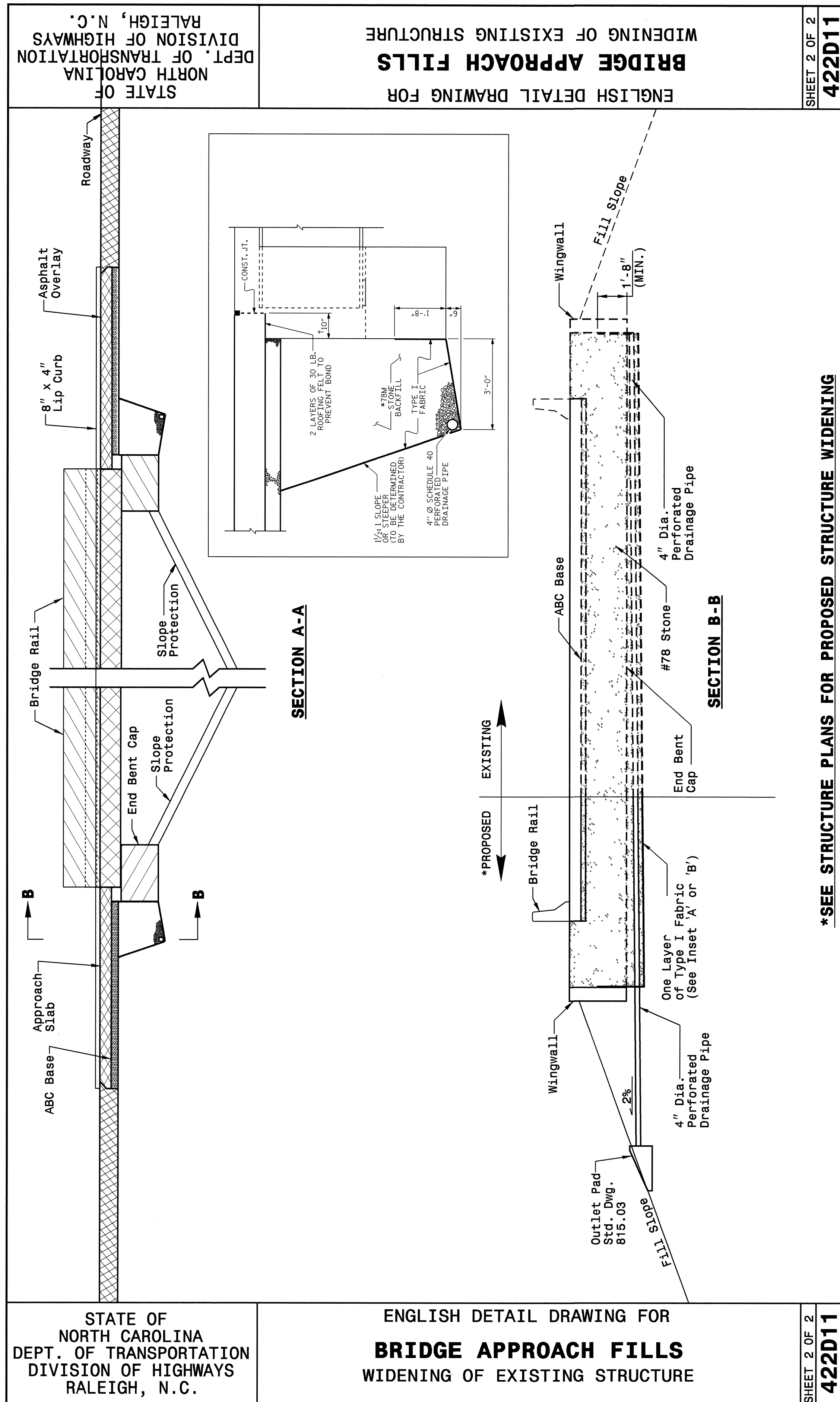
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PLAN VIEW

*SEE STRUCTURE PLANS FOR PROPOSED STRUCTURE WIDENING

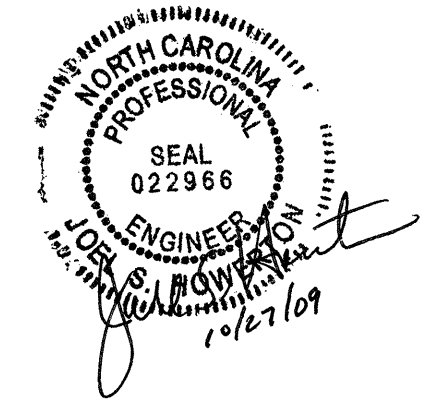


SECTION A-A

SECTION B-B

*SEE STRUCTURE PLANS FOR PROPOSED STRUCTURE WIDENING

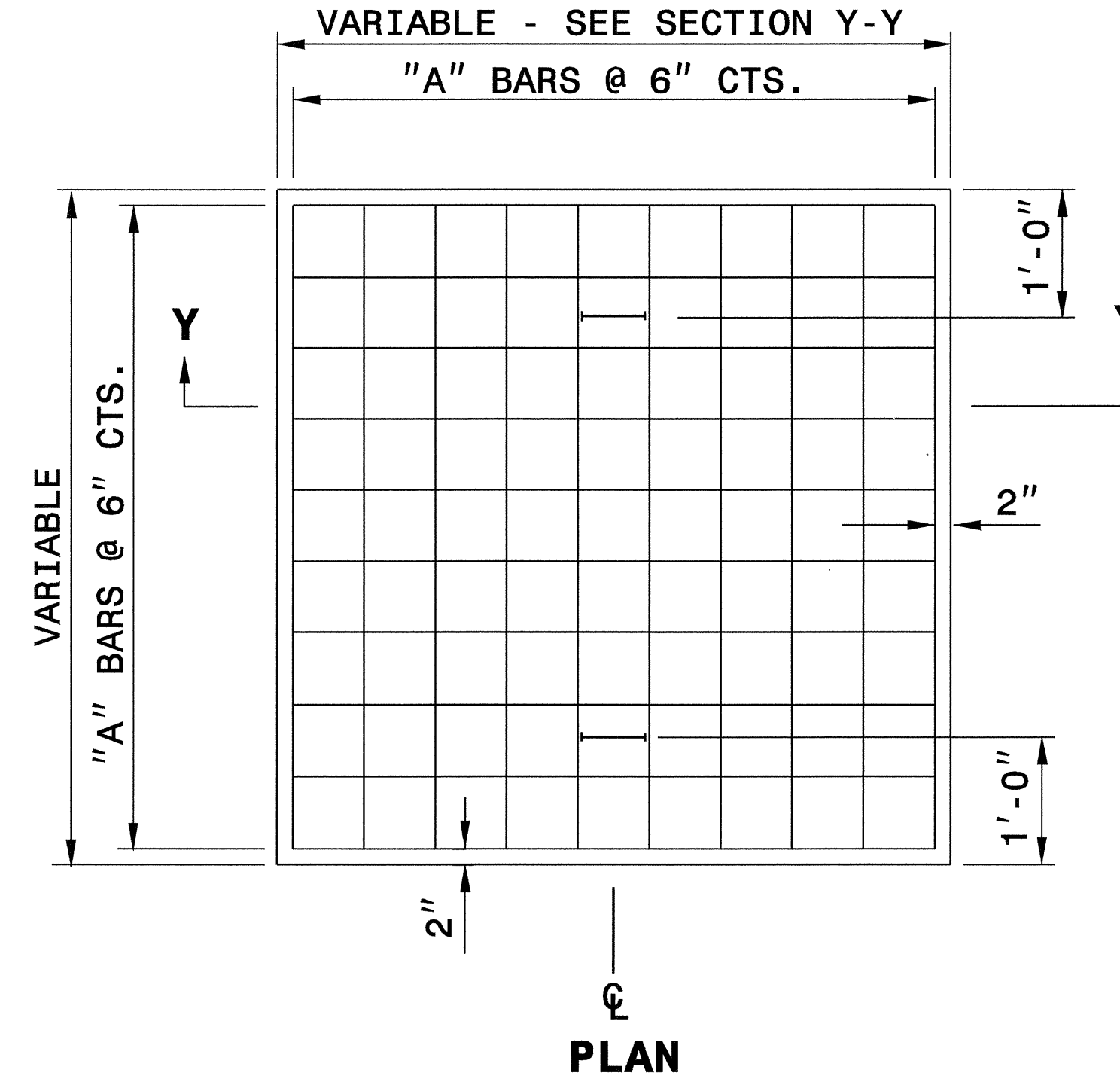
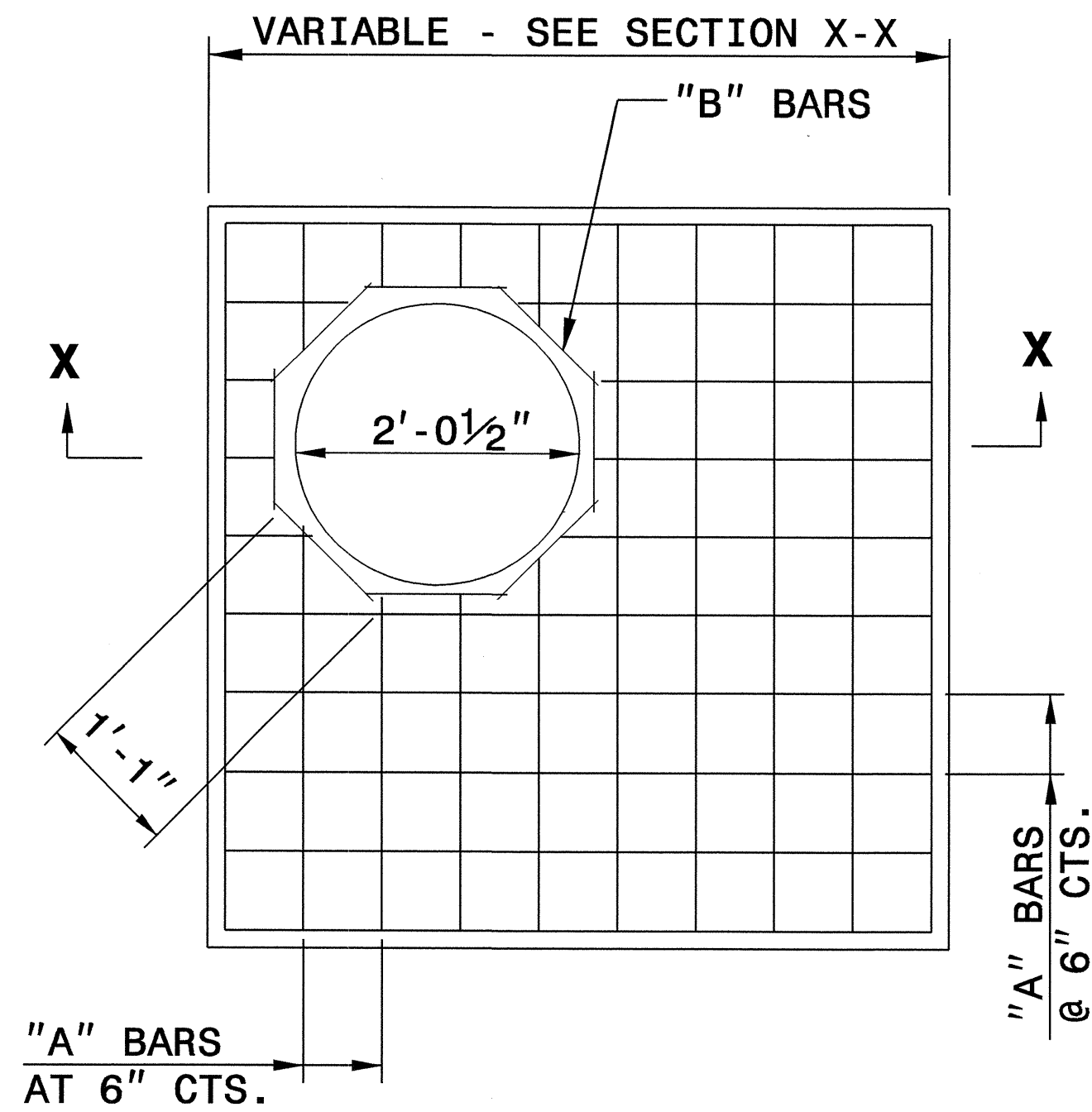
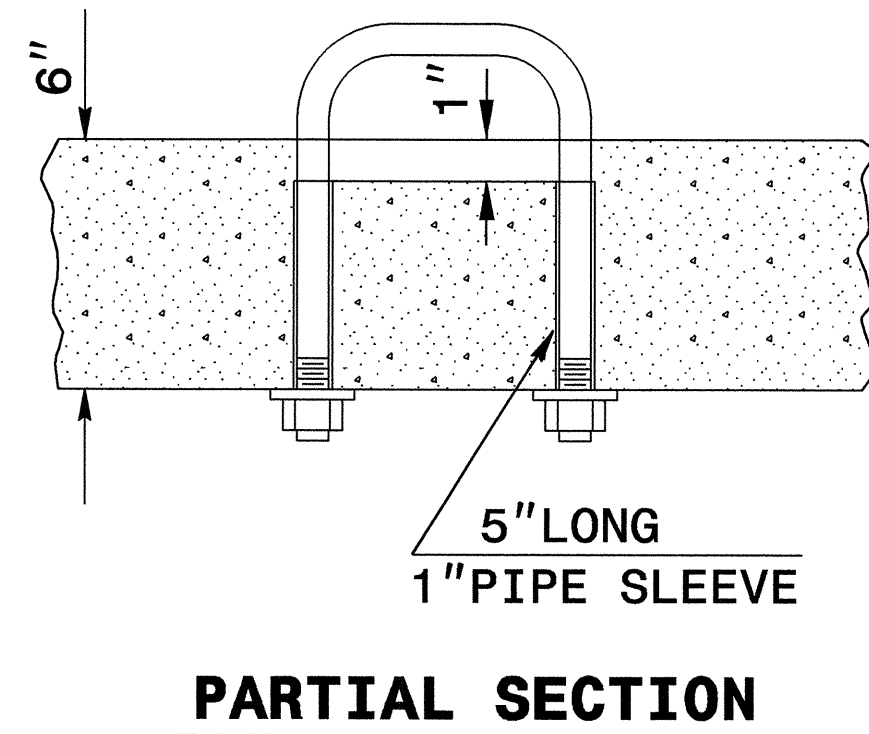
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BRIDGE APPROACH FILLS
WIDENING OF EXISTING STRUCTURE

ORIGINAL BY: K. A. Kempf	DATE: 6-10-08
MODIFIED BY: rnbritt	DATE: 10-06-09
CHECKED BY:	DATE:
FILE SPEC.: nbritt\english\misc\bridge approach fill1422d11.dgn	



GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

FIELD VERIFY THE DIMENSIONS FOR THE EXISTING BOXES

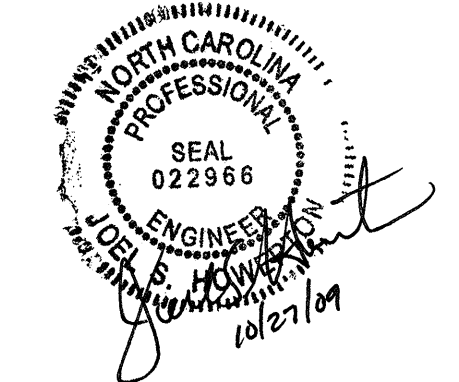
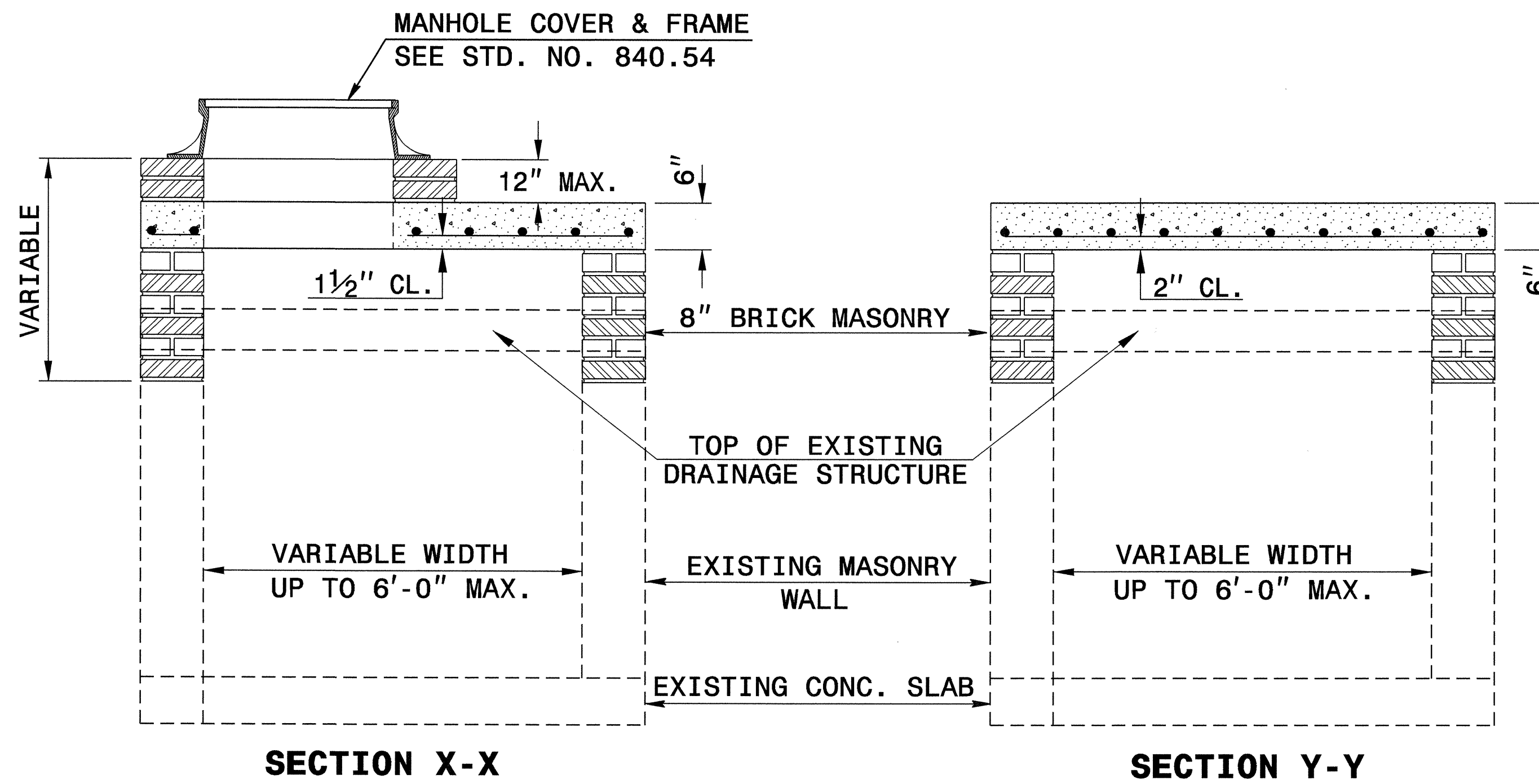
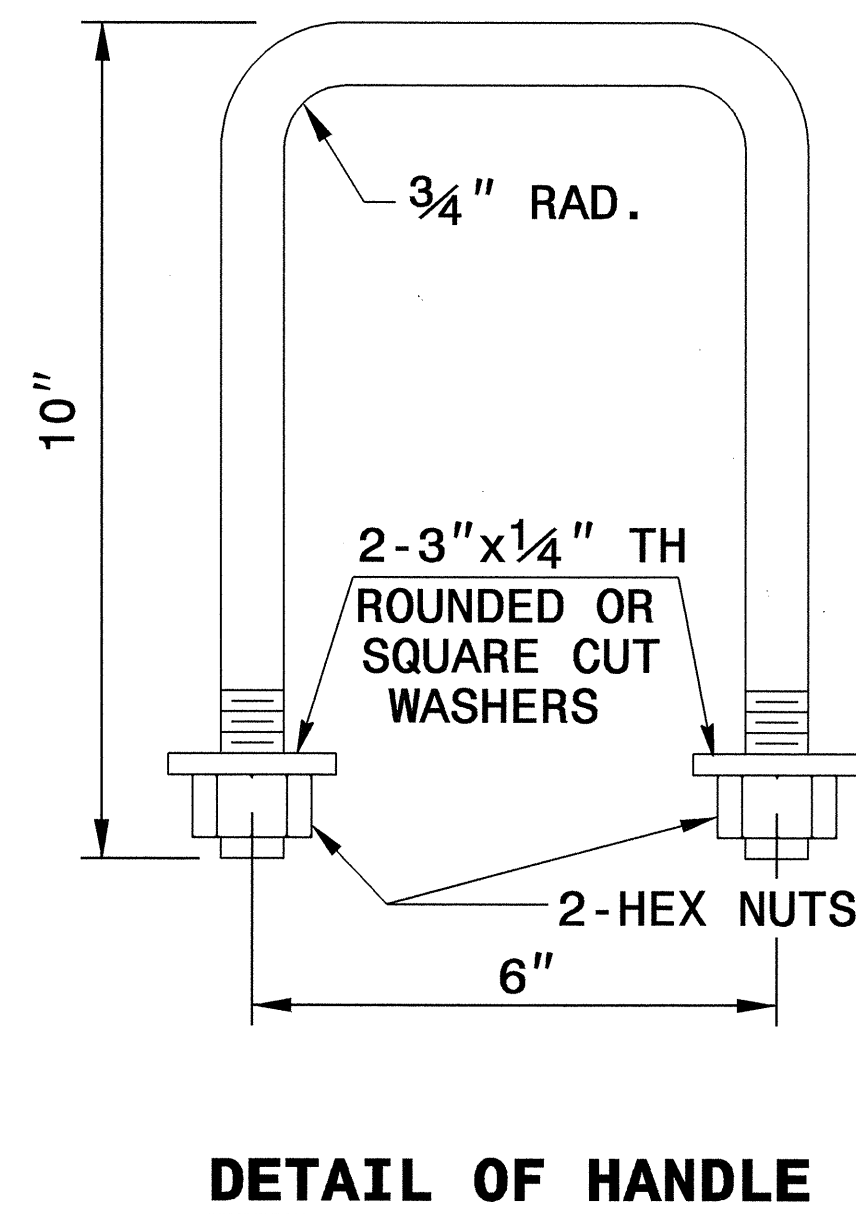
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

BILL OF MATERIALS

REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *
MASONRY				CU YDS
TOP SLAB CONCRETE CLASS "B"				.433 *
BRICK MASONRY PER FT HT (MIN)				.4111

*** NOTE:**

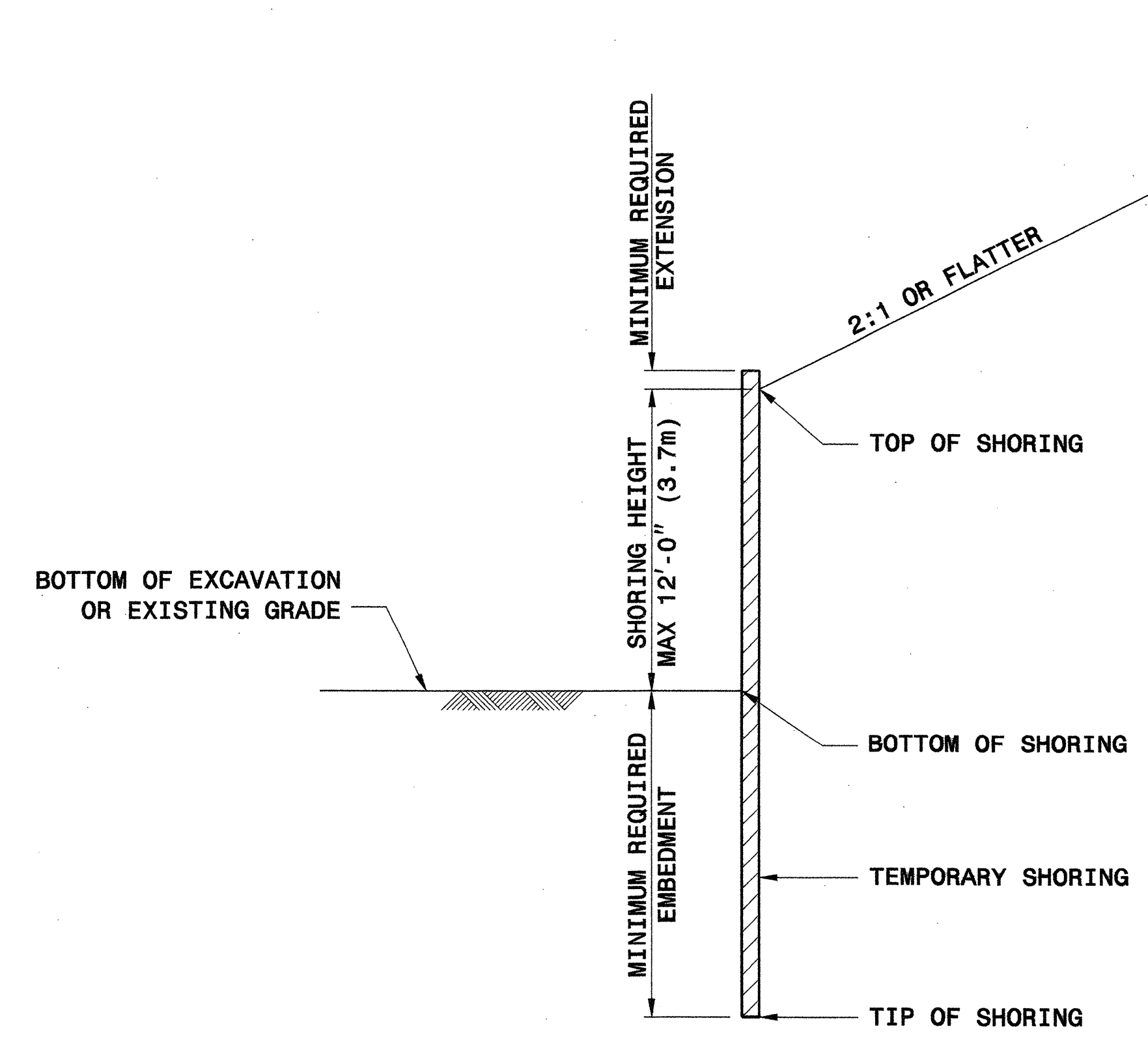
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



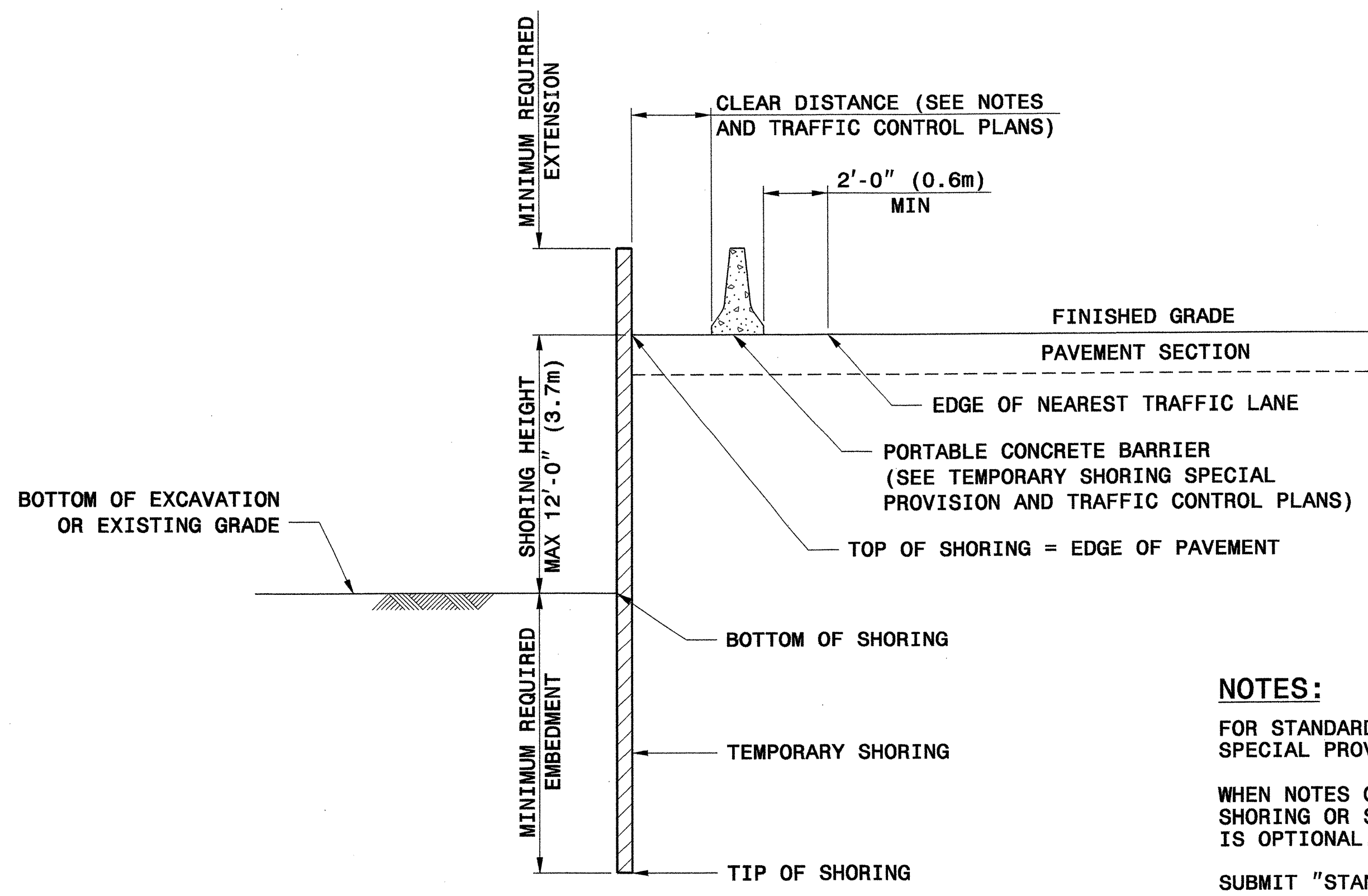
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**DETAIL TO CONVERT EXISTING
DROP INLET OR CATCH BASIN
TO JUNCTION BOX
(MANHOLE OPTIONAL)**

ORIGINAL BY: T.S.S. DATE: NOV. 1997
 MODIFIED BY: E.E.W. DATE: 8-28-02
 CHECKED BY: *Joe B. Howland* DATE: 10/21/09
 FILE SPEC: C:\usr\details\stand\boxtoibe.dgn



SLOPE CASE



SURCHARGE CASE

NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.
 WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING OR STANDARD 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 AVAILABLE IS LESS THAN THE MINIMUM REQUIRED IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS, SET THE BARRIER AGAINST THE TRAFFIC SIDE OF THE SHORING AND 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.

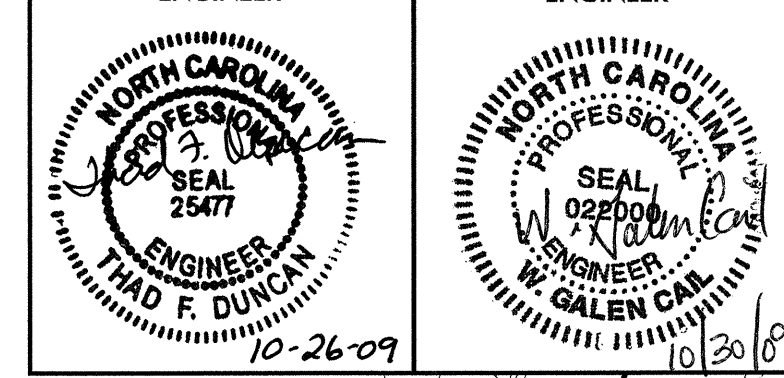
CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF THE SHORING. COLLECT AND DIRECT RUNOFF AWAY FROM SHORING.

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT						SURCHARGE CASE WITH TRAFFIC IMPACT									
		SHEET PILES		H PILES WITH TIMBER LAGGING				SHEET PILES		H PILES WITH TIMBER LAGGING							
		MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	MINIMUM REQUIRED EMBEDMENT FT (m)				MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	MINIMUM REQUIRED EMBEDMENT FT (m)							
		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".

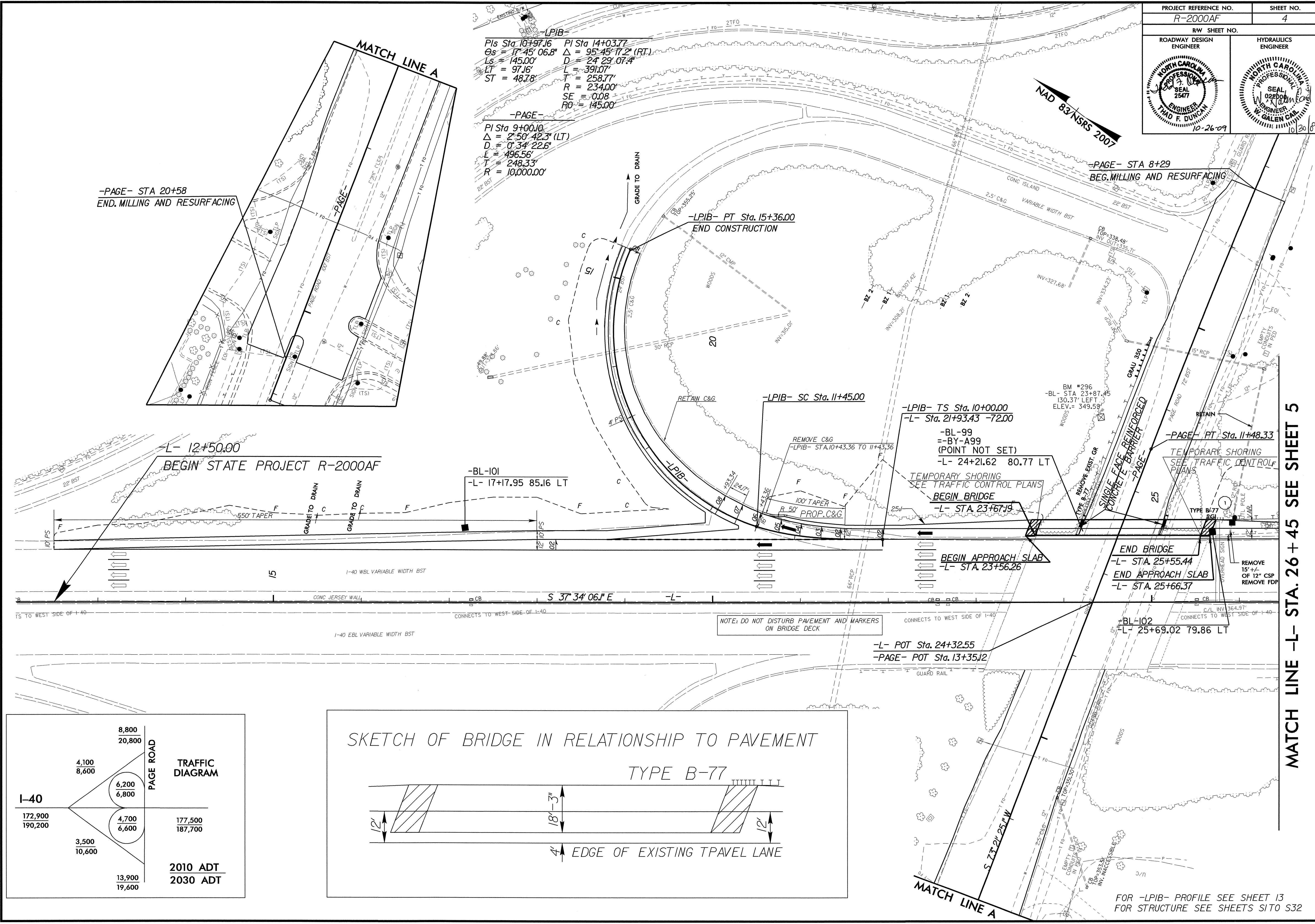
 <p>GEOTECHNICAL ENGINEERING UNIT STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH</p>	STANDARD DRAWING NO. 1801.01
	<p>STANDARD TEMPORARY SHORING</p> DATE: 2-20-07



-LPIB-
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 $L_s = 145.00'$ $D = 24^\circ 29' 07.4''$
 $LT = 97.16'$ $L = 391.07'$
 $ST = 48.78'$ $T = 258.77'$
 $R = 234.00'$
 $SE = 0.08$
 $RO = 145.00'$

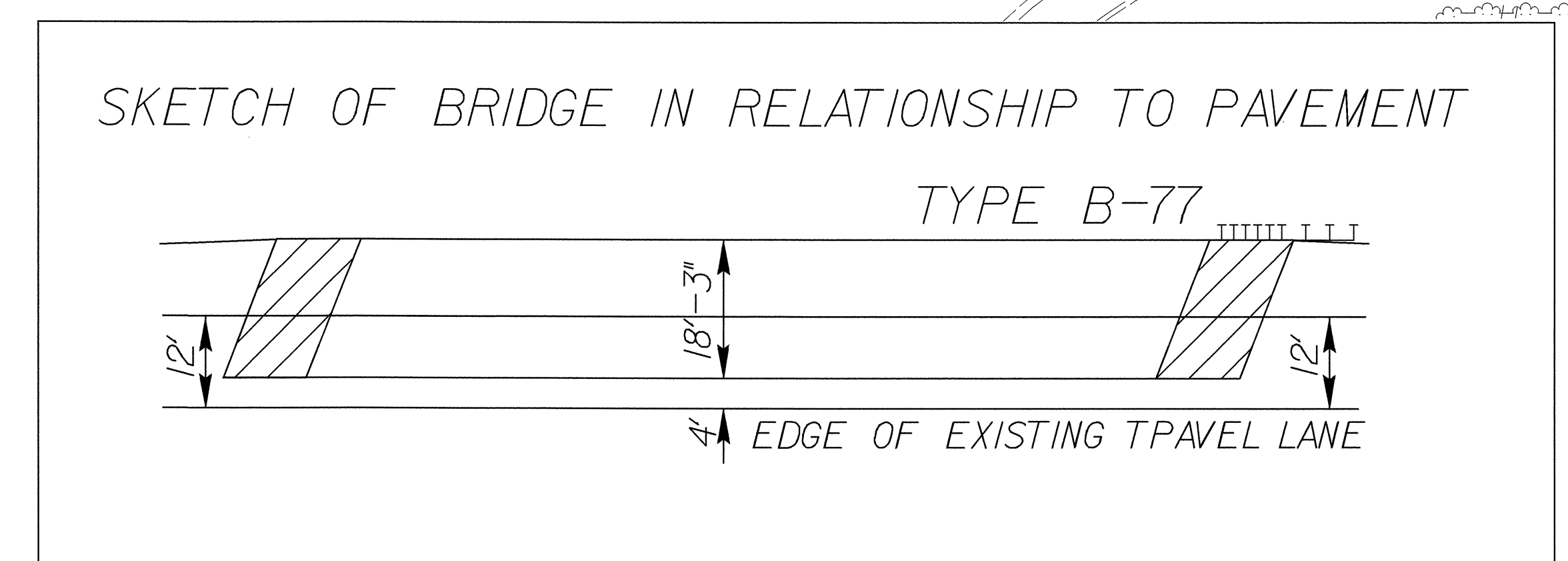
-PAGE-
 PI Sta 9+00.10
 $\Delta = 2^\circ 50' 42.3''$ (LT)
 $D = 0^\circ 34' 22.6''$
 $L = 496.56'$
 $T = 248.33'$
 $R = 10,000.00'$

-PAGE- STA 20+58
 END. MILLING AND RESURFACING



TRAFFIC DIAGRAM	
8,800	20,800
4,100	8,600
6,200	6,800
4,700	6,600
3,500	10,600
13,900	19,600
172,900	177,500
190,200	187,700

2010 ADT
2030 ADT



MATCH LINE -L- STA. 26 + 45 SEE SHEET 5

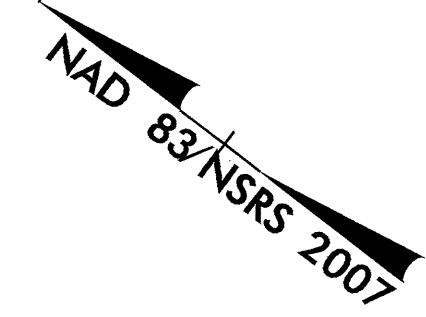
22-OCT-2009 14:25
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 5/14/09

FOR -LPIB- PROFILE SEE SHEET 13
 FOR STRUCTURE SEE SHEETS S10 S32

5/14/09

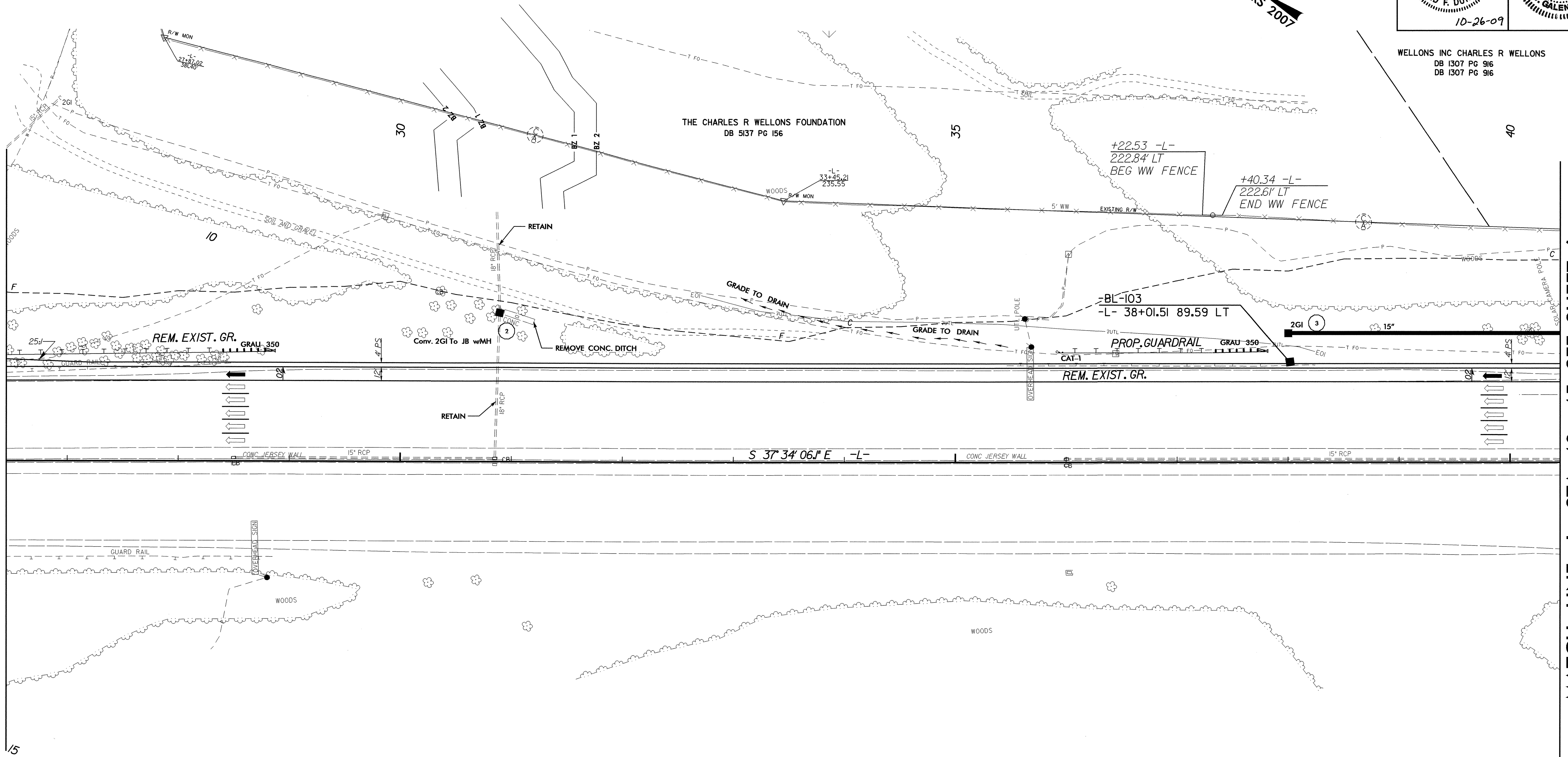
PROJECT REFERENCE NO. R-2000AF	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 25477 THAD F. DUNCAN 10-26-09	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 04200 W. GALEN CAL 10/30/09

WELLONS INC CHARLES R WELLONS
DB 1307 PG 916
DB 1307 PG 916



MATCH LINE -L- STA. 26+45 SEE SHEET 4

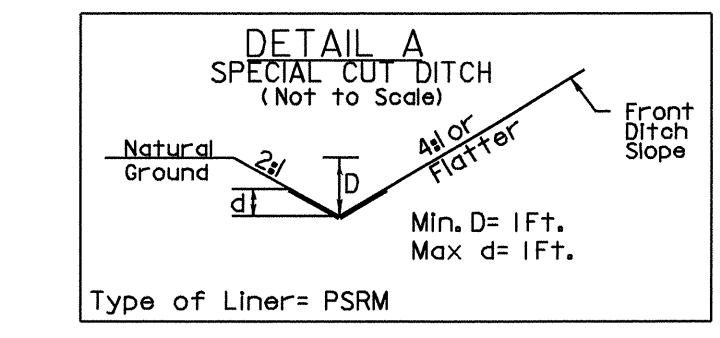
MATCH LINE -L- STA. 40+45 SEE SHEET 6



22-OCT-2009 12:10
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5/14/99

PROJECT REFERENCE NO. R-2000AF	SHEET NO. 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
10-2609	

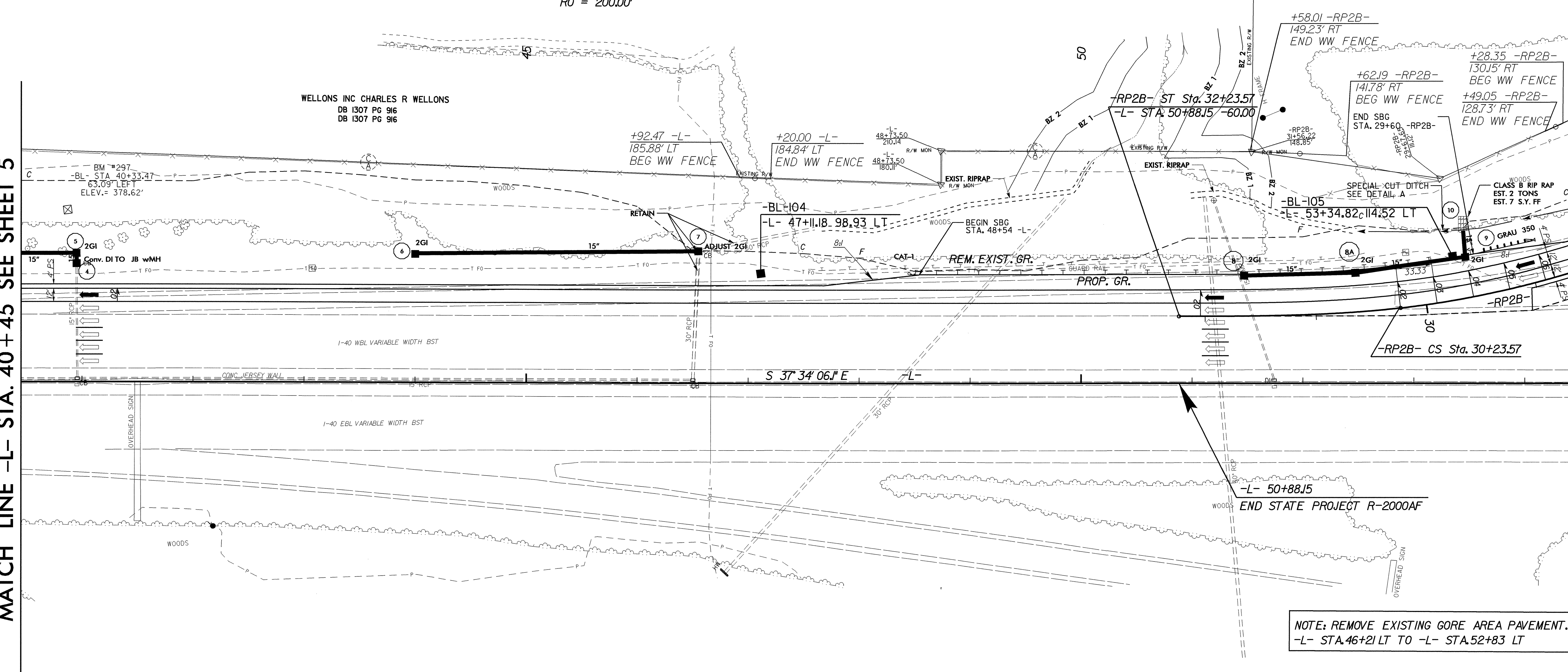


NAD 83/NSRS 2007

-RP2B-
 PIs Sta 30+82.31 PI Sta 25+30.58
 $\Theta_s = 6' 44'' 26.4''$ $\Delta = 9' 14'' 26.9''$ (RT)
 $L_s = 200.00'$ $D = 6' 44'' 26.4''$
 $LT = 133.43'$ $L = 1,353.58'$
 $ST = 66.75'$ $T = 868.61'$
 $SE = 0.08$ $R = 850.00'$
 $RO = 200.00'$

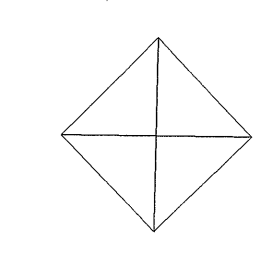
MATCH LINE -L- STA. 40+45 SEE SHEET 5

MATCH LINE -L- STA. 54+45 SEE SHEET 7

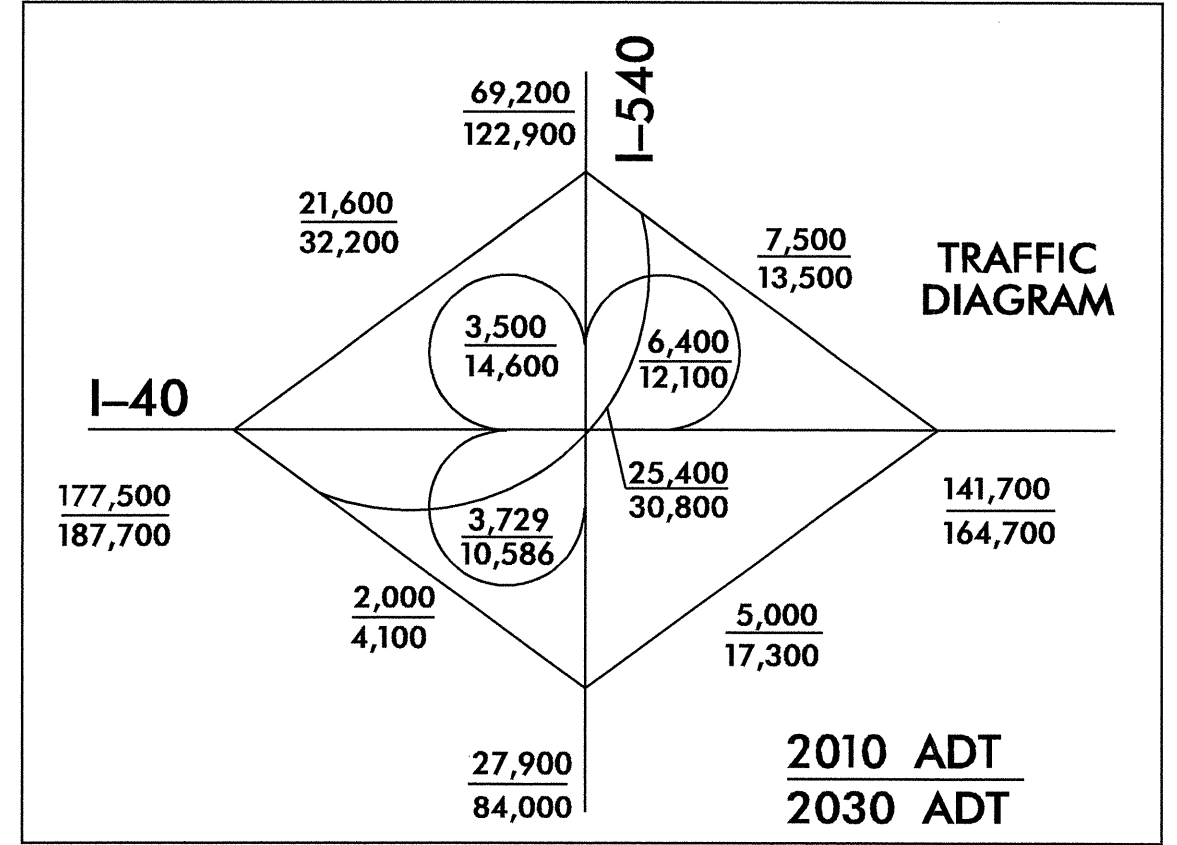


NOTE: REMOVE EXISTING GORE AREA PAVEMENT.
 -L- STA.46+21 LT TO -L- STA.52+83 LT

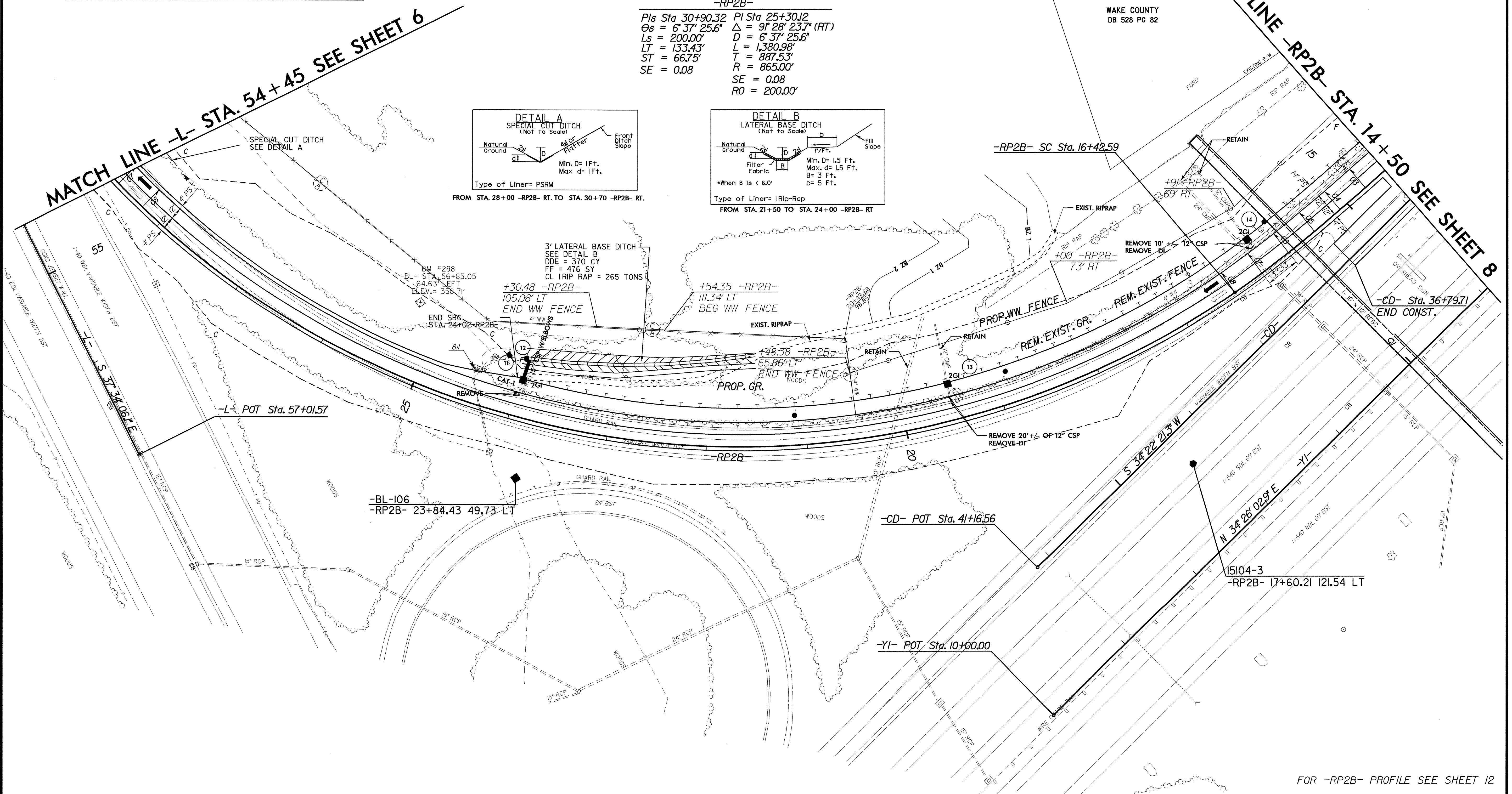
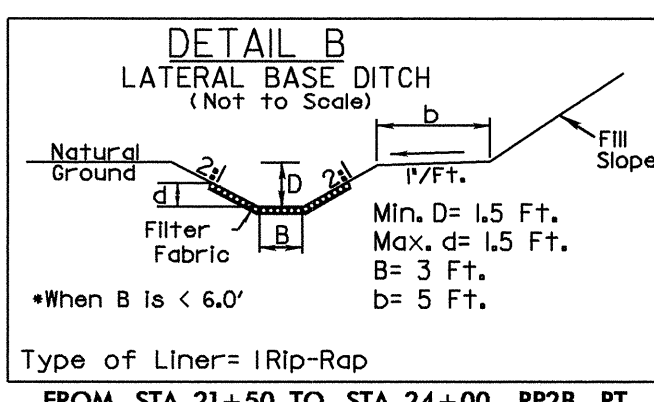
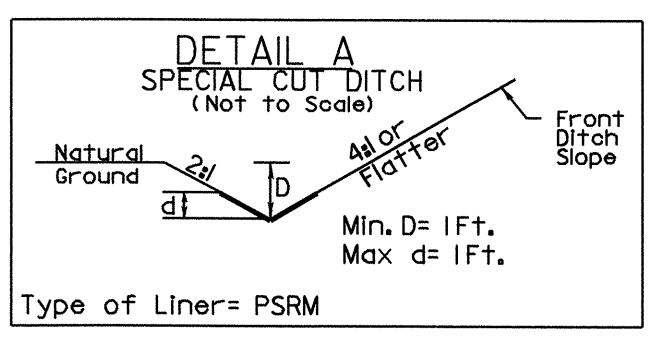
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FOR -RP2B- PROFILE SEE SHEET 12



-RP2B-
 Pls Sta 30+90.32 PI Sta 25+30.12
 $\theta_s = 6' 37'' 25.6''$ $\Delta = 9' 28'' 23.7''$ (RT)
 $L_s = 200.00'$ $D = 6' 37'' 25.6''$
 $LT = 133.43'$ $L = 1,380.98'$
 $ST = 66.75'$ $T = 887.53'$
 $SE = 0.08$ $R = 865.00'$
 $SE = 0.08$
 $RO = 200.00'$



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23-OCT-2009 08:17:2000sf_rdy_psh_08.dgn

PROJECT REFERENCE NO. R-2000AF	SHEET NO. 8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 25477 MAD F. DUNCAN 10-26-09	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 02000 W. GALEN CAL 10/26/09

-RP2B-

PIs Sta 15+76.01	PI Sta 25+30.12
$\Theta_s = 6^\circ 37' 25.6"$	$\Delta = 9^\circ 28' 23.7" (RT)$
Ls = 200.00'	D = 6' 37' 25.6"
LT = 133.43'	L = 1,380.98'
ST = 66.75'	T = 887.53'
SE = 0.08	R = 865.00'
	SE = 0.08
	RO = 200.00'

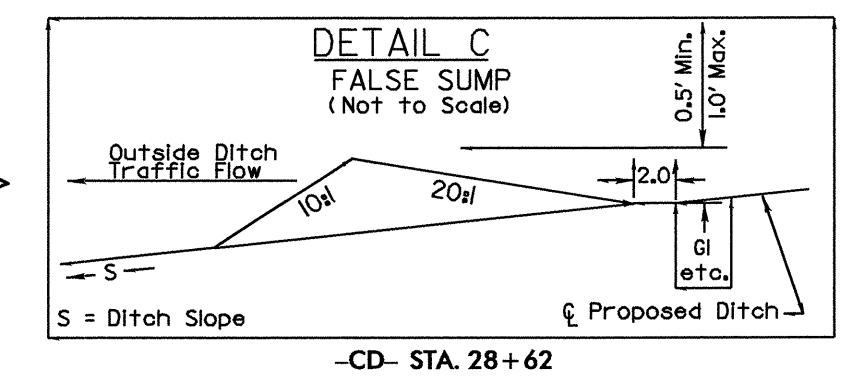
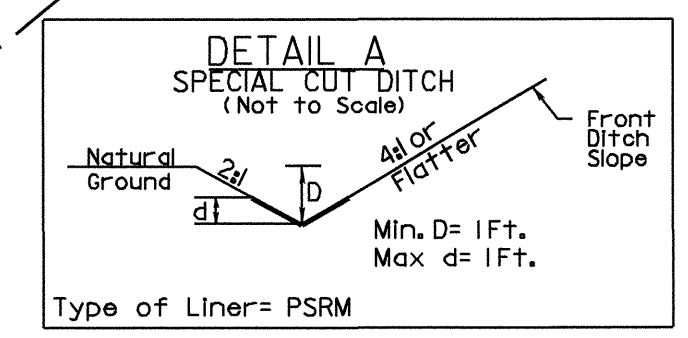
-CD-

PI Sta 25+41.52
$\Delta = 2^\circ 06' 29.0" (LT)$
D = 0' 24' 33.3"
L = 515.10'
T = 257.58'
R = 14,000.00'
SE = NC

WAKE COUNTY
DB 528 PG 82

DURHAM COUNTY & ARRINGTON LLC
DB 96 PG 00
DB 256 PG 154

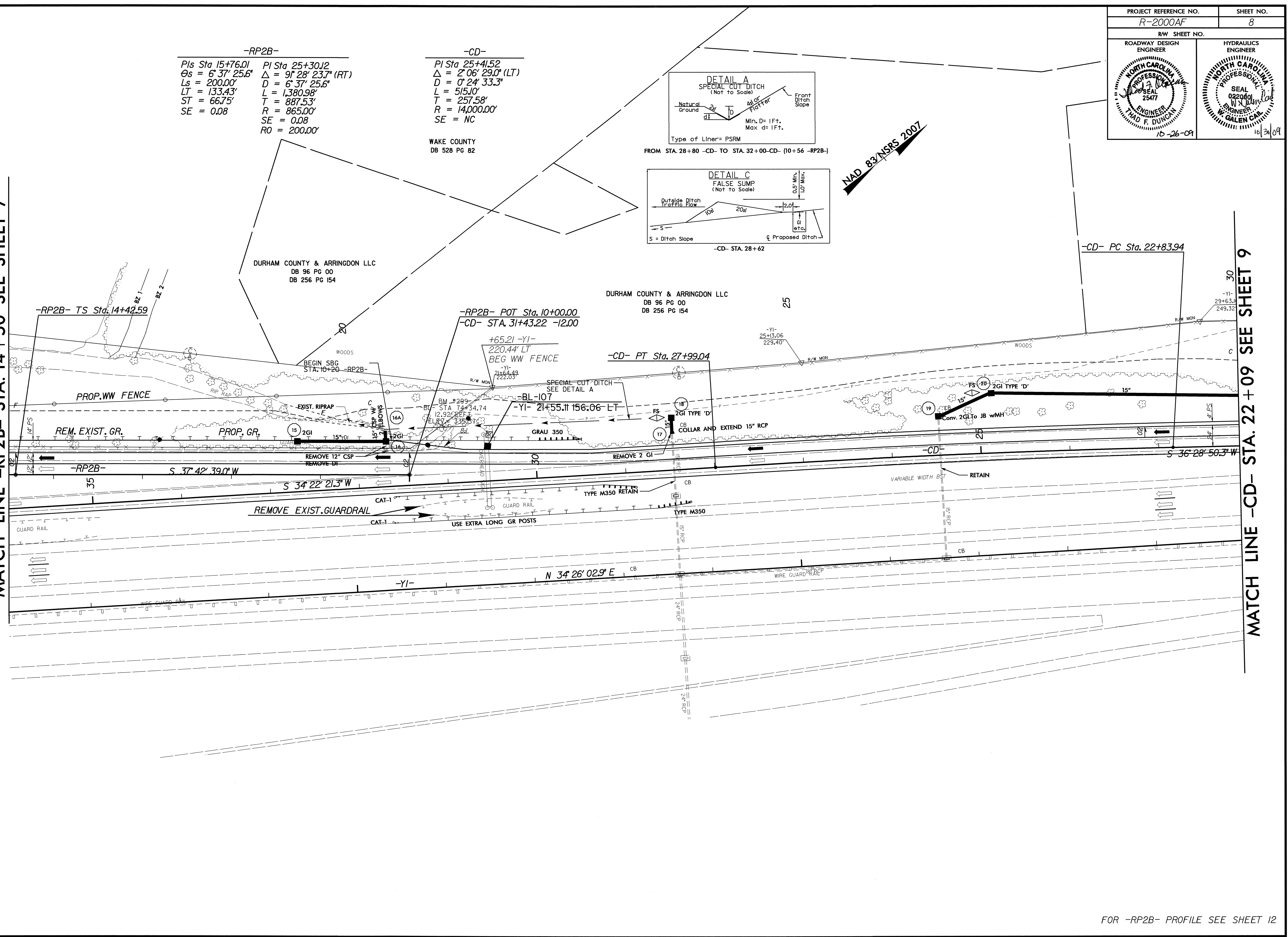
DURHAM COUNTY & ARRINGTON LLC
DB 96 PG 00
DB 256 PG 154



NAD 83/NSRS 2007

MATCH LINE -RP2B- STA. 14+50 SEE SHEET 7

MATCH LINE -CD- STA. 22+09 SEE SHEET 9



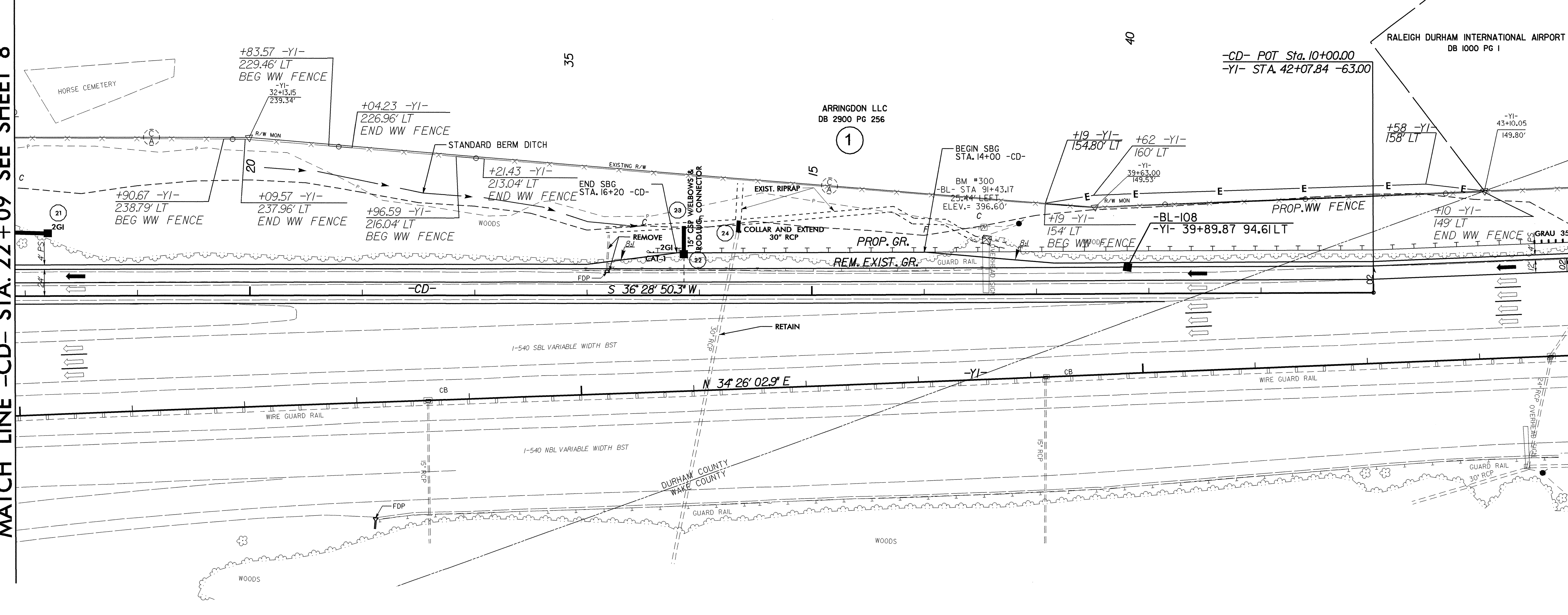
FOR -RP2B- PROFILE SEE SHEET 12

PROJECT REFERENCE NO. R-2000AF		SHEET NO. 9
RW SHEET NO.		
ROADWAY DESIGN ENGINEER THAD F. DUNCAN 10-26-09	HYDRAULICS ENGINEER GALEN CALDWELL 10-26-09	

NAD 83 NSRS 2007

MATCH LINE -CD- STA. 22+09 SEE SHEET 8

MATCH LINE -YI- STA. 43+94 SEE SHEET 10



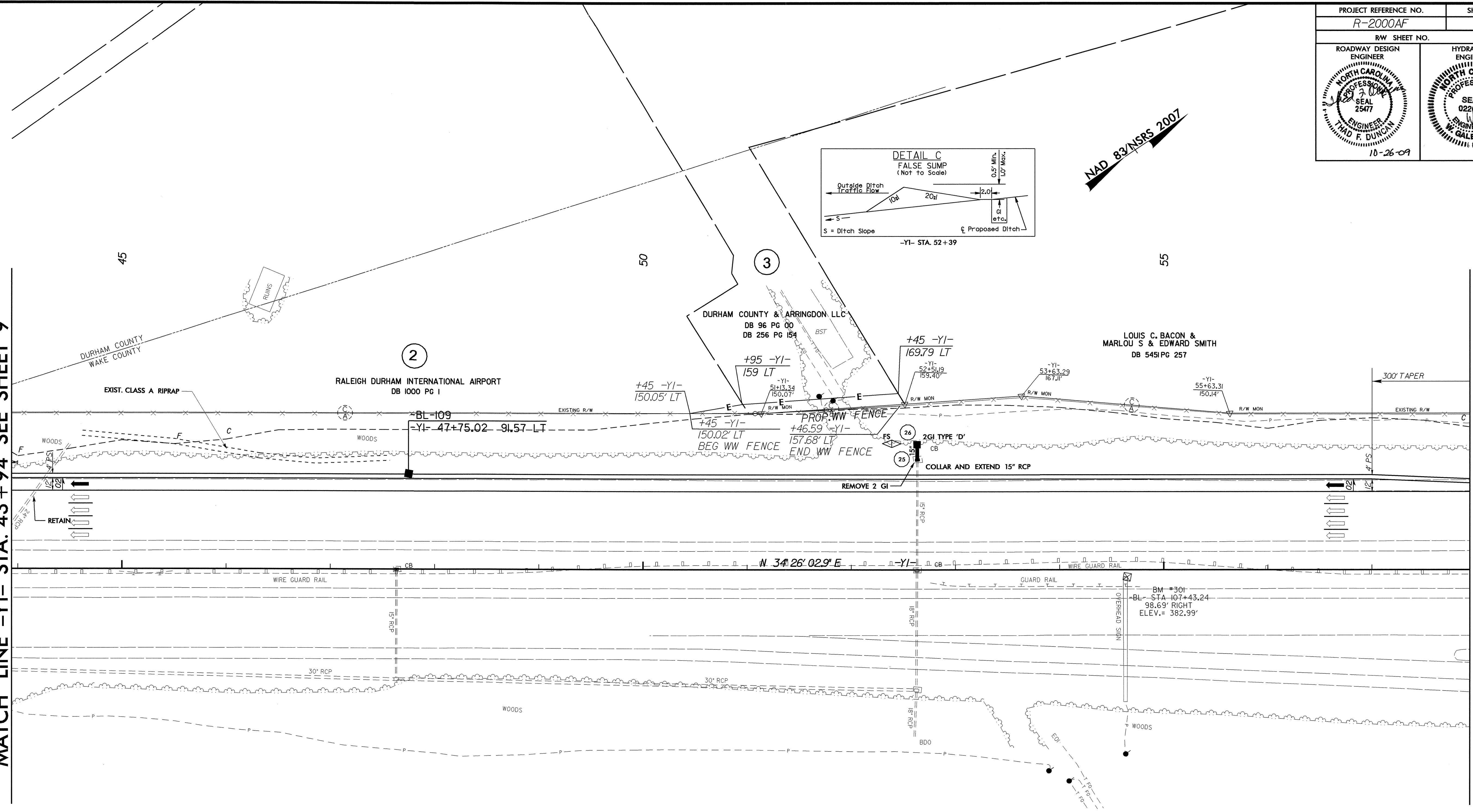
5/14/09

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PROJECT REFERENCE NO. R-2000AF	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER THOMAS F. DUNCAN NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25477 10-26-09	HYDRAULICS ENGINEER W. GALEN C. MARLOU NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022000 10/30/09

MATCH LINE -Y1- STA. 43 + 94 SEE SHEET 9

MATCH LINE -Y1- STA. 57 + 94 SEE SHEET 11



NAD 83/NSRS 2007

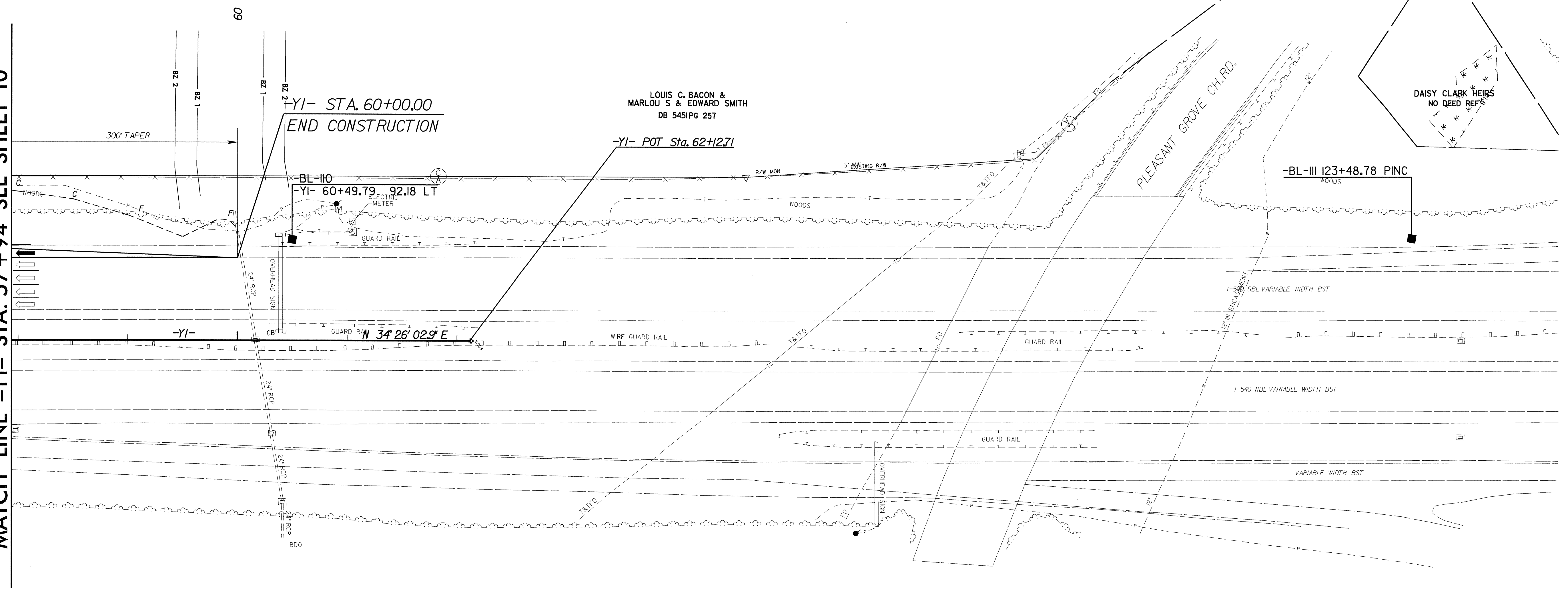
PROJECT REFERENCE NO. R-2000AF		SHEET NO. 11	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

WILLIAM CLARK & KATHLEEN
DB 4560 PG 848

DAISY CLARK HEIGS
NO DEED REF'S

NAD 83/NSRS 2007

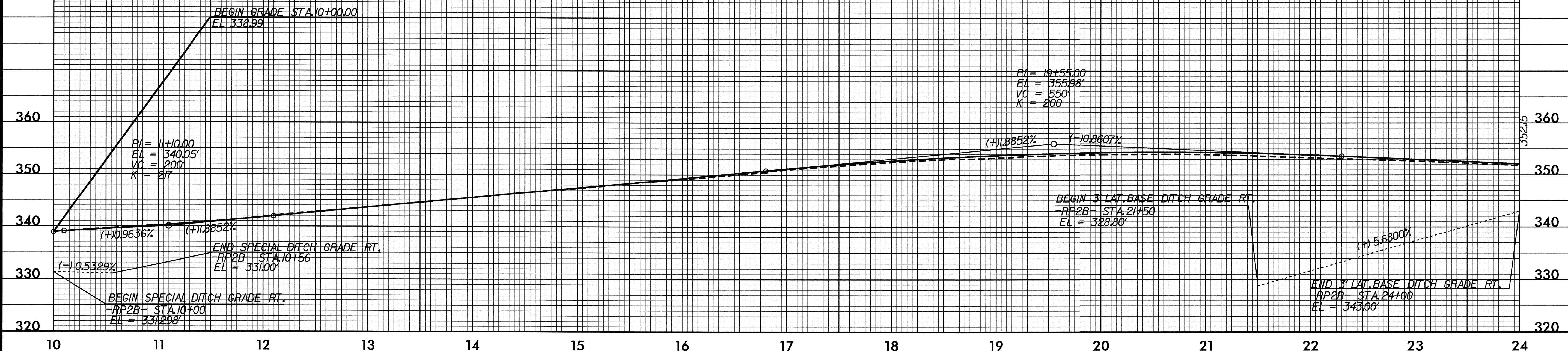
MATCH LINE -Y1- STA. 57 + 94 SEE SHEET 10



5/28/98

PROJECT REFERENCE NO. R-2000AF	SHEET NO. 12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-RP2B-



-RP2B-

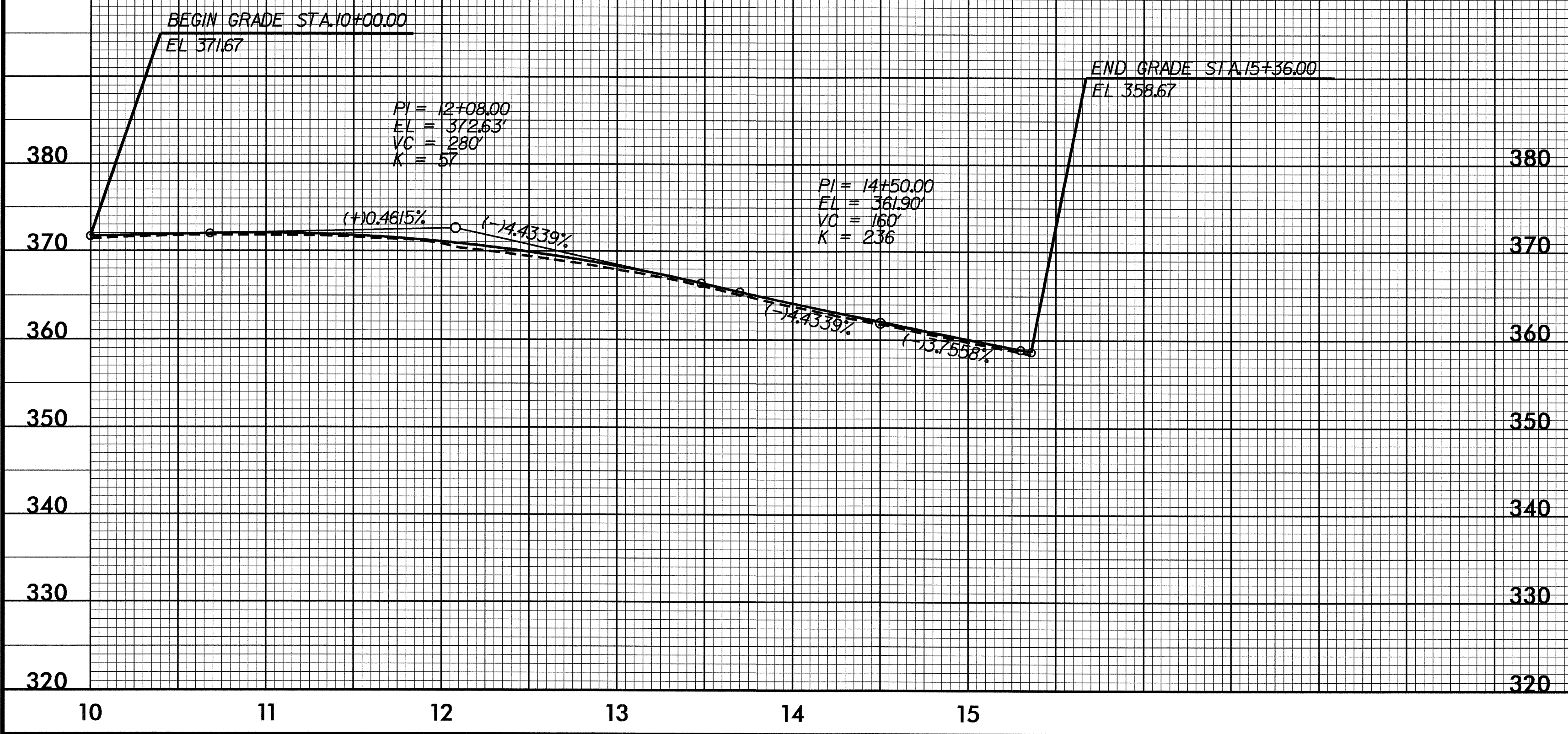


22-OCT-2009 12:10
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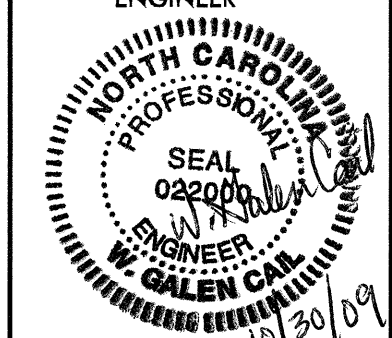
PROJECT REFERENCE NO. R-2000AF	SHEET NO. 13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-LP1B-



22-OCT-2009 12:10
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5/28/09

PROJECT REFERENCE NO. <i>R-2000AF</i>	SHEET NO. <i>14</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	

-CD-

370

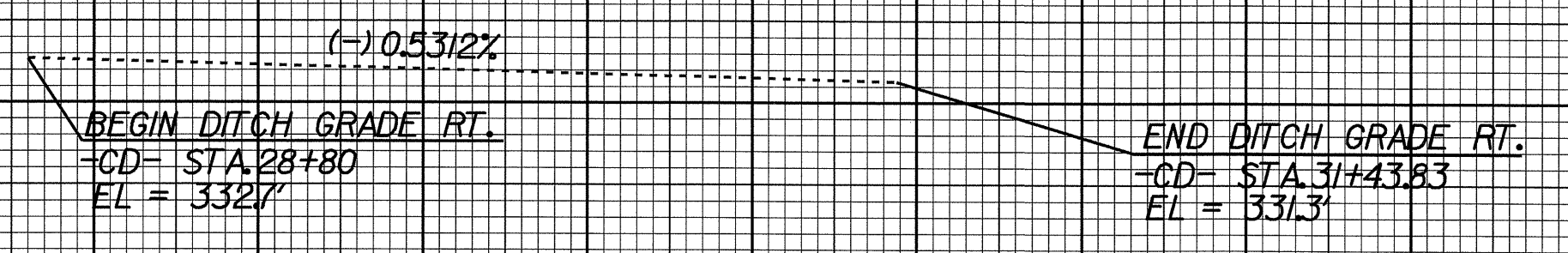
360

350

340

330

320



28

29

30

31

26-OCT-2009 14:54
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