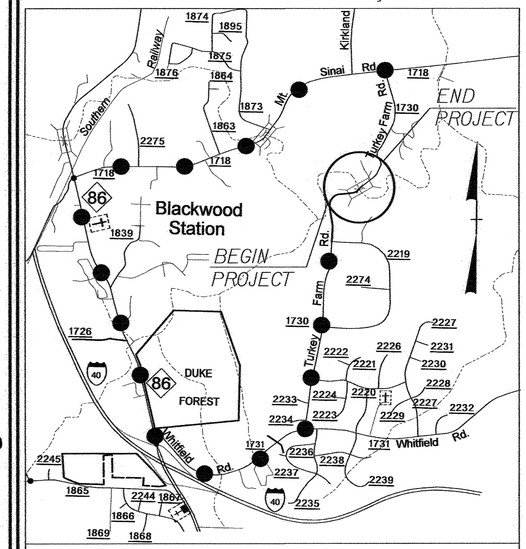
09/08/09

TIP PROJECT: B-4218

CONTRACT: C201872

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



VICINITY MAP
DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

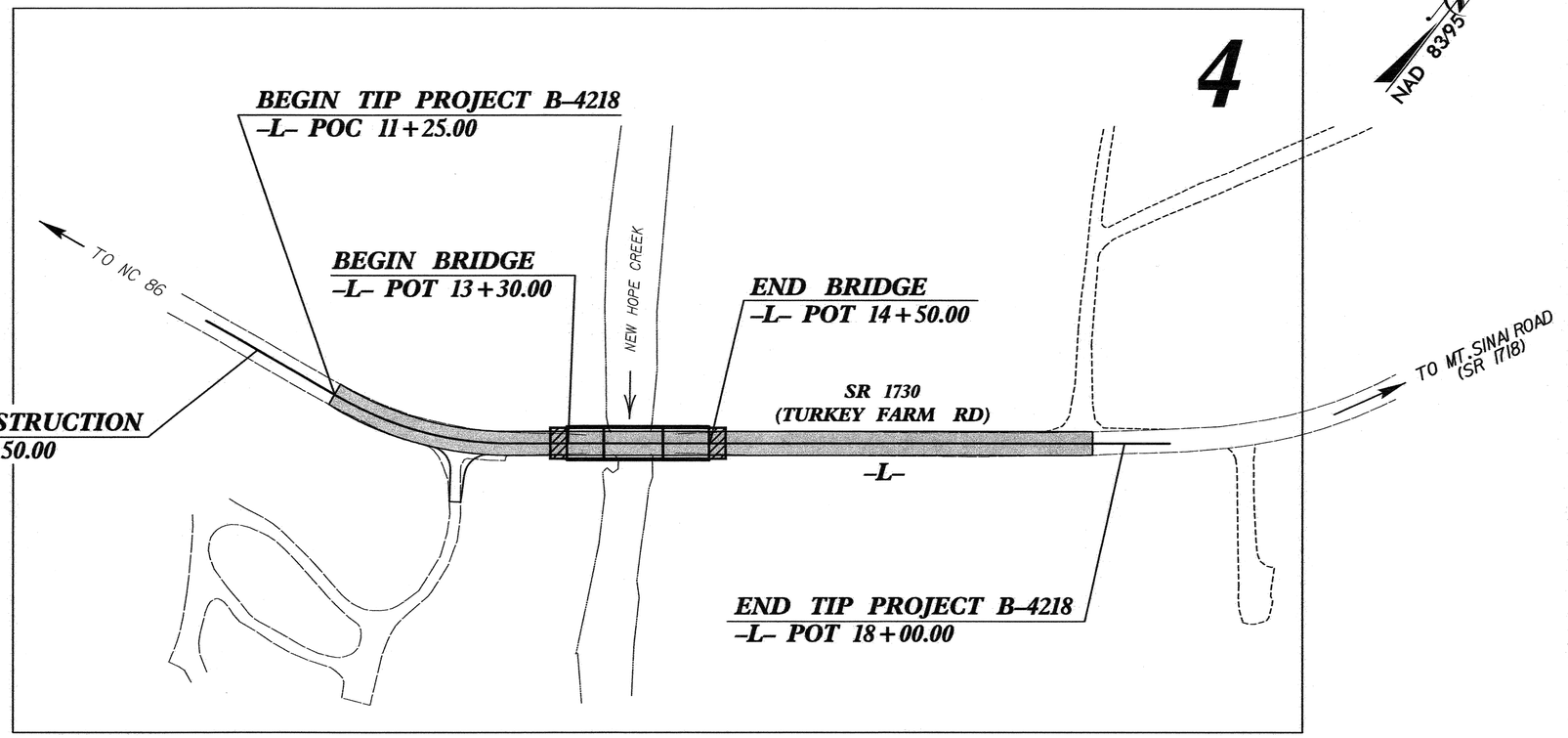
ORANGE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4218	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33563.1.1	BRZ-1730(5)	P.E.
33563.2.1	BRZ-1730(5)	R/W & UTIL.
33563.3.1	BRZ-1730(5)	CONSTRUCTION

LOCATION: BRIDGE NO. 108 OVER NEW HOPE CREEK ON SR 1730 (TURKEY FARM ROAD)

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



NOTE:
DESIGN EXCEPTION REQUIRED FOR MINIMUM HORIZONTAL CURVATURE, VERTICAL CURVE K VALUE, MAXIMUM SUPER AND MINIMUM SHOULDER WIDTH.

NCDOT CONTACT: CATHY HOUSER, PE
PROJECT ENGINEER – ROADWAY DESIGN, ENGINEERING COORDINATION
ROBERT J. STROUP, PE
PROJECT DESIGN ENGINEER – ROADWAY DESIGN, ENGINEERING COORDINATION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008	=	681
ADT 2028	=	1,291
DHV	=	10 %
D	=	60 %
T	=	4 % *
V	=	40 MPH
* TTST 1		DUAL 3
FUNC CLASS	=	LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4218	=	0.105 mi
LENGTH STRUCTURE TIP PROJECT B-4218	=	0.023 mi
TOTAL LENGTH OF TIP PROJECT B-4218	=	0.128 mi

PLANS PREPARED BY:

CH ENGINEERING
PO BOX 30026 RALEIGH, NC 27622
TELE 919.788.0224 FAX 919.788.0232

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 20, 2007

LETTING DATE:
JULY 15, 2008

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh, NC 27610

THOMAS R. HEPLER, PE, PLS
PROJECT ENGINEER

RHONDA B. EARLY, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 026696 ENGINEER JEFFREY L. RECK
SIGNATURE: 5-1-08 P.E.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 10359 ENGINEER THOMAS R. HEPLER
SIGNATURE: 5/1/08 P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
P.E.
STATE HIGHWAY DESIGN ENGINEER

4/30/2008
Y:\NCDOT\B4218\Roadway\Proj\B4218_RDY_TSH.dgn
USERNAME

PROJECT NO.	SHEET NO.
B-4218	1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Index of Sheets

Sheet #	Description
1	Title Sheet
1A	Index of Sheets, General Notes & List of Standards
	Standards
1B	Conventional Symbols
1C	Survey Control Sheet
2	Pavement Schedule, Wedging Detail and Typical Sections
2A	Anchorage for Frames Detail
3	Summary of Quantities
3A	Summary of Earthwork and Summary of Existing Pavement Removal
3B	List of Pipes, Endwalls, etc., (for pipes 48" & Under) and Guardrail Summary
4	Plan and Profile
TCP - 1 thru TCP-2	Traffic Control Plans
EC-1 thru EC-4	Erosion Control Plans
UO-1 thru UO-2	Utilities by Others Plans
X-0	Cross-Section Index of Sheets
X-0A	Cross-Section Volume Summary Sheet
X-1 thru X-7	Cross Sections
S-1 thru S-26	Structure Plans

General Notes

GENERAL NOTES: **2006 SPECIFICATIONS**
EFFECTIVE: 07-18-06
REVISED: 07-18-06

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. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

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

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

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

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

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

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

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

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

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, BELLSOUTH & TIME WARNER CABLE

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

Standard Drawings

EFF. 07-18-06

REV. 01-02-07

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
~~840.25~~	~~Anchorage for Frames - Brick or Concrete~~
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

10/25/05

PROJECT REFERENCE NO.	SHEET NO.
B-4218	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- 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
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

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
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- 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 — T
- Telephone Booth — 3
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — W
- 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 — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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:

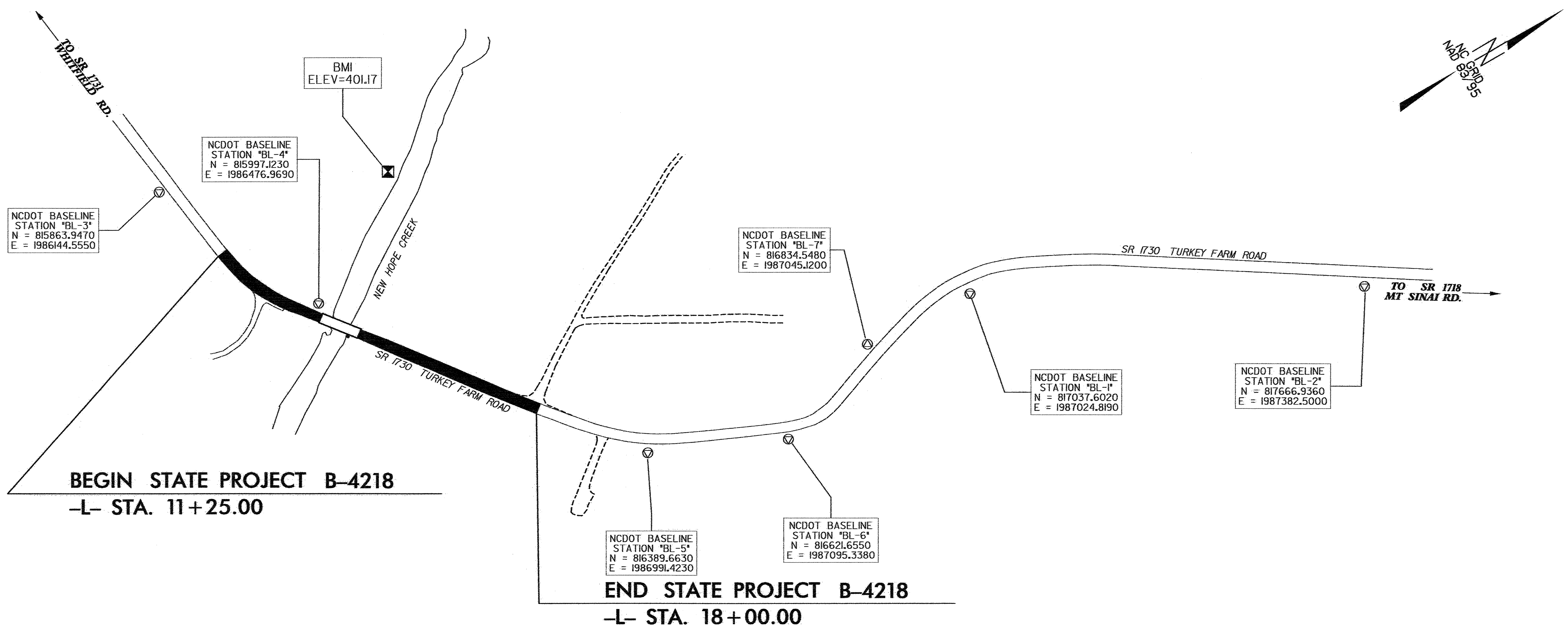
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- 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.

PROJECT REFERENCE NO.	SHEET NO.
B-4218	1C
Location and Surveys	

B-4218 SURVEY CONTROL SHEET



BASELINE DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL-3	815863.9470	1986144.5550	404.51	OUTSIDE PROJECT LIMITS	
4	BL-4	815997.1230	1986476.9690	403.40	13+36.32	11.20 LT
5	BL-5	816389.6630	1986991.4230	434.83	OUTSIDE PROJECT LIMITS	
6	BL-6	816621.6550	1987095.3380	441.82	OUTSIDE PROJECT LIMITS	
7	BL-7	816834.5480	1987045.1200	438.31	OUTSIDE PROJECT LIMITS	
1	B4218-1	817037.6020	1987024.8190	430.01	OUTSIDE PROJECT LIMITS	
2	B4218-2	817666.9360	1987382.5000	463.89	OUTSIDE PROJECT LIMITS	

NOTES

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
b4218_ls_control_060424.txt

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

◎ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4218-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 817037.602(ft) EASTING: 1987024.819(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99994088 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4218-1" TO -L- STATION 11+25.00 IS S 32° 32' 43.27" W 1353.062 FT ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

BENCHMARK DATA

BM1 ELEVATION = 401.17
N 816236 E 1986332
L STATION 13+66 289 LEFT
RR SPIKE IN 18" POPLAR

NOTE: DRAWING NOT TO SCALE

12/01/2005
4/30/2008
Y:\NCDOT\B4218\Roadway\Proj\b4218_RDY_psh01c.dgn
USERNAME

8/17/99

REVISIONS

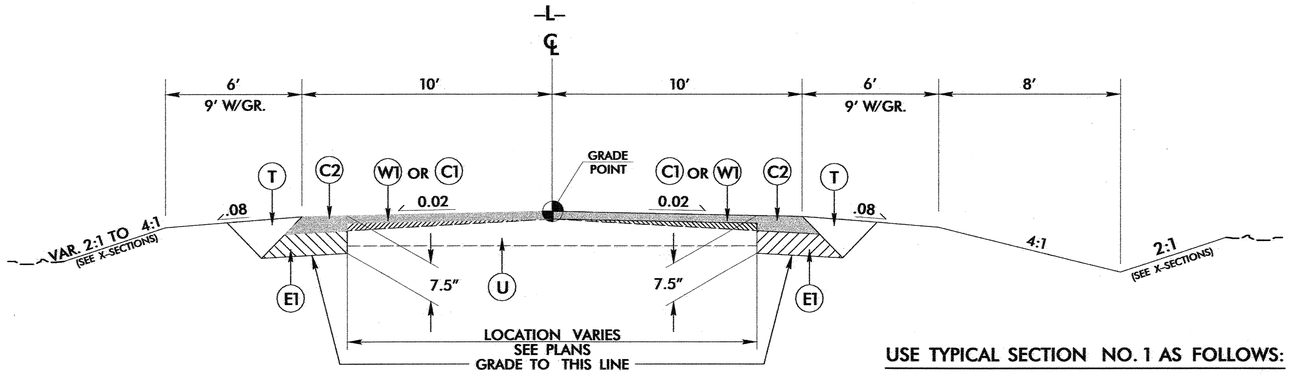
PROJECT REFERENCE NO.	SHEET NO.
B-4218	2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

PAVEMENT ~~INVESTIGATIONS~~ DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20299 ENGINEER THOMAS R. HEPLER 5/1/08

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON 5/5/08



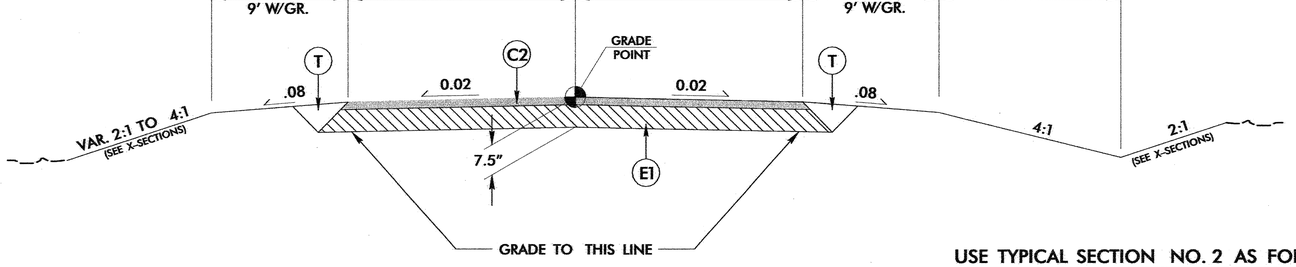
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:

–L– STA 11+35 TO –L– STA 12+70
–L– STA 15+40 TO –L– STA 17+63
(REFER TO INSET "A" FOR STA 16+00 TO STA 17+50 – LEFT)

TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
–L– STA 11+25 TO –L– STA 11+35

TRANSITION FROM T.S. NO. 1 TO EXISTING FROM
–L– STA 17+63 TO –L– STA 17+73



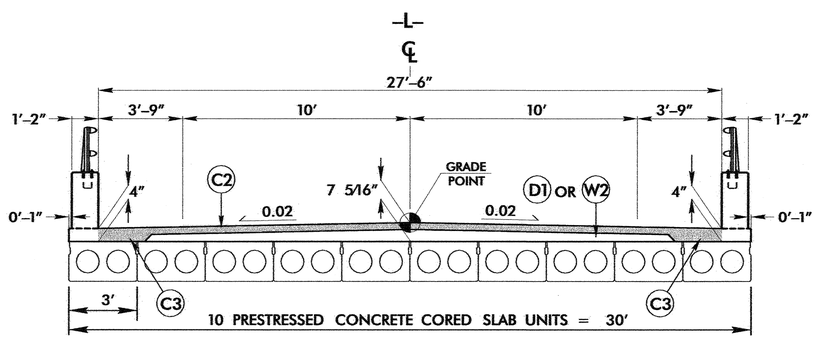
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AS FOLLOWS:

–L– STA 12+70 TO –L– STA 13+30 (BEGIN BRIDGE)
–L– STA 14+50 (END BRIDGE) TO –L– 15+40

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1¼″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE,TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1″ OR GREATER THAN 1½″ IN DEPTH.
D1	PROP. VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE,TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 5.5″ IN DEPTH OR LESS THAN 3″ IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL 1)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL 2)

NOTE : PAVEMENT EDGE SLOPE ARE 1:1 UNLESS SHOWN OTHERWISE



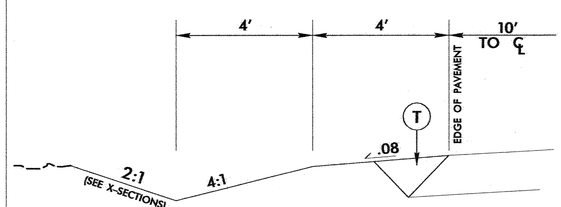
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 AS FOLLOWS:

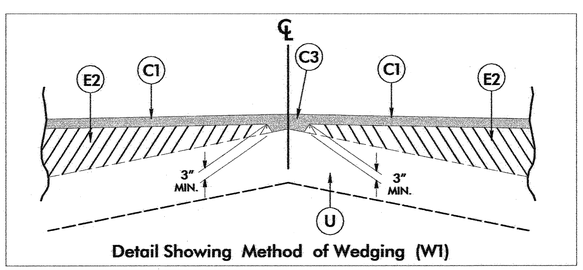
–L– STA 13+30 (BEGIN BRIDGE) TO –L– STA 14+50 (END BRIDGE)

INSET "A"

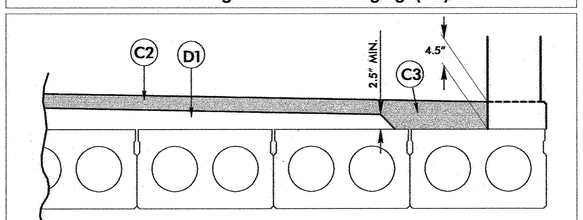
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION NO. 1
FOR –L– STA 16+00 TO STA 17+50 (LEFT)



NOTE:
DESIGN EXCEPTION REQUIRED FOR MINIMUM HORIZONTAL CURVATURE, VERTICAL CURVE K VALUE, MAXIMUM SUPER AND MINIMUM SHOULDER WIDTH.



Detail Showing Method of Wedging (W1)



Detail Showing Method of Wedging (W2)

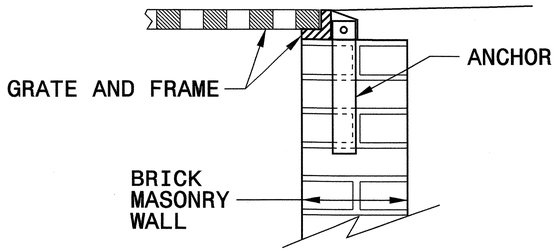
4/30/2008
N:\Roadway\Proj\B4218\Roadway\Proj\B4218_RDY_TYP.dgn
USERNAME

PROJECT REFERENCE NO.	SHEET NO.
B-4218	2-A

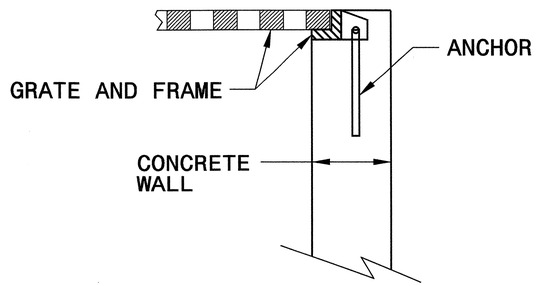
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

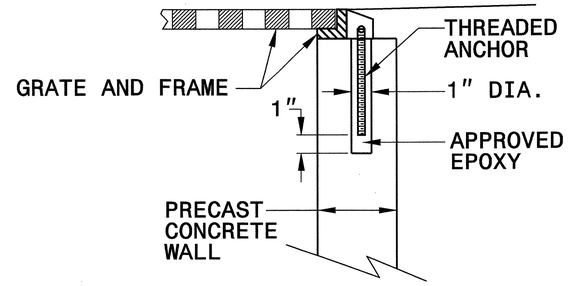
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



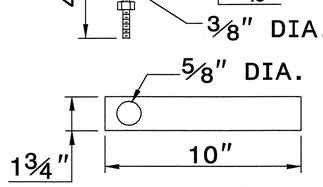
CONCRETE CONSTRUCTION



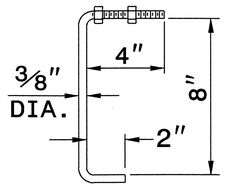
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

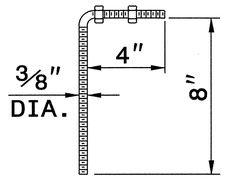
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



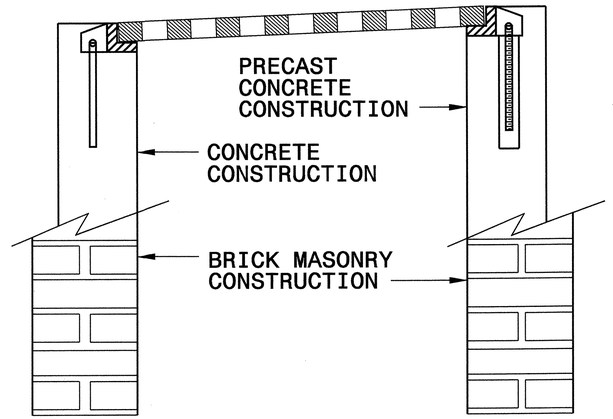
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



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

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
5/8/08

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

SEE PLATE FOR TITLE

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

01-MAR-2007 09:04
s:\contracts\special details\erioward\stds\06' stds to special details\840 25 anchorage for frames\0840d25.dgn
jhowerton AT PS21260

COMPUTED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

PROJECT NO.	SHEET NO.
B-4218	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201872

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	200	CY	UNDERCUT EXCAVATION
0195000000-E	265	200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	200	SY	FABRIC FOR SOIL STABILIZATION
0318000000-E	300	16	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0344000000-E	310	68	LF	18" SIDE DRAIN PIPE
0366000000-E	310	80	LF	15" RC PIPE CULVERTS, CLASS III
0995000000-E	340	108	LF	PIPE REMOVAL
1220000000-E	545	200	TON	INCIDENTAL STONE BASE
1330000000-E	607	120	SY	INCIDENTAL MILLING
1489000000-E	610	250	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	60	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1525000000-E	610	210	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-E	620	30	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	12	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2022000000-E	815	22.4	CY	SUBDRAIN EXCAVATION
2033000000-E	815	16.8	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	100	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	3	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
2286000000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	80	LF	SHOULDER BERM GUTTER
3030000000-E	862	285	LF	STEEL BM GUARDRAIL
3045000000-E	862	22.5	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	10	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
3635000000-E	876	40	TON	RIP RAP, CLASS II
3649000000-E	876	10	TON	RIP RAP, CLASS B
3656000000-E	876	635	SY	FILTER FABRIC FOR DRAINAGE
4400000000-E	1110	275	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	94	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4445000000-E	1145	48	LF	BARRICADES (TYPE III)
4810000000-E	1205	5,400	LF	PAINT PAVEMENT MARKING LINES (4")
4900000000-N	1251	17	EA	PERMANENT RAISED PAVEMENT MARKERS
6000000000-E	1605	235	LF	TEMPORARY SILT FENCE
6006000000-E	1610	75	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	225	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6029000000-E	SP	150	LF	SAFETY FENCE
6030000000-E	1630	605	CY	SILT EXCAVATION
6036000000-E	1631	385	SY	MATTING FOR EROSION CONTROL
6038000000-E	SP	380	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	50	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	8	EA	SPECIAL STILLING BASINS
6071030000-E	SP	115	LF	COIR FIBER BAFFLES
6084000000-E	1660	1.5	ACR	SEEDING & MULCHING
6087000000-E	1660	1	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	1.25	TON	FERTILIZER TOPDRESSING
6114000000-N	SP	2	HR	SPECIALIZED HAND MOWING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL

Printed: 4/30/2008

COMPUTED BY:	RBE	DATE:	2/21/2008
CHECKED BY:	TRH	DATE:	2/22/2008

PROJECT NO.	SHEET NO.
B-4218	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
PHASE I					
L- 11+25	13+30	14	147	133	0
L- 14+50	17+73	232	241	9	0
PHASE I SUBTOTALS:		**246**	**388**	**142**	**0**
PROJECT SUBTOTAL:		246	388	142	0
LOSS DUE TO CLEARING & GRUBBING		-50		50	
WASTE IN LIEU OF BORROW				0	0
REPLACE TOPSOIL ON BORROW PIT				10	
PROJECT TOTALS:		**196**	**388**	**202**	**0**
SAY		**210**		**220**	**0**

DRAINAGE DITCH EXCAVATION: 0 CY
SELECT GRANULAR MATERIAL (CLASS II AND III): 200 CY*

ESTIMATED UNDERCUT: 200 CY*

* PER GEOTECHNICAL REPORT DATED 7/20/2006

NOTE:

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

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

LINE	Station	Station	LOC LT/RT/CL	Avg. Width	SY
-L-	12+70	13+45	CL	19	158
-L-	14+21	15+40	CL	19	251
				TOTAL:	410
				SAY:	500

NOTE:

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

COMPUTED BY:	T CORMIER	DATE:	3/10/2008
CHECKED BY:	J RECK	DATE:	3/10/2008

PROJECT NO.	SHEET NO.
B-4218	3B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"
-L- 12+94	LT	1		403.9	400.7										
-L- 12+42	RT	2	OUT												
-L- 12+96	CL	1	3	403.9	400.7	400.6	X		24						
-L- 13+00	RT	3		403.9	400.6										
-L- 13+00	RT	3	OUT	403.9	400.6	400.5			16						
-L- 17+62	LT	4	OUT						40						
-L- 10+80	CL														
SHEET TOTAL									80						

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	CLASS III R.C. PIPE OR C.S.PIPE, TYPE IR ALUMINIZED OR 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
-L- 12+94																										
-L- 12+42																								68			
-L- 12+96																										
-L- 13+00																										
-L- 13+00																										
-L- 17+62																										
-L- 10+80																										
SHEET TOTAL																								68		

STATION	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH GRATE STD. 840.20	M.D.I. FRAME WITH TWO GRATES STD. 840.22	M.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	M.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29				J.B. STD. 840.31 OR 840.32		MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54		T.B.D.I. STD 840.35	T.B.D.I. FRAME WITH GRATE STD 840.37	T.B. PRECAST DRAINAGE STRUCTURE STD 840.46				CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
-L- 12+94	1															1										1		1								
-L- 12+42																																			28	Remove existing 15" RC
-L- 12+96																																				
-L- 13+00	1															1										1		1								
-L- 13+00																																				
-L- 17+62																																			32	Remove existing 15" RC
-L- 10+80																																			48	Remove existing 18" CMP (crushed)
SHEET TOTAL	2															2										2		2							108	

ABBREVIATIONS

- C.B. CATCH BASIN
- N.D.I. NARROW DROP INLET
- D.I. DROP INLET
- M.D.I. MEDIAN DROP INLET
- M.D.I.(N.S.) MEDIAN DROP INLET (NARROW SLOT)
- J.B. JUNCTION BOX
- M.H. MANHOLE
- T.B.D.I. TRAFFIC BEARING DROP INLET
- T.B.J.B. TRAFFIC BEARING JUNCTION BOX

COMPUTED BY:	R B EARLY	DATE:	3/10/2008
CHECKED BY:	T HEPLER	DATE:	3/10/2008

"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

GUARDRAIL SUMMARY

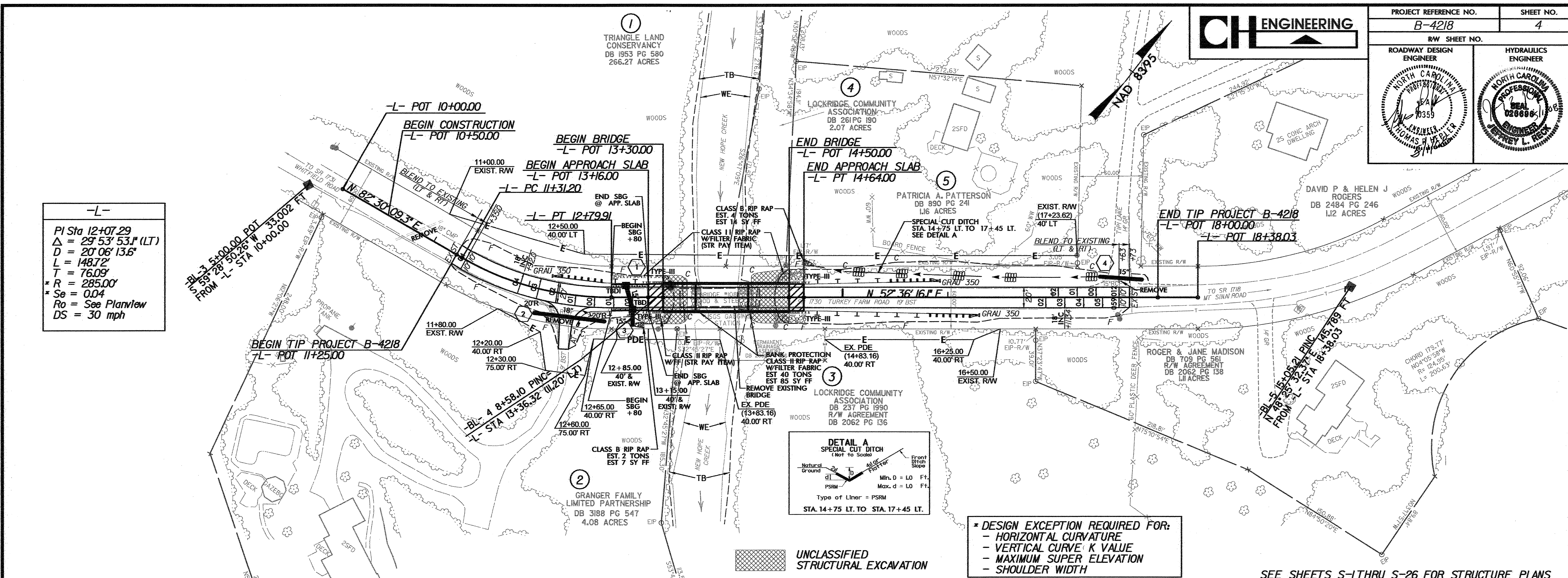
LINE	BEG. STA.	END STA.	LENGTH LOC.	STRAIGHT	SHOP CURVED	DOUBLE FACED	WARRANT POINT APPR. END	TRAIL. END	"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLARE LENGTH APPR. END	TRAIL. END	W APPR. END	TRAIL. END	ANCHORS XI MOD	XI	GRAU 350	M-350	III	AT-1	VI MOD	IMP. ATTEN. TYPE 350 EA	G	NG	REMOVE EXISTING GUARDRAIL		REMARKS
L	12+23.75	13+30.00	LT	106.25				13+30	3' 8.5"	6		50.0		1.0			1		1								RSD 862.01 SHEET 3
L	12+61.25	13+30.00	RT	62.50	22.5		13+30		3' 8.5"	6									1	1							RSD 862.01 SHEET 3
L	14+50.00	16+31.25	RT	181.25				15+50	3' 8.5"	6		50.0		1.0			1		1								RSD 862.01 SHEET 3
L	14+50.00	15+93.75	LT	143.75			14+50		3' 8.5"	6	50.0		1.0				1		1								RSD 862.01 SHEET 3
		TOTAL		493.75	22.5												3		4	1							
				516.25	TOTAL GUARDRAIL LENGTH																						
				-231.25	LESS ANCHOR DEDUCTIONS																						
				285.00	**LF GUARDRAIL**																						
	(10 ADDITIONAL POST)																										

ANCHOR DEDUCTIONS

150	3 @ 50' EACH PER GRAU 350
75	4 @ 18.75' EACH PER TYPE III
6.25	1 @ 6.25' EACH PER AT-1
231.25	LF REDUCTION

CH ENGINEERING

PROJECT REFERENCE NO.	SHEET NO.
B-4218	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

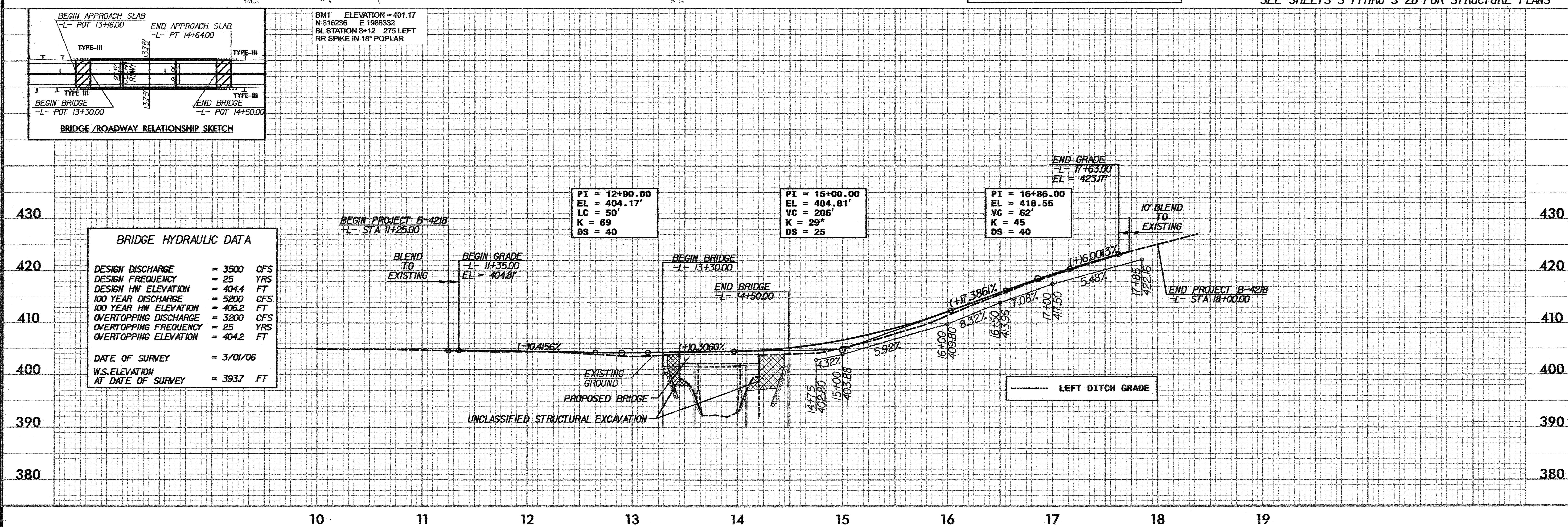


-L-

PI Sta 12+07.29
Δ = 29° 53' 53.1" (LT)
D = 20° 06' 13.6"
L = 148.72'
T = 76.09'
* R = 285.00'
* Se = 0.04
Ro = See Planview
DS = 30 mph

* DESIGN EXCEPTION REQUIRED FOR:
- HORIZONTAL CURVATURE
- VERTICAL CURVE K VALUE
- MAXIMUM SUPER ELEVATION
- SHOULDER WIDTH

BM1 ELEVATION = 401.17
N 816236 E 1986332
BL STATION 8+12 275 LEFT
RR SPIKE IN 18" POPLAR



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3500	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 404.4	FT
100 YEAR DISCHARGE	= 5200	CFS
100 YEAR HW ELEVATION	= 406.2	FT
OVERTOPPING DISCHARGE	= 3200	CFS
OVERTOPPING FREQUENCY	= 25	YRS
OVERTOPPING ELEVATION	= 404.2	FT
DATE OF SURVEY	= 3/01/06	
W.S. ELEVATION AT DATE OF SURVEY	= 393.7	FT

REVISIONS

Date: Description

4/30/2008
B4218_RDY_PSH04.dgn