

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3706	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33246.1.1	BRZ-1100(8)	P.E.	
33246.2.1	BRZ-1100(8)	RW & UTIL.	
33246.3.1	BRZ-1100(8)	CONSTRUCTION	

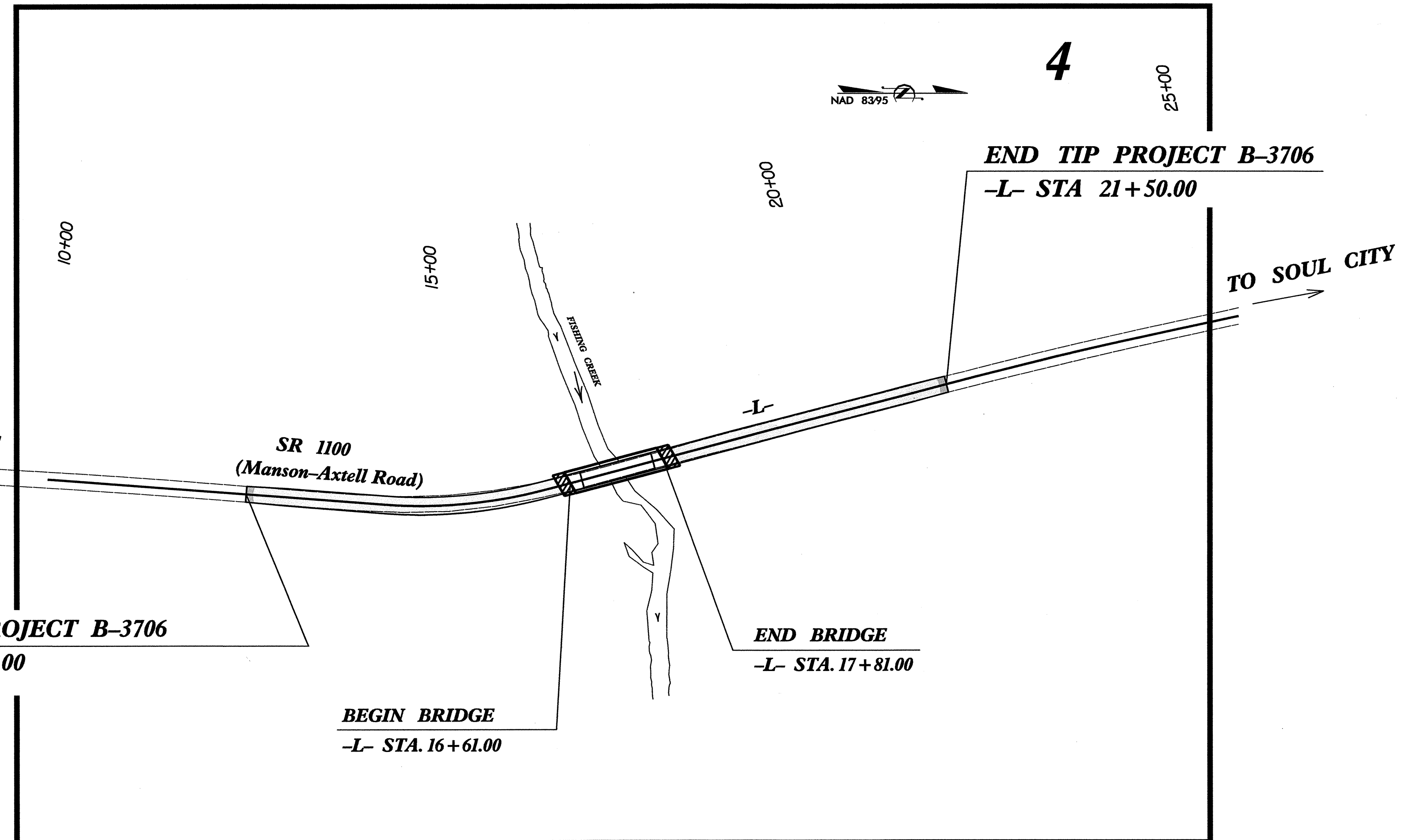
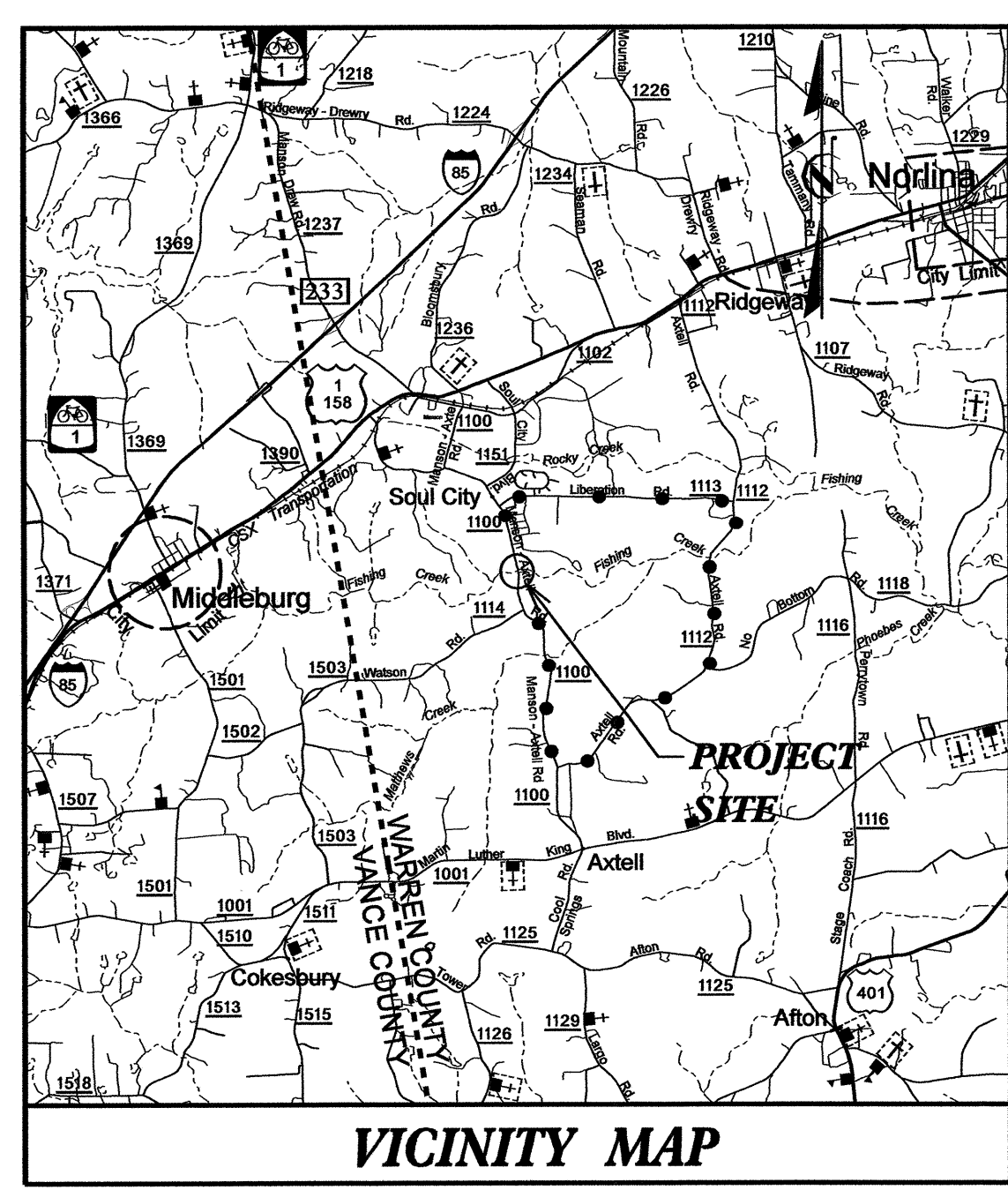
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**WARREN COUNTY**

**LOCATION:** Bridge No. 20 over Fishing Creek on SR 1100 (Manson-Axtell Road)

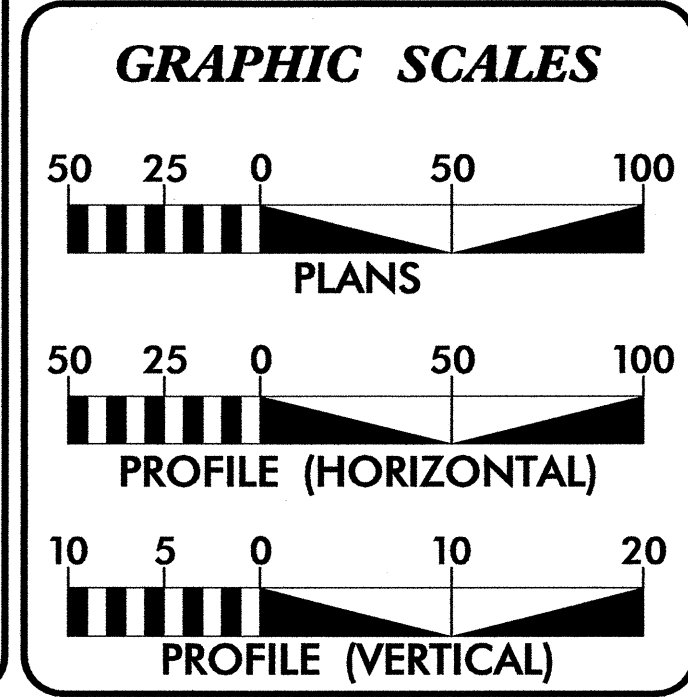
**TYPE OF WORK:** Grading, Drainage, Paving and Structure

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



NCDOT CONTACT: **B. DOUG TAYLOR, P.E.,**  
ROADWAY DESIGN - ENGINEERING COORDINATION

CONTRACT: C202103 TIP PROJECT: B-3706



**DESIGN DATA**

ADT 2009 =	900
ADT 2029 =	1525
DHV =	10 %
D =	60 %
T =	5 % *
V =	30 MPH
(* TTST 2% + DUAL 3%)	
FUNC. CLASS. =	RURAL LOCAL

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-3706	=	0.147 mi.
LENGTH OF STRUCTURE TIP PROJECT B-3706	=	0.023 mi.
<b>TOTAL LENGTH OF TIP PROJECT B-3706</b>	<b>=</b>	<b>0.170 mi.</b>

Prepared in the Office of:  
**KO & ASSOCIATES, P.C.**  
Consulting Engineers  
5121 Kingdom Way, Suite 100, Raleigh, NC 27607 (919) 851-6066  
For the North Carolina Department of Transportation

2006 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
March 12, 2008

**LETTING DATE:**  
APRIL 21, 2009

**Brian A. Wiles, P.E.**  
PROJECT ENGINEER

**Michael A. Young, P.E.**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

*Herbert Turner*  
SIGNATURE

**ROADWAY DESIGN ENGINEER**

*Brian A. Wiles*  
SIGNATURE

Professional Engineer Seals for Herbert Turner, Jr. (Seal 021162) and Brian Allen Wiles (Seal 16689).

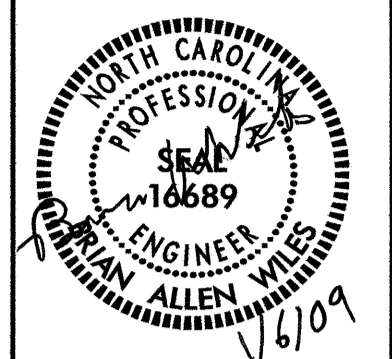
**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

*at millan*  
P.E.  
STATE HIGHWAY DESIGN ENGINEER

12/17/2008 P:\Roadway\Proj\B3706-Rdy-tsh.dgn Ko & Associates, P.C.

6/4/99

PROJECT REFERENCE NO.	SHEET NO.
B-3706	1-A



**KO & ASSOCIATES, P.C.**  
**Consulting Engineers**  
 5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607  
 (919) 851-6066

# DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

## INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	Title Sheet
1-A	Index of Sheets, General Notes and List of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheet
2	Typical Sections, Wedging Detail and Pavement Schedule
2-A	Anchorage for Frames Detail
3	Summary of Quantities
3-A	List of Pipes, Endwalls, Etc. (for Pipes 48" and Under) and Summary of Guardrail
3-B	Summary of Earthwork and Summary of Pavement Removal
4	Plan Sheet
5	Profile Sheet
TCP-1 thru TCP-4	Traffic Control Plans
SD-1	Special Sign Design
EC-1 thru EC-5	Erosion Control Plans
RF-1	Reforestation Detail Sheet
SIGN-1 thru SIGN-3	Signing Plans
UC-1 thru UC-3	Utility Construction Plans
OU-1 thru OU-2	Utility by Others Plans
X-1	Cross Section Summary Sheet
X-2 thru X-7	Cross Sections
S-1 thru S-21	Structure Plans

## GENERAL NOTES:

**GENERAL NOTES:** 2006 SPECIFICATIONS  
 EFFECTIVE: 07-18-06  
 REVISED: 07-30-08

**GRADING AND SURFACING OR RESURFACING AND WIDENING:**  
 THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

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

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

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

**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 Warren County Public Works, Progress Energy and Embarq.  
 ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

**RIGHT-OF-WAY MARKERS:**  
 ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

## 2006 ROADWAY STANDARD DRAWINGS

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

2006 ROADWAY 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
<b>DIVISION 2 - EARTHWORK</b>	
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
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.10	Reinforced Bridge Approach Fills
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 6 - SUBGRADE, BASES AND SHOULDERS</b>	
654.01	Pavement Repairs
<b>DIVISION 8 - INCIDENTALS</b>	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
840.00	Concrete Base Pad for Drainage Structures
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
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.04	Drainage Ditches with Class 'B' Rip Rap

6/2009 Roadway\Proc\162706-Rdy-3ser-res.dgn

3/15/06

**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	_____ X
Property Monument	□ EDM
Parcel/Sequence Number	①23
Existing Fence Line	-X-X-X-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	--- WLB
Proposed Wetland Boundary	--- WLB
Existing Endangered Animal Boundary	--- EAB
Existing Endangered Plant Boundary	--- EPB

**BUILDINGS AND OTHER CULTURE:**

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

**HYDROLOGY:**

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

**RAILROADS:**

Standard Gauge	_____
RR Signal Milepost	○
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

**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
Proposed Wheel Chair Ramp Curb Cut	⊗ WCC
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	_____

**EXISTING STRUCTURES:**

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

**UTILITIES:**

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	○
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	□
H-Frame Pole	●
Recorded U/G Power Line	_____
Designated U/G Power Line (S.U.E.*)	_____

**TELEPHONE:**

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	○
Telephone Booth	□
Telephone Pedestal	□
Telephone Cell Tower	⊗
U/G Telephone Cable Hand Hole	□
Recorded U/G Telephone Cable	_____
Designated U/G Telephone Cable (S.U.E.*)	_____
Recorded U/G Telephone Conduit	_____
Designated U/G Telephone Conduit (S.U.E.*)	_____
Recorded U/G Fiber Optics Cable	_____
Designated U/G Fiber Optics Cable (S.U.E.*)	_____

**WATER:**

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

**TV:**

TV Satellite Dish	⊗
TV Pedestal	□
TV Tower	⊗
U/G TV Cable Hand Hole	□
Recorded U/G TV Cable	_____
Designated U/G TV Cable (S.U.E.*)	_____
Recorded U/G Fiber Optic Cable	_____
Designated U/G Fiber Optic Cable (S.U.E.*)	_____

**GAS:**

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

**SANITARY SEWER:**

Sanitary Sewer Manhole	⊗
Sanitary Sewer Cleanout	⊗
U/G Sanitary Sewer Line	_____
Above Ground Sanitary Sewer	_____
Recorded SS Forced Main Line	_____
Designated SS Forced Main Line (S.U.E.*)	_____

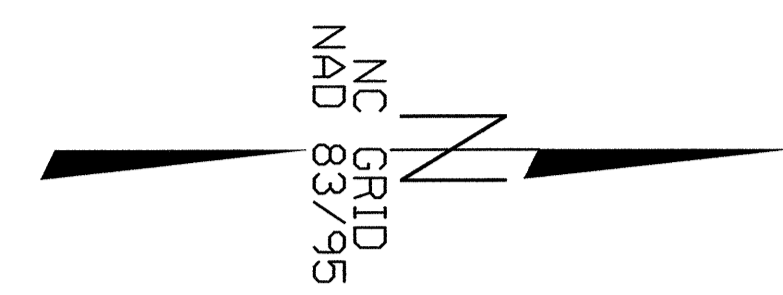
**MISCELLANEOUS:**

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

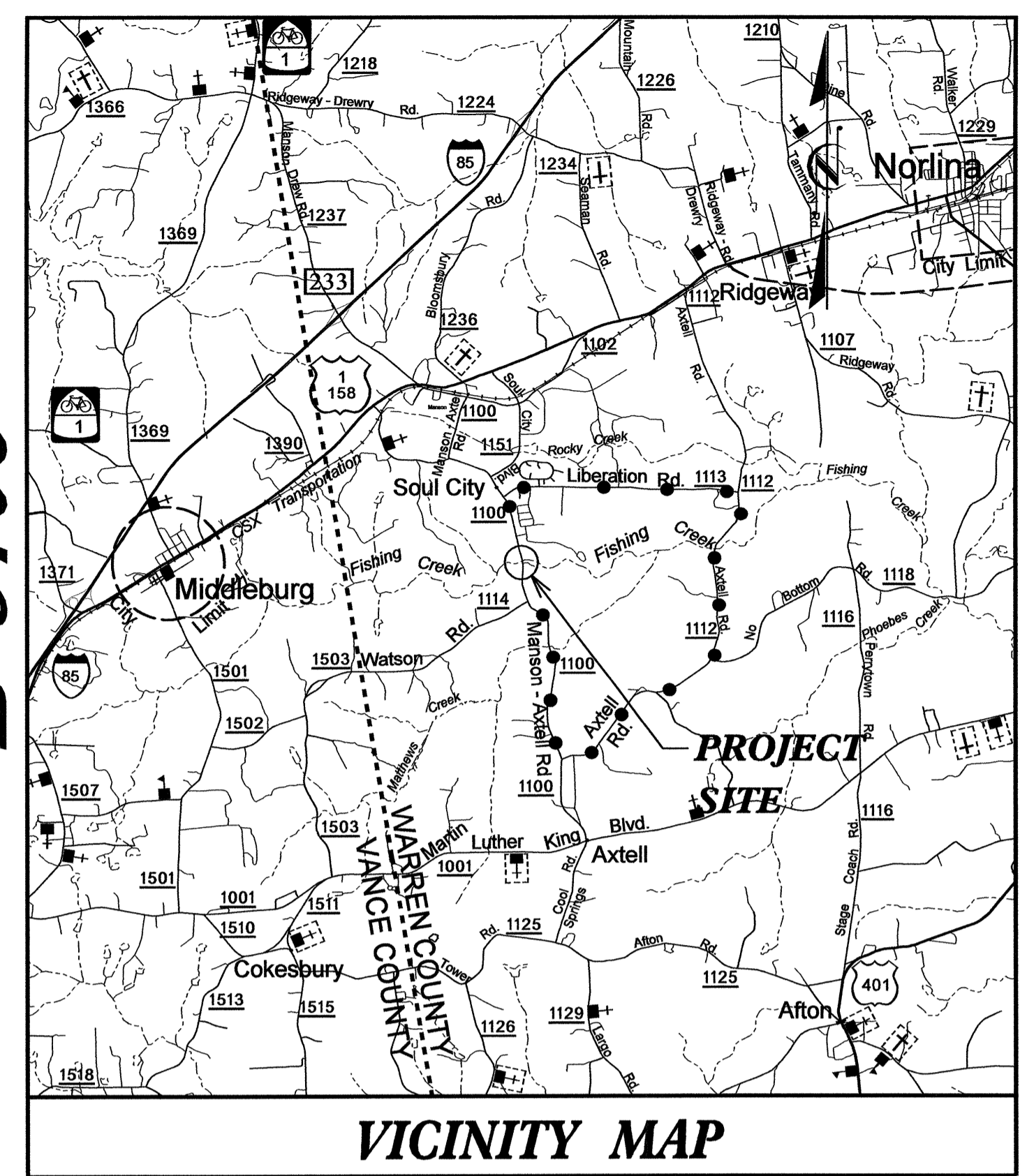
# SURVEY CONTROL SHEET B-3706

# WARREN COUNTY

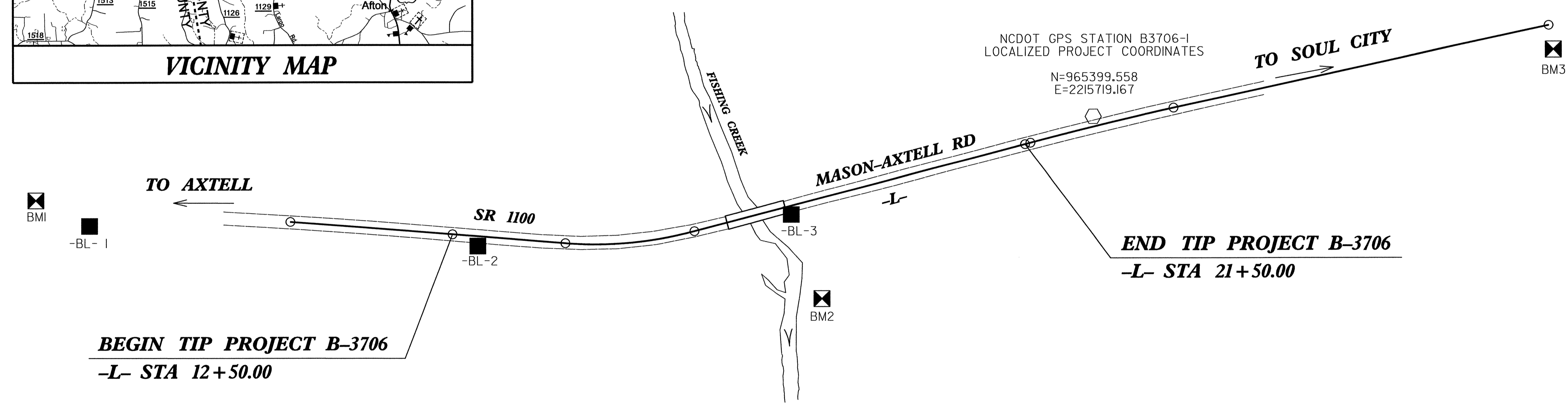
**LOCATION: BRIDGE #20 OVER FISHING CREEK AND APPROACHES ON SR 1100 (MASON-AXTELL ROAD)**



NCDOT GPS STATION B3706-2  
LOCALIZED PROJECT COORDINATES  
N=966401.289  
E=2215544.686



**VICINITY MAP**



NCDOT GPS STATION B3706-1  
LOCALIZED PROJECT COORDINATES  
N=965399.558  
E=2215719.167

**END TIP PROJECT B-3706**  
-L- STA 21+50.00

**BEGIN TIP PROJECT B-3706**  
-L- STA 12+50.00

**CONTROL DATA**

BASELINE POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-1	963856.240	2215886.674	362.13	OUTSIDE PROJECT LIMITS	
102	BL-2	964453.172	2215917.347	343.28	12+90.09	14.89 RT
103	BL-3	964935.048	2215869.336	323.55	17+74.55	13.11 RT
1	B3706-1	965399.558	2215719.167	355.42	22+61.69	15.08 LT
2	B3706-2	966401.289	2215544.686	400.66	OUTSIDE PROJECT LIMITS	

**BENCHMARK DATA**

BM1	ELEVATION = 366.96	BM2	ELEVATION = 315.49
N 963774	E 2215847	N 964982	E 2215998
L STATION 10+00		L STATION 17+88 150' RIGHT	
S 4° 52' 09.0" W DIST 392.49'		*BENCLITE* NAIL SET IN 14 INCH BIRCH TREE	
*BENCLITE* NAIL SET IN POWER POLE			
BM3	ELEVATION = 386.83		
N 966107	E 2215617		
L STATION 29+74 38' RIGHT			
*BENCLITE* NAIL SET IN POWER POLE CP&L (6W403 40K)			

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3706-1"  
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF  
NORTHING: 965399.558(±) EASTING: 2215719.167(±)  
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00007405  
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3706-1" TO -L- STATION 12+50.00 IS  
S 10°22'08.2" E 1001.57'  
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

**NOTE: DRAWING NOT TO SCALE**

**NOTES:**

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/)  
B3706\_ls\_control\_071210.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 HARN MONUMENTS

6/2/99

**B-3706**

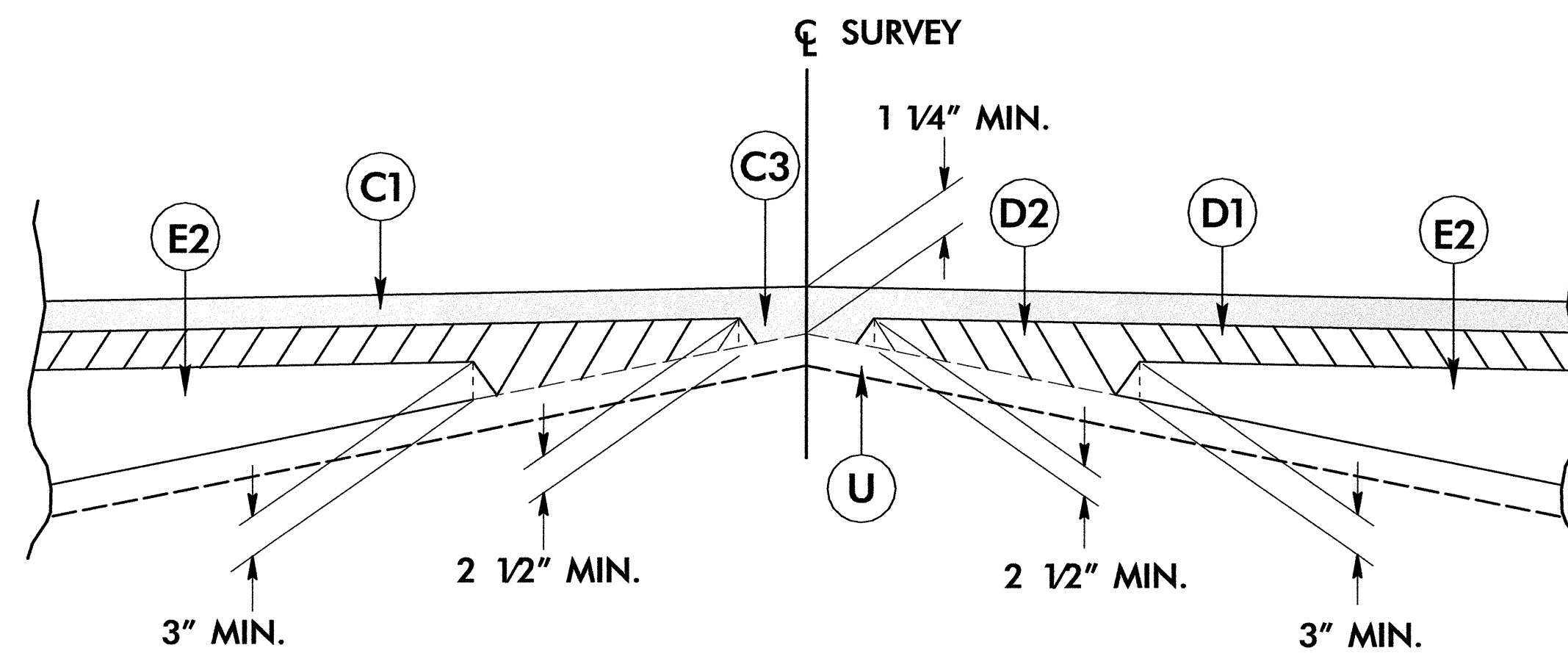
12/3/2008  
C:\Roadway\Proj\B3706\ls\_1c.dgn

6/2/09

12/17/2008  
 K:\Roadway\Proj\B3706\_Fdy\_tup.dgn  
 KO & Associates, P.C.

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. 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" IN DEPTH OR GREATER THAN 1 1/2" IN DEPTH.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. 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 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET.)

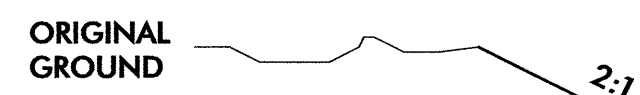
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



Detail Showing Method of Wedging (W)

TRANSITION FROM EXISTING TO T.S. NO. 1

-L- STA. 12+50.00 TO 13+00.00

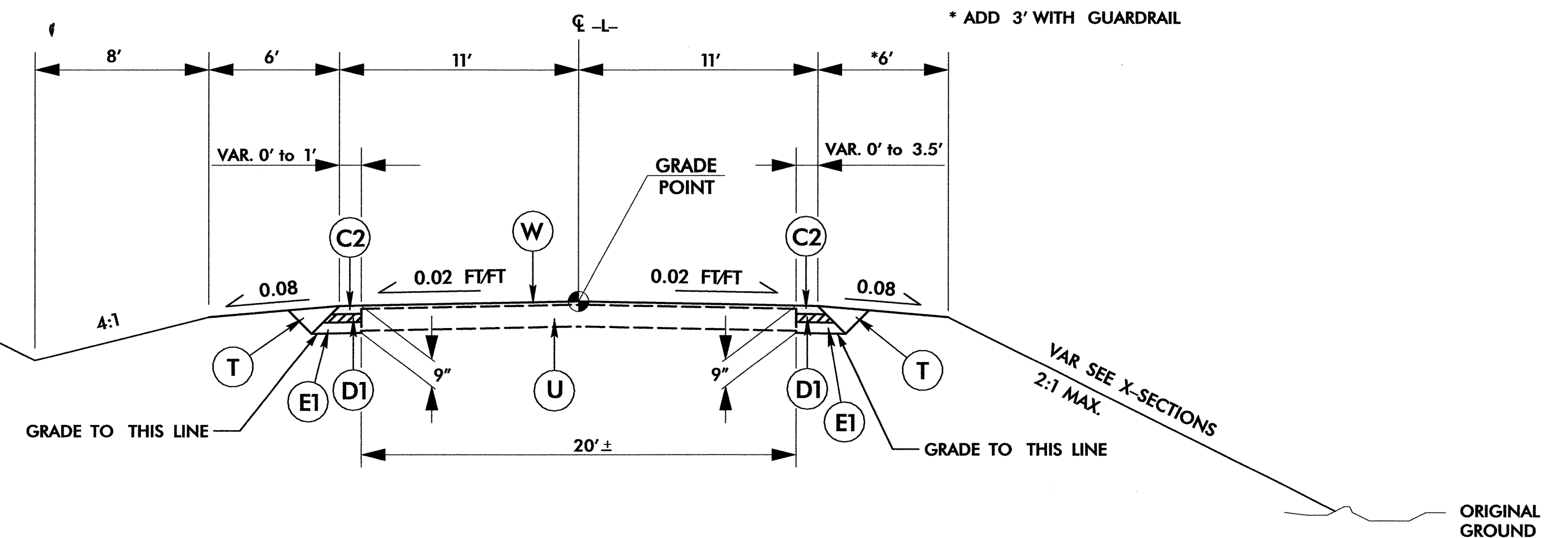


USE TYPICAL SECTION NO. 1

-L- STA. 13+00.00 TO 15+25.00  
 -L- STA. 20+00.00 TO 21+00.00

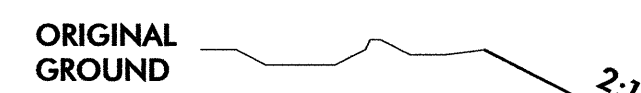
TRANSITION FROM T.S. NO. 1 TO EXISTING

-L- STA. 21+00.00 TO 21+50.00



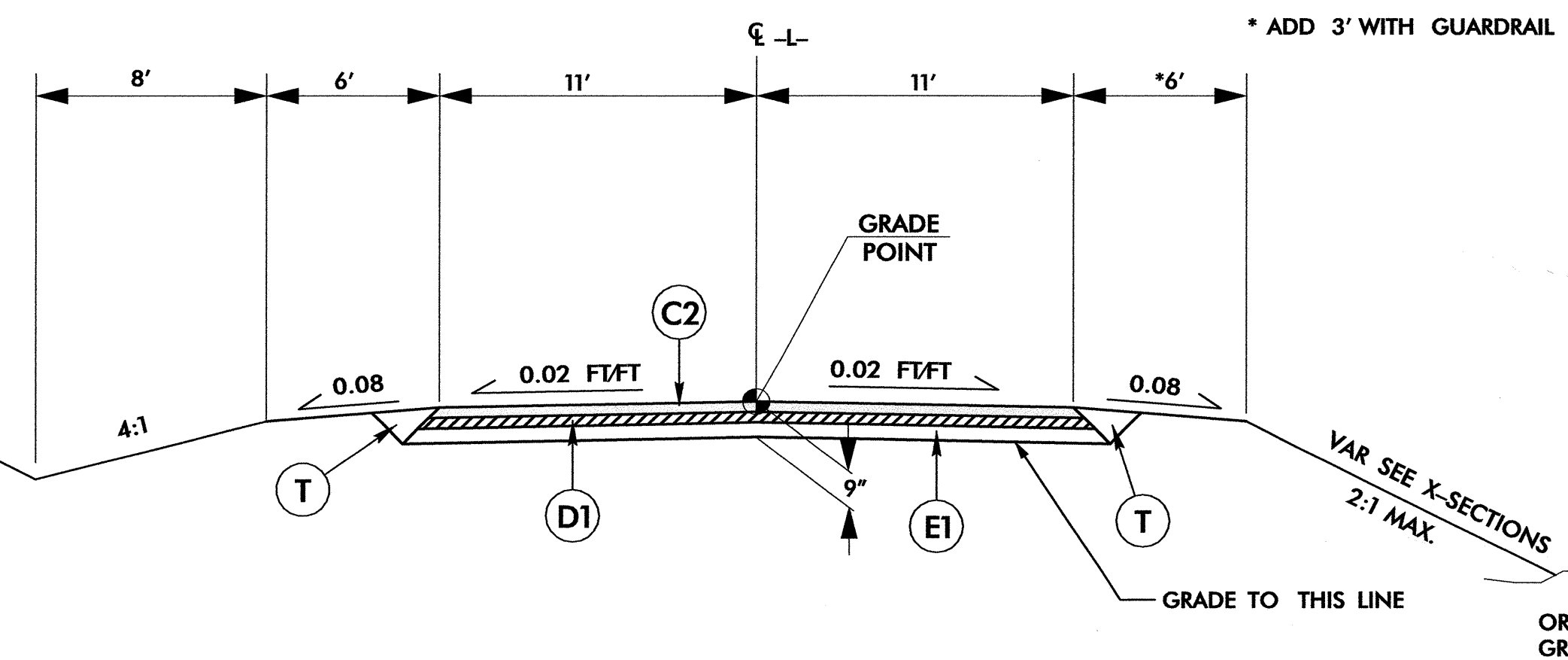
TYPICAL SECTION NO. 1

-L- (SR 1100)



USE TYPICAL SECTION NO. 2

-L- STA. 15+25.00 TO 16+46.86 (APPROACH SLAB)  
 -L- STA. 17+95.14 (APPROACH SLAB) TO 20+00.00



TYPICAL SECTION NO. 2

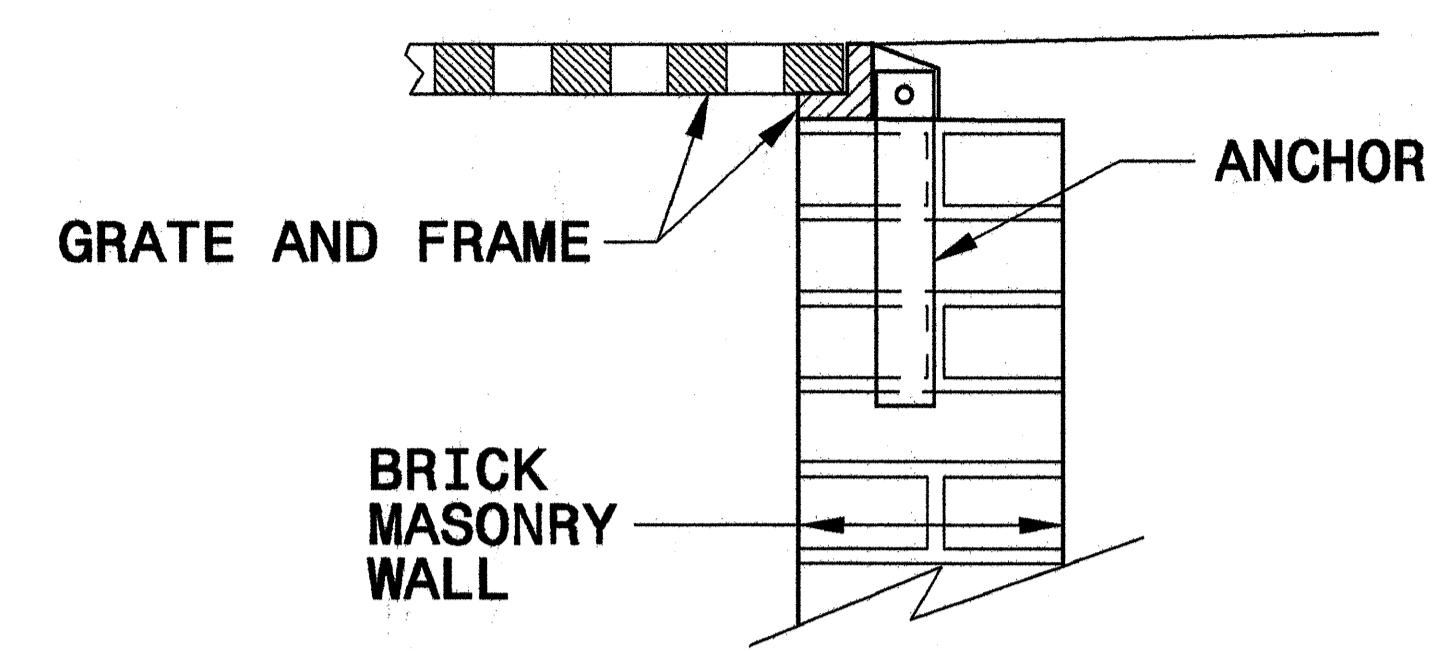
-L- (SR 1100)

PROJECT REFERENCE NO. B-3706	SHEET NO. 2
ROADWAY DESIGN ENGINEER SEAL 18689 12/17/08	PAVEMENT DESIGN ENGINEER SEAL 22896 12/23/08
<b>KO &amp; ASSOCIATES, P.C.</b> Consulting Engineers 521 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607 (919) 851-6066	

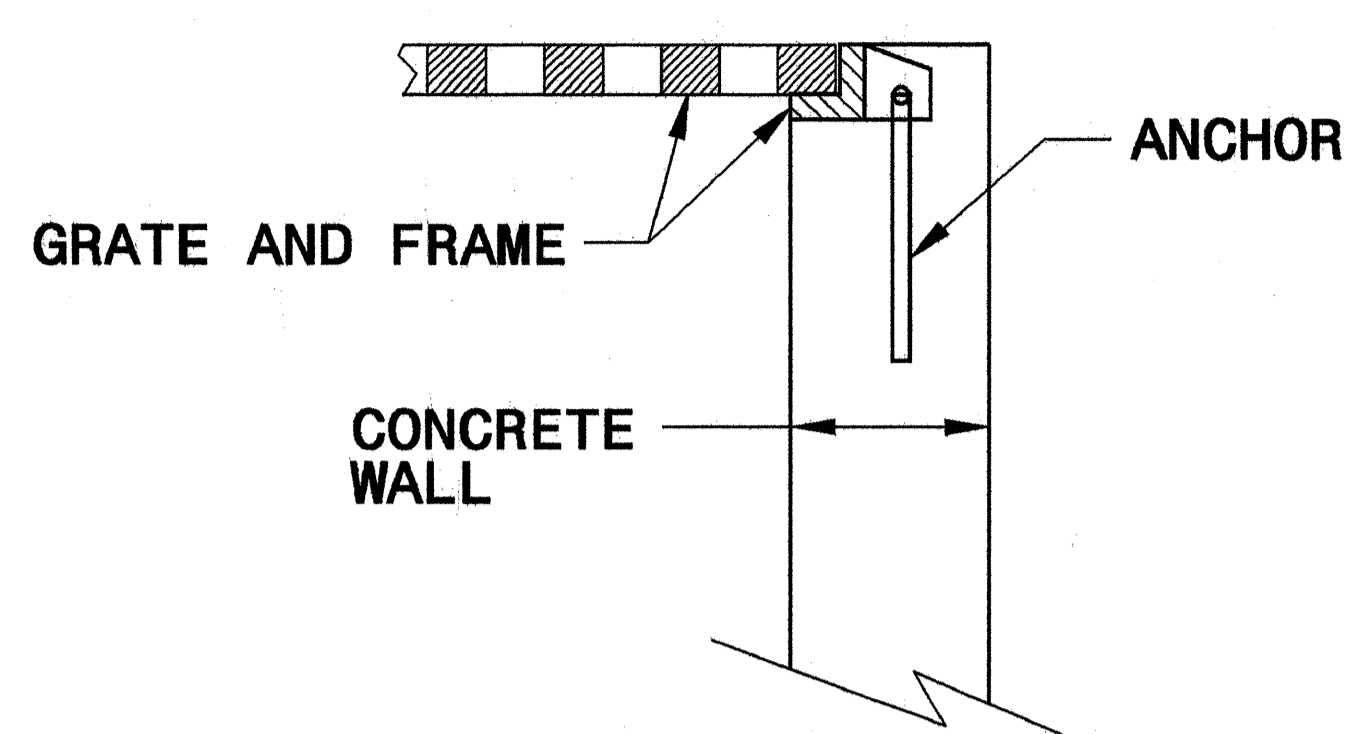
STATE OF  
NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

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

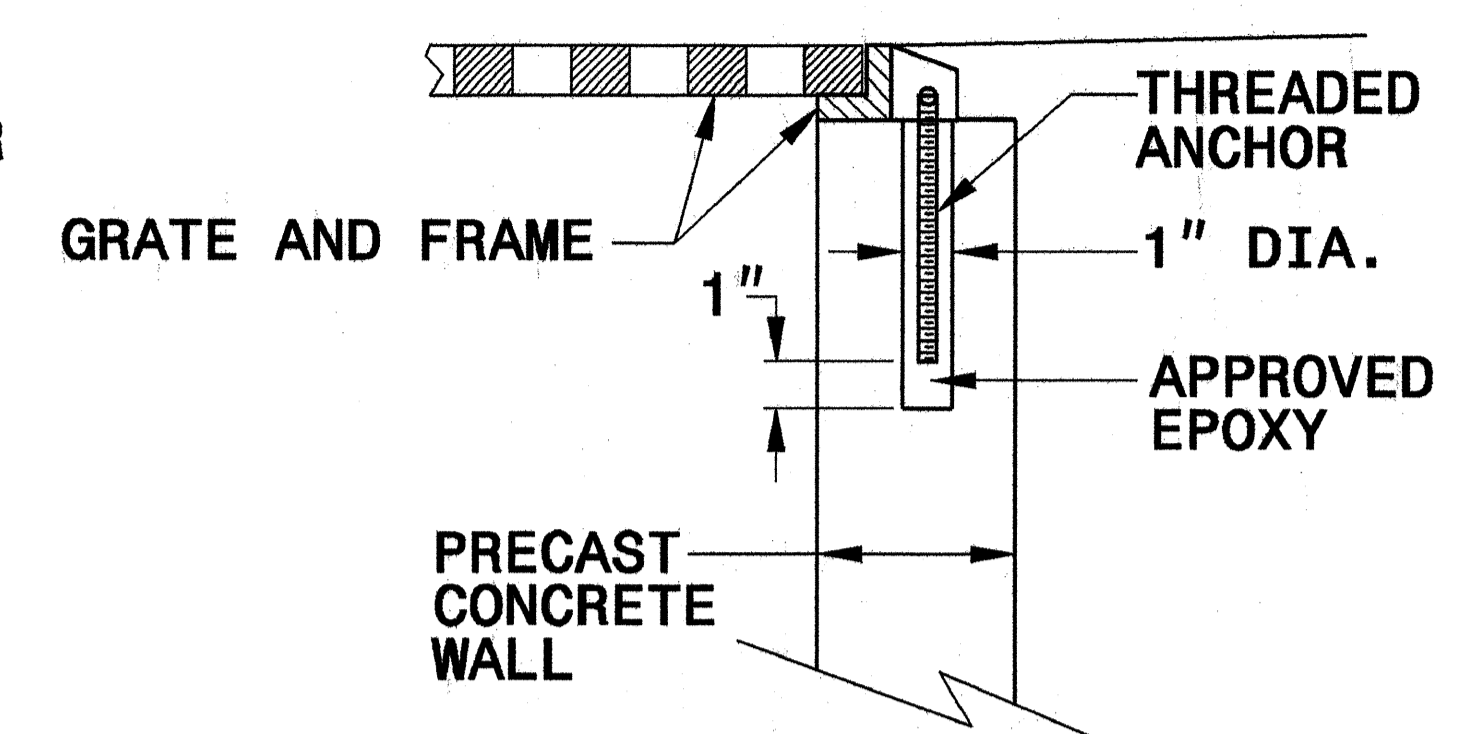
SHEET 1 OF 1  
**840D25**



**BRICK MASONRY  
CONSTRUCTION**



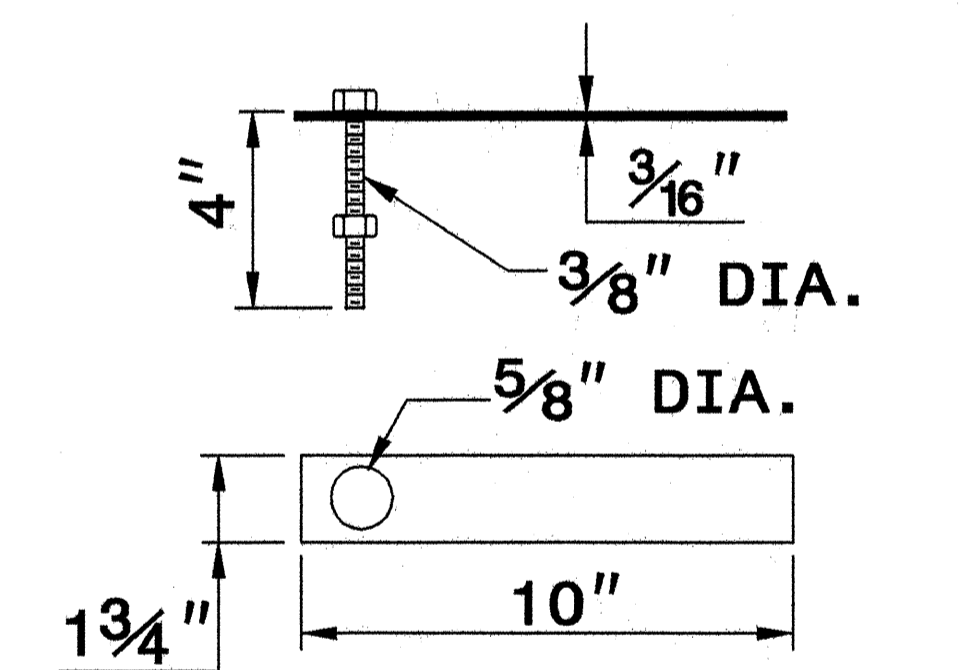
**CONCRETE  
CONSTRUCTION**



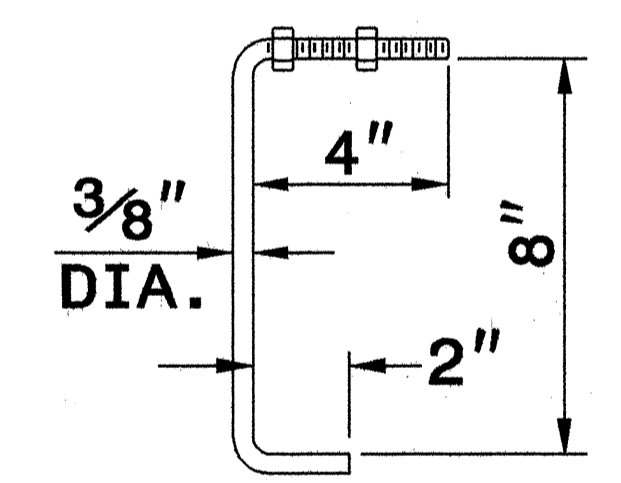
**PRECAST CONCRETE  
CONSTRUCTION**

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

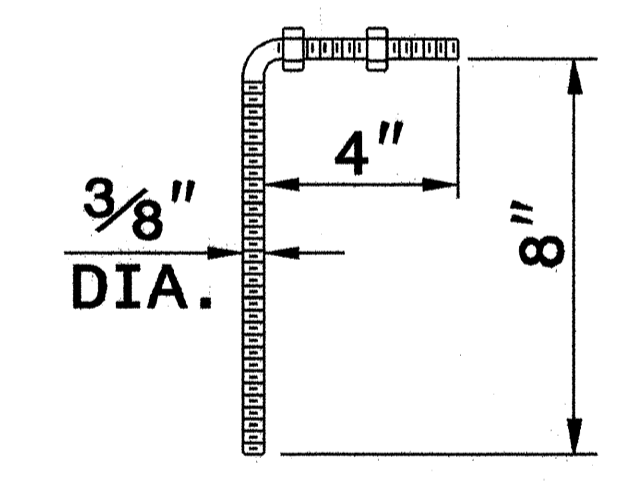
NOTE:  
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL  
OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



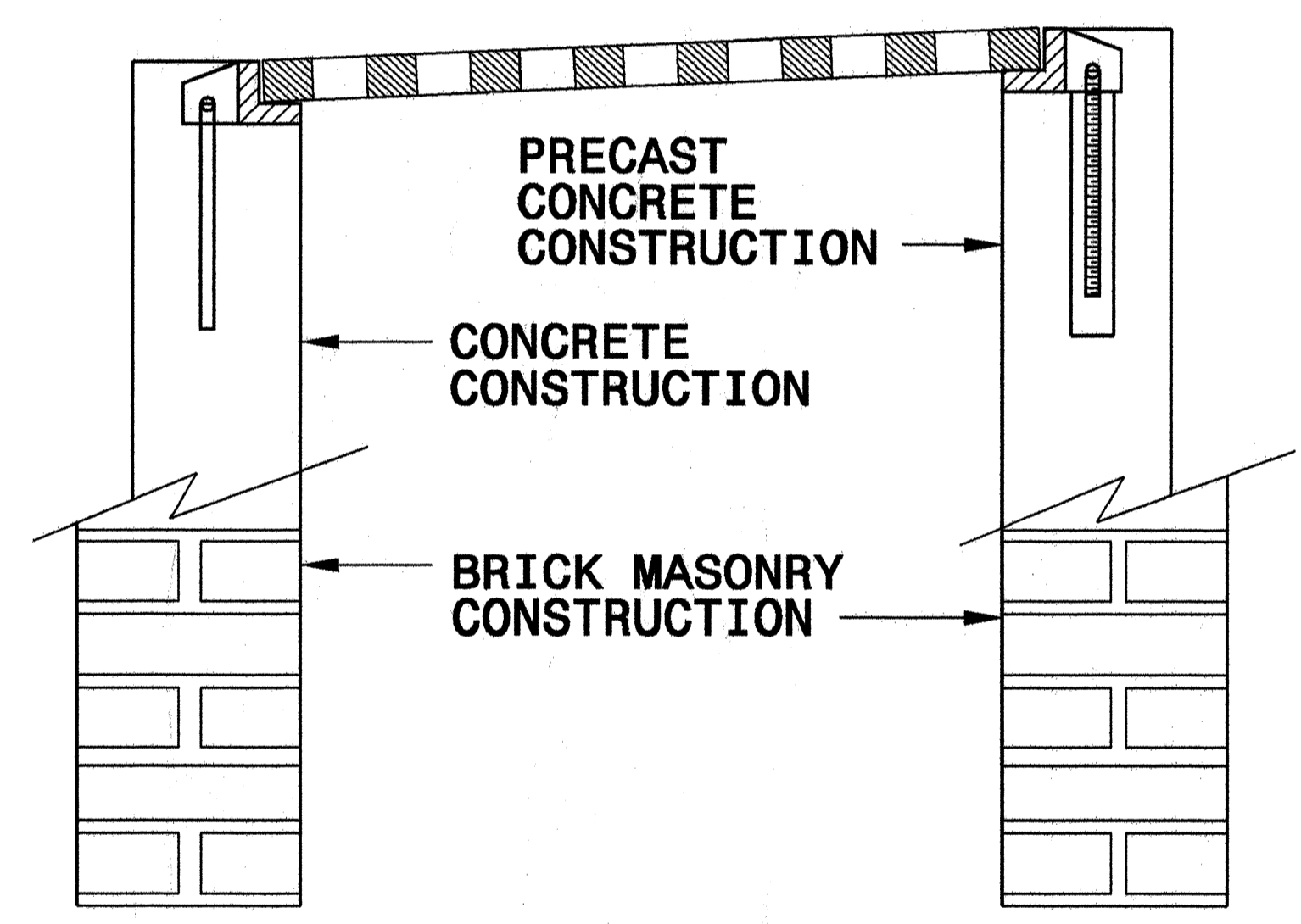
**MASONRY ANCHOR**  
3/8" DIA. BOLT WITH PLATE



**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**

27-SEP-2006 08:59 ar:\projects\840D25\Special Details\review\dstds\06' Studs to Special Details\0840d25.dgn

**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.:	

# DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

## STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202103

ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION
000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
000100000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
000800000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUB- BING
002200000-E	225	300	CY	UNCLASSIFIED EXCAVATION
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (17+21.00)
003600000-E	225	300	CY	UNDERCUT EXCAVATION
010600000-E	230	4,300	CY	BORROW EXCAVATION
013400000-E	240	80	CY	DRAINAGE DITCH EXCAVATION
015600000-E	250	170	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
017700000-E	250	690	SY	BREAKING OF EXISTING ASPHALT PAVEMENT
019500000-E	265	400	CY	SELECT GRANULAR MATERIAL
019600000-E	270	400	SY	FABRIC FOR SOIL STABILIZATION
031800000-E	300	25	TON	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRS
070800000-E	310	20	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
080600000-E	310	2	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
101100000-N	500	Lump Sum		FINE GRADING
122000000-E	545	300	TON	INCIDENTAL STONE BASE
148900000-E	610	425	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
149800000-E	610	250	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
152500000-E	610	300	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
156000000-E	620	50	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
169300000-E	654	100	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
200000000-N	806	13	EA	RIGHT OF WAY MARKERS
203300000-E	815	16.8	CY	SUBDRAIN FINE AGGREGATE
204400000-E	815	100	LF	6" PERFORATED SUBDRAIN PIPE
205500000-E	815	3	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
206600000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
207700000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
228600000-N	840	1	EA	MASONRY DRAINAGE STRUCTURES
236700000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
255600000-E	846	28	LF	SHOULDER BERM GUTTER
303000000-E	862	362.5	LF	STEEL BM GUARDRAIL
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
327000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
331700000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
336000000-E	863	460	LF	REMOVE EXISTING GUARDRAIL
364900000-E	876	205	TON	RIP RAP, CLASS B
365600000-E	876	920	SY	FILTER FABRIC FOR DRAINAGE
407200000-E	903	16	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
410200000-N	904	2	EA	SIGN ERECTION, TYPE E
415500000-N	907	7	EA	DISPOSAL OF SIGN SYSTEM, U- CHANNEL
440000000-E	1110	394	SF	WORK ZONE SIGNS (STATIONARY)
441000000-E	1110	107	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
444500000-E	1145	96	LF	BARRICADES (TYPE III)
481000000-E	1205	7,200	LF	PAINT PAVEMENT MARKING LINES (4")
490000000-N	1251	11	EA	PERMANENT RAISED PAVEMENT MARKERS
532600000-E	1510	366	LF	10" WATER LINE

ItemNumber	Sec #	Quantity	Unit	Description
564800000-N	1515	1	EA	RELOCATE WATER METER
567200000-N	1515	1	EA	RELOCATE FIRE HYDRANT
600000000-E	1605	475	LF	TEMPORARY SILT FENCE
600600000-E	1610	75	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	250	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	125	TON	SEDIMENT CONTROL STONE
601500000-E	1615	2.5	ACR	TEMPORARY MULCHING
601800000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
602100000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEED- ING
602400000-E	1622	550	LF	TEMPORARY SLOPE DRAINS
602700000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
602900000-E	SP	500	LF	SAFETY FENCE
603000000-E	1630	560	CY	SILT EXCAVATION
603600000-E	1631	2,050	SY	MATting FOR EROSION CONTROL
603700000-E	SP	25	SY	COIR FIBER MAT
603800000-E	SP	450	SY	PERMANENT SOIL REINFORCEMENT MAT
604200000-E	1632	175	LF	1/4" HARDWARE CLOTH
607101000-E	SP	200	LF	WATTLE
607102000-E	SP	64	LB	POLYACRYLAMIDE (PAM)
607103000-E	SP	225	LF	COIR FIBER BAFFLES
607105000-E	SP	4	EA	*** SKIMMER (1-1/2")
608400000-E	1660	5	ACR	SEEDING & MULCHING
608700000-E	1660	1.5	ACR	MOWING
609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
609600000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
610800000-E	1665	1.5	TON	FERTILIZER TOPDRESSING
611400000-N	SP	5	HR	SPECIALIZED HAND MOWING
611700000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
612300000-E	1670	0.1	ACR	REFORESTATION

6/4/99  
12/3/2008  
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DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA

**SUMMARY OF EARTHWORK**  
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
<b>SUMMARY NO. 1</b>					
-L- 12+50 TO 16+61.00	23		1803	1680	
<b>TOTAL SUMMARY NO. 1</b>	<b>123</b>		<b>1803</b>	<b>1680</b>	
<b>SUMMARY NO. 2</b>					
-L- 17+81.00 TO 21+50	95		3005	2910	
<b>TOTAL SUMMARY NO. 2</b>	<b>95</b>		<b>3005</b>	<b>2910</b>	
<b>SUB-TOTAL SUMMARY NOS. 1 &amp; 2</b>	<b>218</b>		<b>4808</b>	<b>4590</b>	
<b>UNCL. STRUCTURE EXCAVATION IN LIEU BORROW</b>				-500	
<b>PROJECT TOTAL</b>	<b>218</b>		<b>4808</b>	<b>4090</b>	
EST. 5% REPLACE TOPSOIL ON BORROW PITS				204	
<b>GRAND TOTALS</b>	<b>218</b>			<b>4294</b>	
<b>SAY</b>	<b>300</b>			<b>4300</b>	

ESTIMATE DRAINAGE DITCH EXCAVATION 80 C.Y.  
 UNDERCUT (CONTINGENCY) 300 C.Y.

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.

Note: Quantities are approximate only. The Resident Engineer will re-cross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

**SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL**

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD <sup>2</sup>
L	15+25	15+60	CL	77.78
L	19+60	20+00	CL	88.89
<b>TOTAL:</b>				<b>166.67</b>
<b>SAY:</b>				<b>170</b>

**SUMMARY OF EXISTING ASPHALT PAVEMENT BREAKING**

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD <sup>2</sup>
L	15+60	16+75	CL	255.56
L	17+68	19+60	CL	426.67
<b>TOTAL:</b>				<b>682.22</b>
<b>SAY:</b>				<b>690</b>

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 12/17/2008  
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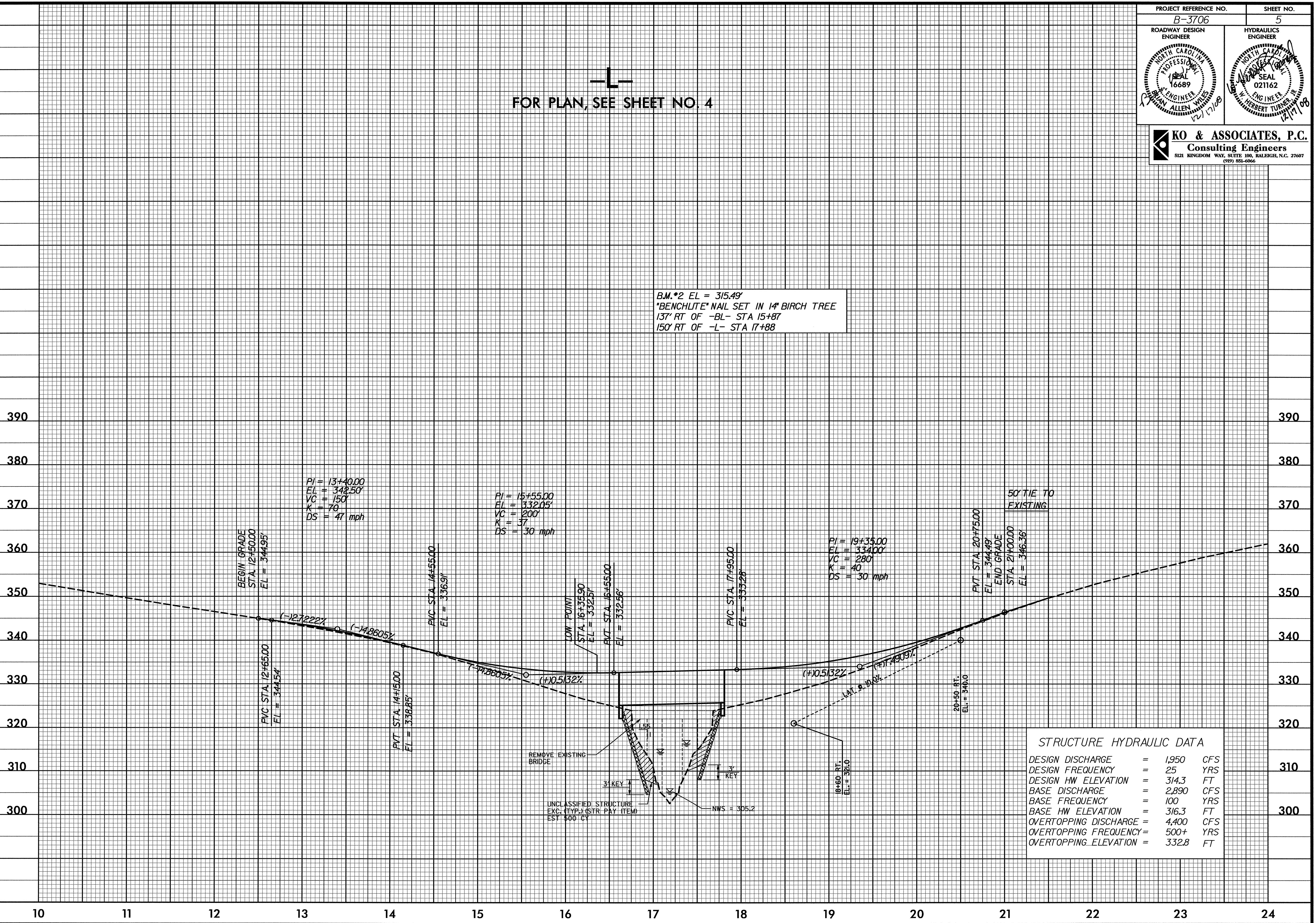


5/14/99

12/17/2008  
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KO & Associates, P.C.

FOR PLAN, SEE SHEET NO. 4

PROJECT REFERENCE NO. B-3706	SHEET NO. 5
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
<b>KO &amp; ASSOCIATES, P.C.</b> Consulting Engineers 5121 KINGDOM WAY, SUITE 100, RALEIGH, N.C. 27607 (919) 851-6066	



B.M.\*2 EL = 315.49  
 "BENCHLITE" NAIL SET IN 1" BIRCH TREE  
 137' RT OF -BL- STA 15+87  
 150' RT OF -L- STA 17+88

PI = 13+40.00  
 EL = 342.50'  
 VC = 150'  
 K = 70  
 DS = 47 mph

PI = 15+55.00  
 EL = 332.05'  
 VC = 200'  
 K = 37  
 DS = 30 mph

PI = 19+35.00  
 EL = 334.00'  
 VC = 280'  
 K = 40  
 DS = 30 mph

50' TIE TO EXISTING

STRUCTURE HYDRAULIC DATA	
DESIGN DISCHARGE	= 1,950 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 314.3 FT
BASE DISCHARGE	= 2,890 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 316.3 FT
OVERTOPPING DISCHARGE	= 4,400 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 332.8 FT

REMOVE EXISTING BRIDGE  
 UNCLASSIFIED STRUCTURE  
 EXC. (TYP.) (STR PAY ITEM)  
 EST 500 CY

NWS = 305.2