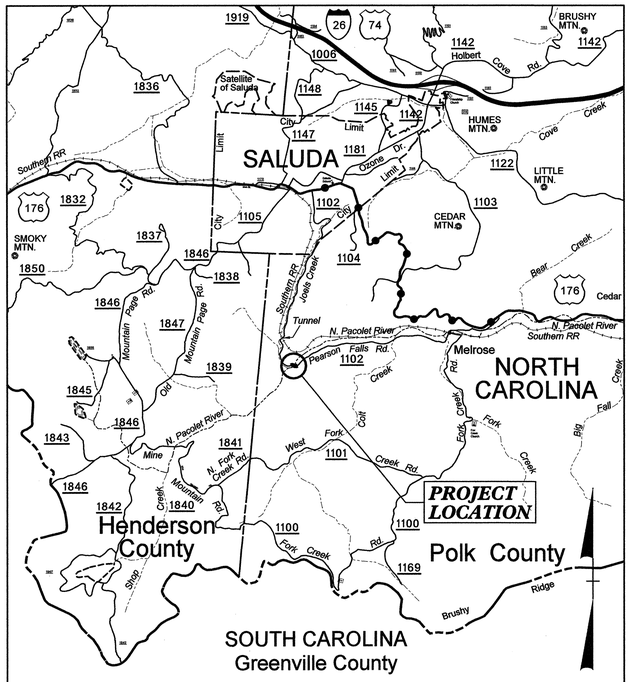
09/08/08

TIP PROJECT: B-4239

CONTRACT: C202070

See Sheet 1-A For Index of Sheets



VICINITY MAP (N.T.S.)

DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

POLK COUNTY

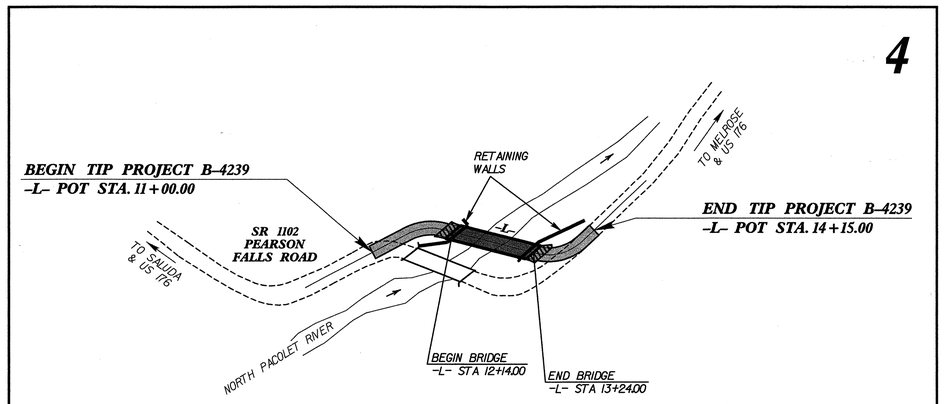
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4239	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33582.1.1	BRZ-1102 (1)	PE
33582.2.1	BRZ-1102 (1)	R/W, UTILITIES
33582.3.1	BRZ-1102 (1)	CONSTRUCTION

LOCATION: BRIDGE NO. 2 OVER NORTH PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)

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

4



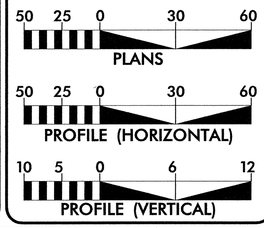
NAD 83

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED.

NCDOT CONTACT:

MR. DOUG TAYLOR, PE – ENGINEERING COORDINATION – PROJECT ENGINEER – ROADWAY DESIGN UNIT

GRAPHIC SCALES



DESIGN DATA

ADT 2009 = 260
ADT 2029 = 435
DHV = 10 %
D = 60 %
T = 3 % *
V = 15 MPH **
* (TTST 1% + DUAL 2%)
FUNC. CLASS: RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4239	=	*0.039 mi.*
LENGTH STRUCTURE TIP PROJECT B-4239	=	*0.021 mi.*
TOTAL LENGTH TIP PROJECT B-4239	=	*0.060 mi.*

Prepared for:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610
By:
MA ENGINEERING CONSULTANTS, INC.
598 EAST CHATHAM STREET, SUITE 137
CARY, NORTH CAROLINA 27511
919-297-0220

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 15, 2008

LETTING DATE:
FEBRUARY 17, 2009

R. W. PORTER, JR PE
PROJECT ENGINEER

K.S. HUTCHENS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER ROGER S. WEAVER

11/17/08 P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19814 ENGINEER ROBERT W. PORTER, JR

11-17-2008 P.E.
SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

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PROJECT REFERENCE NO.	SHEET NO.
B-4239	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19814 ENGINEER ROBERT W. POWER, JR.

Robert W. Power, Jr. 12-22-2008

MA Engineering CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

GENERAL NOTES: 2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 09-12-08

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 II.

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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

2006 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 07-18-06
REV. 01-02-07

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
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 8 - INCIDENTALS	
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
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap

INDEX OF SHEETS

12/22/2008
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3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4239	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
- Wetland
- 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
- 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 — 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
- 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.

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PROJECT REFERENCE NO.	SHEET NO.
B-4239	1-C
Location and Surveys	

SURVEY CONTROL SHEET B-4239

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS-B4239-102" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 550871.198 (ft) EASTING: 1000696.585 (ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .9997858 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-B4239-102" TO -L- STATION 10+00.00 IS S 25° 55' 02.33" W 783.15 (ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NCDOT GPS STATION GPS-B4239-101
LOCALIZED PROJECT COORDINATES
N = 550891.707
E = 1000510.220

NCDOT GPS STATION GPS-B4239-102
LOCALIZED PROJECT COORDINATES
N = 550871.198
E = 1000696.585

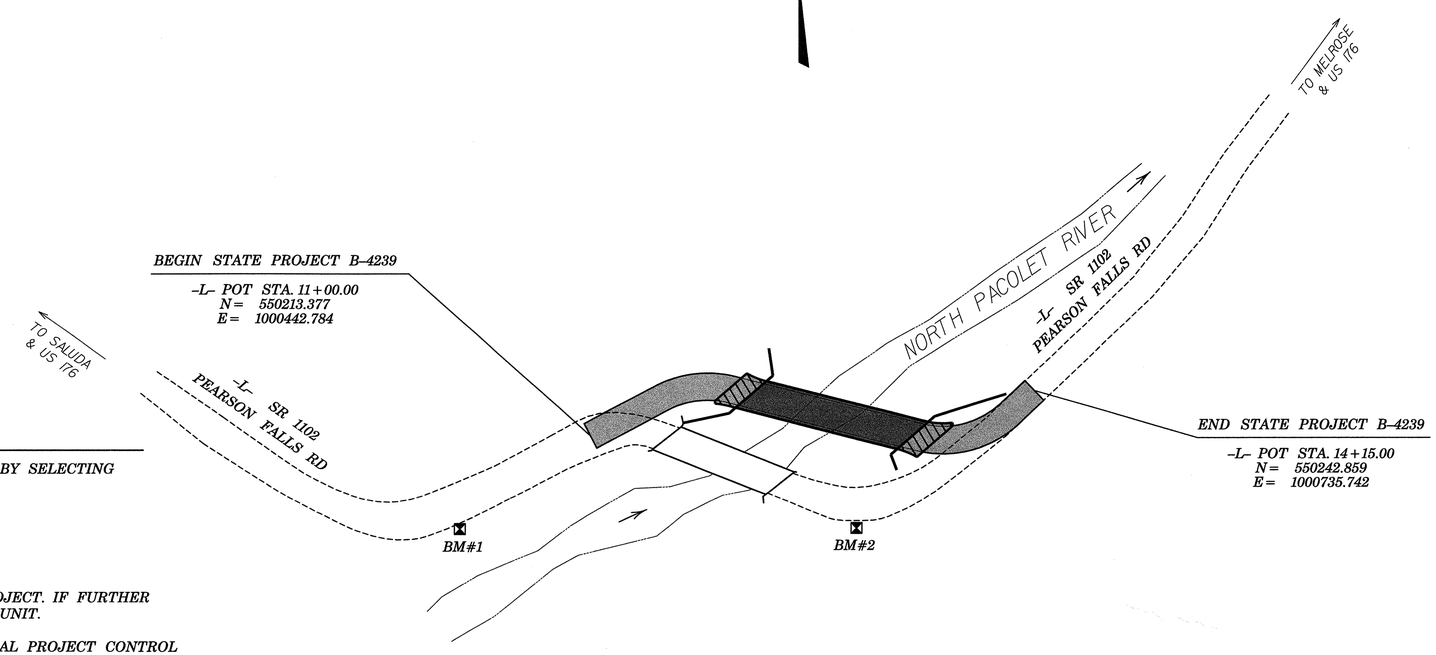
BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
121	BL-1	550167.3200	1000253.8800	1687.66'	OUTSIDE PROJECT LIMITS	
117	BL-2	550199.8900	1000446.0600	1671.17'	10+96.62	13.46' RT
113	BL-3	550161.4700	1000645.6600	1671.62'	13+27.24	52.71' RT
115	BL-4	550338.3600	1000844.0600	1659.54'	OUTSIDE PROJECT LIMITS	

****
BM#1 ELEVATION = 1680.33
N 550151 E 1000357
-BL- STATION 5+98 33' RIGHT
S 8° 12' 46.3" 15.76' FROM -L- STA. 10+00
60D NAIL IN 24" POPLAR
****

****
BM#2 ELEVATION = 1671.93
N 550152 E 1000618
-L- STATION 13+03 69' RIGHT
REBAR WITH CAP STAMPED "TBM2"
****

NC GRID
NAD 83



NOTES:

1. *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

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B4239_LS_CONTROL_071219.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 USER SERVICE (OPUS).

SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
B-4239	2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19814 ENGINEER ROBERT W. PORTER, JR.

Robert W. Porter, Jr. 11-17-2008

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON

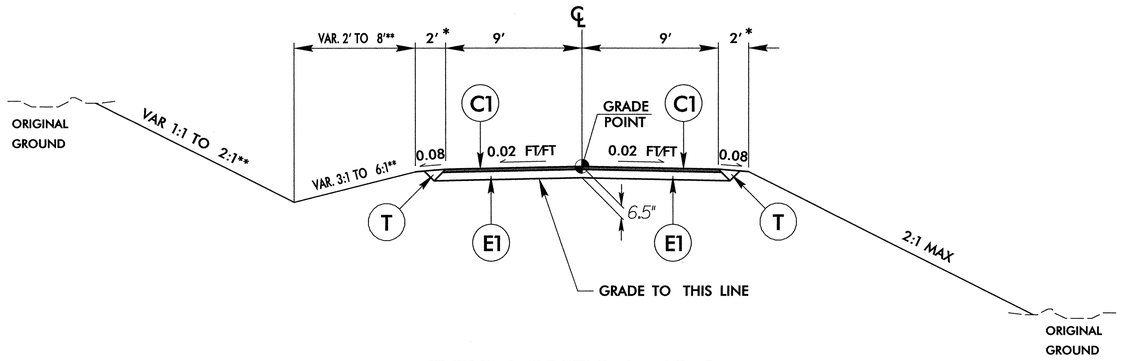
Clark S. Morrison 11/25/08

MA Engineering CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.50" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.50 Lbs PER SQUARE YARD IN EACH OF TWO LAYERS.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 Lbs PER SQUARE YARD.
T	EARTH MATERIAL

PAVEMENT EDGE SLOPES AND TRENCH SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



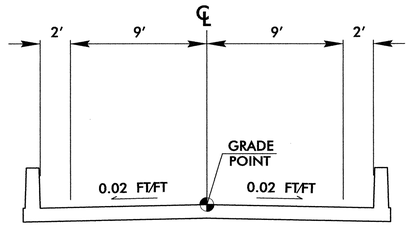
TYPICAL SECTION NO. 1

FROM –L– STA. 11+00.00 TO STA. 12+14.00 (BEGIN BRIDGE)
FROM –L– STA. 13+24.00 (END BRIDGE) TO STA. 14+15.00

NOTES

* – 7' WITH GUARDRAIL (FACE GR MIN. 4' FROM EOP)
** – SEE CROSS SECTIONS

USE MINIMUM 1' WIDTH TURF SHOULDER OUTSIDE OF VARIABLE WIDTH PAVED SHOULDER WHERE NO GUARDRAIL IS PRESENT.



TYPICAL SECTION ON STRUCTURE

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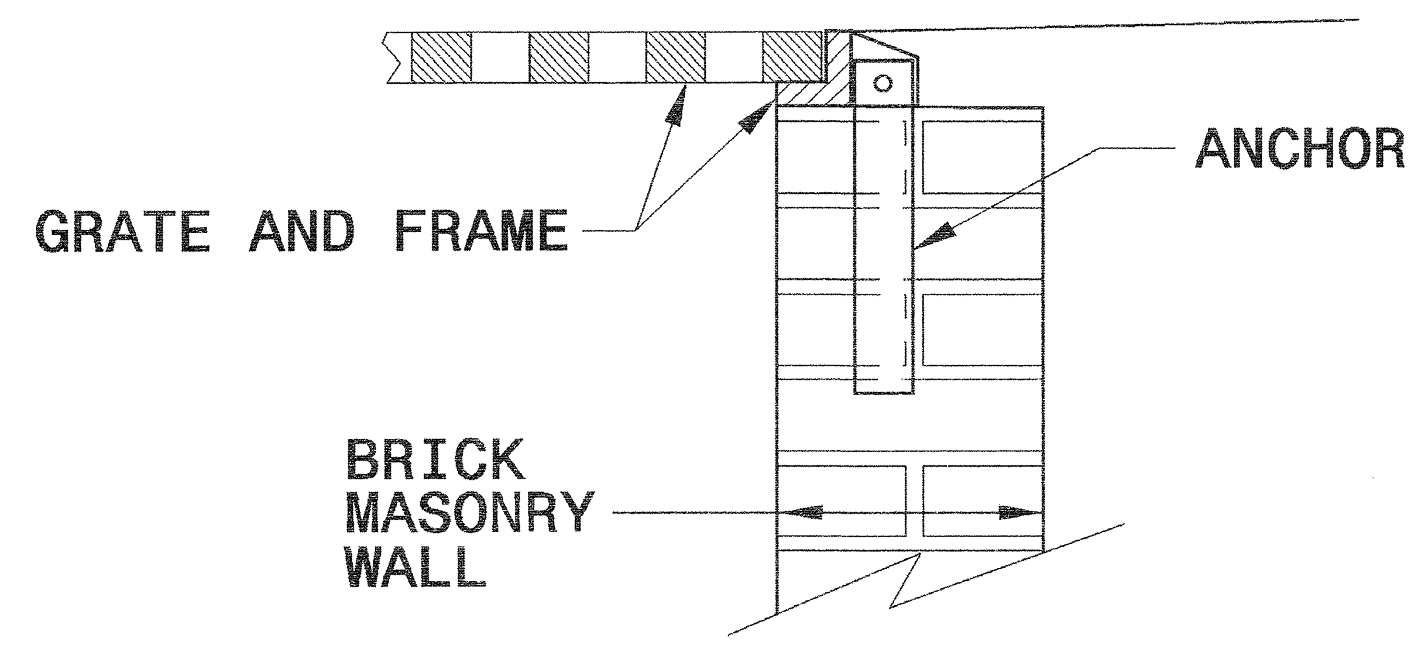
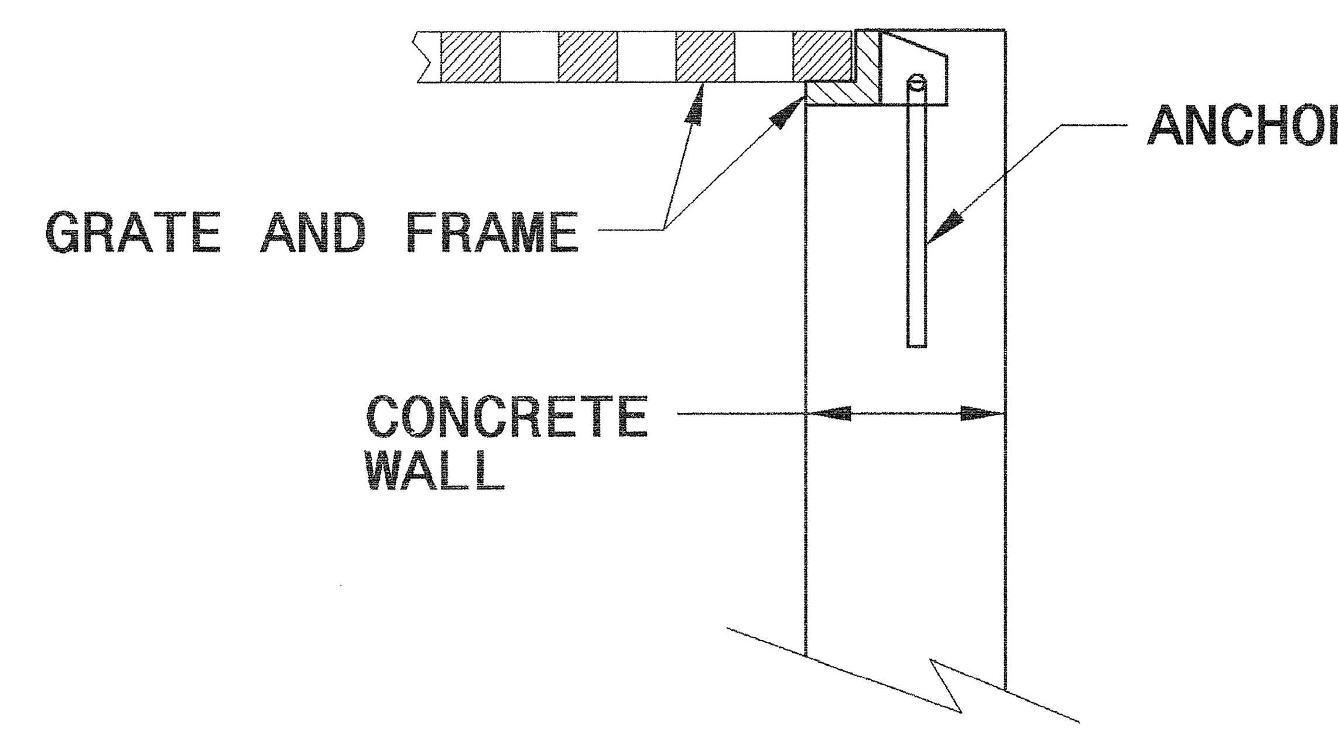
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

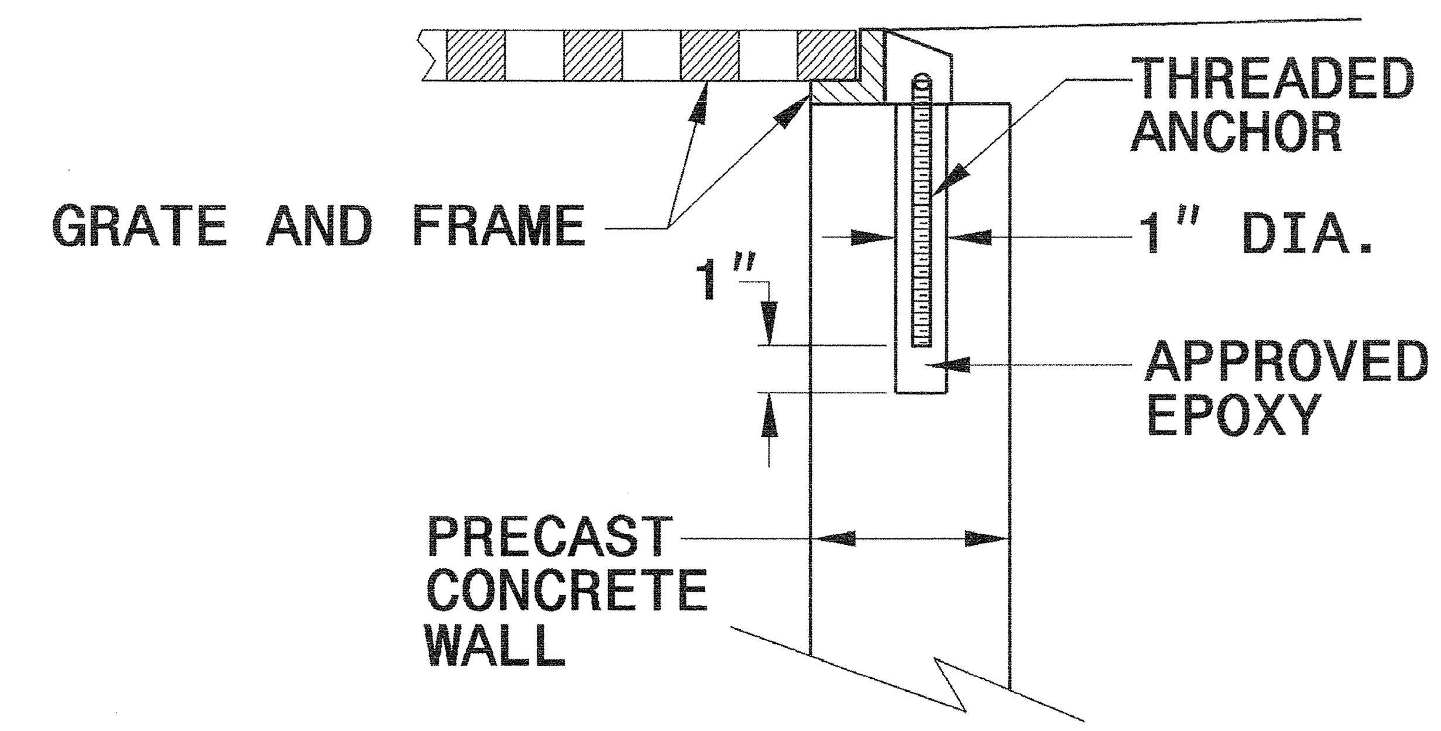
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



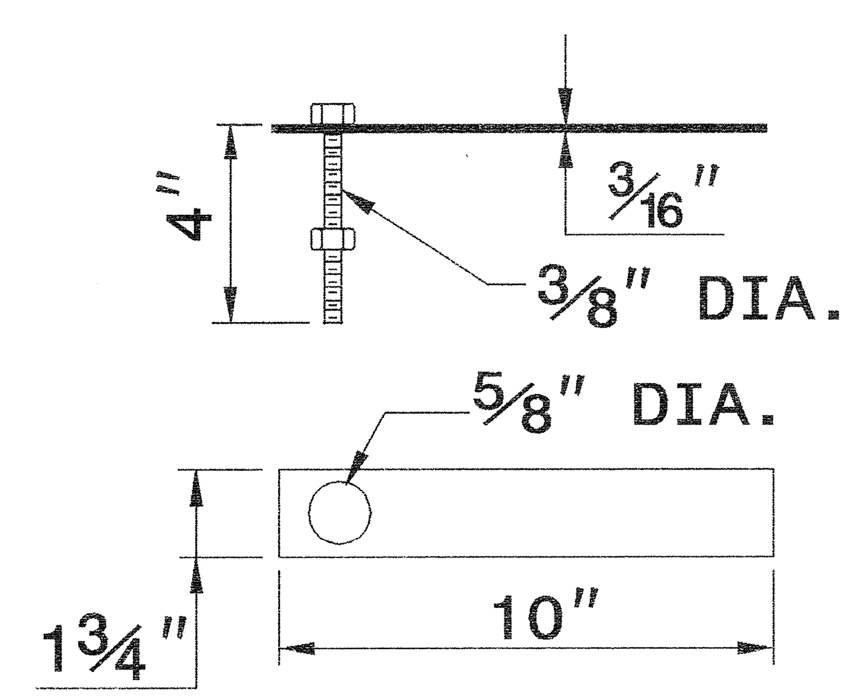
CONCRETE CONSTRUCTION



PRECAST CONCRETE CONSTRUCTION

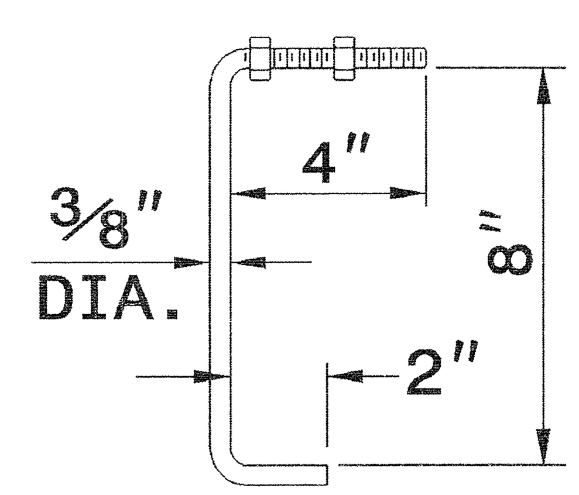
DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

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



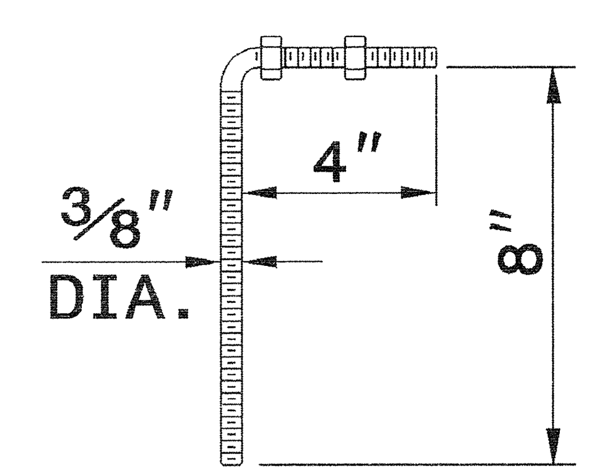
MASONRY ANCHOR

3/8" DIA. BOLT WITH PLATE



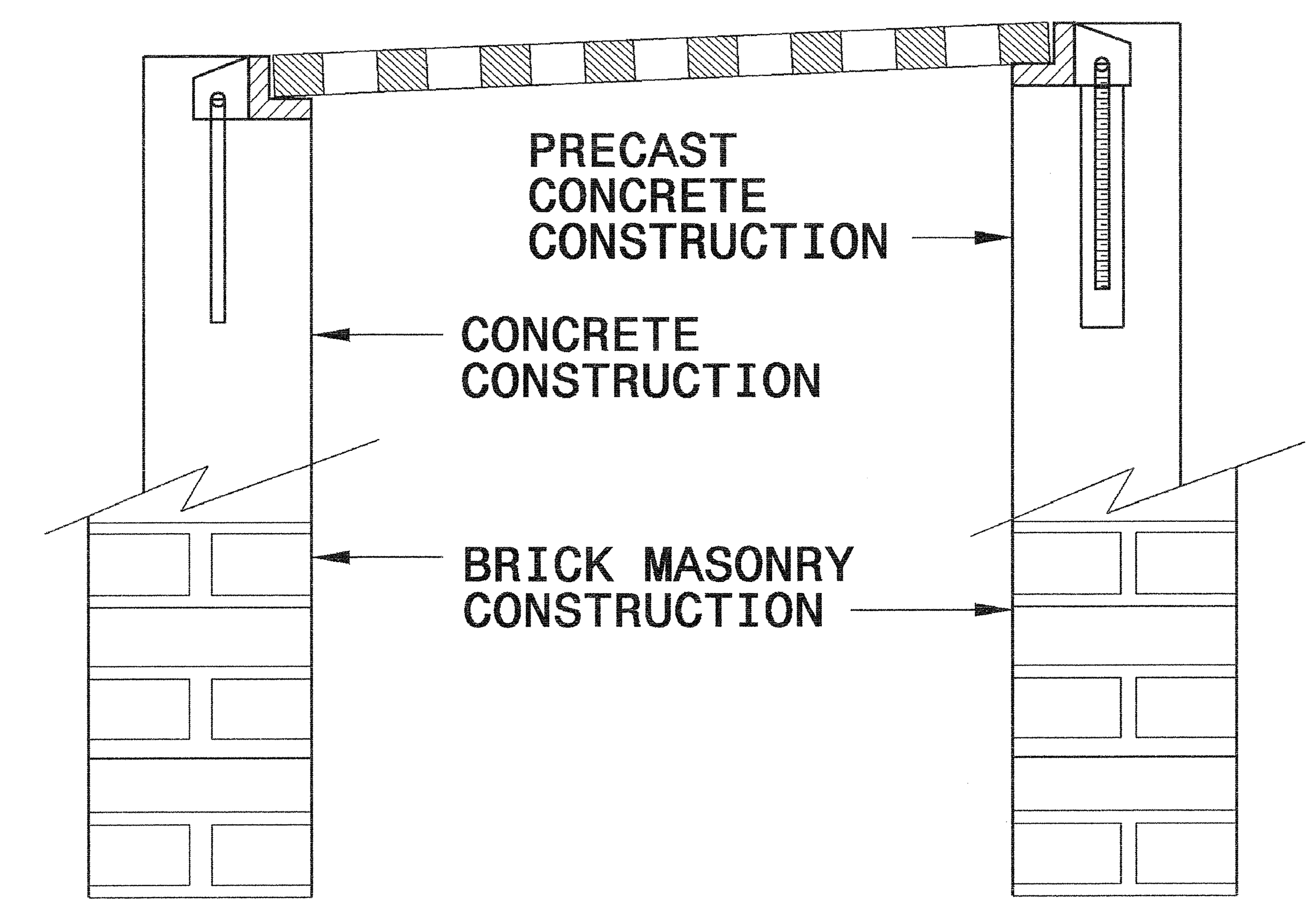
CONCRETE ANCHOR

3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR

3/8" DIA. BENT BAR



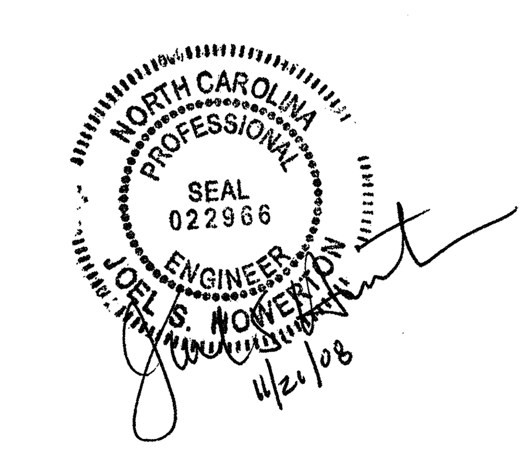
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

SHEET 1 OF 1
840D25

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

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

SHEET 1 OF 1
840D25



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.:

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ericward AT PS222293

PROJECT REFERENCE NO.	SHEET NO.
B-4239	2-B

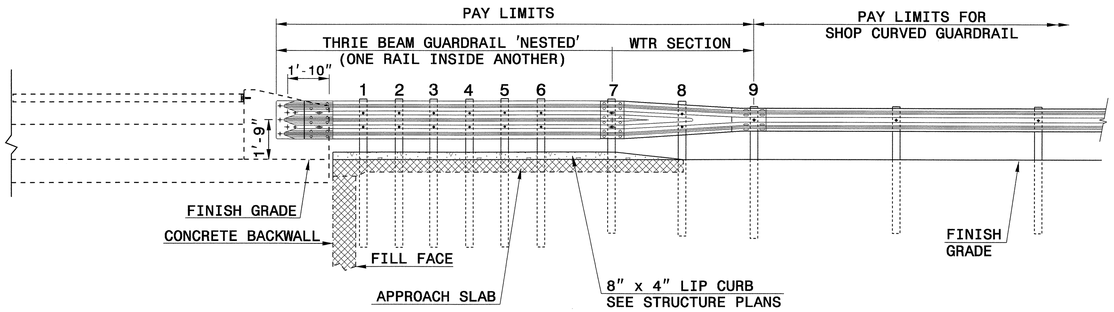
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

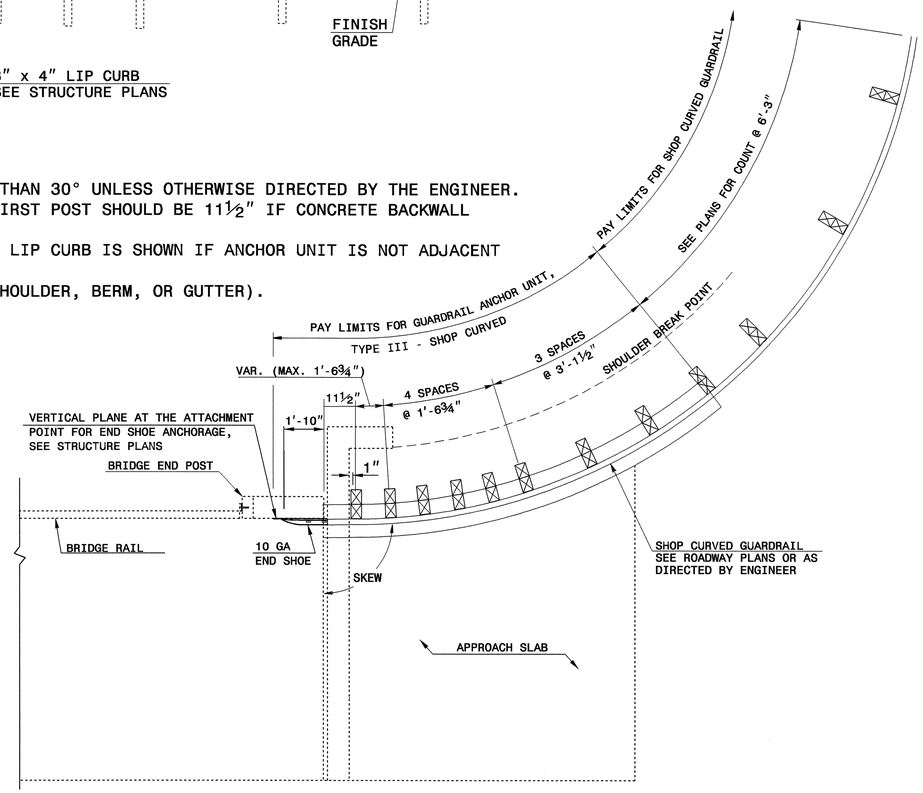
TYPE III SC



ELEVATION

SEE ROADWAY PLANS FOR END TREATMENT

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED FOR ATTACHMENT TO RAIL ON BRIDGE

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

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

TYPE III SC

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL B. HOWARD
11/21/08

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE: 4-4-02
MODIFIED BY: DATE:
CHECKED BY: DATE: 10/14/08
FILE SPEC.: ward:\usr\details\stand\862stds\typeiiisc.dgn

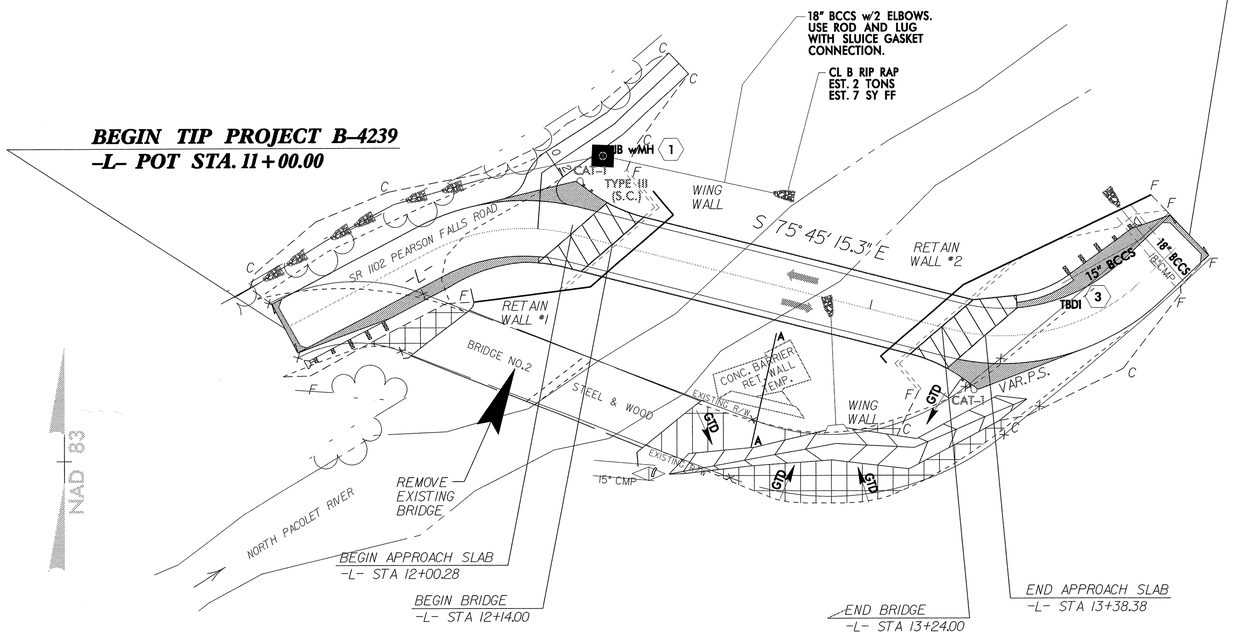
5/14/99

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

BM #2 REBAR WITH CAP STAMPED "TBM2" STA. 13+03 -L- 69.00' RT.
EL. = 1671.93' N 550152 E 1000618

END TIP PROJECT B-4239
-L- POT STA. 14+15.00

BEGIN TIP PROJECT B-4239
-L- POT STA. 11+00.00



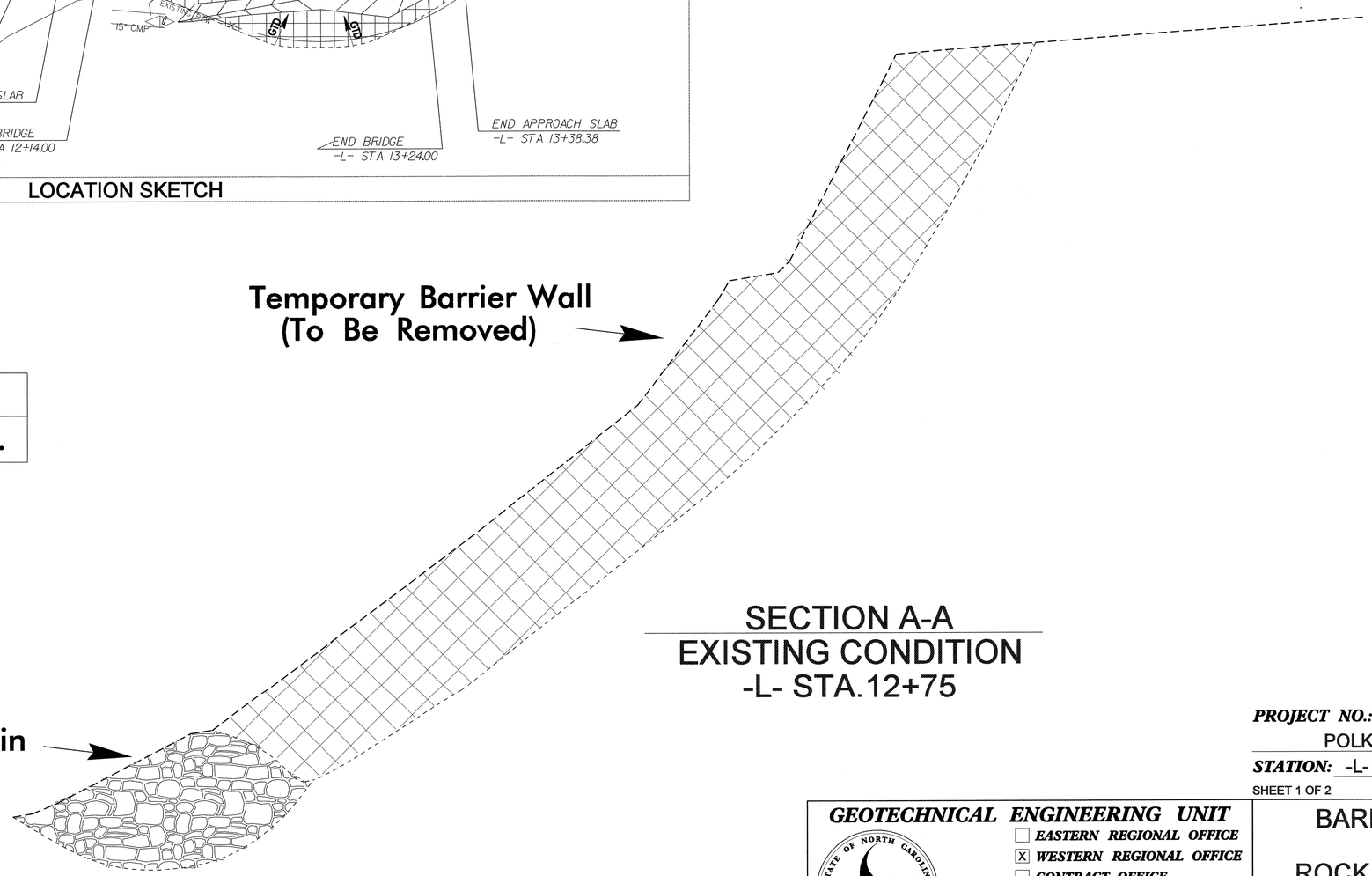
LOCATION SKETCH

NOTES

1. Contractor to remove barriers from slope and waste offsite, barrier removal and wasting is considered incidental to the rock plating and no additional payment or compensation will be made.
2. See Rock Plating Special Provision
3. The area indicated is an estimate, the extents of the rock plating will be determined by the Engineer.

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK	
Shane Clark 12/19/08	
SIGNATURE DATE	SIGNATURE DATE
B-4239	Z-C

Estimated Quantities
Rock Plating 165 sq. yd.



SECTION A-A
EXISTING CONDITION
-L- STA.12+75

PREPARED BY: JTW	DATE: 12.18.08
REVIEWED BY: SCC	DATE: 12.18.08

GEOTECHNICAL ENGINEERING UNIT
☐ *EASTERN REGIONAL OFFICE*
☒ *WESTERN REGIONAL OFFICE*
☐ *CONTRACT OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

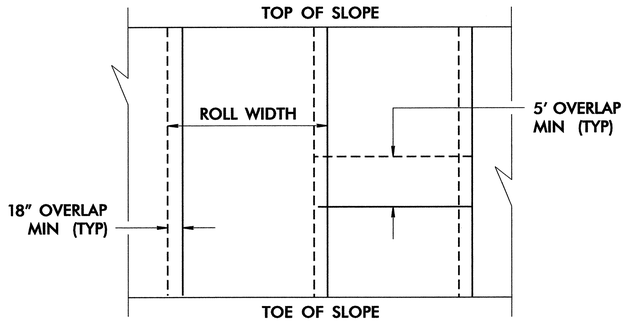
BARRIER REMOVAL AND ROCK PLATING DETAIL

REVISIONS

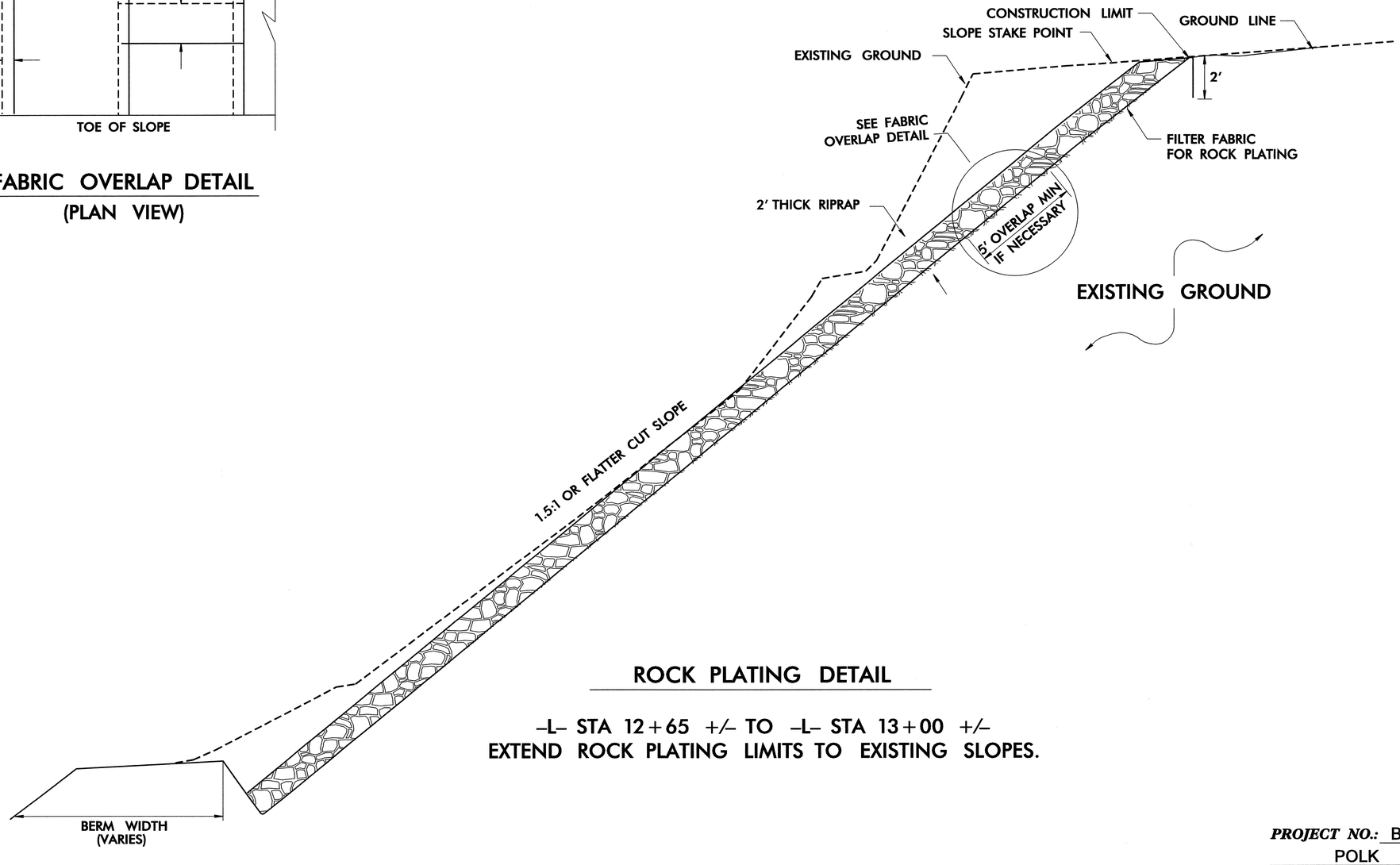
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PROJECT NO.: B-4239
POLK ***COUNTY***
STATION: -L- STA. 12+65± to 13+00±
SHEET 1 OF 2

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK — SIGNATURE 12/19/08 DATE	SIGNATURE DATE
B-4239	Z-D



FABRIC OVERLAP DETAIL
(PLAN VIEW)



ROCK PLATING DETAIL

–L– STA 12+65 +/– TO –L– STA 13+00 +/–
EXTEND ROCK PLATING LIMITS TO EXISTING SLOPES.

SECTION A-A
FINAL CONDITION
-L- STA.12+75

PREPARED BY: JTW	DATE: 12.18.08
REVIEWED BY: SCC	DATE: 12.18.08

PROJECT NO.: B-4239
POLK ***COUNTY***
STATION: -L- STA. 12+65± to 13+00±
SHEET 2 OF 2

GEOTECHNICAL ENGINEERING UNIT
☐ *EASTERN REGIONAL OFFICE*
☒ *WESTERN REGIONAL OFFICE*
☐ *CONTRACT OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARRIER REMOVAL AND ROCK PLATING DETAIL

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-4239	3

MA Engineering CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202070

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000950000-E	SP	2,170	SF	GENERIC MISCELLANEOUS ITEM TEMPORARY SOIL NAIL WALLS
[redacted]				[redacted]
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	100	CY	UNDERCUT EXCAVATION
0080000000-E	SP	100	TON	CLASS IV SUBGRADE STABILIZATION
0134000000-E	240	130	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	100	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	100	SY	FABRIC FOR SOIL STABILIZATION
0223000000-E	SP	165	SY	ROCK PLATING
0318000000-E	300	30	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0708000000-E	310	30	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0714000000-E	310	168	LF	18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0807000000-E	310	6	EA	18" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0995000000-E	340	20	LF	PIPE REMOVAL
1220000000-E	545	100	TON	INCIDENTAL STONE BASE
1489000000-E	610	107	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1525000000-E	610	63	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-E	620	9	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
2022000000-E	815	30	CY	SUBDRAIN EXCAVATION
2033000000-E	815	20	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	3	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	1.5	LF	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
2396000000-N	840	2	EA	FRAME WITH COVER, STD 840.54
2556000000-E	846	19	LF	SHOULDER BERM GUTTER
2619000000-E	850	15	SY	4" CONCRETE PAVED DITCH
3030000000-E	862	25	LF	STEEL BM GUARDRAIL
3045000000-E	862	25	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3165000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE ********** (350 TL-2)
3180000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ********** (III, SHOP CURVED)
3210000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3628000000-E	876	5	TON	RIP RAP, CLASS I
3642000000-E	876	20	TON	RIP RAP, CLASS A
3649000000-E	876	10	TON	RIP RAP, CLASS B
3656000000-E	876	275	SY	FILTER FABRIC FOR DRAINAGE
4400000000-E	1110	238	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	94	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	20	EA	DRUMS
4445000000-E	1145	96	LF	BARRICADES (TYPE III)
4810000000-E	1205	2,800	LF	PAINT PAVEMENT MARKING LINES (4")
6000000000-E	1605	450	LF	TEMPORARY SILT FENCE
6006000000-E	1610	120	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	200	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	80	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6029000000-E	SP	375	LF	SAFETY FENCE
6030000000-E	1630	270	CY	SILT EXCAVATION
6036000000-E	1631	650	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	10	SY	COIR FIBER MAT
6038000000-E	SP	20	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	125	LF	1/4" HARDWARE CLOTH
6071030000-E	SP	75	LF	COIR FIBER BAFFLES
6071050000-E	SP	1	EA	** SKIMMER (1-1/2")
6084000000-E	1660	8	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	0.75	TON	FERTILIZER TOPDRESSING
6114000000-N	SP	5	HR	SPECIALIZED HAND MOWING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.2	ACR	REFORESTATION

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COMPUTED BY:	KSH	DATE:	09-12-2008
CHECKED BY:	RWP	DATE:	11-12-2008

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4239	3-A

MA Engineering CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- 11+00.00 TO 12+14.00 (BEGIN BRIDGE) (INCL. -DRV-)	150		273	123	
-L- 13+24.00 (END BRIDGE) TO 14+15.00	65		403	338	
TOTAL	215		676	461	
EST. LOSS DUE TO CLEARING AND GRUBBING	-5			5	
PROJECT TOTAL	210		676	466	
EST. 5% TO REPLACE TOPSOIL ON BORROW PIT				23	
GRAND TOTAL (CUBIC YARDS)	210			489	
SAY (CUBIC YARDS)	300			500	

SELECT GRANULAR MATERIAL (CL II or III) = 100 CY
ESTIMATED UNDERCUT = 100 CY
(THESE ARE CONTINGENCY ITEMS PER 'GEOTECHNICAL REPORT - DESIGN RECOMMENDATIONS' LETTER DATED DECEMBER 19, 2007)

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

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.

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"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHRWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR C.S. PIPE, TYPE IR ALUMINIZED OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"
-L- 11+75	LT	IN	1		1667.9	1666.9												50													
-DRV- 10+50	RT		1	1673.4																											
-L- 12+60	LT	1	OUT		1666.9	1646.0												50													
-L- 12+98	RT	2	OUT		1670.0	1646.8												36													
-L- 13+69	LT		3	1669.2																											
-L- 13+87	LT	3	4		1666.5	1663.9											30														
-L- 14+04	LT		4	1668.4																											
-L- 14+03	CL	IN	4		1666.1	1663.9												20													
-L- 14+05	LT	4	OUT		1663.4	1659.8												12													
TOTALS																	30	168													

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES 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	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. FRAME & COVER STD. 840.54	BERM DRAINAGE OUTLET (BDO) SEE STD. 850.10	CORR. STEEL ELBOWS NO. & SIZE	PIPE REMOVAL LIN.FT.	REMARKS
-L- 11+75																										
-DRV- 10+50						1	1.5												1			1				
-L- 12+60																								2, 18"		USE ROD & LUG w/SLUICE GASKET CONN.
-L- 12+98																							1	2, 18"	20	USE ROD & LUG w/SLUICE GASKET CONN.
-L- 13+69						1												1			1					
-L- 13+87																										
-L- 14+04						1														1		1				
-L- 14+03																										
-L- 14+05																								2, 18"		USE ROD & LUG w/SLUICE GASKET CONN.
TOTALS						3	1.5											1	1	1	1	2	1	6, 18"	20	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED 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

"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.

GUARDRAIL SUMMARY

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH * APPROACH END	FLARE LENGTH * TRAILING END	W * APPROACH END	W * TRAILING END	ANCHORS TYPE III (SHOP CURVED)	ANCHORS CAT-1	ANCHORS TYPE 350 TL-2	IMPACT ATTENUATOR TYPE 350 NO.	PERMITTED G	PERMITTED NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	11+00	12+06.30	RT	50.00	43.75 **		12+06.30		4.00	7.00	25.00		2.00		1 (13.34' @ 54' R)		1							** SHOP CURVED GUARDRAIL - 25' @ 52.8' R
-L-	11+98	12+21.70	LT	6.25	18.75			12+21.70	2.00	VAR.		25.00		5.83	1 (18.75' @ 50' R)	1								
-L-	13+16.30	13+38	RT	6.25	18.75			13+16.30	2.00	VAR.		25.00		6.68	1 (18.75' @ 50' R)	1								
-L-	13+49.43	14+06	LT	25.00	18.75		13+49.43		VAR.	VAR.	18.75		2.00		1 (18.75' @ 35' R)		1 ***							*** -L- STA./OFF. AT BEGINNING & END OF TYPE 350 TL-2 ANCHOR - 13+73.06 (15.06' LT) (FACE RAIL, FIRST POST) & 14+02.90 (14.49' LT) (FACE RAIL, LAST POST).
	SUBTOTAL			87.50	100.00										4	2	2							
	LESS ANCHORS	TL-2	2 x 25.00' =	50.00																				
		TYPE III (S.C.)	4 x 18.75' =		75.00																			
		CAT-1	2 x 6.25' =	12.50																				
	TOTAL			25.00	25.00		ADDITIONAL GUARDRAIL POSTS = 5 EACH																	

* FLARE LENGTH & 'W' CORRESPOND TO NON-PARALLEL SHOP CURVE TRANSITION LENGTHS & OFFSETS.

PROJECT REFERENCE NO.	SHEET NO.
B-4239	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19814 ENGINEER ROBERT W. POPPER, JR. — Robert W. Popper 12-22-2008

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER ROGER S. WEAVER — 12/22/08

MA Engineering CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-24

FOR RETAINING WALL PLANS, SEE SHEET W-1 THRU W-2

8/17/99

REVISIONS

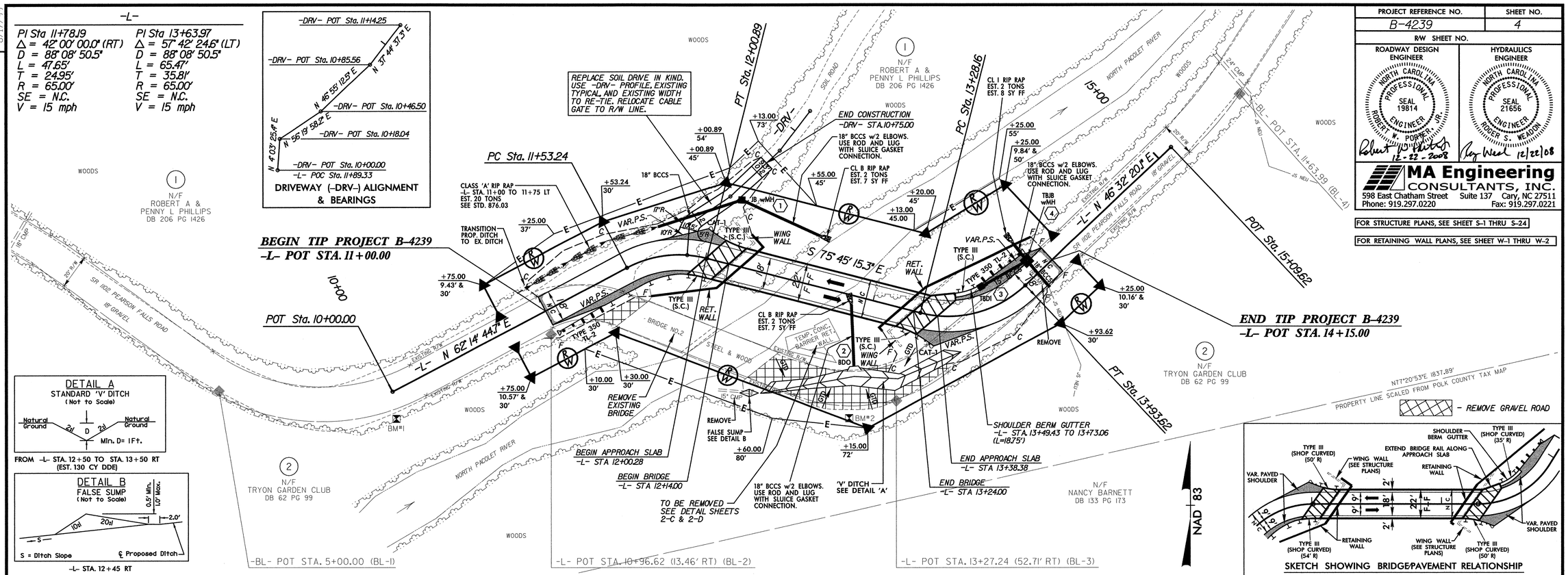
-L-

PI Sta 11+78.19
Δ = 42° 00' 00.0" (RT)
D = 88° 08' 50.5"
L = 47.65'
T = 24.95'
R = 65.00'
SE = N.C.
V = 15 mph

PI Sta 13+63.97
Δ = 57° 42' 24.6" (LT)
D = 88° 08' 50.5"
L = 65.47'
T = 35.81'
R = 65.00'
SE = N.C.
V = 15 mph

-DRV- POT Sta. 11+14.25
-DRV- POT Sta. 10+85.56
-DRV- POT Sta. 10+46.50
-DRV- POT Sta. 10+18.04
-DRV- POT Sta. 10+00.00
-L- POC Sta. 11+89.33
N 03° 25.4" E
N 56° 19' 58.2" E
N 46° 55' 12.5" E
N 37° 44' 37.5" E

DRIVEWAY (-DRV-) ALIGNMENT & BEARINGS

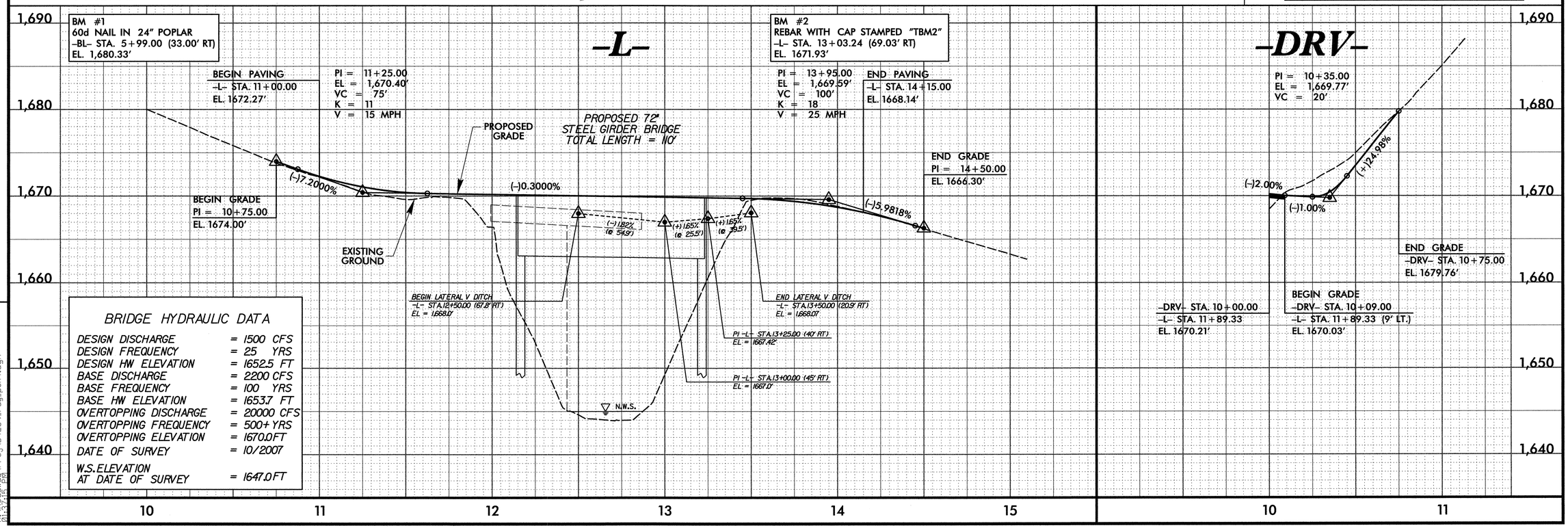


DETAIL A
STANDARD 'V' DITCH
(Not to Scale)

FROM -L- STA. 12+50 TO STA. 13+50 RT
(EST. 130 CY DDE)

DETAIL B
FALSE SUMP
(Not to Scale)

SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1500 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1652.5 FT
BASE DISCHARGE	= 2200 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1653.7 FT
OVERTOPPING DISCHARGE	= 20000 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 1670.0 FT
DATE OF SURVEY	= 10/2007
W.S. ELEVATION AT DATE OF SURVEY	= 1647.0 FT

12/22/2008
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