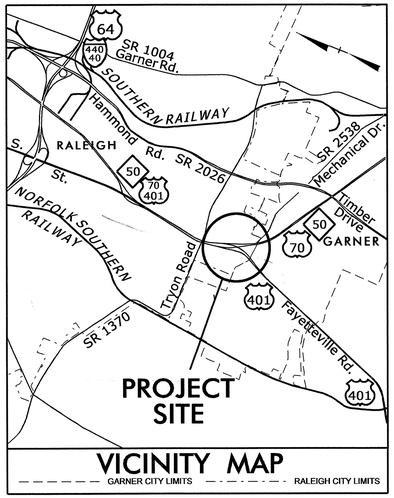
09/08/99

TIP PROJECT: B-4946

CONTRACT: C203091

See Sheet 1-A For Index of Sheets



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

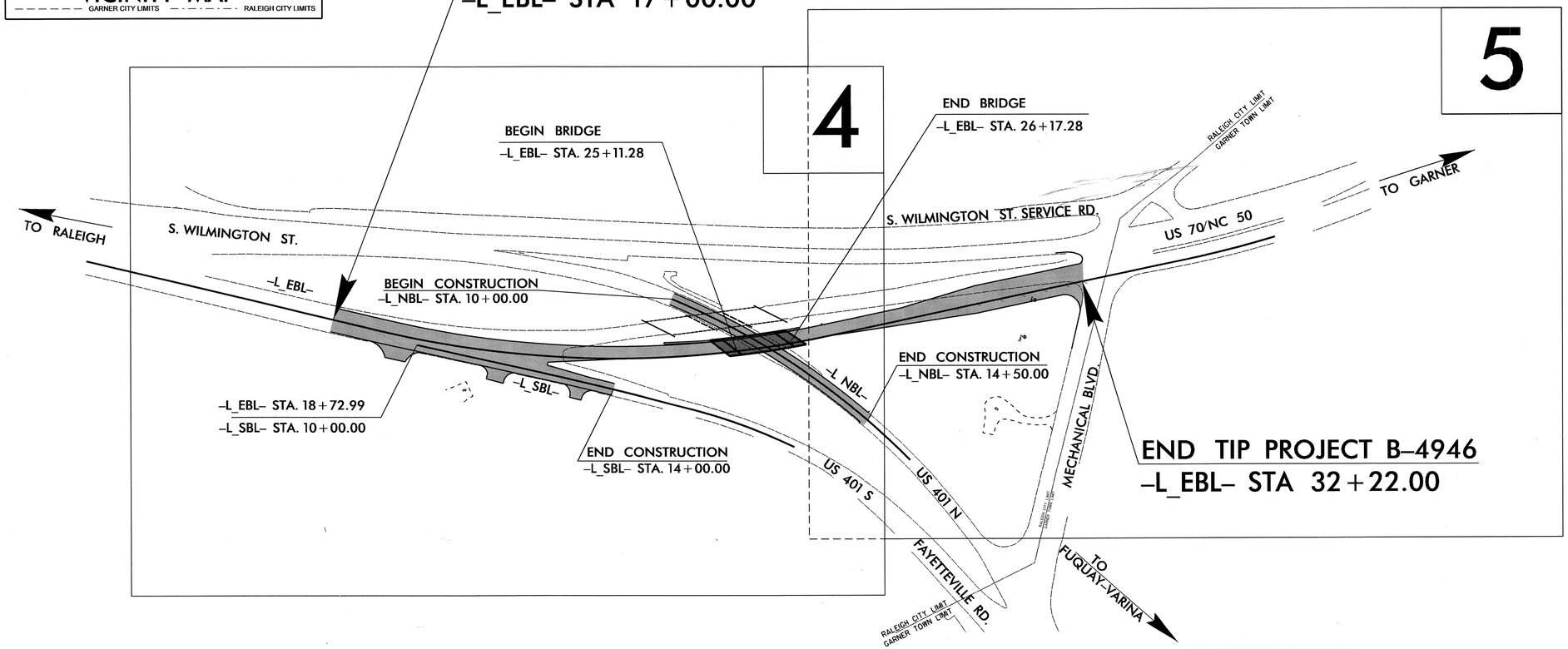
LOCATION: BRIDGE 251 OVER US 401 ON US 70 / NC 50

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4946	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
39978.1.1	BRSTP-0070(103)	P.E.
39978.2.1	BRSTP-0070(103)	R/W /UTIL.
39978.3.1	BRSTP-0070(103)	CONST.

BEGIN TIP PROJECT B-4946
-L_EBL- STA 17+00.00



END TIP PROJECT B-4946
-L_EBL- STA 32+22.00

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 2013 = 14,156
ADT 2033 = 18,678
DHV = 10 %
D = 60 %
T = 4 % *
V = 50 MPH
* TTST =1 DUAL 3
FUNC CLASS = ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4946 = 0.268 MILES

LENGTH STRUCTURE TIP PROJECT B-4946 = 0.020 MILES

TOTAL LENGTH OF TIP PROJECT B-4946 = 0.288 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
APRIL 20, 2012

LETTING DATE:
APRIL 16, 2013

JASON MOORE, P.E.
PROJECT ENGINEER

BRYAN KEY, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26870 ENGINEER MARC T. SHOWN
SIGNATURE:

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY
SIGNATURE: 1-31-13

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

29-JAN-2013 10:24
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4946	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26984 ENGINEER BRYAN C. KEY 2-18-13

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2 THRU 2-C	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-D	SUPERELEVATION TRANSITION DETAIL
2-E	DETOUR ALIGNMENT (-TEMP_EBL_TCP-)
2-F THRU 2-G	DETAIL OF TEMPORARY ANCHOR UNIT TYPE W-BEAM
2-H THRU 2-K	TEMPORARY SHORING DETAILS
2-L	GUARDRAIL STRUCTURE ANCHOR UNIT, TYPE III
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES
3-B	GUARDRAIL SUMMARY, SHOULDER BERM GUTTER SUMMARY EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4 THRU 5	PLAN SHEETS
6 THRU 7	PROFILE SHEETS
TMP-1 THRU TMP-17	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-6	SIGNING PLANS
SIG-1 THRU SIG-13	SIGNALS PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTION SUMMARY
X-1 THRU X-11	CROSS-SECTIONS
S-1 THRU S-31	STRUCTURE PLANS
W-1 THRU W-3	MSE WALLS

GENERAL NOTES

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 07-30-2012

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.

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. 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.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

Progress Energy, Dukenet Communications, Time Warner Cable, and AT&T

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

STANDARD DRAWINGS

EFF. 01-17-2012
REV. 10-30-2012

2012 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 January, 2012 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
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
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
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
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
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units (Use detail in Lieu of Standard Drawing for Type-III Anchors, See Sheet 2-L)
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units

8/17/99

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04/16/11

PROJECT REFERENCE NO.	SHEET NO.
B-4946	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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — 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 R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- 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 Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — 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
- 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 — TH
- 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
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

RD261646 1/11/2013 sym 01-B bckey RD-Oce860-34

PROJECT REFERENCE NO.	SHEET NO.
B-4946	1-C
Location and Surveys	

SURVEY CONTROL SHEET B-4946

WAKE COUNTY

BRIDGE #251 OVER US 401 ON US 70 /NC 50

L_EBL

TYPE	STATION	NORTH	EAST
POT	10+00.00	721154.8552	2103499.3885
TS	17+22.99	720439.4520	2103603.8522
SC	18+72.99	720291.3178	2103627.3776
PT	26+87.34	719542.1081	2103931.9204
PC	34+26.91	718927.4408	2104343.1837
PT	36+05.73	718783.0578	2104448.6078

L_NBL

TYPE	STATION	NORTH	EAST
PC	10+00.00	719851.4568	2103888.7598
PT	15+74.92	719293.3289	2103767.6837

L_SBL

TYPE	STATION	NORTH	EAST
POT	10+00.00	720289.1399	2103615.5769
PC	12+82.52	720010.3451	2103661.3202
PT	14+60.40	719834.3534	2103687.0983
PC	15+60.10	719735.4722	2103699.8502
PT	17+78.99	719517.0372	2103706.5416

NC GRID
NAD 83/NSRS 2007

BEGIN TIP PROJECT B-4946
-L EBL- STA 17+00.00

NCDOT GPS STATION "B4946-1"
LOCALIZED PROJECT COORDINATES:
N = 721,784.367
E = 2,103,571.561

BEGIN BRIDGE

END BRIDGE

BMI

TO RALEIGH

S. WILMINGTON ST.

S. WILMINGTON ST. SERVICE RD.

-BL-101

-BL-102

-BY-108

-BL-103

-BL-104

-BL-105

-BL-106

-BL-107

BM3

TO GARNER

L-EBL

L-SBL

L-NBL

-BY2-110

BM4

NCGS STATION "CARL"
LOCALIZED PROJECT COORDINATES:
N = 719,352.421
E = 2,103,842.606
(-BY2-CA2)

-BY3-111

MECHANICAL BLVD.

FAYETTEVILLE RD.

-BY1-109

TO FUQUAY-VARINA

END TIP PROJECT B-4946
-L EBL- STA 32+22.00

CONTROL DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L_EBL STATION	OFFSET
1	B4946-1	721784.3670	2103571.5610	356.04	OUTSIDE PROJECT LIMITS	
101	BL-101	721339.2730	2103425.0250	365.44	OUTSIDE PROJECT LIMITS	
102	BL-102	720919.0610	2103565.5190	352.33	12+42.87	31.37 LT
103	BL-103	719999.0450	2103706.9480	359.26	21+76.35	2.27 LT
104	BL-104	719673.0450	2103951.9970	362.82	25+85.20	87.00 LT
105	BL-105	719128.5120	2104326.9220	356.81	32+50.75	98.30 LT
106	BL-106	718732.6810	2104647.4110	354.84	OUTSIDE PROJECT LIMITS	
107	BL-107	718377.1700	2105037.9400	346.49	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	L_NBL STATION	OFFSET
A108	BY-108	720367.8840	2103837.2760	340.22	OUTSIDE PROJECT LIMITS	
A104	BL-104	719673.0450	2103951.9970	362.82	11+68.98	76.16 LT
CA2	NCGS "CARL"	719352.4210	2103842.6060	361.70	14+93.35	47.27 LT
109	BY1-109	718905.6240	2103591.5840	360.50	OUTSIDE PROJECT LIMITS	

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	L_SBL STATION	OFFSET
A103	BL-103	719999.0450	2103706.9480	359.26	13+00.91	43.23 LT
110	BY2-110	719604.4140	2103743.3180	358.69	16+91.92	34.33 LT
A109	BY1-109	718905.6240	2103591.5840	360.50	OUTSIDE PROJECT LIMITS	

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	L_EBL STATION	OFFSET
B105	BL-105	719128.5120	2104326.9220	356.81	32+50.75	98.30 LT
111	BY3-111	719066.8880	2103962.1720	357.09	30+99.13	239.12 RT
B109	BY1-109	718905.6240	2103591.5840	360.50	30+27.08	636.80 RT

BENCHMARK DATA

BM2 WAS IN PROPOSED SLOPE EASEMENT AND WAS DESTROYED.
BM2 HAS BEEN REPLACED WITH BM4 01/11/2012

BM1 ELEVATION = 360.01
N 721334 E 2103616
L_EBL STATION 10+00.00
N 33° 03' 41.34" E 213.75'
TOP OF BOLT IN SIGNAL LIGHT BASE

BM3 ELEVATION = 355.16
N 718636 E 2104480
L_EBL STATION 10+00.00
S 21° 16' 16.97" E 2703.00'
CHISLED 'X' IN BASE OF LIGHT POLE

BM4 ELEVATION = 360.20
N 719667 E 2103586
L_EBL STATION 24+22 237.27' RIGHT
RRS IN 26" PINE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "CARL"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 719,352.421(ft) EASTING: 2,103,842.606(ft)
ELEVATION: 361.70(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989622
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "CARL" TO -L- EBL STATION 17+00.00 IS N 12 18' 19" W 1,135.87'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

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: B4946_LS_CONTROL.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)

01/10/12

08-JAN-2013 17:07
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$$$$USERNAME$$$$

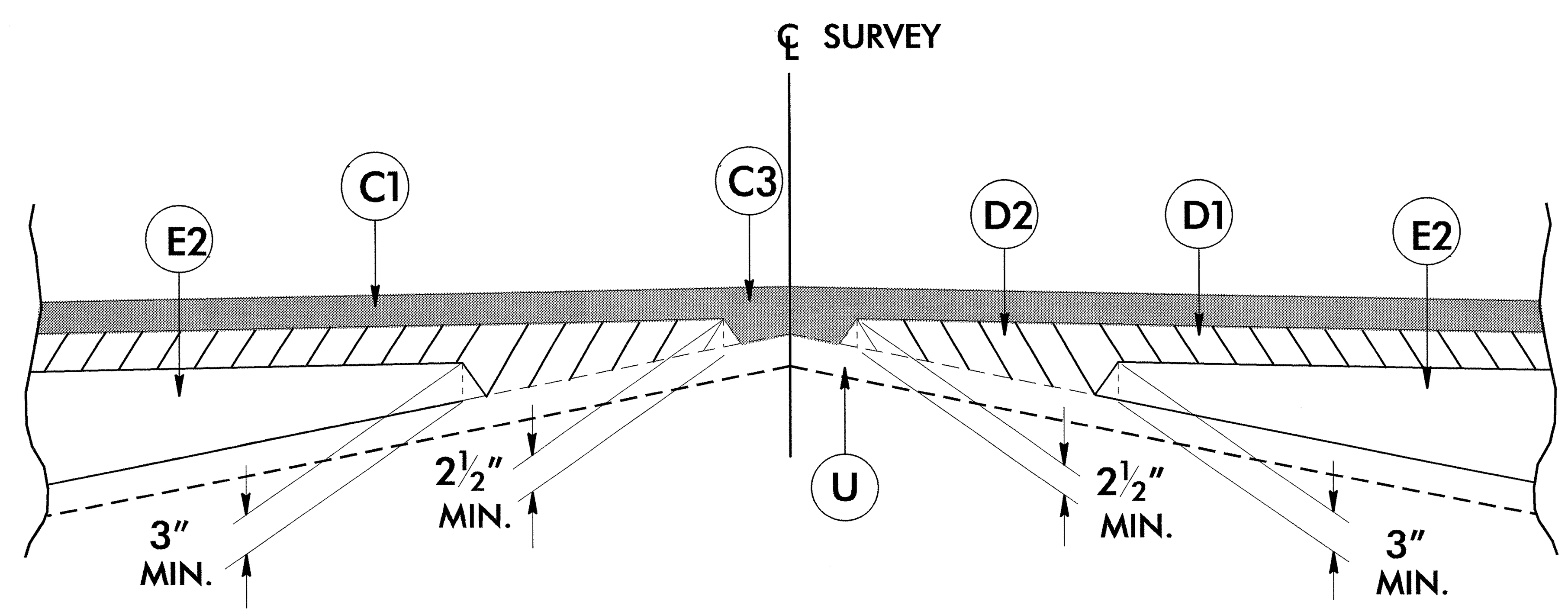
RD266202 1/8/2013 survey 01-C reodell RD-Oce860-34

PROJECT REFERENCE NO.	SHEET NO.
B-4946	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

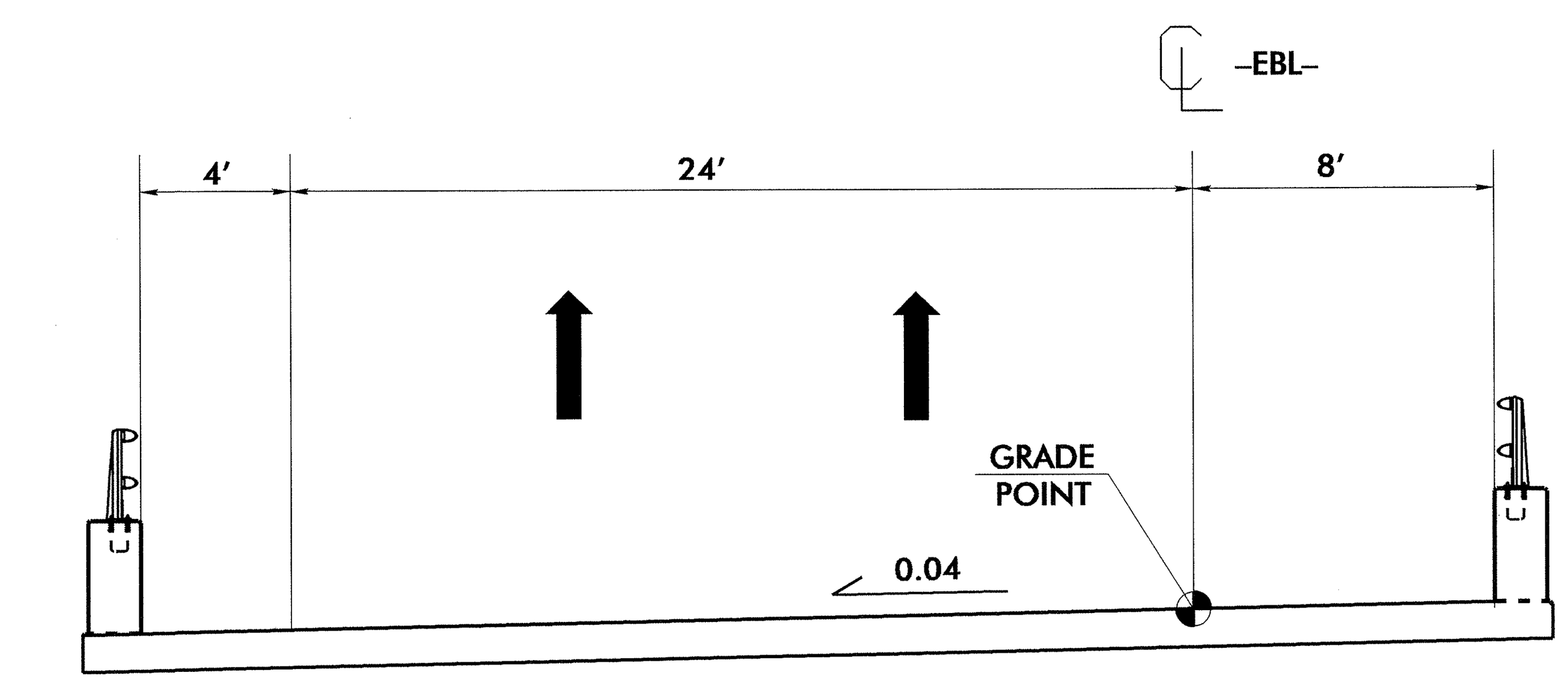
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R	SINGLE FACED CONCRETE BARRIER
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	T	EARTH MATERIAL
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	V	VARIABLE DEPTH MILLING (SEE MILLING DETAIL BELOW)
E1	PROP. APPROX. 7½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 427.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL BELOW)

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

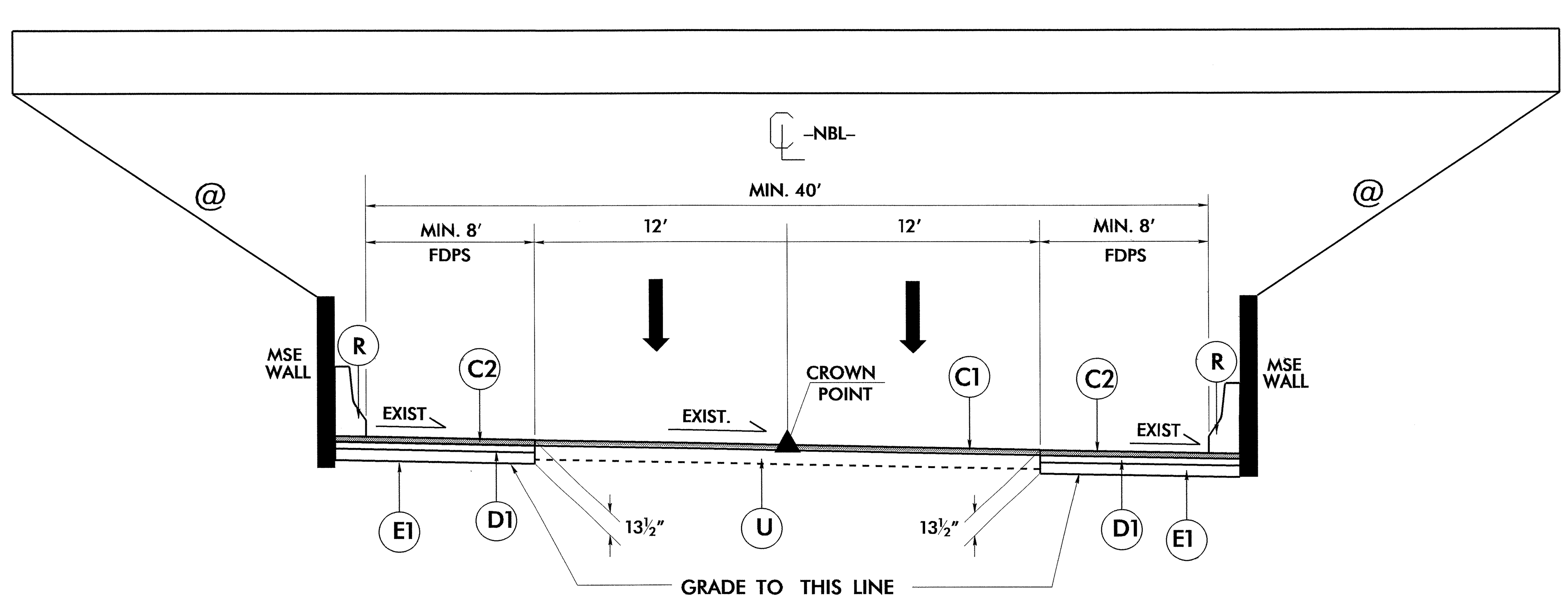


Detail Showing Method of Wedging



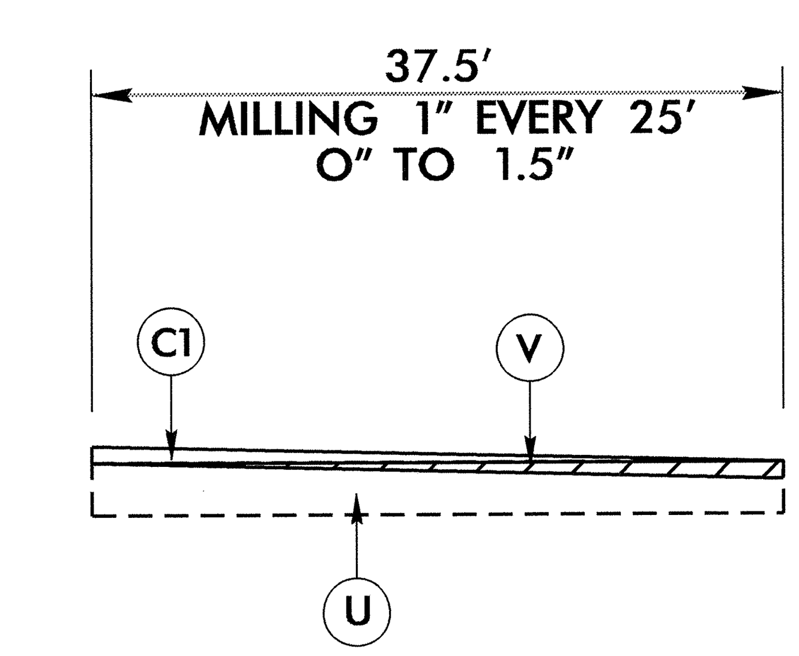
TYPICAL SECTION ON STRUCTURE

-L EBL- STA. 25+11.28 TO 26+17.28



TYPICAL SECTION ON ROADWAY UNDER STRUCTURE

@ SLOPE TO BE DETERMINED BY STRUCTURE DESIGN



MILLING DETAIL

USE MILLING DETAIL AT RESURFACING TIES

6/2/99

31-JAN-2013 09:59
R:\Roadway\Proj\B4946_Rdy_typ.dgn
$$$$USERNAME$$$$

RD266202 1/31/2013 typ 02 reodell RD-Oce860-34

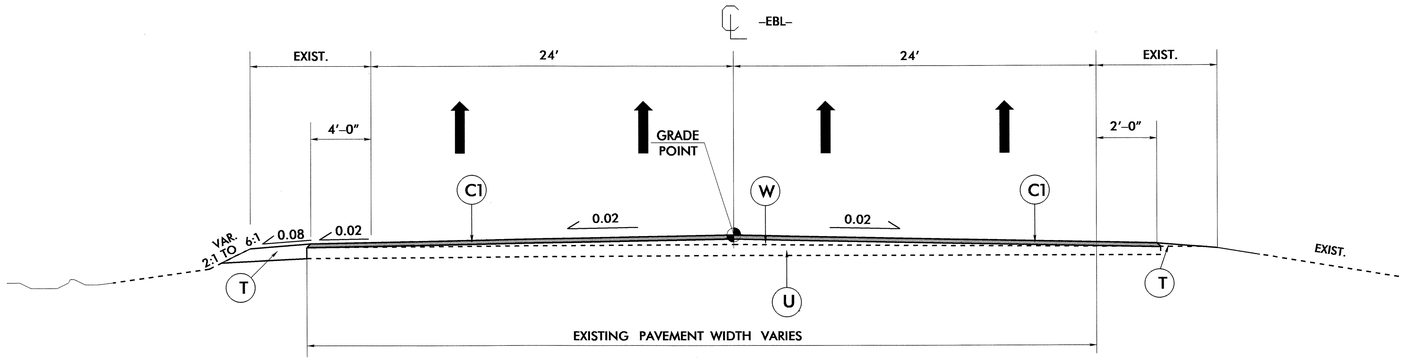
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4946	2-A

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26864 ENGINEER BRYAN C. KEY
1-31-13

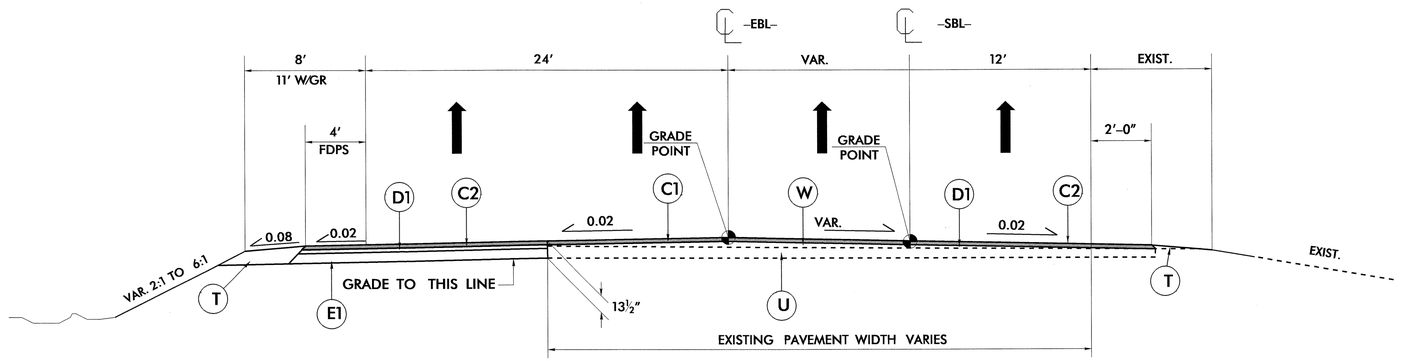
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
1/31/13

PAVEMENT SCHEDULE	
C1	1½" S9.5C
C2	3" S9.5C
D1	3" I19.0C
E1	7½" B25.0C
T	EARTH MATERIAL
U	EXIST PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
–L EBL– STA. 17+00.00 TO 18+72.99



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
–L EBL– STA. 18+72.99 to 21+76.81

14-JAN-2013 09:40
R:\Roadway\Proj\B4946_Rdy_typ.dgn
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RD266447 1/14/2013 typ 02-A scalhoun RD-Oce860-34

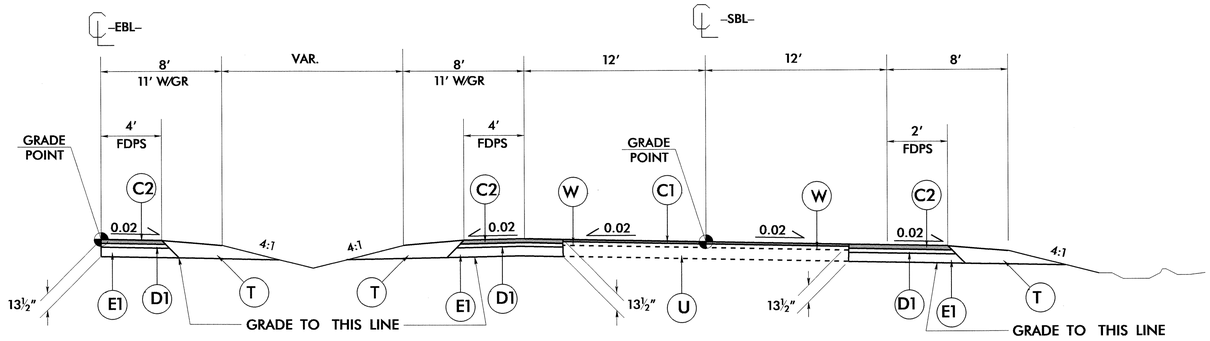
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4946	2-B

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26984 ENGINEER BRYAN C. KEY
1-31-13

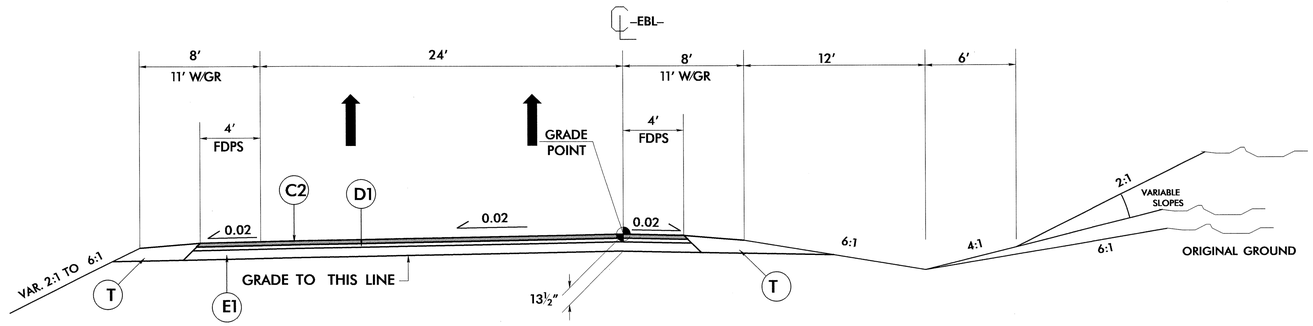
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
1/31/13

PAVEMENT SCHEDULE	
C1	1½" S9.5C
C2	3" S9.5C
D1	3" I19.0C
E1	7½" B25.0C
T	EARTH MATERIAL
U	EXIST PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
-L SBL- STA. 13+05.23 to 14+00.00



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-L EBL- STA. 21+76.81 to BEGIN BRIDGE STA. 25+11.28
-L EBL- END BRIDGE STA. 26+17.28 TO 30+00.00

14-JAN-2013 09:40
R:\Roadway\Proj\B4946_Rdy_typ.dgn
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RD266447 1/14/2013 typ 02-B scalhoun RD-Oce860-34

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4946	2-C

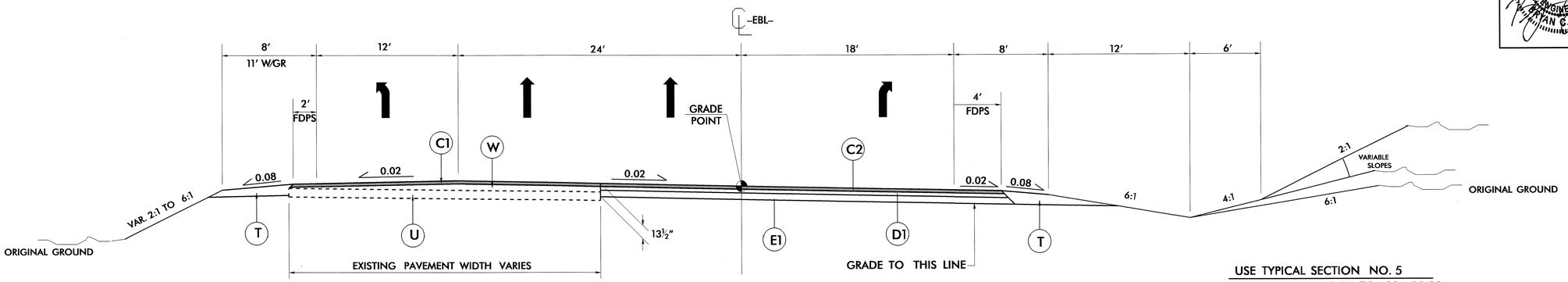
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRIAN C. KEY
1-31-13

PAVEMENT DESIGN ENGINEER

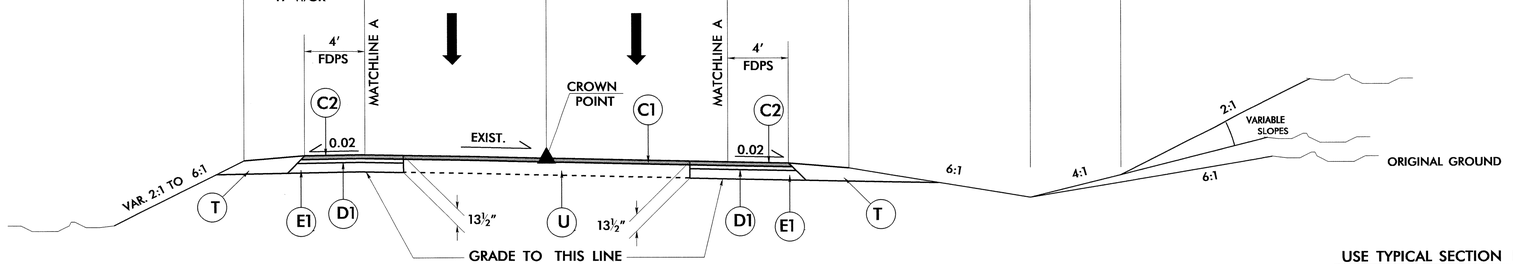
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
1/31/13

PAVEMENT SCHEDULE	
C1	1½" S9.5C
C2	3" S9.5C
D1	3" I19.0C
E1	7½" B25.0C
R	CONC. BARRIER
T	EARTH MATERIAL
U	EXIST PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 5

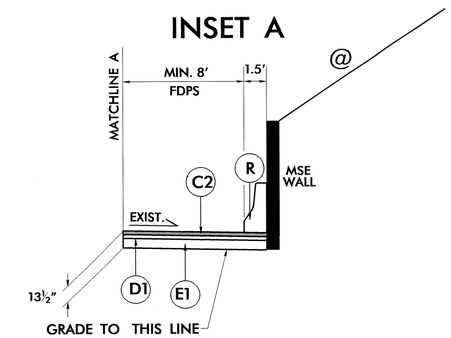
USE TYPICAL SECTION NO. 5
–L EBL– STA. 30+00.00 TO 32+00.00



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
–L NBL– STA. 10+00.00 TO 14+50.00
USE INSET A FROM –L NBL– LT. STA. 11+67.80 TO 13+06.50 (MIRROR)
USE INSET A FROM –L NBL– RT. STA. 11+23.30 TO 12+27.90

INSET A



@ SLOPE TO BE DETERMINED BY STRUCTURE DESIGN

23-JAN-2013 16:28
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PROJECT REFERENCE NO.	SHEET NO.
B-4946	2-D
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY
1-31-13

REVISIONS 8/17/99

-L_NBL- PC Sta. 10+00.00

NC GRID NAD 83 NSRS 2007

INSET A

4' 24' .04 -L EBL- VAR. .01 12' 12' .03 -L SBL-

-L EBL-

PIs Sta 18+23.00
Θs = 2° 08' 54.9"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

PI Sta 22+85.89
Δ = 23° 19' 46.4" (LT)
D = 2° 51' 53.2"
L = 814.35'
T = 412.90'
R = 2,000.00'
SE = .04
V_D = 50mph

-L SBL-

PI Sta 13+71.47
Δ = 1° 58' 09.9" (RT)
D = 1° 06' 25.8"
L = 177.88'
T = 88.95'
R = 5,175.00'
SE = SEE PLANS
V_D = 50mph

PI Sta 16+69.89
Δ = 11° 11' 15.0" (RT)
D = 5° 06' 40.1"
L = 218.89'
T = 109.79'
R = 1,121.00'
SE = SEE PLANS
V_D = 50mph

-L NBL-

PI Sta 12+91.34
Δ = 22° 52' 31.3" (RT)
D = 3° 58' 43.9'
L = 574.92'
T = 291.34'
R = 1,440.00'
SE = EXIST.
V_D = EXIST.

20+00 (L_EBL)

25+00 (L_EBL)

37.5'

.03 .01 .02 .04 -L EBL- S 9° 19' 04.0" E .03 .01 .04 .03 .02 .04 VAR. .03 .04 -L SBL-

-L NBL-

8:1 TAPER

8:1 TAPER

RETAINING WALL TYPE-III

BARRIER

TYPE-III

8:1 GRAU 350

8:1 GRAU 350

.04 .03 .02 .01

4' FDPS

24'

2' FDPS

+00.00

50'

37.5'

+50.00

S 7° 20' 54.1" E

-L_EBL- SC Sta. 18+72.99

-L_SBL- POT Sta. 10+00.00
OFF 12' RT.

-L_SBL- PC Sta. 12+82.52

END CONSTRUCTION
-L_SBL- STA. 14+00.00

-L_SBL- PT Sta. 14+60.40

-L_SBL- PC Sta. 15+60.10

15+00 (L_SBL)

SEE SHEET 4 FOR PLAN VIEW

31-JAN-2013 19:23
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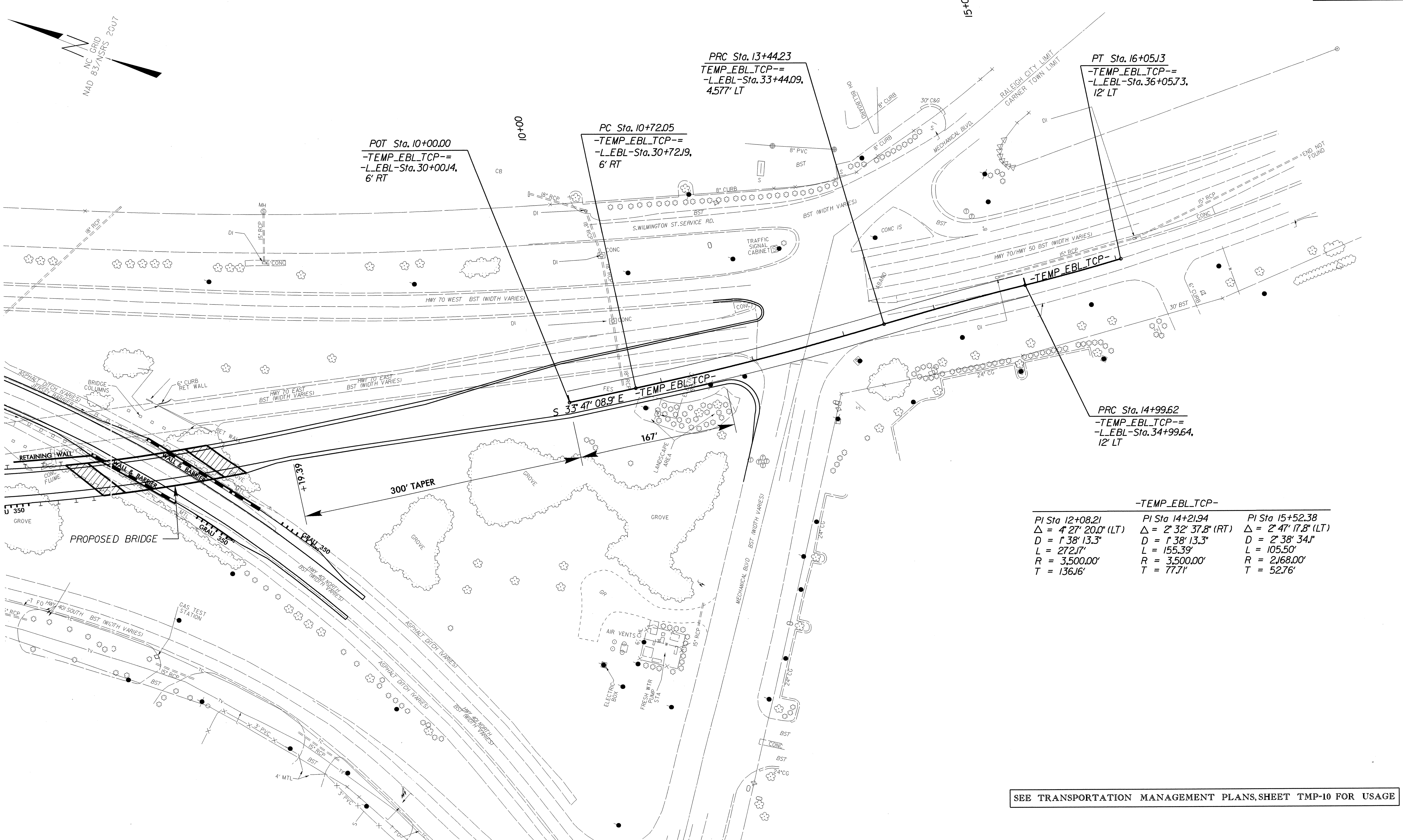
PROJECT REFERENCE NO.	SHEET NO.
B-4946	2-E
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY 1-31-13

REVISIONS

8/17/99



-TEMP_EBL_TCP-

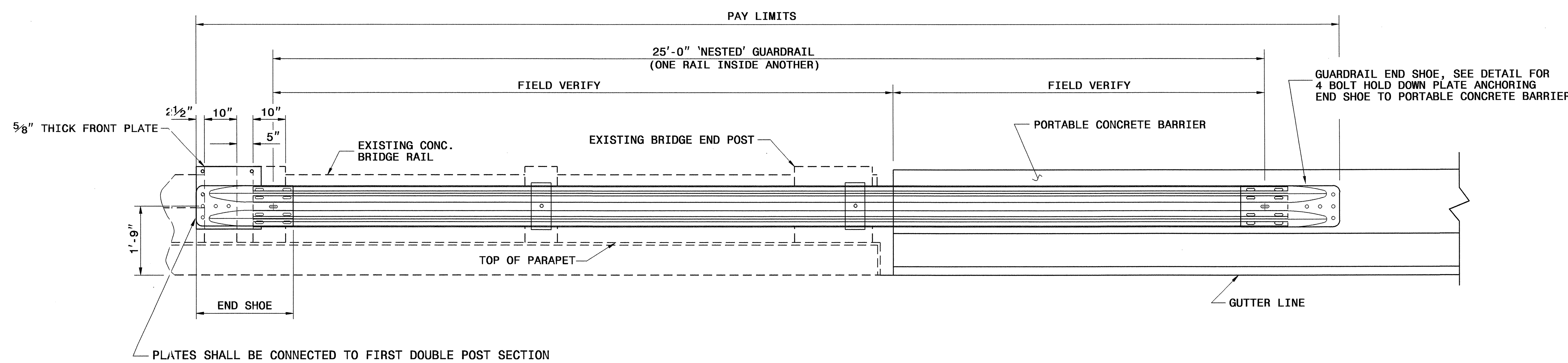
PI Sta 12+08.21	PI Sta 14+21.94	PI Sta 15+52.38
Δ = 4° 27' 20.0" (LT)	Δ = 2° 32' 37.8" (RT)	Δ = 2° 47' 17.8" (LT)
D = 1° 38' 13.3"	D = 1° 38' 13.3"	D = 2° 38' 34.1"
L = 272.17'	L = 155.39'	L = 105.50'
R = 3,500.00'	R = 3,500.00'	R = 2,168.00'
T = 136.16'	T = 77.71'	T = 52.76'

SEE TRANSPORTATION MANAGEMENT PLANS, SHEET TMP-10 FOR USAGE

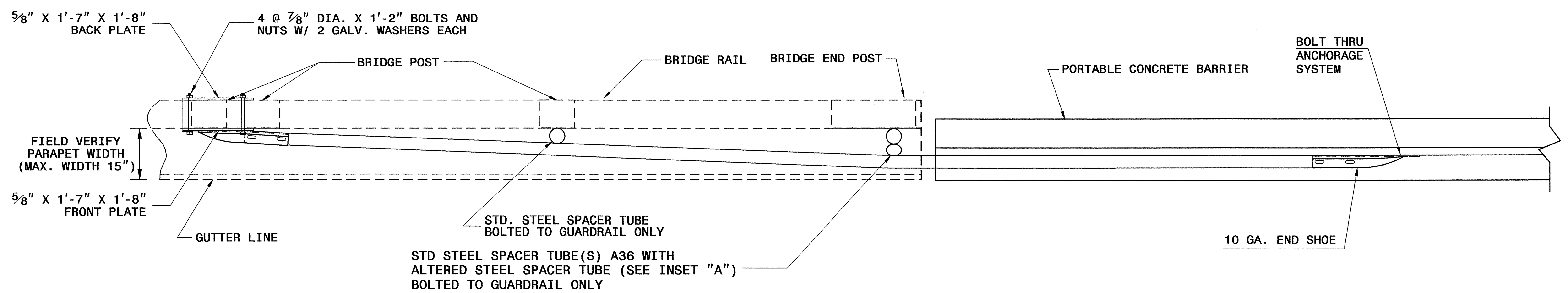
01-FEB-2013 11:17
R:\Roadway\Proj\B-4946_Rdy_det_2-E.dgn

RD261646 2/1/2013 DET_02-E bckey RD-Oce860-34

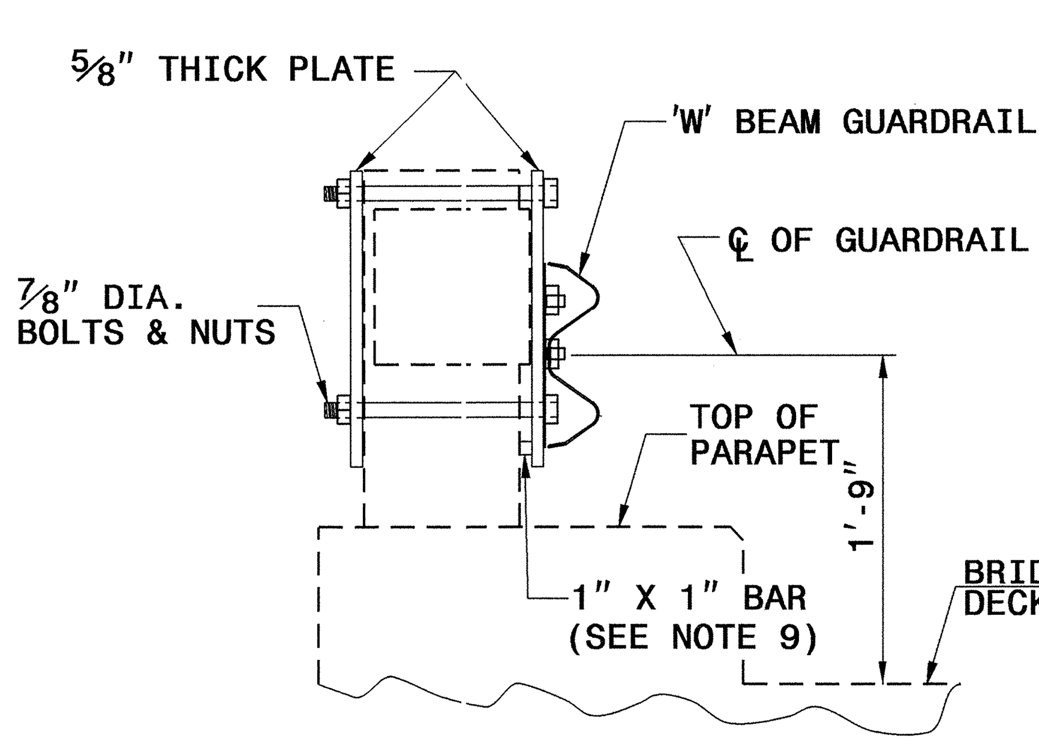
PROJECT REFERENCE NO.	SHEET NO.
B-4946	2-F



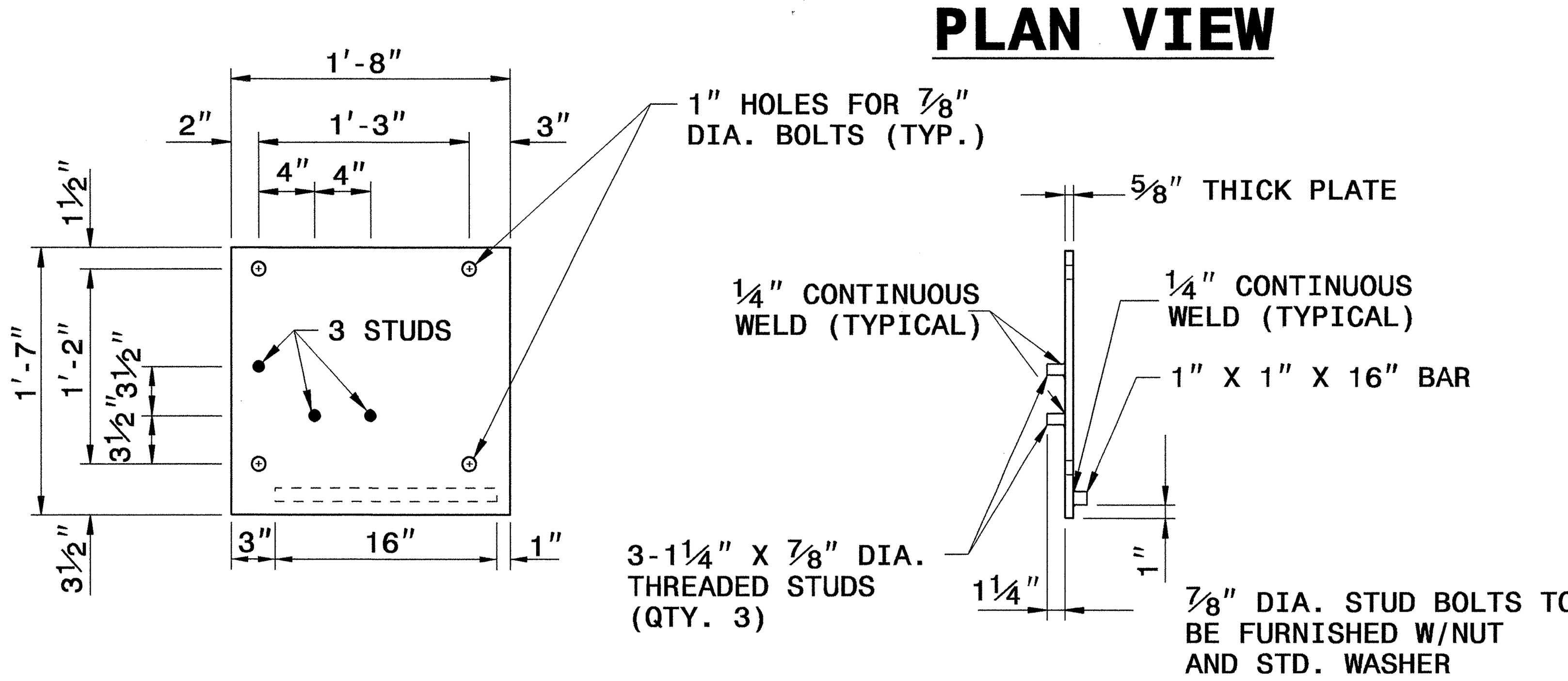
ELEVATION VIEW



PLAN VIEW



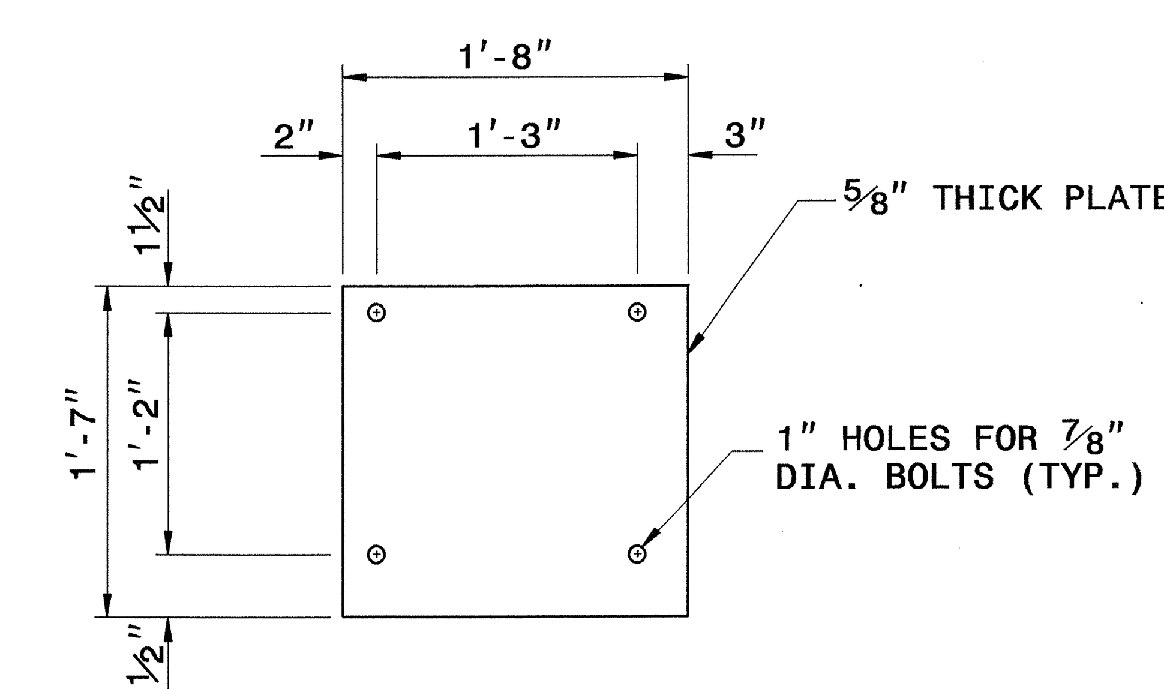
SECTION VIEW



STUDS MAY BE ADJUSTED TO MEET FIELD CONDITIONS

FRONT VIEW **SIDE VIEW**

FRONT PLATE



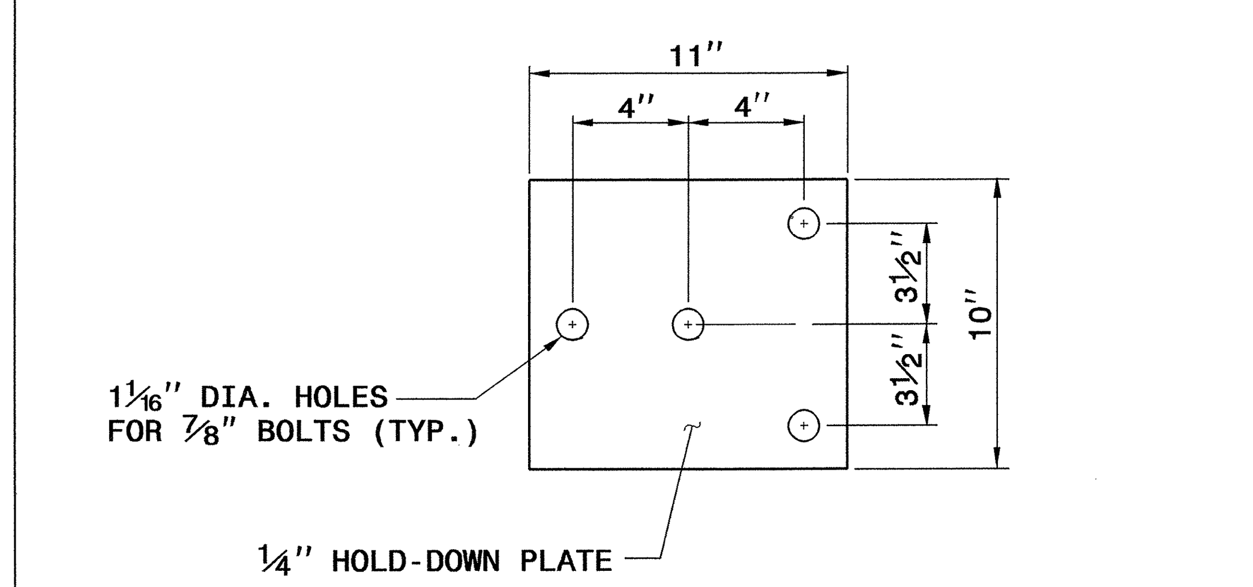
BACK PLATE

NOTES FOR 4 BOLT HOLD DOWN PLATE

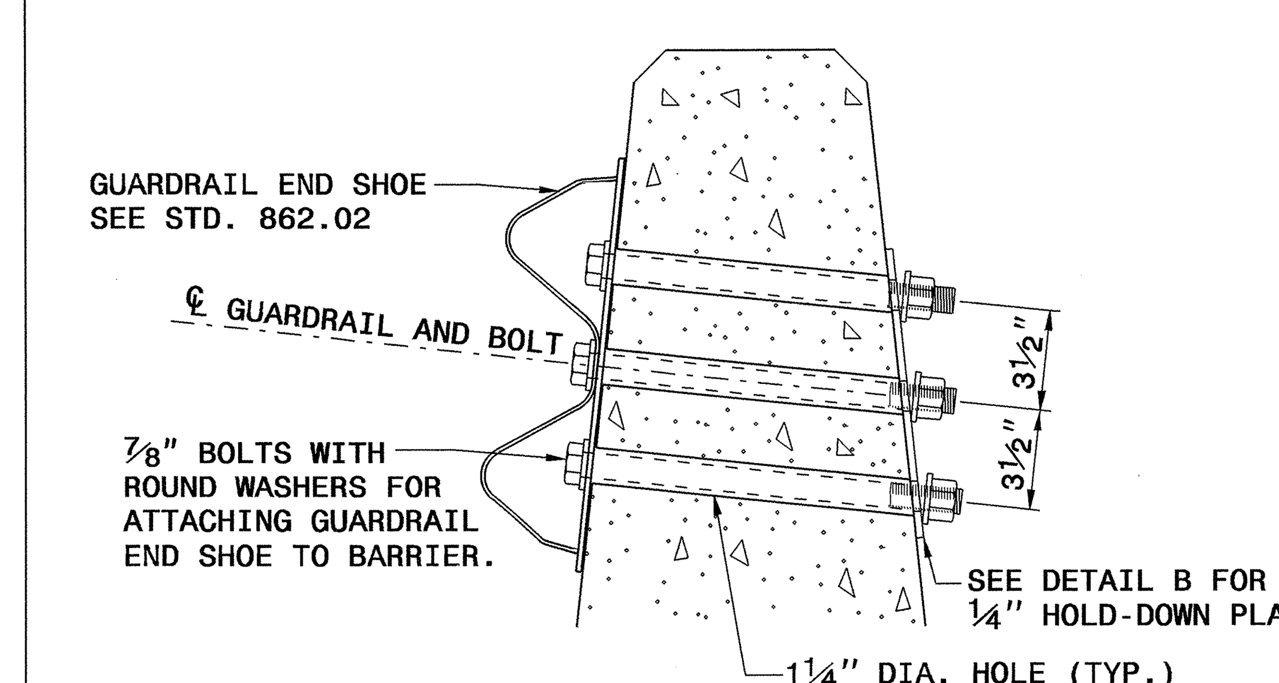
THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 4 - 7⁄8" DIA. BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1¼" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

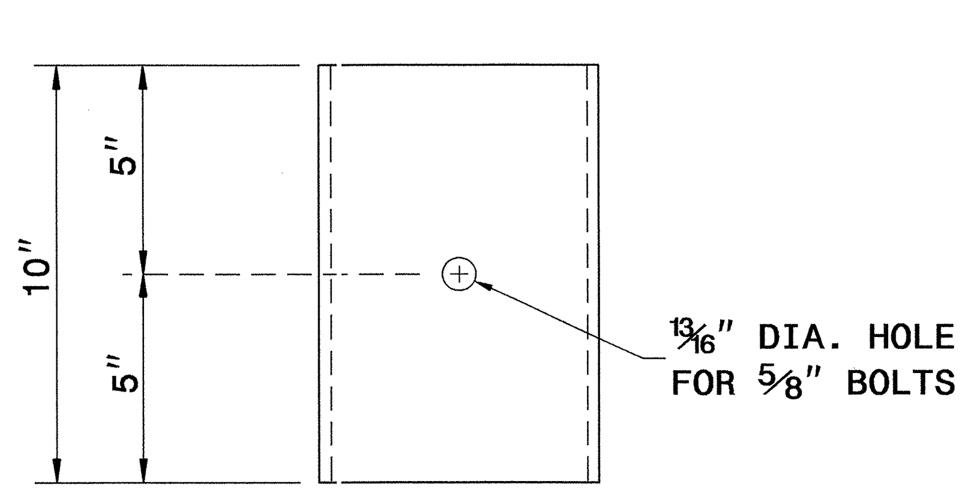


4 BOLT HOLD DOWN PLATE

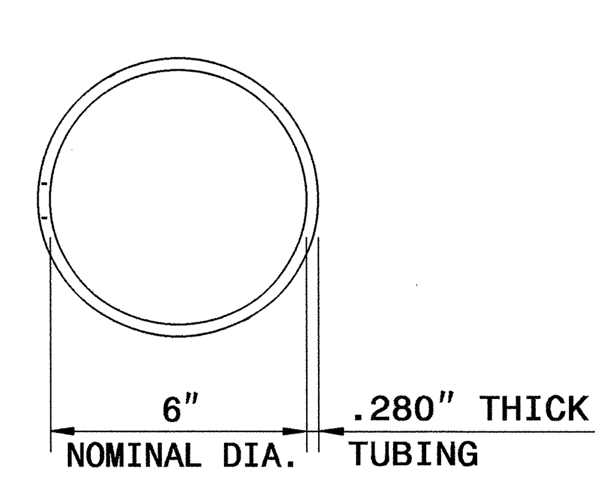


PART SECTION OF BARRIER OR RAIL

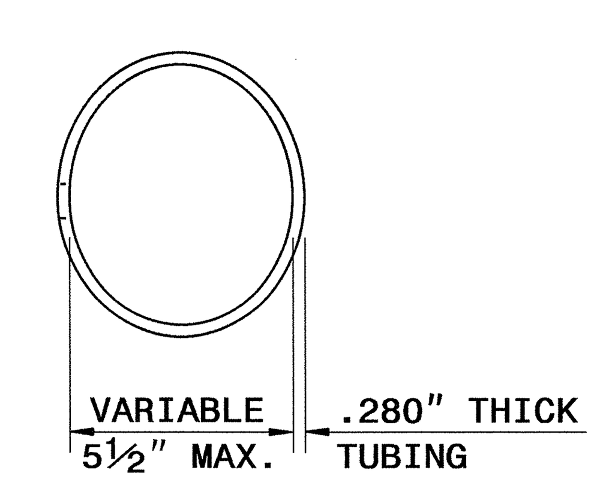
THRU END SHOE SECTION AND
4 BOLT HOLD DOWN PLATE



FRONT VIEW



PLAN VIEW



PLAN VIEW INSET "A"

STEEL SPACER TUBE

GENERAL NOTES:

1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
2. TAP NUTS FOR THE 7⁄8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
7. KEEP TOE OF PORTABLE CONCRETE BARRIER FLUSH WITH FACE OF PARAPET.
8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH ¼" WELDS ALL AROUND.
9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

TEMPORARY ANCHOR UNIT TYPE W-BEAM

ORIGINAL BY: E.E. WARD DATE: 4-03
MODIFIED BY: E.E. WARD DATE: 6-04
CHECKED BY: [signature] DATE: 1/7/13
FILE SPEC.: Xusr\details\stand\862stds\anc.dgn

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

CSD261656 11/30/2012 anc jhowerton CSD-Oce860-34bond

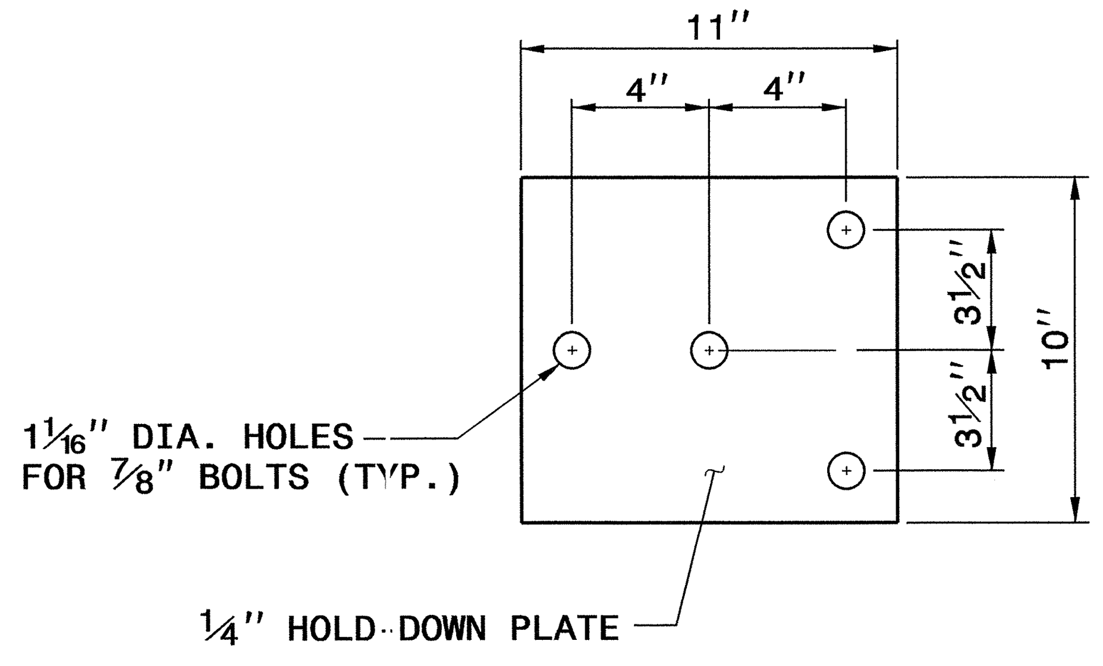
PROJECT REFERENCE NO.	SHEET NO.
B-4946	2-G

NOTES FOR 4 BOLT HOLD DOWN PLATE

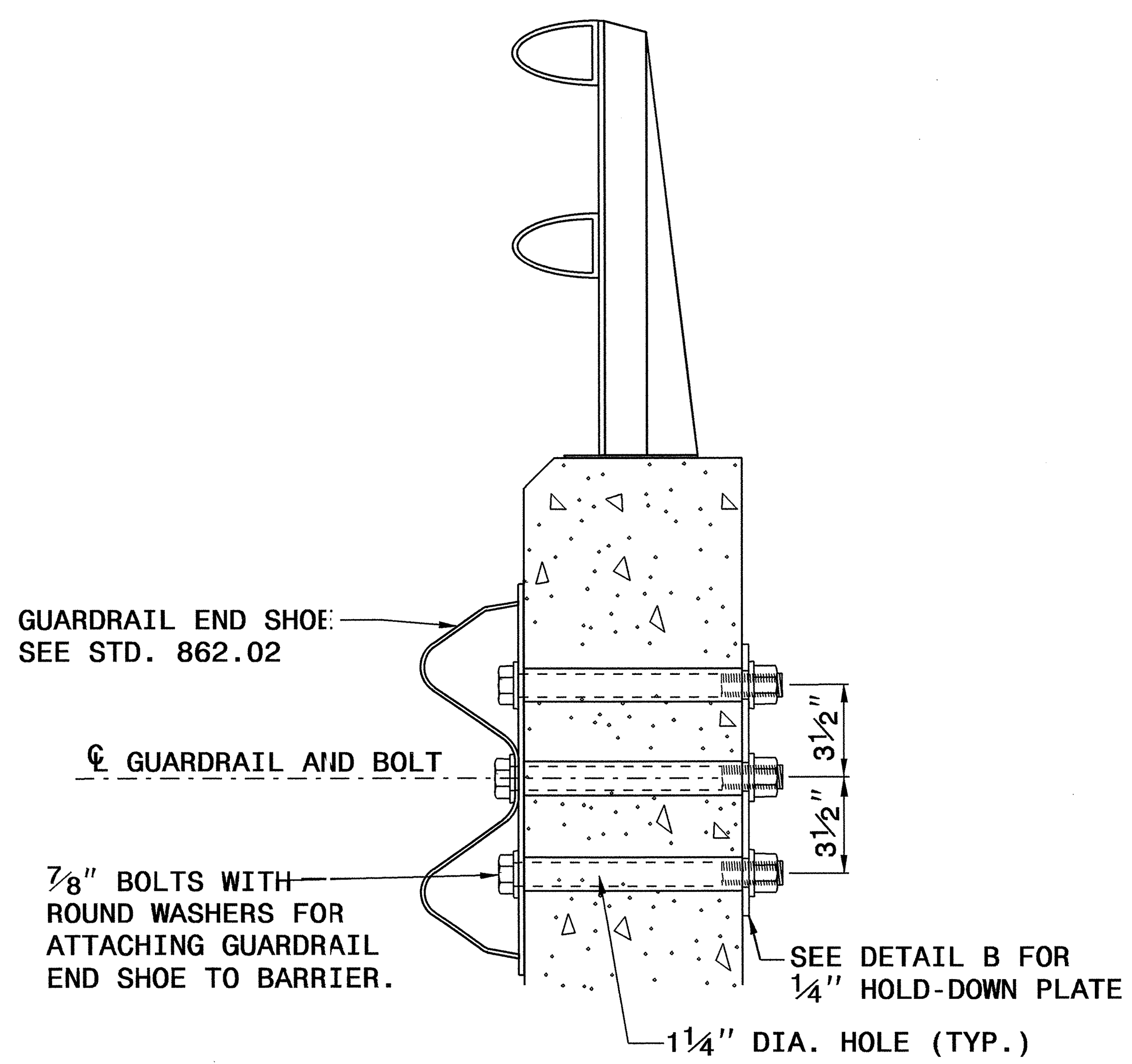
THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 7/8" DIA. BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1 1/4" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

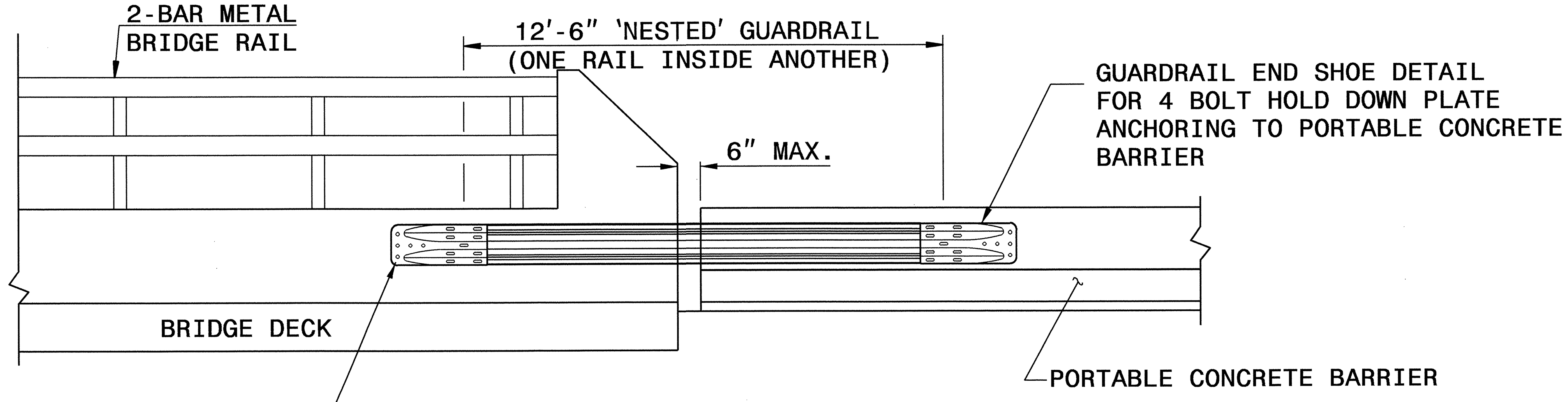


4 BOLT HOLD DOWN PLATE



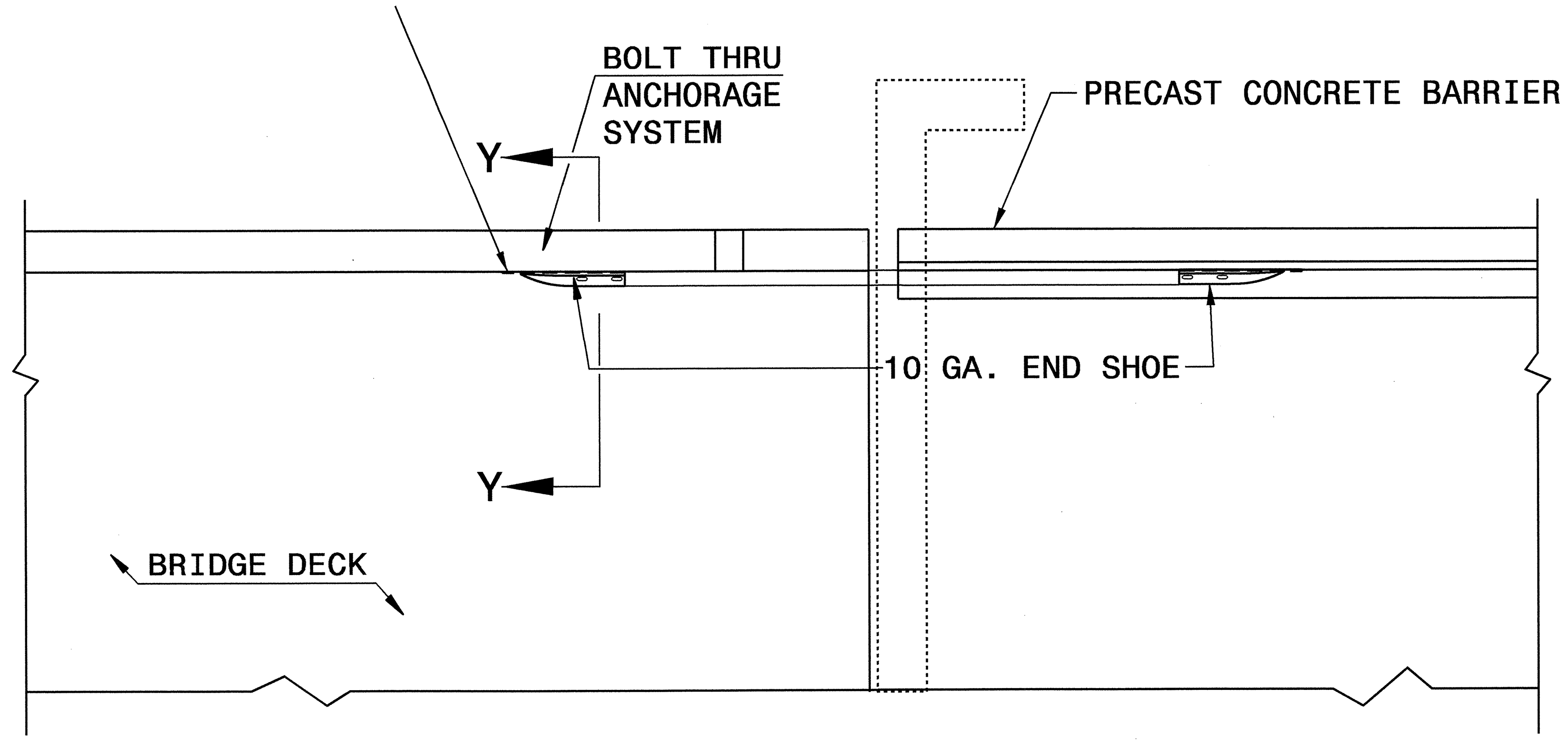
PART SECTION OF BARRIER OR RAIL

THRU END SHOE SECTION AND 4 BOLT HOLD DOWN PLATE

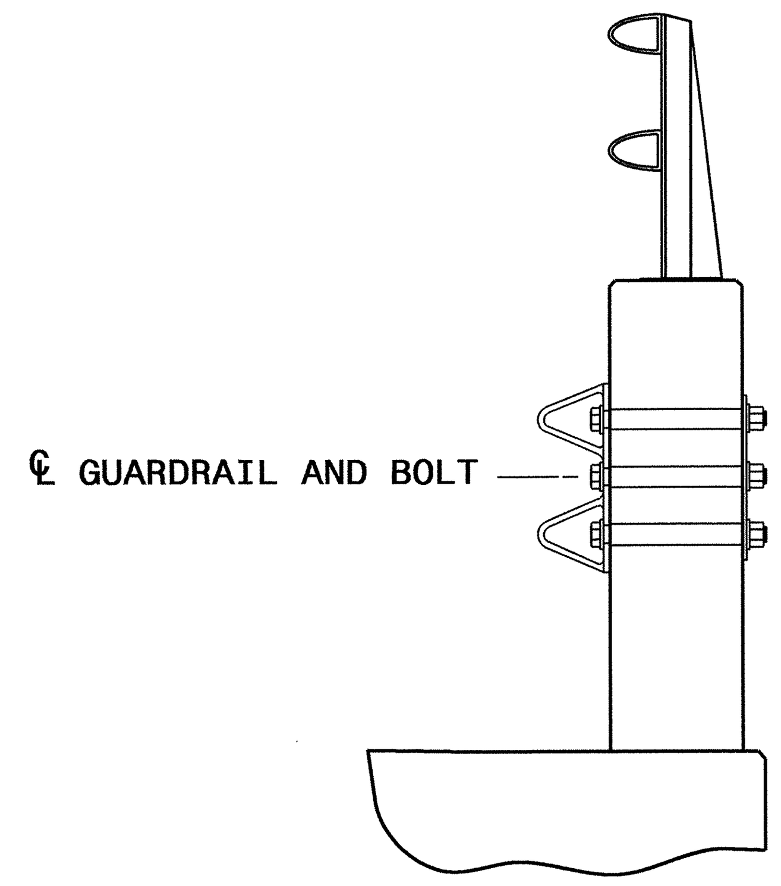


ELEVATION VIEW

USE THE PROPOSED ANCHOR HOLES AS SHOWN IN THE STRUCTURE PLANS



PLAN VIEW



SECTION Y-Y

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

TEMPORARY ANCHOR UNIT TYPE W-BEAM

ORIGINAL BY: E.E. WARD DATE: 8-03
MODIFIED BY: K.A. KEMPF DATE: 12-12
CHECKED BY: DATE: 1/7/13
FILE SPEC.: /usr/details/stand/862stds/anc.dgn

04-JAN-2013 14:13
S:\Contracts\Contracts\Special Details\ericward\usr\details\stand\862stds\anc.dgn
$$$$USERNAME$$$$

CSD261657 1/4/2013 anc kkempf CSD-Oce860-34bond

PROJECT REFERENCE NO.	SHEET
B-4946	2-H

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

Scott A. Hidden 8/10/12
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

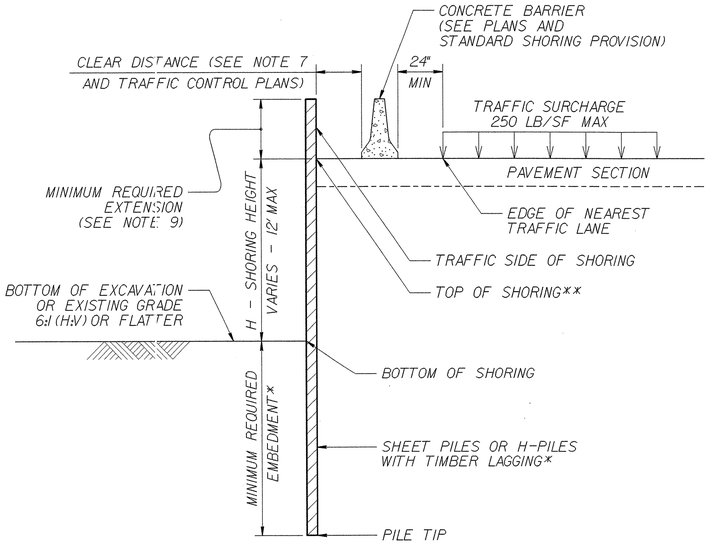
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

***DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".**

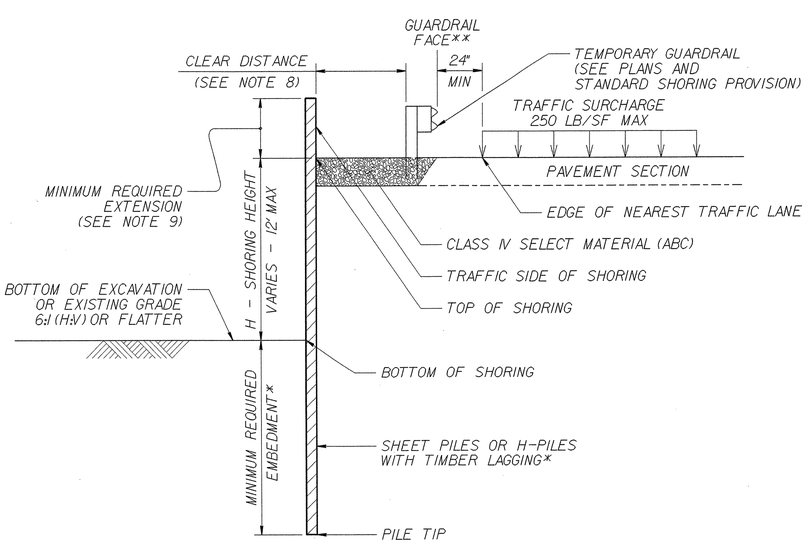
NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
4. DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM.
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



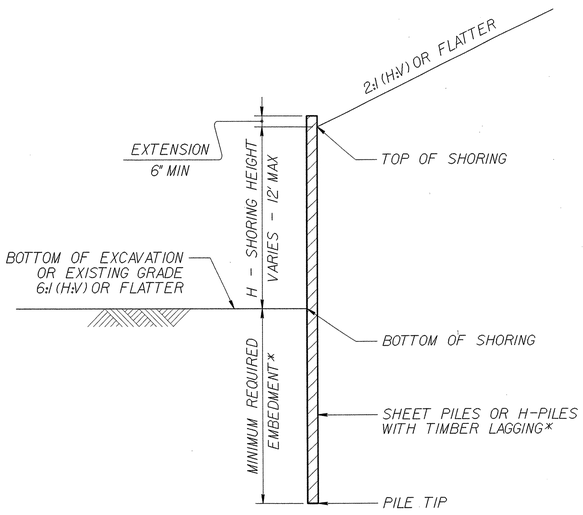
CONCRETE BARRIER

****TOP OF SHORING = EDGE OF PAVEMENT**



TEMPORARY GUARDRAIL

****GUARDRAIL FACE = EDGE OF PAVEMENT**



STANDARD TEMPORARY SHORING

(SLOPE CASE)

***SEE TABLE ABOVE.**

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)

***SEE TABLE ABOVE.**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET
B-4946	2-I

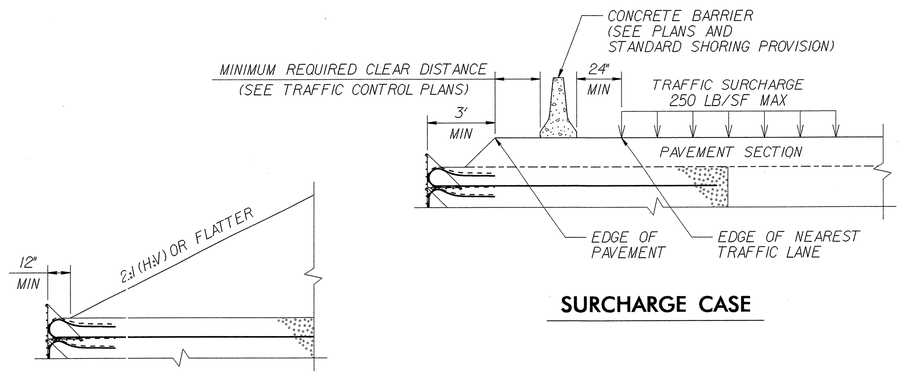
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

scott a. Hidden 8/10/12
SIGNATURE DATE

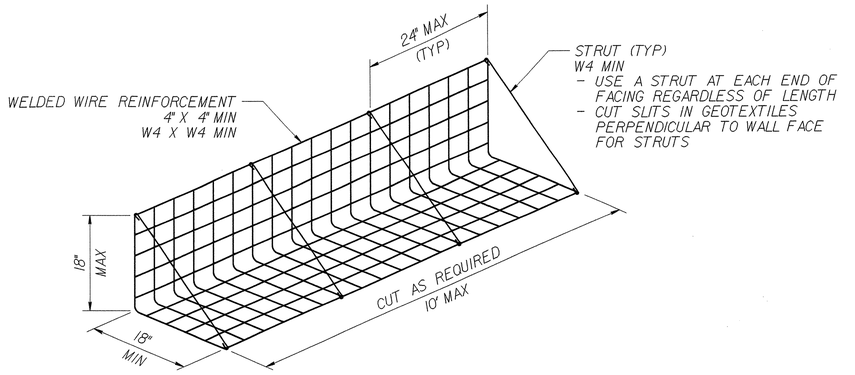
ENGINEER

SIGNATURE DATE

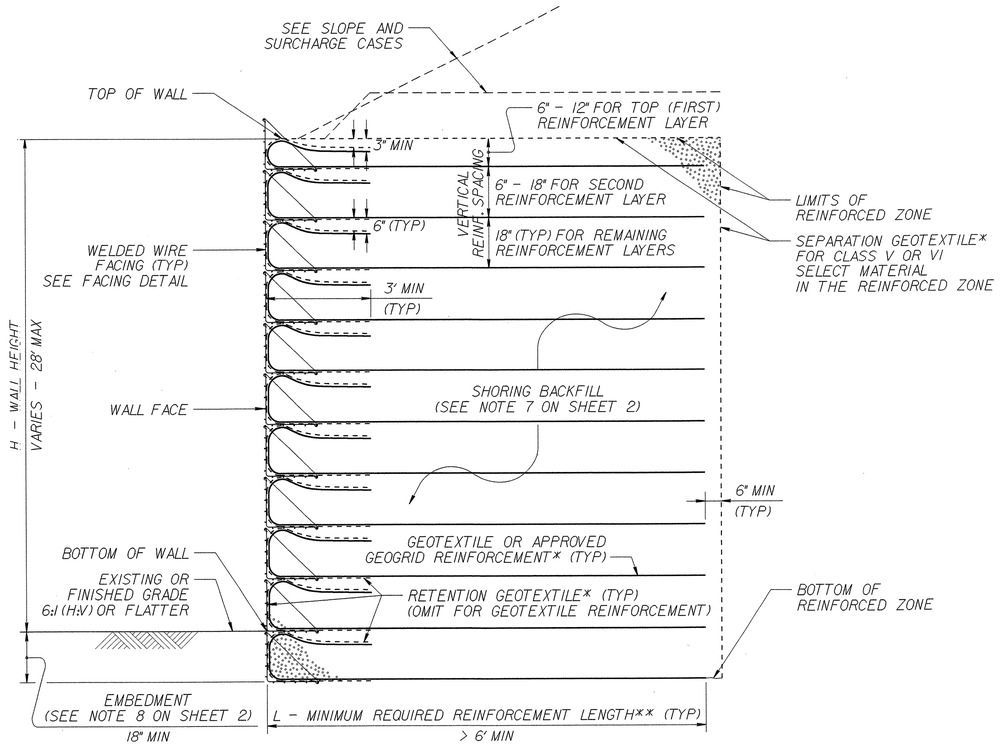


SURCHARGE CASE

SLOPE CASE

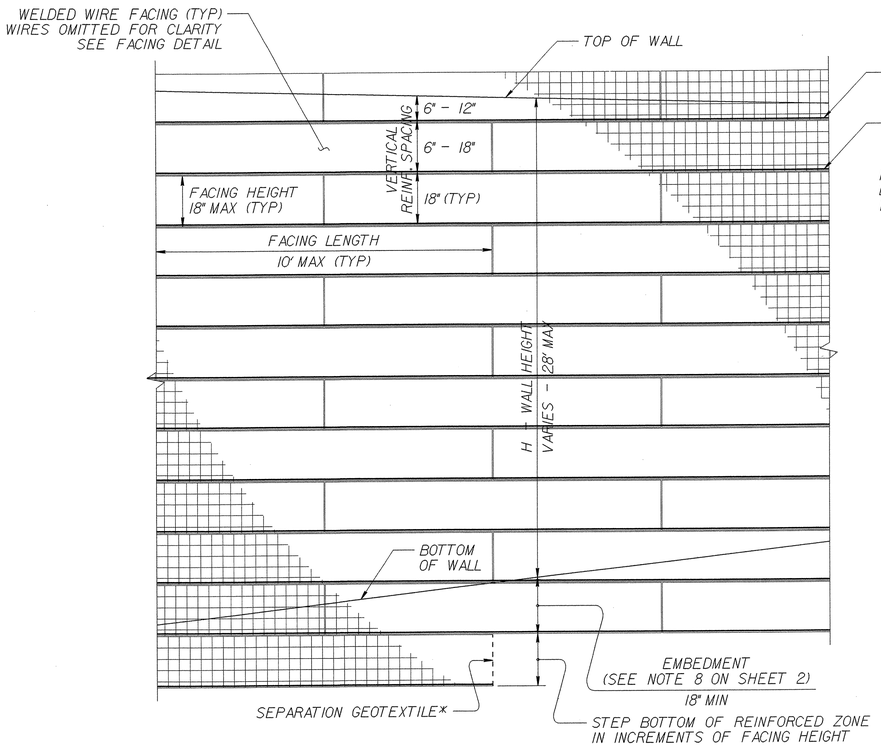


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
***SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.**
****SEE REINFORCEMENT TABLES ON SHEET 3.**



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

***SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.**
****SEE REINFORCEMENT TABLES ON SHEET 3.**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD
TEMPORARY WALL
Sheet 1 of 3

DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET
B-4946	2-J

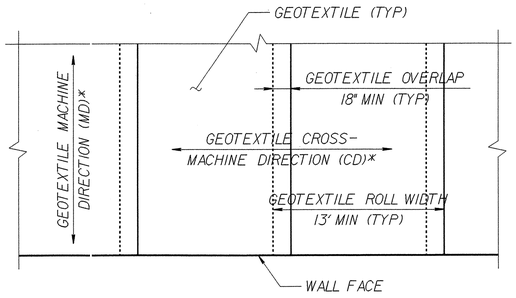
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/10/12
SIGNATURE DATE

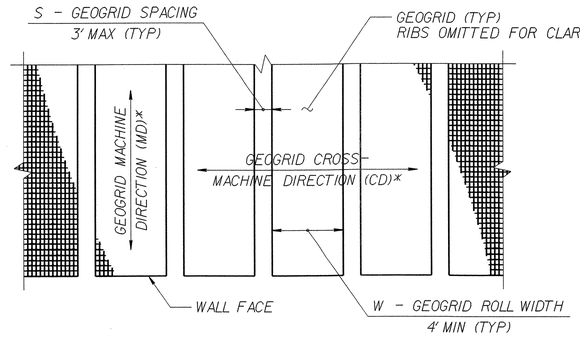
ENGINEER

SIGNATURE DATE



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

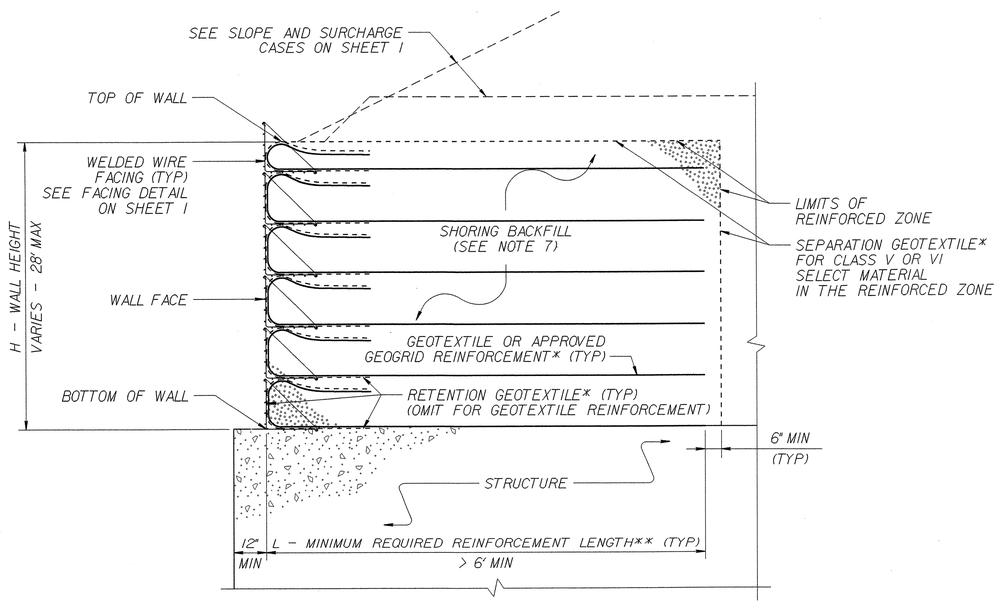


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 ≥ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
***SEE NOTE 12.**



TEMPORARY WALL ON STRUCTURE DETAIL

***SEE GEOSYNTHETIC PLACEMENT DETAILS.**
****SEE REINFORCEMENT TABLES ON SHEET 3.**

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE APPROVED FOR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) BASED ON MATERIAL TYPE. FOR DETAILS OF APPROVED GEOGRIDS AND SHORT-TERM DESIGN STRENGTHS, SEE www.ncdot.org/doh/operations/materials/soils/geo.html
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) ≥ L (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD ≥ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION.
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL
Sheet 2 of 3

DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET
B-4946	2-K

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H – WALL HEIGHT (FT)																								
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20′ > 0 TO 10 FOR H ≥ 20′	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20′ > 10 FOR H ≥ 20′	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 – 4	3
4 – 5.5	4
5.5 – 7	5
7 – 8.5	6
8.5 – 10	7
10 – 11.5	8
11.5 – 13	9
13 – 14.5	10
14.5 – 16	11
16 – 17.5	12
17.5 – 19	13
19 – 20.5	14
20.5 – 22	15
22 – 23.5	16
23.5 – 25	17
25 – 26.5	18
26.5 – 28	19
28 – 29.5	20

***BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.**

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT SHORT-TERM DESIGN STRENGTH (LB/FT)

(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

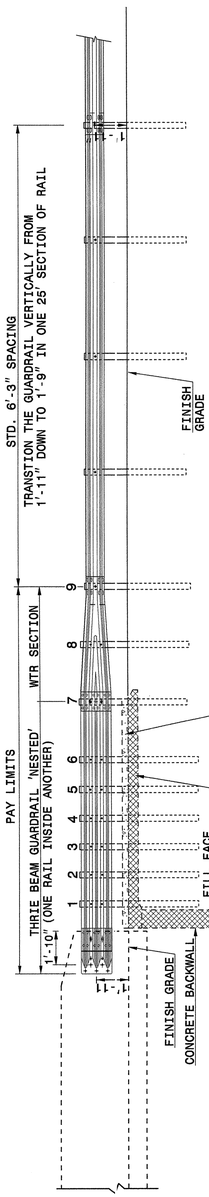
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL
Sheet 3 of 3

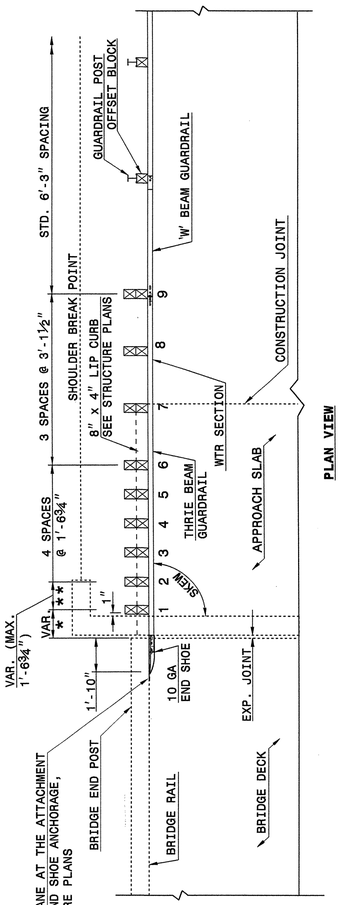
DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET NO.
B-4946	2-L



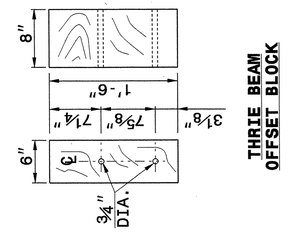
ELEVATION

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).
- -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
- -SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.

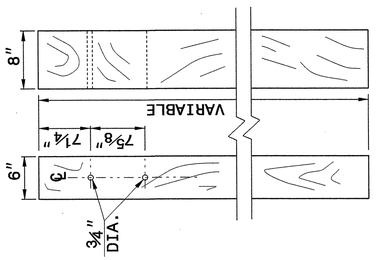


PLAN VIEW

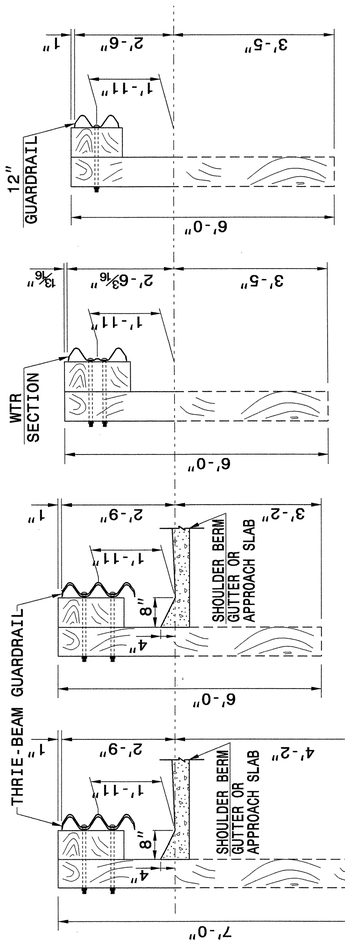
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER



THRIE BEAM OFFSET BLOCK



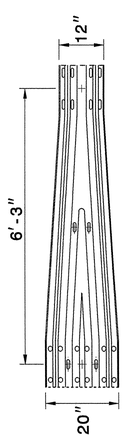
THRIE BEAM LINE POST



SECTION OF 'W' BEAM POST 9

SECTION OF WTR BEAM POST 8

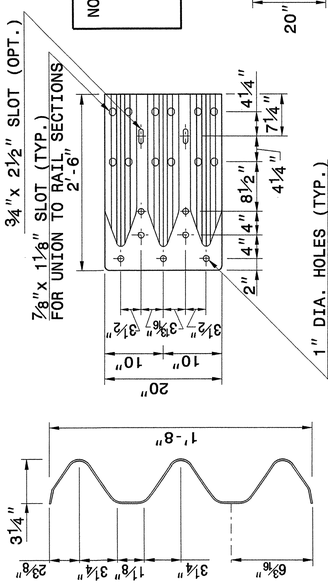
NOTE: THE MID POST AND OFFSET BLOCK OF THE WTR SECTION WILL REQUIRE SPECIAL BOLT HOLE DRILLING IN THE THRIE BEAM OFFSET BLOCK AND LINE POST.



WTR SECTION
ELEVATION VIEW

SECTION OF THRIE BEAM POST 7

SECTION OF THRIE BEAM POSTS 1 THRU 6



THRIE-BEAM SECTION

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: DATE:
CHECKED BY: DATE: 11/13/12
FILE SPEC.:

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
2/4/13

\$\$\$\$SYSTIME\$\$\$\$
\$\$\$\$USERNAME\$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
B-4946	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	200	CY	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0106000000-E	230	18,250	CY	BORROW EXCAVATION
0134000000-E	240	100	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	600	SY	GEOTEXTILE FOR SOIL STABILIZATION
0199000000-E	SP	959	SF	TEMPORARY SHORING
0318000000-E	300	130	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES
0320000000-E	300	400	SY	FOUNDATION CONDITIONING GEOTEXTILE
0335200000-E	305	100	LF	15" DRAINAGE PIPE
0335850000-E	305	4	EA	** DRAINAGE PIPE ELBOWS (15")
0344000000-E	310	120	LF	18" SIDE DRAIN PIPE
0448200000-E	310	540	LF	15" RC PIPE CULVERTS, CLASS IV
0448300000-E	310	316	LF	18" RC PIPE CULVERTS, CLASS IV
0582000000-E	310	108	LF	15" CS PIPE CULVERTS, 0.064" THICK
0636000000-E	310	2	EA	** CS PIPE ELBOWS, ***** THICK (15", 0.064")
1099500000-E	505	100	CY	SHALLOW UNDERCUT
1099700000-E	505	200	TON	CLASS IV SUBGRADE STABILIZATION
1220000000-E	545	200	TON	INCIDENTAL STONE BASE
1330000000-E	607	1,000	SY	INCIDENTAL MILLING
1491000000-E	610	2,520	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1503000000-E	610	1,340	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1523000000-E	610	1,620	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1575000000-E	620	275	TON	ASPHALT BINDER FOR PLANT MIX
1693000000-E	654	30	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
2070000000-N	815	1	EA	SUBDRAIN PIPE OUTLET
2076000000-E	815	6	LF	4" OUTLET PIPE
2286000000-N	840	18	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	2.5	LF	MASONRY DRAINAGE STRUCTURES
2365000000-N	840	7	EA	FRAME WITH TWO GRATES, STD 840.22
2367000000-N	840	5	EA	FRAME WITH TWO GRATES, STD 840.29
2396000000-N	840	3	EA	FRAME WITH COVER, STD 840.54
2556000000-E	846	180	LF	SHOULDER BERM GUTTER
2619000000-E	850	150	SY	4" CONCRETE PAVED DITCH
2724000000-E	857	250	LF	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED
3030000000-E	862	225	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3215000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	620	LF	REMOVE EXISTING GUARDRAIL
3387000000-N	862	4	EA	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ********** (W-BEAM)
3656000000-E	876	700	SY	GEOTEXTILE FOR DRAINAGE
4054000000-E	902	1	CY	PLAIN CONCRETE SIGN FOUNDATIONS
4057000000-E	SP	20	CY	OVERHEAD FOOTING
4060000000-E	903	553	LB	SUPPORTS, BREAKAWAY STEEL BEAM
4072000000-E	903	340	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (18+73 -L-EBL)
4096000000-N	904	4	EA	SIGN ERECTION, TYPE D
4102000000-N	904	9	EA	SIGN ERECTION, TYPE E
4108000000-N	904	2	EA	SIGN ERECTION, TYPE F
4109000000-N	904	4	EA	SIGN ERECTION, TYPE *** (OVERHEAD) (A)
4109000000-N	904	2	EA	SIGN ERECTION, TYPE *** (OVERHEAD) (B)
4110000000-N	904	1	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
4116100000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (F)
4149000000-N	907	1	EA	DISPOSAL OF SIGN SYSTEM, OVERHEAD
4155000000-N	907	10	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4192000000-N	907	1	EA	DISPOSAL OF SUPPORT, U-CHANNEL
4234000000-N	907	4	EA	DISPOSAL OF SIGN, A OR B (OVERHEAD)
4400000000-E	1110	249	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	606	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	70	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW BOARD
4420000000-N	1120	9	EA	PORTABLE CHANGEABLE MESSAGE SIGN
4430000000-N	1130	230	EA	DRUMS
4445000000-E	1145	56	LF	BARRICADES (TYPE III)
4465000000-N	1160	5	EA	TEMPORARY CRASH CUSHIONS
4470000000-N	1160	3	EA	RESET TEMPORARY CRASH CUSHION
4480000000-N	1165	2	EA	TMA
4485000000-E	1170	2,610	LF	PORTABLE CONCRETE BARRIER
4500000000-E	1170	440	LF	RESET PORTABLE CONCRETE BARRIER
4510000000-N	SP	458	HR	LAW ENFORCEMENT
4650000000-N	1251	135	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	4,890	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	1,089	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4695000000-E	1205	1,392	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4697000000-E	1205	156	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)
4700000000-E	1205	76	LF	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)
4710000000-E	1205	120	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4725000000-E	1205	9	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4770000000-E	1205	344	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (2)
4770000000-E	1205	698	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4810000000-E	1205	10,432	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	65	LF	PAINT PAVEMENT MARKING LINES (8")
4825000000-E	1205	1,597	LF	PAINT PAVEMENT MARKING LINES (12")
4835000000-E	1205	234	LF	PAINT PAVEMENT MARKING LINES (24")
4845000000-N	1205	19	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-E	1205	3,404	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4860000000-E	1205	70	LF	REMOVAL OF PAVEMENT MARKING LINES (8")
4870000000-E	1205	212	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4875000000-N	1205	10	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1251	2	EA	PERMANENT RAISED PAVEMENT MARKERS
4905000000-N	1253	155	EA	SNOWPLOWABLE PAVEMENT MARKERS
5255000000-N	1413	Lump Sum		PORTABLE LIGHTING
6000000000-E	1605	2,900	LF	TEMPORARY SILT FENCE
6006000000-E	1610	495	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	330	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	365	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	5	ACR	TEMPORARY MULCHING
6018000000-E	1620	200	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.75	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	325	LF	TEMPORARY SLOPE DRAINS
6029000000-E	SP	200	LF	SAFETY FENCE
6030000000-E	1630	1,230	CY	SILT EXCAVATION
6036000000-E	1631	6,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	25	SY	COIR FIBER MAT
6042000000-E	1632	750	LF	1/4" HARDWARE CLOTH
6071010000-E	SP	600	LF	WATTLE
6071020000-E	SP	200	LB	POLYACRYLAMIDE (PAM)
6071030000-E	1640	500	LF	COIR FIBER BAFFLE
6071050000-E	SP	1	EA	** SKIMMER (1-1/2")
6084000000-E	1660	5	ACR	SEEDING & MULCHING
6087000000-E	1660	2.5	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	150	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	4	TON	FERTILIZER TOPDRESSING
6114500000-N	1667	10	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
7060000000-E	1705	3,025	LF	SIGNAL CABLE
7120000000-E	1705	24	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7144000000-E	1705	3	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7264000000-E	1710	1,550	LF	MESSENGER CABLE (3/8")
7300000000-E	1715	575	LF	UNPAVED TRENCHING (**********) (1, 2")
7300100000-E	1715	300	LF	UNPAVED TRENCHING FOR TEMPORARY LEAD-IN
7301000000-E	1715	75	LF	DIRECTIONAL DRILL (**********) (1, 2")
7324000000-N	1716	6	EA	JUNCTION BOX (STANDARD SIZE)
7408000000-E	1722	2	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	10	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	950	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	4,350	LF	LEAD-IN CABLE (**********) (14-2)
7576000000-N	SP	8	EA	METAL STRAIN SIGNAL POLE
7613000000-N	SP	8	EA	SOIL TEST
7614100000-E	SP	64	CY	DRILLED PIER FOUNDATION
7636000000-N	1745	5	EA	SIGN FOR SIGNALS

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RD261646 1/11/2013 sum_03 bckey RD-Oce860-34

RD248661

COMPUTED BY: SEC DATE: 1/14/2012

CHECKED BY: BCK DATE: 1/15/2012

PROJECT NO.	SHEET NO.
B-4946	3-A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
L_EBL																			
23+66	LT	0401		364.9	361.7														
22+92	CL	0403		355.9	352.6														
23+66	LT	0401	0402		361.7	354.5													
23+70	RT	0402		356.6	354.5														
22+92	RT	0403	0402		352.9	354.5													
26+40	LT	0409		367.2	364.1														
27+05	RT	0411		356.5	353.8														
27+05	RT	0409	0411		364.1	353.8													
30+60	CL	0502		356.9	353.6														
30+60	RT	0502	0501		353.6	353.8													
L_SBL																			
11+13	RT	0420																	
L_NBL																			
10+00	LT	0416		342	334.5														
10+00	LT	0416	0415		339.3	339.8			44										
10+05	LT	0415		342.5	339.8														
10+00	LT	0415	0419		339.8	340.7													
10+95	LT	0419		344.8	340.7														
10+95	LT	0419	0414		340.7	342.3													
12+20	LT	0414		345.5	342.3														
12+20	LT	0414	0413		342.3	344.9													
13+47	LT	0413		348.1	344.9														
13+47	LT	0413	0412		344.9	345.3													
13+47	LT	0412		348	345.3														
13+47	LT	0412	0411		345.3	353.8			28							X			
10+00	RT	0408		339.1	335.9														
10+00	RT	0408	0407		336.1	337.8													
10+35	RT	0407		342.7	337.8														
10+35	RT	0407	0418		337.8	338.3													
11+10	RT	0418		342.8	338.3														
11+10	RT	0418	0406		338.3	339													
12+12	RT	0406		343.6	339														
12+12	RT	0406	0405		339	339.1													
12+12	RT	0405		342.1	339.1														
12+12	RT	0405	0404		339.4	353.4			28							X			
12+12	RT	0404		356.2	353.4														
SHEET TOTAL								0	100	0	0	0	0	0	0	0	0	0	0

STATION	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"
27+05 (0409–0411)		108														
SHEET TOTAL	0	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATION	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	** " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE
23+66 (0401–0402)		80											
22+92 (0403–0402)		96											
30+60 (0502–0501)			44										
11+13 (0420)													120
10+00 (0415–0419)		96											
10+95 (0419–0414)		128											
12+20 (0414–0413)		128											
13+47 (0413–0412)		12											
10+00 (0408–0407)			76										
10+35 (0407–0418)			76										
11+10 (0418–0406)			104										
12+12 (0406–0405)			16										
SHEET TOTAL	0	540	316	0	0	0	0	0	0	0	0	0	120

STATION	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS 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	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
23+66 (0401)			1								
22+92 (0403)			1								
23+70 (0402)			1								
26+40 (0409)			1								
27+05 (0411)			1								
30+60 (0502)			1								
10+00 (0416)			1	2.5							
10+05 (0415)			1								
10+95 (0419)			1								
12+20 (0414)			1								
13+47 (0413)			1								
13+47 (0412)			1								
10+00 (0408)			1								
10+35 (0407)			1								
11+10 (0418)			1								
12+12 (0406)			1								
12+12 (0405)			1								
12+12 (0404)			1								
SHEET TOTAL			18	2.5						0	0

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND 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	T.B.D.I. STD. 840.35	G.D.I. FRAME WITH TWO WIDE SLOT FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO WIDE SLOT SAG 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. 840.29	T.B.J.B. STD. 840.34	OTCB STD. 840.04 OR 840.05	T.B.J.B. WITH MANHOLE STD. 840.34	MANHOLE FRAME AND COVER 840.54
23+66 (0401)						1				1				
22+92 (0403)											1			
23+70 (0402)												1		
26+40 (0409)						1				1				
27+05 (0411)				1				1						
30+60 (0502)											1			
10+00 (0416)				1				1						
10+05 (0415)				1				1						
10+95 (0419)													1	1
12+20 (0414)						1				1				
13+47 (0413)						1				1				
13+47 (0412)				1				1						
10+00 (0408)				1				1						
10+35 (0407)													1	1
11+10 (0418)													1	1
12+12 (0406)						1				1				
12+12 (0405)				1				1						
12+12 (0404)				1				1						
SHEET TOTAL	0	0	0	7	0	5	0	7	0	5	2	1	3	3

STATION	DRAINAGE PIPE ELBOWS NO. & SIZE	C.S. PIPE ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
27+05 (0409–0411)		2@15"			
11+13 (0420)					REMOVE EXIST 18" RCP
10+00 (0416)					REMOVE EXIST. DI
13+47 (0412–0411)	2@15"				
10+00 (0408)					REMOVE EXIST. DI
12+12 (0405–0404)	2@15"				
SHEET TOTAL	4@15"	2@15"			

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.)	(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: BWJ	DATE: 1/11/13
CHECKED BY: SEC	DATE: 1/15/13

12/06/07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4946	3-B

SUMMARY OF EARTHWORK
IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
L EBL RT					
17+00.00	25+11.28	120	6,709	6,589	
26+17.28	32+22.00	31	9,469	9,438	
SUBTOTAL:		151	16,178	16,027	
L SBL RT.					
10+00.00	14+00.00	2	7	5	
SUBTOTAL:		2	7	5	
L NBL LT.					
10+00.00	14+50.00	145	6		139
SUBTOTAL:		145	6		139
L NBL RT.					
10+00.00	14+50.00	136	13		123
SUBTOTAL:		136	13		123
L EBL LT.					
17+00.00	25+11.28	1,340	444		896
26+17.28	32+22.00	355	373	18	
SUBTOTAL:		1,695	817	18	896
TOTALS:		2,129	17,022	16,051	1,158
SHOULDER MATERIAL			1,344	1,344	
WASTE IN LIEU OF BORROW				-262	-262
PROJECT TOTALS:		2,129	18,366	896	896
5% TO REPLACE TOP SOIL ON BORROW PIT				857	
GRAND TOTAL:		2,129	18,366	17,989	896
SAY:		2,150		18,250	

UNDERCUT (CONTINGENCY): 200 CY
SHALLOW UNDERCUT: 100 CY
DDE: 100 CY

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.

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
L EBL	17+00.00	23+52.00	LT	1,091.11
L EBL	26+11.00	32+20.00	LT	1,747.78
L NBL	10+00.00	14+00.00	LT	88.89
L NBL	10+00.00	14+00.00	RT	88.89
TOTAL:				3,016.67
SAY:				3,020

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
L EBL LT	23+66.00	24+85.00	119.00
L EBL LT	25+88.00	26+40.00	52.00
TOTAL:			171.00
SAY:			180.00

"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

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 SHOUL. WIDTH	FLARE LENGTH: APPROACH END	FLARE LENGTH: TRAILING END	W: APPROACH END	W: TRAILING END
-L EBL-	23+69.23	25+19.23	RT.	150.00'			25+19.23		8'	11'	50'		1'	
-L EBL-	22+95.18	24+82.68	LT.	187.50'			24+82.68		4'	11'	193.75'		3.228'	
-L NBL-	12+27.85	13+02.85	RT.	75.00'			12+27.85		8.3'	11.3'	50'		1'	
-L NBL-	13+06.57	13+81.57	LT.	75.00'			13+06.57		9.7'	12.7'	50'		1'	
TOTAL:				487.50'										
		4 GRAU 350 @ 50.0'		-200.00'										
		2 TYPE III @ 18.75'		-37.50'										
		2 B-77 @ 18.75'		-37.50'										
SEE TRANSPORTATION MANAGEMENT PLANS FOR USAGE LOCATIONS														
GRAND TOTAL:				212.50'										
SAY:				225.00'										
5 ADDITIONAL GUARDRAIL POSTS														

SURVEY LINE	ANCHORS: XI MOD	ANCHORS: XI	ANCHORS: GRAU 350	ANCHORS: B-77	ANCHORS: III	ANCHORS: TEMP. ANCHOR UNIT TYPE W-BEAM	ANCHORS:	IMPACT ATTENUATOR TYPE 350: EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L EBL-			1		1									SEE SHEET 2-L FOR GUARDRAIL STRUCTURE ANCHOR UNIT, TYPE III
-L EBL-			1		1									SEE SHEET 2-L FOR GUARDRAIL STRUCTURE ANCHOR UNIT, TYPE III
-L NBL-			1	1										SEE STD. 862.03 FOR GUARDRAIL STRUCTURE ANCHOR, TYPE B-77
-L NBL-			1	1										SEE STD. 862.03 FOR GUARDRAIL STRUCTURE ANCHOR, TYPE B-77
TOTAL:			4	2	2							620'		
SEE TRANSPORTATION MANAGEMENT PLANS FOR USAGE LOCATIONS						4								SEE SHEETS 2-F THRU 2-G FOR DETAIL OF ANCHOR UNITS
GRAND TOTAL:			4	2	2	4						620'		
SAY:			4	2	2	4						620'		

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RD261646 1/29/2013 sum_03-B bckey RD-Oce860-34

PROJECT REFERENCE NO.	SHEET NO.
B-4946	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY — 2-18-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN — 2/18/13

8/17/99

REVISIONS

–L EBL–

PIs Sta 18+23.00
Θs = 2° 08' 54.9"
Ls = 150.00'
LT = 100.01'
ST = 50.01'

PI Sta 22+85.89
Δ = 23° 19' 46.4" (LT)
D = 2° 51' 53.2"
L = 814.35'
T = 412.90'
R = 2,000.00'
SE = .04
V_D = 50mph

–L SBL–

PI Sta 13+71.47
Δ = 1° 58' 09.9" (RT)
D = 1° 06' 25.8"
L = 177.88'
T = 88.95'
R = 5,175.00'
SE = SEE PLANS
V_D = 50mph

PI Sta 16+69.89
Δ = 11° 11' 15.0" (RT)
D = 5° 06' 40.1"
L = 218.89'
T = 109.79'
R = 1,121.00'
SE = SEE PLANS
V_D = 50mph

–L NBL–

PI Sta 12+91.34
Δ = 22° 52' 31.3" (RT)
D = 3° 58' 43.9"
L = 574.92'
T = 291.34'
R = 1,440.00'
SE = EXIST.
V_D = EXIST.

NC GRID
NAD 83/NSRS 2007

-BY-108 11+14.53 PINC
= -BYI-AI08- 5+00.00 POT

TO RALEIGH

15+00 (L_EBL)

20+00 (L_EBL)

-BL-I04- 27+50.33 PINC
=-BYI-AI04- 12+04.25 PINC

25+00 (L_EBL)

10+00 (L_NBL)

10+00 (L_SBL)

15+00 (L_SBL)

MATCHLINE –L_EBL– STA 27+50.00
SEE SHEET 5

-L_EBL- TS Sta. 17+22.99

S 8° 18' 27.6" E

-BG-I03- 23+42.50 PINC
= BY2-AI03- 5+00.00 POT

3' STANDARD BASE DITCH GRASS LINED SEE DETAIL 'A' 10 CY DOE

BEGIN CONSTRUCTION
–L NBL– PC Sta. 10+00.00

BEGIN WALL
–L EBL– RT. STA. 24+03.30
OFF 36.3'

BEGIN SINGLE FACED BARRIER
–L NBL– RT. STA. 11+23.30
OFF 21.5'

REMOVE EXIST. STRUCTURE

REMOVE & REPLACE

NOTE: REPLACE ASPHALT PAVED DITCH TO BEGIN WALL LT. & FROM 13+47 LT. TO STA. 14+50 LT. –L NBL–. SEE STANDARD DRAWING 850.01

-L_EBL- PT Sta. 26+87.34
S 33° 47' 08.9" E

BEGIN WALL & SINGLE FACED BARRIER
–L NBL– LT.
STA. 11+67.80
OFF 23.2'

WALL 1
L NBL LT.
STA. 12+71.10
OFF 21.9'

END SBG @ STA. 26+40 LT.
GRADE TO DRAIN

BEGIN SBG @ END BRIDGE LT.

BEGIN SBG @ STA. 23+66 LT.

END SBG @ BEGIN BRIDGE LT.

END WALL & SINGLE FACED BARRIER
–L NBL– RT. STA. 12+27.90
OFF 21.8'

END WALL & SINGLE FACED BARRIER
–L NBL– LT. STA. 13+06.50
OFF 23.2'

-L_EBL- POC Sta. 25+71.28
-L_NBL- POC Sta. 12+12.08
Δ = 39° 42' 04.2"

-L_EBL- SC Sta. 18+72.99
-L_SBL- POT Sta. 10+00.00
OFF 12' RT.

-L_SBL- PC Sta. 12+82.52

END CONSTRUCTION
–L_SBL– STA. 14+00.00

-L_SBL- PT Sta. 14+60.40

-L_SBL- PC Sta. 15+60.10

-L_SBL- PT Sta. 17+78.99

END CONSTRUCTION
–L_NBL– STA. 14+50.00

BEGIN TIP PROJECT B–4946
–L_EBL– STA. 17+00.00

TO FUQUAY–VARINA

BM4
ELEV.= 360.20'
BL STA 23+35 296' RT
RR SPIKE IN 26" PINE

-BY2-110 8+96.30 PINC

-L_EBL- PT Sta. 26+87.34
S 33° 47' 08.9" E

TYPE–III (SEE SHEET 2–L)

END BRIDGE
–L EBL– STA. 26+17.28

BEG. BRIDGE
–L EBL– STA. 25+11.28

BEG. APP. SLAB
–L EBL– STA. 24+87.70

END APP. SLAB
–L EBL– STA. 26+40.87

BRIDGE SKETCH
(NOT TO SCALE)

AVERAGE DAILY TRAFFIC (IN HUNDREDS) 2013 2033

WILMINGTON ST –L EBL– US 70
356/432 → 142/187
–L SBL– US 401 ← 214/245

WILMINGTON ST US 70
356/432 → 142/187
–L NBL– US 401 ← 214/245

PAVEMENT REMOVAL

DETAIL 'A'
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2H, D, 2H, Natural Ground, B
Min. D= 1.5 Ft.
B= 3 Ft.

STA. 19+40+/- TO STA. 19+70+/- LT. –L EBL–

SEE SHEET 2-L FOR GUARDRAIL STRUCTURE ANCHOR UNIT, TYPE III
SEE SHEETS 6 & 7 FOR PROFILES
SEE TRANSPORTATION MANAGEMENT PLANS FOR SHORING LOCATIONS
SEE SHEETS S-1 to S-31 FOR STRUCTURE PLANS
SEE SHEETS W-1 to W-3 FOR RETAINING WALL PLANS

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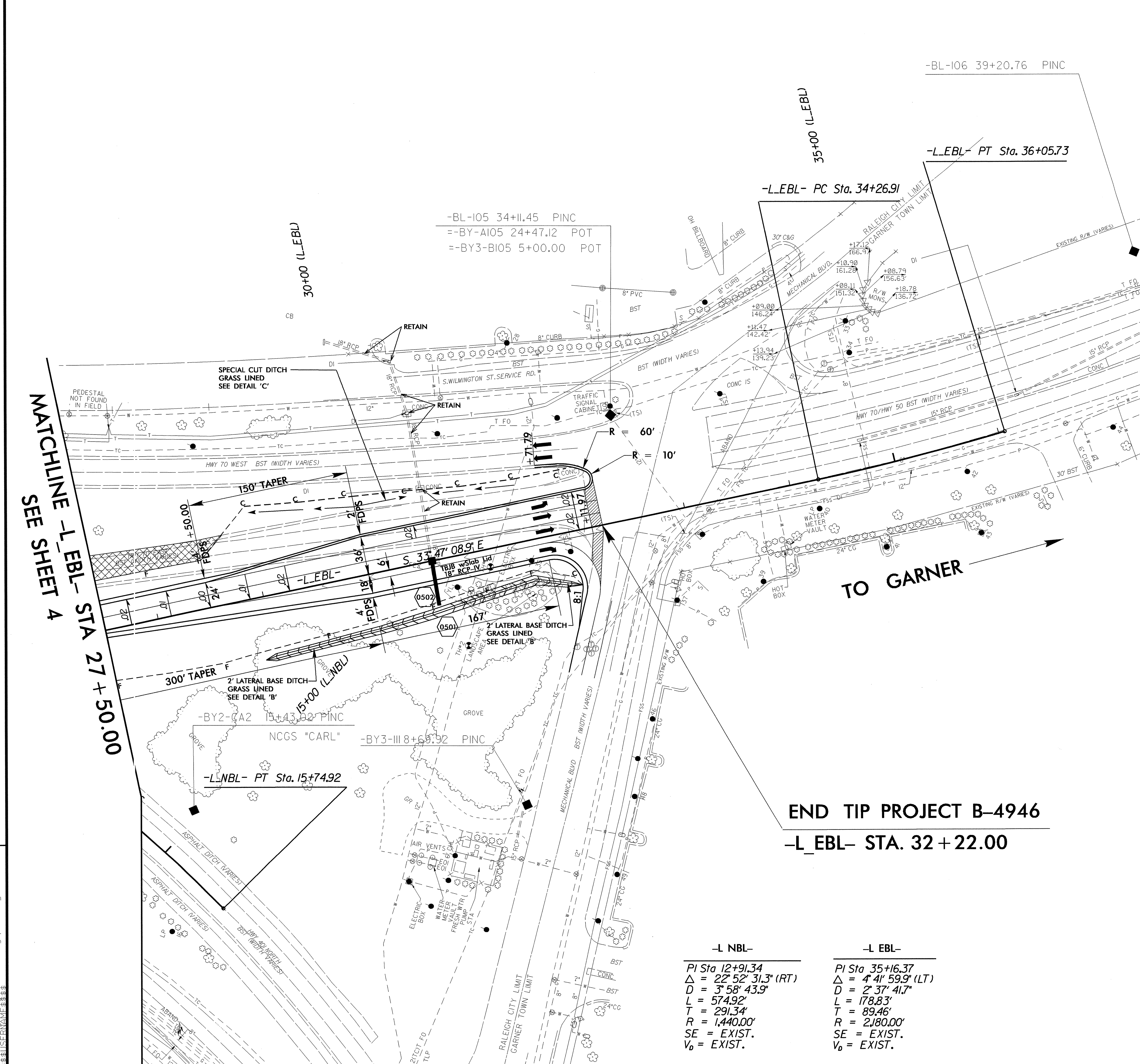
RD261646 2/18/2013 psh 04 bckey RD-Oce860-34

PROJECT REFERENCE NO.	SHEET NO.
B-4946	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

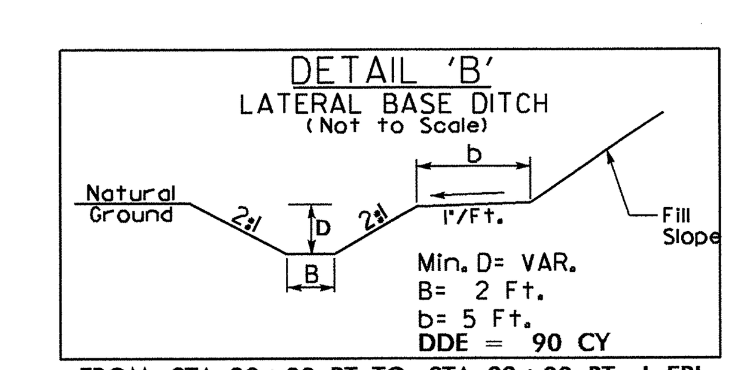
8/17/99

REVISIONS

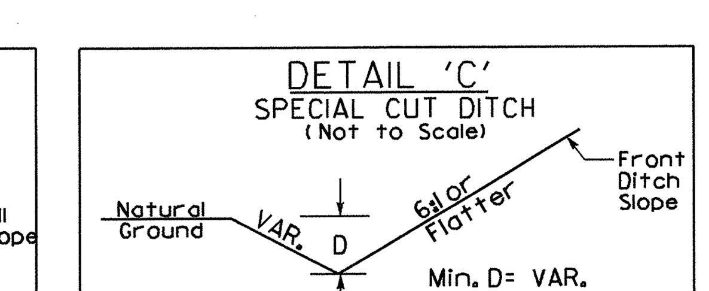


-L NBL-
PI Sta 12+91.34
Δ = 22° 52' 31.3" (RT)
D = 3° 58' 43.9"
L = 574.92'
T = 291.34'
R = 1,440.00'
SE = EXIST.
V_D = EXIST.

-L EBL-
PI Sta 35+16.37
Δ = 4° 41' 59.9" (LT)
D = 2° 37' 41.7"
L = 178.83'
T = 89.46'
R = 2,180.00'
SE = EXIST.
V_D = EXIST.



FROM STA. 29+00 RT. TO STA. 32+00 RT. -L_EBL-



FROM STA. 29+00 LT. TO STA. 31+50 LT. -L_EBL-

PAVEMENT REMOVAL

SEE SHEET 6 FOR PROFILE

25-JAN-2013 12:52

RD261646 1/25/2013 psh 05 bckey RD-Oce860-34

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-4946	6

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRIAN C. KEY
1-31-13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
2/4/13

–L EBL–

BM1 ELEVATION = 360.01
N 721334 E 2103616
–L_EBL STATION 10+00.00
N 33° 03' 41.34" E 213.75'
TOP OF BOLT IN SIGNAL LIGHT BASE

BM2 ELEVATION = 359.42
N 719763 E 2103753
–L_EBL STATION 24+10.00 46' RIGHT
RRS IN 28" SWEET GUM

BM3 ELEVATION = 355.16
N 718636 E 2104480
–L_EBL STATION 10+00.00
S 21° 16' 16.97" E 2703.00'
CHISLED 'X' IN BASE OF LIGHT POLE

BEGIN GRADE
–L EBL– STA. 17+00.00
ELEV. 352.74'

–L EBL– STA 18+72.99
–L_SBL– STA 10+00.00

PI = 21+70.00
EL = 360.28'
VC = 160'
K = 97
V = 50 mph

PI = 25+75.00
EL = 373.31'
VC = 616'
K = 99
V = 50 mph

–L EBL– STA 25+11.28
BEGIN BRIDGE

–L EBL– STA 26+17.28
END BRIDGE

(+)11.5600%
(+)3.2179%
(+)3.2179%
(-)3.0170%
367.14

–L_EBL– STA 25+71.28
–L_NBL– STA 12+12.08

SEE SHEETS 4 & 5
FOR PLAN VIEW

360
350
340
330
14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00

–L EBL–

–L EBL–

PI = 25+75.00
EL = 373.31'
VC = 616'
K = 99
V = 50 mph

PI = 30+65.00
EL = 358.53'
VC = 250'
K = 103
V = 50mph

END GRADE
–L_EBL– STA. 32+00.00
ELEV. 357.74'

–L_EBL– STA. 32+22.00
END RESURFACING

367.14
(-)3.0170%

BEGIN LT. DITCH GRADE
PI=29+00.00
EI = 355.85

(+)1.1000%
(-)1.9683%
(-)0.5828%
(+)0.6322%
(-)0.3987%
(+)1.4295%

BEGIN RT. DITCH GRADE
PI=29+00.00
EI = 354.40

PI=30+00.00
EI = 356.95

PI=30+63.000
EI = 355.71

PI=30+58.000
EI = 353.77

END LT. DITCH GRADE
PI=31+50.00
EI = 356.26

END RT. DITCH GRADE
PI=32+00.00
EI = 355.80

LEFT DITCH –·–·–·–
RIGHT DITCH ----------

SEE SHEETS 4 & 5
FOR PLAN VIEW

360
350
340
330
28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-4946	7

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY
1-31-13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
2/4/13

–L NBL–

–L NBL–

360
350
340
330
320
310
300

10+00 11+00 12+00 13+00 14+00 15+00

SEE SHEETS 4 & 5 FOR PLAN VIEW

–L SBL–

–L SBL– STA 10+00.00
–L EBL– STA 18+72.99
ELEV. 355.49'

PI = 11+50.00
EL = 358.12'
VC = 300'
K = 206
V = 50mph

END GRADE
–L SBL– STA. 14+00.00
ELEV. 358.87'

(+)1.7533%
(+)0.5000%

–L SBL–

370
360
350
340
330
320
310
300

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00

SEE SHEET 4 FOR PLAN VIEW

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RD266447 1/14/2013 pfl 07 scalhoun RD-Oce860-34