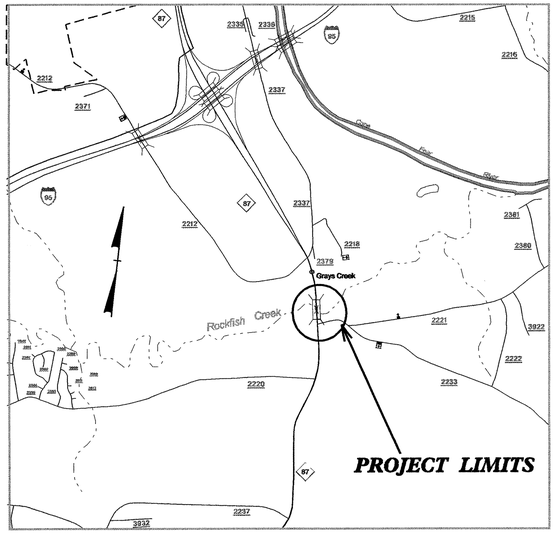
CONTRACT: C201512 R-2562AC



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

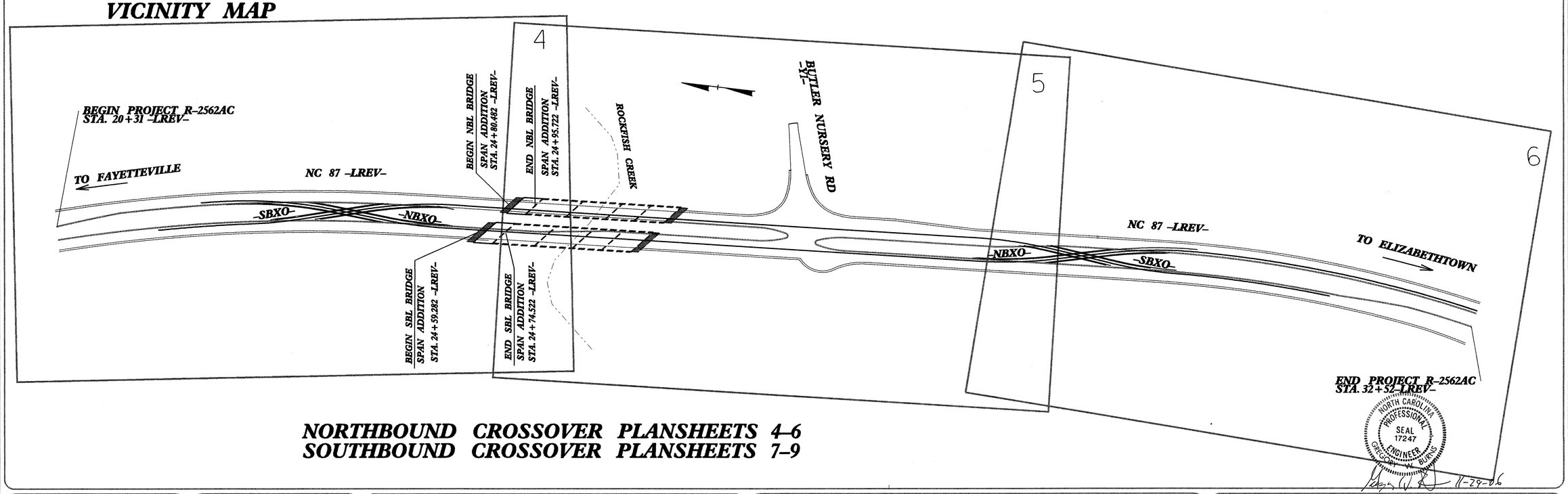
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2562AC	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34467.3.2		P.E.
34467.3.11		CONSTRUCTION

METRIC
ALL DIMENSIONS IN THESE PLANS ARE IN METERS

LOCATION: NC 87 FROM SOUTH OF I-95 TO SOUTH OF SR 2233
NC 87 DUAL BRIDGES OVER ROCKFISH CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES



NORTHBOUND CROSSOVER PLANSHEETS 4-6
SOUTHBOUND CROSSOVER PLANSHEETS 7-9

NORTH CAROLINA PROFESSIONAL SEAL 17247 ENGINEER GREGORY W. BURNS
11-29-06

GRAPHIC SCALES

5 0 10
PLANS

5 0 10
PROFILE (HORIZONTAL)

5 0 10
PROFILE (VERTICAL)

DESIGN DATA

ADT (1996) = 9,400
ADT (2020) = 18,600
DHV = 11%
D = 65%
T = 15%
V = 100 km/h

LENGTH OF ROADWAY PROJECT R-2562AC = 1.104 KM
LENGTH OF STRUCTURES PROJECT R-2562AC = 0.015 KM
TOTAL LENGTH, STATE PROJECT R-2562AC = 1.119 KM

DIVISION OF HIGHWAYS
DIVISION SIX
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DESIGN/CONSTRUCT UNIT

Prepared In the Office of:
DIVISION 6 DDC
558 Gillespie St. Fayetteville, NC 28302

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
1/16/07

PROJECT ENGINEER

PROJECT DESIGN ENGINEER

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
2 THRU 2A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND MILLING DETAILS
2B THRU 2M	SPECIAL DETAILS
3	SUMMARY OF QUANTITIES
3A THRU 3B	SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4 THRU 11	PLAN SHEET
TCP-1 THRU TCP-9	TRAFFIC CONTROL PLANS
EC-1 THRU EC-8	EROSION CONTROL PLANS
X-1 THRU X- 11	CROSS-SECTIONS
S-1 THRU S-44	STRUCTURE PLANS

2002 ROADWAY METRIC 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 15, 2002 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 - Method 'A'
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS	
700.05	Tying Proposed Pavement to Existing
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
820.04	Drain Installation in Shoulder Berm Gutter
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Median Drop Inlet Type 'B' - 300mm thru 900mm Pipe
840.27	Brick Median Drop Inlet Type 'B' - 300mm thru 900mm Pipe
840.29	Frames and Narrow Slot Flat Grates
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
862.01	Guardrail Placement
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

2002 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED:

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. 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.

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.

SUBSURFACE PLANS:

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

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

END BENTS:

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

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	1B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- 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:

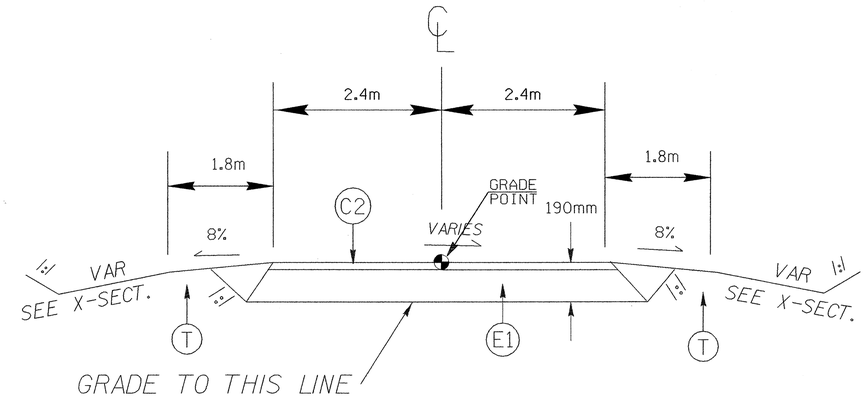
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

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.

PROJ. REFERENCE NO.	SHEET NO.
R-2562AC	2

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg PER SQ. METER.
C2	PROP. APPROX. 50 mm ASPHALT CONC. SURFACE COURSE, TYPE S12.5C, AT AN AVERAGE RATE OF 120 kg PER SQ. METER.
D1	PROP. APPROX. 90 mm ASPHALT CONC. SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 220 kg PER SQ. METER.
E1	PROP. APPROX. 140 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 343 kg PER SQ. METER.
S	SHOULDER RECONSTRUCTION
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.



TYPICAL SECTION NO.1

CROSSOVER (NB AND SB)

MILLING AT PAVEMENT TIE-INS

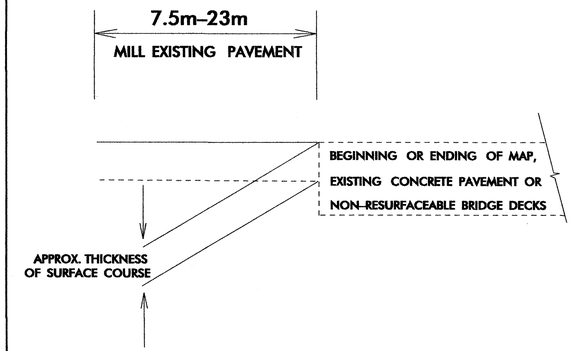
NOTES TO CONTRACTOR

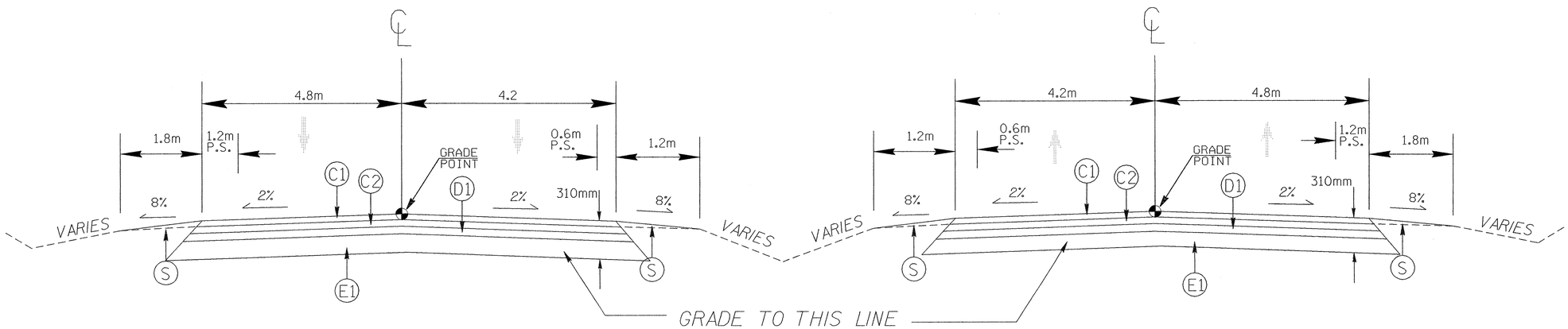
For surface mixes over 25mm in thickness, mill the existing pavement in acoordance with the following sketch as directed by the Engineer.

Locations shall include ties into existing concrete pavement, at bridge approaches where the bridge will not be resurfaced, and at the beginning and ending point of each resurfacing map.

Perform the work in accordance with Section 607 of the January 2002 North Carolina Department of Transportation Standard Specifications for Roads and Structures. Resurfacing will be accomplished at the same time as the milling operation.

Payment for this item will be made under: Incidental Milling (SM)





TYPICAL SECTION NO.2

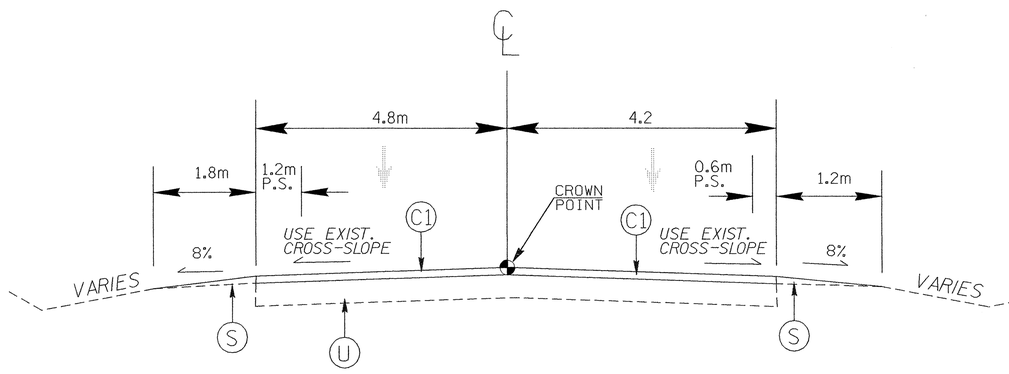
FROM STA.24+40+/- -LREV- TO STA.24+54.533 -LREV- SBL (BEGIN APPROACH SLAB)
FROM STA.24+60+/- -LREV- TO STA.24+75.733 -LREV- NBL (BEGIN APPROACH SLAB)

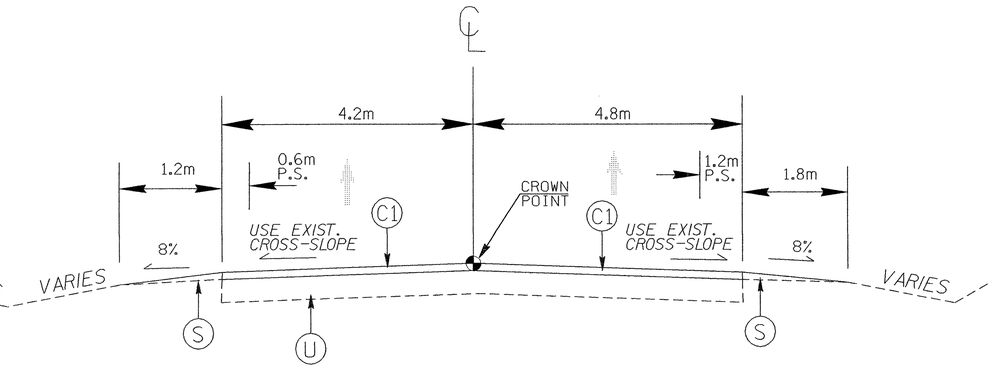
NORTH CAROLINA PROFESSIONAL SEAL 17247 ENGINEER GREGORY W. BURNS

11-29-06

PROJ. REFERENCE NO.	SHEET NO.
R-2562AC	2A

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg PER SQ. METER.
C2	PROP. APPROX. 50 mm ASPHALT CONC. SURFACE COURSE, TYPE S12.5C, AT AN AVERAGE RATE OF 120 kg PER SQ. METER.
D1	PROP. APPROX. 90 mm ASPHALT CONC. SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 220 kg PER SQ. METER.
E1	PROP. APPROX. 140 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 343 kg PER SQ. METER.
S	SHOULDER RECONSTRUCTION
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.





TYPICAL SECTION NO.3

FROM STA. 20+30 -LREV- TO STA. 24+40+/- -LREV- SBL
FROM STA. 20+30 -LREV- TO STA. 24+60+/- -LREV- NBL
(END BRIDGE) FROM STA. 25+87.142 -LREV- TO STA. 32+60 -LREV- SBL & NBL

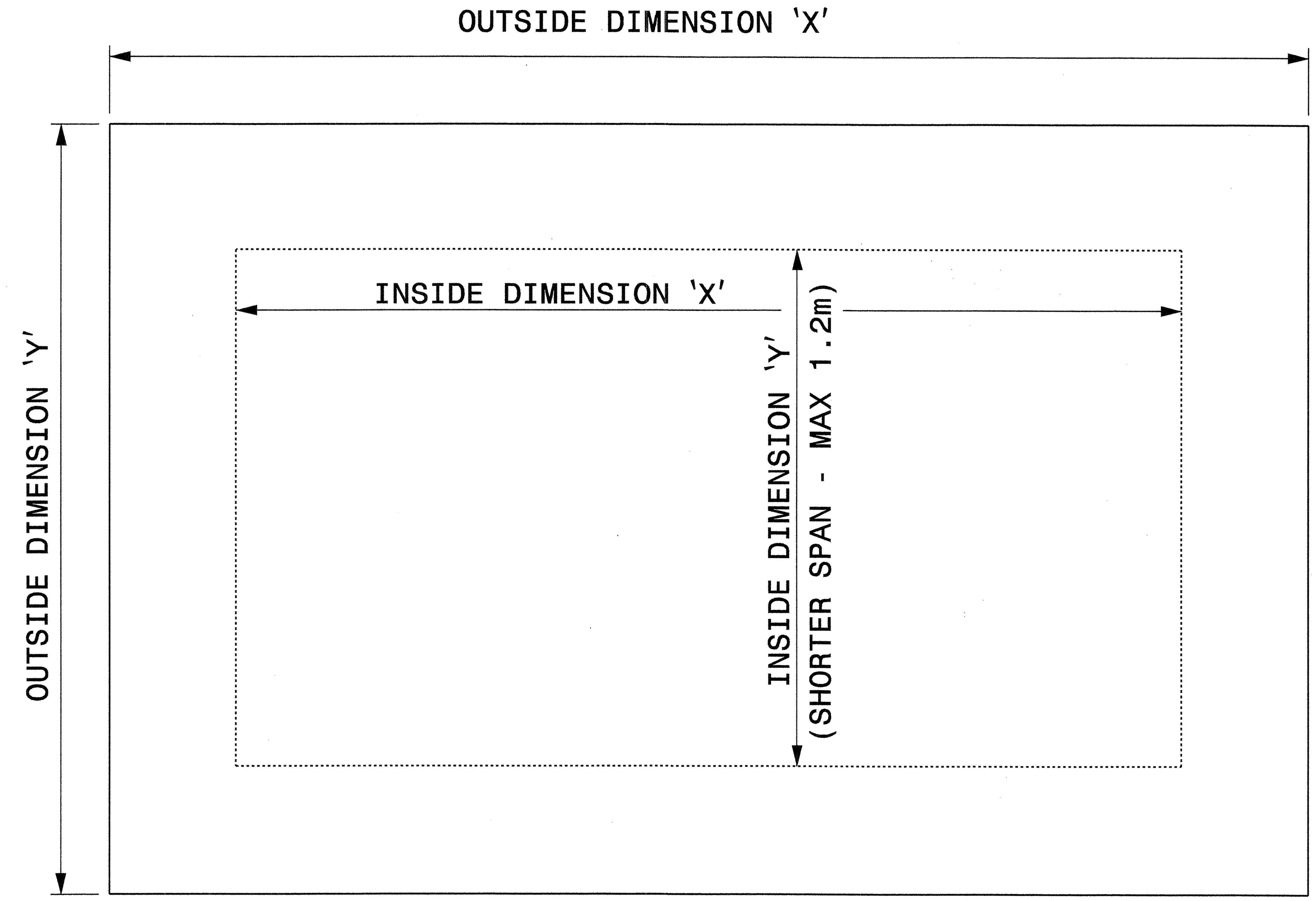
NORTH CAROLINA PROFESSIONAL SEAL 17247 ENGINEER GREGORY W. BURNS

11-29-06

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

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	2B

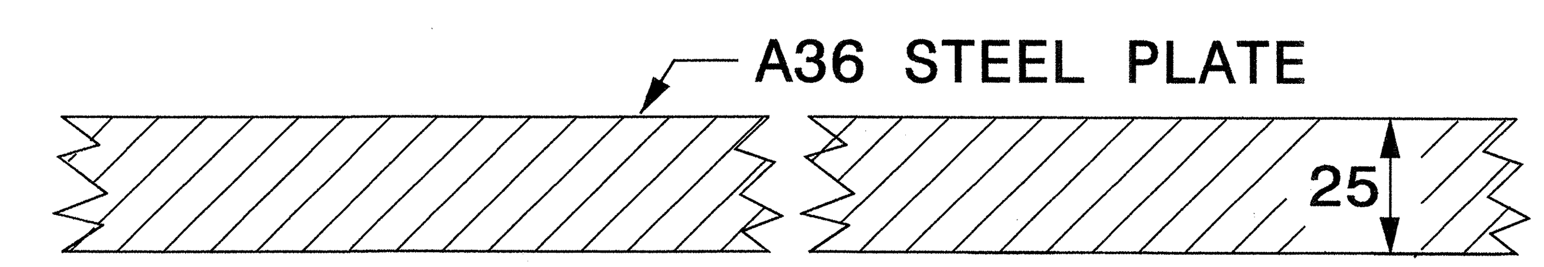
METRIC



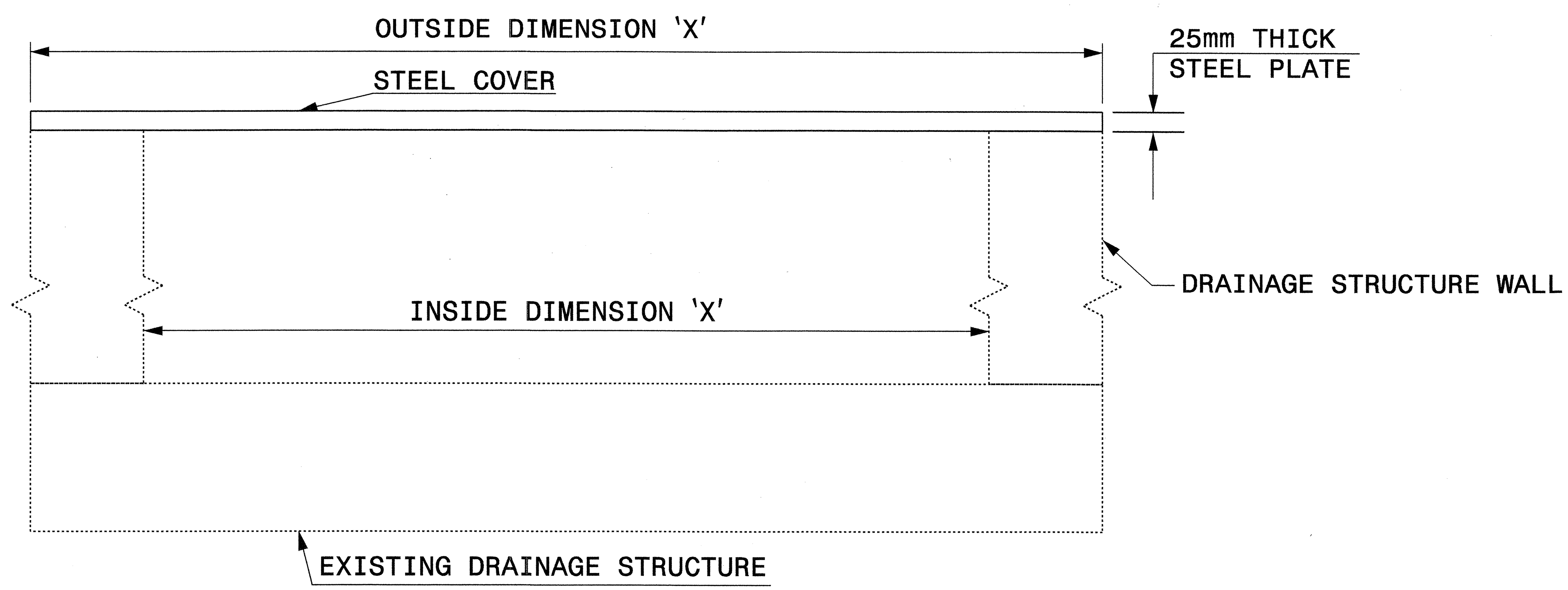
PLAN VIEWS

GENERAL NOTES:

- -USE GRADE A36 STEEL
- -STEEL COVERS ARE FOR TEMPORARY USE FOR DURING PHASE CONSTRUCTION.
- -FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
- -SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
- -QUANTITES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



SECTION VIEW OF STEEL TOP PLATE



ELEVATION VIEWS

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

DETAIL OF TEMPORARY 25mm STEEL COVER OVER DRAINAGE STRUCTURE

ORIGINAL BY: E.E. WARD DATE: 2-2-98
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/12/04
FILE SPEC.: eric:/usr/details/metric/stand/stlcvr2.dgn

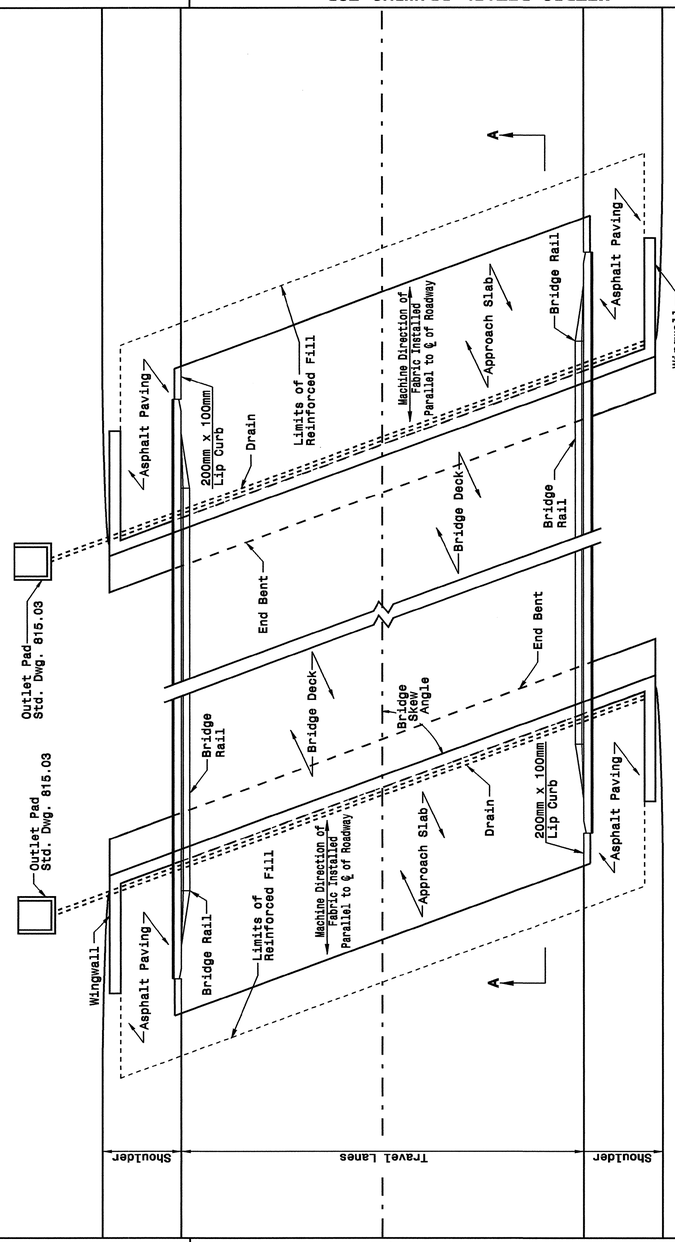
PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	2C

METRIC

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

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
4.57m MINIMUM APPROACH SLAB

SHEET 1 OF 7
422D10



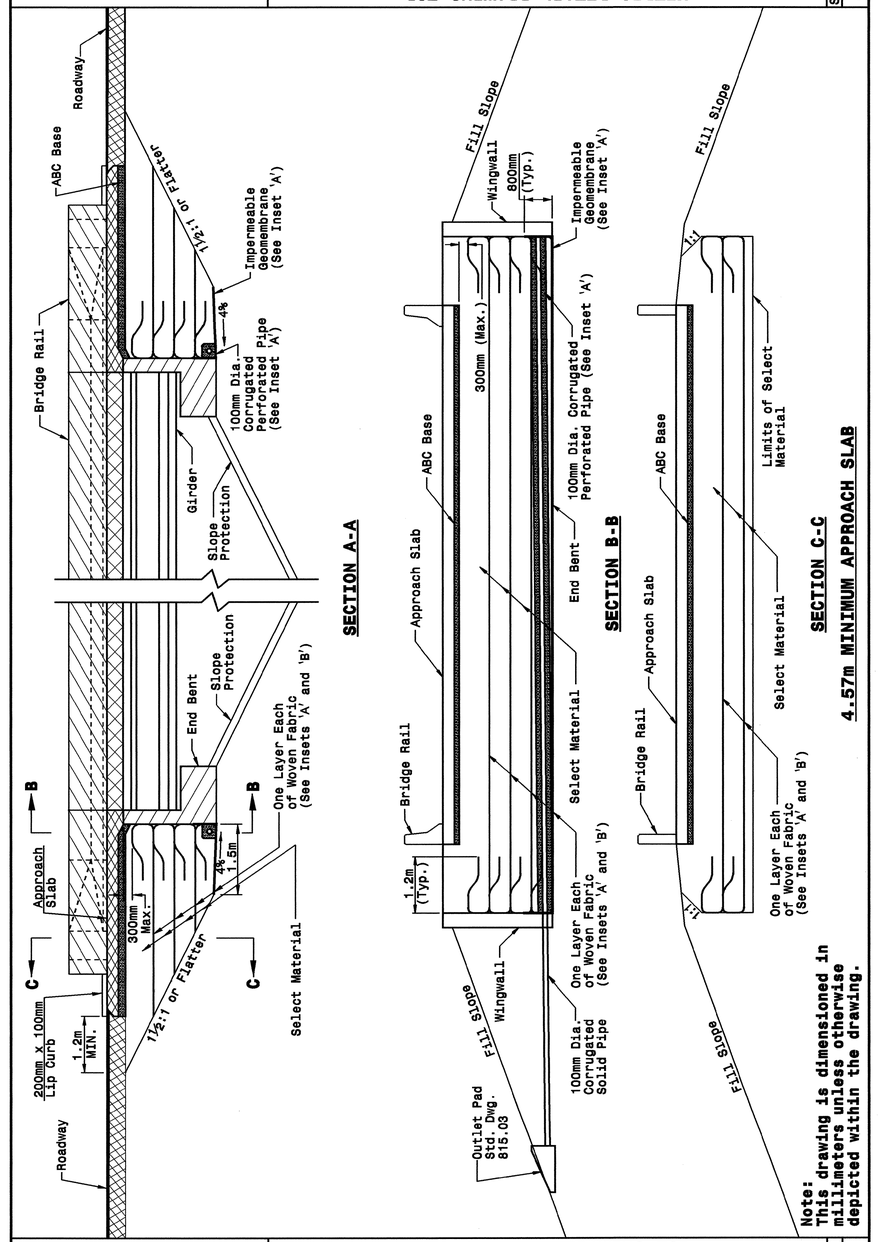
PLAN VIEW
4.57m MINIMUM APPROACH SLAB

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
PRESTRESSED AND PLATE GIRDER BRIDGES
4.57m MINIMUM APPROACH SLAB

SHEET 2 OF 7
422D10



SECTION A-A

SECTION B-B

SECTION C-C
4.57m MINIMUM APPROACH SLAB

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

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

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
4.57m MINIMUM APPROACH SLAB

SHEET 1 OF 7
422D10

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

SEE PLATE FOR TITLE

ORIGINAL BY:	2002 STANDARDS	DATE: 01-15-02
MODIFIED BY:	E.E. WARD	DATE: 09-28-05
CHECKED BY:		DATE:
FILE SPEC.:	stds/02stdstodetails/metric/422d10.dgn	

29-SEP-2005 14:6
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ericward AT PS222293

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	2D

METRIC

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

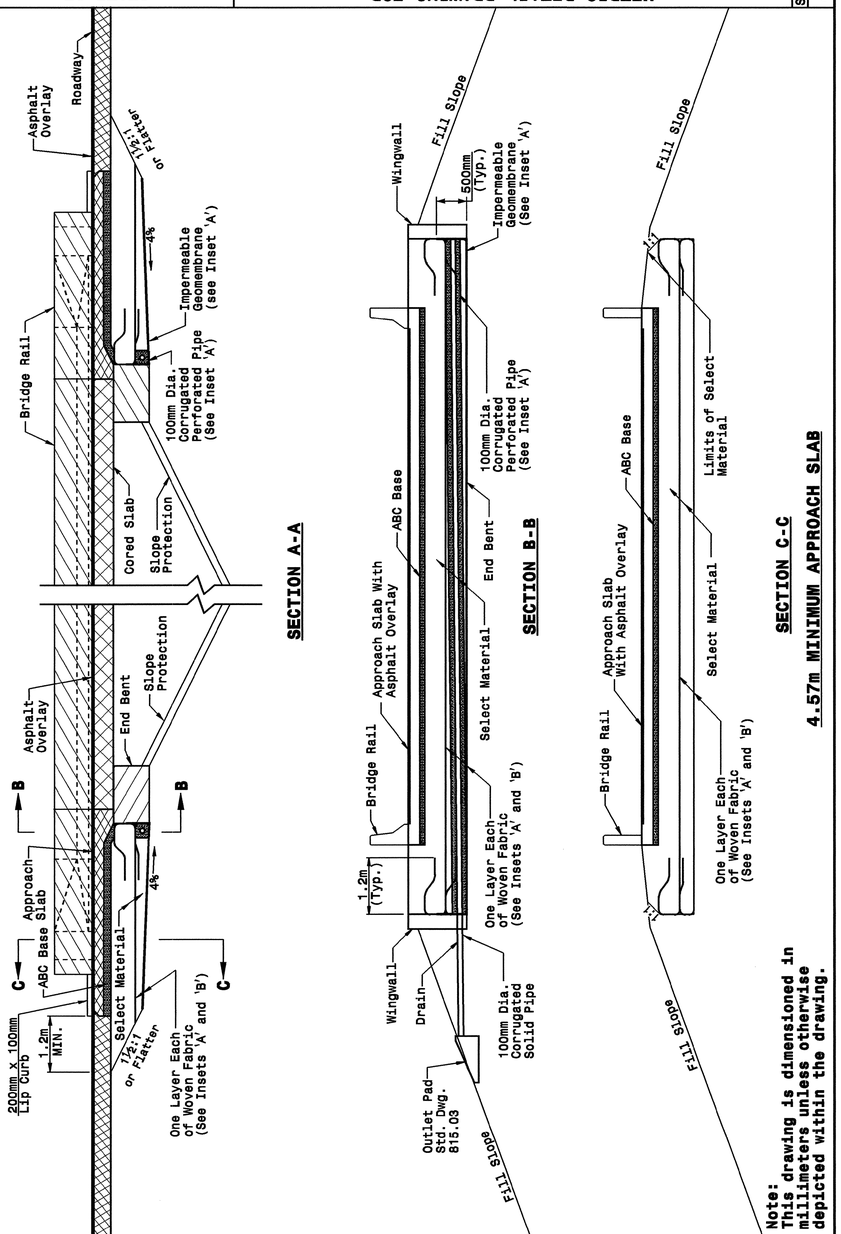
METRIC DETAIL DRAWING FOR

REINFORCED BRIDGE APPROACH FILLS

4.57M MINIMUM APPROACH SLAB

CORED SLAB BRIDGES

SHEET 3 OF 7
422D10



Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

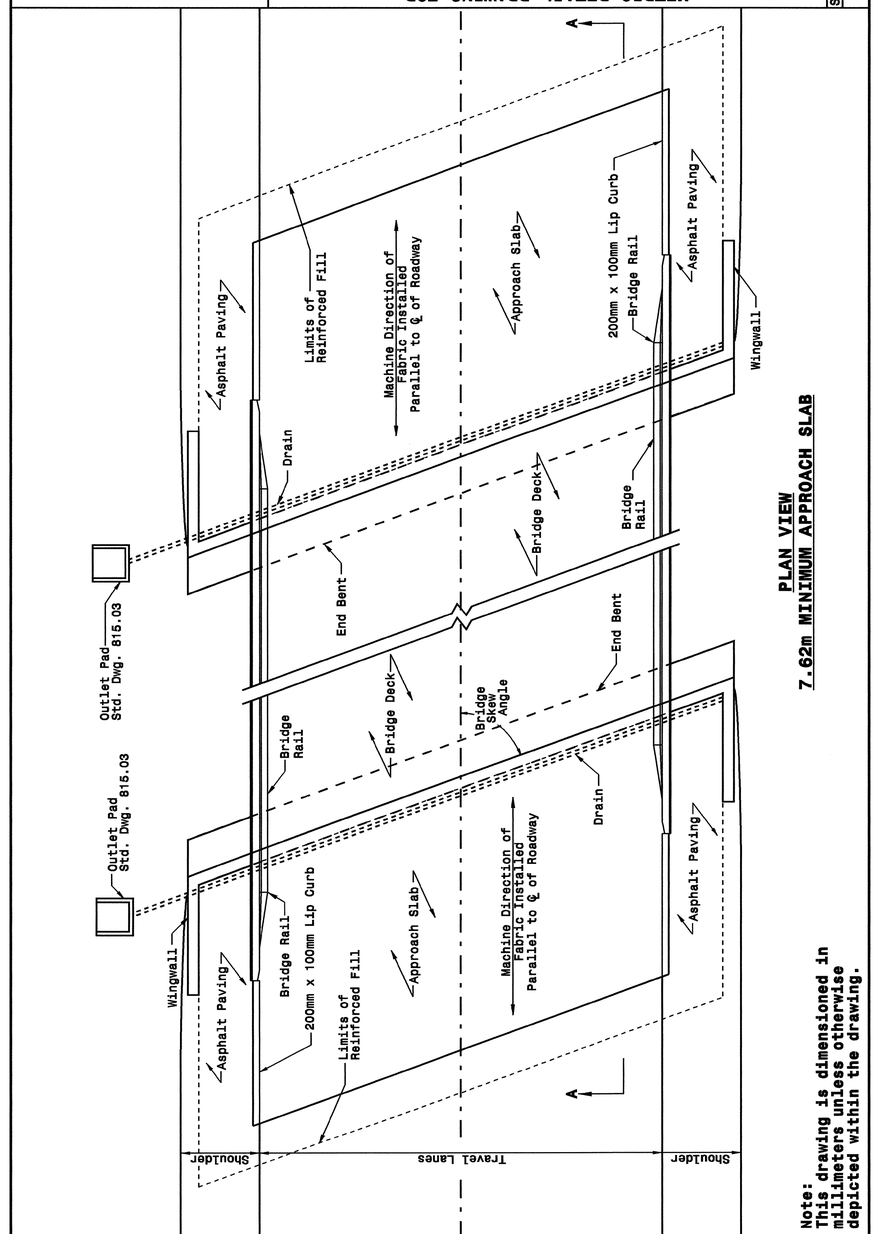
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR

REINFORCED BRIDGE APPROACH FILLS

7.62m MINIMUM APPROACH SLAB

SHEET 4 OF 7
422D10



Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

NORTH CAROLINA PROFESSIONAL SEAL 022056 ENGINEER JOEL E. STAMEY
10/29/06

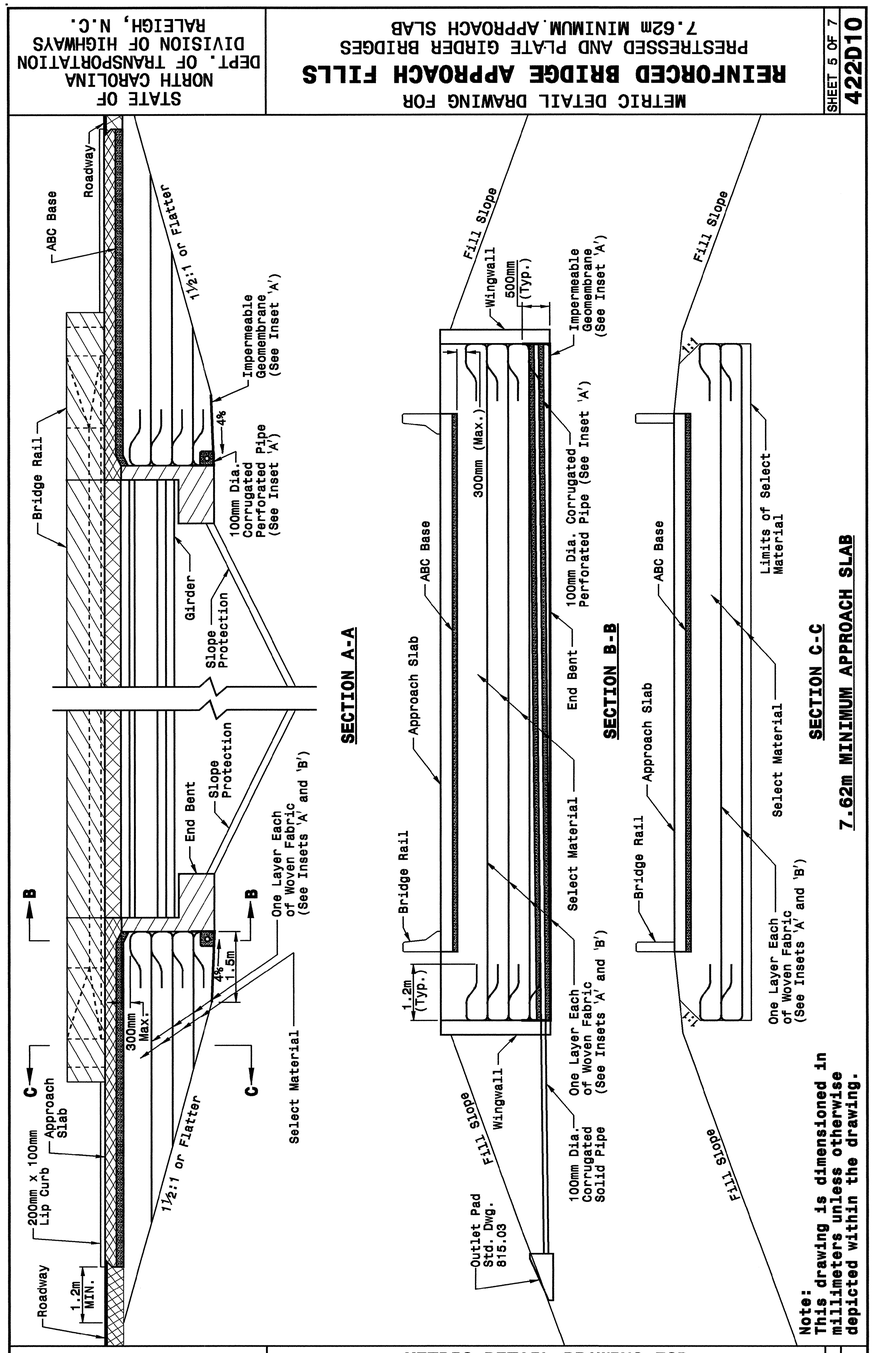
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY:	2002 STANDARDS	DATE:	01-15-02
MODIFIED BY:	E.E. WARD	DATE:	09-28-05
CHECKED BY:		DATE:	
FILE SPEC.:	stds/02stdstodetails/metric/422d10.dgn		

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	2E

METRIC



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

METRIC DETAIL DRAWING FOR

REINFORCED BRIDGE APPROACH FILLS

PRESTRESSED AND PLATE GIRDER BRIDGES
7.62m MINIMUM APPROACH SLAB

SHEET 5 OF 7 — 422D10

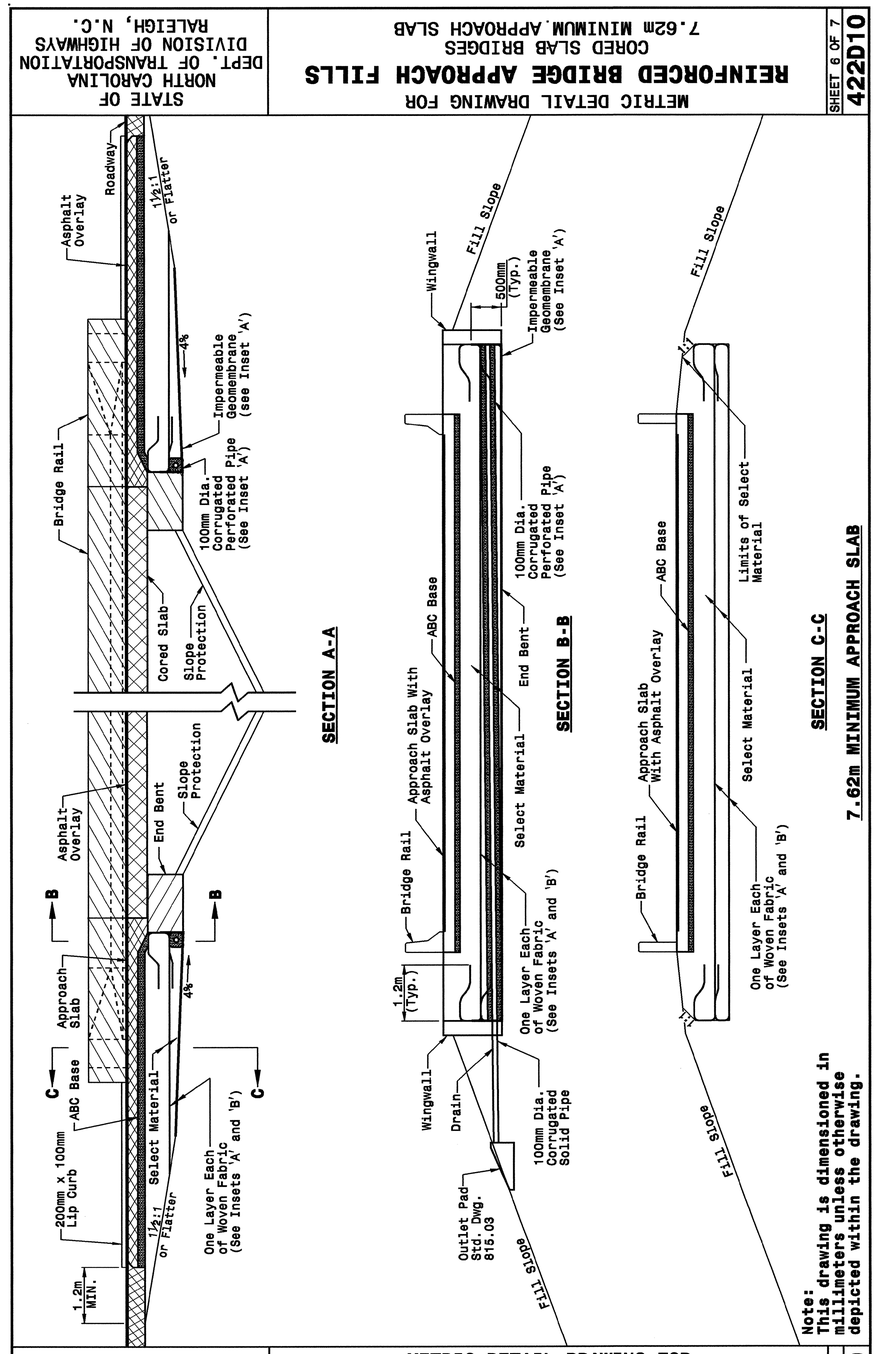
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR

REINFORCED BRIDGE APPROACH FILLS

CORED SLAB BRIDGES
7.62m MINIMUM APPROACH SLAB

SHEET 6 OF 7 — 422D10



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

METRIC DETAIL DRAWING FOR

REINFORCED BRIDGE APPROACH FILLS

PRESTRESSED AND PLATE GIRDER BRIDGES
7.62m MINIMUM APPROACH SLAB

SHEET 5 OF 7 — 422D10

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

METRIC DETAIL DRAWING FOR

REINFORCED BRIDGE APPROACH FILLS

CORED SLAB BRIDGES
7.62m MINIMUM APPROACH SLAB

SHEET 6 OF 7 — 422D10

23-SEP-2005 09:02
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ericward AT PS222293

PROJECT SERVICES UNIT
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ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
MODIFIED BY: E.E. WARD DATE: 09-12-05
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FILE SPEC.: stds/02stdstodetails/metric/422d10.dgn

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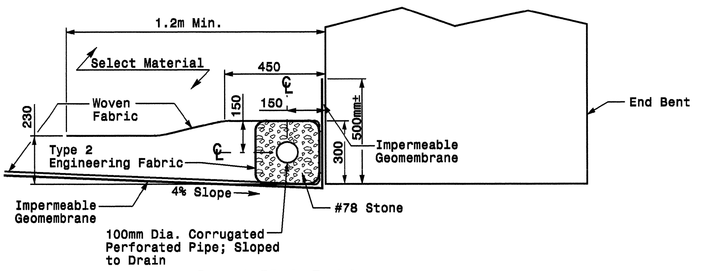
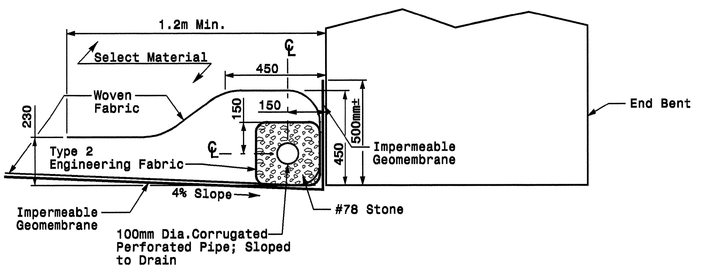
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
INSETS AND CHARTS

SHEET 7 OF 7
422D10

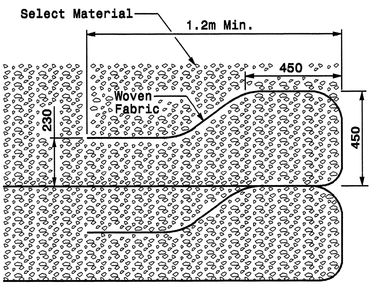


Cored Slab Bridge
Showing First Lift and Drains



Girder Bridge
Showing First Lift and Drains

Inset 'A'



Typical Fabric Lift and Wrap
Showing Second and Above Lifts

Inset 'B'

Height of Backwall	Number of Fabric Layers
1400-1750	3
1760-2200	4
2210-2650	5
2660-3100	6
3110-3550	7

Note: Cored Slab Structures Require 2 Fabric Layers.

Length of Bridge End Bent Inside Wingwalls
If Bridge Skew is Less Than or Equal to 90°: $\frac{\text{(Roadway Width + 2140mm)}}{\text{Sin (Bridge Skew Angle)}}$ = Dis. Between Wingwalls
If Bridge Skew is Greater Than 90°: $\frac{\text{(Roadway Width + 2140mm)}}{\text{Cos (Bridge Skew Angle - 90°)}}$ = Dis. Between Wingwalls

Note:
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STATE OF NORTH CAROLINA
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RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
INSETS AND CHARTS

SHEET 7 OF 7
422D10

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ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
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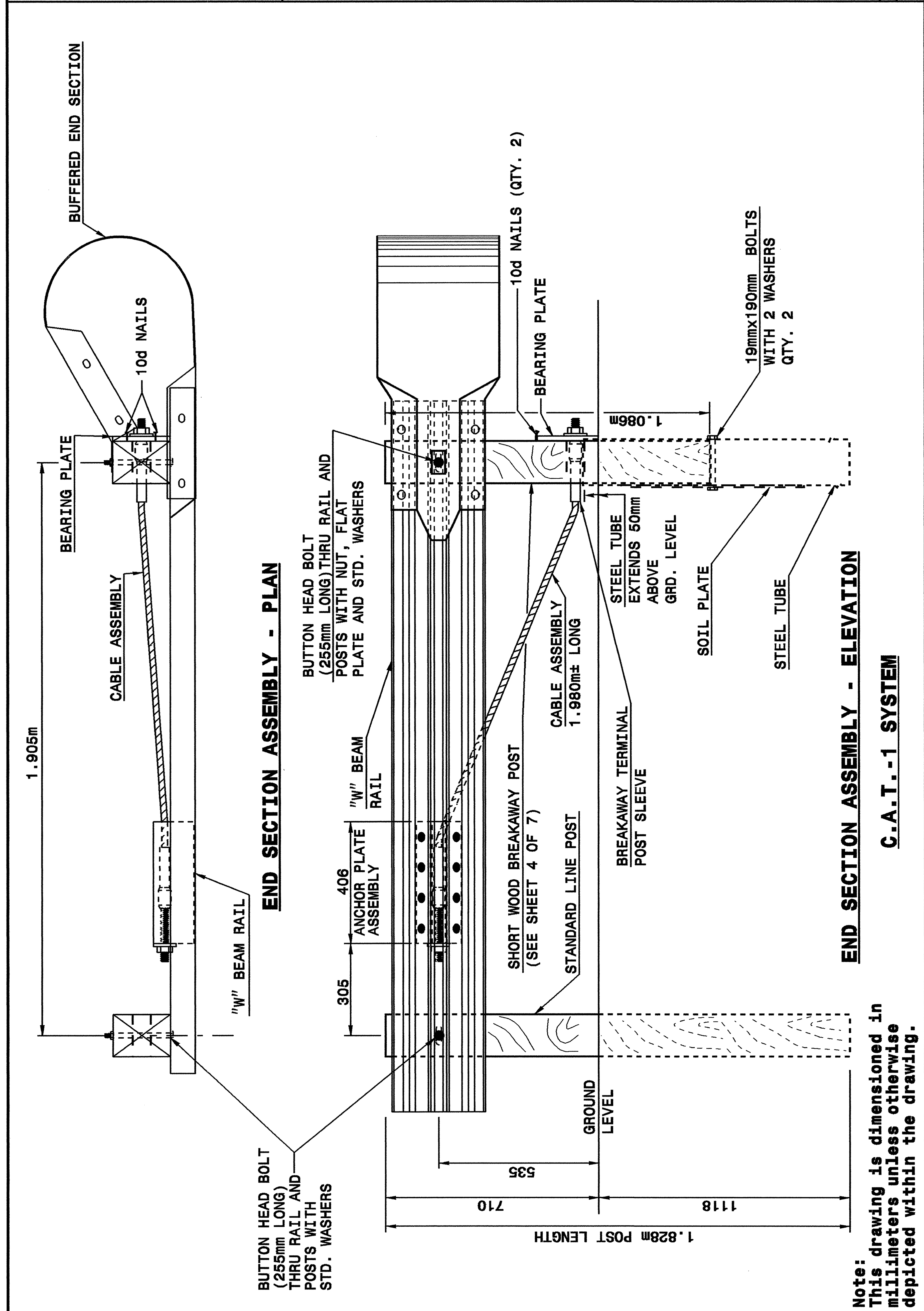
FILE SPEC.: stds/02stdstodetails/metric/422d10.dgn

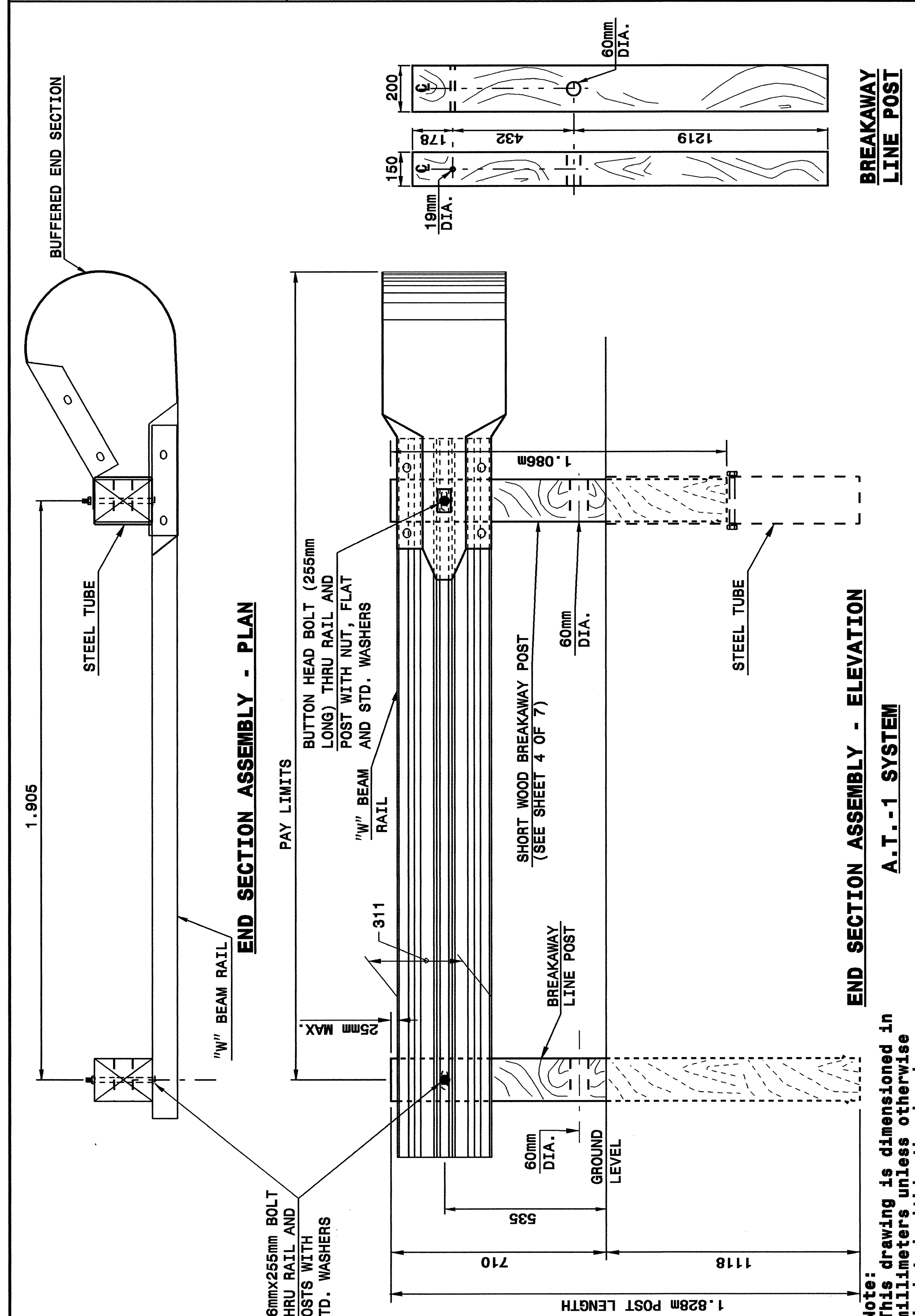
PROJECT REFERENCE NO. R-2562AC
SHEET NO. 2F
METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	26

METRIC



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	METRIC DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**	SHEET 1 OF 7 **862D02**



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	METRIC DETAIL DRAWING FOR **GUARDRAIL INSTALLATION**	SHEET 2 OF 7 **862D02**

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
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SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD.862.02 DATE:
MODIFIED BY: E.E. WARD DATE: 02-09-03
CHECKED BY: DATE:
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PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	2H

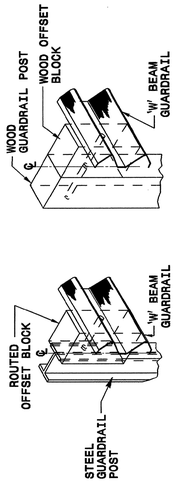
METRIC

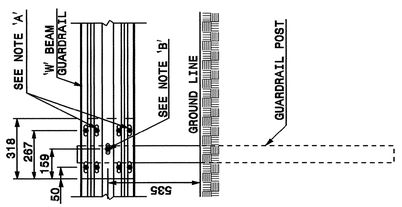
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

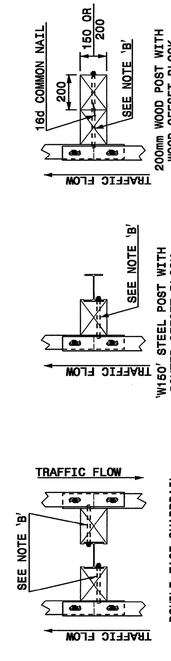
SHEET 3 OF 7
862D02

ISOMETRIC VIEWS

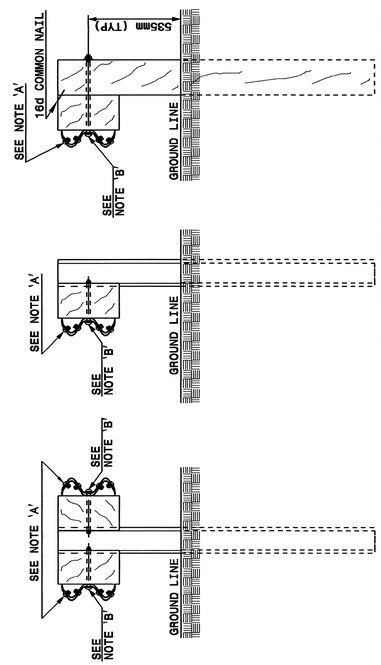




FRONT



PLAN



SIDE

NOTES:
A - 16mm DIA. BUTTON HEAD SPLICE BOLT 32mm LONG (8 REQ. PER SPLICE JOINT).
B - 16mm DIA. BUTTON HEAD BOLT 190mm/228mm LONG WITH NUT FOR BOLTING 150mm/200mm ROUTED OFFSET BLOCK TO STEEL POSTS OR
16mm DIA. BUTTON HEAD BOLT 457mm LONG WITH STD. WASHER UNDER NUT FOR BOLTING TO WOOD POSTS (1 REQ. PER LOCATION)
C - FIELD PUNCH HOLES INTO THE GUARDRAIL AS DIRECTED BY THE ENGINEER.

TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

Note:
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STATE OF
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RALEIGH, N.C.

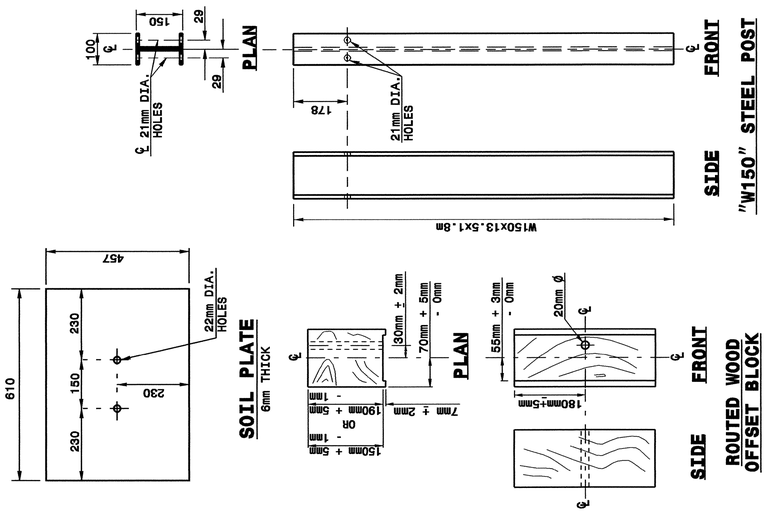
METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 7
862D02

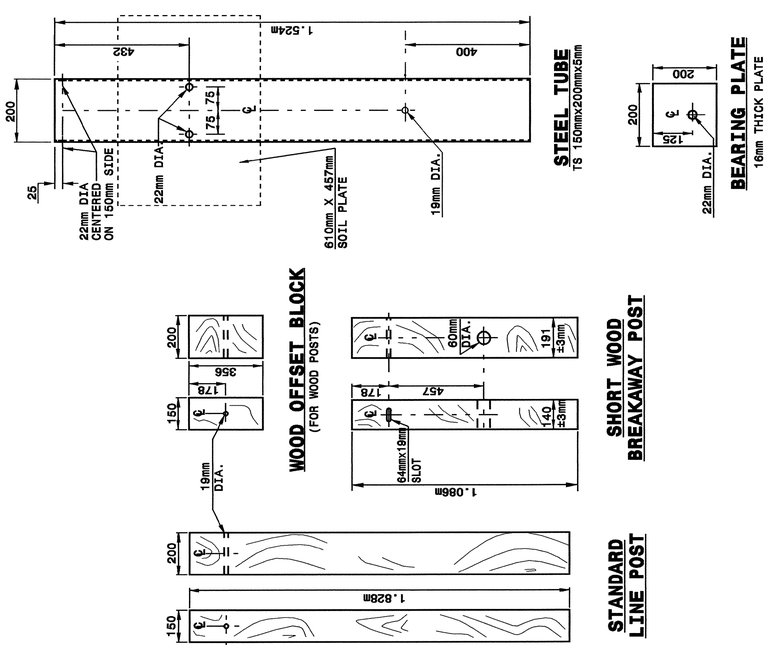
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 7
862D02



SYSTEM PARTS



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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 7
862D02

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ORIGINAL BY: 2002 STD.862.02 DATE:
MODIFIED BY: E.E. WARD DATE: 02-09-03
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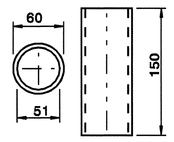
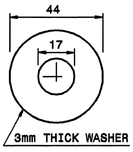
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 7
862D02

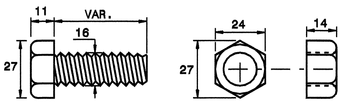


BREAKAWAY TERMINAL POST SLEEVE

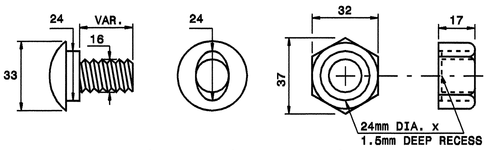


DETAIL OF STANDARD WASHER

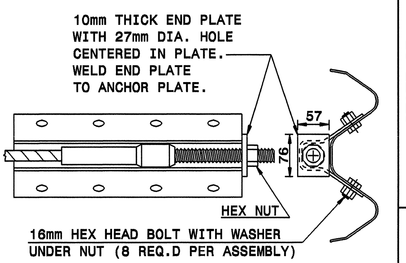
STANDARD WASHER: TYPICAL USE UNDER NUT WITH WOOD POST



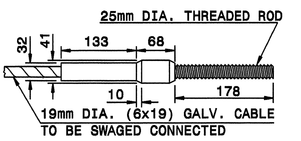
DETAIL OF STANDARD HEX BOLT AND NUT



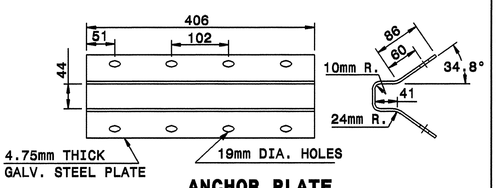
DETAIL OF BUTTON HEAD BOLT AND NUT



ANCHOR PLATE ASSEMBLY



SWAGED CABLE



ANCHOR PLATE

CABLE ASSEMBLY

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

SYSTEM PARTS

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

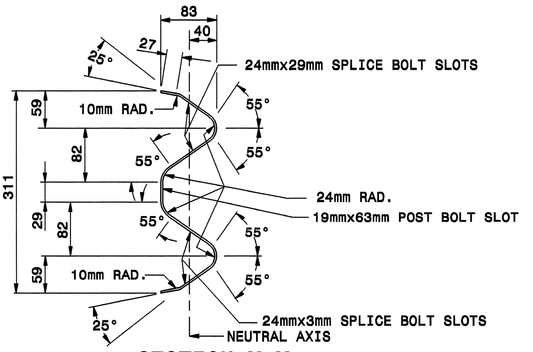
METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 7
862D02

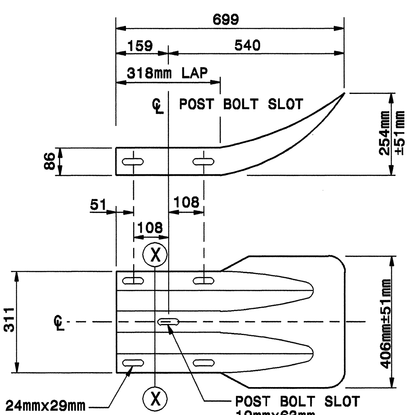
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

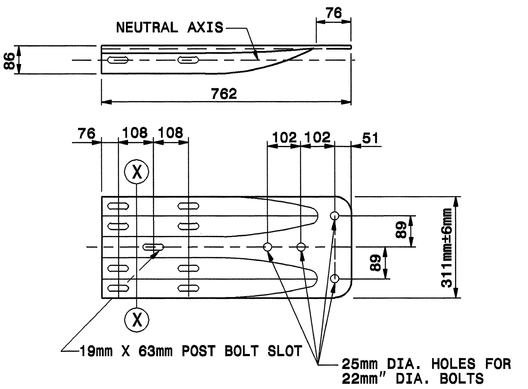
SHEET 6 OF 7
862D02



SECTION X-X



TERMINAL END SECTION



TYPICAL END SHOE

Note:
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SYSTEM PARTS - GENERAL USE

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 7
862D02

PROJECT SERVICES UNIT
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SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD. 862.02 DATE:
MODIFIED BY: E.E. WARD DATE: 02-09-03
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FILE SPEC.: /usr/stds/02standrail/metric/86202/0862d02m.dgn

PROJECT REFERENCE NO. R-2562AC
SHEET NO. 21

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2562 AC	2 J

METRIC

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

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02

PLAN

ELEVATION

BUFFERED END SECTION

Note:
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STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 7 OF 7
862D02

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ericward AT DS212260

NORTH CAROLINA
PROFESSIONAL
SEAL
022169
ENGINEER
JOEL STEPHEN HUNT
11/29/06

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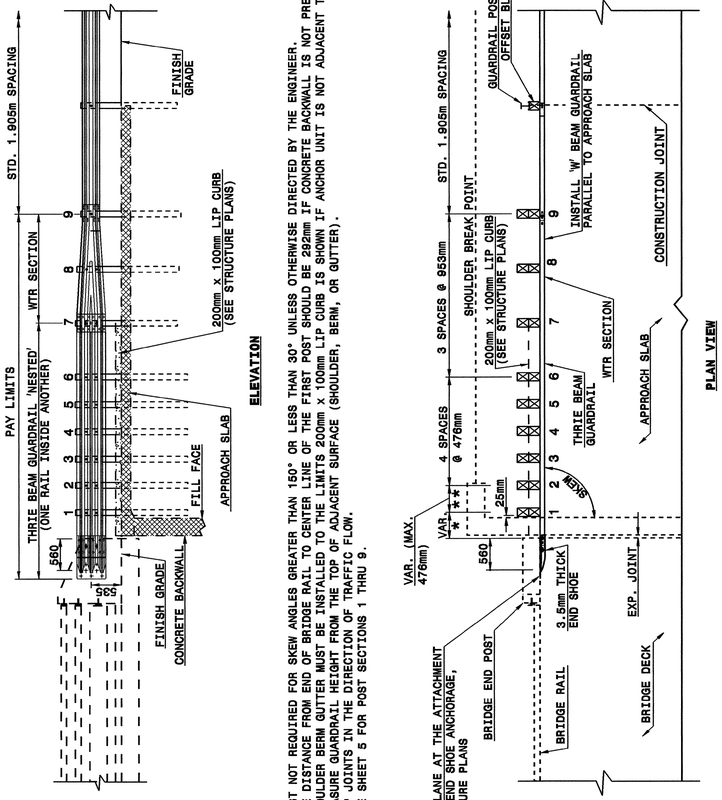
PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	2K

METRIC

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

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE (7.62m MINIMUM LENGTH APPROACH SLAB)

SHEET 2 OF 6 | 862D03



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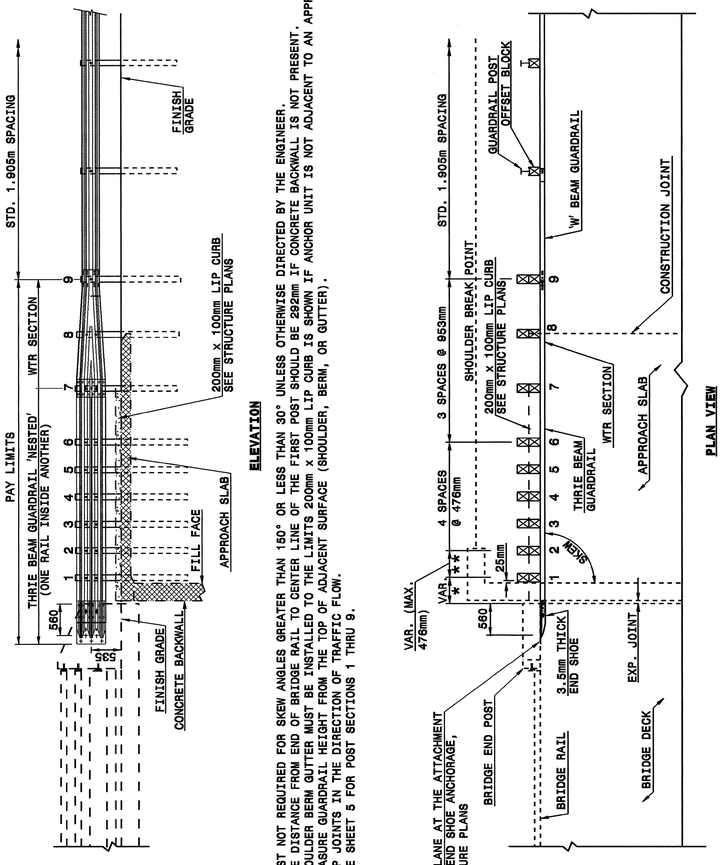
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE (7.62m MINIMUM LENGTH APPROACH SLAB)

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

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE (4.57m MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6 | 862D03



Note:
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GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE (4.57m MINIMUM LENGTH APPROACH SLAB)

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

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE (4.57m MINIMUM LENGTH APPROACH SLAB)

SHEET 1 OF 6 | 862D03

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FILE SPEC.:	stds/02stdstodetails/metric/862d03.dgn		

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	2L

METRIC

STATE OF
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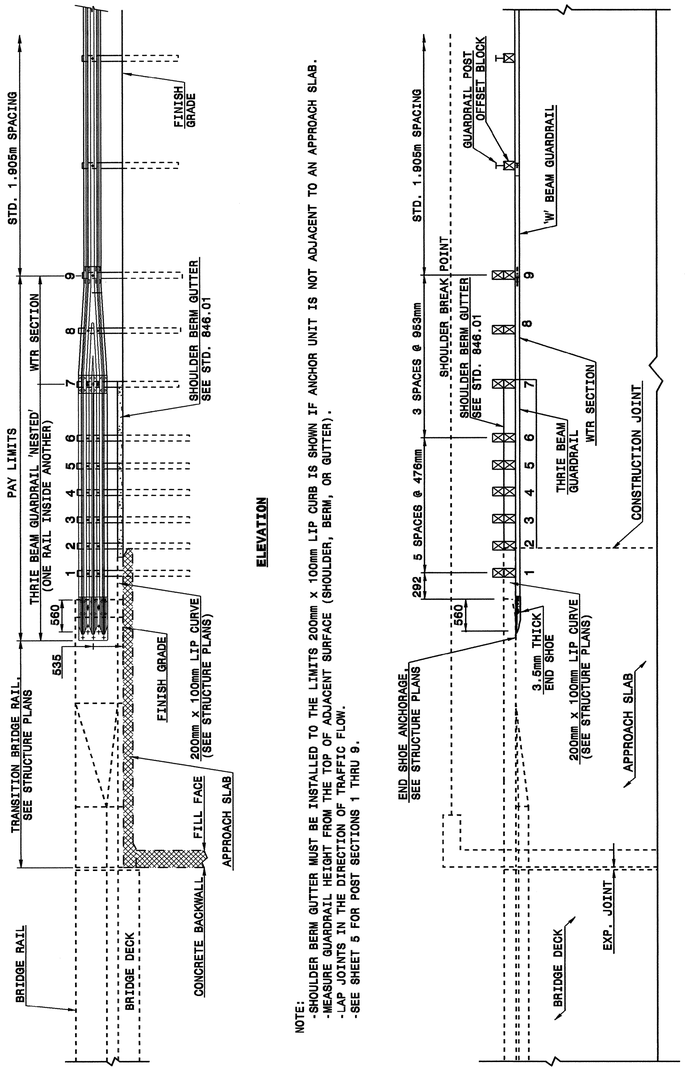
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (4.57m MINIMUM LENGTH APPROACH SLAB)

SHEET 3 OF 6
862D03



Note:
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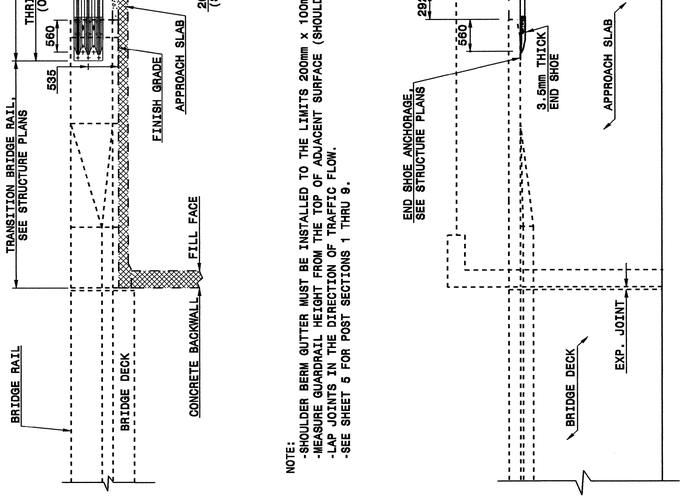
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (4.57m MINIMUM LENGTH APPROACH SLAB)

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

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (7.62m MINIMUM LENGTH APPROACH SLAB)

SHEET 4 OF 6
862D03



Note:
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GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON APPROACH SLAB (7.62m MINIMUM LENGTH APPROACH SLAB)

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

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (4.57m MINIMUM LENGTH APPROACH SLAB)

SHEET 3 OF 6
862D03

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

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON APPROACH SLAB (7.62m MINIMUM LENGTH APPROACH SLAB)

SHEET 4 OF 6
862D03

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
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FILE SPEC.:	stds/02stdstodetails/metric/862d03.dgn	

PROJECT REFERENCE NO.	SHEET NO.
R-2562 AC	2M

METRIC

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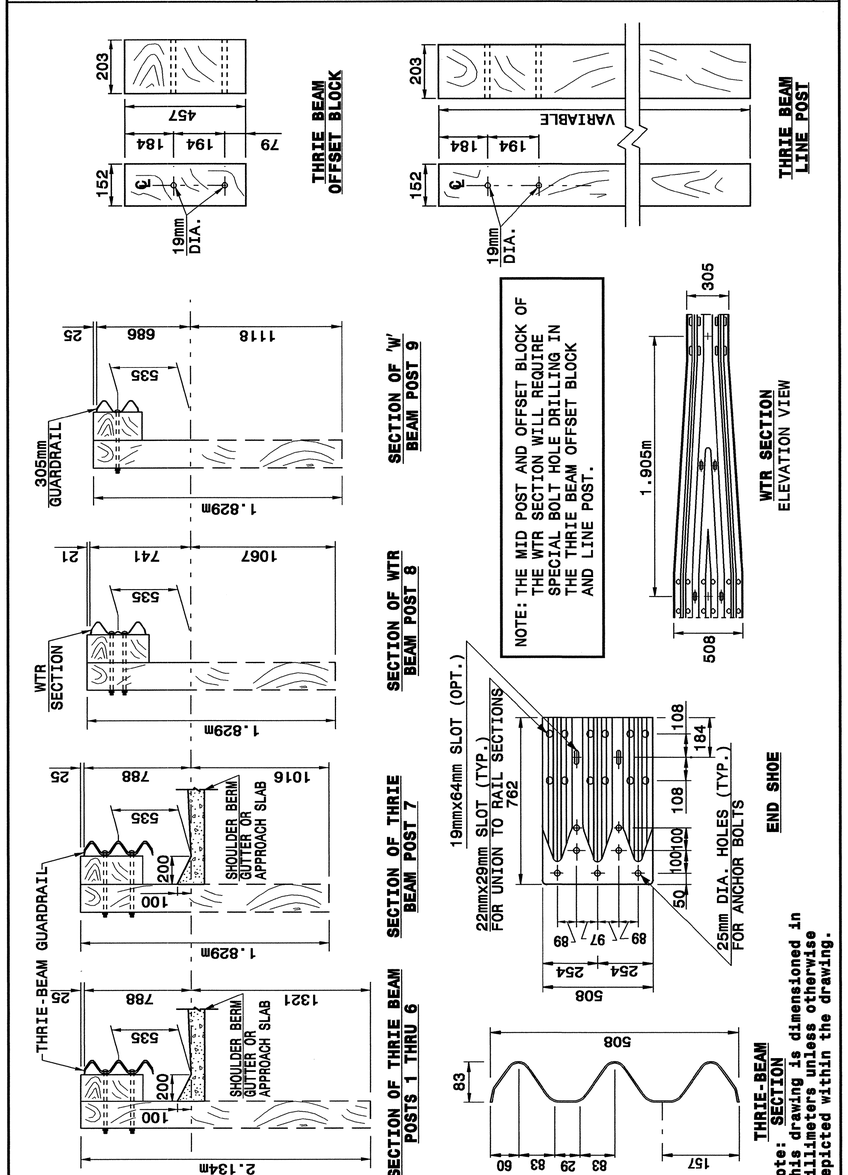
DIVISION OF HIGHWAYS
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 5 OF 6 — 862D03



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.

Note:
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STATE OF NORTH CAROLINA
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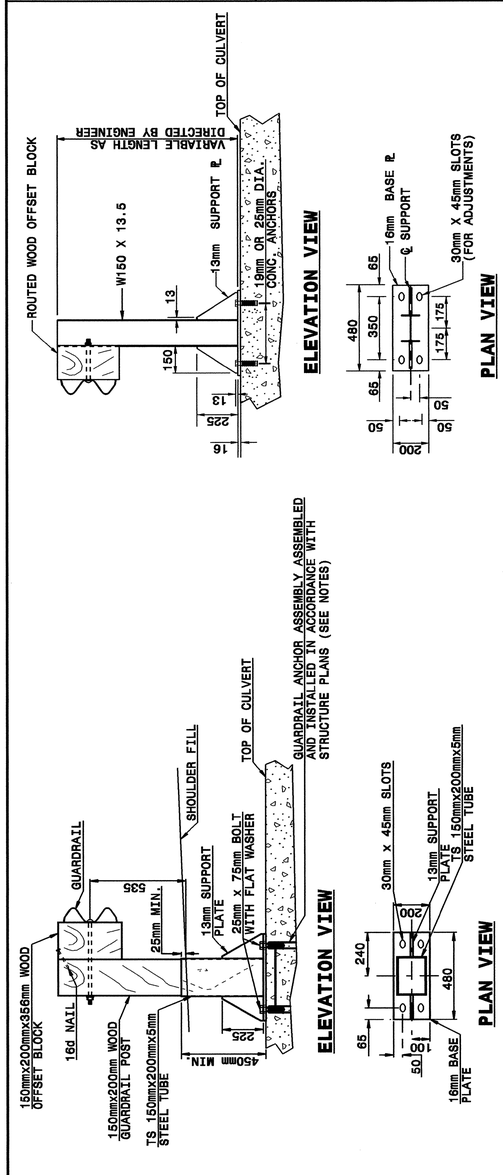
RALEIGH, N.C.

METRIC DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 6 OF 6 — 862D03



NOTES FOR:
GUARDRAIL POST ANCHORED TO STRUCTURE:
-USE FULL LENGTH 6mm BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST OR STEEL TUBE.
-USE POST AND PLATE MATERIALS CONFORMING TO A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.
-USE WOOD POSTS WHICH FIT SNUGLY IN THE STEEL TUBE WITH A MAXIMUM OF 3mm CLEARANCE BETWEEN TUBE WALL AND POST.

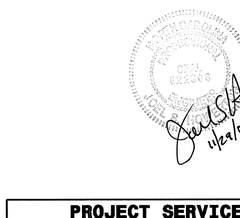
NEW STRUCTURES:
-ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STUCTURE DURING CONSTRUCTION.

EXISTING STRUCTURES:
-USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 100KN FOR A 25mm DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON ¼ THE ACTUAL HOLDING POWER OF THE ANCHOR IN 24MPa CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.

-USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.

Note:
This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT



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

SEE PLATE FOR TITLE

ORIGINAL BY:	2002 STANDARDS	DATE:	01-15-02
MODIFIED BY:	E.E. WARD	DATE:	09-14-05
CHECKED BY:		DATE:	
FILE SPEC.:	stds/02stdstodetails/metric/862d03.dgn		

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201512

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ************ (24+65.00-LREV-)
0050000000-M	226	0.4	HA	SUPPLEMENTARY CLEARING & GRUB-BING
0057000000-M	226	200	M3	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0106000000-M	230	1,100	M3	BORROW EXCAVATION
0156000000-M	250	4,640	M2	REMOVAL OF EXISTING ASPHALT PAVEMENT
0318000000-M	300	35	MTN	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRS
0582000000-M	310	84	M	400MM CS PIPE CULVERTS, 1.63MM THICK
0706000000-M	310	20	M	300MM BIT COAT CS PIPE CUL-VERTS, TYPE B 1.63MM THICK
0995000000-M	340	96	M	PIPE REMOVAL
1245000000-M	SP	1.7	SKM	SHOULDER RECONSTRUCTION
1330000000-M	607	720	M2	INCIDENTAL MILLING
1491000000-M	610	1,400	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0C
1503000000-M	610	70	MTN	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1519000000-M	610	2,350	MTN	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1539000000-M	610	495	MTN	ASPHALT CONC SURFACE COURSE, TYPE S12.5C
1560000000-M	620	205	MTN	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-M	620	28	MTN	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
2022000000-M	815	80	M3	SUBDRAIN EXCAVATION
2033000000-M	815	60	M3	SUBDRAIN FINE AGGREGATE
2044000000-M	815	120	M	150MM PERFORATED SUBDRAIN PIPE
2055000000-M	815	12	EA	150MM SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	2	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-M	815	4	M	150MM OUTLET PIPE (SUBDRAINS)
2264000000-M	840	0.1	M3	PIPE PLUGS
2286000000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-M	846	60	M	SHOULDER BERM GUTTER
2995000000-N	SP	1	EA	GENERIC DRAINAGE ITEM TEMPORARY STEEL COVER FOR DRAINAGE STRUCTURE
3345000000-M	864	207	M	REMOVE & RESET EXISTING GUARD-RAIL
3649000000-M	876	4	MTN	PLAIN RIP RAP, CLASS B
3656000000-M	876	155	M2	FILTER FABRIC FOR DRAINAGE
4412000000-M	SP	35	M2	WORK ZONE SIGNS (STATIONARY)
4412100000-M	SP	9	M2	WORK ZONE SIGNS (PORTABLE)
4412200000-M	SP	2	M2	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	3	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	200	EA	DRUMS
4446100000-M	SP	18	M	BARRICADES (TYPE III)
4455000000-N	1150	20	MD	FLAGGER
4460000000-N	1155	3	EA	WARNING LIGHTS (TYPE B)
4480000000-N	1165	1	EA	TRUCK MOUNTED IMPACT ATTENUA-TOR (60 MPH)
4495000000-M	1170	718	M	PORTABLE CONCRETE BARRIER (DRAINAGE)
4500000000-M	1170	694	M	RESET PORTABLE CONCRETE BAR-RIER
4520000000-N	1266	50	EA	TUBULAR MARKERS (FIXED)
4620000000-M	1205	175	M	REMOVABLE TAPE PAVEMENT MARK-ING LINES (150MM)
4685000000-M	1205	4,796	M	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 2.3MM)
4686000000-M	1205	933	M	THERMOPLASTIC PAVEMENT MARKING LINES (100MM, 3.1MM)
4695000000-M	1205	50	M	THERMOPLASTIC PAVEMENT MARKING LINES (200MM, 2.3MM)
4710000000-M	1205	25	M	THERMOPLASTIC PAVEMENT MARKING LINES (600MM, 3.1MM)
4725000000-M	1205	17	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (2.3MM)
4810000000-M	1205	9,381	M	PAINT PAVEMENT MARKING LINES (100MM)
4845000000-N	1205	6	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-M	1205	12,733	M	REMOVAL OF PAVEMENT MARKING LINES (100MM)
4875000000-N	1205	6	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4905000000-N	1253	150	EA	SNOWPLOWABLE PAVEMENT MARKERS
6000000000-M	1605	230	M	TEMPORARY SILT FENCE
6006000000-M	1610	75	MTN	STONE FOR EROSION CONTROL, CLASS A
6009000000-M	1610	65	MTN	STONE FOR EROSION CONTROL, CLASS B
6012000000-M	1610	45	MTN	SEDIMENT CONTROL STONE
6015000000-M	1615	1	HA	TEMPORARY MULCHING
6018000000-M	1620	50	KG	SEED FOR TEMPORARY SEEDING
6021000000-M	1620	0.5	MTN	FERTILIZER FOR TEMPORARY SEED-ING
6030000000-M	1630	75	M3	SILT EXCAVATION
6036000000-M	1631	600	M2	MATTING FOR EROSION CONTROL
6084000000-M	1660	1	HA	SEEDING & MULCHING
6087000000-M	1660	0.5	HA	MOWING
6090000000-M	1661	25	KG	SEED FOR REPAIR SEEDING
6093000000-M	1661	0.25	MTN	FERTILIZER FOR REPAIR SEEDING
6096000000-M	1662	25	KG	SEED FOR SUPPLEMENTAL SEEDING
6108000000-M	1665	1.5	MTN	FERTILIZER TOPDRESSING
6114000000-N	SP	2	HR	SPECIALIZED HAND MOWING
6132000000-N	SP	8	EA	GENERIC EROSION CONTROL ITEM RESPONSE FOR EROSION CONTROL

6/16/99

COMPUTED BY: CLH DATE: 5-31-06
CHECKED BY: DATE:

"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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	3A

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 SHOULDER WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS M-350	.	.	.	.	.	.	.	.	IMPACT ATTENUATOR TYPE 350 NO.	PERMITTED G	PERMITTED NG	.	.	.	REMARKS
L REV	23+75	24+68	SB RT	93																										REMOVE AND RESET
L REV	24+26	24+83	SB LT	57																										REMOVE AND RESET
L REV	24+34	24+91	NB LT	57																										REMOVE AND RESET
			TOTAL	207																										

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 mm & 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)								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)													CLASS III R.C. PIPE OR C.S. PIPE OR TYPE IR ALUMINIZED OR HDPE PIPE, TYPE S OR D								375mm SIDE DRAIN PIPE	450mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTITIES: STRUCTURES PER EACH (0 THRU 1.50)	FOR DRAINAGE *TOTAL M FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') METERS A 1.50 THRU 3.00	METERS B 3.00 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	J.B. STD. 840.31 OR 840.32	D.I. FRAME & GRATE STD. 840.29	CORR. STEEL ELBOW NO. & SIZE	CONC. COLLARS, CL. "B" m^3 STD.840.72	CONC. & BRICK PIPE PLUG m^3 STD.840.71	PIPE REMOVAL (meters)	REMARKS
SIZE								300	375	450	600	750	900	1050	1200	300	400	450	600		800		900		1000		1200		300	400	450	600	800	900	1000	1200																								
THICKNESS OR GAUGE																1.63	1.63	1.63	1.63		2.01		2.01		2.77		2.77																																	
23+18		1	2		25.3	24.5											42																																									.05	42	Temp.Detour-Plain CSP
23+60		2	3		24.5	25.3											42																																									.05	42	Temp.Detour-Plain CSP
24+40		4																																								1						1							1					
24+40		5														10																																												
24+73		6																																								1						1							1					
24+73		7														10																																												
24+55	RT																																																										8	REMOVE EXISTING PIPE
24+92	LT																																																										4	REMOVE EXISTING PIPE
TOTAL																20	84																									2						2							2			.10	96	

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

COMPUTED BY: CLH DATE: 5-30-06
CHECKED BY: DJU DATE: 5-30-06

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	3B

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC METERS

LOCATION	UNCLASSIFIE EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
NBX0					
STA.10+20 TO 11+82			217	217	-0-
STA.15+75 TO 17+16	4		133	129	
SUBTOTAL	4		350	346	-0-
SBX0					
STA.12+60 TO 14+00	5		164	159	-0-
STA.18+25 TO 19+44			156	156	
SUBTOTAL	5		320	315	-0-
GRANDTOTAL	9		670	661	-0-
LOSS DUE TO C & G	-9			9	
SUBTOTAL	-0-		670	670	-0-
WASTE TO REPLACE BORROW				-0-	-0-
5% TO REPLACE TOPSOIL				30	
ON BORROW PITT					
BORROW TO REPAIR SLOPES				200	
PROJECT TOTAL	-0-		670	900	-0-
SAY	-0-			1100	-0-
EST.UNDERCUT		200			
EMBANKMENT DOES NOT INCLUDE BACKFILL FOR UNDERCUT					

SUMMARY OF PAVEMENT REMOVAL

LOCATION	SM
NBX0 STA.10+18 TO 11+90	1012
NBX0 STA.15+70 TO 17+16	869
SBX0 STA.12+64 TO 13+95	824
SBX0 STA.18+25 TO 19+44	765
SBX0 STA.24+40 TO 25+04	576
NBX0 STA.24+60 TO 25+26	594
TOTAL	4640

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

6/4/99

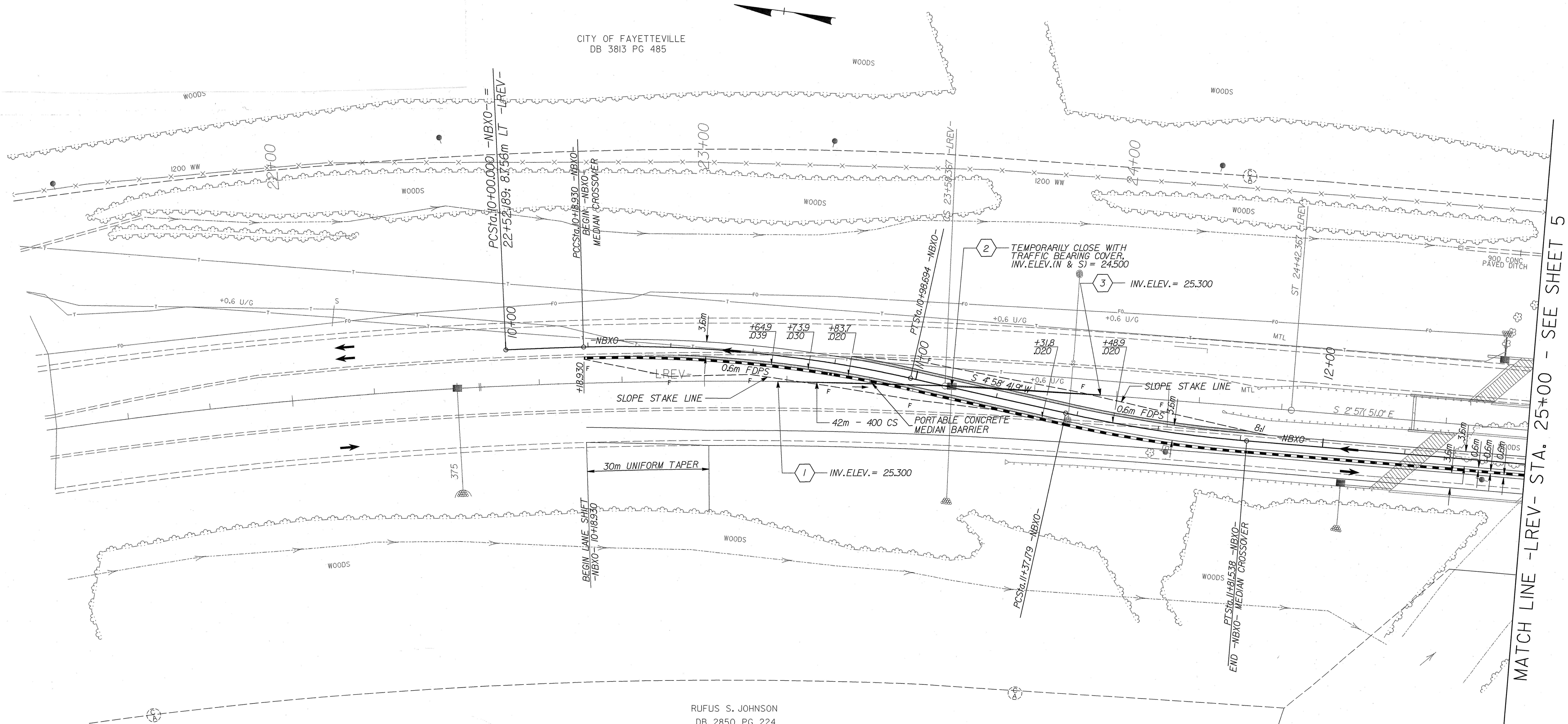
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	4

	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.	NORTH CAROLINA PROFESSIONAL SEAL 016067 ENGINEER BRIAN D. DEHLER	NORTH CAROLINA PROFESSIONAL SEAL 016067 ENGINEER BRIAN D. DEHLER
R/W REV.	10-12-04	10-12-04

5 0 10



-NBXO- CURVE DATA

PI Sta 10+09.465	PI Sta 10+59.020	PI Sta 11+59.394
Δ = 0° 55' 13.9" (RT)	Δ = 14° 16' 54.5" (RT)	Δ = 7° 56' 32.9" (LT)
L = 18.930	L = 79.765	L = 44.359
T = 9.465	T = 40.090	T = 22.215
R = 1,178.215	R = 320.000	R = 320.000
DS = 80 kph	DS = 80 kph	DS = 80 kph

SEE SHEET 10 FOR -NBXO- PROFILE

10/12/2004
R2562AA_RDY_PSH4.dgn

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35024
CHARLOTTE, NORTH CAROLINA 28235

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2562AC	5
CONST. REV.	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.	NORTH CAROLINA PROFESSIONAL SEAL 018067 ENGINEER BRYAN D. DEHLER 10-12-04	NORTH CAROLINA PROFESSIONAL SEAL 018067 ENGINEER BRYAN D. DEHLER 10-12-04

MATCH LINE -LREV- STA. 25+00 - SEE SHEET 4

MATCH LINE -LREV- STA. 28+60 - SEE SHEET 6

EIP
26.554(P)
N19°40'19"W

3
D.L. MATTHEWS
DB 2471PG 751

26+00

S87°16'30"E

WOODS

600 CSP

ROCKFISH CREEK

13+00

MTL

+0.6 U/G

S 2°57'51.0" E

-LREV-

-NBXO-

3.6m

0.6m

WETLANDS

1
RUBELL S. HARRIS
DB 2850 PG 224

2
ELEANOR P. YATES
DB 2981PG 1

4
ELEANOR Y. BUNNELLS
DB 2981PG 7

5
JOSEPHINE P. LYLE
DB 2981PG 10

7
CHARLES J. PATE
DB 2981PG 4

8
D.L. MATTHEWS
DB 2312 PG 171

S56°10'33"W
441.725(D)

S59°39'46"W
421.258(D)

S66°54'11"W
376.046(D)

PORTABLE CONCRETE MEDIAN BARRIER

3
D.L. MATTHEWS
DB 2471PG 751

POND

WOODS

WETLANDS

WLB

28+00

N.H. PERSON
DB 2921PG 313

N82°22'35"E
1049.925(D)

FRANCES PERSON
DB 2921PG 313

S85°29'54"E
149.712(D)

3.0 HW

SLOPE STAKE LINE

15+00

16+00

+08.8
020

0.6m FDPS

POSta.15+74.876
BEGIN -NBXO-
MEDIAN CROSSOVER

S85°29'54"E
1023.513(D)

-NBXO-

PI Sta 16+02.874
Δ = 10° 00' 00.0" (LT)
L = 55.851
T = 27.996
R = 320.000
DS = 80 kph

SEE SHEET 10 FOR -NBXO- PROFILE

n:\PROJ\3102562\roadway\dgn\r-dwg\R2562AA_RDY_PROFILE.dgn
10/12/2004
matthew.bell

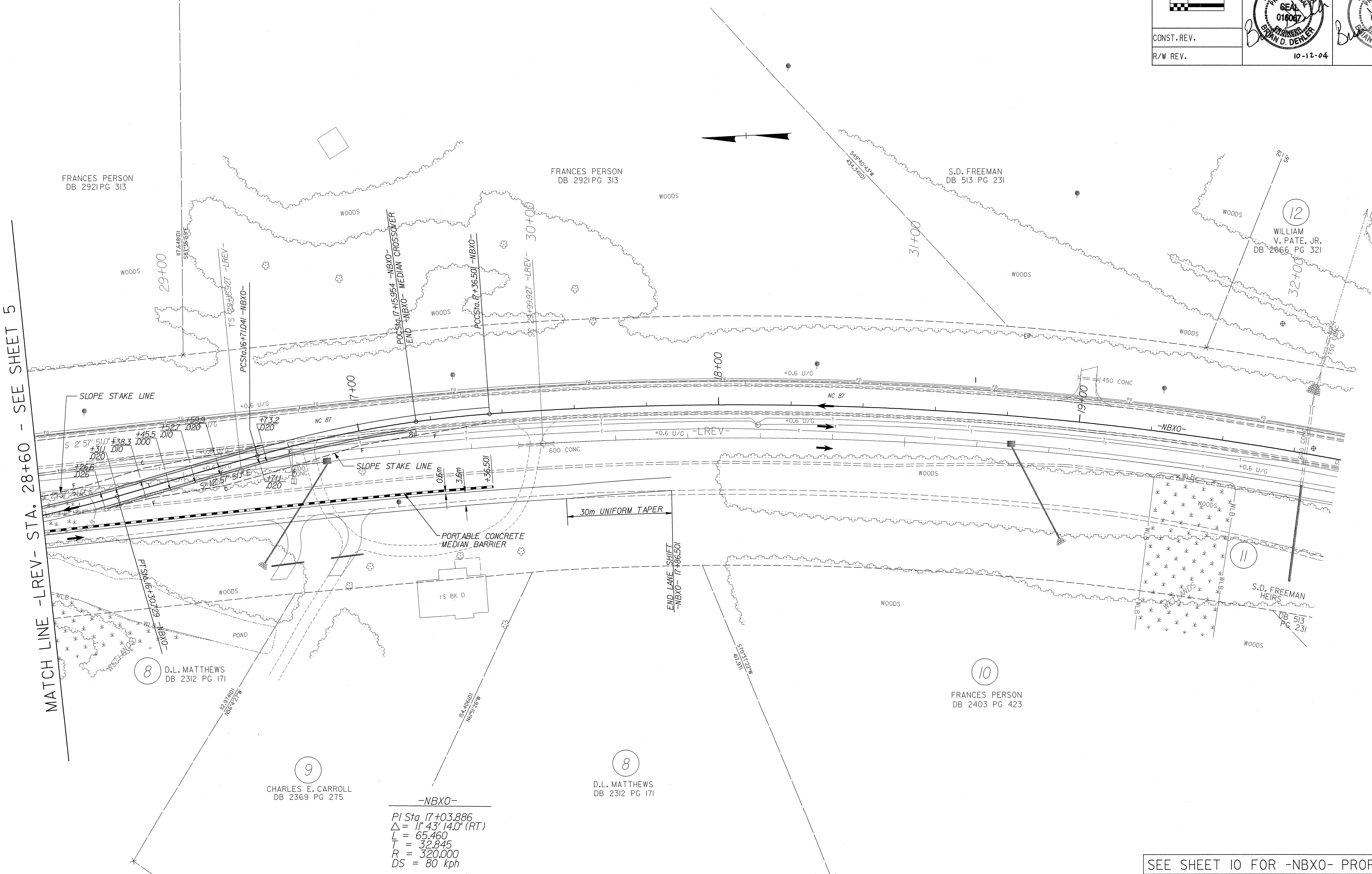
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	6
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 016097 ENGINEER BRIAN D. DEHLER 10-12-04	NORTH CAROLINA PROFESSIONAL SEAL 016097 ENGINEER BRIAN D. DEHLER 10-12-04

CONST. REV.

R/W REV.


MATCH LINE -LREV- STA. 28+60 - SEE SHEET 5
FRANCES PERSON
DB 2921 PG 313
S.D. FREEMAN
DB 513 PG 231
12
WILLIAM
V. PATE, JR.
DB 2666 PG 321
WOODS
29+00
30+00
31+00
32+00
17+00
18+00
19+00
SLOPE STAKE LINE
PCS Sta. 17+15.954 -NBXO-
END -NBXO- MEDIAN CROSSOVER
PCC Sta. 17+36.501 -NBXO-
PC Sta. 16+71.041 -NBXO-
PT Sta. 16+30.129 -NBXO-
NC 87
-LREV-
-NBXO-
+0.6 U/G
600 CONC
450 CONC
30m UNIFORM TAPER
PORTABLE CONCRETE
MEDIAN BARRIER
END LANE SHIFT
-NBXO- 17+86.501
POND
WETLANDS
8
D.L. MATTHEWS
DB 2312 PG 171
9
CHARLES E. CARROLL
DB 2369 PG 275
10
FRANCES PERSON
DB 2403 PG 423
11
S.D. FREEMAN
HEIRS
DB 513
PG 231
1S BK D

-NBXO-
PI Sta 17+03.886
Δ = 11° 43' 14.0" (RT)
L = 65.460
T = 32.845
R = 320.000
DS = 80 kph

SEE SHEET 10 FOR -NBXO- PROFILE

10/12/2004

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

METRIC

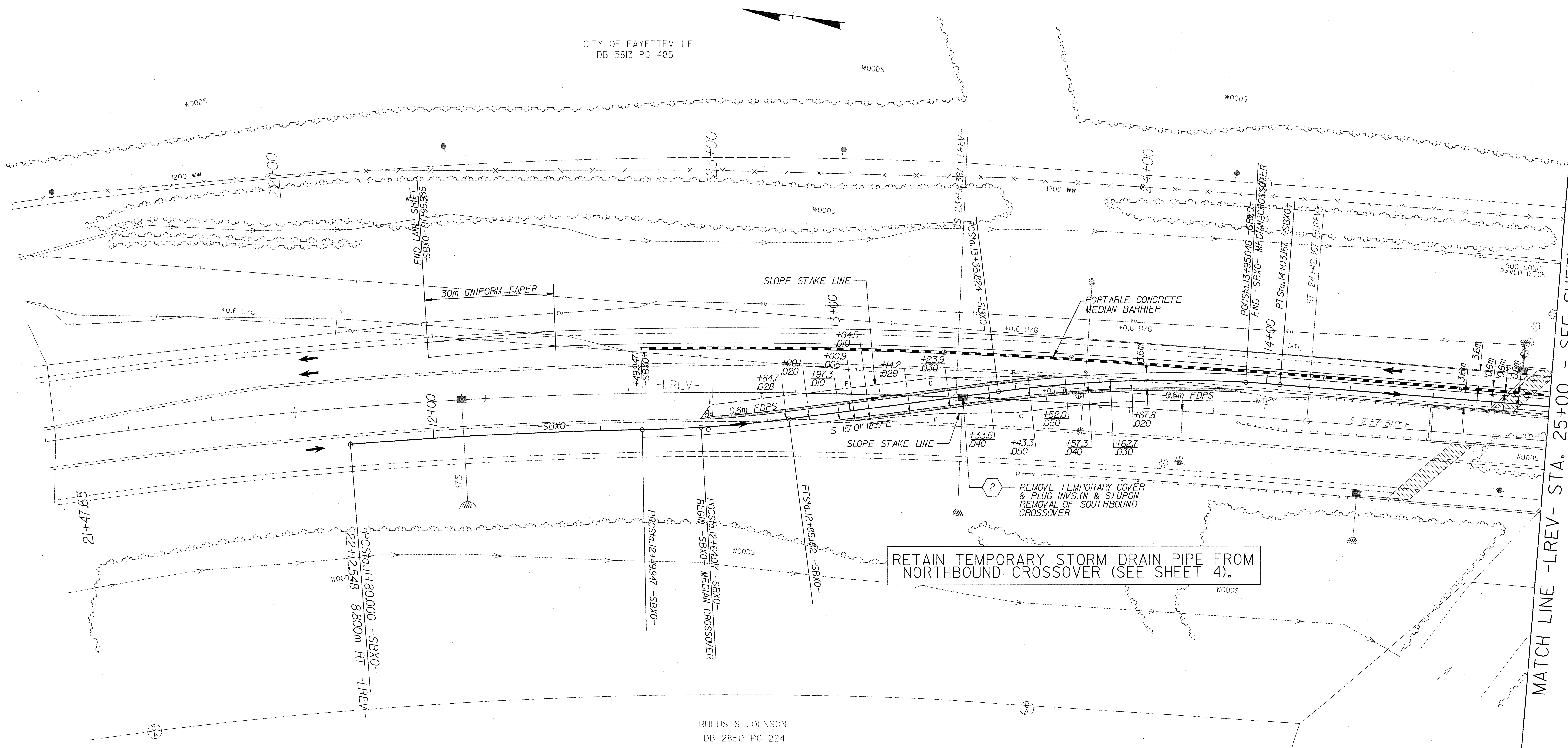
PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	7

HIGHWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 016067 BRIAN D. DEHLER 10-12-04

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 016067 BRIAN D. DEHLER 10-12-04

CONST. REV.

R/W REV.


CITY OF FAYETTEVILLE
DB 3813 PG 485
WOODS
END LANE SHIFT -SBXO- 11+99.986
30m UNIFORM TAPER
SLOPE STAKE LINE
PORTABLE CONCRETE MEDIAN BARRIER
POCSta.13+95.046 -SBXO- END -SBXO- MEDIAN CROSSOVER
PTSta.14+03.167 -SBXO-
PCSta.13+35.824 -SBXO-
-LREV-
-SBXO-
0.6m FDPS
S 15° 01' 18.5" E
S 2° 57' 51.0" E
REMOVE TEMPORARY COVER & PLUG INVS.(N & S) UPON REMOVAL OF SOUTHBOUND CROSSOVER
PCSta.11+80.000 -SBXO- 22+12.548 8.800m RT -LREV-
PRCSta.12+49.947 -SBXO-
POCSta.12+64.017 -SBXO- BEGIN -SBXO- MEDIAN CROSSOVER
PTSta.12+85.182 -SBXO-
21+47.63
RETAIN TEMPORARY STORM DRAIN PIPE FROM NORTHBOUND CROSSOVER (SEE SHEET 4).
MATCH LINE -LREV- STA. 25+00 - SEE SHEET 8
RUFUS S. JOHNSON
DB 2850 PG 224
RUBELL S. HARRIS
DB 2850 PG 224

-SBXO- CURVE DATA

PI Sta 12+67.582	PI Sta 13+69.620	PI Sta 11+25.459
Δ = 6° 18' 31.0" (LT)	Δ = 12° 03' 27.5" (RT)	Δ = 12° 20' 19.6" (RT)
L = 35.234	L = 67.342	L = 249.947
T = 17.635	T = 33.796	T = 125.459
R = 320.005	R = 320.000	R = 1,160.643
DS = 80 kph	DS = 80 kph	DS = 80 kph

SEE SHEET 10 FOR -SBXO- PROFILE

10/12/2004
n:\PROJ\3231\ustation\r-dwg\R2562AA_RDY_PSH7.dgn

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

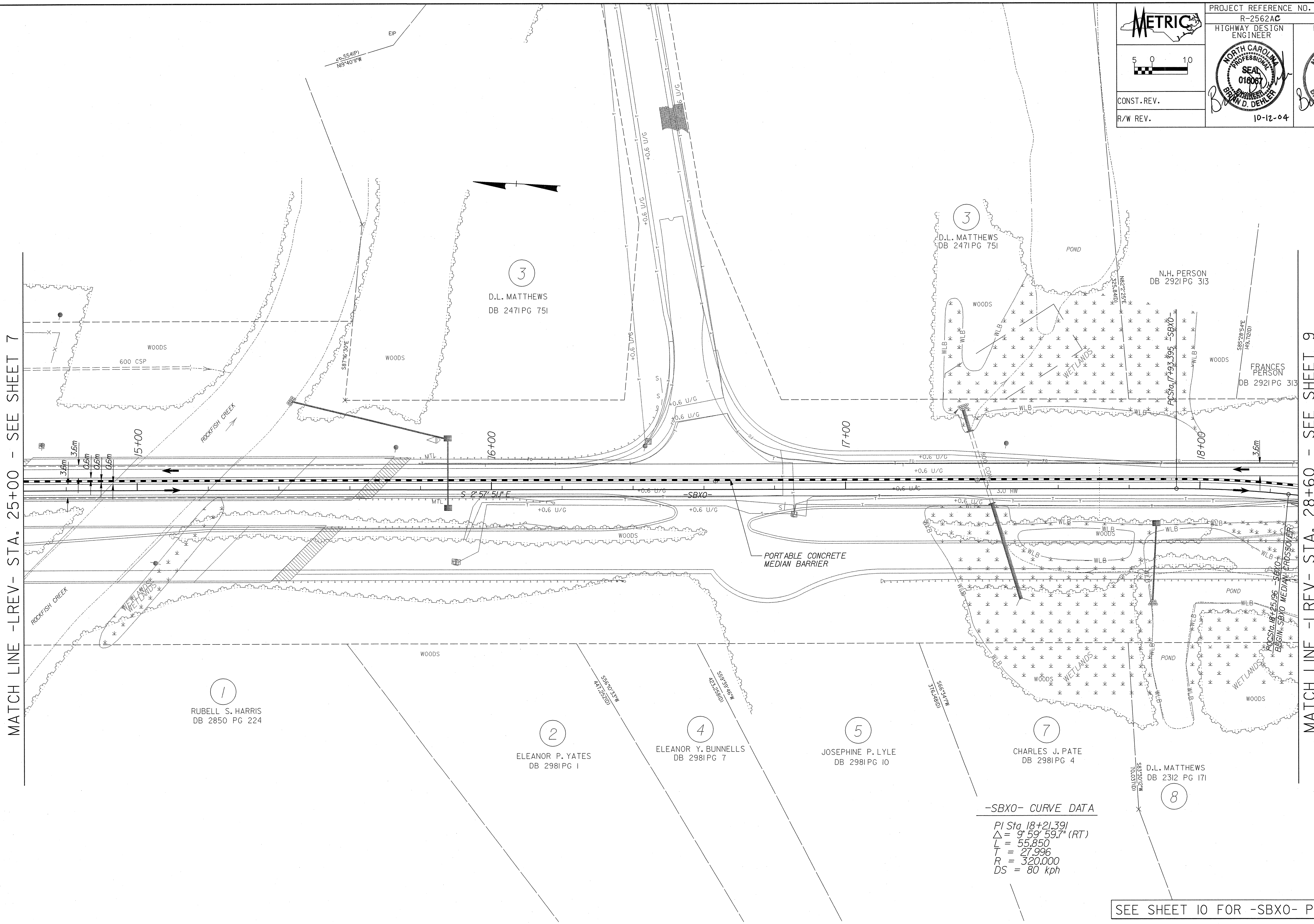
PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	8

METRIC

HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 016067 ENGINEER BRIAN D. DEHLER 10-12-04	NORTH CAROLINA PROFESSIONAL SEAL 016067 ENGINEER BRIAN D. DEHLER 10-12-04

CONST.REV.

R/W REV.


MATCH LINE -LREV- STA. 25+00 - SEE SHEET 7
MATCH LINE -LREV- STA. 28+60 - SEE SHEET 9
3
D.L. MATTHEWS
DB 2471 PG 751
WOODS
600 CSP
S87°16'30"E
ROCKFISH CREEK
15+00
16+00
17+00
18+00
3.6m
0.6m
S 2° 57' 51" E
-SBXO-
+0.6 U/G
PORTABLE CONCRETE
MEDIAN BARRIER
N.H. PERSON
DB 2921 PG 313
FRANCES
PERSON
DB 2921 PG 313
POND
WETLANDS
WLB
1
RUBELL S. HARRIS
DB 2850 PG 224
2
ELEANOR P. YATES
DB 2981 PG 1
4
ELEANOR Y. BUNNELLS
DB 2981 PG 7
5
JOSEPHINE P. LYLE
DB 2981 PG 10
7
CHARLES J. PATE
DB 2981 PG 4
8
D.L. MATTHEWS
DB 2312 PG 171
BEGIN -SBXO- MEDIAN CROSSOVER

-SBXO- CURVE DATA

PI Sta 18+21.391
Δ = 9° 59' 59.7" (RT)
L = 55.850
T = 27.996
R = 320.000
DS = 80 kph

SEE SHEET 10 FOR -SBXO- PROFILE

10/12/2004
matthew.bell

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
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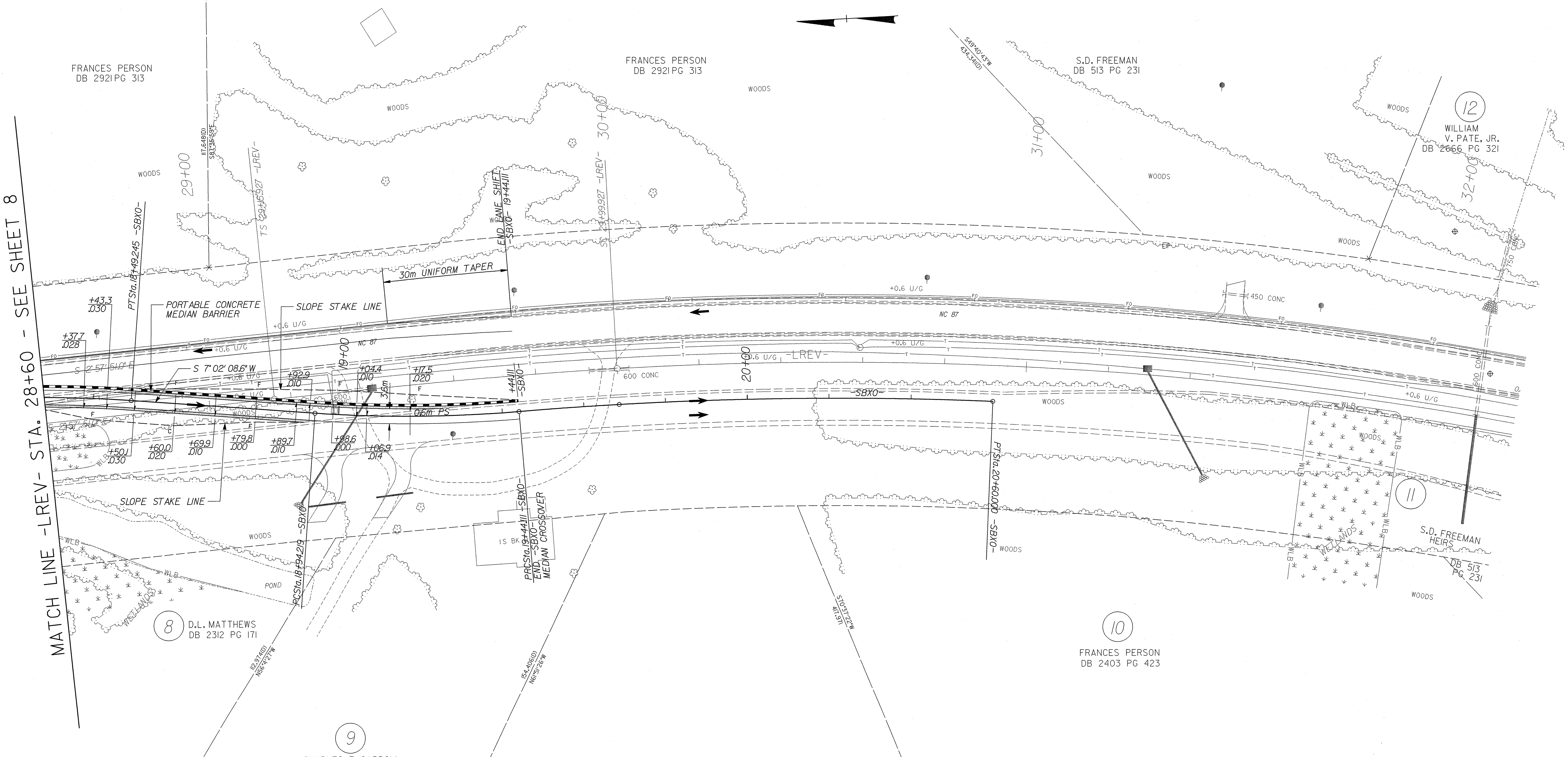
CHARLOTTE, NORTH CAROLINA 28235

METRIC	PROJECT REFERENCE NO.	SHEET NO.
	R-2562AC	9
	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.		
R/W REV.	10-12-04	10-12-04



-SBXO- CURVE DATA

PI Sta 19+19.216	PI Sta 19+56.391
Δ = 8° 55' 59.3" (LT)	Δ = 1° 32' 14.5" (RT)
L = 49.892	L = 24.558
T = 24.997	T = 12.280
R = 320.000	R = 915.244
DS = 80 kph	DS = 80 kph

SEE SHEET 10 FOR -SBXO- PROFILE

10/12/2004

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CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	10
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

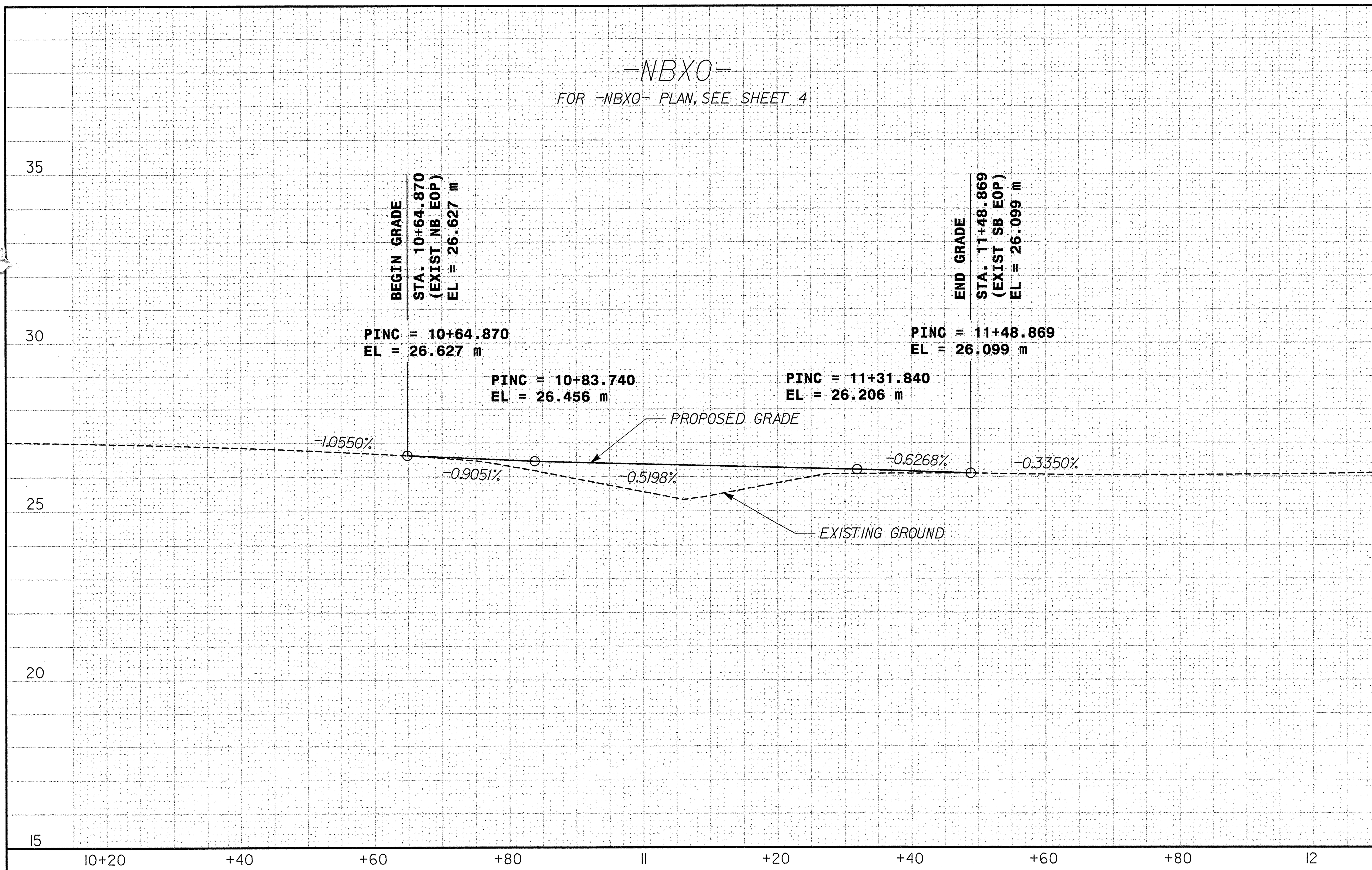
METRIC

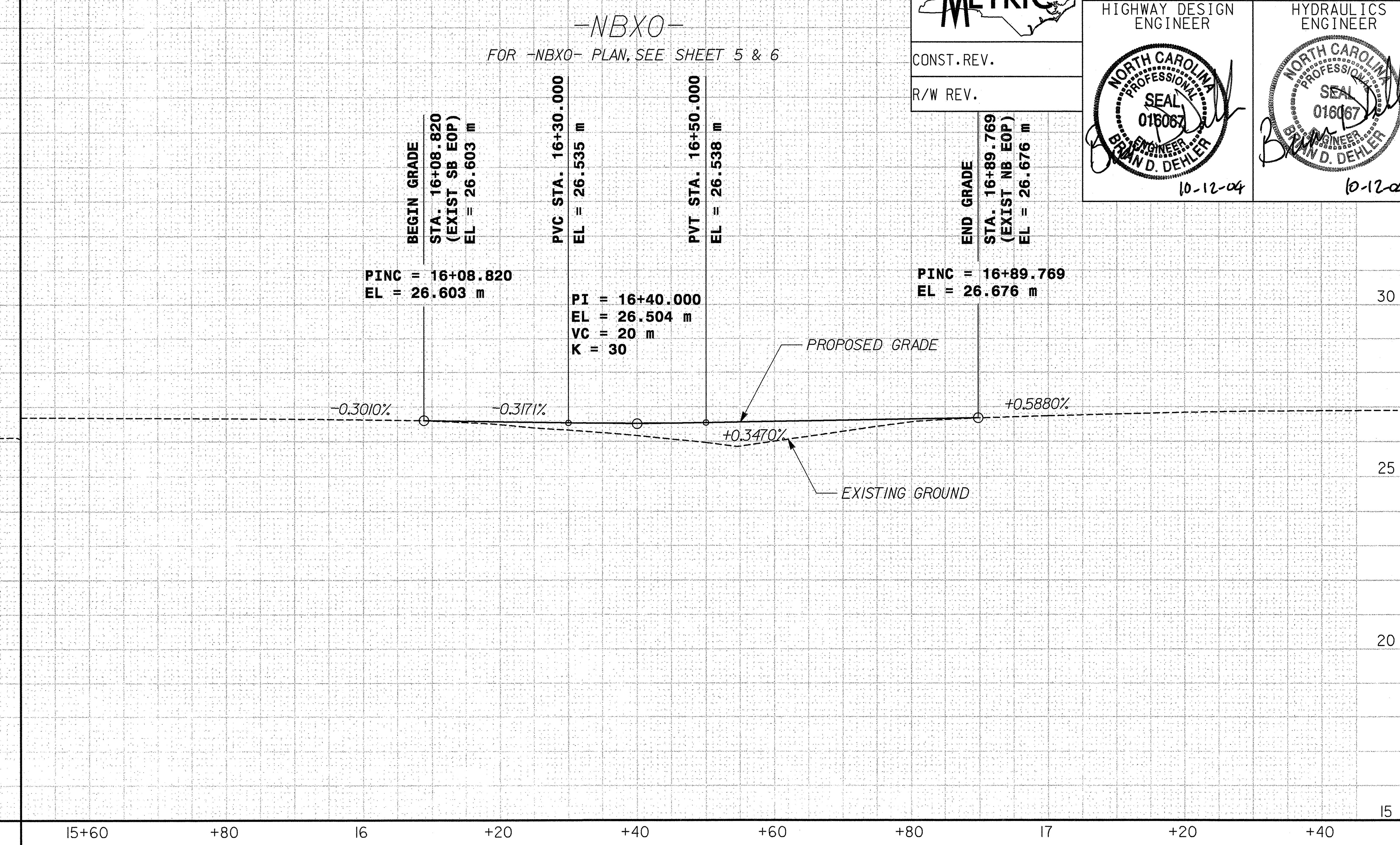
CONST. REV.

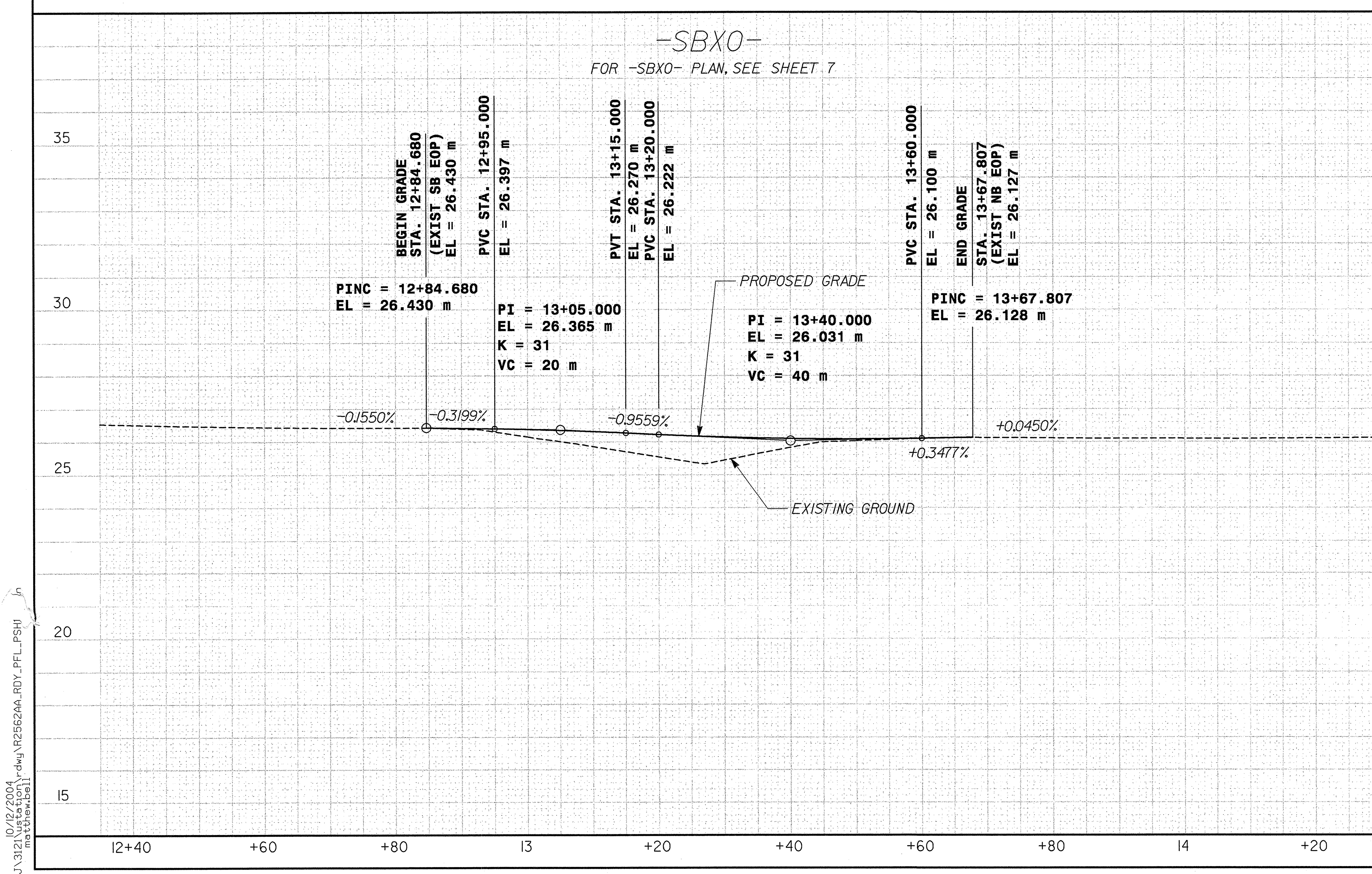
R/W REV.

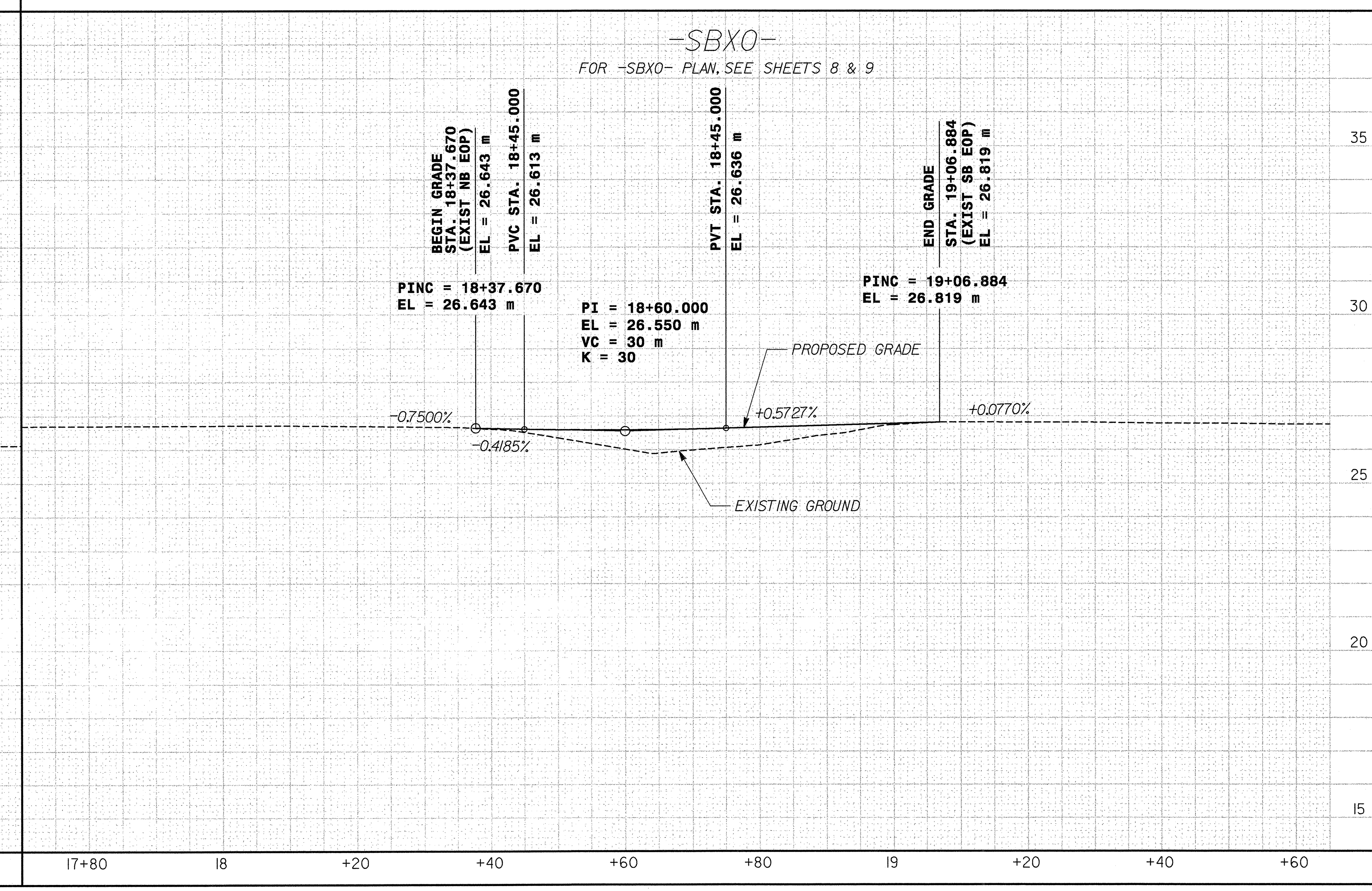
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 016067 BRIAN D. DEHLER 10-12-04

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 016067 BRIAN D. DEHLER 10-12-04









PROJECT REFERENCE NO.	SHEET NO.
R-2562AC	11
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST. REV.

R/W REV.

1. Installed underdrain where shown on the plans or as directed by the Engineer. Details for the underdrain can be found on sheet 815.03 of the Roadway Standard Drawings and in Section 815 of the Standard Specifications.
2. Underdrain locations shown are approximate and may need to be adjusted in the field by the Engineer to achieve proper slope and to avoid obstacles or underground obstructions.

UD Line 1

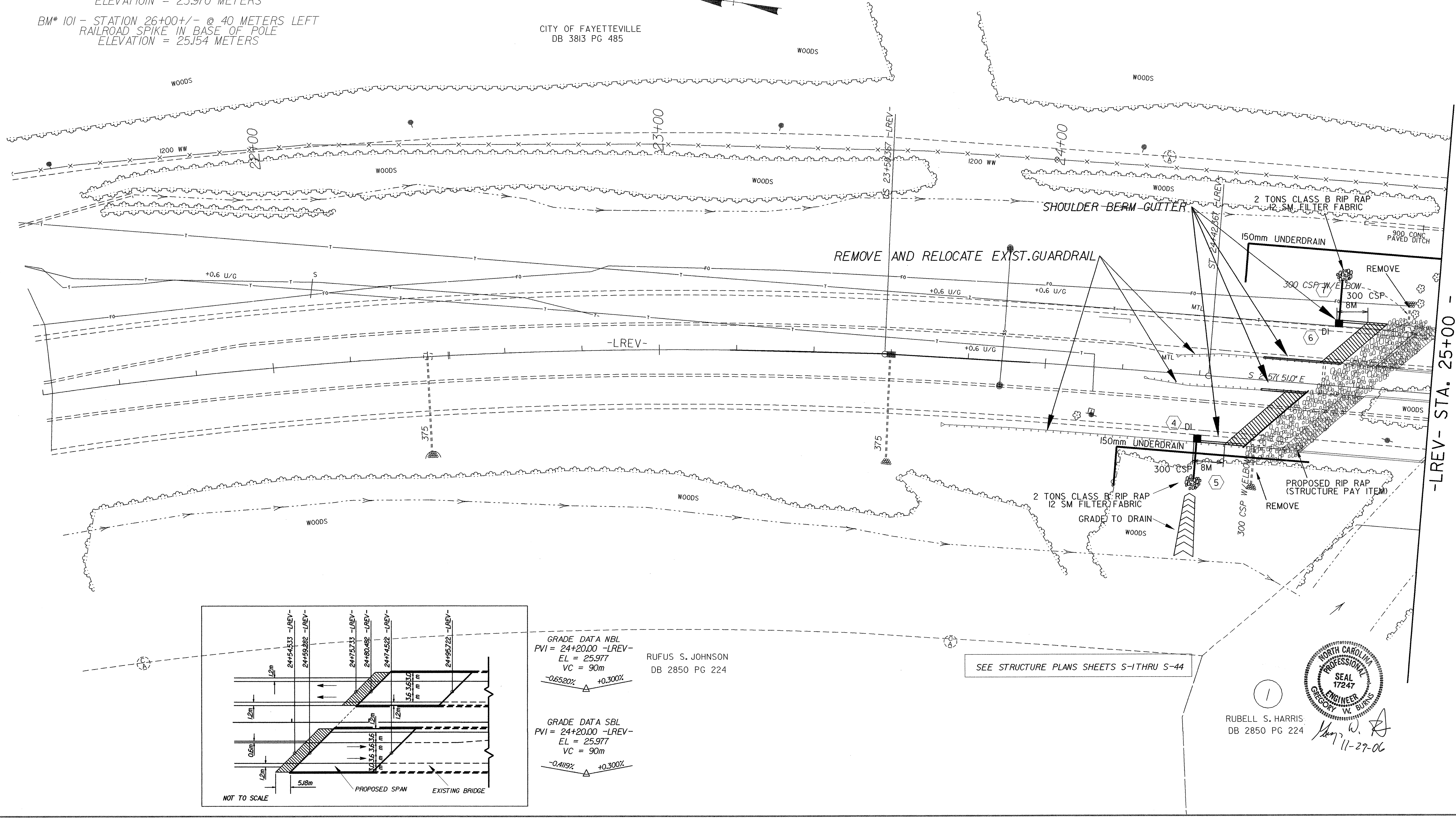
	Station*	Offset*
Begin UD	24+20+/-	30M+/- Right
Turn UD	24+20+/-	20M+/- Right
End UD	24+70+/-	20M+/- Right

*Referenced from –LREV-

UD Line 2

	Station*	Offset*
Begin UD	24+50+/-	25M+/- Left
Turn UD	24+50+/-	35M+/- Left
End UD	25+00+/-	35M+/- Left

*Referenced from –LREV-



BM# 100 - STATION 24+00+/- @ 60 METERS RIGHT
ONE NAIL IN BASE OF 18 GUM TREE
ELEVATIOIN = 23.970 METERS
BM# 101 - STATION 26+00+/- @ 40 METERS LEFT
RAILROAD SPIKE IN BASE OF POLE
ELEVATION = 25.154 METERS
CITY OF FAYETTEVILLE
DB 3813 PG 485
WOODS
1200 WW
SHOULDER BERM GUTTER
2 TONS CLASS B RIP RAP
12 SM FILTER FABRIC
150mm UNDERDRAIN
REMOVE AND RELOCATE EXIST. GUARDRAIL
REMOVE
300 CSP W/ ELBOW
300 CSP
8M
DI
-LREV-
-LREV- STA. 25+00 -
PROPOSED RIP RAP
(STRUCTURE PAY ITEM)
GRADE TO DRAIN
GRADE DATA NBL
PVI = 24+20.00 -LREV-
EL = 25.977
VC = 90m
GRADE DATA SBL
PVI = 24+20.00 -LREV-
EL = 25.977
VC = 90m
PROPOSED SPAN
EXISTING BRIDGE
NOT TO SCALE
RUFUS S. JOHNSON
DB 2850 PG 224
SEE STRUCTURE PLANS SHEETS S-1 THRU S-44
RUBELL S. HARRIS
DB 2850 PG 224
NORTH CAROLINA PROFESSIONAL SEAL 17247 ENGINEER GREGORY W. BURNS
11-29-06