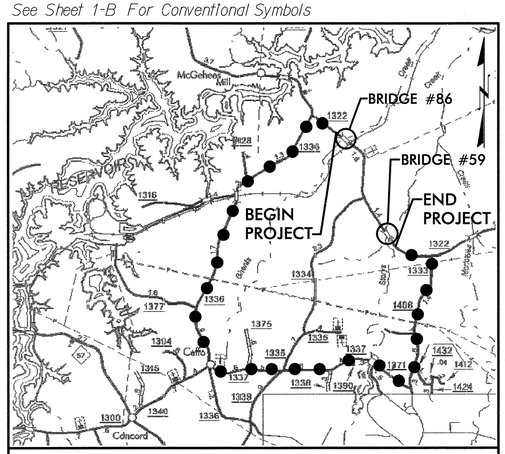
TIP PROJECT: R-4906

CONTRACT: C202147

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



VICINITY MAP
DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PERSON COUNTY

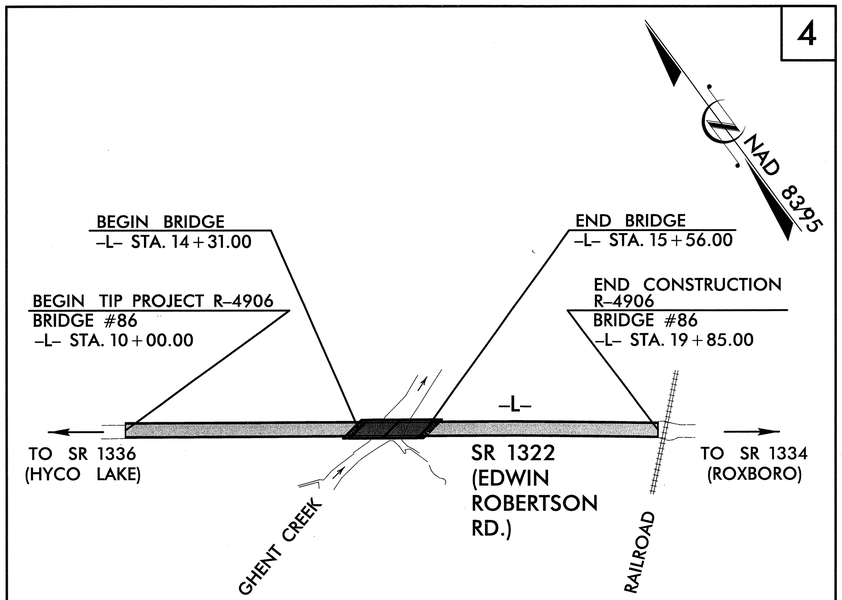
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4906	1	

STATE PROJECT NO.	F. A. PROJ. NO.	DESCRIPTION
40547.1.1		P.E.
40547.2.1		R /W, UTIL.
40547.3.1		CONST.

LOCATION: BRIDGE NO. 59 OVER STORY'S CREEK AND BRIDGE NO. 86 OVER GHENT CREEK ON SR 1322 (EDWIN ROBERTSON ROAD)

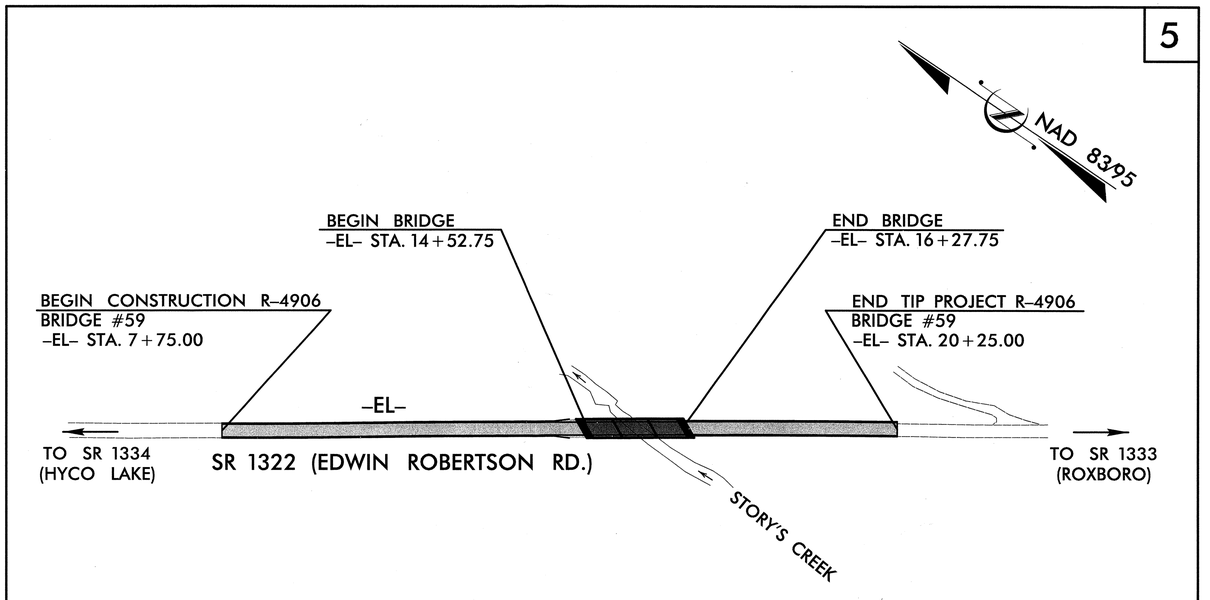
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES.

4



LOCATION SKETCH BRIDGE # 86

5



LOCATION SKETCH BRIDGE # 59

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 2009 = 850
ADT 2029 = 1660
T = 46 % *
V = 60 MPH

* TTST 44 % DUAL 2 %

FUNC CLASS = LR /NONFA

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R–4906 = 0.366 MILE
LENGTH STRUCTURE TIP PROJECT R–4906 = 0.057 MILE
TOTAL LENGTH TIP PROJECT R–4906 = 0.423 MILE

Prepared In the Office of:
MULKEY
ENGINEERS & CONSULTANTS
FOR
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

LETTING DATE:
SEPTEMBER 15, 2009

TIM JORDAN, PE
ROADWAY ENGINEER

KEVIN ALFORD, PE
HYDRAULICS ENGINEER

NCDOT CONTACT: MIKE SUMMERS
BRIDGE MANAGEMENT PROJECT MANAGER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER TIMOTHY JORDAN

SIGNATURE: P.E. 7/24/09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD

SIGNATURE: P.E. 7-24-09

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

P.E.
STATE HIGHWAY DESIGN ENGINEER

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-4906 - *59 & *86	1-A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN
7/24/09

INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARDS

Index of Sheets

Sheet Number	Sheet
1	Title Sheet
1-A	Index of Sheets, General Notes, & List of Standards
1-B	Conventional Symbols
2	Pavement Schedule, Wedging Detail & Typical Sections - Bridge #86
2-A	Typical Sections - Bridge #86
2-B	Pavement Schedule, Wedging Detail & Typical Sections - Bridge #59
2-C	Typical Sections - Bridge #59
2-D	Detail of Anchorage for Frames
3	Summary of Quantities
3-A	Guardrail Summary, Summary of Earthwork, & Summary of Pavement Removal
3-B	List of Pipes, Endwalls, Etc (For Pipes 48" & Under)
4	Plan & Profile - Bridge #86
5	Plan & Profile - Bridge #59
TCP-1 thru TCP-3	Traffic Control Plans
SD-1	Special Sign Design
EC-1 thru EC-13	Erosion Control Plans
UO-1 thru UO-2	Utilities by Others Plans
X-1	Cross Section Summary Sheet
X-2 thru X-5	Cross-Sections - Bridge #86
X-6 thru X-11	Cross-Sections - Bridge #59
S-1 thru S-50	Structure Plans

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

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

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

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

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.

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

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

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

UTILITY OWNERS ON THE PROJECT ARE PIEDMONT ELECTRIC CORPORATION MEMBERSHIP.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

2006 ROADWAY ENGLISH STANDARD DRAWINGS
EFFECTIVE: 07-18-06
REVISED: 01-02-07

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

STD.NO. TITLE

DIVISION 2 - EARTHWORK

200.03 Method of Clearing - Method III
225.02 Guide for Grading Subgrade - Secondary and Local

DIVISION 3 - PIPE CULVERTS

300.01 Method of Pipe Installation - Method 'A'

DIVISION 4 - MAJOR STRUCTURES

422.10 Reinforced Bridge Approach Fills

DIVISION 6 - ASPHALT BASES AND PAVEMENTS

654.01 Pavement Repairs

DIVISION 8 - INCIDENTALS

806.01 Concrete Right-of-Way Marker
806.02 Granite Right-of-Way Marker
815.03 Pipe Underdrain and Blind Drain
840.00 Concrete Base Pad for Drainage Structures
840.36 Traffic Bearing Drop Inlet - for Steel(840.37) Double Frame and Grates
840.37 Steel Grate and Frame
840.46 Traffic Bearing Precast Drainage Structure
840.66 Drainage Structure Steps
846.01 Concrete Curb, Gutter and Curb & Gutter
846.04 Drop Inlet Installation in Shoulder Berm Gutter
862.01 Guardrail Placement
862.02 Guardrail Installation
862.03 Structure Anchor Units
862.04 Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02 Guide for Rip Rap at Pipe Outlets
876.04 Drainage Ditches with Class 'B' Rip Rap

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3/15/06

PROJECT REFERENCE NO.	SHEET NO.
R-4906	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- 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
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access
- Proposed Control of Access
- Existing Easement Line (E)
- Proposed Temporary Construction Easement (E)
- Proposed Temporary Drainage Easement (TDE)
- Proposed Permanent Drainage Easement (PDE)
- Proposed Permanent Utility Easement (PUE)

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut (C)
- Proposed Slope Stakes Fill (F)
- Proposed Wheel Chair Ramp (WCR)
- 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
- Storm Sewer

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- Recorded U/G Power Line
- Designated U/G Power Line (S.U.E.*)

TELEPHONE:

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

WATER:

- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line
- Designated U/G Water Line (S.U.E.*)
- Above Ground Water Line (A/G Water)

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

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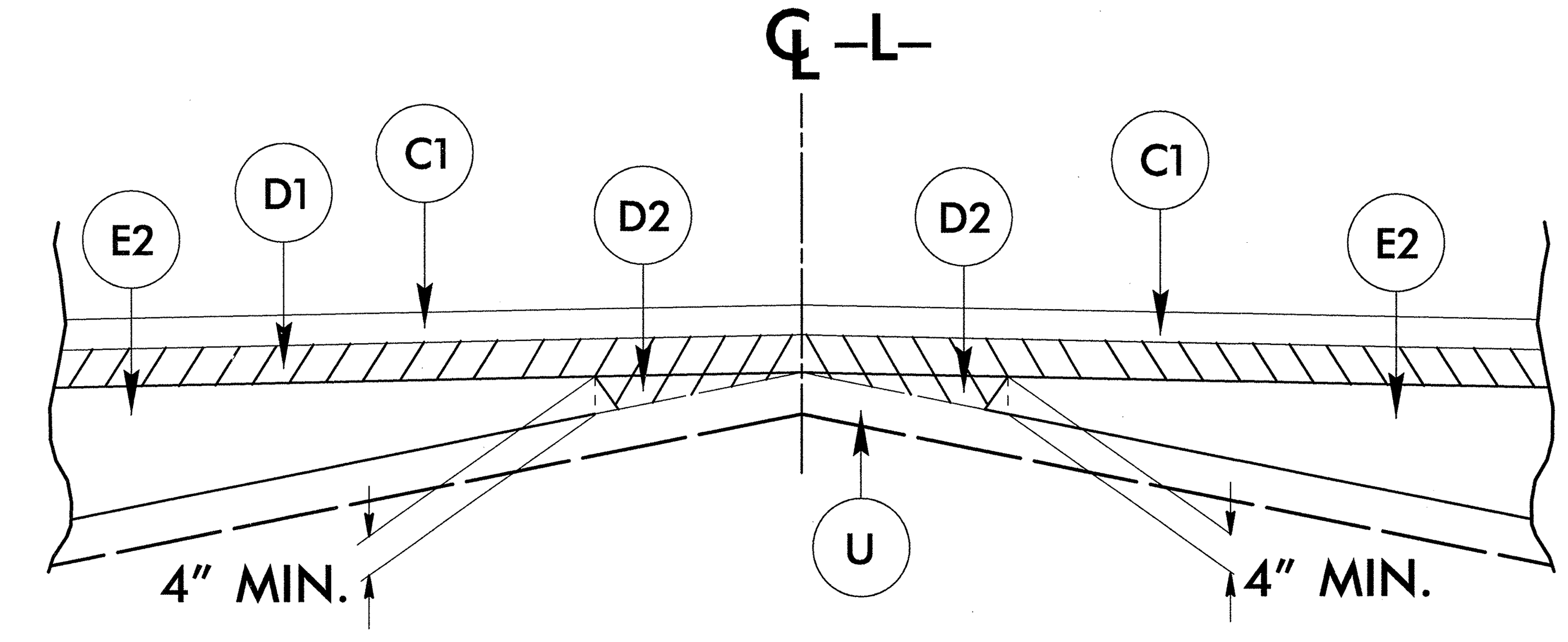
PROJECT REFERENCE NO.	SHEET NO.
R-4906 - *86	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

5/14/99

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

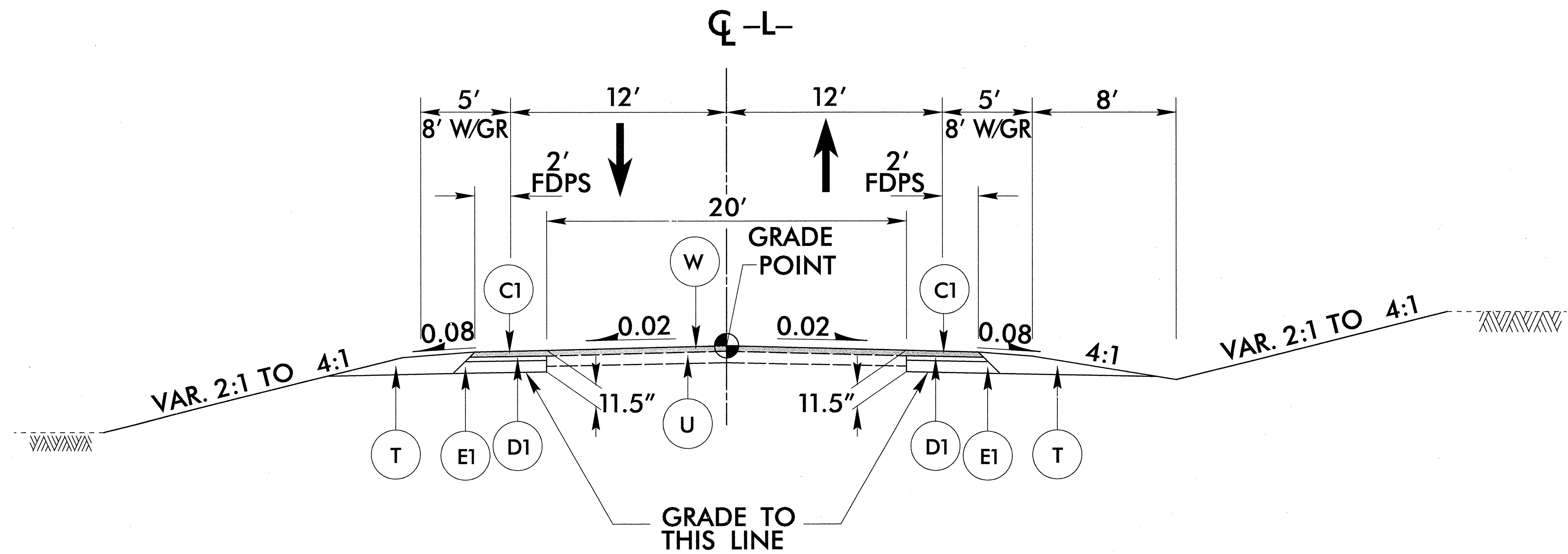
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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.
E1	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD IN EACH OF TWO LAYERS.
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 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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



DETAIL SHOWING METHOD OF WEDGING

USE IN CONJUCTION WITH TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
AT THE FOLLOWING LOCATIONS

-L- STA. 10+00.00 TO STA. 11+25 +/-
-L- STA. 17+25 +/- TO STA. 19+85.00

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5/14/99

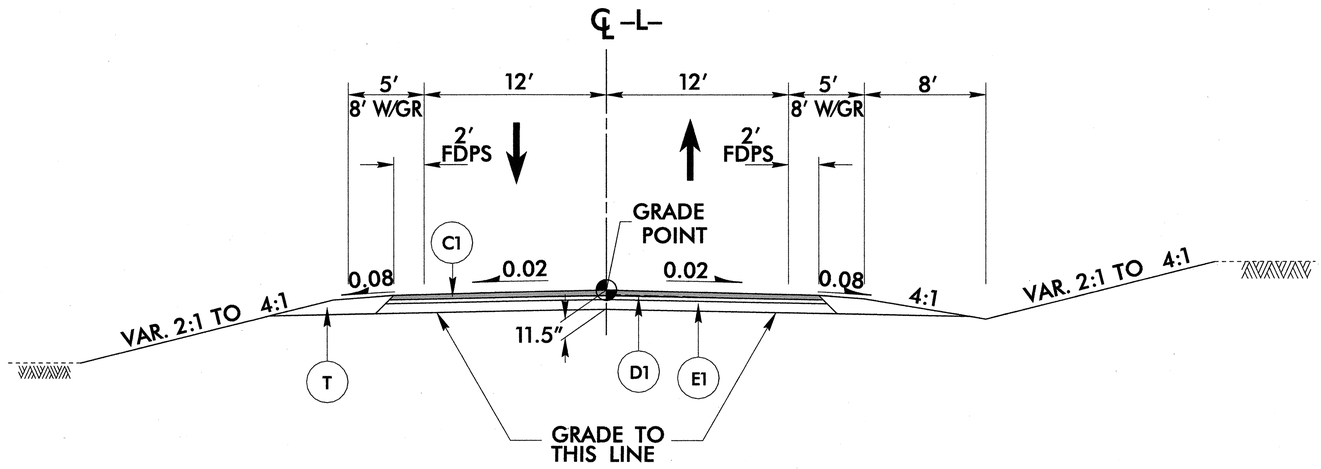
PROJECT REFERENCE NO.	SHEET NO.
R-4906 - *86	2-A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY ADRIAN
7/1/09

PAVEMENT DESIGN ENGINEER

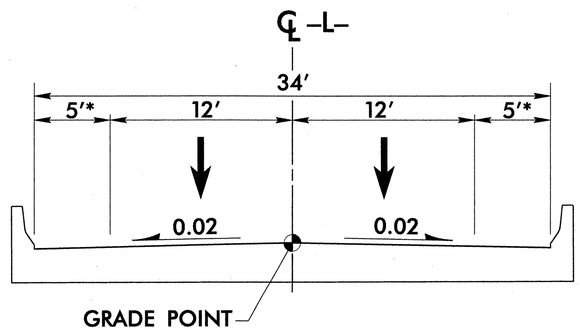
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
7/24/09



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
AT THE FOLLOWING LOCATIONS

–L– STA. 11+25 +/– TO STA. 14+31.00 (BEGIN BRIDGE)
–L– STA. 15+56.00 (END BRIDGE) TO STA. 17+25 +/–



DETAIL OF BRIDGE

–L– STA 14+31.00 TO STA 15+56.00

* BRIDGE WIDENED FOR HYDRAULIC SPREAD

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	1½" S9.5C
D1	4" I19.0C
E1	6" B25.0C
T	EARTH MATERIAL

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PROJECT REFERENCE NO.	SHEET NO.
R-4906 - *59	2-B
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN
7/24/09

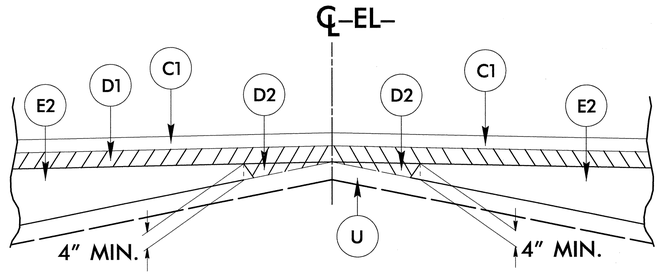
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22886 ENGINEER CLARK S. MORRISON
7/24/09

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

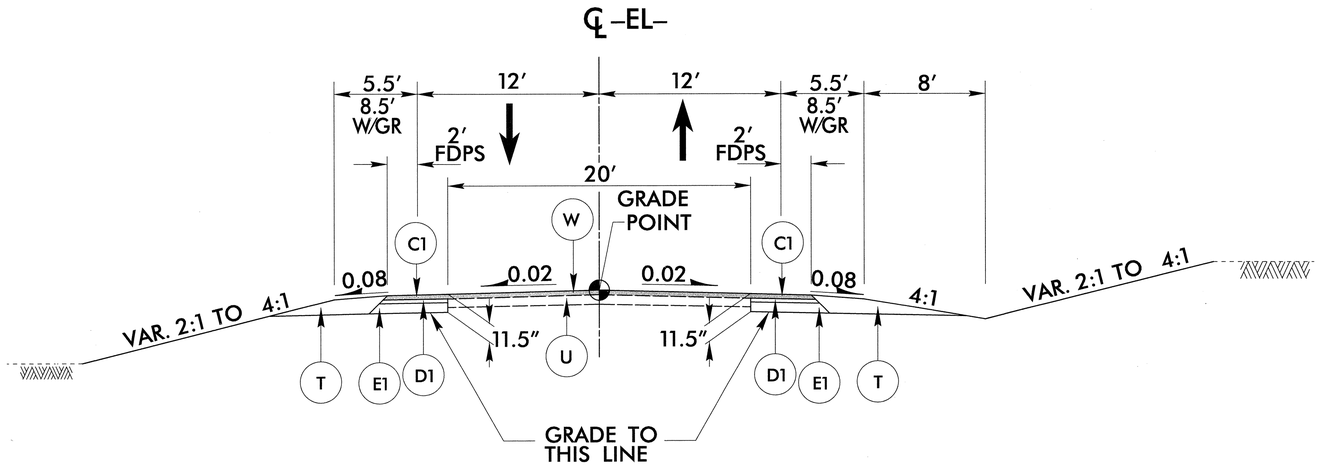
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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.
E1	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD IN EACH OF TWO LAYERS.
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 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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



DETAIL SHOWING METHOD OF WEDGING

USE IN CONJUCTION WITH TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
AT THE FOLLOWING LOCATIONS

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–EL– STA. 18+75+/– TO STA. 20+25.00

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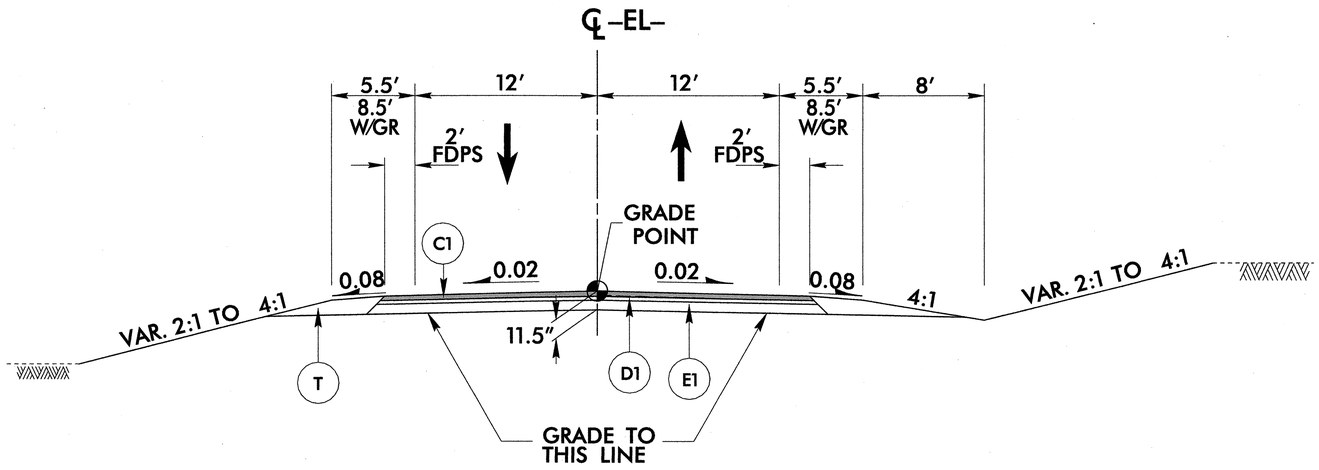
PROJECT REFERENCE NO.	SHEET NO.
R-4906 - #59	2-C
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN 7/1/09

PAVEMENT DESIGN ENGINEER

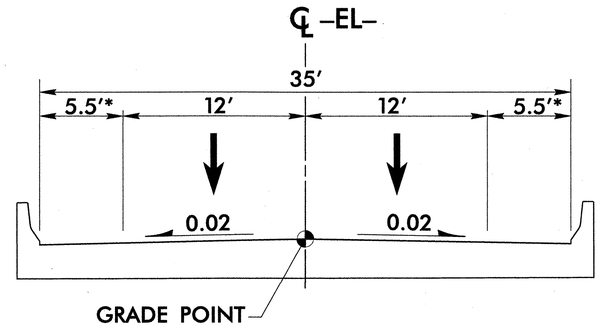
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON 7/1/09



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
AT THE FOLLOWING LOCATIONS

–EL– STA. 8+60+/– TO STA. 14+52.75 (BEGIN BRIDGE)
–EL– STA. 16+27.75 (END BRIDGE) TO STA. 18+75+/–



DETAIL OF BRIDGE

–EL– STA 14+52.75 TO STA 16+27.75

* BRIDGE WIDENED FOR HYDRAULIC SPREAD

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	1½″ S9.5C
D1	4″ I19.0C
E1	6″ B25.0C
T	EARTH MATERIAL

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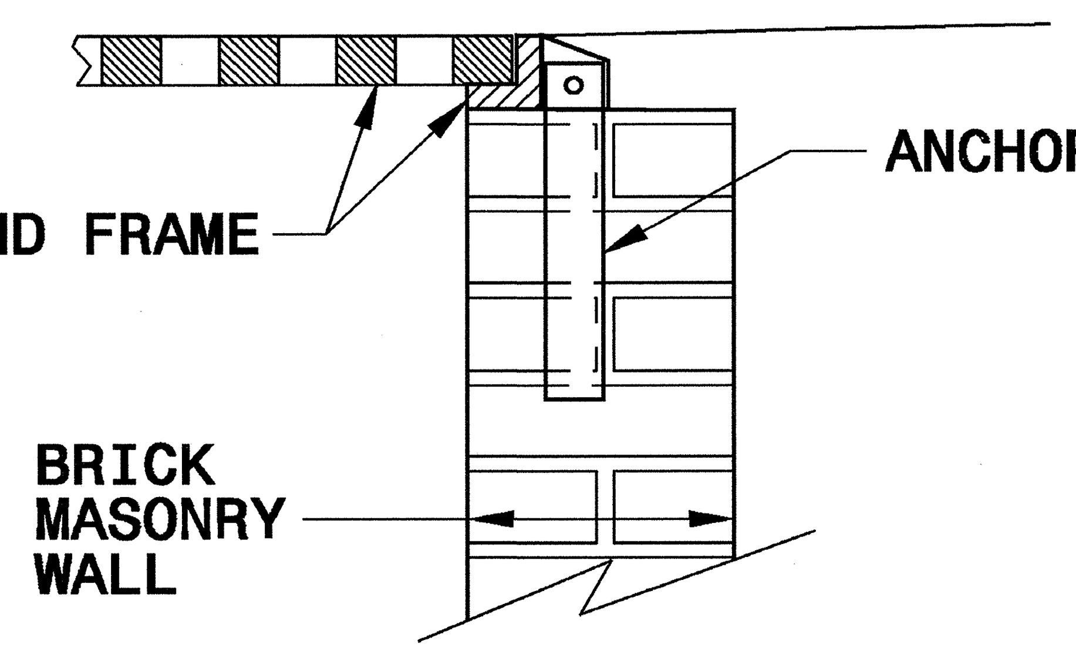
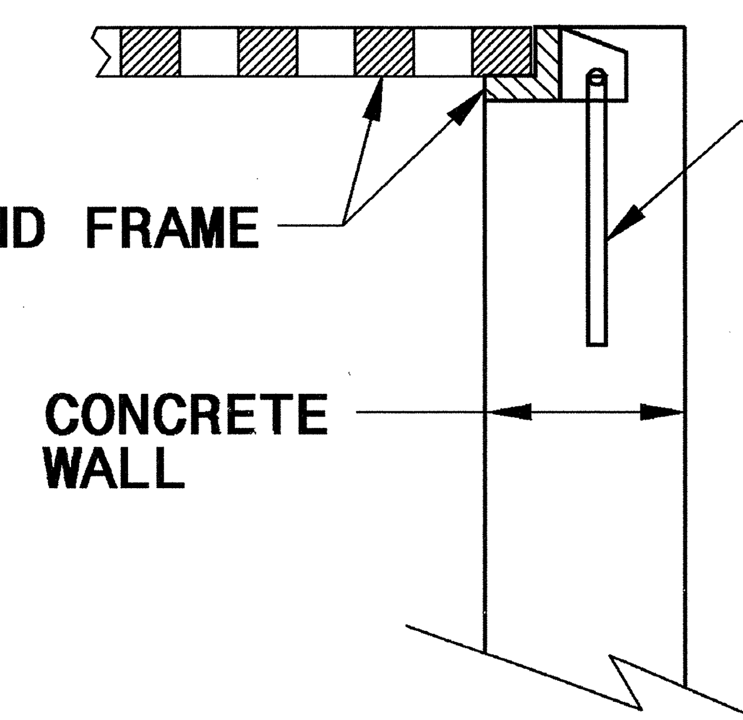
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

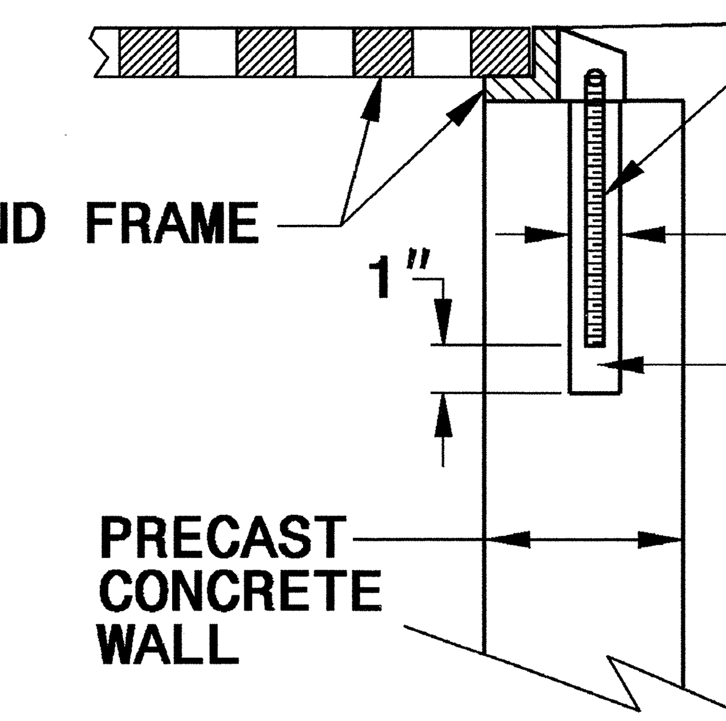
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



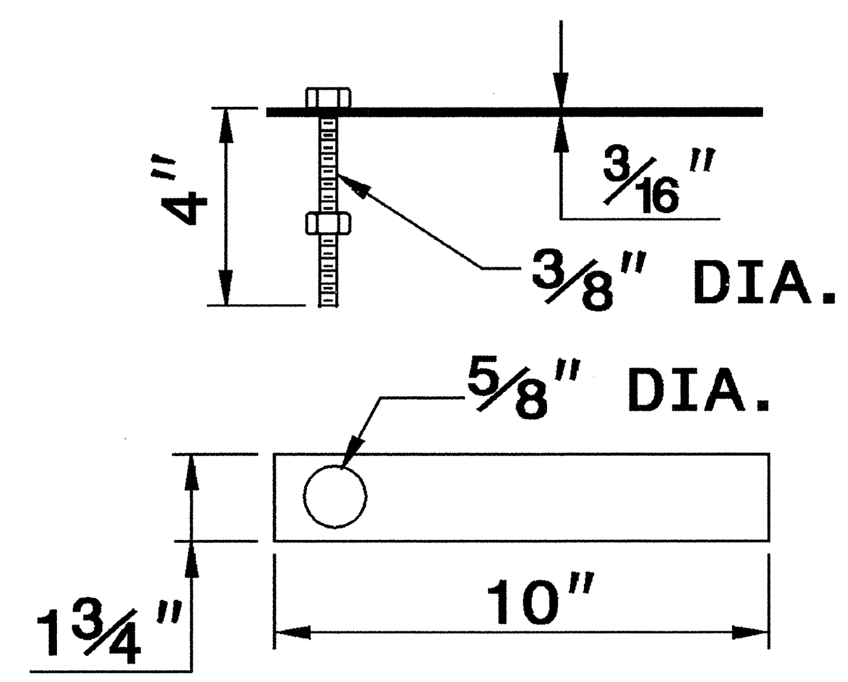
CONCRETE CONSTRUCTION



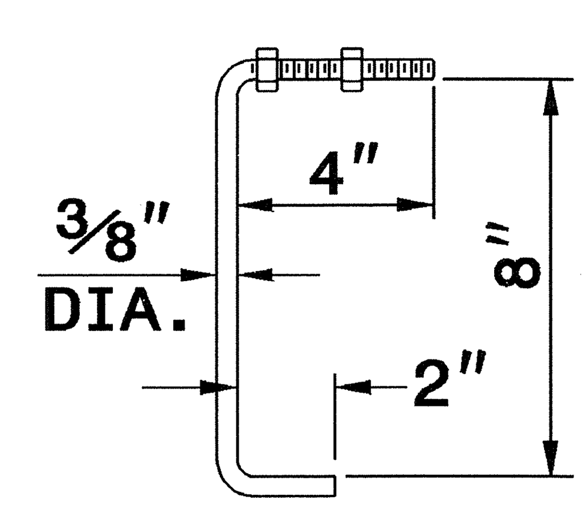
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

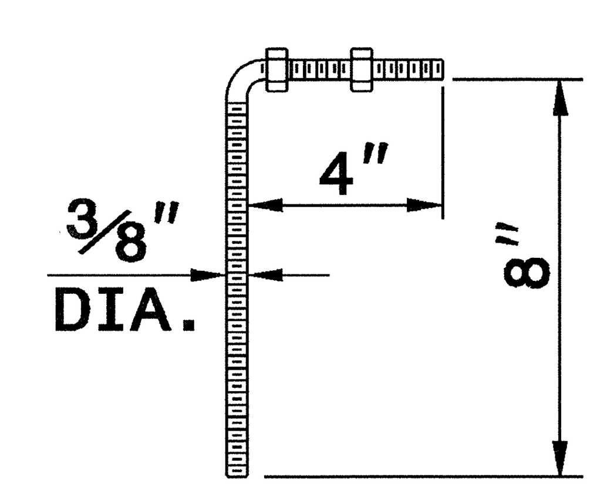
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



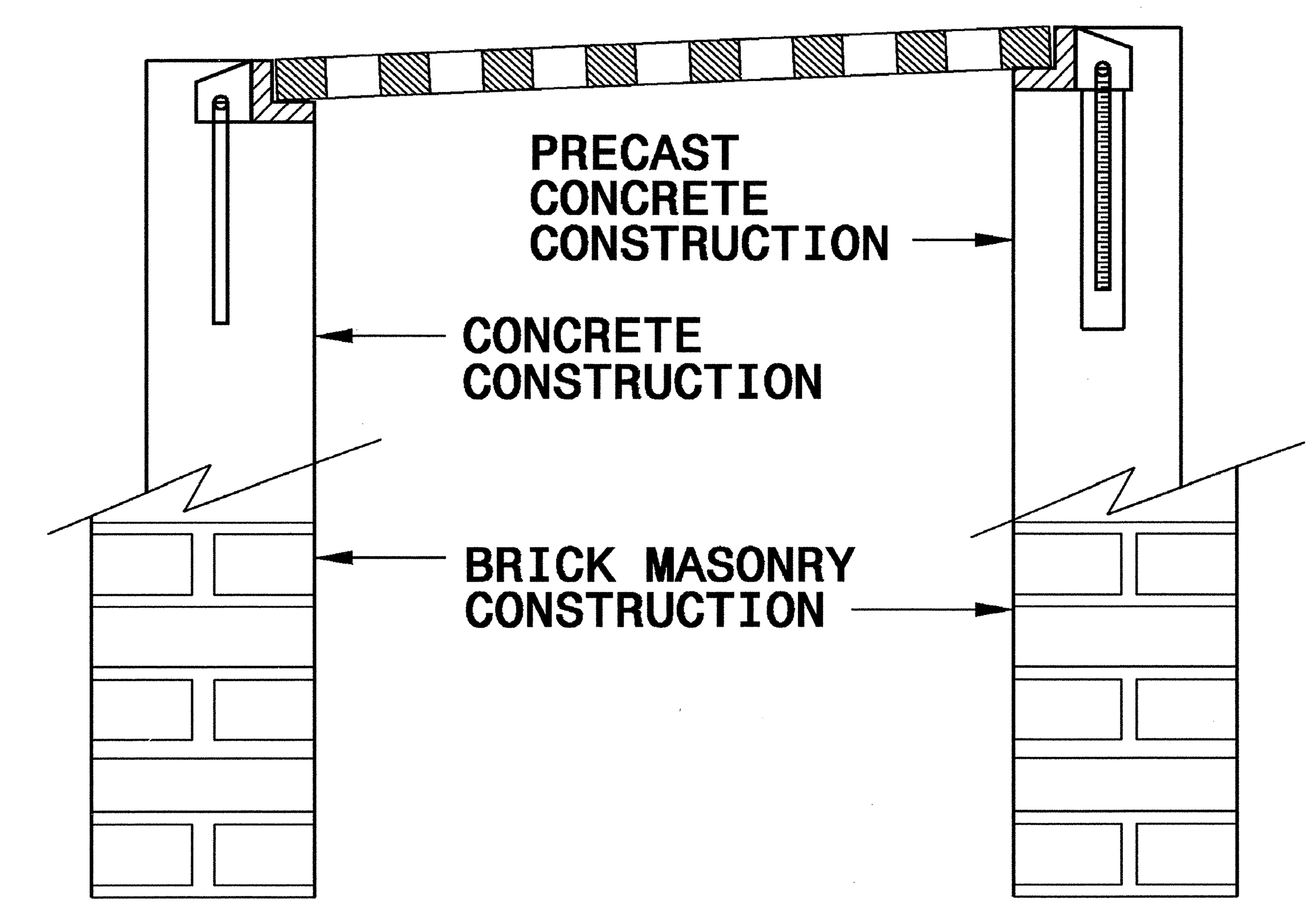
MASONRY ANCHOR
3⁄8″ DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3⁄8″ DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3⁄8″ DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

SHEET 1 OF 1
840D25

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

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

SHEET 1 OF 1
840D25

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOEL S. HOMERYK 7/1/07

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

SEE PLATE FOR TITLE

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

5/14/99

27-SEP-2006 08:59
S:\Contracts\Projects\Special Details\ericward\stds\06'Stds to Special Details\84025 Anchorage for Frames\0840d25.dgn
ericward AT PS222293

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-4906	3

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202147

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 ********** (14+93.50)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (15+40.25)
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	200	CY	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0106000000-E	230	12,600	CY	BORROW EXCAVATION
0134000000-E	240	50	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	250	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	200	SY	FABRIC FOR SOIL STABILIZATION
0318000000-E	300	12	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0366000000-E	310	64	LF	15" RC PIPE CULVERTS, CLASS III
0660000000-E	310	48	LF	***"BIT COAT CS PIPE CULVERTS, TYPE A *****" THICK 15" BIT COAT CS PIPE, TYPE A 0.064" THICK
0680000000-E	310	4	EA	**" BIT COAT CS PIPE ELBOWS, TYPE A *****" THICK 15" BIT COAT CS PIPE ELBOWS, TYPE A 0.064" THICK
0806000000-E	310	4	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
1220000000-E	545	300	TON	INCIDENTAL STONE BASE
1491000000-E	610	1,730	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1503000000-E	610	1,540	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1523000000-E	610	620	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1560000000-E	620	150	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-E	620	40	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-E	654	50	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	33	EA	RIGHT OF WAY MARKERS
2022000000-E	815	44.8	CY	SUBDRAIN EXCAVATION
2033000000-E	815	33.6	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	200	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	6	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
2286000000-N	840	4	EA	MASONRY DRAINAGE STRUCTURES
2407000000-N	840	4	EA	STEEL FRAME WITH TWO GRATES, STD 840.37
2556000000-E	846	87	LF	SHOULDER BERM GUTTER
3030000000-E	862	2,887.5	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3270000000-N	SP	8	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	8	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3635000000-E	876	10	TON	RIP RAP, CLASS II
3649000000-E	876	342	TON	RIP RAP, CLASS B
3656000000-E	876	2,289	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4400000000-E	1110	573	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	188	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4445000000-E	1145	128	LF	BARRICADES (TYPE III)
4685000000-E	1205	3,870	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	3,870	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4770000000-E	1205	1,308	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (III)
4900000000-N	1251	28	EA	PERMANENT RAISED PAVEMENT MARKERS
6000000000-E	1605	4,100	LF	TEMPORARY SILT FENCE
6006000000-E	1610	240	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	360	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	430	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	5	ACR	TEMPORARY MULCHING
6018000000-E	1620	400	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	300	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	8	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	750	LF	SAFETY FENCE
6030000000-E	1630	1,020	CY	SILT EXCAVATION
6036000000-E	1631	2,000	SY	MATTING FOR EROSION CONTROL
6038000000-E	SP	100	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	140	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	6	EA	SPECIAL STILLING BASINS
6071030000-E	SP	310	LF	COIR FIBER BAFFLES
6084000000-E	1660	10	ACR	SEEDING & MULCHING
6087000000-E	1660	6	ACR	MOWING
6090000000-E	1661	200	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.5	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	250	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	7	TON	FERTILIZER TOPDRESSING
6114000000-N	SP	10	HR	SPECIALIZED HAND MOWING
6117000000-N	SP	24	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.1	ACR	REFORESTATION

8/17/99

COMPUTED BY: WBA DATE: 6/09
CHECKED BY: JTJ DATE: 6/09

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PROJECT REFERENCE NO.	SHEET NO.
R-4906	3-A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

"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			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACE CONCRETE BARRIER STD. 857.01	REMOVE EXISTING GUARDRAIL		REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	TYPE III	CAT-1	AT-1	B-77				EA	G	NG				
-L-	11+73	14+48	LT	275.0'			14+48	13+00	5'	8'					1				1										
-L-	10+14	14+14	RT	400.0'			11+50	14+14	5'	8'					1				1										
-L-	15+73	19+48	LT	375.0'			19+00	15+73	5'	8'					1				1										BREAK FOR RAILROAD
-L-	15+39	19+39	RT	400.0'			15+39	19+00	5'	8'					1				1										BREAK FOR RAILROAD
-EL-	7+80.26	14+42.76	LT	662.5'			14+42.76	9+00	5.5'	8.5'					1				1										
-EL-	8+12.74	14+62.74	RT	650.0'			9+50	14+62.74	5.5'	8.5'					1				1										
-EL-	16+17.76	19+05.26	LT	287.5'			16+17.76	16+17.76	5.5'	8.5'					1				1										
-EL-	16+37.74	20+25.24	RT	387.5'			16+37.74	19+00	5.5'	8.5'					1				1										
PROJECT TOTAL				3437.5'											8				8										
LESS ANCHOR DEDUCTIONS			GRAU-350 8 @ 50' =	- 400'																									
			B-77 8 @ 18.75' =	- 150'																									
GRAND TOTAL				2887.5'			(5 ADDITIONAL GUARDRAIL POSTS)								8				8										

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- 10+00.00 TO 14+31.00	501		2653	2152	
BRIDGE #86					
-L- 15+56.00 TO 19+85.00	16		1024	1008	
SUBTOTAL	517		3677	3160	
-EL- 7+75.00 TO 14+52.75	75		6222	6147	
BRIDGE #59					
-EL- 16+27.75 TO 20+25.00	630		2198	1568	
SUBTOTAL	705		8420	7715	
TOTAL	1222		12097	10875	
LOSS DUE TO CLEAR & GRUB.					
EST. SHOULDER MATERIAL			1009	1009	
WASTE TO REPLACE BORROW					
ADDITIONAL UNDERCUT					
PROJECT TOTAL	1222		13106	11884	
5% TO REPLACE BORROW				595	
GRAND TOTAL	1222			12479	
SAY	1250			12600	

EST. DDE = 50 CY
EST. FABRIC FOR SOIL STABILIZATION = 200 SY
EST. SELECT GRANULAR MATERIAL = 250 CY
EST. UNDERCUT EXCAVATION = 200 CY

SUMMARY OF PAVEMENT REMOVAL
IN SQUARE YARDS

LOCATION	ASPHALT REMOVAL	ASPHALT BREAK UP	CONCRETE REMOVAL	CONCRETE BREAK UP
BRIDGE #86				
-L- 11+25 TO 14+17.41		662		
-L- 14+17.41 TO 14+57.56	89			
-L- 15+32.20 TO 15+69.69	83			
-L- 15+69.59 TO 17+25		674		
BRIDGE #59				
-EL- 8+60 TO 14+38.90		1424		
-EL- 14+38.90 TO 14+59.20	45			
-EL- 16+18.43 TO 16+41.60	52			
-L- 16+41.60 TO 18+75		516		
TOTAL	269	3276		
SAY	270	3280		

NOTE: Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the contract Lump Sum price for "Grading".

COMPUTED BY: WBA	DATE: 5/08
CHECKED BY: JTJ	DATE: 5/08

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PROJECT REFERENCE NO.	SHEET NO.
R-4906	3-B

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE A (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR C.S. PIPE OR TYPE IR ALUMINIZED OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	18" ALUMINIZED C.S. PIPE, TYPE IR			ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	J.B. STD. 840.31 OR 840.32	G.D.I. TYPE "B" STD. 840.18 OR 840.27	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.36	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.29	STEEL FRAME & GRATE STD. 840.37	G.D.I. FRAME & GRATE STD. 840.20	M.H. FRAME & COVER STD. 840.54		CONV. EXIST. C.B. TO T.B.J.B.	CONV. EXIST. D.I. TO J.B.	ADJUST M.H.	FLOWABLE FILL, C.Y.		CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
BRIDGE #59																																																																	
14+22 -EL-	LT	1		390.94																																	1													1		1													
14+22 -EL-	CL	1	2		387.77	387.67			32																																																								
14+22 -EL-	RT	2		390.94																																	1													1		1													
14+22 -EL-	RT	2	OUT		387.67	380.00											28																																												2@15"				ROD & LUG
SUB-TOTAL									32								28																				2													2		2													
BRIDGE #86																																																																	
15+95 -L-	LT	1		389.20																																	1													1		1													
15+95 -L-	CL	1	2		386.03	385.93			32																																																								
15+95 -L-	RT	2		389.20																																	1													1		1													
15+95 -L-	RT	2	OUT		385.93	381.20											20																																												2@15"				
SUB-TOTAL									32								20																				2													2		2													
PROJECT TOTAL									64								48																				4													4		4												4@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.)	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

8/17/99

8/17/99

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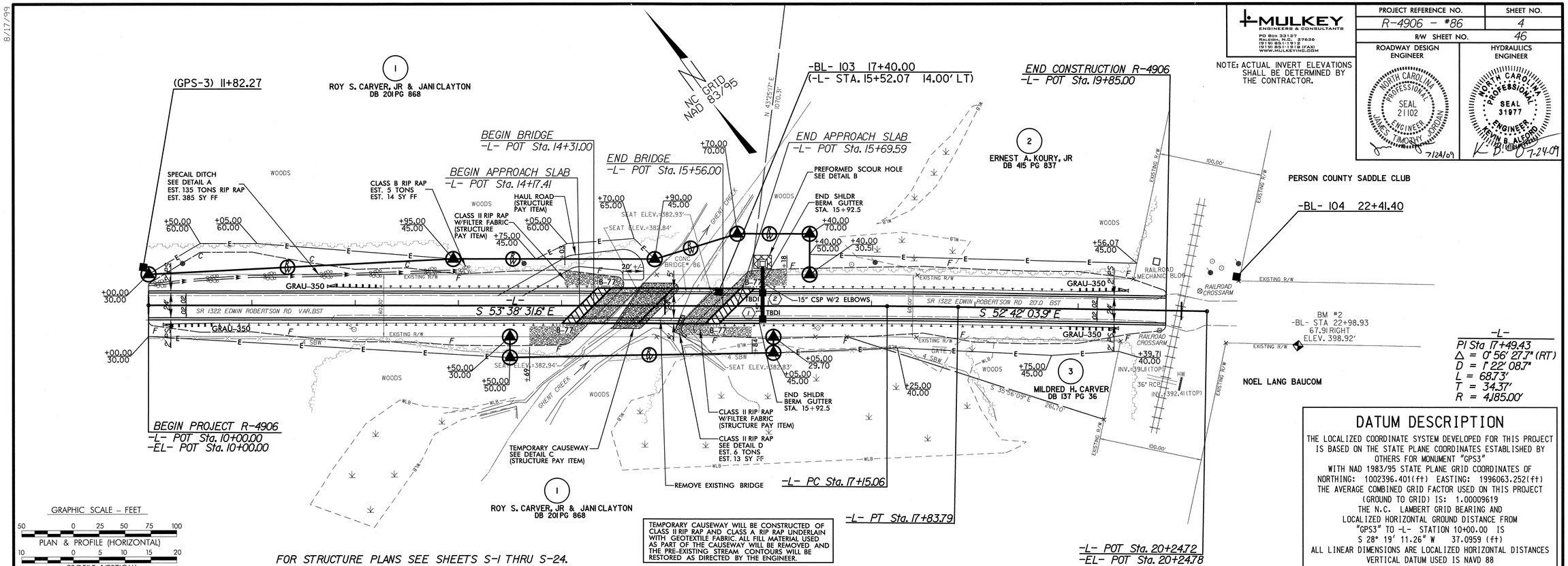
PROJECT REFERENCE NO.	SHEET NO.
R-4906 - *86	4
R/W SHEET NO.	46

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN — 7/24/09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD — 7-24-09

NOTE: ACTUAL INVERT ELEVATIONS SHALL BE DETERMINED BY THE CONTRACTOR.



GRAPHIC SCALE – FEET

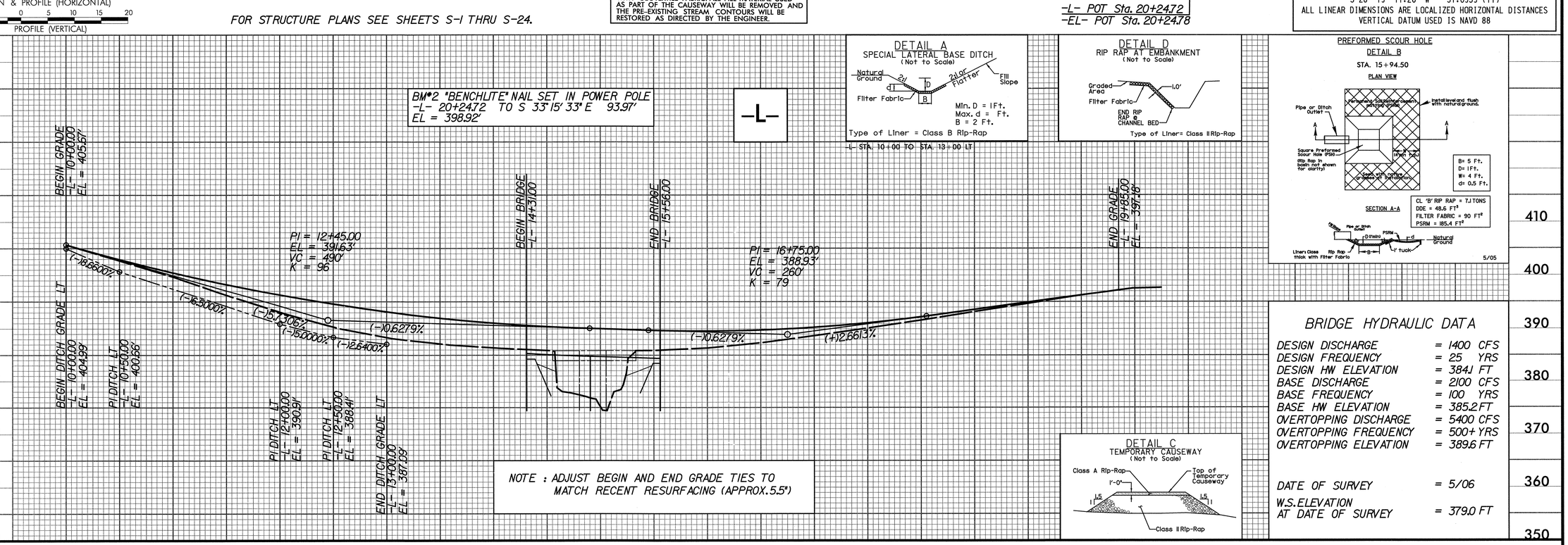
50 0 25 50 75 100
PLAN & PROFILE (HORIZONTAL)
10 0 5 10 15 20
PROFILE (VERTICAL)

FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-24.

TEMPORARY CAUSEWAY WILL BE CONSTRUCTED OF CLASS II RIP RAP AND CLASS A RIP RAP UNDERLAIN WITH GEOTEXTILE FABRIC. ALL FILL MATERIAL USED AS PART OF THE CAUSEWAY WILL BE REMOVED AND THE PRE-EXISTING STREAM CONTOURS WILL BE RESTORED AS DIRECTED BY THE ENGINEER.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "GPS3"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 1002396.401(ft) EASTING: 1996063.252(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00009619
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS3" TO -L- STATION 10+00.00 IS S 28° 19' 11.26" W 37.0959 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88



NOTE : ADJUST BEGIN AND END GRADE TIES TO MATCH RECENT RESURFACING (APPROX. 5.5")

DETAIL A
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Min. D = 1Ft.
Max. d = Ft.
B = 2 Ft.
Type of Liner = Class B Rip-Rap
-L- STA. 10+00 TO STA. 13+00 LT

DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)

Type of Liner= Class II Rip-Rap

PREFORMED SCOUR HOLE
DETAIL B
STA. 15+94.50
PLAN VIEW

SECTION A-A

CL 'B' RIP RAP = 7.1 TONS
DDE = 48.6 FT²
FILTER FABRIC = 90 FT²
PSRM = 185.4 FT²
5/05

DETAIL C
TEMPORARY CAUSEWAY
(Not to Scale)

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1400 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 384.1 FT
BASE DISCHARGE	= 2100 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 385.2 FT
OVERTOPPING DISCHARGE	= 5400 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 389.6 FT
DATE OF SURVEY	= 5/06
W.S. ELEVATION AT DATE OF SURVEY	= 379.0 FT

7/24/2009
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8/17/99

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "GPS-1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 994498.884(ft) EASTING: 1999957.506(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00009619
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-1" TO -EL- STATION 7+75.00 IS N 35° 35' 57.69" W 1,353.8498(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

-EL-

PI Sta 8+91.06	PI Sta 11+65.63	PI Sta 18+24.33
Δ = 0° 54' 52.7" (LT)	Δ = 0° 33' 47.2" (RT)	Δ = 0° 38' 16.1" (RT)
D = 0° 28' 38.9"	D = 0° 22' 18.5"	D = 0° 13' 35.8"
L = 191.56'	L = 151.45'	L = 281.44'
T = 95.78'	T = 75.73'	T = 140.72'
R = 12,000.00'	R = 15,409.94'	R = 25,282.63'

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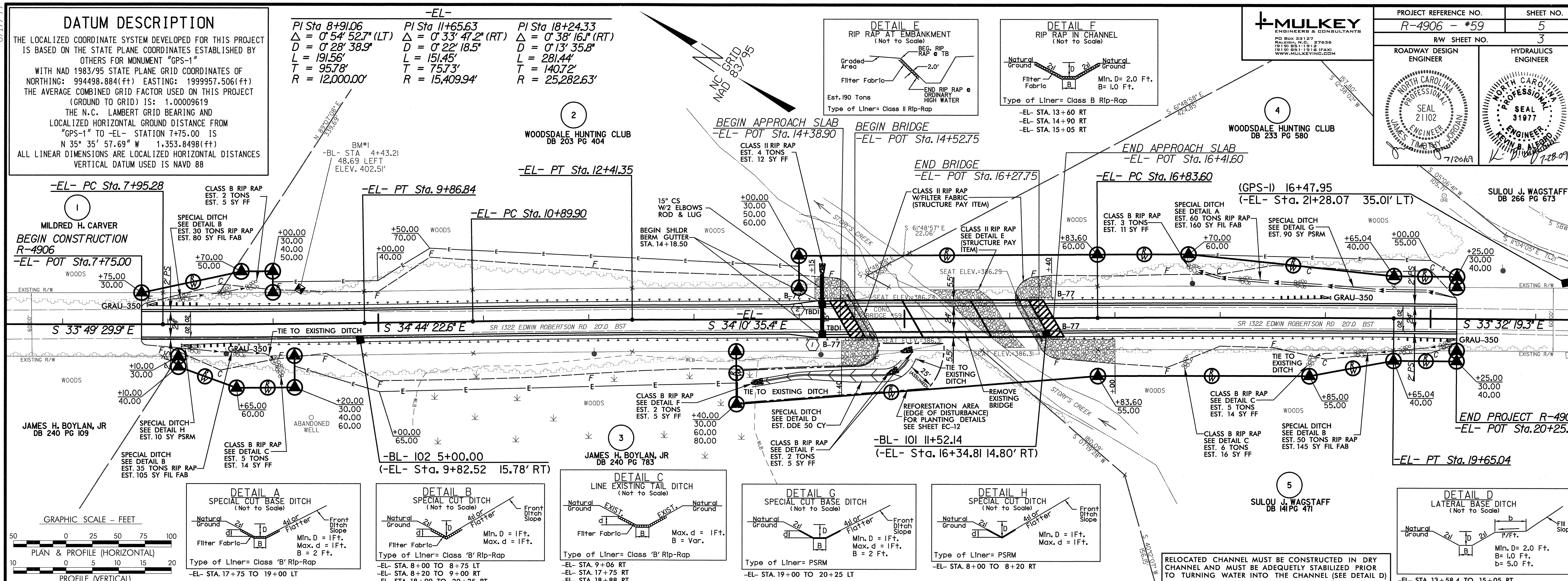
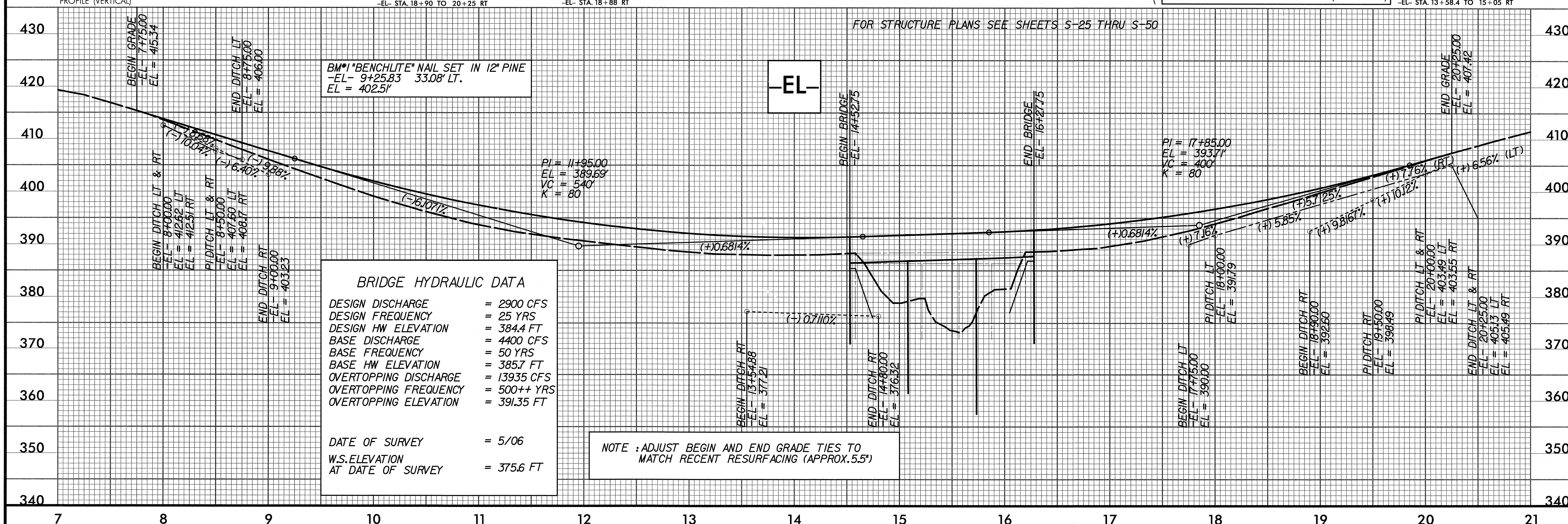
PROJECT REFERENCE NO.	SHEET NO.
R-4906 - #59	5
R/W SHEET NO.	3

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 JAMES TIMOTHY JORDAN 7/28/09	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN B. ALFORD 7-28-09





BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2900 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 384.4 FT
BASE DISCHARGE	= 4400 CFS
BASE FREQUENCY	= 50 YRS
BASE HW ELEVATION	= 385.7 FT
OVERTOPPING DISCHARGE	= 13935 CFS
OVERTOPPING FREQUENCY	= 500++ YRS
OVERTOPPING ELEVATION	= 391.35 FT
DATE OF SURVEY	= 5/06
W.S. ELEVATION AT DATE OF SURVEY	= 375.6 FT

NOTE : ADJUST BEGIN AND END GRADE TIES TO MATCH RECENT RESURFACING (APPROX. 5.5")