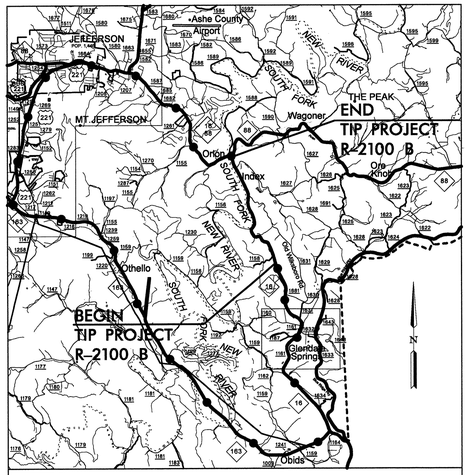
TIP PROJECT: R-2100B

CONTRACT: C202594

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



VICINITY MAP
(NOT TO SCALE)

PROP. DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ASHE COUNTY

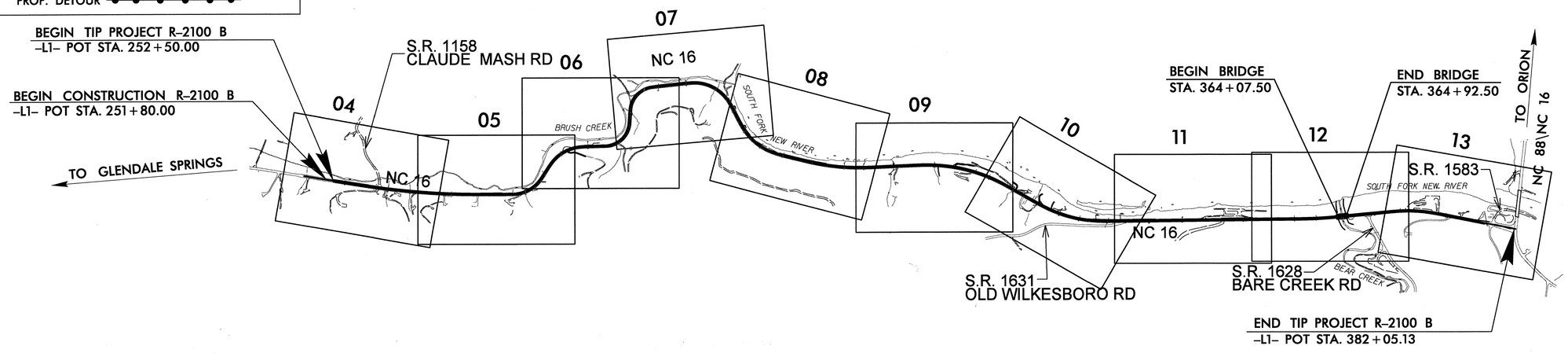
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2100B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34369.1.1	STP – 16 (1)	PE
34369.2.4	STP – 0016(41)	R/W & UTILITIES
34369.3.5	STP – 0016(44)	CONSTR.

LOCATION: NC 16 FROM SOUTHEAST OF SR 1158 TO SOUTHEAST OF NC 88

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

NC GRID
NAD 83



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

FUNCTIONAL CLASSIFICATION:
RURAL MAJOR COLLECTOR

ADT 2010 = 3620
ADT 2030 = 6100
DHV = 13 %
D = 60 %
T = 9 % *
V = 60 MPH

* TTST=3 % DUAL=6%
DESIGN EXCEPTION REQUIRED FOR HORIZONTAL AND VERTICAL ALIGNMENTS LESS THAN 60 MPH

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2100B =	2.438 MI.
LENGTH STRUCTURES TIP PROJECT R-2100B =	0.016 MI.
TOTAL LENGTH TIP PROJECT R-2100B =	2.454 MI.

Prepared In the Office of:

AECOM

NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

FOR THE N. C. DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
December 21, 2007

LETTING DATE:
— JUNE 15, 2010 —

KEVIN M. HAUGHEY, P.E.
PROJECT ENGINEER

KEVIN J. VAN METRE, P.E.
PROJECT DESIGN ENGINEER

B. DOUG TAYLOR, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD

1-21-10

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 17623 ENGINEER KEVIN M. HAUGHEY

1-21-10

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

P.E.

STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	1-A

RW SHEET NO.

ROADWAY DESIGN ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Index of Sheets

1	Title Sheet
1-A	Index of Sheets, General Notes, Std. Drawing List
1-B	Conventional Symbols
1-C	Survey Control Sheet
2 thru 2-A	Typical Sections
2-B	Detail for Anchorage for Frames
2-C & 2-D	Detail for Method of Pipe Installation
2-E	Detail for Soil Nail Slope Stabilization
3 (2 SHEETS)	Summary of Quantities
3-A thru 3-G	Drainage Summary
3-H	Guardrail Summary
3-I	Earthwork Summary
3-J	Miscellaneous Summaries
3-K	Parcel Index Sheet
4 thru 13	Plan Sheets
14 thru 19	Profile Sheets
TCP-1 thru TCP-22	Traffic Control Plans
PMP-1 thru PMP-3	Pavement Marking Plans
EC-1 thru EC-23	Erosion Control Plans
UO-1 thru UO-11	Utilities By Others
RF-1	Reforestation Plans
S-1 thru S-19	Structure (Bridge) Plans
W-1 thru W-16	Retaining Wall Plans
X-0	Cross Section Index Sheet
XSUM-1	Cross Section Summary Sheet
X-1 thru X-208	Cross Section Sheets

GENERAL NOTES:

2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-30-08

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

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.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

UNDERDRAINS:

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

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE: Blue Ridge EMC (Power), Skyline TMC (Telephone), Embarq (Telephone), AND Ashe County Cablevision (CATV).

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.05	Concrete 'L' Endwall for Single Pipe Culverts - 15" thru 48" Pipe
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.15	Brick 'L' Endwall for Single Pipe Culverts - 15" thru 48" Pipe
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.39	Reinforced Concrete Endwall - for Single 72" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.57	Reinforced Brick Endwall - for Single 60" Pipe 90 Skew
838.69	Reinforced Brick Endwall - for Single 72" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
852.01	Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
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
866.04	Barbed Wire Fence with Wood Posts (2 - 7 Strands)
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

REVISIONS

USER: vanmetrek
DATE: 2/16/2010
TIME: 9:36:00 AM
DGN: G:\60131811\R2100B\Roadway\Proj\r2100b_rdy_tsh.dgn

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

REVISIONS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- 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
- Proposed Temporary Utility Easement — TUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed 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 — 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
- Designated U/G Water Line (S.U.E.*)
- 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

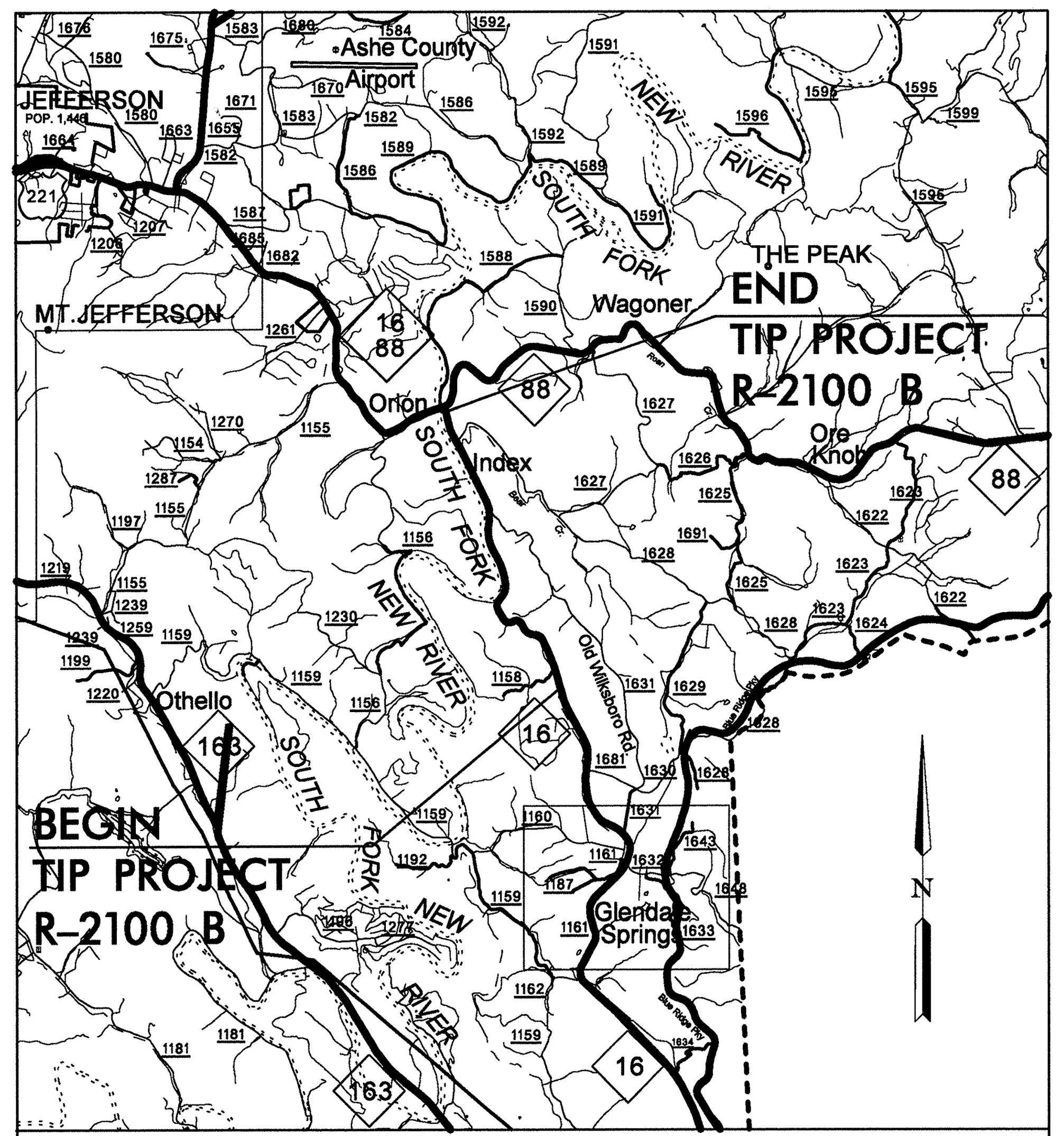
MISCELLANEOUS:

- 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.

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	1-C

Location and Surveys

SURVEY CONTROL SHEET R-2100B



VICINITY MAP
(NOT TO SCALE)

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L1 STATION	OFFSET
BL32	BL-32	959336.6058	1296499.5641	2869.80	OUTSIDE PROJECT LIMITS	
BL33	BL-33	960738.9293	1296085.5005	2828.25	256+71.68	17.52 LT
BL34	BL-34	961398.6230	1295897.6130	2819.34	263+55.99	26.85 RT
BL35	BL-35	962153.2760	1295517.9270	2803.20	271+95.61	17.88 RT
BL36	BL-36	962324.3468	1294908.6880	2792.79	278+14.36	45.62 LT
BL137	BL-137	962840.0664	1294652.8501	2770.05	283+58.92	48.31 RT
BL38	BL-38	962691.0975	1294178.6152	2746.78	288+19.75	55.95 LT
BL39	BL-39	963045.6240	1293882.6300	2719.29	292+59.81	17.59 LT
BL40	BL-40	963438.9744	1293734.5400	2699.19	296+74.98	24.91 LT
BL41	BL-41	964099.1188	1294109.0367	2688.67	304+28.96	18.82 RT
BL42	BL-42	964963.1673	1293941.0077	2681.37	313+06.62	13.94 RT
BL43	BL-43	965768.5007	1293509.9695	2887.37	322+17.49	19.42 LT
BL44	BL-44	966388.2170	1293384.8839	2692.27	328+46.39	18.15 LT
BL45	BL-45	966887.7527	1293464.4278	2692.06	333+49.11	27.09 RT
BL46	BL-46	967651.8752	1293307.2849	2685.94	341+27.83	19.80 RT
BL147	BL-147	968499.4375	1292857.7946	2685.89	350+86.37	18.31 LT
BL48	BL-48	969222.0937	1292498.6794	2681.13	358+93.27	28.99 LT
BL49	BL-49	969909.3702	1292140.5948	2676.79	366+70.61	14.93 LT
BL50	BL-50	970382.1960	1291883.5350	2680.32	372+07.08	14.72 LT
BL51	BL-51	971297.1630	1291661.7840	2687.66	381+47.16	0.65 RT
BL52	BL-52	971111.3610	1290754.3060	2706.17	381+79.92	925.08 LT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y10 STATION	OFFSET
BY155	BY-155	960312.7850	1295644.2410	2903.38	OUTSIDE PROJECT LIMITS	
BY154	BY-154	960455.9330	1295721.5170	2877.51	OUTSIDE PROJECT LIMITS	
BY153	BY-153	960523.8910	1295852.1720	2851.68	OUTSIDE PROJECT LIMITS	
BY148	BY-148	960700.4850	1295931.3420	2827.20	11+02.73	16.04 LT
BY146	BY-146	960738.9293	1296085.5005	2828.25	12+53.68	47.09 RT

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y11 STATION	OFFSET
BY1145	BY1-145	967651.8752	1293307.2849	2685.94	11+12.44	21.87 RT
BY1149	BY1-149	967467.0230	1293435.8240	2705.74	13+38.90	11.75 LT
BY1156	BY1-156	967014.4880	1293598.7010	2743.56	OUTSIDE PROJECT LIMITS	
BY1157	BY1-157	966829.9200	1293854.3890	2774.50	OUTSIDE PROJECT LIMITS	
BY1158	BY1-158	966600.7520	1293937.4530	2796.74	OUTSIDE PROJECT LIMITS	

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y12 STATION	OFFSET
BY2144	BY2-144	969909.3702	1292140.5948	2676.79	OUTSIDE PROJECT LIMITS	
BY2150	BY2-150	970138.6770	1292273.5460	2687.43	12+36.68	14.45 LT
BY2159	BY2-159	970510.7890	1292540.0160	2722.05	OUTSIDE PROJECT LIMITS	

BM#1 ELEVATION = 2826.77'
N 960718 E 1295945
Y10 STATION 11+23 16' LEFT
8" SPIKE IN BASE OF POWER POLE

BM#2 ELEVATION = 2793.67'
N 962325 E 1294892
L1 STATION 278+26 56'
8" SPIKE IN ROOT OF 18" WHITE PINE LEFT

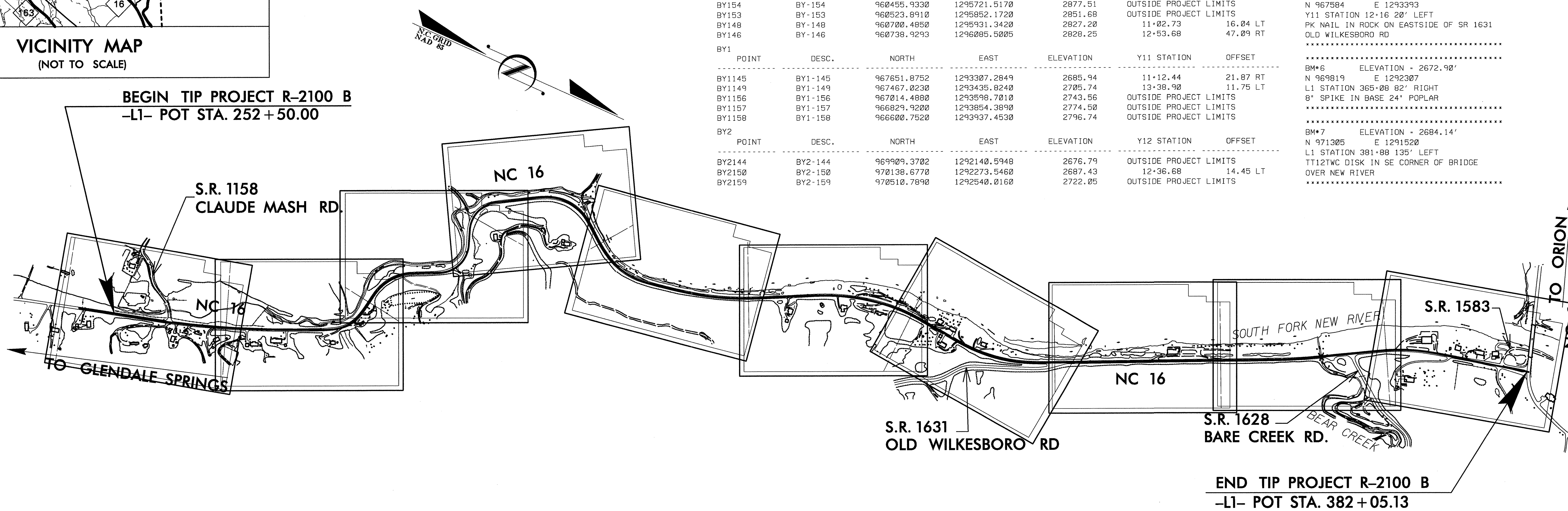
BM#3 ELEVATION = 2688.62'
N 963579 E 1293727
L1 STATION 297+96 66' LEFT
8" SPIKE IN ROOT OF 10" POPLAR

BM#4 ELEVATION = 2680.06'
N 965419 E 1293742
L1 STATION 318+02 33' RIGHT
PK NAIL IN SOUTH END OF HEAD WALL

BM#5 ELEVATION = 2697.24'
N 967584 E 1293393
Y11 STATION 12+16 20' LEFT
PK NAIL IN ROCK ON EASTSIDE OF SR 1631
OLD WILKESBORO RD

BM#6 ELEVATION = 2672.90'
N 969819 E 1292307
L1 STATION 365+08 82' RIGHT
8" SPIKE IN BASE 24" POPLAR

BM#7 ELEVATION = 2684.14'
N 971305 E 1291520
L1 STATION 381+88 135' LEFT
TT12TWC DISK IN SE CORNER OF BRIDGE
OVER NEW RIVER



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT ""CALLOWAY""
WITH NAD 1983 STATE PLANE GRID COORDINATES OF
NORTHING: 930843.1890(ft) EASTING: 1293861.6330(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99993295
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM ""CALLOWAY"" TO -L1- STATION 252+50.00 IS
N 04°34'11" E 29,589.78
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
TIP R2100B_LS_CONTROL_061215.TXT

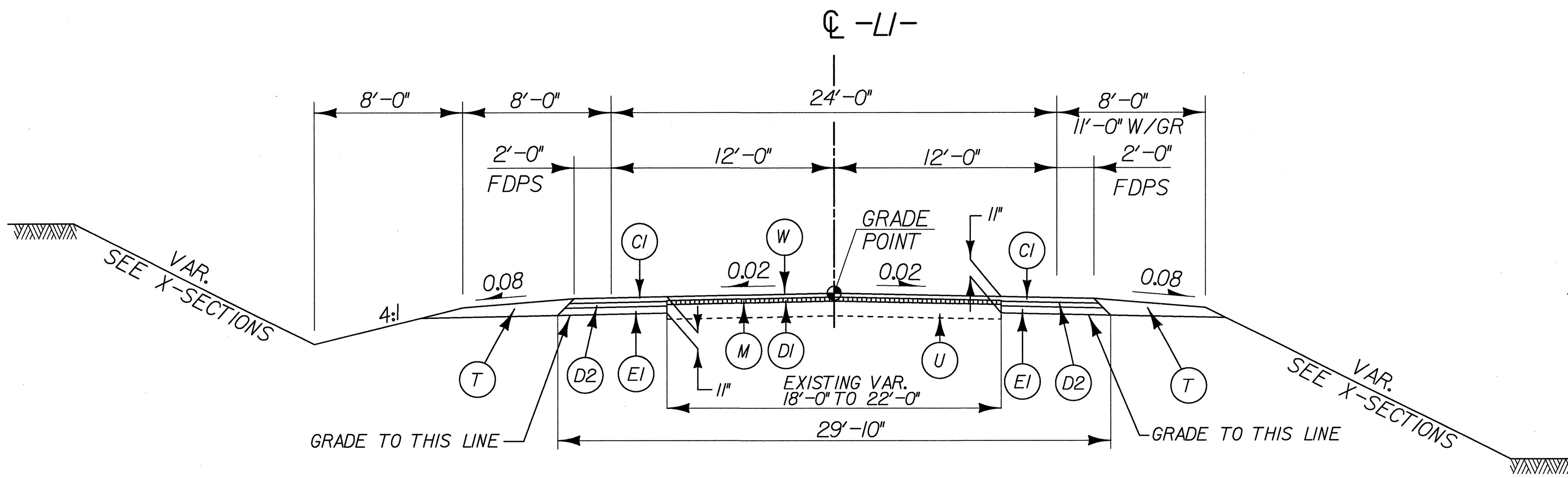
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

NOTE: DRAWING NOT TO SCALE

6/2/99
12:17:39 PM
r:\roadway\proj\r2100b_rdy-pshlc.dgn
roguec

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

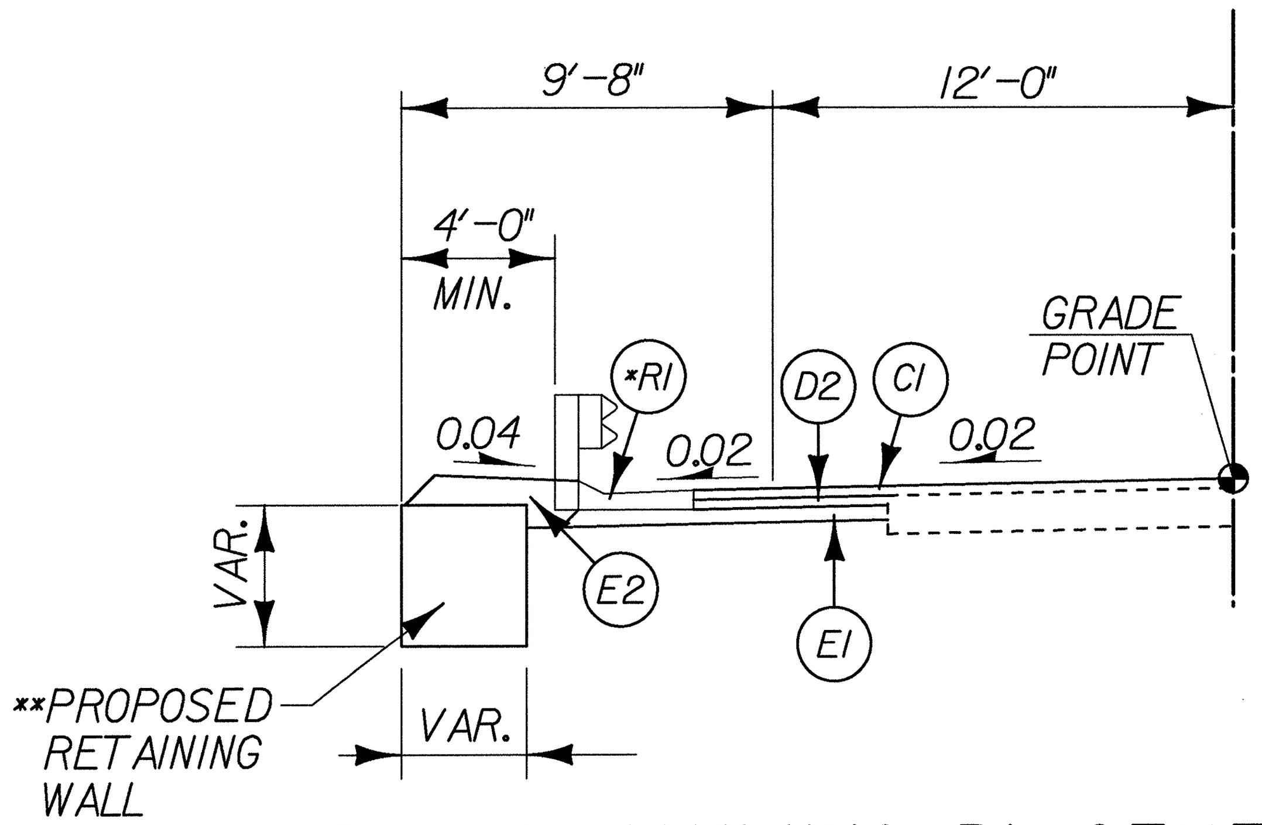
PROJECT REFERENCE NO.	SHEET NO.
R-2100B	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER



TYPICAL SECTION NO. 1

USE TYPICAL SECTION No.1 AS FOLLOWS:
-L1- STA.252+50.00 TO STA.364+07.50 (BEGIN BRIDGE)
-L1- STA.364+92.50 (END BRIDGE) TO STA.379+00.00

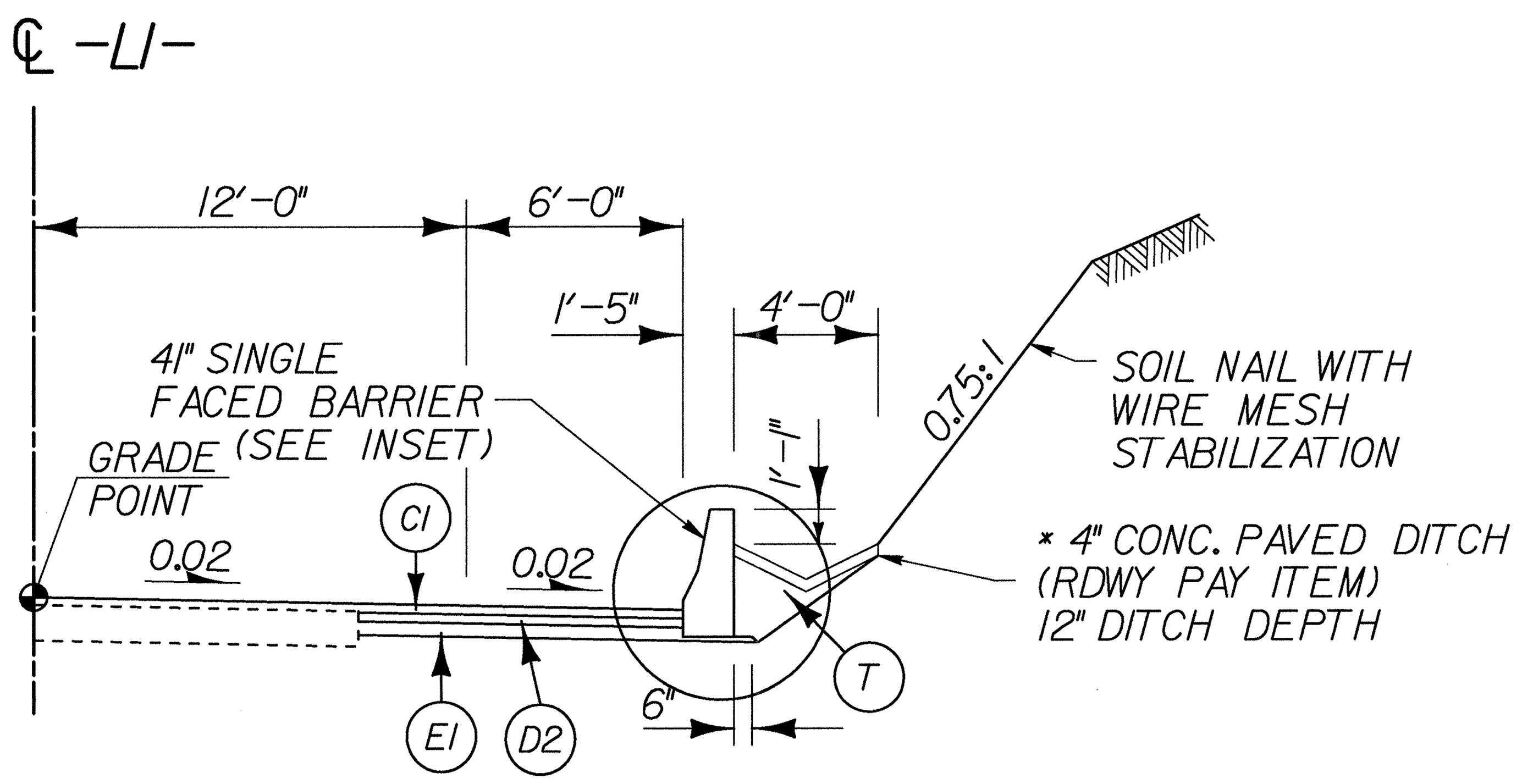
* SEE STD.846.01 AND STD.862.03 FOR SHOULDER BERM GUTTER



DETAIL SHOWING PLACEMENT OF RETAINING WALL

USE IN CONJUNCTION WITH TYPICAL SECTION NO.1
SEE PLANS FOR LOCATIONS

**SEE RETAINING WALL DETAIL SHEETS

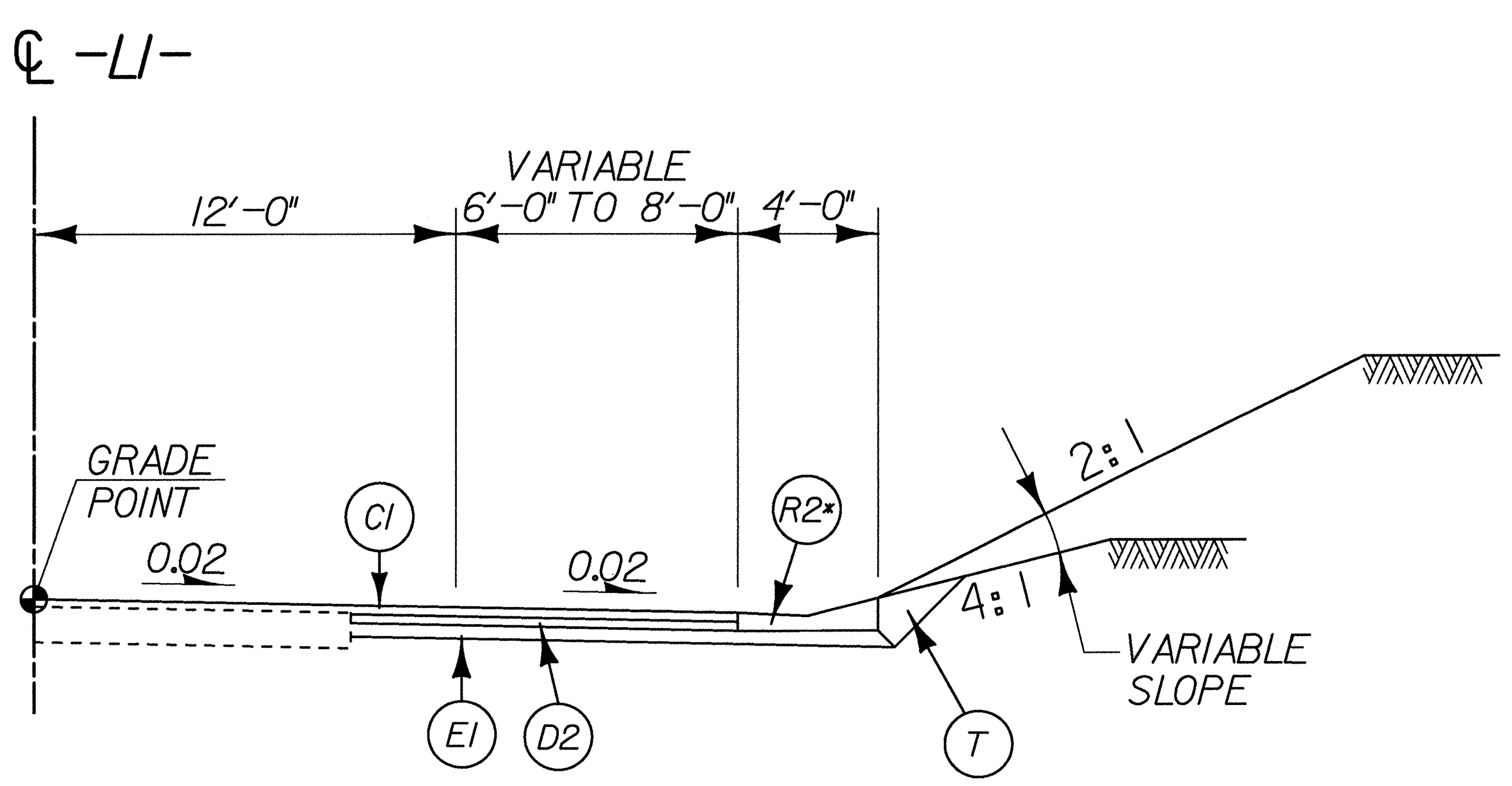


DETAIL SHOWING PLACEMENT OF SINGLE FACED BARRIER

USE IN CONJUNCTION WITH TYPICAL SECTION NO.1
SEE GUARDRAIL SUMMARY SHEET 3-H FOR LOCATIONS

* SEE STD.850.01 FOR 4" CONC.PAVED DITCH

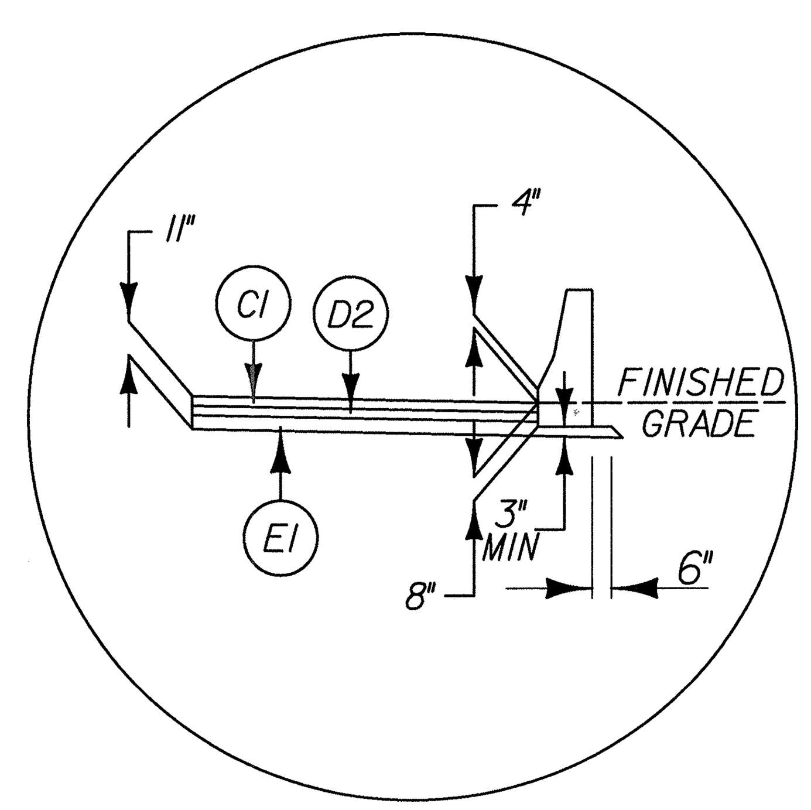
NOTE: TRANSITION FROM CONC. V-DITCH TO VAR.WIDTH BASE DITCH FOR PLACEMENT OF GRATED INLETS



DETAIL SHOWING PLACEMENT OF EXPRESSWAY GUTTER

USE IN CONJUNCTION WITH TYPICAL SECTION NO.1
SEE SUMMARY SHEET 3-J FOR LOCATIONS

* SEE STD.846.01 FOR EXPRESSWAY GUTTER



INSET FOR SF BARRIER

PAVEMENT SCHEDULE

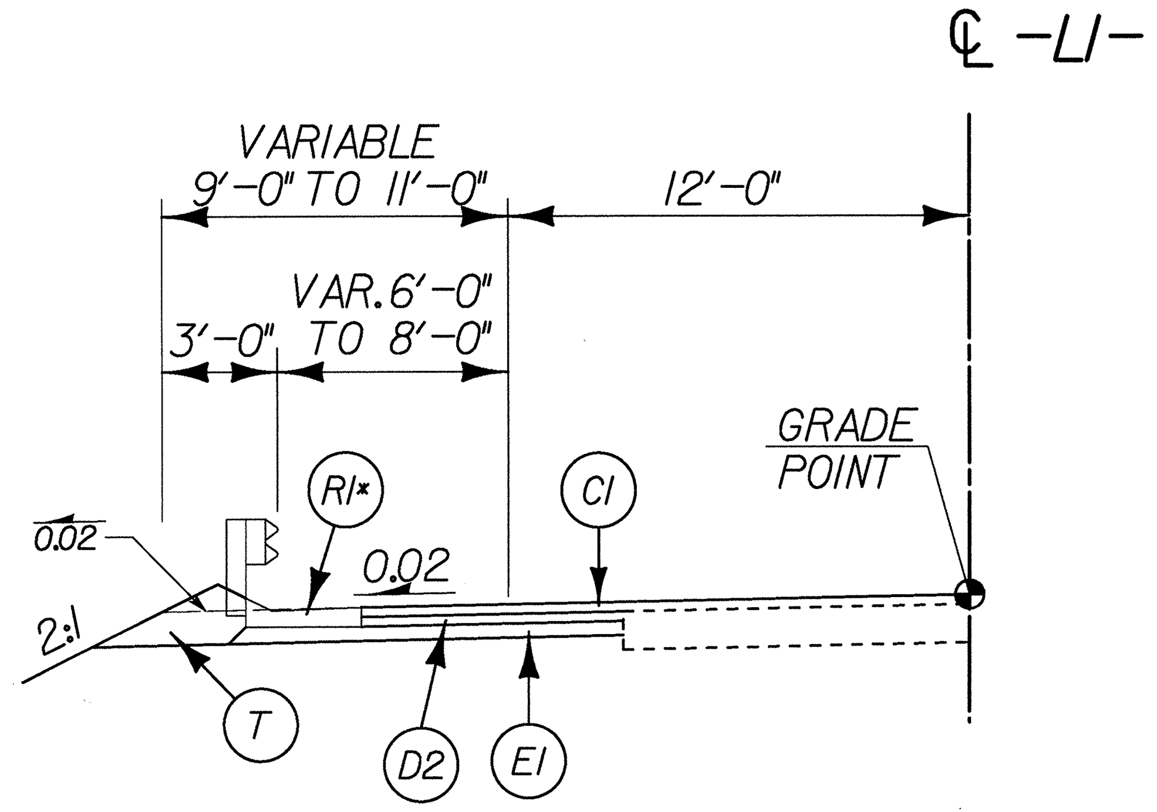
C1	PROPOSED APPROXIMATE 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YARD IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROPOSED APPROXIMATE 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YARD.
D2	PROPOSED APPROXIMATE 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROPOSED APPROXIMATE 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
M	MILLING ASPHALT PAVEMENT, 2.5" DEPTH
R1	SHOULDER BERM GUTTER
R2	EXPRESSWAY GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED-IN)
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	PROPOSED WEDGING. SEE WEDGING DETAIL.

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

REVISIONS

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

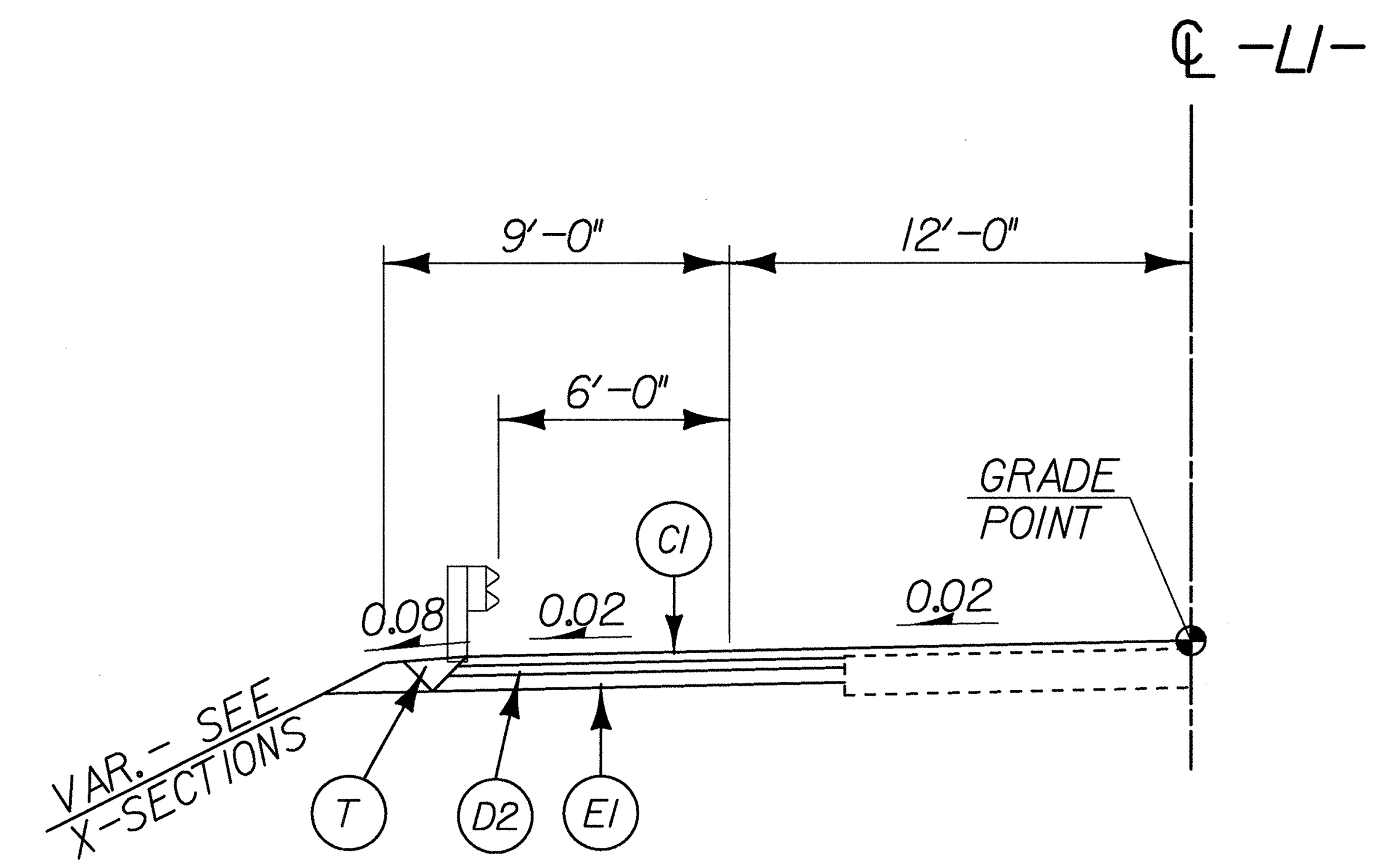
PROJECT REFERENCE NO.	SHEET NO.
R-2100B	2-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER



DETAIL SHOWING USE OF GUARDRAIL WITH SHOULDER BERM GUTTER

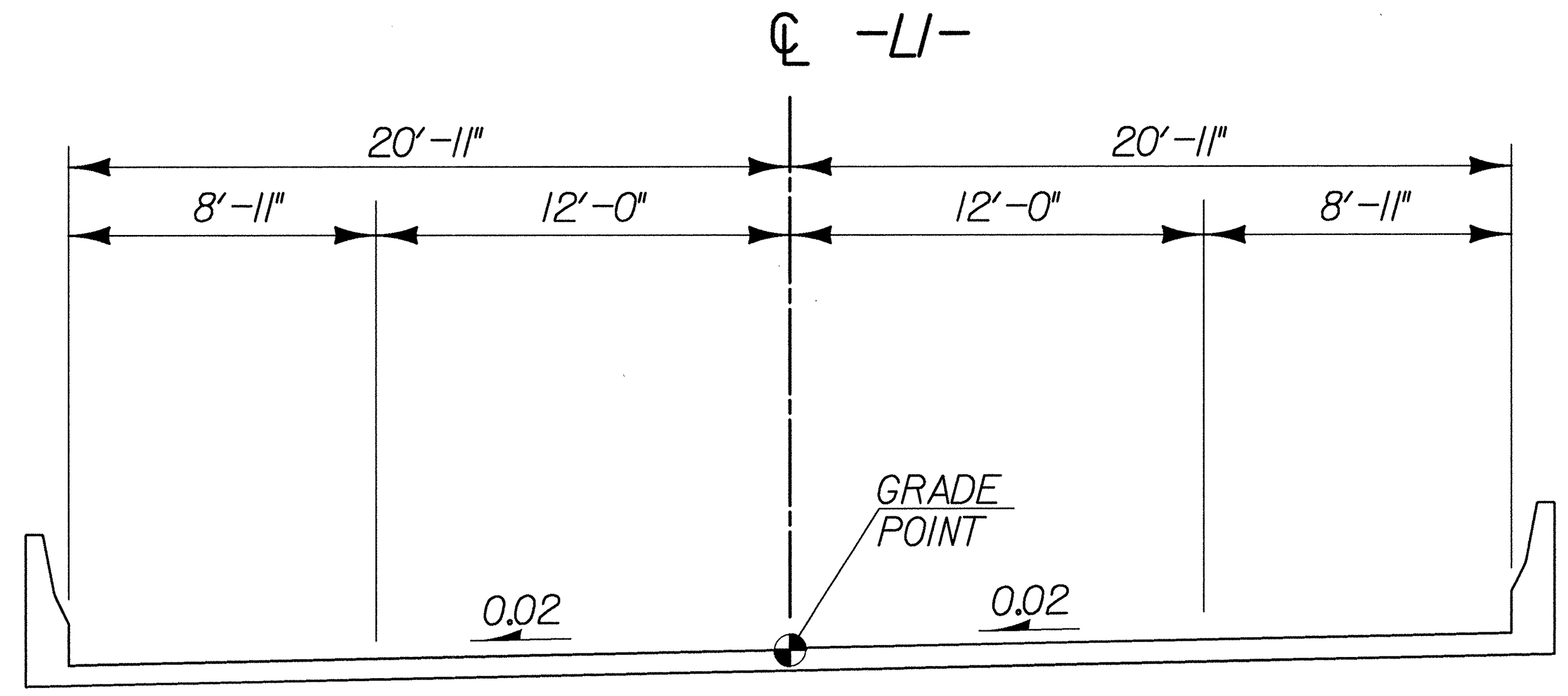
USE IN CONJUNCTION WITH TYPICAL SECTION NO.1
SEE SUMMARY SHEET 3-J FOR LOCATIONS

* SEE STD.846.01 AND STD.862.03 FOR SHOULDER BERM GUTTER



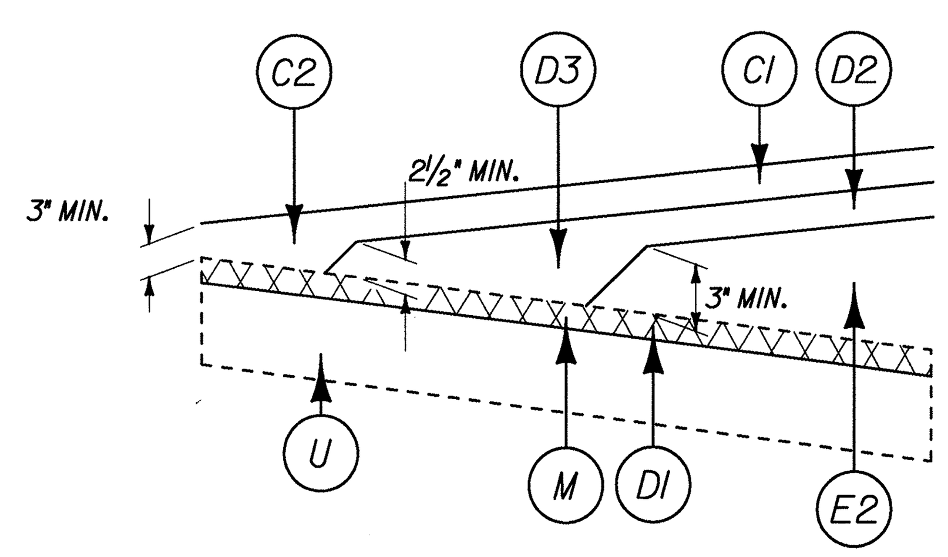
DETAIL SHOWING 6' OFFSET TO GUARDRAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO.1
SEE PLANS FOR LOCATIONS



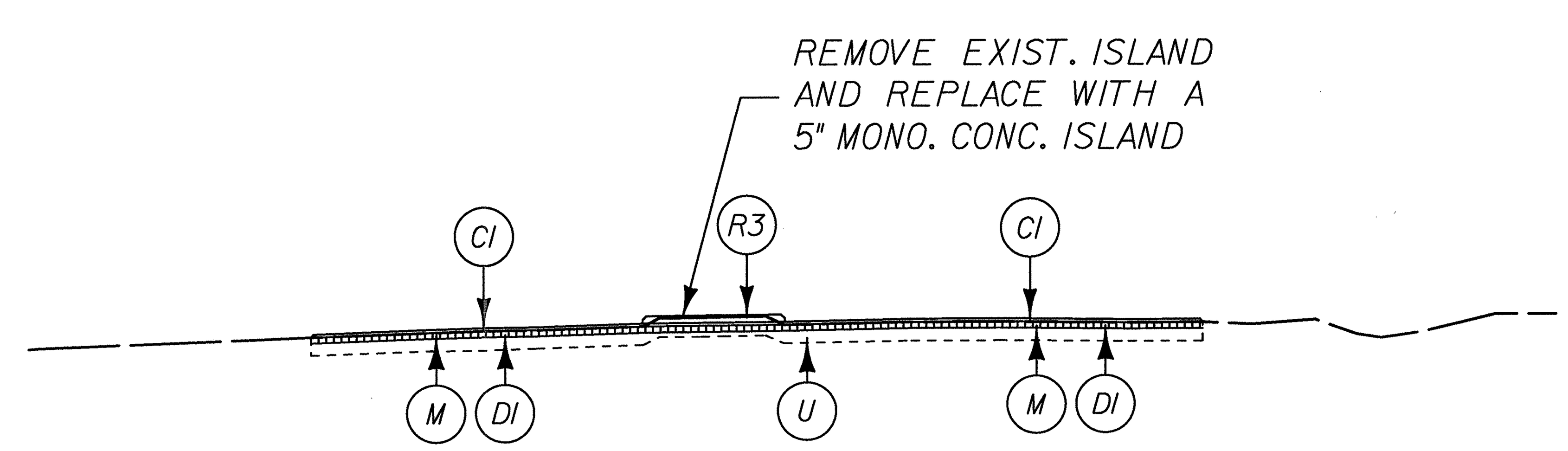
TYPICAL SECTION NO. 2

USE TYPICAL SECTION No.2 AS FOLLOWS:
-L- STA.364+07.50 (BEGIN BRIDGE)
TO STA.364+92.50 (END BRIDGE)



WEDGING DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO.1



TYPICAL SECTION NO. 3

USE TYPICAL SECTION No.3 AS FOLLOWS:
-L- STA.379+00.0 TO STA.382+05.13

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. DEPTH S9.5B
D1	2½" I19.0B
D2	4" I19.0B
D3	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	VAR. DEPTH B25.0B
M	MILL 2.5" DEPTH
R1	SHOULDER BERM GUTTER
R2	EXPRESSWAY GUTTER
R3	5" MONOL. CONC. ISLAND
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

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

REVISIONS

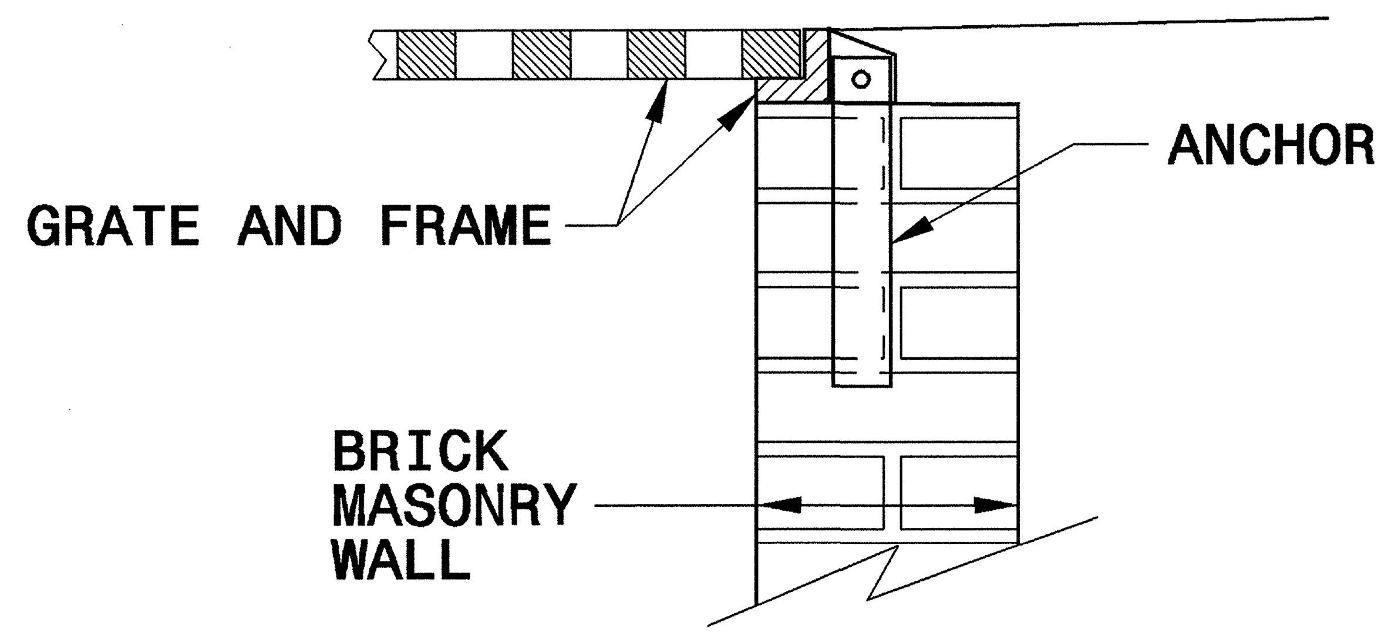
REVISION 1: 8/12/2008 Removed Typical Section for Detour.

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	2-B

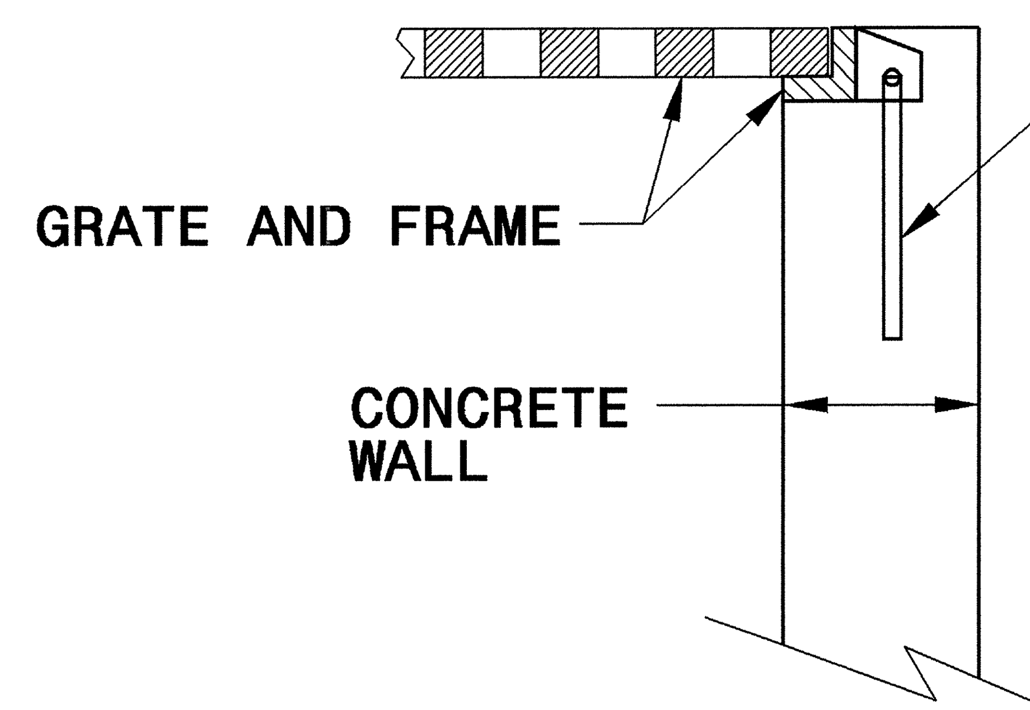
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

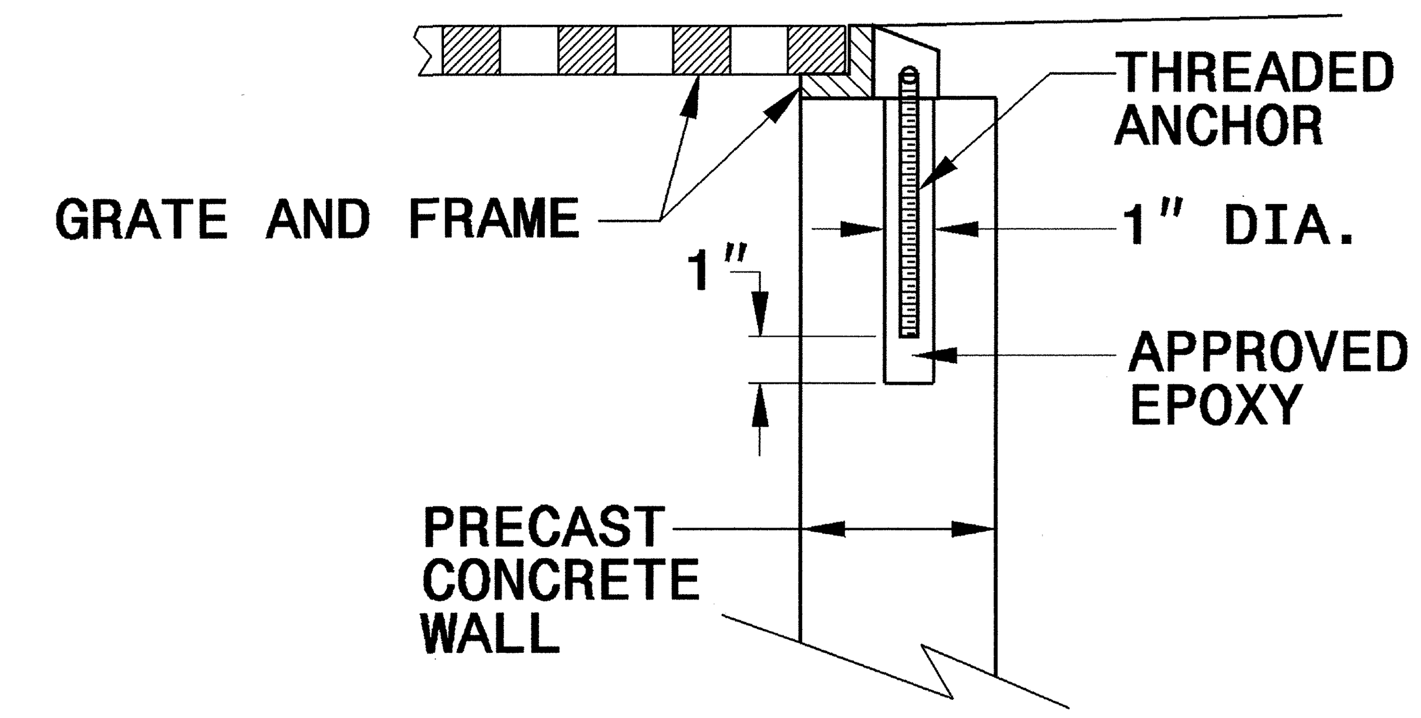
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



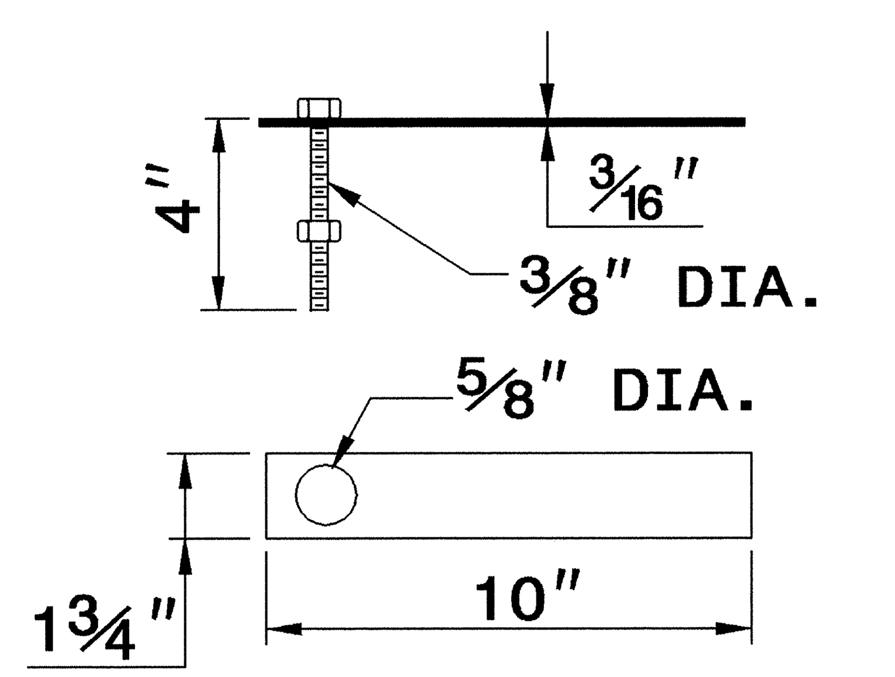
CONCRETE CONSTRUCTION



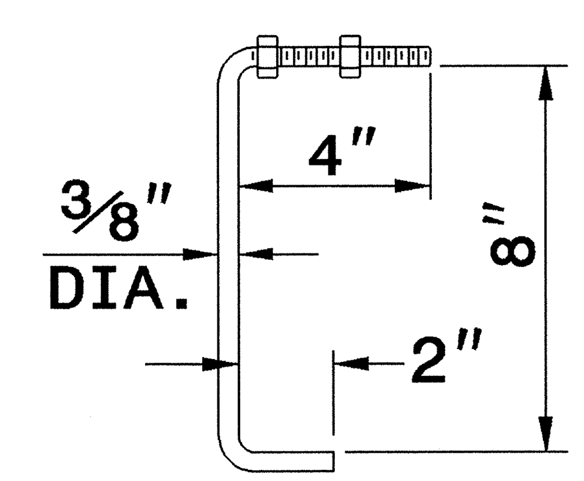
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

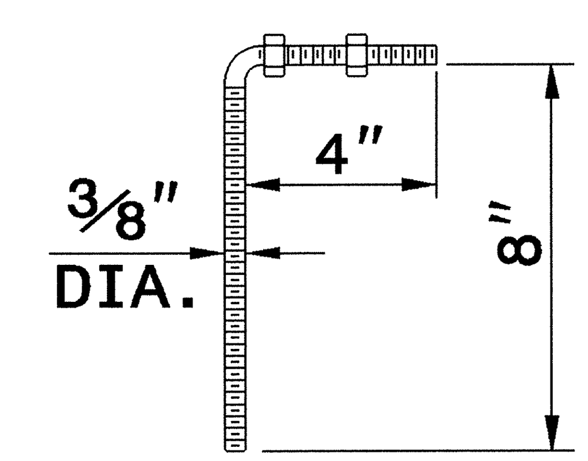
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



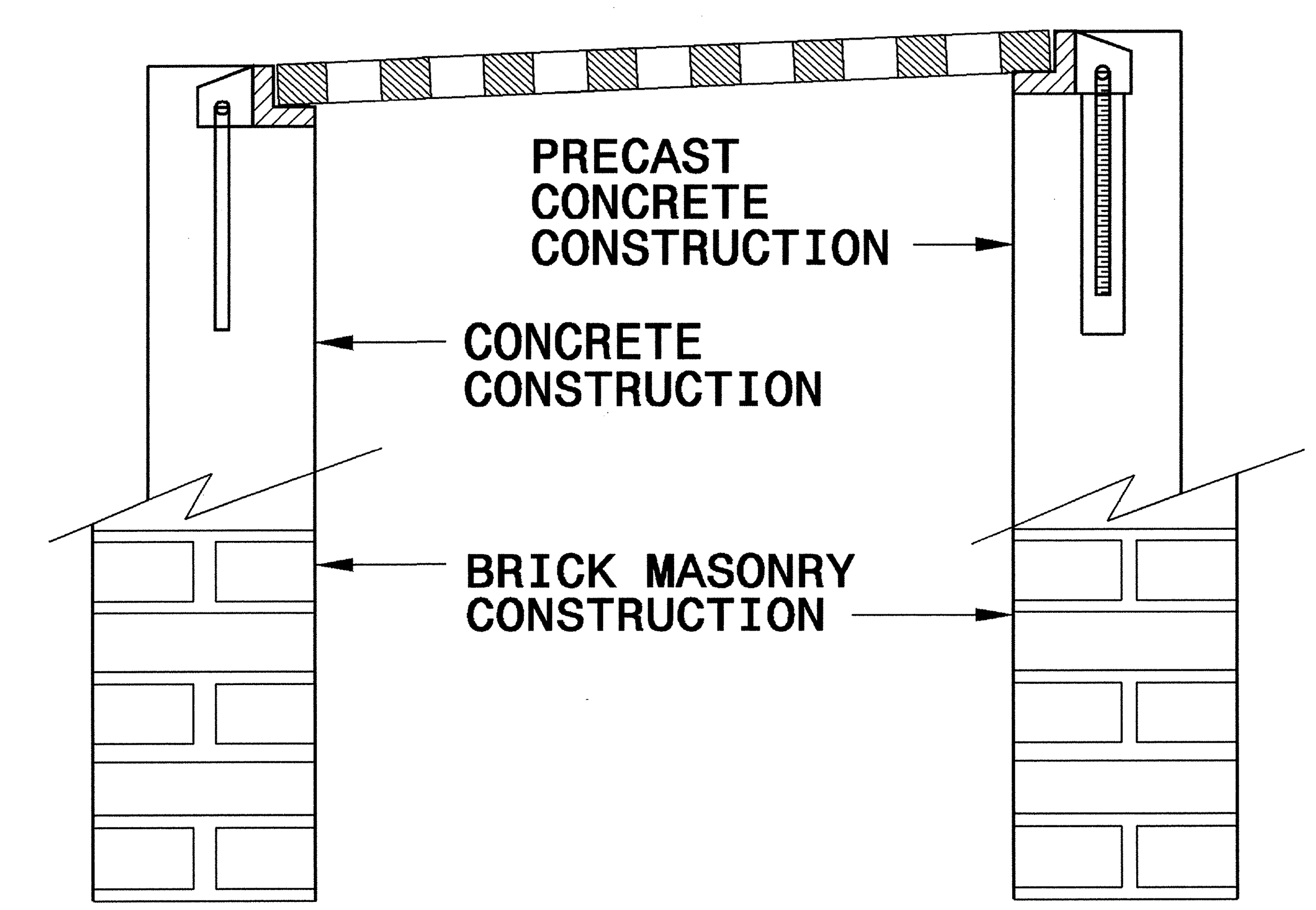
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

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

SHEET 1 OF 1
840D25

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022866
1/27/10

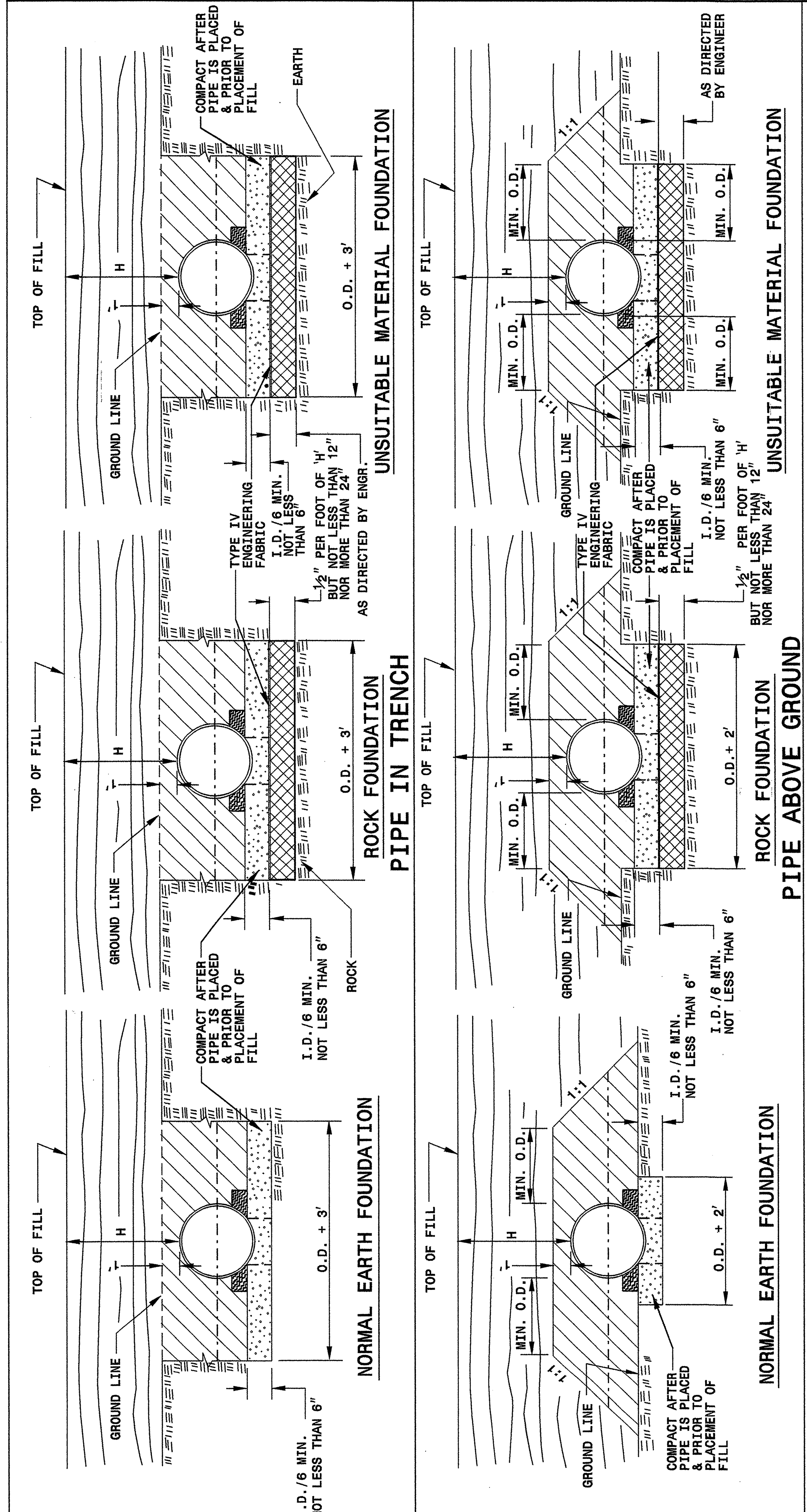
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

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.:

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

7-06 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION — FLEXIBLE PIPE — SHEET 1 OF 3 300D01



GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL.

UNDISTURBED EARTH MATERIAL

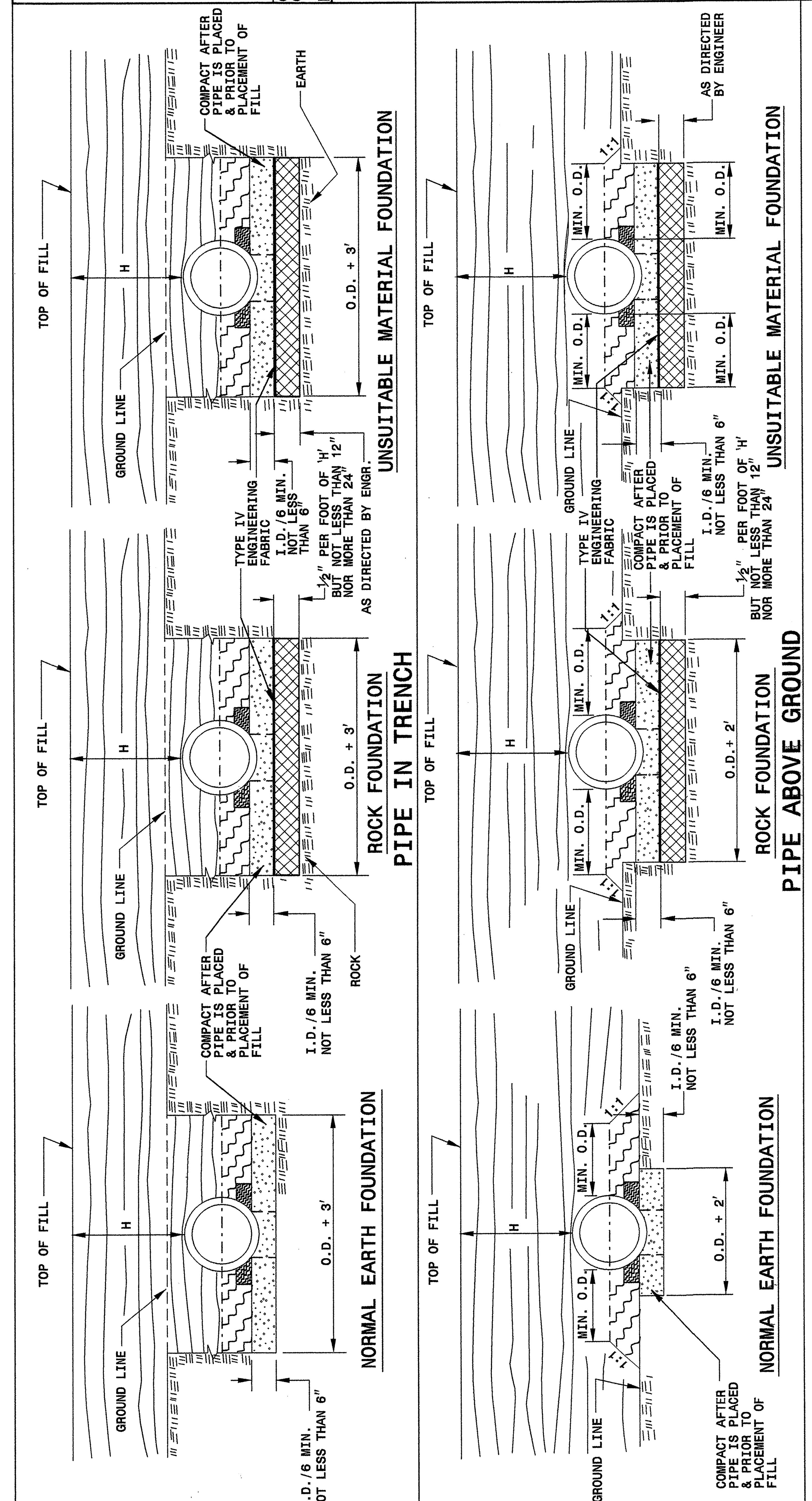
SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 3
300D01

7-06 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION — RIGID PIPE — SHEET 2 OF 3 300D01



GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.

APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE

SHEET 2 OF 3
300D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022866
1/27/10

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/20/09
FILE SPEC: s:/ericward/stds/stdstodetails/30001/0300d01.dgn

30-JUL-2009 08:49
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jhowerton AT PS237501

5/14/99

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

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3

300D01

FLEXIBLE PIPE

Round Corrugated Steel Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	14	12	10	8
12	12	204	256			
15	12	162	204			
18	12	135	169	239		
21	12	115	145	204		
24	12	100	126	178		
30	12	79	100	142		
36	12	65	83	117	152	
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

Round Corrugated Aluminum Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (Ga) 16	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	76	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	50	74
60	12				50	62
66	12					51
72	12					41

** FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

HDPE - * (Minimum fill) 2′ for pipe diameters ≥ 12″ and ≤ 60″
* (Maximum fill) 20′ for pipe diameters ≤ 24″
17′ for pipe diameters ≥ 30″ and ≤ 60″

PVC - * (Minimum fill) 2′ for pipe diameters ≥ 12″ and ≤ 36″
* (Maximum fill) 30′ for pipe diameters ≥ 12″ and ≤ 36″

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

CSP - AASHTO M36
CAAP - AASHTO M196
HDPE - AASHTO M294
PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1′ MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

RCP - * (Minimum fill) 1′ for Class IV & CLASS V
2′ for Class III & Class II

* (Maximum fill) 10′ - Class II pipe
20′ - Class III pipe
30′ - Class IV pipe
40′ - Class V pipe

(For fills > 40′ & < 80′ use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1′ MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

7-06

ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3

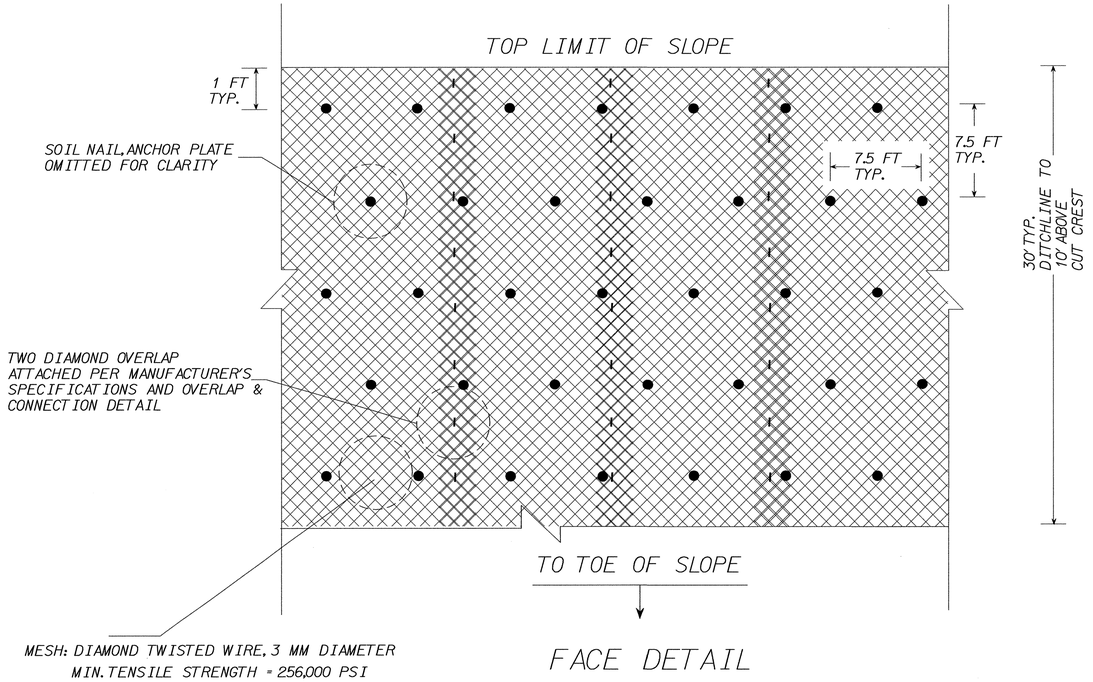
300D01

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

SEE PLATE FOR TITLE

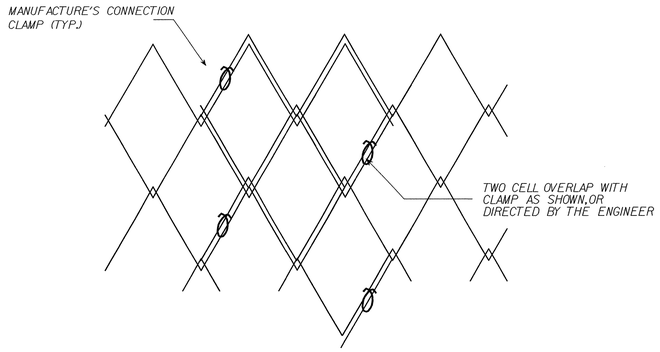
ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/9/09
FILE SPEC: s:\contracts\contracts\special details\ericward\stds\06' stds to special details\30001\0300d01.dgn

PROJECT REFERENCE NO. R-2100B
SHEET NO. 2-D



FACE DETAIL

MESH: DIAMOND TWISTED WIRE, 3 MM DIAMETER
MIN. TENSILE STRENGTH = 256,000 PSI
MIN. LONGITUDINAL TENSILE = 21,700 PSI
MIN. HORIZONTAL TENSILE = 8,600 PSI
GALVANIZED 95% ZINC/5% ALUMINUM, 0.49 OZ/FT
MESH OPENINGS = 3.25" X 5.4"

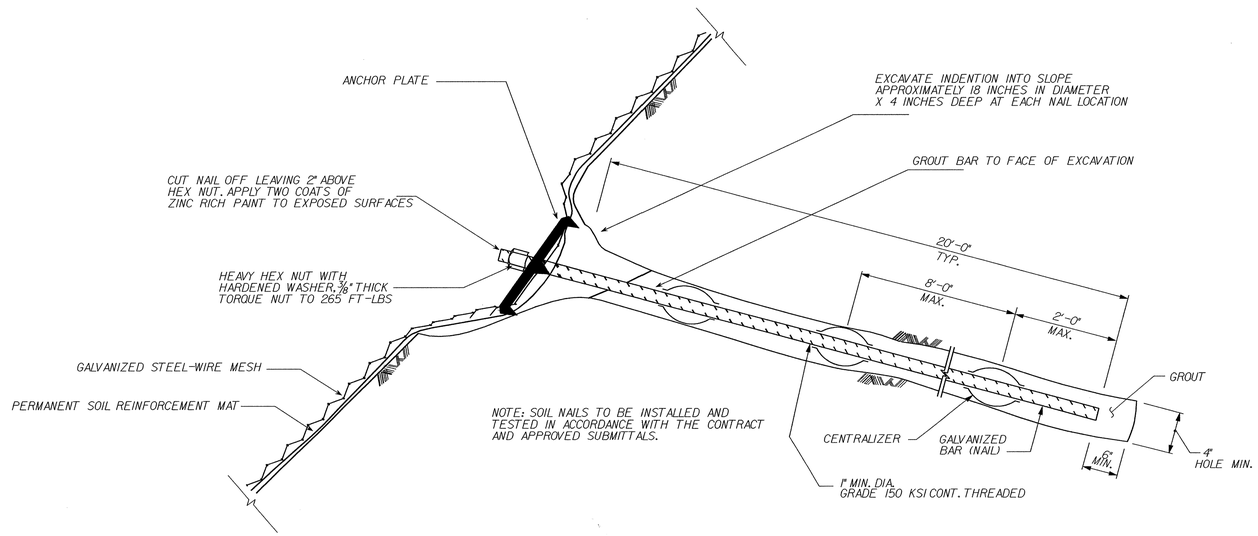


MESH OVERLAP & CONNECTION DETAIL

NOTES:

1) WIRE MESH SHALL BE INSTALLED ROCK/WEATHERED ROCK CUT SLOPES AS DIRECTED THE ENGINEER. AREAS TO BE ANCHORED MUST BE APPROVED BY THE ENGINEER PRIOR TO ORDERING MATERIALS OR BEGINNING CONSTRUCTION.
2) SOIL NAIL LENGTH = 20 FT (TYP)
3) DESIGN TEST LOAD (DTL) = 40 KIPS
4) INSTALL NAILS INTO SLOPE WITH AN INCLINATION OF 15 DEGREES (+/- 2) TO THE HORIZONTAL

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK	
SIGNATURE 1/15/10 DATE	SIGNATURE DATE



TYPICAL SECTION

TOTAL BILL OF MATERIAL	
SOIL NAIL SLOPE STABILIZATION	500 SQ. YDS.
PERMANENT SOIL REINFORCEMENT MAT	500 SQ. YDS.
SUPPLIMENTAL SOIL NAILS (20 FT)	10 EACH

PREPARED BY: JCK	DATE: 1/10
REVIEWED BY: SCC	DATE: 1/10

PROJECT NO.: R-2100B
ASHE ***COUNTY***
STATION: VARIES
SHEET 1 OF 1

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SOIL NAIL SLOPE STABILIZATION

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	2-E
1			3			TOTAL SHEETS
2			4			

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	3(1of 2)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202594

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0008000000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0015000000-N	205	1	EA	SEALING ABANDONED WELLS
0022000000-E	225	25,800	CY	UNCLASSIFIED EXCAVATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (364+50.00)
0036000000-E	225	1,000	CY	UNDERCUT EXCAVATION
0038000000-E	SP	500	CY	SHALLOW UNDERCUT
0080000000-E	SP	1,000	TON	CLASS IV SUBGRADE STABILIZATION
0098000000-E	SP	6,600	SY	PRE-SPLITTING OF ROCK
0106000000-E	230	11,600	CY	BORROW EXCAVATION
0134000000-E	240	1,050	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	100	LF	BERM DITCH CONSTRUCTION
0156000000-E	250	380	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0195000000-E	265	1,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	1,500	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	28,925	SF	TEMPORARY SHORING
0241000000-E	SP	500	SY	GENERIC GRADING ITEM SOIL NAIL SLOPE STABILIZATION
0262000000-N	SP	9	EA	GENERIC GRADING ITEM STABILIZATION SOIL NAIL PROOF TESTS
0262000000-N	SP	3	EA	GENERIC GRADING ITEM STABILIZATION SOIL NAIL VERIFICATION TESTS
0262000000-N	SP	10	EA	GENERIC GRADING ITEM SUPPLEMENTAL STABILIZATION SOIL NAILS
0320000000-E	SP	2,600	SY	FOUNDATION CONDITIONING FABRIC
0330000000-E	SP	830	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS

ItemNumber	Sec #	Quantity	Unit	Description
0987000000-E	310	12	LF	GENERIC PIPE ITEM 12" RC PIPE CULVERTS, CLASS III
0987000000-E	310	32	LF	GENERIC PIPE ITEM 15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0987000000-E	310	132	LF	GENERIC PIPE ITEM 15" SIDE DRAIN PIPE
0987000000-E	310	48	LF	GENERIC PIPE ITEM 18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0987000000-E	310	1,420	LF	GENERIC PIPE ITEM 18" RC PIPE CULVERTS, CLASS III
0987000000-E	310	54	LF	GENERIC PIPE ITEM 24" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0987000000-E	310	140	LF	GENERIC PIPE ITEM 30" BIT COAT CS PIPE CULVERTS, TYPE B 0.079" THICK
0987000000-E	310	164	LF	GENERIC PIPE ITEM 30" RC PIPE CULVERTS, CLASS III
0987000000-E	310	92	LF	GENERIC PIPE ITEM 36" BIT COAT CS PIPE CULVERTS, TYPE B 0.079" THICK
0987000000-E	310	352	LF	GENERIC PIPE ITEM 36" RC PIPE CULVERTS, CLASS III
0987000000-E	310	68	LF	GENERIC PIPE ITEM 42" BIT COAT CS PIPE CULVERTS, TYPE B 0.109" THICK
0987000000-E	310	44	LF	GENERIC PIPE ITEM 42" RC PIPE CULVERTS, CLASS III
0987000000-E	310	68	LF	GENERIC PIPE ITEM 48" BIT COAT CS PIPE CULVERTS, TYPE B 0.109" THICK
0987000000-E	310	64	LF	GENERIC PIPE ITEM 48" RC PIPE CULVERTS, CLASS III
0987000000-E	310	80	LF	GENERIC PIPE ITEM 54" BIT COAT CS PIPE CULVERTS, TYPE B 0.138" THICK
0987000000-E	310	76	LF	GENERIC PIPE ITEM 54" RC PIPE CULVERTS, CLASS III

ItemNumber	Sec #	Quantity	Unit	Description
0987000000-E	310	12	LF	GENERIC PIPE ITEM 60" BIT COAT CS PIPE CULVERTS, TYPE B 0.138" THICK
0987000000-E	310	92	LF	GENERIC PIPE ITEM 60" RC PIPE CULVERTS, CLASS III
0987000000-E	310	80	LF	GENERIC PIPE ITEM 72" RC PIPE CULVERTS, CLASS III
0988000000-E	310	2	EA	GENERIC PIPE ITEM 15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0988000000-E	310	2	EA	GENERIC PIPE ITEM 18" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0988000000-E	310	2	EA	GENERIC PIPE ITEM 24" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0988000000-E	310	2	EA	GENERIC PIPE ITEM 30" BIT COAT CS PIPE ELBOWS, TYPE B 0.079" THICK
0995000000-E	340	758	LF	PIPE REMOVAL
0996000000-N	350	2	EA	PIPE CLEAN-OUT
1011000000-N	500	Lump Sum		FINE GRADING
1110000000-E	510	500	TON	STABILIZER AGGREGATE
1220000000-E	545	250	TON	INCIDENTAL STONE BASE
1297000000-E	607	31,300	SY	MILLING ASPHALT PAVEMENT, **** DEPTH (2-1/2")
1489000000-E	610	6,700	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	13,200	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	10,100	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-E	620	1,515	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	640	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	138	EA	RIGHT OF WAY MARKERS
2022000000-E	815	560	CY	SUBDRAIN EXCAVATION

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STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-2100B	3(2 of 2)

ItemNumber	Sec #	Quantity	Unit	Description
2033000000-E	815	420	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	2,500	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	75	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	5	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	30	LF	6" OUTLET PIPE (SUBDRAINS)
2209000000-E	838	21	CY	ENDWALLS
2220000000-E	838	36	CY	REINFORCED ENDWALLS
2253000000-E	840	5	CY	PIPE COLLARS
2264000000-E	840	2	CY	PIPE PLUGS
2275000000-E	SP	25	CY	FLOWABLE FILL
2286000000-N	840	116	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	53	LF	MASONRY DRAINAGE STRUCTURES
2352000000-N	840	1	EA	FRAME WITH GRATE, STD 840.**** (840.20)
2354000000-N	840	3	EA	FRAME WITH GRATE, STD 840.22
2364000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.16
2364200000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.20
2365000000-N	840	23	EA	FRAME WITH TWO GRATES, STD 840.22
2366000000-N	840	12	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	75	EA	FRAME WITH TWO GRATES, STD 840.29
2396000000-N	840	3	EA	FRAME WITH COVER, STD 840.54
2556000000-E	846	4,390	LF	SHOULDER BERM GUTTER
2577000000-E	846	2,750	LF	CONCRETE EXPRESSWAY GUTTER
2619000000-E	850	2,200	SY	4" CONCRETE PAVED DITCH
2655000000-E	852	205	SY	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)
2724000000-E	857	4,710	LF	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED

ItemNumber	Sec #	Quantity	Unit	Description
3000000000-N	SP	1	EA	IMPACT ATTENUATOR UNIT, TYPE 350
3030000000-E	862	9,600	LF	STEEL BM GUARDRAIL
3045000000-E	862	150	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3165000000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE ********** (350 TL-2)
3195000000-N	862	3	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3270000000-N	SP	34	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	15	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3435000000-N	SP	4	EA	GENERIC GUARDRAIL ITEM IMPACT ATTENUATOR UNIT, TYPE 350 TL-2
3559000000-E	866	1,000	LF	** STRAND BARBED WIRE FENCE WITH POSTS (4)
3628000000-E	876	260	TON	RIP RAP, CLASS I
3635000000-E	876	3,009	TON	RIP RAP, CLASS II
3649000000-E	876	70	TON	RIP RAP, CLASS B
3656000000-E	876	7,980	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	6	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4400000000-E	1110	450	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	192	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	144	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4420000000-N	1120	4	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	286	EA	DRUMS
4445000000-E	1145	64	LF	BARRICADES (TYPE III)
4455000000-N	1150	1,440	MD	FLAGGER
4465000000-N	1160	18	EA	TEMPORARY CRASH CUSHIONS
4480000000-N	1165	2	EA	TMIA

ItemNumber	Sec #	Quantity	Unit	Description
4485000000-E	1170	4,592	LF	PORTABLE CONCRETE BARRIER
4510000000-N	SP	80	HR	LAW ENFORCEMENT
4520000000-N	1266	6	EA	TUBULAR MARKERS (FIXED)
4650000000-N	1251	270	EA	TEMPORARY RAISED PAVEMENT MARKERS
4810000000-E	1205	176,890	LF	PAINT PAVEMENT MARKING LINES (4")
4847000000-E	1205	50,928	LF	POLYUREA PAVEMENT MARKING LINES (4", **********) (STANDARD GLASS BEADS)
4847140000-E	1205	34	LF	POLYUREA PAVEMENT MARKING LINES (24", **********) (STANDARD GLASS BEADS)
4850000000-E	1205	5,644	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4905000000-N	1253	162	EA	SNOWPLOWABLE PAVEMENT MARKERS
6000000000-E	1605	35,500	LF	TEMPORARY SILT FENCE
6006000000-E	1610	3,040	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	1,915	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	3,195	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	27.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	450	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	2.75	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	2,450	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	24	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	6,500	LF	SAFETY FENCE
6030000000-E	1630	4,145	CY	SILT EXCAVATION
6036000000-E	1631	47,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	600	SY	COIR FIBER MAT
6038000000-E	SP	2,500	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	9,150	LF	1/4" HARDWARE CLOTH

ItemNumber	Sec #	Quantity	Unit	Description
6070000000-N	SP	4	EA	SPECIAL STILLING BASINS
6071010000-E	SP	4,270	LF	WATTLE
6071020000-E	SP	1,067	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	100	LF	COIR FIBER BAFFLES
6071050000-E	SP	1	EA	**" SKIMMER (1-1/2")
6084000000-E	1660	15	ACR	SEEDING & MULCHING
6087000000-E	1660	10	ACR	MOWING
6090000000-E	1661	250	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	325	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	9.25	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	250	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	45	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.6	ACR	REFORESTATION

******* BEGIN SCHEDULE AA ******* ******* (3 ALTERNATES) *******				
0987000000-E AA1	310	4,488	LF	GENERIC PIPE ITEM 15" RC PIPE CULVERTS, CLASS III
0987000000-E AA1	310	260	LF	GENERIC PIPE ITEM 24" RC PIPE CULVERTS, CLASS III
*** OR ***				
0536000000-E AA2	SP	204	LF	**** HDPE PIPE CULVERTS (15")
0536000000-E AA2	SP	12	LF	**** HDPE PIPE CULVERTS (24")
0987000000-E AA2	310	4,284	LF	GENERIC PIPE ITEM 15" RC PIPE CULVERTS, CLASS III
0987000000-E AA2	310	248	LF	GENERIC PIPE ITEM 24" RC PIPE CULVERTS, CLASS III
*** OR ***				

USRAL3PC009

COMPUTED BY: JMK DATE: 4/16/2009

CHECKED BY: KBA DATE: 12/6/2009

PROJECT NO.	SHEET NO.
R-2100B	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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) SIZE	12"	15"	18"	24"	30"	36"	42"	48"
								THICKNESS OR GAUGE								
252+00	RT	1		2835.1	2830.8											
252+00	CL	1	OUT		2830.8	2830.0				60						
252+95	RT	2		2834.0	2831.3											
252+95	RT	2	1		2831.3	2830.8	X									
253+70	CL															
254+40	RT	3		2832.8	2830.1											
254+40	RT	3	5		2830.1	2826.8				164						
256+05	RT	5		2830.5	2826.8											
256+05	RT	4		2830.1	2827.3											
256+05	RT	4	5		2827.3	2826.8				8						
256+05	RT	5	6		2826.8	2825.6				60						
256+65	RT	6		2829.7	2825.6											
256+30	LT	7		2829.5	2826.3											
256+30	LT	7	8		2826.3	2823.7				52						
256+80	LT	8		2828.8	2823.7											
256+80	LT	8	OUT		2823.7	2823.5					20					
257+80	RT	8A														
260+30	CL	9A	OUT		2820.5	2819.1								68		
260+70	RT	9		2823.4	2820.6											
260+70	RT	9	OUT		2820.6	2820.5	X									
261+40	RT	10		2822.7	2820.7											
261+40	RT	10	9		2820.7	2820.6	X									
263+60	RT	11		2819.7	2817.0											
263+60	RT	11	12		2817.0	2815.5				92						
264+52	RT	12		2818.2	2812.7											
264+52	LT	12A	OUT		2811.7	2811.0										
265+75	LT	13		2815.6	2812.4											
265+75	LT	13	14		2812.4	2811.5				52						
266+25	LT	14		2814.6	2806.1											
266+25	LT	14	OUT		2806.1	2806.0	X			24						
265+50	RT	15		2816.5	2813.7											
265+50	RT	15	16		2813.7	2806.0				128						
266+77	RT	16		2814.1	2806.0											
266+77	CL	16	OUT		2806.0	2805.2										
267+55	RT	17		2812.3	2808.3											
267+55	RT	17	16		2808.3	2806.0				80						
268+35	RT	18		2810.7	2808.7											
268+35	RT	18	17		2808.7	2808.3				80						
SHEET TOTALS									800	20			68		64	

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE	12"	15"	18"	24"	30"	36"	42"	48"
	THICKNESS OR GAUGE	.064	.064	.064	.064	.079	.079	.109	.109
252+00									
252+00									
252+95									
252+95									
253+70									
254+40									
254+40									
256+05									
256+05									
256+05									
256+05									
256+65									
256+30									
256+30									
256+80									
256+80									
257+80									
260+30									
260+70									
260+70									
261+40									
261+40									
263+60									
263+60									
264+52									
264+52									
265+75									
265+75									
266+25									
266+25									
265+50									
265+50									
266+77									
266+77									
267+55									
267+55									
268+35									
268+35									
SHEET TOTALS									

STATION	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D SIZE	12"	15"	18"	24"	30"	36"	42"	48"
	THICKNESS OR GAUGE								
252+00									
252+00									
252+95									
252+95			96						
253+70									
254+40									
254+40									
256+05									
256+05									
256+05									
256+05									
256+65									
256+30									
256+30									
256+80									
256+80									
257+80									
260+30									
260+70									
260+70			36						
261+40									
261+40			72						
263+60									
263+60									
264+52									
264+52					12				
265+75									
265+75									
266+25									
266+25									
265+50									
265+50									
266+77									
266+77									
267+55									
267+55									
268+35									
268+35									
SHEET TOTALS			204		12				

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
252+00					
252+00					
252+95					
252+95					
253+70					
254+40					
254+40					
256+05					
256+05					
256+05					
256+05					
256+65					
256+30					
256+30					
256+80					
256+80					
257+80	28				
260+30				3.4	
260+70					
260+70					
261+40					
261+40					
263+60					
263+60					
264+52					
264+52					
265+75					
265+75					
266+25					
266+25					
265+50					
265+50					
266+77					
266+77					
267+55					
267+55					
268+35					
268+35					
SHEET TOTALS	28			3.4	

STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02
252+00	1			
252+00				
252+95	1			
252+95				
253+70				
254+40	1			
254+40				
256+05	1			
256+05				
256+05	1			
256+05				
256+65	1			
256+30	1			
256+30				
256+80	1	0.1		
256+80				
257+80				
260+30				
260+70	1			
260+70				
261+40	1			
261+40				
263+60	1			
263+60				
264+52	1	0.5		
264+52				
265+75	1			
265+75				
266+25	1	3.5		
266+25				
265+50	1			
265+50				
266+77	1	3.1		
266+77				
267+55	1			
267+55				
268+35	1			
268+35				
SHEET TOTALS	18	7.2		

STATION	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 AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. (W.S. FLAT) FRAME WITH TWO GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	TRAFFIC BEARING J.B. STD. 840.34	TRAFFIC BEARING G.I. STD. 840.35	G.D.I. (N.S. FLAT) FRAME WITH TWO GRATES STD. 840.29	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH GRATE STD. 840.22	BERM DRAINAGE OUTLET STD. 850.11	FLOWABLE FILL, CY	CONVERT DI TO CB	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
252+00												1																
252+00																												
252+95							1				1																	
252+95																												
253+70																						2.8				0.13		PLUG & FILL PIPE, REMOVE HW
254+40							1								1													
254+40													1															
256+05																		1										
256+05							1				1																	
256+05																												
256+05							1								1													
256+65																												
256+30																		1	1									
256+30																												
256+80																		1	1									
256+80																										20		
257+80																										20		REMOVE DRIVE PIPE
260+30																												REMOVE EX. PIPE AND CONC. HW
260+70							1							1														
260+70																												
261+40								1		1																		
261+40																												
263+60							1											1										
263+60																										87		REMOVE EX. 15" RCP
264+52							1											1										
264+52																											0.6		COLLAR & EXTEND EX. 24" RCP
265+75																		1	1									
265+75																												
266+25																		1	1									
266+25																												
265+50							1											1										
265+50																												
266+77						1												1										
266+77																												REMOVE 13' - 42" CMP & 30' - 3' X 3' RCBC
267+55							1											1										
267+55																												REMOVE 15" CMP
268+35								1										1										
268+35																												
SHEET TOTALS						1	10	2		3	2	1	4	12		1						2.8			0.6	0.13	127	

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

USRAL3PC006,11/9/2009,R:\Roadway\Proj\r2100b_drainage_summary.xls

USRAL3PC009

COMPUTED BY: JMK DATE: 4/16/2009

CHECKED BY: KBA DATE: 12/6/2009

PROJECT NO.	SHEET NO.
R-2100B	3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION (SIZE / THICKNESS OR GAUGE)	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE
269+08	LT	19		2808.5	2798.1																													
269+08	LT	19	OUT		2798.1	2798.0	X		24																									
269+50	LT	20		2808.1	2804.9																													
269+50	LT	20	19		2804.9	2804.7	X		44																									
269+50	RT	21		2808.9	2805.7																													
269+50	RT	21	20		2805.7	2804.9			32																									
270+00	RT	22		2807.8	2805.9																													
270+00	RT	22	21		2805.9	2804.9			52																									
270+59	RT																																	
271+27	RT	23		2805.1	2802.3																													
271+27	RT	23	OUT		2802.3	2800.0			36																									
272+00	CL	23A	OUT		2797.8	2788.8																	68											
273+95	RT	24A																														24		
274+55	LT	24		2795.5	2792.5																													
274+55	LT	24	26		2792.5	2792.3	X			44																								
274+40	RT	25		2797.5	2794.4																													
274+40	RT	25	26		2794.4	2792.5	X		32																									
274+70	LT	26		2797.1	2787.8																													
274+70	LT	26	OUT		2787.8	2787.0				20																								
277+20	RT	27		2789.9	2786.9																													
277+20	RT	27	OUT		2786.9	2785.0				76																								
279+80	RT																																	
278+00	RT	27A																														44		
280+17	RT	28		2782.5	2779.5																													
280+17	RT	28	28A		2779.5	2779.2				12																								
280+17	LT	28B	OUT		2773.6	2772.7				8																								
280+25	RT																																	
281+40	RT																																	
282+40	LT	29		2775.4	2767.1																													
282+40	LT	29	OUT		2767.1	2767.0	X		28																									
283+50	RT	29A	OUT		2767.8	2764.5								44																				
285+50	LT	30		2760.2	2757.0																													
285+50	LT	30	31		2757.0	2755.3			36																									
285+85	LT	31		2758.4	2751.6																													
285+85	LT	31	OUT		2751.6	2748.0			56																									
293+20	LT	32		2717.4	2714.2																													
293+20	LT	32	34		2714.2	2711.4			60																									
293+78	RT	33		2711.8	2708.8																													
293+78	RT	33	34		2708.8	2705.0				44																								
293+78	LT	34		2714.6	2705.0																													
293+78	LT	34	OUT		2705.0	2705.0	X			12																								
296+88	CL	34A	OUT		2793.0	2689.4																68												
SHEET TOTALS									400	216				44								68	68									68		

STATION	LOCATION	FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. (W.S. FLAT) FRAME WITH TWO GRATES STD. 840.20-	G.D.I. (W.S. SAG) FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	TRAFFIC BEARING J.B. STD. 840.34	TRAFFIC BEARING D.I. STD. 840.35	G.D.I. (N.S. FLAT) FRAME WITH TWO GRATES STD. 840.29	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH GRATE STD. 840.22	BERM DRAINAGE OUTLET STD. 850.11	FLOWABLE FILL, CY	CONVERT DI TO CB	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
269+08	LT	19				1	5	0.4																1	1													
269+08	LT	19	OUT																																			
269+50	LT	20				1																		1	1													
269+50	LT	20	19																																			
269+50	RT	21				1										1									1													
269+50	RT	21	20																																			
270+00	RT	22				1											1								1													
270+00	RT	22	21																																			
270+59	RT																															3.8				0.232	36	REMOVE EX. HW ON 24" CMP
271+27	RT	23				1										1					1																	
271+27	RT	23	OUT																																			
272+00	CL	23A	OUT		4.9																																	REMOVE EX. 4' x 4' RCBC & HW, 42" CMP
273+95	RT	24A																																				
274+55	LT	24				1										1					1																	
274+55	LT	24	26																																			
274+40	RT	25				1																		1	1													
274+40	RT	25	26																																			REMOVE EX. 18" CMP & HW
274+70	LT	26				1	4.3																	1	1													
274+70	LT	26	OUT																																			
277+20	RT	27				1										1			1																			
277+20	RT	27	OUT																																			REMOVE EX. 24" CMP & HW
279+80	RT																																				15	REMOVE 4" PLASTIC
278+00	RT	27A																																				
280+17	RT	28				1										1			1																			
280+17	RT	28	28A																																0.4			REM.& REPL. 1 JOINT 18" RCP & REM. HW
280+17	LT	28B	OUT																																			
280+25	RT																																				15	REMOVE 6" TERRA COTTA
281+40	RT																																				30	REMOVE 15" RCP
282+40	LT	29				1	3.3																	1	1													
282+40	LT	29	OUT																																			
283+50	RT	29A	OUT	4.5																																	35	REMOVE 6' X 3' RCBC & 2 HW
285+50	LT	30				1																		1	1													
285+50	LT	30	31																																			
285+85	LT	31				1	1.8																	1	1													
285+85	LT	31	OUT																																			
293+20	LT	32				1																		1	1													
293+20	LT	32	34																																			
293+78	RT	33				1										1			1																			
293+78	RT	33	34																																			REMOVE EX. 24" RCP & 2 HW
293+78	LT	34				1	4.6																	1	1													
293+78	LT	34	OUT																																			
296+88	CL	34A	OUT		4.0																																	REMOVE EX. 24" CMP & HW, INSTALL 'L' HW
SHEET TOTALS				13.4		16	19.5									6	1		3		2			9	11							3.8			0.4	0.232	131	

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: JMK DATE: 4/16/2009
CHECKED BY: KBA DATE: 12/6/2009

PROJECT NO.	SHEET NO.
R-2100B	3-C

USRAL3PC009

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	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"
299+80	RT	35		2689.7	2686.7										
299+80	RT	35	OUT		2686.7	2684.3				56					
302+10	RT	36		2692.9	2688.0										
302+10	RT	36	37		2687.9	2687.8				8					
302+10	RT	37		2691.6	2687.8										
302+10	RT	37	38		2687.8	2685.1				32					
302+15	LT	38		2688.8	2685.1										
302+15	LT	38	39		2685.1	2681.4				44					
302+55	LT	39		2688.4	2681.4										
302+55	LT	39	OUT		2681.4	2680.0				20					
304+30	CL														
306+50	RT	40		2688.7	2683.7										
306+50	RT	40	41		2683.7	2683.6			8						
306+50	RT	41		2687.3	2683.6										
306+50	RT	41	OUT		2683.6	2680.7			52						
306+75	CL														
307+90	LT	42		2685.0	2681.8										
307+90	LT	42	43		2681.8	2680.7			140						
309+30	LT	43		2683.8	2680.7										
309+30	LT	43	46		2680.7	2677.3			148						
309+80	CL														
310+75	RT	44		2685.6	2680.0										
310+75	RT	44	45		2680.0	2679.9					8				
310+75	RT	45		2684.2	2679.9										
310+75	RT	45	46		2679.9	2677.3					32				
310+75	LT	46		2682.0	2677.3										
310+75	LT	46	47		2677.3	2677.0					32				
311+05	LT	47		2681.8	2677.0										
311+05	LT	47	OUT		2677.0	2676.5					16				
313+00	RT	48A		2684.5	2679.8										
313+00	RT	48A	48B		2679.8	2679.7			8						
313+00	RT	48B		2683.0	2679.7										
313+00	RT	48B	49		2679.7	2678.7			200						
313+07	CL														
315+00	RT	48		2684.9	2678.7										
315+00	RT	48	49		2678.8	2678.7			8						
315+00	RT	49		2683.5	2678.7										
315+00	RT	49	50		2678.7	2677.5			32						
315+00	LT	50		2681.5	2677.5										
315+00	LT	50	OUT		2677.5	2675.5			24						
315+04	CL														
316+55	RT	51		2683.6	2680.9										
316+55	RT	51	OUT		2680.9	2680.0			56						
318+30	RT	51B													
SHEET TOTALS									676	160	88				

STATION	STRUCTURE NO.	BITUMINOUS COATED C.S. PIPE TYPE B (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 ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
318+30	51B																	36				
SHEET TOTALS																		36				

STATION	STRUCTURE NO.	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 AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. (W.S. FLAT) FRAME WITH TWO GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	TRAFFIC BEARING J.B. STD. 840.34	TRAFFIC BEARING D.I. STD. 840.35	G.D.I. (N.S. FLAT) FRAME WITH TWO GRATES STD. 840.29	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH GRATE STD. 840.22	BERM DRAINAGE OUTLET STD. 850.11
299+80	35	1										1			1												
302+10	36	1									1			1											1		
302+10	37	1										1									1						
302+15	38	1																		1	1						
302+55	39	1	2																	1	1						
306+50	40	1										1			1												
306+50	41	1										1									1						
307+90	42	1																		1	1						
309+30	43	1																		1	1						
310+75	44	1	0.6								1				1											1	
310+75	45	1										1									1						
310+75	46	1									1										1						
311+05	47	1									1										1						
313+00	48A	1										1			1												
313+00	48B	1										1									1						
315+00	48	1	1.2									1			1												
315+00	49	1										1									1						
315+00	50	1																		1	1						
316+55	51	1										1			1												
SHEET TOTALS		19	3.8								4	10		1	6					5	12				1	1	

STATION	STRUCTURE NO.	FLOWABLE FILL, CY	CONVERT DI TO CB	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
299+80	35-OUT							REMOVE EX. 18" CMP & HW
302+10	36							INSTALL 3GI 'A'
302+10	37-38							REMOVE EX. 18" CMP & HW
304+30		2.5				0.13		REMOVE HW, PLUG & FILL EX. 18" CMP
306+75		2.2				0.13	15	PLUG & FILL 18" CMP, REMOVE 15 LF & HW
309+80		2.0				0.13	10	PLUG & FILL 18" CMP, REMOVE 10 LF & HW
310+75	44							INSTALL 3GI 'A'
313+07		2.6				0.13	4	PLUG & FILL 18" CMP, REMOVE 4 LF & HW
315+04							53	REMOVE 18" CMP & HW
318+30	51B						20	REMOVE EX. DRIVE PIPE
SHEET TOTALS		9.3				0.52	102	

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

USRAL3PC009

COMPUTED BY:	JMK	DATE:	4/16/2009
CHECKED BY:	KBA	DATE:	12/6/2009

PROJECT NO.	SHEET NO.
R-2100B	3-D

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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"
322+70	RT	52		2686.1	2683.4										
322+70	RT	52	OUT		2683.4	2683.0			52						
325+75	RT	53		2688.6	2685.8										
325+75	RT	53	54		2685.8	2685.3	X		100						
326+75	RT	54		2689.2	2685.3										
326+75	RT	54	55		2685.3	2685.2	X		32						
327+05	RT	55		2689.4	2684.9										
327+05	RT	55	OUT		2684.9	2674.5				92					
328+20	RT	56		2690.2	2687.4										
328+20	RT	56	55		2687.4	2685.2			116						
327+86	CL														
330+53	CL	56A	OUT		2687.0	2675.0									
333+20	RT	57A	57		2689.0	2685.6					32				
333+20	RT	57		2690.4	2682.4										
333+20	RT	57	58		2682.4	2680.2							60		
333+10	LT	58		2690.0	2680.2										
333+10	LT	58	OUT		2680.2	2669.2									
334+95	RT	59		2691.6	2688.9										
334+95	RT	59	60		2688.9	2686.7			92						
335+85	RT	60		2690.8	2685.9										
336+90	RT	61		2689.9	2687.1										
336+90	RT	61	62		2687.1	2685.2			100						
337+90	RT	62		2689.0	2685.2										
337+90	RT	62	OUT		2685.2	2680.7			56						
338+45	RT	63		2688.5	2685.7										
338+45	RT	63	62		2685.7	2685.2			56						
340+05	RT	64		2686.0	2683.3										
340+05	RT	64	65		2683.3	2681.7			72						
340+75	RT	65		2685.6	2680.9										
340+75	RT	65A	65		2690.0	2680.9									
341+20	RT	66		2685.1	2682.4										
341+20	RT	66	65		2682.4	2681.7			44						
340+38	LT	67		2685.1	2682.0										
340+38	LT	67	68		2682.0	2681.7	X		48						
340+85	LT	68		2685.0	2678.1										
340+85	LT	68	OUT		2678.1	2677.0					20				
342+28	LT	69		2684.5	2681.4										
342+28	LT	69	71		2681.4	2680.2	X		76						
342+50	RT	70		2686.0	2683.3										
342+50	RT	70	72		2683.3	2680.7			52						
SHEET TOTALS									896	92	52		60		

SIZE / THICKNESS OR GAUGE

STATION	LOC.	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
322+70	RT	52																											
322+70	RT	52	OUT																										
325+75	RT	53																											
325+75	RT	53	54																										
326+75	RT	54																											
326+75	RT	54	55																										
327+05	RT	55																											
327+05	RT	55	OUT																										
328+20	RT	56																											
328+20	RT	56	55																										
327+86	CL																												
330+53	CL	56A	OUT						112																				2.0
333+20	RT	57A	57																										
333+20	RT	57																											
333+20	RT	57	58																										
333+10	LT	58																											
333+10	LT	58	OUT								92																		
334+95	RT	59																											
334+95	RT	59	60																										
335+85	RT	60																											
336+90	RT	61																											
336+90	RT	61	62																										
337+90	RT	62																											
337+90	RT	62	OUT																										
338+45	RT	63																											
338+45	RT	63	62																										
340+05	RT	64																											
340+05	RT	64	65																										
340+75	RT	65																											
340+75	RT	65A	65				54																						1.8
341+20	RT	66																											
341+20	RT	66	65																										
340+38	LT	67																											
340+38	LT	67	68																										
340+85	LT	68																											
340+85	LT	68	OUT																										
342+28	LT	69																											
342+28	LT	69	71																										
342+50	RT	70																											
342+50	RT	70	72																										
SHEET TOTALS							54		112		92																		3.8

STATION	LOC.	FROM	TO	QUANITIES 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 AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. (W.S. FLAT) FRAME WITH TWO GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	TRAFFIC BEARING J.B. STD. 840.34	TRAFFIC BEARING D.I. STD. 840.35	G.D.I. (N.S. FLAT) FRAME WITH TWO GRATES STD. 840.29	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH GRATE STD. 840.22	BERM DRAINAGE OUTLET STD. 850.11	FLOWABLE FILL, CY	CONVERT DI TO CB	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
322+70	RT	52		1										1					1																	
322+70	RT	52	OUT																																30	REMOVE 15" RCP DRIVE PIPE
325+75	RT	53		1										1									1													
325+75	RT	53	54																																	
326+75	RT	54		1										1									1													
326+75	RT	54	55																											3.0				0.13	10	PLUG & FILL EX. 18" CMP, REMOVE 10 LF
327+05	RT	55		1										1									1													
327+05	RT	55	OUT																																	
328+20	RT	56		1										1									1													
328+20	RT	56	55																																	
327+86	CL																													3.1				0.13		PLUG & FILL EX. 18" CMP, REMOVE HW
330+53	CL	56A	OUT																																	REMOVE 24" RCP & 2 HW
333+20	RT	57A	57																																	
333+20	RT	57		1	3.0								1						1																	
333+20	RT	57	58																																	REMOVE 24" RCP & CB
333+10	LT	58		1	4.8									1					1																	
333+10	LT	58	OUT																																	
334+95	RT	59		1										1									1													
334+95	RT	59	60																																	
335+85	RT	60		1										1									1													REMOVE HW ON EX. 24" RCP
336+90	RT	61		1										1									1													
336+90	RT	61	62																																	
337+90	RT	62		1										1									1													
337+90	RT	62	OUT																																	REMOVE 18" CMP & HW
338+45	RT	63		1										1									1													
338+45	RT	63	62																																	
340+05	RT	64		1										1					1																	
340+05	RT	64	65																																	
340+75	RT	65		1										1									1													
340+75	RT	65A	65																													2@24"				REM 18" CMP &HW, INST. 'L' HW & 2-24" ELB.
341+20	RT	66		1										1									1													
341+20	RT	66	65																																	
340+38	LT	67		1																		1	1													
340+38	LT	67	68																																	
340+85	LT	68		1	1.9																	1	1													
340+85	LT	68	OUT																																	REMOVE 16 LF OF 24" CMP
342+28	LT	69		1																		1	1													
342+28	LT	69	71																																	
342+50	RT	70		1										1					1																	
342+50	RT	70	72																																	
SHEET TOTALS				19	9.7								1	15					5			3	14							6.1		2@24"		0.26	40	

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

USRAL3PC009

COMPUTED BY:	JMK	DATE:	4/16/2009
CHECKED BY:	KBA	DATE:	12/6/2009

PROJECT NO.	SHEET NO.
R-2100B	3-E

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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 15"	CLASS III R.C. PIPE 18"	CLASS III R.C. PIPE 24"	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	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. (W.S. SAG) FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME WITH TWO GRATES STD. 840.24	TRAFFIC BEARING D.I. STD. 840.35	G.D.I. (N.S. FLAT) FRAME WITH TWO GRATES STD. 840.29	G.D.I. (W.S. SAG) FRAME WITH GRATE STD. 840.22	FLOWABLE FILL, CY	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	REMARKS
343+03	LT	71		2684.5	2680.2						1					1	1					
343+03	LT	71	72		2680.2	2680.7	X	36														
343+03	RT	72		2684.4	2680.5						1			1		1						
343+03	RT	72	73		2680.5	2680.2	X		48													
343+50	RT	73		2684.4	2680.2						1			1				1				
343+50	RT	73	75		2680.2	2679.8	X		96													
344+00	LT	74		2684.6	2681.4						1						1	1				
344+00	LT	74	71		2681.4	2680.2	X	96														
344+45	RT	75		2684.7	2679.8						1			1				1				
344+45	RT	75	OUT		2679.8	2678.0			48													
345+55	RT	76		2685.0	2681.0						1			1				1				
345+55	RT	76	OUT		2681.0	2678.0		56														
346+50	RT	77		2685.4	2681.9						1			1				1				
346+50	RT	77	76		2681.9	2681.0		96														
347+50	RT	78		2685.7	2682.9						1			1				1				
347+50	RT	78	77		2682.9	2681.9		100														
348+33	RT	79		2686.0	2680.1						1	0.9		1				1				
348+33	RT	79	OUT		2680.1	2676.9				52												REMOVE 18" CMP & 2 HW
349+75	RT	80		2686.5	2682.1						1			1				1				
349+75	RT	80	79		2682.1	2680.6			144													
351+00	RT	81		2686.9	2683.4						1			1				1				
351+00	RT	81	80		2683.4	2682.1			128													
351+00	RT	82		2688.5	2683.5						1		1		1				1			INSTALL 3GI'A'
351+00	RT	82	81		2683.5	2683.4			8													
354+49	CL																			2.2	0.13	PLUG & FILL EX. PIPE
354+21	LT	83		2686.5	2683.3						1						1	1				
354+21	LT	83	83A		2683.3	2683.0		36														
354+21	RT	83A		2686.5	2683.0						1			1				1				
354+21	RT	83A	85		2683.0	2682.0		52														
354+70	RT	84		2687.7	2682.1						1	0.6		1	1							
354+70	RT	84	85		2682.1	2682.0		8														
354+70	RT	85		2689.2	2682.0						1	2.2		1				1				
354+70	RT	85	87		2682.0	2680.7		232														
357+00	RT	86		2686.1	2680.8						1	0.3		1	1							
357+00	RT	86	87		2680.8	2680.7		8														
357+00	RT	87		2684.0	2680.5						1			1				1				
357+00	RT	87	88		2680.5	2678.6			236													
359+35	RT	88		2681.6	2678.6						1			1				1				
359+35	RT	88	90		2678.6	2677.3			36													
359+70	RT	89		2683.0	2677.4						1	0.6	1		1				1			INSTALL 3GI'A'
359+70	RT	89	90		2677.4	2677.3			8													
359+70	RT	90		2681.5	2676.8						1			1				1				
359+70	RT	90	OUT		2676.8	2674.2				56												REMOVE EX. 24" CMP & HW
361+85	RT	91		2681.8	2677.0						1			1	1							
361+85	RT	91	92		2677.0	2676.9		8														
361+85	RT	92		2680.4	2676.9						1			1				1				
361+85	RT	92	OUT		2676.9	2672.9	X	52														REMOVE 18" CMP & HW
365+11	LT	93		2677.8	2673.3						1						1	1				
365+21	LT	93	OUT		2673.3	2671.0		24														
SHEET TOTALS								804	752	108	24	4.6	2	18	5	2	4	17	2	2.2	0.13	

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

USRAL3PC009

COMPUTED BY:	JMK	DATE:	4/16/2009
CHECKED BY:	KBA	DATE:	12/6/2009

PROJECT NO.	SHEET NO.
R-2100B	3-F

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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.P. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109
365+35	RT																						
366+72	RT	94A	94		2673.2	2672.0				104													
367+75	RT	94		2675.0	2672.0																		
367+75	RT	94	OUT		2672.0	2670.0				64													
369+03	RT	95		2679.1	2676.3																		
369+03	RT	95	94B		2676.3	2673.9			100														
368+04	RT	94B		2678.3	2673.9																		
368+04	RT	94B	94		2673.9	2672.3			32														
370+50	RT	96		2680.1	2674.3																		
370+50	RT	96	97		2674.3	2674.2			8														
370+50	RT	97		2678.5	2674.2																		
370+50	RT	97	OUT		2674.2	2670.0			68														
372+00	RT	99		2680.5	2675.8																		
372+00	RT	99	98		2675.8	2675.7			8														
372+00	RT	98		2678.9	2675.7																		
372+00	RT	98	97		2675.7	2674.2			152														
371+10	LT	100		2680.5	2676.3																		
371+10	LT	100	OUT		2676.3	2670.0											32						
371+85	LT	101		2678.9	2676.7																		
371+85	LT	101	100		2676.7	2676.3	X		76														
373+48	LT	102		2679.5	2677.3																		
373+48	LT	102	OUT		2677.3	2675.0			88														
378+73	LT											24											
378+80	LT											8											
374+55	RT	103		2680.9	2678.1																		
374+55	RT	103	104		2678.1	2677.8	X		44														
375+00	RT	104		2681.0	2677.8																		
375+00	RT	104A	104		2684.0	2677.8												48					
375+00	LT	104B	OUT		2676.3	2675.3				12													
375+55	RT	105		2681.2	2678.4																		
375+55	RT	105	104		2678.4	2677.8			56														
376+30	RT	106		2681.4	2678.7																		
376+30	RT	106	105		2678.7	2678.4	X	12	76														
378+15	RT	107			2688.0																		
378+15	RT	107	108		2688.0	2676.8														28			
378+15	RT	108		2681.8	2676.8																		
378+15	RT	108	109		2676.8	2673.9						56											
378+35	LT	109		2679.1	2673.9																		
378+35	LT	109	110		2673.9	2673.2	X					76											
379+10	LT	110		2680.0	2673.2																		
379+10	LT	110	111		2673.2	2672.5	X						28										
380+19	LT	111		2680.6	2672.5																		
380+19	LT	111	112		2672.5	2668.3							60										
380+30	LT	112		2674.0	2668.3																		
380+30	LT	112	113		2668.3	2658.3							80										
380+87	LT	113		2664.0	2658.3																		
380+87	LT	113	OUT		2658.3	2658.0	X						56										
SHEET TOTALS								12	708	180		164	224				32	48		28			
GRAND TOTALS								12	4284	1420	248	164	352	44	64		32	48	54	140	92	68	68

STATION	FROM	TO	CLASS III R.C.P. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES 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
365+35																		
366+72	94A	94																
367+75	94															1		
367+75	94	OUT																
369+03	95															1		
369+03	95	94B																
368+04	94B															1		
368+04	94B	94																
370+50	96															1	0.8	
370+50	96	97																
370+50	97															1		
370+50	97	OUT																
372+00	99															1		
372+00	99	98																
372+00	98															1		
372+00	98	97																
371+10	100															1		
371+10	100	OUT																
371+85	101															1		
371+85	101	100																
373+48	102															1		
373+48	102	OUT																
378+73																		
378+80																		
374+55	103															1		
374+55	103	104																
375+00	104															1		
375+00	104A	104																
375+00	104B	OUT																
375+55	105															1		
375+55	105	104																
376+30	106															1		
376+30	106	105																
378+15	107																	
378+15	107	108																
378+15	108															1		
378+15	108	109																
378+35	109															1	0.2	
378+35	109	110																
379+10	110															1	1.8	
379+10	110	111																
380+19	111															1	3.1	
380+19	111	112																
380+30	112															1	0.7	
380+30	112	113																
380+87	113															1	0.7	
380+87	113	OUT																
SHEET TOTALS																20	7.3	
GRAND TOTALS				204		12					132			20.60		116	52.12	
														SAY 21			SAY 53	

STATION	FROM	TO	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 AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. (W.S. FLAT) FRAME WITH TWO GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	TRAFFIC BEARING J.B. STD. 840.34	TRAFFIC BEARING D.I. STD. 840.35	G.D.I. (N.S. FLAT) FRAME WITH TWO GRATES STD. 840.29	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. SAG) FRAME WITH GRATE STD. 840.22	BERM DRAINAGE OUTLET STD. 850.11
365+35																									
366+72	94A	94																							
367+75	94									1			1												
367+75	94	OUT																							
369+03	95									1									1						
369+03	95	94B																							
368+04	94B									1									1						
368+04	94B	94																							
370+50	96									1			1												
370+50	96	97																							
370+50	97									1									1						
370+50	97	OUT																							
372+00	99									1			1												
372+00	99	98																							
372+00	98									1									1						
372+00	98	97																							
371+10	100																	1	1						
371+10	100	OUT																							
371+85	101						1	1																	
371+85	101	100																							
373+48	102						1	1																	
373+48	102	OUT																							
378+73																									
378+80																									
374+55	103									1			1												
374+55	103	104																							
375+00	104									1									1						
375+00	104A	104																							
375+00	104B	OUT																							
375+55	105									1									1						
375+55	105	104																							
376+30	106									1									1						
376+30	106	105																							
378+15	107																								1
378+15	107	108																							
378+15	108									1									1						
378+15	108	109																							
378+35	109								1						1										
378+35	109	110																							
379+10	110																1					1			
379+10	110	111																							
380+19	111															1						1			
380+19	111	112																							
380+30	112								1				1												
380+30	112	113																							
380+87	113								1				1												
380+87	113	OUT																							
SHEET TOTALS							2	2	3	12			6		1	1	1	1	9			2			1
GRAND TOTALS							2	2	11	71	3	1	23		12	2	1	26	75			3	1	3	1

STATION	FROM	TO	FLOWABLE FILL, CY	CONVERT DI TO CB	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
365+35								46	REMOVE 18" CMP
366+72	94A	94							
367+75	94							70	REMOVE 18" CMP
367+75	94	OUT						32	REMOVE 18" CMP & HW
369+03	95								
369+03	95	94B							
368+04	94B								
368+04	94B	94							
370+50	96								
370+50	96	97							
370+50	97								
370+50	97	OUT							REMOVE 18" CMP & HW
372+00	99								
372+00	99	98							
372+00	98								
372+00	98	97							
371+10	100								
371+10	100	OUT			2@15"			11	REM. 12" PLST & CB, INST.2-15" CS ELBOWS
371+85	101								
371+85	101	100						91	REMOVE 15" CMP
373+48	102								TIE 6" DRAIN TO DI
373+48	102	OUT						80	REMOVE 15" CMP
378+73								20	REMOVE 18" CMP
378+80								8	REMOVE 1 JOINT EX. 30" RCP
374+55	103								
374+55	103	104							
375+00	104								
375+00	104A	104			2@18"				INSTALL 2 - 18" CSP ELBOWS, REM. 15" CMP
375+00	104B	OUT				0.4			COLLAR & EXTEND 18" RCP, CLEAN PIPE
375+55	105								REMOVE DRIVE PIPE
375+55	105	104							
376+30	106								
376+30	106	105							
378+15	107								
378+15	107	108			2@30"				INSTALL 2 - 30" CSP ELBOWS
378+15	108								
378+15	108	109							REMOVE 18" CMP & HW
378+35	109						0.065		
378+35	109	110							
379+10	110						0.182		
379+10	110	111							
380+19	111								
380+19	111	112							
380+30	112								REMOVE DRIVEWAY PIPE
380+30	112	113							
380+87	113								REMOVE 15" CMP
380+87	113	OUT							
SHEET TOTALS					2@15"	0.4	0.247	358	
					2@18"				
					2@30"				
GRAND TOTALS			24.2		2@15"	1.4	1.519	758	
			SAY 25		2@18"	SAY 2	SAY 2		
					2@24"				
					2@30"				

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

USRAL3PC009

COMPUTED BY: JMK DATE: 4/16/2009

CHECKED BY: KBA DATE: 12/6/2009

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2100B	3-G

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54" & OVER)

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) 54"	60"	66"	72"	78"	84"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 54" .109	54" .138	54" .168	54" SHOP ELON-GATED .138	54" SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	72" .139	72" .168	STRUCTURAL PLATE PIPE 60" 12	60" 10	66" 12	66" 10	72" 12	72" 10	REINFORCED ENDWALLS WITH R.C. - C.Y.	REINFORCED ENDWALLS WITH C.S. - C.Y.	MASONRY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR 840.02	FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & Size	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SIZE																																									
THICKNESS OR GAUGE																																									
258+06	CL	8B	OUT		2820.5	2819.0			92																					5.6											REMOVE EX. 54" CMP AND HW
286+52	RT	31A	OUT		2745.2	2745.1	X											12												5.9										2.9		REMOVE EX. HW
318+06	CL	51A	OUT		2673.5	2667.0					80																		14.2												REMOVE 56' EX. 6' X 4' RCBC & 2 HW
322+20	CL	52A	OUT		2680.5	2672.5									80															5.2											REMOVE 51' EX. 3' X 4' RCBC & HW
344+97	CL	75A	OUT		2675.5	2668.0		76																					5.0											REMOVE EX. PIPE & HW
SHEET TOTALS								76	92		80				80										12					35.9										2.9	
																														SAY 36										SAY 3	

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

12/17/200910:42 AM

COMPUTED BY: RR DATE: 10/08/07
CHECKED BY: jmkd / RR DATE: 10/23/07 04/22/09
REVISED BY: CMKR 12/11/09

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	3-H

USRAL3P

"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 BEGIN

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

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

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 FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END		TYPE III	GRAU 350	GRAU 350 (TL-2)	M-350	CAT-1	AT-1	BIC	B-77	G	NG				
-L1-	251+96.20	256+83.70	LEFT	487.50			256+00		6	9							1										TIE TO EX. GR. @ TRAILING END.
-L1-	252+25.00	253+00.00	RIGHT	75.00			253+00										1						1				
-L1-	253+00.00	256+00.00	RIGHT																						300.00		
-L1-	256+00.00	256+75.00	RIGHT	75.00				256+00									1						1				
-L1-	260+75.00	261+50.00	RIGHT	75.00			261+50										1						1				
-L1-	261+50.00	263+00.00	RIGHT																						150.00		
-L1-	263+00.00	263+70.00	RIGHT	25.00	50.00			263+00													1		1				
-L1-	262+00.00	265+75.00	LEFT	375.00				263+25	8	11							2										
-L1-	266+00.00	275+50.00	LEFT	950.00			275+00		6	9							2										
-L1-	267+20.00	268+47.75	RIGHT	100.00	50.00		268+47.75														1		1				
-L1-	268+47.75	271+00.00	RIGHT																						252.25		
-L1-	279+00.00	286+50.00	LEFT	750.00			285+25	280+00	6	9							2										
-L1-	271+00.00	271+20.00	RIGHT					271+00																1			20' TEST LEVEL 2 ATTENUATOR
-L1-	283+50.00	287+00.00	RIGHT	350.00			283+50	286+50	8	11							2										DRIVEWAY @ APPROACH; HW @ TRAILING END
-L1-	290+00.00	298+00.00	LEFT	800.00				290+50	6	9							2										
-L1-	298+50.00	324+12.50	LEFT	2562.50					6	9							2										
-L1-	299+25.00	300+00.00	RIGHT	75.00			300+00										1						1				
-L1-	300+00.00	316+50.00	RIGHT																						1650.00		
-L1-	316+50.00	318+12.50	RIGHT	162.50				316+50	6	9							1						1				
-L1-	322+75.00	324+00.00	RIGHT	125.00			324+00										1						1				
-L1-	324+00.00	325+70.00	RIGHT																						170.00		
-L1-	325+70.00	325+90.00	RIGHT					325+70																1			20' TEST LEVEL 2 ATTENUATOR
-L1-	324+37.50	330+62.50	LEFT	625.00			329+37.50		8	11							2										
-L1-	333+50.00	338+50.00	RIGHT	500.00			334+75										1						1				
-L1-	338+50.00	340+00.00	RIGHT																						150.00		
-L1-	339+00.00	347+50.00	LEFT	850.00			346+25	339+50	6	9							2										
-L1-	340+00.00	340+75.00	RIGHT	75.00				340+00									1						1				
-L1-	342+62.50	348+50.00	RIGHT	587.50			343+87.50										1						1				HEADWALL
-L1-	348+50.00	351+95.00	RIGHT																						345.00		
-L1-	351+95.00	352+15.00	RIGHT					351+95																1			20' TEST LEVEL 2 ATTENUATOR
-L1-	352+00.00	354+75.00	LEFT	275.00			354+50	352+50	6	9							1	1									1 @ 25' TEST LEVEL 2
-L1-	352+60.00	352+80.00	RIGHT				352+80																	1			20' TEST LEVEL 2 ATTENUATOR
-L1-	352+80.00	363+93.50	RIGHT				BRIDGE																		1113.50		BRIDGE
-L1-	355+47.50	358+72.50	LEFT	325.00				356+72.50	8	11							2										
-L1-	359+21.00	364+08.50	LEFT	487.50			BRIDGE		8	11							1						1				BRIDGE
-L1-	364+91.50	366+16.50	LEFT	125.00			BRIDGE		8.917	11.917							1						1				BRIDGE
-L1-	364+91.50	366+54.00	RIGHT	162.50			BRIDGE		8.917	11.917							1						1				BRIDGE
-L1-	366+47.50	370+97.50	LEFT	450.00			369+72.50		8	11							2										
-L1-	367+38.00	369+00.00	RIGHT	137.50	62.50		369+00														1		1				
-L1-	369+00.00	374+50.00	RIGHT																						550.00		
-L1-	374+50.00	374+90.00	RIGHT					374+50																1			40' TYPICAL ATTENUATOR
SUBTOTAL				**11587.5**	**162.5**												**34**	**1**			**3**		**15**	**5**	**4680.75**			
DEDUCTIONS		**LENGTH**	**QTY**																								
	GRAU-350	50.00	34	-1700																							
TL-2	GRAU-350	25.00	1	-25																							
	AT-1	6.25	3		-18.75		**ADDITIONAL GUARDRAIL POSTS = 10 EA**																				
	CAT-1	6.25	0	0																							
	B-77	18.75	15	-281.25																							
TOTAL DEDUCTIONS				-2006.25	-18.75																						
GRAND TOTAL				**9581.25**	**143.75**												**34**	**1**			**3**		**15**	**5**	**4680.75**		
SAY				**9600**	**150**																				**4710**		

COMPUTED BY: PTS DATE: 10/30/2009
CHECKED BY: KJV DATE: 11/2/2009
REVISED BY: PTS DATE: 2/22/2010

PROJECT NO.	SHEET NO.
R-2100B	3-I

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

in Cubic Yards

SUMMARY #	LINE	STATION to STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBANKMENT +%	BORROW	WASTE
PHASE 1, #1	-L1-	252+00.00 TO 280+00.00	736	0	944	208	0
	SUBTOTAL SUMMARY NO. 1 (PHASE 1, LT SIDE)		**736**	**0**	**944**	**208**	**0**
PHASE 1, #2	-L1-	280+00.00 TO 310+00.00	591	0	337	0	254
	SUBTOTAL SUMMARY NO. 2 (PHASE 1, LT SIDE)		**591**	**0**	**337**	**0**	**254**
PHASE 1, #3	-L1-	310+00.00 TO 340+00.00	273	0	7,533	7,260	0
	SUBTOTAL SUMMARY NO. 3 (PHASE 1, LT SIDE)		**273**	**0**	**7,533**	**7,260**	**0**
PHASE 1, #4	-L1-	340+00.00 TO 364+07.50	511	0	734	223	0
	SUBTOTAL SUMMARY NO. 4 (PHASE 1, LT SIDE)		**511**	**0**	**734**	**223**	**0**
PHASE 1, #5	-L1-	364+92.50 TO 382+05.13	273	0	1,065	792	0
	SUBTOTAL SUMMARY NO. 5 (PHASE 1, LT SIDE)		**273**	**0**	**1,065**	**792**	**0**
PHASE 1, SUBTOTAL			**2,384**	**0**	**10,612**	**8,482**	**254**
PHASE 2, #1	-L1-	252+00.00 TO 280+00.00	5,116	0	321	0	4,795
	SUBTOTAL SUMMARY NO. 1 (PHASE 2, RT SIDE)		**5,116**	**0**	**321**	**0**	**4,795**
PHASE 2, #2	-L1-	280+00.00 TO 310+00.00	8,867	0	786	0	8,081
	SUBTOTAL SUMMARY NO. 2 (PHASE 2, RT SIDE)		**8,867**	**0**	**786**	0	**8,081**
PHASE 2, #3	-L1-	310+00.00 TO 340+00.00	5,752	0	595	0	5,157
	SUBTOTAL SUMMARY NO. 3 (PHASE 2, RT SIDE)		**5,752**	**0**	**595**	**0**	**5,157**
PHASE 2, #4	-L1-	340+00.00 TO 364+07.50	2,369	0	174	0	2,195
	SUBTOTAL SUMMARY NO. 4 (PHASE 2, RT SIDE)		**2,369**	**0**	**174**	**0**	**2,195**
PHASE 2, #5	-L1-	364+92.50 TO 382+05.13	1,405	0	224	0	1,181
	SUBTOTAL SUMMARY NO. 5 (PHASE 2, RT SIDE)		**1,405**	**0**	**224**	**0**	**1,181**
PHASE 2, SUBTOTAL			**23,509**	**0**	**2,099**	**0**	**21,410**
	PROJECT SUBTOTAL		**25,893**	**0**	**12,711**	**8,482**	**21,664**
	PHASE 1 SUITABLE WASTE IN LIEU OF BORROW					-254	-254
	SHOULDER MATERIAL				+2,530	+2,530	
	LOSS DUE TO CLEARING AND GRUBBING		-750				-750
	PROJECT TOTAL		**25,143**	**0**	**15,241**	**10,758**	**20,660**
	ADJUST FOR ROCK SWELL						+1,368
	5% TO REPLACE TOPSOIL ON BORROW PIT					+538	
	GRAND TOTAL		**25,143**	**0**	**15,241**	**11,296**	**22,028**
	SAY		**25,800**			**11,600**	

DDE = 1,050 CY
CONTINGENCY UNDERCUT = 1,500 CY
PAVEMENT STRUCTURE VOLUME = 5,000 CY

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on Subsurface Data provided by the Geotechnical Engineering Unit.

Quantites are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out.
These cross-section notes will be used in computing the final quantites for which the contractor will be paid.

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	3-J
R/W SHEET NO.	

MISCELLANEOUS SUMMARIES

PROPOSED UNDERDRAINS

LOCATION	SIDE	BEG. STA.	END STA.	LENGTH
-L1-	RT	268+00.00	269+00.00	100
-L1-	RT	269+75.00	270+50.00	75
-L1-	RT	283+00.00	283+50.00	50
-L1-	RT	290+50.00	292+00.00	150
-L1-	RT	315+00.00	316+50.00	150
-L1-	RT	325+50.00	326+00.00	50
-L1-	RT	360+00.00	364+00.00	400
	TOTAL FROM NCDOT GEOTECHNICAL UNIT			975
	*CONTINGENCY AMOUNT FROM NCDOT GEOTECHNICAL UNIT			1500
			TOTAL	**2475**
			SAY	**2500**

*Some of these areas probably can be mitigated by better maintenance of ditches and drain pipes. For those areas that, at the discretion of the engineer, require more robust measures, we recommend underdrains to be installed at the shoulder point on the Right Side, at a depth of 6 feet or at the rock line, whichever is the, shallower. For that purpose and for the other contingencies, we recommend 1500 feet of underdrain, to be used at the discretion of the engineer.

EXPRESSWAY GUTTER

LOC.	BEG. STA.	END STA.	SIDE	NET LENGTH
-L1-	256+00.00	256+60.00	RT	60.00
-L1-	263+00.00	268+47.75	RT	547.75
-L1-	316+50.00	317+00.00	RT	50.00
-L1-	323+00.00	324+00.00	RT	100.00
-L1-	325+70.00	330+50.00	RT	480.00
-L1-	334+00.00	338+50.00	RT	450.00
-L1-	340+00.00	341+21.78	RT	121.78
-L1-	343+12.50	344+50.00	RT	137.50
-L1-	345+50.00	348+50.00	RT	300.00
-L1-	368+00.00	369+00.00	RT	100.00
-L1-	374+50.00	378+50.00	RT	400.00
			TOTAL	**2,747.03**
			SAY	**2,750**

SHOULDER BERM GUTTER

LOCATION	SIDE	BEG. STA.	END STA.	LENGTH
-L1-	LT	253+00.00	256+00.00	300.00
-L1-	LT	262+50.00	266+30.00	380.00
-L1-	LT	267+50.00	269+50.00	200.00
-L1-	LT	272+00.00	275+00.00	300.00
-L1-	LT	280+60.00	285+90.00	530.00
-L1-	LT	290+50.00	295+50.00	500.00
-L1-	LT	299+00.00	302+50.00	350.00
-L1-	LT	306+50.00	316+60.00	1010.00
-L1-	LT	339+50.00	345+50.00	600.00
-L1-	LT	352+50.00	354+50.00	200.00
-L1-	LT	365+06.50	365+14.00	7.50
			TOTAL	**4377.50**
			SAY	**4390**

REMOVAL OF EXISTING ASPHALT PAVEMENT

LOC.	BEG. STA.	END STA.	SIDE	AREA	WIDTH	SQUARE YARDS
-L1-	285+90	289+28	LT	1263.72		140.41
-L1-	363+94	364+42	CTR	999.16		111.02
-L1-	364+58	364+57	CTR	1029.30		114.37
-L1-	377+53	378+54	LT	117.93		13.10
					TOTAL	**378.90**
					SAY	**380**

REVISIONS

USER: rgayes
DATE: 12/16/2009
TIME: 12:56:12 PM
DGN: r:\roadway\proj\r2100b_rdy_pat03.dgn

PROJ. REFERENCE NO.	SHEET NO.
R-2100B	3-K

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

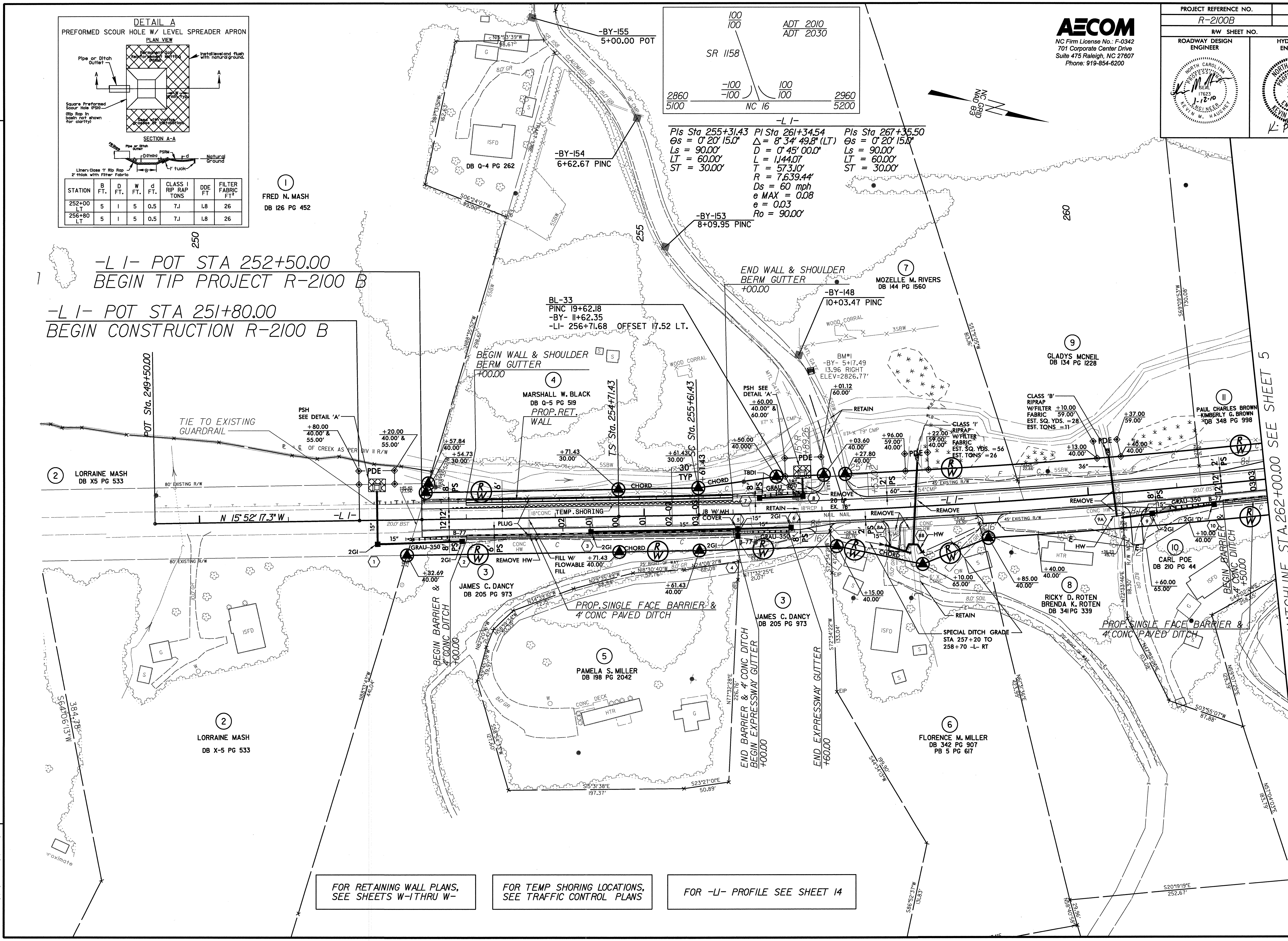
PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	FRED N. MASH
2	4	LORRAINE MASH
3	4	JAMES C. DANCY
4	4	MARSHALL W. BLACK
5	4	PAMELA S. MILLER
6	4	FLORENCE M. MILLER
7	4	MOZELLE M. RIVERS
8	4	RICKY D. ROTEN, BRENDA K. ROTEN
9	4	GLADYS MCNEIL
10	4, 5	CARL POE
11	4, 5	PAUL CHARLES BROWN, KIMBERLY G. BROWN
12	4, 5	TERRY BLACK
13	5	KENNETH MASH
13A	5, 6	CLATE MASH AND WIFE, BARBARA MASH
14	5	JACK L. FARRINGTON
15	5	ARIZONA POE
16	5	JOSEPH D. RUSSELL
17	5, 6	BOBBY STANLEY
18	5, 6	ROBIN SOUTH BOGGS, ERNEST ROSS BOGGS
19	6	KATHY HUDLER GALATI
20	6, 7	TABERNACLE BAPTIST CHURCH TRUSTEES
21	6, 7, 8	DALE C. SHEETS TRUSTEE
22	7	ROBERT P. SHEETS
23		JOAN G. PARTRICK
24	6, 7	MARY F. AVERY
25	7	WARREN MILLER
25A	7	UNKNOWN
26	9	PEGGY HARTZOG
27	9	R.J. COMBS
28	9	JEFFREY MILLER
30	9	JOE DAVID HAMBY
31	9, 10	BOBBY G. HAMBY
32	9, 10	IRENE BARE SHEETS
33	10	TERRY MILLER
34	10	CINNAMON MARTIN, JULIE BROWN, MATTHEW LEDFORD
35	10	RICHARD MILLER
36	10	THOMAS LARRY MILLER
37	10	PATRICIA K. BALLARD
38	10	KATHY LEE COTO
39	10	A.P. FARRINGTON
40	10, 11, 12, 13	NEWTON WILLIAM FARRINGTON
41	12, 13	GALE F. BENNETT
42	12, 13	DONALD SHEETS
43	13	JEFF SHEETS
44	13	DONALD SHEETS
45	13	ABNER B. FORTNER,JR.
46	13	FRANK G. SHEETS
47	12	ASHE COUNTY
48	13	EDDIE LIDDIE
49	13	JEFF SHEETS
50	13	DAVID B. LOPP

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	4
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200



NC GRID NAD 83
-L I- POT STA 252+50.00
BEGIN TIP PROJECT R-2100 B
-L I- POT STA 251+80.00
BEGIN CONSTRUCTION R-2100 B
POT Sta. 249+50.00
TIE TO EXISTING GUARDRAIL
N 15° 52' 17.3" W
-BY-155 5+00.00 POT
-BY-154 6+62.67 PINC
-BY-153 8+09.95 PINC
-BY-148 10+03.47 PINC
BL-33 PINC 19+62.18
-BY- 11+62.35
-LI- 256+71.68 OFFSET 17.52 LT.
BEGIN WALL & SHOULDER BERM GUTTER +00.00
END WALL & SHOULDER BERM GUTTER +00.00
PROP. RET. WALL
TS Sta. 254+71.43
SC Sta. 255+61.43
TEMP. SHORING
PROP. SINGLE FACE BARRIER & 4' CONC PAVED DITCH
BEGIN BARRIER & 4' CONC DITCH +00.00
END BARRIER & 4' CONC DITCH BEGIN EXPRESSWAY GUTTER +00.00
END EXPRESSWAY GUTTER +60.00
BM#1 -BY- 5+17.49 13.96 RIGHT ELEV=2826.77'
SPECIAL DITCH GRADE STA 257+20 TO 258+70 -L- RT
CLASS 'B' RIPRAP W/FILTER FABRIC EST. SQ. YDS. =28 EST. TONS =11
CLASS 'I' RIPRAP W/FILTER FABRIC EST. SQ. YDS. =56 EST. TONS =26
MATCHLINE STA. 262+00.00 SEE SHEET 5
1 FRED N. MASH DB 126 PG 452
2 LORRAINE MASH DB X5 PG 533
2 LORRAINE MASH DB X-5 PG 533
3 JAMES C. DANCY DB 205 PG 973
4 MARSHALL W. BLACK DB Q-5 PG 519
5 PAMELA S. MILLER DB 198 PG 2042
6 FLORENCE M. MILLER DB 342 PG 907 PB 5 PG 617
7 MOZELLE M. RIVERS DB 144 PG 1560
8 RICKY D. ROTEN BRENDA K. ROTEN DB 341 PG 339
9 GLADYS MCNEIL DB 134 PG 1228
10 CARL POE DB 210 PG 44
11 PAUL CHARLES BROWN KIMBERLY G. BROWN DB 348 PG 998
DB Q-4 PG 262

DETAIL A

PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON

PLAN VIEW — SECTION A-A

STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
252+00 LT	5	1	5	0.5	7.1	1.8	26
256+80 LT	5	1	5	0.5	7.1	1.8	26

SR 1158 — NC 16: 100/100, ADT 2010 / ADT 2030; 2860/5100, -100/-100, 100/100, 2960/5200

-L I-

PIs Sta 255+31.43	PI Sta 261+34.54	PIs Sta 267+35.50
Θs = 0° 20' 15.0"	Δ = 8° 34' 49.8" (LT)	Θs = 0° 20' 15.0"
Ls = 90.00'	D = 0° 45' 00.0"	Ls = 90.00'
LT = 60.00'	L = 1,144.07'	LT = 60.00'
ST = 30.00'	T = 573.10'	ST = 30.00'
	R = 7,639.44'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.03	
	Ro = 90.00'	

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-

FOR TEMP SHORING LOCATIONS, SEE TRAFFIC CONTROL PLANS

FOR -LI- PROFILE SEE SHEET 14

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

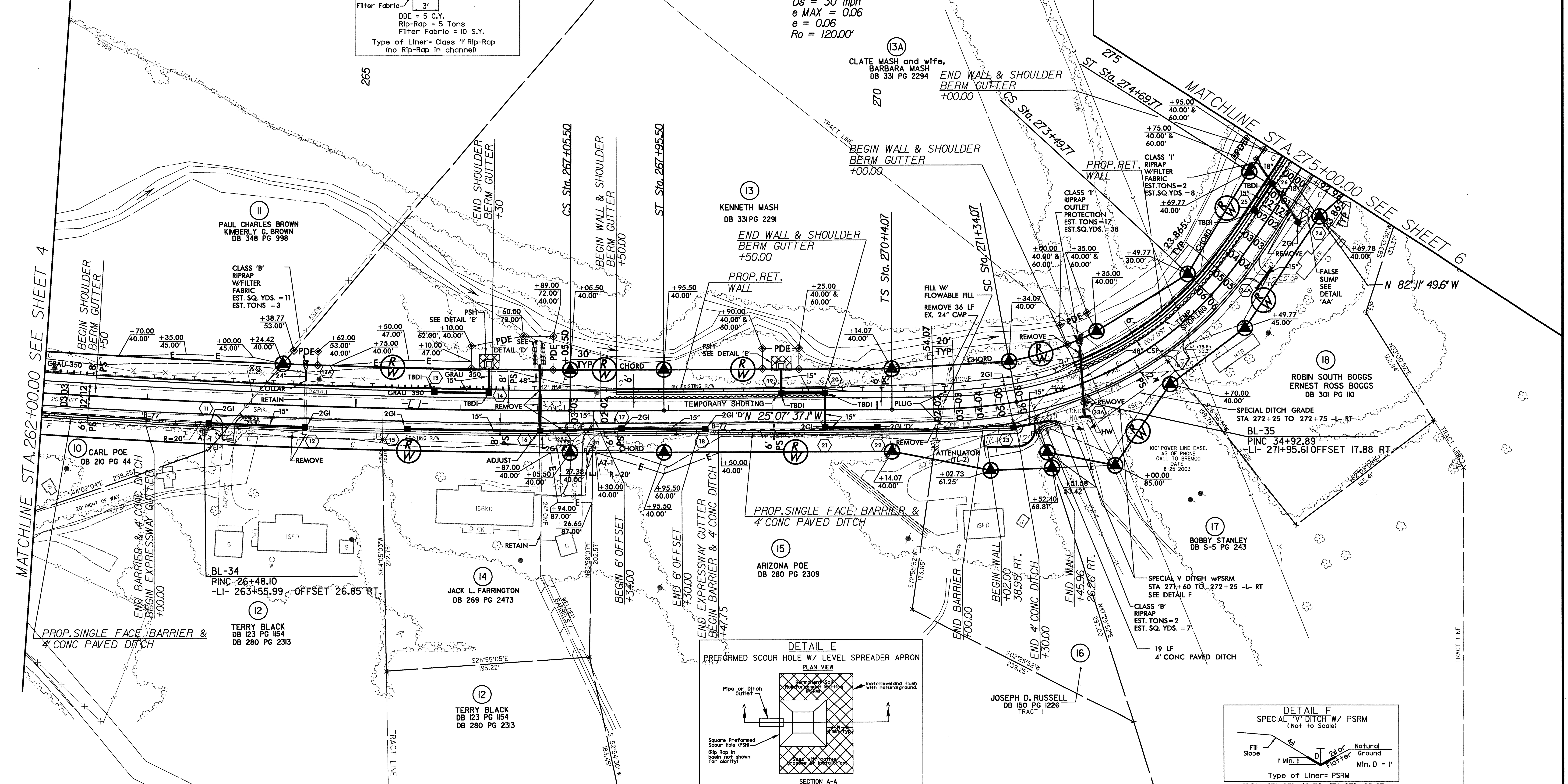
-L1-

PIs Sta 255+31.43	PI Sta 261+34.54	PIs Sta 267+35.50
Θs = 0° 20' 15.0"	Δ = 8° 34' 49.8" (LT)	Θs = 0° 20' 15.0"
Ls = 90.00'	D = 0° 45' 00.0"	Ls = 90.00'
LT = 60.00'	L = 1,144.07	LT = 60.00'
ST = 30.00'	T = 573.10'	ST = 30.00'
	R = 7,639.44'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.03	
	Ro = 90.00'	

-L1-

PIs Sta 270+94.20	PI Sta 272+45.76	PIs Sta 273+89.89
Θs = 10° 12' 00.0"	Δ = 36° 40' 12.5" (LT)	Θs = 10° 12' 00.0"
Ls = 120.00'	D = 17° 00' 00.0"	Ls = 120.00'
LT = 80.13'	L = 215.71	LT = 80.13'
ST = 40.12'	T = 111.69'	ST = 40.12'
	R = 337.03'	
	Ds = 30 mph	
	e MAX = 0.06	
	e = 0.06	
	Ro = 120.00'	

DETAIL D
3' BASE TAIL DITCH
(Not to Scale)
DDE = 5 C.Y.
Rip-Rap = 5 Tons
Filter Fabric = 10 S.Y.
Type of Liner= Class 'I' Rip-Rap
(no Rip-Rap in channel)



DETAIL E
PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON

STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
266+27 LT	5	1	5		7.1	1.8	26
269+08 LT	5	1	5		7.1	1.8	26

DETAIL AA
FALSE SUMP
(Not to Scale)
S = Ditch Slope
STA. 274+65 RT

DETAIL F
SPECIAL 'V' DITCH W/ PSRM
(Not to Scale)
Type of Liner= PSRM
FROM STA. 271+60 TO STA. 272+25 RT.

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-

FOR TEMP SHORING LOCATIONS, SEE TRAFFIC CONTROL PLANS

FOR -L1- PROFILE SEE SHEET 14

REVISIONS

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	6
R/W SHEET NO.	

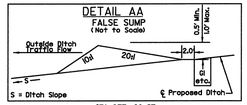
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN M. HAUGHEY — 1-12-10

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN B. ALFORD — 1-12-10

REVISIONS

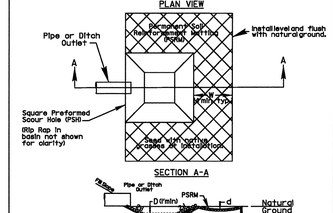
USER: vanmefrak
DATE: 1/11/2010
TIME: 5:04:29 PM
DGN: H:\Roadway\PROJ\R-2100b_rdy_set05.dgn

DETAIL AA
FALSE SUMP
(Not to Scale)



STA. 277+30 RT
STA. 280+25 RT

DETAIL H
PREFORMED SCOUR HOLE W/ LEVEL SPREADER APRON



STATION	B FT.	D FT.	W FT.	d FT.	CLASS I RIP RAP TONS	DDE FT	FILTER FABRIC FT²
282+60 LT	5	1	5	0.5	7.1	1.8	26
285+85 RT	5	1	5	0.5	7.1	1.8	26

-DRI-
PI Sta 10+35.87
Δ = 61° 45' 00.0" (LT)
D = 95° 29' 34.7"
L = 64.66'
T = 35.87'
R = 60.00'

PI Sta 10+87.59
Δ = 34° 00' 00.0" (RT)
D = 76° 23' 39.7"
L = 44.51'
T = 22.93'
R = 75.00'

-L1-
PI Sta 284+22.48
Δ = 84° 37' 04.7" (LT)
D = 23° 00' 00.0"
L = 367.90'
T = 226.75'
R = 249.11'
Ds = 30 mph
e MAX = 0.08
e = 0.08
Ro = 160.00'

-L1-
PI Sta 288+97.62
Δ = 79° 57' 49.4" (RT)
D = 23° 00' 00.0"
L = 347.67'
T = 208.90'
R = 249.11'
Ds = 30 mph
e MAX = 0.08
e = 0.08
Ro = 160.00'

-L1-
PIs Sta 275+96.23
Θs = 8° 42' 00.0"
Ls = 120.00'
LT = 80.10'
ST = 40.09'

PI Sta 277+73.35
Δ = 38° 17' 59.0" (RT)
D = 14° 30' 00.0"
L = 264.14
T = 137.22'
R = 395.14'
Ds = 35 mph
e MAX = 0.06
e = 0.06
Ro = 120.00'

PIs Sta 279+40.36
Θs = 8° 42' 00.0"
Ls = 120.00'
LT = 80.10'
ST = 40.09'

(20) TABERNACLE BAPTIST CHURCH TRUSTEES
DB 196 PG 1490

(19) KATHY HUDLER GALATI
DB 155 PG 813
DB 203 PG 931

(13A) CLATE MASH and wife: BARBARA MASH
DB 331 PG 2294

(18) ROBIN SOUTH BOGGS
ERNEST ROSS BOGGS
DB 301 PG 110

(17) BOBBY STANLEY
DB A6 PG 361

(24) MARY F. AVERY
DB 260 PG 2190

(21) DALE C. SHEETS TRUSTEE
DB 250 PG 99

(21) DALE C. SHEETS TRUSTEE
DB 250 PG 99

BL-36
PINC 41+25.69
-LI- 278+14.36 OFFSET 45.62 LT.

PC STA. 10+00.00 -DRI- =
POC STA. 277+96.00 -LI-

BL-137
PINC 47+01.38
-LI- 283+58.92 OFFSET 48.31 RT.

MATCHLINE STA. 275+00.00 SEE SHEET 5

MATCHLINE STA. 288+00.00 SEE SHEET 7

N 82° 11' 49.6" W

N 26° 29' 50.6" W

BEGIN WALL +00.00
END WALL +50.00
BEGIN SHOULDER BERM GUTTER +60.00
END SHOULDER BERM GUTTER +90.00
BEGIN 6' OFFSET +50.00
END 6' OFFSET +80.00
PT Sta. 285+63.64
PC Sta. 286+88.72
PT Sta. 11+09.17
POT Sta. 12+02.80
POT STA. 11+83.22 END CONST.
SC Sta. 276+36.14
ST Sta. 280+20.27
ST Sta. 279+00.27
ST Sta. 275+16.14

CLASS 'I' RIPRAP W/FILTER FABRIC EST.TONS=2 EST.SQ.YDS.=8

REMOVE AND REPLACE 1 JOINT 18" RCP

TEMP. SHORING

FALSE SUMP SEE DETAIL 'AA'

APPROXIMATE LOCATION OF DRIVE

RETAIN & EXTEND

COLLAR

PSH SEE DETAIL 'H'

SEE DETAIL 'G'

SEE DETAIL 'I'

SEE DETAIL 'J'

SEE DETAIL 'K'

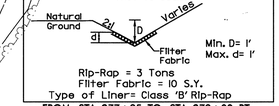
SEE DETAIL 'L'

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-

FOR TEMP SHORING LOCATIONS, SEE TRAFFIC CONTROL PLANS

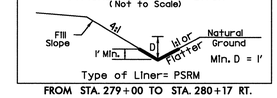
FOR -LI- PROFILE SEE SHEETS 14 & 15
FOR -DRI- PROFILE SEE SHEET 19

DETAIL I
DRIVEWAY TYPICAL DITCH
(Not to Scale)



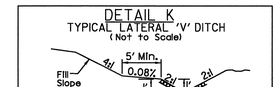
Rip-Rap = 3 Tons
Filter Fabric = 10 S.Y.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 277+85 TO STA. 279+00 RT.

DETAIL J
TYPICAL LATERAL 'V' DITCH
(Not to Scale)



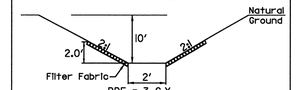
Type of Liner= PSRM
FROM STA. 279+00 TO STA. 280+17 RT.

DETAIL K
TYPICAL LATERAL 'V' DITCH
(Not to Scale)



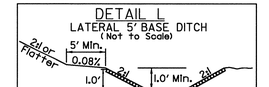
Rip-Rap = 10 Tons
Filter Fabric = 21 S.Y.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 283+00 TO STA. 283+25 RT.

DETAIL G
2' BASE TAIL DITCH
(Not to Scale)



DDE = 3 C.Y.
Rip-Rap = 5 Tons
Filter Fabric = 5 S.Y.
Type of Liner= Class 'I' Rip-Rap
(no Rip-Rap in channel)

DETAIL L
LATERAL 5' BASE DITCH
(Not to Scale)



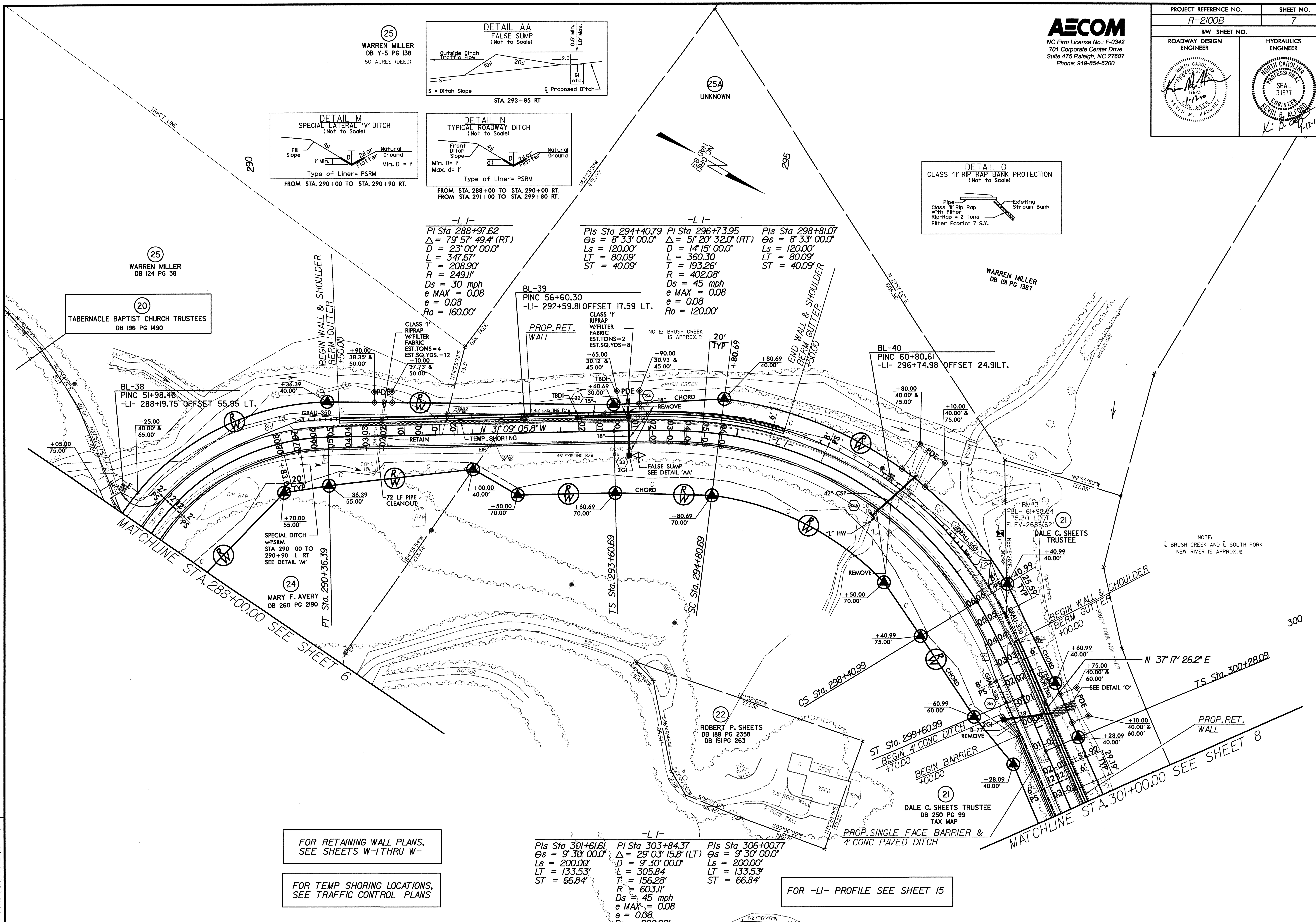
Rip-Rap = 48 Tons
Filter Fabric = 100 S.Y.
Type of Liner= Class 'I' Rip-Rap
FROM STA. 283+60 TO STA. 284+35 RT.

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

REVISIONS



DETAIL AA
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
S = Ditch Slope
℄ Proposed Ditch
STA. 293+85 RT
DETAIL M
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= PSRM
FROM STA. 290+00 TO STA. 290+90 RT.
DETAIL N
TYPICAL ROADWAY DITCH
(Not to Scale)
Type of Liner= PSRM
FROM STA. 288+00 TO STA. 290+00 RT.
FROM STA. 291+00 TO STA. 299+80 RT.
DETAIL O
CLASS 'II' RIP RAP BANK PROTECTION
(Not to Scale)
Class 'II' Rip Rap with Filter
Rip-Rap = 2 Tons
Filter Fabric= 7 S.Y.
WARREN MILLER
DB Y-5 PG 138
50 ACRES (DEED)
UNKNOWN
WARREN MILLER
DB 124 PG 38
WARREN MILLER
DB 191 PG 1387
TABERNACLE BAPTIST CHURCH TRUSTEES
DB 196 PG 1490
MARY F. AVERY
DB 260 PG 2190
ROBERT P. SHEETS
DB 188 PG 2358
DB 151 PG 263
DALE C. SHEETS TRUSTEE
DB 250 PG 99
TAX MAP
-L1-
PI Sta 288+97.62
Δ = 79° 57' 49.4" (RT)
D = 23° 00' 00.0"
L = 347.67'
T = 208.90'
R = 249.11'
Ds = 30 mph
e MAX = 0.08
e = 0.08
Ro = 160.00'
-L1-
PIs Sta 294+40.79
Θs = 8° 33' 00.0"
Ls = 120.00'
LT = 80.09'
ST = 40.09'
PI Sta 296+73.95
Δ = 51° 20' 32.0" (RT)
D = 14° 15' 00.0"
L = 360.30
T = 193.26'
R = 402.08'
Ds = 45 mph
e MAX = 0.08
e = 0.08
Ro = 120.00'
PIs Sta 298+81.07
Θs = 8° 33' 00.0"
Ls = 120.00'
LT = 80.09'
ST = 40.09'
-L1-
PIs Sta 301+61.61
Θs = 9° 30' 00.0"
Ls = 200.00'
LT = 133.53'
ST = 66.84'
PI Sta 303+84.37
Δ = 29° 03' 15.8" (LT)
D = 9° 30' 00.0"
L = 305.84
T = 156.28'
R = 603.11'
Ds = 45 mph
e MAX = 0.08
e = 0.08
Ro = 200.00'
PIs Sta 306+00.77
Θs = 9° 30' 00.0"
Ls = 200.00'
LT = 133.53'
ST = 66.84'
BL-38
PINC 51+98.46
-L1- 288+19.75 OFFSET 55.95 LT.
BL-39
PINC 56+60.30
-L1- 292+59.81 OFFSET 17.59 LT.
BL-40
PINC 60+80.61
-L1- 296+74.98 OFFSET 24.91LT.
N 31° 09' 05.8" W
N 37° 17' 26.2" E
MATCHLINE STA. 288+00.00 SEE SHEET 6
MATCHLINE STA. 301+00.00 SEE SHEET 8
PT Sta. 290+36.39
TS Sta. 293+60.69
SC Sta. 294+80.69
CS Sta. 298+40.99
ST Sta. 299+60.99
TS Sta. 300+28.09
BEGIN WALL & SHOULDER BERM GUTTER
END WALL & SHOULDER BERM GUTTER
PROP. RET. WALL
TEMP. SHORING
NOTE: BRUSH CREEK IS APPROX.℄
NOTE: ℄ BRUSH CREEK AND ℄ SOUTH FORK NEW RIVER IS APPROX.℄
BM#3
-BL- 61+98.84
75.30 LEFT
ELEV=2688.62'
BEGIN 4' CONC DITCH +70.00
BEGIN BARRIER +00.00
PROP. SINGLE FACE BARRIER & 4' CONC PAVED DITCH
SPECIAL DITCH w/PSRM
STA. 290+00 TO 290+90 -L- RT
SEE DETAIL 'M'
72 LF PIPE CLEANOUT
FALSE SUMP
SEE DETAIL 'AA'
SEE DETAIL 'O'

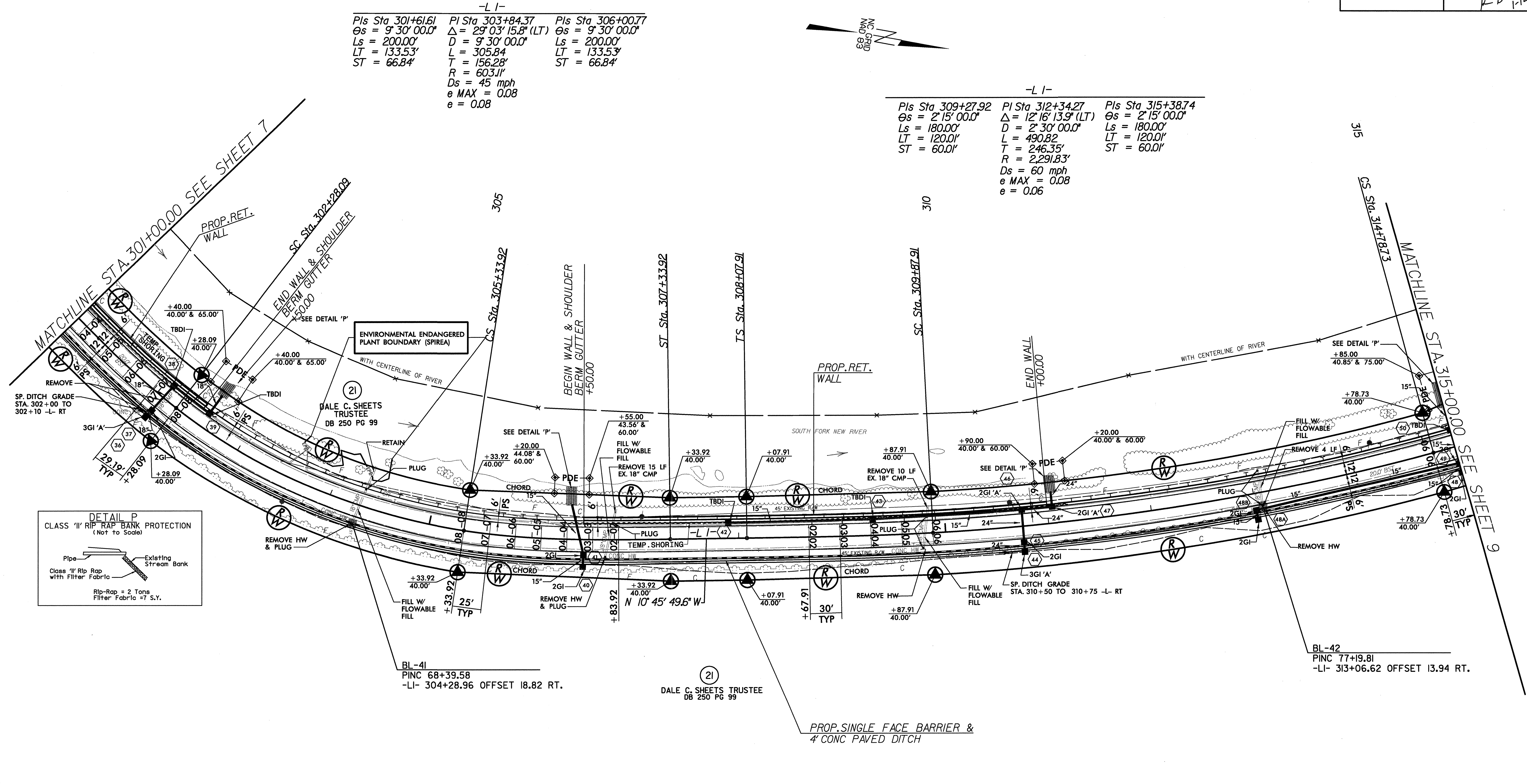
FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-

FOR TEMP SHORING LOCATIONS, SEE TRAFFIC CONTROL PLANS

FOR -L1- PROFILE SEE SHEET 15

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

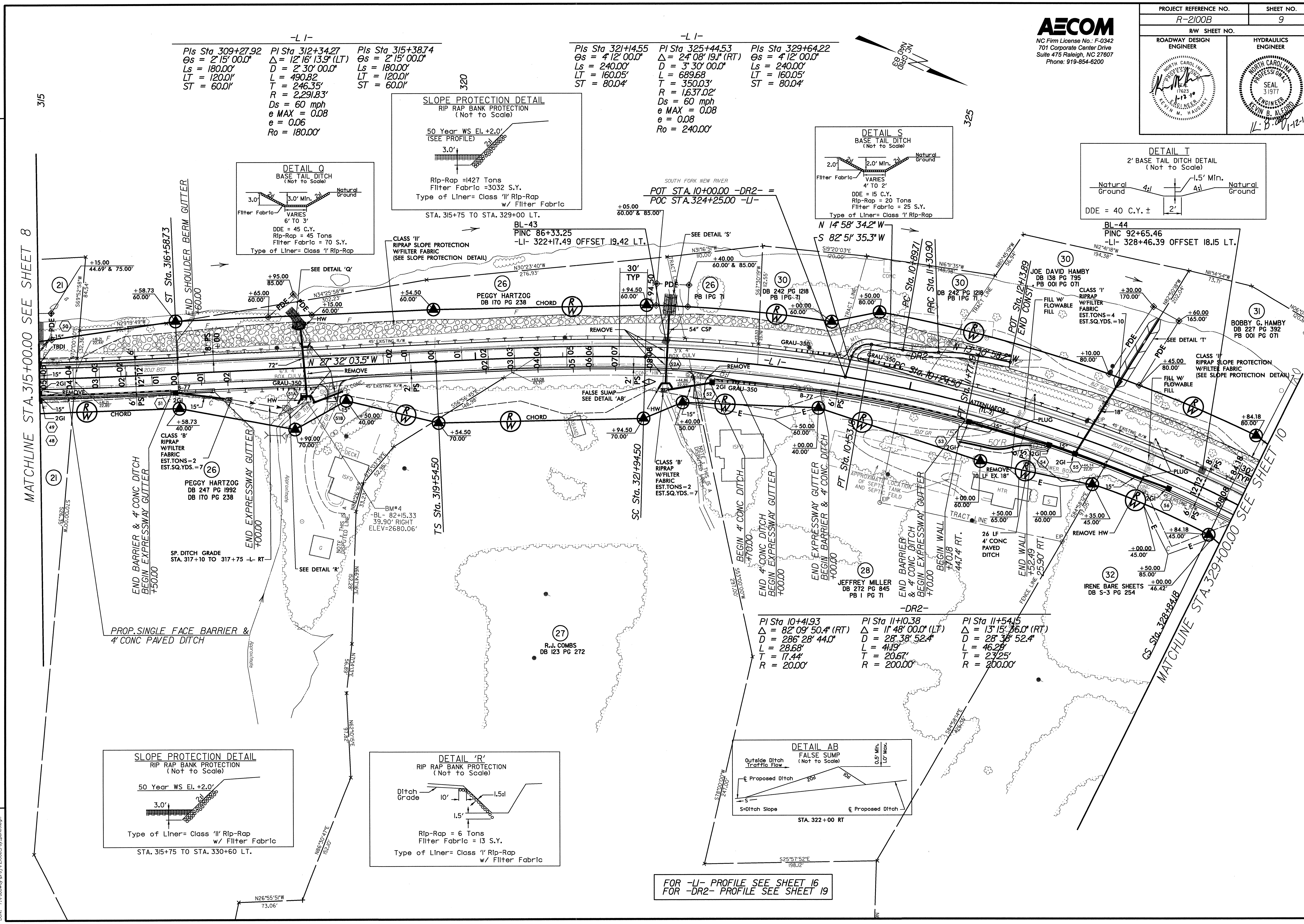

-L1-
PIs Sta 301+61.61
Θs = 9° 30' 00.0"
Ls = 200.00'
LT = 133.53'
ST = 66.84'
PI Sta 303+84.37
Δ = 29° 03' 15.8" (LT)
D = 9° 30' 00.0"
L = 305.84
T = 156.28'
R = 603.11'
Ds = 45 mph
e MAX = 0.08
e = 0.08
PIs Sta 306+00.77
Θs = 9° 30' 00.0"
Ls = 200.00'
LT = 133.53'
ST = 66.84'
NC GRID NAD 83
-L1-
PIs Sta 309+27.92
Θs = 2° 15' 00.0"
Ls = 180.00'
LT = 120.01'
ST = 60.01'
PI Sta 312+34.27
Δ = 12° 16' 13.9" (LT)
D = 2° 30' 00.0"
L = 490.82
T = 246.35'
R = 2,291.83'
Ds = 60 mph
e MAX = 0.08
e = 0.06
PIs Sta 315+38.74
Θs = 2° 15' 00.0"
Ls = 180.00'
LT = 120.01'
ST = 60.01'
MATCHLINE STA. 301+00.00 SEE SHEET 7
MATCHLINE STA. 315+00.00 SEE SHEET 9
PROP. RET. WALL
END WALL & SHOULDER BERM GUTTER +50.00
SC Sta. 302+28.09
CS Sta. 305+33.92
BEGIN WALL & SHOULDER BERM GUTTER +50.00
ST Sta. 307+33.92
TS Sta. 308+07.91
SC Sta. 309+87.91
END WALL +00.00
CS Sta. 314+78.73
ENVIRONMENTAL ENDANGERED PLANT BOUNDARY (SPIREA)
WITH CENTERLINE OF RIVER
SOUTH FORK NEW RIVER
DALE C. SHEETS TRUSTEE DB 250 PG 99
SEE DETAIL 'P'
TEMP. SHORING
REMOVE
SP. DITCH GRADE STA. 302+00 TO 302+10 -L- RT
SP. DITCH GRADE STA. 310+50 TO 310+75 -L- RT
REMOVE HW & PLUG
FILL W/ FLOWABLE FILL
REMOVE 15 LF EX. 18" CMP
REMOVE 10 LF EX. 18" CMP
REMOVE 4 LF
REMOVE HW
PLUG
CHORD
PDE
TBDI
N 10° 45' 49.6" W
25' TYP
30' TYP
BL-41
PINC 68+39.58
-L1- 304+28.96 OFFSET 18.82 RT.
BL-42
PINC 77+19.81
-L1- 313+06.62 OFFSET 13.94 RT.
PROP. SINGLE FACE BARRIER & 4' CONC PAVED DITCH
DETAIL P
CLASS 'II' RIP RAP BANK PROTECTION
(Not to Scale)
Pipe
Existing Stream Bank
Class 'II' Rip Rap with Filter Fabric
Rip-Rap = 2 Tons
Filter Fabric = 7 S.Y.

FOR -L1- PROFILE SEE SHEETS 15 & 16

FOR TEMP SHORING LOCATIONS, SEE TRAFFIC CONTROL PLANS

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-

REVISIONS



PROJECT REFERENCE NO. R-2100B
SHEET NO. 9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200
-L1-
PIs Sta 309+27.92 Θs = 2°15′00.0″ Ls = 180.00′ LT = 120.01′ ST = 60.01′
PI Sta 312+34.27 Δ = 12°16′13.9″ (LT) D = 2°30′00.0″ L = 490.82 T = 246.35′ R = 2,291.83′ Ds = 60 mph e MAX = 0.08 e = 0.06 Ro = 180.00′
PIs Sta 315+38.74 Θs = 2°15′00.0″ Ls = 180.00′ LT = 120.01′ ST = 60.01′
-L1-
PIs Sta 321+14.55 Θs = 4°12′00.0″ Ls = 240.00′ LT = 160.05′ ST = 80.04′
PI Sta 325+44.53 Δ = 24°08′19.1″ (RT) D = 3°30′00.0″ L = 689.68 T = 350.03′ R = 1,637.02′ Ds = 60 mph e MAX = 0.08 e = 0.08 Ro = 240.00′
PIs Sta 329+64.22 Θs = 4°12′00.0″ Ls = 240.00′ LT = 160.05′ ST = 80.04′
SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION (Not to Scale)
50 Year WS El. +2.0′ (SEE PROFILE)
Rip-Rap =1427 Tons
Filter Fabric =3032 S.Y.
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 315+75 TO STA. 329+00 LT.
DETAIL Q
BASE TAIL DITCH (Not to Scale)
VARIES 6′ TO 3′
DDE = 45 C.Y.
Rip-Rap = 45 Tons
Filter Fabric = 70 S.Y.
Type of Liner= Class 'I' Rip-Rap
DETAIL S
BASE TAIL DITCH (Not to Scale)
VARIES 4′ TO 2′
DDE = 15 C.Y.
Rip-Rap = 20 Tons
Filter Fabric = 25 S.Y.
Type of Liner= Class 'I' Rip-Rap
DETAIL T
2′ BASE TAIL DITCH DETAIL (Not to Scale)
DDE = 40 C.Y. ±
POT STA. 10+00.00 -DR2- =
POC STA. 324+25.00 -L1-
BL-43
PINC 86+33.25
-L1- 322+17.49 OFFSET 19.42 LT.
BL-44
PINC 92+65.46
-L1- 328+46.39 OFFSET 18.15 LT.
N 14°58′34.2″ W
S 82°51′35.3″ W
N 27°32′03.5″ W
MATCHLINE STA. 315+00.00 SEE SHEET 8
MATCHLINE STA. 329+00.00 SEE SHEET 10
PEGGY HARTZOG DB 170 PG 238
PEGGY HARTZOG DB 247 PG 1992 DB 170 PG 238
JOE DAVID HAMBY DB 138 PG 795 PB 001 PG 071
BOBBY G. HAMBY DB 227 PG 392 PB 001 PG 071
JEFFREY MILLER DB 272 PG 845 PB 1 PG 71
R.J. COMBS DB 123 PG 272
IRENE BARE SHEETS DB S-3 PG 254
BM#4 -BL- 82+15.33 39.90′ RIGHT ELEV=2680.06′
PROP. SINGLE FACE BARRIER & 4′ CONC PAVED DITCH
-DR2-
PI Sta 10+41.93 Δ = 82°09′50.4″ (RT) D = 286°28′44.0″ L = 28.68′ T = 17.44′ R = 20.00′
PI Sta 11+10.38 Δ = 11°48′00.0″ (LT) D = 28°38′52.4″ L = 41.19 T = 20.67′ R = 200.00′
PI Sta 11+54.15 Δ = 13°15′36.0″ (RT) D = 28°38′52.4″ L = 46.29′ T = 23.25′ R = 200.00′
SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION (Not to Scale)
50 Year WS El. +2.0′
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 315+75 TO STA. 330+60 LT.
DETAIL 'R'
RIP RAP BANK PROTECTION (Not to Scale)
Rip-Rap = 6 Tons
Filter Fabric = 13 S.Y.
Type of Liner= Class 'I' Rip-Rap w/ Filter Fabric
DETAIL AB
FALSE SUMP (Not to Scale)
S=Ditch Slope
STA. 322+00 RT
FOR -L1- PROFILE SEE SHEET 16
FOR -DR2- PROFILE SEE SHEET 19

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

NC GRID NAD 83

2960 / 5200 — NC 16 — 3200 / 5600
-100 / -100 — 240 / 400
240 / 400 — SR 1631
ADT 2010
ADT 2030

-L1-

PIs Sta 321+14.55	PI Sta 325+44.53	PIs Sta 329+64.22
Θs = 4° 12' 00.0"	Δ = 24° 08' 19.1" (RT)	Θs = 4° 12' 00.0"
Ls = 240.00'	D = 3° 30' 00.0"	Ls = 240.00'
LT = 160.05'	L = 689.68	LT = 160.05'
ST = 80.04'	T = 350.03'	ST = 80.04'
	R = 1,637.02'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.08	
	Ro = 240.00'	

-DR3-

PI Sta 10+46.94	PI Sta 11+10.41
Δ = 92° 34' 58.8" (LT)	Δ = 9° 37' 23.9" (RT)
D = 286° 28' 44.0"	D = 28° 38' 52.4"
L = 32.32'	L = 33.59'
T = 20.92'	T = 16.84'
R = 20.00'	R = 200.00'

SLOPE PROTECTION DETAIL

RIP RAP BANK PROTECTION
(Not to Scale)

50 Year WS El. +2.0'
(SEE PROFILE)
3.0'
2:1

Rip-Rap =30 Tons
Filter Fabric =78 S.Y.
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric

STA. 329+00 TO STA. 329+54 LT.

DETAIL X

3' BASE TAIL DITCH
(Not to Scale)

2.0' — 2:1 — 2.0' Min. — 2:1 — Natural Ground
Filter Fabric — 3'

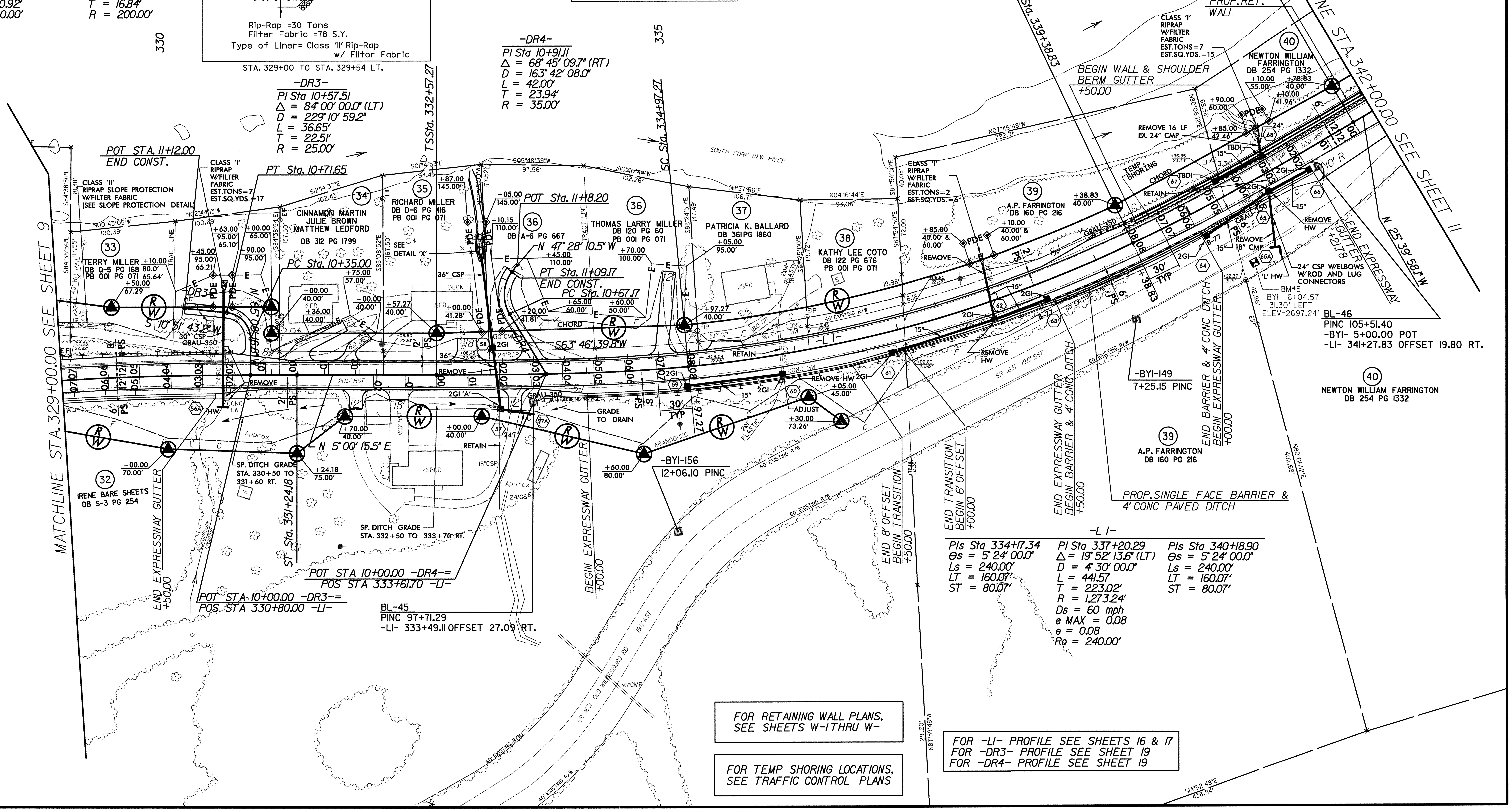
DDE = 15 C.Y.
Rip-Rap = 20 Tons
Filter Fabric = 25 S.Y.
Type of Liner= Class 'I' Rip-Rap

-DR3-

PI Sta 10+57.51
Δ = 84° 00' 00.0" (LT)
D = 229° 10' 59.2"
L = 36.65'
T = 22.51'
R = 25.00'

-DR4-

PI Sta 10+91.11
Δ = 68° 45' 09.7" (RT)
D = 163° 42' 08.0"
L = 42.00'
T = 23.94'
R = 35.00'



-L1-

PIs Sta 334+17.34	PI Sta 337+20.29	PIs Sta 340+18.90
Θs = 5° 24' 00.0"	Δ = 19° 52' 13.6" (LT)	Θs = 5° 24' 00.0"
Ls = 240.00'	D = 4° 30' 00.0"	Ls = 240.00'
LT = 160.07'	L = 441.57	LT = 160.07'
ST = 80.07'	T = 223.02'	ST = 80.07'
	R = 1,273.24'	
	Ds = 60 mph	
	e MAX = 0.08	
	e = 0.08	
	Ro = 240.00'	

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-

FOR TEMP SHORING LOCATIONS, SEE TRAFFIC CONTROL PLANS

FOR -L1- PROFILE SEE SHEETS 16 & 17
FOR -DR3- PROFILE SEE SHEET 19
FOR -DR4- PROFILE SEE SHEET 19

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	11
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

N65°56'39"E

SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)

50 Year WS El. +2.0'
(SEE PROFILE)
3.0'
2:1

Rip-Rap =15 Tons
Filter Fabric =31 S.Y.
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric

STA. 355+75 TO STA. 356+00 LT.

DETAIL 'Z'
BASE TAIL DITCH
(Not to Scale)

1.0' 2:1 1.0' Min. 2:1 Natural Ground
Filter Fabric
VARIES 4' TO 2'

DDE = 7 C.Y.
Rip-Rap = 10 Tons
Filter Fabric = 20 S.Y.
Type of Liner= Class 'B' Rip-Rap (no Rip-Rap in channel)

345 350 355

SOUTH FORK NEW RIVER

MATCHLINE STA. 342+00.00 SEE SHEET 10

MATCHLINE STA. 356+00.00 SEE SHEET 12

N30°44'48"W 712.59'

N28°41'48"W 413.26'

S27°38'23"E 1246.55'

BL-147
PINC 115+10.78
-LI- 350+86.37 OFFSET 18.31 LT.

-L1- N 25° 39' 58.1" W

BEGIN WALL & SHOULDER BERM GUTTER +50.00

END WALL & SHOULDER BERM GUTTER +50.00

BEGIN WALL & SHOULDER BERM GUTTER +50.00

+05.00 40.00' & 80.00'

+80.00 40.00' & 80.00'

+00.00 55.00'

+50.00 40.00'

+00.00 40.00'

+25.00 40.00' & 60.00'

+50.00 40.00' & 60.00'

+00.00 55.00'

+50.00 40.00'

+00.00 40.00'

SEE DETAIL 'Z'

TEMP. SHORING

PROP. RET. WALL

ISFD BUS

PROP. RET. WALL

REMOVE

PDE

RW

TBDI

GRAU-350

GRAU-350 (TL-2)

18"CMP

45° EXISTING R/W

4'X3' BOX CULV.

TEMP. SHORING

CONC. HW

24"

2GI

3GI'A'

ATTENUATOR (TL-2)

LOCATE & REMOVE

TEMPORARY SHORING

PLUG

FILL W/ FLOWABLE FILL

UNABLE TO GET INV., LOCATION, OR PIPE SIZE

SOIL

CLASS 'I' RIPRAP W/FILTER FABRIC EST.TONS=4 EST.SQ.YDS.=12

CLASS 'B' RIPRAP W/FILTER FABRIC EST.TONS=1 EST.SQ.YDS.=5

CLASS 'B' RIPRAP W/FILTER FABRIC EST.TONS=2 EST.SQ.YDS.=7

ADJUST 1" PLASTIC PIPE

CLASS 'II' RIPRAP SLOPE PROTECTION W/FILTER FABRIC (SEE SLOPE PROTECTION DETAIL)

40 NEWTON WILLIAM FARRINGTON DB 254 PG 1332

40 NEWTON WILLIAM FARRINGTON DB 254 PG 1332

BEGIN EXPRESSWAY GUTTER +12.50

END EXPRESSWAY GUTTER +50.00

BEGIN EXPRESSWAY GUTTER +50.00

END EXPRESSWAY GUTTER BEGIN BARRIER & 4' CONC DITCH +50.00

END BARRIER & 4' CONC DITCH +95.00

BEGIN BARRIER & 4' CONC DITCH +80.00

PROP. SINGLE FACE BARRIER & 4' CONC PAVED DITCH

PROP. SINGLE FACE BARRIER & 4' CONC PAVED DITCH

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-

FOR TEMP SHORING LOCATIONS, SEE TRAFFIC CONTROL PLANS

FOR -LI- PROFILE SEE SHEETS 17 & 18

REVISIONS

USER: vanmetrek
DATE: 1/11/2010
TIME: 8:03:39 PM
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PROJECT REFERENCE NO.	SHEET NO.
R-2100B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

NORTH CAROLINA PROFESSIONAL ENGINEER KEVIN M. HAUGHEY 1-12-10

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN B. ALFORD 1-12-10

NC 16 / SR 1628 — 3200 / 5600, 3620 / 6100, -100 / 100, 440 / 600, 460 / 700, ADT 2010 / ADT 2030

-L 1-

Pls Sta 363+65.38
Θs = 0° 54' 00.0"
Ls = 120.00'
LT = 80.00'
ST = 40.00'

PI Sta 362+19.37
Δ = 3° 10' 51.6" (LT)
D = 1° 30' 00.0"
L = 212.07
T = 106.06'
R = 3,819.72'
Ds = 60 mph
e MAX = 0.08
e = 0.04
Ro = 120.00'

Pls Sta 360+73.31
Θs = 0° 54' 00.0"
Ls = 120.00'
LT = 80.00'
ST = 40.00'

-L 1-

Pls Sta 370+21.11
Θs = 4° 48' 00.0"
Ls = 240.00'
LT = 160.06'
ST = 80.05'

PI Sta 371+94.30
Δ = 7° 26' 56.9" (RT)
D = 4° 00' 00.0"
L = 186.23
T = 93.25'
R = 1,432.39'
Ds = 60 mph
e MAX = 0.08
e = 0.08
Ro = 240.00'

Pls Sta 373+67.33
Θs = 4° 48' 00.0"
Ls = 240.00'
LT = 160.06'
ST = 80.05'

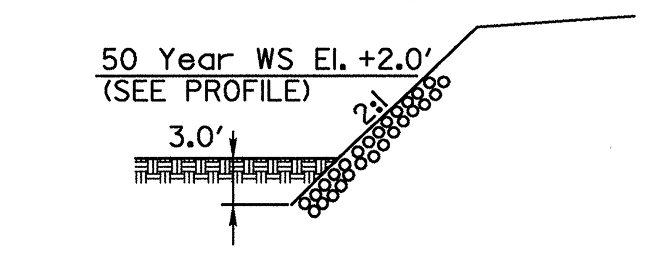
-DET L 1-

PI Sta 11+16.98
Δ = 15° 56' 57.7" (LT)
D = 6° 51' 42.4"
L = 232.44'
T = 116.98'
R = 835.00'

PI Sta 15+94.16
Δ = 25° 04' 45.8" (RT)
D = 6° 51' 42.4"
L = 365.49'
T = 185.72'
R = 835.00'
Ds = 50 mph
e = 0.06
Ro = 132.00'

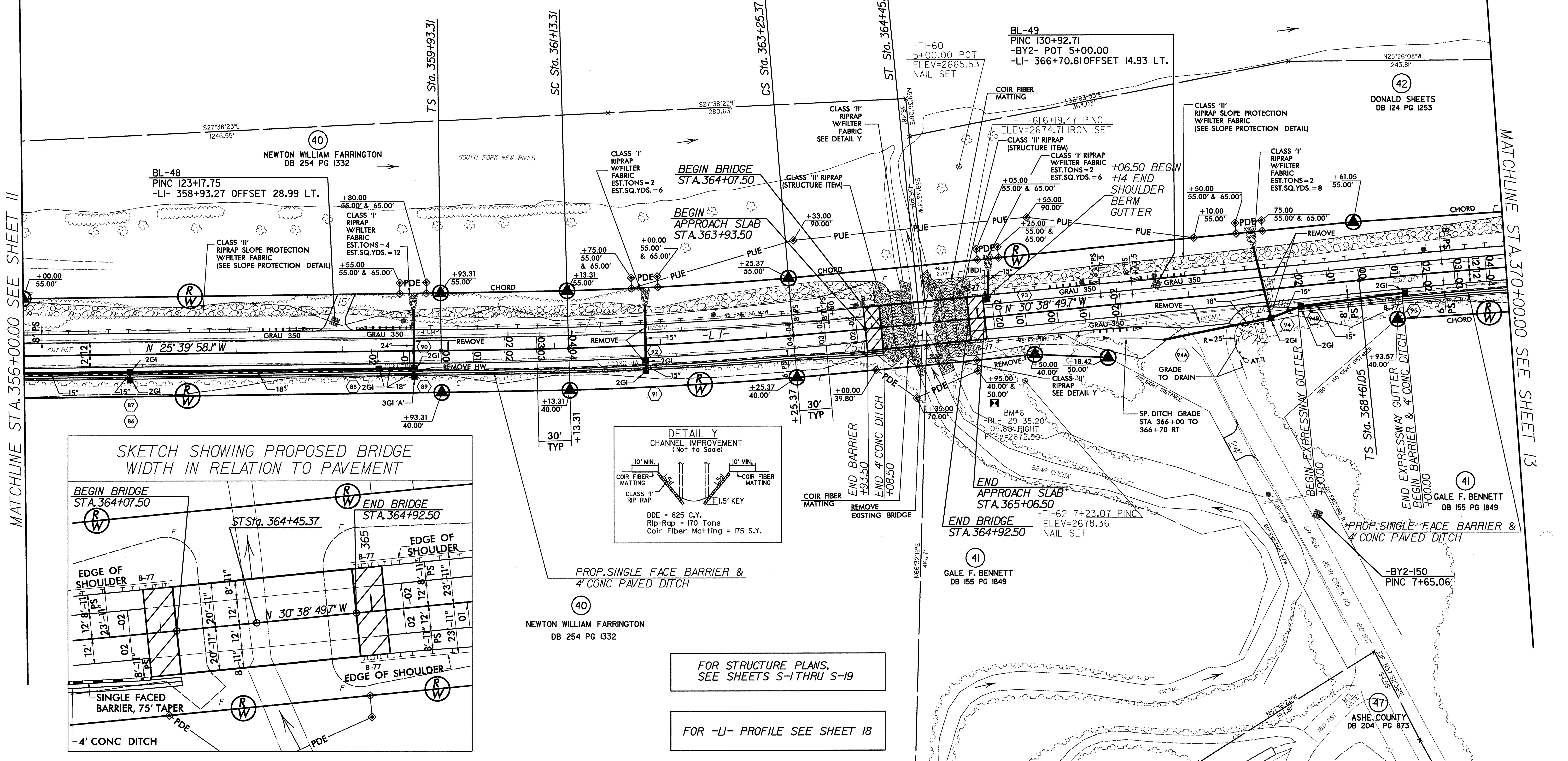
PI Sta 20+40.42
Δ = 12° 22' 09.1" (LT)
D = 6° 51' 42.4"
L = 180.26'
T = 90.48'
R = 835.00'

SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)



Rip-Rap = 1172 Tons
Filter Fabric = 2704 S.Y.
Type of Liner = Class 'II' Rip-Rap w/ Filter Fabric

STA. 356+00 TO STA. 370+00 LT.



FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-19

FOR -L1- PROFILE SEE SHEET 18

REVISIONS


PROJECT REFERENCE NO. R-2100B
SHEET NO. 13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200
-L1-
PIs Sta 370+21.11
Θs = 4° 48' 00.0"
Ls = 240.00'
LT = 160.06'
ST = 80.05'
PI Sta 371+94.30
Δ = 7° 26' 56.9" (RT)
D = 4° 00' 00.0"
L = 186.23
T = 93.25'
R = 1,432.39'
Ds = 60 mph
e MAX = 0.08
e = 0.08
Ro = 240.00'
PIs Sta 373+67.33
Θs = 4° 48' 00.0"
Ls = 240.00'
LT = 160.06'
ST = 80.05'
SLOPE PROTECTION DETAIL
RIP RAP BANK PROTECTION
(Not to Scale)
50 Year WS El. +2.0'
(SEE PROFILE)
Rip-Rap =185 Tons
Filter Fabric =173 S.Y.
Type of Liner= Class 'II' Rip-Rap w/ Filter Fabric
STA. 370+00 TO STA. 370+75 LT.
DETAIL U
2' BASE TAIL DITCH
(Not to Scale)
Natural Ground
Filter Fabric
DDE = 7 C.Y.
Rip-Rap = 10 Tons
Filter Fabric = 20 S.Y.
Type of Liner= Class 'B' Rip-Rap
NC GRID NAD 83
-L1- POT STA 382+05.13
END TIP PROJECT R-2100 B
SOUTH FORK NEW RIVER
MATCHLINE STA.370+00.00 SEE SHEET 12
DONALD SHEETS DB 124 PG 1253
JEFF SHEETS DB 235 PG 1502
DONALD SHEETS DB 124 PG 1253
FRANK G. SHEETS WD 94-E DB C-4 PG 82
ROBERT BOWER DB 143 PG 402 DB K-4 PG 135 DB J-3 PG 114
EDDIE LIDDIE DB 135 PG 496
DAVID B. LOPP DB 220 PG 1152
JEFF SHEETS DB 200 PG 148
ABNER B. FORTNER,JR. DB 208 PG 518
GALE F. BENNETT DB 155 PG 1849
BL-50
PINC 136+30.90
-L1- 372+07.08 OFFSET 14.72 LT.
BL-51
PINC 145+72.35
-BY4- POT 7+17.45
-BY3- PINC 5+00.00
-L1- 381+47.16 OFFSET 0.65' RT
BY3-151
5+00.00 POT
BY4-152
POT 7+64.74
BM#7
-BY4- 12+89.35
35.98' LEFT
ELEV=2684.14'
CLASS 'I' RIPRAP W/FILTER FABRIC EST.TONS=15 EST.SQ.YDS.=30
CLASS 'B' RIPRAP W/FILTER FABRIC EST.TONS=1 EST.SQ.YDS.=5
SEE DETAIL 'U'
SP. DITCH GRADE STA. 377+00 TO 378+35 -L- LT
SP. BERM DITCH STA. 377+50 TO 378+50-L- RT
MILL & RESURFACE TO NC 88
N 13° 35' 52.8" W
REMOVE EXIST. ISLAND AND REPLACE WITH A 5" MONO. CONC. ISLAND
END BARRIER & 4' CONC DITCH BEGIN EXPRESSWAY GUTTER +50.00
END EXPRESSWAY GUTTER +50.00
MATCH EXISTING PAVEMENT WIDTH 379+00
PROP. SINGLE FACE BARRIER & 4' CONC PAVED DITCH
SC Sta. 371+01.05
CS Sta. 372+87.28
ST Sta. 375+27.28
POT Sta. 382+18.39
DETAIL W
SPECIAL BERM DITCH
(Not to Scale)
Filter Fabric
DDE = 8 C.Y.
Rip-Rap = 11 Tons
Filter Fabric = 50 S.Y.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 377+50 TO STA. 378+50
FOR -L1- PROFILE SEE SHEET 18
REVISIONS

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

12-21-09

REVISIONS

Revision 0 – 09-24-2004

USER: rogusc
DATE: 12/16/2009
TIME: 12:34:11 PM
DGN: r:\roadway\proj\r2100b_rdy_pshtdgn

-L1- STA 252+50.00
BEGIN TIP PROJECT R-2100 B
ELEV. 2835.19

-L1-

PI = 253+85.00
EL = 2833.89'
VC = 200'
K = 331

(-)0.9630%

(-)1.5676%

PI = 257+25.00
EL = 2828.56'
VC = 300'
K = 1298

(-)1.5676%

(-)1.3364%

PROPOSED GRADE

PI = 263+70.00
EL = 2819.94'
VC = 400'
K = 769

(-)1.3364%

(-)1.8566%

36" RCP

EXISTING GROUND

5.5%

3.3%

60" RCP

BM#1
BY 5+17.49
13.96 RIGHT
ELEV=2826.77'

BEGIN SPECIAL DITCH RT. +20 ELEV. 2825.90'

-L1 RT. ELEV. 2821.50

END SPECIAL DITCH RT. +20 ELEV. 2823.90'

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 8B

DRAINAGE AREA	= 34	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 95	CFS
DESIGN HW ELEVATION	= 2825.7	FT
100 YEAR DISCHARGE	= 120	CFS
100 YEAR HW ELEVATION	= 2826.3	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 122	CFS
OVERTOPPING ELEVATION	= 2826.5	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 9A

DRAINAGE AREA	= 20	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 33	CFS
DESIGN HW ELEVATION	= 2824.1	FT
100 YEAR DISCHARGE	= 38	CFS
100 YEAR HW ELEVATION	= 2824.6	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 43	CFS
OVERTOPPING ELEVATION	= 2825.0	FT

FOR -L1- PLAN, SEE SHEETS 4,5 & 6

-L1-

PI = 266+70.26
EL = 2814.37'
VC = 200'
K = 789

PROPOSED GRADE

(-)1.8566%

(-)2.1101%

PI = 270+25.00
EL = 2806.88'
VC = 120'
K = 407

(-)2.1101%

(-)1.8154%

PI = 272+20.00
EL = 2803.34'
VC = 230'
K = 318

(-)1.8154%

(-)2.5391%

PI = 274+50.00
EL = 2797.50'
VC = 180'
K = 195

(-)2.5391%

(-)1.6158%

PI = 276+40.00
EL = 2794.43'
VC = 100'
K = 173

(-)1.6158%

(-)2.1933%

EXISTING GROUND

5.6%

4.7%

0.30%

48" CSP

BEGIN SPECIAL V DITCH RT. +60 ELEV. 2800.00'

+90 RT. ELEV. 2799.80

+25 RT. ELEV. 2800.55

END SPECIAL V DITCH RT. +75 ELEV. 2800.70'

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 23A

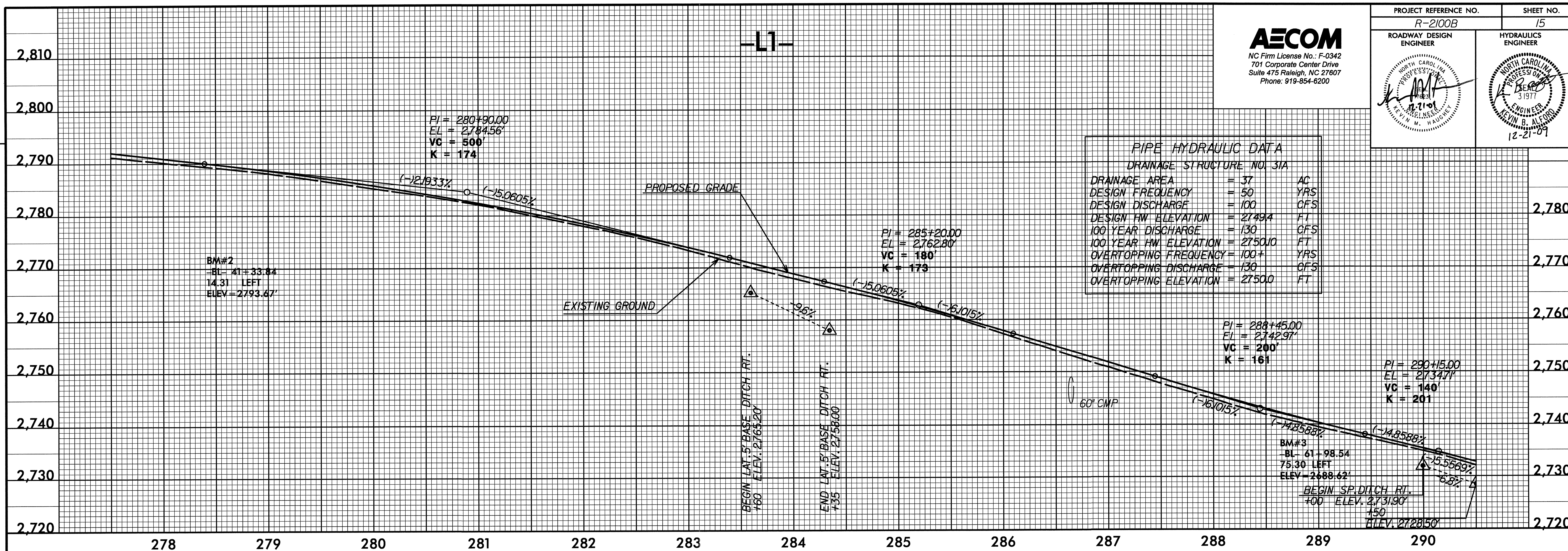
DRAINAGE AREA	= 17	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 3	CFS
DESIGN HW ELEVATION	= 2801.0	FT
100 YEAR DISCHARGE	= 35	CFS
100 YEAR HW ELEVATION	= 2801.2	FT
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING DISCHARGE	= 52	CFS
OVERTOPPING ELEVATION	= 2802.0	FT

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	15

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

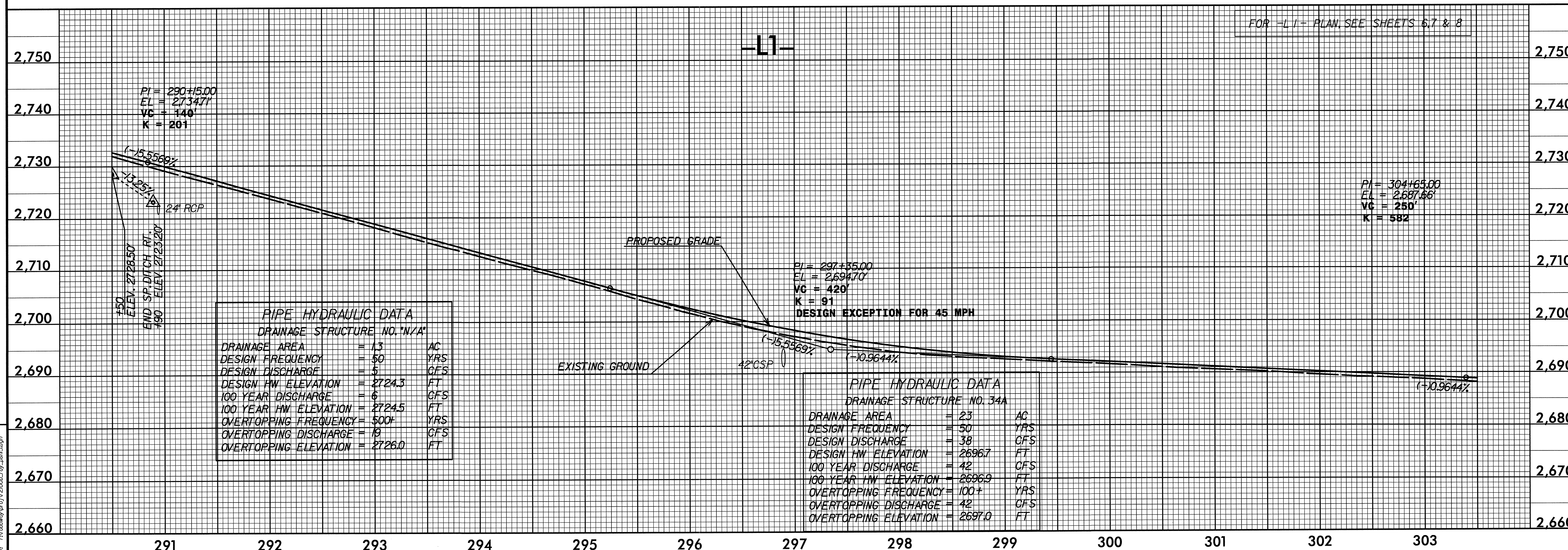
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27623 KEVIN M. HAUGHEY 12-21-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN B. ALFORD 12-21-09



PIPE HYDRAULIC DATA			
DRAINAGE STRUCTURE NO. 31A			
DRAINAGE AREA	=	37	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	100	CFS
DESIGN HW ELEVATION	=	2749.4	FT
100 YEAR DISCHARGE	=	130	CFS
100 YEAR HW ELEVATION	=	2750.10	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	130	CFS
OVERTOPPING ELEVATION	=	2750.0	FT

FOR -L1- PLAN, SEE SHEETS 6,7 & 8



PIPE HYDRAULIC DATA			
DRAINAGE STRUCTURE NO. "N/A"			
DRAINAGE AREA	=	1.3	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	5	CFS
DESIGN HW ELEVATION	=	2724.3	FT
100 YEAR DISCHARGE	=	6	CFS
100 YEAR HW ELEVATION	=	2724.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	19	CFS
OVERTOPPING ELEVATION	=	2726.0	FT

PIPE HYDRAULIC DATA			
DRAINAGE STRUCTURE NO. 34A			
DRAINAGE AREA	=	23	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	38	CFS
DESIGN HW ELEVATION	=	2696.7	FT
100 YEAR DISCHARGE	=	42	CFS
100 YEAR HW ELEVATION	=	2696.9	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	42	CFS
OVERTOPPING ELEVATION	=	2697.0	FT

REVISIONS
Revision 0 - 09-24-2004

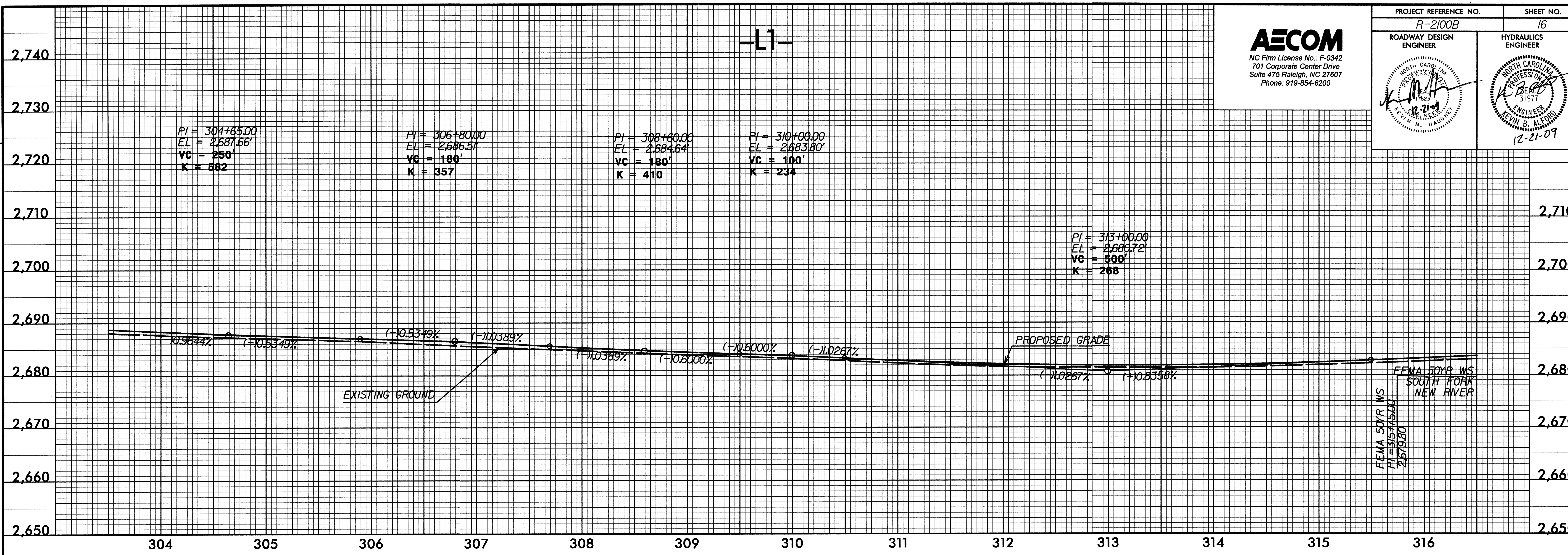
USER: roquec
DATE: 12/16/2009
TIME: 12:14:09 PM
DGN: r:\roadway\proj\r2100b_rdy_psh15.dgn

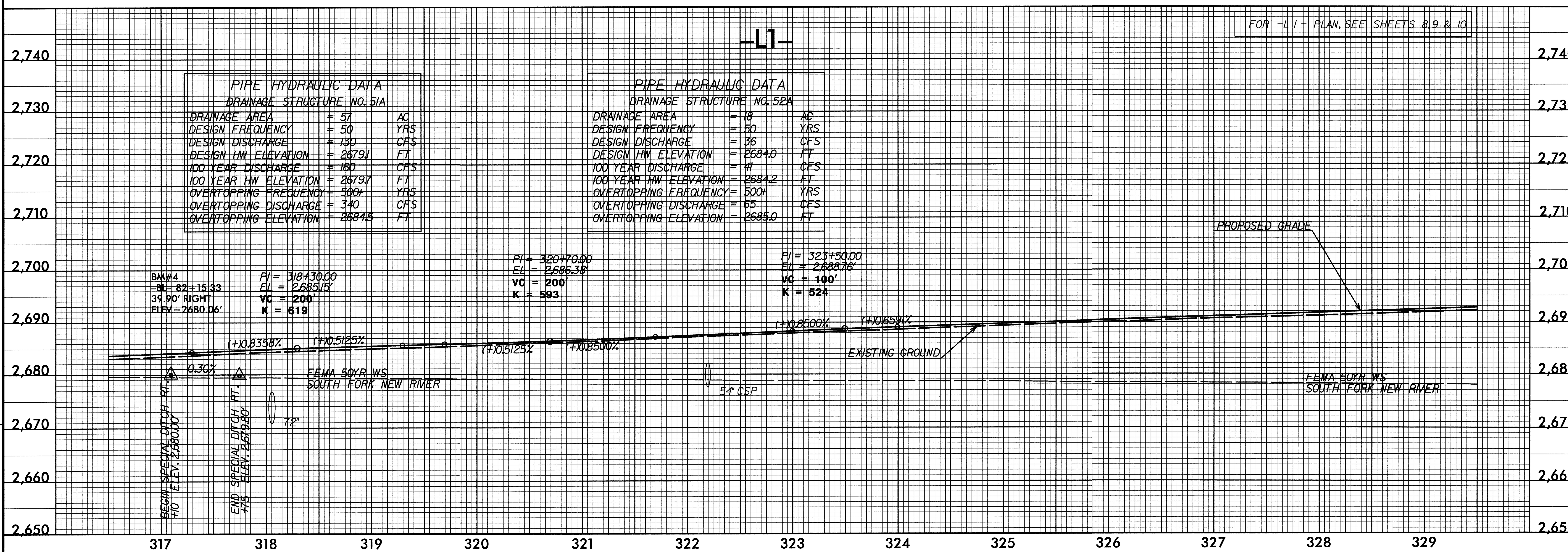
PROJECT REFERENCE NO.	SHEET NO.
R-2100B	16

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17623 KEVIN M. HAUGHEY — 12-21-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31977 KEVIN B. ALFORD — 12-21-09





PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 51A

DRAINAGE AREA	=	57	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	130	CFS
DESIGN HW ELEVATION	=	2679.1	FT
100 YEAR DISCHARGE	=	160	CFS
100 YEAR HW ELEVATION	=	2679.7	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	340	CFS
OVERTOPPING ELEVATION	=	2681.5	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 52A

DRAINAGE AREA	=	18	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	36	CFS
DESIGN HW ELEVATION	=	2684.0	FT
100 YEAR DISCHARGE	=	41	CFS
100 YEAR HW ELEVATION	=	2684.2	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	65	CFS
OVERTOPPING ELEVATION	=	2685.0	FT

REVISIONS

Revision 0 - 09-24-2004

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	17

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

REVISIONS

Revision 0 - 09-24-2004

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DATE: 12/16/2009
TIME: 12:44:04 PM
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PROJECT REFERENCE NO.	SHEET NO.
R-2100B	18

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

NORTH CAROLINA PROFESSIONAL ENGINEER 036231 KEVIN M. HAWKINS

NORTH CAROLINA PROFESSIONAL ENGINEER 031977 KEVIN B. ALFORD

12-21-09

REVISIONS

Revision 0 - 09-24-2004

USER: rowe
DATE: 12/16/2009
TIME: 12:40:01 PM
DGN: I:\roadway\proj\Y-2100b_rdy_pshtl8.dgn

-L1-

STREAM HYDRAULIC DATA

DRAINAGE AREA	= 3.0	MI^2
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1200	CFS
DESIGN STREAM ELEVATION	= 2668.7	FT
100 YEAR DISCHARGE	= 1500	CFS
100 YEAR STREAM ELEVATION	= 2669.3	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 2300+	CFS
OVERTOPPING ELEVATION	= 2678.2	FT

-L1- STA 364+07.50
BEGIN BRIDGE
ELEV. 2678.42

-L1- STA 364+92.50
END BRIDGE
ELEV. 2678.23

2,740 / 2,730 / 2,720 / 2,710 / 2,700 / 2,690 / 2,680 / 2,670 / 2,660 / 2,650

356 357 358 359 360 361 362 363 364 365 366 367 368

(−)1.0249%

FEMA 50YR WS
SOUTH FORK NEW RIVER

FEMA 50YR WS
PI = 355+75.00
2674.000

PI = 353+40.00
EL = 2688.12'
VC = 500'
K = 359

EXISTING GROUND

PROPOSED GRADE

(+)0.3097%

(−)1.0249%

PI = 363+85.00
EL = 2677.41'
VC = 650'
K = 487

BM#6
BL 129+35.20
105.80' RIGHT
ELEV=2672.90'

BEGIN SPECIAL DITCH RT.
+00 ELEV. 2675.40'

END SPECIAL DITCH RT.
+76 ELEV. 2673.20'

(−)3.42%

FEMA 50YR WS
SOUTH FORK NEW RIVER

FOR -L1- PLAN, SEE SHEETS 11,12 & 13

-L1-

2,740 / 2,730 / 2,720 / 2,710 / 2,700 / 2,690 / 2,680 / 2,670 / 2,660 / 2,650

369 370 371 372 373 374 375 376 377 378 379 380 381 382

PI = 369+50.00
EL = 2679.16'
VC = 200'
K = 936

PI = 372+50.00
EL = 2680.73'
VC = 150'
K = 677

STA 379+00.00
END GRADE
ELEV. 2682.03

PI = 378+00.00
EL = 2682.39'
VC = 100'
K = 151

-L1- STA 382+05.13
END TIP PROJECT R-2100 B
END RESURFACING

RESURFACING

BM#7
BY4 12+89.35
35.98' LEFT
ELEV=2684.14'

16.40%

13.33%

6.00%

FEATHER TO MATCH EXIST.

RECONSTRUCT EXIST. ISLAND

20'

PROPOSED GRADE

(+)0.3018%

(+)0.3018%

(−)0.3600%

(+)0.5233%

(+)0.5233%

(+)0.3097%

FEMA 50YR WS
SOUTH FORK NEW RIVER

EXISTING GROUND

FEMA 50YR WS
PI = 370+75.00
2673.200

BEGIN SPECIAL BERM DITCH RT.
+50 ELEV. 2696.20'

+00 RT
ELEV. 2693.00'

+15 RT
ELEV. 2688.00'

END SPECIAL BERM DITCH RT.
+50 ELEV. 2690.00'

PROJECT REFERENCE NO.	SHEET NO.
R-2100B	19

AECOM
NC Firm License No.: F-0342
701 Corporate Center Drive
Suite 475 Raleigh, NC 27607
Phone: 919-854-6200

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER KEVIN M. HAUGHEY 12-21-09

NORTH CAROLINA PROFESSIONAL SEAL 31977 ENGINEER KEVIN B. ALFORD 12-21-09

REVISIONS

Revision 0 - 09-24-2004
REVISION 1: 8/12/2008 Changed Proposed Grade, DR3. Removed Detour Profile.