09/08/99

TIP PROJECT: R-2633BA

CONTRACT: C203199

17-OCT-2013 15:38
R:\Roadway\Proj\R-2633BA\R-2633BA_RDY_TSH.dgn
$$$$USERNAME$$$$

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

VICINITY MAP FOR STATE PROJECT R-2633BA

● ● ● OFF SITE DETOUR ROUTE FOR -Y8-

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2633BA	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34491.1.2	STPNHF-17(1)	P.E.
34491.2.3		R / W
34491.3.GVS3	NHS-0017(124)	CONST.

BRUNSWICK COUNTY

LOCATION: US 17 (WILMINGTON BYPASS) FROM US 74/76 EAST OF MALMO IN BRUNSWICK COUNTY TO SR 1430 (CEDAR HILL ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS STRUCTURES, AND ITS

PREPARED FOR
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, NC
PLANS COORDINATED BY:
Brenda Moore, P.E. – Project Engineer (NCDOT)

GRAPHIC SCALES

50′ 25′ 0 50′ 100′ — PLANS

50′ 25′ 0 50′ 100′ — PROFILE (HORIZONTAL)

10′ 5′ 0 10′ 20′ — PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 34,000
ADT 2035 = 65,400
DHV = 12 %
D = 60 %
T = 15 % *
V = 70 MPH
* TTST 10% DUAL 5%
FUNC. CLASS. = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2633BA = 4.451 Miles
LENGTH STRUCTURES TIP PROJECT R-2633BA = 0.187 Miles
TOTAL LENGTH STATE TIP PROJECT R-2633BA = 4.638 Miles

THIS IS A CONTROL ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGES

NORTHBOUND LANES (-L- RT) WERE USED FOR PROJECT LENGTH CALCULATIONS

Prepared In the Office of:
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612 — NC License Number F-0159
MULKEY, INC. — NC License Number C-1021

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
June 20, 2008

LETTING DATE:
January 21, 2014

Brian K. Eason, P.E.
PROJECT ENGINEER

David Martin
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. SCARCE
Jonathan K. Scarce P.E. 10/17/13
SIGNATURE:

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON
Brian K Eason P.E. 10/18/13
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

09/08/99

TIP PROJECT: R-2633BA

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17-OCT-2013 15:38
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$$$$USERNAME$$$$

See Sheet 1-A For Index of Sheets
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● ● ● OFF SITE DETOUR ROUTE FOR -Y8-

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

LOCATION: ***US 17 (WILMINGTON BYPASS) FROM US 74/76 EAST OF MALMO IN BRUNSWICK COUNTY TO SR 1430 (CEDAR HILL ROAD)***

TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, SIGNALS STRUCTURES, AND ITS***

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	R-2633BA		1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION		
34491.1.2	STPNHF-17(1)	P.E.		
34491.2.3		R / W		
34491.3.GVS3	NHS-0017(124)	CONST.		

Part 1of 2

PREPARED FOR
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, NC

PLANS COORDINATED BY:
Brenda Moore, P.E. – Project Engineer (NCDOT)

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ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON
Brian K Eason P.E. 10/18/13
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

8/17/99

INDEX OF SHEETS R-2633BA

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1-C THRU 1-E SURVEY CONTROL SHEETS

1-F THRU 1-G CENTERLINE COORDINATE LIST

2 THRU 2-E PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS

2-F THRU 2-G DETAIL FOR CROSS SECTIONS

2-H Y7 DETOUR (PLAN/PROFILE)

2-I THRU 2-J INTERSECTION DETAILS

2-K DETAIL FOR CONCRETE ENDWALL FOR TRIPLE PIPE CULVERTS

2-L STANDARD TEMPORARY WALL (SHEET 1 OF 3)

2-M STANDARD TEMPORARY WALL (SHEET 2 OF 3)

2-N STANDARD TEMPORARY WALL (SHEET 3 OF 3)

2-O DETAIL OF REINFORCED SANDBAG HEADWALL

2-P GROUND IMPROVEMENT (SHEET 1 OF 4)

2-Q GROUND IMPROVEMENT (SHEET 2 OF 4)

2-R EMBANKMENT MONITORING-INSTRUMENTATIONS (SHEET 3 OF 4)

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3-K 48" CHAIN LINK FENCE, WIRE WOVEN FENCE, ASPHALT PAVEMENT REMOVAL, ASPHALT PAVEMENT BREAKING, CABLE GUIDERAIL, SHOULDER BERM GUTTER, SUBSURFACE DRAINAGE, SETTLEMENT GAUGES AND EMBANKMENT WAITING PERIODS

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3-N PARCEL INDEX

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28 THRU 55 PROFILE SHEETS

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PMP-1 THRU PMP-17 PAVEMENT MARKING PLANS

EC-1 THRU EC-54/CONST. 27 EROSION CONTROL PLANS

RF-1 THRU RF-3 REFORESTATION PLANS

SIGN-1 THRU SIGN-19 SIGNING PLANS

SIG-1 THRU SIG-24 SIGNAL PLANS

UC-1 THRU UC-21 UTILITY CONSTRUCTION PLANS

UO-1 THRU UO-13 UTILITIES BY OTHERS PLANS

ITS-1 THRU ITS-24 ITS PLANS

S-1 THRU S- 348 STRUCTURE PLANS

X-A THRU X-315 CROSS-SECTIONS

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.07	Grading for False Cut at Grade Separations
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.02	Parallel Pipe End Section - Precast Concrete Section for 15" to 24" Pipe
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
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges - Method III
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
815.02	Subsurface 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
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" 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
838.75	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
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
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
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.37	Steel Grate and Frame
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in 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
865.01	Cable Guiderail
866.01	Chain Link Fence - 4', 5' and 6' High Fence
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	1-A

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
10/23/13

GENERAL NOTES: 2012 SPECIFICATIONS

EFFECTIVE: 01-17-12

REVISED: 08/31/11

GRADE LINE:

GRADING AND SURFACING:

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

CLEARING:

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. 225.05 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.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 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 PROGRESS ENERGY, AT&T PIEDMONT NATURAL GAS, AND TIME WARNER CABLE

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

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12/05/11

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

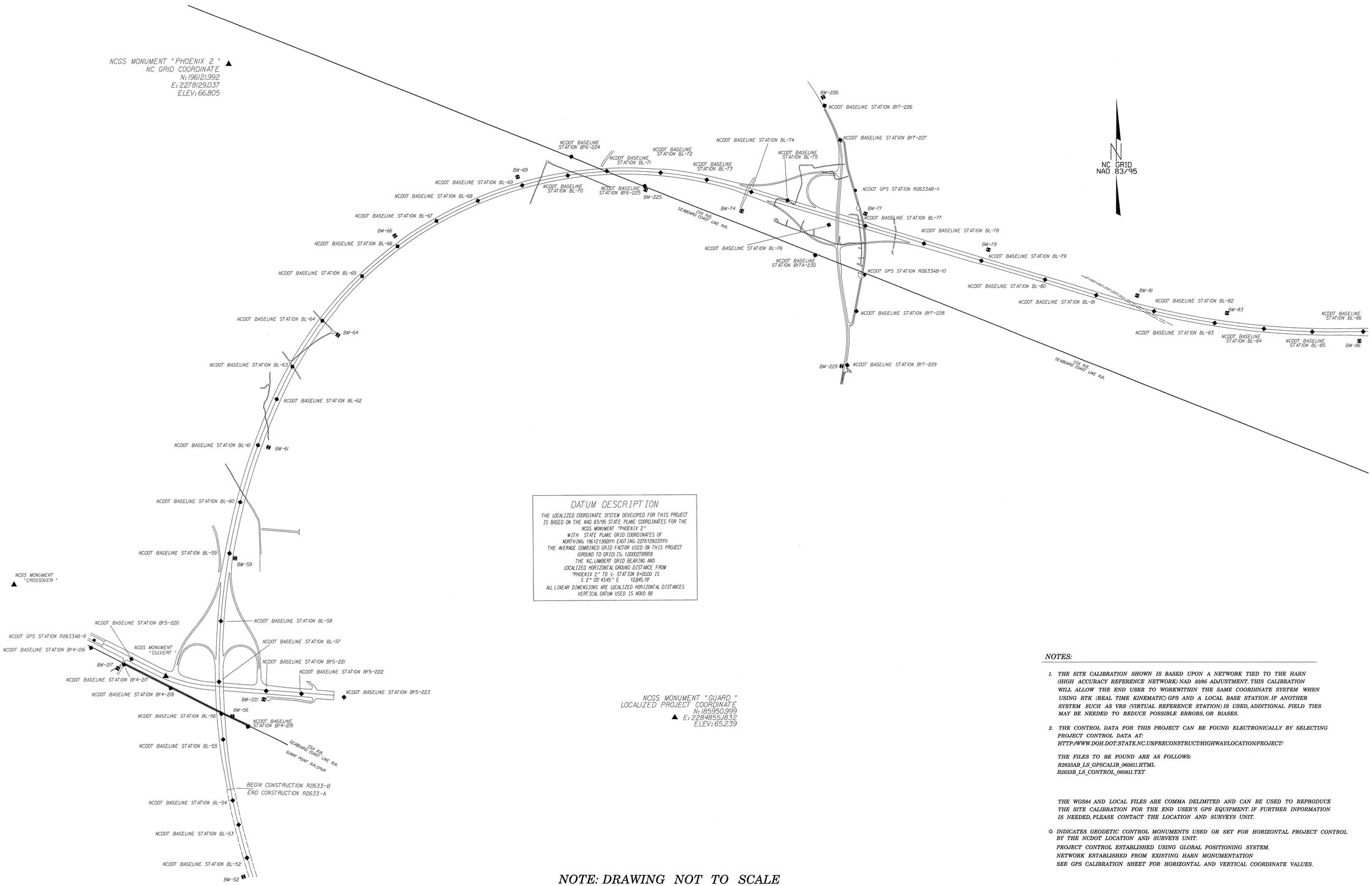
MISCELLANEOUS:

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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633-BA	1C 1
Location and Surveys	

SURVEY CONTROL SHEET R-2633B



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE NAD 83/95 STATE PLANE COORDINATES FOR THE NCGS MONUMENT "PHOENIX 2"

WITH STATE PLANE GRID COORDINATES OF
NORTHING 196121.992(ft) EASTING 2278129.037(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 1.00002789978
THE NC LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"PHOENIX 2" TO -L- STATION 8+00.00 IS
S 2° 05' 43.45" E 12,845.18'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 88

NCGS MONUMENT "GUARD"
LOCALIZED PROJECT COORDINATE
▲ N: 185950.999
E: 2284855.832
ELEV: 65.239

NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORKWITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

2. 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:
R2633AB_LS_GPSCALIB_060811.HTML
R2633B_LS_CONTROL_060811.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

© INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

SYTIME
R:\Roadway\Proj\R-2633BA\r-2633ba_ls_lcl_080902.dgn
USER NAME = ls

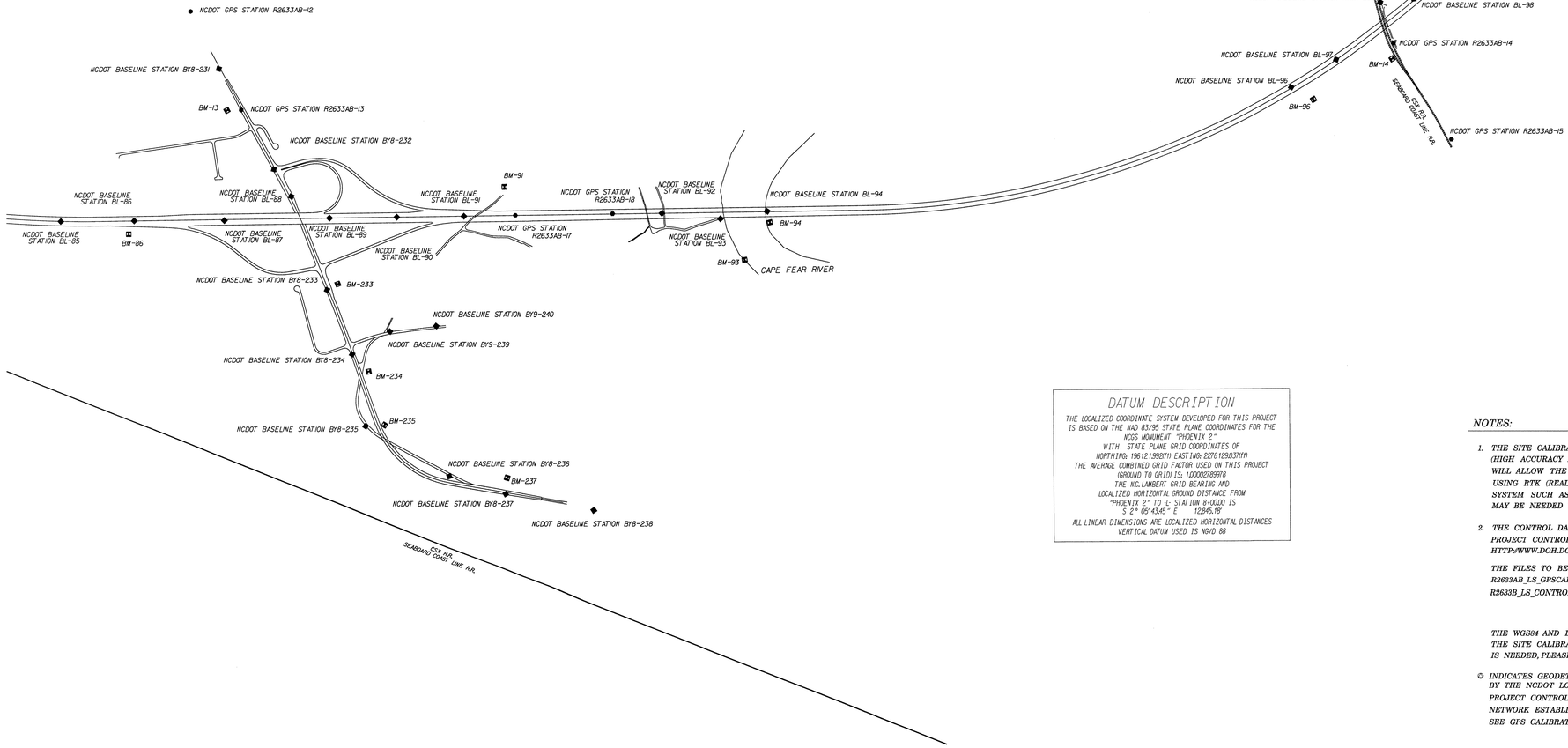
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633-BA	1C 2
Location and Surveys	

SURVEY CONTROL SHEET R-2633B

NCGS MONUMENT "PHOENIX 2" ▲
NC GRID COORDINATE
N:196121.992
E:2278129.037
ELEV:66.805

NC GRID
NAD 83/95



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THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000278978
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"PHOENIX 2" TO -L- STATION 8+00.00 IS
S 2° 05' 43.45" E 12,845.18'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 88

NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 8395 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORKWITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

2. 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:
R2633AB_LS_GPSCALIB_060811.HTML
R2633B_LS_CONTROL_060811.TXT

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© INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

SYTIME
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USERNAME

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633-BA	1D
Location and Surveys	

SURVEY CONTROL SHEET R-2633-B

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE NAD 83/95 STATE PLANE COORDINATES FOR THE NCGS MONUMENT "PHOENIX 2" WITH STATE PLANE GRID COORDINATES OF NORTHING: 196121.992(ft) EASTING: 2278129.037(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000027900 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "PHOENIX 2" TO -L- STATION 8+00.00 IS S 2° 05' 43.45" E 12,845.18' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 88

GPS CALIBRATION REPORT

PROJECT : R2633AB

TIP NUMBER	R-2633B		
USER NAME	JNEAL	DATE & TIME	2:04:32 PM 3/27/2006
COORDINATE SYSTEM	SITE(AT GROUND)	ZONE	NORTH CAROLINA 3200(3)
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM	NAVD 88	GEOID MODEL	GEOID03 (CONUS)(2)
COORDINATE UNITS	US SURVEY FEET		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	US SURVEY FEET		

LOCAL SITE INFORMATION

LOCALIZED AROUND	PHOENIX 2
LATITUDE	34°17'07.13697"N
LONGITUDE	78°04'45.45174"W
SITE SCALE FACTOR	0.9999721010
HEIGHT	-51.790SFT

THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION USES A LOCALIZED COORDINATE SYSTEM WHICH IS VERY SIMILAR TO NORTH CAROLINA ZONE 3200 FROM WHICH IT IS DERIVED. PLEASE TAKE CARE IN UTILIZING THESE COORDINATES TO ELIMINATE CONFUSION OF THE TWO SYSTEMS. THIS FILE IS TO AID IN THE USE OF REAL TIME KINEMATIC (RTK) GPS DURING CONSTRUCTION LAYOUT.

DATUM TRANSFORMATION PARAMETERS

DATUM TRANSFORMATION COMPUTATION NOT REQUESTED

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION

UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ROTATION CENTER	182836.287SFT
EASTING COORDINATE OF ROTATION CENTER	2288166.692SFT
ROTATION ABOUT THE CENTER POINT	0°00'00"
TRANSLATION NORTH	0.002SFT
TRANSLATION EAST	-0.005SFT
SCALE FACTOR	1.00000010

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	155960.007SFT
EASTING COORDINATE OF ORIGIN POINT	2276068.189SFT
VERTICAL SEPARATION AT ORIGIN	0.143SFT
SLOPE NORTH	-2.970PPM
SLOPE EAST	1.302PPM

GEOID MODEL DEFINITION

GEOID03 (CONUS)(2)

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.001SFT	0.000	CROSSOVER_GPS
VERTICAL	0.099SFT	0.013	R2633AB-6_GPS
THREE-DIMENSIONAL	0.099SFT	0.013	R2633AB-6_GPS

POINT RESIDUALS

WGS84 COORDINATES		CALCULATED POINT FOR DISPLAY ONLY		LOCAL COORDINATES	
POINT	R2633AB-3_GPS	NORTHING	155960.007SFT	POINT	R2633AB-3
LATITUDE	34°10'30.06193"N	EASTING	2276068.189SFT	NORTHING	155960.007SFT
LONGITUDE	78°05'14.41103"W	ELEVATION	21.233SFT	EASTING	2276068.190SFT
HEIGHT	-98.598SFT	HORZ ERROR	0.000SFT	ELEVATION	21.199SFT
		VERT ERROR	0.034SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.034SFT	QUALITY	QUALITY
POINT	R2633AB-2_GPS	NORTHING	157482.842SFT	POINT	R2633AB-2
LATITUDE	34°10'45.05824"N	EASTING	2276800.926SFT	NORTHING	157482.842SFT
LONGITUDE	78°05'05.52363"W	ELEVATION	25.248SFT	EASTING	2276800.927SFT
HEIGHT	-94.556SFT	HORZ ERROR	0.000SFT	ELEVATION	25.161SFT
		VERT ERROR	0.088SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.088SFT	QUALITY	QUALITY
POINT	R2633AB-4_GPS	NORTHING	163101.269SFT	POINT	R2633AB-4
LATITUDE	34°11'40.19955"N	EASTING	2281510.100SFT	NORTHING	163101.269SFT
LONGITUDE	78°04'08.84982"W	ELEVATION	19.484SFT	EASTING	2281510.101SFT
HEIGHT	-100.279SFT	HORZ ERROR	0.000SFT	ELEVATION	19.540SFT
		VERT ERROR	0.056SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.056SFT	QUALITY	QUALITY
POINT	R2633AB-5_GPS	NORTHING	163905.843SFT	POINT	R2633AB-5
LATITUDE	34°11'48.03700"N	EASTING	2282811.187SFT	NORTHING	163905.842SFT
LONGITUDE	78°03'53.27169"W	ELEVATION	37.147SFT	EASTING	2282811.188SFT
HEIGHT	-82.630SFT	HORZ ERROR	0.000SFT	ELEVATION	37.117SFT
		VERT ERROR	0.030SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.030SFT	QUALITY	QUALITY
POINT	R2633AB-6_GPS	NORTHING	163460.218SFT	POINT	R2633AB-6
LATITUDE	34°11'43.86771"N	EASTING	2280239.165SFT	NORTHING	163460.218SFT
LONGITUDE	78°04'23.93893"W	ELEVATION	24.964SFT	EASTING	2280239.165SFT
HEIGHT	-94.749SFT	HORZ ERROR	0.000SFT	ELEVATION	25.063SFT
		VERT ERROR	0.099SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.099SFT	QUALITY	QUALITY
POINT	R2633AB-7_GPS	NORTHING	174900.776SFT	POINT	R2633AB-7
LATITUDE	34°13'37.13239"N	EASTING	2279148.653SFT	NORTHING	174900.776SFT
LONGITUDE	78°04'35.65348"W	ELEVATION	58.911SFT	EASTING	2279148.653SFT
HEIGHT	-60.399SFT	HORZ ERROR	0.000SFT	ELEVATION	58.985SFT
		VERT ERROR	0.074SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.074SFT	QUALITY	QUALITY
POINT	R2633AB-8_GPS	NORTHING	176127.712SFT	POINT	R2633AB-8
LATITUDE	34°13'49.27985"N	EASTING	2279026.882SFT	NORTHING	176127.711SFT
LONGITUDE	78°04'36.96772"W	ELEVATION	61.601SFT	EASTING	2279026.882SFT
HEIGHT	-57.664SFT	HORZ ERROR	0.000SFT	ELEVATION	61.586SFT
		VERT ERROR	0.015SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.015SFT	QUALITY	QUALITY
POINT	R2633AB-9_GPS	NORTHING	187071.436SFT	POINT	R2633AB-9
LATITUDE	34°15'37.79538"N	EASTING	2276129.314SFT	NORTHING	187071.436SFT
LONGITUDE	78°05'10.27516"W	ELEVATION	65.763SFT	EASTING	2276129.314SFT
HEIGHT	-53.064SFT	HORZ ERROR	0.000SFT	ELEVATION	65.788SFT
		VERT ERROR	0.025SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.025SFT	QUALITY	QUALITY
POINT	CULVERT_GPS	NORTHING	186538.254SFT	POINT	CULVERT
LATITUDE	34°15'32.42311"N	EASTING	2277206.408SFT	NORTHING	186538.254SFT
LONGITUDE	78°04'57.50205"W	ELEVATION	64.441SFT	EASTING	2277206.408SFT
HEIGHT	-54.435SFT	HORZ ERROR	0.000SFT	ELEVATION	64.490SFT
		VERT ERROR	0.049SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.049SFT	QUALITY	QUALITY
POINT	CROSSOVER_GPS	NORTHING	188860.353SFT	POINT	CROSSOVER
LATITUDE	34°15'55.81045"N	EASTING	2272593.989SFT	NORTHING	188860.354SFT
LONGITUDE	78°05'52.19916"W	ELEVATION	63.955SFT	EASTING	2272593.990SFT
HEIGHT	-54.717SFT	HORZ ERROR	0.001SFT	ELEVATION	63.865SFT
		VERT ERROR	0.091SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.091SFT	QUALITY	QUALITY
POINT	GUARD_GPS	NORTHING	185950.999SFT	POINT	GUARD
LATITUDE	34°15'25.90542"N	EASTING	2284855.183SFT	NORTHING	185950.999SFT
LONGITUDE	78°03'26.44768"W	ELEVATION	65.014SFT	EASTING	2284855.183SFT
HEIGHT	-54.114SFT	HORZ ERROR	0.000SFT	ELEVATION	65.139SFT
		VERT ERROR	?	UTILIZED	HORIZONTAL ADJUSTED
		3D ERROR	0.000SFT	QUALITY	QUALITY
POINT	PHOENIX2_GPS	NORTHING	196121.992SFT	POINT	PHOENIX2
LATITUDE	34°17'07.13693"N	EASTING	2278129.037SFT	NORTHING	196121.992SFT
LONGITUDE	78°04'45.45168"W	ELEVATION	66.792SFT	EASTING	2278129.037SFT
HEIGHT	-51.829SFT	HORZ ERROR	0.000SFT	ELEVATION	66.805SFT
		VERT ERROR	0.012SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.012SFT	QUALITY	QUALITY
POINT	R2633AB-10_GPS	NORTHING	192590.417SFT	POINT	R2633AB-10
LATITUDE	34°16'31.31185"N	EASTING	2287690.511SFT	NORTHING	192590.417SFT
LONGITUDE	78°02'51.91211"W	ELEVATION	34.020SFT	EASTING	2287690.511SFT
HEIGHT	-84.996SFT	HORZ ERROR	0.000SFT	ELEVATION	34.021SFT
		VERT ERROR	0.001SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.001SFT	QUALITY	QUALITY
POINT	R2633AB-11_GPS	NORTHING	193867.094SFT	POINT	R2633AB-11
LATITUDE	34°16'43.95360"N	EASTING	2287548.981SFT	NORTHING	193867.094SFT
LONGITUDE	78°02'53.45265"W	ELEVATION	34.472SFT	EASTING	2287548.981SFT
HEIGHT	-84.502SFT	HORZ ERROR	0.000SFT	ELEVATION	34.474SFT
		VERT ERROR	0.002SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.002SFT	QUALITY	QUALITY
POINT	R2633AB-12_GPS	NORTHING	193967.705SFT	POINT	R2633AB-12
LATITUDE	34°16'44.15896"N	EASTING	2295759.587SFT	NORTHING	193967.705SFT
LONGITUDE	78°01'15.60457"W	ELEVATION	19.283SFT	EASTING	2295759.587SFT
HEIGHT	-99.959SFT	HORZ ERROR	0.000SFT	ELEVATION	19.279SFT
		VERT ERROR	0.004SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.004SFT	QUALITY	QUALITY
POINT	R2633AB-13_GPS	NORTHING	192941.439SFT	POINT	R2633AB-13
LATITUDE	34°16'33.95558"N	EASTING	2296292.523SFT	NORTHING	192941.439SFT
LONGITUDE	78°01'09.37399"W	ELEVATION	21.184SFT	EASTING	2296292.523SFT
HEIGHT	-98.107SFT	HORZ ERROR	0.000SFT	ELEVATION	21.178SFT
		VERT ERROR	0.006SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.006SFT	QUALITY	QUALITY
POINT	R2633AB-17_GPS	NORTHING	191867.882SFT	POINT	R2633AB-17
LATITUDE	34°16'23.05570"N	EASTING	2299151.719SFT	NORTHING	191867.882SFT
LONGITUDE	78°00'35.43273"W	ELEVATION	17.681SFT	EASTING	2299151.719SFT
HEIGHT	-101.746SFT	HORZ ERROR	0.000SFT	ELEVATION	17.672SFT
		VERT ERROR	0.009SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.009SFT	QUALITY	QUALITY
POINT	R2633AB-18_GPS	NORTHING	191890.435SFT	POINT	R2633AB-18
LATITUDE	34°16'23.17837"N	EASTING	2300167.740SFT	NORTHING	191890.434SFT
LONGITUDE	78°00'23.32406"W	ELEVATION	17.177SFT	EASTING	2300167.740SFT
HEIGHT	-102.285SFT	HORZ ERROR	0.000SFT	ELEVATION	17.167SFT
		VERT ERROR	0.010SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.010SFT	QUALITY	QUALITY
POINT	R2633AB-14_GPS	NORTHING	193701.682SFT	POINT	R2633AB-14
LATITUDE	34°16'40.27850"N	EASTING	2308298.063SFT	NORTHING	193701.682SFT
LONGITUDE	77°58'46.22883"W	ELEVATION	10.417SFT	EASTING	2308298.023SFT
HEIGHT	-109.282SFT	HORZ ERROR	0.000SFT	ELEVATION	10.483SFT
		VERT ERROR	0.014SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.014SFT	QUALITY	QUALITY
POINT	R2633AB-15_GPS	NORTHING	192705.039SFT	POINT	R2633AB-15
LATITUDE	34°16'30.35823"N	EASTING	2308907.023SFT	NORTHING	192705.039SFT
LONGITUDE	77°58'39.09494"W	ELEVATION	11.900SFT	EASTING	2308907.023SFT
HEIGHT	-107.854SFT	HORZ ERROR	0.000SFT	ELEVATION	11.885SFT
		VERT ERROR	0.015SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.015SFT	QUALITY	QUALITY
POINT	R2633AB-16_GPS	NORTHING	196171.708SFT	POINT	R2633AB-16
LATITUDE	34°17'04.26301"N	EASTING	2312669.810SFT	NORTHING	196171.708SFT
LONGITUDE	77°57'53.82936"W	ELEVATION	32.293SFT	EASTING	2312669.810SFT
HEIGHT	-87.494SFT	HORZ ERROR	0.000SFT	ELEVATION	32.106SFT
		VERT ERROR	?	UTILIZED	HORIZONTAL ADJUSTED
		3D ERROR	0.000SFT	QUALITY	QUALITY
POINT	R2633C-79_GPS	NORTHING	197241.003SFT	POINT	R2633C-79
LATITUDE	34°17'14.91148"N	EASTING	2311975.296SFT	NORTHING	197241.004SFT
LONGITUDE	77°58'01.97309"W	ELEVATION	23.884SFT	EASTING	2311975.296SFT
HEIGHT	-95.844SFT	HORZ ERROR	0.000SFT	ELEVATION	23.898SFT
		VERT ERROR	0.013SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.013SFT	QUALITY	QUALITY
POINT	LANVALE_GPS	NORTHING	168808.541SFT	POINT	LANVALE
LATITUDE	34°12'37.26313"N	EASTING	2274853.604SFT	NORTHING	168808.542SFT
LONGITUDE	78°05'27.46559"W	ELEVATION	69.182SFT	EASTING	2274853.604SFT
HEIGHT	-50.203SFT	HORZ ERROR	0.000SFT	ELEVATION	69.164SFT
		VERT ERROR	0.017SFT	UTILIZED	HORZ AND VERT ADJUSTED
		3D ERROR	0.017SFT	QUALITY	QUALITY

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PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

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$$$$USERNAME$$$$

CONTROL DATA

-BL-

POINT	DESC.	NORTH	EAST	ELEVATION	-L- STATION	OFFSET
52	BL-52	183810.3230	2278434.4160	69.08	13+50.01	3.80 LT
53	BL-53	184301.3300	2278307.1010	71.44	18+57.27	5.04 RT
54	BL-54	184664.7210	2278216.4870	70.21	22+31.81	1.71 LT
55	BL-55	185569.9230	2278070.4940	72.20	31+48.92	0.89 LT
56	BL-56	185975.1100	2278042.8520	68.08	35+55.13	9.47 RT
57	BL-57	186459.8260	2278004.8770	65.67	40+41.27	5.05 LT
58	BL-58	187367.3370	2278030.9580	64.74	49+49.25	0.66 RT
59	BL-59	188375.3850	2278156.6790	67.94	59+65.83	4.67 RT
60	BL-60	189143.1320	2278315.3670	69.43	67+50.12	1.40 LT
61	BL-61	190003.1810	2278580.3600	72.90	76+50.33	0.25 RT
62	BL-62	190698.4730	2278859.4560	69.20	83+99.77	0.93 RT
63	BL-63	191183.4380	2279094.4090	69.92	89+38.65	4.22 LT
64	BL-64	191866.5000	2279543.5190	64.59	97+56.43	1.16 LT
65	BL-65	192534.8590	2280138.4000	50.15	106+51.94	0.79 LT
66	BL-66	192989.0770	2280671.5300	43.37	113+52.64	1.16 LT
67	BL-67	193374.7280	2281255.2680	41.53	120+52.54	1.52 LT
68	BL-68	193682.6770	2281875.9070	40.96	127+45.68	0.40 LT
69	BL-69	193918.7530	2282542.9540	41.30	134+53.68	0.27 LT
70	BL-70	194069.6310	2283225.8620	41.88	141+53.47	0.08 RT
71	BL-71	194139.4050	2283812.8130	41.91	147+44.39	7.39 LT
72	BL-72	194118.0510	2284622.2130	40.02	155+54.25	0.94 RT
73	BL-73	194013.7480	2285316.4200	38.47	162+56.86	2.00 RT
74	BL-74	193834.3430	2285985.4680	38.06	169+49.95	2.63 RT
75	BL-75	193713.0190	2286529.4360	37.46	175+06.00	35.21 LT
76	BL-76	193342.6750	2287150.3340	35.16	182+06.41	143.95 RT
77	BL-77	193329.8890	2287699.5930	35.10	187+36.76	0.52 RT
78	BL-78	193068.6120	2288580.5980	28.50	196+55.69	1.35 RT
79	BL-79	192813.0290	2289443.2560	27.69	205+55.42	1.92 RT
80	BL-80	192530.2530	2290400.7420	32.51	215+53.79	1.69 RT
81	BL-81	192303.3960	2291169.6460	27.01	223+55.46	1.30 RT
82	BL-82	192068.0350	2292038.3950	26.35	232+55.59	2.12 RT
83	BL-83	191895.3310	2292950.2610	25.92	241+83.71	3.14 RT
84	BL-84	191814.9660	2293690.8100	25.20	249+28.65	0.77 LT
85	BL-85	191776.9100	2294416.8590	23.26	256+55.79	1.43 RT
86	BL-86	191785.8790	2295181.5700	22.16	264+20.58	0.28 LT
87	BL-87	191794.4050	2296120.4340	22.04	273+59.42	10.38 RT
88	BL-88	192048.3460	2296817.1800	21.52	280+61.21	229.27 LT
89	BL-89	191827.1640	2297216.0180	20.33	284+55.45	0.01 RT
90	BL-90	191841.2350	2297916.1330	22.41	291+55.70	0.25 RT
91	BL-91	191855.1160	2298616.8010	21.65	298+56.51	0.69 RT
17	R2633AB-17	191867.8820	2299151.7190	17.67	303+91.58	1.14 LT
18	R2633AB-18	191890.4340	2300167.7400	17.17	314+07.85	2.93 LT
92	BL-92	191898.1450	2300682.2570	11.42	319+22.41	0.12 LT
93	BL-93	191843.6780	2301292.0430	0.00	325+30.96	66.79 RT
94	BL-94	191925.0600	2301778.6080	0.00	330+19.08	4.63 LT
96	BL-96	193236.8710	2307233.5890	2.55	387+14.60	10.37 LT
97	BL-97	193528.8820	2307700.9030	6.98	392+66.08	2.70 LT
14	R2633AB-14	193701.6820	2308298.0630	10.40	398+42.69	212.58 RT
98	BL-98	194167.9170	2308506.6870	18.33	402+95.92	13.22 LT
99	BL-99	194542.5410	2308926.7510	12.04	408+59.20	1.67 LT
100	BL-100	195104.7740	2309447.6680	23.14	416+26.06	2.31 LT
101	BL-101	195780.3920	2309979.1030	19.00	424+85.92	0.57 LT
102	BL-102	195659.7830	2310681.2600	15.95	428+12.23	632.75 RT
103	BL-103	196200.8900	2310366.9440	14.17	430+55.16	56.05 RT
104	BL-104	197060.5610	2310926.7320	25.74	440+78.60	14.35 LT
105	BL-105	197002.0920	2312138.3530	25.93	447+61.19	988.40 RT
C79	R2633C-79	197241.0040	2311975.2960	23.90	448+53.83	714.39 RT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
9	R2633AB-9	187071.4360	2276129.3140	65.79	OUTSIDE PROJECT LIMITS	
220	BY5-220	186793.1739	2276688.9170	64.70	14+80.60	16.23 RT
C1	CULVERT	186538.2540	2277206.4080	64.49	20+56.37	17.41 RT
57	BL-57	186459.8260	2278004.8770	65.67	28+64.70	71.43 LT
221	BY5-221	186324.0289	2278713.2493	66.35	35+80.95	13.54 RT
222	BY5-222	186284.5245	2279244.2170	65.75	41+13.38	15.10 RT
223	BY5-223	186236.1414	2279883.8471	63.49	OUTSIDE PROJECT LIMITS	

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	Y7 STATION	OFFSET
226	BY7-226	195129.3923	2287082.4381	34.49	14+43.84	21.84 LT
227	BY7-227	194616.6776	2287318.8412	35.46	20+03.26	29.39 LT
11	R2633AB-11	193867.0940	2287548.9810	34.47	27+31.23	240.77 LT
77	BL-77	193329.8890	2287699.5930	35.10	32+82.31	421.63 LT
10	R2633AB-10	192590.4170	2287690.5110	34.02	40+75.53	371.41 LT
228	BY7-228	192045.8410	2287567.3784	31.19	46+07.77	164.47 LT
229	BY7-229	191239.6880	2287432.6189	29.36	53+86.04	34.98 LT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	Y8 STATION	OFFSET
231	BY8-231	193369.0115	2296056.9892	19.43	11+99.45	13.12 RT
13	R2633AB-13	192941.4390	2296292.5230	21.18	16+87.60	13.90 RT
232	BY8-232	192325.2314	2296634.3654	21.52	23+92.28	12.92 RT
88	BY8-88	192048.3460	2296817.1800	21.52	27+22.93	13.19 LT
233	BY8-233	191078.3250	2297193.0312	20.84	37+62.38	13.77 RT
234	BY8-234	190409.0746	2297457.4497	13.58	44+82.27	7.65 RT
235	BY8-235	189656.0418	2297600.7711	13.21	52+35.56	124.90 RT
236	BY8-236	189145.9744	2298474.6228	21.65	62+50.23	65.63 LT
237	BY8-237	188964.2945	2299063.6092	21.81	68+63.25	15.24 RT
238	BY8-238	188801.8806	2299983.2242	18.54	OUTSIDE PROJECT LIMITS	

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	Y9 STATION	OFFSET
240	BY9-240	190711.5104	2298331.9538	17.57	19+27.70	14.27 LT
239	BY9-239	190650.1275	2297849.6904	19.70	14+42.26	14.53 LT
234	BY8-234	190409.0746	2297457.4497	13.58	OUTSIDE PROJECT LIMITS	

SURVEY CONTROL SHEET R-2633-B

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
216	BY4-216	186955.8218	2276081.4546	65.67	44+94.12	1928.66 LT
217	BY4-217	186709.6969	2276575.7529	66.48	42+88.90	1431.44 LT
218	BY4-218	186358.0112	2277279.2644	66.40	39+62.50	733.21 LT
56	BL-56	185975.1100	2278042.8520	68.08	35+55.13	9.47 RT
219	BY4-219	185774.0936	2278441.3102	68.49	33+16.11	389.42 RT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
224	BY6-224	194346.9729	2283279.6913	41.82	142+45.76	266.20 LT
71	BL-71	194139.4050	2283812.8130	41.91	147+44.39	7.39 LT
225	BY6-225	193916.6085	2284383.9544	40.75	153+25.57	217.85 RT

BY9A

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
241	BY9A-241	194566.3522	2308038.1306	11.53	401+98.10	621.00 LT
263	BY9A-263	194129.9986	2308156.8664	12.24	400+00.47	209.92 LT
14	R2633AB-14	193701.6820	2308298.0630	10.40	398+42.69	212.58 RT
15	R2633AB-15	192705.0390	2308907.0230	11.89	397+22.72	1373.25 RT

BY10

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
242	BY10-242	195822.2210	2309609.5562	21.67	422+96.89	320.85 LT
101	BL-101	195780.3920	2309979.1030	19.00	424+85.92	0.57 LT
243	BY10-243	195711.2976	2310633.5012	16.31	428+24.63	563.60 RT

BY12

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
244	BY12-244	196423.6082	2310241.6711	14.85	431+57.61	178.04 LT
103	BL-103	196200.8900	2310366.9440	14.17	430+55.16	56.05 RT
243	BY10-243	195711.2976	2310633.5012	16.31	428+24.63	563.60 RT

BY13

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BY1	R2633C-BY1	197749.4926	2310547.0379	31.78	444+00.23	732.23 LT
104	BL-104	197060.5610	2310926.7320	25.74	440+78.60	14.35 LT
245	BY13-245	196693.0437	2311131.2206	25.55	439+08.20	370.15 RT

BM52 ELEVATION = 74.09
N 183487 E 2278395
L STATION 10+52 136 LEFT
RR SPIKE AT THE BASE OF A 12" PINE

BM56 ELEVATION = 69.37
N 185940 E 2278210
L STATION 35+07 173 RIGHT
RR SPIKE SET AT THE BASE OF A 12" PINE

BM59 ELEVATION = 69.63
N 188304 E 2278241
L STATION 59+09 100 RIGHT
RR SPIKE SET AT THE BASE OF A 10" PINE

BM61 ELEVATION = 75.13
N 189974 E 2278737
L STATION 76+75 157 RIGHT
RR SPIKE SET AT THE BASE OF A 14" PINE

BM64 ELEVATION = 64.54
N 191657 E 2279776
L STATION 97+29 311 RIGHT
RR SPIKE SET AT THE BASE OF A 12" PINE

BM66 ELEVATION = 45.02
N 193147 E 2280631
L STATION 114+14 152 LEFT
RR SPIKE SET AT THE BASE OF A 15" PINE

BM69 ELEVATION = 43.83
N 194044 E 2282474
L STATION 134+23 140 LEFT
RR SPIKE SET AT THE BASE OF A 15" PINE

BM74 ELEVATION = 40.70
N 193546 E 2285840
L STATION 168+92 320 RIGHT
RR SPIKE SET AT THE BASE OF A 20" OAK

BM77 ELEVATION = 33.54
N 193516 E 2287699
L STATION 186+84 178 LEFT
RR SPIKE SET AT THE BASE OF A 12" OAK

BM79 ELEVATION = 29.07
N 192980 E 2289548
L STATION 206+08 188 LEFT
RR SPIKE SET AT THE BASE OF A 15" TWIN PINE

BM81 ELEVATION = 27.84
N 192301 E 2291786
L STATION 229+53 164 LEFT
RR SPIKE SET AT THE BASE OF A 18" PINE

BM83 ELEVATION = 27.24
N 192047 E 2293136
L STATION 243+48 173 LEFT
RR SPIKE SET AT THE BASE OF A 8" PINE

BM86 ELEVATION = 24.94
N 191647 E 2295125
L STATION 263+61 138 RIGHT
RR SPIKE SET AT THE BASE OF A 15" PINE

BM91 ELEVATION = 20.52
N 192160 E 2299037
L STATION 302+83 296 LEFT
RR SPIKE SET AT THE BASE OF A 18" PINE

BM93 ELEVATION = 3.61
N 191421 E 2301547
L STATION 327+77 494 RIGHT
RR SPIKE SET AT THE BASE OF A 16" CYPRESS

BM94 ELEVATION = 2.67
N 191809 E 2301808
L STATION 330+46 112 RIGHT
RR SPIKE SET AT THE BASE OF A 12" CYPRESS

BM96 ELEVATION = 7.55
N 193109 E 2307467
L STATION 388+45 220 RIGHT
RR SPIKE SET AT THE BASE OF A 24" TWIN OAKS

BM101 ELEVATION = 16.81
N 195741 E 2310505
L STATION 427+71 443 RIGHT
RR SPIKE SET AT THE BASE OF A 18" PINE

BM217 ELEVATION = 68.11
N 186654 E 2276484
L STATION 42+40 1523 LEFT
RR SPIKE SET AT THE BASE OF A 12" PINE

BM221 ELEVATION = 68.80
N 186199 E 2278677
L STATION 37+45 657 RIGHT
RR SPIKE SET AT THE BASE OF A 18" PINE

BM225 ELEVATION = 41.41
N 193860 E 2284397
L STATION 153+42 274 RIGHT
RR SPIKE SET AT THE BASE OF A 12" PINE

BM226 ELEVATION = 34.83
N 195253 E 2287061
L STATION 175+79 1663 LEFT
RR SPIKE SET AT THE BASE OF A 8" OAK

BM229 ELEVATION = 28.80
N 191225 E 2287347
L STATION 189+96 2119 RIGHT
RR SPIKE SET AT THE BASE OF A 18" PINE

BM233 ELEVATION = 23.14
N 191143 E 2297305
L STATION 285+30 685 RIGHT
RR SPIKE SET AT THE BASE OF A 20" PINE

BM234 ELEVATION = 11.46
N 190226 E 2297631
L STATION 288+37 1609 RIGHT
RR SPIKE SET AT THE BASE OF A 18" PINE

BM235 ELEVATION = 14.24
N 189671 E 2297798
L STATION 289+93 2167 RIGHT
RR SPIKE SET AT THE BASE OF A 11" PINE

BM237 ELEVATION = 16.41
N 189133 E 2299078
L STATION 302+62 2731 RIGHT
RR SPIKE SET AT THE BASE OF A 9" PINE

BM245 ELEVATION = 26.06
N 196683 E 2311154
L STATION 439+14 394 RIGHT
RR SPIKE SET AT THE BASE OF A 10" PINE

BM13 ELEVATION = 24.20
N 192936 E 2296143
BY8 STATION 9+21 134 RIGHT
RR SPIKE IN BASE OF 10' OAK

BM14 ELEVATION = 17.24
N 193539 E 2308284
BY9A STATION 15+35 97 RIGHT
RR SPIKE IN BASE OF A 12" PINE

NOTES

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAYBE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

2. 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:

   R2633AB_LS_GPSCALIB_060811.HTML
   R2633B_LS_CONTROL_060811.TXT

   THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "PHOENIX 2"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 196121.992(ft) EASTING: 2278129.037(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00002790
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "PHOENIX 2" TO -L- STATION 8+00.00 IS
S 2°05'43.5" E 12,845.18'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

PROJ. REFERENCE NO.	SHEET NO.
R-2633BA	1F

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	LREV	304+00.00	183665.1586	2278482.7206
2	LREV	305+00.00	183760.8228	2278453.5939
3	LREV	306+00.00	183856.6132	2278424.8856
4	LREV	307+00.00	183952.6368	2278396.9683
5	LREV	308+00.00	184048.9344	2278370.0110
6	LREV	309+00.00	184145.4975	2278344.0209
7	LREV	310+00.00	184242.3164	2278319.0006
8	LREV	311+00.00	184339.3814	2278294.9527
9	LREV	312+00.00	184436.6827	2278271.8796
10	LREV	313+00.00	184534.2106	2278249.7835
11	LREV	314+00.00	184631.9551	2278228.6668
12	LREV	315+00.00	184729.9066	2278208.5315
13	LREV	316+00.00	184828.0551	2278189.3796
14	LREV	317+00.00	184926.3907	2278171.2131
15	LREV	318+00.00	185024.9036	2278154.0339
16	LREV	319+00.00	185123.5838	2278137.8435
17	LREV	320+00.00	185222.4215	2278122.6438
18	LREV	321+00.00	185321.4066	2278108.4361
19	LREV	322+00.00	185420.5293	2278095.2220
20	LREV	323+00.00	185519.7795	2278083.0027
21	LREV	324+00.00	185619.1473	2278071.7796
22	LREV	325+00.00	185718.6226	2278061.5536
23	LREV	326+00.00	185818.1956	2278052.3259
24	LREV	327+00.00	185917.8560	2278044.0973
25	LREV	328+00.00	186017.5940	2278036.8688
26	LREV	329+00.00	186117.3995	2278030.6410
27	LREV	330+00.00	186217.2624	2278025.4145
28	LREV	331+00.00	186317.1727	2278021.1899
29	LREV	332+00.00	186417.1203	2278017.9676
30	LREV	333+00.00	186517.0953	2278015.7480
31	LREV	334+00.00	186617.0874	2278014.5312
32	LREV	335+00.00	186717.0868	2278014.3173
33	LREV	336+00.00	186817.0833	2278015.1065
34	LREV	337+00.00	186917.0668	2278016.8986
35	LREV	338+00.00	187017.0273	2278019.6934
36	LREV	339+00.00	187116.9548	2278023.4907
37	LREV	340+00.00	187216.8391	2278028.2901
38	LREV	341+00.00	187316.6703	2278034.0910
39	LREV	342+00.00	187416.4383	2278040.8930
40	LREV	343+00.00	187516.1330	2278048.6952
41	LREV	344+00.00	187615.7445	2278057.4971
42	LREV	345+00.00	187715.2626	2278067.2975
43	LREV	346+00.00	187814.6775	2278078.0957
44	LREV	347+00.00	187913.9791	2278089.8904
45	LREV	348+00.00	188013.1574	2278102.6805
46	LREV	349+00.00	188112.2023	2278116.4647
47	LREV	350+00.00	188211.1041	2278131.2416
48	LREV	351+00.00	188309.8527	2278147.0098
49	LREV	352+00.00	188408.4381	2278163.7676
50	LREV	353+00.00	188506.8506	2278181.5134
51	LREV	354+00.00	188605.0800	2278200.2453
52	LREV	355+00.00	188703.1167	2278219.9616
53	LREV	356+00.00	188800.9507	2278240.6601
54	LREV	357+00.00	188898.5721	2278262.3389
55	LREV	358+00.00	188995.9712	2278284.9957
56	LREV	359+00.00	189093.1382	2278308.6283
57	LREV	360+00.00	189190.0632	2278333.2343
58	LREV	361+00.00	189286.7366	2278358.8112
59	LREV	362+00.00	189383.1485	2278385.3564
60	LREV	363+00.00	189479.2894	2278412.8673
61	LREV	364+00.00	189575.1495	2278441.3411
62	LREV	365+00.00	189670.7192	2278470.7750
63	LREV	366+00.00	189765.9888	2278501.1659
64	LREV	367+00.00	189860.9489	2278532.5108
65	LREV	368+00.00	189955.5898	2278564.8066
66	LREV	369+00.00	190049.8939	2278598.0727
67	LREV	370+00.00	190143.8380	2278632.3424
68	LREV	371+00.00	190237.4112	2278667.6123
69	LREV	372+00.00	190330.6028	2278703.8784
70	LREV	373+00.00	190423.4022	2278741.1367
71	LREV	374+00.00	190515.7988	2278779.3828
72	LREV	375+00.00	190607.7822	2278818.6125
73	LREV	375+54.20	190657.4529	2278840.2814
74	L	84+00.00	190699.0640	2278858.6970
75	L	85+00.00	190790.1515	2278899.9636
76	L	86+00.00	190880.6365	2278942.5342
77	L	87+00.00	190970.3916	2278986.6224
78	L	88+00.00	191059.3664	2279032.2649
79	L	89+00.00	191147.5340	2279079.4477
80	L	90+00.00	191234.8678	2279128.1567
81	L	91+00.00	191321.3412	2279178.3771
82	L	92+00.00	191406.9283	2279230.0937
83	L	93+00.00	191491.6030	2279283.2909
84	L	94+00.00	191575.3398	2279337.9526
85	L	95+00.00	191658.1133	2279394.0622
86	L	96+00.00	191739.8986	2279451.6028
87	L	97+00.00	191820.6708	2279510.5570
88	L	98+00.00	191900.4056	2279570.9069
89	L	99+00.00	191979.0788	2279632.6343
90	L	100+00.00	192056.6666	2279695.7206
91	L	101+00.00	192133.1456	2279760.1466
92	L	102+00.00	192208.4927	2279825.8928
93	L	103+00.00	192282.6850	2279892.9395
94	L	104+00.00	192355.7001	2279961.2662
95	L	105+00.00	192427.5159	2280030.8524
96	L	106+00.00	192498.1107	2280101.6769
97	L	107+00.00	192567.4632	2280173.7184
98	L	108+00.00	192635.5524	2280246.9551
99	L	109+00.00	192702.3577	2280321.3648
100	L	110+00.00	192767.8588	2280396.9250
101	L	111+00.00	192832.0360	2280473.6129
102	L	112+00.00	192894.8699	2280551.4053
103	L	113+00.00	192956.3414	2280630.2786
104	L	114+00.00	193016.4320	2280710.2090
105	L	115+00.00	193075.1235	2280791.1723
106	L	116+00.00	193132.3981	2280873.1441
107	L	117+00.00	193188.2386	2280956.0994
108	L	118+00.00	193242.6279	2281040.0134
109	L	119+00.00	193295.5498	2281124.8604
110	L	120+00.00	193346.9881	2281210.6150
111	L	121+00.00	193396.9273	2281297.2512
112	L	122+00.00	193445.3523	2281384.7427
113	L	123+00.00	193492.2485	2281473.0631
114	L	124+00.00	193537.6017	2281562.1857
115	L	125+00.00	193581.3981	2281652.0835
116	L	126+00.00	193623.6245	2281742.7294
117	L	127+00.00	193664.2682	2281834.0959
118	L	128+00.00	193703.3169	2281926.1554
119	L	129+00.00	193740.7586	2282018.8801
120	L	130+00.00	193776.5822	2282112.2418
121	L	131+00.00	193810.7768	2282206.2125
122	L	132+00.00	193843.3320	2282300.7635
123	L	133+00.00	193874.2380	2282395.8665
124	L	134+00.00	193903.4855	2282491.4925
125	L	135+00.00	193931.0655	2282587.6127
126	L	136+00.00	193956.9699	2282684.1979
127	L	137+00.00	193981.1906	2282781.2191
128	L	138+00.00	194003.7204	2282878.6468
129	L	139+00.00	194024.5525	2282976.4515
130	L	140+00.00	194043.6806	2283074.6038
131	L	141+00.00	194061.0989	2283173.0738
132	L	142+00.00	194076.8022	2283271.8319
133	L	143+00.00	194090.7856	2283370.8481
134	L	144+00.00	194103.0449	2283470.0925
135	L	145+00.00	194113.5765	2283569.5352
136	L	146+00.00	194122.3772	2283669.1459
137	L	147+00.00	194129.4443	2283768.8946
138	L	148+00.00	194134.7756	2283868.7511
139	L	149+00.00	194138.3695	2283968.6852
140	L	150+00.00	194140.2251	2284068.6668
141	L	151+00.00	194140.3416	2284168.6654
142	L	152+00.00	194138.7191	2284268.6510
143	L	153+00.00	194135.3580	2284368.5933
144	L	154+00.00	194130.2594	2284468.4619
145	L	155+00.00	194123.4248	2284568.2268
146	L	156+00.00	194114.8563	2284667.8578
147	L	157+00.00	194104.5565	2284767.3247
148	L	158+00.00	194092.5284	2284866.5974
149	L	159+00.00	194078.7758	2284965.6460
150	L	160+00.00	194063.3028	2285064.4403
151	L	161+00.00	194046.1140	2285162.9507
152	L	162+00.00	194027.2147	2285261.1473
153	L	163+00.00	194006.6105	2285359.0003
154	L	164+00.00	193984.3078	2285456.4802
155	L	165+00.00	193960.3132	2285553.5576
156	L	166+00.00	193934.6345	2285650.2031
157	L	167+00.00	193907.4510	2285746.4367
158	L	168+00.00	193879.3699	2285842.4129
159	L	169+00.00	193851.0286	2285938.3127
160	L	170+00.00	193822.6828	2286034.2112
161	L	171+00.00	193794.3371	2286130.1097
162	L	172+00.00	193765.9913	2286226.0081
163	L	173+00.00	193737.6456	2286321.9066
164	L	174+00.00	193709.2999	2286417.8051
165	L	175+00.00	193680.9541	2286513.7036
166	L	176+00.00	193652.6084	2286609.6021
167	L	177+00.00	193624.2626	2286705.5005
168	L	178+00.00	193595.9169	2286801.3990
169	L	179+00.00	193567.5711	2286897.2975
170	L	180+00.00	193539.2254	2286993.1960
171	L	181+00.00	193510.8796	2287089.0945
172	L	182+00.00	193482.5339	2287184.9929
173	L	183+00.00	193454.1881	2287280.8914
174	L	184+00.00	193425.8424	2287376.7899
175	L	185+00.00	193397.4966	2287472.6884
176	L	186+00.00	193369.1509	2287568.5869
177	L	187+00.00	193340.8051	2287664.4853
178	L	188+00.00	193312.4594	2287760.3838
179	L	189+00.00	193284.1136	2287856.2823
180	L	190+00.00	193255.7679	2287952.1808
181	L	191+00.00	193227.4221	2288048.0793
182	L	192+00.00	193199.0764	2288143.9777
183	L	193+00.00	193170.7306	2288239.8762
184	L	194+00.00	193142.3849	2288335.7747
185	L	195+00.00	193114.0391	2288431.6732
186	L	196+00.00	193085.6934	2288527.5717
187	L	197+00.00	193057.3477	2288623.4701
188	L	198+00.00	193029.0019	2288719.3686
189	L	199+00.00	193000.6562	2288815.2671
190	L	200+00.00	192972.3104	2288911.1656
191	L	201+00.00	192943.9647	2289007.0641
192	L	202+00.00	192915.6189	2289102.9626
193	L	203+00.00	192887.2732	2289198.8610
194	L	204+00.00	192858.9274	2289294.7595
195	L	205+00.00	192830.5817	2289390.6580
196	L	206+00.00	192802.2359	2289486.5565
197	L	207+00.00	192773.8902	2289582.4550
198	L	208+00.00	192745.5444	2289678.3534
199	L	209+00.00	192717.1987	2289774.2519
200	L	210+00.00	192688.8529	2289870.1504
201	L	211+00.00	192660.5072	2289966.0489
202	L	212+00.00	192632.1614	2290061.9474
203	L	213+00.00	192603.8157	2290157.8458
204	L	214+00.00	192575.4699	2290253.7443
205	L	215+00.00	192547.1242	2290349.6428
206	L	216+00.00	192518.7784	2290445.5413
207	L	217+00.00	192490.4327	2290541.4398
208	L	218+00.00	192462.0869	2290637.3382
209	L	219+00.00	192433.7412	2290733.2367
210	L	220+00.00	192405.3955	2290829.1352
211	L	221+00.00	192377.0497	2290925.0337
212	L	222+00.00	192348.7040	2291020.9322
213	L	223+00.00	192320.3582	2291116.8306
214	L	224+00.00	192292.0125	2291212.7291
215	L	225+00.00	192263.6667	2291308.6276
216	L	226+00.00	192235.4072	2291404.5515
217	L	227+00.00	192207.8587	2291500.6817
218	L	228+00.00	192181.1472	2291597.0478
219	L	229+00.00	192155.2746	2291693.6425
220	L	230+00.00	192130.2429	2291790.4586
221	L	231+00.00	192106.0540	2291887.4887
222	L	232+00.00	192082.7098	2291984.7254
223	L	233+00.00	192060.2120	2292082.1615
224	L	234+00.00	192038.5623	2292179.7895
225	L	235+00.00	192017.7624	2292277.6021
226	L	236+00.00	191997.8137	2292375.5918
227	L	237+00.00	191978.7179	2292473.7513
228	L	238+00.00	191960.4764	2292572.0732
229	L	239+00.00	191943.0905	2292670.5499
230	L	240+00.00	191926.5616	2292769.1741
231	L	241+00.00	191910.8909	2292867.9383
232	L	242+00.00	191896.0796	2292966.8350
233	L	243+00.00	191882.1288	2293065.8568
234	L	244+00.00	191869.0396	2293164.9961
235	L	245+00.00	191856.8130	2293264.2455
236	L	246+00.00	191845.4499	2293363.5975
237	L	247+00.00	191834.9511	2293463.0446
238	L	248+00.00	191825.3174	2293562.5791
239	L	249+00.00	191816.5496	2293662.1937
240	L	250+00.00	191808.6484	2293761.8807
241	L	251+00.00	191801.6143	2293861.6327
242	L	252+00.00	191795.4478	2293961.4421
243	L	253+00.00	191790.1495	2294061.3013
244	L	254+00.00	191785.7197	2294161.2029
245	L	255+00.00	191782.1588	2294261.1391
246	L	256+00.00	191779.4670	2294361.1026
247	L	257+00.00	191777.6445	2294461.0856
248	L	258+00.00	191776.6915	2294561.0808
249	L	259+00.00	191776.6081	2294661.0804
250	L	260+00.00	191777.3942	2294761.0770
251	L	261+00.00	191779.0486	2294861.0630
252	L	262+00.00	191781.0919	2294961.0422
253	L	263+00.00	191783.1353	2295061.0213
254	L	264+00.00	191785.1786	2295161.0004
255	L	265+00.00	191787.2220	2295260.9795
256	L	266+00.00	191789.2653	2295360.9586
257	L	267+00.00	191791.3087	2295460.9378
258	L	268+00.00	191793.3520	2295560.9169
259	L	269+00.00	191795.3954	2295660.8960
260	L	270+00.00	191797.4387	2295760.8751
261	L	271+00.00	191799.4821	2295860.8542
262	L	272+00.00	191801.5254	2295960.8334
263	L	273+00.00	191803.5688	2296060.8125
264	L	274+00.00	191805.6121	2296160.7916
265	L	275+00.00	191807.6555	2296260.7707
266	L	276+00.00	191809.6988	2296360.7499
267	L	277+00.00	191811.7422	2296460.7290
268	L	278+00.00	191813.7855	2296560.7081
269	L	279+00.00	191815.8288	2296660.6872
270	L	280+00.00	191817.8722	2296760.6663
271	L	281+00.00	191819.9155	2296860.6455
272	L	282+00.00	191821.9589	2296960.6246
273	L	283+00.00	191824.0022	2297060.6037
274	L	284+00.00	191826.0456	2297160.5828
275	L	285+00.00	191828.0889	2297260.5620
276	L	286+00.00	191830.1323	2297360.5411
277	L	287+00.00	191832.1756	2297460.5202
278	L	288+00.00	191834.2190	2297560.4993
279	L	289+00.00	191836.2623	2297660.4784
280	L	290+00.00	191838.3057	2297760.4576
281	L	291+00.00	191840.3490	2297860.4367
282	L	292+00.00	191842.3924	2297960.4158
283	Y7	10+00.00	195493.7297	2286826.2501
284	Y7	11+00.00	195411.3314	2286882.9115
285	Y7	12+00.00	195327.9400	2286938.0957
286	Y7	13+00.00	195243.1327	2286991.0782
287	Y7	14+00.00	195156.9676	2287041.8228
288	Y7	15+00.00	195069.5038	2287090.2945
289	Y7	16+00.00	194980.8012	2287136.4603
290	Y7	17+00.00	194890.9206	2287180.2885
291	Y7	18+00.00	194799.8456	2287221.5731
292	Y7	19+00.00	194707.0350	2287258.7697
293	Y7	20+00.00	194611.9495	2287289.6511
294	Y7	21+00.00	194514.6573	2287312.6391
295	Y7	22+00.00	194415.7894	2287327.4490
296	Y7	23+00.00	194316.0317	2287333.9781
297	Y7	24+00.00	194216.0566	2287332.8004
298	Y7	25+00.00	194116.2441	2287326.7506
299	Y7	26+00.00	194016.5391	2287319.0756
300	Y7	27+00.00	193916.8383	2287311.3457
301	Y7	28+00.00	193817.1375	2287303.6158
302	Y7	29+00.00	193717.4367	2287295.8859
303	Y7	30+00.00	193617.6915	2287288.7678
304	Y7	31+00.00	193517.8388	2287283.3659
305	Y7	32+00.00	193417.9071	2287279.7043
306	Y7	33+00.00	193317.9268	2287277.7842
307	Y7	34+00.00	193217.9282	2287277.6061
308	Y7	35+00.00	193117.9417	2287279.1701
309	Y7	36+00.00	193017.9976	2287282.4757
310	Y7	37+00.00	192918.1263	2287287.5219
311	Y7	38+00.00	192818.3580	2287294.3071
312	Y7	39+00.00	192718.7231	2287302.8294
313	Y7	40+00.00	192619.2518	2287313.0861
314	Y7	41+00.00	192519.9742	2287325.0740
315	Y7	42+00.00	192420.9205	2287338.7897
316	Y7	43+00.00	192322.1208	2287354.2288
317	Y7	44+00.00	192223.4985	2287370.7709
318	Y7	45+00.00	192124.8796	2287387.3330
319	Y7	46+00.00	192026.2607	2287403.8952
320	Y7	47+00.00	191927.5759	2287420.0557
321	Y7	48+00.00	191828.4904	2287433.4939
322	Y7	49+00.00	191728.8337	2287441.5811
323	Y7	50+00.00	191628.8686	2287443.5449
324	Y7	51+00.00	191528.9713	2287439.3761
325	Y7	52+00.00	191429.5166	2287429.0966
326	Y7	53+00.00	191330.7260	2287413.6340
327	Y7	54+00.00	191232.3510	2287395.6830
328	Y7	55+00.00	191134.0321	2287377.4240
329	Y8	10+00.00	193549.8985	2295971.9545
330	Y8	11+00.00	193462.3861	2296020.3444
331	Y8	12+00.00	193374.8737	2296068.7343
332	Y8	13+00.00	193287.3613	2296117.1241
333	Y8	14+00.00	193199.8489	2296165.5140
334	Y8	15+00.00	193112.3365	2296213.9039
335	Y8	16+00.00	193024.8241	2296262.2938
336	Y8	17+00.00	192937.3117	2296310.6837
337	Y8	18+00.00	192849.7993	2296359.0735
338	Y8	19+00.00	192762.2869	2296407.4634
339	Y8	20+00.00	192674.7745	2296455.8533
340	Y8	21+00.00	192587.2621	2296504.2432
341	Y8	22+00.00	192499.7497	2296552.6330
342	Y8	23+00.00	192412.2373	2296601.0229
343	Y8	24+00.00	192324.7249	2296649.4128
344	Y8	25+00.00	192237.2125	2296697.8027
345	Y8	26+00.00	192149.7001	2296746.1925
346	Y8	27+00.00	192062.1873	2296794.5817
347	Y8	28+00.00	191973.7620	2296841.2704
348	Y8	29+00.00	191883.6686	2296884.6528
349	Y8	30+00.00	191792.0306	2296924.6694
350	Y8	31+00.00	191699.1913	2296961.8259
351	Y8	32+00.00	191606.2240	2296998.6645
352	Y8	33+00.00	191513.2567	2297035.5031
353	Y8	34+00.00	191420.2894	2297072.3417
354	Y8	35+00.00	191327.3221	2297109.1803
355	Y8	36+00.00	191234.3548	2297146.0189
356	Y8	37+00.00	191141.3875	2297182.8575
357	Y8	38+00.00	191048.4202	2297219.6961
358	Y8	39+00.00	190955.4529	2297256.5347
359	Y8	40+00.00	190862.4856	2297293.3733
360	Y8	41+00.00	190769.4570	2297330.0565
361	Y8	42+00.00	190676.1963	2297366.1452
362	Y8	43+00.00	190582.6970	2297401.6113
363	Y8	44+00.00	190488.9633	2297436.4534
364	Y8	45+00.00	190394.9995	2297470.6697
365	Y8	46+00.00	190300.8096	2297504.2589
366	Y8	47+00.00	190206.4883	2297537.4778
367	Y8	48+00.00	190112.1661	2297570.6939
368	Y8	49+00.00	190017.8438	2297603.9100
369	Y8	50+00.00	189923.5215	2297637.1261
370	Y8	51+00.00	189829.1993	2297670.3423
371	Y8	52+00.00	189735.1018	2297704.1844
372	Y8	53+00.00	189642.4864	2297741.8565
373	Y8	54+00.00	189553.2883	2297786.9714
374	Y8	55+00.00	189469.2164	2297841.0352
375	Y8	56+00.00	189391.2218	2297903.5475
376	Y8	57+00.00	189320.1498	2297973.8308
377	Y8	58+00.00	189256.7711	2298051.1231
378	Y8	59+00.00	189201.7726	2298134.5864
379	Y8	60+00.00	189155.7506	2298223.3159
380	Y8	61+00.00	189119.2040	2298316.3499
381	Y8	62+00.00	189092.2503	2298412.6111
382	Y8	63+00.00	189072.3858	2298510.6064
383	Y8	64+00.00	189055.6220	2298609.1907
384	Y8	65+00.00	189039.1530	2298707.8252
385	Y8	66+00.00	189022.6840	2298806.4598
386	Y8	67+00.00	189006.2149	2298905.0943
387	Y8	68+00.00	188989.7459	2299003.7288
388	Y8	69+00.00	188973.2769	2299102.3634
389	Y8	70+00.00	188956.8079	2299200.9979
390	Y8	71+00.00	188940.3389	2299299.6324
391	Y8	72+00.00	188923.8699	2299398.2670
392	Y8A	10+00.00	192754.8833	2296411.5572
393	Y8A	11+00.00	192706.1481	2296324.2366
394	Y8A	12+00.00	192663.8308	2296233.9743
395	Y8A	13+00.00	192646.7948	2296135.4890
396	Y8A	14+00.00	192631.4387	2296036.6751
397	Y8A	15+00.00	192616.0826	2295937.8612
398	Y8A	16+00.00	192600.7266	2295839.0473
399	Y8A	17+00.00	192585.3705	2295740.2333
400	Y8A	18+00.00	192570.0144	2295641.4194
401	Y8A	19+00.00	192554.6584	2295542.6055
402	Y8A	20+00.00	192539.3023	2295443.7916
403	Y8A	21+00.00	192543.7378	2295344.5560
404	Y8A	22+00.00	192566.7722	2295247.6060
405	Y8A	23+00.00	192557.2602	2295148.3149
406	Y8A	24+00.00	192541.8491	2295049.5096

PROJ. REFERENCE NO.	SHEET NO.
R-2633BA	1G

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
407	Y8A	25+00.00	192526.4379	2294950.7042
408	Y8A	25+38.41	192520.5177	2294912.7482
409	Y8B	10+00.00	192548.5159	2295503.0799
410	Y8B	11+00.00	192451.4164	2295526.9897
411	Y8B	12+00.00	192354.3168	2295550.8996
412	Y8B	13+00.00	192257.2173	2295574.8094
413	Y8B	14+00.00	192160.1178	2295598.7192
414	Y8B	14+04.55	192155.6988	2295599.8073
415	Y8C	9+00.00	192144.7811	2295500.4052
416	Y8C	10+00.00	192155.6988	2295599.8074
417	Y8C	11+00.00	192166.6165	2295699.2096
418	Y8C	12+00.00	192177.5343	2295798.6119
419	Y8C	13+00.00	192189.7592	2295897.8384
420	Y8C	14+00.00	192216.9278	2295993.9495
421	Y8C	15+00.00	192237.7048	2296091.5970
422	Y8C	16+00.00	192248.6224	2296190.9992
423	Y8C	17+00.00	192259.5399	2296290.4015
424	Y8C	18+00.00	192270.4575	2296389.8037
425	Y8C	19+00.00	192281.3751	2296489.2060
426	Y8C	19+96.65	192291.9274	2296585.2824
427	Y8D	10+00.00	193354.9908	2296079.7285
428	Y8D	11+00.00	193306.6840	2295992.1702
429	Y8D	12+00.00	193258.3772	2295904.6119
430	Y8D	13+00.00	193210.0704	2295817.0536
431	Y8D	14+00.00	193161.7636	2295729.4953
432	Y8D	15+00.00	193113.4568	2295641.9370
433	Y8D	16+00.00	193065.1500	2295554.3788
434	Y8D	17+00.00	193016.8432	2295466.8205
435	Y8D	18+00.00	192968.5364	2295379.2622
436	Y8D	19+00.00	192922.3044	2295290.6273
437	Y8D	20+00.00	192886.6135	2295197.2830
438	Y8D	21+00.00	192862.8388	2295100.2173
439	Y8D	22+00.00	192847.3605	2295001.4242
440	Y8D	23+00.00	192832.1240	2294902.5918
441	Y8D	24+00.00	192816.8876	2294803.7594
442	Y8D	25+00.00	192801.6511	2294704.9269
443	Y8D	26+00.00	192786.4146	2294606.0945
444	Y8D	26+48.06	192779.0916	2294558.5935
445	RP_A1REV	10+00.00	188327.5378	2278102.2959
446	RP_A1REV	11+00.00	188229.8773	2278080.7918
447	RP_A1REV	12+00.00	188132.2168	2278059.2877
448	RP_A1REV	13+00.00	188034.6320	2278037.4448
449	RP_A1REV	14+00.00	187937.5270	2278013.5746
450	RP_A1REV	15+00.00	187841.5074	2277985.6822
451	RP_A1REV	16+00.00	187747.3053	2277952.1756
452	RP_A1REV	17+00.00	187655.3798	2277912.8506
453	RP_A1REV	18+00.00	187566.0900	2277867.8608
454	RP_A1REV	19+00.00	187479.7847	2277817.3818
455	RP_A1REV	20+00.00	187396.7998	2277761.6120
456	RP_A1REV	21+00.00	187317.0240	2277701.3278
457	RP_A1REV	22+00.00	187239.0830	2277638.6781
458	RP_A1REV	23+00.00	187161.0436	2277576.1530
459	RP_A1REV	24+00.00	187080.1229	2277517.4388
460	RP_A1REV	25+00.00	186994.0326	2277466.6618
461	RP_A1REV	26+00.00	186902.8491	2277425.7315
462	RP_A1REV	27+00.00	186807.9052	2277394.4390
463	RP_A1REV	28+00.00	186711.1702	2277369.1179
464	RP_A1REV	29+00.00	186614.0455	2277345.3105
465	RP_A1REV	29+67.51	186548.4725	2277329.2447
466	RP_D1REV	10+00.00	188465.2550	2278221.6572
467	RP_D1REV	11+00.00	188366.7355	2278204.5213
468	RP_D1REV	12+00.00	188267.7962	2278190.0311
469	RP_D1REV	13+00.00	188168.3263	2278179.8577
470	RP_D1REV	14+00.00	188068.4328	2278175.6888
471	RP_D1REV	15+00.00	187968.5101	2278178.9302
472	RP_D1REV	16+00.00	187869.1319	2278189.8408
473	RP_D1REV	17+00.00	187770.8860	2278208.3562
474	RP_D1REV	18+00.00	187674.3535	2278234.3667
475	RP_D1REV	19+00.00	187580.1053	2278267.7185
476	RP_D1REV	20+00.00	187488.6949	2278308.2064
477	RP_D1REV	21+00.00	187400.2486	2278354.8384
478	RP_D1REV	22+00.00	187313.9427	2278405.3403
479	RP_D1REV	23+00.00	187228.5803	2278457.4290
480	RP_D1REV	24+00.00	187142.2255	2278507.8358
481	RP_D1REV	25+00.00	187052.1781	2278551.2106
482	RP_D1REV	26+00.00	186957.5664	2278583.3914
483	RP_D1REV	27+00.00	186859.6808	2278603.5261

Point #	Chain	Station	Northing (Y)	Easting (X)
484	RP_D1REV	28+00.00	186760.1291	2278612.6320
485	RP_D1REV	29+00.00	186660.1904	2278616.0431
486	RP_D1REV	30+00.00	186560.2247	2278618.6608
487	RP_D1REV	31+00.00	186460.2589	2278621.2785
488	RP_D1REV	31+80.66	186379.6262	2278623.3900
489	RP_B2	10+00.00	194051.3772	2285374.2587
490	RP_B2	11+00.00	194029.1044	2285471.7460
491	RP_B2	12+00.00	194005.8236	2285568.9980
492	RP_B2	13+00.00	193982.2640	2285666.1831
493	RP_B2	14+00.00	193960.4623	2285763.7723
494	RP_B2	15+00.00	193943.7283	2285862.3435
495	RP_B2	16+00.00	193933.8390	2285961.8329
496	RP_B2	17+00.00	193930.9137	2286061.7698
497	RP_B2	18+00.00	193934.9668	2286161.6673
498	RP_B2	19+00.00	193945.9786	2286261.0387
499	RP_B2	20+00.00	193963.8953	2286359.3999
500	RP_B2	21+00.00	193988.6228	2286456.2737
501	RP_B2	22+00.00	194019.0323	2286551.5292
502	RP_B2	23+00.00	194051.9862	2286645.9430
503	RP_B2	24+00.00	194083.7359	2286740.7628
504	RP_B2	25+00.00	194109.5951	2286837.3294
505	RP_B2	26+00.00	194126.0561	2286935.9231
506	RP_B2	27+00.00	194132.5923	2287035.6675
507	RP_B2	28+00.00	194130.1959	2287135.6177
508	RP_B2	29+00.00	194123.2218	2287235.3722
509	RP_B2	29+91.64	194116.2441	2287326.7506
510	LP_B2	10+00.00	193542.5820	2287147.6496
511	LP_B2	11+00.00	193572.9646	2287052.3960
512	LP_B2	12+00.00	193615.2180	2286961.9325
513	LP_B2	13+00.00	193678.8567	2286885.3520
514	LP_B2	14+00.00	193765.3912	2286836.4735
515	LP_B2	15+00.00	193863.9432	2286823.6339
516	LP_B2	16+00.00	193960.1126	2286848.7093
517	LP_B2	17+00.00	194039.8478	2286908.0358
518	LP_B2	18+00.00	194091.4983	2286992.9449
519	LP_B2	19+00.00	194109.6984	2287090.8627
520	LP_B2	20+00.00	194106.5654	2287190.7520
521	LP_B2	21+00.00	194098.9569	2287290.4621
522	LP_B2	21+34.89	194096.3005	2287325.2495
523	RP_C2	10+00.00	193822.9638	2285867.4511
524	RP_C2	11+00.00	193788.8164	2285961.4402
525	RP_C2	12+00.00	193754.6691	2286055.4294
526	RP_C2	13+00.00	193720.0005	2286149.2262
527	RP_C2	14+00.00	193682.2288	2286241.8070
528	RP_C2	15+00.00	193638.4430	2286331.6816
529	RP_C2	16+00.00	193587.3891	2286417.6333
530	RP_C2	17+00.00	193529.3579	2286499.0373
531	RP_C2	18+00.00	193464.7724	2286575.3466
532	RP_C2	19+00.00	193395.0158	2286646.9813
533	RP_C2	20+00.00	193322.5928	2286715.9343
534	RP_C2	21+00.00	193250.2141	2286784.9307
535	RP_C2	22+00.00	193182.8554	2286858.7726
536	RP_C2	23+00.00	193126.6343	2286941.3412
537	RP_C2	24+00.00	193084.3998	2287031.8651
538	RP_C2	25+00.00	193056.4682	2287127.8075
539	RP_C2	26+00.00	193037.5791	2287225.9949
540	RP_C2	26+56.89	193027.9893	2287282.0668
541	RP_D2	10+00.00	192986.2002	2288698.3644
542	RP_D2	11+00.00	193014.2109	2288602.3680
543	RP_D2	12+00.00	193040.2041	2288505.8096
544	RP_D2	13+00.00	193062.1722	2288408.2633
545	RP_D2	14+00.00	193079.0479	2288309.7091
546	RP_D2	15+00.00	193090.7425	2288210.4068
547	RP_D2	16+00.00	193097.2240	2288110.6285
548	RP_D2	17+00.00	193098.4747	2288010.6478
549	RP_D2	18+00.00	193094.5133	2287910.7372
550	RP_D2	19+00.00	193086.2375	2287811.0850
551	RP_D2	20+00.00	193075.6679	2287711.6458
552	RP_D2	21+00.00	193064.6370	2287612.2561
553	RP_D2	22+00.00	193053.6057	2287512.8664
554	RP_D2	23+00.00	193042.5744	2287413.4767
555	RP_D2	24+00.00	193031.5432	2287314.0870
556	RP_D2	24+32.22	193027.9893	2287282.0668
557	LP_A3	10+00.00	191869.4624	2296984.7807
558	LP_A3	11+00.00	191874.7062	2297084.6020
559	LP_A3	12+00.00	191898.8551	2297181.2827
560	LP_A3	13+00.00	191954.7551	2297263.4565

Point #	Chain	Station	Northing (Y)	Easting (X)
561	LP_A3	14+00.00	192037.4029	2297318.6531
562	LP_A3	15+00.00	192134.7227	2297338.8074
563	LP_A3	16+00.00	192232.4945	2297320.9748
564	LP_A3	17+00.00	192316.4325	2297267.7606
565	LP_A3	18+00.00	192374.2722	2297186.9404
566	LP_A3	19+00.00	192397.5758	2297090.3239
567	LP_A3	20+00.00	192387.8202	2296991.0806
568	LP_A3	21+00.00	192362.1824	2296894.4441
569	LP_A3	22+00.00	192334.7188	2296798.2893
570	LP_A3	23+00.00	192307.2552	2296702.1345
571	LP_A3	23+38.68	192296.6334	2296664.9459
572	RP_C3	10+00.00	191739.2101	2295211.9503
573	RP_C3	11+00.00	191737.2395	2295311.9309
574	RP_C3	12+00.00	191735.2688	2295411.9115
575	RP_C3	13+00.00	191733.1412	2295511.8886
576	RP_C3	14+00.00	191728.3511	2295611.7641
577	RP_C3	15+00.00	191716.7641	2295711.0602
578	RP_C3	16+00.00	191696.6128	2295808.9764
579	RP_C3	17+00.00	191668.0043	2295904.7637
580	RP_C3	18+00.00	191631.1562	2295997.6931
581	RP_C3	19+00.00	191586.3490	2296087.0573
582	RP_C3	20+00.00	191533.9250	2296172.1772
583	RP_C3	21+00.00	191475.1092	2296253.0331
584	RP_C3	22+00.00	191413.2518	2296331.6043
585	RP_C3	23+00.00	191352.9076	2296411.3235
586	RP_C3	24+00.00	191301.9612	2296497.2440
587	RP_C3	25+00.00	191268.0775	2296591.1514
588	RP_C3	26+00.00	191253.5257	2296689.9186
589	RP_C3	27+00.00	191258.8860	2296789.6080
590	RP_C3	28+00.00	191278.3922	2296887.6792
591	RP_C3	29+00.00	191298.4762	2296985.6415
592	RP_C3	30+00.00	191318.5603	2297083.6039
593	RP_C3	30+27.42	191324.0682	2297110.4697
594	SVRD7	10+00.00	194615.5873	2287288.6237
595	SVRD7	11+00.00	194579.9070	2287375.1440
596	SVRD7	12+00.00	194481.8605	2287391.9808
597	SVRD7	13+00.00	194382.5709	2287403.8790
598	SVRD7	14+00.00	194283.3058	2287415.9705
599	SVRD7	15+00.00	194185.4007	2287436.0256
600	SVRD7	16+00.00	194089.4810	2287464.2917
601	SVRD7	17+00.00	193993.6404	2287492.8327
602	SVRD7	18+00.00	193897.7998	2287521.3736
603	SVRD7	19+00.00	193801.9593	2287549.9146
604	SVRD7	20+00.00	193706.1187	2287578.4556
605	SVRD7	21+00.00	193610.2781	2287606.9965
606	SVRD7	22+00.00	193514.1187	2287634.4198
607	SVRD7	23+00.00	193416.7460	2287657.1434
608	SVRD7	24+00.00	193318.3365	2287674.8459
609	SVRD7	25+00.00	193219.1489	2287687.4808
610	SVRD7	26+00.00	193119.4441	2287695.0147
611	SVRD7	27+00.00	193019.4842	2287697.4278
612	SVRD7	28+00.00	192919.5320	2287694.7139
613	SVRD7	29+00.00	192819.8503	2287686.8801
614	SVRD7	30+00.00	192720.7012	2287673.9469
615	SVRD7	31+00.00	192622.2704	2287656.3314
616	SVRD7	32+00.00	192524.0068	2287637.7771
617	SVRD7	33+00.00	192425.7432	2287619.2228
618	SVRD7	34+00.00	192327.4796	2287600.6686
619	SVRD7	35+00.00	192229.2160	2287582.1143
620	SVRD7	36+00.00	192130.9523	2287563.5600
621	SVRD7	37+00.00	192032.6887	2287545.0057
622	SVRD7	38+00.00	191934.4251	2287526.4515
623	SVRD7	39+00.00	191842.0561	2287495.2746
624	SVRD7	39+64.06	191828.4904	2287433.4939
625	SR8	10+00.00	192083.6877	2287554.6354
626	SR8	11+00.00	192002.6095	2287500.7445
627	SR8	11+93.14	191976.9443	2287412.1348
628	SVRD9	10+00.00	192754.8852	2296411.5561
629	SVRD9	11+00.00	192765.0166	2296505.7693
630	SVRD9	12+00.00	192685.8324	2296564.1554
631	SVRD9	13+00.00	192598.3704	2296612.6364
632	SVRD9	13+94.81	192515.4484	2296658.6007
633	Y7_DET	10+00.00	192041.1766	2287544.5859
634	Y7_DET	11+00.00	191942.8354	2287526.4470
635	Y7_DET	12+00.00	191843.7011	2287514.4085
636	Y7_DET	13+00.00	191744.1976	2287522.3881
637	Y7_DET	14+00.00	191646.0879	2287541.3405

Point #	Chain	Station	Northing (Y)	Easting (X)
638	Y7_DET	15+00.00	191546.2666	2287541.9120
639	Y7_DET	16+00.00	191447.6565	2287525.5053
640	Y7_DET	17+00.00	191351.0145	2287500.4136
641	Y7_DET	18+00.00	191261.4513	2287456.3336
642	Y7_DET	19+00.00	191176.3009	2287404.0874
643	Y7_DET	20+00.00	191082.8061	2287369.1110
644	Y7_DET	21+00.00	190984.7263	2287349.7251
645	Y7_DET	21+26.74	190958.4284	2287344.8745

Point #	Chain	Station	Northing (Y)	Easting (X)

6/2/99

PAVEMENT DESIGN SCHEDULE

C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.	E4	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 5.5" IN DEPTH.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J1	PROP. 8" AGGREGATE BASE COURSE.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	PROP. 10" AGGREGATE BASE COURSE.
C4	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J3	PROP. VAR. DEPTH AGGREGATE BASE COURSE.
C5	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 TO EXCEED 2 " IN DEPTH.	P	PRIME COAT AT THE RATE OF 0.35 GAL PER SY.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R2	5" MONOLITHIC CONCRETE ISLAND.
D3	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R3	SHOULDER BERM GUTTER
D4	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.	T	EARTH MATERIAL.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	V	MILLED RUMBLE STRIPS
E3	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL No. 1, SHEET 2-B)
		W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL No. 2, SHEET 2-B)

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

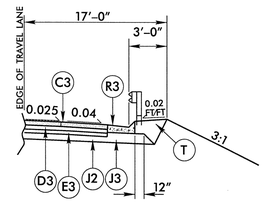
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
9/30/13

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER
10/21/13

DETAIL OF SHOULDER BERM GUTTER

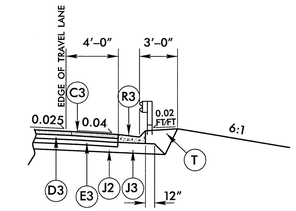


PARTIAL TYPICAL SECTION NO. 1A

USE PARTIAL TYPICAL 1A IN CONJUNCTION WITH TYPICAL 1 AT:

-L- STA. 102+85 RT. TO 106+15 RT.
-L- STA. 105+70 LT. TO 116+50 LT.
-L- STA. 136+10 LT. TO 145+01 LT.
-L- STA. 136+47 RT. TO 147+48 RT.
-L- STA. 147+53 LT. TO 165+00 LT.
-L- STA. 150+29 RT. TO 163+44 RT.
-L- STA. 255+59 LT. TO 263+25 LT
-L- STA. 252+00 RT. TO 263+70 RT.
-L- STA. 267+35 LT. TO 280+19 LT.
-L- STA. 278+47 RT. TO 280+63 RT.
-L- STA. 282+63 RT. TO 282+95 RT.

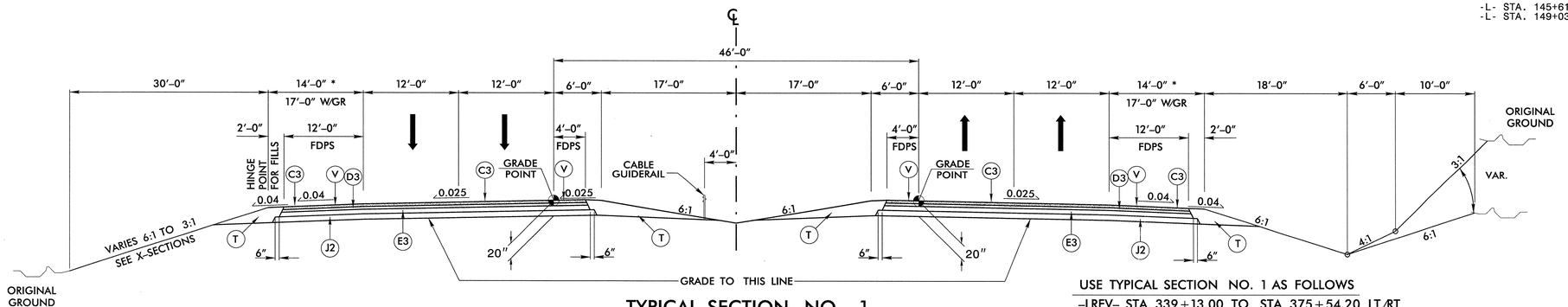
DETAIL OF SHOULDER BERM GUTTER AT MEDIAN



PARTIAL TYPICAL SECTION NO. 1B

USE PARTIAL TYPICAL 1B IN CONJUNCTION WITH TYPICAL 1 AT:

-L- STA. 145+61.51 LT. TO 145+85.00 LT.
-L- STA. 149+03.99 LT. TO 151+23.49 LT.



TYPICAL SECTION NO. 1

-LREV-/-L- US 17

USE TYPICAL SECTION NO. 1 AS FOLLOWS

-LREV- STA. 339+13.00 TO STA. 375+54.20 LT./RT.
-L- STA. 83+54.50 LT. TO STA. 144+81.63 LT. (BEGIN BRIDGE)
-L- STA. 83+54.50 RT. TO STA. 146+08.13 RT. (BEGIN BRIDGE)
-L- STA. 149+02.20 LT. (END BRIDGE) TO STA. 263+76.22 LT. (BEGIN BRIDGE)
-L- STA. 150+45.13 RT. (END BRIDGE) TO STA. 264+02.78 RT. (BEGIN BRIDGE)
-L- STA. 267+02.22 LT. (END BRIDGE) TO STA. 280+58.40 LT. (BEGIN BRIDGE)
-L- STA. 267+28.78 RT. (END BRIDGE) TO STA. 280+77.01 RT. (BEGIN BRIDGE)
-L- STA. 282+03.40 LT. (END BRIDGE) TO STA. 292+00.00 LT.
-L- STA. 282+22.01 RT. (END BRIDGE) TO STA. 292+00.00 RT.

SYTIME
R:\Roadway\Proj\R-2633BA\R-2633BA_RDY_TYP.dgn
$$$$USERNAME$$$$

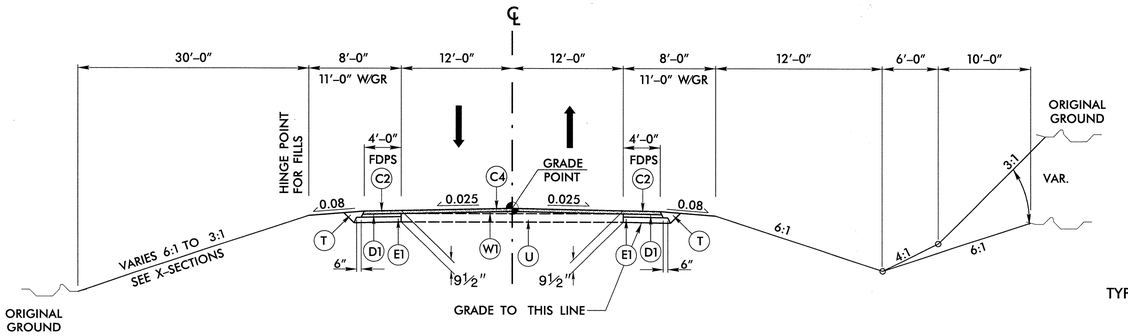
6/2/99

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-A

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JAMES K. BARGER
10/9/13

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV
10/21/13

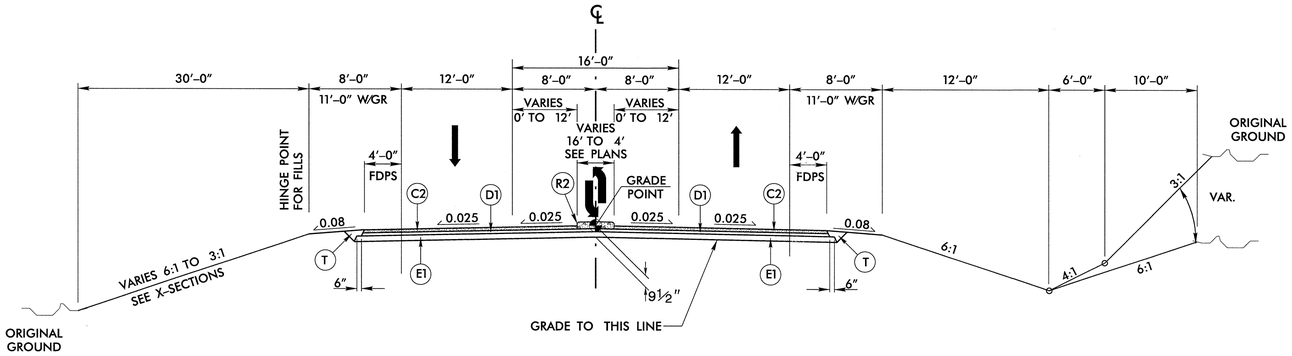


TYPICAL SECTION NO. 2

-Y7- MT. MISERY RD. (SR 1426)

USE TYPICAL SECTION NO. 2 AS FOLLOWS
-Y7- STA. 15+00.00 TO STA. 18+68.00

TRANSITION FROM TYPICAL SECTION NO. 2 TO TYPICAL SECTION NO. 3 -Y7- STA 18+68.00 TO 23+68.00

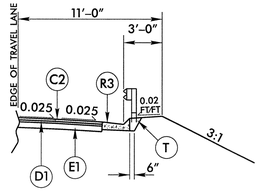


TYPICAL SECTION NO. 3

-Y7- MT. MISERY RD. (SR 1426)

USE TYPICAL SECTION NO. 3 AS FOLLOWS
-Y7- STA. 23+68.00 TO STA. 30+54.96 (BEGIN BRIDGE)
-Y7- STA. 32+64.81 (END BRIDGE) TO STA. 35+32.00

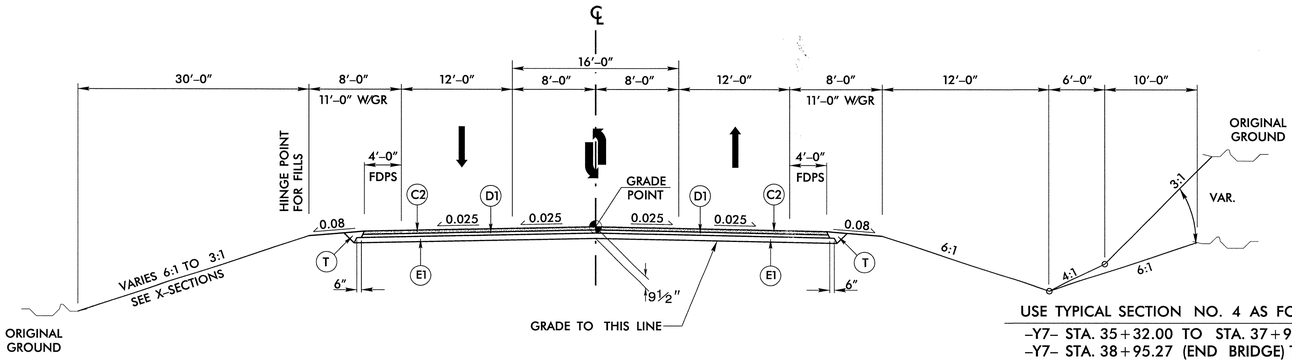
DETAIL OF SHOULDER BERM GUTTER



PARTIAL TYPICAL SECTIONS NO. 3A & 4A

USE PARTIAL TYPICALS 3A & 4A IN CONJUNCTION WITH TYPICALS 3 & 4 AT:

-Y7- STA. 26+75 RT. TO 30+25 RT.
-Y7- STA. 27+00 LT. TO 30+37 LT.
-Y7- STA. 32+81 RT. TO 35+39 RT.
-Y7- STA. 32+95 LT. TO 35+30 LT.
-Y7- STA. 36+00 RT. TO 37+61 RT.
-Y7- STA. 36+08 LT. TO 37+92 LT.
-Y7- STA. 39+06 RT. TO 45+50 RT.
-Y7- STA. 39+38 LT. TO 45+50 LT.
-Y7- STA. 51+25 LT. TO 52+92 LT.
-Y7- STA. 51+25 RT. TO 52+92 RT.



TYPICAL SECTION NO. 4

-Y7- MT. MISERY RD. (SR 1426)

USE TYPICAL SECTION NO. 4 AS FOLLOWS
-Y7- STA. 35+32.00 TO STA. 37+97.52 (BEGIN BRIDGE)
-Y7- STA. 38+95.27 (END BRIDGE) TO STA. 50+00.00

TRANSITION FROM TYPICAL SECTION NO. 4 TO TYPICAL SECTION NO. 5 -Y7- STA 50+00.00 TO 52+00.00

PAVEMENT SCHEDULE

C1	2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	3" TYPE S9.5C
C4	1½" TYPE S9.5B
C5	VAR. TYPE S9.5B
D1	2½" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0C
D4	VAR. TYPE I19.0B
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	4" TYPE B25.0C
E4	VAR. TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VAR. DEPTH ABC
P	PRIME COAT
R1	2'-6" C & G
R2	5" MONOLITHIC CONCRETE ISLAND.
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2

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6/2/99

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

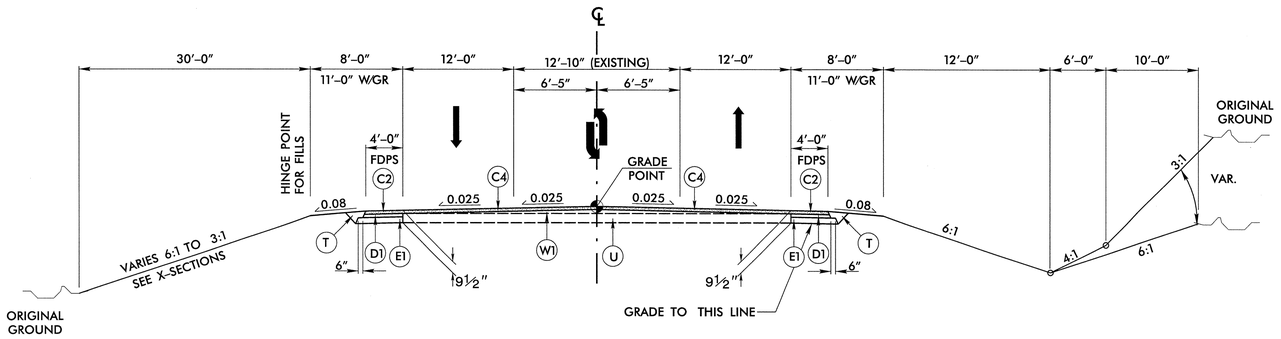
PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-B

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
10/9/13

PAVEMENT DESIGN ENGINEER

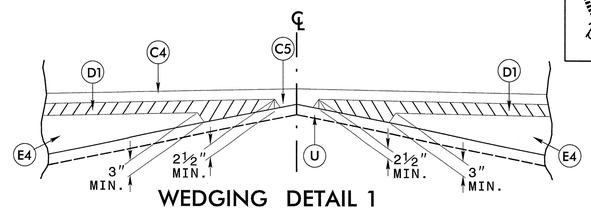
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHELL
10/21/13



TYPICAL SECTION NO. 5

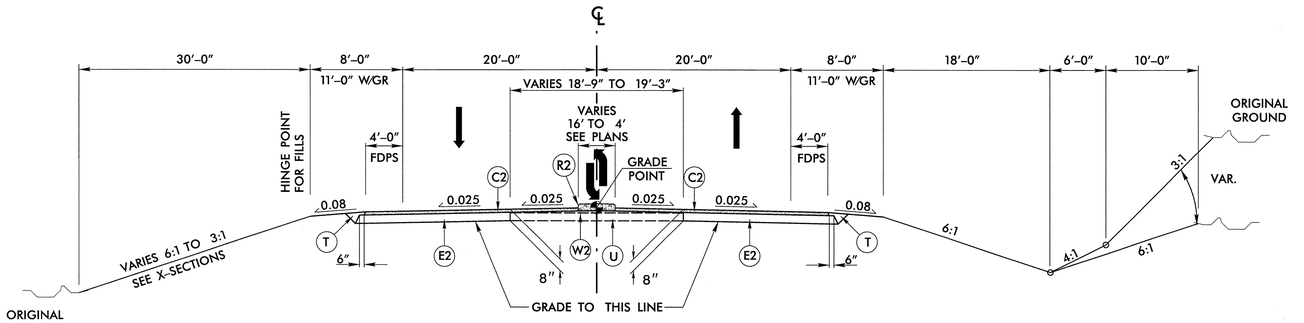
–Y7– MT. MISERY RD. (SR 1426)

USE TYPICAL SECTION NO. 5 AS FOLLOWS
–Y7– STA. 52+00.00 TO STA. 55+00.00



WEDGING DETAIL 1

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO.'s 2 & 5



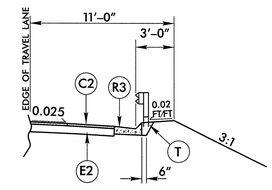
TYPICAL SECTION NO. 6

–Y8– CEDAR HILL RD. (SR 1430)

USE TYPICAL SECTION NO. 6 AS FOLLOWS
–Y8– STA. 18+80.00 TO STA. 43+82.30

TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 6 –Y8– STA 13+40.00 TO 18+80.00

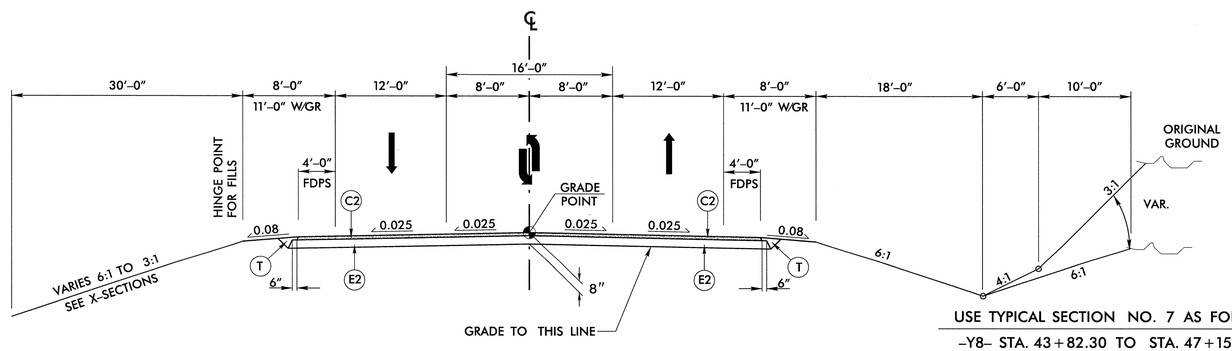
DETAIL OF SHOULDER BERM GUTTER



PARTIAL TYPICAL SECTION NO. 7A

USE PARTIAL TYPICAL 7A IN CONJUNCTION WITH TYPICAL 7 AT:
-Y8- STA. 50+58 RT. TO 50+95 RT.
-Y8- STA. 50+75 LT. TO 53+00 LT

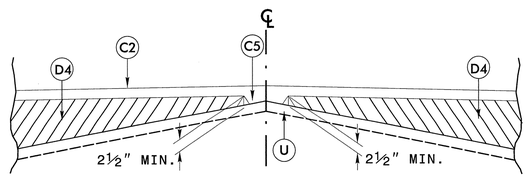
PAVEMENT SCHEDULE	
C1	2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	3" TYPE S9.5C
C4	1½" TYPE S9.5B
C5	VAR. TYPE S9.5B
D1	2½" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0C
D4	VAR. TYPE I19.0B
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	4" TYPE B25.0C
E4	VAR. TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VAR. DEPTH ABC
P	PRIME COAT
R1	2'-6" C & G
R2	5" MONOLITHIC CONCRETE ISLAND.
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2



TYPICAL SECTION NO. 7

–Y8– CEDAR HILL RD.(SR 1430)

USE TYPICAL SECTION NO. 7 AS FOLLOWS
–Y8– STA. 43+82.30 TO STA. 47+15.00 (BEGIN BRIDGE)
–Y8– STA. 50+43.00 (END BRIDGE) TO STA. 66+00.00



WEDGING DETAIL 2

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO.'s 6 & 8

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6/2/99

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

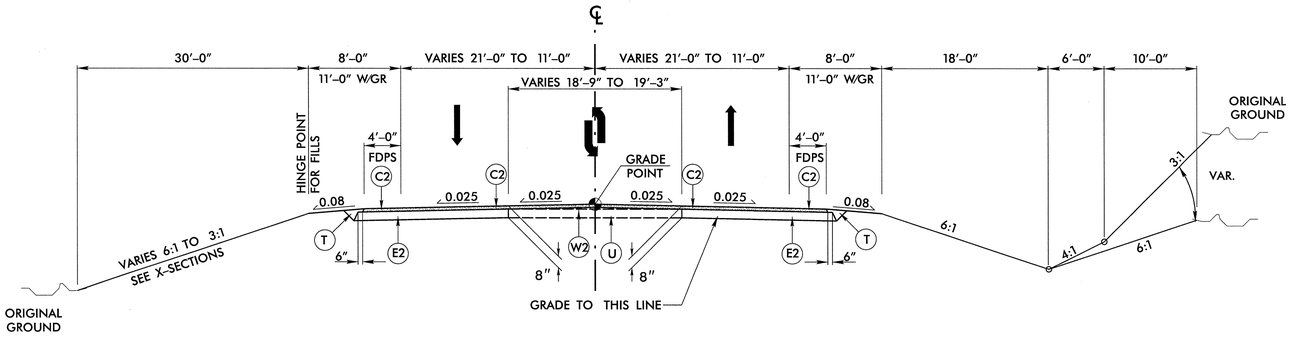
PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-C

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN KIRBY
10/7/13

PAVEMENT DESIGN ENGINEER

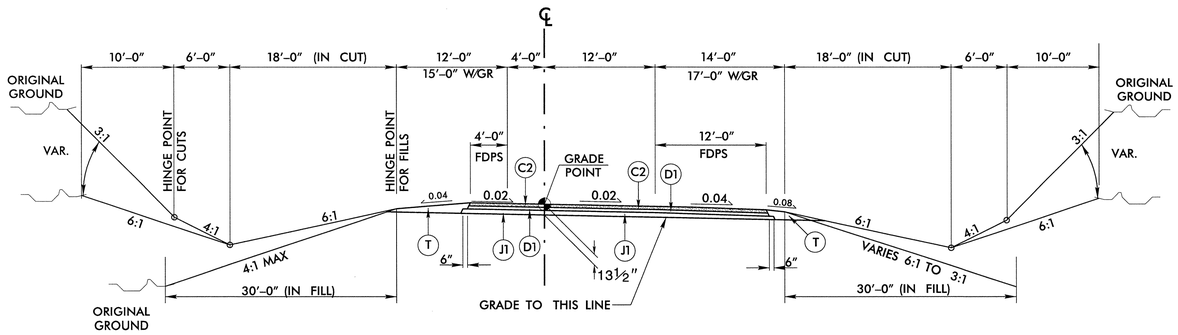
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER TIMOTHY G. MITCHELL
10/4/13



TYPICAL SECTION NO. 8

–Y8– CEDAR HILL RD. (SR 1430)

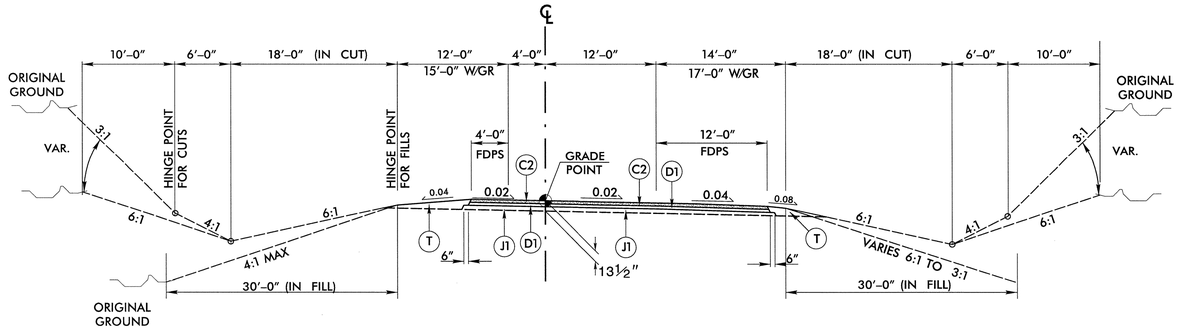
USE TYPICAL SECTION NO. 8 AS FOLLOWS
–Y8– STA. 66+00.00 TO STA. 72+40.00



TYPICAL SECTION NO. 9

–RP_A1REV–
–RP_B2–
–RP_C2–
–RP_C3–
–RP_D1REV–
RP_D2–

USE TYPICAL SECTION NO. 9 AS FOLLOWS
–RP_A1REV– STA. 10+00.00 TO STA. 22+20.00
–RP_B2– STA. 10+00.00 TO STA. 29+58.64
–RP_C2– STA. 10+00.00 TO STA. 26+35.42
–RP_C3– STA. 10+00.00 TO STA. 30+06.10
–RP_D1REV– STA. 10+00.00 TO STA. 22+53.00
–RP_D2– STA. 10+00.00 TO STA. 23+99.13

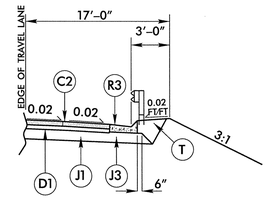


TYPICAL SECTION NO. 10

–RP_A1REV–
–RP_D1REV–

USE TYPICAL SECTION NO. 10 AS FOLLOWS
–RP_A1REV– STA. 22+00.00 TO STA. 28+84.25
–RP_D1REV– STA. 22+53.00 TO STA. 30+99.82

DETAIL OF SHOULDER BERM GUTTER



PARTIAL TYPICAL SECTION NO. 9A

USE PARTIAL TYPICAL 9A IN CONJUNCTION WITH TYPICAL 9 AT:
-RP_C2- STA. 18+00 RT. TO 25+90 RT.
-RP_D2- STA. 19+50 LT. TO 23+67 LT.
-RP_C3- STA. 13+45 RT. TO 19+50 RT.

PAVEMENT SCHEDULE	
C1	2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	3" TYPE S9.5C
C4	1½" TYPE S9.5B
C5	VAR. TYPE S9.5B
D1	2½" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0C
D4	VAR. TYPE I19.0B
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	4" TYPE B25.0C
E4	VAR. TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VAR. DEPTH ABC
P	PRIME COAT
R1	2'-6" C & G
R2	5" MONOLITHIC CONCRETE ISLAND.
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2

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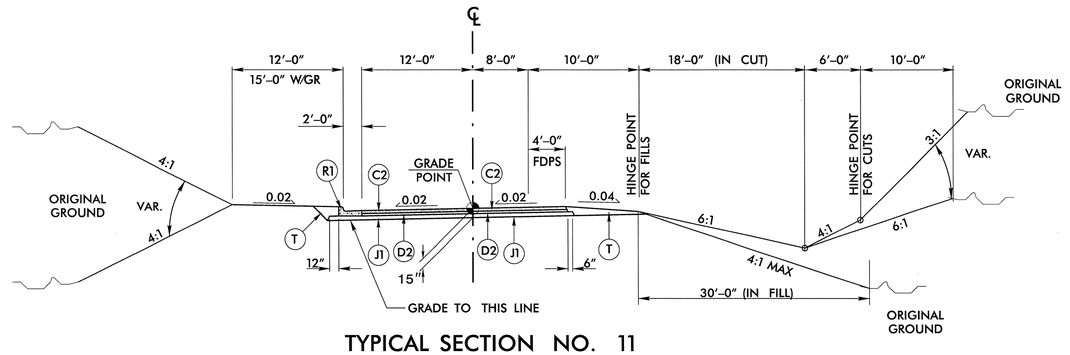
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-D

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER — 10/9/13

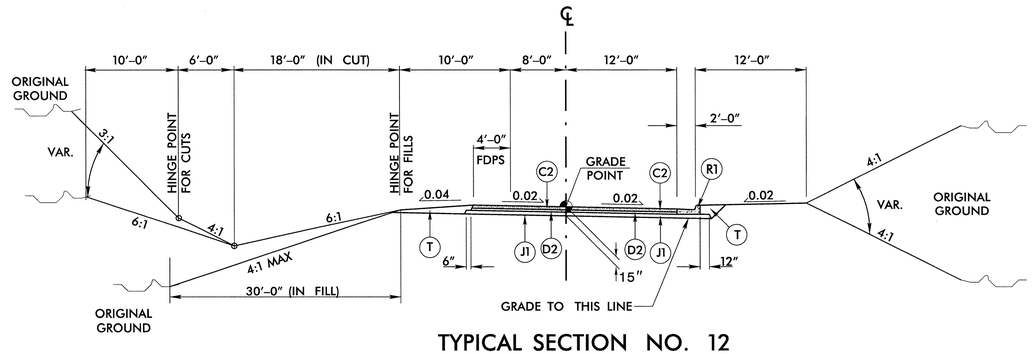
PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV — 10/21/13



TYPICAL SECTION NO. 11

-LP_A3-

USE TYPICAL SECTION NO. 11 AS FOLLOWS
-LP_A3- STA. 10+00.00 TO STA. 23+17.12

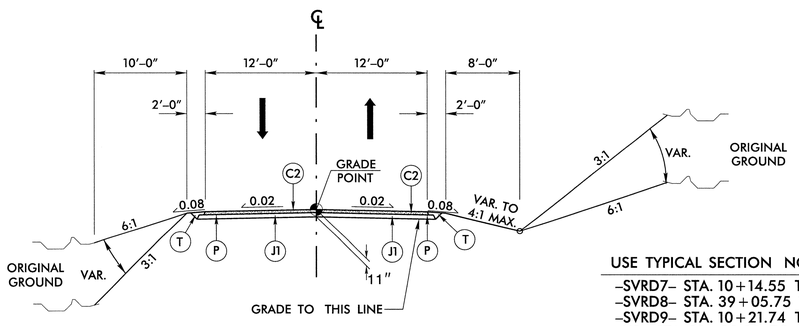


TYPICAL SECTION NO. 12

-LP_B2-

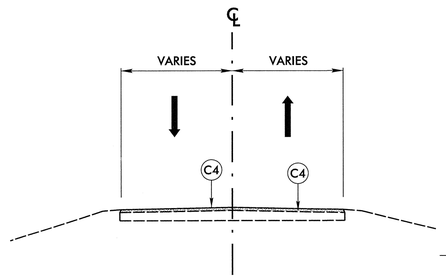
USE TYPICAL SECTION NO. 12 AS FOLLOWS
-LP_B2- STA. 10+00.00 TO STA. 21+13.89

PAVEMENT SCHEDULE	
C1	2" TYPE S9.5B
C2	3" TYPE S9.5B
C3	3" TYPE S9.5C
C4	1½" TYPE S9.5B
C5	VAR. TYPE S9.5B
D1	2½" TYPE I19.0B
D2	4" TYPE I19.0B
D3	3" TYPE I19.0C
D4	VAR. TYPE I19.0B
E1	4" TYPE B25.0B
E2	5" TYPE B25.0B
E3	4" TYPE B25.0C
E4	VAR. TYPE B25.0B
J1	8" ABC
J2	10" ABC
J3	VAR. DEPTH ABC
P	PRIME COAT
R1	2'-6" C & G
R2	5" MONOLITHIC CONCRETE ISLAND.
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2



USE TYPICAL SECTION NO. 13 AS FOLLOWS
-SVRD7- STA. 10+14.55 TO STA. 13+15.28
-SVRD8- STA. 39+05.75 TO STA. 39+44.06
-SVRD9- STA. 10+21.74 TO STA. 14+03.10
-Y9- STA. 10+20.00 TO STA. 13+50.00

TYPICAL SECTION NO. 13



USE TYPICAL SECTION NO. 14 AS FOLLOWS
-Y8- STA. 11+77.00 TO STA. 13+40.00
-SVRD7- STA. 15+21.72 TO STA. 21+41.89
-SVRD8- STA. 32+14.18 TO STA. 37+27.87

TYPICAL SECTION NO. 14

TRANSITION FROM TYPICAL SECTION NO. 13 TO TYPICAL SECTION NO. 14 -SVRD7- STA 13+15.28 TO 15+21.72 AND -SVRD8- STA 37+27.87 TO 39+05.75

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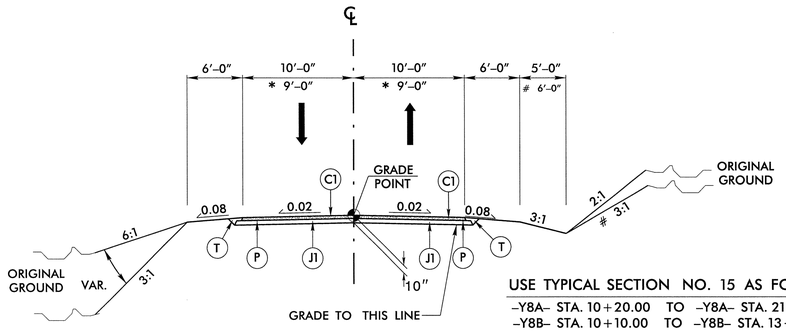
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-E

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
10/9/13

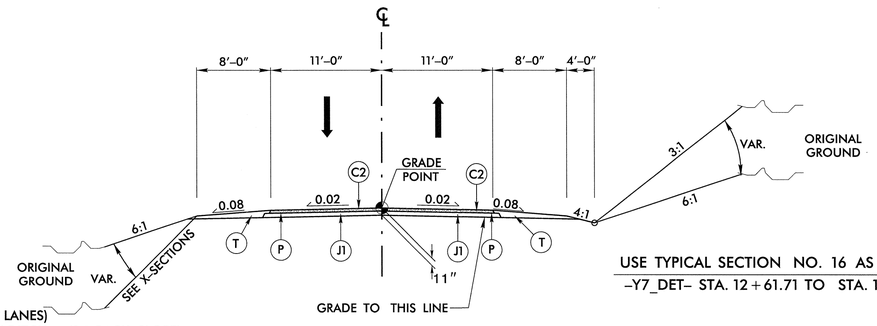
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV
10/2/13



USE TYPICAL SECTION NO. 15 AS FOLLOWS

–Y8A–	STA. 10+20.00	TO	–Y8A– STA. 21+50.00
–Y8B–	STA. 10+10.00	TO	–Y8B– STA. 13+88.00
*–Y8C–	STA. 10+00.00	TO	–Y8B– STA. 19+96.69 (–Y8C– HAS 9′ LANES)
#–Y8D–	STA. 10+10.00	TO	–Y8D– STA. 26+09.24 (–Y8D– HAS 6′ DITCH w/3:1 BACK SLOPE)

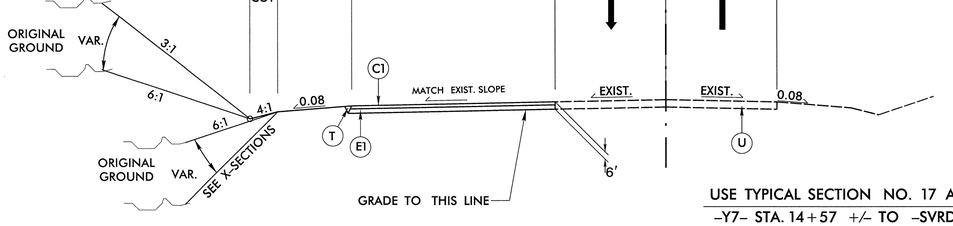
TYPICAL SECTION NO. 15



USE TYPICAL SECTION NO. 16 AS FOLLOWS

–Y7_DET– STA. 12+61.71 TO STA. 18+42.96

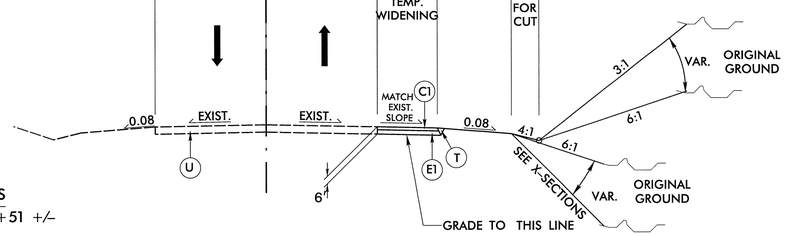
TYPICAL SECTION NO. 16



USE TYPICAL SECTION NO. 17 AS FOLLOWS

–Y7– STA. 14+57 +/– TO –SVRD7– STA. 16+51 +/–

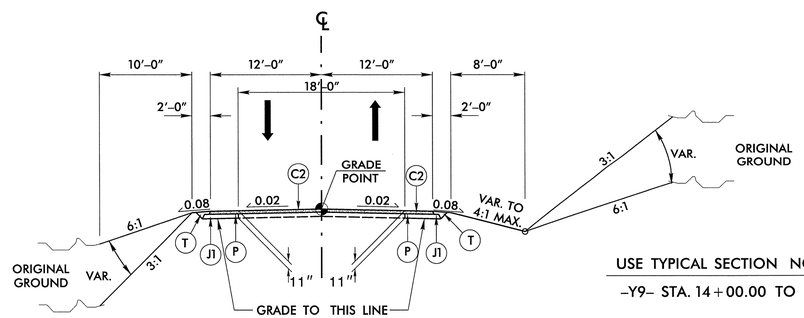
TYPICAL SECTION NO. 17
TEMPORARY WIDENING



TYPICAL SECTION NO. 18
TEMPORARY WIDENING

USE TYPICAL SECTION NO. 18 AS FOLLOWS

–Y7– STA. 17+50 +/– TO STA. 21+77 +/–



TRANSITION FROM TYPICAL SECTION NO. 13 TO TYPICAL SECTION NO. 19 –Y9– STA 13+50.00 TO 14+00.00

TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19 AS FOLLOWS

–Y9– STA. 14+00.00 TO STA. 16+50.00

PAVEMENT SCHEDULE

C1	2″ TYPE S9.5B
C2	3″ TYPE S9.5B
C3	3″ TYPE S9.5C
C4	1½″ TYPE S9.5B
C5	VAR. TYPE S9.5B
D1	2½″ TYPE I19.0B
D2	4″ TYPE I19.0B
D3	3″ TYPE I19.0C
D4	VAR. TYPE I19.0B
E1	4″ TYPE B25.0B
E2	5″ TYPE B25.0B
E3	4″ TYPE B25.0C
E4	VAR. TYPE B25.0B
J1	8″ ABC
J2	10″ ABC
J3	VAR. DEPTH ABC
P	PRIME COAT
R1	2′-6″ C & G
R2	5″ MONOLITHIC CONCRETE ISLAND.
R3	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING SEE DETAIL 1
W2	WEDGING SEE DETAIL 2

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X-SECTION LAYOUT & SHEAR POINT DIAGRAM
@ -Y7- INTERCHANGE
SCALE 1"=100'

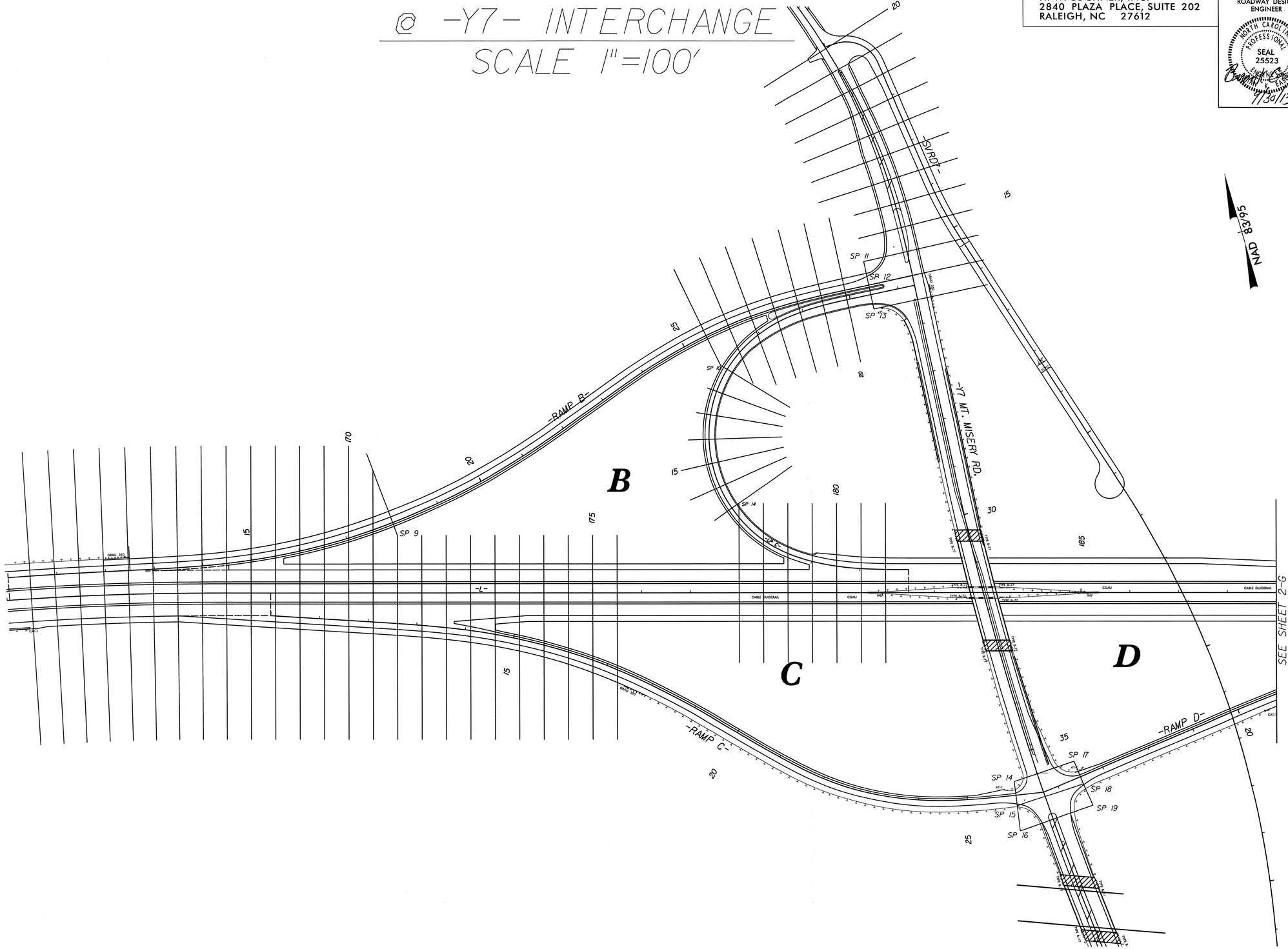
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-F
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER

9/30/13



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8/17/99

X-SECTION LAYOUT & SHEAR POINT DIAGRAM
@ -Y8- INTERCHANGE
SCALE 1"=100'

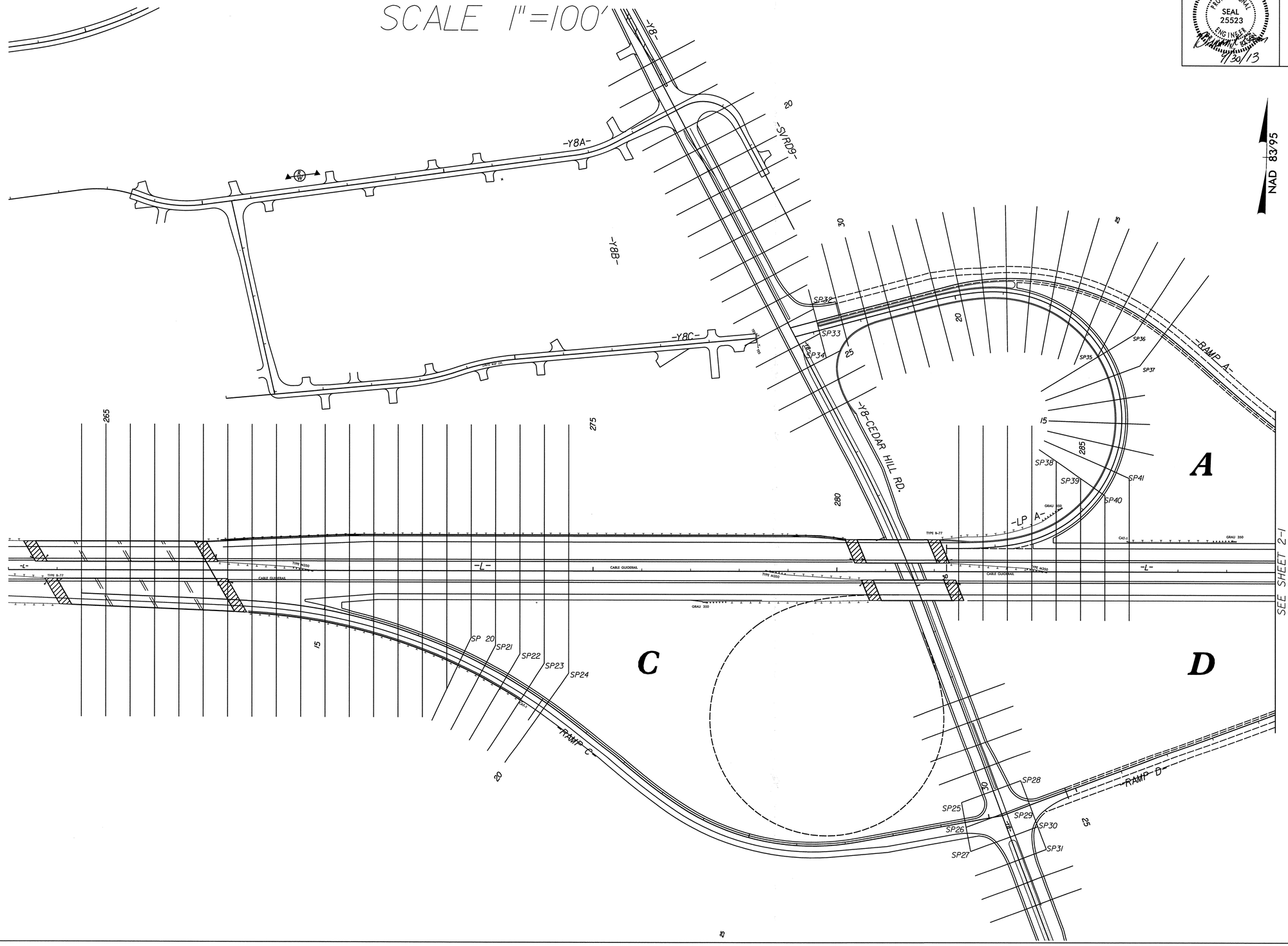
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-G
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
11/30/13

NAD 83/95



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8/17/99

REVISIONS

-Y7_DET-

PI Sta 12+29.01
Δ = 24° 43' 14.7" (LT)
D = 11° 48' 48.8"
L = 209.26'
T = 106.28'
R = 485.00'

PI Sta 14+38.27
Δ = 24° 43' 14.7" (RT)
D = 11° 48' 48.8"
L = 209.26'
T = 106.28'
R = 485.00'

PI Sta 17+22.93
Δ = 24° 43' 14.7" (RT)
D = 11° 48' 48.8"
L = 209.26'
T = 106.28'
R = 485.00'

PI Sta 19+32.18
Δ = 24° 43' 14.7" (LT)
D = 11° 48' 48.8"
L = 209.26'
T = 106.28'
R = 485.00'

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-H
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JOHN K. EASON
10/11/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JOHN K. EASON
10/11/13

-Y7_DET-POT Sta. 10+00.00
-BY7- 228 PINC 37+04.48

N 10°30'02" E 90.07'

33A E.G. DALE ET UX DB 3109 PG 1209

34 DONALD BEATTY ET UX DB 610 PG 239

35 D & H INVESTORS, INC. DB 1225 PG 663

35A E. G. DALEET UX DB 1845 PG26 MB 6 PG 121

JEREMY GIBBS DB 2512 PG 117 MB 33 PG 469

JAMES B. SMITH, ET UX DB2286 PG 899 MB 33 PG 469

TRACY McELROY, ET VIR DB 2429 PG 819 MB 33 PG 469

35C EASTBROOK ESTATES HOA INC COMMON AREA

LLOYD L. FREEMAN DB 435 PG 178

ANNETTE ANDREWS TROY ET AL DB 450 PG 599

NORTH CAROLINA AGRICULTURAL FOUNDATION, INC DB 1527 PG 1070 MB 25 PG 202

D8- +74.79 PL

-SVRD8- +15.00 57.50' LT

-SVRD8- +25.00 66.50' LT

-SVRD8- +73.00 57.00' LT

-Y7- +60.00 113.50' (LT.)

-Y7- +90.00 151.50 (LT.)

-Y7- +50.00 151.00 (LT.)

-Y7- +78.00 88.87' LT (EXIST R/W)

-BY7- 229 POT 45+98.81

-Y7_DET- PRC Sta. 13+31.98

-Y7_DET- PC Sta. 11+22.73

-Y7_DET- PT Sta. 15+14.24

-Y7_DET- PC Sta. 16+66.64

-Y7_DET- PT Sta. 18+23.90

-Y7_DET- POT Sta. 21+26.74

-Y7_DET- Sta. 20+35.16

20+00

15+00

HEADWALL SEE DETAIL 2-O

/ CORNER XIST.R/W

S 10° 27' 02.4" W

S 9° 29' 28.0" W

S 76° 57' 27" E

S 55°00'24" E

S 09°46'44" W 106.53'

S 84°55'52" E 100.13'

S 73°21'00" E 65.79'

N 23°17'32" E 118.26'

N 60°41'32" W

S 43°09'37" W 17.15'

N 07°44'40" W 17.16'

S 05°07'23" W 16.98'

N 59° 58' 00" W

N 71° 02' 19" W 349.23'

S 10° 27' 02.4" W

END CONSTRUCTION TIE TO EXISTING POCSta.55+00.00 -Y7-

NAD 83/95

-Y7-

-Y7_DET-

-Y7_DET-

BEGIN GRADE
-Y7_DET- STA.12+61.71
EL.= 30.46'

PI = 15+60.00
EL = 31.36'
VC = 200'
K = 286

(+)0.3014%

(-)0.3990%

2 - 84" CMP

END GRADE
-Y7_DET- STA.18+42.96
EL.= 30.23'

40 30 20 10 0

10 11 12 13 14 15 16 17 18 19 20

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R:\Projects\R-2633BA\R-2633BA_RDY_PSH_Y7DET.dgn
$$$$USERNAME$$$$

8/17/99

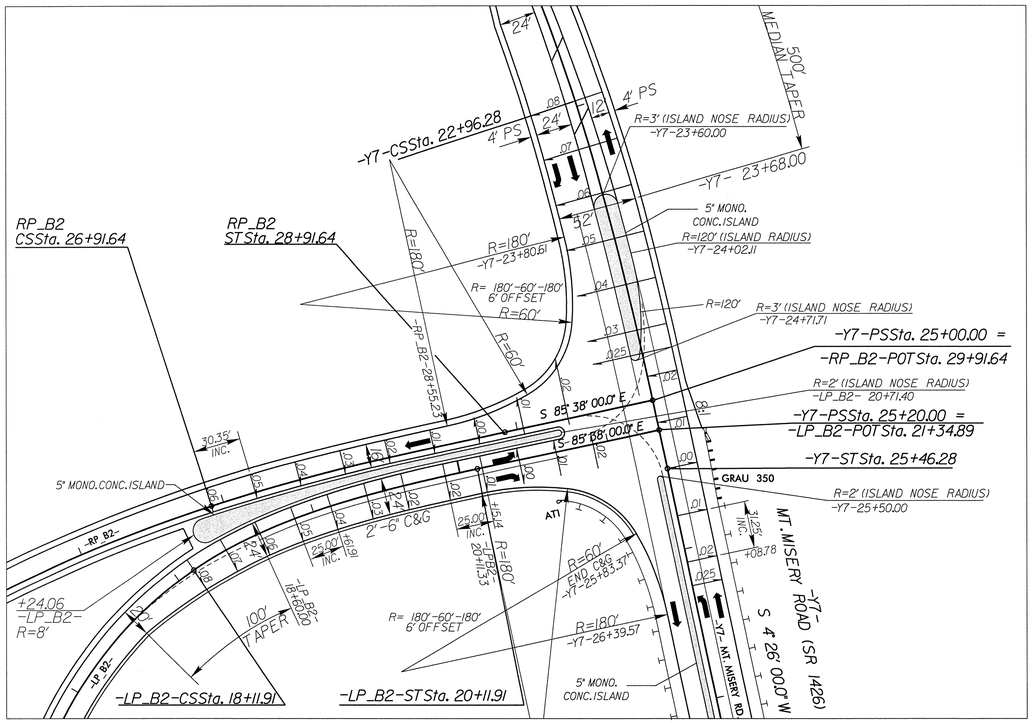
NAD 83/95

-RP_B2-

PIs Sta 24+10.27	PI Sta 25+84.67	PIs Sta 27+58.37
Θs = 5° 43' 46.5"	Δ = 12° 18' 20.4" (RT)	Θs = 5° 43' 46.5"
Ls = 200.00'	D = 5° 43' 46.5"	Ls = 200.00'
LT = 133.40'	L = 214.77'	LT = 133.40'
ST = 66.73'	T = 107.80'	ST = 66.73'
	R = 1,000.00'	
	e = 6.0%	

-LP_B2-

PIs Sta 12+03.60	PI Sta 16+91.39	PIs Sta 18+79.53
Θs = 33° 03' 18.9"	Δ = 112° 48' 28.5" (RT)	Θs = 22° 02' 12.6"
Ls = 300.00'	D = 22° 02' 12.6"	Ls = 200.00'
LT = 203.60'	L = 511.91'	LT = 134.38'
ST = 103.28'	T = 391.39'	ST = 67.62'
	R = 260.00'	
	e = 8.0%	



DETAIL SHOWING

INTERSECTION OF -RP_B2- & -LP_B2- AT -Y7- MOUNT MISERY ROAD (SR 1426)

50' 0' 50' 100'
25'
(ENGLISH)

SEE SHEET 13 FOR ROADWAY PLAN VIEW

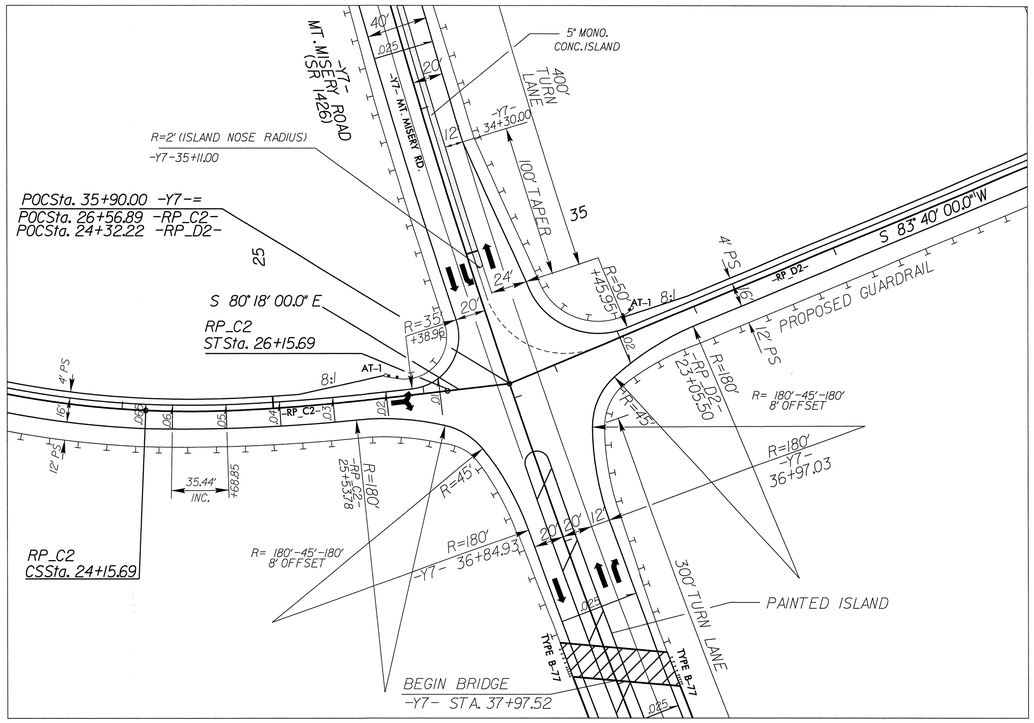
NAD 83/95

-Y7-

PI Sta 36+19.17
Δ = 13° 58' 00.0" (LT)
D = 0° 59' 53.5"
L = 1,399.21'
T = 703.09'
R = 5,740.00'
e = 2.5%

-RP_C2-

PIs Sta 21+46.98	PI Sta 23+15.48	PIs Sta 24+82.52
Θs = 9° 14' 28.5"	Δ = 18° 41' 15.9" (LT)	Θs = 9° 14' 28.5"
Ls = 200.00'	D = 9° 14' 28.5"	Ls = 200.00'
LT = 133.52'	L = 202.22'	LT = 133.52'
ST = 66.83'	T = 102.02'	ST = 66.83'
	R = 620.00'	
	e = 6.5%	



DETAIL SHOWING

INTERSECTION OF -RP_C2- & -RP_D2- AT -Y7- MOUNT MISERY ROAD (SR 1426)

50' 0' 50' 100'
25'
(ENGLISH)

SEE SHEET 13 FOR ROADWAY PLAN VIEW

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
11/24/13

30-SEP-2013 14:19
R:\R-2633BA\R-2633BA_RDY_IntersectionDetails.dgn
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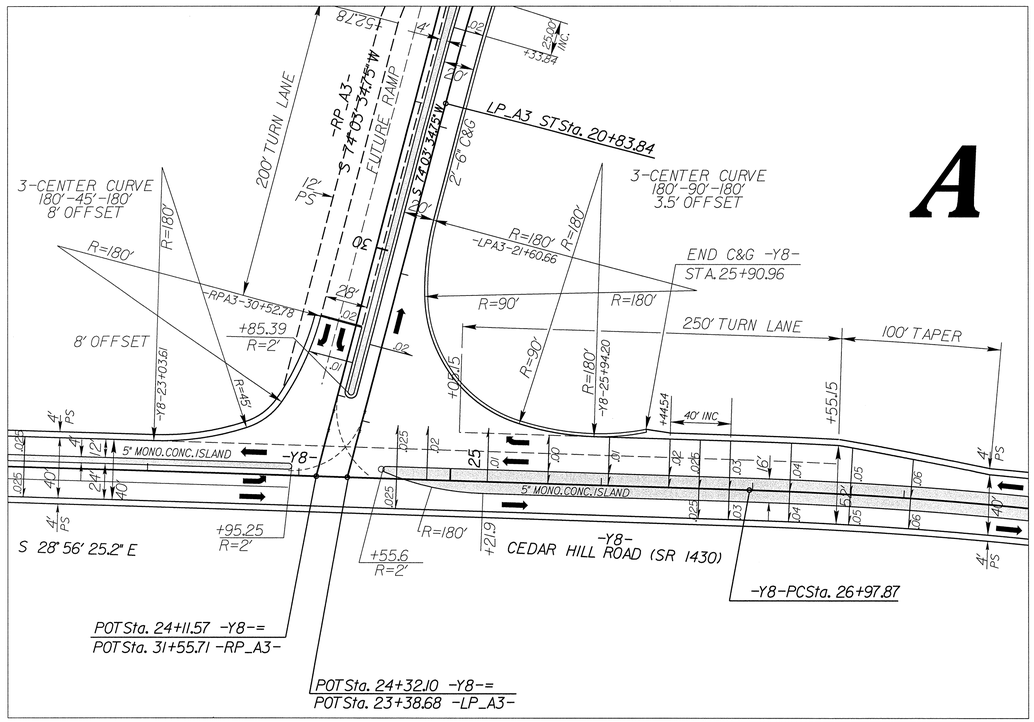
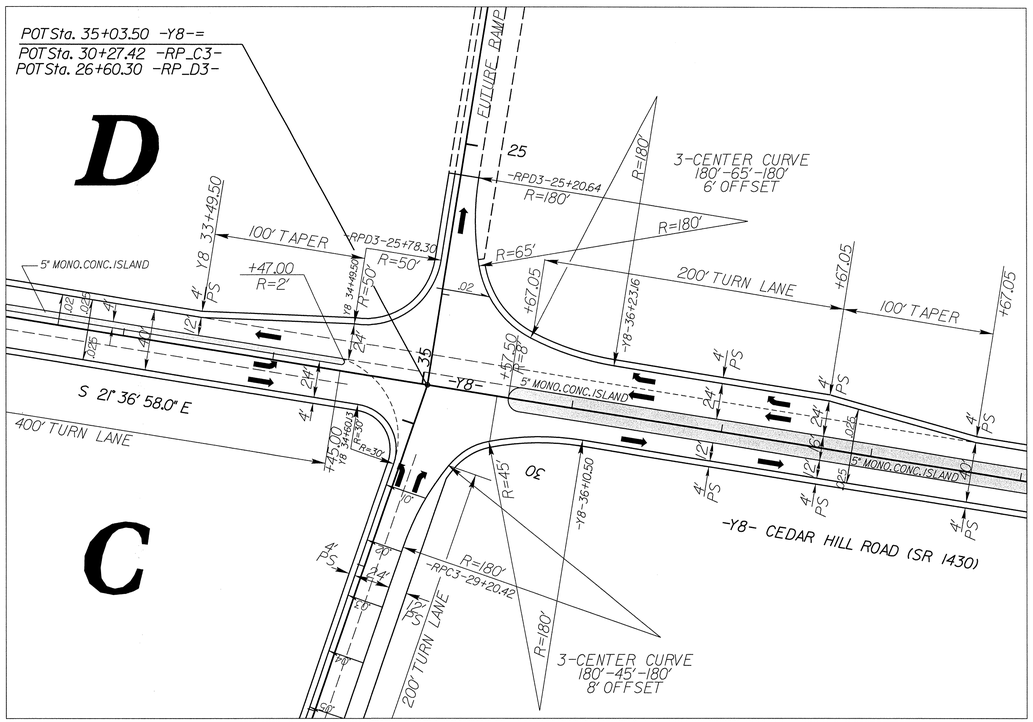
LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 NC License Number F-0159	R-2633BA	2-J
MULKEY INC. NC License Number C-1021	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
9/30/13





DETAIL SHOWING

INTERSECTION OF -RP_A3- & -LP_A3- AT -Y8- CEDAR HILL ROAD (SR 1430)

50' 0' 50' 100'
25'
(ENGLISH)

SEE SHEET 20 FOR ROADWAY PLAN VIEW

DETAIL SHOWING

INTERSECTION OF -RP_C3- & -RP_D3- AT -Y8- CEDAR HILL ROAD (SR 1430)

50' 0' 50' 100'
25'
(ENGLISH)

SEE SHEET 20 FOR ROADWAY PLAN VIEW

8/17/99
30-SEP-2013 14:20
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$$$$USERNAME$$$$

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

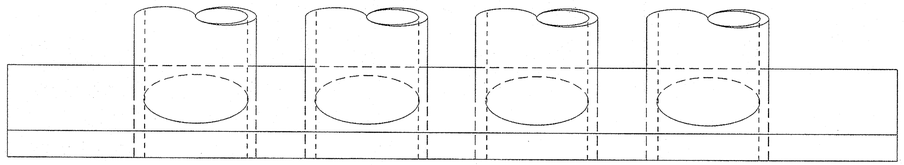
ENGLISH DETAIL DRAWING FOR

CONCRETE ENDWALL FOR TRIPLE AND QUADRUPLE PIPE CULVERTS

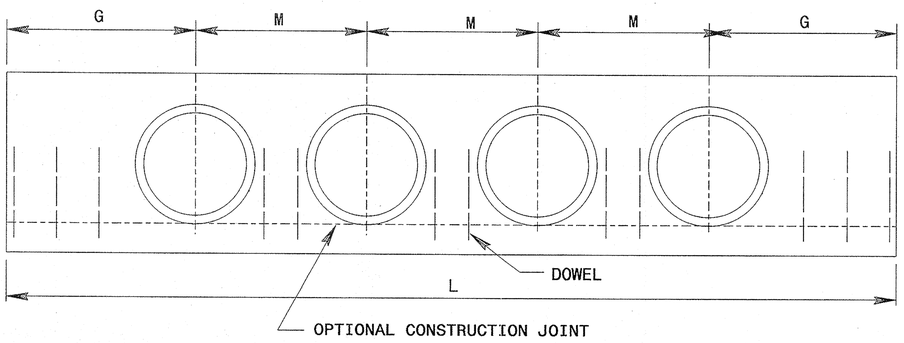
15" THRU 48" PIPE - 90° SKEW

SHEET 1 OF 3

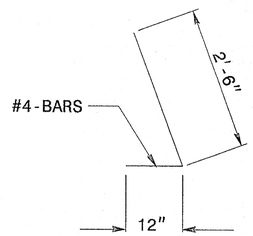
838D01



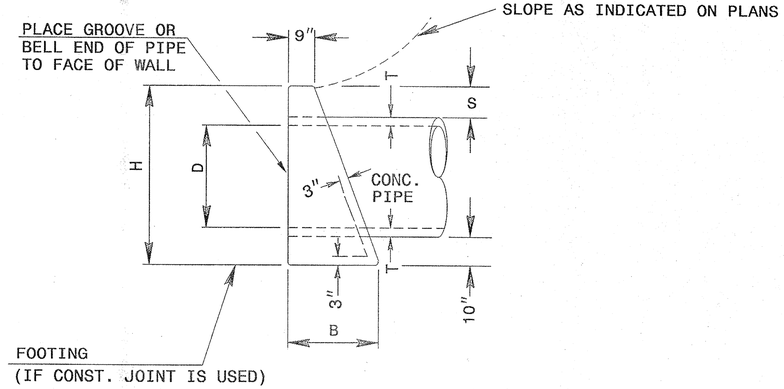
PLAN



ELEVATION



DOWEL
BAR-"X"



END ELEVATION

DIMENSIONS AND CONCRETE QUANTITIES USING CONCRETE PIPE										
COMMON DIMENSIONS						TRIPLE PIPE		QUADRUPLE PIPE		
D	H	B	G	T	S	L	YD³	L	YD³	M
15"	3'-3"	1'-8"	2'-9"	2¼"	9½"	9'-10"	1.3	12'-0"	1.6	2'-2"
18"	3'-7"	1'-10"	3'-2"	2½"	10"	11'-6"	1.6	14'-1"	1.9	2'-7"
24"	4'-2"	2'-1"	4'-0"	3"	10"	14'-10"	2.5	18'-3"	3.0	3'-5"
30"	5'-0"	2'-6"	4'-7"	4¼"	11½"	17'-8"	3.9	21'-11"	4.7	4'-3"
36"	5'-8"	2'-8"	5'-6"	4¾"	12½"	21'-0"	5.6	26'-0"	6.7	5'-0"
42"	6'-2"	3'-1"	6'-4"	5¼"	11½"	24'-4"	7.5	30'-2"	9.0	5'-10"
48"	6'-9"	3'-5"	7'-2"	5¾"	11½"	27'-8"	10.0	34'-4"	12.0	6'-8"

* NOTE: SEE ROADWAY STANDARD DRAWING 838.01 SHEET 3 OF 3 FOR GENERAL NOTES

DOWELS IN ENDWALL WITH REINFORCED CONCRETE PIPE																			
	PIPE	TRIPLE PIPE									QUADRUPLE PIPE								
LOC.	DIA.	15"	18"	24"	30"	36"	42"		48"		15"	18"	24"	30"	36"	42"		48"	
	BARS	"X"	"X"	"X"	"X"	"X"	"X"	Y*	"X"	Y*	"X"	"X"	"X"	"X"	"X"	"X"	Y*	"X"	Y*
G	QTY.	2	2	3	3	4	4		5		2	2	3	3	4	4		5	
M(s)	QTY.	2	2	4	4	4	4	2	6	2	3	3	6	6	6	6	2	9	2
G	QTY.	2	2	3	3	4	4		5		2	2	3	3	4	4		5	
TOTAL LBS.		14	14	23	23	28	100		119		17	17	28	28	33	122		147	

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

ENGLISH DETAIL DRAWING FOR

CONCRETE ENDWALL FOR TRIPLE AND QUADRUPLE PIPE CULVERTS

15" THRU 48" PIPE - 90° SKEW

SHEET 1 OF 3

838D01

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 10/8/13

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE:
MODIFIED BY: K.A. Kempf DATE:
CHECKED BY: DATE: 8/7/13
FILE SPEC.: /details/kkempf/english/838d0101.dgn

USERNAME
USERNAME

PROJECT REFERENCE NO.	SHEET
R-2633BA	2-L

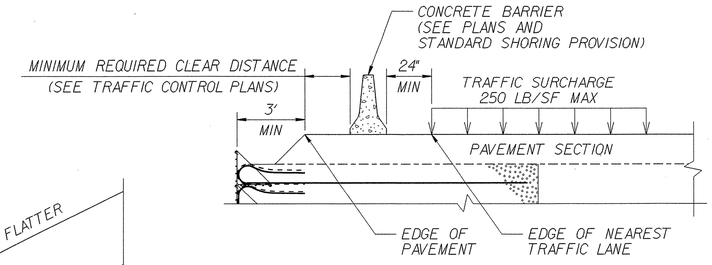
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

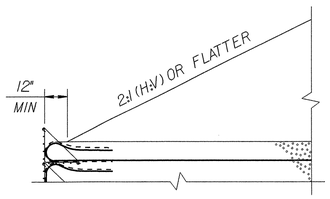
Scott A. Hidden 8/10/12
SIGNATURE DATE

ENGINEER

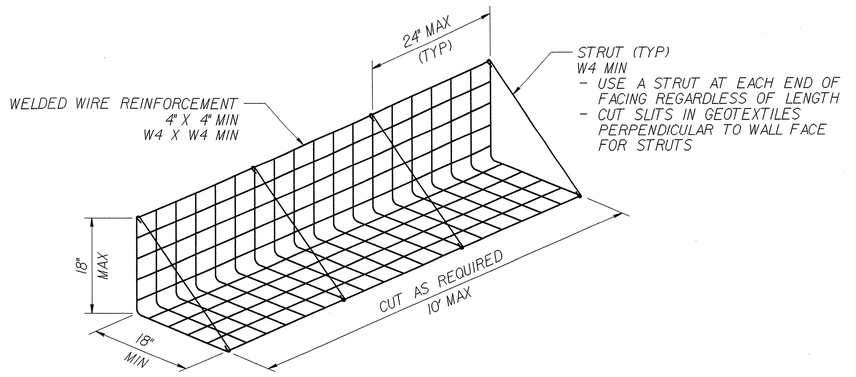
SIGNATURE DATE



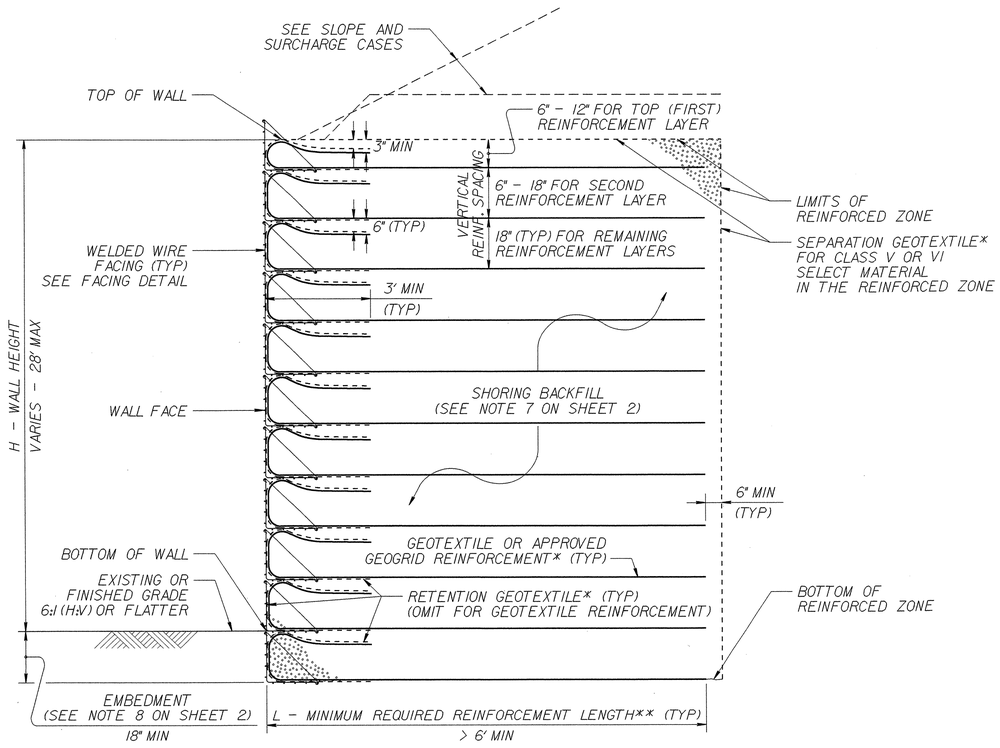
SURCHARGE CASE



SLOPE CASE

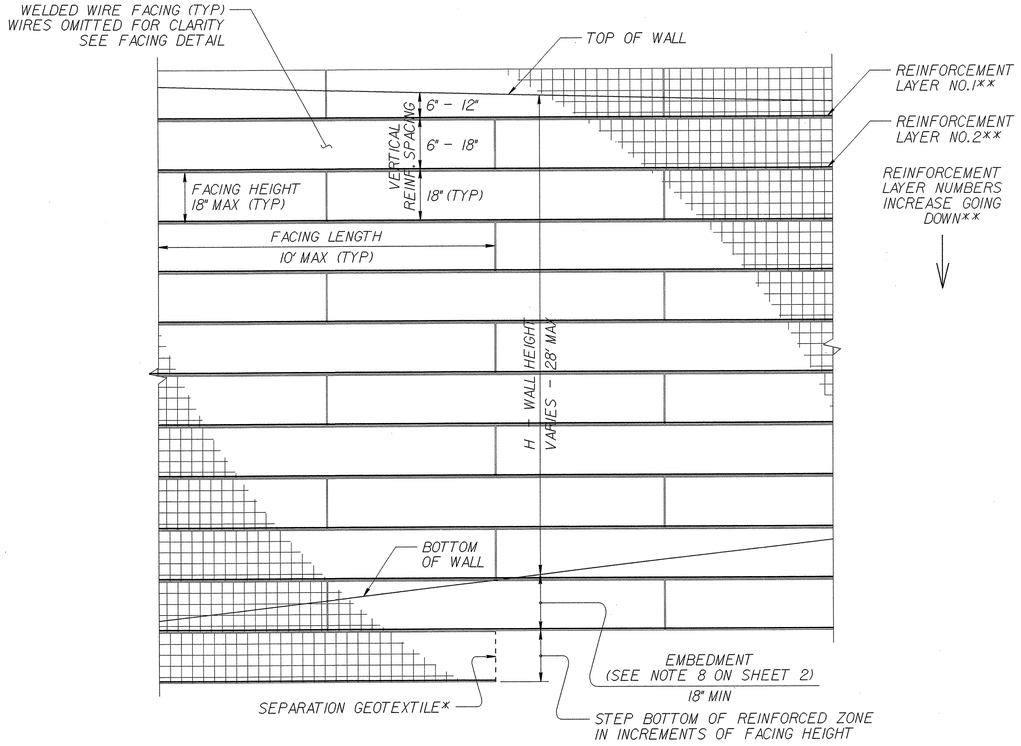


FACING DETAIL



STANDARD TEMPORARY WALL

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



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD
TEMPORARY WALL
Sheet 1 of 3

DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET
R-2633BA	2-M

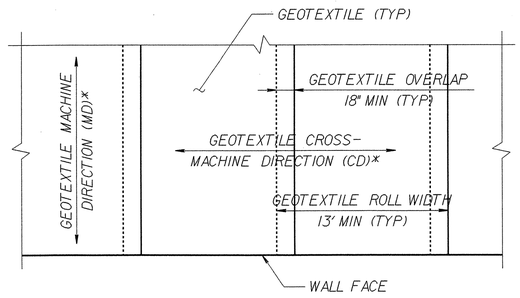
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A Hidden 8/10/12
SIGNATURE DATE

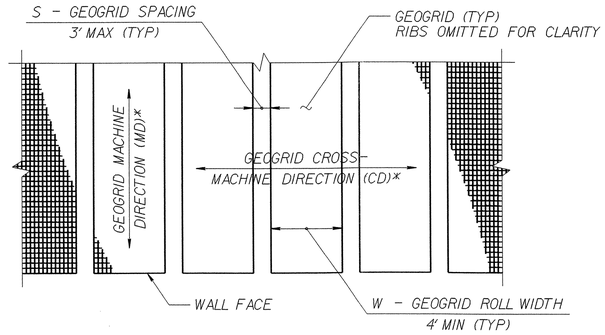
ENGINEER

SIGNATURE DATE



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

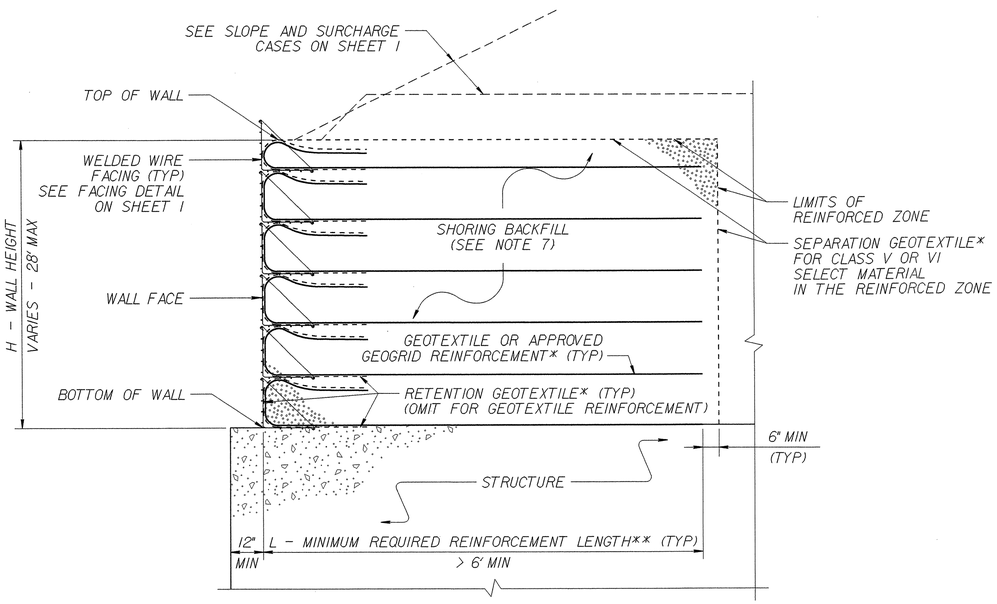


GEOGRID PLACEMENT

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

GEOSYNTHETIC PLACEMENT DETAILS

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



TEMPORARY WALL ON STRUCTURE DETAIL

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

NOTES:

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

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

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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL
Sheet 2 of 3

DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET
R-2633BA	2-N

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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

L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

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

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

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

GEOTEXTILE REINFORCEMENT ULTIMATE TENSILE STRENGTH (LB/FT)

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

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

(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 1915

GEOTECHNICAL ENGINEERING UNIT

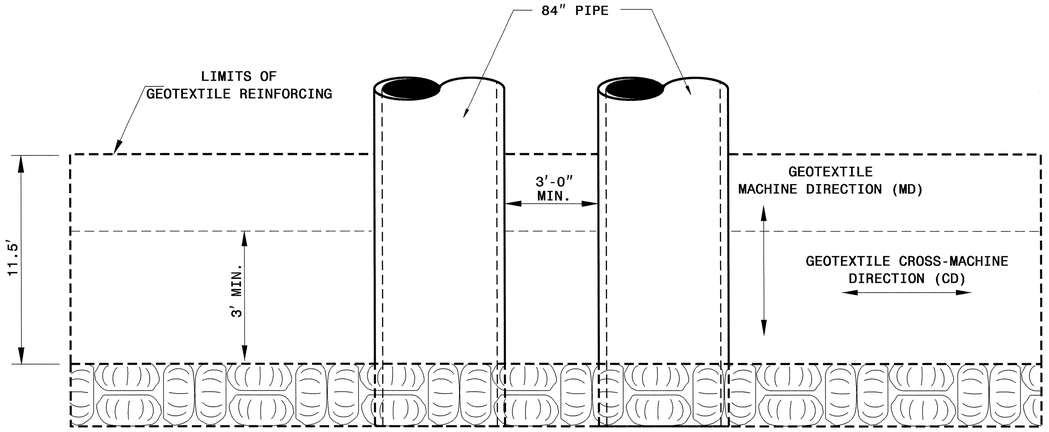
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

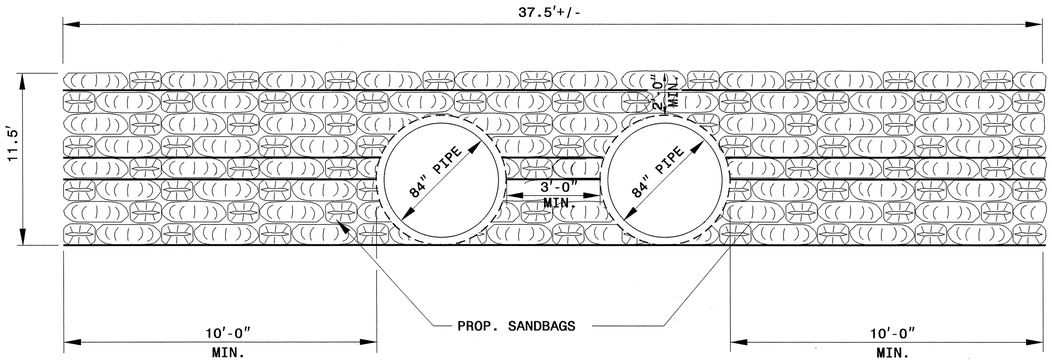
STANDARD TEMPORARY WALL
Sheet 3 of 3

DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	2-0



PLAN



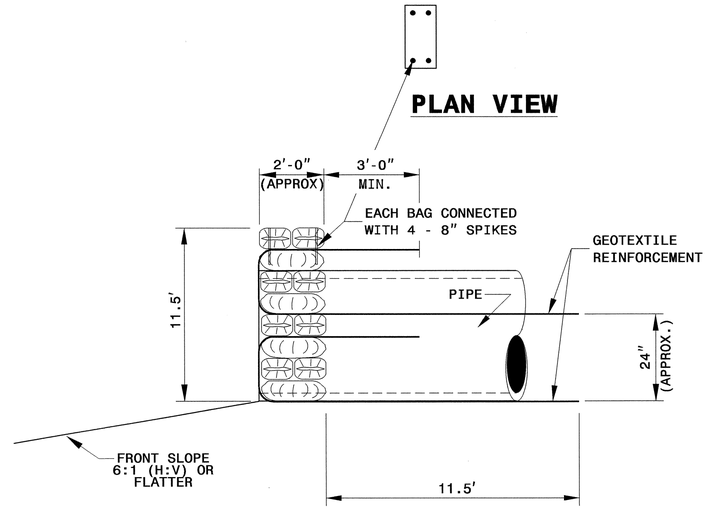
FRONT ELEVATION

GENERAL NOTES:

1. FOR REINFORCED SANDBAG HEADWALLS, SEE SANDBAG HEADWALLS PROVISION.
2. REINFORCED SANDBAG HEADWALLS ARE BASED ON A TRAFFIC SURCHARGE OF 250 LB/SF OR LESS AND A BACK SLOPE OF 2:1(H:V) OR FLATTER.
3. REINFORCED SANDBAG HEADWALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:

   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF

4. DO NOT USE REINFORCED SANDBAG HEADWALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE REINFORCED SANDBAG HEADWALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW SANDBAGS OR PIPES.
6. DO NOT PLACE GEOTEXTILE REINFORCEMENT OR SANDBAGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
7. 24" LONG #4 REINFORCING STEEL BARS MAY BE SUBSTITUTED FOR 8" LONG STEEL SPIKES. DRIVE #4 BAR THROUGH NO MORE THAN 5 SANDBAGS.
8. DO NOT SPLICE OR OVERLAP GEOTEXTILE REINFORCEMENT SO SEAMS ARE PARALLEL TO THE HEADWALL FACE.
9. HEADWALL DIMENSIONS MAY BE ADJUSTED FOR ONE OR MORE PIPES AS SHOWN IN THE PLANS.



PLAN VIEW

SIDE ELEVATION

GEOTEXTILE REINFORCEMENT
(TYPE 5 GEOTEXTILE)

WALL HEIGHT H (ft)	REINF. LENGTH L (ft)	WIDE WIDTH TENSILE STRENGTH @ ULTIMATE (MD) (lb/ft)
< 4	6	2400
4 TO 6	6	3400
6 TO 8	= H	4300
8 TO 10	= H	5200
10 TO 12	= H	6200

TOTAL AREA SANDBAG HEADWALL = 355 S.F.

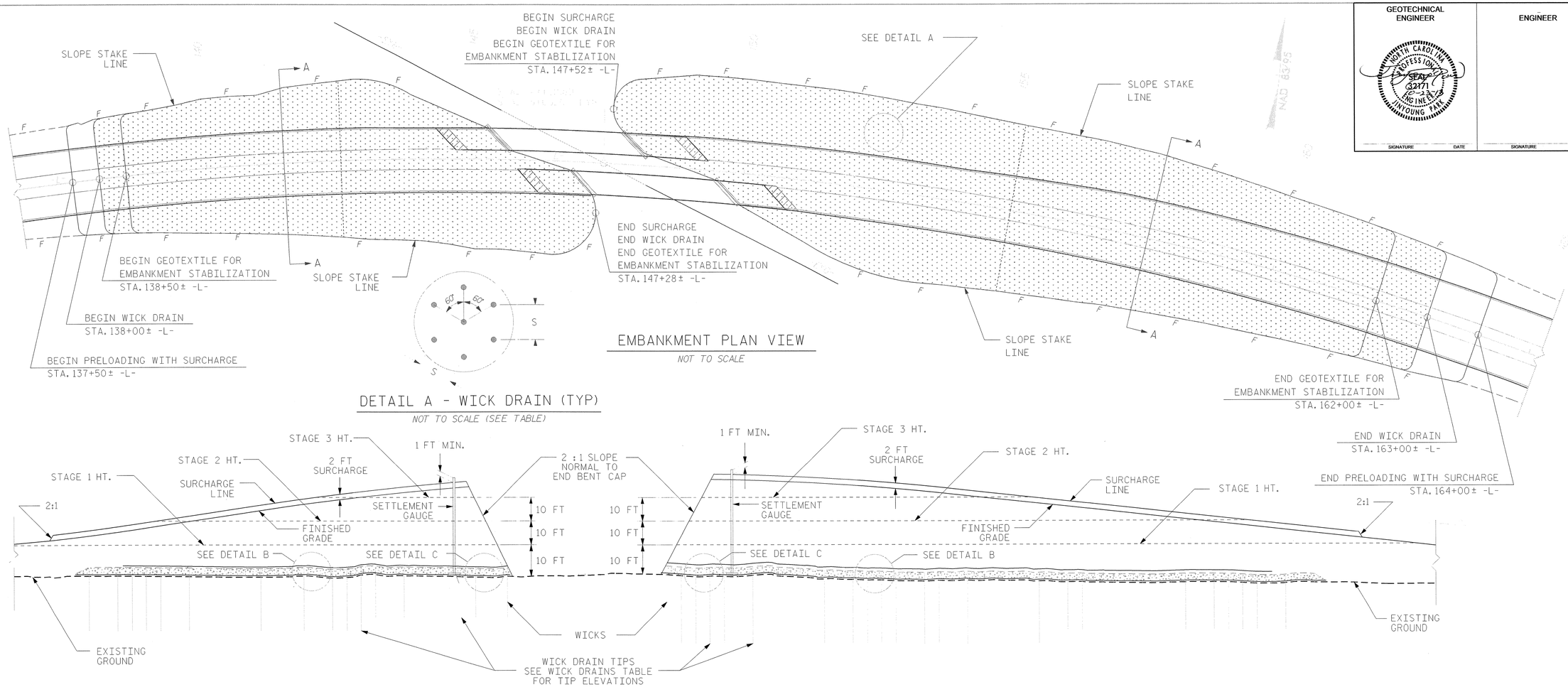
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
10/8/13

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

DETAIL OF REINFORCED SANDBAG HEADWALL

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: tspell DATE: 6-10-08
CHECKED BY: Joel S. Howerton DATE: 9/13/13
FILE SPEC.: s:details/howerton/sandbagheadwall.dgn

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 32471 ENGINEER IN-YOUNG PARK	
SIGNATURE DATE	SIGNATURE DATE



EMBANKMENT PLAN VIEW

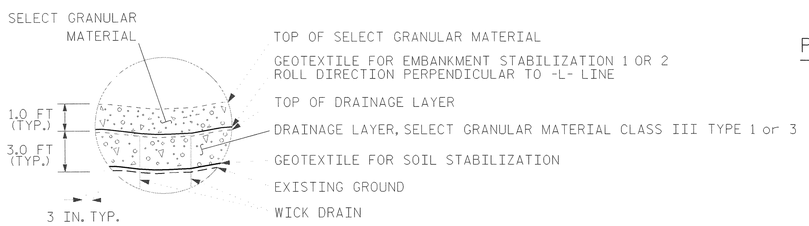
NOT TO SCALE

DETAIL A - WICK DRAIN (TYP)

NOT TO SCALE (SEE TABLE)

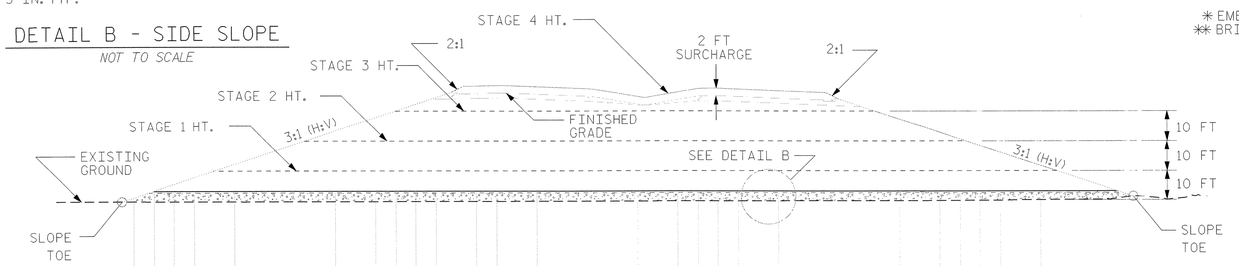
PROFILE ALONG CENTER LANE

NOT TO SCALE



DETAIL B - SIDE SLOPE

NOT TO SCALE



CROSS SECTION A-A (TYP)

NOT TO SCALE

STAGE CONSTRUCTION		
STAGE	EMBANKMENT HEIGHTS*	WAITING** PERIOD
STAGE 1	10 FT	2 MO.
STAGE 2	10 FT. TO 20 FT.	2 MO.
STAGE 3	20 FT. TO 30 FT.	2 MO.
STAGE 4	GREATER THAN 30 FT.	3 MO.

* EMBANKMENT HEIGHTS INCLUDE 2 FT OF SURCHARGE
** BRIDGE/EMBANKMENT WAITING PERIOD AT EACH STAGE

WICK DRAINS		
STATIONS	SPACING, S	TIP ELEVATIONS
138+00± TO 142+50±	5 FT	22 FT
142+50± TO 147+28±	4 FT	28 FT
147+52± TO 155+50±	4 FT	18 FT
155+50± TO 163+00±	5 FT	22 FT

PREPARED BY: J. PARK	DATE: 10 / 2013
REVIEWED BY: J. BATTS	DATE: 10 / 2013

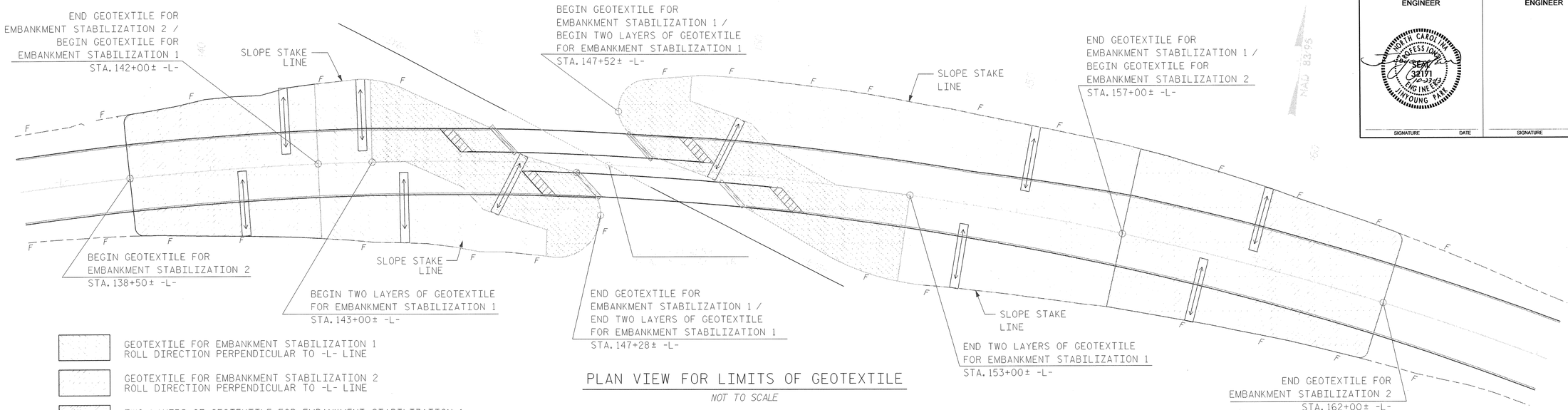
PROJECT NO.: R-2633BA
BRUNSWICK ***COUNTY***
STATION: 147+38.89 -L-
SHEET 1 OF 4

GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
☒ ***EASTERN REGIONAL OFFICE***
☐ ***WESTERN REGIONAL OFFICE***
☐ ***CONTRACT OFFICE***
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GROUND IMPROVEMENT

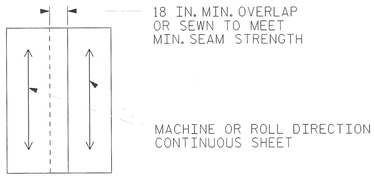
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	-	-	3	-	-	TOTAL SHEETS
2	-	-	4	-	-	-

GEJ266089 10/23/2013 R2633BA_GEO_Ground_Improvement_Plans jpark RD-Oce860-34



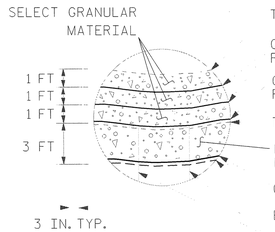
PLAN VIEW FOR LIMITS OF GEOTEXTILE

NOT TO SCALE



GEOTEXTILE OVERLAP DETAIL

NOT TO SCALE



DETAIL C - END SLOPE

NOT TO SCALE

NOTES

1. THE BRIDGE END BENT SLPPE SHALL BE 2:1 (H:V) OR FLATTER NORMAL TO THE END BENT CAP.
2. FOR WICK DRAINS AND DRAINAGE LAYER, SEE VERTICAL WICK DRAINS AND DRAINAGE LAYER SPECIAL PROVISION.
3. GEOTEXTILE FOR SOIL STABILIZATION SHALL BE PLACED ON EXISTING GROUND AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. FOR GEOTEXTILE FOR SOIL STABILIZATION, SEE SECTION 270 OF THE STANDARD SPECIFICATIONS.
4. THE DRAINAGE LAYER OF SELECT GRANULAR MATERIAL CLASS III TYPE 1 OR 3 SHALL BE INSTALLED AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.
5. INSTALL WICK DRAINS AS DIRECTED BY PROVISIONS, PLANS, AND/OR ENGINEER AFTER THE SELECT GRANULAR MATERIAL CLASS III HAS BEEN PLACED AND COMPACTED. WICK DRAINS SHALL PENETRATE THE SELECT GRANULAR MATERIAL CLASS III AND SHALL BE INSTALLED TO THE LENGTH SHOWN ON THE WICK DRAIN TABLE AND/OR DIRECTED BY THE ENGINEER.
6. PRE-AUGERING MAY BE REQUIRED TO INSTALL THE WICK DRAINS. IF PRE-AUGERING IS NECESSARY, THE COST OF PRE-AUGERING IS INCIDENTAL TO THE COST OF THE WICK DRAINS.
7.
10. INSTALL SURCHARGE MATERIAL AS SHOWN ON THE PLANS. FOR SURCHARGES, SEE EMBANKMENT SETTLEMENT GAUGES PROVISION AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
11. MAINTAIN THE SURCHARGE ELEVATIONS THROUGHOUT THE WAITING PERIODS.
12. EACH WAITING PERIOD BEGINS AFTER CONSTRUCTING THE EMBANKMENT TO THE HEIGHTS SPECIFIED IN STAGE CONSTRUCTION TABLE.
13. FOR EMBANKMENT SETTLEMENT GAUGES, SEE EMBANKENT MONITORING INSTRUMENTATION AND EMBANKMENT MONITORING DETAIL SHEET.
14. FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION , SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.
15. PLACE GEOTEXTILE FOR EMBANKMENT STABILIZATION 1 OR 2 PERPENDICULAR TO -L- CENTERLINE ON THE TOP OF DRAINAGE LAYER OR DIRECTED BY THE ENGINEER.
16. PLACE TWO LAYERS OF GEOTEXTILE FOR EMBANKMENT STABILIZATION 1 PERPENDICULAR TO -EY6- CENTERLINE OR DIRECTED BY THE ENGINEER.
17. PLACE 1 FT. OF SELECT GRANULAR MATERIAL BETWEEN GEOTEXTILES.
18. PLACE 1 FT. OF SELECT GRANULAR MATERIAL ON TOP LAYER OF GEOTEXTILE.
19. PLACE THE GEOTEXTILE WITHOUT ANY WRINKLES OR CREASES.
20. NO SEAMS OR JOINTS ARE ALLOWED IN THE MACHINE DIRECTION OF GEOTEXTILE.
21. GEOTEXTILE FOR EMBANKMENT STABILIZATION SHEETS MUST HAVE A CONTINUOUS LENGTHS THAT ARE SPECIFIED IN THE GEOTEXTILE FOR EMBANKMENT STABILIZATION TABLE.
22. THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
23. OVERLAP ADJACENT GEOTEXTILE SHEETS MINIMUM 18 INCHES IN ROLL DIRECTION OR SEW BY AN APPROVED METHOD TO DEVELOP THE REQUIRED SEAM STRENGTH.

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 32171 ENGINEER JINYOUNG PARK	
SIGNATURE DATE	SIGNATURE DATE

MAP 93-95

GEOTEXTILE FOR EMBANKMENT STABILIZATION (GES.)				
STATIONS	GES. TYPE *	ROLL OR MACHINE DIRECTION PERPENDICULAR TO	NUMBER OF LAYERS	MINIMUM GEOTEXTILE LENGTH
138+50± TO 142+00±	GES. 2	-L-	1	TOE TO TOE
142+00± TO 147+28±	GES. 1	-L-	1	TOE TO TOE
143+00± TO 147+28±	GES. 1	-EY6-	2	130 FT
147+52± TO 153+00±	GES. 1	-EY6-	2	130 FT
147+52± TO 157+00±	GES. 1	-L-	1	TOE TO TOE
147+52± TO 157+50±	GES. 2	-L-	1	TOE TO TOE

* FOR GES. TYPE, SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.

ESTIMATED QUANTITIES	
WICK DRAINS	863,000 FT
SELECT GRANULAR MATERIAL, CLASS III (TYPE 1 OR 3)	70,500 CY
GEOTEXTILE FOR SOIL STABILIZATION	70,500 SY
GEOTEXTILE FOR EMBANKMENT STABILIZATION 1	67,800 SY
GEOTEXTILE FOR EMBANKMENT STABILIZATION 2	24,900 SY
SELECT GRANULAR MATERIAL	30,900 CY
BORROW EXCAVATION	20,800 CY
UNCLASSIFIED EXCAVTION	20,800 CY

PREPARED BY: J. PARK	DATE: 10 / 2013
REVIEWED BY: J. BATTS	DATE: 10 / 2013

PROJECT NO.: R-2633BA

BRUNSWICK ***COUNTY***

STATION: 147+38.89 -L-

SHEET 2 OF 4

GEOTECHNICAL ENGINEERING UNIT

[X] ***EASTERN REGIONAL OFFICE***

[ ] ***WESTERN REGIONAL OFFICE***

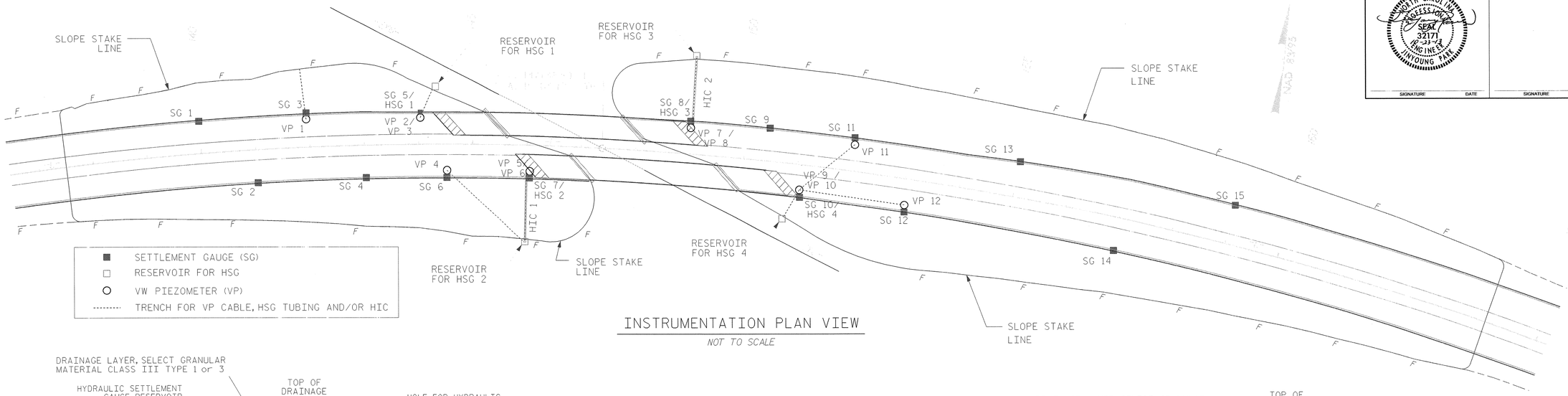
[ ] ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GROUND IMPROVEMENT

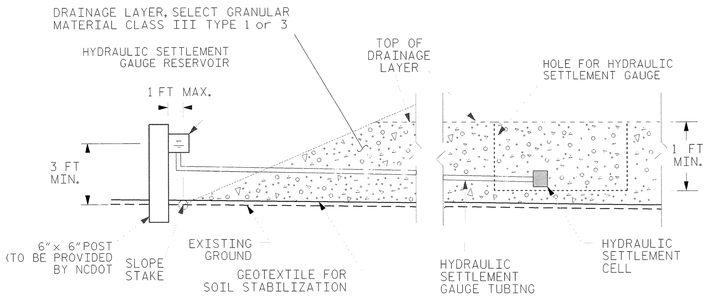
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	--
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	--

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 32171 ENGINEER JINYOUNG PARK	
SIGNATURE DATE	SIGNATURE DATE



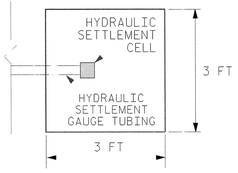
INSTRUMENTATION PLAN VIEW

NOT TO SCALE



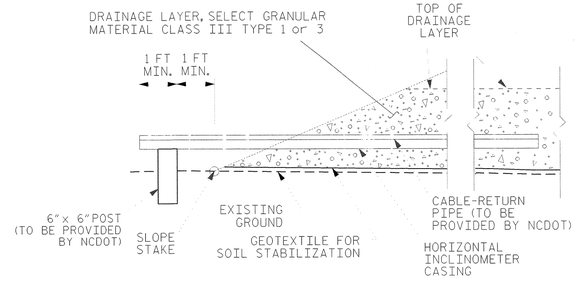
HYDRAULIC SETTLEMENT GAUGE ACCESS BOX TYPICAL SECTION AT EMBANKMENTS

NOT TO SCALE



HOLE FOR HYDRAULIC SETTLEMENT GAUGE TYPICAL PLAN VIEW

NOT TO SCALE



HORIZONTAL CASING ACCESS BOX TYPICAL SECTION AT EMBANKMENTS

NOT TO SCALE

SETTLEMENT GAUGES		
ID	STATION	OFFSET (FT)
SG 1	140+00±	55± LT.
SG 2	141+00±	55± RT.
SG 3	142+00±	55± LT.
SG 4	143+00±	55± RT.
SG 5	144+00±	55± LT.
SG 6	144+75±	55± RT.
SG 7	146+00±	55± RT.
SG 8	149+00±	55± LT.
SG 9	150+25±	55± LT.
SG 10	151+00±	55± RT.
SG 11	152+00±	55± LT.
SG 12	153+00±	55± RT.
SG 13	155+00±	55± LT.
SG 14	157+00±	55± RT.
SG 15	159+00±	55± LT.

VW PIEZOMETERS				
ID	STATION	OFFSET (FT)	ELEVATION (FT)	MIN. CABLE LENGTH (FT)
VP 1	142+00±	55± LT.	32.0±	110.0
VP 2	144+00±	55± LT.	32.0±	80.0
VP 3	144+00±	55± LT.	25.0±	90.0
VP 4	144+50±	55± RT.	32.0±	210.0
VP 5	146+00±	55± RT.	32.0±	140.0
VP 6	146+00±	55± RT.	25.0±	150.0
VP 7	149+00±	55± LT.	32.0±	140.0
VP 8	149+00±	55± LT.	22.0±	150.0
VP 9	151+00±	55± RT.	32.0±	80.0
VP 10	151+00±	55± RT.	22.0±	90.0
VP 11	152+00±	55± LT.	30.0±	210.0
VP 12	153+00±	55± RT.	30.0±	280.0

HYDRAULIC SETTLEMENT GAUGES**		
ID	STATION	OFFSET (FT)
HSG 1	144+00±	55± LT.
HSG 2	146+00±	55± RT.
HSG 3	149+00±	55± LT.
HSG 4	151+00±	55± RT.

** HYDRAULIC SETTLEMENT GAUGES WILL BE PROVIDED BY NCDOT

HORIZONTAL INCLINOMETER CASINGS			
ID	STATION	BEGIN (FT)	END (FT)
HIC 1	146+00±	52± RT.	172± RT.
HIC 2	149+00±	55± LT.	175± LT.

QUANTITIES	
EMBANKMENT SETTLEMENT GAUGES	15 EACH
VW PIEZOMETER	12 EACH
HORIZONTAL INCLINOMETER CASING	270 FT

NOTES

1. FOR VW PIEZOMETERS (VP), HORIZONTAL INCLINOMETER CASINGS (HIC), AND HYDRAULIC SETTLEMENT GAUGUS (HSG), SEE EMBANKMENT INSTRUMENTATION SPECIAL PROVISION.
2. FOR SETTLEMENT GAUGES, SEE EMBANKMENT MONITORING DETAIL SHEET AND EMBANKMENT SETTLEMENT GAUGES PROVISION.

PREPARED BY: J. PARK	DATE: 10 / 2013
REVIEWED BY: J. BATTS	DATE: 10 / 2013

PROJECT NO.: R-2633BA

BRUNSWICK ***COUNTY***

STATION: 147+38.89 -L- / 15+63.72 -EY6-

SHEET 3 OF 4

GEOTECHNICAL ENGINEERING UNIT

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[ ] ***WESTERN REGIONAL OFFICE***

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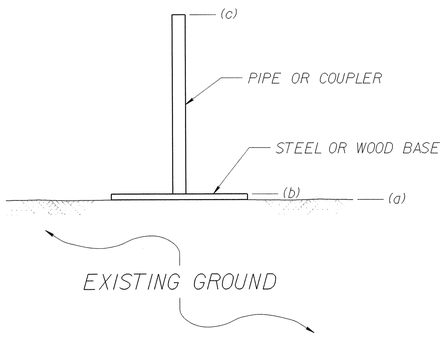
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EMBANKMENT MONITORING - INSTRUMENTATIONS

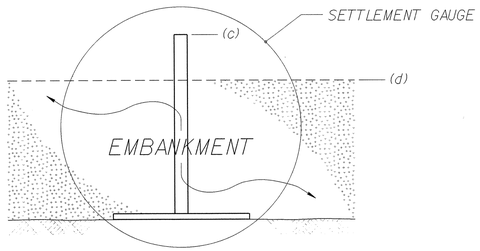
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1	_	_	3	_	_	TOTAL SHEETS
2	_	_	4	_	_	_

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 32171 ENGINEER JINTOUNG PARK	
SIGNATURE DATE	SIGNATURE DATE

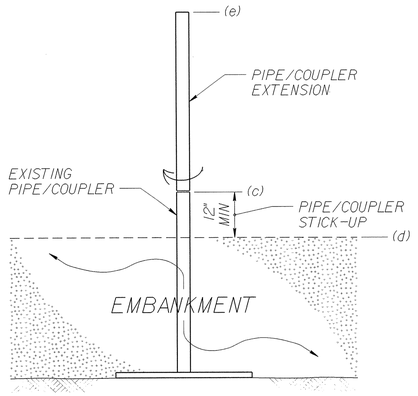
EMBANKMENT MONITORING SEQUENCE



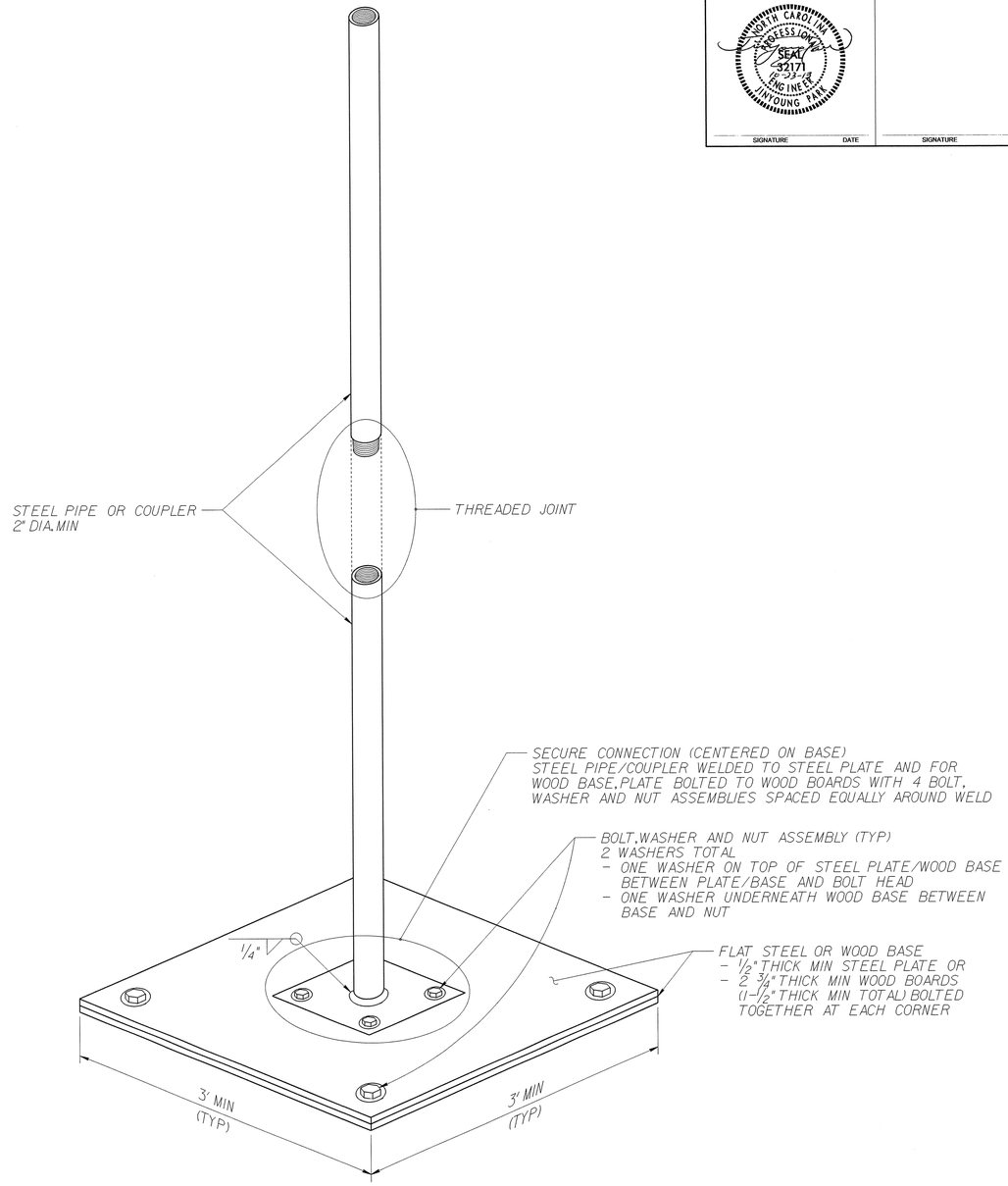
1. PLACE STEEL/WOOD BASE AT APPROXIMATE GAUGE LOCATIONS SHOWN IN THE PLANS AS DETERMINED BY THE ENGINEER.
2. SET BASE ON LEVEL GROUND SO PIPE/COUPLER IS PLUMB.
3. BEFORE CONSTRUCTING EMBANKMENT, NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (a) EXISITING GROUND ELEVATION,
   (b) TOP OF BASE ELEVATION AND
   (c) TOP OF PIPE ELEVATION.



4. MAKE SETTLEMENT GAUGE HIGHLY VISIBLE SO GAUGE IS NOT HIT OR DAMAGED.
5. PLACE AND COMPACT FILL MATERIAL AROUND SETTLEMENT GAUGE WITHOUT DISTURBING GAUGE.
6. NOTIFY ENGINEER WEEKLY TO SURVEY AND RECORD THE FOLLOWING:
   (c) TOP OF PIPE ELEVATION AND
   (d) EMBANKMENT ELEVATION.



7. CONNECT PIPE/COUPLER EXTENSION TO EXISTING PIPE/COUPLER AS NEEDED TO MAINTAIN A PIPE/COUPLER STICK-UP OF AT LEAST 12" WHILE MONITORING SETTLEMENT.
8. SCREW PIPES/COUPLERS TOGETHER HAND TIGHT AND THEN TIGHTEN 2 TO 3 FULL TURNS WITH A WRENCH.
9. NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (c) TOP OF PIPE ELEVATION,
   (d) EMBANKMENT ELEVATION AND
   (e) TOP OF EXTENSION ELEVATION.
10. RETURN TO STEP 4 WITH NEW TOP OF PIPE ELEVATION EQUAL TO TOP OF EXTENSION ELEVATION.



SETTLEMENT GAUGE

NOTES:

1. SEE ROADWAY SUMMARY SHEETS FOR APPROXIMATE SETTLEMENT GAUGE LOCATIONS.
2. FOR STANDARD EMBANKMENT MONITORING, SEE EMBANKMENT SETTLEMENT GAUGES PROVISION.
3. INSTALL SETTLEMENT GAUGES AFTER CLEARING AND GRUBBING GAUGE LOCATIONS AND BEFORE CONSTRUCTING EMBANKMENTS WITH EMBANKMENT MONITORING.

PREPARED BY: J. PARK	DATE: 10 / 2013
REVIEWED BY: J. BATTS	DATE: 10 / 2013

PROJECT NO.: R-2633BA

BRUNSWICK ***COUNTY***

STATION: 147+38.89 -L- / 15+63.72 -EY6-

SHEET 4 OF 4

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

- [X] ***EASTERN REGIONAL OFFICE***
- [ ] ***WESTERN REGIONAL OFFICE***
- [ ] ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EMBANKMENT MONITORING - DETAILS

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C203199

SUMMARY OF QUANTITIES - R-2633BA

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0000700000-N	SP	Lump Sum		FIELD OFFICE
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0008000000-E	200	5	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0015000000-N	205	12	EA	SEALING ABANDONED WELLS
0022000000-E	225	63,600	CY	UNCLASSIFIED EXCAVATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (144+41.79 -L- LT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (145+67.97 -L- RT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (265+00.00 -L- LT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (265+00.00 -L- RT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (281+51.83 -L- LT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (281+51.83 -L- RT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (31+63.68 -Y7-)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (48+79 -Y8-)
0036000000-E	225	16,400	CY	UNDERCUT EXCAVATION
0084000000-E	SP	863,000	LF	WICK DRAINS
0106000000-E	230	2,723,900	CY	BORROW EXCAVATION
0127000000-N	SP	15	EA	EMBANKMENT SETTLEMENT GAUGES
0134000000-E	240	22,600	CY	DRAINAGE DITCH EXCAVATION
0156000000-E	250	8,000	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0177000000-E	250	2,000	SY	BREAKING OF EXISTING ASPHALT PAVEMENT
0192000000-N	260	60	HR	PROOF ROLLING
0194000000-E	SP	70,500	CY	SELECT GRANULAR MATERIAL, CLASS III
0195000000-E	265	87,400	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	130,000	SY	GEOTEXTILE FOR SOIL STABILIZATION
0199000000-E	SP	250	SF	TEMPORARY SHORING
0241000000-E	SP	67,800	SY	GENERIC GRADING ITEM GEOTEXTILE FOR EMBANKMENT STABILIZATION 1
0241000000-E	SP	24,900	SY	GENERIC GRADING ITEM GEOTEXTILE FOR EMBANKMENT STABILIZATION 2
0257000000-E	SP	270	LF	GENERIC GRADING ITEM HORIZONTAL INCLINOMETER CASING
0262000000-N	SP	12	EA	GENERIC GRADING ITEM VW PIEZOMETER
0318000000-E	300	3,530	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES
0320000000-E	300	7,950	SY	FOUNDATION CONDITIONING GEOTEXTILE
0342000000-E	310	48	LF	** SIDE DRAIN PIPE (30")
0342000000-E	310	224	LF	** SIDE DRAIN PIPE (36")
0343000000-E	310	24	LF	15" SIDE DRAIN PIPE
0344000000-E	310	2,256	LF	18" SIDE DRAIN PIPE
0345000000-E	310	220	LF	24" SIDE DRAIN PIPE
0348000000-E	310	50	EA	** SIDE DRAIN PIPE ELBOWS (18")
0354000000-E	310	292	LF	**** RC PIPE CULVERTS, CLASS ***** (30", V)
0354000000-E	310	344	LF	**** RC PIPE CULVERTS, CLASS ***** (36", V)
0372000000-E	310	2,364	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E	310	48	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E	310	772	LF	30" RC PIPE CULVERTS, CLASS III
0390000000-E	310	4,488	LF	36" RC PIPE CULVERTS, CLASS III
0396000000-E	310	792	LF	42" RC PIPE CULVERTS, CLASS III
0402000000-E	310	732	LF	48" RC PIPE CULVERTS, CLASS III
0408000000-E	310	464	LF	54" RC PIPE CULVERTS, CLASS III
0448000000-E	310	708	LF	***** RC PIPE CULVERTS, CLASS IV (48")
0448200000-E	310	728	LF	15" RC PIPE CULVERTS, CLASS IV
0448300000-E	310	4,552	LF	18" RC PIPE CULVERTS, CLASS IV
0448400000-E	310	784	LF	24" RC PIPE CULVERTS, CLASS IV
0448500000-E	310	600	LF	30" RC PIPE CULVERTS, CLASS IV
0448600000-E	310	1,412	LF	36" RC PIPE CULVERTS, CLASS IV
0448700000-E	310	172	LF	42" RC PIPE CULVERTS, CLASS IV
0453000000-E	310	4	EA	** PIPE END SECTION (18")
0546000000-E	310	784	LF	** CAA PIPE CULVERTS, ***** THICK (18", 0.064")
0546000000-E	310	192	LF	** CAA PIPE CULVERTS, ***** THICK (84", 0.105")
0564000000-E	310	14	EA	** CAA PIPE ELBOWS, ***** THICK (18", 0.064")
0995000000-E	340	2,536	LF	PIPE REMOVAL
1000000000-E	462	2,800	SY	6" SLOPE PROTECTION
1011000000-N	500	Lump Sum		FINE GRADING
1099500000-E	505	1,000	CY	SHALLOW UNDERCUT
1099700000-E	505	1,900	TON	CLASS IV SUBGRADE STABILIZATION
1111000000-E	SP	18,750	TON	CLASS IV AGGREGATE STABILIZATION
1121000000-E	520	193,000	TON	AGGREGATE BASE COURSE
1220000000-E	545	5,000	TON	INCIDENTAL STONE BASE
1275000000-E	600	4,879	GAL	PRIME COAT
1330000000-E	607	1,000	SY	INCIDENTAL MILLING
1489000000-E	610	13,300	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-E	610	51,400	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-E	610	7,900	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1503000000-E	610	38,000	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1519000000-E	610	15,700	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1523000000-E	610	37,100	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1575000000-E	620	8,205	TON	ASPHALT BINDER FOR PLANT MIX
1693000000-E	654	1,090	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
1840000000-E	665	93,100	LF	MILLED RUMBLE STRIPS (ASPHALT CONCRETE)
2022000000-E	815	2,500	CY	SUBDRAIN EXCAVATION
2026000000-E	815	7,400	SY	GEOTEXTILE FOR SUBSURFACE DRAINS
2036000000-E	815	1,250	CY	SUBDRAIN COARSE AGGREGATE
2044000000-E	815	7,400	LF	6" PERFORATED SUBDRAIN PIPE
2070000000-N	815	15	EA	SUBDRAIN PIPE OUTLET
2077000000-E	815	90	LF	6" OUTLET PIPE
2199000000-E	SP	355	SF	SANDBAG HEADWALLS
2209000000-E	838	57.2	CY	ENDWALLS
2220000000-E	838	10.4	CY	REINFORCED ENDWALLS
2253000000-E	840	1	CY	PIPE COLLARS
2264000000-E	840	1	CY	PIPE PLUGS
2275000000-E	SP	12	CY	FLOWABLE FILL
2286000000-N	840	148	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	36	LF	MASONRY DRAINAGE STRUCTURES
2354000000-N	840	7	EA	FRAME WITH GRATE, STD 840.22
2364000000-N	840	18	EA	FRAME WITH TWO GRATES, STD 840.16
2364200000-N	840	34	EA	FRAME WITH TWO GRATES, STD 840.20
2365000000-N	840	49	EA	FRAME WITH TWO GRATES, STD 840.22
2367000000-N	840	24	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	3	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	3	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	11	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	2	EA	FRAME WITH COVER, STD 840.54
2407000000-N	840	3	EA	STEEL FRAME WITH TWO GRATES, STD 840.37
2440000000-N	852	2	EA	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN
2451000000-N	852	18	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLET
2549000000-E	846	2,400	LF	2'-6" CONCRETE CURB & GUTTER
2556000000-E	846	14,900	LF	SHOULDER BERM GUTTER
2647000000-E	852	3,010	SY	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)
2724000000-E	857	128	LF	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED
2830000000-N	858	8	EA	ADJUSTMENT OF MANHOLES
3000000000-N	SP	3	EA	IMPACT ATTENUATOR UNIT, TYPE 350
3030000000-E	862	18,500	LF	STEEL BM GUARDRAIL
3045000000-E	862	525	LF	STEEL BM GUARDRAIL, SHOP CURVED
3105000000-N	862	2	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	5	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3210000000-N	862	13	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3270000000-N	SP	20	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3285000000-N	SP	6	EA	GUARDRAIL ANCHOR UNITS, TYPE M-350
3317000000-N	862	34	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	525	LF	REMOVE EXISTING GUARDRAIL
3380000000-E	862	250	LF	TEMPORARY STEEL BM GUARDRAIL
3389100000-N	SP	4	EA	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350
3389200000-E	865	22,500	LF	CABLE GUIDERAIL
3389500000-N	865	10	EA	ADDITIONAL GUIDERAIL POSTS
3389600000-N	865	26	EA	CABLE GUIDERAIL ANCHOR UNITS
3503000000-E	866	50,900	LF	WOVEN WIRE FENCE, 47" FABRIC
3509000000-E	866	3,320	EA	4" TIMBER FENCE POSTS, 7'-6" LONG
3515000000-E	866	610	EA	5" TIMBER FENCE POSTS, 8'-0" LONG
3536000000-E	866	2,700	LF	CHAIN LINK FENCE, 48" FABRIC
3542000000-E	866	230	EA	METAL LINE POSTS FOR 48" CHAIN LINK FENCE
3548000000-E	866	20	EA	METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE
3557000000-E	866	500	LF	ADDITIONAL BARBED WIRE
3564000000-E	866	9	EA	SINGLE GATES, **' HIGH, **' WIDE, **' OPENING (47', 20', 20')
3572000000-E	867	1,600	LF	CHAIN LINK FENCE RESET

SUMMARY OF QUANTITIES - R-2633BA

ItemNumber	Sec #	Quantity	Unit	Description
3574000000-E	867	100	LF	GENERIC FENCING ITEM 40" WOOD RAIL FENCE RESET
3628000000-E	876	320	TON	RIP RAP, CLASS I
3649000000-E	876	1,000	TON	RIP RAP, CLASS B
3656000000-E	876	7,975	SY	GEOTEXTILE FOR DRAINAGE
3659000000-N	SP	5	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4048000000-E	902	70	CY	REINFORCED CONCRETE SIGN FOUNDATIONS
4054000000-E	902	2	CY	PLAIN CONCRETE SIGN FOUNDATIONS
4057000000-E	SP	30	CY	OVERHEAD FOOTING
4060000000-E	903	32,150	LB	SUPPORTS, BREAKAWAY STEEL BEAM
4066000000-E	903	13,868	LB	SUPPORTS, SIMPLE STEEL BEAM
4072000000-E	903	3,592	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4078000000-E	903	40	EA	SUPPORTS, 2-LB STEEL U-CHANNEL
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (19+00 -Y5- EBL)
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (37+30 -Y5- WBL)
4096000000-N	904	13	EA	SIGN ERECTION, TYPE D
4102000000-N	904	90	EA	SIGN ERECTION, TYPE E
4108000000-N	904	32	EA	SIGN ERECTION, TYPE F
4109000000-N	904	8	EA	SIGN ERECTION, TYPE *** (OVERHEAD) (A)
4110000000-N	904	25	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
4111000000-N	904	19	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)
4114000000-N	904	40	EA	SIGN ERECTION, MILEMARKERS
4115000000-N	904	3	EA	SIGN ERECTION, OVERLAY (OVERHEAD)
4116000000-N	904	4	EA	SIGN ERECTION, OVERLAY (GROUND MOUNTED)
4116100000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (A)
4116100000-N	904	5	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (B)
4116200000-N	904	4	EA	SIGN ERECTION, REPOSITION OVERHEAD
4138000000-N	907	2	EA	DISPOSAL OF SUPPORT, STEEL BEAM
4152000000-N	907	7	EA	DISPOSAL OF SIGN SYSTEM, STEEL BEAM
4155000000-N	907	24	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4234000000-N	907	4	EA	DISPOSAL OF SIGN, A OR B (OVERHEAD)
4236000000-N	907	2	EA	DISPOSAL OF SIGN, A, B OR C (GROUND MOUNTED)
4238000000-N	907	1	EA	DISPOSAL OF SIGN, D, E OR F
4400000000-E	1110	682	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	412	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	365	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4420000000-N	1120	2	EA	PORTABLE CHANGEABLE MESSAGE SIGN
4430000000-N	1130	350	EA	DRUMS
4435000000-N	1135	100	EA	CONES
4445000000-E	1145	408	LF	BARRICADES (TYPE III)
4455000000-N	1150	376	DAY	FLAGGER
4465000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
4480000000-N	1165	2	EA	TMA
4485000000-E	1170	390	LF	PORTABLE CONCRETE BARRIER
4516000000-N	1180	100	EA	SKINNY DRUM
4650000000-N	1251	203	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	27,589	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	31,369	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4695000000-E	1205	1,150	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4710000000-E	1205	330	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4725000000-E	1205	58	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4810000000-E	1205	181,911	LF	PAINT PAVEMENT MARKING LINES (4")
4835000000-E	1205	130	LF	PAINT PAVEMENT MARKING LINES (24")
4847000000-E	1205	4,051	LF	POLYUREA PAVEMENT MARKING LINES (4", **********) (HIGHLY REFLECTIVE ELEMENTS)
4847100000-E	1205	130,847	LF	POLYUREA PAVEMENT MARKING LINES (6", *********) (HIGHLY REFLECTIVE ELEMENTS)
4847120000-E	1205	3,492	LF	POLYUREA PAVEMENT MARKING LINES (12", **********) (HIGHLY REFLECTIVE ELEMENTS)
4850000000-E	1205	7,100	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4900000000-N	1251	232	EA	PERMANENT RAISED PAVEMENT MARKERS
4905000000-N	1253	1,067	EA	SNOWPLOWABLE PAVEMENT MARKERS
5325600000-E	1510	182	LF	6" WATER LINE
5326200000-E	1510	6,149	LF	12" WATER LINE
5328000000-E	1510	2,104	LF	30" WATER LINE
5540000000-E	1515	4	EA	6" VALVE
5558000000-E	1515	11	EA	12" VALVE
5560000000-E	1515	6	EA	30" VALVE
5589100000-E	1515	1	EA	1" AIR RELEASE VALVE
5648000000-N	1515	16	EA	RELOCATE WATER METER
5666000000-E	1515	1	EA	FIRE HYDRANT
5672000000-N	1515	8	EA	RELOCATE FIRE HYDRANT
5691300000-E	1520	115	LF	8" SANITARY GRAVITY SEWER
5691400000-E	1520	631	LF	10" SANITARY GRAVITY SEWER
5709400000-E	1520	395	LF	8" FORCE MAIN SEWER
5709600000-E	1520	476	LF	12" FORCE MAIN SEWER
5768000000-N	1520	1	EA	SANITARY SEWER CLEAN-OUT
5775000000-E	1525	3	EA	4' DIA UTILITY MANHOLE
5776000000-E	1525	6	EA	5' DIA UTILITY MANHOLE
5781000000-E	1525	2	LF	UTILITY MANHOLE WALL, 4' DIA
5782000000-E	1525	54	LF	UTILITY MANHOLE WALL, 5' DIA
5801000000-E	1530	348	LF	ABANDON 8" UTILITY PIPE
5802000000-E	1530	761	LF	ABANDON 10" UTILITY PIPE
5804000000-E	1530	5,720	LF	ABANDON 12" UTILITY PIPE
5814000000-E	1530	1,817	LF	ABANDON 30" UTILITY PIPE
5835000000-E	1540	550	LF	*** ENCASEMENT PIPE (42")
5836000000-E	1540	700	LF	24" ENCASEMENT PIPE
5882000000-N	SP	6	EA	GENERIC UTILITY ITEM CONNECTION DETAIL NO 2
5882000000-N	SP	14	EA	GENERIC UTILITY ITEM CONNECTION DETAIL NO 4
5888000000-E	SP	550	LF	GENERIC UTILITY ITEM 42" DUMMY ENCASEMENT PIPE
5888000000-E	SP	280	LF	GENERIC UTILITY ITEM 54" DUMMY ENCASEMENT PIPE
5912000000-N	SP	Lump Sum		GENERIC UTILITY ITEM 4" WATER METER ASSEMBLY
5912000000-N	SP	Lump Sum		GENERIC UTILITY ITEM REMOVE EXISTING 4" WATER METER ASSEMBLY
6000000000-E	1605	125,000	LF	TEMPORARY SILT FENCE
6006000000-E	1610	3,025	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	6,000	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	6,000	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	300	ACR	TEMPORARY MULCHING
6018000000-E	1620	7,850	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	32	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	30,000	LF	TEMPORARY SLOPE DRAINS
6029000000-E	SP	15,600	LF	SAFETY FENCE
6030000000-E	1630	100,000	CY	SILT EXCAVATION
6036000000-E	1631	100,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	2,600	SY	COIR FIBER MAT
6038000000-E	SP	2,350	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	9,550	LF	1/4" HARDWARE CLOTH
6043000000-E	SP	950	SY	LOW PERMEABILITY GEOTEXTILE
6045000000-E	SP	100	LF	*** TEMPORARY PIPE (24")
6046000000-E	1636	50	LF	TEMPORARY PIPE FOR STREAM CROSSING
6048000000-E	SP	25	SY	FLOATING TURBIDITY CURTAIN
6069000000-E	1638	400	CY	STILLING BASINS
6070000000-N	1639	6	EA	SPECIAL STILLING BASINS
6071012000-E	SP	4,000	LF	COIR FIBER WATTLE
6071020000-E	SP	925	LB	POLYACRYLAMIDE (PAM)
6071030000-E	1640	8,000	LF	COIR FIBER BAFFLE
6071050000-E	SP	29	EA	*** SKIMMER (1-1/2")
6071050000-E	SP	4	EA	*** SKIMMER (2")
6071050000-E	SP	1	EA	*** SKIMMER (3")
6084000000-E	1660	300	ACR	SEEDING & MULCHING
6087000000-E	1660	120	ACR	MOWING
6090000000-E	1661	3,600	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	19.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	9,525	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	285.5	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	255	LF	IMPERVIOUS DIKE
6114500000-N	1667	225	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	150	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	5	ACR	REFORESTATION
6126000000-E	SP	0.14	ACR	STREAMBANK REFORESTATION
6135000000-E	SP	20	ACR	GENERIC EROSION CONTROL ITEM COMPOST BLANKET
7060000000-E	1705	1,275	LF	SIGNAL CABLE
7120000000-E	1705	8	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7132000000-E	1705	2	EA	VEHICLE SIGNAL HEAD (12", 4 SECTION)
7252000000-E	1710	390	LF	MESSENGER CABLE (1/4")
7279000000-E	1715	1,450	LF	TRACER WIRE
7300000000-E	1715	1,040	LF	UNPAVED TRENCHING (**********) (1, 2")
7300000000-E	1715	160	LF	UNPAVED TRENCHING (**********) (2, 2")
7300000000-E	1715	1,815	LF	UNPAVED TRENCHING (**********) (2,1-1/2")
7301000000-E	1715	450	LF	DIRECTIONAL DRILL (**********) (1, 2")
7301000000-E	1715	1,585	LF	DIRECTIONAL DRILL (**********) (2, 1-1/2")
7301000000-E	1715	180	LF	DIRECTIONAL DRILL (**********) (2, 2")
7324000000-N	1716	32	EA	JUNCTION BOX (STANDARD SIZE)
7348000000-N	1716	5	EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
7360000000-N	1720	7	EA	WOOD POLE
7372000000-N	1721	2	EA	GUY ASSEMBLY
7384000000-E	1722	5	EA	**** RISER WITH ********** (1-1/2", WEATHERHEAD)
7444000000-E	1725	895	LF	INDUCTIVE LOOP SAWCUT

SUMMARY OF QUANTITIES - R-2633BA

ItemNumber	Sec #	Quantity	Unit	Description
7456000000-E	1726	1,525	LF	LEAD-IN CABLE (**********) (14-2)
7485000000-N	SP	1	EA	WIRELESS MAGNETIC SENSOR VEHI-CLE DETECTOR SYSTEM
7516000000-E	1730	1,550	LF	COMMUNICATIONS CABLE (**FIBER) (12)
7552000000-N	1731	2	EA	INTERCONNECT CENTER
7564000000-N	1732	2	EA	FIBER-OPTIC TRANSCEIVER, DROP & REPEAT
7566000000-N	1733	5	EA	DELINEATOR MARKER
7588000000-N	SP	1	EA	METAL POLE WITH SINGLE MAST ARM
7590000000-N	SP	1	EA	METAL POLE WITH DUAL MAST ARM
7613000000-N	SP	2	EA	SOIL TEST
7614100000-E	SP	16	CY	DRILLED PIER FOUNDATION
7631000000-N	SP	2	EA	MAST ARM WITH METAL POLE DE-SIGN
7684000000-N	1750	1	EA	SIGNAL CABINET FOUNDATION
7756000000-N	1751	1	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	5	EA	DETECTOR CARD (TYPE 2070L)
7901000000-N	1753	1	EA	CABINET BASE EXTENDER
7980000000-N	SP	60	EA	GENERIC SIGNAL ITEM 5/8" X 10' GROUNDING ELECTRODE
7980000000-N	SP	8	EA	GENERIC SIGNAL ITEM CCTV CAMERA ASSEMBLY
7980000000-N	SP	7	EA	GENERIC SIGNAL ITEM CCTV WOOD POLE
7980000000-N	SP	6	EA	GENERIC SIGNAL ITEM CENTRAL MEDIA CONVERTER
7980000000-N	SP	6	EA	GENERIC SIGNAL ITEM DMS
7980000000-N	SP	5	EA	GENERIC SIGNAL ITEM DMS ACCESS LADDER
7980000000-N	SP	4	EA	GENERIC SIGNAL ITEM DMS PEDESTAL STRUCTURE (TYPE A)
7980000000-N	SP	1	EA	GENERIC SIGNAL ITEM DMS PEDESTAL STRUCTURE (TYPE B)
7980000000-N	SP	12	EA	GENERIC SIGNAL ITEM EQUIPMENT CABINET DISCONNECT
7980000000-N	SP	8	EA	GENERIC SIGNAL ITEM FIELD EQUIPMENT CABINET
7980000000-N	SP	9	EA	GENERIC SIGNAL ITEM METER BASE/DISCONNECT COMBINA-TION PANEL
7980000000-N	SP	1	EA	GENERIC SIGNAL ITEM SOLAR POWER ASSEMBLY
7980000000-N	SP	4	EA	GENERIC SIGNAL ITEM VIDEO ETHERNET DECODER
7980000000-N	SP	8	EA	GENERIC SIGNAL ITEM VIDEO ETHERNET ENCODER
7980000000-N	SP	4	EA	GENERIC SIGNAL ITEM WOOD PEDESTAL
7985000000-N	SP	Lump Sum		GENERIC SIGNAL ITEM INTEGRATION AND CONFIGURATION
7990000000-E	SP	520	LF	GENERIC SIGNAL ITEM #4 SOLID BARE GROUNDING CON-DUCTOR
7990000000-E	SP	1,895	LF	GENERIC SIGNAL ITEM 3-WIRE COPPER FEEDER CONDUC-TORS
7990000000-E	SP	125	LF	GENERIC SIGNAL ITEM 3-WIRE COPPER SERVICE ENTRANCE CONDUCTORS
7990000000-E	SP	1,630	LF	GENERIC SIGNAL ITEM 4-WIRE COPPER FEEDER CONDUC-TORS
7992000000-E	SP	40	CY	GENERIC SIGNAL ITEM ITS OVERHEAD FOOTING

COMPUTED BY: WCB DATE: 7/6/2012

CHECKED BY: BKE DATE: 9/24/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2633BA	3-A

44003WS

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

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL
-LREV- 340+51	CL	04-01		76.2			
-LREV- 340+51	CL	04-01	04-02		73.4	64.0	
-LREV- 344+75	CL	04-04		74.9			
-LREV- 344+75	CL	04-04	04-05		72.1	67.0	
-LREV- 347+53	CL	04-06					
-LREV- 347+88	CL	04-07					
-LREV- 348+25	CL	04-08		73.8			
-LREV- 348+25	LT	04-08	04-09		71.1	67.0	
-RP_A1REV 22+01.00	CL	04-11					
-RP_D1REV 17+93	CL	04-12					
-LREV- 353+25	CL	05-01		72.5			
-LREV- 353+25	CL	05-01	05-02		68.2	68.0	X
-LREV- 354+37	CL	05-03					
-LREV- 354+74	CL	05-04					
-LREV- 355+11	CL	05-05					
-LREV- 357+00	CL	05-06		74.7			
-LREV- 357+00	LT	05-06	05-07		72.0	68.9	
-LREV- 362+00	LT	05-08		78.0			
-LREV- 362+00	LT	05-08	05-09		75.2	70.6	
-LREV- 366+00	LT	05-10		79.4			
-LREV- 366+00	LT	05-10	05-11		76.7	71.8	
-LREV- 374+67	CL	06-01					
-LREV- 375+30	CL	06-02		78.9			
-LREV- 375+30	CL	06-02	06-03		76.2	71.5	
-L- 89+00	CL	07-01		77.2			
-L- 89+00	CL	07-01	07-02		74.4	69.0	
-L- 94+70	CL	07-03		74.8			
-L- 94+70	CL	07-03	07-04		72.0	67.4	
-L- 100+40	CL	08-01		67.4			
-L- 100+40	CL	08-01	08-02		64.6	58.2	
-L- 106+10	CL	08-03		58.2			
-L- 106+10	CL	08-03	08-04		55.5	55.2	
-L- 106+10	RT	08-04		59.9			
-L- 106+10	RT	08-04	08-05		55.2	46.9	
-L- 110+60	CL	08-06					
-L- 111+85	CL	08-07		52.2			
-L- 111+85	CL	08-07	08-08		49.4	45.0	
-L- 112+81	CL	09-01					
-L- 115+30	CL	09-02					
-L- 116+45.00	LT	09-03		54.1			
-L- 116+45.00	LT	09-03	09-04		51.1	43.5	
-L- 117+60	CL	09-05		49.8			
-L- 117+60	CL	09-05	09-06		47.0	43.3	
-L- 119+25	CL	09-07					
-L- 122+80	CL	09-08					
-L- 123+35	CL	09-09		47.4			
-L- 123+35	CL	09-09	09-10		44.7	41.3	
-L- 126+20	CL	10-01					
-L- 129+09	CL	10-02		45.5			
SHEET TOTALS							

STATION	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	CAA PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109
-LREV- 340+51																				
-LREV- 340+51																				
-LREV- 344+75																				
-LREV- 344+75																				
-LREV- 347+53																				
-LREV- 347+88																				
-LREV- 348+25																				
-LREV- 348+25																				
-RP_A1REV 22+01.00																				
-RP_D1REV 17+93																				
-LREV- 353+25																				
-LREV- 353+25																				
-LREV- 354+37																				
-LREV- 354+74																				
-LREV- 355+11																				
-LREV- 357+00																				
-LREV- 357+00																				
-LREV- 362+00																				
-LREV- 362+00																				
-LREV- 366+00																				
-LREV- 366+00																				
-LREV- 374+67																				
-LREV- 375+30																				
-LREV- 375+30																				
-L- 89+00																				
-L- 89+00																				
-L- 94+70																				
-L- 94+70																				
-L- 100+40																				
-L- 100+40																				
-L- 106+10																				
-L- 106+10																				
-L- 106+10																				
-L- 106+10			44							X										
-L- 110+60																				
-L- 111+85																				
-L- 111+85																				
-L- 112+81																				
-L- 115+30																				
-L- 116+45.00																				
-L- 116+45.00			32							X										
-L- 117+60																				
-L- 117+60																				
-L- 119+25																				
-L- 122+80																				
-L- 123+35																				
-L- 123+35																				
-L- 126+20																				
-L- 129+09																				
SHEET TOTALS			76																	

STATION	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
-LREV- 340+51																
-LREV- 340+51			124													
-LREV- 344+75																
-LREV- 344+75			100													
-LREV- 347+53														248		
-LREV- 347+88														240		
-LREV- 348+25																
-LREV- 348+25			108													
-RP_A1REV 22+01.00						100										
-RP_D1REV 17+93																88
-LREV- 353+25																
-LREV- 353+25			76													
-LREV- 354+37						336										
-LREV- 354+74						336										
-LREV- 355+11						336										
-LREV- 357+00																
-LREV- 357+00			112													
-LREV- 362+00																
-LREV- 362+00			104													
-LREV- 366+00																
-LREV- 366+00			104													
-LREV- 374+67						204										
-LREV- 375+30																
-LREV- 375+30			88													
-L- 89+00																
-L- 89+00			104													
-L- 94+70																
-L- 94+70			100													
-L- 100+40																
-L- 100+40			100													
-L- 106+10																
-L- 106+10											56					
-L- 106+10																
-L- 106+10																
-L- 110+60						188										
-L- 111+85																
-L- 111+85			92													
-L- 112+81						232										
-L- 115+30						196										
-L- 116+45.00																
-L- 116+45.00																
-L- 117+60																
-L- 117+60			80													
-L- 119+25						188										
-L- 122+80						176										
-L- 123+35																
-L- 123+35			84													
-L- 126+20														168		
-L- 129+09																
SHEET TOTALS			1,376			2,292					56			656		88

STATION	30" R.C. PIPE (CLASS V)	36" R.C. PIPE (CLASS V)	****" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
-LREV- 340+51								1								
-LREV- 340+51																
-LREV- 344+75								1								
-LREV- 344+75																
-LREV- 347+53																
-LREV- 347+88																
-LREV- 348+25								1								
-LREV- 348+25																
-RP_A1REV 22+01.00																
-RP_D1REV 17+93						6.0										
-LREV- 353+25								1								
-LREV- 353+25																
-LREV- 354+37																
-LREV- 354+74																
-LREV- 355+11																
-LREV- 357+00								1								
-LREV- 357+00																
-LREV- 362+00								1								
-LREV- 362+00																
-LREV- 366+00								1								
-LREV- 366+00																
-LREV- 374+67																
-LREV- 375+30								1								
-LREV- 375+30																
-L- 89+00								1								
-L- 89+00																
-L- 94+70								1								
-L- 94+70																
-L- 100+40								1								
-L- 100+40																
-L- 106+10								1								
-L- 106+10																
-L- 106+10								1								
-L- 106+10																
-L- 110+60																
-L- 111+85								1								
-L- 111+85																
-L- 112+81																
-L- 115+30																
-L- 116+45.00								1								
-L- 116+45.00																
-L- 117+60								1								
-L- 117+60																
-L- 119+25																
-L- 122+80																
-L- 123+35								1								
-L- 123+35																
-L- 126+20																
-L- 129+09								1								
SHEET TOTALS						6.0		18								

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATES STD. 840.20 (WIDE SLOT/FLAT)	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22 (W.S./SAG)	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.36	M.H. FRAME AND COVER STD. 840.54	PARALLEL END SECTION, STD. 310.04	O.T.C.B. STD. 840.04 OR 840.05	STEEL FRANE WITH TWO GRATES 840.37	T.B.G.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CAA PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
-LREV- 340+51				1				1																
-LREV- 340+51																								PREFORMED SCOUR HOLE
-LREV- 344+75				1				1																
-LREV- 344+75																								PREFORMED SCOUR HOLE
-LREV- 347+53																								EQUALIZER PIPE
-LREV- 347+88																								EQUALIZER PIPE
-LREV- 348+25				1				1																
-LREV- 348+25																								
-RP_A1REV 22+01.00																								EQUALIZER PIPE
-RP_D1REV 17+93																								
-LREV- 353+25			1				1	1																3 G.D.I.
-LREV- 353+25																								
-LREV- 354+37																								EQUALIZER PIPE
-LREV- 354+74																								EQUALIZER PIPE
-LREV- 355+11																								EQUALIZER PIPE
-LREV- 357+00				1				1																
-LREV- 357+00																								
-LREV- 362+00				1				1																
-LREV- 362+00																								
-LREV- 366+00				1				1																
-LREV- 366+00																								
-LREV- 374+67																								EQUALIZER PIPE
-LREV- 375+30				1				1																
-LREV- 375+30																								
-L- 89+00				1				1																
-L- 89+00																								
-L- 94+70				1				1																
-L- 94+70																								
-L- 100+40				1				1																
-L- 100+40																								
-L- 106+10				1				1																
-L- 106+10																								
-L- 106+10				1		1																		
-L- 106+10																			2 @ 18"					2-18" ELBOWS
-L- 110+60																								EQUALIZER PIPE
-L- 111+85				1				1																
-L- 111+85																								
-L- 112+81																								EQUALIZER PIPE
-L- 115+30																								EQUALIZER PIPE
-L- 116+45.00				1		1																		
-L- 116+45.00																								
-L- 117+60				1				1																
-L- 117+60																								
-L- 119+25																								EQUALIZER PIPE
-L- 122+80																								EQUALIZER PIPE
-L- 123+35				1				1																
-L- 123+35																								
-L- 126+20																								EQUALIZER PIPE
-L- 129+09			1				1	1																3 G.D.I.
SHEET TOTALS			2	16		2	2	16											2 @ 18"					

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

COMPUTED BY: WCB DATE: 7/6/2012

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

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-L- 129+09	CL	10-02	10-03		41.2	40.0													
-L- 129+74	CL	10-04																	
-L- 132+00	CL	10-05																	
-L- 133+10	CL	10-06		47.1															
-L- 133+10	CL	10-06	10-07		44.3	40.0													
-L- 137+00	CL	10-08																	
-L- 137+70	CL	10-09		52.9															
-L- 137+70	CL	10-09	10-10		50.1	49.8													
-L- 137+70	RT	10-10		54.5															
-L- 137+50	RT	10-10	10-11		49.8	49.7	X												
-L- 137+50	RT	10-11		54.0															
-L- 137+50	RT	10-11	10-12		49.7	38.6													
-L- 136+00	RT	10-12		51.3															
-L- 136+00	RT	10-12	10-13		48.0	40.9				28							X		
-L- 142+44	CL	11-01																	
-L- 144+10	LT	11-02		73.1															
-L- 144+10	LT	11-02	11-03		68.1	67.2													
-L- 144+10	CL	11-03		70.2															
-L- 144+10	CL	11-03	11-04		67.2	66.9													
-L- 144+10	RT	11-04		71.8															
-L- 144+10	RT	11-04	11-05		66.9	66.2													
-L- 145+73	RT	11-05		74.5															
-L- 145+73	RT	11-05	11-06		66.2	38.0													
-L- 151+55	RT	11-07		75.5															
-L- 151+55	RT	11-07	11-08		72.5	70.8													
-L- 151+55	CL	11-08		73.8															
-L- 151+55	CL	11-08	11-09		70.8	70.7				12							X		
-L- 151+55	LT	11-09		76.8															
-L- 151+55	LT	11-09	11-10		70.7	42.0													
-L- 153+43	CL	12-01																	
-L- 156+00	CL	12-02																	
-L- 158+00	CL	12-03		61.3															
-L- 158+00	CL	12-03	12-04		58.5	58.2													
-L- 158+00	RT	12-04		62.9															
-L- 158+00	RT	12-04	12-05		58.2	40.3													
-L- 159+66	CL	12-06																	
-L- 162+00	CL	12-07																	
-L- 163+30	RT	12-08		51.5															
-L- 163+30	RT	12-08	12-10		46.7	46.7													
-L- 163+40	CL	12-09		49.7															
-L- 163+40	CL	12-09	12-10		47.0	46.7													
-L- 163+40	RT	12-10		51.3															
-L- 163+40	RT	12-10	12-11		46.7	38.9				40							X		
-L- 164+95	LT	12-12		50.8															
-L- 164+95	LT	12-12	12-13		47.8	39.5				32							X		
-L- 166+41	CL	13-01																	
-L- 168+37	RT	13-02	13-03		36.7	36.5													
-L- 168+41	CL	13-03		43.3															
-L- 168+41	CL	13-03	13-04		36.5	36.3													
-L- 171+50	CL	13-05		42.0															
-L- 171+50	CL	13-05	13-06		39.2	36.5													
SHEET TOTALS										112									

STATION	FROM	TO	CAA PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
-L- 129+09	10-02	10-03											80													
-L- 129+74	10-04																								172	
-L- 132+00	10-05																							176		
-L- 133+10	10-06																									
-L- 133+10	10-06	10-07																			80					
-L- 137+00	10-08																	268								
-L- 137+70	10-09																									
-L- 137+70	10-09	10-10																			52					
-L- 137+70	10-10																									
-L- 137+50	10-10	10-11																			16					
-L- 137+50	10-11																									
-L- 137+50	10-11	10-12																			140					
-L- 136+00	10-12																									
-L- 136+00	10-12	10-13																								
-L- 142+44	11-01																									620
-L- 144+10	11-02																									
-L- 144+10	11-02	11-03																			12					
-L- 144+10	11-03																									
-L- 144+10	11-03	11-04																			52					
-L- 144+10	11-04																									
-L- 144+10	11-04	11-05																			112					
-L- 145+73	11-05																									
-L- 145+73	11-05	11-06																			104					
-L- 151+55	11-07																									
-L- 151+55	11-07	11-08																			52					
-L- 151+55	11-08																									
-L- 151+55	11-08	11-09																								
-L- 151+55	11-09																									
-L- 151+55	11-09	11-10			152																					
-L- 153+43	12-01																									
-L- 156+00	12-02																							308		
-L- 158+00	12-03																									
-L- 158+00	12-03	12-04																			56					
-L- 158+00	12-04																									
-L- 158+00	12-04	12-05			72																					
-L- 159+66	12-06																							272		
-L- 162+00	12-07															240										
-L- 163+30	12-08																									
-L- 163+30	12-08	12-10																			8					
-L- 163+40	12-09																									
-L- 163+40	12-09	12-10																			52					
-L- 163+40	12-10																									
-L- 163+40	12-10	12-11																								
-L- 164+95	12-12																									
-L- 164+95	12-12	12-13																								
-L- 166+41	13-01															204										
-L- 168+37	13-02	13-03														112										
-L- 168+41	13-03																									
-L- 168+41	13-03	13-04														132										
-L- 171+50	13-05																									
-L- 171+50	13-05	13-06																			104					
SHEET TOTALS					224								80			688		268			840			756	172	620

STATION	FROM	TO	30" R.C. PIPE (CLASS V)	36" R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
-L- 129+09	10-02	10-03																
-L- 129+74	10-04							4.5										
-L- 132+00	10-05																	
-L- 133+10	10-06									1								
-L- 133+10	10-06	10-07																
-L- 137+00	10-08							6.0										
-L- 137+70	10-09									1								
-L- 137+70	10-09	10-10																
-L- 137+70	10-10									1								
-L- 137+50	10-10	10-11																
-L- 137+50	10-11									1								
-L- 137+50	10-11	10-12																
-L- 136+00	10-12									1								
-L- 136+00	10-12	10-13																
-L- 142+44	11-01							6.0										
-L- 144+10	11-02									1	0.8							
-L- 144+10	11-02	11-03																
-L- 144+10	11-03									1								
-L- 144+10	11-03	11-04																
-L- 144+10	11-04									1	1.3							
-L- 144+10	11-04	11-05																
-L- 145+73	11-05									1	3.2							
-L- 145+73	11-05	11-06																
-L- 151+55	11-07									1								
-L- 151+55	11-07	11-08																
-L- 151+55	11-08									1								
-L- 151+55	11-08	11-09																
-L- 151+55	11-09									1	1							
-L- 151+55	11-09	11-10																
-L- 153+43	12-01			344														
-L- 156+00	12-02																	
-L- 158+00	12-03									1								
-L- 158+00	12-03	12-04																
-L- 158+00	12-04									1								
-L- 158+00	12-04	12-05																
-L- 159+66	12-06																	
-L- 162+00	12-07																	
-L- 163+30	12-08									1								
-L- 163+30	12-08	12-10																
-L- 163+40	12-09									1								
-L- 163+40	12-09	12-10																
-L- 163+40	12-10									1								
-L- 163+40	12-10	12-11																
-L- 164+95	12-12									1								
-L- 164+95	12-12	12-13																
-L- 166+41	13-01																	
-L- 168+37	13-02	13-03																
-L- 168+41	13-03									1	1.8							
-L- 168+41	13-03	13-04																
-L- 171+50	13-05									1								
-L- 171+50	13-05	13-06																
SHEET TOTALS				344				**16.5**		20	8.1							

STATION	FROM	TO	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. FRAME WITH GRATES STD. 840.20 (WIDE SLOT/FLAT)	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22 (W.S./SAG)	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.36	M.H. FRAME AND COVER STD. 840.54	PARALLEL END SECTION, STD. 310.04	O.T.C.B. STD. 840.04 OR 840.05	STEEL FRANE WITH TWO GRATES 840.37	T.B.G.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CAA PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
-L- 129+09	10-02	10-03																								
-L- 129+74	10-04																									
-L- 132+00	10-05																									EQUALIZER PIPE
-L- 133+10	10-06					1				1																
-L- 133+10	10-06	10-07																								PREFORMED SCOUR HOLE
-L- 137+00	10-08																									
-L- 137+70	10-09					1				1																
-L- 137+70	10-09	10-10																								
-L- 137+70	10-10					1		1																		
-L- 137+50	10-10	10-11																								
-L- 137+50	10-11					1		1																		
-L- 137+50	10-11	10-12																								
-L- 136+00	10-12					1		1																		
-L- 136+00	10-12	10-13																			2 @ 18"					2-18" ELBOWS
-L- 142+44	11-01																									
-L- 144+10	11-02													1				1								
-L- 144+10	11-02	11-03																								
-L- 144+10	11-03					1				1																
-L- 144+10	11-03	11-04																								
-L- 144+10	11-04					1		1																		
-L- 144+10	11-04	11-05																								
-L- 145+73	11-05					1		1																		
-L- 145+73	11-05	11-06																			2 @ 18"					2-18" ELBOWS
-L- 151+55	11-07					1		1																		
-L- 151+55	11-07	11-08																								
-L- 151+55	11-08					1				1																
-L- 151+55	11-08	11-09																								
-L- 151+55	11-09													1				1								
-L- 151+55	11-09	11-10																				2 @ 18"				2-18" ELBOWS
-L- 153+43	12-01																									EQUALIZER PIPE
-L- 156+00	12-02																									EQUALIZER PIPE
-L- 158+00	12-03					1				1																
-L- 158+00	12-03	12-04																								
-L- 158+00	12-04					1		1																		
-L- 158+00	12-04	12-05																				2 @ 18"				2-18" ELBOWS
-L- 159+66	12-06																									EQUALIZER PIPE
-L- 162+00	12-07																									EQUALIZER PIPE
-L- 163+30	12-08					1		1																		
-L- 163+30	12-08	12-10																								
-L- 163+40	12-09					1				1																
-L- 163+40	12-09	12-10																								
-L- 163+40	12-10					1		1																		
-L- 163+40	12-10	12-11																			2 @ 18"					2-18" ELBOWS
-L- 164+95	12-12					1		1																		
-L- 164+95	12-12	12-13																								
-L- 166+41	13-01																									EQUALIZER PIPE
-L- 168+37	13-02	13-03																								
-L- 168+41	13-03					1				1																
-L- 168+41	13-03	13-04																							32	REMOVE 15" RCP
-L- 171+50	13-05					1				1																
-L- 171+50	13-05	13-06																								
SHEET TOTALS						18		10		8				2				2			6 @ 18"	4 @ 18"			32	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

WSRAL-1003A

COMPUTED BY: WCB DATE: 7/6/2012

CHECKED BY: BKE DATE: 9/24/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2633BA	3-C

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

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

STATION (SIZE / THICKNESS OR GAUGE)	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-L- 177+10	CL	13-07																	
-L- 177+10	CL	13-07	13-08																
-L- 176+10	CL	13-08		40.0															
-L- 176+10	CL	13-08	13-09		35.5	35.0	X												
-RP_B2- 22+77	CL	13-10																	
-LP_B2- 12+25	RT	13-11		39.3															
-LP_B2- 12+25	RT	13-11	13-13		36.3	35.8													
-LP_B2- 13+00	RT	13-12		39.9															
-LP_B2- 12+75	RT	13-12	13-13		36.9	35.8													
-LP_B2- 13+00	RT	13-13		39.0															
-LP_B2- 13+00	RT	13-13	13-14		35.8	34.4				36							X		
-LP_B2- 16+80	RT	13-15		38.4															
-LP_B2- 16+80	RT	13-15	13-16		35.4	35.2													
-LP_B2- 17+30	RT	13-16		38.3															
-LP_B2- 17+30	RT	13-16	13-19		34.9	34.7													
-RP_B2- 27+00	LT	13-17		41.1															
-RP_B2- 27+00	RT	13-17	13-18		38.1	35.9													
-LP_B2- 18+42	RT	13-18		38.9															
-LP_B2- 18+42	RT	13-18	13-19		35.9	34.9													
-LP_B2- 17+85	RT	13-19		38.4															
-LP_B2- 17+85	RT	13-19	13-20		34.7	34.5				28							X		
-RP_C2- 18+03	RT	13-21		46.9															
-RP_C2- 18+03	RT	13-21	13-22		44.2	34.6				44							X		
-RP_C2- 22+90	CL	13-23																	
-L- 182+56.50	CL	13-24		38.5															
-L- 182+56.50	CL	13-24	13-25		35.7	35.0													
-L- 181+00	CL	13-25		38.9															
-L- 181+00	CL	13-25	13-26		35.0	33.2													
-Y7- 25+55	RT	13-27		45.5															
-Y7- 25+55	RT	13-27	13-28		36.8	33.2													
-Y7- 26+75	RT	13-29		50.2															
-Y7- 26+75	RT	13-29	13-30		47.0	46.8													
-Y7- 27+03	RT	13-30		51.4															
-Y7- 27+03	RT	13-30	13-31		46.8	46.8													
-Y7- 27+03	RT	13-31		52.0															
-Y7- 27+03	RT	13-31	13-32		46.8	46.6													
-Y7- 27+03	LT	13-32		62.9															
-Y7- 27+03	LT	13-32	13-33		46.6	32.4				60							X		
-Y7- 28+22	CL	13-34																	
-SVRD7- 19+05	CL	13-35																	
-Y7- 29+33	RT	13-36		61.3															
-Y7- 29+33	RT	13-36	13-39		58.5	57.4													
-Y7- 30+25	RT	13-37		63.6															
-Y7- 30+25	RT	13-37	13-38		60.8	59.7													
-Y7- 30+25	LT	13-38		62.9															
-Y7- 30+25	LT	13-38	13-39		59.7	57.4													
-Y7- 29+33	LT	13-39		60.6															
-Y7- 29+33	LT	13-39	13-40		57.4	32.5				88									
-Y7- 33+15	RT	13-41		68.0															
-Y7- 33+15	RT	13-41	13-42		65.0	64.8													
SHEET TOTALS										256									

STATION	FROM	TO	CAA PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
-L- 177+10	13-07																									
-L- 177+10	13-07	13-08																			92					
-L- 176+10	13-08																									
-L- 176+10	13-08	13-09																			96					
-RP_B2- 22+77	13-10														108											
-LP_B2- 12+25	13-11																									
-LP_B2- 12+25	13-11	13-13																			48					
-LP_B2- 13+00	13-12																									
-LP_B2- 12+75	13-12	13-13																			24					
-LP_B2- 13+00	13-13																									
-LP_B2- 13+00	13-13	13-14																								
-LP_B2- 16+80	13-15																									
-LP_B2- 16+80	13-15	13-16																			48					
-LP_B2- 17+30	13-16																									
-LP_B2- 17+30	13-16	13-19																			56					
-RP_B2- 27+00	13-17																									
-RP_B2- 27+00	13-17	13-18																			40					
-LP_B2- 18+42	13-18																									
-LP_B2- 18+42	13-18	13-19																			56					
-LP_B2- 17+85	13-19																									
-LP_B2- 17+85	13-19	13-20																								
-RP_C2- 18+03	13-21																									
-RP_C2- 18+03	13-21	13-22																								
-RP_C2- 22+90	13-23																									
-L- 182+56.50	13-24																									
-L- 182+56.50	13-24	13-25																			152					
-L- 181+00	13-25																									
-L- 181+00	13-25	13-26																			108					
-Y7- 25+55	13-27																									
-Y7- 25+55	13-27	13-28											68													
-Y7- 26+75	13-29																									
-Y7- 26+75	13-29	13-30																			28					
-Y7- 27+03	13-30																									
-Y7- 27+03	13-30	13-31																			24					
-Y7- 27+03	13-31																									
-Y7- 27+03	13-31	13-32																			32					
-Y7- 27+03	13-32																									
-Y7- 27+03	13-32	13-33																								
-Y7- 28+22	13-34																					204				
-SVRD7- 19+05	13-35														72											
-Y7- 29+33	13-36																									
-Y7- 29+33	13-36	13-39																			28					
-Y7- 30+25	13-37																									
-Y7- 30+25	13-37	13-38																			28					
-Y7- 30+25	13-38																									
-Y7- 30+25	13-38	13-39																			84					
-Y7- 29+33	13-39																									
-Y7- 29+33	13-39	13-40																								
-Y7- 33+15	13-41																									
-Y7- 33+15	13-41	13-42																			24					
SHEET TOTALS													68		180						968	204				

STATION	FROM	TO	30" R.C. PIPE (CLASS V)	36" R.C. PIPE (CLASS V)	****RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
-L- 177+10	13-07									1								
-L- 177+10	13-07	13-08																
-L- 176+10	13-08									1								
-L- 176+10	13-08	13-09																
-RP_B2- 22+77	13-10																	
-LP_B2- 12+25	13-11									1			1		1			
-LP_B2- 12+25	13-11	13-13																
-LP_B2- 13+00	13-12									1			1			1		
-LP_B2- 12+75	13-12	13-13																
-LP_B2- 13+00	13-13									1			1	1				
-LP_B2- 13+00	13-13	13-14																
-LP_B2- 16+80	13-15									1			1		1			
-LP_B2- 16+80	13-15	13-16																
-LP_B2- 17+30	13-16									1			1	1				
-LP_B2- 17+30	13-16	13-19																
-RP_B2- 27+00	13-17									1			1			1		1
-RP_B2- 27+00	13-17	13-18																
-LP_B2- 18+42	13-18									1			1			1		
-LP_B2- 18+42	13-18	13-19																
-LP_B2- 17+85	13-19									1			1	1				
-LP_B2- 17+85	13-19	13-20																
-RP_C2- 18+03	13-21									1								
-RP_C2- 18+03	13-21	13-22																
-RP_C2- 22+90	13-23		292															
-L- 182+56.50	13-24									1								
-L- 182+56.50	13-24	13-25																
-L- 181+00	13-25									1								
-L- 181+00	13-25	13-26																
-Y7- 25+55	13-27									1	3.7						1	
-Y7- 25+55	13-27	13-28																
-Y7- 26+75	13-29									1								
-Y7- 26+75	13-29	13-30																
-Y7- 27+03	13-30									1								
-Y7- 27+03	13-30	13-31																
-Y7- 27+03	13-31									1	0.2						1	
-Y7- 27+03	13-31	13-32																
-Y7- 27+03	13-32									1	5.0	6.3						
-Y7- 27+03	13-32	13-33																
-Y7- 28+22	13-34																	
-SVRD7- 19+05	13-35																	
-Y7- 29+33	13-36									1							1	
-Y7- 29+33	13-36	13-39																
-Y7- 30+25	13-37									1							1	
-Y7- 30+25	13-37	13-38																
-Y7- 30+25	13-38									1								
-Y7- 30+25	13-38	13-39																
-Y7- 29+33	13-39									1								
-Y7- 29+33	13-39	13-40																
-Y7- 33+15	13-41									1								
-Y7- 33+15	13-41	13-42																
SHEET TOTALS			292							23	8.9	6.3	8	3	2	3	4	1

STATION	FROM	TO	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. FRAME WITH GRATES STD. 840.20 (WIDE SLOT/FLAT)	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22 (W.S./SAG)	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.36	M.H. FRAME AND COVER STD. 840.54	PARALLEL END SECTION, STD. 310.04	O.T.C.B. STD. 840.04 OR 840.05	STEEL FRANE WITH TWO GRATES 840.37	T.B.G.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29
-L- 177+10	13-07					1				1										
-L- 177+10	13-07	13-08																		
-L- 176+10	13-08				1				1	1										
-L- 176+10	13-08	13-09																		
-RP_B2- 22+77	13-10																			
-LP_B2- 12+25	13-11																			
-LP_B2- 12+25	13-11	13-13																		
-LP_B2- 13+00	13-12																			
-LP_B2- 12+75	13-12	13-13																		
-LP_B2- 13+00	13-13																			
-LP_B2- 13+00	13-13	13-14																		
-LP_B2- 16+80	13-15																			
-LP_B2- 16+80	13-15	13-16																		
-LP_B2- 17+30	13-16																			
-LP_B2- 17+30	13-16	13-19																		
-RP_B2- 27+00	13-17																			
-RP_B2- 27+00	13-17	13-18																		
-LP_B2- 18+42	13-18																			
-LP_B2- 18+42	13-18	13-19																		
-LP_B2- 17+85	13-19																			
-LP_B2- 17+85	13-19	13-20																		
-RP_C2- 18+03	13-21					1		1												
-RP_C2- 18+03	13-21	13-22																		
-RP_C2- 22+90	13-23																			
-L- 182+56.50	13-24					1				1										
-L- 182+56.50	13-24	13-25																		
-L- 181+00	13-25					1				1										
-L- 181+00	13-25	13-26																		
-Y7- 25+55	13-27		1	1																
-Y7- 25+55	13-27	13-28																		
-Y7- 26+75	13-29																		1	1
-Y7- 26+75	13-29	13-30																		
-Y7- 27+03	13-30																		1	1
-Y7- 27+03	13-30	13-31																		
-Y7- 27+03	13-31		1	1																
-Y7- 27+03	13-31	13-32																		
-Y7- 27+03	13-32																		1	1
-Y7- 27+03	13-32	13-33																		
-Y7- 28+22	13-34																			
-SVRD7- 19+05	13-35																			
-Y7- 29+33	13-36		1	1																
-Y7- 29+33	13-36	13-39																		
-Y7- 30+25	13-37		1	1																
-Y7- 30+25	13-37	13-38																		
-Y7- 30+25	13-38																		1	1
-Y7- 30+25	13-38	13-39																		
-Y7- 29+33	13-39																		1	1
-Y7- 29+33	13-39	13-40																		
-Y7- 33+15	13-41																		1	1
-Y7- 33+15	13-41	13-42																		
SHEET TOTALS			4	4	1	4		1	1	4									6	6

STATION	FROM	TO	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CAA PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
-L- 177+10	13-07							
-L- 177+10	13-07	13-08					24	REMOVE 24" RCP
-L- 176+10	13-08							3 G.D.I.
-L- 176+10	13-08	13-09					24	REMOVE 24" RCP
-RP_B2- 22+77	13-10						16	REMOVE 24" RCP
-LP_B2- 12+25	13-11							
-LP_B2- 12+25	13-11	13-13						
-LP_B2- 13+00	13-12							
-LP_B2- 12+75	13-12	13-13						
-LP_B2- 13+00	13-13							
-LP_B2- 13+00	13-13	13-14						
-LP_B2- 16+80	13-15							
-LP_B2- 16+80	13-15	13-16						
-LP_B2- 17+30	13-16							
-LP_B2- 17+30	13-16	13-19						
-RP_B2- 27+00	13-17							
-RP_B2- 27+00	13-17	13-18						
-LP_B2- 18+42	13-18							
-LP_B2- 18+42	13-18	13-19						
-LP_B2- 17+85	13-19							
-LP_B2- 17+85	13-19	13-20						
-RP_C2- 18+03	13-21							
-RP_C2- 18+03	13-21	13-22	2 @ 18"					2-18" ELBOWS
-RP_C2- 22+90	13-23						88	REMOVE 6" PVC & 2-DI
-L- 182+56.50	13-24							
-L- 182+56.50	13-24	13-25						
-L- 181+00	13-25							
-L- 181+00	13-25	13-26						
-Y7- 25+55	13-27						24	REMOVE 18" RCP
-Y7- 25+55	13-27	13-28						
-Y7- 26+75	13-29							
-Y7- 26+75	13-29	13-30						
-Y7- 27+03	13-30							
-Y7- 27+03	13-30	13-31						
-Y7- 27+03	13-31							
-Y7- 27+03	13-31	13-32						
-Y7- 27+03	13-32							
-Y7- 27+03	13-32	13-33	2 @ 18"					2-18" ELBOWS
-Y7- 28+22	13-34							
-SVRD7- 19+05	13-35						68	REMOVE 24" RCP & HW
-Y7- 29+33	13-36							
-Y7- 29+33	13-36	13-39						
-Y7- 30+25	13-37							
-Y7- 30+25	13-37	13-38						
-Y7- 30+25	13-38							
-Y7- 30+25	13-38	13-39						
-Y7- 29+33	13-39							
-Y7- 29+33	13-39	13-40	2 @ 18"					2-18" ELBOWS
-Y7- 33+15	13-41							
-Y7- 33+15	13-41	13-42						
SHEET TOTALS			6 @ 18"	0 @ 18"			244	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

COMPUTED BY: WCB DATE: 7/6/2012

CHECKED BY: BKE DATE: 9/24/2013

WSRAL-1003A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2633BA	3-D

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

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

STATION (SIZE / THICKNESS OR GAUGE)	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-Y7- 33+15	LT	13-42		67.6															
-Y7- 33+15	LT	13-42	13-45		64.8	63.9													
-Y7- 34+00	LT	13-43																	
-Y7- 34+00	LT	13-43	13-44																
-Y7- 34+00	LT	13-44																	
-Y7- 34+00	LT	13-44	13-45																
-Y7- 33+15	LT	13-45		67.0															
-Y7- 33+15	LT	13-45	13-46		63.9	32.4				108							X		
-Y7- 37+35	RT	13-47		69.0															
-Y7- 37+35	RT	13-47	13-48		65.6	64.4													
-Y7- 37+35	LT	13-48		67.8															
-Y7- 37+35	LT	13-48	13-49		64.4	34.4													
-L- 183+35	CL	13-50		38.6															
-L- 183+35	CL	13-50	13-51		35.9	35.2													
-L- 184+70	CL	13-51		39.1															
-L- 183+35	CL	13-51	13-52		35.2	32.4													
-RP_D2- 22+75	LT	13-53		61.7															
-RP_D2- 22+75	LT	13-53	13-54		59.0	34.1				92							X		
-RP_D2- 20+00	LT	13-55		49.6															
-RP_D2- 20+00	LT	13-55	13-56		46.8	45.0													
-RP_D2- 19+58	LT	13-56		47.7															
-RP_D2- 19+58	LT	13-56	13-57		45.0	32.8													
-L- 188+00	CL	13-58																	
-L- 191+00	CL	13-59		38.0															
-L- 191+00	CL	13-59	13-60		35.2	30.0													
-L- 194+10	CL	14-01		36.8															
-L- 194+10	CL	14-01	14-02		34.0	30.0													
-L- 197+00	CL	14-03																	
-L- 199+80	CL	14-04		34.2															
-L- 199+80	CL	14-04	14-05		30.0	28.2													
-L- 201+00	CL	14-06																	
-L- 205+20	CL	14-07		35.4															
-L- 205+20	CL	14-07	14-08		32.6	27.7													
-L- 206+00	CL	14-09																	
-L- 211+00	CL	15-01																	
-L- 215+97	CL	15-02																	
-L- 216+20	CL	15-03		35.3															
-L- 216+20	CL	15-03	15-04		32.6	25.5													
-L- 221+75	CL	16-01		33.9															
-L- 221+75	CL	16-01	16-02		32.6	27.3													
-L- 227+30	CL	16-03		32.5															
-L- 227+30	CL	16-03	16-04		28.3	27.1													
-L- 228+00	CL	16-04		30.6															
-L- 228+00	CL	16-04	16-05		27.1	25.5													
-L- 228+28	CL	16-06																	
-L- 231+60	CL	16-07		33.5															
-L- 231+60	CL	16-07	16-06		30.7	24.3													
-L- 235+50	CL	16-07	17-01		30.7														
-L- 235+50	CL	17-02																	
-L- 239+80	CL	17-03		33.3															
SHEET TOTALS										200									

STATION	CAA PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
-Y7- 33+15																								
-Y7- 33+15																			16					
-Y7- 34+00																								
-Y7- 34+00																			20					
-Y7- 34+00																								
-Y7- 34+00																			80					
-Y7- 33+15																								
-Y7- 33+15																								
-Y7- 37+35																								
-Y7- 37+35																			60					
-Y7- 37+35																								
-Y7- 37+35			112																					
-L- 183+35																								
-L- 183+35																			132					
-L- 184+70																								
-L- 183+35																			100					
-RP_D2- 22+75																								
-RP_D2- 22+75																								
-RP_D2- 20+00																								
-RP_D2- 20+00																			36					
-RP_D2- 19+58																								
-RP_D2- 19+58			48																					
-L- 188+00													220											
-L- 191+00																								
-L- 191+00											92													
-L- 194+10																								
-L- 194+10											92													
-L- 197+00														184										
-L- 199+80																								
-L- 199+80											92													
-L- 201+00														184										
-L- 205+20																								
-L- 205+20											100													
-L- 206+00														188										
-L- 211+00														184										
-L- 215+97															600									
-L- 216+20																								
-L- 216+20											106													
-L- 221+75																								
-L- 221+75											102													
-L- 227+30																								
-L- 227+30											68													
-L- 228+00																								
-L- 228+00											96													
-L- 228+28																								
-L- 231+60																								
-L- 231+60														340										
-L- 235+50														284										
-L- 235+50													200											
-L- 239+80																								
SHEET TOTALS			160								748		420	1,364	600				444					

STATION	30" R.C. PIPE (CLASS V)	36" R.C. PIPE (CLASS V)	****" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
-Y7- 33+15								1							1	
-Y7- 33+15																
-Y7- 34+00								1							1	
-Y7- 34+00																
-Y7- 34+00								1								
-Y7- 34+00																
-Y7- 33+15								1								
-Y7- 33+15																
-Y7- 37+35								1								
-Y7- 37+35																
-Y7- 37+35								1								
-Y7- 37+35																
-L- 183+35								1								
-L- 183+35																
-L- 184+70								1								
-L- 183+35																
-RP_D2- 22+75								1								
-RP_D2- 22+75																
-RP_D2- 20+00								1								
-RP_D2- 20+00																
-RP_D2- 19+58								1								
-RP_D2- 19+58																
-L- 188+00																
-L- 191+00								1								
-L- 191+00																
-L- 194+10								1								
-L- 194+10																
-L- 197+00																
-L- 199+80								1								
-L- 199+80																
-L- 201+00																
-L- 205+20								1								
-L- 205+20																
-L- 206+00																
-L- 211+00																
-L- 215+97						10.5										
-L- 216+20								1								
-L- 216+20																
-L- 221+75								1								
-L- 221+75																
-L- 227+30								1								
-L- 227+30																
-L- 228+00								1								
-L- 228+00																
-L- 228+28						3.4										
-L- 231+60								1								
-L- 231+60																
-L- 235+50																
-L- 235+50																
-L- 239+80								1								
SHEET TOTALS						13.9		21							2	

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATES STD. 840.20 (WIDE SLOT/FLAT)	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22 (W.S./SAG)	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.36	M.H. FRAME AND COVER STD. 840.54	PARALLEL END SECTION, STD. 310.04	O.T.C.B. STD. 840.04 OR 840.05	STEEL FRANE WITH TWO GRATES 840.37	T.B.G.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CAA PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
-Y7- 33+15	1	1																						
-Y7- 33+15																								
-Y7- 34+00	1	1																						
-Y7- 34+00																								
-Y7- 34+00																	1	1						
-Y7- 34+00																								
-Y7- 33+15																	1	1						
-Y7- 33+15																			2 @ 18"					2-18" ELBOWS
-Y7- 37+35																	1	1						
-Y7- 37+35																								
-Y7- 37+35																	1	1						
-Y7- 37+35																				2 @ 18"				2-18" ELBOWS
-L- 183+35				1				1																
-L- 183+35																								
-L- 184+70				1				1																
-L- 183+35																								
-RP_D2- 22+75				1		1																		
-RP_D2- 22+75																			2 @ 18"					2-18" ELBOWS
-RP_D2- 20+00				1		1																		
-RP_D2- 20+00																							60	REMOVE 2-12" RCP
-RP_D2- 19+58				1		1																		
-RP_D2- 19+58																				2 @ 18"				2-18" ELBOWS
-L- 188+00																							80	REMOVE 2-18" RCP & HW
-L- 191+00				1				1																
-L- 191+00																								PREFORMED SCOUR HOLE
-L- 194+10				1				1																
-L- 194+10																								PREFORMED SCOUR HOLE
-L- 197+00																								EQUALIZER PIPE
-L- 199+80			1				1	1																3 G.D.I.
-L- 199+80																								
-L- 201+00																								EQUALIZER PIPE
-L- 205+20				1				1																
-L- 205+20																								
-L- 206+00																								EQUALIZER PIPE
-L- 211+00																								EQUALIZER PIPE
-L- 215+97																								3@42" RCP @ 200 LF Each, SEE DETAIL 2-K
-L- 216+20				1				1																
-L- 216+20																								
-L- 221+75				1				1																
-L- 221+75																								
-L- 227+30			1				1	1																3 G.D.I.
-L- 227+30																								
-L- 228+00				1				1																
-L- 228+00																								
-L- 228+28																								
-L- 231+60				1				1																
-L- 231+60																								
-L- 235+50																								
-L- 235+50																								
-L- 239+80				1				1																
SHEET TOTALS	2	2	2	13		3	2	12									4	4	4 @ 18"	4 @ 18"			140	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

COMPUTED BY:	WCB	DATE:	7/6/2012
CHECKED BY:	BKE	DATE:	9/24/2013

WSRAL-1003A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2633BA	3-E

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-L- 239+80	CL	17-03	17-04		30.6	24.5													
-L- 242+00	CL	17-05																	
-L- 244+10	CL	17-06		32.2															
-L- 244+10	CL	17-06	17-07		29.4	23.1													
-L- 248+43	CL	18-01		31.2															
-L- 248+43	CL	18-01	18-02		27.0	25.2													
-L- 252+00	CL	18-03		32.1															
-L- 252+00	CL	18-03	18-04		29.3	22.3													
-L- 252+05	CL	18-05		35.3															
-L- 252+05	CL	18-05	18-06		32.3	21.8				32							X		
-L- 255+60	CL	18-07		33.5															
-L- 255+60	CL	18-07	18-08		30.8	30.5													
-L- 255+60	LT	18-08		35.5															
-L- 255+70	LT	18-09		35.6															
-L- 252+60	LT	18-09	18-08		31.6	30.5													
-L- 252+60	LT	18-08	18-10		30.5	21.5				48							X		
-L- 259+50	CL	18-11		35.1															
-L- 259+50	CL	18-11	18-12		32.4	32.1													
-L- 259+50	LT	18-12		37.1															
-L- 259+50	LT	18-12	18-13		32.1	20.3													
-L- 261+00	RT	19-01		38.1															
-L- 261+00	RT	19-01	19-02		35.4	35.0													
-L- 261+80	RT	19-02		38.4															
-L- 261+80	RT	19-02	19-03		35.0	19.9				60							X		
-L- 263+20	LT	19-04		38.8															
-L- 263+20	LT	19-04	19-05		36.1	19.2				68							X		
-L- 263+93	RT	19-06		38.8															
-L- 263+93	RT	19-06	19-07		36.1	19.5				72							X		
-L- 267+40	CL	19-08		39.8															
-L- 267+40	CL	19-08	19-10		37.1	36.8													
-L- 268+00	LT	19-09		40.5															
-L- 268+00	LT	19-09	19-10		37.8	36.8													
-L- 267+40	LT	19-10		40.3															
-L- 267+40	LT	19-10	19-11		36.8	22.6				48							X		
-RP_C3- 13+50	RT	19-12		39.8															
-RP_C3- 13+50	RT	19-12	19-13		37.0	18.5				72							X		
-L- 270+30	LT	20-01		41.2															
-L- 270+30	LT	20-01	20-02		38.5	20.0				72							X		
-L- 273+20	CL	20-03		40.7															
-L- 273+20	CL	20-03	20-04		36.5	36.2													
-L- 273+20	LT	20-04		42.4															
-L- 273+20	LT	20-04	20-05		36.1	19.4													
-L- 276+50	CL	20-06		42.7															
-L- 276+50	CL	20-06	20-07		39.9	39.6													
-L- 276+50	LT	20-07		44.4															
-L- 276+50	LT	20-07	20-08		39.6	18.8				84							X		
-L- 278+50	RT	20-09		46.5															
-L- 278+50	RT	20-09	20-10		43.8	21.0				100							X		
-L- 279+60	LT	20-11		46.9															
-L- 279+60	LT	20-11	20-12		44.2	18.1				92							X		
SHEET TOTALS										748									

STATION	CAA PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
-L- 239+80																			102					
-L- 242+00																188								
-L- 244+10																								
-L- 244+10																			92					
-L- 248+43																								
-L- 248+43																			102					
-L- 252+00																								
-L- 252+00											92													
-L- 252+05																								
-L- 252+05																								
-L- 255+60																								
-L- 255+60																			60					
-L- 255+60																								
-L- 255+70																								
-L- 252+60																			8					
-L- 252+60																								
-L- 259+50																								
-L- 259+50																			60					
-L- 259+50																								
-L- 259+50			60																					
-L- 261+00																								
-L- 261+00																			72					
-L- 261+80																								
-L- 261+80																								
-L- 263+20																								
-L- 263+20																								
-L- 263+93																								
-L- 263+93																								
-L- 267+40																								
-L- 267+40																			56					
-L- 268+00																								
-L- 268+00																			56					
-L- 267+40																								
-L- 267+40																								
-RP_C3- 13+50																								
-RP_C3- 13+50																								
-L- 270+30																								
-L- 270+30																								
-L- 273+20																								
-L- 273+20																			68					
-L- 273+20																								
-L- 273+20			76																					
-L- 276+50																								
-L- 276+50																			68					
-L- 276+50																								
-L- 276+50																								
-L- 278+50																								
-L- 278+50																								
-L- 279+60																								
-L- 279+60																								
SHEET TOTALS			136								92					188			744					

STATION	30 " R.C. PIPE (CLASS V)	36 " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
-L- 239+80																
-L- 242+00						6.0										
-L- 244+10								1								
-L- 244+10																
-L- 248+43								1								
-L- 248+43																
-L- 252+00								1								
-L- 252+00																
-L- 252+05								1								
-L- 252+05																
-L- 255+60								1								
-L- 255+60																
-L- 255+60								1								
-L- 255+70								1								
-L- 252+60																
-L- 252+60																
-L- 259+50								1								
-L- 259+50																
-L- 259+50								1								
-L- 259+50																
-L- 261+00								1								
-L- 261+00																
-L- 261+80								1								
-L- 261+80																
-L- 263+20								1								
-L- 263+20																
-L- 263+93								1								
-L- 263+93																
-L- 267+40								1								
-L- 267+40																
-L- 268+00								1								
-L- 268+00																
-L- 267+40								1								
-L- 267+40																
-RP_C3- 13+50								1								
-RP_C3- 13+50																
-L- 270+30								1								
-L- 270+30																
-L- 273+20								1								
-L- 273+20																
-L- 273+20								1	1.3							
-L- 273+20																
-L- 276+50								1								
-L- 276+50																
-L- 276+50								1								
-L- 276+50																
-L- 278+50								1								
-L- 278+50																
-L- 279+60								1								
-L- 279+60																
SHEET TOTALS						6		24	1.3							

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATES STD. 840.20 (WIDE SLOT/FLAT)	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22 (W.S./SAG)	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.36	M.H. FRAME AND COVER STD. 840.54	PARALLEL END SECTION, STD. 310.04	O.T.C.B. STD. 840.04 OR 840.05	STEEL FRANE WITH TWO GRATES 840.37	T.B.G.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29
-L- 239+80																		
-L- 242+00																		
-L- 244+10				1				1										
-L- 244+10																		
-L- 248+43			1				1	1										
-L- 248+43																		
-L- 252+00				1				1										
-L- 252+00																		
-L- 252+05				1		1												
-L- 252+05																		
-L- 255+60				1				1										
-L- 255+60																		
-L- 255+60				1		1												
-L- 255+70				1		1												
-L- 252+60																		
-L- 252+60																		
-L- 259+50				1				1										
-L- 259+50																		
-L- 259+50				1		1												
-L- 259+50																		
-L- 261+00				1		1												
-L- 261+00																		
-L- 261+80				1		1												
-L- 261+80																		
-L- 263+20				1		1												
-L- 263+20																		
-L- 263+93				1		1												
-L- 263+93																		
-L- 267+40				1				1										
-L- 267+40																		
-L- 268+00				1		1												
-L- 268+00																		
-L- 267+40				1		1												
-L- 267+40																		
-RP_C3- 13+50				1		1												
-RP_C3- 13+50																		
-L- 270+30				1		1												
-L- 270+30																		
-L- 273+20			1				1	1										
-L- 273+20																		
-L- 273+20				1		1												
-L- 273+20																		
-L- 276+50				1				1										
-L- 276+50																		
-L- 276+50				1		1												
-L- 276+50																		
-L- 278+50				1		1												
-L- 278+50																		
-L- 279+60												1				1		
-L- 279+60																		
SHEET TOTALS			2	21		15	2	8				1				1		

STATION	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CAA PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
-L- 239+80						
-L- 242+00						
-L- 244+10						
-L- 244+10						
-L- 248+43						3 G.D.I.
-L- 248+43						
-L- 252+00						
-L- 252+00						
-L- 252+05						
-L- 252+05						
-L- 255+60						
-L- 255+60						
-L- 255+60						
-L- 255+70						
-L- 252+60						
-L- 252+60	2 @ 18"					2-18" ELBOWS
-L- 259+50						
-L- 259+50						
-L- 259+50						
-L- 259+50		2 @ 18"				2-18" ELBOWS
-L- 261+00						
-L- 261+00						
-L- 261+80						
-L- 261+80	2 @ 18"					2-18" ELBOWS
-L- 263+20						
-L- 263+20	2 @ 18"					2-18" ELBOWS
-L- 263+93						
-L- 263+93	2 @ 18"					2-18" ELBOWS
-L- 267+40						
-L- 267+40						
-L- 268+00						
-L- 268+00						
-L- 267+40						
-L- 267+40	2 @ 18"					2-18" ELBOWS
-RP_C3- 13+50						
-RP_C3- 13+50	2 @ 18"					2-18" ELBOWS
-L- 270+30						
-L- 270+30	2 @ 18"					2-18" ELBOWS
-L- 273+20						3 G.D.I.
-L- 273+20						
-L- 273+20						
-L- 273+20		2 @ 18"				2-18" ELBOWS
-L- 276+50						
-L- 276+50						
-L- 276+50						
-L- 276+50	2 @ 18"					2-18" ELBOWS
-L- 278+50						
-L- 278+50	2 @ 18"					2-18" ELBOWS
-L- 279+60						
-L- 279+60	2 @ 18"					2-18" ELBOWS
SHEET TOTALS	20 @ 18"	4 @ 18"				

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

COMPUTED BY: WCB	DATE: 7/6/2012	PROJECT NO.	SHEET NO.
CHECKED BY: BKE	DATE: 9/24/2013	R-2633BA	3-F

WSRAL-1003A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

Station	Location (LT, RT, or CL')	Structure No. From	Structure No. To	Top Elevation	Invert Elevation	Invert Elevation	Slope Critical	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	Do Not Use RCP	Do Not Use CSP	Do Not Use CAAP	Do Not Use HDPE
-RP_C3- 19+00	RT	20-13		35.5															
-RP_C3- 19+00	RT	20-13	20-14		32.7	31.9													
-RP_C3- 19+45	RT	20-14		34.7															
-RP_C3- 19+45	RT	20-14	20-15		31.9	17.1				60							X		
-RP_C3- 21+75	CL	20-16																	
-Y8- 23+90	LT	20-17		23.0															
-Y8- 23+90	LT	20-17	20-18		20.3	19.8													
-LP_A3- 22+37.50	LT	20-19																	
-LP_A3- 22+37.50	LT	20-19	20-20																
-Y8- 24+85	LT	20-20																	
-Y8- 24+85	LT	20-20	20-21																
-Y8- 25+60	LT	21-21																	
-Y8- 25+60	LT	21-21	21-22							52							X		
-Y8- 26+30	LT	20-23		22.9															
-Y8- 26+30	LT	20-23	20-24		20.2	18.1													
-Y8- 26+85	LT	20-25		22.9															
-Y8- 26+85	LT	20-25	20-27		20.2	17.9													
-Y8- 27+50	RT	20-26	20-27		18.0	19.9													
-Y8- 27+50	LT	20-27		22.9															
-Y8- 27+50	LT	20-27	20-28		17.9	17.8													
-Y8- 30+25	LT	20-29		22.7															
-Y8- 30+25	LT	20-29	20-30		.19.95	19.5													
-Y8- 29+65	LT	20-30		22.7															
-Y8- 29+65	LT	20-30	20-31		19.5	19.2													
-Y8- 29+09	LT	20-31		22.6															
-Y8- 29+09	LT	20-31	20-32		19.2	18.8													
-Y8- 28+60	LT	20-32		22.7															
-Y8- 28+60	LT	20-32	20-33		18.8	18.4													
-Y8- 28+00	LT	20-33		22.8															
-Y8- 28+00	LT	20-33	20-34		18.4	17.9													
-Y8- 32+55	RT	20-35	20-36		18.5	18.4	X												
-Y8- 32+55	LT	20-36		22.7															
-Y8- 32+55	LT	20-36	20-37		18.4	18.3	X												
-Y8- 34+40	LT	20-38		22.7															
-Y8- 34+40	LT	20-38	20-39		19.9	19.0													
-Y8C- 15+75	LT	20-40																	
-Y8C- 17+88	RT	20-41																	
-Y8C- 18+95	LT	20-42																	
-Y8C- 18+95	RT	20-43																	
-Y8C- 19+43	RT	20-44																	
-L- 282+18	LT	20-45		45.8															
-L- 282+18	LT	20-45	20-46		42.5	42.2													
-LP_A3- 10+63	LT	20-46		46.5															
-LP_A3- 10+63	LT	20-46	20-47		42.2	19.0													
-L- 282+95	RT	20-48		46.9															
-L- 282+95	RT	20-48	20-49		44.1	19.2				88							X		
-L- 288+50	CL	20-50		36.2															
-L- 288+50	CL	20-50	20-51		33.1	18.5													
-L- 290+55	CL	20-52																	
-LP_A3- 14+50	CL	20-53																	
SHEET TOTALS										200									

Station	Structure No. From	Structure No. To	CAA Pipe 12" .064	CAA Pipe 15" .064	CAA Pipe 18" .064	CAA Pipe 24" .064	CAA Pipe 30" .079	CAA Pipe 36" .079	CAA Pipe 42" .109	CAA Pipe 48" .109	R.C. Pipe Class III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. Pipe Class IV 12"	15"	18"	24"	30"	36"	42"	48"	30" R.C. Pipe (Class V)	36" R.C. Pipe (Class V)	***" RC Pipe Culverts, Contractor Design	15" Side Drain Pipe	18" Side Drain Pipe	Endwalls Std. 838.01, 838.11 or Std. 838.80 (Unless Noted Otherwise) Cu. Yards R.C.P.	Endwalls C.S.P.
-RP_C3- 19+00	20-13																																
-RP_C3- 19+00	20-13	20-14																			36												
-RP_C3- 19+45	20-14																																
-RP_C3- 19+45	20-14	20-15																															
-RP_C3- 21+75	20-16															144																3.4	
-Y8- 23+90	20-17																																
-Y8- 23+90	20-17	20-18																			56												
-LP_A3- 22+37.50	20-19																																
-LP_A3- 22+37.50	20-19	20-20																			36												
-Y8- 24+85	20-20																																
-Y8- 24+85	20-20	20-21																			72												
-Y8- 25+60	21-21																																
-Y8- 25+60	21-21	21-22																															
-Y8- 26+30	20-23																																
-Y8- 26+30	20-23	20-24																			60												
-Y8- 26+85	20-25																																
-Y8- 26+85	20-25	20-27																		60													
-Y8- 27+50	20-26	20-27																				168											
-Y8- 27+50	20-27																																
-Y8- 27+50	20-27	20-28																				180											
-Y8- 30+25	20-29																																
-Y8- 30+25	20-29	20-30																			52												
-Y8- 29+65	20-30																																
-Y8- 29+65	20-30	20-31																			52												
-Y8- 29+09	20-31																																
-Y8- 29+09	20-31	20-32																			44												
-Y8- 28+60	20-32																																
-Y8- 28+60	20-32	20-33																			52												
-Y8- 28+00	20-33																																
-Y8- 28+00	20-33	20-34																			80												
-Y8- 32+55	20-35	20-36																				52											
-Y8- 32+55	20-36																																
-Y8- 32+55	20-36	20-37																				44											
-Y8- 34+40	20-38																																
-Y8- 34+40	20-38	20-39																			48												
-Y8C- 15+75	20-40																			24													
-Y8C- 17+88	20-41																			52													
-Y8C- 18+95	20-42																			24													
-Y8C- 18+95	20-43																			24													
-Y8C- 19+43	20-44																			32													
-L- 282+18	20-45																																
-L- 282+18	20-45	20-46																			64												
-LP_A3- 10+63	20-46																																
-LP_A3- 10+63	20-46	20-47			120																												
-L- 282+95	20-48																																
-L- 282+95	20-48	20-49																															
-L- 288+50	20-50																																
-L- 288+50	20-50	20-51			144																												
-L- 290+55	20-52																	276														6.0	
-LP_A3- 14+50	20-53																192																
SHEET TOTALS					264											144	192	276		216	652	444										9.4	

*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')

Station	Structure No. From	Structure No. To	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	Frame, Grates, and Hood Standard 840.03 Type of Grate E	F	G	Concrete Transitional Section Drop Inlet	Catch Basin	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. Frame with Grates Std. 840.20 (Wide Slot/Flat)	G.D.I. Frame with Grate Std. 840.22	G.D.I. Frame with Two Grates Std. 840.22 (W.S./Sag)	G.D.I. (N.S.) Frame with Grate Std. 840.24	G.D.I. (N.S.) Frame with Two Grates Std. 840.24	J.B. Std. 840.31 or 840.32	T.B.G.D.I. Std. 840.36	M.H. Frame and Cover Std. 840.54	Parallel End Section, Std. 310.04	O.T.C.B. Std. 840.04 or 840.05	Steel Frane with Two Grates 840.37	T.B.G.D.I. Std. 840.35	G.D.I. (N.S.) Frame with Two Grates Std. 840.29	Side Drain Pipe Elbows No. & Size	CAA Pipe Elbows No. & Size	Conc. & Brick Pipe Plug, C.Y. Std. 840.71	Flowable Fill	Pipe Removal Lin. Ft.	Remarks
-RP_C3- 19+00	20-13		1												1		1																		
-RP_C3- 19+00	20-13	20-14																																	
-RP_C3- 19+45	20-14		1												1		1																		
-RP_C3- 19+45	20-14	20-15																												2 @ 18"					2-18" ELBOWS
-RP_C3- 21+75	20-16																																		
-Y8- 23+90	20-17		1							1		1	1																					44	REMOVE 2-15" RCP
-Y8- 23+90	20-17	20-18																																	
-LP_A3- 22+37.50	20-19		1			1			1																										
-LP_A3- 22+37.50	20-19	20-20																																	
-Y8- 24+85	20-20		1			1			1																										
-Y8- 24+85	20-20	20-21																																	
-Y8- 25+60	21-21		1			1			1																										
-Y8- 25+60	21-21	21-22																																	
-Y8- 26+30	20-23		1							1		1	1																						
-Y8- 26+30	20-23	20-24																																24	REMOVE 12" RCP
-Y8- 26+85	20-25		1							1		1	1																						
-Y8- 26+85	20-25	20-27																																	
-Y8- 27+50	20-26	20-27																																	3@ 24" RCP-IV
-Y8- 27+50	20-27		1							1		1	1																						
-Y8- 27+50	20-27	20-28																																	3@ 24" RCP-IV
-Y8- 30+25	20-29		1							1		1	1																						
-Y8- 30+25	20-29	20-30																																	
-Y8- 29+65	20-30		1							1		1	1																						
-Y8- 29+65	20-30	20-31																																	
-Y8- 29+09	20-31		1							1		1	1																						
-Y8- 29+09	20-31	20-32																																	
-Y8- 28+60	20-32		1							1		1	1																						
-Y8- 28+60	20-32	20-33																																	
-Y8- 28+00	20-33		1							1		1	1																						
-Y8- 28+00	20-33	20-34																																	
-Y8- 32+55	20-35	20-36																																24	REMOVE 18" RCP
-Y8- 32+55	20-36		1							1		1	1																						
-Y8- 32+55	20-36	20-37																																	
-Y8- 34+40	20-38		1							1		1	1																						
-Y8- 34+40	20-38	20-39																																68	REMOVE 15" CMP/2-18" RCP & 1 DI
-Y8C- 15+75	20-40																																	20	REMOVE 15" CMP
-Y8C- 17+88	20-41																																		
-Y8C- 18+95	20-42																																		
-Y8C- 18+95	20-43																																		
-Y8C- 19+43	20-44																																		
-L- 282+18	20-45		1			1			1																										
-L- 282+18	20-45	20-46																																	
-LP_A3- 10+63	20-46		1			1			1																										
-LP_A3- 10+63	20-46	20-47																													2 @ 18"				2-18" ELBOWS
-L- 282+95	20-48		1												1		1																		
-L- 282+95	20-48	20-49																												2 @ 18"					2-18" ELBOWS
-L- 288+50	20-50		1												1				1																
-L- 288+50	20-50	20-51																												2 @ 18"					2-18" ELBOWS
-L- 290+55	20-52																																		
-LP_A3- 14+50	20-53																																		
SHEET TOTALS			20			5			5	11		11	11		4		3		1											6 @ 18"	2 @ 18"			180	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

WSR4L-1003A

COMPUTED BY: WCB DATE: 7/6/2012

CHECKED BY: BKE DATE: 9/24/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2633BA	3-G

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

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE							SIDE DRAIN PIPE THICKNESS OR GAUGE				CAA PIPE SIZE							CAA PIPE THICKNESS OR GAUGE				R.C. PIPE CLASS III SIZE							R.C. PIPE CLASS IV SIZE						
								12"	15"	18"	24"	30"	36"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	12"	15"	18"	24"	30"	36"	48"	.064	.064	.064	.064	12"	15"	18"	24"	30"	36"	48"	12"	15"	18"	24"	30"	36"	48"
-LP_A3- 18+80	LT	20-54		24.2																																						
-LP_A3- 18+80	LT	20-54	20-55		21.2	20.9	X																														96					
-LP_A3- 19+85	LT	20-55		23.9																																						
-LP_A3- 19+85	LT	20-55	20-57		20.9	20.6																															80					
-LP_A3- 20+75	LT	20-56		24.1																																						
-LP_A3- 20+75	LT	20-56	20-57		21.1	20.6																															20					
-LP_A3- 20+75	LT	20-57		23.6																																						
-LP_A3- 20+75	LT	20-57	20-58		20.3	19.5				28						X																										
-YBC- 12+29	RT	20-59																																			24					
-YBC- 13+12	LT	20-60																																			24					
-YBC- 14+16	RT	20-61																																			24					
-YBC- 15+39	RT	20-62																																			24					
-Y7- 15+46	LT	21-01								24						X																										
-Y7- 19+91	RT	21-02																																	48								
-Y7- 20+18	CL	21-03																																								
-Y7- 39+45	LT	22-01		66.0																																						
-Y7- 39+45	LT	22-01	22-02		62.6	60.7																															80					
-Y7- 40+65	LT	22-02		63.8																																						
-Y7- 40+65	LT	22-02	22-03		60.7	58.3																															80					
-Y7- 41+50	LT	22-03		61.5																																						
-Y7- 41+50	LT	22-03	22-04		58.3	28.8				104						X																										
-Y7- 45+00	LT	22-05		47.3																																						
-Y7- 45+00	LT	22-05	22-06		44.1	42.2																															44					
-Y7- 45+45	LT	22-06		45.3																																						
-Y7- 45+45	RT	22-06	22-07		42.2	41.9																															52					
-Y7- 45+45	RT	22-07		45.3																																						
-Y7- 45+45	RT	22-07	22-08		41.9	26.8				56						X																										
-Y7- 45+78	CL	22-09																																	172								
-Y7- 51+75	RT	22-10		28.7																																						
-Y7- 51+75	RT	22-10	22-11		25.5	25.3																															8					
-Y7- 51+60.50	RT	22-11		28.7																																						
-Y7- 51+60.50	RT	22-11	22-12		25.3	23.9				24						X																										
-Y7- 52+70	RT	22-13									136					X																										
-Y7- 52+85	LT	22-14		31.4																																						
-Y7- 52+85	LT	22-14	22-15		28.7	22.7				28						X																										
-Y7- 53+50	LT	22-16																																			164					
-SVRD8- 32+50	LT	22-17								36						X																										
-SVRD8- 35+86	LT	22-18								28						X																										
-SD8- 10+80	LT	22-19								24						X																										
-Y7- 48+50	LT	22-20								32						X																										
-Y8A- 19+18	RT	23-01																																			24					
-Y8A- 21+17	RT	23-02																																			32					
-Y8A- 21+80	LT	23-03																																								
-Y8B- 13+46	RT	23-04																																			24					
-Y8C- 9+88	CL	23-05																																			48					
-Y8C- 10+55	LT	23-06																																			24					
-Y8C-10+90	RT	23-07																																			24					
-Y8A- 18+65	LT	23-08																																			24					
-Y8A- 17+33	RT	23-09																																			24					
-Y8A- 20+80	LT	23-10																																			24					
SHEET TOTALS										384	136																								48	172	344	460	164	320			

STATION	30 " R.C. PIPE (CLASS V)	36 " R.C. PIPE (CLASS V)	""" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	QUANTITIES FOR DRAINAGE STRUCTURES LIN. FT. A (5.0' THRU 10.0')	QUANTITIES FOR DRAINAGE STRUCTURES LIN. FT. 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	TYPE OF GRATE F	TYPE OF GRATE G	CONCRETE TRANSITIONAL SECTION DROP INLET	CONCRETE TRANSITIONAL SECTION CATCH BASIN	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. FRAME WITH GRATES STD. 840.20 (WIDE SLOT/FLAT)	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22 (W.S./SAG)	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.36	M.H. FRAME AND COVER STD. 840.54	PARALLEL END SECTION, STD. 310.04	O.T.C.B. STD. 840.04 OR 840.05	STEEL FRAME WITH TWO GRATES 840.37	T.B.G.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CAA PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
-LP_A3- 18+80								1			1																														
-LP_A3- 18+80								1			1																														
-LP_A3- 19+85								1			1																														
-LP_A3- 19+85								1			1																														
-LP_A3- 20+75								1			1	1			1																										
-LP_A3- 20+75								1			1																														
-LP_A3- 20+75								1			1																														
-YBC- 12+29																																								
-YBC- 13+12																																								
-YBC- 14+16																																								
-YBC- 15+39																																								
-Y7- 15+46																																							76	REMOVE 3-15" RCP
-Y7- 19+91																																						11.6	80	REMOVE 24" RCP & 18" RCP
-Y7- 20+18					320		3.1																														0.5		36	REMOVE 36' OF 24" RCP & HW/4-36" PLUGS
-Y7- 39+45								1			1																														
-Y7- 39+45																																								
-Y7- 40+65								1			1																														
-Y7- 40+65																																								
-Y7- 41+50								1			1																														
-Y7- 41+50																																					2 @ 18"			2-18" ELBOWS
-Y7- 45+00								1			1																														
-Y7- 45+00																																								
-Y7- 45+45								1			1																														
-Y7- 45+45																																								
-Y7- 45+45								1			1																														
-Y7- 45+45																																					2 @ 18"			2-18" ELBOWS
-Y7- 45+78																																								
-Y7- 51+75								1			1																														
-Y7- 51+75																																								
-Y7- 51+60.50								1			1																														
-Y7- 51+60.50																																							356	REMOVE 1-DI,2-24" RCP & 18" RCP
-Y7- 52+70																																							184	REMOVE 24" RCP
-Y7- 52+85								1			1																														
-Y7- 52+85																																					2 @ 18"		160	2-18" ELBOWS & REMOVE 2-84" CMP
-Y7- 53+50					164																																	128	REMOVE 18" RCP
-SVRD8- 32+50																																							40	REMOVE 18" RCP
-SVRD8- 35+86																																							28	REMOVE 12" RCP
-SD8- 10+80																																							20	REMOVE 12" RCP
-Y7- 48+50																																						0.2		2-24" PLUGS
-Y8A- 19+18																																							32	REMOVE 2-6" PVC
-Y8A- 21+17																																								
-Y8A- 21+80																																								NOT USED
-Y8B- 13+46																																								
-Y8C- 9+88																																								
-Y8C- 10+55																																								
-Y8C-10+90																																								
-Y8A- 18+65																																								
-Y8A- 17+33																																								
-Y8A- 20+80																																								
SHEET TOTALS					320		3.1	13			4	1	3		1																					9	9	6 @ 18"		0.7	11.6	1140	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

WSR4L-1003A

COMPUTED BY: WCB DATE: 7/6/2012

CHECKED BY: BKE DATE: 9/24/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2633BA	3-H

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

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

STATION	LOCATION (LT, RT, OR CL)*	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
								THICKNESS OR GAUGE											
-Y8- 12+04	RT	24-01																	
-Y8- 13+22	LT	24-02								40							X		
-Y8- 15+33	RT	24-03									20						X		
-Y8- 16+27	RT	24-04									20						X		
-Y8- 17+48	RT	24-05									20						X		
-Y8A- 10+48	CL	24-06																	
-SVRD9- 10+45	LT	24-07																	
-Y8- 20+73	LT	24-08		23.0															
-Y8- 20+73	LT	24-08	24-09		20.3	19.5													
-SVRD9- 12+21	LT	24-10							24								X		
-Y8A- 11+30	RT	24-11																	
-Y8A- 11+32	LT	24-12																	
-Y8A- 12+17	LT	24-13																	
-Y8A- 14+08	LT	24-14																	
-Y8A- 14+29	RT	24-15																	
-Y8A- 15+21	RT	24-16																	
-Y8A- 16+57	LT	24-17																	
-Y8- 43+87	LT	25-01	25-04		15.0	8.4													
-Y9- 10+62	CL	25-02	25-04		15.0	7.9													
-Y9- 10+75	RT	25-03	25-04		13.1	8.4					24						X		
-Y8- 44+20	LT	25-04		16.0															
-Y8- 44+20	LT	25-04	25-05		10.6	7.4							104				X		
-Y8- 45+25	LT	25-05		17.0															
-Y8- 45+25	LT	25-05	25-06		7.4	6.3							60				X		
-Y8- 45+90	LT	25-06		11.0															
-Y8- 45+90	LT	25-06	25-07		6.3	6.2	X						60				X		
-Y9- 11+66	RT	25-08								48							X		
-Y9- 13+87	LT	25-09								36							X		
-Y9- 14+52	RT	25-10								28							X		
-Y9- 15+84	RT	25-11								24							X		
-Y8- 50+90	RT	26-01		17.2															
-Y8- 50+90	RT	26-01	26-02		14.1	13.9													
-Y8- 50+90	LT	26-02		17.2															
-Y8- 50+90	LT	26-02	26-03		13.9	13.4													
-Y8- 51+85	LT	26-03		16.9															
-Y8- 51+85	LT	26-03	26-05		13.4	12.9													
-Y8- 52+95	LT	26-04		16.3															
-Y8- 52+95	LT	26-04	26-05		13.1	12.9													
-Y8- 52+50	LT	26-05		16.7															
-Y8- 52+50	LT	26-05	26-06		7.7	6.3				32							X		
-Y8- 53+00	LT	26-07										48					X		
-Y8- 60+56	LT	27-01								36							X		
-Y8- 60+61	RT	27-02								36							X		
SHEET TOTALS								24	280	84	48	224							

STATION	CAA PIPE SIZE 12"	15"	18"	24"	30"	36"	42"	48"	THICKNESS OR GAUGE .064	.064	.064	.064	.079	.079	.109	.109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	30 " R.C. PIPE (CLASS V)	36 " R.C. PIPE (CLASS V)	**** RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE
-Y8- 12+04																												52									
-Y8- 13+22																																					
-Y8- 15+33																																					
-Y8- 16+27																																					
-Y8- 17+48																																					
-Y8A- 10+48																												56									
-SVRD9- 10+45																												64									
-Y8- 20+73																																					
-Y8- 20+73																												40									
-SVRD9- 12+21																																					
-Y8A- 11+30																																					
-Y8A- 11+32																																					
-Y8A- 12+17																																					
-Y8A- 14+08																																					
-Y8A- 14+29																																					
-Y8A- 15+21																																					
-Y8A- 16+57																																					
-Y8- 43+87																												124									
-Y9- 10+62																													76								
-Y9- 10+75																																					
-Y8- 44+20																																					
-Y8- 44+20																																					
-Y8- 45+25																																					
-Y8- 45+25																																					
-Y8- 45+90																																					
-Y8- 45+90																																					
-Y9- 11+66																																					
-Y9- 13+87																																					
-Y9- 14+52																																					
-Y9- 15+84																																					
-Y8- 50+90																																					
-Y8- 50+90																												48									
-Y8- 50+90																																					
-Y8- 50+90																												88									
-Y8- 51+85																																					
-Y8- 51+85																												56									
-Y8- 52+95																																					
-Y8- 52+95																												36									
-Y8- 52+50																																					
-Y8- 52+50																																					
-Y8- 53+00																																					
-Y8- 60+56																																					
-Y8- 60+61																																					
SHEET TOTALS																												168	388	176	76				2.3		

STATION	QUANTITIES FOR DRAINAGE STRUCTURES "TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL. "B") LIN. FT. PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	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. FRAME WITH GRATES STD. 840.20 (WIDE SLOT/FLAT)	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22 (W.S./SAG)	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.36	M.H. FRAME AND COVER STD. 840.54	PARALLEL END SECTION, STD. 310.04	O.T.C.B. STD. 840.04 OR 840.05	STEEL FRAME WITH TWO GRATES 840.37	T.B.G.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CAA PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
-Y8- 12+04																																			40	REMOVE 18" CMP
-Y8- 13+22																																			28	REMOVE 15" RCP
-Y8- 15+33																																			24	REMOVE 18" RCP
-Y8- 16+27																																			32	REMOVE 2-18" RCP
-Y8- 17+48																																			24	REMOVE 15" RCP
-Y8A- 10+48																																	2		56	REMOVE 15" RCP & PIPE END TREATMENT
-SVRD9- 10+45																																	2			PIPE END TREATMENT
-Y8- 20+73	1								1			1	1																								
-Y8- 20+73																																			24	REMOVE 15" RCP
-SVRD9- 12+21																																					
-Y8A- 11+30																																					
-Y8A- 11+32																																					
-Y8A- 12+17																																					
-Y8A- 14+08																																					
-Y8A- 14+29																																					
-Y8A- 15+21																																					
-Y8A- 16+57																																					
-Y8- 43+87																																			136	REMOVE 5-18" RCP & 12" RCP
-Y9- 10+62																																					
-Y9- 10+75																																					
-Y8- 44+20	1	0.4																				1		1												
-Y8- 44+20																																					
-Y8- 45+25	1	4.6																				1		1												
-Y8- 45+25																																					
-Y8- 45+90	1																										1									
-Y8- 45+90																																			104	REMOVE 24" RCP
-Y9- 11+66																																					
-Y9- 13+87																																			40	REMOVE 12" PVC
-Y9- 14+52																																					
-Y9- 15+84																																					
-Y8- 50+90	1																										1	1							100	REMOVE 2-36" CMP
-Y8- 50+90																																					
-Y8- 50+90	1																										1	1								
-Y8- 50+90																																					
-Y8- 51+85	1																										1	1								
-Y8- 51+85																																					
-Y8- 52+95	1																										1	1								
-Y8- 52+95																																					
-Y8- 52+50	1	4.0																									1	1								
-Y8- 52+50																																					
-Y8- 53+00																																					
-Y8- 60+56																																					
-Y8- 60+61																																					
SHEET TOTALS	9	9.0							1		1	1										2		2	4	1	5	5	0 @ 18"					608	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT) JUNCTION BOX
J.B.	MANHOLE
M.H.	TRAFFIC BEARING
T.B.D.I.	DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

WSRAL-1003A

COMPUTED BY: WCB DATE: 7/6/2012

CHECKED BY: BKE DATE: 9/24/2013

PROJECT NO.	SHEET NO.
R-2633BA	3-I

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
SHEET 3-A TOTAL										76									
SHEET 3-B TOTAL										112									
SHEET 3-C TOTAL										256									
SHEET 3-D TOTAL										200									
SHEET 3-E TOTAL										748									
SHEET 3-F TOTAL										200									
SHEET 3-G TOTAL										384	136								
SHEET 3-H TOTAL									24	280	84	48	224						
PROJECT TOTALS									24	2256	220	48	224						
SAY									24	2256	220	48	224						

STATION	CAA 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"
SHEET 3-A TOTAL											1376			2292		
SHEET 3-B TOTAL			224								80			688		268
SHEET 3-C TOTAL											68		180			
SHEET 3-D TOTAL			160								748		420	1364	600	
SHEET 3-E TOTAL			136								92					188
SHEET 3-F TOTAL			264											144	192	276
SHEET 3-G TOTAL												48	172			
SHEET 3-H TOTAL																
PROJECT TOTALS			784								2364	48	772	4488	792	732
SAY			784								2364	48	772	4488	792	732

STATION	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	30" R.C. PIPE (CLASS V)	36" R.C. PIPE (CLASS V)	**** RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
SHEET 3-A TOTAL			56			656		88						6	
SHEET 3-B TOTAL			840			756	172	620		344				16.5	
SHEET 3-C TOTAL			968		204				292						
SHEET 3-D TOTAL			444											13.9	
SHEET 3-E TOTAL			744											6	
SHEET 3-F TOTAL		216	652	444										9.4	
SHEET 3-G TOTAL		344	460	164	320									3.1	
SHEET 3-H TOTAL		168	388	176	76									2.3	
PROJECT TOTALS		728	4552	784	600	1412	172	708	292	344				57.2	
SAY		728	4552	784	600	1412	172	708	292	344				57.2	

STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
SHEET 3-A TOTAL	18								
SHEET 3-B TOTAL	20	8.1							
SHEET 3-C TOTAL	23	8.9	6.3	8	3	2	3	4	1
SHEET 3-D TOTAL	21							2	
SHEET 3-E TOTAL	24	1.3							
SHEET 3-F TOTAL	20			5			5	11	
SHEET 3-G TOTAL	13			4		1	3		1
SHEET 3-H TOTAL	9	9.0						1	
PROJECT TOTALS	148	27.3	6.3	17	3	3	11	18	2
SAY	148	36.0		17	3	3	11	18	2
		SAY 36.0 LF		LF QUANTITY COMPUTED AS: (27.3 + (1.3 x 6.3)					

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATES STD. 840.20 (WIDE SLOT/FLAT)	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22 (W.S./SAG)	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B.G.D.I. STD. 840.36	M.H. FRAME AND COVER STD. 840.54	PARALLEL END SECTION, STD. 310.04	O.T.C.B. STD. 840.04 OR 840.05	STEEL FRAME WITH TWO GRATES 840.37	T.B.G.D.I. STD. 840.35	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29
SHEET 3-A TOTAL			2	16		2	2	16										
SHEET 3-B TOTAL				18		10		8				2				2		
SHEET 3-C TOTAL	4	4	1	4		1	1	4									6	6
SHEET 3-D TOTAL	2	2	2	13		3	2	12									4	4
SHEET 3-E TOTAL			2	21		15	2	8				1				1		
SHEET 3-F TOTAL	11	11		4		3		1										
SHEET 3-G TOTAL																	9	9
SHEET 3-H TOTAL	1	1									2		2	4	1		5	5
PROJECT TOTALS	18	18	7	76		34	7	49			2	3	2	4	1	3	24	24
SAY	18	18	7	76		34	7	49			2	3	2	4	1	3	24	24

STATION	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CAA PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 3-A TOTAL	2 @ 18"					
SHEET 3-B TOTAL	6 @ 18"	4 @ 18"			32	
SHEET 3-C TOTAL	6 @ 18"	0 @ 18"			244	
SHEET 3-D TOTAL	4 @ 18"	4 @ 18"			140	
SHEET 3-E TOTAL	20 @ 18"	4 @ 18"				
SHEET 3-F TOTAL	6 @ 18"	2 @ 18"			180	
SHEET 3-G TOTAL	6 @ 18"		0.7	11.6	1140	
SHEET 3-H TOTAL	0 @ 18"				608	
PROJECT TOTALS	50 @ 18"	14 @ 18"	0.7	11.6	2344	
SAY	50 @ 18"	14 @ 18"	1	12	2344	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

COMPUTED BY: WCB DATE: 7/6/2012

CHECKED BY: BKE DATE: 9/24/2013

PROJECT NO.	SHEET NO.
R-2633BA	3-J

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

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"	CAA PIPE 54" .109	54" .138	54" .168	54" SHOP ELON-GATED .138	54" SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	84" .139	84" .168	84" .105	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	CONCRETE TRANSITIONAL SECTION DROP INLET	CONCRETE TRANSITIONAL SECTION CATCH BASIN	REINFORCED SANDBAG HEADWALL S.F. SEE DETAIL 2-O	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
-LREV- 343+66.17	CL	04-03						248																								5.2															
-RP_A1REV- 19+48	CL	04-10						216																								5.2															
-Y7_DET- 16+44	CL	2H-01																							192																355					192	REMOVE 2-84" & SANDBAG HW
TOTALS								464																	192							10.4									355					192	

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

44003WS

12/06/07

COMPUTED BY: B. EASON DATE: 08-06-13
CHECKED BY: D. MARTIN DATE: 09-24-13

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	3-K

CABLE GUIDERAIL SUMMARY

SURVEY LINE	STATION	STATION	LENGTH	END ANCHOR UNIT	INTERMEDIATE ANCHOR UNIT	COMMENTS
-LREV-	339+13	375+54	3,641	1	2	Beg. Project to Equality
-L-	83+55	144+27	6,072	1	6	
-L-	150+79	180+39	2,960	2	2	
-L-	185+62	263+54	7,792	2	6	
-L-	267+50	280+43	1,293	2	0	
-L-	282+42	292+00	958	2	0	Tie to R-2633BB
		SUBTOTAL:	22,716	10	16	
LESS TERMINAL ANCHOR UNITS			-250			
		GRAND TOTALS:	22,466	10	16	
		SAY:	22,500	10	16	

WOVEN WIRE FENCE SUMMARY

SURVEY LINE	STATION	STATION	LOCATION (LT/CL/RT)	LINEAR FEET	4" POST	5" POSTS
-RPA1REV-	10+00	28+70	RT	1,870	123	20
-RPD1REV-	10+00	31+00	LT	2,065	134	26
-LREV-	351+11	375+54	LT	2,479	165	23
-LREV-	351+11	375+54	RT	2,267	148	26
-L-	83+54	144+09	LT	6,229	408	68
-L-	83+54	149+05	RT	6,390	446	20
-L-	146+02	146+08	RT	123	7	4
-L-	146+04	149+03	LT	328	20	8
-L-	146+04	163+05	LT	1,754	117	17
-L-	151+26	153+59	RT	279	14	11
-L-	153+59	168+40	RT	1,340	89	14
-RPB2-	10+00	29+09	LT	1,968	126	27
-RPC2-	10+00	25+31	RT	1,562	104	15
-RPC2- / -Y7-	25+31	37+51	RT	155	9	5
-Y7-	20+24	22+96	RT	281	12	15
-Y7- / -L-	20+70	184+14	LT	995	64	14
-Y7-	38+18	48+60	RT	982	62	16
-Y7-	39+54	45+80	LT	681	44	10
-Y7- / -RPD2-	38+45	17+39	LT	895	55	17
-L-	184+14	215+97	LT	3,208	212	32
-RPD2-	10+00	17+39	LT	712	46	9
-L-	197+92	215+85	RT	1,811	119	20
-L-	216+11	263+55	LT	4,744	302	69
-L-	215+93	264+30	RT	4,837	305	76
-L-	266+81	279+90	RT	1,309	82	22
-L- / -RPC3-	267+64	13+70	LT	164	10	5
-RPC3-	13+70	28+04	RT	1458	94	20
			TOTALS:	50,885	3,317	609
			SAY:	50,900	3,320	610

SUMMARY OF REMOVAL OF EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-Y7-	22+10	24+49	LT.	319
-Y7-	48+00	50+50	LT.	583
-SVRD7-	21+47	22+65	CL.	327
-SVRD7-	25+22	25+73	CL.	141
-SVRD8-	27+16	31+14	CL.	1,104
-Y8-	45+52	46+59	LT.	241
-Y8-	47+31	54+02	RT.	1,940
-Y8-	55+44	63+59	LT.	1,722
-Y7DET-	12+62	18+43	CL.	1,552
			TOTAL:	7,929
			SAY:	8,000

48" CHAIN LINK FENCE SUMMARY

SURVEY LINE	STATION	STATION	LOCATION (LT/CL/RT)	LINEAR FEET	LINE POST	TERMINAL POST
-Y8-	19+75	27+26	RT	752	63	4
-Y8-	19+80	22+75	LT	295	25	2
-RPC3-	28+04	43+44	RT	934	79	6
-Y8-/-Y9-	36+34	11+05	LT	702	59	4
			TOTALS:	2,684	226	16
			SAY:	2,700	230	20

SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-Y7-	20+44	22+01	LT.	238
-Y7-	48+37	48+64	LT.	23
-Y8-	45+80	46+96	LT.	387
-Y8-	53+50	56+13	RT./LT.	555
-Y8-	62+85	65+20	LT.	496
-Y9-	12+00	13+50	RT.	300
			TOTAL:	1,999
			SAY:	2,000

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- (RT.)	103+50	106+15	265
-L- (LT.)	105+70	116+50	1,080
-L- (RT.)	135+95	145+78	983
-L- (LT.)	136+10	143+88	778
-L- (LT. Med.)	144+15	144+22	7
-L- (LT.)	149+28	165+00	1,572
-L- (LT. Med.)	149+70	151+24	154
-L- (RT.)	151+48	163+44	1,196
-L- (RT.)	252+00	264+04	1,204
-L- (LT.)	255+59	263+33	774
-L- (LT.)	267+06	280+18	1,312
-L- (RT.)	278+47	280+67	220
-L- (RT.)	282+61	282+95	34
-RPC3- (RT.)	13+39	19+50	611
-Y7- (RT.)	26+75	30+25	350
-Y7- (LT.)	27+00	30+37	337
-Y7- (RT.)	32+81	35+39	258
-Y7- (LT.)	32+95	35+30	235
Y7/RPD2 (LT.)	37+92	19+50	600
RPC2/Y7 (LT.)	18+00	37+62	991
-Y7- (RT.)	39+06	45+50	644
-Y7- (LT.)	39+38	45+50	612
-Y7- (RT.)	51+25	52+91	166
-Y7- (LT.)	51+25	52+91	166
-Y8- (RT.)	50+58	50+95	37
-Y8- (LT.)	50+77	53+00	223
		TOTAL:	14,809
		SAY:	14,900

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6/4/99

COMPUTED BY: B. EASON DATE: 03-01-13
CHECKED BY: B. BOLLMAN DATE: 08-26-13

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	3-L

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

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

LOCATION		UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY 1						
-LREV- US 17	339+13 TO 369+50	240	-	164,371	164,131	-
-RP_A1REV-	16+00 TO 22+20	-	-	14,869	14,869	-
-RP_D1REV-	17+50 TO 22+50	-	-	5,476	5,476	-
SUMMARY TOTAL		240	-	184,716	184,476	-
SUMMARY 2						
-LREV- US 17	369+50 TO 375+54.20 LB	-	-	41,718	41,718	-
-L- US 17	83+54.50 LA TO 114+00	-	-	173,219	173,219	-
SUMMARY TOTAL		-	-	214,936	214,936	-
SUMMARY 3						
-L- US 17	114+00 TO 145+67.97(NBL) (BEGIN BRIDGE)	-	-	286,890	286,890	-
SUMMARY TOTAL		-	-	286,890	286,890	-
SUMMARY 4						
-L- US 17	150+85.29 (END BRIDGE) TO 172+00	76	-	389,521	389,445	-
SUMMARY TOTAL		76	-	389,521	389,445	-
SUMMARY 5						
-L- US 17	172+00 TO 202+00	993	6,797	139,976	138,983	6,797
-RP_B2-	18+00 TO 29+00.00	1,483	-	9,926	8,443	-
-LP_B2-	14+00 TO 17+00	-	-	2,468	2,468	-
-RP_C2-	17+50 TO 26+00.00	81	-	140,403	140,322	-
-RP_D2-	18+00 TO 23+50.00	-	-	50,079	50,079	-
-Y7- SR 1462	15+00 TO 30+54.96 (BEGIN BRIDGE)	333	-	66,638	66,305	-
-Y7- SR 1462	32+64.81(END BRIDGE) TO 37+97.52(BEG.BRIDGE)	-	-	108,354	108,354	-
-Y7- SR 1462	38+95.27 (END BRIDGE) TO 55+00	698	-	127,208	126,510	-
-SVRD8-	32+01.16 TO 37+50	217	-	1,729	1,512	-
-Y7DET-	12+50 TO 18+50	27	-	5,429	5,402	-
-Y7DET- (REMOVAL)	12+50 TO 18+50	5,429	-	-	-	5,429
SUMMARY TOTAL		9,261	6,797	652,208	648,376	12,226
SUMMARY 6						
-L- US 17	202+00 TO 232+00	-	2,525	178,551	178,551	2,525
SUMMARY TOTAL		-	2,525	178,551	178,551	2,525
SUMMARY 7						
-L- US 17	232+00 TO 264+02.78 (BEG.BRIDGE)	-	-	231,345	231,345	-
SUMMARY TOTAL		-	-	231,345	231,345	-

LOCATION		UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY 8						
-L- US 17	267+28.78 (END BRIDGE) TO 280+77.01(BEG.BRIDGE)	-	-	277,715	277,715	-
-RP_C3-	18+00 TO 29+50.00	3,757	=	21,230	17,473	-
-Y8A-	10+50.00 TO 24+75.00	1,435	-	144	-	1,291
-Y8B-	10+50.00 TO 14+00.00	608	-	-	-	608
-Y8C-	10+00.00 TO 19+50.00	1,287	-	188	-	1,100
-Y8D-	10+00.00 TO 25+50.00	296		4,425	4,129	-
SUMMARY TOTAL		7,383		303,701	299,317	2,999
SUMMARY 9						
-L- US 17	282+22.01 (END BRIDGE) TO 292+00 (END PROJECT)	206	-	174,903	174,697	-
-LP_A3-	13+50 TO 16+50		-	16,486	16,486	-
-Y8- SR 1430	13+50 TO 47+15 (BEGIN BRIDGE)	9,251	-	10,873	1,622	-
-Y8- SR 1430	50+43.00 (END BRIDGE) TO 72+40	6,701	-	9,981	3,280	-
-Y9-	10+50.00 TO 16+50	1,616	-	401	-	1,215
SUMMARY TOTAL		17,774	-	212,644	196,085	1,215
SUBTOTAL (SUMMARIES 1 - 9)		34,734	9,322	2,654,513	2,629,422	18,964
MATERIAL FOR SHLD CONST.				38,175	38,175	
EST.LOSS DUE TO CLEAR. & GRUBBING					-	-
ADDITIONAL UNDERCUT			7,000	8,750	8,750	7,000
SELECT GRANULAR MATERIAL,CLASS III				-70,500	-70,500	
SELECT GRANULAR MATERIAL				-30,900	-30,900	
SURCHARGE & REMOVAL		28,800		28,800	28,800	28,800
WASTE IN LIEU OF BORROW					-9,642	-9,642
PROJECT TOTAL		63,534	16,322	2,628,838	2,594,105	45,122
EST.5% TO REPLACE BORROW PIT					129,705	
GRAND TOTAL		63,534	16,322	2,628,838	2,723,810	45,122
SAY:		63,600	16,400		2,723,900	

EST.SHALLOW UNDERCUT = 1,000 CY
EST.DDE = 22,600 CY

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASE IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

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COMPUTED BY: DWM DATE: 1/14/2013
CHECKED BY: BKE DATE: 9/30/2013

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	3-M

WSRAL-0801A

"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

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	XI MOD	IAU	GRAU 350	M-350	XIII	AT-1	CAT-1	B-77	TES	G	NG				
L	102+34.88	106+34.88	RT	400.00			105+72.38		14	17	50		1				1				1							
L	105+62.5	117+00	LT	1137.50			114+50.00	105+74.00	14	17	50		1				1				1							
L	135+92.37	146+04.87	RT	1012.50			136+00.00	BRIDGE	14	17	50		1				1					1						
L	136+11.07	144+11.07	LT	800.00			BRIDGE	136+10.00	14	17											1	1						
L	143+49.90	145+62.40	RT/MED	212.50			BRIDGE		6	9	37.5		4					1				1						
L	144+49.70	144+47.28	LT/MED	37.50			BRIDGE	144+49.70	6	9			4								1	1						
L	149+48.58	153+23.58	LT/MED	375.00			151+23.49	BRIDGE	6	9	37.5		4					1				1						
L	149+03.27	165+53.27	LT	1650.00			164+00.00	BRIDGE	14	17	50		1				1					1						
L	151+25.76	163+50.76	RT	1225.00			BRIDGE	163+43.73	14	17											1	1						
L	180+84.10	185+16.00	MED	725.00					13	23	162.5	162.5	10.5	10.5								4		2		128			MEDIAN PIER PROTECTION
L	251+42.54	264+30.04	RT	1287.50			252+00.00	BRIDGE	14	17	50		1				1					1						
L	255+55.44	263+55.44	LT	800.00			BRIDGE	255+59.00	14	17											1	1						
L	261+86.82	263+99.32	RT/MED	212.50			BRIDGE		6	9	37.5		4					1				1						
L	267+05.68	269+18.18	LT/MED	212.50			BRIDGE		6	9	37.5		4					1				1						
L	266+81.44	280+41.41	LT	1362.50			BRIDGE	BRIDGE	14	17												2						
L	267+64.01	19+56.49/RP_C3	RT	787.50			BRIDGE	19+50.00	14	17											1	1						
L	277+29.0707	280+91.57	RT	362.50			BRIDGE		14	17	50		1				1					1						
L	278+62.08	280+74.58	RT/MED	212.50			BRIDGE		6	9	37.5		4					1				1						
L	281+86.41	12+61.29/LP_A3	LT	300.00			BRIDGE		14	17	50		1				1					1						
L	282+05.83	284+18.33	LT/MED	212.50			BRIDGE		6	9	37.5		4					1				1						
L	285+94.81	288+19.81	LT	225.00			286+01.06		14	17	50		1				1				1							
Y7/SVRD7	Y7 20+25	SVRD7 14+50	LT																							525		
Y7	20+84.85/LPB2	30+48.79	RT	400.00	100.00		26+50.00	BRIDGE	8	11										1		1						
Y7	25+23.69	30+61.19	LT	537.50			26+50.00	BRIDGE	8	11	50		1				1					1						
Y7	32+57.63	25+75.18/RP_C2	RT	312.50	50.00		BRIDGE		8	11										1		1						
Y7	32+72.06	23+56.99/RP_D2	LT	337.50	50.00		BRIDGE		8	11										1		1						
Y7	17+50.00/RP_C2	37+85.01	RT	1150.00	75.00		18+75.00	BRIDGE	14/8	17/11	50		1				1					1						
Y7	19+40.00/RP_D2	38+16.04	LT	662.50	50.00		BRIDGE	17+50.00	8/14	11/17											1	1						
Y7	38+82.21	47+32.21	RT	850.00			BRIDGE	46+00.00	8	11	50		1				1					1						
Y7	39+14.59	10+41.28/SR8	LT	587.50	150.00		BRIDGE	46+50.00	8	11										1		1						
Y7	50+51.00	53+38.50	RT	287.50			52+00.53	52+12.00	8	11	50	50	1	1			2											
Y7	50+76.46	54+25.00	LT	287.50	50.00		52+17.91	52+06.00	8	11		50		1			1			1								
Y8	44+04.81	47+04.81	RT	300.00			BRIDGE		8	11	50		1				1					1						
Y8	45+87.69	47+25.19	LT	137.50				BRIDGE	8	11		50		1			1					1						
Y8	50+32.81	51+70.31	RT	137.50				BRIDGE	8	11		50		1			1					1						
Y8	50+53.19	53+53.19	LT	300.00			BRIDGE		8	11	50		1				1					1						
Y8C	19+96.65			25.00																		2						GUARDRAIL BARRICADE
ADDITIONAL ITS GUARDRAIL				600.00													2				4				1			OUTSIDE PROJECT R-2633BA LIMITS
		SUB-TOTAL		20462.50	525.00	0.00											20	6	0	5	13	34	2	2	1	128	525	0	
LESS ANCHORS:																												
GRAU 350		20	@ 50.00	- 1000.00																								
M 350		6	@ 37.50	- 225.00																								
AT-1		5	@ 6.25	- 31.25																								
CAT-1		13	@ 6.25	- 81.25																								
B-77		34	@ 18.75	- 637.50																								
		TOTAL		18487.50	525.00	0.00											20	6		5	13	34	2	2	1	128	525		
		SAY		18,500	525	0.00											20	6		5	13	34	2	2	1	128	525		
ADDITIONAL POSTS= 10 EA																												
TEMP. GUARDRAIL																												
Y7DET	17+58.00	17+58.00	RT	225.00			16+40.00	16+60.00	8	11	50	50	1	1			2											
Y7DET	17+58.00	17+58.00	LT	225.00			16+60.00	16+40.00	8	11	50	50	1	1			2											
		SUB-TOTAL		450.00													4											
LESS ANCHORS:																												
GRAU 350		4	@ 50.00	- 200.00																								
		TOTAL		250.00													4											
		SAY		250													4											

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	3-N

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	–	R–2633AB
2	4	T.F. HOLDINGS LIMITED PARTNERSHIP
3	4	JOHN M. HEWITT, ETUX
4	4,5	V. A. CREECH, JR.
5	–	R–2633AB
6	–	UNKNOWN
7	4	LEONARD BASDEN, ETUX
8	–	R–2633AB
9	–	UNKNOWN
10	4,5,6,7,8,9	74 HOLDING, LLC
10A	4,5	YDV, INC.
11	5,6,7,8	WCM ENTERPRISES, LLC.
11A	9,10,11,12	WCM ENTERPRISES, LLC.
11B	8,9	MEBANE W. CARTER III
12	–	UNKNOWN
13	8,9,10	CHADWICK–ONE, LLC.
13A	11	CHADWICK–ONE, LLC
14	–	UNKNOWN
15	11,12,13,21	BARNEY L. PADGETT ET UX
16	21	DORIS ELLIS LONG ESTATE
16A	21	OSCAR R. LONG ETAL
17	–	UNKNOWN
18	–	UNKNOWN
19	21	LONG ACRES SUBDIVISION INC.
20	21	RAIFORD S. GURGANIOUS ET UX
21	13,14,21	LOUISE VERZAAL JOYNER
22	13,21	TILLMAN IVEY, JR., ETAL
23	13,21	GEORGE W. CLEMMONS ET UX
24	13,21	MARY COOK COSTON
25	13	WILLIAM HENRY COOK
26	13	TILLMAN IVEY, JR.
27	–	UNKNOWN
28	13	STEPHANIE W. LABRECQUE–FOYIL

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
29	13	TILLMAN IVEY, JR. ET AL
29A	13	MARY ELIZABETH IVEY
30	13	PATRICK J. MOORE ET UX
31	22	ALMA SOOBRIAN GORE
32	22	E. G. DALE ET UX
33	–	UNKNOWN
33A	22	E.G. DALE ET UX
34	22	DONALD BEATTY ET UX
35	22	D & H INVESTORS, INC.
35A	22	E.G. DALE ET UX
35B	22	EASTBROOK ESTATES HOA INC
35C	22	TRACY McELROY, ET VIR
36	22	ANNETTE ANDREWS TROY ET AL
37	22	NORTH CAROLINA AGRICULTURAL FOUNDATION, INC
38	13,14	JULIAN A. ALTOBELLIS ET UX
39	13,14,15	LINCOLN DEVELOPMENT CO., INC.
40	15,16,17,18,19, 20,25,26	RAIFORD G. TRASK, JR.
41	24	FRANKLIN BRYANT ET AL
41A	24	FRANKLIN BRYANT ET AL
42	24	NORMAN A. WILLIS
43	24	THOMAS ELLIOTT ET UX
44	24	MARGARET MCBRIDE
45	20,24	NEHEMIAH HOLLIDAY
46	20,24	DORETHA W. POWELL
47	24	DARYL EDWARD RATTLEY ET AL
48	24	HENRY LEE BALLARD, JR.
49	20,24	FRED DAVIS ET UX
50	23	LORI JOY PETERSON
51	19,20,23	JUANITA DAVID
52	23	FREDERICK DAVIS ET UX
53	20,23	GWENDALYN J. DAVID–PETERSON
54	20,23,24	ESAU DAVID ET UX
55	20	WILLIE JAMES HALL ET UX

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
56	20	CLIFTON BALLARD ET UX
57	20	EVELYN B. HALL
58	20	TRAVIS B. LARKIN
59	20,25	WILMINGTON RIVER CLUB, LLC
60	20	JIMMY THOMAS, ETUX
61	–	UNKNOWN
62	20	WADUS A. CLARK
63	20	JOHNNY LLOYD WRIGHT ET UX
64	20,25	DONALD KEITH LEE ET UX
65	25	MEGOES, LLC
66	25	MANDY CLEMMONS
67	25	MARILYYN GAIL RACKLEY
68	25	ELWOOD HARDISON ET UX
69	25	ROBERT H. DOWDY, JR. ET UX
70	25	TOWN OF NAVASSA
71	25,26	WAYNE D. HINSON ET UX
72	25,26	CHARLES A. HINSON
73	25,26	BETTY LOU KORNEGAY
74	25,26	ESTATE OF ESSIE E. BLIZZARD
75	26,27	LINCOLN DEVELOPEMENT COMPANY, INC.
75A	26	ROGERS FAMILY PROPERTIES, LLC.
97	23	FRED DAVIS, JR. ET UX
98	23	KENNETH HALL, ET UX
98A	23	WILLIAM E. MACK, ET UX
99	23	LINDA G. BRYANT
99A	23	JOYCE M. ROBBINS
100	23	PATRICE ROBBINS
101	23	JONATHAN LEE, ET UX
102	23	JOSE M. SEGURA, ET UX
103	23,24	ERNEST A. MCINTYRE, ET AL
104	23	ABT, LLC.
41B	24	WILLIAM HENRY BRYANT
75Z	26	RODGERS FAMILY PROPERTIES, LLC.

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF BRIDGE WAITING PERIODS

BRIDGE DESCRIPTION	ENDBENT/BENT NO.	MONTHS
BRIDGE ON -L- OVER -EY6- STR.#1 (LEFT LANE)	EB1, IB1, IB2, &EB2	3*
BRIDGE ON -L- OVER -EY6-, STR. #2 (RIGHT LANE)	EB1, IB1, IB2, &EB2	3*

* THE 3 MONTH BRIDGE WAITING PERIODS BEGIN AFTER EMBANKMENT CONSTRUCTION TO FINISH GRADE AND PLACEMENT OF 2' SURCHARGE.

SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS

SURVEY LINE	STATION	STATION	SURCHARGE HEIGHT (FT)	MONTHS
-L-	137+50+/-	147+28+/-	2.0	9*
-L-	147+52+/-	164+00+/-	2.0	9*

* TOTAL WAITING PERIODS FOR STAGE CONSTRUCTION TO BUILD EMBANKMENTS WITH 2.0' OF SURCHARGE. SEE GROUND IMPROVEMENT PLAN SHEETS FOR STAGE CONSTRUCTION.

SUMMARY OF SUBSURFACE DRAINAGE

SURVEY LINE	STATION	STATION	LOCATION (LT/CL/RT)	DRAIN TYPE* UD/BD/SD	LF
-RAMP B2-	18+50	22+25	LT	SD	375
-RAMP B2-	22+25	25+50	RT	SD	325
-LOOP B2-	17+00	19+50	RT	SD	250
-Y8-	13+40	46+50	LT/RT	SD	3310
-Y8-	50+50	61+00	LT/RT	SD	1050
			CONTINGENCY	SD	2000
				TOTAL LF	7310
				SAY	7400

* UD - UNDERDRAIN
* BD - BLIND DRAIN
* SD - SUBSURFACE DRAIN

Note: From GEOTECHNICAL LETTER 5/08/13

SUMMARY OF AGGREGATE SUBGRADE STABILIZATION

LOCATION	SHALLOW UNDERCUT CY	CLASS IV SUBGRADE STABILIZATION TONS	CLASS IV AGGREGATE STABILIZATION TONS	GEOTEXTILE FOR SOIL STABILIZATION SY
CONTINGENCY	1,000	1,900	18,750	129,000
EROSION CONTROL				1,000
TOTAL	1,000	1,900	18,750	130,000

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LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021
PROJECT REFERENCE NO. R-2633BA
SHEET NO. 04
RW SHEET NO. 06
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
10/1/13
REVISIONS
NAD 83/95
-Y5WBL-
PIs Sta 19+59.69 θs = 3° 32' 43.9" Ls = 250.00' LT = 166.70' ST = 83.36'
PI Sta 22+96.43 Δ = 14° 18' 10.0" (LT) D = 2° 50' 11.1" L = 504.25' T = 253.44' R = 2,020.00' DS = 60 mph e = EXISTING
PIs Sta 26+57.31 θs = 4° 40' 48.4" Ls = 330.00' LT = 220.08' ST = 110.07'
-Y5- US 74/76
277/492
14/44
49/78
247/468
282/502
5/8
5/8
225/386
2013 ADT
2035 ADT
(ADT In hundreds)
-LREV-
PI Sta 338+29.63 Δ = 35° 28' 13.1" (RT) D = 0° 34' 28.9" L = 6,172.16' T = 3,188.57' R = 9,970.00' e = 2.5% Runoff = 113'
-RP_AIREV-
PIs Sta 14+00.09 θs = 5° 22' 17.3" Ls = 300.00' LT = 200.09' ST = 100.08'
PI Sta 17+44.57 Δ = 17° 22' 54.0" (RT) D = 3° 34' 51.6" L = 485.39' T = 244.57' R = 1,600.00' e = 8.0%
PIs Sta 20+58.75 θs = 3° 56' 20.7" Ls = 220.00' LT = 146.70' ST = 73.37'
-RP_AIREV-
PIs Sta 23+52.17 θs = 7° 00' 10.1" Ls = 220.00' LT = 146.78' ST = 73.44'
PI Sta 25+14.73 Δ = 11° 20' 16.3" (LT) D = 6° 21' 58.3" L = 178.09' T = 89.34' R = 900.00' e = 8.0%
PIs Sta 26+76.92 θs = 7° 00' 10.1" Ls = 220.00' LT = 146.78' ST = 73.44'
EQUALIZER PIPE INVERTS WILL NOT BE BURIED
DETAIL B FALSE SUMP (Not to Scale)
DETAIL C SPECIAL CUT 2' BASE DITCH (Not to Scale)
Min. D = 1.0 Ft. Min. d = 1.0 Ft. B = 2.0 Ft.
FROM STA. 340+50 TO STA. 344+30 -LREV- RT.
DETAIL F LINE W/ PSRM (Not to Scale)
d = 1.0 Ft.
Type of Liner= PSRM
FROM STA. 342+86 TO STA. 344+00 -LREV- LT.
FROM STA. 344+80 TO STA. 346+00 -LREV- RT.
-L-
PI Sta 50+09.64 Δ = 40° 43' 04.0" (RT) D = 0° 34' 54.1" L = 7,009.00' T = 3,655.14' R = 9,850.00' e = 2.5%
-Y5-
PI Sta 23+29.43 Δ = 22° 31' 21.9" (LT) D = 2° 43' 42.1" L = 825.50' T = 418.15' R = 2,100.00' e = 6.0%
-RP_AI-
PIs Sta 14+00.10 θs = 5° 43' 46.5" Ls = 300.00' LT = 200.10' ST = 100.10'
PI Sta 17+06.02 Δ = 15° 38' 27.6" (RT) D = 3° 49' 11.0" L = 409.48' T = 206.02' R = 1,500.00' e = 6.0%
PIs Sta 20+09.58 θs = 5° 43' 46.5" Ls = 300.00' LT = 200.10' ST = 100.10'
-RP_AI-
PIs Sta 23+42.90 θs = 6° 21' 58.3" Ls = 200.00' LT = 133.42' ST = 66.75'
PI Sta 25+07.39 Δ = 12° 25' 03.9" (LT) D = 6° 21' 58.3" L = 195.06' T = 97.91' R = 900.00' e = 6.0%
PIs Sta 26+71.28 θs = 6° 21' 58.3" Ls = 200.00' LT = 133.42' ST = 66.75'
-LP_AI-
PIs Sta 12+39.12 θs = 38° 33' 52.1" Ls = 350.00' LT = 239.12' ST = 121.95'
PI Sta 16+57.30 Δ = 99° 31' 53.1" (LT) D = 22° 02' 12.6" L = 451.66' T = 307.30' R = 260.00' e = 8.0%
PIs Sta 18+86.87 θs = 27° 32' 45.8" Ls = 250.00' LT = 168.73' ST = 85.21'
-RP_DI-
PIs Sta 12+00.14 θs = 6° 36' 39.8" Ls = 300.00' LT = 200.14' ST = 100.13'
PI Sta 16+35.50 Δ = 28° 56' 31.5" (LT) D = 4° 24' 26.5" L = 656.88' T = 335.50' R = 1,300.00' e = 7.8%
PIs Sta 20+56.80 θs = 6° 36' 39.8" Ls = 300.00' LT = 200.14' ST = 100.13'
-RP_DI-
PIs Sta 23+90.12 θs = 7° 09' 43.1" Ls = 200.00' LT = 133.44' ST = 66.77'
PI Sta 25+69.18 Δ = 16° 00' 37.9" (RT) D = 7° 09' 43.1" L = 223.56' T = 112.51' R = 800.00' e = 6.0%
PIs Sta 27+46.99 θs = 7° 09' 43.1" Ls = 200.00' LT = 133.44' ST = 66.77'
-LP_DI-
PIs Sta 12+03.60 θs = 33° 03' 18.9" Ls = 300.00' LT = 203.60' ST = 103.28'
PI Sta 17+88.98 Δ = 123° 59' 57.5" (RT) D = 22° 02' 12.6" L = 562.69' T = 488.98' R = 260.00' e = 8.0%
PIs Sta 19+30.31 θs = 22° 02' 12.6" Ls = 200.00' LT = 134.38' ST = 67.62'
-RP_DIREV-
PIs Sta 12+51.69 θs = 1° 09' 14.5" θs = 8° 48' 55.9" Ls = 400.00' LT = 251.69' ST = 149.20'
PI Sta 16+90.97 Δ = 25° 13' 55.8" (LT) D = 4° 24' 26.5" L = 572.50' T = 290.97' R = 1,300.00' e = 8.0%
PIs Sta 20+72.63 θs = 6° 36' 39.8" Ls = 300.00' LT = 200.14' ST = 100.13'
-RP_DIREV-
PIs Sta 24+05.94 θs = 7° 09' 43.1" Ls = 200.00' LT = 133.44' ST = 66.77'
PI Sta 25+82.61 Δ = 15° 40' 24.9" (RT) D = 7° 09' 43.1" L = 218.84' T = 110.11' R = 800.00' e = 8.0%
PIs Sta 27+58.11 θs = 7° 09' 43.1" Ls = 200.00' LT = 133.44' ST = 66.77'
A
D
T.F.HOLDINGS
JOHN M. HEWITT, ETUX
V. A. CREECH, JR.
NEVA BROWN
LEONARD BASDEN, ETUX
74 HOLDING, LLC
CP-BRUNSWICK, LLC
CAROLINA POWER & LIGHT CO.
CKC, LLC
T.F.HOLDINGS LIMITED PARTNERSHIP
CONSTRUCTED UNDER TIP R-2633AB
BEGIN STATE PROJECT R-2633BA
BEGIN PAVING
-LREV- POC Sta. 339+13.00
END CONSTRUCTION
END PAVING ONLY
-RP_AIREV- STA.28+84.25
END GRADING AND PAVING
BEG.PAVING ONLY
-RP_AIREV STA.22+20.00
END CONSTRUCTION
END PAVING ONLY
-RP_DIREV- STA.30+36.81
END GRADING AND PAVING
BEG.PAVING ONLY
-RP_DIREV-STA.22+53.00
-L- STA.35+79.08 = -EY4- STA.32+33.37 Δ= 120° 35' 41.69"
POCSta. 39+69.01 -L- = POTSta. 28+76.85 -Y5- Δ= 95° 51' 42.48"
POCSta. 351+10.13 -LREV- POT Sta. 10+00.00 -RP_AIREV- (47.00' LT) Δ= 3° 00' 00.00"
POCSta. 352+66.26 -LREV- STSta. 10+00.00 -RP_DIREV- (47.00' RT)
MATCH TO SHEET 5 -LREV- STA.353+00.00
PREFORMED SCOUR HOLE *NOT TO SCALE
PLAN VIEW
SECTION A-A
B=5.0 Ft. D=1.0 Ft. W=4.0 Ft.
STA. 340+51 -LREV- LT.
STA. 344+75 -LREV- RT
PROPOSED SIGNAL
SEE SHEETS 28 & 29 FOR -LREV- PROFILE
SEE SHEETS 39 FOR -RP_AIREV- PROFILE
SEE SHEET 40 FOR -RP_DIREV- PROFILE
GRAPHIC SCALE
50 25 0 50 100
PLANS
LOCATION: US 17 WILMINGTON BYPASS @ US 74/76
TIP NO.: R-2633BA
COUNTY: BRUNSWICK
DESIGNED BY: David Martin
CHECKED BY:
DATE:
01-OCT-2013 08:37
R:\Roadway\Proj\R-2633BA\R-2633BA_RDY_PSH04.dgn

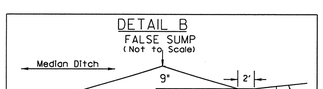
8/17/99

REVISIONS

-L-
PI Sta 50+09.64
Δ = 40° 43' 04.0" (RT)
D = 6° 34' 54.9"
L = 7,009.00'
T = 3,655.14'
R = 9,850.00'
e = 2.5%

-LREV-
PI Sta 338+29.63
Δ = 35° 28' 13.10" (RT)
D = 0° 34' 28.85"
L = 6,172.16'
T = 3,188.57'
R = 9,970.00'
e = 2.5%
Runoff = 113'

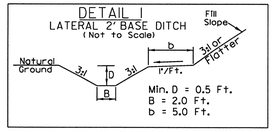
DETAIL B
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

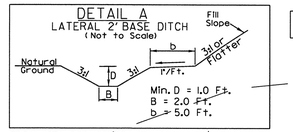
-LREV- STA. 356+85 +/-
-LREV- STA. 361+85 +/-
-LREV- STA. 365+85 +/-

DETAIL I
LATERAL 2' BASE DITCH
(Not to Scale)



FROM STA. 358+50 TO STA. 366+00 -LREV- RT. (DDE=434 CY)

DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)



FROM STA. 356+10 TO STA. 358+50 -LREV- RT. (DDE=22 CY)

EQUALIZER PIPE INVERTS WILL NOT BE BURIED

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	05
R/W SHEET NO.	07

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JOHN K. EASLEY
10/1/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JOHN K. EASLEY
10/1/13

NAD 83/95

MATCH TO SHEET 4 -LREV- STA. 353+00.00

MATCH TO SHEET 6 -LREV- STA. 367+00.00

355 360 365

10A
CP BRUNSWICK, LLC

10
74 HOLDING, LLC

11
WCM ENTERPRISES, LLC.

4
V. A. CREECH, JR.

CKC, LLC

CKC, LLC

-L- +95.17 PC

-L- +43.00 115.00' LT

-L- +00.00 128.00' LT

-BL- 60

-L- +52.18 PL

-L- +54.97 PC

-L- +05.36 147.21' RT

-L- +66.26

-LREV-

CLASS B RIP RAP
EST. 3 TON
EST. 10 SY FF

LAT. 2' BASE DITCH
SEE DETAIL A

LAT. 2' BASE DITCH
SEE DETAIL I

600' ACCELERATION LANE

300' TAPER

PROP. WW FENCE

PROP. R/W

DIRT PILE 35'WX20'T

WOODS

CABLE GUIDERAIL

36" RCP-III EQUALIZER

18" RCP-III

RAD: 10036.45' (MAP 45 PG 53)

RAD: 9976' (MAP 45 PG 53)

P.I. 400.44 202.12'

P.I. +05.12 265.12'

N 30°42'27" W 199.33'

N 30°46'15" W 175.19'

N 04°56'08" W 1692.67'

S 50° W 17'

SEE SHEET 29 FOR -LREV- PROFILE

01-OCT-2013 08:40
R:\Roadway\Proj\R-2633BA\R-2633BA_RDY_PSH05.dgn
$$$$USERNAME$$$$

8/17/99

REVISIONS

-L-
PI Sta 50+09.64
~~Δ = 40° 43' 04.0" (RT)~~
D = 6° 34' 54.1"
L = 7,000.00'
T = 3,655.14'
R = 9,850.00'
~~e = 2.5%~~

-L-
PIs Sta 84+90.46
Θs = 0° 43' 37.5"
Θs = 1° 14' 44.1"
Ls = 250.00'
LT = 135.96'
ST = 114.06'

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%
Runoff = 180'

-LREV-
PI Sta 338+29.63
Δ = 35° 28' 13.10" (RT)
D = 0° 34' 28.85"
L = 6,172.16'
T = 3,188.57'
R = 9,970.00'
e = 2.5%
Runoff = 113'

PI Sta 371+83.90
Δ = 4° 31' 45.0" (RT)
D = 0° 36' 40.5"
L = 740.97'
T = 370.68'
R = 9,373.62'
e = 2.5%
Runoff = 113'

EQUALIZER PIPE INVERTS WILL NOT BE BURIED

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	06
RW SHEET NO.	08

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. MULKEY
9/30/13

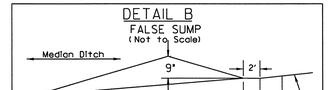
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER NAN W. PRICE
9/30/13

DETAIL J
TOE PROTECTION
(Not to Scale)

d = 1.0 Ft.
B = 3.0 Ft.
Type of Liner= Class 'B' Rip-Rap

FROM STA. 370+50 TO STA. 374+20 -LREV- LT.
CLASS B RIP RAP(179 TON) GEOTEXTILE(411 SY)
FROM -LREV- STA. 374+50 TO -L- STA. 87+00 LT.
CLASS B RIP RAP(111 TON) GEOTEXTILE(256 SY)

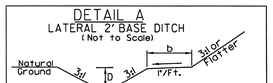
DETAIL B
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 375+30 +/- -LREV-

DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)



Min. D = 0.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.

FROM STA. 86+00 TO STA. 87+00 -L- RT. (DDE=113 CY)

74 HOLDING, LLC

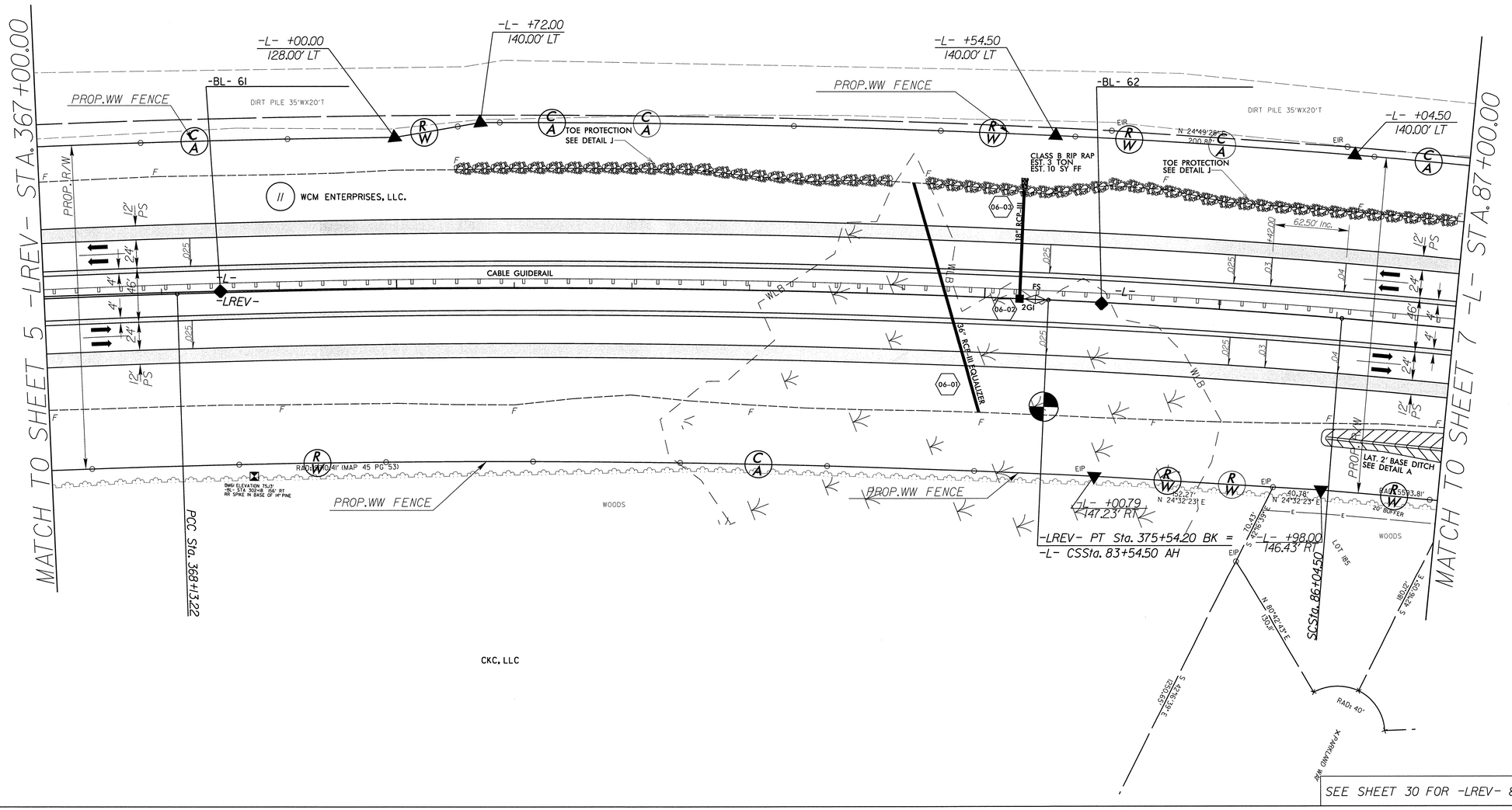
370

10

NAD 83/95

375

85



CKC, LLC

SEE SHEET 30 FOR -LREV- & -L- PROFILE

SYTIME
R:\RDs\Raleigh\Proj\R-2633BA\R-2633BA_RDY_PSH06.dgn
$$$$USERNAME$$$$

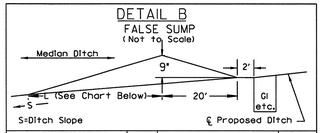
LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 — NC License Number F-0159	R-2633BA	07
MULKEY INC. — NC License Number C-1021	R/W SHEET NO.	09
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EARGLE 9/30/13

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. EARGLE 9/30/13

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%
Runoff = 180'

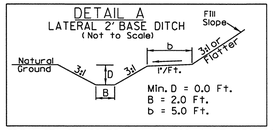
DETAIL B
FALSE SUMP
(Not to Scale)



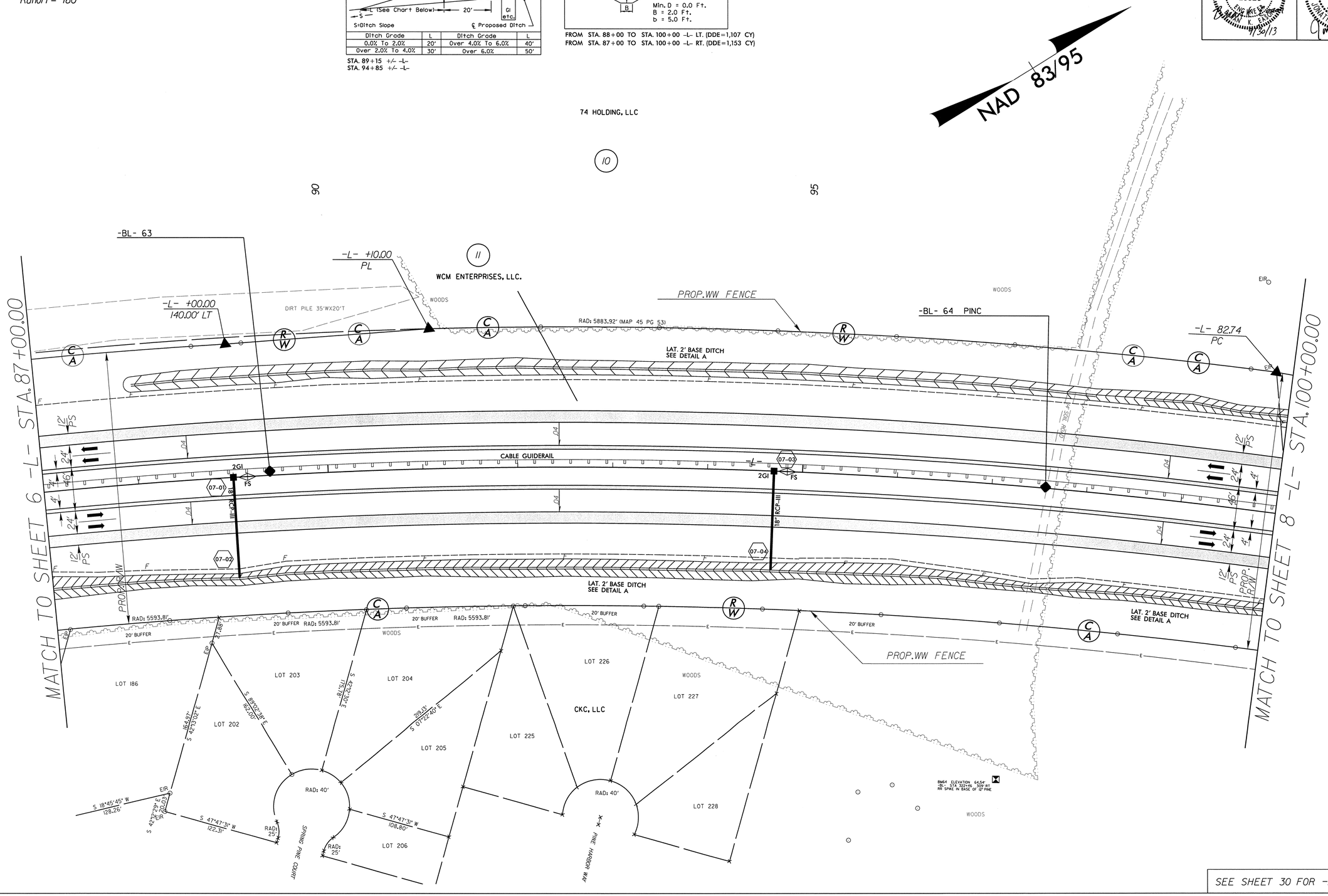
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 89+15 +/- -L-
STA. 94+85 +/- -L-

DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)



FROM STA. 88+00 TO STA. 100+00 -L- LT. (DDE=1,107 CY)
FROM STA. 87+00 TO STA. 100+00 -L- RT. (DDE=1,153 CY)



SEE SHEET 30 FOR -L- PROFILE

REVISIONS

8/17/99

SYTIME
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$$$$USERNAME$$$$

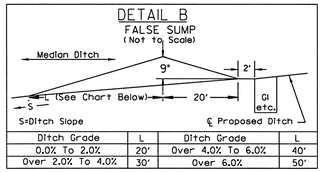
LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 NC License Number F-0159	R-2633BA	08
MULKEY INC. NC License Number C-1021	R/W SHEET NO.	10
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EASON 10/1/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. SCHAFER 10/1/13

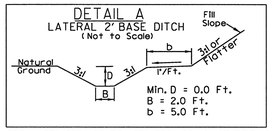
EQUALIZER PIPE INVERTS WILL NOT BE BURIED

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%
Runoff = 180'

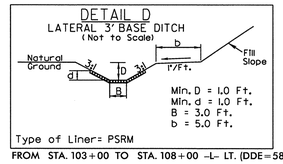


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

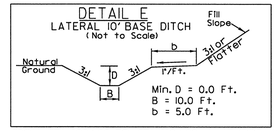
STA. 100+55+/-
STA. 106+28+/-
STA. 112+00+/-



FROM STA. 100+00 TO STA. 103+00 -L- LT.(DDE=260CY)
FROM STA. 100+00 TO STA. 107+00 -L- RT.(DDE=632CY)



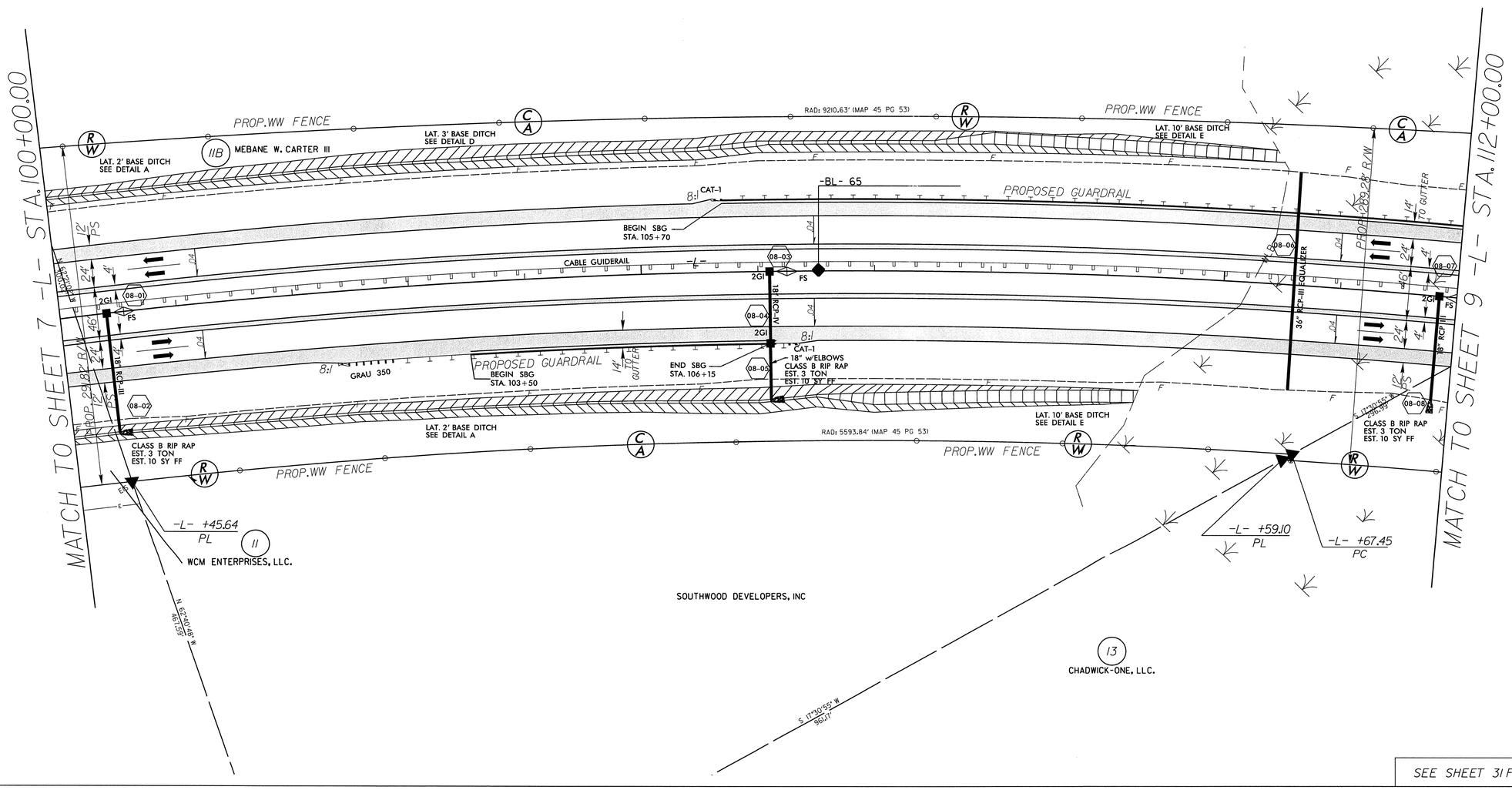
FROM STA. 103+00 TO STA. 108+00 -L- LT. (DDE=587CY)



FROM STA. 108+00 TO STA. 110+38 -L- LT. (DDE=189CY)
FROM STA. 107+00 TO STA. 109+25 -L- RT. (DDE=175CY)

10 74 HOLDING, LLC

NAD 83/95



SEE SHEET 31 FOR -L- PROFILE

REVISIONS

8/17/99

01-OCT-2013 11:55
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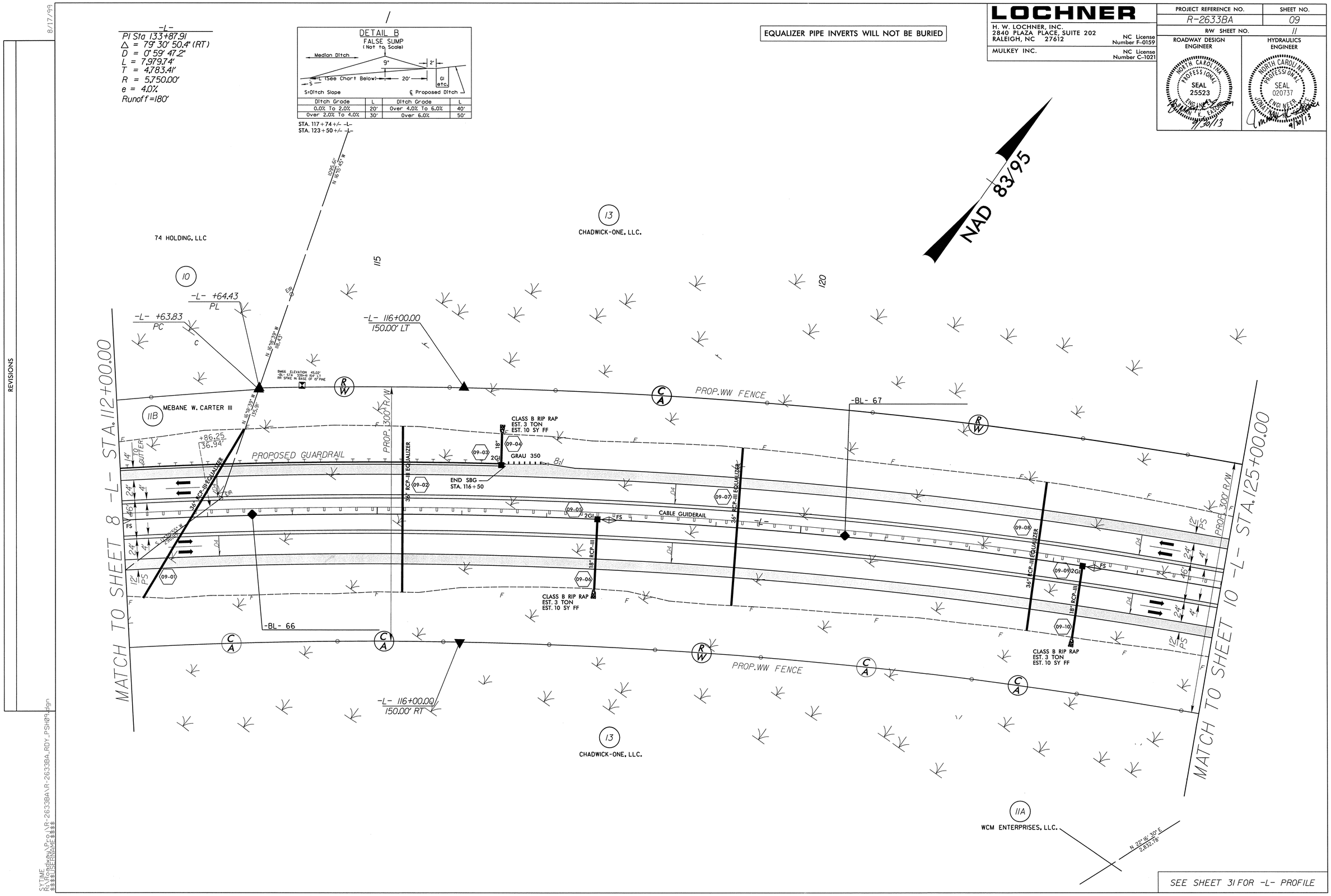

SEE SHEET 31 FOR -L- PROFILE

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	09
R/W SHEET NO.	11

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
9/30/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
9/30/13

REVISIONS

8/17/99

SYTIME
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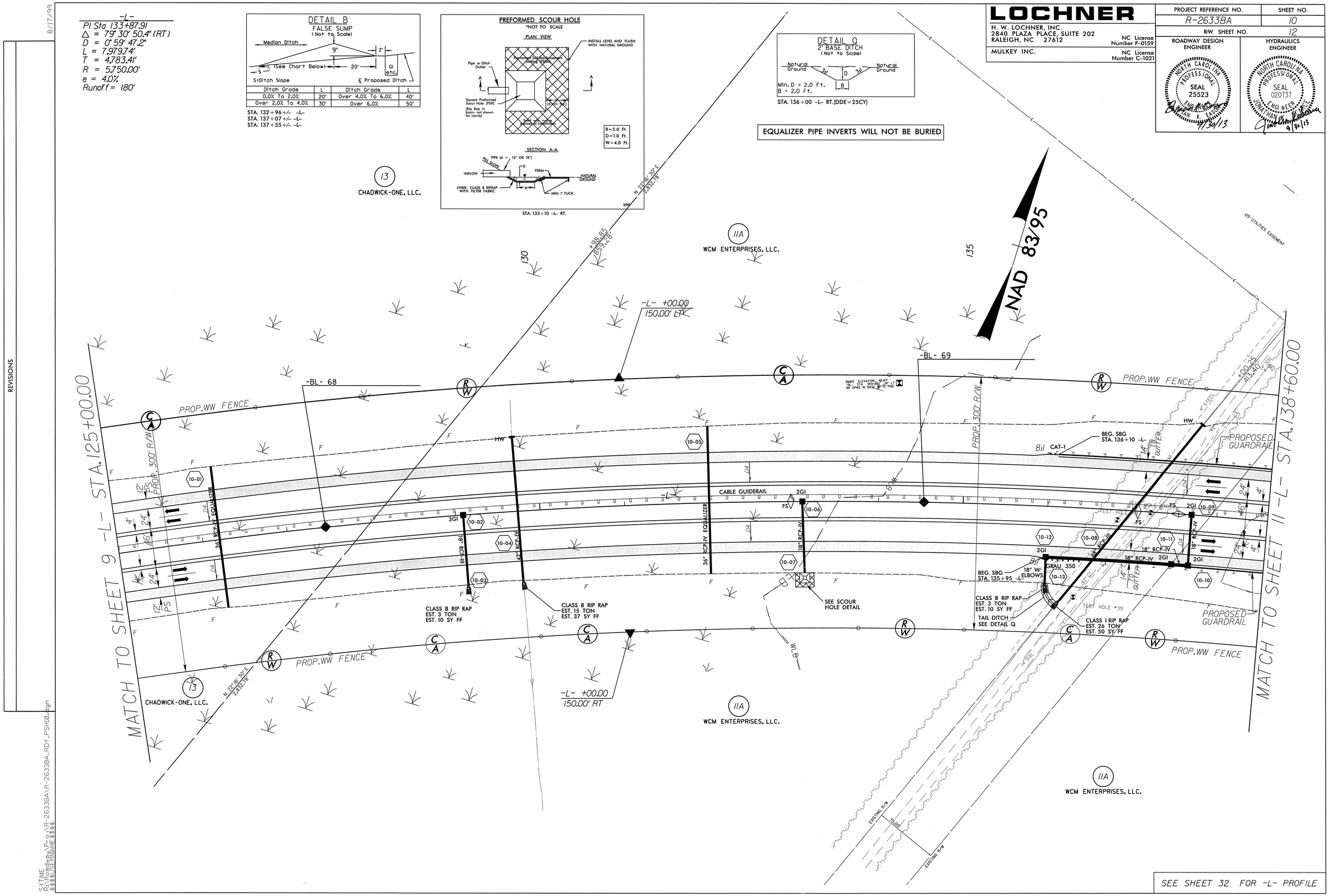

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	10
R/W SHEET NO.	12

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EASON
9/30/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. EASON
9/30/13

REVISIONS

8/17/99

SYTIME
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$$$$USERNAME$$$$

8/17/99

REVISIONS

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

MULKEY INC.
NC License Number C-1021

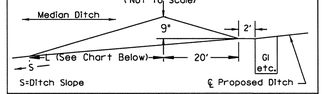
PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	11
RW SHEET NO.	13

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
10/18/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
10-17-13

-L-
PI Sta. 133+87.91
Δ = 19° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%
Runoff = 180'

DETAIL B
FALSE SUMP
(Not to Scale)



S=Ditch Slope

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 117+74+/- -L-
STA. 123+50+/- -L-

NAD 83/95

NOTE: A RAILROAD CROSSING AGREEMENT WILL BE NEEDED AT THIS LOCATION (-L- Sta.147+38.89).

EQUALIZER PIPE INVERTS WILL NOT BE BURIED

MATCH TO SHEET 10 -L- STA. 138+60.00

MATCH TO SHEET 12 -L- STA. 152+00.00

-BY6- 224
-BL- 70
-L- +30.00
150.00' LT
(EXIST RR R/W)
END CA
-L- +09.18
59.00' LT
END WW FENCE
-BL- 71
-BY6- 71
-L- +03.58
175.00' LT
(EXIST RR R/W)
BEG CA
BEGIN APPROACH SLAB
-L- STA. 144+18.24
BEGIN BRIDGE
-L- STA. 144+41.79
-EY6-
-L- +10.00
195.00' LT
CLASS B RIP RAP
EST. 3 TON
EST. 10 SY FF
END BRIDGE
-L- STA. 149+42.04
END APPROACH SLAB
-L- STA. 149+65.47
BEGIN SBG
STA. 149+26 -L-
-L- +03.27
59.00' LT
BEG. WW FENCE
PROPOSED GUARDRAIL
END BRIDGE
-L- STA. 150+85.29
END APPROACH SLAB
-L- STA. 151+08.89
END SBG
STA. 151+60
18" CAAP
W/ELBOWS
PROP. SBG
BEGIN SBG
STA. 149+72 -L-
BEGIN SBG
STA. 151+49
+25.76
59.00' RT
BEG. WW FENCE
-L- STA. 147+38.89 =
-EY6- STA. 15+63.72
Δ = 24° 28' 53.54"
-L- +04.66
180.66' RT
(EXIST RR R/W)
END CA
-L- +70.00
183.93' RT
-L- +00.00
150.00' RT
-L- +40.00
180.00' RT
BEGIN APPROACH SLAB
-L- STA. 145+44.24
BEGIN BRIDGE
-L- STA. 145+67.97
-L- +01.7352
59.00' RT
END WW FENCE
END SBG
STA. 145+78 -L-
PROP. 20' GATE
PROP. WW FENCE
PROPOSED GUARDRAIL
CABLE GUIDERAIL
END SBG
STA. 143+87 -L-
END SBG
STA. 144+24 -L-
BEGIN SBG
STA. 144+05
TYPE B-77
TYPE M350
CAT-1
CGAU
TB 2GI
2GI
18" RCP-IV
18" CLASS IV RCP
18" w/ELBOWS
FS
8:1
4' STEEL
CSX RAILROAD
CSX RR TRACK
EXISTING R/R R/W
NORS EASEMENT
125' UTILITIES EASEMENT
14' TO GUTTER
PROP. 300' R/W
75.00'
HW
WLB
℄ TM
℄ BL
℄ -L-
℄ -EY6-
℄ -BY6-
℄ -BL-
℄ -EL-
℄ -EM-
℄ -EN-
℄ -EP-
℄ -EQ-
℄ -ER-
℄ -ES-
℄ -ET-
℄ -EU-
℄ -EV-
℄ -EW-
℄ -EX-
℄ -EZ-

(13A) CHADWICK-ONE, LLC

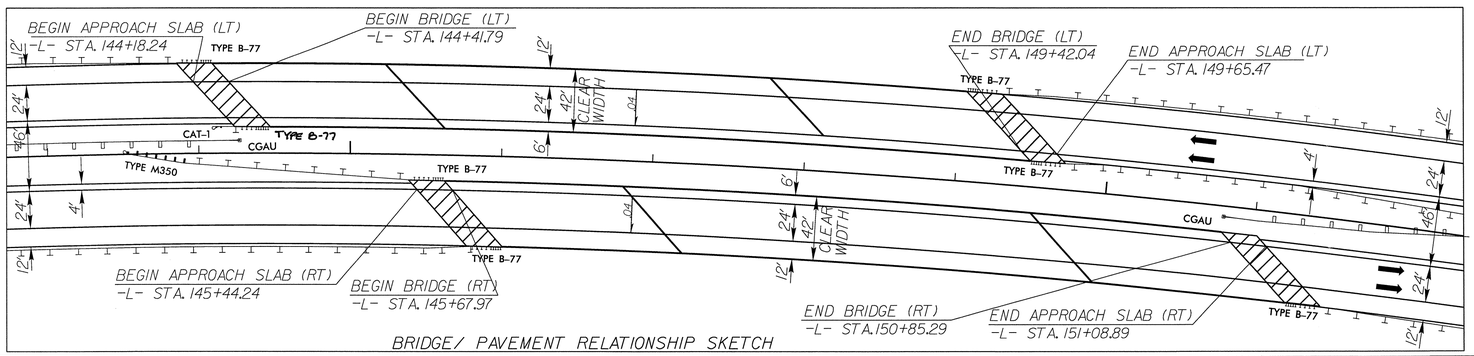
(15) BARNEY L. PADGETT ET UX

(IIA) WCM ENTERPRISES, LLC.

BARNEY L. PADGETT HEIRS

CLASS I RIP RAP
EST. 26 TON
EST. 50 SY FF

(11-01) (11-02) (11-03) (11-04) (11-05) (11-06) (11-07) (11-08) (11-09) (11-10)



BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

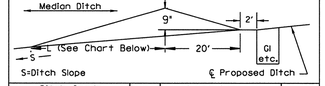
SEE SHEETS S-1 TO S-100 FOR STRUCTURE PLANS

SEE SHEET 32 FOR -L- PROFILE

17-OCT-2013 16:09
R:\Roadway\R-2633BA\R-2633BA_ROY_PSH11.dgn
$$$$USERNAME$$$$

-L-	-RP_B2-	
PI Sta 133+87.91	PIs Sta 10+83.34	PIs Sta 13+83.37
Δ = 79° 30' 50.4" (RT)	Θs = 1° 14' 07.7"	Θs = 4° 00' 00.0"
D = 0° 59' 47.2"	Ls = 250.00'	Ls = 200.00'
L = 7,979.74'	LT = 166.67'	LT = 133.37'
T = 4,783.41'	ST = 83.34'	ST = 66.70'
R = 5,750.00'		
e = 4.0%		
Runoff = 180'		

DETAIL B
FALSE SUMP
(Not to Scale)

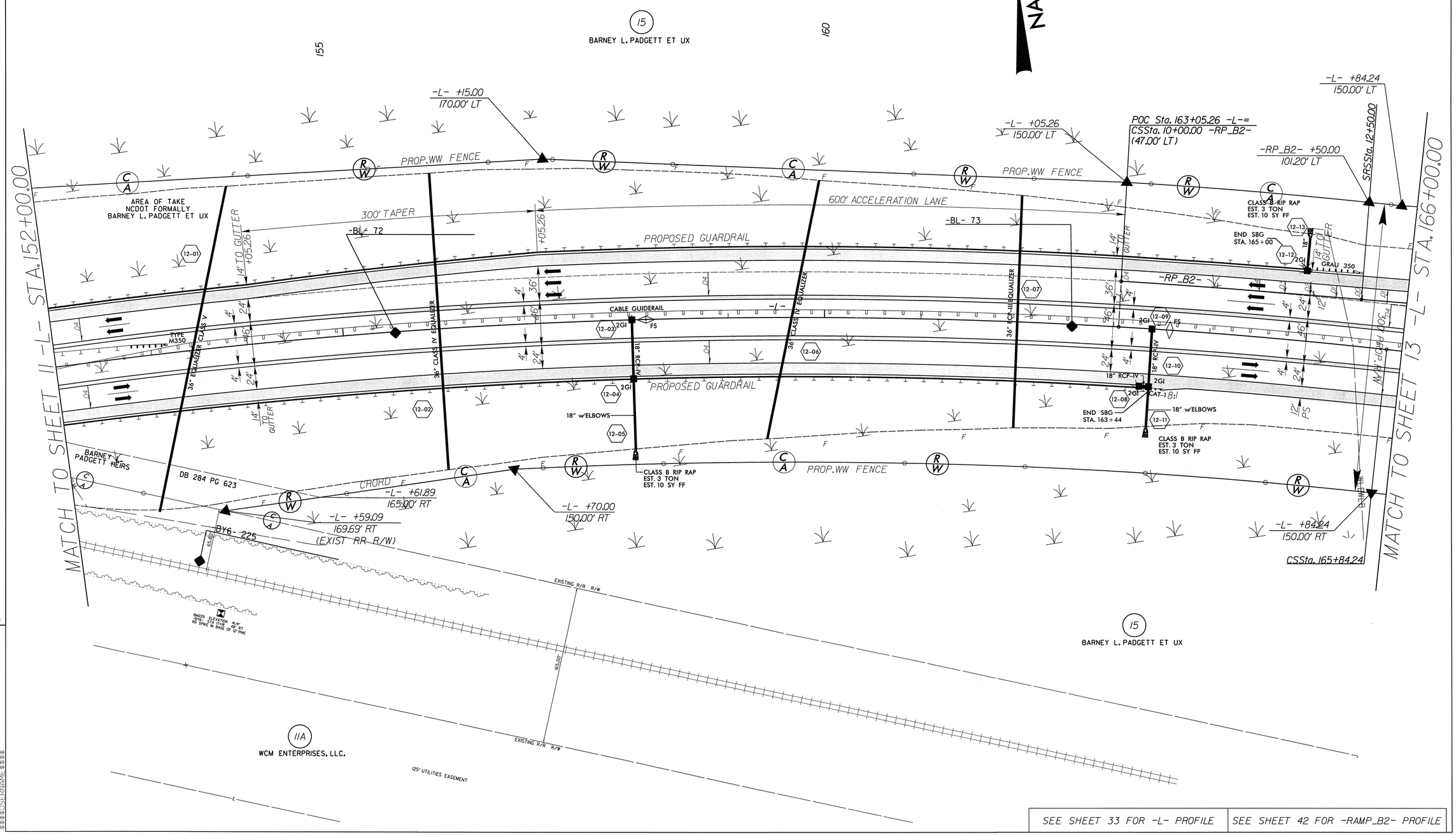


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 158+15 +/- -L-
STA. 163+58 +/- -L-

EQUALIZER PIPE INVERTS WILL NOT BE BURIED

NAD 83/95



SEE SHEET 33 FOR -L- PROFILE	SEE SHEET 42 FOR -RAMP_B2- PROFILE

REVISIONS

8/17/99

01-OCT-2013 08:52
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LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	12
R/W SHEET NO.	14

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
10/1/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
10/1/13

REVISIONS

5/2/23

REVISIONS

MATCH TO SHEET 12 -L- STA.166+00.00

MATCH TO SHEET 14 -L- STA.194+00.00

MATCH TO SHEET 2 -Y7- STA.23+50.00

MATCH TO SHEET 22 -Y7- STA.39+50.00

NAD 83/95

LOCHNER
C. T. LOCHNER & ASSOCIATES, P.A.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1071

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	13
RW SHEET NO.	15

ROADWAY DESIGN ENGINEER — SEAL 23523 — NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — 10/1/13

HYDRAULICS ENGINEER — SEAL 030751 — NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — 10/1/13

DETAIL G — SPECIAL 'V' DITCH (Not To Scale)
FROM STA. 15+40 TO STA. 15+60 -RP- BT.
FROM STA. 17+00 TO STA. 17+50 -L- LT.
FROM STA. 17+50 TO STA. 17+70 -RP- BT.
FROM STA. 17+70 TO STA. 18+00 -RP C2- LT.
FROM STA. 18+50 TO STA. 21+60 -RP B2- LT.

DETAIL L — SPECIAL 'V' DITCH (Not To Scale)
Type of Liner= PSM
FROM STA. 190+00 TO STA. 190+50 -L- RT.

DETAIL M — SPECIAL 'V' BASE DITCH (Not To Scale)
FROM STA. 184+70 TO STA. 190+00 -L- RT.

DETAIL N — SPECIAL 'V' BASE DITCH (Not To Scale)
FROM STA. 21+60 TO STA. 22+75 -RP B2- LT.

DETAIL O — LATERAL 'V' DITCH (Not To Scale)
FROM STA. 18+03 TO STA. 23+13 -RP C2- RT. (DOE=250 CY)
FROM STA. 24+00 TO STA. 25+55 -Y7- LT. (DOE= 65 CY)

DETAIL A — LATERAL 'V' BASE DITCH (Not To Scale)
FROM STA. 25+55 TO STA. 30+35 -Y7-LT.(DOE=673CY)
FROM STA. 37+00 TO STA. 38+00 -Y7-LT.(DOE=350CY)
FROM STA. 19+50 TO STA. 22+50 -RPC2-LT.(DOE=236CY)
FROM STA. 18+55 TO STA. 22+75 -RPD2-LT.(DOE=136CY)

DETAIL P — 'VE' PROTECTION (Not To Scale)
Type of Liner= Class 'B' Rip-Rap
FROM STA. 22+50 TO STA. 24+00 -RP C2- LT.

DETAIL Q — 3' BASE DITCH (Not To Scale)
STA. 12+75 -LP B2- RT.(DOE=100 CY)
STA. 17+85 -LP B2- RT.(DOE=100 CY)

DETAIL R — 3' BASE DITCH (Not To Scale)
STA. 22+75 -RP B2- RT. (DOE=75 CY)

DETAIL S — 3' BASE DITCH CLEANOUT (Not To Scale)
STA. 38+15 -Y7- LT. (DOE=350 CY)

DETAIL T — 'V' BASE DITCH (Not To Scale)
STA. 28+20 -Y7- RT. (DOE= 35 CY)

DETAIL U — 3' BASE DITCH CLEANOUT (Not To Scale)
STA. 180+63 -L- LT. (DOE=200 CY)
STA. 176+10 -L- LT. (DOE=120 CY)

DETAIL B — FALSE SUMP (Not To Scale)
Ditch Grade

Ditch Grade	L	Ditch Front
Over 0% To 2.5%	50'	40'
Over 2.5% To 4.0%	60'	50'
Over 4.0%	80'	50'

STA. 171+50 +/-
STA. 168+40 +/-
STA. 171+50 +/-
STA. 191+50 +/-

PERFORMED SCOUR HOLE (Not To Scale)
STA. 191+00 -L- LT.

SEAL ABANDONED WELLS
-L- STA. 184+25 59' LT
-RPB2- STA. 26+82 36' LT
-RPB2- STA. 25+23 24' LT
-RPB2- STA. 29+09 31' LT
-RPC2- STA. 17+52 3' LT
-RPC2- STA. 19+90 130' LT
-RPD2- STA. 21+66 103' LT
-Y7- 33+37 118' LT

-Y7- MT.MISERY RD OVER US 17 BYPASS (-L-)
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

-Y7- MT.MISERY RD OVER CSX RAILROAD (EYTA)
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

-Y7- (SR 1426) MT. MISERY RD.
2013 ADT
2035 ADT
(ADT in hundreds)

SEE SHEET 2-1 FOR INTERSECTION DETAIL

SEE SHEET 45 FOR -SVRD7- PROFILE
SEE SHEET 44 FOR -RP_C2- PROFILE
SEE SHEETS 44 & 45 FOR -RP_D2- PROFILE
SEE SHEETS 42 & 43 FOR -RP_B2- PROFILE
SEE SHEETS S-1 TO S-7 FOR STRUCTURE PLANS
SEE SHEET 43 FOR -LP_B2- PROFILE
SEE SHEET 41 FOR -Y7- PROFILE
SEE SHEETS 33 & 34 FOR -L- PROFILE

★ PROPOSED SIGNAL

NOTE: ALL DRIVEWAY RADII ARE TO BE 10', UNLESS OTHERWISE NOTED.

LOCATION: US 17 WILMINGTON BYPASS @ -Y7- MT. MISERY ROAD (SR1426)
TIP NO.: R-2633BA
COUNTY: BRUNSWICK
DESIGNED BY: David Martin
CHECKED BY:
DATE:

GRAPHIC SCALE
50 25 0 50 100
PLANS

R:\Structural\Projects\R-2633BA_NDY_PHII\Roadway\Plans\R-2633BA_NDY_PHII_Sht01.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	14
R/W SHEET NO.	16

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
9/30/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
9/30/13

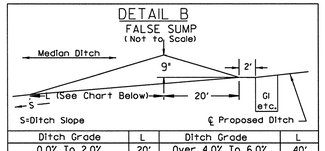
8/17/99

REVISIONS

-RP_D2-

PIs Sta 11+66.70	PI Sta 15+06.53	PIs Sta 18+43.37
Θs = 3° 45' 00.0"	Δ = 15° 18' 00.0" (LT)	Θs = 3° 45' 00.0"
Ls = 250.00'	D = 3° 00' 00.0"	Ls = 250.00'
LT = 166.70'	L = 510.00'	LT = 166.70'
ST = 83.37'	T = 256.53'	ST = 83.37'
	R = 1,909.86'	
	e = 7.0%	

DETAIL B
FALSE SUMP
(Not to Scale)

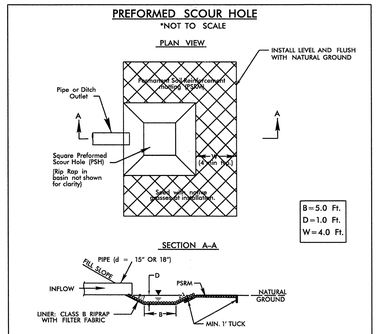


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

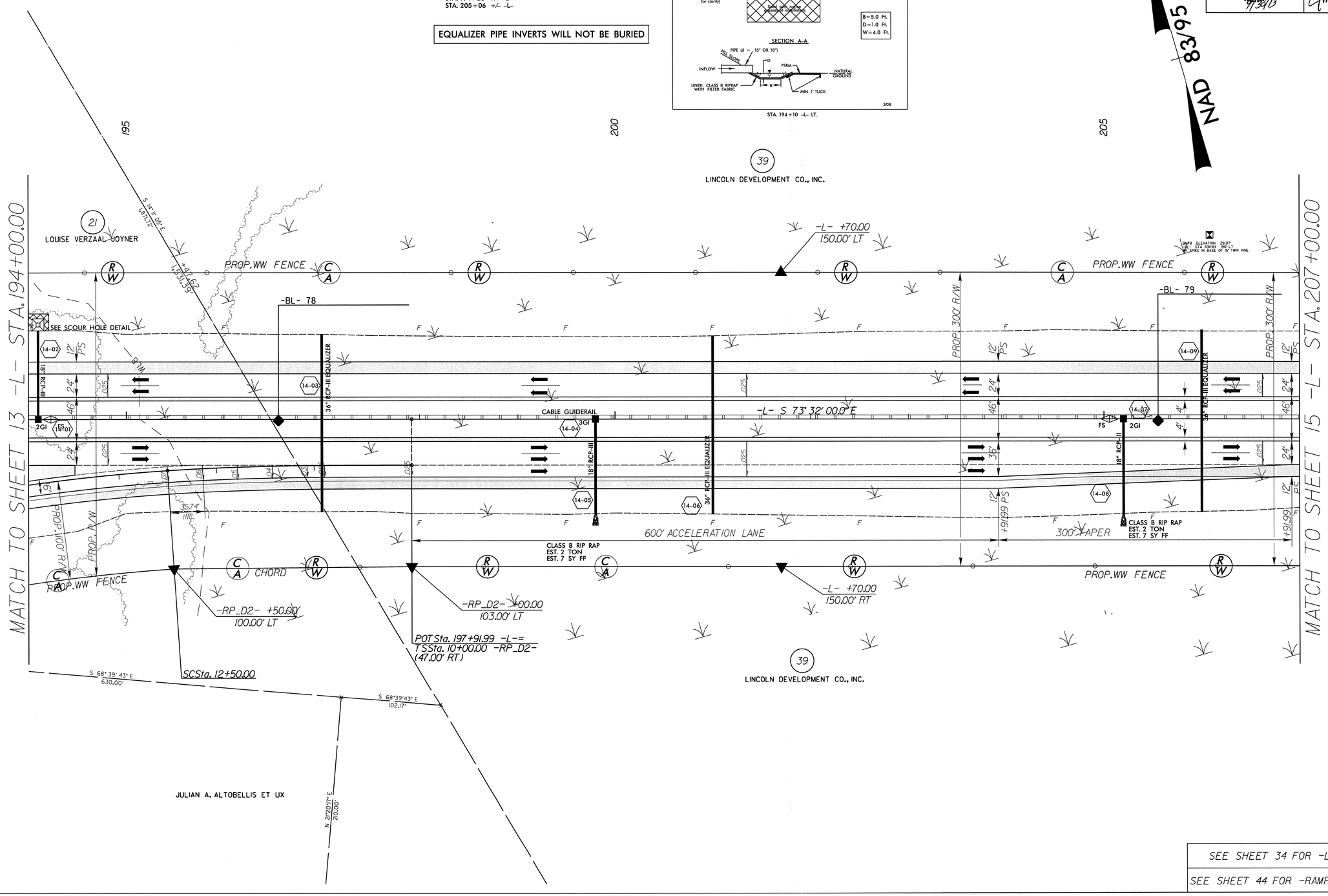
STA. 194+23 +/- -L-
STA. 205+06 +/- -L-

EQUALIZER PIPE INVERTS WILL NOT BE BURIED

PREFORMED SCOUR HOLE
*NOT TO SCALE



STA. 194+10 -L- LT.



SEE SHEET 34 FOR -L- PROFILE

SEE SHEET 44 FOR -RAMP_D2- PROFILE

SYTIME
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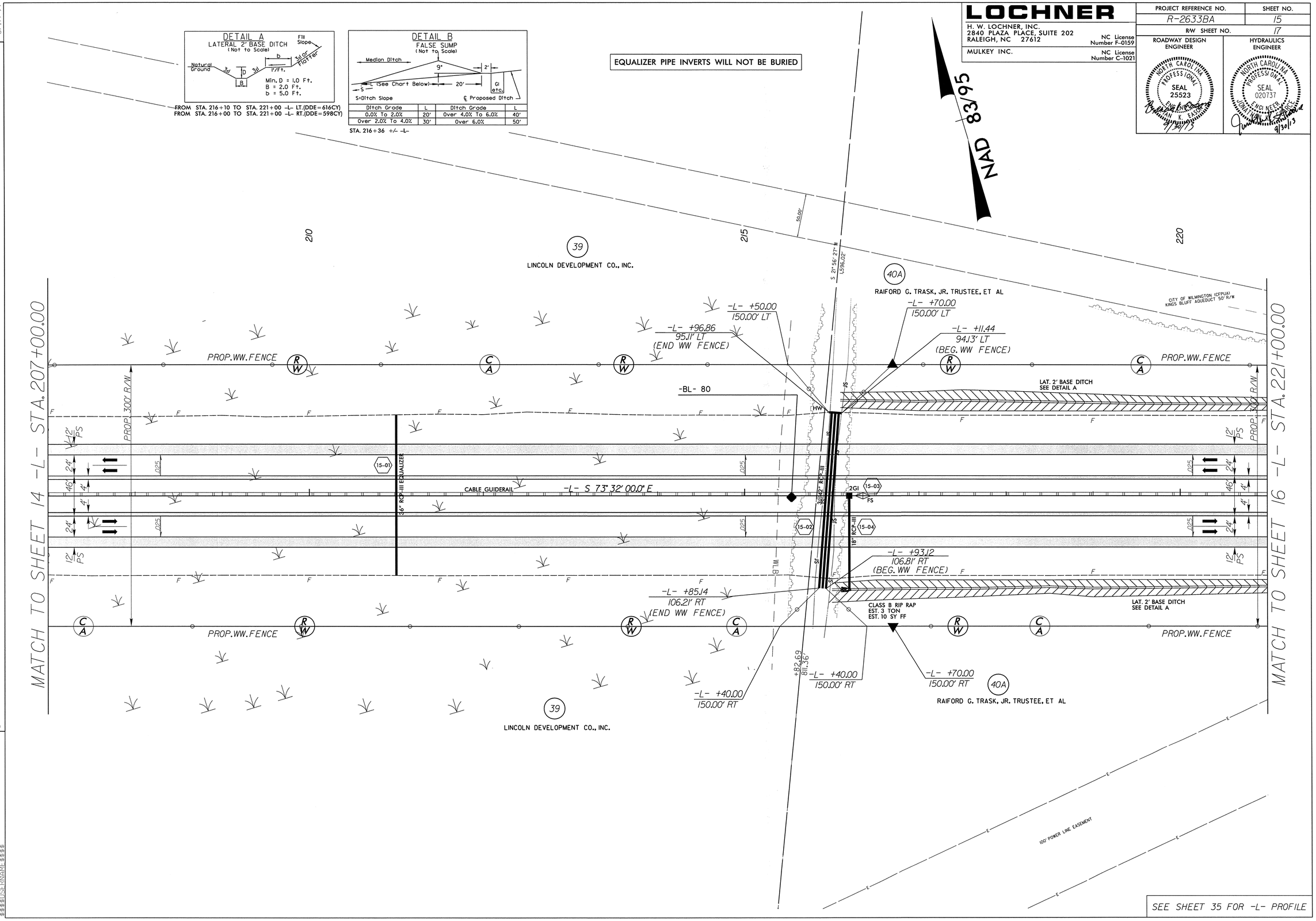
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	15
R/W SHEET NO.	17

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JAN K. EASON 9/30/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN W. SPRUCE 9/30/13



SEE SHEET 35 FOR -L- PROFILE

REVISIONS

8/17/99

SYTIME
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LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 NC License Number F-0159	R-2633BA	16
MULKEY INC. NC License Number C-1021	R/W SHEET NO.	18
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

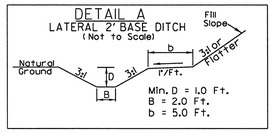
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON 9/30/13

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. SUMMERS 9/30/13

-L-
PI Sta 243+38.67
△ = 17° 38' 15.0" (LT)
D = 0° 29' 53.6"
L = 3,540.07'
T = 1,784.15'
R = 11,500.00'
e = 2.5%
Runoff = 113'

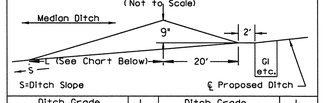
EQUALIZER PIPE INVERTS WILL NOT BE BURIED

DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)



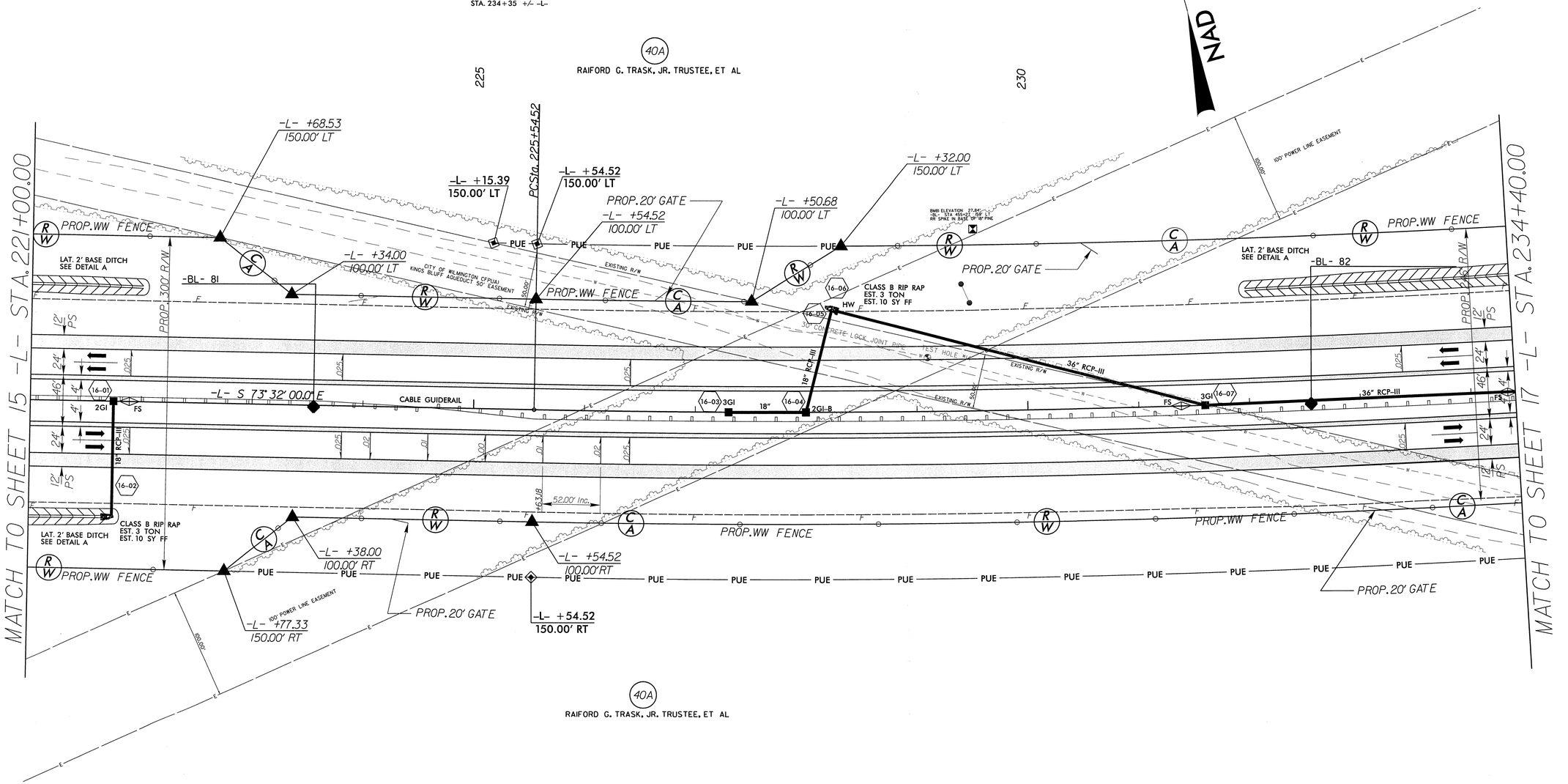
FROM STA. 221+00 TO STA. 222+00 -L- LT.(DDE=117CY)
FROM STA. 221+00 TO STA. 221+75 -L- RT.(DDE=51CY)
FROM STA. 232+00 TO STA. 234+40 -L- LT.(DDE=237CY)

DETAIL B
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 221+89 +/- -L-
STA. 231+45 +/- -L-
STA. 234+35 +/- -L-



SEE SHEET 35 FOR -L- PROFILE

REVISIONS

8/17/99

SYTIME
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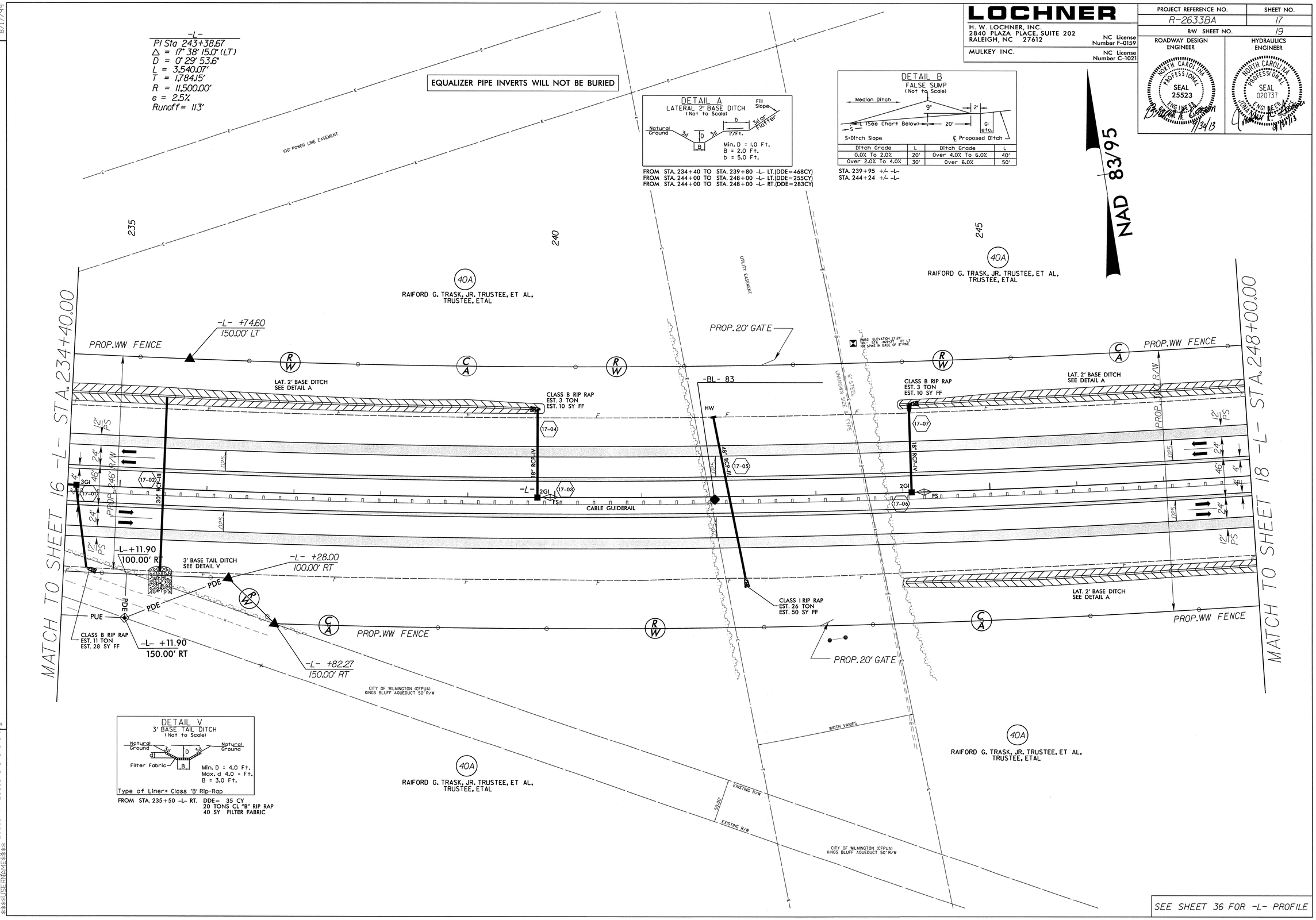

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021
PROJECT REFERENCE NO.
R-2633BA
SHEET NO.
17
R/W SHEET NO.
19
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
-L-
PI Sta 243+38.67
Δ = 17° 38' 15.0" (LT)
D = 0° 29' 53.6"
L = 3,540.07'
T = 1,784.15'
R = 11,500.00'
e = 2.5%
Runoff = 113'
EQUALIZER PIPE INVERTS WILL NOT BE BURIED
DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)
Natural Ground
Fill Slope
3:1 or Flatter
1'/Ft.
Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
FROM STA. 234+40 TO STA. 239+80 -L- LT.(DDE=468CY)
FROM STA. 244+00 TO STA. 248+00 -L- LT.(DDE=255CY)
FROM STA. 244+00 TO STA. 248+00 -L- RT.(DDE=283CY)
DETAIL B
FALSE SUMP
(Not to Scale)
Median Ditch
L (See Chart Below)
S=Ditch Slope
℄ Proposed Ditch
Ditch Grade | L | Ditch Grade | L
0.0% To 2.0% | 20' | Over 4.0% To 6.0% | 40'
Over 2.0% To 4.0% | 30' | Over 6.0% | 50'
STA. 239+95 +/- -L-
STA. 244+24 +/- -L-
NAD 83/95
100' POWER LINE EASEMENT
UTILITY EASEMENT
235
240
245
40A
RAIFORD G. TRASK, JR. TRUSTEE, ET AL, TRUSTEE, ETAL
-L- +74.60
150.00' LT
PROP.WW FENCE
PROP.20' GATE
LAT. 2' BASE DITCH SEE DETAIL A
CLASS B RIP RAP EST. 3 TON EST. 10 SY FF
-BL- 83
HW
18" RCP-IV
48" RCP-III
30" RCP-III
CABLE GUIDERAIL
-L- +11.90
100.00' RT
3' BASE TAIL DITCH SEE DETAIL V
-L- +28.00
100.00' RT
PDE
PUE
CLASS B RIP RAP EST. 11 TON EST. 28 SY FF
-L- +11.90
150.00' RT
-L- +82.27
150.00' RT
CLASS I RIP RAP EST. 26 TON EST. 50 SY FF
CITY OF WILMINGTON (CFPUA) KINGS BLUFF AQUEDUCT 50' R/W
WIDTH VARIES
EXISTING R/W
50.00'
MATCH TO SHEET 16 -L- STA. 234+40.00
MATCH TO SHEET 18 -L- STA. 248+00.00
DETAIL V
3' BASE TAIL DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Min. D = 4.0 Ft.
Max. d 4.0 = Ft.
B = 3.0 Ft.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 235+50 -L- RT. DDE= 35 CY
20 TONS CL "B" RIP RAP
40 SY FILTER FABRIC
SEE SHEET 36 FOR -L- PROFILE
REVISIONS
8/17/99
SYTIME
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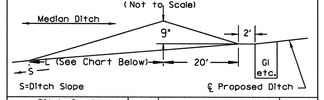
LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 NC License Number F-0159	R-2633BA	18
MULKEY INC. NC License Number C-1021	R/W SHEET NO.	20
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EASON 9/30/13

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. EASON 9/30/13

-L-
PI Sta 243+38.67
Δ = 17° 38' 15.0" (LT)
D = 0° 29' 53.6"
L = 3,540.07'
T = 1,784.15'
R = 11,500.00'
e = 2.5%
Runoff = 113'

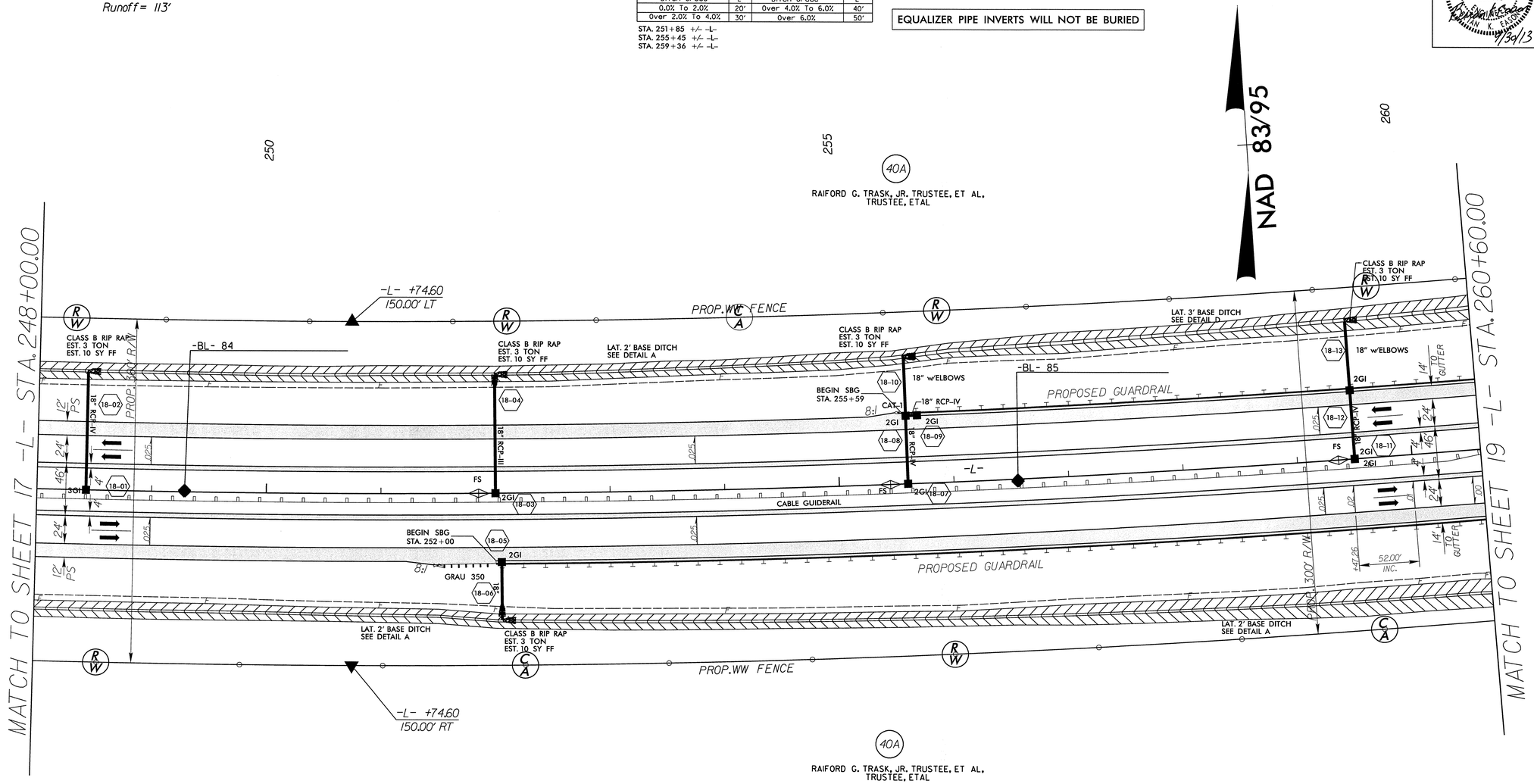
DETAIL B
FALSE SUMP
(Not to Scale)



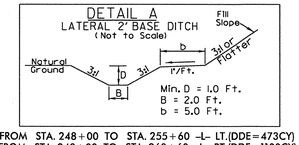
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 251+85 +/- -L-
STA. 255+45 +/- -L-
STA. 259+36 +/- -L-

EQUALIZER PIPE INVERTS WILL NOT BE BURIED

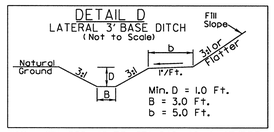


DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)



FROM STA. 248+00 TO STA. 255+60 -L- LT.(DDE=473CY)
FROM STA. 248+00 TO STA. 260+60 -L- RT.(DDE=1100CY)

DETAIL D
LATERAL 3' BASE DITCH
(Not to Scale)



FROM STA. 255+60 TO STA. 260+60 -L- LT.(DDE=484CY)

SEE SHEET 36 FOR -L- PROFILE

REVISIONS

8/17/99

SYTIME
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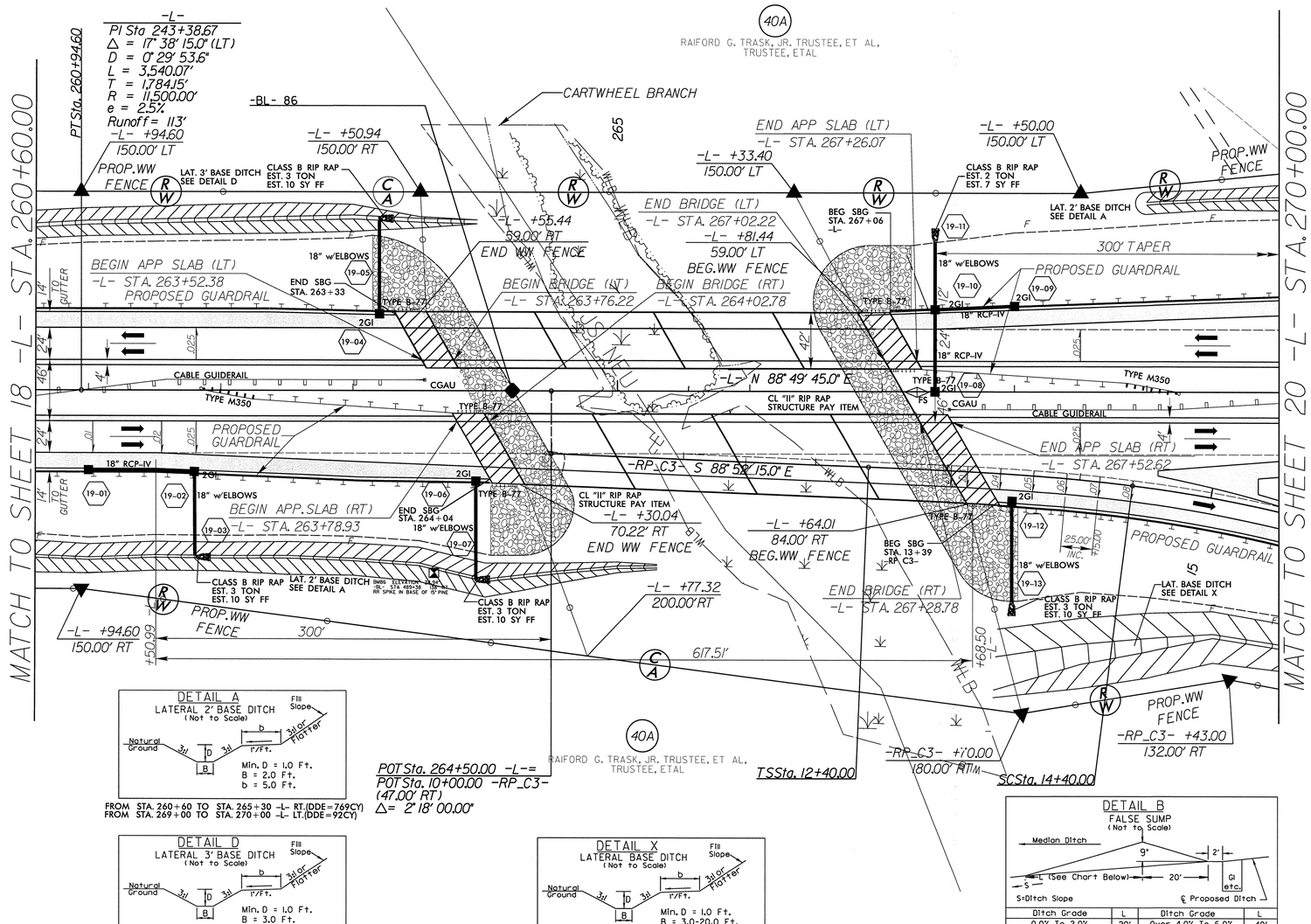
8/17/99

REVISIONS

LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 NC License Number F-0159	R-2633BA	19
MULKEY INC. NC License Number C-1021	RW SHEET NO. 21	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER DARRIN K. EASTER 11/30/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN W. CRISCO 11/30/13

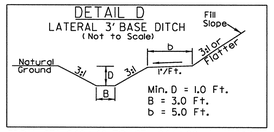


DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.

FROM STA. 260+60 TO STA. 265+30 -L- RT.(DDE=769CY)
FROM STA. 269+00 TO STA. 270+00 -L- LT.(DDE=92CY)

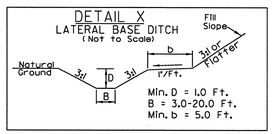
DETAIL D
LATERAL 3' BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 3.0 Ft.
b = 5.0 Ft.

FROM STA. 260+60 TO STA. 264+00 -L- LT.(DDE=415CY)

DETAIL X
LATERAL BASE DITCH
(Not to Scale)



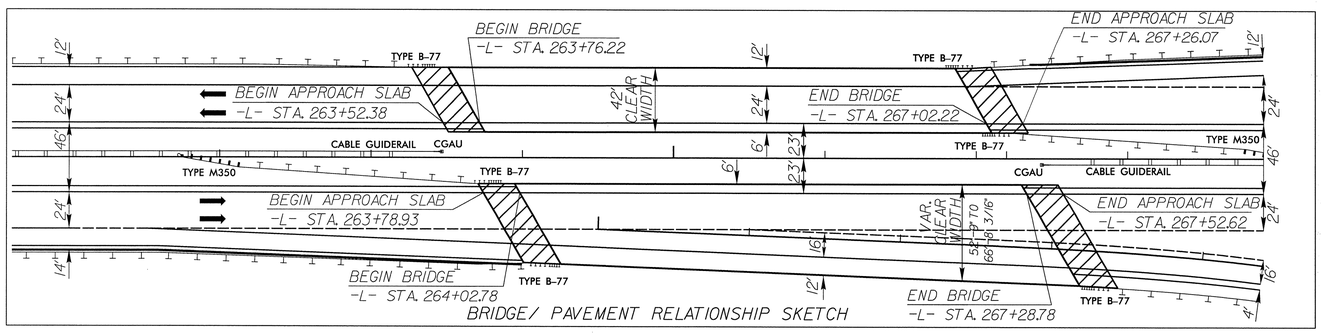
Min. D = 1.0 Ft.
B = 3.0-20.0 Ft.
Min. b = 5.0 Ft.

FROM STA. 13+45 TO STA. 15+75 -RP C3- RT.(DDE=1281CY)

DETAIL B
FALSE SUMP
(Not to Scale)

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 267+22 +/-



BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

-RP_C3-
PIs Sta 13+73.39
Θs = 5° 00' 00.0"
Ls = 200.00'
LT = 133.39'
ST = 66.72'
PI Sta 17+18.94
△ = 27° 21' 43.5" (RT)
D = 5° 00' 00.0"
L = 547.24'
T = 278.94'
R = 1,145.92'
e = 8.0%

SEE SHEETS S-169 TO S-259 FOR STRUCTURE PLANS

SEE SHEET 52 FOR -RP_C3- PROFILE

SEE SHEET 37 FOR -L- PROFILE

SYSTIME
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$$$$USERNAME$$$$

REVISIONS

SEAL ABANDONED WELLS
-L- STA. 280+11 49' RT
-RPC3- STA. 29+58 5' RT
-Y8- STA. 33+85 50' RT
-Y8- STA. 35+57 56' RT

MATCH TO SHEET 24 -Y8- STA.22+50.00

MATCH TO SHEET 23 -Y8- STA.14+45.00

MATCH TO SHEET 19 -L- STA.270+00.00

MATCH TO SHEET 25 -Y8- STA.37+00.00

SEE INSET A-A

-L- POT STA.292+00.00
END STATE PROJECT R-2633BA
END CONSTRUCTION
-RP_A3- +49.38 100.00' RT

POT Sta. 299+00.00 -L-=
POT Sta. 10+00.00 -RP_A3-
(47.00' LT)
Δ = 2°18' 00.00"

NAD 83/95

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number P-0158

MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	20
RW SHEET NO.	22

ROADWAY DESIGN ENGINEER
SEAL 23523
7/30/13

HYDRAULICS ENGINEER
SEAL 30075
7/30/13

DETAIL V
V BASE DITCH
1 Not To Scale
Type of Liner= Class 'B' Rip-Rap
FROM STA. 18+15 -RP_D3- RT. (DOE=50 CY)

DETAIL D
LATERAL 'V' BASE DITCH
1 Not To Scale
Type of Liner= Class 'B' Rip-Rap
FROM STA. 13+75 TO STA. 21+83 -RP_C3- RT.(DOE=2077CY)

DETAIL W
'W' DITCH
1 Not To Scale
Type of Liner= Class 'B' Rip-Rap
FROM STA. 287+50 -L- RT. (DOE=25 CY)

DETAIL A
LATERAL 'V' BASE DITCH
1 Not To Scale
FROM STA. 14+00 TO STA. 16+50 -LPA3-RT.(DOE=159CY)
FROM STA. 269+00 TO STA. 280+25 -L-LT.(DOE=1156CY)

DETAIL M
SPECIAL 'V' BASE DITCH
1 Not To Scale
FROM STA. 21+50 TO STA. 26+50 -RP_C3- RT.
FROM STA. 20+00 TO STA. 26+50 -RP_C3- LT.
FROM STA. 26+00 TO STA. 27+50 -Y8- LT.

DETAIL Z
'S' BASE DITCH
1 Not To Scale
STA. 14+50 -LP_A3- RT. (DOE=780CY)
STA. 14+50 -LP_A3- LT. (DOE=850CY)

DETAIL G
SPECIAL 'V' DITCH
1 Not To Scale
FROM STA. 19+50 TO STA. 23+50 -Y8- LT.
FROM STA. 18+84 TO STA. 29+00 -Y8- RT.
FROM STA. 27+50 TO STA. 28+75 -Y8- LT.
FROM STA. 30+50 TO STA. 34+50 -Y8- RT.
FROM STA. 31+00 TO STA. 34+50 -Y8- LT.
FROM STA. 21+44 -Y8A- LT. TO STA. 24+38 -Y8- RT.
FROM STA. 10+26 -Y8B- LT. TO STA. 23+94 -Y8- RT.

DETAIL N
SPECIAL 'V' BASE DITCH
1 Not To Scale
FROM STA. 10+00 TO STA. 13+50 -RP_A3- RT.

DETAIL F
'V' DITCH W/ PSRM
1 Not To Scale
Type of Liner= PSRM
FROM STA. 272+00 TO STA. 274+50 -L- RT.
FROM STA. 280+00 TO STA. 286+50 -L- LT.

DETAIL B
FALSE SUMP
1 Not To Scale

Ditch Grade	L	Ditch Grade	L
0.0% to 3.0%	20'	Over 4.0% To 6.0%	40'
Over 3.0% To 4.0%	30'	Over 6.0%	50'

STA. 276+50 +/-
STA. 287+50 +/-
STA. 294+00 +/-

DETAIL Y
SPECIAL MEDIAN 'V' DITCH
1 Not To Scale
Type of Liner= PSRM
FROM STA. 290+00 TO STA. 291+00 -L- LT.
FROM STA. 291+00 TO STA. 293+50 -L- RT.
FROM STA. 16+00 TO STA. 16+50 -LP A3- RT.

DETAIL AZ
SPECIAL 'V' DITCH
1 Not To Scale
FROM STA. 10+00 -YBC- RT. TO STA. 24+38 -Y8- RT.
FROM STA. 10+00 -YBC- LT. TO STA. 23+91 -Y8- RT.

DETAIL AA
'V' DITCH
1 Not To Scale
STA. 278+50 -L- RT. (DOE=80 CY)
STA. 286+10 -L- LT. (DOE=10 CY)
STA. 10+63 -LP A3- LT. (DOE=15 CY)

DETAIL H
'S' BASE DITCH
1 Not To Scale
STA. 31+86 -Y8- LT. (DOE=60 CY)
STA. 33+55 -Y8- LT. (DOE=975 CY)
STA. 20+75 -LP A3- LT. (DOE=85 CY)

-RP_C3-
Pis Sta 11+33.37
Gs = 3°52'16.8"
Ls = 200.00'
LT = 133.35'
ST = 66.70'

Pis Sta 13+64.73
Δ = 13°45'09.4" (LT)
D = 3°55'00.0"
L = 328.73'
R = 1,460.00'
e = 8.0%

Pis Sta 15+94.82
Gs = 3°52'16.8"
Ls = 200.00'
LT = 133.35'
ST = 66.70'

-Y8- (SR 1430) CEDAR HILL RD.
14 / 76
3/4 30/70 396/808
3/4 32/92
37/98
2013 ADT
2035 ADT
(ADT in hundreds)

Pis Sta 13+83.39
Gs = 5°00'00.0"
Ls = 200.00'
LT = 133.39'
ST = 66.72'

Pis Sta 17+47.01
Δ = 89°03'42.3" (RT)
D = 5°00'00.0"
L = 581.64'
T = 297.01'
R = 1,145.92'
e = 8.0%

Pis Sta 20+19.35
Gs = 5°00'00.0"
Ls = 200.00'
LT = 133.39'
ST = 66.72'

Pis Sta 23+46.85
Gs = 11°27'33.0"
Ls = 200.00'
LT = 133.61'
ST = 66.92'

Pis Sta 26+36.87
Δ = 44°40'15.6" (LT)
D = 11°27'33.0"
L = 389.64'
T = 205.43'
R = 500.00'
e = 7.0%

Pis Sta 11+34.38
Gs = 12°02'12.6"
Ls = 200.00'
LT = 134.59'
ST = 67.52'

Pis Sta 17+94.45
Δ = 153°41'45.0" (LT)
D = 12°02'12.6"
L = 1,921.96'
T = 994.45'
R = 250.00'
e = 8.0%

-LP_A3-
Pis Sta 19+45.46
Gs = 12°02'12.6"
Ls = 200.00'
LT = 134.59'
ST = 67.52'

-RP_A3-
Pis Sta 21+66.85
Gs = 11°27'33.0"
Ls = 200.00'
LT = 133.61'
ST = 66.92'

Pis Sta 26+36.87
Δ = 44°40'15.6" (LT)
D = 11°27'33.0"
L = 389.64'
T = 205.43'
R = 500.00'
e = 7.0%

-Y8-
PI Sta 28+70.88
Δ = 7°19'27.2" (RT)
D = 2°01'54.6"
L = 345.15'
T = 172.81'
R = 2,700.00'
e = 6.0%
Runoff = 230'

Pis Sta 13+83.39
Gs = 5°00'00.0"
Ls = 200.00'
LT = 133.39'
ST = 66.72'

Pis Sta 17+47.01
Δ = 89°03'42.3" (RT)
D = 5°00'00.0"
L = 581.64'
T = 297.01'
R = 1,145.92'
e = 8.0%

Pis Sta 20+19.35
Gs = 5°00'00.0"
Ls = 200.00'
LT = 133.39'
ST = 66.72'

Pis Sta 23+46.85
Gs = 11°27'33.0"
Ls = 200.00'
LT = 133.61'
ST = 66.92'

Pis Sta 26+36.87
Δ = 44°40'15.6" (LT)
D = 11°27'33.0"
L = 389.64'
T = 205.43'
R = 500.00'
e = 7.0%

Pis Sta 11+34.38
Gs = 12°02'12.6"
Ls = 200.00'
LT = 134.59'
ST = 67.52'

Pis Sta 17+94.45
Δ = 153°41'45.0" (LT)
D = 12°02'12.6"
L = 1,921.96'
T = 994.45'
R = 250.00'
e = 8.0%

-LP_A3-
Pis Sta 19+45.46
Gs = 12°02'12.6"
Ls = 200.00'
LT = 134.59'
ST = 67.52'

-RP_A3-
Pis Sta 21+66.85
Gs = 11°27'33.0"
Ls = 200.00'
LT = 133.61'
ST = 66.92'

Pis Sta 26+36.87
Δ = 44°40'15.6" (LT)
D = 11°27'33.0"
L = 389.64'
T = 205.43'
R = 500.00'
e = 7.0%

-Y8-
PI Sta 28+70.88
Δ = 7°19'27.2" (RT)
D = 2°01'54.6"
L = 345.15'
T = 172.81'
R = 2,700.00'
e = 6.0%
Runoff = 230'

GRAPHIC SCALE				
50	25	0	50	100
PLANS				

SEE SHEETS 5 - 10 S -FOR STRUCTURE PLANS	SEE SHEETS 37 & 38 FOR -L- PROFILE
SEE SHEET 2-J FOR INTERSECTION DETAIL	SEE SHEET 52 FOR -LP_A3- PROFILE
	SEE SHEETS 46 & 47 FOR -Y8- PROFILE
	SEE SHEETS 51 & 52 FOR -RP_C3- PROFILE

BRIDGE / PAVEMENT RELATIONSHIP SKETCH

NOTE: ALL DRIVEWAY RADII ARE TO 10', UNLESS OTHERWISE NOTED.

LOCATION: US 17 WILMINGTON BYPASS @ -Y8- CEDAR HILL ROAD (SR1430)

TIP NO.: R-2633BA
COUNTY: BRUNSWICK

DESIGNED BY: David Martin
CHECKED BY:
DATE:

RevisionsDate: 7/17/13
File: R-2633BA_TIP_PSHEET.dgn

8/17/99

REVISIONS

LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 NC License Number F-0159	R-2633BA	21
MULKEY INC. NC License Number C-1021	RW SHEET NO.	36

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASTON — 10/17/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. STEVENS — 10/17/13

-Y7-

PI Sta 14+00.93	PIs Sta 18+67.29	PI Sta 21+34.33
Δ = 9° 36' 16.6" (RT)	Θs = 1° 52' 21.1"	Δ = 15° 33' 42.2" (RT)
D = 1° 29' 59.6"	Θs = 5° 58' 14.3"	D = 4° 46' 28.7"
L = 640.35'	Ls = 250.00'	L = 325.92'
T = 320.93'	LT = 146.94'	T = 163.97'
R = 3,820.00'	ST = 103.43'	R = 1,200.00'
e = 5.0%		e = 8.0%

-SVRD7-

PI Sta 10+87.08	PI Sta 14+52.06
Δ = 84° 45' 00.0" (RT)	Δ = 9° 45' 00.0" (LT)
D = 81° 51' 04.0"	D = 6° 59' 14.2"
L = 103.54'	L = 139.54'
T = 63.86'	T = 69.94'
R = 70.00'	R = 820.00'
e = 4.0%	e = NC

Runoff = See Plans

NAD 83/95

POT Sta. 10+00.00

BEGIN CONSTRUCTION POCSta.15+00.00 -Y7-

-BY7- 226

BM#26 ELEVATION 34.83' RR Spike in BASE OF 8" DIA.

S 34° 32' 40.1" E

MT. MISERY RD. (SR 1426) 24' BST

EXISTING R/W

EXISTING EDGE OF PAVEMENT

PCSta. 10+80.00

S 54° 16' 20.1" W 89.22'

MATTHEW G. FERRELL

RADFORD S. GURGANIOUS, JR ET UX

16 DORIS ELLIS LONG ESTATE

16A OSCAR R. LONG etal

19 NORTH AUGUSTA COMPANY

15 BARNEY L. PADGETT ET UX

20 RAIFORD S. GURGANIOUS ET UX

21 LOUISE VERZAAL JOYNER

22 TILLMAN IVEY, JR., ETAL

23 GEORGE W. CLEMMONS ET UX

-BY7- 227

-SVRD7- +57.00 45.00' LT

-Y7- +51.60 44.79' LT (EXIST R/W)

-SVRD7- +82.00 87.00' LT

-SVRD7- +93.00 45.00' & 74.00' LT

-SVRD7- +26.76 45.00' LT

-SVRD7- +50.00 46.00' LT

-SVRD7- +00.00 31.35' LT (EXIST R/W)

-Y7- +60.00 38.98' RT

-Y7- +70.35 60.00' RT

-Y7- +23.48 45.00' RT BEG.WW-FENCE

-Y7- +10.43 65.79' RT

-Y7- +475.00 60.00' RT

-Y7- +18.00 104.00' RT

-Y7- +20.00 75.00' RT

-Y7- +40.00 45.00' RT BEG.CA 69.22' RT

-Y7- +46.00 69.83' & 100.00' RT

-Y7- +96.28 75.00' RT

-Y7- +00.00 55.00' LT BEG.CA BEG.WW-FENCE

CLASS B RIP RAP EST. 84 TON EST. 185 SY FF

SP. 'V' DITCH SEE DETAIL G

10' BASE TAIL DITCH SEE DETAIL AP CLASS B RIP RAP EST. 44 TONS

CLASS B RIP RAP EST. 58 TON EST. 122 SY. FF

BASE DITCH CLEANOUT SEE DETAIL AO CLASS B RIP RAP EST. 55 TON EST. 122 SY. FF

SP. CUT BASE DITCH SEE DETAIL AN

REMOVE & RESET 72" CHAIN LINK FENCE

REMOVE & FILL w/ FLOWABLE FILL

REMOVE 36 LF 2@24" EX. PIPE

REMOVE 10 LF 2@24" EX. PIPE

REMOVE 16 LF 3@24" EX. PIPE

REMOVE 10 LF 3.8x-EXP. 10" EX. PIPE

PCSta. 10+23.21 N 88° 25' 00.0" E

PTSta. 11+26.76

PCSta. 13+82.12

S 6° 50' 00.0" E

S 84° 38' 29" E 486.09'

N 00° 54' 35" W 150.40'

N 89° 38' 35" W 180.10'

S 81° 54' 26" W 56.10'

N 00° 54' 35" W 85.90'

S 46° 54' 34" E 144.90'

S 73° 33' 35" E 99.30'

N 59° 53' 47" E 199.75'

N 25° 07' 43" W 99.90'

N 25° 07' 41" W 26.15'

N 86° 59' 57" W 226.66'

S 16° 57' 24" W 100.15'

N 86° 45' 45" W 326.36'

CSSta. 17+20.35

SCSta. 19+70.35

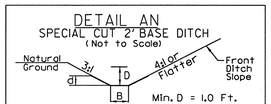
POCSta. 19+96.22 -Y7-=

POT Sta. 10+00.00 -SVRD7-

CSSta. 22+96.28

MATCH TO SHEET 13 -Y7- STA. 23+50.00

DETAIL AN
SPECIAL CUT 2' BASE DITCH
(Not to Scale)

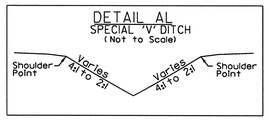


Min. D = 1.0 Ft.
Min. d = 1.0 Ft.
B = 2.0 Ft.

Type of Liner= PSRM

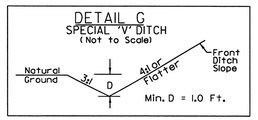
FROM STA. 20+25 TO STA. 21+00 -Y7- RT.

DETAIL AL
SPECIAL 'V' DITCH
(Not to Scale)



FROM STA. 20+50 TO STA. 22+55 -Y7- LT.

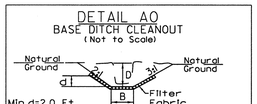
DETAIL G
SPECIAL 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.

FROM STA. 21+00 TO STA. 22+00 -Y7- RT.
FROM STA. 10+20 TO STA. 10+75 -SVRD 7- LT.

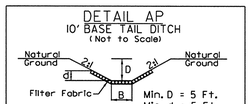
DETAIL AO
BASE DITCH CLEANOUT
(Not to Scale)



Min.d=2.0 Ft.
Min. D=2.0 Ft.
B=Varies 3 Ft. to 8 Ft.
Type of Liner= Class 'B' Rip-Rap

STA. 20+18 -Y7- RT. (DDE=83 CY)

DETAIL AP
10' BASE TAIL DITCH
(Not to Scale)

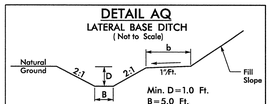


Min. D = 5 Ft.
Min. d = 5 Ft.
B = 10 Ft.

Type of Liner= Class 'B' Rip-Rap

STA. 20+10 -Y7- LT. (DDE=188 CY)

DETAIL AQ
LATERAL BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
B=5.0 Ft.
Min. b=5.0 Ft.

FROM STA. 19+50 TO STA. 19+90 -Y7- RT. (DDE=10 CY)

NOTE: ALL DRIVEWAY RADII ARE TO BE 10', UNLESS OTHERWISE NOTED.

SEE SHEET 41 FOR -Y7- PROFILE

SEE SHEET 45 FOR -SVRD7- PROFILE

01-OCT-2013 12:57
R:\Roadway\Proj\R-2633BA\R-2633BA_RDY_PSH21.dgn
$$$$USERNAME$$$$

1"=50'

REVISIONS

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	22
R/W SHEET NO.	37

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JOHN K. FAINE

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER TIMOTHY E. NEAL

7/24/13

DETAIL AO
LATERAL 2' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Fill Slope, 3:1 or Flatter, b, 1'/Ft., B
Min. D = 1.5 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
FROM STA. 41+50 TO STA. 45+75 -Y7- LT. (DDE=231CY)

DETAIL A
LATERAL 2' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Fill Slope, 3:1 or Flatter, b, 1'/Ft., B
Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
FROM STA. 45+45 TO STA. 47+45 -Y7- RT.(DDE=147CY)
FROM STA. 52+15 TO STA. 52+70 -Y7- RT.(DDE=46CY)

DETAIL AR
2' BASE DITCH CLEANOUT
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Natural Ground, B
D=Varies
Min. D=2.5 Ft.
B = 2.0 Ft.
STA. 47+60 -Y7- RT.(DDE=65CY)
STA. 42+70 -Y7- LT.(DDE=215CY)

DETAIL M
SPECIAL 2' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope, B
Min. D = 1.0 Ft.
B = 2.0 Ft.
FROM STA. 51+60 TO STA. 51+90 -Y7- RT.

DETAIL AI
LATERAL 2' BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, b, Fill Slope, 1'/Ft., Filter Fabric, B
Min. D = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 52+50 TO STA. 53+50 -Y7- LT.(DDE=200CY)

DETAIL O
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, b, Fill Slope, 3:1 or Flatter, 1'/Ft.
Min. D = 1.0 Ft.
b = 5.0 Ft.
FROM STA. 36+00-SVRD8- TO STA. 10+50 -SR8- LT.(DDE=99CY)
FROM STA. 47+75 TO STA. 48+50 -Y7- RT.(DDE=58CY)

DETAIL G
SPECIAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D = 1.0 Ft.
FROM STA. 33+00 TO STA. 35+75 -SVRD8- LT.
FROM STA. 32+50 TO STA. 33+83 -SVRD8- RT.
FROM STA. 49+00 TO STA. 51+60 -Y7- RT.
FROM STA. 11+00 -SR8- LT. TO STA. 48+50 -Y7- LT.

NAD 83\95

-BY7- R2633AB-10
-BY7A- R2633AB-10
BEGIN CONSTRUCTION
TIE TO EXISTING
POCSta.32+01.16 -SVRD8-

-SVRD8- +30.41
38.84' LT
(EXIST R/W)

-SVRD8- +80.00
53.00' LT
PL / CORNER
EXIST.R/W

-SVRD8- +74.79
PL

-SVRD8- +15.00
57.50' LT

REMOVE & RESET 48" CHL FENCE

-SVRD8- POT Sta. 36+48.10=
-SR8- PC Sta. 10+00.00

-BY7- 228

-SVRD8- +25.00
66.50' LT

-SVRD8- +73.00
57.00' LT

PTSta. 39+26.03
PCSta. 38+62.38

-Y7- +60.00
113.50 (LT.)
S 83° 37' 30.0" W

-Y7- +90.00
151.50 (LT.)

-Y7- +50.00
151.00 (LT.)

-Y7- +78.00
88.87' LT
(EXIST R/W)

-Y7- +54.00
TIE TO WALL
BEG.C/A FENCE
BEG.WW FENCE

-Y7- +47.75
160.00' LT

+44.18
(20.00' RT)

-Y7- +80.00
112.00' LT
END C/A
END WW FENCE

120'-40'-120'
2' OFFSET

-SR8- PT Sta. 11+52.58

-Y7- +80.00
120.00' LT
END C/A
END WW FENCE

-Y7- +65.00
88.07' RT

-Y7- +95.00
98.16' RT

-Y7- +05.00
160.00' RT

-Y7- +05.80
110.00' RT

-Y7- +15.80
78.90' RT

-Y7- +60.00
70.00' RT
END C/A
END WW FENCE

-Y7- +76.32
70.00' RT

-Y7- +86.32
60.00' RT

-Y7- +15.29
150.00' RT

-Y7- +00.00
60.00' & 40.56' RT
(EXIST R/W)

TSSta. 46+05.80

POCSta. 46+50.00 -Y7-=
-SR8- POT Sta. 11+93.14

POCSta. 48+00.00 -Y7-=
POTSta. 39+64.06 -SVRD8-

SCSSta. 48+15.80

CSSta. 51+76.32

POTSta. 56+28.44

SCSSta. 53+86.32

ENDSta. 55+00.00 -Y7-

S 80° 37' 48.0" W

S 9° 32' 00.0" E

S 10° 41' 34.0" W

S 10° 31' 14.5" W

N 71° 02' 19" W

MATCH SHEET 13 -Y7- STA. 39+50.00

MATCH TO SHEET AA

MATCH TO AA

SR 1426 MT MISERY RD 25' BST

PROPANE FENCE

PROP.WW FENCE

PROP.C/A FENCE

PAINTED ISLAND

GRADE TO DRAIN

RETAIN

REMOVE

EXISTING R/W

2' BASE DITCH SEE DETAIL AR

SP. 'V' DITCH SEE DETAIL G

LAT. 'V' DITCH SEE DETAIL O

LAT. 2' BASE DITCH SEE DETAIL AQ

LAT. 2' BASE DITCH SEE DETAIL A

SP. 'V' DITCH SEE DETAIL A

CLASS B RIP RAP EST. 3 TON EST. 10 SY FF

CLASS B RIP RAP EST. 8 TON EST. 21 SY FF

CLASS B RIP RAP EST. 5 TON EST. 10 SY FF

CLASS B RIP RAP EST. 5 TON EST. 14 SY FF

CLASS B RIP RAP EST. 63 TON EST. 115 SY FF

CLASS B RIP RAP EST. 3 TON EST. 10 SY FF

CLASS B RIP RAP EST. 5 TON EST. 14 SY FF

CLASS B RIP RAP EST. 5 TON EST. 5 TON

18" w/ELBOWS

24" RCP-IV

18" RCP-IV

1@12'x11' RCBC

2@1

GRAU 350

BEGIN SBG STA. 39+38 -Y7-

130' TAPER

BEGIN SBG STA. 51+25 -Y7-

200' MEDIAN TAPER

END SBG STA. 45+50 -Y7-

END SBG STA. 51+25 -Y7-

END SBG STA. 52+91 -Y7-

END SBG STA. 32+75 -Y7-

SBG +06 -Y7-

END CONSTRUCTION
TIE TO EXISTING
POCSta. 55+00.00 -Y7-

-Y7-

PI Sta 36+19.17	PIs Sta 47+45.84	PI Sta 49+96.80	PIs Sta 52+46.35
Δ = 13° 58' 00.0" (LT)	Θs = 3° 41' 27.0"	Δ = 12° 40' 20.5" (RT)	Θs = 3° 41' 27.0"
D = 0° 59' 53.5"	Ls = 210.00'	D = 3° 30' 54.3"	Ls = 210.00'
L = 1,399.21'	LT = 140.03'	L = 360.51'	LT = 140.03'
T = 703.09'	ST = 70.03'	T = 181.00'	ST = 70.03'
R = 5,740.00'		R = 1,630.00'	
e = 2.5%		e = 7.0%	

-SR8-

PI Sta 10+87.42
Δ = 69° 56' 14.0" (RT)
D = 45° 50' 11.8"
L = 152.58'
T = 87.42'
R = 125.00'
e = 4.0%

-SVRD8-

PI Sta 38+99.33
Δ = 72° 55' 56.0" (RT)
D = 114° 35' 29.6"
L = 63.68'
T = 36.95'
R = 50.00'
e = 4.0%

NOTE: ALL DRIVEWAY RADII ARE TO BE 10', UNLESS OTHERWISE NOTED.

31 ALMA SOOBRIAN GORE

32 E.G. DALE ET UX

33A E.G. DALE ET UX

34 DONALD BEATTY ET UX

35 D & H INVESTORS, INC.

35A TRACY McELROY, ET VIR

35C EASTBROOK ESTATES HOA COMMON AREA

36 ANNETTE ANDREWS TROY ET AL

37 NORTH CAROLINA AGRICULTURAL FOUNDATION, INC

INSET

LLOYD L. FREEMAN
DB 435 PG 178

NORTH CAROLINA AGRICULTURAL FOUNDATION, INC
DB 1527 PG 1070
MB 25 PG 202

SEE SHEET 2-H FOR -Y7DET- PLAN/PROFILE | SEE SHEETS 45 & 46 FOR -SVRD8- AND -SR8- PROFILE | SEE SHEETS 41 & 42 FOR -Y7- PROFILE

SYTIME
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LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	23
R/W SHEET NO.	38A

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EASTER — 10/11/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. EASTER — 10/11/13

8/17/99

REVISIONS

MATCH TO SHEET 24
-Y8D- STA. 16+25.00

NAD 83/95

-Y8D-PC Sta. 18+38.84

-Y8D- +38.84
40.00' &
45.00' RT

-Y8D- +38.84
40.00' &
55.00' LT

-Y8A-PC Sta. 20+00.29

-Y8A-PRC Sta. 21+27.29

-Y8D-PT Sta. 21+19.80

-Y8A POT Sta. 19+40.00 =
-Y8B- POT Sta. 10+00.00

98B
KENNETH HALL, ET UX

S 67°06'50.5" W

S 78°52'03" E
159.30'

DETAIL BA
SPECIAL 'V' DITCH
(Not to Scale)
Natural Ground — 3:1 or Flatter — D — 3:1 or Flatter — Front Ditch Slope
Min. D = 1.0 Ft.

FROM STA. 10+20 TO STA. 26+00 -Y8D- RT.
FROM STA. 10+20 TO STA. 26+00 -Y8D- LT.

-Y8D-
PI Sta 19+80.78
△ = 20° 07' 19.1" (RT)
D = 7° 09' 43.1"
L = 280.96'
T = 141.94'
R = 800.00'

DETAIL AZ
SPECIAL 'V' DITCH
(Not to Scale)
Natural Ground — 2% — D — 3:1 or Flatter — Front Ditch Slope
Min. D = 1.0 Ft.

FROM STA. 10+49 TO STA. 21+60 -Y8A- RT.
FROM STA. 10+47 TO STA. 19+10 -Y8A- LT.
FROM STA. 19+74 TO STA. 21+00 -Y8A- LT.
FROM STA. 10+25 TO STA. 13+80 -Y8B- RT.
FROM STA. 10+26 TO STA. 12+50 -Y8B- LT.
FROM STA. 10+00 -Y8C- RT. TO STA. 24+38 -Y8- RT.
FROM STA. 10+50 -Y8C- LT. TO STA. 23+91 -Y8- RT.

S 81°46'09.6" W
-Y8D-

PROP. 80' R/W

END CONSTRUCTION
-Y8D-POT Sta. 26+25.54

-Y8D-POT Sta. 26+48.06

-Y8D- +68.85
PL

N 57°49'03" W
459.59'

-Y8D- +45.11
PL

N 81°13'23" E
326.90'

WILLIAM E. MACK, ET UX

-Y8A-PT Sta. 22+54.44

S 81°08'05.0" W

N 57°47'49" W
243.71'

RAIFORD G. TRASK, JR. TRUSTEE, ET AL, TRUSTEE, ETAL
40A

-Y8A- POT Sta. 25+38.41

-Y8A- +58.59
PROPERTY CORNER

KENNETH HALL, ET UX

104
LOUIS SYLVESTER BROWN

-Y8A- +18.59
PROPERTY CORNER

-Y8A- +81.99
Exist. R/W

-Y8A- +85.29
40.00' LT.

-Y8A- +50.00
40.00' RT.

REMOVE & RESET CHL FENCE

-Y8A- +41.98
30.00' RT

-Y8A- +28.00
37.00' RT.

-Y8A- +03.40
30.00' RT

-Y8A- +08.63
40.00' RT.

-Y8A- +70.65
40.00' RT.

-Y8A- +67.54
30.00'

END CONSTRUCTION
-Y8A- POT Sta. 21+50.00

MATCH TO SHEET 24
-Y8A- STA. 17+00.00

-Y8B- +71.39
PL

-Y8B- +56.19
PROPERTY CORNER

100
PATRICE ROBBINS

MICHAEL G. DAVIS

-Y8C- +46.30
30.00' LT

FREDERICK DAVIS, ET
52

SP. 'V' DITCH -Y8B- +58.04
SEE DETAIL G
30.00' LT

-Y8B- +00.00
41.00' LT.
LORI JOY PETERSON
50

-Y8B- +64.13
42.00' LT.

-Y8B- +44.09

75' TAPER

-Y8B- +62.13
40.74' RT.

-Y8B- +70.00
30.00' RT

LINDA G. BRYANT
99

-Y8A- +30.00
PL

-Y8A- +22.99
PC

-Y8A- +42.39
30.00'

-Y8B- +28.53
40.00' RT

SP. 'V' DITCH
SEE DETAIL G

LORI JOY PETERSON

MATCH TO SHEET 20
-Y8C- STA. 11+45.00

GWENDOLYN DAVID DYSON
51

-Y8C- +82.71
40.00' LT.

-Y8C- +72.44
PL

-Y8C- POT Sta. 9+00.00

-Y8C- +10.80
PL

-Y8B- +20.78
30.00' RT

-Y8B- POT Sta. 14+04.55=
-Y8C- POT Sta. 10+00.00

JOYCE M. ROBBINS

-Y8A-

PI Sta 20+65.19	PI Sta 21+92.27
△ = 29° 06' 25.5" (RT)	△ = 29° 08' 20.5" (LT)
D = 22° 55' 05.9"	D = 22° 55' 05.9"
L = 127.00'	L = 127.14'
T = 64.90'	T = 64.98'
R = 250.00'	R = 250.00'
e= 4.0%	e= 4.0%
Runoff = 73'	Runoff = 73'

-Y8C-

PI Sta 13+23.07	PI Sta 14+41.29
△ = 13° 32' 50.6" (LT)	△ = 13° 32' 50.9" (RT)
D = 11° 27' 33.0"	D = 11° 27' 33.0"
L = 118.22'	L = 118.22'
T = 59.35'	T = 59.39'
R = 500.00'	R = 500.00'
e= 4.0%	e= 4.0%
Runoff = 73'	Runoff = 73'

NOTE: ALL DRIVEWAY RADII ARE TO BE 10' UNLESS OTHERWISE NOTED.

SEE SHEET 50 FOR -Y8C- PROFILE	SEE SHEET 49 FOR -Y8A- PROFILE
SEE SHEET 55 FOR -Y8D- PROFILE	SEE SHEET 50 FOR -Y8B- PROFILE

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LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

MULKEY INC.
NC License Number C-1021

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	24
R/W SHEET NO.	38

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER — 10/1/13
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER — 10/1/13

DETAIL AS
SPECIAL 2' BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft. B = 2.0 Ft.

FROM STA. 13+50 TO STA. 18+85 -Y8- LT.

DETAIL AT
SPECIAL 2' BASE DITCH TYPICAL
(Not to Scale)
Min. D = 1.0 Ft. B = 2.0 Ft.

FROM STA. 13+40 TO STA. 18+84 -Y8- RT.

DETAIL G
SPECIAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.

FROM STA. 18+84 TO STA. 29+00 -Y8- RT.
FROM STA. 19+50 TO STA. 23+50 -Y8- LT.
FROM STA. 10+39 TO STA. 12+68 -SVRD9- LT.

DETAIL BA
SPECIAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.

FROM STA. 10+20 TO STA. 26+00 -Y8D- RT.
FROM STA. 10+20 TO STA. 26+00 -Y8D- LT.

DETAIL AZ
SPECIAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.

FROM STA. 10+49 TO STA. 21+60 -Y8A- RT.
FROM STA. 10+47 TO STA. 19+10 -Y8A- LT.
FROM STA. 19+74 TO STA. 21+00 -Y8A- LT.
FROM STA. 10+25 TO STA. 13+80 -Y8B- RT.
FROM STA. 10+26 TO STA. 12+50 -Y8B- LT.
FROM STA. 10+00 -Y8C- RT. TO STA. 24+38 -Y8- RT.
FROM STA. 10+50 -Y8C- LT. TO STA. 23+91 -Y8- RT.

NOTE: ALL DRIVEWAY RADII ARE TO 10', UNLESS OTHERWISE NOTED.

SEE SHEET 46 FOR -Y8- PROFILE
SEE SHEET 49 FOR -Y8A- PROFILE
SEE SHEET 55 FOR -Y8D- PROFILE
SEE SHEET 54 FOR -SVRD9- PROFILE

REVISIONS

8/17/99

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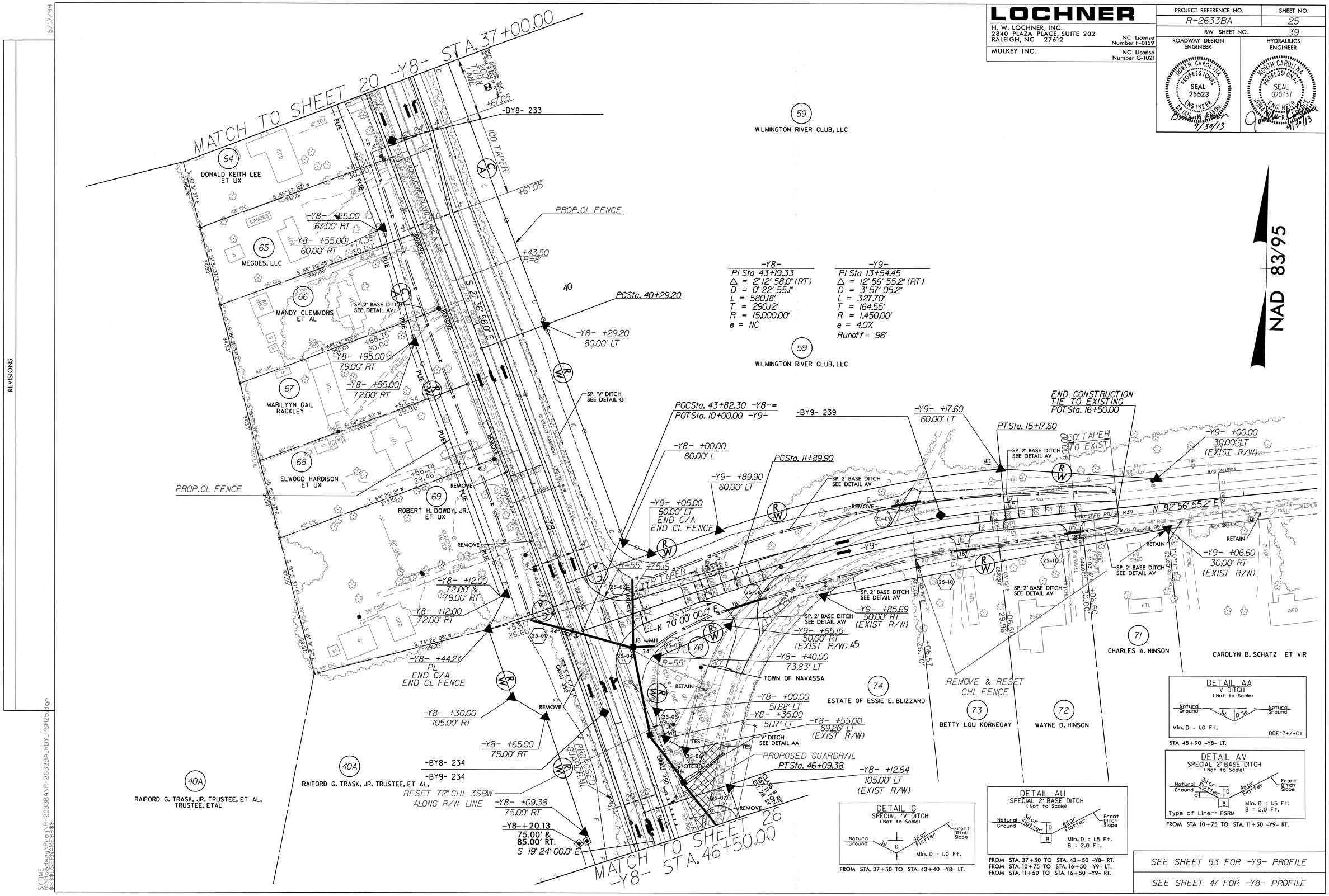

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
MULKEY INC.
NC License Number C-1021
PROJECT REFERENCE NO.
R-2633BA
SHEET NO.
25
R/W SHEET NO.
39
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
9/30/13
MATCH TO SHEET 20 -Y8- STA. 37+00.00
MATCH TO SHEET 26 -Y8- STA. 46+50.00
NAD 83/95
-Y8-
PI Sta 43+19.33
Δ = 2° 12' 58.0" (RT)
D = 0° 22' 55.1"
L = 580.18'
T = 290.12'
R = 15,000.00'
e = NC
-Y9-
PI Sta 13+54.45
Δ = 12° 56' 55.2" (RT)
D = 3° 57' 05.2"
L = 327.70'
T = 164.55'
R = 1,450.00'
e = 4.0%
Runoff = 96'
59
WILMINGTON RIVER CLUB, LLC
64
DONALD KEITH LEE ET UX
65
MEGOES, LLC
66
MANDY CLEMMONS ET AL
67
MARILYYN GAIL RACKLEY
68
ELWOOD HARDISON ET UX
69
ROBERT H. DOWDY, JR. ET UX
70
71
CHARLES A. HINSON
CAROLYN B. SCHATZ ET VIR
72
WAYNE D. HINSON
73
BETTY LOU KORNEGAY
74
ESTATE OF ESSIE E. BLIZZARD
40A
RAIFORD G. TRASK, JR. TRUSTEE, ET AL, TRUSTEE, ETAL
PROP.CL FENCE
PCSta. 40+29.20
-Y8- +29.20
80.00' LT
POCSta. 43+82.30 -Y8-=
POTSta. 10+00.00 -Y9-
-Y8- +00.00
80.00' L
PCSta. 11+89.90
-Y9- +89.90
60.00' LT
-Y9- +05.00
60.00' LT
END C/A
END CL FENCE
-Y9- +17.60
60.00' LT
PTSta. 15+17.60
END CONSTRUCTION
TIE TO EXISTING
POTSta. 16+50.00
-Y9- +00.00
30.00' LT
(EXIST R/W)
-Y9- +06.60
30.00' RT
(EXIST R/W)
-Y9- +85.69
50.00' RT
(EXIST R/W)
-Y9- +65.15
50.00' RT
(EXIST R/W)
-Y8- +40.00
73.83' LT
TOWN OF NAVASSA
-Y8- +00.00
51.88' LT
-Y8- +35.00
51.17' LT
-Y8- +55.00
69.26' LT
(EXIST R/W)
-Y8- +12.64
105.00' LT
(EXIST R/W)
PTSta. 46+09.38
-Y8- +12.00
72.00' &
79.00' RT
-Y8- +12.00
72.00' RT
-Y8- +44.27
PL
END C/A
END CL FENCE
-Y8- +30.00
105.00' RT
-Y8- +65.00
75.00' RT
-Y8- +09.38
75.00' RT
-Y8-+20.13
75.00' &
85.00' RT.
S 19° 24' 00.0" E
-BY8- 233
-BY9- 239
-BY8- 234
-BY9- 234
-Y8- +55.00
67.00' RT
-Y8- +55.00
60.00' RT
-Y8- +95.00
79.00' RT
-Y8- +95.00
72.00' RT
-Y8- +65.00
75.00' RT
-Y8- +30.00
105.00' RT
-Y8- +12.00
72.00' &
79.00' RT
-Y8- +12.00
72.00' RT
-Y8- +44.27
PL
END C/A
END CL FENCE
N 82° 56' 55.2" E
N 70° 00' 00.0" E
S 21° 36' 58.0" E
100' TAPER
50' TAPER TO EXIST
175' TAPER
PROPOSED GUARDRAIL
RESET 72" CHL 3SBW ALONG R/W LINE
REMOVE & RESET CHL FENCE
SP. 2' BASE DITCH SEE DETAIL AV
SP. 'V' DITCH SEE DETAIL G
DETAIL AA
V DITCH
(Not to Scale)
Natural Ground
Min. D = 1.0 Ft.
DDE=7+/-CY
STA. 45+90 -Y8- LT.
DETAIL AV
SPECIAL 2' BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
B = 2.0 Ft.
Type of Liner= PSRM
FROM STA. 10+75 TO STA. 11+50 -Y9- RT.
DETAIL G
SPECIAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
FROM STA. 37+50 TO STA. 43+40 -Y8- LT.
DETAIL AU
SPECIAL 2' BASE DITCH
(Not to Scale)
Min. D = 1.5 Ft.
B = 2.0 Ft.
FROM STA. 37+50 TO STA. 43+50 -Y8- RT.
FROM STA. 10+75 TO STA. 16+50 -Y9- LT.
FROM STA. 11+50 TO STA. 16+50 -Y9- RT.
SEE SHEET 53 FOR -Y9- PROFILE
SEE SHEET 47 FOR -Y8- PROFILE
REVISIONS
8/17/99
SYTIME
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8/17/99

REVISIONS

LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 — NC License Number F-0159	R-2633BA	26
MULKEY INC. — NC License Number C-1021	R/W SHEET NO.	40

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER — 11/3/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER — 11/5/13

LYNE D. HINSON ET UX

CAROLYN B. SCHATZ, ET VIR

S 49°47'07" W 126.37'

CHARLES A. HINSON

BETTY LOU KORNEGAY

S 80°39'29" W 100.08'

S 19°32'22" W 60.10'

74

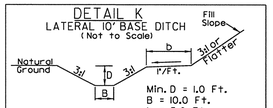
ESTATE OF ESSIE E. BLIZZARD

S 33°50'44" E 221.86'

-Y8-
PIs Sta 52+68.24 PI Sta 57+60.90
Θs = 7° 27' 37.4" Δ = 46° 12' 00.0" (LT)
Ls = 250.00' D = 5° 58' 05.9"
LT = 166.81' L = 774.09'
ST = 83.47' T = 409.47'
R = 960.00'
e = 8.0%

NAD 83/95

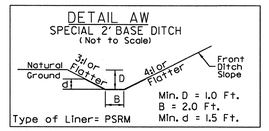
DETAIL K
LATERAL 10' BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 10.0 Ft.
b = 5.0 Ft.

FROM STA. 46+50 TO STA. 47+75 -Y8- LT.(DDE=226CY)
FROM STA. 51+00 TO STA. 52+50 -Y8- LT.(DDE=369CY)

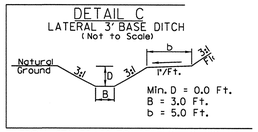
DETAIL AW
SPECIAL 2' BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 2.0 Ft.
Min. d = 1.5 Ft.
Type of Liner= PSRM

FROM STA. 53+00 TO STA. 54+00 -Y8- LT.

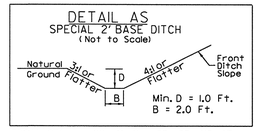
DETAIL C
LATERAL 3' BASE DITCH
(Not to Scale)



Min. D = 0.0 Ft.
B = 3.0 Ft.
b = 5.0 Ft.

FROM STA. 50+10 TO STA. 52+50 -Y8- LT.

DETAIL AS
SPECIAL 2' BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 2.0 Ft.

FROM STA. 54+00 TO STA. 59+50 -Y8- LT.
FROM STA. 54+00 TO STA. 59+50 -Y8- RT.

BEGIN BRIDGE
-Y8- STA. 47+90.89
BEGIN BRIDGE
-Y8- STA. 47+15.00

BM234 ELEVATION: 5.46'
-Y8- STA 59+36 13M LT
RR SPIKE IN BASE OF 18" PINE

REMOVE

-Y8- +95.00
80.00' & 105.00' LT

-Y8- +80.00
138.00' LT

-Y8- +01.42
80.00' LT

-Y8- +00.00
159.00' LT

END BRIDGE
-Y8- STA. 50+43.00
END APP. SLAB
-Y8- STA. 50+67.11

TSSta. 51+01.42

LAT. 10' BASE DITCH SEE DETAIL K

LAT. 3' BASE DITCH SEE DETAIL C

PROPOSED GUARDRAIL

-Y8- +90.00
90.00' LT

CLASS B RIP RAP
EST. 8 TON
EST. 21 SY FF

-Y8- +70.00
91.00' LT

END SBG
STA. 53+00
-Y8-

SCSta. 53+51.42

-Y8- +51.42
70.00' LT

75

LINCOLN DEVELOPEMENT COMPANY, INC.

SP. 2' BASE DITCH SEE DETAIL AW

-Y8- +23.78
70.00' LT
(EXIST R/W)

MATCH TO SHEET 25
-Y8- STA. 46+50.00

S 19° 24' 00.0" E

LAT. 10' BASE DITCH SEE DETAIL K

CLASS II RIP RAP w/FILTER FABRIC

REMOVE

PUE

-Y8- +20.68
85.00' RT

PL / CORNER
(EXIST R/W)

40A

RAIFORD G. TRASK, JR. TRUSTEE et al

-Y8- +39.00
95.17' RT
(EXIST R/W)

-Y8- +92.65
124.98' RT
(EXIST R/W)

CLASS B RIP RAP
EST. 10 TON
EST. 20 SY FF

-Y8 +94.50
154.31' RT
(EXIST R/W)

-Y8- +05.69
150.65' RT
(EXIST R/W)

-BY8- 235

CLASS B RIP RAP
EST. 5 TON
EST. 10 SY FF

-Y8- +02.67
62.00' RT
(EXIST R/W)

-Y8- +30.00
68.00' RT

75A

ROGERS FAMILY PROPERTIES, LLC.

-Y8- +40.00
92.00' RT

SP. 2' BASE DITCH SEE DETAIL AS

75A

ROGERS FAMILY PROPERTIES, LLC.

MATCH TO SHEET 27
-Y8- STA. 59+50.00

N 87°56'27" W 445.82'

TB 2GI
18" RCP-IV
GRAU 350
26-01
26-02
26-03
26-04
26-05
26-06
26-07
30"

BEGIN APP. SLAB
-Y8- STA. 46+90.89
BEGIN BRIDGE
-Y8- STA. 47+15.00
END BRIDGE
-Y8- STA. 50+43.00
END APP. SLAB
-Y8- STA. 50+67.11

TYPE-III
4'
20' 20'
40'
56' CLEAR WIDTH

-Y8- (CEDAR HILL RD) OVER CARTWHEEL BRANCH
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

-Y8E-
RETAIN
3 @ 36" RCP
RIP RAP AREA
JS
CONC. HW
EXISTING R/W
LEFT GATE
30' CONCRETE LOCK JOINT PIPE
12' SIDE
ROGERS FAMILY PROPERTIES, LLC.
CITY OF WILMINGTON 100' ARMES BLUFF AGREEMENT
EXIST.
S 33°35'16" E 1686.77'
00+01

SEE SHEETS S- 314 TO S- 348 FOR STRUCTURE PLANS

SEE SHEETS 47 & 48 FOR -Y8- PROFILE

SYTIME
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LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 NC License Number F-0159	R-2633BA	27
MULKEY INC. NC License Number C-1021	R/W SHEET NO.	41
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER — 7/30/13	HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER — 8/30/13	

8/17/99

REVISIONS

-Y8-
PI Sta 57+60.90
Δ = 46° 12' 00.0" (LT)
D = 5° 58' 05.9"
L = 774.09'
T = 409.47'
R = 960.00'
e= 8.0%

PIs Sta 62+08.98
Θs = 7° 27' 37.4"
Ls = 250.00'
LT = 166.81'
ST = 83.47'

NAD 83/95

60 65 70

75 LINCOLN DEVELOPEMENT COMPANY, INC.

75A ROGERS FAMILY PROPERTIES, LLC.

MATCH TO SHEET 26 -Y8- STA. 59+50.00

-BY8- 236

CSSta. 61+25.51

-Y8- +69.01
80.58' LT
(EXIST. R/W)

STSta. 63+75.51

-Y8- +33.68
62.00' LT
(EXIST R/W)

-Y8- +50.00
62.00' LT

-Y8- +00.00
55.00' LT

-Y8- +90.77
30.00' LT
(EXIST. R/W)

-BY8- 237

BM237 ELEVATION 16.41' STA. 57+74 6x43, 90° LT 90' SPIKE IN BASE OF 37 PINE

END CONSTRUCTION
TIE TO EXISTING
POCSta.72+40.00 -Y8-

-Y8- +40.00
55.00' LT

-Y8- +40.00
45.00' LT
(EXIST R/W)

PROP. PAINTED ISLAND

SP. 2' BASE DITCH SEE DETAIL AS

(27-01)

(27-02)

CITY OF WILMINGTON (CFPUA) KINGS BLUFF AQUEDUCT 50' EASEMENT

EXISTING R/W

18" RCP

24"

TOP=19.52
INV=9.59
MH

TOP=20.84
INV=8.38
MH

INV=8.34

10" PVC

36" CONCRETE LOCK JOINT PIPE

TOP=20.80
INV=10.80
MH

INV=10.82
MH

TOP=20.61
INV=11.99
MH

INV=11.96

15' UTILITY EASEMENT

10' EASEMENT DB 326 PG 571

-Y8- S 80° 31' 14.7" E

CEDAR HILL RD.(SR 1430)

60.00'

TEST HOLE #7

10" PLASTIC

-Y8- +60.00
102.50' RT

-Y8- +20.00
78.50' RT

31.25'
INC

-Y8- +30.00
60.00' RT

+40.00

500' TAPER (BOTH SIDES)

-Y8- +40.00
60.00' RT

-Y8- +40.00
30.00' RT
(EXIST R/W)

DETAIL AS
SPECIAL 2' BASE DITCH
(Not to Scale)

Natural Ground — 3:1 or Flatter — D — B — 4:1 or Flatter — Front Ditch Slope

Min. D = 1.0 Ft.
B = 2.0 Ft.

FROM STA. 59+50 TO STA. 67+00 -Y8- LT.
FROM STA. 59+50 TO STA. 67+00 -Y8- RT.

SEE SHEET 48 FOR -Y8- PROFILE

SYTIME
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PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	28

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
7/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
7/30/13

-LREV-

110
100
90
80
70
60
50
40

334 335 336 337 338 339

(-)13.0000%

(-)13.0000%

BEG. LAT. 2' BASE DITCH (RT)
+00.00 EL = 64.10

RIGHT DITCH - - - - -

SEE SHEET 4 FOR -L- PLAN VIEW

$YTIME
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PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	29

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
7/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
9/30/13

BM59 ELEVATION 69.63'
-L- STA 59+09.45 99.95' RT
RR SPIKE IN BASE OF 10" PINE

-LREV-

BEGIN GRADE
STATE PROJECT R-2633B
TIE TO STATE PROJECT R-2633AB
(UNDER CONSTRUCTION)
-LREV- STA. 339+13.00
EL = 76.12'

PI = 339+15.00
EL = 72.80'
VC = 770'
K = 225

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.0403

DRAINAGE AREA	= 71	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 77	CFS
DESIGN HW ELEVATION	= 68.90	FT
100 YEAR DISCHARGE	= 89	CFS
100 YEAR HW ELEVATION	= 69.22	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 210	CFS
OVERTOPPING ELEVATION	= 77.00	FT

PI = 348+62.01
EL = 76.82'
VC = 280'
K = 386
SSD = 1629'

(+)0.4248%
(-)13.0000%
(+) 0.1000% (RT)
(+) 0.1000% (RT)
(+) 0.2000% (RT)
54" RCP
INV.= 64.70
(+)0.4248%
(-)0.3000%
(-)0.3000%
36" EQUALIZER PIPE
INV.= 67.40
36" EQUALIZER PIPE
INV.= 67.40

PI = +00.00 (RT.)
EL = 64.40

END LAT. 2' BASE DITCH (RT.)
+50.00 EL = 64.70

SEE SHEET 4 FOR -L- PLAN VIEW

-LREV-

PI = 353+99.65
EL = 75.21'
VC = 300'
K = 250

PI = 364+99.70
EL = 85.11'
VC = 1,900'
K = 1583
SSD = 1848'

(-)0.3000%
(+)0.9000%
(+)0.9000%
(-)0.3000%
(+) 0.1944% (RT)
(+) 0.5000% (RT)
(+) 0.3000% (RT)
36" EQUALIZER PIPE
INV.= 67.50

BEG. LAT. 2' BASE DITCH (RT)
+20.00 EL = 68.75

PI = +00.00 (RT)
EL = 69.10

PI = +50.00 (RT)
EL = 69.85

END SP 2' BASE DITCH (RT)
+00.00 EL = 71.80

RIGHT DITCH - - - - -

SEE SHEET 5 FOR -L- PLAN VIEW

SYTIME
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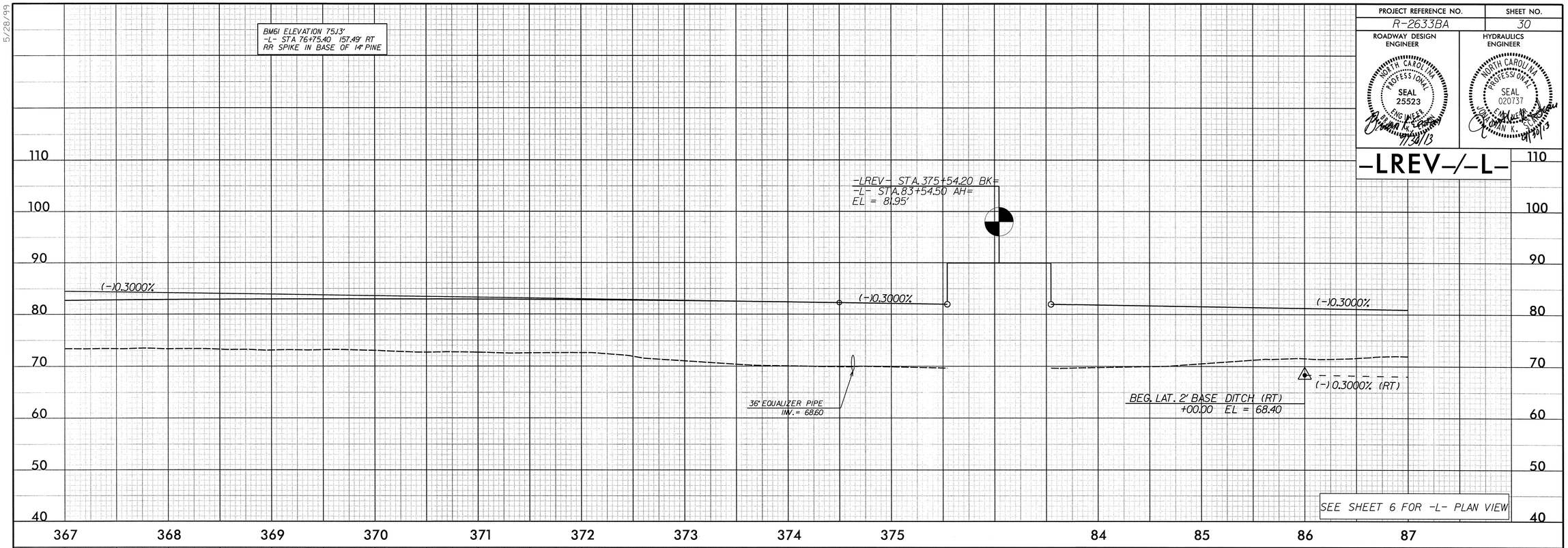
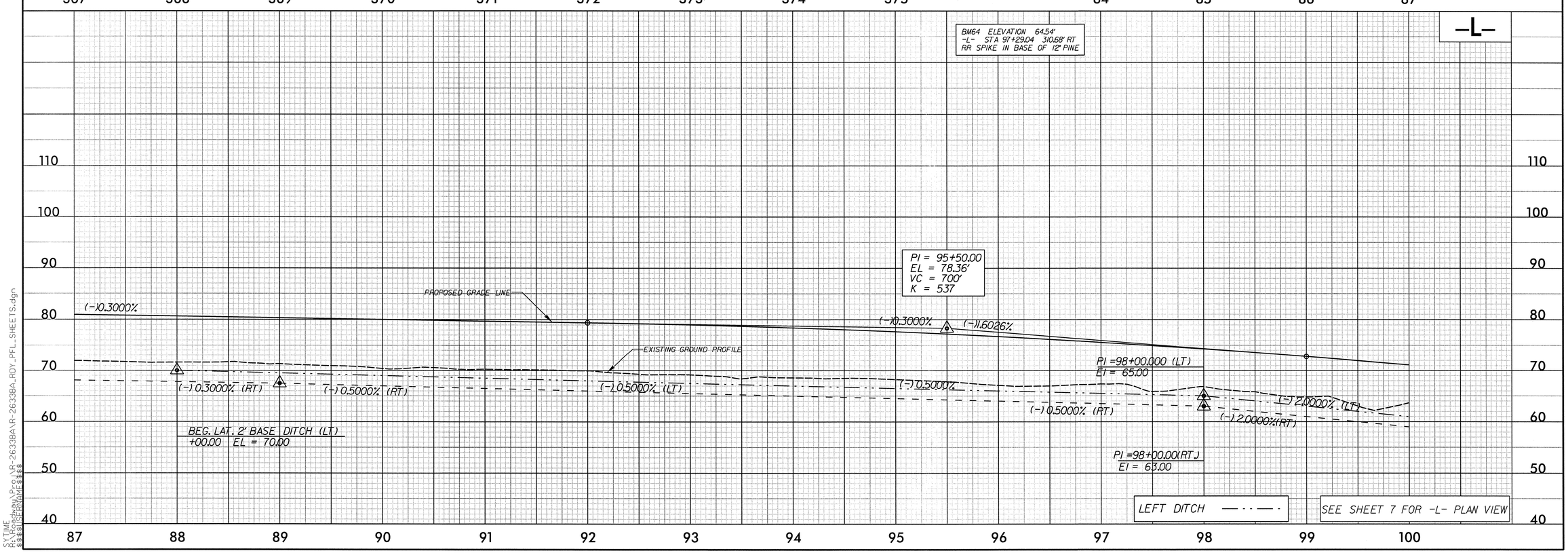
PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	30

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. CRAIGHEAD 9/30/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. SCARBOROUGH 9/30/13





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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	31

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER

7/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER

8/30/13

-L-

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

LAT. 2' BASE DITCH (LT) (-) 2.0000%

LAT. 2' BASE DITCH (LT) (-) 2.0000%

(-) 1.5000%

(-) 1.8433%

(-) 2.0000%

(-) 0.5500%

(-) 1.8433%

(-) 0.2000%

(-) 1.6026%

(-) 0.4110%

(-) 0.1975%

PI = 109+20.00
EL = 56.40'
VC = 500'
K = 420

END LAT. 2' BASE DITCH (LT) +00.00
BEG.LAT. 3' BASE DITCH (LT) EL. 55.00

PI = 105+00.000
EL = 52.00

PI = 106+00.00(RT.)
EL = 47.00

END LAT. 10' BASE DITCH (RT)
+25.00 EL. 46.00

END LAT. 3' BASE DITCH (LT) +00.00
BEG.LAT. 10' BASE DITCH (LT) EL. 46.47

END LAT. 2' BASE DITCH (RT) +00.00
BEG.LAT. 10' BASE DITCH (RT) EL. 46.45

END LAT. 10' BASE DITCH (LT)
+38.00 EL. 46.00

36" EQUALIZER PIPE
INV.= 45.30

SEE SHEET 8 FOR -L- PLAN VIEW

BM66 ELEVATION 45.02'
-L- STA 114+13.72 152.06' LT
RR SPIKE IN BASE OF 15" PINE

-L-

(-) 0.4110%

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

36" EQUALIZER PIPE
INV.= 43.25

36" EQUALIZER PIPE
INV.= 41.80

36" EQUALIZER PIPE
INV.= 41.20

36" EQUALIZER PIPE
INV.= 41.50

SEE SHEET 9 FOR -L- PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	32

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K ELLISON
10/18/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K MARCUS
10-17-13

BM69 ELEVATION 43.83'
-L- STA 134+22.77 140.00' LT
RR SPIKE IN BASE OF 15" PINE

-L-

PI = 129+70.00
EL = 47.97'
VC = 500'
K = 464

PI = 136+80.00
EL = 52.71'
VC = 500'
K = 214

PROPOSED GRADE LINE

(-)0.4110% (+)0.6670% (+)0.6670% (+)3.0000%

36" EQUALIZER PIPE
INV. = 40.80

42" RCP
INV. = 38.80

36" EQUALIZER PIPE
INV. = 40.50

EXISTING GROUND PROFILE

48" RCP
INV. = 38.60

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1004

DRAINAGE AREA	= 28	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 53	CFS
DESIGN HW ELEVATION	= 43.39	FT
100 YEAR DISCHARGE	= 62	CFS
100 YEAR HW ELEVATION	= 44.25	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 60	CFS
OVERTOPPING ELEVATION	= 44.00	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1008

DRAINAGE AREA	= 8.6	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 19	CFS
DESIGN HW ELEVATION	= 41.33	FT
100 YEAR DISCHARGE	= 22	CFS
100 YEAR HW ELEVATION	= 41.51	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 30	CFS
OVERTOPPING ELEVATION	= 42.00	FT

SEE SHEET 10 FOR -L- PLAN VIEW

-L-

PI = 148+00.00
EL = 86.31'
VC = 1,280'
K = 247

BEGIN BRIDGE
-L- STA 145+04.88

(+)3.0000% (-)2.7127%

END BRIDGE
-L- STA 150+13.67

PROPOSED GRADE LINE

BRIDGE

EXIST. RR
℄

EXISTING GROUND PROFILE

48" RCP PIPE CL IV
INV. = 37.97

STA 147+38.89
Horizontal Clearance = 73' (width skew=176.06')

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1101

DRAINAGE AREA	= 1.6	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 12	CFS
DESIGN HW ELEVATION	= 40.98	FT
100 YEAR DISCHARGE	= 13	CFS
100 YEAR HW ELEVATION	= 41.66	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 19	CFS
OVERTOPPING ELEVATION	= 42.00	FT

SEE SHEET 11 FOR -L- PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	33

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER

7/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER

7/30/13

BM225 ELEVATION 41.41'
-L- STA 153+42.25 273.82' RT
RR SPIKE IN BASE OF 12" PINE

-L-

PI = 165+85.00
EL = 47.53'
VC = 350'
K = 202

(-)12.1727%

PROPOSED GRADE LINE

(-)10.4388%

(-)12.1727%

36" EQUALIZER PIPE CL.IV
INV.= 40.45

36" EQUALIZER PIPE CL.IV
INV.= 40.35

36" EQUALIZER PIPE CL.IV
INV.= 37.20

EXISTING GROUND PROFILE

36" EQUALIZER PIPE
INV.= 39.10

SEE SHEET 12 FOR -L- PLAN VIEW

152 153 154 155 156 157 158 159 160 161 162 163 164 165 166

10 20 30 40 50 60 70 80

BM74 ELEVATION 40.70'
-L- STA 168+91.97 320.09' RT
RR SPIKE IN BASE OF 20" OAK

-L-

PI = 165+85.00
EL = 47.53'
VC = 350'
K = 202

(-)10.4388%

36" EQUALIZER PIPE
INV.= 39.10

36" EQUALIZER PIPE
INV.= 38.50

(-) 3.0000% (LT)

BEG. SP 'V' DITCH (LT)
+00.00 EL = 38.00

END SP 'V' DITCH (LT)
+50.00 EL = 36.50

PROPOSED GRADE LINE

(-) 4.7200% (RT)

(+) 1.0211% (LT)

(-)10.4388%

BEG. SP 'V' DITCH (RT)
+50.00 EL = 37.36

END SP 'V' DITCH (RT)
+00.00 EL = 35.00

BEG. SP 'V' DITCH (LT)
+10.00 EL = 35.04

EXISTING GROUND PROFILE

END SP 'V' DITCH (LT)
+00.00 EL = 36.98

LEFT DITCH — · — · —

RIGHT DITCH - - - - -

SEE SHEET 13 FOR -L- PLAN VIEW

166 167 168 169 170 171 172 173 174 175 176 177 178 179 180

10 20 30 40 50 60 70 80

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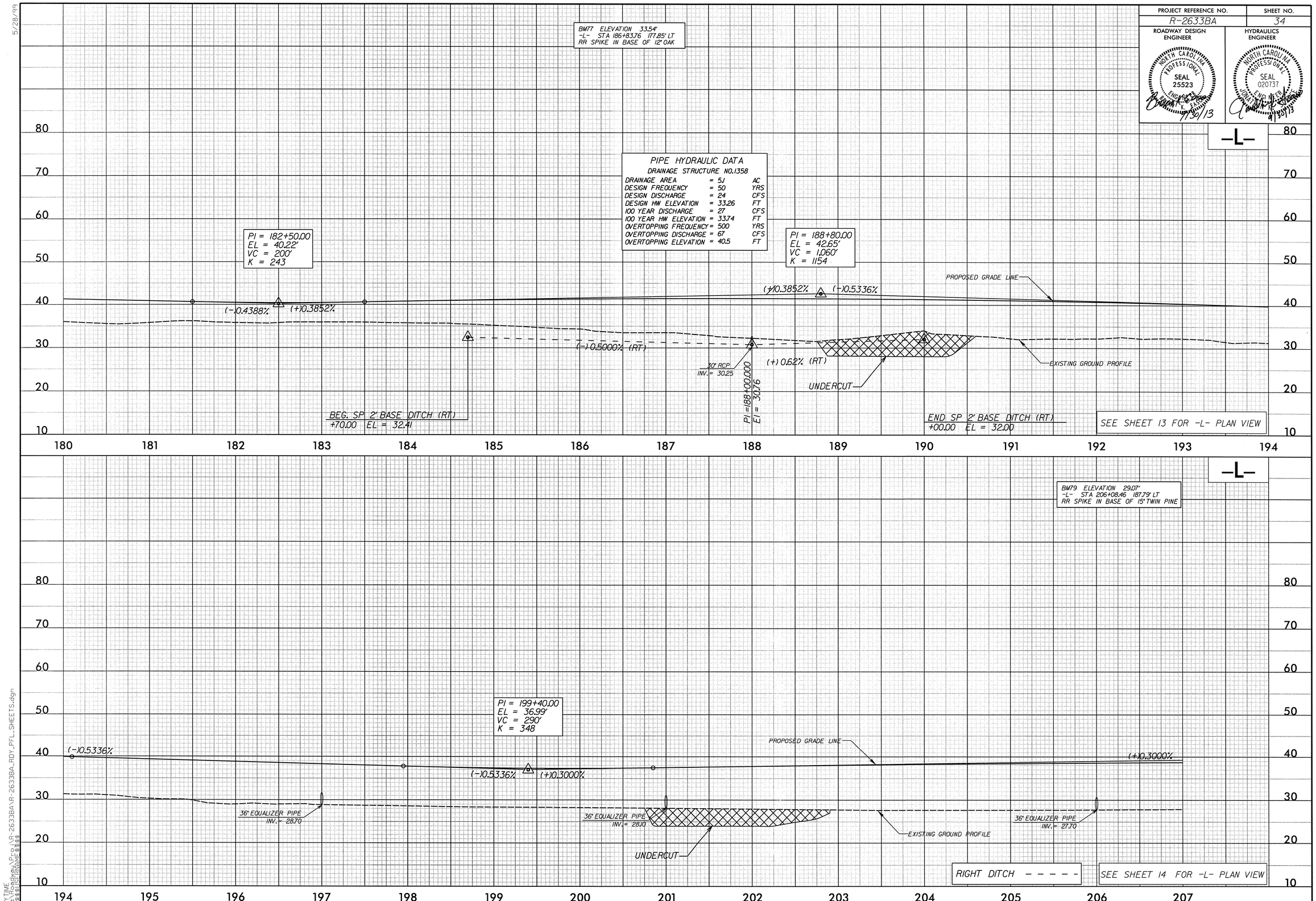

PROJECT REFERENCE NO.
R-2633BA
SHEET NO.
34
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
9/30/13
-L-
BM77 ELEVATION 33.54'
-L- STA 186+83.76 177.85' LT
RR SPIKE IN BASE OF 12" OAK
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1358
DRAINAGE AREA = 5.1 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 24 CFS
DESIGN HW ELEVATION = 33.26 FT
100 YEAR DISCHARGE = 27 CFS
100 YEAR HW ELEVATION = 33.74 FT
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING DISCHARGE = 67 CFS
OVERTOPPING ELEVATION = 40.5 FT
PI = 182+50.00
EL = 40.22'
VC = 200'
K = 243
PI = 188+80.00
EL = 42.65'
VC = 1,060'
K = 1154
PROPOSED GRADE LINE
(-)0.4388%
(+)0.3852%
(+)0.3852%
(-)0.5336%
(-) 0.5000% (RT)
30" RCP
INV. = 30.25
(+) 0.62% (RT)
UNDERCUT
EXISTING GROUND PROFILE
PI = 188+00.000
EI = 30.76
BEG. SP 2' BASE DITCH (RT)
+70.00 EL = 32.41
END SP 2' BASE DITCH (RT)
+00.00 EL = 32.00
SEE SHEET 13 FOR -L- PLAN VIEW
-L-
BM79 ELEVATION 29.07'
-L- STA 206+08.46 187.79' LT
RR SPIKE IN BASE OF 15" TWIN PINE
PI = 199+40.00
EL = 36.99'
VC = 290'
K = 348
PROPOSED GRADE LINE
(-)0.5336%
(-)0.5336%
(+)0.3000%
(+)0.3000%
36" EQUALIZER PIPE
INV. = 28.70
36" EQUALIZER PIPE
INV. = 28.10
36" EQUALIZER PIPE
INV. = 27.70
EXISTING GROUND PROFILE
UNDERCUT
RIGHT DITCH - - - - -
SEE SHEET 14 FOR -L- PLAN VIEW

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	35

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
7/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
4/30/13

-L-

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1502

DRAINAGE AREA	= 60.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 93	CFS
DESIGN HW ELEVATION	= 26.20	FT
100 YEAR DISCHARGE	= 110	CFS
100 YEAR HW ELEVATION	= 26.59	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 125	CFS
OVERTOPPING ELEVATION	= 27.00	FT

PI = 210+60.00
EL = 40.35'
VC = 1.950'
K = 3249

(+)0.3000% (-)0.3002%

PROPOSED GRADE LINE

(-)0.3002%

BEG. LAT. 2' BASE DITCH (LT)
+10.00 EL = 23.50

36" EQUALIZER PIPE
INV.= 27.70

3 @ 42" RCP
INV.= 22.60

(+) 0.3000%
(+) 0.3009%

EXISTING GROUND PROFILE

BEG. LAT. 2' BASE DITCH (RT)
+00.00 EL = 23.75

SEE SHEET 15 FOR -L- PLAN VIEW

70 60 50 40 30 20 10 0

207 208 209 210 211 212 213 214 215 216 217 218 219 220 221

-L-

BMBI ELEVATION 27.84'
-L- STA 229+52.92 164.33' LT
RR SPIKE IN BASE OF 18" PINE

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1606

DRAINAGE AREA	= 20.1	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 35	CFS
DESIGN HW ELEVATION	= 28.36	FT
100 YEAR DISCHARGE	= 40	CFS
100 YEAR HW ELEVATION	= 28.74	FT
OVERTOPPING FREQUENCY	= 10	YRS
OVERTOPPING DISCHARGE	= 19	CFS
OVERTOPPING ELEVATION	= 27.00	FT

PI = 227+30.00
EL = 35.34'
VC = 360'
K = 600

(-)0.3002% (+)0.3000%

PROPOSED GRADE LINE

(+)0.3000%

END LAT. 2' BASE DITCH (LT)
+00.00 EL.25.27

(+) 0.3000%
(+) 0.3009%

BEG. LAT. 2' BASE DITCH (LT)
+00.00 EL = 24.28

EXISTING GROUND PROFILE

36" RCP
INV.= 24.21

(-) 0.3000%

END LAT. 2' BASE DITCH (RT)
+75.00 EL.25.48

SEE SHEET 16 FOR -L- PLAN VIEW

70 60 50 40 30 20 10 0

221 222 223 224 225 226 227 228 229 230 231 232 233 234

SYTIME
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	36

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER

7/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER

7/30/13

BM83 ELEVATION 27.24'
-L- STA 243+47.72 172.58' LT
RR SPIKE IN BASE OF 8" PINE

-L-

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1701

DRAINAGE AREA	= 8.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 28	CFS
DESIGN HW ELEVATION	= 26.20	FT
100 YEAR DISCHARGE	= 31	CFS
100 YEAR HW ELEVATION	= 26.60	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 31	CFS
OVERTOPPING ELEVATION	= 26.60	FT

PI = 235+60.00
EL = 37.83'
VC = 1,300'
K = 2156

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1704

DRAINAGE AREA	= 4.1	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 11	CFS
DESIGN HW ELEVATION	= 24.12	FT
100 YEAR DISCHARGE	= 13	CFS
100 YEAR HW ELEVATION	= 24.32	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 21	CFS
OVERTOPPING ELEVATION	= 26.00	FT

(+)0.3000% (-)0.3029%

PROPOSED GRADE LINE

(-)0.3029%

(-) 0.3000% (+) 0.3000%

30" RCP
INV.= 22.92

PI =235+50.000
EL = 23.23

48" RCP
INV.= 22.00

END LAT. 2' BASE DITCH (LT)
+00.00 EL.24.58

EXISTING GROUND PROFILE

SEE SHEET 17 FOR -L- PLAN VIEW

234 235 236 237 238 239 240 241 242 243 244 245 246 247 248

0 10 20 30 40 50 60 70

-L-

PI = 248+80.00
EL = 33.83'
VC = 500'
K = 702

(-)0.3029% (+)0.4090%

PROPOSED GRADE LINE

(+)0.4090%

(-)0.3000% (LT)

EXISTING GROUND PROFILE

BEG. LAT. 2' BASE DITCH (LT)
+60.00 EL = 21.47

LEFT DITCH — · · — · ·

SEE SHEET 18 FOR -L- PLAN VIEW

248 249 250 251 252 253 254 255 256 257 258 259 260

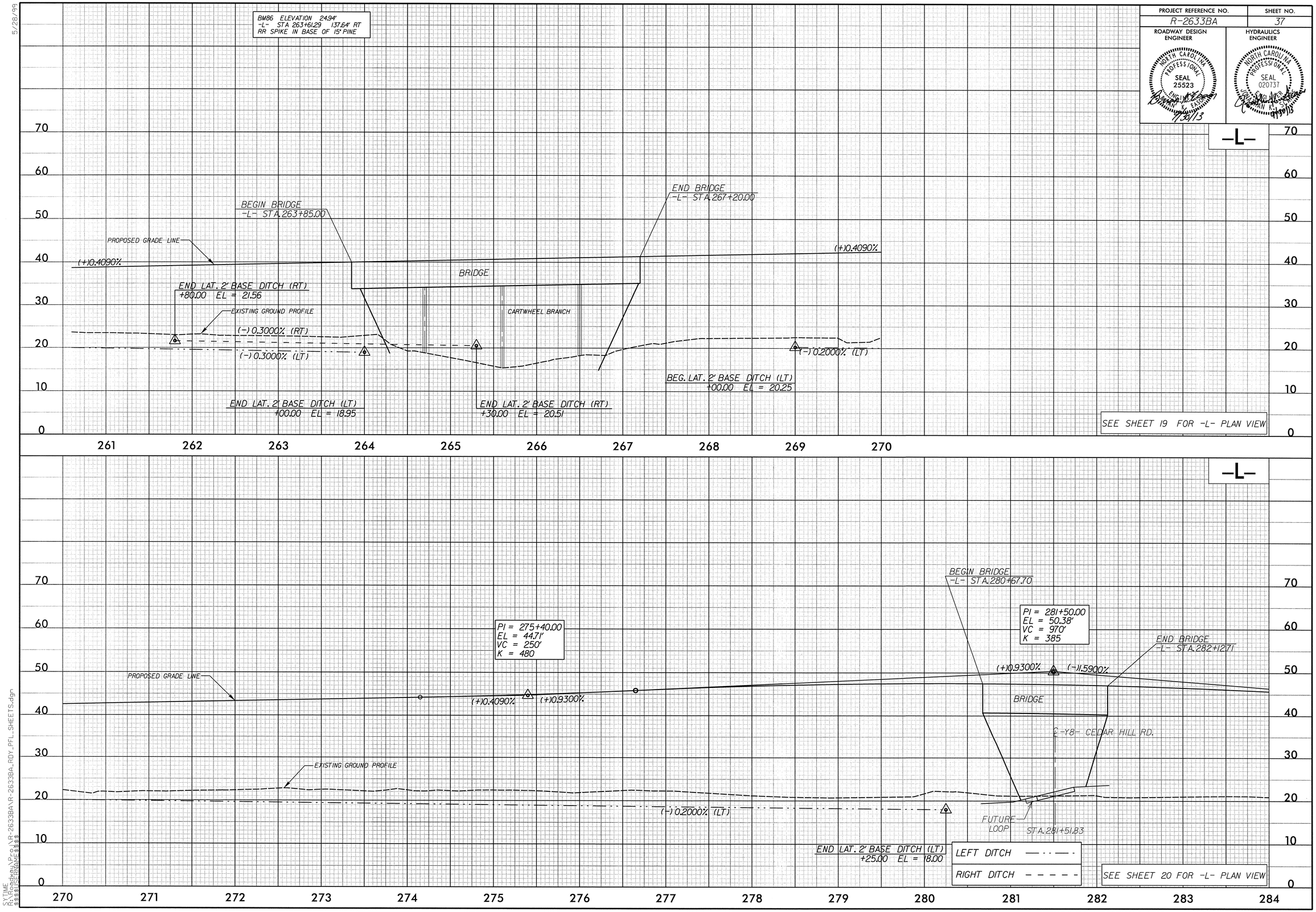
0 10 20 30 40 50 60 70

SYTIME
R:\Roadway\Proj\R-2633BA\R-2633BA_ROY_PFL_SHEETS.dgn
$$USERNAME$$

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	37

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER — 7/30/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER — 9/30/13



5/28/99

SYTIME
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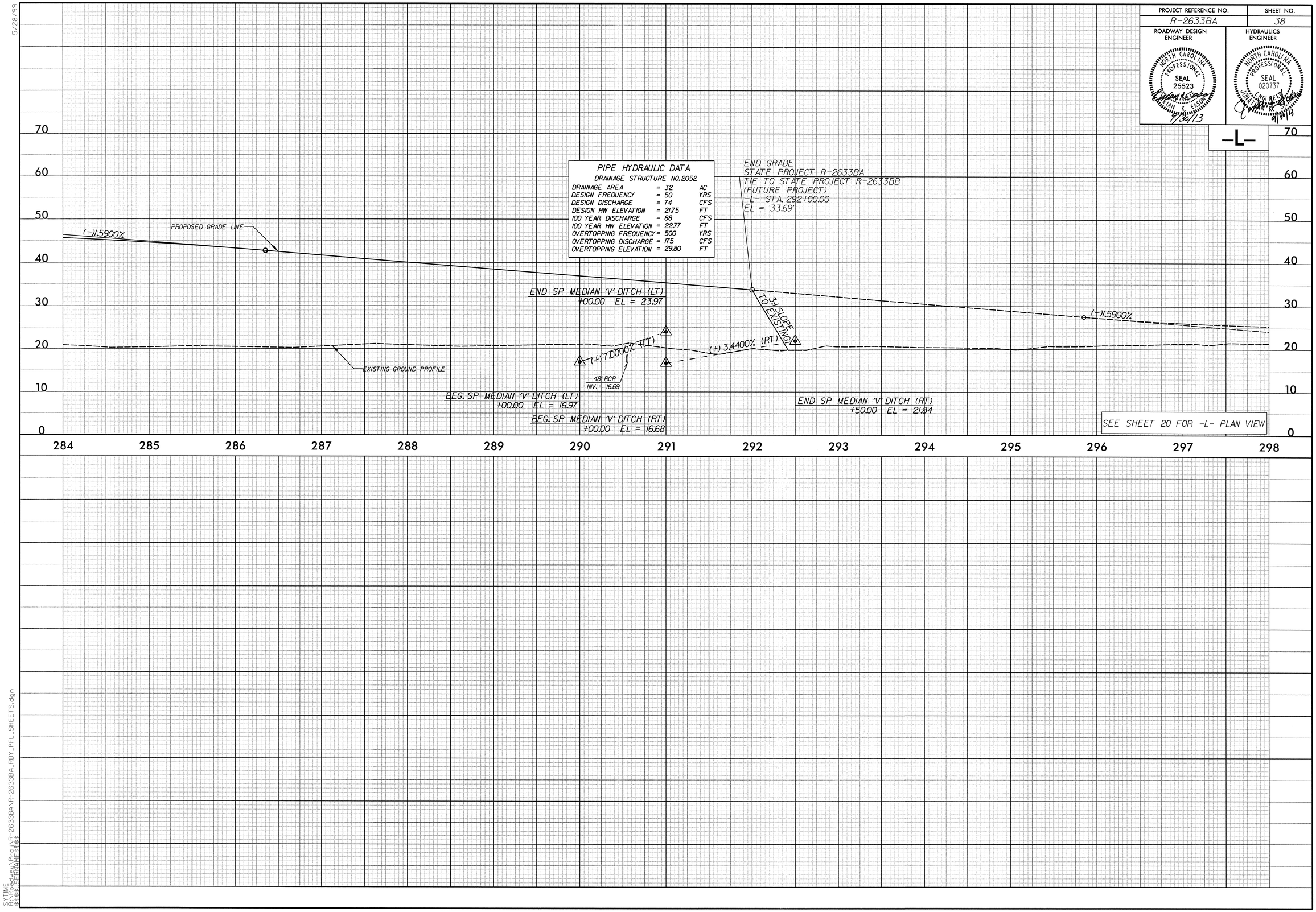
PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	38

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EASON 9/30/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. EASON 9/30/13



5/28/99

SYTIME
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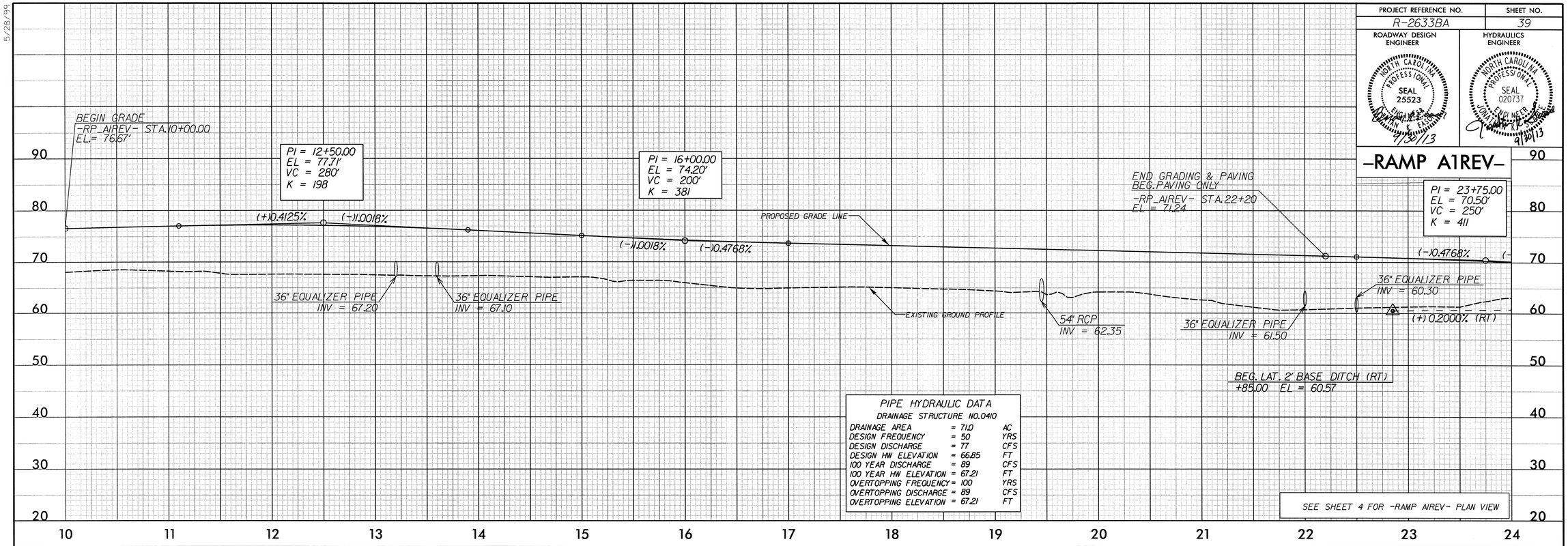
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	39

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EASON — 9/30/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. EASON — 9/30/13

-RAMP A1REV-

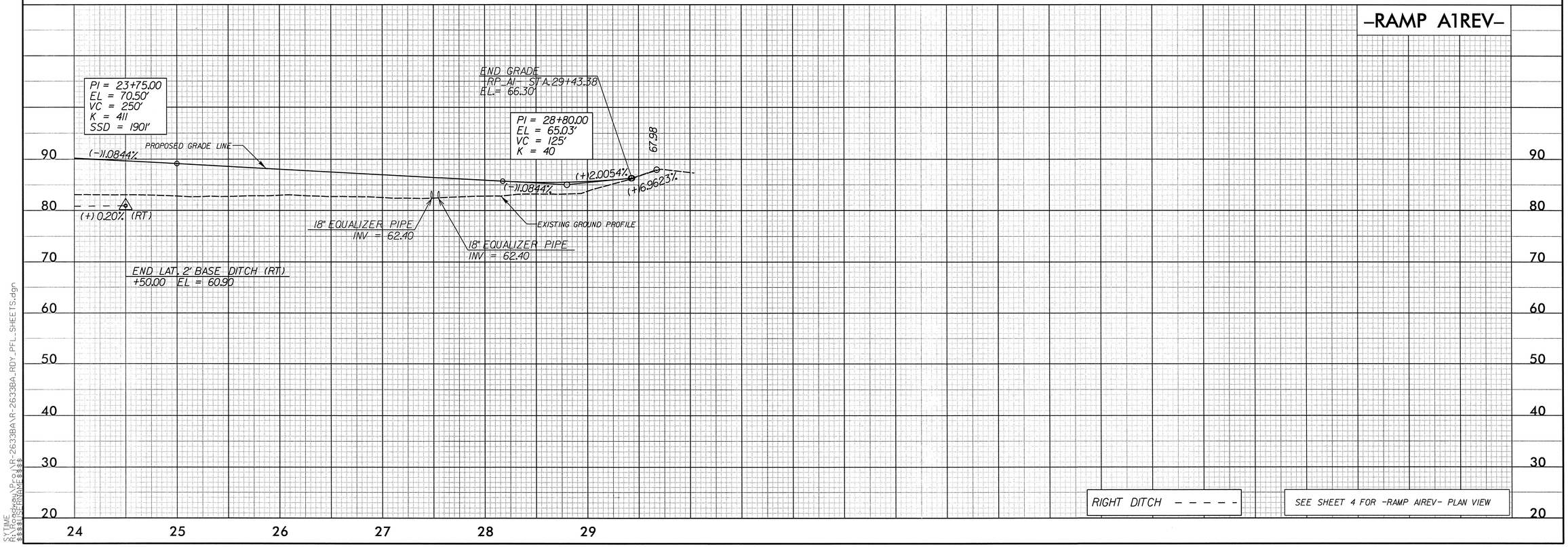


PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.0410

DRAINAGE AREA	= 71.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 77	CFS
DESIGN HW ELEVATION	= 66.85	FT
100 YEAR DISCHARGE	= 89	CFS
100 YEAR HW ELEVATION	= 67.21	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 89	CFS
OVERTOPPING ELEVATION	= 67.21	FT

-RAMP A1REV-



5/28/99

SYTIME
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	40

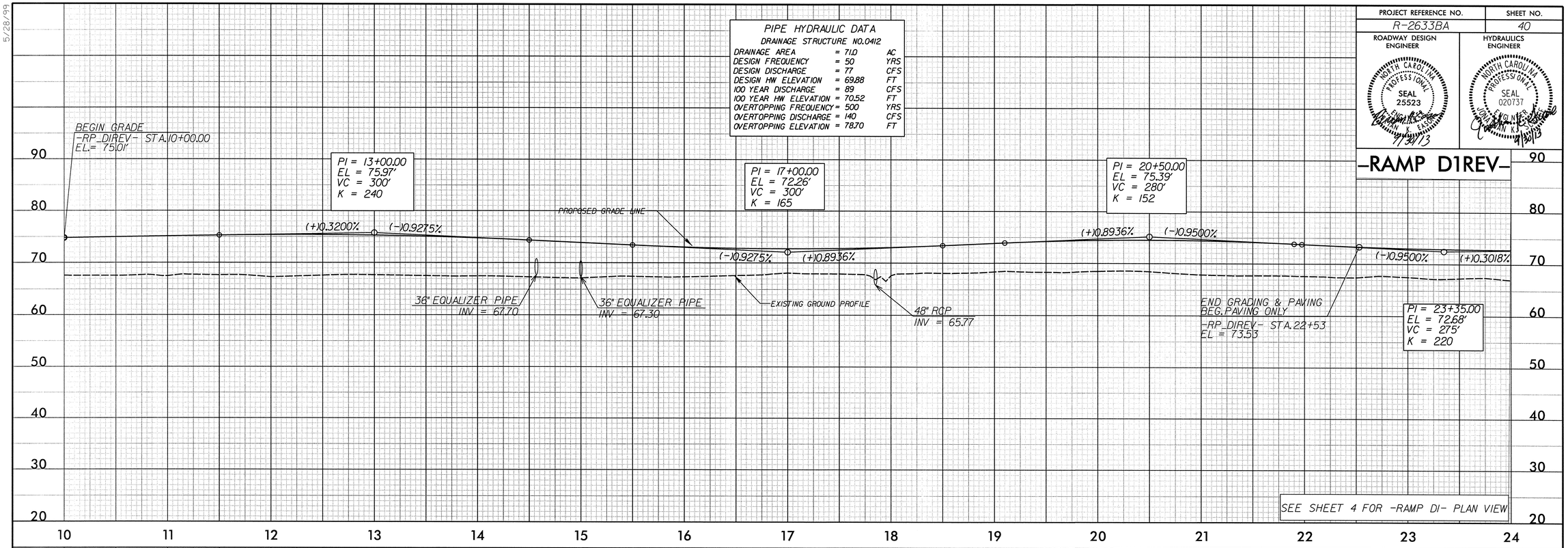
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. FASON 7/30/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. FASON 7/30/13

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.0412

DRAINAGE AREA	= 71.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 77	CFS
DESIGN HW ELEVATION	= 69.88	FT
100 YEAR DISCHARGE	= 89	CFS
100 YEAR HW ELEVATION	= 70.52	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 140	CFS
OVERTOPPING ELEVATION	= 78.70	FT



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SYTIME
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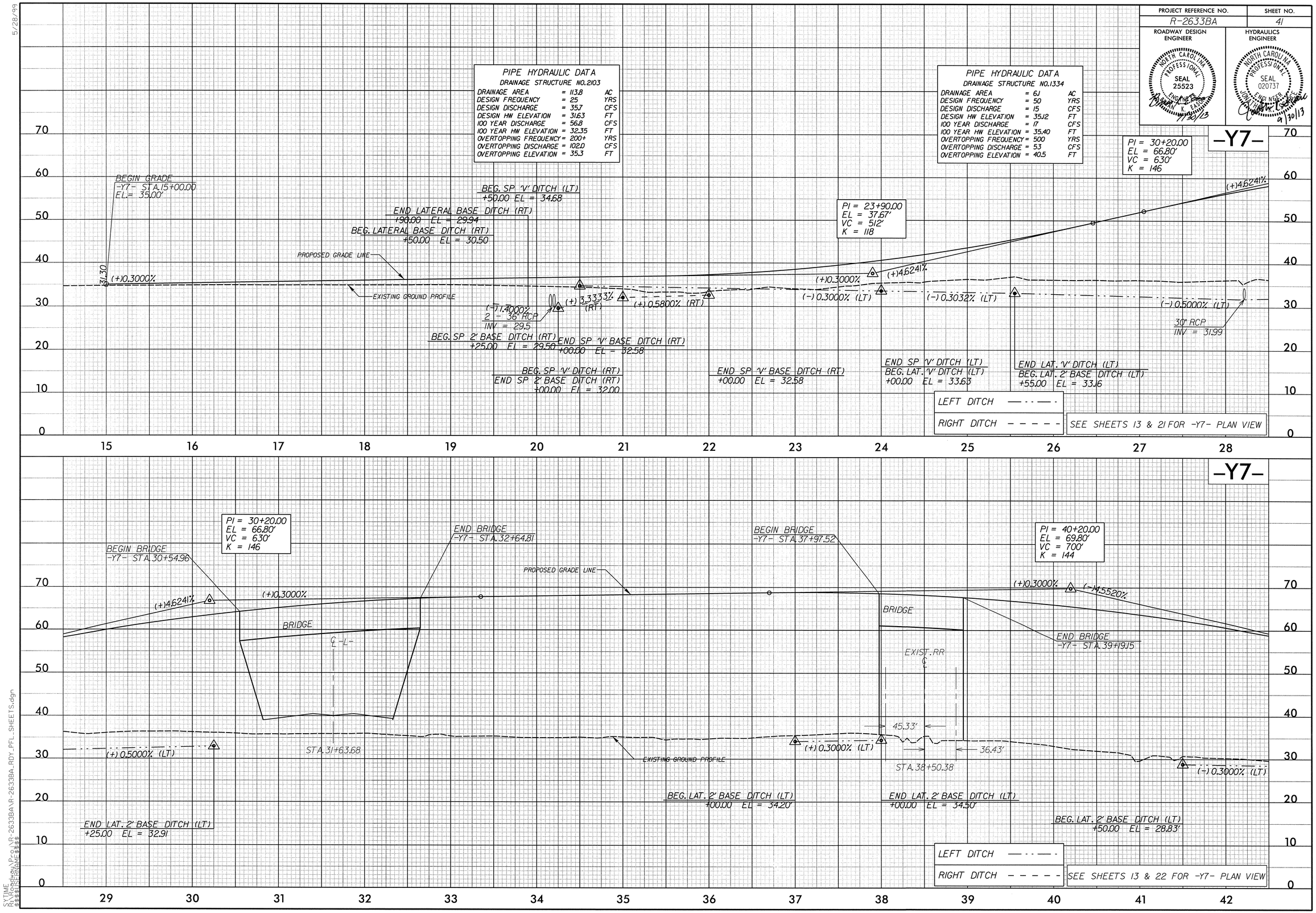
PROJECT REFERENCE NO.
R-2633BA
SHEET NO.
41
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
9/30/13
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.2103
DRAINAGE AREA = 113.8 AC
DESIGN FREQUENCY = 25 YRS
DESIGN DISCHARGE = 35.7 CFS
DESIGN HW ELEVATION = 31.63 FT
100 YEAR DISCHARGE = 56.8 CFS
100 YEAR HW ELEVATION = 32.35 FT
OVERTOPPING FREQUENCY = 200+ YRS
OVERTOPPING DISCHARGE = 102.0 CFS
OVERTOPPING ELEVATION = 35.3 FT
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.1334
DRAINAGE AREA = 6.1 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 15 CFS
DESIGN HW ELEVATION = 35.12 FT
100 YEAR DISCHARGE = 17 CFS
100 YEAR HW ELEVATION = 35.40 FT
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING DISCHARGE = 53 CFS
OVERTOPPING ELEVATION = 40.5 FT
-Y7-
PI = 30+20.00
EL = 66.80'
VC = 630'
K = 146
PI = 23+90.00
EL = 37.67'
VC = 512'
K = 118
BEGIN GRADE
-Y7- STA.15+00.00
EL.= 35.00'
BEG. SP 'V' DITCH (LT)
+50.00 EL = 34.68
END LATERAL BASE DITCH (RT)
+90.00 EL = 29.94
BEG. LATERAL BASE DITCH (RT)
+50.00 EL = 30.50
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
31.30
(+)0.3000%
(+)4.6241%
(+)0.3000%
(+)4.6241%
(-) 1.4000%
2 - 36" RCP
INV = 29.5
(+) 3.3333% (RT)
(+) 0.5800% (RT)
(-) 0.3000% (LT)
(-) 0.3032% (LT)
(-) 0.5000% (LT)
30" RCP
INV = 31.99
BEG. SP 2' BASE DITCH (RT)
+25.00 EL = 29.50
END SP 'V' BASE DITCH (RT)
+00.00 EL = 32.58
BEG. SP 'V' DITCH (RT)
END SP 2' BASE DITCH (RT)
+00.00 EL = 32.00
END SP 'V' BASE DITCH (RT)
+00.00 EL = 32.58
END SP 'V' DITCH (LT)
BEG. LAT. 'V' DITCH (LT)
+00.00 EL = 33.63
END LAT. 'V' DITCH (LT)
BEG. LAT. 2' BASE DITCH (LT)
+55.00 EL = 33.16
LEFT DITCH
RIGHT DITCH
SEE SHEETS 13 & 21 FOR -Y7- PLAN VIEW
-Y7-
PI = 30+20.00
EL = 66.80'
VC = 630'
K = 146
PI = 40+20.00
EL = 69.80'
VC = 700'
K = 144
BEGIN BRIDGE
-Y7- STA.30+54.96
END BRIDGE
-Y7- STA.32+64.81
BEGIN BRIDGE
-Y7- STA.37+97.52
END BRIDGE
-Y7- STA.39+19.15
PROPOSED GRADE LINE
(+)4.6241%
(+)0.3000%
(+)0.3000%
(-)4.5520%
BRIDGE
BRIDGE
℄ -L-
EXIST. RR ℄
45.33'
36.43'
STA.31+63.68
STA.38+50.38
(+) 0.5000% (LT)
(+) 0.3000% (LT)
(-) 0.3000% (LT)
EXISTING GROUND PROFILE
BEG. LAT. 2' BASE DITCH (LT)
+00.00 EL = 34.20'
END LAT. 2' BASE DITCH (LT)
+00.00 EL = 34.50'
END LAT. 2' BASE DITCH (LT)
+25.00 EL = 32.91
BEG. LAT. 2' BASE DITCH (LT)
+50.00 EL = 28.83'
LEFT DITCH
RIGHT DITCH
SEE SHEETS 13 & 22 FOR -Y7- PLAN VIEW
5/28/99
SYTIME
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	42

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K EASTER

7/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K SLATER

7/30/13

BM229 ELEVATION 28.80'
-Y7- STA 54+16.48 46' RT
RR SPIKE IN BASE OF 18" PINE

-Y7-

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.2209

DRAINAGE AREA	= 4.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 23	CFS
DESIGN HW ELEVATION	= 28.73	FT
100 YEAR DISCHARGE	= 26	CFS
100 YEAR HW ELEVATION	= 28.98	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 63	CFS
OVERTOPPING ELEVATION	= 34.5	FT

CULVERT HYDRAULIC DATA
12' X 11' RCBC

DRAINAGE AREA	= 1.67	SQ. MI.
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1600	CFS
DESIGN HW ELEVATION	= 29.40	FT
BASE DISCHARGE	= 1800	CFS
BASE HW ELEVATION	= 30.40	FT
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 2068	CFS
OVERTOPPING ELEVATION	= 31.3	FT

PI = 40+20.00
EL = 69.80'
VC = 700'
K = 144

PI = 49+00.00
EL = 29.74'
VC = 600'
K = 123

(-)14.5520%

(-)14.5520%

BEG. LAT. 2' BASE DITCH (RT)
+45.00 EL = 26.75

EXISTING GROUND PROFILE

BEG. SP 'V' DITCH (RT)
+00.00 EL = 27.00'

BEG. LAT. 'V' DITCH (RT)
+75.00 EL = 24.65

PROPOSED GRADE LINE

12'X11' RCBC

END LAT. 2' BASE DITCH (RT)
+70.00 EL = 23.40'

END GRADE
-Y7- STA 55+00.00
EL = 31.66'

(+)0.3200%

(-) 0.3000% (LT)

(-) 1.0000% (LT)

END LAT. 2' BASE DITCH (LT)
+78.00 EL = 26.30

(-) 1.0000% (RT)

(-) 0.3000% (LT)

(+) 1.00% (RT)

(-) 1.2000% (RT)

(-) 1.20% (RT)

(+) 0.3273% (RT)

(+) 2.0000% (LT)

END LAT 2' BASE DITCH (LT)
+50.00 EL = 24.00'

PI = 44+00.000
EL = 28.08

30" RCP
INV = 26.30'

BEG. LAT. 'V' DITCH (LT)
+10.00 EL = 27.00'

END LAT. 2' BASE DITCH (RT)
+45.00 EL = 24.75

END LAT. 'V' DITCH (RT)
+50.00 EL = 25.40

END LAT. 'V' DITCH (LT)
+70.00 EL = 26.52'

END SP 'V' DITCH (RT)
BEG. SP 2' BASE DITCH (RT)
+60.00 EL = 23.88'

BEG. LAT. 2' BASE DITCH (LT)
+50.00 EL = 22.00'

BEG. LAT. 2' BASE DITCH (RT)
+15.00 EL = 23.22'

END SP 2' BASE DITCH (RT)
+90.00 EL = 23.52'

LEFT DITCH — · · — · —

RIGHT DITCH — — — — —

SEE SHEET 22 FOR -Y7- PLAN VIEW

-RAMP B2-

BEGIN GRADE
-RP_B2- STA.10+00.00
EL.= 54.57'

PI = 11+74.06
EL = 50.82'
VC = 130'
K = 191

PI = 13+20.00
EL = 48.67'
VC = 160'
K = 111

PI = 14+50.00
EL = 46.47'
VC = 90'
K = 135

PI = 16+00.00
EL = 44.94'
VC = 200'
K = 715

(-)12.1518%

(-)11.4700%

(-)11.4700%

(-)11.6931%

(-)11.6931%

(-)11.0250%

(-)10.7454%

BEG. SP 'V' DITCH (RT)
+40.00 EL = 36.50

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.13110

DRAINAGE AREA	= 6.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 26	CFS
DESIGN HW ELEVATION	= 37.23	FT
100 YEAR DISCHARGE	= 29	CFS
100 YEAR HW ELEVATION	= 37.50	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 55	CFS
OVERTOPPING ELEVATION	= 40.7	FT

PI = 23+00.00
EL = 39.72'
VC = 200'
K = 162

PI = 22+75.00 (RT)
EI = 34.50

(-)0.7454%

(+)0.4917%

(-) 0.4598% (RT)
(-) 0.5000% (LT)

(+) 0.5091% (RT)

(-) 0.3130% (LT)

30" RCP
INV = 34.35'

PI = 21+60.00 (LT)
EI = 34.56

BEG. SP 'V' DITCH (LT)
+50.00 EL = 36.11

END SP 'V' DITCH (LT)
+75.00 EL = 34.20

LEFT DITCH — · · — · —

RIGHT DITCH — — — — —

SEE SHEETS 12 & 13 FOR -RAMP B2- PLAN VIEW

SYTIME
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	43

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER

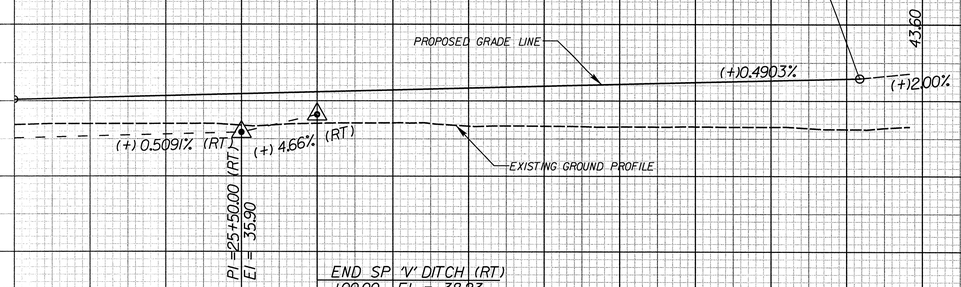
9/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER

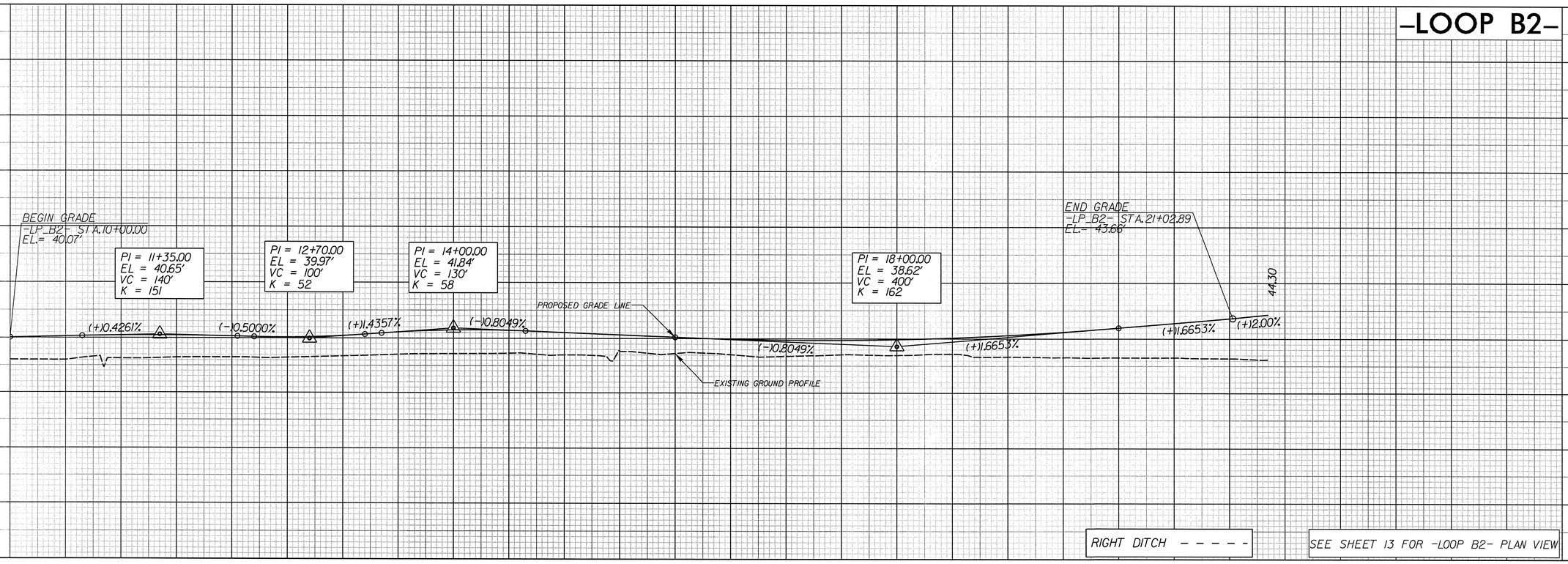
9/30/13

–RAMP B2–



SEE SHEET 13 FOR –RAMP B2– PLAN VIEW

–LOOP B2–



RIGHT DITCH – – – – –

SEE SHEET 13 FOR –LOOP B2– PLAN VIEW

SY TIME
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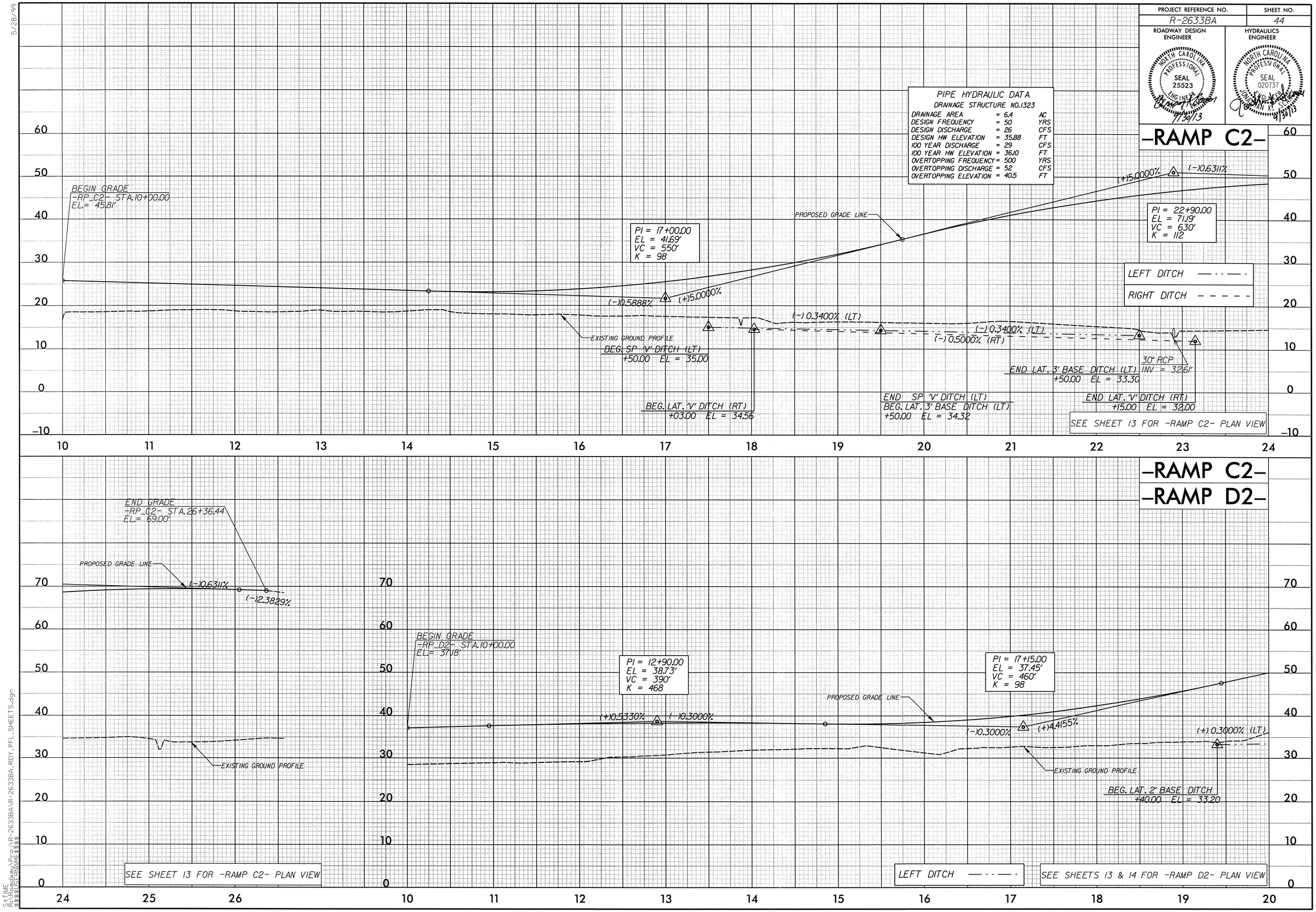
PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	44

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER — 9/30/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER — 9/30/13



5/28/99

SYTIME R:\Roadway\Proj\R-2633BA\R-2633BA_RDY_PFL_SHEETS.dgn $$$$USERNAME$$$$

5/28/99

$$$SYTIME$$$
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$$$$USERNAME$$$$

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	46

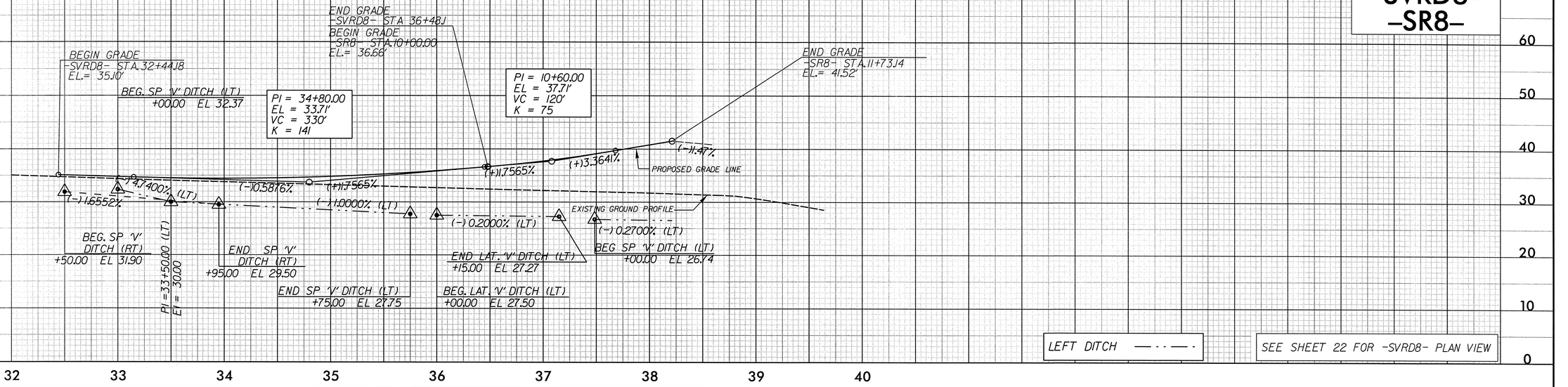
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER BRIAN K. EASON
11/20/13

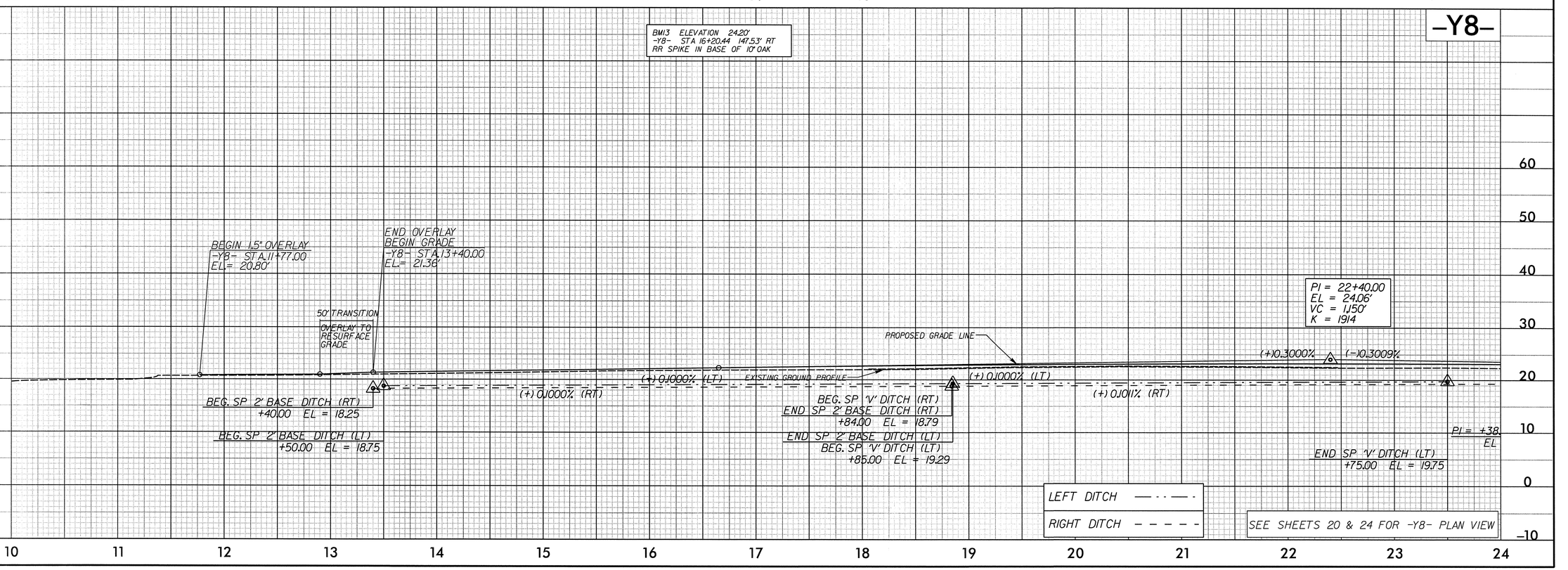
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER BRIAN K. EASON
9/30/13

-SVRD8-
-SR8-



-Y8-



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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	47

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER DUNCAN K. EASTERS 9/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER DUNCAN K. EASTERS 9/30/13

BM233 ELEVATION 23.14'
-Y8- STA 37+43.14 114.30' LT
RR SPIKE IN BASE OF 20" PINE

-Y8-

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.2028

DRAINAGE AREA	= 15.5	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 41	CFS
DESIGN HW ELEVATION	= 20.68	FT
100 YEAR DISCHARGE	= 47	CFS
100 YEAR HW ELEVATION	= 21.11	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 41	CFS
OVERTOPPING ELEVATION	= 20.7	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.2037

DRAINAGE AREA	= 3.5	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 11.3	CFS
DESIGN HW ELEVATION	= 20.35	FT
100 YEAR DISCHARGE	= 12.6	CFS
100 YEAR HW ELEVATION	= 20.50	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 12.6	CFS
OVERTOPPING ELEVATION	= 20.5	FT

END SP 2' BASE DITCH (LT)
BEG. SP 'V' BASE DITCH (LT)
+50.00 EL = 27.88

PI = 29+10.00
EL = 22.04'
VC = 140'
K = 228

BEG. SP 'V' DITCH (RT)
+50.00 EL = 19.40

PI = 33+10.00
EL = 23.30'
VC = 600'
K = 977

PI = 38+10.00
EL = 21.80'
VC = 140'
K = 233

PROPOSED GRADE LINE

(-)0.4327% (RT)
(-)0.2000% (LT)
(-)0.3009%
(+)1.6960% (LT)
(+)0.2600% (RT)
(+)0.3140%
EXISTING GROUND PROFILE
(-)1.4774% (LT)
(-)0.4390% (RT)
(+)0.3140%
(-)0.3000%
(+)0.2000% (RT)
(+)0.3838% (LT)
(-)0.3000%
(-)0.6767% (RT)
(-)0.6373% (LT)

00 (RT)
= 19.35

BEG. SP 2' BASE DITCH (LT)
+00.00 EL = 18.18

PI = +50.00 (RT)
EL = 18.00

3 - 24" RCP
INV = 17.90'

END SP 'V' DITCH (LT)
+75.00 EL = 20.00

END SP 'V' DITCH (RT)
+00.00 EL = 18.39

PI = +55.00 (RT)
EL = 18.50

BEG. SP 'V' DITCH (LT)
+00.00 EL = 20.58

24" RCP
INV = 18.38'

PI = +55.00 (LT)
EL = 18.29

END SP 'V' DITCH (LT)
+40.00 EL = 19.00

END SP 'V' DITCH (RT)
+50.00 EL = 18.89

BEG. SP 2' BASE DITCH (RT)
+50.00 EL = 19.06

BEG. SP 'V' DITCH (LT)
+50.00 EL = 18.76

SEE SHEETS 20 & 25 FOR -Y8- PLAN VIEW

-Y8-

BM234 ELEVATION 11.46'
-Y8- STA 47+12.21 94.51' LT
RR SPIKE IN BASE OF 18" PINE

BRIDGE HYDRAULIC DATA

DRAINAGE AREA	= 1.1	SQ MI
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1100	CFS
DESIGN HW ELEVATION	= 7.2	FT
BASE DISCHARGE	= 1300	CFS
BASE HW ELEVATION	= 7.5	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 2400+	CFS
OVERTOPPING ELEVATION	= 17.73	FT

PI = 38+10.00
EL = 21.80'
VC = 140'
K = 233

PI = 39+60.00
EL = 22.25'
VC = 160'
K = 163

PI = 42+10.00
EL = 20.54'
VC = 200'
K = 524

END SP 'V' DITCH (RT)
+50.00 EL = 16.91

BEGIN BRIDGE
-Y8- STA 47+15.00

END BRIDGE
-Y8- STA 50+43.00

PROPOSED GRADE LINE

(-)0.3000%
(+)0.3000%
(-)0.6820%
(-)0.6767% (RT)
(-)0.6373% (LT)
(+)1.9100% (RT)
(-)0.3000%
(-)0.3000%

BEG. LAT. 10' BASE DITCH (LT)
+50.00 EL = 6.21

END LAT. 10' BASE DITCH (LT)
+50.00 EL = 6.11

(SEE BSR)

BEG. LAT. 3' BASE DITCH (LT)
+10.00 EL = 4.0

EXISTING GROUND PROFILE

EXCAVATE
EL = 5.0'

CARTWHEEL BRANCH

PI = +50.00 (LT)
EL = 4.08

(-)0.1000% (LT)
(+)0.2000% (LT)
(+)1.1100% (LT)

END SP 'V' DITCH (LT)
+40.00 EL = 15.00

END SP 2' BASE DITCH (RT)
BEG. SP 'V' DITCH (RT)
+50.00 EL = 15.00

LEFT DITCH — · — · —
RIGHT DITCH - - - - -

SEE SHEETS 25 & 26 FOR -Y8- PLAN VIEW

SY TIME
R:\Roadway\Proj\R-2633BA\R-2633BA_RDY_PFL_SHEETS.dgn
$$$$USERNAME$$$$

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	48

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
9/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
9/30/13

-Y8-

BM235 ELEVATION 14.24'
-Y8- STA 52+96.29 62.75' LT
RR SPIKE IN BASE OF 11" PINE

PI = 53+40.00
EL = 17.15'
VC = 200'
K = 137

END LAT 3' BASE DITCH (LT)
+50.000 EL = 6.3

(−)0.3000%

BEG. SP 2' BASE DITCH (RT)
+00.00 EL = 17.16

PI = 56+15.00
EL = 20.34'
VC = 270'
K = 432

(+)1.1597%

(+)0.5346%

(+) 0.2000% (RT)

(+) 0.7323% (LT)

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

PI = +50.00 (LT)
EL = 18.43

PI = 63+90.00
EL = 24.49'
VC = 300'
K = 229

(+)0.5346%

(−)0.7753%

(+) 0.2046% (LT)

(+) 0.2000% (RT)

PI = 66+70.00
EL = 22.32'
VC = 210'
K = 154

(−)0.7753%

+) 1.1100%
(LT)

(+) 3.0000% (LT)

PI = +00.00 (LT)
EL = 13.67

BEG. SP 2' BASE DITCH (LT)
+00.00 EL = 10.67

SEE SHEETS 26 & 27 FOR -Y8- PLAN VIEW

52 53 54 55 56 57 58 59 60 61 62 63 64 65 66

60 50 40 30 20 10 0 −10

-Y8-

BM237 ELEVATION 16.41'
-Y8- STA 68+49.15 153.95' LT
RR SPIKE IN BASE OF 9" PINE

PI = 66+70.00
EL = 22.32'
VC = 210'
K = 154

(−)0.7753%

(+) 0.2000% (RT)
(+) 0.2046% (LT)

PROPOSED GRADE LINE

(+)0.5864%

PI = 68+75.00
EL = 23.52'
VC = 200'
K = 145

(+)0.5864%

(−)0.7944%

EXISTING GROUND PROFILE

END SP 2' BASE DITCH (RT)
+00.00 EL = 19.76

END SP 2' BASE DITCH (LT)
+00.00 EL = 19.76

PI = 71+00.00
EL = 21.73'
VC = 110'
K = 235

(−)0.7944%

(−)0.3260%

END GRADE
-Y8- STA 72+00.00
EL = 21.40'

LEFT DITCH — · · — · ·

RIGHT DITCH − − − − −

SEE SHEET 27 FOR -Y8- PLAN VIEW

66 67 68 69 70 71 72 73 74

60 50 40 30 20 10 0 −10

-Y8-

SYTIME
R:\Roadway\Proj\R-2633BA\R-2633BA_RDY_PFL_SHEETS.dgn
$$$$USERNAME$$$$

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	49

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
7/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
7/30/13

-Y8A-

BEGIN GRADE
-Y8A- STA 10+20.00
EL.= 22.41'

BEG. SP 'V' DITCH (LT)
+47.00 EL = 18.84

PI = 11+20.00
EL = 22.11'
VC = 196'
K = 285

PROPOSED GRADE LINE

PI = 13+50.00
EL = 23.00'
VC = 258'
K = 366

PI = 16+00.00
EL = 22.20'
VC = 200'
K = 185

PI = 19+00.00
EL = 24.49'
VC = 380'
K = 347

END SP 'V' DITCH (LT)
+10.00 EL = 21.67

BEG. SP 'V' DITCH (LT)
+74.00 EL = 21.14

END SP 'V' DITCH (LT)
+50.00 EL = 21.32

END GRADE
-Y8A- STA 21+50.00
EL.= 23.67

(−)0.3000% (+)0.3865% (+)0.4631% (+)0.4925% (+)0.0971% (+)0.0971% (−)0.3200% (+)0.0971% (−)0.3200% (+)0.7639% (+)0.5000% (+)0.5000% (+)0.7639% (+)0.0107% (−)0.3300% (+)0.0100% (+)0.0107% (−)0.3300%

EXISTING GROUND PROFILE

PI = 12+50.00 (RT)
EL = 19.78

PI = 16+00.00 (RT)
EL = 20.12

PI = 17+50.00 (RT)
EL = 20.87

BEG. SP 'V' DITCH (RT)
+49.00 EL 18.79

PI = 12+50.00 (LT)
EL = 19.78

PI = 16+00.00 (LT)
EL = 20.12

END SP 'V' DITCH (RT)
+50.00 EL 21.30

SEE SHEETS 23 FOR -Y8A- PLAN VIEW

-Y8A-

LEFT DITCH —·—·—·

RIGHT DITCH – – – – –

SEE SHEETS 23 FOR -Y8A- PLAN VIEW

SYTIME
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	50

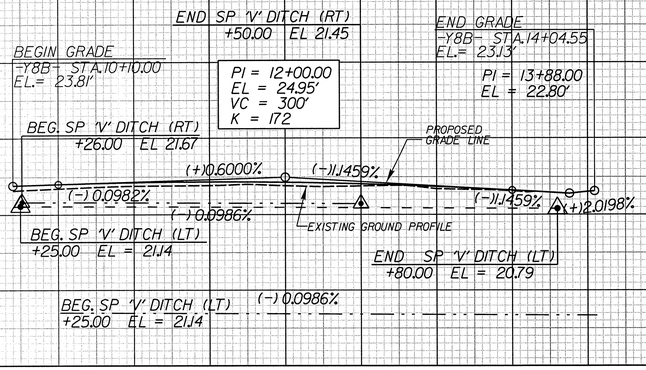
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER
7/30/13

HYDRAULICS ENGINEER

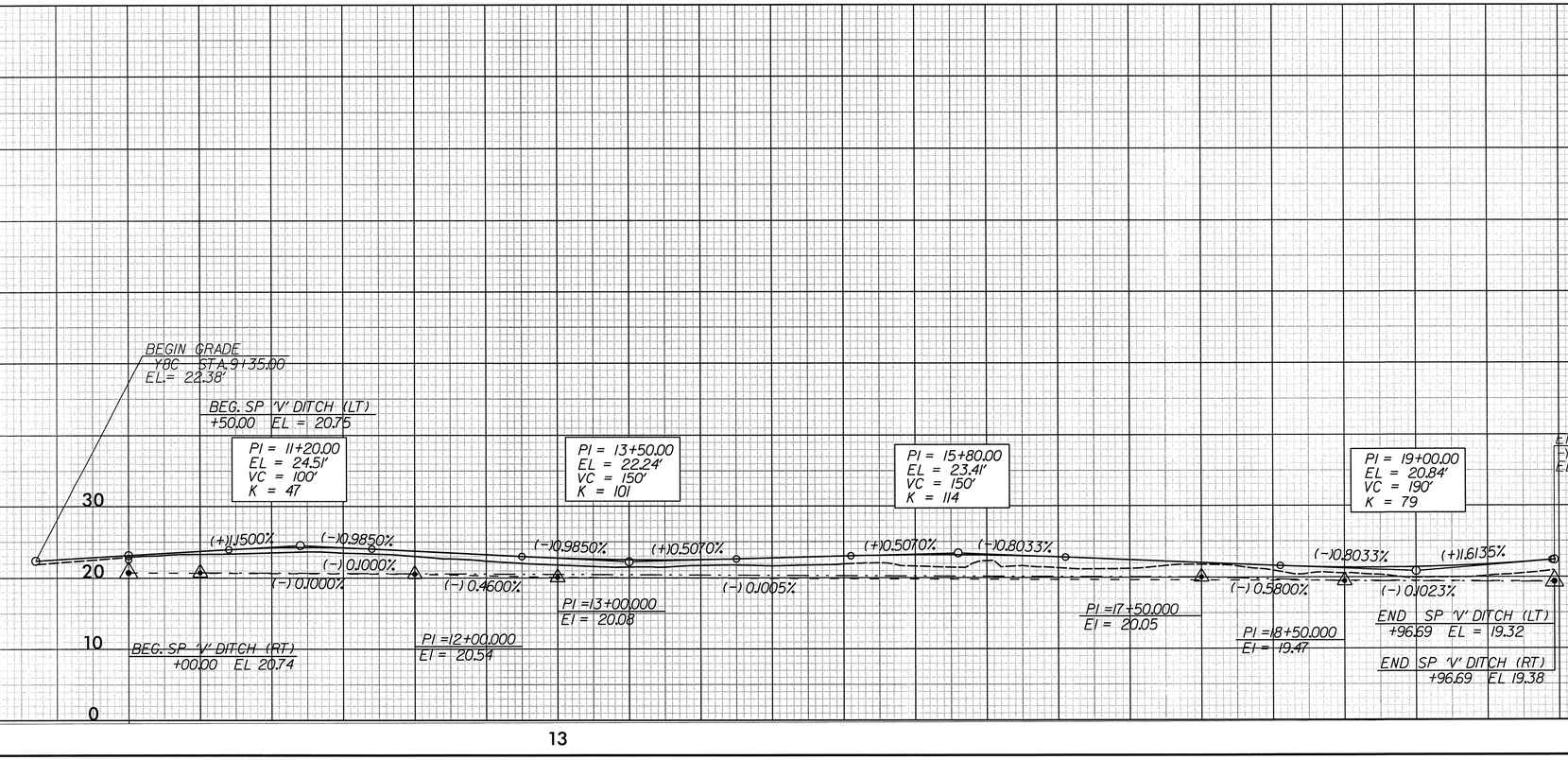
NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER
7/30/13

-Y8B-



SEE SHEET 23 FOR -Y8B- PLAN VIEW

-Y8C-



SEE SHEETS 20 & 23 FOR -Y8B- PLAN VIEW

SYTIME
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	51

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JOHN K. EASTER

11/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JOHN K. EASTER

12/3/13

-LOOP A3-

BEGIN GRADE
-LP_A3- STA.10+00.00
EL.= 46.40'

PI = 11+30.00
EL = 45.67'
VC = 174'
K = 61

PI = 13+70.00
EL = 37.50'
VC = 150'
K = 263

PI = 17+75.00
EL = 26.02'
VC = 200'
K = 94

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.2053

DRAINAGE AREA	= 22	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 56	CFS
DESIGN HW ELEVATION	= 21.17	FT
100 YEAR DISCHARGE	= 63	CFS
100 YEAR HW ELEVATION	= 21.55	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 85	CFS
OVERTOPPING ELEVATION	= 23.00	FT

(-)10.5615%
(-)13.4042%
(-)13.4042%
(-)12.8334%
(-)12.8334%
(-)10.7034%
(+)5.7800% (RT)
(+)1.5000% (RT)
(+)2.50%

PROPOSED GRADE LINE
EXISTING GROUND PROFILE

END GRADE
-LP_A3- STA.23+05.83
EL.= 22.29'

42" RCP
INV = 17.32'

BEG. LAT. 2' BASE DITCH (RT)
+50.00 EL 17.31

END MEDIAN 'V' DITCH (RT)
+50.00 EL 22.45

END LAT. 2' BASE DITCH (RT)
BEG. MEDIAN 'V' DITCH (RT)
+00.00 EL 19.56

LEFT DITCH — · — · —
RIGHT DITCH - - - - -

SEE SHEET 20 FOR -LOOP A3- PLAN VIEW

-RAMP C3-

BEGIN GRADE
-RP_C3- STA.10+00.00
EL.= 39.65'

PI = 14+00.00
EL = 40.88'
VC = 220'
K = 242

PI = 19+00.00
EL = 37.88'
VC = 300'
K = 152

PI = 24+40.00
EL = 23.96'
VC = 220'
K = 97

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.2016

DRAINAGE AREA	= 7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 28	CFS
DESIGN HW ELEVATION	= 20.50	FT
100 YEAR DISCHARGE	= 32	CFS
100 YEAR HW ELEVATION	= 20.77	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 29	CFS
OVERTOPPING ELEVATION	= 20.50	FT

(+)0.3078%
(-)0.6000%
(-)0.6000%
(-)12.5783%
(-)12.5783%
(-)1.5250% (LT)
(+)0.6933% (RT)
(+)0.2000% (LT)
(+)1.9130% (RT)
(+)0.2000% (RT)

PROPOSED GRADE LINE
EXISTING GROUND PROFILE

BEG. SP 2' BASE DITCH (LT)
+00.00 EL = 21.00

PI = +00.00 (LT)
EL = 17.95

36" RCP
INV = 17.77'

END LAT. 3' BASE DITCH (RT)
BEG. SP 2' BASE DITCH (RT)
+00.00 EL = 17.65

BEG. VAR. DEPTH LAT. BASE DITCH (RT)
+45.00 EL = 12.00

END VAR. DEPTH LAT. BASE DITCH (RT)
BEG. LAT. 3' BASE DITCH (RT)
+75.00 EL = 16.40

SEE SHEETS 19 & 20 FOR -RAMP C3- PLAN VIEW

SYTIME
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PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	52

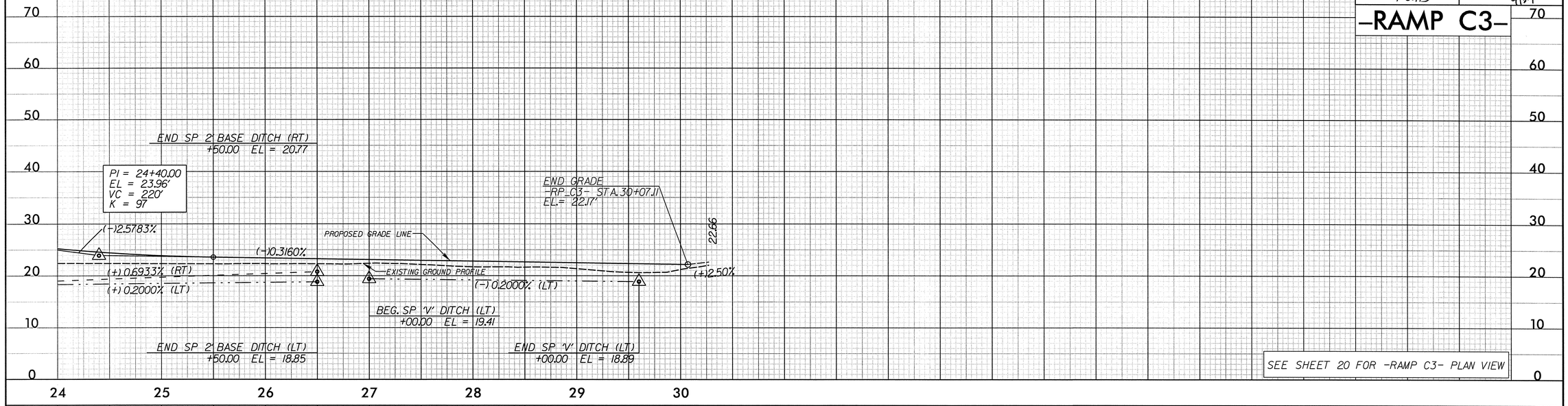
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JOHN K. EASON 9/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. SUGGS 9/30/13

-RAMP C3-



SEE SHEET 20 FOR -RAMP C3- PLAN VIEW

5/28/99

SYTIME
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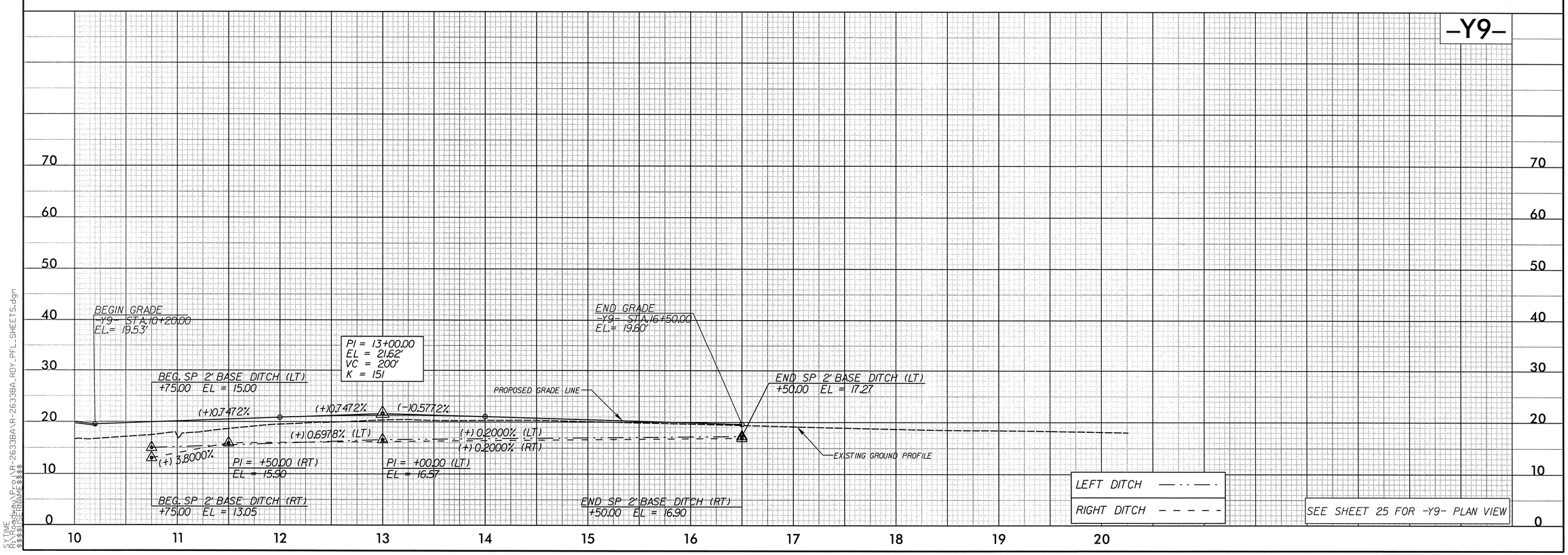
PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	53

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EASON 9/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. SOBECK 9/30/13



SEE SHEET 25 FOR -Y9- PLAN VIEW

5/28/99

SYTIME
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	54

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER

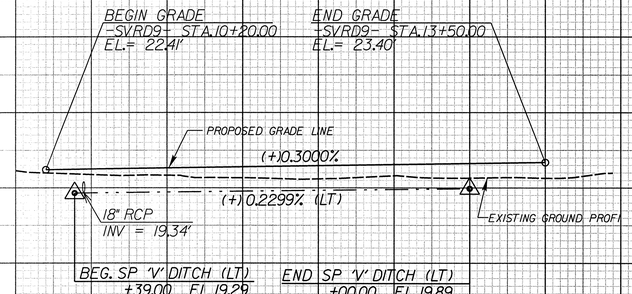
4/30/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER

9/30/13

-SVRD9-



SEE SHEET 24 FOR -SVRD9- PLAN VIEW

70 60 50 40 30 20 10 0

10 11 12 13

SYTIME
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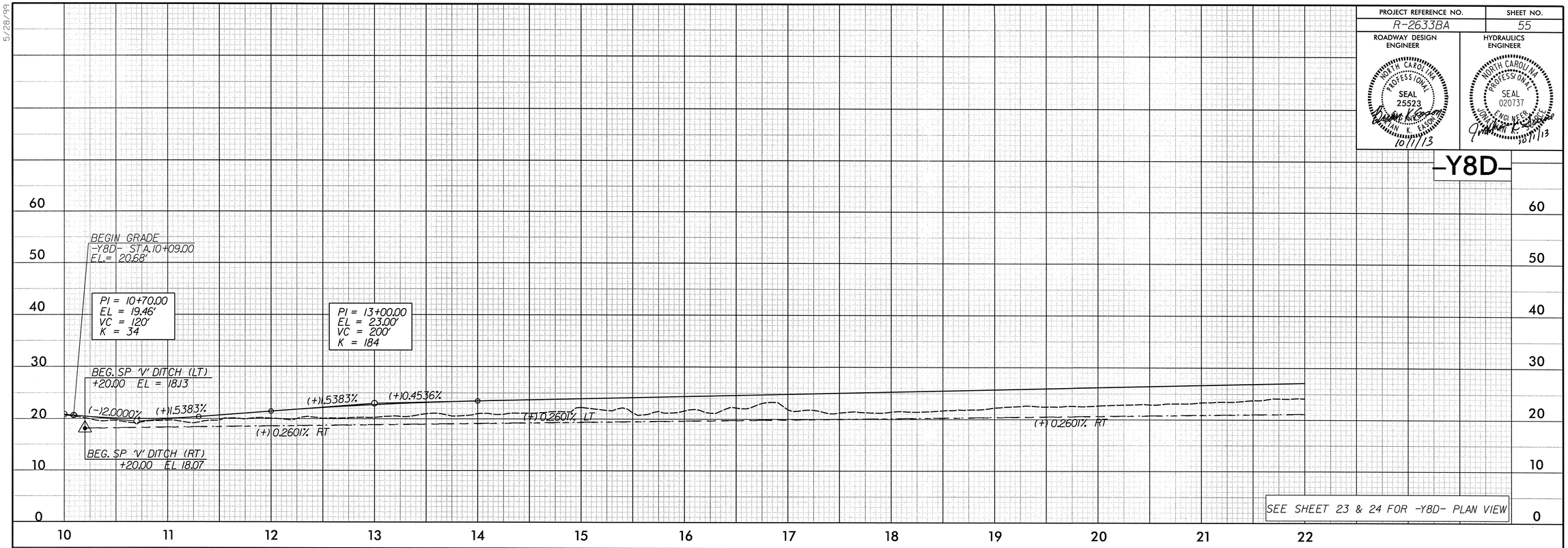
$$USERNAME$$

PROJECT REFERENCE NO.	SHEET NO.
R-2633BA	55

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 25523 ENGINEER JONATHAN K. EASON 10/1/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 020737 ENGINEER JONATHAN K. SHARPE 10/1/13



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SYTIME
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