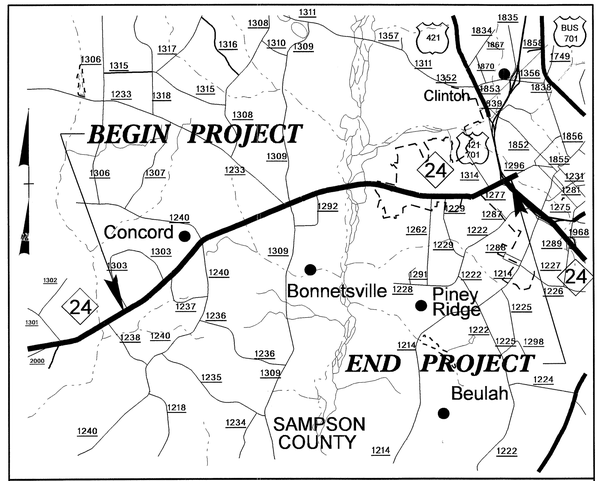
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2303D	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34416.1.1		PE
34416.2.5		R / W, UTIL.
34416.3.S2		CONST.

TIP PROJECT: R-2303D

CONTRACT: C203464

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



VICINITY MAP

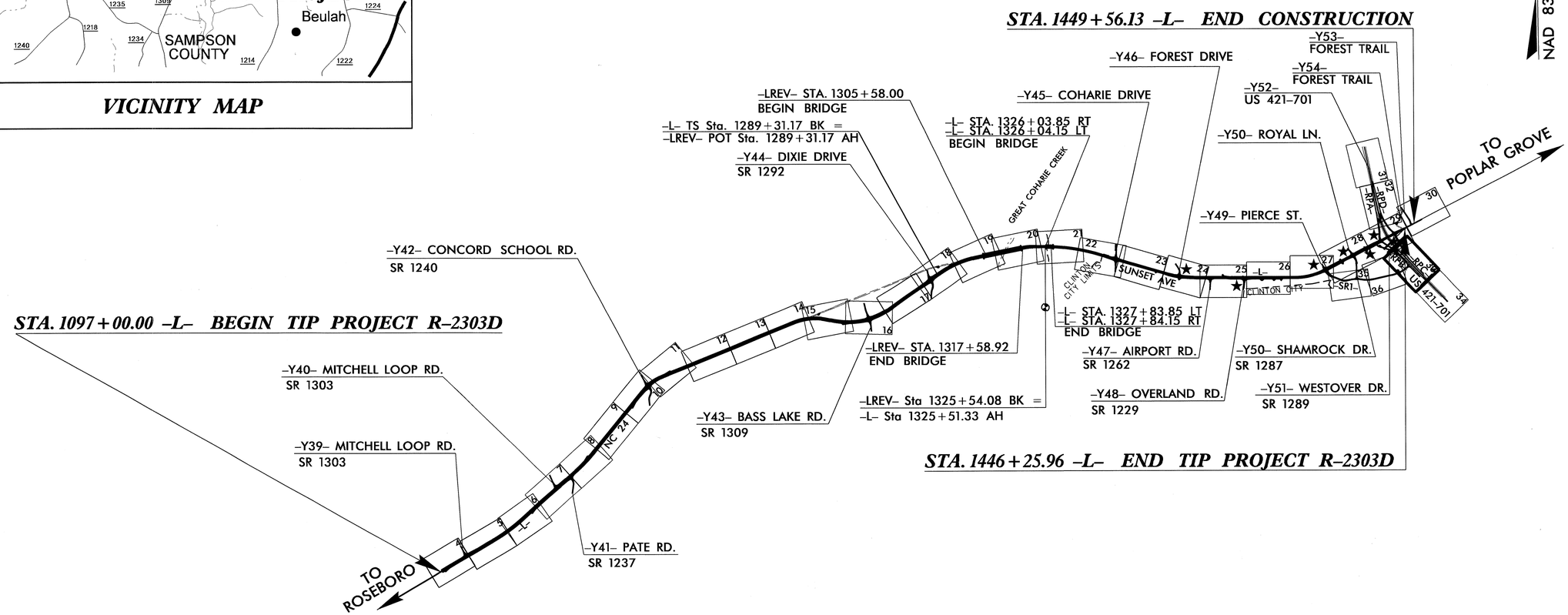
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SAMPSON COUNTY

LOCATION: NC 24 FROM SR 1303 (MITCHELL LOOP ROAD) TO US 421-701 / SR 1296 (SUNSET AVENUE)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING, SIGNALS STRUCTURES, AND CULVERTS

NAD 83/95



★ TRAFFIC SIGNAL

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 = 20240
ADT 2033 = 41840
DHV = 11 %
D = 55 %
T = 8 % *
V (SHOULDER) = 60 MPH
V (CURB & GUTTER) = 50 MPH
* (TTST 5% + DUAL 3%)
FUNC. CLASS = ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2303D = 6.47 MILES
LENGTH STRUCTURES TIP PROJECT R-2303D = 0.26 MILES
TOTAL LENGTH TIP PROJECT R-2303D = 6.73 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 30, 2011

LETTING DATE: NOVEMBER 19, 2013

G. E. BREW, PE
PROJECT ENGINEER

WAYNE BEST
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL
SIGNATURE: W. Galen Cail 7/19/13

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW
7-3-13
SIGNATURE: Gregory E. Brew

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

09/08/99

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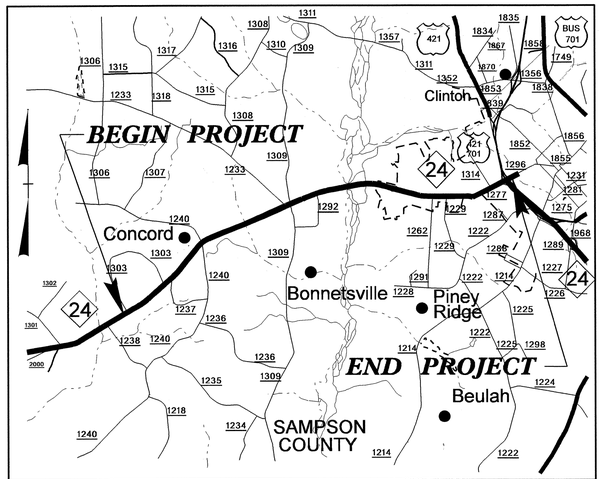
Page # 161

09/08/99

TIP PROJECT: R-2303D

CONTRACT: C203162

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SAMPSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2303D	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34416.1.1		PE
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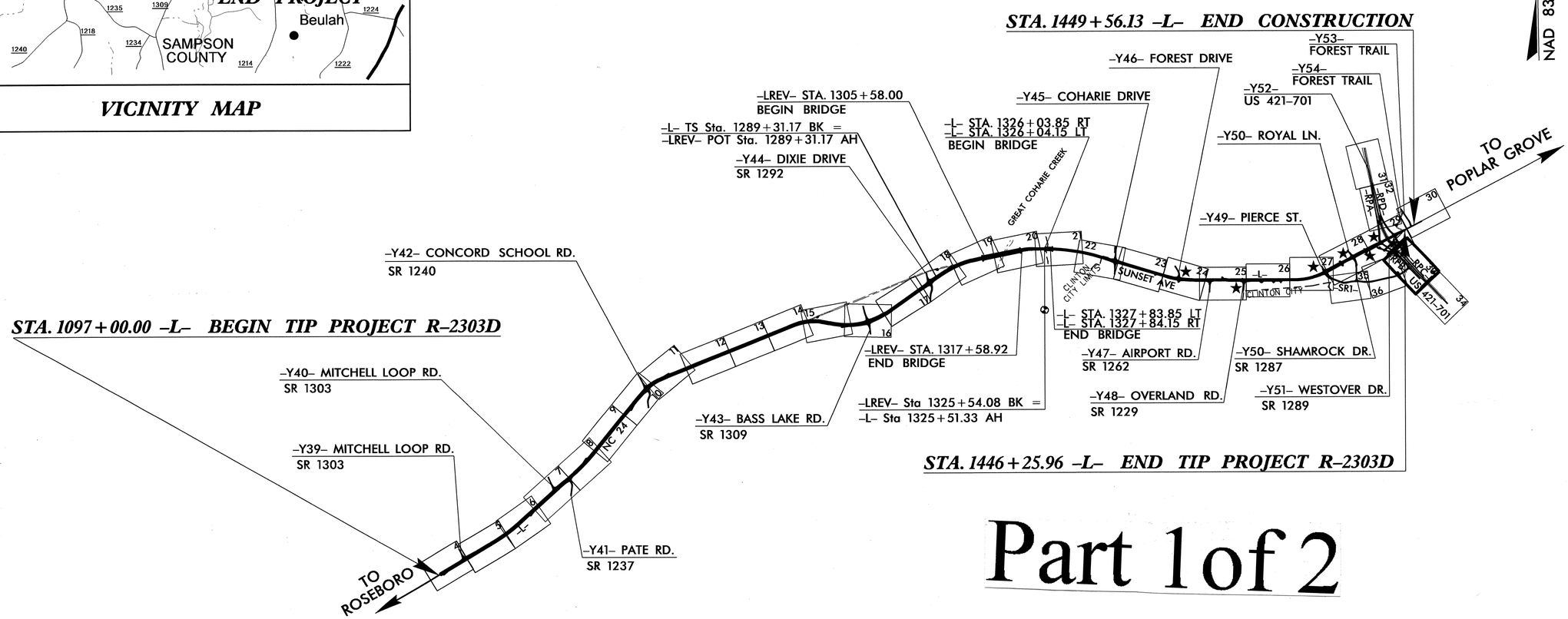
NAD 83/95



★ TRAFFIC SIGNAL

Part 1 of 2

GRAPHIC SCALES

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

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ADT 2013 = 20240
ADT 2033 = 41840
DHV = 11 %
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Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 30, 2011

LETTING DATE: SEPTEMBER 17, 2013

G. E. BREW, PE
PROJECT ENGINEER

WAYNE BEST
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL
SIGNATURE: W. Galen Cail 7/19/13

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW P.E.
7-3-13
SIGNATURE: Gregory E. Brew

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

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$$$USERNAME$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18906 ENGINEER GREGORY E. BREW

7-18-13

Index of Sheets

1	Title Sheet
1–A	Index of Sheets, General Notes, and List of Standards
1–B	Conventional Symbols
1–C thru 1–G	Survey Control Sheets
2 thru 2–F	Pavement Schedule, Typical Sections, and Miscellaneous Details
2–G	Drainage Ditch Details
2–H thru 2–M	Intersection Detail Sheets
2–N	Detail Showing Method for Placement of Drop Inlets in Concrete Islands
2–O	Detail for Curb Ramps
2–P	Detail of Temporary 1" Steel Cover over Drainage Structures
2–Q	Detail of Special Junction Box with Slab Lid
2–R	Detail of Modified Concrete Flume
2–S	Detail for Special Concrete Catch Basin
2–T	Detail for Traffic Bearing Junction Box
2–U	Detail for Drainage Structure
2–V	Detail for Special Drop Inlet Double 42" RCP–IV
2–W	Detail for Concrete Catch Basin
2–X	Detail for GRAU Type B–77 for F–shape Barrier
2–Y	Detail for Standard Rock Plating
2–Z	Detail for Rock Embankments
2–AA	Embankment Settlement Gauge Detail
2–AB	Temporary Shoring
2–AC	Detail for Ground Improvements at Bridge 51 Endbents
2–AD thru 2–AF	Detail for Standard Temporary Wall
2–AG	Special Catch Basin
2–AH	Detail for Temporary Containment of Cantaminated Soil
3 (3 SHEETS)	Summary of Quantities
3–A thru 3–W	Summary of Drainage Quantities
3–X	Guardrail Summary Sheet
3–Y	Summary of Subsurface Drainage, Summary of Bridge Waiting Periods, Summary of Settlement Guages, Summary of Rock Plating, And Summary of Woven Wire Fence
3–Z	Summary of Existing Ashpalt Removal, Summary of Existing Concrete Pavement Removal, Summary of Existing Concrete Pavement Breaking
3–AA thru 3–AB	Earthwork Summary Sheet
3–AC thru 3–AD	Index of Parcels Sheet
4 thru 36	Plan Sheets
37 thru 65	Profile Sheets
TMP–1 thru TMP–139	Transportation Management Plans
PMP–1 thru PMP–17	Pavement Marking Plans
EC–1 thru EC–72	Erosion Control Plans
RF–1 thru RF–3	Reforestation Plans
SIGN–1 thru SIGN–19	Signing Plans
SIG–1 thru SIG–67	Signal Plans
UC–1 thru UC–83	Utility Construction Plans
UO–1 thru UO–34	Utilities By Others
X–1A thru X–1J	Cross–Section Summary Sheets
X–1 thru X–222	Cross–Sections
S–1 thru S–218	Structure Plans
C–1 thru C–14	Culvert Plans
W–1 thru W–8	Retaining Wall Plans

GENERAL NOTES:

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND 225.05 SHOWN ON THE PLANS SUPERELEVATION IS TO BE REVOLVED ABOUT THE GREADE 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 AND STD. NO. 560.02

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:

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

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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: STARVISION CABLE, STAR TELEPHONE, SAMPSON COUNTY PUBLIC WORKS, AND CITY OF CLINTON PUBLIC WORKS, AND PIEDMONT NATURAL GAS COMPANY.

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.

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

EFF. 01–17–2012

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 – EARTHWORK	
200.03	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
DIVISION 3 – PIPE CULVERTS	
300.01	Method of Pipe Installation
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 Caurve – Method II
DIVISION 6 – ASPHALT BASES AND PAVEMENTS	
610.01	Guide for Paving Shoulders Under Bridges – Method I
610.02	Guide for Paving Shoulders Under Bridges – Method II
654.01	Pavement Repairs
DIVISION 8 – INCIDENTALS	
806.03	Concrete Contol of Access Marker
815.02	Subsurface Drain
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
838.27	Reinforced Concrete Endwall – for Single 60" Pipe 90 Skew
838.33	Reinforced Concrete Endwall – for Single 66" Pipe 90 Skew
838.39	Reinforced Concrete Endwall – for Single 72" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall – Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall – for Single 54" Pipe 90 Skew
838.57	Reinforced Brick Endwall – for Single 60" Pipe 90 Skew
838.63	Reinforced Brick Endwall – for Single 66" Pipe 90 Skew
838.69	Reinforced Brick Endwall – for Single 72" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall – Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls – 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	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
840.19	Concrete Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames – Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' – 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box – 12" thru 66" Pipe
840.32	Brick Junction Box – 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box – for Use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout – Radius Type
848.04	Street Turnout
848.05	Curb Ramp – Proposed Curb & Gutter
850.01	Concrete Paved Ditches
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median – Using 1'–6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
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

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	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
- 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:

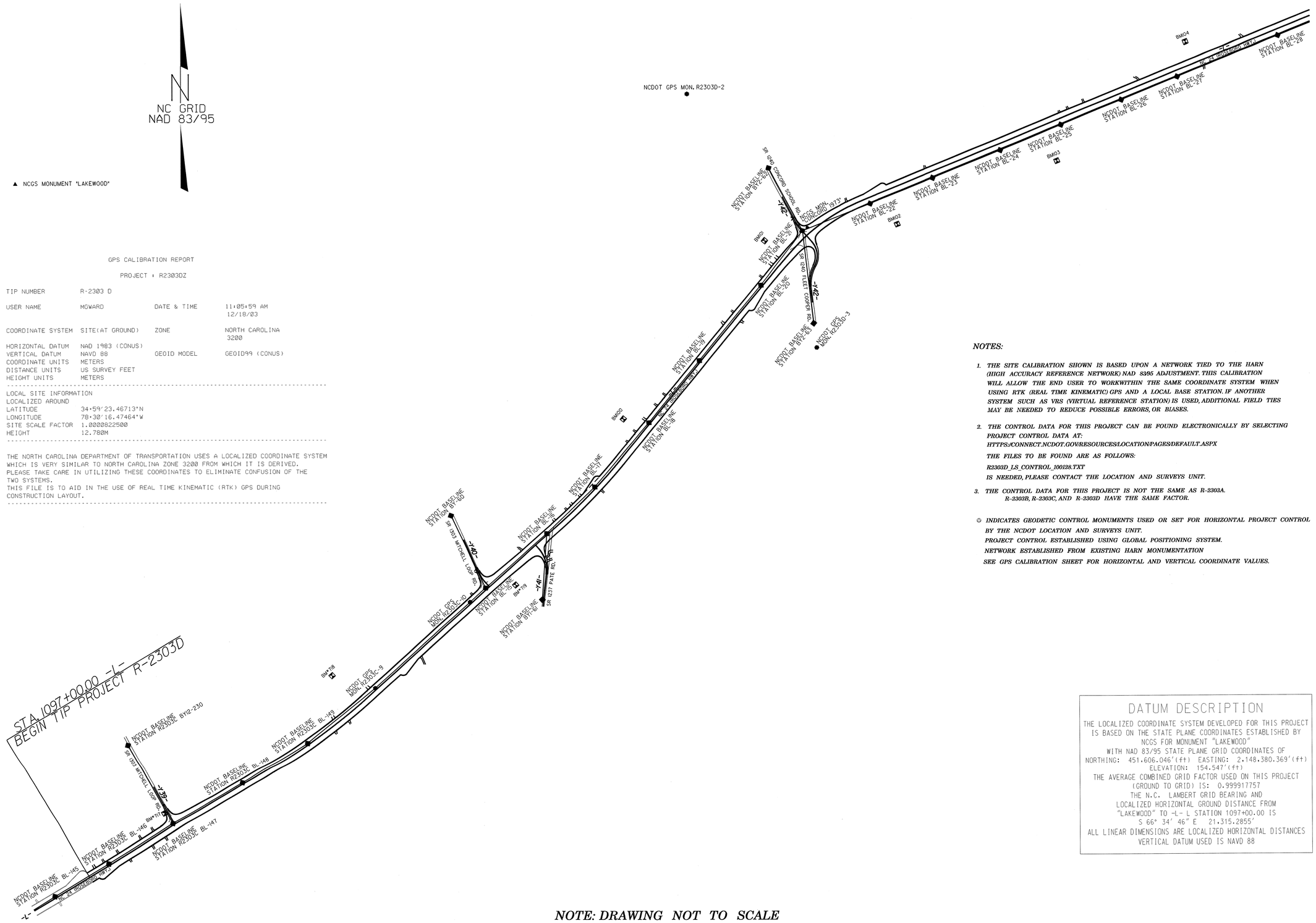
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According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

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2303-D	1C

Location and Surveys

SURVEY CONTROL SHEET R-2303D



GPS CALIBRATION REPORT

PROJECT : R2303DZ

TIP NUMBER	R-2303 D		
USER NAME	MGWARD	DATE & TIME	11:05:59 AM 12/18/03
COORDINATE SYSTEM	SITE(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM	NAVD 88	GEOID MODEL	GEOID99 (CONUS)
COORDINATE UNITS	METERS		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	METERS		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	34°59'23.46713"N
LONGITUDE	78°30'16.47464"W
SITE SCALE FACTOR	1.0000822500
HEIGHT	12.780M

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.

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:*
   HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/PAGES/DEFAULT.ASPX
   THE FILES TO BE FOUND ARE AS FOLLOWS:
   R2303D_LS_CONTROL_100128.TXT
   IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

3. *THE CONTROL DATA FOR THIS PROJECT IS NOT THE SAME AS R-2303A. R-2303B, R-2303C, AND R-2303D HAVE THE SAME FACTOR.*

◎ *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.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "LAKEWOOD"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 451,606.046'(ft) EASTING: 2,148,380.369'(ft)
ELEVATION: 154.547'(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999917757
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"LAKEWOOD" TO -L- L STATION 1097+00.00 IS
S 66° 34' 46" E 21,315.2855'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2303-D	1D
Location and Surveys	

SURVEY CONTROL SHEET R-2303D

GPS CALIBRATION REPORT

PROJECT : R2303DZ

TIP NUMBER	R-2303 D		
USER NAME	MGWARD	DATE & TIME	11:05:59 AM 12/18/03
COORDINATE SYSTEM	SITE(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM	NAVD 88	GEOID MODEL	GEOID99 (CONUS)
COORDINATE UNITS	METERS		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	METERS		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	34°59'23.46713"N
LONGITUDE	78°30'16.47464"W
SITE SCALE FACTOR	1.0000822500
HEIGHT	12.780M

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.

N
NC GRID
NAD 83/95

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.*
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   THE FILES TO BE FOUND ARE AS FOLLOWS:
   R2303D_LS_CONTROL_100128.TXT
   IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
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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
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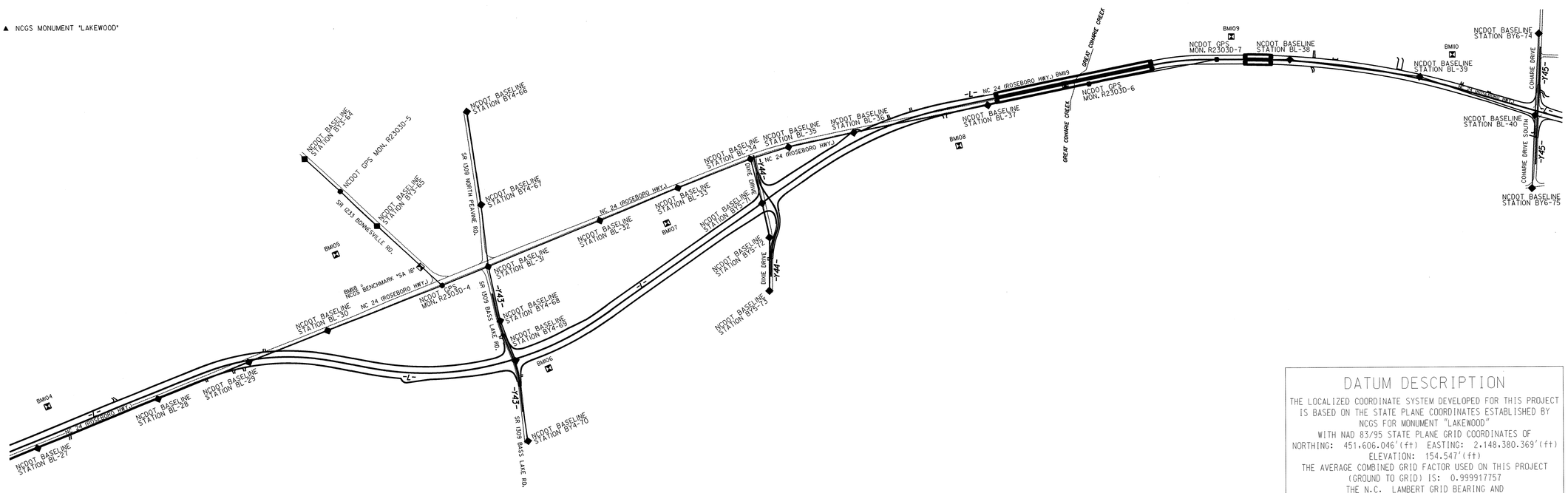
▲ NCGS MONUMENT "LAKEWOOD"



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PROJECT REFERENCE NO.	SHEET NO.
R-2303-D	1E
Location and Surveys	

SURVEY CONTROL SHEET R-2303D

GPS CALIBRATION REPORT

PROJECT : R2303DZ

TIP NUMBER	R-2303 D		
USER NAME	MGWARD	DATE & TIME	11:05:59 AM 12/18/03
COORDINATE SYSTEM	SITE(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM	NAVD 88	GEOID MODEL	GEOID99 (CONUS)
COORDINATE UNITS	METERS		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	METERS		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	34°59'23.46713"N
LONGITUDE	78°30'16.47464"W
SITE SCALE FACTOR	1.0000822500
HEIGHT	12.780M

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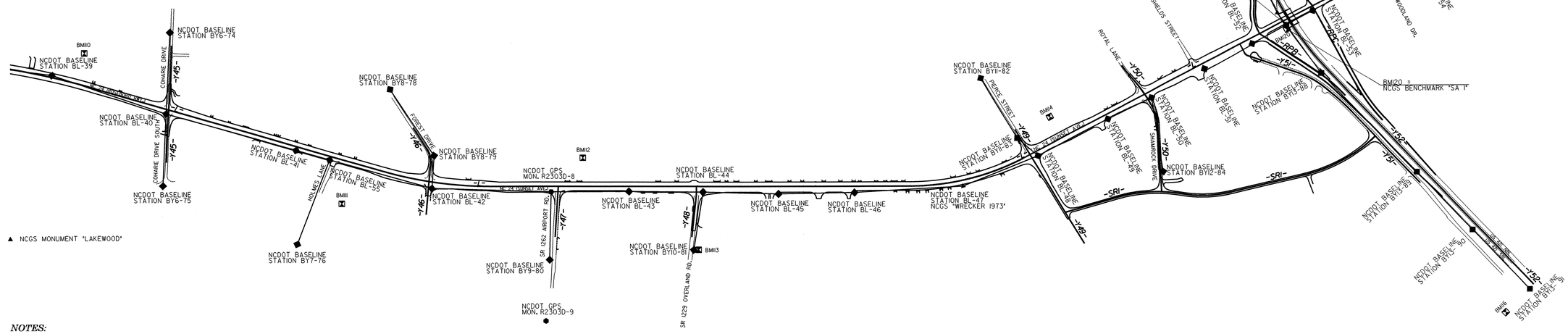

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NOTE: DRAWING NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2303-D	1F
Location and Surveys	

SURVEY CONTROL SHEET R2303D

GPS CALIBRATION REPORT

PROJECT : R2303DZ

TIP NUMBER	R-2303 D		
USER NAME	MGWARD	DATE & TIME	11:05:59 AM 12/18/03
COORDINATE SYSTEM	SITE(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM	NAVD 88	GEOID MODEL	GEOID99 (CONUS)
COORDINATE UNITS	METERS		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	METERS		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	34°59'23.46713"N
LONGITUDE	78°30'16.47464"W
SITE SCALE FACTOR	1.0000822500
HEIGHT	12.780M

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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	137477.931M
EASTING COORDINATE OF ROTATION CENTER	667448.836M
ROTATION ABOUT THE CENTER POINT	0°00'00"
TRANSLATION NORTH	0.008M
TRANSLATION EAST	0.005M
SCALE FACTOR	1.00000018

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	135602.640M
EASTING COORDINATE OF ORIGIN POINT	661596.847M
VERTICAL SEPARATION AT ORIGIN	-0.040M
SLOPE NORTH	3.955PPM
SLOPE EAST	-0.140PPM

GEOID MODEL DEFINITION

GEOID99 (CONUS)

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.03SFT	0.004	R2303C-9 GPS
VERTICAL	0.07SFT	0.009	R2303D-8 GPS
THREE-DIMENSIONAL	0.07SFT	0.009	R2303D-8 GPS

POINT RESIDUALS

WGS84 COORDINATES	CALCULATED POINT FOR DISPLAY ONLY	LOCAL COORDINATES
POINT LAKEWOOD GPS LATITUDE 34°59'23.46713"N LONGITUDE 78°30'16.47464"W HEIGHT 12.776M	NORTHING 137649.804M EASTING 654827.648M ELEVATION 47.075M HORZ ERROR 0.02SFT VERT ERROR ? 3D ERROR 0.02SFT	POINT LAKEWOOD NORTHING 137649.798M EASTING 654827.646M ELEVATION 47.106M UTILIZED HORIZONTAL CONTROL QUALITY QUALITY
POINT R2303C-9 GPS LATITUDE 34°58'15.85734"N LONGITUDE 78°25'50.01865"W HEIGHT 11.626M	NORTHING 135602.640M EASTING 661596.847M ELEVATION 46.066M HORZ ERROR 0.03SFT VERT ERROR 0.01SFT 3D ERROR 0.03SFT	POINT R2303C-9 NORTHING 135602.638M EASTING 661596.839M ELEVATION 46.068M UTILIZED HORZ AND VERT QUALITY CONTROL QUALITY
POINT R2303C-10 GPS LATITUDE 34°58'23.63403"N LONGITUDE 78°25'39.37939"W HEIGHT 13.486M	NORTHING 135843.832M EASTING 661865.335M ELEVATION 47.929M HORZ ERROR 0.01SFT VERT ERROR 0.01SFT 3D ERROR 0.01SFT	POINT R2303C-10 NORTHING 135843.834M EASTING 661865.334M ELEVATION 47.927M UTILIZED HORZ AND VERT QUALITY CONTROL QUALITY
POINT R2303D-2 GPS LATITUDE 34°59'10.14006"N LONGITUDE 78°25'14.71455"W HEIGHT 13.938M	NORTHING 137280.552M EASTING 662482.592M ELEVATION 48.382M HORZ ERROR 0.01SFT VERT ERROR 0.01SFT 3D ERROR 0.02SFT	POINT R2303D-2 NORTHING 137280.550M EASTING 662482.588M ELEVATION 48.385M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT CONCORD GPS LATITUDE 34°58'57.85499"N LONGITUDE 78°25'01.46880"W HEIGHT 15.851M	NORTHING 136903.952M EASTING 662820.737M ELEVATION 50.325M HORZ ERROR 0.01SFT VERT ERROR 0.05SFT 3D ERROR 0.05SFT	POINT CONCORD NORTHING 136903.952M EASTING 662820.736M ELEVATION 50.291M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT R2303D-3 GPS LATITUDE 34°58'46.72873"N LONGITUDE 78°25'00.52801"W HEIGHT 13.720M	NORTHING 136561.234M EASTING 662846.612M ELEVATION 48.178M HORZ ERROR 0.00SFT VERT ERROR ? 3D ERROR 0.00SFT	POINT R2303D-3 NORTHING 136561.236M EASTING 662846.611M ELEVATION 48.148M UTILIZED HORIZONTAL ADJUSTED QUALITY QUALITY
POINT R2303D-5 GPS LATITUDE 34°59'30.86341"N LONGITUDE 78°23'51.74739"W HEIGHT 16.436M	NORTHING 137931.667M EASTING 664582.829M ELEVATION 50.921M HORZ ERROR 0.00SFT VERT ERROR 0.01SFT 3D ERROR 0.01SFT	POINT R2303D-5 NORTHING 137931.666M EASTING 664582.828M ELEVATION 50.917M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT R2303D-4 GPS LATITUDE 34°59'23.61004"N LONGITUDE 78°23'42.34675"W HEIGHT 15.783M	NORTHING 137709.603M EASTING 664822.581M ELEVATION 50.275M HORZ ERROR 0.00SFT VERT ERROR 0.01SFT 3D ERROR 0.01SFT	POINT R2303D-4 NORTHING 137709.603M EASTING 664822.581M ELEVATION 50.277M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT R2303D-6 GPS LATITUDE 34°59'38.64405"N LONGITUDE 78°22'41.96491"W HEIGHT -5.922M	NORTHING 138182.338M EASTING 666350.938M ELEVATION 28.601M HORZ ERROR 0.00SFT VERT ERROR 0.04SFT 3D ERROR 0.04SFT	POINT R2303D-6 NORTHING 138182.338M EASTING 666350.939M ELEVATION 28.588M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT R2303D-7 GPS LATITUDE 34°59'40.44157"N LONGITUDE 78°22'30.03749"W HEIGHT -5.780M	NORTHING 138239.628M EASTING 666653.048M ELEVATION 28.749M HORZ ERROR 0.01SFT VERT ERROR 0.02SFT 3D ERROR 0.02SFT	POINT R2303D-7 NORTHING 138239.629M EASTING 666653.051M ELEVATION 28.755M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT R2303D-8 GPS LATITUDE 34°59'29.59788"N LONGITUDE 78°21'24.32628"W HEIGHT 13.905M	NORTHING 137916.123M EASTING 668321.525M ELEVATION 48.481M HORZ ERROR 0.01SFT VERT ERROR 0.07SFT 3D ERROR 0.07SFT	POINT R2303D-8 NORTHING 137916.124M EASTING 668321.527M ELEVATION 48.503M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT R2303D-9 GPS LATITUDE 34°59'19.59261"N LONGITUDE 78°21'24.92206"W HEIGHT 13.720M	NORTHING 137607.712M EASTING 668308.414M ELEVATION 48.301M HORZ ERROR 0.01SFT VERT ERROR 0.03SFT 3D ERROR 0.03SFT	POINT R2303D-9 NORTHING 137607.714M EASTING 668308.416M ELEVATION 48.309M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT CLINTPORT GPS LATITUDE 34°58'34.57345"N LONGITUDE 78°21'46.96830"W HEIGHT 8.953M	NORTHING 136216.840M EASTING 667758.225M ELEVATION 43.543M HORZ ERROR 0.02SFT VERT ERROR 0.00SFT 3D ERROR 0.02SFT	POINT CLINTPORT NORTHING 136216.844M EASTING 667758.229M ELEVATION 43.543M UTILIZED HORZ AND VERT QUALITY CONTROL QUALITY
POINT R2303D-10 GPS LATITUDE 34°59'53.22216"N LONGITUDE 78°20'18.38245"W HEIGHT 8.253M	NORTHING 138655.097M EASTING 669988.943M ELEVATION 42.861M HORZ ERROR 0.01SFT VERT ERROR ? 3D ERROR 0.01SFT	POINT R2303D-10 NORTHING 138655.096M EASTING 669988.945M ELEVATION 42.914M UTILIZED HORIZONTAL ADJUSTED QUALITY QUALITY
POINT SUN SET GPS LATITUDE 34°59'42.97107"N LONGITUDE 78°20'15.89601"W HEIGHT 15.999M	NORTHING 138339.629M EASTING 670054.099M ELEVATION 50.614M HORZ ERROR 0.01SFT VERT ERROR 0.03SFT 3D ERROR 0.03SFT	POINT SUN SET NORTHING 138339.630M EASTING 670054.101M ELEVATION 50.604M UTILIZED HORZ AND VERT QUALITY ADJUSTED QUALITY
POINT ELIZABETH GPS LATITUDE 34°59'13.55584"N LONGITUDE 78°19'42.82848"W HEIGHT 16.210M	NORTHING 137438.832M EASTING 670898.750M ELEVATION 50.864M HORZ ERROR 0.02SFT VERT ERROR 0.01SFT 3D ERROR 0.02SFT	POINT ELIZABETH NORTHING 137438.836M EASTING 670898.755M ELEVATION 50.867M UTILIZED HORZ AND VERT QUALITY CONTROL QUALITY
POINT KENANPORT GPS LATITUDE 34°59'56.98256"N LONGITUDE 77°58'58.10727"W HEIGHT 4.666M	NORTHING 139045.474M EASTING 702451.171M ELEVATION 40.280M HORZ ERROR 0.02SFT VERT ERROR 0.01SFT 3D ERROR 0.02SFT	POINT KENANPORT NORTHING 139045.472M EASTING 702451.167M ELEVATION 40.278M UTILIZED HORZ AND VERT QUALITY CONTROL QUALITY

NOTES:

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PROJECT REFERENCE NO.	SHEET NO.
R-2303-D	1G
Location and Surveys	

SURVEY CONTROL SHEET R2303D

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
145	(R2303C) BL-145	442958.9145	2167616.3083	132.86	1093+32.89	15.65 LT
146	(R2303C) BL-146	443257.6064	2168115.6657	146.57	1099+14.76	16.09 LT
147	(R2303C) BL-147	443610.9612	2168709.9855	131.46	1106+06.19	14.78 LT
148	(R2303C) BL-148	443994.8859	2169354.3462	141.53	1113+56.25	14.07 LT
149	(R2303C) BL-149	444376.8702	2169959.5221	146.87	1120+73.24	14.69 LT
C9	R2303C-9	444889.6540	2170588.9620	151.14	1128+87.44	15.52 LT
C10	R2303C-10	445680.9800	2171469.8490	157.24	1140+71.57	16.27 LT
BL15	BL-15	445810.9220	2171613.8180	159.56	1142+65.50	16.84 LT
BL16	BL-16	446313.2880	2172182.4690	168.55	1150+24.25	11.02 LT
BL17	BL-17	446750.3330	2172628.9020	167.76	1156+50.42	13.89 LT
BL18	BL-18	447344.4490	2173131.2400	162.33	1164+29.41	13.92 LT
BL19	BL-19	447916.1730	2173600.7110	161.06	1171+69.19	14.70 LT
BL20	BL-20	448615.6720	2174173.3840	163.38	1180+73.20	16.99 LT
BL21	BL-21	449123.6750	2174561.0230	164.70	1187+04.32	59.58 LT
BL22	BL-22	449377.6200	2175189.0420	158.57	1193+73.46	55.55 RT
BL23	BL-23	449613.3970	2175768.3500	145.87	1199+99.32	55.82 RT
BL24	BL-24	449866.2250	2176395.2040	152.85	1206+75.24	58.03 RT
BL25	BL-25	450097.9180	2176958.5790	153.88	1212+84.39	55.87 RT
BL26	BL-26	450325.4330	2177518.3380	140.35	1218+88.62	56.22 RT
BL27	BL-27	450537.4610	2178037.2140	129.75	1224+49.14	55.50 RT
BL28	BL-28	450915.4140	2178969.9500	156.26	1234+55.55	57.15 RT
BL29	BL-29	451201.2710	2179673.1940	160.35	1242+20.73	14.21 RT
BL30	BL-30	451451.4060	2180284.2380	160.43	1248+03.13	231.77 LT
D4	R2303D-4	451802.2540	2181172.0830	164.95	1257+88.17	681.16 LT
BL31	BL-31	451948.0320	2181529.5790	164.51	1263+38.55	753.81 LT
BL32	BL-32	452307.5410	2182395.2020	127.58	1274+84.18	617.44 LT
BL33	BL-33	452555.8860	2183000.6460	108.47	1281+21.89	470.60 LT
BL34	BL-34	452782.4070	2183562.9120	94.86	1287+11.75	330.88 LT
BL35	BL-35	452874.4020	2183858.2870	93.03	1290+04.94	235.55 LT
BL36	BL-36	452982.0690	2184364.0190	93.36	1294+73.00	65.52 LT
BL37	BL-37	453193.5240	2185402.8920	92.89	1305+25.14	41.34 RT
D6	R2303D-6	453353.2200	2186186.3710	93.79	1313+24.73	41.95 RT
D7	R2303D-7	453541.1810	2187177.5500	94.34	1323+37.62	2.33 LT
BL38	BL-38	453537.4020	2187743.7310	96.68	1329+03.47	9.16 LT
BL39	BL-39	453398.9710	2188749.0480	126.31	1339+17.33	16.08 LT
BL40	BL-40	453096.2540	2189640.9350	150.84	1348+57.50	35.44 RT
BL41	BL-41	452809.2280	2190656.8260	161.69	1359+13.14	28.83 RT
BL55	BL-55	452734.7203	2190919.3032	163.91	1361+85.98	27.45 RT
BL42	BL-42	452507.8140	2191718.6540	161.45	1370+11.52	49.51 RT
D8	R2303D-8	452479.8170	2192651.5430	159.09	1379+38.71	43.61 RT
BL43	BL-43	452483.6320	2193259.9840	158.53	1385+47.15	39.38 RT
BL44	BL-44	452478.6880	2193839.0860	155.63	1391+26.26	43.92 RT
BL45	BL-45	452464.0820	2194429.4510	154.87	1397+16.63	58.12 RT
BL46	BL-46	452474.0630	2195023.6500	154.01	1403+10.82	47.73 RT
BL47	BL-47	452520.1980	2195874.0070	154.76	1411+54.34	46.76 RT
BL48	BL-48	452759.2760	2196460.6970	158.09	1417+78.79	37.26 RT
BL49	BL-49	453044.9510	2197007.8180	164.80	1423+96.00	36.90 RT
BL50	BL-50	453209.8690	2197349.7530	163.28	1427+75.45	48.75 RT
BL51	BL-51	453433.0750	2197764.3480	160.01	1432+46.27	42.51 RT
BL52	BL-52	453628.2560	2198138.5230	151.87	1436+68.29	42.43 RT
BL56	NOT SET	453773.6130	2198405.1047	UNKNOWN	1439+71.87	36.79 RT
BL53	BL-53	453886.3490	2198611.8600	141.26	1442+07.32	32.42 RT
BL54	BL-54	454326.1910	2199450.0260	129.29	1451+53.87	29.90 RT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y40 STATION	OFFSET
BY60	BY-60	446482.7280	2171295.8110	164.55	OUTSIDE PROJECT LIMITS	
BY15	BL-15	445810.9220	2171613.8180	159.60	14+83.16	34.50 RT

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y41 STATION	OFFSET
BY16	BL-16	446313.2880	2172182.4690	168.58	OUTSIDE PROJECT LIMITS	
BY61	BY1-61	445704.2040	2172138.5670	157.77	15+33.88	14.42 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y42 STATION	OFFSET
BY62	BY2-62	449709.6440	2174248.9250	160.20	OUTSIDE PROJECT LIMITS	
BY21	BL-21	449123.6750	2174561.0230	164.70	13+72.42	4.46 LT
BY63	BY2-63	448259.3940	2174662.3840	159.05	OUTSIDE PROJECT LIMITS	

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BY64	BY3-64	452786.4540	2180110.8900	166.35	1246+03.02	1546.92 LT
D5	R2303D-5	452530.8070	2180385.4930	167.05	1247+68.56	1314.91 LT
BY65	BY3-65	452265.0700	2180668.6920	167.63	1250+11.33	1100.53 LT
BY4	R2303D-4	451802.2540	2181172.0830	164.95	1257+88.17	681.16 LT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y43 STATION	OFFSET
BY66	BY4-66	453153.0590	2181369.1050	149.06	OUTSIDE PROJECT LIMITS	
BY67	BY4-67	452429.0860	2181476.8170	160.45	OUTSIDE PROJECT LIMITS	
BY31	BL-31	451948.0320	2181529.5790	164.51	OUTSIDE PROJECT LIMITS	
BY68	BY4-68	451527.2180	2181622.3100	153.72	12+20.08	14.39 LT
BY69	BY4-69	451211.4210	2181739.9030	150.73	15+58.17	13.95 LT
BY70	BY4-70	450585.2340	2181832.7410	145.27	OUTSIDE PROJECT LIMITS	

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y44 STATION	OFFSET
BY34	BL-34	452782.4070	2183562.9120	94.86	10+23.38	28.79 RT
BY71	BY5-71	452438.0030	2183651.5890	95.12	13+60.84	64.72 RT
BY72	BY5-72	452172.8930	2183707.4210	93.88	16+96.47	39.75 RT
BY73	BY5-73	451757.2510	2183705.8140	96.04	OUTSIDE PROJECT LIMITS	

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	Y45 STATION	OFFSET
BY74	BY6-74	453732.9880	2189672.6050	149.38	OUTSIDE PROJECT LIMITS	
BY40	BL-40	453096.2540	2189640.9350	150.84	15+35.07	19.25 RT
BY75	BY6-75	452527.9170	2189615.2230	157.33	OUTSIDE PROJECT LIMITS	

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BY55	BL-55	452734.7203	2190919.3032	163.91	1361+85.98	27.45 RT
BY76	BY7-76	452067.3945	2190663.7336	156.31	1361+25.95	739.51 RT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	Y46 STATION	OFFSET
BY78	BY8-78	453286.2920	2191393.6360	164.18	OUTSIDE PROJECT LIMITS	
BY79	BY8-79	452768.4610	2191735.5480	158.59	12+60.39	33.46 LT
BY42	BL-42	452507.8140	2191718.6540	161.44	15+12.02	27.95 LT

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	Y47 STATION	OFFSET
BY8	R2303D-8	452479.8170	2192651.5430	159.09	10+47.07	52.54 RT
BY80	BY9-80	451946.5980	2192638.5370	158.16	OUTSIDE PROJECT LIMITS	

BY10

POINT	DESC.	NORTH	EAST	ELEVATION	Y48 STATION	OFFSET
BY44	BL-44	452478.6880	2193839.0860	155.63	10+44.00	51.84 LT
BY81	BY10-81	452023.0340	2193765.4980	159.17	OUTSIDE PROJECT LIMITS	

BY11

POINT	DESC.	NORTH	EAST	ELEVATION	Y49 STATION	OFFSET
BY82	BY11-82	453365.9370	2196013.9860	156.68	OUTSIDE PROJECT LIMITS	
BY83	BY11-83	452897.7270	2196298.3990	156.94	10+67.17	19.26 RT
BY48	BL-48	452759.2760	2196460.6970	158.09	12+69.44	49.53 LT

BY12

POINT	DESC.	NORTH	EAST	ELEVATION	Y50 STATION	OFFSET
BY50	BL-50	453209.8690	2197349.7530	163.28	13+39.07	30.95 LT
BY84	BY12-84	452630.7590	2197439.0130	172.75	19+20.65	20.26 LT

BY13

POINT	DESC.	NORTH	EAST	ELEVATION	Y52 STATION	OFFSET
BY85	BY13-85	455910.3930	2197791.4610	118.72	11+59.10	47.09 RT
BY86	BY13-86	455332.6030	2197913.8270	130.37	17+49.70	49.27 RT
BY87	BY13-87	454390.8070	2198084.7160	151.83	27+01.78	85.03 RT
SUNSET1	SUNSET	453869.2680	2198335.8310	166.02	32+64.42	50.66 RT
BY56	(NOT SET) BL-56	453773.6130	2198405.1047	UNKNOWN	33+79.78	40.15 RT
BY88	BY13-88	453397.4600	2198677.5160	165.26	38+35.75	56.24 RT
BY89	BY13-89	452620.7520	2199423.7600	155.08	49+12.29	49.33 RT
BY90	BY13-90	452162.7910	2199858.6330	149.75	55+43.83	49.15 RT
BY91	BY13-91	451693.8640	2200306.3070	144.01	OUTSIDE PROJECT LIMITS	

BENCHMARKS

717 ELEVATION - 137.10
N 443710 E 2168632
L STATION 1105+91.00 140 LEFT
RR SPIKE SET AT THE BASE OF A 20"OAK

718 ELEVATION - 149.47
N 445008 E 2170189
L STATION 1126+63.00 370 LEFT
RR SPIKE SET AT THE BASE OF A 15"GUM

719 ELEVATION - 162.27
N 445840 E 2171892
L STATION 1144+92.00 148 RIGHT
RR SPIKE SET AT THE BASE OF A 18"PECAN

BM100 ELEVATION - 166.36
N 447381 E 2172896
L STATION 1163+08.00 219 LEFT
RR SPIKE SET AT THE BASE OF A 16" OAK

BM101 ELEVATION - 161.52
N 449233 E 2174209
L STATION 1184+16.00 255 LEFT
RR SPIKE SE AT THE BASE OF 24" PINE

BM102 ELEVATION - 157.63
N 449184 E 2175440
L STATION 1195+33.00 330 RIGHT
RR SPIKE SET AT THE BASE OF 12" PINE

BM103 ELEVATION - 160.53
N 449768 E 2176921
L STATION 1211+25.00 347 RIGHT
RR SPIKE SET AT THE BASE OF A 40" OAK

BM104 ELEVATION - 138.08
N 450860 E 2178114
L STATION 1226+42.00 215 LEFT
RR SPIKE SET AT HTE BASE OF A 14" OAK

BM105 ELEVATION - 159.92
N 452043 E 2180349
L STATION 1247+88.00 827 LEFT
RR SPIKE SET AT THE BASE OF A 20" PINE

BENCHMARKS

BM118 ELEVATION - 165.63
N 451946 E 2181004
L STATION 1255+45.00 830 LEFT
NCGS BM " SA 18" DISK IS SET IN WEST HEADWALL OF CULVERT

BM106 ELEVATION - 148.73
N 451152 E 2181996
Y43 STATION 16+70.00 244 LEFT
RR SPIKE SET AT THE BASE OF A 10" OAK

BM107 ELEVATION - 111.85
N 452287 E 2182914
L STATION 1278+96.00 301 LEFT
RR SPIKE SET AT THE BASE OF A 15" OAK

BM108 ELEVATION - 89.29
N 452881 E 2185179
L STATION 1302+39.00 303 RIGHT
RR SPIKE SET AT THE BASE OF A 27" OAK

BM119 ELEVATION - 95.21
N 453351 E 2186001
L STATION 1311+42.00 7 RIGHT
NCGS BM "SA 17" DISK IS SET FLUSH WITH WINGWALL

BM109 ELEVATION - 95.88
N 453719 E 2187291
L STATION 1324+51.00 180 LEFT
RR SPIKE SET AT THE BASE OF A 20" PINE

BM110 ELEVATION - 120.87
N 453572 E 2189003
L STATION 1341+17.00 245 LEFT
RR SPIKE SET AT THE BASE OF A 24" MAPLE

BM111 ELEVATION - 163.65
N 452389 E 2191014
L STATION 1363+73.00 333 RIGHT
RR SPIKE SET AT THE BASE OF A 8" OAK

BENCHMARKS

BM112 ELEVATION - 162.24
N 452751 E 2192900
L STATION 1381+87.00 228 LEFT
RR SPIKE SET AT THE BASE OF A 18" PINE

BM113 ELEVATION - 161.18
N 452024 E 2193804
Y48 STATION 10+00.00
S 01°52'34.99" E DIST 498.63
RR SPIKE SET AT THE BASE OF A 30" OAK

BM114 ELEVATION - 163.40
N 453064 E 2196554
L STATION 1420+02.00 190 LEFT
RR SPIKE SET AT THE BASE OF A 18" PINE

BM120 ELEVATION - 167.80
N 453743 E 2198410
L STATION 1439+62.00 67 RIGHT
NCGS BM " SA 1" DISK IS SET IN SW WINGWALL OF SOUTHBOUND LANE BRIDGE

BM117 ELEVATION - 119.54
N 454009 E 2199333
L STATION 1449+03.00 257 RIGHT
RR SPIKE SET AT THE BASE OF A 20" OAK

BM115 ELEVATION - 109.50
N 456012 E 2197606
Y52 STATION 10+21.00 207 RIGHT
RR SPIKE SET AT THE BASE OF A 20" OAK

BM116 ELEVATION - 148.81
N 451513 E 2200117
Y52 STATION 10+00.00
S 26°52'58.84" E DIST 5115.15
RR SPIKE SET AT THE BASE OF A 10" PINE

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 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:*
   HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/PAGES/DEFAULT.ASPX
   THE FILES TO BE FOUND ARE AS FOLLOWS:
   R2303D_LS_CONTROL_100128.TXT
   IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
3. *THE CONTROL DATA FOR THIS PROJECT IS NOT THE SAME AS R-2303A. R-2303B, R-2303C, AND R-2303D HAVE THE SAME FACTOR.*

◎ 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.

GPS CALIBRATION REPORT

PROJECT : R2303DZ

TIP NUMBER	R-2303 D		
USER NAME	MGWARD	DATE & TIME	11:05:59 AM 12/18/03
COORDINATE SYSTEM	SITE(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM	NAVD 88	GEOID MODEL	GEOID99 (CONUS)
COORDINATE UNITS	METERS		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	METERS		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	34°59'23.46713"N
LONGITUDE	78°30'16.47464"W
SITE SCALE FACTOR	1.0000822500
HEIGHT	12.780M

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 DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "LAKEWOOD"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 451,606.046'(ft) EASTING: 2,148,380.369'(ft)
ELEVATION: 154.547'(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999917757
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "LAKEWOOD" TO -L- L STATION 1097+00.00 IS
S 66° 34' 46" E 21,315.2855'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

6/2/99

14-JUN-2013 15:26
R:\Roadway\Proj\r-2303d_ls_lg.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 7-9-13

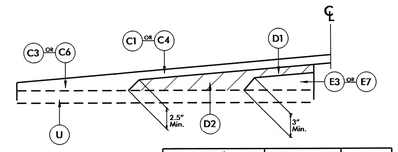
NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VIDHIN G. MUTHEY 07/09/13

PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

C1	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.	J2	PROP. VAR. DEPTH AGGREGATE BASE COURSE.
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	L1	PROP. VAR. DEPTH CLASS IV SUBGRADE STABILIZATION.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	N1	GEOTEXTILE FOR SOIL STABILIZATION
C4	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	R1	8" X 18" CONCRETE CURB
C5	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.	R2	1'-6" CONCRETE AND GUTTER
C6	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	R3	2'-0" CONCRETE CURB AND GUTTER
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	2'-6" CONCRETE CURB AND GUTTER
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R5	CONCRETE EXPRESSWAY GUTTER
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R6	CONCRETE SHOULDER BERM GUTTER
E2	PROP. APPROX. 4 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	R7	4" CONCRETE PAVED DITCH
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	S	4" CONCRETE SIDEWALK.
E4	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	T	EARTH MATERIAL.
E5	PROP. APPROX. 4 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E6	PROP. APPROX. 5 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	V1	MILLING BITUMINOUS PAVEMENT. 3" DEPTH.
E7	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V2	INCIDENTAL MILLING FOR BITUMINOUS PAVEMENT.
J1	PROP. 8" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2)

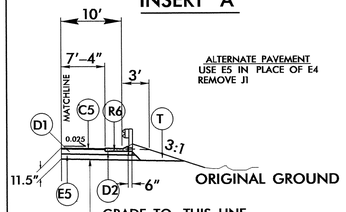
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



LINE	SURFACE C1	SURFACE C3	SURFACE C4	SURFACE C6	INTERMEDIATE D1	INTERMEDIATE D2	INTERMEDIATE –	BASE E3	BASE E7
-L- (USE WITH TYP. SECTIONS 1, 2, 3, 5, 6, 7 & 8)		X	X		X	X		X	
-Y39-, -Y40-, -Y46- & -Y47- (USE WITH TYP. SECT. 11)		X	X		X	X		X	
-Y41-, -Y42-, -Y43-, -Y44- & -Y45- (USE WITH TYP. SECT. 12)	X			X					X
-Y48-, -Y49- & -Y50- (USE WITH TYP. SECT. 13)	X			X					X
RAMPS A, B, C & D (USE WITH TYP. SECTS. 15, 16, 17 & 18)		X	X		X	X		X	
–									
–									
–									

DETAIL 1 (METHOD OF WEDGING)

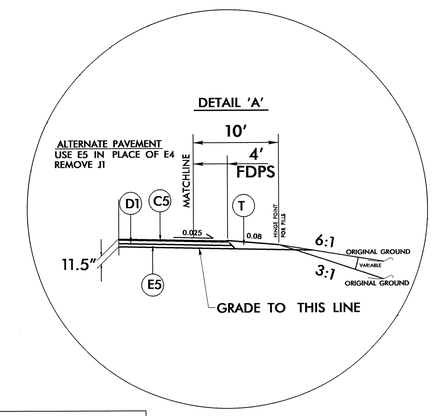
INSERT 'A'

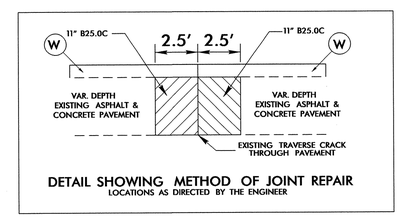


DETAIL FOR SHOULDER BERM GUTTER

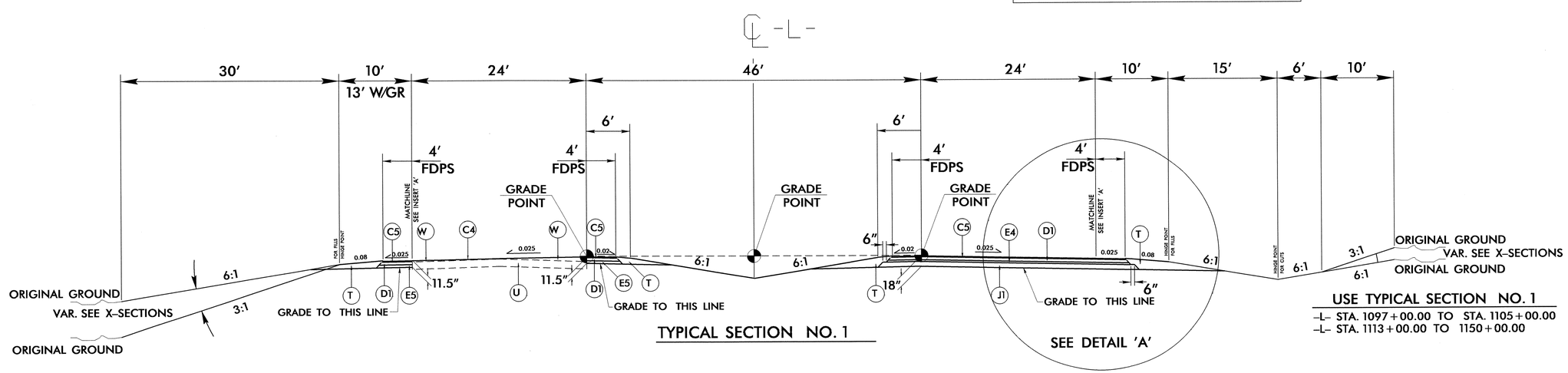
SEE PLANS FOR LOCATIONS

ALTERNATE PAVEMENT DESIGN





DETAIL SHOWING METHOD OF JOINT REPAIR
LOCATIONS AS DIRECTED BY THE ENGINEER



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

-L- STA. 1097+00.00 TO STA. 1105+00.00

-L- STA. 1113+00.00 TO 1150+00.00

6/2/99

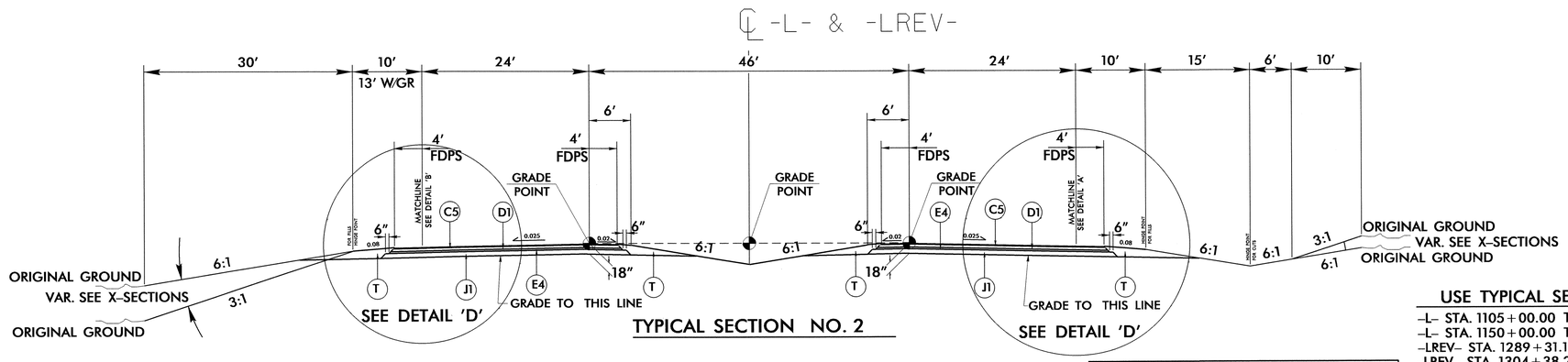
09-JUL-2013 09:13
R:\Roadway\Proj\r2303d_rdy_tdp.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 7-9-13

NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MIDCHEV 07/19/13

PAVEMENT SCHEDULE	
C5	3" S9.5C
D1	4" I19.5C
D2	VAR. I19.0C
E4	3" B25.0C
E5	4.5" B25.0C
J1	8" ABC
R2	1'-6" C&G
R4	2' -6" C&G
R6	SHLD. BM. GUTTER
R7	4" CONC DITCH
T	EARTH MATERIAL

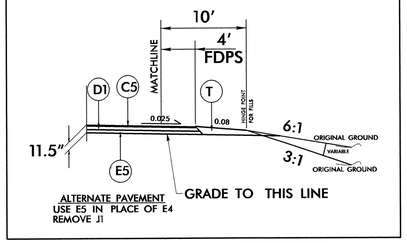


TYPICAL SECTION NO. 2

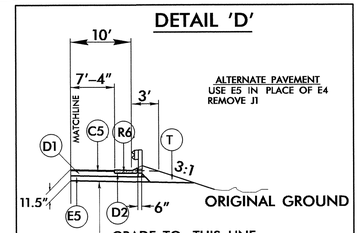
USE TYPICAL SECTION NO. 2

-L- STA. 1105+00.00 TO STA. 1113+00.00
-L- STA. 1150+00.00 TO STA. 1289+31.17 L.B.
-LREV- STA. 1289+31.17 L.A. TO STA. 1304+38.25
-LREV- STA. 1304+38.25 TO STA. 1305+58.00 (BEG. BRIDGE)
-LREV- STA. 1317+58.00 (END BRIDGE) TO STA. 1318+50.72
-LREV- STA. 1318+50.72 TO STA. 1325+01.20, TRANSITION FROM TYP. SECT NO. 2 TO NO. 3

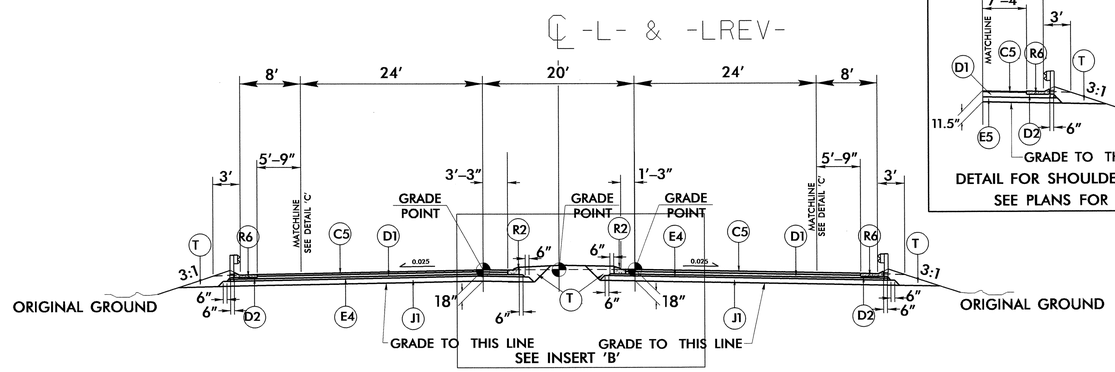
DETAIL 'A'



DETAIL 'D'



DETAIL FOR SHOULDER BERM GUTTER
SEE PLANS FOR LOCATIONS

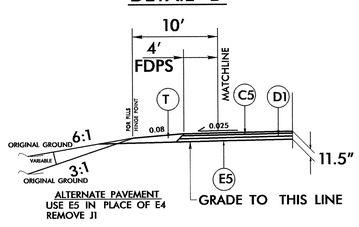


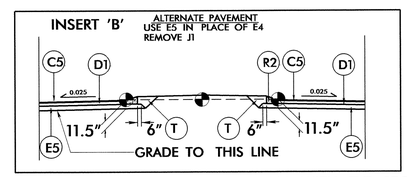
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-LREV- STA. 1325+01.20 TO STA. 1325+54.08 L.B.
-L-LT. STA. 1325+51.33 L.A. TO STA. 1326+03.85 (BEG. BRIDGE)
-L-RT. STA. 1325+51.33 L.A. TO STA. 1326+04.15 (BEG. BRIDGE)
-L-LT. STA. 1327+83.85 (END BRIDGE) TO STA. 1329+58.00
-L-RT. STA. 1327+84.15 (END BRIDGE) TO STA. 1329+59.15

DETAIL 'B'

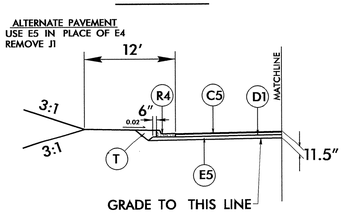


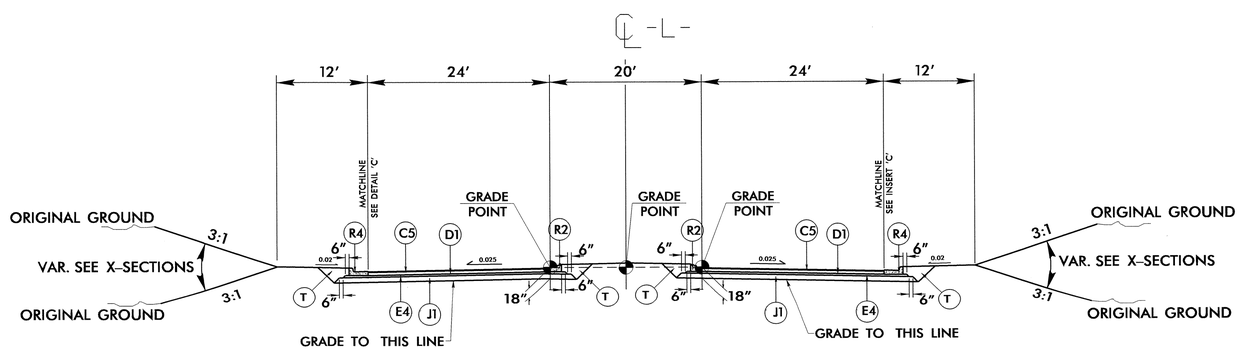


USE INSERT 'B' IN CONJUNCTION WITH TYP. SECT. NO. 3

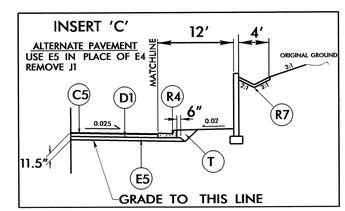
-LREV- STA. 1323+74.58 TO 1325+54.08 B.K.
-L- STA. 1325+51.33 A.H. TO 1325+79.64

DETAIL 'C'





TYPICAL SECTION NO. 4



USE INSERT 'C' IN CONJUNCTION WITH TYP. SECT. NO. 4

-L- STA. 1331+20.00 TO 1340+70.00

USE TYPICAL SECTION NO. 4

-L- STA. 1329+57.23 TO 1330+58.20, TRANSTION FROM TYP. SECT. NO. 3 TO 4
-L- STA. 1328+59.15 TO 1330+58.20, TRANSTION FROM TYP. SECT. NO. 3 TO 4
-L- STA. 1330+58.20 TO 1332+00.00

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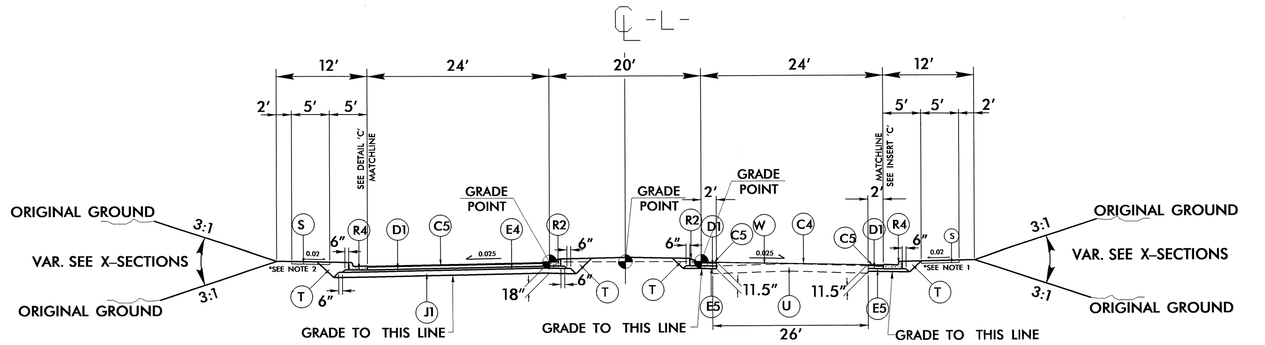
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18906 ENGINEER GREGORY E. BREW 7-18-13

NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV 07/19/13

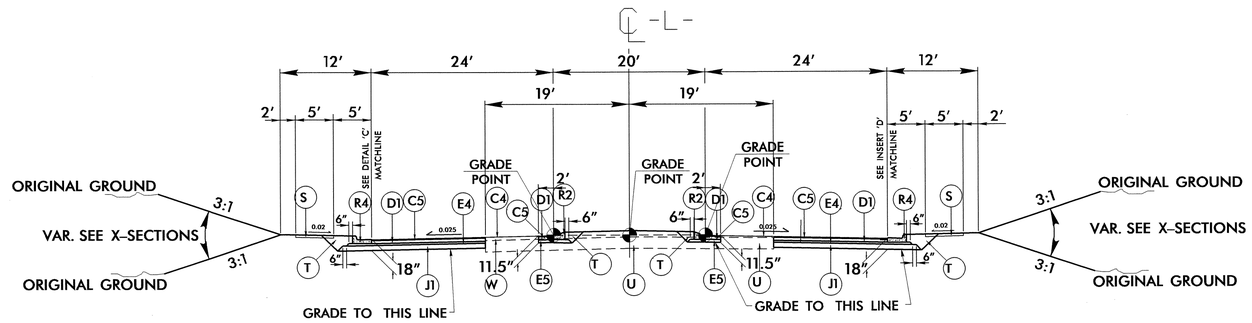
PAVEMENT SCHEDULE	
C4	1.5" S9.5C
C5	3" S9.5C
D1	4" I19.0C
E4	3" B25.0C
E5	4.5" B25.0C
E7	VAR. B25.0C
J1	8" ABC
R1	8"X18"CONC. CURB
R2	1'-6" C&G
R3	2'-0" C&G
R4	2' -6" C&G
R7	4" CONC DITCH
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	3" MILLING
W	WEDGING



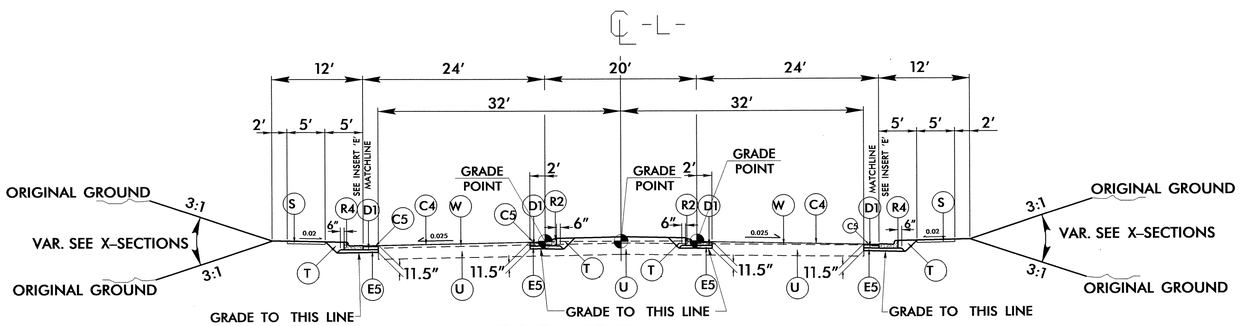
NOTE 2 – BEGIN SIDEWALK –L–LT. STA. 1344+51.45

TYPICAL SECTION NO. 5

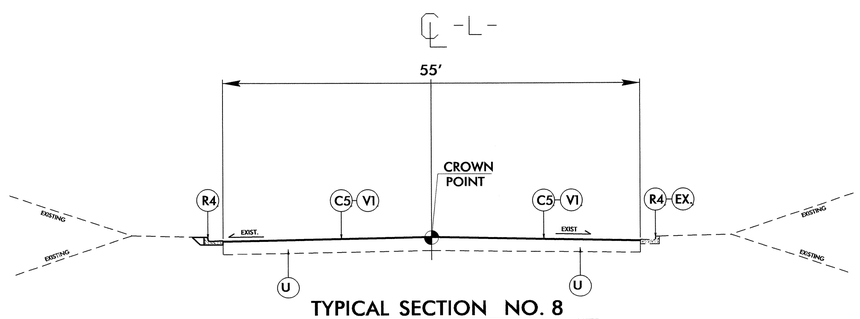
NOTE 1 – BEGIN SIDEWALK –L–RT. STA. 1344+22.79



TYPICAL SECTION NO. 6

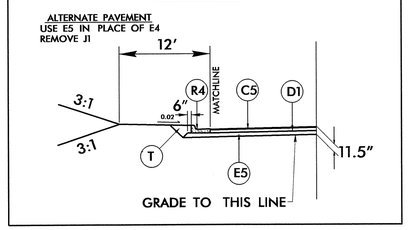


TYPICAL SECTION NO. 7

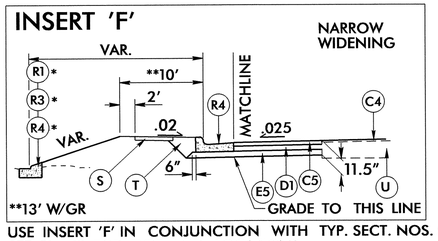


TYPICAL SECTION NO. 8

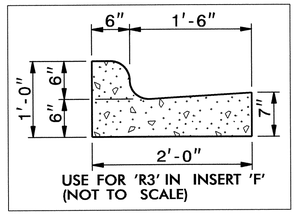
DETAIL 'C'



INSERT 'F'



USE INSERT 'F' IN CONJUNCTION WITH TYP. SECT. NOS. 5, 6, & 7
*SEE PLANS FOR TYPE AND LOCATIONS

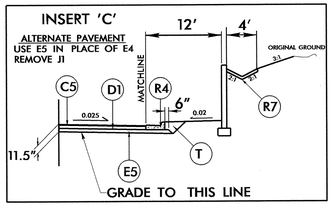


USE FOR 'R3' IN INSERT 'F'
(NOT TO SCALE)

DETAIL SHOWING DIMENSIONS FOR 2'-0" CONCRETE CURB AND GUTTER

USE TYPICAL SECTION NO. 5

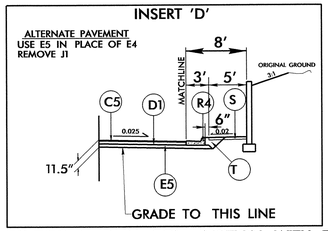
–L– STA. 1332+00.00 TO STA. 1342+56.21
–L– STA. 1341+60.00 TO 1347+48.00, TRANSTION FROM TYP. SECT. NO. 5 TO TYP. SECT. NO. 6



USE INSERT 'C' IN CONJUNCTION WITH TYP. SECT. NO. 5
–L– RT. STA. 1331+20.00 TO 1340+70.00
–L– RT. STA. 1341+25.00 TO STA. 1447+35.00

USE TYPICAL SECTION NO. 6

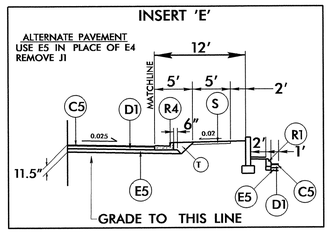
–L– STA. 1347+48.00 TO STA. 1377+33.00
–L– STA. 1377+32 TO 1379+42.00, TRANSTION FROM TYP. SECT. NO. 6 TO TYP. SECT. NO. 7



USE INSERT 'D' IN CONJUNCTION WITH TYP. SECT. NO. 6
–L– RT. STA. 1350+25.00 TO STA. 1354+75.00

USE TYPICAL SECTION NO. 7

–L– STA. 1379+42.00 TO STA. 1438+00.00



USE INSERT 'E' IN CONJUNCTION WITH TYP. SECT. NO. 7
–L– LT. STA. 1420+90.00 TO STA. 1431+75.00
–L– RT. STA. 1428+75.00 TO STA. 1431+20.00

USE TYPICAL SECTION NO. 8

–L– STA. 1438+00.00 TO STA. 1442+06.00
–L–RT. STA. 1439+30.91 TO STA. 1441+51.43, RETAIN EXISTING 2'-6" CURB AND GUTTER

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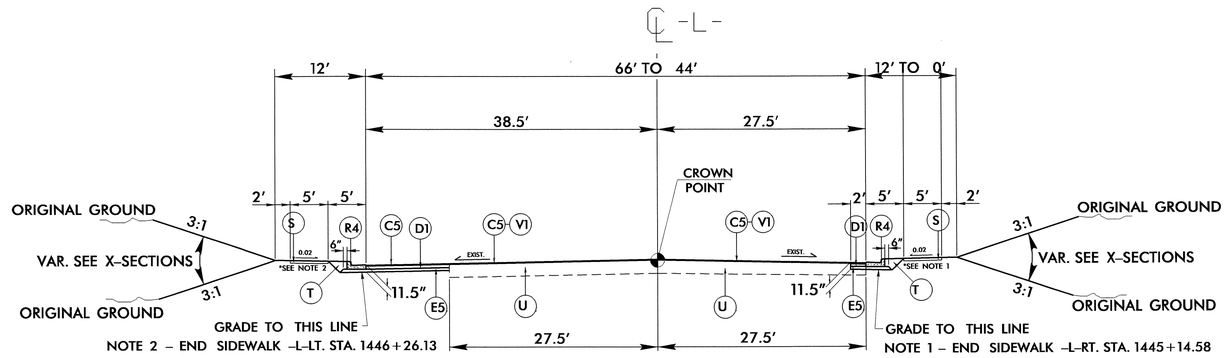
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 7-9-13

NORTH CAROLINA PROFESSIONAL SEAL 037404 ENGINEER VLADIMIR G. MITCHEV 07/19/13

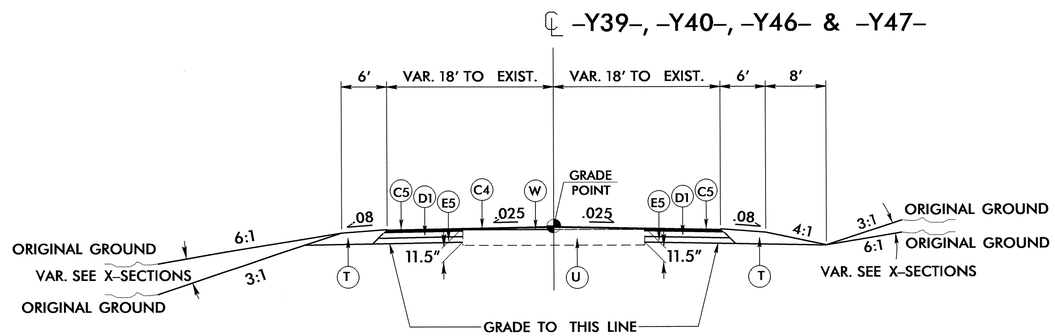
PAVEMENT SCHEDULE	
C1	1¼" SF9.5A
C2	2½" SF9.5A
C3	VAR. DEPTH SF9.5A
C4	1½" S9.5C
C5	3" S9.5C
C6	VAR. DEPTH S9.5C
D1	4" I19.0C
E1	4" B25.0B
E5	4½" B25.0C
E7	VAR. B25.0C
R4	2'-6" C & G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	MILLING 3" DEPTH
V2	INCIDENTAL MILLING
W	WEDGING



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9

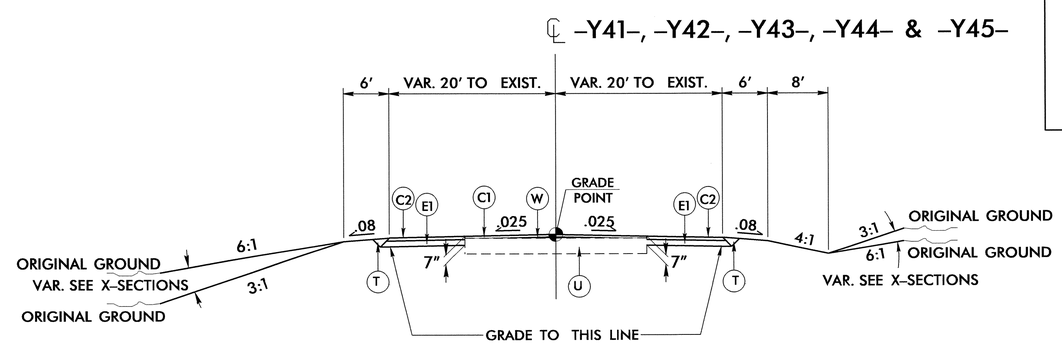
-L- STA. 1443+06.00 TO STA. 1446+25.96



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10

-Y39- STA. 11+84.96 TO STA. 12+34.71
-Y40- STA. 12+83.00 TO STA. 13+14.08
-Y46- STA. 12+56.95 TO STA. 13+54.02
-Y47- STA. 11+27.21 TO STA. 11+46.27

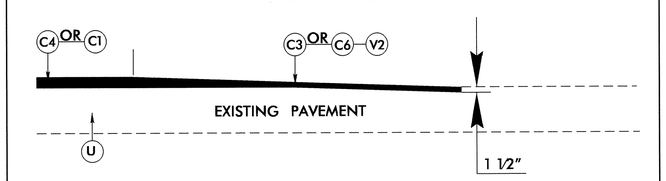


TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11

-Y41- STA. 12+32.33 TO STA. 12+94.30
-Y42- STA. 12+15.01 TO STA. 12+50.51
-Y42- STA. 17+56.57 TO STA. 19+45.90
-Y43- STA. 13+18.84 TO STA. 13+88.85
-Y43- STA. 17+22.44 TO STA. 17+60.77
-Y44- STA. 11+41.95 TO STA. 11+62.88
-Y44- STA. 15+75.83 TO STA. 18+53.83
-Y45- STA. 12+97.17 TO STA. 13+82.77
-Y45- STA. 16+36.04 TO STA. 17+10.46

INSERT 'G'



DETAIL FOR THE TAPERING OF PAVEMENT AT END OF RESURFACING

USE INSERT 'G' IN CONJUNCTION WITH TYP. SECT. NOS. 10, and 11

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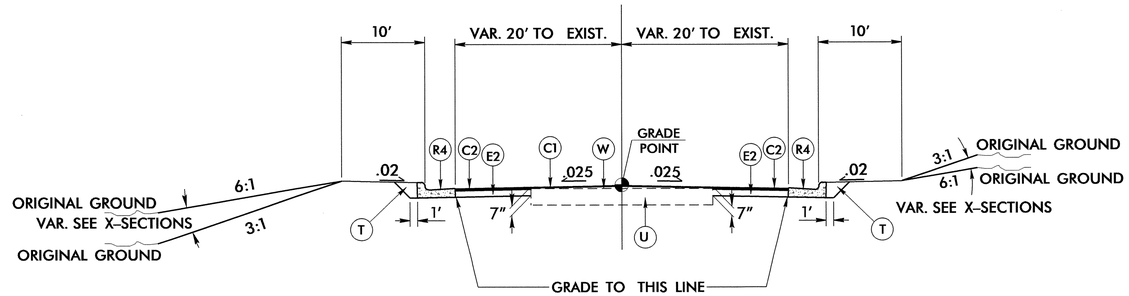
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19905 ENGINEER GREGORY E. GREEN 7-9-13

NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV 02/19/13

PAVEMENT SCHEDULE	
C1	1¼" SF9.5A
C2	2½" SF9.5A
C4	1½" S9.5C
C5	3" S9.5C
D1	4" I19.0C
E2	4½" B25.0B
E5	4½" B25.0C
R4	2'-6" C & G
R5	EXPRESSWAY GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V2	INCIDENTAL MILLING
W	WEDGING

℄ –Y48–, –Y49– & –Y50–

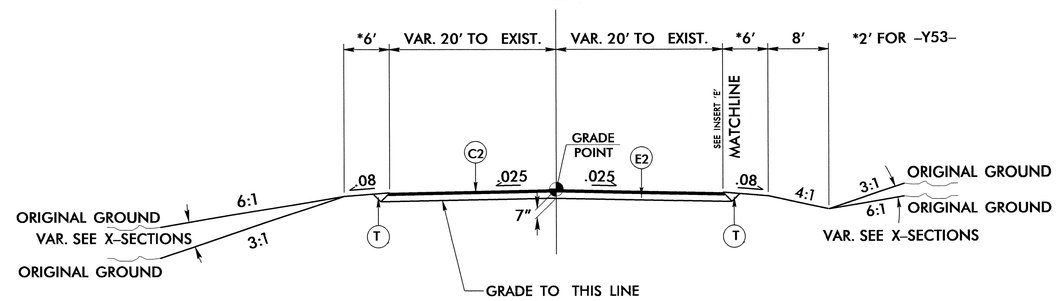


TYPICAL SECTION NO. 12

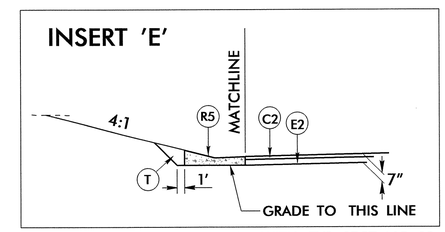
USE TYPICAL SECTION NO. 12

–Y48– STA. 11+36.26 TO STA. 13+48.17
–Y49– STA. 10+82.26 TO STA. 10+99.10
–Y50– STA. 10+93.00 TO STA. 11+78.17
–Y50– STA. 13+93.12 TO STA. 16+10.00

℄ –SR1–, –SR1REV2– & –Y53–



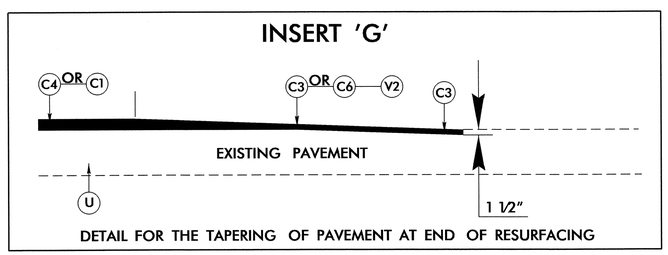
TYPICAL SECTION NO. 13



USE INSERT 'E' IN CONJUNCTION WITH TYP. SECT. NO. 13
–Y53– RT. STA. 14+84.50 TO 16+00.70

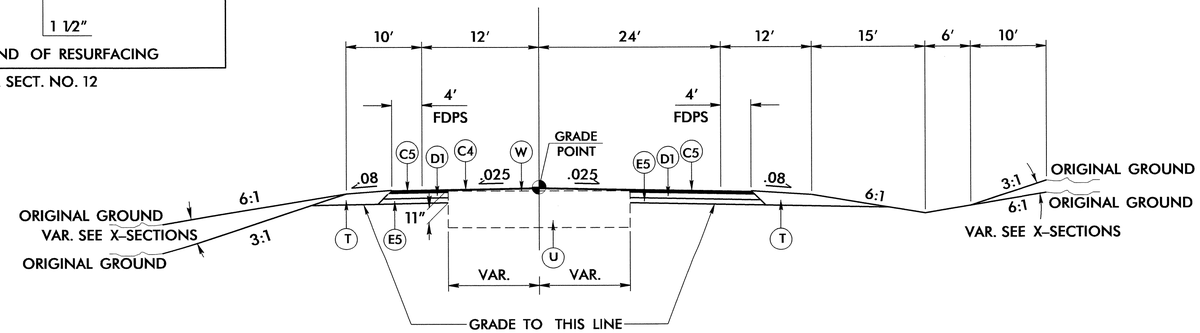
USE TYPICAL SECTION NO. 13

–SR1– STA. 11+49.78 TO STA. 32+21.82 L.B.
–SRIREV2– STA. 32+21.82 L.A. TO STA. 38+66.22
–Y53– STA. 10+00.00 TO STA. 15+68.94



USE INSERT 'G' IN CONJUNCTION WITH TYP. SECT. NO. 12

℄ –RAMP A–



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14

–RAMP A– STA. 10+58.72 TO STA. 16+24.10

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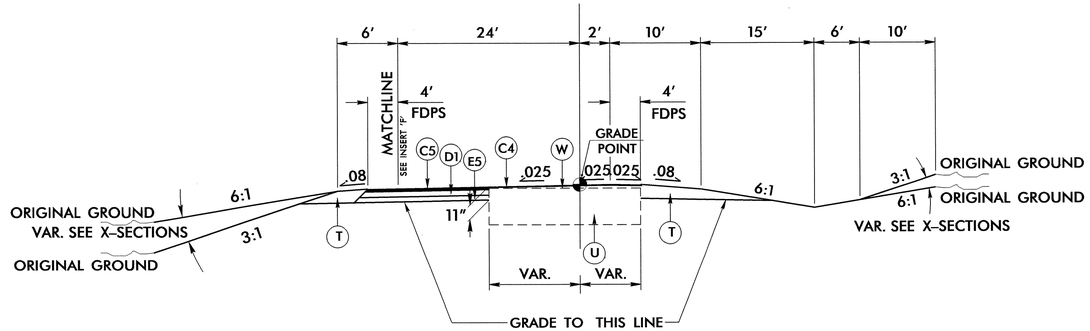
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BRIEN 7-9-13

NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VADIMIR G. MITCHEV 07/19/13

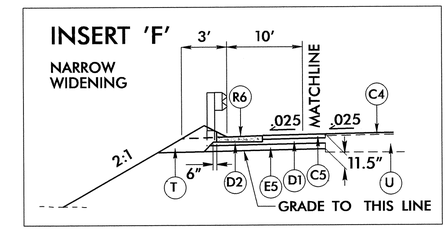
PAVEMENT SCHEDULE	
C4	1½" S9.5C
C5	3" S9.5C
D1	4" I19.0C
D2	VAR. I19.0C
E5	4.5" B25.0C
R6	SHLD.BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

℄ –RAMP B–



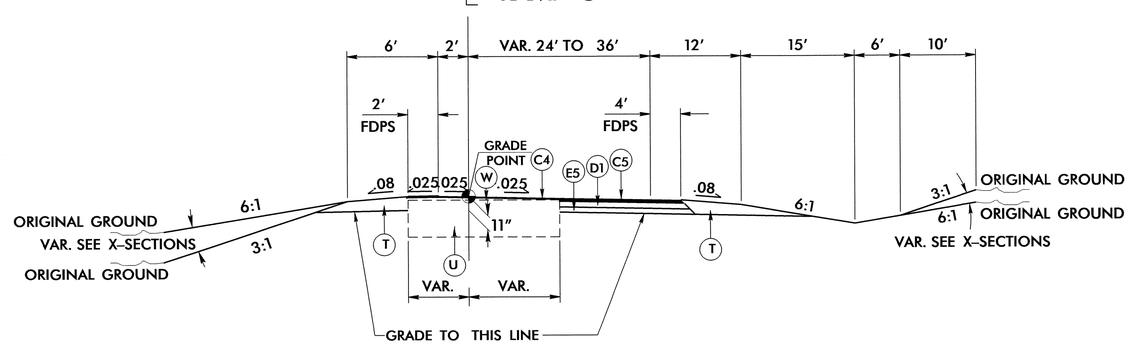
TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15
–RAMP B– STA. 7+36.31 TO STA. 12+25.36



USE INSERT 'F' IN CONJUNCTION WITH TYP. SECT. NO. 15
–RAMP B– LT. STA. 10+05.00 TO –Y52– RT. STA. 45+70.00

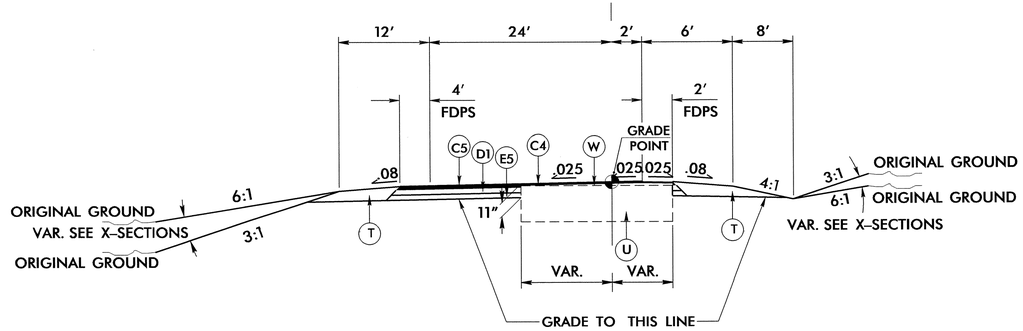
℄ –RAMP C–



TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16
–RAMP C– STA. 8+07.56 TO STA. 14+40.54

℄ –RAMP D–



TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17
–RAMP D– STA. 8+49.68 TO STA. 14+65.08

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-F

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BRITSON

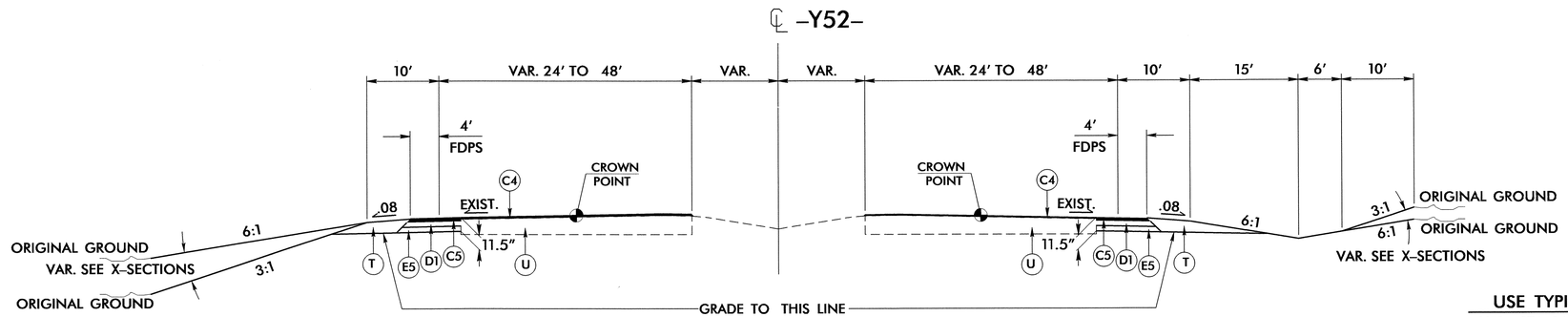
7-10-13

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV

7/19/13

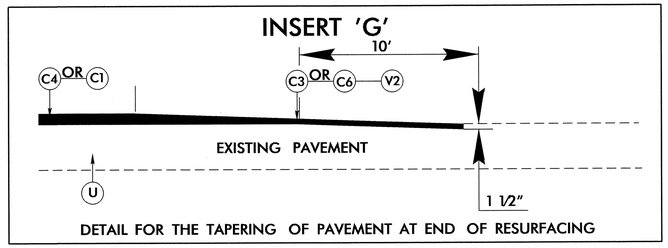
PAVEMENT SCHEDULE	
C4	3" S9.5C
C5	VAR. S9.5C
D1	4" I19.0C
E5	4.5" B25.0C
E6	5.5" B25.0C
R7	CONC PAVED DITCH
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V2	INCIDENTAL MILLING



USE TYPICAL SECTION NO. 18

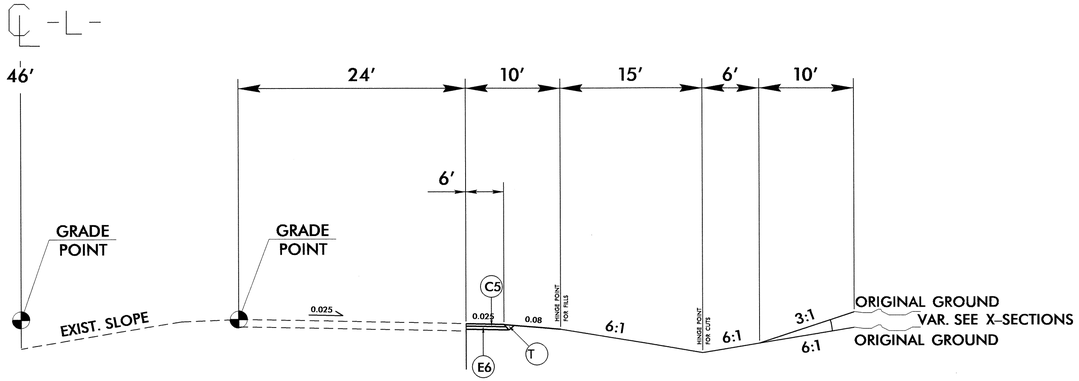
-Y52- STA. 14+62.48 TO STA. 51+91.90

TYPICAL SECTION NO. 18



DETAIL FOR THE TAPERING OF PAVEMENT AT END OF RESURFACING

USE INSERT 'G' IN CONJUNCTION WITH TYP. SECT. NO. 18

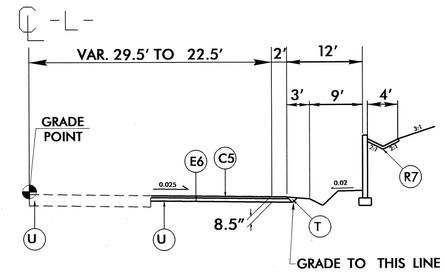


TYPICAL SECTION NO. 19

TEMPORARY PAVEMENT FOR TRAFFIC CONTROL

USE TYPICAL SECTION NO. 19

-L- RT. STA. 1102+43.00+/- TO STA. 1106+00.00+/-
-L- RT. STA. 1109+20.00+/- TO STA. 1115+39.00+/-

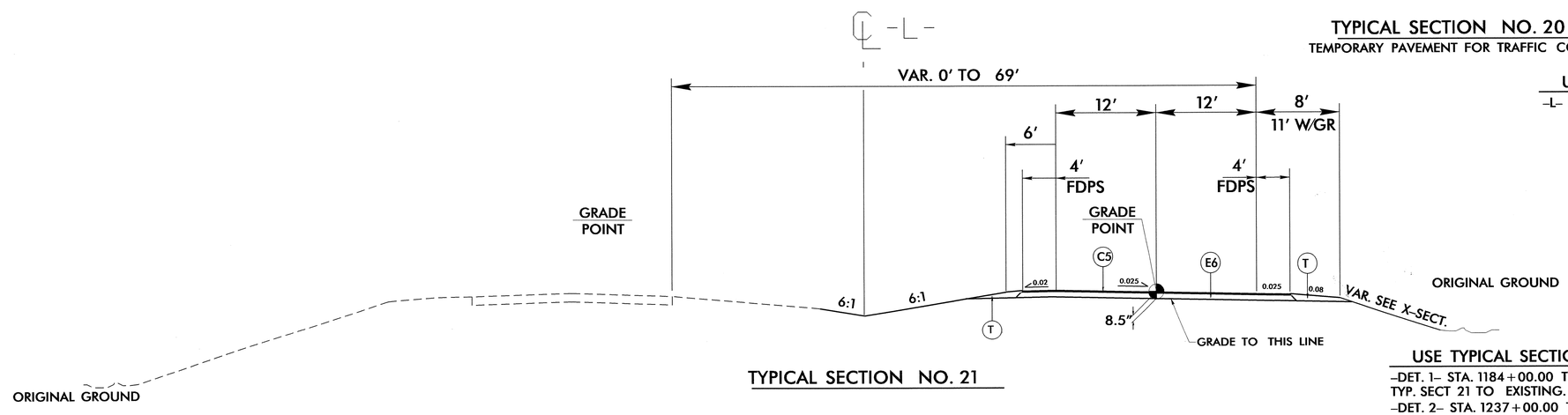


TYPICAL SECTION NO. 20

TEMPORARY PAVEMENT FOR TRAFFIC CONTROL

USE TYPICAL SECTION NO. 20

-L- RT. STA. 1329+00.00+/- TO STA. 1367+43.00+/-



TYPICAL SECTION NO. 21

USE TYPICAL SECTION NO. 21

-DET. 1- STA. 1184+00.00 TO STA. 1193+06.53+/- TRANSITION FROM TYP. SECT 21 TO EXISTING.
-DET. 2- STA. 1237+00.00 TO STA. 1247+48+/- TRANSITION FROM EXISTING TO TYP. SECT 21.
-DET. 3- STA. 1293+00.00 TO STA. 1301+80+/- TRANSITION FROM TYP. SECT 21 TO EXISTING.

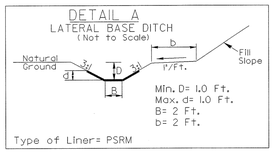
6/2/99
08-JUL-2013 16:04
R:\Roadway\Proj\r2303d_rdy_typ.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-G
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 48906 ENGINEER GREGORY E. BREW 7-10-13

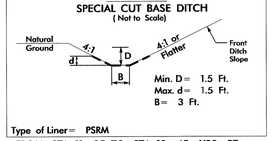
NORTH CAROLINA PROFESSIONAL SEAL 022906 ENGINEER B. GALEN CAIL 7/19/13

DETAIL A
LATERAL BASE DITCH
(Not to Scale)



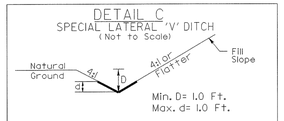
FROM STA. 1100+00 TO STA. 1106+15 –L– RT.
FROM STA. 1154+50 TO STA. 1157+70 –L– LT.
FROM STA. 1158+50 TO STA. 1160+46 –L– LT.
FROM STA. 1160+80 TO STA. 1162+63 –L– LT.
FROM STA. 1163+10 TO STA. 1164+11 –L– LT.
FROM STA. 1164+50 TO STA. 1165+81 –L– LT.
FROM STA. 1171+70 TO STA. 1174+68 –L– LT.
FROM STA. 1176+55 TO STA. 1180+50 –L– RT.
FROM STA. 1180+50 TO STA. 1186+00 –L– RT. (16+00 –Y42– RT.)
FROM STA. 16+00 TO STA. 17+88 –Y42– RT.
FROM STA. 1189+00 TO STA. 1197+50 –L– RT.
FROM STA. 1245+80 TO STA. 1248+15 –L– LT.
FROM STA. 1247+00 TO STA. 1248+72 –L– RT.
FROM STA. 1279+00 TO STA. 1285+70 –L– LT.
FROM STA. 1287+10 TO STA. 1289+00 –L– LT.
FROM STA. 9+40 TO STA. 10+85 –RPD– LT.
FROM STA. 17+15 TO STA. 20+50 –SR1– RT.
FROM STA. 15+94 TO STA. 17+19 –RPA– RT

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)



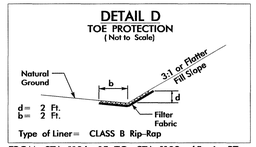
FROM STA. 11+85 TO STA. 12+45 –Y39– RT.
FROM STA. 18+50 TO STA. 22+00 –Y42– LT.
FROM STA. 13+68 TO STA. 15+30 –Y50– LT.

DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



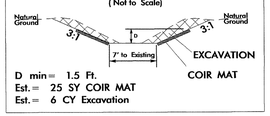
FROM STA. 1141+50 TO STA. 1142+41 –L– LT (14+20 –Y40– RT.)
FROM STA. 12+93 TO STA. 14+20 –Y40– RT.
FROM STA. 1152+00 TO STA. 1153+60 –L– LT.
FROM STA. 1166+20 TO STA. 1167+00 –L– LT.
FROM STA. 1168+00 TO STA. 1169+20 –L– LT.
FROM STA. 1174+68 TO STA. 1179+50 –L– LT.
FROM STA. 1197+60 TO STA. 1198+50 –L– LT
FROM STA. 1200+05 TO STA. 1200+50 –L– LT
FROM STA. 1201+90 TO STA. 1202+50 –L– RT
FROM STA. 1211+00 TO STA. 1213+80 –L– LT.
FROM STA. 1297+55 TO STA. 1300+00 –L– LT
FROM STA. 1300+40 TO STA. 1301+50 –L– RT
FROM STA. 1302+00 TO STA. 1302+95 –L– RT.
FROM STA. 8+90 TO STA. 14+00 –RPC– LT
FROM STA. 17+50 TO STA. 18+50 –Y52– RT
FROM STA. 17+25 TO STA. 18+00 –Y52– LT
FROM STA. 11+00 TO STA. 14+60 –RPA– LT
FROM STA. 12+50 TO STA. 12+80 –Y39– LT
FROM STA. 11+50 TO STA. 12+70 –Y44– RT.
FROM STA. 11+50 TO STA. 12+50 –Y44– LT.
FROM STA. 16+50 TO STA. 18+00 –Y44– LT.
FROM STA. 12+93 TO STA. 13+93 –Y40– LT.
FROM STA. 46+00 TO STA. 51+50 –Y52– RT.
FROM STA. 19+05 TO STA. 21+00 –SR1– LT

DETAIL D
TOE PROTECTION
(Not to Scale)



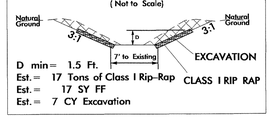
FROM STA. 1106+15 TO STA. 1108+65 –L– RT
FROM STA. 1109+00 TO STA. 1110+45 –L– RT
FROM STA. 1106+95 TO STA. 1109+50 –L– LT
FROM STA. 1109+80 TO STA. 1110+20 –L– LT
FROM STA. 1163+30 TO STA. 1167+40 –L– RT
FROM STA. 1170+00 TO STA. 1172+65 –L– LT
FROM STA. 1170+70 TO STA. 1176+00 –L– RT
FROM STA. 1197+25 TO STA. 1197+70 –L– LT
FROM STA. 1197+80 TO STA. 1198+40 –L– RT
FROM STA. 1199+30 TO STA. 1201+65 –L– RT
FROM STA. 1204+75 TO STA. 1205+15 –L– RT
FROM STA. 1207+45 TO STA. 1207+80 –L– RT
FROM STA. 1221+00 TO STA. 1224+50 –L– RT
FROM STA. 1224+80 TO STA. 1225+45 –L– RT
FROM STA. 1222+15 TO STA. 1224+10 –L– LT
FROM STA. 1224+40 TO STA. 1225+15 –L– LT
FROM STA. 1266+50 TO STA. 1269+25 –L– RT
FROM STA. 1290+60 TO STA. 1300+00 –L– RT
FROM STA. 1296+25 TO STA. 1297+40 –L– LT
FROM STA. 1301+50 TO STA. 1305+32 –L– LT
FROM STA. 1304+90 TO STA. 1305+32 –L– RT
FROM STA. 1317+82 TO STA. 1325+78 –L– LT & RT
FROM STA. 1328+10 TO STA. 1328+50 –L– RT
FROM STA 1328+10 TO STA. 1329+05 –L– LT
FROM STA. 13+55 TO STA. 16+95 –SR1– RT
FROM STA. 14+50 TO STA. 16+50 –SR1– LT

DETAIL E
CULVERT INLET CHANNEL
(Not to Scale)



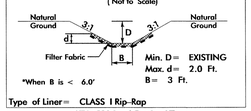
STA. 1109+60 –L– LT

DETAIL F
CULVERT OUTLET CHANNEL
(Not to Scale)



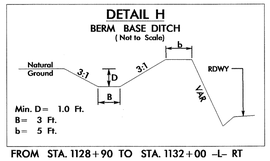
STA. 1108+85 –L– RT

DETAIL G
STANDARD BASE DITCH
(Not to Scale)



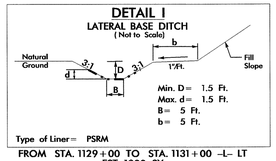
STA. 1128+95 –L– LT
FROM STA. 1197+50 TO STA. 1197+90 –L– RT

DETAIL H
BERM BASE DITCH
(Not to Scale)



FROM STA. 1128+90 TO STA. 1132+00 –L– RT

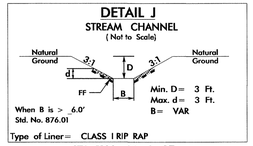
DETAIL I
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 1129+00 TO STA. 1131+00 –L– LT
EST. 1800 SY
FROM STA. 1248+23 TO STA. 1251+00 –L– LT.

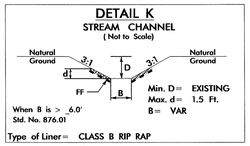
FROM STA. 1248+87 TO STA. 1250+65 –L– RT.

DETAIL J
STREAM CHANNEL
(Not to Scale)



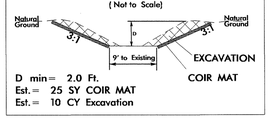
STA. 1198+00 –L– RT
EST 55 TONS; EST 70 SY FF; EST 20 CY EXCAV
STA. 1278+55 –L– LT
EST 35 TONS; EST 40 SY FF; EST 35 CY EXCAV
STA. 1281+30 –L– RT
EST 35 TONS; EST 40 SY FF; EST 25 CY EXCAV
STA. 1291+75 –L– RT
EST 40 TONS; EST 50 SY FF; EST 10 CY EXCAV
STA. 16+40 –Y44– LT
EST 35 TONS; EST 40 SY FF; EST 60 CY EXCAV
STA. 16+75 –Y44– RT
EST 70 TONS; EST 80 SY FF; EST 100 CY EXCAV
STA. 1294+70 –L– RT
EST 40 TONS; EST 40 SY FF; EST 30 CY EXCAV

DETAIL K
STREAM CHANNEL
(Not to Scale)



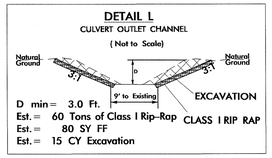
STA. 1200+10 –L– RT
EST 55 TONS; EST 70 SY FF; EST 20 CY EXCAV

DETAIL K
CULVERT INLET CHANNEL
(Not to Scale)



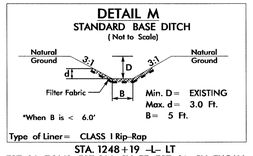
STA. 1224+30 –L– LT

DETAIL L
CULVERT OUTLET CHANNEL
(Not to Scale)



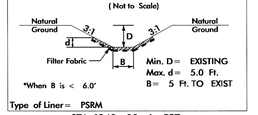
STA. 1224+60 –L– RT

DETAIL M
STANDARD BASE DITCH
(Not to Scale)



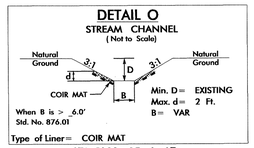
STA. 1248+19 –L– LT
EST 80 TONS; EST 100 SY FF; EST 60 CY EXCAV
STA. 1248+79 –L– RT
EST 80 TONS; EST 100 SY FF; EST 60 CY EXCAV
STA. 1347+60 –L– LT
EST 110 TONS; EST 140 SY FF; EST 110 CY EXCAV

DETAIL N
STANDARD BASE DITCH
(Not to Scale)



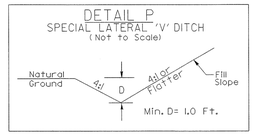
STA. 1249+00 –L– RRT

DETAIL O
STREAM CHANNEL
(Not to Scale)



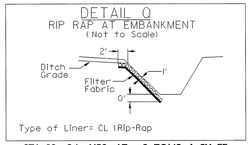
STA. 1290+05 –L– LT
EST 75 SY COIR MAT; EST 25 CY EXCAV
STA 1294+50 –L– LT
EST 70 SY COIR MAT; EST 30 CY EXCAV

DETAIL P
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



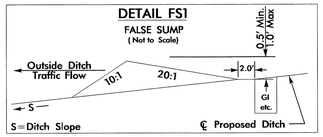
FROM STA. 1131+00 TO STA. 1139+75 –L– LT
FROM STA. 5+84 TO STA. 10+00 –RPC– RT
FROM STA. 10+00 TO STA. 15+00 –RPA– RT

DETAIL Q
RIP RAP AT EMBANKMENT
(Not to Scale)



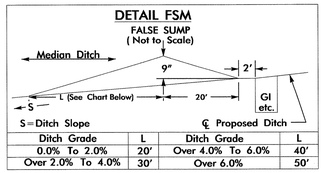
STA. 12+34 –Y53– LT 3 TONS; 6 SY FF
STA. 12+54 –Y53– LT 3 TONS; 6 SY FF
STA. 12+57 –Y53– RT 3 TONS; 6 SY FF
STA. 12+77 –Y53– RT 3 TONS; 6 SY FF

DETAIL FS1
FALSE SUMP
(Not to Scale)



SEE PLANS FOR LOCATION

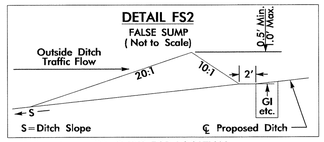
DETAIL FSM
FALSE SUMP
(Not to Scale)



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'

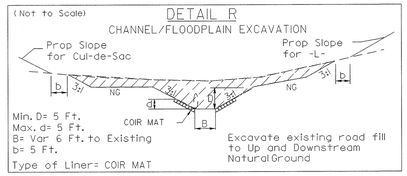
SEE PLANS FOR LOCATION

DETAIL FS2
FALSE SUMP
(Not to Scale)



SEE PLANS FOR LOCATION

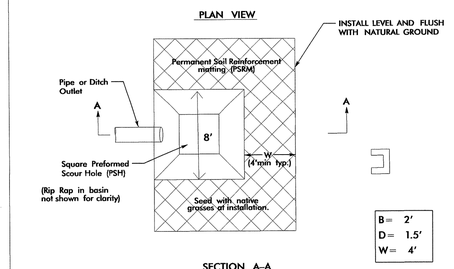
DETAIL R
CHANNEL/FLOODPLAIN EXCAVATION
(Not to Scale)



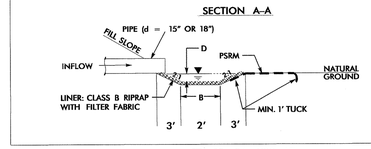
FROM STA. 1444+10 TO STA. 1445+40 –L– LT
EST EXCAV = 530 CY
EST COIR MAT = 400 SY

PREFORMED SCOUR HOLE
*NOT TO SCALE

PLAN VIEW



SECTION A–A

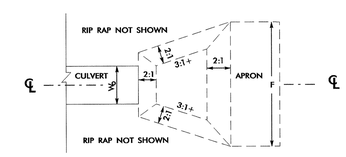


STA. 12+84 –Y39– LT
STA. 1106+18 –L– RT
STA. 1168+00 –L– RT
STA. 1169+20 –L– LT
STA. 1176+45 –L– RT
STA. 1201+90 –L– RT
STA. 17+10– –SR1– RT

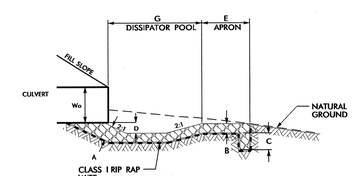
DETAIL S
RIP–RAPPED ENERGY DISSIPATOR BASIN

DIM. (ft)	RIP RAP BASIN # #1	#2	
A	2.0'	2.0'	
B	2.0'	2.0'	
C	1.5'	1.5'	
D	1.5'	1.5'	
E	5'	5'	
F	16'	16'	
G	15'	15'	

ALL DIMENSIONS APPROXIMATE



PLAN



BASIN #	LOCATION (AT OUTLET)
#1	STA 1205+25 –L– RT
#2	STA 1329+20 –L– LT

7/08

5/14/99

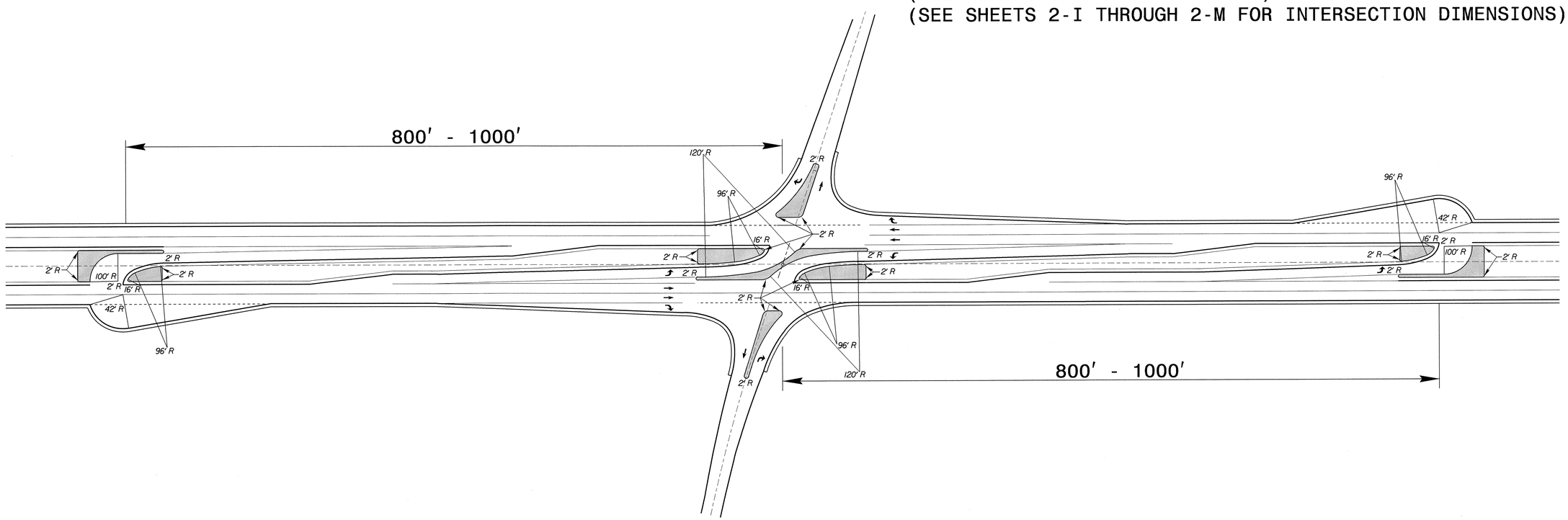
10-JUL-2013 12:14
R:\Roadway\Proj\r2303d_rdy_typ.dgn
$$USERNAME$$

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-H
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 14903 ENGINEER GREGORY E. BREW
6-27-13

MONOLITHIC ISLANDS

(SEE PLAN SHEETS FOR LOCATIONS)
(SEE SHEETS 2-I THROUGH 2-M FOR INTERSECTION DIMENSIONS)



DIRECTIONAL CROSSOVER WITH MEDIAN U-TURNS
STANDARD INTERSECTION RADII

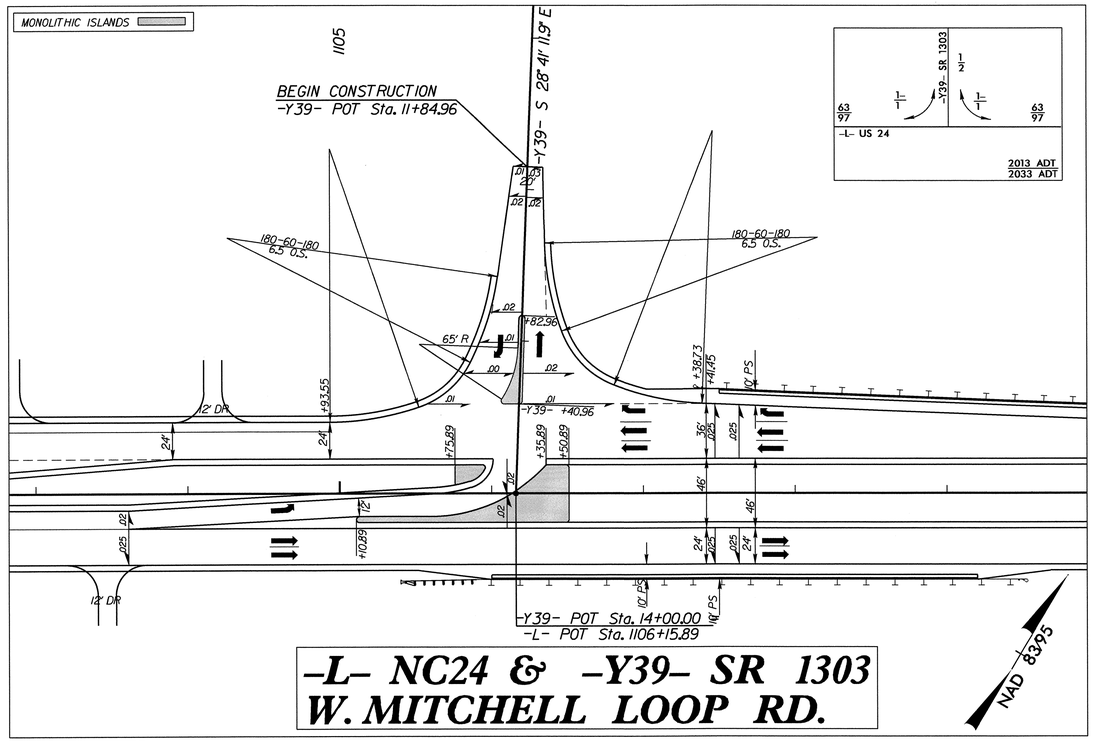
27-JUN-2013 13:56
R:\Roadway\Proj\r2303d_rdy_dtl_intersection.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

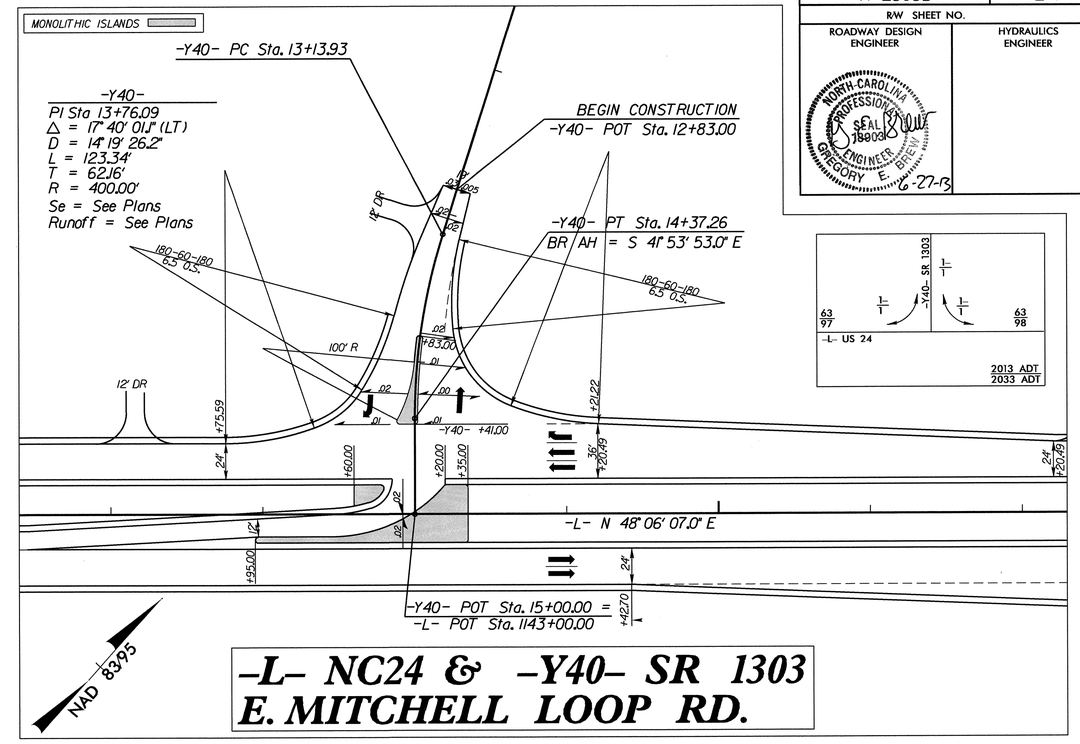
NORTH CAROLINA PROFESSIONAL SEAL 18003 ENGINEER GREGORY E. BREW
6-27-13

REVISIONS

8/17/99



-L- NC24 & -Y39- SR 1303 W. MITCHELL LOOP RD.



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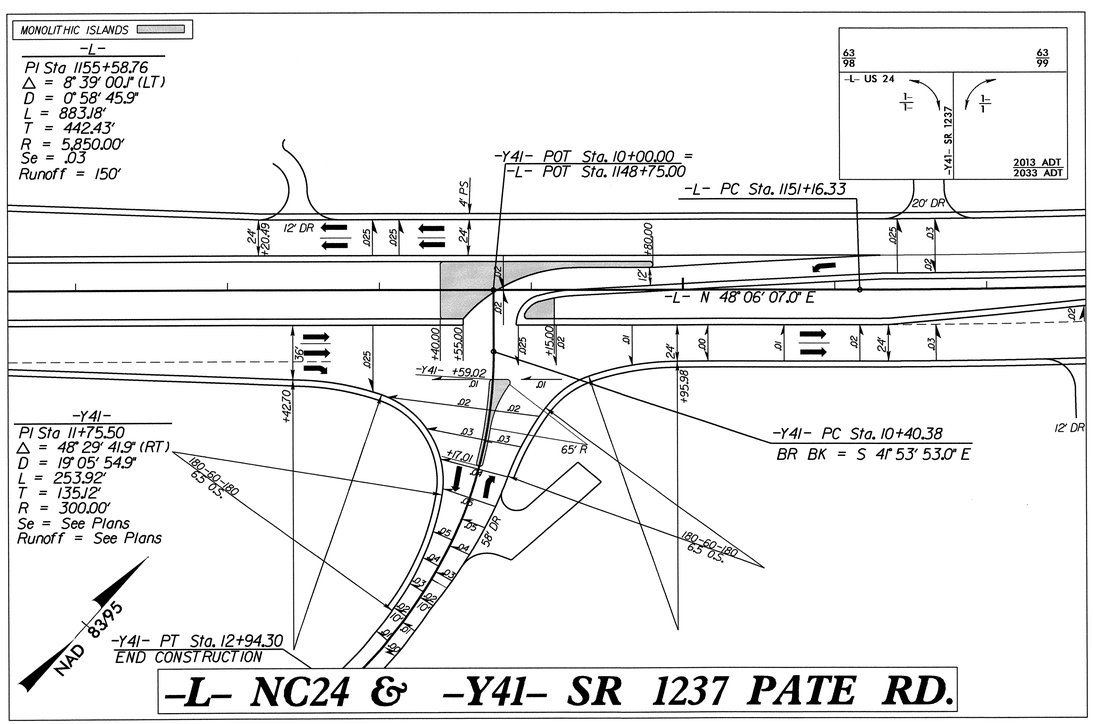
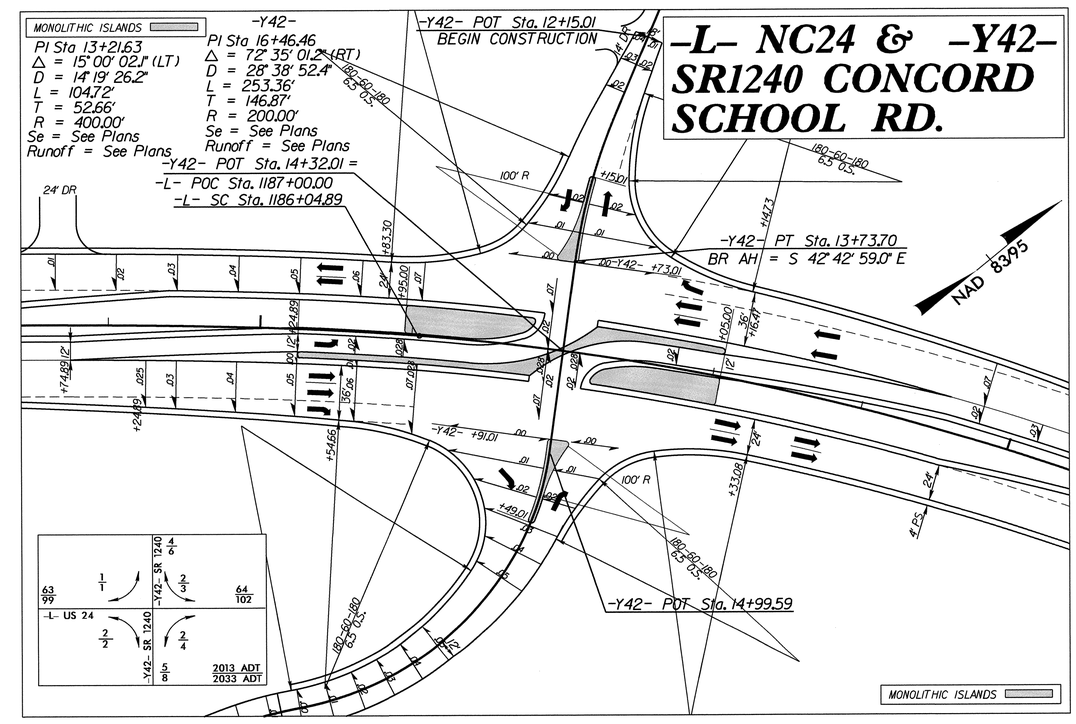


-L- NC24 & -Y41- SR 1237 PATE RD.



-L- NC24 & -Y42- SR1240 CONCORD SCHOOL RD.

27-JUN-2013 13:57
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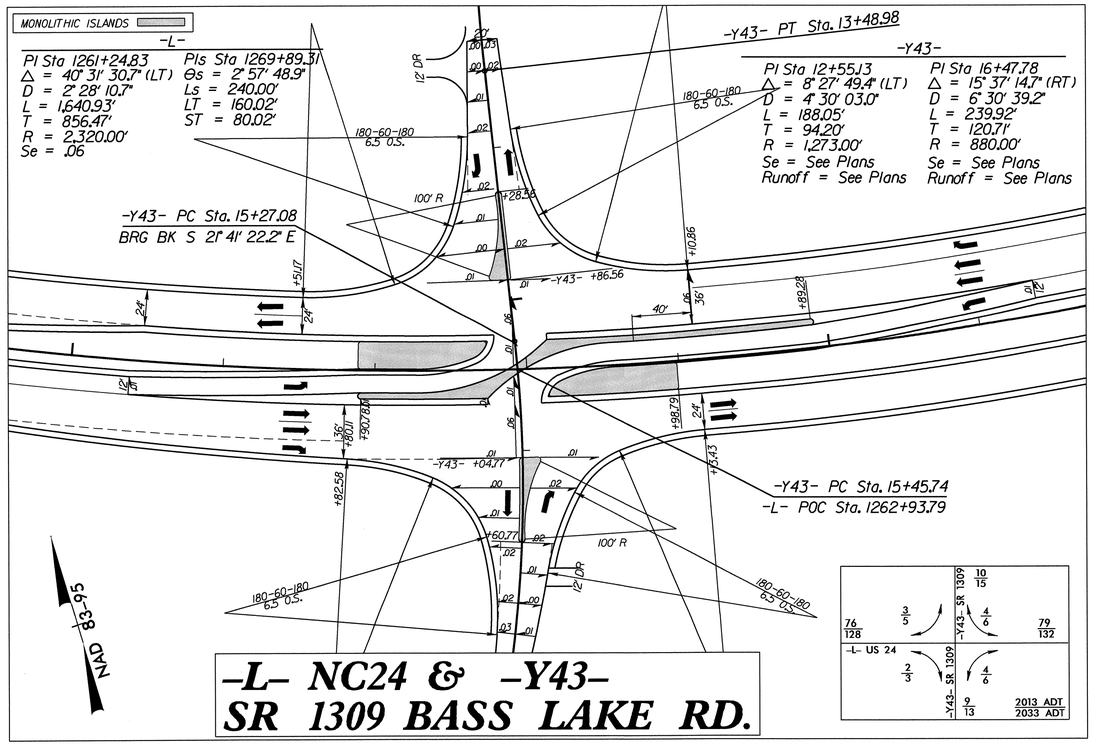
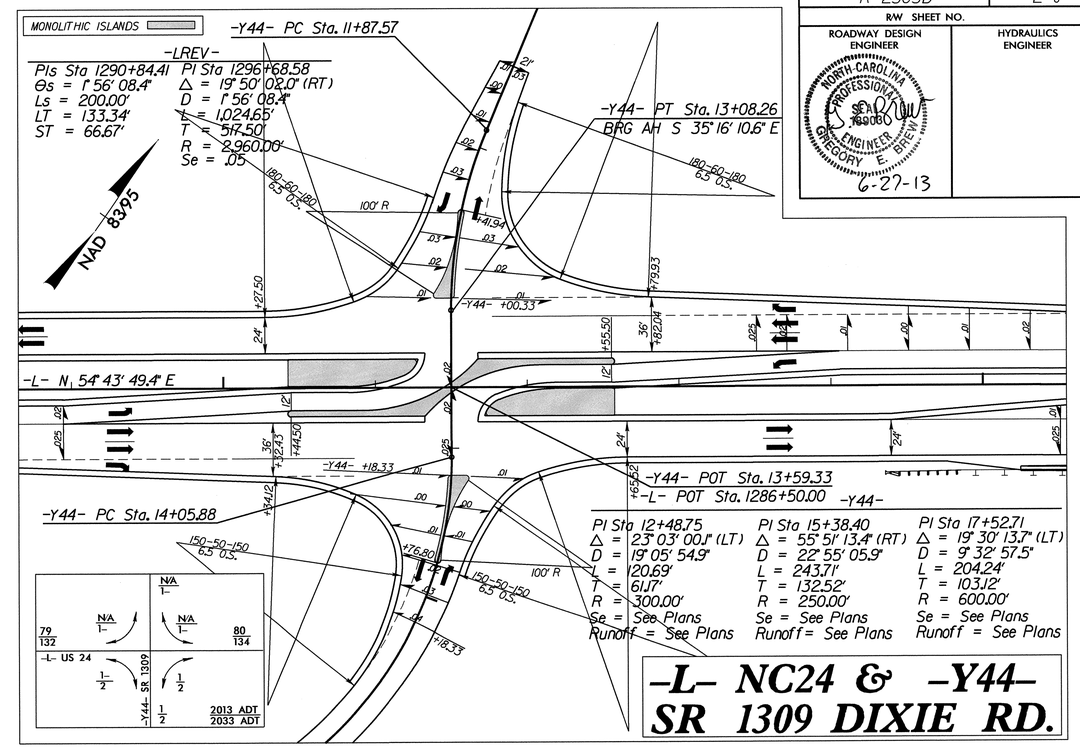
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-J
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

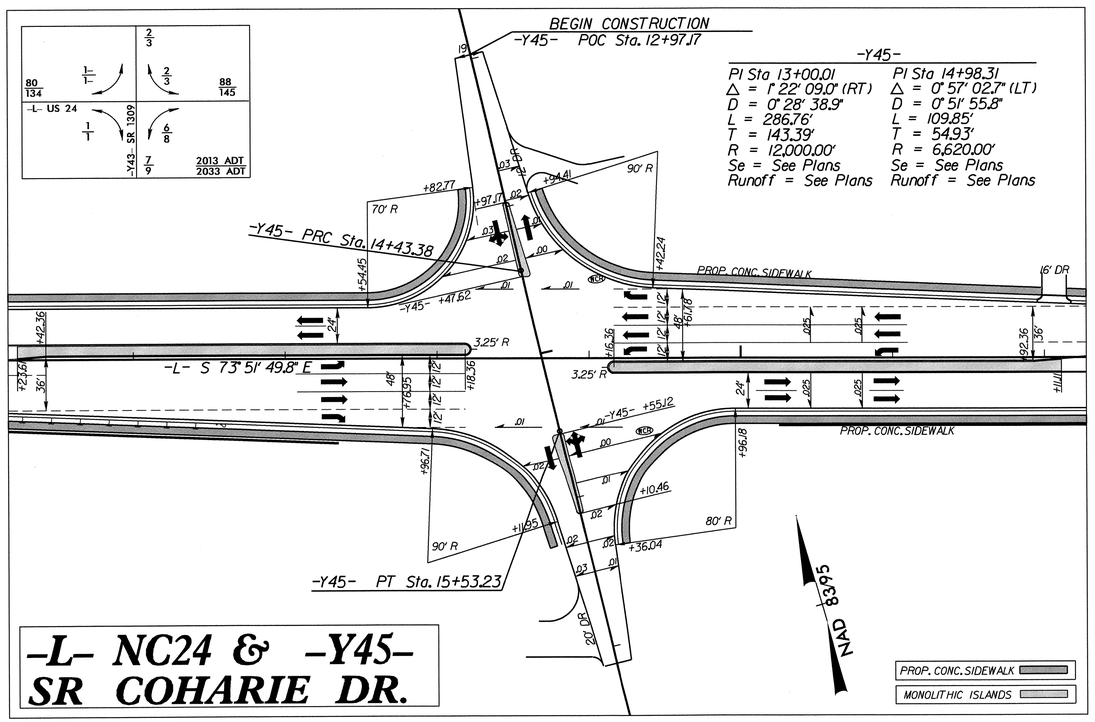
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18903 GREGORY E. BREW
6-27-13



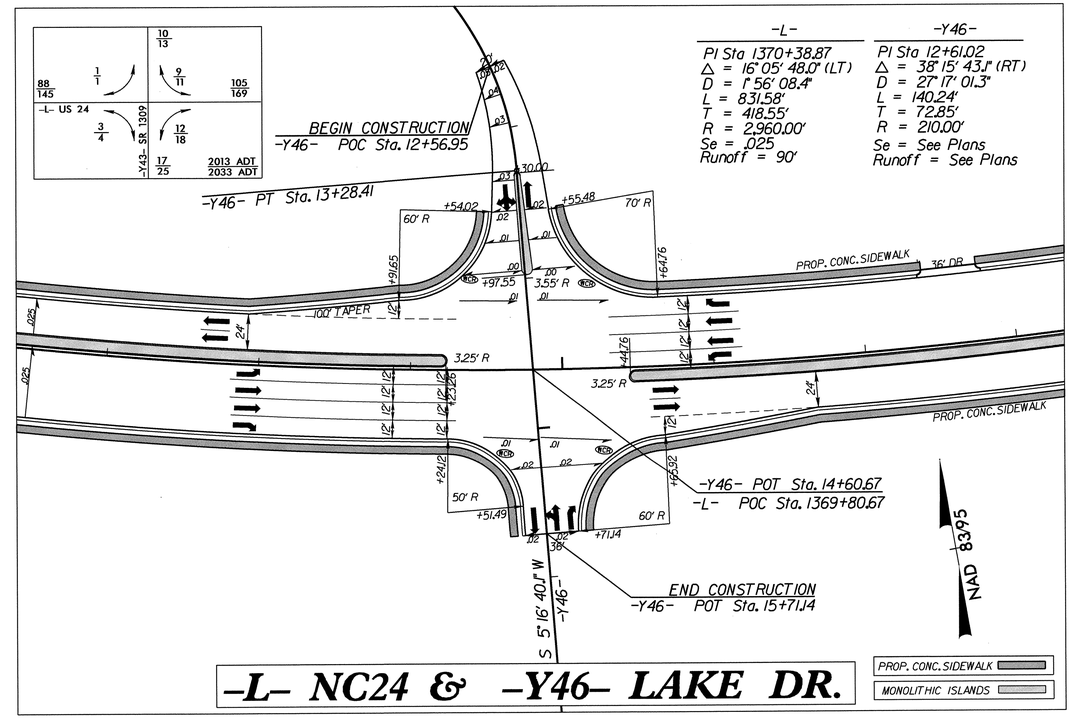
-L- NC24 & -Y43-
SR 1309 BASS LAKE RD.



-L- NC24 & -Y44-
SR 1309 DIXIE RD.



-L- NC24 & -Y45-
SR COHARIE DR.



-L- NC24 & -Y46- LAKE DR.

REVISIONS

8/17/99

27-JUN-2013 13:58
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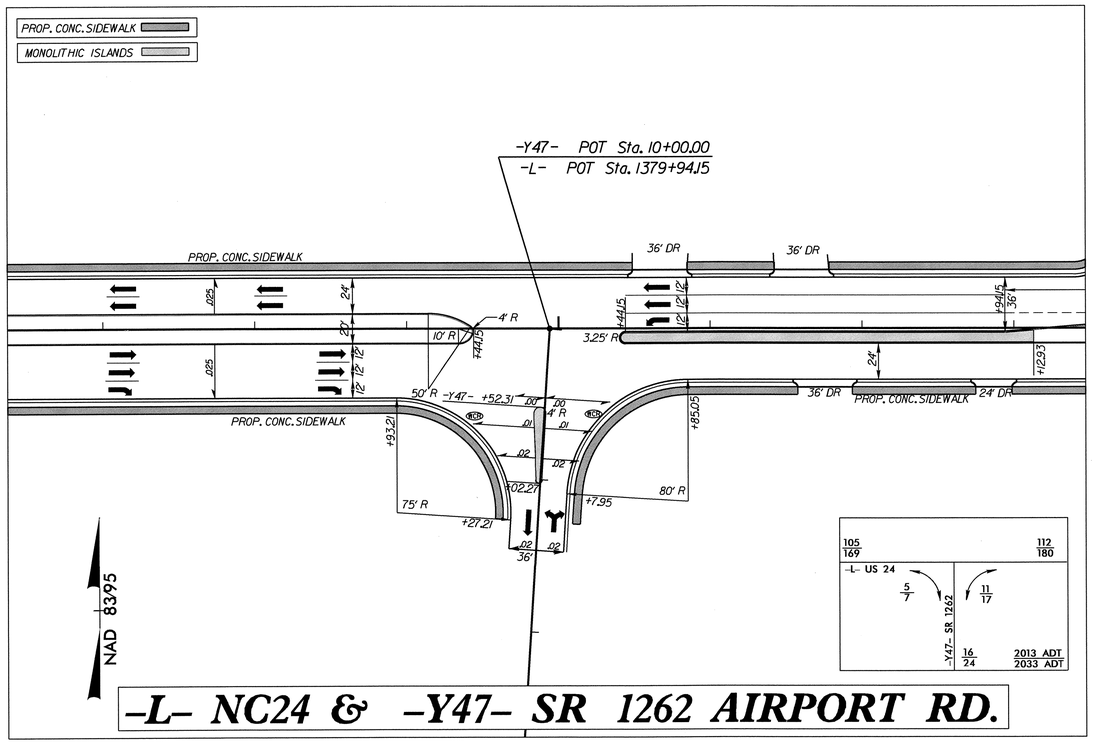
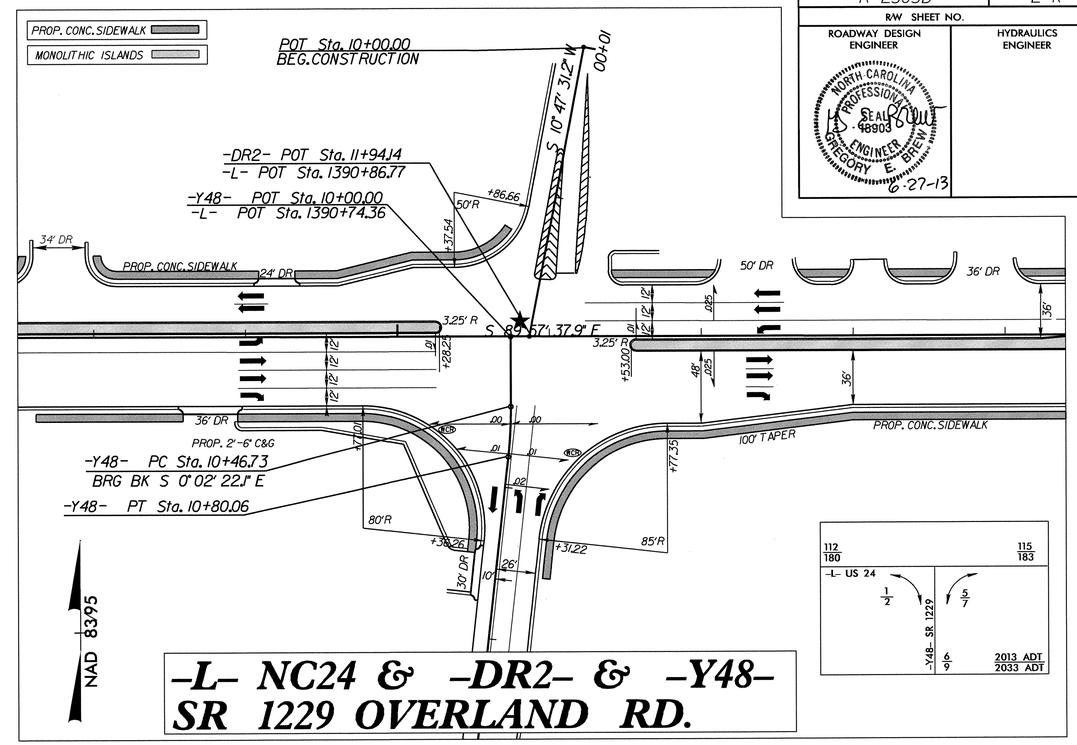
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-K
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

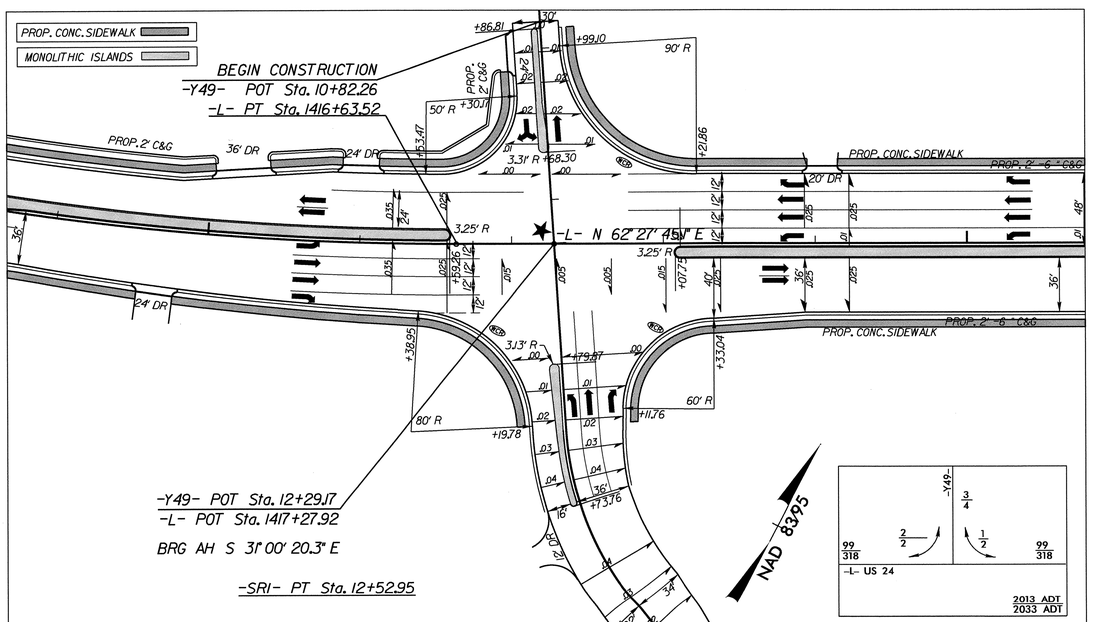
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER
6-27-13



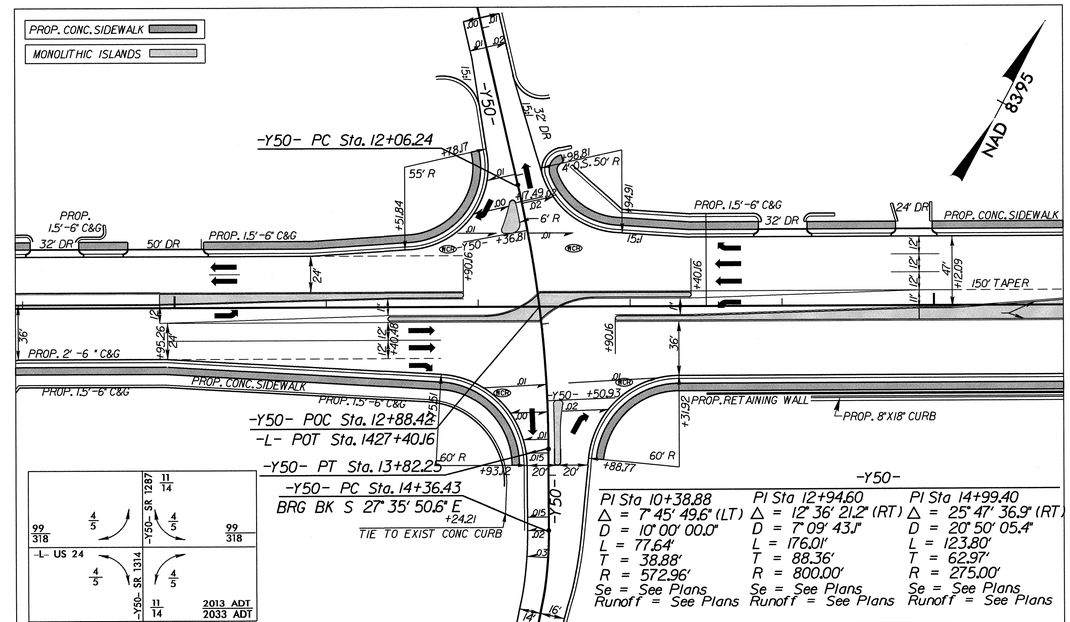
-L- NC24 & -Y47- SR 1262 AIRPORT RD.



-L- NC24 & -DR2- & -Y48- SR 1229 OVERLAND RD.



-L- NC24 & -Y49- PIERCE ST. & -SR1-



-Y50-

PI Sta 10+38.88	PI Sta 12+94.60	PI Sta 14+99.40
Δ = 7° 45' 49.6" (LT)	Δ = 12° 36' 21.2" (RT)	Δ = 25° 47' 36.9" (RT)
D = 10° 00' 00.0"	D = 7° 09' 43.1"	D = 20° 50' 05.4"
L = 77.64'	L = 176.01'	L = 123.80'
T = 38.88'	T = 88.36'	T = 62.97'
R = 572.96'	R = 800.00'	R = 275.00'
Se = See Plans	Se = See Plans	Se = See Plans
Runoff = See Plans	Runoff = See Plans	Runoff = See Plans

-L- NC24 & -Y50- SR 1314 ROYAL LN. & SR 1287 SHAMROCK DR.

REVISIONS

8/17/99

27-JUN-2013 13:59
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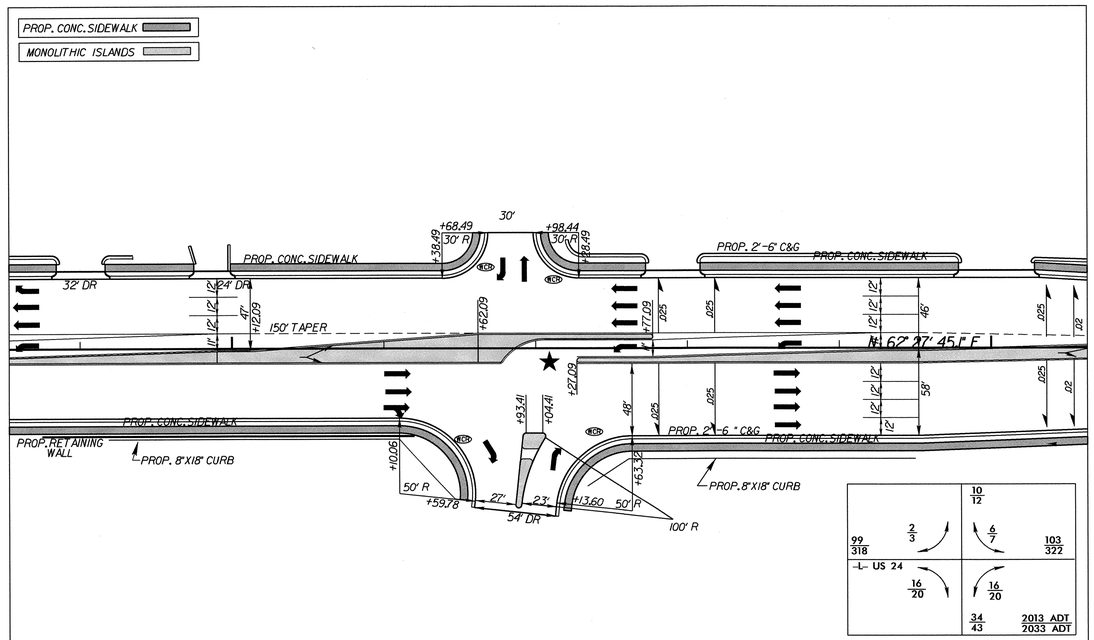
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-L
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

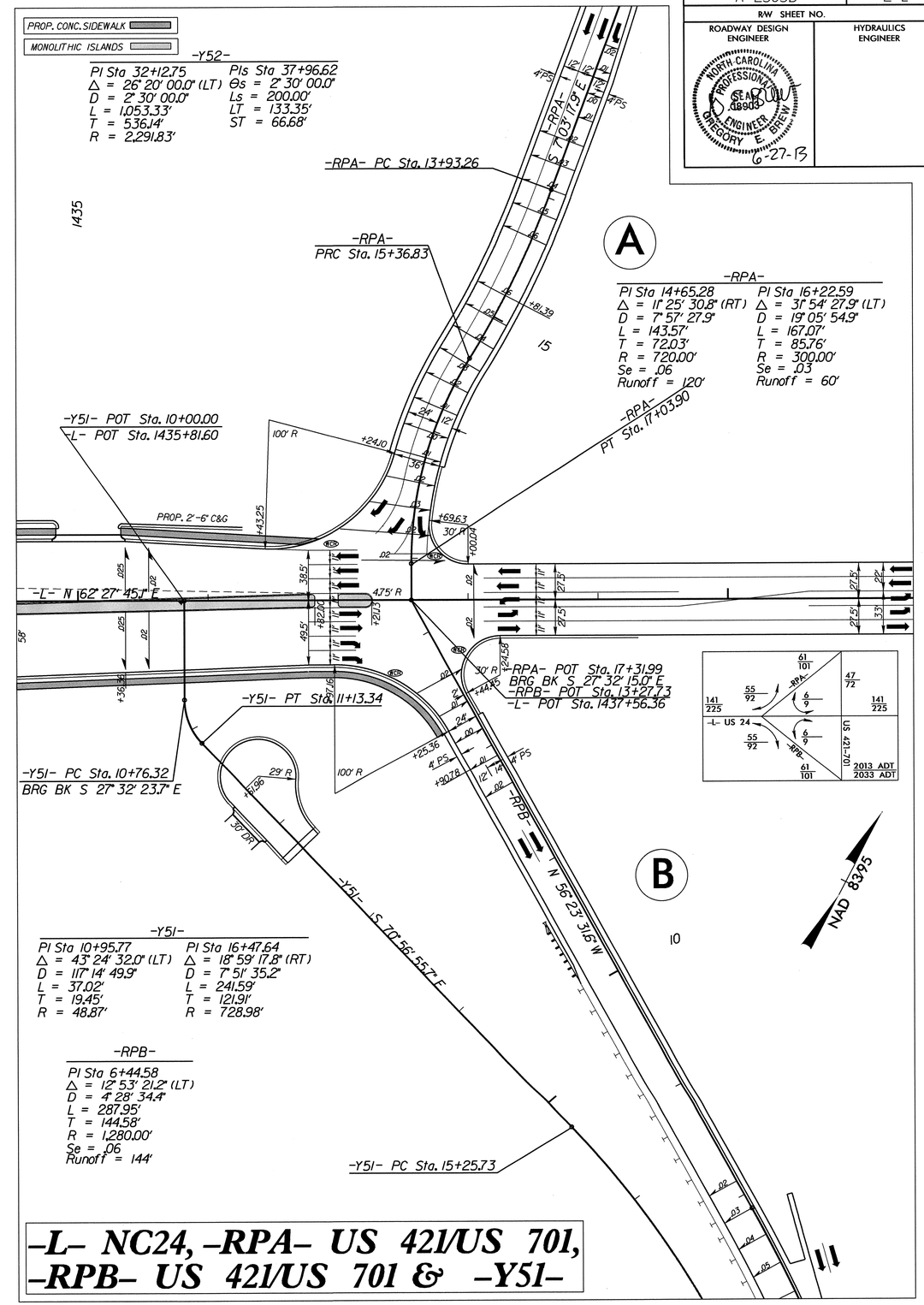
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW
6-27-13

REVISIONS

8/17/99



-L- NC24 & SHIELD ST. & SHOPPING CENTER ENTRANCE



-Y51-

PI Sta 10+95.77	PI Sta 16+47.64
Δ = 43° 24' 32.0" (LT)	Δ = 18° 59' 17.8" (RT)
D = 117° 14' 49.9"	D = 7° 51' 35.2"
L = 37.02'	L = 241.59'
T = 19.45'	T = 121.91'
R = 48.87'	R = 728.98'

-RPB-

PI Sta 6+44.58
Δ = 12° 53' 21.2" (LT)
D = 4° 28' 34.4"
L = 287.95'
T = 144.58'
R = 1,280.00'
Se = .06
Runoff = 144'

-L- NC24, -RPA- US 421/US 701, -RPB- US 421/US 701 & -Y51-

27-JUN-2013 14:00
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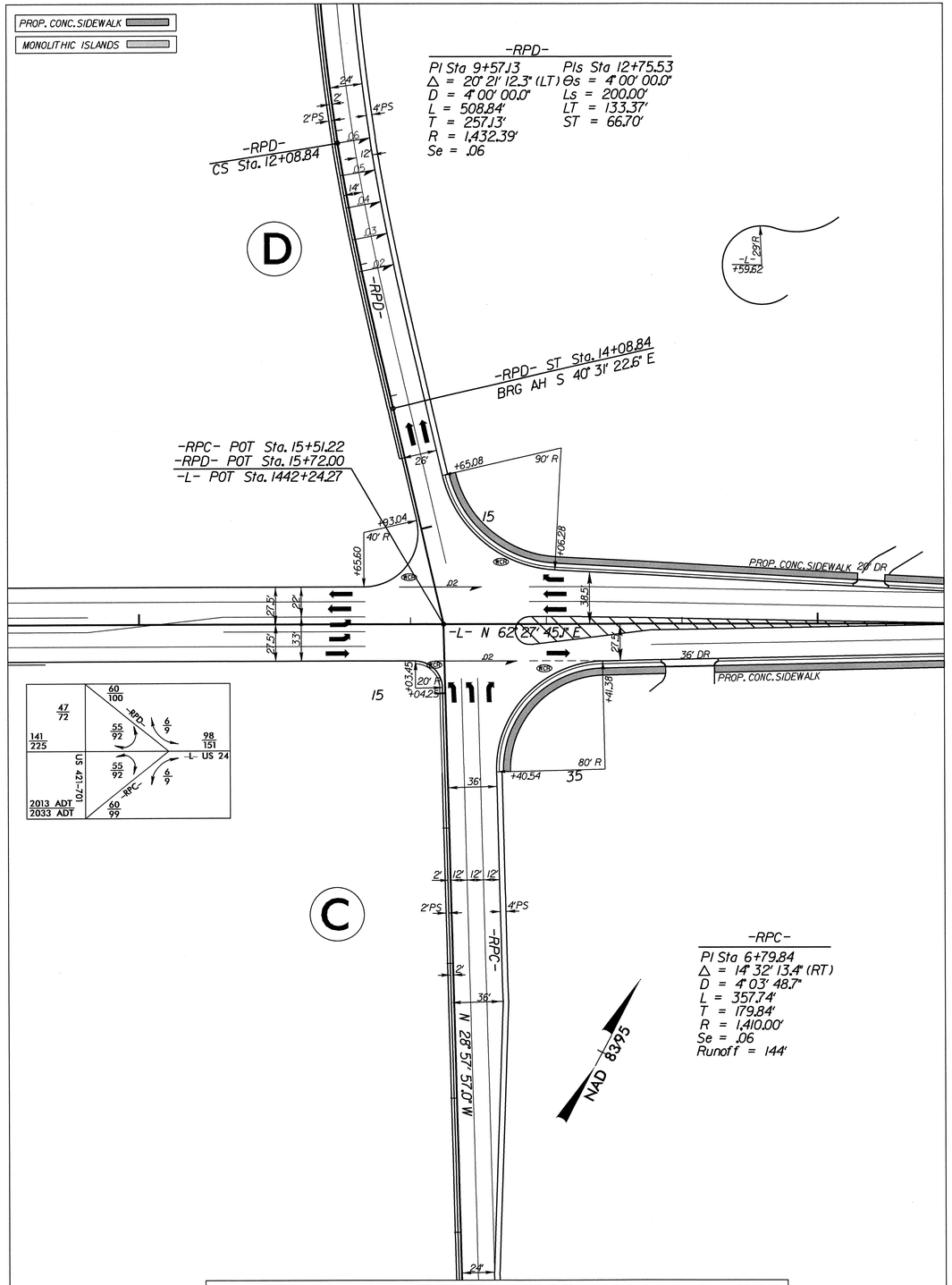
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-M
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

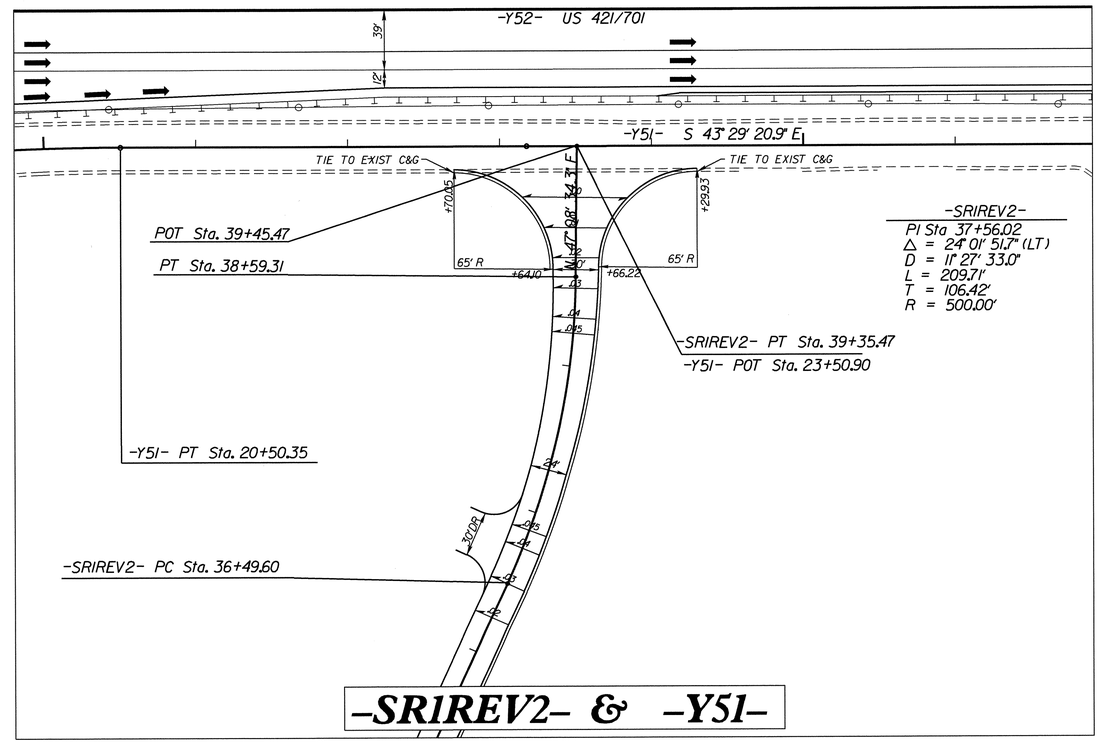
NORTH CAROLINA PROFESSIONAL SEAL 19903 ENGINEER GREGORY E. BREW
6-27-13

REVISIONS

8/17/99



-L- NC24, -RPD- US 421/US 701 & -RPC- US 421/US 701



-SRIREV2- & -Y51-

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-N

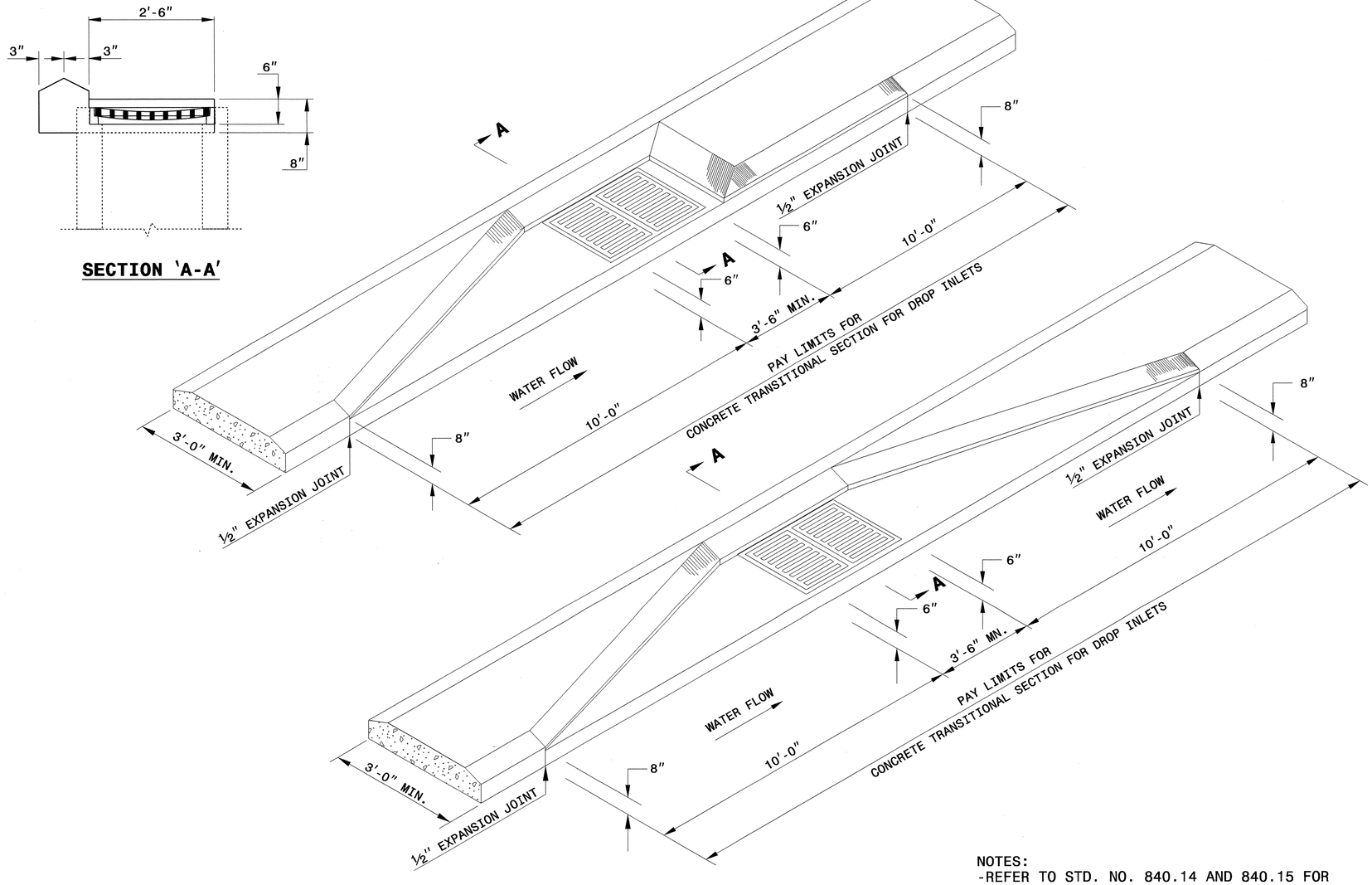
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

METHOD FOR PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS

SHEET 1 OF 1

852D06



NOTES:
-REFER TO STD. NO. 840.14 AND 840.15 FOR DRAINAGE STRUCTURE.
-REFER TO STD. NO. 840.16 FOR GRATE AND FRAME.

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

ENGLISH DETAIL DRAWING FOR

METHOD FOR PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS

SHEET 1 OF 1

852D06

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
7/11/13

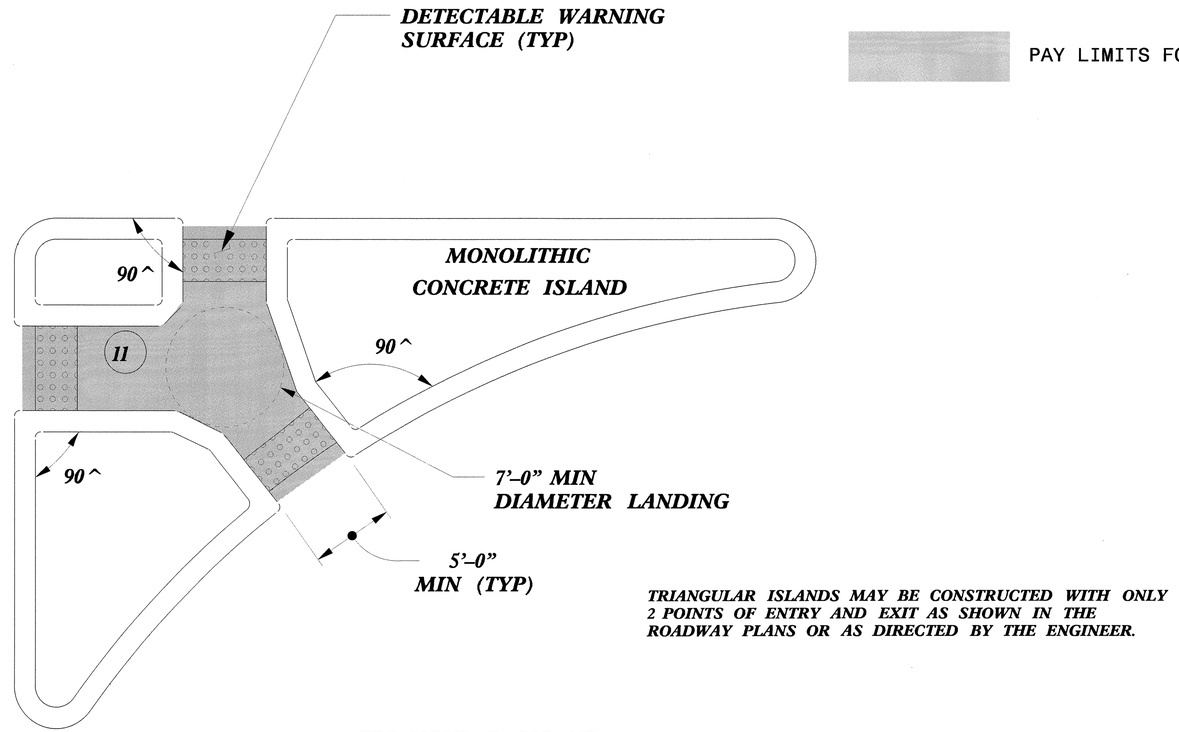
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE PLATE

ORIGINAL BY: KKEMPF DATE: 8/2/10
MODIFIED BY: DATE:
CHECKED BY: DATE: 4/24/13
FILE SPEC.: KKEMPF\ENGLISH\852D0601.DGN

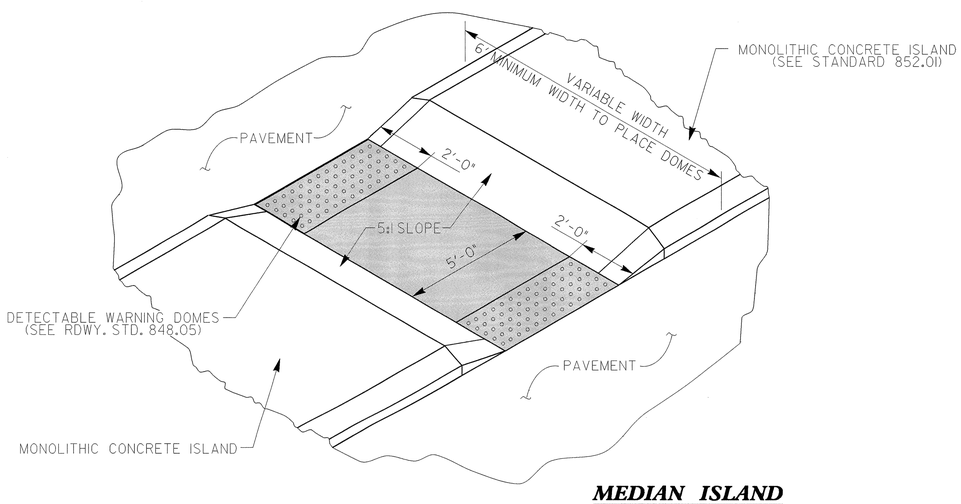
PROJECT REFERENCE NO.	SHEET NO.
R2303D	2-0

PAY LIMITS FOR 1 CURB RAMP

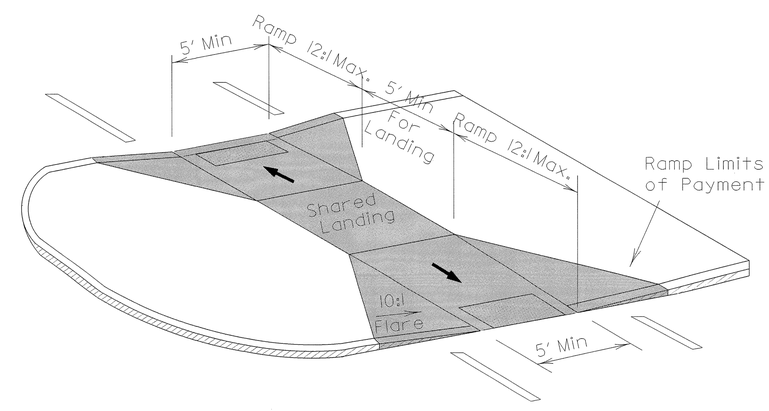


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

TRIANGULAR ISLAND WITH CUT THROUGH



MEDIAN ISLAND WITH CUT THROUGH



MEDIAN ISLAND CURB RAMPS

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOELS HOWERTON
7/11/13

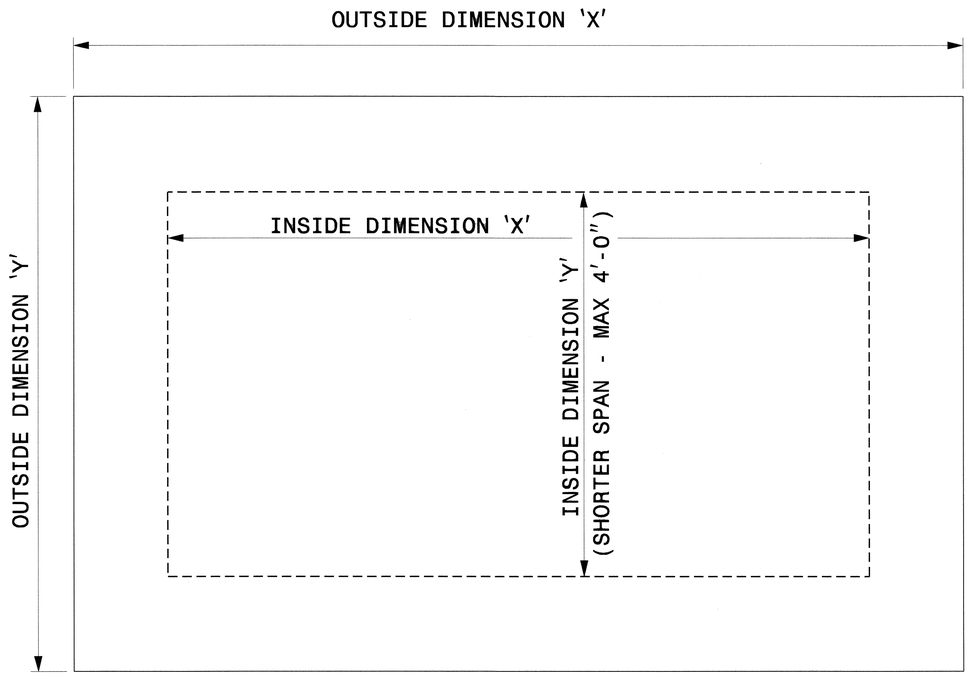
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

CURB RAMPS

Median or Turn Lane Islands

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: DATE:
CHECKED BY: DATE: 6/18/13
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

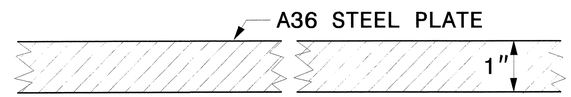
PROJECT REFERENCE NO.	SHEET NO.
R2303D	2-P



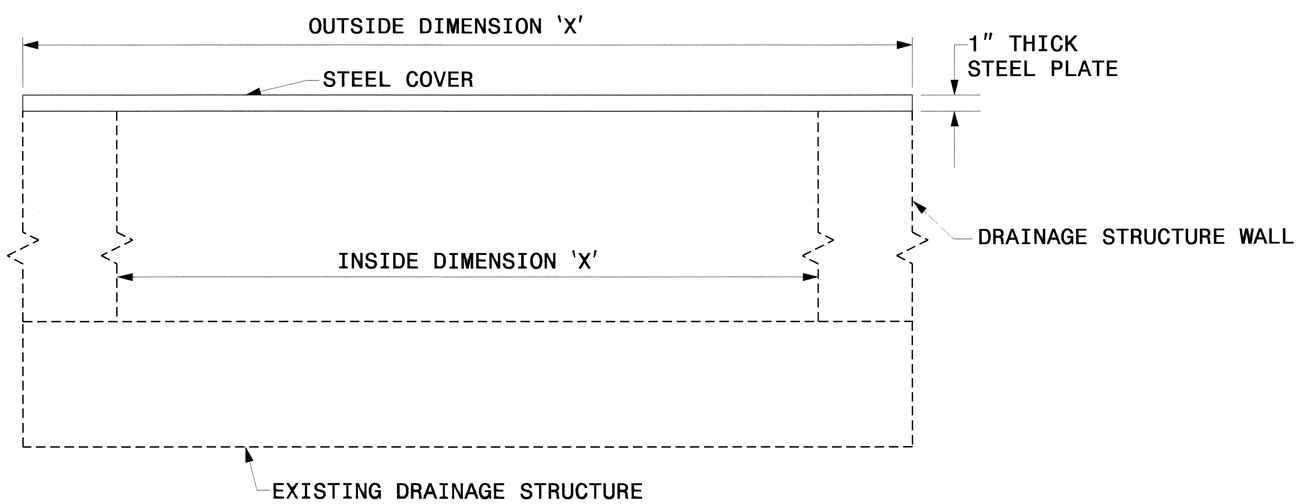
PLAN VIEWS

GENERAL NOTES:

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



SECTION VIEW OF STEEL TOP PLATE



ELEVATION VIEWS

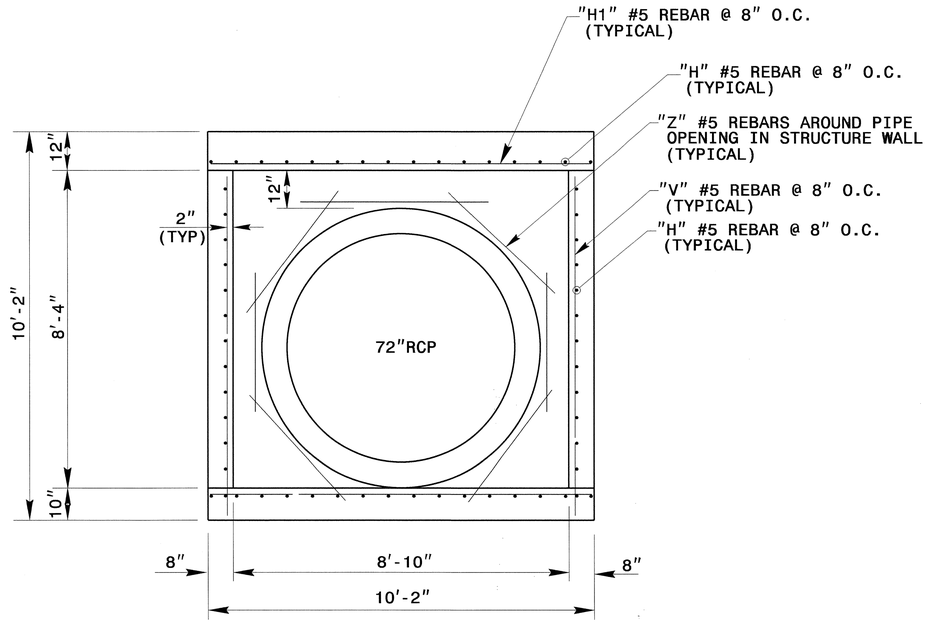
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 7/11/13

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

DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 04-29-04
CHECKED BY: [signature] DATE: 6/18/13
FILE SPEC.: details/nbritt/english/misc/steelcover.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-Q



SECTION A-A

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS OR BRICK/BLOCK WALLS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

BOX DIMENSIONS MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.

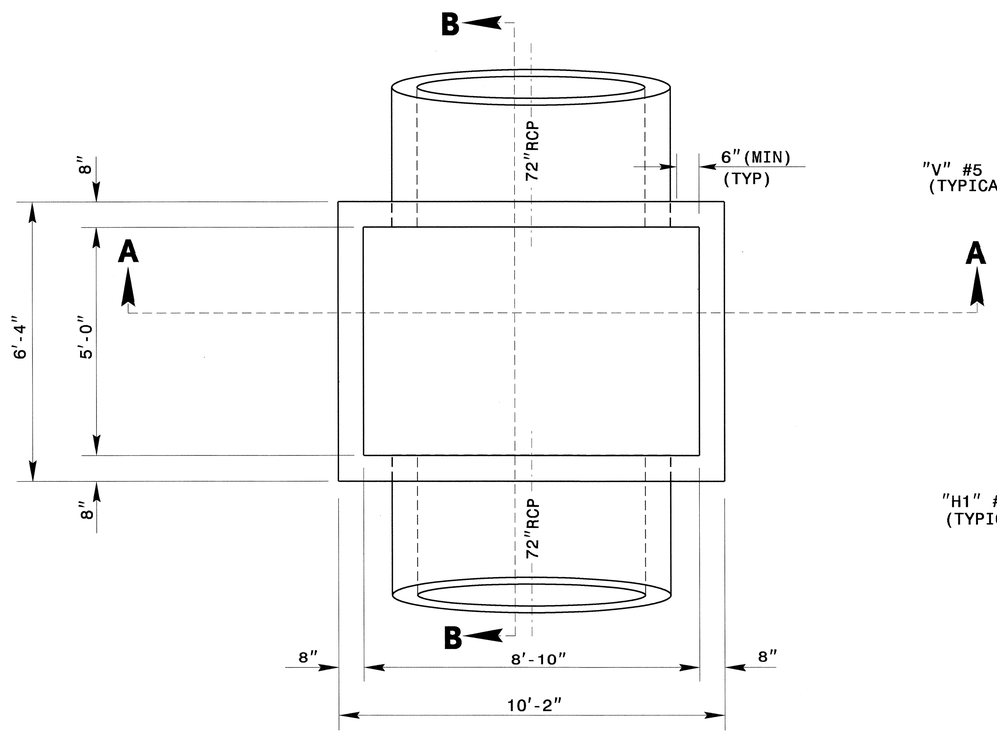
2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

BILL OF MATERIALS

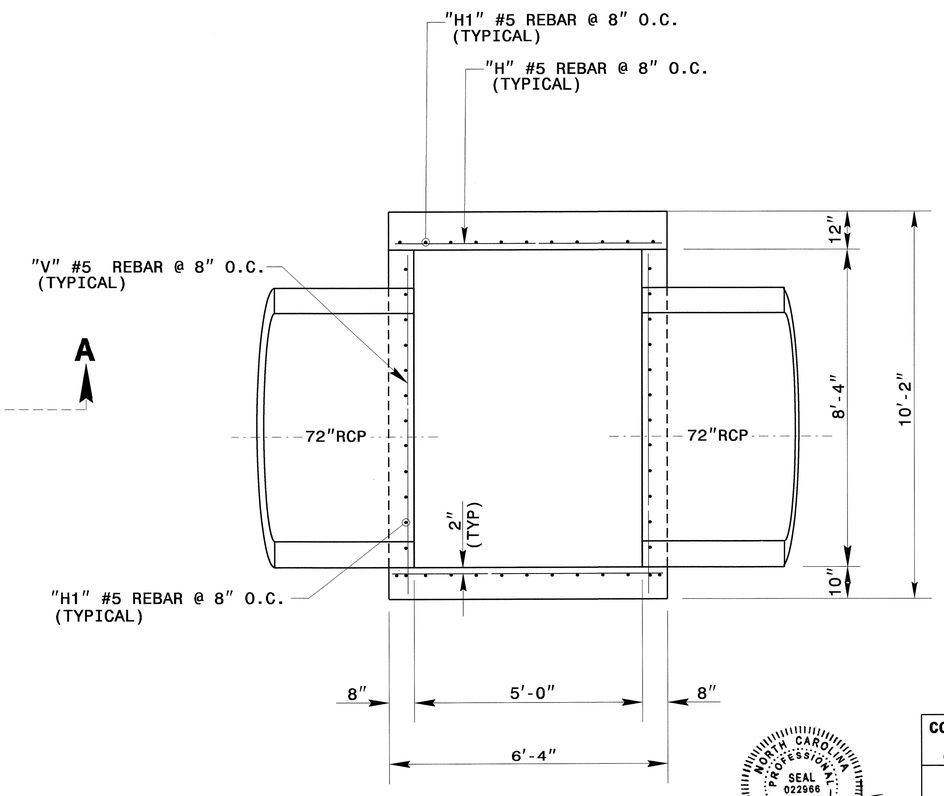
BAR	NO.	SIZE	LENGTH	WEIGHT
H	42	#5	8'-10"	387
H1	48	#5	8'-6"	426
V	54	#5	7'-6"	423
Z	14	#5	5'-0"	74
TOTAL REINF. STEEL (LBS.)				1310
TOTAL CONC. (CU. YDS.)				* 11.8

* NO DEDUCTION HAS BEEN MADE FOR PIPES

* 2.00 CU. YD. DEDUCTION FOR 2-72" RC PIPE



PLAN VIEW



SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
THIS DOCUMENT HAS BEEN ELECTRONICALLY SEALED
7/11/13

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

SPECIAL JUNCTION BOX WITH SLAB LID

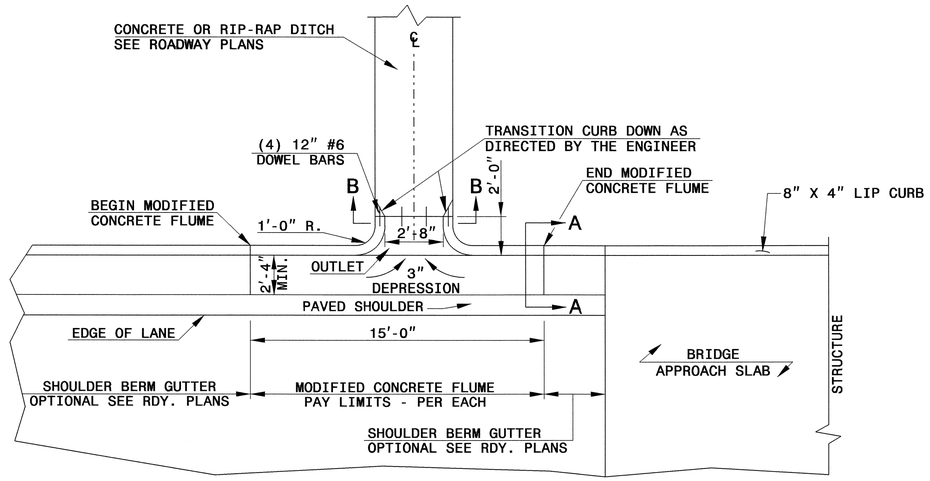
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: nbritt DATE: 04/17/09
CHECKED BY: [signature] DATE: 6/25/13
FILE SPEC.: detail/nbritt/english/rural/r2417c72jb.dgn

5/14/99
SYSTIME= 11:14
USERNAME= DUCNGUYEN

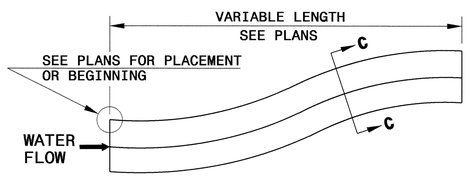
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-R

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

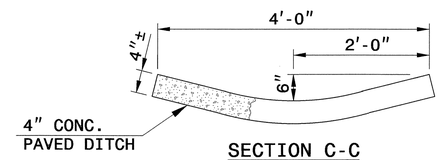
ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH



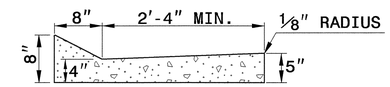
PLAN VIEW



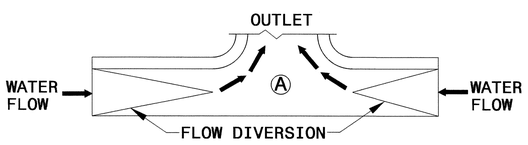
DOWNGRADE OR SAG



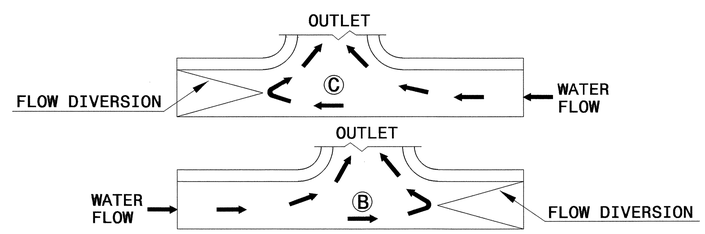
SECTION C-C



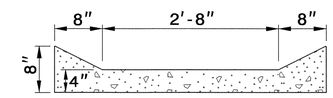
SECTION A-A



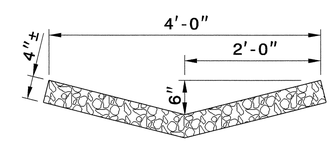
SAG



DOWN GRADE



SECTION B-B



RIP-RAP LINED DITCH

FLOW DIVERSION EXAMPLES

NOTES:

- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDER BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
- CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
- CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
- CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18" PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
- MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.

SHEET 1 OF 1
MODFLMDTCH

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

ENGLISH DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH

SHEET 1 OF 1
MODFLMDTCH

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
7/11/13

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. Ward DATE: Apr. 2002
MODIFIED BY: E.E. Ward DATE: July 2004
CHECKED BY: [signature] DATE: 6/25/13
FILE SPEC.: w:details\stand\modifiedflume.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-S

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

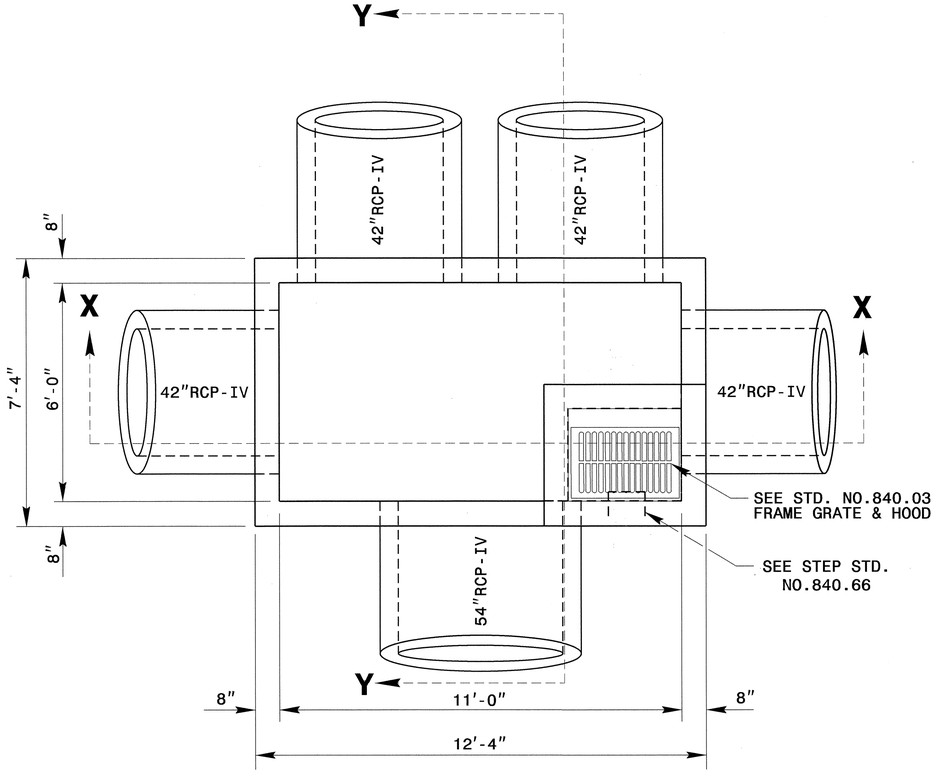
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

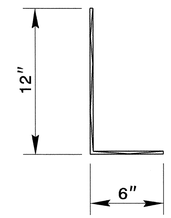
INSTALL CATCH BASIN IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.

CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.



PLAN VIEW



DOWEL

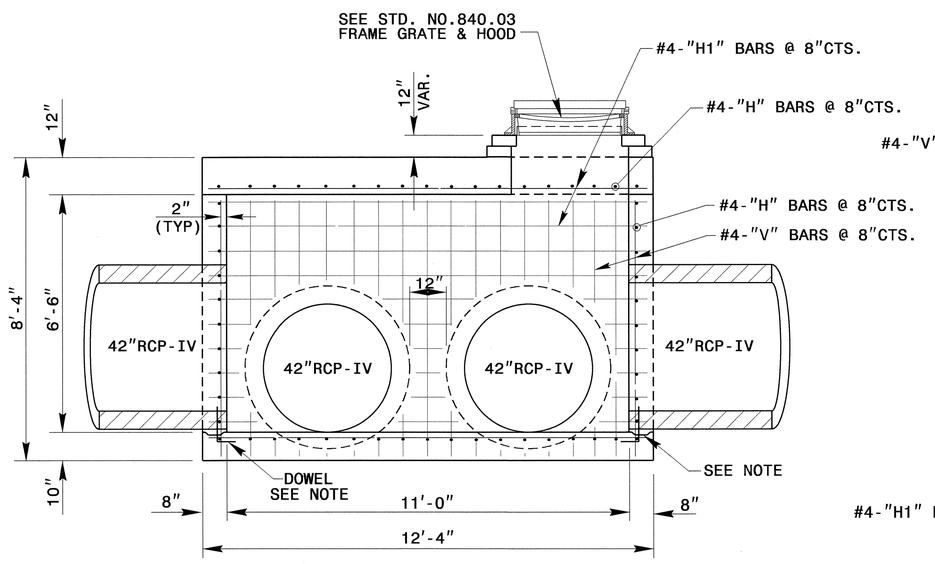
SEE NOTE

BILL OF MATERIALS

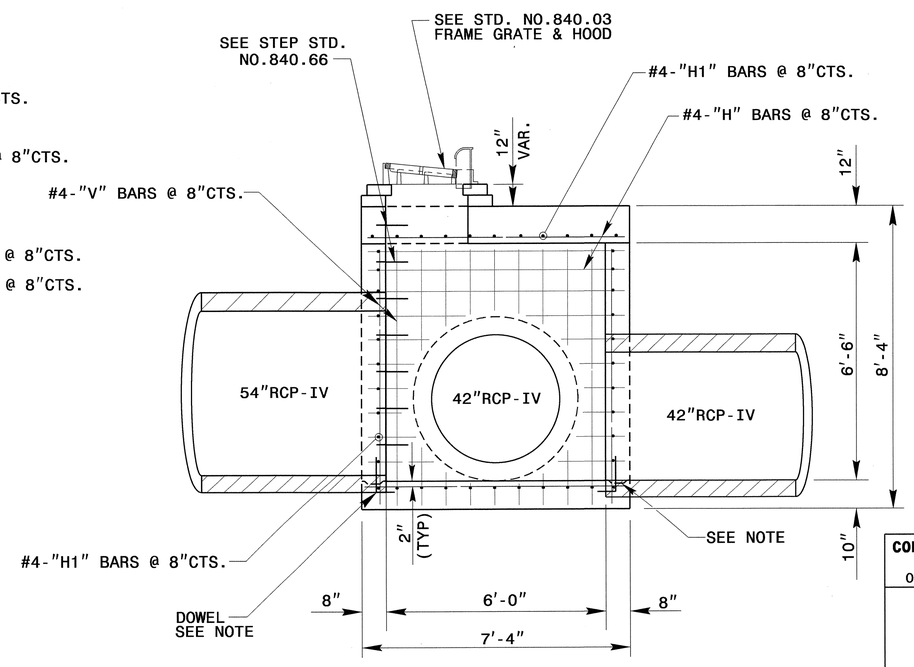
BAR	NO.	SIZE	LENGTH	WEIGHT
H	56	#4	7'-0"	262
H1	42	#4	12'-0"	337
V	54	#4	7'-0"	253
TOTAL REINF. STEEL (LBS.)				852
TOTAL CONC. (CU. YDS.)				12
CONCRETE DEDUCTION FOR PIPES (CU. YDS.)				-2.2
TOTAL CONC. (CU. YDS.)				9.8

* 0.30 CU. YD. PER FOOT OF RISER HEIGHT

* 0.6 CU. YD. DEDUCTION FOR 1-54" RCP-IV
* 1.6 CU. YD. DEDUCTION FOR 4-42" RCP-IV



SECTION X-X



SECTION Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 19761 ENGINEER CYNTHIA B. PERRY
7/19/13

STR.#2703

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6900 FAX 919-250-4119

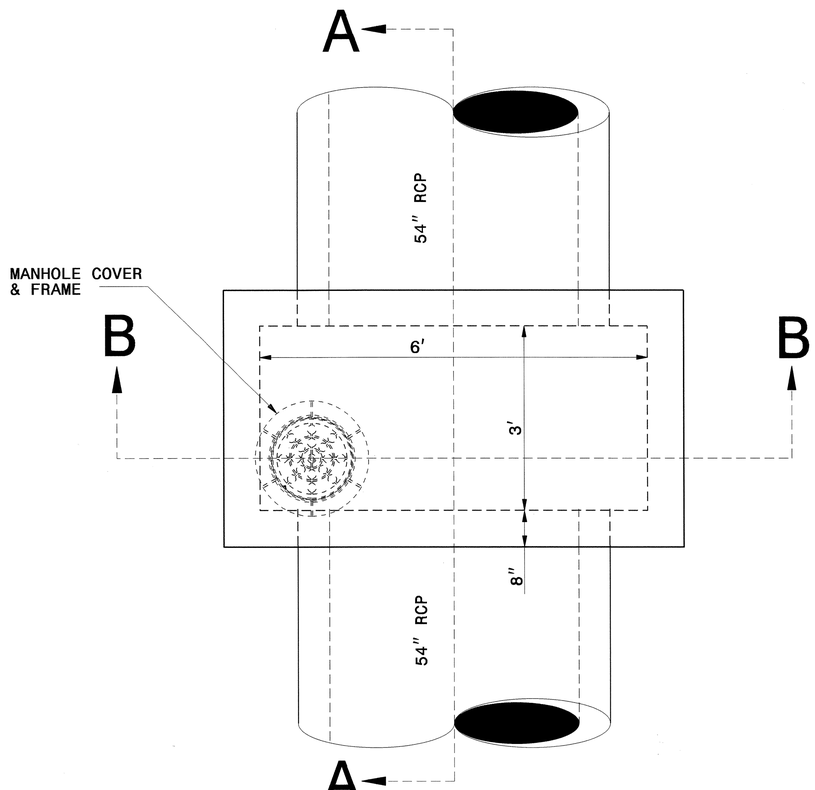
SPECIAL CATCH BASIN

ORIGINAL BY: DATE:
MODIFIED BY: nbritt DATE: 07/17/2013
CHECKED BY: DATE: 7/22/13
FILE SPEC.: detail/nbritt/english/rural/r2303d 54 cb.dgn

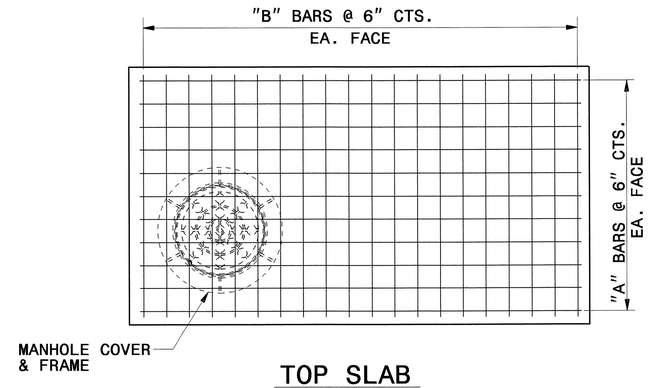
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-T

NOTES:

1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORADANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS.
3. CONSTRUCT BOTTOM SLAB WITH FORMS.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES.
5. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 2" CLEARANCE AROUND PIPES OR AS DIRECTED BY THE ENGINEER.



PLAN

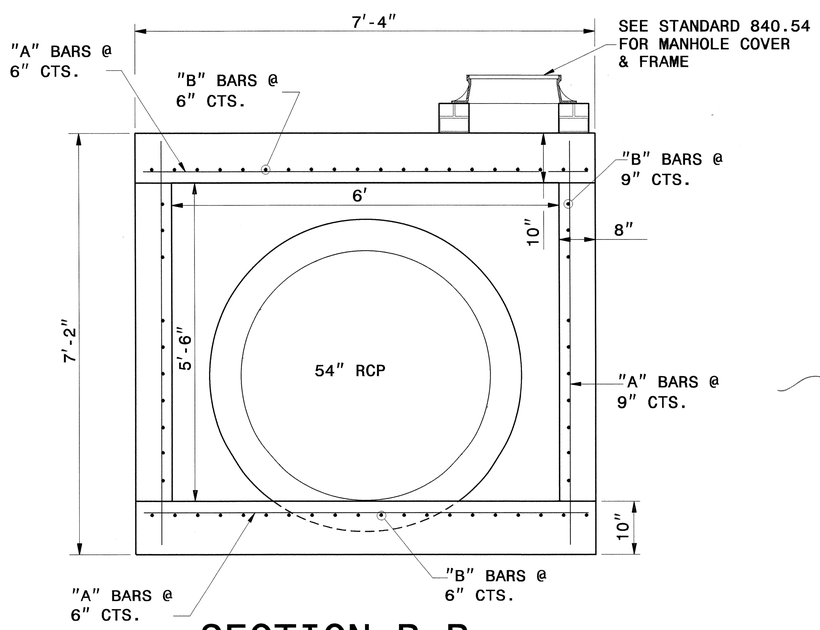


TOP SLAB

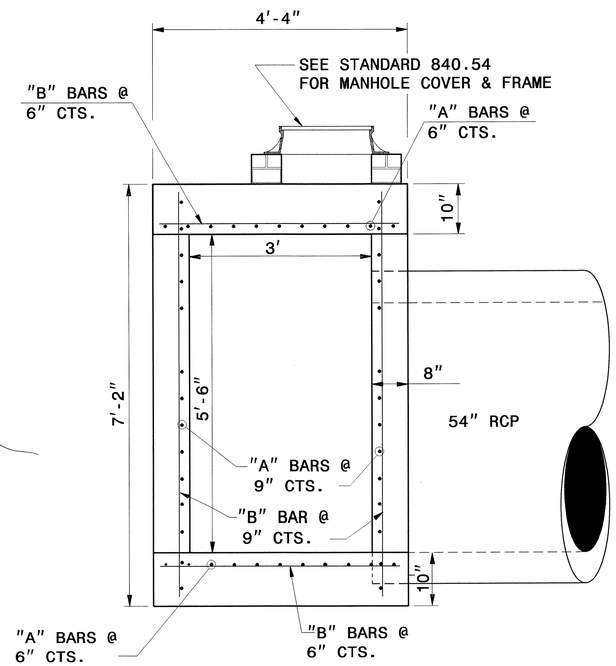
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	42	#4	7'	197
B	54	#4	4'	145
C	28	#4	6'-10"	128
TOTAL REINF. STEEL (lbs.)				470
TOTAL CONC. (CY)				4.8

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES.



SECTION B-B



SECTION A-A

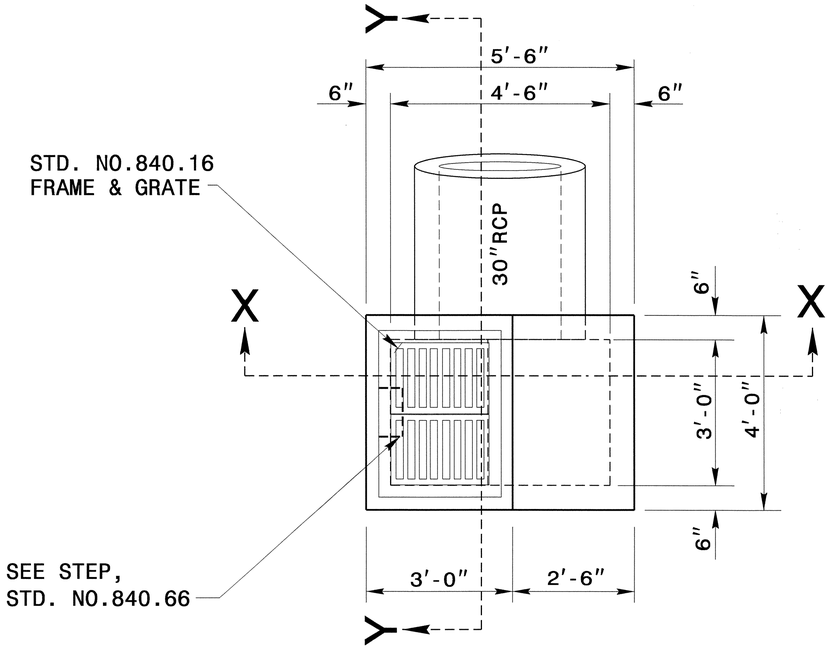
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 7/11/13

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

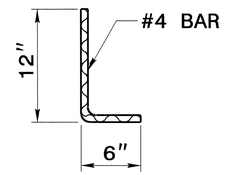
TRAFFIC BEARING JUNCTION BOX

ORIGINAL BY: rnbritt DATE: 10-11-04
MODIFIED BY: tspell DATE: 04-15-09
CHECKED BY: [signature] DATE: 6/25/13
FILE SPEC.: details/nbritt/metric/hydro/tbjb1200_375.dgn

PROJ. REFERENCE NO.	SHEET NO.
R-2303D	2-U



PLAN



DOWEL

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

CONSTRUCT WITH PIPE CROWNS MATCHING.

INSTALL STONE DRAINS, OF A MINIMUM OF 1 CUBIC FOOT OF NO. 78M STONE IN A POROUS FABRIC BAG OR WRAP, AT EACH WEEP HOLE OR AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 1".

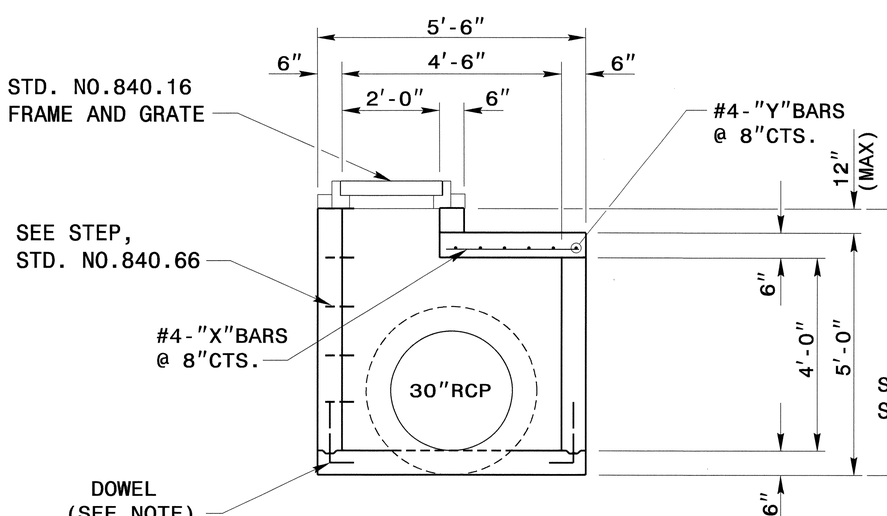
DRAWING NOT TO SCALE.

DIMENSIONS MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.

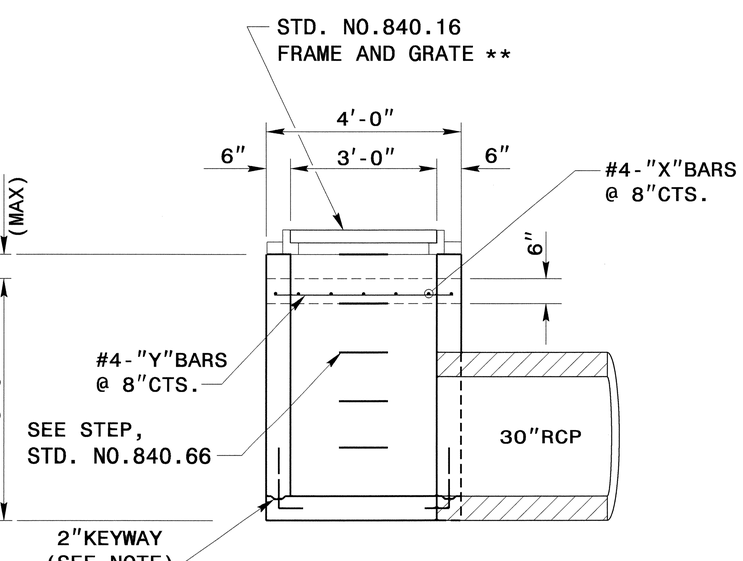
BILL OF MATERIAL

BAR	SIZE	NO.	LENGTH	WEIGHT
X	#4	7	2'-8"	13
Y	#4	6	3'-8"	15
TOTAL REINF. STEEL (lbs.)				28
DEDUCTION FOR PIPE 1 @ 30"RCP (cu. yds.)				-0.2
CLASS "B" CONC. (cu. yds.)				2.1

** NO CONCRETE DEDUCTION MADE FOR GRATE OPENING.



SECTION X-X



SECTION Y-Y

STRUCTURES,
NO.2423 AND NO.2427

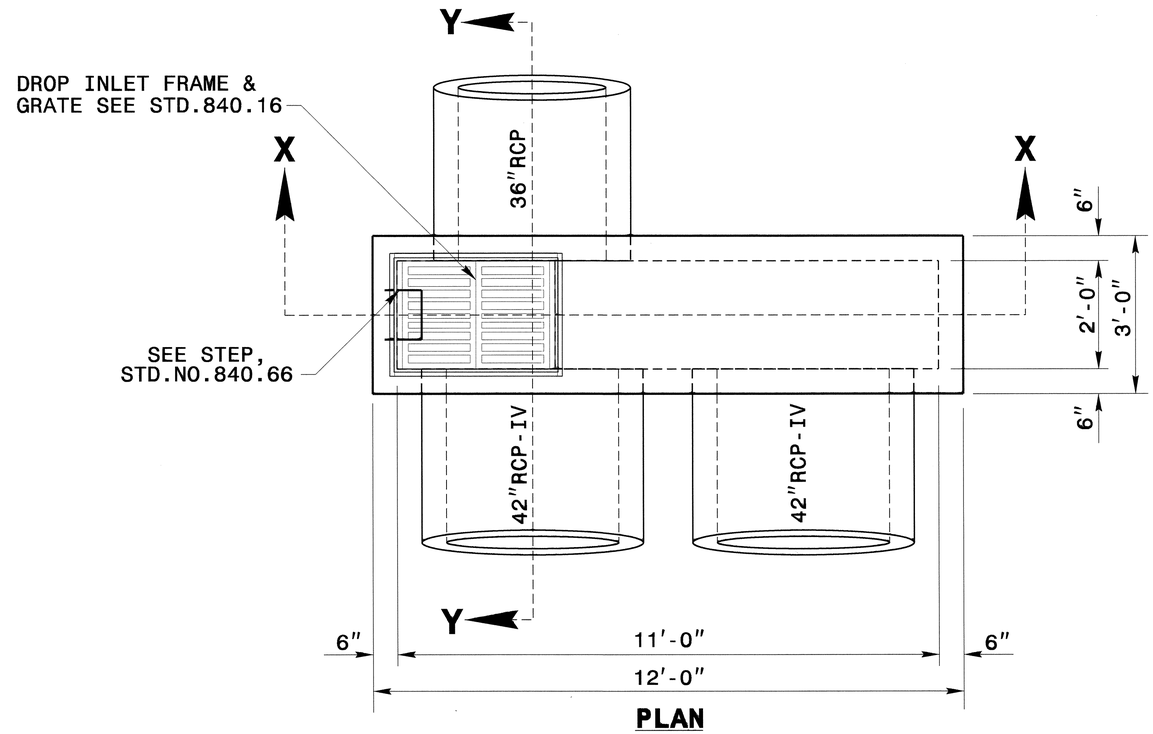
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 7/11/13

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

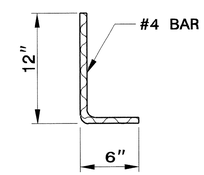
DRAINAGE STRUCTURE DETAIL

ORIGINAL BY: DATE:
MODIFIED BY: rnbritt DATE: 06-25-13
CHECKED BY: DATE:
FILE SPEC.: detail/nbritt/english/rural/r2303d 30di.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-V



PLAN



DOWEL

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

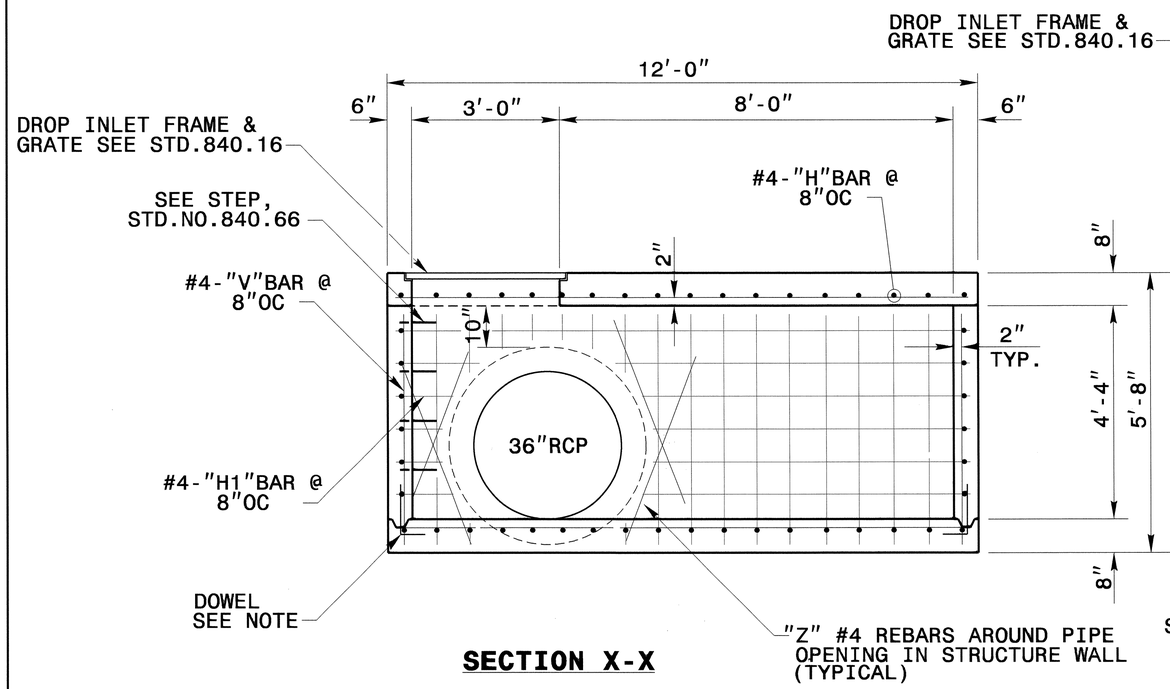
ADJUST REINFORCING STEEL AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 1".

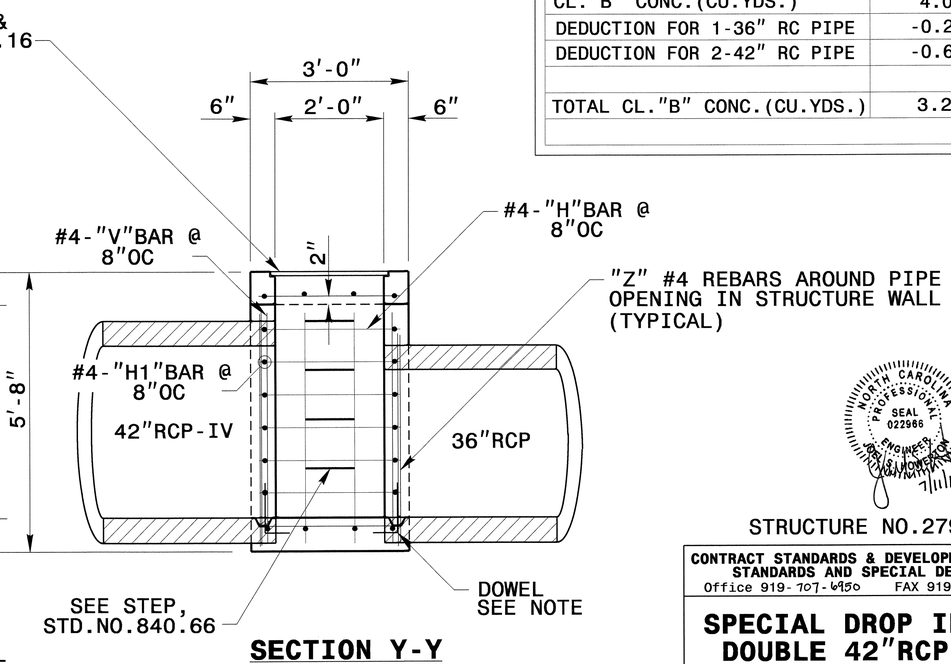
MINIMUM OF 2" COVERAGE ON ALL REBAR.

BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	48	#4	2'-8"	86
H1	20	#4	11'-8"	156
V	40	#4	4'-4"	116
Z	12	#4	4'-0"	32
TOTAL REINF. STEEL (LBS.)				390
CL."B" CONC.(CU.YDS.)				4.0
DEDUCTION FOR 1-36" RC PIPE				-0.2
DEDUCTION FOR 2-42" RC PIPE				-0.6
TOTAL CL."B" CONC.(CU.YDS.)				3.2



SECTION X-X



SECTION Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
7/11/13

STRUCTURE NO.2794

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

SPECIAL DROP INLET DOUBLE 42"RCP-IV

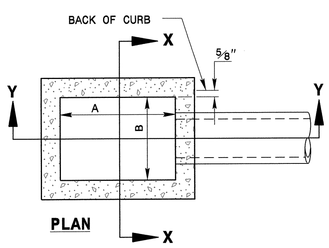
ORIGINAL BY:		DATE:	
MODIFIED BY:	rnbritt	DATE:	06-19-13
CHECKED BY:		DATE:	
FILE SPEC.:	details/nbritt/english/rural/r2303d double 42di.dgn		

5-14-99

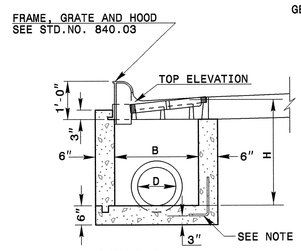
USER NAME = USERNAME
DGN = ****
TIME = ****

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

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE



PLAN



SECTION X-X

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

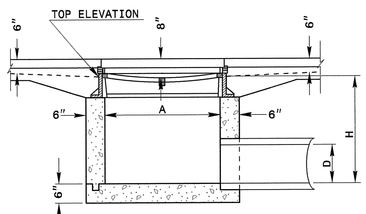
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

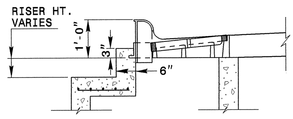
CONSTRUCT WITH PIPE CROWNS MATCHING.

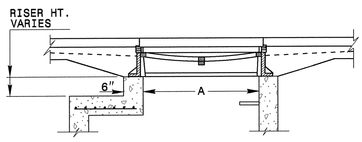
CHAMFER ALL EXPOSED CORNERS 1".

DRAWING NOT TO SCALE.

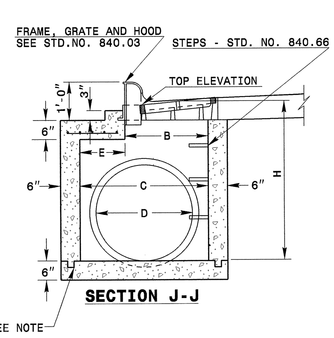


SECTION Y-Y

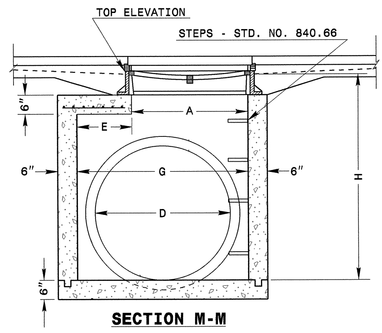




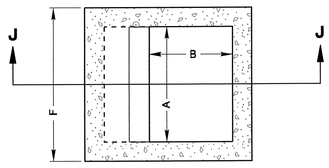
DETAIL SHOWING METHOD OF RISER CONSTRUCTION



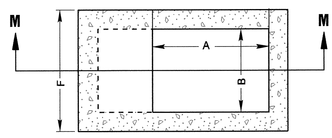
SECTION J-J



SECTION M-M



PLAN

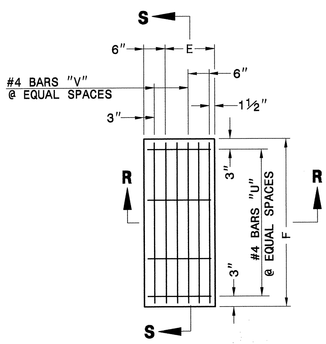


PLAN

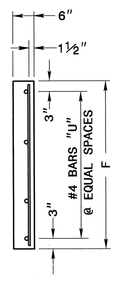
SHEET 1 OF 2
840D02

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

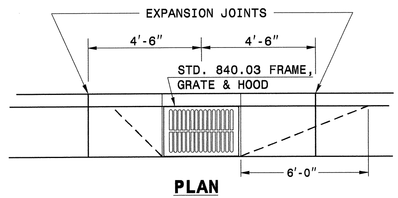
ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE



PLAN OF TOP SLAB

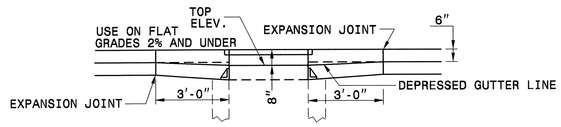


SECTION S-S



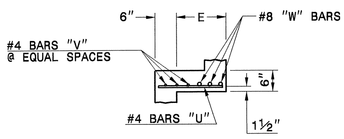
PLAN

CURB AND GUTTER WITH CATCH BASIN ON STEEP GRADES

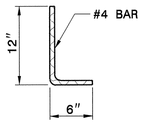


ELEVATION

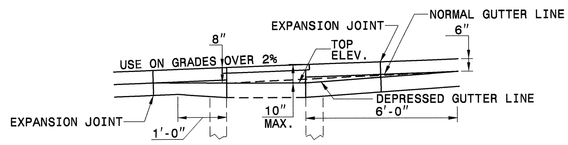
NORMAL CURB AND GUTTER ON LIGHT GRADES



SECTION R-R



DOWEL



ELEVATION

NORMAL CURB AND GUTTER ON STEEP GRADES

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

DIMENSIONS OF BOX AND PIPE						COVER DIMENSION		BARS-U		BARS-V		BARS-W		TOTAL LBS.	CU.YDS. CONC. IN BOX			DEDUCTIONS ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN. HEIGHT										TOP SLAB	BOTTOM SLAB	TOT. CONC. FOR MINIMUM HEIGHT, H		
D	A	B	C	G	H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH					C.M.	R.C.
12"	3'-0"	2'-2"	--	--	2'-9"	--	--	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15"	3'-0"	2'-2"			3'-0"											0.235	0.829	0.023	0.036
18"	3'-0"	2'-2"			3'-3"											0.235	0.887	0.033	0.049
24"	3'-0"	2'-2"			3'-9"											0.235	1.001	0.059	0.085
30"	3'-0"	2'-2"	3'-4"	3'-4"	4'-3"	1'-2"	4'-0"	4	1'-5"	2	3'-9"	3	3'-9"	39	0.123	0.321	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"	3'-10"	4'-9"	1'-8"	4'-0"	4	1'-11"	3	3'-9"	3	3'-9	43	0.161	0.358	1.714	0.132	0.178
42"	3'-0"	2'-2"	4'-5"	4'-5"	5'-3"	1'-5"	3'-2"	4	1'-8"	2	2'-11"	3	2'-11"	32	0.112	0.318	1.738	0.180	0.243
48"	3'-0"	2'-2"	5'-0"	5'-0"	5'-9"	2'-0"	3'-2"	4	2'-3"	3	2'-11"	3	2'-11"	35	0.145	0.352	2.052	0.235	0.317
54"	3'-0"	2'-2"	5'-7"	5'-7"	6'-3"	2'-7"	3'-2"	4	2'-10"	5	2'-11"	3	2'-11"	41	0.180	0.386	2.387	0.297	0.401

* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

SHEET 2 OF 2
840D02

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

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

SHEET 2 OF 2
840D02

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

ORIGINAL BY: 2002 Std.840.01 DATE:
MODIFIED BY: E.E. WARD DATE: 3-1-02
CHECKED BY: DATE: 6/24/13
FILE SPEC.: s:\details\stand\840d01.dgn

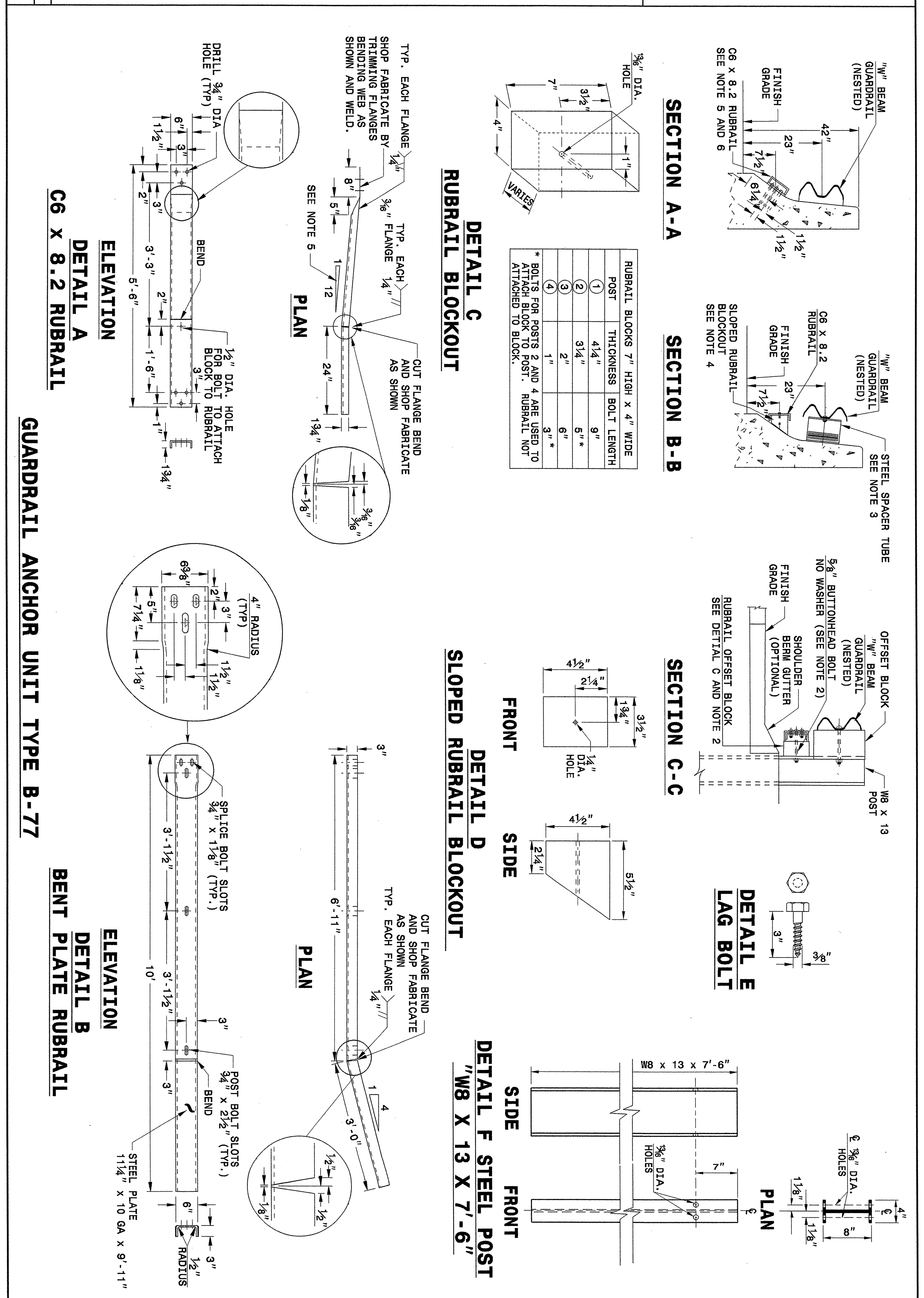
SEE PLATE FOR TITLE

NORTH CAROLINA PROFESSIONAL SEAL 02986 ENGINEER JOHN D. WILLIAMSON

PROJECT REFERENCE NO. R-2303D
SHEET NO. 2-W

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-X

SHEET 5 OF 7 862D03
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNIT GUARDRAIL ANCHOR UNIT TYPE B-77 FOR F-SHAPE BARRIER

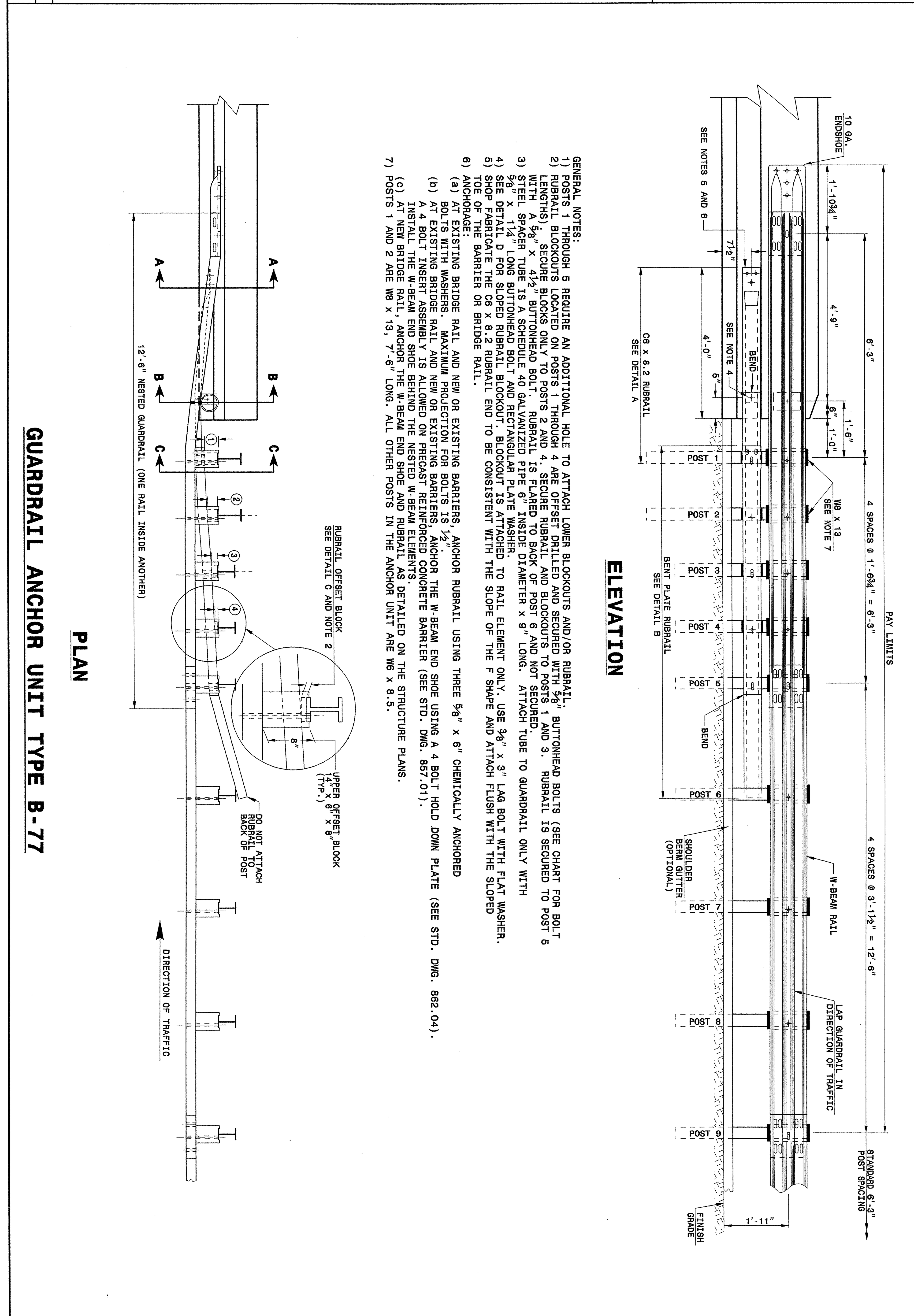


SHEET 5 OF 7
862D03

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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 4 OF 7 862D03
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR GUARDRAIL ANCHOR UNIT GUARDRAIL ANCHOR UNIT TYPE B-77 FOR F-SHAPE BARRIER



SHEET 4 OF 7
862D03

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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966
7/11/13

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

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET
R-2303D	2-Y

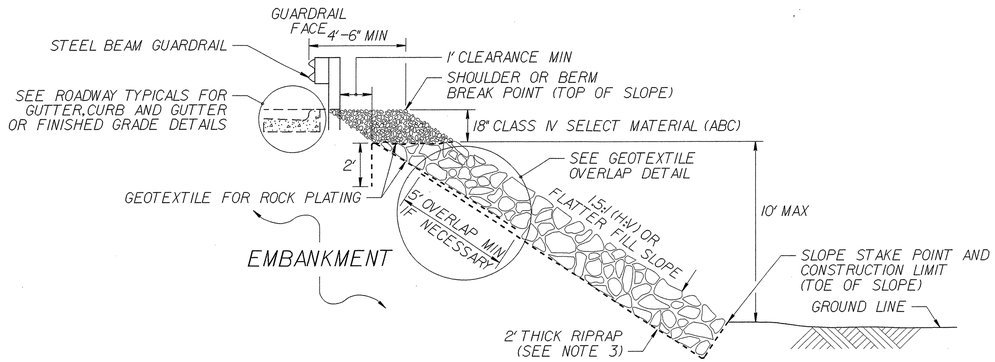
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

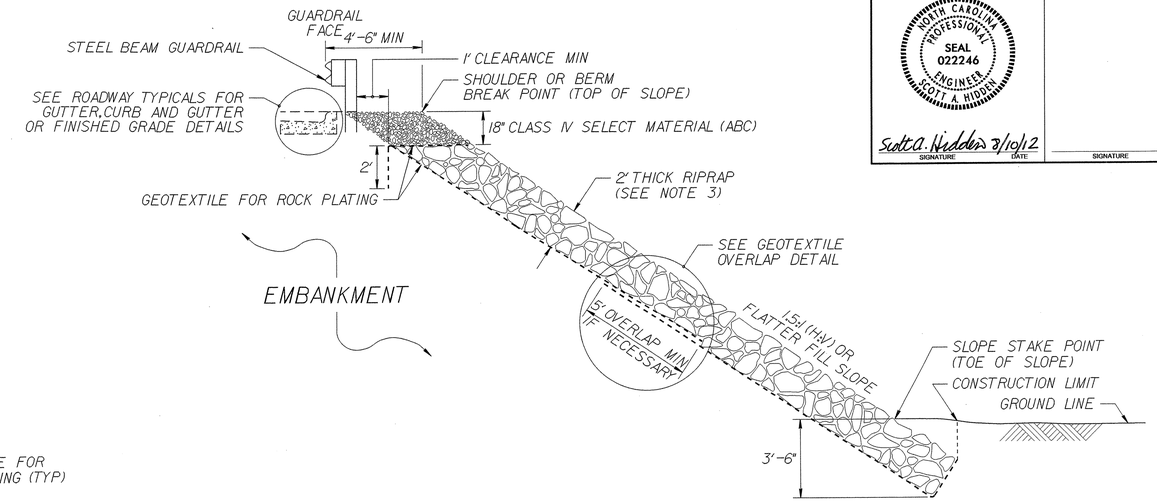
Scott A. Hidden 8/10/12
SIGNATURE DATE

ENGINEER

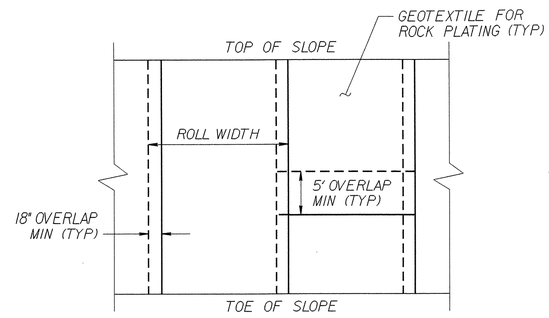
SIGNATURE DATE



ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION

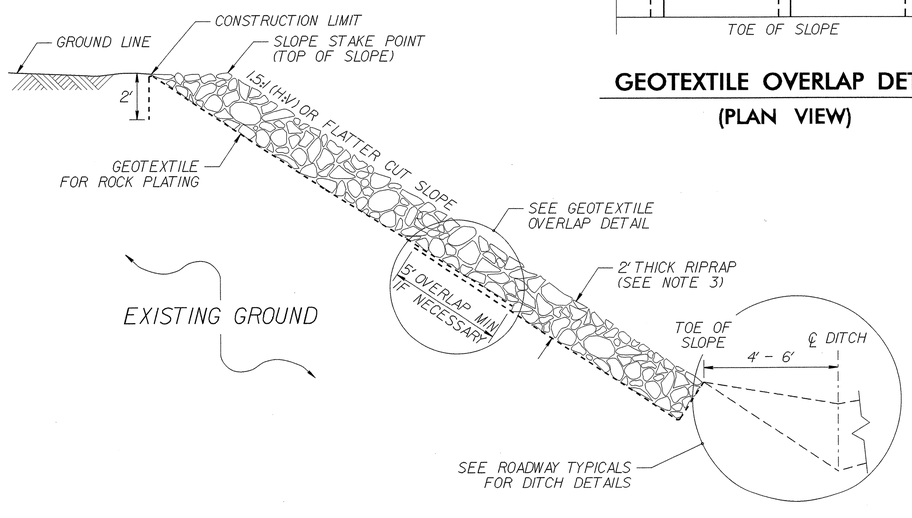


ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION

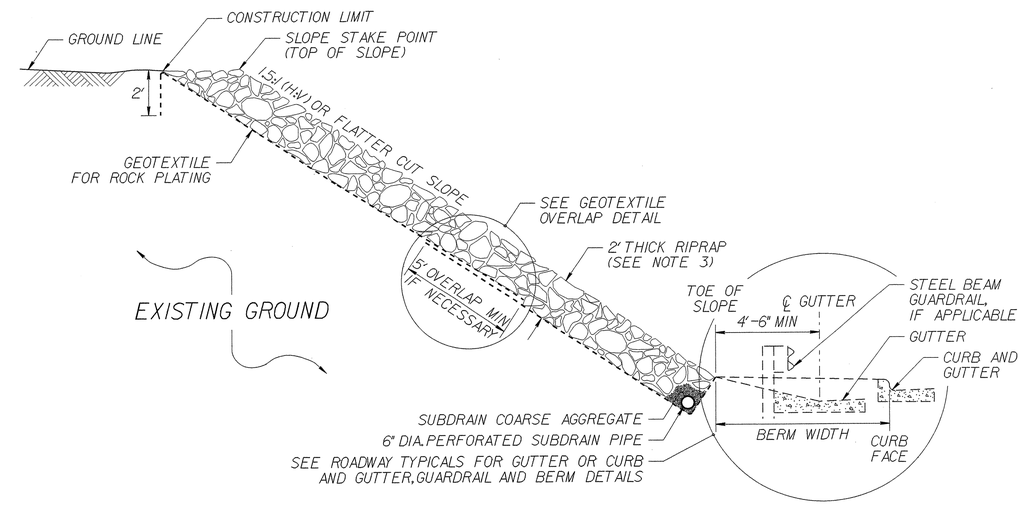


GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)



ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR STANDARD ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS I, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1802.01

STANDARD ROCK PLATING

DATE: 2-19-13

PROJECT REFERENCE NO.	SHEET
R-2303D	2-Z

GEOTECHNICAL ENGINEER

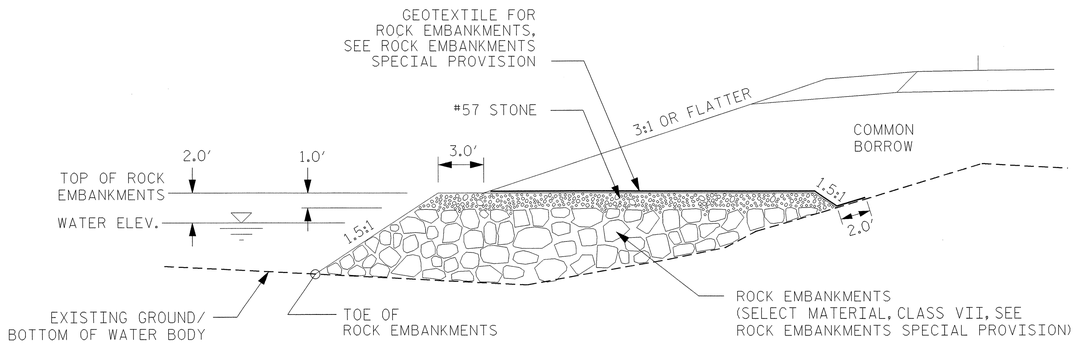
NORTH CAROLINA PROFESSIONAL SEAL 038175 ENGINEER SHIHAI ZHANG

6-14-2013

SIGNATURE DATE

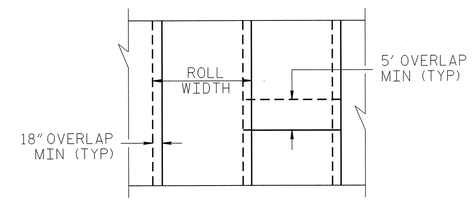
ENGINEER

SIGNATURE DATE



ROCK EMBANKMENTS TYPICAL CROSS SECTION

NOT TO SCALE



GEOTEXTILE FOR ROCK EMBANKMENTS OVERLAP DETAIL

(PLAN VIEW)

ROCK EMBANKMENTS				
BEGIN	END	LOCATION	EST. WATER ELEV.	TOP OF ROCK EMBANKMENTS
1297+25± -L-	1299+25± -L-	RT	86.9 FT.	88.9 FT.

ESTIMATED QUANTITIES	
ROCK EMBANKMENTS	5,000 TONS
#57 STONE	2,400 TONS
GEOTEXTILE FOR ROCK EMBANKMENTS	2,600 SY

FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS SPECIAL PROVISION.

THE ESTIMATED QUANTITIES OF #57 STONE INCLUDE ADDITIONAL TONNAGE FOR FOR FILLING OF GAPS BETWEEN SELECT MATERIAL, CLASS VII.

PREPARED BY: S. ZHANG	DATE: 10/2012
REVIEWED BY: J. BATTS	DATE: 10/2012

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

ROCK EMBANKMENTS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PROJECT REFERENCE NO.	SHEET
R-2303D	2-AA

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

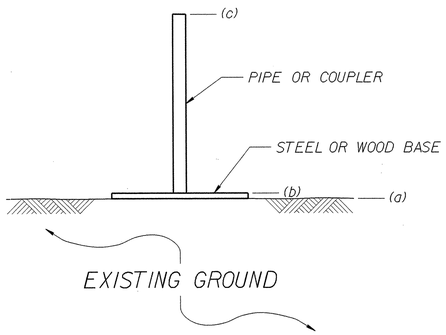
Scott A. Hidden 8/14/12

SIGNATURE DATE

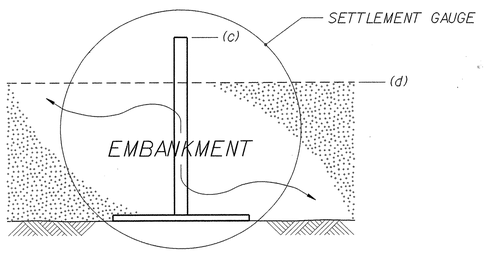
ENGINEER

SIGNATURE DATE

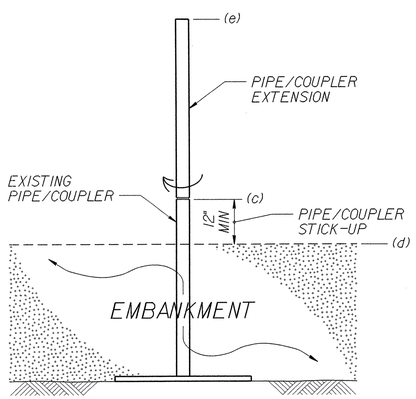
EMBANKMENT MONITORING SEQUENCE



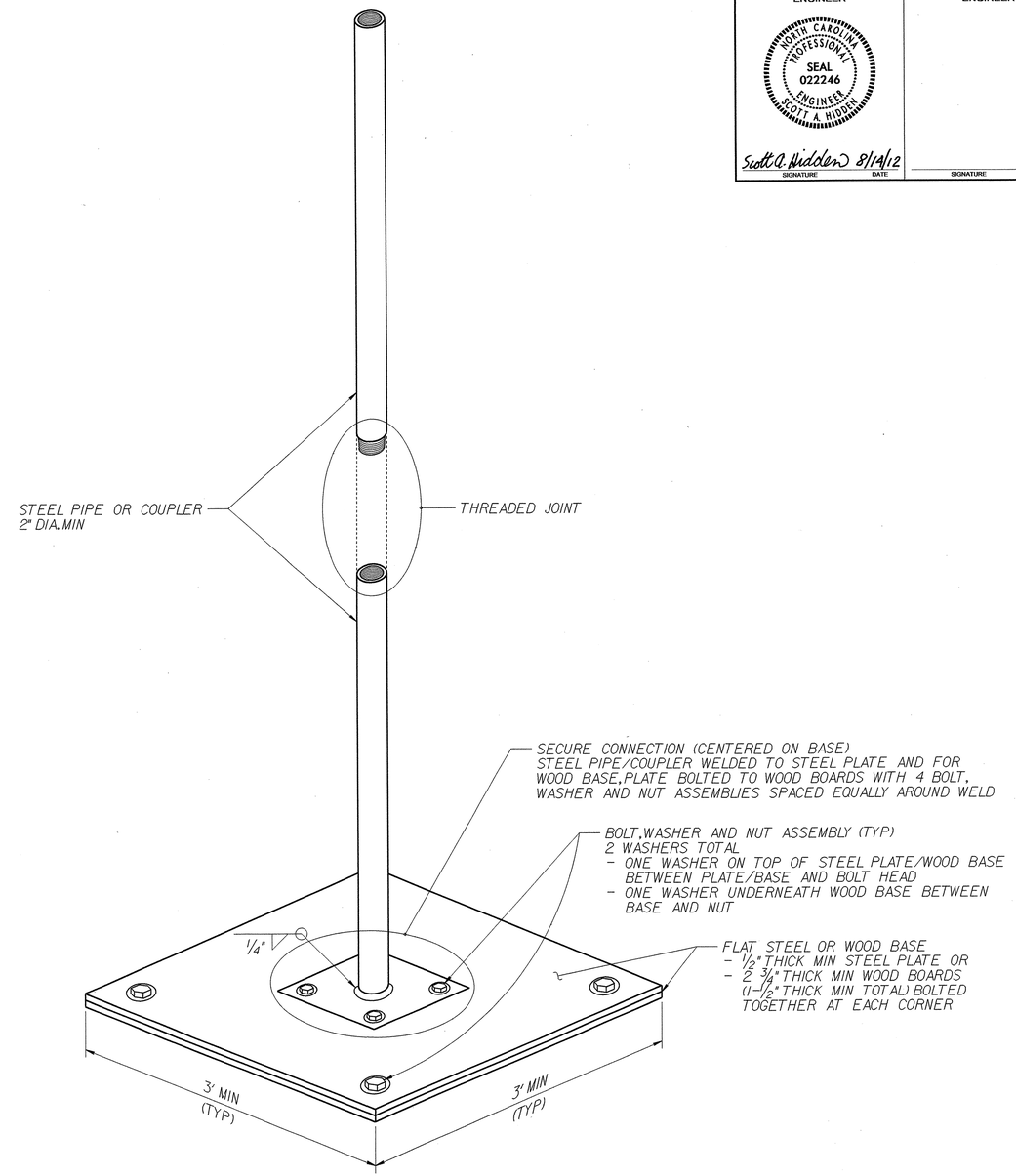
1. PLACE STEEL/WOOD BASE AT APPROXIMATE GAUGE LOCATIONS SHOWN IN THE PLANS AS DETERMINED BY THE ENGINEER.
2. SET BASE ON LEVEL GROUND SO PIPE/COUPLER IS PLUMB.
3. BEFORE CONSTRUCTING EMBANKMENT, NOTIFY ENGINEER TO SURVEY AND RECORD THE FOLLOWING:
   (a) EXISITING GROUND ELEVATION,
   (b) TOP OF BASE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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1804.01

STANDARD EMBANKMENT MONITORING

DATE: 2-19-13

PROJECT REFERENCE NO.	SHEET
R2303D	2-AB

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

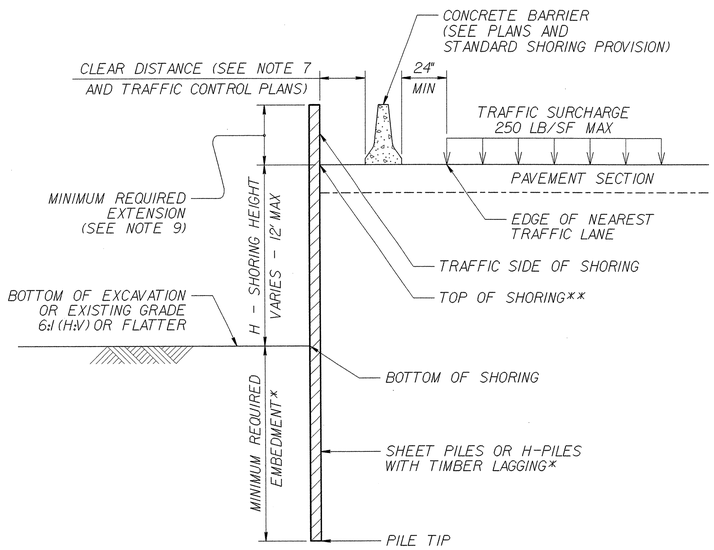
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

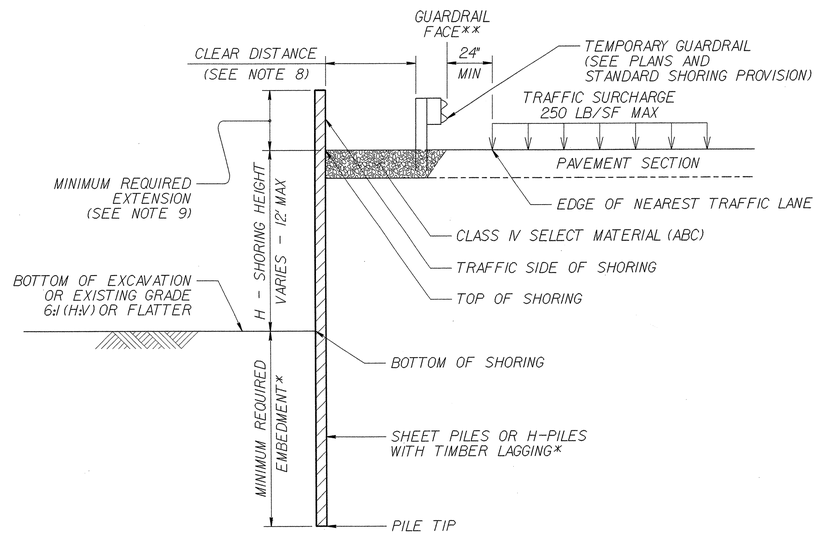
NOTES:

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



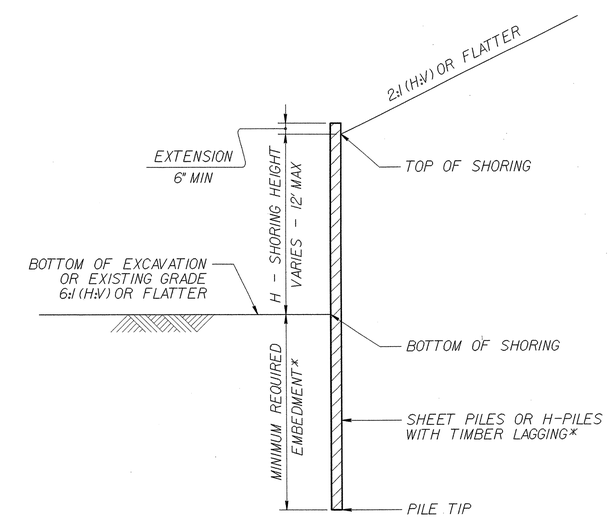
CONCRETE BARRIER

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



TEMPORARY GUARDRAIL

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



STANDARD TEMPORARY SHORING

(SLOPE CASE)

***SEE TABLE ABOVE.**

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)

***SEE TABLE ABOVE.**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET
R-2303D	2-AC

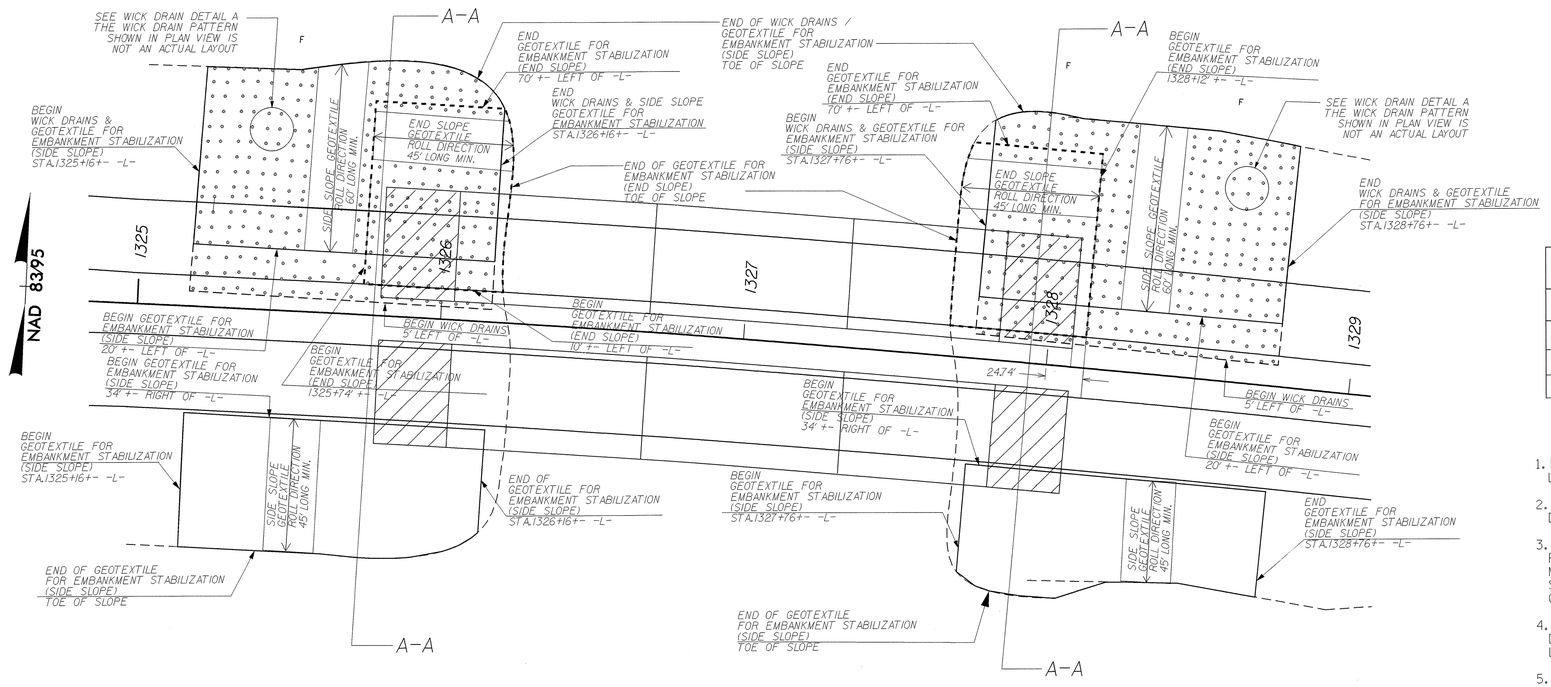
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 028176 ENGINEER SHIHAI ZHANG 6-14-2013

SIGNATURE DATE

ENGINEER

SIGNATURE DATE



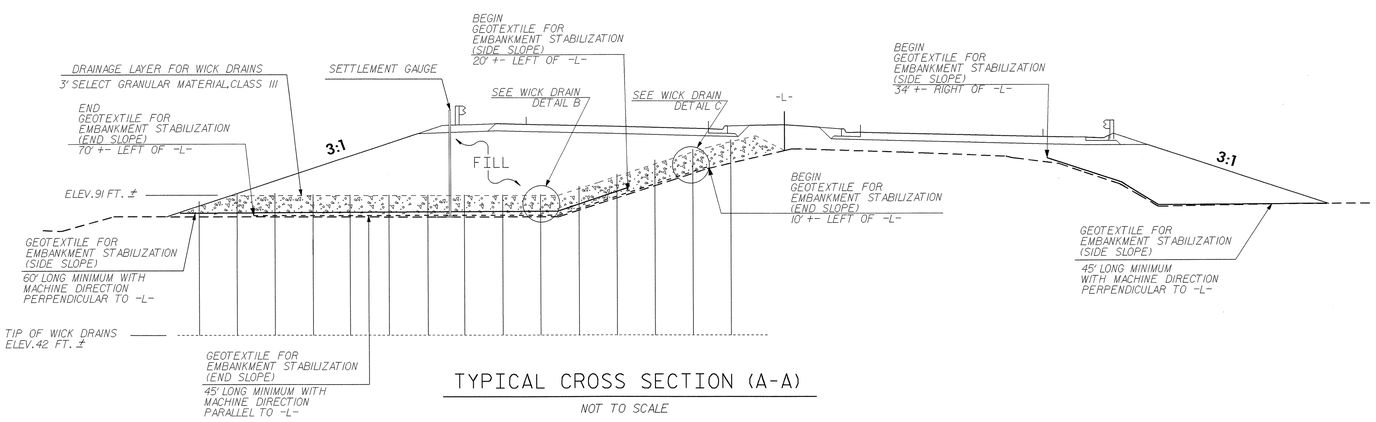
PLAN VIEW

NOT TO SCALE

WICK DRAIN CONFIGURATION				
STATIONS (-L-)		WICK DRAIN SPACING	WICK DRAIN TIP ELEVATION	ESTIMATED WAITING PERIOD
FROM	TO			
1325+16.0±	1326+16.0±	5 FT.	42 FT.	6 MONTH
1327+76.0±	1328+76.0±	5 FT.	42 FT.	6 MONTH

NOTES

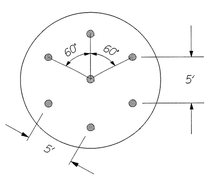
1. FOR WICK DRAINS, SEE INSTALLATION OF VERTICAL WICK DRAINS AND DRAINAGE LAYER SPECIAL PROVISION.
2. FOR SETTLEMENT GAUGES, SEE STANDARD EMBANKMENT MONITORING (STANDARD DRAWING NO. 1804.01) AND EMBANKMENT SETTLEMENT GAUGES PROVISION.
3. PLACE GEOTEXTILE FOR EMBANKMENT STABILIZATION ON THE EXISTING GROUND PRIOR TO FILL/SELECT MATERIAL PLACEMENT AND MAINTAIN 12 INCHES OF SELECT MATERIAL BETWEEN SIDE SLOPE AND END SLOPE GEOTXTILE. WHERE OVERLAPS ARE SHOWN IN THE PLAN, INSTALL END SLOPE GEOTEXTILE PRIOR TO SIDE SLOPE GEOTEXTILE WITHIN THE OVERLAPS.
4. PLACE END SLOPE GEOTEXTILE FOR EMBANKMENT STABILIZATION WITH MACHINE DIRECTION PARALLEL TO EMBANKMENT CENTERLINE WITH A MINIMUM CONTINUOUS LENGTH OF 45 FEET.
5. PLACE SIDE SLOPE GEOTEXTILE FOR EMBANKMENT STABILIZATION WITH MACHINE DIRECTION PERPENDICULAR TO EMBANKMENT CENTERLINE WITH USE A MINIMUM CONTINUOUS LENGTH OF 60 FEET LEFT OF -L- AND 45 FEET RIGHT OF -L-.
6. NO SEAMS OR JOINTS ARE ALLOWED IN THE MACHINE DIRECTION OF GEOTEXTILE FOR EMBANKMENT STABILIZATION.
7. ALL JOINTS IN THE CROSS MACHINE DIRECTION MUST BE SEWN BY AN APPROVED METHOD TO DEVELOP THE REQUIRED SEAM STRENGTH.
8. THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
9. THE DRAINAGE LAYER SHALL BE INSTALLED AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. FOR DRAINAGE LAYER, SEE INSTALLATION OF VERTICAL WICK DRAINS AND DRAINAGE LAYER SPECIAL PROVISION.
10. 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 ELEVATION 42 FEET UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
11. SELECT GRANULAR MATERIAL, CLASS III, WILL BE PAID FOR AS SELECT GRANULAR MATERIAL IN SECTION 265 OF THE STANDARD SPECIFICATIONS. SEE SELECT GRANULAR MATERIAL SPECIAL PROVISION.
12. WAITING PERIOD BEGINS AFTER CONSTRUCTING THE ROADWAY EMBANKMENT TO WITHIN 18 INCHES OF FINISH GRADE. THE ESTIMATED WAITING PERIOD FOR LEFT LANE BRIDGE IS 6 MONTHS. NO SURCHARGE IS REQUIRED, SEE EMBANKMENT SETTLEMENT GAUGES PROVISION.
13. 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.
14. UTILIZE APPROPRIATE WICK DRAIN INSTALLATION EQUIPMENT CAPABLE OF WORKING ON SOFT GROUND AND EXISTING SLOPES OR PREPARE TEMPORARY EARTHWORK ACCESS PATH OTHERWISE.



TYPICAL CROSS SECTION (A-A)

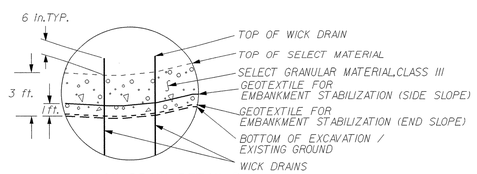
NOT TO SCALE

ESTIMATED QUANTITIES		
WICK DRAINS	31,500	FOOT
SELECT GRANULAR MATERIAL	2,200	CUBIC YARD
GEOTEXTILE FOR EMBANKMENT STABILIZATION	2,950	SQUARE YARD



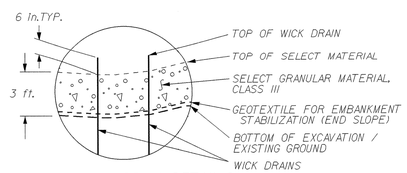
WICK DRAIN DETAIL A

NOT TO SCALE



WICK DRAIN DETAIL B

NOT TO SCALE



WICK DRAIN DETAIL C

NOT TO SCALE

PREPARED BY: S. ZHANG	DATE: 4/2013
REVIEWED BY: J. BATTS	DATE: 4/2013

GEOTECHNICAL ENGINEERING UNIT

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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

GROUND IMPROVEMENT AT BRIDGE NO. 51 END BENTS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PROJECT REFERENCE NO.	SHEET
R-2303D	2-AD

GEOTECHNICAL ENGINEER

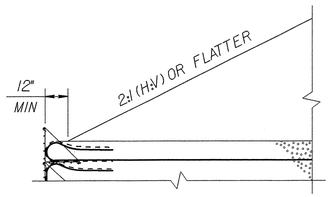
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12

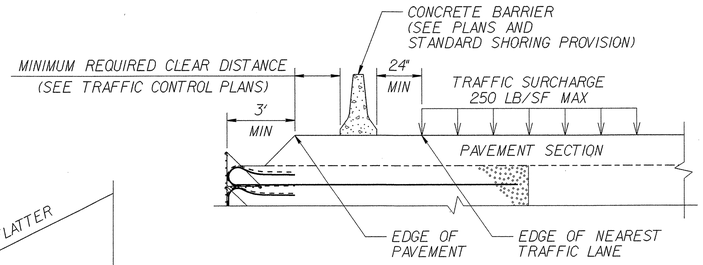
SIGNATURE DATE

ENGINEER

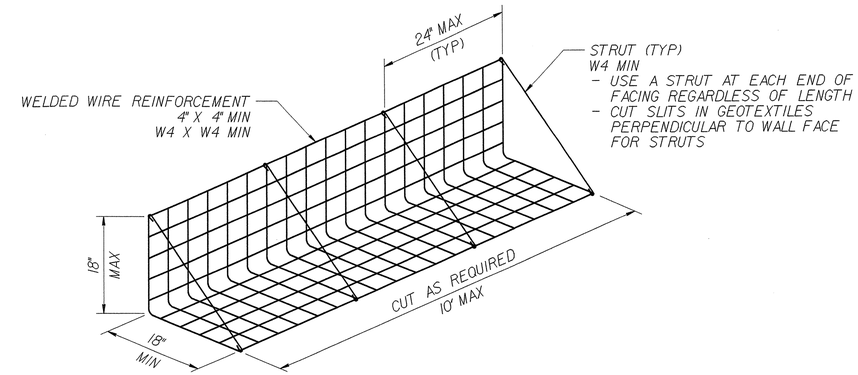
SIGNATURE DATE



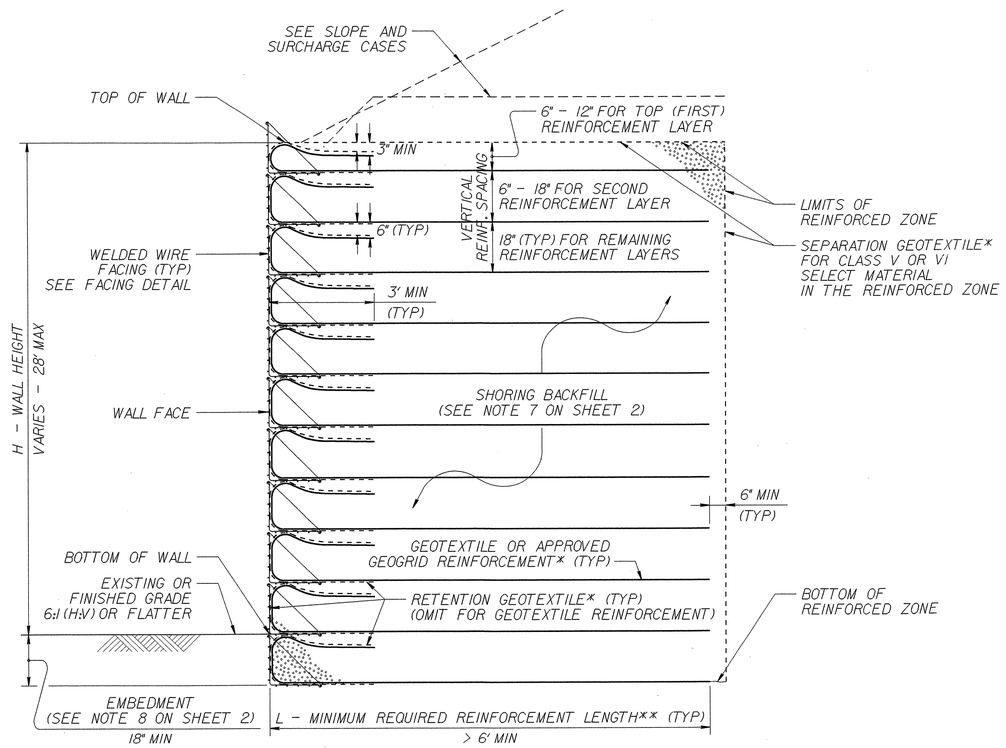
SLOPE CASE



SURCHARGE CASE

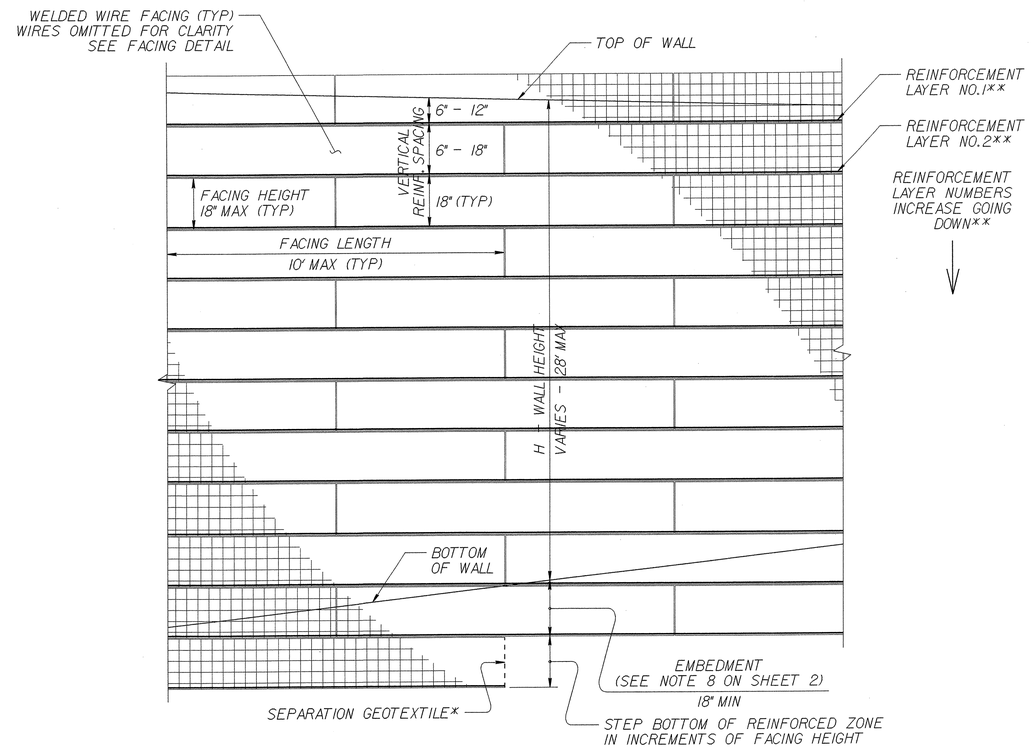


FACING DETAIL



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-2303D	2-AE

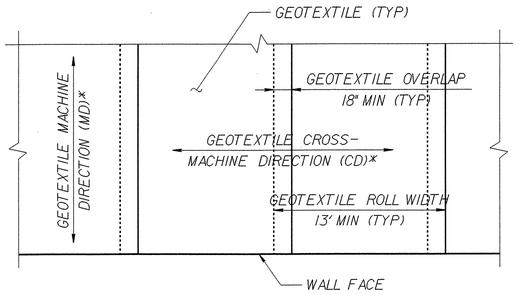
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12
SIGNATURE DATE

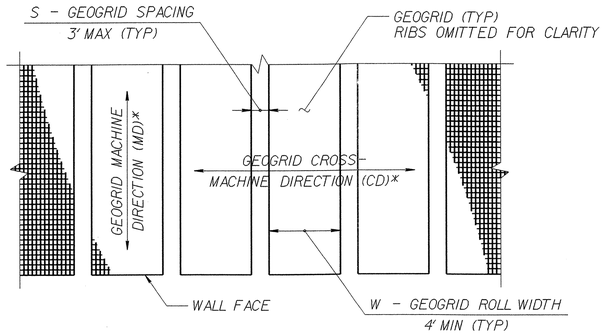
ENGINEER

SIGNATURE DATE



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

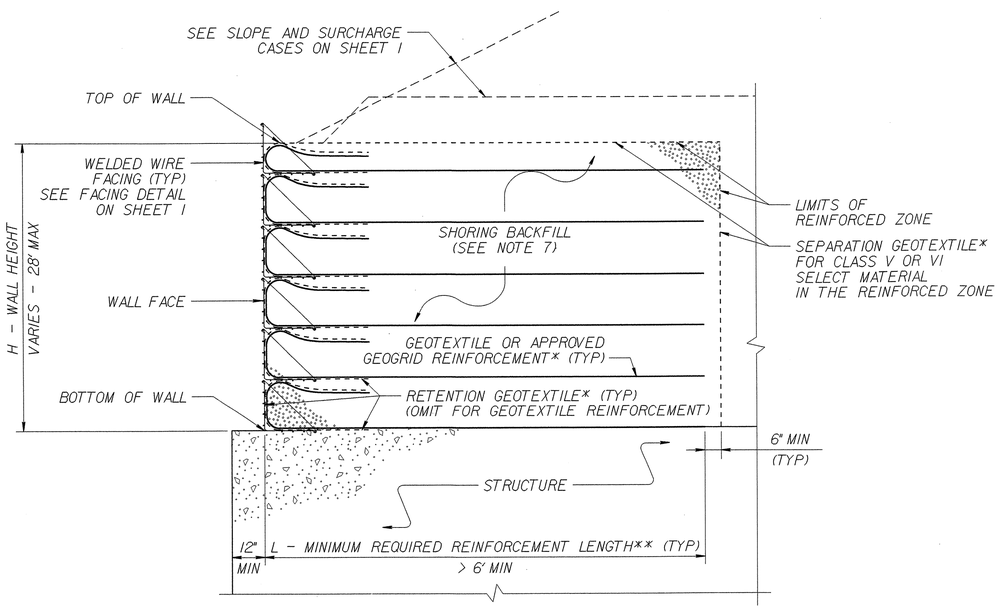


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S} \times 100 \geq 80\%$, 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 1 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-2303D	2-AF

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

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

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

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

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

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

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD
(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL
Sheet 3 of 3

DATE: 11-20-12

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	2-AG

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

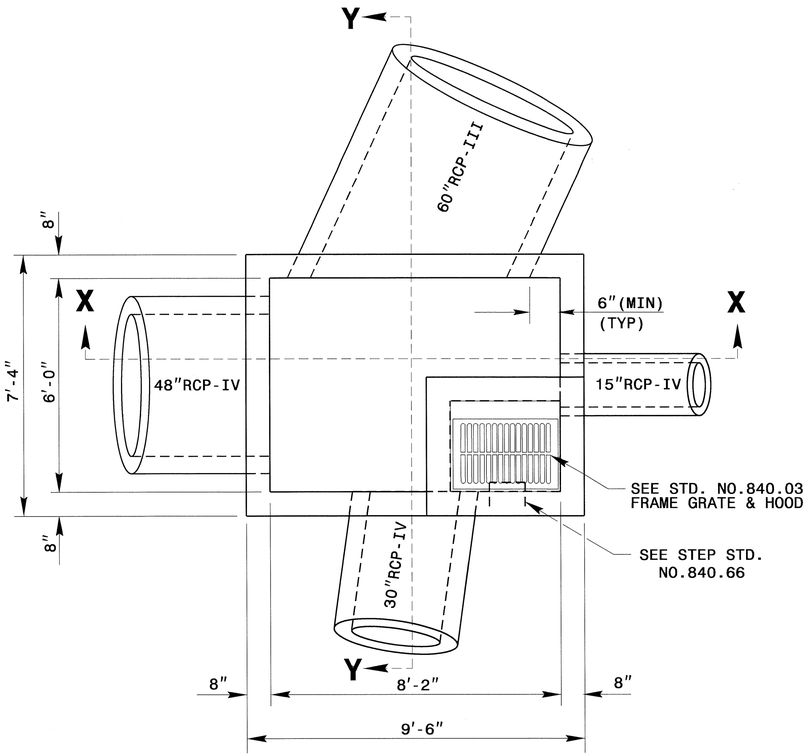
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

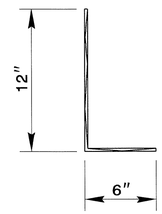
INSTALL CATCH BASIN IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.

CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.



PLAN VIEW

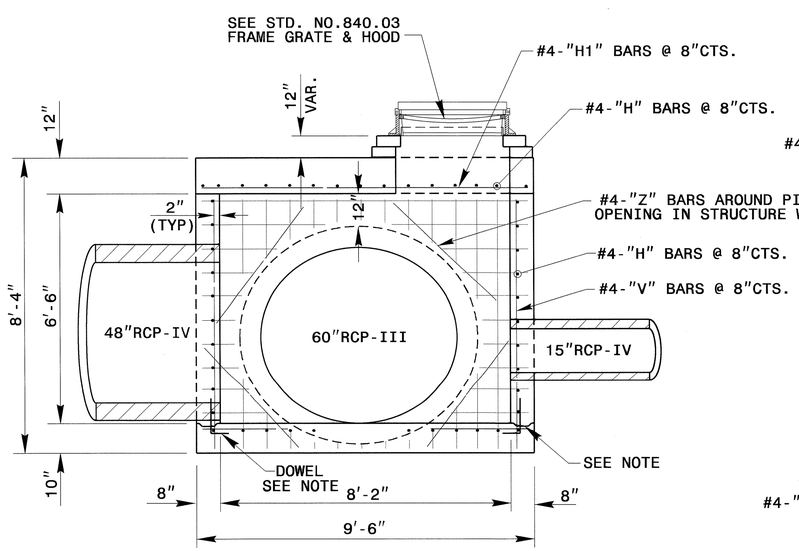


DOWEL

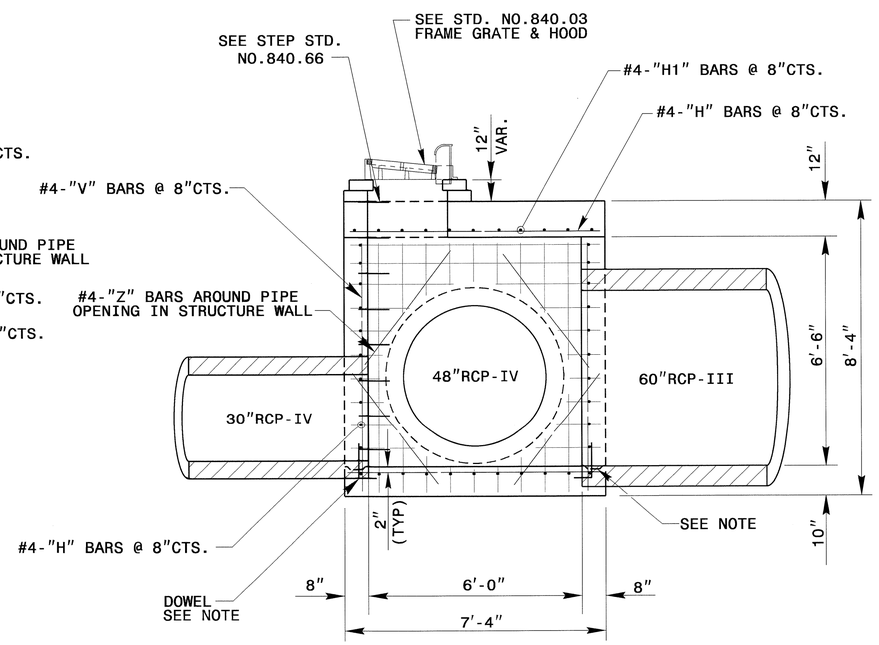
SEE NOTE

BILL OF MATERIALS				
BAR	NO.	SIZE	LENGTH	WEIGHT
H	50	#4	7'-0"	234
H1	42	#4	9'-2"	258
V	46	#4	7'-0"	216
Z	8	#4	4'-0"	22
TOTAL REINF. STEEL (LBS.)				730
TOTAL CONC. (CU. YDS.)				9.7
CONCRETE DEDUCTION				
FOR PIPES (CU. YDS.)				-1.6
TOTAL CONC. (CU. YDS.)				8.1

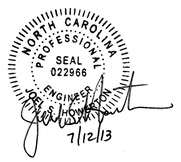
* 0.30 CU. YD. PER FOOT OF RISER HEIGHT
* 0.80 CU. YD. DEDUCTION FOR 1-60" RCP-III
* 0.50 CU. YD. DEDUCTION FOR 1-48" RCP-IV
* 0.20 CU. YD. DEDUCTION FOR 1-30" RCP-IV
* 0.10 CU. YD. DEDUCTION FOR 1-15" RCP-IV



SECTION X-X



SECTION Y-Y



STR.#2556

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6900 FAX 919-250-4119

SPECIAL CATCH BASIN

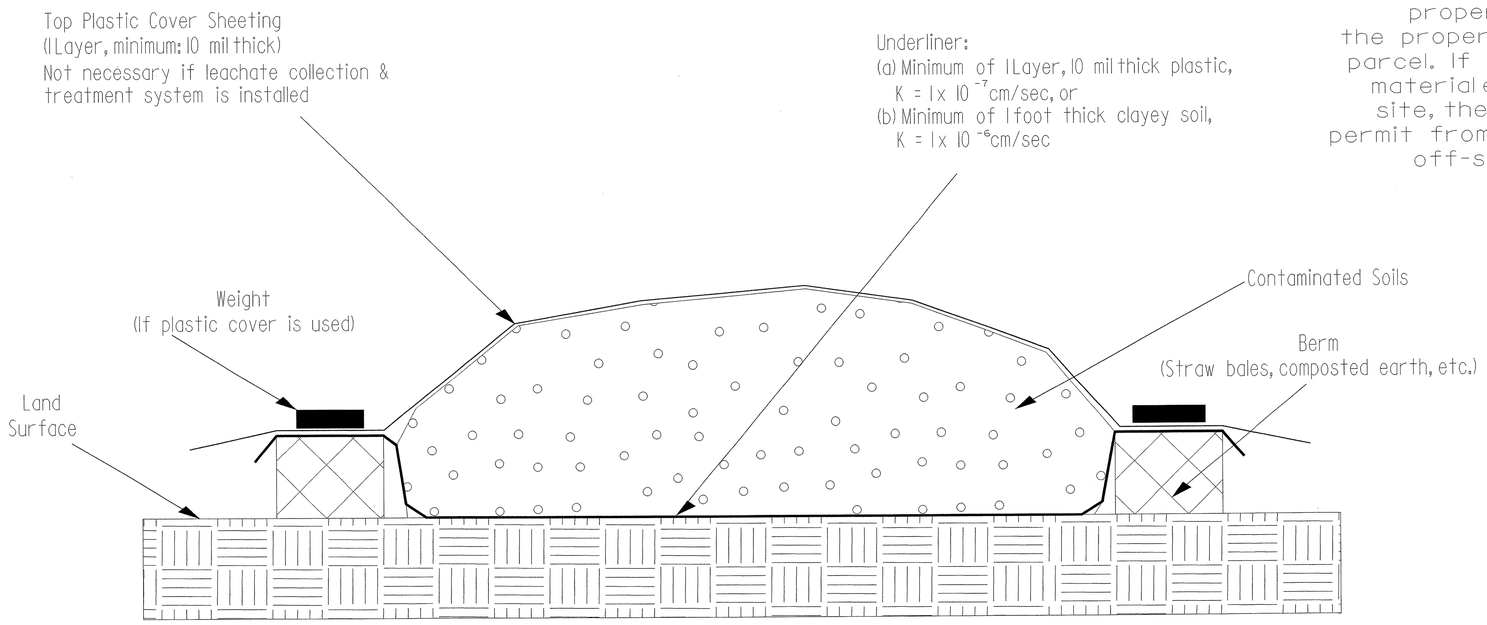
ORIGINAL BY: DATE:
MODIFIED BY: nbritt DATE: 06/12/13
CHECKED BY: DATE: 7/11/13
FILE SPEC.: detail/nbritt/english/rural/r2303d 60 cb.dgn

PROJECT REFERENCE NO.	SHEET
R-2303D	2-AH

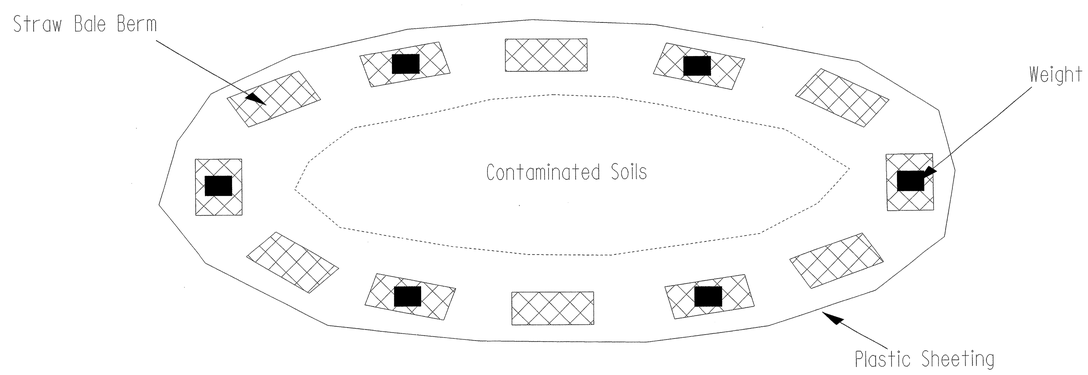
Detail for Temporary Containment of Contaminated Soil

Cross-Section View

NOTE:
The Contractor shall stockpile all contaminated soil excavated from a property in a location within the property boundaries of the source parcel. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDENR UST Section for off-site temporary storage.



Map View



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT C203464

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000700000-N	SP	Lump Sum		FIELD OFFICE
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0008000000-E	200	3	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0015000000-N	205	4	EA	SEALING ABANDONED WELLS
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ************ (1311+58-L-LT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ************ (1311+58-L-RT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ************ (1326+94-L-LT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ************ (1326+94-L-RT)
0084000000-E	SP	31,500	LF	WICK DRAINS
0127000000-N	SP	4	EA	EMBANKMENT SETTLEMENT GAUGES
0134000000-E	240	5,138	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	1,000	LF	BERM DITCH CONSTRUCTION
0156000000-E	250	3,910	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0163000000-E	250	26,670	SY	REMOVAL OF EXISTING CONCRETE PAVEMENT
0185000000-E	250	23,510	SY	BREAKING OF EXISTING CONCRETE PAVEMENT
0192000000-N	260	69	HR	PROOF ROLLING
0195000000-E	265	47,200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	45,200	SY	GEOTEXTILE FOR SOIL STABILIZA-TION
0199000000-E	SP	3,380	SF	TEMPORARY SHORING
0220000000-E	SP	5,000	TON	ROCK EMBANKMENTS
0222000000-E	SP	2,600	SY	GEOTEXTILE FOR ROCK EMBANK-MENTS
0223000000-E	275	350	SY	ROCK PLATING
0241000000-E	SP	2,950	SY	GENERIC GRADING ITEM GEOTEXTILE FOR EMBANKMENT STABILIZATION
0248000000-N	SP	Lump Sum		GENERIC GRADING ITEM GRADING FOR MITIGATION
0255000000-E	SP	900	TON	GENERIC GRADING ITEM HAULING AND DISPOSAL OF PETROLEUM CONTAMINATED SOIL
0318000000-E	300	4,410	TON	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRUCTURES
0320000000-E	300	13,860	SY	FOUNDATION CONDITIONING GEO-TEXTILE
0342000000-E	310	76	LF	**" SIDE DRAIN PIPE (36")
0343000000-E	310	3,212	LF	15" SIDE DRAIN PIPE
0344000000-E	310	1,400	LF	18" SIDE DRAIN PIPE
0345000000-E	310	412	LF	24" SIDE DRAIN PIPE
0348000000-E	310	26	EA	**" SIDE DRAIN PIPE ELBOWS (15")
0348000000-E	310	2	EA	**" SIDE DRAIN PIPE ELBOWS (18")
0366000000-E	310	4,584	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E	310	4,532	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E	310	3,916	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E	310	1,728	LF	30" RC PIPE CULVERTS, CLASS III
0390000000-E	310	1,132	LF	36" RC PIPE CULVERTS, CLASS III
0396000000-E	310	132	LF	42" RC PIPE CULVERTS, CLASS III
0414000000-E	310	204	LF	60" RC PIPE CULVERTS, CLASS III
0420000000-E	310	496	LF	66" RC PIPE CULVERTS, CLASS III
0426000000-E	310	56	LF	72" RC PIPE CULVERTS, CLASS III
0448000000-E	310	2,436	LF	****" RC PIPE CULVERTS, CLASS IV (48")
0448000000-E	310	572	LF	****" RC PIPE CULVERTS, CLASS IV (54")
0448000000-E	310	272	LF	****" RC PIPE CULVERTS, CLASS IV (60")
0448000000-E	310	228	LF	****" RC PIPE CULVERTS, CLASS IV (66")
0448000000-E	310	224	LF	****" RC PIPE CULVERTS, CLASS IV (72")
0448200000-E	310	6,498	LF	15" RC PIPE CULVERTS, CLASS IV
0448300000-E	310	2,802	LF	18" RC PIPE CULVERTS, CLASS IV
0448400000-E	310	2,068	LF	24" RC PIPE CULVERTS, CLASS IV
0448500000-E	310	3,282	LF	30" RC PIPE CULVERTS, CLASS IV
0448600000-E	310	1,026	LF	36" RC PIPE CULVERTS, CLASS IV
0448700000-E	310	388	LF	42" RC PIPE CULVERTS, CLASS IV
0582000000-E	310	198	LF	15" CS PIPE CULVERTS, 0.064" THICK
0588000000-E	310	84	LF	18" CS PIPE CULVERTS, 0.064" THICK
0594000000-E	310	12	LF	24" CS PIPE CULVERTS, 0.064" THICK
0973100000-E	330	136	LF	**" WELDED STEEL PIPE, ****" THICK, GRADE B IN SOIL (42", 0.625")
0973100000-E	330	56	LF	**" WELDED STEEL PIPE, ****" THICK, GRADE B IN SOIL (48", 0.625")
0995000000-E	340	6,530	LF	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1077000000-E	SP	2,400	TON	#57 STONE
1099500000-E	505	500	CY	SHALLOW UNDERCUT
1099700000-E	505	950	TON	CLASS IV SUBGRADE STABILIZA-TION
1110000000-E	510	1,000	TON	STABILIZER AGGREGATE
1220000000-E	545	5,000	TON	INCIDENTAL STONE BASE
1297000000-E	607	4,860	SY	MILLING ASPHALT PAVEMENT, ***" DEPTH (3")
1330000000-E	607	660	SY	INCIDENTAL MILLING
1489000000-E	610	3,400	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1503000000-E	610	64,000	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1523000000-E	610	38,000	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1525000000-E	610	2,000	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1693000000-E	654	5,000	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
1880000000-E	SP	5,000	TON	GENERIC PAVING ITEM JOINT REPAIR
2020000000-N	806	20	EA	CONTROL OF ACCESS MARKERS
2022000000-E	815	1,250	CY	SUBDRAIN EXCAVATION
2026000000-E	815	3,700	SY	GEOTEXTILE FOR SUBSURFACE DRAINS
2036000000-E	815	630	CY	SUBDRAIN COARSE AGGREGATE
2044000000-E	815	3,700	LF	6" PERFORATED SUBDRAIN PIPE
2070000000-N	815	8	EA	SUBDRAIN PIPE OUTLET
2077000000-E	815	48	LF	6" OUTLET PIPE
2190000000-N	828	29	EA	TEMPORARY STEEL PLATE COVERS FOR MASONRY DRAINAGE STRUCTURE
2209000000-E	838	36	CY	ENDWALLS
2220000000-E	838	63	CY	REINFORCED ENDWALLS
2253000000-E	840	9	CY	PIPE COLLARS
2264000000-E	840	2	CY	PIPE PLUGS
2286000000-N	840	421	EA	MASONRY DRAINAGE STRUCTURES
2297000000-E	840	84	CY	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	144	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	98	EA	FRAME WITH TWO GRATES, STD 840.16
2364200000-N	840	47	EA	FRAME WITH TWO GRATES, STD 840.20
2365000000-N	840	9	EA	FRAME WITH TWO GRATES, STD 840.22
2366000000-N	840	111	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	4	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	29	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	53	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	73	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	25	EA	FRAME WITH COVER, STD 840.54
2451000000-N	852	55	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLET
2535000000-E	846	815	LF	**"X **" CONCRETE CURB (8" X 18")
2538000000-E	846	1,400	LF	**'-**" CONCRETE CURB & GUTTER (2'-0")
2542000000-E	846	11,780	LF	1'-6" CONCRETE CURB & GUTTER
2549000000-E	846	25,900	LF	2'-6" CONCRETE CURB & GUTTER
2556000000-E	846	6,900	LF	SHOULDER BERM GUTTER
2570000000-N	SP	1	EA	MODIFIED CONCRETE FLUME
2577000000-E	846	120	LF	CONCRETE EXPRESSWAY GUTTER
2591000000-E	848	10,260	SY	4" CONCRETE SIDEWALK
2605000000-N	848	60	EA	CONCRETE CURB RAMP
2612000000-E	848	1,040	SY	6" CONCRETE DRIVEWAY
2619000000-E	850	420	SY	4" CONCRETE PAVED DITCH
2647000000-E	852	7,400	SY	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)
2800000000-N	858	3	EA	ADJUSTMENT OF CATCH BASINS
2815000000-N	858	1	EA	ADJUSTMENT OF DROP INLETS
2830000000-N	858	2	EA	ADJUSTMENT OF MANHOLES
3000000000-N	SP	2	EA	IMPACT ATTENUATOR UNIT, TYPE 350
3030000000-E	862	11,925	LF	STEEL BM GUARDRAIL
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3210000000-N	862	11	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3270000000-N	SP	14	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3285000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE M-350
3317000000-N	862	15	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	1,698	LF	REMOVE EXISTING GUARDRAIL
3380000000-E	862	1,875	LF	TEMPORARY STEEL BM GUARDRAIL
3389100000-N	SP	6	EA	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350
3503000000-E	866	41,990	LF	WOVEN WIRE FENCE, 47" FABRIC
3509000000-E	866	3,440	EA	4" TIMBER FENCE POSTS, 7'-6" LONG
3515000000-E	866	340	EA	5" TIMBER FENCE POSTS, 8'-0" LONG
3628000000-E	876	975	TON	RIP RAP, CLASS I
3649000000-E	876	3,907	TON	RIP RAP, CLASS B
3656000000-E	876	15,215	SY	GEOTEXTILE FOR DRAINAGE
3659000000-N	SP	7	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4048000000-E	902	12	CY	REINFORCED CONCRETE SIGN FOUN-DATIONS
4054000000-E	902	1	CY	PLAIN CONCRETE SIGN FOUNDA-TIONS
4060000000-E	903	8,667	LB	SUPPORTS, BREAKAWAY STEEL BEAM
4066000000-E	903	1,128	LB	SUPPORTS, SIMPLE STEEL BEAM
4072000000-E	903	3,562	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4096000000-N	904	9	EA	SIGN ERECTION, TYPE D
4102000000-N	904	129	EA	SIGN ERECTION, TYPE E

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STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-2303D	3 (2 of 3)

ItemNumber	Sec #	Quantity	Unit	Description
4108000000-N	904	41	EA	SIGN ERECTION, TYPE F
4110000000-N	904	13	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
4110000000-N	904	1	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)
4116100000-N	904	6	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (D)
4152000000-N	907	7	EA	DISPOSAL OF SIGN SYSTEM, STEEL BEAM
4155000000-N	907	99	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4400000000-E	1110	4,452	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	1,525	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	667	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW BOARD
4420000000-N	1120	5	EA	PORTABLE CHANGEABLE MESSAGE SIGN
4422000000-N	1120	252	DAY	PORTABLE CHANGEABLE MESSAGE SIGN (SHORT TERM)
4430000000-N	1130	1,946	EA	DRUMS
4435000000-N	1135	550	EA	CONES
4445000000-E	1145	2,016	LF	BARRICADES (TYPE III)
4455000000-N	1150	450	DAY	FLAGGER
4465000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
4470000000-N	1160	6	EA	RESET TEMPORARY CRASH CUSHION
4480000000-N	1165	3	EA	TMA
4485000000-E	1170	1,442	LF	PORTABLE CONCRETE BARRIER
4490000000-E	1170	150	LF	PORTABLE CONCRETE BARRIER (ANCHORED)
4500000000-E	1170	1,876	LF	RESET PORTABLE CONCRETE BARRIER
4507000000-E	1170	397	LF	WATER FILLED BARRIER
4510000000-N	SP	500	HR	LAW ENFORCEMENT
4516000000-N	1180	595	EA	SKINNY DRUM
4590000000-E	SP	3,469	LF	GENERIC TRAFFIC CONTROL ITEM MODULAR LANE SEPARATOR
4650000000-N	1251	1,057	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	117,865	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	42,745	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4688000000-E	1205	8,996	LF	THERMOPLASTIC PAVEMENT MARKING LINES (6", 90 MILS)
4690000000-E	1205	2,572	LF	THERMOPLASTIC PAVEMENT MARKING LINES (6", 120 MILS)
4695000000-E	1205	10,104	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4697000000-E	1205	1,960	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)
4700000000-E	1205	2,428	LF	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)
4702000000-E	1205	1,530	LF	THERMOPLASTIC PAVEMENT MARKING LINES (12", 120 MILS)
4710000000-E	1205	1,600	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4721000000-E	1205	48	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4725000000-E	1205	354	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4770000000-E	1205	8,880	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4810000000-E	1205	596,567	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	19,134	LF	PAINT PAVEMENT MARKING LINES (8")
4825000000-E	1205	4,228	LF	PAINT PAVEMENT MARKING LINES (12")
4835000000-E	1205	4,077	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	28	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	251	EA	PAINT PAVEMENT MARKING SYMBOL

ItemNumber	Sec #	Quantity	Unit	Description
4847000000-E	1205	6,215	LF	POLYUREA PAVEMENT MARKING LINES (4", **********) (HIGHLY REFLECTIVE ELEMENTS)
4850000000-E	1205	67,654	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4860000000-E	1205	597	LF	REMOVAL OF PAVEMENT MARKING LINES (8")
4870000000-E	1205	441	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4875000000-N	1205	45	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1251	60	EA	PERMANENT RAISED PAVEMENT MARKERS
4905000000-N	1253	2,151	EA	SNOWPLOWABLE PAVEMENT MARKERS
5255000000-N	1413	Lump Sum		PORTABLE LIGHTING
5325200000-E	1510	236	LF	2" WATER LINE
5325400000-E	1510	507	LF	4" WATER LINE
5325600000-E	1510	921	LF	6" WATER LINE
5325800000-E	1510	4,433	LF	8" WATER LINE
5326000000-E	1510	14,489	LF	10" WATER LINE
5326200000-E	1510	16,143	LF	12" WATER LINE
5326600000-E	1510	99	LF	16" WATER LINE
5536000000-E	1515	2	EA	2" VALVE
5538000000-E	1515	2	EA	4" VALVE
5540000000-E	1515	5	EA	6" VALVE
5546000000-E	1515	8	EA	8" VALVE
5552000000-E	1515	18	EA	10" VALVE
5558000000-E	1515	12	EA	12" VALVE
5558600000-E	1515	1	EA	16" VALVE
5571600000-E	1515	1	EA	6" TAPPING VALVE
5572000000-E	1515	1	EA	10" TAPPING VALVE
5648000000-N	1515	72	EA	RELOCATE WATER METER
5649000000-N	1515	15	EA	RECONNECT WATER METER
5666000000-E	1515	3	EA	FIRE HYDRANT
5672000000-N	1515	15	EA	RELOCATE FIRE HYDRANT
5691300000-E	1520	3,081	LF	8" SANITARY GRAVITY SEWER
5691400000-E	1520	798	LF	10" SANITARY GRAVITY SEWER
5775000000-E	1525	27	EA	4' DIA UTILITY MANHOLE
5781000000-E	1525	116.2	LF	UTILITY MANHOLE WALL, 4' DIA
5801000000-E	1530	8,720	LF	ABANDON 8" UTILITY PIPE
5802000000-E	1530	18,335	LF	ABANDON 10" UTILITY PIPE
5804000000-E	1530	7,641	LF	ABANDON 12" UTILITY PIPE
5828000000-N	1530	16	EA	REMOVE UTILITY MANHOLE
5835700000-E	1540	106	LF	16" ENCASEMENT PIPE
5835800000-E	1540	136	LF	18" ENCASEMENT PIPE
5835900000-E	1540	285	LF	20" ENCASEMENT PIPE
5836000000-E	1540	360	LF	24" ENCASEMENT PIPE
5836200000-E	1540	959	LF	30" ENCASEMENT PIPE
5871600000-E	1550	373	LF	TRENCHLESS INSTALLATION OF 10" IN SOIL
5871610000-E	1550	373	LF	TRENCHLESS INSTALLATION OF 10" NOT IN SOIL
5871700000-E	1550	2,487	LF	TRENCHLESS INSTALLATION OF 12" IN SOIL
5871710000-E	1550	2,485	LF	TRENCHLESS INSTALLATION OF 12" NOT IN SOIL
5871900000-E	1550	53	LF	TRENCHLESS INSTALLATION OF 16" IN SOIL
5871910000-E	1550	53	LF	TRENCHLESS INSTALLATION OF 16" NOT IN SOIL
5872000000-E	1550	14	LF	TRENCHLESS INSTALLATION OF 18" IN SOIL
5872010000-E	1550	14	LF	TRENCHLESS INSTALLATION OF 18" NOT IN SOIL
5872100000-E	1550	110	LF	TRENCHLESS INSTALLATION OF 20" IN SOIL
5872110000-E	1550	109	LF	TRENCHLESS INSTALLATION OF 20" NOT IN SOIL

ItemNumber	Sec #	Quantity	Unit	Description
5872200000-E	1550	160	LF	TRENCHLESS INSTALLATION OF 24" IN SOIL
5872210000-E	1550	158	LF	TRENCHLESS INSTALLATION OF 24" NOT IN SOIL
5872300000-E	1550	480	LF	TRENCHLESS INSTALLATION OF 30" IN SOIL
5872310000-E	1550	479	LF	TRENCHLESS INSTALLATION OF 30" NOT IN SOIL
5882000000-N	SP	1	EA	GENERIC UTILITY ITEM WATER METER VAULT
5882000000-N	SP	1	EA	GENERIC UTILITY ITEM WATER METERING STATION
6000000000-E	1605	121,000	LF	TEMPORARY SILT FENCE
6006000000-E	1610	6,000	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	10,000	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	10,000	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	183.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	3,600	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	17.75	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	4,000	LF	TEMPORARY SLOPE DRAINS
6029000000-E	SP	13,000	LF	SAFETY FENCE
6030000000-E	1630	25,000	CY	SILT EXCAVATION
6036000000-E	1631	60,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	1,480	SY	COIR FIBER MAT
6038000000-E	SP	13,800	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	20,000	LF	1/4" HARDWARE CLOTH
6045000000-E	SP	130	LF	**" TEMPORARY PIPE (24")
6045000000-E	SP	120	LF	**" TEMPORARY PIPE (36")
6048000000-E	SP	280	SY	FLOATING TURBIDITY CURTAIN
6069000000-E	1638	420	CY	STILLING BASINS
6070000000-N	1639	12	EA	SPECIAL STILLING BASINS
6071012000-E	SP	25,000	LF	COIR FIBER WATTLE
6071020000-E	SP	16,000	LB	POLYACRYLAMIDE (PAM)
6071030000-E	1640	10,000	LF	COIR FIBER BAFFLE
6071050000-E	SP	24	EA	**" SKIMMER (1-1/2")
6071050000-E	SP	1	EA	**" SKIMMER (2")
6084000000-E	1660	141	ACR	SEEDING & MULCHING
6087000000-E	1660	60	ACR	MOWING
6090000000-E	1661	1,850	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	6.75	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	3,350	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	100.25	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	500	LF	IMPERVIOUS DIKE
6114500000-N	1667	60	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	150	EA	RESPONSE FOR EROSION CONTROL
6120000000-E	SP	125	CY	CULVERT DIVERSION CHANNEL
6123000000-E	1670	12	ACR	REFORESTATION
6126000000-E	SP	0.3	ACR	STREAMBANK REFORESTATION
7060000000-E	1705	9,000	LF	SIGNAL CABLE
7120000000-E	1705	67	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7132000000-E	1705	9	EA	VEHICLE SIGNAL HEAD (12", 4 SECTION)
7144000000-E	1705	5	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7252000000-E	1710	8,400	LF	MESSENGER CABLE (1/4")
7264000000-E	1710	1,500	LF	MESSENGER CABLE (3/8")
7279000000-E	1715	550	LF	TRACER WIRE
7300000000-E	1715	800	LF	UNPAVED TRENCHING (**********) (1, 2")

STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
R-2303D	3 (3 of 3)

ItemNumber	Sec #	Quantity	Unit	Description
7300000000-E	1715	100	LF	UNPAVED TRENCHING (**********) (2, 2")
7300100000-E	1715	6,900	LF	UNPAVED TRENCHING FOR TEMPORARY LEAD-IN
7301000000-E	1715	900	LF	DIRECTIONAL DRILL (**********) (1, 2")
7301000000-E	1715	1,100	LF	DIRECTIONAL DRILL (**********) (2, 2")
7324000000-N	1716	12	EA	JUNCTION BOX (STANDARD SIZE)
7348000000-N	1716	10	EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
7360000000-N	1720	7	EA	WOOD POLE
7372000000-N	1721	6	EA	GUY ASSEMBLY
7420000000-E	1722	7	EA	2" RISER WITH WEATHERHEAD
7432000000-E	1722	4	EA	2" RISER WITH HEAT SHRINK TUBING
7444000000-E	1725	13,000	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	14,700	LF	LEAD-IN CABLE (**********) (14-2)
7516000000-E	1730	10,000	LF	COMMUNICATIONS CABLE (**FIBER) (12)
7564000000-N	1732	5	EA	FIBER-OPTIC TRANSCEIVER, DROP & REPEAT
7566000000-N	1733	4	EA	DELINEATOR MARKER
7575142000-N	1736	1	EA	900MHZ RADIO
7575142060-N	SP	4	EA	MODIFY RADIO INSTALLATION
7588000000-N	SP	16	EA	METAL POLE WITH SINGLE MAST ARM
7590000000-N	SP	1	EA	METAL POLE WITH DUAL MAST ARM
7613000000-N	SP	17	EA	SOIL TEST
7614100000-E	SP	121	CY	DRILLED PIER FOUNDATION
7631000000-N	SP	17	EA	MAST ARM WITH METAL POLE DESIGN
7636000000-N	1745	3	EA	SIGN FOR SIGNALS
7642200000-N	1743	2	EA	TYPE II PEDESTAL WITH FOUNDATION

ItemNumber	Sec #	Quantity	Unit	Description
7684000000-N	1750	5	EA	SIGNAL CABINET FOUNDATION
7756000000-N	1751	5	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	29	EA	DETECTOR CARD (TYPE 2070L)
7901000000-N	1753	5	EA	CABINET BASE EXTENDER
******* BEGIN SCHEDULE AA ******* ******* (2 ALTERNATES) *******				
0022000000-E AA1	225	80,600	CY	UNCLASSIFIED EXCAVATION
0036000000-E AA1	225	60,204	CY	UNDERCUT EXCAVATION
0106000000-E AA1	230	595,800	CY	BORROW EXCAVATION
1121000000-E AA1	520	79,400	TON	AGGREGATE BASE COURSE
1491000000-E AA1	610	56,200	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1575000000-E AA1	620	8,070	TON	ASPHALT BINDER FOR PLANT MIX
*** OR ***				
0022000000-E AA2	225	67,600	CY	UNCLASSIFIED EXCAVATION
0036000000-E AA2	225	44,756	CY	UNDERCUT EXCAVATION
0106000000-E AA2	230	621,000	CY	BORROW EXCAVATION
1491000000-E AA2	610	71,800	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1575000000-E AA2	620	8,757	TON	ASPHALT BINDER FOR PLANT MIX
******* END SCHEDULE AA *******				

COMPUTED BY: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-A

CSD265813

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
1099+73.00 -L-	Lt.	401		144.7	142.8														
1102+60.00 -L-	Lt.	402		140.4	138.5														
		401	402		142.8	138.5													
1104+00.00 -L-	Lt.	403		136.6	134.4														
		402	403		138.5	134.7													
1105+50.00 -L-	Lt.	404		133.5	129.0														
		403	404		134.4	130.5													
		405	404		131.7	130.0													
1105+50.00 -L-	CL	407		135.7	128.8														
		404	407		129.0	128.8													
1106+15.00 -L-	CL	408		136.3	128.6														
		407	408		128.8	128.6													
1097+80.00 -L	CL	411		144.8	141.6														
1098+09.00 -L-	Lt.	412		144.5	141.7														
1097+10.00 -L-	Lt.	413		143.2	140.4														
		412	413		141.7	140.4													
1097+10.00 -L-	CL	414		144.1	140.2														
		411	414		141.6	140.2													
		413	414		140.4	140.2													
1104+04.14 -L-	Rt.	409							24'										
1103+47.22 -L-	Rt.	410							24'										
1096+75.92 -L-	Lt.																		
1097+62.46 -L-	Lt.																		
1098+51.26 -L-	Lt.																		
1100+39.02 -L-	Lt.																		
1101+05.07 -L-	CL																		
1101+42.14 -L-	CL																		
1102+87.33 -L-	Lt.																		
1102+90.43 -L-	CL																		
1103+42.08 -L-	CL																		
1104+15.06 -L-	Lt.																		
1104+87.89 -L-	CL																		
13+43.18 -Y39-	CL																		
12+44.14 -Y39-	CL																		
1108+35.00 -L-	CL	501		132.5	126.7														
		408	501		128.6	126.7													
1109+00.00 -L-	CL	502	510	132.7	126.5	124.6													
		501	502		126.7	126.5													
1109+49.00 -L-	CL	503	511	132.6	127.3	125.7													
1111+50.00 -L-	CL	504		135.4	132.7														
1111+50.00 -L-	Rt.	505		135.6	130.3														
		504	505		132.6	131.7													
		505	503		130.3	127.3													
1112+00.00 -L-	Lt.	506		136.5	133.8														
		506	505		133.8	131.7													
1117+00.00 -L-	Lt.	507		142.5	139.8														
1117+00.00 -L-	CL	508		142.8	138.1														
		507	508		139.8	138.8													
SHEET TOTALS									48'										

STATION	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
1099+73.00 -L-																								
1102+60.00 -L-																								
										284'														
1104+00.00 -L-																								
										136'														
1105+50.00 -L-																								
											32'													
												92'												
1105+50.00 -L-																								
														60'										
1106+15.00 -L-																								
														20'										
1097+80.00 -L																								
1098+09.00 -L-																								
1097+10.00 -L-																								
										100'														
1097+10.00 -L-																								
										68'														
										72'														
1104+04.14 -L-																								
1103+47.22 -L-																								
1096+75.92 -L-																								
1097+62.46 -L-																								
1098+51.26 -L-																								
1100+39.02 -L-																								
1101+05.07 -L-																								
1101+42.14 -L-																								
1102+87.33 -L-																								
1102+90.43 -L-																								
1103+42.08 -L-																								
1104+15.06 -L-																								
1104+87.89 -L-																								
13+43.18 -Y39-																								
12+44.14 -Y39-																								
1108+35.00 -L-																								
														220'										
1109+00.00 -L-														16'										
														60'										
1109+49.00 -L-													16'											
1111+50.00 -L-																								
1111+50.00 -L-																								
										72'														
													200'											
1112+00.00 -L-																								
										88'														
1117+00.00 -L-																								
1117+00.00 -L-																								
										72'														
SHEET TOTALS										892'	32'	92'	216'	376'										

STATION	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK	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 (EACH) DROP INLET	CATCH BASIN
1099+73.00 -L-					1								
1102+60.00 -L-					1								
1104+00.00 -L-					1								
1105+50.00 -L-					1								
1105+50.00 -L-					1	1.9							
1106+15.00 -L-					1	2.7						1	
1097+80.00 -L					1							1	
1098+09.00 -L-					1								
1097+10.00 -L-													
1097+10.00 -L-					1								
1104+04.14 -L-													
1103+47.22 -L-													
1096+75.92 -L-													
1097+62.46 -L-													
1098+51.26 -L-													
1100+39.02 -L-													
1101+05.07 -L-													
1101+42.14 -L-													
1102+87.33 -L-													
1102+90.43 -L-													
1103+42.08 -L-													
1104+15.06 -L-													
1104+87.89 -L-													
13+43.18 -Y39-													
12+44.14 -Y39-													
1108+35.00 -L-					1	0.8							
1109+00.00 -L-					1	1.2							
1109+49.00 -L-					1	0.3							
1111+50.00 -L-					1								
1111+50.00 -L-					1	0.3							
1112+00.00 -L-					1								
1117+00.00 -L-					1								
1117+00.00 -L-					1								
SHEET TOTALS					17	7.2						2	

STATION	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
1099+73.00 -L-						1		1													
1102+60.00 -L-						1		1													
1104+00.00 -L-						1		1													
1105+50.00 -L-					1			1													
1105+50.00 -L-				1				1													
1106+15.00 -L-		1	1																		
1097+80.00 -L		1	1																		
1098+09.00 -L-					1			1													
1097+10.00 -L-																					
1097+10.00 -L-					1			1													
1104+04.14 -L-																					
1103+47.22 -L-																					
1096+75.92 -L-																					
1097+62.46 -L-																					
1098+51.26 -L-																					
1100+39.02 -L-																					
1101+05.07 -L-																					
1101+42.14 -L-																					
1102+87.33 -L-																					
1102+90.43 -L-																					
1103+42.08 -L-																					
1104+15.06 -L-																					
1104+87.89 -L-																					
13+43.18 -Y39-																					
12+44.14 -Y39-																					
1108+35.00 -L-				1				1													
1109+00.00 -L-				1				1													
1109+49.00 -L-				1				1													
1111+50.00 -L-					1			1													
1111+50.00 -L-				1				1													
1112+00.00 -L-					1			1													
1117+00.00 -L-					1			1													
1117+00.00 -L-				1				1													
SHEET TOTALS		2	2	6	6	3		15													

STATION	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
1099+73.00 -L-					
1102+60.00 -L-					
1104+00.00 -L-					
1105+50.00 -L-					
					Inlet Pipe
1105+50.00 -L-					
1106+15.00 -L-					
1097+80.00 -L					
1098+09.00 -L-					
1097+10.00 -L-					
1097+10.00 -L-					
1104+04.14 -L-					
1103+47.22 -L-					
1096+75.92 -L-				80'	Rem. 15" RCP with DI
1097+62.46 -L-				85'	Rem. 15" RCP with DI
1098+51.26 -L-				85'	Rem. 15" RCP with DI
1100+39.02 -L-				20'	Rem. 15" RCP
1101+05.07 -L-				21'	Rem 15" CMP
1101+42.14 -L-				21'	Rem 15" CMP
1102+87.33 -L-				50'	Rem 15" CMP
1102+90.43 -L-				20'	Rem 15" CMP
1103+42.08 -L-				32'	Rem 15" CMP
1104+15.06 -L-				20'	Rem 15" CMP
1104+87.89 -L-				32'	Rem 15" CMP
13+43.18 -Y39-				76'	Rem 18" RCP Cross Pipe
12+44.14 -Y39-				52'	Rem 24" CMP Cross Pipe
1108+35.00 -L-					
1109+00.00 -L-					Tie 36" RCP into 7'X7' Culvert
1109+49.00 -L-					Tie 36" RCP into 7'X7' Culvert
1111+50.00 -L-					
1111+50.00 -L-					
1112+00.00 -L-					
1117+00.00 -L-					
1117+00.00 -L-					
SHEET TOTALS				594'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-B

CSD265813

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"	SIDE DRAIN PIPE 15"	SIDE DRAIN PIPE 18"	SIDE DRAIN PIPE 24"	SIDE DRAIN PIPE 30"	SIDE DRAIN PIPE 36"	SIDE DRAIN PIPE 42"	SIDE DRAIN PIPE 48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12" .064	C.S. PIPE 15" .064	C.S. PIPE 18" .064	C.S. PIPE 24" .064	C.S. PIPE 30" .079	C.S. PIPE 36" .079	C.S. PIPE 42" .109	C.S. PIPE 48" .109	R.C. PIPE CLASS III 12"	R.C. PIPE CLASS III 15"	R.C. PIPE CLASS III 18"	R.C. PIPE CLASS III 24"	R.C. PIPE CLASS III 30"	R.C. PIPE CLASS III 36"	R.C. PIPE CLASS III 42"	R.C. PIPE CLASS III 48"	R.C. PIPE CLASS IV 12"	R.C. PIPE CLASS IV 15"	R.C. PIPE CLASS IV 18"	R.C. PIPE CLASS IV 24"	R.C. PIPE CLASS IV 30"	R.C. PIPE CLASS IV 36"	R.C. PIPE CLASS IV 42"	R.C. PIPE CLASS IV 48"	42 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	48 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS 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'	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 (EACH) DROP INLET	CONCRETE TRANSITIONAL SECTION (EACH) CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
		508	505		138.1	130.9																									548'																																																			
1108+35.00 -L-	Rt.	512	513	134.2	131.4	124.4			32'																																							1													1		1																2 @ 15"				
1109+68.05 -L-	Lt.																																																																																	60'	Rem. 36" CMP (4'X3' RCBC)
1108+35.00 -L-	Lt.	514	515	133.9	131.1	125.7			28'																																							1													1		1																2 @ 15"				
1123+71.00 -L-	CL	610		146.4	143.3																																											1													1			1																			
		610	508		143.3	138.5																								668'																																																					
1123+71.00 -L-	Rt.	611		147.4	144.6																																											1													1			1																			
		611	610		144.6	143.6																							72'																																																									
1125+23.00 -L-	Rt.	612		148.2	145.4																																											1													1			1																			
		612	611		145.4	144.6			152'																																																																												
123+59.94 -L-	CL																																																																																		22'	Rem. 15" HDPE
1124+15.99 -L-	Lt.																																																																																	42'	Rem 18" RCP
1124+45.00 -L-	Lt.	613		146.4	143.6																																											1													1			1																			
		613	610		143.6	143.3																							100'																																																									
1127+24.09 -L-	Lt.																																																																																	32'	Rem. 15" RCP
1128+95.00 -L-	CL	614	622	149.5	146.8	146.6																									72'																	1														1		1																			
1128+95.00 -L-	Rt.	615		149.3	147.1																																											1														1		1																			
		615	614		147.1	146.8																								72'																																																									
		623	615		149.8	147.1																								24'																																																							
1132+44.00 -L-	CL	616		152.5	147.7																																											1												1				1																			
1134+20.00 -L-	CL	618		151.7	148.7																																											1													1			1																			
1134+20.00 -L-	Rt.	619		153.0	148.2																																											1													1			1																			
		618	619		148.7	148.5																								64'																																																									
		619	616		148.2	147.7																									172'																																																							
1131+55.00 -L-	CL	620	621	153.5	147.4	147.1																									100'																	1	1.1						1			1	1																										
		616	620		147.7	147.4																									88'																																																								
1128+95.08 -L-	Lt.																																																																																		46'	Rem. 18" RCP with 2 HW's
1129+06.36 -L-	Lt.																																																																																	14'	Rem. 18" RCP
1134+04.30 -L-	CL																																																																																	24'	Rem. 15" RCP
1139+35.97 -L-	Lt.																																																																																			Rem 18" RCP with 2 HW's (No Quantity)
1139+35.00 -L-	CL	711	710	155.9	152.9	152.7																								68'																		1													1			1																			
1139+35.00 -L-	CL	712		159.1	156.3																																											1													1			1																			
		712	711		156.3	153.2																							220'																																																										
1141+28.76 -L-	Lt.																																																																																	18'	Rem. 15" CMP
1147+20.59 -L-	Lt.																																																																																	20'	Rem. 15" CONC
1147+21.51 -L-	CL																																																																																	48'	Rem. 15" CONC
1147+46.95 -L-	Lt.	715							24'																																																																											
13+06.84 -Y40-	Rt.																																																																																		21'	Rem. 18" CONC
13+08.18 -Y40-	Rt.	716							24'																																																																													
1293+50.00 -Y40-	CL	717	718		154.9	154.3																																		56'																																																
1148+76.00 -L-	CL	810		169.1	165.9																																											1								1			1	1																										
1149+40.00 -L-	CL	811	809	168.8	165.8	165.5																							80'																			1													1			1																			
		810	811		165.9	165.8																								124'																																																								
1150+27.70 -L-	Rt.																																																																																	20'	Rem. 15" CMP
1151+60.56 -L-	Lt.																																																																																	28'	Rem. 15" CONC
SHEET TOTALS									260'																				472'	1020'	980'									56'								16	1.1						2			2	2	1	11	2	2	12														4 @ 15"			374'	

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: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 6/27/2013

PROJECT NO.	SHEET NO.
R-2303D	3-C

CSD265813

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 (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
1152+70.70 -L-	CL																		
1153+15.86 -L-	Lt.																		
1153+14.97 -L-	Lt.	812							28'										
1153+62.00 -L-	CL	813	814		166.5	166.3													
1153+62.00 -L-	CL	814		171.3	166.2														
1153+84.02 -L-	Lt.																		
1155+00.36 -L-	Lt.	815							36'										
1155+07.05 -L-	Lt.								36'										
1156+22.00 -L-	CL	816		169.9	165.1														
		814	816		166.2	165.4													
1157+45.00 -L-	CL	817		171.1	164.7														
		816	817		165.1	164.7													
1157+71.00 -L-	Lt.	818	819		165.0	164.1													
1158+23.00 -L-	CL	819		168.8	164.1														
		817	819		164.7	164.1													
1160+46.00 -L-	Lt.	820	821		164.0	163.2													
1160+73.00 -L-	CL	821		167.4	162.1														
		819	821		164.1	162.7													
1158+80.41 -L-	Lt.	822							24'										
1161+66.72 -L-	Lt.	910							20'										
1162+63.00 -L-	Lt.	911		163.2	161.3														
1164+11.00 -L-	Lt.	912		162.2	160.0														
		911	912		161.3	160.3			144'										
1161+68.71 -L-	Lt.																		
1162+85.56 -L-	Lt.																		
1164+31.69 -L-	Lt.																		
1164+11.00 -L-	CL	913		166.5	159.7														
		912	913		160.0	159.7													
		821	913		162.1	160.0													
1165+96.54 -L-	Lt.																		
1167+21.70 -L-	Lt.																		
1165+81.00 -L-	Lt.	914		160.6	158.7														
1167+00.00 -L-	Lt.	915		160.3	158.1														
		914	915		158.7	158.4			116'										
1167+00.00 -L-	CL	916		165.6	157.8														
		915	916		158.1	157.8													
		913	916		159.7	158.1													
1167+68.00 -L-	Rt.	917	918	166.9	164.1	160.7			24'										
1169+55.001 -L-	CL																		
1170+50.00 -L-	Rt.	933	936	166.3	163.5				24'										
		916	919		158.7	156.4													
1172+11.55 -L-	Lt.																		
1172+50.00 -L-	CL	922		164.1	158.8														
1172+50.00 -L-	Lt.	924		165.9	159.0														
		924	922		159.0	158.8													
1172+50.00 -L-	Lt.	925	924		159.0	159.0													
1172+50.00 -L-	Rt.	926		165.9	158.7														
		922	926		158.8	158.7													
SHEET TOTALS									452'										

STATION	FROM	TO	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	42 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	48 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	ENDWALLS STD. 838.01, 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
1153+62.00 -L-	813	814											80'																	
	814	816											256'																	
	816	817												124'																
1157+71.00 -L-	818	819												96'																
	817	819												76'																
1160+46.00 -L-	820	821											88'																	
	819	821												248'																
	912	913											92'																	
	821	913													336'															
	915	916											92'																	
	913	916													288'															
	916	919														480'														
	924	922																						56'						
1172+50.00 -L-	925	924																						24'					3.4	
	922	926																						54'						
SHEET TOTALS													608'	544'	624'	480'								134'					3.4	

STATION	FROM	TO	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
1153+62.00 -L-	814		1	0.1												1			1													
1156+22.00 -L-	816		1												1				1													
1157+45.00 -L-	817		1	1.4						1			1	1																		
1158+23.00 -L-	819		1												1				1													
1160+73.00 -L-	821		1												1				1													
1162+63.00 -L-	911		1														1		1													
1164+11.00 -L-	912		1														1		1													
1164+11.00 -L-	913		1							1					1				1													
1165+81.00 -L-	914		1														1		1													
1167+00.00 -L-	915		1														1		1													
1167+00.00 -L-	916		1												1				1													
1167+68.00 -L-	917	918	1													1		1														
1170+50.00 -L-	933	936	1													1		1														
1172+50.00 -L-	922		1	0.3												1			1													
1172+50.00 -L-	924		1	1.9												1		1														
1172+50.00 -L-	926		1	2.2												1		1														
SHEET TOTALS			16	5.9						2			1	1	5	6	4	4	11													

STATION	FROM	TO	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
1152+70.70 -L-						24"	Rem. 18" CONC
1153+15.86 -L-						18'	Rem. 15" CONC
1153+84.02 -L-						28'	Rem. 15" CONC
1155+07.05 -L-						20'	Rem. 15" CONC
	816	817					Rem. 15" Plastic Pipe
1161+68.71 -L-						16'	Rem. 15" CONC
1162+85.56 -L-						22'	Rem. 18" CONC
1164+31.69 -L-						28'	Rem. 18" CONC
1165+96.54 -L-						18'	
1167+21.70 -L-						20'	Rem. 18" CONC
1167+68.00 -L-	917	918	2 @ 15"				
1169+55.001 -L-						26'	Rem. 15" Plastic Pipe
1170+50.00 -L-	933	936	2 @ 15"				
1172+11.55 -L-						46'	Rem. 18" CONC with HW
SHEET TOTALS			4 @ 15"			266'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	6/27/2013

CSD265813

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	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
		926	927		158.7	158.7													
1173+78.00 -L-	Rt.	934		166.3	158.2														
		928	934		159.0	158.2													
		934	929		158.2	158.2													
1174+67.00 -L-	CL	931		165.6	159.8														
		931	930		159.8	159.0													
		931	932		159.8	158.5													
1175+84.09 -L-	Lt.	1010							24'										
1177+17.24 -L-	Lt.	1011							24'										
1177+03.62 -L-	Rt.	1012							24'										
1178+29.00 -L-	CL	1013		168.2	163.8														
		931	1013		162.6	163.8													
1180+00.00 -L-	CL	1014		167.1	164.3														
		1013	1014		163.8	164.3													
1183+74.00 -L-	CL	1015		168.5	165.7														
		1014	1015		164.3	165.7													
1181+50.54 -L-	Rt.	1012A								24'									
1175+78.09 -L-	Lt.																		
1176+83.15 -L-	CL																		
1177+15.47 -L-	Lt.																		
1178+47.23 -L-	CL																		
1181+36.64 -L-	Lt.																		
1182+86.74 -L-	Lt.																		
1183+60.64 -L-	Lt.																		
1184+61.88 -L-	Lt.																		
12+25.88 -Y42-	Rt.	1016							28'										
1186+06.00 -L-	CL	1017		171.0	167.8														
		1017	1018		167.8	162.0													
1187+03.00 -L-	CL	1019		171.4	168.2														
		1019	1017		168.2	167.8													
1187+28.00 -L-	CL	1020		171.8	168.6														
		1020	1019		168.6	168.2													
18+15.78 -Y42-	CL	1021	1022		161.0	159.5													
1190+00.00 -L-	CL	1110		168.6	165.9														
1190+49.00 -L-	CL	1111		168.3	165.6														
		1110	1111		165.9	165.6													
1193+50.00 -L-	CL	1112		161.7	159.0														
		1111	1112		165.6	159.0													
1194+95.00 -L-	CL	1124		157.8	154.8														
		1112	1124		159.0	155.3													
1195+70.00 -L-	CL	1125		158.3	154.6														
		1124	1125		155.1	154.6													
1196+26.00 -L-	Lt.	1114		154.0	151.3														
1196+35.00 -L-	CL	1115		154.4	151.0														
		1114	1115		151.3	151.0													
		1125	1115		154.6	151.0													
		1115	1117		151.0	143.3													
1197+84.81 -L-	Rt.																		
SHEET TOTALS									100'	24'									

STATION	FROM	TO	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK
	926	927																						24'				
	928	934																						144'				
	934	929																						24'				
	931	930																						92'				
	931	932																						80'				
	931	1013											360'															
	1013	1014											168'															
	1014	1015											372'															
	1017	1018																		104'								
	1019	1017																		96'								
	1020	1019																		28'								
18+15.78 -Y42-	1021	1022																			84'							
	1110	1111										44'																
	1111	1112										296'																
	1112	1124										144'																
	1124	1125											72'															
	1114	1115										72'																
	1125	1115											64'															
	1115	1117											124'															
SHEET TOTALS												556'	1160'							228'	84'			364'				

STATION	FROM	TO	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
1173+78.00 -L-	934				1	3.1												1		1														
	928	934	3.4																															
1174+67.00 -L-	931				1	0.8												1			1													
	931	930	3.4																															
1178+29.00 -L-	1013				1							1			1	1																		
1180+00.00 -L-	1014				1													1			1													
1183+74.00 -L-	1015				1													1			1													
1186+06.00 -L-	1017				1							1			1	1																		
1187+03.00 -L-	1019				1							1			1	1																		
1187+28.00 -L-	1020				1							1			1	1																		
1190+00.00 -L-	1110				1													1			1													
1190+49.00 -L-	1111				1													1			1													
1193+50.00 -L-	1112				1													1			1													
1194+95.00 -L-	1124				1													1			1													
1195+70.00 -L-	1125				1							1			1	1																		
1196+26.00 -L-	1114				1													1			1													
1196+35.00 -L-	1115				1													1			1													
SHEET TOTALS			6.8		15	3.9						5			5	5		10		1	9													

STATION	FROM	TO	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
1175+78.09 -L-						22'	Rem. 15" CONC with HW's
1176+83.15 -L-						22'	Rem. 15" CONC
1177+15.47 -L-						22'	Rem. 15" CONC with HW's
1178+47.23 -L-						30'	Rem. 15" CONC
1181+36.64 -L-						24"	Rem. 15" CONC
1182+86.74 -L-						52'	Rem. 15" CONC
1183+60.64 -L-						36'	Rem. 15" CONC
1184+61.88 -L-						36'	Rem. 15" CONC
	1111	1112					Rem. 15" CONC (No Quantity)
1197+84.81 -L-						50'	Rem. 30" CONC
SHEET TOTALS						294'	

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

CSD265813

COMPUTED BY: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	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	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL
1199+10.00 -L-	Rt.	1127	1128	151.0	148.2	145.5	
1199+23.21 -L-	Rt.						
1199+48.13 -L-	Rt.						
1199+67.67 -L-	Rt.						
1200+05.00 -L-	Lt.	1119	1120		148.0	144.4	
1199+87.00 -L-	CL	1120	1121	148.9	143.3	140.7	
1200+62.00 -L-	CL	1122		148.7	143.9		
		1122	1120		143.9	143.3	
1200+62.00 -L-	Rt.	1123		150.5	147.8		
1201+02.00 -L-	Rt.	1129		150.6	147.8		
		1129	1123		147.8	147.7	
		1123	1126		147.7	140.5	
1202+25.00 -L-	CL	1210		149.6	144.8		
		1210	1122		144.8	145.5	
1202+25.00 -L-	Lt.	1222		148.5	145.5		
		1211	1222		149.7	146.0	
		1222	1210		145.0	144.8	
1202+81.04 -L-	Rt.						
1204+86.83 -L-	Rt.						
1205+10.48 -L-	Rt.						
1205+25.00 -L	CL	1213		152.2	148.7		
		1212	1213		149.9	149.2	
		1213	1214		148.7	147.2	
1206+50.00 -L-	Lt.	1215		153.3	149.5		
		1215	1213		149.5	149.1	
1206+50.00 -L-	CL	1216		152.7	149.7		
		1216	1215		149.7	149.5	
1207+25.91 -L-	Rt.						
1213+05.63 -L-	Rt.						
1214+00.00 -L-	Rt.						
1213+03.00 -L-	Lt.	1218		151.2	148.5		
1213+79.00 -L-	Lt.	1219		149.7	146.7		
		1218	1219		148.5	147.0	
1213+79.00 -L	CL	1220		151.6	146.5		
		1219	1220		146.7	146.5	
1212+80.00 -L-	Rt.	1221		151.0	148.3		
		1221	1220		148.2	146.8	
1211+85.00 -L-	Rt.	1223		154.1	151.3		
		1223	1221		151.3	148.2	
1215+30.99 -L-	Rt.						
1215+58.94 -L-	Rt.						
1216+53.75 -L-	Rt.						
1217+28.17 -L-	Rt.						
1215+57.57 -L-	Lt.	1310					
1217+50.00 -L-	Lt.	1311		143.5	140.8		
1217+50.00 -L-	CL	1312		144.1	139.4		
		1311	1312		140.8	140.1	
		1220	1312		146.5	139.9	
1217+49.00 -L-	Rt.	1313		143.5	140.8		
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	C.S. PIPE 12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE													.064	.064	.064	.064	.079	.079	.109	.109
1199+10.00 -L-		20'																		
1199+23.21 -L-																				
1199+48.13 -L-																				
1199+67.67 -L-																				
1200+05.00 -L-																				
1199+87.00 -L-																				
1200+62.00 -L-																				
1200+62.00 -L-																				
1201+02.00 -L-																				
		32'																		
1202+25.00 -L-																				
1202+25.00 -L-																				
1202+81.04 -L-																				
1204+86.83 -L-																				
1205+10.48 -L-																				
1205+25.00 -L																				
1206+50.00 -L-																				
1206+50.00 -L-																				
1207+25.91 -L-																				
1213+05.63 -L-																				
1214+00.00 -L-																				
1213+03.00 -L-																				
1213+79.00 -L-																				
		76'																		
1213+79.00 -L																				
1212+80.00 -L-																				
1211+85.00 -L-																				
		192'																		
1215+30.99 -L-																				
1215+58.94 -L-																				
1216+53.75 -L-																				
1217+28.17 -L-																				
1215+57.57 -L-		20'																		
1217+50.00 -L-																				
1217+50.00 -L-																				
1217+49.00 -L-																				
SHEET TOTALS		340'																		

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"
1199+10.00 -L-																
1199+23.21 -L-																
1199+48.13 -L-																
1199+67.67 -L-																
1200+05.00 -L-			76'													
1199+87.00 -L-					84'											
1200+62.00 -L-																
					72'											
1200+62.00 -L-																
1201+02.00 -L-																
										36'						
1202+25.00 -L-																
				160'												
1202+25.00 -L-																
			20'													
			72'													
1202+81.04 -L-																
1204+86.83 -L-																
1205+10.48 -L-																
1205+25.00 -L																
			76'													
				84'												
1206+50.00 -L-																
			124'													
1206+50.00 -L-																
			292'													
1207+25.91 -L-																
1213+05.63 -L-																
1214+00.00 -L-																
1213+03.00 -L-																
1213+79.00 -L-																
1213+79.00 -L																
			76'													
1212+80.00 -L-																
		72'														
1211+85.00 -L-																
1215+30.99 -L-																
1215+58.94 -L-																
1216+53.75 -L-																
1217+28.17 -L-																
1215+57.57 -L-																
1217+50.00 -L-																
1217+50.00 -L-																
		72'														
			368'													
1217+49.00 -L-																
SHEET TOTALS		144'	1104'	244'	156'					36'						

STATION	42 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	48 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	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 (EACH) DROP INLET	CATCH BASIN
1199+10.00 -L-					1								
1199+23.21 -L-													
1199+48.13 -L-													
1199+67.67 -L-													
1200+05.00 -L-													
1199+87.00 -L-					1								
1200+62.00 -L-					1								
1200+62.00 -L-					1								
1201+02.00 -L-					1								
1202+25.00 -L-					1								
1202+25.00 -L-					1								
1202+81.04 -L-													
1204+86.83 -L-													
1205+10.48 -L-													
1205+25.00 -L					1								
1206+50.00 -L-					1								
1206+50.00 -L-					1								
1207+25.91 -L-													
1213+05.63 -L-													
1214+00.00 -L-													
1213+03.00 -L-					1								
1213+79.00 -L-					1								
1213+79.00 -L					1	0.1							
1212+80.00 -L-					1								
1211+85.00 -L-					1								
1215+30.99 -L-													
1215+58.94 -L-													
1216+53.75 -L-													
1217+28.17 -L-													
1215+57.57 -L-													
1217+50.00 -L-					1								
1217+50.00 -L-					1	4.7							
1217+49.00 -L-					1								
SHEET TOTALS					18	4.8							

STATION	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
1199+10.00 -L-					1		1														
1199+23.21 -L-																					
1199+48.13 -L-																					
1199+67.67 -L-																					
1200+05.00 -L-																					
1199+87.00 -L-				1				1													
1200+62.00 -L-				1				1													
1200+62.00 -L-					1		1														
1201+02.00 -L-					1		1														
1202+25.00 -L-				1			1														
1202+25.00 -L-					1			1													
1202+81.04 -L-																					
1204+86.83 -L-																					
1205+10.48 -L-																					
1205+25.00 -L					1			1													
1206+50.00 -L-					1			1													
1206+50.00 -L-					1			1													
1207+25.91 -L-																					
1213+05.63 -L-																					
1214+00.00 -L-																					
1213+03.00 -L-					1			1													
1213+79.00 -L-					1			1													
1213+79.00 -L					1			1													
1212+80.00 -L-					1			1													
1211+85.00 -L-					1			1													
1215+30.99 -L-																					
1215+58.94 -L-																					
1216+53.75 -L-																					
1217+28.17 -L-																					
1215+57.57 -L-																					
1217+50.00 -L-					1			1													
1217+50.00 -L-				1				1													
1217+49.00 -L-					1			1													
SHEET TOTALS				4	14		4	14													

STATION	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
1199+10.00 -L-	2 @ 15"				
1199+23.21 -L-				18'	Rem. 15" Plastic Pipe
1199+48.13 -L-				24'	Rem. 18" CONC
1199+67.67 -L-				53'	Rem. 18" CONC
1200+05.00 -L-					
1199+87.00 -L-					
1200+62.00 -L-					
1200+62.00 -L-	2 @ 15"				
1201+02.00 -L-					
1202+25.00 -L-					
1202+25.00 -L-					
1202+81.04 -L-				20'	Rem. 15" Plastic Pipe
1204+86.83 -L-				38'	Rem. 15" Plastic Pipe
1205+10.48 -L-		0.13		16'	Rem. Partial 18" CONC, Plug and Fill
1205+25.00 -L					
1206+50.00 -L-					
1206+50.00 -L-					
1207+25.91 -L-				20'	Rem. 18" CONC
1213+05.63 -L-				18'	Rem. 15" CONC
1214+00.00 -L-				16'	Rem. 15" CONC
1213+03.00 -L-					
1213+79.00 -L-					
1213+79.00 -L					
1212+80.00 -L-					
1211+85.00 -L-					
1215+30.99 -L-				24'	Rem. 15" CONC
1215+58.94 -L-				22'	Rem. 15" CONC
1216+53.75 -L-				20'	Rem. 18" CMP
1217+28.17 -L-				30'	Rem. 18" CMP
1215+57.57 -L-					
1217+50.00 -L-					
1217+50.00 -L-					
1217+49.00 -L-					
SHEET TOTALS	4 @ 15"	0.13		319'	

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

CSD265813

COMPUTED BY:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-F

**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
		1313	1312		140.8	140.1													
1221+50.00 -L-	Lt.	1315		136.6	133.6														
1221+50.00 -L-	Cl	1316		137.2	131.5														
		1315	1316		133.6	133.0													
		1312	1316		139.4	132.5													
1221+66.41 -L-																			
1222+80.00 -L-	CL	1317		136.7	131.0														
		1316	1317		131.5	131.0													
1224+24.00 -L-	Cl	1318		137.4	125.4														
		1317	1318		131.0	125.4													
		1318	1325		125.4	121.0													
1222+80.00 -L-	Lt.	1319			135.9														
1222+80.00 -L-	Lt.	1320		138.8	136.0														
		1320	1319		136.1	125.1			44'										
1223+00.00 -L-	Lt.	1321		138.8	136.1														
		1321	1320		136.1	136.1													
1222+80.00 -L-	Rt.	1322			135.9														
1222+80.00 -L-	Rt.	1323		138.8	136.0														
		1323	1322		136.1	127.9			36'										
1222+80.00 -L-	Rt.	1324		138.8	136.1														
		1324	1323		136.1	136.0													
1220+63.00 -L-	Rt	1326		138.8	135.9														
		1326	1326A		135.9	135.8													
1224+68.76 -L-	CL	1327		137.8	125.8														
1224+51.12 -L-	CL	1328			121.0														
		1327	1328		125.8	121.0													
1226+14.30 -L-	Rt.																		
1227+18.07 -L-	Rt.																		
1227+32.22	Rt.																		
1229+50.00 -L-	Lt.	1410		149.3	146.6														
1219+50.00 -L-	CL	1411		148.2	143.5														
		1410	1411		146.6	144.2													
		1411	1327		143.5	132.7													
1232+10.00 -L-	Lt.	1412			155.8														
	Lt.	1413		154.7	151.7														
		1412	1413		155.8	151.7				20'									
13+32.10	CL	1414		155.5	150.8														
		1414	1411		150.8	143.5													
		1413	1414		151.7	151.3													
1227+18.07 -L-	Rt.																		
1235+50.00 -L-	Cl	1415		159.0	156.3														
1235+50.00 -L-	Rt.	1416		158.4	156.5														
		1415	1414		156.3	151.5													
		1416	1415		156.5	156.3													
1238+49.98 -L-	Rt.	1417							28'										
1238+62.25 -L-	Rt.																		
1240+86.79 -L-	Rt.																		
1241+72.49 -L-	Rt.																		
1242+95.63 -L-	Rt.																		
SHEET TOTALS									108'	20'									

STATION	FROM	TO	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
	1313	1312										72'																		
1221+50.00 -L-	1315																													
1221+50.00 -L-	1316																													
	1315	1316											72'																	
	1312	1316												400'																
1221+66.41 -L-																														
1222+80.00 -L-	1317																													
	1316	1317														124'														
1224+24.00 -L-	1318																													
	1317	1318														140'														
	1318	1325																												
1222+80.00 -L-	1319																													
1222+80.00 -L-	1320																													
	1320	1319																												
1223+00.00 -L-	1321																													
	1321	1320										16'																		
1222+80.00 -L-	1322																													
1222+80.00 -L-	1323																													
	1323	1322																												
1222+80.00 -L-	1324																													
	1324	1323										16'																		
1220+63.00 -L-	1326																													
	1326	1326A																												
1224+68.76 -L-	1327																													
1224+51.12 -L-	1328																													
	1327	1328												16'																
1226+14.30 -L-																														
1227+18.07 -L-																														
1227+32.22																														
1229+50.00 -L-	1410																													
1219+50.00 -L-	1411																													
	1410	1411										72'																		
	1411	1327												476'																
1232+10.00 -L-	1412																													
	1413																													
	1412	1413																												
13+32.10	1414																													
	1414	1411												256'																
	1413	1414											72'																	
1227+18.07 -L-																														
1235+50.00 -L-	1415																													
1235+50.00 -L-	1416																													
	1415	1414										436'																		
	1416	1415										112'																		
1238+49.98 -L-	1417																													
1238+62.25 -L-																														
1240+86.79 -L-																														
1241+72.49 -L-																														
1242+95.63 -L-																														
SHEET TOTALS												724'	144'	1148'		264'														

STATION	FROM	TO	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
	1313	1312																																			
1221+50.00 -L-	1315		1													1			1																		
1221+50.00 -L-	1316		1												1				1																		
	1315	1316																																			
	1312	1316																																			
1221+66.41 -L-																																				31'	Rem. 24" RCP
1222+80.00 -L-	1317		1	0.8											1				1																		
	1316	1317																																			
1224+24.00 -L-	1318		1	5.0	2										1				1																		
	1317	1318																																			
	1318	1325																																			Tie in to Prop. 9'x9' RCBC
1222+80.00 -L-	1319																																				
1222+80.00 -L-	1320		1													1		1																			
	1320	1319																															2 @ 15"				
1223+00.00 -L-	1321		1													1		1																			
	1321	1320																																			
1222+80.00 -L-	1322																																				15" Outlet Pipe
1222+80.00 -L-	1323		1													1		1																			
	1323	1322																															2 @ 15"				
1222+80.00 -L-	1324		1													1		1																			
	1324	1323																																			
1220+63.00 -L-	1326		1													1		1																			
	1326	1326A																																			
1224+68.76 -L-	1327		1	5.0	2										1			1																			
1224+51.12 -L-	1328																																				
	1327	1328																																			
1226+14.30 -L-																																				18'	Rem. 24" CONC
1227+18.07 -L-																																				19'	Rem. 18" CONC
1227+32.22																																				32'	Rem. 24" CONC
1229+50.00 -L-	1410		1													1			1																		
1219+50.00 -L-	1411		1												1				1																		
	1410	1411																																			
	1411	1327																																			
1232+10.00 -L-	1412																																				18" Inlet Pipe
	1413		1													1			1																		
	1412	1413																																			
13+32.10	1414		1												1				1																		
	1414	1411																																			
	1413	1414																																			
1227+18.07 -L-																																				32'	Rem. 15" CONC
1235+50.00 -L-	1415		1													1			1																		
1235+50.00 -L-	1416		1														1		1																		
	1415	1414																																			
	1416	1415																																			
1238+49.98 -L-	1417																																				
1238+62.25 -L-																																				28'	Rem. 15" CONC
1240+86.79 -L-																																				24'	Rem. 15" CONC
1241+72.49 -L-																																				32'	Rem. 15" CONC
1242+95.63 -L-																																				60'	Rem. 15" CONC
SHEET TOTALS			16	10.8	4										6	9	1	6	10														4 @ 15"			276'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

CSD265813

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	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) 12"	15"	18"	24"	30"	36"	42"	48"	Do Not Use RCP	Do Not Use CSP	Do Not Use CAAP	Do Not Use HDPE
1241+75.81 -L-	Rt.	1418							24'										
1243+48.84 -L-	Lt.	1509							20'										
1243+73.05 -L-	Lt.																		
1244+10.48 -L-	Lt.																		
1244+39.69 -L-	Lt.																		
1247+00.00 -L-	Cl	1510		157.1	154.3														
		1510	1512		154.3	148.2													
1251+50.00 -L-	CL	1514		157.7	153.3														
1251+50.00 -L-	Lt	1515		157.0	153.5														
1252+82.00 -L-	Lt.	1516		158.3	155.6														
		1516	1515		155.6	154.3			128'										
		1515	1514		153.5	153.3													
1250+66.00 -L-	Rt.	1517			152.9														
		1514	1517		153.3	152.9													
1254+51.00 -L-	CL	1518		162.5	159.1														
		1518	1514		159.3	154.6													
1255+19.00 -L-	Rt.	1519		161.2	159.3														
		1519	1518		159.3	159.1													
1261+65.90 -L-	Lt.	1609		156.6	153.8														
1262+22.00 -L-	Lt.	1610		151.7	144.8														
13+71.00 -Y43-	Rt.	1611		150.3	145.1														
13+29.00 -Y43-	Rt.	1612			151.8														
1371+.00 -Y43-	Lt.	1613		150.3	147.6														
		1613	1611		147.6	146.3													
		1612	1611		151.8	145.0					44'								
		1611	1610		145.0	144.8													
1262+66.00 -L-	Rt.	1614		156.4	144.5														
		1610	1614		144.8	144.5													
1262+66.00 -L-	Rt.	1615		156.3	144.5														
17+33.91 -Y43-	Rt.	1616			144.0														
		1609	1615		153.8	144.5													
		1614	1615		144.5	144.5													
		1615	1616		144.5	144.0													
16+80.00 -Y43-	Lt																		
16+80.57 -Y43-	Lt.	1617							24'										
1267+00.00 -L-	Lt.	1618		139.9	137.2														
1268+76.00 -L-	Lt	1619			137.7														
1268+76.00 -L-	Lt.	1620		136.0	132.5														
1268+76.00 -L-	Rt.	1621		137.9	132.3														
1269+94.00 -L-	Rt.	1622		129.9	125.0														
1623+95.00 -L-	Rt.	1623			124.9														
		1618	1620		137.2	133.3			168'										
		1619	1620		137.7	133.0				20'									
		1620	1621		132.5	132.3													
		1621	1622		132.3	127.0													
		1622	1623		125.0	124.9													
1274+20.00 -L-	Lt.	1710		123.9	121.2														
1274+20.00 -L-	CL	1711		124.5	120.9														
1274+20.00 -L-	Rt.	1712		119.8	115.4														
SHEET TOTALS									364'	20'	44'								

Station	Str. From	Str. To	C.S. Pipe 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. Pipe Class III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. Pipe Class IV 12"	15"	18"	24"	30"	36"	42"	48"	42" Welded Steel Pipe (Grade B) 0.625" Thick	48" Welded Steel Pipe (Grade B) 0.625" Thick	Endwalls Std. 838.01, 838.11 or Std. 838.80 (Unless Noted Otherwise) Cu. Yards R.C.P.	C.S.P.
1241+75.81 -L-	1418																													
1243+48.84 -L-	1509																													
1243+73.05 -L-																														
1244+10.48 -L-																														
1244+39.69 -L-																														
1247+00.00 -L-	1510																													
	1510	1512										144'																		
1251+50.00 -L-	1514																													
1251+50.00 -L-	1515																													
1252+82.00 -L-	1516																													
	1516	1515																												
	1515	1514												68'																
1250+66.00 -L-	1517																													
	1514	1517													132'															
1254+51.00 -L-	1518																													
	1518	1514										300'																		
1255+19.00 -L-	1519																													
	1519	1518		72'																										
1261+65.90 -L-	1609																													
1262+22.00 -L-	1610																													
13+71.00 -Y43-	1611																													
13+29.00 -Y43-	1612																													
1371+.00 -Y43-	1613																													
	1613	1611										52'																		
	1612	1611																												
	1611	1610													80'															
1262+66.00 -L-	1614																													
	1610	1614													108'															
1262+66.00 -L-	1615																													
17+33.91 -Y43-	1616																													
	1609	1615										100'																		
	1614	1615													4'															
	1615	1616													164'															
16+80.00 -Y43-																														
16+80.57 -Y43-	1617																													
1267+00.00 -L-	1618																													
1268+76.00 -L-	1619																													
1268+76.00 -L-	1620																													
1268+76.00 -L-	1621																													
1269+94.00 -L-	1622																													
1623+95.00 -L-	1623																													
	1618	1620																												
	1619	1620																												
	1620	1621												76'																
	1621	1622												104'																
	1622	1623													24'															
1274+20.00 -L-	1710																													
1274+20.00 -L-	1711																													
1274+20.00 -L-	1712																													
SHEET TOTALS				72'								596'		248'	512'															

Station	Str. From	Str. To	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 (Each) Drop Inlet	Catch Basin	Open Throat Catch Basin Std. 840.04 or 840.05	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 Two Grate Std. 840.20	G.D.I. Frame with Two Grates Std. 840.24	J.B. Std. 840.31 or 840.32	M.H. Frame and Cover Std. 840.54	T.B.J.B. Std. 840.34	T.B.G.D.I. Std. 840.35	G.D.I. Frame with Two Grates Std. 840.29	G.D.I. Frame with Two Grates Std. 840.22	Special D.I. (See Detail Sheet 2-Q)	Special DI (See Detail 2-U)	Special D.I. (See Detail Sheet 2-V)	Adjust Exist. MH	Adjust Exist. CB	Adjust Exist. DI	Modified Concrete Flume (See Detail Sht. 2-R)
1241+75.81 -L-	1418																															
1243+48.84 -L-	1509																															
1243+73.05 -L-																																
1244+10.48 -L-																																
1244+39.69 -L-																																
1247+00.00 -L-	1510		1													1			1													
	1510	1512																														
1251+50.00 -L-	1514		1													1			1													
1251+50.00 -L-	1515		1													1			1													
1252+82.00 -L-	1516		1													1			1													
	1516	1515																														
	1515	1514																														
1250+66.00 -L-	1517																															
	1514	1517																														
1254+51.00 -L-	1518		1							1			1	1																		
	1518	1514																														
1255+19.00 -L-	1519		1														1		1													
	1519	1518																														
1261+65.90 -L-	1609		1													1			1													
1262+22.00 -L-	1610		1	1.9											1				1													
13+71.00 -Y43-	1611		1	0.3											1				1													
13+29.00 -Y43-	1612																															
1371+.00 -Y43-	1613		1													1			1													
	1613	1611																														
	1612	1611																														
	1611	1610																														
1262+66.00 -L-	1614		1	5.0	1.9					1			1	1																		
	1610	1614																														
1262+66.00 -L-	1615		1	5.0	1.8					1			1	1																		
17+33.91 -Y43-	1616																															
	1609	1615																														
	1614	1615																														
	1615	1616																														
16+80.00 -Y43-																																
16+80.57 -Y43-	1617																															
1267+00.00 -L-	1618		1													1			1													
1268+76.00 -L-	1619																															
1268+76.00 -L-	1620		1													1			1													
1268+76.00 -L-	1621		1	0.6												1			1													
1269+94.00 -L-	1622		1																	1	1											
1623+95.00 -L-	1623																															
	1618	1620																														
	1619	1620																														
	1620	1621																														
	1621	1622																														
	1622	1623																														
1274+20.00 -L-	1710		1													1		1														
1274+20.00 -L-	1711		1													1		1														
1274+20.00 -L-	1712		1																	1	1											
SHEET TOTALS			19	12.8	3.7					3			3	3	2	11	1	2	12	2	2											

Station	Str. From	Str. To	Side Drain Pipe Elbows No. & Size	Conc. & Brick Pipe Plug, C.Y. Std. 840.71	Conc. Collars Cl. 'B' C.Y. Std. 840.72	Pipe Removal Lin. Ft.	Remarks
1241+75.81 -L-	1418						
1243+48.84 -L-	1509						
1243+73.05 -L-						66'	Rem 12" CONC with DI
1244+10.48 -L-						20'	Rem 15" CONC
1244+39.69 -L-						64'	Rem. 12" CONC
1247+00.00 -L-	1510						
	1510	1512					
1251+50.00 -L-	1514						
1251+50.00 -L-	1515						
1252+82.00 -L-	1516						
	1516	1515					
	1515	1514					
1250+66.00 -L-	1517						30" RCP-III Outlet Pipe
	1514	1517					
1254+51.00 -L-	1518						
	1518	1514					
1255+19.00 -L-	1519						
	1519	1518					
1261+65.90 -L-	1609						
1262+22.00 -L-	1610						
13+71.00 -Y43-	1611						
13+29.00 -Y43-	1612						
1371+.00 -Y43-	1613						
	1613	1611					24" Inlet Pipe
	1612	1611					Rem. 15" CONC Pipe, No Quantity
	1611	1610					
1262+66.00 -L-	1614						
	1610	1614					
1262+66.00 -L-	1615						
17+33.91 -Y43-	1616						30" RCP-III Outlet Pipe
	1609	1615					
	1614	1615					
	1615	1616					Rem. 15" CONC Pipe No Quantity
16+80.00 -Y43-						24'	Rem. 15" CONC
16+80.57 -Y43-	1617						
1267+00.00 -L-	1618						
1268+76.00 -L-	1619						18" Inlet Pipe
1268+76.00 -L-	1620						
1268+76.00 -L-	1621						
1269+94.00 -L-	1622						
1623+95.00 -L-	1623						30" RCP-III Outlet Pipe
	1618	1620					
	1619	1620					
	1620	1621					
	1621	1622					
	1622	1623					
1274+20.00 -L-	1710						
1274+20.00 -L-	1711						
1274+20.00 -L-	1712						
SHEET TOTALS						174'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-H

CSD265813

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
1274+20.00 -L-	Lt.	1713			119.8		
		1710	1711		121.2	120.9	
		1711	1712		120.9	117.4	
		1712	1713		115.4	115.3	
1276+50.00 -L-	Lt.	1714		118.3	115.6		
1276+50.00 -L-	CL	1715		118.9	115.2		
		1714	1715		115.6	115.2	
		1715	1717		115.2	101.3	
1285+23.00 -L-	Lt.	1810		98.7	95.9		
1285+70.00 -L-	Lt.	1811			92.6		
1285+70.00 -L-	Lt.	1812		99.2	94.8		
1285+30.11 -L-	Rt.	1813			91.0		
1286+45.00 -L-	CL	1814		98.2	95.0		
		1810	1812		95.9	92.6	
		1811	1812		92.6	91.3	
		1814	1812		95.0	92.6	
		1812	1813		91.3	91.0	
1289+00.00 -L-	Lt.	1815		91.9	89.7		
1289+00.00 -L-	CL	1816		94.7	89.4		
		1815	1816		89.7	89.4	
		1816	1817		91.7	90.3	
1292+78.00 -L-	CL	1821		92.1	89.4		
1295+61.00 -L-	CL	1825		92.8	89.9		
1292+78.00 -L-	Rt.	1826		93.3	90.5		
1293+35.00 -L-	Rt.	1827		93.5	90.7		
		1821	1823		89.3	88.8	
		1825	1823		89.8	89.3	
		1827	1826		90.7	90.5	
		1821	1826		90.5	89.3	
16+90.00 -Y44-	Lt.	1831					
1296+60.00 -L-	CL	1910		93.1	90.4		
1296+60.00 -L-	Rt.	1911		94.6	91.9		
		1911	1910		91.7	90.3	
		1910	1825		90.3	90.0	
1297+56.47 -L-	Lt.						
1298+55.68 -L-	Lt.	1914					
1301+33.78 -L-	Lt.						
1301+85.00 -L-	CL	1915		95.7	93.0		
1301+85.00 -L-	Lt.	1916		98.5	92.8		
1301+85.00 -L-	Lt.	1917			87.6		
		1915	1916		93.0	92.8	
		1916	1917		92.8	87.6	
1303+07.00 -L-	Rt.	1920		96.9	94.1		
1305+14.00 -L	Rt	1918		97.5	93.5		
1305+14.00 -L	Rt	1919			86.3		
		1920	1918		94.1	93.5	
		1918	1919		93.5	86.3	
1305+14.00 -L-	Lt.	1921		97.5	94.7		
		1921	1922		94.7	85.6	
SHEET TOTALS							

STATION	FROM	TO	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	C.S. PIPE 12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE															.064	.064	.064	.064	.079	.079	.109	.109
	1710	1711														72'						
	1711	1712															84'					
	1712	1713																12'				
16+90.00 -Y44-	1831					28'																
1298+55.68 -L-	1914			36'																		
	1915	1916														54'						
	1916	1917		32'																		
	1918	1919		40'																		
	1921	1922		44'																		
SHEET TOTALS				152'		28'										126'	84'	12'				

STATION	FROM	TO	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"	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK
	1714	1715		72'																
	1715	1717		204'																
	1810	1812		44'																
	1811	1812					92'													
	1814	1812										72'								
	1812	1813					108'													
	1815	1816			84'															
	1816	1817			92'															
	1821	1823		160'																
	1825	1823			116'															
	1827	1826										54'								
	1821	1826										54'								
	1911	1910										50'								
	1910	1825		96'																
	1920	1918										200'								
SHEET TOTALS				576'	292'		200'					430'								

STATION	FROM	TO	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
1276+50.00 -L-	1714			1													1			1													
1276+50.00 -L-	1715			1													1			1													
1285+23.00 -L-	1810			1													1			1													
1285+70.00 -L-	1812			1	2.9						1			1	1																		
1286+45.00 -L-	1814			1							1			1	1																		
1289+00.00 -L-	1815			1														1		1													
1289+00.00 -L-	1816			1	0.3												1			1													
1292+78.00 -L-	1821			1													1			1													
1295+61.00 -L-	1825			1													1			1													
1292+78.00 -L-	1826			1													1		1														
1293+35.00 -L-	1827			1													1		1														
	1825	1823		1													1		1														
1296+60.00 -L-	1910			1													1		1														
1296+60.00 -L-	1911			1													1		1														
1301+85.00 -L-	1915			1													1			1													
1301+85.00 -L-	1916			1	0.8												1		1														
1303+07.00 -L-	1920			1													1		1														
1305+14.00 -L	1918			1													1		1														
1305+14.00 -L-	1921			1													1		1														
SHEET TOTALS				19	4.0						2			2	2		16	1	9	8													

STATION	FROM	TO	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
1274+20.00 -L-	1713						24" RCP-III Outlet Pipe
	1715	1717					See 54" and Over Summary for STR. 1717
	1816	1817					See 54" and Over for Str. 1817
	1821	1823					See 54" and Over for Str. 1823
1297+56.47 -L-						29'	Rem. 15" CONC
1301+33.78 -L-						20'	Rem. 18" CONC
1301+85.00 -L-	1917						15" Outlet Pipe
	1916	1917	2 @ 15"				
1305+14.00 -L	1919		2 @ 15"				15" Outlet Pipe
	1918	1919					15" Outlet Pipe
	1921	1922	2 @ 15"				15" Outlet Pipe
SHEET TOTALS			6 @ 15"			49'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

CSD265813

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-I

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
1318+62.00 -L-	Rt.	2010		97.9	95.2														
		2010	2011		95.2	86.9			36'										
1322+00.00 -L-	Med.	2012		96.5	93.8														
1322+00.00 -L-	Rt.	2013		96.8	94.1														
1323+00.00 -L-	Med.	2014		96.3	93.3														
1323+00.00 -L-	Rt.	2015		96.6	93.6														
		2012	2014		93.8	93.5													
		2014	2015		93.3	93.2													
		2013	2015		94.1	93.8													
		2015	2016		93.6	87.5													
1325+79.00 -L-	Lt.	2106		98.8	95.6														
1325+14.00 -L-	Lt.	2107		98.6	95.4														
1325+59.00 -L-	Rt.	2108		97.2	94.5														
		2106	2107		95.6	95.4													
		2107	2108		95.4	94.1													
		2108	2109		94.1	86.3			36'										
1329+20.00 -L-	Lt.	2110			90.0														
1328+65.00 -L-	Lt.	2111		99.6	96.1														
1328+20.00 -L-	Rt.	2112		98.3	95.3														
1328+10.00 -L-	Lt.	2113		99.4	96.2														
1329+20.00 -L-	Rt.	2114		98.9	94.7														
1329+20.00 -L-	Lt.	2115		100.0	94.5														
1329+20.00 -L-	Lt.	2116		94.9	90.0														
		2112	2114		95.3	95.8													
		2114	2115		94.7	94.5													
		2113	2111		96.2	95.8													
		2111	2115		96.4	96.3													
		2115	2116		94.5	91.0													
		2116	2110		90.0	90.0													
1330+00.00 -L-	Lt.	2117		101.0	97.8														
1331+00.00 -L	Rt.	2118		102.5	97.7														
1330+95.00 -L-	Rt.	2119		101.7	97.6														
		2118	2119		97.7	97.6					20'								
		2119	2114		97.6	95.2													
		2117	2115		97.8	95.1													
1331+00.12 -L-	Lt.																		
1331+32.36 -L-	Lt.																		
1332+49.00 -L-	Rt.	2120		112.8	108.0														
1332+80.00 -L-	Rt.	2121		106.9	103.2														
1332+80.00 -L-	Lt.	2122		108.0	103.1														
1332+80.00 -L-	Lt.	2123		106.4	103.2														
		2122	2121		103.4	103.9													
		2123	2122		103.6	103.4													
		2120	2118		108.0	103.9					144'								
		2122	2117		103.4	97.8													
1331+73.43 -L-	Lt.																		
1334+48.00 -L-	Rt.	2124		120.0	117.0														
SHEET TOTALS									72'		164'								

Station	Structure From	Structure To	C.S. Pipe 12"	15"	18"	24"	30"	36"	42"	48"	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"
Thickness or Gauge			.064	.064	.064	.064	.079	.079	.109	.109																
1318+62.00 -L-	2010																									
	2010	2011																								
1322+00.00 -L-	2012																									
1322+00.00 -L-	2013																									
1323+00.00 -L-	2014																									
1323+00.00 -L-	2015																									
	2012	2014										96'														
	2014	2015											44'													
	2013	2015										96'														
	2015	2016											32'													
1325+79.00 -L-	2106																									
1325+14.00 -L-	2107																									
1325+59.00 -L-	2108																									
	2106	2107										64'														
	2107	2108										48'														
	2108	2109																								
1329+20.00 -L-	2110																									
1328+65.00 -L-	2111																									
1328+20.00 -L-	2112																									
1328+10.00 -L-	2113																									
1329+20.00 -L-	2114																									
1329+20.00 -L-	2115																									
1329+20.00 -L-	2116																									
	2112	2114																		104'						
	2114	2115																					44'			
	2113	2111																		52'						
	2111	2115																		52'						
	2115	2116																					60'			
	2116	2110																					12'			
1330+00.00 -L-	2117																									
1331+00.00 -L	2118																									
1330+95.00 -L-	2119																									
	2118	2119																								
	2119	2114																				172'				
	2117	2115																				76'				
1331+00.12 -L-																										
1331+32.36 -L-																										
1332+49.00 -L-	2120																									
1332+80.00 -L-	2121																									
1332+80.00 -L-	2122																									
1332+80.00 -L-	2123																									
	2122	2121																		44'						
	2123	2122																		44'						
	2120	2118																								
	2122	2117																				276'				
1331+73.43 -L-																										
1334+48.00 -L-	2124																									
SHEET TOTALS												304'	76'							296'		524'	116'			

Station	Structure From	Structure To	42" Welded Steel Pipe (Grade B) 0.625" Thick	48" Welded Steel Pipe (Grade B) 0.625" Thick	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 (Each) Drop Inlet	Catch Basin
1318+62.00 -L-	2010						1								
	2010	2011													
1322+00.00 -L-	2012						1								
1322+00.00 -L-	2013						1								
1323+00.00 -L-	2014						1								
1323+00.00 -L-	2015						1								
	2012	2014													
	2014	2015													
	2013	2015													
	2015	2016													
1325+79.00 -L-	2106						1								
1325+14.00 -L-	2107						1								
1325+59.00 -L-	2108						1								
	2106	2107													
	2107	2108													
	2108	2109													
1329+20.00 -L-	2110														
1328+65.00 -L-	2111						1							1	
1328+20.00 -L-	2112						1								
1328+10.00 -L-	2113						1							1	
1329+20.00 -L-	2114						1			1			1		
1329+20.00 -L-	2115						1	0.5						1	
1329+20.00 -L-	2116						1								
	2112	2114													
	2114	2115													
	2113	2111													
	2111	2115													
	2115	2116													
	2116	2110													
1330+00.00 -L-	2117						1							1	
1331+00.00 -L	2118						1								
1330+95.00 -L-	2119						1			1			1		
	2118	2119													
	2119	2114													
	2117	2115													
1331+00.12 -L-															
1331+32.36 -L-															
1332+49.00 -L-	2120						1								
1332+80.00 -L-	2121						1			1			1		
1332+80.00 -L-	2122						1							1	
1332+80.00 -L-	2123						1								
	2122	2121													
	2123	2122													
	2120	2118													
	2122	2117													
1331+73.43 -L-															
1334+48.00 -L-	2124						1								
SHEET TOTALS							22	0.5		3			3	5	

Station	Structure From	Structure To	Open Throat Catch Basin Std. 840.04 or 840.05	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 Two Grate Std. 840.20	G.D.I. Frame with Two Grates Std. 840.24	J.B. Std. 840.31 or 840.32	M.H. Frame and Cover Std. 840.54	T.B.J.B. Std. 840.34	T.B.G.D.I. Std. 840.35	G.D.I. Frame with Two Grates Std. 840.29	G.D.I. Frame with Two Grates Std. 840.22	Special D.I. (See Detail Sheet 2-Q)	Special DI (See Detail 2-U)	Special D.I. (See Detail Sheet 2-V)	Adjust Exist. MH	Adjust Exist. CB	Adjust Exist. DI	Modified Concrete Flume (See Detail Sht. 2-R)
1318+62.00 -L-	2010						1		1														
	2010	2011																					
1322+00.00 -L-	2012						1		1														
1322+00.00 -L-	2013						1		1														
1323+00.00 -L-	2014						1		1														
1323+00.00 -L-	2015						1		1														
	2012	2014																					
	2014	2015																					
	2013	2015																					
	2015	2016																					
1325+79.00 -L-	2106			1	1																		
1325+14.00 -L-	2107			1	1																		
1325+59.00 -L-	2108						1		1														
	2106	2107																					
	2107	2108																					
	2108	2109																					
1329+20.00 -L-	2110																						
1328+65.00 -L-	2111			1	1																		
1328+20.00 -L-	2112			1	1																		
1328+10.00 -L-	2113			1	1																		
1329+20.00 -L-	2114																						
1329+20.00 -L-	2115			1	1																		
1329+20.00 -L-	2116										1	1											
	2112	2114																					
	2114	2115																					
	2113	2111																					
	2111	2115																					
	2115	2116																					
	2116	2110																					
1330+00.00 -L-	2117			1	1																		
1331+00.00 -L	2118					1				1													
1330+95.00 -L-	2119																						
	2118	2119																					
	2119	2114																					
	2117	2115																					
1331+00.12 -L-																							
1331+32.36 -L-																							
1332+49.00 -L-	2120						1			1													
1332+80.00 -L-	2121																						
1332+80.00 -L-	2122			1	1																		
1332+80.00 -L-	2123			1	1																		
	2122	2121																					
	2123	2122																					
	2120	2118																					
	2122	2117																					
1331+73.43 -L-																							
1334+48.00 -L-	2124						1			1													
SHEET TOTALS				9	9	1	8		6	3	1	1											

Station	Structure From	Structure To	Side Drain Pipe Elbows No. & Size	Conc. & Brick Pipe Plug, C.Y. Std. 840.71	Conc. Collars Cl. 'B' C.Y. Std. 840.72	Pipe Removal Lin. Ft.	Remarks
1318+62.00 -L-	2010						
	2010	2011	2 @ 15"				
1322+00.00 -L-	2012						
1322+00.00 -L-	2013						
1323+00.00 -L-	2014						
1323+00.00 -L-	2015						
	2012	2014					
	2014	2015					
	2013	2015					
	2015	2016	2 @ 18"				18" Outlet Pipe w/Elbows
1325+79.00 -L-	2106						
1325+14.00 -L-	2107						
1325+59.00 -L-	2108						
	2106	2107					
	2107	2108					
	2108	2109	2 @ 15"				15" Outlet Pipe
1329+20.00 -L-	2110						
1328+65.00 -L-	2111						
1328+20.00 -L-	2112						
1328+10.00 -L-	2113						
1329+20.00 -L-	2114						
1329+20.00 -L-	2115						
1329+20.00 -L-	2116						
	2112	2114					
	2114	2115					
	2113	2111					
	2111	2115					
	2115	2116					
	2116	2110					
1330+00.00 -L-	2117						
1331+00.00 -L	2118						
1330+95.00 -L-	2119						
	2118	2119					
	2119	2114					
	2117	2115					
1331+00.12 -L-						8'	Rem. 15" CONC with DI
1331+32.36 -L-						36'	Rem. 15" CONC
1332+49.00 -L-	2120						
1332+80.00 -L-	2121						
1332+80.00 -L-	2122						
1332+80.00 -L-	2123						
	2122	2121					
	2123	2122					
	2120	2118					
	2122	2117					
1331+73.43 -L-						51'	Rem. 15" CONC
1334+48.00 -L-	2124						
			4 @ 15"				
SHEET TOTALS			2 @ 18"			95'	

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: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 7/12/2013

PROJECT NO.	SHEET NO.
R-2303D	3-J

CSD265813

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
		2124	2120		117.0	108.5				196'									
1335+57.00 -L-	Rt.	2125		115.5	112.5														
1335+57.00 -L-	Lt	2126		116.6	112.3														
		2126	2125		112.3	112.5													
		2126	2122		112.3	103.4													
1334+91.51 -L-	Lt																		
1336+50.00 -L-	Lt	2127		119.5	116.3														
1336+50.00 -L-	Lt.	2131		120.2	117.2														
		2131	2127		117.2	116.3													
		2127	2126		116.3	112.3													
1336+46.00 -L-	Rt.	2105		133.9	129.3														
		2105	2124		129.3	117.0				192'									
1337+45.00 -L-	Rt.	2244		132.3	129.6														
1338+44.00 -L-	Rt.	2211		133.5	130.7														
		2211	2244		130.7	129.6			96'										
		2244	2105		129.6	129.3				96'									
1340+16.00 -L-	Lt.	2208		130.9	126.7														
1340+66.00 -L-	Lt	2209		132.5	129.3														
		2209	2208		129.3	127.2													
1340+02.00 -L	Lt.	2213		131.1	123.9														
		2208	2213		126.7	126.5													
1340+41.00 -L-	Rt.	2216		130.6	126.9														
1340+97.00 -L-	Rt.	2218		132.4	129.2														
1340+97.00 -L-	Rt.	2217		132.5	132.5														
		2217	2218		129.5	129.2													
		2218	2216		129.2	127.4													
		2216	2208		126.9	126.7													
1338+39.00 -L-	Lt.	2241		121.0	117.5														
1338+48.00-L-	Lt.	2242		121.5	116.2														
1338+51.14 -L-	Lt.	2243			116.2														
1338+30.15 -L-	Lt.	2245		125.7	118.3														
		2213	2241		126.5	117.5													
		2241	2242		117.5	116.2													
		2242	2243		116.2	116.2													
		2245	2241		118.3	118.5													
		2245	2131		118.3	117.2													
1341+59.96 -L-	Lt.																		
1343+57.25 -L-	Lt.																		
1343+34.00 -L-	Lt.	2219		140.3	137.3														
1343+71.00 -L-	Lt.	2220		141.1	138.1														
		2219	2213		137.3	127.3													
		2220	2219		138.1	137.3													
1345+46.00 -L-	Rt.	2221		146.3	143.3														
1345+46.00 -L-	Lt.	2222		147.2	143.2														
1345+46.00 -L-	Lt.	2223		146.4	143.1														
1344+65.02 -L-	Lt.																		
		2221	2222		143.3	143.2													
		2222	2223		143.2	143.1													
		2223	2220		143.1	138.1													
SHEET TOTALS									96'	484'									

STATION	FROM	TO	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK
	2124	2120																										
1335+57.00 -L-	2125																											
1335+57.00 -L-	2126																											
	2126	2125																		44'								
	2126	2122																			276'							
1334+91.51 -L-																												
1336+50.00 -L-	2127																											
1336+50.00 -L-	2131																											
	2131	2127																			24'							
	2127	2126																			92'							
1336+46.00 -L-	2105																											
	2105	2124																										
1337+45.00 -L-	2244																											
1338+44.00 -L-	2211																											
	2211	2244																										
	2244	2105																										
1340+16.00 -L-	2208																											
1340+66.00 -L-	2209																											
	2209	2208																		48'								
1340+02.00 -L	2213																											
	2208	2213																				28'						
1340+41.00 -L-	2216																											
1340+97.00 -L-	2218																											
1340+97.00 -L-	2217																											
	2217	2218																			16'							
	2218	2216																			54'							
	2216	2208																				48'						
1338+39.00 -L-	2241																											
1338+48.00-L-	2242																											
1338+51.14 -L-	2243																											
1338+30.15 -L-	2245																											
	2213	2241												164'														
	2241	2242												40'														
	2242	2243												12'														
	2245	2241											32'															
	2245	2131																			180'							
1341+59.96 -L-																												
1343+57.25 -L-																												
1343+34.00 -L-	2219																											
1343+71.00 -L-	2220																											
	2219	2213																		332'								
	2220	2219																		32'								
1345+46.00 -L-	2221																											
1345+46.00 -L-	2222																											
1345+46.00 -L-	2223																											
1344+65.02 -L-																												
	2221	2222																		40'								
	2222	2223																		32'								
	2223	2220																		172'								
SHEET TOTALS													32'	216'						700'	642'	76'						

STATION	FROM	TO	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
	2124	2120																																					
1335+57.00 -L-	2125				1			1			1																												
1335+57.00 -L-	2126				1							1			1	1																							
	2126	2125																																					
	2126	2122																																					
1334+91.51 -L-																																						51'	Rem. 18" CONC with 2 HW
1336+50.00 -L-	2127				1							1			1	1																							
1336+50.00 -L-	2131				1										1	1																							
	2131	2127																																					
	2127	2126																																					
1336+46.00 -L-	2105				1													1			1																		
	2105	2124																																					
1337+45.00 -L-	2244				1														1		1																		
1338+44.00 -L-	2211				1													1			1																		
	2211	2244																																					
	2244	2105																																					
1340+16.00 -L-	2208				1							1			1	1																							
1340+66.00 -L-	2209				1							1			1	1																							
	2209	2208																																					
1340+02.00 -L	2213				1	2.2		1		1																													
	2208	2213																																					
1340+41.00 -L-	2216				1			1			1																												
1340+97.00 -L-	2218				1			1			1																												
1340+97.00 -L-	2217				1									1																									
	2217	2218																																					
	2218	2216																																					
	2216	2208																																					
1338+39.00 -L-	2241				1												1				1																		
1338+48.00-L-	2242				1	0.3																1	1																
1338+51.14 -L-	2243																																						
1338+30.15 -L-	2245				1	2.4		1		1																													
	2213	2241																																					
	2241	2242																																					Rem 15" CONC (No Quantity)
	2242	2243																																					
	2245	2241																																					
	2245	2131																																					
1341+59.96 -L-																																						25'	Rem. 15" CONC
1343+57.25 -L-																																						31'	Rem. 15" CMP
1343+34.00 -L-	2219				1			1		1																													
1343+71.00 -L-	2220				1			1		1																													
	2219	2213																																					
	2220	2219																																					
1345+46.00 -L-	2221				1			1			1																												
1345+46.00 -L-	2222				1							1			1	1																							
1345+46.00 -L-	2223				1			1		1																													
1344+65.02 -L-																																						24'	Rem. 18" CONC
	2221	2222																																					
	2222	2223																																					
	2223	2220																																					
SHEET TOTALS					21	4.9		9		5	4	5		1	6	6	1	2	1		4	1	1															131'	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(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

CSD265813

COMPUTED BY: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-K

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
1347+56.00 -L-	Rt.	2224		148.9	146.7														
1347+72.00 -L-	Rt.	2225		150.5	146.3														
1347+72.00 -L-	Lt.	2226		150.7	145.5														
1346+72.00 -L-	Lt.	2227			145.8														
		2224	2225		146.7	146.6				20'									
		2225	2226		146.3	145.9													
		2226	2227		145.5	145.8													
13+77.00 -Y45-	Rt.	2228			146.0														
14+00.00 -Y45-	Rt.	2229		150.4	147.3														
14+00.00 -Y45-	Lt.	2230		150.4	147.4														
		2230	2229		147.4	147.3													
		2229	2228		147.4	146.0			64'										
13+55.00 -Y-45-	CL	2231		151.6	147.0														
16+55.00 -Y45-	Lt.	2232		151.2	149.0														
16+40.00 -Y45-	Lt.	2233		151.6	147.9														
15+95.00 -Y45-	Lt.	2234		151.4	147.2														
16+00.00 -Y45-	Lt.	2235		151.8	149.6														
		2232	2233		149.0	148.4				12'									
		2233	2234		147.9	147.7													
		2235	2234		149.6	148.4			12'										
		2234	2231		147.2	147.0													
		2231	2225		147.2	146.3													
15+91.94 -Y45-	Lt.																		
1348+63.62 -L-	Lt.																		
1348+69.13 -L-	Rt.																		
1349+05.66 -L-	Rt.																		
1350+07.00 -L-	Rt	2237		153.1	150.1														
		2237	2231		150.1	148.4													
1349+49.00 -L-	Lt.	2238		152.0	147.8														
1349+45.00 -L-	Lt.	2239		150.9	148.7														
1350+15.00 -L-	Lt.	2240		152.9	148.6														
1348+00.00 -L-	Lt.	2244		150.4	146.1														
		2244	2226		146.1	145.9													
		2239	2238		148.7	148.6			16'										
		2238	2226		147.8	146.5													
		2240	2238		148.6	147.8													
1350+57.00 -L-	Rt	2310		153.6	150.6														
		2310	2237		150.6	150.1													
1324+95.00 -L-	Rt.	2311		157.8	153.6														
1324+87.00 -L-	Lt.	2312		157.7	153.4														
1324+87.00 -L-	Lt.	2324		158.9	153.2														
1325+10.00 -L-	Lt.	2313		158.4	155.6														
1324+95.00 -L-	Rt.	2314		156.7	153.9														
1325+60.00 -L-	Rt.	2315		157.1	154.1														
		2315	2314		154.1	153.9			64'										
		2314	2311		153.9	153.8			16'										
		2311	2312		153.6	153.4													
		2321	2313		157.7	155.6													
		2313	2324		155.6	154.7													
SHEET TOTALS									172'	32'									

SIZE / THICKNESS OR GAUGE

STATION	FROM	TO	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
1347+56.00 -L-	2224																									
1347+72.00 -L-	2225																									
1347+72.00 -L-	2226																									
1346+72.00 -L-	2227																									
	2224	2225																								
	2225	2226																					84'			
	2226	2227																					20'			
13+77.00 -Y45-	2228																									
14+00.00 -Y45-	2229																									
14+00.00 -Y45-	2230																									
	2230	2229																		44'						
	2229	2228																								
13+55.00 -Y-45-	2231																									
16+55.00 -Y45-	2232																									
16+40.00 -Y45-	2233																									
15+95.00 -Y45-	2234																									
16+00.00 -Y45-	2235																									
	2232	2233																								
	2233	2234																				44'				
	2235	2234																								
	2234	2231																					48'			
	2231	2225																					108'			
15+91.94 -Y45-																										
1348+63.62 -L-																										
1348+69.13 -L-																										
1349+05.66 -L-																										
1350+07.00 -L-	2237																									
	2237	2231																		124'						
1349+49.00 -L-	2238																									
1349+45.00 -L-	2239																									
1350+15.00 -L-	2240																									
1348+00.00 -L-	2244																									
	2244	2226																					28'			
	2239	2238																								
	2238	2226																					148'			
	2240	2238																					64'			
1350+57.00 -L-	2310																									
	2310	2237																		56'						
1324+95.00 -L-	2311																									
1324+87.00 -L-	2312																									
1324+87.00 -L-	2324																									
1325+10.00 -L-	2313																									
1324+95.00 -L-	2314																									
1325+60.00 -L-	2315																									
	2315	2314																								
	2314	2311																								
	2311	2312																					68'			
	2321	2313																		288'						
	2313	2324										20'														
SHEET TOTALS												20'								512'		44'	568'			

STATION	FROM	TO	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK	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 (EACH) DROP INLET	CATCH BASIN
1347+56.00 -L-	2224						1								
1347+72.00 -L-	2225						1			1			1		
1347+72.00 -L-	2226						1			1		1			
1346+72.00 -L-	2227														
	2224	2225													
	2225	2226													
	2226	2227													
13+77.00 -Y45-	2228														
14+00.00 -Y45-	2229						1			1			1		
14+00.00 -Y45-	2230						1			1		1			
	2230	2229													
	2229	2228													
13+55.00 -Y-45-	2231						1							1	
16+55.00 -Y45-	2232						1								
16+40.00 -Y45-	2233						1								
15+95.00 -Y45-	2234						1			1		1			
16+00.00 -Y45-	2235						1								
	2232	2233													
	2233	2234													
	2235	2234													
	2234	2231													
	2231	2225													
15+91.94 -Y45-															
1348+63.62 -L-															
1348+69.13 -L-															
1349+05.66 -L-															
1350+07.00 -L-	2237						1			1			1		
	2237	2231													
1349+49.00 -L-	2238						1			1		1			
1349+45.00 -L-	2239						1								
1350+15.00 -L-	2240						1			1		1			
1348+00.00 -L-	2244						1			1		1			
	2244	2226													
	2239	2238													
	2238	2226													
	2240	2238													
1350+57.00 -L-	2310						1			1			1		
	2310	2237													
1324+95.00 -L-	2311														
1324+87.00 -L-	2312						1			1		1			
1324+87.00 -L-	2324						1								
1325+10.00 -L-	2313						1								
1324+95.00 -L-	2314						1								
1325+60.00 -L-	2315						1			1	1				
	2315	2314													
	2314	2311													
	2311	2312													
	2321	2313													
	2313	2324													
SHEET TOTALS							21			12	1	7	4	1	

STATION	FROM	TO	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
1347+56.00 -L-	2224							1		1													
1347+72.00 -L-	2225																						
1347+72.00 -L-	2226																						
1346+72.00 -L-	2227																						
	2224	2225																					
	2225	2226																					
	2226	2227																					
13+77.00 -Y45-	2228																						
14+00.00 -Y45-	2229																						
14+00.00 -Y45-	2230																						
	2230	2229																					
	2229	2228																					
13+55.00 -Y-45-	2231			1	1																		
16+55.00 -Y45-	2232							1		1													
16+40.00 -Y45-	2233										1												
15+95.00 -Y45-	2234																						
16+00.00 -Y45-	2235			1	1																		
	2232	2233																					
	2233	2234																					
	2235	2234																					
	2234	2231																					
	2231	2225																					
15+91.94 -Y45-																							
1348+63.62 -L-																							
1348+69.13 -L-																							
1349+05.66 -L-																							
1350+07.00 -L-	2237																						
	2237	2231																					
1349+49.00 -L-	2238																						
1349+45.00 -L-	2239			1	1																		
1350+15.00 -L-	2240																						
1348+00.00 -L-	2244																						
	2244	2226																					
	2239	2238																					
	2238	2226																					
	2240	2238																					
1350+57.00 -L-	2310																						
	2310	2237																					
1324+95.00 -L-	2311																						
1324+87.00 -L-	2312																						
1324+87.00 -L-	2324			1	1																		
1325+10.00 -L-	2313			1	1																		
1324+95.00 -L-	2314			1	1																		
1325+60.00 -L-	2315																						
	2315	2314																					
	2314	2311																					
	2311	2312																					
	2321	2313																					
	2313	2324																					
SHEET TOTALS				6	6			2		2	1												

STATION	FROM	TO	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
1347+56.00 -L-	2224						
1347+72.00 -L-	2225						
1347+72.00 -L-	2226						
1346+72.00 -L-	2227						
	2224	2225					Rem. 12" CONC (No Quantity)
	2225	2226					Rem. 18" CONC (No Quantity)
	2226	2227					
13+77.00 -Y45-	2228						
14+00.00 -Y45-	2229						
14+00.00 -Y45-	2230						
	2230	2229					
	2229	2228					
13+55.00 -Y-45-	2231						
16+55.00 -Y45-	2232						
16+40.00 -Y45-	2233						
15+95.00 -Y45-	2234						
16+00.00 -Y45-	2235						
	2232	2233					Rem. 16' 12"CONC (No Quantity)
	2233	2234					
	2235	2234					
	2234	2231					
	2231	2225					
15+91.94 -Y45-						96'	Rem. 15" CONC
1348+63.62 -L-						66'	Rem. 18" CONC
1348+69.13 -L-						59'	Rem. 15" CONC with DI
1349+05.66 -L-						13'	Rem. 15" CONC
1350+07.00 -L-	2237						
	2237	2231					
1349+49.00 -L-	2238						
1349+45.00 -L-	2239						
1350+15.00 -L-	2240						
1348+00.00 -L-	2244						
	2244	2226					
	2239	2238					
	2238	2226					
	2240	2238					
1350+57.00 -L-	2310						
	2310	2237					
1324+95.00 -L-	2311						
1324+87.00 -L-	2312						
1324+87.00 -L-	2324						
1325+10.00 -L-	2313						
1324+95.00 -L-	2314						
1325+60.00 -L-	2315						
	2315	2314					
	2314	2311					
	2311	2312					
	2321	2313					
	2313	2324					
SHEET TOTALS						234'	

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: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 7/12/2013

CSD265813

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-L

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
		2312	2324		153.4	153.2													
		2324	2240		153.2	148.6													
1354+99.93 -L-	Lt.																		
1355+98.42 -L-	Rt.																		
1326+27.00 -L-	Rt.	2316		159.1	154.5														
1326+27.00 -L-	Rt.	2317		157.6	154.6														
1356+78.00 -L-	Rt.	2318		158.0	155.8														
		2316	2311		154.5	154.1													
		2318	2317		155.8	154.6			48'										
		2317	2316		154.6	154.5			16'										
1357+48.00 -L-	Rt.	2319		160.2	156.3														
1357+49.00 -L-	Rt	2320		159.5	156.4														
		2320	2319		156.4	156.3					16'								
		2319	2316		156.3	154.5													
1358+00.00 -L-	Lt.	2321		160.7	157.7														
		2321	2313		157.7	155.6													
1359+85.00 -L-	Rt.	2322		162.5	159.5														
1359+85.00 -L-	Rt.	2323		162.2	160.0														
		2323	2322		160.0	159.5			12'										
1359+45.23 -L-	Rt.	2322	2319		159.5	157.2													
1363+74.00 -L-	Rt.	2410		163.5	161.2														
1364+77.00 -L-	Rt.	2411		164.5	161.5														
1365+24.00 -L-	Rt.	2412		164.3	160.8														
1365+24.00 -L-	Rt.	2413		164.6	160.7														
		2410	2412		161.2	160.8			148'										
		2411	2413		161.5	161.0													
		2412	2413		160.8	160.7				12'									
1364+24.00 -L-	Lt.	2414		164.2	160.5														
		2413	2414		160.7	160.5													
1367+89.00 -L-	Lt.	2415		162.5	159.3														
		2414	2415		160.5	159.3													
1368+00.00 -L-	Lt.	2416		163.3	160.1														
1368+62.00 -L-	Lt.	2417		162.9	159.7														
1369+17.00 -L-	Lt.	2418		162.5	158.5														
		2416	2417		160.1	159.7													
		2417	2418		159.7	158.8													
1369+29.00 -L-	Rt.	2419		162.8	158.7														
15+47.00 -Y46-	Rt.	2420		162.2	158.9														
15+47.00 -Y46-	Lt.	2421		162.0	159.0														
		2421	2420		159.0	158.9													
		2420	2419		158.9	158.7													
		2419	2418		158.7	158.5													
1369+10.00 -L-	Lt.	2422		161.4	157.6														
		2415	2422		159.3	157.6													
		2418	2422		158.5	157.6													
13+90.00 -Y46-	Rt.	2423		160.9	157.0														
13+39.00 -Y46-	Rt.	2426		159.3	155.6														
13+39.00 -Y46-	Lt.	2427		159.7	155.3														
		2422	2423		157.6	155.1													
SHEET TOTALS									224'	12'	16'								

STATION	FROM	TO	C.S. PIPE 12"	15"	18"	24"	30"	36"	42"	48"	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"	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
THICKNESS OR GAUGE			.064	.064	.064	.064	.079	.079	.109	.109																				
	2312	2324													12'															
	2324	2240																					468'							
1354+99.93 -L-																														
1355+98.42 -L-																														
1326+27.00 -L-	2316																													
1326+27.00 -L-	2317																													
1356+78.00 -L-	2318																													
	2316	2311																				132'								
	2318	2317																												
	2317	2316																												
1357+48.00 -L-	2319																													
1357+49.00 -L-	2320																													
	2320	2319																												
	2319	2316																				120'								
1358+00.00 -L-	2321																													
	2321	2313																		288'										
1359+85.00 -L-	2322																													
1359+85.00 -L-	2323																													
	2323	2322																												
1359+45.23 -L-	2322	2319																		236'										
1363+74.00 -L-	2410																													
1364+77.00 -L-	2411																													
1365+24.00 -L-	2412																													
1365+24.00 -L-	2413																													
	2410	2412																												
	2411	2413																		44'										
	2412	2413																												
1364+24.00 -L-	2414																													
	2413	2414																			72'									
1367+89.00 -L-	2415																													
	2414	2415																			260'									
1368+00.00 -L-	2416																													
1368+62.00 -L-	2417																													
1369+17.00 -L-	2418																													
	2416	2417																		60'										
	2417	2418																		52'										
1369+29.00 -L-	2419																													
15+47.00 -Y46-	2420																													
15+47.00 -Y46-	2421																													
	2421	2420																		40'										
	2420	2419																		48'										
	2419	2418																			68'									
1369+10.00 -L-	2422																													
	2415	2422																			120'									
	2418	2422																			48'									
13+90.00 -Y46-	2423																													
13+39.00 -Y46-	2426																													
13+39.00 -Y46-	2427																													
	2422	2423																				68'								
SHEET TOTALS															12'					768'	568'	320'	468'							

STATION	FROM	TO	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24
	2312	2324																	
	2324	2240																	
1354+99.93 -L-																			
1355+98.42 -L-																			
1326+27.00 -L-	2316		1			1			1										
1326+27.00 -L-	2317		1			1	1												
1356+78.00 -L-	2318		1										1	1					
	2316	2311																	
	2318	2317																	
	2317	2316																	
1357+48.00 -L-	2319		1			1			1										
1357+49.00 -L-	2320		1									1							
	2320	2319																	
	2319	2316																	
1358+00.00 -L-	2321		1			1		1											
	2321	2313																	
1359+85.00 -L-	2322																		
1359+85.00 -L-	2323																		
	2323	2322																	
1359+45.23 -L-	2322	2319																	
1363+74.00 -L-	2410		1										1	1					
1364+77.00 -L-	2411		1			1		1											
1365+24.00 -L-	2412		1										1	1					
1365+24.00 -L-	2413		1			1		1											
	2410	2412																	
	2411	2413																	
	2412	2413																	
1364+24.00 -L-	2414		1			1			1										
	2413	2414																	
1367+89.00 -L-	2415		1			1			1										
	2414	2415																	
1368+00.00 -L-	2416		1							1			1	1					
1368+62.00 -L-	2417		1							1			1	1					
1369+17.00 -L-	2418		1							1			1	1					
	2416	2417																	
	2417	2418																	
1369+29.00 -L-	2419		1										1	1					
15+47.00 -Y46-	2420		1			1	1												
15+47.00 -Y46-	2421		1			1	1												
	2421	2420																	
	2420	2419																	
	2419	2418																	
1369+10.00 -L-	2422		1			1			1										
	2415	2422																	
	2418	2422																	
13+90.00 -Y46-	2423		1							1				1					
13+39.00 -Y46-	2426		1			1			1										
13+39.00 -Y46-	2427		1							1				1					
	2422	2423																	
SHEET TOTALS			22			12	3	3	6	5		1	7	9					

STATION	FROM	TO	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
	2312	2324																		
	2324	2240																		
1354+99.93 -L-																			12'	Rem. 15" CONC
1355+98.42 -L-																			54'	Rem. 15" Plastic Pipe
1326+27.00 -L-	2316																			
1326+27.00 -L-	2317																			
1356+78.00 -L-	2318																			
	2316	2311																		
	2318	2317																		
	2317	2316																		
1357+48.00 -L-	2319																			
1357+49.00 -L-	2320																			
	2320	2319																		
	2319	2316																		
1358+00.00 -L-	2321																			
	2321	2313																		
1359+85.00 -L-	2322																			
1359+85.00 -L-	2323																			
	2323	2322																		
1359+45.23 -L-	2322	2319																		Rem. 15" CONC (No Quantity)
1363+74.00 -L-	2410																			
1364+77.00 -L-	2411																			
1365+24.00 -L-	2412																			
1365+24.00 -L-	2413																			
	2410	2412																		
	2411	2413																		
	2412	2413																		
1364+24.00 -L-	2414																			
	2413	2414																		
1367+89.00 -L-	2415																			
	2414	2415																		
1368+00.00 -L-	2416																			
1368+62.00 -L-	2417																			
1369+17.00 -L-	2418																			
	2416	2417																		
	2417	2418																		
1369+29.00 -L-	2419																			
15+47.00 -Y46-	2420																			
15+47.00 -Y46-	2421																			
	2421	2420																		
	2420	2419																		
	2419	2418																		
1369+10.00 -L-	2422																			
	2415	2422																		
	2418	2422																		
13+90.00 -Y46-	2423									1										
13+39.00 -Y46-	2426																			
13+39.00 -Y46-	2427									1										
	2422	2423																		
SHEET TOTALS										2									66'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-M

CSD265813

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	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	42 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	48 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
		2424	2426		156.7	155.6																																	20'																																										24" RCP-IV Inlet Pipe
		2426	2427		155.6	155.3																																	20'																																										
		2425	2427		157.6	156.3																																28'																																												18" RCP-IV Inlet Pipe
		2427	2423		155.3	155.1																																		48'																																									
1370+93.69 -L-	Rt.																																																																															116'	Rem 18" CONC with CB
1369+82.30 -L-	Lt.																																																																														54'	Rem.15" CONC with DI
1370+85.16 -L-	Lt.																																																																														150'	Rem. 15" CONC
1401.61 -Y46-	Rt.																																																																														42'	Rem. 12" Plastic Pipe
1370+70.00 -L-	Lt.	2428		160.4	154.8																																											1			1			1																											
1371+63.00 -L_	Lt.	2429		159.9	154.6																																											1			1			1																											
		2423	2428		155.1	154.8																																			92'																																								
		2428	2429		154.8	154.6																																			88'																																								
1372+82.00 -L-	Rt.	2430		160.8	157.6																																											1							1			1	1																								
1373+32.00 -L-	Rt.	2431		160.7	156.0																																											1							1			1	1																								
1373+82.00 -L-	Rt.	2432		160.7	157.5																																											1							1			1	1																								
1373+32.00 -L-	Rt.	2433		159.0	157.1																																											1													1			1																		
		2430	2431		157.6	156.3																															48'																																											
		2433	2431		157.1	156.3																							44'																																																			
		2432	2431		157.5	156.3																															48'																																											
1373+32.00 -L-	L	2434		159.3	154.1																																											1	0.2		1	1																													
		2431	2434		156.0	155.6																								52'																																																		
		2429	2434		154.6	154.1																																			164'																																								
1373+73.00 -L-	Lt.	2435		159.3	153.6																																											1	0.8		1		1																												
1373+63.00 -L-	Lt.	2436			155.1																																									3.4																																					
		2436	2435		155.1	154.6																																			20'																																								
		2434	2435		154.1	153.9																																			40'																																								
1373+26.60 -L-	Lt.																																																																																	126'	Rem. 15"CONC with DI
1373+88.43 -L-	Lt.																																																																														9'	Reem. 24" CONC
1375+37.88 -L-	Lt.																																																																														291'	Rem. 24" CONC with DI
1375+48.00 -L-	Lt.	2437		160.1	153.1																																											1	1.2		1		1																												Use Precast Structure-Std840.45
1376+86.00 -L-	Lt.	2438		160.6	152.5																																											1	3.1		1		1																												
		2435	2437		153.6	153.1																																					120'																																						
		2437	2438		153.1	152.5																																					148'																																						
1376+83.00 -L-	Rt.	2441		160.3	154.5																																											1	1.1		1		1																												
1376+83.00 -L-	Rt.																																																																																		
		2442	2441		154.6	154.5																												20'												4.5																																					
		2441	2438		154.5	153.0																												84'																																																Rem. 30" CMP with DI (No Quanityty)
10+96.00 -Y47-	Rt.	2510		159.8	156.8																																											1			1	1																													
11+55.00 -Y47-	Rt.	2510	2511		156.8	157.8			60'																																																																										Rem. 8' 15" RCP (No Quantity)
11+34.00 -Y47-	Lt.	2512			159.8																																																																													
10+71.00 -Y47-	Lt.	2513		160.3	154.3																																											1																		1	1																Rem. Exist. CB (No Quantity)-Precast Str Std840.46
1380+10.00 -L-	Lt.	2514		160.8	151.5																																											1	4.3		1			1																											
		2438	2514		152.5	151.5																																					320'																																						
1381+36.00 -L-	Lt.	2515		160.3	151.1																																											1	4.2		1			1																											
1383+57.00 -L-	Rt.	2517		159.4	154.6																																											1			1		1																												
1383+35.00 -L-	Lt.	2519		159.4	150.4																																											1	1.4		1			1																											
1383+57.00 -L-	Lt.	2550		159.5	150.3																																											1	4.1																			1																Rem. Exist. JB replace with TBJB with Slab Lid.
		2514	2515		151.5	151.1																																					124'																																						
		2515	2519		151.1	150.4																																					196'																																						
SHEET TOTALS									60'																				44'	52'				104'			96'	28'	40'	48'	404'		908'			7.9		18	20.4		12	2	5	5	3			3	3		1			1		1	2															788'	

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

CSD265813

COMPUTED BY: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-N

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.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC)								DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE								R.C. PIPE CLASS III								R.C. PIPE CLASS IV								42 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	48 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE)		QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT.		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION (EACH)		OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SIZE								12"	15"	18"	24"	30"	36"	42"	48"					12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"			CU. YARDS		PER EACH (0' THRU 5.0')	A	B		TYPE OF GRATE E	F	G	DROP INLET	CATCH BASIN																									
THICKNESS OR GAUGE		FROM	TO																	.064	.064	.064	.064	.079	.079	.109	.109																			R.C.P.	C.S.P.		5.0' THRU 10.0'	10.0' AND ABOVE																																
		2519	2550		150.4	150.3																																						20'																																								
1385+03.00 -L-	Lt.	2551																																											1			1	1																									1							Use Precast Structure-Std 840.46
1385+03.00 -L-	Lt.	2552		158.6	150.0																																									1			1			1																											
		2550	2552		150.3	150.0																																						144'																																								
1386+70.00 -L-	Rt.	2526		158.0	154.8																																																																																
1386+96.00 -L-	Rt.	2520	2521		157.7	154.0																															12'																																									0.399		Rem. CB Collar and Extend 15" RCP-IV
		2526	2520		154.8	154.0																															28'																																											
1386+98.00 -L-	Lt.	2522		158.0	149.4																															4'											1	3.6		1			1																										0.399		Rem. CB Collar and Extend 15" RCP-IV
1388+46.00 -L-	Lt.	2525		157.4	149.0																															4'											1	3.4		1			1																										0.399		Rem. CB Collar and Extend 15" RCP-IV
1385+27.97 -L-	Lt.																																																																																	338'	Rem. 36" CONC
		2520	2522		154.0	149.4																																						192'																																								
		2522	2525		149.4	149.0																																						148'																																								
1388+40.00 -L-	Rt.	2546		157.2	154.0																																									1										1	1																								
1388+40.00 -L-		2523		157.1	153.0																																									1			1		1																												
		2546	2523		154.0	153.0																															12'																																											
1388+40.00 -L-	Rt.	2523	2525		153.0	151.8																															12'																																									0.399		Rem. CB Collar and Extend 15" RCP-IV
1389+57.00 -L-	Lt.	2527		156.8	148.7																																									1	3.5		1			1																											
		2525	2527		149.0	148.5																																						108'																																								
1389+21.00 -L-	Lt.	2544		156.2	148.3																																									1	2.9		1			1																											
1390+60.00 -L-	Lt.	2547		156.3	148.3																																									1	3.0		1	1																													
		2527	2544		148.7	148.5																																						64'																																								
		2544	2547		148.5	148.3																																						36'																																								
1390+61.00 -L-	Lt.	2553	2547		150.8	148.5																									20'																																																									0.5526		Rem. CB Collar and Extend 24" RCP-IV
1359+53.45 -L-	Lt.																																																																																	100'	Rem 36" CONC
1390+71.00 -L-	Lt.	2545	2556		148.8	148.3																										8'																																																								0.656		Collar and Extend 30" RCP-III
11+25.00 -Dr2-	Rt.	2554		155.5	150.3																																									1	0.2		1	1																													
		2554	2556		150.3	150.1																															20'																																											
1391+02.00 -L-	Lt.	2555		156.2	148.8																																									1	2.4																1	1															Rem. CB replace with TBJB-Precast Str-Std 840.46
1390+22.21 -L-	Rt.																																																																																	28'	Rem 15" CONC
1390+42.31 -L-	Rt.																																																																																	40'	Rem.15" CONC
1390+12.00 -L-	Rt.	2529		155.9	152.7																																									1										1	1																								
11+10.00 -Y48_	Rt.	2530		156.0	153.0																																									1			1	1																													
10+95.00 -Y48-	Rt.	2533		155.9	152.6																																									1			1	1																													
		2529	2533		152.7	152.6			28'																																																																															
		2530	2533		153.0	152.6																															16'																																											
1390+61.00 -L-	Rt.	2532		156.8	151.2																																																																	1								Adjust Exist Manhole
10+95.00 -Y48-	Lt.	2535	2534	155.7	153.1																																12'									1			1	1																										0.4465		Collar and Extend 18" RCP-IV
11+42.00 -Y48-	Lt.	2537		154.9	150.2																																									1										1	1																								
1391+38.00 -L-	Rt.	2536		155.6	152.6																																									1			1	1																													Use Precast Structure-Std 840.46
1391+25.00 -L-	Rt.	2540		155.9	149.9																																									1	1.0																1	1															Rem. JB and replace with TBJB
		2536	2540		152.6	152.5																															12'																																											
12+57.00 -Y48-	Lt.	2538		156.2	150.7																																									1	0.5															1	1															
12+57.00 -Y48-	Lt.	2539		156.9	153.7																																12'									1			1	1																													
		2539	2538		153.7	150.7																																																																																			
12+89.56 -Y48-	Lt.	2539A																																																																									1							
1391+50.00 -L-	Lt.	2542		156.5	153.5																																									1			1	1																													
1391+37.00 -L-	Lt.	2543		155.4	150.5																																									1			1	1																													
		2542	2543		153.5	150.5																															24'																																											
1392+00.00 -L-	Rt.	2608		155.9	152.9																																									1			1			1																											
SHEET TOTALS								28'																						20'	8'				144'	24'					712'					23	20.5		17	10	1	6				3	3						1	3	2							2	1					3.2511	506'	

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

CSD265813

COMPUTED BY: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-O

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
		2608	2536		152.9	152.6													
1393+99.00 -L-	Lt.	2609		155.6	151.8														
1394+20.00 -L-	Lt.	2610		156.5	151.7														
		2609	2610		151.8	151.7													
1394+01.00 -L-	Rt.	2611		156.2	152.2														
1393+98.00 -L-	Rt.	2640		156.5	152.0														
1395+65.00 -L-	Rt.	2612		155.8	152.8														
1397+27.00 -L-	Rt.	2613		155.3	151.8														
1397+22.00 -L-	Rt.	2613	2614		151.8	150.8													
		2612	2613		152.8	151.8													
1396+00.00 -L-	Lt.	2699		156.0	151.2														
1397+40.00 -L-	Lt.	2639																	
1397+42.00 -L-	Lt.	2614		155.5	150.8														
		2610	2699		151.7	151.2													
		2699	2614		151.2	150.8													
		2639	2614		150.8	150.8													
1395+67.38 -L-	Lt.																		
1399+13.97 -L-	Lt.																		
1398+45.00 -L-	Rt	2615		154.9	151.9														
1399+60.00 -L-	Rt	2617		154.6	151.6														
1399+60.00 -L-	Rt	2641		155.9	152.7														
1400+87.00 -L-	Rt	2619		154.1	150.9														
1400+79.00 -L-	Rt	2630																	
		2615	2617		151.9	151.6													
		2641	2617																
		2617	2619		151.6	151.1													
		2630	2619						16'										
1399+18.00 -L-	Lt	2698		155.3	151.2														
1399+15.00 -L-	Lt	2632		154.3	151.3														
1400+88.00 -L-	Lt	2618		154.5	150.8														
1400+52.00 -L-	Lt	2633		153.8	150.6														
1400+90.00 -L-	Lt	2634		153.7	150.5														
1400+88.00 -L-	Lt.	2635																	
		2614	2698		150.8	150.5													
		2632	2698		151.3	151.2													
		2698	2618		150.5	149.4													
		2635	2618		149.4	149.4													
1399+00.65 -L-	Lt.																		
1402+25.00 -L-	Lt.	2697		154.5	149.0														
1403+77.00 -L-	Lt	2626		153.6	148.5														
1405+32.00 -L-	Lt	2628		153.6	148.0														
		2618	2697		149.4	149.0													
		2697	2626		149.0	148.5													
		2626	2628		148.5	148.0													
1404+65.00 -L-	Lt.	2637		153.6	150.4														
1405+32.00 -L-	Lt.	2636		153.2	149.4														
1405+83.29 -L-	Lt.	2799		152.8	149.6														
		2637	2636		150.4	149.4													
SHEET TOTALS									16'										

STATION	FROM	TO	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
	2608	2536																		68'						
1393+99.00 -L-	2609																									
1394+20.00 -L-	2610																									
	2609	2610																		24'						
1394+01.00 -L-	2611																									
1393+98.00 -L-	2640																									
1395+65.00 -L-	2612																									
1397+27.00 -L-	2613																									
1397+22.00 -L-	2613	2614										8'														
	2612	2613																		160'						
1396+00.00 -L-	2699																									
1397+40.00 -L-	2639																									
1397+42.00 -L-	2614																									
	2610	2699																		176'						
	2699	2614																		140'						
	2639	2614																		4'						
1395+67.38 -L-																										
1399+13.97 -L-																										
1398+45.00 -L-	2615																									
1399+60.00 -L-	2617																									
1399+60.00 -L-	2641																									
1400+87.00 -L-	2619																									
1400+79.00 -L-	2630																									
	2615	2617																		112'						
	2641	2617																		44'						
	2617	2619																		124'						
	2630	2619																								
1399+18.00 -L-	2698																									
1399+15.00 -L-	2632																									
1400+88.00 -L-	2618																									
1400+52.00 -L-	2633																									
1400+90.00 -L-	2634																									
1400+88.00 -L-	2635																									
	2614	2698																			176'					
	2632	2698																			16'					
	2698	2618																				168'				
	2635	2618																		12'						
1399+00.65 -L-																										
1402+25.00 -L-	2697																									
1403+77.00 -L-	2626																									
1405+32.00 -L-	2628																									
	2618	2697																				136'				
	2697	2626																				148'				
	2626	2628																					156'			
1404+65.00 -L-	2637																									
1405+32.00 -L-	2636																									
1405+83.29 -L-	2799																									
	2637	2636																		64'						
SHEET TOTALS												8'								928'	192'	452'	156'			

STATION	FROM	TO	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK	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 (EACH) DROP INLET	CATCH BASIN
	2608	2536													
1393+99.00 -L-	2609						1								
1394+20.00 -L-	2610						1			1			1		
	2609	2610													
1394+01.00 -L-	2611						1			1		1			
1393+98.00 -L-	2640						1							1	
1395+65.00 -L-	2612						1			1		1			
1397+27.00 -L-	2613						1			1		1			
1397+22.00 -L-	2613	2614													
	2612	2613													
1396+00.00 -L-	2699						1			1			1		
1397+40.00 -L-	2639														
1397+42.00 -L-	2614						1			1			1		
	2610	2699													
	2699	2614													
	2639	2614													
1395+67.38 -L-															
1399+13.97 -L-															
1398+45.00 -L-	2615						1			1		1			
1399+60.00 -L-	2617						1			1		1			
1399+60.00 -L-	2641						1							1	
1400+87.00 -L-	2619						1			1		1			
1400+79.00 -L-	2630														
	2615	2617													
	2641	2617													
	2617	2619													
	2630	2619													
1399+18.00 -L-	2698						1			1			1		
1399+15.00 -L-	2632						1			1			1		
1400+88.00 -L-	2618						1	0.1		1			1		
1400+52.00 -L-	2633						1								
1400+90.00 -L-	2634						1								
1400+88.00 -L-	2635														
	2614	2698													
	2632	2698													
	2698	2618													
	2635	2618													
1399+00.65 -L-															
1402+25.00 -L-	2697						1	0.1		1			1		
1403+77.00 -L-	2626						1	0.1		1			1		
1405+32.00 -L-	2628						1	0.6		1			1		
	2618	2697													
	2697	2626													
	2626	2628													
1404+65.00 -L-	2637						1								
1405+32.00 -L-	2636						1								
1405+83.29 -L-	2799						1								
	2637	2636													
SHEET TOTALS							23	0.9		15		6	9	2	

STATION	FROM	TO	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
	2608	2536																					
1393+99.00 -L-	2609											1	1										
1394+20.00 -L-	2610																						
	2609	2610																					
1394+01.00 -L-	2611																						
1393+98.00 -L-	2640			1	1																		
1395+65.00 -L-	2612																						
1397+27.00 -L-	2613																						
1397+22.00 -L-	2613	2614																					
	2612	2613																					
1396+00.00 -L-	2699																						
1397+40.00 -L-	2639																						
1397+42.00 -L-	2614																						
	2610	2699																					
	2699	2614																					
	2639	2614																					
1395+67.38 -L-																							
1399+13.97 -L-																							
1398+45.00 -L-	2615																						
1399+60.00 -L-	2617																						
1399+60.00 -L-	2641			1	1																		
1400+87.00 -L-	2619																						
1400+79.00 -L-	2630																						
	2615	2617																					
	2641	2617																					
	2617	2619																					
	2630	2619																					
1399+18.00 -L-	2698																						
1399+15.00 -L-	2632																						
1400+88.00 -L-	2618																						
1400+52.00 -L-	2633			1	1																		
1400+90.00 -L-	2634			1	1																		
1400+88.00 -L-	2635																						
	2614	2698																					
	2632	2698																					
	2698	2618																					
	2635	2618																					
1399+00.65 -L-																							
1402+25.00 -L-	2697																						
1403+77.00 -L-	2626																						
1405+32.00 -L-	2628																						
	2618	2697																					
	2697	2626																					
	2626	2628																					
1404+65.00 -L-	2637			1	1																		
1405+32.00 -L-	2636			1	1																		
1405+83.29 -L-	2799			1	1																		
	2637	2636																					
SHEET TOTALS				7	7							1	1										

STATION	FROM	TO	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
	2608	2536					
1393+99.00 -L-	2609						Use Precast Structure-Std 840.46
1394+20.00 -L-	2610						
	2609	2610					
1394+01.00 -L-	2611						Rem. Exist CB and 4" 15" RCP
1393+98.00 -L-	2640						Use Precast Structure-Std 840.45
1395+65.00 -L-	2612						
1397+27.00 -L-	2613						
1397+22.00 -L-	2613	2614			0.399		Rem 8'-15" RCP (No Quantity) and exten 15" RCP-III
	2612	2613					
1396+00.00 -L-	2699						Collar and extend 15" RCP-IV
1397+40.00 -L-	2639				0.399		Collar and extend 15" RCP-IV
1397+42.00 -L-	2614						
	2610	2699					
	2699	2614					
	2639	2614					
1395+67.38 -L-							Rem. 15" CONC (No Quantity)
1399+13.97 -L-							Rem. 18" CONC (No Quantity)
1398+45.00 -L-	2615						
1399+60.00 -L-	2617						
1399+60.00 -L-	2641						Use Precast Structure-Std 840.45
1400+87.00 -L-	2619						
1400+79.00 -L-	2630				0.399		Rem. 16'-15" CONC, (No Quantiy), Collar and extend
	2615	2617					
	2641	2617					
	2617	2619					
	2630	2619					
1399+18.00 -L-	2698						
1399+15.00 -L-	2632						
1400+88.00 -L-	2618						
1400+52.00 -L-	2633						
1400+90.00 -L-	2634						
1400+88.00 -L-	2635				0.399		Rem. CB Collar and extend 15"-RCP-IV
	2614	2698					
	2632	2698					
	2698	2618					
	2635	2618					
1399+00.65 -L-						5'	Rem. 8'-15" RCP
1402+25.00 -L-	2697						
1403+77.00 -L-	2626						
1405+32.00 -L-	2628						
	2618	2697					
	2697	2626					
	2626	2628					
1404+65.00 -L-	2637						
1405+32.00 -L-	2636						
1405+83.29 -L-	2799						
	2637	2636					
SHEET TOTALS					1.596	5'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

CSD265813

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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	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	42 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	48 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
		2799	2636		149.6	149.4																															48'																																													
		2636	2628		149.4	148.0			12'																																																																										
1403+82.00 -L-	Rt.	2696		153.5	150.5																																											1			1		1																												
		2625		153.4	150.6																																											1							1			1	1																							Use Precast Structure-Std 840.45
		2627		153.1	149.9																																											1			1		1																												
		2696	2627		150.5	150.1																															148'																																												
		2625	2627		150.6	149.9																															32'																																												
1402+78.50 -L-	Lt.																																																																																		Rem. 18" CONC (No Quantity)
1404+94.74 -L-	Lt.																																																																																	Rem. 24" CONC (No Quantity)
1406+19.51 -L-	Rt.																																																																																	Rem. 15" CONC (No Quantity)
1407+09.00 -L-	Rt.	2702		153.1	148.2																																											1			1		1																												
1406+23.00 -L-	Rt.	2751		151.5	148.3																																											1	5.0	1.4								1	1																						
1407+15.00 -L-	Rt.	2760		151.9	148.7																																											1										1	1																						
1407+39.00 -L-	Rt.	2752		151.7	148.5																																											1										1	1																						
1407+92.00 -L-	Rt.	2753		151.1	147.9																																											1										1	1																						
1408+22.00 -L-	Rt.	2754				146.5																																																																													15" Outlet Pipe
1408+26.00 -L-	Rt.	2795		154.6	146.6																																											1	2.9		1	1																													Use Precast Structure-Std 840.45
		2627	2702		149.9	148.2																																72'																																										
		2751	2702		148.3	148.2			24'																																																																									
		2702	2795		148.2	147.5																																216'																																										
		2760	2752		148.7	148.5			20'																																																																									
		2752	2753		148.5	147.9			52'																																																																									
		2753	2754		147.9	146.5			32'																																																																								
1407+44.13 -L-	Rt.																																																																															0.09			
1407+95.14 -L-	Rt.																																																																															0.09			
1408+27.84 -L-	Rt.	2704		153.6	146.4																																											1							1			1	1																							
1407+61.00 -L-	Rt.	2796		153.1	149.9																																											1							1			1	1																							Use Precast Structure-Std 840.45
		2796	2704		149.9	148.2																															64'																																												
1405+83.00 -L-	Lt.	2799		152.8	149.6																																											1										1	1																						
		2799	2636		149.6	149.4			48'																																																																								
1406+75.00 -L-	Lt	2701		152.7	147.6																																											1	0.1		1			1																											
1406+59.00 -L-	Lt.	2798		152.8	149.4																																											1										1	1																						
		2628	2701		148.0	147.6																																		140'																																								
		2798	2701		149.4	148.9			24'																																																																								
1408+30.00 -L-	Lt.	2797		152.1	146.1																																											1	1.0		1		1																												
		2701	2797		148.5	147.9																																		152'																																								
1408+43.00 -L-	Lt.	2794		150.3	145.4																																											1											1														1									
		2794	2703																																							24'																																								2 at 12' 42" RCP-IV Pipes
1408+30.00 -L-	Lt.	2756																																																																																0.764		Collar and extend 36" RCP-IV
		2756	2797			146.1																																				8'																																									
		2797	2703		146.1	146.0																																					8'																																								
1407+38.00 -L-	Lt.																																																																																	Rem. 24" RCP (No Quantity)
1410+00.00 -L-	Lt.	2705		152.5	147.3																																											1	0.2		1		1																												
1410+00.00 -L-	Rt.	2706		154.3	151.1																																											1							1			1	1																							Use Precast Structure-Std 840.45
		2706	2705		151.1	149.5																															40'																																												
		2705	2703		147.3	146.0																																				156'																																								
1411+10.00 -L-	Rt.	2707		155.4	151.2																																											1			1			1																											
1411+10.00 -L-	Rt.	2708		154.1	149.7																																											1							1			1	1																							Use Precast Structure-Std 840.45
1411+80.00 -L-	Lt.	2709		153.5	148.3																																											1	0.2		1		1																												
SHEET TOTALS									212'																												332'	288'		292'	8'	188'						21	9.4	1.4	9	1	6	2	5			11	12														1							0.18	0.764		

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

CSD265813

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-Q

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
		2707	2708		151.2	149.7													
		2708	2709		149.7	149.3													
		2709	2705		148.3	147.3													
1413+81.00 -L-	Med	2712		156.0	152.8														
1413+81.00 -L-	Lt.	2792		154.8	150.6														
1413+24.00 -L-	Lt.	2710		154.3	151.1														
1413+24.00 -L-		2711		154.3	150.1														
		2712	2792		153.0	151.8													
		2792	2711		150.6	150.1													
		2710	2711		151.1	151.1			12'										
		2711	2709		150.1	149.3													
1414+05.00 -L-	Rt.	2714		154.9	151.9														
1413+84.00 -L-	Rt.	2713		157.6	151.8														
		2714	2713		151.9	151.8													
		2713	2707		151.8	151.2													
1413+51.00 -L-	Rt.																		
1414+05.00 -L-	Rt.																		
1414+53.00 -L-	Rt.																		
1415+41.00 -L-	Rt.	2793		155.0	152.5														
1415+41.00 -L-	Rt.	2720		158.3	154.1														
		2793	2720		152.5	152.4				24'									
		2720	2712		154.1	151.8													
1414+95.56 -L-	Rt.																		
1415+39.49 -L-	Rt.																		
1415+39.57 -L-	Rt.																		
1416+47.00 -L-	Rt.	2721		159.0	154.7														
10+90.00 -SR1-	Rt.	2722		159.2	155.0														
10+90.00 -SR1-	Lt.	2723		158.9	155.1														
11+13.00 -SR1-	Lt.	2749		158.9	155.9														
11+00.00 -SR1-	Lt.	2750		157.8	155.6														
		2750	2723		155.6	155.5													
		2749	2723		155.9	155.8													
		2723	2722		155.1	155.0													
		2722	2721		155.0	154.7													
		2721	2720		154.7	154.1													
1416+33.78 -L-	Rt.																		
1418+82.00 -L-	Lt.	2726		159.1	154.8														
1417+60.00 -L-	Lt.	2715		157.5	153.3														
1416+36.00 -L-	Lt.	2716		156.4	152.2														
1415+45.00 -L-	Lt.	2717		156.0	152.8														
1415+45.00 -L-	Lt.	2718		155.6	151.4														
1415+41.00 -L-	Med	2719		156.9	153.9														
		2726	2715		154.9	153.3													
		2715	2716		153.3	152.2													
		2716	2718		152.2	151.4													
		2717	2718		152.8	152.6													
		2719	2718		153.9	152.6													
		2718	2792		151.4	150.6													
1418+07.78 -L-	Rt.																		
SHEET TOTALS									12'	24'									

Station	Structure No. From	Structure No. To	C.S. Pipe 12" (.064)	C.S. Pipe 15" (.064)	C.S. Pipe 18" (.064)	C.S. Pipe 24" (.064)	C.S. Pipe 30" (.079)	C.S. Pipe 36" (.079)	C.S. Pipe 42" (.109)	C.S. 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"	42" Welded Steel Pipe (Grade B) 0.625" Thick	48" Welded Steel Pipe (Grade B) 0.625" Thick
	2707	2708																					28'					
	2708	2709																					44'					
	2709	2705																							168'			
1413+81.00 -L-	2712																											
1413+81.00 -L-	2792																											
1413+24.00 -L-	2710																											
1413+24.00 -L-	2711																											
	2712	2792																		32'								
	2792	2711																					64'					
	2710	2711																										
	2711	2709																					136'					
1414+05.00 -L-	2714																											
1413+84.00 -L-	2713																											
	2714	2713												28'														
	2713	2707																					196'					
1413+51.00 -L-																												
1414+05.00 -L-																												
1414+53.00 -L-																												
1415+41.00 -L-	2793																											
1415+41.00 -L-	2720																											
	2793	2720																										
	2720	2712																					160'					
1414+95.56 -L-																												
1415+39.49 -L-																												
1415+39.57 -L-																												
1416+47.00 -L-	2721																											
10+90.00 -SR1-	2722																											
10+90.00 -SR1-	2723																											
11+13.00 -SR1-	2749																											
11+00.00 -SR1-	2750																											
	2750	2723																		20'								
	2749	2723																		24'								
	2723	2722																				52'						
	2722	2721																				92'						
	2721	2720																				108'						
1416+33.78 -L-																												
1418+82.00 -L-	2726																											
1417+60.00 -L-	2715																											
1416+36.00 -L-	2716																											
1415+45.00 -L-	2717																											
1415+45.00 -L-	2718																											
1415+41.00 -L-	2719																											
	2726	2715																					116'					
	2715	2716																					128'					
	2716	2718																					84'					
	2717	2718										12'																
	2719	2718																		40'								
	2718	2792																					160'					
1418+07.78 -L-																												
SHEET TOTALS												12'		28'						116'		252'	1116'		168'			

Station	Structure No. From	Structure No. To	Endwalls Std. 838.01, 838.11 or Std. 838.80 (Unless Noted Otherwise) Cu. Yards R.C.P.	Endwalls Cu. Yards 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'	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 (Each) Drop Inlet	Concrete Transitional Section (Each) Catch Basin	Open Throat Catch Basin Std. 840.04 or 840.05	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 Two Grate Std. 840.20	G.D.I. Frame with Two Grates Std. 840.24	J.B. Std. 840.31 or 840.32	M.H. Frame and Cover Std. 840.54	T.B.J.B. Std. 840.34	T.B.G.D.I. Std. 840.35	G.D.I. Frame with Two Grates Std. 840.29	G.D.I. Frame with Two Grates Std. 840.22	Special D.I. (See Detail Sheet 2-Q)	Special DI (See Detail 2-U)	Special D.I. (See Detail Sheet 2-V)	Adjust Exist. MH	Adjust Exist. CB	Adjust Exist. DI	Modified Concrete Flume (See Detail Sht. 2-R)	Side Drain Pipe Elbows No. & Size	Conc. & Brick Pipe Plug, C.Y. Std. 840.71	Conc. Collars Cl. 'B' C.Y. Std. 840.72	Pipe Removal Lin. Ft.	Remarks
	2707	2708																																					
	2708	2709																																					
	2709	2705																																					Rem. 24" RCP (No Quantity)
1413+81.00 -L-	2712				1							1			1	1																							Use Precast Stucture-Std 840.45
1413+81.00 -L-	2792				1			1		1																													
1413+24.00 -L-	2710				1										1	1																							
1413+24.00 -L-	2711				1			1		1																													
	2712	2792																																					
	2792	2711																																					
	2710	2711																																					
	2711	2709																																					
1414+05.00 -L-	2714				1										1	1																							
1413+84.00 -L-	2713				1			1			1																												
	2714	2713																																					
	2713	2707																																					Rem. 24" RCP
1413+51.00 -L-																																						12'	Rem. 15" Alt.
1414+05.00 -L-																																						12'	Rem. 15" Alt.
1414+53.00 -L-																																						14'	Rem. 15" Alt.
1415+41.00 -L-	2793				1										1	1																							
1415+41.00 -L-	2720				1			1			1																												
	2793	2720																																					
	2720	2712																																					Rem. 15" CONC (No Quantity)
1414+95.56 -L-																																						50'	Rem. 18" CONC
1415+39.49 -L-																																						8'	Rem. 15" CONC
1415+39.57 -L-																																				0.09			Plug both ends 15" CONC
1416+47.00 -L-	2721				1			1			1																												
10+90.00 -SR1-	2722				1							1			1	1																							Use Precast Structure-Std 840.45
10+90.00 -SR1-	2723				1			1			1																												
11+13.00 -SR1-	2749				1			1			1																												
11+00.00 -SR1-	2750				1										1	1																							
	2750	2723																																					
	2749	2723																																					
	2723	2722																																					
	2722	2721																																					
	2721	2720																																					
1416+33.78 -L-																																						190'	Rem. 18" CONC
1418+82.00 -L-	2726				1			1			1																												
1417+60.00 -L-	2715				1			1		1																													
1416+36.00 -L-	2716				1			1		1																													Use Precast Structure-Std 840.45
1415+45.00 -L-	2717				1										1	1																							
1415+45.00 -L-	2718				1			1		1																													
1415+41.00 -L-	2719				1							1			1	1																							Use Precast Structure-Std 840.45
	2726	2715																																					
	2715	2716																																					
	2716	2718																																					
	2717	2718																																					
	2719	2718																																					
	2718	2792																																					
1418+07.78 -L-																																						154'	Rem. 18" CONC
SHEET TOTALS					19			11		5	6	3			8	8																				0.09		440'	

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

CSD265813

COMPUTED BY:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-R

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	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109
1418+82.00 -L-	Rt.	2724		159.2	156.2																						
1418+18.00 -L-	Rt.	2727		158.5	155.3																						
		2724	2727		156.2	155.5																					
		2727	2723		155.3	155.1																					
1418+82.30 -L-	Med																										
1420+02.00 -L-	Lt.	2808		160.5	156.8																						
1420+02.00 -L-	Lt.	2809		160.2	158.0																						
1422+14.00 -L-	Lt.	2814		162.8	159.6																						
1422+27.00 -L-	Lt.	2815		162.6	159.4																						
1422+43.00 -L-	Lt.	2816		163.2	160.2																						
1423+67.00 -L-	Lt.	2819		164.9	161.9																						
1423+87.00 -L-	Lt.	2818		165.4	162.2																						
		2818	2819		162.2	161.9																					
		2819	2816		161.9	160.2																					
		2816	2814		160.2	159.4																					
		2815	2814		159.4	159.4																					
		2814	2808		159.4	157.3																					
		2809	2808		158.0	157.5																					
		2808	2726		156.8	155.4																					
1422+14.75 -L-	Med																										
1420+63.00 -L-	Rt.	2810		161.2	158.2																						
1422+16.00 -L-	Rt.	2811		163.0	160.0																						
		2811	2810		160.0	158.2																					
		2810	2724		158.2	156.2																					
1420+50.82 -L-	Rt.																										
1426+33.00 -L-	Lt.	2820		165.3	162.1																						
1426+53.00 -L-	Lt.	2821		164.3	161.3																						
11+78.00 -Y50-	Rt.	2822		163.5	159.3																						
12+04.00 -Y50-	Rt.	2823		163.5	159.2																						
1427+87.00 -L-	Lt.	2824		163.0	158.8																						
13+55.00 -Y50-	Lt.	2826		162.9	159.0																						
1427+93.00 -L-	Lt.	2860		162.8	159.6																						
		2820	2821		162.1	161.3			28'																		
		2821	2823		161.3	159.2																					
		2822	2823		159.3	159.2																					
		2823	2826		159.2	159.0																					
		2826	2824		159.0	158.8																					
		2860	2824		159.6	158.8																					
12+17.08 -Y50-	Rt.																										
12+21.74 -Y50-	Lt.																										
12+47.80 -Y50-	Lt.																										
12+21.17 -Y50-	Lt.																										
1427+89.59 -L-	Med																										
1427+62.72 -L-	Rt.																										
1426+70.00 -L-	Lt.	2827		165.0	161.8																						
1427+06.00 -L-	Rt.	2828		164.8	161.6																						
1427+87.00 -L-	Lt.	2829		164.1	158.6																						
		2827	2828		161.8	161.6																					
		2828	2829		161.6	160.9																					
SHEET TOTALS									28'																		

STATION	FROM	TO	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"	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
1418+82.00 -L-	2724																					
1418+18.00 -L-	2727																					
	2724	2727										68'										
	2727	2723											52'									
1418+82.30 -L-																						
1420+02.00 -L-	2808																					
1420+02.00 -L-	2809																					
1422+14.00 -L-	2814																					
1422+27.00 -L-	2815																					
1422+43.00 -L-	2816																					
1423+67.00 -L-	2819																					
1423+87.00 -L-	2818																					
	2818	2819										20'										
	2819	2816										120'										
	2816	2814										28'										
	2815	2814		20'																		
	2814	2808											212'									
	2809	2808		16'																		
	2808	2726												124'								
1422+14.75 -L-																						
1420+63.00 -L-	2810																					
1422+16.00 -L-	2811																					
	2811	2810										152'										
	2810	2724										172'										
1420+50.82 -L-																						
1426+33.00 -L-	2820																					
1426+53.00 -L-	2821																					
11+78.00 -Y50-	2822																					
12+04.00 -Y50-	2823																					
1427+87.00 -L-	2824																					
13+55.00 -Y50-	2826																					
1427+93.00 -L-	2860																					
	2820	2821																				
	2821	2823										64'										
	2822	2823											24'									
	2823	2826											64'									
	2826	2824											24'									
	2860	2824										16'										
12+17.08 -Y50-																						
12+21.74 -Y50-																						
12+47.80 -Y50-																						
12+21.17 -Y50-																						
1427+89.59 -L-																						
1427+62.72 -L-																						
1426+70.00 -L-	2827																					
1427+06.00 -L-	2828																					
1427+87.00 -L-	2829																					
	2827	2828										36'										
	2828	2829										80'										
SHEET TOTALS				36'								756'	376'	124'								

STATION	FROM	TO	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
1418+82.00 -L-	2724		1			1			1																												
1418+18.00 -L-	2727		1			1			1																												
	2724	2727																																			
	2727	2723																																			
1418+82.30 -L-																																		0.09			Plug both ends 15" CONC
1420+02.00 -L-	2808		1			1		1																													
1420+02.00 -L-	2809		1										1	1																							
1422+14.00 -L-	2814		1			1		1																													
1422+27.00 -L-	2815		1										1	1																							
1422+43.00 -L-	2816		1			1		1																													
1423+67.00 -L-	2819		1			1		1																													
1423+87.00 -L-	2818		1			1		1																													
	2818	2819																																			
	2819	2816																																			
	2816	2814																																			
	2815	2814																																			
	2814	2808																																			
	2809	2808																																			
	2808	2726																																			
1422+14.75 -L-																																		0.09			Plug both ends 15" CONC
1420+63.00 -L-	2810		1			1			1																												
1422+16.00 -L-	2811		1			1			1																												
	2811	2810																																			
	2810	2724																																			
1420+50.82 -L-																																				328'	Rem 15" CONC
1426+33.00 -L-	2820		1										1	1																							
1426+53.00 -L-	2821		1			1			1																												
11+78.00 -Y50-	2822		1			1		1																													
12+04.00 -Y50-	2823		1			1			1																												
1427+87.00 -L-	2824		1			1	1																														
13+55.00 -Y50-	2826		1			1	1																														
1427+93.00 -L-	2860		1							1			1	1																							
	2820	2821																																			
	2821	2823																																			
	2822	2823																																			
	2823	2826																																			
	2826	2824																																			
	2860	2824																																			
12+17.08 -Y50-																																				24'	Rem. 15" CONC
12+21.74 -Y50-																																				40'	Rem. 18" CONC
12+47.80 -Y50-																																				36'	Rem. 18" CONC
12+21.17 -Y50-																																				24'	Rem. 18" CONC
1427+89.59 -L-																																				24'	Rem. 18" CONC
1427+62.72 -L-																																				80'	Rem. 15" CONC
1426+70.00 -L-	2827		1							1			1	1																							Use Precast Structure-Std 840.45
1427+06.00 -L-	2828		1							1			1	1																							Use Precast Structure-Std 840.45
1427+87.00 -L-	2829		1	0.3						1			1	1																							Use Precast Structure-Std 840.45
	2827	2828																																			
	2828	2829																																			
SHEET TOTALS			21	0.3		14	2	6	6	4			7	7																				0.18		532'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-S

CSD265813

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
		2824	2829		159.8	158.6													
1426+69.00 -L-	Rt.	2830		164.6	162.4														
1426+82.00 -L-	Rt.	2831		164.1	161.1														
13+68.00 -Y50-	Rt.	2832		163.8	160.8														
13+56.00 -Y50-	Lt.	2833		163.6	160.2														
13+55.00 -Y50-	Lt.	2825		162.9	159.6														
1428+07.00 -L-	Rt.	2835		163.6	158.4														
		2830	2831		162.4	161.1			20'										
		2831	2832		161.1	160.8													
		2832	2833		160.8	160.4													
		2833	2825		160.2	159.6													
		2825	2835		159.6	159.4													
		2829	2835		158.6	158.4													
1429+29.47 -L-	Rt.																		
1430+39.00 -L	Rt.	2836		158.5	155.9														
1430+57.00 -L-	Rt.	2837		161.1	155.5														
1430+57.00 -L-	Rt.	2839		162.0	155.9														
1429+50.00 -L-	Rt.	2840		163.0	159.8														
1430+56.80 -L-	Lt.	2841																	
1430+56.00 -L-	Lt.	2842		161.1	156.8														
1429+64.00 -L-	Lt.	2843		159.7	157.4														
1429+64.00 -L-	Lt.	2856		161.8	157.2														
		2835	2837	158.4	156.9														
		2836	2837	155.9	155.6						20'								
		2840	2839	159.8	158.8														
		2839	2837	155.9	155.6														
		2843	2856	157.4	157.2				20'										
		2856	2842																
		2842	2841																
1429+70.20 -L-	Lt.																		
14+19.00 -Y50-	Rt.	2854		164.4	161.2														
14+19.00 -Y50-	Rt.	2855		164.9	161.1														
		2854	2588		161.2	161.1			4'										
1431+97.00-L-	Rt.	2845		160.7	155.0														
1432+46.00 -L-	Rt.	2853		159.2	153.9														
1431+27.00 -L-	Lt.	2846		160.4	157.4														
1431+68.00 -L-	Lt.	2847		159.7	156.0														
1432+02.00 -L-	Lt.	2848		159.9	155.8														
1432+37.00 -L-	Lt.	2850		159.7	156.0														
1432+37.00 -L-	Lt.	2851		159.6	156.4														
1432+40.00 -L-	Lt.	2861A		160.6	155.7														
1432+40.00 -L-	Rt.	2861		160.6	155.6														
		2837	2845		155.5	155.0													
		2845	2853		155.0	153.9													
		2846	2847		157.4	156.7													
		2847	2848		156.0	155.8													
		2848	2850		156.2	156.0													
		2851	2850		156.4	156.4			12'										
		2850	2861A		156.0	155.7													
SHEET TOTALS									56'		20'								

SIZE / THICKNESS OR GAUGE (C.S. PIPE gauges: 12" .064, 15" .064, 18" .064, 24" .064, 30" .079, 36" .079, 42" .109, 48" .109)

STATION	LOC.	FROM	TO	C.S. PIPE 12"	15"	18"	24"	30"	36"	42"	48"	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"	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK
		2824	2829																					44'					
1426+69.00 -L-	Rt.	2830																											
1426+82.00 -L-	Rt.	2831																											
13+68.00 -Y50-	Rt.	2832																											
13+56.00 -Y50-	Lt.	2833																											
13+55.00 -Y50-	Lt.	2825																											
1428+07.00 -L-	Rt.	2835																											
		2830	2831																										
		2831	2832																		52'								
		2832	2833																		28'								
		2833	2825																			36'							
		2825	2835																			20'							
		2829	2835																					62'					
1429+29.47 -L-	Rt.																												
1430+39.00 -L	Rt.	2836																											
1430+57.00 -L-	Rt.	2837																											
1430+57.00 -L-	Rt.	2839																											
1429+50.00 -L-	Rt.	2840																											
1430+56.80 -L-	Lt.	2841																											
1430+56.00 -L-	Lt.	2842																											
1429+64.00 -L-	Lt.	2843																											
1429+64.00 -L-	Lt.	2856																											
		2835	2837																					248'					
		2836	2837																										
		2840	2839																		104'								
		2839	2837																				36'						
		2843	2856																										
		2856	2842																		92'								
		2842	2841																				16'						
1429+70.20 -L-	Lt.																												
14+19.00 -Y50-	Rt.	2854																											
14+19.00 -Y50-	Rt.	2855																											
		2854	2588																										
1431+97.00-L-	Rt.	2845																											
1432+46.00 -L-	Rt.	2853																											
1431+27.00 -L-	Lt.	2846																											
1431+68.00 -L-	Lt.	2847																											
1432+02.00 -L-	Lt.	2848																											
1432+37.00 -L-	Lt.	2850																											
1432+37.00 -L-	Lt.	2851																											
1432+40.00 -L-	Lt.	2861A																											
1432+40.00 -L-	Rt.	2861																											
		2837	2845																								52'		
		2845	2853																								136'		
		2846	2847																		40'								
		2847	2848																				36'						
		2848	2850																				40'						
		2851	2850																										
		2850	2861A																				40'						
SHEET TOTALS																					316'	56'	168'	354'			188'		

STATION	LOC.	FROM	TO	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 (EACH) DROP INLET	CATCH BASIN
		2824	2829											
1426+69.00 -L-	Rt.	2830				1								
1426+82.00 -L-	Rt.	2831				1			1		1			
13+68.00 -Y50-	Rt.	2832				1			1			1		
13+56.00 -Y50-	Lt.	2833				1							1	
13+55.00 -Y50-	Lt.	2825				1			1	1				
1428+07.00 -L-	Rt.	2835				1	0.2		1	1				
		2830	2831											
		2831	2832											
		2832	2833											
		2833	2825											
		2825	2835											
		2829	2835											
1429+29.47 -L-	Rt.													
1430+39.00 -L	Rt.	2836				1								
1430+57.00 -L-	Rt.	2837				1	0.6		1		1			
1430+57.00 -L-	Rt.	2839				1	1.1						1	
1429+50.00 -L-	Rt.	2840				1							1	
1430+56.80 -L-	Lt.	2841												
1430+56.00 -L-	Lt.	2842				1			1			1		
1429+64.00 -L-	Lt.	2843				1								
1429+64.00 -L-	Lt.	2856				1			1			1		
		2835	2837											
		2836	2837											
		2840	2839											
		2839	2837											
		2843	2856											
		2856	2842											
		2842	2841											
1429+70.20 -L-	Lt.													
14+19.00 -Y50-	Rt.	2854				1								
14+19.00 -Y50-	Rt.	2855				1								
		2854	2588											
1431+97.00-L-	Rt.	2845				1	0.7		1		1			
1432+46.00 -L-	Rt.	2853				1	0.3		1	1				
1431+27.00 -L-	Lt.	2846				1			1			1		
1431+68.00 -L-	Lt.	2847				1			1	1				
1432+02.00 -L-	Lt.	2848				1			1	1				
1432+37.00 -L-	Lt.	2850				1			1			1		
1432+37.00 -L-	Lt.	2851				1								
1432+40.00 -L-	Lt.	2861A				1							1	
1432+40.00 -L-	Rt.	2861				1							1	
		2837	2845											
		2845	2853											
		2846	2847											
		2847	2848											
		2848	2850											
		2851	2850											
		2850	2861A											
SHEET TOTALS						24	2.9		13	5	3	5	5	

STATION	LOC.	FROM	TO	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
		2824	2829																					
1426+69.00 -L-	Rt.	2830			1	1																		
1426+82.00 -L-	Rt.	2831																						
13+68.00 -Y50-	Rt.	2832																						
13+56.00 -Y50-	Lt.	2833			1	1																		
13+55.00 -Y50-	Lt.	2825																						
1428+07.00 -L-	Rt.	2835																						
		2830	2831																					
		2831	2832																					
		2832	2833																					
		2833	2825																					
		2825	2835																					
		2829	2835																					
1429+29.47 -L-	Rt.																							
1430+39.00 -L	Rt.	2836			1	1																		
1430+57.00 -L-	Rt.	2837																						
1430+57.00 -L-	Rt.	2839			1	1																		
1429+50.00 -L-	Rt.	2840			1	1																		
1430+56.80 -L-	Lt.	2841																						
1430+56.00 -L-	Lt.	2842																						
1429+64.00 -L-	Lt.	2843			1	1																		
1429+64.00 -L-	Lt.	2856																						
		2835	2837																					
		2836	2837																					
		2840	2839																					
		2839	2837																					
		2843	2856																					
		2856	2842																					
		2842	2841																					
1429+70.20 -L-	Lt.																							
14+19.00 -Y50-	Rt.	2854			1	1																		
14+19.00 -Y50-	Rt.	2855										1	1											
		2854	2588																					
1431+97.00-L-	Rt.	2845																						
1432+46.00 -L-	Rt.	2853																						
1431+27.00 -L-	Lt.	2846																						
1431+68.00 -L-	Lt.	2847																						
1432+02.00 -L-	Lt.	2848																						
1432+37.00 -L-	Lt.	2850																						
1432+37.00 -L-	Lt.	2851			1	1																		
1432+40.00 -L-	Lt.	2861A			1	1																		
1432+40.00 -L-	Rt.	2861			1	1																		
		2837	2845																					
		2845	2853																					
		2846	2847																					
		2847	2848																					
		2848	2850																					
		2851	2850																					
		2850	2861A																					
SHEET TOTALS					10	10						1	1											

STATION	LOC.	FROM	TO	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
		2824	2829					
1426+69.00 -L-	Rt.	2830						
1426+82.00 -L-	Rt.	2831						
13+68.00 -Y50-	Rt.	2832						
13+56.00 -Y50-	Lt.	2833						Use Precast Structure-Std 840.45
13+55.00 -Y50-	Lt.	2825						
1428+07.00 -L-	Rt.	2835						
		2830	2831					
		2831	2832					
		2832	2833					
		2833	2825					
		2825	2835					
		2829	2835					
1429+29.47 -L-	Rt.						252'	Rem. 18"CONC
1430+39.00 -L	Rt.	2836						
1430+57.00 -L-	Rt.	2837						
1430+57.00 -L-	Rt.	2839						Use Precast Structure-Std 840.45
1429+50.00 -L-	Rt.	2840						Use Precast Structure-Std 840.45
1430+56.80 -L-	Lt.	2841				0.4465		Collar and extend 18" RCP
1430+56.00 -L-	Lt.	2842						
1429+64.00 -L-	Lt.	2843						
1429+64.00 -L-	Lt.	2856						
		2835	2837					
		2836	2837					
		2840	2839					
		2839	2837					
		2843	2856					
		2856	2842					
		2842	2841					
1429+70.20 -L-	Lt.				0.029			Plug one end 10" HDPE
14+19.00 -Y50-	Rt.	2854						
14+19.00 -Y50-	Rt.	2855						
		2854	2588					
1431+97.00-L-	Rt.	2845						
1432+46.00 -L-	Rt.	2853						
1431+27.00 -L-	Lt.	2846						
1431+68.00 -L-	Lt.	2847						
1432+02.00 -L-	Lt.	2848						
1432+37.00 -L-	Lt.	2850						
1432+37.00 -L-	Lt.	2851						
1432+40.00 -L-	Lt.	2861A						
1432+40.00 -L-	Rt.	2861						
		2837	2845					
		2845	2853					
		2846	2847					
		2847	2848					Rem. 15" CONC (No Quantity)
		2848	2850					Rem. 15" CONC (No Quantity)
		2851	2850					
		2850	2861A					Rem. 24" CONC
SHEET TOTALS					0.029	0.4465	252'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

CSD265813

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-T

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
		2861A	2861		155.7	155.6													
		2861	2853		155.6	155.4													
1431+50.00 -L-	Rt.																		
1433+90.44 -L-	Rt.																		
1433+32.00 -L-	Rt.	2910		160.0	156.8														
		2910	2861	156.8	155.6														
1434+24.00 -L-	Lt.	2911		157.2	154.0														
1436+17.00 -L-	Lt.	2912		154.1	150.7														
1436+17.00 -L-	Lt.	2913		153.3	150.2														
1436+44.00 -L-	Lt.	2914		153.1	149.9														
1436+65.21 -L-	Lt.	2918			149.7														
		2911	2912		154.0	150.7													
		2912	2913		150.7	150.2													
		2913	2914		150.2	149.9													
		2914	2918		149.9	149.7													
1436+18.00 -L-	Lt.																		
1435+55.00 -L-	Rt.	2915		154.9	149.2														
1436+97.00 -L-	Rt.	2916		151.6	144.6														
1438+78.00 -L-	Rt.	2917		148.1	142.3														
11+62.34 -Y51-	Lt.	2943		151.6	151.4														
1438+79.02 -L-	Rt.	2945			144.0														
1440+40.00 -L-	Lt.	2946		148.0	141.7														
		2853	2915	153.9	149.2														
		2915	2916	149.2	144.6														
		2916	2917	144.6	142.3														
		2917	2946	142.3	141.7														
		2946	2945		141.7	144.0													
1439+09.95 -L-	Rt.																		
1439+15.00 -L-	Med																		
15+34.81 -RpA-	Med	2920	2952		148.2	145.0													
16+21.20 -RpA-	Med	2919	2953		147.0	145.0													
1438+88.00 -L-	Lt.																		
14+93.00 -RpD-	Lt.	2924		137.9	135.1														
14+00.00 -RpD-	Rt.	2925		139.6	136.8														
		2925	2924		136.8	135.1			92'										
		2924	2923		135.1	134.9			48'										
1441+98.00 -L-	Med																		
1441+58.00 -L-	Rt.	2931		142.4	136.7														
1442+03.00 -L-	Rt.	2951		141.5	135.8														
		2931	2951		136.7	135.8													
15+22.00 -RpC-	Lt.	2930		141.9	132.9														
14+25.00 -RpC-	Lt.	2932		142.3	139.5														
12+99.00 -RpC-	Lt.	2933		137.8	135.0														
		2932	2933		139.5	135.0			124'										
		2933	2930		135.0	132.9				60'									
12+50.00 -RpC-	Rt.	2935		144.5	141.5														
13+64.00 -RpC-	Rt.	2936		137.8	134.8														
14+66.00 -RpC-	Rt.	2937		134.3	129.5														
SHEET TOTALS									264'	60'									

Station	From	To	C.S. Pipe 12" (.064)	C.S. 15" (.064)	C.S. 18" (.064)	C.S. 24" (.064)	C.S. 30" (.079)	C.S. 36" (.079)	C.S. 42" (.109)	C.S. 48" (.109)	R.C. Pipe Class III 12"	III 15"	III 18"	III 24"	III 30"	III 36"	III 42"	III 48"	R.C. Pipe Class IV 12"	IV 15"	IV 18"	IV 24"	IV 30"	IV 36"	IV 42"	IV 48"	42" Welded Steel Pipe (Grade B) 0.625" Thick	48" Welded Steel Pipe (Grade B) 0.625" Thick
	2861A	2861																				16'						
	2861	2853																				52'						
1431+50.00 -L-																												
1433+90.44 -L-																												
1433+32.00 -L-	2910																											
	2910	2861																		88'								
1434+24.00 -L-	2911																											
1436+17.00 -L-	2912																											
1436+17.00 -L-	2913																											
1436+44.00 -L-	2914																											
1436+65.21 -L-	2918																											
	2911	2912																		192'								
	2912	2913																			12'							
	2913	2914																			24'							
	2914	2918																			36'							
1436+18.00 -L-																												
1435+55.00 -L-	2915																											
1436+97.00 -L-	2916																											
1438+78.00 -L-	2917																											
11+62.34 -Y51-	2943																											
1438+79.02 -L-	2945																											
1440+40.00 -L-	2946																											
	2853	2915																								308'		
	2915	2916																								140'		
	2916	2917																								180'		
	2917	2946																										56'
	2946	2945																							32'			
1439+09.95 -L-																												
1439+15.00 -L-																												
15+34.81 -RpA-	2920	2952																						116'				
16+21.20 -RpA-	2919	2953																					108'					
1438+88.00 -L-																												
14+93.00 -RpD-	2924																											
14+00.00 -RpD-	2925																											
	2925	2924																										
	2924	2923																										
1441+98.00 -L-																												
1441+58.00 -L-	2931																											
1442+03.00 -L-	2951																											
	2931	2951																		44'								
15+22.00 -RpC-	2930																											
14+25.00 -RpC-	2932																											
12+99.00 -RpC-	2933																											
	2932	2933																										
	2933	2930																										
12+50.00 -RpC-	2935																											
13+64.00 -RpC-	2936																											
14+66.00 -RpC-	2937																											
SHEET TOTALS																				324'	72'	68'	108'	116'	32'	628'		56'

Station	From	To	Endwalls Std. 838.01, 838.11 or Std. 838.80 (unless noted otherwise) Cu. Yards R.C.P.	Endwalls Cu. Yards 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'	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 (Each) Drop Inlet	Catch Basin	Open Throat Catch Basin Std. 840.04 or 840.05	D.I. Std. 840.14 or Std. 840.15	D.I. Frame and Grate Std. 840.16
	2861A	2861														
	2861	2853														
1431+50.00 -L-																
1433+90.44 -L-																
1433+32.00 -L-	2910				1							1			1	1
	2910	2861														
1434+24.00 -L-	2911				1										1	1
1436+17.00 -L-	2912				1										1	1
1436+17.00 -L-	2913				1			1			1					
1436+44.00 -L-	2914				1			1			1					
1436+65.21 -L-	2918															
	2911	2912														
	2912	2913														
	2913	2914														
	2914	2918														
1436+18.00 -L-																
1435+55.00 -L-	2915				1	0.7		1		1						
1436+97.00 -L-	2916				1	2.0		1		1						
1438+78.00 -L-	2917				1	0.8		1		1						
11+62.34 -Y51-	2943															
1438+79.02 -L-	2945		4.5													
1440+40.00 -L-	2946				1	1.3		1			1					
	2853	2915														
	2915	2916														
	2916	2917														
	2917	2946														
	2946	2945														
1439+09.95 -L-																
1439+15.00 -L-																
15+34.81 -RpA-	2920	2952	3.4													
16+21.20 -RpA-	2919	2953														
1438+88.00 -L-																
14+93.00 -RpD-	2924				1											
14+00.00 -RpD-	2925				1											
	2925	2924														
	2924	2923														
1441+98.00 -L-																
1441+58.00 -L-	2931				1	0.7		1		1						
1442+03.00 -L-	2951				1	0.7		1		1						
	2931	2951														
15+22.00 -RpC-	2930				1	4.0										
14+25.00 -RpC-	2932				1											
12+99.00 -RpC-	2933				1											
	2932	2933														
	2933	2930														
12+50.00 -RpC-	2935				1											
13+64.00 -RpC-	2936				1											
14+66.00 -RpC-	2937				1											
SHEET TOTALS			7.9		19	10.2		8		5	3	1			3	3

Station	From	To	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 Two Grate Std. 840.20	G.D.I. Frame with Two Grates Std. 840.24	J.B. Std. 840.31 or 840.32	M.H. Frame and Cover Std. 840.54	T.B.J.B. Std. 840.34	T.B.G.D.I. Std. 840.35	G.D.I. Frame with Two Grates Std. 840.29	G.D.I. Frame with Two Grates Std. 840.22	Special D.I. (See Detail Sheet 2-Q)	Special DI (See Detail 2-U)	Special D.I. (See Detail Sheet 2-V)	Adjust Exist. MH	Adjust Exist. CB	Adjust Exist. DI	Modified Concrete Flume (See Detail Sht. 2-R)
	2861A	2861																		
	2861	2853																		
1431+50.00 -L-																				
1433+90.44 -L-																				
1433+32.00 -L-	2910																			
	2910	2861																		
1434+24.00 -L-	2911																			
1436+17.00 -L-	2912																			
1436+17.00 -L-	2913																			
1436+44.00 -L-	2914																			
1436+65.21 -L-	2918																			
	2911	2912																		
	2912	2913																		
	2913	2914																		
	2914	2918																		
1436+18.00 -L-																				
1435+55.00 -L-	2915																			
1436+97.00 -L-	2916																			
1438+78.00 -L-	2917																			
11+62.34 -Y51-	2943																			1
1438+79.02 -L-	2945																			
1440+40.00 -L-	2946																			
	2853	2915																		
	2915	2916																		
	2916	2917																		
	2917	2946																		
	2946	2945																		
1439+09.95 -L-																				
1439+15.00 -L-																				
15+34.81 -RpA-	2920	2952																		
16+21.20 -RpA-	2919	2953																		
1438+88.00 -L-																				
14+93.00 -RpD-	2924			1			1													
14+00.00 -RpD-	2925			1			1													
	2925	2924																		
	2924	2923																		
1441+98.00 -L-																				
1441+58.00 -L-	2931																			
1442+03.00 -L-	2951																			
	2931	2951																		
15+22.00 -RpC-	2930							1	1											
14+25.00 -RpC-	2932			1			1													
12+99.00 -RpC-	2933			1			1													
	2932	2933																		
	2933	2930																		
12+50.00 -RpC-	2935			1			1													
13+64.00 -RpC-	2936			1			1													
14+66.00 -RpC-	2937			1			1													
SHEET TOTALS				7			7	1	1											1

Station	From	To	Side Drain Pipe Elbows No. & Size	Conc. & Brick Pipe Plug, C.Y. Std. 840.71	Conc. Collars Cl. 'B' C.Y. Std. 840.72	Pipe Removal Lin. Ft.	Remarks
	2861A	2861					Rem. 24" CONC
	2861	2853					
1431+50.00 -L-						182'	Rem. 24" CONC
1433+90.44 -L-						268'	Rem. 24" CONC
1433+32.00 -L-	2910						
	2910	2861					
1434+24.00 -L-	2911						
1436+17.00 -L-	2912						
1436+17.00 -L-	2913						
1436+44.00 -L-	2914						
1436+65.21 -L-	2918						18" RCP-IV Outlet Pipe
	2911	2912					
	2912	2913					
	2913	2914					
	2914	2918					18" RCP-IV Outlet Pipe
1436+18.00 -L-						110'	Rem. 15" CONC
1435+55.00 -L-	2915						
1436+97.00 -L-	2916						
1438+78.00 -L-	2917						Use Precast Structure-Std 840.45
11+62.34 -Y51-	2943						
1438+79.02 -L-	2945						
1440+40.00 -L-	2946						
	2853	2915					
	2915	2916					
	2916	2917					
	2917	2946					
	2946	2945					
1439+09.95 -L-				0.116		400'	Rem. And plug one end 24" CONC
1439+15.00 -L-				0.232			Plug both ends of 24" CONC
15+34.81 -RpA-	2920	2952				63'	Rem. 15" CONC
16+21.20 -RpA-	2919	2953				46'	Rem. 15" CONC
1438+88.00 -L-						66'	Rem. 18" CONC
14+93.00 -RpD-	2924						
14+00.00 -RpD-	2925						
	2925	2924					
	2924	2923					
1441+98.00 -L-				0.09			Plug both ends 15" CONC
1441+58.00 -L-	2931						
1442+03.00 -L-	2951						
	2931	2951					
15+22.00 -RpC-	2930						Rem. 2GI replace with JB w/MH
14+25.00 -RpC-	2932						
12+99.00 -RpC-	2933						
	2932	2933					
	2933	2930					
12+50.00 -RpC-	2935						
13+64.00 -RpC-	2936						
14+66.00 -RpC-	2937						
SHEET TOTALS				0.438		1135'	

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:	SWH	DATE:	4/23/2013
CHECKED BY:	WTB	DATE:	7/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-2303D	3-U

CSD265813

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)

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

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
15+02.00 -RpC-	Rt.	2938		140.0	137.0														
14+88.00 -RpC-	Rt.	2939		133.3	128.5														
15+04.00 -RpC-	Rt.	1940		138.0	127.9														
		2935	2936		141.5	134.8				112'									
		2936	2937		134.8	129.5				100'									
		2938	2937		137.0	129.5			36'										
		2937	2939		129.5	128.5					36'								
		2939	2940		128.5	127.9					20'								
10+75.35 -RpB-	Lt.	2948																	
10+74.12 -RpB-	Lt.	2949																	
1447+31.00 -L-	Lt.	3011		130.1	127.1														
1447+96.00 -L-	Lt.	3012		128.9	125.9														
1449+36.00 -L-	Lt.	3013		126.6	121.0														
		3011	3012																
		3012	3013																
14+54.24 -Y53-	Rt.	3017		123.7	120.9														
14+31.26 -Y53-	Rt.	3010				120.3													
		3017	3010		20.9	120.3			24'										
10+34.43 -Y53-	Rt.	3016		117.7	115.0														
17+40.32 -Y52-	Rt.	3210	3211			121.0													
17+39.68 -Y52-	Med	3211A																	
17+23.00 -Y52-	Lt.	3212	3213	124.9	119.5	119.4													
20+81.00 -Y52-	Rt.	3214	3215	136.2	134.3														
20+77.00 -Y52-	Lt.	3217	3216	136.0	133.2														
9+83.00 -RpA-	Rt.	3219	3218	149.2	147.0														
9+04.00 -RpD-	Lt.	3220	3221	146.8	140.5	140.3													
17+41.00 -Y51-	Rt.	3306																	
18+20.00 -Y51-	Rt.	3307		156.8	153.8														
19+88.00 -Y51-	Rt.	3308		157.8	154.8														
41+64.00 -Y52-	Rt.	3309		160.8	155.8														
		3309	3308		155.8	154.8													
		3308	3307		154.8	153.8													
		3307	3306		153.8														
8+85.00 -RpC-	Lt.	3310		160.5	155.5														
8+91.00 -RpC-	Lt.	3311		157.1	154.3														
		3310	3311		255.5	154.3													
8+87.00 -RpC-	Rt.	3312		153.8	150.8														
		3311	3312		154.3	150.8													
		3312	2935		150.8	141.5				356'									
36+71.86 -SR1Rev2	Lt.	3305							48'										
38+50.00 -SR1Rev2	Rt.	3315		157.8	153.4														
38+67.00 -SR1REV2	Rt.	3316		158.6	153.2														
23+07.00 -Y51-	Rt.	3318		157.3	152.9														
23+07.00 -Y51-	Lt.	3319		157.3	152.8														
45+64.00 -Y52-	Rt.	3320		158.2	153.2														
		3315	3316		153.4	153.2													
		3316	3318		153.2	152.9													
		3318	3319		152.9	152.8													
		3320	3319		153.2	152.8													
SHEET TOTALS									108'	568'	56'								

STATION	FROM	TO	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
15+02.00 -RpC-	2938																									
14+88.00 -RpC-	2939																									
15+04.00 -RpC-	1940																									
	2935	2936																								
	2936	2937																								
	2938	2937																								
	2937	2939																								
	2939	2940																								
10+75.35 -RpB-	2948																									
10+74.12 -RpB-	2949																									
1447+31.00 -L-	3011																									
1447+96.00 -L-	3012																									
1449+36.00 -L-	3013																									
	3011	3012																		64'						
	3012	3013																		140'						
14+54.24 -Y53-	3017																									
14+31.26 -Y53-	3010																									
	3017	3010																								
10+34.43 -Y53-	3016																									
17+40.32 -Y52-	3210	3211												12'												
17+39.68 -Y52-	3211A																									
17+23.00 -Y52-	3212	3213														12'										
20+81.00 -Y52-	3214	3215										16'														
20+77.00 -Y52-	3217	3216										12'														
9+83.00 -RpA-	3219	3218																			40'					
9+04.00 -RpD-	3220	3221																			36'					
17+41.00 -Y51-	3306																									
18+20.00 -Y51-	3307																									
19+88.00 -Y51-	3308																									
41+64.00 -Y52-	3309																									
	3309	3308																		40'						
	3308	3307																		164'						
	3307	3306																		76'						
8+85.00 -RpC-	3310																									
8+91.00 -RpC-	3311																									
	3310	3311																		16'						
8+87.00 -RpC-	3312																									
	3311	3312										68'														
	3312	2935																								
36+71.86 -SR1Rev2	3305																									
38+50.00 -SR1Rev2	3315																									
38+67.00 -SR1REV2	3316																									
23+07.00 -Y51-	3318																									
23+07.00 -Y51-	3319																									
45+64.00 -Y52-	3320																									
	3315	3316										40'														
	3316	3318										60'														
	3318	3319																			40'					
	3320	3319																		16'						
SHEET TOTALS												196'		12'		12'				516'	116'					

STATION	FROM	TO	42" WELDED STEEL PIPE (GRADE B) 0.625" THICK	48" WELDED STEEL PIPE (GRADE B) 0.625" THICK	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 (EACH) DROP INLET	CATCH BASIN	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)
15+02.00 -RpC-	2938						1			1	1																									
14+88.00 -RpC-	2939						1													1			1													
15+04.00 -RpC-	1940						1	5.0	0.1															1	1											
	2935	2936																																		
	2936	2937																																		
	2938	2937																																		
	2937	2939																																		
	2939	2940																																		
10+75.35 -RpB-	2948						1																	1												
10+74.12 -RpB-	2949																			1									1							
1447+31.00 -L-	3011						1			1			1																							
1447+96.00 -L-	3012						1			1			1																							
1449+36.00 -L-	3013																																	1		
	3011	3012																																		
	3012	3013																																		
14+54.24 -Y53-	3017						1																				1	1								
14+31.26 -Y53-	3010																																			
	3017	3010																																		
10+34.43 -Y53-	3016						1													1			1													
17+40.32 -Y52-	3210	3211																																		
17+39.68 -Y52-	3211A																																		1	
17+23.00 -Y52-	3212	3213					1	0.4																1	1											
20+81.00 -Y52-	3214	3215					1														1	1														
20+77.00 -Y52-	3217	3216					1													1		1														
9+83.00 -RpA-	3219	3218					1														1	1														
9+04.00 -RpD-	3220	3221					1	1.3																1	1											
17+41.00 -Y51-	3306																																	1		
18+20.00 -Y51-	3307						1			1			1																							
19+88.00 -Y51-	3308						1			1			1																							
41+64.00 -Y52-	3309						1															1					1									
	3309	3308																																		
	3308	3307																																		
	3307	3306																																		
8+85.00 -RpC-	3310						1																	1	1											
8+91.00 -RpC-	3311						1													1		1														
	3310	3311																																		
8+87.00 -RpC-	3312						1													1			1													
	3311	3312																																		
	3312	2935																																		
36+71.86 -SR1Rev2	3305																																			
38+50.00 -SR1Rev2	3315						1													1								1								
38+67.00 -SR1REV2	3316						1	0.4												1								1								
23+07.00 -Y51-	3318						1			1		1																								
23+07.00 -Y51-	3319						1			1			1																							
45+64.00 -Y52-	3320						1															1					1									
	3315	3316																																		
	3316	3318																																		
	3318	3319																																		
	3320	3319																																		
SHEET TOTALS							24	7.1	0.1	7	1	1	5							8	2	6	3	5	4		3	3	1					2	1	

STATION	FROM	TO	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
15+02.00 -RpC-	2938						
14+88.00 -RpC-	2939						
15+04.00 -RpC-	1940						Rem. 2GI replace with JB w/MH
	2935	2936					
	2936	2937					
	2938	2937					
	2937	2939					
	2939	2940					
10+75.35 -RpB-	2948						
10+74.12 -RpB-	2949						
1447+31.00 -L-	3011						
1447+96.00 -L-	3012						
1449+36.00 -L-	3013						
	3011	3012					
	3012	3013					
14+54.24 -Y53-	3017						
14+31.26 -Y53-	3010						15" Outlet Pipe
	3017	3010					
10+34.43 -Y53-	3016						
17+40.32 -Y52-	3210	3211			0.5526		Inlet Pipe
17+39.68 -Y52-	3211A						Adjust existing 2GI and Repair apron
17+23.00 -Y52-	3212	3213					
20+81.00 -Y52-	3214	3215			0.399		Rem. Exist. DI collar 15" CONC
20+77.00 -Y52-	3217	3216			0.399		Rem. Exist. DI collar 15" CONC
9+83.00 -RpA-	3219	3218			0.4465		Rem. 16' 18" CONC and collar 18" RCP-IV
9+04.00 -RpD-	3220	3221					18" RCP-IV Outlet Pipe
17+41.00 -Y51-	3306						
18+20.00 -Y51-	3307						
19+88.00 -Y51-	3308						Use Precast Structure-Std 840.45
41+64.00 -Y52-	3309						Use Precast Structure-Std 840.45
	3309	3308					
	3308	3307					
	3307	3306					
8+85.00 -RpC-	3310						
8+91.00 -RpC-	3311						
	3310	3311					Rem. 12' 15" CONC (No Quantity)
8+87.00 -RpC-	3312						
	3311	3312					
	3312	2935					
36+71.86 -SR1Rev2	3305						
38+50.00 -SR1Rev2	3315						
38+67.00 -SR1REV2	3316						
23+07.00 -Y51-	3318						Use Precast Structure-Std 840.45
23+07.00 -Y51-	3319						Use Precast Structure-Std 840.45
45+64.00 -Y52-	3320						Use Precast Structure-Std 840.45
	3315	3316					
	3316	3318					
	3318	3319					
	3320	3319					
SHEET TOTALS					1.7971		

CSD265813

COMPUTED BY: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 6/27/2013

PROJECT NO.	SHEET NO.
R-2303D	3-V

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)

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

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
27+00.00 -Y51-	Lt.	3321		155.4	151.7														
27+00.00 -Y51-	Lt.	3322	3323	154.2	149.4	150.8													
		3319	3321		153.2	151.7													
		3321	3322		151.7	149.9													
51+50.00 -Y52-	Rt.	3324		151.9	147.1														
		3322	3324		149.4	147.1													
52+49.00 -Y52-	Rt.	3410		147.5	141.2														
52+74.00 -Y52-	Rt.	3411		147.5	141.2														
52+66.00 -Y52-	Lt.	3412	3414	140.5	134.6	134.5													
52+74.00 -Y52-	Lt.	3413	3415	140.5	134.6	134.5													
		3324	3410		147.1	141.2													
		3410	3411		141.2	141.2													
		3411	3413		141.2	134.6													
18+50.98 -SR1-	CL	3513	3514		162.0	155.4				156'									
14+86.20 -SR1-	CL	3515	1516		153.1	152.9							76'						
25+89.93 -SR1-	CL	3610	3611		161.4	16.5					84'								
32+90.30 -SR1Rev2-	CL	3612	3613		161.9	161.7													
33+24.77 -SR1Rev2-	Rt.	3614							40'										
PROJECT TOTALS																			
SHEET TOTALS									40'	156'	84'		76'						
PROJECT TOTALS FOR 54" and OVER																			
PROJECT TOTALS									3212'	1400'	412'		76'						
SAY																			

STATION	C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	30" (.079)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
27+00.00 -Y51- (3321)																								
27+00.00 -Y51- (3322)										4'														
(3319)																			300'					
(3321)											12'													
51+50.00 -Y52- (3324)																								
(3322)												280'												
52+49.00 -Y52- (3410)																								
52+74.00 -Y52- (3411)																								
52+66.00 -Y52- (3412)												8'												
52+74.00 -Y52- (3413)															8'									
(3324)												96'												
(3410)															20'									
(3411)																								
18+50.98 -SR1-																								
14+86.20 -SR1-																								
25+89.93 -SR1-																								
32+90.30 -SR1Rev2-																			56'					
33+24.77 -SR1Rev2-																								
PROJECT TOTALS																								
SHEET TOTALS										4'	12'	384'			28'				356'					
PROJECT TOTALS FOR 54" and OVER																								
PROJECT TOTALS		198'	84'	12'						4584'	4532'	3916'	1728'	1132'	132'			6498'	2802'	2068'	3282'	1026'	388'	2436'
SAY																								

STATION	42 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	48 " WELDED STEEL PIPE (GRADE B) 0.625" THICK	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 (EACH) DROP INLET	CATCH BASIN
27+00.00 -Y51- (3321)					1			1			1		
27+00.00 -Y51- (3322)					1								
(3319)													
(3321)													
51+50.00 -Y52- (3324)					1								
(3322)													
52+49.00 -Y52- (3410)					1	1.3							
52+74.00 -Y52- (3411)					1	1.3							
52+66.00 -Y52- (3412)			1.512		1	0.9							
52+74.00 -Y52- (3413)			4.5		1	0.9							
(3324)													
(3410)													
(3411)	136'												
18+50.98 -SR1-													
14+86.20 -SR1-			3.4										
25+89.93 -SR1-													
32+90.30 -SR1Rev2-													
33+24.77 -SR1Rev2-													
PROJECT TOTALS									2		4		
SHEET TOTALS	136'		9.412		7	4.4		1	2		5		
PROJECT TOTALS FOR 54" and OVER													
PROJECT TOTALS	136'	56'	35.412		421	132.0	9.2	143	27	53	69	55	
SAY			36			144.0							

STATION	OPEN THROAT CATCH BASIN STD. 840.04 OR 840.05	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 TWO GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.J.B. STD. 840.34	T.B.G.D.I. STD. 840.35	G.D.I. FRAME WITH TWO GRATES STD. 840.29	G.D.I. FRAME WITH TWO GRATES STD. 840.22	SPECIAL D.I. (SEE DETAIL SHEET 2-Q)	SPECIAL DI (SEE DETAIL 2-U)	SPECIAL D.I. (SEE DETAIL SHEET 2-V)	ADJUST EXIST. MH	ADJUST EXIST. CB	ADJUST EXIST. DI	MODIFIED CONCRETE FLUME (SEE DETAIL SHT. 2-R)	SIDE DRAIN PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. 'B' C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
27+00.00 -Y51- (3321)																										Use Precast Structure-Std 840.45
27+00.00 -Y51- (3322)				1									1											0.399		Use Precast Structure-Std 840.45
(3319)																										
(3321)																										Rem. 15" CONC (No Quantity)
51+50.00 -Y52- (3324)				1			1																			Use Precast Structure-Std 840.45
(3322)																										
52+49.00 -Y52- (3410)				1										1												
52+74.00 -Y52- (3411)				1										1												Use Precast Structure-Std 840.45
52+66.00 -Y52- (3412)									1	1																Use Precast Structure-Std 840.45
52+74.00 -Y52- (3413)									1	1																
(3324)																										
(3410)																										
(3411)																										Trenchless installation of 42" Steel Welded Pipe
18+50.98 -SR1-																										
14+86.20 -SR1-																										
25+89.93 -SR1-																										
32+90.30 -SR1Rev2-																										
33+24.77 -SR1Rev2-																										
PROJECT TOTALS							3			4				3												
SHEET TOTALS				4			4		2	6			1	5										0.399		
PROJECT TOTALS FOR 54" and OVER				6			3			4				3												
PROJECT TOTALS	2	95	98	36	109	17	47	111	15	25	5	3	4	9		2	1	2	3	1	1	26 @ 15"	1.047	8.2537	6530'	
SAY																						2 @ 18"	2	9	6530'	

RD266429

COMPUTED BY: SWH DATE: 4/23/2013

CHECKED BY: WTB DATE: 6/27/2013

PROJECT NO.	SHEET NO.
R-2303D	3-W

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 54" & OVER)

Station / Size / Thickness or Gauge	Location (LT, RT, or CL)	Structure No. From	Structure No. To	Top Elevation	Invert Elevation	Invert Elevation	Slope Critical	Class III R.C. Pipe 54"	Class III 60"	Class III 66"	Class III 72"	Class III 78"	Class III 84"	Class III 90"	Class III 96"	C.S. Pipe 54" .109	C.S. 54" .138	C.S. 54" .168	C.S. 54" Shop Elongated .138	C.S. 54" Shop Elongated .168	C.S. 60" .138	C.S. 60" .168	C.S. 66" .138	C.S. 66" .168	C.S. 72" .139	C.S. 72" .168	C.S. 72"	Class IV R.C. Pipe 54"	Class IV 60"	Class IV 66"	Class IV 72"	Class IV 78"	Class IV 84"	Class IV 90"	Class IV 96"
1171+82.00 -L-	CL	919		164.2	156.4																														
1171+82.00 -L-	CL	920				156.1																													
1171+82.00 -L-	Lt.	921			159.0																														
		921	919																										76'						
		919	920																										76'						
1197+59.00 -L-	Lt.	1116			145.0																														
1197+88.00 -L-	Rt.	1117		151.6	143.3																														
1197+90.16 -L-	Rt.	1118				143.1																													
		1116	1117		145.0	143.3			88'																										
		1117	1118		143.3	143.1				80'																									
1248+19.59 -L-	Lt.	1511			151.7																														
1248+75.58 -L-	Rt.	1512		156.4	148.2																														
1248+75.58 -L-	Rt.	1513				148.0																													
		1511	1512		151.7	148.2																								80'					
		1512	1513		148.2	148.0																								80'					
1278+55.00 L-	Lt.	1716			101.6																														
1278+55.00 -L-	CL	1717		113.8	101.3																														
1280+50.00 -L-	CL	1718		109.0	100.7																														
1280+84.00 -L-	Rt.	1719		102.8	94.9																														
		1716	1717		101.6	101.3				92'																									
		1717	1718		101.3	100.7				192'																									
		1718	1719		100.7	94.9				92'																									
		1719	1720		94.9	94.8				40'																									
16+54.47 -Y44-	CL	1809	1830		86.4	85.5																								68'					
1290+05.00 -L-	Lt.	1818			87.7																														
1289+95.00 -L-	CL	1817		94.5	86.7																														
		1818	1817		87.7	86.7																							84'						
1290+75.00 -L-	CL	1819		94.6	86.5																														
1291+59.50 -L-	Rt.	1820				86.2																													
		1817	1819		86.7	86.5																							76'						
		1819	1820		86.5	86.2																							112'						
1294+47.99 -L-	Lt.	1822				86.6																													
1294+41.00 -L-	Lt.	1823		94.2	85.4																														
1294+64.98 -L-	Rt.	1824				85.0																													
		1822	1823		86.6	85.4																									80'				
		1823	1824		85.4	85.0																									88'				
1390+84.55 -L-	Lt.	2548				147.5																													
1390+64.00 -L-	Lt.	2556		156.0	148.2																														
		2556	2548		148.2	147.5			116'																										
1408+41.00 -L-	Lt.	2703		152.0	145.7																														
1408+42.50 -L-		2755				146.3																													
		2703	2755		145.7	146.3																						88'							
1438+91.00 -L-	Lt.	2946		148.00	141.7																														
1439+50.00 -L-	Lt.	2954		147.00	139.6																														
1440+70.00 -L-	Lt.	2955		144.40	137.0																														
		2946	2954		141.7	139.6																						56'							
		2954	2955		139.6	137.0																						116'							
1441+19.00 -L-	Lt.	2922		143.2	136.8																														
1441+64.00 -L-	Lt.	2923		142.2	134.9																														
1443+02.00 -L-	Lt.	2928		138.9	132.6																														
1443+87.00 -L-	Lt.	2941	2942	133.5	121.5	121.3					56'																								
		2955	2922	144.4	137.0	136.8																						48'							
		2922	2923		136.8	134.9																						44'							
		2923	2928		134.9	132.6																						136'							
		2928	2941		132.6	126.0																						84'							
12+56.00 -Y53-	CL	3014	3015		109.8	109.6																									56'				
SHEET TOTALS									204'	496'	56'																	572'	272'	228'	224'				

Station	Structure No. From	Structure No. To	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	Catch Basin	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. Frame with Two Grates Std. 840.20	G.D.I. Frame with Two Grates Std. 840.22	G.D.I. Frame with Two Grates Std. 840.24	G.D.I Type "D" (See Special Detail, Sheet 2-?)	G.D.I. Frame with Two Grates Std. 840.24	J.B. Std. 840.31 or 840.32	M.H. Frame and Cover Std. 840.54	T.B.J.B. Std. 840.34	Special Catch Basin (See Detail Sheet 2-S)	Special Catch Basin (See Sheet 2-AG)	Reinf. Conc. Flared End Sections No. & Size	Corr. Steel Flared End Sections No. & Size	Corr. Steel Elbows No. & Size	Conc. & Brick Pipe Plug, C.Y. Std. 840.71	Conc. Collars Cl. 'B' C.Y. Std. 840.72	Pipe Removal Lin. Ft.	Remarks
1171+82.00 -L-	919				5.18							1			1															
1171+82.00 -L-	920																													60" RCP-IV Inlet Pipe with HW
1171+82.00 -L-	921		5.7																											60" RCP-IV Outlet Pipe
1197+59.00 -L-	1116		5.7																											60" RCP-IV Inlet Pipe
1197+88.00 -L-	1117				5.76							1		1																
1197+90.16 -L-	1118																													66" RCP-IV Outlet Pipe
1248+19.59 -L-	1511		6.3																											66" RCP-IV Inlet Pipe with HW
1248+75.58 -L-	1512				5.34							1			1															
1248+75.58 -L-	1513																													66" RCP-IV Outlet Pipe
1278+55.00 L-	1716		6.3																											
1278+55.00 -L-	1717				5.67							1			1															
1280+50.00 -L-	1718				5.7							1			1															
1280+84.00 -L-	1719				5.81														1	1										
16+54.47 -Y44-	1809	1830	6.3																											66" RCP-IV Cross-Pipe with HW
1290+05.00 -L-	1818		5.7																											
1289+95.00 -L-	1817				5.13							1		1																
1290+75.00 -L-	1819				5.18							1		1																
1294+47.99 -L-	1822		9.9																											72" RCP-IV Inlet Pipe with HW
1294+41.00 -L-	1823				6.36							1		1																
1294+64.98 -L-	1824																													72" RCP-IV Outlet Pipe
1390+64.00 -L-	2556				8.1		1																1							
1408+41.00 -L-	2703				9.8		1															1								See Special Detail
1408+42.50 -L-	2755		7.1																											
1438+91.00 -L-	2946				1.5	1			1																					
1439+50.00 -L-	2954				4.8															1	1									Use Precast Structure-Std 840.46
1440+70.00 -L-	2955				4.8															1	1									Use Precast Structure-Std 840.46
1441+19.00 -L-	2922				1.59	1			1																					
1441+64.00 -L-	2923				1.59	1			1																					
1443+02.00 -L-	2928				1.54	1			1																					
1443+87.00 -L-	2941	2942																	1	1										
12+56.00 -Y53-	3014	3015	9.9																											
SHEET TOTALS			62.9		83.85	4	2		4			6		3	3				2	4	2	1	1							
Say			63		84																									

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:	WAS	DATE:	5/8/13
CHECKED BY:	WTB	DATE:	6/25/13

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	3-X

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL

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	XI	GRAU 350	M-350	XIII	CAT-1	TYPE B-77	BIC	G	NG				
-L-	1105+40.00	1109+58.75	Rt.	418.75			1106+00.00	1109+20.00	10'	13'	50'		1				1			1								
-L-	1107+33.87	1111+01.75	Lt.	368.75			1110+40.00	1107+50.00	10'	13'		50'		1			1			1								
-L-	1162+35.00	1176+16.25	Rt.	1381.25			1163+00.00	1175+75.00	10'	13'	50'		1				1			1								
-L-	1169+70.00	1173+88.75	Lt.	418.75			1173+00.00	1172+00.00	10'	13'		50'		1			1			1								
-L-	1196+55.00	1202+61.25	Rt.	606.25			1197+35.00	1202+50.00	10'	13'	50'		1				1			1								
-L-	1218+25.00	1225+93.75	Rt.	768.75			1219+00.00	1225+50.00	10'	13'	50'		1				1			1								
-L-	1222+11.00	1226+42.25	Lt.	431.25			1225+50.00	1222+25.00	10'	13'		50'		1			1			1								
-LRev-	1289+35.00	1300+28.75	Rt.	1093.75			1290+25.00	1300+25.00	10'	13'	50'		1				1			1								
-LRev-	1301+64.25	1305+58.00	Lt. Outside	393.75				1305+56.32	10'	13'		100'		2						1	1							
-LRev-	1303+89.25	1305+58.00	Lt. Med.	168.75				1305+56.32	4'	7'			1					1			1							
-LRev-	1303+64.25	1305+58.00	Rt. Med.	193.75			1305+56.32		4'	7'	139'		13.26'					1			1							
-LRev-	1302+14.25	1305+58.00	Rt. Outside	343.75			1305+56.32		10'	13'	100'		2				1				1							
-LRev-	1317+58.00	1325+54.08	Lt. Outside	850.00			1305+56.32	1301+78.31	10'	13'											1							
-L-	1325+51.33	1326+04.15	Lt. Outside	275.00			1303+00.00	1305+56.32	4'			150'									1							
-LRev-	1323+75.58	1325+54.08	Lt. Med.	183.50					4'	9.7'		104'									1			1				
-L-	1325+51.33	1326+04.15	Lt. Med.	56.25'			1326+56.15	-	4'												1							
-LRev-	1317+58.00	1325+54.08	Rt. Med.	56.25				-	2'		104'										1					148		
-L-	1325+51.33	1326+04.15	Rt. Med.	235.25			1326+04.15	-	2'												1							
-LRev-	1317+58.00	1325+54.08	Rt. Outside	793.75			1317+56.32	1326+04.15	8'	11'											1							
-L-	3125+51.33	1326+04.15	Rt. Outside	56.25'			1326+04.15		8'	11'											1					160		
-L-	1327+83.85	1329+65.05	Lt.	181.25			-	1326+04.15	8'	11'	50'			1			1				1							
-L-	1327+83.85	1329+48.60	Lt. Med.	143.75			-	1326+04.15	4'	-	100'										1							
-L-	1327+84.15	1329+48.60	Rt. Med.	131.25			1326+04.15	-	2'	-	100'	-									1			1		177		
-L-	1331+03.20	1346+80.01	Rt.	1568.75			1331+50.00	1346+55.00	2'	12'	50'	50'	1	1			1			1								
-L-	1438+24.58	1442+03.45	Rt.	375.00				1439+62.15	2'	8'	50	50'		1			2									328		
-Ramp B-	10+55.00	5+00.00	Lt.	1600.00			10+05.00		6'	9'		50'		1			1			1						177		
-LRev-	1309+67.65	1312+72.86	Rt. Med.																							177		
-LRev-	1309+68.51	1311+43.80	Rt. Outside																							175		
-LRev-	1312+83.97	1314+62.33	Rt. Med.																							179		
-LRev-	1312+85.79	1314+84.10	Rt. Outside																							177		
Total			Total	12981.25						Additional Graudrail Post = 10.00 Ea.							14	2		11	15			2		1698		
		Deduction for Anchor Units		-1225.00																								ANCHOR DEDUCTIONS
			Project Total	11756.25																								GRAU TYPE (@50') X 14 Ea. =700.00'
			Say	11925.00																								CAT-1 (@ 6.25') X 11 Ea. = 68.75'
																												TYPE B-77 (@ 18.75') X 15 Ea. =281.25'
																												GRAU TYPE M-350 (@37.50') X 2 Ea. =75.00'
																												IMPACT ATTENUATOR TYPE 350 (@ 50.00') X 2Ea. =100.00'

TEMPORARY GUARDRAIL SUMMARY

-L-	1107+66.31	1110+66.31	Lt.	300													2											
-L-	1223+50.00	1226+50.00	Rt.	300													2											
-L=	1331+03.00	1346+65.00	Rt.	1562.5													2											
																												ANCHOR DEDUCTIONS
			Total	2162.5																								TEMPORARY GRAU TYPE-350 (@50') X 6 Ea. =300.00'
		Deduction for Anchor Units		-300																								Total = 300.00'
			Total	1862.5																								
			Say	1875.00'																								

COMPUTED BY:	GEOTECH	DATE:	
CHECKED BY:	WTB	DATE:	6/24/2013

(2-19-13)

PROJECT NO.	SHEET NO.
R-2303D	3-Y

GEC25522

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-L-	1329+00.00	1345+75.00	Rt.	SD	1700
Additional for Contingency item					2000
CONTINGENCY					
				TOTAL LF:	3700

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/	MONTHS
Dual Structures on NC 24 over Great Coharie Creek Lt. Lane (WBL)	1 & 2	1
Dual Structures on NC 24 over Great Coharie Creek Overflow (WBL)	1 & 2	see sheet 2-AC
Dual Structures on NC 24 over Great Coharie Creek Overflow (EBL)	1 & 2	1

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE	Approx. Station	Approx. Offset
1	-L-	1325+70.00	50' Lt.
2	-L-	1326+00.00	48' Lt.
3	-L-	1328+00.00	48' Lt.
4	-L-	1328+30.00	50' Lt.
		TOTAL GAUGES (EACH):	4

SUMMARY OF ROCK PLATING

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	SY
-L-	2:1 (H:V)	1303+02.00	2:1 (H:V)	1304+67.00	Rt.	1		350
							TOTAL SY:	350

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF WOVEN WIRE FENCE

LINE	Station	Station	FABRIC	4" TIMBER POSTS 7'6" LONG	5" TIMBER 5" POSTS
-L-	1095+71.00	1100+65.00	523.59	42	7
-L-	1097+60.00	1098+60.00	100.10	9.00	2
-L-	1099+14.00	1100+10.00	96.00	8.00	2
-L-	1100+70.00	1102+50.00	180.00	15.00	2
-L-	1101+25.00	1103+20.00	195.00	16.00	2
-L-	1103+10.00	1103+86.00	76.00	6.00	2
-L-	1103+80.00	1122+60.00	1901.39	156.00	11
-L-	1104+46.00	1105+99.00	276.48	23.00	4
-L-	1106+49.00	1123+15.00	1732.97	142.00	11
-L-	1123+20.00	1124+75.00	157.78	13.00	2
-L-	1124+45.00	1128+15.00	364.71	30.00	3
-L-	1125+35.00	1133+55.00	883.94	71.00	10
-L-	1128+75.00	1140+86.00	1231.00	100.00	9
-L-	1134+25.00	1147+50.00	1325.00	109.00	6
-L-	1144+00.00	1147+00.00	300.00	25.00	3
-L-	1147+60.00	1151+33.00	377.72	31.00	5
-L-	1150+00.00	1152+32.00	234.13	20.00	2
-L-	1151+93.00	1152+85.00	90.43	8.00	2
-L-	1152+92.00	1156+57.50	372.06	31.00	3
-L-	1155+30.00	1157+80.00	272.95	22.00	4
-L-	1157+17.50	1158+80.00	165.41	14.00	4
-L-	1159+09.50	1161+20.00	208.85	18.00	2
-L-	1159+40.00	1176+90.00	1771.07	145.00	2
-L-	1164+50.00	1165+85.00	135.00	11.00	9
-L-	1167+58.00	1175+60.00	802.00	66.00	2
-L-	1177+30.00	1181+20.00	395.00	32.00	4
-L-	1177+40.00	1181+70.00	370.00	31.00	5
-L-	1181+70.00	1183+55.00	185.10	16	3
-L-	1181+80.00	1185+73.75	540.61	44	2
-L-	1184+15.00	1186+25.00	218.79	18	2
-L-	1187+75.00	1191+77.00	428.05	35.00	4
-L-	1187+75.00	1191+35.00	336.98	28.00	3

LINE	Station	Station	FABRIC	4" TIMBER POSTS 7'6" LONG	5" TIMBER 5" POSTS
-L-	1191+95.00	1211+70.00	1987.80	162.00	13
-L-	1192+25.00	1199+50.00	761.29	62.00	8
-L-	1200+10.00	1209+00.00	890.00	74.00	4
-L-	1210+90.00	1212+85.00	195.00	16.00	2
-L-	1212+30.00	1226+75.00	1486.56	121.00	11
-L-	1214+20.00	1215+41.00	121.00	10.00	2
-L-	1217+35.00	1220+38.00	303.00	25.00	3
-L-	1220+98.00	1231+00.00	1032.00	84.00	9
-L-	1227+35.00	1238+20.00	1103.57	90.00	8
-L-	1231+60.00	1234+20.00	260.00	22.00	2
-L-	1234+80.00	1243+30.00	877.43	72.00	5
-L-	1238+80.00	1240+40.00	152.38	13.00	2
-L-	1243+52.00	1262+43.00	2056.62	165.00	21
-L-	1243+90.00	1262+00.00	1851.68	149.00	18
-L-	1263+75.00	1285+90.00	2190.61	179.00	13
-L-	1263+75.00	1285+19.00	2199.57	180.00	13
-L-	1287+50.00	1298+28.00	1108.68	91.00	6
-L-	1287+50.00	1301+44.00	1358.44	112.00	7
-L-	1298+86.00	1299+23.00	38.69	3.00	2
-L-	1299+83.00	1301+13.00	134.83	11.00	2
-L-	1302+04.00	1305+26.00	360.67	29.00	7
-L-	1318+49.00	1329+00.00	1025.99	84.00	6
-L-	1321+68.00	1324+50.00	306.15	25.00	5
-L-	1434+53.00	1436+22.00	169.42	14.00	2
-Y52-	19+57.00	30+61.00	1156.31	95	7
-Y52-	26+74.00	28+11.00	134.32	11	4
-Y52-	33+92.00	51+92.00	2124.40	174.00	12
-L-	1442+47.00	1445+51.00	349.90	29	3
		Total	41984.42	3437	332
		Say	41990	3440	340

COMPUTED BY:	SWH	DATE:	6/5/2013
CHECKED BY:	WTB	DATE:	6/19/2013

PROJECT NO.	SHEET NO.
R-2303D	3-Z

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

IN SQUARE YARDS

LINE	STATION	STATION	LOC LT/RT/CL	AREA SY
REMOVAL OF EXISTING PAVEMENT				
-Y42	12+50	14+02	CL	438
-Y42-	14+26	18+50	CL	1051
-Y43-	14+35	17+25	CL	635
-Y44-	12+25	17+75	CL	1145
-Y51-	10+31	11+61	CL	632
			TOTAL:	3901
			SAY:	3,910 SY

SUMMARY OF EXISTING CONCRETE PAVEMENT REMOVAL

IN SQUARE YARDS

LINE	STATION	STATION	LOC LT/RT/CL	AREA SY
REMOVAL OF EXISTING PAVEMENT				
-L-	1104+50	1105+50	Lt.	279
-L-	1111+50	1113+00	Lt.	403
-L-	11+50	1152+50	Lt.	680
-L-	1202+25	1204+75	Rt.	680
-L-	1208+50	1220+00	Rt.	3193
-L-	1224+25	1225+00	Rt.	206
-L-	1234+00	1245+92	CL	3388
-L-	1291+21	1291+51	CL	102
-L-	1291+51	1301+75	CL	3015
-L-	1305+34	1311+44	Rt.	1626
-L-	1312+85	1317+82	Rt.	218
-L-	1325+51	1326+21	Rt.	8
-L-	1327+11	1345+00	Rt.	4351
-L-	1352+11	1366+11	CL	3269
-L-	1373+94	1379+44	CL	1256
-L-	1383+12	1387+06	CL	810
-L-	1394+42	1396+02	CL	314
-L-	1399+96	1402+40	CL	520
-L-	1406+04	1413+60	CL	1693
-L-	1420+95	1424+90	CL	650
			TOTAL:	26661
			SAY:	26670 SY

SUMMARY OF EXISTING CONCRETE PAVEMENT BREAKING

IN SQUARE YARDS

LINE	STATION	STATION	LOC LT/RT/CL	AREA
BREAKING OF EXISTING PAVEMENT				
-L-	1105+50	1111+50	Lt.	1623
-L-	1152+50	1202+25	Lt./Rt.	13625
-L-	1204+75	1208+50	Rt.	1053
-L-	1220+00	1224+25	Rt.	1171
-L-	1225+00	1234+00	Rt.	2566
-LRev-	1301+75	1305+34	Rt.	1019
-LRev-	1317+82	1325+54	Rt.	2445
			TOTAL	23502
			SAY:	23,510 SY

COMPUTED BY: WTB DATE: 7/2/2013

PROJECT NUMBER	SHEET NUMBER
R-2303D	3-AA

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.
SUMMARY 1							
-L-	1097+00.00	1126+00.00	3,664	852	10,798	7,704	1,422
-L-	1097+00.00	1126+00.00	4,408	1,900	26,165	21,761	1,904
-Y39-	11+84.96	13+25.00	127		268	141	
SUBTOTAL			**8,199**	**2,752**	**37,230**	**29,605**	**3,326**
SUMMARY 2							
-L-	1126+00.00	1150+00.00	3,683	1,046	2,174		2,555
-L-	1126+00.00	1150+00.00	3,404	1,243	3,726	358	1,279
-Y40-	12+83.00	14+41.00	209	409	764	764	618
-Y41-	10+59.01	12+94.30	301		138		164
SUBTOTAL			**7,597**	**2,698**	**6,801**	**1,122**	**4,616**
SUMMARY 3							
-L-	1150+00.00	1183+00.00	805		39,101	38,296	
-L-	1150+00.00	1183+00.00			48,660	48,660	
SUBTOTAL			**805**		**87,761**	**86,956**	
SUMMARY 4							
-L-	1183+00.00	1215+00.00	4,628	2,399	31,885	28,152	3,294
-L-	1184+00.00	1193+00.00	886		1,864	978	
-L-	1183+00.00	1215+00.00	1,064	1,273	29,908	29,059	1,488
-Y42-	12+15.01	13+73.01	26		2,040	2,014	
-Y42-	14+91.01.00	19+45.90	119		2,710	2,591	
SUBTOTAL			**6,723**	**3,672**	**68,406**	**62,793**	**4,782**
SUMMARY 5							
-L-	1215+00.00	1246+00.00	8,134	3,702	36,449	28,315	3,702
-L-	1237+00.00	1247+50.00	1,012		1,696	684	
-L-	1215+00.00	1246+00.00	982	1,171	38,405	37,423	1,171
SUBTOTAL			**10,128**	**4,873**	**76,550**	**66,422**	**4,873**
SUMMARY 6							
-L-	1246+00.00	1276+00.00	10,173		9,974		199
-L-	1246+00.00	1276+00.00	375		36,554	36,179	
SUBTOTAL			**10,548**		**46,528**	**36,179**	**199**
SUMMARY 7							
-L-	1276+00.00	1293+00.00	53	878	29,179	29,126	878
-L-	1276+00.00	1293+00.00		1,146	37,940	37,940	1,146
-Y43-	13+28.56	14+86.56	203		208	5	
-Y43-	16+04.77	17+60.77	65		1,503	1,438	
-Y44-	11+41.95	13+00.33	6		308	302	
-Y44-	14+18.33	18+53.33	24	109	2,648	2,624	109
SUBTOTAL			**351**	**2,133**	**71,784**	**71,433**	**2,133**
SUMMARY 8							
-L-	1293+00.00	1305+50.00	113	4,662	29,508	29,395	4,662
-L-	1293+00.00	1301+50.00	151	5,112	18,971	18,820	5,112
-L-	1293+00.00	1305+50.00	544	12,452	22,406	21,862	12,452
SUBTOTAL			**808**	**22,226**	**70,885**	**70,077**	**22,226**
SUMMARY 9							
-L-	1318+00.00	1325+50.00		354	11,538	11,538	354
-L-	1318+00.00	1325+50.00			5,003	5,003	
SUBTOTAL				**354**	**16,540**	**16,540**	**354**

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.
SUMMARY 10							
-L-	1328+00.00	1350+00.00	2,007	2,085	12,703	11,527	2,916
-L-	1328+00.00	1350+00.00	4,599	1,553	4,708	1,793	3,237
-Y45-	12+58.21	14+56.05	107		105		2
-Y45-	15+50.55	17+10.46	307		21		286
SUBTOTAL			**7,020**	**3,638**	**17,536**	**13,319**	**6,441**
SUMMARY 11							
-L-	1350+00.00	1381+00.00	1,573		2,789	1,216	
-L-	1350+00.00	1381+00.00	1,416		3,694	2,278	
-Y46-	12+56.95	14+14.56	146		70		76
-Y46-	15+06.77	15+71.14	30		19		11
-Y47-	10+46.09	11+46.27	93	218	335	242	218
SUBTOTAL			**3,258**	**218**	**6,906**	**3,736**	**305**
SUMMARY 12							
-L-	1381+00.00	1415+00.00	1,228		1,273	45	
-L-	1381+00.00	1415+00.00	1,332		1,869	537	
-DR2-	10+25.00	11+25.00	14		421	407	
-Y48-	10+58.00	13+48.17	251		343	92	
SUBTOTAL			**2,825**		**3,905**	**1,080**	
SUMMARY 13							
-L-	1415+00.00	1437+00.00	1,484	801	1,378	209	1,116
-L-	1415+00.00	1437+00.00	1,609	1,176	2,706	1,893	1,972
-Y49-	10+82.26	11+83.09	123		36		87
-SR1-	11+00.00	32+00.00	420	591	22,085	21,690	616
-SR1-	32+00.00	39+00.00	3,034	1,286	1,814		2,506
-DR1-	10+25.00	11+75.00	259		113		147
-Y50-	19+67.42	20+73.30	243				243
-Y50-	10+93.00	12+38.86	44		34		10
-Y50-	13+34.61	16+10.00	83		68		16
-Y51-	11+33.09	12+25.00	109		21		88
SUBTOTAL			**7,408**	**3,854**	**28,254**	**23,792**	**6,800**
SUMMARY 14							
-L-	1443+00.00	1445+00.00	148	30	1,424	1,287	41
-L-	1443+00.00	1446+00.00	148	78	361	282	147
-Y52-	14+50.00	27+50.00	2,108		421		1,687
-Y52-	16+00.00	27+50.00	6,320	820	1,384		5,756
-Y52-	41+50.00	50+50.00	1,094	198	449		843
-Y52-	37+00.00	51+50.00	990		644		346
-Y53-	10+00.00	16+32.58	1,397		694		703
-Y54-	11+50.00	12+44.13	55				55
-RPA-	11+00.00	17+00.00	676	532	2,539	1,863	532
-RPB-	8+50.00	12+50.00	278		3,281	3,003	
-RPC-	8+00.00	15+00.00	955	628	1,950	995	628
-RPD-	8+50.00	15+00.00	705		1,725	1,020	
SUBTOTAL			**14,874**	**2,286**	**14,871**	**8,450**	**10,739**

COMPUTED BY: WTB DATE: 7/2/2013

PROJECT NUMBER	SHEET NUMBER
R-2303D	3-AB

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.
SHEET TOTALS			80,544	48,704	553,958	491,503	66,794
LOSS DUE TO CLEARING AND GRUBBING			-520			520	
MATERIAL FOR SHOULDER CONSTRUCTION					72,793	72,793	
ADDITIONAL UNDERCUT				11,500	14,375	14,375	11,500
EARTH WASTE IN LIEU OF BORROW						-12,258	-12,258
PROJECT TOTAL			80,024	60,204	641,125	566,933	66,036
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT						28,347	
GRAND TOTAL			80,024			595,280	
SAY			80,600			595,800	
Earthwork Totals For Alternate Pavement Design							
TOTALS FOR ABC PAVEMENT DESIGN			80,544	48,704	553,958	491,503	66,794
ADJUST FOR B25.0C ALTERNATE PAVEMENT DESIGN			-12,958	-15,448	35,698	46,220	-17,886
LOSS DUE TO CLEARING AND GRUBBING			-520			520	
MATERIAL FOR SHOULDER CONSTRUCTION					48,999	48,999	
ADDITIONAL UNDERCUT				11,500	14,375	14,375	11,500
EARTH WASTE IN LIEU OF BORROW						-10,721	
PROJECT TOTAL			67,066	44,756	653,030	590,896	60,408
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT						29,545	
GRAND TOTAL			67,066			620,441	
SAY			67,600			621,000	

ESTIMATED SHALLOW UNDERCUT = 500 C.Y.
ESTIMATED CLASS IV SUBGRADE STABILIZATION = 950 TONS
ESTIMATED SELECT GRANULAR MATERIAL = 47,200 CY

-L- ASPHALT PAVEMENT DESIGN STRUCTURE VOLUME = 10,219 CU.YDS.
-L- ABC PAVEMENT DESIGN STRUCTURE VOLUME = 23,288 CU.YDS.

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.

PROJ. REFERENCE NO.	SHEET NO.
R-2303D	3-AC

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
2	4	JOSEPH ROBERT MILLER
3	4	WILLIAM H. HARRIS LINDA T. HARRIS
3A	4	JEWELL SESSOMS
3B	4	JEFFREY LUCAS, ET AL
4	4	JEFFREY POPE
5	4	ROBERT BUTLER
6	4	RAEFORD HORNE
7	4	CHERYL SIMMONS
8	4, 5, 6	STANLEY S. SMITH
8A	4, 5, 6	PATRICK DUDLEY NEAL
8C	4	WILLIAM HARRIS
8B	6	ALBERTENE GOODMAN
9	6, 7	JAMES L. HOPE
10	6, 7	MARION FAIRCLOTH
11	7	MAURICE HART STEER
12	7, 8	TERENCE ZEZNOCK
13	7	PAULA LYNN CANNADY NETHERCUTT
14	7, 8	PEGGY F. CANNADY
16	8	TREVA E. JACKSON, ETVIE
17	8	DAVID W. PHILLIPS, ETUX
18	8	PATRICA HERRING MILLER
20	8	HENRY D. BROWN, ETUX
20A	8	DANIEL DAVID BROWN
20B	8	HENRY D. BROWN, ETUX
21	8	SELECT PROPERTY INVESTMENTS, LLC
22	8	JUANITA N. KORNEGAY
23	8, 9, 10	JEFF C. GRAHAM
24	8	JANET L. HERRING
24A	8	JACQUELINE L. HERRING
25	8	GEORGE D. MATTHIS, ETUX
27	8, 9	CALVIN GANDY, JR.
28	9	ANNIE GRAHAM HEIRS
29	9	MICHAEL A. FISHER
30	9	WILLIAM PETERSON
31	9	BERTHA P. FISHER
32	9	JOHN D. MOORE
33	9	JOYCE ANNE SAMPSON
35	9, 10	EVERETT LEE SMITH, ETUX
36	10	JOSE G. RODRIGUEZ
37	10	MARK R. TRATHEN
38	10	BRUCE R. O'BRIEN
39	9, 10	ROBERT D. POPE, ETUX
40	10	WILMA B. LUCAS
41	10	DONALD R. SIMMONS, ETUX
42	10	IDA JEANETTE MILLER
43	10, 11	WILLIAM A. RICH, ETAL (TRUSTEES)
44	10, 11, 12	CECELIA A. PRITCHARD
45	11	WILLIAM H. POPE, ETUX
46	11	EARNEST E. GURLEY
47	11, 12	ROBERT T. LITTLE
48	12	LARRY J. KING
49	12	HUBERT N. CRUMPLER
50	12	MICHAEL K. ODUM
51	11, 12	ERNEST M. ODUM, ETUX
52	12	JAMIE D. GODWIN, ET UX
53	12, 13	ASHLEY V. ODUM
54	13	NEIL CRUMPLER
55	13, 14, 15	EVA S. ZARATE
56	13	RONALD WEINMAN
44	13	CECELIA A. PRITCHARD

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
57	13, 14	KENNETH A. CANNADY
58	14	ROBERT LEWIS CANNADY
59	14	DONALD R. CLACK, ETUX
60	14	ANN T. STRICKLAND
61	14	JOHNNY M. PARKER, ETUX
62	14, 15	DORIS F. VONCANNON
63	14, 15	EUGENE CRUMPLER
63A	15	WILLIAM E. CRUMPLER
64	15	ALBERT B. CRUMPLER
64A	15	WILLIAM S. GRANTHAM
65	15	DONNIE M. AUTRY, ETAL
67	15	ALBERT L. CARTER, ETUX
68	15, 16	ELBERT CANNADY, ETUX
71	15, 16	DIANNA G. WOOD
72	16	RYAN KEITH CANNADY
73	16	SAMUEL L. CANNADY, ETUX
74	16, 17	GEORGE W. RACKLEY
75	16	MARCOS A. LUNA
76	16	MARY D. WOOD
77	16, 17, 18	ANIUEL E. SPELL, ETUX
78	16	MARY D. G. WOOD, ETVIR
77A	17, 18	ANIUEL E. SPELL, ETUX
78A	17	HENRY D. SURLES
79	17	CAROLYN WILEY
80	17, 18	RUBY C. TEW VANN
80B	17	VERTIE MAE LETT, HEIRS
81	17	MARILYN W. BOONE
82	18	JAMES COLWELL
83	18	WILBERT O. BROWN, ETUX
84	18, 19, 20	JOHNNY F. PATTERSON, ETUX
85	18, 19	NORTH CAROLINA REAL ESTATE SERVICES INC.
85A	18, 19	WILLIAM V. SMITH
86	19	CLINTON CONGREGATION OF
87	19	LAMONT BUTLER
88	19	SULA RUTH BUTLER
89	19	LONNIE W. GLASPIE
91B	19, 20	JAMES CARNETT BONEY FAMILY TRUST
91	20, 21	LONNIE W. GLASPIE
91A	20	STATE OF NORTH CAROLINA
92	20, 21	COHARIE INCORPORATED
92A	21, 22	COHARIE INC.
92B	22	COHARIE INC.
93	20, 21	JACK W. GRIFFIN, ET AL
93A	21	JACK W. GRIFFIN, ETUX
93B	21	JACK W. GRIFFIN, ET UX
96	21, 22	CAROLINA TELEPHONE AND TELEGRAPH CO.
97	21	JEFFERY SWARTZ, ETUX
98	21, 22	WILLIAM K. SUTTON, ETUX
100	22	WILLIAM L. SUTTON, ETUX
101	22	ELLIOTT L. SPELL, ETUX
103	22	JACKIE B. DIXON
104	22	JINM GARAY, ETUX
105	22	RALPH W. JERNIGAN, ETUX
106	22	PRESTAGE-COHARIE, LLC
107	22	JOHN F. MARSHALL, ETUX
108	22	LEWIS WARREN, ETUX
92A	22	FOXCROFT SUBDIVISON
110	22, 23	JEFFERY D. HEATH, ETUX
111	22	LUTHER D. STARLING JR.
112	22, 23	MICHAEL W. THORNTON, ETUX

PROJ. REFERENCE NO.	SHEET NO.
R-2303D	3-AD

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
113	23	HAMPTON HUBBARD
114	23	FOXCROFT SUBDIVISON VACANT LOT 3
115	23	CHRISTOPHER H. CAISON
116	23	BART SMITH
117	23	CHERIE E. GRIFFIN
118	23	KELLY F. STANLEY
119	23	ISAAC CORTES, JR., ETUX
120	23	HB BARWICK, INC.
121	23	TRUSTEES OF FIRST UNITED
122	23	DALE W. DENNING, ETUX
123	23	CHARLES R. KNOWLES, ETUX
124	23	CLINTON PENTECOSTAL HOLINESS CHURCH
125	23	KAY KNOWLES B. MILLER
126	23, 24, 25	THE TRUSTEES OF SAMPSON TECHNICAL INST.
127	23	R. McPHAIL HERRING
128	23, 24	BOBBY E. BUNKER
129	24	NELL H. CALDWELL
130	24	JAMES E. SINCLAIR, ETAL
130A	24	GEORGE E. WILSON FAMILY ENTERPRISES, LLC
131	24, 25	CLINTON PENTECOSTAL HOLINESS CHURCH
132	25	BOBBY R. HALL
133	25	JUNE M. MASSENGILL
134	25	POHLEMEIER MANAGEMENT L.L.C.
135	25	A. G. THORNTON, ETAL
135A	25	SPRING VIEW FARMS
136	25	WADE-CARY ENTERPRISES INC.
137	25	HARRIS SIGHT AND SOUND, INC.
138	25	PARKER GAS COMPANY, INC.
139	25, 26	K. E. AUSTIN CORP.
140	25, 26	FAIRCLOTH FAMILY PROPERTIES, LLC.
142	26	GUPTA & BAKRI, LLC
143	26	JS INVESTMENT HOLDINGS,LLC.
144	26	TABLEROCK REAL PROPERTY INVESTMENTS,LLC.
145	26	BENTON & SONS #4 LLC.
146	26	ERASTUS BALKCUM, JR., ETUX
146A	26	ERASTUS BALKCUM, JR., ETUX
147	26	SHELTON A. DAVIS & WIFE SHARON T.
148	26	GEDDIE W. TEW, ETUX
149	26, 27	CATHERINE P. WATSON
150	27	SUNSET AVENUE CAR WASH,LLC.
151	27	BETTY H. COOMBS, ETAL
152	27	WING KO, ETUX
153	27	J.L. HONEYCUTT, ETUX
140A	27, 28	FAIRCLOTH FAMILY PROPERTIES, LLC
140B	27	FAIRCLOTH FAMILY PROPERTIES,LLC.
154	27	MILTON W. LINKOUS
155	27	NOEL THOMPSON
155A	27	REBECCA K. CAISON
156	27	WILLIAM H. HARRIS & WIFE LINDA T.
157	27, 28	JOHN F. CRUMPLER, ETUX
158	27, 28, 35	PEGGY S. WEST
160	28	701 SQUARE, LLC
161	28	RUBY TUESDAY, INC.
162	28	PARIS & POTTER PARTNERSHIP
163	28	MARTHA ANN GILMORE KNOWLES
164	28	SUNSET AVENUE CENTER, LLC
165	28, 35	SHAMROCK PLAZA
166	28, 35	IMMANUEL BAPTIST CHURCH OF CLINTON, N.C.
167	28	RAUL LLAMAS
168	28	PATRIOT STATE BANK

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
169	28, 29, 33	ANNE B. FAIRCLOTH
170	28, 29	SAMPSON-BLADEN OIL CO.,INC.
171	29, 32	ANTHONY Q. LEE, SR.,ET AL
172	29	TRI HUU TRAM
173	29, 32	LOUIS TODD BREWER
174	29	ALICE HOLDER
175	29	DEBORAH S. OWEN
176	29, 30	JAMES H. SMITH
177	29, 30	MARY W. GODWIN
178	29, 30	RUBERT W. BRINSON
179	32	CLINTON HCRE,LLC.
180	30, 31, 32	LOUIS TODD BREWER
181	33, 36	SOUTHERN STATES COOPERATIVE, INC.
182	33, 36	SOUTHEASTERN GRAIN COMPANY LLC.
183	33, 34	MILLARD T OWEN, III, ETUX
140A	35, 36	FAIRCLOTH FAMILY PROPERTIES, LLC
169	35, 36	ANNE B. FAIRCLOTH

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS

NORTH CAROLINA PROFESSIONAL SEAL 18913 ENGINEER GREGORY E. BREW 7-10-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/19/13

FOR INTERSECTION DETAIL SEE SHEET 2-H

FOR -L- PROFILE SEE SHEET 37
FOR -Y39- PROFILE SEE SHEET 53

NAD 83/95

REVISIONS

5/14/99

-Y39- SR 1303 — 264/400 — 100/100 — 100/100
-L- US 24 — 6344/13904 — 6344/13904
2013 ADT / 2033 ADT

FROM -L- STA. 1095+47.50 LT
TO -L- STA. 1098+58.46 LT
THE R/W WILL BE PURCHASED
UNDER R-2303C

STA. 1097+00.00 -L- BEGIN TIP PROJECT R-2303D

-Y39- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-Y39- POT Sta. 11+84.96

MATCH LINE -L- STA 1107+50 SEE SHEET 5

-Y39- POT Sta. 14+00.00 =
-L- POT Sta. 1106+15.89

MILLARD T. OWEN III
DB 1315 PG 904
MB 34 PG 31

ROSA DEAVER BEST
DB 1528 PG 838

GREGORY LYMAN GRIFFIN
DB 1080 PG 696

JOSEPH ROBERT MILLER
DB 1716 PG 71

RAEFORD HORNE
DB 885 PG 13

JEFFREY POPE
DB 1124 PG 751

ROBERT BUTLER
DB 1535 PG 405

CHERYL SIMMONS
DB 1318 PG 127

WILLIAM HARRIS
DB 1575 PG 982

STANLEY S. SMITH
DB 1771 PG 820

KENNETH R. GAUTIER
DB 906 PG 763
DB 1016 PG 147
DB 1575 PG 978
PB 52 PG 29

JEWELL SESSOMS
DB 1066 PG 177
DB 1575 PG 952
DB 1575 PG 964
DB 1576 PG 818

JEFFREY LUCAS, ET AL
DB 1327 PG 302

JEWELL SESSOMS
DB 1576 PG 818

WILLIAM H. HARRIS
LINDA T. HARRIS
DB 906 PG 509
DB 1576 PG 815
PB 52 PG 29

PATRICK DUDLEY NEAL
DB 1773 PG 296

R/W ACQUIRED UNDER R-2303C

R/W ACQUIRED UNDER R-2303C

SPECIAL CUT BASE DITCH
SEE DETAIL B
EST 75 SY PSRM

SPECIAL LATERAL V DITCH
SEE DETAIL C
-60 SY PSRM

2' LATERAL BASE DITCH
SEE DETAIL A
EST. 386 CY DDE

TOE PROTECTION
CLASS B RIP RAP
SEE DETAIL D
EST. 100 TONS
EST. 185 SY FF

N 59°09' 28.5" E

-L- N 59°09' 28.5" E

N 59°59' 03" E
251.31'

N 59°03' 57" E
464.54'

S 31°43' 28" E
268.21'

S 31°08' 14" E
200.961'

S 28°41' 19" E

S 31°07' 00" E

-BL- 146

-BY12- 147

-BL- 152

MATCH LINE -L- STA 1107+50 SEE SHEET 5

10-JUL-2013 10:11
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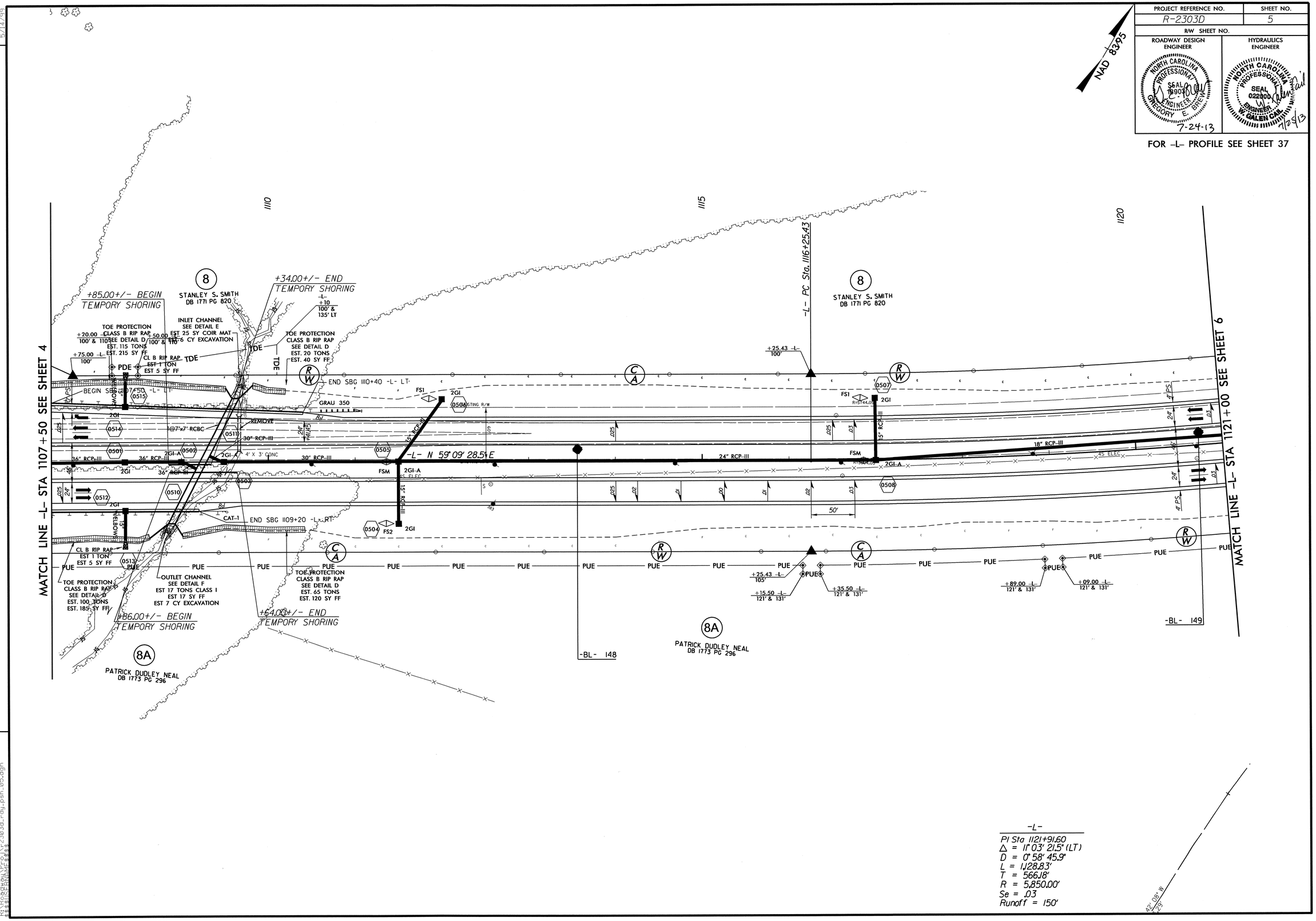
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19903 ENGINEER GREGORY E. BREW 7-24-13	NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 7/25/13

FOR -L- PROFILE SEE SHEET 37



REVISIONS

5/14/99

22-JUL-2013 15:49
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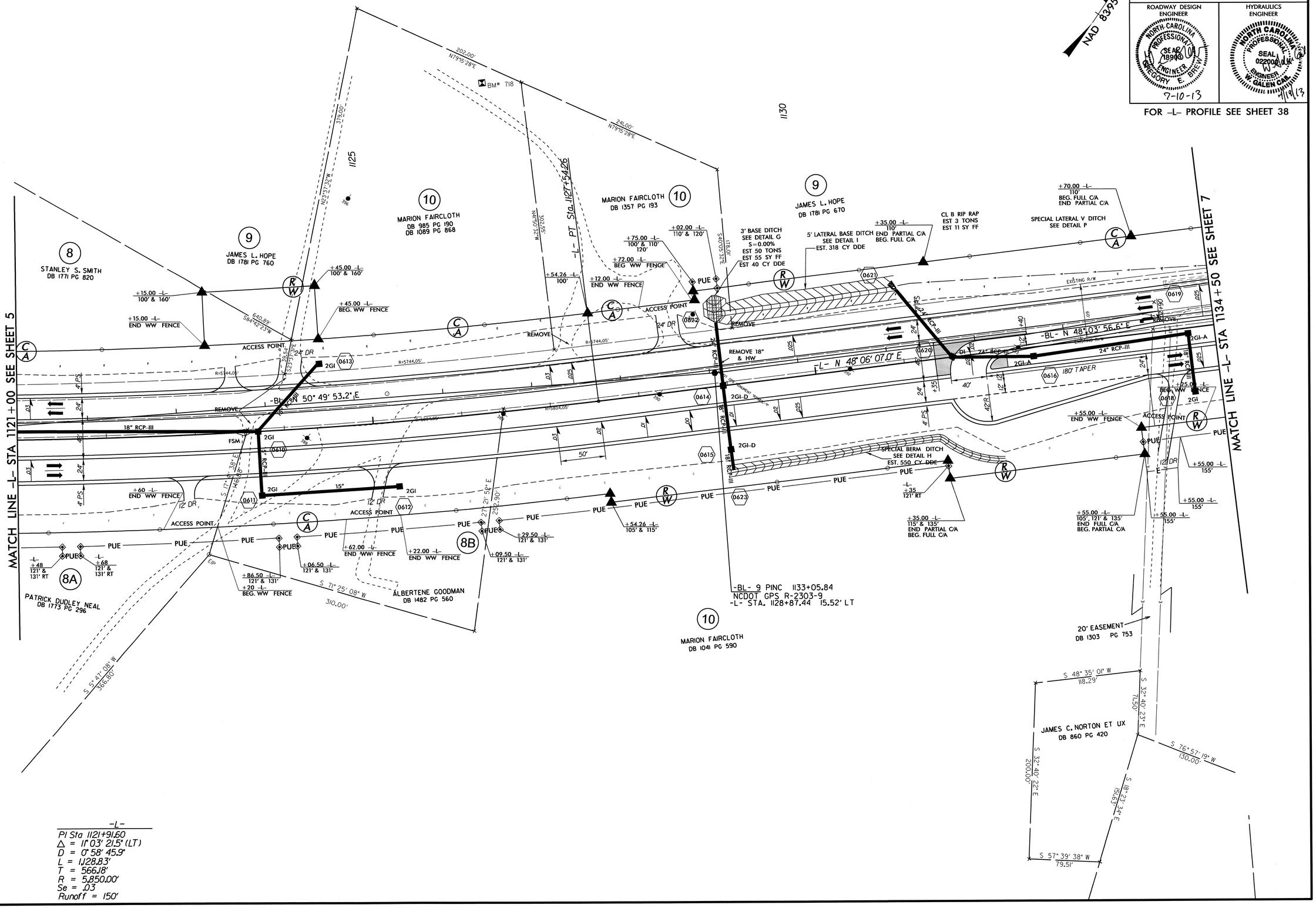
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18906 ENGINEER GREGORY E. BREW 9-10-13

NORTH CAROLINA PROFESSIONAL SEAL 022004 ENGINEER W. GALEN CAIL 7/19/13

FOR -L- PROFILE SEE SHEET 38



REVISIONS

5/14/99

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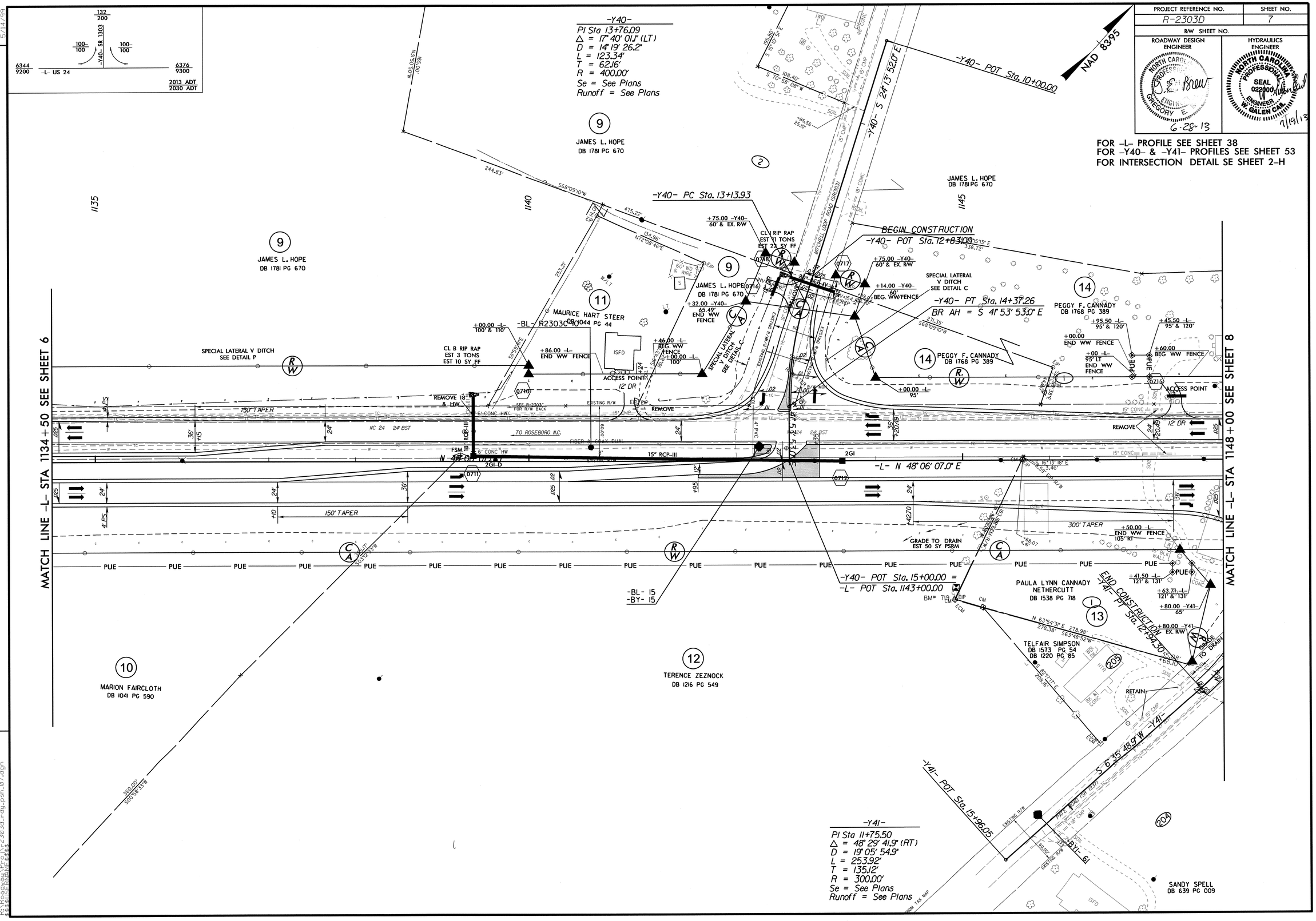
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER GREGORY E. BREW — 6-28-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAMPBELL — 7/19/13

FOR -L- PROFILE SEE SHEET 38
FOR -Y40- & -Y41- PROFILES SEE SHEET 53
FOR INTERSECTION DETAIL SE SHEET 2-H



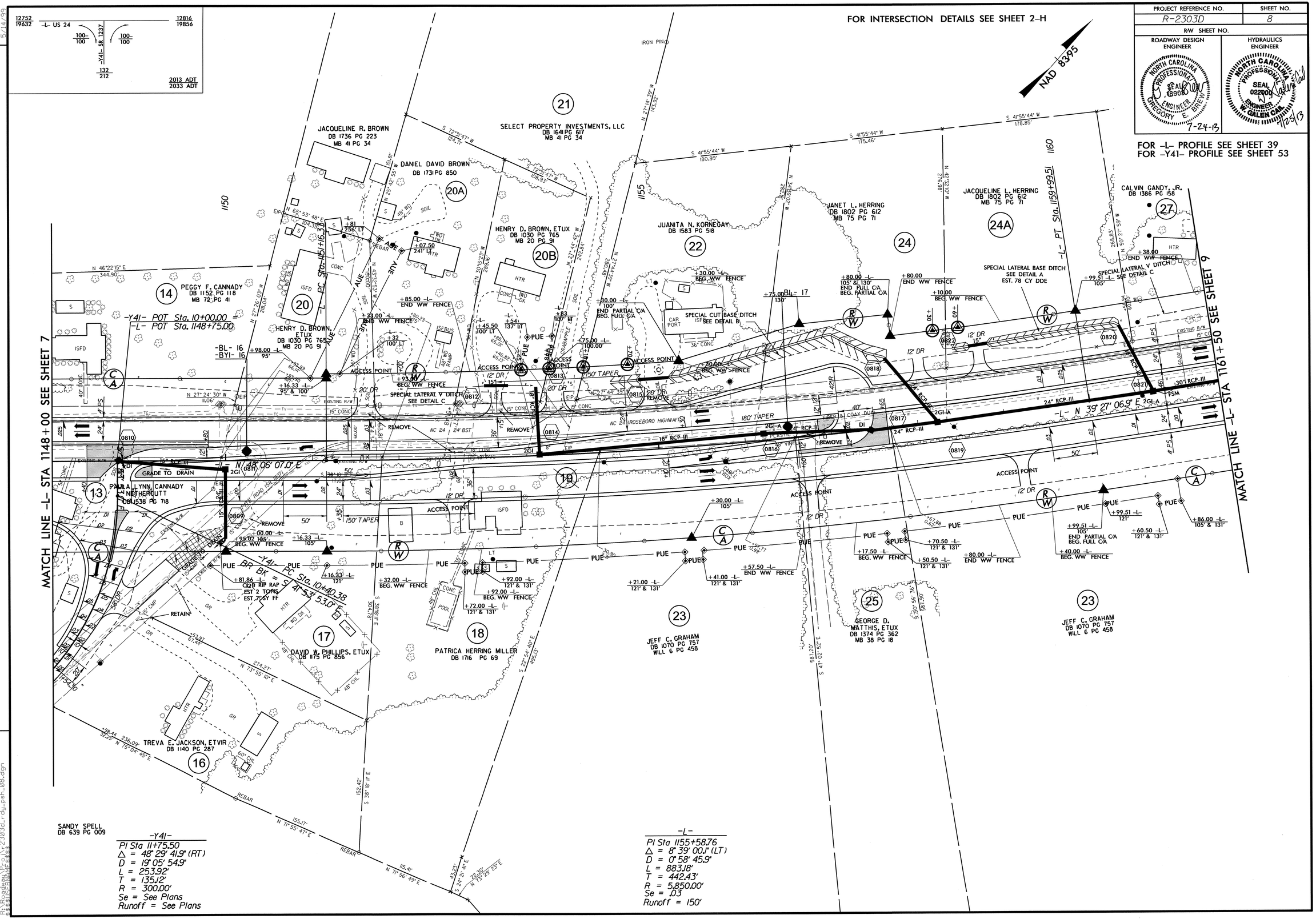
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 019080 ENGINEER GREGORY E. BREW — 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL — 7/23/13

FOR INTERSECTION DETAILS SEE SHEET 2-H

FOR -L- PROFILE SEE SHEET 39
FOR -Y41- PROFILE SEE SHEET 53



REVISIONS

5/14/99

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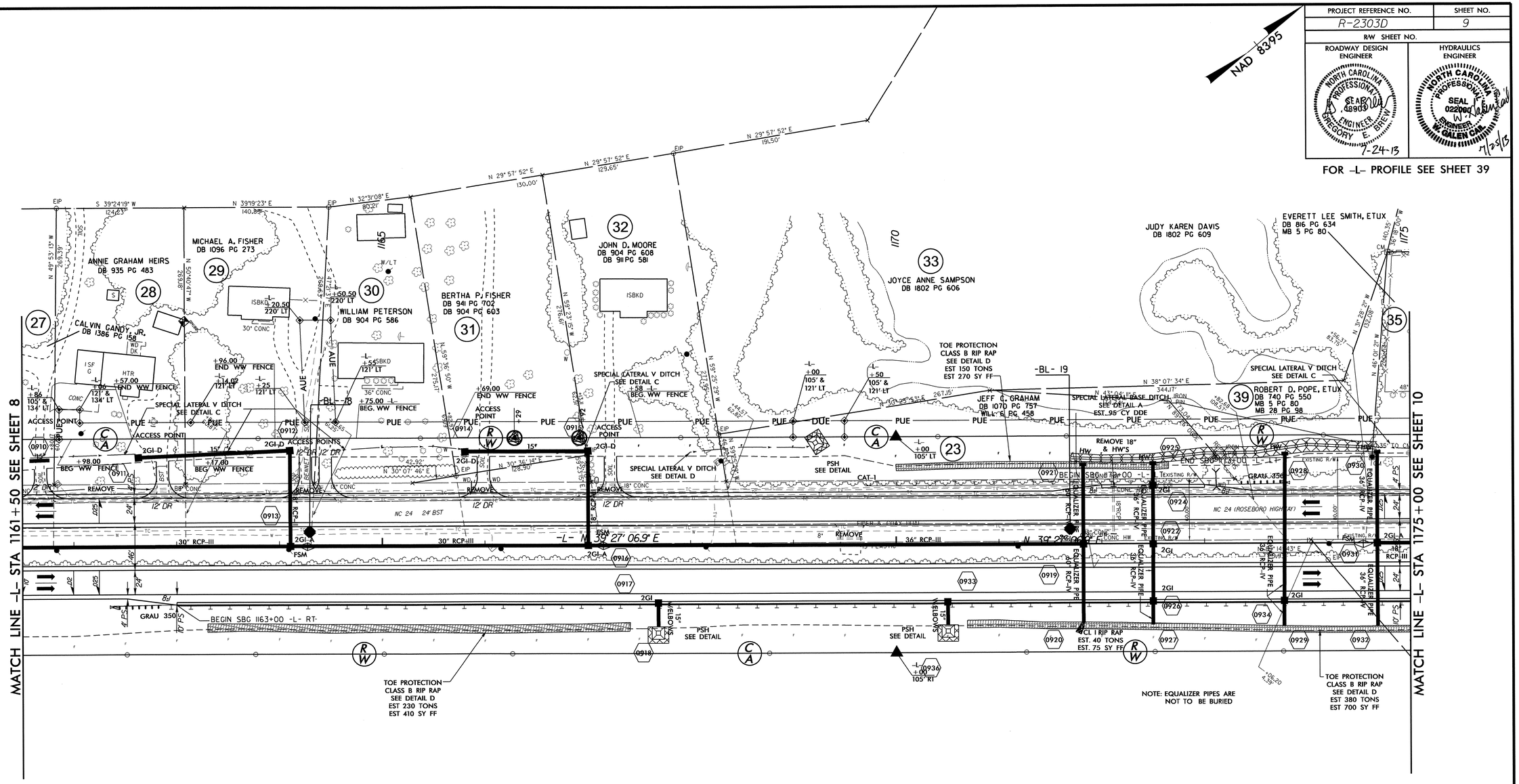
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022060 ENGINEER W. GALEN CAIN 7/25/13

FOR -L- PROFILE SEE SHEET 39



23

JEFF C. GRAHAM
DB 1070 PG 757
WILL 6 PG 458

REVISIONS

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER 7-10-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/19/13

FOR -L- PROFILE SEE SHEET 40
FOR -Y42- PROFILE SEE SHEET 54
FOR INTERSECTION DETAILS SEE SHEET 2-H

-L-
PIs Sta 1185+11.63
Θs = 4° 39' 49.0"
Ls = 280.00'
LT = 186.73'
ST = 93.39'

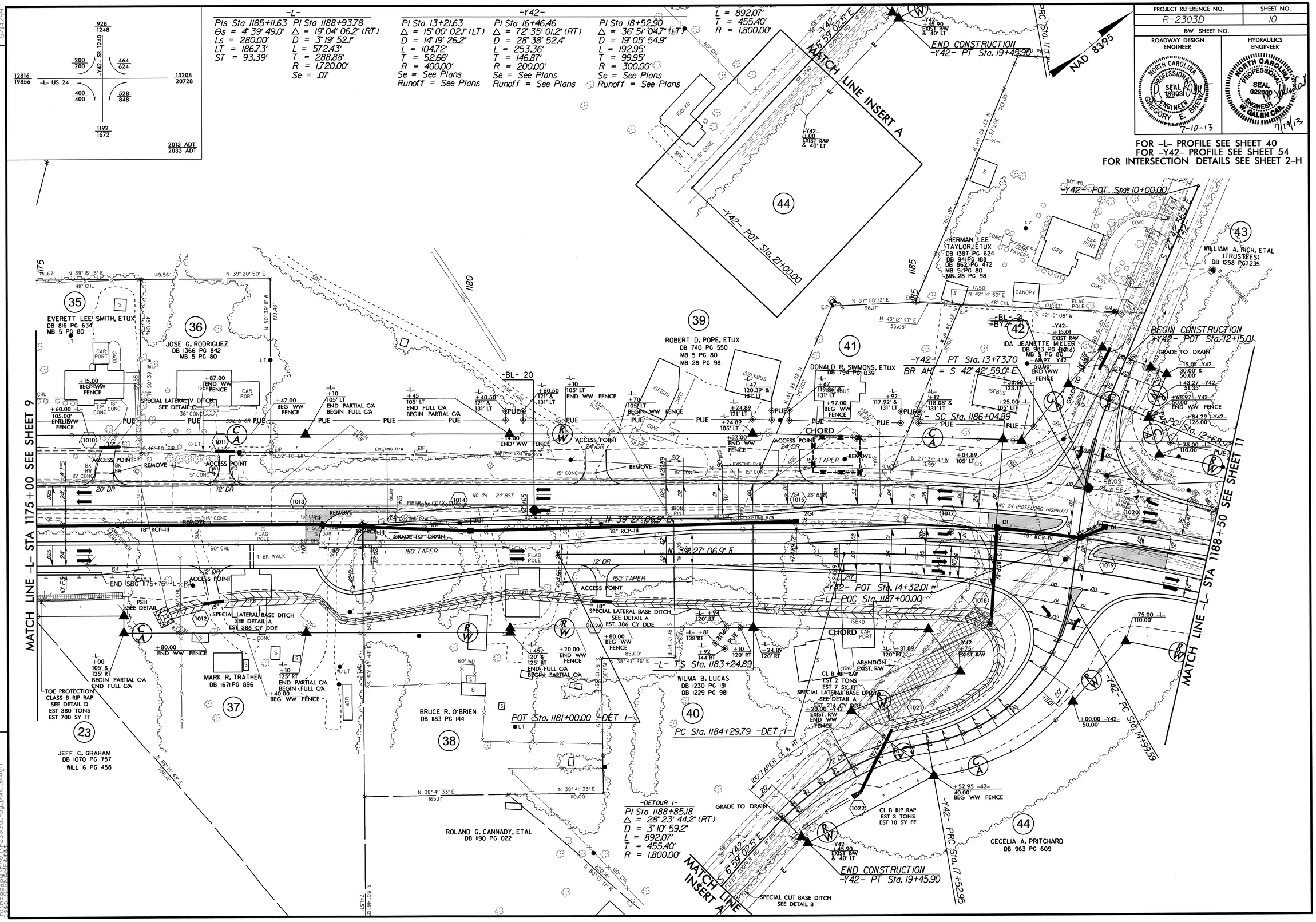
PI Sta 1188+93.78
Δ = 19° 04' 06.2" (RT)
D = 3° 19' 52.1"
L = 572.43'
T = 288.88'
R = 1,720.00'
Se = .07

-Y42-
PI Sta 13+21.63
Δ = 15° 00' 02.1" (LT)
D = 14° 19' 26.2"
L = 104.72'
T = 52.66'
R = 400.00'
Se = See Plans
Runoff = See Plans

PI Sta 16+46.46
Δ = 72° 35' 01.2" (RT)
D = 28° 38' 52.4"
L = 253.36'
T = 146.87'
R = 200.00'
Se = See Plans
Runoff = See Plans

PI Sta 18+52.90
Δ = 36° 51' 04.7" (LT)
D = 19° 05' 54.9"
L = 192.95'
T = 99.95'
R = 300.00'
Se = See Plans
Runoff = See Plans

L = 892.07'
T = 455.40'
R = 1,800.00'

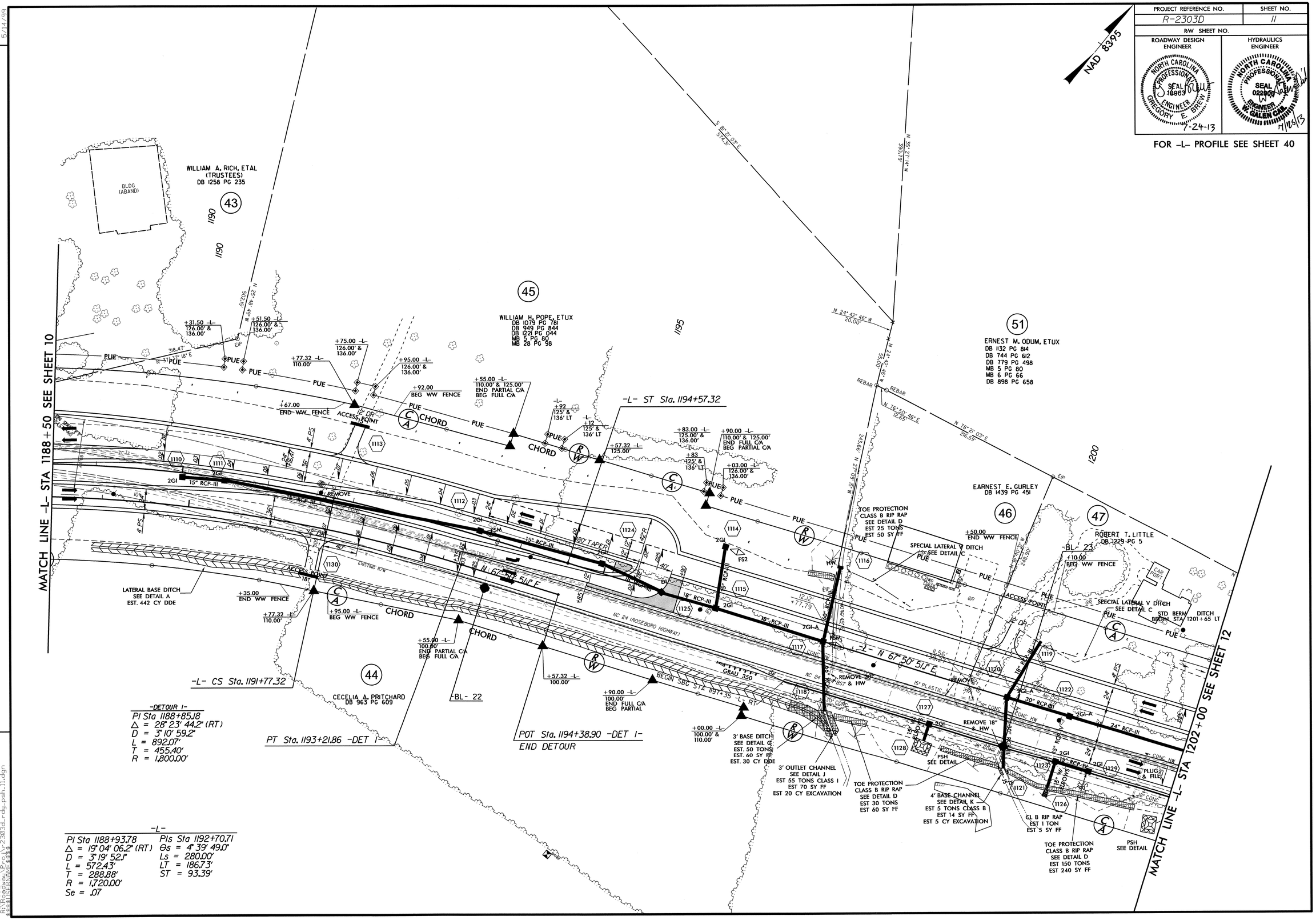


PROJECT REFERENCE NO.	SHEET NO.
R-2303D	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16903 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022001 ENGINEER W. GALEN CAIN 7/25/13

FOR -L- PROFILE SEE SHEET 40



-DETOUR 1-

PI Sta 1188+85.18
Δ = 28° 23' 44.2" (RT)
D = 3° 10' 59.2"
L = 892.07'
T = 455.40'
R = 1,800.00'

-L-

PI Sta 1188+93.78	PIs Sta 1192+70.71
Δ = 19° 04' 06.2" (RT)	Θs = 4° 39' 49.0"
D = 3° 19' 52.1"	Ls = 280.00'
L = 572.43'	LT = 186.73'
T = 288.88'	ST = 93.39'
R = 1,720.00'	
Se = .07	

REVISIONS

5/14/99

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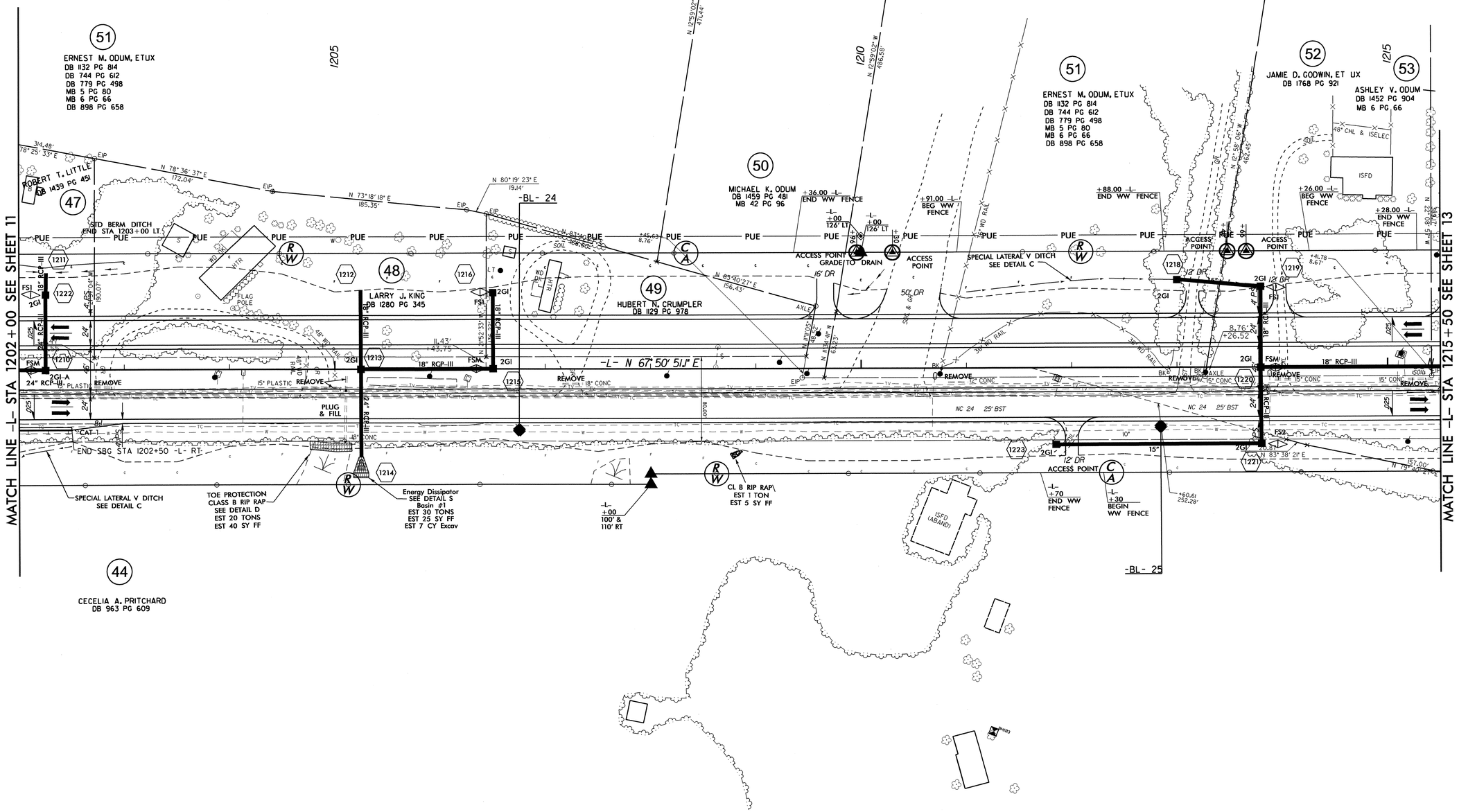
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022004 ENGINEER W. GALEN CAMPBELL 7/19/13

FOR -L- PROFILE SEE SHEET 41



REVISIONS

5/14/99

25-JUN-2013 16:00
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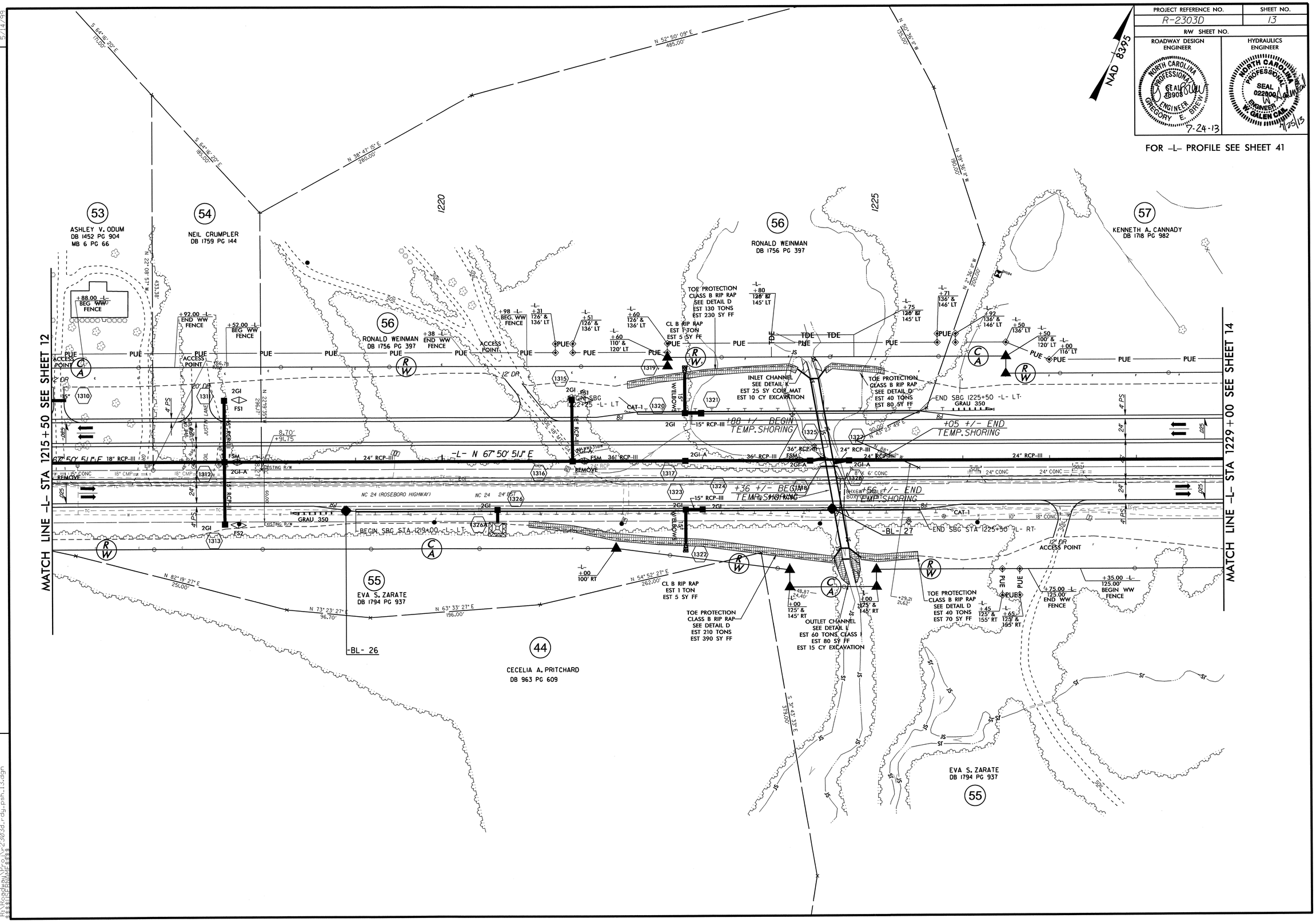
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022800 ENGINEER W. GALEN CAIN 7/29/13

FOR -L- PROFILE SEE SHEET 41

NAD 8395



REVISIONS

5/14/99

22-JUL-2013 15:16
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$$$$USERNAME$$$$

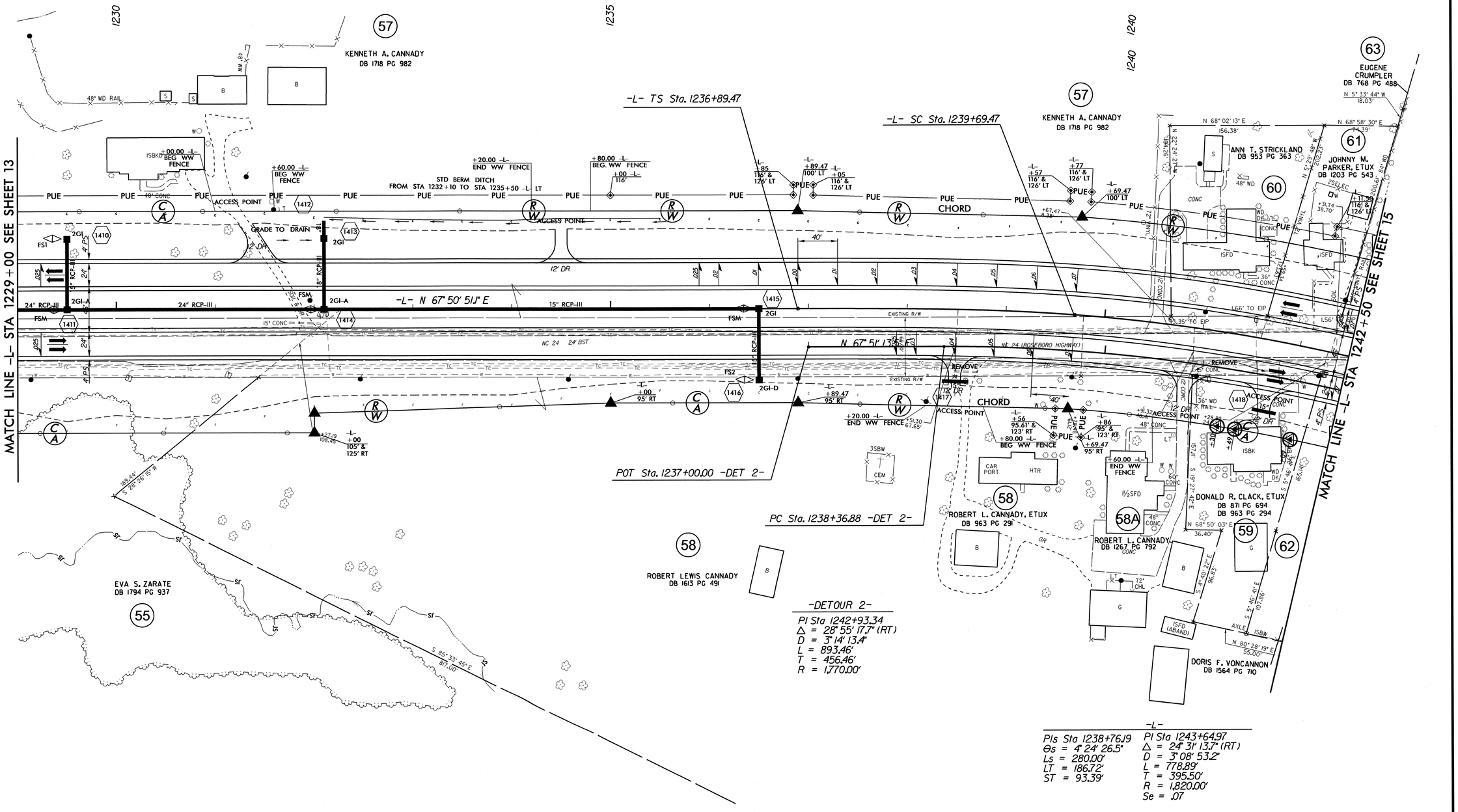
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 7/19/13

NAD 83/95

FOR -L- PROFILE SEE SHEET 42



-DETOUR 2-

PI Sta 1242+93.34
Δ = 28° 55' 17.7" (RT)
D = 3° 14' 13.4"
L = 893.46'
T = 456.46'
R = 1,770.00'

-L-

PIs Sta 1238+76.19
Θs = 4° 24' 26.5"
Ls = 280.00'
LT = 186.72'
ST = 93.39'

PI Sta 1243+64.97
Δ = 24° 31' 13.7" (RT)
D = 3° 08' 53.2"
L = 778.89'
T = 395.50'
R = 1,820.00'
Se = .07

REVISIONS

5/14/99

25-JUN-2013 16:00
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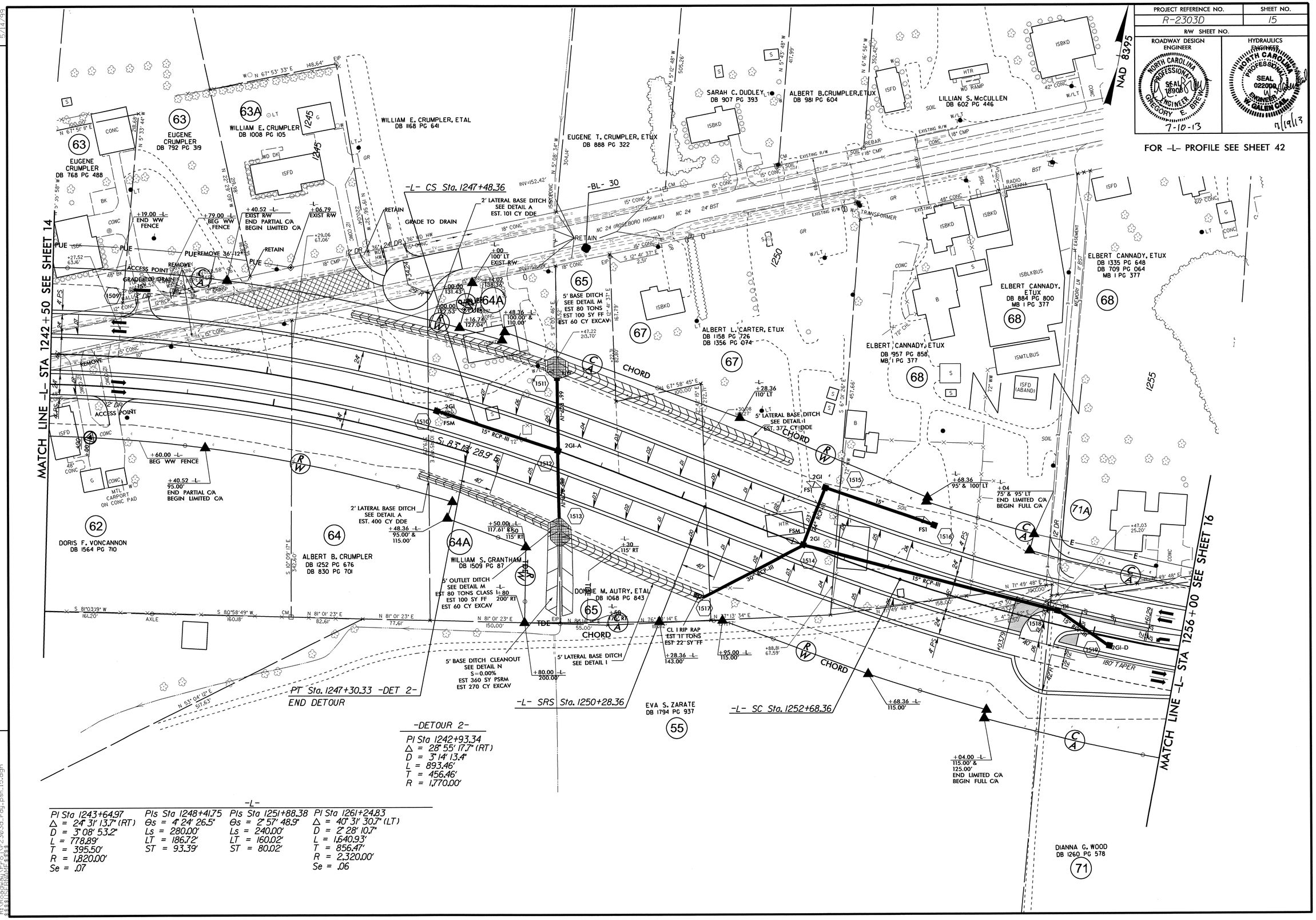
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	15
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREW
7-10-13

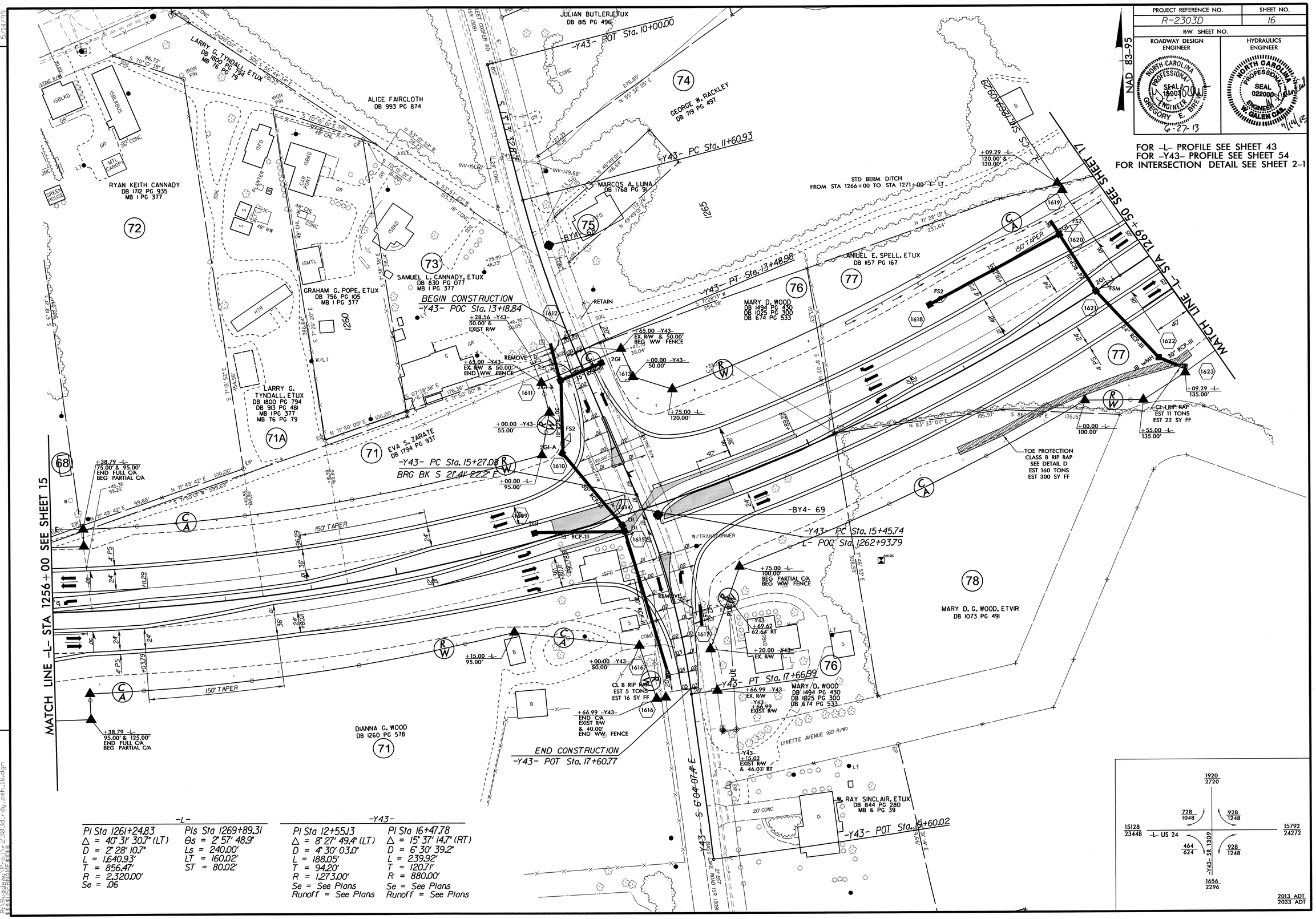
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022009 ENGINEER W. GALEN CAIN
7/19/13



PROJECT REFERENCE NO.	SHEET NO.
R-2303D	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83-95

FOR -L- PROFILE SEE SHEET 43
FOR -Y43- PROFILE SEE SHEET 54
FOR INTERSECTION DETAIL SEE SHEET 2-1



-L-	
PI Sta 1261+24.83	PIs Sta 1269+89.31
Δ = 40° 31' 30.7" (LT)	Θs = 2° 57' 48.9"
D = 2° 28' 10.7"	Ls = 240.00'
L = 1,640.93'	LT = 160.02'
T = 856.47'	ST = 80.02'
R = 2,320.00'	
Se = .06	

-Y43-	
PI Sta 12+55.13	PI Sta 16+47.78
Δ = 8° 27' 49.4" (LT)	Δ = 15° 37' 14.7" (RT)
D = 4° 30' 03.0"	D = 6° 30' 39.2"
L = 188.05'	L = 239.92'
T = 94.20'	T = 120.71'
R = 1,273.00'	R = 880.00'
Se = See Plans	Se = See Plans
Runoff = See Plans	Runoff = See Plans

REVISIONS

5/14/99

25-JUN-2013 15:59
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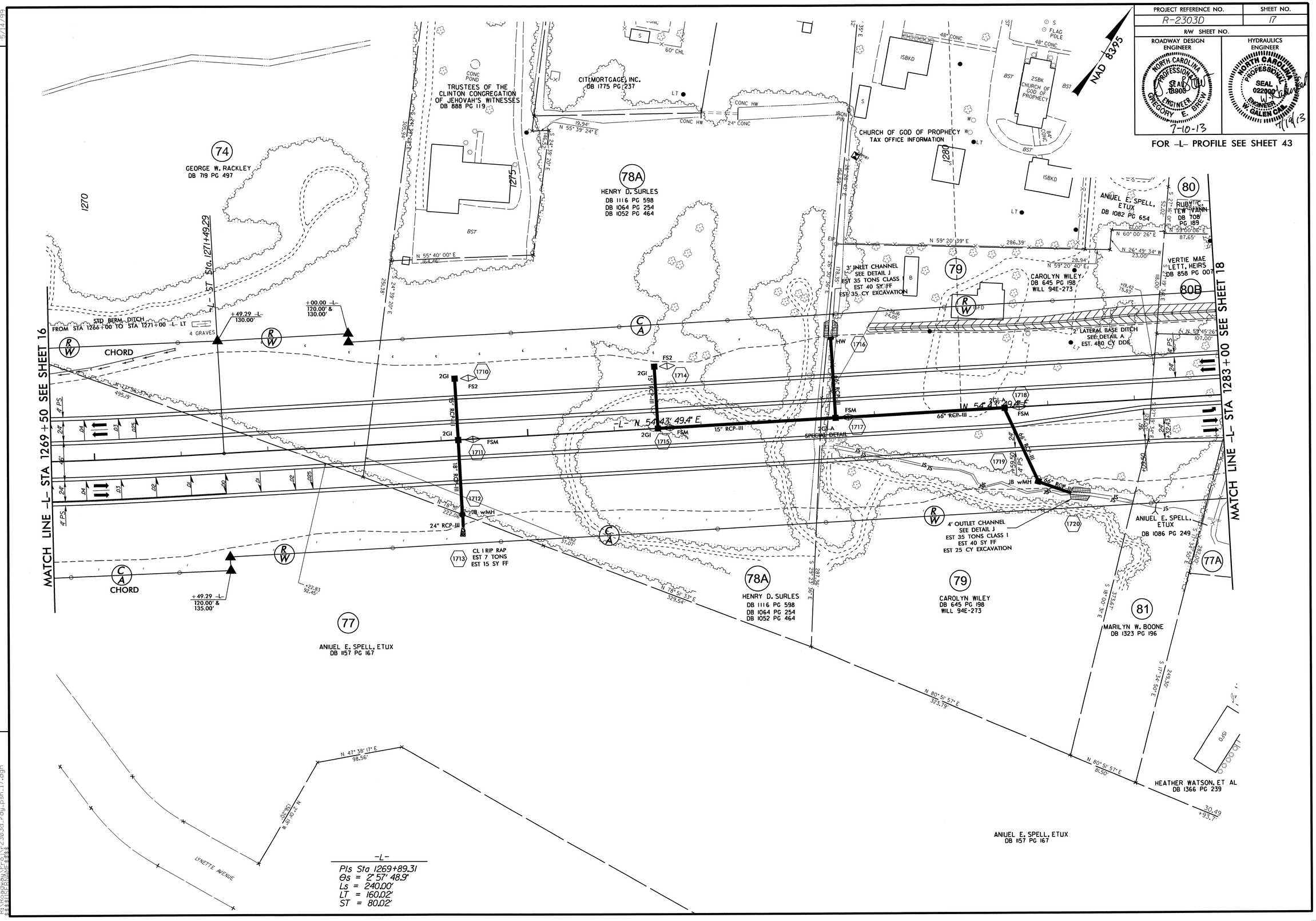
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18906 ENGINEER GREGORY E. BREW 7-10-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 7/19/13

FOR -L- PROFILE SEE SHEET 43



REVISIONS

5/14/99

09-JUL-2013 11:24
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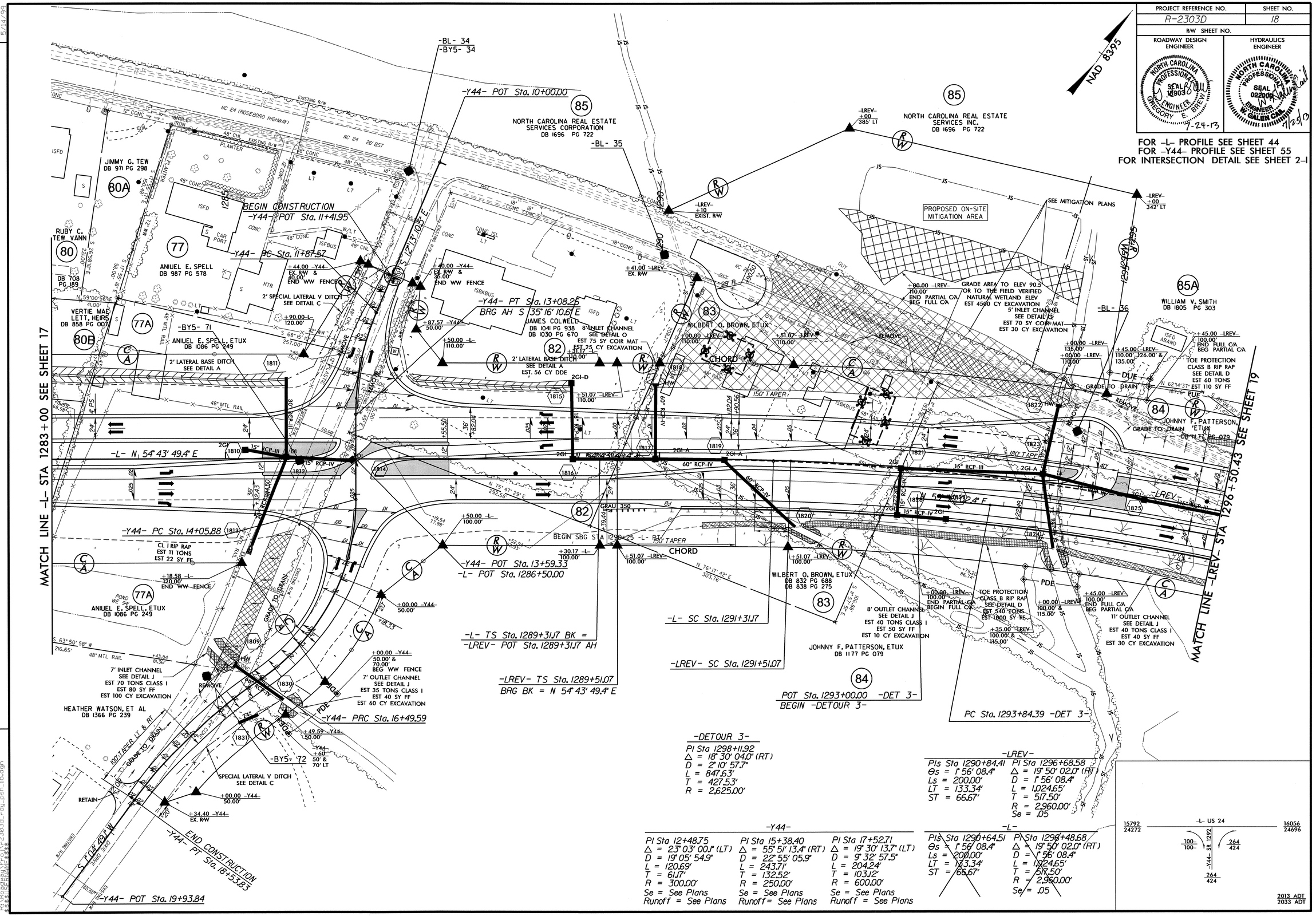
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16903 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022009 ENGINEER W. GALEN CAIN 7/25/13

FOR -L- PROFILE SEE SHEET 44
FOR -Y44- PROFILE SEE SHEET 55
FOR INTERSECTION DETAIL SEE SHEET 2-I



-DETOUR 3-

PI Sta 1298+11.92
Δ = 18° 30' 04.0" (RT)
D = 2° 10' 57.7"
L = 847.63'
T = 427.53'
R = 2,625.00'

-LREV-

PIs Sta 1290+84.41	PI Sta 1296+68.58
Θs = 1° 56' 08.4"	Δ = 19° 50' 02.0" (RT)
Ls = 200.00'	D = 1° 56' 08.4"
LT = 133.34'	L = 1,024.65'
ST = 66.67'	T = 517.50'
	R = 2,960.00'
	Se = .05

-Y44-

PI Sta 12+48.75	PI Sta 15+38.40	PI Sta 17+52.71
Δ = 23° 03' 00.1" (LT)	Δ = 55° 51' 13.4" (RT)	Δ = 19° 30' 13.7" (LT)
D = 19° 05' 54.9"	D = 22° 55' 05.9"	D = 9° 32' 57.5"
L = 120.69'	L = 243.71'	L = 204.24'
T = 61.17'	T = 132.52'	T = 103.12'
R = 300.00'	R = 250.00'	R = 600.00'
Se = See Plans	Se = See Plans	Se = See Plans
Runoff = See Plans	Runoff = See Plans	Runoff = See Plans

-L-

PIs Sta 1290+64.51	PI Sta 1296+48.68
Θs = 1° 56' 08.4"	Δ = 19° 50' 02.0" (RT)
Ls = 200.00'	D = 1° 56' 08.4"
LT = 133.34'	L = 1,024.65'
ST = 66.67'	T = 517.50'
	R = 2,960.00'
	Se = .05

15792 / 24272 -L- US 24 16056 / 24696
100 / 100 -Y44- SR 1292 264 / 424
264 / 424

2013 ADT
2033 ADT

REVISIONS

5/14/99

23-JUL-2013 15:02
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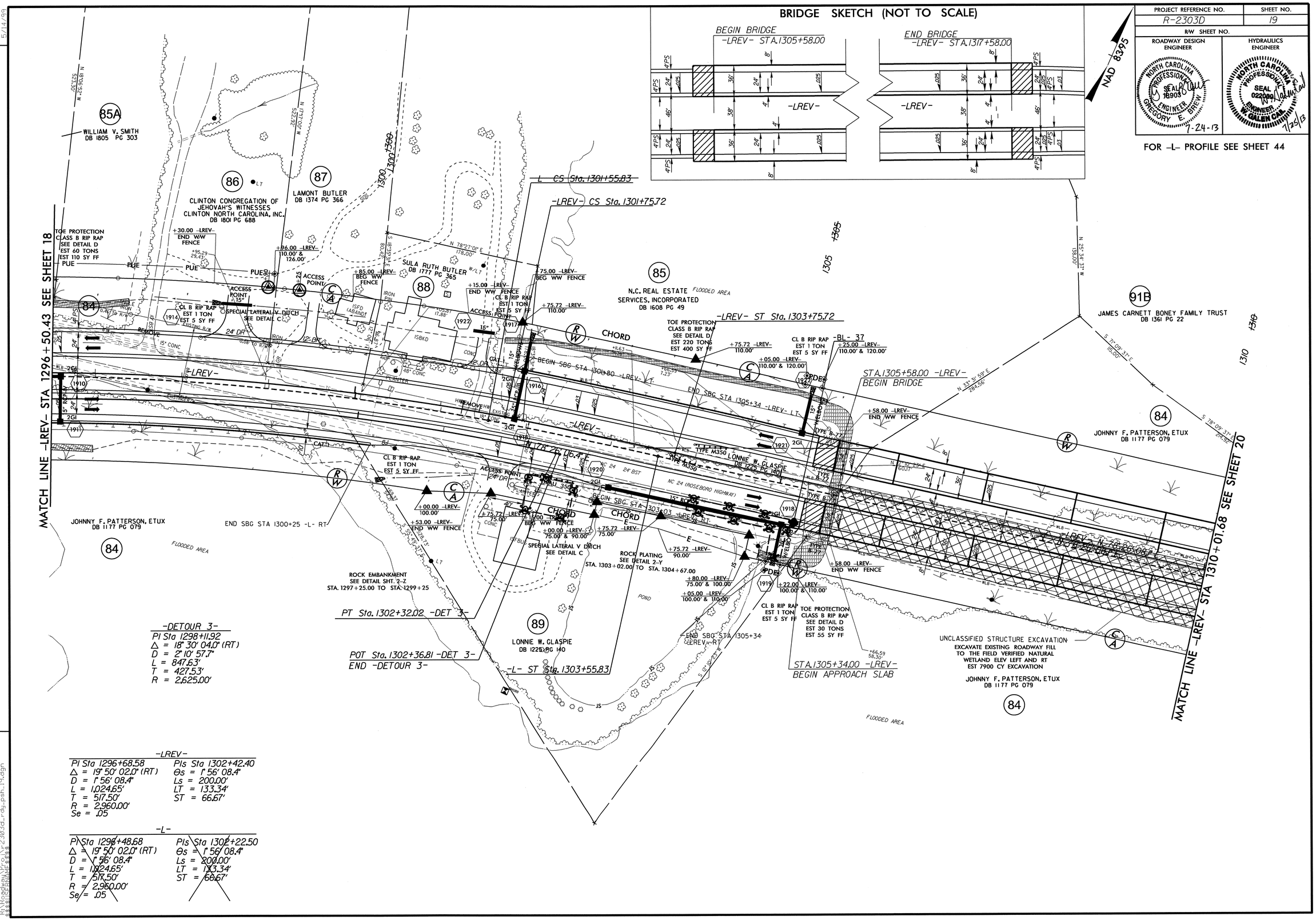
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16903 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022099 ENGINEER W. GALEN CAIN 7/25/13

FOR -L- PROFILE SEE SHEET 44

BRIDGE SKETCH (NOT TO SCALE)



-DETOUR 3-

PI Sta 1298+11.92
Δ = 18° 30' 04.0" (RT)
D = 2° 10' 57.7"
L = 847.63'
T = 427.53'
R = 2,625.00'

-LREV-

PI Sta 1296+68.58	PIs Sta 1302+42.40
Δ = 19° 50' 02.0" (RT)	Θs = 1° 56' 08.4"
D = 1° 56' 08.4"	Ls = 200.00'
L = 1,024.65'	LT = 133.34'
T = 517.50'	ST = 66.67'
R = 2,960.00'	
Se = .05	

-L-

~~PI Sta 1298+48.68~~	~~PIs Sta 1302+22.50~~
~~Δ = 19° 50' 02.0" (RT)~~	~~Θs = 1° 56' 08.4"~~
~~D = 1° 56' 08.4"~~	~~Ls = 200.00'~~
~~L = 1,024.65'~~	~~LT = 133.34'~~
~~T = 517.50'~~	~~ST = 66.67'~~
~~R = 2,960.00'~~	
~~Se = .05~~	

REVISIONS

5/14/99

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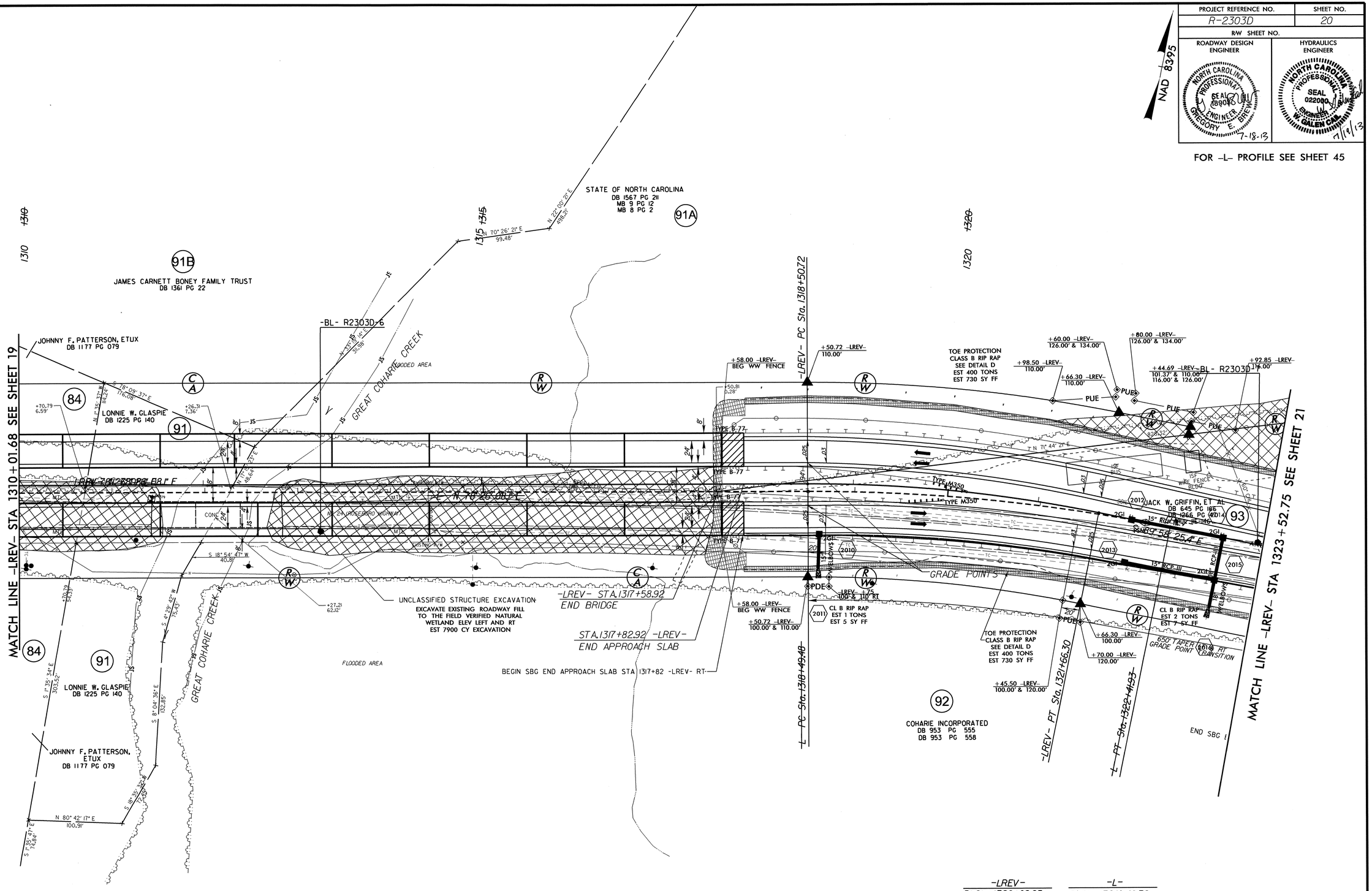
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREW 7-18-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/19/13

NAD 83/95

FOR -L- PROFILE SEE SHEET 45



-LREV-	-L-
PI Sta 1320+09.05	PI Sta 1320+46.38
Δ = 11° 35' 26.5" (RT)	Δ = 11° 35' 26.5" (RT)
D = 3° 40' 22.1"	D = 2° 57' 12.2"
L = 315.58'	L = 392.45'
T = 158.33'	T = 196.90'
R = 1,560.00'	R = 1,940.00'
Se = .03	Se = .03
Runoff = 120'	Runoff = 108'

REVISIONS

5/14/99

18-JUL-2013 10:51
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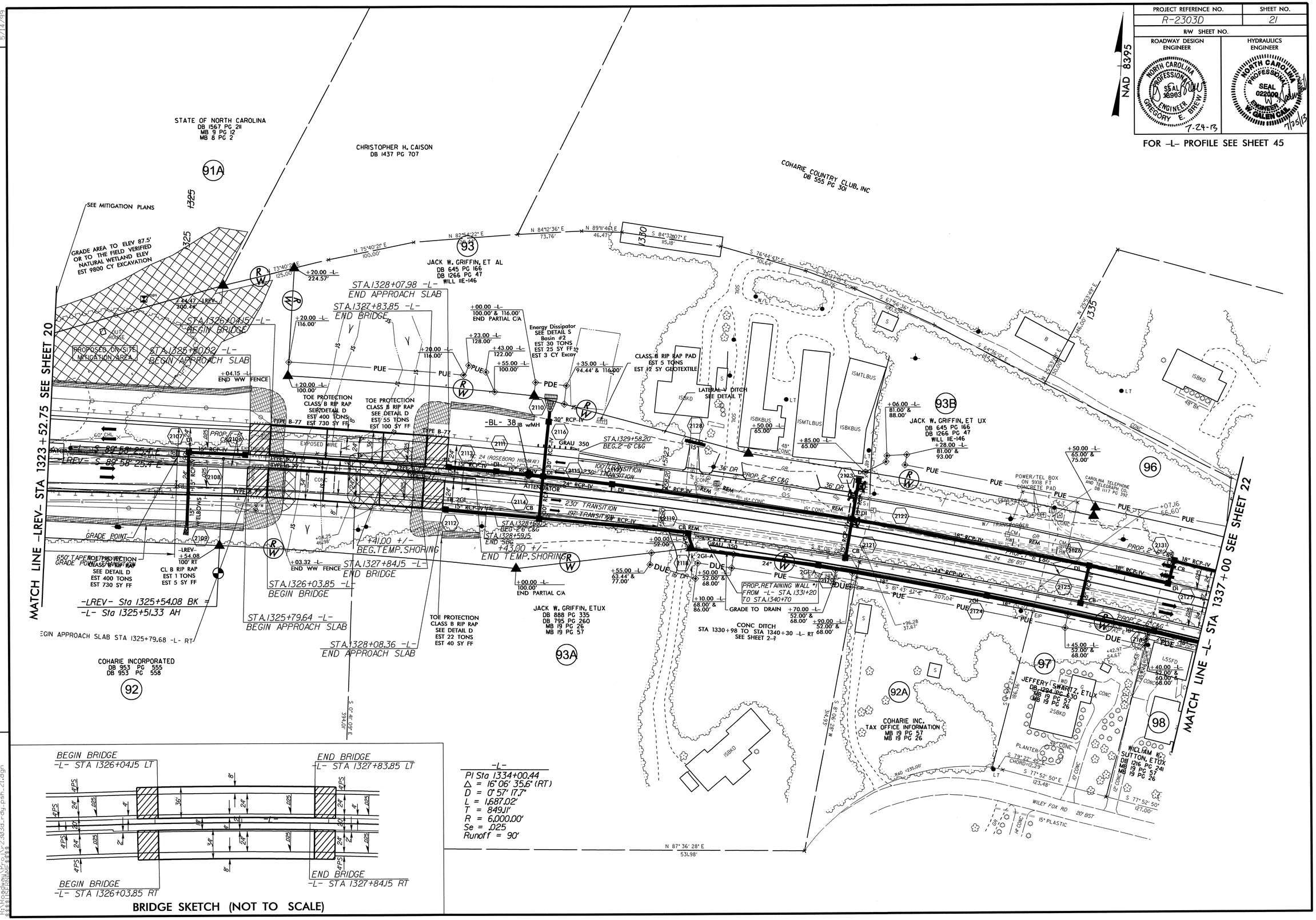
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 7/25/13

NAD 83/95

FOR -L- PROFILE SEE SHEET 45



-L-
PI Sta 1334+00.44
Δ = 16° 06' 35.6" (RT)
D = 0° 57' 17.7"
L = 1,687.02'
T = 849.11'
R = 6,000.00'
Se = .025
Runoff = 90'

BRIDGE SKETCH (NOT TO SCALE)

REVISIONS

5/14/99

22-JUL-2013 15:48
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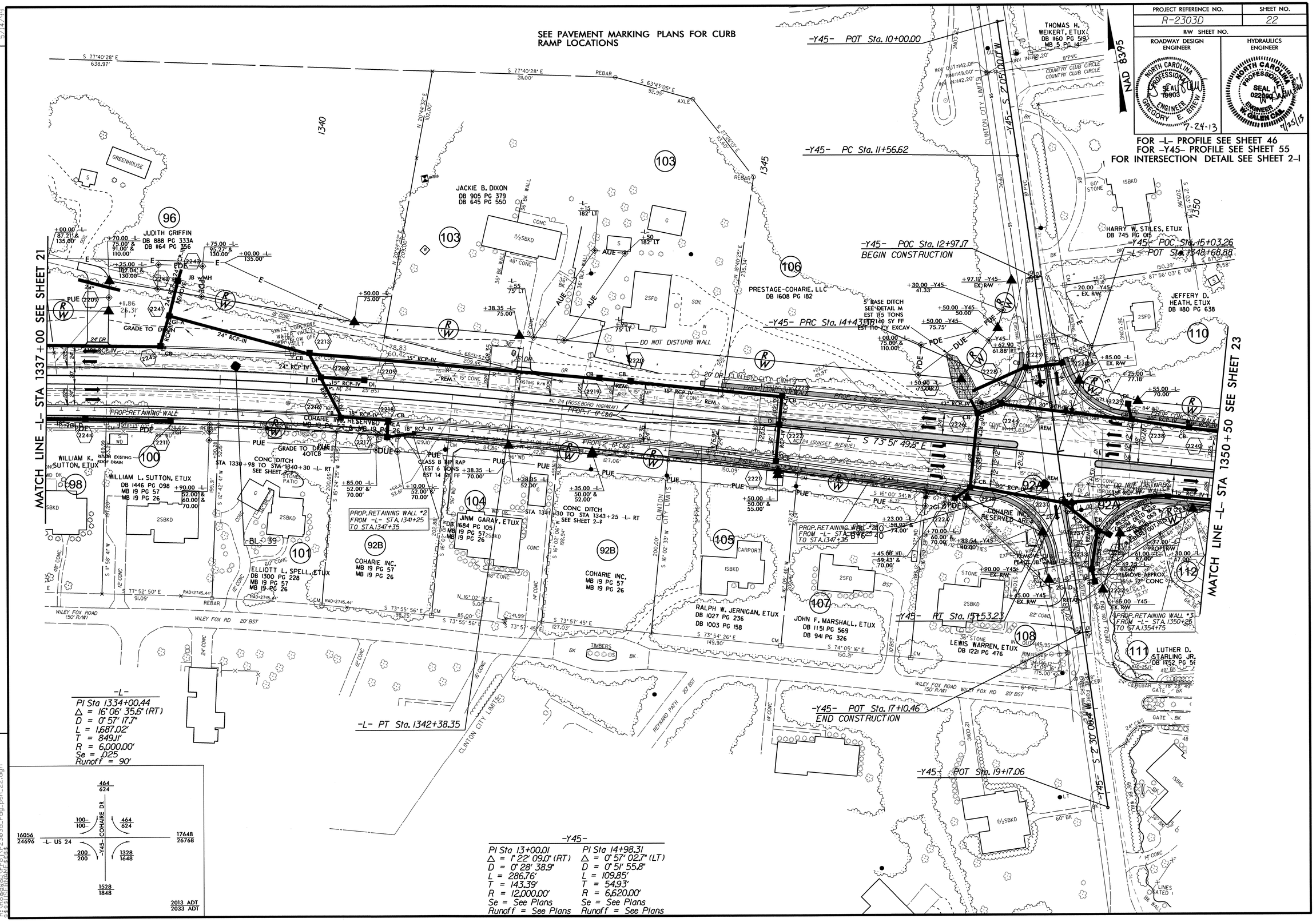
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19903 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022404 ENGINEER W. GALEN CAIN 7/25/13

FOR -L- PROFILE SEE SHEET 46
FOR -Y45- PROFILE SEE SHEET 55
FOR INTERSECTION DETAIL SEE SHEET 2-I



PROJECT REFERENCE NO.	SHEET NO.
R-2303D	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18906 ENGINEER GREGORY E. BREW 7-10-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/19/13

NAD 83/95

FOR -L- PROFILE SEE SHEET 46

SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS

REVISIONS

5/14/99

MATCH LINE -L- STA 1350+50 SEE SHEET 22

MATCH LINE -L- STA 1364+00 SEE SHEET 24

HAMPTON HUBBARD DB 1060 PG 900 (113)

CHRISTOPHER H. CAISON DB 1437 PG 707 (115)

CHERIE E. GRIFFIN DB 1751 PG 913 (117)

ISAAC CORTES, JR., ETUX DB 1050 PG 500 MB 5 PG 98 (119)

TRUSTEES OF FIRST UNITED METHODIST CHURCH & CHRISTOPHER H. CAISON, JOSEPH W. BEST, JR., KIMBALL CAISON DB 1298 PG 574 MB 5 PG 98 (121)

CHARLES R. KNOWLES, ETUX DB 1078 PG 060 MB 5 PG 98 (123)

KAY KNOWLES B. MILLER DB 1240 PG 940 MB 5 PG 98 (125)

TRUSTEES OF FIRST UNITED METHODIST CHURCH & CHRISTOPHER H. CAISON, JOSEPH W. BEST, JR., KIMBALL CAISON DB 1298 PG 574 MB 5 PG 98 (121)

R. McPHAIL HERRING DB 874 PG 085 MB 5 PG 98 (127)

MICHAEL W. THORNTON, ETUX DB 1460 PG 645 MB 25 PG 69 (112)

FOXCROFT SUBDIVISON VACANT LOT 3 TAX OFFICE INFORMATION MB 25 PG 69 (114)

BART SMITH DB 1788 PG 80 MB 25 PG 69 (116)

KELLY F. STANLEY DB 1679 PG 875 (118)

HB BARWICK, INC. DB 1357 PG 129 MB 26 PG 73 (120)

DALE W. DENNING, ETUX DB 1177 PG 529 MB 26 PG 73 (122)

CLINTON PENTECOSTAL HOLINESS CHURCH DB 1361 PG 103 MB 7 PG 93 (124)

THE TRUSTEES OF SAMPSON TECHNICAL INST. DB 837 PG 558 DB 856 PG 689 (126)

(128)

"FOXCROFT" SUBDIVISON COMMON AREA NO.1 (FOR PRIVATE ACCESS) MB 25 PG 69

PROP. RETAINING WALL #3 FROM -L- STA. 1350+25 TO STA. 1354+75

-L- S 73° 51' 49.8" E

NC 24 (SUNSET AVENUE)

REMOVE APPROX 20' OF CONC DITCH

PROP. 24" C&G

PROP. 2'-6" C&G

PROP. CONC. SIDEWALK

-BL- 41

-BL- 55

-BY7- 55

10-JUL-2013 12:38
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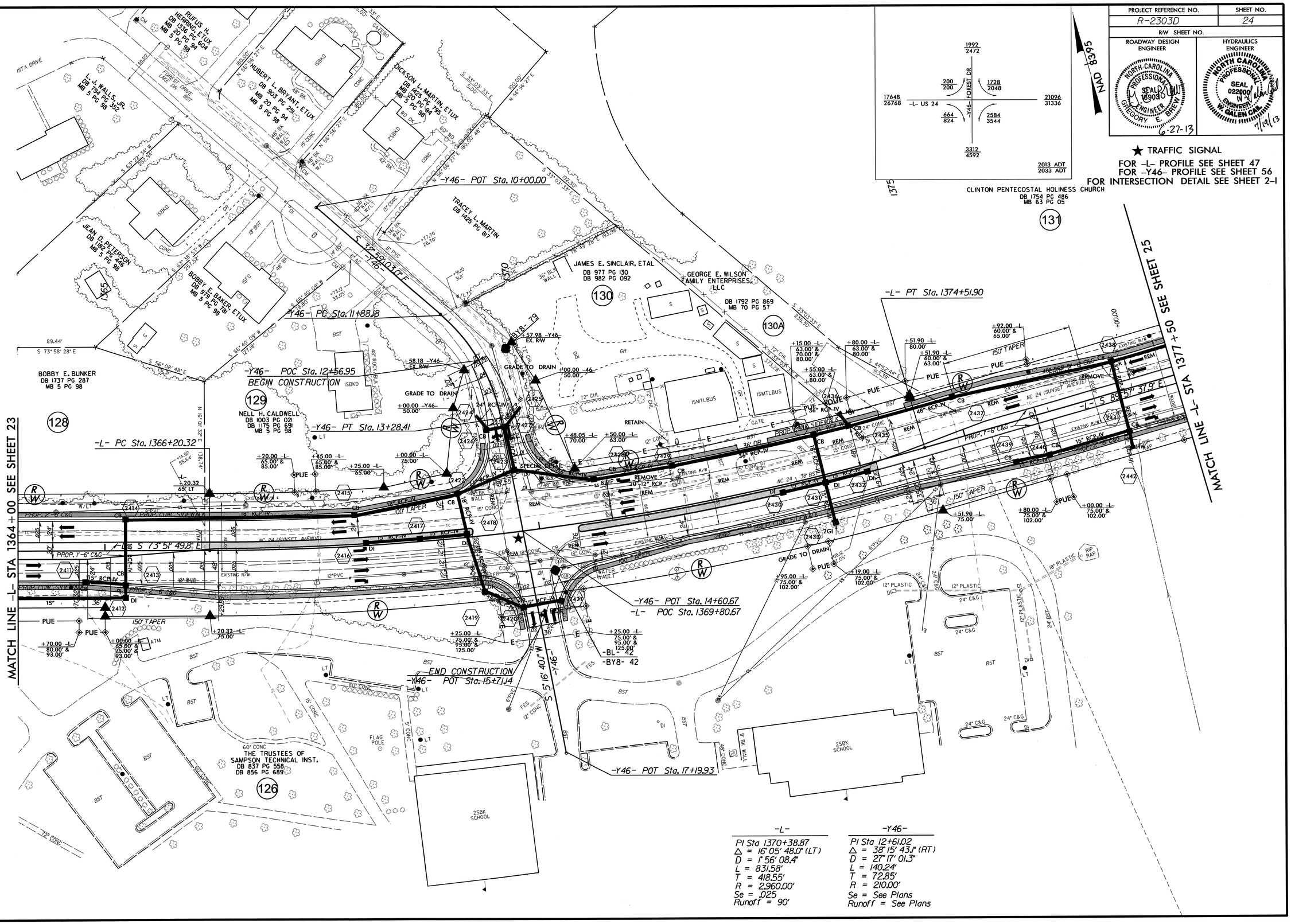
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16903 ENGINEER GREGORY E. BREWER 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAMPBELL 7/19/13



-L-	-Y46-
PI Sta 1370+38.87	PI Sta 12+61.02
Δ = 16° 05' 48.0" (LT)	Δ = 38° 15' 43.1" (RT)
D = 1° 56' 08.4"	D = 27° 17' 01.3"
L = 831.58'	L = 140.24'
T = 418.55'	T = 72.85'
R = 2,960.00'	R = 210.00'
Se = .025	Se = See Plans
Runoff = 90'	Runoff = See Plans

REVISIONS

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

★ TRAFFIC SIGNAL

FOR -L- PROFILE SEE SHEET 47
FOR -Y47- & -Y48- & -DR2- PROFILES SEE SHEET 56
FOR INTERSECTION DETAILS SEE SHEET 2-J

NAD 83/95

MATCH LINE -L- STA 1377+50 SEE SHEET 24

MATCH LINE -L- STA 1391+50 SEE SHEET 26

REVISIONS

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21096 / 31336 -L- US 24 22352 / 33232
928 / 1248 -Y47- SR 1242 2184 / 3144
3112 / 4392
2013 ADT / 2033 ADT

CLINTON PENTECOSTAL HOLINESS CHURCH
DB 1777 PG 800
MB 51 PG 48

CLINTON PENTECOSTAL HOLINES CHURCH
DB 1754 PG 486
MB 63 PG 05

BOBBY R. HALL
DB 1501 PG 725
MB 45 PG 80

JUNE M. MASSENGILL
DB 794 PG 046
MB 45 PG 80

POHLEMEIER MANAGEMENT L.L.C.
DB 1700 PG 71
MB 51 PG 048

SPRING VIEW FARMS
DB 1588 PG 118
MB 51 PG 48

WADE-CARY ENTERPRISES INC.
DB 1771 PG 832
MB 45 PG 80

PARKER GAS COMPANY, INC.
DB 1048 PG 746

K. E. AUSTIN CORP.
DB 1102 PG 808

THE TRUSTEES OF SAMPSON TECHNICAL INST.
DB 837 PG 558
DB 856 PG 689

A. G. THORNTON, ETAL
DB 837 PG 250
& EXCEPTIONS FROM
DB 1392 PG 140
DB 963 PG 931
DB 1041 PG 107

HARRIS SIGHT AND SOUND, INC.
DB 1400 PG 647

FAIRCLOTH FAMILY PROPERTIES L.L.C.
DB 1275 PG 775

NC LAND LIMITED PARTNERSHIP
DB 1286 PG 822

CITY OF CLINTON
DB 1055 PG 575

-BL- R2303D-8
-BY9- R2303D-8
-Y47- POT Sta. 10+00.00
-L- POT Sta. 1379+94.15
-Y47- POT Sta. 11+46.27
END CONSTRUCTION
-Y47- POT Sta. 14+00.00
-BY9- 80
-BL- 43
-DR2- POT Sta. 11+94.14
-L- POT Sta. 1390+86.77
-Y48- POT Sta. 10+00.00
-L- POT Sta. 1390+74.36
POT Sta. 10+00.00
BEG. CONSTRUCTION
-BY10- 44
-Y48- PC Sta. 10+46.73
BRG BK S 0° 02' 22.1" E
-Y48- PT Sta. 10+80.06
-Y48- POT Sta. 13+48.17
END CONSTRUCTION
-Y48- POT Sta. 14+00.00
-BY10- 91
-L- S 89° 57' 37.9" E

-Y48-
PI Sta 10+63.41
Δ = 6° 21' 56.1" (RT)
D = 19° 05' 54.9"
L = 33.33'
T = 16.68'
R = 300.00'
Se = See Plans
Runoff = See Plans

22352 / 33232 -L- US 24 23016 / 34056
264 / 424 -Y48- SR 1229 928 / 1248
1192 / 1672
2013 ADT / 2033 ADT

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

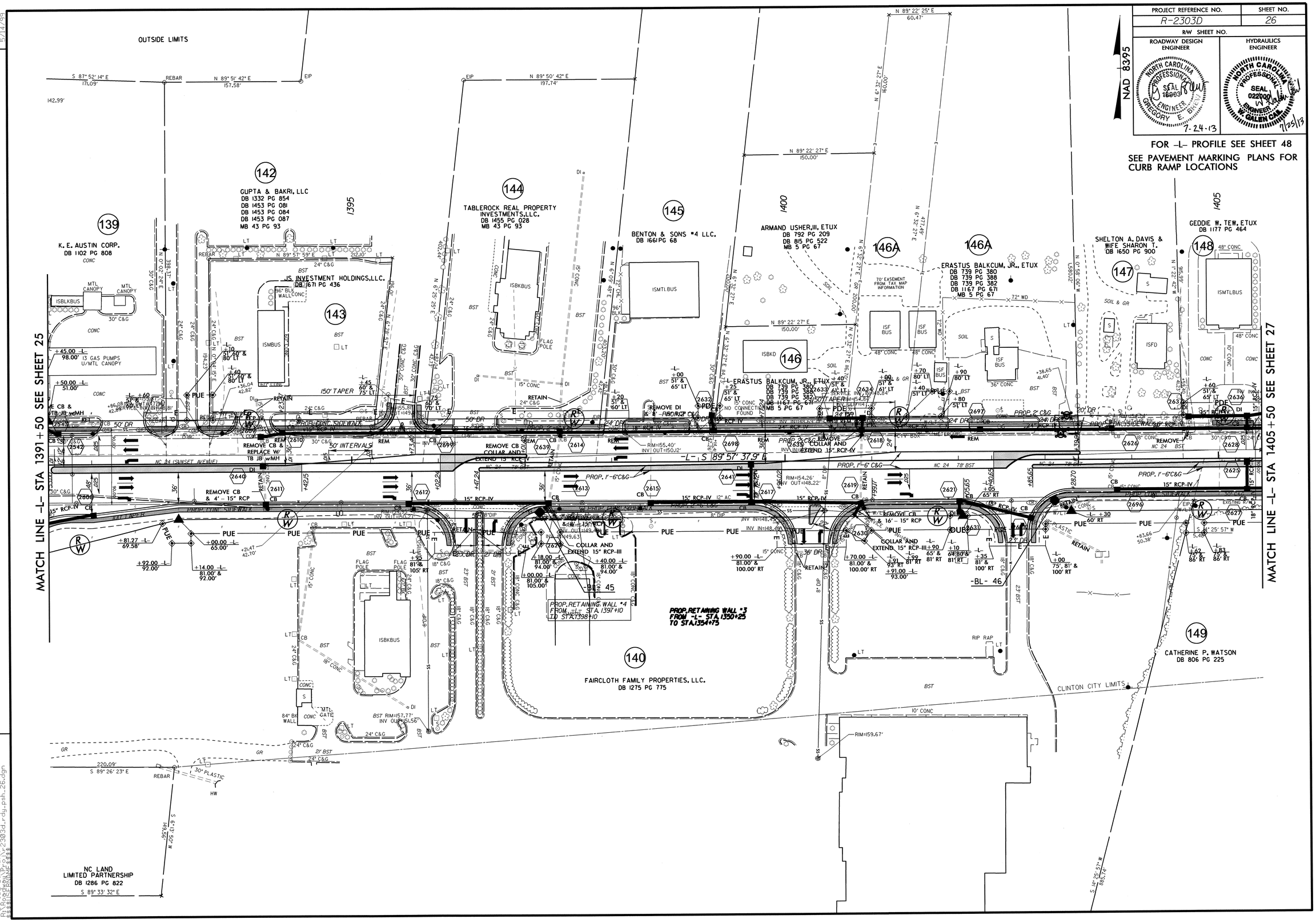
NORTH CAROLINA PROFESSIONAL SEAL 16903 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/25/13

NAD 83/95

FOR -L- PROFILE SEE SHEET 48

SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS



REVISIONS

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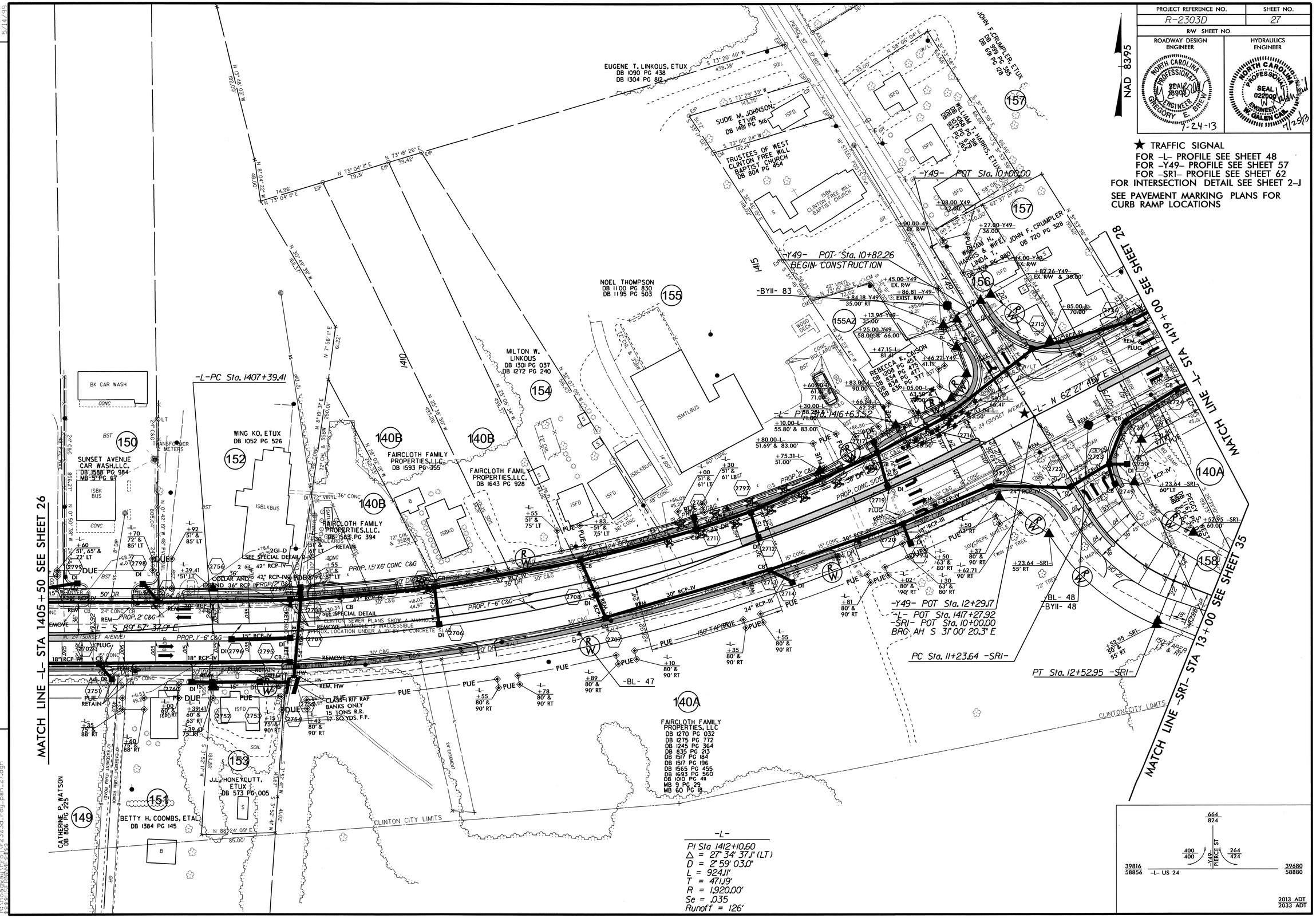
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 28905 ENGINEER GREGORY E. BREW 7-24-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/25/13

NAD 83/95

★ TRAFFIC SIGNAL
FOR -L- PROFILE SEE SHEET 48
FOR -Y49- PROFILE SEE SHEET 57
FOR -SR1- PROFILE SEE SHEET 62
FOR INTERSECTION DETAIL SEE SHEET 2-J
SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS



REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19903 ENGINEER GREGORY E. BREW 7-24-13

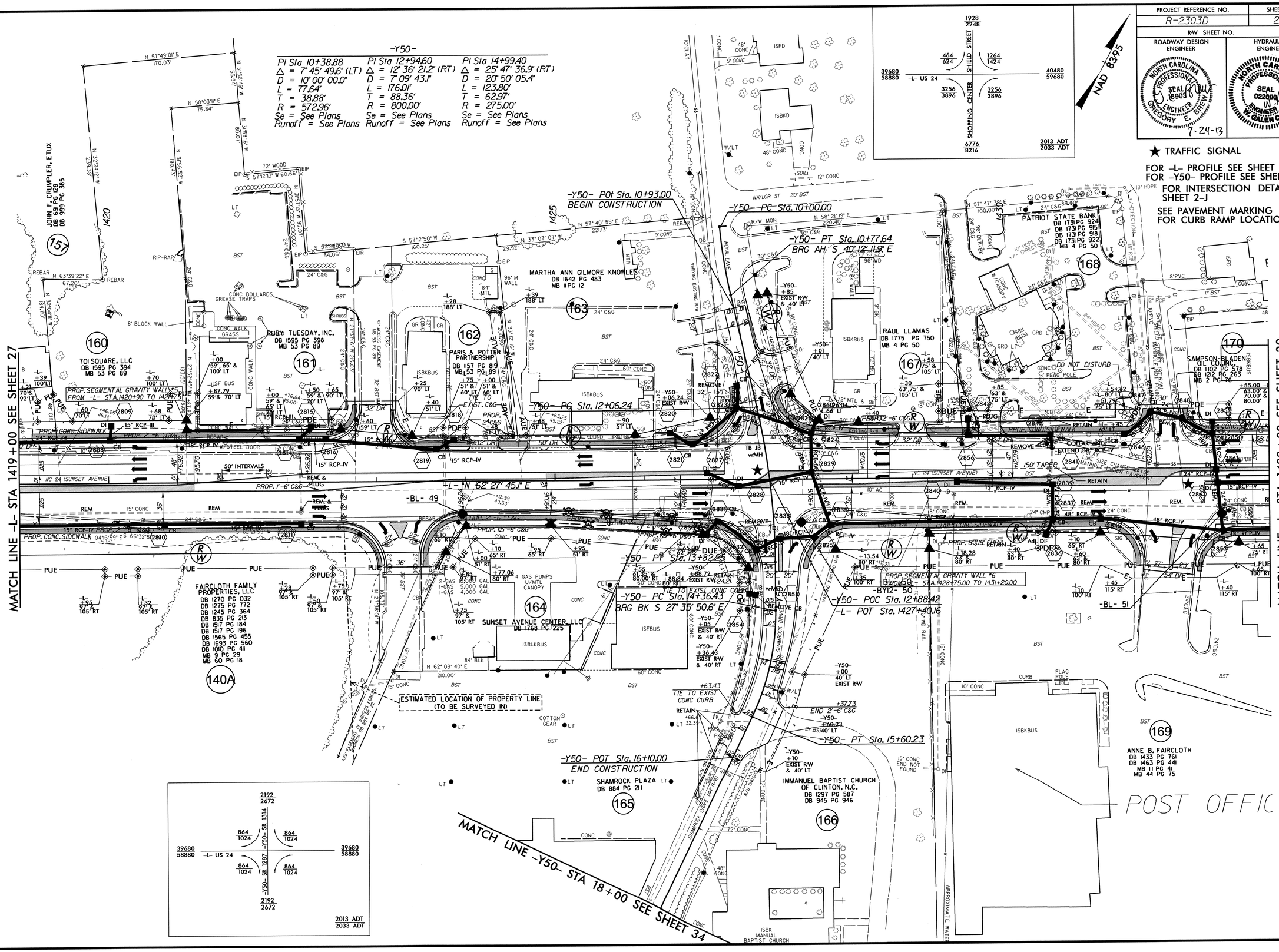
NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/25/13

★ TRAFFIC SIGNAL

FOR -L- PROFILE SEE SHEET 49
FOR -Y50- PROFILE SEE SHEET 57
FOR INTERSECTION DETAIL SEE SHEET 2-J

SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS

-Y50-		
PI Sta 10+38.88	PI Sta 12+94.60	PI Sta 14+99.40
Δ = 7° 45' 49.6" (LT)	Δ = 12° 36' 21.2" (RT)	Δ = 25° 47' 36.9" (RT)
D = 10° 00' 00.0"	D = 7° 09' 43.1"	D = 20° 50' 05.4"
L = 77.64'	L = 176.01'	L = 123.80'
T = 38.88'	T = 88.36'	T = 62.97'
R = 572.96'	R = 800.00'	R = 275.00'
Se = See Plans	Se = See Plans	Se = See Plans
Runoff = See Plans	Runoff = See Plans	Runoff = See Plans



REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREWER 7-25-13

NORTH CAROLINA PROFESSIONAL SEAL 022006 ENGINEER W. GALEN CAIN 7/25/13

SEE PAVEMENT MARKING PLANS FOR CURB RAMP LOCATIONS

★ TRAFFIC SIGNAL

FOR -L- PROFILE SEE SHEET 49
FOR -RPA- & -RPB- PROFILES SEE SHEET 51
FOR -RPC- & -RPD- PROFILES SEE SHEET 52
FOR -Y52- PROFILE SEE SHEET 59
FOR INTERSECTION DETAILS SEE SHEET 2-K AND SHEET 2-L

NAD 83/95

MATCH LINE -Y52- STA 29+00 SEE SHEET 32

MATCH LINE -L- STA 1433+00 SEE SHEET 28

MATCH LINE -L- STA 1447+00 SEE SHEET 30

MATCH LINE -Y52- STA 38+00 SEE SHEET 33

STA. 1446+25.96 -L- END TIP PROJECT R-2303D

-L- POT Sta. 1435+81.60
-Y51- POT Sta. 10+00.00
-L- POT Sta. 1442+24.27
-RPC- POT Sta. 15+51.22
-RPD- POT Sta. 15+72.00
-RPA- POT Sta. 17+03.90
-RPA- POT Sta. 17+31.99
BRG BK S 27° 32' 15.0" E
-RPB- POT Sta. 13+27.73
-L- POT Sta. 1431+56.36
-RPD- ST Sta. 14+08.84
BRG AH S 40° 31' 22.6" E
-Y51- PC Sta. 10+76.32
BRG BK S 27° 32' 23.7" E
-Y51- PT Sta. 11+13.34
-Y51- PC Sta. 15+25.73
-L- N 62° 27' 45.1" E
-BL- 56
-BY13- "SUNSET"
-RPA- PC Sta. 13+93.26
-RPA- PRC Sta. 15+36.83
CS Sta. 12+08.84 -RPD-
CS Sta. 37+29.94 -Y52-
-Y51- S 70° 56' 55.2" E
-RPB- N 36° 23' 31.6" W
-RPC- N 28° 57' 50.0" W

-RPA-
PI Sta 14+65.28
Δ = 11° 25' 30.8" (RT)
D = 7° 57' 27.9"
L = 143.57'
T = 72.03'
R = 720.00'
Se = .06
Runoff = 120'

PI Sta 16+22.59
Δ = 31° 54' 27.9" (LT)
D = 19° 05' 54.9"
L = 167.07'
T = 85.76'
R = 300.00'
Se = .03
Runoff = 60'

-Y52-
PI Sta 32+12.75
Δ = 26° 20' 00.0" (LT)
D = 2° 30' 00.0"
L = 1,053.33'
T = 536.14'
R = 2,291.83'

PIs Sta 32+96.62
Θs = 2° 30' 00.0"
Ls = 200.00'
LT = 133.35'
ST = 66.68'

-RPB-
PI Sta 6+44.58
Δ = 12° 53' 21.2" (LT)
D = 4° 28' 34.4"
L = 287.95'
T = 144.58'
R = 1,280.00'
Se = .06
Runoff = 144'

-Y51-
PI Sta 10+95.77
Δ = 43° 24' 32.0" (LT)
D = 11° 14' 49.9"
L = 37.02'
T = 19.45'
R = 48.87'

PI Sta 16+47.64
Δ = 18° 59' 17.8" (RT)
D = 7° 51' 35.2"
L = 241.59'
T = 121.91'
R = 728.98'

-RPD-
PI Sta 9+57.13
Δ = 20° 21' 12.3" (LT)
D = 4° 00' 00.0"
L = 508.84'
T = 257.13'
R = 1,432.39'
Se = .06

PIs Sta 12+75.53
Θs = 4° 00' 00.0"
Ls = 200.00'
LT = 133.37'
ST = 66.70'

2013 ADT
2033 ADT

ANGELA CUL DB 1698 PG MB 55 PG
TRI HUU TRAM DB 1714 PG 619 MB 27 PG 76
ANTHONY O. LEE, SR., ET AL DB 1584 PG 540 MB 27 PG 76
LOUIS TODD BREWER DB 1620 PG 350
RUBERT W. BRINSON DB 1759 PG 40
MARY W. GODWIN DB 1110 PG 880
SAMPSON-BLADEN OIL CO., INC. DB 1102 PG 578 DB 1212 PG 263 MB 2 PG 76
JAMES H. SMITH DB 1636 PG 210 MB 1 PG 363
DEBORAH S. OWEN DB 1478 PG 531 MB 1 PG 363
CHRISTOPHER M. COSTIN DB 1765 PG 860 MB 1 PG 363
EDWIN L. PURCELL, ET UX DB 1814 PG 573 MB 1 PG 363
ROY S. GUNTER, ET UX DB 639 PG 591 MB 1 PG 363
ANNE B. FAIRCLOTH DB 1433 PG 761 DB 1463 PG 441 MB 11 PG 41 MB 44 PG 75

REVISIONS

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16908 ENGINEER GREGORY E. BREW 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022009 ENGINEER W. GALEN CAIN 7/19/13

NAD 83/95

FOR -L- PROFILE SEE SHEET 50
FOR -Y53- & -Y54- PROFILE SEE SHEET 61

MATCH LINE -L- STA 1447+00 SEE SHEET 29

-Y53- POT Sta. 10+00.00 BEGIN CONSTRUCTION

-Y54- POT Sta. 12+58.00
-Y53- POT Sta. 11+21.00

-Y53- PC Sta. 14+39.12

-Y53- PT Sta. 15+88.77

STA. 1449+56.13 -L- END CONSTRUCTION

-L- POT Sta. 1452+48.24

-Y53- POT Sta. 16+57.69
BRG BK -S 12° 29' 28.9" E
-L- POT Sta. 1448+46.36

-L- N 62° 27' 45.1" E

LOUIS TODD BREWER
DB 1620 PG 354
MB 4 PG 130

CLINTON HCRE, LLC.
DB 1640 PG 78

THE CITY OF CLINTON
DB 1495 PG652

JOHN M. DALY ET UX
DB 1113 PG 811
DB 806 PG 508
MB 19 PG 90

FRED ROBERT EDGECOMB ET UX
DB 1268 PG 630
DB 1304 PG 603
DB 1624 PG 305

RUBERT W. BRINSON
DB 1759 PG 40

MARY W. GODWIN
DB 1110 PG 880

JAMES H. SMITH
DB 1636 PG 210
MB 1 PG 363

JAMES H. SMITH
DB 1640 PG 775

COUNTY OF SAMPSON
NORTH CAROLINA
DB 1653 PG 642

VICTOR H. PHILIPE & CECILIA L. MENDOSA
DB 1542 PG 512
DB 406 PG 504
MB 1 PG 28

LOT CONSISTS OF 3 PARCELS
1600147
1600TR2
1600TR3

ROY S. GUNTER, ETUX
DB 639 PG 591
MB 1 PG 363

-Y53-
PI Sta 15+14.83
Δ = 21° 26' 09.0" (RT)
D = 14° 19' 26.2"
L = 149.65'
T = 75.71'
R = 400.00'
Se = See Plans
Runoff = See Plans

REVISIONS

5/14/99

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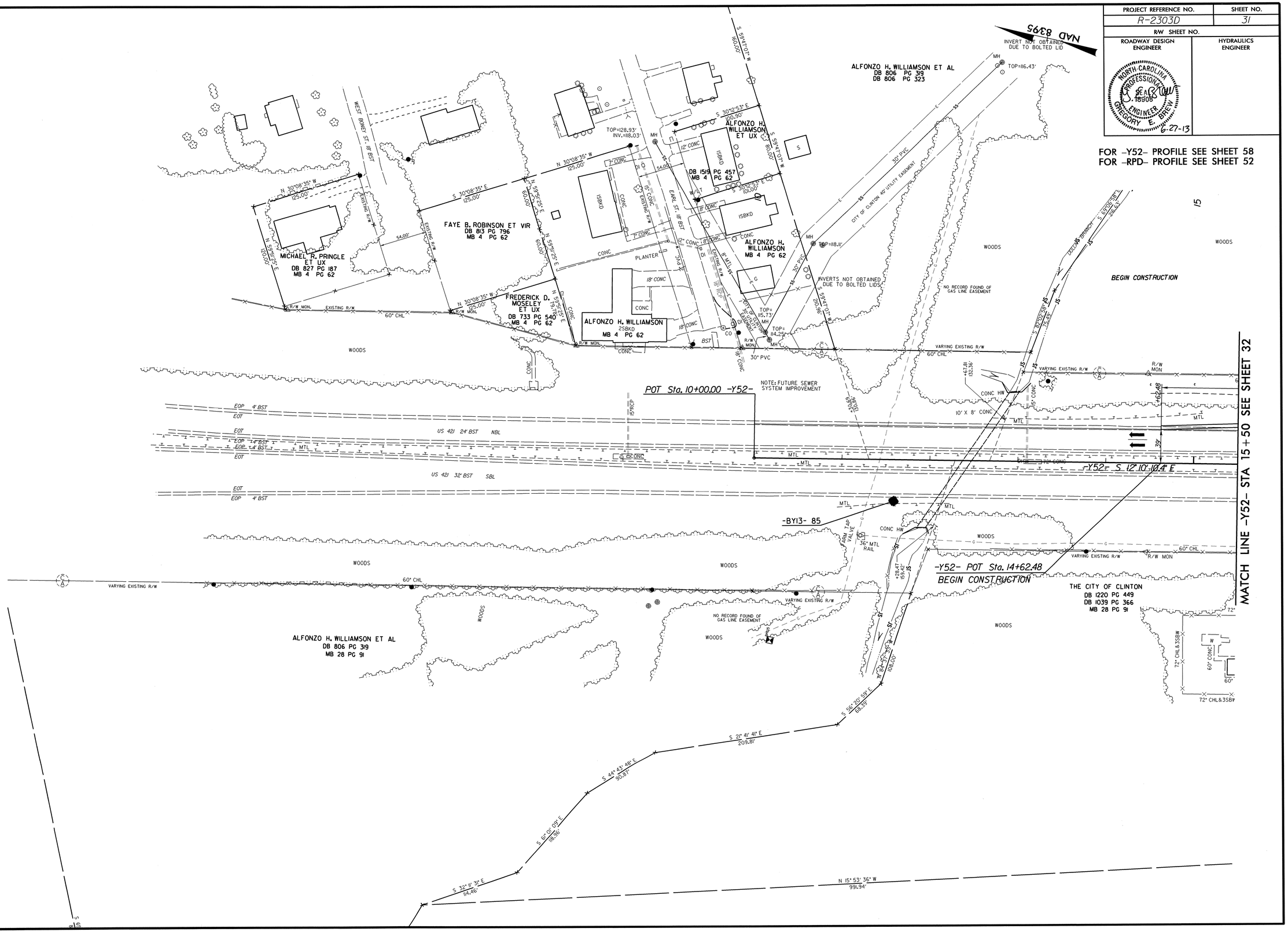
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREW 6-27-13

FOR -Y52- PROFILE SEE SHEET 58
FOR -RPD- PROFILE SEE SHEET 52



REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 7-10-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN COB 7/19/13

FOR -Y52- PROFILE SEE SHEET 59
FOR -RPA- PROFILE SEE SHEET 51
FOR -RPD- PROFILE SEE SHEET 52

NAD 83/95

REVISIONS

MATCH LINE -Y52- STA 15+00 SEE SHEET 31

MATCH LINE -Y52- STA 29+00 SEE SHEET 29

180 LOUIS TODD BREWER DB 1620 PG 354 MB 4 PG 130

179 CLINTON HCRE,LLC. DB 1760 PG 78

173 LOUIS TODD BREWER DB 1620 PG 350

171 ANTHONY O. LEE, SR., ET AL DB 1584 PG 540

CHARLES D. WOODARD, ETUX DB 1034 PG 26 MB 4 PG 130

-Y52- +10 EXIST R/W & 120' LT

-Y52- +75 EXIST R/W & 120' LT

CLASS I RIP RAP EST 3 TONS EST 6 SY FF

600' TAPER

JB w/MH

LATERAL V DITCH SEE DETAIL C

COLLAR AND EXTEND 15" RCP-III

200' FULL LANES

REMOVE

Adj. 2GI (REPAIR APRON)

RETAIN

-Y52- S 12°10'10.4" E

REMOVE HW 24" CONC COLLAR AND EXTEND 24" RCP-III

CONC HW

LATERAL V DITCH SEE DETAIL C

COLLAR AND EXTEND 15" RCP-III 2GI-D

S 9°52'10.4" E

200' TAPER

REMOVE 16'-18" RCP

COLLAR AND EXTEND 18" RCP-IV 2GI-D

S 7°03'17.9" E -RPA-

-Y52- +56.92 EXIST R/W

-Y52- +90 EXIST R/W & 120' RT

-Y52- +25 EXIST R/W & 120' RT

-BY13- 86

-RPA- +00 100' RT

-RPA- POT Sta. 5+00.00
-Y52- POT Sta. 21+74.74 (39' RT)

-RPA- PC Sta. 9+02.92

-RPA- +02.92 85' RT

-BY13- 87

SPECIAL LATERAL "V" DITCH SEE DETAIL C

-RPA- +99 85' RT

-RPA- PT Sta. 10+99.41

-RPD- +90 EXIST R/W & 95' LT

SC Sta. 7+00.00 -RPD-

TS Sta. 24+76.61 -RPD-

-RPD- ST Sta. 5+00.00
-Y52- POT Sta. 22+64.48 (39' LT)

-RPD-CLASS B RIP RAP +25 EST. 3 TONS EXIST R/W & 90' LT EST. 10 SY FF

SC Sta. 26+76.61 -Y52-

LATERAL BASE DITCH SEE DETAIL A EST. 111 CY DDE

TIE WW FENCE TO SLOPE STAKES

MOORE STREET (60' R/W)

ANTHONY O. LEE, SR., ET AL DB 1584 PG 540

BRETH 645 60

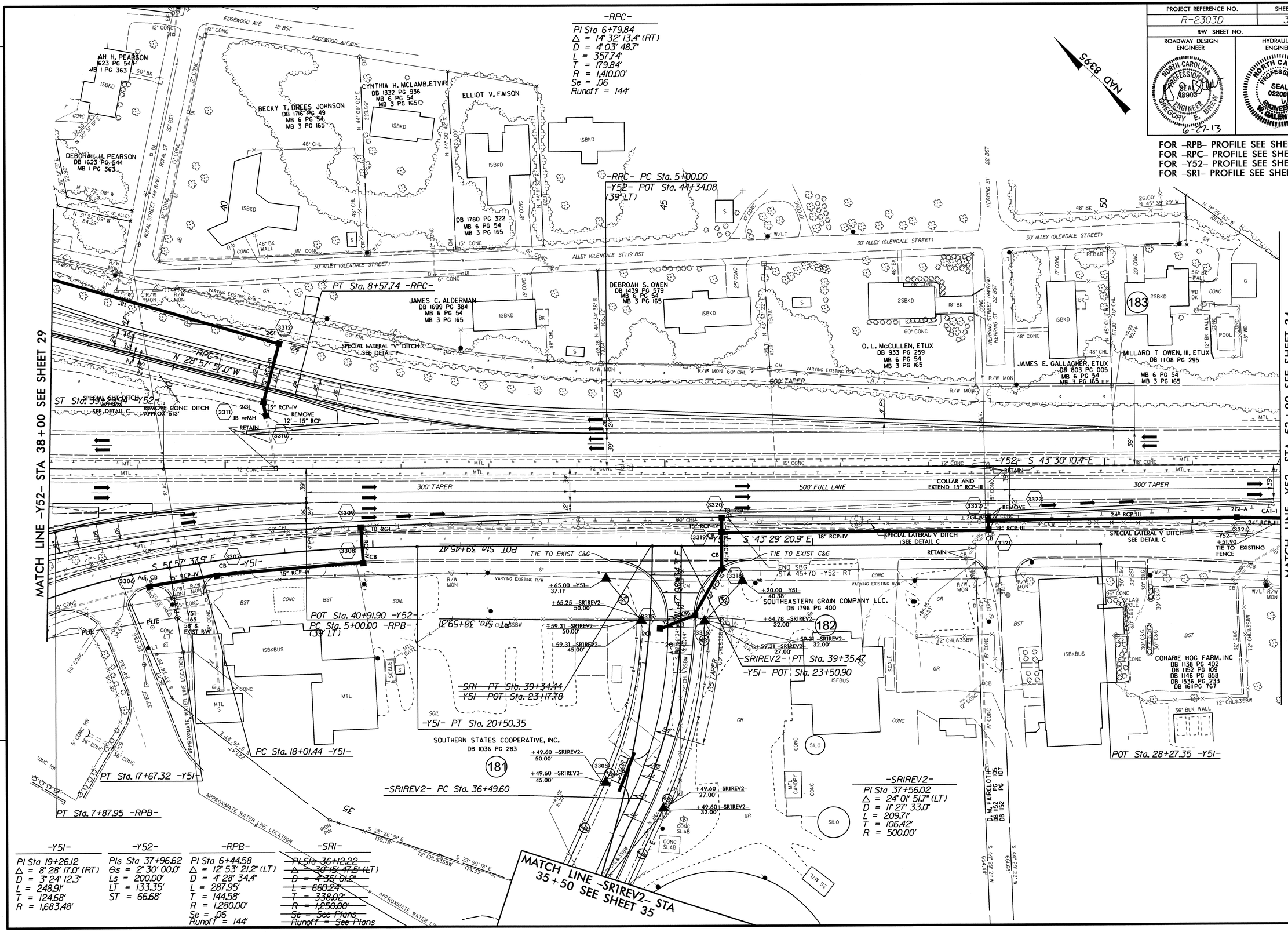
-RPA-	-RPD-		-Y52-	
PI Sta 10+01.19	PIs Sta 6+33.37	PI Sta 9+57.13	PIs Sta 26+09.96	PI Sta 32+12.75
Δ = 2° 48' 52.5" (RT)	Θs = 4° 00' 00.0"	Δ = 20° 21' 12.3" (LT)	Θs = 2° 30' 00.0"	Δ = 26° 20' 00.0" (LT)
D = 1° 25' 56.6"	Ls = 200.00'	D = 4° 00' 00.0"	Ls = 200.00'	D = 2° 30' 00.0"
L = 196.49'	LT = 133.37'	L = 508.84'	LT = 133.35'	L = 1,053.33'
T = 98.27'	ST = 66.70'	T = 257.13'	ST = 66.68'	T = 536.14'
R = 4,000.00'		R = 1,432.39'		R = 2,291.83'
Se = .03		Se = .06		
Runoff = 72'				

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BRETT 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN GILL 7/19/13

FOR -RPB- PROFILE SEE SHEET 51
FOR -RPC- PROFILE SEE SHEET 52
FOR -Y52- PROFILE SEE SHEET 60
FOR -SR1- PROFILE SEE SHEET 62



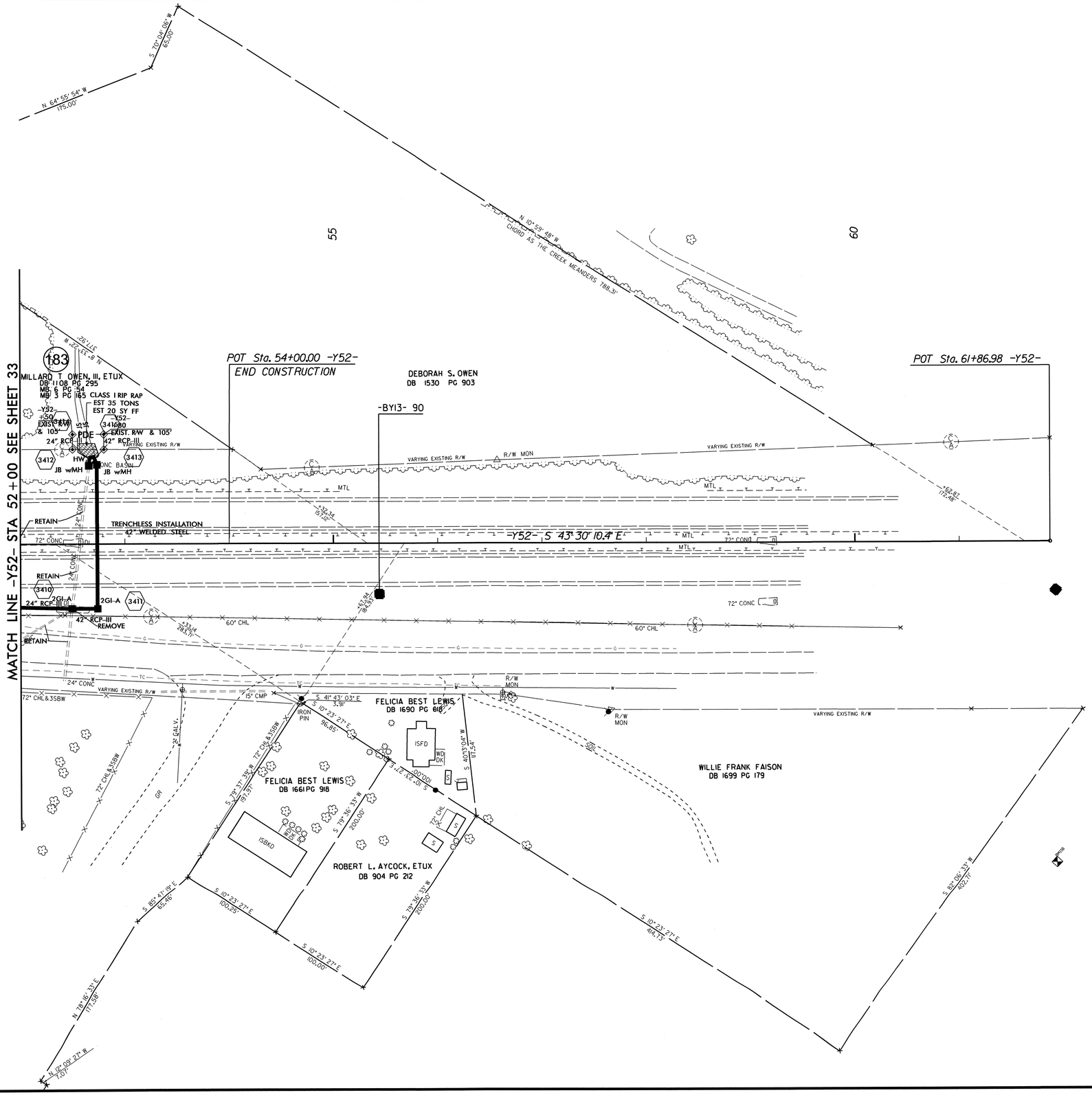
-Y51-	-Y52-	-RPB-	-SRI-
PI Sta 19+26.12	PIs Sta 37+96.62	PI Sta 6+44.58	~~PI Sta 36+12.22~~
Δ = 8° 28' 17.0" (RT)	Θs = 2° 30' 00.0"	Δ = 12° 53' 21.2" (LT)	~~Δ = 30° 15' 47.5" (LT)~~
D = 3° 24' 12.3"	Ls = 200.00'	D = 4° 28' 34.4"	~~D = 4° 35' 01.2"~~
L = 248.91'	LT = 133.35'	L = 287.95'	~~L = 660.24'~~
T = 124.68'	ST = 66.68'	T = 144.58'	~~T = 338.02'~~
R = 1,683.48'		R = 1,280.00'	~~R = 1,250.00'~~
		Se = .06	~~Se = See Plans~~
		Runoff = 144'	~~Runoff = See Plans~~

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 019080 ENGINEER GREGORY E. BREW 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/10/13

FOR -Y52- PROFILE SEE SHEET 60



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2303D	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 019198 ENGINEER GREGORY E. BROW 7-10-13

NORTH CAROLINA PROFESSIONAL SEAL 022006 ENGINEER W. GALEN CAIN 7/9/13

FOR -Y50- PROFILE SEE SHEET 57
FOR -SR1- PROFILE SEE SHEET 62

NAD 83/95

MATCH LINE -Y50- STA 18+00 SEE SHEET 28

MATCH LINE -SR1- STA 13+00 SEE SHEET 27

MATCH LINE -SR1- STA 25+50 SEE SHEET 36

-DRI- POT Sta. 10+00.00
-Y50- POT Sta. 20+00.09

-DRI- PC Sta. 11+40.06
-DRI- PT Sta. 11+79.39
-DRI- POT Sta. 12+19.26

PC Sta. 16+57.76 -SRI-

PRC Sta. 18+21.91 -SRI-

-Y50- POT Sta. 20+85.31
-SRI- POC Sta. 21+47.77

PRC Sta. 23+29.39 -SRI-

158
PEGGY S. WEST
DB 1167 PG 079
MB 9 PG 29
MB 60 PG 18

140A
FAIRCLOTH FAMILY PROPERTIES, LLC
DB 1270 PG 032
DB 1275 PG 772
DB 1245 PG 364
DB 835 PG 213
DB 1517 PG 184
DB 1517 PG 196
DB 1565 PG 455
DB 1693 PG 560
DB 1010 PG 411
MB 9 PG 29
MB 60 PG 18

165
SHAMROCK PLAZA
DB 884 PG 211

166
IMMANUEL BAPTIST CHURCH OF CLINTON, N.C.
DB 1297 PG 587
DB 945 PG 946

169
ANNE B. FAIRCLOTH
DB 1433 PG 761
DB 1463 PG 441
MB 11 PG 41
MB 44 PG 75

140A
FAIRCLOTH FAMILY PROPERTIES, LLC
DB 1270 PG 032
DB 1275 PG 772
DB 1245 PG 364
DB 835 PG 213
DB 1517 PG 184
DB 1517 PG 196
DB 1565 PG 455
DB 1693 PG 560
DB 1010 PG 411
MB 9 PG 29
MB 60 PG 18

SANDY WHITTED ESTATE
DB 480 PG 525
DB 536 PG 169

CLINTON CITY LIMITS

TOE PROTECTION
CLASS B RIP RAP
SEE DETAIL D
EST. 85 TONS
EST. 160 SY FF

CL I RIP RAP
EST 15 TONS
EST 30 SY FF

TOE PROTECTION
CLASS B RIP RAP
SEE DETAIL D
EST. 150 TONS
EST. 280 SY FF

SPECIAL LATERAL V DITCH
SEE DETAIL C

GRADE TO DRAIN

LATERAL BASE DITCH
SEE DETAIL A
EST. 214 CY DDE

PSH
SEE DETAIL

CLASS I RIP RAP
EST. 2 TONS
EST. 8 SY

-BY12- 84

S 68°03'02" E

N 86°55'58" E

N 80°34'33" E

N 76°50'52" E
524.66'

S 83°08'57" W
393.19'

N 62°59'04" W
388.45'

-SRI-

PI Sta 17+42.92	PI Sta 20+79.50	PI Sta 25+20.33
Δ = 37° 37' 08.5" (LT)	Δ = 24° 13' 49.2" (RT)	Δ = 21° 37' 14.3" (LT)
D = 22° 55' 05.9"	D = 4° 46' 28.7"	D = 5° 43' 46.5"
L = 164.14'	L = 507.48'	L = 377.35'
T = 85.15'	T = 257.59'	T = 190.95'
R = 250.00'	R = 1,200.00'	R = 1,000.00'
Se = See Plans	Se = See Plans	Se = See Plans
Runoff = See Plans	Runoff = See Plans	Runoff = See Plans

-DRI-

PI Sta 11+60.41
Δ = 36° 21' 04.4" (LT)
D = 92° 24' 45.2"
L = 39.34'
T = 20.36'
R = 62.00'

REVISIONS

5/14/99

09-JUL-2013 11:23
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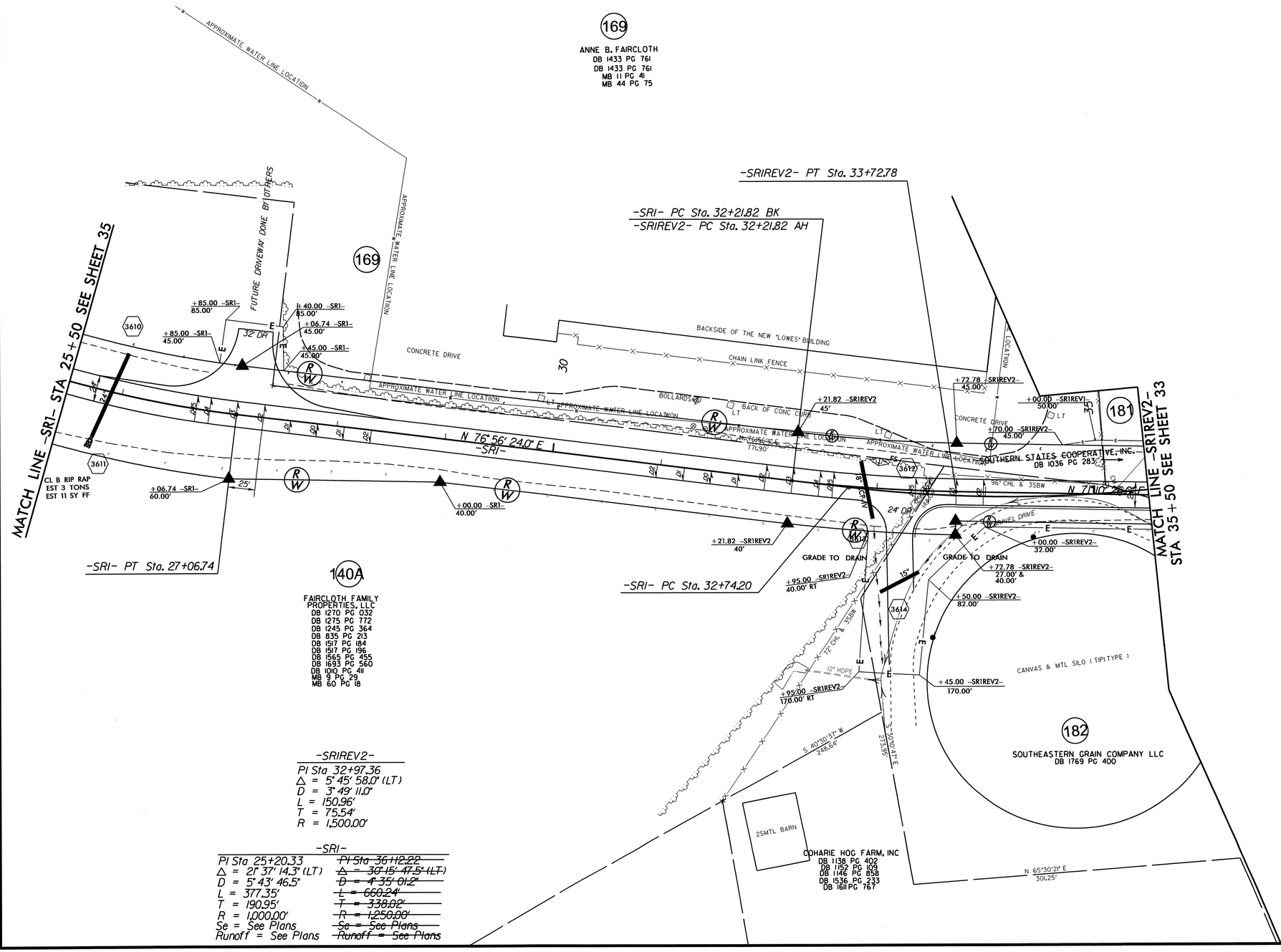
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022090 ENGINEER W. GALEN CAIN 7/19/13

FOR -SR1- PROFILE SEE SHEET 63

NAD 83/95



-SRIREV2-

PI Sta 32+97.36
Δ = 5° 45' 58.0" (LT)
D = 3° 49' 11.0"
L = 150.96'
T = 75.54'
R = 1,500.00'

-SRI-

PI Sta 25+20.33	~~PI Sta 36+12.22~~
Δ = 21° 37' 14.3" (LT)	~~Δ = 30° 15' 47.5" (LT)~~
D = 5° 43' 46.5"	~~D = 4° 35' 01.2"~~
L = 377.35'	~~L = 660.24'~~
T = 190.95'	~~T = 338.82'~~
R = 1,000.00'	~~R = 1,250.00'~~
Se = See Plans	~~Se = See Plans~~
Runoff = See Plans	~~Runoff = See Plans~~

REVISIONS

5/14/99

27-JUN-2013 15:55
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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	37

ROADWAY DESIGN ENGINEER

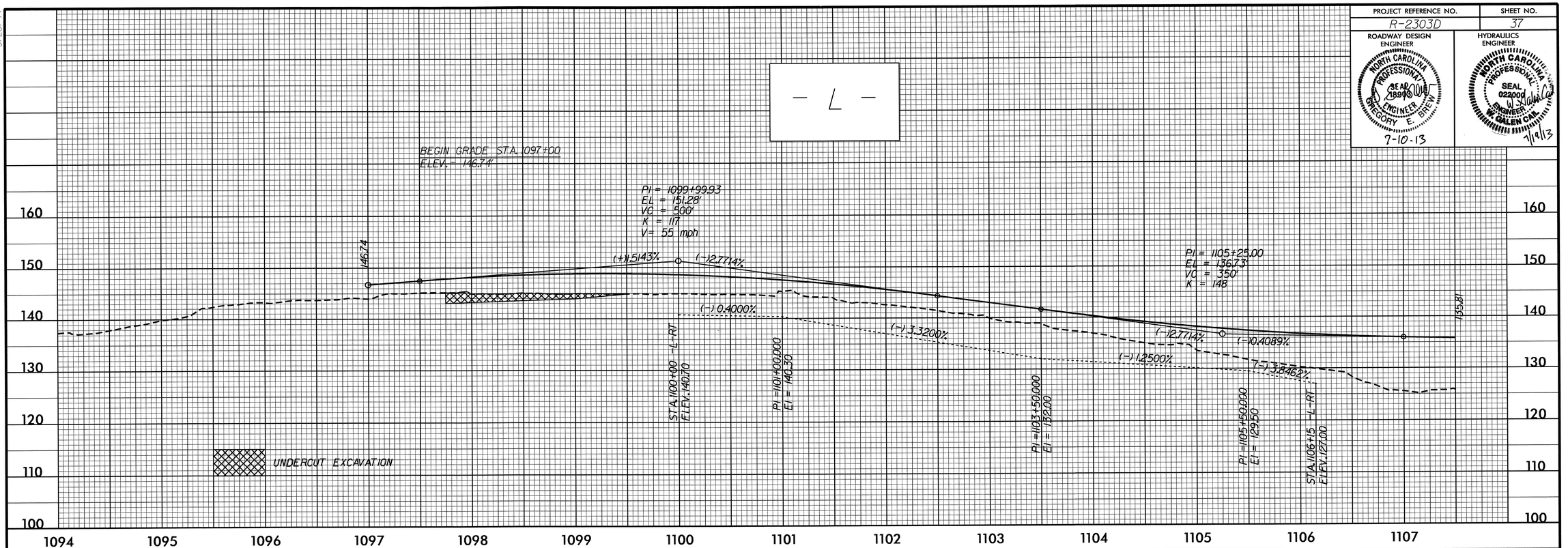
NORTH CAROLINA PROFESSIONAL SEAL 038904 ENGINEER GREGORY E. BREW

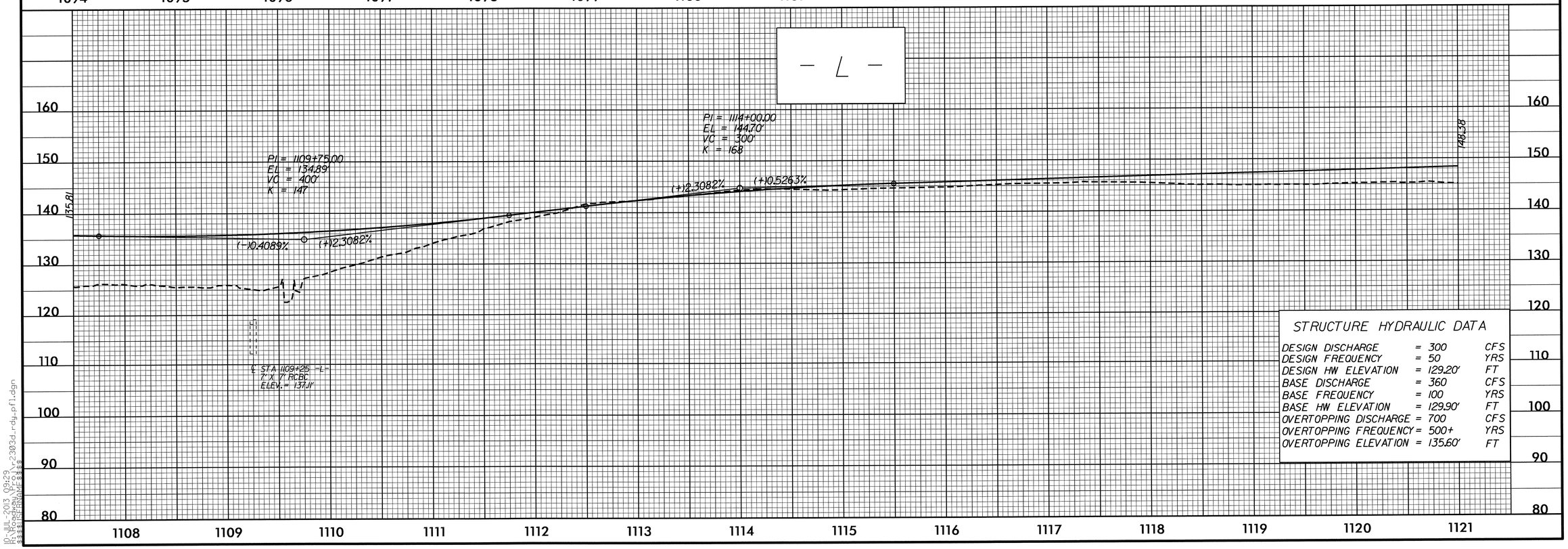
7-10-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER GALEN CAIL

7/12/13





STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	300	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	129.20'	FT
BASE DISCHARGE	=	360	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	129.90'	FT
OVERTOPPING DISCHARGE	=	700	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	135.60'	FT

5/28/99

10-JUL-2013 03:29
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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	38

ROADWAY DESIGN ENGINEER

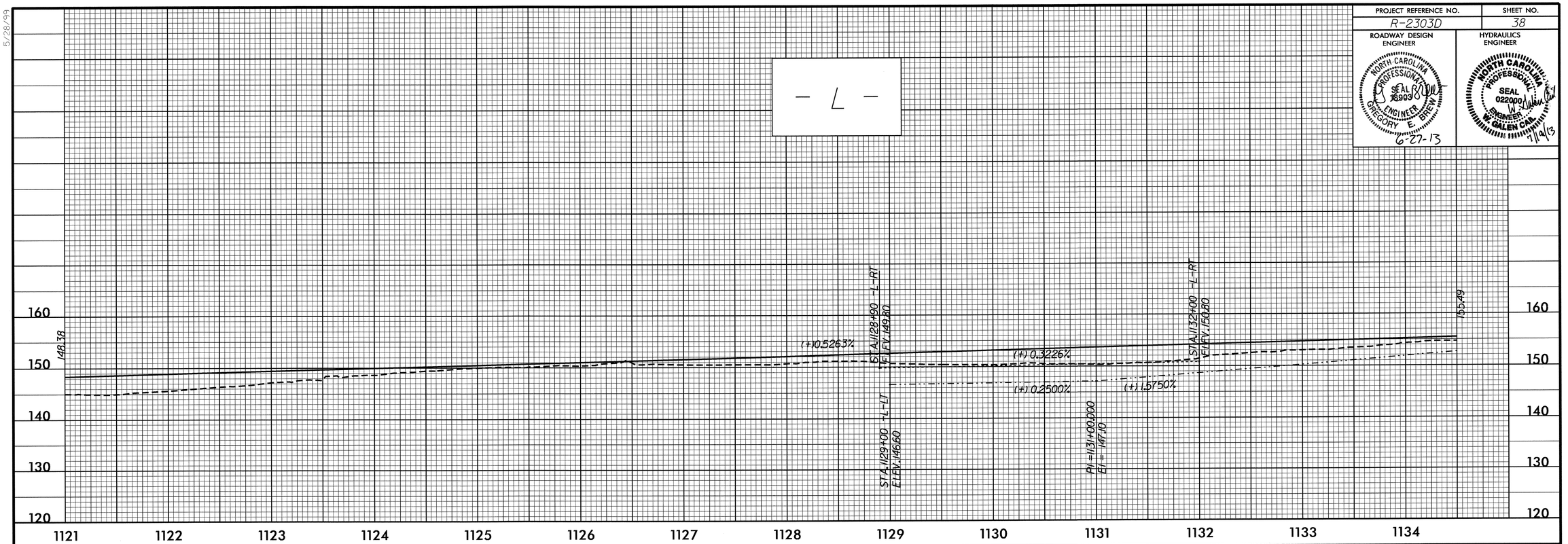
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

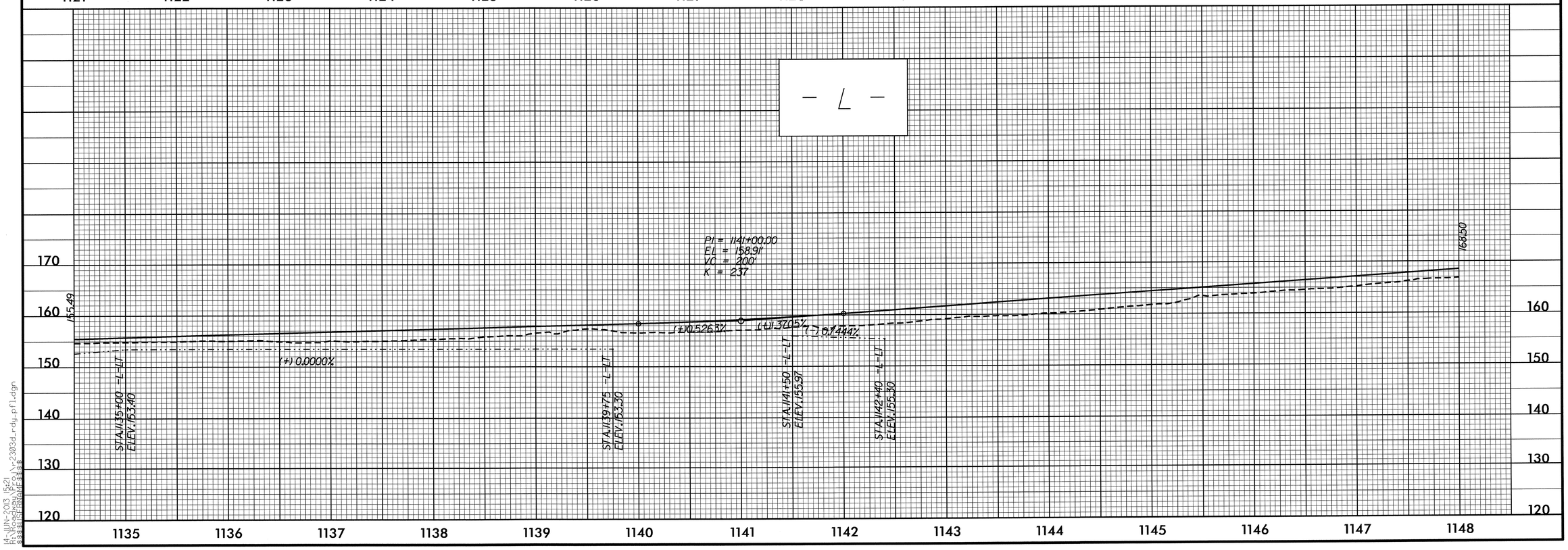
6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CLAY

7/9/13





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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	39

ROADWAY DESIGN ENGINEER

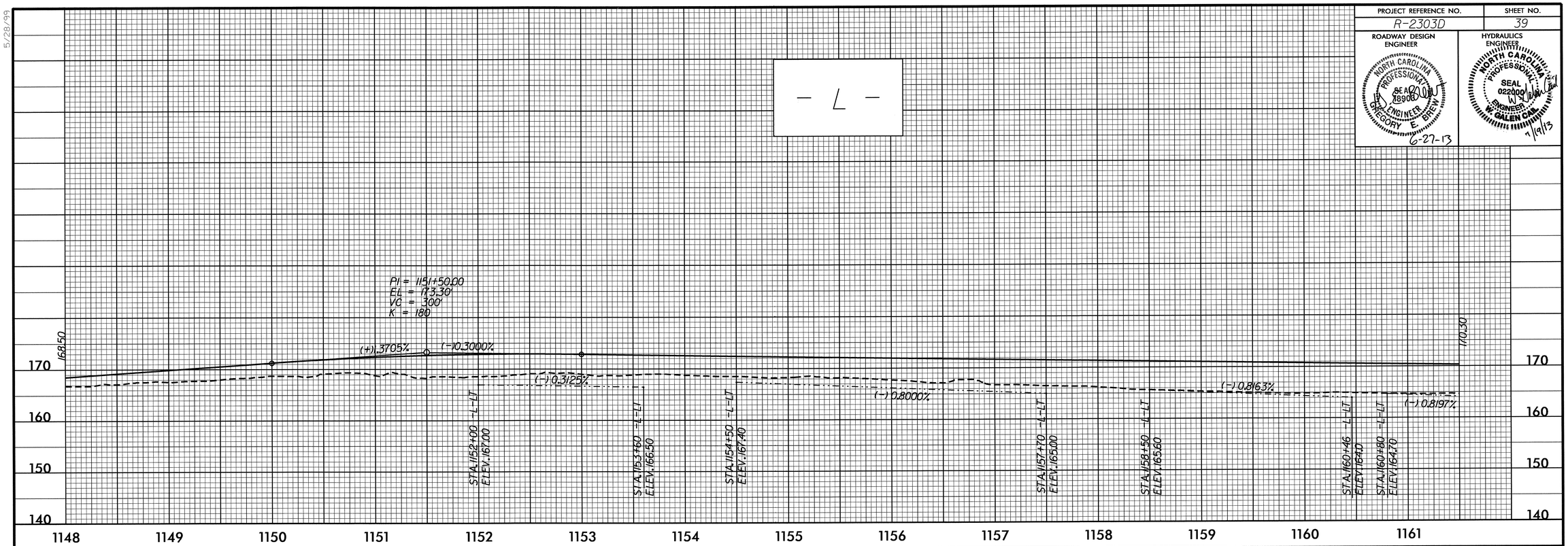
NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREW

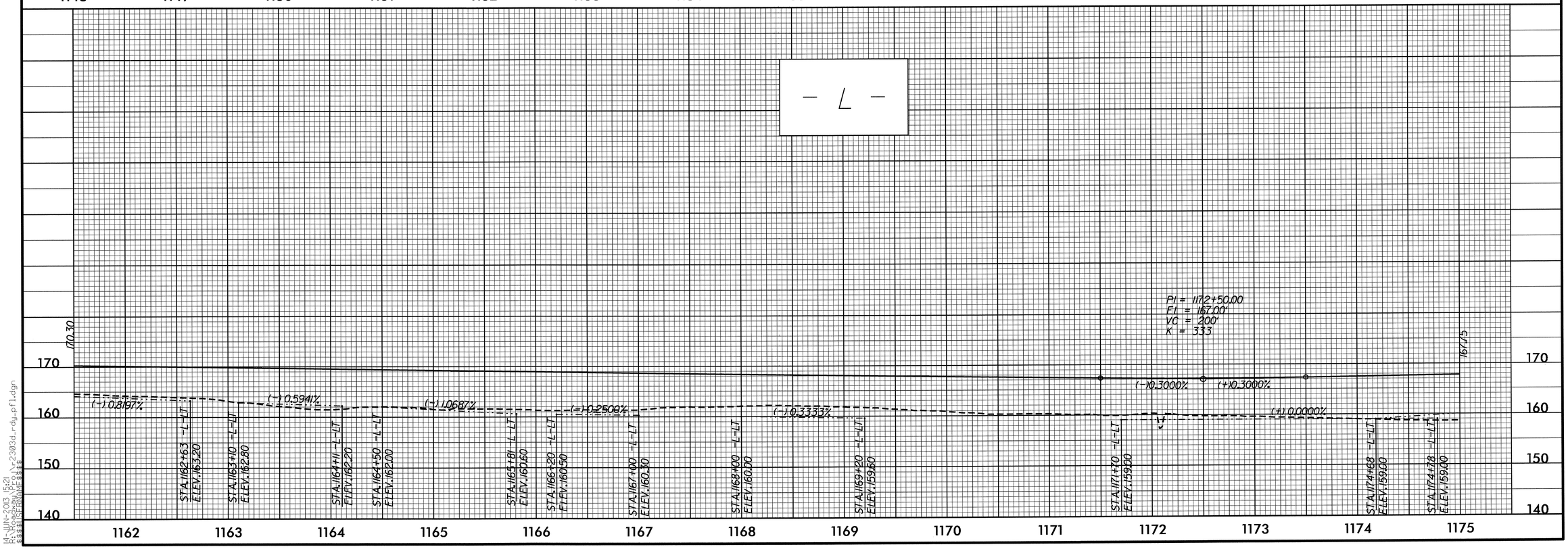
6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CLAR

7/9/13





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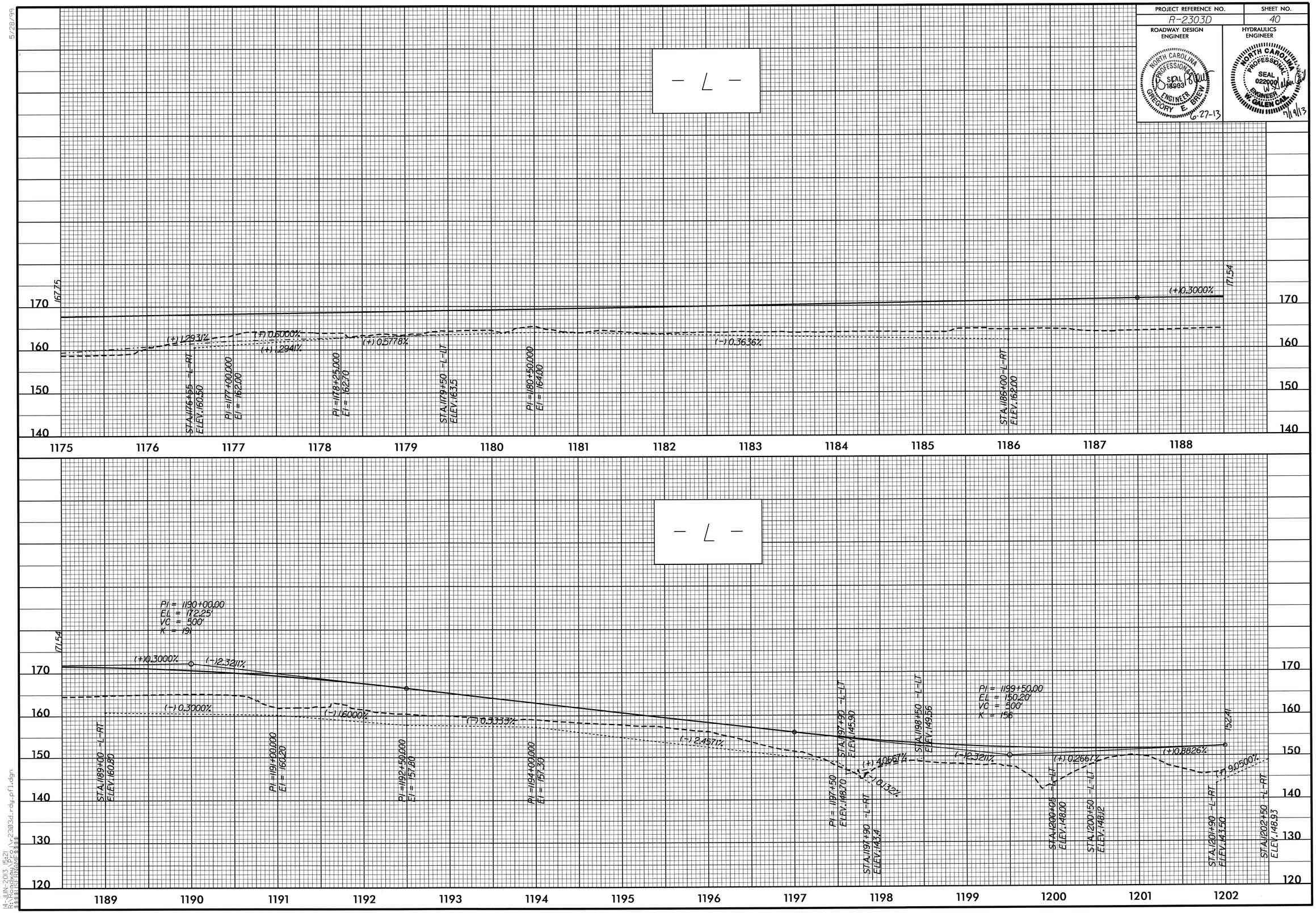
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	40

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 7/19/13



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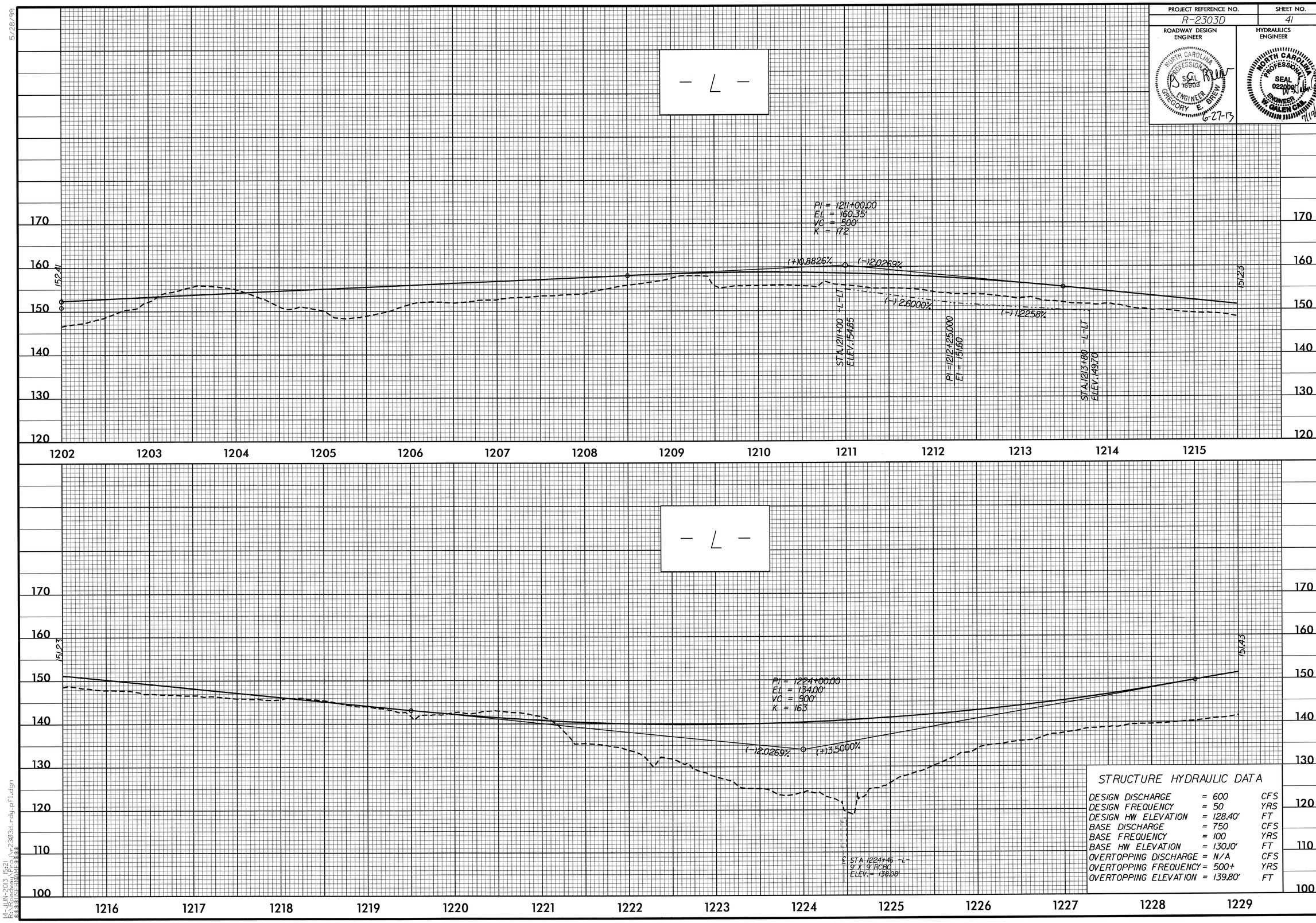
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022009 ENGINEER W. GALEN CAIL 7/19/13



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 600	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 128.40'	FT
BASE DISCHARGE	= 750	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 130.10'	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 139.80'	FT

5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	42

ROADWAY DESIGN ENGINEER

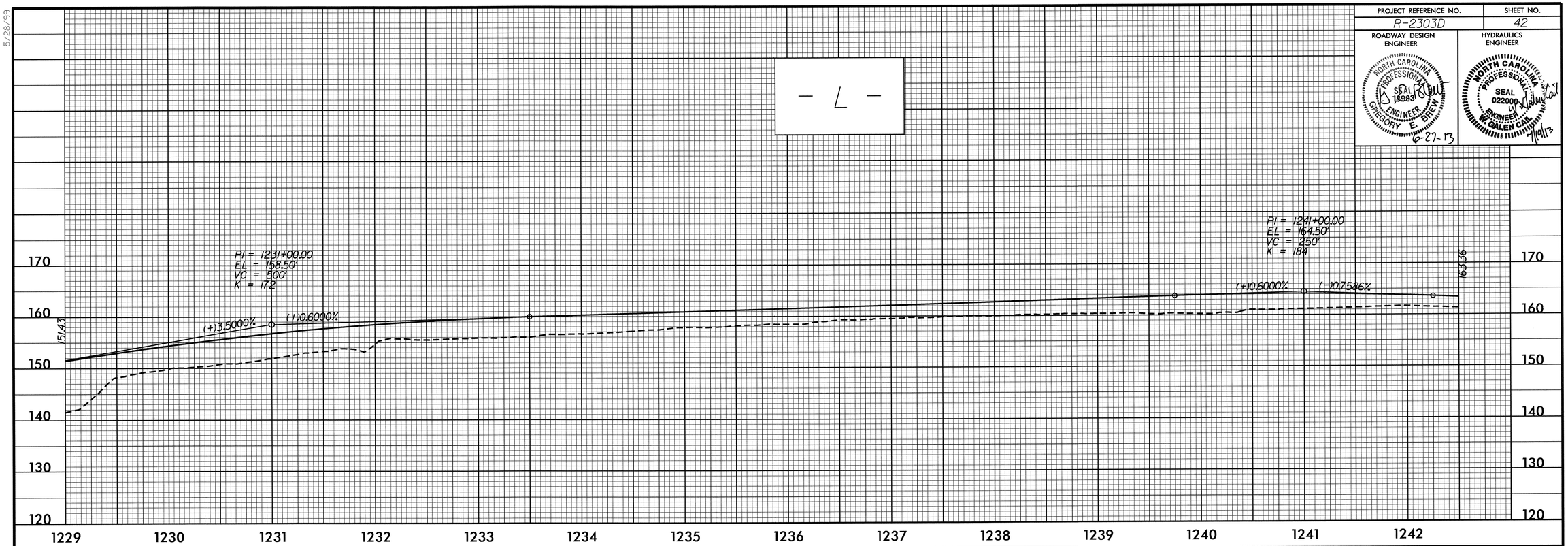
NORTH CAROLINA PROFESSIONAL SEAL 16983 ENGINEER GREGORY E. BREW

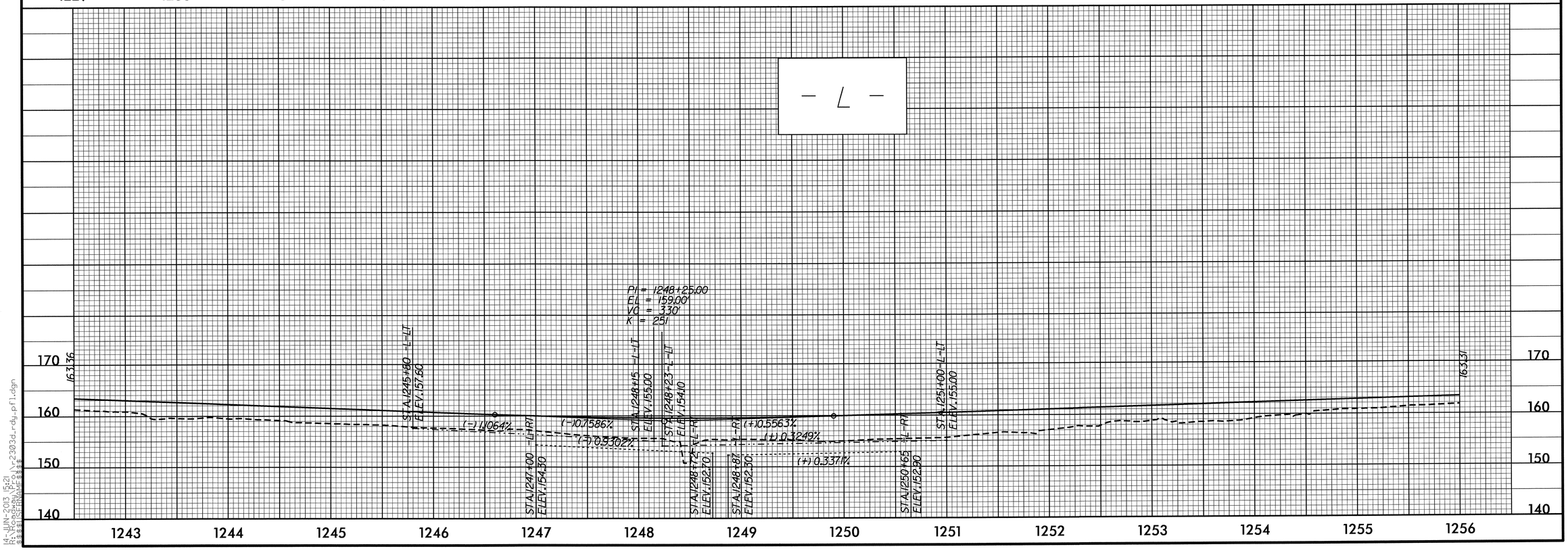
6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER M. GALEN CAIL

7/19/13





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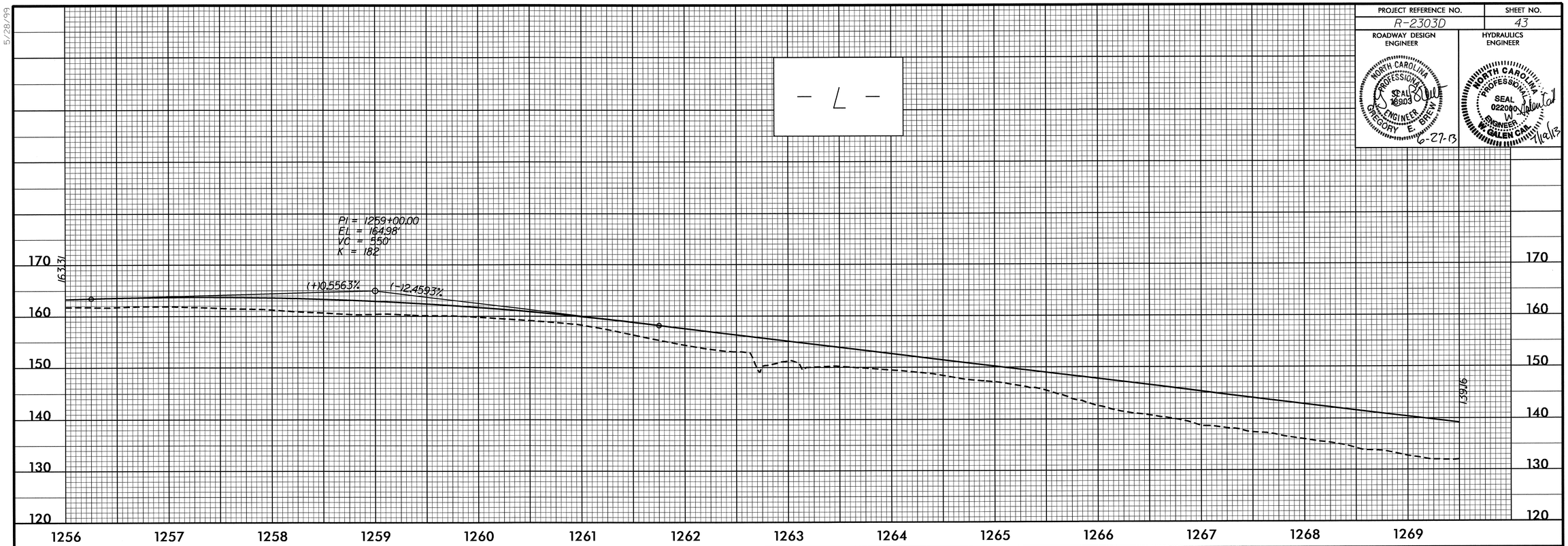
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	43

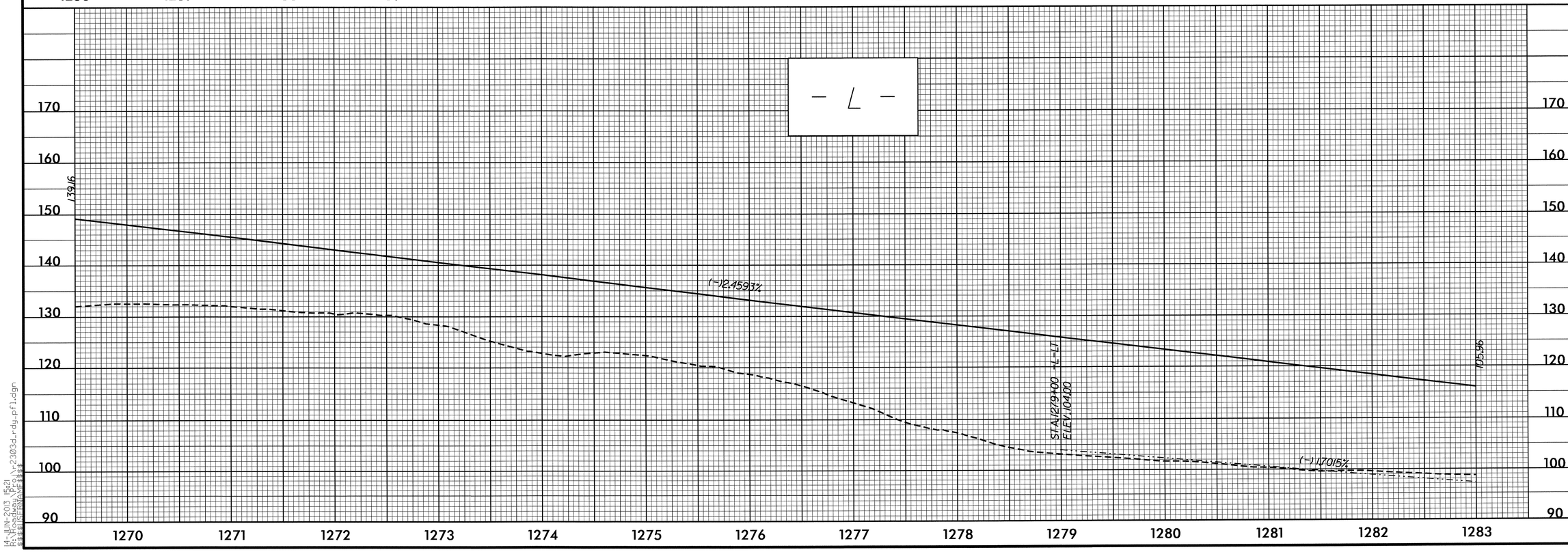
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18603 ENGINEER GREGORY E. BREW
6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL
7/9/13





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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	44

ROADWAY DESIGN ENGINEER

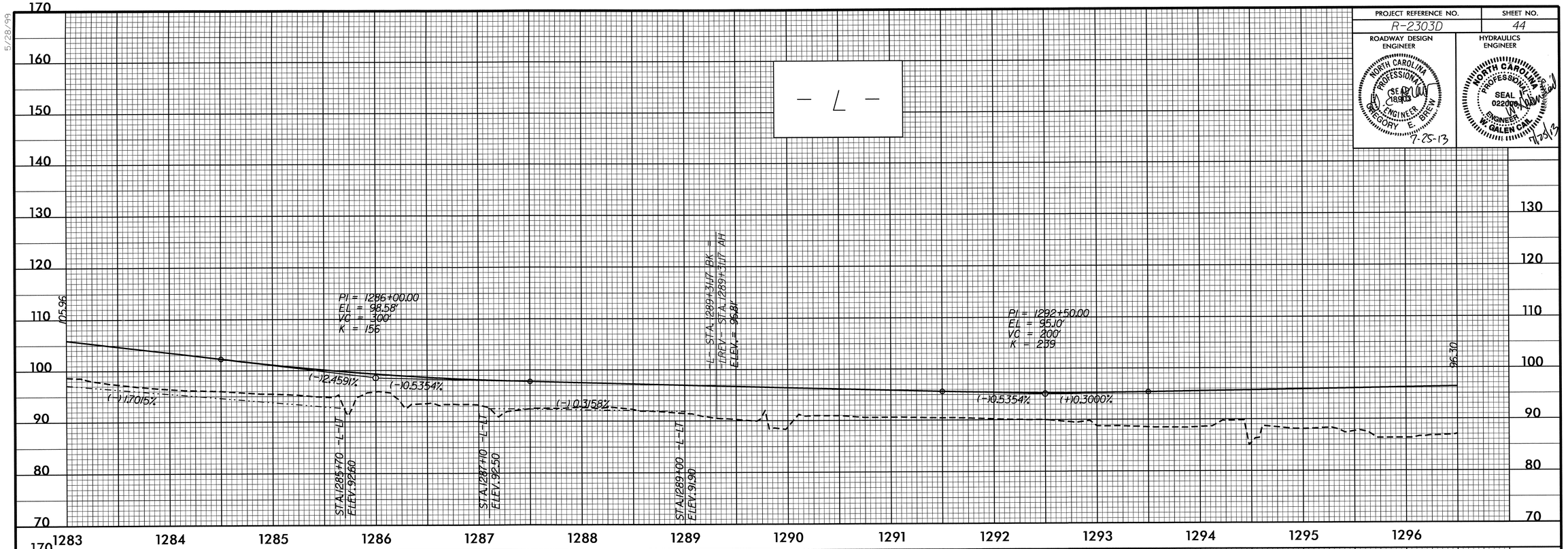
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

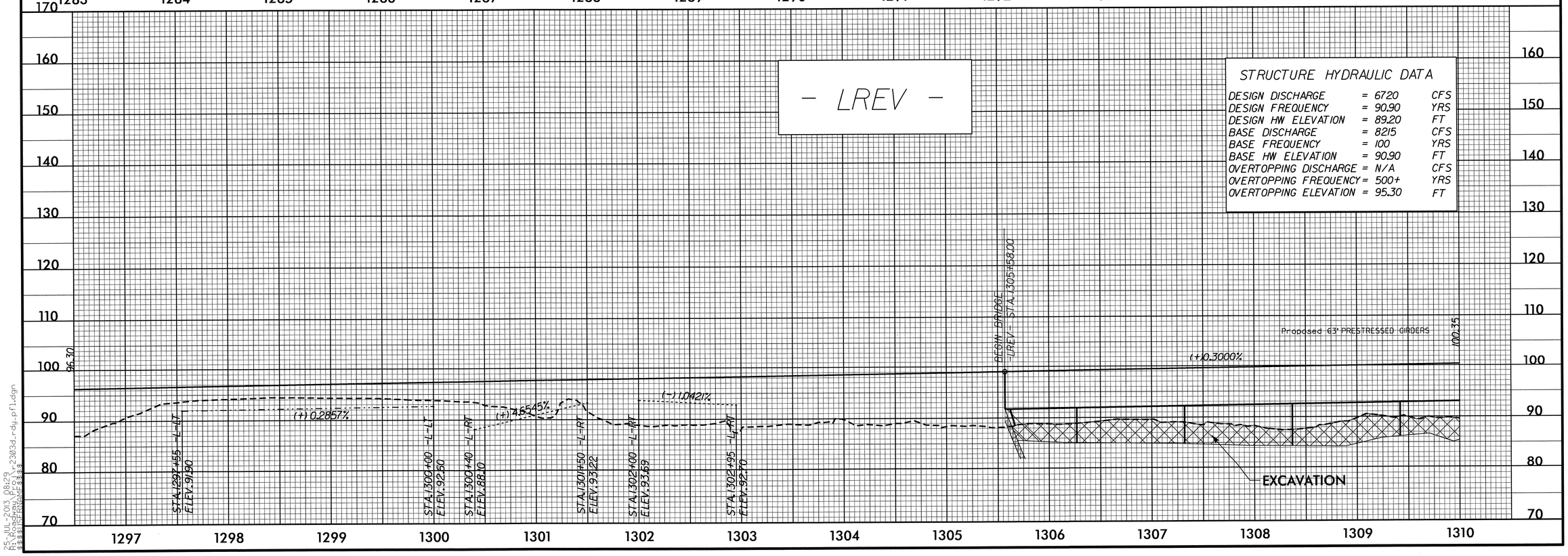
7-25-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022026 ENGINEER W. GALEN CAIN

7/25/13





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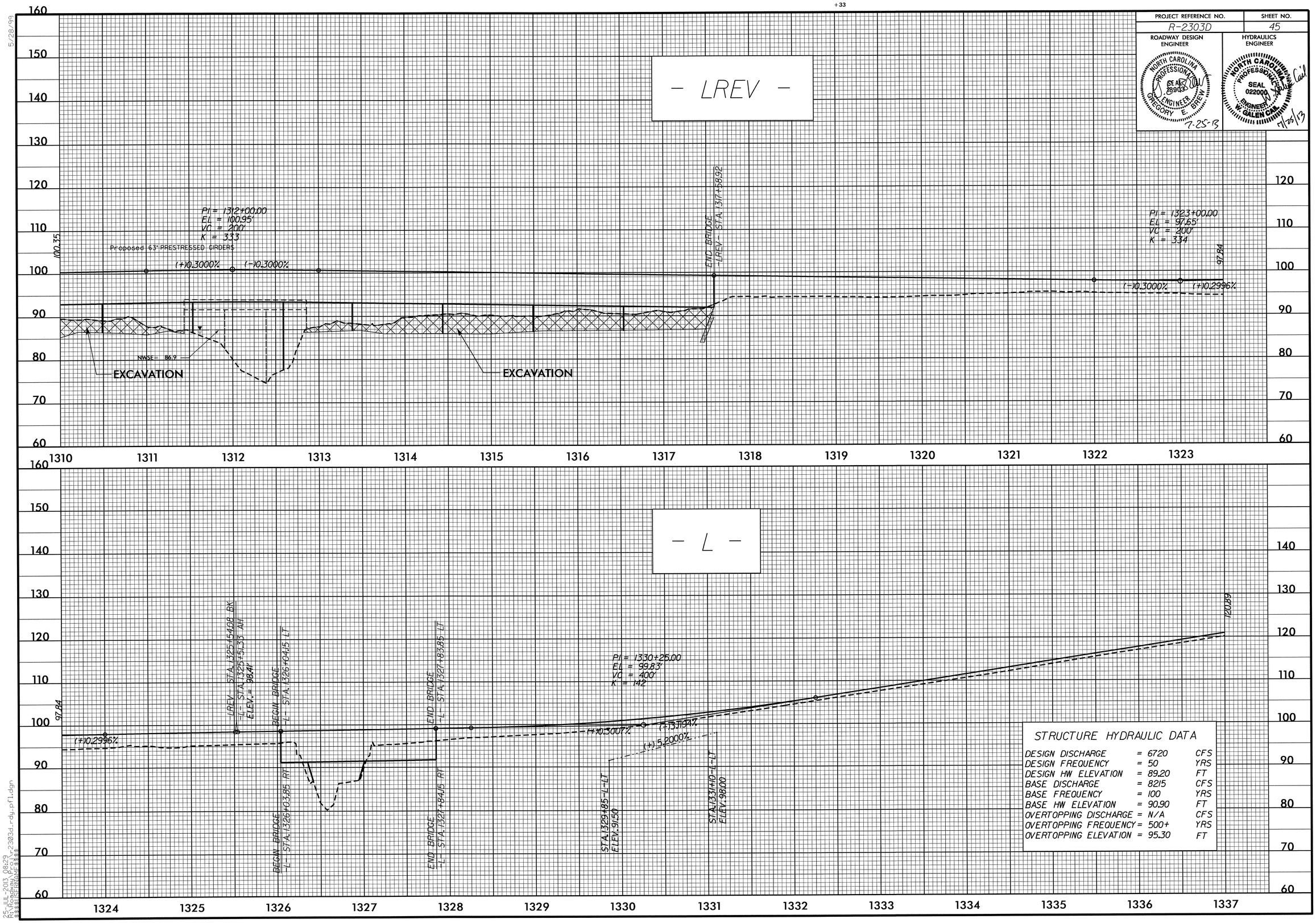
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	45

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 7-25-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 7/25/13



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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	46

ROADWAY DESIGN ENGINEER

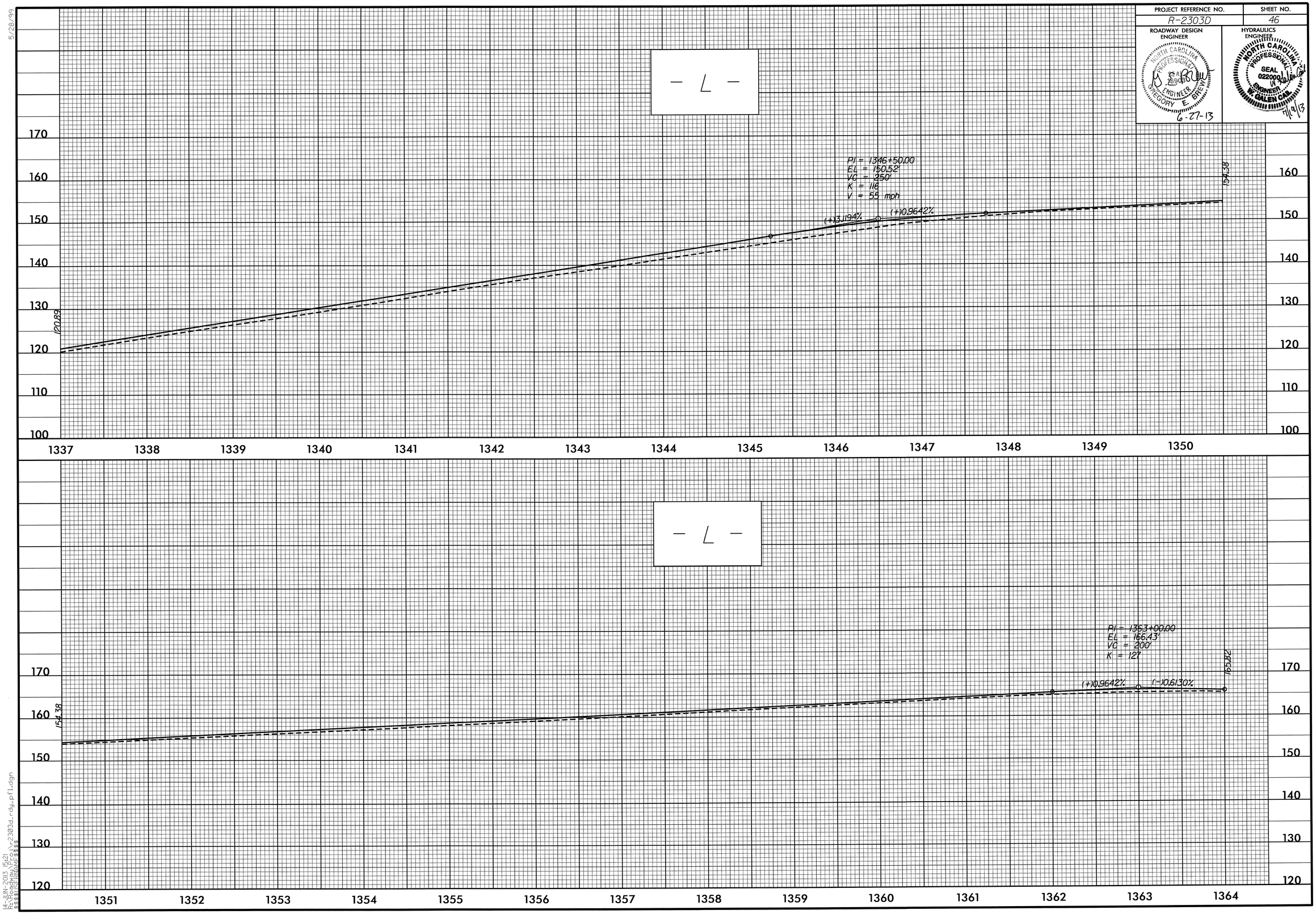
NORTH CAROLINA PROFESSIONAL SEAL 28903 ENGINEER GREGORY E. BREW

6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL

7/19/13



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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	47

ROADWAY DESIGN ENGINEER

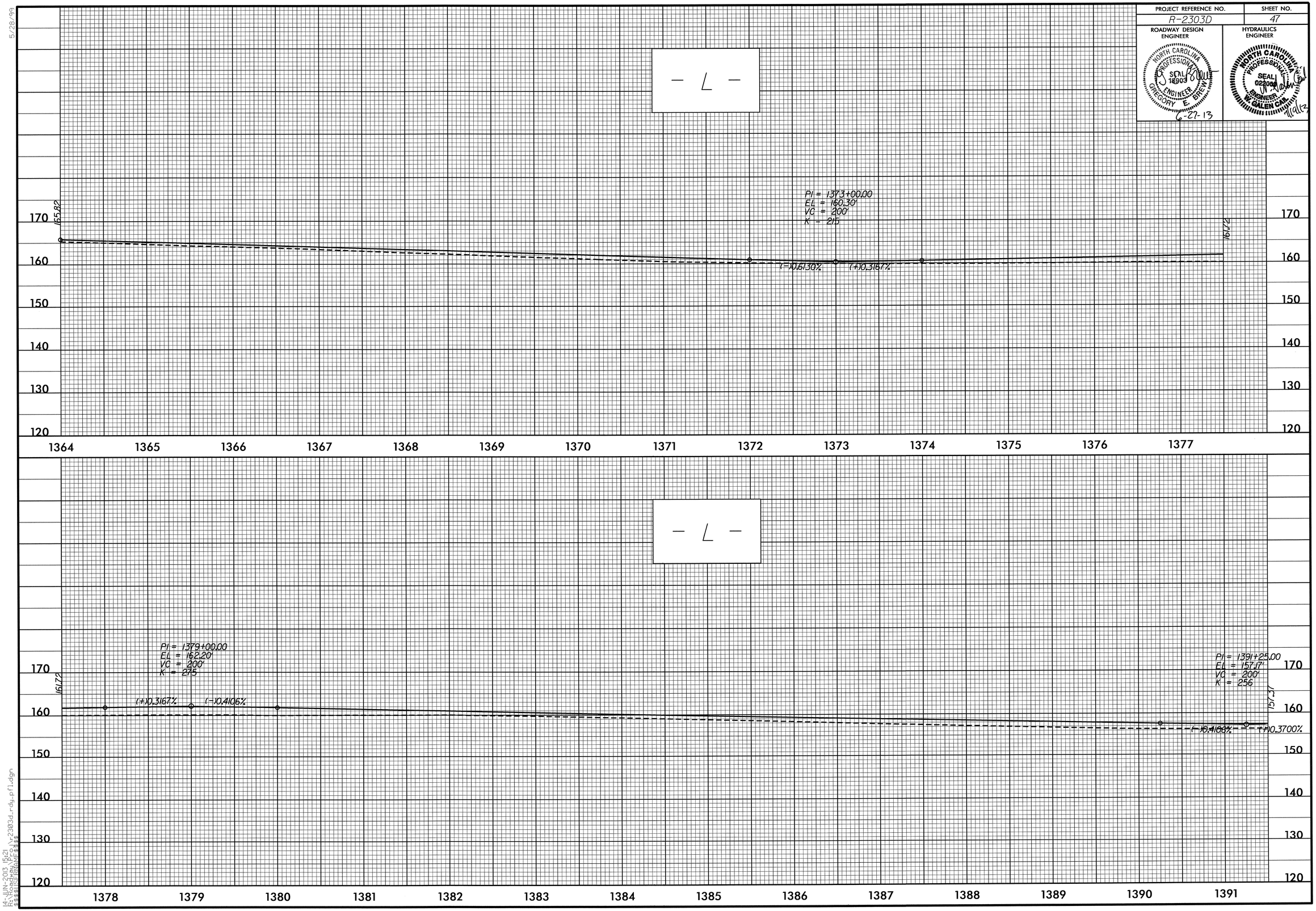
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL

7/19/13



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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	48

ROADWAY DESIGN ENGINEER

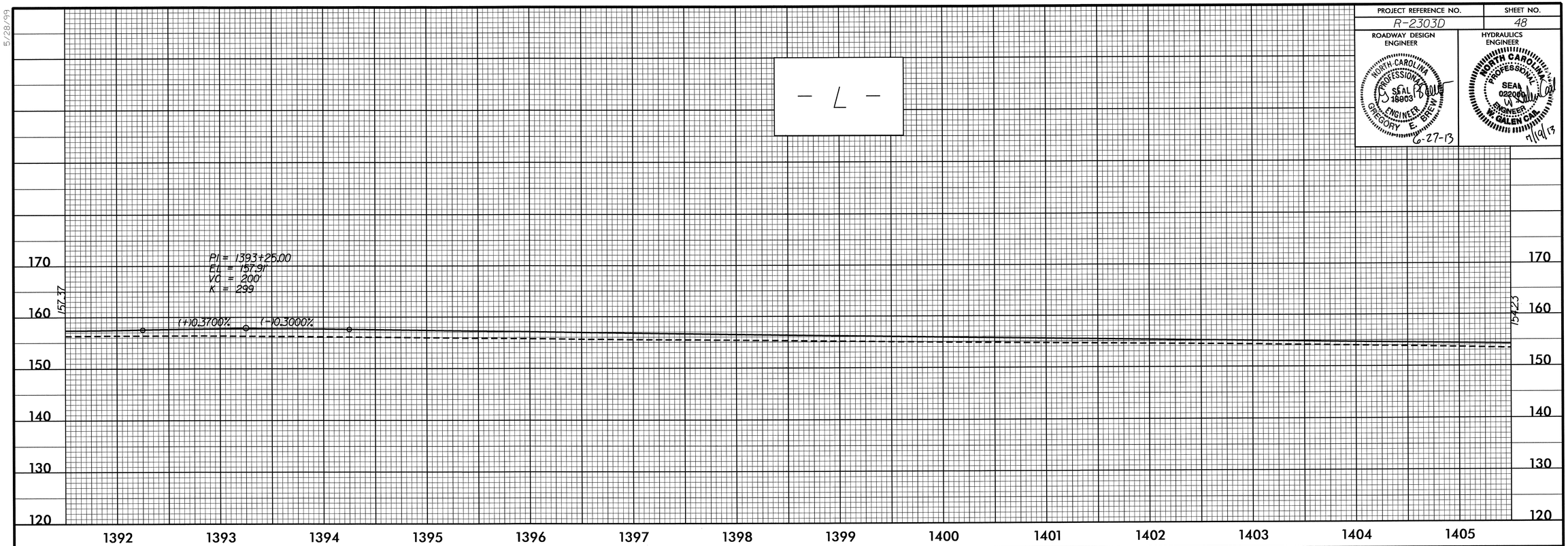
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

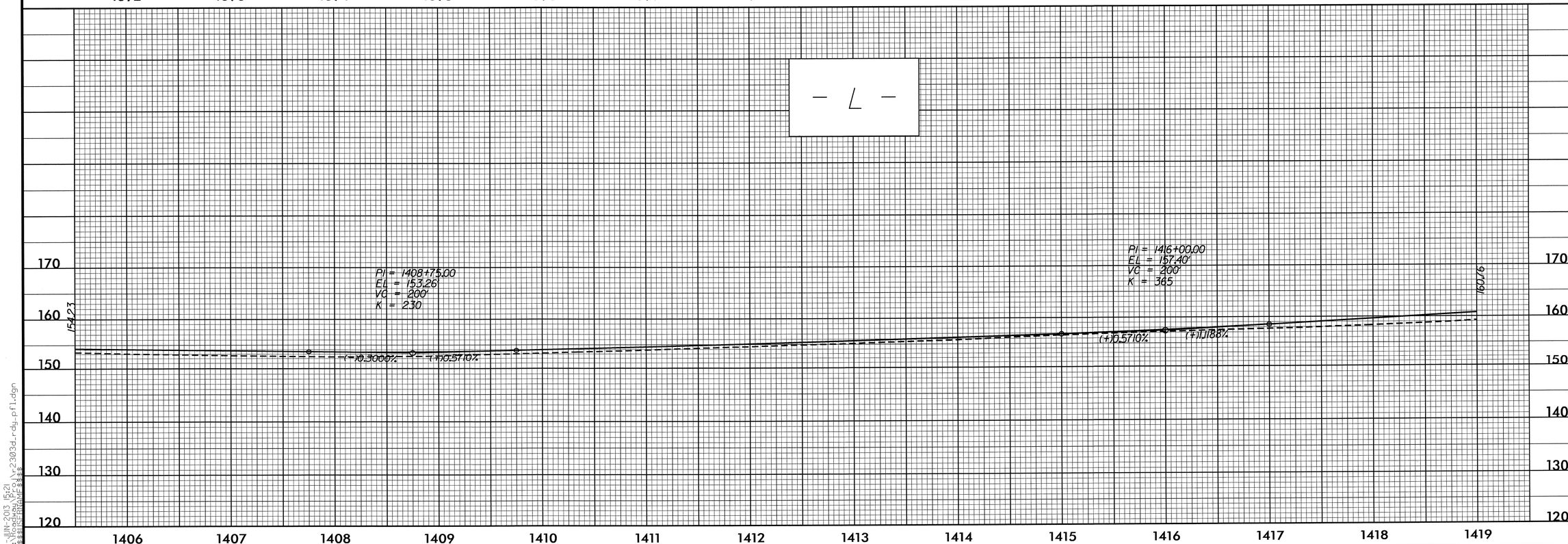
6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022060 ENGINEER W. GALEN CAIL

7/19/13





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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	49

ROADWAY DESIGN ENGINEER

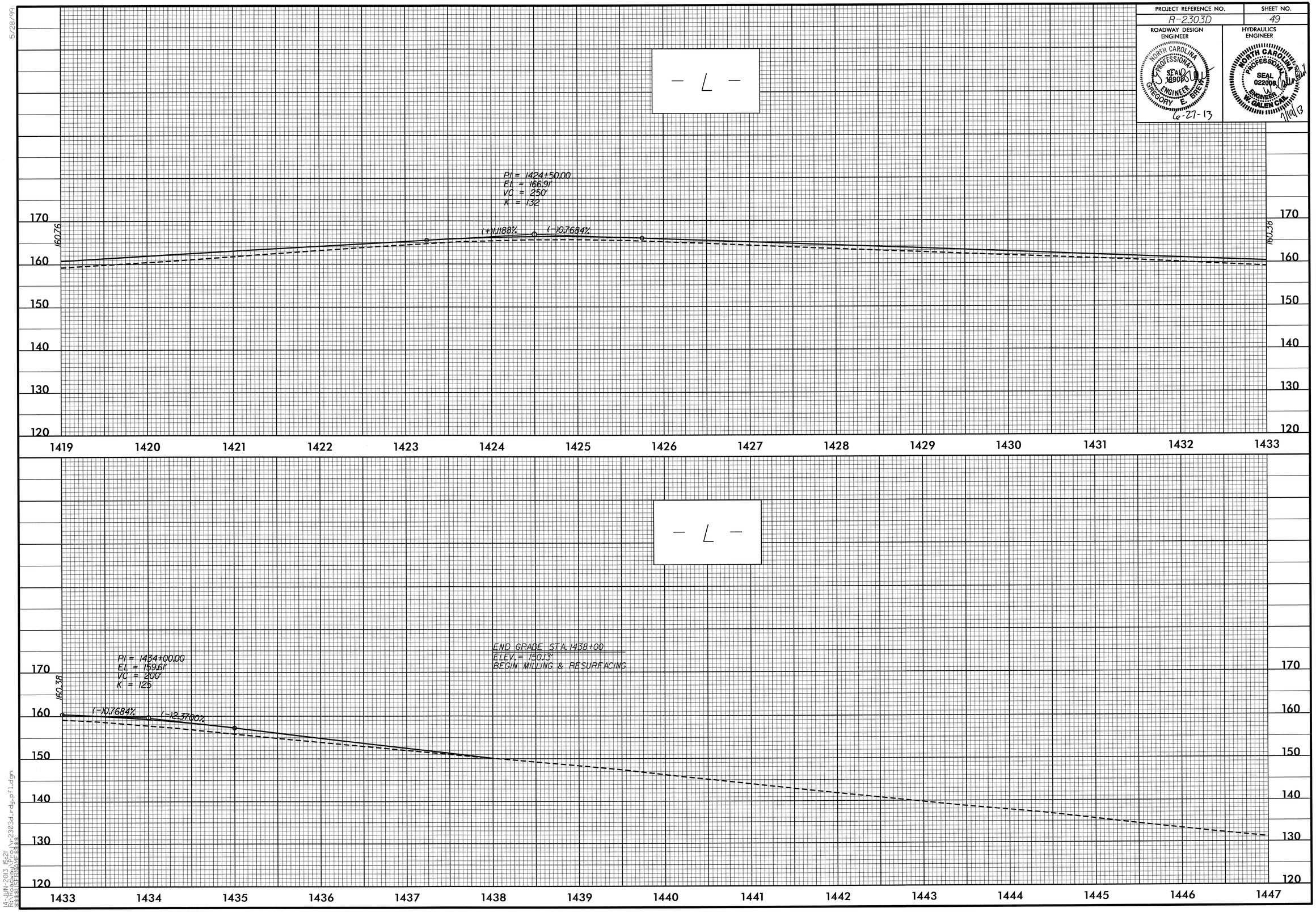
NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREWER

6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022008 ENGINEER W. GALEN CAIN

7/19/13



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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	50

ROADWAY DESIGN ENGINEER

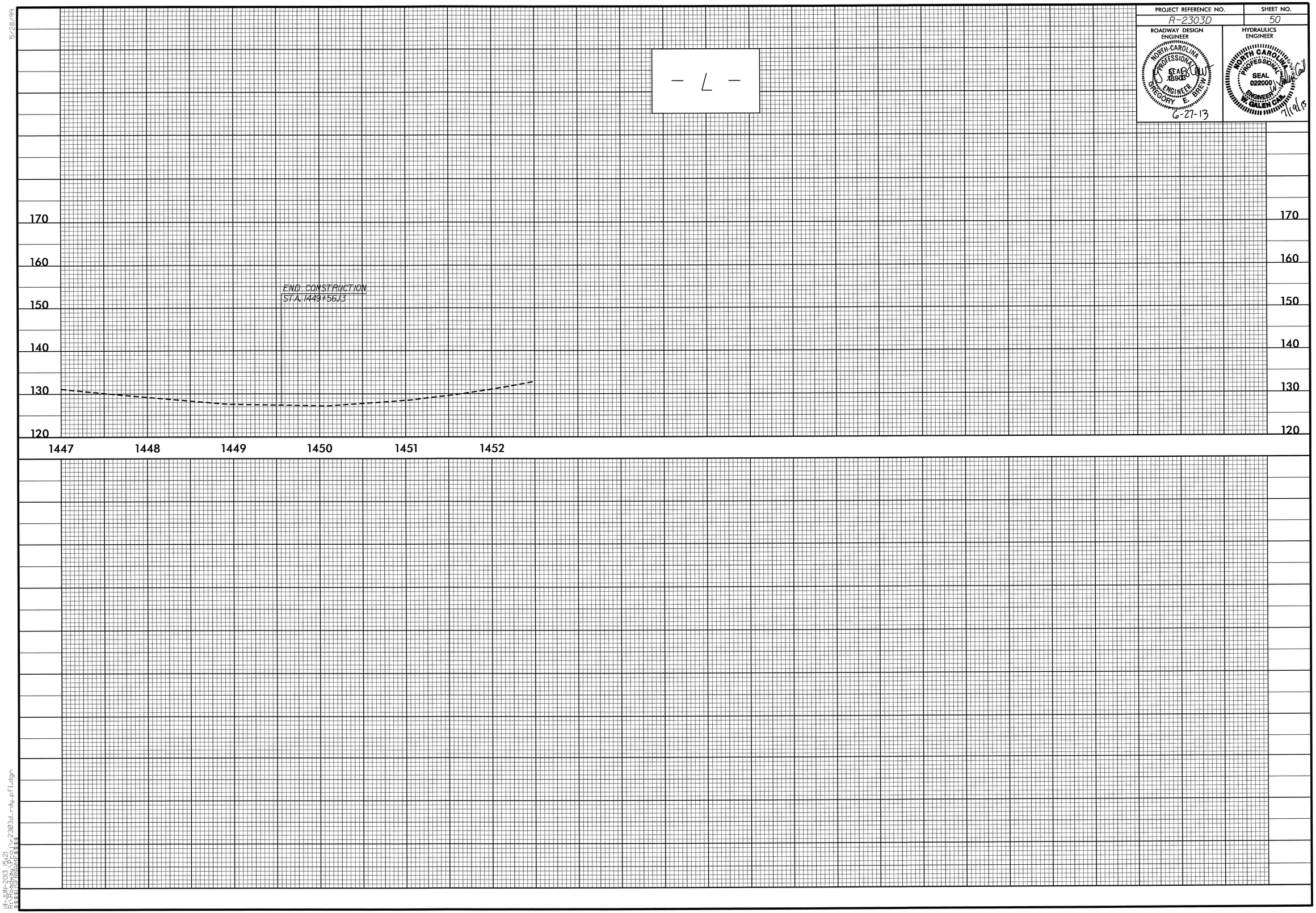
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL

7/19/13



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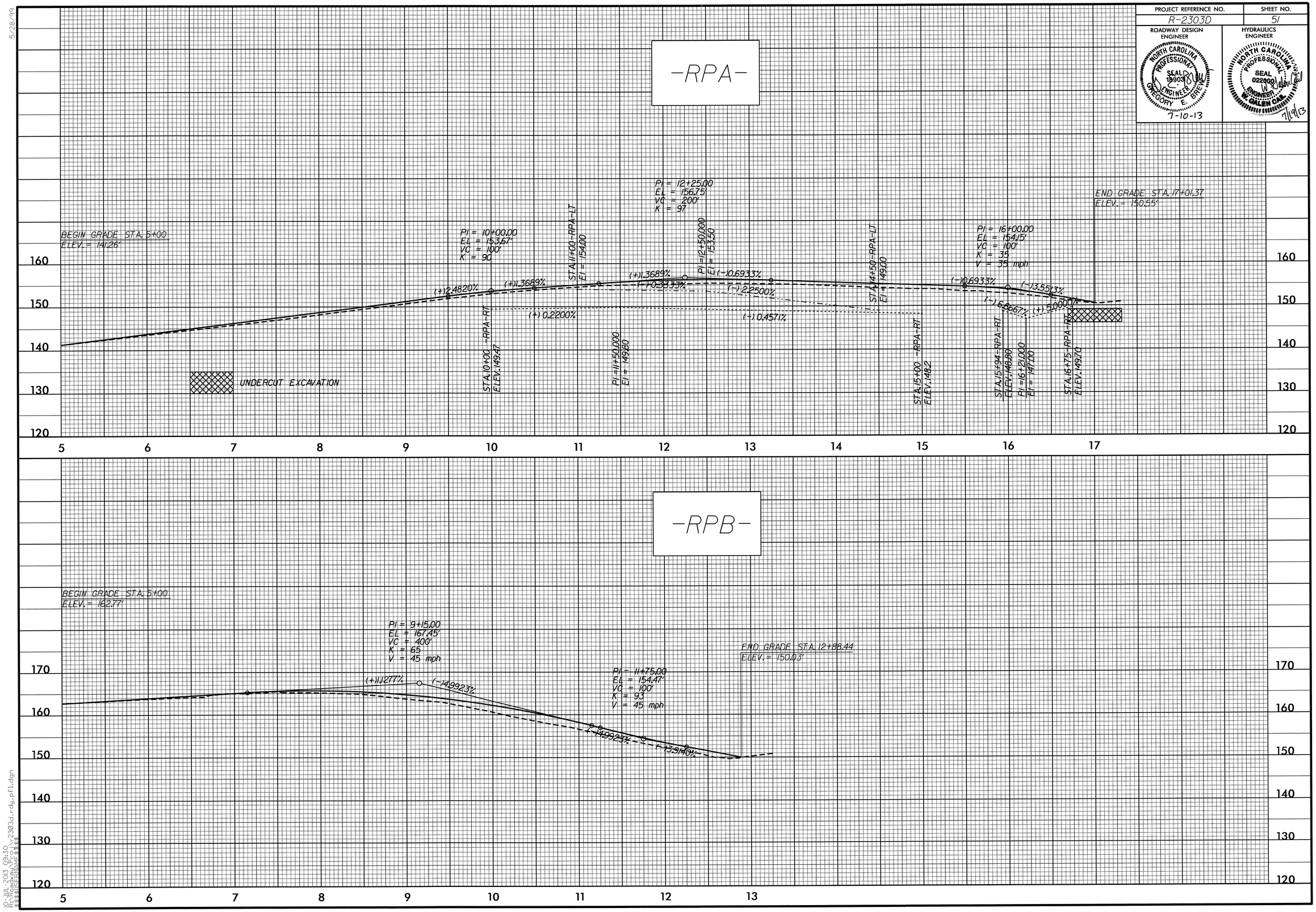
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	51

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19903 ENGINEER GREGORY E. BREW — 7-10-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL — 7/19/13



5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	52

ROADWAY DESIGN ENGINEER

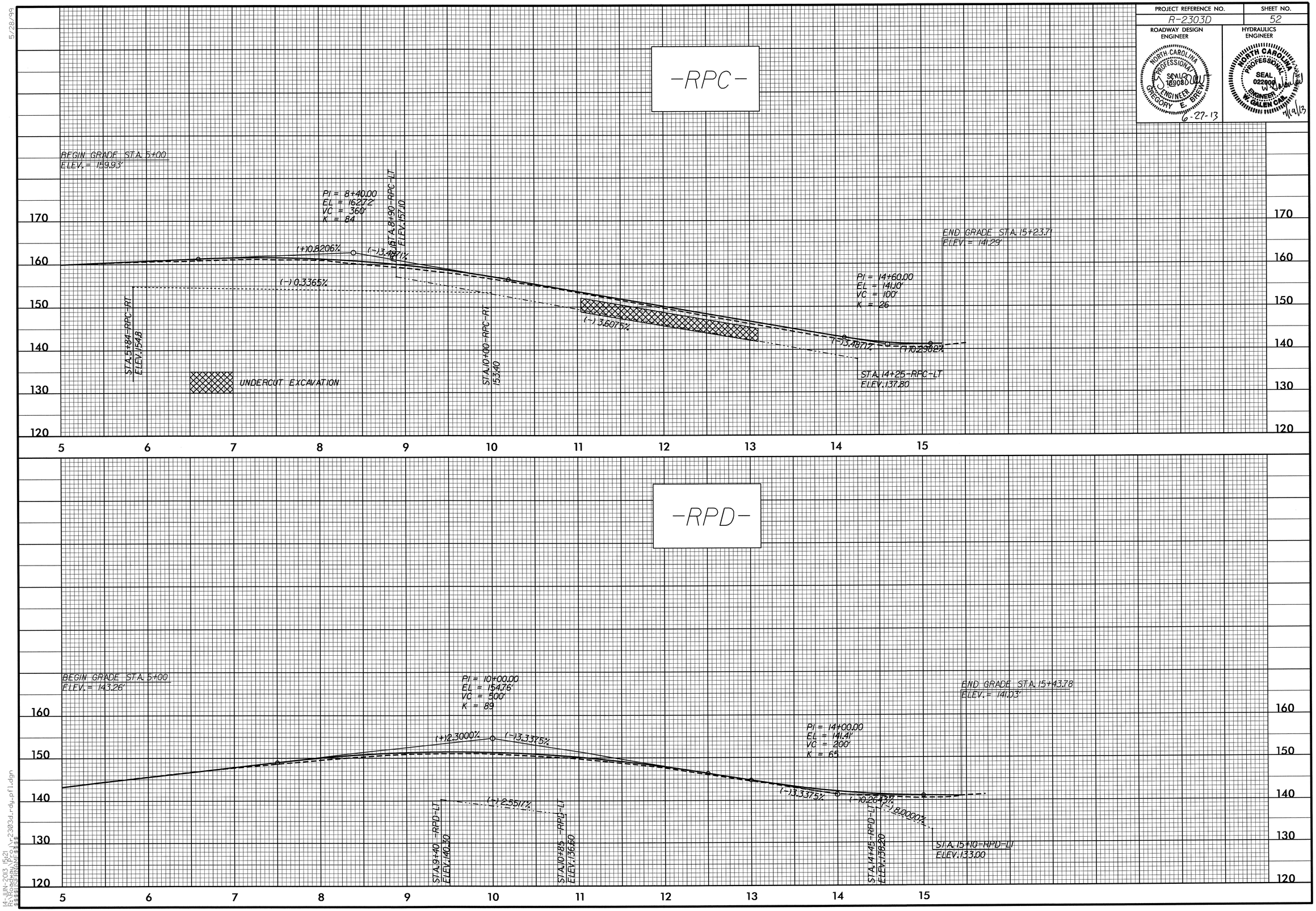
NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREW

6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL

7/19/13



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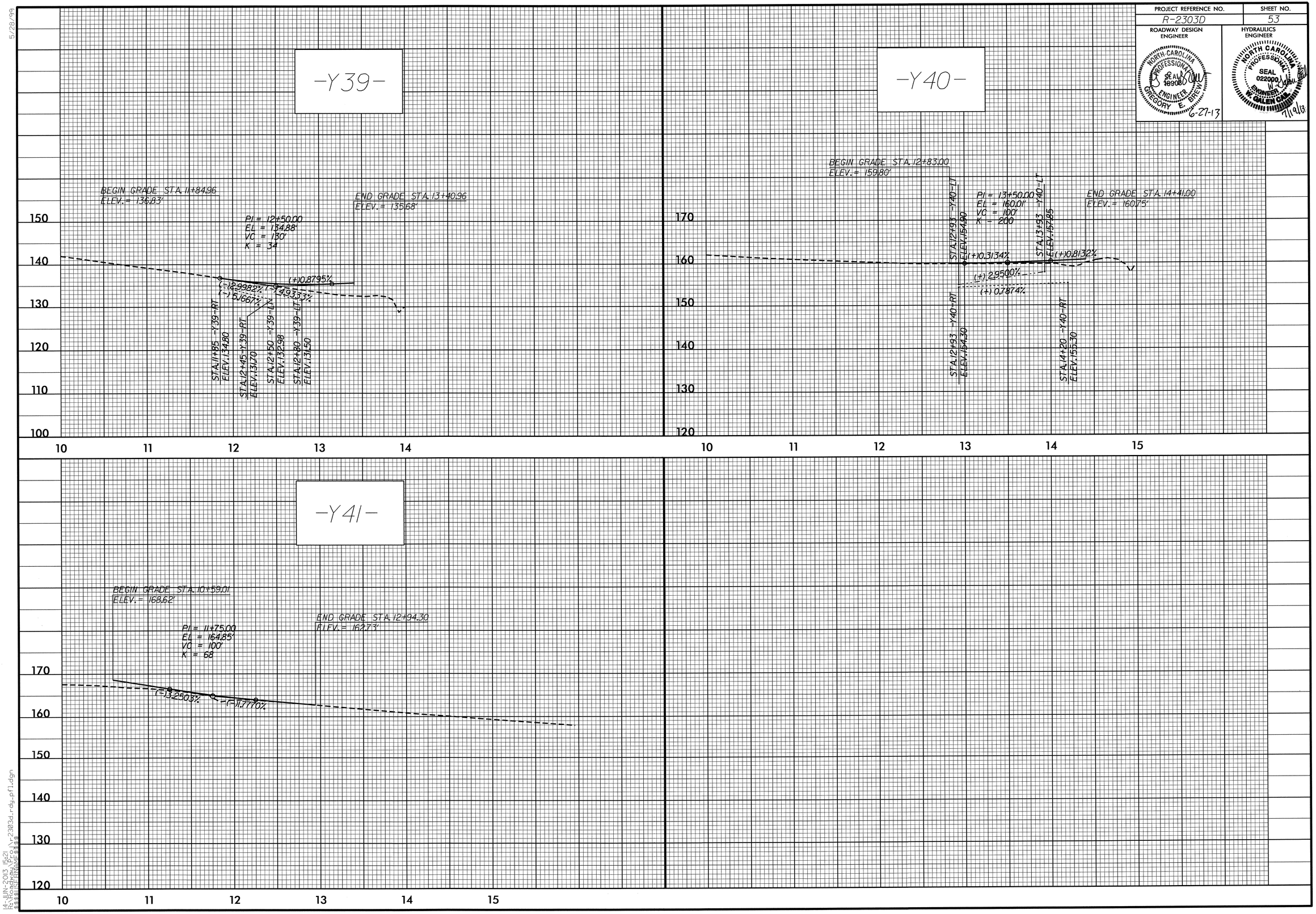
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	53

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREW 6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAS 7/19/13



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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	54

ROADWAY DESIGN ENGINEER

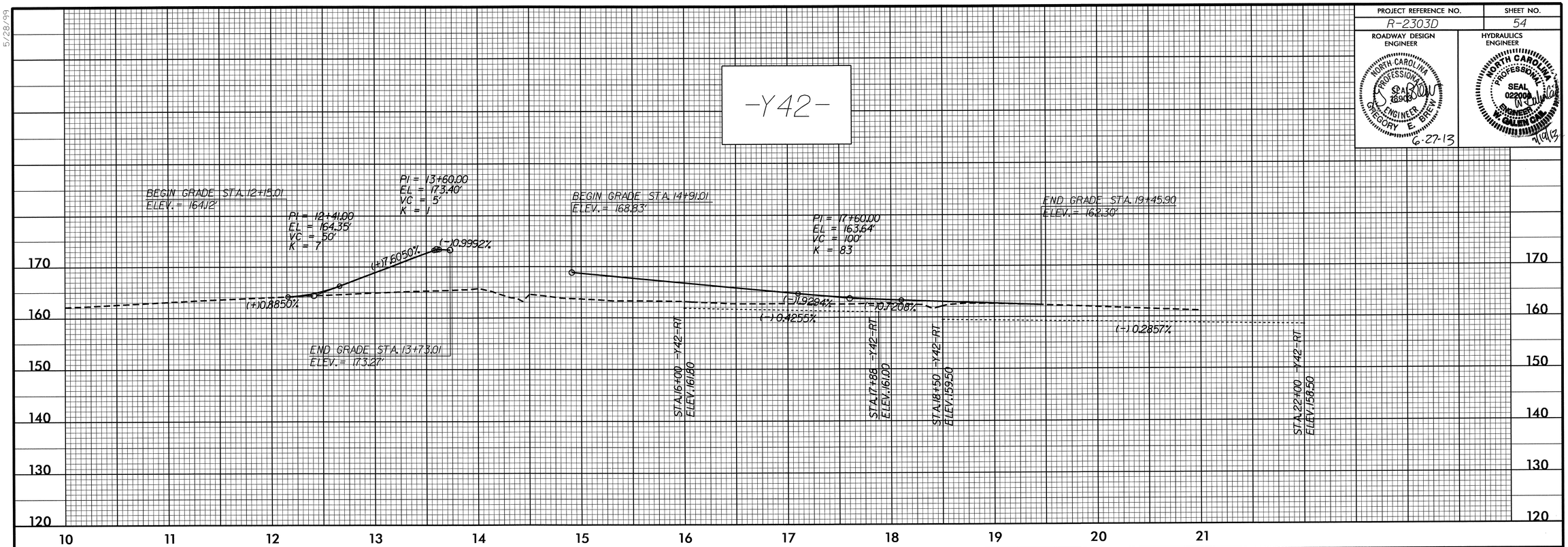
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022008 ENGINEER W. GALEN CAIL

7/19/13



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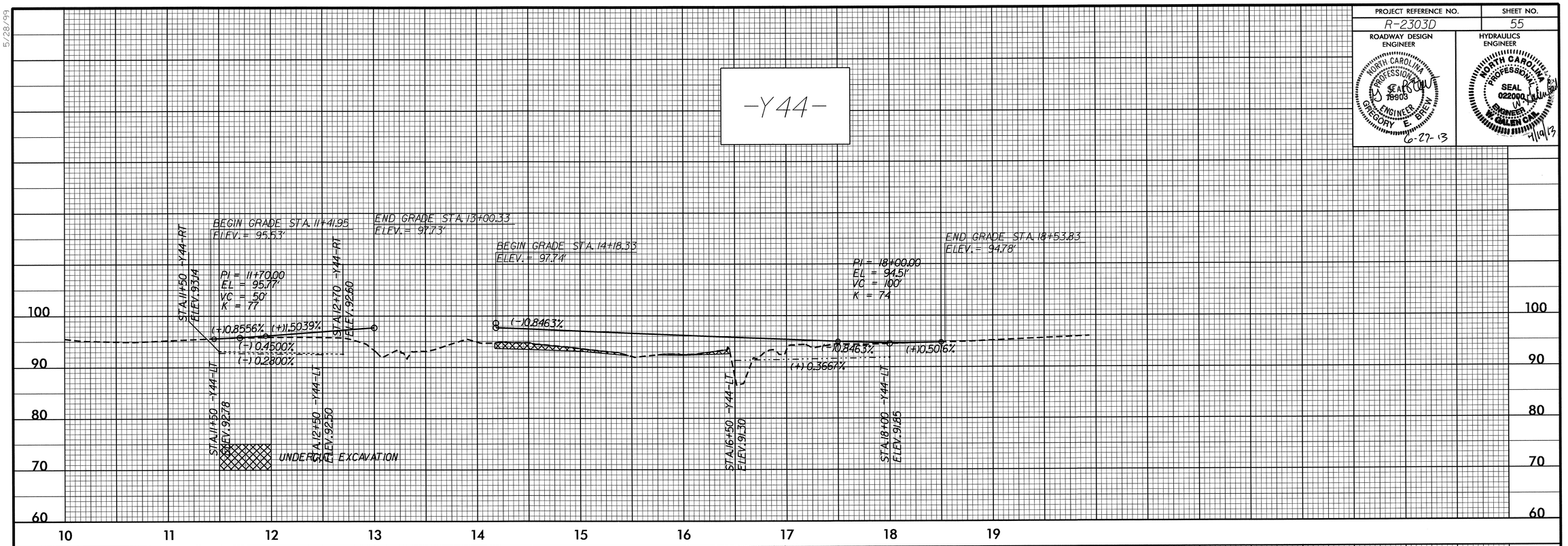
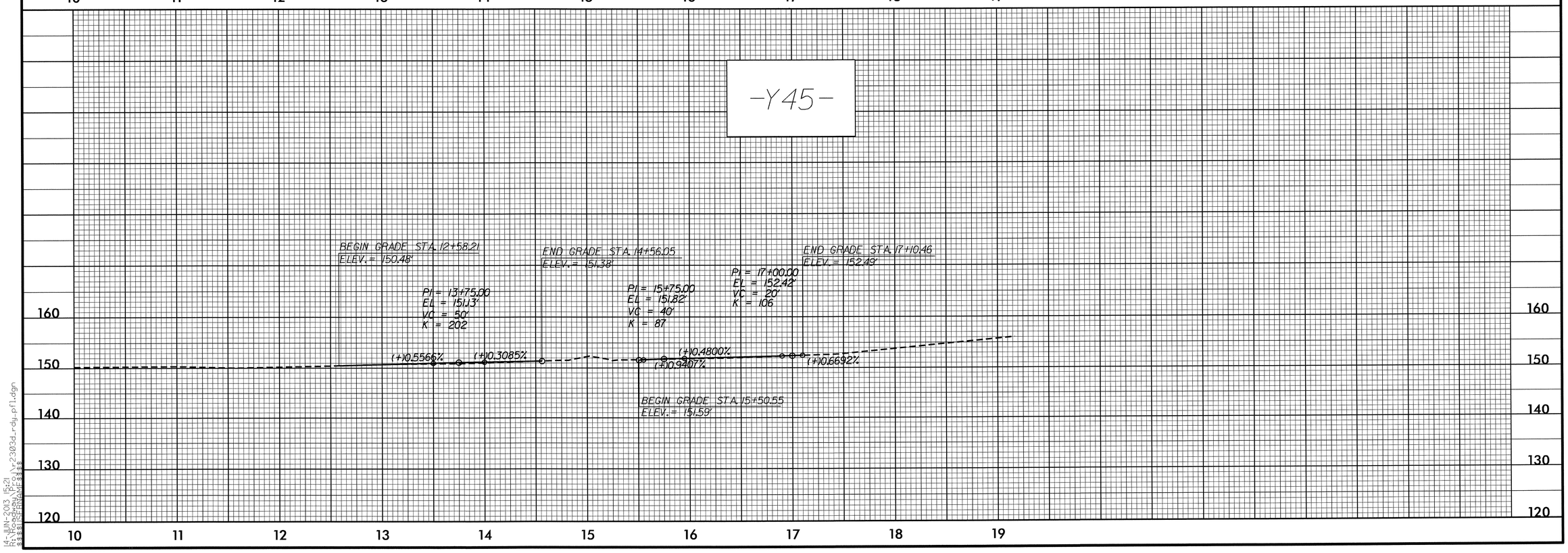
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	55

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19903 ENGINEER GREGORY E. BREW
6-27-13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER GALEN CAIN
7/19/13





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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	56

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

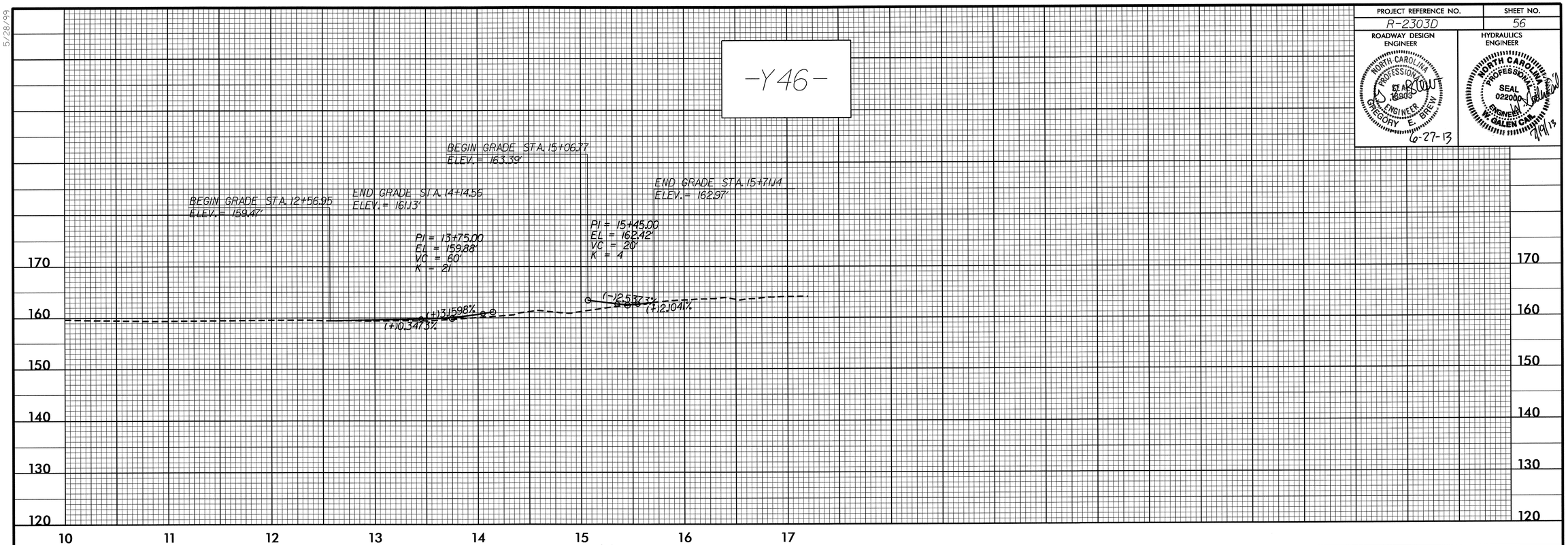
6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CLAR

7/19/13

-Y46-



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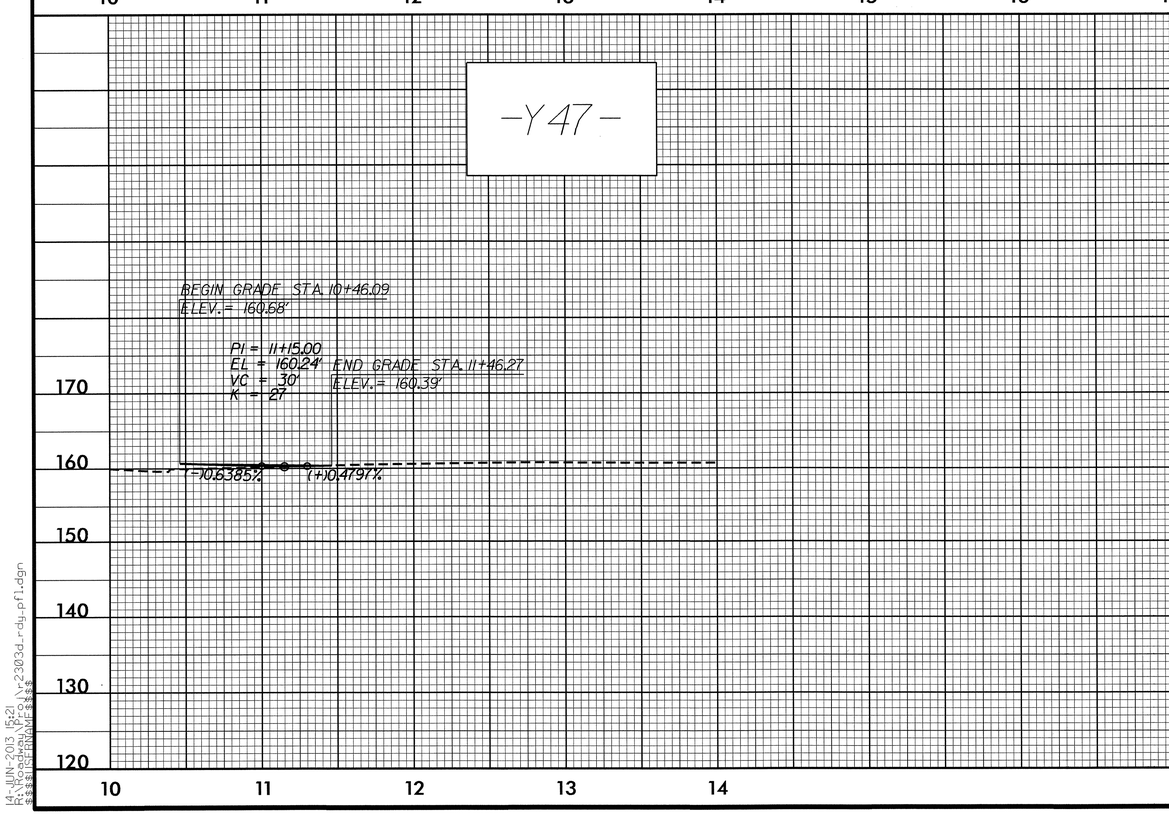

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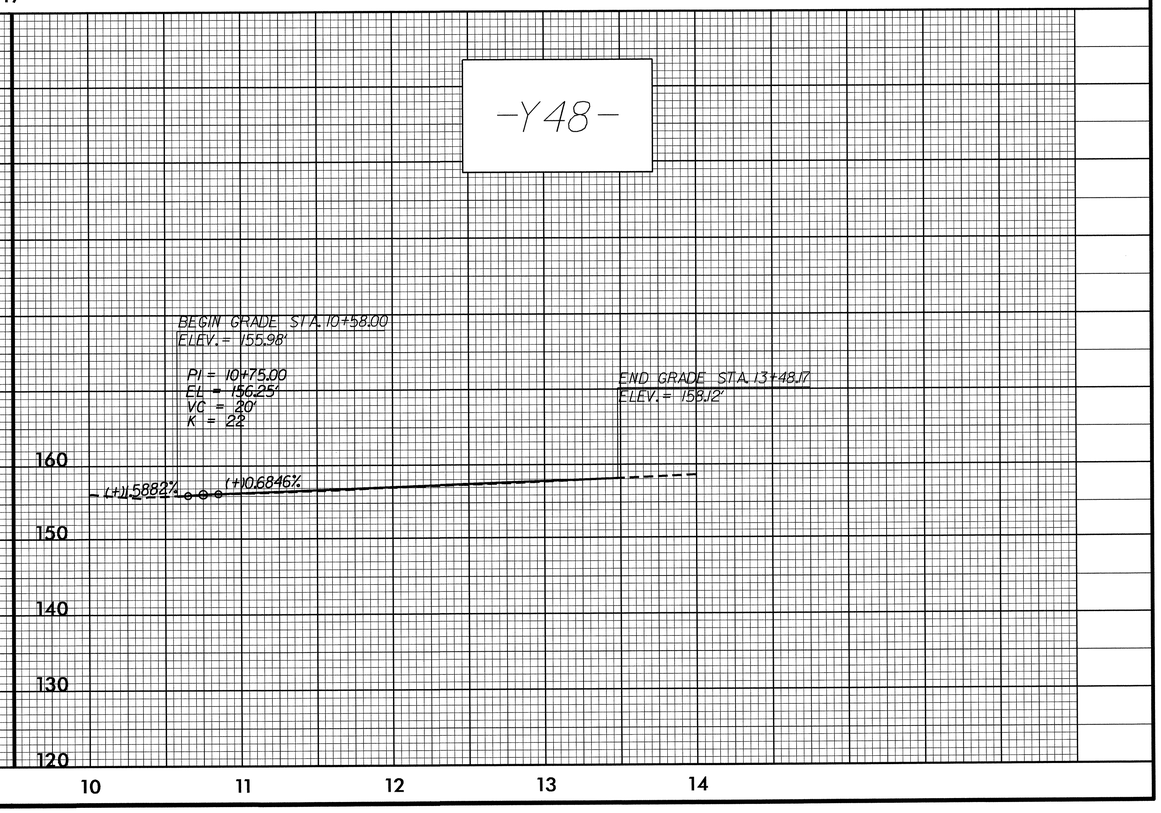

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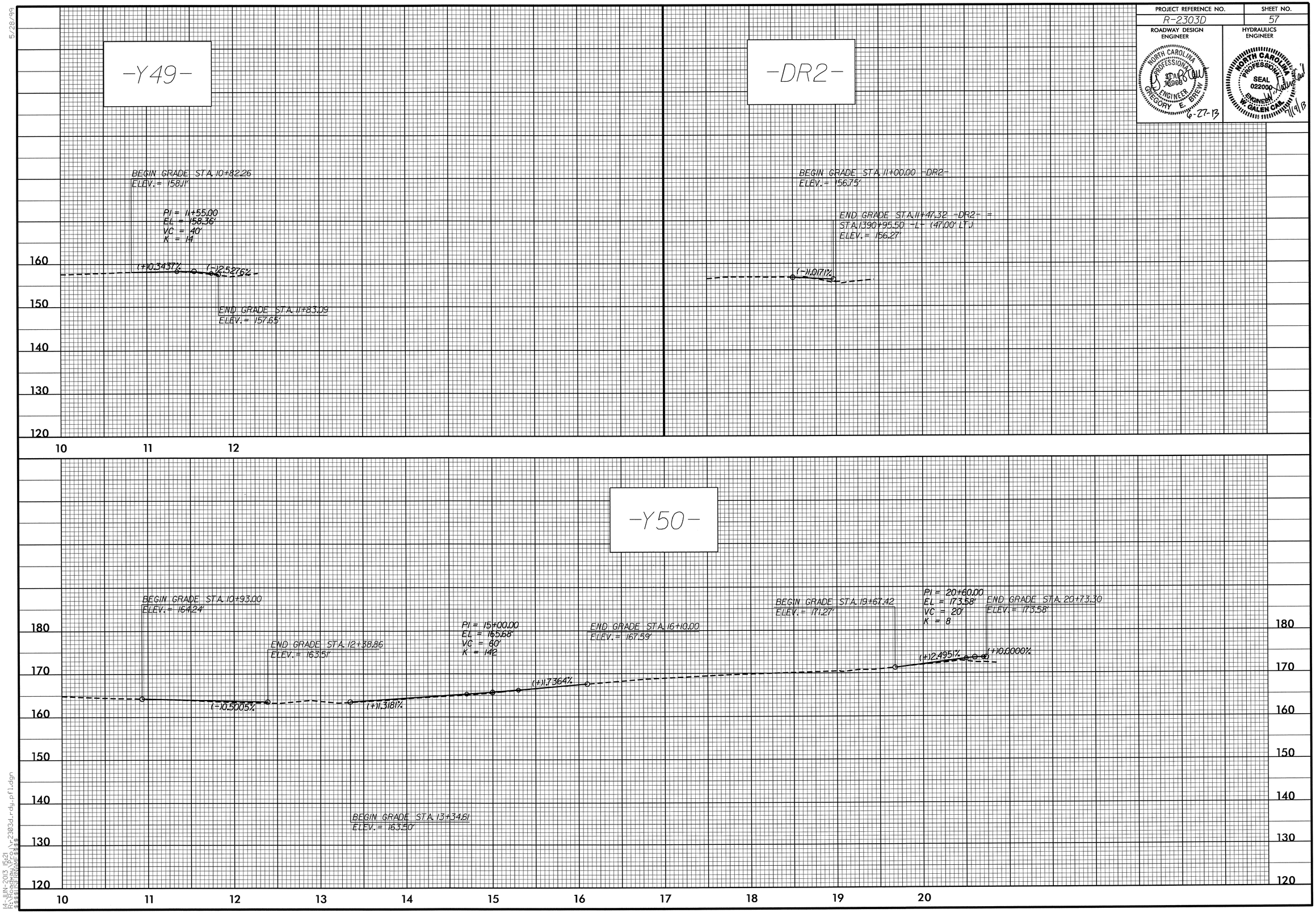
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	57
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16908 ENGINEER GREGORY E. BREW 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN 11/21/13



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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	58

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18998 ENGINEER GREGORY E. BREW

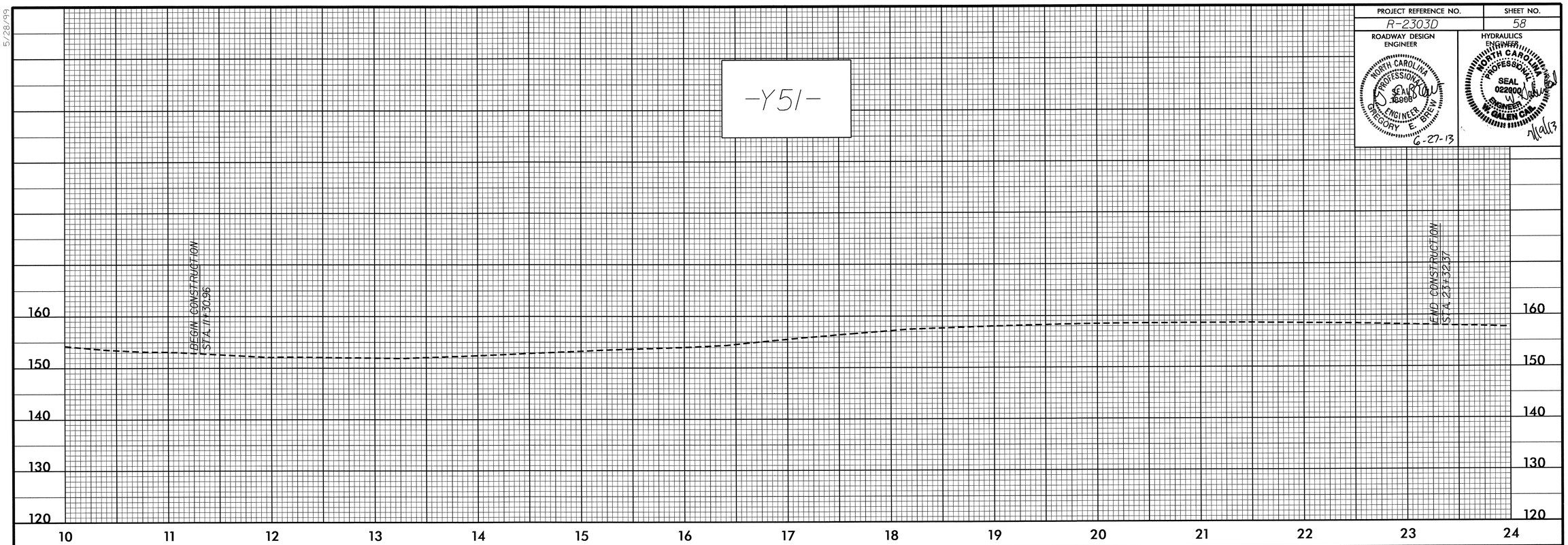
6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIN

7/19/13

-Y51-



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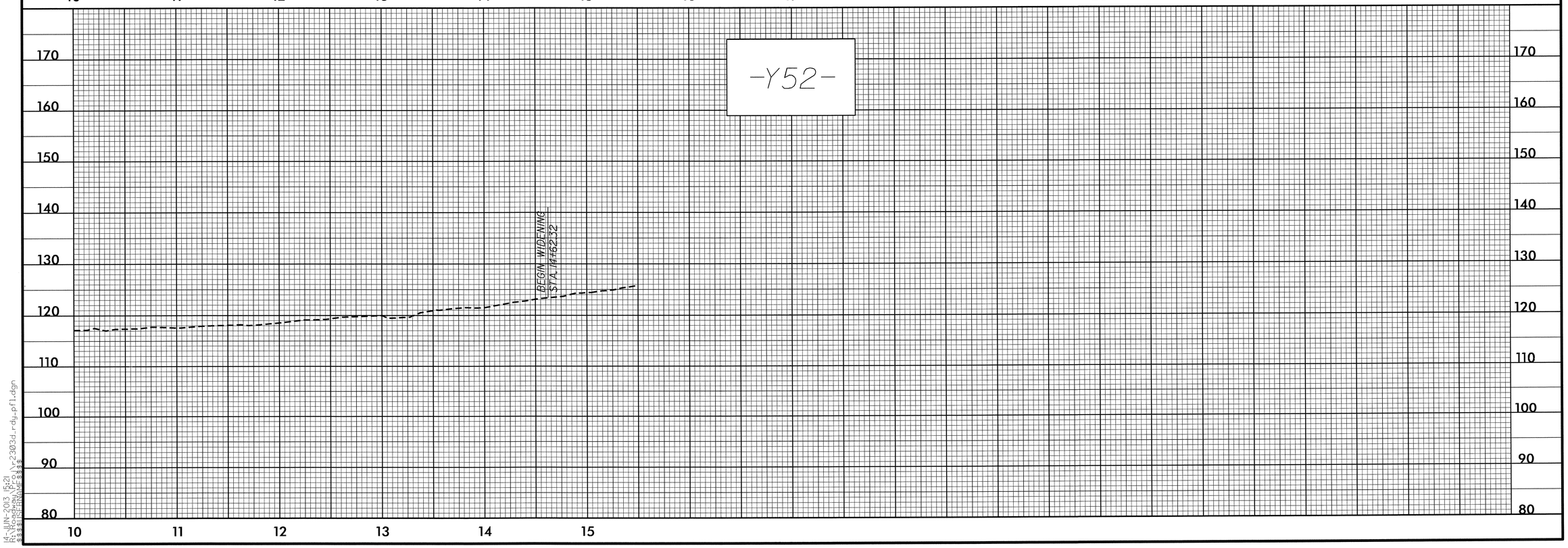

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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	59

ROADWAY DESIGN ENGINEER

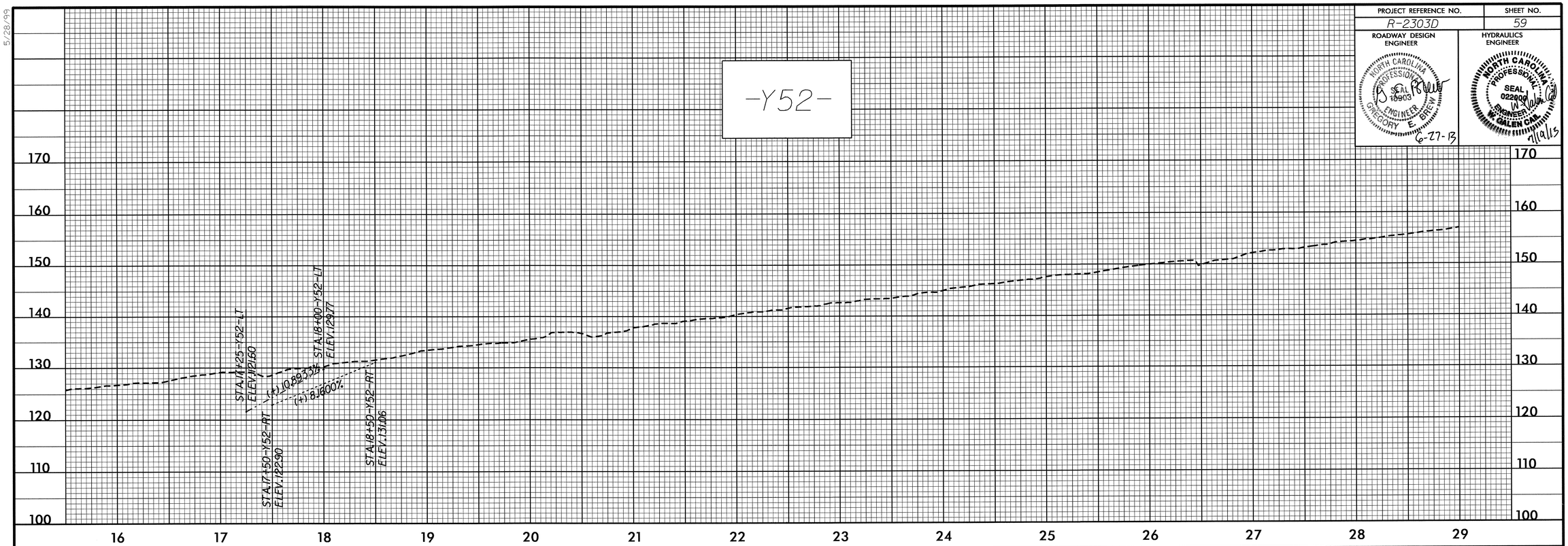
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

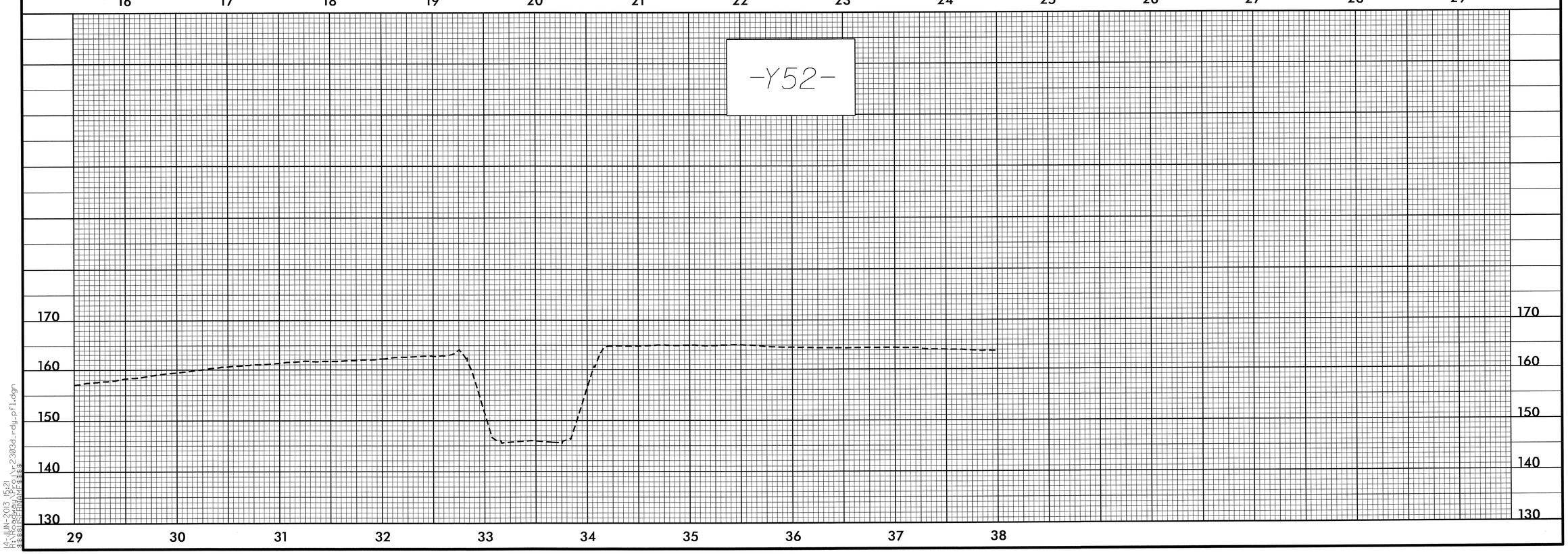
6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022909 ENGINEER W. GALEN CAB.

7/19/13





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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	60

ROADWAY DESIGN ENGINEER

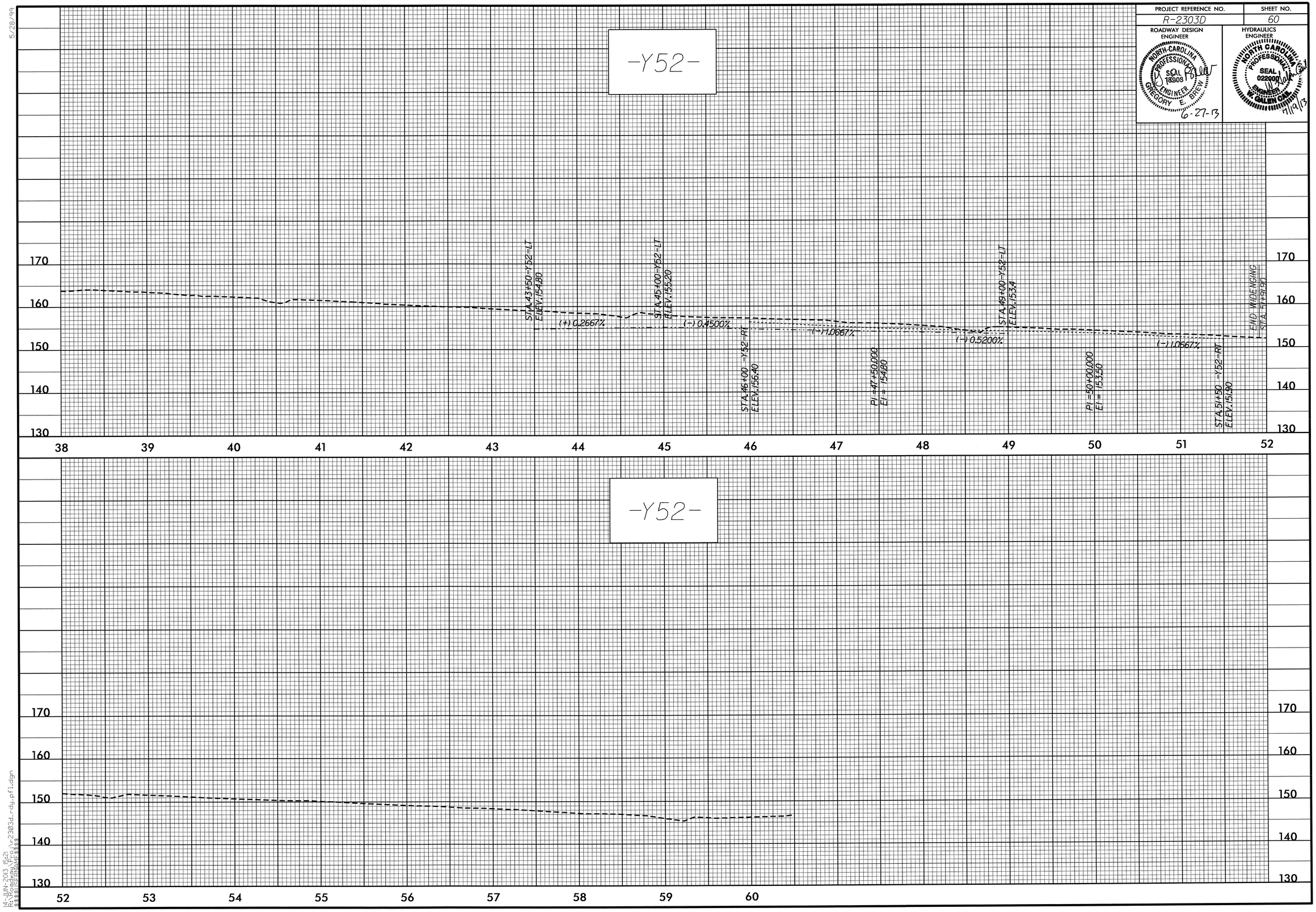
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

6-27-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022002 ENGINEER GALEN CAMP

7/19/13



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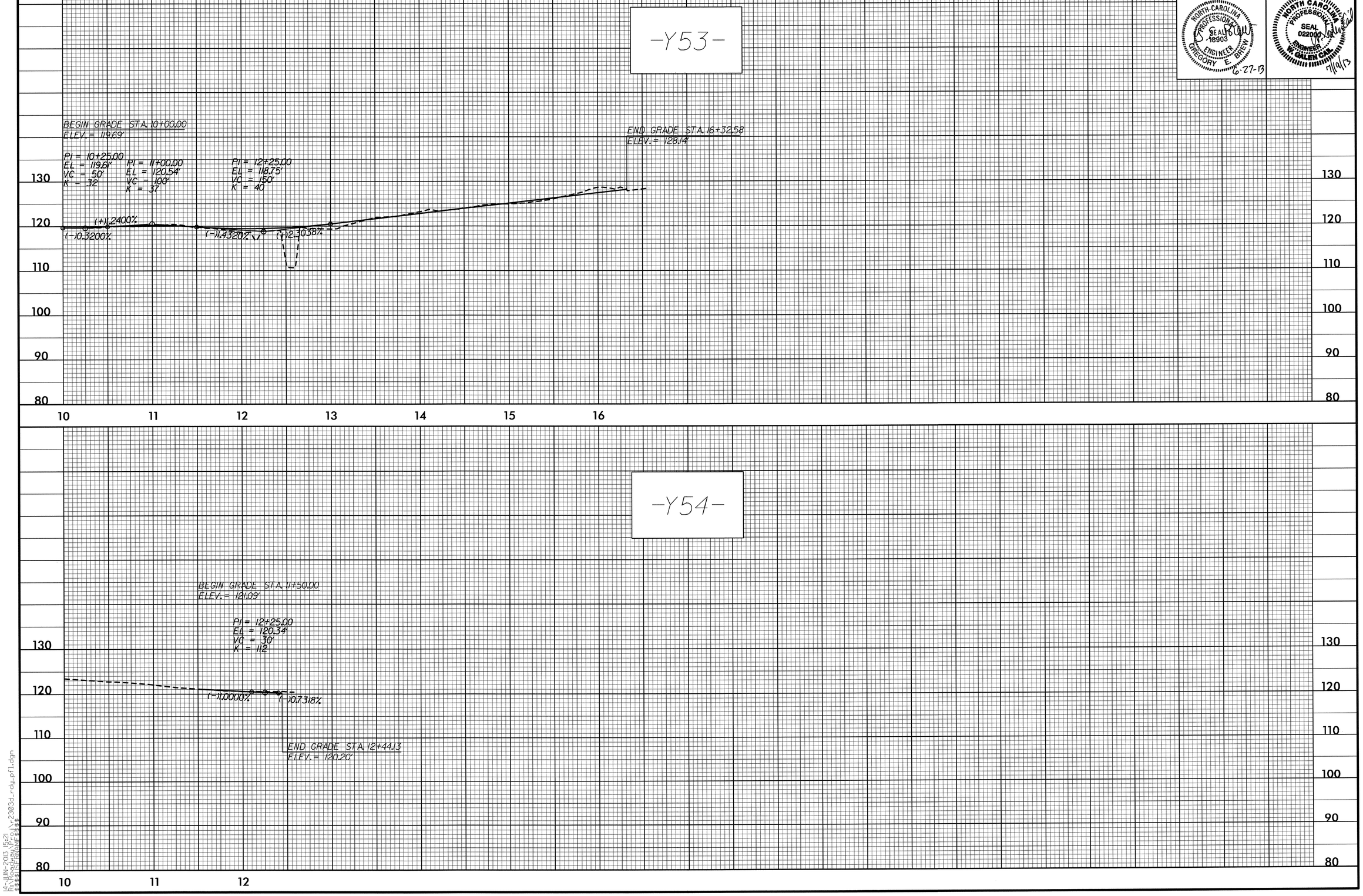
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 7/19/13



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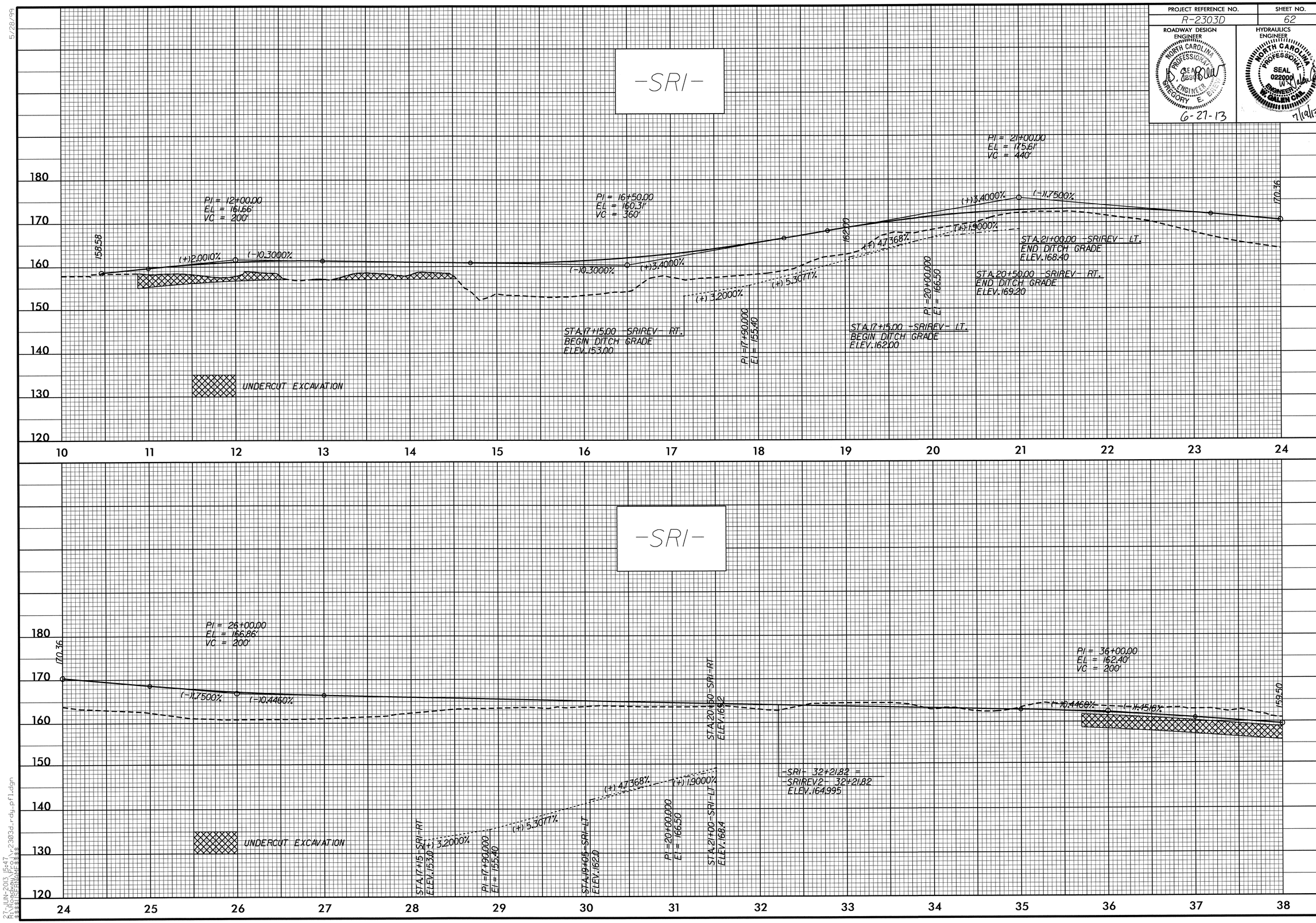
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	62

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18901 ENGINEER GREGORY E. BRIEN — 6-27-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CALL — 7/19/13



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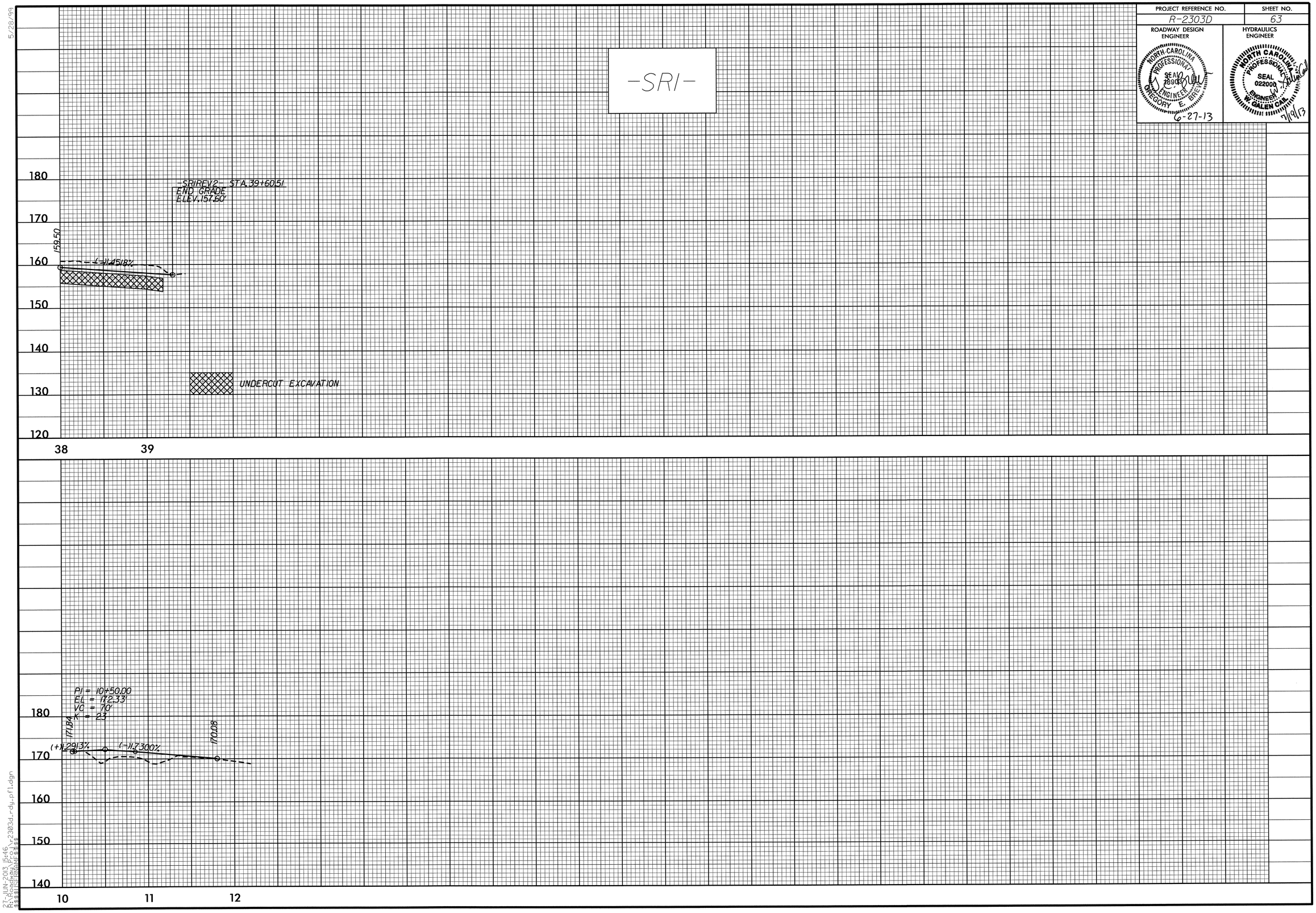
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	63
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18906 ENGINEER GREGORY E. BITE 6-27-13

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL 7/19/13



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PROJECT REFERENCE NO.	SHEET NO.
R-2303D	64

ROADWAY DESIGN ENGINEER

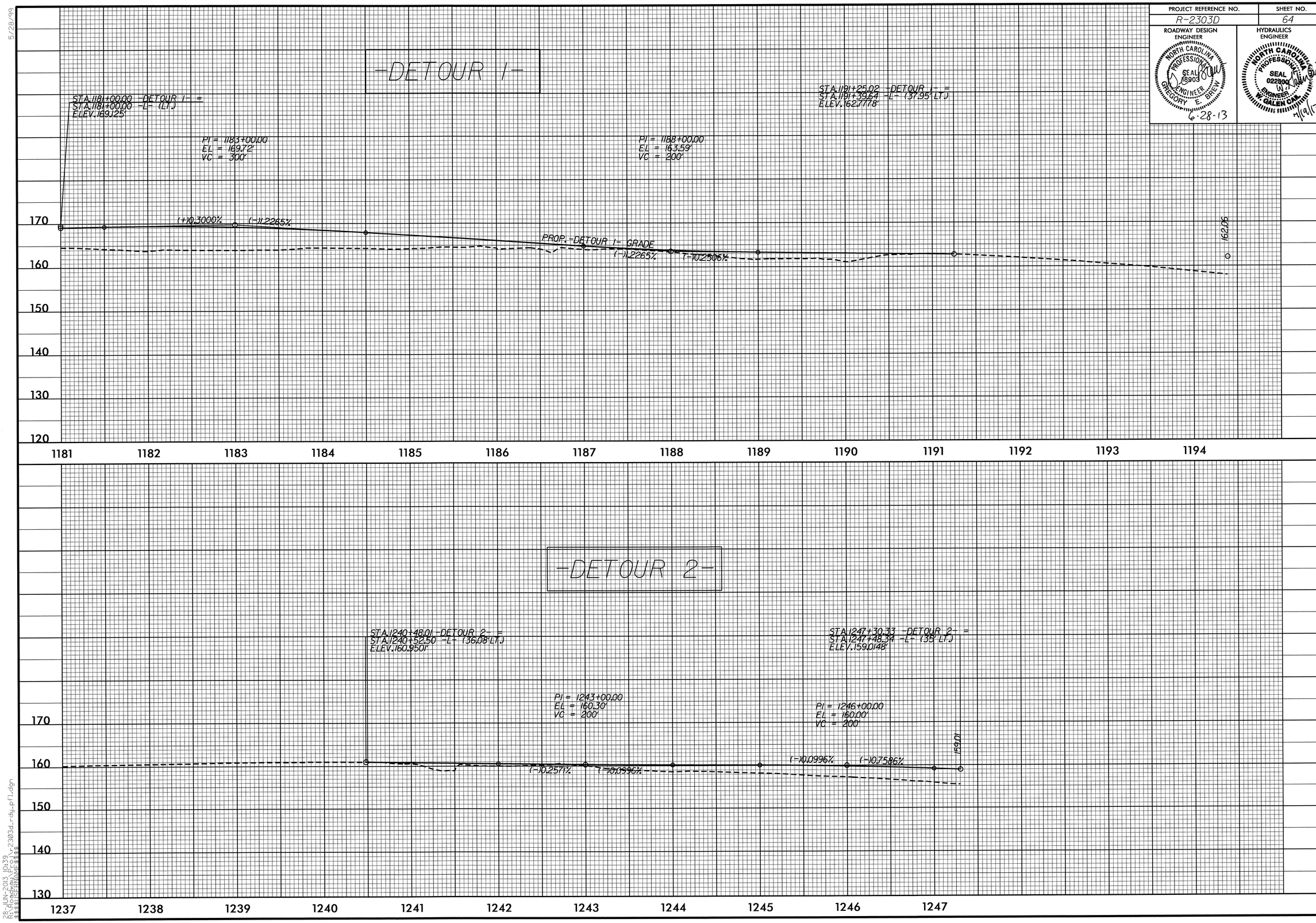
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

6-28-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022000 ENGINEER W. GALEN CAIL

7/19/13



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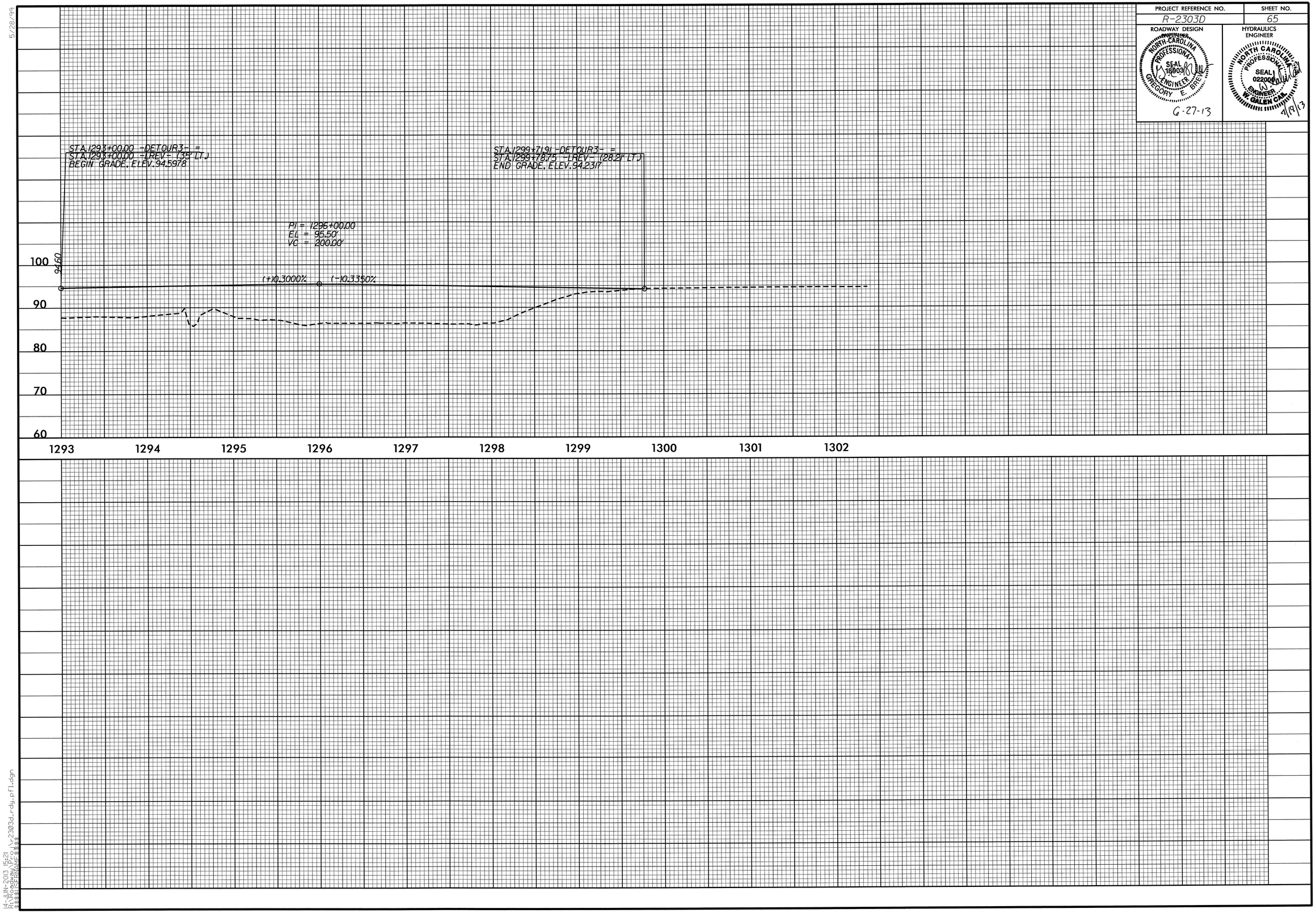
PROJECT REFERENCE NO.	SHEET NO.
R-2303D	65

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18003 ENGINEER GREGORY E. BREE
6-27-13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022004 ENGINEER W. GALEN CIA
7/19/13



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