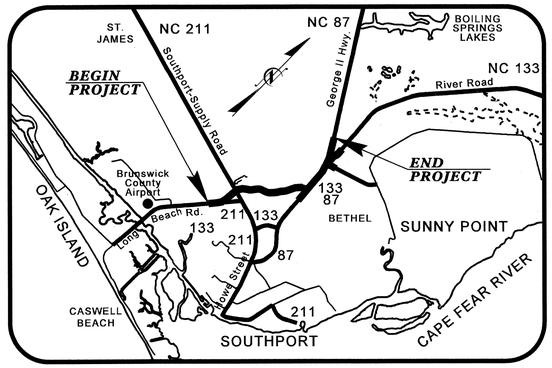
09/08/98

TIP PROJECT: R-3324

CONTRACT: C202155

See Sheet 1-A For Index of Sheets



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

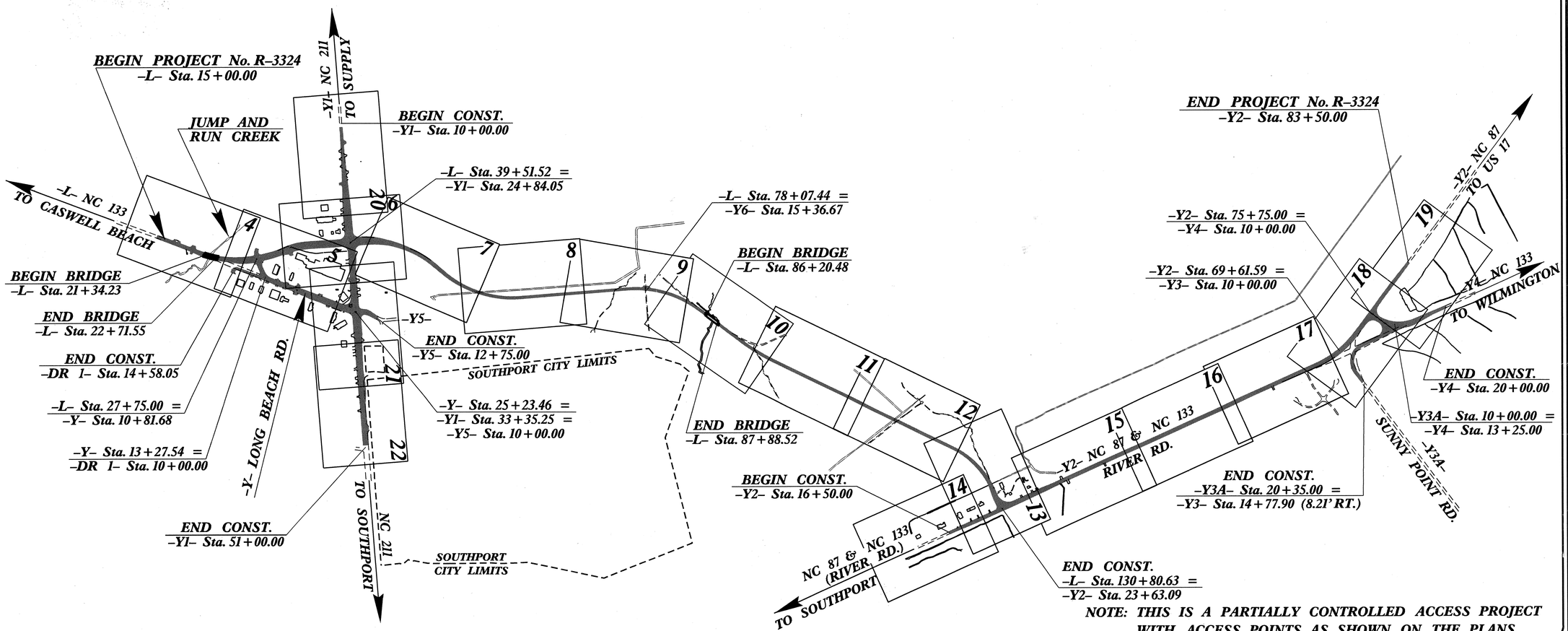
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3324	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34531.1.1	STP-0133(3)	PE
34531.2.1	STP-0133(3)	R/W & Utilities
34531.3.1	STP-0133(7)	CONST.

LOCATION: NEW ROUTE FROM NC 133 (LONG BEACH RD.) TO NC 133.

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, STRUCTURES, CULVERTS, RETAINING WALL.

NAD 83/95



NOTE: THIS IS A PARTIALLY CONTROLLED ACCESS PROJECT WITH ACCESS POINTS AS SHOWN ON THE PLANS.

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 2012 = 9,520 – 13,720

ADT 2033 = 13,620 – 47,170

DHV = 50 %

D = 10 %

T = 5 % *

V = 50 MPH

FUNCTIONAL CLASSIFICATION: LOCAL

* TTST 2% DUAL 3%

PROJECT LENGTH

LENGTH ROADWAY TIP No. R-3324 (-L-) = 2.193 MILES

LENGTH ROADWAY TIP No. R-3324 (-Y2-) = 1.134 MILES

LENGTH STRUCTURES PROJECT No. R-3324:

(@ Jump-n-Run Creek) = 0.026 MILES

(@ Trib. to Dutchman Creek) = 0.032 MILES

TOTAL LENGTH TIP PROJECT No. R-3324 = 3.269 MILES

THIS PROJECT DESIGNED USING STATEWIDE TIER GUIDELINES

Prepared In the Office of:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 31, 2008

LETTING DATE: MARCH 19, 2013

JIMMY GOODNIGHT, PE — PROJECT ENGINEER

STEVE KENDALL, PE — PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020870 ENGINEER MARC T. SHOWN

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL

SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

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$$$$USERNAME$$$$

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-3324	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KERNS
S.D. Kerns 12-3-12

2012 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-17-12
REV. 01-02-07

The following Roadway Standard as appears 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
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
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
DIVISION 6 – SUBGRADE, BASES AND SHOULDERS	
654.01	Pavement Repair
DIVISION 8 – INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structures and Concrete Pad (Shoulder Drains)
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
838.27	Reinforced Concrete Endwall – for Single 60" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall – Std. 838.21 thru 838.40
838.57	Reinforced Brick Endwalls – for Single 60" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall – Std. 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 – 12" thru 30" Pipe
840.15	Brick Drop Inlet – 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grate – for use with Std. Dwg. 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
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
840.27	Brick Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box – 12" thru 66" Pipe
840.32	Brick Junction Box – 12" thru 66" Pipe
840.34	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
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.04	Street Turnout
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring of Guardrail – B-77 and B-83 Anchor Units
866.01	Chain Link Fence – 4', 5' and 6' High Fence
866.02	Woven Wire Fence – with Wooden Posts
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES

2012 SPECIFICATIONS
EFFECTIVE DATE: 01-17-12
REVISED DATE 07-30-12

GRADE LINE:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATION CURVES SHALL BE IN ACCORDANCE WITH Std. No. 560.01.

SIDE ROADS:

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

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH Std. No. 815.03 AT LOCATIONS 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 THE BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE:
City of Southport Brunswick EMC Brunswick County Public Utilities
Progress Energy Atlantic Telephone Membership Corp.
A. T. & T. Telephone Time Warner Cable

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

RIGHT-OF-WAY MARKERS:

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

INDEX OF SHEETS

SHEET No.	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C thru 1-H	SURVEY CONTROL SHEET
1-I	CENTERLINE COORDINATION LIST
2 thru 2-E	PAVEMENT SCHEDULE, TYPICAL SECTIONS, WEDGING DETAILS, SUBGRADE CONSTRUCTION / SHALLOW UNDERCUT TYPICAL SECTION.
2-F	STRUCTURE TYPICAL SECTION, SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP.
2-G	DRAINAGE DETAILS
2-H	INTERSECTION DETAILS
2-I	STANDARD TEMP. SHORING DETAIL, Std. 1801.1
2-J thru 2-L	STANDARD TEMP. SHORING DETAIL, Std. 1801.2
2-M	DETAIL TO CONVERT EXISTING DROP INLET TO CATCH BASIN.
3 (2 SHEETS)	SUMMARY OF QUANTITIES
3-A thru 3-H	DRAINAGE SUMMARY (48" & UNDER) DRAINAGE SUMMARY (54" & OVER) GUARDRAIL SUMMARY
3-I	EARTHWORK SUMMARY
3-J	MISCELLANEOUS SUMMARIES: CHAIN LINK FENCE SUMMARY, WOVEN WIRE FENCE SUMMARY, REMOVAL OF EXISTING ASPHALT PAVEMENT, BREAKING OF EXISTING ASPHALT PAVEMENT.
3-J	GEOTECHNICAL SUMMARIES: BRIDGE WAITRING PERIOD SUBSURFACE DRAINAGE
3-K	PARCEL INDEX
4 thru 22	PLAN SHEETS
4-A	DETOUR PLAN SHEETS
23 thru 35	PROFILE SHEETS
TMP-1 thru TMP-36	TRANSPORTATION MANAGEMENT PLAN
PM-1 thru PM-11	PAVEMENT MARKING PLANS
EC-1 thru EC-45	EROSION CONTROL PLAN
RF-1 thru RF-3	REFORESTATION PLAN
SIGN-1 thru SIGN-14	SIGNING PLANS
SIG-1 thru SIG-58	SIGNAL PLANS
UC-1 thru UC-23	UTILITIES CONSTRUCTION PLANS
UO-1 thru U0-16	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION INDEX OF SHEETS
X-1A thru X-1C	CROSS-SECTION SUMMARY SHEETS
X-2 thru X-150	CROSS-SECTIONS
C-1 thru C-10	CULVERT STRUCTURE PLANS
S-1 thru S-76	BRIDGE STRUCTURE PLANS
W-1 thru W-3	RETAINING WALL PLANS

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	1-B

04/16/11

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:

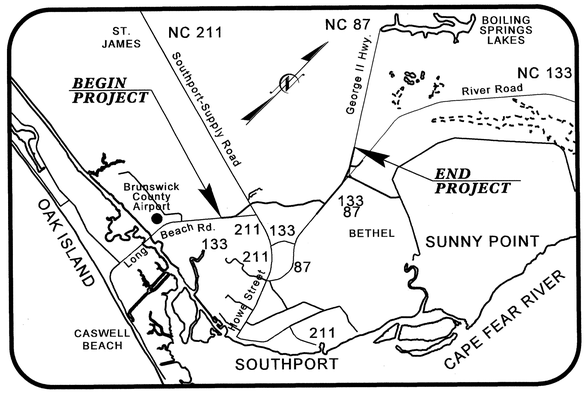
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

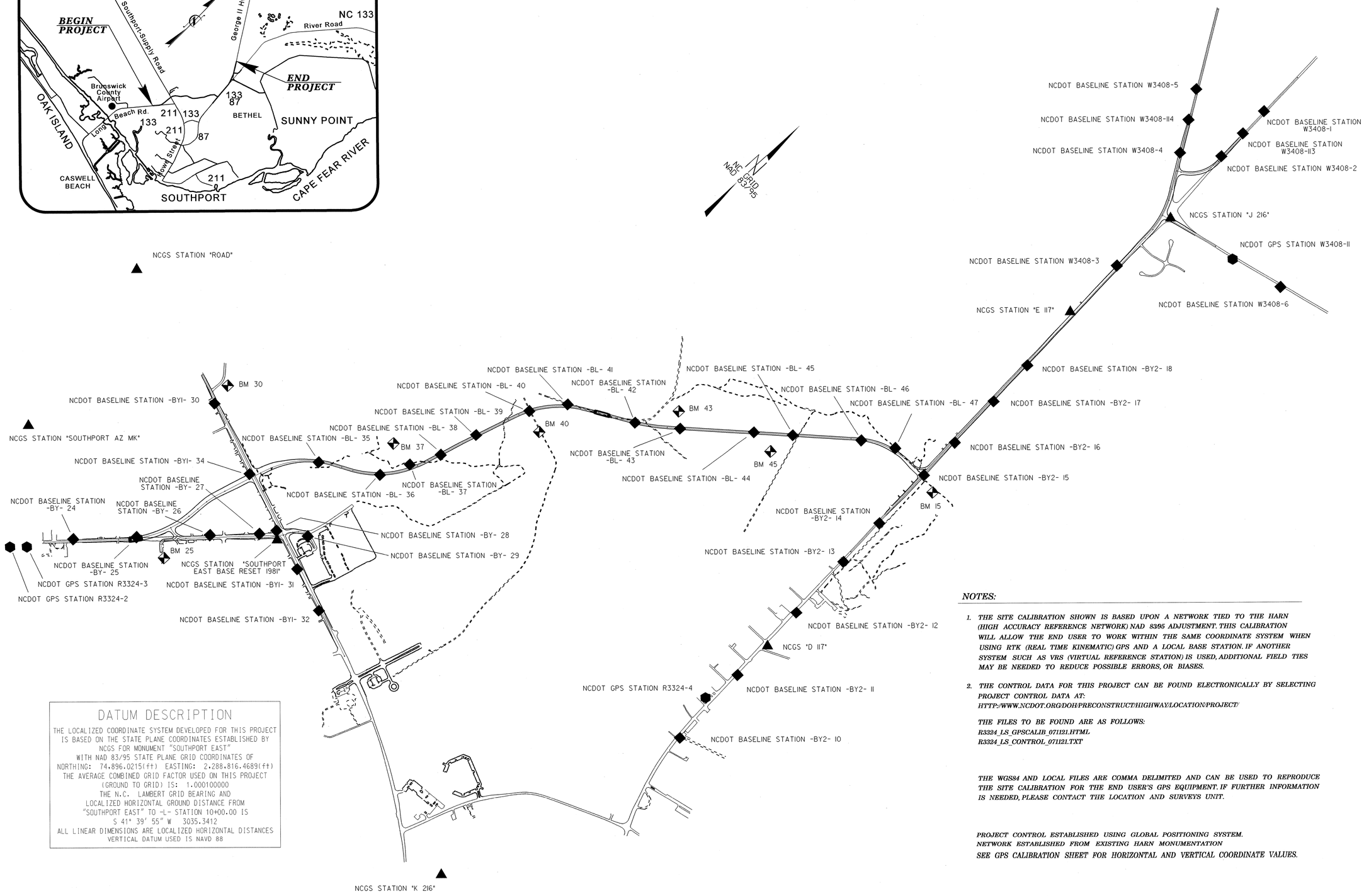
MISCELLANEOUS:

- 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.

PROJECT REFERENCE NO.	SHEET NO.
R-3324	1-C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS





DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "SOUTHPORT EAST"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 74,896.0215(ft) EASTING: 2,288,816.4689(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000100000
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SOUTHPORT EAST" TO -L- STATION 10+00.00 IS
S 41° 39' 55" W 3035.3412
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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

2. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
R3324_LS_GPSCALIB_071121.HTML
R3324_LS_CONTROL_071121.TXT

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

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

5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	1-D

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GPS CALIBRATION REPORT

PROJECT : R3324

TIP NUMBER	R3324		
USER NAME	JNEAL	DATE & TIME	11:52:31 AM 10/10/2005
COORDINATE SYSTEM	US STATE PLANE 1983(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM	NAVD 88	GEOID MODEL	GEOID03 (CONUS) NC SUB GRID
COORDINATE UNITS	US SURVEY FEET		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	US SURVEY FEET		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	33°57'07.08872"N
LONGITUDE	78°02'51.95161"W
SITE SCALE FACTOR	0.9999000100
HEIGHT	-87.8847SFT

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

DATUM TRANSFORMATION PARAMETERS

DATUM TRANSFORMATION COMPUTATION NOT REQUESTED

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION

UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ROTATION CENTER	76973.8767SFT
EASTING COORDINATE OF ROTATION CENTER	2288670.7106SFT
ROTATION ABOUT THE CENTER POINT	0°00'00"
TRANSLATION NORTH	-0.0018SFT
TRANSLATION EAST	-0.0220SFT
SCALE FACTOR	1.00000183

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	86560.1485SFT
EASTING COORDINATE OF ORIGIN POINT	2294460.6210SFT
VERTICAL SEPARATION AT ORIGIN	-0.0522SFT
SLOPE NORTH	-5.209PPM
SLOPE EAST	0.521PPM

GEOID MODEL DEFINITION

GEOID03 (CONUS) NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.041SFT	0.007	K 216 GPS
VERTICAL	0.006SFT	0.001	R3324-3 GPS
THREE-DIMENSIONAL	0.041SFT	0.007	K 216 GPS

POINT RESIDUALS

WGS84 COORDINATES		CALCULATED POINT FOR DISPLAY ONLY		LOCAL COORDINATES	
POINT	W3408-11 GPS	NORTHING	86560.1485SFT	POINT	W3408-11
LATITUDE	33°59'01.92596"N	EASTING	2294460.6210SFT	NORTHING	86560.1335SFT
LONGITUDE	78°01'43.60234"W	ELEVATION	36.8964SFT	EASTING	2294460.6221SFT
HEIGHT	-84.5267SFT	HORZ ERROR	0.015SFT	ELEVATION	36.8963SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.015SFT	QUALITY	ADJUSTED QUALITY
POINT	J 216 GPS	NORTHING	86318.0862SFT	POINT	J 216
LATITUDE	33°58'59.62175"N	EASTING	2293527.0193SFT	NORTHING	86318.0651SFT
LONGITUDE	78°01'54.71623"W	ELEVATION	39.4448SFT	EASTING	2293527.0187SFT
HEIGHT	-81.9499SFT	HORZ ERROR	0.021SFT	ELEVATION	39.4455SFT
		VERT ERROR	0.001SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.021SFT	QUALITY	CONTROL QUALITY
POINT	E 117 GPS	NORTHING	84538.1043SFT	POINT	E 117
LATITUDE	33°58'42.01259"N	EASTING	2293548.4460SFT	NORTHING	84538.0924SFT
LONGITUDE	78°01'54.66794"W	ELEVATION	35.9634SFT	EASTING	2293548.4502SFT
HEIGHT	-85.4793SFT	HORZ ERROR	0.013SFT	ELEVATION	35.9678SFT
		VERT ERROR	0.004SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.013SFT	QUALITY	CONTROL QUALITY
POINT	D 117 GPS	NORTHING	78695.5268SFT	POINT	D 117
LATITUDE	33°57'44.16419"N	EASTING	2294122.0299SFT	NORTHING	78695.5292SFT
LONGITUDE	78°01'48.53524"W	ELEVATION	31.0203SFT	EASTING	2294122.0391SFT
HEIGHT	-90.5931SFT	HORZ ERROR	0.010SFT	ELEVATION	31.0175SFT
		VERT ERROR	0.003SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.010SFT	QUALITY	ADJUSTED QUALITY
POINT	R3324-4 GPS	NORTHING	77658.0739SFT	POINT	R3324-4
LATITUDE	33°57'33.90333"N	EASTING	2294108.6372SFT	NORTHING	77658.0872SFT
LONGITUDE	78°01'48.81454"W	ELEVATION	30.8585SFT	EASTING	2294108.6471SFT
HEIGHT	-90.7804SFT	HORZ ERROR	0.017SFT	ELEVATION	30.8559SFT
		VERT ERROR	0.003SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.017SFT	QUALITY	ADJUSTED QUALITY
POINT	K 216 GPS	NORTHING	70153.6678SFT	POINT	K 216
LATITUDE	33°56'19.55166"N	EASTING	2295355.3399SFT	NORTHING	70153.7066SFT
LONGITUDE	78°01'34.88894"W	ELEVATION	22.6212SFT	EASTING	2295355.3525SFT
HEIGHT	-99.2481SFT	HORZ ERROR	0.041SFT	ELEVATION	22.6213SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.041SFT	QUALITY	CONTROL QUALITY
POINT	SOUTHPORT EB GPS	NORTHING	74896.0158SFT	POINT	SOUTHPORT EB
LATITUDE	33°57'07.08872"N	EASTING	2288816.4465SFT	NORTHING	74896.0215SFT
LONGITUDE	78°02'51.95161"W	ELEVATION	33.6079SFT	EASTING	2288816.4689SFT
HEIGHT	-87.8941SFT	HORZ ERROR	0.023SFT	ELEVATION	33.6023SFT
		VERT ERROR	0.006SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.024SFT	QUALITY	CONTROL QUALITY
POINT	R3324-3 GPS	NORTHING	71868.6673SFT	POINT	R3324-3
LATITUDE	33°56'37.39808"N	EASTING	2286117.3215SFT	NORTHING	71868.6731SFT
LONGITUDE	78°03'24.33096"W	ELEVATION	35.5067SFT	EASTING	2286117.3230SFT
HEIGHT	-85.9584SFT	HORZ ERROR	0.006SFT	ELEVATION	35.5132SFT
		VERT ERROR	0.006SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.009SFT	QUALITY	ADJUSTED QUALITY
POINT	R3324-2 GPS	NORTHING	70968.5914SFT	POINT	R3324-2
LATITUDE	33°56'28.56678"N	EASTING	2285350.7807SFT	NORTHING	70968.5936SFT
LONGITUDE	78°03'33.52993"W	ELEVATION	19.0419SFT	EASTING	2285350.7670SFT
HEIGHT	-102.4122SFT	HORZ ERROR	0.014SFT	ELEVATION	19.0429SFT
		VERT ERROR	0.001SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.014SFT	QUALITY	ADJUSTED QUALITY
POINT	SOUTHPORT AZ MK	NORTHING	65045.3128SFT	POINT	SOUTHPORT AZ MK
LATITUDE	33°55'30.52359"N	EASTING	2279444.5691SFT	NORTHING	65045.3104SFT
LONGITUDE	78°04'44.27846"W	ELEVATION	16.9423SFT	EASTING	2279444.5312SFT
HEIGHT	-104.3983SFT	HORZ ERROR	0.038SFT	ELEVATION	16.9422SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.038SFT	QUALITY	CONTROL QUALITY
POINT	ROAD GPS	NORTHING	80010.4292SFT	POINT	ROAD
LATITUDE	33°57'59.35969"N	EASTING	2270526.3631SFT	NORTHING	80010.4111SFT
LONGITUDE	78°06'28.50573"W	ELEVATION	51.3332SFT	EASTING	2270526.3545SFT
HEIGHT	-69.3078SFT	HORZ ERROR	0.020SFT	ELEVATION	51.3319SFT
		VERT ERROR	0.001SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.020SFT	QUALITY	ADJUSTED QUALITY

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "SOUTHPORT EAST BASE RESET 1981 " WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 74,896.0215(ft) EASTING: 2,288,816.4689(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000100000
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SOUTHPORT EAST " TO -L- STATION 10+00.00 IS S 41°39' 55" W 3035.3412
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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

2. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
R3324_LS_GPSCALIB_071121.HTML
R3324_LS_CONTROL_071121.TXT

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

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
A34	BY1-34	75202.5510	2287943.7390	33.71	39+14.83	52.90 LT
35	BL-35	75973.7430	2288432.4490	33.53	48+34.87	11.08 RT
36	BL-36	76455.7410	2289086.9850	33.45	56+50.15	10.71 RT
37	BL-37	76835.2150	2289248.9890	36.71	60+66.63	52.85 LT
38	BL-38	77217.3900	2289426.1850	32.48	64+89.09	7.26 RT
39	BL-39	77730.4660	2289545.0610	33.41	70+15.39	12.40 LT
40	BL-40	78456.1520	2289776.2710	33.09	77+77.62	1.86 RT
41	BL-41	78885.4310	2290046.0910	31.46	82+81.82	28.28 LT
42	BL-42	79375.0050	2290810.7150	30.37	91+85.92	1.06 RT
43	BL-43	79756.2380	2291262.9340	32.36	97+78.07	4.53 RT
44	BL-44	80434.9440	2291943.3550	33.13	107+39.05	6.72 LT
45	BL-45	80783.8300	2292311.0410	36.10	112+45.88	0.00 LT
46	BL-46	81400.4490	2292965.1360	31.50	121+45.44	12.13 RT
47	BL-47	81658.5470	2293330.6540	29.80	125+88.40	36.81 LT
A15	BY2-15	81695.4690	2293846.2790	32.70	OUTSIDE PROJECT LIMITS	

BY

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
24	BY-24	72935.5128	2287028.8782	33.74	13+82.96	24.63 LT
25	BY-25	73562.8979	2287562.8770	11.95	22+09.08	17.22 LT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
26	BY-26	74287.8300	2288185.0560	28.52	15+68.53	29.82 LT
27	BY-27	74775.1852	2288603.7110	35.15	22+11.00	25.27 LT
28	BY-28	74968.1233	2288723.3796	35.61	24+35.57	58.63 LT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
29	BY-29	75222.2089	2289047.3788	34.84	13+26.92	43.08 RT

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
30	BY1-30	75483.9370	2286957.9690	30.17	14+06.12	28.05 RT
34	BY1-34	75202.5510	2287943.7390	33.71	24+31.23	36.80 RT
A28	BY-28	74968.1233	2288723.3796	35.61	32+45.15	55.17 RT
31	BY1-31	74833.9320	2289272.5890	32.91	38+10.26	38.28 RT
32	BY1-32	74679.9330	2289860.7030	27.99	44+18.15	30.12 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
10	BY2-10	77049.6000	2294238.9720	29.07	OUTSIDE PROJECT LIMITS	
11	BY2-11	78154.4880	2294137.8630	31.00	OUTSIDE PROJECT LIMITS	
D117	NCGS D 117	78695.5290	2294122.0390	31.02	OUTSIDE PROJECT LIMITS	
12	BY2-12	79267.9830	2294046.6640	30.89	OUTSIDE PROJECT LIMITS	
13	BY2-13	80168.8470	2293969.0540	31.93	OUTSIDE PROJECT LIMITS	
14	BY2-14	80850.2390	2293913.9220	30.87	15+22.19	18.55 RT
15	BY2-15	81695.4690	2293846.2790	32.70	23+70.16	18.55 RT
16	BY2-16	82278.9570	2293799.7080	33.16	29+55.50	17.61 RT
17	BY2-17	83015.5630	2293740.3640	33.26	36+94.49	15.87 RT
18	BY2-18	83654.9040	2293688.5810	33.81	43+35.92	14.08 RT
E117	NCGS E 117	84538.0920	2293548.4500	35.97	52+27.35	56.78 LT
W3	W3408-3	85388.3730	2293509.7670	35.49	60+78.06	29.06 LT
J216	NCGS J 116	86318.0650	2293527.0190	39.45	69+78.29	108.37 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
W2	W3408-2	87353.1690	2293369.5530	38.78	16+62.03	18.56 LT
W113	W3408-113	87759.5650	2293338.6700	38.79	20+69.59	18.50 LT
W1	W3408-1	88157.1400	2293308.4580	39.01	24+68.31	18.44 LT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
W5	W3408-5	87699.0560	2292504.3530	38.32	86+71.71	17.15 LT
W114	W3408-114	87356.7850	2292730.5580	37.68	82+61.44	17.53 LT
W4	W3408-4	86986.0020	2292975.6170	37.31	78+16.99	17.94 LT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
J216	NCGS J 216	86318.0650	2293527.0190	39.45	11+07.56	21.91 LT
W11	W3408-11	86560.1340	2294460.6220	36.90	OUTSIDE PROJECT LIMITS	
W6	W3408-6	86777.3810	2295147.7760	35.75	OUTSIDE PROJECT LIMITS	

****
BM25 ELEVATION = 20.24
N 73647 E 2288003
Y STATION 11+39 333' RIGHT
SQUARE CUT IN CONCRETE CURB
****

****
BM30 ELEVATION = 32.34
N 75768 E 2286901
Y1 STATION 12+75 231' LEFT
RR SPIKE IN BASE OF 10" PINE
****

****
BM37 ELEVATION = 34.91
N 76861 E 2288905
L STATION 59+13 374' LEFT
RR SPIKE IN BASE OF 10" BAY TREE
****

****
BM40 ELEVATION = 34.29
N 78368 E 2290066
L STATION 78+30 301' RIGHT
RR SPIKE IN BASE OF 15" PINE TREE
****

****
BM43 ELEVATION = 34.39
N 79897 E 2291083
L STATION 97+48 221' LEFT
RR SPIKE IN BASE OF 10" PINE
****

****
BM45 ELEVATION = 34.27
N 80429 E 2292273
L STATION 109+71 228' RIGHT
RR SPIKE IN BASE OF 12" PINE
****

****
BM15 ELEVATION = 40.92
N 81634 E 2294082
Y2 STATION 22+90 249' RIGHT
RR SPIKE IN BASE OF 14" PINE
****

DATUM DESCRIPTION

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VERTICAL DATUM USED IS NAVD 88

NOTES:

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

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$$$$USERNAME$$$$

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL SHEET R-3324

-Y- RIGHT OF WAY

ALIGN	STATION	OFFSET	NORTH	EAST
Y	12+51.59	-70.00	74150.1706	2287962.6136
Y	13+00.00	-57.00	74143.2538	2287997.3285
Y	13+50.00	-44.00	74146.7761	2288036.6171
Y	14+14.13	-44.00	74179.1597	2288074.4572
Y	18+30.00	38.91	74442.9552	2288406.4802
Y	19+40.00	55.00	74516.5037	2288489.8438
Y	19+67.00	52.00	74539.0474	2288505.0024
Y	23+49.32	-44.00	74892.8485	2288678.8019

-Y- PERMANENT EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y	17+00.00	-54.00	74403.7840	2288251.5648
Y	17+00.00	-44.00	74397.3218	2288259.1962
Y	17+12.16	38.41	74353.3520	2288329.9448
Y	17+21.84	-44.00	74413.9913	2288273.3118
Y	17+21.86	-52.00	74419.1769	2288267.2199
Y	17+22.30	57.00	74349.0726	2288350.6860
Y	17+22.33	48.64	74354.4981	2288344.3206
Y	17+72.00	-44.00	74452.2711	2288305.7266
Y	17+72.00	-54.00	74458.7333	2288298.0951
Y	17+90.00	57.00	74400.7365	2288394.4343
Y	17+90.00	38.74	74412.5370	2288380.4987

-Y1- RIGHT OF WAY

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	18+05.50	-74.55	75476.4967	2287370.2516
Y1	18+05.64	-95.00	75496.1684	2287375.8304
Y1	19+10.00	-95.00	75468.3814	2287476.4195
Y1	23+20.00	75.83	75194.5511	2287826.1300
Y1	23+40.00	-95.00	75353.8858	2287890.8942
Y1	23+50.00	75.85	75186.5412	2287855.0427
Y1	23+80.94	101.74	75153.3482	2287877.9681
Y1	26+10.00	76.04	75117.1258	2288105.6052
Y1	26+20.00	-95.00	75279.3301	2288160.7857
Y1	26+80.00	76.09	75098.4371	2288173.0643
Y1	27+10.00	-95.00	75255.3654	2288247.5382
Y1	28+00.00	-90.00	75226.5816	2288332.9577
Y1	29+01.92	-73.75	75183.7761	2288426.8668
Y1	29+02.04	-90.00	75199.4135	2288431.3143
Y1	32+55.00	-73.48	75089.5091	2288767.1339
Y1	32+70.00	-90.00	75101.4346	2288785.9900
Y1	34+10.00	-90.00	75064.1568	2288920.9358
Y1	35+80.00	-90.00	75018.8909	2289084.7985
Y1	35+80.00	-73.24	75002.7379	2289080.3364
Y1	43+71.90	77.34	74646.7301	2289803.5502
Y1	45+58.91	77.48	74596.8025	2289983.7695

-Y1- PERMANENT EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	16+35.88	-85.00	75531.7312	2287209.5374
Y1	18+05.58	-85.00	75486.5476	2287373.1020
Y1	18+05.81	-120.03	75520.2533	2287382.6609
Y1	18+10.68	-100.00	75499.6475	2287382.0143
Y1	18+10.81	-120.00	75518.8891	2287387.4712
Y1	23+43.81	-100.00	75357.6912	2287895.8965
Y1	26+14.52	-100.00	75285.6077	2288156.8389
Y1	27+10.00	-100.00	75260.1849	2288248.8696
Y1	28+00.00	-95.00	75231.4011	2288334.2891
Y1	29+02.08	-95.00	75204.2208	2288432.6816

-Y2- RIGHT OF WAY

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	16+49.95	50.34	80980.1238	2293935.4192
Y2	22+13.84	-50.04	81534.2040	2293790.3650
Y2	25+00.00	-60.00	81818.7912	2293757.8423
Y2	26+12.00	-60.00	81930.4504	2293749.1116
Y2	26+72.00	-60.00	81990.2678	2293744.4345
Y2	26+76.60	75.30	82005.4010	2293878.9629
Y2	26+77.73	50.30	82004.5755	2293853.9496
Y2	27+60.00	-60.00	82078.0000	2293737.5746
Y2	28+85.00	-60.00	82202.6195	2293727.8284
Y2	31+20.00	-60.00	82436.9044	2293709.5095
Y2	31+23.77	-75.30	82439.4739	2293693.9676
Y2	32+65.00	-75.48	82580.2565	2293682.7739
Y2	33+40.00	-85.00	82654.2861	2293667.4360
Y2	33+84.27	74.36	82710.8400	2293822.8628
Y2	34+55.00	-85.00	82768.9362	2293658.4714
Y2	36+00.00	-76.31	82914.1726	2293655.8345
Y2	37+15.00	73.15	83040.4736	2293795.8769
Y2	37+15.00	275.00	83056.2082	2293997.1103
Y2	37+75.00	73.15	83100.2910	2293791.1997
Y2	37+75.00	275.00	83116.0256	2293992.4331
Y2	43+30.44	-78.57	83642.2131	2293596.6455
Y2	43+30.75	71.43	83654.2183	2293746.1643
Y2	48+84.74	70.83	84206.4775	2293702.3796
Y2	48+84.85	-79.17	84194.8866	2293552.8279
Y2	59+99.82	73.57	85318.3729	2293618.1803
Y2	60+00.17	-76.43	85307.0269	2293468.6100
Y2	60+59.82	73.71	85378.2014	2293613.6497
Y2	60+60.19	-76.29	85366.8750	2293464.0780
Y2	63+45.68	74.41	85663.2466	2293592.0644
Y2	63+46.02	-75.59	85651.8891	2293442.4950
Y2	66+64.54	-74.50	85968.2009	2293418.4099
Y2	68+92.99	101.37	86227.4619	2293549.1031
Y2	71+57.56	171.83	86526.9341	2293501.2278
Y2	72+44.04	-74.51	86477.9524	2293243.6189
Y2	77+00.00	75.00	86939.7716	2293117.6960
Y2	83+50.00	-75.00	87398.8923	2292633.7458

-Y2- PERMANENT EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	16+50.00	60.00	80980.9467	2293945.0435
Y2	24+65.71	-76.00	81783.3625	2293744.5637
Y2	26+77.52	55.00	82004.7308	2293858.6546
Y2	28+21.98	-69.00	82139.0945	2293723.7701
Y2	28+23.57	-76.00	82140.1267	2293716.6680
Y2	28+50.00	-76.00	82166.4789	2293714.6075
Y2	28+50.00	-69.00	82167.0246	2293721.5862
Y2	30+95.00	-69.00	82411.2790	2293702.4878
Y2	30+95.00	-76.00	82410.7334	2293695.5091
Y2	31+22.36	-69.00	82438.5533	2293700.3552
Y2	31+27.42	-91.50	82441.8445	2293677.5292
Y2	32+65.00	-91.50	82579.0078	2293666.8043
Y2	33+40.00	-101.00	82653.0390	2293651.4867
Y2	34+55.00	-101.00	82767.6891	2293642.5222
Y2	36+00.00	-91.50	82912.9884	2293640.6901
Y2	65+86.68	-91.50	85890.5849	2293407.8696
Y2	67+36.68	-91.50	86033.9351	2293393.6111
Y2	71+74.68	-91.50	86413.1565	2293263.0918
Y2	73+24.68	-91.00	86535.1932	2293186.5221
Y2	78+00.00	-91.00	86931.4934	2292924.0806
Y2	78+00.00	-75.00	86940.3276	2292937.4207

-Y4- RIGHT OF WAY

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	11+50.38	-60.24	86927.3322	2293202.1849
Y4	14+48.37	71.87	87127.4362	2293455.4109
Y4	15+27.83	-60.00	87223.2269	2293334.7659
Y4	15+87.38	-60.00	87275.5898	2293333.9046
Y4	16+40.00	-50.00	87328.8194	2293339.8781

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCGS FOR MONUMENT "SOUTHPORT EAST BASE RESET 1981 "
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 74,896.0215(ft) EASTING: 2,288,816.4689(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 1.000100000
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"SOUTHPORT EAST " TO -L- STATION 10+00.00 IS
S 41°39' 55" W 3035.3412
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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

2. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   R3324_LS_GPSCALIB_071121.HTML
   R3324_LS_CONTROL_071121.TXT

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

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

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	1-G
Location and Surveys	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL SHEET R-3324

L

TYPE	STATION	NORTH	EAST
POT	10·00.00	72628.4940	2286798.6440
TS	19·73.00	73367.8553	2287431.1579
SC	21·23.00	73483.4874	2287526.6769
CS	29·54.28	74248.1507	2287822.6445
SRS	31·04.28	74397.9589	2287829.8658
SC	32·54.28	74547.7246	2287837.7323
CS	33·78.60	74670.6048	2287856.1991
ST	35·28.60	74816.0672	2287892.7005
TS	40·48.60	75317.5858	2288030.1015
SC	41·98.60	75461.3727	2288072.7340
CS	49·94.47	76077.9146	2288552.7393
SRS	51·44.47	76154.5059	2288681.6810
SC	52·94.47	76230.9328	2288810.7238
CS	61·55.68	76898.3353	2289329.0413
ST	63·05.68	77042.2814	2289371.1443
TS	74·82.68	78178.1927	2289679.4207
SC	76·32.68	78322.1728	2289721.4136
CS	84·56.05	78976.6564	2290199.1746
ST	86·06.05	79060.5282	2290323.5095
PC	91·55.55	79359.2146	2290784.7434
PT	96·10.38	79642.4574	2291139.6637
TS	120·07.19	81315.1268	2292856.3089
SC	121·57.19	81417.2592	2292966.1234
CS	127·63.10	81661.5255	2293511.8751
ST	129·13.10	81675.3786	2293661.2014
POT	130·80.63	81686.9712	2293828.3326

Y

TYPE	STATION	NORTH	EAST
POT	10·81.68	74070.8509	2287796.8501
PC	12·51.59	74080.2776	2287966.5033
PT	14·14.13	74150.7248	2288108.0370
POT	25·23.46	74997.3110	2288824.9153

Y1

TYPE	STATION	NORTH	EAST
POT	10·00.00	75619.1169	2286573.9762
POT	51·00.00	74527.4095	2290525.9599

Y2

TYPE	STATION	NORTH	EAST
POT	10·00.00	80328.2317	2293937.1030
POT	23·63.09	81686.9712	2293828.3326
TS	65·86.68	85897.7176	2293499.0912
SC	67·36.68	86046.9467	2293484.1812
CS	71·74.68	86458.6423	2293342.4850
ST	73·24.68	86585.4376	2293262.3937
POT	97·44.52	88602.9923	2291926.3106

Y3A

TYPE	STATION	NORTH	EAST
POT	10·00.00	87025.2607	2293345.6677
PC	10·40.31	86996.3834	2293373.7868
PT	11·59.53	86890.1659	2293422.6872
PC	14·85.85	86565.1931	2293452.2780
PT	18·87.70	86371.0499	2293744.1358
POT	20·35.00	86415.4259	2293884.5909

Y4

TYPE	STATION	NORTH	EAST
POT	10·00.00	86794.1431	2293124.1828
PC	10·56.44	86825.3070	2293171.2420
PT	15·87.38	87280.1451	2293393.7314
POT	30·87.38	88775.8158	2293279.8493

Y5

TYPE	STATION	NORTH	EAST
POT	10·00.00	74997.3110	2288824.9153
PC	11·25.00	75109.7115	2288879.6065
PT	12·02.33	75171.0652	2288925.8779
POT	13·43.80	75265.5481	2289031.1767

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "SOUTHPORT EAST BASE RESET 1981 " WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 74,896.0215(ft) EASTING: 2,288,816.4689(ft)
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VERTICAL DATUM USED IS NAVD 88

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NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	1-H
Location and Surveys	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL SHEET R-3324

-L- RIGHT OF WAY

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+74.69	-50.00	72793.7386	2286874.2085
L	11+74.71	-28.04	72779.4820	2286890.9060
L	13+04.55	31.86	72839.2062	2287020.8269
L	13+04.57	65.00	72817.6741	2287046.0230
L	14+90.00	65.00	72958.5800	2287166.5683
L	16+00.27	86.00	73028.7196	2287254.2078
L	17+60.00	95.00	73144.2450	2287364.8823
L	18+25.00	70.00	73209.8888	2287388.1397
L	19+32.57	-50.00	73369.6350	2287366.8804
L	19+73.00	70.00	73322.3507	2287484.3494
L	19+92.61	-63.00	73423.6727	2287395.9933
L	21+00.00	-63.00	73504.5182	2287463.1547
L	21+23.00	-63.00	73521.9128	2287476.7499
L	21+35.00	110.00	73426.6620	2287621.6791
L	21+35.00	100.00	73432.6942	2287613.7055
L	21+97.50	110.00	73481.1477	2287661.0824
L	22+00.00	-68.00	73584.2807	2287515.9846
L	22+10.00	61.23	73519.6155	2287628.3132
L	22+88.59	-137.19	73690.9260	2287502.4198
L	23+80.10	-119.92	73755.2634	2287558.2047
L	24+53.34	-101.86	73808.1512	2287604.0619
L	27+50.00	-120.00	74073.0274	2287674.5042
L	28+50.00	-105.00	74160.7902	2287706.5593
L	28+85.00	85.00	74168.2156	2287899.5548
L	29+54.28	-110.00	74257.2318	2287713.0200
L	29+54.28	80.00	74241.5462	2287902.3714
L	29+89.00	75.73	74278.1288	2287900.7173
L	29+94.00	68.84	74283.7215	2287894.1471
L	31+04.28	-114.00	74401.4838	2287715.9187
L	31+04.28	65.00	74395.9496	2287894.8335
L	31+04.38	58.00	74396.2660	2287887.8399
L	31+70.00	66.50	74460.7570	2287898.6056
L	32+30.00	67.00	74518.4239	2287902.4577
L	32+54.28	-120.00	74559.1763	2287718.2799
L	32+54.28	44.00	74543.5254	2287881.5298
L	33+10.00	40.00	74597.3163	2287883.9663
L	33+15.94	-115.81	74626.0760	2287730.7120
L	33+78.60	75.00	74655.5028	2287929.6612
L	33+78.66	-108.99	74692.6206	2287749.4597
L	34+22.00	98.00	74690.1649	2287960.9673
L	34+29.85	-106.09	74745.7503	2287764.4308
L	34+76.00	99.50	74739.7726	2287975.1060
L	34+76.22	-104.81	74792.4065	2287777.6901
L	35+28.60	100.27	74789.5713	2287989.4108
L	35+30.61	-104.47	74845.6109	2287792.4717
L	38+40.00	101.50	75089.5788	2288072.8794
L	41+00.00	78.00	75345.9642	2288118.8771
L	41+10.00	-95.00	75402.8069	2287955.1745
L	41+98.60	70.00	75438.6961	2288138.9574
L	41+98.60	-85.00	75488.9088	2287992.3178
L	43+00.00	-80.00	75588.0150	2288036.3663
L	43+90.00	55.00	75610.8938	2288197.4306
L	45+05.00	60.00	75702.3620	2288257.7407
L	45+50.00	-65.00	75810.4544	2288180.4831
L	46+53.52	-65.00	75896.2430	2288247.8753
L	47+53.52	-65.00	75973.3044	2288319.7626
L	49+94.47	60.00	76027.6513	2288585.5021
L	49+94.47	-65.00	76132.3677	2288517.2449
L	51+43.99	74.99	76089.0151	2288718.2117
L	51+44.47	-60.00	76206.7185	2288652.1202
L	52+94.47	-70.00	76289.7218	2288772.7258

-L- RIGHT OF WAY

ALIGN	STATION	OFFSET	NORTH	EAST
L	52+94.47	80.00	76163.7454	2288854.1502
L	54+00.00	80.00	76228.4269	2288945.7058
L	54+00.00	-70.00	76347.2641	2288854.1759
L	55+00.00	85.00	76292.7759	2289030.6179
L	55+00.00	-70.00	76407.8118	2288926.7346
L	55+30.00	115.00	76292.7078	2289074.7321
L	58+30.00	-70.00	76644.2672	2289128.8637
L	59+00.00	115.00	76608.1462	2289323.7157
L	59+75.00	-85.00	76769.7666	2289183.7138
L	60+00.00	75.00	76721.8031	2289338.3643
L	61+55.68	75.00	76874.4833	2289400.1474
L	61+55.68	-105.00	76931.7282	2289229.4927
L	63+05.68	70.00	77023.9473	2289438.7007
L	63+05.68	-105.00	77069.7828	2289269.8098
L	63+70.00	-85.00	77126.6191	2289305.9582
L	65+25.00	-85.00	77276.2081	2289346.5553
L	66+00.00	75.00	77306.6832	2289520.6136
L	71+00.00	-60.00	77824.5880	2289521.2835
L	74+82.68	60.00	78162.4777	2289737.3262
L	74+82.68	-60.00	78193.9079	2289621.5154
L	76+32.68	-65.00	78342.7024	2289659.7408
L	76+32.72	55.00	78304.8411	2289773.6114
L	76+94.63	-521.63	78568.0647	2289255.6091
L	77+46.31	-65.00	78454.0393	2289702.1598
L	77+65.30	-537.35	78665.2868	2289279.0540
L	77+66.11	55.00	78423.9467	2289820.0096
L	78+43.49	-65.00	78546.0906	2289745.8547
L	78+72.83	55.00	78515.5221	2289865.5681
L	80+50.00	-73.00	78734.4799	2289853.8446
L	80+70.00	55.00	78673.9266	2289968.3950
L	80+70.00	90.00	78652.7500	2289996.2617
L	84+56.05	85.00	78908.0245	2290249.3210
L	84+56.05	-80.00	79041.2511	2290151.9780
L	86+06.05	-85.00	79131.8746	2290277.3067
L	86+06.05	85.00	78989.1817	2290369.7119
L	88+25.00	-85.00	79250.8871	2290461.0868
L	91+55.55	-70.00	79417.9705	2290746.6942
L	91+55.55	85.00	79287.8681	2290830.9460
L	92+10.00	85.00	79319.1168	2290877.9709
L	93+00.00	-70.00	79497.7397	2290861.7829
L	93+00.00	75.00	79381.2177	2290948.0825
L	93+60.00	75.00	79418.7376	2290997.3842
L	93+60.00	-70.00	79532.9688	2290908.0746
L	96+10.38	75.00	79588.7408	2291192.0043
L	96+10.38	-70.00	79692.5929	2291090.8126
L	97+10.00	75.00	79658.2645	2291263.3557
L	97+45.00	90.00	79671.9467	2291298.8916
L	98+90.00	90.00	79773.1384	2291402.7436
L	100+25.00	75.00	79878.0946	2291488.9654
L	103+00.00	-70.00	80173.8619	2291584.7345
L	103+00.00	75.00	80070.0098	2291685.9262
L	103+60.00	75.00	80111.8822	2291728.8994
L	103+60.00	-70.00	80215.7343	2291627.7078
L	106+50.00	80.00	80310.6844	2291940.0929
L	106+60.00	-75.00	80428.6774	2291839.0848
L	112+10.00	70.00	80708.6557	2292334.1980
L	112+10.00	85.00	80697.9124	2292344.6661
L	112+60.00	-80.00	80850.9826	2292265.3280
L	112+60.00	-70.00	80843.8204	2292272.3068
L	112+95.00	65.00	80771.5561	2292391.5874
L	112+95.00	85.00	80757.2317	2292405.5449

-L- RIGHT OF WAY

ALIGN	STATION	OFFSET	NORTH	EAST
L	113+50.00	-80.00	80913.7912	2292329.7879
L	113+50.00	-65.00	80903.0479	2292340.2561
L	120+07.19	-55.00	81354.5223	2292817.9270
L	120+07.19	60.00	81272.1557	2292898.1836
L	121+57.19	-65.00	81466.8647	2292924.1199
L	121+57.19	65.00	81367.6578	2293008.1317
L	122+50.00	-65.00	81527.1501	2293001.8791
L	122+50.00	65.00	81421.0685	2293077.0237
L	123+10.00	-65.00	81562.4616	2293054.7994
L	123+10.00	65.00	81452.3533	2293123.9092
L	126+90.00	65.00	81585.3316	2293453.2428
L	127+63.10	-65.00	81725.8984	2293502.8680
L	127+63.10	80.00	81582.2973	2293522.9608
L	128+20.00	-49.00	81716.8806	2293563.6883
L	128+80.00	-40.00	81712.9472	2293625.2823
L	129+13.10	80.00	81595.5705	2293666.7394
L	129+20.00	-40.00	81715.7603	2293665.3194
L	129+95.00	80.00	81601.2393	2293748.4430

-L- PERMANENT EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
L	16+30.00	145.00	73012.9576	2287318.3677
L	16+40.00	88.24	73057.4550	2287281.7366
L	16+60.00	130.00	73045.5049	2287326.4715
L	21+33.00	-153.00	73583.9109	2287410.8599
L	22+06.39	75.00	73508.7442	2287637.5744
L	22+10.00	-253.00	73695.9894	2287368.2522
L	22+45.00	-264.00	73726.0479	2287374.9294
L	22+90.00	-260.00	73755.2446	2287397.7934
L	23+10.00	-133.66	73705.8331	2287515.3475
L	24+00.00	-217.00	73815.0480	2287479.7246
L	25+17.87	146.00	73770.5012	2287857.5882
L	25+21.15	135.20	73777.8757	2287848.9129
L	85+50.00	-132.00	79140.1675	2290203.9236
L	85+88.00	-180.00	79201.7195	2290210.3973
L	86+94.00	-85.00	79179.6807	2290351.1293
L	87+25.00	85.00	79053.8382	2290469.5550
L	87+25.00	125.00	79020.2634	2290491.2974
L	88+00.00	125.00	79061.0304	2290554.2502
L	88+00.00	85.00	79094.6052	2290532.5078

DATUM DESCRIPTION

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PROJ. REFERENCE NO.	SHEET NO.
R-3324	1-7

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	10+00.0000	72628.4940	2286798.6440
2	L	11+00.0000	72704.4818	2286863.6506
3	L	12+00.0000	72780.4696	2286928.6571
4	L	13+00.0000	72856.4574	2286993.6637
5	L	14+00.0000	72932.4452	2287058.6703
6	L	15+00.0000	73008.4330	2287123.6769
7	L	16+00.0000	73084.4208	2287188.6834
8	L	17+00.0000	73160.4086	2287253.6900
9	L	18+00.0000	73236.3964	2287318.6966
10	L	19+00.0000	73312.3842	2287383.7031
11	L	20+00.0000	73388.3818	2287448.6982
12	L	21+00.0000	73465.3668	2287512.5123
13	L	22+00.0000	73545.7256	2287571.9980
14	L	23+00.0000	73629.9874	2287625.8125
15	L	24+00.0000	73717.7572	2287673.6924
16	L	25+00.0000	73808.6179	2287715.4103
17	L	26+00.0000	73902.1374	2287750.7677
18	L	27+00.0000	73997.8710	2287779.5965
19	L	28+00.0000	74095.3637	2287801.7597
20	L	29+00.0000	74194.1520	2287817.1520
21	L	30+00.0000	74293.7617	2287825.7731
22	L	31+00.0000	74393.6805	2287829.7334
23	L	32+00.0000	74493.6000	2287833.6650
24	L	33+00.0000	74593.1377	2287842.9912
25	L	34+00.0000	74691.5274	2287860.6923
26	L	35+00.0000	74788.4776	2287885.1651
27	L	36+00.0000	74884.9294	2287911.5667
28	L	37+00.0000	74981.3753	2287937.9900
29	L	38+00.0000	75077.8212	2287964.4132
30	L	39+00.0000	75174.2671	2287990.8365
31	L	40+00.0000	75270.7130	2288017.2598
32	L	41+00.0000	75367.1254	2288043.8042
33	L	42+00.0000	75462.6968	2288073.1883
34	L	43+00.0000	75555.8031	2288109.5947
35	L	44+00.0000	75645.5560	2288153.6247
36	L	45+00.0000	75731.3324	2288204.9727
37	L	46+00.0000	75812.5372	2288263.2822
38	L	47+00.0000	75888.6066	2288328.1487
39	L	48+00.0000	75959.0128	2288399.1218
40	L	49+00.0000	76023.2671	2288475.7090
41	L	50+00.0000	76080.9236	2288557.3787
42	L	51+00.0000	76132.5256	2288643.0227
43	L	52+00.0000	76181.9934	2288729.9301
44	L	53+00.0000	76233.9445	2288815.3615
45	L	54+00.0000	76291.8068	2288896.8898
46	L	55+00.0000	76355.8601	2288973.6497
47	L	56+00.0000	76425.7132	2289045.1720
48	L	57+00.0000	76500.9393	2289111.0199
49	L	58+00.0000	76581.0787	2289170.7910
50	L	59+00.0000	76665.6417	2289224.1201
51	L	60+00.0000	76754.1118	2289270.6814
52	L	61+00.0000	76845.9484	2289310.1903
53	L	62+00.0000	76940.5680	2289342.4778
54	L	63+00.0000	77036.7999	2289369.6565
55	L	64+00.0000	77133.3089	2289395.8484
56	L	65+00.0000	77229.8179	2289422.0401
57	L	66+00.0000	77326.3269	2289448.2318
58	L	67+00.0000	77422.8360	2289474.4235
59	L	68+00.0000	77519.3450	2289500.6152
60	L	69+00.0000	77615.8540	2289526.8069
61	L	70+00.0000	77712.3631	2289552.9986
62	L	71+00.0000	77808.8721	2289579.1903
63	L	72+00.0000	77905.3812	2289605.3821
64	L	73+00.0000	78001.8902	2289631.5738
65	L	74+00.0000	78098.3992	2289657.7655
66	L	75+00.0000	78194.9071	2289683.9614
67	L	76+00.0000	78291.0509	2289711.4458
68	L	77+00.0000	78385.4823	2289744.2815
69	L	78+00.0000	78477.1942	2289784.0838
70	L	79+00.0000	78565.6607	2289830.6561
71	L	80+00.0000	78650.3830	2289883.7357
72	L	81+00.0000	78730.8832	2289943.0233
73	L	82+00.0000	78806.7074	2290008.1845
74	L	83+00.0000	78877.4281	2290078.8520
75	L	84+00.0000	78942.6464	2290154.6271
76	L	85+00.0000	79002.0527	2290235.0422
77	L	86+00.0000	79057.2394	2290318.4312
78	L	87+00.0000	79111.5956	2290402.3682
79	L	88+00.0000	79165.9516	2290486.3052
80	L	89+00.0000	79220.3077	2290570.2422
81	L	90+00.0000	79274.6637	2290654.1792
82	L	91+00.0000	79329.0197	2290738.1162

Point #	Chain	Station	Northing (Y)	Easting (X)
83	L	92+00.0000	79383.7347	2290821.8174
84	L	93+00.0000	79441.4863	2290903.4458
85	L	94+00.0000	79502.7312	2290982.4868
86	L	95+00.0000	79567.3538	2291058.7911
87	L	96+00.0000	79635.2318	2291132.2146
88	L	97+00.0000	79705.0023	2291203.8530
89	L	98+00.0000	79774.7897	2291275.4751
90	L	99+00.0000	79844.5770	2291347.0972
91	L	100+00.0000	79914.3644	2291418.7193
92	L	101+00.0000	79984.1517	2291490.3414
93	L	102+00.0000	80053.9390	2291561.9636
94	L	103+00.0000	80123.7264	2291633.5857
95	L	104+00.0000	80193.5137	2291705.2078
96	L	105+00.0000	80263.3011	2291776.8299
97	L	106+00.0000	80333.0884	2291848.4520
98	L	107+00.0000	80402.8758	2291920.0741
99	L	108+00.0000	80472.6631	2291991.6962
100	L	109+00.0000	80542.4504	2292063.3183
101	L	110+00.0000	80612.2378	2292134.9404
102	L	111+00.0000	80682.0251	2292206.5625
103	L	112+00.0000	80751.8125	2292278.1847
104	L	113+00.0000	80821.5998	2292349.8068
105	L	114+00.0000	80891.3872	2292421.4289
106	L	115+00.0000	80961.1745	2292493.0510
107	L	116+00.0000	81030.9618	2292564.6731
108	L	117+00.0000	81100.7492	2292636.2952
109	L	118+00.0000	81170.5365	2292707.9173
110	L	119+00.0000	81240.3239	2292779.5394
111	L	120+00.0000	81310.1112	2292851.1615
112	L	121+00.0000	81379.3021	2292923.3556
113	L	122+00.0000	81444.2693	2292999.3376
114	L	123+00.0000	81502.0520	2293080.9093
115	L	124+00.0000	81552.0077	2293167.4958
116	L	125+00.0000	81593.7045	2293258.3482
117	L	126+00.0000	81626.7818	2293352.6811
118	L	127+00.0000	81650.9536	2293449.6786
119	L	128+00.0000	81666.0625	2293548.4961
120	L	129+00.0000	81674.4700	2293648.1353
121	L	130+00.0000	81681.3919	2293747.8955
122	L	130+80.6304	81686.9712	2293828.3326
123	Y	11+00.0000	74071.8673	2287815.1419
124	Y	12+00.0000	74077.4152	2287914.9879
125	Y	13+00.0000	74088.7571	2288014.0400
126	Y	14+00.0000	74140.2748	2288098.5345
127	Y	15+00.0000	74216.2583	2288163.5300
128	Y	16+00.0000	74292.5731	2288228.1523
129	Y	17+00.0000	74368.8879	2288292.7747
130	Y	18+00.0000	74445.2027	2288357.3971
131	Y	19+00.0000	74521.5175	2288422.0195
132	Y	20+00.0000	74597.8323	2288486.6419
133	Y	21+00.0000	74674.1471	2288551.2643
134	Y	22+00.0000	74750.4619	2288615.8867
135	Y	23+00.0000	74826.7766	2288680.5091
136	Y	24+00.0000	74903.0914	2288745.1315
137	Y	25+00.0000	74979.4062	2288809.7538
138	Y	25+23.4617	74997.3110	2288824.9153
139	Y1	10+00.0000	75619.1169	2286573.9762
140	Y1	11+00.0000	75592.4899	2286670.3661
141	Y1	12+00.0000	75565.8628	2286766.7559
142	Y1	13+00.0000	75539.2358	2286863.1457
143	Y1	14+00.0000	75512.6088	2286959.5356
144	Y1	15+00.0000	75485.9818	2287055.9254
145	Y1	16+00.0000	75459.3548	2287152.3153
146	Y1	17+00.0000	75432.7278	2287248.7051
147	Y1	18+00.0000	75406.1008	2287345.0950
148	Y1	19+00.0000	75379.4738	2287441.4848
149	Y1	20+00.0000	75352.8468	2287537.8747
150	Y1	21+00.0000	75326.2198	2287634.2645
151	Y1	22+00.0000	75299.5928	2287730.6544
152	Y1	23+00.0000	75272.9658	2287827.0442
153	Y1	24+00.0000	75246.3387	2287923.4341
154	Y1	25+00.0000	75219.7117	2288019.8239
155	Y1	26+00.0000	75193.0847	2288116.2137
156	Y1	27+00.0000	75166.4577	2288212.6036
157	Y1	28+00.0000	75139.8307	2288308.9934
158	Y1	29+00.0000	75113.2037	2288405.3833
159	Y1	30+00.0000	75086.5767	2288501.7731
160	Y1	31+00.0000	75059.9497	2288598.1630
161	Y1	32+00.0000	75033.3227	2288694.5528
162	Y1	33+00.0000	75006.6957	2288790.9427

Point #	Chain	Station	Northing (Y)	Easting (X)
163	Y1	34+00.0000	74980.0687	2288887.3325
164	Y1	35+00.0000	74953.4417	2288983.7224
165	Y1	36+00.0000	74926.8147	2289080.1122
166	Y1	37+00.0000	74900.1876	2289176.5021
167	Y1	38+00.0000	74873.5606	2289272.8919
168	Y1	39+00.0000	74846.9336	2289369.2817
169	Y1	40+00.0000	74820.3066	2289465.6716
170	Y1	41+00.0000	74793.6796	2289562.0614
171	Y1	42+00.0000	74767.0526	2289658.4513
172	Y1	43+00.0000	74740.4256	2289754.8411
173	Y1	44+00.0000	74713.7986	2289851.2310
174	Y1	45+00.0000	74687.1716	2289947.6208
175	Y1	46+00.0000	74660.5446	2290044.0107
176	Y1	47+00.0000	74633.9176	2290140.4005
177	Y1	48+00.0000	74607.2906	2290236.7904
178	Y1	49+00.0000	74580.6635	2290333.1802
179	Y1	50+00.0000	74554.0365	2290429.5701
180	Y1	51+00.0000	74527.4095	2290525.9599
181	Y2	10+00.0000	80328.2317	2293937.1030
182	Y2	11+00.0000	80427.9128	2293929.1233
183	Y2	12+00.0000	80527.5939	2293921.1436
184	Y2	13+00.0000	80627.2750	2293913.1639
185	Y2	14+00.0000	80726.9561	2293905.1842
186	Y2	15+00.0000	80826.6372	2293897.2044
187	Y2	16+00.0000	80926.3183	2293889.2247
188	Y2	17+00.0000	81025.9995	2293881.2450
189	Y2	18+00.0000	81125.6806	2293873.2653
190	Y2	19+00.0000	81225.3617	2293865.2856
191	Y2	20+00.0000	81325.0428	2293857.3058
192	Y2	21+00.0000	81424.7239	2293849.3261
193	Y2	22+00.0000	81524.4050	2293841.3464
194	Y2	23+00.0000	81624.0861	2293833.3667
195	Y2	24+00.0000	81723.7726	2293825.4550
196	Y2	25+00.0000	81823.4683	2293817.6598
197	Y2	26+00.0000	81923.1640	2293809.8645
198	Y2	27+00.0000	82022.8597	2293802.0692
199	Y2	28+00.0000	82122.5554	2293794.2739
200	Y2	29+00.0000	82222.2512	2293786.4786
201	Y2	30+00.0000	82321.9469	2293778.6834
202	Y2	31+00.0000	82421.6426	2293770.8881
203	Y2	32+00.0000	82521.3383	2293763.0928
204	Y2	33+00.0000	82621.0340	2293755.2975
205	Y2	34+00.0000	82720.7297	2293747.5022
206	Y2	35+00.0000	82820.4254	2293739.7070
207	Y2	36+00.0000	82920.1211	2293731.9117
208	Y2	37+00.0000	83019.8168	2293724.1164
209	Y2	38+00.0000	83119.5125	2293716.3211
210	Y2	39+00.0000	83219.2082	2293708.5258
211	Y2	40+00.0000	83318.9039	2293700.7306
212	Y2	41+00.0000	83418.5996	2293692.9353
213	Y2	42+00.0000	83518.2953	2293685.1400
214	Y2	43+00.0000	83617.9910	2293677.3447
215	Y2	44+00.0000	83717.6867	2293669.5494
216	Y2	45+00.0000	83817.3824	2293661.7541
217	Y2	46+00.0000	83917.0781	2293653.9589
218	Y2	47+00.0000	84016.7738	2293646.1636
219	Y2	48+00.0000	84116.4695	2293638.3683
220	Y2	49+00.0000	84216.1653	2293630.5730
221	Y2	50+00.0000	84315.8610	2293622.7777
222	Y2	51+00.0000	84415.5567	2293614.9825
223	Y2	52+00.0000	84515.2524	2293607.1872
224	Y2	53+00.0000	84614.9481	2293599.3919
225	Y2	54+00.0000	84714.6438	2293591.5966
226	Y2	55+00.0000	84814.3395	2293583.8013
227	Y2	56+00.0000	84914.0352	2293576.0061
228	Y2	57+00.0000	85013.7309	2293568.2108
229	Y2	58+00.0000	85113.4266	2293560.4155
230	Y2	59+00.0000	85213.1223	2293552.6202
231	Y2	60+00.0000	85312.8180	2293544.8249
232	Y2	61+00.0000	85412.5137	2293537.0297
233	Y2	62+00.0000	85512.2094	2293529.2344
234	Y2	63+00.0000	85611.9051	2293521.4391
235	Y2	64+00.0000	85711.6008	2293513.6438
236	Y2	65+00.0000	85811.2965	2293505.8485
237	Y2	66+00.0000	85910.9921	2293498.0510
238	Y2	67+00.0000	86010.5639	2293488.8699
239	Y2	68+00.0000	86109.3417	2293473.4721
240	Y2	69+00.0000	86206.4365	2293449.6730
241	Y2	70+00.0000	86301.1217	2293417.6024
242	Y2	71+00.0000	86392.6940	2293377.4985
243	Y2	72+00.0000	86480.4813	2293329.6725

Point #	Chain	Station	Northing (Y)	Easting (X)
244	Y2	73+00.0000	86564.8528	2293276.0083
245	Y2	74+00.0000	86648.2362	2293220.8067
246	Y2	75+00.0000	86731.6116	2293165.5931
247	Y2	76+00.0000	86814.9870	2293110.3794
248	Y2	77+00.0000	86898.3624	2293055.1658
249	Y2	78+00.0000	86981.7378	2292999.9522
250	Y2	79+00.0000	87065.1132	2292944.7386
251	Y2	80+00.0000	87148.4886	2292889.5250
252	Y2	81+00.0000	87231.8640	2292834.3114
253	Y2	82+00.0000	87315.2394	2292779.0978
254	Y2	83+00.0000	87398.6148	2292723.8842
255	Y2	84+00.0000	87481.9902	2292668.6706
256	Y2	85+00.0000	87565.3656	2292613.4570
257	Y2	86+00.0000	87648.7410	2292558.2434
258	Y2	87+00.0000	87732.1164	2292503.0298
259	Y2	88+00.0000	87815.4918	2292447.8162
260	Y2	89+00.0000	87898.8672	2292392.6026
261	Y2	90+00.0000	87982.2426	2292337.3890
262	Y2	91+00.0000	88065.6180	2292282.1753
263	Y2	92+00.0000	88148.9934	2292226.9617
264	Y2	93+00.0000	88232.3688	2292171.7481
265	Y2	94+00.0000	88315.7442	2292116.5345
266	Y2	95+00.0000	88399.1196	2292061.3209
267	Y2	96+00.0000	88482.4950	2292006.1073
268	Y2	97+00.0000	88565.8704	2291950.8937
269	Y2	97+44.5237	88602.9923	2291926.3106
270	Y3	10+00.0000	86265.0834	2293430.8853
271	Y3	11+00.0000	86294.9020	2293526.3361
272	Y3	12+00.0000	86324.7205	2293621.7869
273	Y3	13+00.0000	86354.5391	2293717.2377
274	Y3	14+00.0000	86384.3577	2293812.6884
275	Y3	15+00.0000	86414.1762	2293908.1392
276	Y3	16+00.0000	86443.9948	2294003.5900
277	Y3	17+00.0000	86473.8134	2294099.0408
278	Y3	18+00.0000	86503.6319	2294194.4916
279	Y3A	10+00.0000	87025.2607	2293345.6677
280	Y3A	11+00.0000	86947.4063	2293407.4050
281	Y3A	12+00.0000	86849.8646	2293426.3569
282	Y3A	13+00.0000	86750.2766	2293435.4250
283	Y3A	14+00.0000	86650.6886	2293444.4931
284	Y3A	15+00.0000	86551.1502	2293454.0034
285	Y3A	16+00.0000	86458.8969	2293490.4149
286	Y3A	17+00.0000	86391.2614	2293562.9540
287	Y3A	18+00.0000	86361.3853	2293657.5261
288	Y3A	19+00.0000	86374.7550	2293755.8630
289	Y3A	20+00.0000	86404.8816	2293851.2171
290	Y3A	20+35.0000	86415.4259	2293884.5909
291	Y4	10+00.0000	86794.1431	2293124.1828
292	Y4	11+00.0000	86850.9071	2293206.4655
293	Y4	12+00.0000	86920.5506	2293277.9952
294	Y4	13+00.0000	87003.0166	2293334.2631
295	Y4	14+00.0000	87095.0174	2293373.0258
296	Y4	15+00.0000	87192.8854	2293392.7382
297	Y4	16+00.0000	87292.7321	2293392.7730
298	Y4	17+00.0000	87392.4435	2293385.1809
299	Y4	18+00.0000	87492.1549	2293377.5887
300	Y4	19+00.0000	87591.8663	2293369.9966
301	Y4	20+00.0000	87691.5777	2293362.4045
302	Y4	21+00.0000	87791.2890	2293354.8123
303	Y4	22+00.0000	87891.0004	2293347.2202
304	Y4	23+00.0000	87990.7118	2293339.6280
305	Y4	24+00.0000	88090.4232	2293332.0359
306	Y4	25+00.0000	88190.1346	2293324.4437
307	Y4	26+00.0000	88289.8459	2293316.8516
308	Y4	27+00.0000	88389.5573	2293309.2595
309	Y4	28+00.0000	88489.2687	2293301.6673
310	Y4	29+00.0000	88588.9801	2293294.0752
311	Y4	30+00.0000	88688.6915	2293286.4830
312	Y4	30+87.3765	88775.8158	2293279.8493
313	Y5	10+00.0000	74997.3110	2288824.9153
314	Y5	11+00.0000	75087.2314	2288868.6683
315	Y5	12+00.0000	75169.5012	2288924.1551
316	Y5	13+00.0000	75236.2959	2288998.5759
317	Y5	13+43.8007	75265.5481	2289031.1767
318	Y6	10+00.0000	78616.6757	2289267.3315
319	Y6	11+00.0000	78591.9349	2289364.2227
320	Y6	12+00.0000	78567.1940	2289461.1138

Point #	Chain	Station	Northing (Y)	Easting (X)
321	Y6	13+00.0000	78542.4532	2289558.0049
322	Y6	14+00.0000	78517.7123	2289654.8960
323	Y6	15+00.0000	78492.9715	2289751.7872
324	Y6	16+00.0000	78468.2306	2289848.6783
325	Y6	17+00.0000	78443.4897	2289945.5694
326	Y6	18+00.0000	78418.7489	2290042.4605
327	DR1	10+00.0000	74098.8074	2288039.6432
328	DR1	11+00.0000	74010.9841	2288003.1516
329	DR1	12+00.0000	73934.4032	2287938.8448
330	DR1	13+00.0000	73857.8223	2287874.5380
331	DR1	14+00.0000	73776.4106	2287820.2776
332	DR1	14+58.0512	73731.8192	2287854.0225

PROJECT REFERENCE NO.	SHEET NO.
R-3324	2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
S.D. Kendall 11/28/12

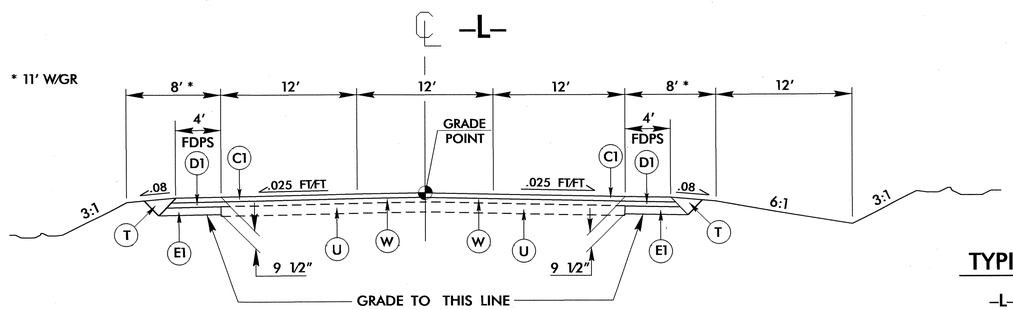
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DON-CHI CHEN
Don-Chi Chen 11/29/12

PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN

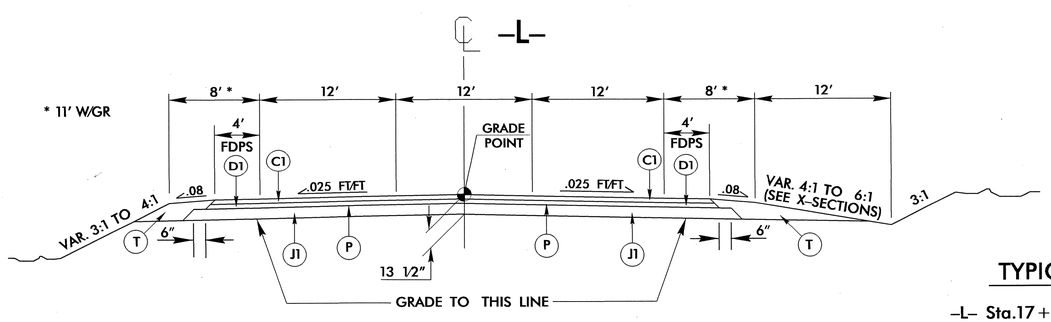
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R1	PROP. 5" MONOLITIC CONCRETE ISLAND (SURFACE MOUNTED).
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	R2	PROP. 2'-6" CONCRETE CURB AND GUTTER
C4	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.	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.	T	EARTH MATERIAL
C5	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E4	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	E5	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.	V	MILLING BITUMINOUS PAVEMENT. 1½" DEPTH.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	J1	PROP. 8" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE STANDARD WEDGING DETAILS)
D3	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	J2	PROP. 6" AGGREGATE BASE COURSE.		

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



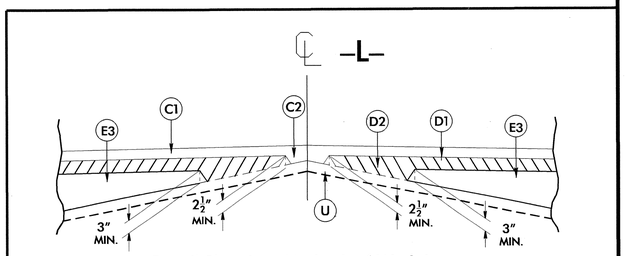
TYPICAL SECTION NO. 1

-L- Sta.15+00 to Sta. 17+50



TYPICAL SECTION NO. 2

-L- Sta.17+50 to Sta. 21+34.23 BEGIN BRIDGE



Detail Showing Method of Wedging

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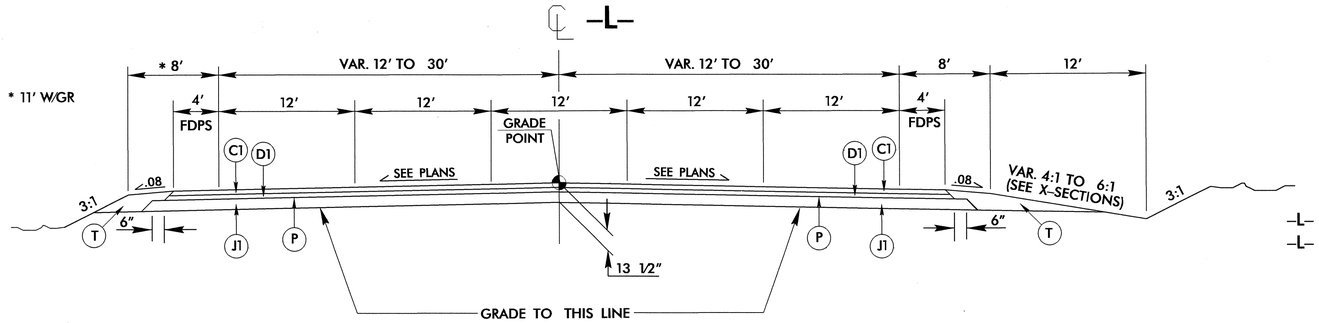
PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-A

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — 11-29-12

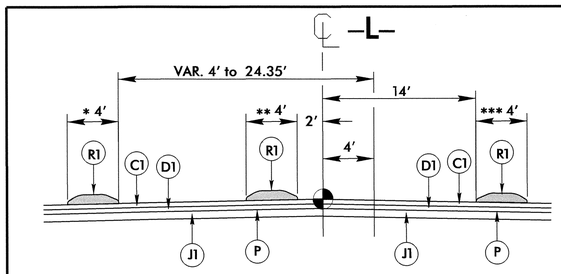
PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER CHI CHEN — 11/29/12

C1	3" S9.5B
C2	VAR. S9.5B
D1	2½" I19.0B
D2	VAR. I19.0B
J1	8" ABC
J2	6" ABC
P	PRIME COAT
R1	5" MONO. ISLAND
R2	2'-6" CONC. C&G
T	EARTH MATERIAL
U	EXIST. PAVE.
W	WEDGING



TYPICAL SECTION NO. 3

-L- Sta. 22+71.55 (END BR.) to Sta. 86+20.48 (BEG. BR.)
-L- Sta. 87+88.51 (END BR.) to Sta. 130+80.63

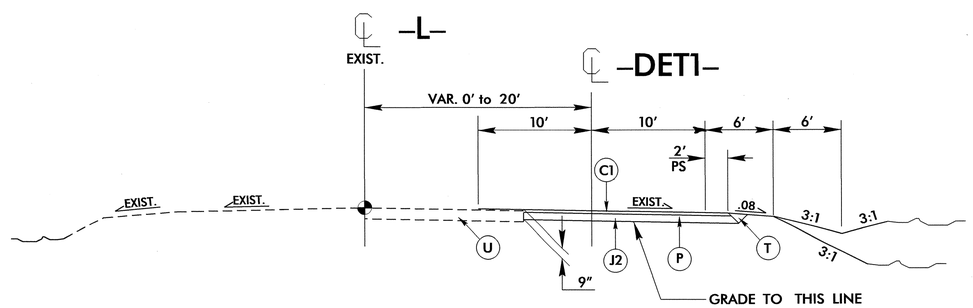


TYPICAL SECTION NO. 3A

USE CONJUNCTION WITH TYPICAL NO. 3 (SEE PLANS)

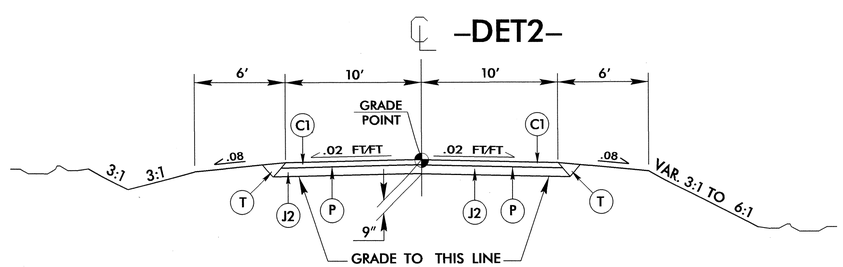
* -L- Sta. 28+25 to Sta. 38+45
** -L- Sta. 40+21 to Sta. 41+65
*** -L- Sta. 128+14 to Sta. 130+49

DETOUR TYPICAL SECTIONS



TYPICAL SECTION NO. 4

-DET1- Sta.12+00 to Sta. 24+00



TYPICAL SECTION NO. 5

-DET2- Sta. 10+13.77 to Sta. 17+17.20

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-B

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL

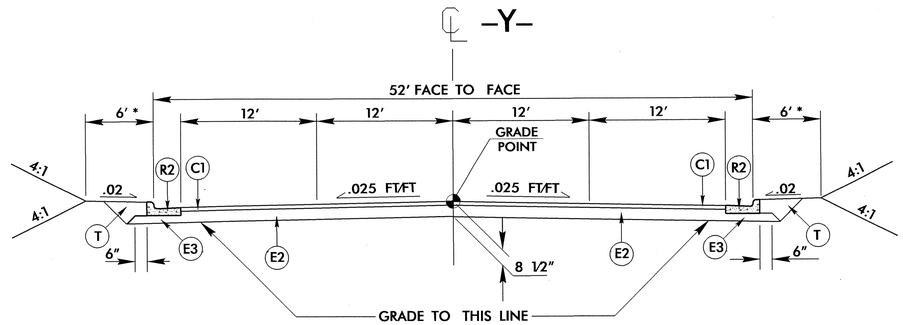
B. D. Kendall 11-29-12

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DOU-CHI CHEN

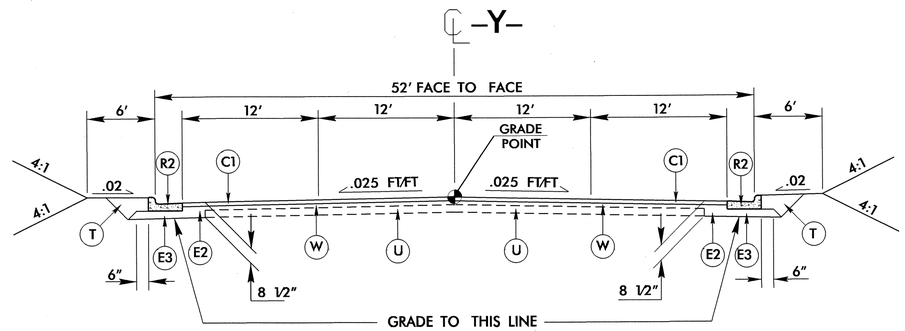
11/29/12

C1	3" S9.5B
C2	VAR. S9.5B
E2	5½" B25.0B
E3	VAR. B25.0B
R1	5" MONO. ISLAND
R2	2'-6" CONC. C&G
T	EARTH MATERIAL
U	EXIST. PAVE.
W	WEDGING



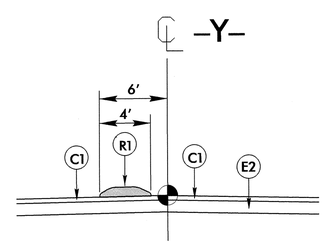
TYPICAL SECTION NO. 6

-Y- Sta. 10+00 to Sta. 14+25 +/-



TYPICAL SECTION NO. 7

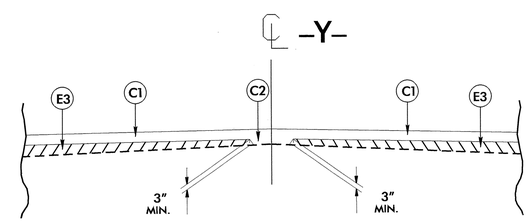
-Y- Sta. 14+25 +/- to Sta. 24+80 +/-



TYPICAL SECTION NO. 7A

USE IN CONJUNCTION WITH TYPICAL NO. 7 (SEE PLANS)

-Y- Sta 19+85 to Sta. 24+40



Detail Showing Method of Wedging

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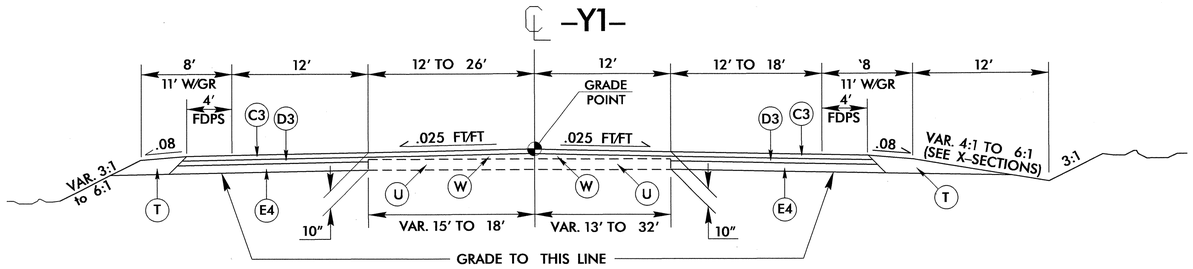
PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-C

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — S. D. Kendall 11-29-12

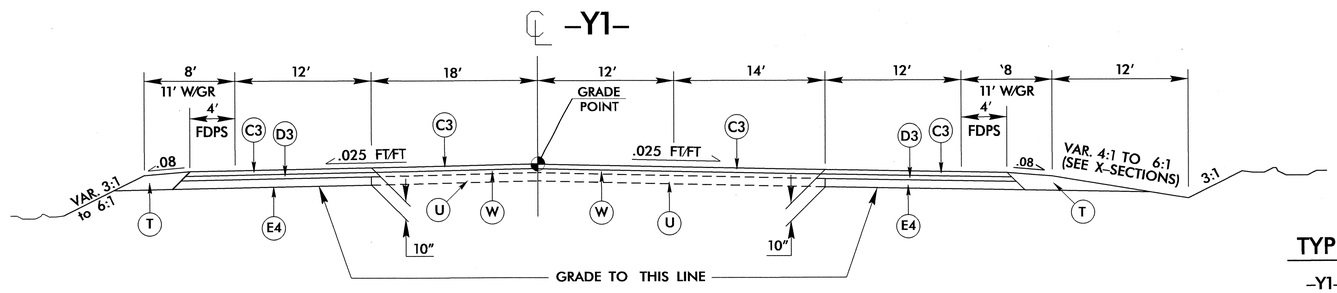
PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER LIONG-CHI CHEN — 11/29/12

C3	3" S9.5C
C4	VAR. S9.5C
D3	2½" I19.0C
D4	VAR. I19.0C
E4	4½" B25.0C
E5	VAR. B25.0C
R1	5" MONO. ISLAND
T	EARTH MATERIAL
U	EXIST. PAVE.
R2	2'-6" CONC. C&G
W	WEDGING



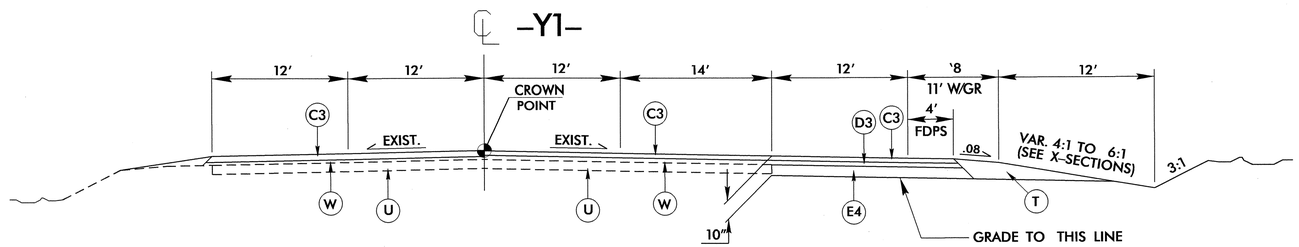
TYPICAL SECTION NO. 8

-Y1- Sta. 10+00 to Sta. 33+00



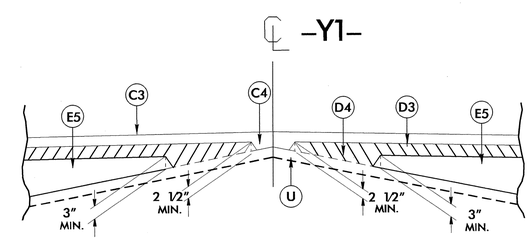
TYPICAL SECTION NO. 9

-Y1- Sta. 33+00 to Sta. 43+50

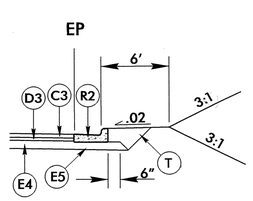


TYPICAL SECTION NO. 10

-Y1- Sta. 43+50 to Sta. 50+00 RT.



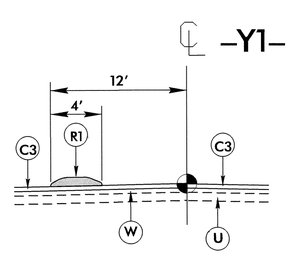
Detail Showing Method of Wedging



TYPICAL SECTION NO. 8A

USE CONJUNCTION WITH TYPICAL NO. 8 (SEE PLANS)

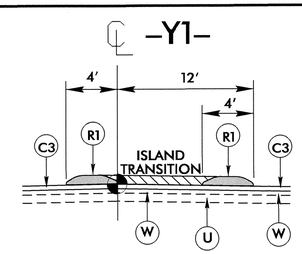
-Y1- Sta. 29+71 to Sta. 31+74



TYPICAL SECTION NO. 9A

USE CONJUNCTION WITH TYPICAL NO. 9 (SEE PLANS)

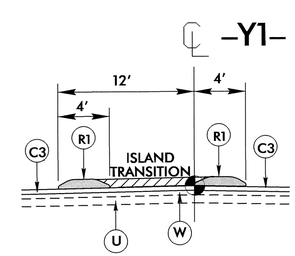
-Y1- Sta. 21+50 to Sta. 23+50 LT.



TYPICAL SECTION NO. 9B

USE CONJUNCTION WITH TYPICAL NO. 9 (SEE PLANS)

-Y1- Sta. 25+60 to Sta. 29+20 RT.
-Y1- Sta. 29+20 to Sta. 30+20 TRANSITION
-Y1- Sta. 30+20 to Sta. 32+20 LT.
-Y1- Sta. 40+29 to Sta. 41+23 RT.
-Y1- Sta. 41+23 to Sta. 41+48 TRANSITION
-Y1- Sta. 41+48 to Sta. 42+45 LT.
-Y1- Sta. 42+22 to Sta. 44+07



TYPICAL SECTION NO. 10A

USE CONJUNCTION WITH TYPICAL NO. 10 (SEE PLANS)

-Y1- Sta. 33+77 to Sta. 38+60 RT.
-Y1- Sta. 38+60 to Sta. 39+66 TRANSITION
-Y1- Sta. 39+66 to Sta. 41+00 LT.

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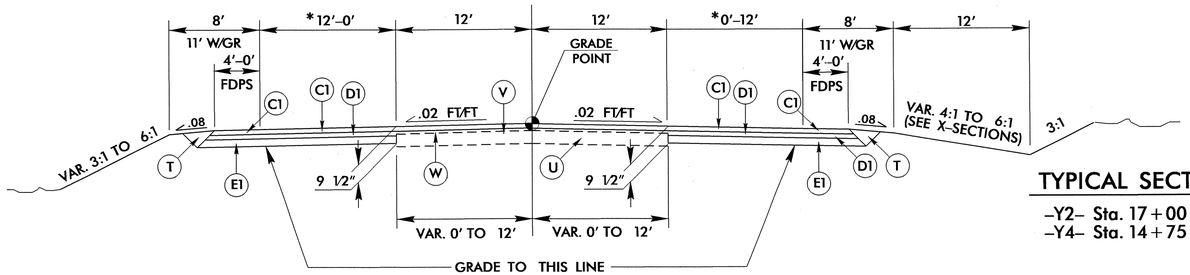
PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-D

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
S. D. Kendall 11-29-12

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER LIONG-CHI CHEN
11/29/12

–Y2– & –Y4–

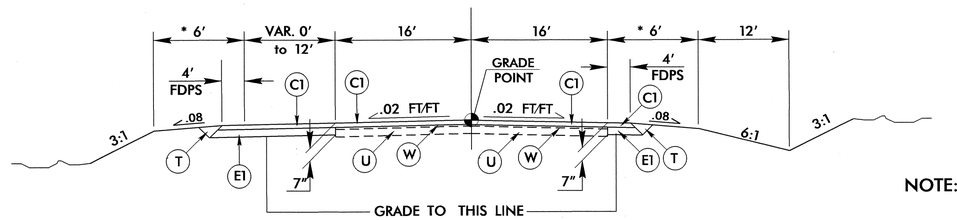


TYPICAL SECTION NO. 11

–Y2– Sta. 17+00 to Sta. 83+00
–Y4– Sta. 14+75 to Sta. 20+00

NOTE: MILLING THE EXISTING ROADWAY ON –Y2– WHERE CRACKING IS SEVER TO A DEPTH OF 1 1/2" AND REPLACE WITH 1 1/2" S9.5B.

–Y3A–

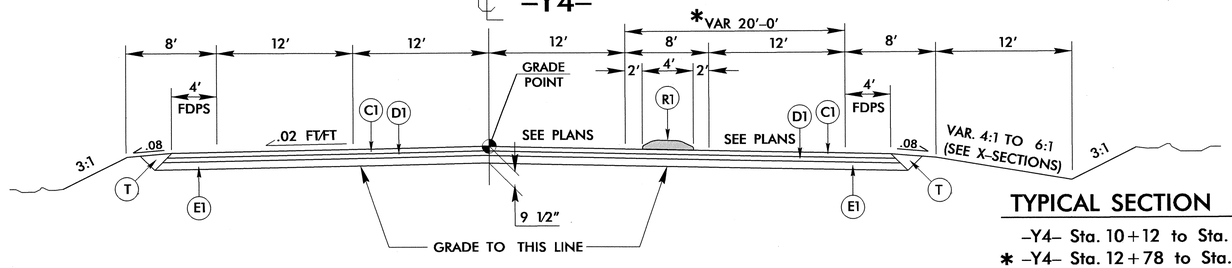


TYPICAL SECTION NO. 12

–Y3A– Sta. 11+70 to Sta. 20+00

NOTE: SEE TYPICAL 12A AND DETAIL SHEET 2–H FOR ISLAND LOCATION

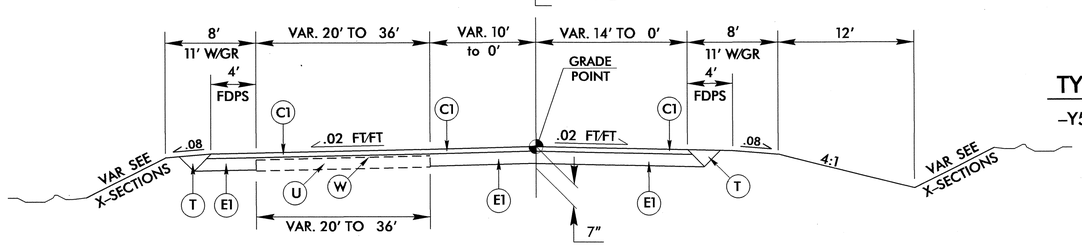
–Y4–



TYPICAL SECTION NO. 13

–Y4– Sta. 10+12 to Sta. 12+78
* –Y4– Sta. 12+78 to Sta. 14+75

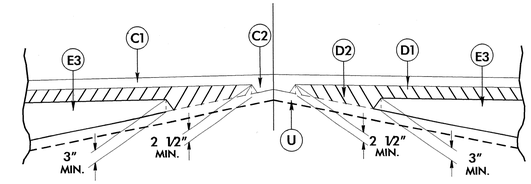
–Y5–



TYPICAL SECTION NO. 14

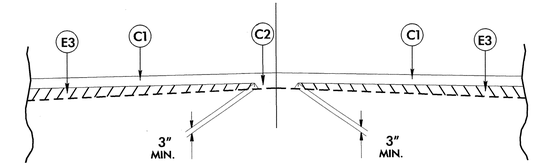
–Y5– Sta. 10+42.72 to Sta. 12+80

–Y2–, –Y4–



Detail Showing Method of Wedging

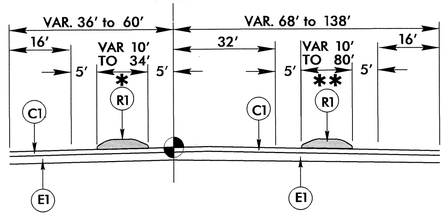
–Y3A–



Detail Showing Method of Wedging

C1	3" S9.5B	J2	6" ABC
C2	VAR. S9.5B	R1	5" MONO. ISLAND.
D1	2½" I19.0B	T	EARTH MATERIAL
D2	VAR. I19.0	U	EXIST. PAVE.
E1	4" B25.0B	V	MILLING (SEE NOTE)
E3	VAR. B25.0B	W	WEDGING

–Y3A–



TYPICAL SECTION NO. 12A

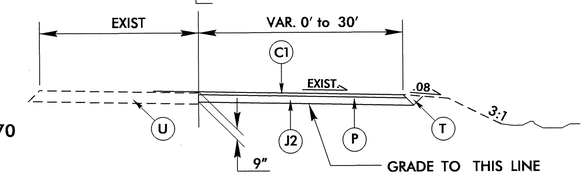
USE CONJUNCTION WITH TYPICAL NO. 12 (SEE PLANS)

* –Y3A– Sta. 10+14 to Sta. 10+82
** –Y3A– Sta. 10+56 to Sta. 11+70

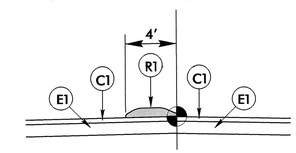
TYPICAL SECTION NO. 12B

TEMPORARY PAVEMENT
–Y3D– Sta. 15+56.86 to Sta. 18+87.70
SEE TMP–15 PLAN FOR DETAIL

–Y3D–



–Y5–



TYPICAL SECTION NO. 14A

USE CONJUNCTION WITH TYPICAL NO. 14 (SEE PLANS)

–Y5– Sta. 10+69 to Sta. 11+00

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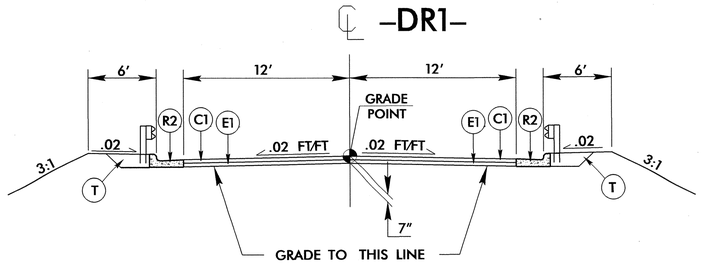
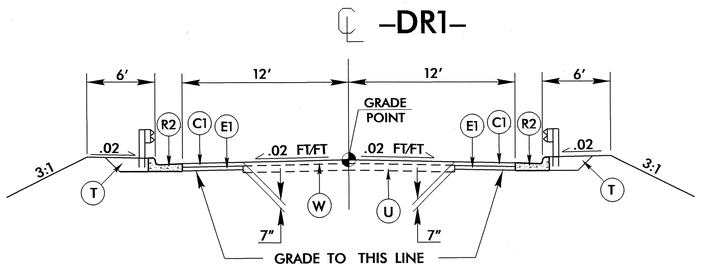


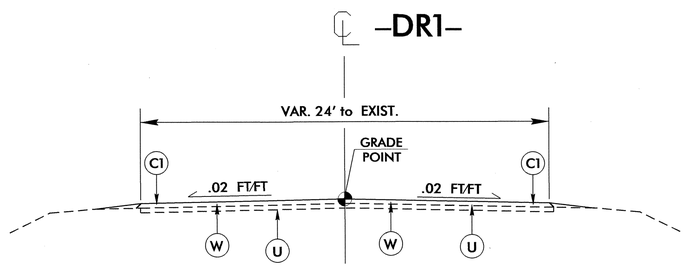
TYPICAL SECTION NO. 15

-DR1- Sta. 10+29.24 to Sta. 11+50.00



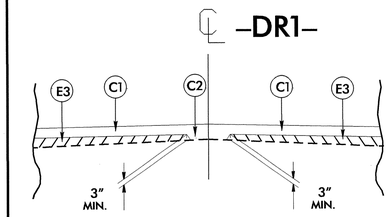
TYPICAL SECTION NO. 16

-DR1- Sta. 11+50.00 to Sta. 12+75.00



TYPICAL SECTION NO. 17

-DR1- 12+75.00 to 14+58.05



Detail Showing Method of Wedging

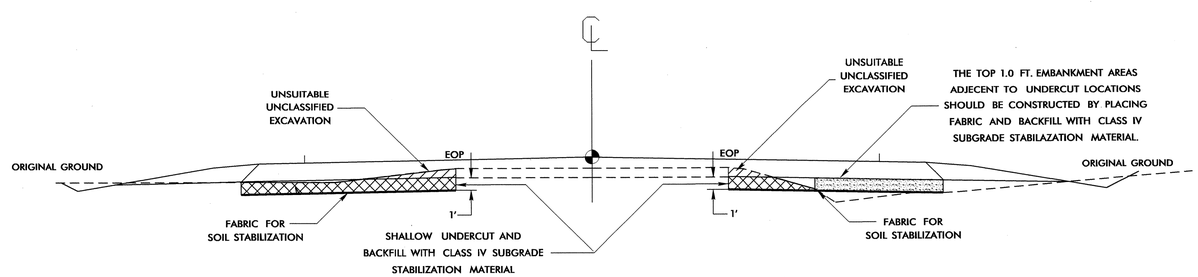
PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-E

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — 11-29-12

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER LONG-CHI CHEN — 11/29/12

C1	3" S9.5B
C2	VAR. S9.5B
D1	2½" I19.0B
E1	4" B25.0B
J1	8" ABC
R1	5" MONO. ISLAND
R2	2'-6" CONC. C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

SUBGRADE CONSTRUCTION /SHALLOW UNDERCUT TYPICAL SECTION



SUBGRADE CONSTRUCTION AND SHALLOW UNDERCUT TYPICAL SECTION

-Y1- Sta. 18+00 to Sta. 45+00
-Y2- Sta. 27+50 to Sta. 45+00
-Y2- Sta. 60+00 to Sta. 70+00

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-F

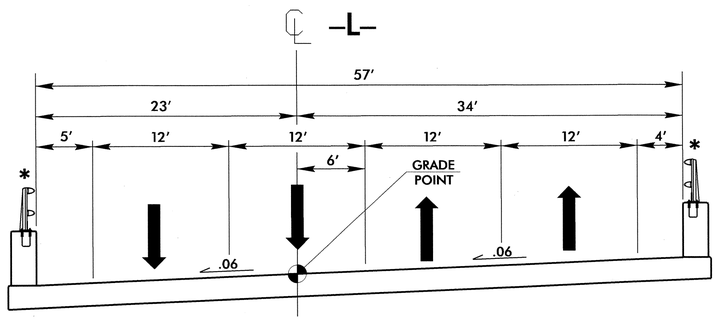
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
B.D. Kendall 12-3-12

DESIGN DATA

ADT 2012	=	14,902
ADT 2033	=	26,739
DHV	=	60 %
D	=	9 %
T	=	3 % *
V	=	50 MPH

* TTST = 2% DUAL = 1%

FUNCTIONAL CLASSIFICATION = LOCAL



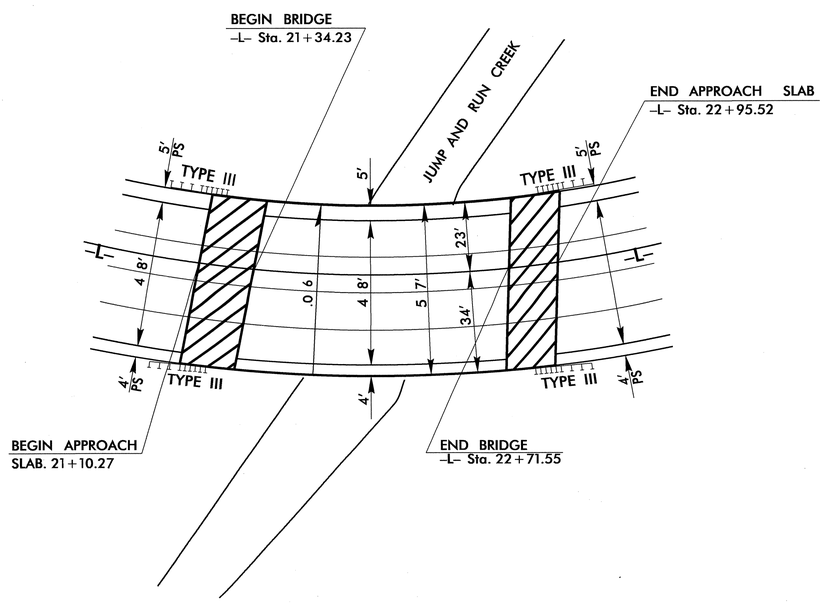
TYPICAL SECTION ON BRIDGE

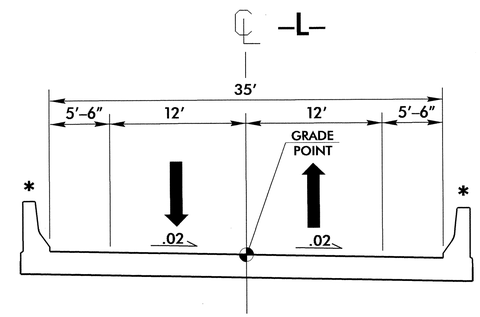
–L– Sta. 21+34.23 to Sta. 22+71.55

* BRIDGE RAIL TO BE DETERMINED BY STRUCTURE DESIGN UNIT.

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP

–L– Sta. 21+34.23 to Sta. 22+71.55





TYPICAL SECTION ON BRIDGE

–L– Sta. 86+20.48 to Sta. 87+88.52

DESIGN DATA

ADT 2012	=	9,381
ADT 2033	=	13,921
DHV	=	55 %
D	=	10 %
T	=	5 % *
V	=	50 MPH

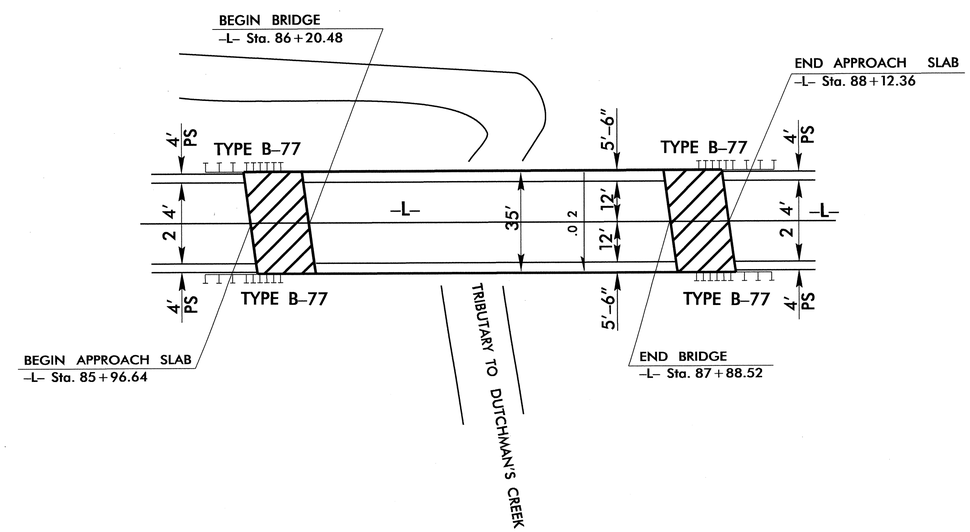
* TTST 3% DUAL 2%

FUNCTIONAL CLASSIFICATION = LOCAL

* BRIDGE RAIL TO BE DETERMINED BY STRUCTURE DESIGN UNIT.

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP

–L– Sta. 86+20.48 to Sta. 87+88.52



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PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-G

HYDRAULICS ENGINEER

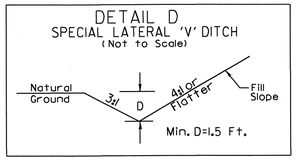
NORTH CAROLINA PROFESSIONAL SEAL 29878 ENGINEER MARC T. SHOWN

11/3/12

DITCH DETAILS

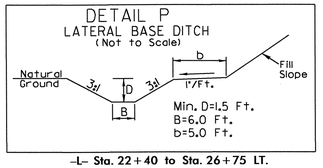
SHT. No. 4

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



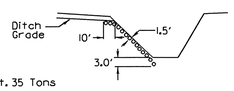
-L- Sta. 18+00 to Sta. 21+00 LT.

DETAIL P
LATERAL BASE DITCH
(Not to Scale)



-L- Sta. 22+40 to Sta. 26+75 LT.

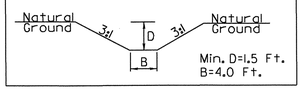
DETAIL Q
RIP RAP AT EMBANKMENT
(Not to Scale)



Est. 35 Tons

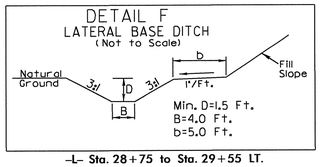
Type of Liner= CLASS I Rip-Rap

DETAIL R
STANDARD GRASSED SWALE
(Not to Scale)



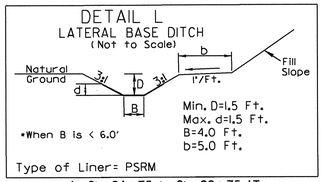
SHT. No. 5

DETAIL F
LATERAL BASE DITCH
(Not to Scale)



-L- Sta. 28+75 to Sta. 29+55 LT.

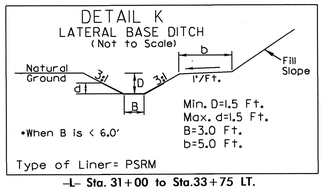
DETAIL L
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= PSRM

-L- Sta. 26+75 to Sta. 28+75 LT.
-L- Sta. 29+75 to Sta. 31+00 LT.

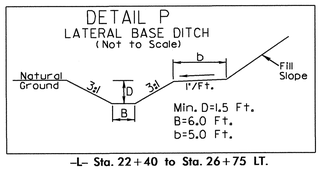
DETAIL K
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= PSRM

-L- Sta. 31+00 to Sta.33+75 LT.

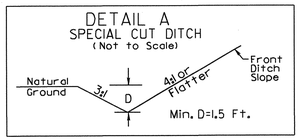
DETAIL P
LATERAL BASE DITCH
(Not to Scale)



-L- Sta. 22+40 to Sta. 26+75 LT.

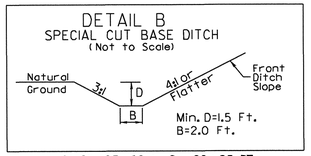
SHT. No. 6

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



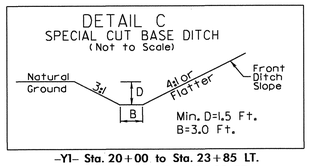
-L- Sta. 36+50 to Sta. 37+50 LT.
-L- Sta. 42+00 to Sta. 43+50 RT.
-Y1- Sta. 20+00 to Sta. 23+50 RT.

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)



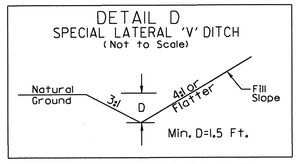
-L- Sta. 35+00 to Sta. 38+85 RT.
-Y1- Sta. 25+50 to Sta. 29+50 LT.
-Y1- Sta. 25+50 to Sta. 29+00 RT.
-Y1- Sta. 37+25 to Sta. 47+20 LT.

DETAIL C
SPECIAL CUT BASE DITCH
(Not to Scale)



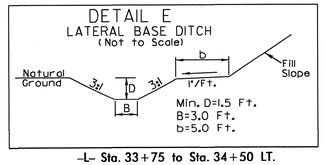
-Y1- Sta. 20+00 to Sta. 23+85 LT.
-Y1- Sta. 37+00 to Sta. 40+00 RT.

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



-L- Sta. 34+50 to Sta. 36+50 LT.
-L- Sta. 40+27 to Sta.42+00 RT.

DETAIL E
LATERAL BASE DITCH
(Not to Scale)



-L- Sta. 33+75 to Sta. 34+50 LT.

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-H

ROADWAY DESIGN ENGINEER

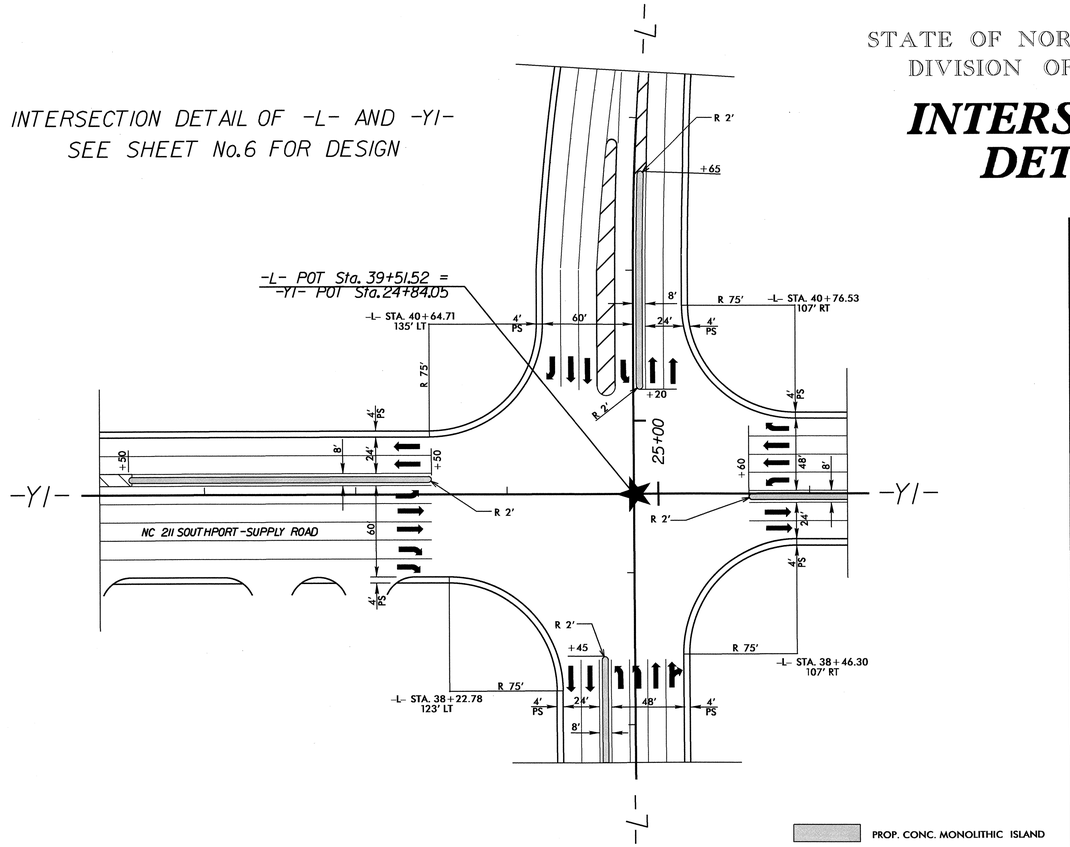
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL

S. V. Kendall 12-13-12

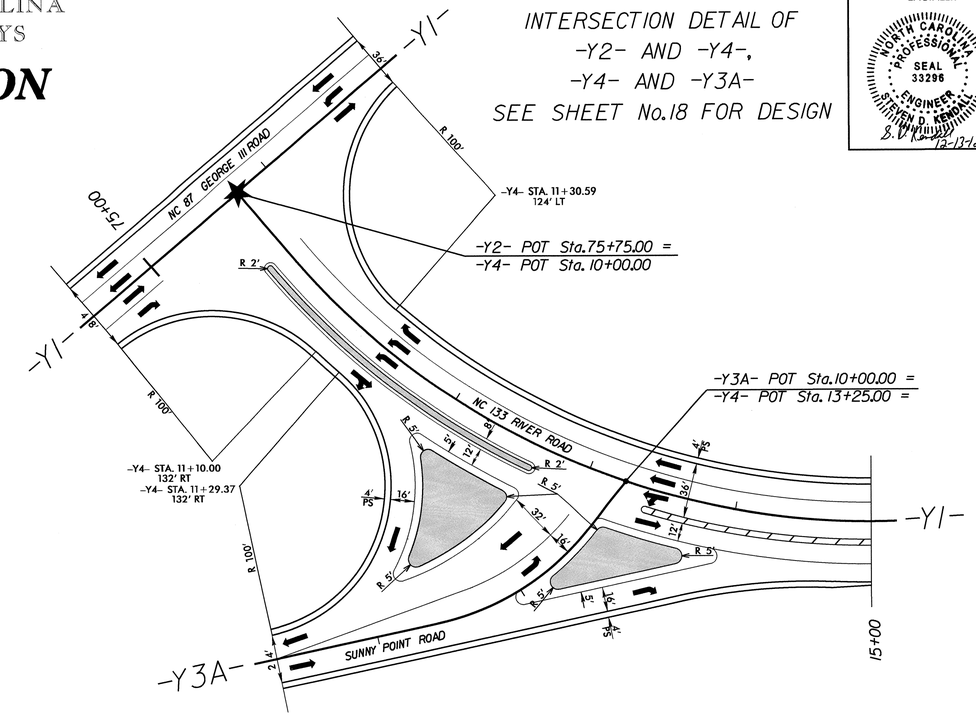
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INTERSECTION DETAILS

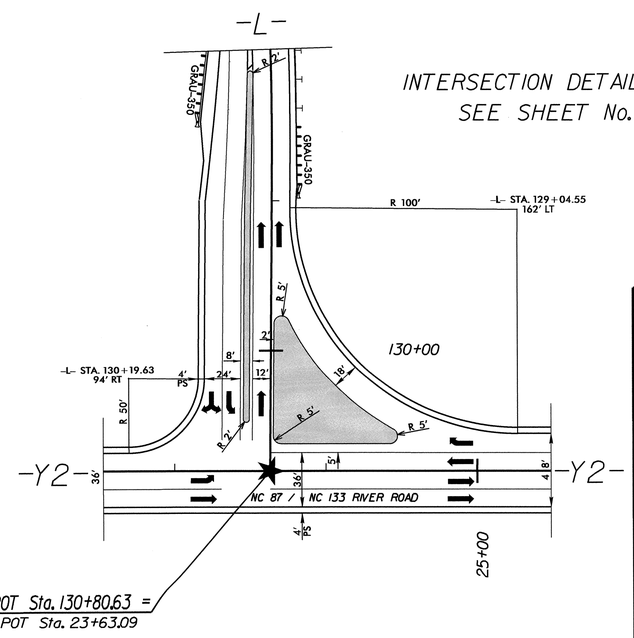
INTERSECTION DETAIL OF -L- AND -Y1-
SEE SHEET No.6 FOR DESIGN



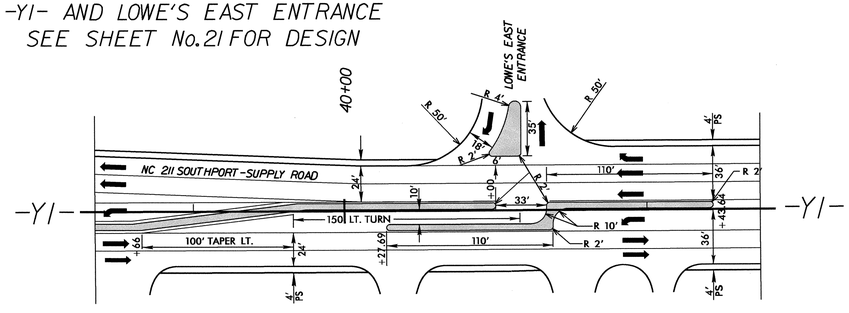
INTERSECTION DETAIL OF
-Y2- AND -Y4-,
-Y4- AND -Y3A-
SEE SHEET No.18 FOR DESIGN

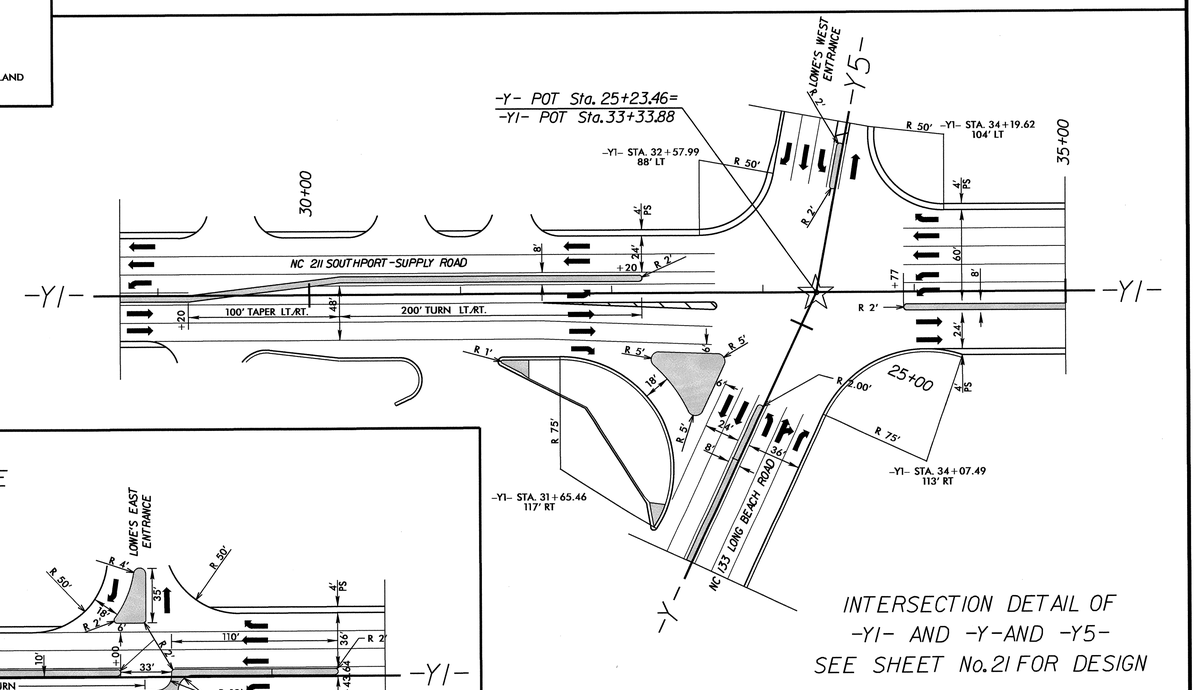


INTERSECTION DETAIL OF -L- AND -Y2-
SEE SHEET No.13 FOR DESIGN



INTERSECTION DETAIL OF
-Y1- AND LOWE'S EAST ENTRANCE
SEE SHEET No.21 FOR DESIGN





INTERSECTION DETAIL OF
-Y1- AND -Y-AND -Y5-
SEE SHEET No.21 FOR DESIGN

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PROJECT REFERENCE NO.	SHEET
R-3324	2-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

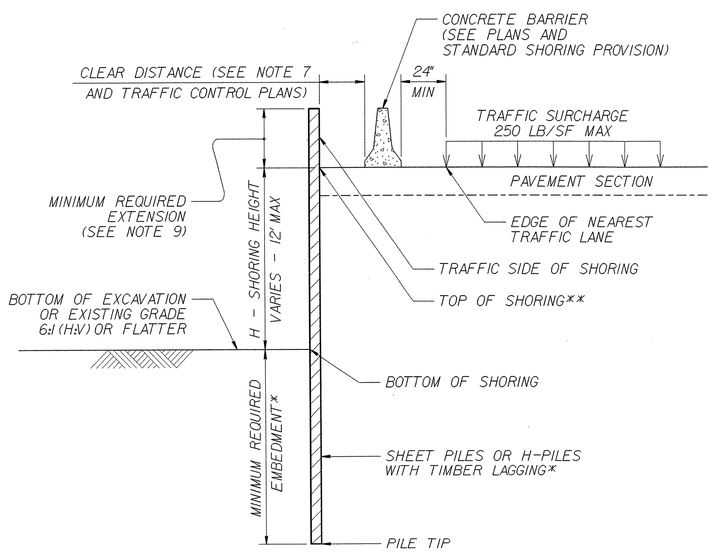
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (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 "--".**

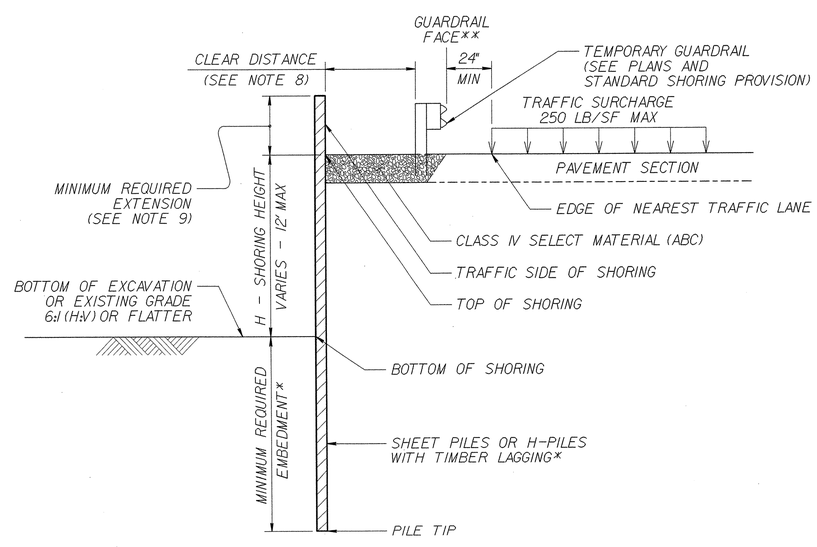
NOTES:

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.



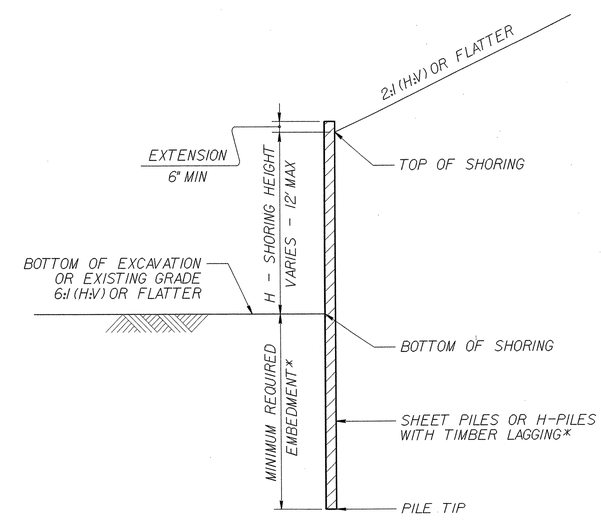
CONCRETE BARRIER

****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-3324	2-J

GEOTECHNICAL ENGINEER

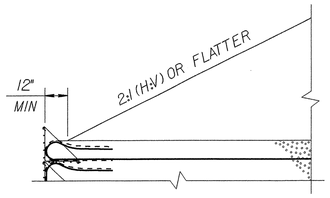
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12

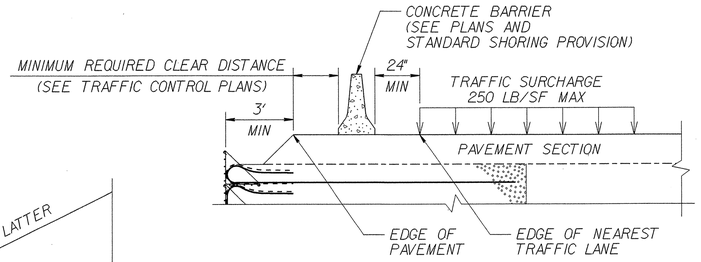
SIGNATURE DATE

ENGINEER

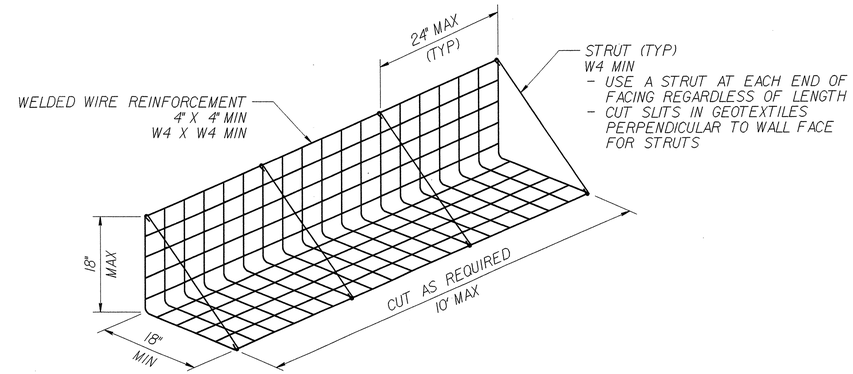
SIGNATURE DATE



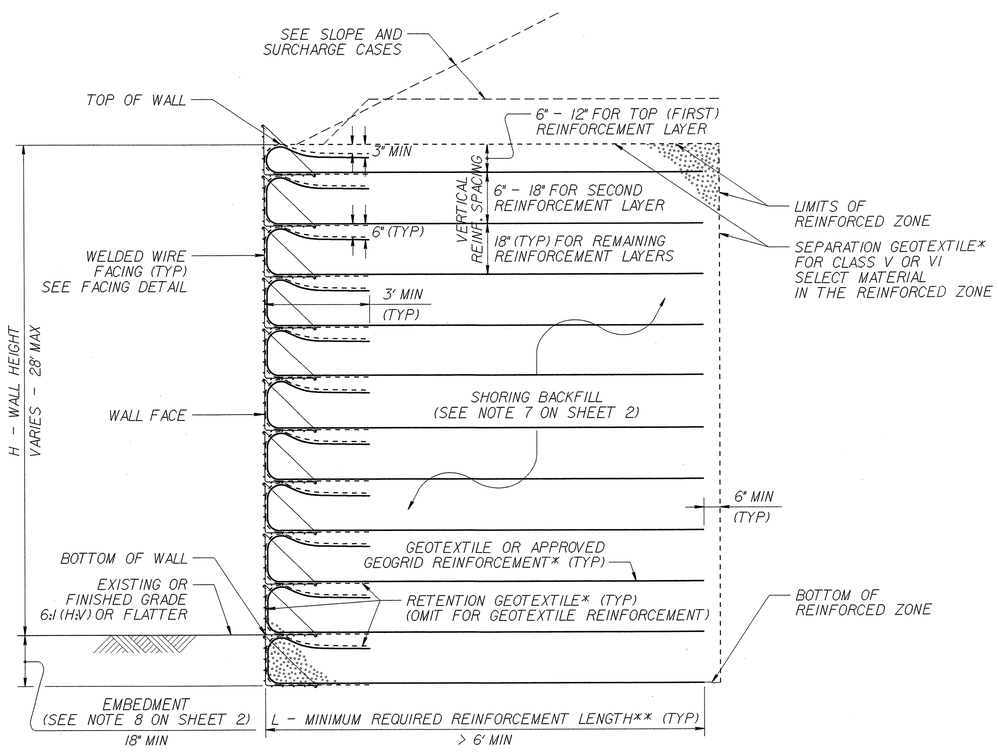
SLOPE CASE



SURCHARGE CASE

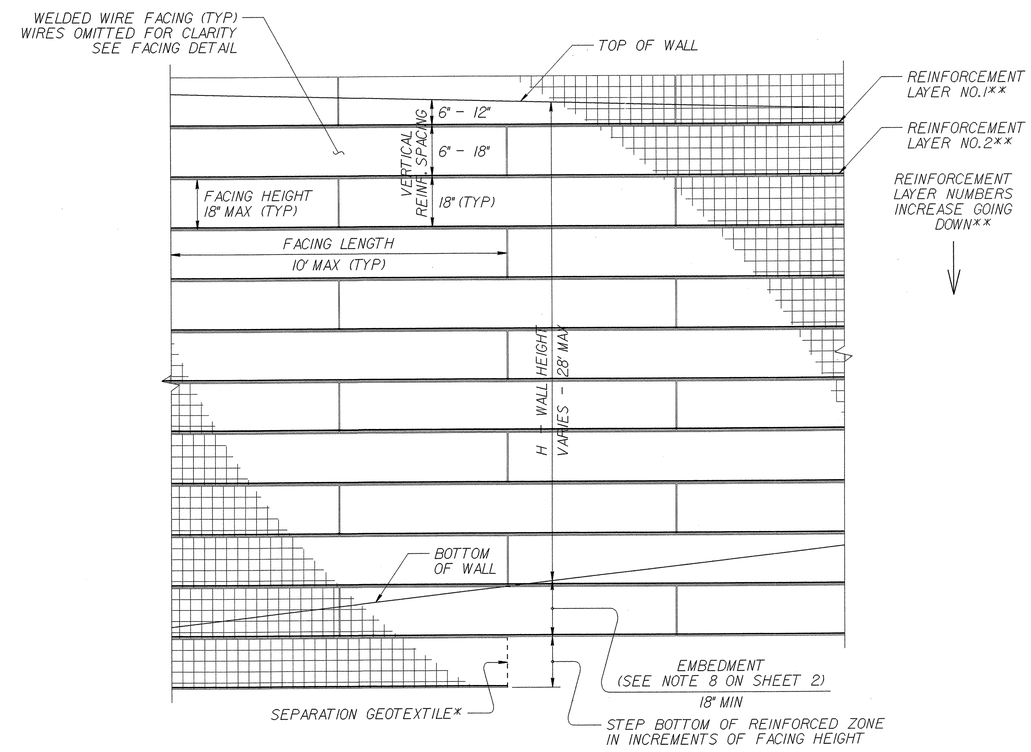


FACING DETAIL



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.**

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-3324	2-K

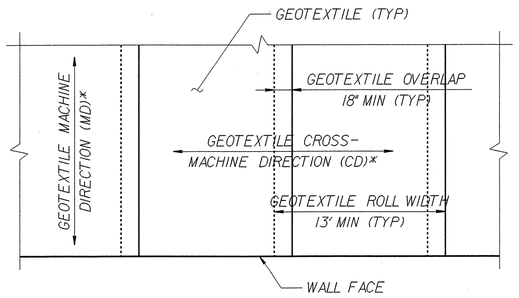
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 8/10/12
SIGNATURE DATE

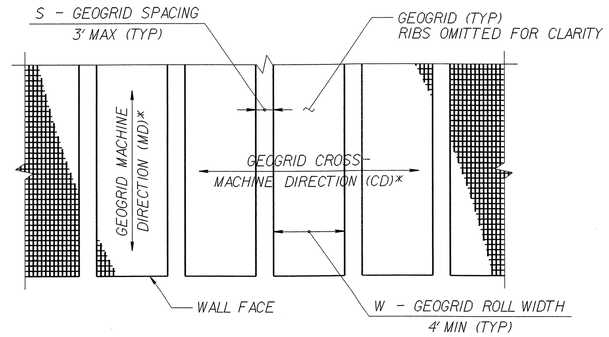
ENGINEER

SIGNATURE DATE



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

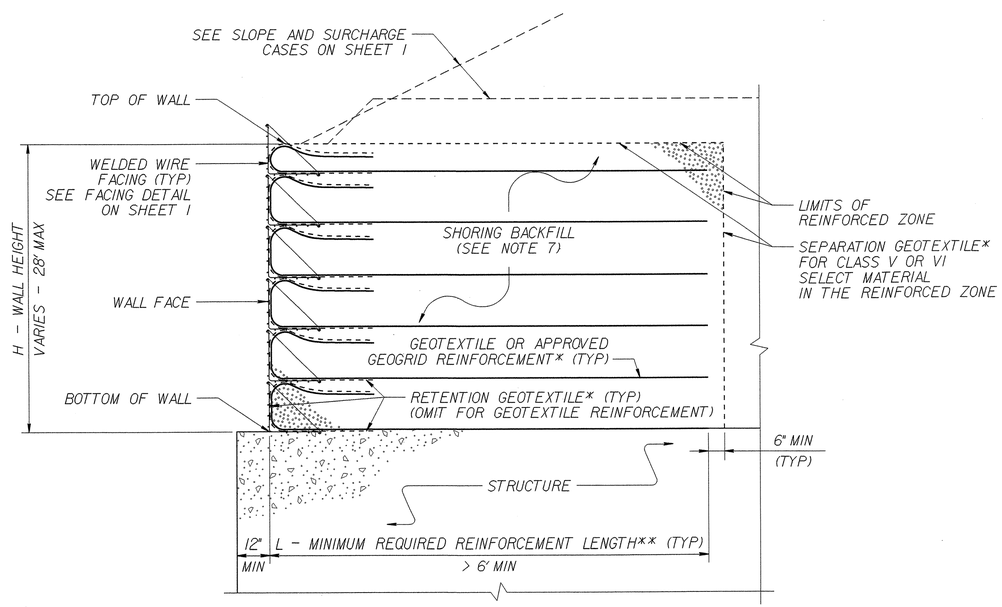


GEOGRID PLACEMENT

(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 I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) $\geq$ L (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD $\geq$ 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-3324	2-L

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

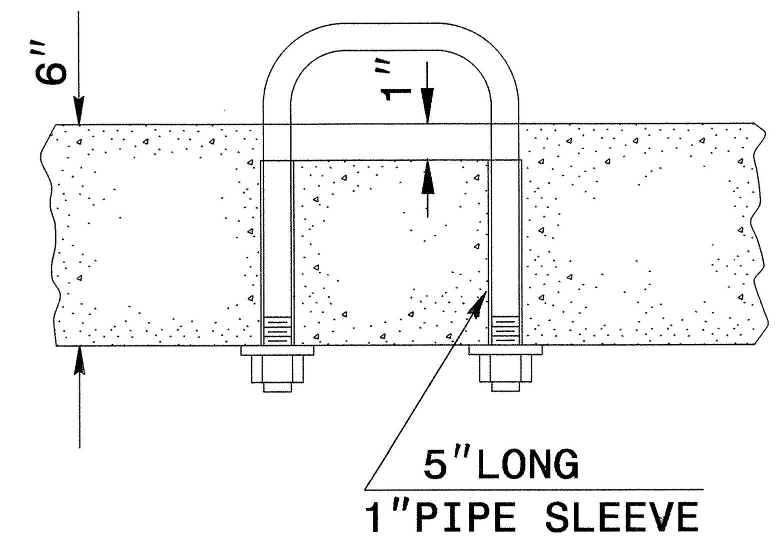
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

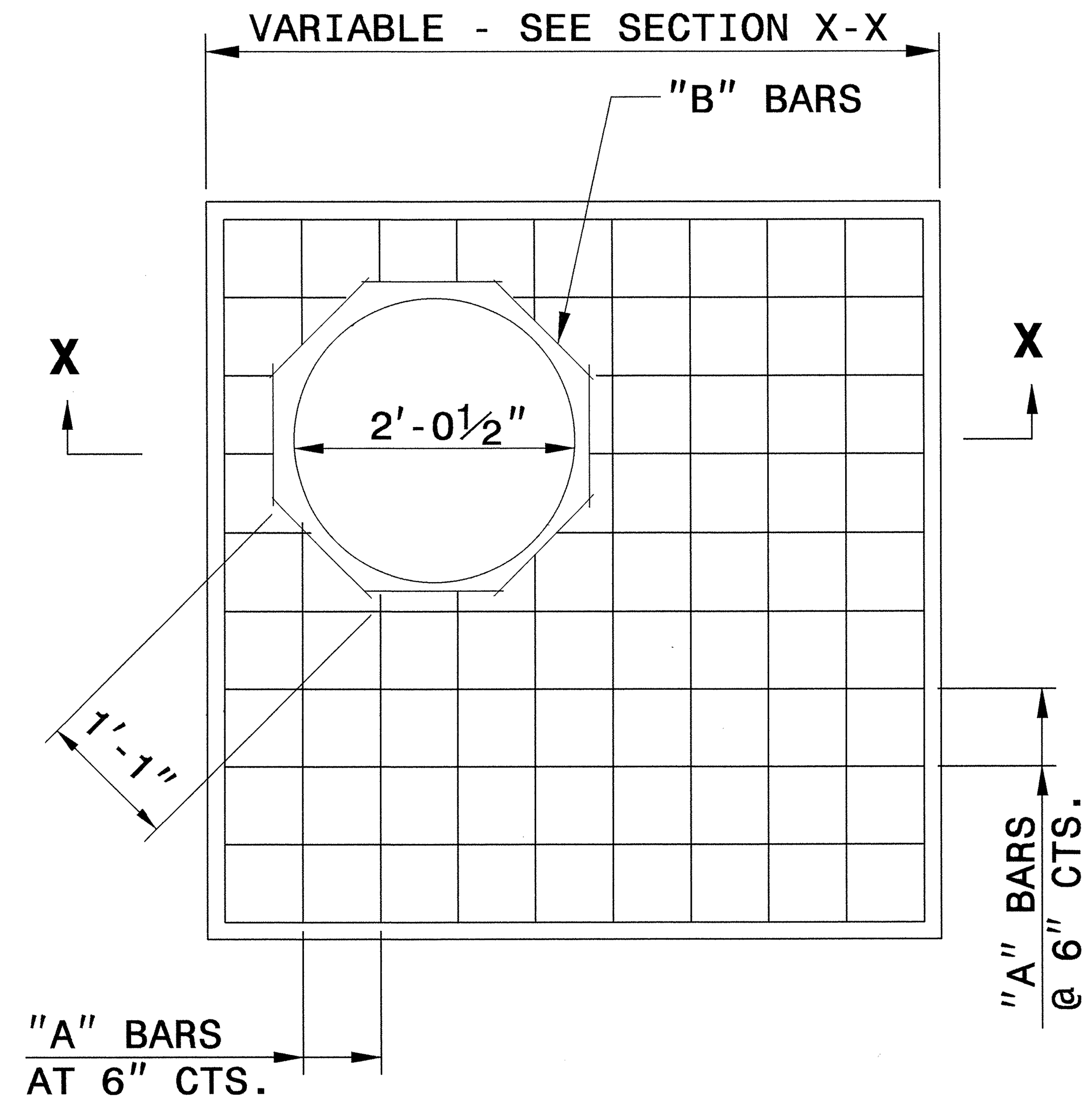
STANDARD
TEMPORARY WALL
Sheet 3 of 3

DATE: 11-20-12

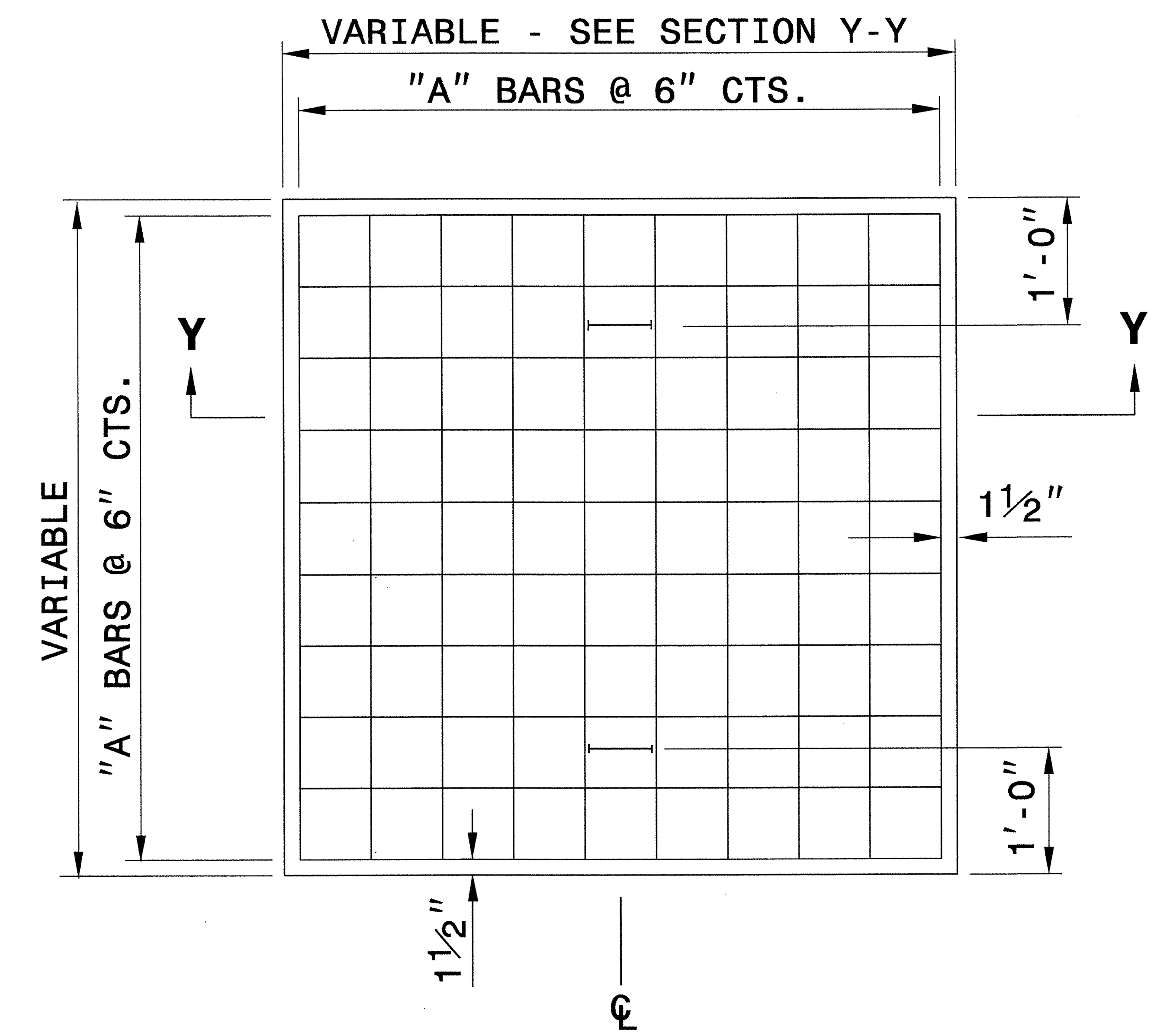
PROJECT REFERENCE NO.	SHEET NO.
R-3324	2-M



PARTIAL SECTION



PLAN



PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

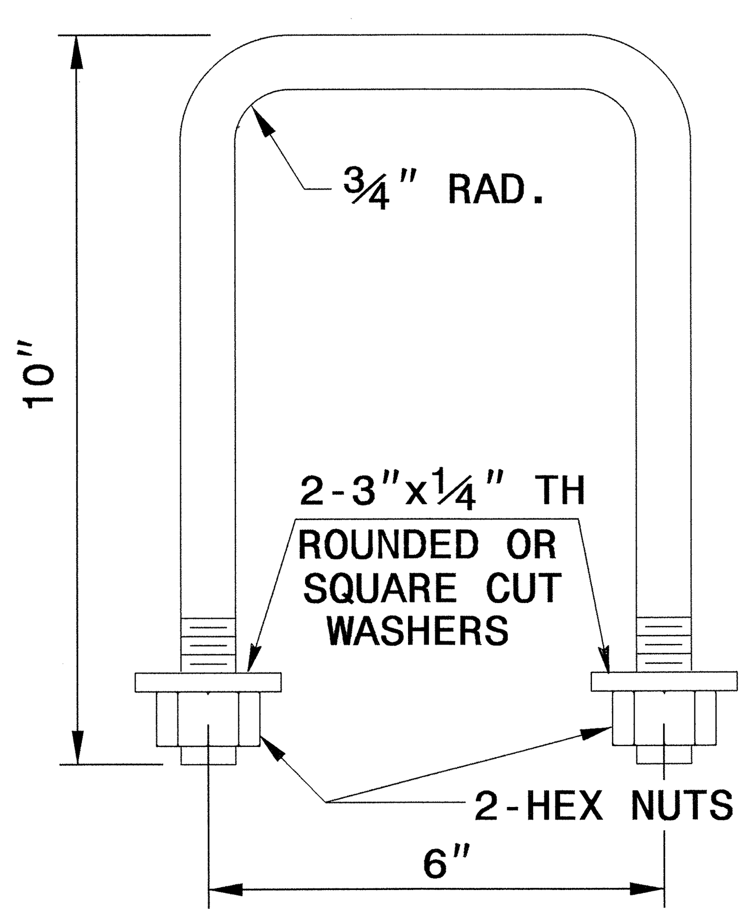
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

BILL OF MATERIALS

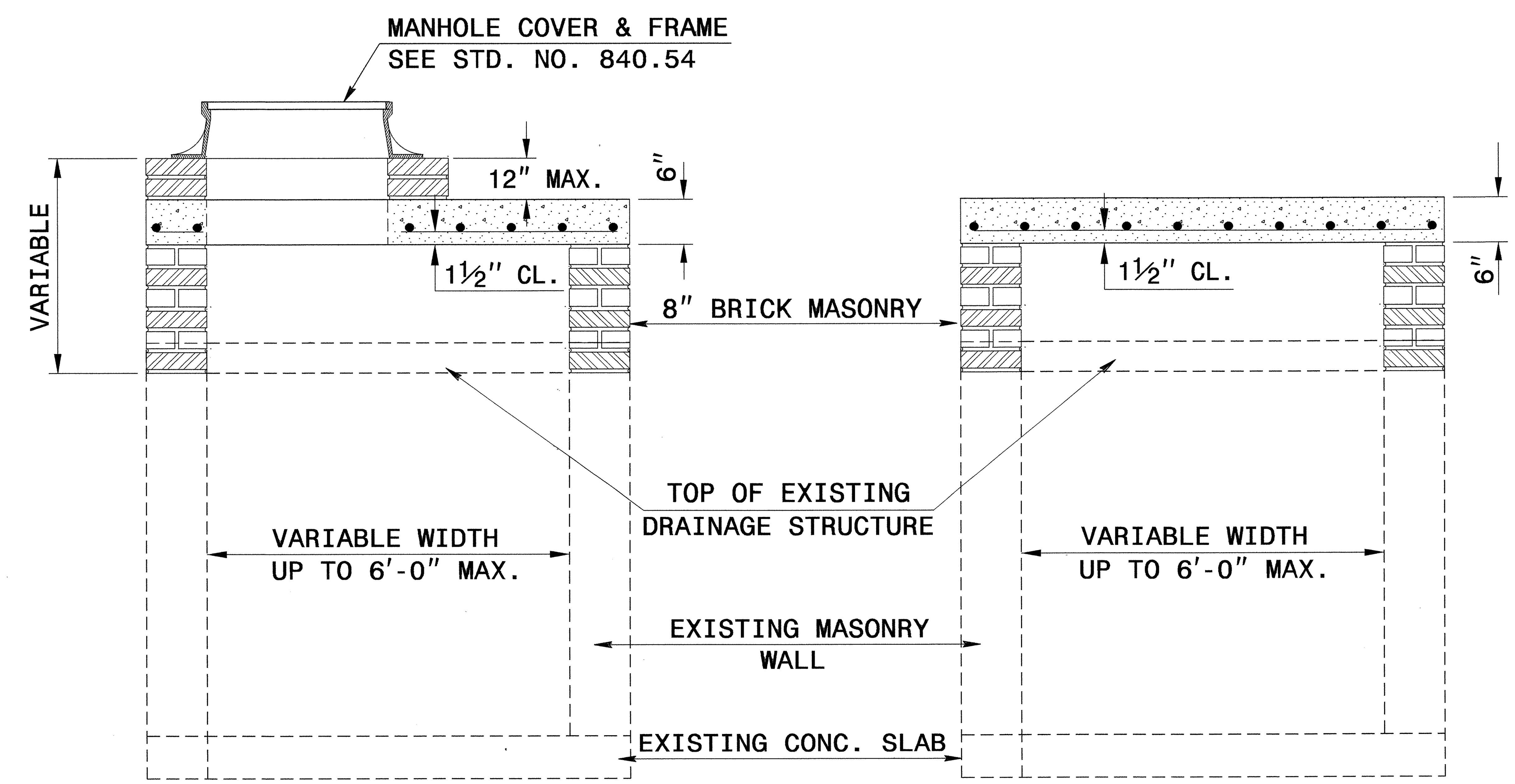
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *

MASONRY	CU YDS
TOP SLAB CONCRETE CLASS "B"	.4326 *
BRICK MASONRY PER FT HT (MIN)	.4111

★ NOTE:
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.

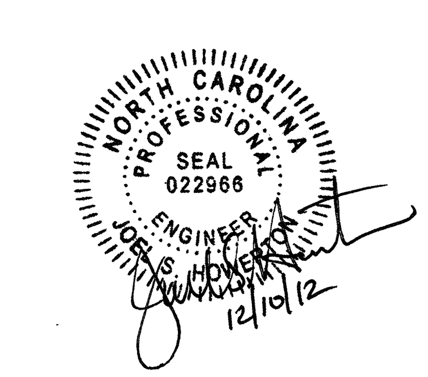


DETAIL OF HANDLE



SECTION X-X

SECTION Y-Y



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

DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO JUNCTION BOX (MANHOLE OPTIONAL)

ORIGINAL BY: T.S.S. DATE: NOV.1997
MODIFIED BY: T.S.S. DATE: FEB.2000
CHECKED BY: [signature] DATE: 11/26/12
FILE SPEC.: ds174:/usr/details/stand/boxtojbe.dgn

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202155

SUMMARY OF QUANTITIES - R-3324

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0015000000-N	205	17	EA	SEALING ABANDONED WELLS
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (22+00-L-)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (87+00-L-)
0050000000-E	226	3	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0057000000-E	226	1,700	CY	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0106000000-E	230	419,000	CY	BORROW EXCAVATION
0134000000-E	240	9,085	CY	DRAINAGE DITCH EXCAVATION
0192000000-N	260	22	HR	PROOF ROLLING
0195000000-E	265	1,500	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	20,850	SY	GEOTEXTILE FOR SOIL STABILIZA-TION
0199000000-E	SP	2,880	SF	TEMPORARY SHORING
0318000000-E	300	1,860	TON	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRUCTURES
0320000000-E	300	4,070	SY	FOUNDATION CONDITIONING GEO-TEXTILE
0342000000-E	310	1,960	LF	*** SIDE DRAIN PIPE (30")
0342000000-E	310	2,144	LF	*** SIDE DRAIN PIPE (36")
0342000000-E	310	316	LF	*** SIDE DRAIN PIPE (42")
0342000000-E	310	132	LF	*** SIDE DRAIN PIPE (48")
0343000000-E	310	3,840	LF	15" SIDE DRAIN PIPE
0344000000-E	310	1,752	LF	18" SIDE DRAIN PIPE
0345000000-E	310	1,400	LF	24" SIDE DRAIN PIPE
0414000000-E	310	312	LF	60" RC PIPE CULVERTS, CLASS III
0448200000-E	310	56	LF	15" RC PIPE CULVERTS, CLASS IV
0448300000-E	310	112	LF	18" RC PIPE CULVERTS, CLASS IV
0582000000-E	310	264	LF	15" CS PIPE CULVERTS, 0.064" THICK
0588000000-E	310	140	LF	18" CS PIPE CULVERTS, 0.064" THICK
0636000000-E	310	14	EA	*** CS PIPE ELBOWS, ***** THICK (15", 0.064")
0636000000-E	310	4	EA	*** CS PIPE ELBOWS, ***** THICK (18", 0.064")
0995000000-E	340	5,154	LF	PIPE REMOVAL
1099500000-E	505	4,330	CY	SHALLOW UNDERCUT
1099700000-E	505	7,900	TON	CLASS IV SUBGRADE STABILIZA-TION
1110000000-E	510	16,000	TON	STABILIZER AGGREGATE
1121000000-E	520	27,225	TON	AGGREGATE BASE COURSE
1220000000-E	545	1,000	TON	INCIDENTAL STONE BASE
1275000000-E	600	21,105	GAL	PRIME COAT
1297000000-E	607	150	SY	MILLING ASPHALT PAVEMENT, *** DEPTH (1-1/2")
1330000000-E	607	1,300	SY	INCIDENTAL MILLING
1489000000-E	610	12,470	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-E	610	4,910	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-E	610	12,701	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1503000000-E	610	1,810	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1519000000-E	610	21,012	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1523000000-E	610	6,510	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1575000000-E	620	3,110	TON	ASPHALT BINDER FOR PLANT MIX
1693000000-E	654	590	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2022000000-E	815	268.8	CY	SUBDRAIN EXCAVATION
2033000000-E	815	201.6	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	1,200	LF	6" PERFORATED SUBDRAIN PIPE
2070000000-N	815	3	EA	SUBDRAIN PIPE OUTLET
2077000000-E	815	18	LF	6" OUTLET PIPE
2209000000-E	838	54	CY	ENDWALLS
2220000000-E	838	16	CY	REINFORCED ENDWALLS
2253000000-E	840	1	CY	PIPE COLLARS
2275000000-E	SP	65	CY	FLOWABLE FILL
2286000000-N	840	108	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	22	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	31	EA	FRAME WITH TWO GRATES, STD 840.16
2365000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.22
2366000000-N	840	13	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	11	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	3	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	9	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	19	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	20	EA	FRAME WITH COVER, STD 840.54
2451000000-N	852	20	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLET
2538000000-E	846	300	LF	**'-** CONCRETE CURB & GUTTER (9" X 12")
2549000000-E	846	5,600	LF	2'-6" CONCRETE CURB & GUTTER
2556000000-E	846	2,210	LF	SHOULDER BERM GUTTER
2612000000-E	848	150	SY	6" CONCRETE DRIVEWAY
2647000000-E	852	2,875	SY	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)
2905000000-N	859	1	EA	CONVERT EXISTING DROP INLET TO JUNCTION BOX
3030000000-E	862	2,400	LF	STEEL BM GUARDRAIL
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	18	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	4,725	LF	REMOVE EXISTING GUARDRAIL
3380000000-E	862	150	LF	TEMPORARY STEEL BM GUARDRAIL
3389100000-N	SP	2	EA	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350
3503000000-E	866	29,550	LF	WOVEN WIRE FENCE, 47" FABRIC
3509000000-E	866	1,870	EA	4" TIMBER FENCE POSTS, 7'-6" LONG
3515000000-E	866	470	EA	5" TIMBER FENCE POSTS, 8'-0" LONG
3536000000-E	866	4,550	LF	CHAIN LINK FENCE, 48" FABRIC
3542000000-E	866	390	EA	METAL LINE POSTS FOR 48" CHAIN LINK FENCE
3548000000-E	866	50	EA	METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE
3557000000-E	866	1,500	LF	ADDITIONAL BARBED WIRE
3565000000-E	866	2	EA	DOUBLE GATES, **' HIGH, **' WIDE, **' OPENING (48", 12', 24')
3628000000-E	876	300	TON	RIP RAP, CLASS I
3635000000-E	876	450	TON	RIP RAP, CLASS II
3649000000-E	876	125	TON	RIP RAP, CLASS B
3656000000-E	876	4,735	SY	GEOTEXTILE FOR DRAINAGE
4048000000-E	902	7	CY	REINFORCED CONCRETE SIGN FOUN-DATIONS
4054000000-E	902	1	CY	PLAIN CONCRETE SIGN FOUNDA-TIONS
4060000000-E	903	6,845	LB	SUPPORTS, BREAKAWAY STEEL BEAM
4072000000-E	903	3,294	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4096000000-N	904	13	EA	SIGN ERECTION, TYPE D
4102000000-N	904	106	EA	SIGN ERECTION, TYPE E
4108000000-N	904	45	EA	SIGN ERECTION, TYPE F
4110000000-N	904	8	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
4110000000-N	904	2	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B)
4116100000-N	904	3	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)
4141000000-N	907	1	EA	DISPOSAL OF SUPPORT, WOOD
4155000000-N	907	70	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4192000000-N	907	2	EA	DISPOSAL OF SUPPORT, U-CHANNEL
4400000000-E	1110	812	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	676	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	389	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW BOARD
4420000000-N	1120	5	EA	PORTABLE CHANGEABLE MESSAGE SIGN
4430000000-N	1130	639	EA	DRUMS
4435000000-N	1135	169	EA	CONES
4445000000-E	1145	640	LF	BARRICADES (TYPE III)
4450000000-N	1150	8,800	HR	FLAGGER
4465000000-N	1160	1	EA	TEMPORARY CRASH CUSHIONS
4480000000-N	1165	2	EA	TMA
4485000000-E	1170	375	LF	PORTABLE CONCRETE BARRIER
4490000000-E	1170	670	LF	PORTABLE CONCRETE BARRIER (ANCHORED)
4507000000-E	1170	710	LF	WATER FILLED BARRIER
4510000000-N	SP	320	HR	LAW ENFORCEMENT
4516000000-N	1180	213	EA	SKINNY DRUM
4520000000-N	1266	95	EA	TUBULAR MARKERS (FIXED)
4650000000-N	1251	1,858	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	53,923	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	89,405	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4695000000-E	1205	3,010	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4697000000-E	1205	510	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)
4710000000-E	1205	962	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4721000000-E	1205	8	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4725000000-E	1205	181	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4770000000-E	1205	1,378	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (III)
4770000000-E	1205	2,381	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4780000000-E	1205	89	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (8") (III)
4800000000-N	1205	4	EA	COLD APPLIED PLASTIC PAVEMENT MARKING CHARACTER, TYPE ** (IV)
4805000000-N	1205	2	EA	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (III)
4805000000-N	1205	2	EA	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV)
4810000000-E	1205	291,876	LF	PAINT PAVEMENT MARKING LINES (4")

SUMMARY OF QUANTITIES - R-3324

ItemNumber	Sec #	Quantity	Unit	Description
4820000000-E	1205	7,092	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	2,152	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	88	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	420	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-E	1205	6,750	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4860000000-E	1205	149	LF	REMOVAL OF PAVEMENT MARKING LINES (8")
4875000000-N	1205	4	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1251	1,781	EA	PERMANENT RAISED PAVEMENT MARKERS
5255000000-N	1413	Lump Sum		PORTABLE LIGHTING
5325200000-E	1510	1,034	LF	2" WATER LINE
5325600000-E	1510	2,359	LF	6" WATER LINE
5325800000-E	1510	259	LF	8" WATER LINE
5326200000-E	1510	83	LF	12" WATER LINE
5327400000-E	1510	2,987	LF	24" WATER LINE
5536000000-E	1515	1	EA	2" VALVE
5540000000-E	1515	5	EA	6" VALVE
5546000000-E	1515	6	EA	8" VALVE
5559400000-E	1515	2	EA	24" VALVE
5571600000-E	1515	5	EA	6" TAPPING VALVE
5571800000-E	1515	3	EA	8" TAPPING VALVE
5572200000-E	1515	3	EA	12" TAPPING VALVE
5572600000-E	1515	1	EA	16" TAPPING VALVE
5573400000-E	1515	1	EA	24" TAPPING VALVE
5589100000-E	1515	2	EA	1" AIR RELEASE VALVE
5648000000-N	1515	35	EA	RELOCATE WATER METER
5649000000-N	1515	20	EA	RECONNECT WATER METER
5672000000-N	1515	6	EA	RELOCATE FIRE HYDRANT
5691300000-E	1520	1,216	LF	8" SANITARY GRAVITY SEWER
5709300000-E	1520	2,382	LF	6" FORCE MAIN SEWER
5709400000-E	1520	946	LF	8" FORCE MAIN SEWER
5709600000-E	1520	168	LF	12" FORCE MAIN SEWER
5768000000-N	1520	5	EA	SANITARY SEWER CLEAN-OUT
5775000000-E	1525	6	EA	4' DIA UTILITY MANHOLE
5800000000-E	1530	2,485	LF	ABANDON 6" UTILITY PIPE
5801000000-E	1530	5,397	LF	ABANDON 8" UTILITY PIPE
5804000000-E	1530	2,790	LF	ABANDON 12" UTILITY PIPE
5810000000-E	1530	2,725	LF	ABANDON 16" UTILITY PIPE
5816000000-N	1530	4	EA	ABANDON UTILITY MANHOLE
5828000000-N	1530	1	EA	REMOVE UTILITY MANHOLE
5836400000-E	1540	100	LF	36" ENCASEMENT PIPE
5871700000-E	1550	84	LF	TRENCHLESS INSTALLATION OF 12" IN SOIL
5871710000-E	1550	84	LF	TRENCHLESS INSTALLATION OF 12" NOT IN SOIL
5872400000-E	1550	50	LF	TRENCHLESS INSTALLATION OF 36" IN SOIL
5872410000-E	1550	50	LF	TRENCHLESS INSTALLATION OF 36" NOT IN SOIL
5875000000-N	SP	2	EA	CONCRETE PIERS
5882000000-N	SP	5	EA	GENERIC UTILITY ITEM RECONNECT SEWER FORCE MAIN SERVICE
6000000000-E	1605	60,000	LF	TEMPORARY SILT FENCE
6006000000-E	1610	4,350	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	11,200	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	7,660	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	180	ACR	TEMPORARY MULCHING
6018000000-E	1620	3,450	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	14.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	10,000	LF	TEMPORARY SLOPE DRAINS
6029000000-E	SP	16,000	LF	SAFETY FENCE
6030000000-E	1630	17,380	CY	SILT EXCAVATION
6036000000-E	1631	50,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	2,500	SY	COIR FIBER MAT
6038000000-E	SP	3,050	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	9,000	LF	1/4" HARDWARE CLOTH
6045000000-E	SP	115	LF	** TEMPORARY PIPE (18")
6045000000-E	SP	200	LF	** TEMPORARY PIPE (30")
6046000000-E	1636	80	LF	TEMPORARY PIPE FOR STREAM CROSSING
6048000000-E	SP	50	SY	FLOATING TURBIDITY CURTAIN
6070000000-N	1639	15	EA	SPECIAL STILLING BASINS
6071012000-E	SP	5,500	LF	COIR FIBER WATTLE
6071020000-E	SP	4,500	LB	POLYACRYLAMIDE (PAM)
6071030000-E	1640	2,500	LF	COIR FIBER BAFFLE
6071050000-E	SP	10	EA	** SKIMMER (1-1/2")
6071050000-E	SP	1	EA	** SKIMMER (2")
6071050000-E	SP	1	EA	** SKIMMER (3")
6084000000-E	1660	120	ACR	SEEDING & MULCHING
6087000000-E	1660	90	ACR	MOWING
6090000000-E	1661	1,800	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	6	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	2,950	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	88.5	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	525	LF	IMPERVIOUS DIKE
6114500000-N	1667	25	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	150	EA	RESPONSE FOR EROSION CONTROL
6120000000-E	SP	250	CY	CULVERT DIVERSION CHANNEL
6123000000-E	1670	5	ACR	REFORESTATION
6126000000-E	SP	0.55	ACR	STREAMBANK REFORESTATION
6135000000-E	SP	40	ACR	GENERIC EROSION CONTROL ITEM COMPOST BLANKET
7060000000-E	1705	13,080	LF	SIGNAL CABLE
7120000000-E	1705	72	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7132000000-E	1705	17	EA	VEHICLE SIGNAL HEAD (12", 4 SECTION)
7144000000-E	1705	10	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7252000000-E	1710	891	LF	MESSENGER CABLE (1/4")
7264000000-E	1710	1,260	LF	MESSENGER CABLE (3/8")
7300000000-E	1715	6,077	LF	UNPAVED TRENCHING (**********) (1, 2")
7301000000-E	1715	195	LF	DIRECTIONAL DRILL (**********) (1, 2")
7301000000-E	1715	1,607	LF	DIRECTIONAL DRILL (**********) (3, 2")
7324000000-N	1716	40	EA	JUNCTION BOX (STANDARD SIZE)
7348000000-N	1716	21	EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
7360000000-N	1720	9	EA	WOOD POLE
7372000000-N	1721	18	EA	GUY ASSEMBLY
7408000000-E	1722	2	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	5	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	10,800	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	25,700	LF	LEAD-IN CABLE (**********) (14-2)
7481000000-N	SP	1	EA	SITE SURVEY
7481200000-N	SP	2	EA	LUMINAIRE ARM FOR VIDEO SYSTEM
7481240000-N	SP	4	EA	CAMERA WITHOUT INTERNAL LOOP EMULATOR PROCESSING UNIT
7481260000-N	SP	1	EA	EXTERNAL LOOP EMULATOR PROCESSING UNIT
7484000000-N	SP	2	EA	MICROWAVE VEHICLE DETECTOR
7575142000-N	1736	6	EA	900MHZ RADIO
7588000000-N	SP	11	EA	METAL POLE WITH SINGLE MAST ARM
7590000000-N	SP	5	EA	METAL POLE WITH DUAL MAST ARM
7613000000-N	SP	16	EA	SOIL TEST
7614100000-E	SP	112	CY	DRILLED PIER FOUNDATION
7636000000-N	1745	10	EA	SIGN FOR SIGNALS
7684000000-N	1750	5	EA	SIGNAL CABINET FOUNDATION
7756000000-N	1751	5	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	40	EA	DETECTOR CARD (TYPE 2070L)
7901000000-N	1753	5	EA	CABINET BASE EXTENDER

COMPUTED BY: V. BARODAWALA	DATE: NOVEMBER 2012
CHECKED BY: F. TUCK	DATE: NOVEMBER 2012

PROJECT REFERENCE NO.	SHEET NO.
R-3324	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE PVC	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	36" .079	42" .109	48" .109
-L- 13+32	RT.	1		33.8	29.0																					
-L- 14+65	RT.	2		30.5	27.5																					
		1	2		29.0	27.5			128									X	X							
-L- 16+00	RT.	3		25.2	22.2																					
		2	3		27.5	22.2	X		132									X								
		3	4		22.2	9.0										X		X	X			84				
-L- 17+00	LT.	T5						56							X		X	X	X							
-L- 17+18	LT.	5						40							X		X	X	X							
-L- 17+75	LT.	6						52							X		X	X	X							
-L- 17+50	RT.	7		25.1	20.1																					
		7	8		20.1	6.5									X	X		X	X			56				
-L- 18+73	RT.	9		23.7	20.5																					
		7	9		20.1	20.5		120							X		X	X	X							
-L- 19+65	LT.	10						64							X		X	X	X							
-L- 20+88	RT.	11		24.2	21.0																					
-L- 20+88	LT.	12		21.3	18.1																					
		11	12		21.0	18.1		52							X		X	X	X							
-L- 21+01	LT.	13		15.5	12.5																					
		12	13	21.3	18.1	12.8									X	X		X	X		32					
		13	14		12.5	11.7	X		20									X								
-L- 23+30	RT.	15									280							X	X							
-L- 22+93	RT.	16		25.7	22.5																					
-L- 23+30	LT.	17		22.6	19.4																					
		16	17		22.5	19.4		56							X		X	X	X							
-L- 24+52	LT.	20		23.7	19.0																					
		17	20		19.4	19.0		136							X		X	X	X							
		20	21		19.0	11.7									X	X		X	X		40					
-L- 23+97	LT.	18		13.5	6.2																					
		18	19		6.2	5.3						160						X	X							
-L- 25+52	LT.	22		13.8	7.0																					
		18	22		6.2	7.0	X					144						X	X							
-L- 28+00	LT.	23A									60				X		X	X	X							
-L- 28+00	LT.	23		19.0	12.0																					
		22	23		7.0	12.0						180						X	X							
-L- 28+76	LT.	24		19.0	12.8																					
		23	24		12.0	12.8						124			X		X	X	X							
-L- 30+50	LT.	25		19.4	14.0																					
		24	25		13.0	14.0	X				164							X								
-L- 31+34	LT.	27		20.8	14.5																					
		25	27		13.1	14.5					84							X	X							
-L- 28+37	MD.	29		29.2	26.0																					
		28	29		18.9	26.0		72							X		X	X	X							
SHEET									280		588										72					
TOTAL								648				608										140				

STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* 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 CATCH BASIN	DROP INLET	G.D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. 840.14 OR 840.15	M.H. FRAME & COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	CONV. EXIST. D.I. TO J.B.	OPEN THROAT CB STD. 840.04	CORR. STEEL ELBOWS NO. & SIZE	FLOWABLE FILL Cu. Yds.	SIDE DRAIN ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" Cu. Yds. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-L- 13+32	1																			1											1		1												
-L- 14+65	2																			1											1		1												
	1	2																																											
-L- 16+00	3																			1											1		1												
	2	3																																										412'	
	3	4																																						2@18"					
																																												TEMPORARY PIPE
-L- 17+00	T5																																											56'	SEE SHT. 4A
-L- 17+18	5																																												
-L- 17+75	6																																												
-L- 17+50	7																			1											1		1												
	7	8																																						2@18"				41'	
-L- 18+73	9																			1											1		1												
	7	9																																											
-L- 19+65	10																																												
-L- 20+88	11																			1											1		1												
-L- 20+88	12																			1												1	1												
	11	12																																										113'	
-L- 21+01	13																			1										1			1												
	12	13																																						2@15"					
	13	14																																											
-L- 23+30	15																		3.4																									47'	
-L- 22+93	16																			1												1	1												
-L- 23+30	17																			1												1	1												
	16	17																																											
-L- 24+52	20																			1												1	1												
	17	20																																											
	20	21																																						2@15"					
-L- 23+97	18																			1	2.3														1	1									
	18	19																																										224'	
-L- 25+52	22																			1	2.6														1	1									
	18	22																																											
-L- 28+00	23A																																											60'	
-L- 28+00	23																			1	2														1	1									
	22	23																																											
-L- 28+76	24																			1	1.2														1	1									
	23	24																																											
-L- 30+50	25																			1	0.4														1	1									
	24	25																																											
-L- 31+34	27																			1	1.3														1	1									
	25	27																																											
-L- 28+37	29																			1									1	1					1										
	28	29																																											
SHEET																			3.4		18								1		1		4		1		6				4@15"					SHEET
TOTAL																						9.8								1		6		11		6					4@18"				953'	TOTAL

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

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4/04/06

COMPUTED BY: V. BARODAWALA DATE: NOVEMBER 2012
CHECKED BY: F. TUCK DATE: NOVEMBER 2012

PROJECT REFERENCE NO.	SHEET NO.
R-3324	3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

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) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-L- 29+00	MD.	30		29.5	26.4														
		29	30		26.0	26.4		68							X		X	X	X
-L- 31+03	RT.	31		31.4	28.3														
		31	26		28.3	19.8		116							X		X	X	X
-L- 31+23	RT.	32		23.5	16.7														
-L- 31+34	RT.	33		23.3	16.5														
		32	33		16.7	16.5					12							X	X
		33	27		16.5	15.0					144				X		X	X	X
-L- 31+58	RT.	34		24.2	22.0														
		33	34		21.1	22.0		20										X	X
-L- 32+32	RT.	35		27.4	25.2														
		34	35		22.0	25.2		72							X		X	X	X
-L- 31+44	MD.	37		32.2	27.2														
		37	36		27.2	20.8		68							X		X	X	X
-L- 32+42	MD.	38		33.8	27.5														
		37	38		27.2	27.5	X	96									X	X	
-L- 32+42	RT.	39		30.8	27.6														
		38	39		27.5	27.6	X	68									X	X	
-L- 33+00	RT.	40		31.8	28.7														
		39	40		27.6	28.7		56							X		X	X	X
-DR1- 13+55	LT.	41		13.0	9.8														
-DR1- 14+58	LT.	42		12.6	9.4														
		41	42		9.8	9.6	X	24										X	
-DR1- 14+58	RT.	43		13.2	9.1														
		42	43		9.4	9.1	X		60								X	X	
-DR1- 14+21	RT.	44		13.4	8.4														
		43	44		9.1	8.9	X		40								X	X	
		44	45		8.4	8.3						8						X	
-DR1- 13+51	LT.	46		13.8	9.0														
		44	46		8.4	9.0						76			X		X	X	X
-DR1- 13+50	LT.	47		11.4	9.2														
		46	47		9.1	9.2	X	16										X	
-DR1- 12+77	LT.	48		14.5	9.8														
		46	48		9.0	9.8						68			X		X	X	X
-DR1- 12+77	RT.	49		14.4	12.2														
		48	49		11.5	12.2		36							X		X	X	X
-DR1- 11+39	LT.	50		16.8	12.1														
		48	50		9.8	12.1						136			X		X	X	X
-Y- 12+10	RT.	51		24.8	14.1														
		50	51		12.1	14.1						244			X		X	X	X
-Y- 12+10	RT.	52		27.9	24.9														
SHEET TOTAL								640	100		156	532							

C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.

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, 840.03	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. FRAME AND TWO GRATES STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. 840.14 OR STD. 840.15
-L- 29+00	30		1								1	1					1
-L- 31+03	31		1												1	1	
-L- 31+23	32		1	1.8								1					1
-L- 31+34	33		1	1.8								1					1
-L- 31+58	34		1									1					1
-L- 32+32	35		1									1					1
-L- 31+44	37		1								1	1					1
-L- 32+42	38		1	1.3							1	1					1
-L- 32+42	39		1											1		1	
-L- 33+00	40		1											1		1	
-DR1- 13+55	41		1									1					1
-DR1- 14+58	42		1			1			1								
-DR1- 14+58	43		1			1		1									
-DR1- 14+21	44		1			1		1									
-DR1- 13+51	46		1			1			1								
-DR1- 13+50	47		1									1					1
-DR1- 12+77	48		1			1			1								
-DR1- 12+77	49		1									1					1
-DR1- 11+39	50		1			1			1								
-Y- 12+10	51																
-Y- 12+10	52		1			1		1									
SHEET TOTAL			20	4.9		7		3	4		3	10		2	1	3	10

STATION	FROM	TO	M.H. FRAME & COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	CONV. EXIST. D.I. TO J.B.	OPEN THROAT CB STD. 840.04	CORR. STEEL ELBOWS NO. & SIZE	FLOWABLE FILL Cu. Yds.	SIDE DRAIN ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-L- 31+34	33											213'	
-DR1- 13+50	47											54'	
-Y- 12+10	51		1			1						200'	
SHEET TOTAL			1			1						467'	SHEET TOTAL

ABBREVIATIONS

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

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COMPUTED BY: V. BARODAWALA DATE: NOVEMBER 2012
CHECKED BY: F. TUCK DATE: NOVEMBER 2012

PROJECT REFERENCE NO.	SHEET NO.
R-3324	3-C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE PVC	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	36" .079	42" .109	48" .109	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	R.C. PIPE (CLASS IV) 15"	18"	24"	30"	36"	42"	48"
-Y- 12+10	LT.	53		27.8	24.8																																	
		52	53		24.9	24.8		56							X		X	X	X																			
-Y- 13+00	LT.	54		22.6	17.7																																	
		53	54		24.8	19.6		92							X		X	X	X																			
-Y- 13+00	LT.	55		19.7	16.7																																	
		54	55		17.7	16.7	X			20							X	X																				
-Y- 11+81	LT.	56		17.0	13.5																																	
		55	56		16.7	13.5	X			112							X	X																				
		56	24		13.5	12.8					144				X		X	X	X																			
-Y- 13+53	LT.	57		21.8	18.1																																	
		54	57		17.7	18.1	X			40							X	X																				
-Y- 14+51	LT.	58		24.3	20.6																																	
		57	58		18.1	20.6				88					X		X	X	X																			
		59		25.4	22.1																																	
		58	59		21.1	22.1			56						X		X	X	X																			
-Y- 15+62	RT.	60		28.5	25.2																																	
		59	60		22.1	25.2			96						X		X	X	X																			
-Y- 16+91	RT.	61		31.4	28.1																																	
		60	61		25.2	28.1			128						X		X	X	X																			
-Y- 18+02	RT.	62		32.6	29.6																																	
		61	62		28.4	29.6		112							X		X	X	X																			
-Y- 20+02	RT.	63		34.2	31.2																																	
		62	63		29.6	31.2		200							X		X	X	X																			
-Y- 15+64	LT.	64		28.5	25.3																																	
		58	64		21.1	25.3			108						X		X	X	X																			
-Y- 15+64	LT.	65		29.1	25.2																																	
		64	65		25.0	25.2			8						X		X	X	X																			
-Y- 17+84	LT.	66		32.3	29.3																																	
		64	66		25.5	29.3		216							X		X	X	X																			
-Y- 20+83	LT.	67		34.9	31.9																																	
		66	67		29.3	31.9		296							X		X	X	X																			
-L- 34+02	LT.	68		31.0	22.7																																	
		27	68		15.0	22.7					280				X		X	X	X																			
-L- 33+98	RT.	69		27.6	23.3																																	
		68	69		22.7	23.3					140				X		X	X	X																			
-L- 34+78	RT.	70		30.5	23.9																																	
		69	70		23.3	23.9	X			84							X	X																				
-L- 34+50	MD.	71		35.2	31.1																																	
		71	72		31.1	27.0		60							X		X	X	X																			
-L- 34+70		73			27.9	27.1					148				X		X	X	X																			
SHEET								1,032		344																												
TOTAL									396		712																											

STATION	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02, 840.03	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. 840.14 OR STD. 840.15	M.H. FRAME & COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	CONV. EXIST. D.I. TO J.B.	OPEN THROAT CB STD. 840.04	CORR. STEEL ELBOWS NO. & SIZE	FLOWABLE FILL Cu. Yds.	SIDE DRAIN ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-Y- 12+10			1			1			1																				
																												242'	
-Y- 13+00			1			1			1																				
-Y- 13+00			1										1					1											
-Y- 11+81			1																				1						
-Y- 13+53			1			1	1																						
-Y- 14+51			1			1		1																					
			1			1			1																			52'	
-Y- 15+62			1			1			1																				
																												160'	
-Y- 16+91			1			1			1																				
-Y- 18+02			1			1			1																				
-Y- 20+02			1			1			1																				
-Y- 15+64			1			1		1																					
-Y- 15+64			1																1	1									
-Y- 17+84			1			1		1																					
-Y- 20+83			1			1		1																					
-L- 34+02			1	3.3															1	1									
-L- 33+98			1																				1						
-L- 34+78			1	1.6									1					1											
-L- 34+50			1									1	1					1											
-L- 34+70																													
SHEET			19				1		7			1	3					3		2			2						SHEET
TOTAL				4.9		12		4											2									454'	TOTAL

ABBREVIATIONS

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

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COMPUTED BY: V. BARODAWALA DATE: NOVEMBER 2012
CHECKED BY: F. TUCK DATE: NOVEMBER 2012

PROJECT REFERENCE NO.	SHEET NO.
R-3324	3-D

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-L- 35+40	MD.	74		34.9	31.4														
		71	74		31.1	31.4		88							X		X	X	X
-L- 35+78	MD.	75		34.7	31.5														
		74	75		31.4	31.5		40							X		X	X	X
-L- 37+00	MD.	76		34.5	31.2														
		76	77		31.2	31.0		48							X		X	X	X
-L- 37+20	MD.	78		34.4	31.3														
		76	78		31.2	31.3		16							X		X	X	X
-L- 40+25		79			29.5	29.0						168			X		X	X	X
-L- 41+00	MD.	80		36.0	32.8														
		80	81		32.8	30.5		56							X		X	X	X
-L- 41+35	MD.	82		36.0	32.9														
		80	82		32.8	32.9		28							X		X	X	X
-L- 66+00		86			32.7	32.9						120			X		X	X	X
-L- 68+50		87			32.8	32.8						116			X		X	X	X
-L- 76+20		88			32.0	31.7					128				X		X	X	X
-L- 80+65		89			26.9	26.5						180			X		X	X	X
-L- 84+55		90A		40.7	37.6														
		90A	90		35.9			32							X		X	X	X
-L- 84+55	RT.	90		39.0	35.9														
		90	91		35.9	23.9									X	X		X	X
-L- 88+04	LT.	92		41.3	38.1														
-L- 88+24	RT.	93		40.8	37.6														
		92	93		38.1	37.6		40							X		X	X	X
		93	94		37.6	23.9									X	X		X	X
-L- 97+20		95			30.1	29.7								132	X		X	X	X
-L- 106+50		96			31.8	31.8						124			X		X	X	X
-L- 113+53	RT.	97		44.4	41.2														
		97	98		41.2	31.9									X	X		X	X
-L- 115+40	LT.	99		40.9	37.7														
		99	100		37.7	32.9									X	X		X	X
-L- 117+00		101			31.8	31.8						104			X		X	X	X
-L- 127+95	RT.	102		33.1	29.9														
		102	103		29.9	26.8									X	X		X	X
-L- 129+72	MD.	106		32.5	29.3														
		106	107		29.3	29.2		48							X		X	X	X
-L- 130+53	MD.	108		33.0	29.8														
		106	108		29.3	29.8		68							X		X	X	X
SHEET								464				812							
TOTAL											128			132					

STATION	STRUCTURE NO. FROM	TO	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	36" .079	42" .109	48" .109	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
-L- 35+40	74																										1						
	71	74																															
-L- 35+78	75																										1						
	74	75																															
-L- 37+00	76																										1						
	76	77																															
-L- 37+20	78																										1						
	76	78																															
-L- 40+25	79																								3.4								
-L- 41+00	80																										1						
	80	81																															
-L- 41+35	82																										1						
	80	82																															
-L- 66+00	86																								3.4								
-L- 68+50	87																								3.4								
-L- 76+20	88																																
-L- 80+65	89																								3.4								
-L- 84+55	90A																										1						
	90A	90																															
-L- 84+55	90																										1						
	90	91		48																													
-L- 88+04	92																										1						
-L- 88+24	93																										1						
	92	93																															
	93	94		48																													
-L- 97+20	95																								6.0								
-L- 106+50	96																								3.4								
-L- 113+53	97																										1						
	97	98		40																													
-L- 115+40	99																										1						
	99	100		36																													
-L- 117+00	101																								3.4								
-L- 127+95	102																										1						
	102	103		20																													
-L- 129+72	106																										1						
	106	107																															
-L- 130+53	108																										1						
	106	108																															
SHEET				192																					26.4								
TOTAL																											15						

STATION	STRUCTURE NO. FROM	TO	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. 840.14 OR 840.15	M.H. FRAME & COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	CONV. EXIST. D.I. TO J.B.	OPEN THROAT CB STD. 840.04	CORR. STEEL ELBOWS NO. & SIZE	FLOWABLE FILL Cu. Yds.	SIDE DRAIN ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-L- 35+40	74			1	1					1											
	71	74																			
-L- 35+78	75			1	1					1											
	74	75																			
-L- 37+00	76			1	1					1											
	76	77																			
-L- 37+20	78			1	1					1											
	76	78																			
-L- 40+25	79																				
-L- 41+00	80			1	1					1											
	80	81																			
-L- 41+35	82			1	1					1											
	80	82																			
-L- 66+00	86																				
-L- 68+50	87																				
-L- 76+20	88																				
-L- 80+65	89																				
-L- 84+55	90A							1	1												
	90A	90																			
-L- 84+55	90						1		1												
	90	91														2@15"					
-L- 88+04	92							1	1												
-L- 88+24	93							1	1												
	92	93																			
	93	94														2@15"					
-L- 97+20	95																				
-L- 106+50	96																				
-L- 113+53	97							1	1												
	97	98														2@15"					
-L- 115+40	99							1	1												
	99	100														2@15"					
-L- 117+00	101																				
-L- 127+95	102						1		1												
	102	103														2@15"					
-L- 129+72	106			1	1					1											
	106	107																			
-L- 130+53	108			1	1					1											
	106	108																		32'	
SHEET				8	8		2	5								10@15"				32'	SHEET
TOTAL									7	8											TOTAL

ABBREVIATIONS

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

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COMPUTED BY: V. BARODAWALA DATE: NOVEMBER 2012
CHECKED BY: F. TUCK DATE: NOVEMBER 2012

PROJECT REFERENCE NO. R-3324 | SHEET NO. 3-E

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE PVC	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, 36" .079, 42" .109, 48" .109	R.C. PIPE (CLASS III) 15", 18", 24", 30", 36", 42", 48"	R.C. PIPE (CLASS IV) 12", 15", 18", 24", 30", 36", 42", 48"	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02, 840.03	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. 840.14 OR STD. 840.15	M.H. FRAME & COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	CONV. D.I. TO J.B.	OPEN THROAT CB STD. 840.04	CORR. STEEL ELBOWS NO. & SIZE	FLOWABLE FILL Cu. Yds.	SIDE DRAIN ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-L- 130+65	CL.	109		33.6	30.5																				1								1	1					1											
		108	109		29.8	30.5		28							X		X	X	X																															
-Y- 22+13	RT.	110		35.2	32.2																				1			1			1																			
-Y- 22+52	RT.	111		35.2	31.7																				1			1			1																			
		110	111		32.2	31.7			136						X		X	X	X																														188′	
-Y- 24+50	RT.	112		35.0	32.0																				1			1	1																					
		111	112		32.0	32.0		8							X		X	X	X																														8′	
-Y- 24+50	RT.	111		36.6	31.4																				1	0.2		1			1																			
		111	113		31.7	31.4	X		92								X	X																																
-Y- 24+90	RT.	114		35.8	31.3																				1			1			1																			
		113	114		31.4	31.3	X		44								X	X																																
-Y1- 12+35	LT.	115											48		X		X	X	X				4.5																										50′	
-Y1- 13+42	RT.	115A						32							X		X	X	X																															
-Y1- 14+00	LT.	116											44		X		X	X	X				4.5																										34′	
-Y1- 16+00	LT.	117										40			X		X	X	X				3.4																										40′	
-Y1- 16+80	LT.	118										40			X		X	X	X				3.4																										31′	
-Y1- 19+50	RT.	119																																															1,227′	REMOVAL FROM SHTS. 6, 20, & 21
-Y1- 19+50	RT.	120							48						X		X	X	X																															
-Y1- 20+60	RT.	121						40							X		X	X	X																															
-Y1- 21+20	RT.	122						40							X		X	X	X																															
-Y1- 22+45	RT.	123						52							X		X	X	X																															
-Y1- 23+10	RT.	124						40							X		X	X	X																														36′	
-Y1- 23+45	MD.	125		35.0	31.8																				1								1	1					1											
		125	126		31.8	28.9		56							X		X	X	X																															
-Y1- 25+75	RT.	127																																															44′	
-Y1- 27+10	RT.	128							64						X		X	X	X																															
-Y1- 27+10	LT.	129																																															32′	
-Y1- 29+50	LT.	130								48					X		X	X	X																														48′	
-Y1- 29+80	RT.	131		34.7	30.8																				1			1			1																			
		131	132		30.8	30.1			76						X		X	X	X																															
-Y1- 30+05	RT.	133		34.8	31.0																				1			1			1																			
		131	133		30.8	31.0	X		28								X	X																																
-Y1- 30+00	RT.	134		34.9	32.7																				1									1					1											
		133	134		31.8	32.7		12							X		X	X	X																															
-Y1- 30+25	MD.	135		36.0	32.8																				1								1	1					1											
		133	135		31.8	32.8		52							X		X	X	X																															
-Y1- 30+60	LT.	136								44					X		X	X	X																															
-Y1- 31+35	LT.	137						36							X		X	X	X																															
-Y1- 31+32	RT.	138		35.2	31.7																				1			1			1																			
		133	138		31.0	31.7	X	124									X	X																																
SHEET								520		92		80											15.8		12			8			7			4					4										1,738′	SHEET
TOTAL									488				92													0.2			1				3																	TOTAL

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

ABBREVIATIONS

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

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COMPUTED BY: V. BARODAWALA DATE: NOVEMBER 2012
CHECKED BY: F. TUCK DATE: NOVEMBER 2012

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATEWIDE

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-Y1- 31+25	RT.	139		35.8	32.7														
		138	139		32.2	32.7		12							X		X	X	X
-Y1- 32+00	RT.	140		35.2	31.9														
		138	140		31.7	31.9	X	68									X	X	
-Y1- 32+35	RT.	141		35.1	32.1														
		140	141		31.9	32.1	X	52									X	X	
-Y1- 32+60	LT.	142																	
-Y1- 34+35	RT.	143		36.1	31.2														
		114	143		31.3	31.2	X		52								X	X	
		143	144		32.4	32.6			24									X	X
-Y1- 35+80	RT.	145		35.9	30.5														
		143	145		31.2	30.7	X		156								X	X	
-Y1- 35+80	RT.	146		32.5	30.6														
		145	146		30.5	30.6	X	16									X	X	
-Y1- 36+97	RT.	147							48						X		X	X	X
-Y1- 37+52	RT.	148		34.8	29.4														
		145	148		30.5	30.0				168					X		X	X	X
-Y1- 37+52	RT.	149		31.4	29.5														
		148	149		29.4	29.5	X	16									X	X	
-Y1- 38+17	RT.	150		34.2	28.8														
		148	150		29.4	29.2	X			64							X	X	
-Y1- 38+17	RT.	151		30.8	28.9														
		150	151		28.8	28.9		16							X		X	X	X
-Y1- 38+58	RT.	152		33.9	28.7														
		150	152		28.8	28.7	X			40							X	X	
-Y1- 38+58	MD.	153		34.7	31.5														
		152	153		29.7	31.5		32							X		X	X	X
-Y1- 40+05	RT.	154		32.5	27.6														
		152	154		28.7	27.6				144					X		X	X	X
-Y1- 40+05	RT.	155		30.1	28.2														
		154	155		28.1	28.2	X	16									X	X	
-Y1- 41+00	RT.	156		31.6	26.7														
		154	156		27.6	26.7				92					X		X	X	X
		156	157		27.4	27.5	X	20										X	
-Y1- 41+20	MD.	158		32.1	29.0														
		156	158		27.4	29.0		36							X		X	X	X
-Y1- 41+80	RT.	159		30.7	25.3														
		156	159		26.7	25.8			80						X		X	X	X
		159	160		26.6	27.5			16									X	X
SHEET								284		508									
TOTAL									376										

C.S. PIPE 12" (.064)	15" (.064)	18" (.064)	24" (.064)	36" (.079)	42" (.109)	48" (.109)	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.

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, 840.03	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. 840.14 OR STD. 840.15	M.H. FRAME & COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	CONV. D.I. TO J.B.	OPEN THROAT CB STD. 840.04	CORR. STEEL ELBOWS NO. & SIZE	FLOWABLE FILL Cu. Yds.	SIDE DRAIN ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-Y1- 31+25	139		1										1					1											
-Y1- 32+00	140		1			1			1																				
-Y1- 32+35	141		1			1	1																						
-Y1- 32+60	142																											156'	
-Y1- 34+35	143		1			1		1																					
-Y1- 35+80	145		1	0.2															1		1								
-Y1- 35+80	146		1												1		1												
-Y1- 36+97	147																											45'	
-Y1- 37+52	148		1																1		1								
	145	148																										252'	
-Y1- 37+52	149		1												1		1												
-Y1- 38+17	150		1	0.4															1		1								
-Y1- 38+17	151		1													1	1												
-Y1- 38+58	152		1	0.2															1		1								
-Y1- 38+58	153		1									1	1					1											
-Y1- 40+05	154		1																1		1								
-Y1- 40+05	155		1												1		1												
-Y1- 41+00	156		1																1		1								
-Y1- 41+20	158		1									1	1					1											
-Y1- 41+80	159		1																1		1								
SHEET			17			3		1				2				1		3										453'	SHEET
TOTAL				0.8			1		1				3		3		4		7		7								TOTAL

ABBREVIATIONS

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

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COMPUTED BY: V. BARODAWALA	DATE: NOVEMBER 2012
CHECKED BY: F. TUCK	DATE: NOVEMBER 2012

PROJECT REFERENCE NO.	SHEET NO.
R-3324	3-G

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-Y1- 42+50	RT.	161		30.1	24.7														
		159	161		25.3	24.7					68				X		X	X	X
		161	162	30.1	24.7	24.5	X				28							X	
-Y1- 43+50	MD.	163		30.0	26.8														
		163	164		26.8	24.2		60							X		X	X	X
-Y1- 41+78	LT.	165		30.7	25.8														
		165	166		25.8	27.7				120					X		X	X	X
-Y1- 43+50	LT.	167		29.0	24.1														
		165	167		25.8	24.1				172					X		X	X	X
-Y1- 44+00	LT.	168		28.9	23.8														
		167	168		24.1	23.8	X			52					X		X	X	
		168	169		23.8	23.7	X			20							X	X	
-Y1- 45+50	RT.	170									36				X		X	X	X
-Y1- 47+20	LT.	171		25.8	21.5														
		171	172		21.5	21.6					12							X	X
		171	173		21.5	19.7					76				X		X	X	X
-Y1- 45+50	RT.	174																	
-Y2- 17+85	LT.	175							48						X		X	X	X
-Y2- 19+50	LT.	176						24							X		X	X	X
-Y2- 20+50	LT.	177						24							X		X	X	X
															X		X	X	X
-Y2- 25+90	LT.	178						28											
-Y2- 26+80	LT.	179			30.0	29.7			12						X		X	X	X
-Y2- 26+80	RT.	180			30.0	29.7			12						X		X	X	X
-Y2- 27+90	LT.	181						28							X		X	X	X
-Y2- 28+55	LT.	182						40							X		X	X	X
-Y2- 31+85	LT.	183						48							X		X	X	X
-Y2- 32+44	RT.	184							40						X		X	X	X
-Y2- 33+83	CL.	185			29.0	28.0							112		X		X	X	X
-Y2- 33+90	CL.	186			29.0	28.0							112		X		X	X	X
-Y2- 37+10	RT.	187								24					X		X	X	X
-Y2- 37+70	RT.	188								32					X		X	X	X
-Y2- 60+30	RT.	189								36					X		X	X	X
-Y2- 64+80	RT.	190																	
-Y2- 70+50	RT.	191																	
-Y2- 71+50	RT.	192			35.7	35.2													
-Y2- 72+40	CL.	193			33.9	33.5						112			X		X	X	X
-Y2- 76+40	LT.	194																	
-Y4- 10+48	CL.	195			34.3	34.2					156				X		X	X	X
-Y4- 11+77	CL.	195A																	
-Y4- 11+77	CL.	195A	195B	38.1	34.9	34.3													
SHEET								252		456		112							
TOTAL									112		376		224						
								15"	18"	24"	30"	36"	42"	48"					
GRAND								3,840		1,400		2,144		132					
TOTAL									1,752		1,960		316						

STATION	STR. FROM	STR. TO	C.S. PIPE 15" .064	C.S. 18" .064	C.S. 24" .064	C.S. 36" .079	C.S. 42" .109	C.S. 48" .109	R.C. PIPE (CLASS 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"	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	
-Y1- 42+50	161																									1	0.4						
	159	161																															
	161	162																															
-Y1- 43+50	163																									1							
	163	164																															
-Y1- 41+78	165																									1							
	165	166																															
-Y1- 43+50	167																									1							
	165	167																															
-Y1- 44+00	168																									1	0.1						
	167	168																															
	168	169																															
-Y1- 45+50	170																																
-Y1- 47+20	171																									1			1		1		
	171	172																															
	171	173																															
-Y1- 45+50	174																																
-Y2- 17+85	175																																
-Y2- 19+50	176																																
-Y2- 20+50	177																																
-Y2- 25+90	178																																
-Y2- 26+80	179																																
-Y2- 26+80	180																																
-Y2- 27+90	181																																
-Y2- 28+55	182																																
-Y2- 31+85	183																																
-Y2- 32+44	184																																
-Y2- 33+83	185																								4.5									
-Y2- 33+90	186																																
-Y2- 37+10	187																																
-Y2- 37+70	188																																
-Y2- 60+30	189																																
-Y2- 64+80	190																																
-Y2- 70+50	191																																
-Y2- 71+50	192																		112														
-Y2- 72+40	193																								3.4									
-Y2- 76+40	194																																
-Y4- 10+48	195																																
-Y4- 11+77	195A																										1							
-Y4- 11+77	195A	195B																56																
SHEET																		112							7.9		7			1		1		
TOTAL																	56											0.5						
GRAND			264														56								53.5		108	21.1			3		19	
TOTAL				140														112							SAY 54			SAY 22		31		9		

ABBREVIATIONS

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

STATION	STR. FROM	STR. TO	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. 840.14 OR 840.15	M.H. FRAME & COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	CONV. EXIST. D.I. TO J.B.	OPEN THROAT CB STD. 840.04	CORR. STEEL ELBOWS NO. & SIZE	FLOWABLE FILL Cu. Yds.	SIDE DRAIN ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-Y1- 42+50	161										1		1								
	159	161																			
	161	162																			
-Y1- 43+50	163			1	1					1											
	163	164																			
-Y1- 41+78	165										1		1							112'	
	165	166																			
-Y1- 43+50	167										1		1								
	165	167																			
-Y1- 44+00	168										1		1								
	167	168																			
	168	169																			
-Y1- 45+50	170																				
-Y1- 47+20	171																			70'	
	171	172																			
	171	173																			
-Y1- 45+50	174																			418'	-Y1- Sta. 41+00 – 46+10
-Y2- 17+85	175																			48'	-Y2- Sta. 17+81
-Y2- 19+50	176																			22'	-Y2- Sta. 19+50
-Y2- 20+50	177																			24'	-Y2- Sta. 20+51
-Y2- 25+90	178																				
-Y2- 26+80	179																		.4465		
-Y2- 26+80	180																		.4465		
-Y2- 27+90	181																			28'	
-Y2- 28+55	182																			30'	
-Y2- 31+85	183																				
-Y2- 32+44	184																				
-Y2- 33+83	185																27				DOUBLE HEADWALL
-Y2- 33+90	186																27				STR. 185 & 186
-Y2- 37+10	187																			21'	-Y2- STA. 37+10
-Y2- 37+70	188																				
-Y2- 60+30	189																				
-Y2- 64+80	190																			60'	
-Y2- 70+50	191																			90'	REMOVE DI's
-Y2- 71+50	192																			110'	
-Y2- 72+40	193																11				
-Y2- 76+40	194																			24'	
-Y4- 10+48	195																				
-Y4- 11+77	195A			1	1					1											
-Y4- 11+77	195A	195B																			
SHEET				2	2					2							65		.893		SHEET
TOTAL											4		4							1,057'	TOTAL
GRAND					31		13		25		20		11		2	14@15"	65		.893		GRAND
TOTAL				20		1		11		31		8		1		4@18"			SAY 1	5,154'	TOTAL

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4/04/06

4/04/06

COMPUTED BY: V. BARODAWALA DATE: AUGUST 2012
CHECKED BY: F. TUCK DATE: AUGUST 2012

PROJECT REFERENCE NO.	SHEET NO.
R-3324	3-H

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATEWIDE

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE	THICKNESS OR GAUGE	C.S. PIPE SIZE	THICKNESS OR GAUGE	STRUCTURAL PLATE PIPE SIZE	THICKNESS OR GAUGE	REINFORCED ENDWALLS WITH R.C. – C.Y.	REINFORCED ENDWALLS WITH C.S. – C.Y.	MASONARY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE	CONCRETE TRANSITIONAL SECTION CATCH BASIN	CONCRETE TRANSITIONAL SECTION DROP INLET	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & SIZE	REINF. CONC. ELBOWS NO. & SIZE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-L- 59+55	CL.	84			29.1	29.1		156						7.9													DOUBLE HEADWALL
																											STR. No's 84 & 85
-L- 59+55	CL.	85			29.1	29.1		156						7.9													BOTH ENDS OF PIPE
GRAND TOTAL								312						15.8													
													SAY	16													

CLASS III R.C. PIPE: 54" 60" 66" 72" 78" 84"
C.S. PIPE: 54" (.109, .138, .168, .138 SHOP ELON-GATED, .168); 60" (.138, .168); 66" (.138, .168); 72" (.138, .168)
STRUCTURAL PLATE PIPE: 60" (12, 10); 66" (12, 10); 72" (12, 10)

ABBREVIATIONS

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

"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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH TEMPORARY GUARDRAIL	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS GRAU 350	ANCHORS TEMP. GRAU 350	ANCHORS TYPE III	ANCHORS TYPE B-77	ANCHORS AT-1	IMPACT ATTENUATOR TYPE 350 NO.	PERMITTED G	PERMITTED NG	REMOVE EXISTING GUARDRAIL	REMARKS
-L-	15+50.00	18+75.00	RT.	325'			16+50.00	17+75.00	8'	11'	50'				2								712.5'	
-L-	20+52.75	21+40.25	LT.	87.5'				21+40.25	8'	11'		50'			1		1						525'	
-L-	22+78.11	24+90.61	LT	212.5'			22+88.13		8'	11'	50'				1		1						337.5'	
																							325'	
-L-	19+88.13	21+25.63	RT.	137.5'			21+25.63		8'	11'	50'				1		1							
-L-	22+62.25	24+16.67	RT.	162.5'				23+16.67	8'	11'		50'			1		1						450'	
																							500'	
-L-	83+97.59	86+10.09	LT.	212.5'				83+97.59	8'	11'		50'			1			1					150'	
-L-	87+78.13	89+90.63	LT.	212.5'			87+78.13		8'	11'	50'				1			1					775'	
-L-	84+18.37	86+30.87	RT.	212.5'			86+30.87		8'	11'	50'				1			1						
-L-	87+98.91	92+98.91	RT.	500'				87+98.91	8'	11'		50'			1			1					600'	
																							162.5'	
-L-	111+55.00	116+05.00	LT.	450'			113+07.58	113+07.58	8'	11'	50'	50'			2								162.5'	
-L-	109+65.00	114+15.00	RT.	450'			112+56.45	112+56.45	8'	11'	50'	50'			2									
-L-	126+60.69	128+98.19	LT.	237.5'			127+49.25	127+49.25	8'	11'		50'			2									
-L-	126+10.00	128+47.50	RT.	237.5'			127+41.86	127+41.86	8'	11'	50'	50'			2									
TEMPORARY GUARDRAIL																								
-DET 1-	18+18.00	20+55.50	RT.			237.5'	20+18.00		8'	11'	50'	50'				2								
			SUB-TOTAL	3,437.5'		237.5'									18	2	4	4					TOTAL 4,700'	
		ANCHOR	DEDUCTIONS	-1050'		-100'																		
			TOTAL	2,387.5'		137.5'																	SAY 4,725'	
			SAY	2,400'		150'																		
		ADDITIONAL GUARDRAIL POSTS =		10 EACH																				

ANCHOR DEDUCTIONS

GRAU-350	18	@ 50' =	900'
TYPE III	4	@ 18.75' =	75.00'
TYPE B-77	4	@ 18.75' =	75.00'
TEMP. GRAU-350	2	@ 50' =	100'

COMPUTED BY: L. CHAROVA DATE: NOVEMBER 2012
CHECKED BY: S. KENDALL DATE: NOVEMBER 2012

PROJECT REFERENCE NO.	SHEET NO.
R-3324	3-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	STATION – STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
	SUMMARY No. 1					
–DET 1–	12+00 – 23+50	649		1,789	1,140	0
–DET 2–	10+16.33 – 17+74.26	1,227		165	0	1,062
–L–	15+00 – 21+34.23	714		7,213	6,499	0
–L–	22+71.55 – 39+00	1,684		62,443	60,759	0
–Y–	11+25 – 24+50	572		10,124	9,552	0
–Y1–	10+50 – 25+50	3,327		1,341	0	1,986
–Y1–	25+50 – 49+70	6,040		1,434	0	4,606
–Y5–	10+46 – 12+75	35		84	49	0
–DR1–	10+26.32 – 14+58.05	94		428	334	0
	SUMMARY No. 1 TOTAL	14,342		85,021	78,333	7,654
	SUMMARY No. 2					
–L–	40+00 – 70+00	235		105,954	105,719	0
	SUMMARY No. 2 TOTAL	235		105,954	105,719	0
	SUMMARY No. 3					
–L–	70+00 – 86+20.48	0		51,788	51,788	0
–L–	87+88.52 – 100+00	0		53,859	53,859	0
	SUMMARY No. 3 TOTAL	0		105,647	105,647	0
	SUMMARY No. 4					
–L–	100+00 – 130+69.90	573		102,311	101,738	0
	SUMMARY No. 4 TOTAL	573		102,311	101,738	0
	SUMMARY No. 5					
–Y2–	16+50 – 46+50	4,366		6,824	3,349	891
	SUMMARY No. 5 TOTAL	4,366		6,824	3,349	891
	SUMMARY No. 6					
–Y2–	46+50 – 76+50	10,040		6,140	0	3,900
	SUMMARY No. 6 TOTAL	10,040		6,140	0	3,900

LOCATION	STATION – STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
	SUMMARY No. 7					
–Y2–	76+50 – 83+00	376		879	503	0
–Y3A–	10+50 – 20+00	141		1,035	894	0
–Y4–	10+50 – 19+50	1,048		2,099	1,051	0
	SUMMARY No. 7 TOTAL	1,565		4,013	2,448	0
	DETOUR REMOVAL					
	SUMMARY No. 8					
DET 1	12+00 23+50	1,789		0	0	1,789
DET 2	10+16.33 17+74.26	165		0	0	165
	SUMMARY No. 8 TOTAL	1,954		0	0	1,954
	SUMMARY's TOTAL	33,075		415,910	397,234	14,399
SHOULDER MATERIAL				10,788	10,788	
UNSUITABLE UNCLASS. EXCAV.		100				100
CLASS IV SUBGRADE STABILITY ADJUSTMENT				–1000	–1000	
WASTE IN LIEU OF BORROW					–8,544	–8,544
PROJECT TOTAL		33,175		425,698	398,478	5,955
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					19,924	
GRAND TOTAL		33,175		425,698	418,402	5,955
SAY		33,500			419,000	

DRAINAGE DITCH EXCAVATION = 9,085 Cu. Yds.
CLASS IV SUBGRADE STABILIZATION = 7,900 TONS
EST . UNDERCUT EXCAVATION = 1,700 Cu. Yds.

SHALLOW UNDECUT BY STATION = 4,250 Cu. Yds.
SHALLOW UNDERCUT CONTINGENCY = 80 Cu. Yds.
TOTAL SHALLOW UNDERCUT = 4,330 Cu. Yds.
PAVEMENT STRUCTURE VOLUME = 11,000 Cu. Yds.

NOTE:
Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing & Grubbing, Removal of Existing Asphalt Pavement, and Breaking of Existing Asphalt Pavement will be paid for at the lump sum price for "Grading".

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.

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COMPUTED BY: F. TUCK DATE: NOVEMBER 2012
CHECKED BY: S. KENDALL DATE: NOVEMBER 2012

PROJECT REFERENCE NO.	SHEET NO.
R-3324	3-J

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF CHAIN LINK FENCE

LOCATION	STATION – STATION	SIDE	FEET
–L–	19+92.61 – 21+41.50	LT.	148.89
–L–	22+77.29 – 27+50.00	LT.	472.71
–L–	28+50.00 – –Y1– 23+20.00	LT.	1,084.49
–Y1–	19+10.00 – –L– 46+53.52	LT.	1,087.18
–Y–	13+50.00 – –L– 31+70.00	RT.	443.71
–L–	32+30.00 – –Y1– 26+80.00	RT.	735.11
–Y–	28+00 LT. – –L– 43+90.98	RT.	541.39
		TOTAL	4,513.48
		SAY	4,550

REMOVAL OF EXISTING ASPHALT PAVEMENT

LOCATION	STATION – STATION	SIDE	SQ. YDS.
–DR1–	11+00 – 13+09	RT.	311.56
–Y2–	67+00 – 71+88	RT.	2,715.56
–Y3A–	16+40 – 19+71	LT.	615.67
–Y5–	10+23 – 11+55	LT.	181.71
–DET 1–	12+70 – 23+35	LT./RT.	2,352.12
–DET 2–	10+16 – 17+17	LT./RT.	1,591.29
		TOTAL	7,767.90
		SAY	8,000

BREAKING OF EXISTING ASPHALT PAVEMENT

LOCATION	STATION – STATION	SIDE	SQ. YDS.
–L–	17+50 – 25+00	CL	3,000
–DR1–	13+09 – 13+89	CL	320.00
–Y–	13+00 – 14+25	CL	666.67
		TOTAL	3,986.67
		SAY	4,000

SUMMARY OF WOVEN WIRE FENCE

LOCATION	STATION – STATION	SIDE	FEET
–L–	47+53.52 – 54+00	LT.	654.18
–L–	55+00 – 77+43.64	LT.	2,243.64
–L–	80+45 – 86+06.05	LT.	628.37
–L–	87+73.76 – 103+00	LT.	1,526.24
–L–	103+60 – 112+96.16	LT.	938.44
–L–	113+26.92 – 122+50	LT.	934.06
–L–	123+10 – 127+35	LT.	450.82
–L–	127+63 – 129+91.96	LT.	255.97
–L–	127+57.05 – 128+20	LT.	88.50
–L–	45+05 – 54+00	RT.	895.00
–L–	55+00 – 77+66.11	RT.	2,266.11
–L–	78+79.67 – 86+06.05	RT.	798.74
–L–	87+99.86 – 103+00	RT.	879.46
–L–	103+60 – 112+39.46	RT.	881.73
–L–	112+69.02 – 122+50	RT.	980.98
–L–	123+10 TO 127+15	RT.	405.00
–L–	127+49.41 TO 129+95	RT.	685.00
–Y2–	24+40 – 26+12	LT.	172.00
–Y2–	28+72 – 27+60	LT.	88.00
–Y2–	28+85 – 31+73	LT.	303.75
–Y2–	31+97 – 60+00	LT.	2,803.00

LOCATION	STATION – STATION	SIDE	FEET
–Y2–	60+60 – 83+50	LT.	2,290.00
–Y2–	16+49.95 – 32+33	RT.	1,608.05
–Y2–	32+57 – 37+15	RT.	458.00
–Y2–	37+75 – 60+00	RT.	2,225.00
–Y2–	60+60 – 75+17.12	RT.	1,457.12
–Y2–	77+00 – 79+80	RT.	503.15
–Y3A–	10+02.39 – 16+30.97	LT.	628.58
–Y4–	10+81.17 – 11+50	LT.	85.39
–Y4–	11+50 – 15+27.83	LT.	377.50
–Y4–	15+87.38 – 16+40	LT.	52.62
–Y6–	12+35 – 15+17.67	LT.	377.74
–Y6–	16+30.49 – 17+25	LT.	181.03
–Y6–	16+04.66 – 17+00	LT.	94.51
–Y6–	12+35 – 14+43.33	RT.	208.33
–Y6–	15+92.31 – 17+00	RT.	107.69
		TOTAL	29,533.70
		SAY	29,550

GEOTECH SUMMARY's

COMPUTED BY: GEOTECH

SUMMARY OF BRIDGE WAITING PERIOD

BRIDGE DESCRIPTION	END BENT / BENT No.	MONTHS
–L– 22+02.90	1	1
–L– 22+02.90	2	1

SUMMARY OF SUBSURFACE DRAINAGE

LOCATION	STATION – STATION	SIDE	DRAIN TYPE *	LIN. FEET
–L–	129+00 – 131+00	LT./RT.	UD	400
–Y2–	23+00 – 26+00	LT./RT.	UD	300
	CONTINGENCY		UD	500
			TOTAL	1,200
* UD = UNDERDRAIN				

5/28/99

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PROJECT	SHEET NO.
R-3324	3K

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4, 4A	CHARLES W. AND JEAN J. KIRKMAN FAMILY LIMITED PARTNERSHIP
2	4, 4A	DANNY C. LEONARD, ET AL
3	4, 4A	MIK-B, LLC
4	4, 4A	GREGORY KENT HEDRICK ET UX
5	4, 4A	BUFFLEHEAD PROPERTIES, LLC
6	4, 4A	SOUTHPORT CINEMA ENTERTAINMENT, INC.
7	4, 4A	NCDOT FORMERLY SOUTHPORT-OAK ISLAND CHAMBER OF COMMERCE
8	4, 4A	KATHLEEN VILOSKI
9	4, 5, 6	COASTAL CAROLINA COMMERCIAL DEVELOPMENT, LLC
10	4A, 5	DAVIDSON ANIMAL HOSPITAL, PA
11	4A,5	RONALD M. HUGHES
12	5	GREGORY K. HEDRICK
13	5	GREGORY K. HEDRICK
14	5	I33 PROPERTIES, LCC
15	5	ISAAC SHAMAH ET UX
16	5	KEITH R. ROGERS ET UX
17	5	JOHN L. HELMS
18	5, 21	JORDAN& RIDDLE, LLC
19	5, 6, 21	LIVE OAK VILLAGE SHOPPING CENTER, LLC
20	5	FOOD LION, LLC
21	5, 21	R & W PIZZA HUTS OF NORTH CAROLINA BLDG. PARTNERSHIP
22	21	McDONALD'S CORPORATION
23	6	NCDOT FORMERLY THOMAS WALTER HARPER
24	6	NCDOT FORMERLY DWAYNE BARTLETT
25	6	BRUCE McLAURIN IVES
26	6	NCDOT FORMERLY KENNETH BELLAMY ET UX
27	20	BRUNSWICK CHURCH OF CHRIST

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
28	20	JAMES EARL BELLAMY
29	6, 7, 8, 9, 20	BRIAN K. KEESEE, ETUX
30	6	J B F INVESTMENTS, LLC
31	6	GATEWAY HOSPITALITY SOUTHPORT. LLC
32	6	STEPHENS, STOKER, & THOMAS, LLC
33	6	NCDOT FORMERLY FRANK R. GONZALES ET UX
34	21	WEAVER R. HATCHER
35	21	SAMPSON-BLADEN OIL CO., INC.
36	21	BRUNSWICK ELECTRIC MEMBERSHIP CORP
38	21	NATIONSBANK OF NORTH CAROLINA
40	22	JS SOUTH, LLC
41	22	T.F. PROPERTIES, LLC
042Z	22	FRANK GARNER JR., ET UX
43	7,8,9	TRI CITY, INC
44	9, 10, 11, 12, 13	ALLEN J. EARP, ETAL
45	13	CHARLES F. RIGGS
46	13	NCDOT FORMERLY RUTH CREWS ESTATE
47	13,15	RAYMOND C. CASTEEN, ETUX
48	13,14	FRANKLIN D. COX
49	13,15	PROGRESS ENERGY CAROLINA, INC. , ET AL
50	13,15	BRUNSWICK CO.
51	15	PAT NEWTON PROPERTIES, LLC
52	18,19	DOLLAR PROPERTIES THREE, LLC.
53	13,15,16,17,18,19	MARTIN MARIETTA, INC.
53A	18	UNITED STATES of AMERICA
54	18,19	SUNNY POINT PROPERTIES, LLC.
55	22	JUNE SMITH ET UX

PROJECT REFERENCE NO.	SHEET NO.
R-3324	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — S. D. Kendall 12-3-12	NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN — 12/3/12

SEE SHEET No. 23 FOR -L- PROFILE

SEE SHEET No. 2-F FOR RELATIONSHIP OF BRIDGE TO ROADWAY SKETCH

SEE SHEET No. S-1 to S-76 FOR STRUCTURE PLANS

SEE SHEET No. W-1 to W-3 FOR RETAINING WALL #1 PLANS

SEE SHEET No. 2-G FOR DITCH DETAILS

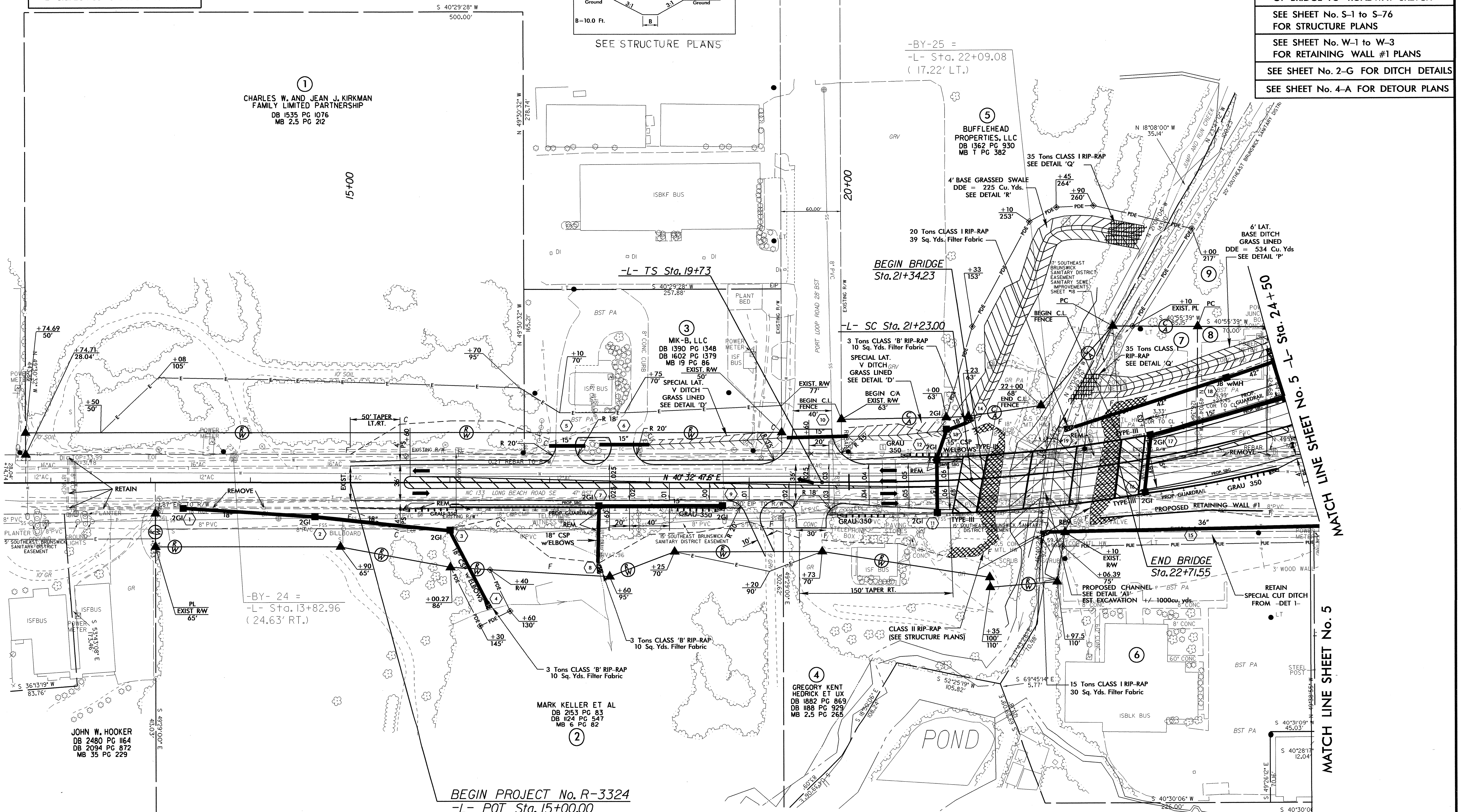
SEE SHEET No. 4-A FOR DETOUR PLANS

SHOULDER BERM GUTTER LOCATIONS
-L- Sta. 20+87 to BEGIN BRIDGE LT.
-L- END BRIDGE to Sta. 27+00 LT.
-L- Sta. 16+00 to Sta. 18+70 RT.
-L- END BRIDGE to Sta. 25+85 RT.
-L- Sta. 28+00 to Sta. 31+00 RT.

PROPERTY OWNERS			
6	SOUTHEAST CINEMA ENTERTAINMENT, INC. DB 1835 PG 420 MB X PG 62 MB X PG 28	8	KATHLEEN VILOSKI DB 2368 PG 1197
7	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION FORMERLY SOUTHPORT-OAK ISLAND CHAMBER OF COMMERCE DB 3083 PG 1116 DB 576 PG 382 DB 1134 PG 894	10	DAVIDSON ANIMAL HOSPITAL, PA DB 1835 PG 420 DB 2160 PG 844 DB 1195 PG 1088 MB Y PG 263
		11	RONALD M. HUGHES DB 904 PG 482 MB X PG 28

-L-

PIs Sta 20+73.01	PI Sta 25+50.41
Θs = 2° 57′ 48.9″	Δ = 32° 50′ 51.0″ (LT)
Ls = 150.00′	D = 3° 57′ 05.2″
LT = 100.01′	L = 831.28′
ST = 50.01′	T = 427.41′
	R = 1,450.00′



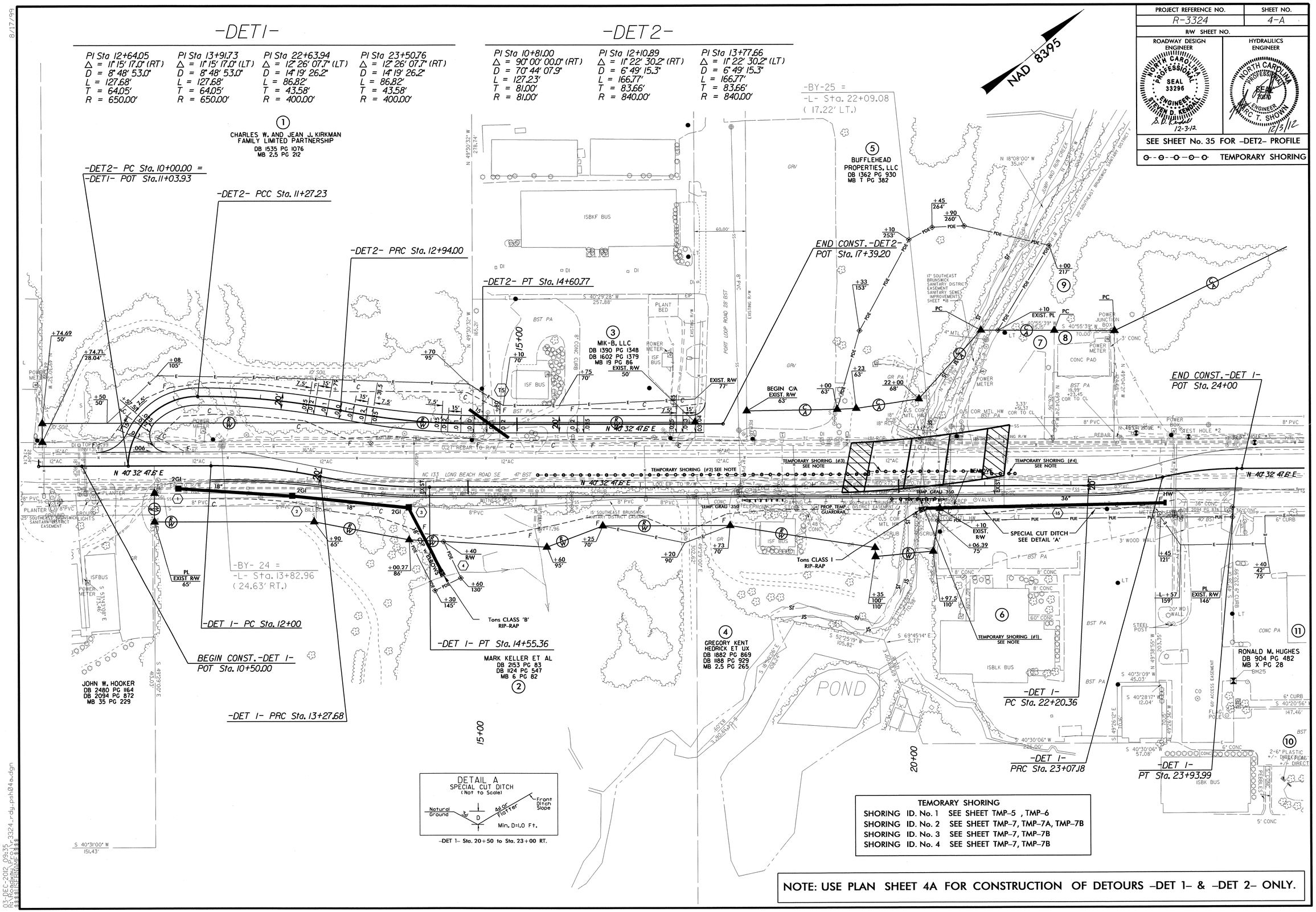
PROJECT REFERENCE NO.	SHEET NO.
R-3324	4-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KEIGHT 12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 19202 ENGINEER MARC T. SHOWN 12/3/12

SEE SHEET No. 35 FOR -DET2- PROFILE

-·-·-·-·-·- TEMPORARY SHORING



NOTE: USE PLAN SHEET 4A FOR CONSTRUCTION OF DETOURS -DET 1- & -DET 2- ONLY.

8/17/99

03-DEC-2012 09:35
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$$$$USERNAME$$$$

PROPERTY OWNERS	
(10)	DAVIDSON ANIMAL HOSPITAL, PA DB 1835 PG 420 DB 2160 PG 844 DB 1195 PG 1088 MB Y PG 263
(12)	GREGORY K. HEDRICK DB 1284 PG 974 DB 1155 PG 910 DB 2160 PG 844 DB 1176 PG 835
(13)	GREGORY K. HEDRICK DB 2412 PG 1036
(14)	133 PROPERTIES, LLC DB 2044 PG 471 DB 1134 PG 55

-L-

Pls Sta 30+04.29	Pls Sta 32+04.30	PI Sta 33+16.50
Θs = 2° 57′ 48.9″	Θs = 3° 42′ 16.1″	Δ = 6° 08′ 25.8″ (RT)
Ls = 150.00′	Ls = 150.00′	D = 4° 56′ 21.4″
LT = 100.01′	LT = 100.02′	L = 124.32′
ST = 50.01′	ST = 50.02′	T = 62.22′
		R = 1,160.00′

-DRI-

PI Sta 14+10.24	PI Sta 10+43.97
Δ = 90° 29′ 12.6″ (LT)	Δ = 40° 27′ 10.3″ (RT)
D = 143° 14′ 22.0″	D = 143° 14′ 22.0″
L = 63.17′	L = 28.24′
T = 40.34′	T = 14.74′
R = 40.00′	R = 40.00′

-Y-

PI Sta 13+37.65
Δ = 46° 33′ 43.7″ (LT)
D = 28° 38′ 52.4″
L = 162.53′
T = 86.06′
R = 200.00′

NOTE: THE CONTRACTOR SHALL MAINTAIN ACCESS TO PARCEL No. 9 DURING CONSTRUCTION OF THIS PROJECT.

NOTE:
SHOULDER BERM GUTTER
-L- Sta. 31+05 to 31+70 RT.

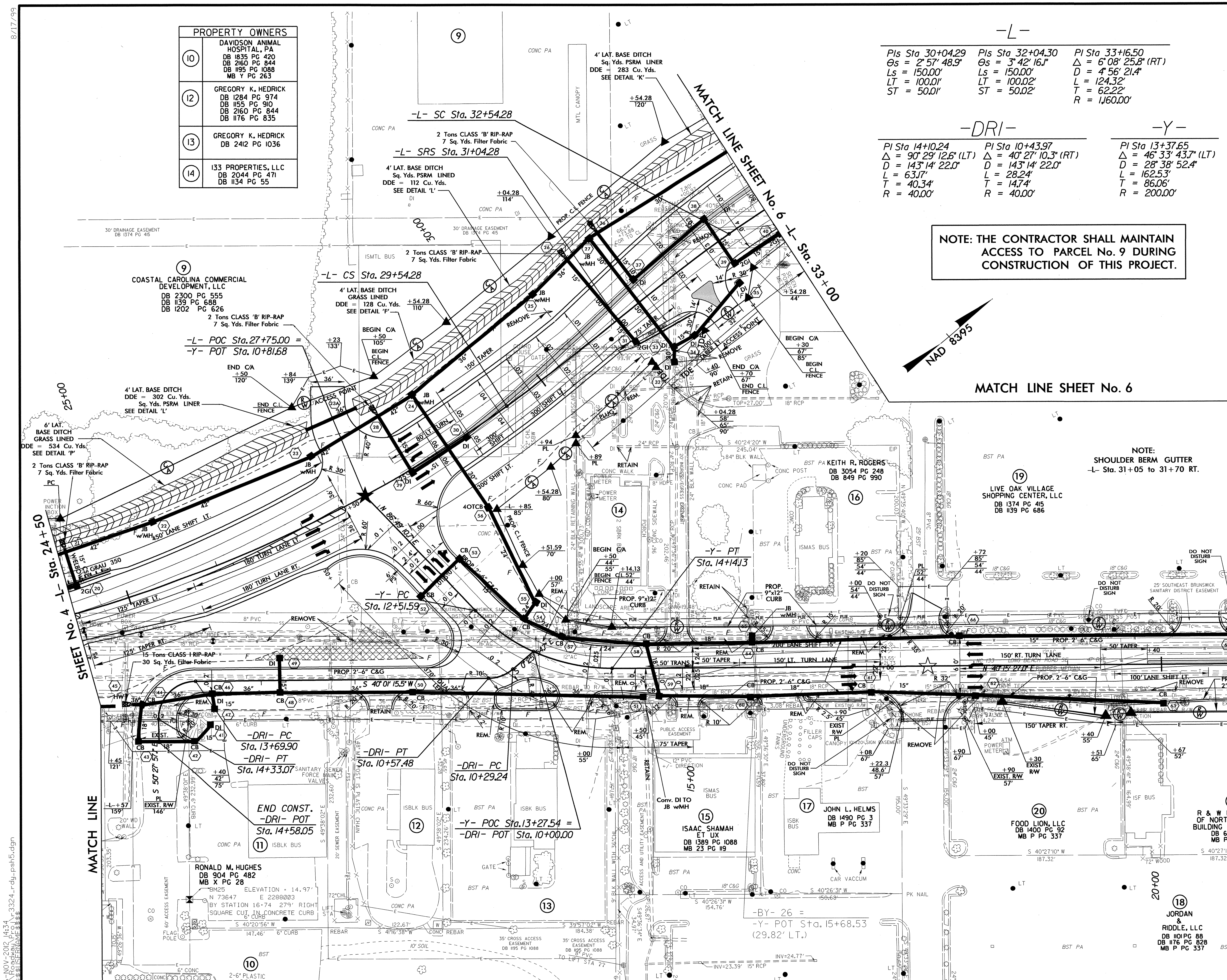
PROJECT REFERENCE NO.	SHEET NO.
R-3324	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — S.D. Kendall 12-3-12	NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN — 12/3/12

SEE SHEET No. 23 FOR -L- PROFILE
SEE SHEET No. 28 FOR -Y- PROFILE
SEE SHEET No. 35 FOR -DR1- PROFILE

SEE SHEET No. 2-G FOR DITCH DETAILS

PROPOSED PAVEMENT REMOVAL
PROPOSED CONC. ISLAND
★ PROPOSED TRAFFIC SIGNAL
☆ EXIST. TRAFFIC SIGNAL TO BE REVISED

ADT. 2012 / ADT. 2033
-L- 13,720 / 26,739
-L- 26,039 / 47,170
901 / 1,001
12,519 / 21,432
LONG BEACH ROAD NC 133 — 13,420 / 22,433



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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3324	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
S.D. Kendall 12-3-12

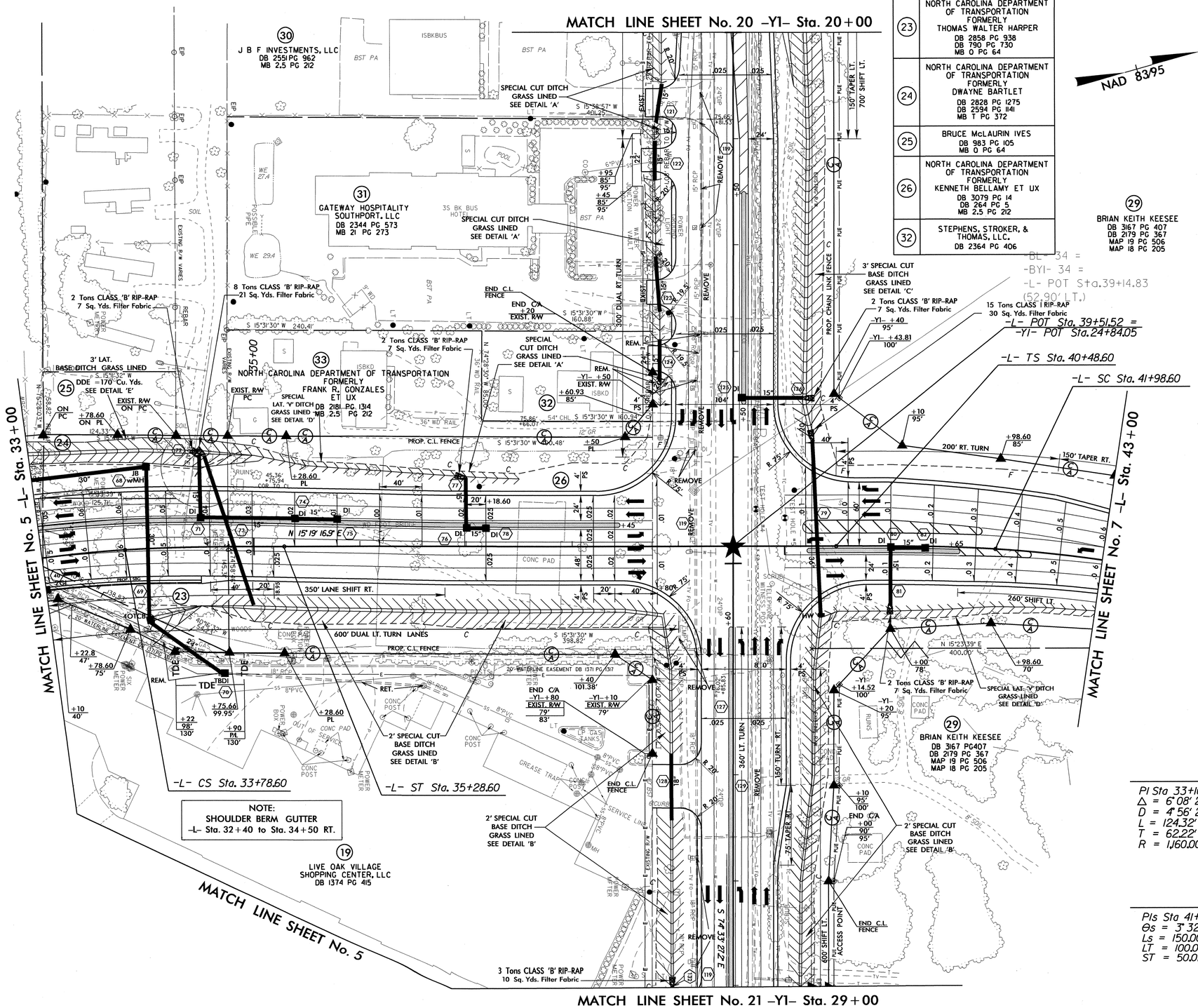
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 23 & 24 FOR -L- PROFILE
SEE SHEET No. 29 FOR -Y1- PROFILE

SEE SHEET 2-G FOR DITCH DETAILS

★ PROPOSED TRAFFIC SIGNAL

PROPOSED CONC. ISLAND



PROPERTY OWNERS	
23	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION FORMERLY THOMAS WALTER HARPER DB 2858 PG 938 DB 790 PG 730 MB O PG 64
24	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION FORMERLY DWAYNE BARTLET DB 2828 PG 1275 DB 2594 PG 1141 MB T PG 372
25	BRUCE McLAURIN IVES DB 983 PG 105 MB O PG 64
26	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION FORMERLY KENNETH BELLAMY ET UX DB 3079 PG 14 DB 264 PG 5 MB 2.5 PG 212
32	STEPHENS, STROKER, & THOMAS, LLC. DB 2364 PG 406

ADT. 2012 / ADT. 2033		
	19,229 / 36,053	
6,109 / 14,421	NC 211	1,502 / 3,605
13,720 / 26,739 -L-		-L- 9,614 / 15,323
701 / 1,001	-Y1-	451 / 701
	12,819 / 20,030	

-L-

PI Sta 33+16.50	PIs Sta 34+28.62
Δ = 6° 08' 25.8" (RT)	Θs = 3° 42' 16.1"
D = 4° 56' 21.4"	Ls = 150.00'
L = 124.32'	LT = 100.02'
T = 62.22'	ST = 50.02'
R = 1,160.00'	

-L-

PIs Sta 41+48.62	PI Sta 46+11.79
Θs = 3° 32' 51.55"	Δ = 38° 00' 00.0" (RT)
Ls = 150.00'	D = 4° 46' 28.7"
LT = 100.02'	L = 795.87'
ST = 50.02'	T = 413.19'
	R = 1,200.00'

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

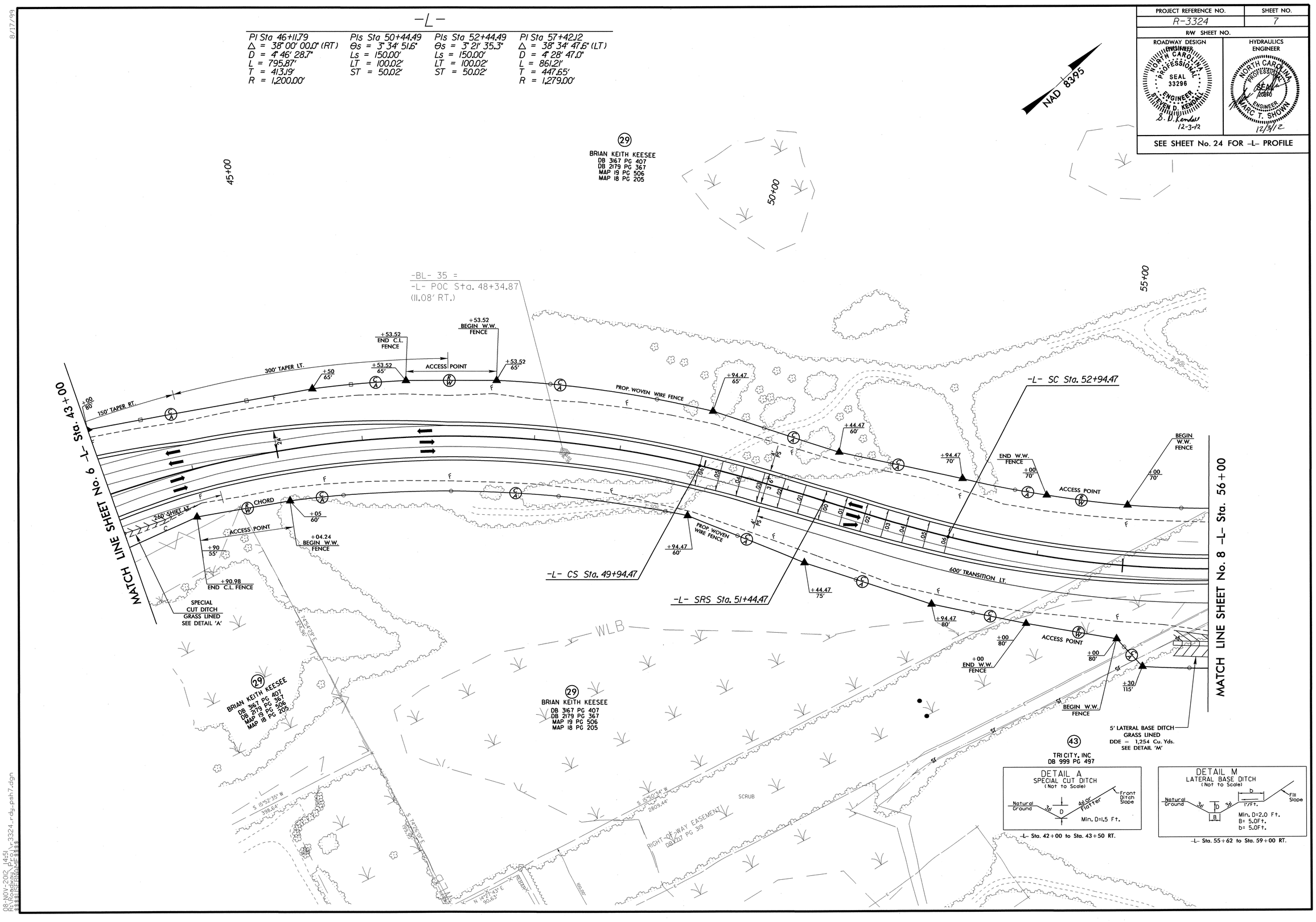
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — S. D. Kendall 12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 12080 ENGINEER MARC T. SHOWN — 12/3/12

SEE SHEET No. 24 FOR -L- PROFILE

-L-

PI Sta 46+11.79	PIs Sta 50+44.49	PIs Sta 52+44.49	PI Sta 57+42.12
Δ = 38° 00' 00.0" (RT)	Θs = 3° 34' 51.6"	Θs = 3° 21' 35.3"	Δ = 38° 34' 47.6" (LT)
D = 4° 46' 28.7"	Ls = 150.00'	Ls = 150.00'	D = 4° 28' 47.0"
L = 795.87'	LT = 100.02'	LT = 100.02'	L = 861.21'
T = 413.19'	ST = 50.02'	ST = 50.02'	T = 447.65'
R = 1,200.00'			R = 1,279.00'



8/17/99

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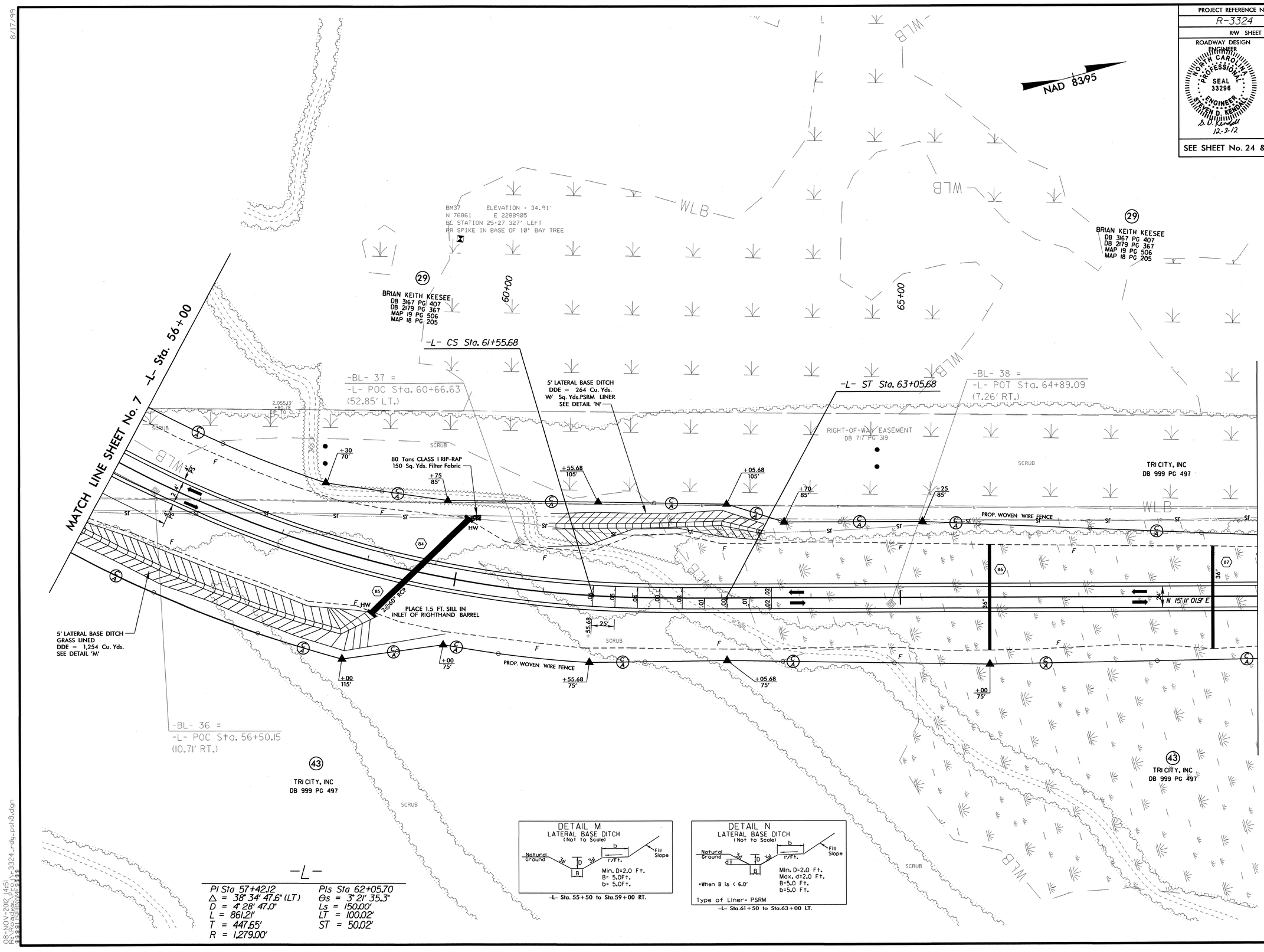
PROJECT REFERENCE NO.	SHEET NO.
R-3324	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 24 & 25 FOR -L- PROFILE



-L-

PI Sta 57+42.12	PIs Sta 62+05.70
Δ = 38° 34' 47.6" (LT)	Θs = 3° 21' 35.3"
D = 4° 28' 47.0"	Ls = 150.00'
L = 861.21'	LT = 100.02'
T = 447.65'	ST = 50.02'
R = 1,279.00'	

8/17/99

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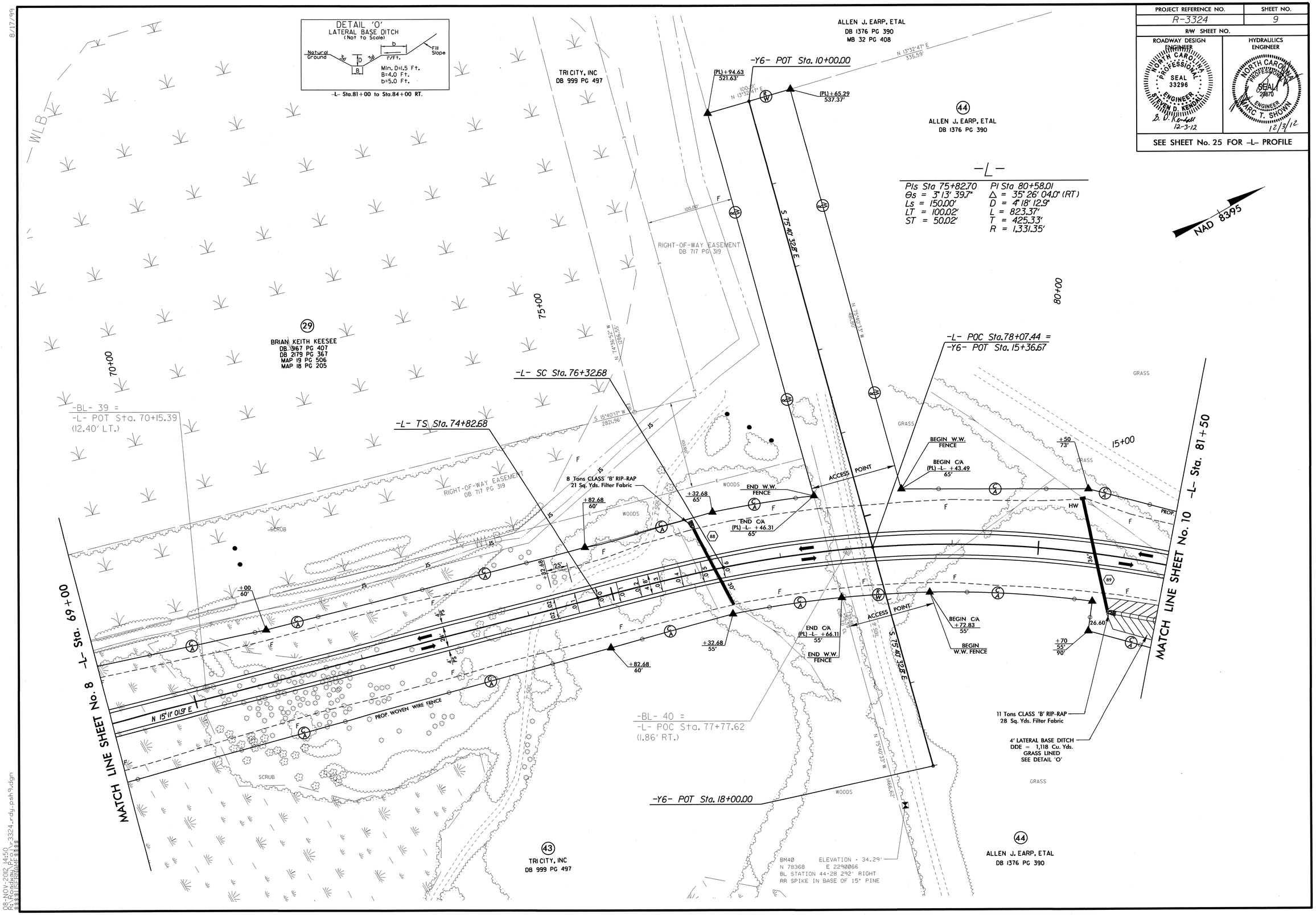
PROJECT REFERENCE NO.	SHEET NO.
R-3324	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL B. D. Kendall 12-3-12	NORTH CAROLINA PROFESSIONAL SEAL 29670 ENGINEER MARC T. SHOWN 12/3/12

SEE SHEET No. 25 FOR -L- PROFILE



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PROJECT REFERENCE NO.	SHEET NO.
R-3324	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

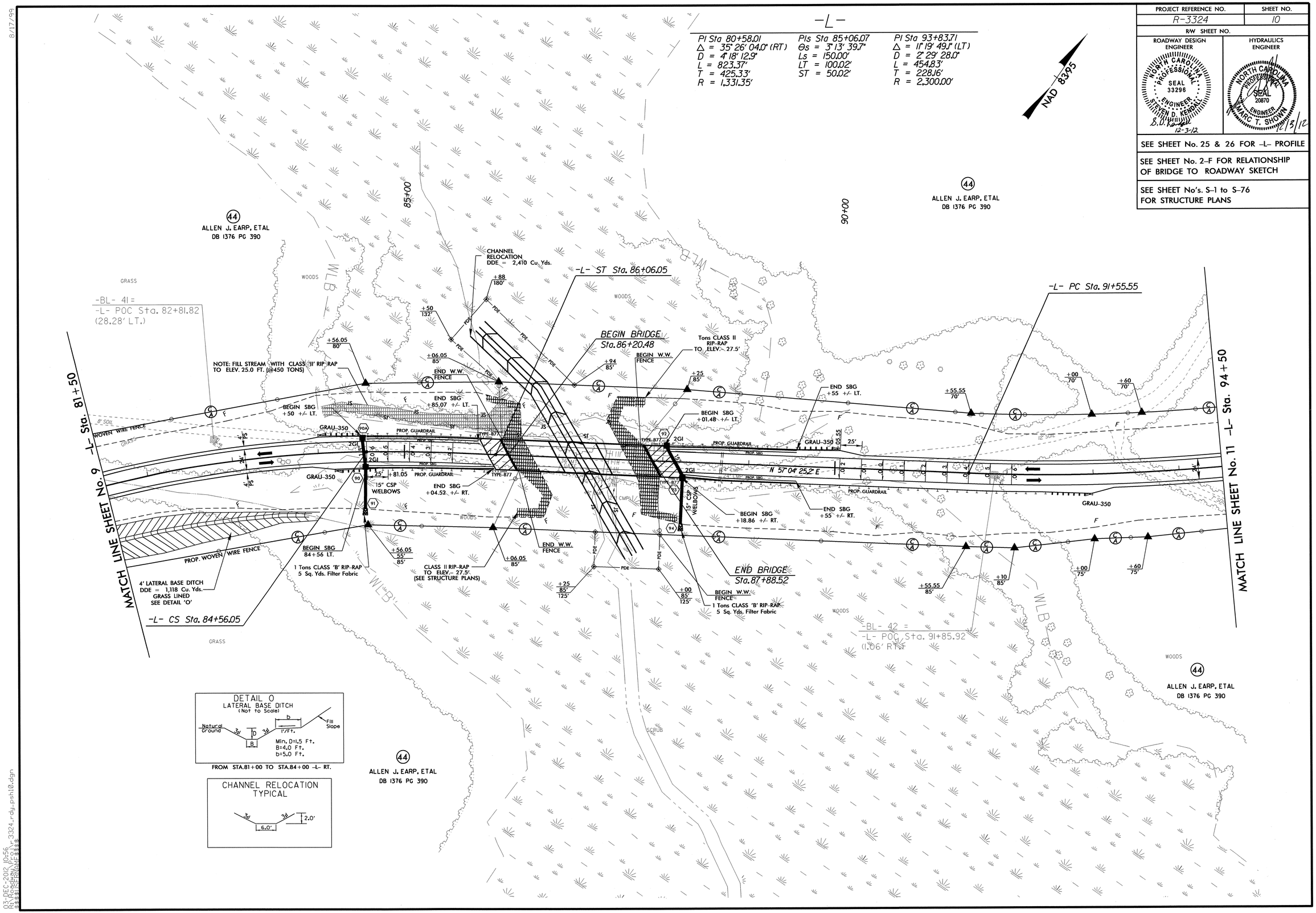
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
S.D. Kendall 12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 25 & 26 FOR -L- PROFILE

SEE SHEET No. 2-F FOR RELATIONSHIP OF BRIDGE TO ROADWAY SKETCH

SEE SHEET No's. S-1 to S-76 FOR STRUCTURE PLANS



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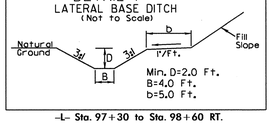
PROJECT REFERENCE NO.	SHEET NO.
R-3324	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
B. D. Kendal 12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 26 & 27 FOR -L- PROFILE

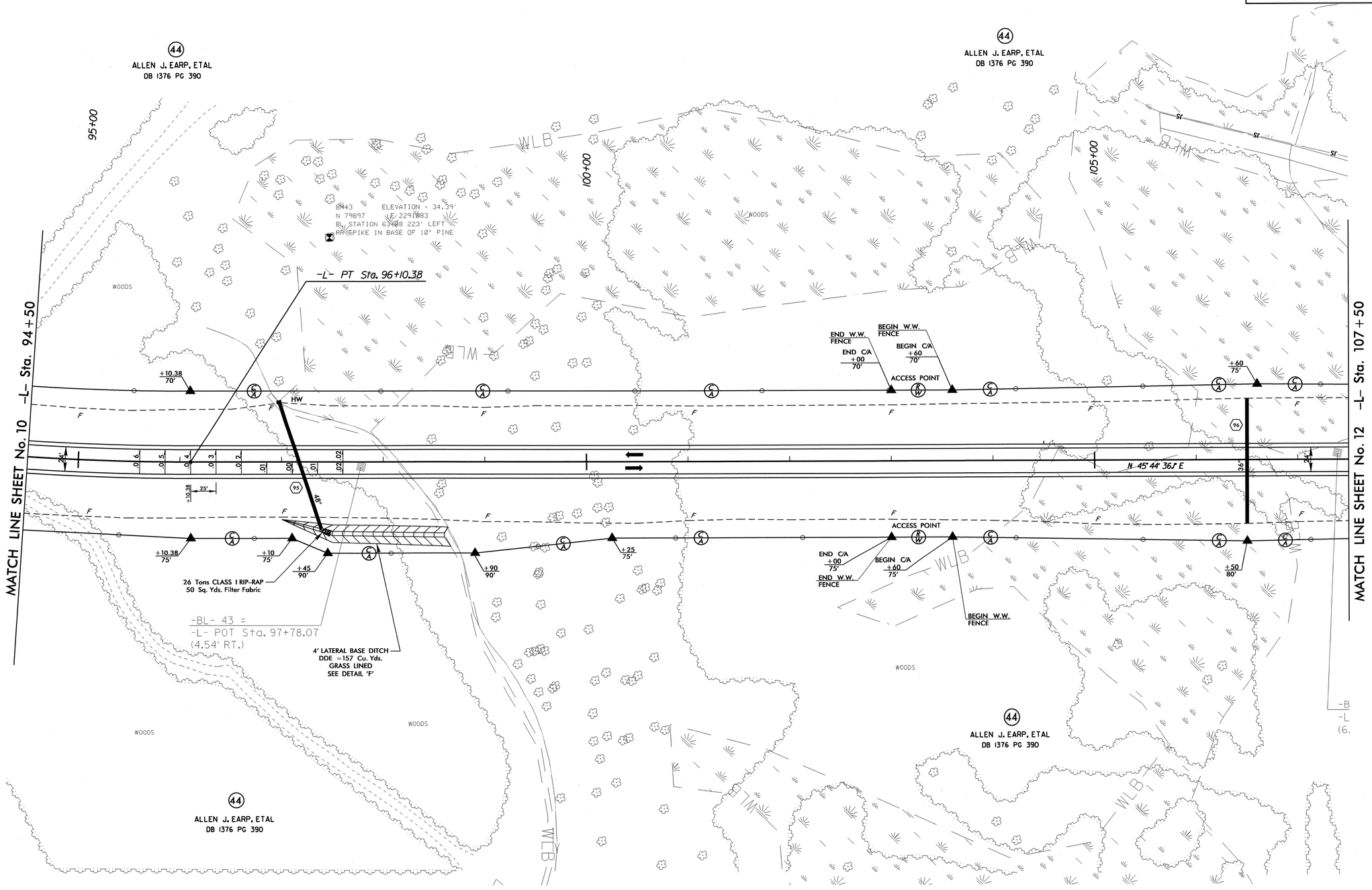
DETAIL F
LATERAL BASE DITCH
(Not to Scale)



-L- Sta. 97+30 to Sta. 98+60 RT.

-L-
PI Sta 93+83.71
Δ = 11° 19' 49.1" (LT)
D = 2° 29' 28.0"
L = 454.83'
T = 228.16'
R = 2,300.00'

NAD 83/95



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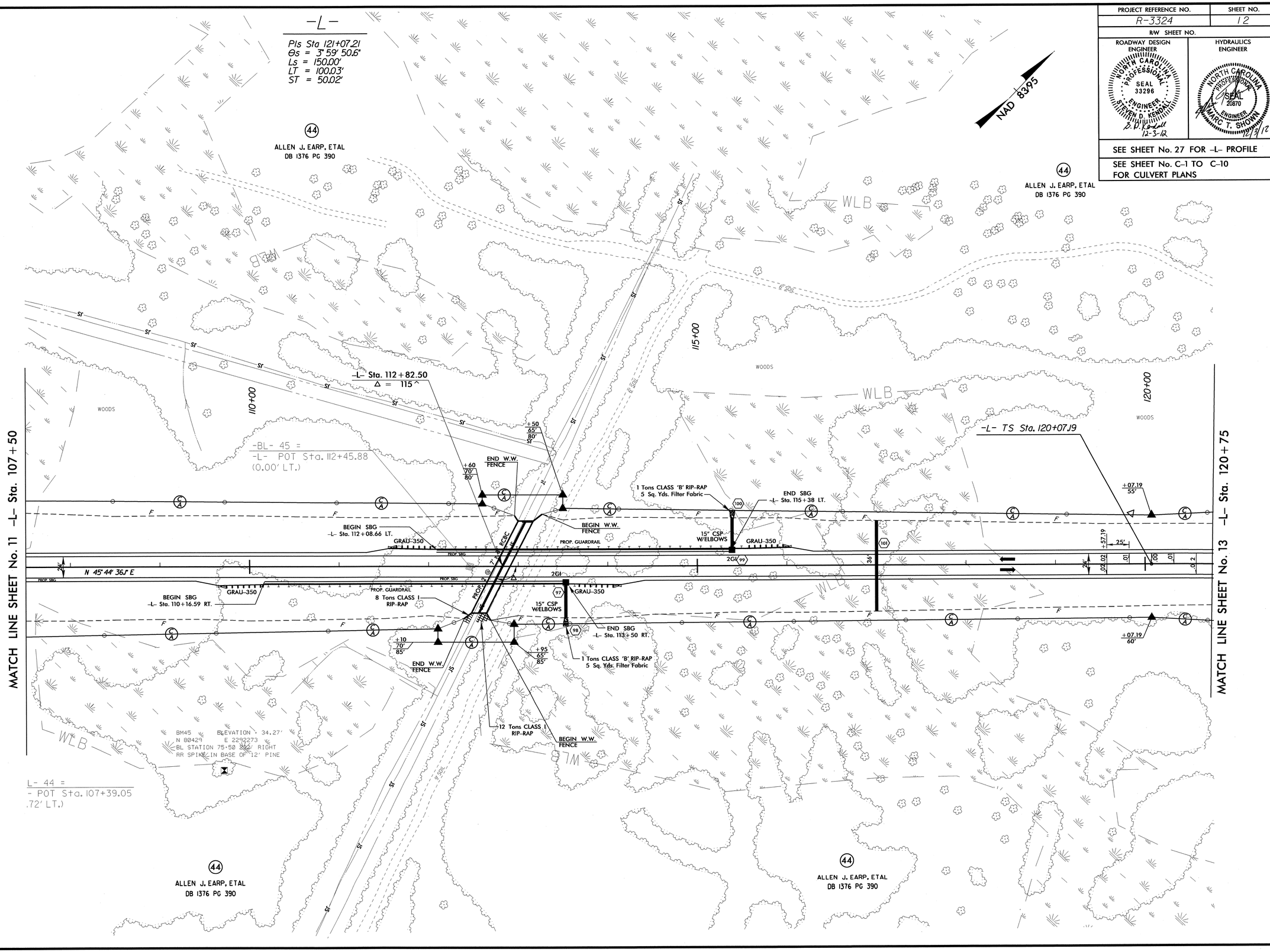
PROJECT REFERENCE NO.	SHEET NO.
R-3324	12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
D. V. Kendall 12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 27 FOR -L- PROFILE

SEE SHEET No. C-1 TO C-10 FOR CULVERT PLANS



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PROJECT REFERENCE NO.	SHEET NO.
R-3324	13

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — 1-23-13

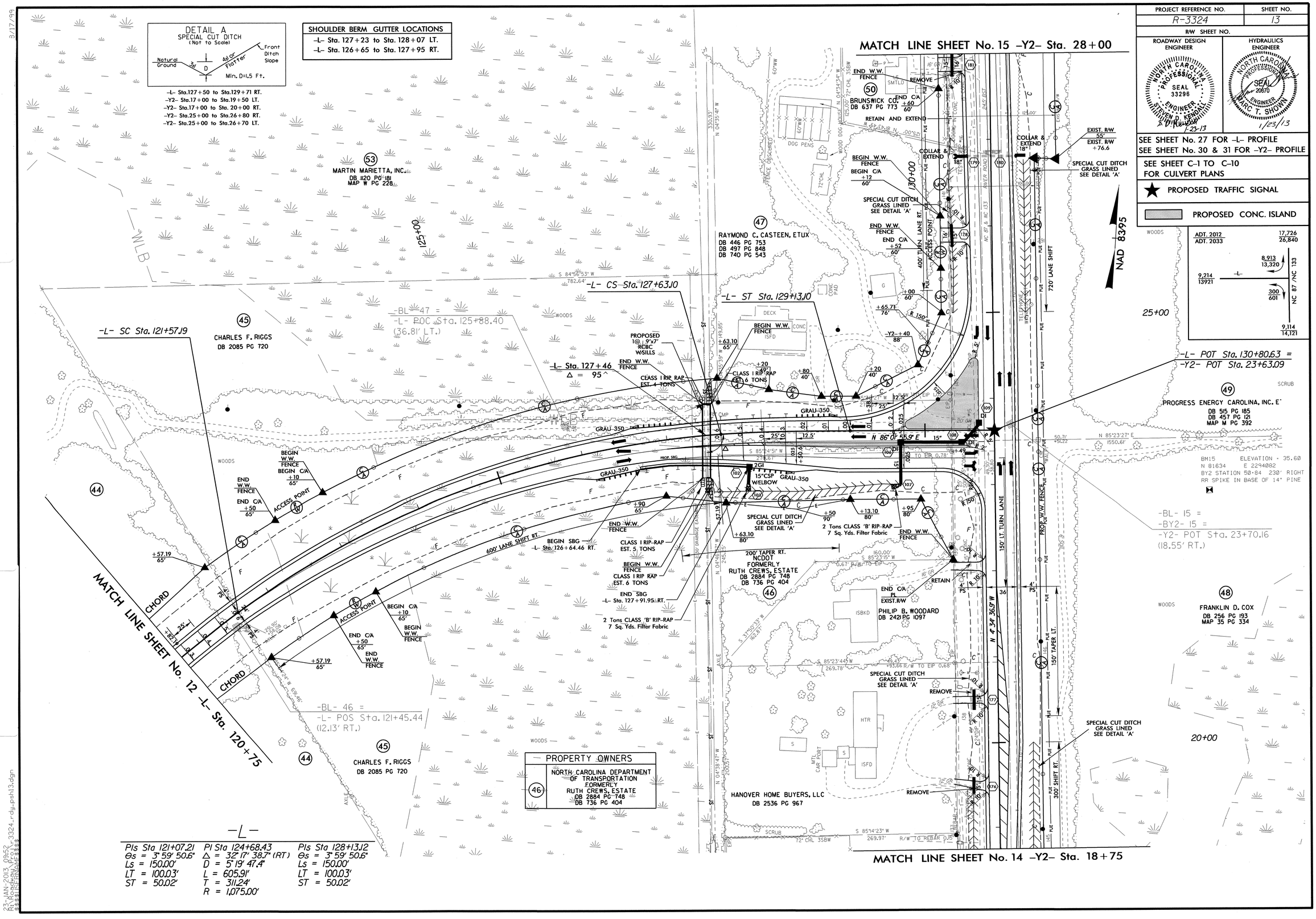
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20670 ENGINEER MARC T. SHOWN — 1/23/13

SEE SHEET No. 27 FOR -L- PROFILE
SEE SHEET No. 30 & 31 FOR -Y2- PROFILE

SEE SHEET C-1 TO C-10 FOR CULVERT PLANS

★ PROPOSED TRAFFIC SIGNAL

PROPOSED CONC. ISLAND



MATCH LINE SHEET No. 14 -Y2- Sta. 18+75

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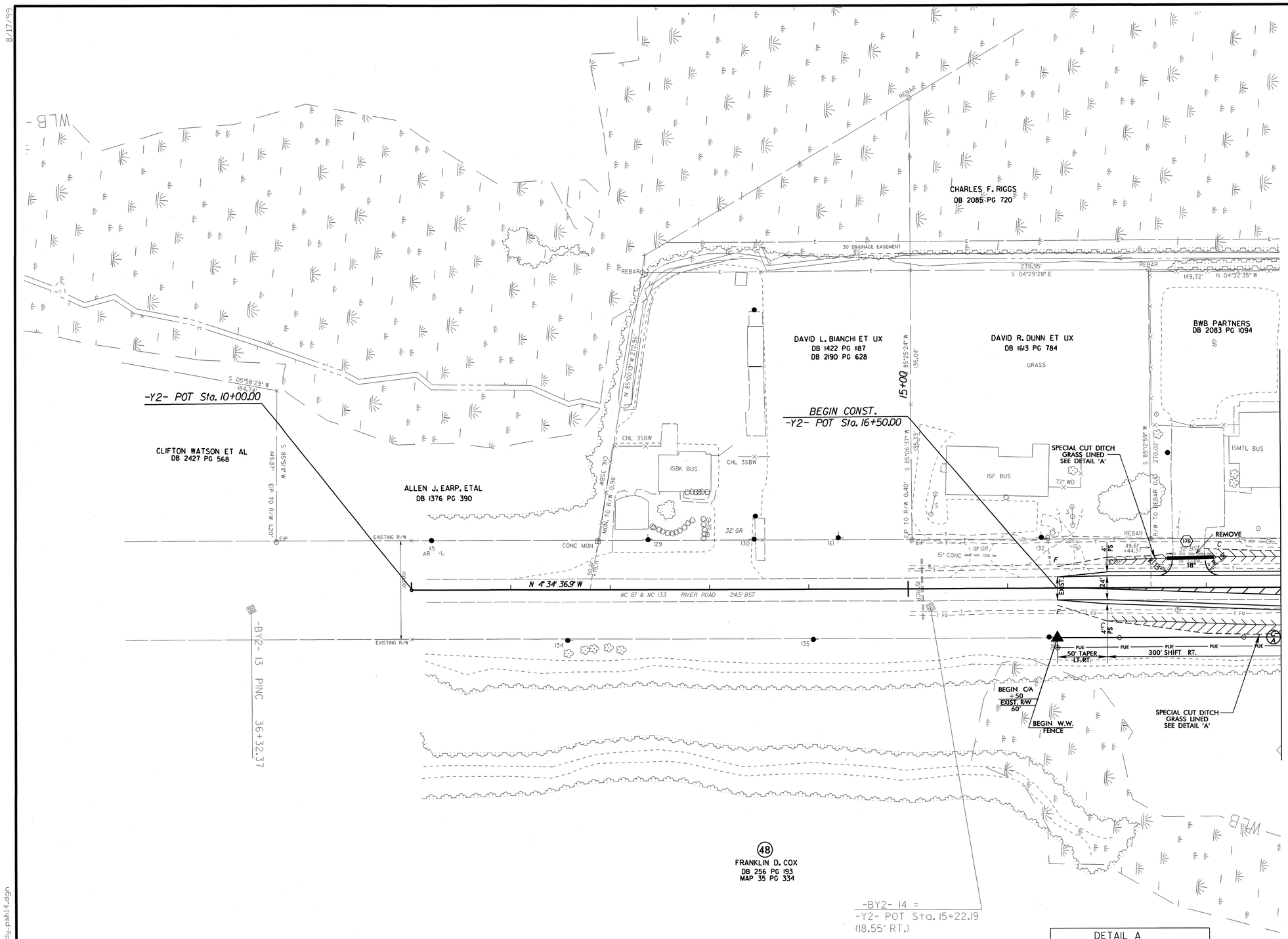
PROJECT REFERENCE NO.	SHEET NO.
R-3324	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33298 ENGINEER STEVEN D. KENDALL
B.D. Kendall 12-3-12

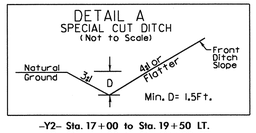
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 30 FOR -Y2- PROFILE

NAD 83/95



DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



-Y2- Sta. 17+00 to Sta. 19+50 LT.
-Y2- Sta. 17+00 to Sta. 20+00 RT.

MATCH LINE SHEET No. 13 -Y2- Sta. 18+75

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	15
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
12-3-12

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 31 FOR -Y2- PROFILE

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

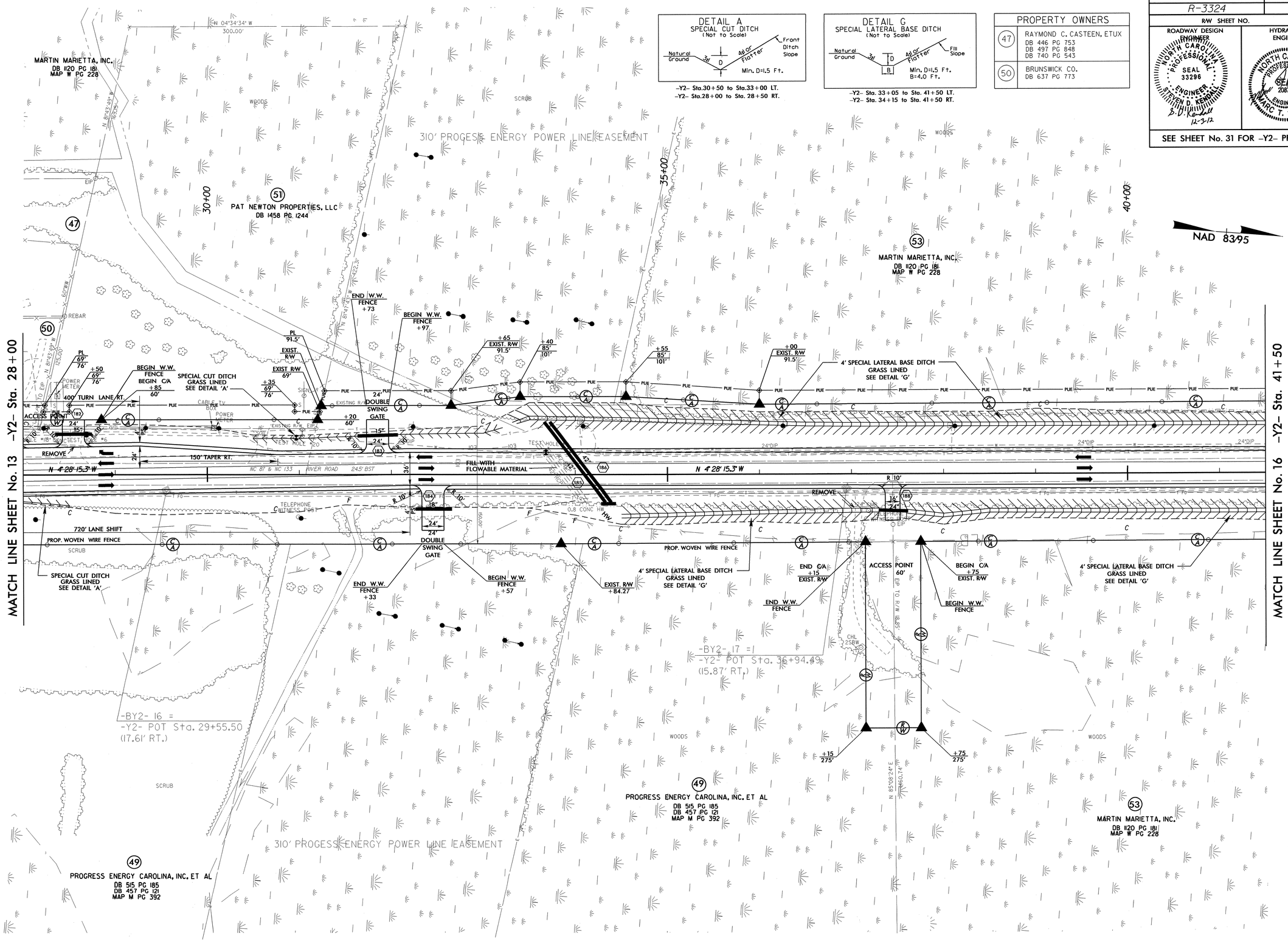
-Y2- Sta.30+50 to Sta.33+00 LT.
-Y2- Sta.28+00 to Sta.28+50 RT.

DETAIL G
SPECIAL LATERAL BASE DITCH
(Not to Scale)

-Y2- Sta. 33+05 to Sta. 41+50 LT.
-Y2- Sta. 34+15 to Sta. 41+50 RT.

PROPERTY OWNERS

47	RAYMOND C. CASTEEN, ETUX DB 446 PG 753 DB 497 PG 848 DB 740 PG 543
50	BRUNSWICK CO. DB 637 PG 773



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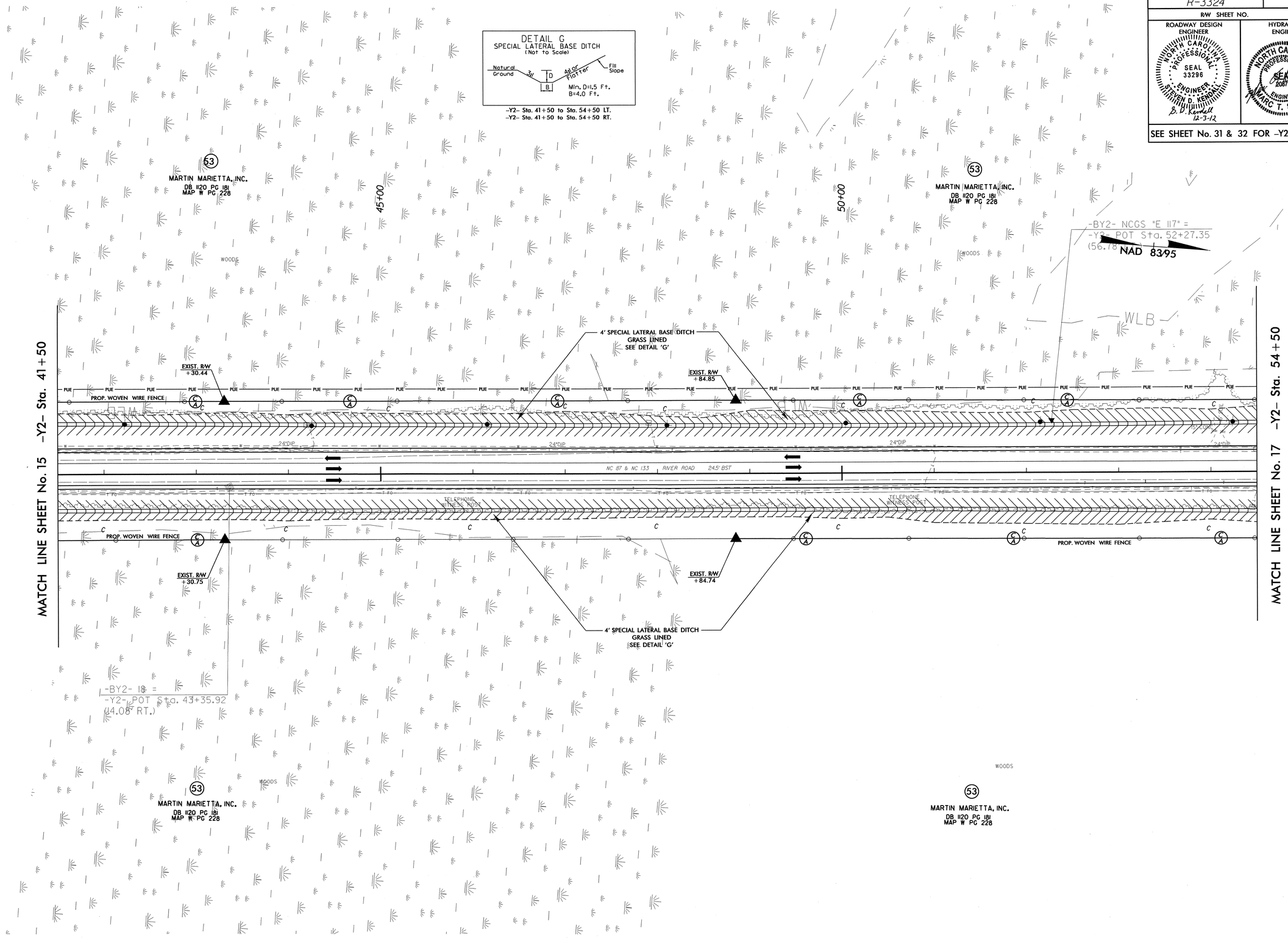
PROJECT REFERENCE NO.	SHEET NO.
R-3324	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
S.D. Kendall 12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 31 & 32 FOR -Y2- PROFILE



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PROJECT REFERENCE NO.	SHEET NO.
R-3324	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
S D Kendall 12-3-12

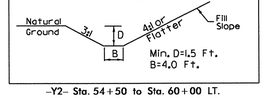
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 32 FOR -Y2- PROFILE

NAD 83/95

-Y2-
Pls Sta 66+86.71
Θs = 3° 42' 16.1"
Ls = 150.00'
LT = 100.02'
ST = 50.02'

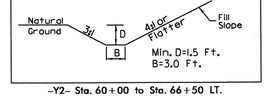
DETAIL G
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
B=4.0 Ft.

-Y2- Sta. 54+50 to Sta. 60+00 LT.
-Y2- Sta. 54+50 to Sta. 58+00 RT.
-Y2- Sta. 63+50 to Sta. 65+50 RT.
-Y2- Sta. 59+85 to Sta. 62+00 RT.
-Y2- Sta. 58+00 to Sta. 59+85 RT.

DETAIL J
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
B=3.0 Ft.

-Y2- Sta. 60+00 to Sta. 66+50 LT.

-BY2- W5408-3 =
-Y2-IPOT Sta. 60+78.06
(29.06' LT.)

-Y2- TS Sta. 65+86.68

MATCH LINE SHEET No. 16 -Y2- Sta. 54+50

MATCH LINE SHEET No. 18 -Y2- Sta. 66+50

55+00 60+00 65+00

(53) MARTIN MARIETTA, INC.
DB 1120 PG 181
MAP W PG 228

WOODS

4' SPECIAL LATERAL BASE DITCH
GRASS LINED
SEE DETAIL 'G'

END W.W. FENCE

END C/A +00 EXIST. R/W

BEGIN W.W. FENCE

BEGIN C/A +60 EXIST. R/W

3' SPECIAL LATERAL BASE DITCH
GRASS LINED
SEE DETAIL 'J'

EXIST. R/W +46.02

+86.68 / 91.5'

PUE

PROP. WOVEN WIRE FENCE

TELEPHONE WITNESS POST

SCRUB

EXISTING R/W

N 4° 28' 15.3" W

R 10'

16'

24'

NC 87 & NC 133

RIVER ROAD

24.5' BST

12.5' 25'

TELEPHONE WITNESS POST

REMOVE

CABLE

BK WALL

MTL POSTS

22' BST

REMOVE SIGN

ACCESS POINT

720' LANE SHIFT RT.

EXIST. R/W +45.68

4' SPECIAL LATERAL BASE DITCH
GRASS LINED
SEE DETAIL 'G'

(53) MARTIN MARIETTA, INC.
DB 1120 PG 181
MAP W PG 228

WOODS

(53) MARTIN MARIETTA, INC.
DB 1120 PG 181
MAP W PG 228

WOODS

WOODS

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	18
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — 12-3-12

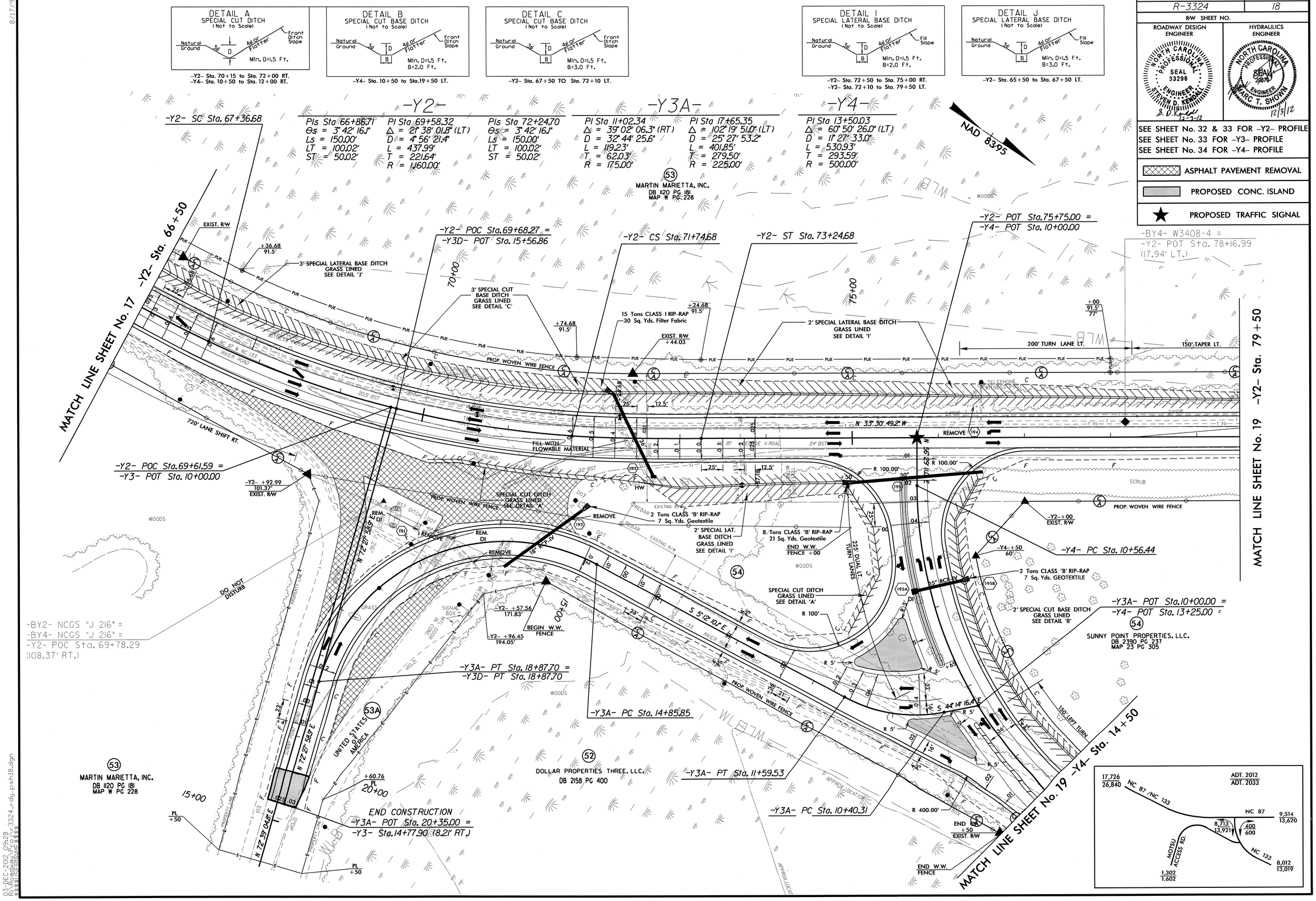
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20876 ENGINEER MARC T. SHOWN — 12/3/12

SEE SHEET No. 32 & 33 FOR -Y2- PROFILE
SEE SHEET No. 33 FOR -Y3- PROFILE
SEE SHEET No. 34 FOR -Y4- PROFILE

ASPHALT PAVEMENT REMOVAL

PROPOSED CONC. ISLAND

★ PROPOSED TRAFFIC SIGNAL



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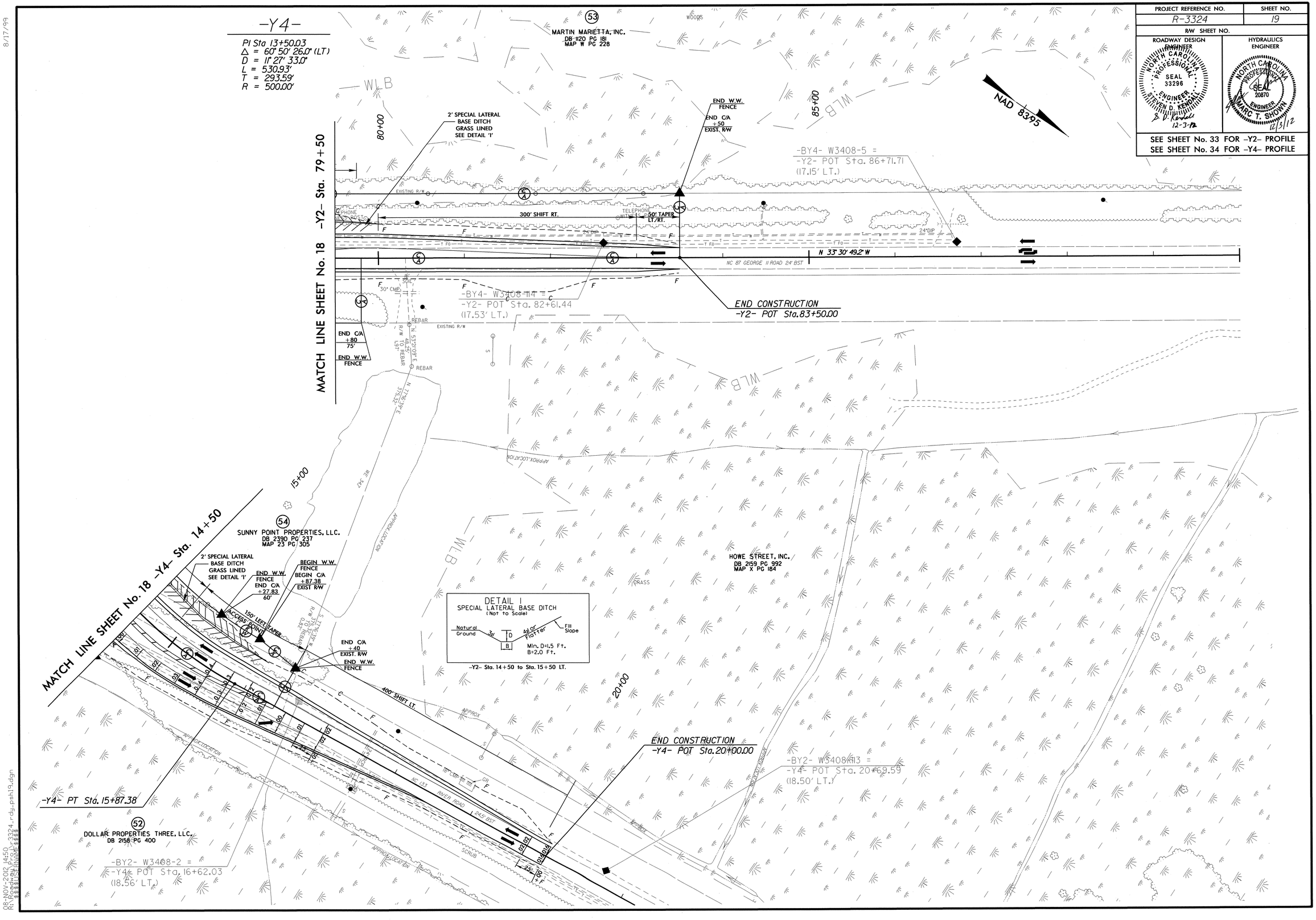
PROJECT REFERENCE NO.	SHEET NO.
R-3324	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL 12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN 12/3/12

SEE SHEET No. 33 FOR -Y2- PROFILE
SEE SHEET No. 34 FOR -Y4- PROFILE



8/17/99

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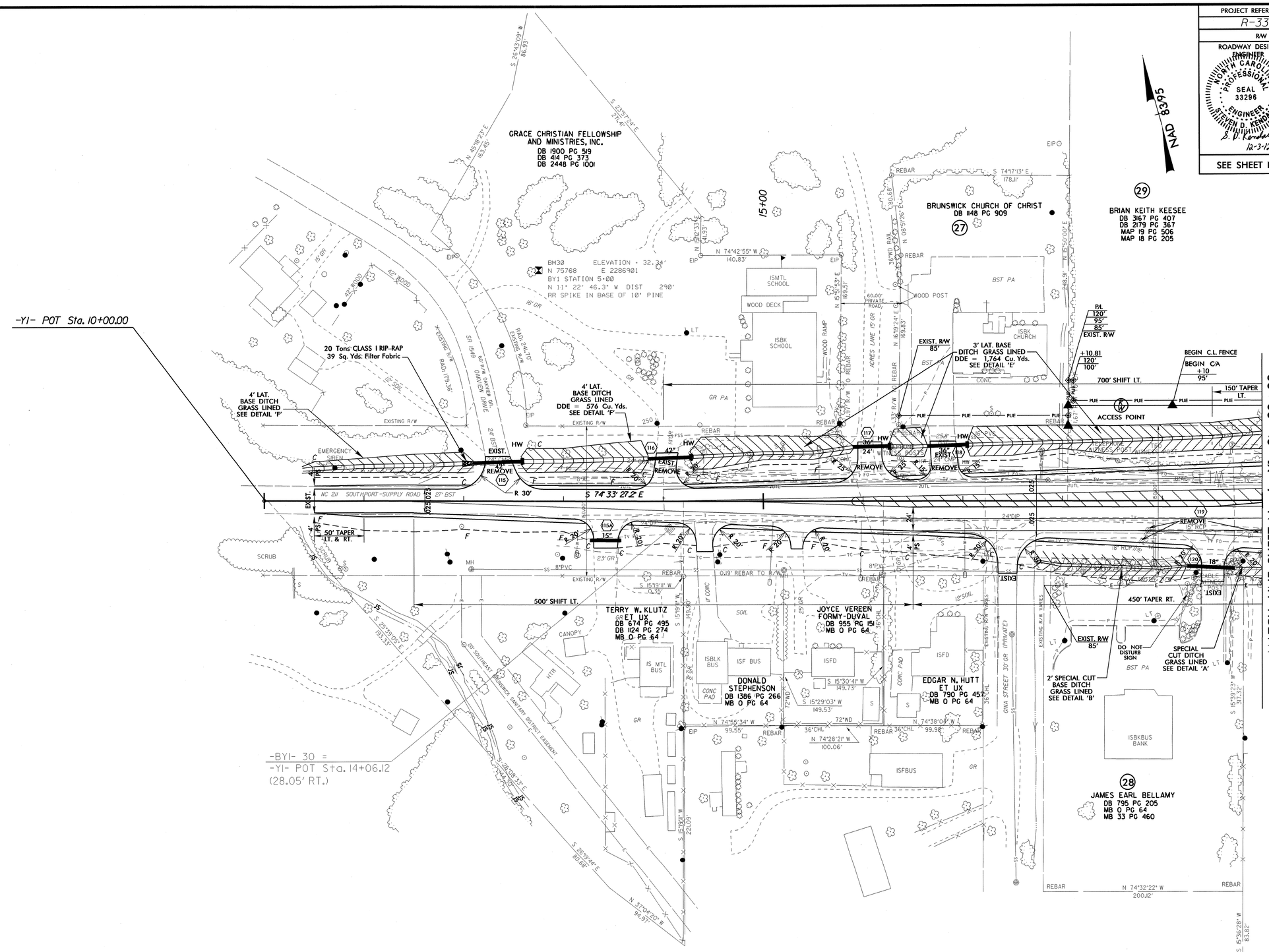
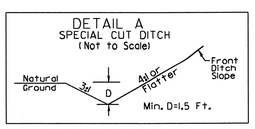
PROJECT REFERENCE NO.	SHEET NO.
R-3324	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
12-3-12

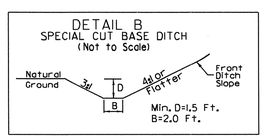
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

SEE SHEET No. 29 FOR -Y1- PROFILE

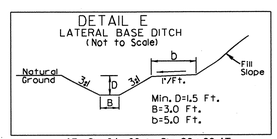




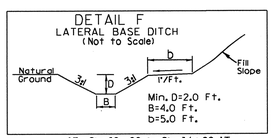
-Y1- Sta. 19+50 to Sta. 20+00 RT.



-Y1- Sta. 17+70 to Sta. 19+25 RT.



-Y1- Sta. 14+00 to Sta. 20+00 LT.



-Y1- Sta. 10+00 to Sta. 14+00 LT.

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — B. D. Kendall 12-3-12

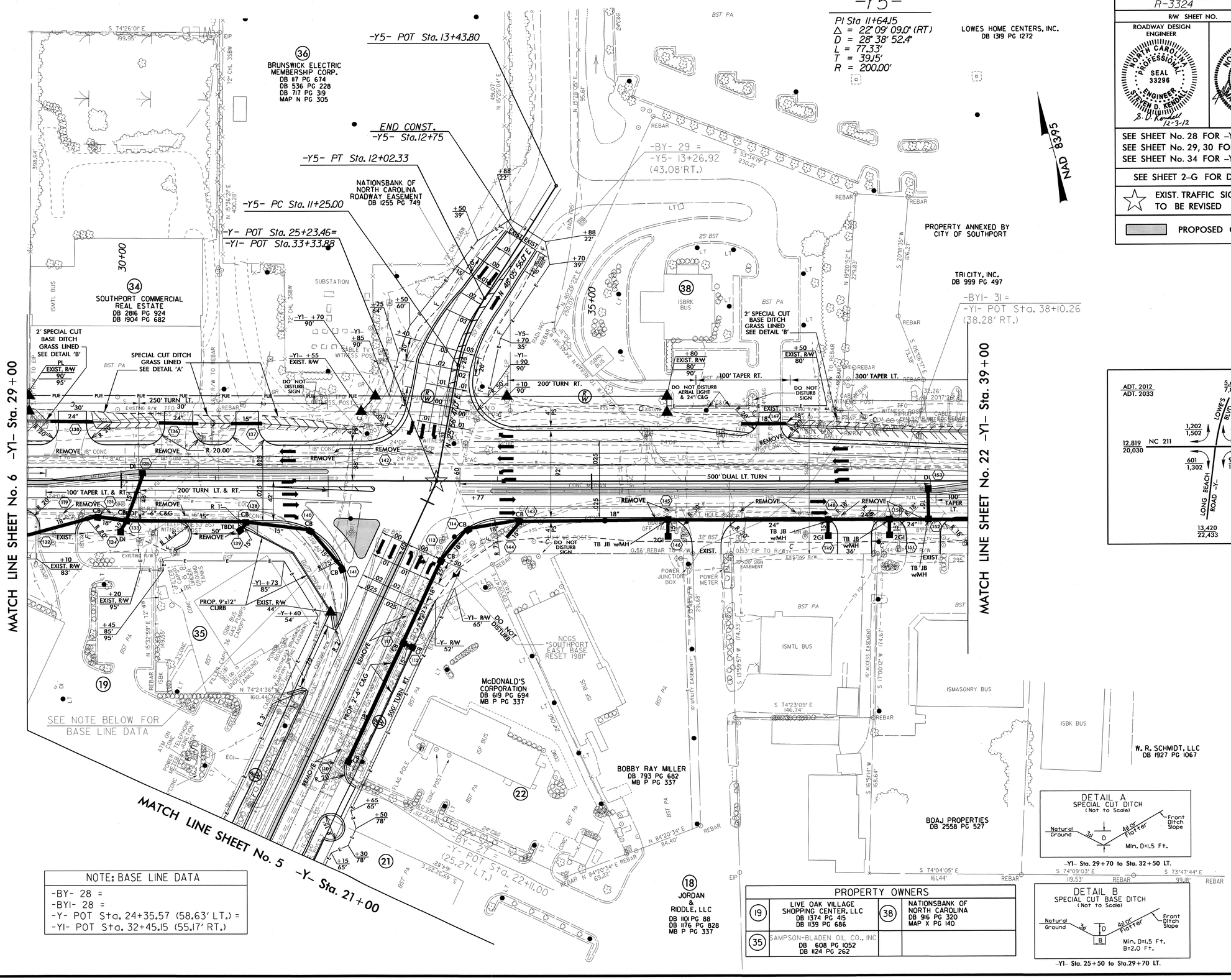
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN — 12/3/12

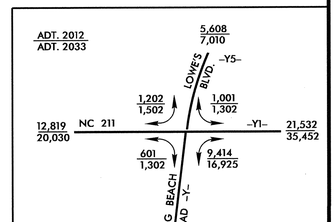
SEE SHEET No. 28 FOR -Y- PROFILE
SEE SHEET No. 29, 30 FOR -Y1- PROFILE
SEE SHEET No. 34 FOR -Y5- PROFILE

SEE SHEET 2-G FOR DITCH DETAILS

☆ EXIST. TRAFFIC SIGNAL TO BE REVISED

PROPOSED CONC. ISLAND





NOTE: BASE LINE DATA
-BY- 28 =
-BYI- 28 =
-Y- POT Sta. 24+35.57 (58.63' LT.) =
-Y1- POT Sta. 32+45.15 (55.17' RT.)

PROPERTY OWNERS			
19	LIVE OAK VILLAGE SHOPPING CENTER, LLC DB 1374 PG 415 DB 1139 PG 686	38	NATIONSBANK OF NORTH CAROLINA DB 916 PG 320 MAP X PG 140
35	SAMPSON-BLADEN OIL CO., INC DB 608 PG 1052 DB 1124 PG 262		

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 4:1 or Flatter — Front Ditch Slope
Min. D=1.5 Ft.
-Y1- Sta. 29+70 to Sta. 32+50 LT.

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — B — 4:1 or Flatter — Front Ditch Slope
Min. D=1.5 Ft.
B=2.0 Ft.
-Y1- Sta. 25+50 to Sta.29+70 LT.

8/17/99

26-NOV-2012 14:34
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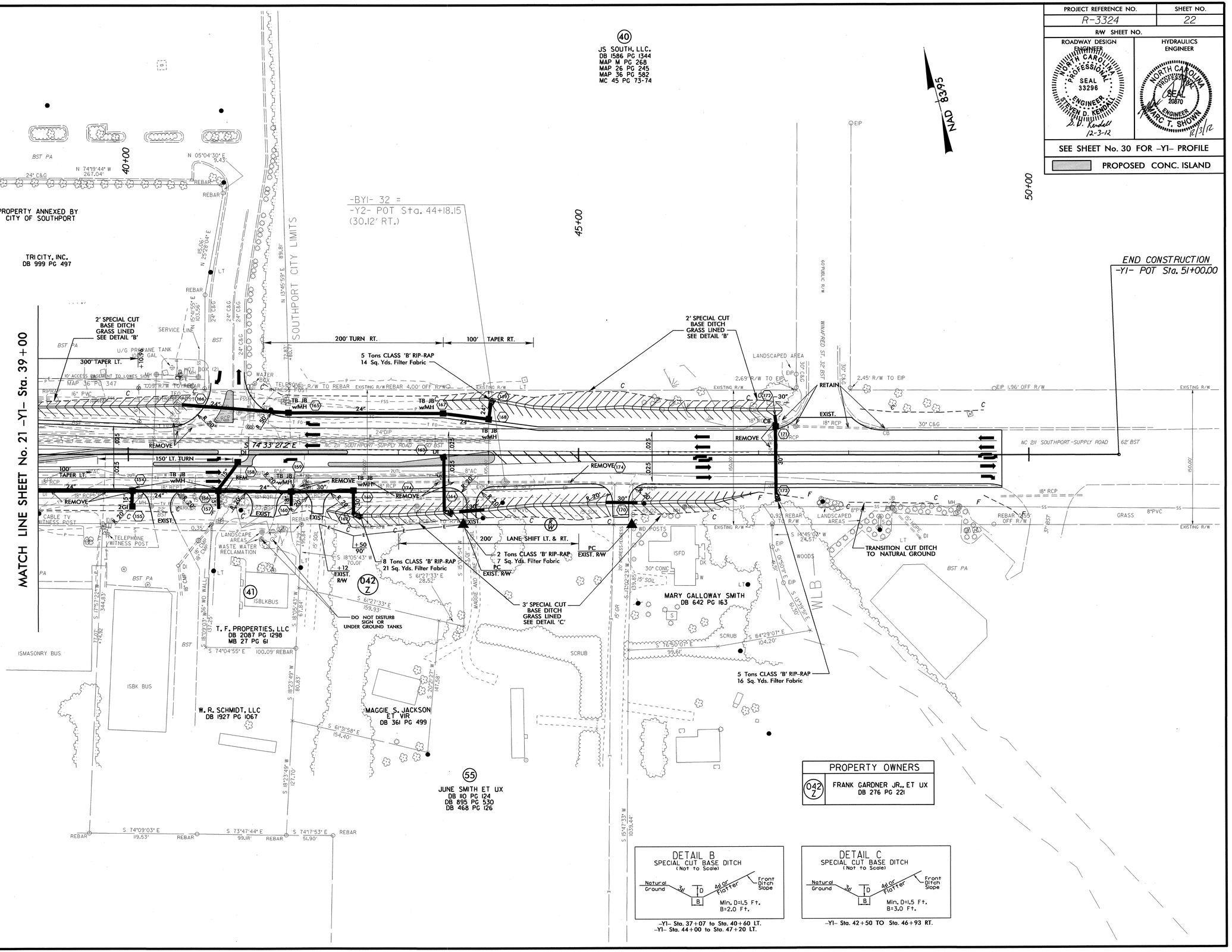
PROJECT REFERENCE NO.	SHEET NO.
R-3324	22
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
S. D. Kendall 12-3-12

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
10/3/12

SEE SHEET No. 30 FOR -Y1- PROFILE

PROPOSED CONC. ISLAND



PROPERTY OWNERS	
042 Z	FRANK GARDNER JR., ET UX DB 276 PG 221

-Y1- Sta. 37+07 to Sta. 40+60 LT.
-Y1- Sta. 44+00 to Sta. 47+20 LT.

-Y1- Sta. 42+50 TO Sta. 46+93 RT.

8/17/99

26-NOV-2012 14:24
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PROJECT REFERENCE NO.	SHEET NO.
R-3324	23

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER ELLEN D. KENDALL

12-3-12

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN

12/3/12

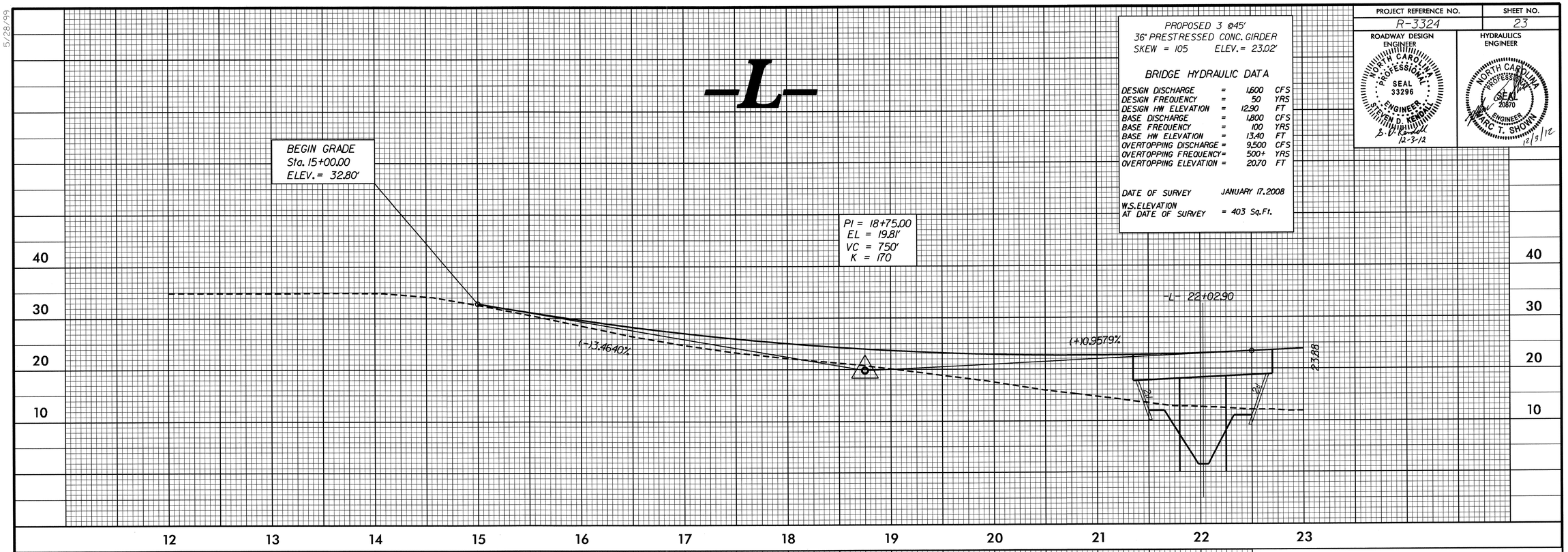
PROPOSED 3 @45'
36" PRESTRESSED CONC. GIRDER
SKEW = 105 ELEV. = 23.02'

BRIDGE HYDRAULIC DATA

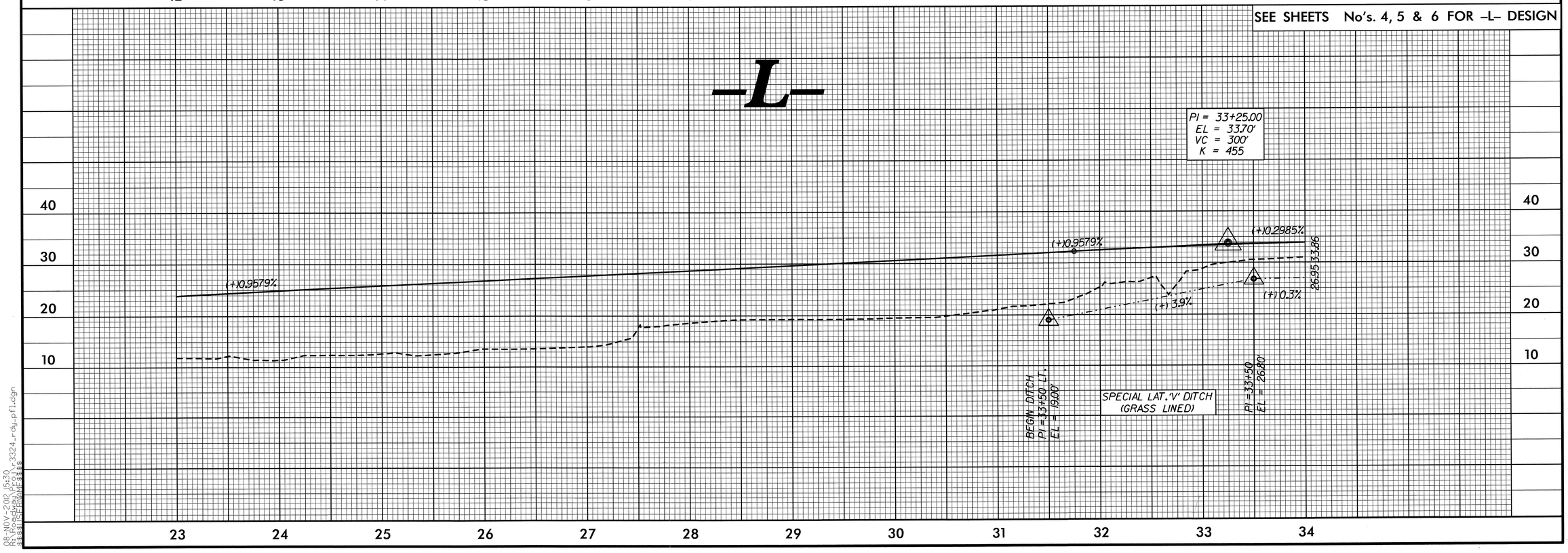
DESIGN DISCHARGE	=	1,600	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	12.90	FT
BASE DISCHARGE	=	1,800	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	13.40	FT
OVERTOPPING DISCHARGE	=	9,500	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	20.70	FT

DATE OF SURVEY JANUARY 17, 2008

W.S. ELEVATION AT DATE OF SURVEY = 403 Sq.Ft.



SEE SHEETS No's. 4, 5 & 6 FOR -L- DESIGN



5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	24

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL

D. D. Kendall 12-3-12

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN

12/3/12

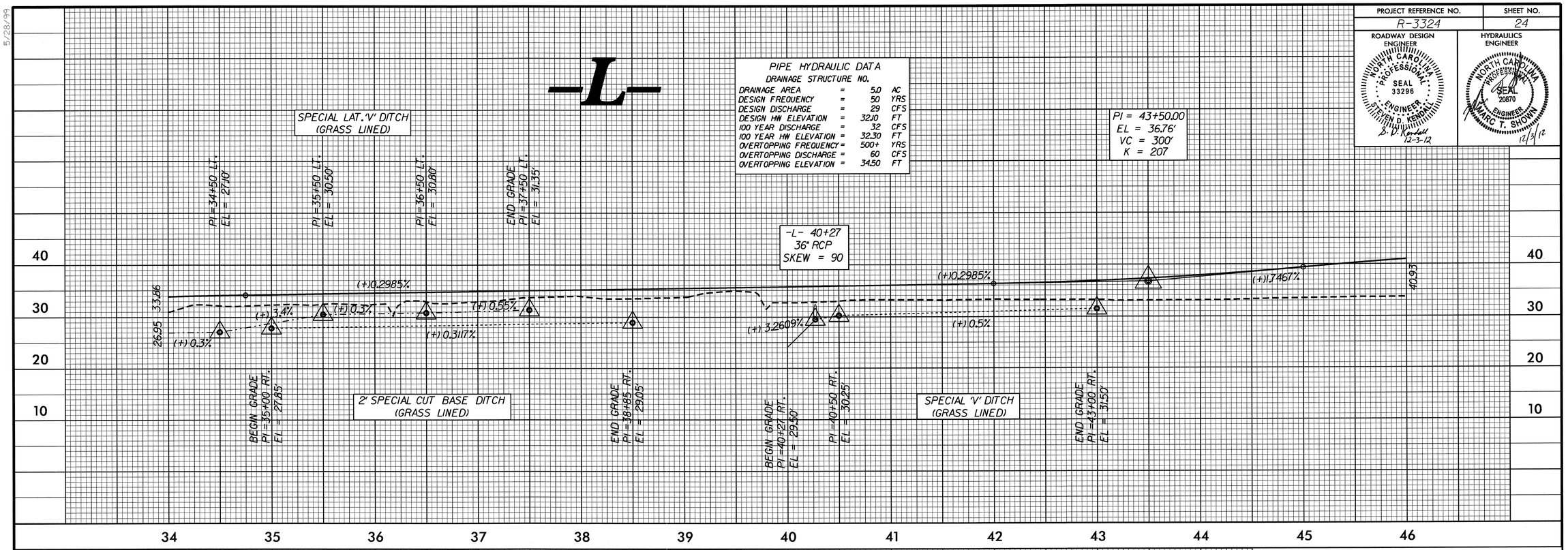
5/28/99

-L-

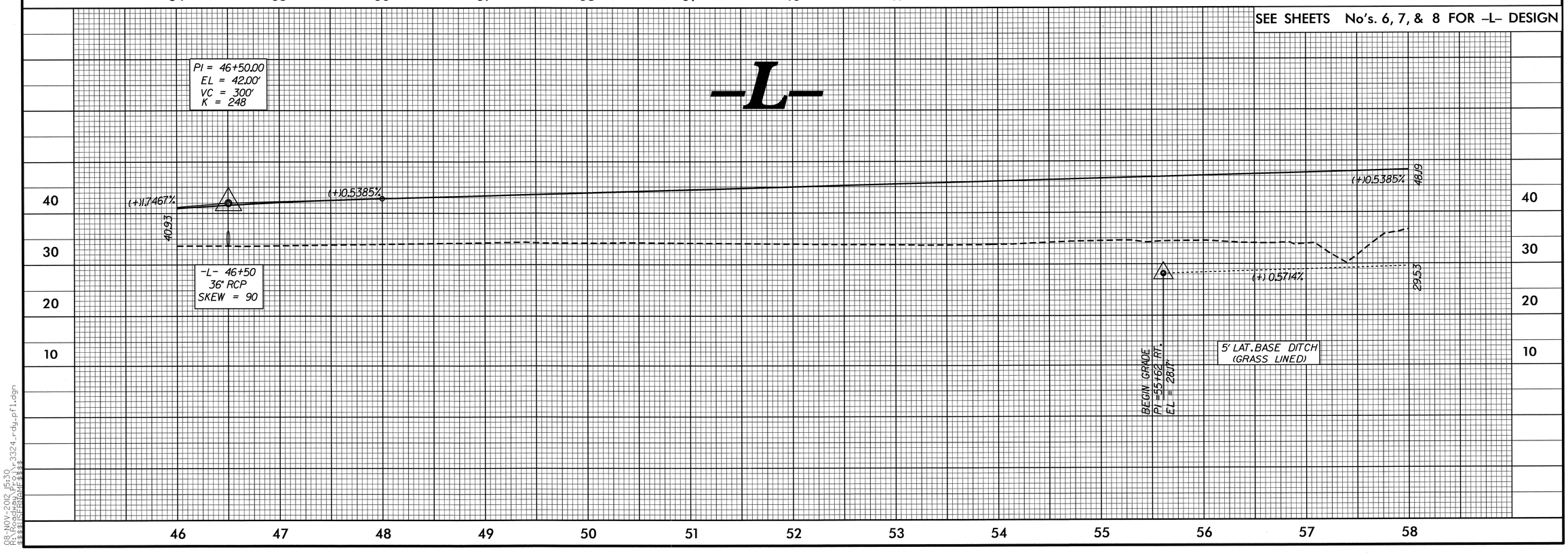
PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	5.0	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	29	CFS
DESIGN HW ELEVATION	=	32.10	FT
100 YEAR DISCHARGE	=	32	CFS
100 YEAR HW ELEVATION	=	32.30	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	60	CFS
OVERTOPPING ELEVATION	=	34.50	FT



SEE SHEETS No's. 6, 7, & 8 FOR -L- DESIGN



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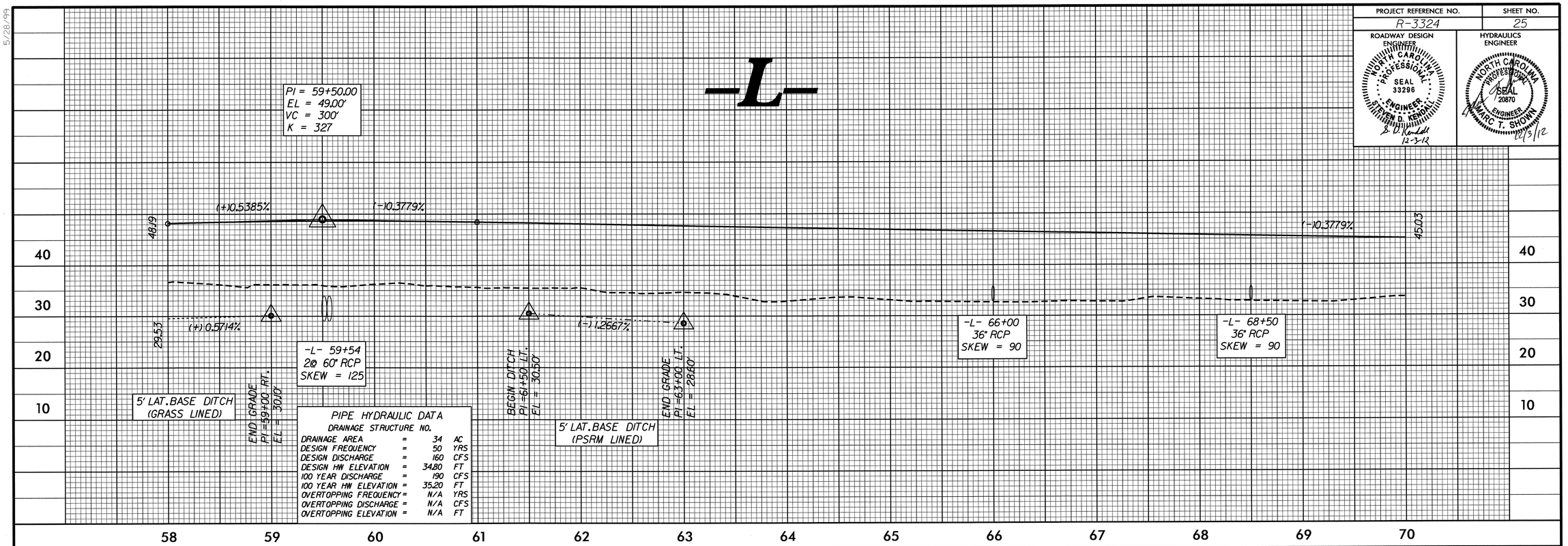
PROJECT REFERENCE NO.	SHEET NO.
R-3324	25

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEPHEN D. KENDALL
S. D. Kendall 12-3-12

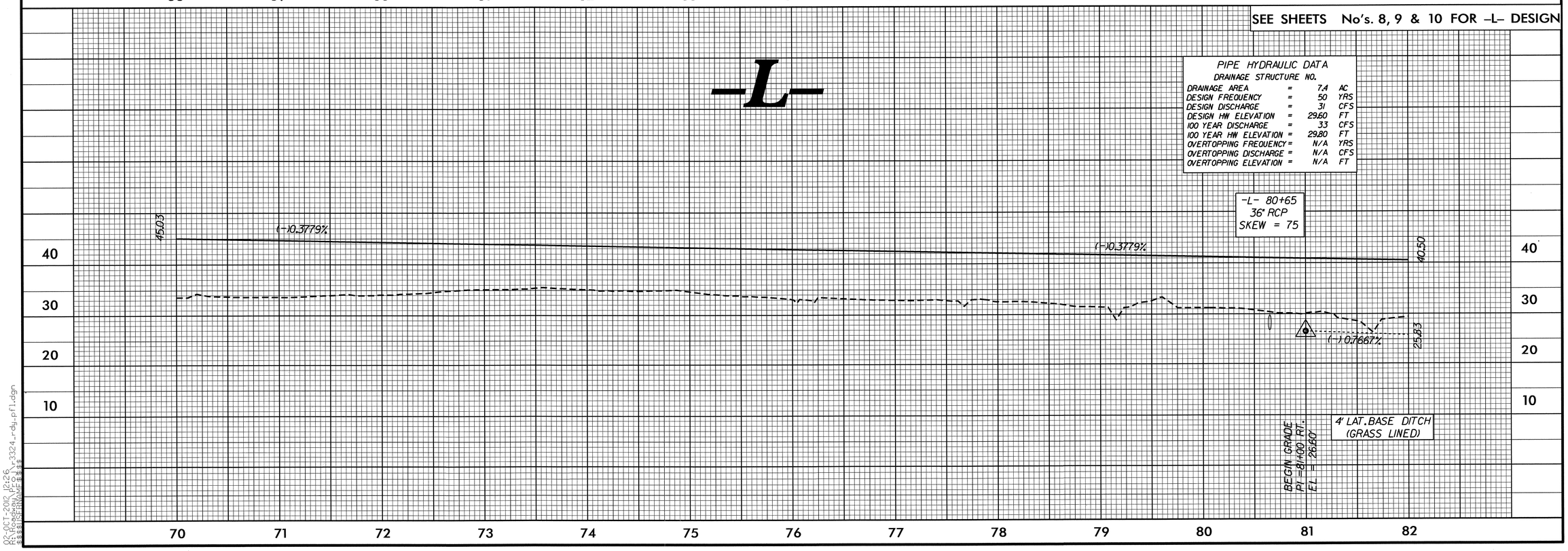
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	34	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	160	CFS
DESIGN HW ELEVATION	=	34.80	FT
100 YEAR DISCHARGE	=	190	CFS
100 YEAR HW ELEVATION	=	35.20	FT
OVERTOPPING FREQUENCY	=	N/A	YRS
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING ELEVATION	=	N/A	FT

SEE SHEETS No's. 8, 9 & 10 FOR -L- DESIGN



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	7.4	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	31	CFS
DESIGN HW ELEVATION	=	29.60	FT
100 YEAR DISCHARGE	=	33	CFS
100 YEAR HW ELEVATION	=	29.80	FT
OVERTOPPING FREQUENCY	=	N/A	YRS
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING ELEVATION	=	N/A	FT

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	26

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEPHEN D. KENDALL
12-3-12

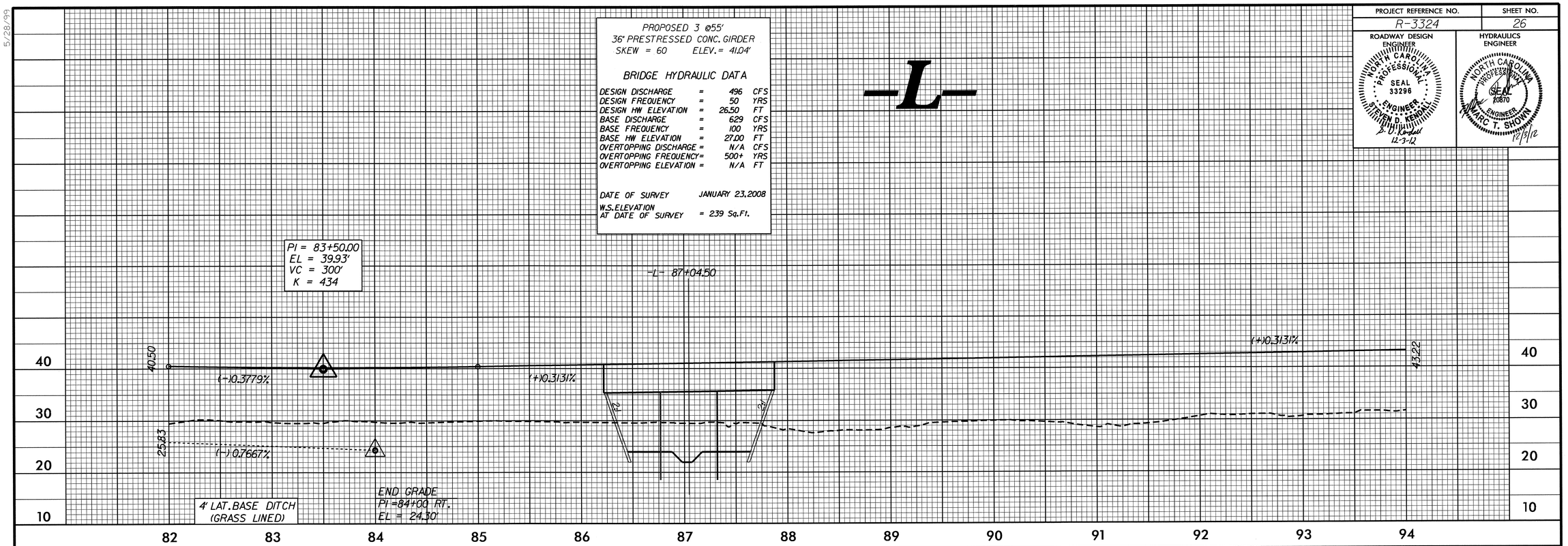
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

PROPOSED 3 @55'
36" PRESTRESSED CONC. GIRDER
SKEW = 60 ELEV. = 41.04'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	496	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	26.50	FT
BASE DISCHARGE	=	629	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	27.00	FT
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	N/A	FT

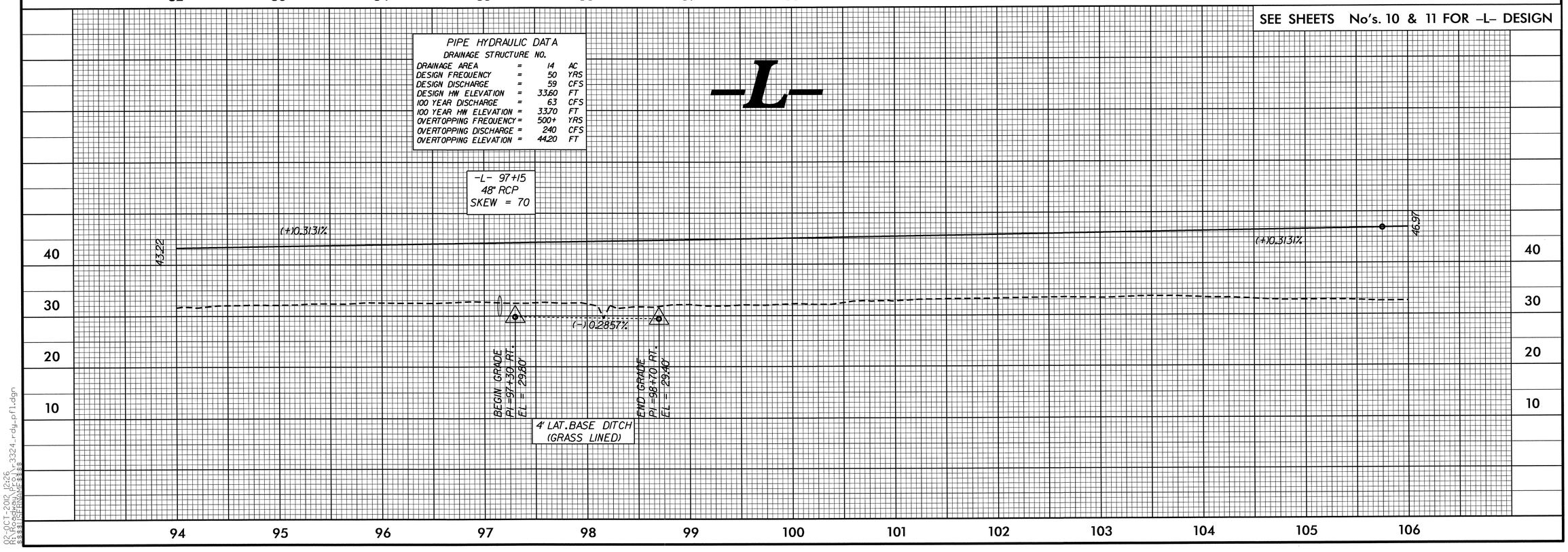
DATE OF SURVEY JANUARY 23, 2008
W.S. ELEVATION AT DATE OF SURVEY = 239 Sq.Ft.



SEE SHEETS No's. 10 & 11 FOR -L- DESIGN

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	14	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	59	CFS
DESIGN HW ELEVATION	=	33.60	FT
100 YEAR DISCHARGE	=	63	CFS
100 YEAR HW ELEVATION	=	33.70	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	240	CFS
OVERTOPPING ELEVATION	=	44.20	FT



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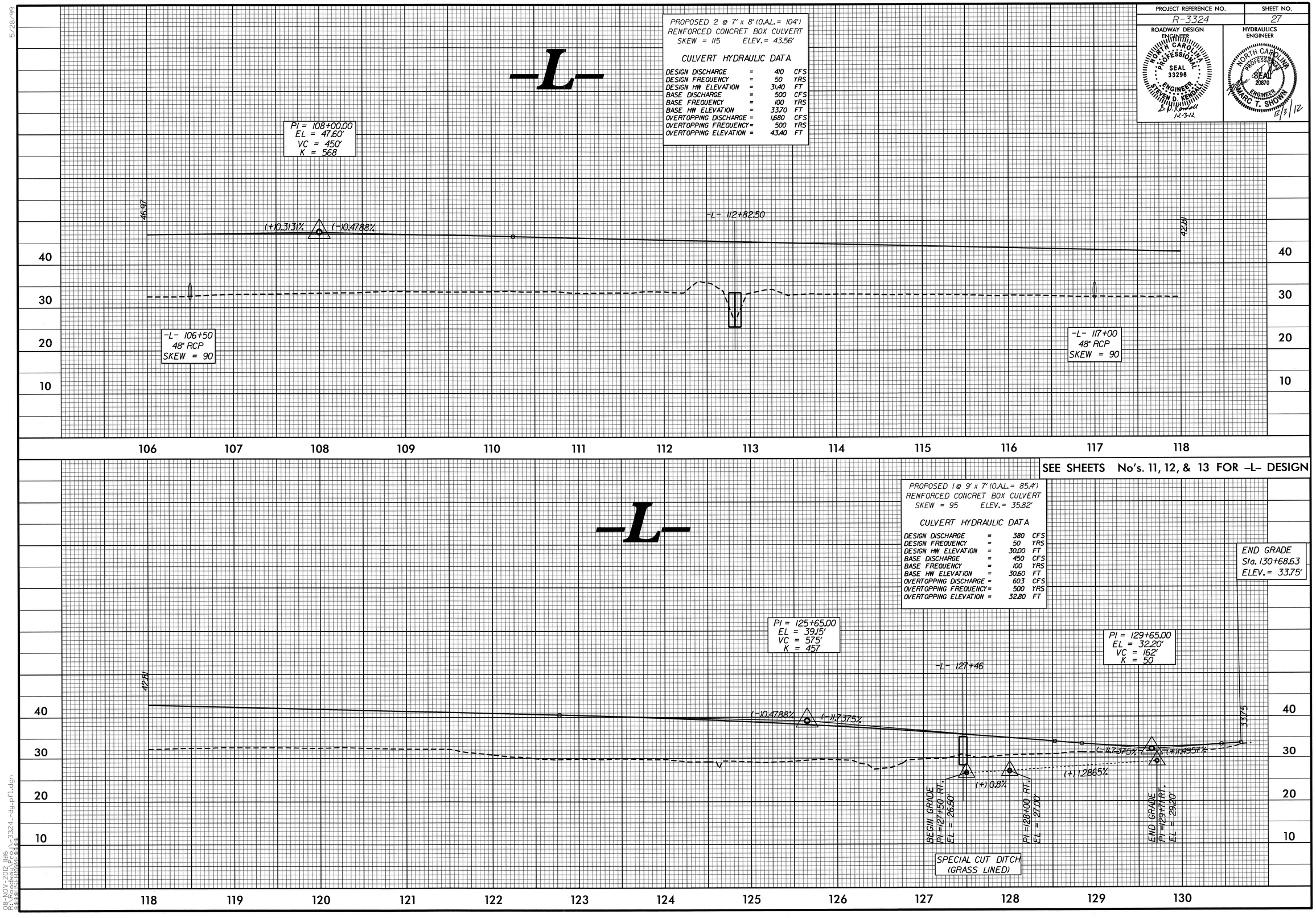
PROJECT REFERENCE NO.	SHEET NO.
R-3324	27

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
12-3-12

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12



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PROJECT REFERENCE NO.	SHEET NO.
R-3324	28

ROADWAY DESIGN ENGINEER

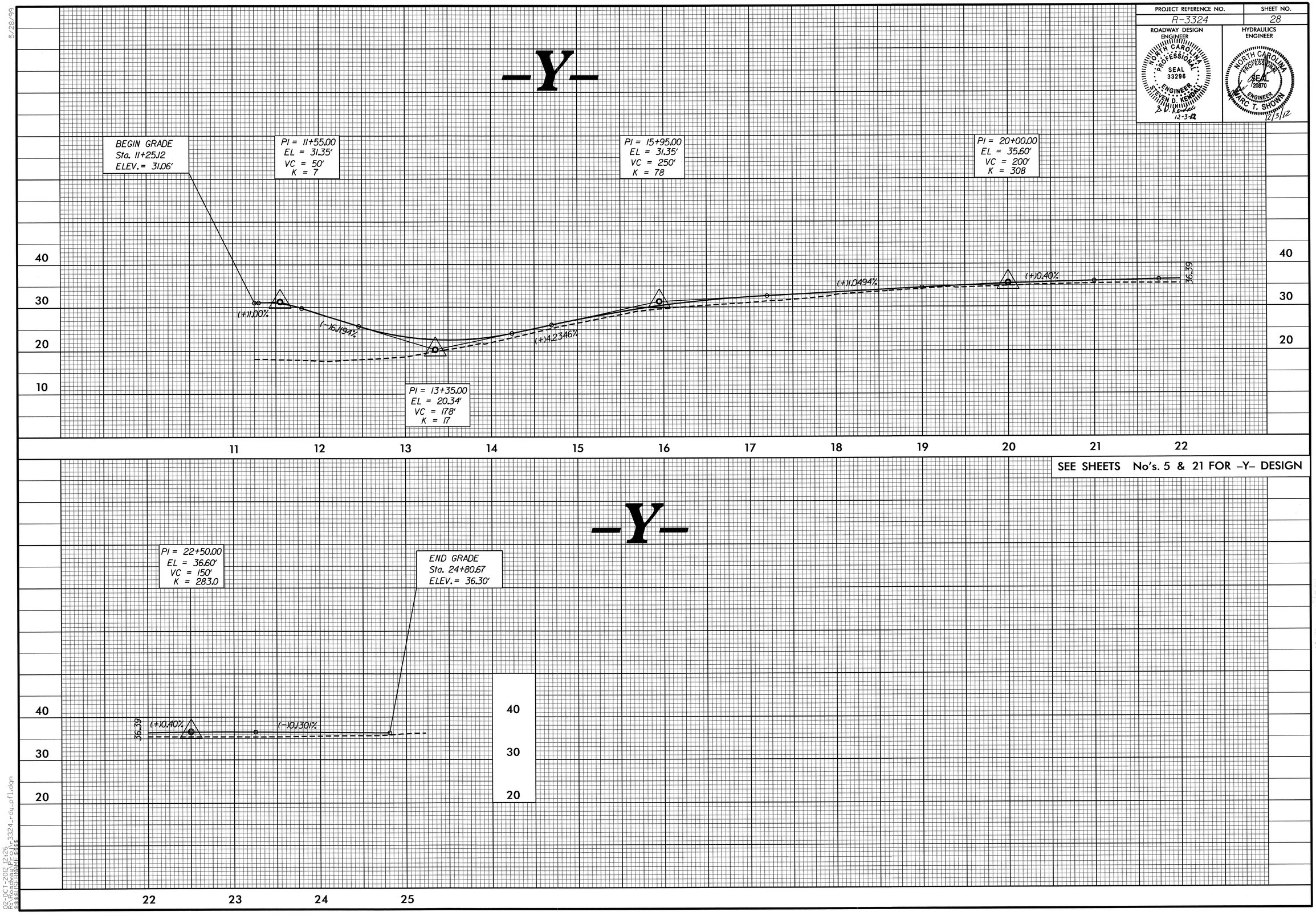
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KEMP

S. D. Kemp 12-3-12

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN

12/3/12



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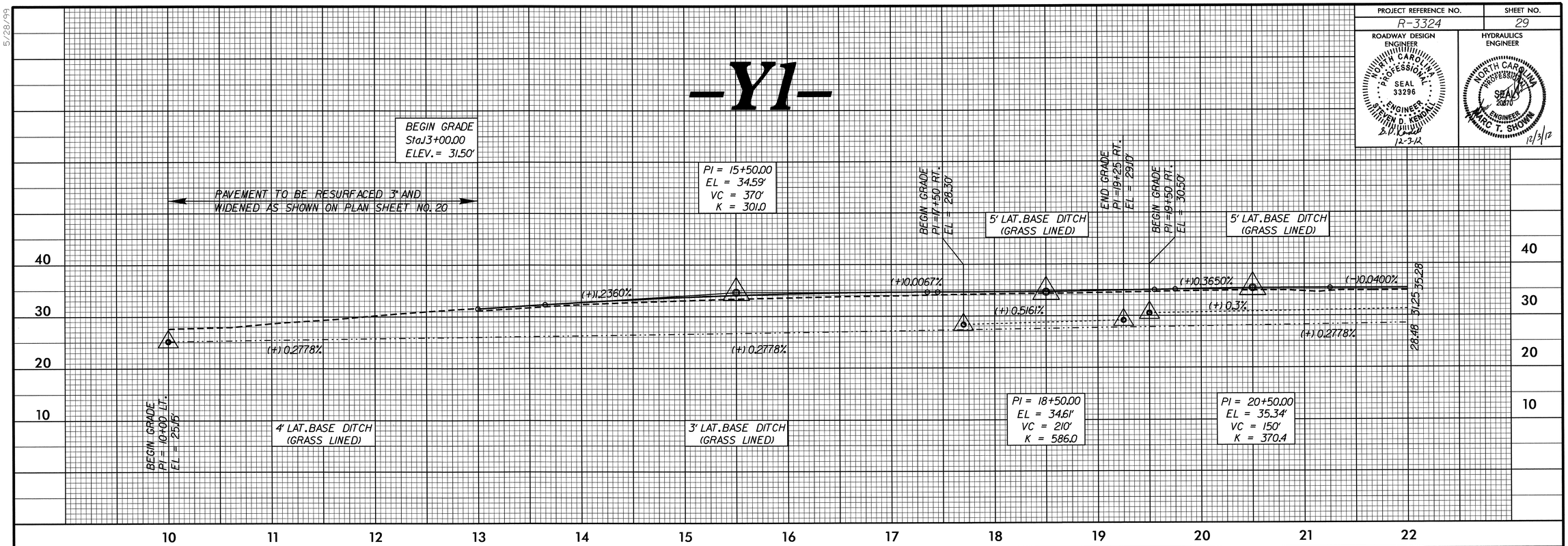
PROJECT REFERENCE NO.	SHEET NO.
R-3324	29

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL 12-3-12

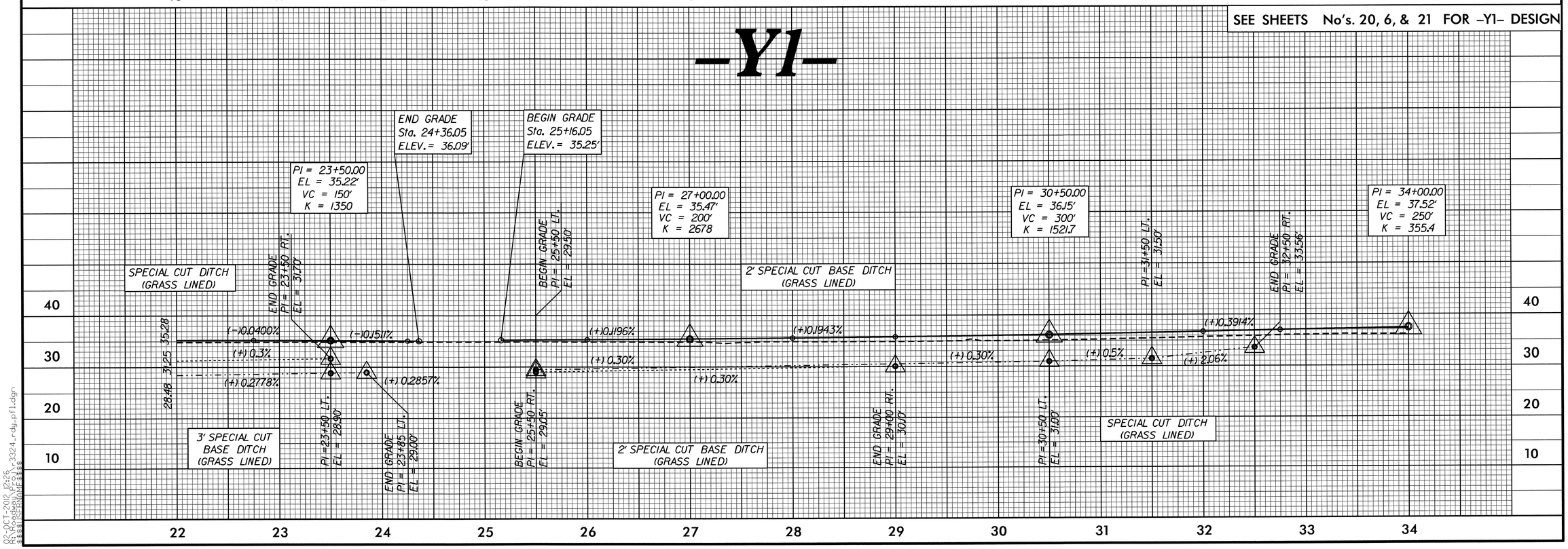
HYDRAULICS ENGINEER: NORTH CARLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN 12/3/12

-Y1-



SEE SHEETS No's. 20, 6, & 21 FOR -Y1- DESIGN

-Y1-



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PROJECT REFERENCE NO.	SHEET NO.
R-3324	30

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — 12-3-12

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN — 12/3/12

-Y1-

END GRADE
Sta.43+50.00
ELEV.= 30.06'

PAVEMENT TO BE RESURFACED 3" AND WIDENED AS SHOWN ON PLAN SHEET NO. 22 TO STA 50+00

PI = 34+00.00
EL = 37.52'
VC = 250'
K = 355.4

PI = 36+50.00
EL = 36.74'
VC = 250'
K = 421.1

PI = 40+00.00
EL = 33.57'
VC = 150'
K = 1544.1

(−)0.3120%
(−)0.9057%
(−)1.0029%
(−) 0.30%
(−) 0.3000%
(−)1.4833%
(−) 0.5350%

BEGIN GRADE
PI = 34+50 RT.
EL = 31.00'

SPECIAL CUT BASE DITCH
(GRASS LINED)

PI = 37+00 RT.
EL = 30.25'

END GRADE
PI = 40+00 RT.
EL = 29.35'

BEGIN GRADE
PI = 42+50 RT.
EL = 24.57'

BEGIN GRADE
PI = 46+50 LT.
EL = 24.05'

SPECIAL CUT DITCH
(GRASS LINED)

END GRADE
PI = 47+00 LT.
EL = 22.30'

SPECIAL CUT BASE DITCH
(GRASS LINED)

END GRADE
PI = 46+93 RT.
EL = 22.20'

SEE SHEETS No's. 21 & 22 FOR -Y1- DESIGN

34 35 36 37 38 39 40 41 42 43 44 45 46 47

SEE SHEETS No's. 14 & 13 FOR -Y2- DESIGN

-Y2-

BEGIN GRADE
Sta. 17+00.00
ELEV.= 32.33'

PI = 18+50.00
EL = 33.44'
VC = 150'
K = 120

PI = 20+00.00
EL = 32.67'
VC = 150'
K = 167

PI = 24+50.00
EL = 34.39'
VC = 200'
K = 328

PI = 27+00.00
EL = 33.82'
VC = 200'
K = 302

(+)0.74%
(+) 0.68%
(+) 0.30%
(−)0.5133%
(+)0.3822%
(−)0.2280%
(−) 0.6411%
(−) 0.60%
(−) 0.80%
(−) 0.60%
(+) 1.0%
(−) 0.6667%
(+) 0.60%
(+)0.4338%
(+) 0.80%
34.25

BEGIN GRADE
PI = 17+00 LT.
EL = 29.60'

END GRADE
PI = 19+50 LT.
EL = 30.02'

BEGIN GRADE
PI = 25+00 LT.
EL = 31.40'

SPECIAL CUT DITCH
(GRASS LINED)

END GRADE
PI = 26+70 LT.
EL = 30.30'

BEGIN GRADE
PI = 17+00 RT.
EL = 28.90'

SPECIAL CUT DITCH RT.
(GRASS LINED)

SPECIAL CUT DITCH LT.
(GRASS LINED)

END GRADE
PI = 20+00 RT.
EL = 29.80'

BEGIN GRADE
PI = 25+00 RT.
EL = 31.30'

PI = 25+50 RT.
EL = 31.00'

PI = 26+00 RT.
EL = 30.60'

PI = 26+50 RT.
EL = 30.30'

PI = 26+80 RT.
EL = 30.10'

PI = 27+00 RT.
EL = 30.30'

PI = 27+50 RT.
EL = 30.60'

PI = 28+00 RT.
EL = 31.00'

SPECIAL CUT DITCH
(GRASS LINED)

16 17 18 19 20 21 22 23 24 25 26 27 28

5/28/99

02-OCT-2012 12:26
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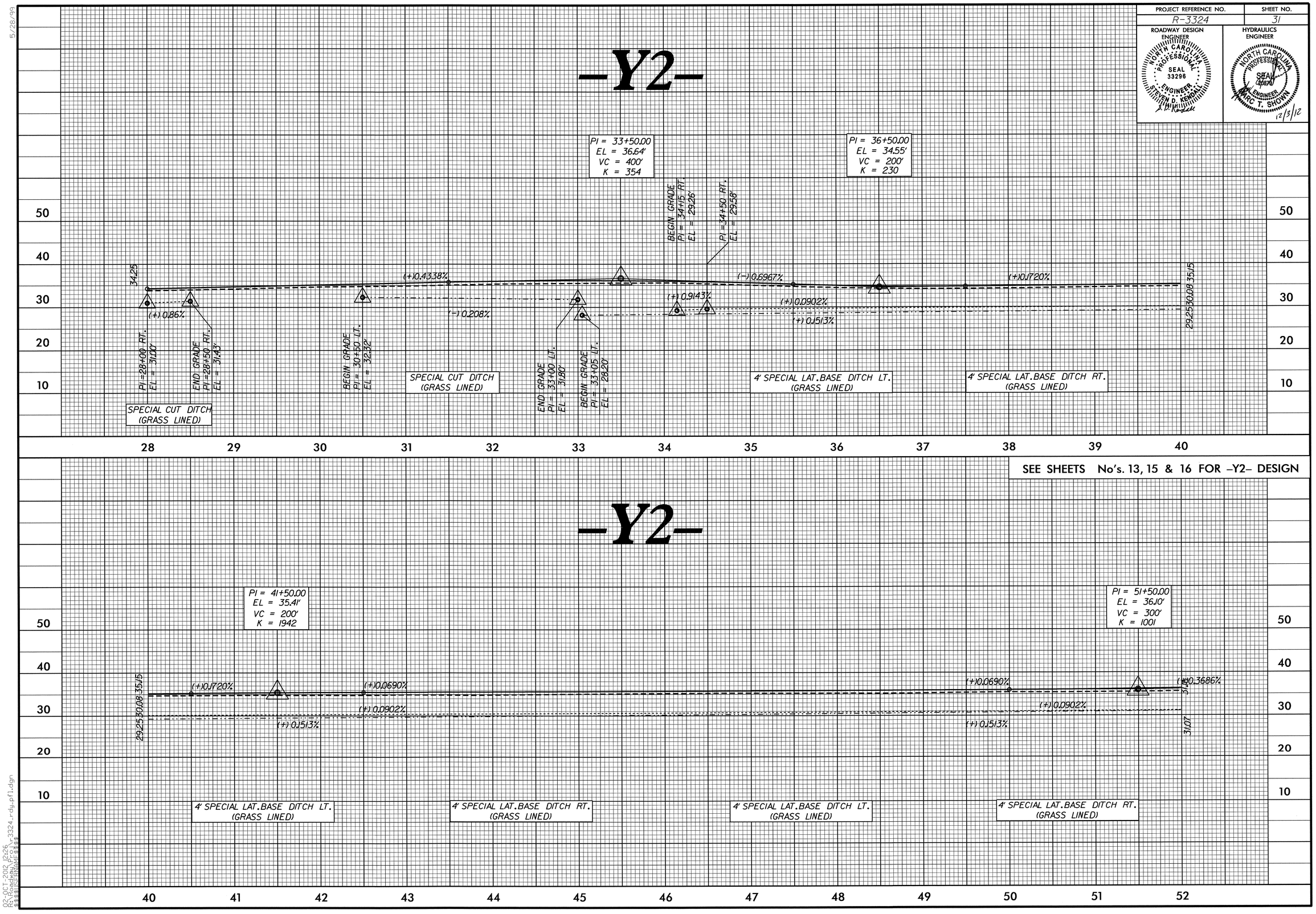
PROJECT REFERENCE NO.	SHEET NO.
R-3324	31

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
12/3/12

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12



SEE SHEETS No's. 13, 15 & 16 FOR -Y2- DESIGN

5/28/99

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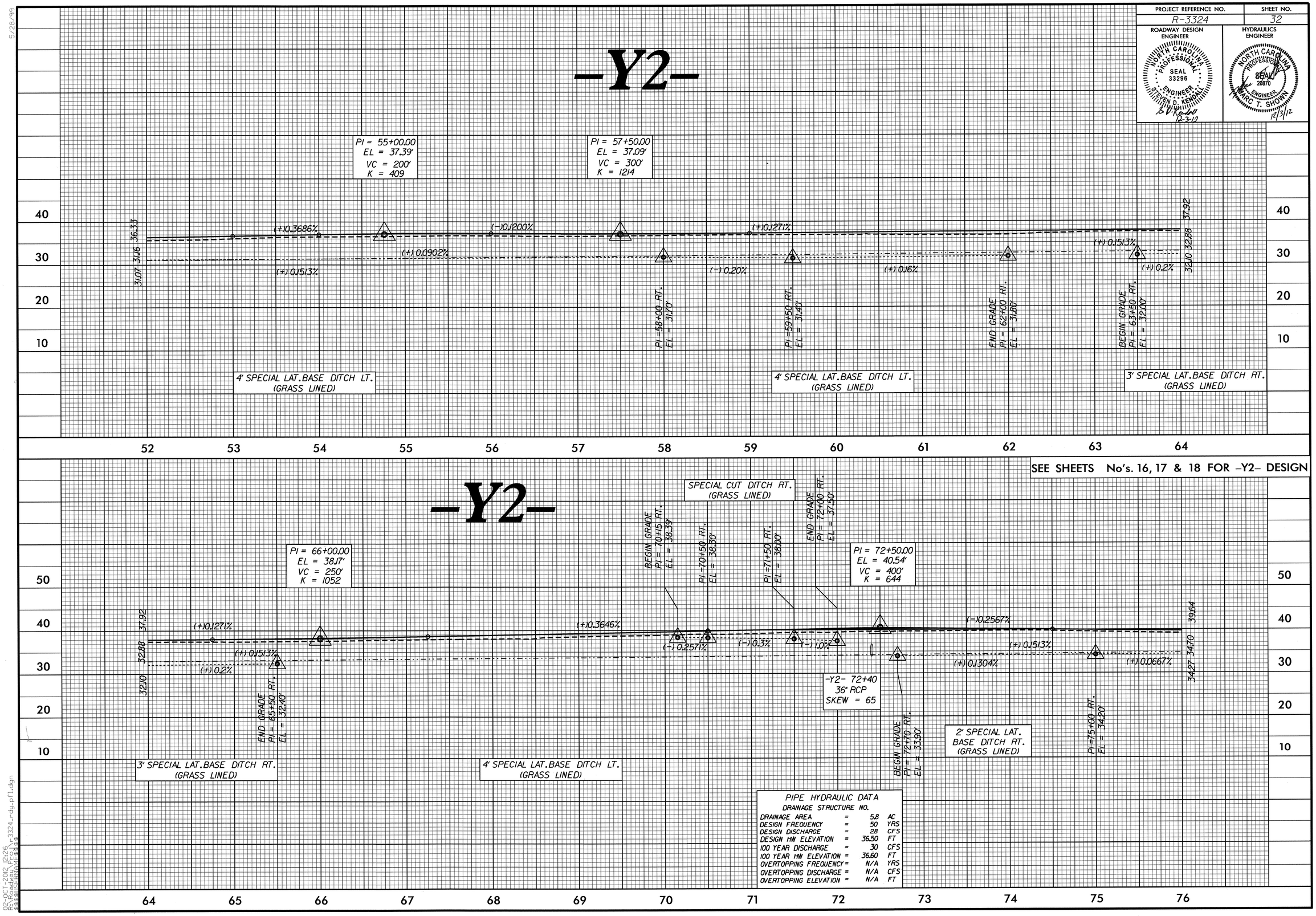
PROJECT REFERENCE NO.	SHEET NO.
R-3324	32

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL — B.D. Kendall 12-3-12

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN — 12/3/12



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PROJECT REFERENCE NO.	SHEET NO.
R-3324	33

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL

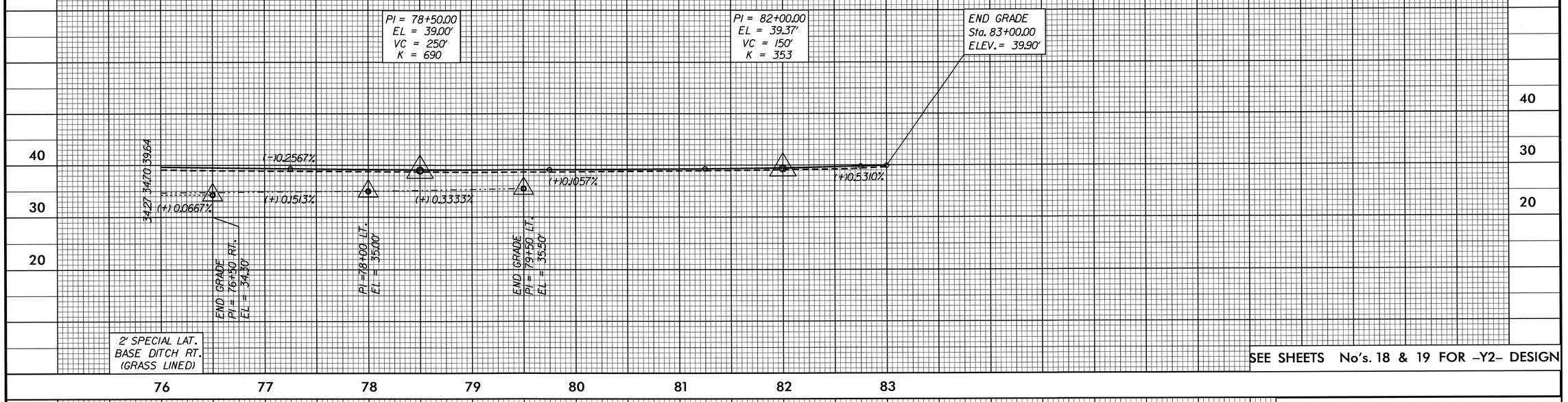
S. D. Kendall 12-3-12

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWIN

12/3/12

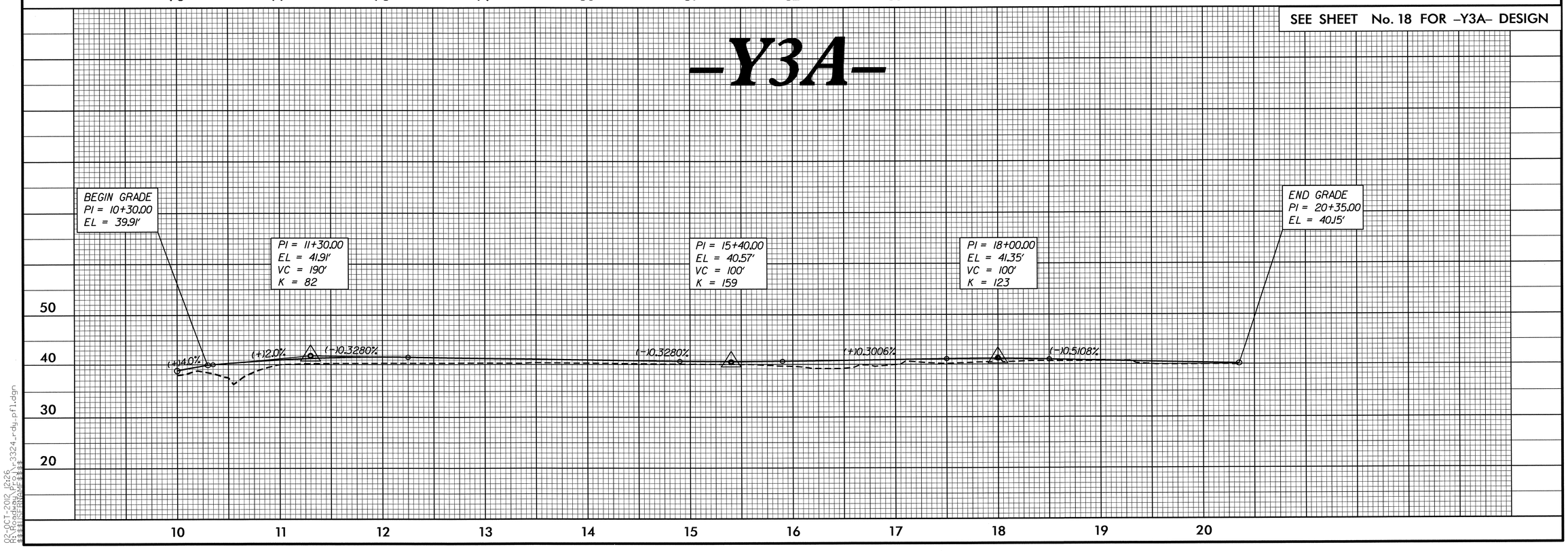
-Y2-



SEE SHEETS No's. 18 & 19 FOR -Y2- DESIGN

SEE SHEET No. 18 FOR -Y3A- DESIGN

-Y3A-



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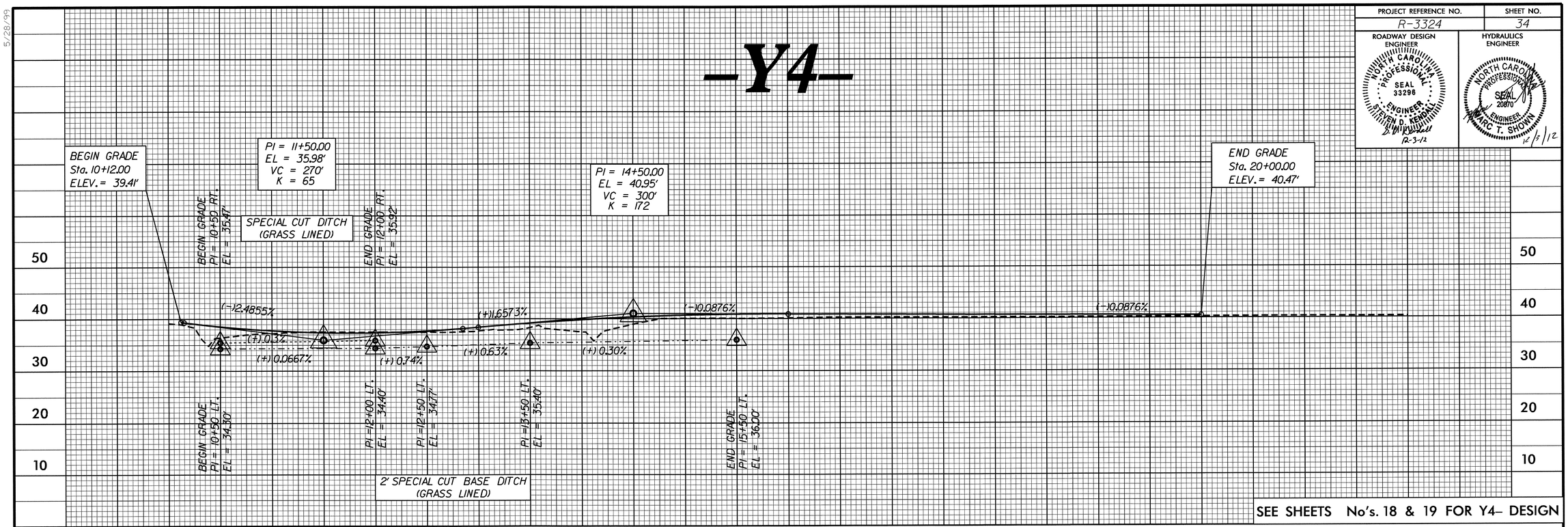
PROJECT REFERENCE NO.	SHEET NO.
R-3324	34

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL
12-3-12

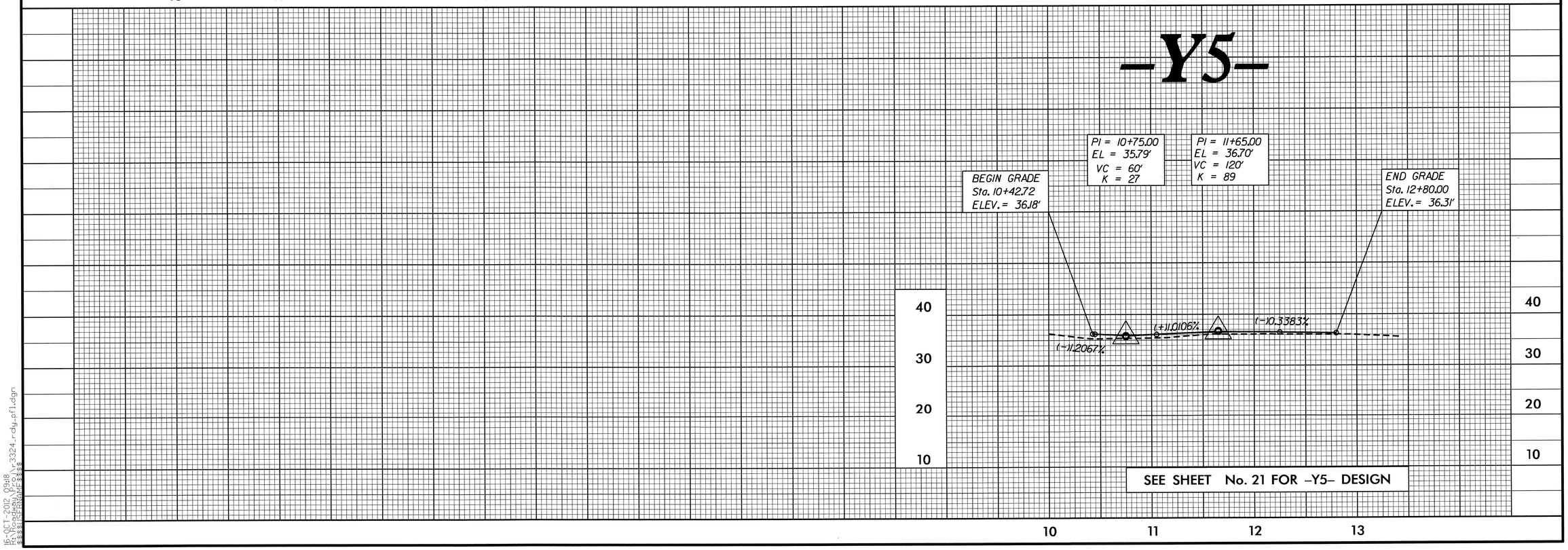
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
12/3/12

-Y4-



SEE SHEETS No's. 18 & 19 FOR Y4- DESIGN

-Y5-



SEE SHEET No. 21 FOR -Y5- DESIGN

5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
R-3324	35

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33296 ENGINEER STEVEN D. KENDALL

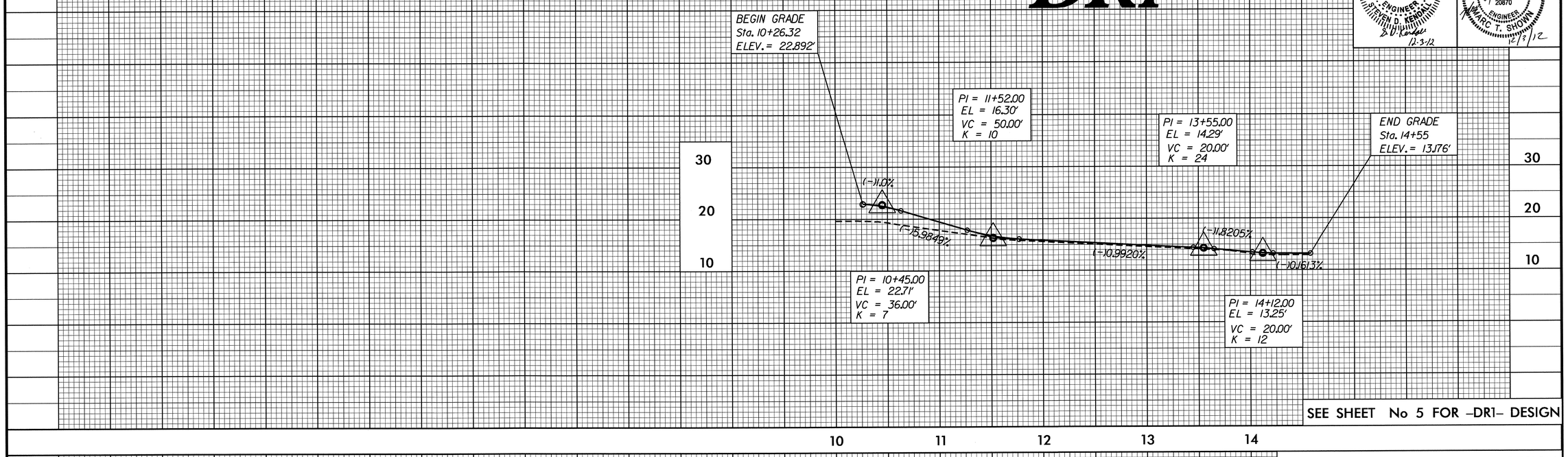
S.D. Kendall 12-3-12

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN

12/3/12

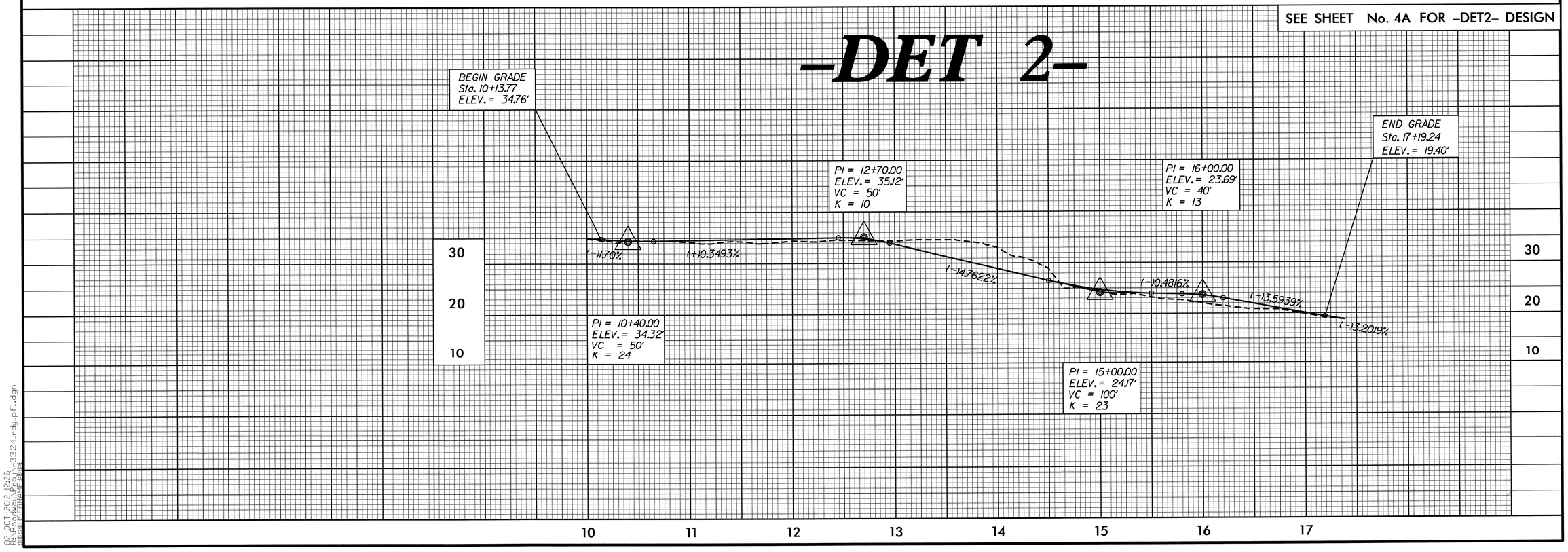
-DR1-



SEE SHEET No 5 FOR -DR1- DESIGN

SEE SHEET No. 4A FOR -DET2- DESIGN

-DET 2-



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