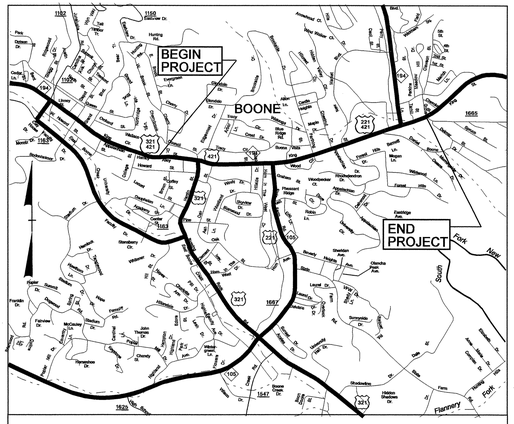
09/08/99

TIP PROJECT: U-4020

CONTRACT: C202084

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

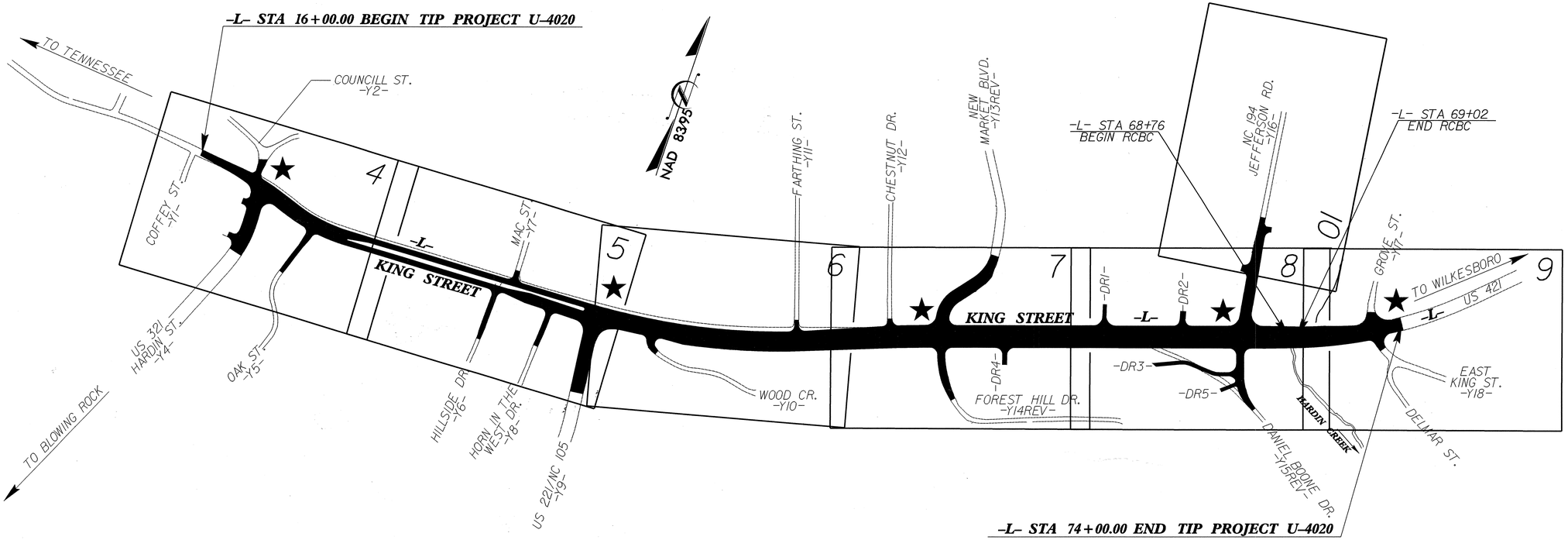
WATAUGA COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4020	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
35015.1.1	NHF-421(31)	PE
35015.2.1	NHF-421(31)	R/W & UTIL
35015.3.ST1	STM-0421(47)	CONSTRUCTION

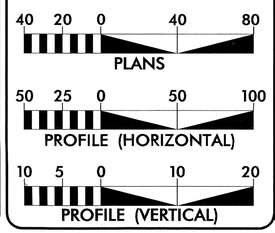
LOCATION: US 421 (KING STREET) FROM US 321 (HARDIN STREET) TO EAST OF NC 194 (JEFFERSON ROAD) IN BOONE

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT EXTENSION, RETAINING WALLS, SIGNING AND SIGNALS



★ ***SIGNALIZED INTERSECTION***

GRAPHIC SCALES



DESIGN DATA

ADT 2009 = 21,100 – 43,200
ADT 2030 = 29,300 – 67,800
DHV = 9 %
D = 55 %
T = 6 % *
V = 40 MPH
* TTST 2% DUAL 4%

FUNCTIONAL CLASSICATION
MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4020 = 1.098 MILES

TOTAL LENGTH OF TIP PROJECT U-4020 = 1.098 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 29, 2007

LETTING DATE:
JUNE 16, 2009

G.E. BREW, P.E.
PROJECT ENGINEER

I.T. YOUNIS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN L. MORGAN
SIGNATURE: 3-24-09 P.E.

ROADWAY DESIGN ENGINEER
4-3-09
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
P.E.
STATE HIGHWAY DESIGN ENGINEER

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-4020	1-A

ROADWAY DESIGN ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-E	SURVEY CONTROL SHEET
2 THRU 2-H	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-I	TRAFFIC VOLUME DIAGRAMS
2-J THRU 2-M	INTERSECTION AND CHANNELIZATION DETAILS
2-N	DETAIL OF ANCHORAGE FOR FRAMS - BRICK/CONCRETE/ PRECAST CONCRETE
2-O	DETAIL FOR TRAFFIC BEARING GRATED DROP INLET TYPE 'A'
2-P THRU 2-AA	TEMPORARY SHORING DETAILS
2-AB	DETAIL FOR TRANSITION FROM 2'-6" CURB AND GUTTER TO CONCRETE VALLEY GUTTER
3	SUMMARY OF QUANTITIES
3-A THRU 3-G	SUMMARY OF DRAINAGE QUANTITIES
3-H	SUMMARY OF GUARDRAIL QUANTITIES SUMMARY OF EARTHWORK, SUMMARY OF CHAIN LINK FENCE, ASPHALT PAVEMENT REMOVAL SUMMARY, AND EXISTING CONCRETE PAVEMENT REMOVAL SUMMARY
3-I	PARCEL INDEX
4 THRU 10	PLAN SHEET
11 THRU 18	PROFILE SHEET
TCP-1 THRU TCP-33	TRAFFIC CONTROL PLANS
PM-1 THRU PM-5	PAVEMENT MARKING PLANS
EC-1 THRU EC-18	EROSION CONTROL PLANS
L-1 THRU L-7	LANDSCAPING PLANS
SIGN-1 THRU SIGN-17	SIGNING PLANS
SIG-1 THRU SIG-64	SIGNAL PLANS
UC-1 THRU UC-14 UC-1A THRU UC10A	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-8	UTILITIES BY OTHERS PLANS
C-1 THRU C-11	CULVERT PLANS
W-1 THRU W-19	RETAINING WALL PLANS
X-1A THRU X-1B	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-54	CROSS-SECTIONS

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

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

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

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

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

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

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

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

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

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

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE NEW RIVER LIGHT & POWER, AT & T OF NC, FRONTIER ENERGY (GAS), BLUE RIDGE EMC, CHARTER COMMUNICATIONS CATV, TOWN OF BOONE, AND APPLACHAIN STATE UNIVERSITY
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

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

WHEELCHAIR RAMPS:
WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. NO. 848.06

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

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
300.01	Method of Pipe Installation - Method 'A'
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method 1
654.01	Pavement Repairs
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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3/15/06

PROJECT REFERENCE NO.	SHEET NO.
U-4020	1-B

Note: Not to Scale

S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — 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 Marker — RW
- 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 Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — 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

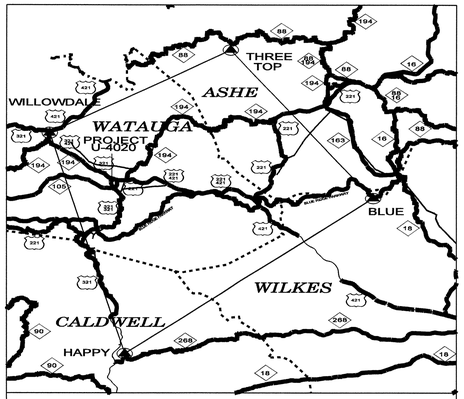
MISCELLANEOUS:

- 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
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

6/2/98

PROJECT REFERENCE NO.	SHEET NO.
U-4020	1-C
Location and Surveys	

SURVEY CONTROL SHEET U-4020



NC DOT GPS STATION U4020-1
LOCALIZED PROJECT COORDINATES
N = 908436.2190
E = 1210342.9270

BEGIN TIP PROJECT U-4020
-L- STA 16+00.00
N = 908,364.3337
E = 1,210,710.1820

NC DOT GPS STATION U4020-2
LOCALIZED PROJECT COORDINATES
N = 908308.1690
E = 1210982.3110

NC DOT GPS STATION U4020-3
LOCALIZED PROJECT COORDINATES
N = 908218.1620
E = 1212795.6690

NC DOT GPS STATION U4020-4
LOCALIZED PROJECT COORDINATES
N = 908614.3790
E = 1214181.7710

NC DOT GPS STATION U4020-5
LOCALIZED PROJECT COORDINATES
N = 909541.6460
E = 1216537.1440

END TIP PROJECT U-4020
-L- STA 74+00.00
N = 909402.7468
E = 1216289.4386

NC DOT GPS STATION U4020-6
LOCALIZED PROJECT COORDINATES
N = 910242.3210
E = 1217200.5910

NAD 83/95

NC 194/US 421/US 321 WEST KING ST.
COUNCILL ST. -Y2-
COFFEY ST. -Y1-
US 321 HARDIN ST. -Y4-
OAK ST. -Y5-
MAC ST. -Y7-
HILLSIDE DR. -Y6-
HORN IN THE WEST DR. -Y8-
US 221/NC 194 -Y9-
WOOD CR. -Y10-
FARTHING ST. -Y11-
CHESTNUT DR. -Y12-
NEW MARKET BLVD. -Y13REV-
FOREST HILL DR. -Y14REV-
DANIEL BOONE -Y15REV- DR.
HARDIN CREEK
NC 194 JEFFERSON RD. -Y16-
GROVE ST. -Y17-
US 421
DELMAR ST.
EAST KING ST. -Y18-
-L-

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS U4020-2"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 908308.1690(ft) EASTING: 1210982.3110(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986585
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS U4020-2" TO -L- STATION 16+00.00 IS N 78°20'18.47" W 227.8645'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

GPS MONUMENT "U4020-2" HAS BEEN DISTURBED.

COORDINATES ON THE DATUM DESCRIPTION ARE CORRECT.

COORDINATES ON U4020_LS_1D_070803.DGN AND U4020_LS_GPSCALIB_070803.HTML ARE INCORRECT.

COORDINATES ON THESE TWO ITEMS ARE BASED ON THE ORIGINAL LOCALIZATION AND SHOULD NOT BE USED.

WHEN USING COORDINATES FOR "U4020-2" THE DATUM DESCRIPTION COORDINATES SHOULD BE USED.

NOTE: DRAWING NOT TO SCALE

NOTES:

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

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

THE FILES TO BE FOUND ARE AS FOLLOWS:
U4020_LS_GPSCALIB_070803.HTML
U4020_LS_WGS84_070803.TXT
U4020_LS_LOCAL_070803.TXT
U4020_LS_CONTROL_070803.TXT

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

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

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4020	1-D
Location and Surveys	

SURVEY CONTROL SHEET U-4020

GPS CALIBRATION REPORT

PROJECT : U4020ADD

TIP NUMBER	U-4020		
USER NAME	RGMILLER	DATE & TIME	10:04:28 AM 3/24/2004
COORDINATE SYSTEM	US STATE PLANE 1983	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983 (CONUS)		
VERTICAL DATUM		GEOID MODEL	GEOID99 NC SUB GRID
COORDINATE UNITS	US SURVEY FEET		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	US SURVEY FEET		

LOCAL SITE INFORMATION
LOCALIZED AROUND

LATITUDE	N/A
LONGITUDE	N/A
SITE SCALE FACTOR	N/A
HEIGHT	N/A

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	911680.371SFT
EASTING COORDINATE OF ROTATION CENTER	1225213.033SFT
ROTATION ABOUT THE CENTER POINT	0°00'00"
TRANSLATION NORTH	0.458SFT
TRANSLATION EAST	1.908SFT
SCALE FACTOR	1.00013420

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	908436.220SFT
EASTING COORDINATE OF ORIGIN POINT	1210342.929SFT
VERTICAL SEPARATION AT ORIGIN	-0.150SFT
SLOPE NORTH	0.878PPM
SLOPE EAST	5.850PPM

GEOID MODEL DEFINITION

GEOID99 NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.009SFT	0.002	BLUE - WGS84
VERTICAL	0.297SFT	0.058	WILLOWDALE - WGS
THREE-DIMENSIONAL	0.297SFT	0.058	WILLOWDALE - WGS

POINT RESIDUALS

WGS84 COORDINATES		CALCULATED POINT FOR DISPLAY ONLY		LOCAL COORDINATES	
POINT	U4020-1 - WGS84	NORTHING	908436.220SFT	POINT	U4020-1 - LOCAL
LATITUDE	36°13'00.14318"N	EASTING	1210342.929SFT	NORTHING	908436.219SFT
LONGITUDE	81°40'37.50215"W	ELEVATION	3211.710SFT	EASTING	1210342.927SFT
HEIGHT	3109.574SFT	HORZ ERROR	0.002SFT	ELEVATION	3211.520SFT
		VERT ERROR	0.190SFT	UTILIZED	HORZ AND VERT CONTROL
		3D ERROR	0.190SFT	QUALITY	QUALITY
POINT	U4020-2 - WGS84	NORTHING	908308.283SFT	POINT	U4020-2 - LOCAL
LATITUDE	36°12'59.04905"N	EASTING	1210982.153SFT	NORTHING	908308.279SFT
LONGITUDE	81°40'29.66339"W	ELEVATION	3204.515SFT	EASTING	1210982.152SFT
HEIGHT	3102.356SFT	HORZ ERROR	0.005SFT	ELEVATION	3204.328SFT
		VERT ERROR	0.187SFT	UTILIZED	HORZ AND VERT CONTROL
		3D ERROR	0.187SFT	QUALITY	QUALITY
POINT	U4020-3 - WGS84	NORTHING	908218.160SFT	POINT	U4020-3 - LOCAL
LATITUDE	36°12'58.64084"N	EASTING	1212795.671SFT	NORTHING	908218.162SFT
LONGITUDE	81°40'07.51418"W	ELEVATION	3259.192SFT	EASTING	1212795.669SFT
HEIGHT	3156.975SFT	HORZ ERROR	0.003SFT	ELEVATION	3259.026SFT
		VERT ERROR	0.166SFT	UTILIZED	HORZ AND VERT CONTROL
		3D ERROR	0.166SFT	QUALITY	QUALITY
POINT	U4020-4 - WGS84	NORTHING	908614.378SFT	POINT	U4020-4 - LOCAL
LATITUDE	36°13'02.92500"N	EASTING	1214181.773SFT	NORTHING	908614.379SFT
LONGITUDE	81°39'50.73749"W	ELEVATION	3180.928SFT	EASTING	1214181.771SFT
HEIGHT	3078.678SFT	HORZ ERROR	0.002SFT	ELEVATION	3180.785SFT
		VERT ERROR	0.143SFT	UTILIZED	HORZ AND VERT CONTROL
		3D ERROR	0.143SFT	QUALITY	QUALITY
POINT	HAPPY - WGS84	NORTHING	826747.799SFT	POINT	HAPPY - LOCAL
LATITUDE	35°59'41.21489"N	EASTING	1242955.940SFT	NORTHING	826747.796SFT
LONGITUDE	81°33'34.00960"W	ELEVATION	1230.187SFT	EASTING	1242955.938SFT
HEIGHT	1124.273SFT	HORZ ERROR	0.004SFT	ELEVATION	1230.405SFT
		VERT ERROR	0.218SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.218SFT	QUALITY	SURVEY QUALITY
POINT	THREE TOP - WGS8	NORTHING	982320.275SFT	POINT	THREE TOP - LOCA
LATITUDE	36°25'15.16759"N	EASTING	1228574.838SFT	NORTHING	982320.271SFT
LONGITUDE	81°37'18.92978"W	ELEVATION	2882.394SFT	EASTING	1228574.844SFT
HEIGHT	2780.959SFT	HORZ ERROR	0.008SFT	ELEVATION	2882.580SFT
		VERT ERROR	0.186SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.187SFT	QUALITY	SURVEY QUALITY
POINT	WILLOWDALE - WGS	NORTHING	922986.328SFT	POINT	WILLOWDALE - LOC
LATITUDE	36°15'16.54369"N	EASTING	1183047.037SFT	NORTHING	922986.328SFT
LONGITUDE	81°46'15.37959"W	ELEVATION	2738.953SFT	EASTING	1183047.040SFT
HEIGHT	2637.452SFT	HORZ ERROR	0.003SFT	ELEVATION	2739.250SFT
		VERT ERROR	0.297SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.297SFT	QUALITY	SURVEY QUALITY
POINT	BLUE - WGS84	NORTHING	927815.182SFT	POINT	BLUE - LOCAL
LATITUDE	36°16'33.96228"N	EASTING	1298839.193SFT	NORTHING	927815.191SFT
LONGITUDE	81°22'43.68430"W	ELEVATION	3470.379SFT	EASTING	1298839.192SFT
HEIGHT	3364.977SFT	HORZ ERROR	0.009SFT	ELEVATION	3470.364SFT
		VERT ERROR	0.015SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.018SFT	QUALITY	SURVEY QUALITY

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS U4020-2"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 908308.1690(ft) EASTING: 1210982.3110(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986585
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS U4020-2" TO -L- STATION 16+00.00 IS
N 78°20'18.47" W 227.8645'
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 WORKWITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.*

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

THE FILES TO BE FOUND ARE AS FOLLOWS:
U4020_LS_GPSCALIB_070803.HTML
U4020_LS_WGS84_070803.TXT
U4020_LS_LOCAL_070803.TXT
U4020_LS_CONTROL_070803.TXT

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

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

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PROJECT REFERENCE NO.	SHEET NO.
U-4020	I-E
Location and Surveys	

SURVEY CONTROL SHEET U-4020

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL7	(BL-7)	908372.3395	1210071.1221	3226.41	OUTSIDE PROJECT LIMITS	
U4020	(GPS U4020-1)	908436.2190	1210342.9270	3211.55	12+32.37	38.25 LT
BL8	(BL-8)	908340.7913	1210736.4946	3196.61	16+28.62	20.68 RT
BL9	(BL-9)	908307.3846	1211002.0316	3205.22	18+99.35	15.64 RT
BL10	(BL-10)	908213.4501	1211403.3928	3227.59	23+12.86	5.70 LT
BL11	(BL-11)	908227.8889	1211790.5336	3249.14	27+01.69	16.05 LT
BL12	(BL-12)	908234.7948	1212273.7770	3268.63	31+84.87	5.46 LT
BL13	(BL-13)	908308.8462	1212526.7756	3273.98	34+40.38	70.31 LT
U40203	(GPS U4020-3)	908218.1620	1212795.6690	3259.03	37+04.75	31.88 RT
BL14	(BL-14)	908339.5387	1213346.2012	3217.68	42+65.52	0.40 LT
BL15	(BL-15)	908438.2105	1213656.5029	3196.49	45+91.40	2.47 LT
BL16	(BL-16)	908628.3072	1214026.2708	3181.44	50+03.73	55.82 LT
BL17	(BL-17)	908727.6212	1214315.3161	3181.58	53+08.18	54.04 LT
BL18	(BL-18)	908849.7431	1214696.9289	3190.70	57+08.82	48.08 LT
BL19	(BL-19)	908964.8623	1215039.0654	3178.27	60+69.80	48.08 LT
BL20	(BL-20)	909102.6120	1215654.8434	3140.16	66+97.36	17.74 RT
BL21	(BL-21)	909278.3381	1216150.8842	3144.88	72+19.02	36.66 RT
U40205	(GPS U4020-5)	909541.6460	1216537.1440	3163.83	OUTSIDE PROJECT LIMITS	
U40206	(GPS U4020-6)	910242.3210	1217200.5910	3219.50	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
BY124	(BY1-24)	908340.7913	1210736.4946	3196.61	10+21.34	13.59 LT
BY125	(BY1-25)	908204.2988	1210698.7893	3195.80	OUTSIDE PROJECT LIMITS	

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
BY226	(BY2-26)	908565.5127	1210834.8524	3202.93	OUTSIDE PROJECT LIMITS	
BY227	(BY2-27)	908482.4664	1211031.0030	3215.04	12+00.19	26.86 LT
BY228	(BY2-28)	908307.3846	1211002.0316	3205.22	OUTSIDE PROJECT LIMITS	

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
BY431	(BY4-31)	908307.3846	1211002.0316	3205.22	10+09.61	65.27 RT
BY432	(BY4-32)	908034.4960	1211115.1794	3200.43	12+80.48	44.27 LT
BY433	(BY4-33)	907560.9192	1210938.8163	3185.96	17+75.28	47.84 LT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
BY534	(BY5-34)	908213.4501	1211403.3928	3227.59	10+19.83	32.91 LT
BY535	(BY5-35)	907971.1671	1211275.8924	3223.11	12+88.10	15.95 RT
BY536	(BY5-36)	907800.1973	1211285.5903	3228.66	OUTSIDE PROJECT LIMITS	

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
BY637	(BY6-37)	908234.7948	1212273.7770	3268.63	10+23.07	14.83 LT
BY638	(BY6-38)	907891.5801	1212258.2629	3272.78	OUTSIDE PROJECT LIMITS	

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	Y7 STATION	OFFSET
BY739	(BY7-39)	908547.5338	1212312.6611	3298.50	OUTSIDE PROJECT LIMITS	
BY740	(BY7-40)	908234.7948	1212273.7770	3268.63	12+21.13	55.02 RT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	Y8 STATION	OFFSET
BY841	(BY8-41)	908308.8462	1212526.7756	3273.98	OUTSIDE PROJECT LIMITS	
BY842	(BY8-42)	908014.4214	1212528.4002	3267.81	12+47.29	12.51 LT

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	Y9 STATION	OFFSET
BY943	(BY9-43)	908218.1620	1212795.6690	3259.03	10+56.28	68.92 LT
BY944	(BY9-44)	908026.7666	1212783.4744	3263.04	12+45.23	36.07 LT
BY945	(BY9-45)	907658.1177	1212817.3033	3252.97	16+11.40	35.84 LT

BY10

POINT	DESC.	NORTH	EAST	ELEVATION	Y10 STATION	OFFSET
BY1046	(BY10-46)	908218.1620	1212795.6690	3259.03	10+22.56	203.78 RT
BY1047	(BY10-47)	908149.7965	1213160.9476	3241.31	12+56.91	10.05 LT
BY1048	(BY10-48)	908142.1249	1213562.7280	3223.61	OUTSIDE PROJECT LIMITS	

BY11

POINT	DESC.	NORTH	EAST	ELEVATION	Y11 STATION	OFFSET
BY1149	(BY11-49)	908656.8519	1213562.9778	3195.59	10+02.60	14.52 RT
BY1150	(BY11-50)	908438.2105	1213656.5029	3196.49	12+39.44	6.95 LT

BY12

POINT	DESC.	NORTH	EAST	ELEVATION	Y12 STATION	OFFSET
BY1251	(BY11-51)	908980.2990	1213936.9280	3170.18	OUTSIDE PROJECT LIMITS	
BY1252	(BY11-52)	908628.3072	1214026.2708	3181.44	11+74.72	14.60 RT

BY13

POINT	DESC.	NORTH	EAST	ELEVATION	Y13REV STATION	OFFSET
BY1353	(BY13-53)	909562.7323	1214243.5752	3183.31	10+02.34	29.15 LT
BY1354	(BY13-54)	909228.3637	1214413.5956	3158.99	13+69.18	34.40 LT
BY1355	(BY13-55)	908727.6212	1214315.3161	3181.58	19+25.87	52.37 LT

BY14

POINT	DESC.	NORTH	EAST	ELEVATION	Y14REV STATION	OFFSET
BY1456	(BY14-56)	908727.6212	1214315.3161	3181.58	OUTSIDE PROJECT LIMITS	
BY1457	(BY14-57)	908480.1093	1214350.9676	3192.78	11+91.09	7.99 RT
BY1458	(BY14-58)	908347.3387	1214471.0408	3205.07	OUTSIDE PROJECT LIMITS	

BY15

POINT	DESC.	NORTH	EAST	ELEVATION	Y15REV STATION	OFFSET
BY1559	(BY15-59)	908964.8623	1215039.0654	3178.27	OUTSIDE PROJECT LIMITS	
BY1560	(BY15-60)	908878.5399	1215567.1504	3155.91	11+95.71	103.52 RT
BY1561	(BY15-61)	908785.5907	1215827.8145	3149.09	14+13.67	11.31 LT

BY16

POINT	DESC.	NORTH	EAST	ELEVATION	Y16 STATION	OFFSET
BY1662	(BY16-62)	910172.8793	1215480.6570	3172.28	OUTSIDE PROJECT LIMITS	
BY1663	(BY16-63)	909557.5440	1215515.9735	3146.52	16+04.50	18.22 RT
BY1664	(BY16-64)	909102.6120	1215654.8434	3140.16	OUTSIDE PROJECT LIMITS	

BY17

POINT	DESC.	NORTH	EAST	ELEVATION	Y17 STATION	OFFSET
BY1765	(BY17-65)	909554.0732	1216122.7362	3154.18	OUTSIDE PROJECT LIMITS	
BY1766	(BY17-66)	909278.3381	1216150.8842	3144.88	OUTSIDE PROJECT LIMITS	

BY18

POINT	DESC.	NORTH	EAST	ELEVATION	Y18 STATION	OFFSET
BY1867	(BY18-67)	909278.3381	1216150.8842	3144.88	10+25.06	56.71 RT
BY1868	(BY18-68)	909251.6242	1216344.5643	3151.88	12+04.56	22.74 LT
BY1869	(BY18-69)	909239.7967	1216526.5071	3163.18	13+88.11	14.59 LT

****

BM1 ELEVATION - 3222.15
N 908311 E 1210227
L STATION 11+12 82 RIGHT
PK NAIL IN PARKING LOT NEXT TO CURB

****

****

BM2 ELEVATION - 3264.86
N 908333 E 1212037
L STATION 29+51 112 LEFT
CHISELED SQUARE ON CONCRETE HORSE SHOE PIT

****

****

BM3 ELEVATION - 3166.32
N 908916 E 1213968
OUTSIDE PROJECT LIMITS
CHISELED SQUARE ON CONCRETE JUNCTION BOX

****

****

BM4 ELEVATION - 3156.50
N 909277 E 1216348
Y18 STATION 12+07 48 LEFT
CHISELED SQUARE ON CONCRETE BASE FOR VACUUM AT WILCO

****

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS U4020-2"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 908308.1690(ft) EASTING: 1210982.3110(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986585
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"GPS U4020-2" TO -L- STATION 16+00.00 IS
N 78°20'18.47" W 227.8645'
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 WORKWITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.*

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

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   U4020_LS_GPSCALIB_070803.HTML
   U4020_LS_WGS84_070803.TXT
   U4020_LS_LOCAL_070803.TXT
   U4020_LS_CONTROL_070803.TXT

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

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

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PROJECT REFERENCE NO.	SHEET NO.
U-4020	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

2-9-09

PAVEMENT DESIGN ENGINEER

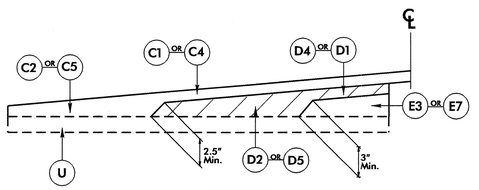
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER CHI CHEN

2/4/09

FINAL PAVEMENT SCHEDULE

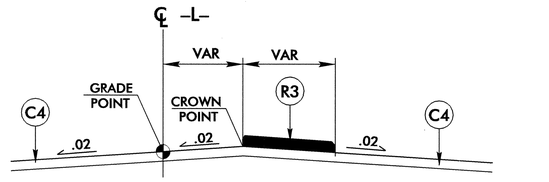
C	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E5	PROP. APPROX. 6.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 370.50 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E6	PROP. APPROX. 8" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E7	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C3	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R2	1'-6" CONCRETE CURB AND GUTTER.
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	R3	5" MONOLITHIC CONCRETE ISLAND.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	8" x 18" CONCRETE CURB
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.	R5	CONCRETE DRIVE
D3	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R6	4" CONCRETE ISLAND COVERS
D4	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R7	CONCRETE VALLEY GUTTER
D5	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.	S	4" CONCRETE SIDEWALK.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
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.	V	MILLING BITUMINOUS PAVEMENT 2.5"
E4	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	V1	MILLING BITUMINOUS PAVEMENT 0"- 6"
		W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)

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

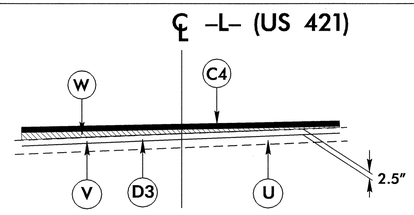


LINE	SURFACE C1	SURFACE C2	SURFACE C4	SURFACE C5	INTERMEDIATE D1	INTERMEDIATE D2	INTERMEDIATE D4	INTERMEDIATE D5	BASE E3	BASE E7
–L– (USE WITH TYP. SECTION 1, 2, 3,4,5)			X	X			X	X		X
–Y4– (USE WITH TYP. SECTION 7)	X	X			X	X			X	
–Y5–, –Y6–, (USE WITH TYP. SECTION 10, 12)	X	X							X	
–Y9– (USE WITH TYP. SECTION 14)			X	X			X	X		X
–Y13REV– (USE WITH TYP. SECTION 16)	X	X			X	X			X	
–DR1–, –DR2– (USE WITH TYP. SECTION 22)	X	X							X	
–Y8–, –Y14REV–, –Y15REV–	X	X							X	
–Y16– (USE WITH TYP. SECTION 19, 20)	X	X			X	X			X	

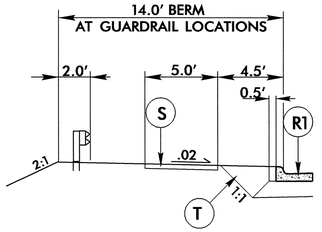
DETAIL SHOWING METHOD OF WEDGING



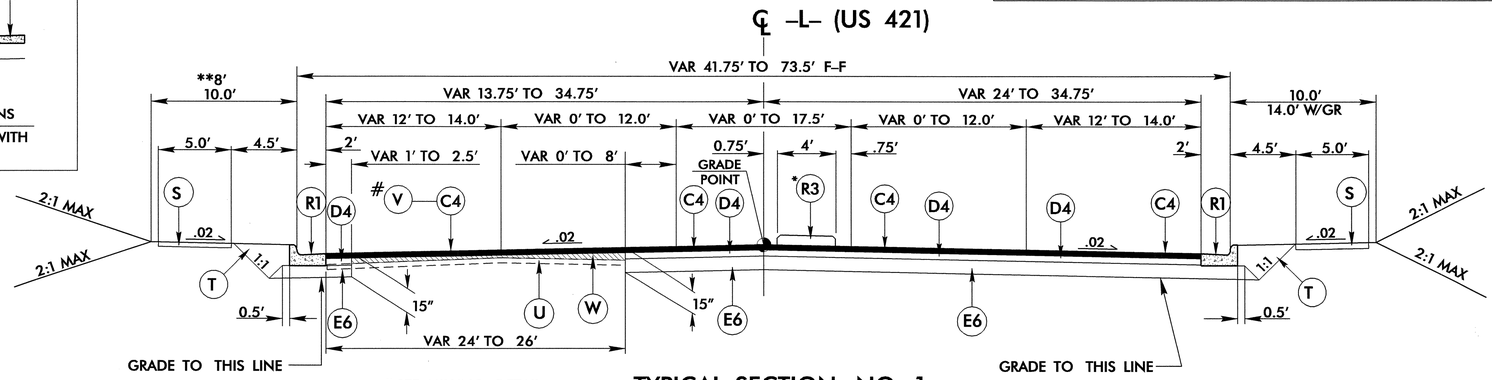
DETAIL 1
SUPERELEVATION TREATMENT ADJACENT TO PROPOSED CHANNELIZATION
TO BE USED IN CONJUNCTION WITH TYPICAL SECTIONS 3 AND 4
(SEE PLANS FOR LOCATIONS)



DETAIL 2 (MILLING OF EXISTING PAVEMENT)
TO BE USED IN CONJUNCTION WITH TYPICAL SECTIONS 1 THRU 4
MILL EXISTING –L– LINE PAVEMENT 2.5" AND REPLACE WITH I19.0C



DETAIL FOR PLACEMENT OF
GUARDRAIL AT SIDEWALK LOCATIONS
TO BE USED IN CONJUNCTION WITH
TYPICAL SECTIONS 1 THRU. 4



*SEE PLANS FOR ISLAND LOCATIONS
**SEE CROSS SECTIONS

–L– STA. 16+00.00 TO 16+50, OVERLAY EXISTING PAVEMENT

USE TYPICAL SECTION NO. 1

–L– STA. 16+50 TO 24+39.51

#SEE MILLING DETAIL

TYPICAL SECTION NO. 1

23-JAN-2009 15:30
U:\4020\roadway\4020_rdy_tsp.dgn
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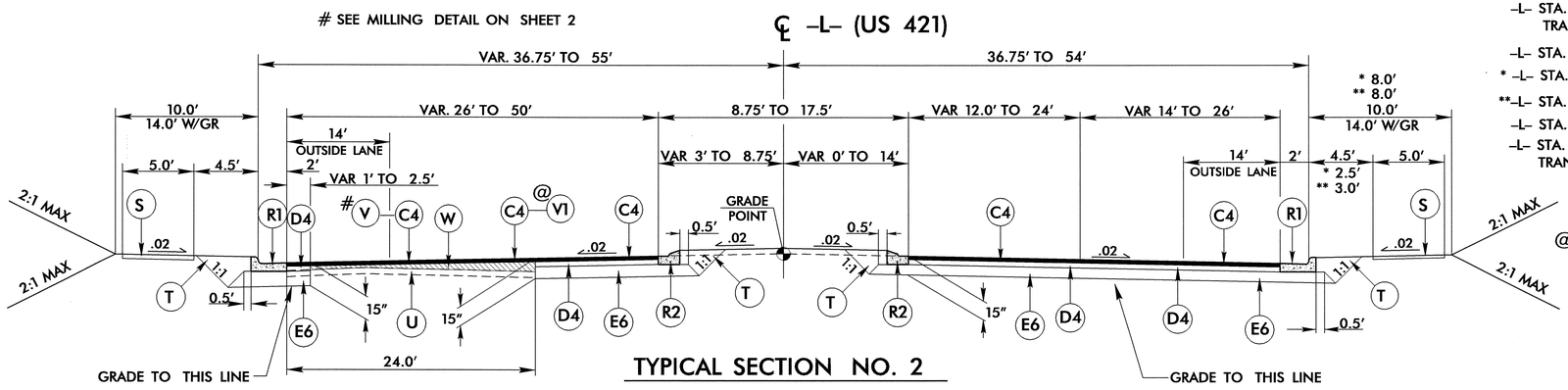
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-A

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19903 ENGINEER GREGORY E. BRIEN — 2-9-09

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER CHI CHEN — 2/4/09



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

–L– STA. 24+39.51 TO 25+39.51
TRANSITION FROM T.S. 1 TO T.S. 2

–L– STA. 25+39.51 TO 32+21.33

* –L– STA. 32+21.33 TO 33+22.49

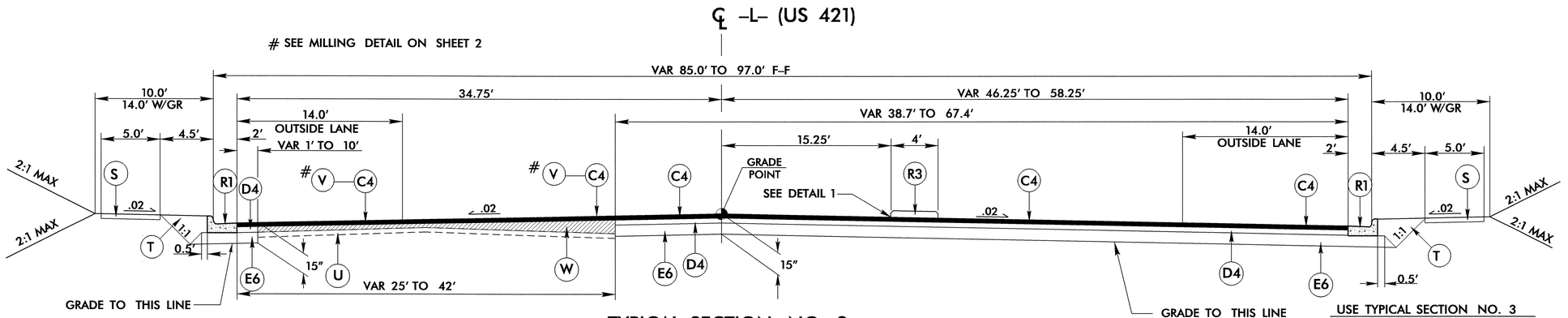
**–L– STA. 53+17.96 TO 57+25.46

–L– STA. 67+29.56 TO 69+00.00

–L– STA. 69+00.00 TO 72+00.00,
TRANSITION FROM T.S. 2 TO T.S. 5

@ VAR DEPTH MILLING
FROM –L– 67+29.56 TO 72+00 +/–

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C4	3" S9.5C
C5	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E5	6.5" B25.0C
E6	8" B25.0C
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

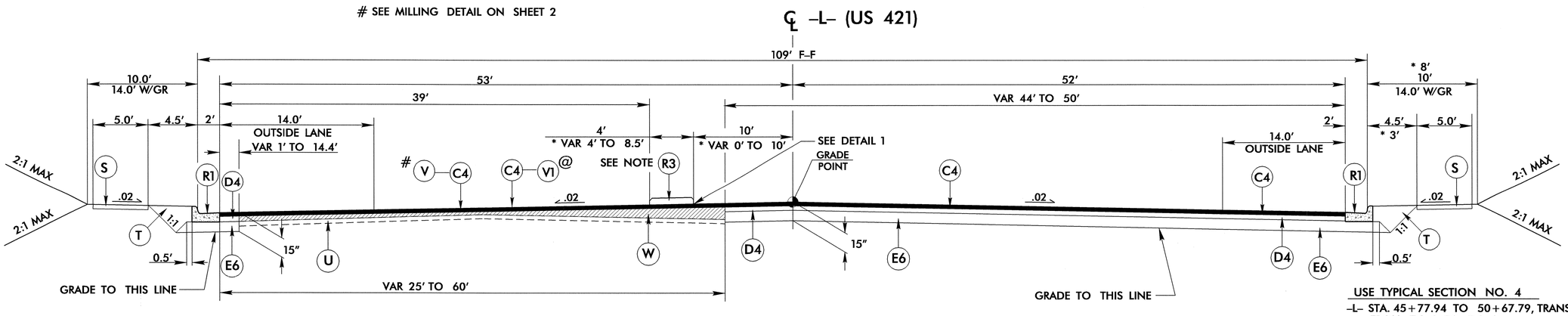


TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

–L– STA. 33+22.49 TO 37+09.84,
TRANSITION FROM T.S. 2 TO T.S. 3

–L– STA. 36+87.77 TO 45+77.94



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

–L– STA. 45+77.94 TO 50+67.79, TRANSITION
FROM T.S. 3 TO T.S. 4

–L– STA. 50+67.79 TO 53+17.96

* –L– STA. 57+25.46 TO 61+00.00

–L– STA. 61+00.00 TO 67+29.56

@ VAR DEPTH MILLING
FROM –L– 67+00 TO 67+29.56 +/–

NOTE: SEE PLANS FOR ISLAND LOCATIONS

04-DEC-2008 07:29
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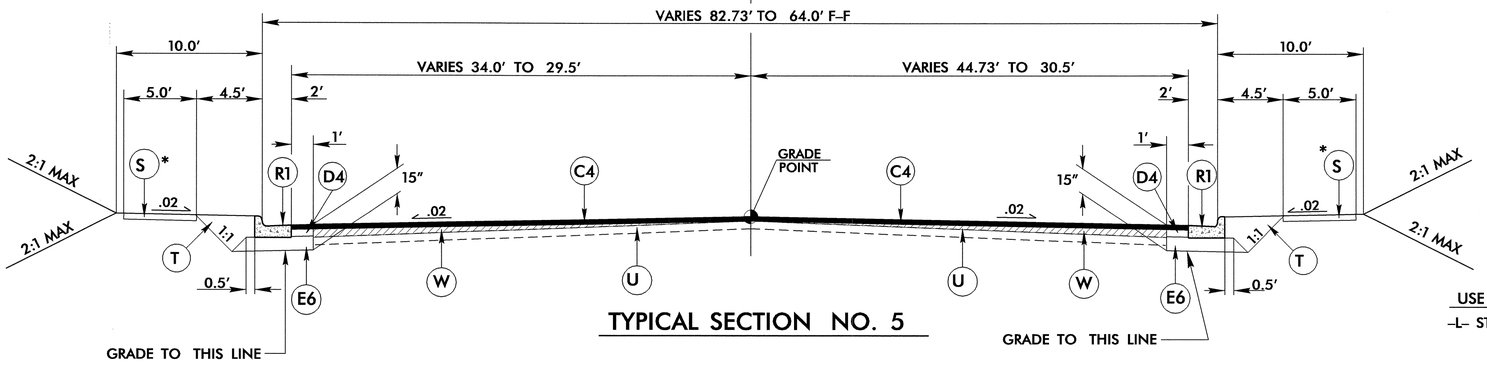
$$$$STRIPMAP$$$

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-B

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 12903 ENGINEER GREGORY E. BREW — 2-9-09

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DAVID CHI CHEN — 2/4/09

℄ –L– (US 421)

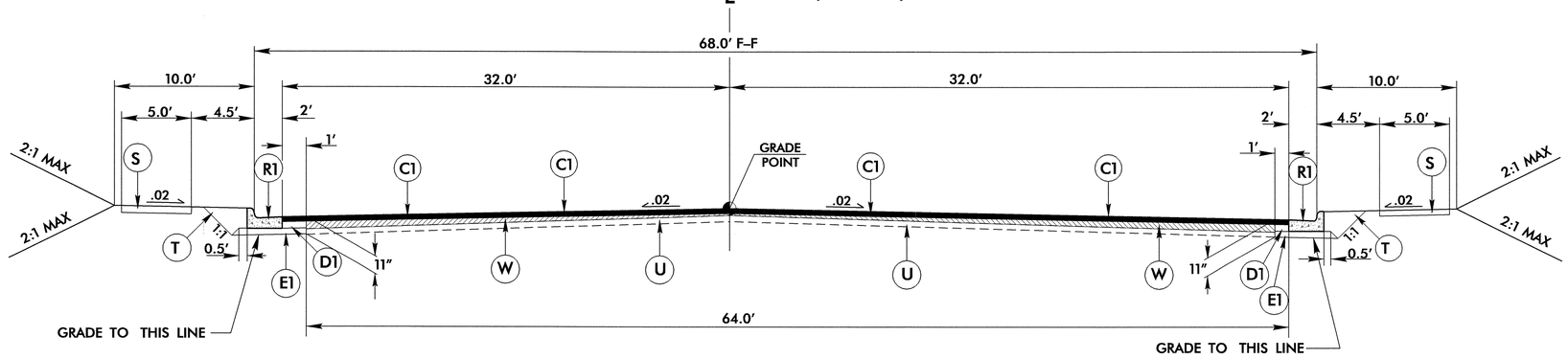


TYPICAL SECTION NO. 5

* SEE PLANS FOR SIDEWALK LOCATIONS

USE TYPICAL SECTION NO. 5
–L– STA. 72+00.00 TO 74+00.00

℄ –Y4– (US 321)

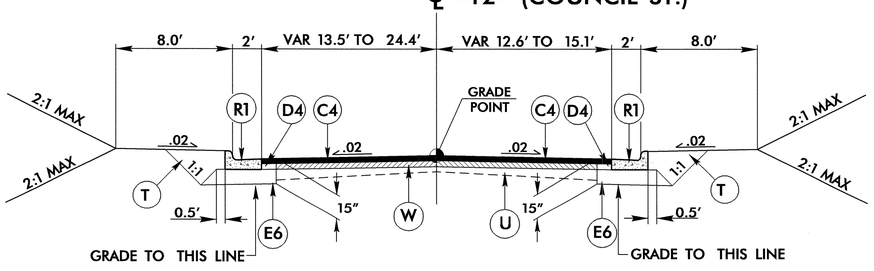


TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
–Y4– STA. 11+29.56 TO 12+00.00
–Y4– STA. 12+0.00 TO 13+50.00

NOTE: SEE PLANS FOR ISLAND LOCATIONS

℄ –Y2– (COUNCIL ST.)



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7
–Y2– STA. 12+50.00 TO 13+00.00, TRANSITION FROM EXISTING TO T.S. 8

–Y2– STA. 13+00.00 TO 13+03.03

PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	VAR. S9.5B
C4	3″ S9.5C
C5	VAR. S9.5C
D1	4″ I19.0B
D2	VAR. I19.0B
D3	2.5″ I19.0C
D4	4″ I19.0C
D5	VAR. I19.0C
E1	4″ B25.0B
E2	5″ B25.0B
E5	6.5″ B25.0C
E6	8″ B25.0C
R1	2′-6″ C & G
R2	1′-6″ C & G
R3	5″ MONO. ISLAND
R4	8′x18″ CURB
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5″
V1	VAR. MILLING
W	WEDGING

6/2/9

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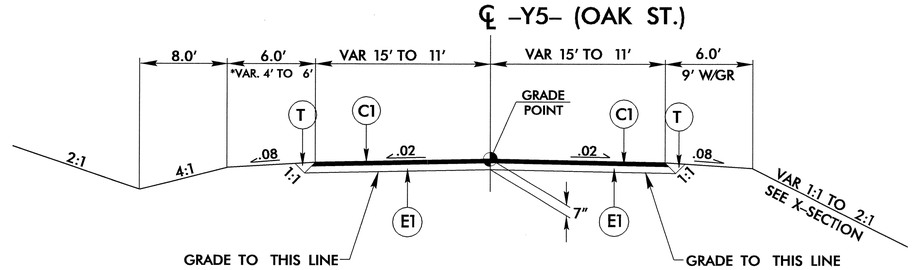
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-C

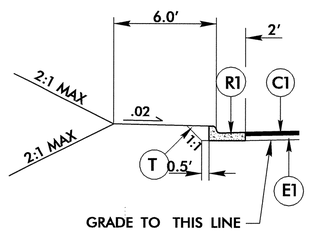
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW — 2-9-09

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DON-CHI CHEN — 2/4/09

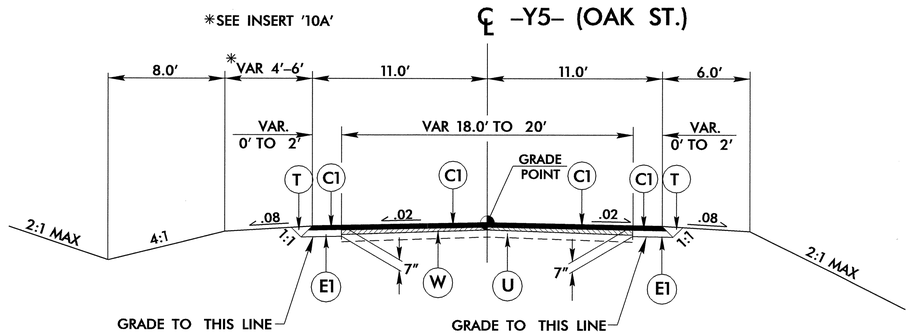


TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8
-Y5- STA. 10+95.60 TO 12+50.00

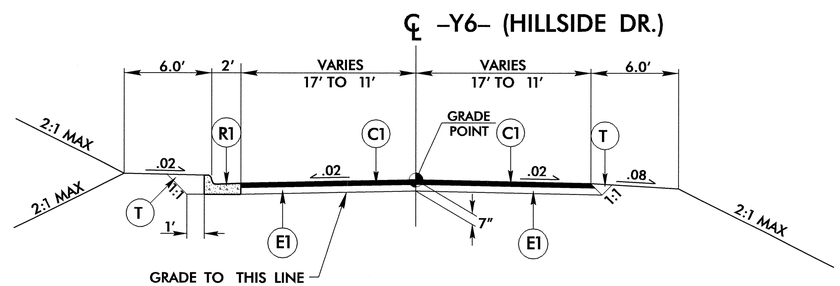


INSERT '10A'
(USE IN CONJUNCTION WITH TYPICAL 9)
-Y- STA. 12+55.00 TO 12+75 (LT.)



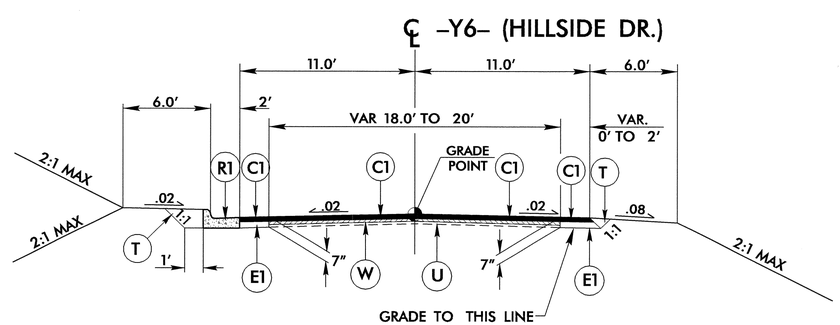
TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9
-Y5- STA. 12+50.00 TO 13+00.00



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10
-Y6- STA. 10+92.68 TO 11+80.00



TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11
-Y6- STA. 11+80.00 TO 12+10.00

PAVEMENT SCHEDULE

C1	3" S9.5B
C2	VAR. S9.5B
C4	3" S9.5C
C5	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E5	6.5" B25.0C
E6	8" B25.0C
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

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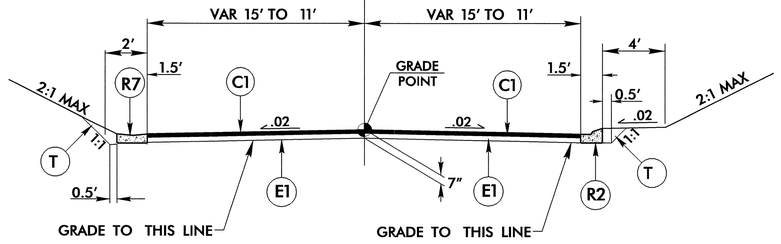
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-D

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER — 2-9-09

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DON CHI CHEN — 2/4/09

℄ -Y8- (HORN IN THE WEST)



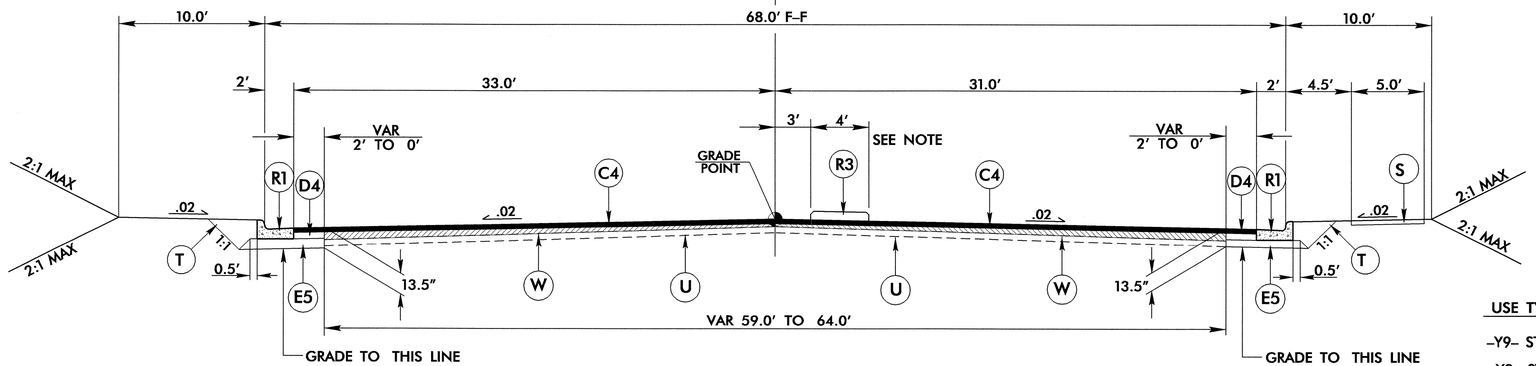
TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12

-Y8- STA. 11+04.68 TO 12+00.00

-Y8- STA. 12+00.00 TO 12+50, TRANSITION FROM T.S. 12 TO EXISTING

℄ -Y9- (NC 105/US 221)



TYPICAL SECTION NO. 13

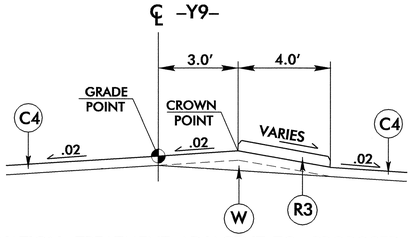
USE TYPICAL SECTION NO. 13

-Y9- STA. 11+48.99 TO 13+50.00

-Y9- STA. 13+50.00 TO 14+00, TRANSITION FROM T.S. 13 TO EXISTING

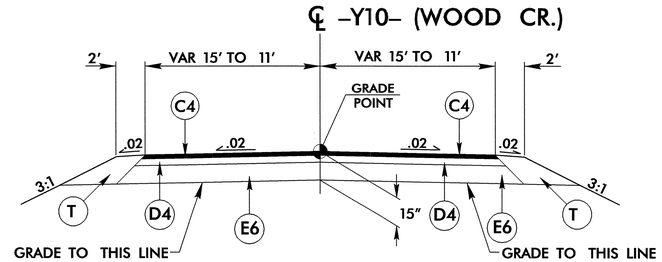
NOTE: SEE PLANS FOR ISLAND LOCATIONS

℄ -Y9-



SUPERELEVATION TREATMENT ADJACENT TO PROPOSED CHANNELIZATION DETAIL
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 13
(SEE PLANS FOR LOCATIONS)

℄ -Y10- (WOOD CR.)



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14

-Y10- STA. 11+33.33 TO 11+50.00

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C4	3" S9.5C
C5	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E5	6.5" B25.0C
E6	8" B25.0C
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	8'x18" CURB
R7	VALLEY GUTTER
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

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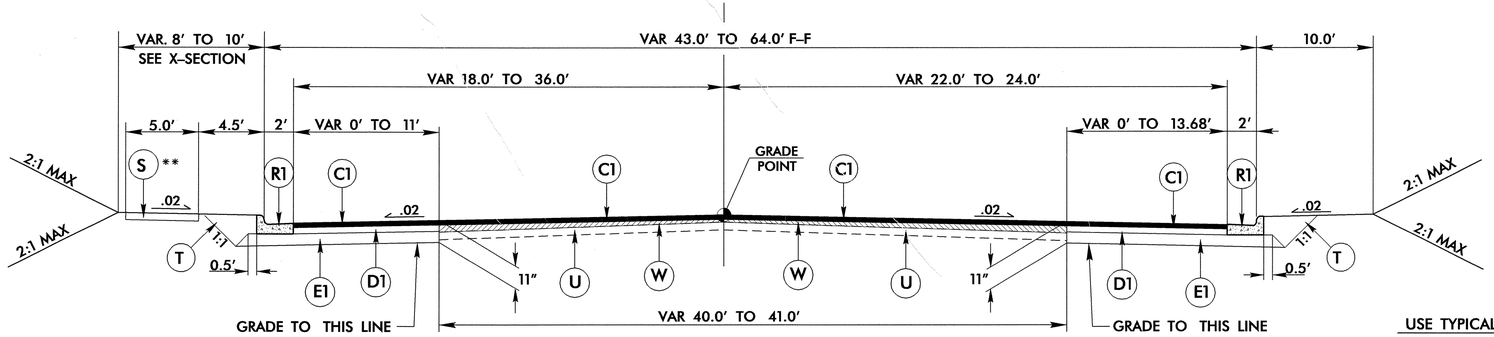
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-E

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26903 ENGINEER GREGORY E. BREW — 2-9-09

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER HONG-CHI CHIEN — 2/4/09

℄ –Y13REV– (NEW MARKET BLVD)



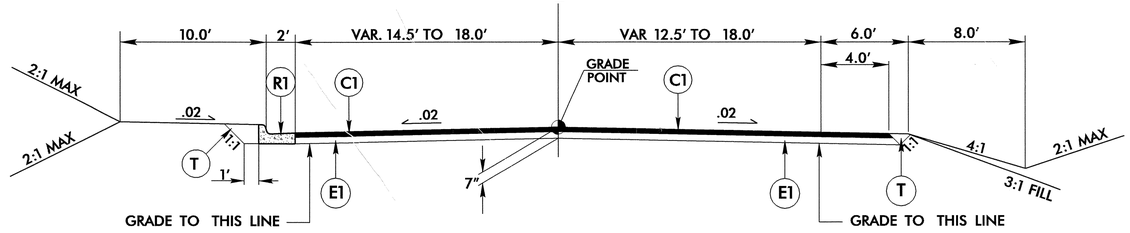
TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15

–Y13REV– STA. 15+00 TO 18+86.65

**SEE PLANS FOR SIDEWALK LOCATIONS

℄ –Y14REV– (FOREST HILL DR.)



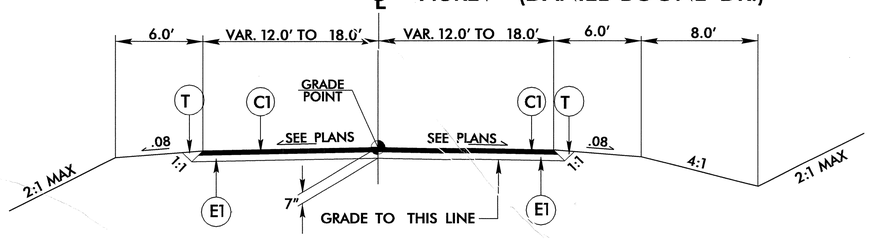
TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16

–Y14REV– STA. 10+84.79 TO 12+75.00

–Y14REV– STA. 12+75.00 TO 13+00, TRANSITION FROM T.S. 16 TO EXISTING

℄ –Y15REV– (DANIEL BOONE DR.)



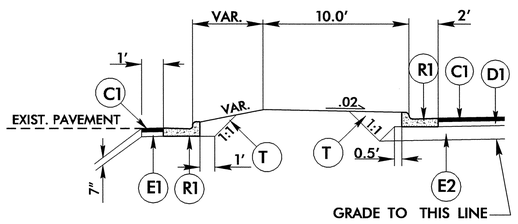
TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17

–Y15REV– STA. 11+04 TO 12+75.00

–Y15REV– STA. 12+75.00 TO 13+00, TRANSITION FROM T.S. 17 TO EXISTING

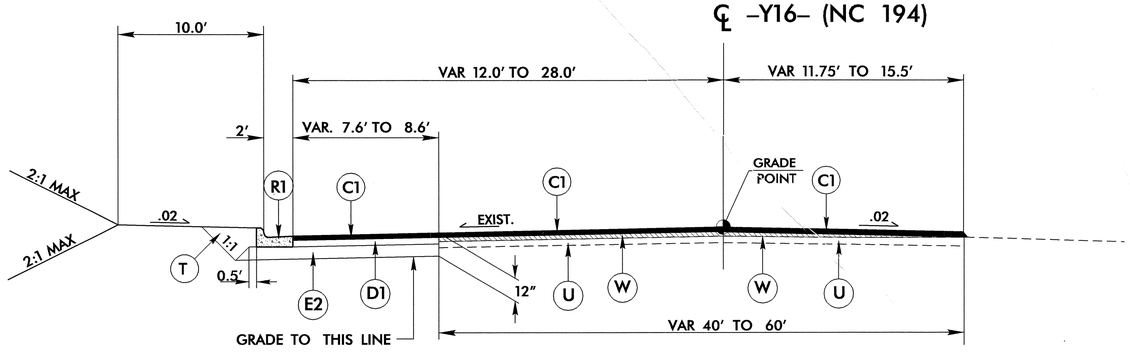
PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	VAR. S9.5B
C4	3″ S9.5C
C5	VAR. S9.5C
D1	4″ I19.0B
D2	VAR. I19.0B
D3	2.5″ I19.0C
D4	4″ I19.0C
D5	VAR. I19.0C
E1	4″ B25.0B
E2	5″ B25.0B
E5	6.5″ B25.0C
E6	8″ B25.0C
J	6″ ABC
R1	2′-6″ C & G
R2	1′-6″ C & G
R3	5″ MONO. ISLAND
R4	8′x18″ CURB
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5″
V1	VAR. MILLING
W	WEDGING



DETAIL 18A

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 18 & 19 (SEE PLANS FOR LOCATIONS)

℄ –Y16– (NC 194)



TYPICAL SECTION NO. 18

–Y16– STA. 15+00 TO 15+89.41, TRANSITION FROM EXISTING TO T.S. 18

USE TYPICAL SECTION NO. 18

–Y16– STA. 15+89.41 TO 16+47.37

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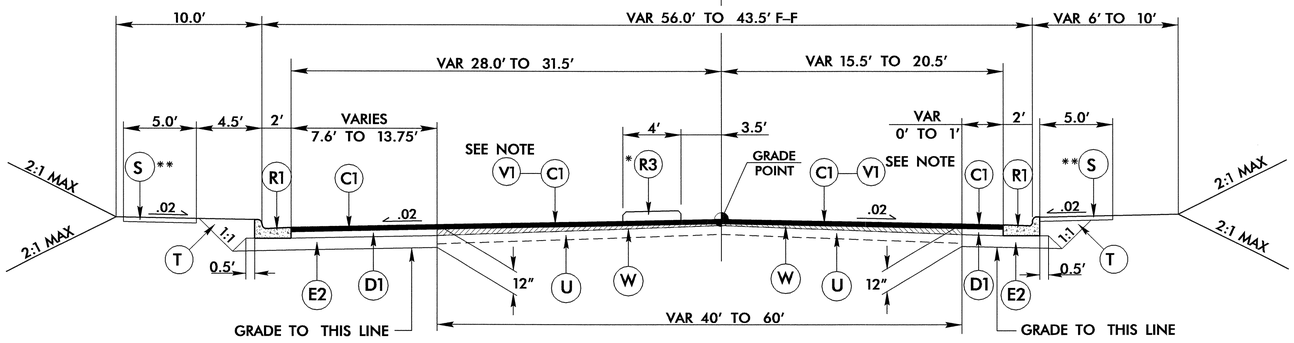
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 2-9-09

NORTH CAROLINA PROFESSIONAL SEAL 13868 ENGINEER DAN-CHI CHEN 2/4/09

℄ -Y16- (NC 194)



TYPICAL SECTION NO. 19

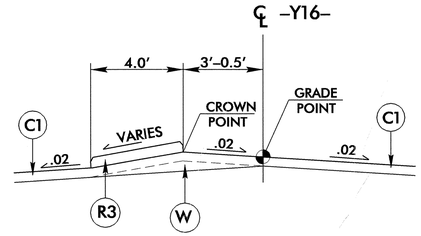
* SEE PLANS FOR ISLAND LOCATION

** SEE PLANS FOR SIDEWALK LOCATIONS

NOTE: MILL EXIST. PAVEMENT FROM STA 18+50 TO 19+44.69 RT.

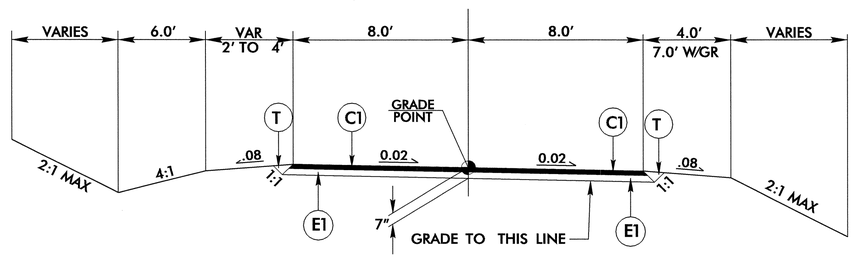
USE TYPICAL SECTION NO. 19

-Y16- STA. 16+47.37 TO 19+44.69



SUPERELEVATION TREATMENT ADJACENT TO PROPOSED CHANNELIZATION DETAIL TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 19 (SEE PLANS FOR LOCATIONS)

℄ -DR3-

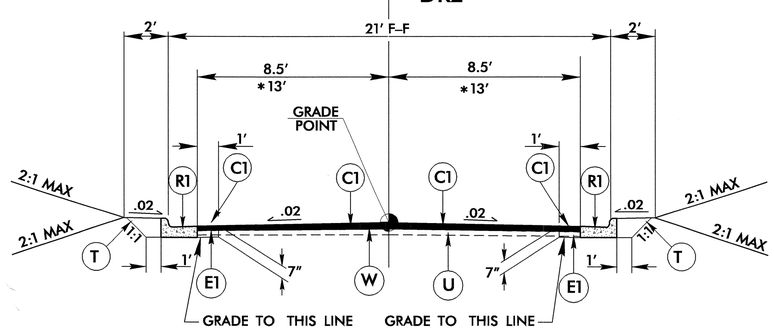


TYPICAL SECTION NO. 20

USE TYPICAL SECTION NO. 20

-DRV3- STA. 10+55.28 TO 14+10.00

℄ -DR1- -DR2-



TYPICAL SECTION NO. 21

USE TYPICAL SECTION NO. 21

-DR1- STA. 11+00.00 TO 11+53.09

* -DR2- STA. 10+50.00 TO 10+85.97

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C4	3" S9.5C
C5	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E5	6.5" B25.0C
E6	8" B25.0C
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

6/2/99

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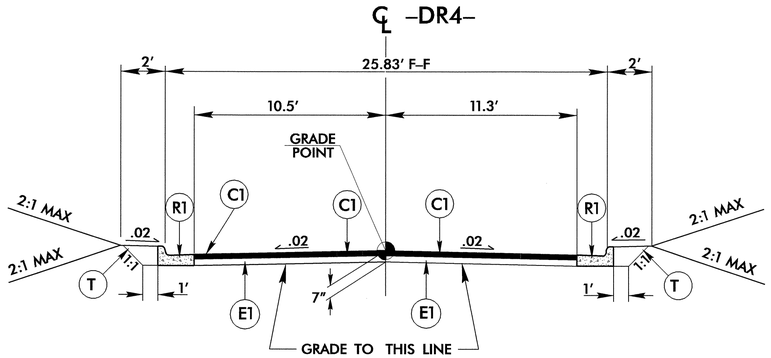
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-G

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER 2-9-09

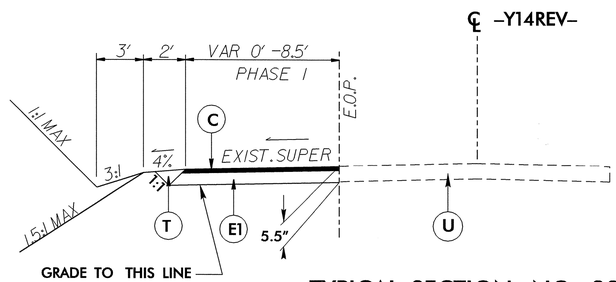
PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13268 ENGINEER DON-CHI CHEN 2/4/09



TYPICAL SECTION NO. 22

USE TYPICAL SECTION NO. 22

-DR4- STA. 10+84.78 TO 11+40.00

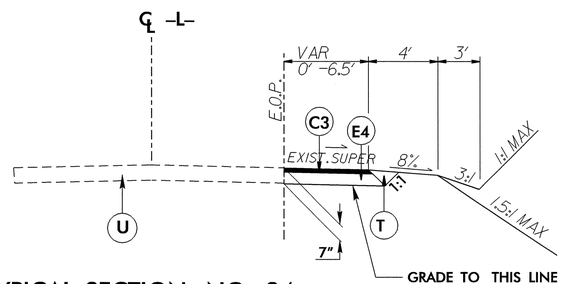


TYPICAL SECTION NO. 23

NOTE: TEMPORARY WIDENING FOR MAINTENANCE OF TRAFFIC
SEE TRAFFIC CONTROL PLANS

USE TYPICAL SECTION NO. 23

-Y14REV- STA. 11+00 +/- TO 13+20.00 +/- LT

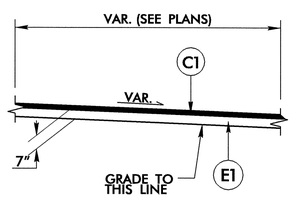


TYPICAL SECTION NO. 24

NOTE: TEMPORARY WIDENING FOR MAINTENANCE OF TRAFFIC
SEE TRAFFIC CONTROL PLANS

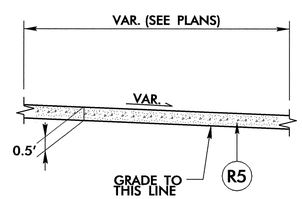
USE TYPICAL SECTION NO. 24

-L- STA. 49+60 +/- TO 54+25.00 +/- RT



ROADWAY
MISC. PAVED PRIVATE DRIVES

REMARKS
SEE PLANS FOR LOCATIONS



ROADWAY
MISC. CONC. PRIVATE DRIVES

REMARKS
SEE PLANS FOR LOCATIONS

PAVEMENT SCHEDULE

C1	3" S9.5B
C2	VAR. S9.5B
C3	2" S9.5C
C4	3" S9.5C
C5	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E4	5" B25.0C
E5	6.5" B25.0C
E6	8" B25.0C
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	8'x18" CURB
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

6/2/99

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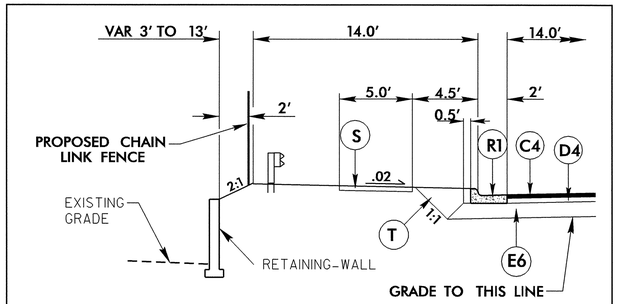
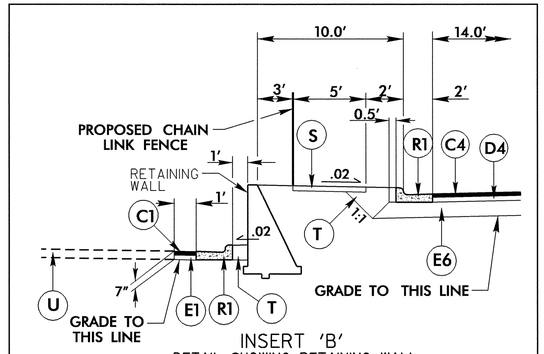
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-H

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW — 2-9-09

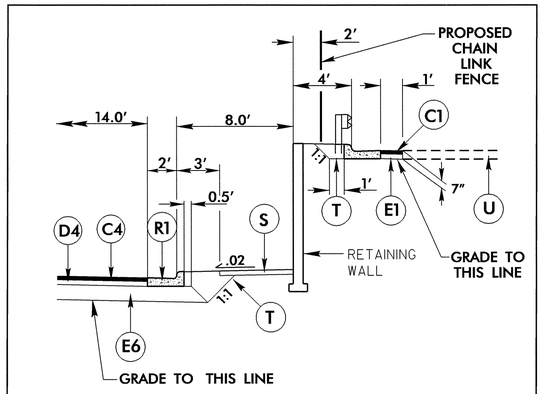
PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 13268 ENGINEER DON-CHI CHEN — 2/4/09



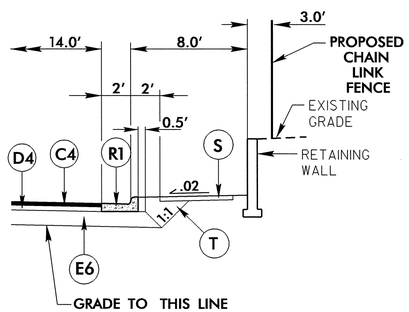
INSERT 'A'
DETAIL SHOWING RETAINING WALL
(USE IN CONJUNCTION WITH TYPICAL SECTION 4)
-L- STA. 53+40.00 TO 59+92.27 (LT.)
-L- STA. 60+40.00 TO 63+52.12 (LT.)



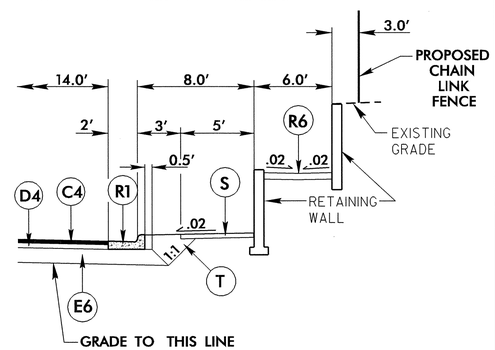
INSERT 'B'
DETAIL SHOWING RETAINING WALL
(USE IN CONJUNCTION WITH TYPICAL SECTION 4)
-L- STA. 64+02.65 TO 65+30.00 (LT.)



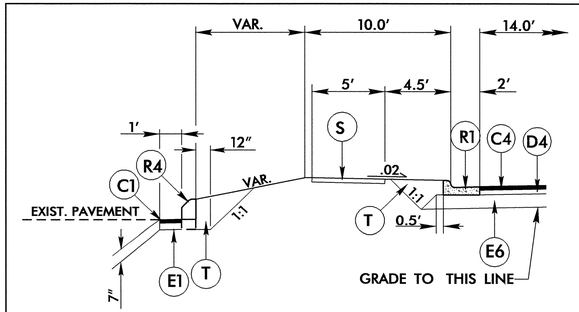
INSERT 'C'
DETAIL SHOWING RETAINING WALL
(USE IN CONJUNCTION WITH TYPICAL SECTION 4)
-L- STA. 52+86.89 TO 55+25.00 (RT.)



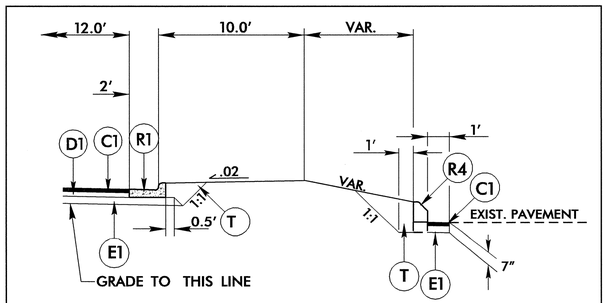
INSERT 'D'
DETAIL SHOWING RETAINING WALL
(USE IN CONJUNCTION WITH TYPICAL SECTION 4)
-L- STA. 55+81.74 TO 56+80.00 (RT.)
-L- STA. 61+30.00 TO 61+60.00 (RT.)



INSERT 'E'
DETAIL SHOWING RETAINING WALL
(USE IN CONJUNCTION WITH TYPICAL SECTION 4)
-L- STA. 56+80.00 TO 61+30.00 (RT.)



CHANNELIZATION DETAIL "A" (-L-)
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 4
(SEE PLANS FOR LOCATIONS)



CHANNELIZATION DETAIL "B" (-Y13REV-)
TO BE USED IN CONJUNCTION WITH TYPICAL SECTION 15
(SEE PLANS FOR LOCATIONS)

PAVEMENT SCHEDULE

C1	3" S9.5B
C2	VAR. S9.5B
C4	3" S9.5C
C5	VAR. S9.5C
D1	4" I19.0B
D2	VAR. I19.0B
D3	2.5" I19.0C
D4	4" I19.0C
D5	VAR. I19.0C
E1	4" B25.0B
E2	5" B25.0B
E5	6.5" B25.0C
E6	8" B25.0C
R1	2'-6" C & G
R2	1'-6" C & G
R3	5" MONO. ISLAND
R4	8'x18" CURB
R6	4" CONC. ISLAND COVER
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 2.5"
V1	VAR. MILLING
W	WEDGING

6/2/99

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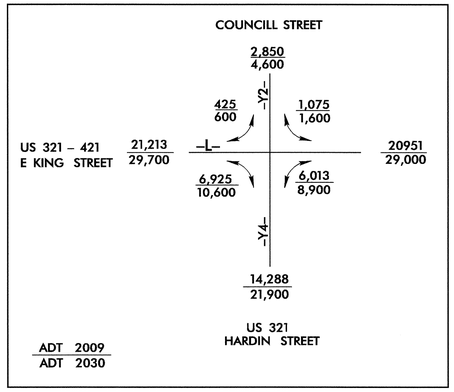
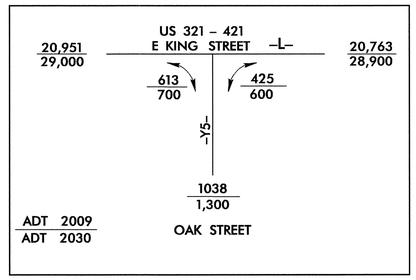
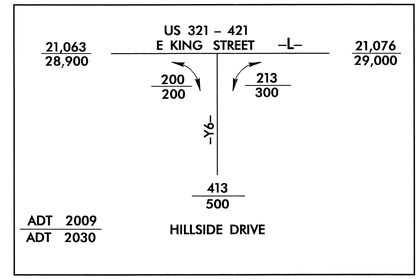
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

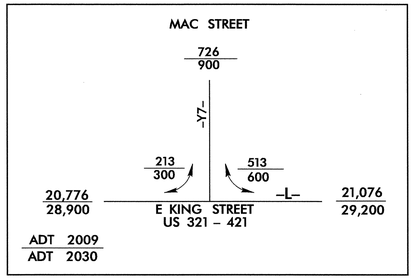
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER

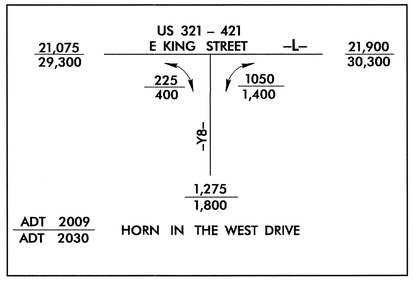
TRAFFIC DIAGRAMS

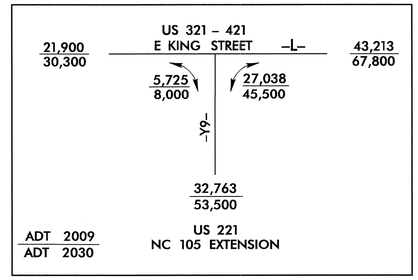


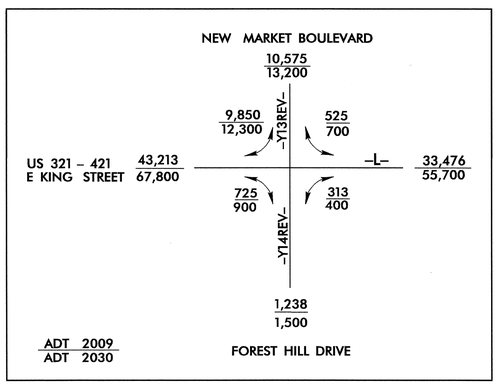


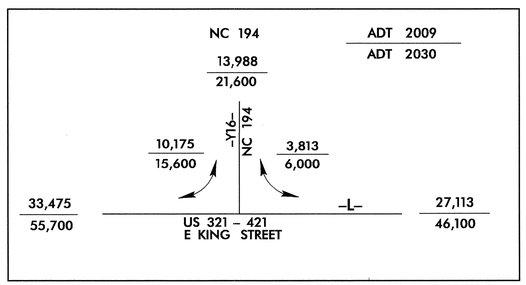


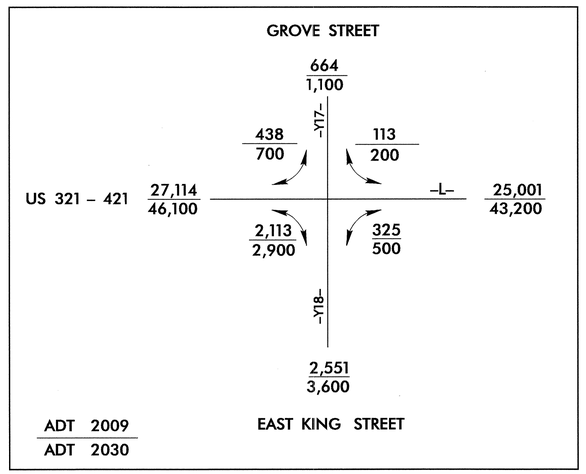












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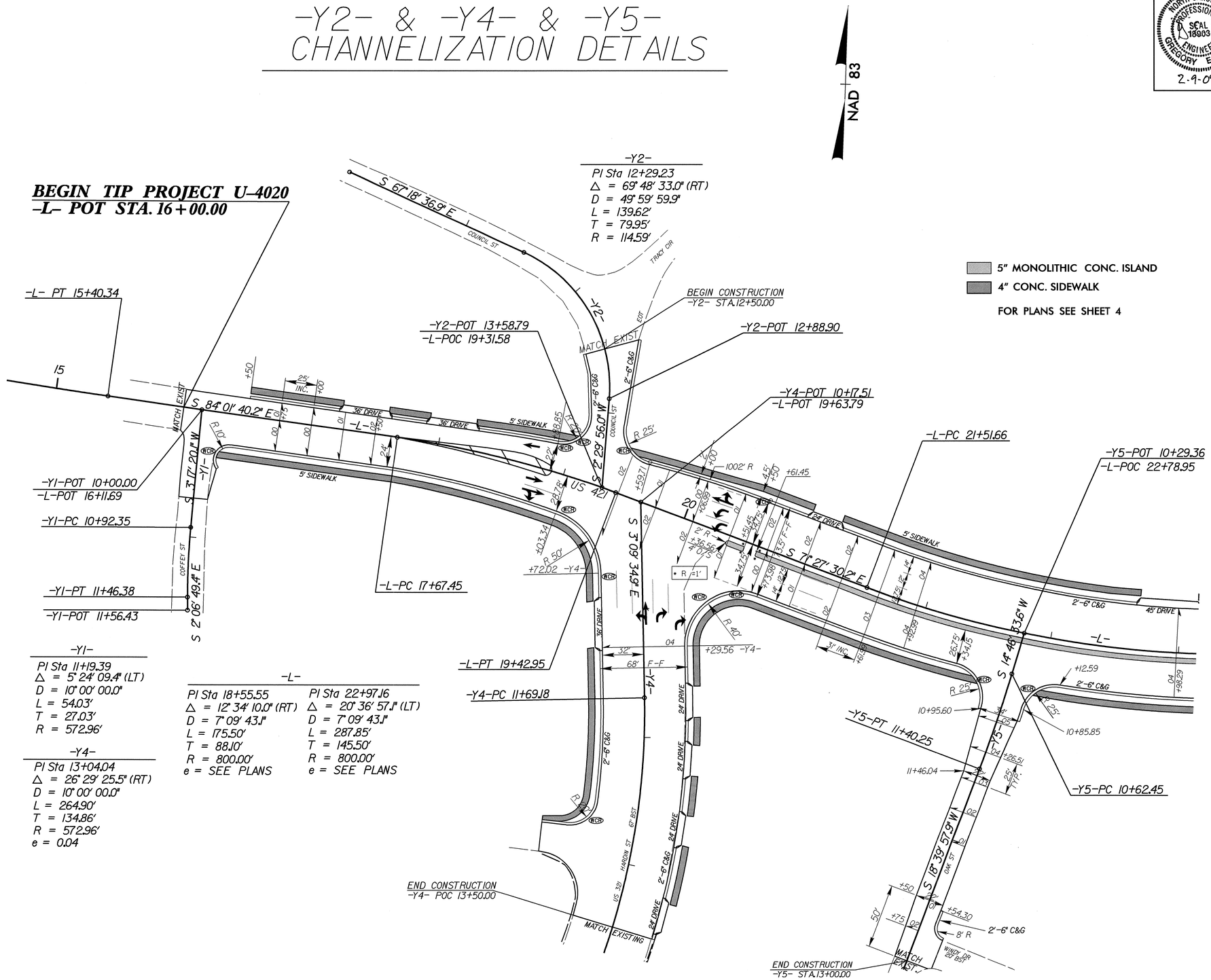
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-J
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW
2-9-09

-Y2- & -Y4- & -Y5- CHANNELIZATION DETAILS



5" MONOLITHIC CONC. ISLAND
4" CONC. SIDEWALK
FOR PLANS SEE SHEET 4

-Y1-
PI Sta 11+19.39
Δ = 5° 24' 09.4" (LT)
D = 10° 00' 00.0"
L = 54.03'
T = 27.03'
R = 572.96'

-Y4-
PI Sta 13+04.04
Δ = 26° 29' 25.5" (RT)
D = 10° 00' 00.0"
L = 264.90'
T = 134.86'
R = 572.96'
e = 0.04

-L-
PI Sta 18+55.55
Δ = 12° 34' 10.0" (RT)
D = 7° 09' 43.1"
L = 175.50'
T = 88.10'
R = 800.00'
e = SEE PLANS

PI Sta 22+97.16
Δ = 20° 36' 57.1" (LT)
D = 7° 09' 43.1"
L = 287.85'
T = 145.50'
R = 800.00'
e = SEE PLANS

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-K
R/W SHEET NO.	

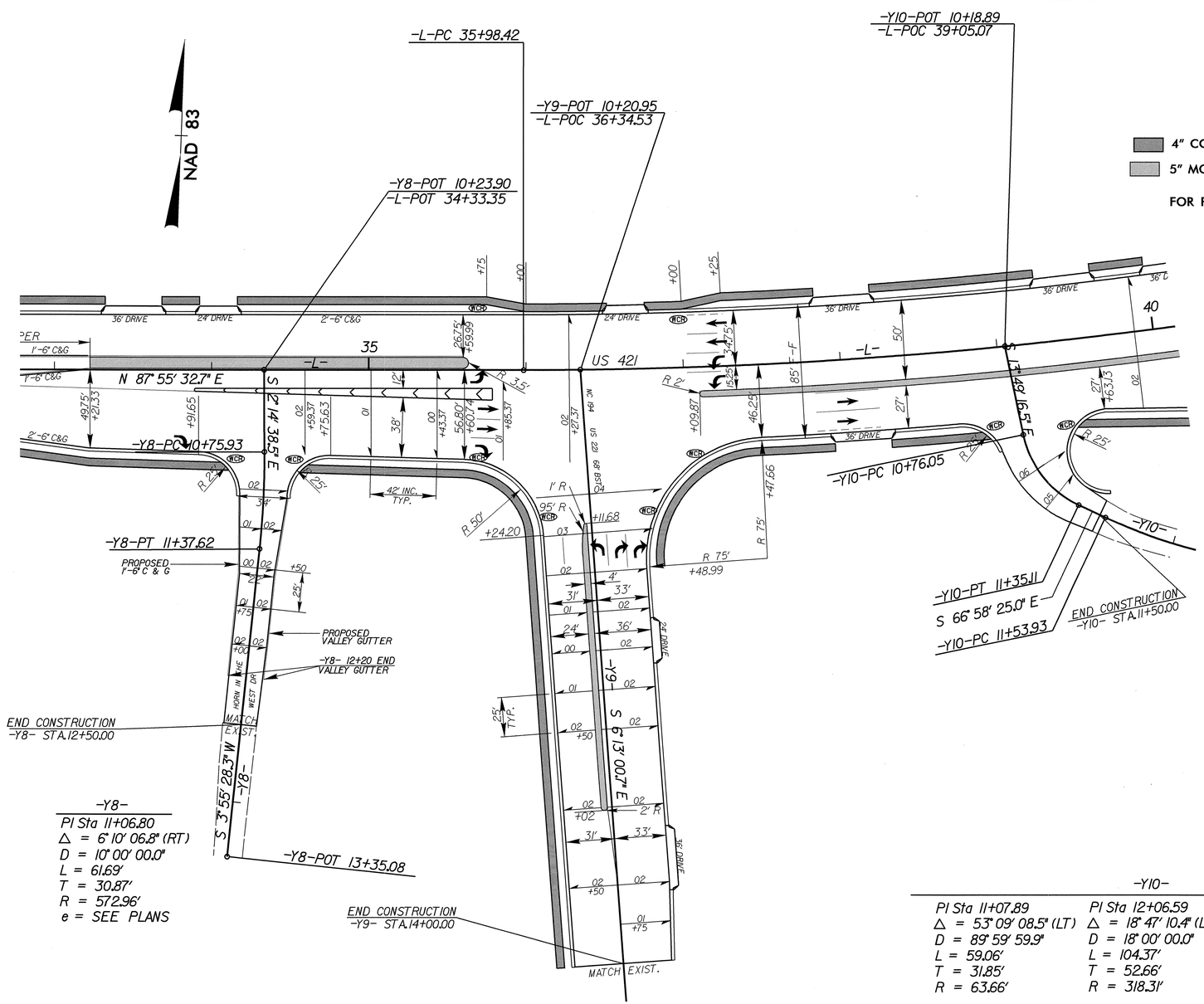
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW

2-9-09

-Y9- INTERSECTION DETAIL

-L-
PI Sta 40+86.69
△ = 17° 45' 38.8" (LT)
D = 1° 50' 00.5"
L = 968.70'
T = 488.27'
R = 3,125.00'
e = SEE PLANS



-Y8-
PI Sta 11+06.80
△ = 6° 10' 06.8" (RT)
D = 10° 00' 00.0"
L = 61.69'
T = 30.87'
R = 572.96'
e = SEE PLANS

-Y10-

PI Sta 11+07.89	PI Sta 12+06.59	PI Sta 13+09.57
△ = 53° 09' 08.5" (LT)	△ = 18° 47' 10.4" (LT)	△ = 15° 35' 47.6" (LT)
D = 89° 59' 59.9"	D = 18° 00' 00.0"	D = 32° 00' 00.0"
L = 59.06'	L = 104.37'	L = 48.74'
T = 31.85'	T = 52.66'	T = 24.52'
R = 63.66'	R = 318.31'	R = 179.05'

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-L
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

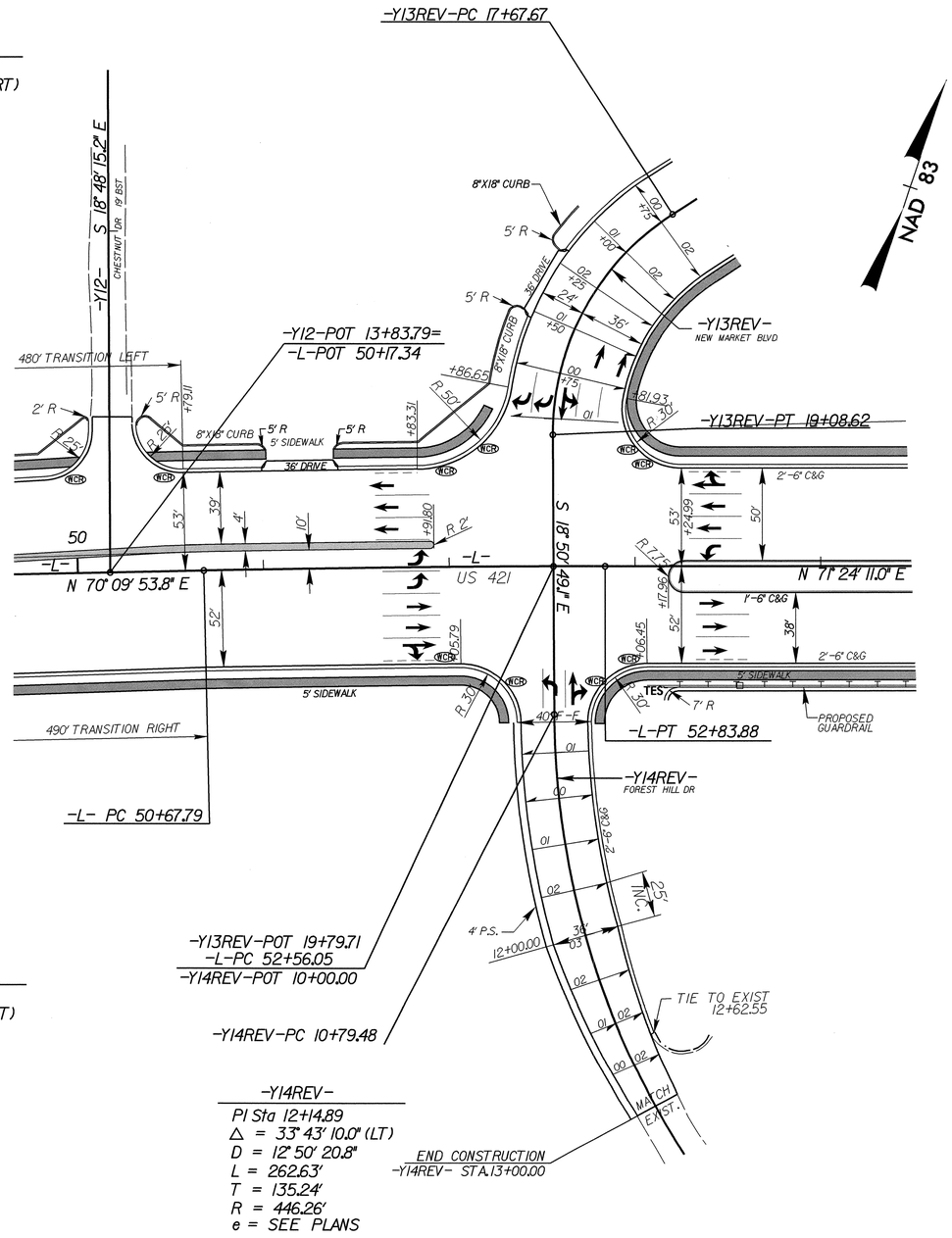
NORTH CAROLINA PROFESSIONAL SEAL 18908 ENGINEER GREGORY E. BREW

2-9-09

-Y13REV- & -Y14REV- INTERSECTION DETAILS

-Y13REV-

PI Sta 18+44.77	PI Sta 15+66.57
Δ = 57° 41' 03.9" (LT)	Δ = 50° 14' 20.7" (RT)
D = 40° 55' 32.0"	D = 23° 52' 23.7"
L = 140.95'	L = 210.44'
T = 77.10'	T = 112.52'
R = 140.00'	R = 240.00'
e = SEE PLANS	e = SEE PLANS



CONCRETE SIDEWALK

5" MONOLITHIC CONC. ISLAND

FOR PLANS SEE SHEET 7

-L-

PI Sta 51+75.84
Δ = 1° 14' 17.2" (RT)
D = 0° 34' 22.6"
L = 216.09'
T = 108.05'
R = 10,000.00'
SE = N.C.

-Y14REV-

PI Sta 12+14.89
Δ = 33° 43' 10.0" (LT)
D = 12° 50' 20.8"
L = 262.63'
T = 135.24'
R = 446.26'
e = SEE PLANS

REVISIONS

8/17/99

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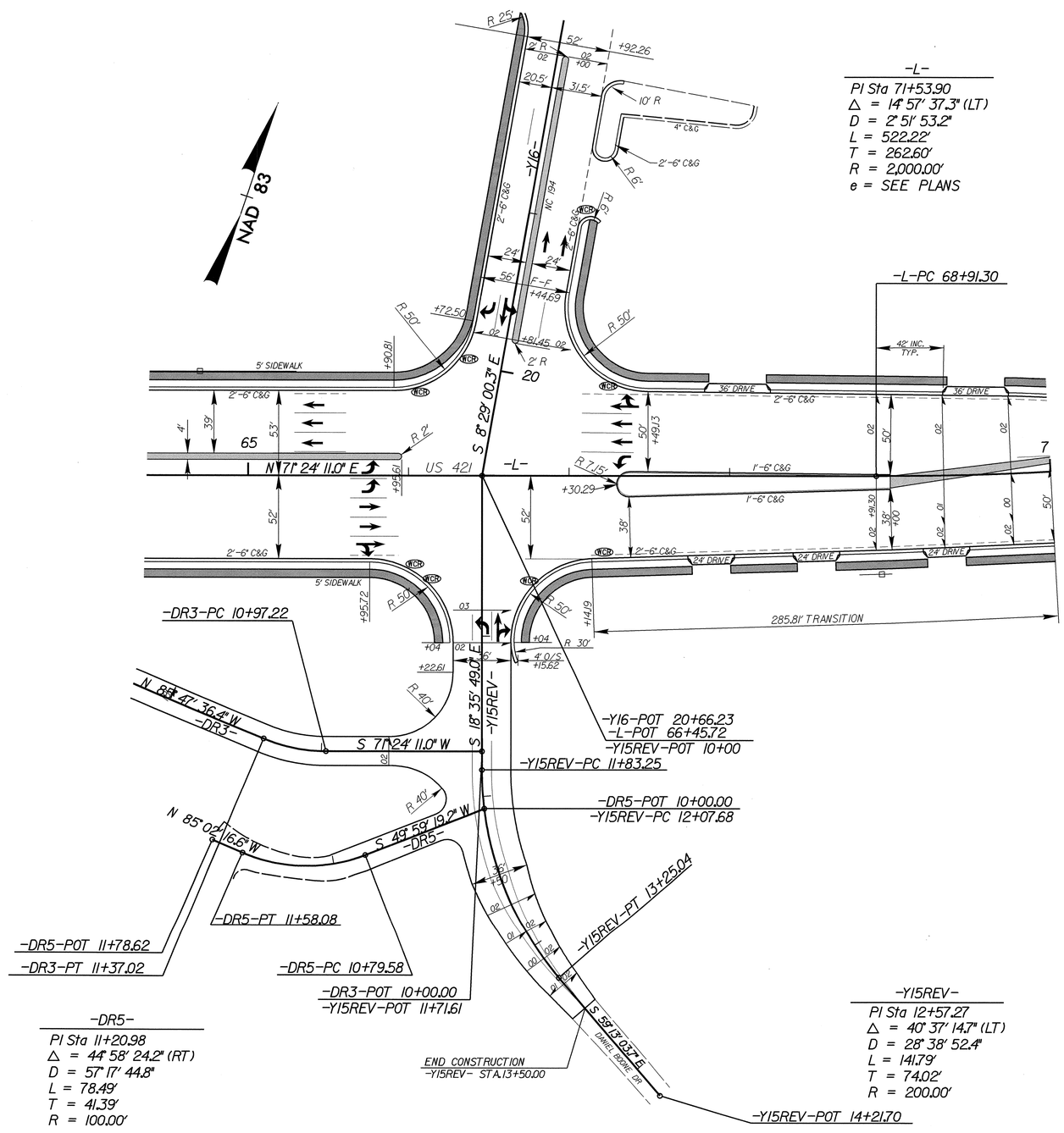
PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-M
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER

2-9-09

-Y15REV- & -Y16- INTERSECTION DETAILS



-L-
PI Sta 71+53.90
Δ = 14° 57' 37.3" (LT)
D = 2° 51' 53.2"
L = 522.22'
T = 262.60'
R = 2,000.00'
e = SEE PLANS

-DR5-
PI Sta 11+20.98
Δ = 44° 58' 24.2" (RT)
D = 57° 17' 44.8"
L = 78.49'
T = 41.39'
R = 100.00'

-Y15REV-
PI Sta 12+57.27
Δ = 40° 37' 14.7" (LT)
D = 28° 38' 52.4"
L = 141.79'
T = 74.02'
R = 200.00'

CONCRETE SIDEWALK

5" MONOLITHIC CONC. ISLAND

FOR PLANS SEE SHEET 8

REVISIONS

8/17/99

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

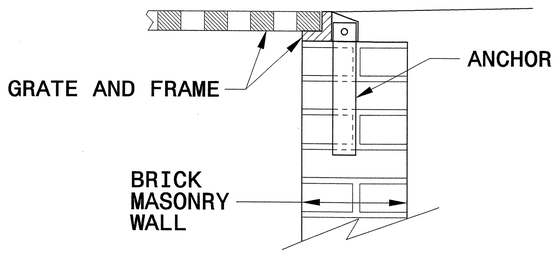
ENGLISH DETAIL DRAWING FOR

ANCHORAGE FOR FRAMES

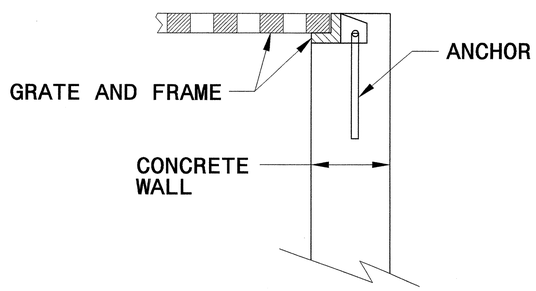
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

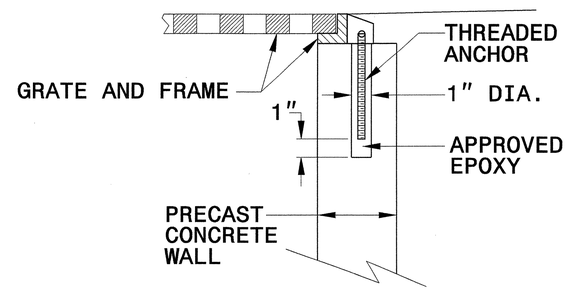
840D25



BRICK MASONRY CONSTRUCTION



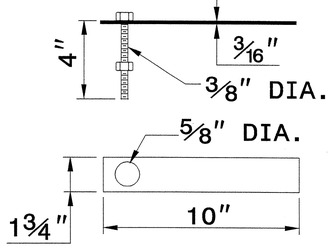
CONCRETE CONSTRUCTION



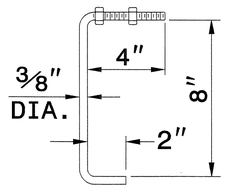
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

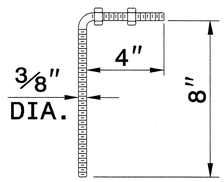
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



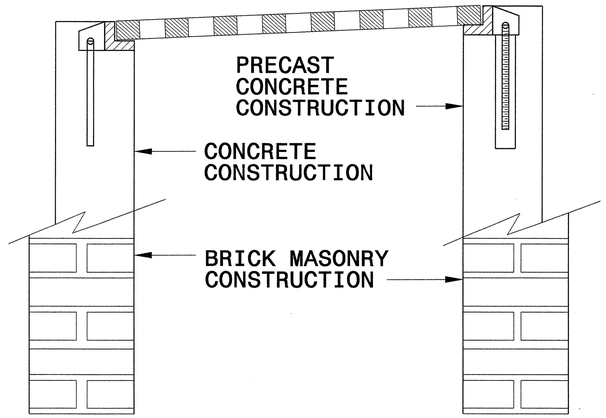
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

ENGLISH DETAIL DRAWING FOR

ANCHORAGE FOR FRAMES

BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

840D25

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HORTON
2/19/07

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE: 11/1/06
FILE SPEC.:

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

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

ENGLISH DETAIL DRAWING FOR
TRAFFIC BEARING DROP INLET
FOR DOUBLE FRAME AND GRATES

SHEET 1 OF 2 840D35

NOTES:
- HORIZONTAL AND VERTICAL DIMENSIONS MAY BE ADJUSTED AS THE FIELD CONDITIONS AND/OR ALTERNATE DESIGN REQUIRE.
- MAXIMUM HEIGHT FOR THIS STRUCTURE SHALL BE 14'-0".
- ALL ADJUSTMENTS ARE TO BE MADE AS DIRECTED BY THE ENGINEER.
- DEPTH OF STEEL GRATE WILL REQUIRE DEEPER SEAT ALONG SHORT WALLS.

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

ENGLISH DETAIL DRAWING FOR
TRAFFIC BEARING DROP INLET
FOR DOUBLE FRAME AND GRATES

SHEET 1 OF 2 **840D35**

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

ENGLISH DETAIL DRAWING FOR
TRAFFIC BEARING DROP INLET
FOR DOUBLE FRAME AND GRATES

SHEET 2 OF 2 840D35

BILL OF MATERIALS

COMMON		CONCRETE ALT.			BRICK ALT.		
BAR	SIZE	LENGTH	QUANTITY	WEIGHT	LENGTH	QUANTITY	WEIGHT
A	#5	8'-10"	6	55	9'-4½"	6	64
B	#5	5'-3"	12	66	5'-4½"	12	78
C	#5	4'-7"	12	57	0	0	0
D	#5	8'-0"	6	50	9'-3½"	6	58
E	#5	5'-6"	24	138	4'-9"	12	69
F	#5	4'-8"	24	117	4'-8"	12	58
G	#5	3'	7	16	2'-3½"	4	12
H	#4	1'-9"	5	6	1'-9"	5	6
REINF. STEEL (TOTAL WEIGHT LBS.)				505			345
CONCRETE IN TOP SLAB (CU.YDS.)				0.31			0.33
CONCRETE IN BASE (CU.YDS.)				0.89			1.02
CONCRETE IN WALLS (CU.YDS.)				2.22			0.80
BRICK IN WALLS (CU.YDS.)				-0-			0.90
CONCRETE TOTAL (CU.YDS.)				3.42			2.15
BRICK & CONCRETE TOTAL (CU.YDS.)				3.42			3.05
CONC. CU.YDS. IN WALL/FOOT OF HEIGHT				0.35			0.11
BRICK CU.YDS. IN WALL/FOOT OF HEIGHT				-0-			0.15
LBS. OF REINF. STEEL IN WALL/FOOT OF HEIGHT				103.2			72.0

GENERAL NOTES:
- CHAMFER ALL EXPOSED CONCRETE CORNERS 3".
- USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
- IF PIPES ARE SET IN THE BASE, FOLLOW CONSTRUCTION PROCEDURES SHOWN BY STD. DWG. 840.00.
- PRECAST UNITS MADE OF CLASS "AA" CONCRETE MAY BE USED IN LIEU OF BRICK MASONRY CONSTRUCTION.
- INCLUDE REINFORCING STEEL COST IN THE UNIT OR PER METER BID PRICE FOR "MASONRY DRAINAGE STRUCTURE".
- REFERENCE STD. DWG. 840.25 FOR FRAME ANCHORAGE.
- CONCRETE BRICK, JUMBO BRICK AND 4" SOLID CONCRETE BLOCK WILL BE PERMITTED.
- PROVIDE DROP INLETS OVER 3'-6" DEEP WITH STEPS AS DIRECTED BY STD. DWG. 840.66.
- FRAME AND GRATES SHALL BE SEPARATE CONTRACT ITEM.

STATE OF
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
TRAFFIC BEARING DROP INLET
FOR DOUBLE FRAME AND GRATES

SHEET 2 OF 2 **840D35**

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

SEE PLATE FOR TITLE

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PROJECT REFERENCE NO.	SHEET
U-4020	2-P

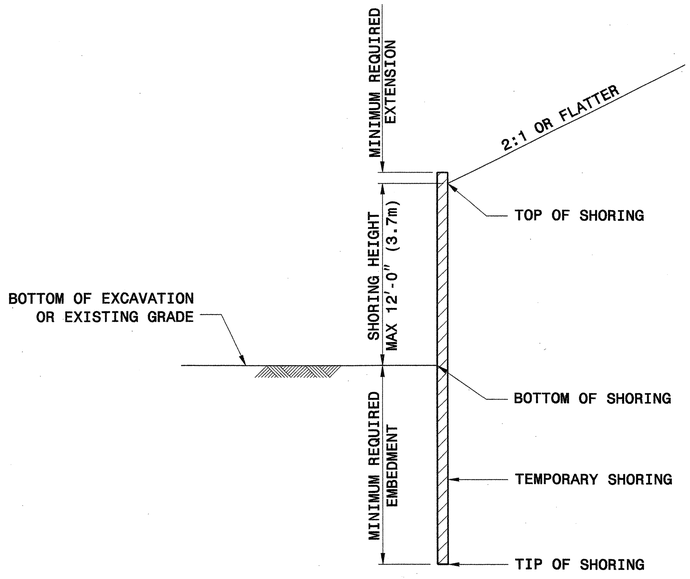
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

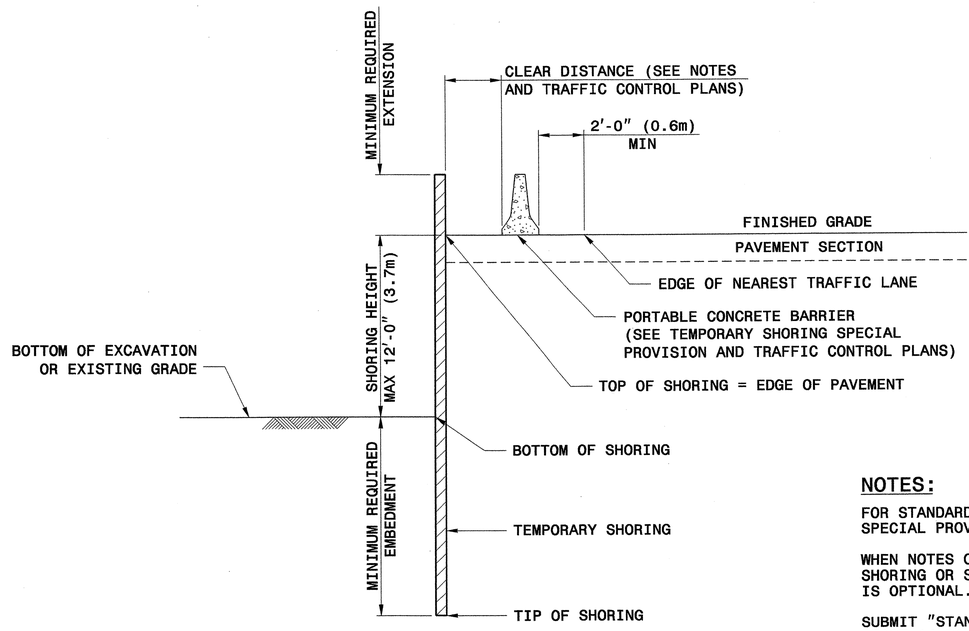
Scott A. Hiddon 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE



SLOPE CASE



SURCHARGE CASE

		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 (m)					MINIMUM REQUIRED EMBEDMENT FT (m)		
GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN^3/FT (cm^3/m)	HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)	MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN^3/FT (cm^3/m)	HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)
GROUNDWATER ELEVATION BELOW TIP OF SHORING	< 6 (1.8)	7.5 (2.3)	3.0 (161)	8.0 (2.4)	8.0 (2.4)	8.0 (2.4)	11.0 (3.4)	10.0 (538)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)
	7 (2.1)	8.5 (2.6)	4.5 (242)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	12.0 (3.7)	12.0 (645)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)
	8 (2.4)	10.0 (3.0)	6.5 (349)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	12.5 (3.8)	14.0 (753)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)
	9 (2.7)	11.0 (3.4)	9.5 (511)	--	12.0 (3.7)	12.0 (3.7)	13.5 (4.1)	16.5 (887)	--	12.5 (3.8)	12.5 (3.8)
	10 (3.0)	12.5 (3.8)	13.0 (699)	--	--	13.5 (4.1)	14.0 (4.3)	19.5 (1048)	--	13.5 (4.1)	13.5 (4.1)
	11 (3.4)	13.5 (4.1)	17.0 (914)	--	--	14.5 (4.4)	15.0 (4.6)	22.5 (1210)	--	--	14.5 (4.4)
	12 (3.7)	15.0 (4.6)	21.5 (1156)	--	--	16.0 (4.9)	16.0 (4.9)	25.5 (1371)	--	--	15.5 (4.7)
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND TIP OF SHORING	< 6 (1.8)	11.5 (3.5)	4.5 (242)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)	16.0 (4.9)	12.0 (645)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)
	7 (2.1)	13.0 (4.0)	7.0 (376)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)	17.0 (5.2)	14.5 (780)	14.5 (4.4)	14.5 (4.4)	14.5 (4.4)
	8 (2.4)	15.0 (4.6)	10.0 (538)	--	15.0 (4.6)	15.0 (4.6)	18.0 (5.5)	17.0 (914)	--	15.5 (4.7)	15.5 (4.7)
	9 (2.7)	17.0 (5.2)	14.0 (753)	--	17.0 (5.2)	17.0 (5.2)	19.0 (5.8)	20.0 (1075)	--	17.0 (5.2)	17.0 (5.2)
	10 (3.0)	18.5 (5.6)	19.5 (1048)	--	--	18.5 (5.6)	20.0 (6.1)	23.5 (1263)	--	--	18.5 (5.6)
	11 (3.4)	20.5 (6.3)	26.0 (1398)	--	--	--	21.0 (6.4)	28.0 (1505)	--	--	20.0 (6.1)
	12 (3.7)	22.5 (6.9)	33.0 (1774)	--	--	--	22.0 (6.7)	33.0 (1774)	--	--	21.5 (6.6)

NOTE: MINIMUM REQUIRED EXTENSION IS 6" (150mm) FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" (800 mm) FOR "SURCHARGE CASE WITH TRAFFFIC IMPACT".

NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING OR STANDARD SHORING, STANDARD TEMPORARY SHORING IS OPTIONAL.

SUBMIT "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 14 DAYS BEFORE BEGINNING SHORING CONSTRUCTION. UP TO THREE LOCATIONS MAY BE INCLUDED ON EACH SELECTION FORM.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING CONDITIONS:
1) MAXIMUM SHORING HEIGHT IS 12'-0" (3.7m).
2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
3) BOTTOM OF EXCAVATION OR EXISTING GRADE IN FRONT OF SHORING IS 6:1 (H:V) SLOPE OR FLATTER.
4) H PILE SPACING IS 6'-0" (1.8m).
5) H PILE EMBEDMENT DEPTHS ARE FOR DRIVEN PILES.
6) TIMBER LAGGING IS A MINIMUM OF 3" (75mm) THICK.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M^3)
FRICTION ANGLE = 30 DEGREES
COHESION = 0 PSF (0 KPA)
GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT WITHIN THE EMBEDMENT DEPTH.

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

IF THE CLEAR DISTANCE AVAILABLE IS LESS THAN THE MINIMUM REQUIRED IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS, SET THE BARRIER AGAINST THE TRAFFIC SIDE OF THE SHORING AND USE THE "SURCHARGE CASE WITH TRAFFIC IMPACT".

AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF THE SHORING. COLLECT AND DIRECT RUNOFF AWAY FROM SHORING.

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

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: 2-20-07

PROJECT REFERENCE NO.	SHEET
U-4020	2-Q

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

STANDARD TEMPORARY MSE WALL OPTIONS

TEMPORARY MSE WALL OPTION	VENDOR	CONTACT INFORMATION	REINFORCEMENT TYPE	SHEETS
TEMPORARY FABRIC WALL	N/A	N/A	POLYESTER OR POLYPROPYLENE FABRIC	3
HILFIKER TEMPORARY WALL	HILFIKER RETAINING WALLS	1902 HILFIKER LANE, EUREKA, CA 95503-5711 707-443-5093 WWW.HILFIKER.COM	WELDED WIRE MAT	4
SIERRASCAPE TEMPORARY WALL	TENSAR EARTH TECHNOLOGIES, INC	5883 GLENRIDGE DRIVE, SUITE 200 ATLANTA, GA 30328-5363 404-250-1290 WWW.TENSARCORP.COM	GEOGRID	5
RETAINED EARTH TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	WELDED WIRE MESH	6-8
TERRATREL TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	RIBBED STEEL STRIPS	9-11

FOR STANDARD TEMPORARY MSE WALLS, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT TEMPORARY MSE WALLS OR STANDARD SHORING, STANDARD TEMPORARY MSE WALLS ARE OPTIONAL.

WHEN NOTES ON PLANS REQUIRE TEMPORARY MSE WALLS, USE STANDARD TEMPORARY MSE WALLS OR CONTRACTOR DESIGNED TEMPORARY MSE WALLS.

WHEN THE ALIGNMENT OF STANDARD TEMPORARY MSE WALLS RESULTS IN AN INTERIOR ANGLE LESS THAN 90 DEGREES, SUBMIT AN ACUTE CORNER DETAIL FOR THE SPECIFIC SITUATION IN ACCORDANCE WITH THE WALL VENDOR RECOMMENDATIONS. ALSO, SUBMIT A "STANDARD TEMPORARY MSE WALL SELECTION FORM" FOR EACH TEMPORARY MSE WALL LOCATION. SUBMIT THESE ITEMS AT LEAST 14 DAYS BEFORE BEGINNING WALL CONSTRUCTION.

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING CONDITIONS:
1) MAXIMUM WALL HEIGHT IS 28'-0" (8.5m).
2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
3) EXISTING OR FINISHED GRADE IN FRONT OF WALL IS 6:1 (H:V) SLOPE OR FLATTER.
4) THE GRADE OF THE TOP OF WALL IS LESS THAN 4% FOR RETAINED EARTH AND TERRATREL TEMPORARY WALLS.
5) DESIGN SERVICE LIFE IS 3 YEARS.
6) MATERIAL IN REINFORCED ZONE IS SHORING BACKFILL.
7) MAXIMUM APPLIED BEARING PRESSURE IS 1 TSF (100 KPA) FOR WALL HEIGHTS UP TO 8'-0" (2.4m), 2 TSF (195 KPA) FOR WALL HEIGHTS BETWEEN 8'-0" AND 18'-0" (2.4m AND 5.5m) AND 3 TSF (290 KPA) FOR WALL HEIGHTS OVER 18'-0" (5.5m).

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMMED SOIL PARAMETERS:
TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M^3)
FRICTION ANGLE = 30 DEGREES
COHESION = 0 PSF (0 KPA)
GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF REINFORCED ZONE.

DO NOT USE STANDARD TEMPORARY MSE WALLS WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW THE BOTTOM OF REINFORCED ZONE.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF STANDARD TEMPORARY MSE WALLS. COLLECT AND DIRECT RUNOFF AWAY FROM WALLS AND SHORING BACKFILL.

EXCAVATE AS NECESSARY FOR STANDARD TEMPORARY MSE WALLS IN ACCORDANCE WITH THE FOLLOWING FOR THE WALL OPTION CHOSEN:
1) MINIMUM EMBEDMENT OF 18" (450mm) UNLESS WALL BEARS ON ROCK, CONCRETE OR PAVEMENT AS DETERMINED BY THE ENGINEER
2) VERTICAL STEPS IN INCREMENTS EQUAL TO THE VERTICAL REINFORCEMENT SPACING
3) WITH THE EXCEPTION OF EITHER THE FIRST OR LAST SECTION OF WALL, HORIZONTAL SECTION LENGTHS IN INCREMENTS EQUAL TO THE FOLLOWING:

STANDARD TEMPORARY MSE WALL OPTION	INCREMENT
TEMPORARY FABRIC WALL	9'-0" (2.7m) MIN (VARIES)
HILFIKER TEMPORARY WALL	10'-0" (3.0m) MIN (VARIES)
SIERRASCAPE TEMPORARY WALL	18'-7¼" (5.7m)
RETAINED EARTH TEMPORARY WALL	24'-0" (7.3m)
TERRATREL TEMPORARY WALL	19'-8" (6.0m)

DO NOT PLACE SHORING BACKFILL OR FIRST REINFORCEMENT LAYER UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

IF APPLICABLE, INSTALL FOUNDATIONS LOCATED WITHIN THE REINFORCED ZONE BEFORE BEGINNING WALL CONSTRUCTION UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

ERECT AND MAINTAIN FACINGS AND FORMS AS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS. STAGGER VERTICAL JOINTS OF FACINGS AND FORMS TO CREATE A RUNNING BOND WHEN POSSIBLE UNLESS SHOWN OTHERWISE ON THESE DETAILS.

PLACE FACINGS AND FORMS AS NEAR TO VERTICAL AS POSSIBLE WITH NO NEGATIVE BATTER. CONSTRUCT STANDARD TEMPORARY MSE WALLS WITH A VERTICAL AND HORIZONTAL TOLERANCE OF 3" (75mm) WHEN MEASURED WITH A 10'-0" (3m) STRAIGHT EDGE AND AN OVERALL VERTICAL PLUMBNESS (BATTER) AND HORIZONTAL ALIGNMENT OF LESS THAN 6" (150mm).

PLACE REINFORCEMENT AT LOCATIONS AND ELEVATIONS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS AND IN SLIGHT TENSION FREE OF KINKS, FOLDS, WRINKLES OR CREASES.

DO NOT SPLICE REINFORCEMENT IN THE REINFORCEMENT DIRECTION (RD), i.e., PARALLEL TO THE WALL FACE. SEAMS ARE ALLOWED IN THE CROSS-REINFORCEMENT DIRECTION (CRD).

CONTACT THE ENGINEER WHEN EXISTING OR FUTURE STRUCTURES SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT. TO AVOID STRUCTURES, DELFECT, SKEW AND MODIFY REINFORCEMENT.

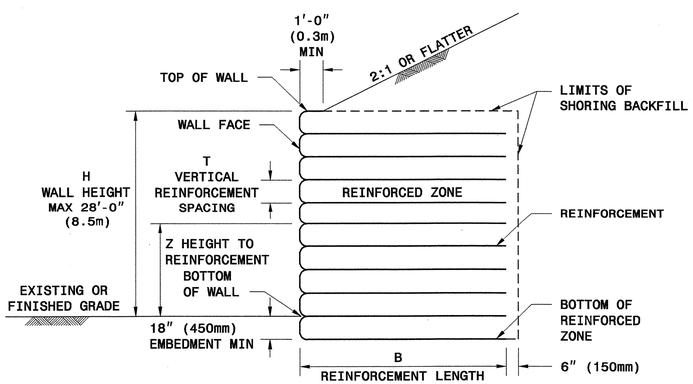
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

DO NOT DAMAGE REINFORCEMENT WHEN PLACING AND COMPACTING SHORING BACKFILL. DO NOT OPERATE HEAVY EQUIPMENT ON REINFORCEMENT UNTIL IT IS COVERED WITH AT LEAST 10" (250mm) OF SHORING BACKFILL. DO NOT USE SHEEPSFOOT, GRID ROLLERS OR OTHER TYPES OF COMPACTION EQUIPMENT WITH FEET.

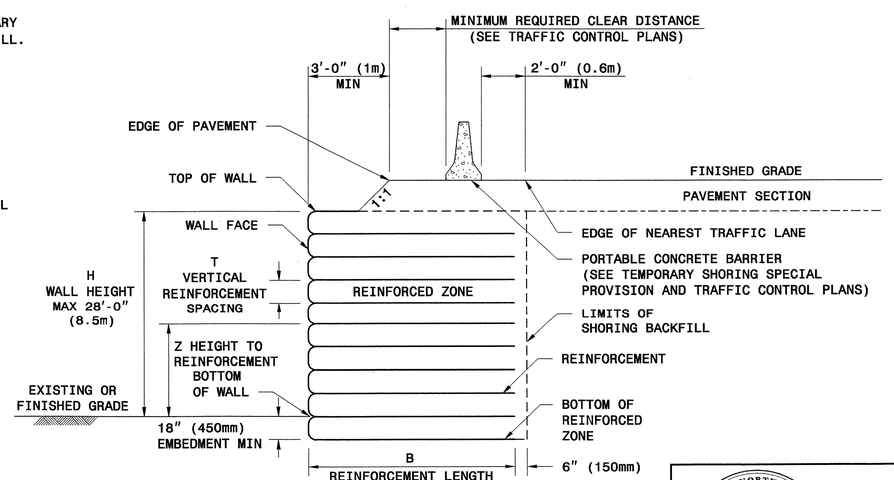
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

BENCH STANDARD TEMPORARY MSE WALLS INTO THE SIDES OF EXCAVATIONS WHERE APPLICABLE.

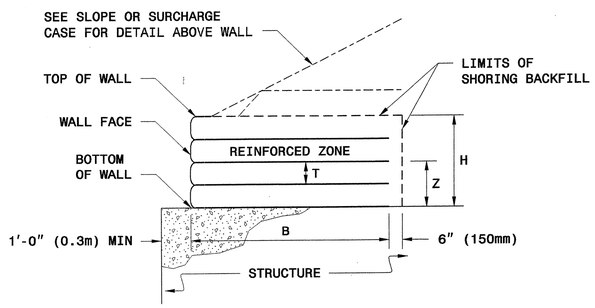
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE

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 MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
U-4020	2-R

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

scott a. hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

HOW TO USE THIS SHEET:

- FOR ALL WALL OPTIONS, DETERMINE MINIMUM REQUIRED REINFORCEMENT LENGTH (B) FROM TABLE AT RIGHT BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE
- FOR STANDARD TEMPORARY FABRIC WALL, SEE SHEET 3 FOR FABRIC STRENGTH REQUIREMENTS BASED ON WALL HEIGHT (H)
- FOR ALL OTHER WALL OPTIONS, DETERMINE REINFORCEMENT TYPE FROM TABLES BELOW FOR EACH HEIGHT TO REINFORCEMENT (Z) BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

WALL HEIGHT H (FT)	<8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE	8	11	13	14	16	18	20	22	24	25	27
SURCHARGE CASE	8	9	11	12	14	15	16	18	19	21	22

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT-INCHES)
												3	27 - 8
											3	3	26 -10
											3	3	25 - 2
										3	3	3	23 - 6
									3	3	3	3	21 -10
								3	3	3	3	3	20 - 2
							3	3	3	3	3	3	18 - 6
						3	3	3	3	3	3	3	16 -10
						3	3	3	3	3	3	3	15 - 2
					4	3	3	3	3	3	3	3	13 - 6
				4	4	3	3	3	3	3	3	3	11 -10
			5	4	4	3	3	3	3	3	3	3	10 - 2
		5	5	4	4	3	3	3	3	3	3	3	8 - 6
	5	5	5	4	4	3	3	3	3	3	3	3	6 -10
	5	5	5	4	4	3	3	3	3	3	3	3	5 - 2
5	5	5	5	4	4	3	3	3	3	3	3	3	3 - 6
5	5	5	5	4	4	3	3	3	3	3	3	3	1 -10
5	5	5	5	4	4	3	3	3	3	3	3	3	0 - 2
5	5	5	5	4	4	3	3	3	3	3	3	3	-0 - 8

SLOPE AND SURCHARGE CASES

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

11 = UX1100MSE
14 = UX1400MSE
15 = UX1500MSE
16 = UX1600MSE
17 = UX1700MSE

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												11	26.5
											11	11	25.5
											11	11	24
										11	11	11	22.5
									11	11	11	15	21
								11	11	11	14	15	19.5
							11	11	11	11	14	15	18
						11	11	11	11	14	15	15	16.5
					11	11	11	11	14	15	15	15	15
					11	11	11	15	15	15	15	15	13.5
				11	11	11	11	15	15	15	15	16	12
			11	11	11	11	15	15	15	15	16	16	10.5
		11	11	11	11	14	15	15	15	16	16	16	9
	11	11	11	11	14	15	15	15	16	16	16	16	7.5
	11	11	11	11	14	15	15	15	16	16	16	17	6
11	11	11	11	14	15	15	15	15	16	16	16	17	4.5
11	11	11	11	14	15	15	15	16	16	16	17	17	3
11	11	11	14	15	15	15	15	16	16	17	17	17	1.5
11	11	11	14	15	15	15	15	16	16	17	17	17	0
11	11	11	14	15	15	15	15	16	16	17	17	17	-1.5

SLOPE CASE

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												11	26.5
												11	25.5
											11	11	24
											11	11	22.5
										11	11	11	21
									11	11	11	11	19.5
								11	11	11	11	15	18
							11	11	11	11	15	15	16.5
						11	11	11	11	11	15	15	15
						11	11	11	11	15	15	15	13.5
					11	11	11	11	15	15	15	15	12
					11	11	11	15	15	15	15	15	10.5
				11	11	11	11	15	15	15	15	15	9
			11	11	11	11	15	15	15	15	15	16	7.5
		11	11	11	11	15	15	15	15	15	16	16	6
	11	11	11	11	15	15	15	15	15	16	16	16	4.5
11	11	11	11	14	15	15	15	15	16	16	16	16	3
11	11	11	11	14	15	15	15	16	16	16	16	17	1.5
11	11	11	14	15	15	15	15	16	16	16	17	17	0
11	11	11	14	15	15	15	15	15	16	16	17	17	-1.5

SURCHARGE CASE

Z (FT)

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

4.5 = W4.5 x W3.5
7.0 = W7.0 x W3.5
9.5 = W9.5 x W4.0

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												4.5	26
											4.5	7.0	24
										4.5	7.0	7.0	22
									4.5	7.0	7.0	7.0	20
								4.5	7.0	7.0	7.0	7.0	18
							4.5	7.0	7.0	7.0	7.0	7.0	16
						4.5	7.0	7.0	7.0	7.0	7.0	9.5	14
					4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	4
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	3
4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	2
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	7.0	1
7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	7.0	0
7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	-1.5

SLOPE CASE

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												4.5	26
											4.5	7.0	24
										4.5	7.0	7.0	22
									4.5	7.0	7.0	7.0	20
								4.5	7.0	7.0	7.0	7.0	18
							4.5	7.0	7.0	7.0	7.0	7.0	16
						4.5	7.0	7.0	7.0	7.0	7.0	7.0	14
					4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	4
4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	2
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	1
7.0	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	0
7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	-1.5

SURCHARGE CASE

Z (FT)

RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

3X1 = 3W8 x W8 x 1.0'
3X2 = 3W8 x W8 x 2.0'

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT-INCHES)
												3X1	27 - 6
												3X1	26 -10
											3X1	3X2	25 - 2
										3X1	3X1	3X2	23 - 6
									3X1	3X1	3X2	3X2	21 -10
								3X1	3X1	3X2	3X2	3X2	20 - 2
							3X1	3X1	3X2	3X2	3X2	3X2	18 - 6
						3X1	3X2	3X2	3X2	3X2	3X2	3X2	16 -10
						3X1	3X2	3X2	3X2	3X2	3X2	3X2	15 - 2
					3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	13 - 6
				3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	11 -10
			3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	10 - 2
		3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	8 - 6
		3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	6 -10
	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	5 - 2
3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3 - 6
3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	1 -10
3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	0 - 2
3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	-1 - 6

SLOPE AND SURCHARGE CASES

NOTES FOR HILFIKER TEMPORARY WALL

1) CAP MAT AT TOP OF WALL IS NOT INCLUDED IN TABLES.
2) REINFORCEMENT IS NOT REQUIRED AT 1' LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 24'.
3) REINFORCEMENT IS NOT REQUIRED AT 3' LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26'.
4) REINFORCEMENT IS NOT REQUIRED AT 1' LEVEL FOR SURCHARGE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26'.

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GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11 DATE: 2-20-07

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-4020	2-S

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

scott a. hidden 3/29/07

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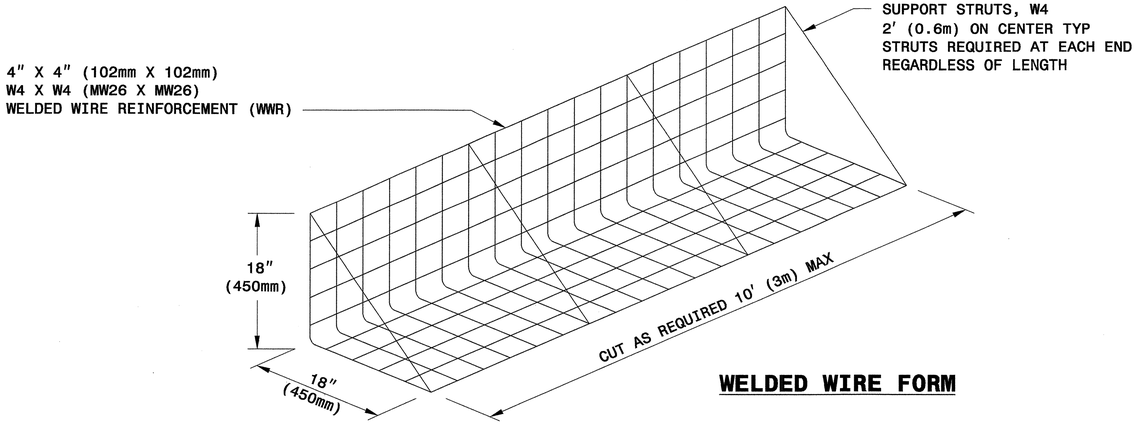
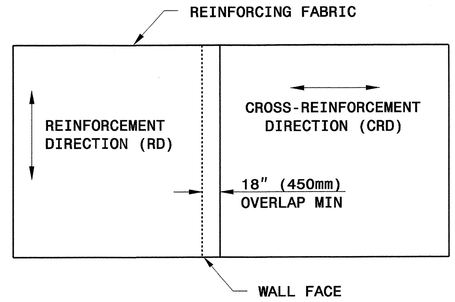
ENGINEER

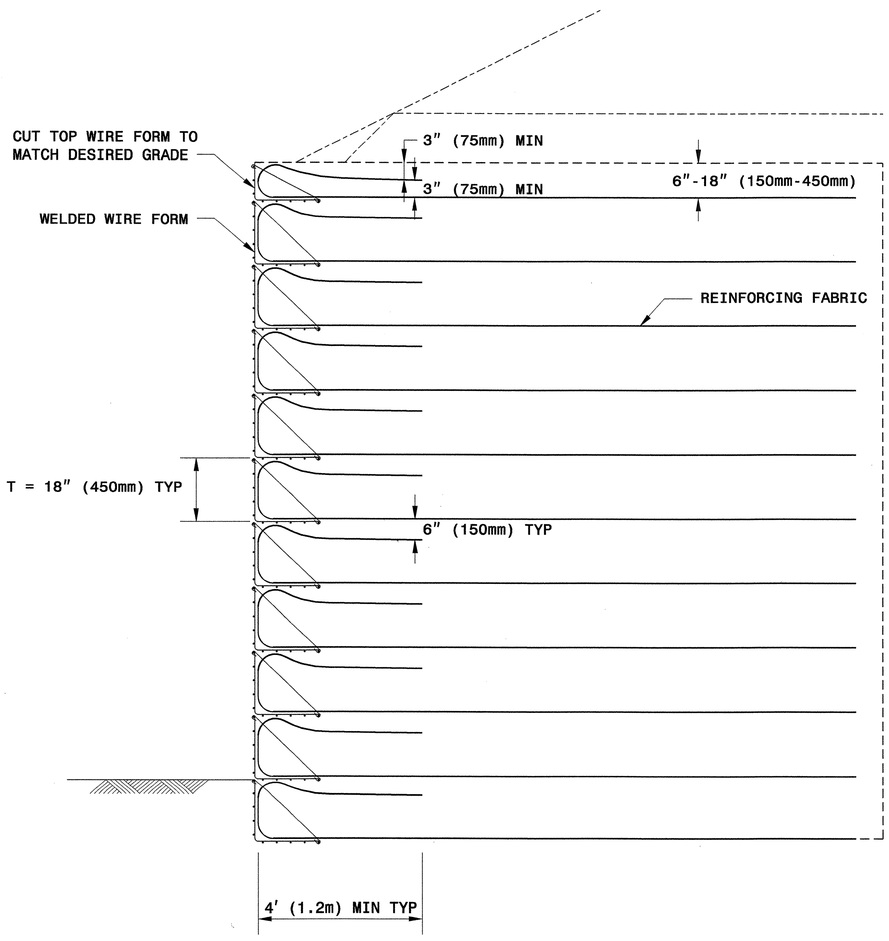
SIGNATURE DATE



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP



TYPICAL SECTION

MINIMUM REQUIRED REINFORCING FABRIC STRENGTH FOR RD*
(SLOPE AND SURCHARGE CASES)

WALL HEIGHT H FEET (M)	POLYESTER WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)	POLYPROPYLENE WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)
4 (1.2)	200 (35)	200 (35)
6 (1.8)	200 (35)	200 (35)
8 (2.4)	200 (35)	200 (35)
10 (3.0)	200 (35)	230 (40)
12 (3.7)	220 (39)	264 (46)
14 (4.3)	248 (43)	297 (52)
16 (4.9)	276 (48)	330 (58)
18 (5.5)	304 (53)	364 (64)
20 (6.1)	332 (58)	397 (70)
22 (6.7)	359 (63)	431 (76)
24 (7.3)	387 (68)	464 (81)
26 (7.9)	415 (73)	497 (87)
28 (8.5)	443 (78)	531 (93)

*RD = REINFORCEMENT DIRECTION

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RALEIGH

STANDARD DRAWING NO. 1801.02

TEMPORARY
FABRIC WALL

SHEET 3 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
U-4020	2-T

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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ENGINEER

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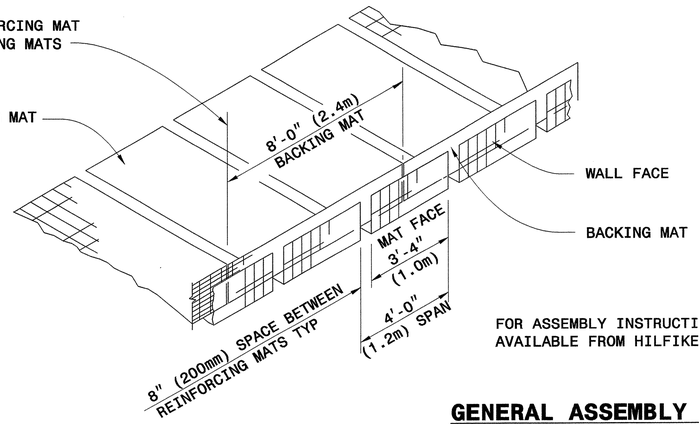
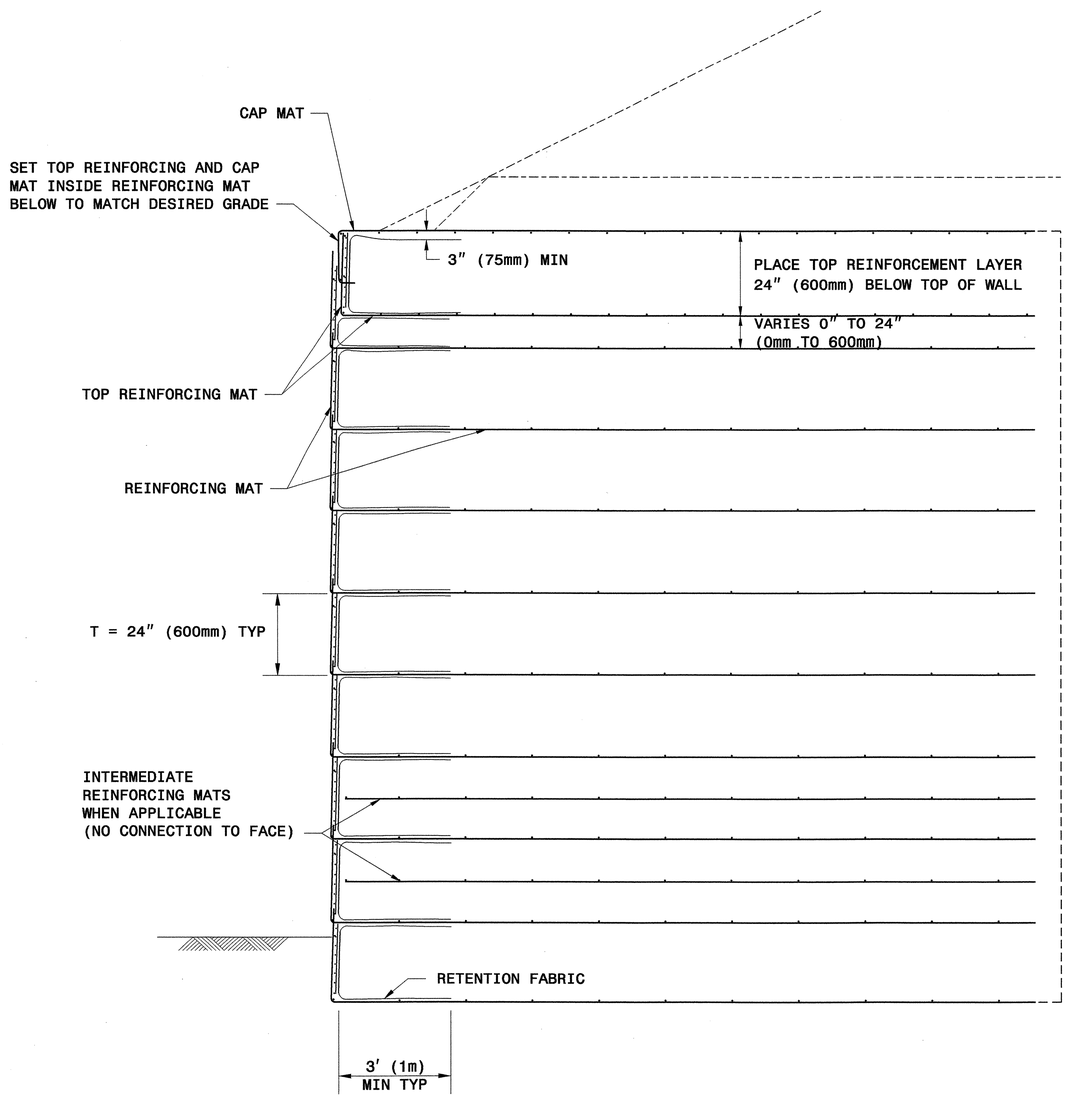
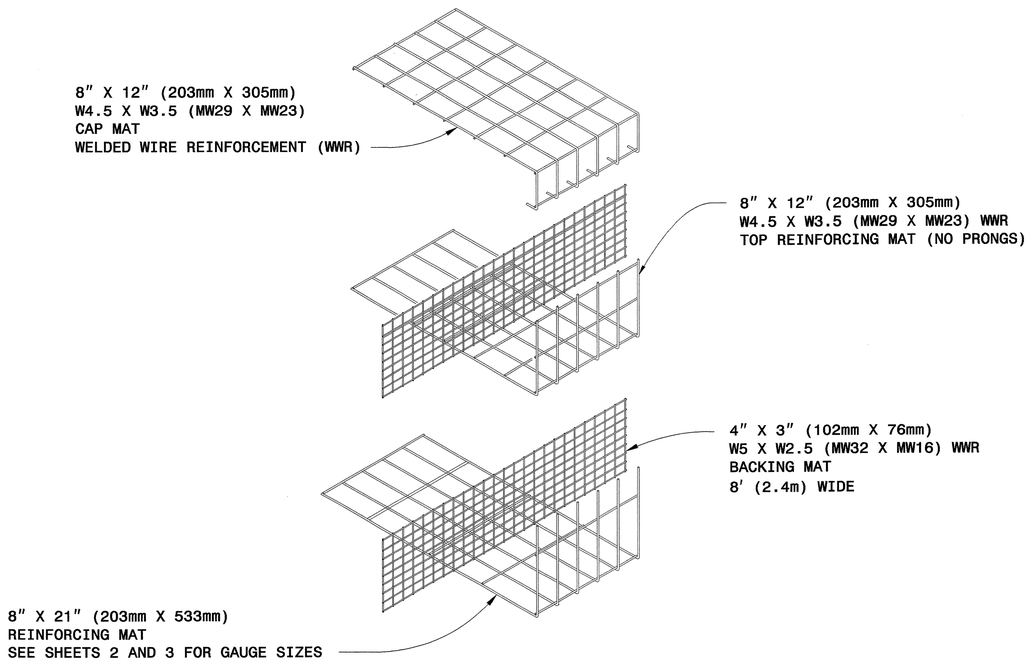


FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL



TYPICAL SECTION



WALL COMPONENTS

HILFIKER RETAINING WALLS

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

HILFIKER TEMPORARY WALL

SHEET 4 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-4020	2-U

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

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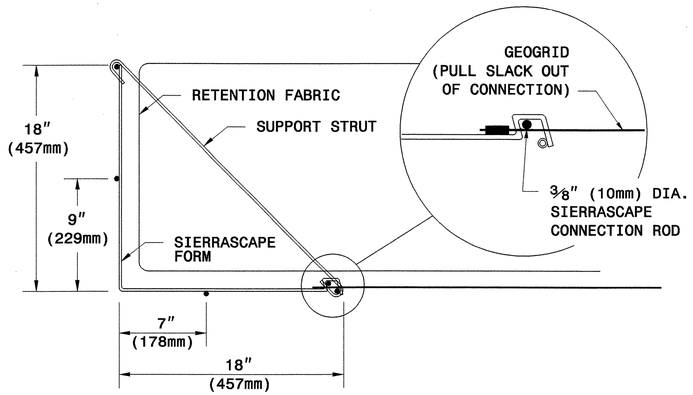
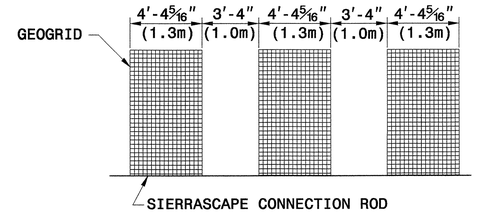
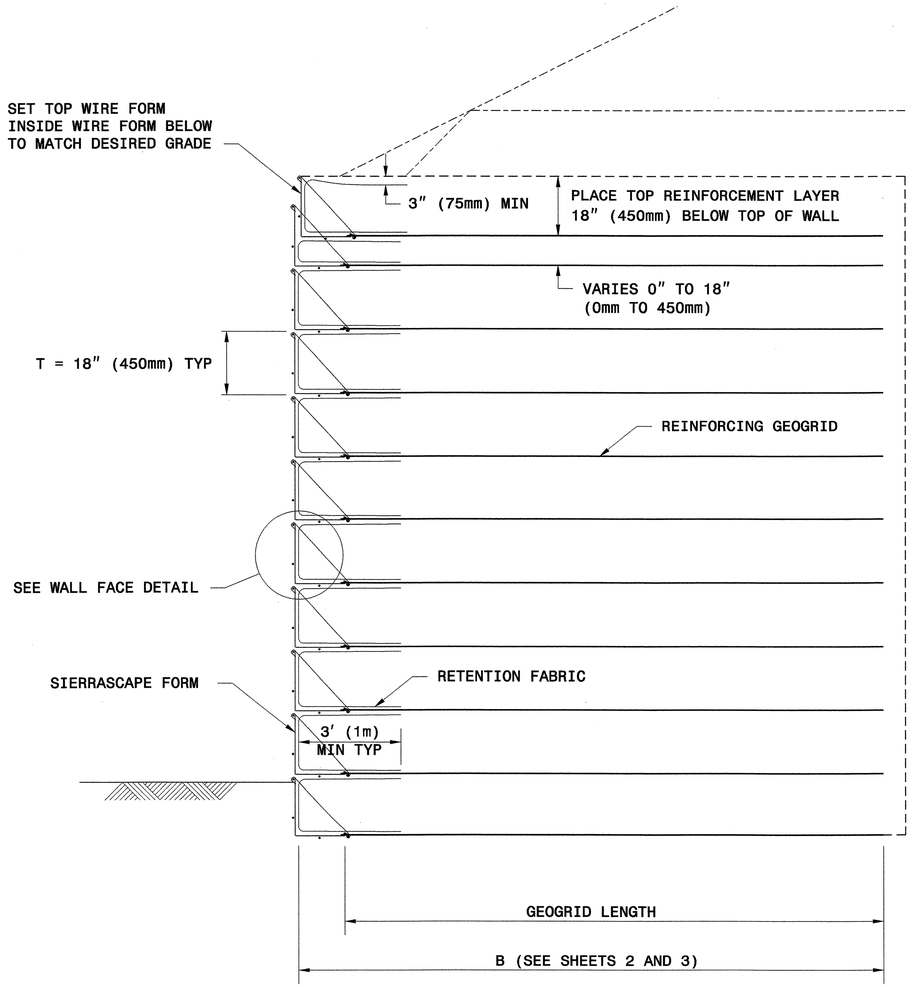


WALL FACE DETAIL

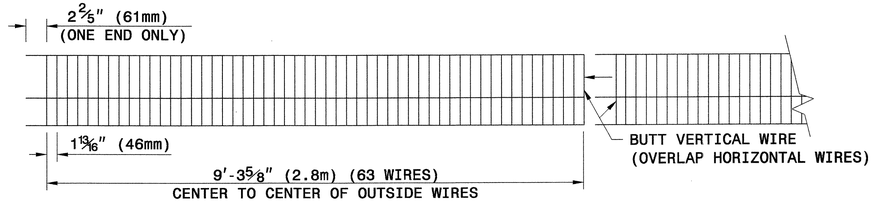


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN
SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

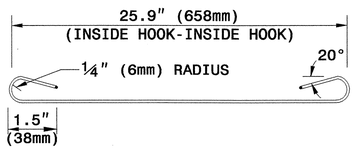
TYPICAL GEOGRID COVERAGE



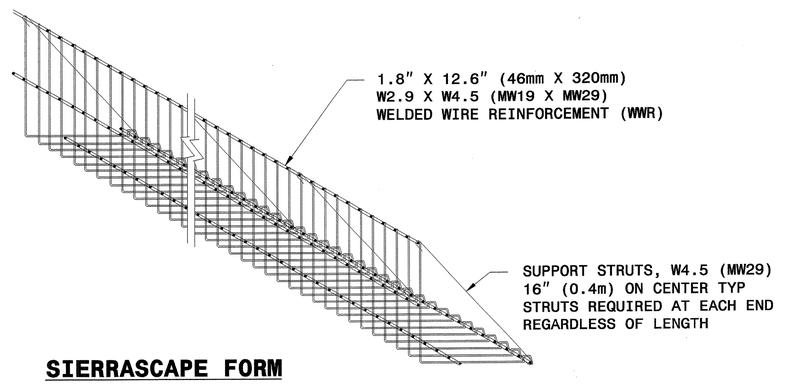
TYPICAL SECTION



ELEVATION VIEW



SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS

TENSAR®
TENSAR EARTH TECHNOLOGIES, INC.

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE
TEMPORARY WALL

SHEET 5 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
U-4020	2-V

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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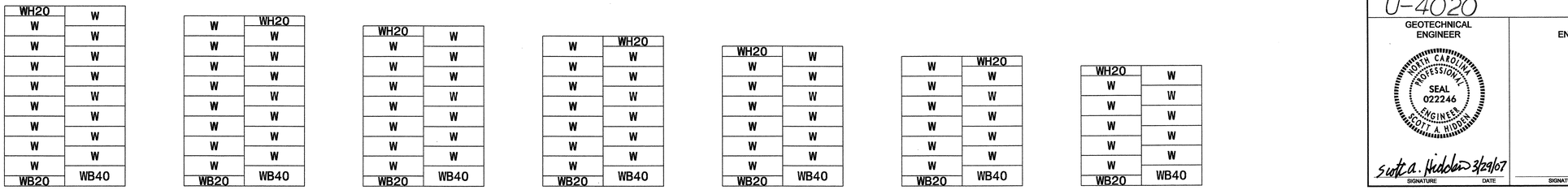
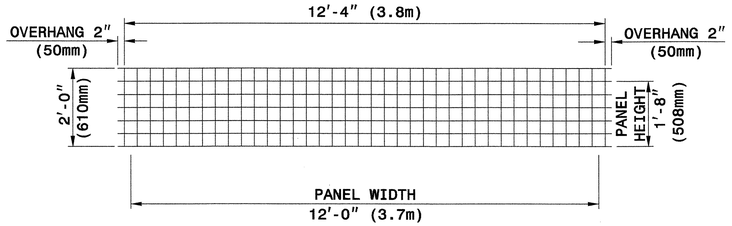
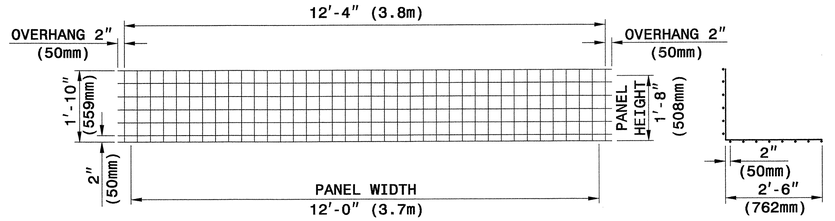
PANEL LAYOUTS

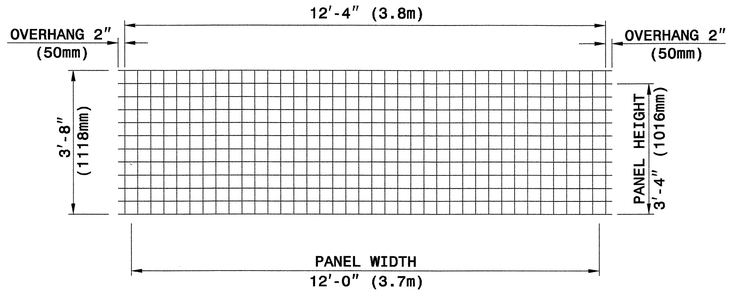




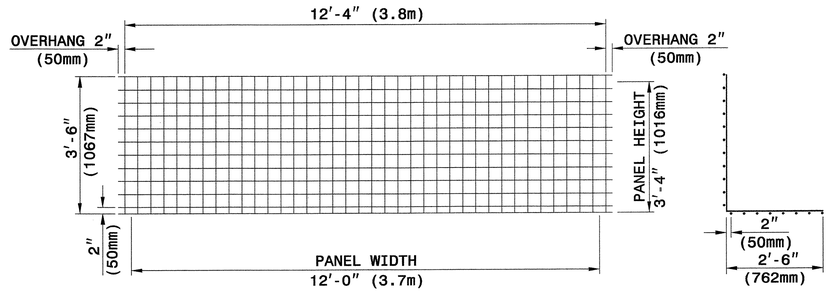
TYPE WH20



TYPE WB20 **SECTION**



TYPE W



TYPE WB40 **SECTION**

WELDED WIRE FACINGS

WELDED WIRE FORMS

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

4" X 4" (100mm X 100mm), W8 X W8 (MW52 X MW52) WELDED WIRE REINFORCEMENT (WWR)

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 6 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
U-4020	2-W

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022246 SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
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ENGINEER

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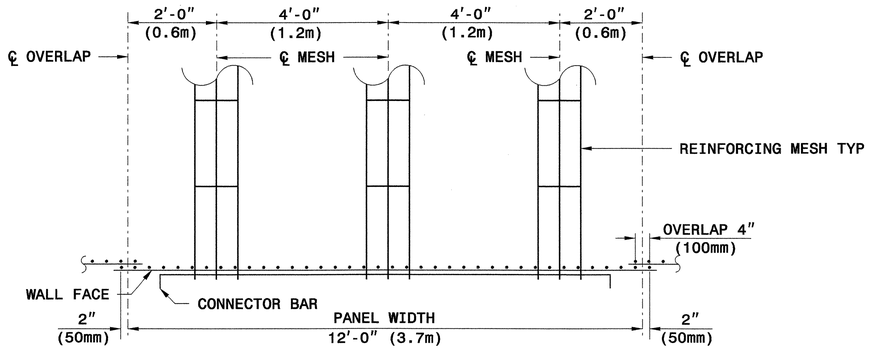
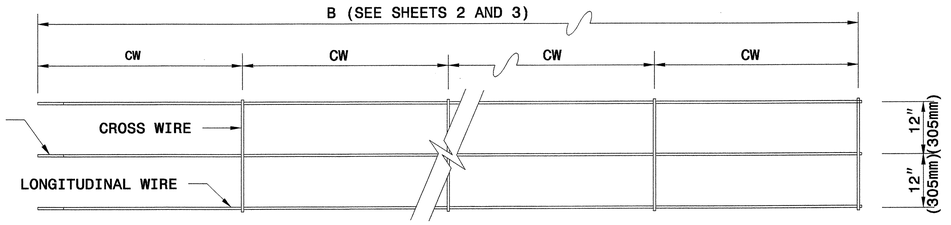


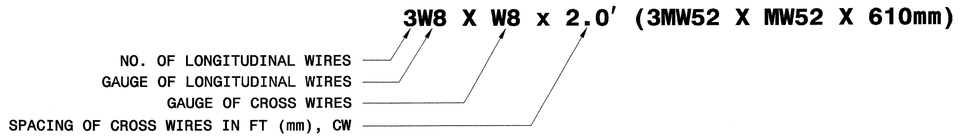
REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)

½" (13mm) DIA. BAR

CONNECTOR BAR

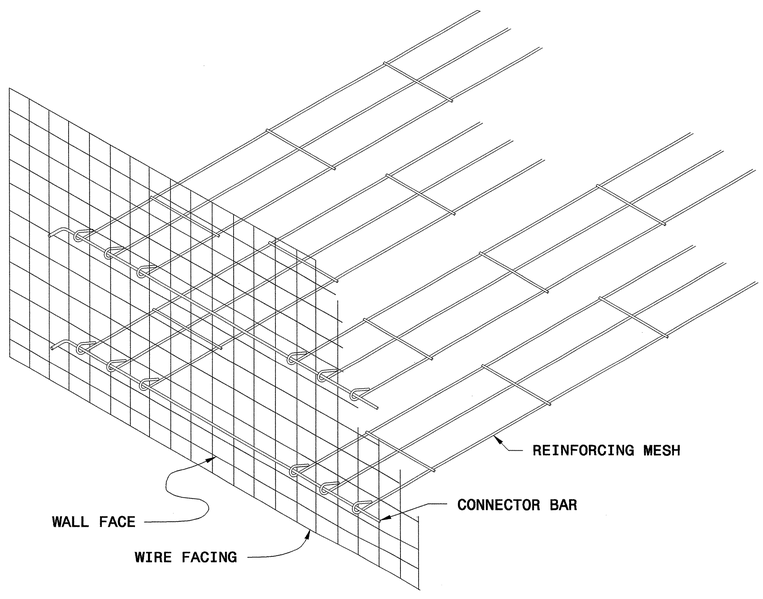


IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

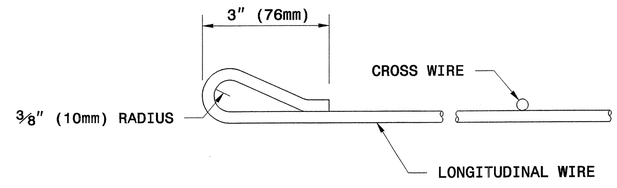


REINFORCING MESH DESIGNATION

REINFORCING MESH



GENERAL ASSEMBLY DETAIL



REINFORCING MESH LOOP DETAIL

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 7 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-4020	2-X

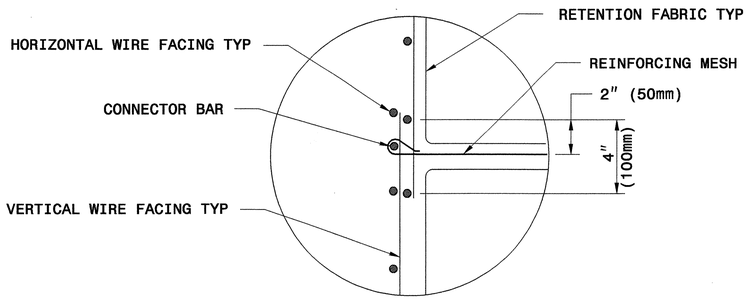
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

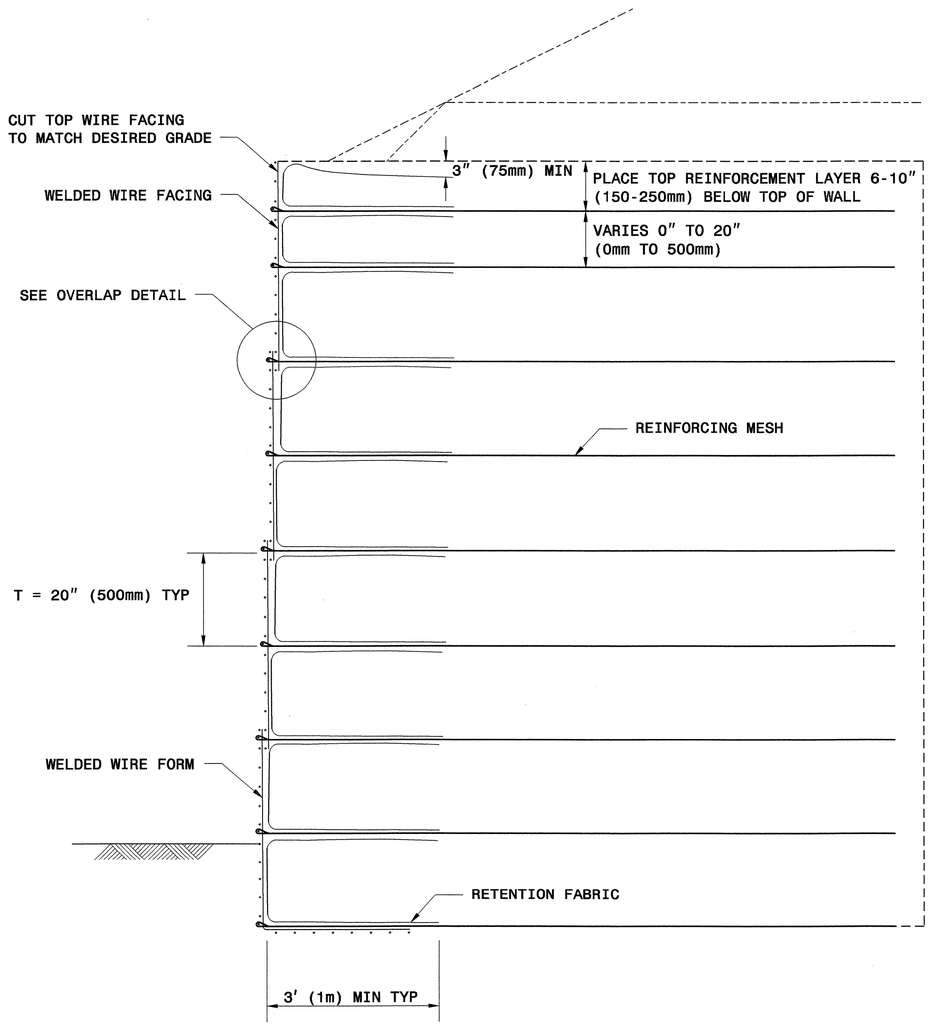
SIGNATURE scott a. hidden DATE 3/29/07

ENGINEER

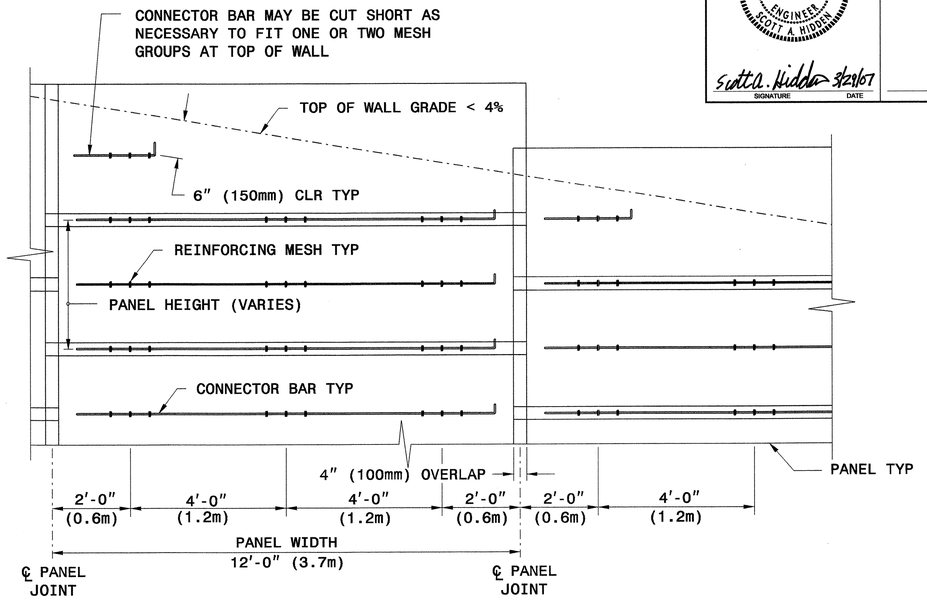
SIGNATURE DATE



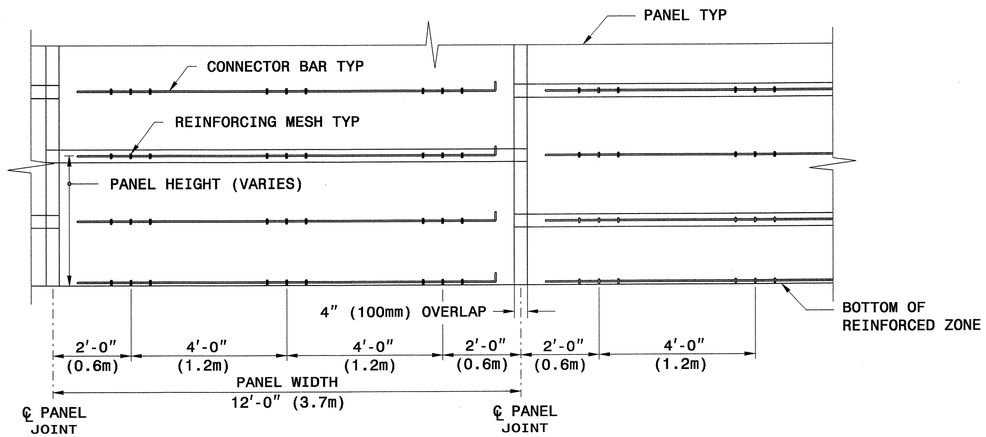
OVERLAP DETAIL



TYPICAL SECTION



TYPICAL ELEVATION @ TOP OF WALL
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL ELEVATION @ BOTTOM OF WALL
(WIRES NOT SHOWN FOR CLARITY)

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 8 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-4020	2-Y

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

scott a. Hidden 3/29/07

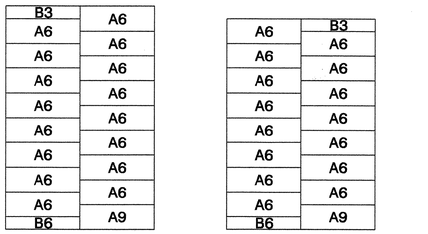
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

PANEL LAYOUTS

H - WALL HEIGHT

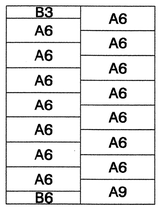


(FEET-INCHES) < 28 - 0

(METER) < 8.5

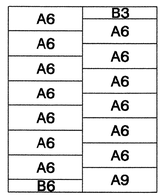
(FEET-INCHES) < 27 - 8

(METER) < 8.4



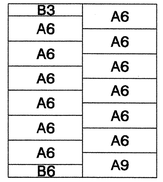
(FEET-INCHES) < 26 - 0

(METER) < 7.9



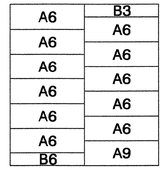
(FEET-INCHES) < 24 - 4

(METER) < 7.4



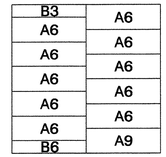
(FEET-INCHES) < 22 - 8

(METER) < 6.9



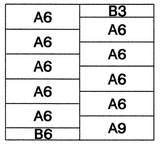
(FEET-INCHES) < 21 - 0

(METER) < 6.4



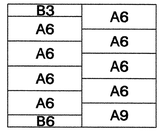
(FEET-INCHES) < 19 - 4

(METER) < 5.9



(FEET-INCHES) < 17 - 8

(METER) < 5.4



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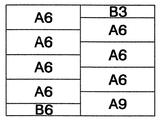
(METER) < 4.9



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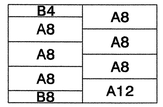
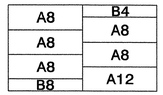
(METER) < 4.4



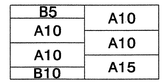
(FEET-INCHES) < 12 - 8

(METER) < 3.9



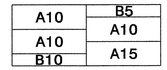
(FEET-INCHES) < 11 - 0

(METER) < 3.4



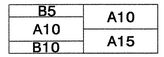
(FEET-INCHES) < 9 - 4

(METER) < 2.8



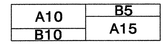
(FEET-INCHES) < 7 - 8

(METER) < 2.3



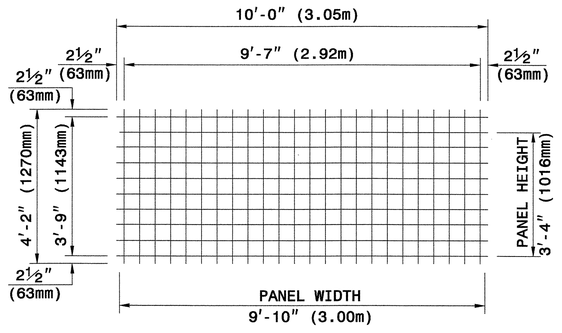
(FEET-INCHES) < 6 - 0

(METER) < 1.8

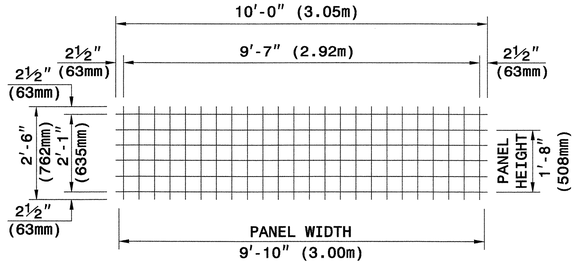


(FEET-INCHES) < 4 - 4

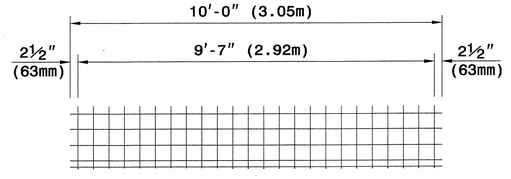
(METER) < 1.3



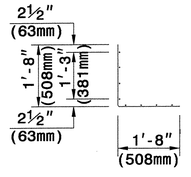
TYPE A



TYPE B



WELDED WIRE FORM



SECTION

WELDED WIRE FACINGS

PANEL TYPES (WELDED WIRE FACINGS AND FORM

5″ X 5″ (125mm X 125mm), W5 X W5 (MW32 X MW32) WELDED WIRE REINFORCEMENT (WWR)

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 9 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-4020	2-Z

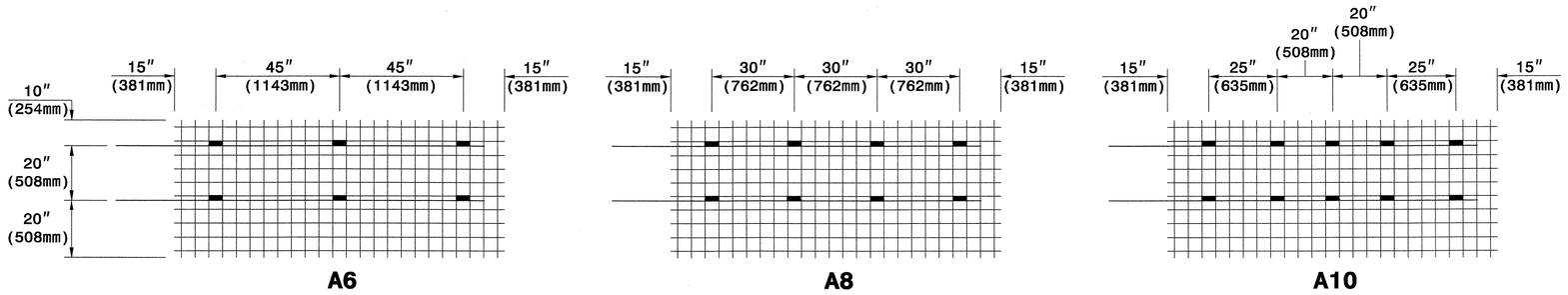
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

scott a. hidden 3/29/07
SIGNATURE DATE

ENGINEER

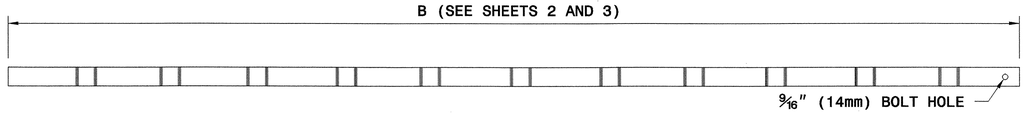
SIGNATURE DATE



KEY: A8

NUMBER OF REINFORCING STRIPS
PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)

½" (13mm) DIA. ROD

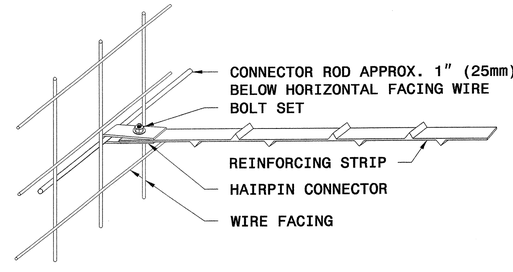
CONNECTOR ROD

½" (13mm) BOLT WITH NUT AND WASHER

BOLT SET

HAIRPIN CONNECTOR

WALL COMPONENTS



STRIP TO FACING CONNECTION

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 10 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-4020	2-AA

GEOTECHNICAL ENGINEER

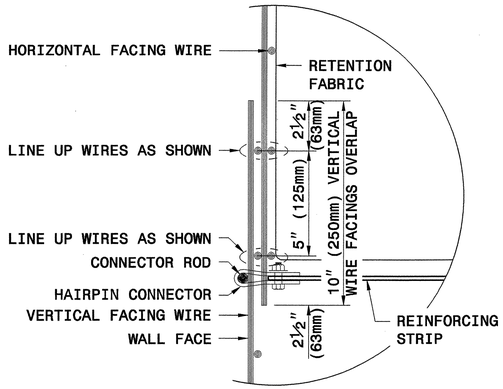
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

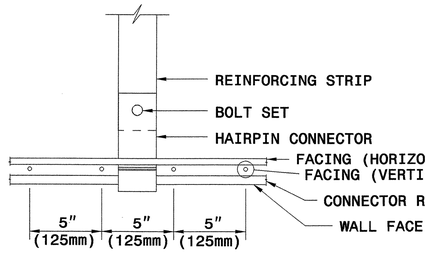
ENGINEER

SIGNATURE DATE

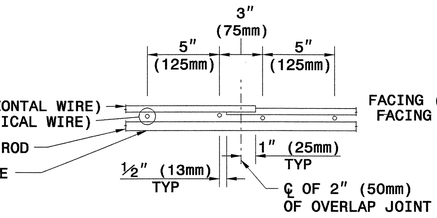


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

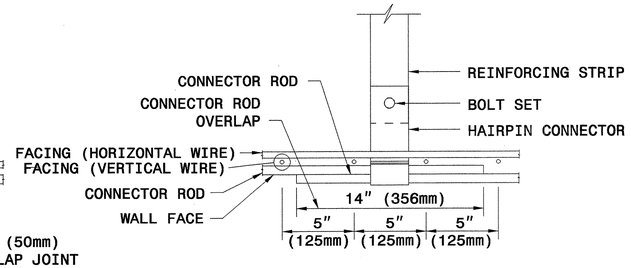
VERTICAL OVERLAP DETAIL



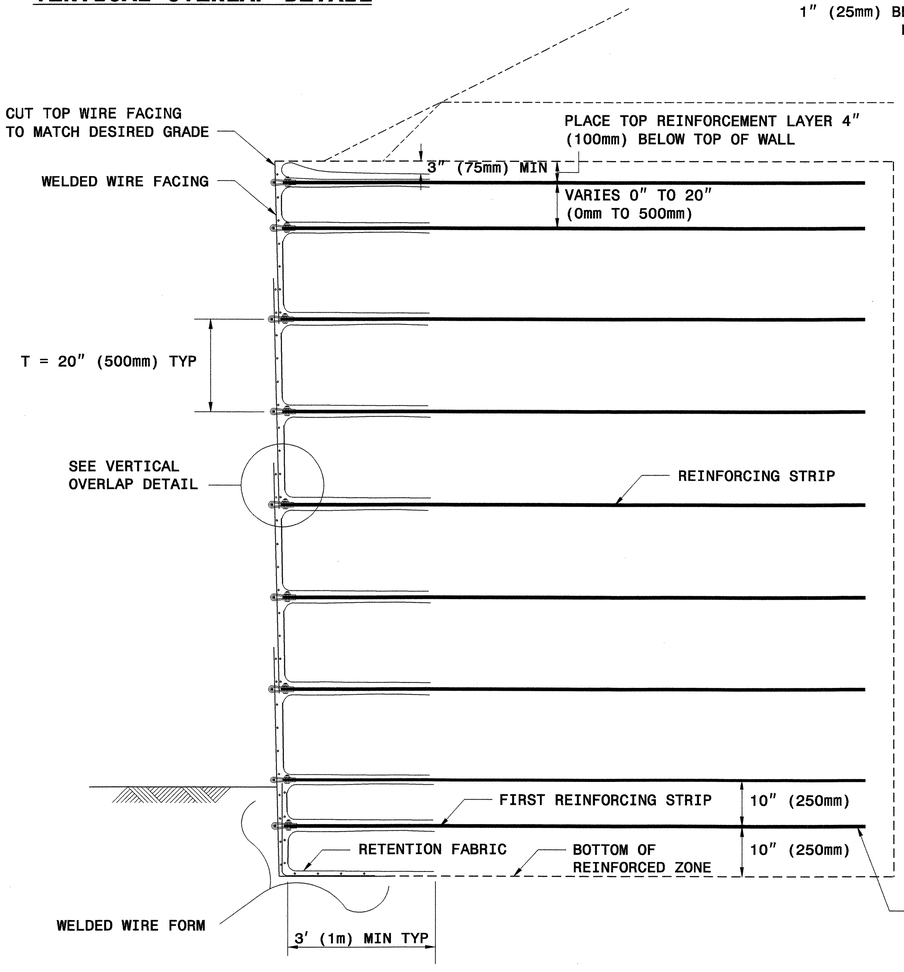
PLAN DETAIL 'A'
STRIP CONNECTION



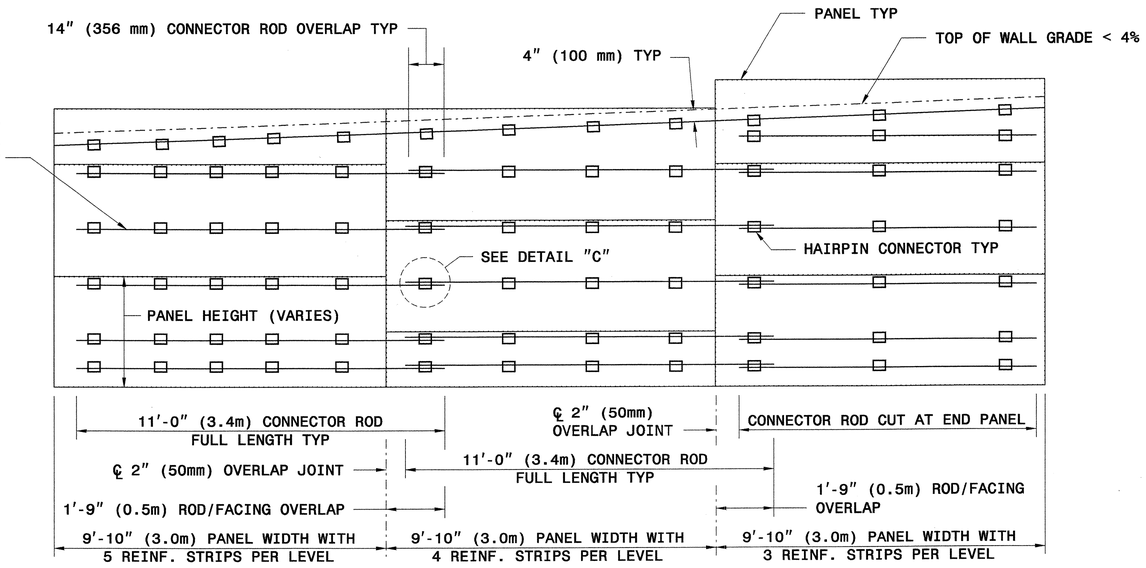
PLAN DETAIL 'B'
HORIZONTAL OVERLAP DETAIL



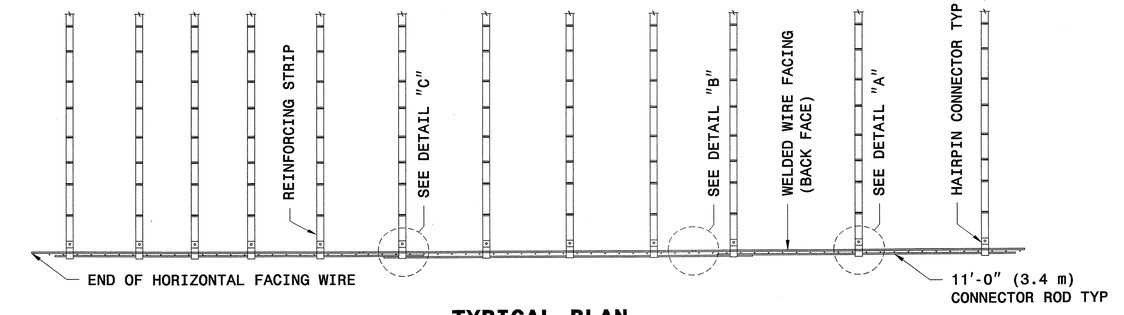
PLAN DETAIL 'C'
STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL



TYPICAL SECTION



TYPICAL ELEVATION
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

SHEET 11 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET NO.
U-4020	2-AB

*NOTE: SEE STD. DWG. 846.01
FOR GENERAL NOTES

2'-6" CURB AND GUTTER

VALLEY GUTTER

ISOMETRIC VIEW OF TRANSITION

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 2/18/09

SEE PLAN SHEET 5

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

TRANSITION FROM 2'-6" CURB AND GUTTER TO VALLEY GUTTER

ORIGINAL BY: T.S.SPELL DATE: FEB.4,2009
MODIFIED BY: DATE:
CHECKED BY: [signature] DATE: 2/5/09
FILE SPEC.: w:usr/details/stand/cgtransit.dgn

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

5/28/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202084

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0000900000-N	SP	Lump Sum		GENERIC MISCELLANEOUS ITEM BUILDING SURVEYS
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0057000000-E	226	2,100	CY	UNDERCUT EXCAVATION
0080000000-E	SP	1,900	TON	CLASS IV SUBGRADE STABILIZA-TION
0134000000-E	240	116	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	560	LF	BERM DITCH CONSTRUCTION
0195000000-E	265	2,100	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	2,600	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	154	SF	TEMPORARY SHORING
0255000000-E	SP	3,500	TON	GENERIC GRADING ITEM EXCAVATION, HAULING & DISPOSAL OF CONTAMINATED SOIL
0318000000-E	300	1,747	TON	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRS
0360000000-E	310	52	LF	12" RC PIPE CULVERTS, CLASS III
0384000000-E	310	892	LF	30" RC PIPE CULVERTS, CLASS III
0390000000-E	310	852	LF	36" RC PIPE CULVERTS, CLASS III
0402000000-E	310	124	LF	48" RC PIPE CULVERTS, CLASS III
0706000000-E	310	36	LF	12" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0708000000-E	310	168	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0714000000-E	310	68	LF	18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0720000000-E	310	40	LF	24" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0805000000-E	310	2	EA	12" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0806000000-E	310	4	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0807000000-E	310	1	EA	18" BIT COAT CS PIPE ELBOWS, T YPE B 0.064" THICK
0808000000-E	310	1	EA	24" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0995000000-E	340	4,357	LF	PIPE REMOVAL
1220000000-E	545	250	TON	INCIDENTAL STONE BASE
1297000000-E	607	20,100	SY	MILLING ASPHALT PAVEMENT, ***" DEPTH (2-1/2")
1308000000-E	607	1,300	SY	MILLING ASPHALT PAVEMENT, ***" TO ******" DEPTH (0" TO 6")
1489000000-E	610	2,300	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-E	610	24,100	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-E	610	875	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1503000000-E	610	15,400	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1519000000-E	610	1,925	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1523000000-E	610	10,200	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1560000000-E	620	2,016	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-E	620	612	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-E	654	465	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2190000000-N	828	30	EA	TEMPORARY STEEL PLATE COVERS FOR MASONRY DRAINAGE STRUCTURE
2209000000-E	838	6	CY	ENDWALLS
2253000000-E	840	2	CY	PIPE COLLARS
2264000000-E	840	1	CY	PIPE PLUGS
2275000000-E	SP	46	CY	FLOWABLE FILL
2286000000-N	840	125	EA	MASONRY DRAINAGE STRUCTURES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ItemNumber	Sec #	Quantity	Unit	Description
2308000000-E	840	32	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	20	EA	FRAME WITH TWO GRATES, STD 840.16
2366000000-N	840	6	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	9	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	13	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	29	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	33	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	11	EA	FRAME WITH COVER, STD 840.54
2451000000-N	852	7	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLETS
2535000000-E	846	415	LF	**"X **" CONCRETE CURB (8" X 18")
2542000000-E	846	3,060	LF	1'-6" CONCRETE CURB & GUTTER
2549000000-E	846	13,670	LF	2'-6" CONCRETE CURB & GUTTER
2580000000-E	846	120	LF	CONCRETE VALLEY GUTTER
2591000000-E	848	6,050	SY	4" CONCRETE SIDEWALK
2605000000-N	848	65	EA	CONCRETE WHEELCHAIR RAMPS
2612000000-E	848	2,000	SY	6" CONCRETE DRIVEWAY
2619000000-E	850	53	SY	4" CONCRETE PAVED DITCH
2627000000-E	852	300	SY	4" CONCRETE ISLAND COVERS
2647000000-E	852	1,750	SY	5" MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)
2800000000-N	858	8	EA	ADJUSTMENT OF CATCH BASINS
2830000000-N	858	22	EA	ADJUSTMENT OF MANHOLES
2845000000-N	858	42	EA	ADJUSTMENT OF METER BOXES OR VALVE BOXES
3030000000-E	862	1,987.5	LF	STEEL BM GUARDRAIL
3045000000-E	862	75	LF	STEEL BM GUARDRAIL, SHOP CURVED
3105000000-N	862	6	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3165000000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE ************ (350 TL-2)
3210000000-N	862	5	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3270000000-N	SP	6	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3360000000-E	863	39	LF	REMOVE EXISTING GUARDRAIL
3536000000-E	866	1,820	LF	CHAIN LINK FENCE, 48" FABRIC
3542000000-E	866	152	EA	METAL LINE POSTS FOR 48" CHAIN LINK FENCE
3548000000-E	866	19	EA	METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE
3575000000-E	SP	721	LF	GENERIC FENCING ITEM TEMPORARY CHAIN LINK FENCE, 72" FABRIC
3578000000-N	SP	60	EA	GENERIC FENCING ITEM TEMPORARY METAL LINE POST, 72" CHAIN LINK FENCE
3578000000-N	SP	8	EA	GENERIC FENCING ITEM TEMPORARY METAL TERMINAL POST, 72" CHAIN LINK FENCE
3628000000-E	876	90	TON	RIP RAP, CLASS I
3649000000-E	876	16	TON	RIP RAP, CLASS B
3656000000-E	876	1,185	SY	FILTER FABRIC FOR DRAINAGE
4048000000-E	902	6	CY	REINFORCED CONCRETE SIGN FOUN-DATIONS
4057000000-E	SP	22	CY	OVERHEAD FOOTING
4060000000-E	903	3,385	LB	SUPPORTS, BREAKAWAY STEEL BEAM
4072000000-E	903	1,084	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (13+00 -Y9-)

ItemNumber	Sec #	Quantity	Unit	Description
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (38+50 -L-)
4096000000-N	904	2	EA	SIGN ERECTION, TYPE D
4102000000-N	904	44	EA	SIGN ERECTION, TYPE E
4108000000-N	904	21	EA	SIGN ERECTION, TYPE F
4110000000-N	904	3	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
4116100000-N	904	6	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)
4141000000-N	907	2	EA	DISPOSAL OF SUPPORT, WOOD
4149000000-N	907	5	EA	DISPOSAL OF SIGN SYSTEM, OVER-HEAD
4155000000-N	907	57	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4158000000-N	907	10	EA	DISPOSAL OF SIGN SYSTEM, WOOD
4192000000-N	907	4	EA	DISPOSAL OF SUPPORT, U-CHANNEL
4234000000-N	907	1	EA	DISPOSAL OF SIGN, A OR B (OVERHEAD)
4238000000-N	907	4	EA	DISPOSAL OF SIGN, D, E OR F
4400000000-E	1110	1,067	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	511	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	251	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	4	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	650	EA	DRUMS
4435000000-N	1135	150	EA	CONES
4445000000-E	1145	480	LF	BARRICADES (TYPE III)
4450000000-N	1150	5,000	HR	FLAGGER
4465000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
4480000000-N	1165	2	EA	TMIA
4485000000-E	1170	110	LF	PORTABLE CONCRETE BARRIER
4507000000-E	SP	1,122	LF	WATER FILLED BARRIER
4516000000-N	1180	300	EA	SKINNY DRUM
4605000000-N	SP	240	HR	GENERIC TRAFFIC CONTROL ITEM POLICE
4650000000-N	1251	1,048	EA	TEMPORARY RAISED PAVEMENT MARKERS
4810000000-E	1205	155,412	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	5,342	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	8,718	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	80	EA	PAINT PAVEMENT MARKING CHARAC-TER
4845000000-N	1205	332	EA	PAINT PAVEMENT MARKING SYMBOL
4847000000-E	1205	26,632	LF	POLYUREA PAVEMENT MARKING LINES (4", **********) (STANDARD GLASS BEADS)
4847110000-E	1205	1,068	LF	POLYUREA PAVEMENT MARKING LINES (8", **********) (STANDARD GLASS BEADS)
4847140000-E	1205	3,399	LF	POLYUREA PAVEMENT MARKING LINES (24", **********) (STANDARD GLASS BEADS)
4847200000-N	1205	40	EA	POLYUREA PAVEMENT MARKING CHARACTER (**********) (STANDARD GLASS BEADS)
4847220000-N	1205	124	EA	POLYUREA PAVEMENT MARKING SYMBOL (**********) (STANDARD GLASS BEADS)
4850000000-E	1205	34,669	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4860000000-E	1205	1,202	LF	REMOVAL OF PAVEMENT MARKING LINES (8")
4870000000-E	1205	589	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4875000000-N	1205	50	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1251	76	EA	PERMANENT RAISED PAVEMENT MARKERS
4905000000-N	1253	423	EA	SNOWPLOWABLE PAVEMENT MARKERS

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STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.

ItemNumber	Sec #	Quantity	Unit	Description
5319000000-E	1505	14	CY	CLASS B CONCRETE FOR ENCASING UTILITY LINES
5325200000-E	1510	3	LF	2" WATER LINE
5325600000-E	1510	1,912	LF	6" WATER LINE
5325800000-E	1510	503	LF	8" WATER LINE
5326200000-E	1510	591	LF	12" WATER LINE
5326600000-E	1510	1,061	LF	16" WATER LINE
5540000000-E	1515	4	EA	6" VALVE
5546000000-E	1515	2	EA	8" VALVE
5558600000-E	1515	2	EA	16" VALVE
5571000000-E	1515	1	EA	** TAPPING VALVE (2")
5571600000-E	1515	3	EA	6" TAPPING VALVE
5572200000-E	1515	1	EA	12" TAPPING VALVE
5572600000-E	1515	2	EA	16" TAPPING VALVE
5648000000-N	1515	13	EA	RELOCATE WATER METER
5649000000-N	1515	20	EA	RECONNECT WATER METER
5666000000-E	1515	1	EA	FIRE HYDRANT
5672000000-N	1515	16	EA	RELOCATE FIRE HYDRANT
5679200000-E	1515	2	EA	16" LINE STOP
5691200000-E	1520	9	LF	6" SANITARY GRAVITY SEWER
5691300000-E	1520	4,235	LF	8" SANITARY GRAVITY SEWER
5775000000-E	1525	25	EA	4' DIA UTILITY MANHOLE
5781000000-E	1525	58	LF	UTILITY MANHOLE WALL, 4' DIA
5800000000-E	1530	2,768	LF	ABANDON 6" UTILITY PIPE
5801000000-E	1530	4,793	LF	ABANDON 8" UTILITY PIPE
5804000000-E	1530	584	LF	ABANDON 12" UTILITY PIPE
5810000000-E	1530	662	LF	ABANDON 16" UTILITY PIPE
5815000000-N	1530	18	EA	REMOVE WATER METER
5828000000-N	1530	8	EA	REMOVE UTILITY MANHOLE
5871900000-E	1550	70	LF	TRENCHLESS INSTALLATION OF 16" IN SOIL
5871910000-E	1550	70	LF	TRENCHLESS INSTALLATION OF 16" NOT IN SOIL
6000000000-E	1605	13,500	LF	TEMPORARY SILT FENCE
6006000000-E	1610	1,310	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	435	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	1,800	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	18.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	450	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	2.75	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	750	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	5	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	440	LF	SAFETY FENCE
6030000000-E	1630	1,820	CY	SILT EXCAVATION
6036000000-E	1631	9,850	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	25	SY	COIR FIBER MAT
6038000000-E	SP	750	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	3,350	LF	1/4" HARDWARE CLOTH
6045000000-E	SP	50	LF	** TEMPORARY PIPE (15")
6070000000-N	SP	3	EA	SPECIAL STILLING BASINS
6071030000-E	SP	145	LF	COIR FIBER BAFFLES
6071050000-E	SP	4	EA	** SKIMMER (1-1/2")
6084000000-E	1660	20	ACR	SEEDING & MULCHING
6087000000-E	1660	11.5	ACR	MOWING
6090000000-E	1661	150	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	275	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	8	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	120	LF	IMPERVIOUS DIKE
6114000000-N	SP	5	HR	SPECIALIZED HAND MOWING
6117000000-N	SP	36	EA	RESPONSE FOR EROSION CONTROL
6640000000-N	1670	14	EA	GENERIC PLANTING ITEM CORNUS KOUSA, CHINESE DOGWOOD, 5-6', B&B
6640000000-N	1670	1,822	EA	GENERIC PLANTING ITEM HEMEROCALLIS 'STELLA D ORO', STELLA D ORO DAYLILLY, 12-15", 1 CONT
6640000000-N	1670	111	EA	GENERIC PLANTING ITEM LIRIOPE MUSCARI 'VARIEGAT A' VARIEGATED LIRIOPE, 12-15", 1 CONT
6640000000-N	1670	6	EA	GENERIC PLANTING ITEM MALUS 'PRAIRIFIRE' PRAIRIFIRE CRABAPPLE 5-6', B&B
6650000000-E	1670	114	CY	MULCH FOR PLANTING
6655000000-E	1670	14	M/G	WATER FOR PLANTING
6660000000-E	1670	858	SY	PLANT BED FUMIGATION
6675000000-E	SP	190	SY	GENERIC PLANTING ITEM CONCRETE PAVER BASE
6676000000-E	SP	1,714	SF	GENERIC PLANTING ITEM BRICK PAVERS
7000000000-E	1705	24	EA	PEDESTRIAN SIGNAL HEAD (**", ** SECTION) (16" , 1 SECTION WITH COUNT-DOWN)
7060000000-E	1705	14,080	LF	SIGNAL CABLE
7120000000-E	1705	88	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7132000000-E	1705	8	EA	VEHICLE SIGNAL HEAD (12", 4 SECTION)
7144000000-E	1705	10	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7264000000-E	1710	2,975	LF	MESSENGER CABLE (3/8")
7300000000-E	1715	1,340	LF	UNPAVED TRENCHING (**********) (1, 2")
7301000000-E	1715	1,500	LF	DIRECTIONAL DRILL (**********) (2, 2")
7324000000-N	1716	45	EA	JUNCTION BOX (STANDARD SIZE)
7360000000-N	1720	20	EA	WOOD POLE
7372000000-N	1721	37	EA	GUY ASSEMBLY
7408000000-E	1722	5	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	23	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	16,995	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	18,980	LF	LEAD-IN CABLE (**********) (14-2)
7575142000-N	SP	5	EA	900MHZ WIRELESS RADIO SYSTEM
7588000000-N	SP	15	EA	METAL POLE WITH SINGLE MAST ARM
7590000000-N	SP	2	EA	METAL POLE WITH DUAL MAST ARM
7613000000-N	SP	17	EA	SOIL TEST
7614100000-E	SP	136	CY	DRILLED PIER FOUNDATION
7624000000-N	1743	7	EA	SIGNAL PEDESTAL WITH FOUNDATION
7631000000-N	SP	17	EA	MAST ARM WITH METAL POLE DESIGN
7636000000-N	1745	6	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	45	EA	DETECTOR CARD (TYPE 2070L)
7901000000-N	1753	5	EA	CABINET BASE EXTENDER
7960000000-N	SP	3	EA	METAL POLE FOUNDATION REMOVAL
7972000000-N	SP	3	EA	METAL POLE REMOVAL
7980000000-N	SP	1	EA	GENERIC SIGNAL ITEM FURNISH WIRELESS RADIO LIGHTNING ARRESTOR
7980000000-N	SP	1	EA	GENERIC SIGNAL ITEM FURNISH WIRELESS RADIO MODEM

ItemNumber	Sec #	Quantity	Unit	Description
******* BEGIN SCHEDULE AA ******* ******* (3 ALTERNATES) *******				
0366000000-E AA1	310	3,356	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA1	310	1,224	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA1	310	1,672	LF	24" RC PIPE CULVERTS, CLASS III
*** OR ***				
0366000000-E AA2	310	2,924	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA2	310	1,104	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA2	310	1,652	LF	24" RC PIPE CULVERTS, CLASS III
0536000000-E AA2	SP	432	LF	*** HDPE PIPE CULVERTS (15")
0536000000-E AA2	SP	120	LF	*** HDPE PIPE CULVERTS (18")
0536000000-E AA2	SP	20	LF	*** HDPE PIPE CULVERTS (24")
*** OR ***				
0366000000-E AA3	310	2,924	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E AA3	310	1,104	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E AA3	310	1,652	LF	24" RC PIPE CULVERTS, CLASS III
0540000000-E AA3	SP	432	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, **** THICK (15", 0.064")
0540000000-E AA3	SP	120	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, **** THICK (18", 0.064")
0540000000-E AA3	SP	20	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, **** THICK (24", 0.064")
******* END SCHEDULE AA *******				

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RD238340

COMPUTED BY: JBT DATE: 12/1/2008

CHECKED BY: ITY DATE: 12/3/2008

PROJECT NO.	SHEET NO.
U-4020	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) (FT.) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D (FT.) 85"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 OR STD 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	OPEN THROAT CATCH BASIN STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T. B. G.D.I. TYPE "A" (SEE DETAIL SHEET 2-O)	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	T.B. D.I. STD. 840.35	FRAME & N.S. GRATE STD. 840.29	M.H. FRAME AND COVER STD. 840.54	ADJUST EXIST. CB	CONCRETE TRANSITION SECTION FOR D.I. (EA)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 16+27	RT	1		3196.1	3190.5																																1	0.6															1	1								REMOVE EXIST CB
		2	1		3194.7	3193.0			48																																																					
L 16+75	RT	2		3197.7	3194.7																																1			1			1																			
		3	2		3196.4	3194.7			92																																																					
L 17+67	RT	3		3199.4	3196.4																																1			1			1																			
L 16+85	LT	4		3197.6	3194.6																																																			1						ADJUST CB
		5	4		3195.0	3194.6																			16																																					
L 16+85	LT	5		3197.3	3195.0																																1								1	1																
L 17+70	LT	6		3199.1	3196.1																																1			1		1																					REMOVE EXIST. CB
		7	6		3198.0	3196.1																			24																																					
L 17+81	LT	7		3200.3	3198.0																																1								1	1																
L 18+85	LT	8		3204.6																																																				1						ADJUST CB
L 19+06	LT	9		3207.5																																																				1						ADJUST CB
L 19+32	LT	10		3209.3																																																				1						ADJUST CB
Y4 10+87	RT	11		3205.8																																																				1						ADJUST CB
Y4 12+47	RT	12		3198.5																																																				1						ADJUST CB
Y4 12+36	LT	13		3201.5	3196.8																																1			1			1																			REMOVE EXIST. CB.
Y4 11+30	LT	14		3206.9	3202.2																																1			1			1																			
		14	13		3202.2	3197.3						108																																																		
L 20+82	RT	15		3215.8	3208.8																																1	2							1	1												1					
		15	14		3208.8	3202.2						96																																																		
L 20+26	RT																																																											0.058		REMOVE CB & PLUG 12" PIPE, BOTHSIDES
L 20+14	RT																																																											0.09		PLUG 15" PIPE & FILL
L 21+28	RT	16		3217.3	3214.1																																1								1	1												1					
		16	15		3214.1	3212.6			44																																																					
L 20+85	RT	17		3214.9	3211.2																																1			1		1																					
		17	15		3211.2	3210.8					40																																																			
L 21+93	LT	18		3220.9	3217.2																																1			1		1																					
		18	17		3217.2	3211.2					104																																																			
L 23+65	LT	19		3231.2	3226.0																																1	0.17		1		1																			0.13		PLUG 18" PIPE & FILL
		19	18		3226.0	3217.2					164																																																		38	REMOVE 18" PIPE
L 23+56	LT	20																																																									0.5526			REMOVE EXIST. CB.
		20	19		3226.3	3226.0																					20																																			
		19	21		3226.0	3234.8					120																																																			
L 24+92	LT	21		3238.6	3234.8																																1			1		1																					
		21	22		3234.8	3234.5										16																																										1 @ 12"				
L 25+34	LT	23		3240.7	3237.0																																1			1		1																					
		23	21		3237.0	3234.8					40																																																			
		24	23		3240.8	3237.0										20																																										1 @ 12"				
		33	23		3245.3	3237.0					152																																																			
SHEET TOTALS									184		620	204				36									40		20										15	2.77		10		6	4		4	4							1	1		6	2	2 @ 12"	0.5526	0.278	38	

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

RD238340

COMPUTED BY:	JBT	DATE:	12/1/2008
CHECKED BY:	ITY	DATE:	12/3/2008

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4020	3-B

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

ABBREVIATIONS

C.B. — CATCH BASIN
N.D.I. — NARROW DROP INLET
D.I. — DROP INLET
G.D.I. — GRATED DROP INLET
G.D.I.(N.S.) — 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	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) (FT.) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D (FT.) 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 OR STD 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	OPEN THROAT CATCH BASIN STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T. B. G.D.I. TYPE "A" (SEE DETAIL SHEET 2-O)	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	T.B. D.I. STD. 840.35	FRAME & N.S. GRATE STD. 840.29	M.H. FRAME AND COVER STD. 840.54	ADJUST EXIST. CB	CONCRETE TRANSITION SECTION FOR D.I. (EA)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
Y5 12+64	LT	25		3222.5	3219.5																																1			1		1																				
Y5 11+42	RT	26		3206.0	3201.6																																1								1	1																
Y5 11+34	LT	27		3225.4	3210																																1	5	5.4													1			1							
		27	26		3210	3201.6						100																																																	111	REMOVE EXIST 24" PIPE
		25	27		3219.5	3218.2			128																																																				125	REMOVE EXIST 15" CMP
Y5 11+31	LT	28		3218.1	3211.2																																1	1.9							1	1																
		28	27		3211.2	3210.0						36																																																25	REMOVE PART OF 24" PIPE
L 22+94	RT																																																												99	REMOVE 15" CMP
L 25+53	RT	29		3242.2	3239.2																																1			1			1																			
		29	30		3239.2	3226.4											48																																									2 @ 15"				
L 25+84	RT	31		3243.6	3240.6																																1			1			1																			
		31	29		3240.6	3239.2			28																																																					
L 26+97	LT	32		3250.4	3248.2																																1			1			1																			
L 26+89	LT	33		3249.0	3245.3																																1			1		1																				
		32	33		3248.2	3246.0																			20																																			18	REMOVE PART OF 12" CMP
		34	33		3249.3	3245.8				68																																																				
L 27+58	LT	34		3252.6	3249.3																																1			1		1																				TIE TO DRAIN
		35	34		3258.9	3249.6			196																																																					
L 29+56	LT	35		3261.9	3258.9																																1			1		1																				
L 29+59	LT	36		3261.9	3259.6																																1								1	1																
		36	35		3259.6	3258.9																			16																																				
L 30+74	LT	37		3266.8	3263.8																																1			1		1																				
		37	35		3263.8	3258.9			116																																																				
L 30+74	LT	38		3266.3	3264.1																																1								1	1																
		38	37		3264.1	3263.8																			16																																				
L 32+00	LT	39		3269.7	3266.7																																1			1		1																				
		37	39		3263.8	3266.7			124																																																				
Y7 11+60	RT	40		3271.5	3268.5																																1			1		1																				
Y7 11+64	LT	41		3271.0	3268																																1			1			1																			
		40	39		3268.5	3266.7			40																																																				
L 32+79	LT	42		3270.0	3267																																1			1			1																			
		41	42		3268.0	3267.0			36																																																				
L 32+79	LT	43		3269.5	3267.6																																1								1	1																
		43	42		3267.6	3267.0																			12																																				
L 33+26	LT	44		3269.8	3266.8																																1								1	1																
L 33+26	LT	45		3269.7	3266.5																																1			1			1																			
		44	45		3266.8	3266.5																			12																																				
		42	45		3267.0	3266.5			44																																																				
SHEET TOTALS									712	68		136					48								76												20	6.9	5.4	13		7	6		6	6						1			1			2 @ 15"			378	

COMPUTED BY:	JBT	DATE:	12/1/2008
CHECKED BY:	ITY	DATE:	12/3/2008

RD238340

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4020	3-C

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) (FT.) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D (FT.) 12"	15"	18"	24"	30"	36"	42"	48"
Y6 11+52	LT	46		3261.9	3259.7																										
Y6 11+56	LT	47		3261.8	3258.8																										
		46	47		3259.7	3258.8			12																						
Y6 12+08	LT	48		3261.0	3258.8																										
Y6 12+08	LT	49		3261.3	3258.1																										
		48	49		3258.8	3258.1																				8					
		47	49		3258.8	3258.3			52																						
Y6 12+08	RT	49A		3258.3	3254.3																										
		49	49A		3258.1	3254.3				36																					
		49A	49B		3254.3	3252.3																				112					
L 33+84	RT	50		3268.7	3265.7																										
L 35+01	RT	51		3270.1	3267.9																										
L 35+01	RT	52		3266.6	3263.6																										
		50	52		3265.7	3263.6			116																						
		51	52		3267.9	3263.6																			20						
L 35+80	RT																														
L 35+00	LT	53		3266.4	3263.1																										
		52	53		3263.6	3263.1			92																						
L 34+17	LT	54		3270.4	3268.2																										
L 34+26	LT	55		3268.3	3265.1																										
		53	55		3263.1	3265.1				72																					
		54	55		3268.2	3265.3																			20						
		45	55		3266.5	3265.3			100																						
L 36+63	RT																														
L 36+84	LT	56		3258.9	3255.7																										
		53	56		3263.1	3255.7				180																					
L 38+40	RT																														
L 39+03	LT	57		3244.7	3241																										
		56	57		3255.7	3241.5				216																					
L 39+03	LT	58		3245.5	3243.3																										
		58	57		3243.3	3241.7																			24						
L 39+84	RT	59		3240.3	3237.3																										
L 39+84	LT	60		3238.9	3234.6																										
		59	60		3237.3	3235.9			52																						
L 39+84	LT	61		3238.5	3236.3																										
		61	60		3236.3	3235.9																			24						
		57	60		3241.0	3235.1					80																				
L 40+92	LT	63		3231.1	3226.8																										
		60	63		3234.6	3226.8						104																			
L 40+92	LT	62		3231.0	3228.7																										
		62	63		3228.7	3228.1																			20						
L 41+50	CL																														
L 43+31	LT	64		3213.9	3209.6																										
	LT	63	64		3226.8	3209.6						236																			
L 42+80	LT																														
SHEET TOTALS									424	504	80	340													108	120					

STATION	LOC.	FROM	TO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 OR STD 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	OPEN THROAT CATCH BASIN STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T. B. G.D.I. TYPE "A" (SEE DETAIL SHEET 2-O)	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	T.B. D.I. STD. 840.35	FRAME & N.S. GRATE STD. 840.29	M.H. FRAME AND COVER STD. 840.54	ADJUST EXIST. CB	CONCRETE TRANSITION SECTION FOR D.I. (EA)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
Y6 11+52	LT	46							1								1	1																
Y6 11+56	LT	47							1			1			1																			
		46	47																															
Y6 12+08	LT	48							1										1			1												
Y6 12+08	LT	49							1			1	1																					
		48	49																															
		47	49																															
Y6 12+08	RT	49A							1										1			1												
		49	49A																														48	REMOVE 12" RCP
		49A	49B																															
L 33+84	RT	50							1			1		1																				
L 35+01	RT	51							1								1	1																
L 35+01	RT	52							1			1		1																			10	REMOVE 15" CMP AND CB
		50	52																															
		51	52																															
L 35+80	RT																																57	REMOVE 15" RCP AND 2 DI s
L 35+00	LT	53							1			1			1																			
		52	53																															
L 34+17	LT	54							1			1			1																			
L 34+26	LT	55							1			1			1																			
		53	55																															
		54	55																															
		45	55																															
L 36+63	RT																															0.09		PLUG 15" RCP
L 36+84	LT	56							1			1			1																			
		53	56																															
L 38+40	RT																																233	REMOVE 15" RCP AND 2 CBs
L 39+03	LT	57							1			1			1																			
		56	57																															
L 39+03	LT	58							1								1	1																
		58	57																															
L 39+84	RT	59							1																1	1			1				137	REMOVE 15" RCP
L 39+84	LT	60							1			1			1																			
		59	60																															
L 39+84	LT	61							1								1	1																
		61	60																															
		57	60																															
L 40+92	LT	63							1			1			1																			
		60	63																															
L 40+92	LT	62							1								1	1															221	REMOVE 15" CMP
		62	63																															
L 41+50	CL																																103	REMOVE 15" RCP
L 43+31	LT	64							1			1			1																			
	LT	63	64																													0.09		PLUG 15" RCP & FILL (BOTH SIDES)
L 42+80	LT																															0.09		PLUG 15" CMP & FILL (BOTH SIDES)
SHEET TOTALS									20			12	1	2	9		5	5	2			2			1	1			1			0.27	809	

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

RD238340

COMPUTED BY: JBT DATE: 12/1/2008

CHECKED BY: ITY DATE: 12/3/2880

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-4020	3-D

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) (FT.) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D (FT.) 12"	15"	18"	24"	30"	36"	42"	48"
L 43+31	LT	65		3212.9	3210.7																										
		65	64		3210.7	3210.4																			16						
L 43+30	RT	66		3215.5	3212.3																										
		66	64		3212.3	3209.6			52																						
		67	66		3215.3	3212.3			108																						
L 45+46	LT	68		3199.0	3194.2																										
L 45+46	RT	69		3200.3	3195.8																										
		69	68		3195.8	3194.2							52																		
		64	68		3209.6	3194.7						212																			
L 45+67	RT	70		3199.0	3195.9																										
		70	69		3195.9	3195.8			20																						
		71	69		3196.3	3195.8							60																		
L 45+83	RT																														
		72	73		3206.0	3187.4												44													
L 47+24	RT	73		3190.4	3187.4																										
L 47+24	LT	74		3190.7	3185.9																										
		73	74		3187.4	3185.9				100																					
		68	74		3194.2	3185.9							176																		
L 50+88	LT																														
L 49+82	LT	75		3182.7	3177.9																										
		74	75		3185.9	3177.9							256																		
Y 12 13+06	LT	76		3178.4	3173.7																										
		75	76		3177.9	3173.7							56																		
Y 12 11+47	LT	77		3169.3	3163.5																										
		76	77		3173.7	3163.5							156																		
Y 12 10+67	LT	78		3167.4	3162																										
		77	78		3163.5	3162.0							76																		
		78	79		3162.0	3161.3							20																		
		80	81		3192.6	3179.0											40														
L 50+00	RT	81		3182.2	3179																										
		81	82		3179.0	3177.0				164																					
L 51+64	RT	82		3180.3	3174																										
		83	82		3174.7	3174.0									20																
L 51+69	CL	84A		3178.8	3171																										
		82	84A		3174.0	3173.0									52																
		84A	91		3171.0	3170.0									52																
L 51+65	RT	83			3174.7																										
L 51+73	RT	84		3180.3	3177.1																										
		84	82		3177.1	3177.0			8																						
L 53+17	RT	85		3181.9	3177.8																										
SHEET TOTALS									188	264		212	852		124		40	44							16						

STATION	FROM	TO	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 OR STD 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	OPEN THROAT CATCH BASIN STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T. B. G.D.I. TYPE "A" (SEE DETAIL SHEET 2-O)	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	T.B. D.I. STD. 840.35	FRAME & N.S. GRATE STD. 840.29	M.H. FRAME AND COVER STD. 840.54	ADJUST EXIST. CB	CONCRETE TRANSITION SECTION FOR D.I. (EA)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 43+31	65							1								1	1															143	REMOVE EXIST. 15" CMP
	65	64																															REMOVE EX. CB AND REPLACE WITH DI
L 43+30	66							1																1	1			1					
	66	64																															
	67	66																															
L 45+46	68							1			1			1																			
L 45+46	69							1																1	1			1			0.09		PLUG 15" CMP & FILL (BOTH SIDES)
	69	68																															
	64	68																														213	REMOVE EXIST. 15" CMP
L 45+67	70							1																1	1			1					
	70	69																															
	71	69																															
L 45+83																																100	REMOVE 24" PLASTIC AND CB
	72	73																											1 @ 18"				BERM DITCH OUTLET
L 47+24	73							1			1		1																				
L 47+24	74							1			1			1																			
	73	74																															
	68	74																															
L 50+88																																173	REMOVE EXIST. 15" CMP
L 49+82	75							1			1			1																			
	74	75																															
Y 12 13+06	76							1			1		1																				
	75	76																															
Y 12 11+47	77							1	0.8											1					1								
	76	77																															
Y 12 10+67	78							1	0.4														1			1							
	77	78																															
	78	79																															
	80	81																											1 @ 15"				BERM DITCH OUTLET
L 50+00	81							1			1		1																			260	REMOVE EXIST. 15" CMP
	81	82																															
L 51+64	82							1	1.3		1	1																					
	83	82																															
L 51+69	84A							1	2.8														1										
	82	84A																														44	REMOVE EXIST. 36" CMP
	84A	91																															
L 51+65	83					5.4																											
L 51+73	84							1			1	1																					
	84	82																														44	REMOVE EXIST. 36" CMP
L 53+17	85							1			1			1																		134	REMOVE 15" CMP
																													1 @ 15"				
SHEET TOTALS						5.4		16	5.3		9	2	3	4		1	1			1			2	3	4	1		3	1 @ 18"		0.09	1111	

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

RD238340

COMPUTED BY: JBT DATE: 12/1/2008

CHECKED BY: ITY DATE: 12/3/2008

PROJECT NO.	SHEET NO.
U-4020	3-E

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) (FT.)								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)								CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D (FT.)								15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 OR STD 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	OPEN THROAT CATCH BASIN STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T. B. G.D.I. TYPE "A" (SEE DETAIL SHEET 2-O)	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	T.B. D.I. STD. 840.35	FRAME & N.S. GRATE STD. 840.29	M.H. FRAME AND COVER STD. 840.54	ADJUST EXIST. CB	CONCRETE TRANSITION SECTION FOR D.I. (EA)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
SIZE								12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"																														
THICKNESS OR GAUGE															.064	.064	.064	.064	.079	.079	.109	.109																																						
L 53+17	CL	85A		3182.0	3177.3																																	1															1							0.5526			TEMPORARY JB
L 53+28	RT																																																													48	REMOVE 15" RCP
L 53+23	RT	86		3193.3	3189.6																																	1			1	1																				19	REMOVE 15" PLASTIC
L 53+46	RT	87		3194.0	3189.8																																	1															1			1						27	REMOVE 12" PLASTIC
		87	86		3189.8	3189.6			20																																																								82	REMOVE 15" CMP
L 53+03	RT	86A		3193.5	3189.0																																	1														1				1									
		86	86A		3189.6	3189.0			32																																																									
L 52+80	RT	86B		3182.4	3179.4																																	1														1				1									
		86A	86B		3189.0	3179.4										20																																																
L 52+90	RT	86C		3182.0	3179.0																																	1														1				1									
		86B	86C		3179.4	3179.0			28																																																									
		86C	85		3179.0	3178.4			32																																																									
L 53+46	RT																																																													6	REMOVE 15" CMP
		88	85		3184.0	3178.6				188																																																							95	REMOVE 15" CMP
L 55+05	RT	88		3187.2	3184.0																																	1			1			1																	27	REMOVE 15" CMP
L 56+27	RT																																																													127	REMOVE TWO 60" RCP
DR4 10+83	RT	89		3194.2	3191.4																																	1			1		1																		5	REMOVE PART OF 15"CMP
		89	88		3191.4	3184.0				64																																																							67	REMOVE 15" RCP
DR4 10+94		89A		3197.0	3193.4																																	1														1				1							REMOVE HEADWALL
		89A	89		3193.4	3191.4											12																																														36	REMOVE 15" PLASTIC
DR4 10+74		89B		3197.2	3193.5																																	1														1				1						8	REMOVE PART OF 15" RCP & CB
		89B	89		3193.5	3191.4											12																																														5	REMOVE PART OF 15" RCP
L 51+69	LT	90		3180.2	3177.2																																	1			1	1																						
L 51+77	LT	91		3180.2	3169.8																																	1	5	0.4	1	1																						
		90	91		3177.2	3177.0			8																																																								17	REMOVE 12" PLASTIC
L 53+27	LT	92		3182.0	3176.7																																	1	0.3		1		1																			175	REMOVE 15" CMP
		92	91		3176.7	3175.2					148																																																							
		85	85A		3177.8	3177.3					48																																																							
		85A	92		3177.3	3176.7					60																																																							
Y13REV 16+08	LT	93		3159.0	3153.9																																	1	0.1															1			1									
Y13REV 16+07	LT	94		3160.9	3157.9																																	1								1	1															
Y13REV 16+36	LT	95		3161.9	3158.9																																	1			1		1																		15	REMOVE PART OF 12" RCP
		93	94		3155.3	3157.9			32																																																								17	REMOVE 15" RCP & CB & DI
		94	95		3157.9	3158.9																		32																																						33	REMOVE 15" RCP & CB
		95	96		3158.9	3164.6		52																																																						0.3528		56	REMOVE 12" RCP, COLLAR AND EXTEND
L 59+60	LT	97		3183.8	3180.8																																	1			1			1																	203	REMOVE 15" CMP
L 63+30	LT	98		3167.1	3164.1																																	1			1			1																	18	REMOVE 24" CMP
		97	98		3180.8	3164.1			368																																																						0.232		PLUG 24" CMP & FILL (BOTH SIDES)
L 65+91	LT	99		3142.4	3139.4																																	1			1			1																		
		136	99		3140.8	3139.4			52																																																								199	REMOVE 15" CMP
		98	136		3164.1	3140.8			208																																																									
L 62+73	RT																																																													280	REMOVE 15" CMP AND 10" CMP
L 65+00	LT	134		3144.4	3141.5																																	1																	1	1									
L 65+38	LT	135		3144.8	3141.1																																	1																	1	1									
		134	135		3141.5	3141.1			36																																																									
L 65+38	LT	136		3145.0	3140.8																																	1			1			1																		
		135	136		3141.1	3140.8																		12																																							
L 61+09	RT	100		3195.7	3191.7																																	1														1				1						64	REMOVE 12" RCP & CB
		100	100A		3191.7	3168.6										48																																												1 @ 15			16	REMOVE 15" CMP & CB
L 61+55	RT	101		3171.2	3168.0																																	1			1		1																			
L 61+56	RT	100A		3174.0	3168.6																																	1	0.4						1																	
SHEET TOTALS								52	816	252	256							68	24								44														25	5.8	0.4	12	3	4	5	1	1	1					6	3	2	2	8			1 @ 15"	0.9054	0.232	1645	

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

RD238340

COMPUTED BY:	JBT	DATE:	12/1/2008
CHECKED BY:	ITY	DATE:	12/3/2008

PROJECT NO.	SHEET NO.
U-4020	3-F

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL
		100A	101		3168.6	3168.2	
L 61+73	RT	102		3170.5	3166.8		
		101	102		3168.0	3167.3	
		103	102		3184.0	3166.8	
		102	102A		3166.8	3150.3	
L 64+00	RT	102A		3154.1	3150.3		
		102A	104		3150.3	3138.6	
L 65+92	RT	104		3142.4	3138.6		
		105	104		3139.7	3139.4	
Y15REV 10+95	RT	105		3141.6	3139.7		
L 68+37	RT	106		3137.6	3133.8		
		106	107		3133.8	3132.0	
		104	106		3138.6	3133.8	
Y16 15+32	LT	108					
Y16 16+56	LT	109		3144.8	3141.8		
Y16 16+55	LT	110		3145.2	3142.2		
		110	109		3142.2	3141.8	
Y16 17+13	LT	111		3144.3	3141.3		
Y16 17+15	LT	112		3143.1	3140.1		
		109	112		3141.8	3140.1	
		111	112		3141.3	3140.1	
Y16 18+11	LT	113		3141.2	3138.9		
Y16 18+22	LT	114		3140.9	3137.9		
		113	114		3138.9	3137.9	
		112	114		3140.1	3137.9	
Y16 18+50	LT	115		3140.2	3137.3		
		114	115		3137.9	3137.3	
Y16 18+78	RT	116		3140.0	3137.0		
		115	116		3137.3	3137.0	
Y16 18+83	RT	117			3135.0		
Y16 19+47	RT	118		3139.7	3136.7		
		116	117		3137.0	3135.0	
Y16 19+64	LT	119		3139.4	3136.4		
L 67+37	LT	120		3138.1	3135.9		
		119	120A		3136.4	3136.0	
L 67+30	LT	120A		3138.0	3136.0		
		120A	120		3136.0	3135.9	
L 68+55	LT	121		3137.1	3134.1		
L 69+20.07	LT	122		3136.9	3128.8		
		121	122		3134.1	3133.8	
L 69+32	LT	123		3136.9	3133.9		
		123	122		3133.9	3133.8	
SHEET TOTALS							

Pipes (FT.) — CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE); BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE), THICKNESS OR GAUGE: 12" .064, 15" .064, 18" .064, 24" .064, 30" .079, 36" .079, 42" .109, 48" .109; CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D; ENDWALLS STD. 838.01 OR STD. 838.11 OR STD 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS

FROM	TO	Cl. III RCP 12"	Cl. III RCP 15"	Cl. III RCP 18"	Cl. III RCP 24"	Cl. III RCP 30"	Cl. III RCP 36"	Cl. III RCP 42"	Cl. III RCP 48"	Bit. C.S. 12"	Bit. C.S. 15"	Bit. C.S. 18"	Bit. C.S. 24"	Bit. C.S. 30"	Bit. C.S. 36"	Bit. C.S. 42"	Bit. C.S. 48"	RCP/Alum./HDPE 12"	RCP/Alum./HDPE 15"	RCP/Alum./HDPE 18"	RCP/Alum./HDPE 24"	RCP/Alum./HDPE 30"	RCP/Alum./HDPE 36"	RCP/Alum./HDPE 42"	RCP/Alum./HDPE 48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS R.C.P.	ENDWALLS C.S.P.
100A	101										12																			
101	102			16																										
103	102												40																	
102	102A				224																									
102A	104				188																									
105	104																		68											
106	107				40																									
104	106				244																									
110	109																		12											
109	112		56																											
111	112																		20											
113	114																		24											
112	114		104																											
114	115		28																											
115	116		60																											
116	117																		16											
119	120A		40																											
120A	120																		8											
121	122		64																											
123	122		8																											
SHEET TOTALS			360	16	696						12		40						148											

Drainage structures — QUANITIES FOR DRAINAGE STRUCTURES; *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B'); FRAME, GRATES, AND HOOD STANDARD 840.03, TYPE OF GRATE

STRUCTURE NO.	PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	GRATE E	GRATE F	GRATE G	OPEN THROAT CATCH BASIN STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T. B. G.D.I. TYPE "A" (SEE DETAIL SHEET 2-O)	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	T.B. D.I. STD. 840.35	FRAME & N.S. GRATE STD. 840.29	M.H. FRAME AND COVER STD. 840.54	ADJUST EXIST. CB	CONCRETE TRANSITION SECTION FOR D.I. (EA)
102	1			1		1															
102A	1			1		1															
104	1			1		1															
105	1											1		1							
106	1			1		1															
108	1																1	1			
109	1			1			1														
110	1			1	1																
111	1			1	1																
112	1			1			1														
113	1								1	1											
114	1			1			1														
115	1			1			1														
116	1			1		1															
117	1														1						
118																				1	
119	1			1	1																
120	1								1	1											
120A	1														1				1		
121	1			1			1														
122	1	3.1		1	1																
123	1			1	1																
SHEET TOTALS	21	3.1		15	5	5	5		2	2		1		1	2		1	1	1	1	

STRUCTURE NO. FROM	TO	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
102	102A	1 @ 24"				BERM DRAINAGE OUTLET
106	107				61	REMOVE 12" CMP
104	106				59	REMOVE 15" RCP
113	114				18	REMOVE 15" CMP
117						JB
121						TIE TO EXIST. 36" PIPE
122						REMOVE PART OF EXIST. 15" RCP
SHEET TOTALS		1 @ 24"			138	

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

RD238340

COMPUTED BY:	JBT	DATE:	12/1/2008
CHECKED BY:	ITY	DATE:	12/3/2008

PROJECT NO.	SHEET NO.
U-4020	3-G

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

ABBREVIATIONS

- C.B. — CATCH BASIN
- N.D.I. — NARROW DROP INLET
- D.I. — DROP INLET
- G.D.I. — GRATED DROP INLET
- G.D.I.(N.S.) — 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 / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) (FT.) 12"	15"	18"	24"	30"	36"	42"	48"
L 69+09		125		3137.2	3132.2										
		125	124		3132.2	3132.0			8						
L 69+17		126		3137.3	3134.3										
		126	125		3134.3	3134.2			4						
Y15REV 11+30	LT														
Y15REV 11+95	RT	127		3146.5	3144										
		127	105		3144.0	3139.7			76						
Y15REV 12+38	RT	128		3149.1	3146.1										
		128	127		3146.1	3144.0			48						
Y15REV 11+50	RT														
Y15REV 12+56	RT														
DR3 10+97	LT	129		3150.6	3148										
		129	127		3148.0	3144.0			56						
DR5 10+66	CL														
DR5 10+63	LT														
L 70+64	LT	130		3139.6	3136.4										
L 70+64	LT	131		3138.3	3135.3										
L 70+76	LT	132		3138.5	3135.5										
		130	131		3136.4	3135.3			36						
		132	131		3135.5	3135.3			12						
L 73+58	LT	133													
Sheet Total									240						
Project Total								52	2924	1104	1652	892	852		124
SAY															

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D (FT.) 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE
Project Total	36	168	68	40						432	120	20							

STATION	FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 OR STD 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	OPEN THROAT CATCH BASIN STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	T. B. G.D.I. TYPE "A" (SEE DETAIL SHEET 2-O)	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	T.B. J.B. STD. 840.34	T.B. D.I. STD. 840.35	FRAME & N.S. GRATE STD. 840.29	M.H. FRAME AND COVER STD. 840.54	ADJUST EXIST. CB	CONCRETE TRANSITION SECTION FOR D.I. (EA)	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLAES CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
L 69+09	125				1			1	1																					
L 69+17	126				1			1	1																					
Y15REV 11+30																													17	REMOVE 12" CMP
Y15REV 11+95	127				1										1			1												
Y15REV 12+38	128				1										1			1												
Y15REV 11+50																													26	REMOVE 12" CMP
Y15REV 12+56																													73	REMOVE 12" PLASTIC
DR3 10+97	129				1										1			1											21	REMOVE 15" CMP
	129	127																											56	REMOVE 15" CMP
DR5 10+66																													31	REMOVE 15" CMP
DR5 10+63																													14	REMOVE 12" PLASTIC
L 70+64	130				1								1	1												1					
L 70+64	131				1			1		1																					
L 70+76	132				1			1		1																					
L 73+58	133																								1						
Sheet Total					8			4	2	2			1	1	3			3							1	1				238	
Project Total			5.4		125	23.87	5.8	75	13	29	33	1	20	20	5	1	1	6	8	6	8	9	11	8	7	2 @ 12"	1.458	0.87	4357	Project Total
						31.41																				4 @ 15"				
SAY			6			32																				1 @ 18"	2	1		SAY
																										1 @ 24"				

COMPUTED BY: JBT DATE: 11/3/2008
CHECKED BY: IY DATE: 11/21/2008

PROJECT NO.	SHEET NO.
U-4020	3-H

RD22316

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

CUBIC YARDS

Station to Station	Uncl. Exc. C.Y.	Embank. +% C.Y.	Borrow C.Y.	Waste C.Y.
SUMMARY NO. 1				
LEFT SIDE				
-L- STA 16+00 to 46+50	290	2,934	2,644	
-Y2- STA 12+50 to 13+10	25	30	5	
RIGHT SIDE				
-L- STA 16+00 to 46+50	3,695	18,466	14,771	
-Y4- STA 10+75 to 13+50	16	376	360	
-Y5- STA 11+05 to 13+00	4	1,374	1,370	
-Y6- STA 11+00 to 12+20	3	332	329	
-Y8- STA 10+93 to 13+00	399	2		397
-Y9- STA 11+00 to 14+50	142	130		12
-Y10- STA 10+80 to 11+50	8	3		5
SUMMARY NO. 1 TOTAL	4,582	23,647	19,479	414
SUMMARY NO. 2				
LEFT SIDE				
-L- STA 46+50 to 74+50	1,478	7,527	6,049	
-Y13REV- STA 15+50 to 19+00	610	40		570
-Y16- STA 15+50 to 19+95	246	155		91
-DR1- STA 11+00 to 11+75	11	161	150	
-DR2- STA 10+50 to 11+00	3	49	46	
RIGHT SIDE				
-L- STA 46+50 to 74+50	28,285	1,262		27,023
-Y14REV- STA 10+80 to 13+50	778	145		633
-Y15REV- STA 10+65 to 13+50	414	577	163	
-Y18- STA 10+75 to 11+00	8	13	5	
-DR3- STA 10+40 to 14+20	845	2,155	1,310	
-DR4- STA 10+75 to 11+50	52	5		47
SUMMARY NO. 2 TOTAL	32,730	12,089	7,723	28,364
PROJECT SUB TOTAL	37,312	35,736	27,202	28,778
ROCK waste to replace borrow			-3,301	-3,301
Adjustment to EARTH displaced by ROCK		-495	-495	
EARTH waste to replace borrow			-23,406	-23,406
GRAND TOTALS	37,312	35,241		2,071
SAY	37,500			
ESTIMATED DDE = 116 CU. YDS				
ESTIMATED UNDERCUT = 2100 CU. YDS				

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, REMOVAL OF EXISTIING ASPHALT PAVEMENT, BREAKING OF EXISTING ASPHALT PAVEMENT AND REMOVAL OF EXISTING CONCRETE PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

SUMMARY OF CHAIN LINK FENCE

LINE	Station to Station	LOCATION	FABRIC LIN. FT.	LINE POST (EA)	TERMINAL POST (EA)
-L-	53+40.00 TO 59+75.00	LT	635.76	53	5
-L-	60+60.00 TO 63+52.12	LT	292.12	24	2
-L-	64+20.00 TO 65+30.00	LT	132.98	9	3
-L-	53+06.45 TO 54+83.61	RT	177.16	14	2
-L-	55+94.96 TO 61+50.00	RT	579.04	49	6
		PROJ. TOTAL	1,817.06	151	18
		SAY	1,820	152	19
TEMPORARY 72" CHAIN LINK FENCE					
-L-	53+15.00 TO 55+02.00	RT	187.00	15	2
-L-	55+78.00 TO 61+00.00	RT	534.00	45	6
		PROJ. TOTAL	721.00	60	8

SUMMARY FOR BREAKING OF ASPHALT PAVEMENT

LINE	Station to Station	LOC LT/RT/ CL	Asphalt BREAKING SQ. YDS.
-Y5-	10+62.45 TO 12+50	CL	131.45
-Y6	10+92.44 TO 11+50	CL	124.32
PROJECT TOTAL			255.77
SAY			260

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

SUMMARY OF ASPHALT PAVEMENT REMOVAL

LINE	Station to Station	LOC LT/RT/CL	Asphalt Removal SQ. YDS.
-L-	19+34.38 TO 32+21.42	LT	1,549.17
-L-	22+46.63 TO 23+08.41	CL	195.03
-L-	31+56.07 TO 31+92.01	CL	194.42
-L-	32+49.76 TO 45+77.34	LT	2,183.98
-L-	33+79.57 TO 35+82.99	LT	140.98
-L-	33+96.26 TO 34+51.97	RT	258.61
-L-	38+59.50 TO 39+52.13	RT	214.80
-L-	45+96.02 TO 48+96.17	LT	295.85
-L-	49+50.66 TO 50+19.36	RT	134.51
-L-	53+17.00 TO 57+25.52	CL	391.16
-L-	53+17.00 TO 55+14.15	RT	653.25
-L-	54+89.95 TO 54+89.95	RT	352.92
-L-	61+61.06 TO 66+70.29	RT	1,131.75
-Y8-	11+03.43 TO 12+25.01	CL	286.07
-Y14REV-	10+04.67 TO 12+75.00	CL	910.18
	TEMPORARY WIDENING AREAS TO BE REMOVED		
-L-	49+61.26 TO 52+31.70	RT	174.24
-L-	52+74.37 TO 54+25.20	RT	47.05
-Y14REV-	10+73.32 TO 13+25.07	CL	113.13
		PROJ. TOTAL	9,227.10
		SAY	9,300

SUMMARY OF EXISTING CONCRETE PAVEMENT REMOVAL

LINE	Station to Station	LOC LT/RT/CL	SQ. YDS.
-L-	67+00.00 TO 72+00.00	CL	2,400.53
		PROJ. TOTAL	2,400.53
		SAY	2,500

GUARDRAIL SUMMARY

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

LINE	BEG. STA.	END STA.	LOC.	LENGTH (FT.) STRAIGHT	LENGTH (FT.) SHOP CURVED	LENGTH (FT.) DOUBLE FACED	WARRANT POINT APPR. END	WARRANT POINT TRAIL. END	"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLARE LENGTH (FT.) APPR. END	FLARE LENGTH (FT.) TRAIL. END	W (FT.) APPR. END	W (FT.) TRAIL. END	ANCHORS (EA) GRAU 350	ANCHORS (EA) TYPE CAT-1	ANCHORS (EA) GRAU 350 TL-II	ANCHORS (EA) TES	IMP. ATTEN. TYPE 350 EA	IMP. ATTEN. TYPE 350 G	IMP. ATTEN. TYPE 350 NG	REMOVE EXISTING GUARDRAIL	REMARKS
-L-/-Y5-	20+67.53	11+55.59 -Y5- RT	RT.	225.00	37.50		21+50.00		10'/ 6'	14'/ 9'	50'	50	1	1	2								
-Y5-/-L-	11+41.73 -Y5- LT	27+02.33 -L- RT	RT.	437.50	37.50		23+50.00	27+00.00	10'/6'	14'/9'	50'	50	1	1	1	1							
-L-	38+41.00	39+16.00	LT.	75.00			38+50.00		2'		50		1		1	1							Protection for Overhead sign Support
-L-	53+34.50	59+72.00	LT.	637.50			59+50.00	53+50.00	10' BERM	14'	50'		1		1	1							
-L-	60+54.50	63+42.00	LT.	287.50			63+00.00	60+50.00	10' BERM	14'	50'		1		1	1							
-Y5-	12+00.00	12+50.00	RT.	50.00			12+00.00	12+50.00	6'	9'	25'		1			1	1						1:1 FILL SLOPE
-L-	53+13.00	54+88.00	RT.	175.00			53+13.00	54+88.00	3'									2					Guardrail Placed in Parking Lot
-L-	57+96.30	60+46.30	RT.	250.00			57+96.30	60+46.30	6'									2					Guardrail Placed in Parking Lot
-DR3-	12+00	14+00	RT.	200.00			12+00.00	14+00.00	4'	7'								2					
-L-	68+72	69+11	RT.																			39'	
		SUBTOTALS		2,337.50	75.00										6	5	1	6				39'	SUB-TOTAL
DEDUCTION FOR ANCHOR UNITS																							
		7 GRAU 350 @ 50'		-300.00																			
		5 CAT-1 @ 6.25'		-31.25																			
		1 GRAU 350 TL-II @ 25'		-25.00																			
		PROJECT TOTAL		1,981.25	75.00										6	5	1	6				39'	Project Total
		SAY		1,987.50																			
ADDITIONAL GUARDRAIL POSTS=10 EA																							

PROJ. REFERENCE NO.	SHEET NO.
U-4020	3-I

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
8	4	TURNHART ACQUISITION CORPORATION
10	4	DAN'L BOONE INN OF BOONE, INC
11	4	DALE S. WHISENANT
12	4	GRACE EVANGELICAL LUTHERN CHURCH
13	4	B D BUILDINGS LTD.
14	4	APPALACHIAN SOUTH INC
15	4	ANDREA M. McDONOUGH
16	4	BELLSOUTH TELECOMMUNICATIONS
17	4	MATTHEWS FAMILY, LLC
18	4	JEFFREY R. SUTTON
19	4,5	KINGSWOOD CONDOMINIUMS
20	4	WADE COFFEY
21	4	ROBERT F. HELMS
22	4,5	ROBERT F. HELMS ETAL
90	5	WESLEY P. SAYLORS
91	5	DEBORAH K. WALKER, ET AL
23	5	JAMES B. GRAHAM, TRUSTEE LIVING TRUST
24	5	ORANGE AVENUE AUTO SALES, INC
25	5	RENO MANAGEMENT LLC
26	5	TOWN OF BOONE
27	5	LETTIE JUNE STAMEY
28	5	TRAILWAY LAUNDRY INC
29	5	A. E. MCCREARY
30	5	GILES H. O'NEAL
31	5	BETTY B. ELLIOTT
32	5	KELLE JOE EDMISTEN
33	5	BOONE GOSPEL TABERNACLE
34	5	BOONE UNITARIAN UNIVERSALIST FELLOWSHIP
35	5	REBECCA E. YOUNCE
36	5	STACY EGGERS, JR.
37	5,6	MACK D. BROWN
38	5,6	RAY KHAN
95	5	HILL BUMGARNER
96	5	HENRY J. KNOLL
101	5	BOONE STATION PARTNERS, LLC
100	5	FRED PERRY
106	5,6	BOONE HOSPITALITY, LLC
136	5	ROBERT D. LEE
39	6	BUDDY WOOD
41	6	WALTER OTTO
42	6	COLVARD OIL CO, INC.
43	6	NEWTON DEVELOPERS LLC
44	6	BARNEY L. BROOKSHIRE
45	6	TODD R. GREENE, ET AL
46	6	MARY ANN COLE
47	6	MOUNTAIN OIL II, LLC.
48	6	KENNETH BUDDY WOOD
49	6	KENNETH BUDDY WOOD
50	6,7	KENNETH BUDDY WOOD, ET UX
108	6	HAROLD E. STEELMAN, JR.
111	6,7	KENNETH BUDDY WOOD
51	7	TOYOTA OF BOONE
52	7	WOOD MASONRY SUPPLY
53	7	JOHN WAISTEL HODGES
54	7	ROBERT LEE DUNNIGAN
55	7	TOYOTA OF BOONE, INC. NORMAN LEE CHEEK
56	7	RWE PROPERTIES, LLC
57	7	VALLE CAPITAL GROUP, LLC
58	7,8	AJD INVESTMENTS INC.
59	7,8	BOONE MOVIE PARCEL, LLC

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
60	7,8	BOONE INVESTMENT GROUP, LLC
61	8	NEW RIVER LIGHT AND POWER
62	8	CHARLIE E. WALLACE
63	8	AILSA L. MILLER ETAL
64	8	JAMES C. HASTINGS
65	8	CLYDE JONES DISTRIBUTING CO., INC
66	8	LARRY K. NORRIS ETAL
67	8,9	WILCOHESS LLC
68	8	JOSEPH JERRY IDOL, JR.
69	8,9	THE PANTRY, INC.
119	8	TOMMY A. BLAKE
120	8	HIGH COUNTRY BANK
121	8	ANNA M. GREENE
123	8,10	JAMES P. MIZNER MICHAEL C. MCKIBBIN
122	8,10	JOSEPH C. LEMYRE
70	9	JOHN ELLIS GREENE

PROJECT REFERENCE NO.	SHEET NO.
U-4020	4
R/W SHEET NO.	

20 0 40

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 14903 ENGINEER GREGORY E. BREWER
4-22-09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER
5-8-09

NAD 83/95

SEE SHEET 11 FOR PROFILE OF –L–
SEE SHEET 13 FOR PROFILE OF –Y2–
SEE SHEET 13 FOR PROFILE OF –Y4–
SEE SHEET 14 FOR PROFILE OF –Y5–
SEE SHEET 18 FOR PROFILE OF –DR6–

REVISIONS

8/17/99

BEGIN TIP PROJECT U-4020
–L– POT STA. 16+00.00

-BL-8
-L- POT 16+28.62
(20.68' RT.)

TURNHART ACQUISITION CORPORATION
RB 1111 PG 038

DALE S. WHISENANT
DB 242 PG 822

WESTMINSTER PRESBYTERIAN CHURCH
RB 099 PG 219
RB 111 PG 308

-Y2-
PI Sta 12+29.23
Δ = 69° 48' 33.0" (RT)
D = 49° 59' 59.9"
L = 139.62'
T = 79.95'
R = 114.59'

5+00.00 POT
-BY3-29

-BY2- 7+13.01
-Y2- POT 12+00.19
(26.86' LT.)

BELL SOUTH TELECOMMUNICATIONS
DB 113 PG 041
DB 134 PG 665

-L- PT 15+40.34

BEGIN CONSTRUCTION
-Y2- STA.12+50.00

-Y2+POT 13+58.79
-L-POC 19+31.58

-Y2-POT 12+88.90

GRACE LUTHERAN CHURCH
2SBK

GRACE EVANGELICAL LUTHERN CHURCH
RB 093 PG 123
DB 147 PG 090

-Y4-POT 10+17.51
-L-POT 19+63.79

-L-PT 24+39.51

-L-PC 21+51.66

-Y5-POT 10+29.36
-L-POC 22+78.95

-BL-10
-L- POT 23+12.86
(5.70' LT.)

KINGSWOOD CONDOMINIUMS
DB 249 PG 523
PB 006 PG 006

NOBLETT, LLC
RB 1036 PG 506

-Y1-POT 10+00.00
-L-POT 16+11.69

-Y1-PC 10+92.35

-BL-9
-L- POT 18+99.35
(15.64' RT.)

-Y1-PT 11+46.38

-Y1-POT 11+56.43

APPALACHIAN SOUTH INC.
RB 470 PG 630
TRACT VIII

-L-PC 17+67.45

-L-PT 19+42.95

-Y4-PC 11+69.18

DAN'L BOONE INN OF BOONE, INC
DB 010 PG 827
DB 021 PG 435
DB 183 PG 742
DB 186 PG 325
DB 222 PG 628

-BY1-25
-Y1- POT 11+56.43
(19.95' RT.)

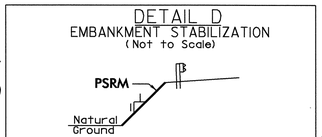
-Y1-
PI Sta 11+19.39
Δ = 5° 24' 09.4" (LT)
D = 10° 00' 00.0"
L = 54.03'
T = 27.03'
R = 572.96'

-Y4-
PI Sta 13+04.04
Δ = 26° 29' 25.5" (RT)
D = 10° 00' 00.0"
L = 264.90'
T = 134.86'
R = 572.96'
e = 0.04

-L-
PI Sta 18+55.55
Δ = 12° 34' 10.0" (RT)
D = 7° 09' 43.1"
L = 175.50'
T = 88.10'
R = 800.00'
e = SEE PLANS

PI Sta 22+97.16
Δ = 20° 36' 57.1" (LT)
D = 7° 09' 43.1"
L = 287.85'
T = 145.50'
R = 800.00'
e = SEE PLANS

DETAIL D
EMBANKMENT STABILIZATION
(Not to Scale)



* PSRM = Permannet Soil Reinforcement Matting

RT. OF –Y5– STA. 12+00 TO 12+50

END CONSTRUCTION
-Y4- POC 13+50.00

-BY4- 32
-Y4- POT 12+80.48
(44.27' LT.)

END CONSTRUCTION
-Y5- STA.13+00.00

-Y5-
PI Sta 11+01.36
Δ = 3° 53' 24.2" (RT)
D = 5° 00' 00.0"
L = 77.80'
T = 38.92'
R = 1,145.92'

PI Sta 13+15.35
Δ = 4° 07' 50.8" (LT)
D = 25° 00' 00.0"
L = 16.52'
T = 8.27'
R = 229.18'
e = SEE PLANS

PI Sta 13+61.27
D = 20° 24' 17.7" (LT)
D = 50° 00' 00.0"
L = 40.81'
T = 20.62'
R = 114.59'

5" MONOLITHIC CONC. ISLAND
4" CONC. SIDEWALK

SEE SHEET 2–I FOR TRAFFIC DIAGRAM
SEE SHEET 2–J FOR INTERSECTION DETAIL

MATCHLINE –L– STA. 26+00.00 SEE SHEET 5

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REVISIONS

4" CONC. SIDEWALK

5" MONOLITHIC CONC. ISLAND

SEE SHEET 2-I FOR TRAFFIC DIAGRAM

SEE SHEET 2-K FOR INTERSECTION DETAIL

20 0 40

PROJECT REFERENCE NO.	SHEET NO.
U-4020	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16903 ENGINEER GREGORY E. BREW

2-2-09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN

2-24-09

SEE SHEET 11 FOR PROFILE OF -L-
SEE SHEET 14 FOR PROFILE OF -Y6-
SEE SHEET 14 FOR PROFILE OF -Y7-
SEE SHEET 14 FOR PROFILE OF -Y8-
SEE SHEET 15 FOR PROFILE OF -Y9-

NAD 83

MATCHLINE -L- STA. 26+00.00 SEE SHEET 4

MATCHLINE -L- STA. 37+25 SEE SHEET 6

-BL-GPS U4020-3
-L- POT 37+04.75
(31.88' RT.)

-L-PC 35+98.42

-BL-I1
-L- POT 27+01.69
(16.05' LT.)

-BL-12
-L- POT 31+84.87
(5.46' LT.)

-BL-13
-L- POT 34+40.38
(70.31' LT.)

-Y7-POT 12+26.32
-L-POT 32+39.87

-Y6-POT 10+29.00
-L-POT 31+69.86

-Y7-POT 10+00

-Y9-POT 10+20.95
-L-POC 36+34.53

-Y8-POT 10+23.90
-L-POT 34+33.35

-Y6-PC 10+85.03
-Y6-PT 11+06.02

-Y8-PC 10+75.93
-Y8-PT 11+37.62

-Y6-PC 12+96.95
-Y6-PT 13+19.25

-Y8-POT 13+35.08

-Y6-POT 13+55.09

-BY6-38
-Y6- POT 13+55.09
(9.97' LT.)

-Y6-
PI Sta 10+95.52
Δ = 2° 05' 54.4" (RT)
D = 10° 00' 00.0"
L = 20.98'
T = 10.49'
R = 572.96'
e = SEE PLANS

PI Sta 13+08.10
Δ = 2° 13' 48.1" (RT)
D = 10° 00' 00.0"
L = 22.30'
T = 11.15'
R = 572.96'
e = SEE PLANS

-Y8-
PI Sta 11+06.80
Δ = 6° 10' 06.8" (RT)
D = 10° 00' 00.0"
L = 61.69'
T = 30.87'
R = 572.96'
e = SEE PLANS

KINGSWOOD CONDOMINIUMS
DB 249 PG 523
PB 006 PG 006

ORANGE AVENUE AUTO SALES, INC
DB 204 PG 646

TOWN OF BOONE
BY TAX MAP
DB 203 PG 399

A.E. MCCREARY
DB 085 PG 081

PINE WOODS CONDOMINIUMS
DB 246 PG 823
PB 6 PG 4

BOONE UNITARIAN UNIVERSALIST FELLOWSHIP
BY TAX MAP
DB 212 PG 392

BOONE UNITARIAN UNIVERSALIST CHURCH

STACY EGGERS, JR.
DB 73 PG 523
BY TAX MAP

KELLY JOE EDMISTEN
BEGIN CONSTRUCTION
-Y7- STA.11+50.00
RB 653 PG 652
PB 2 PG 25

ROBERT F. HELMS ETAL
RB 527 PG 414

JAMES B. GRAHAM, TRUSTEE
LIVING TRUST
RB 475 PG 629

RENO MANAGEMENT LLC
RB 345 PG 660

LETTIE JUNE STAMEY
DB 093 PG 566
BY TAX MAP

TRAILWAY LAUNDRY INC.
BY TAX MAP
DB 070 PG 177

TIE TO EXISTING MANHOLE

JOHNNY R. RAMSEY
DB 176 PG 383

JOE FRANK MATHIS
RB 167 PG 672

GILES H. O'NEAL
RB 230 PG 818

BETTY B. ELLIOTT
RB 338 PG 821

BOONE GOSPEL TABERNACLE
DB 057 PG 041
BY TAX MAP

PROPOSED I-6" & G

BILL BUMGARNER
DB 78 PG 451

FRED PERRY
DB 76 PG 23

ROBERT D. LEE
DB 710 PG 570

HENRY J. KNOLL
RB 144 PG 204

REBECCA E. YOUNCE
DB 011 PG 834

BOONE STATION PARTNERS, LLC
DB 1230 PG 871
DB 1230 PG 885
DB 1230 PG 889
DB 1230 PG 892
DB 1230 PG 898
PB 020 PG 200

END CONSTRUCTION
-Y7- STA.12+50.00

END CONSTRUCTION
-Y8- STA.12+10.00

END CONSTRUCTION
-Y9- STA.14+00.00

PROPOSED VALLEY GUTTER
-Y8- 12+20 END VALLEY GUTTER

DO NOT DISTURB WALL

REMOVE

PROPOSED GUARDRAIL CAT-1

AREA STILL UNDER CONSTRUCTION

3S BUS UNDER CONSTRUCTION

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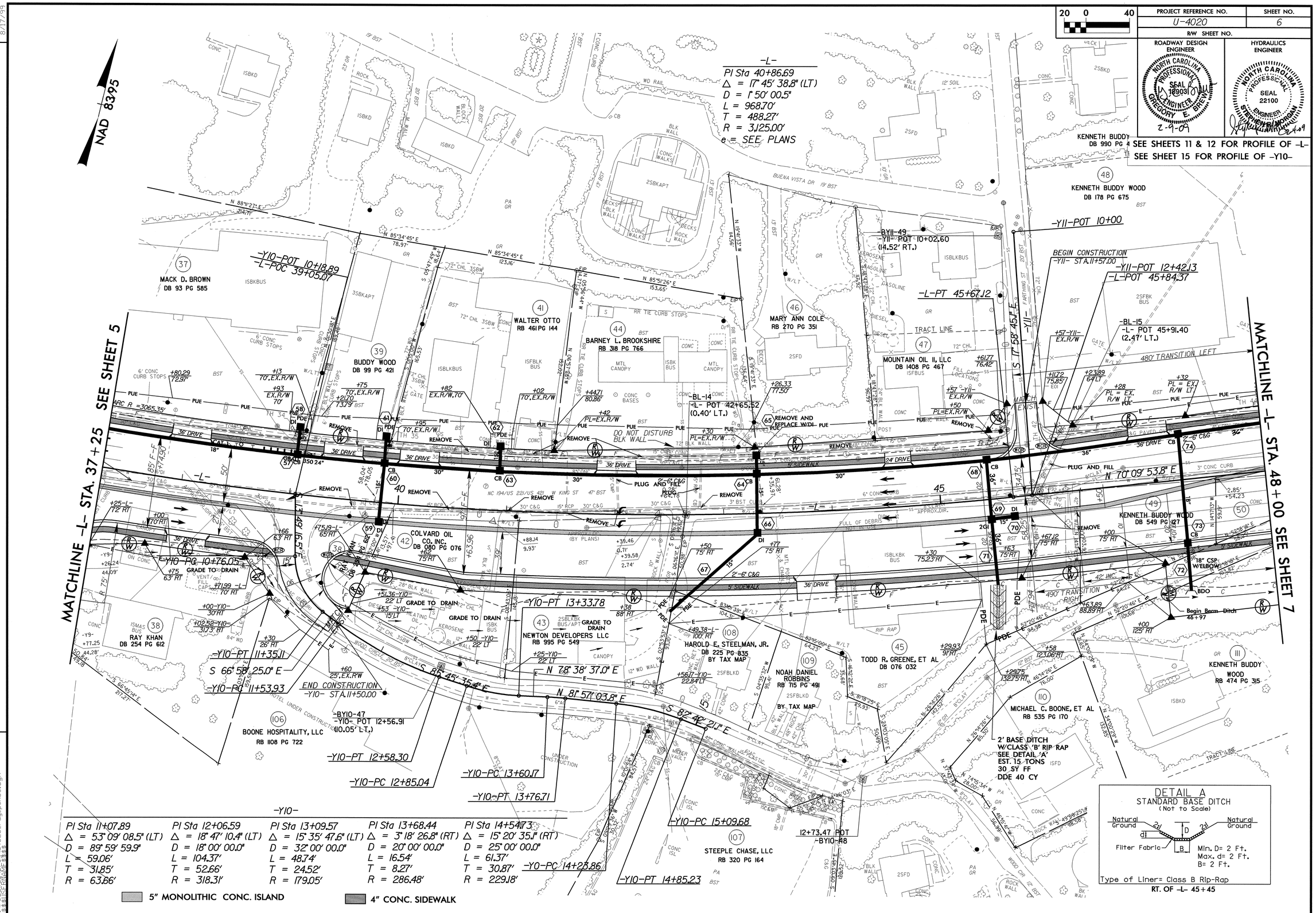
PROJECT REFERENCE NO.	SHEET NO.
U-4020	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW — 2-9-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN — 2-4-09

SEE SHEETS 11 & 12 FOR PROFILE OF -L-
SEE SHEET 15 FOR PROFILE OF -Y10-



-Y10-

PI Sta 11+07.89	PI Sta 12+06.59	PI Sta 13+09.57	PI Sta 13+68.44	PI Sta 14+54.73
Δ = 53° 09' 08.5" (LT)	Δ = 18° 47' 10.4" (LT)	Δ = 15° 35' 47.6" (LT)	Δ = 3° 18' 26.8" (RT)	Δ = 15° 20' 35.1" (RT)
D = 89° 59' 59.9"	D = 18° 00' 00.0"	D = 32° 00' 00.0"	D = 20° 00' 00.0"	D = 25° 00' 00.0"
L = 59.06'	L = 104.37'	L = 48.74'	L = 16.54'	L = 61.37'
T = 31.85'	T = 52.66'	T = 24.52'	T = 8.27'	T = 30.87'
R = 63.66'	R = 318.31'	R = 179.05'	R = 286.48'	R = 229.18'

5" MONOLITHIC CONC. ISLAND

4" CONC. SIDEWALK

REVISIONS

8/17/99

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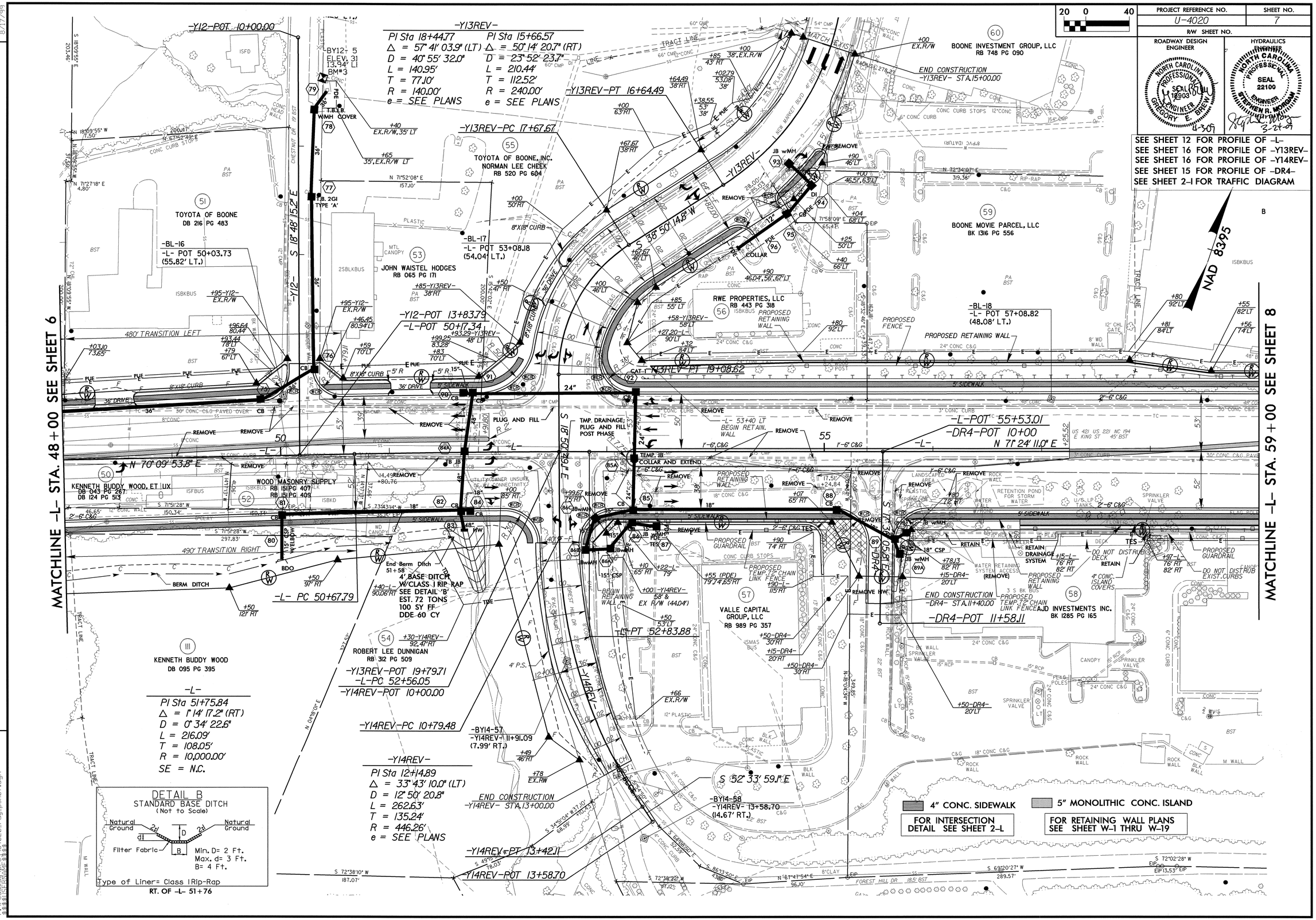

PROJECT REFERENCE NO.
U-4020
SHEET NO.
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
SEE SHEET 12 FOR PROFILE OF -L-
SEE SHEET 16 FOR PROFILE OF -Y13REV-
SEE SHEET 16 FOR PROFILE OF -Y14REV-
SEE SHEET 15 FOR PROFILE OF -DR4-
SEE SHEET 2-1 FOR TRAFFIC DIAGRAM
-Y13REV-
PI Sta 18+44.77
Δ = 57° 41' 03.9" (LT)
D = 40° 55' 32.0"
L = 140.95'
T = 77.10'
R = 140.00'
e = SEE PLANS
PI Sta 15+66.57
Δ = 50° 14' 20.7" (RT)
D = 23° 52' 23.7"
L = 210.44'
T = 112.52'
R = 240.00'
e = SEE PLANS
-Y12-POT 10+00.00
-Y13REV-PT 16+64.49
-Y13REV-PC 17+67.67
TOYOTA OF BOONE, INC.
NORMAN LEE CHEEK
RB 520 PG 604
BOONE INVESTMENT GROUP, LLC
RB 748 PG 090
END CONSTRUCTION
-Y13REV- STA.15+00.00
TOYOTA OF BOONE
DB 216 PG 483
-BL-16
-L- POT 50+03.73
(55.82' LT.)
JOHN WAISTEL HODGES
RB 065 PG 171
-BL-17
-L- POT 53+08.18
(54.04' LT.)
BOONE MOVIE PARCEL, LLC
BK 1316 PG 556
RWE PROPERTIES, LLC
RB 443 PG 318
-BL-18
-L- POT 57+08.82
(48.08' LT.)
-Y12-POT 13+83.79
-L-POT 50+17.34
-Y13REV-PT 19+08.62
480' TRANSITION LEFT
490' TRANSITION RIGHT
PLUG AND FILL
TMP. DRAINAGE; PLUG AND FILL POST PHASE
-L-POT 55+53.01
-DR4-POT 10+00
N 71° 24' 11.0" E
N 70° 09' 53.8" E
KENNETH BUDDY WOOD, ET UX
DB 043 PG 267
DB 124 PG 513
WOOD MASONRY SUPPLY
RB 151 PG 407
RB 151 PG 409
-L- PC 50+67.79
4' BASE DITCH W/CLASS I RIP RAP SEE DETAIL 'B' EST. 72 TONS 100 SY FF DDE 60 CY
KENNETH BUDDY WOOD
DB 095 PG 395
ROBERT LEE DUNNIGAN
RB 312 PG 509
-Y13REV-POT 19+79.71
-L-PC 52+56.05
-Y14REV-POT 10+00.00
-Y14REV-PC 10+79.48
-L-PT 52+83.88
VALLE CAPITAL GROUP, LLC
RB 989 PG 357
END CONSTRUCTION
-DR4- STA.11+40.00
-DR4-POT 11+58.11
AJD INVESTMENTS INC.
BK 1285 PG 165
-L-
PI Sta 51+75.84
Δ = 1° 14' 17.2" (RT)
D = 0° 34' 22.6"
L = 216.09'
T = 108.05'
R = 10,000.00'
SE = N.C.
-Y14REV-
PI Sta 12+14.89
Δ = 33° 43' 10.0" (LT)
D = 12° 50' 20.8"
L = 262.63'
T = 135.24'
R = 446.26'
e = SEE PLANS
-BY14-57
-Y14REV- 11+91.09
(7.99' RT.)
-BY14-58
-Y14REV- 13+58.70
(14.67' RT.)
END CONSTRUCTION
-Y14REV- STA.13+00.00
-Y14REV-PT 13+42.11
-Y14REV-POT 13+58.70
S 52° 33' 59.1" E
S 38° 50' 14.8" W
S 18° 48' 15.2" E
S 18° 50' 49.1" E
S 38° 05' 08.1" E
NAD 83/95
MATCHLINE -L- STA. 48+00 SEE SHEET 6
MATCHLINE -L- STA. 59+00 SEE SHEET 8
DETAIL B
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Min. D= 2 Ft.
Max. d= 3 Ft.
B= 4 Ft.
Type of Liner= Class I Rip-Rap
RT. OF -L- 51+76
4" CONC. SIDEWALK
5" MONOLITHIC CONC. ISLAND
FOR INTERSECTION DETAIL SEE SHEET 2-L
FOR RETAINING WALL PLANS SEE SHEET W-1 THRU W-19
REVISIONS
8/17/99
18-MAR-2009 09:47

8/17/99

REVISIONS

SEE SHEET 17 FOR PROFILE OF –DR1–
SEE SHEET 17 FOR PROFILE OF –DR2–
SEE SHEET 17 FOR PROFILE OF –DR3–

SEE SHEET 2–I FOR TRAFFIC DIAGRAM

5" MONOLITHIC CONC. ISLAND

4" CONC. SIDEWALK

FOR RETAINING WALL PLANS SEE SHEET W–1 THRU W–19

FOR CULVERT PLANS SEE SHEET C–1 THRU C–11

FOR INTERSECTION DETAIL SEE SHEET 2–M

NAD 83/95

20 0 40

PROJECT REFERENCE NO.	SHEET NO.
U-4020	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19903 ENGINEER GREGORY E. BREW
4-3-09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEVEN B. MCGRAW
5-24-09

SEE SHEETS 12 & 13 FOR PROFILE OF –L–
SEE SHEET 16 FOR PROFILE OF –Y15REV–
SEE SHEET 16 FOR PROFILE OF –Y16–

MATCHLINE –Y16– STA. 17+00 SEE SHEET 10

MATCHLINE –L– STA. 59+00 SEE SHEET 7

MATCHLINE –L– STA. 70+00 SEE SHEET 9

–DRI–POT 10+00

–DR2–POT 10+00

–DRI–POT 12+50.00= –L–POT 60+11.46

–DR2–POT 11+70.00

–DR3–POT 14+31.24

–DR3–PC 10+97.22

–DR3–PT 12+87.50

–DR3–PC 12+38.26

–DR5–POT 11+78.62

–DR3–PT 11+37.02

–DR5–PT 11+58.08

–DR5–POT 10+00.00

–DR5–PC 10+79.58

–DR3–POT 10+00.00

–Y15REV–POT 11+71.61

–Y15REV–PT 13+25.04

–Y15REV–POT 14+21.70

–Y16–POT 17+37.50

–L–POT 66+97.36

–L–PC 68+91.30

–Y15REV–POT 10+00

–Y15REV–PC 11+83.25

–DR5–POT 10+00.00

–Y15REV–PC 12+07.68

–Y16–POT 20+66.23

–L–POT 66+45.72

END CONSTRUCTION –DRI– STA.11+00.00

END CONSTRUCTION –DR2– STA.10+50.00

END CONSTRUCTION –DR3– STA.14+10.00

END CONSTRUCTION –Y15REV– STA.13+50.00

–L– 63+51.15 END RETAINING WALL

–L– 60+40 BEGIN RETAINING WALL

–BL–19 –L– POT 60+69.80 (48.08' LT.)

–BL–20 –L– POT 66+97.36 (17.74' RT.)

PROPOSED GUARDRAIL

PROPOSED RETAINING WALL

PROPOSED FENCE

PROPOSED TEMP. 12' CHAIN LINK FENCE

DO NOT DISTURB EXISTING WALL

DO NOT DISTRUB EXIST. CURBS

4' CONC. ISLAND COVERS

REMOVE ISLAND

REMOVE CB AND 58' OF 15" PIPE

RETAIN EXIST 36" AND TIE TO CB

PLUG AND FILL

PLUG PIPES ENTERING CULVERT

REMOVE BLOCK WALL

CLASS I RIP RAP BANK STABILIZATION SEE DETAIL

BOONE INVESTMENT GROUP, LLC
RB 748 PG 090

BOONE MOVIE PARCEL, LLC
BK 1316 PG 556

AJD INVESTMENTS INC.
BK 1285 PG 165

JAMES C. HASTINGS
RB 188 PG 557

HIGH COUNTRY BANK
RB 485 PG 220

ANNA M. GREENE
DB 096 PG 241
BY TAX MAP

WILCOHESS LLC.
RB 927 PG 63

CHARLIE E. WALLACE
RB 1159 PG 230

NEW RIVER LIGHT AND POWER
DB 173 PG 015

AILSA L. MILLER ETAL
RB 1044 PG 214

CLYDE JONES DISTRIBUTING CO., INC
RB 246 PG 151

JOHN E. GREENE
DB 389 PG 721

LARRY K. NORRIS ETAL
RB 913 PG 786

TOMMY A. BLAKE
RB 521PG 891

JOSEPH JERRY IDOL, JR.
RB 881PG 007

THE PANTRY, INC.
RB 394 PG 742

CHARLES F. OCHOA
RB 962 PG 761

ARCHIE LYONS
DB 099 PG 171

DETAIL E
STANDARD 'V' DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, Natural Ground
Min. D= 1.5 Ft.

DETAIL C
EMBANKMENT STABILIZATION
(Not to Scale)
12', 1.5:1
Est. 18 Tons
Type of Liner= CLASS I Rip-Rap
NO FILTER FABRIC
RT. OF –L– 69+05

FROM –L– 61+54 TO 62+23 RT
DDE = 16 c.y.

–Y16–
PI Sta 17+11.73
Δ = 1° 01' 51.1" (LT)
D = 2° 00' 00.0"
L = 51.54'
T = 25.77'
R = 2,864.79'
e = SEE PLANS

–DR3–
PI Sta 12+63.39
Δ = 28° 12' 47.3" (LT)
D = 57° 17' 44.8"
L = 49.24'
T = 25.13'
R = 100.00'

–DR3–
PI Sta 11+17.39
Δ = 22° 48' 16.9" (RT)
D = 57° 17' 44.8"
L = 39.80'
T = 20.17'
R = 100.00'

–DR5–
PI Sta 11+20.98
Δ = 44° 58' 24.2" (RT)
D = 57° 17' 44.8"
L = 78.49'
T = 41.39'
R = 100.00'

–Y15REV–
PI Sta 12+57.27
Δ = 40° 37' 14.7" (LT)
D = 28° 38' 52.4"
L = 141.79'
T = 74.02'
R = 200.00'

–L–
PI Sta 71+53.90
Δ = 14° 57' 37.3" (LT)
D = 2° 51' 53.2"
L = 522.22'
T = 262.60'
R = 2,000.00'
e = SEE PLANS

BY15-60 –Y15REV– POC 11+95.71 (103.52' RT.)

BY15-61 –Y15REV– POT 14+13.67 (11.31' LT.)

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8/17/99

REVISIONS

20 0 40

PROJECT REFERENCE NO.	SHEET NO.
U-4020	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW — 2-9-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN — 2-9-09

SEE SHEET 13 FOR PROFILE –L–
SEE SHEET 17 FOR PROFILE –Y17–
SEE SHEET 17 FOR PROFILE –Y18–
SEE SHEET 2-I FOR INTERSECTION TRAFFIC DIAGRAM

NAD 83/95

–Y17–
PI Sta 11+11.55
△ = 11° 57' 31.6" (LT)
D = 13° 00' 00.0"
L = 91.99'
T = 46.16'
R = 440.74'
e = SEE PLANS

5" MONOLITHIC CONC. ISLAND
4" CONC. SIDEWALK

MATCHLINE –L– STA. 70+00 SEE SHEET 8

-BY17-65
-Y17- POT 10+00
(0.81' LT.)

131 NANCY SUE BEUTTEL
RB 309 PG 633

129 SPENCER COOLIDGE HARRISON
RB 1178 PG 748

67

70 JOHN ELLIS GREENE
DB 1215 PG 280

JOYCE OVERCASH
RB 1189 PG 303

130 RUTH T. BROOKS
DB 082 PG 434

72 J.P. PALMER
LOIS PALMER HAYES
RB 614 PG 097

75 KAREN PROTHERO
RB 377 PG 260

73 ALVIN L. HARDY
RB 135 PG 290

74 WARD G. CARROLL
RB 659 PG 203
PB 014 PG 154

71 STEPHEN T. WILLIAMS
RB 086 PG 392
RB 946 PG 752

76 EULA CARROLL COWLES
RB 740 PG 782
PB 019 PG 182

135 CHARLES EDWARD KELLER
DB 096 PG 456
RB 946 PG 756

133 HARRY DAVID BRIGHAM
DB 240 PG 946

132 DALE & JAMES E. GREENE INVESTMENTS
DB 167 PG 023
DB 195 PG 396

134 BETTY P. FARTHING
RB 611 PG 620

69 THE PANTRY, INC.
RB 394 PG 742

-Y17-POT 10+00
-Y17-PC 10+65.39
-L-PT 76+23.79
-L-PC 74+39.14
-L-PT 74+13.51
-Y17-POT 12+30.09
-L-POC 72+52.62
-Y17-PT 11+57.38
-BL-21
-L- POT 72+19.02
(36.66' RT.)
-Y18-PC 10+63.26
-Y18-PT 12+16.41
-Y18-POT 10+01.70
-L-POC 72+67.74
-BY18-69
-Y18- POT 13+88.11
(84.59' LT.)
6+53.60 POT
-BY19-71
5+00.00 POT
-Y18- POT 12+04.56
(22.74' LT.)
-BL-GPS-U4020-5
72+79.25 PINC
END CONSTRUCTION
-Y18- STA. 11+00.00
BM#4
-BY18- STA. 6+97.42
25.36' LEFT
ELEV. 3156.50'

END TIP PROJECT U-4020
–L– POC STA 74+00.00

–Y18–
PI Sta 11+44.22
△ = 45° 56' 44.0" (LT)
D = 30° 00' 00.0"
L = 153.15'
T = 80.96'
R = 190.99'
e = EXISTING

–L–

PI Sta 71+53.90	PI Sta 75+31.59
△ = 14° 57' 37.3" (LT)	△ = 7° 23' 08.8" (LT)
D = 2° 51' 53.2"	D = 4° 00' 00.0"
L = 522.22'	L = 184.64'
T = 262.60'	T = 92.45'
R = 2,000.00'	R = 1,432.39'
e = SEE PLANS	e = EXISTING

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8/17/99

REVISIONS

NAD 83/95

20 0 40

PROJECT REFERENCE NO.	SHEET NO.
U-4020	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19809 ENGINEER GREGORY E. BREWER
2-9-09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN
2-9-09

SEE SHEET 16 FOR PROFILE -Y16-

MATCHLINE -Y16- STA. 17+00.00 SEE SHEET 8

(127) PERKINSVILLE BAPTIST CHURCH, INC.
RB 706 PG 269
BY TAX MAP

PERKINSVILLE BAPTIST CHURCH

(124) T & C PROPERTIES OF BOONE, LLC
RB 487 PG 662
BY TAX MAP

(123) JAMES P. MIZNER
MICHAEL C. MCKIBBIN
RB 634 PG 245

(126) JOHN E. GREENE
RB 195 PG 200

(128) LAUREL INVESTMENTS
RB 101PG 680

(125) OLD HIGHWAY PROPERTIES, LLC
RB 133IPG 119

(122) JOSEPH C. LEMYRE
RB 400 PG 598

DB 424 PG 082

DB 238 PG 336
PB 1PG 87

-Y16- PI Sta 17+11.73
Δ = 1° 01' 51.1" (LT)
D = 2° 00' 00.0"
L = 51.54'
T = 25.77'
R = 2,864.79'
e = SEE PLANS

5+00.00 POT
-BY16-62

-Y16-POT 10+00.00

-BY16-63
-Y16- POT 16+04.50
(18.22' RT.)

-Y16-PC 16+85.96

-Y16- STA.15+00.00 BEGIN CONSTRUCTION

2'-6" C&G CHANNELIZATION

292.26' TRANSITION

TRACT LINE

-Y16-

S 7° 27' 09.1" E

REMOVE

TBDI

EXIST. MAJOR

SOCCER FIELD

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-4020	11

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BRIEN
2-9-09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN B. MORGAN
2-9-09

SEE SHEETS 4 & 5 FOR PLAN OF -L-

-L-

BM#1 ELEVATION = 3222.15'
N 908311. E 1210227.
BL STA.6+38 96' RT. (-L- STA.11+12 82' RT.)
PK NAIL IN PARKING LOT NEXT TO CURB

PI = 16+15.00
EL = 3,192.98'
VC = 380'
K = 40

BEGIN GRADE
-L- STA.16+50.00
ELEV. 3,197.59

PI = 20+00.00
EL = 3,210.79'
VC = 120'
K = 76

PI = 23+00.00
EL = 3,229.42'
VC = 220'
K = 241

3,199.24

(-)4.83345%

(+)4.62260%

(+)4.62260%

(+)5.21667%

(+)5.29837%

3,255.80

SEE SHEETS 5 & 6 FOR PLAN OF -L-

-L-

BM#2 ELEVATION = 3264.86'
N 908333. E 1212037.
BL STA.24+99 101' LT. (-L- STA.29+51 112' LT.)
CHISELED SQUARE ON CONCRETE HORSE SHOE PIT

PI = 29+00.00
EL = 3,261.21'
VC = 340'
K = 213

PI = 31+70.00
EL = 3,271.20'
VC = 200'
K = 52

PI = 35+60.00
EL = 3,270.56'
VC = 580'
K = 82

3,255.80

(+)5.29837%

(+)3.70000%

(+)3.70000%

(-)10.16417%

(-)10.16417%

(-)11.22002%

3,231.57

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PROJECT REFERENCE NO.	SHEET NO.
U-4020	12

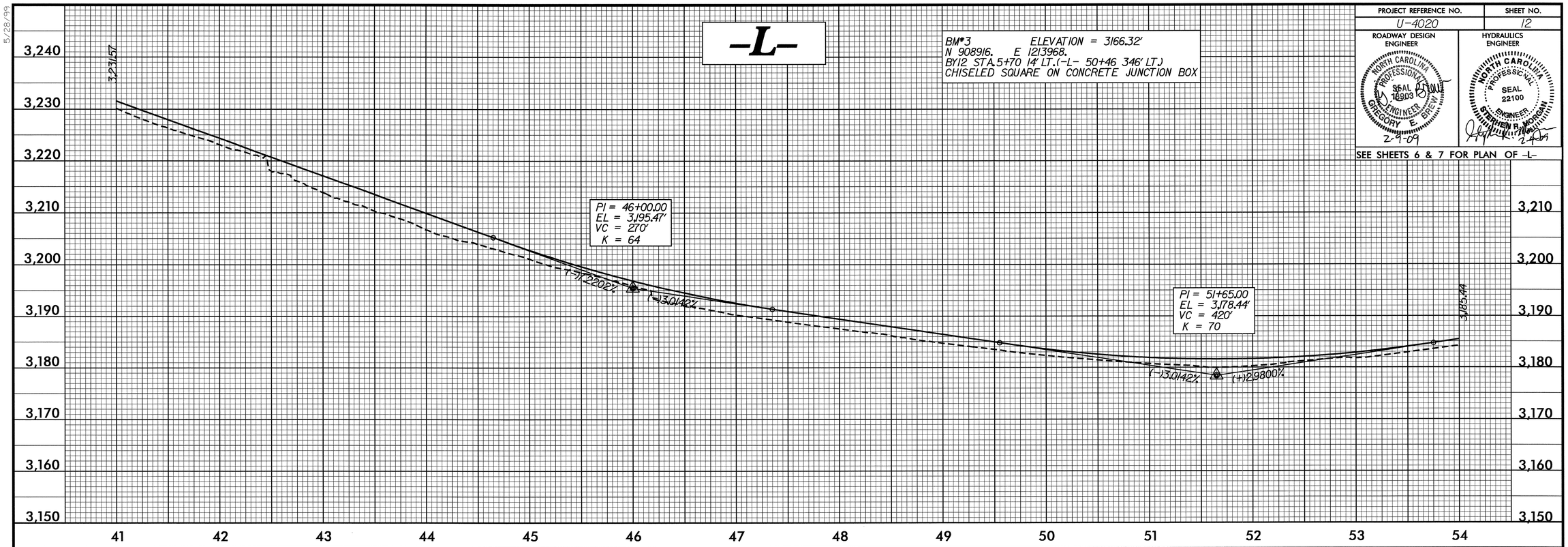
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER
2-9-09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN
2-9-09

SEE SHEETS 6 & 7 FOR PLAN OF -L-



SEE SHEETS 7 & 8 FOR PLAN OF -L-

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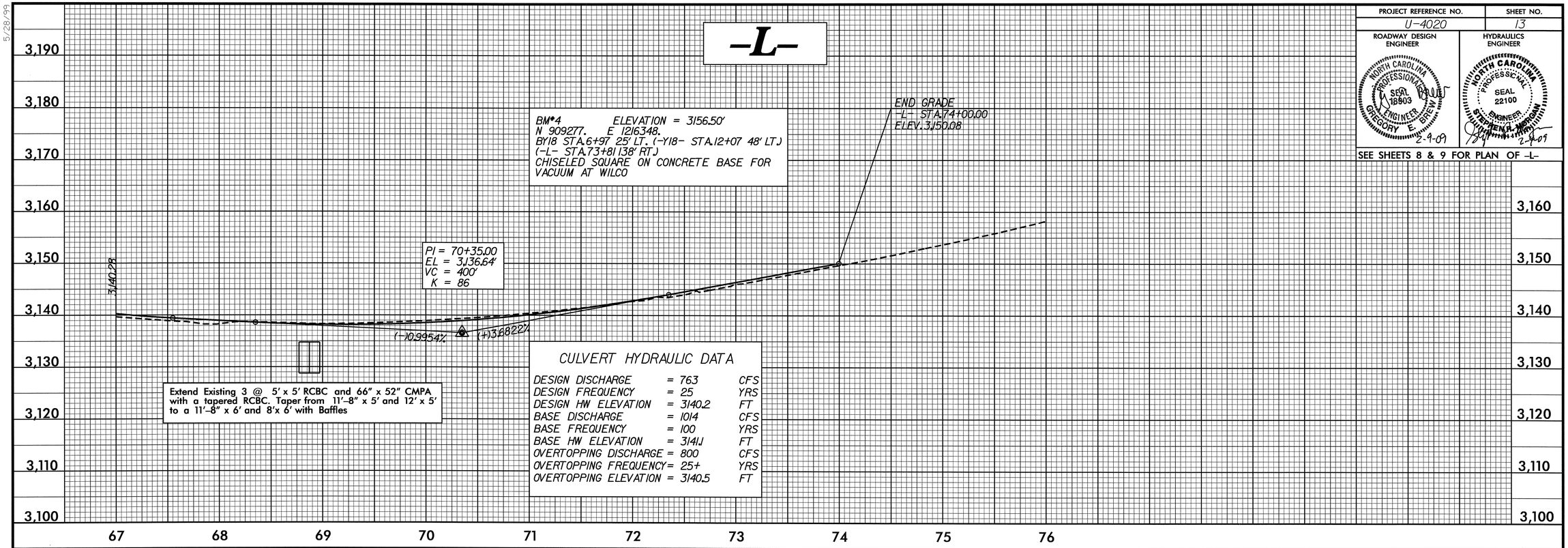
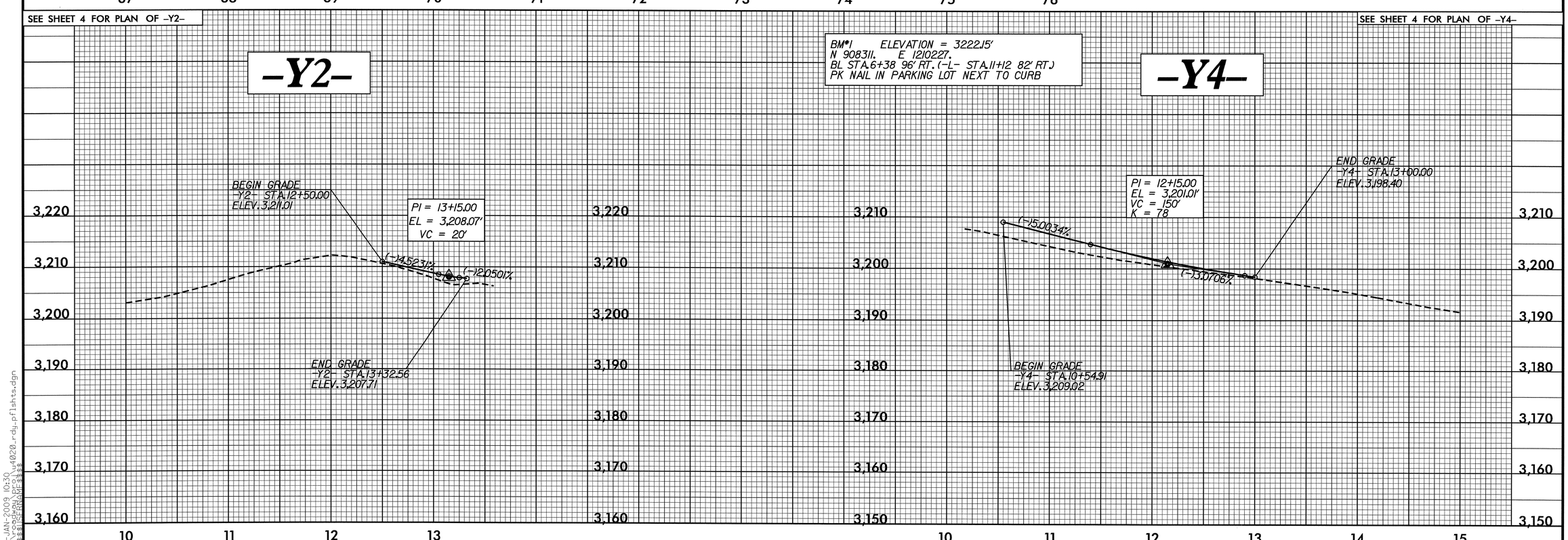
PROJECT REFERENCE NO.	SHEET NO.
U-4020	13

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW — 2-9-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN — 2-9-09



SEE SHEETS 8 & 9 FOR PLAN OF -L-



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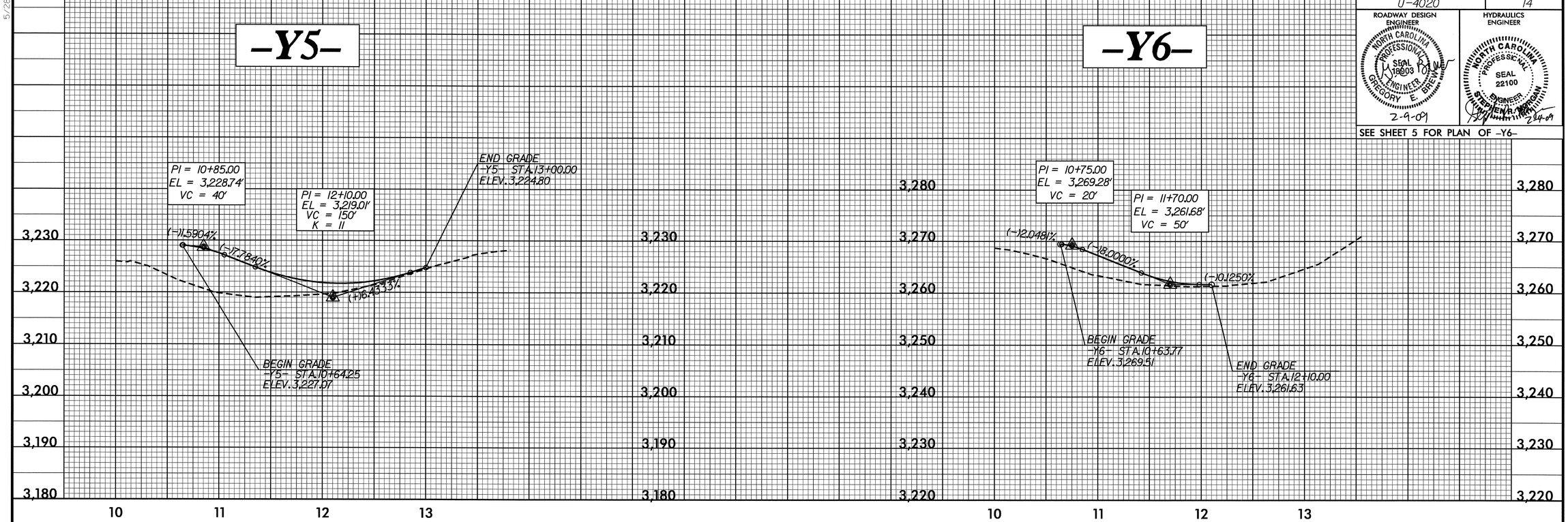
PROJECT REFERENCE NO.	SHEET NO.
U-4020	14

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER — 2-9-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN — 2-4-09

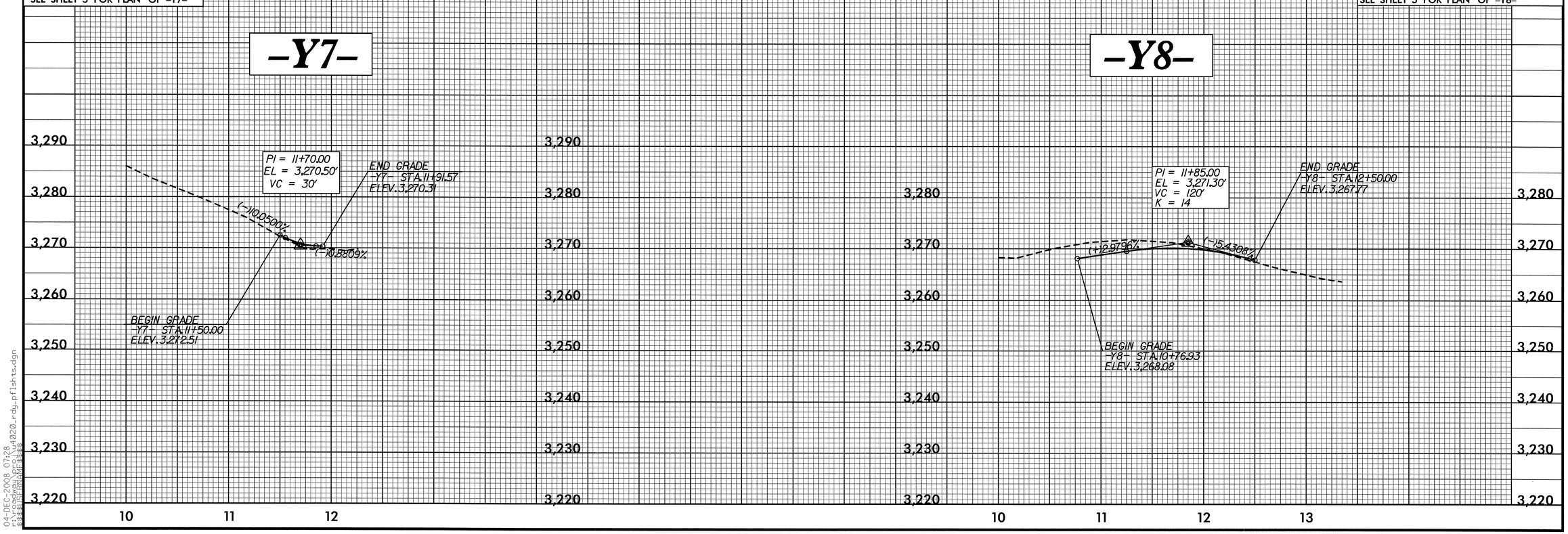
SEE SHEET 4 FOR PLAN OF -Y5-



SEE SHEET 5 FOR PLAN OF -Y6-

SEE SHEET 5 FOR PLAN OF -Y7-

SEE SHEET 5 FOR PLAN OF -Y8-



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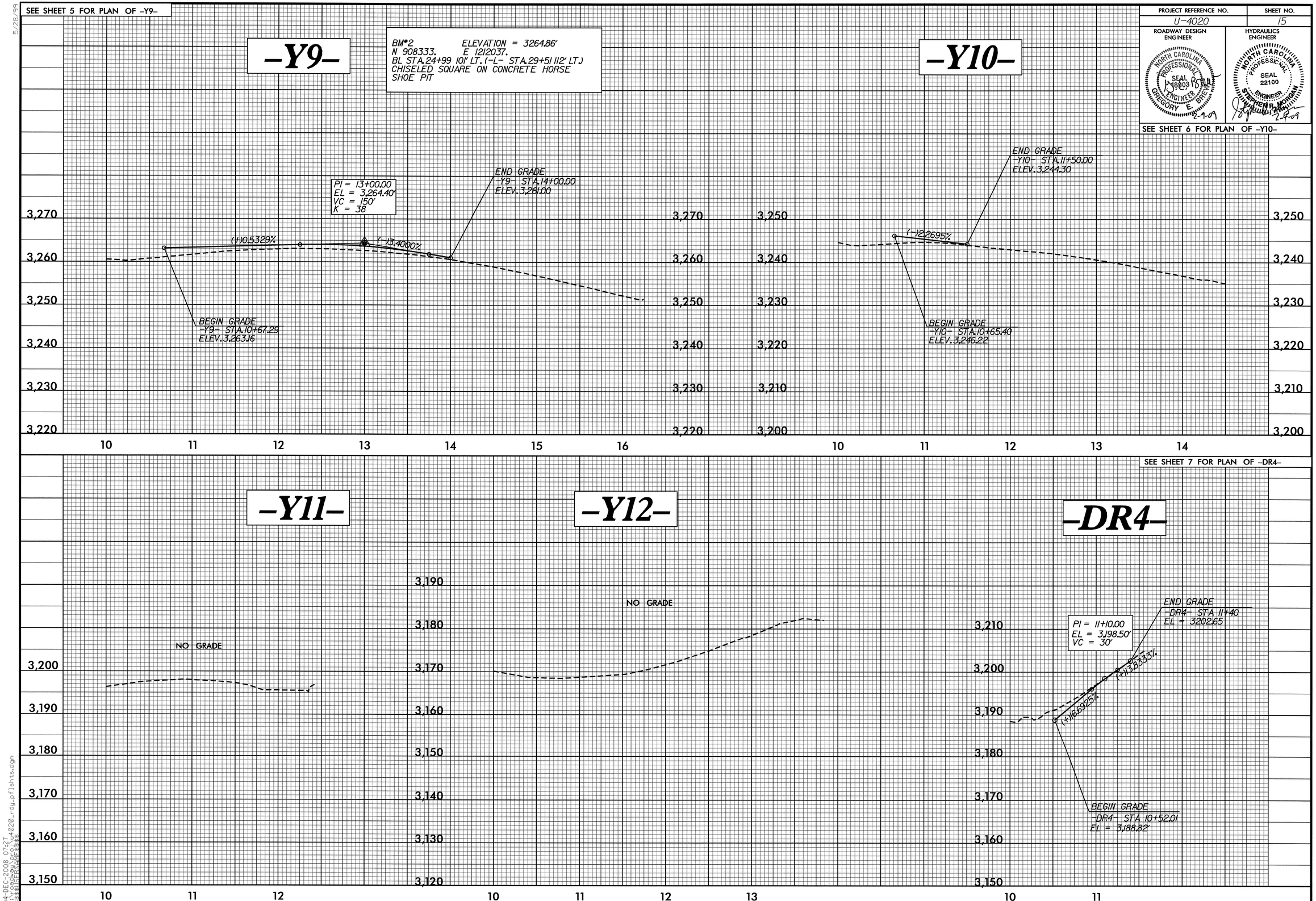
PROJECT REFERENCE NO.	SHEET NO.
U-4020	15

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18803 ENGINEER GREGORY E. BREWER 2-9-09

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN 2-9-09



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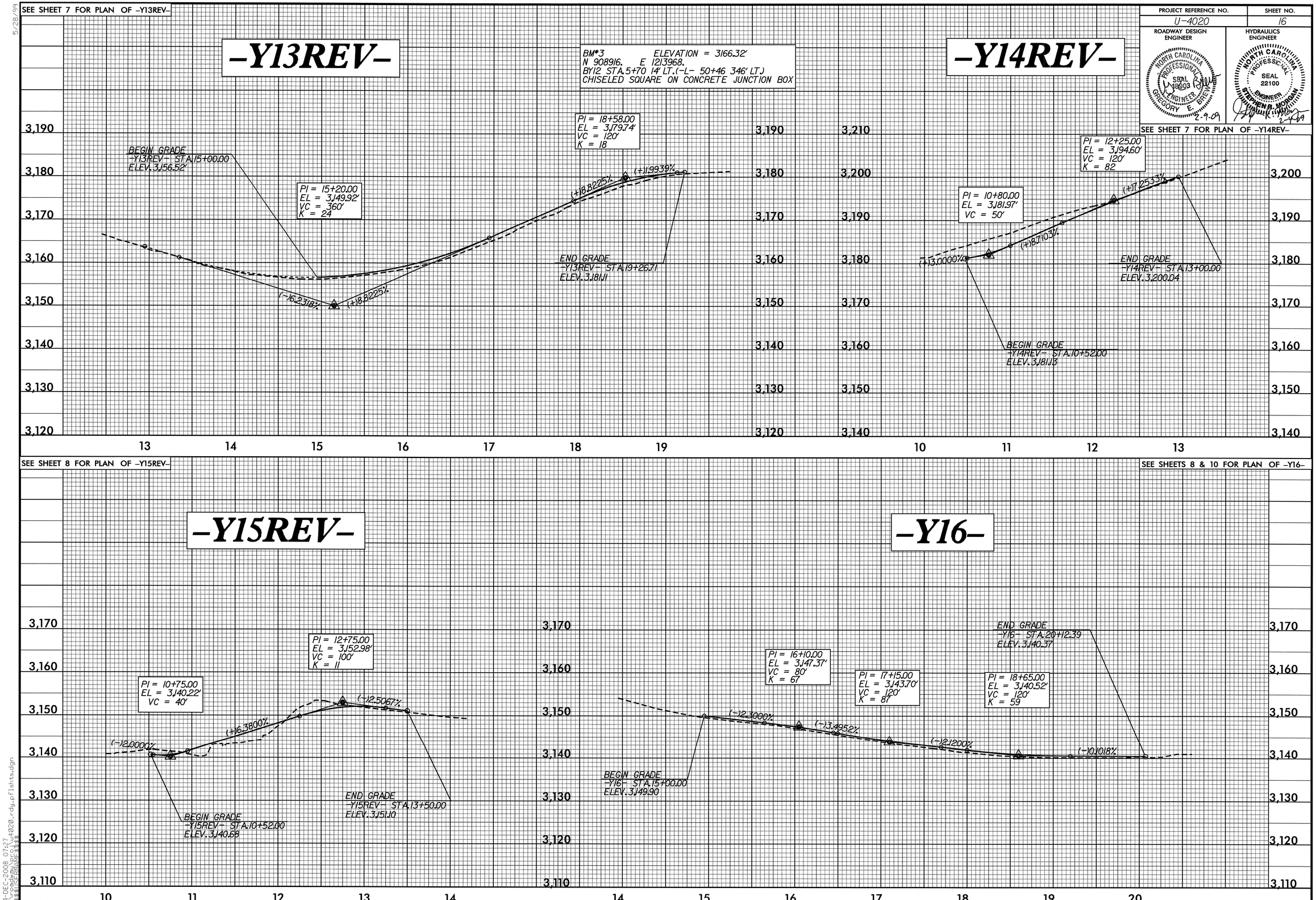
PROJECT REFERENCE NO.	SHEET NO.
U-4020	16

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREWER 2-9-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN 2-4-09



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PROJECT REFERENCE NO.	SHEET NO.
U-4020	17

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16993 ENGINEER GREGORY E. BRENT
2-9-09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN B. NORMAN
2-9-09

SEE SHEET 9 FOR PLAN OF –Y17–

–Y17–

BM*4 ELEVATION = 3156.50'
N 909277. E 1216348.
BY18 STA.6+97 25' LT. (–Y18– STA.12+07 48' LT.)
(–L– STA.73+81 138' RT.)
CHISELED SQUARE ON CONCRETE BASE FOR VACUUM AT WILCO

END GRADE
–Y17– STA.11+50.00
ELEV.3,145.82

PI = 11+80.00
EL = 3,143.55'
VC = 35'

END GRADE
–Y17– STA.12+00.89
ELEV.3,143.99

(–)7.5687%

(+)2.1063%

SEE SHEET 9 FOR PLAN OF –Y18–

–Y18–

PI = 10+80.00
EL = 3,145.89'
VC = 40'

(–)0.6310%

(+)2.3500%

END GRADE
–Y18– STA.11+00.00
ELEV.3,146.55

BEGIN GRADE
–Y18– STA.10+32.46
ELEV.3,146.38

BM*4 ELEVATION = 3156.50'
N 909277. E 1216348.
BY18 STA.6+97 25' LT. (–Y18– STA.12+07 48' LT.)
CHISELED SQUARE ON CONCRETE BASE FOR VACUUM AT WILCO

SEE SHEET 8 FOR PLAN OF –DR2–

–DR1–

PI = 11+85.00
EL = 3,181.19'
VC = 20'

3,166.40

(+)17.2978%

(+)2.1874%

END GRADE
–DR1– STA.11+96.97
ELEV.3,181.45

BEGIN GRADE
–DR1– STA.11+00.00
ELEV.3,166.40

SEE SHEET 8 FOR PLAN OF –DR2–

–DR2–

PI = 10+90.00
EL = 3,155.51'
VC = 20'

(+)9.4146%

(+)2.6671%

END GRADE
–DR2– STA.11+16.77
ELEV.3,156.22

BEGIN GRADE
–DR2– STA.10+50.00
ELEV.3,151.74

SEE SHEET 8 FOR PLAN OF –DR3–

–DR3–

PI = 13+75.00
EL = 3,186.96'
VC = 50'

(+)10.1143%

(+)12.9448%

PI = 10+85.00
EL = 3,149.42'
VC = 100'

(+)12.9448%

(+)4.0000%

END GRADE
–DR3– STA.14+10.00
ELEV.3,186.82

BEGIN GRADE
–DR3– STA.10+18.00
ELEV.3,146.74

04-DEC-2008 07:27
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USER:cpeng
PLOTSCALE:1.0000
PLOTTED BY:cpeng

PROJECT REFERENCE NO.	SHEET NO.
U-4020	18

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18603 ENGINEER GREGORY E. BREWER

2-9-09

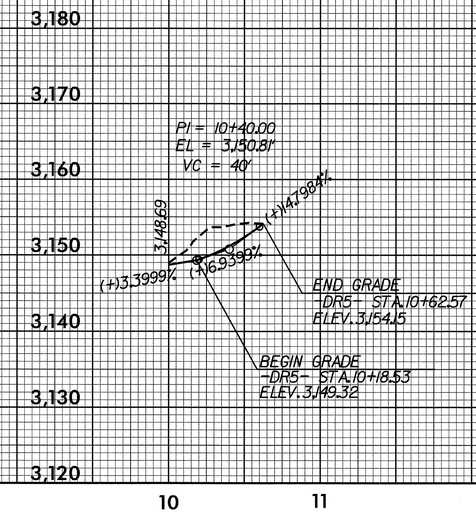
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN

2-4-09

-DR5-

SEE SHEET 8 FOR PLAN OF -DR5-



5/28/99

04-DEC-2008 07:27
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