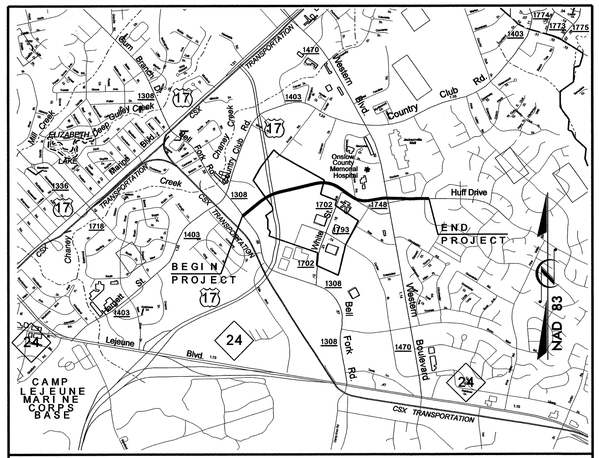
09/08/99

# TIP PROJECT: U-4007A

# CONTRACT: C202647

See Sheet 1-A For Index of Sheets




VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

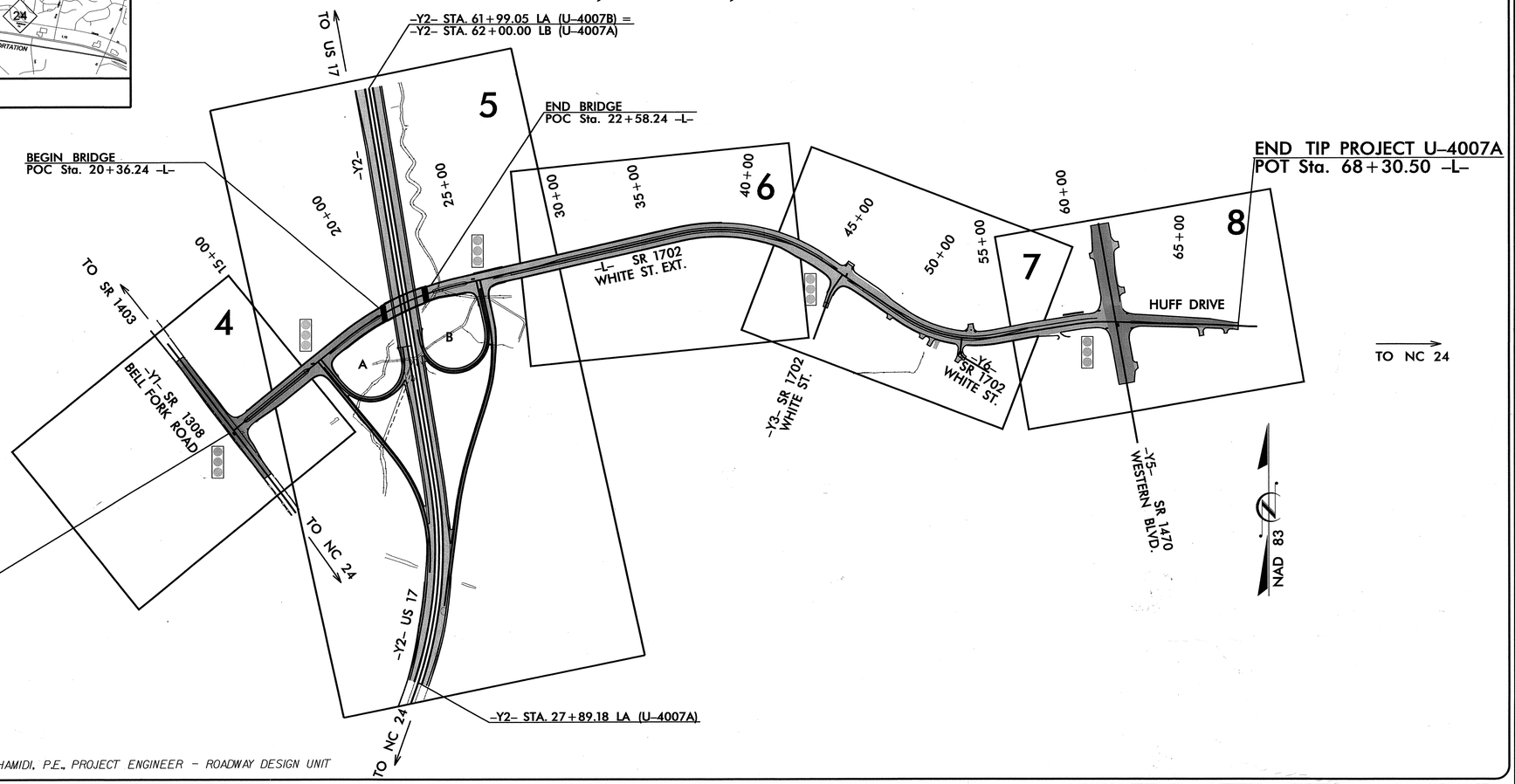
# ONSLOW COUNTY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | U-4007A | 1 | |

| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 35008.1.1 | STPNHF-17(31) | PE |
| 35008.3.1 | STPNHF-17(63) | R/W & UTILS. |
| 35008.2.3 | STPNHF-17(102) | CONST. |

***LOCATION: SR 1702 (WHITE STREET EXTENSION) FROM SR 1308 (BELL FORK ROAD) TO EAST OF SR 1470 (WESTERN BOULEVARD)***

***TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, CULVERTS, AND SIGNALS***




NCDOT CONTACT: K.ZAK HAMIDI, P.E., PROJECT ENGINEER - ROADWAY DESIGN UNIT

***GRAPHIC SCALES***

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

***DESIGN DATA***

ADT 2011 = 14,500
ADT 2031 = 18,400
DHV = 10 %
D = 65 %
T = 2 % *
V = 40 MPH
* (TTST =1% DUALS =1%)
FUNC CLASS =
URBAN MAJOR COLLECTOR
STATEWIDE TIER

***PROJECT LENGTH***

| | | |
|---|---|---|
| LENGTH ROADWAY TIP PROJECT U-4007A | = | 1.062 mi. |
| LENGTH STRUCTURE TIP PROJECT U-4007A | = | 0.042 mi. |
| TOTAL LENGTH TIP PROJECT U-4007A | = | 1.104 mi. |

*Prepared In the Office of:*
***WANG ENGINEERING COMPANY, INC.***
***CARY, N.C.***
*FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION*

*2006 STANDARD SPECIFICATIONS*

***RIGHT OF WAY DATE:***
FEBRUARY 20, 2009

***LETTING DATE:***
JULY 19, 2011

MATTHEW COPPLE, PE
*PROJECT ENGINEER*

*PROJECT DESIGN ENGINEER*

***HYDRAULICS ENGINEER***
*SUNGATE DESIGN GROUP, PA*
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.
*SIGNATURE:* P.E. 5/10/11

***ROADWAY DESIGN ENGINEER***
*WANG ENGINEERING*
NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW COPPLE
*SIGNATURE:* P.E. 4/24/11

***DIVISION OF HIGHWAYS***
***STATE OF NORTH CAROLINA***

art mcmillan P.E.
*STATE HIGHWAY DESIGN ENGINEER*

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

8/17/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 1-A |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER

5/6/11

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-D | SURVEY CONTROL SHEETS |
| 1-E | CENTERLINE COORDINATE LIST |
| 2 THRU 2-C | PAVEMENT SCHEDULE, TYPICAL SECTIONS, C&G FLARE DETAIL, WEDGING DETAIL, AND MILLING DETAIL |
| 2-D | TEMPORARY SHORING DETAIL |
| 2-E | ANCHORAGES FOR FRAMES DETAIL |
| 2-F THUR 2-G | PIPE INSTALLATION DETAILS |
| 2-H THRU 2-I | WHEELCHAIR RAMP DETAILS |
| 2-J | TEMPORARY PAVEMENT DETAIL |
| 2-K | GUARDRAIL PLACEMENT |
| 2-L | CONVERT DI TO JB WITH MANHOLE COVER |
| 3 (2 SHEETS) | SUMMARY OF QUANTITIES |
| 3-A | GUARDRAIL SUMMARY, PAVEMENT BREAKUP AND REMOVAL SUMMARIES, SHOULDER BERM GUTTER SUMMARY, AND UNDERDRAIN SUMMARY |
| 3-B | EARTHWORK SUMMARY |
| 3-C THRU 3-H | DRAINAGE SUMMARIES |
| 3-I | PARCEL INDEX SHEET |
| 4 THRU 8 | PLAN SHEETS |
| 9 THRU 15 | PROFILE SHEETS |
| TMP-1 THRU TMP-15 | TRANSPORTATION MANAGEMENT PLANS |
| SD-1 | SPECIAL SIGN DESIGNS |
| PMP-1 THRU PMP-8 | PAVEMENT MARKING PLANS |
| EC-1 THRU EC-18 | EROSION CONTROL PLANS |
| RF-1 THRU RF-3 | REFORESTATION PLANS |
| SIGN-1 THRU SIGN-22 | SIGNING PLANS |
| SIG.1 THRU SIG.45 | SIGNAL PLANS |
| UC-1 THRU UC-8 | UTILITY CONSTRUCTION PLANS |
| UO-1 THRU UO-6 | UTILITIES BY OTHERS PLANS |
| X-1 THRU X-70 | CROSS-SECTIONS |
| S-1 THRU S-32 | STRUCTURE PLANS |
| C-1 THRU C-12 | CULVERT NO. 1 PLANS |
| C-13 THRU C-16 | CULVERT NO. 2 PLANS |
| C-17 THRU C-21 | CULVERT NO. 3 PLANS |
| W-1 | SEGMENTAL GRAVITY RETAINING WALL |


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 |
|---|---|
| DIVISION 2 - EARTHWORK | |
| 200.03 | Method of Clearing - Method III |
| 225.01 | Guide for Grading Subgrade - Interstate and Freeway |
| 225.02 | Guide for Grading Subgrade - Secondary and Local |
| 225.03 | Deceleration and Acceleration Lanes |
| 225.04 | Method of Obtaining Superelevation - Two Lane Pavement |
| 225.05 | Method of Obtaining Superelevation - Divided Highways |
| 225.06 | Method of Grading Sight Distance at Intersections |
| 225.08 | Earth Berm Median Pier Protection |
| 225.09 | Guide for Shoulder and Ditch Transition at Grade Separations |
| DIVISION 3 - PIPE CULVERTS | |
| 310.10 | Driveway Pipe Construction |
| DIVISION 4 - MAJOR STRUCTURES | |
| 422.10 | Reinforced Bridge Approach Fills |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| 560.02 | Method of Shoulder Construction - High Side of Superelevated Curve - Method II |
| DIVISION 6 - ASPHALT BASES AND PAVEMENTS | |
| 610.03 | Guide for Paving Shoulders Under Bridges - Method III |
| 654.01 | Pavement Repairs |
| DIVISION 8 - INCIDENTALS | |
| 806.01 | Concrete Right-of-Way Marker |
| 806.02 | Granite Right-of-Way Marker |
| 815.03 | Pipe Underdrain and Blind Drain |
| 838.01 | Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew |
| 838.11 | Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew |
| 838.45 | Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40 |
| 838.75 | Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70 |
| 838.80 | Precast Endwalls - 12" thru 72" Pipe 90 Skew |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.01 | Brick Catch Basin - 12" thru 54" Pipe |
| 840.02 | Concrete Catch Basin - 12" thru 54" Pipe |
| 840.03 | Frame, Grates and Hood - for Use on Standard Catch Basin |
| 840.14 | 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 |
| 840.20 | Frames and Wide Slot Flat Grates |
| 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 |
| 840.31 | Concrete Junction Box - 12" thru 66" Pipe |
| 840.32 | Brick Junction Box - 12" thru 66" Pipe |
| 840.34 | Traffic Bearing Junction Box - for Use with Pipes 42" and Under |
| 840.35 | Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates |
| 840.45 | Precast Drainage Structure |
| 840.46 | Traffic Bearing Precast Drainage Structure |
| 840.54 | Manhole Frame and Cover |
| 840.66 | Drainage Structure Steps |
| 840.71 | Concrete and Brick Pipe Plug |
| 840.72 | Pipe Collar |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 846.02 | Drop Inlet Installation in Expressway Gutter |
| 846.04 | Drop Inlet Installation in Shoulder Berm Gutter |
| 848.01 | Concrete Sidewalk |
| 848.02 | Driveway Turnout - Radius Type |
| 848.04 | Street Turnout |
| 852.01 | Concrete Islands |
| 852.02 | Concrete Mountable Median - for Use with Rigid or Flexible Pavement |
| 852.04 | Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter |
| 852.05 | Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter |
| 852.06 | Method for Placement of Drop Inlets in Concrete Islands |
| 852.10 | Median Construction - with Curb and Gutter |
| 857.01 | Precast Reinforced Concrete Barrier - 41" Single Faced |
| 862.01 | Guardrail Placement |
| 862.02 | Guardrail Installation |
| 862.03 | Structure Anchor Units |
| 862.04 | Anchoring End of Guardrail - B-77 and B-83 Anchor Units |
| 865.01 | Cable Guiderail |
| 866.01 | Chain Link Fence - 4', 5' and 6' High Fence |
| 866.02 | Woven Wire Fence - with Wood Post |
| 876.01 | Rip Rap in Channels |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class 'B' Rip Rap |

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. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01 & 560.02.

SIDE ROADS:

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

UNDERDRAINS:

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

DRIVEWAYS:

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

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE City of Jacksonville (Water & Sewer),

Onslow County Water & Sewer Authority (ONWASA.) Centurylink, James-Onslow EMC.

Peidmont Natural Gas Company, Progress Energy (Distribution),

Progress Energy (Transmission)

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 CONTRACT.

$$$$SYSTIME$$$$
$$$$SYSDATE$$$$
$$$$SCENARIO$$$$

01/20/11

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 1B |

***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 Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

## *ROADS AND RELATED FEATURES:*

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed 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
- 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

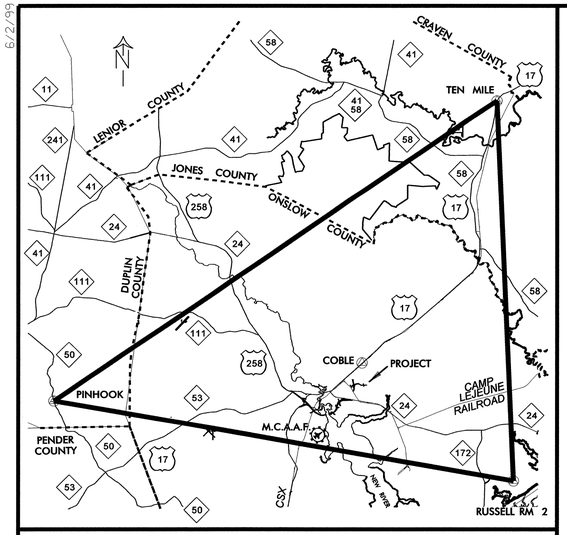
MISCELLANEOUS:

- 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.

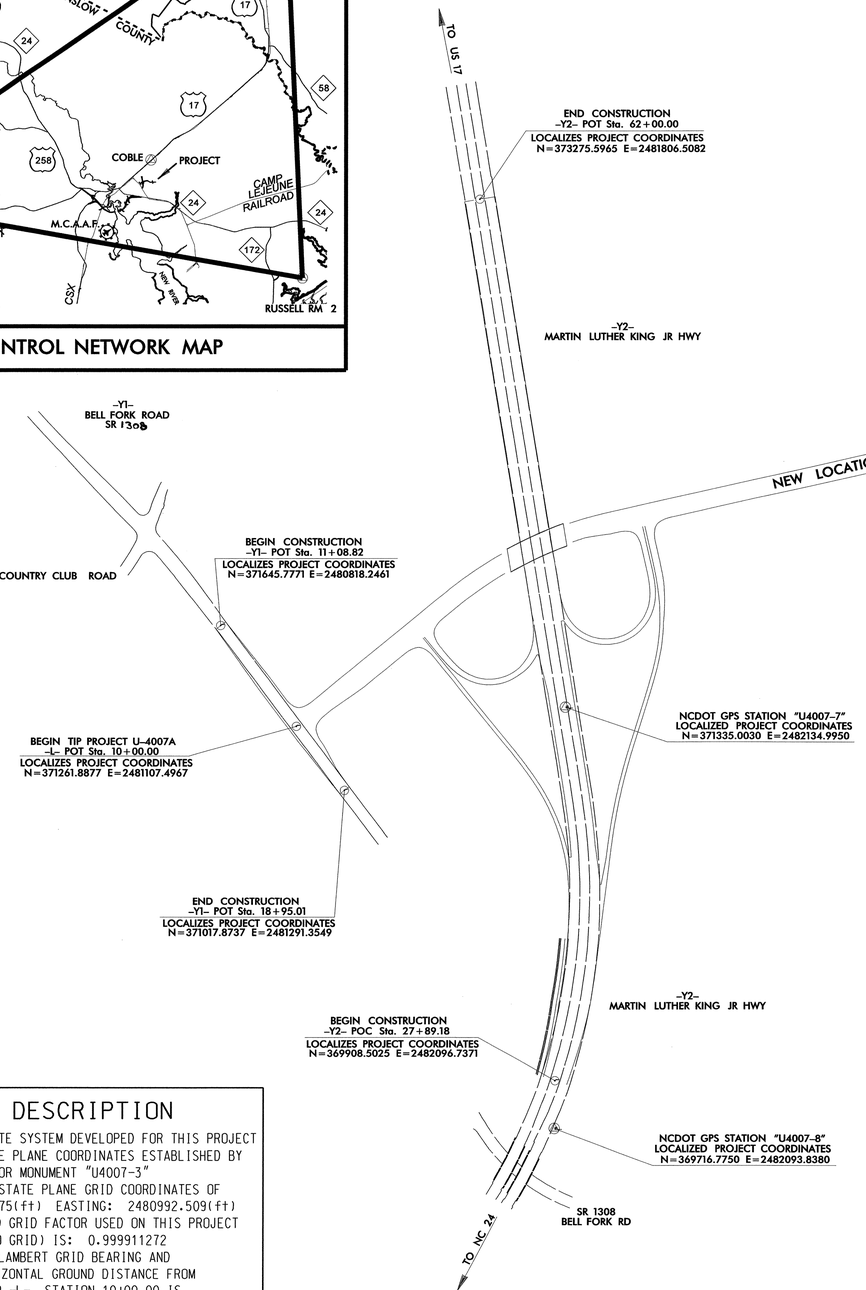
6/2/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007-A | 1-C |
| Location and Surveys | |

# SURVEY CONTROL SHEET U-4007A




GPS CONTROL NETWORK MAP




## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U4007-3"
WITH NAD 83/2001 STATE PLANE GRID COORDINATES OF
NORTHING: 376224.375(ft) EASTING: 2480992.509(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999911272
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U4007-8" TO -L- STATION 10+00.00 IS
S 01°19'38.6" E 4963.819 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

*NOTE: DRAWING NOT TO SCALE*

## *NOTES:*

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/2001 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.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/*

   *THE FILES TO BE FOUND ARE AS FOLLOWS:*
   *U4007_LS_GPSCALIB_080423.HTML*
   *U4007_LS_WGS84_080423.TXT*
   *U4007_LS_LOCAL_080423.TXT*
   *U4007A_LS_CONTROL_080423.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.*

$$$$SYSTIME$$$$
$$$$USERNAME$$$$

6/2/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007-A | 1-D |
| Location and Surveys | |

# SURVEY CONTROL SHEET U-4007A

## GPS CALIBRATON REPORT

PROJECT : 35008.1.1

| | | | |
|---|---|---|---|
| TIP NUMBER | U-4007 | | |
| USER NAME | BREIGNER | DATE & TIME | 10:28:05 AM 10/26/2006 |
| COORDINATE SYSTEM | US STATE PLANE 1983(AT GROUND) | ZONE | NORTH CAROLINA 3200 |
| HORIZONTAL DATUM | NAD 1983/2001 (CONUS) | | |
| VERTICAL DATUM | NAVD88 | GEOID MODEL | GEOID03 (CONUS) NC SUB GRID |
| COORDINATE UNITS | US SURVEY FEET | | |
| DISTANCE UNITS | US SURVEY FEET | | |
| HEIGHT UNITS | US SURVEY FEET | | |

LOCAL SITE INFORMATION

| | |
|---|---|
| LOCALIZED AROUND | U4007-3 |
| LATITUDE | 34°46'23.06985"N |
| LONGITUDE | 77°23'53.56573"W |
| SITE SCALE FACTOR | 1.0000887360 |
| HEIGHT | -82.738SFT |

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 | 380114.336SFT |
| EASTING COORDINATE OF ROTATION CENTER | 2482514.103SFT |
| ROTATION ABOUT THE CENTER POINT | 0°00'00" |
| TRANSLATION NORTH | -0.018SFT |
| TRANSLATION EAST | -0.008SFT |
| SCALE FACTOR | 1.00000000 |

VERTICAL ADJUSTMENT PARAMETERS

| | |
|---|---|
| NORTHING COORDINATE OF ORIGIN POINT | 382744.641SFT |
| EASTING COORDINATE OF ORIGIN POINT | 2478475.734SFT |
| VERTICAL SEPARATION AT ORIGIN | 0.144SFT |
| SLOPE NORTH | -1.149PPM |
| SLOPE EAST | -0.100PPM |

GEOID MODEL DEFINITION

GEOID03 (CONUS) NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

| | MAXIMUM ERROR | ROOT MEAN SQUARE ERROR | POINT |
|---|---|---|---|
| HORIZONTAL | 0.020SFT | 0.002 | TEN MILE_GPS |
| VERTICAL | 0.069SFT | 0.009 | COBLE_GPS |
| THREE-DIMENSIONAL | 0.069SFT | 0.009 | COBLE_GPS |

POINT RESIDUALS

| WGS84 COORDINATES | | CALCULATED POINT FOR DISPLAY ONLY | | LOCAL COORDINATES | |
|---|---|---|---|---|---|
| POINT | U4007-1_GPS | NORTHING | 382744.641SFT | POINT | U4007-1 |
| LATITUDE | 34°47'27.95510"N | EASTING | 2478475.734SFT | NORTHING | 382744.644SFT |
| LONGITUDE | 77°24'22.47564"W | ELEVATION | 46.845SFT | EASTING | 2478475.735SFT |
| HEIGHT | -74.826SFT | HORZ ERROR | 0.003SFT | ELEVATION | 46.844SFT |
| | | VERT ERROR | 0.000SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.003SFT | QUALITY | ADJUSTED QUALITY |
| POINT | U4007-2_GPS | NORTHING | 381810.865SFT | POINT | U4007-2 |
| LATITUDE | 34°47'18.59553"N | EASTING | 2479260.196SFT | NORTHING | 381810.867SFT |
| LONGITUDE | 77°24'13.25144"W | ELEVATION | 49.142SFT | EASTING | 2479260.197SFT |
| HEIGHT | -72.534SFT | HORZ ERROR | 0.002SFT | ELEVATION | 49.142SFT |
| | | VERT ERROR | 0.000SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.002SFT | QUALITY | ADJUSTED QUALITY |
| POINT | COBLE_GPS | NORTHING | 380014.747SFT | POINT | COBLE |
| LATITUDE | 34°46'59.86752"N | EASTING | 2485287.965SFT | NORTHING | 380014.747SFT |
| LONGITUDE | 77°23'01.34295"W | ELEVATION | 43.842SFT | EASTING | 2485287.965SFT |
| HEIGHT | -77.859SFT | HORZ ERROR | 0.000SFT | ELEVATION | 43.911SFT |
| | | VERT ERROR | 0.069SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.069SFT | QUALITY | ADJUSTED QUALITY |
| POINT | U4007-3_GPS | NORTHING | 376224.375SFT | POINT | U4007-3 |
| LATITUDE | 34°46'23.07002"N | EASTING | 2480992.507SFT | NORTHING | 376224.375SFT |
| LONGITUDE | 77°23'53.56565"W | ELEVATION | 38.800SFT | EASTING | 2480992.509SFT |
| HEIGHT | -82.894SFT | HORZ ERROR | 0.002SFT | ELEVATION | 38.805SFT |
| | | VERT ERROR | 0.005SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.006SFT | QUALITY | ADJUSTED QUALITY |
| POINT | U4007-4_GPS | NORTHING | 374746.719SFT | POINT | U4007-4 |
| LATITUDE | 34°46'08.35451"N | EASTING | 2481629.500SFT | NORTHING | 374746.718SFT |
| LONGITUDE | 77°23'46.21715"W | ELEVATION | 60.327SFT | EASTING | 2481629.501SFT |
| HEIGHT | -61.374SFT | HORZ ERROR | 0.001SFT | ELEVATION | 60.334SFT |
| | | VERT ERROR | 0.007SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.007SFT | QUALITY | ADJUSTED QUALITY |
| POINT | U4007-5_GPS | NORTHING | 371782.960SFT | POINT | U4007-5 |
| LATITUDE | 34°45'38.35070"N | EASTING | 2485945.495SFT | NORTHING | 371782.957SFT |
| LONGITUDE | 77°22'55.06964"W | ELEVATION | 35.962SFT | EASTING | 2485945.494SFT |
| HEIGHT | -85.759SFT | HORZ ERROR | 0.003SFT | ELEVATION | 35.970SFT |
| | | VERT ERROR | 0.008SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.008SFT | QUALITY | ADJUSTED QUALITY |
| POINT | U4007-6_GPS | NORTHING | 371858.652SFT | POINT | U4007-6 |
| LATITUDE | 34°45'38.91489"N | EASTING | 2487087.968SFT | NORTHING | 371858.649SFT |
| LONGITUDE | 77°22'41.36386"W | ELEVATION | 36.747SFT | EASTING | 2487087.965SFT |
| HEIGHT | -84.977SFT | HORZ ERROR | 0.004SFT | ELEVATION | 36.754SFT |
| | | VERT ERROR | 0.007SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.008SFT | QUALITY | ADJUSTED QUALITY |
| POINT | U4007-7_GPS | NORTHING | 371335.005SFT | POINT | U4007-7 |
| LATITUDE | 34°45'34.53239"N | EASTING | 2482134.993SFT | NORTHING | 371335.003SFT |
| LONGITUDE | 77°23'40.82016"W | ELEVATION | 31.591SFT | EASTING | 2482134.995SFT |
| HEIGHT | -90.123SFT | HORZ ERROR | 0.002SFT | ELEVATION | 31.602SFT |
| | | VERT ERROR | 0.011SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.011SFT | QUALITY | ADJUSTED QUALITY |
| POINT | U4007-8_GPS | NORTHING | 369716.778SFT | POINT | U4007-8 |
| LATITUDE | 34°45'18.53496"N | EASTING | 2482093.837SFT | NORTHING | 369716.775SFT |
| LONGITUDE | 77°23'41.62694"W | ELEVATION | 50.971SFT | EASTING | 2482093.838SFT |
| HEIGHT | -70.750SFT | HORZ ERROR | 0.003SFT | ELEVATION | 50.983SFT |
| | | VERT ERROR | 0.013SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.013SFT | QUALITY | ADJUSTED QUALITY |
| POINT | TEN MILE_GPS | NORTHING | 480135.771SFT | POINT | TEN MILE |
| LATITUDE | 35°03'21.28051"N | EASTING | 2536763.392SFT | NORTHING | 480135.789SFT |
| LONGITUDE | 77°12'22.64169"W | ELEVATION | 33.927SFT | EASTING | 2536763.399SFT |
| HEIGHT | -87.866SFT | HORZ ERROR | 0.020SFT | ELEVATION | 33.901SFT |
| | | VERT ERROR | 0.026SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.032SFT | QUALITY | CONTROL QUALITY |
| POINT | RUSSELL 2 RM A_G | NORTHING | 335222.597SFT | POINT | RUSSELL 2 RM A |
| LATITUDE | 34°39'27.06524"N | EASTING | 2542912.695SFT | NORTHING | 335222.588SFT |
| LONGITUDE | 77°11'40.38696"W | ELEVATION | 36.531SFT | EASTING | 2542912.692SFT |
| HEIGHT | -85.452SFT | HORZ ERROR | 0.010SFT | ELEVATION | 36.476SFT |
| | | VERT ERROR | 0.054SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.055SFT | QUALITY | CONTROL QUALITY |
| POINT | PINHOOK_GPS | NORTHING | 365778.707SFT | POINT | PINHOOK |
| LATITUDE | 34°44'55.72435"N | EASTING | 2367584.854SFT | NORTHING | 365778.703SFT |
| LONGITUDE | 77°46'34.43032"W | ELEVATION | 74.904SFT | EASTING | 2367584.848SFT |
| HEIGHT | -45.345SFT | HORZ ERROR | 0.007SFT | ELEVATION | 74.865SFT |
| | | VERT ERROR | 0.039SFT | UTILIZED | HORZ AND VERT |
| | | 3D ERROR | 0.039SFT | QUALITY | CONTROL QUALITY |

## BASELINE CONTROL

BY1

| POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|---|---|---|---|---|---|---|
| 39 | BY1-39 | 371280.1510 | 2481130.6280 | 26.01 | 10+29.47 | 0.47 RT |
| 40 | BY1-40 | 371747.5700 | 2481702.5660 | 27.96 | 17+68.11 | 0.17 LT |
| EQ2 | BL-2 | 371950.0370 | 2482032.8050 | 35.22 | 21+56.75 | 1.64 RT |
| 41 | BY1-41 | 372056.9660 | 2482360.7160 | 28.45 | 25+02.57 | 0.33 RT |
| 42 | BY1-42 | 372244.4010 | 2483189.7130 | 30.35 | 33+52.50 | 0.15 RT |
| 43 | BY1-43 | 372324.3950 | 2483888.7900 | 34.93 | 40+61.96 | 0.41 LT |
| 44 | BY1-44 | 372072.5880 | 2484315.8420 | 35.21 | 45+69.46 | 56.63 RT |
| 45 | BY1-45 | 371766.4650 | 2484928.6910 | 34.78 | 52+50.50 | 8.56 RT |
| 46 | BY1-46 | 371753.9550 | 2485529.1600 | 36.43 | 58+45.32 | 60.99 RT |
| GPS5 | GPS U4007-5 | 371782.9570 | 2485945.4940 | 35.97 | 62+75.08 | 57.68 RT |

BY2

| POINT | DESC. | NORTH | EAST | ELEVATION | Y1 STATION | OFFSET |
|---|---|---|---|---|---|---|
| 50 | BY2-50 | 370845.0310 | 2481458.5420 | 26.44 | 21+33.66 | 29.51 LT |
| EQ39 | BY1-39 | 371280.1510 | 2481130.6280 | 26.01 | 15+88.82 | 29.46 LT |
| 51 | BY2-51 | 372077.8140 | 2480522.4690 | 25.01 | OUTSIDE PROJECT LIMITS | |

BL

| POINT | DESC. | NORTH | EAST | ELEVATION | Y2 STATION | OFFSET |
|---|---|---|---|---|---|---|
| GPS8 | GPS U4007-8 | 369716.7750 | 2482093.8380 | 50.98 | 26+10.73 | 63.70 RT |
| 1 | BL-1 | 370494.4080 | 2482275.4770 | 33.78 | 33+90.55 | 69.28 RT |
| GPS7 | GPS U4007-7 | 371335.0030 | 2482134.9950 | 31.60 | 42+31.83 | 10.58 RT |
| 2 | BL-2 | 371950.0370 | 2482032.8050 | 35.22 | 48+55.29 | 9.12 RT |
| 3 | BL-3 | 372865.4960 | 2481882.8780 | 33.67 | 57+82.95 | 9.10 RT |
| 4 | BL-4 | 373962.9920 | 2481758.5470 | 53.55 | 68+86.11 | 63.75 RT |
| GPS4 | GPS U4007-4 | 374746.7180 | 2481629.5010 | 60.33 | 76+80.39 | 63.05 RT |
| 5 | BL-5 | 375824.1850 | 2481405.0390 | 41.44 | 87+64.03 | 68.86 RT |
| 6 | BL-6 | 376246.4160 | 2481474.8250 | 38.92 | 90+18.35 | 366.67 RT |
| 7 | BL-7 | 376817.1160 | 2481640.6150 | 42.15 | 93+12.19 | 877.35 RT |
| 8 | BL-8 | 377219.7500 | 2482107.5650 | 42.14 | 92+86.88 | 1493.39 RT |
| 9 | BL-9 | 377637.5300 | 2482647.3120 | 42.09 | 92+22.88 | 2172.93 RT |

BY

| POINT | DESC. | NORTH | EAST | ELEVATION | Y5 STATION | OFFSET |
|---|---|---|---|---|---|---|
| 52 | BY-52 | 371280.4530 | 2486006.7280 | 36.42 | 21+19.72 | 61.86 LT |
| BYGPS5 | GPS U4007-5 | 371782.9570 | 2485945.4940 | 35.97 | 16+14.25 | 89.53 LT |
| 53 | BY-53 | 372461.4680 | 2485814.2820 | 37.14 | OUTSIDE PROJECT LIMITS | |

*NOTE: THERE WERE NO SUPPLEMENTAL BENCHMARKS SET ON THIS PROJECT.*

## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U4007-3"
WITH NAD 83/2001 STATE PLANE GRID COORDINATES OF
NORTHING: 376224.375(ft) EASTING: 2480992.509(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999911272
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U4007-8" TO -L- STATION 10+00.00 IS
S 01°19'38.6" E 4963.819 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$FILENAME$$$$

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 1-E |

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

## *CENTERLINE COORDINATE LIST*

| Point # | Chain | Station | Northing (Y) | Easting (X) |
|---|---|---|---|---|
| 1 | L | 10+00.00 | 371261.8877 | 2481107.4967 |
| 2 | L | 11+00.00 | 371325.1013 | 2481184.9825 |
| 3 | L | 12+00.00 | 371388.3148 | 2481262.4683 |
| 4 | L | 13+00.00 | 371451.5283 | 2481339.9542 |
| 5 | L | 14+00.00 | 371514.7418 | 2481417.4400 |
| 6 | L | 15+00.00 | 371577.9553 | 2481494.9258 |
| 7 | L | 16+00.00 | 371641.1688 | 2481572.4116 |
| 8 | L | 17+00.00 | 371704.3823 | 2481649.8975 |
| 9 | L | 18+00.00 | 371767.3281 | 2481727.5985 |
| 10 | L | 19+00.00 | 371826.1971 | 2481808.4115 |
| 11 | L | 20+00.00 | 371879.5517 | 2481892.9667 |
| 12 | L | 21+00.00 | 371927.1550 | 2481980.8884 |
| 13 | L | 22+00.00 | 371968.7955 | 2482071.7859 |
| 14 | L | 23+00.00 | 372004.2881 | 2482165.2556 |
| 15 | L | 24+00.00 | 372033.4751 | 2482260.8820 |
| 16 | L | 25+00.00 | 372056.7191 | 2482358.1337 |
| 17 | L | 26+00.00 | 372078.7517 | 2482455.6763 |
| 18 | L | 27+00.00 | 372100.7843 | 2482553.2189 |
| 19 | L | 28+00.00 | 372122.8170 | 2482650.7615 |
| 20 | L | 29+00.00 | 372144.8496 | 2482748.3042 |
| 21 | L | 30+00.00 | 372166.8823 | 2482845.8468 |
| 22 | L | 31+00.00 | 372188.9149 | 2482943.3894 |
| 23 | L | 32+00.00 | 372210.9475 | 2483040.9320 |
| 24 | L | 33+00.00 | 372232.9802 | 2483138.4746 |
| 25 | L | 34+00.00 | 372255.0128 | 2483236.0173 |
| 26 | L | 35+00.00 | 372277.0455 | 2483333.5599 |
| 27 | L | 36+00.00 | 372299.0781 | 2483431.1025 |
| 28 | L | 37+00.00 | 372320.6167 | 2483528.7512 |
| 29 | L | 38+00.00 | 372334.6006 | 2483627.7266 |
| 30 | L | 39+00.00 | 372338.6336 | 2483727.6035 |
| 31 | L | 40+00.00 | 372332.6753 | 2483827.3841 |
| 32 | L | 41+00.00 | 372316.7855 | 2483926.0714 |
| 33 | L | 42+00.00 | 372291.1227 | 2484022.6793 |
| 34 | L | 43+00.00 | 372255.9434 | 2484116.2426 |
| 35 | L | 44+00.00 | 372211.5991 | 2484205.8264 |
| 36 | L | 45+00.00 | 372158.5653 | 2484290.5579 |
| 37 | L | 46+00.00 | 372102.0366 | 2484373.0474 |
| 38 | L | 47+00.00 | 372045.5080 | 2484455.5369 |
| 39 | L | 48+00.00 | 371988.9794 | 2484538.0264 |
| 40 | L | 49+00.00 | 371932.4508 | 2484620.5159 |
| 41 | L | 50+00.00 | 371875.9265 | 2484703.0083 |
| 42 | L | 51+00.00 | 371825.8050 | 2484789.4423 |
| 43 | L | 52+00.00 | 371788.4999 | 2484882.1318 |
| 44 | L | 53+00.00 | 371764.7711 | 2484979.1882 |
| 45 | L | 54+00.00 | 371755.1022 | 2485078.6342 |
| 46 | L | 55+00.00 | 371759.6901 | 2485178.4438 |
| 47 | L | 56+00.00 | 371775.0114 | 2485277.2559 |
| 48 | L | 57+00.00 | 371790.9703 | 2485375.9743 |
| 49 | L | 58+00.00 | 371806.9292 | 2485474.6926 |
| 50 | L | 59+00.00 | 371822.8881 | 2485573.4110 |
| 51 | L | 60+00.00 | 371837.8615 | 2485672.2737 |
| 52 | L | 61+00.00 | 371844.4183 | 2485772.0167 |
| 53 | L | 62+00.00 | 371842.6351 | 2485871.9921 |

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

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

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

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

Wednesday, March 23, 2011 10:6

6/2/09

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW D. LEE

5/6/11

PAVEMENT DESIGN ENGINEER

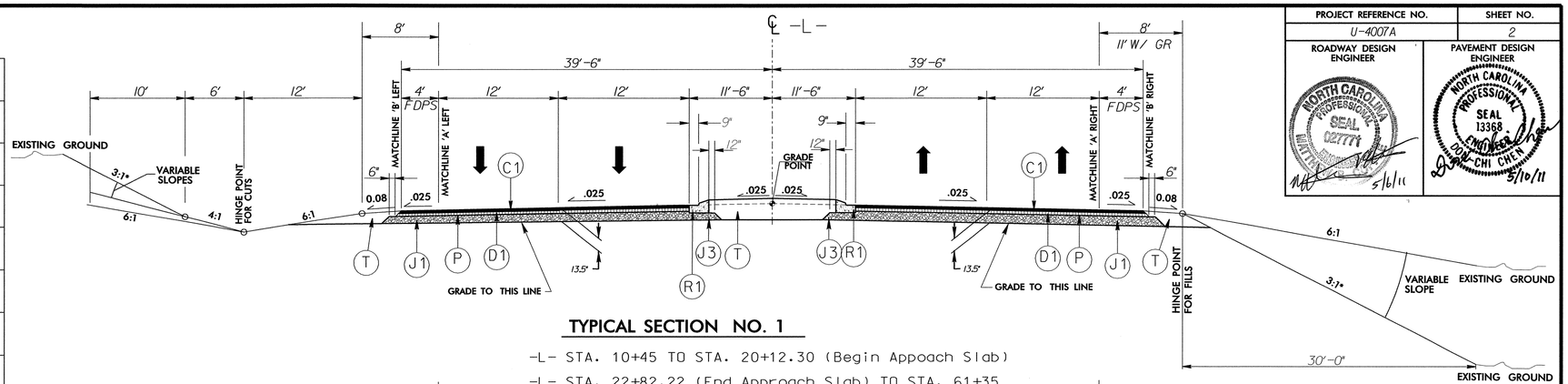
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER JONG-CHI CHEN

5/10/11

## PAVEMENT SCHEDULE

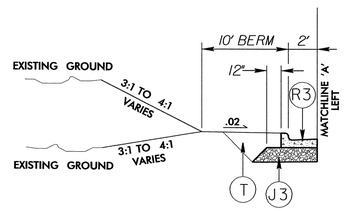
| | |
|---|---|
| C1 | PROP. APPROX. 3" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS PER SQ. YD. IN EACH OF TWO LAYERS. |
| C2 | PROP. APPROX. 3" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS PER SQ. YD. IN EACH OF TWO LAYERS. |
| C3 | PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2" IN DEPTH. |
| C4 | PROP. APPROX. 1.5" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS PER SQ. YD. |
| C6 | PROP. APPROX. 1.5" ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS PER SQ. YD. |
| D1 | PROP. APPROX. 2.5" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS PER SQ. YD. |
| D2 | PROP. APPROX. 4" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS PER SQ. YD. |
| D3 | PROP. APPROX. 4" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS PER SQ. YD. |
| D4 | PROP. VAR. DEPTH ASPHALT CONC. 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 2.5" OR GREATER THAN 4" IN DEPTH. |
| E1 | PROP. APPROX. 4" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS PER SQ. YD. |
| E3 | PROP. VAR. DEPTH ASPHALT CONC. 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" OR GREATER THAN 5.5" IN DEPTH. |
| E5 | PROP. APPROX. 6" ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS PER SQ. YD. IN EACH OF TWO LAYERS |
| E6 | PROP. APPROX. 4" ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS PER SQ. YD. |
| J1 | 8" AGGREGATE BASE COURSE |
| J2 | 10" AGGREGATE BASE COURSE |
| J3 | VAR. DEPTH AGGREGATE BASE COURSE |
| P | PRIME COAT |
| R1 | 1'-6" CONCRETE CURB AND GUTTER |
| R3 | 2'-6" CONCRETE CURB AND GUTTER |
| R4 | EXPRESSWAY GUTTER |
| R5 | 5" MONOLITHIC CONCRETE ISLAND (KEYED IN) |
| R6 | SHOULDER BERM GUTTER |
| S | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| V1 | MILLING BITUMINOUS PAVEMENT, TO A DEPTH OF 1.5" |
| V2 | MILLING BITUMINOUS PAVEMENT, TO A DEPTH OF 2.5" |
| V3 | MILLING BITUMINOUS PAVEMENT, TO A DEPTH OF 4.0" |
| W | WEDGING (SEE DETAIL, SHT. 2-A) |

NOTE: ALL SLOPES 1:1 UNLESS OTHERWISE SPECIFIED
EOT = EDGE OF TRAVEL LANE




## TYPICAL SECTION NO. 1

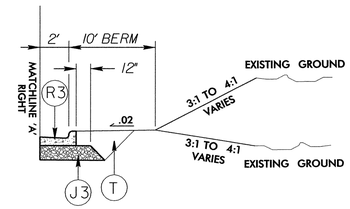
-L- STA. 10+45 TO STA. 20+12.30 (Begin Appoach Slab)
-L- STA. 22+82.22 (End Approach Slab) TO STA. 61+35
* 4:1 INSIDE INTERCHANGE

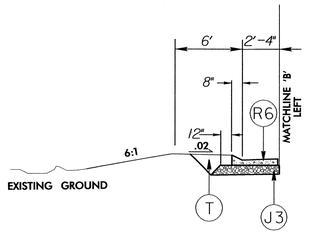



## TYPICAL SECTION NO. 1A LEFT & RIGHT

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

-L- STA. 39+00.00 TO STA. 68+05.00 LEFT
-L- STA. 58+57.00 TO STA. 68+05.00 RIGHT

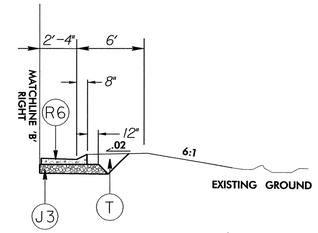


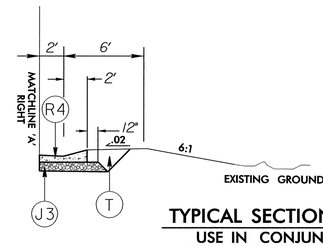




## TYPICAL SECTION NO. 1B LEFT & RIGHT

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

-L- STA. 25+49.00 TO STA. 27+05.00 LEFT
-L- STA. 17+49.00 TO STA. 19+97.00 RIGHT
-L- STA. 22+74.00 TO STA. 24+85.00 RIGHT
-L- STA. 26+29.00 TO STA. 27+05.00 RIGHT

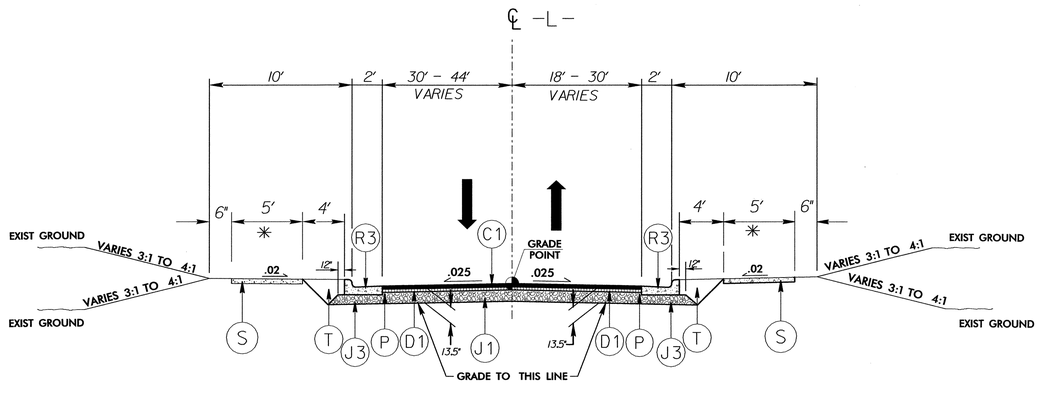



## TYPICAL SECTION NO. 1C

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

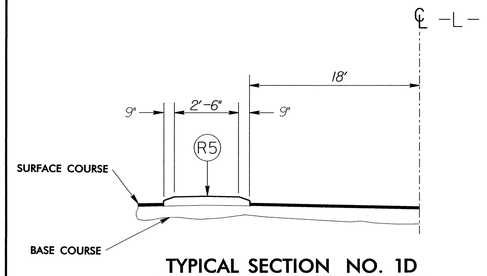
-L- STA. 42+50.00 TO STA. 45+40.00




## TYPICAL SECTION NO. 2

-L- STA. 62+15.69 TO STA. 66+00+/-

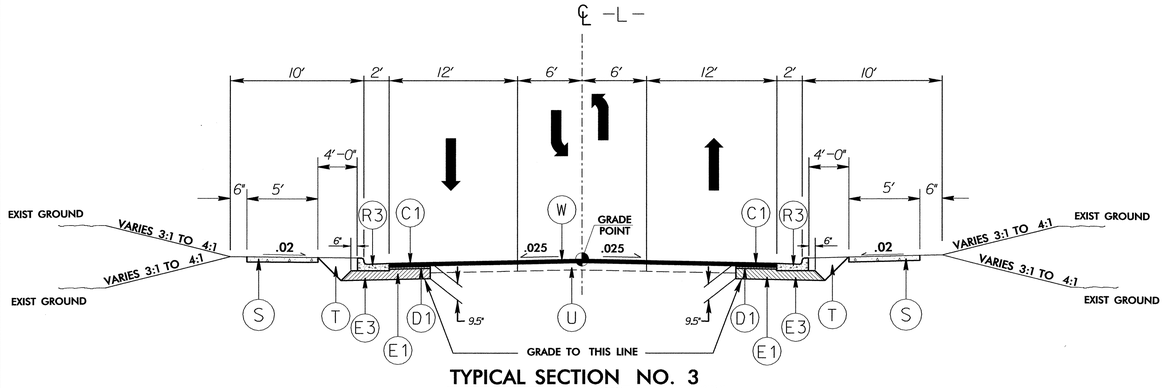
* SEE PLANS FOR SIDEWALK LOCATION




## TYPICAL SECTION NO. 1D

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

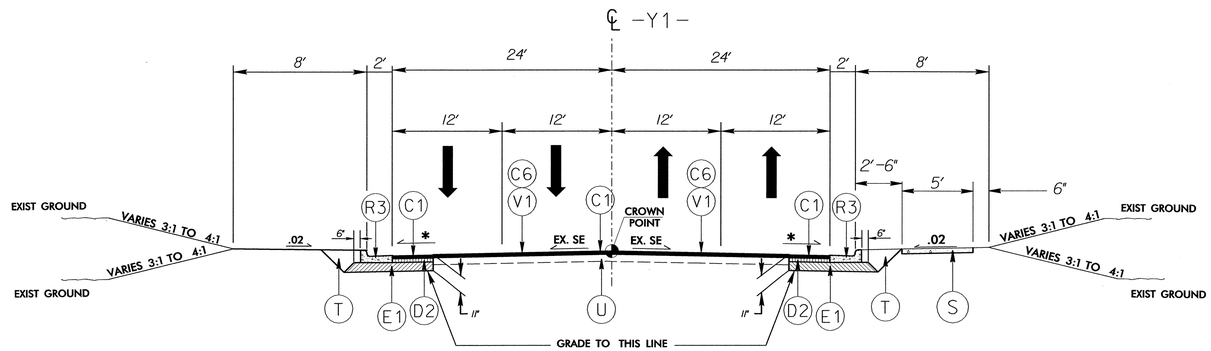
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2-A |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |




TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO.3

-L- STA. 66+00.00 TO STA. 68+30.50

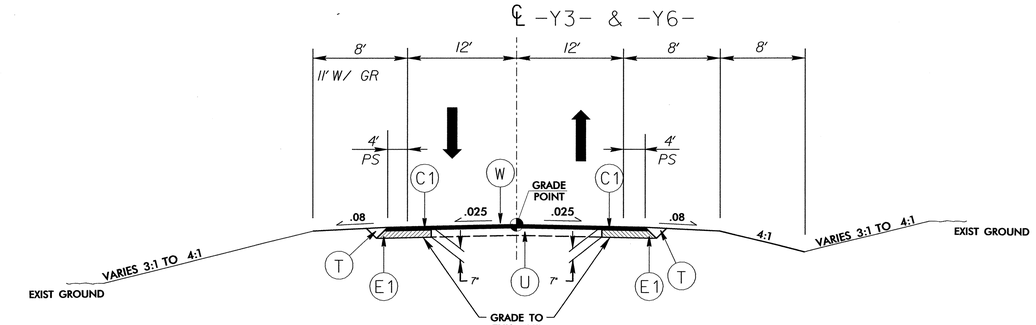



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO.4

-Y1- STA. 11+08.82 TO STA. 18+95.01

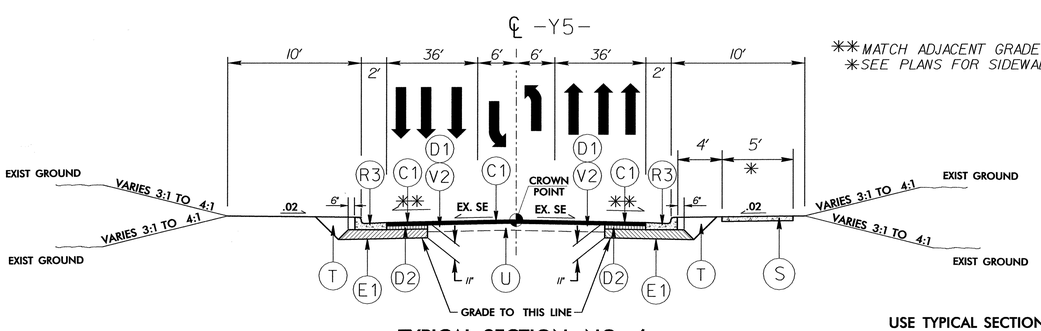
*MATCH ADJACENT GRADE AND SE




TYPICAL SECTION NO. 5

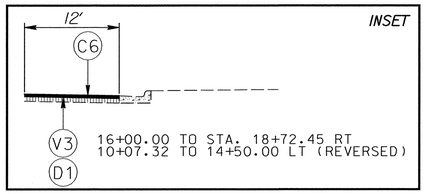
USE TYPICAL SECTION NO.5

-Y3- STA. 10+35.50 TO STA. 11+75.57
-Y6- STA. 10+00.00 TO STA. 11+22.94




TYPICAL SECTION NO. 6

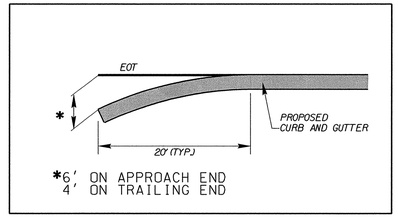
**MATCH ADJACENT GRADE AND SE
*SEE PLANS FOR SIDEWALK LOCATION




16+00.00 TO STA. 18+72.45 RT
10+07.32 TO 14+50.00 LT (REVERSED)

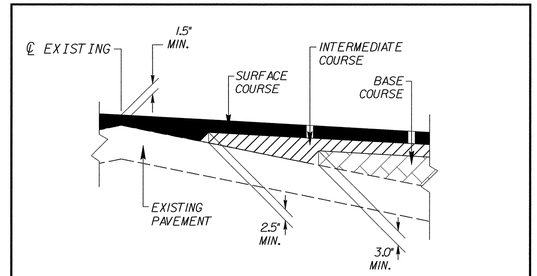
USE TYPICAL SECTION NO.6

-Y5- STA. 10+07.32 TO STA. 18+72.45

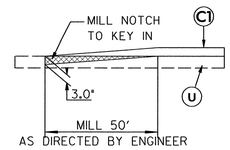



*6' ON APPROACH END
4' ON TRAILING END

DETAIL SHOWING FLARE OF CURB AND GUTTER




DETAIL SHOWING METHOD OF WEDGING




DETAIL SHOWING MILLING

MILL EXISTING PAVEMENT 3.0" DEPTH

| | PAVEMENT SCHEDULE (*) |
|---|---|
| C1 | 3" A.C.S.C. TYPE S9.5B |
| C2 | 3" A.C.S.C. TYPE S9.5C |
| C3 | VAR. DEPTH A.C.S.C. TYPE S9.5B |
| C4 | 1.5" A.C.S.C. TYPE S9.5C |
| C6 | 1.5" A.C.S.C. TYPE S9.5B |
| D1 | 2.5" A.C.I.C. TYPE I19.0B |
| D2 | 4" A.C.I.C. TYPE I19.0B |
| D3 | 4" A.C.I.C. TYPE I19.0C |
| D4 | VAR. DEPTH A.C.I.C. TYPE I19.0B |
| E1 | 4" A.C.B.C. TYPE B25.0B |
| E3 | VAR. DEPTH A.C.B.C. TYPE B25.0B |
| J1 | 8" AGGREGATE BASE COURCE |
| J2 | 10" AGGREGATE BASE COURCE |
| J3 | VAR. DEPTH AGGREGATE BASE COURCE |
| P | PRIME COAT |
| R1 | 1'-6" CONC. CURB & GUTTER |
| R3 | 2'-6" CONC. CURB & GUTTER |
| R4 | EXPRESSWAY GUTTER |
| S | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| V1 | MILLLING BITUMINOUS PAVEMENT, TO A DEPTH OF 1.5" |
| V2 | MILLLING BITUMINOUS PAVEMENT, TO A DEPTH OF 2.5" |
| V3 | MILLLING BITUMINOUS PAVEMENT, TO A DEPTH OF 4.0" |
| W | WEDGING |

(*) = REFER TO SHEET No 2 FOR FULL DESCRIPTIONS.

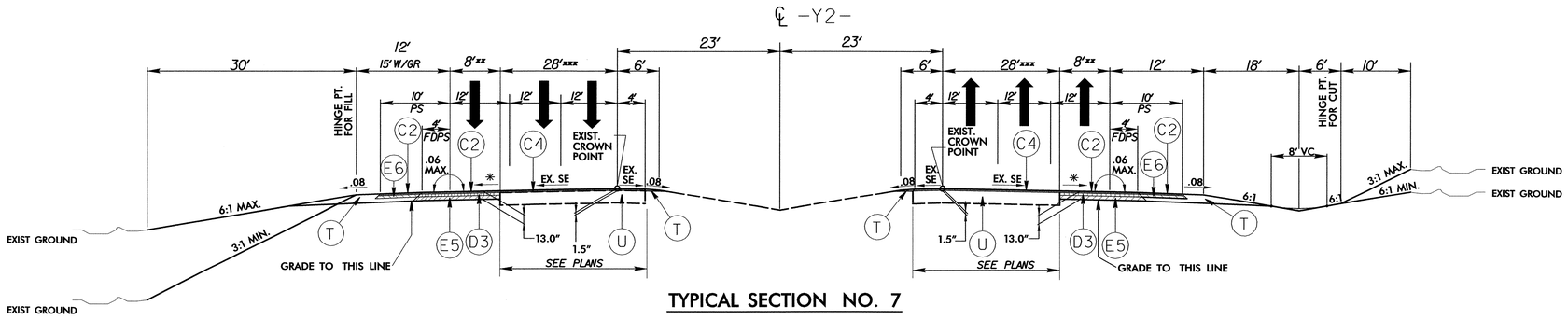
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2-B |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER — 5/5/11

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DAVID CHI CHEN — 5/10/11




## TYPICAL SECTION NO. 7

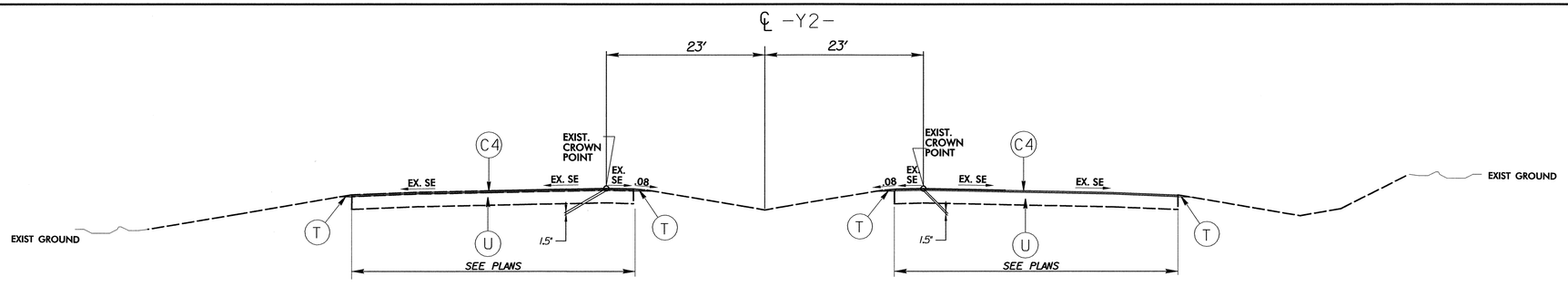
**USE TYPICAL SECTION NO.7**

-Y2- STA. 27+89.18 TO STA. 50+00.00

* MATCH ADJACENT GRADE & SE

** EXISTING 6' PARTIAL-DEPTH PAVED SHOULDER TO BE REMOVED.

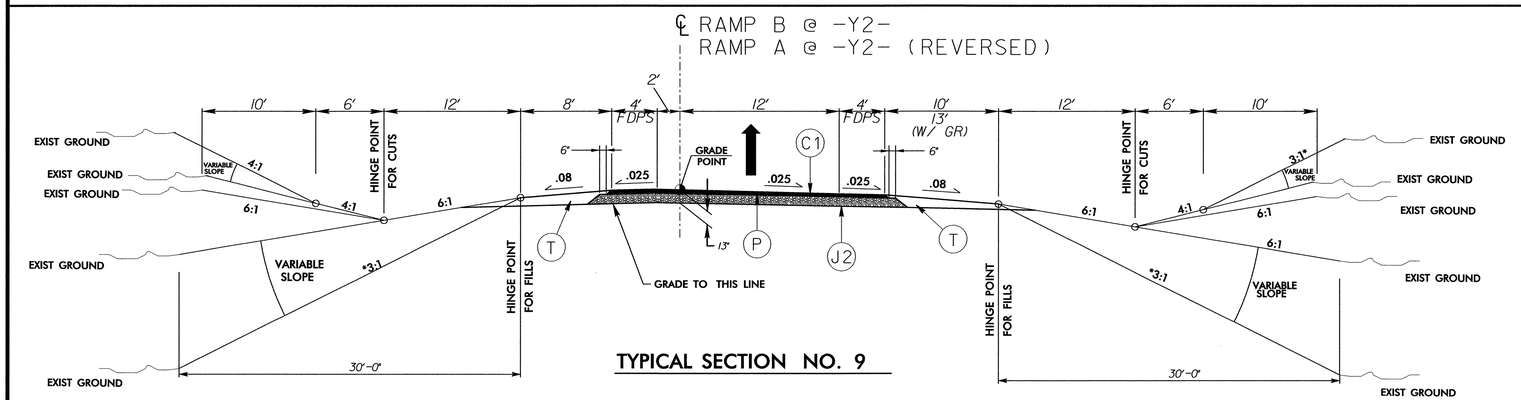
*** WIDTH INCLUDES 2 EXISTING LANES & 4' FDPS.




## TYPICAL SECTION NO. 8

**USE TYPICAL SECTION NO.8**

-Y2- STA. 50+00.00 TO STA. 62+00.00



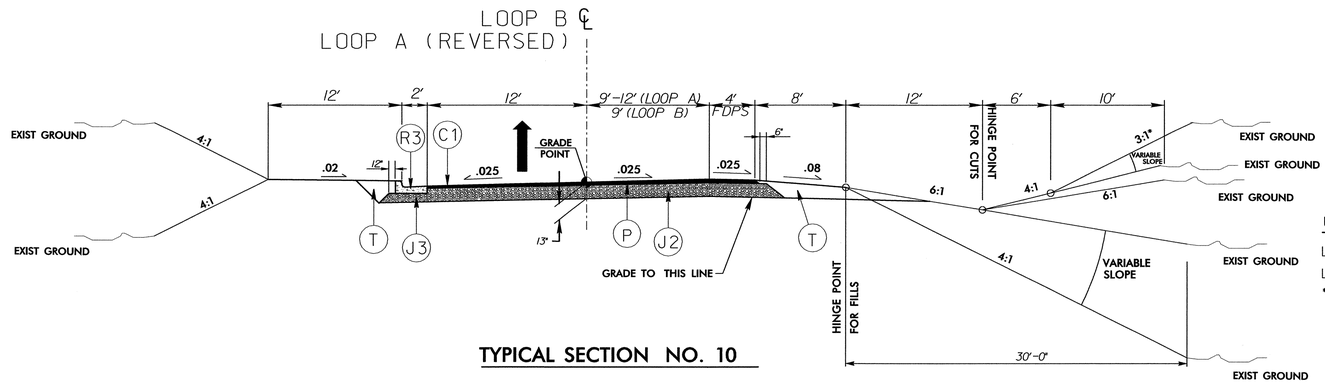

## TYPICAL SECTION NO. 9

**USE TYPICAL SECTION NO.9**

RAMP A STA. 3+57.07 TO STA. 13+22.05

RAMP B STA. 4+10.61 TO STA. 17+50.25

*4:1 Inside Interchange




## TYPICAL SECTION NO. 10

**USE TYPICAL SECTION NO.10**

LOOP A STA. 1+99.39 TO STA. 7+08.93

LOOP B STA. 1+76.40 TO STA. 8+88.11

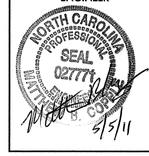
*4:1 Inside Interchange

| PAVEMENT SCHEDULE (*) | |
|---|---|
| C1 | 3" A.C.S.C. TYPE S9.5B |
| C2 | 3" A.C.S.C. TYPE S9.5C |
| C3 | VAR. DEPTH A.C.S.C. TYPE S9.5B |
| C4 | 1.5" A.C.S.C. TYPE S9.5C |
| C6 | 1.5" A.C.S.C. TYPE S9.5B |
| D1 | 2.5" A.C.I.C. TYPE I19.0B |
| D2 | 4" A.C.I.C. TYPE I19.0B |
| D3 | 4" A.C.I.C. TYPE I19.0C |
| D4 | VAR. DEPTH A.C.I.C. TYPE I19.0B |
| E1 | 4" A.C.B.C. TYPE B25.0B |
| E3 | VAR. DEPTH A.C.B.C. TYPE B25.0B |
| E5 | 6" A.C.B.C. TYPE B25.0C |
| E6 | 4" A.C.B.C. TYPE B25.0C |
| J1 | 8" AGGREGATE BASE COURCE |
| J2 | 10" AGGREGATE BASE COURCE |
| J3 | VAR. DEPTH AGGREGATE BASE COURCE |
| P | PRIME COAT |
| R1 | 1'-6" CONC. CURB & GUTTER |
| R3 | 2'-6" CONC. CURB & GUTTER |
| R4 | EXPRESSWAY GUTTER |
| S | 4" CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| V1 | MILLLING BITUMINOUS PAVEMENT, TO A DEPTH OF 1.5" |
| V2 | MILLLING BITUMINOUS PAVEMENT, TO A DEPTH OF 2.5" |
| V3 | MILLLING BITUMINOUS PAVEMENT, TO A DEPTH OF 4.0" |
| W | WEDGING |

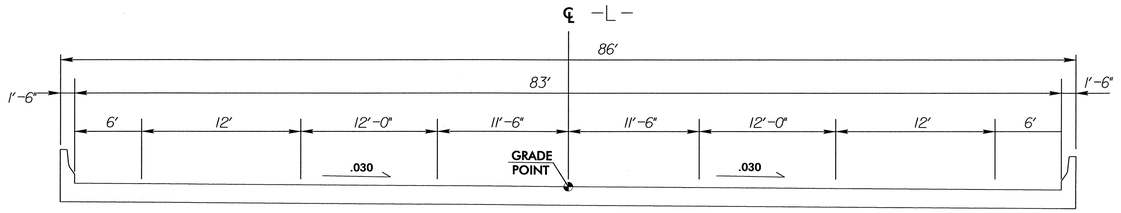
(*) = REFER TO SHEET No 2 FOR FULL DESCRIPTIONS.

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2-C |

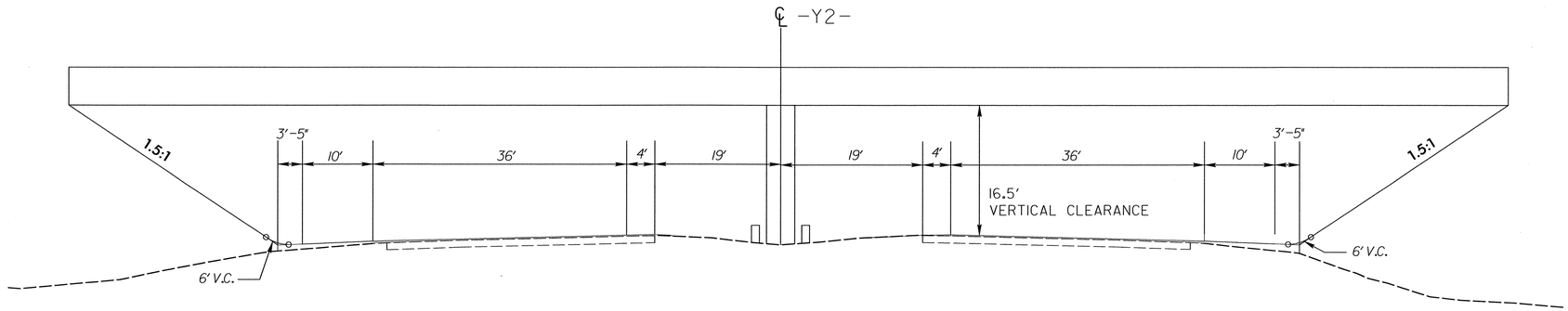
ROADWAY DESIGN ENGINEER



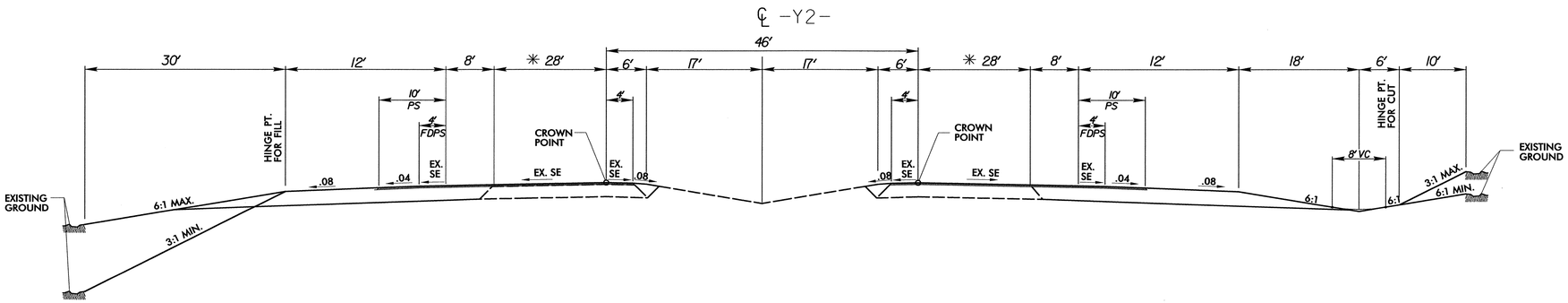

PAVEMENT DESIGN ENGINEER




***TYPICAL SECTION OF STRUCTURE OVER US 17 (PROPOSED)***




***TYPICAL SECTION ON ROADWAY UNDER STRUCTURE***

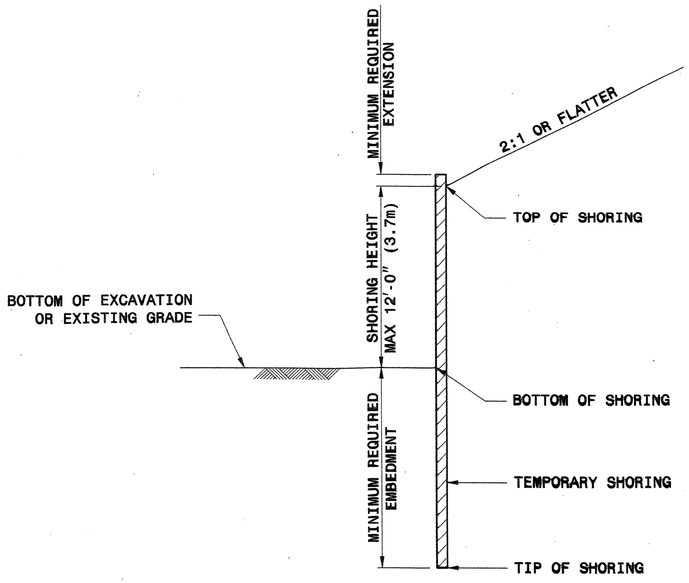



***TYPICAL SECTION ON ROADWAY LEAVING OVERHEAD STRUCTURE***

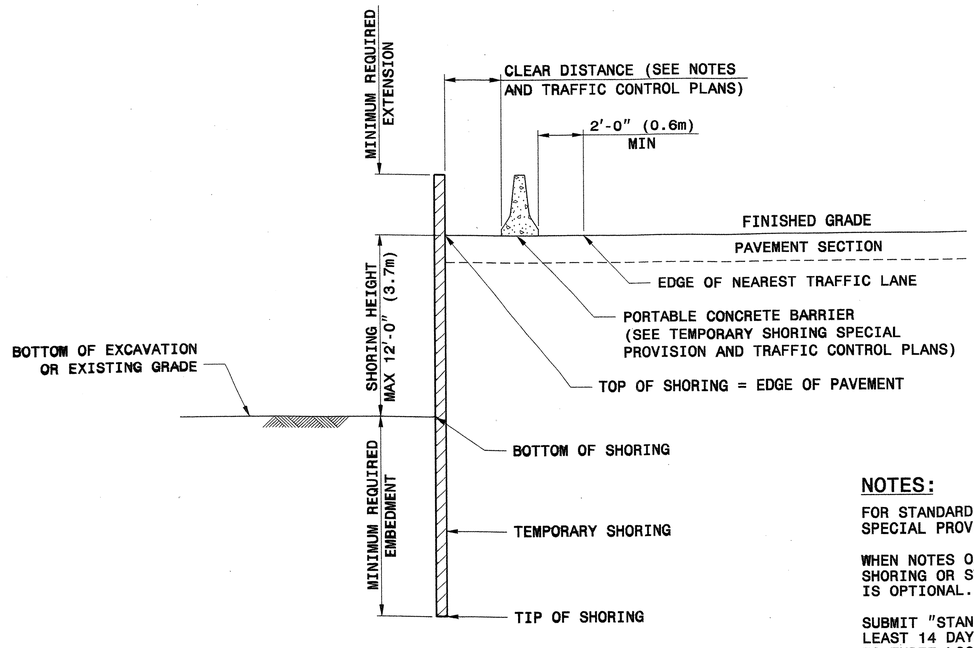
✳ WIDTH INCLUDES 2 EXISTING LANES & 4' FDPS.

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-4007A | 2-D |

| GEOTECHNICAL ENGINEER | ENGINEER |
|---|---|
| NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN | |
| Scott A. Hidden 3/29/07 | |
| SIGNATURE DATE | SIGNATURE DATE |




## SLOPE CASE




## SURCHARGE CASE

| GROUNDWATER CONDITION | SHORING HEIGHT FT (m) | 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 SECTION MODULUS $IN^3/FT$ ($cm^3/m$) | MINIMUM REQUIRED EMBEDMENT FT (m) | | | MINIMUM REQUIRED EMBEDMENT FT (m) | MINIMUM REQUIRED SECTION MODULUS $IN^3/FT$ ($cm^3/m$) | MINIMUM REQUIRED EMBEDMENT FT (m) | | |
| | | | | HP 10x42 (HP 250x62) | HP 12x53 (HP 310x79) | HP 14x73 (HP 360x108) | | | 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

EC221427 3/29/2007 std no 1801 shidden GE-Oce34bond

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2-E |

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

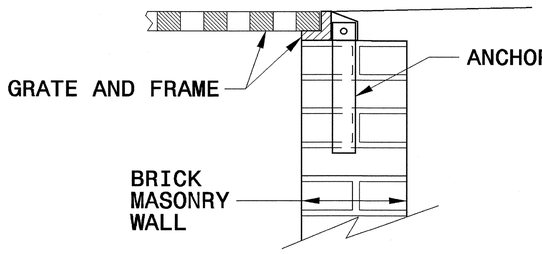
ENGLISH DETAIL DRAWING FOR

# ANCHORAGE FOR FRAMES

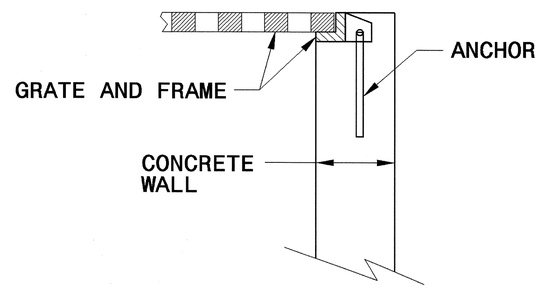
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

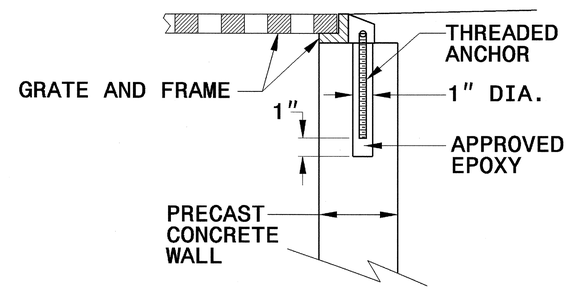
840D25




**BRICK MASONRY CONSTRUCTION**



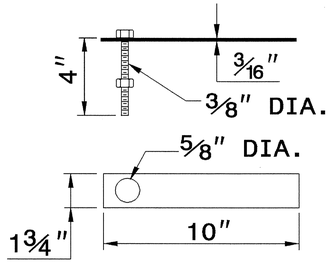

**CONCRETE CONSTRUCTION**



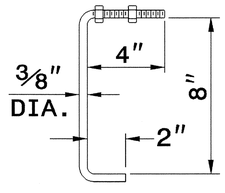

**PRECAST CONCRETE CONSTRUCTION**

## DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

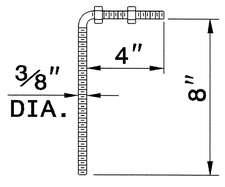
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



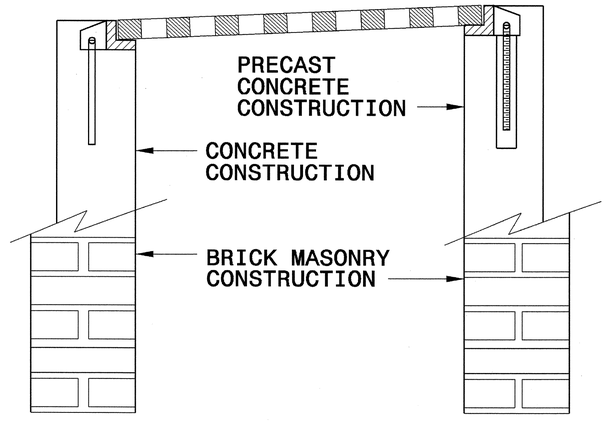

**MASONRY ANCHOR**
3/8" DIA. BOLT WITH PLATE




**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 JOHN S. MOWERY
5/10/11

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
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SEE PLATE FOR TITLE

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

27-SEP-2006 08:59
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ericward AI PS222293

05-NOV-2009 11:35
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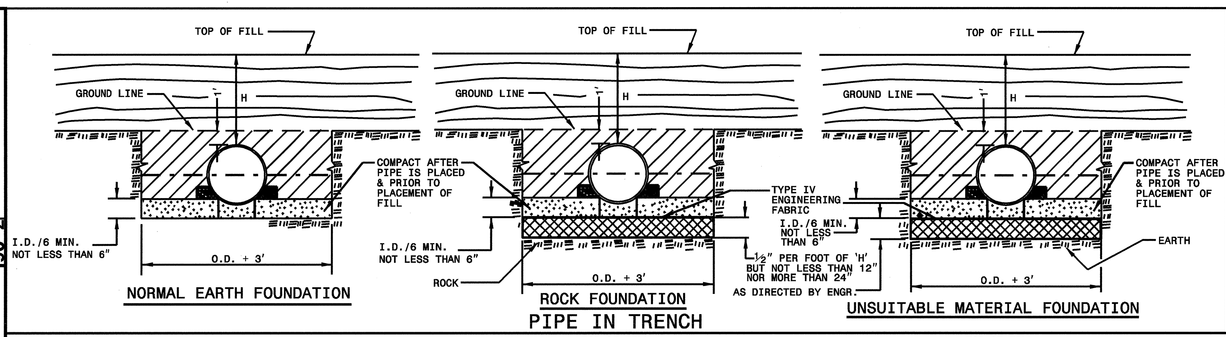
jhowerton AT PS23750I

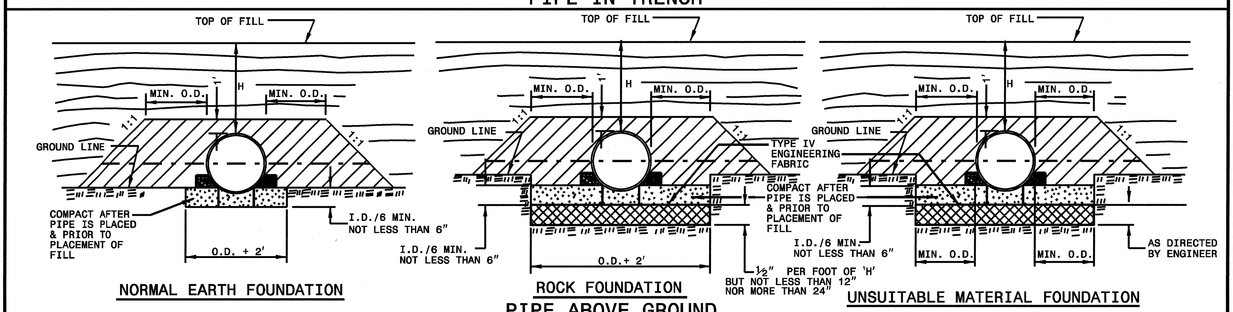
5/14/99

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

7-06

ENGLISH DETAIL DRAWING FOR
**METHOD OF PIPE INSTALLATION**
FLEXIBLE PIPE




GENERAL NOTES:

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

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

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

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

SPRINGLINE OF PIPE

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

APPROVED SUITABLE LOCAL MATERIAL.

UNDISTURBED EARTH MATERIAL

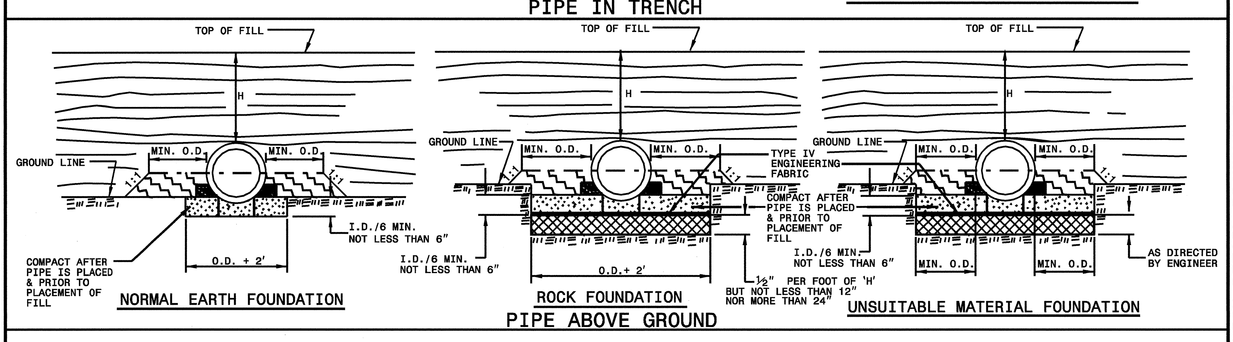
SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

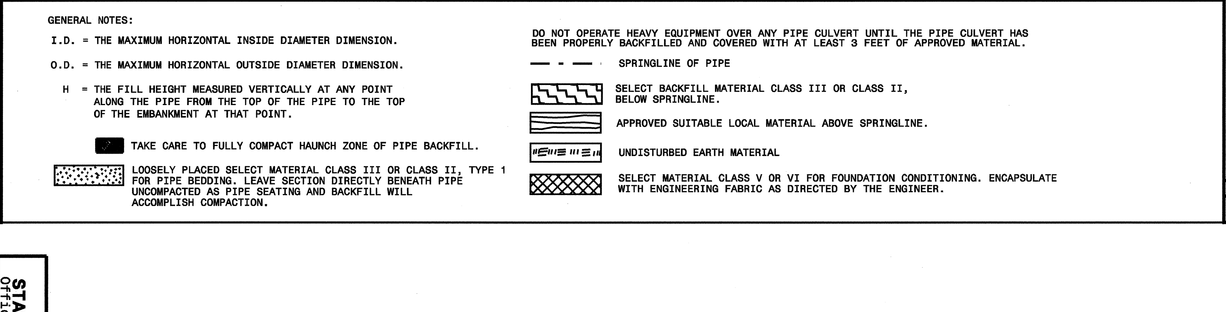
SHEET 1 OF 3
**300D01**

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

7-06

ENGLISH DETAIL DRAWING FOR
**METHOD OF PIPE INSTALLATION**
RIGID PIPE




GENERAL NOTES:

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

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

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

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

SPRINGLINE OF PIPE

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

APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.

UNDISTURBED EARTH MATERIAL

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

SHEET 2 OF 3
**300D01**

**SEE PLATE FOR TITLE**

ORIGINAL BY: Kkempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC's: s:\ncdot\stds\stdsstds\stds\30001\0300d01.dgn

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOSEPH EDWARD HACKNEY II

PROJECT REFERENCE NO. U-4007A
SHEET NO. 2-F

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jhowerton AT PS237501

5/14/99

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

7-06

ENGLISH DETAIL DRAWING FOR

**METHOD OF PIPE INSTALLATION**

FILL HEIGHT TABLES

SHEET 3 OF 3

**300D01**

# FLEXIBLE PIPE

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

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

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

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

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

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

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

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

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

# RIGID PIPE

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

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

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

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

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

7-06

ENGLISH DETAIL DRAWING FOR

**METHOD OF PIPE INSTALLATION**

FILL HEIGHT TABLES

SHEET 3 OF 3

**300D01**

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025966 JOEL IKERD REGISTERED

**SEE PLATE FOR TITLE**

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

PROJECT REFERENCE NO. U-4007A

SHEET NO. 2-6

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2-H |

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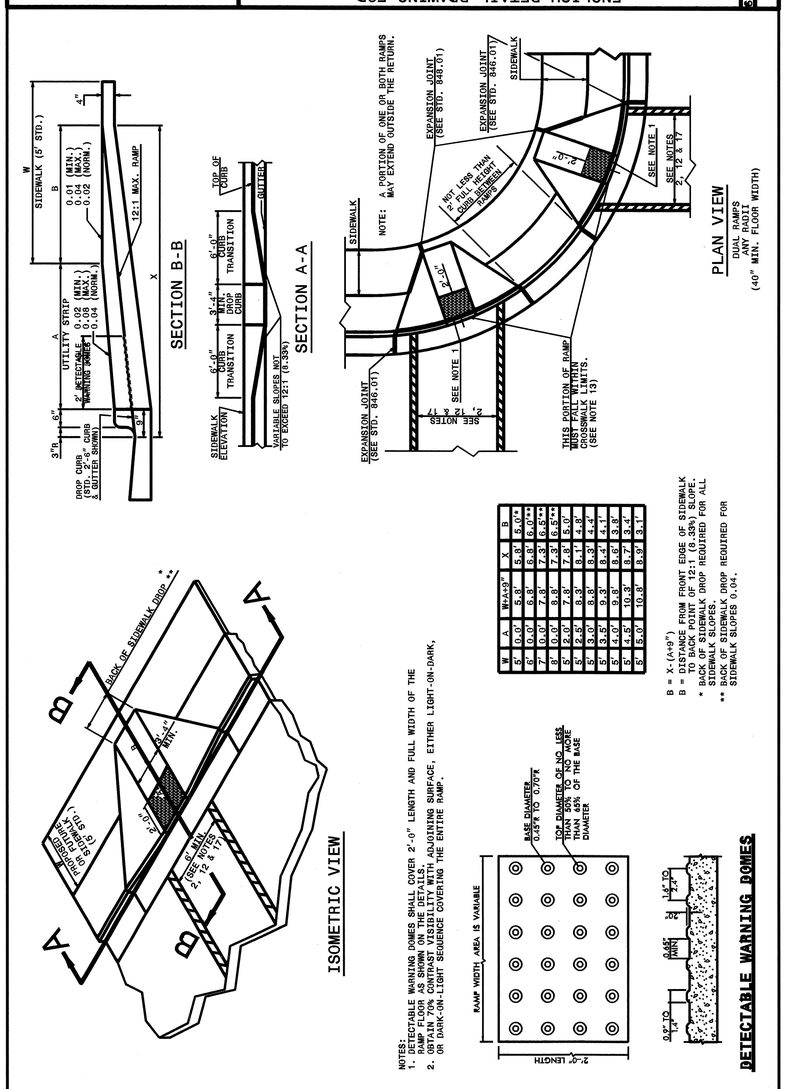



| W | A | W+A+9" | X | B |
|---|---|---|---|---|
| 5' | 0.0' | 5.8' | 5.8' | 5.0'* |
| 6' | 0.0' | 6.8' | 6.8' | 6.0'** |
| 7' | 0.0' | 7.8' | 7.3' | 6.5'** |
| 8' | 0.0' | 8.8' | 7.3' | 6.5'** |
| 5' | 2.4' | 7.8' | 7.8' | 7.0' |
| 5' | 3.0' | 8.4' | 8.3' | 7.4' |
| 5' | 3.5' | 9.3' | 8.4' | 8.1' |
| 5' | 4.0' | 9.8' | 8.6' | 8.8' |
| 5' | 4.5' | 10.3' | 8.7' | 8.4' |
| 5' | 5.0' | 10.8' | 8.9' | 8.1' |

NOTES:
1. DETECTABLE WARNING DOMES SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. OBTAIN 70% CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

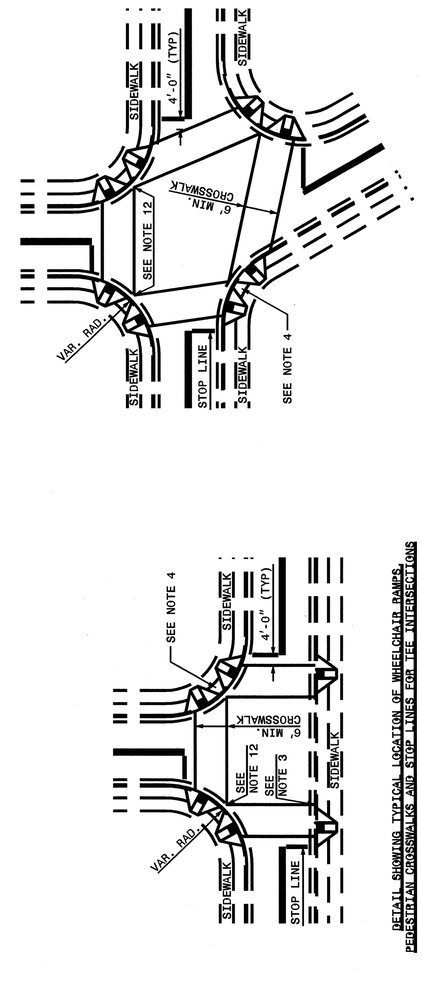
DETECTABLE WARNING DOMES

| STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. | ENGLISH DETAIL DRAWING FOR **WHEELCHAIR RAMP** PROPOSED CURB AND GUTTER | SHEET 1 OF 3 848D05 |
|---|---|---|

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

ENGLISH DETAIL DRAWING FOR **WHEELCHAIR RAMP** PROPOSED CURB AND GUTTER

SHEET 1 OF 3 848D05




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

ENGLISH DETAIL DRAWING FOR **WHEELCHAIR RAMP** PROPOSED CURB AND GUTTER

SHEET 2 OF 3 848D05

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
5/10/11

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ORIGINAL BY: STD.NO.848.05 DATE: 4-22-10
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: SpecialDetails/EricWard/STDS/848d05.dgn

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

ENGLISH DETAIL DRAWING FOR

**WHEELCHAIR RAMP**

PROPOSED CURB AND GUTTER

SHEET 3 OF 3

**848D05**

NOTES:

1. CONSTRUCT THE WALKING SURFACE WITH SLIP RESISTANTANCE AND A 70% CONTRASTING COLOR TO THE SIDEWALK.
2. CROSSWALK WIDTHS AND CONFIGURATION VARY BUT MUST CONFORM TO TRAFFIC DESIGN STANDARDS.
3. NORTH CAROLINA GENERAL STATUTE 136-44.14 REQUIRES THAT ALL STREET CURBS BEING CONSTRUCTED OR RECONSTRUCTED FOR MAINTENANCE PROCEDURES, TRAFFIC OPERATIONS, REPAIRS, CORRECTION OF UTILITIES OR ALTERED FOR ANY REASON AFTER SEPTEMBER 1, 1973 SHALL PROVIDE WHEELCHAIR RAMPS FOR THE PHYSICALLY DISABLED AT ALL INTERSECTIONS WHERE BOTH CURB AND GUTTER AND SIDEWALKS ARE PROVIDED AND AT OTHER POINTS OF PEDESTRIAN FLOW.

   IN ADDITION, SECTION 228 OF THE 1973 FEDERAL AID HIGHWAY SAFETY ACT REQUIRES PROVISION OF CURB RAMPS ON ANY CURB CONSTRUCTION AFTER JULY 1,1976 WHETHER A SIDEWALK IS PROPOSED INITIALLY OR IS PLANNED FOR A FUTURE DATE.

   THE AMERICANS WITH DISABILITIES ACT (ADA) OF 1990 EXTENDS TO INDIVIDUALS WITH DISABILITIES. COMPREHENSIVE CIVIL RIGHTS PROTECTIONS SIMILIAR TO THOSE PROVIDED TO PERSONS ON THE BASIS OF RACE, SEX, NATIONAL ORIGIN AND RELIGION UNDER THE CIVIL RIGHTS ACT OF 1964. THESE CURB RAMPS HAVE BEEN DESIGNED TO COMPLY WITH THE CURRENT ADA STANDARDS.
4. PROVIDE WHEELCHAIR RAMPS AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. LOCATE WHEELCHAIR RAMPS AS DIRECTED BY THE ENGINEER WHERE EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. AFFECT PLACEMENT. WHERE TWO RAMPS ARE INSTALLED PLACE NOT LESS THAN 2 FEET OF FULL HEIGHT CURB BETWEEN THE RAMPS. PLACE DUAL RAMPS AS NEAR PERPENDICULAR TO THE TRAVEL LANE BEING CROSSED AS POSSIBLE.
5. DO NOT EXCEED 0.08 (12:1) SLOPE ON THE WHEELCHAIR RAMP IN RELATIONSHIP TO THE GRADE OF THE STREET.
6. CONSTRUCT WHEELCHAIR RAMPS 40" (3'-4") OR GREATER FOR DUAL RAMPS.
7. USE CLASS "B" CONCRETE WITH A SIDEWALK FINISH IN ORDER TO OBTAIN A ROUGH NON-SKID TYPE SURFACE.
8. PLACE A ½" EXPANSION JOINT WHERE THE CONCRETE WHEELCHAIR RAMP JOINS THE CURB AND AS SHOWN ON STD. DWG. 848.01.
9. PLACE THE INSIDE PEDESTRIAN CROSSWALK LINES NO CLOSER IN THE INTERSECTION BY BISECTING THE INTERSECTION RADII, WITH ALLOWANCE OF A 4' CLEAR ZONE IN THE VEHICULAR TRAVELWAY WHEN ONE RAMP IS INSTALLED. (SEE NOTE 17)
10. COORDINATE THE CURB CUT AND THE PEDESTRIAN CROSSWALK LINES SO THE FLOOR OF THE WHEELCHAIR RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES. PLACE DIAGONAL RAMPS WITH FLARED SIDES SO 24" OF FULL HEIGHT CURB FALLS WITHIN THE CROSSWALK MARKINGS ON EACH SIDE OF THE FLARES.
11. CONSTRUCT THE PEDESTRIAN CROSSWALK A MINIMUM OF 6 FEET. A CROSSWALK WIDTH OF 10 FEET OR GREATER IS DESIRABLE.
12. USE STOP LINES, NORMALLY PERPENDICULAR TO THE LANE LINES, WHERE IT IS IMPORTANT TO INDICATE THE POINT BEHIND WHICH VEHICLES ARE REQUIRED TO STOP IN COMPLIANCE WITH A TRAFFIC SIGNAL, STOP SIGN OR OTHER LEGAL REQUIREMENT. AN UNUSUAL APPROACH SKEW MAY REQUIRE THE PLACEMENT OF THE STOP LINE TO BE PARALLEL TO THE INTERSECTING ROADWAY.
13. TERMINATE PARKING A MINIMUM OF 20 FEET BACK OF PEDESTRIAN CROSSWALK.
14. PLACE ALL PAVEMENT MARKINGS IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION AND THE NORTH CAROLINA SUPPLEMENT TO THE MUTCD.

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

**WHEELCHAIR RAMP**

PROPOSED CURB AND GUTTER

SHEET 3 OF 3

**848D05**

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

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ORIGINAL BY: STD.NO.848.05 DATE: 4-22-10
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: $$$$USERNAME$$$$

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
DEPARTMENT OF TRANSPORTATION
5/10/11

PROJECT REFERENCE NO. U-4007A
SHEET NO. 2-3

8/17/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2-J |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER

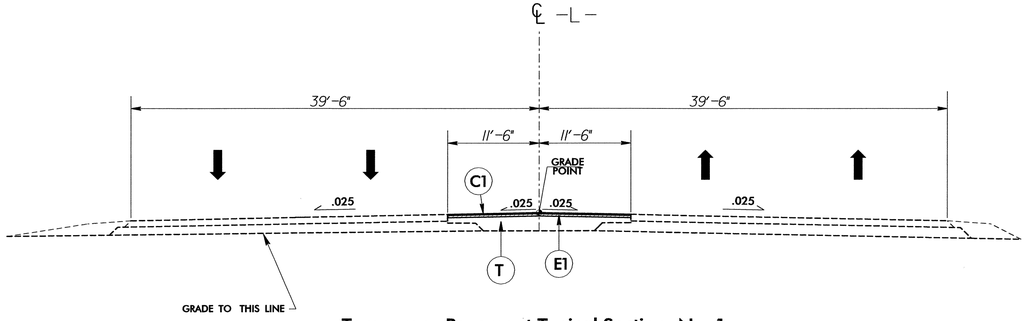
NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER — 4/26/11

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER — DAVID CHI CHEN — 4/27/11

| | PAVEMENT SCHEDULE (*) |
|---|---|
| C1 | 3" A.C.S.C. TYPE S9.5B |
| E1 | 4" A.C.B.C. TYPE B25.0B |
| T | EARTH MATERIAL |

-L-
PI Sta 41+04.58
Δ = 47° 09' 01.3" (RT)
D = 5° 43' 46.5"
L = 822.93'
T = 436.37'
R = 1,000.00'
SE = .035
DS = 40MPH




**Temporary Pavement Typical Section No. 1**
-L- STA. 53+00 TO STA. 53+77

-L-
PI Sta 52+77.32
Δ = 43° 36' 18.8" (LT)
D = 8° 11' 06.4"
L = 532.74'
T = 280.02'
R = 700.00'
SE .04
DS = 40MPH

-Y6-
PI Sta 10+96.57
Δ = 65° 29' 51.1" (LT)
D = 114° 35' 29.6"
L = 57.16'
T = 32.16'
R = 50.00'

NAD 83

45+00

50+00

10+00

55+00

-L- PT Sta.55+30.04

-L- POC Sta.53+38.93
-Y6- POT Sta. 10+00.00

See Temp. Pavmn't. Typ. Sect. No. 1 & Traffic Control Plans

-L- POT Sta.46+05.01
-Y3- POT Sta. 10+00.00

SEE SHEET NO.6
MATCHLINE STA.42+50.00

MATCHLINE SHEET NO.8
SEE SHEET NO.8 STA.56+50.00

STA. 53+77 -L-
END TEMP. PAV'T

STA. 53+00 -L-
BEG. TEMP. PAV'T

-L- S 55° 34' 40.2" E

-Y3- S 56° 25' 19.8" W

-Y3- PC Sta. 10+68.25

-Y3- PT Sta. 11+43.00

-L- PT Sta. 44+91.14

END CONSTRUCTION
-Y3- POT Sta. 12+00.57

-Y3- S 40° 08' 45.7" W

-L- PC Sta.49+97.30

-Y3- POT Sta. 13+83.15

JB w/MH

-Y6- S 61° 27' 34.3" W

-Y6- PC Sta. 10+64.41

-Y6- PT Sta. 11+21.56

END CONSTRUCTION
-Y6- POT Sta. 11+22.94

-Y6- POT Sta. 12+72.46

S 59° 02' 16.8" E

14200/18200 -L- WHITE ST.
13800/17900 -L- WHITE ST.
1300/1500
900/1000
2200/2500
-Y3- EXIST. WHITE ST.
EST. 2011/2031 AADT

-Y3-
PI Sta 11+05.82
Δ = 14° 16' 34.1" (LT)
D = 19° 05' 54.9"
L = 74.75'
T = 37.57'
R = 300.00'

TEMPORARY PAVEMENT

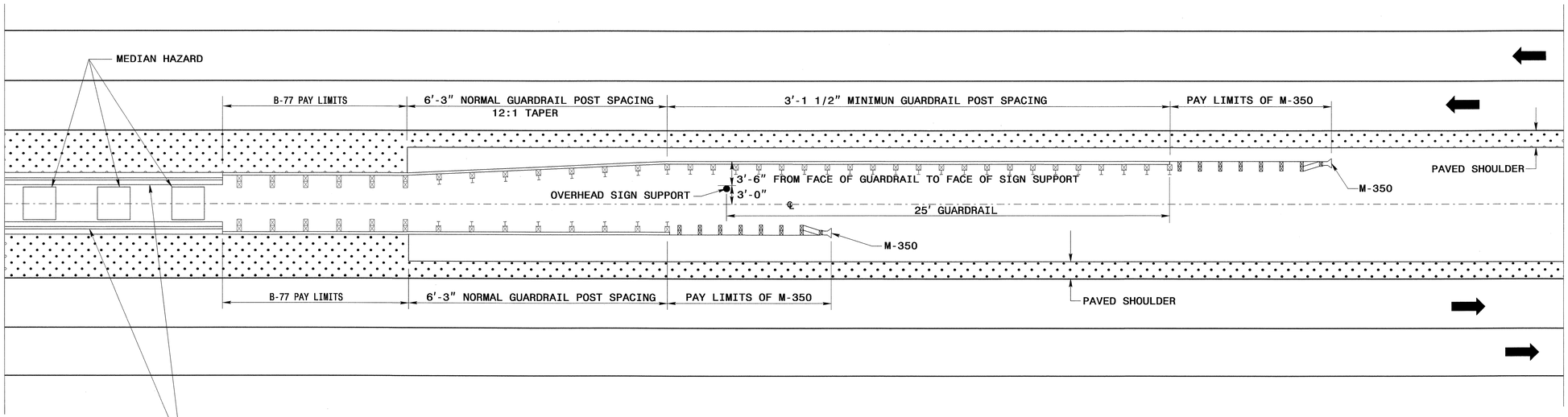
SEE SHEET 10 FOR -L- PROFILE
SEE SHEET 15 FOR -Y3- PROFILE
SEE SHEET 15 FOR -Y6- PROFILE

# TEMPORARY PAVEMENT DETAIL

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

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2-K |

5/14/99




NOTES:

REFER TO ROADWAY STANDARD DRAWING NUMBERS 862.01 AND 862.02 FOR GUARDRAIL PLACEMENT AND INSTALLATION.

ADJUSTMENTS TO LOCATION OF GUARDRAIL AROUND THE OVERHEAD SIGN MAY BE MADE AS DIRECTED BY THE ENGINEER.

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
5/10/11

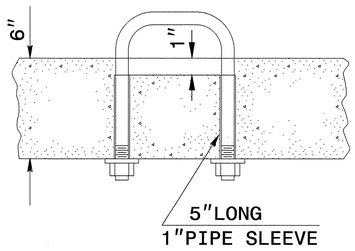

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119


# GUARDRAIL PLACEMENT

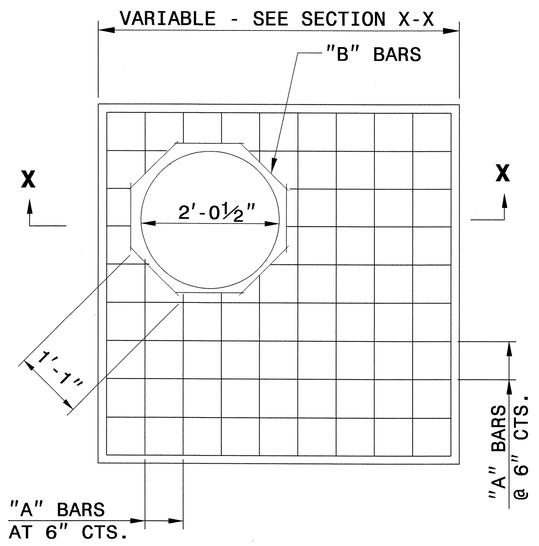
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 05-04-11
CHECKED BY: [signature] DATE: 5/4/11
FILE SPEC.: c:\projects\rnbritt\english\urban\u4007dsignpl.dgn

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

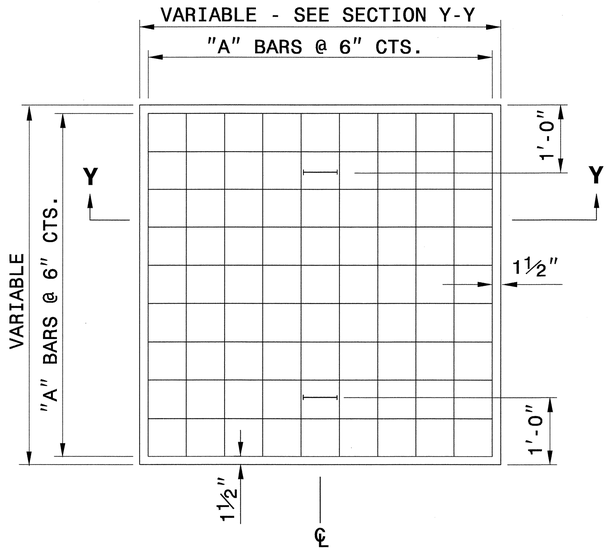
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 2-L |




**PARTIAL SECTION**




**PLAN**




**PLAN**

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

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

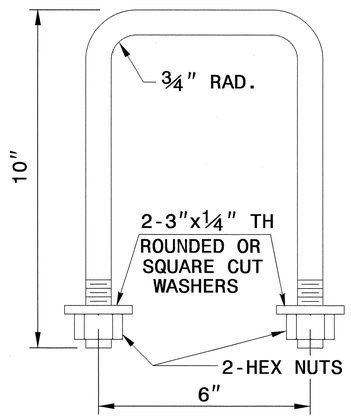
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

## BILL OF MATERIALS

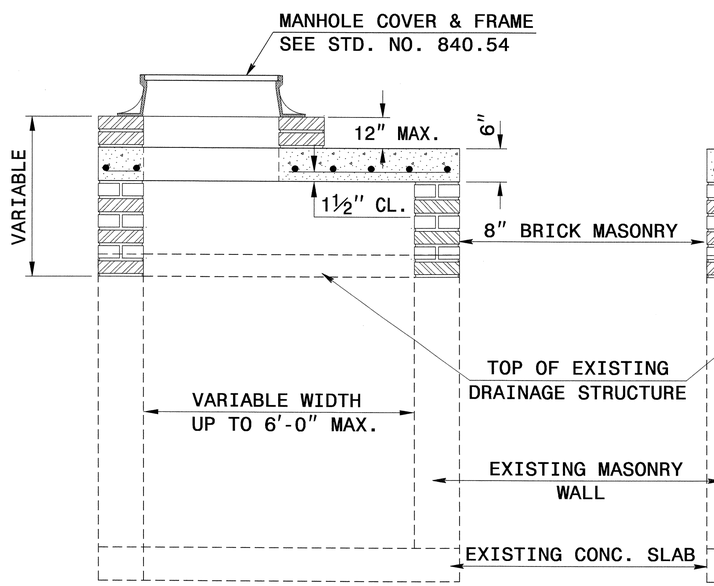
| REINFORCING STEEL | | | | |
|---|---|---|---|---|
| CODE | SIZE | QTY. | LENGTH | REINF. STEEL LBS. |
| A | #4 | 20 | 4'-6" | 60.12 |
| B | #4 | 8 | 1'-1" | 5.79 |
| TOTAL | | | | 65.91 * |

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

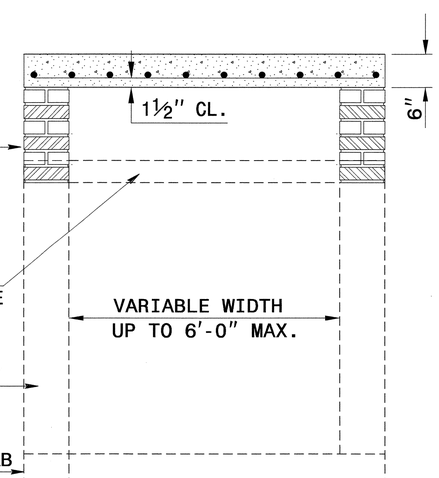
* NOTE:
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



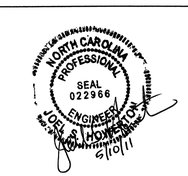

**DETAIL OF HANDLE**




**SECTION X-X**




**SECTION Y-Y**





**CONTRACT STANDARDS AND DEVELOPMENT UNIT**
Office 919-250-4128 FAX 919-250-4119


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

| | | | |
|---|---|---|---|
| ORIGINAL BY: | T.S.S. | DATE: | NOV.1997 |
| MODIFIED BY: | T.S.S. | DATE: | FEB.2000 |
| CHECKED BY: | | DATE: | |
| FILE SPEC.: | ds174:/usr/details/stand/boxtojbe.dgn | | |


$$$$$SYSTEM$$$$
$$$$$DGN$$$$$
$$$$USERNAME$$$$

8/17/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 3(1 of 2) |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202647

# SUMMARY OF QUANTITIES

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 0000100000-N | 800 | Lump Sum | | MOBILIZATION |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ************ (21+47.24) |
| 0036000000-E | 225 | 15,100 | CY | UNDERCUT EXCAVATION |
| 0038000000-E | SP | 500 | CY | SHALLOW UNDERCUT |
| 0050000000-E | 226 | 1 | ACR | SUPPLEMENTARY CLEARING & GRUB-BING |
| 0063000000-N | SP | Lump Sum | | GRADING |
| 0080000000-E | SP | 500 | TON | CLASS IV SUBGRADE STABILIZA-TION |
| 0106000000-E | 230 | 361,400 | CY | BORROW EXCAVATION |
| 0134000000-E | 240 | 2,210 | CY | DRAINAGE DITCH EXCAVATION |
| 0192000000-N | 260 | 20 | HR | PROOF ROLLING |
| 0194000000-E | SP | 18,250 | CY | SELECT GRANULAR MATERIAL, CLASS III |
| 0196000000-E | 270 | 16,900 | SY | FABRIC FOR SOIL STABILIZATION |
| 0199000000-E | SP | 1,647 | SF | TEMPORARY SHORING |
| 0318000000-E | SP | 800 | TON | FOUNDATION CONDITIONING MATE-RIAL, MINOR STRS |
| 0320000000-E | SP | 5,567 | SY | FOUNDATION CONDITIONING FABRIC |
| 0343000000-E | SP | 496 | LF | 15" SIDE DRAIN PIPE |
| 0344000000-E | SP | 80 | LF | 18" SIDE DRAIN PIPE |
| 0348000000-E | SP | 10 | EA | **" SIDE DRAIN PIPE ELBOWS (15") |
| 0348000000-E | SP | 2 | EA | **" SIDE DRAIN PIPE ELBOWS (18") |
| 0448000000-E | SP | 388 | LF | ****" RC PIPE CULVERTS, CLASS IV (66") |
| 0448200000-E | SP | 2,528 | LF | 15" RC PIPE CULVERTS, CLASS IV |
| 0448300000-E | SP | 608 | LF | 18" RC PIPE CULVERTS, CLASS IV |
| 0448400000-E | SP | 364 | LF | 24" RC PIPE CULVERTS, CLASS IV |
| 0448500000-E | SP | 248 | LF | 30" RC PIPE CULVERTS, CLASS IV |
| 0448600000-E | SP | 884 | LF | 36" RC PIPE CULVERTS, CLASS IV |
| 0995000000-E | 340 | 829 | LF | PIPE REMOVAL |
| 1000000000-E | 462 | 1,567 | SY | 6" SLOPE PROTECTION |
| 1077000000-E | SP | 20 | TON | #57 STONE |
| 1110000000-E | 510 | 4,000 | TON | STABILIZER AGGREGATE |
| 1121000000-E | 520 | 27,400 | TON | AGGREGATE BASE COURSE |
| 1220000000-E | 545 | 1,000 | TON | INCIDENTAL STONE BASE |
| 1275000000-E | 600 | 19,250 | GAL | PRIME COAT |
| 1297000000-E | 607 | 3,850 | SY | MILLING ASPHALT PAVEMENT, ***" DEPTH (1-1/2") |
| 1297000000-E | 607 | 6,050 | SY | MILLING ASPHALT PAVEMENT, ***" DEPTH (2-1/2") |
| 1297000000-E | 607 | 2,310 | SY | MILLING ASPHALT PAVEMENT, ***" DEPTH (4") |
| 1308000000-E | 607 | 1,430 | SY | MILLING ASPHALT PAVEMENT, ***" TO ******" DEPTH (0" TO 3") |
| 1489000000-E | 610 | 1,070 | TON | ASPHALT CONC BASE COURSE, TYPE B25.0B |
| 1491000000-E | 610 | 860 | TON | ASPHALT CONC BASE COURSE, TYPE B25.0C |
| 1498000000-E | 610 | 7,440 | TON | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B |
| 1503000000-E | 610 | 430 | TON | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C |
| 1519000000-E | 610 | 11,270 | TON | ASPHALT CONC SURFACE COURSE, TYPE S9.5B |
| 1523000000-E | 610 | 2,970 | TON | ASPHALT CONC SURFACE COURSE, TYPE S9.5C |
| 1560000000-E | 620 | 1,130 | TON | ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22 |
| 1565000000-E | 620 | 180 | TON | ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22 |
| 1693000000-E | 654 | 500 | TON | ASPHALT PLANT MIX, PAVEMENT REPAIR |
| 2000000000-N | 806 | 73 | EA | RIGHT OF WAY MARKERS |
| 2022000000-E | SP | 1,160 | CY | SUBDRAIN EXCAVATION |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 2033000000-E | SP | 580 | CY | SUBDRAIN FINE AGGREGATE |
| 2044000000-E | SP | 3,450 | LF | 6" PERFORATED SUBDRAIN PIPE |
| 2070000000-N | SP | 7 | EA | SUBDRAIN PIPE OUTLETS |
| 2077000000-E | SP | 42 | LF | 6" OUTLET PIPE (SUBDRAINS) |
| 2209000000-E | 838 | 10.2 | CY | ENDWALLS |
| 2220000000-E | 838 | 6.3 | CY | REINFORCED ENDWALLS |
| 2253000000-E | 840 | 3.431 | CY | PIPE COLLARS |
| 2264000000-E | 840 | 0.116 | CY | PIPE PLUGS |
| 2286000000-N | 840 | 84 | EA | MASONRY DRAINAGE STRUCTURES |
| 2297000000-E | 840 | 4.92 | CY | MASONRY DRAINAGE STRUCTURES |
| 2308000000-E | 840 | 16.51 | LF | MASONRY DRAINAGE STRUCTURES |
| 2364000000-N | 840 | 13 | EA | FRAME WITH TWO GRATES, STD 840.16 |
| 2364200000-N | 840 | 8 | EA | FRAME WITH TWO GRATES, STD 840.20 |
| 2366000000-N | 840 | 3 | EA | FRAME WITH TWO GRATES, STD 840.24 |
| 2367000000-N | 840 | 1 | EA | FRAME WITH TWO GRATES, STD 840.29 |
| 2374000000-N | 840 | 11 | EA | FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E) |
| 2374000000-N | 840 | 23 | EA | FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F) |
| 2374000000-N | 840 | 16 | EA | FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G) |
| 2396000000-N | 840 | 6 | EA | FRAME WITH COVER, STD 840.54 |
| 2440000000-N | 852 | 8 | EA | CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN |
| 2451000000-N | 852 | 8 | EA | CONCRETE TRANSITIONAL SECTION FOR DROP INLETS |
| 2542000000-E | 846 | 6,540 | LF | 1'-6" CONCRETE CURB & GUTTER |
| 2549000000-E | 846 | 7,820 | LF | 2'-6" CONCRETE CURB & GUTTER |
| 2556000000-E | 846 | 1,222 | LF | SHOULDER BERM GUTTER |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 2577000000-E | 846 | 290 | LF | CONCRETE EXPRESSWAY GUTTER |
| 2591000000-E | 848 | 1,480 | SY | 4" CONCRETE SIDEWALK |
| 2605000000-N | 848 | 10 | EA | CONCRETE WHEELCHAIR RAMPS |
| 2612000000-E | 848 | 220 | SY | 6" CONCRETE DRIVEWAY |
| 2655000000-E | 852 | 1,630 | SY | 5" MONOLITHIC CONCRETE ISLANDS (KEYED IN) |
| 2724000000-E | 857 | 224 | LF | PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED |
| 2800000000-N | 858 | 1 | EA | ADJUSTMENT OF CATCH BASINS |
| 2815000000-N | 858 | 1 | EA | ADJUSTMENT OF DROP INLETS |
| 2830000000-N | 858 | 1 | EA | ADJUSTMENT OF MANHOLES |
| 2845000000-N | 858 | 1 | EA | ADJUSTMENT OF METER BOXES OR VALVE BOXES |
| 2938000000-N | SP | 1 | EA | CONVERT EXISTING DROP INLET TO JUNCTION BOX WITH MANHOLE COVER |
| 3000000000-N | SP | 3 | EA | IMPACT ATTENUATOR UNIT, TYPE 350 |
| 3030000000-E | 862 | 2,250 | LF | STEEL BM GUARDRAIL |
| 3045000000-E | 862 | 100 | LF | STEEL BM GUARDRAIL, SHOP CURVED |
| 3150000000-N | 862 | 10 | EA | ADDITIONAL GUARDRAIL POSTS |
| 3210000000-N | 862 | 3 | EA | GUARDRAIL ANCHOR UNITS, TYPE CAT-1 |
| 3270000000-N | SP | 3 | EA | GUARDRAIL ANCHOR UNITS, TYPE 350 |
| 3285000000-N | SP | 2 | EA | GUARDRAIL ANCHOR UNITS, TYPE M-350 |
| 3317000000-N | 862 | 12 | EA | GUARDRAIL ANCHOR UNITS, TYPE B-77 |
| 3345000000-E | 864 | 1,312.5 | LF | REMOVE & RESET EXISTING GUARD-RAIL |
| 3347000000-E | 864 | 650 | LF | REMOVE & RESET EXISTING GUIDE-RAIL |
| 3375000000-E | SP | 656.37 | LF | REMOVE & STOCKPILE EXISTING GUARDRAIL |
| 3389600000-N | 865 | 4 | EA | CABLE GUIDERAIL ANCHOR UNITS |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 3420000000-E | SP | 540 | LF | GENERIC GUARDRAIL ITEM REMOVE EXISTING CABLE GUIDERAIL |
| 3503000000-E | 866 | 3,400 | LF | WOVEN WIRE FENCE, 47" FABRIC |
| 3509000000-E | 866 | 230 | EA | 4" TIMBER FENCE POSTS, 7'-6" LONG |
| 3515000000-E | 866 | 40 | EA | 5" TIMBER FENCE POSTS, 8'-0" LONG |
| 3536000000-E | 866 | 2,404 | LF | CHAIN LINK FENCE, 48" FABRIC |
| 3542000000-E | 866 | 200 | EA | METAL LINE POSTS FOR 48" CHAIN LINK FENCE |
| 3548000000-E | 866 | 14 | EA | METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE |
| 3628000000-E | 876 | 135 | TON | RIP RAP, CLASS I |
| 3649000000-E | 876 | 860 | TON | RIP RAP, CLASS B |
| 3656000000-E | 876 | 4,250 | SY | FILTER FABRIC FOR DRAINAGE |
| 3659000000-N | SP | 8 | EA | PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON |
| 4048000000-E | 902 | 12 | CY | REINFORCED CONCRETE SIGN FOUN-DATIONS |
| 4057000000-E | SP | 60 | CY | OVERHEAD FOOTING |
| 4060000000-E | 903 | 6,754 | LB | SUPPORTS, BREAKAWAY STEEL BEAM |
| 4066000000-E | 903 | 2,547 | LB | SUPPORTS, SIMPLE STEEL BEAM |
| 4072000000-E | 903 | 1,017 | LF | SUPPORTS, 3-LB STEEL U-CHANNEL |
| 4078000000-E | 903 | 2 | EA | SUPPORTS, 2-LB STEEL U-CHANNEL |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (32+20.48 -Y2-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (47+50 -Y2-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (50+00 -Y2-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUC-TURE AT STA ****** (77+00 -Y2-) |
| 4102000000-N | 904 | 51 | EA | SIGN ERECTION, TYPE E |
| 4108000000-N | 904 | 8 | EA | SIGN ERECTION, TYPE F |
| 4109000000-N | 904 | 2 | EA | SIGN ERECTION, TYPE *** (OVER-HEAD) (A) |
| 4109000000-N | 904 | 2 | EA | SIGN ERECTION, TYPE *** (OVER-HEAD) (B) |
| 4110000000-N | 904 | 11 | EA | SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A) |
| 4110000000-N | 904 | 3 | EA | SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B) |
| 4114000000-N | 904 | 2 | EA | SIGN ERECTION, MILEMARKERS |
| 4116100000-N | 904 | 1 | EA | SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (A) |
| 4116100000-N | 904 | 1 | EA | SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E) |
| 4138000000-N | 907 | 2 | EA | DISPOSAL OF SUPPORT, STEEL BEAM |
| 4152000000-N | 907 | 1 | EA | DISPOSAL OF SIGN SYSTEM, STEEL BEAM |
| 4155000000-N | 907 | 8 | EA | DISPOSAL OF SIGN SYSTEM, U-CHANNEL |
| 4400000000-E | 1110 | 504 | SF | WORK ZONE SIGNS (STATIONARY) |
| 4405000000-E | 1110 | 706 | SF | WORK ZONE SIGNS (PORTABLE) |
| 4410000000-E | 1110 | 566 | SF | WORK ZONE SIGNS (BARRICADE MOUNTED) |
| 4415000000-N | 1115 | 4 | EA | FLASHING ARROW PANELS, TYPE C |
| 4420000000-N | 1120 | 5 | EA | CHANGEABLE MESSAGE SIGN |
| 4430000000-N | 1130 | 588 | EA | DRUMS |
| 4445000000-E | 1145 | 426 | LF | BARRICADES (TYPE III) |
| 4450000000-N | 1150 | 1,920 | HR | FLAGGER |
| 4465000000-N | 1160 | 3 | EA | TEMPORARY CRASH CUSHIONS |
| 4480000000-N | 1165 | 4 | EA | TMIA |
| 4485000000-E | 1170 | 3,052 | LF | PORTABLE CONCRETE BARRIER |

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

# STATE OF NORTH CAROLINA
# SUMMARY OF QUANTITIES

| PROJECT REFERENCE No. | SHEET No. |
|---|---|
| U-4007A | 3 (2 of 2) |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 4495000000-E | 1170 | 2,100 | LF | PORTABLE CONCRETE BARRIER (DRAINAGE) |
| 4510000000-N | SP | 480 | HR | LAW ENFORCEMENT |
| 4650000000-N | 1251 | 192 | EA | TEMPORARY RAISED PAVEMENT MARKERS |
| 4685000000-E | 1205 | 30,975 | LF | THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS) |
| 4686000000-E | 1205 | 15,998 | LF | THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS) |
| 4695000000-E | 1205 | 3,914 | LF | THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS) |
| 4697000000-E | 1205 | 191 | LF | THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS) |
| 4710000000-E | 1205 | 765 | LF | THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS) |
| 4721000000-E | 1205 | 32 | EA | THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS) |
| 4725000000-E | 1205 | 104 | EA | THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS) |
| 4770000000-E | 1205 | 8,221 | LF | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV) |
| 4775000000-E | 1205 | 1,156 | LF | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (6") (IV) |
| 4780000000-E | 1205 | 346 | LF | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (8") (IV) |
| 4800000000-N | 1205 | 2 | EA | COLD APPLIED PLASTIC PAVEMENT MARKING CHARACTER, TYPE ** (IV) |
| 4805000000-N | 1205 | 4 | EA | COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV) |
| 4810000000-E | 1205 | 99,211 | LF | PAINT PAVEMENT MARKING LINES (4") |
| 4820000000-E | 1205 | 1,410 | LF | PAINT PAVEMENT MARKING LINES (8") |
| 4825000000-E | 1205 | 6,797 | LF | PAINT PAVEMENT MARKING LINES (12") |
| 4835000000-E | 1205 | 1,591 | LF | PAINT PAVEMENT MARKING LINES (24") |
| 4840000000-N | 1205 | 18 | EA | PAINT PAVEMENT MARKING CHARACTER |
| 4845000000-N | 1205 | 212 | EA | PAINT PAVEMENT MARKING SYMBOL |
| 4847000000-E | 1205 | 1,001 | LF | POLYUREA PAVEMENT MARKING LINES (4", **********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4847110000-E | 1205 | 346 | LF | POLYUREA PAVEMENT MARKING LINES (8", **********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4850000000-E | 1205 | 3,990 | LF | REMOVAL OF PAVEMENT MARKING LINES (4") |
| 4860000000-E | 1205 | 55 | LF | REMOVAL OF PAVEMENT MARKING LINES (8") |
| 4880000000-E | 1205 | 1,681 | LF | CURING COMPOUND REMOVAL, LINES |
| 4900000000-N | 1251 | 17 | EA | PERMANENT RAISED PAVEMENT MARKERS |
| 4905000000-N | 1253 | 822 | EA | SNOWPLOWABLE PAVEMENT MARKERS |
| 5255000000-N | 1413 | Lump Sum | | PORTABLE LIGHTING |
| 5325600000-E | 1510 | 162 | LF | 6" WATER LINE |
| 5325800000-E | 1510 | 123 | LF | 8" WATER LINE |
| 5326200000-E | 1510 | 861 | LF | 12" WATER LINE |
| 5326600000-E | 1510 | 985 | LF | 16" WATER LINE |
| 5540000000-E | 1515 | 2 | EA | 6" VALVE |
| 5558600000-E | 1515 | 2 | EA | 16" VALVE |
| 5571800000-E | 1515 | 2 | EA | 8" TAPPING VALVE |
| 5572200000-E | 1515 | 4 | EA | 12" TAPPING VALVE |
| 5606000000-E | 1515 | 1 | EA | 2" BLOW OFF |
| 5648000000-N | 1515 | 7 | EA | RELOCATE WATER METER |
| 5672000000-N | 1515 | 7 | EA | RELOCATE FIRE HYDRANT |
| 5801000000-E | 1530 | 940 | LF | ABANDON 8" UTILITY PIPE |
| 5804000000-E | 1530 | 1,683 | LF | ABANDON 12" UTILITY PIPE |
| 5815000000-N | 1530 | 2 | EA | REMOVE WATER METER |
| 6000000000-E | 1605 | 30,000 | LF | TEMPORARY SILT FENCE |
| 6006000000-E | 1610 | 1,200 | TON | STONE FOR EROSION CONTROL, CLASS A |
| 6009000000-E | 1610 | 2,000 | TON | STONE FOR EROSION CONTROL, CLASS B |
| 6012000000-E | 1610 | 2,000 | TON | SEDIMENT CONTROL STONE |
| 6015000000-E | 1615 | 47.5 | ACR | TEMPORARY MULCHING |
| 6018000000-E | 1620 | 1,250 | LB | SEED FOR TEMPORARY SEEDING |
| 6021000000-E | 1620 | 5 | TON | FERTILIZER FOR TEMPORARY SEEDING |
| 6024000000-E | 1622 | 2,500 | LF | TEMPORARY SLOPE DRAINS |
| 6027000000-N | 1622 | 40 | EA | INLET PROTECTION AT TEMPORARY SLOPE DRAINS |
| 6029000000-E | SP | 7,000 | LF | SAFETY FENCE |
| 6030000000-E | 1630 | 5,910 | CY | SILT EXCAVATION |
| 6036000000-E | 1631 | 7,050 | SY | MATTING FOR EROSION CONTROL |
| 6037000000-E | SP | 75 | SY | COIR FIBER MAT |
| 6038000000-E | SP | 160 | SY | PERMANENT SOIL REINFORCEMENT MAT |
| 6042000000-E | 1632 | 5,950 | LF | 1/4" HARDWARE CLOTH |
| 6045000000-E | SP | 10 | LF | ** TEMPORARY PIPE (48") |
| 6046000000-E | SP | 40 | LF | TEMPORARY PIPE FOR STREAM CROSSING |
| 6048000000-E | SP | 25 | SY | FLOATING TURBIDITY CURTAIN |
| 6069000000-E | 1638 | 450 | CY | STILLING BASINS |
| 6071012000-E | SP | 400 | LF | COIR FIBER WATTLE |
| 6071020000-E | SP | 225 | LB | POLYACRYLAMIDE (PAM) |
| 6071030000-E | SP | 1,000 | LF | COIR FIBER BAFFLE |
| 6084000000-E | 1660 | 47.5 | ACR | SEEDING & MULCHING |
| 6087000000-E | 1660 | 47.5 | ACR | MOWING |
| 6090000000-E | 1661 | 500 | LB | SEED FOR REPAIR SEEDING |
| 6093000000-E | 1661 | 2.25 | TON | FERTILIZER FOR REPAIR SEEDING |
| 6096000000-E | 1662 | 1,500 | LB | SEED FOR SUPPLEMENTAL SEEDING |
| 6108000000-E | 1665 | 45 | TON | FERTILIZER TOPDRESSING |
| 6111000000-E | SP | 400 | LF | IMPERVIOUS DIKE |
| 6114500000-N | SP | 25 | MHR | SPECIALIZED HAND MOWING |
| 6117000000-N | SP | 75 | EA | RESPONSE FOR EROSION CONTROL |
| 6120000000-E | SP | 210 | CY | CULVERT DIVERSION CHANNEL |
| 6123000000-E | 1670 | 5 | ACR | REFORESTATION |
| 6126000000-E | SP | 0.6 | ACR | STREAMBANK REFORESTATION |
| 6135000000-E | SP | 20 | ACR | GENERIC EROSION CONTROL ITEM COMPOST BLANKET |
| 7000000000-E | 1705 | 2 | EA | PEDESTRIAN SIGNAL HEAD (**", ** SECTION) (16",1 SECTION WITH COUNTDOWN) |
| 7060000000-E | 1705 | 7,190 | LF | SIGNAL CABLE |
| 7120000000-E | 1705 | 32 | EA | VEHICLE SIGNAL HEAD (12", 3 SECTION) |
| 7132000000-E | 1705 | 9 | EA | VEHICLE SIGNAL HEAD (12", 4 SECTION) |
| 7144000000-E | 1705 | 9 | EA | VEHICLE SIGNAL HEAD (12", 5 SECTION) |
| 7252000000-E | 1710 | 120 | LF | MESSENGER CABLE (1/4") |
| 7279000000-E | 1715 | 5,501 | LF | TRACER WIRE |
| 7300000000-E | 1715 | 6,578 | LF | UNPAVED TRENCHING (**********) (1, 2") |
| 7300000000-E | 1715 | 120 | LF | UNPAVED TRENCHING (**********) (2, 2") |
| 7301000000-E | 1715 | 1,662 | LF | DIRECTIONAL DRILL (**********) (1, 2") |
| 7301000000-E | 1715 | 1,610 | LF | DIRECTIONAL DRILL (**********) (2, 2") |
| 7324000000-N | 1716 | 45 | EA | JUNCTION BOX (STANDARD SIZE) |
| 7348000000-N | 1716 | 19 | EA | JUNCTION BOX (OVER-SIZED, HEAVY DUTY) |
| 7360000000-N | 1720 | 2 | EA | WOOD POLE |
| 7372000000-N | 1721 | 2 | EA | GUY ASSEMBLY |
| 7408000000-E | 1722 | 1 | EA | 1" RISER WITH WEATHERHEAD |
| 7420000000-E | 1722 | 2 | EA | 2" RISER WITH WEATHERHEAD |
| 7444000000-E | 1725 | 5,165 | LF | INDUCTIVE LOOP SAWCUT |
| 7456000000-E | 1726 | 11,760 | LF | LEAD-IN CABLE (**********) (14-2) |
| 7481000000-N | SP | 1 | EA | SITE SURVEY |
| 7481200000-N | SP | 2 | EA | LUMINAIRE ARM FOR VIDEO SYSTEM |
| 7481240000-N | SP | 3 | EA | CAMERA WITHOUT INTERNAL LOOP EMULATOR PROCESSING UNIT |
| 7481260000-N | SP | 1 | EA | EXTERNAL LOOP EMULATOR PROCESSING UNIT |
| 7484000000-N | SP | 1 | EA | MICROWAVE VEHICLE DETECTOR |
| 7516000000-E | 1730 | 5,445 | LF | COMMUNICATIONS CABLE (**FIBER) (24) |
| 7528000000-E | 1730 | 695 | LF | DROP CABLE |
| 7540000000-N | 1731 | 5 | EA | SPLICE ENCLOSURE |
| 7552000000-N | 1731 | 5 | EA | INTERCONNECT CENTER |
| 7566000000-N | 1733 | 13 | EA | DELINEATOR MARKER |
| 7568000000-N | SP | 1 | EA | FURNISH FIBER-OPTIC RESTORATION KIT |
| 7570000000-N | SP | 1 | EA | FURNISH FIBER-OPTIC POWER METER |
| 7572000000-N | SP | 1 | EA | FURNISH OPTICAL LIGHT GENERATOR |
| 7588000000-N | SP | 9 | EA | METAL POLE WITH SINGLE MAST ARM |
| 7590000000-N | SP | 4 | EA | METAL POLE WITH DUAL MAST ARM |
| 7613000000-N | SP | 13 | EA | SOIL TEST |
| 7614100000-E | SP | 91 | CY | DRILLED PIER FOUNDATION |
| 7624000000-N | 1743 | 1 | EA | SIGNAL PEDESTAL WITH FOUNDATION |
| 7631000000-N | SP | 13 | EA | MAST ARM WITH METAL POLE DESIGN |
| 7684000000-N | 1750 | 5 | EA | SIGNAL CABINET FOUNDATION |
| 7686000000-N | SP | 1 | EA | CONDUIT ENTRANCE INTO EXISTING FOUNDATION |
| 7756000000-N | 1751 | 5 | EA | CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED) |
| 7780000000-N | 1751 | 32 | EA | DETECTOR CARD (TYPE 2070L) |
| 7901000000-N | 1753 | 5 | EA | CABINET BASE EXTENDER |
| 7980000000-N | SP | 4 | EA | GENERIC SIGNAL ITEM POWDER COAT FOR DOUBLE MAST ARM WITH METAL POLE |
| 7980000000-N | SP | 9 | EA | GENERIC SIGNAL ITEM POWDER COAT FOR SINGLE MAST ARM WITH METAL POLE |

12/06/07

COMPUTED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 3-A |

## ASPHALT PAVEMENT REMOVAL SUMMARY

| SURVEY LINE | STATION | STATION | LOCATION LT/RT/CL | SY (CADD) |
|---|---|---|---|---|
| -L- | 48+19 | 48+65 | LT. | 81.78 |
| -L- | 48+72 | 49+13 | LT. | 72.22 |
| -L- | 50+84 | 51+73 | LT. | 203.05 |
| -L- | 51+76 | 53+19 | RT. | 277.22 |
| -L- | 62+77 | 66+15 | RT. | 1417.22 |
| -L- | 64+50 | 65+39 | LT. | 161.22 |
| -L- | 66+49 | 66+92 | RT. | 17.77 |
| -L- | 66+49 | 66+92 | RT. | 17.77 |
| -L- | 53+00 | 53+77 | RT. & LT. | 196.78 |
| | | | TOTAL: | 2,426.60 |
| | | | | |
| | | | SAY: | 2,440 |

## CONCRETE PAVEMENT REMOVAL SUMMARY

| SURVEY LINE | STATION | STATION STATION | LOCATION LT/RT/CL | SY (CADD) |
|---|---|---|---|---|
| -L- | 65+39 | 65+74 | LT. | 36.67 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | TOTAL: | 36.67 |
| | | | | |
| | | | SAY: | 40 |

## SHOULDER BERM GUTTER SUMMARY

| SURVEY LINE | STATION | STATION | LENGTH (LF) |
|---|---|---|---|
| -L- | 17+50 RT. | 19+89 RT. | 239.00 |
| -L- | 2284 RT. | 24+85 RT. | 201.00 |
| -L- | 25+49 LT. | 27+05 RT. | 156.00 |
| -L- | 26+30 RT. | 27+05 RT. | 77.00 |
| -Y2- | 27+89 RT. | 33+38 RT. | 549.00 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | TOTAL: | 1,222.00 |
| | | | |
| | | SAY: | 1,222 |

## UNDERDRAIN SUMMARY

| SURVEY LINE | STATION | LOCATION | LENGTH (LF) |
|---|---|---|---|
| -L- | 58+00 to 61+25 | LEFT AND RIGHT | 650.00 |
| -L- | 62+50 to 68+30 | LEFT AND RIGHT | 1,160.00 |
| | | | |
| | | | |
| | | | |
| CONTINGENCY UNDERDRAINS (PER GEO. REPORT) | | | 1,500.00 |
| | | | |
| | | TOTAL: | 3,310.00 |
| | | | |
| | | SAY: | 3,450 |

"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

## GUARDRAIL SUMMARY

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | LENGTH | | | WARRANT POINT | | "N" DIST. FROM E.O.L. | TOTAL SHOUL. WIDTH | FLARE LENGTH | | W | | ANCHORS | | | | | | | | | IMPACT ATTENUATOR TYPE 350 | | | | SINGLE FACED GUARDRAIL | REMOVE AND RESET EXISTING GUARDRAIL | REMOVE AND STOCKPILE EXISTING GUARDRAIL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | STRAIGHT | SHOP CURVED | DOUBLE FACED | APPROACH END | TRAILING END | | | APPROACH END | TRAILING END | APPROACH END | TRAILING END | | B-77 | GRAU-350 | M-350 | AT-1 | CAT-1 | | | | EA | G | NG | | | | | |
| -L- | 16+50.64 | 20+50.64 | LT. | 400.00 | | | | 20+50.64 | 8 | II | 0.00 | 6.25 | 0.00 | 1.00 | | 1 | | | | 1 | | | | | | | | | | |
| -L- | 18+45.96 | 20+20.96 | RT. | 175.00 | | | 20+20.96 | | 8 | II | 50.00 | 0.00 | 1.00 | 0.00 | | 1 | 1 | | | | | | | | | | | | | |
| -L- | 22+66.22 | 27+41.22 | LT. | 475.00 | | | 22+73.76 | | 8 | II | 50.00 | 0.00 | 1.00 | 0.00 | | 1 | 1 | | | | | | | | | | | | | |
| -L- | 22+49.80 | 23+37.30 | RT. | 87.50 | | | | 22+57.79 | 8 | II | 0.00 | 6.25 | 0.00 | 1.00 | | 1 | | | | 1 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y2- | 27+89.18 | 34+99.29 | LT. | 712.50 | | | | | 13 | 16 | 50.00 | 6.25 | 1.00 | 1.00 | | | | | | | | | | | | | | 712.5 | | |
| -Y2- | 27+89.23 | 34+01.73 | RT. | 612.50 | | | | | 24 | 27 | 50.00 | 6.25 | 1.00 | 1.00 | | | | | | | | | | | | | | 600 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y2- | 31+46.54 | 32+10.48 | MED. LT. | 63.94 | | | | 32+20.48 | 22.54 | 22.54 | 0.00 | 0.00 | | | | 1 | | | | | | | | 1 | | | | | | |
| -Y2- | 31+46.54 | 32+10.48 | MED. RT. | 63.94 | | | 32+20.48 | | 16.34 | 16.34 | 0.00 | 0.00 | | | | 1 | | | | | | | | | | | | | | |
| -Y2- | 32+30.48 | 32+94.44 | MED. LT. | 63.96 | | | 32+20.48 | | 22.54 | 22.54 | 0.00 | 0.00 | | | | 1 | | | | | | | | | | | | | | |
| -Y2- | 32+30.48 | 32+94.44 | MED. RT. | 63.96 | | | | 32+20.48 | 16.34 | 16.34 | 0.00 | 0.00 | | | | 1 | | | | | | | | 1 | | | | | | |
| -Y2- | 47+38.29 | 48+09.29 | MED. LT. | 71.00 | | | | 47+38.29 | 19.50 | 19.50 | 0.00 | 36.00 | | 2.25 | | 1 | | | | | | | | 1 | | | | | | |
| -Y2- | 47+38.29 | 48+09.29 | MED. RT. | 71.00 | | | 47+38.29 | | 19.50 | 19.50 | 36.00 | 0.00 | 2.25 | | | 1 | | | | | | | | | | | | | | |
| -Y2- | 48+99.99 | 50+62.50 | MED. LT. | 162.51 | | | 50+62.50 | | 16.50 | 16.50 | 36.00 | 0.00 | | 3.00 | | 1 | | 1 | | | | | | | | | | | | SEE DETAIL (SHT. 2-K) |
| -Y2- | 48+99.99 | 50+31.25 | MED. RT. | 131.26 | | | | 50+31.25 | 19.50 | 19.50 | 0.00 | 0.00 | | | | 1 | | 1 | | | | | | | | | | | | SEE DETAIL (SHT. 2-K) |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y2- | 45+99.85 | 49+27.58 | LT. | | | | | | | | | | | | | | | | | | | | | | | | | 327.73 | | |
| -Y2- | 45+35.52 | 48+64.16 | RT. | | | | | | | | | | | | | | | | | | | | | | | | | 328.64 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -RAMPB- | 9+50.00 | -L- 27+93.45 | RT. | 862.50 | 87.50 | | | | 8 | II | 50.00 | 6.25 | 0.00 | 0.00 | | | 1 | | | 1 | | | | | | | | | | |
| | | | SUBTOTAL | 4,016.57 | 87.50 | | | | | | | | | | | 12 | 3 | 2 | | 3 | | | | 3 | | | | 1312.5 | 656.37 | |
| | REMOVE & RESET GUARDRAIL DEDUCTION | | | -1,312.50 | | | | | | | | | | | | | | | | | | | | | | | | | | INCLUDES ANCHOR UNITS |
| | | | SUBTOTAL | 2,704.07 | 87.50 | | | | | | | | | | | 12 | 3 | 2 | | 3 | | | | 3 | | | | 1312.5 | 656.37 | |
| | | B-77 | 12 @ 18.75' = | -225.00 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | GRAU-350 | 3 @ 50.00' = | -150.00 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | IMPACT ATTENUATOR TYPE-350 | | 3 @ 21.00' = | -63.00 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | CAT-1 | 3 @ 6.25' = | -18.75 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | M-350 | 2 @ 37.50' = | -75.00 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | TOTAL | 2,172.32 | 87.50 | | | | | | | | | | | 12 | 3 | 2 | | 3 | | | | 3 | | | | 1312.5 | 656.37 | |
| | | | SAY | 2,250.00 | 100.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 10 ADDITIONAL GUARDRAIL POSTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

## CABLE GUIDERAIL SUMMARY

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | REMOVE EXISTING GUIDERAIL | REMOVE AND RESET EXISTING GUIDERAIL | GUIDERAIL ANCHOR UNITS | REMARKS |
|---|---|---|---|---|---|---|---|
| -Y2- | 31+12.40 | 33+28.43 | MED. | 240 | | 2 | |
| -Y2- | 47+11.79 | 49+87.21 | MED. | 300 | | 2 | |
| | | | | | 650 | | PER WZTCU |
| | | | TOTAL | 540 | 650 | 4 | |

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COMPUTED BY: TEM DATE: 4-26-11
CHECKED BY: TEM DATE: 4-26-11

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 3-B |

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

# *SUMMARY OF EARTHWORK*

***IN CUBIC YARDS***

| LOCATION | UNCLASSIFIED EXCAVATION | UNDERCUT | EMBT+% | BORROW | WASTE |
|---|---|---|---|---|---|
| SUMMARY #1 | | | | | |
| –L– STA. 10+50.00 TO STA. 20+36.24 (BEGIN BRIDGE) | 1,621 | 2,574 | 69,129 | 67,508 | 2,574 |
| –Y1– STA. 11+08.82 TO STA. 18+95.01 | 566 | 1,766 | 367 | | 1,965 |
| –RAMPA– STA. 0+00.00 TO STA. 13+22.05 | 1,182 | 303 | 23,616 | 22,434 | 303 |
| –LOOPA– STA. 0+00.00 TO STA. 7+08.93 | | | 4,234 | 4,234 | |
| –Y2– STA. 27+89.18 (LT) TO STA. 50+00.00 (LT) | 2,029 | | 3,323 | 1,294 | |
| SUMMARY #1 SUBTOTALS | 5,398 | 4,643 | 100,669 | 95,470 | 4,842 |
| | | | | | |
| SUMMARY #2 | | | | | |
| –L– STA. 22+58.24 (END BRIDGE) TO STA. 32+00.00 | | | 95,921 | 95,921 | |
| –LOOPB– STA. 0+00.00 TO STA. 8+88.11 | | | 9,158 | 9,158 | |
| –RAMPB– STA. 0+00.00 TO STA. 17+50.25 | | 470 | 70,733 | 70,733 | 470 |
| –Y2– STA. 27+89.18 (RT) TO STA. 50+00.00 (RT) | 1,597 | | 12,889 | 11,292 | |
| SUMMARY #2 SUBTOTALS | 1,597 | 470 | 188,701 | 187,104 | 470 |
| | | | | | |
| SUMMARY #3 | | | | | |
| –L– STA. 32+00.00 TO STA. 61+71.00 | 3,708 | 2,920 | 50,834 | 47,259 | 3,053 |
| –Y3– STA. 10+35.50 TO STA. 11+75.57 | 44 | | 92 | 48 | |
| –Y5– STA. 10+07.48 (RT) TO STA. 16+54.88 (RT) | 281 | 149 | 50 | | 380 |
| –Y6– STA. 10+64.41 TO STA. 11+22.94 | 6 | | 330 | 324 | |
| SUMMARY #3 SUBTOTALS | 4,039 | 3,069 | 51,306 | 47,631 | 3,433 |
| | | | | | |
| SUMMARY #4 | | | | | |
| –L– STA. 61+71.00 TO STA. 68+05.50 | 1,460 | 482 | 355 | | 1,587 |
| –Y5– STA. 16+00.00 (LT) TO STA. 18+72.45 (LT) | 127 | | 7 | | 120 |
| SUMMARY #4 SUBTOTALS | 1,587 | 482 | 362 | | 1,707 |
| | | | | | |
| TOTALS | 12,620 | 8,664 | 341,038 | 330,205 | 10,451 |
| | | | | | |
| ADDITIONAL UNDERCUT | | 6,250 | | | 6,250 |
| EST. SHOULDER MATERIAL | | | 15,163 | 15,163 | |
| EARTH WASTE TO REPLACE BORROW | | | | –1,655 | –1,655 |
| PROJECT TOTALS | 12,620 | 14,914 | 356,201 | 343,713 | 15,047 |
| EST. FOR REPLACING TOPSOIL ON BORROW PITS | | | | 17,186 | |
| GRAND TOTALS | 12,620 | 14,914 | 356,201 | 360,899 | 15,047 |
| | | | | | |
| SAY | 12,800 | 15,100 | | 361,400 | |

EST. SHALLOW UNDERCUT CONTINGENCY 500 CY
CLASS IV SUBGRADE STABILIZATION 500 TONS
SELECT GRANULAR MATERIAL, CLASS III 18,250 CY

NOTES:

All Undercut is to be backfilled with Select Granular Material, Class III.

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.

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

5/9/06

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CHECKED BY: M. COPPLE DATE: 8/20/2010

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
## DIVISION OF HIGHWAYS

| PROJECT NO. | SHEET NO. |
|---|---|
| U-4007A | 3-C |

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

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

**ABBREVIATIONS**

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

| STATION / SIZE | LOCATION (LT, RT, OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | C.S. PIPE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS III 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS IV 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | ** " R.C. PIPE (CLASS V) | ***" RC PIPE CULVERTS, CONTRACTOR DESIGN | ***" RC PIPE CULVERTS, CONTRACTOR DESIGN | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0' | B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29 | 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 | MANHOLE FRAME AND COVER ST.D 840.54 | T.B.D.I STD. 840.35 | CONVERT DI TO JB W/ MH COVER | SIDE DRAIN PIPE ELBOWS 15" ELBOWS | 18" ELBOWS | 24" ELBOWS | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THICKNESS OR GAUGE | | | | | | | | | | | | | | | | | | | | .064 | .064 | .064 | .064 | .079 | .079 | .109 | .109 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y1- 18+49.17 | RT | 1A | | 24.6 | 22.35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | REMOVE DI AND ASSOCIATED PIPE |
| | | 1A | 1 | | 22.35 | 22.28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y1- 18+91.91 | RT | 1 | | 25.57 | 22.28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 1 | 4 | | 22.28 | 22.03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y1- 18+79.33 | LT | 2 | | 25.69 | 21.94 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y1- 18+79.73 | LT | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3 | 2 | | 23.7 | 22.24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y1- 18+49.17 | LT | 4 | | 25.66 | 22.03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y1- 18+49.28 | LT | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 5 | 4 | | 23.8 | 22.53 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 13 | REMOVE 13 LF OF 12" RCP |
| -Y1- 17+47.50 | RT | 6 | | 25.47 | 22.36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 6 | 7 | | 22.36 | 22.32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.447 | | REMOVE CB |
| -Y1- 17+49.32 | LT | 7 | | 25.8 | 22.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | REMOVE CB |
| | | 7 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y1- 17+49.35 | LT | 8 | | 25.3 | 22.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 8 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 16+57.95 | LT | 9 | | 25.87 | 22.47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| | | 9 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 16+58.22 | LT | 10 | | 25.11 | 22.54 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 10 | 9 | | 22.54 | 22.47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 9 | REMOVE DI AND 9 LF OF 15" RCP |
| -YI- 15+48.19 | RT | 11 | | 25.52 | 22.92 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 11 | 12 | | 22.92 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.399 | | |
| -L- 10+24.97 | LT | 12 | | 26.05 | 22.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | REMOVE CB |
| | | 12 | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -L- 10+56.42 | LT | 13 | | 25.57 | 22.84 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 13 | 12 | | 22.84 | 22.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 14 | REMOVE 14 LF OF 15" RCP |
| -L- 10+71.94 | LT | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 14 | 13 | | 23.1 | 22.84 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 14+08.18 | RT | 15A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 15A | 15 | | 23.4 | 22.45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | REMOVE DI |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 14+08.18 | RT | 15 | | 25.6 | 22.45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 15 | 16 | | 22.45 | 22.42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | REMOVE CB |
| -YI- 14+07.81 | RT | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.447 | | |
| | | 16 | 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 14+09.90 | LT | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 17 | 18 | | 23.2 | 22.49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 14 | REMOVE 14 LF OF 15" RCP |
| -YI- 14+10.55 | LT | 18 | | 25.74 | 22.49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 18 | 19 | | 22.49 | 22.11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 14+10.48 | LT | 19 | | 26.11 | 22.11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | REMOVE CB |
| | | 19 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 13+11.65 | RT | 20 | | 24.5 | 22.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | |
| | | 20 | 21 | | 22.25 | 22.21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 13+11.96 | RT | 21 | | 25.58 | 22.21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 21 | 22 | | 22.21 | 22.12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -YI- 12+79.55 | RT | 22 | | 25.59 | 22.12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 22 | 25 | | 22.12 | 21.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 47 | REMOVE 47 LF OF 15" RCP |
| -YI- 12+81.21 | | 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 23 | 24 | | 22.4 | 22.35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 10 | REMOVE 10 LF OF 15" RCP |
| -YI- 12+82.54 | | 24 | | 25.6 | 22.35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 24 | 25 | | 22.35 | 22.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y1- 12+82.38 | | 25 | | 25.95 | 21.61 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | REMOVE CB |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 264 | 104 | | | | | | | | | | | | | | 20 | | | 13 | 4 | 3 | 6 | | | 2 | 2 | | | | | | | | | | 5 | 1 | | | | | | | | 1.293 | 107 | |

| COMPUTED BY: | T. REGISTER | DATE: | 8/20/2010 |
|---|---|---|---|
| CHECKED BY: | M. COPPLE | DATE: | 8/20/2010 |

| PROJECT NO. | SHEET NO. |
|---|---|
| U-4007A | 3-D |

KBISBY

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
## DIVISION OF HIGHWAYS

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

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

| STATION / SIZE / THICKNESS OR GAUGE | LOCATION (LT, RT, OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RPA 12+28.00 | RT | 26 | | 37.7 | 35.0 | | | | | | | | | | | | | | |
| | | 26 | 27 | | 35.0 | 22.3 | | | | | | | | | | | | | |
| L 17+50.00 | RT | 28 | | 46.3 | 43.1 | | | | | | | | | | | | | | |
| | | 28 | 30 | | 43.1 | 42.4 | | | | | | | | | | | | | |
| L 18+00.00 | RT | 29 | | 49.0 | 45.8 | | | | | | | | | | | | | | |
| | | 29 | 28 | | 45.8 | 43.1 | | | | | | | | | | | | | |
| L 17+50.00 | RT | 30 | | 45.2 | 42.4 | | | | | | | | | | | | | | |
| | | 30 | 31 | | 42.4 | 28.0 | | | 72 | | | | | | | X | | | |
| L 19+00.00 | RT | 32 | | 53.4 | 50.6 | | | | | | | | | | | | | | |
| | | 32 | 30 | | 50.6 | 42.4 | | | | | | | | | | | | | |
| L 20+43.41 | CL | 33 | | | 29.0 | 27.0 | | | | | | | | | | | | | |
| LPA 2+99.33 | RT | 34 | | 28.5 | 25.5 | | | | | | | | | | | | | | |
| | | 34 | 35 | | 25.5 | 25.3 | | | | | | | | | | | | | |
| LPA 3+50.00 | RT | 35 | | 29.0 | 25.3 | | | | | | | | | | | | | | |
| | | 35 | 36 | | 25.3 | 24.0 | | | 40 | | | | | | | | | | |
| Y2 31+33.44 | LT | 37 | 38 | | 33.2 | 33.0 | | | | | | | | | | | | | |
| Y2 31+33.66 | LT | 38 | | 36.3 | 33.0 | | | | | | | | | | | | | | |
| Y2 31+33.66 | LT | 38 | OUT | | 33.0 | 24.0 | | | | 44 | | | | | | X | | | |
| Y2 33+30.15 | LT | 39 | 40 | | 28.3 | 28.1 | | | 12 | | | | | | | | | | |
| Y2 33+29.51 | LT | 40 | | 30.5 | 27.7 | | | | | | | | | | | | | | |
| | LT | 40 | OUT | | 27.7 | 24.0 | | | 36 | | | | | | | X | | | |
| Y2 36+79.08 | LT | 41 | OUT | | 23.4 | 23.0 | | | | | | | | | | | | | |
| L 24+35.51 | RT | 42 | | 55.3 | 52.5 | | | | | | | | | | | | | | |
| | | 42 | 44 | | 52.5 | 50.5 | | | | | | | | | | | | | |
| L 24+82.83 | LT | 43 | | 54.6 | 51.6 | | | | | | | | | | | | | | |
| | | 43 | 44 | | 51.6 | 50.5 | | | | | | | | | | | | | |
| L 24+83.15 | RT | 44 | | 53.3 | 50.5 | | | | | | | | | | | | | | |
| | | 44 | 45 | | 50.5 | 29.0 | | | 120 | | | | | | | X | | | |
| RPB 14+40.19 | LT | 46 | | 45.9 | 43.2 | | | | | | | | | | | | | | |
| | | 46 | 47 | | 43.2 | 39.6 | | | | | | | | | | | | | |
| LPB 5+76.52 | LT | 47 | | 42.6 | 39.6 | | | | | | | | | | | | | | |
| | | 47 | 48 | | 39.6 | 29.0 | | | 76 | | | | | | | X | | | |
| LPB 2+11.15 | LT | 49 | | 30.9 | 27.7 | | | | | | | | | | | | | | |
| | | 49 | 51 | | 27.7 | 27.5 | | | 32 | | | | | | | | | | |
| LPB 2+00.64 | LT | 50 | | 30.9 | 27.9 | | | | | | | | | | | | | | |
| | | 50 | 49 | | 27.9 | 27.7 | | | | | | | | | | | | | |
| Y2 47+75.00 | RT | 51A | | | 24.3 | 22.3 | | | | | | | | | | | | | |
| RPA 6+48.58 | CL | 52 | | | 25.0 | 24.5 | | | | | | | | | | | | | |
| RPA 13+06.40 | CL | 53 | | | 30.4 | 29.0 | | | | | | | | | | | | | |
| L 27+00.01 | RT | 54 | | 44.0 | 41.2 | | | | | | | | | | | | | | |
| | | 54 | 55 | | 41.2 | 40.9 | | | | | | | | | | | | | |
| L 26+99.99 | LT | 55 | | 44.1 | 40.9 | | | | | | | | | | | | | | |
| | | 55 | 56 | | 40.9 | 31.1 | | | 44 | | | | | | | X | | | |
| **SHEET TOTALS** | | | | | | | | | 432 | 44 | | | | | | | | | |

| STRUCTURE NO. | C.S. PIPE 12" .064 | 15" .064 | 18" .064 | 24" .064 | 30" .079 | 36" .079 | 42" .109 | 48" .109 | R.C. PIPE CLASS III 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS IV 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26–27 | | | | | | | | | | | | | | | | | | 88 | | | | | | |
| 28–30 | | | | | | | | | | | | | | | | | | 40 | | | | | | |
| 29–28 | | | | | | | | | | | | | | | | | | 48 | | | | | | |
| 32–30 | | | | | | | | | | | | | | | | | | 148 | | | | | | |
| 33 | | | | | | | | | | | | | | | | | | | 232 | | | | | |
| 34–35 | | | | | | | | | | | | | | | | | | 48 | | | | | | |
| 37–38 | | | | | | | | | | | | | | | | | | | 12 | | | | | |
| 41–OUT | | | | | | | | | | | | | | | | | | 16 | | | | | | |
| 42–44 | | | | | | | | | | | | | | | | | | 48 | | | | | | |
| 43–44 | | | | | | | | | | | | | | | | | | 64 | | | | | | |
| 46–47 | | | | | | | | | | | | | | | | | | 40 | | | | | | |
| 50–49 | | | | | | | | | | | | | | | | | | 12 | | | | | | |
| 51A | | | | | | | | | | | | | | | | | | | | 24 | | | | |
| 52 | | | | | | | | | | | | | | | | | | | | 136 | | | | |
| 53 | | | | | | | | | | | | | | | | | | | | | | 204 | | |
| 54–55 | | | | | | | | | | | | | | | | | | 84 | | | | | | |
| **SHEET TOTALS** | | | | | | | | | | | | | | | | | | 636 | 244 | 160 | | 204 | | |

| STRUCTURE NO. | ** " R.C. PIPE (CLASS V) | ***" RC PIPE CULVERTS, CONTRACTOR DESIGN | ***" RC PIPE CULVERTS, CONTRACTOR DESIGN | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0' | B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | | | | | | | | 1 | | | | | | | | |
| 28 | | | | | | | | 1 | | | | | | | 1 | |
| 29 | | | | | | | | 1 | | | | | | | 1 | |
| 30 | | | | | | | | 1 | | | | | | | | |
| 32 | | | | | | | | 1 | | | | | | | | |
| 34 | | | | | | | | 1 | | | 1 | 1 | | | | |
| 35 | | | | | | | | 1 | | | 1 | | | 1 | | |
| 38 | | | | | | | | 1 | | | | | | | | |
| 42 | | | | | | | | 1 | | | | | | | | |
| 43 | | | | | | | | 1 | | | | | | | 1 | |
| 44 | | | | | | | | 1 | | | | | | | | |
| 46 | | | | | | | | 1 | | | | | | | 1 | |
| 47 | | | | | | | | 1 | | | 1 | | 1 | | | |
| 49 | | | | | | | | 1 | | | 1 | 1 | | | | |
| 50 | | | | | | | | 1 | | | 1 | 1 | | | | |
| 54 | | | | | | | | 1 | | | | | | | | |
| 55 | | | | | | | | 1 | | | | | | | | |
| **SHEET TOTALS** | | | | | | | | 17 | | | 5 | 3 | 1 | 1 | 4 | |

| STRUCTURE NO. | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29 | 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 | MANHOLE FRAME AND COVER ST.D 840.54 | T.B.D.I STD. 840.35 | CONVERT DI TO JB W/ MH COVER | SIDE DRAIN PIPE ELBOWS 15" ELBOWS | 18" ELBOWS | 24" ELBOWS | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | | | | | | 1 | | | | | | | 1 | | | | | | | | |
| 28 | 1 | 1 | | | | | | | | | | | | | | | | | | | |
| 29 | 1 | 1 | | | | | | | | | | | | | | | | | | | |
| 30 | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 30–31 | | | | | | | | | | | | | | | 2 | | | | | | |
| 32 | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 37–38 | | | | | | | | | | | | | | | | | | | 0.447 | | REMOVE DI |
| 38 | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 38–OUT | | | | | | | | | | | | | | | | 2 | | | | 50 | REMOVE 50 LF OF 18" RCP |
| 39–40 | | | | | | | | | | | | | | | | | | | 0.399 | | REMOVE DI |
| 40–OUT | | | | | | | | | | | | | | | 2 | | | | | 50 | REMOVE 50 LF OF 15" RCP |
| 41–OUT | | | | | | | | | | | | | | | | | | | 0.399 | | |
| 42 | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 43 | 1 | 1 | | | | | | | | | | | | | | | | | | | |
| 44 | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 44–45 | | | | | | | | | | | | | | | 2 | | | | | | |
| 46 | 1 | 1 | | | | | | | | | | | | | | | | | | | |
| 47–48 | | | | | | | | | | | | | | | 2 | | | | | | |
| 54 | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 55 | | | | 1 | | 1 | | | | | | | | | | | | | | | |
| 55–56 | | | | | | | | | | | | | | | 2 | | | | | | |
| **SHEET TOTALS** | 4 | 4 | | 7 | | 8 | | | | | | | 1 | | 10 | 2 | | | 1.245 | 100 | |

**ABBREVIATIONS**

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

COMPUTED BY: T. REGISTER DATE: 8/20/2010

CHECKED BY: M. COPPLE DATE: 8/20/2010

KBISBY

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
## DIVISION OF HIGHWAYS

| PROJECT NO. | SHEET NO. |
|---|---|
| U-4007A | 3-E |

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

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

| STATION / SIZE / THICKNESS OR GAUGE | LOCATION (LT, RT, OR CL)' | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 35+00.33 | RT | 60 | 58 | | 28.8 | 26.3 | | | | | | | | | | | | | |
| L 36+25.00 | LT | 61 | | 41.0 | 38.0 | | | | | | | | | | | | | | |
| | | 61 | 62 | | 38.0 | 33.0 | | | | | | | | | | | | | |
| L 38+35.29 | CL | 63 | | | 29.7 | 29.2 | | | | | | | | | | | | | |
| L 40+50.00 | LT | 64 | | 39.3 | 36.3 | | | | | | | | | | | | | | |
| | | 64 | 65 | | 36.3 | 36.1 | | | | | | | | | | | | | |
| L 41+00.00 | LT | 65 | | 39.1 | 36.1 | | | | | | | | | | | | | | |
| | | 65 | 66 | | 36.1 | 34.0 | | | | | | | | | | | | | |
| L 44+47.14 | LT | 67 | | 38.2 | 35.2 | | | | | | | | | | | | | | |
| | | 67 | 68 | | 35.2 | 34.6 | | | | | | | | | | | | | |
| L 45+34.99 | LT | 68 | | 37.6 | 34.6 | | | | | | | | | | | | | | |
| | | 68 | 69 | | 34.6 | 33.6 | | | | | | | | | | | | | |
| L 45+34.95 | RT | 69 | | 36.4 | 33.6 | | | | | | | | | | | | | | |
| | | 69 | 70 | | 33.6 | 33.0 | | | 64 | | | | | | | | | | |
| L 49+15.57 | RT | 71 | 75 | | 32.77 | 32.39 | | | | | | | | | | | | | |
| L 49+97.65 | LT | 72A | 72 | | 32.60 | 30.85 | | | | 20 | | | | | | | | | |
| L 50+00.00 | LT | 72 | | 34.10 | 30.85 | | | | | | | | | | | | | | |
| | | 72 | 77 | | 30.85 | 30.46 | | | | | | | | | | | | | |
| L 50+00.00 | RT | 73 | | 35.60 | 32.60 | | | | | | | | | | | | | | |
| | | 73 | 74 | | 32.60 | 32.50 | | | | | | | | | | | | | |
| L 50+24.73 | RT | 74 | | 35.63 | 32.50 | | | | | | | | | | | | | | |
| | | 74 | 75 | | 32.50 | 32.39 | | | | | | | | | | | | | |
| L 50+24.55 | RT | 75 | | 36.30 | 32.39 | | | | | | | | | | | | | | |
| | | 75 | 76 | | 32.39 | 32.34 | | | | 16 | | | | | | | | | |
| L 50+41.30 | LT | 77 | | 33.71 | 30.21 | | | | | | | | | | | | | | |
| | | 77 | 80 | | 30.21 | 29.87 | | | | | | | | | | | | | |
| L 51+35.00 | RT | 78 | | | | | | | | | | | | | | | | | |
| L 51+35.44 | LT | 79 | | 34.50 | 30.83 | | | | | | | | | | | | | | |
| L 51+47.02 | LT | 80 | | 34.12 | 29.87 | | | | | | | | | | | | | | |
| | | 80 | 81 | | 29.87 | 29.70 | | | | | | | | | | | | | |
| L 51+76.48 | RT | 81 | | 36.24 | 29.70 | | | | | | | | | | | | | | |
| | | 81 | 83 | | 29.70 | 29.45 | | | | | | | | | | | | | |
| L 52+11.20 | RT | 82 | 83 | | 31.8 | 29.5 | | | | | | | | | | | | | |
| L 53+38.71 | RT | 84 | | | 29.4 | 29.3 | | | | | | | | | | | | | |
| L 53+92.64 | LT | 85 | 87 | | 31.8 | 31.4 | | | | | | | | | | | | | |
| L 54+31.92 | LT | 86 | | | | | | | | | | | | | | | | | |
| | | 86 | 87 | | 31.20 | 30.65 | | | | | | | | | | | | | |
| L 54+33.54 | LT | 87 | | 35.52 | 30.65 | | | | | | | | | | | | | | |
| | | 87 | 88 | | 30.65 | 30.50 | | | | | | | | | | | | | |
| L 54+15.22 | RT | 88 | | 37.45 | 30.50 | | | | | | | | | | | | | | |
| | | 88 | 89 | | 30.50 | 30.30 | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | 64 | 36 | | | | | | | | | |

| STATION | FROM | TO | C.S. PIPE 12" .064 | 15" .064 | 18" .064 | 24" .064 | 30" .079 | 36" .079 | 42" .109 | 48" .109 | R.C. PIPE CLASS III 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS IV 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 35+00.33 | 60 | 58 | | | | | | | | | | | | | | | | | | | | 104 | | | | |
| L 36+25.00 | 61 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 61 | 62 | | | | | | | | | | | | | | | | | | 80 | | | | | | |
| L 38+35.29 | 63 | | | | | | | | | | | | | | | | | | | | | | | 196 | | |
| L 40+50.00 | 64 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 64 | 65 | | | | | | | | | | | | | | | | | | 52 | | | | | | |
| L 41+00.00 | 65 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 65 | 66 | | | | | | | | | | | | | | | | | | 76 | | | | | | |
| L 44+47.14 | 67 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 67 | 68 | | | | | | | | | | | | | | | | | | 92 | | | | | | |
| L 45+34.99 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 68 | 69 | | | | | | | | | | | | | | | | | | 64 | | | | | | |
| L 45+34.95 | 69 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 69 | 70 | | | | | | | | | | | | | | | | | | | | | | | | |
| L 49+15.57 | 71 | 75 | | | | | | | | | | | | | | | | | | 112 | | | | | | |
| L 49+97.65 | 72A | 72 | | | | | | | | | | | | | | | | | | | | | | | | |
| L 50+00.00 | 72 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 72 | 77 | | | | | | | | | | | | | | | | | | | 40 | | | | | |
| L 50+00.00 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 73 | 74 | | | | | | | | | | | | | | | | | | 28 | | | | | | |
| L 50+24.73 | 74 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 74 | 75 | | | | | | | | | | | | | | | | | | 36 | | | | | | |
| L 50+24.55 | 75 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 75 | 76 | | | | | | | | | | | | | | | | | | | | | | | | |
| L 50+41.30 | 77 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 77 | 80 | | | | | | | | | | | | | | | | | | | | 100 | | | | |
| L 51+35.00 | 78 | | | | | | | | | | | | | | | | | | | | 40 | | | | | |
| L 51+35.44 | 79 | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 51+47.02 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 80 | 81 | | | | | | | | | | | | | | | | | | | | | 56 | | | |
| L 51+76.48 | 81 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 81 | 83 | | | | | | | | | | | | | | | | | | | | | 104 | | | |
| L 52+11.20 | 82 | 83 | | | | | | | | | | | | | | | | | | | 88 | | | | | |
| L 53+38.71 | 84 | | | | | | | | | | | | | | | | | | | | | | 88 | | | |
| L 53+92.64 | 85 | 87 | | | | | | | | | | | | | | | | | | | 84 | | | | | |
| L 54+31.92 | 86 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 86 | 87 | | | | | | | | | | | | | | | | | | | | | | 32 | | |
| L 54+33.54 | 87 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 87 | 88 | | | | | | | | | | | | | | | | | | | | | | 52 | | |
| L 54+15.22 | 88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 88 | 89 | | | | | | | | | | | | | | | | | | | | | | 56 | | |
| SHEET TOTALS | | | | | | | | | | | | | | | | | | | | 540 | 252 | 204 | 248 | 336 | | |

| STATION | FROM | TO | ** " R.C. PIPE (CLASS V) | ***" RC PIPE CULVERTS, CONTRACTOR DESIGN | ***" RC PIPE CULVERTS, CONTRACTOR DESIGN | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0' | B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 35+00.33 | 60 | 58 | | | | | | | | | | | | | | | | |
| L 36+25.00 | 61 | | | | | | | | | 1 | | | 1 | | 1 | | | 1 |
| | 61 | 62 | | | | | | | | | | | | | | | | |
| L 38+35.29 | 63 | | | | | | | 3.4 | | | | | | | | | | |
| L 40+50.00 | 64 | | | | | | | | | 1 | | | 1 | | 1 | | | 1 |
| | 64 | 65 | | | | | | | | | | | | | | | | |
| L 41+00.00 | 65 | | | | | | | | | 1 | | | 1 | | 1 | | | 1 |
| | 65 | 66 | | | | | | | | | | | | | | | | |
| L 44+47.14 | 67 | | | | | | | | | 1 | | | 1 | | 1 | | | 1 |
| | 67 | 68 | | | | | | | | | | | | | | | | |
| L 45+34.99 | 68 | | | | | | | | | 1 | | | | | | | 1 | |
| | 68 | 69 | | | | | | | | | | | | | | | | |
| L 45+34.95 | 69 | | | | | | | | | 1 | | | | | | | | |
| | 69 | 70 | | | | | | | | | | | | | | | | |
| L 49+15.57 | 71 | 75 | | | | | | | | | | | | | | | | |
| L 49+97.65 | 72A | 72 | | | | | | | | | | | | | | | | |
| L 50+00.00 | 72 | | | | | | | | | 1 | | | 1 | | | 1 | | |
| | 72 | 77 | | | | | | | | | | | | | | | | |
| L 50+00.00 | 73 | | | | | | | | | 1 | | | 1 | | | 1 | | 1 |
| | 73 | 74 | | | | | | | | | | | | | | | | |
| L 50+24.73 | 74 | | | | | | | | | 1 | | | 1 | 1 | | | | 1 |
| | 74 | 75 | | | | | | | | | | | | | | | | |
| L 50+24.55 | 75 | | | | | | | | | 1 | | | | | | | | |
| | 75 | 76 | | | | | | | | | | | | | | | | |
| L 50+41.30 | 77 | | | | | | | | | 1 | | | 1 | 1 | | | | |
| | 77 | 80 | | | | | | | | | | | | | | | | |
| L 51+35.00 | 78 | | | | | | | | | | | | | | | | | |
| L 51+35.44 | 79 | | | | | | | | | 1 | | | | | | | | |
| L 51+47.02 | 80 | | | | | | | | | 1 | | | 1 | | 1 | | | |
| | 80 | 81 | | | | | | | | | | | | | | | | |
| L 51+76.48 | 81 | | | | | | | | | 1 | 1.54 | | 1 | | 1 | | | 1 |
| | 81 | 83 | | | | | | | | | | | | | | | | |
| L 52+11.20 | 82 | 83 | | | | | | | | | | | | | | | | |
| L 53+38.71 | 84 | | | | | | | | | | | | | | | | | |
| L 53+92.64 | 85 | 87 | | | | | | | | | | | | | | | | |
| L 54+31.92 | 86 | | | | | | | 3.4 | | | | | | | | | | |
| | 86 | 87 | | | | | | | | | | | | | | | | |
| L 54+33.54 | 87 | | | | | | | | | 1 | | | 1 | | 1 | | | |
| | 87 | 88 | | | | | | | | | | | | | | | | |
| L 54+15.22 | 88 | | | | | | | | | 1 | 1.95 | | 1 | | 1 | | | 1 |
| | 88 | 89 | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | 6.8 | | 16 | 3.49 | | 12 | 2 | 8 | 2 | 1 | 8 |

| STATION | FROM | TO | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29 | 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 | MANHOLE FRAME AND COVER ST.D 840.54 | T.B.D.I STD. 840.35 | CONVERT DI TO JB W/ MH COVER | SIDE DRAIN PIPE ELBOWS 15" ELBOWS | 18" ELBOWS | 24" ELBOWS | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 35+00.33 | 60 | 58 | | | | | | | | | | | | | | | | | | | | | |
| L 36+25.00 | 61 | | | | | | | | | | | | | | | | | | | | | | |
| | 61 | 62 | | | | | | | | | | | | | | | | | | | | | |
| L 38+35.29 | 63 | | | | | | | | | | | | | | | | | | | | | | |
| L 40+50.00 | 64 | | | | | | | | | | | | | | | | | | | | | | |
| | 64 | 65 | | | | | | | | | | | | | | | | | | | | | |
| L 41+00.00 | 65 | | | | | | | | | | | | | | | | | | | | | | |
| | 65 | 66 | | | | | | | | | | | | | | | | | | | | | |
| L 44+47.14 | 67 | | | | | | | | | | | | | | | | | | | | | | |
| | 67 | 68 | | | | | | | | | | | | | | | | | | | | | |
| L 45+34.99 | 68 | | 1 | 1 | | | | | | | | | | | | | | | | | | | |
| | 68 | 69 | | | | | | | | | | | | | | | | | | | | | |
| L 45+34.95 | 69 | | | | | | | | | 1 | | | | | 1 | | | | | | | | |
| | 69 | 70 | | | | | | | | | | | | | | | | | | | | | |
| L 49+15.57 | 71 | 75 | | | | | | | | | | | | | | | | | | | | 32 | REMOVE 32 LF OF 15" RCP |
| L 49+97.65 | 72A | 72 | | | | | | | | | | | | | | | | | | | | | |
| L 50+00.00 | 72 | | | | | | | | | | | | | | | | | | | | | | |
| | 72 | 77 | | | | | | | | | | | | | | | | | | | | | |
| L 50+00.00 | 73 | | | | | | | | | | | | | | | | | | | | | | |
| | 73 | 74 | | | | | | | | | | | | | | | | | | | | | |
| L 50+24.73 | 74 | | | | | | | | | | | | | | | | | | | | | | |
| | 74 | 75 | | | | | | | | | | | | | | | | | | | | | |
| L 50+24.55 | 75 | | | | | | | | | | | 1 | | 1 | | | | | | | | | |
| | 75 | 76 | | | | | | | | | | | | | | | | | | | | | |
| L 50+41.30 | 77 | | | | | | | | | | | | | | | | | | | | | | |
| | 77 | 80 | | | | | | | | | | | | | | | | | | | | | |
| L 51+35.00 | 78 | | | | | | | | | | | | | | | | | | | | | 32 | REMOVE 32 LF OF 15" RCP |
| L 51+35.44 | 79 | | 1 | 1 | | | | | | | | | | | | | | | | | | | |
| L 51+47.02 | 80 | | | | | | | | | | | | | | | | | | | | | | |
| | 80 | 81 | | | | | | | | | | | | | | | | | | | | 65 | REMOVE 65 LF OF 30" RCP |
| L 51+76.48 | 81 | | | | | | | | | | | | | | | | | | | | | | |
| | 81 | 83 | | | | | | | | | | | | | | | | | | | | 46 | REMOVE 46 LF OF 15" RCP |
| L 52+11.20 | 82 | 83 | | | | | | | | | | | | | | | | | | | | | |
| L 53+38.71 | 84 | | | | | | | | | | | | | | | | | | | | | 41 | REMOVE 41 LF OF 15" RCP |
| L 53+92.64 | 85 | 87 | | | | | | | | | | | | | | | | | | | | | |
| L 54+31.92 | 86 | | | | | | | | | | | | | | | | | | | | | | |
| | 86 | 87 | | | | | | | | | | | | | | | | | | | | | |
| L 54+33.54 | 87 | | | | | | | | | | | | | | | | | | | | | | |
| | 87 | 88 | | | | | | | | | | | | | | | | | | | | | |
| L 54+15.22 | 88 | | | | | | | | | | | | | | | | | | | | | | |
| | 88 | 89 | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | 2 | 2 | | | | | | 1 | | 1 | | 1 | 1 | | | | | | | 216 | |

**ABBREVIATIONS**

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

COMPUTED BY: T. REGISTER DATE: 8/20/2010

CHECKED BY: M. COPPLE DATE: 8/20/2010

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
# DIVISION OF HIGHWAYS

| PROJECT NO. | SHEET NO. |
|---|---|
| U-4007A | 3-F |

RD238355

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

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

| STATION | | LOCATION (LT. RT. OR CL)[1] | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE | 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | THICKNESS OR GAUGE | | | | | | | | |
| | | | | | | | | | DO NOT USE RCP | | | | | | | | |
| | | | | | | | | | DO NOT USE CSP | | | | | | | | |
| | | | | | | | | | DO NOT USE CAAP | | | | | | | | |
| | | | | | | | | | DO NOT USE HDPE | | | | | | | | |
| L | 59+00.00 | LT | 90 | | 37.18 | 34.01 | | | | | | | | | | | |
| | | | 90 | 92 | | 34.01 | 33.57 | | | | | | | | | | |
| L | 59+00.00 | RT | 91 | | 35.88 | 32.88 | | | | | | | | | | | |
| | | | 91 | 93 | | 32.88 | 32.44 | | | | | | | | | | |
| L | 59+88.68 | LT | 92 | | 36.74 | 33.57 | | | | | | | | | | | |
| | | | 92 | 94 | | 33.57 | 33.00 | | | | | | | | | | |
| L | 59+88.69 | RT | 93 | | 35.44 | 32.44 | | | | | | | | | | | |
| | | | 93 | 95 | | 32.44 | 32.22 | | | | | | | | | | |
| L | 60+32.21 | LT | 94 | | 36.32 | 31.95 | | | | | | | | | | | |
| | | | 94 | 96 | | 31.95 | 31.00 | | | | | | | | | | |
| L | 60+32.67 | RT | 95 | | 35.54 | 32.22 | | | | | | | | | | | |
| | | | 95 | 94 | | 32.22 | 31.95 | | | | | | | | | | |
| L | 61+15.36 | RT | 96 | | 35.91 | 29.50 | | | | | | | | | | | |
| Y5 | 11+00.00 | RT | 97 | | 37.4 | 31.72 | | | | | | | | | | | |
| Y5 | 11+00.10 | RT | 98 | | 35.7 | 32.95 | | | | | | | | | | | |
| | | | 98 | 97 | | 32.95 | 32.75 | | | | | | | | | | |
| Y5 | 11+35.75 | RT | 99 | | 36.32 | 33.32 | | | | | | | | | | | |
| | | | 99 | 100 | | 33.32 | 32.86 | | | | | | | | | | |
| Y5 | 11+37.94 | RT | 100 | | 37.1 | 31.61 | | | | | | | | | | | |
| Y5 | 11+92.85 | RT | 101 | | | | | | | | | | | | | | |
| Y5 | 11+93.53 | RT | 102 | | 36.14 | 31.58 | | | | | | | | | | | |
| Y5 | 13+36.89 | RT | 103 | | 35.77 | 32.77 | | | | | | | | | | | |
| | | | 103 | 104 | | 32.77 | 32.6 | | | | | | | | | | |
| Y5 | 13+36.87 | RT | 104 | | 35.25 | 31.07 | | | | | | | | | | | |
| Y5 | 14+19.33 | RT | 105 | | 35.39 | 31 | | | | | | | | | | | |
| Y5 | 14+19.24 | RT | 106 | | 35.2 | 32.45 | | | | | | | | | | | |
| | | | 106 | 105 | | 32.45 | 32.25 | | | | | | | | | | |
| Y5 | 14+36.47 | LT | 107 | | 35.75 | 32.75 | | | | | | | | | | | |
| | | | 107 | 109 | | 32.75 | 32.53 | | | | | | | | | | |
| Y5 | 14+71.20 | RT | 108 | | 35.25 | 30.96 | | | | | | | | | | | |
| Y5 | 14+80.11 | LT | 109 | | 35.53 | 30.05 | | | | | | | | | | | |
| Y5 | 16+50.00 | LT | 110 | | 35.16 | 32.16 | | | | | | | | | | | |
| | | | 110 | 111 | | 32.16 | 31.69 | | | | | | | | | | |
| Y5 | 17+00.00 | LT | 111 | | 34.99 | 31.24 | | | | | | | | | | | |
| Y5 | 17+07.00 | LT | | | | | | | | | | | | | | | |
| L | 65+52.00 | LT | 112 | | | | | | | | | | | | | | |
| | | | 112 | 119 | | 31.09 | 30.86 | | | | | | | | | | |
| Y5 | 17+30.71 | LT | 113 | | 34.96 | 31.85 | | | | | | | | | | | |
| | | | 113 | 111 | | 31.85 | 31.69 | | | | | | | | | | |
| Y5 | 17+38.26 | LT | 114 | | 34.96 | 31.9 | | | | | | | | | | | |
| | | | 114 | 113 | | 31.9 | 31.85 | | | | | | | | | | |
| Y5 | 18+70.48 | LT | 115 | | 35.32 | 32.32 | | | | | | | | | | | |
| | | | 115 | 114 | | 32.32 | 31.9 | | | | | | | | | | |
| L | 63+08.00 | LT | 116 | | 35.78 | 30.33 | | | | | | | | | | | |
| | | | 116 | 109 | | 30.33 | 30.05 | | | | | | | | | | |
| L | 63+08.00 | LT | 117 | | 34.30 | 31.13 | | | | | | | | | | | |
| | | | 117 | 116 | | 31.13 | 31.00 | | | | | | | | | | |
| L | 62+97.07 | RT | 118 | | 36.32 | 33.32 | | | | | | | | | | | |
| | | | 118 | 110 | | 33.32 | 32.16 | | | | | | | | | | |
| L | 64+82.00 | LT | 119 | | 34.70 | 30.86 | | | | | | | | | | | |
| **SHEET TOTALS** | | | | | | | | | | | | | | | | | |

| STATION | | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE | C.S. PIPE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS III 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS IV 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | THICKNESS OR GAUGE | .064 | .064 | .064 | .064 | .079 | .079 | .109 | .109 | | | | | | | | | | | | | | | | |
| L | 59+00.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 92 | | | | | | | |
| L | 59+00.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 88 | | | | | | | |
| L | 59+88.68 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 44 | | | | | | | |
| L | 59+88.69 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 44 | | | | | | | |
| L | 60+32.21 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 72 | | | | | | | |
| L | 60+32.67 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 52 | | | | | | | |
| L | 61+15.36 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+00.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+00.10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 12 | | | | | | | |
| Y5 | 11+35.75 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 8 | | | | | | | |
| Y5 | 11+37.94 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+92.85 | | | | | | | | | | | | | | | | | | | 8 | | | | | | |
| Y5 | 11+93.53 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 13+36.89 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 8 | | | | | | | |
| Y5 | 13+36.87 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 14+19.33 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 14+19.24 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 16 | | | | | | | |
| Y5 | 14+36.47 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 48 | | | | | | | |
| Y5 | 14+71.20 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 14+80.11 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 16+50.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 52 | | | | | | | |
| Y5 | 17+00.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 17+07.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 65+52.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | 72 | | |
| Y5 | 17+30.71 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 32 | | | | | | | |
| Y5 | 17+38.26 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 8 | | | | | | | |
| Y5 | 18+70.48 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 132 | | | | | | | |
| L | 63+08.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | 96 | | |
| L | 63+08.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 24 | | | | | | | |
| L | 62+97.07 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 92 | | | | | | | |
| L | 64+82.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| **SHEET TOTALS** | | | | | | | | | | | | | | | | | | | 824 | 8 | | | | 168 | | |

| STATION | | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P. | ENDWALLS CU. YARDS C.S.P. | ** R.C. PIPE (CLASS V) | *** RC PIPE CULVERTS, CONTRACTOR DESIGN | **** RC PIPE CULVERTS, CONTRACTOR DESIGN | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | LIN. FT. 5.0' THRU 10.0' A | LIN. FT. 10.0' AND ABOVE B | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.25 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29 | 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 | MANHOLE FRAME AND COVER ST.D 840.54 | T.B.D.I STD. 840.35 | CONVERT DI TO JB W/ MH COVER | SIDE DRAIN PIPE ELBOWS 15" ELBOWS | 18" ELBOWS | 24" ELBOWS | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | 59+00.00 | | | | | | | | 1 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 59+00.00 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 59+88.68 | | | | | | | | 1 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 59+88.69 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 60+32.21 | | | | | | | | 1 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 60+32.67 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 61+15.36 | | | | | | | | 1 | 1.41 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+00.00 | | | | | | | | 1 | 0.68 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+00.10 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+35.75 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+37.94 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+92.85 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 11+93.53 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 13+36.89 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 13+36.87 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 14+19.33 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 14+19.24 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 14+36.47 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 14+71.20 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 14+80.11 | | | | | | | | 1 | 0.48 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 16+50.00 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 17+00.00 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 17+07.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.116 | | |
| L | 65+52.00 | | 3.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 52 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 17+30.71 | | | | | | | | 1 | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | 33 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 17+38.26 | | | | | | | | 1 | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y5 | 18+70.48 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 63+08.00 | | | | | | | | 1 | 0.45 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 63+08.00 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | 88 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 62+97.07 | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 64+82.00 | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **SHEET TOTALS** | | | 3.4 | | | | | | 27 | 3.02 | | | 16 | 2 | 9 | 5 | 3 | | 5 | 5 | | 2 | 1 | | | 3 | 1 | 2 | 4 | | 1 | | | 0.116 | 0.893 | 212 | |

ABBREVIATIONS

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

| COMPUTED BY: | T. REGISTER | DATE: | |
|---|---|---|---|
| CHECKED BY: | M. COPPLE | DATE: | |

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
# DIVISION OF HIGHWAYS

| PROJECT NO. | SHEET NO. |
|---|---|
| U-4007A | 3-G |

RD238355

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

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

| STATION | LOCATION (LT, RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) |
|---|---|---|---|---|---|---|---|
| SIZE / THICKNESS OR GAUGE | | | | | | | |
| | | 119 | 116 | | 30.86 | 30.33 | |
| L 65+96.03 | LT | 120 | | 35.45 | 31.2 | | |
| | | 120 | 122 | | 31.2 | 31.1 | |
| L 65+96.01 | RT | 121 | | 35.75 | 32.75 | | |
| | | 121 | 120 | | 32.75 | 31.2 | |
| L 65+96.40 | LT | 122 | | | | | |
| L 67+30.09 | LT | 123 | | 34.64 | 31.64 | | |
| | | 123 | 120 | | 31.64 | 31.2 | |
| L 67+30.04 | RT | 124 | | 34.79 | 31.79 | | |
| | | 124 | 123 | | 31.79 | 31.64 | |
| SHEET TOTALS | | | | | | | |
| GRAND TOTALS | | | | | | | |

| STATION | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | C.S. PIPE 12" .064 | 15" .064 | 18" .064 | 24" .064 | 30" .079 | 36" .079 | 42" .109 | 48" .109 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRAND TOTALS | | 496 | 80 | | | | | | | | | | | | | | | | | |

| STRUCTURE FROM–TO / STATION | R.C. PIPE CLASS III 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS IV 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 119–116 | | | | | | | | | | | | | | 176 | | |
| 120–122 | | | | | | | | | | 28 | | | | | | |
| 121–120 | | | | | | | | | | 52 | | | | | | |
| 123–120 | | | | | | | | | | 136 | | | | | | |
| 124–123 | | | | | | | | | | 48 | | | | | | |
| SHEET TOTALS | | | | | | | | | | 264 | | | | 176 | | |
| GRAND TOTALS | | | | | | | | | | 2528 | 608 | 364 | 248 | 884 | | |

| STRUCTURE / STATION | ** R.C. PIPE (CLASS V) | *** RC PIPE CULVERTS, CONTRACTOR DESIGN | *** RC PIPE CULVERTS, CONTRACTOR DESIGN | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0' | B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 120 (L 65+96.03) | | | | | | | | 1 | | | 1 | | | 1 | | |
| 121 (L 65+96.01) | | | | | | | | 1 | | | 1 | | 1 | | | |
| 123 (L 67+30.09) | | | | | | | | 1 | | | 1 | | | 1 | | |
| 124 (L 67+30.04) | | | | | | | | 1 | | | 1 | | 1 | | | |
| SHEET TOTALS | | | | | | | | 4 | | | 4 | | 2 | 2 | | |
| GRAND TOTALS | | | | | | 10.2 | | 84 | 6.51 | | 50 | 11 | 23 | 16 | 8 | 8 |

| STRUCTURE / STATION | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH TWO GRATES STD. 840.20 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29 | 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 | MANHOLE FRAME AND COVER ST.D 840.54 | T.B.D.I STD. 840.35 | CONVERT DI TO JB W/ MH COVER | SIDE DRAIN PIPE ELBOWS 15" ELBOWS | 18" ELBOWS | 24" ELBOWS | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 119–116 | | | | | | | | | | | | | | | | | | | | 194 | REMOVE 36" CMP |
| SHEET TOTALS | | | | | | | | | | | | | | | | | | | | 194 | |
| GRAND TOTALS | 13 | 13 | | 9 | 1 | 8 | | 1 | 3 | 2 | 7 | 6 | 2 | 1 | 10 | 2 | | 0.116 | 3.431 | 829 | |

**ABBREVIATIONS**

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

COMPUTED BY: T. REGISTER DATE:

CHECKED BY: M. COPPLE DATE:

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

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
# DIVISION OF HIGHWAYS

| PROJECT NO. | SHEET NO. |
|---|---|
| U-4007A | 3-H |

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

KBISBY

| STATION | LOCATION (LT, RT, OR C/L) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS IV R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE: 54" | 60" | 66" | 72" | 78" | 84" | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) SIZE: 54" THICKNESS OR GAUGE: .109 | .138 | .168 | SHOP ELON-GATED .138 | SHOP ELON-GATED .168 | 60" .138 | 60" .168 | 66" .138 | 66" .168 | 72" .139 | 72" .168 | STRUCTURAL PLATE PIPE 60" 12 | 60" 10 | 66" 12 | 66" 10 | 72" 12 | 72" 10 | REINFORCED ENDWALLS WITH R.C. - C.Y. | WITH C.S. - C.Y. | MASONRY DRAINAGE STRUCTURES CUBIC YARDS | C.B. STD. 840.01 OR 840.02 | FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN | J.B. STD. 840.31 OR 840.32 | REINF. CONC. FLARED END SECTIONS NO. & SIZE | CORR. STEEL FLARED END SECTIONS NO. & Size | CORR. STEEL ELBOWS NO. & SIZE | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L 34+43.66 | LT | 58 | | 30.1 | 22.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | 4.92 | | | | | | | 1 | | | | | | | |
| | | 58 | 57 | | 22.8 | 22.1 | | | | 292 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L 35+06.30 | LT | 59 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6.3 | | | | | | | | | | | | | | | | |
| | | 59 | 58 | | 23.1 | 22.8 | | | | 96 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET TOTALS | | | | | | | | | | 388 | | | | | | | | | | | | | | | | | | | | | 6.3 | 4.92 | | | | | | 1 | | | | | | | |

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 |

TREGISTERLP,2/19/2009,H:\PROJECTS\NCDOT\U4007A\Roadway\Doc\U4007A_rowparcels.xls

| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 3-I |

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

## *PARCEL INDEX SHEET*

| PARCEL No. | SHEET No. | PROPERTY OWNER NAME |
|---|---|---|
| 1 | 4 | BELL FORK CHURCH OF CHRIST |
| 2 | 4 | ESTELLA WILLIAMS |
| 3 | 4 | WILLIE HENRY SPICER, SR. |
| 4 | 4 | ABNER S. JAMES |
| 5 | 4 | MAYBELLE TILLMAN, et al |
| 6 | 4 | LUCEAL ARMSTRONG |
| 4 | 4 | ABNER S. JAMES |
| 7 | 4 | ROY LAIRD, et ux |
| 8 | 4 | ANTON F. FICKEY, et ux |
| 9 | 4 | TIMOTHY M. ANTAL |
| 10 | 4 | JESSE D. SPICER, et ux |
| 11 | 4 | ROBERTHA MCALLISTER HEIRS |
| 12 | 4 | FRANKLIN B. LEAVEN, et ux |
| 13 | 4 | WASHINGTON BAPTIST CHURCH |
| 14 | 4 | DOROTHY JONES HUMPHREY |
| 15 | 5 | LARRY E. RAMBERT, et ux |
| 16 | 5 | ALLEN R.GOODSON, et ux |
| 17 | 5 | WILLIE MILTON WHITE |
| 18 | 5 | ALLEN R.GOODSON, et ux |
| 19 | 5 | BERTHINA GRAY PALMER |
| 20 | 5 | ALICE L. HEARD |
| 21 | 5 | NC DEPT. OF TRANSPORTATION |
| 22 | 5 | POPKIN BROTHERS INTERPRISES |
| 901 | 5 | NCDOT (FORMERLY CHIPPER DEVELOPMENT GROUP, LLC.) |
| 23 | 6 | POPKIN BROTHERS ENTERPRISES, INC. |
| 24 | 6 | NC DEPT. OF TRANSPORTATION |
| 25 | 6 | ONSLOW MEMORIAL HOSPITAL FOUNDATION, INC. |
| 26 | 6 | FIRE TOWER PROPERTY |
| 27 | 6 | ONSLOW COUNTY |
| 28 | 7 | NEIL REALTY COMPANY, INC. |
| 28 | 7 | NEIL REALTY COMPANY, INC. |
| 29 | 7 | ONSLOW WOMEN'S CENTER, INC. |
| 30 | 8 | D. BLAIR HAROLD, ETAL |
| 920 | 8 | MID ATLANTIC BBQ, LLC |
| 31 | 8 | TIRE COUNTRY, INC. |
| 32 | 8 | DWNR, LLC |
| 921 | 8 | 308 WESTERN BLVD., LLC |

| PARCEL No. | SHEET No. | PROPERTY OWNER NAME |
|---|---|---|

8/17/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 4 |
| RW SHEET NO. | |

ROADWAY DESIGN ENGINEER

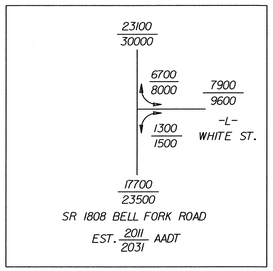
NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW B. COPE

4/26/11

HYDRAULICS ENGINEER

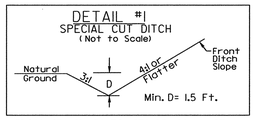
NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

5/10/11

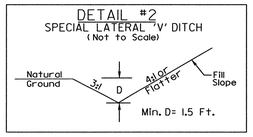



**WARP GUTTERS**
FROM 0.04 AT STA. 12+33 -Y1- LT AND RT
TO 0.12 AT STA. 12+83 -Y1- LT AND RT
TO 0.04 AT STA. 13+33 -Y1- LT AND RT
TO 0.12 AT STA. 14+10 -Y1- LT AND RT
TO 0.04 AT STA. 14+60 -Y1- LT AND RT

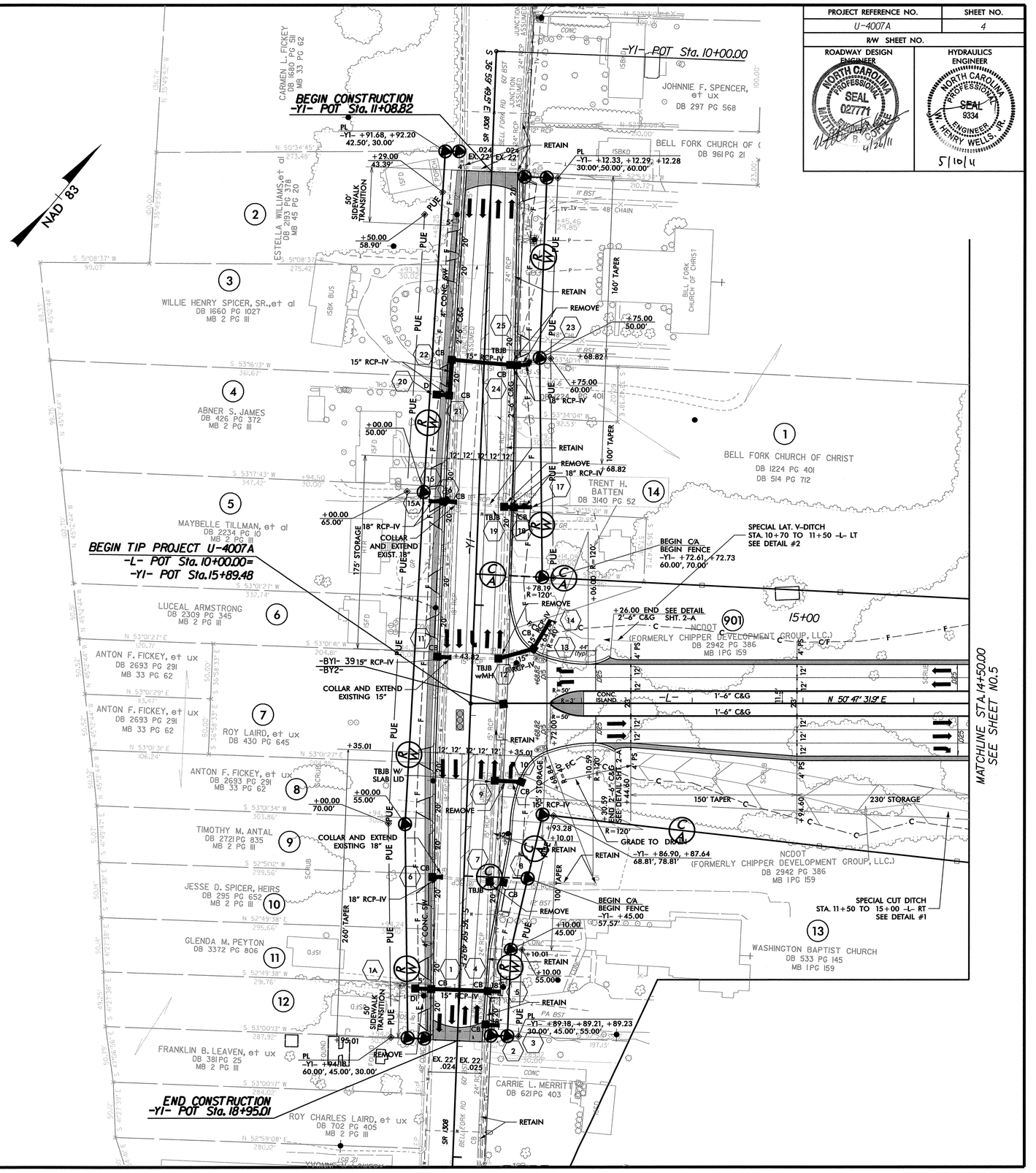
FROM 0.04 AT STA. 14+98 -Y1- RT
TO 0.12 AT STA. 15+48 -Y1- RT
TO 0.04 AT STA. 15+98 -Y1- RT




FROM STA. 11+50 TO STA. 15+00 -L- RT




FROM STA. 10+70 TO STA. 11+50 -L- LT




$$$$SYSTIME$$$$
$$$$SHEETNAME$$$$

| REVISIONS |
|---|
| |

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4907A | 5 |
| RW* SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| HEATH E. CARLTON, PE, SEAL 40779, ENGINEER | SEAL 40779, ENGINEER, HEATH E. WELLS, PE |
| DATE: 5/14/11 | DATE: 5/14/11 |

| -RAMPA- | | | |
|---|---|---|---|
| PI Sta 1+16.08 | PI Sta 3+48.01 | PI Sta 6+20.59 | PI Sta 25+64.49 |
| $\theta s$ = 2°32'33.6" | Δ = 95°22'10.8" (LT) | $\theta s$ = 7°09'43.7" | Δ = 68°31'39.8" (LT) |
| $\theta s$ = 7°09'58.5" | D = 7°09'43.7" | Ls = 200.00' | D = 2°29'41.4" |
| Ls = 200.00' | L = 334.62' | LT = 133.44' | L = 974.67' |
| LT = 116.08' | T = 180.01' | ST = 66.71' | T = 1,564.49' |
| ST = 84.36' | R = 800.00' | | R = 2,296.58' |
| | e = .06 | | SE = EXIST. SE |
| | DS = 50 MPH | | |

| -Y2- | |
|---|---|
| PI Sta 39+38.68 | |
| $\theta s$ = 3°99'15.9" | |
| Ls = 200.00' | |
| LT = 183.76' | |
| ST = 91.89' | |

| -L- | | |
|---|---|---|
| PI Sta 21+80.82 | PI Sta 54+22.37 | PI Sta 147+66 |
| Δ = 95°28'46.8" (RT) | $\theta s$ = 23°55'23.7" | Δ = 102°20'43.0" (RT) |
| D = 5°49'11.0" | Ls = 150.00' | $\theta s$ = 3°49'51.8" |
| L = 600.23' | LT = 100.92' | L = 321.53' |
| T = 432.98' | ST = 50.84' | T = 223.66' |
| R = 1,200.00' | | R = 180.00' |
| SE = .03 | | SE = .08 |
| DS = 40MPH | | DS = 25MPH |

| -LOOPA- | |
|---|---|
| PI Sta 147+66 | PI Sta 149+09.92 |
| Δ = 102°20'43.0" (RT) | $\theta s$ = 23°55'23.7" |
| $\theta s$ = 3°49'51.8" | Ls = 150.00' |
| L = 321.53' | LT = 100.92' |
| T = 223.66' | ST = 50.84' |
| R = 180.00' | |
| SE = .08 | |
| DS = 25MPH | |

BEGIN CONSTRUCTION -Y2- POC Sta.27+89.18

-RAMPA- ST Sta.0+00.00

-RAMPA- CS Sta.5+54.23

-Y2- CS Sta.37+46.78

-RAMPA- SC Sta.2+00.00

-RAMPA- ST Sta.7+54.23

-Y2- ST Sta.40+22.37

SEE SHEET 10.4
MATCHLINE STA.14+90.00

-RAMPA- POT Sta.13+82.65
= -L- POT Sta.13+84.80

-LOOPA- POT Sta.7+44.45
= -L- POT Sta.7+46.60

-L- POC Sta.17+67.80

NAD '83

BEGIN APPROACH SLAB
-L- POC Sta.20+70.00

RESURFACING ONLY

-L- POC Sta.22+82.22

-L- POT Sta.28+61.13

END BRIDGE
-L- POC Sta.22+59.24

END APPROACH SLAB
-L- POC Sta.22+82.22

-LOOPB- POT Sta.9+29.61
= -L- POT Sta.25+53.45

-RAMPB- POT Sta.17+85.75
= -L- POT Sta.25+17.45

-LOOPB- ST Sta.7+26.26

-LOOPB- CS Sta.5+76.26

-LOOPB- SC Sta.1+50.00

-LOOPB- ST Sta.0+00.00
= -Y2- POT Sta.47+03.26 (47° RT.)

-RAMPB- POT Sta.0+00.00
-Y2- POC Sta.32+20.48 (47° RT.)

-RAMPB- ST Sta.0+00.00

-RAMPB- TS Sta.4+20.00

-RAMPB- SC Sta.5+70.00

-RAMPB- CS Sta.7+89.95

-RAMPB- ST Sta.9+39.95

-RAMPB- TS Sta.10+53.36

-RAMPB- CS Sta.14+52.50

-RAMPB- SC Sta.12+53.36

-RAMPB- ST Sta.16+52.50

MATCHLINE STA.28+50.00
SEE SHEET 10.6

MATCHLINE STA.57+40.00
THIS SHEET

END RESURFACING
END CONSTRUCTION
-Y2- POT-Sta. 62+40.00
END PROJECT U-4907A

RESURFACING ONLY
600' AUX LANE

N 57°17' 58.5" W
N 57°17' 58.5" W

SEE SHEET 9 FOR -L- PROFILE
SEE SHEET 13, 14, 15 FOR -Y2- PROFILE
SEE SHEET 12 FOR -RAMP A-, -LOOP A- PROFILE
SEE SHEET 12, 13 FOR -LOOP B- PROFILE
SEE SHEET 13 FOR -RAMP B- PROFILE
SEE SHEETS S1 THRU S32 FOR STRUCTURE PLANS
SEE SHEETS C1 THRU C12 FOR CULVERT NO. 1 PLANS
SEE SHEETS C13 THRU C16 FOR CULVERT NO. 2 PLANS
SEE SHEETS C17 THRU C21 FOR CULVERT NO. 3 PLANS

GRAPHIC SCALE
50 25 0 50 100
PLANS

PREFORMED SCOUR HOLE
NOT TO SCALE

DETAIL #1
SPECIAL CUT DITCH
Not to Scale

DETAIL #3
SPECIAL LATERAL BASE DITCH
Not to Scale

DETAIL #6
TOE PROTECTION
Not to Scale

SKETCH SHOWING BRIDGE IN RELATIONSHIP TO ROADWAY

BEGIN BRIDGE
-L- POC Sta.20+74.24

END BRIDGE
-L- POC Sta.22+59.24

DETAIL #7
CHANNEL CHANGE
Not to Scale

DETAIL #8
CHANNEL CHANGE
Not to Scale

DETAIL #9
CHANNEL CHANGE
Not to Scale

-LOOPB-

| PI Sta 1+10.98 | PI Sta 5+19.98 | PI Sta 6+27.10 |
|---|---|---|
| $\theta s$ = 23°55'23.7" | Δ = 133°40'55.7" (LT) | $\theta s$ = 23°55'23.7" |
| Ls = 150.00' | D = 31°49'51.8" | Ls = 150.00' |
| LT = 100.92' | L = 405.85' | LT = 100.92' |
| ST = 50.84' | T = 441.98' | ST = 50.84' |
| | R = 180.00' | |
| | e = .06 | |
| | DS = 25MPH | |

-RAMPB-

| PI Sta 5+20.00 | PI Sta 6+90.08 | PI Sta 8+39.96 | PI Sta 11+86.82 | PI Sta 13+53.50 | PI Sta 15+19.27 |
|---|---|---|---|---|---|
| $\theta s$ = 2°05'46.8" | Δ = 6°00'04.5" (RT) | $\theta s$ = 2°05'46.8" | $\theta s$ = 7°32'20.1" | Δ = 15°00'45.4" (LT) | $\theta s$ = 7°32'20.1" |
| Ls = 150.00' | D = 2°43'45.1" | Ls = 150.00' | Ls = 200.00' | D = 7°32'20.1" | Ls = 200.00' |
| LT = 100.01' | L = 219.86' | LT = 100.01' | LT = 133.45' | L = 199.13' | LT = 133.45' |
| ST = 50.01' | T = 110.06' | ST = 50.01' | ST = 66.78' | T = 100.04' | ST = 66.78' |
| | R = 2,100.00' | | | R = 760.00' | |
| | e = .06 | | | e = .06 | |
| | DS = 50 MPH | | | DS = 30 MPH | |

RAMP B/LOOP B
EST. 8200 / 8200 AADT

RAMP A/LOOP A
EST. 7600 / 10800 AADT

RAMP A/LOOP A
EST. 5200 / 6900 AADT


MARJORIE G. TREDWELL
DB 1446 PG 645

MATILDA K. SMITH
DB 384 PG 238

RAYMOND BRYANT
DB 256 - PG 624

MELVIN BORDEN
DB 295 - PG 585
DB 687 - PG 733

MAJOR MIDGETT
DB 683 - PG 458
DB 727 - PG 110

DARLENE PALMER
DB 1983 PG 373

ALICE L. HEARD HEIRS
DB 501 PG 180
DB 528 PG 366
MB 32 PG 19

NC DEPT. OF TRANSPORTATION
DB 1759 PG 150

NC DEPT OF TRANSPORTATION
DB 1759 PG 194

NC DEPT OF TRANSPORTATION
DB 1893 PG 102

BELL FORK CHURCH OF CHRIST
DB 1624 PG 40
DB 594 PG 992

DELIVERANCE EVANGELISTIC TEMPLE, INC.
DB 1853 PG 9
MB 16 PG 24

NC DEPT OF TRANSPORTATION
DB 1829 PG 493
MB 16 PG 24

NC DEPT OF TRANSPORTATION
DB 1829 PG 308
MB 16 PG 24

ADAM C. MATTOCKS
DB 3442 PG 256
DB 16 PG 24

THOMASENA M. GIVENS
DB 1829 PG 308
MB 16 PG 24

POPKIN BROTHERS ENTERPRISES INC.
DB 322 PG 470
DB 440 PG 75
DB 1150 PG 568
DB 1750 PG 361
DB 1870 PG 322
DB 2656 PG 458
MB 33 PG 49
MB 5 PG 94
MB 49 PG 94
MB 3 PG 62

POPKIN AND ASSOCIATES
DB 1280 PG 499
MB 33 PG 49
MB 49 PG 94
MB 5 PG 9

POPKIN BROTHERS ENTERPRISES
DB 322 PG 470
DB 440 PG 75
DB 1150 PG 568

POPKIN BROTHERS ENTERPRISES, INC.
DB 322 PG 470
DB 440 PG 75
DB 1150 PG 568

8/17/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 6 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 027771 — 4/26/11

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. — 5/10/11

NAD 83

-L-
PI Sta 41+04.58
Δ = 47° 09' 01.3" (RT)
D = 5° 43' 46.5"
L = 822.93'
T = 436.37'
R = 1,000.00'
SE = .035
DS = 40MPH

SEE SHEET NO.5 MATCHLINE STA.28+50.00

MATCHLINE STA.42+50.00 SEE SHEET NO.7

CAROLINA POWER & LIGHT COMPANY
DB 953 PG 559

ONSLOW MEMORIAL HOSPITAL FOUNDATION, INC.
DB 1041PG 351

23A
POPKIN BROTHERS INTERPRISES
DB 322 PG 470
DB 440 PG 75
DB 960 PG 568

25

27
ONSLOW COUNTY
DB 390 PG 625

26
FIRE TOWER PROPERTY LLC
DB 2920 PG 910
MB 60 PG II

COASTAL ENTERPRISES OF JACKSONVILLE, INC.
DB 3404 PG 769
MB 60 PG II

30+00 35+00 40+00

-BYI- 42 -BYI- 43

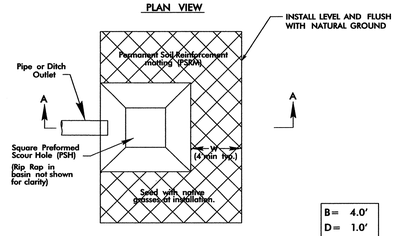
END FENCE +03.83 82.69'
END C/A +00.00 100.00'
+68.21 100.00'
CLASS 'B' RIPRAP EST. 11 TONS EST. 28 SY FF
+89.10 100.00'
PI 92.00'
+00.00 END 4' PS BEGIN 2'-6" C&G
+68.83 52.50'
+50.00 80.00'
+50.00 80.00'

230' STORAGE
150' TAPER
100' RW
+73.45
+23.45
4' PS
1'-6" C&G
N 77° 16' 18.5" E
54" RCP-IV
42" RCP-IV
36" RCP-IV
60 RCP-IV
66" RCP-IV
15" RCP-IV
18" RCP-IV
JB w/Slab Lid
CB
HW
PSH SEE DETAIL
HEAD DITCH EST. DDE 29 CY SEE DETAIL #5
PDE
+68.21 100.00'
+75.00 100.00' 110.00'
+99.02 PI
+03.07 PI
+37.50 PI
2'-6" C&G
130' TAPER
100' RW
PSH SEE DETAIL
+50.00 BEGIN EXPRESSWAY GUTTER
TRANSMISSION TOWER DO NOT DISTURB
100' TAPER
L=529.26'
R=5,779.65'
S 20°44'02" E
529.05' (CHORD)
80' DRAINAGE AND UTILITY
N 20°32'05" W 274.58'
S 68°26' 60"

END FENCE +00.00 75.76'
END C/A +00.00 100.00'
CLASS '1' RIPRAP ON BANKS ONLY EST 12.5 TONS EST 13.0 SY FF
TOE PROTECTION STA. 31+70 TO STA. 34+50 -L- RT SEE DETAIL #4 CLASS 'B' RIPRAP EST. 230 TONS EST. 610 SY FF
-L- PC Sta. 36+68.21
SCRUB
JS
ST
WLB

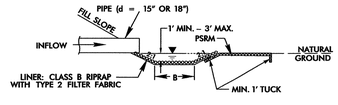
## PREFORMED SCOUR HOLE
*NOT TO SCALE

PLAN VIEW




B= 4.0'
D= 1.0'
W= 4.0'

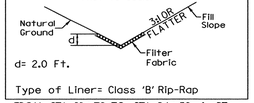
SECTION A-A




308

STA. 36+25 -L- RT
STA. 41+00 -L- LT

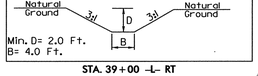
## DETAIL #4
TOE PROTECTION
(Not to Scale)




d= 2.0 Ft.
Type of Liner= Class 'B' Rip-Rap

FROM STA. 31+70 TO STA. 34+50 -L- RT

## DETAIL #5
STANDARD BASE DITCH
(Not to Scale)




Min. D= 2.0 Ft.
B= 4.0 Ft.

STA. 39+00 -L- RT

SEE SHEET 10 FOR -L- PROFILE

8/17/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 7 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW B. CARR

5/9/11

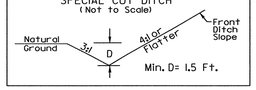
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER JW HENRY WELLS, III

5/5/11

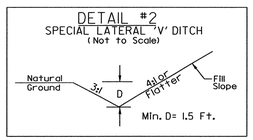
NAD 83

**DETAIL #1**
SPECIAL CUT DITCH
(Not to Scale)



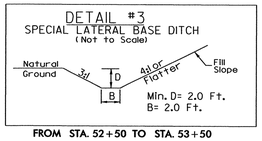

FROM STA. 47+42 TO STA. 49+20 -L- RT
FROM STA. 50+22 TO STA. 51+15 -L- RT

**DETAIL #2**
SPECIAL LATERAL "V" DITCH
(Not to Scale)



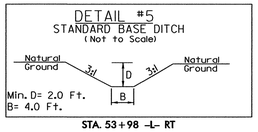

FROM STA. 46+50 TO STA. 50+00 -L- LT
FROM STA. 54+25 TO STA. 58+50 -L- LT

**DETAIL #3**
SPECIAL LATERAL BASE DITCH
(Not to Scale)



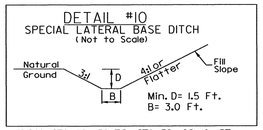

FROM STA. 52+50 TO STA. 53+50

**DETAIL #5**
STANDARD BASE DITCH
(Not to Scale)




STA. 53+98 -L- RT

**DETAIL #10**
SPECIAL LATERAL BASE DITCH
(Not to Scale)



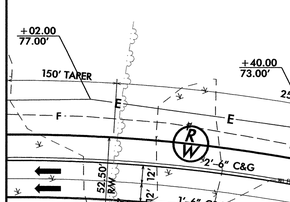

FROM STA. 52+50 TO STA. 53+00 -L- RT

**-L-**
PI Sta 41+04.58
Δ = 47° 09' 01.3" (RT)
D = 5° 43' 46.5"
L = 822.93'
T = 436.37'
R = 1,000.00'
SE = .035
DS = 40MPH

**-L-**
PI Sta 52+77.32
Δ = 43° 36' 18.8" (LT)
D = 8° 11' 06.4"
L = 532.74'
T = 280.02'
R = 700.00'
SE .04
DS = 40MPH

**-Y6-**
PI Sta 10+96.57
Δ = 65° 29' 51.1" (LT)
D = 114° 35' 29.6"
L = 57.16'
T = 32.16'
R = 50.00'

**-Y3-**
PI Sta 11+05.82
Δ = 14° 16' 34.1" (LT)
D = 19° 05' 54.9"
L = 74.75'
T = 37.57'
R = 300.00'




SEE SHEET NO.6
MATCHLINE STA.42+50.00

MATCHLINE SHEET NO.8 STA.56+50.00

-L- POT Sta. 46+05.01
-Y3- POT Sta. 10+00.00

-L- PT Sta. 55+30.04

-L- POC Sta. 53+38.93
-Y6- POT Sta. 10+00.00

-L- PT Sta. 44+91.14

-Y3- PC Sta. 10+68.25

-Y3- PT Sta. 11+43.00

-L- PC Sta. 49+97.30

-Y3- POT Sta. 13+83.15

-Y6- PC Sta. 10+64.41

-Y6- PT Sta. 11+21.56

END CONSTRUCTION
-Y3- POT Sta. 12+00.57

END CONSTRUCTION
-Y6- POT Sta. 11+22.94

-Y6- POT Sta. 12+72.46

MILL TO KEY IN
SEE DETAIL, SHT. 2-A

MILL TO KEY IN
SEE DETAIL, SHT. 2-A

SPECIAL LAT Y-DITCH
STA. 46+50 TO 50+00 -L- LT
SEE DETAIL #2

SPECIAL CUT DITCH
STA. 47+42 TO 49+20 -L- RT
SEE DETAIL #1

SPECIAL CUT DITCH
STA. 50+22 TO 51+15 -L- RT
SEE DETAIL #1

SPEC. LAT. BASE DITCH
STA. 52+50 TO 53+50 -L- LT
SEE DETAIL #3

SPECIAL LAT. 3' BASE DITCH
STA. 52+50 TO 53+00 -L- RT
SEE DETAIL #10

SPECIAL LAT. Y-DITCH
STA. 54+25 TO 58+50 -L- LT
SEE DETAIL #2

4' BASE DITCH
EST. DDE
SEE DETAIL #5

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 7 S.Y. F.F.

CLASS 'B' RIPRAP
EST. 1 TON
EST. 5 S.Y. F.F.

CLASS 'B' RIPRAP
EST. 3 TONS
EST. 10 S.Y. F.F.

CLASS 'B' RIPRAP
EST. 8 TONS
EST. 21 S.Y. F.F.

CLASS 'B' RIPRAP
EST. 11 TONS
EST. 28 S.Y. F.F.

CLASS 'B' RIPRAP
EST. 8 TONS
EST. 21 S.Y. F.F.

SEE SHEET 10 FOR -L- PROFILE
SEE SHEET 15 FOR -Y3- PROFILE
SEE SHEET 15 FOR -Y6- PROFILE

ONSLOW COUNTY
DB 390 PG 625

NEIL REALTY COMPANY, INC.
DB 469 PG 75
MB 60 PG 11

COASTAL ENTERPRISES OF JACKSONVILLE, INC.
DB 3404 PG 769

FIRE TOWER PROPERTY LLC
DB 2960 PG 910
MB 60 PG 11

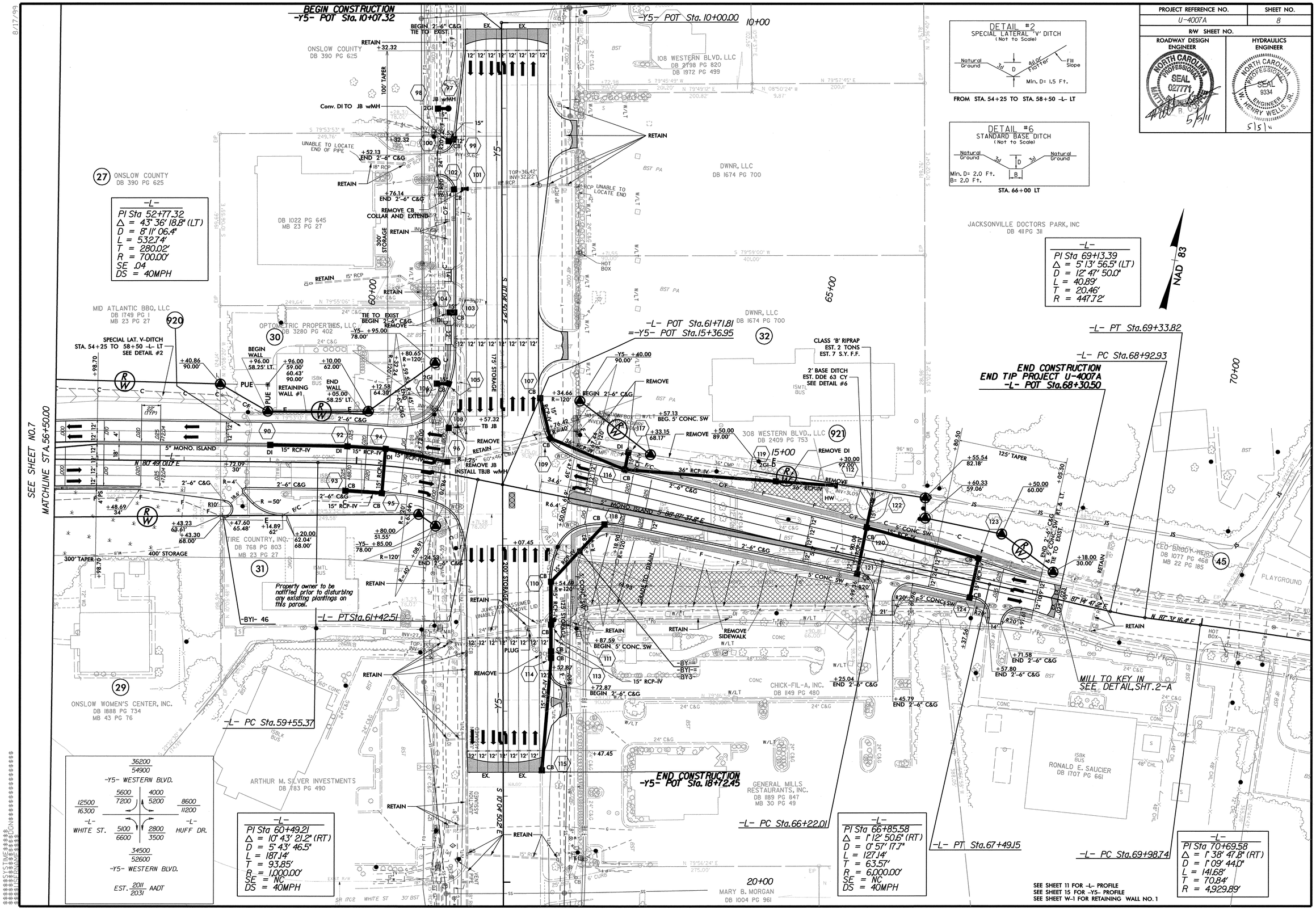
ONSLOW WOMEN'S CENTER, INC.
DB 1888 PG 734
MB 43 PG 176

WHITE STREET PROPERTIES
DB 1579 PG 41
MB 27 PG 44

COASTAL CAROLINA MEDICAL PROPERTIES, LLC
DB 2199 PG 763
MB 27 PG 212

TERESA...

150' STORAGE
100' TAPER
230' STORAGE TB 2GLW/ FLAT GRATE
300' TAPER
25' FEATHER RESURF.
REMOVE +/-60 LF
REMOVE
RETAIN
GRADE TO DRAIN
JB w/MH
WATER METER VAULT
EX. R/W 80.00'
EXIST. 12' 12'
2'-6" C&G
1'-6" C&G
5" MONO ISLAND
18" RCP-IV
15" RCP-IV
24" RCP-IV
36" RCP
30" RCP-IV
CB
DI
S 55°34'40.2" E
S 59°02'16.8" E
S 27°08'45.7" W




| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 8 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DETAIL #2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D= 1.5 Ft.
FROM STA. 54+25 TO STA. 58+50 -L- LT

DETAIL #6
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Min. D= 2.0 Ft.
B= 2.0 Ft.
STA. 66+00 LT

SEE SHEET 11 FOR -L- PROFILE
SEE SHEET 15 FOR -Y5- PROFILE
SEE SHEET W-1 FOR RETAINING WALL NO. 1

5/28/99

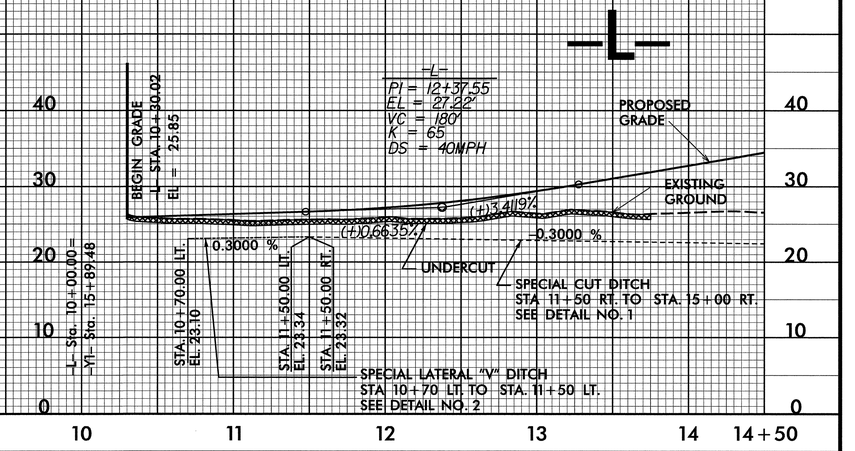
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 9 |

ROADWAY DESIGN ENGINEER

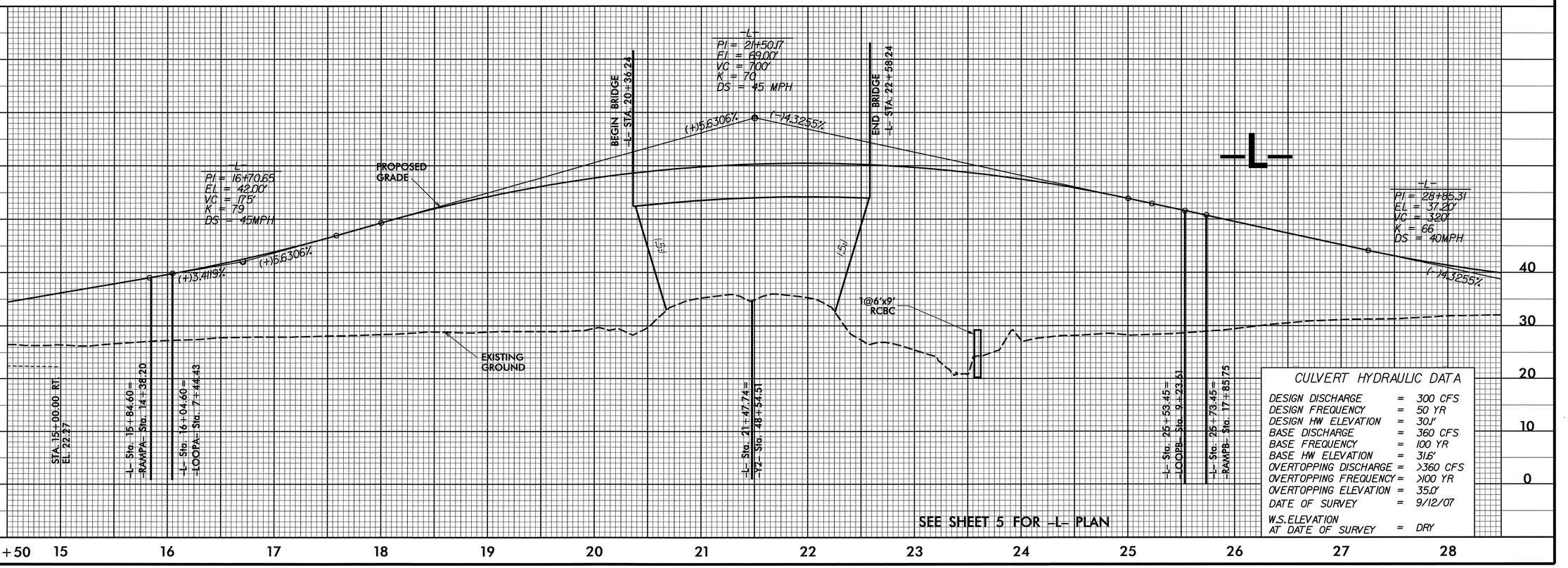
NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW R. CORBETT
5/5/11

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.
5/5/11




SEE SHEET 4 FOR -L- PLAN




SEE SHEET 5 FOR -L- PLAN

CULVERT HYDRAULIC DATA

| | | |
|---|---|---|
| DESIGN DISCHARGE | = | 300 CFS |
| DESIGN FREQUENCY | = | 50 YR |
| DESIGN HW ELEVATION | = | 30.1' |
| BASE DISCHARGE | = | 360 CFS |
| BASE FREQUENCY | = | 100 YR |
| BASE HW ELEVATION | = | 31.6' |
| OVERTOPPING DISCHARGE | = | >360 CFS |
| OVERTOPPING FREQUENCY | = | >100 YR |
| OVERTOPPING ELEVATION | = | 35.0' |
| DATE OF SURVEY | = | 9/12/07 |
| W.S. ELEVATION AT DATE OF SURVEY | = | DRY |

$$$$SYSTIME$$$$
$$$$FILENAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 10 |

ROADWAY DESIGN ENGINEER

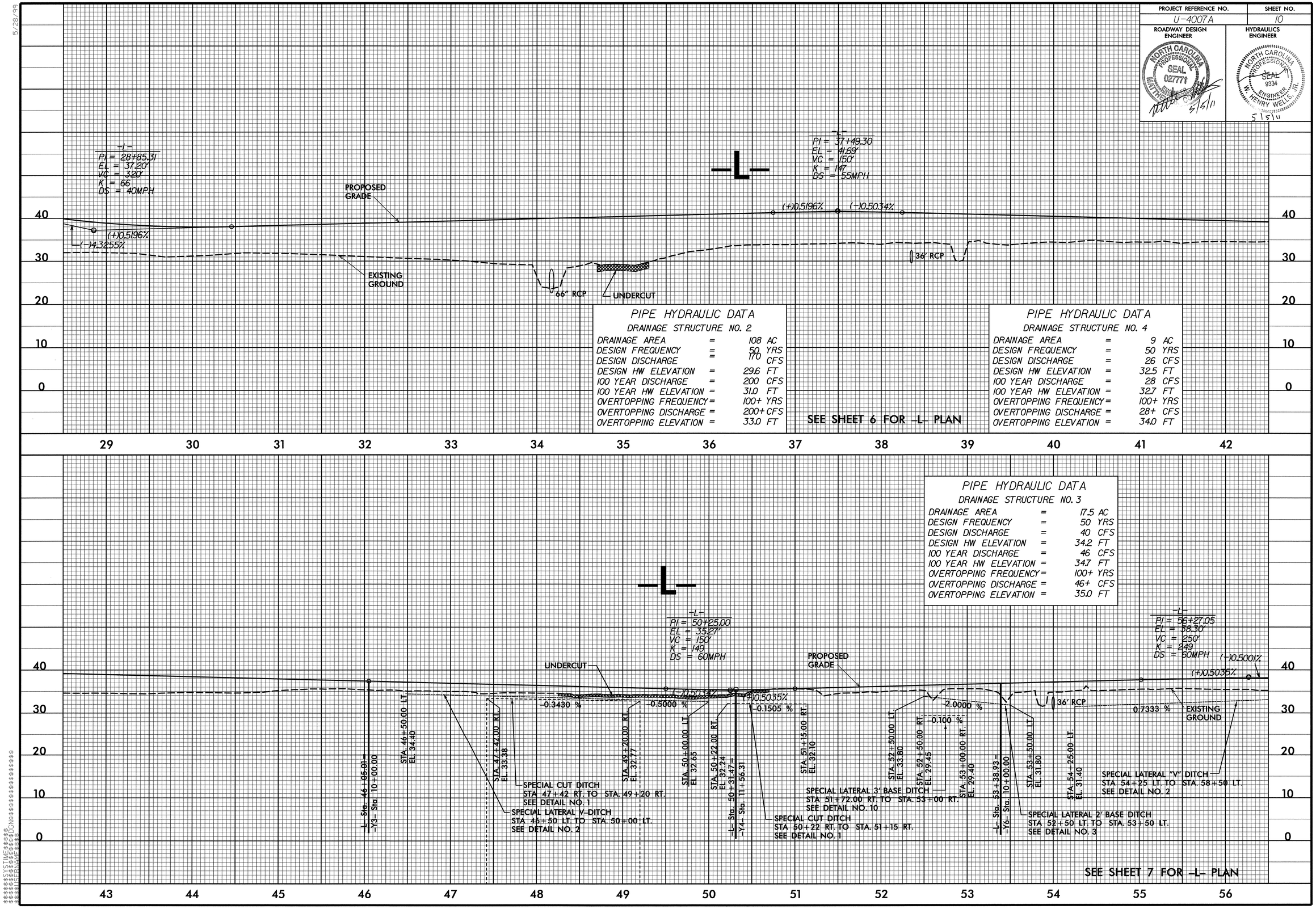
NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW C. COX

5/5/11

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

5/5/11




PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 2

| | | |
|---|---|---|
| DRAINAGE AREA | = | 108 AC |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 170 CFS |
| DESIGN HW ELEVATION | = | 29.6 FT |
| 100 YEAR DISCHARGE | = | 200 CFS |
| 100 YEAR HW ELEVATION | = | 31.0 FT |
| OVERTOPPING FREQUENCY | = | 100+ YRS |
| OVERTOPPING DISCHARGE | = | 200+ CFS |
| OVERTOPPING ELEVATION | = | 33.0 FT |

SEE SHEET 6 FOR -L- PLAN

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 4

| | | |
|---|---|---|
| DRAINAGE AREA | = | 9 AC |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 26 CFS |
| DESIGN HW ELEVATION | = | 32.5 FT |
| 100 YEAR DISCHARGE | = | 28 CFS |
| 100 YEAR HW ELEVATION | = | 32.7 FT |
| OVERTOPPING FREQUENCY | = | 100+ YRS |
| OVERTOPPING DISCHARGE | = | 28+ CFS |
| OVERTOPPING ELEVATION | = | 34.0 FT |

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 3

| | | |
|---|---|---|
| DRAINAGE AREA | = | 17.5 AC |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 40 CFS |
| DESIGN HW ELEVATION | = | 34.2 FT |
| 100 YEAR DISCHARGE | = | 46 CFS |
| 100 YEAR HW ELEVATION | = | 34.7 FT |
| OVERTOPPING FREQUENCY | = | 100+ YRS |
| OVERTOPPING DISCHARGE | = | 46+ CFS |
| OVERTOPPING ELEVATION | = | 35.0 FT |

SEE SHEET 7 FOR -L- PLAN

5/28/99

5/28/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 11 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW R. [illegible]

5/5/11

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER HENRY WELLS, JR.

5/5/11

-L-
PI = 56+27.05
EL = 38.30'
VC = 250'
K = 249
DS = 50MPH

(-)10.5001%

0.7333 %

STA. 58+50.00 LT.
EL. 34.50

SPECIAL LATERAL "V" DITCH
STA 54+25 LT. TO STA. 58+50 LT.
SEE DETAIL NO. 2

UNDERCUT

END GRADE
-L- STA. 61+28.95
EL = 35.79
-Y5- STA. 15+28.41 EP

(-)10.5001%

-L- POT Sta. 61+71.81 = WESTERN BLVD.
-Y5- POT Sta. 15+36.95

2.2%

(+)10.0953%

2.0%

BEGIN GRADE
-L- STA. 62+14.69
EL = 35.87
=-Y5- STA. 15+45.59 EP

(+)1.2600%

-L-
PI = 63+83.74
EL = 58.00'
VC = 150'
K = 77
DS = 45MPH

(+)1.2600%

(-)0.6956%

PROPOSED GRADE

EXISTING GROUND

UNDERCUT

(-)0.6956%

END GRADE
-L- STA. 68+05.50
EL = 36.07

25' TAPER TO EXIST.

END RESURFACING
-L- STA. 68+30.50
EL = 34.75

SEE SHEET 8 FOR -L- PLAN

57 58 59 60 61 62 63 64 65 66 67 68 69 70

40 30 20 10 0

WIDEN & RESURFACE USING EXISTING GRADE AND SUPERS

BEGIN RESURFACING & WIDENING
STA. 11+08.82
EL = 26.28

BEGIN GUTTER GRADE
STA 12+33.00 LT ELEV 25.77

GUTTER GRADE
STA 12+83.00 LT ELEV 25.60

GUTTER GRADE
STA 13+33.00 LT ELEV 25.96

GUTTER GRADE
STA 13+70.00 LT ELEV 25.73

-Y1-

BELL FORK ROAD

END GUTTER GRADE
STA 14+40.00 LT ELEV 25.91

END RESURFACING & WIDENING
STA. 18+95.01
EL = 26.49

-0.3400%
-0.2600%
+0.7200%
+0.3600%
-0.3000%
-0.2300%
+0.3600%
+0.3600%
-0.5000%
+0.3000%

BEGIN GUTTER GRADE
STA 12+33.00 RT ELEV 25.72

GUTTER GRADE
STA 12+83.00 RT ELEV 25.59

GUTTER GRADE
STA 13+33.00 RT ELEV 25.77

GUTTER GRADE
STA 14+10.00 RT ELEV 25.59

EXISTING GROUND

ENDGUTTER GRADE
STA 14+40.00 RT ELEV 25.77

BEGIN GUTTER GRADE
STA 14+98.00 RT ELEV 25.77

GUTTER GRADE
STA 15+48.00 RT ELEV 25.52

-Y1- Sta. 15+89.48 =
-L- Sta. 10+00.00

END GUTTER GRADE
STA 15+98.00 RT ELEV 25.67

UNDERCUT

SEE SHEET 4 FOR -Y1- PLAN

10 11 12 13 14 15 16 17 18 19 20 21

$$$$$$$SYSTIME$$$$$
$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$
$$$$$$$FILENAME$$$$

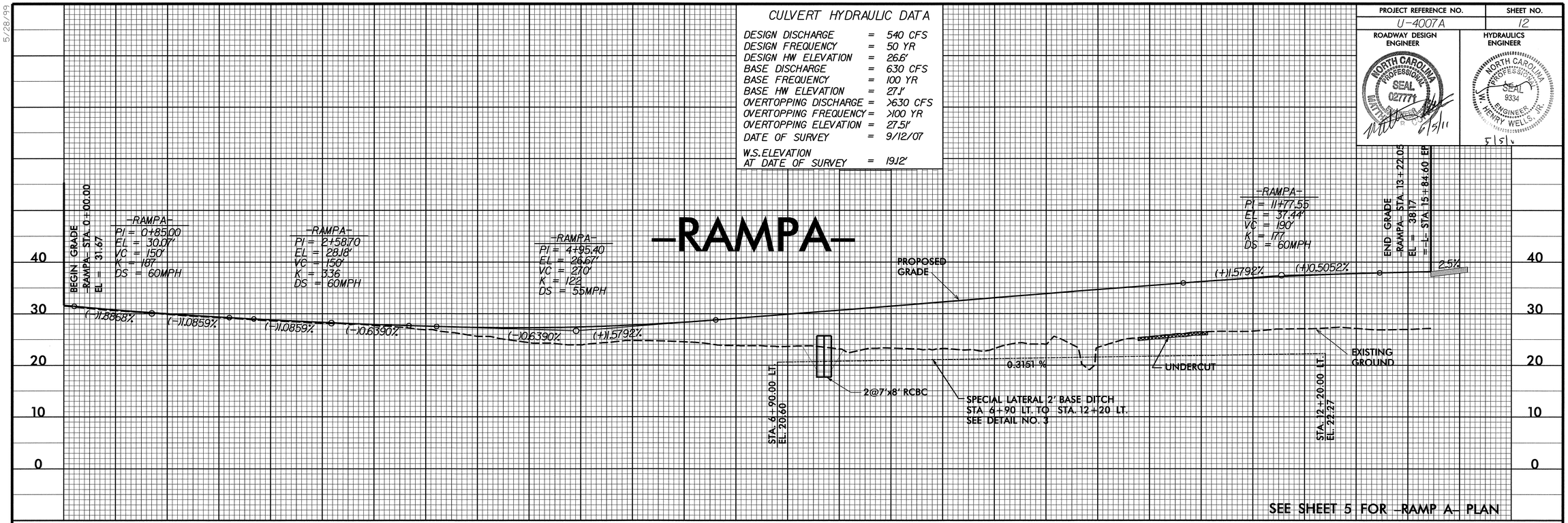
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 12 |

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW R. CUTLER 6/5/11

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. 5/5/11

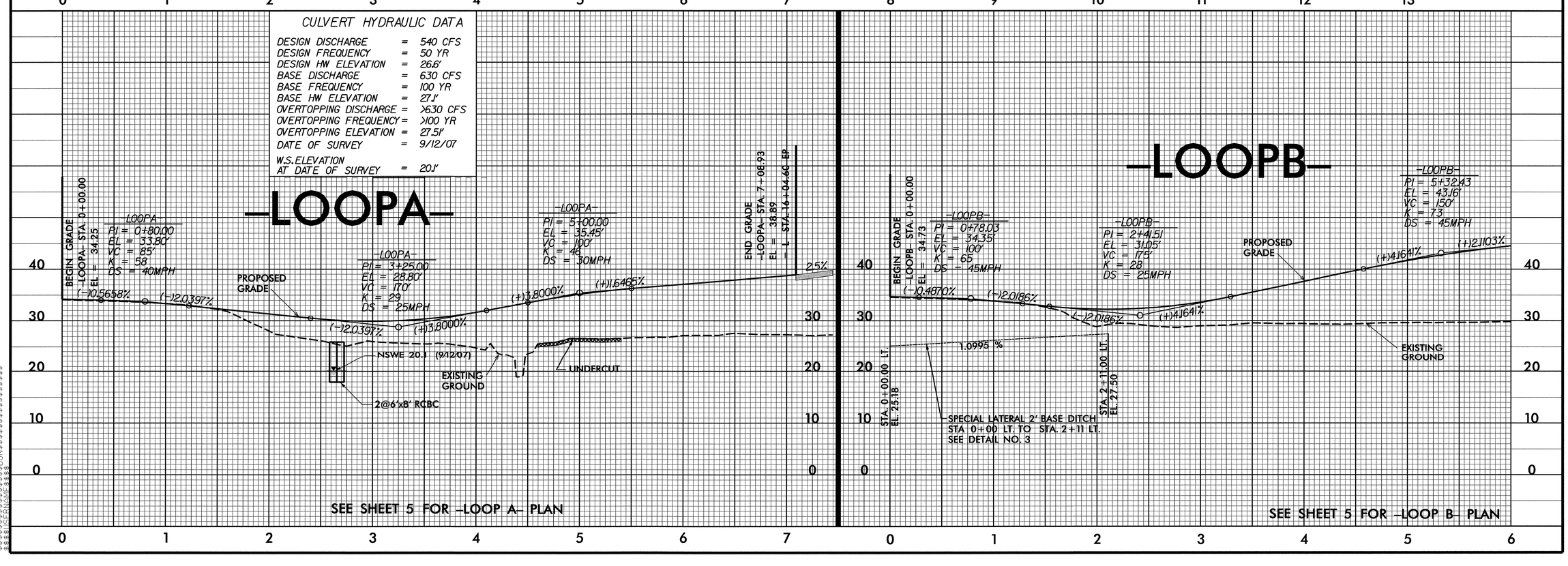
## CULVERT HYDRAULIC DATA

| | | |
|---|---|---|
| DESIGN DISCHARGE | = | 540 CFS |
| DESIGN FREQUENCY | = | 50 YR |
| DESIGN HW ELEVATION | = | 26.6' |
| BASE DISCHARGE | = | 630 CFS |
| BASE FREQUENCY | = | 100 YR |
| BASE HW ELEVATION | = | 27.1' |
| OVERTOPPING DISCHARGE | = | >630 CFS |
| OVERTOPPING FREQUENCY | = | >100 YR |
| OVERTOPPING ELEVATION | = | 27.51' |
| DATE OF SURVEY | = | 9/12/07 |
| W.S. ELEVATION AT DATE OF SURVEY | = | 19.12' |




## CULVERT HYDRAULIC DATA

| | | |
|---|---|---|
| DESIGN DISCHARGE | = | 540 CFS |
| DESIGN FREQUENCY | = | 50 YR |
| DESIGN HW ELEVATION | = | 26.6' |
| BASE DISCHARGE | = | 630 CFS |
| BASE FREQUENCY | = | 100 YR |
| BASE HW ELEVATION | = | 27.1' |
| OVERTOPPING DISCHARGE | = | >630 CFS |
| OVERTOPPING FREQUENCY | = | >100 YR |
| OVERTOPPING ELEVATION | = | 27.51' |
| DATE OF SURVEY | = | 9/12/07 |
| W.S. ELEVATION AT DATE OF SURVEY | = | 20.1' |



5/28/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 13 |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW R. CUTLER

5/5/11

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR.

5/5/11

# -LOOPB-

PROPOSED GRADE

(+)2.1103%

END GRADE
-LOOPB- STA. 8+88.11
EL = 50.67
=L= STA. 25+53.45 EP

2.5%

EXISTING GROUND

UNDERCUT

SEE SHEET 5 FOR -LOOP B- PLAN

# -RAMPB-

-RAMPB-
PI = 2+00.15
EL = 33.97'
VC = 235'
K = 14.6
DS = 60MPH

BEGIN GRADE
-RAMPB- STA. 0+00.00
EL = 38.48

(-)2.2556%

(-)0.6709%

-RAMPB-
PI = 5+37.83
EL = 31.70'
VC = 245'
K = 9.8
DS = 50MPH

(-)0.6709%

(+)1.8322%

PROPOSED GRADE

EXISTING GROUND

24" RCP

0.3856 %

STA. 2+15.00 RT.
EL 23.000

SPECIAL LATERAL 2' BASE DITCH
STA 2+15 RT. TO STA. 6+04 RT.
SEE DETAIL NO. 3

STA. 6+04.00 RT.
EL 24.50

SEE SHEET 5 FOR -RAMP B- PLAN

## PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO. 1

| | | |
|---|---|---|
| DRAINAGE AREA | = | 3.8 AC |
| DESIGN FREQUENCY | = | 50 YRS |
| DESIGN DISCHARGE | = | 14 CFS |
| DESIGN HW ELEVATION | = | 27.0 FT |
| 100 YEAR DISCHARGE | = | 15 CFS |
| 100 YEAR HW ELEVATION | = | 27.2 FT |
| OVERTOPPING FREQUENCY | = | 500+ YRS |
| OVERTOPPING DISCHARGE | = | 25+ CFS |
| OVERTOPPING ELEVATION | = | 31.7 FT |

# -RAMPB-

-RAMPB-
PI = 11+00.00
EL = 42.00'
VC = 250'
K = 39.5
DS = 60MPH

(+)1.8322%

(+)1.1995%

PROPOSED GRADE

END GRADE
-RAMPB- STA. 17+50.25
EL = 49.80
=L= STA. 25+73.45 EP

2.5%

UNDERCUT

EXISTING GROUND

1@6'x9' RCBC

NWSE ON 9-12-07
=22.47

## CULVERT HYDRAULIC DATA

| | | |
|---|---|---|
| DESIGN DISCHARGE | = | 320 CFS |
| DESIGN FREQUENCY | = | 50 YR |
| DESIGN HW ELEVATION | = | 30.0' |
| BASE DISCHARGE | = | 390 CFS |
| BASE FREQUENCY | = | 100 YR |
| BASE HW ELEVATION | = | 31.6' |
| OVERTOPPING DISCHARGE | = | <390 CFS |
| OVERTOPPING FREQUENCY | = | <100 YR |
| OVERTOPPING ELEVATION | = | 31.2' |
| DATE OF SURVEY | = | 9/12/07 |
| W.S. ELEVATION AT DATE OF SURVEY | = | 22.47' |

SEE SHEET 5 FOR -RAMP B- PLAN

WIDEN & RESURFACE USING EXISTING GRADE AND SUPERS

BEGIN RESURFACING
STA. 27+89.18

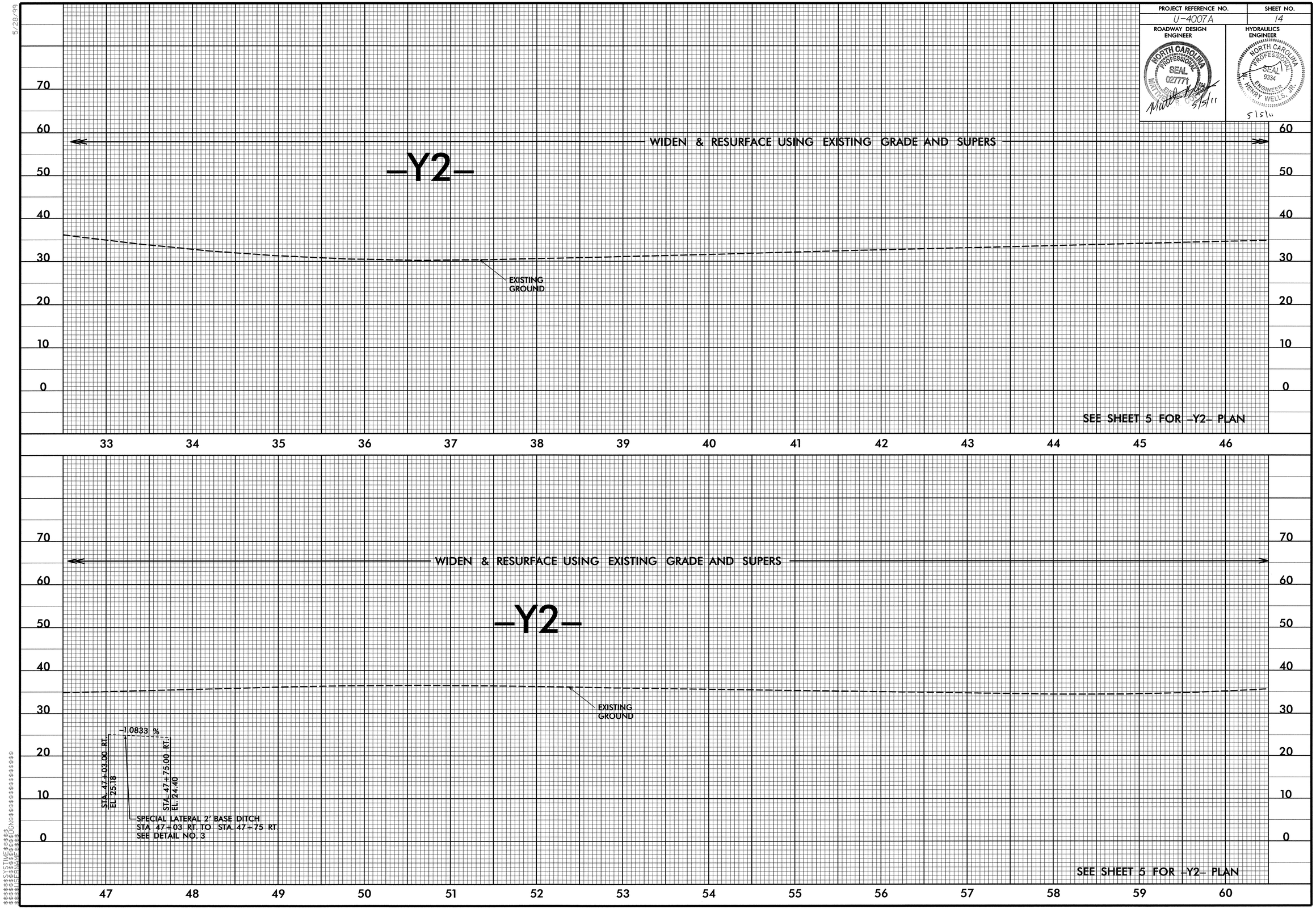
# -Y2-

EXISTING GROUND

SEE SHEET 5 FOR -Y2- PLAN

$$$$$$$SYSTIME$$$$$$
$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$$$REFNAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-4007A | 14 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |



| PROJECT REFERENCE NO. | SHEET NO. |
| --- | --- |
| U-4007A | 15 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| NORTH CAROLINA PROFESSIONAL SEAL 027771 ENGINEER MATTHEW ... 5/5/11 | NORTH CAROLINA PROFESSIONAL SEAL 9334 ENGINEER W. HENRY WELLS, JR. 5/5/11 |