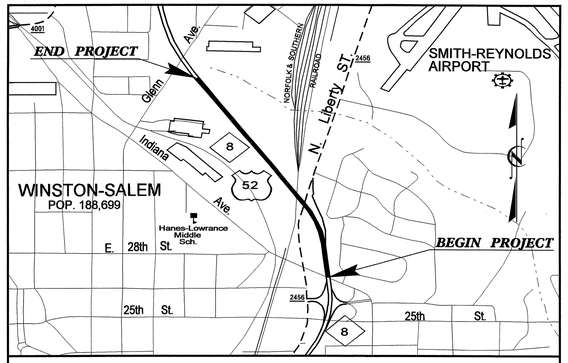
TIP PROJECT: U-2826A

CONTRACT: C202129

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




VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# FORSYTH COUNTY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | U-2826A | 1 | |

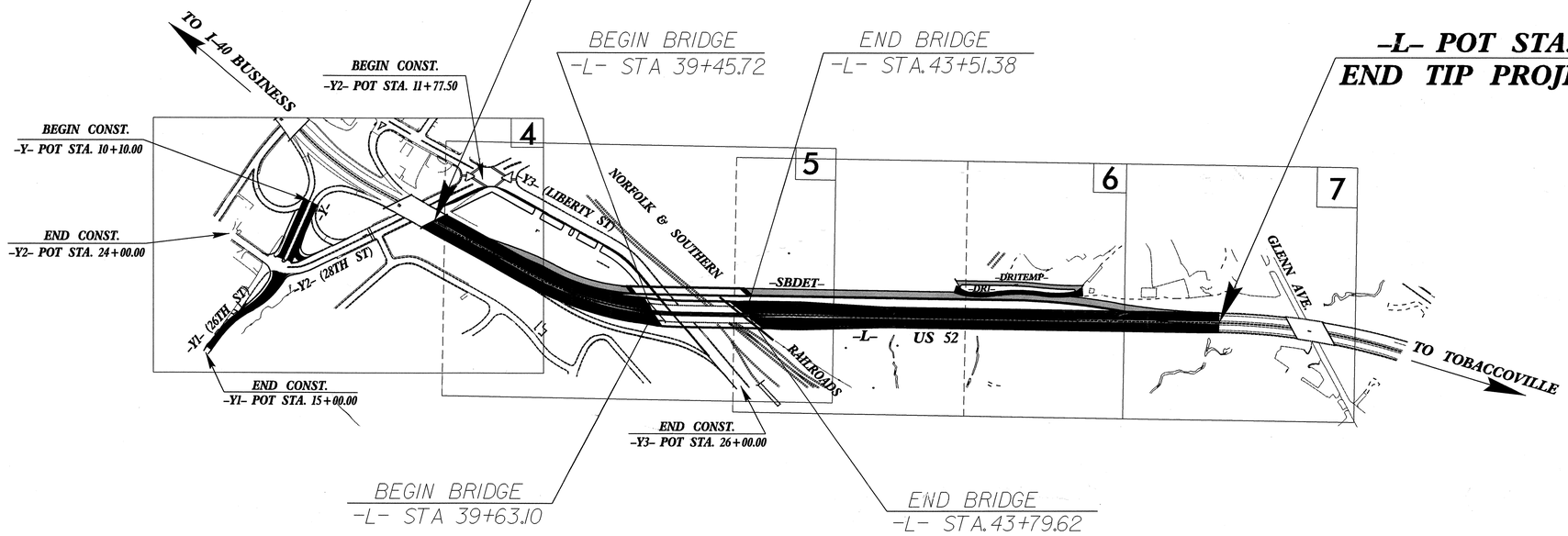
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 34871.1.1 | NHF-52 (4) | P.E. |
| 34871.2.2 | NHF-52 (14) | R/W & UTIL. |
| 34871.3.2 | BRNHS-52(19) | CONST. |

**LOCATION: US 52 OVER THE NORFOLK SOUTHERN RAILROAD IN WINSTON-SALEM**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, RESURFACING, WIDENING, CURB & GUTTER, SIGNING, SIGNALS, AND STRUCTURES**

NAD 83

WINSTON-SALEM




**THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES**

**GRAPHIC SCALES**

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

**DESIGN DATA**

ADT 2009 = 77,800
ADT 2030 = 77,600
DHV = 10 %
D = 50 %
T = 12 % *
V = 55 MPH
V (DETOUR) = 45 MPH
* TTST 7 % DUAL 5%
FUNC CLASS = FREEWAY
STATEWIDE TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-2826A = 0.579 MILES
LENGTH STRUCTURE TIP PROJECT U-2826A = 0.079 MILES
TOTAL LENGTH TIP PROJECT U-2826A = 0.658 MILES

* LENGTHS BASED ON NBL BRIDGES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 19, 2007

LETTING DATE:
FEBRUARY 16, 2010

ROGER D. THOMAS, PE
PROJECT ENGINEER

BRIAN P. ROBINSON
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENSLEY
SIGNATURE: R C Hensley 12-7-09 P.E.

**ROADWAY DESIGN ENGINEER**
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROGER D. THOMAS
SIGNATURE: Roger D. Thomas 12/8/09 P.E.

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

07-DEC-2009 14:12
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$$$$USERNAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 1-A |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19949 ENGINEER ROGER D. THOMAS
1/11/10

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# INDEX OF SHEETS

INDEX OF SHEETS


| SHEET NUMBER | SHEET |
|---|---|
| | TITLE SHEET |
| 1-A | INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS |
| 1-B | CONVENTIONAL SYMBOLS |
| 1-C | SURVEY CONTROL SHEET |
| 2 THRU 2-C | PAVEMENT SCHEDULE, TYPICAL SECTIONS, WEDGING DETAIL, & DETAIL FOR FLARING CURB AND GUTTER |
| 2-D | SHOULDER DRAIN DETAILS AND SUBGRADE CONSTRUCTION DETAIL |
| 2-E AND 2-F | STRUCTURE TYPICAL SECTIONS AND DETAILS SHOWING PAVEMENT-BRIDGE RELATIONSHIP |
| 2-G | TEMPORARY PAVEMENT WIDENING DETAIL |
| 2-H | DETAIL TO CONVERT EXISTING CATCH BASIN TO DROP INLET |
| 2-I | DETAIL OF TEMPORARY ANCHOR UNIT TYPE W-BEAM |
| 2-J | DETAIL OF ANCHORAGE OF FRAMES |
| 2-K | DETAIL OF CONCRETE PAVEMENT JOINTS |
| 2-L | DETAIL OF DOWEL ASSEMBLY |
| 2-M | DETAIL OF STANDARD TEMPORARY SHORING |
| 2-N THRU 2-X | DETAILS OF TEMPORARY WALLS |
| 2-Y AND 2-Z | DETAIL DRAWINGS FOR METHOD OF PIPE INSTALLATION |
| 2-AA | DETAIL OF CONCRETE BARRIER TRANSITION |
| 3 | SUMMARY OF QUANTITIES |
| 3-A THRU 3-D | SUMMARY OF PIPES 48" AND UNDER |
| 3-E | SUMMARY OF TEMPORARY PIPES 48" AND UNDER & SUMMARY OF SHOULDER DRAINS |
| 3-F | GUARDRAIL SUMMARY & TEMPORARY GUARDRAIL SUMMARY |
| 3-G | SUMMARY OF EARTHWORK, ASPHALT PAVEMENT REMOVAL SUMMARY, CONCRETE PAVEMENT REMOVAL SUMMARY, & BREAKING ASPHALT PAVEMENT SUMMARY |
| 3-H | SUMMARY OF CONCRETE BARRIER, SUMMARY OF 60" CHAIN LINK FENCE, AND SUMMARY OF 72"CHAIN LINK FENCE |
| 3-Z | PARCEL INDEX SHEET |
| 4 THRU 10 | PLAN SHEETS |
| 11 THRU 17 | PROFILE SHEETS |
| TCP-1 THRU TCP-70 | TRAFFIC CONTROL PLANS |
| PM-1 THRU PM-6 | PAVEMENT MARKING PLANS |
| E-1 THRU E-3 | ELECTRICAL PLANS |
| EC-1 THRU EC-13 | EROSION CONTROL PLANS |
| SIGN-1 THRU SIGN-18 | SIGNING PLANS |
| SIG-1 THRU SIG-13 | SIGNAL PLANS |
| UO-1 THRU UO-3 | UTILITIES BY OTHERS PLANS |
| X-1A | CROSS-SECTION SUMMARY SHEET |
| X-1 THRU X-63 | CROSS-SECTIONS |
| S-1 THRU S-94 | STRUCTURE PLANS |
| W-1 AND W-2 | RETAINING WALL PLANS |


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.

BERM DITCHES:

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

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS 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.

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".

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

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 Duke Energy - Power Transmission,

Duke Energy - Power Distribution, AT&T, Piedmont Natural Gas, City of Winston-Salem,

and Time Warner Cable.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

WHEELCHAIR RAMPS:

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

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

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

| STD.NO. | TITLE |
|---|---|
| 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 |
| 225.04 | Method of Obtaining Superelevation - Two Lane Pavement |
| 225.05 | Method of Obtaining Superelevation - Divided Highways |
| 240.01 | Guide for Berm Ditch Construction |
| DIVISION 4 - MAJOR STRUCTURES | |
| 422.10 | Reinforced Bridge Approach Fills |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| DIVISION 6 - ASPHALT BASES AND PAVEMENTS | |
| 654.01 | Pavement Repairs |
| 665.01 | Milled Rumble Strips - Asphalt Pavements |
| DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS | |
| 700.02 | Expansion Joint Layout - for Rigid Doweled Pavement at Bridges |
| 700.04 | Concrete Pavement Header Board |
| 700.05 | Tying Proposed Pavement to Existing |
| 710.01 | Concrete Pavement - Station Marking |
| 720.01 | Concrete Shoulders |
| DIVISION 8 - INCIDENTALS | |
| 806.01 | Concrete Right-of-Way Marker |
| 806.02 | Granite Right-of-Way Marker |
| 816.01 | Concrete Pads - for Shoulder Drain Installation |
| 816.02 | Aggregate Shoulder Drain |
| 816.04 | Markers for Drainage Structure and Concrete Pad |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.01 | Brick Catch Basin - 12" thru 54" Pipe |
| 840.02 | Concrete Catch Basin - 12" thru 54" Pipe |
| 840.03 | Frame, Grates and Hood - for Use on Standard Catch Basin |
| 840.04 | Concrete Open Throat Catch Basin - 12" thru 48" Pipe |
| 840.05 | Brick Open Throat Catch Basin - 12" thru 48" Pipe |
| 840.14 | Concrete Drop Inlet - 12" thru 30" Pipe |
| 840.15 | Brick Drop Inlet - 12" thru 30" Pipe |
| 840.16 | Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15 |
| 840.18 | Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe |
| 840.20 | Frames and Wide Slot Flat Grates |
| 840.22 | Frames and Wide Slot Sag Grates |
| 840.24 | Frames and Narrow Slot Sag Grates |
| 840.27 | Brick Grated Drop Inlet Type 'B' - 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 |
| 840.45 | Precast Drainage Structure |
| 840.46 | Traffic Bearing Precast Drainage Structure |
| 840.54 | Manhole Frame and Cover |
| 840.66 | Drainage Structure Steps |
| 840.72 | Pipe Collar |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 846.04 | Drop Inlet Installation in Shoulder Berm Gutter |
| 848.01 | Concrete Sidewalk |
| 848.02 | Driveway Turnout - Radius Type |
| 848.05 | Wheelchair Ramp - Curb Cut |
| 848.06 | Wheelchair Ramp - Retrofitting of Existing Curb |
| 850.01 | Concrete Paved Ditches |
| 850.10 | Guide for Berm Drainage Outlet - 15" and 18" Pipe |
| 852.01 | Concrete Islands |
| 852.06 | Method for Placement of Drop Inlets in Concrete Islands |
| 854.01 | Double Faced Concrete Barrier - Types I, II, III and IV |
| 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 |
| 866.01 | Chain Link Fence - 4', 5' and 6' High Fence |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class 'B' Rip Rap |


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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 1-B |

3/15/06

***Note: Not to Scale***

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

## *BOUNDARIES AND PROPERTY:*

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

## *BUILDINGS AND OTHER CULTURE:*

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

## *HYDROLOGY:*

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

## *RAILROADS:*

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

## *RIGHT OF WAY:*

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

## *ROADS AND RELATED FEATURES:*

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

## *VEGETATION:*

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

## *EXISTING STRUCTURES:*

MAJOR:

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

MINOR:

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

## *UTILITIES:*

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 1C |
| Location and Surveys | |

# SURVEY CONTROL SHEET U-2826A

BL

| POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|---|---|---|---|---|---|---|
| 51 | BL-10(JKA-83) | 863997.2425 | 1635139.9823 | 970.37' | OUTSIDE PROJECT LIMITS | |
| 52 | BL-11 | 864935.2812 | 1635813.2816 | 965.78' | 14+70.86 | 48.16 RT |
| 53 | BL-12 | 865797.5390 | 1636160.4234 | 979.67' | 23+86.71 | 56.70 RT |
| 54 | BL-13 | 866317.3661 | 1636124.7952 | 971.53' | 28+98.33 | 48.44 RT |
| 55 | BL-14(JKA-84)(BY1-45) | 867392.4518 | 1635865.0142 | 975.50' | 39+98.25 | 36.77 RT |
| 56 | BL-15 | 867912.7022 | 1635526.8046 | 974.74' | 46+16.74 | 43.12 RT |
| 57 | BL-16 | 868675.8112 | 1635019.8819 | 952.44' | 55+32.87 | 46.65 RT |
| 58 | BL-17 | 869247.3785 | 1634634.2979 | 953.45' | 62+22.34 | 44.39 RT |
| 59 | BL-18 | 869672.0439 | 1634371.7160 | 961.90' | 67+27.01 | 44.53 RT |
| 60 | BL-19 | 870031.9342 | 1634216.0467 | 969.50' | 71+25.60 | 44.36 RT |
| 61 | BL-20 | 870605.4230 | 1634079.6414 | 981.39' | 77+25.46 | 44.67 RT |
| 62 | BL-21 | 871076.4595 | 1634057.2148 | 990.02' | 82+03.88 | 44.88 RT |
| 63 | BL-22 | 871901.8758 | 1634066.2143 | 984.73' | OUTSIDE PROJECT LIMITS | |

BY1

| POINT | DESC. | NORTH | EAST | ELEVATION | Y3 STATION | OFFSET |
|---|---|---|---|---|---|---|
| 110 | BL-10(JKA-83) | 863997.2425 | 1635139.9823 | 970.37' | OUTSIDE PROJECT LIMITS | |
| 111 | BY1-40 | 864911.5136 | 1635638.3348 | 968.63' | OUTSIDE PROJECT LIMITS | |
| 112 | BY1-41 | 865571.2622 | 1635859.5281 | 960.89' | OUTSIDE PROJECT LIMITS | |
| 113 | BY1-42 | 866309.6516 | 1635852.0479 | 964.16' | 10+46.71 | 56.26 RT |
| 114 | BY1-43 | 867037.8242 | 1635688.8808 | 960.79' | 17+86.78 | 28.21 LT |
| 115 | BY1-45(BL-14)(JKA-84) | 867392.4518 | 1635865.0142 | 975.50' | 21+68.07 | 77.32 RT |
| 116 | BY1-44 | 867850.5558 | 1635875.7179 | 933.79' | 26+14.13 | 27.57 LT |

BY2

| POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|---|---|---|---|---|---|---|
| 117 | BY1-41 | 865571.2622 | 1635859.5281 | 960.89' | 20+93.56 | 198.13 LT |
| 118 | BY2-51 | 865582.2281 | 1636360.1892 | 951.87' | 22+21.51 | 285.48 RT |

BY3

| POINT | DESC. | NORTH | EAST | ELEVATION | Y2 STATION | OFFSET |
|---|---|---|---|---|---|---|
| 119 | BY1-42 | 866309.6516 | 1635852.0479 | 964.16' | 12+66.65 | 66.11 RT |
| 120 | BY3-53 | 866132.9553 | 1636373.8046 | 954.91' | 18+08.18 | 34.89 LT |
| 121 | BY3-54 | 865894.9688 | 1636654.4244 | 949.46' | 21+59.81 | 36.36 LT |
| 122 | BY3-55 | 865867.6314 | 1637115.7737 | 930.43' | 22+01.98 | 490.63 LT |

BY4

| POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|---|---|---|---|---|---|---|
| 123 | BL-13 | 866317.3700 | 1636124.8000 | 971.53' | 28+98.34 | 48.45 RT |
| 124 | BY4-57 | 866360.5579 | 1636287.4184 | 948.79' | 29+24.28 | 214.69 RT |
| 125 | BY4-58 | 866879.1246 | 1636240.0569 | 946.19' | 34+36.38 | 223.06 RT |
| 126 | BY4-59 | 867182.4295 | 1636074.6741 | 950.57' | 37+34.16 | 136.47 RT |
| 127 | BY4-60 | 867494.6142 | 1636105.8659 | 945.37' | 39+69.20 | 296.38 RT |

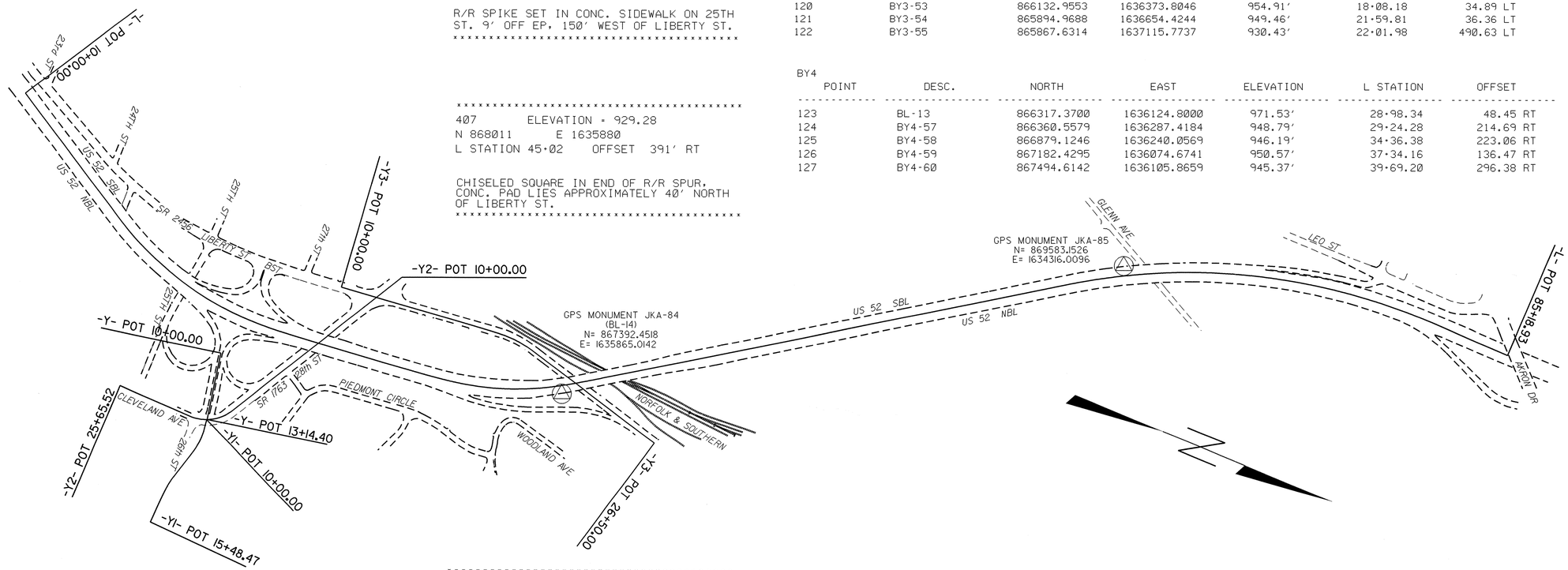
GPS MONUMENT JKA-83
(BL-10)
N= 863997.2425
E= 1635139.9823

****************************************
406 ELEVATION = 961.31
N 865593 E 1635609
L STATION 20+21 OFFSET 443' LT

R/R SPIKE SET IN CONC. SIDEWALK ON 25TH ST. 9' OFF EP, 150' WEST OF LIBERTY ST.
****************************************

****************************************
407 ELEVATION = 929.28
N 868011 E 1635880
L STATION 45+02 OFFSET 391' RT

CHISELED SQUARE IN END OF R/R SPUR, CONC. PAD LIES APPROXIMATELY 40' NORTH OF LIBERTY ST.
****************************************




****************************************
408 ELEVATION = 948.69
N 869154 E 1634774
L STATION 60+67 OFFSET 108' RT

R/R SPIKE SET IN THE BASE 24" OAK
****************************************

****************************************
409 ELEVATION = 1008.00
N 871445 E 1634068
L STATION 85+18.91
N 44°20'00" E 74.00'

STEEL NAIL IN SOUTH SIDEWALK OF AKRON BRIDGE OVER US 52 NORTH BOUND
****************************************

## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS JKA-85" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 869583.1526(ft) EASTING: 1634316.0096(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995080
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS JKA-85" TO -L- STATION 10+00.00 IS
S 13° 35' 55.35" E 5173.97'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

## NOTES:

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

HTTP:\WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT.
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.

NOTE: DRAWING NOT TO SCALE

6/2/99

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2 |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

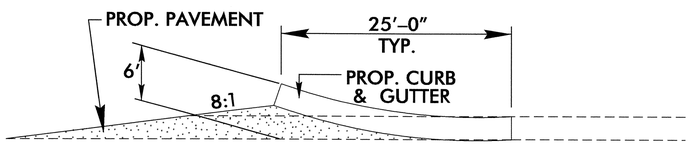
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROBERT D. THOMAS 12/8/09

NORTH CAROLINA PROFESSIONAL SEAL 13361 ENGINEER DAVID CHI CHEN 12/7/09

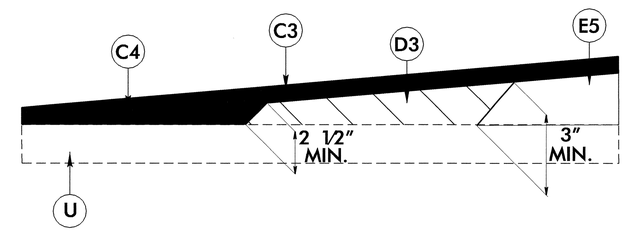
# PAVEMENT SCHEDULE

| | | | | | |
|---|---|---|---|---|---|
| A | 12" JOINTED PORTLAND CEMENT CONCRETE PAVEMENT (WITH DOWELS THROUGH LANES) | E1 | PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD. | R2 | CONCRETE MEDIAN BARRIER. (3" KEY IN DEPTH) |
| C1 | PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE OF 137.5 LBS. PER SQ. YD. | E2 | PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. | R3 | SHOULDER BERM GUTTER. |
| C2 | PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE OF 168 LBS. PER SQ. YD. | E3 | PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD. | S | CONCRETE SIDEWALK. |
| C3 | PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. | E4 | PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. | T | EARTH MATERIAL. |
| C4 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH. | E5 | PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH. | U | EXISTING PAVEMENT. |
| C5 | PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. | J1 | PROP. 6" AGGREGATE BASE COURSE. | W | VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL FOR RESURFACING). |
| D1 | PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD. | J2 | PROP. 10" AGGREGATE BASE COURSE. | Z | MILLED RUMBLE STRIPS |
| D2 | PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. | Q | MILLING EXISTING PAVEMENT, 1½" DEPTH. | | |
| D3 | PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH. | R1 | 2'-6" CONCRETE CURB AND GUTTER. | | |

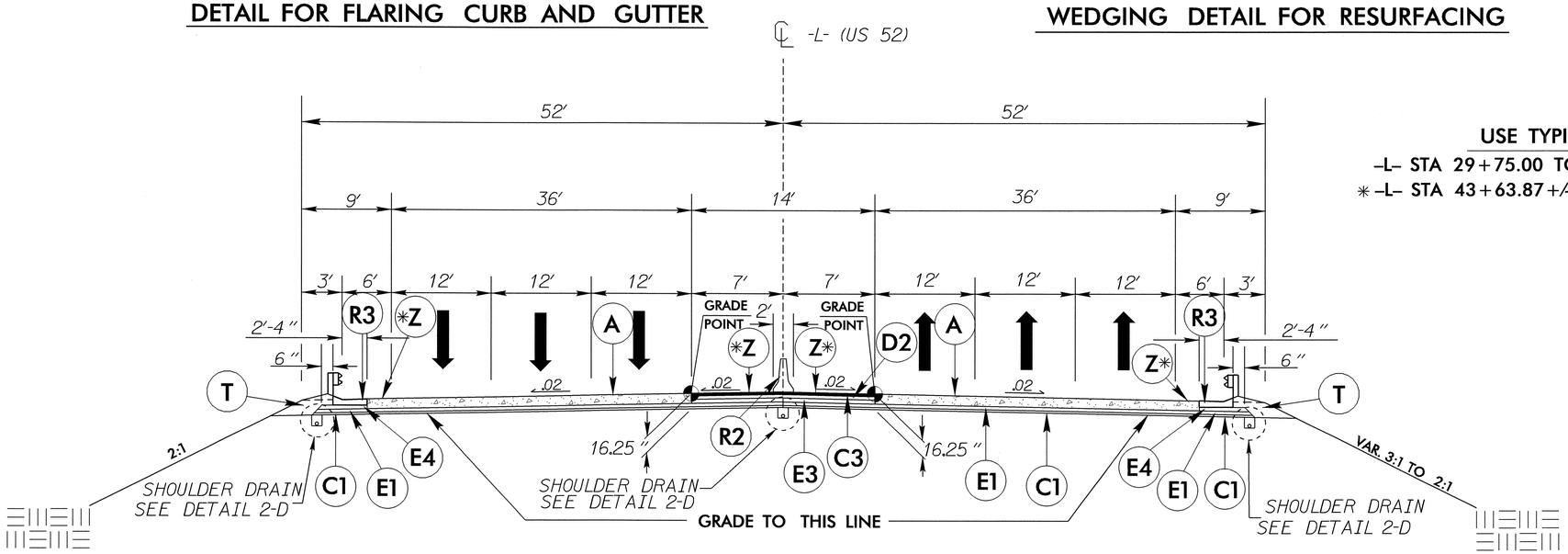
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.




DETAIL FOR FLARING CURB AND GUTTER




WEDGING DETAIL FOR RESURFACING




USE TYPICAL SECTION NO. 1

-L- STA 29+75.00 TO STA 39+55.77 +/- (BEGIN BRIDGE)

* -L- STA 43+63.87 +/- (END BRIDGE) TO 49+60.00

TYPICAL SECTION NO. 1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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-A |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

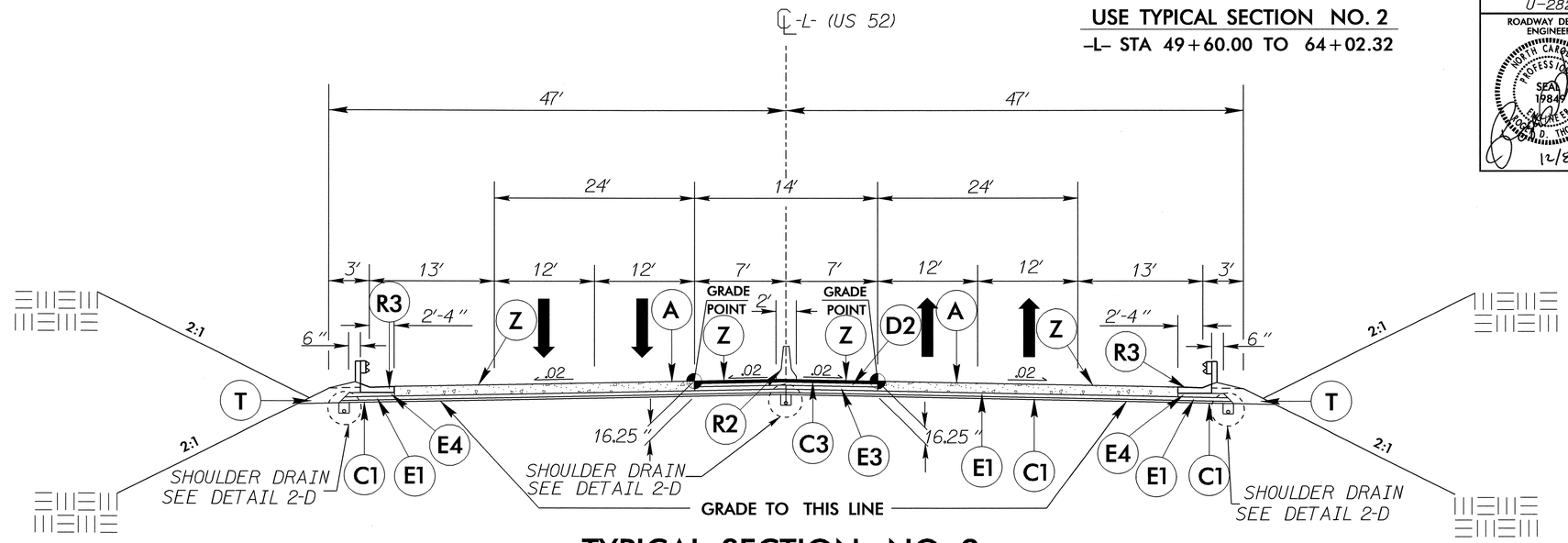
12/8/09 — 12/7/09

| PAVEMENT SCHEDULE | |
|---|---|
| A | 12" JOINTED CONCRETE PAVEMENT |
| C1 | 1¼", TYPE SF9.5A |
| C3 | 3", TYPE S9.5B |
| C5 | 3", TYPE S9.5C |
| D1 | 3", TYPE I19.0C |
| D2 | 4", TYPE I19.0B |
| E1 | 3", TYPE B25.0B |
| E3 | 5", TYPE B25.0B |
| E4 | 7", TYPE B25.0B |
| J2 | 10", ABC |
| R2 | CONCRETE MEDIAN BARRIER (3" KEY IN DEPTH) |
| R3 | SHOULDER BERM GUTTER |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| Z | MILLED RUMBLE STRIPS |

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

## USE TYPICAL SECTION NO. 2

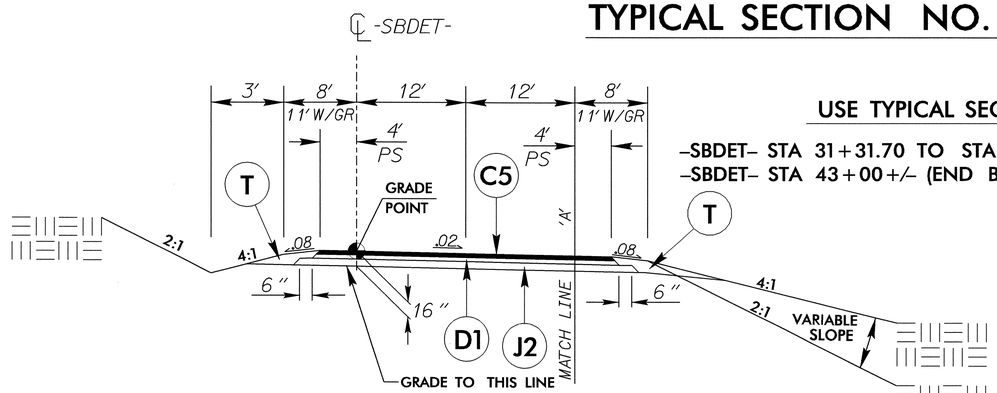
–L– STA 49+60.00 TO 64+02.32



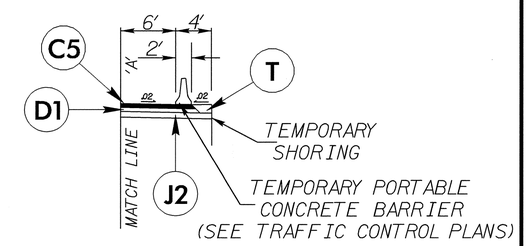

## TYPICAL SECTION NO. 2

## USE TYPICAL SECTION NO. 3

–SBDET– STA 31+31.70 TO STA 38+21+/– (BEGIN BRIDGE)
–SBDET– STA 43+00+/– (END BRIDGE) TO 63+24.76




## TYPICAL SECTION NO. 3

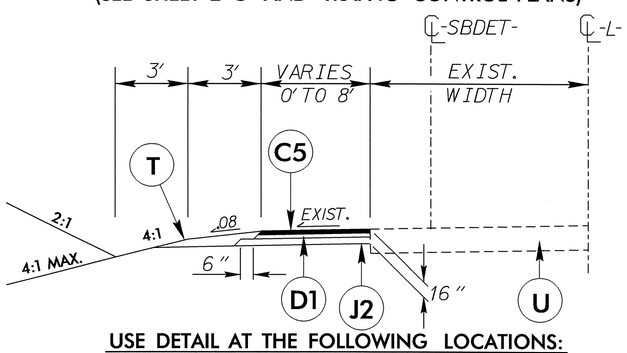



## TYPICAL SECTION NO. 3A

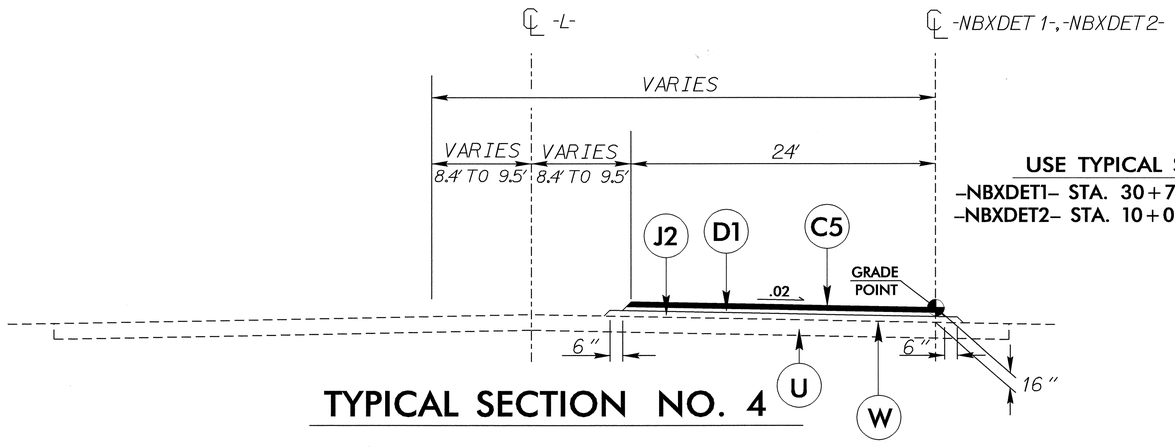
TO BE USED IN CONJUNCTION WITH TYP. SECT. NO. 3
–SBDET– STA. 34+00.00 TO STA. 38+29+/– RT.

## DETAIL FOR TEMPORARY PAVEMENT TO BE USED WITH –SBDET–

(SEE SHEET 2–G AND TRAFFIC CONTROL PLANS)




USE DETAIL AT THE FOLLOWING LOCATIONS:
–L– STA 29+56 TO 32+78.5 LT.
–L– STA 61+96 TO 65+10.5 LT.
OR AS DIRECTED BY THE ENGINEER




## USE TYPICAL SECTION NO. 4

–NBXDET1– STA. 30+78.99 TO STA. 35+64.93
–NBXDET2– STA. 10+00.00 TO STA. 16+21.00

## TYPICAL SECTION NO. 4

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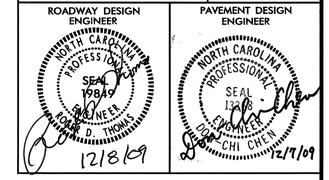
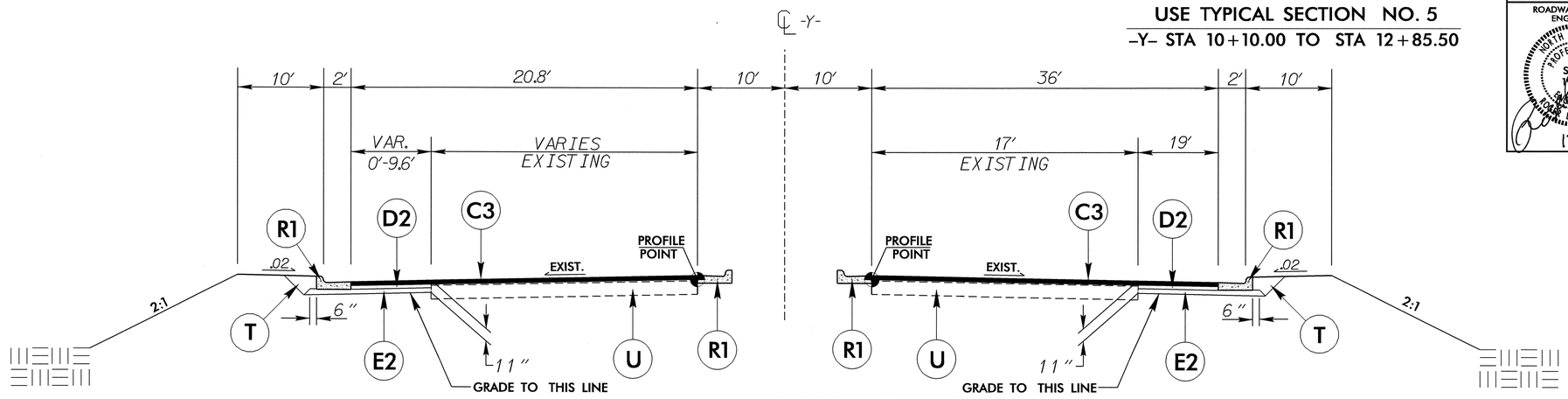
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-B |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |




## USE TYPICAL SECTION NO. 5

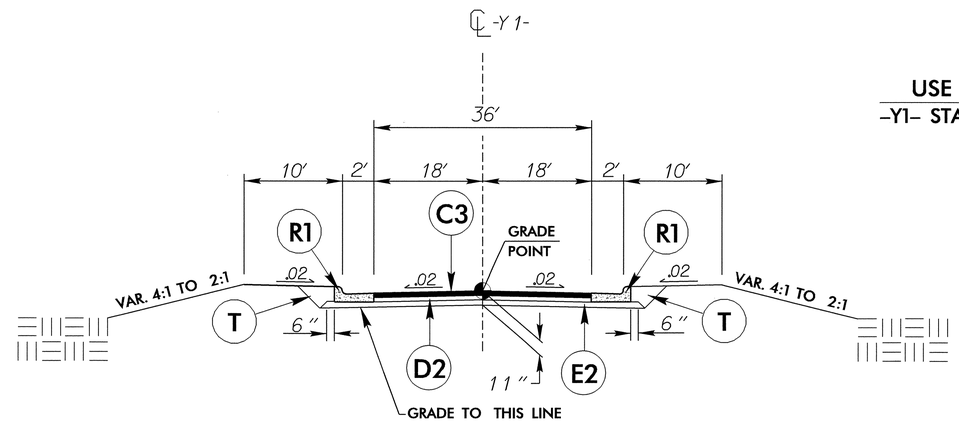
-Y- STA 10+10.00 TO STA 12+85.50




# TYPICAL SECTION NO. 5

## USE TYPICAL SECTION NO. 6

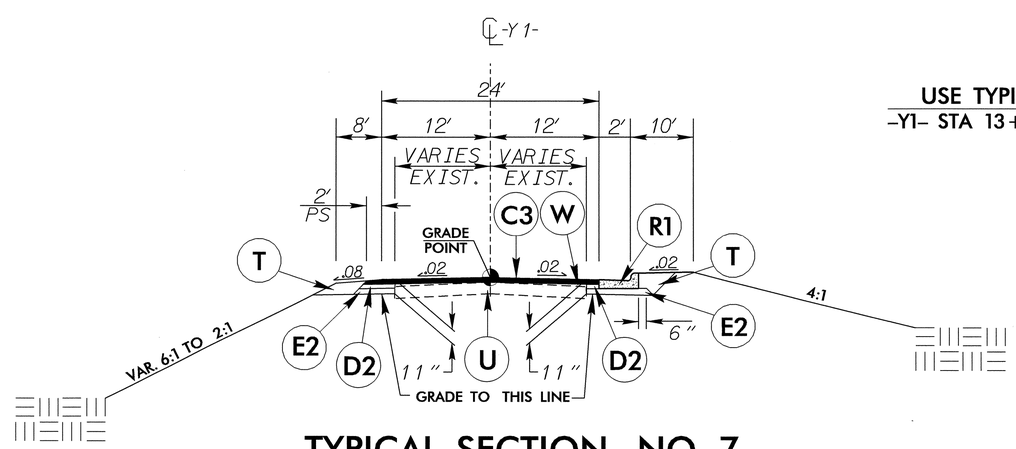
-Y1- STA 10+28.91 TO STA 13+00.00




# TYPICAL SECTION NO. 6

## USE TYPICAL SECTION NO. 7

-Y1- STA 13+00.00 TO STA 15+00.00




# TYPICAL SECTION NO. 7

| PAVEMENT SCHEDULE | |
|---|---|
| C3 | 3", TYPE S9.5B |
| D2 | 4", TYPE I19.0B |
| E2 | 4", TYPE B25.0B |
| R1 | 2'-6" CONC. C&G |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| W | VAR.DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL) |

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

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-C |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER JEFF D. THOMAS 12/8/09

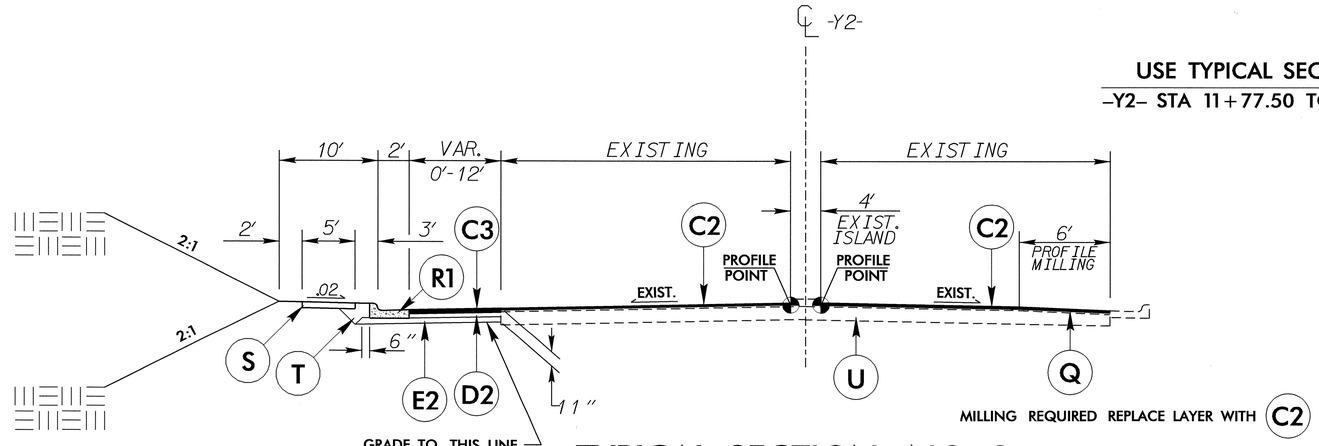
NORTH CAROLINA PROFESSIONAL SEAL 13268 ENGINEER EDWARD CHI CHEN 12/7/09

| PAVEMENT SCHEDULE | |
|---|---|
| C2 | 1½", TYPE S9.5B |
| C3 | 3", TYPE S9.5B |
| D2 | 4", TYPE I19.0B |
| E2 | 4", TYPE B25.0B |
| J1 | 6", ABC |
| Q | MILLING |
| R1 | 2'-6" CONC. C&G |
| S | CONCRETE SIDEWALK |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |

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

USE TYPICAL SECTION NO. 8

-Y2- STA 11+77.50 TO STA 18+07.00

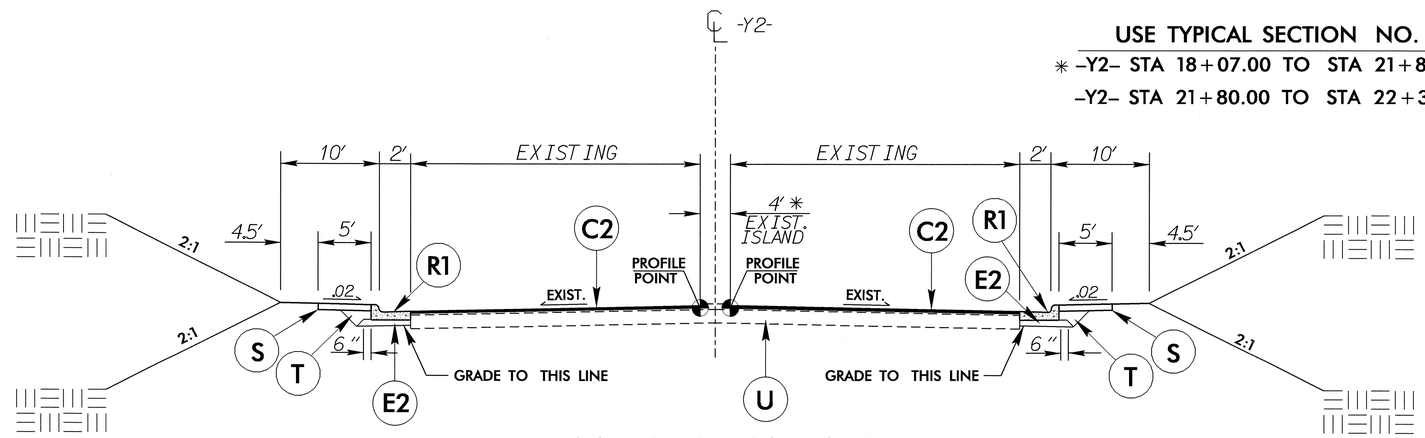



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 9

* -Y2- STA 18+07.00 TO STA 21+80.00

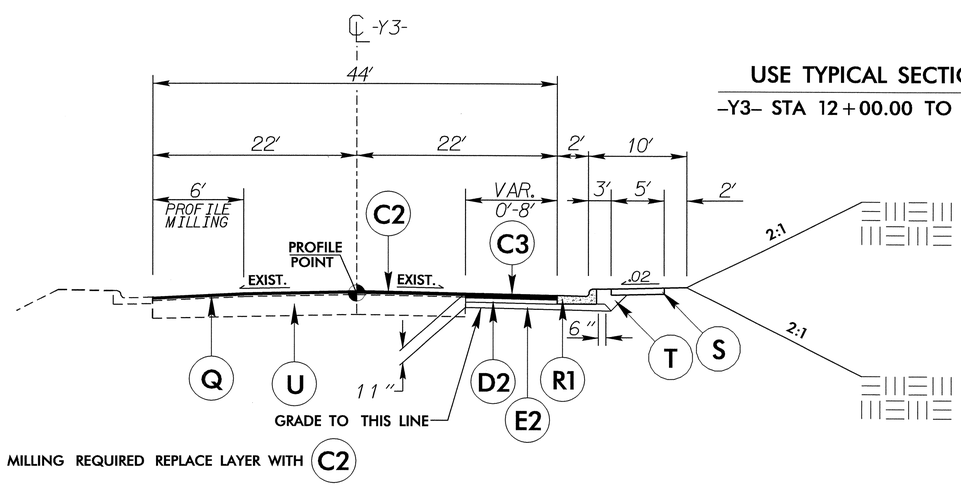
-Y2- STA 21+80.00 TO STA 22+39.00




TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 10

-Y3- STA 12+00.00 TO STA 26+00.00



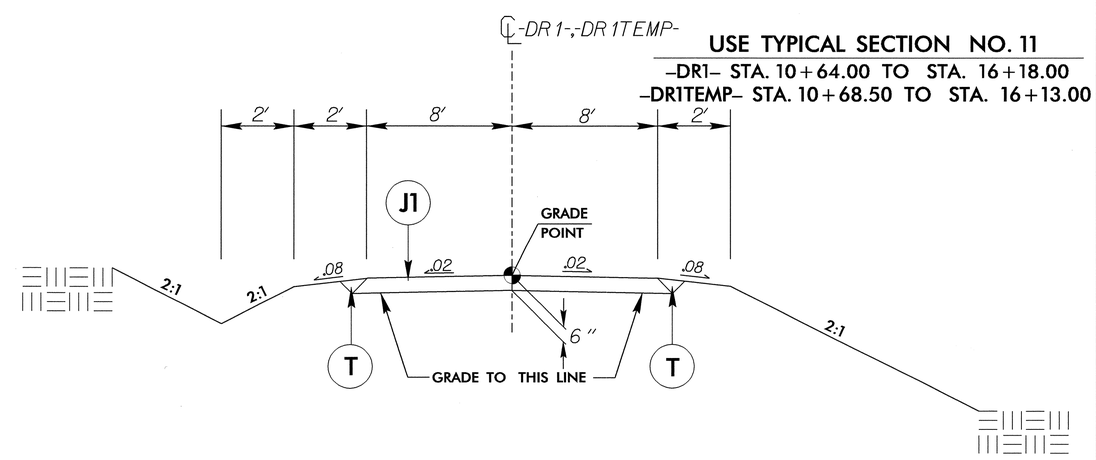

TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 11

-DR1-,-DR1TEMP-

-DR1- STA. 10+64.00 TO STA. 16+18.00

-DR1TEMP- STA. 10+68.50 TO STA. 16+13.00




TYPICAL SECTION NO. 11

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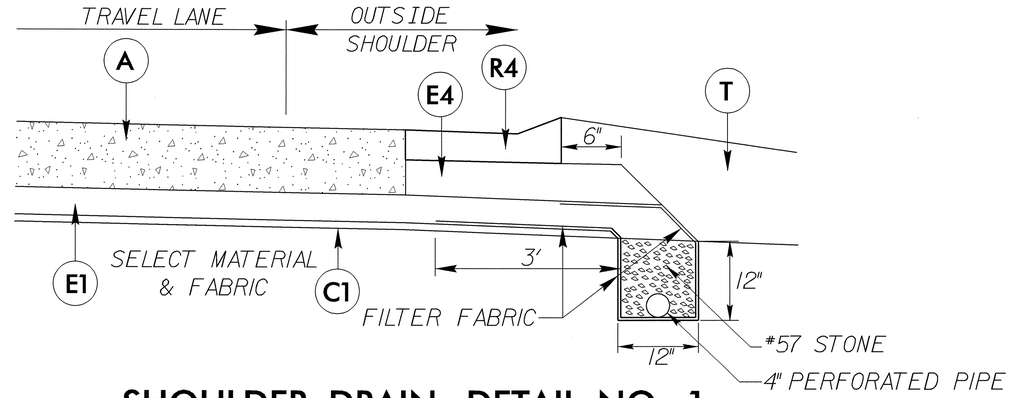
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-D |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROBERT D. THOMAS 1/11/10

NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DON-CHI CHEN 1/11/10

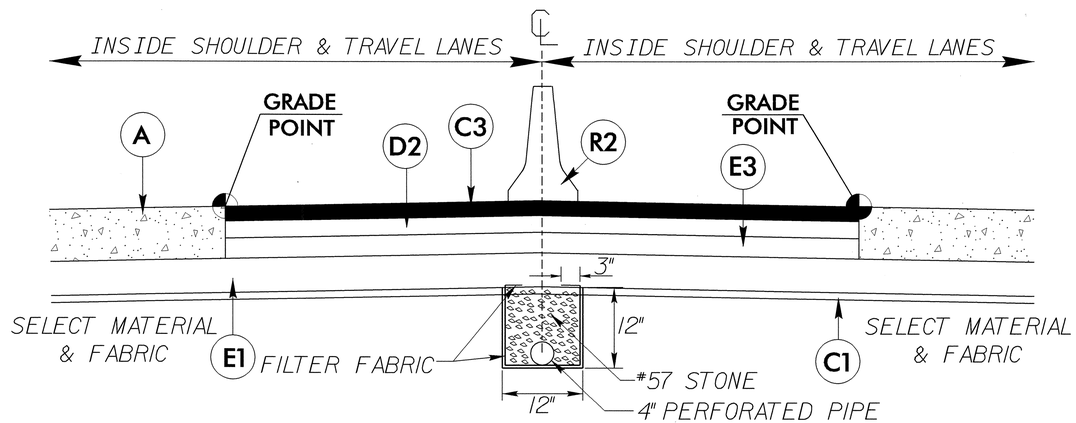
| PAVEMENT SCHEDULE | |
|---|---|
| A | 12" JOINTED CONCRETE PAVEMENT |
| C1 | 1¼", TYPE SF9.5A |
| C3 | 3", TYPE S9.5B |
| D2 | 4", TYPE I19.0B |
| E1 | 3", TYPE B25.0B |
| E3 | 5", TYPE B25.0B |
| E4 | 7", TYPE B25.0B |
| R2 | CONCRETE MEDIAN BARRIER (3" KEY IN DEPTH) |
| R4 | SHOULDER BERM GUTTER |
| T | EARTH MATERIAL |

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



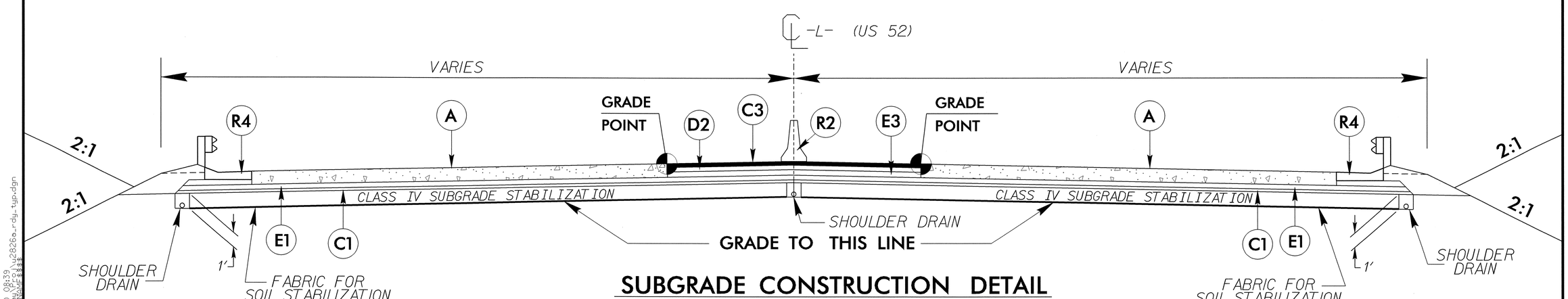

## SHOULDER DRAIN DETAIL NO. 1

USE WITH TYPICAL SECTIONS 1 & 2




## SHOULDER DRAIN DETAIL NO. 2

USE WITH TYPICAL SECTIONS 1 & 2




## SUBGRADE CONSTRUCTION DETAIL

-L- STA. 30+50.00 TO STA. 39+55.77 +/- (BEGIN BRIDGE)
-L- STA. 43+63.87 +/- (END BRIDGE) TO STA. 63+42.00

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-E |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROGER D. THOMAS

12/3/09

# STRUCTURE TYPICAL SECTIONS

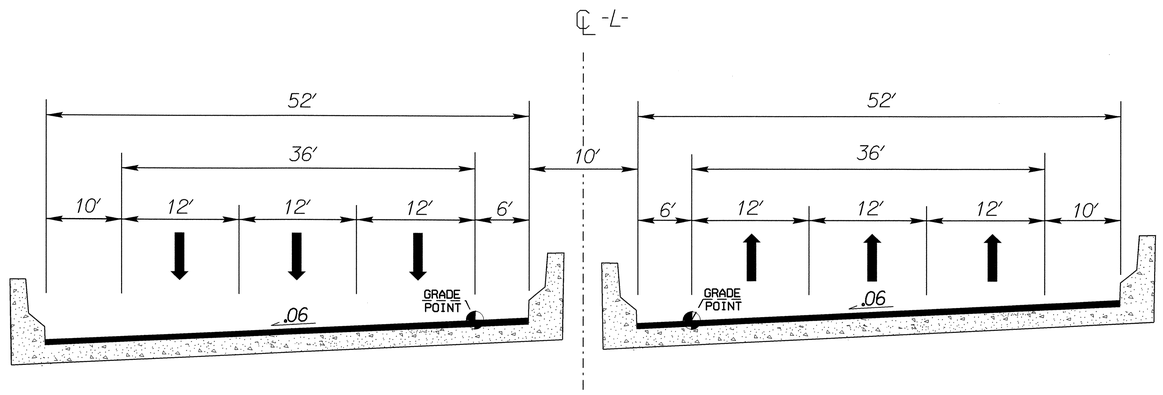
## –L– STRUCTURES

### US 52 OVER NORFOLK AND SOUTHERN RAILROAD AND LIBERTY STREET (–Y3–)

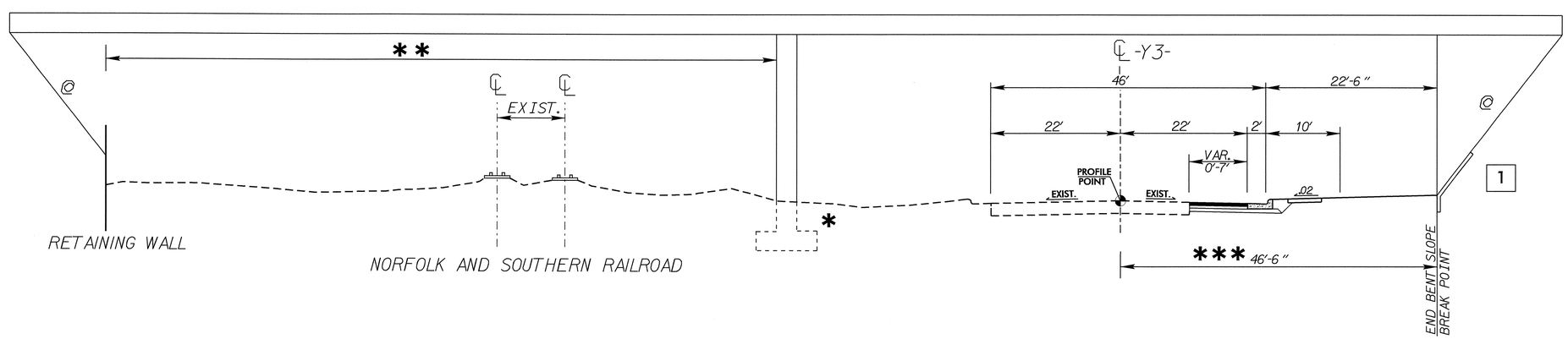
**DESIGN DATA**

ADT 2009 = 77,800
ADT 2030 = 77,600
DHV = 10 %
D = 50 %
T = 12 % *
V = 55 MPH
* TTST 7 % DUAL 5 %
FUNC CLASS = FREEWAY
MIN. VERTICAL CLEARANCE OVER RAILROAD = 23'
MIN. VERTICAL CLEARANCE OVER –Y3– = 15'–6"

1 SEE STD. 610.02




TYPICAL SECTION ON STRUCTURE




TYPICAL SECTION UNDER STRUCTURE

@ SLOPE DETERMINED BY SOILS AND FOUNDATION
* STRUCTURE DESIGN TO DETERMINE IF PIER IS NECESSARY
** HORIZONTAL CLEARANCES TO BE DETERMINED BY STRUCTURE DESIGN
*** ADDITIONAL BERM WIDTH REQUIRED FOR A FUTURE 11' TRAVEL LANE

6/2/99

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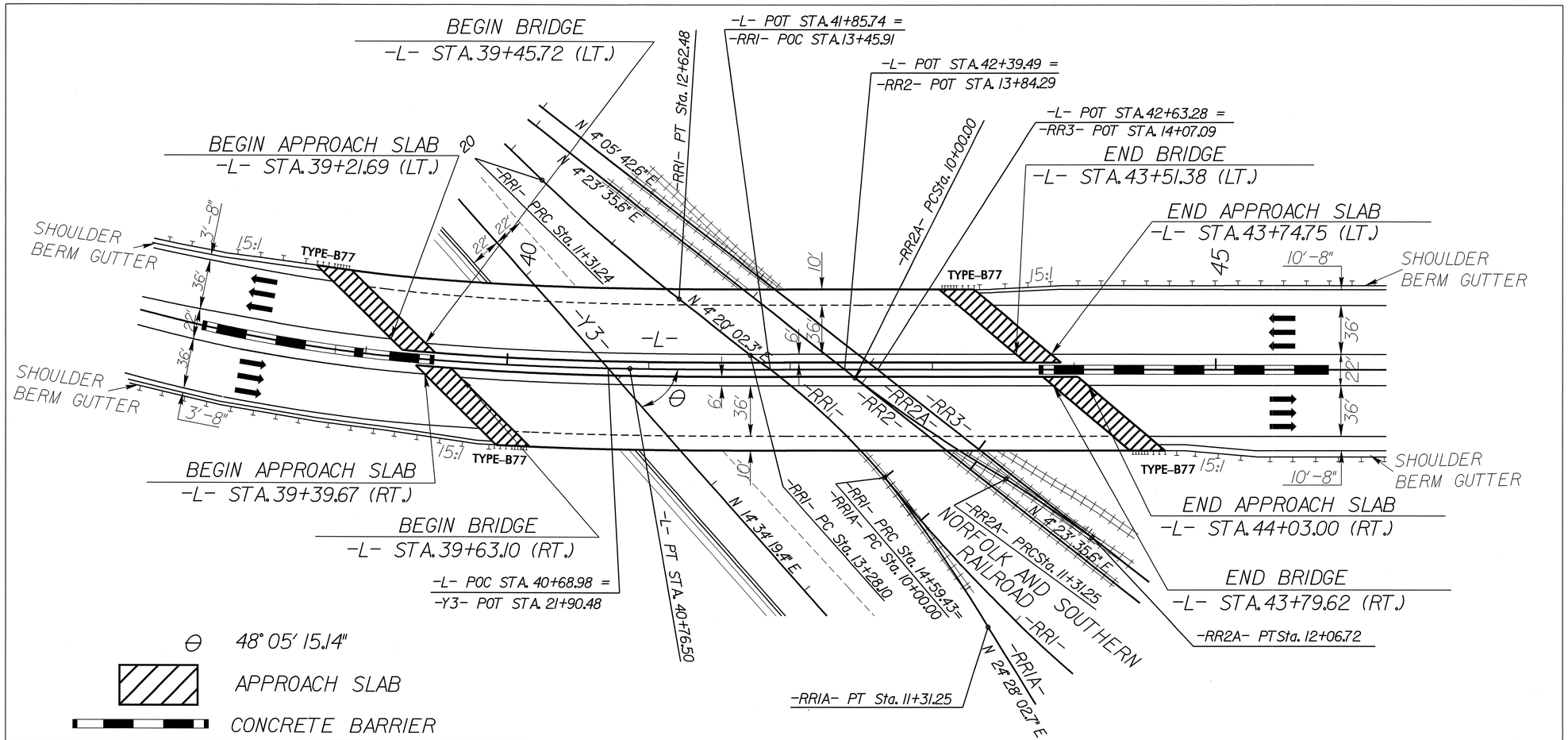
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-F |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROBERT D. THOMAS

12/3/09

# SKETCH SHOWING PAVEMENT WIDTH TO BRIDGE WIDTH RELATIONSHIP




DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP FOR -L- OVER NORFOLK AND SOUTHERN RAILROAD AND LIBERTY STREET (-Y3-)

6/2/99

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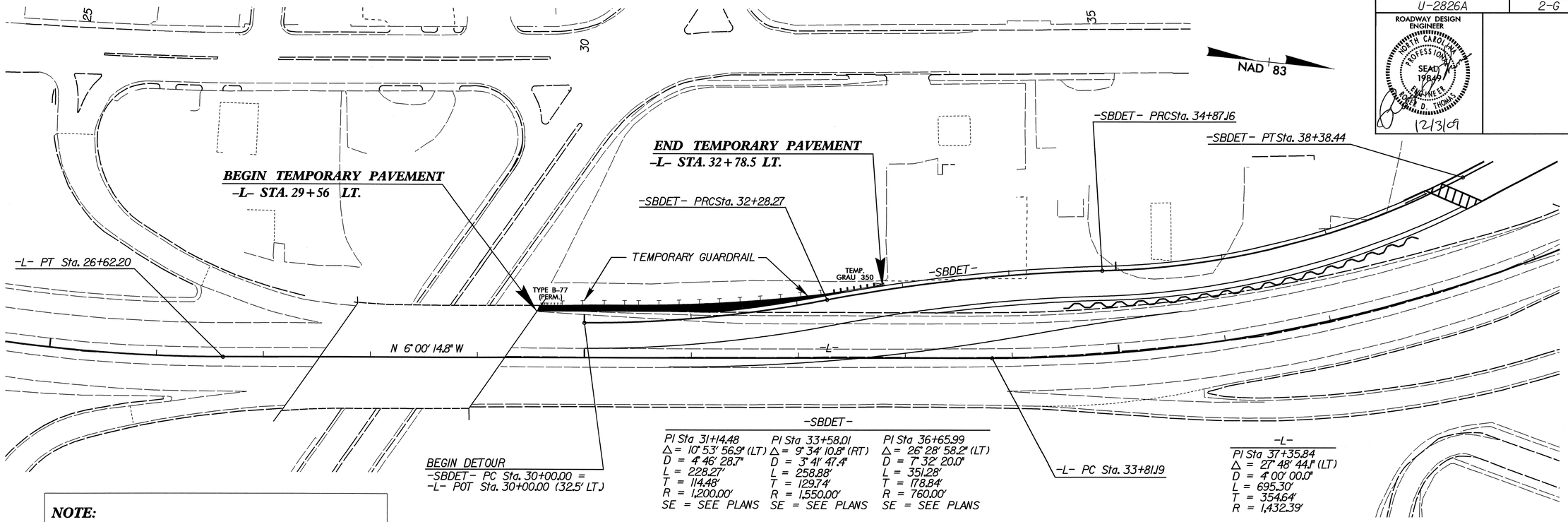
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-G |

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROGER D. THOMAS

12/3/09



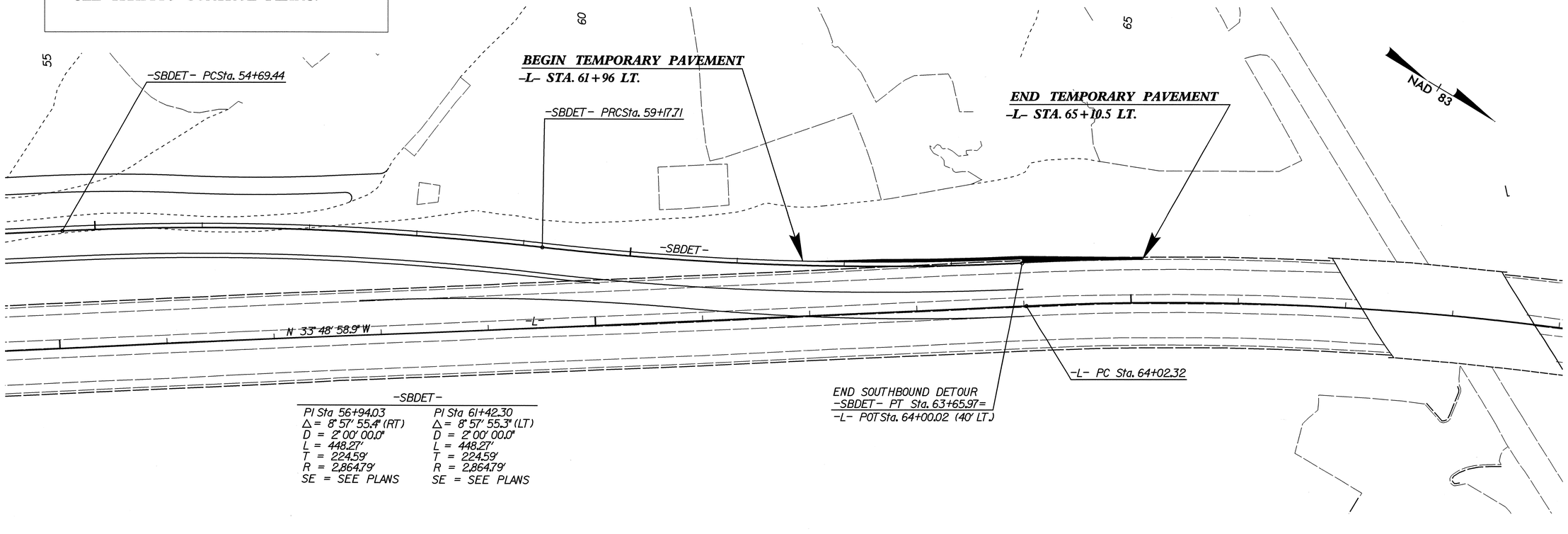

-SBDET-

| PI Sta 31+14.48 | PI Sta 33+58.01 | PI Sta 36+65.99 |
|---|---|---|
| Δ = 10° 53' 56.9" (LT) | Δ = 9° 34' 10.8" (RT) | Δ = 26° 28' 58.2" (LT) |
| D = 4° 46' 28.7" | D = 3° 41' 47.4" | D = 7° 32' 20.0" |
| L = 228.27' | L = 258.88' | L = 351.28' |
| T = 114.48' | T = 129.74' | T = 178.84' |
| R = 1,200.00' | R = 1,550.00' | R = 760.00' |
| SE = SEE PLANS | SE = SEE PLANS | SE = SEE PLANS |

-L-

PI Sta 37+35.84
Δ = 27° 48' 44.1" (LT)
D = 4° 00' 00.0"
L = 695.30'
T = 354.64'
R = 1,432.39'

**NOTE:**
**TEMPORARY PAVEMENT TO BE USED DURING TRAFFIC PHASING. SEE TRAFFIC CONTROL PLANS.**




-SBDET-

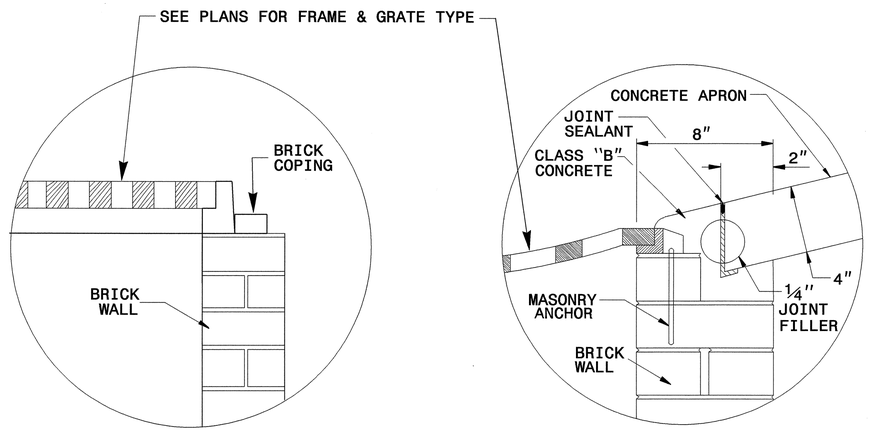
| PI Sta 56+94.03 | PI Sta 61+42.30 |
|---|---|
| Δ = 8° 57' 55.4" (RT) | Δ = 8° 57' 55.3" (LT) |
| D = 2° 00' 00.0" | D = 2° 00' 00.0" |
| L = 448.27' | L = 448.27' |
| T = 224.59' | T = 224.59' |
| R = 2,864.79' | R = 2,864.79' |
| SE = SEE PLANS | SE = SEE PLANS |

REVISIONS

8/17/99

02-DEC-2009 13:56
R:\Roadway\Proj\u2826a_rdy_temppavt_pshdgn
$$$$USERNAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-H |




GRATE PLACEMENT DETAIL

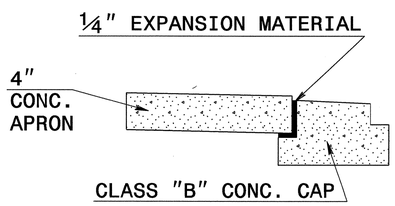
FOR DROP INLETS

GRATE PLACEMENT DETAIL

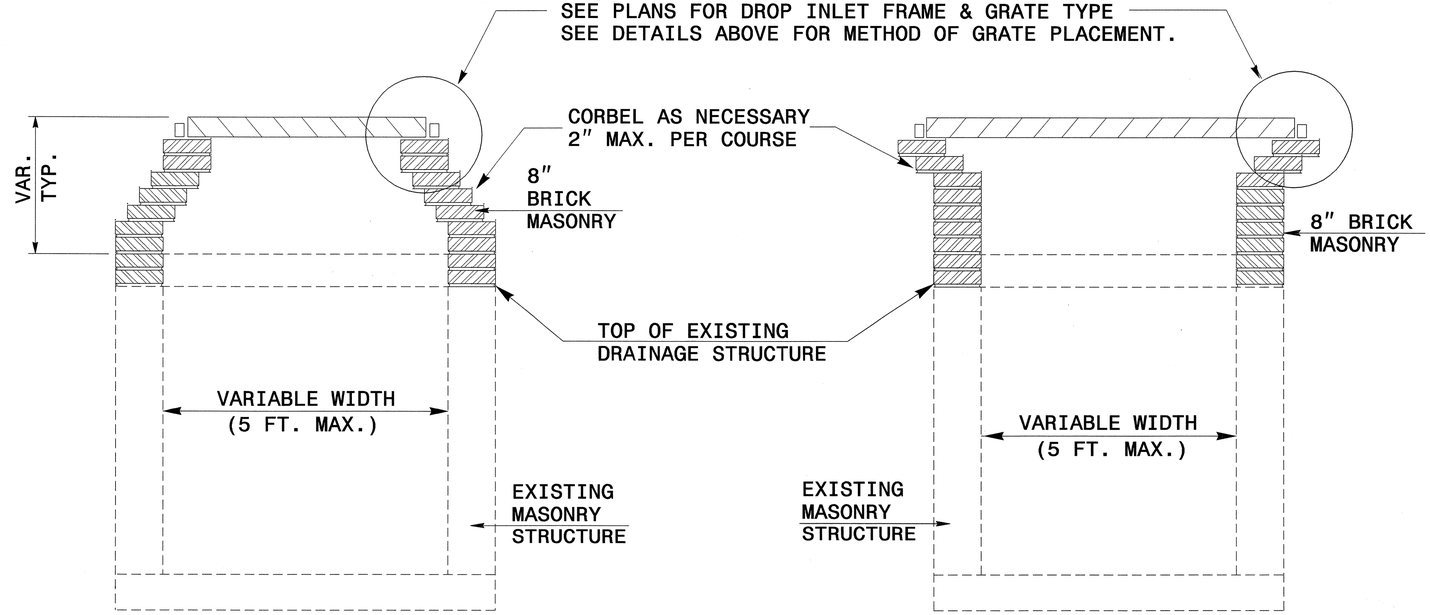
FOR GRATED DROP INLETS

GENERAL NOTES:

- -CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.
- -USE CLASS B CONCRETE.
- -THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.
- -JUMBO CONCRETE BRICK WILL BE PERMITTED. 4" CONCRETE BRICK OR 8" SOLID CONCRETE BLOCK ARE REQUIRED FOR DRAINAGE STRUCTURE.
- -INCLUDE 18" CONCRETE APRON IN UNIT PRICE BID PER EACH, CONVERT EXISTING CATCH BASIN TO DROP INLET.
- -SPECIAL DESIGN IS REQUIRED FOR USE UNDER PAVEMENT.
- -CONFIRM DIMENSIONS ON EACH INDIVIDUAL FRAME & GRATE PROPOSAL.
- -SEE STD. DRAWING 840.25 FOR MASONRY ANCHORAGE.




EXPANSION JOINT DETAIL




TYPICAL SECTION

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWARD
12/9/09

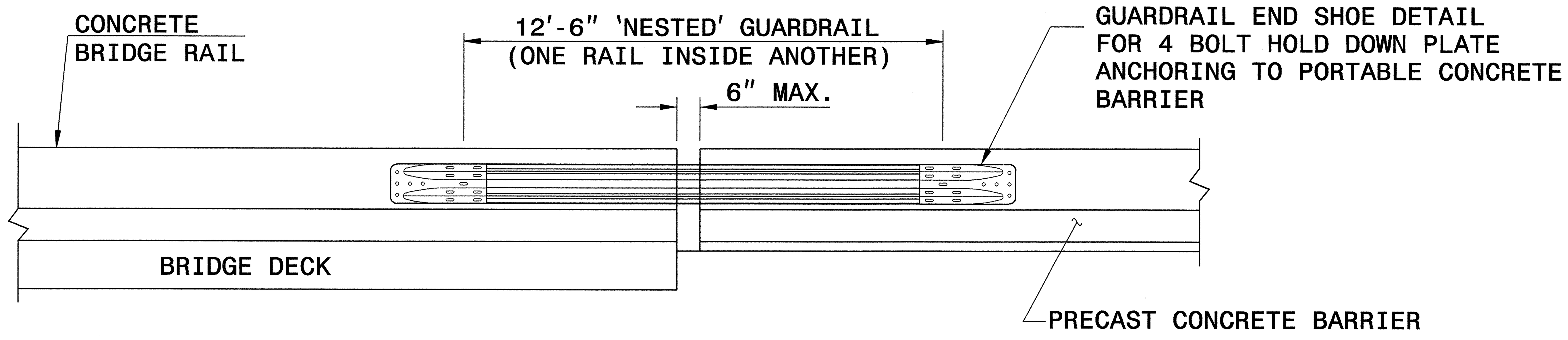
**PROJECT SERVICES UNIT**
**STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

**DETAIL TO CONVERT EXISTING CATCH BASIN OR JUNCTION BOX TO DROP INLET**

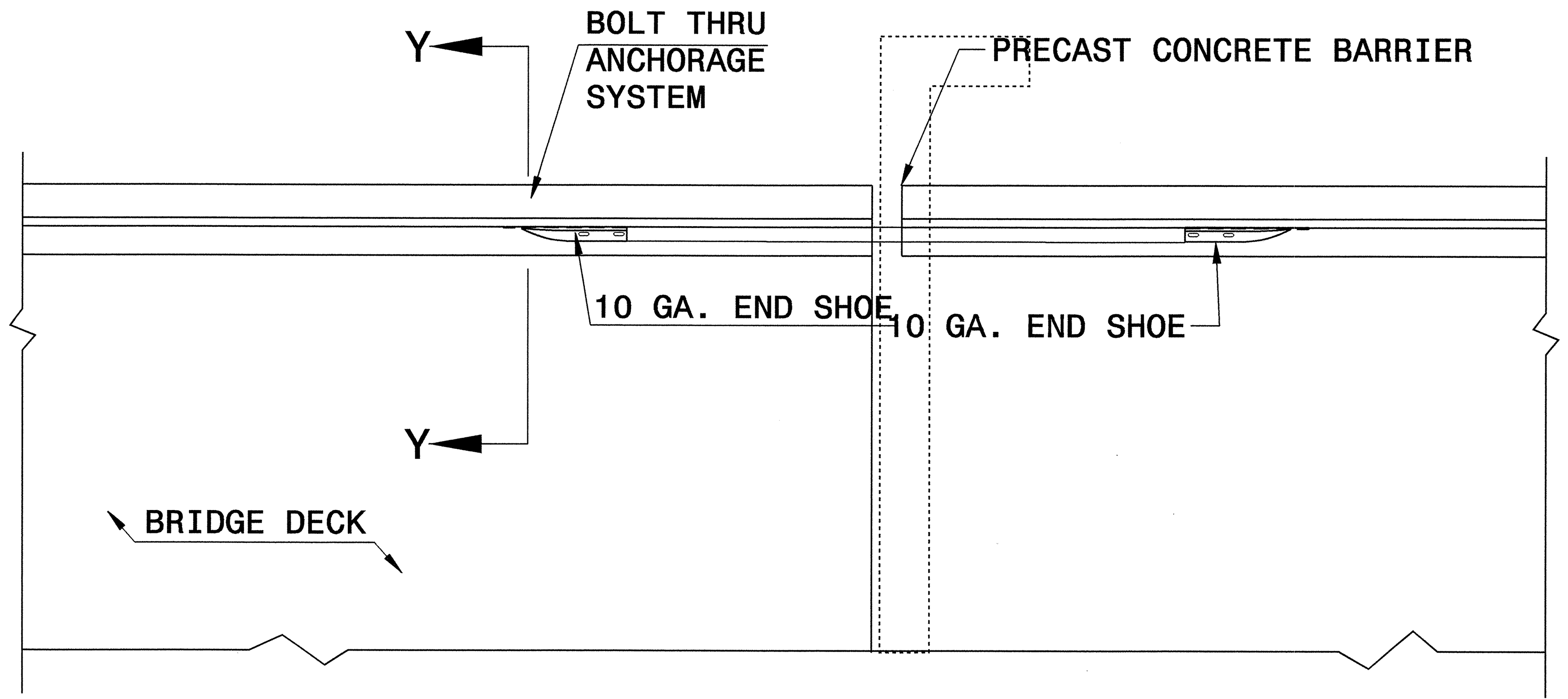
| | | | |
|---|---|---|---|
| ORIGINAL BY: | T.S.S. | DATE: | NOV.1997 |
| MODIFIED BY: | T.S.S. | DATE: | FEB.2000 |
| CHECKED BY: | [signature] | DATE: | 4/22/09 |
| FILE SPEC.: | DS174:usr/details/stand/cbtodi02.dgn | | |

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

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-I |




## ELEVATION VIEW



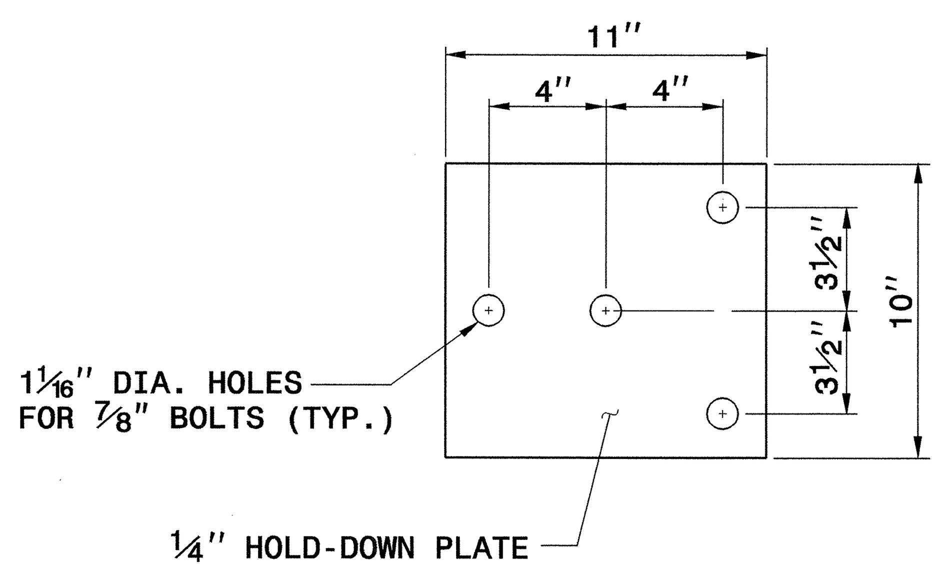

## PLAN VIEW

NOTES FOR 4 BOLT HOLD DOWN PLATE

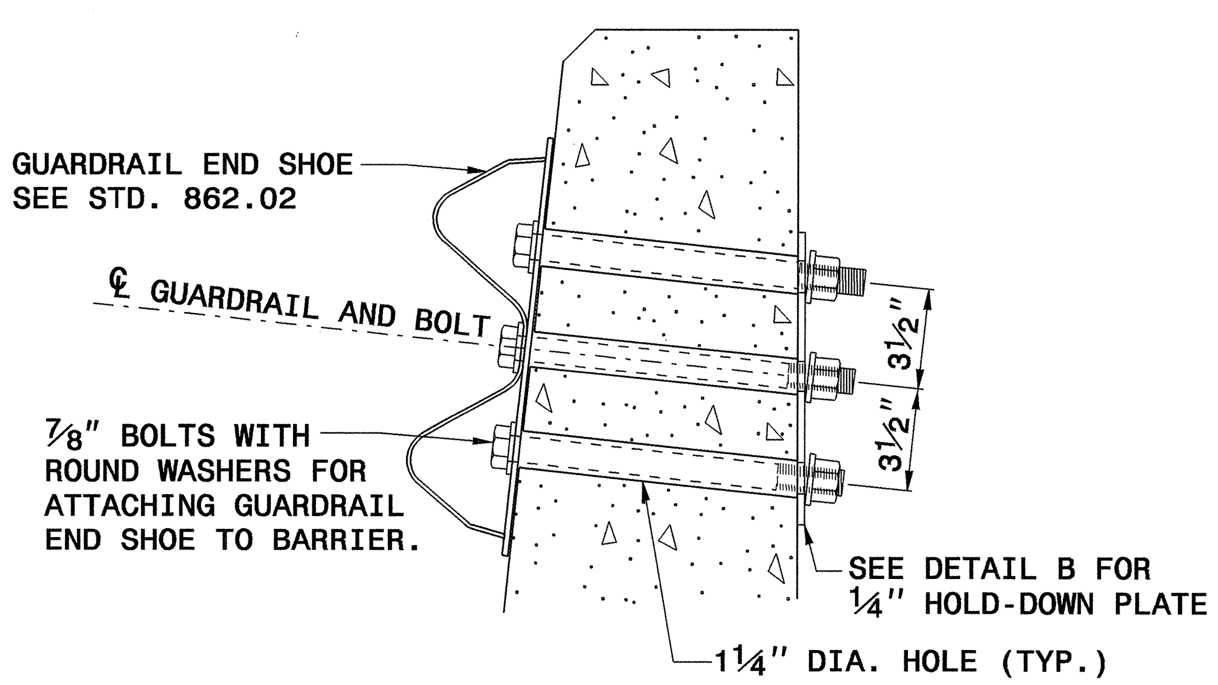
THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 7/8" DIA. BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1 1/4" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

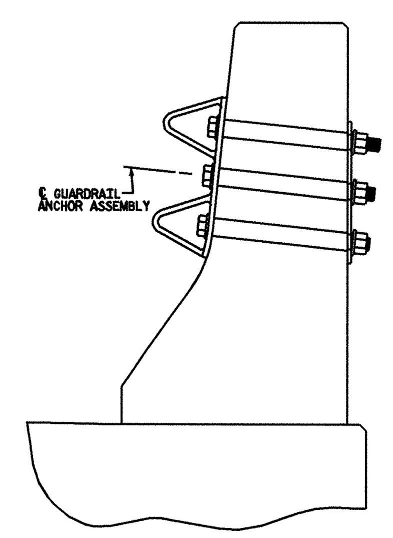



## 4 BOLT HOLD DOWN PLATE




## PART SECTION OF BARRIER OR RAIL

THRU END SHOE SECTION AND
4 BOLT HOLD DOWN PLATE




## SECTION Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 12/9/09

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

# TEMPORARY ANCHOR UNIT TYPE W-BEAM

ORIGINAL BY: C.O. CUEVAS DATE: 8-99
MODIFIED BY: E.E. WARD DATE: 8-03
CHECKED BY: [signature] DATE: 4/22/09
FILE SPEC.: /usr/details/stand/862stds/anc.dgn

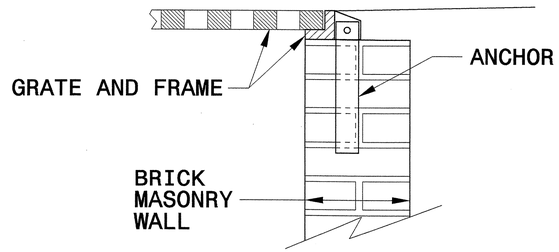
$$$$$$SYSTIME$$$$$ $$$$$$$$DGN$$$$$$$$$$$$$$ $$$$$$USERNAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-J |

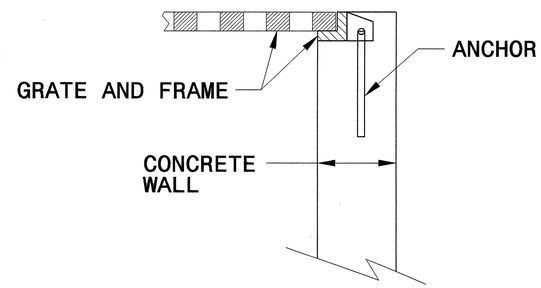
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
**ANCHORAGE FOR FRAMES**
BRICK/CONCRETE/PRECAST CONCRETE

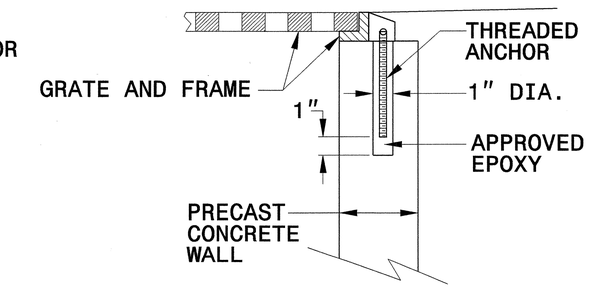
SHEET 1 OF 1
**840D25**




**BRICK MASONRY CONSTRUCTION**



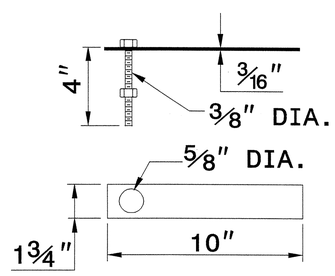

**CONCRETE CONSTRUCTION**



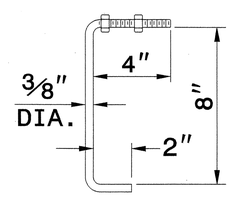

**PRECAST CONCRETE CONSTRUCTION**

## DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

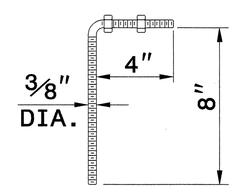
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



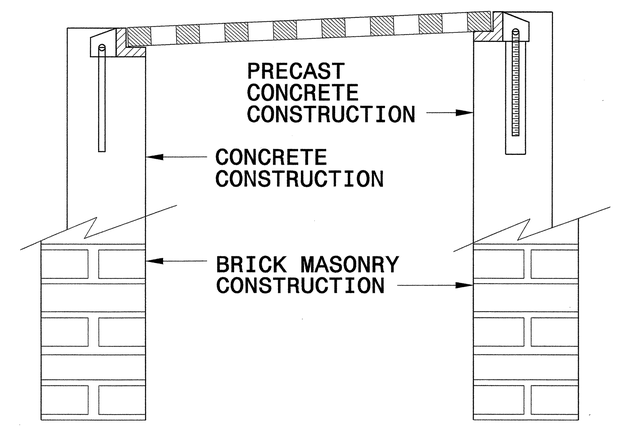

**MASONRY ANCHOR**
3/8" DIA. BOLT WITH PLATE




**CONCRETE ANCHOR**
3/8" DIA. BENT BAR




**PRECAST CONCRETE ANCHOR**
3/8" DIA. BENT BAR




**FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS**

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

ENGLISH DETAIL DRAWING FOR
**ANCHORAGE FOR FRAMES**
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
**840D25**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOMEWOOD
12/9/09

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

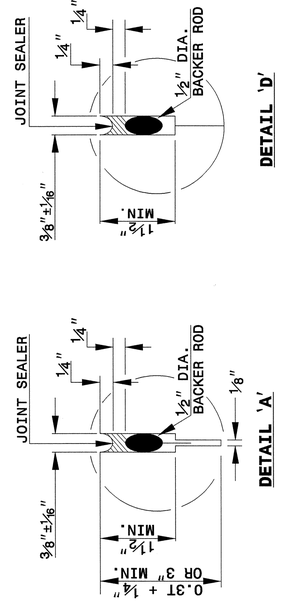
**SEE PLATE FOR TITLE**

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: [signature] DATE: 11/13/08
FILE SPEC.:

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

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-K |

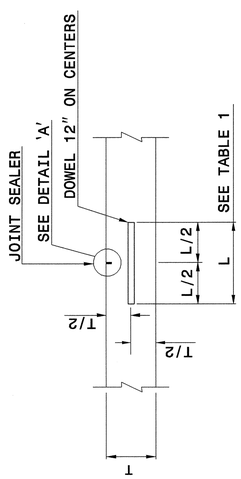
GENERAL NOTES:
- FORM TRANSVERSE CONTRACTION JOINTS BY SAWING WITH APPROVED EQUIPMENT.
- SPACE TRANSVERSE CONTRACTION JOINTS AT INTERVALS OF 15'.
- USE A DOWEL ASSEMBLY OR OTHER APPROVED DOWEL INSERTION TECHNIQUE IN ALL TRANSVERSE CONTRACTION JOINTS. DOWEL ASSEMBLIES ARE COVERED IN DETAIL 700D03.
- PROVIDE SMOOTH DOWEL BARS. PROVIDE DEFORMED TIE BARS.
- WHEN UTILIZING AN EARLY ENTRY SAW, CUT THE JOINT TO A MINIMUM DEPTH OF 3".



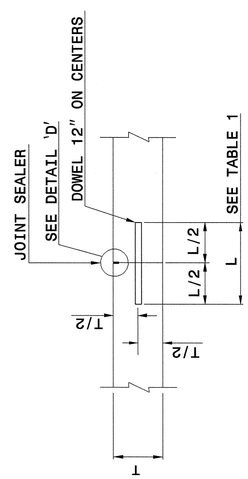

DETAIL 'A'

DETAIL 'D'

| TABLE I - DOWEL BARS | | |
|---|---|---|
| SLAB THICKNESS | DOWEL BAR "D" | DOWEL LENGTH "L" |
| 8" OR LESS | 1" | 14" |
| 8 1/2" TO 9 1/2" | 1 1/8" | 16" |
| 10" TO 10 1/2" | 1 1/4" | 18" |
| 11" AND ABOVE | 1 1/2" | 18" |




TRANSVERSE CONTRACTION JOINT



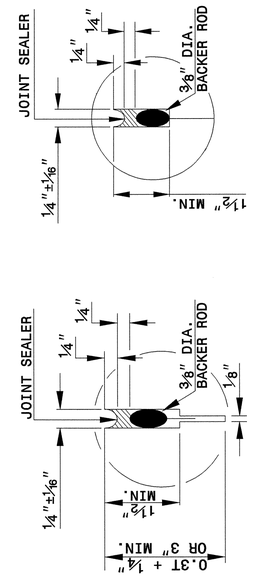

PLANNED TRANSVERSE CONSTRUCTION JOINT

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

ENGLISH DETAIL DRAWING FOR
**CONCRETE PAVEMENT JOINTS**
CONSTRUCTION AND CONTRACTION JOINTS

SHEET 1 OF 2 **700D01**

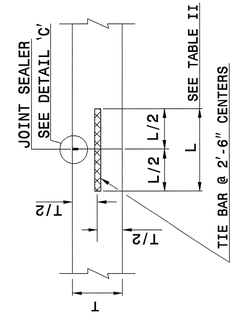
GENERAL NOTES:
- CONSTRUCT TRANSVERSE CONSTRUCTION JOINTS AT THE END OF EACH DAY'S OPERATION (PLANNED JOINT) OR WHEN THE PLACING OF CONCRETE IS SUSPENDED FOR MORE THAN 30 MINUTES (EMERGENCY JOINT).
- USE AN APPROVED HEADER AT EMERGENCY JOINTS STD. DWG. 700.04 AND DESIGNED TO PERMIT THE PLACEMENT OF AND CORRECTLY HOLD IN PLACE TIE BARS.
- USE TIE BARS OF THE SAME DIAMETER AS DOWEL BARS FOR EMERGENCY TRANSVERSE CONSTRUCTION JOINTS.
- LOCATE PLANNED TRANSVERSE CONSTRUCTION JOINTS AT THE SPACING REQUIRED FOR CONTRACTION JOINTS. USE AN APPROVED METHOD OF INSTALLING DOWELS IN ALL PLANNED TRANSVERSE CONSTRUCTION JOINTS.
- DO NOT LOCATE EMERGENCY TRANSVERSE CONSTRUCTION JOINTS LESS THAN 6' FROM ANY CONTRACTION JOINT OR PLANNED CONSTRUCTION JOINT.
- DO NOT PLACE TIE BARS IN LONGITUDINAL JOINTS WITHIN 1'-4" OF A TRANSVERSE JOINT.
- WHEN UTILIZING AN EARLY ENTRY SAW, CUT THE JOINT TO A MINIMUM DEPTH OF 3".



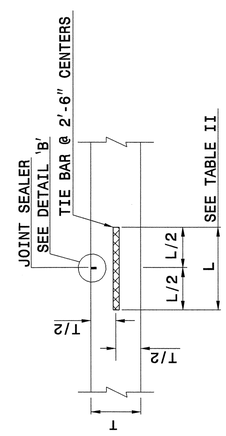

DETAIL 'B'

DETAIL 'C'

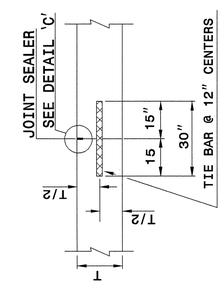
| TABLE II - LONGITUDINAL TIE BARS | | |
|---|---|---|
| SLAB THICKNESS | TIE BAR DIA. "D" | TIE BAR LENGTH "L" |
| 8 1/2" OR LESS | 1/2" | 30" |
| 9" OR ABOVE | 5/8" | 30" |




LONGITUDINAL CONSTRUCTION JOINT




LONGITUDINAL JOINT




EMERGENCY TRANSVERSE CONSTRUCTION JOINT

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

ENGLISH DETAIL DRAWING FOR
**CONCRETE PAVEMENT JOINTS**
CONSTRUCTION AND CONTRACTION JOINTS

SHEET 2 OF 2 **700D01**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL B. HUNTSLOW
12/9/09

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
MODIFIED BY: E.E. WARD DATE: 09-26-06
CHECKED BY: DATE: 4/22/09
FILE SPEC.: stds/06stdstodetails/english/700d01.dgn

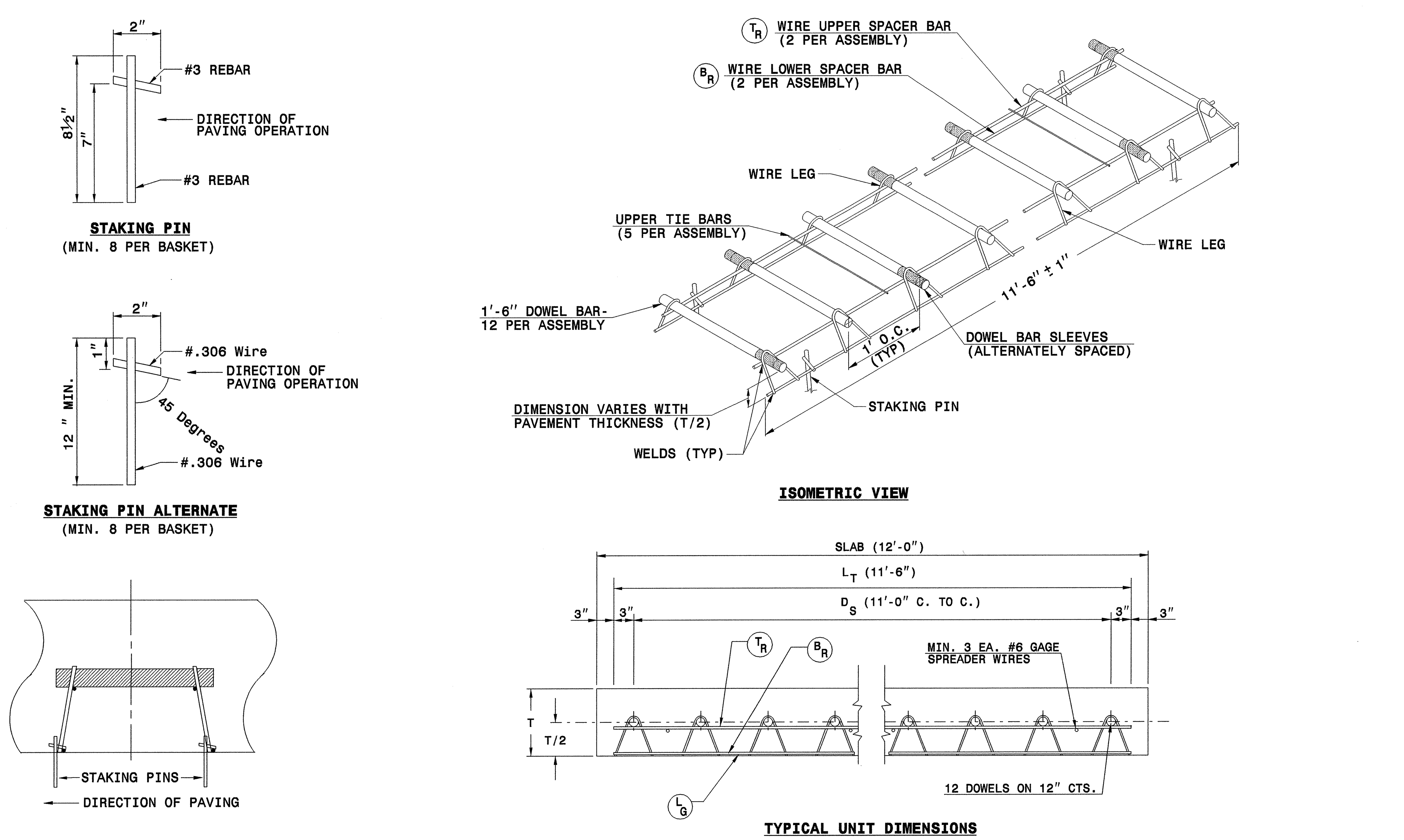
$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-L |

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

ENGLISH DETAIL DRAWING FOR
**DOWEL ASSEMBLY**

SHEET 1 OF 2
**700D03**




| "V" LEG ONLY | | | |
|---|---|---|---|
| SLAB THICKNESS | WIRE GAGE | | |
| | $T_R$ | $B_R$ | $L_G$ |
| 8" OR LESS | 2 | 2 | 2 |
| 8½" - 10" | 0 | 2 | 2 |
| 10½" & ABOVE | 2/0's | 2/0's | 2/0's |

GENERAL NOTES:
- -USE RIGID CONSTRUCTED DOWEL ASSEMBLY CAPABLE OF HOLDING THE DOWEL BAR IN PROPER POSITION DURING PLACMENT OF CONCRETE AND DESIGNED AS TO PERMIT UNRESTRICTED MOVEMENT OF THE SLAB. USE DOWEL ASSEMBLY APPROVED BY THE ENGINEER PRIOR TO USE.
- -USE DOWEL ASSEMBLIES MANUFACTURED WITH DOWELS ALTERNATELY WELDED TO FRAME MEMBERS.
- -USE STAKING PIN OR APPROVED ALTERNATE.
- -SAW CUT EPOXY COATED DOWELS, BUFFING AS NECESSARY TO FACILITATE PROPER WELDING OF THE DOWEL TO THE ASSEMBLY FRAME. TOUCH UP OF THE BUFFED AREA WILL NOT BE REQUIRED.
- -RESISTANCE WELD FRAME MEMBERS; DOWELS AND SPREADER WIRES MAY BE ARC WELDED. WELD IN ACCORDANCE WITH AWS WELDING CODE.
- -FULLY DIP THE DOWEL ASSEMBLIES TO ASSURE A COMPLETE COATING OF WAX.
- -SEE DETAIL 700D01 FOR DOWEL BAR SIZES.


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

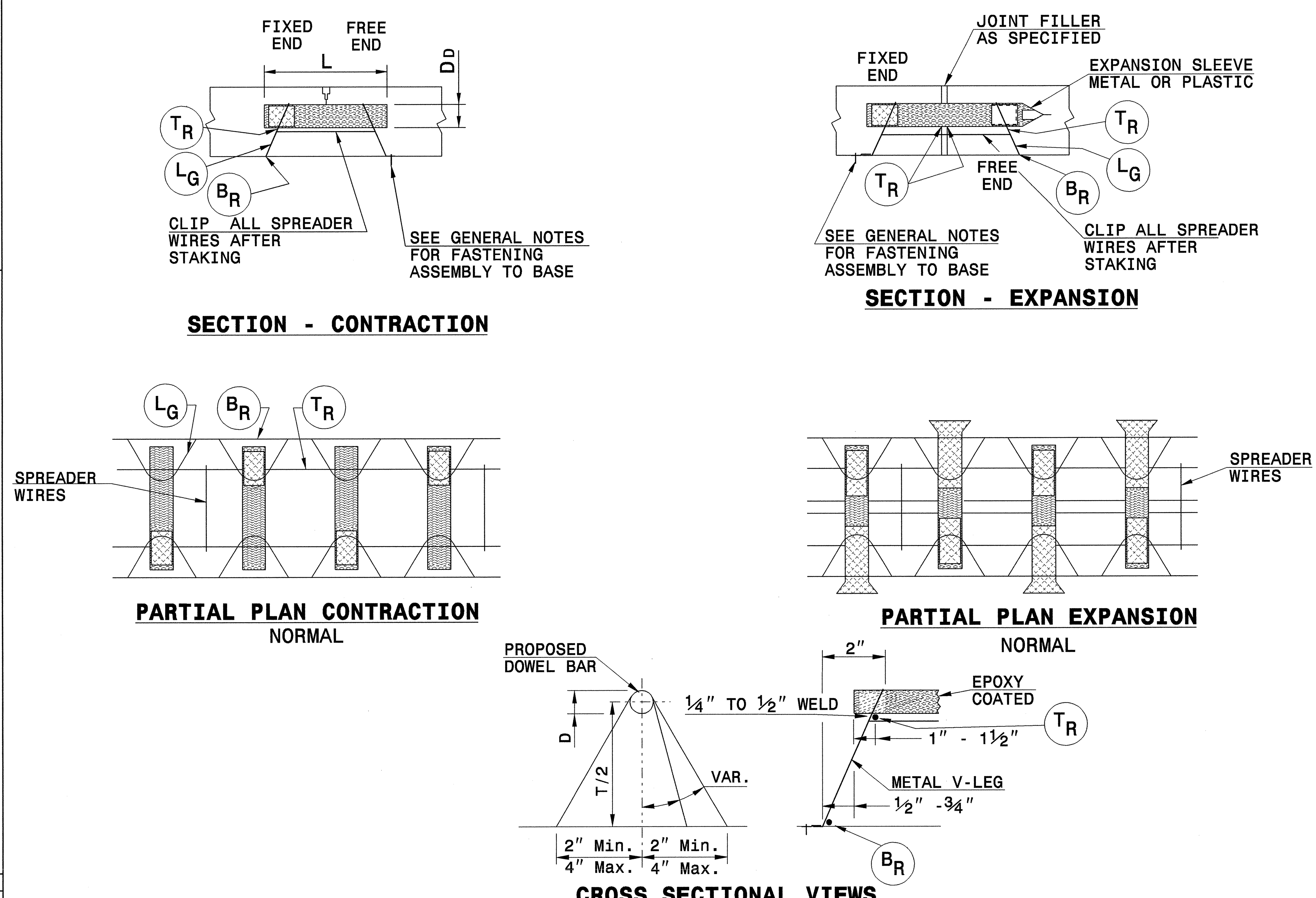
ENGLISH DETAIL DRAWING FOR
**DOWEL ASSEMBLY**

SHEET 1 OF 2
**700D03**


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

ENGLISH DETAIL DRAWING FOR
**DOWEL ASSEMBLY**

SHEET 2 OF 2
**700D03**





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

ENGLISH DETAIL DRAWING FOR
**DOWEL ASSEMBLY**

SHEET 2 OF 2
**700D03**


NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 12/9/09

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
MODIFIED BY: E.E. WARD DATE: 12-15-05
CHECKED BY: [signature] DATE: 4/22/09
FILE SPEC.: stds/02stdstodetails/english/700d01.dgn

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

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2826A | 2-M |

GEOTECHNICAL ENGINEER

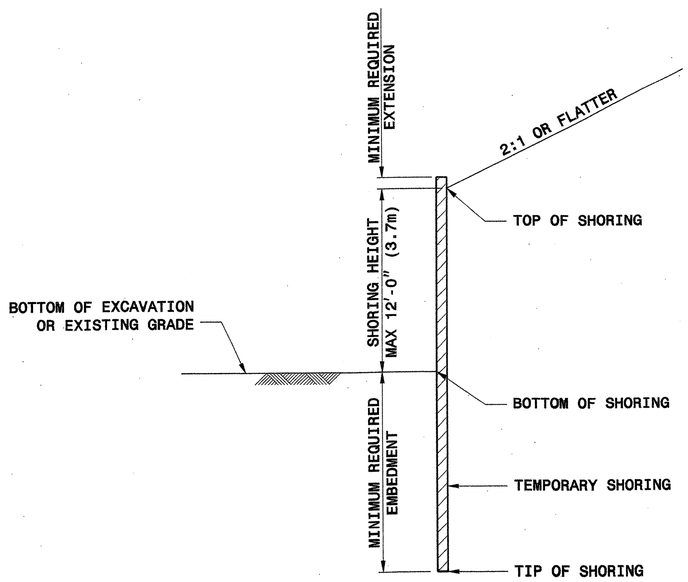
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

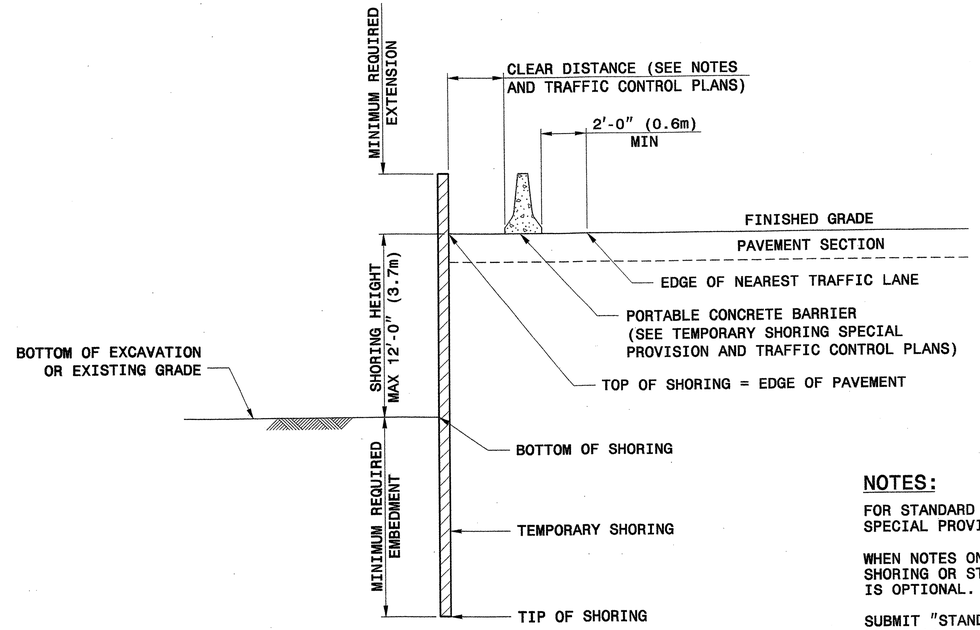
SIGNATURE DATE

ENGINEER

SIGNATURE DATE




## SLOPE CASE




## SURCHARGE CASE

| | | SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT | | | | | SURCHARGE CASE WITH TRAFFIC IMPACT | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SHEET PILES | | H PILES WITH TIMBER LAGGING | | | SHEET PILES | | H PILES WITH TIMBER LAGGING | | |
| | | | | MINIMUM REQUIRED EMBEDMENT FT (m) | | | | | MINIMUM REQUIRED EMBEDMENT FT (m) | | |
| GROUNDWATER CONDITION | SHORING HEIGHT FT (m) | MINIMUM REQUIRED EMBEDMENT FT (m) | MINIMUM REQUIRED SECTION MODULUS $IN^3/FT$ ($cm^3/m$) | HP 10x42 (HP 250x62) | HP 12x53 (HP 310x79) | HP 14x73 (HP 360x108) | MINIMUM REQUIRED EMBEDMENT FT (m) | MINIMUM REQUIRED SECTION MODULUS $IN^3/FT$ ($cm^3/m$) | HP 10x42 (HP 250x62) | HP 12x53 (HP 310x79) | HP 14x73 (HP 360x108) |
| GROUNDWATER ELEVATION BELOW TIP OF SHORING | < 6 (1.8) | 7.5 (2.3) | 3.0 (161) | 8.0 (2.4) | 8.0 (2.4) | 8.0 (2.4) | 11.0 (3.4) | 10.0 (538) | 9.5 (2.9) | 9.5 (2.9) | 9.5 (2.9) |
| | 7 (2.1) | 8.5 (2.6) | 4.5 (242) | 9.5 (2.9) | 9.5 (2.9) | 9.5 (2.9) | 12.0 (3.7) | 12.0 (645) | 10.5 (3.2) | 10.5 (3.2) | 10.5 (3.2) |
| | 8 (2.4) | 10.0 (3.0) | 6.5 (349) | 10.5 (3.2) | 10.5 (3.2) | 10.5 (3.2) | 12.5 (3.8) | 14.0 (753) | 11.5 (3.5) | 11.5 (3.5) | 11.5 (3.5) |
| | 9 (2.7) | 11.0 (3.4) | 9.5 (511) | -- | 12.0 (3.7) | 12.0 (3.7) | 13.5 (4.1) | 16.5 (887) | -- | 12.5 (3.8) | 12.5 (3.8) |
| | 10 (3.0) | 12.5 (3.8) | 13.0 (699) | -- | -- | 13.5 (4.1) | 14.0 (4.3) | 19.5 (1048) | -- | 13.5 (4.1) | 13.5 (4.1) |
| | 11 (3.4) | 13.5 (4.1) | 17.0 (914) | -- | -- | 14.5 (4.4) | 15.0 (4.6) | 22.5 (1210) | -- | -- | 14.5 (4.4) |
| | 12 (3.7) | 15.0 (4.6) | 21.5 (1156) | -- | -- | 16.0 (4.9) | 16.0 (4.9) | 25.5 (1371) | -- | -- | 15.5 (4.7) |
| GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND TIP OF SHORING | < 6 (1.8) | 11.5 (3.5) | 4.5 (242) | 11.5 (3.5) | 11.5 (3.5) | 11.5 (3.5) | 16.0 (4.9) | 12.0 (645) | 13.0 (4.0) | 13.0 (4.0) | 13.0 (4.0) |
| | 7 (2.1) | 13.0 (4.0) | 7.0 (376) | 13.0 (4.0) | 13.0 (4.0) | 13.0 (4.0) | 17.0 (5.2) | 14.5 (780) | 14.5 (4.4) | 14.5 (4.4) | 14.5 (4.4) |
| | 8 (2.4) | 15.0 (4.6) | 10.0 (538) | -- | 15.0 (4.6) | 15.0 (4.6) | 18.0 (5.5) | 17.0 (914) | -- | 15.5 (4.7) | 15.5 (4.7) |
| | 9 (2.7) | 17.0 (5.2) | 14.0 (753) | -- | 17.0 (5.2) | 17.0 (5.2) | 19.0 (5.8) | 20.0 (1075) | -- | 17.0 (5.2) | 17.0 (5.2) |
| | 10 (3.0) | 18.5 (5.6) | 19.5 (1048) | -- | -- | 18.5 (5.6) | 20.0 (6.1) | 23.5 (1263) | -- | -- | 18.5 (5.6) |
| | 11 (3.4) | 20.5 (6.3) | 26.0 (1398) | -- | -- | -- | 21.0 (6.4) | 28.0 (1505) | -- | -- | 20.0 (6.1) |
| | 12 (3.7) | 22.5 (6.9) | 33.0 (1774) | -- | -- | -- | 22.0 (6.7) | 33.0 (1774) | -- | -- | 21.5 (6.6) |

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

## NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

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

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

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

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

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

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

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

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

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

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

**GEOTECHNICAL ENGINEERING UNIT**

*STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH*

*STANDARD DRAWING NO. 1801.01*

STANDARD TEMPORARY SHORING

DATE: 2-20-07

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2826A | 2-N |

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

# STANDARD TEMPORARY MSE WALL OPTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

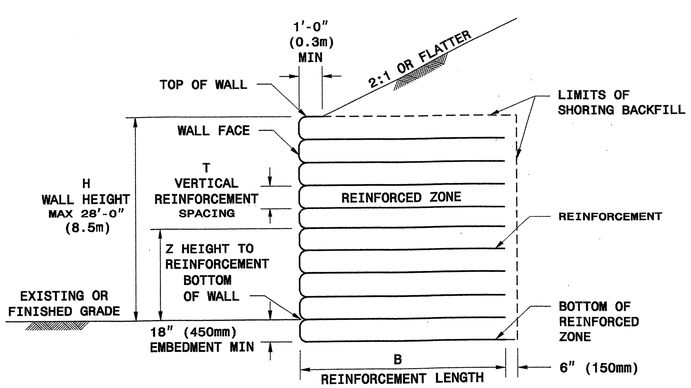
PLACE SHORING BACKFILL IN 8″ TO 10″ (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3′-0″ (1m) OF THE WALL FACE.

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

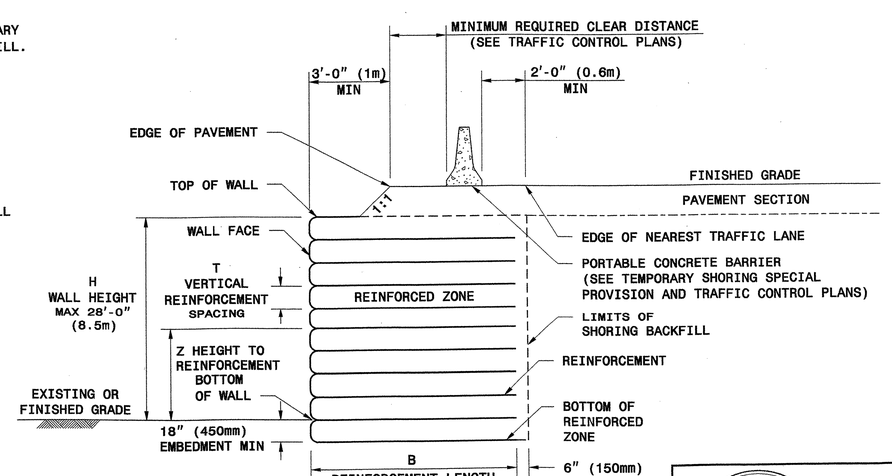
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3″ (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4″ AND 24″ (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

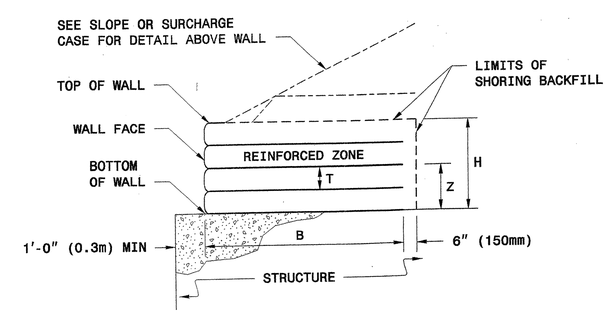
IF THE TOP OF WALL IS WITHIN 5′-0″ (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.




## SLOPE CASE




## SURCHARGE CASE




## TEMPORARY MSE WALL ON STRUCTURE

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11

DATE: 2-20-07

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2826A | 2-0 |

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

HOW TO USE THIS SHEET:

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

# MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

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

## TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT)

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

SLOPE AND SURCHARGE CASES

## SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

H (FT)

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

SLOPE CASE

H (FT)

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

SURCHARGE CASE

## HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

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

H (FT)

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

SLOPE CASE

H (FT)

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

SURCHARGE CASE

## RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

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

H (FT)

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

SLOPE AND SURCHARGE CASES

NOTES FOR HILFIKER TEMPORARY WALL

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

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STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

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| PROJECT REFERENCE NO. | SHEET |
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GEOTECHNICAL ENGINEER

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ENGINEER

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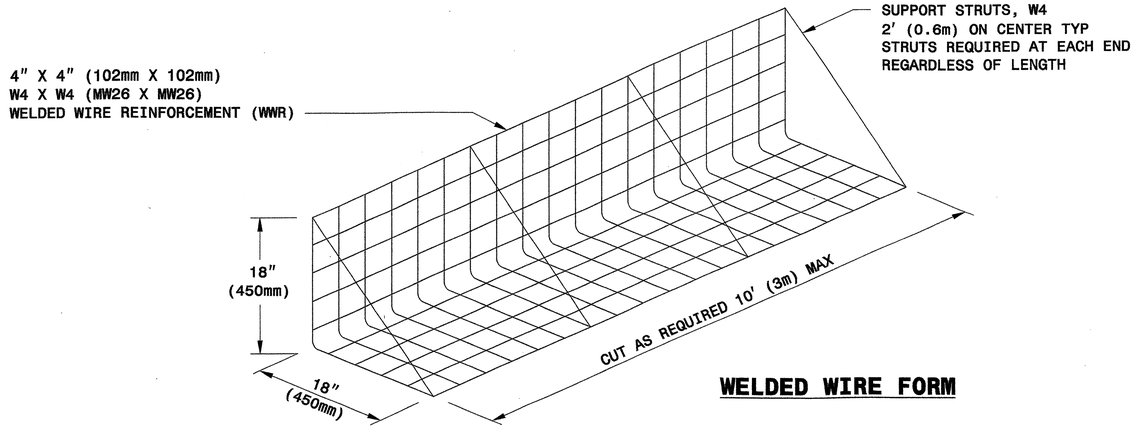
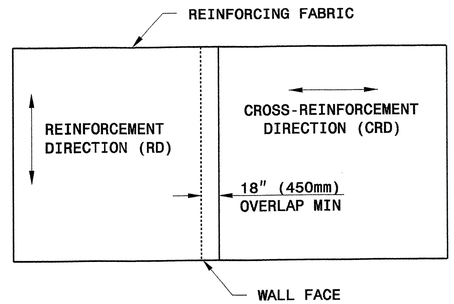
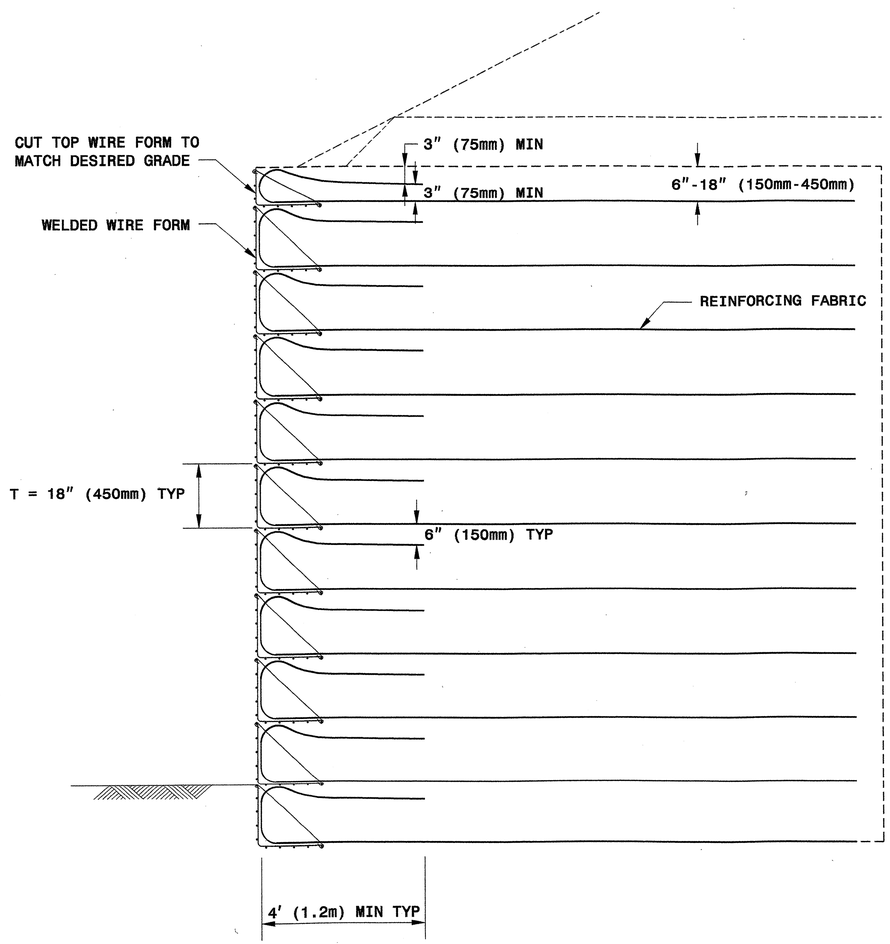



**WELDED WIRE FORM**




**PLAN VIEW OF FABRIC OVERLAP**




**TYPICAL SECTION**

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

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

*RD = REINFORCEMENT DIRECTION

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STANDARD DRAWING NO. 1801.02

TEMPORARY FABRIC WALL

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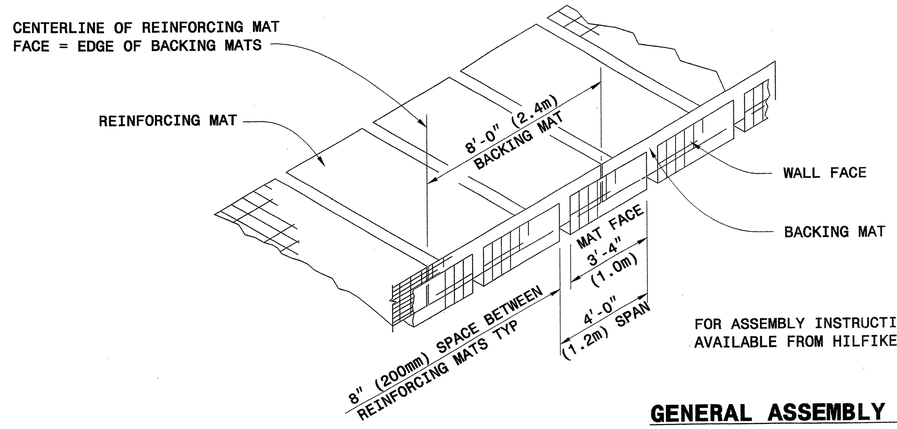
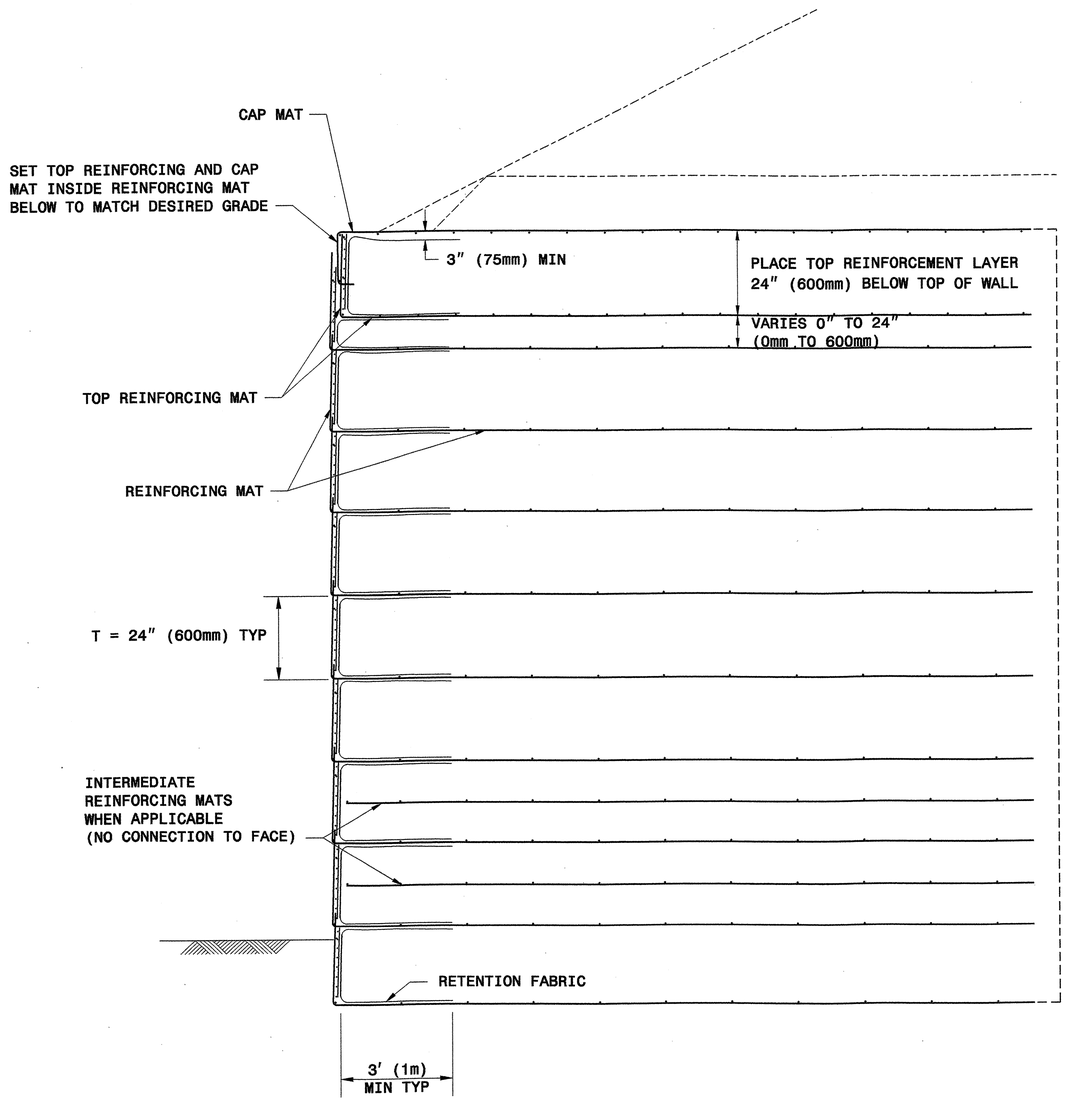
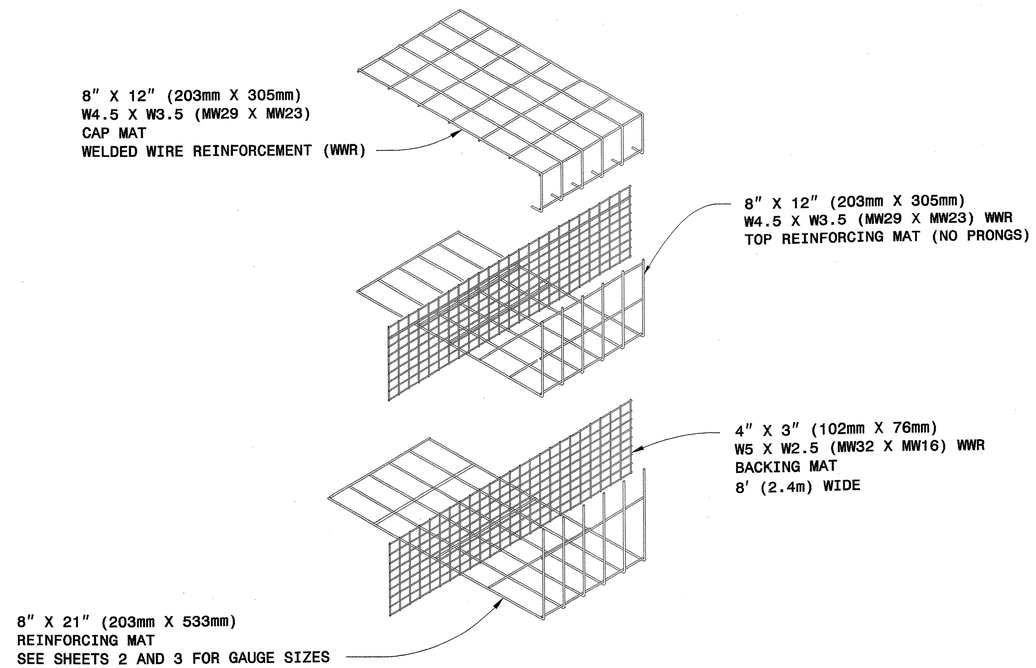



FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

## GENERAL ASSEMBLY DETAIL




## TYPICAL SECTION




## WALL COMPONENTS

HILFIKER RETAINING WALLS

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HILFIKER
TEMPORARY WALL

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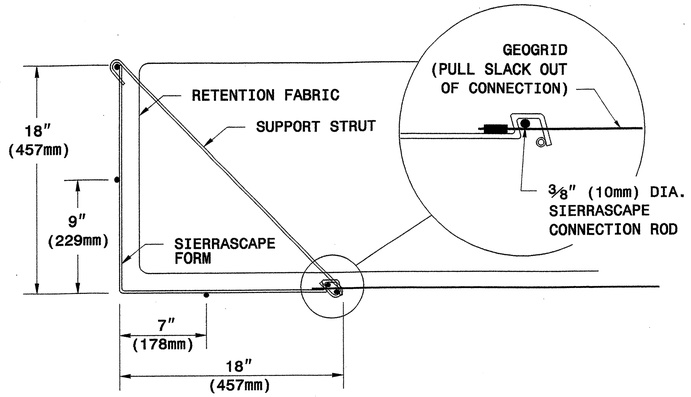
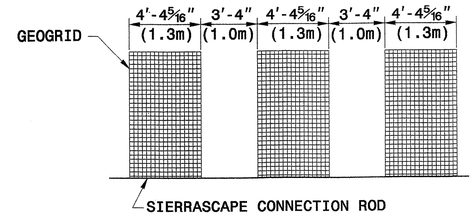
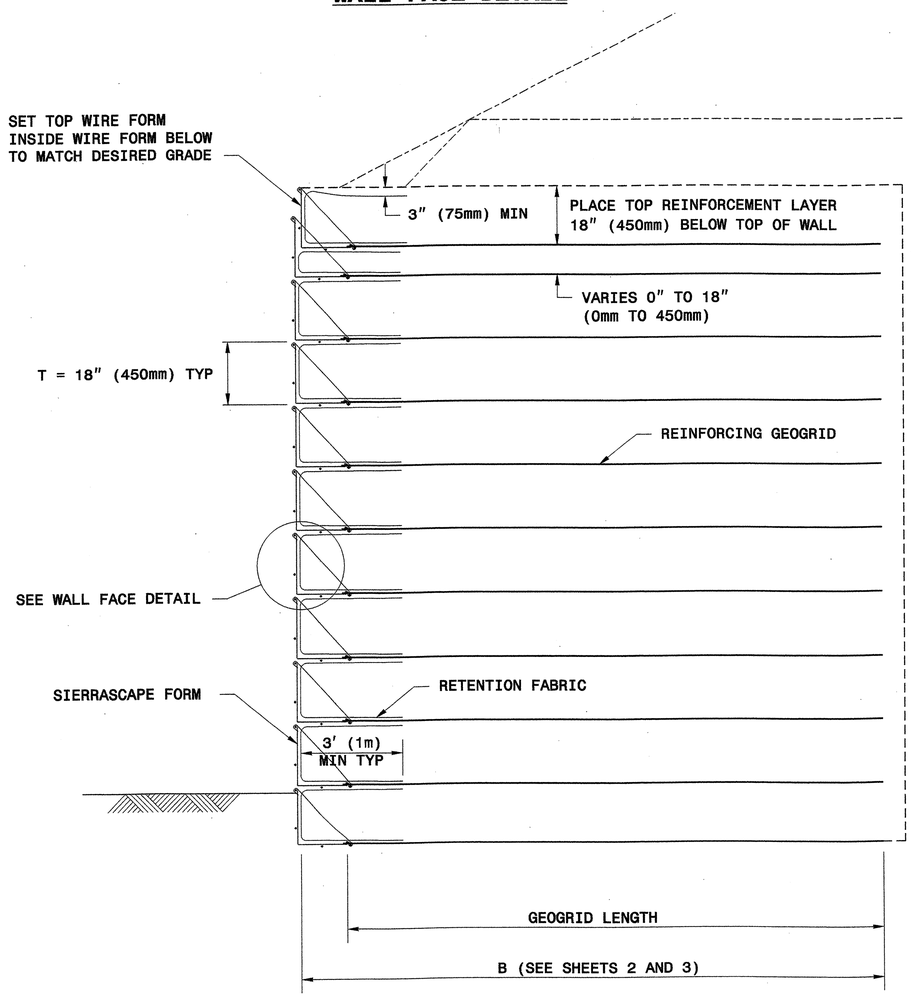



## WALL FACE DETAIL

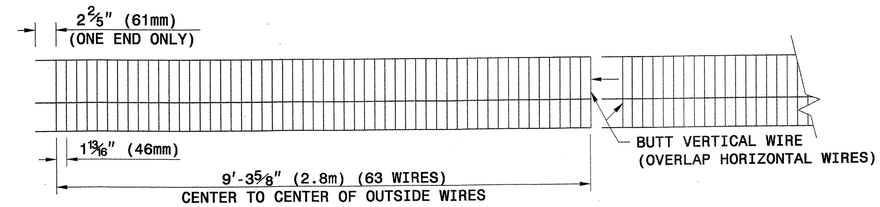



PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

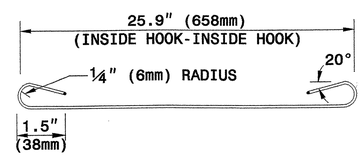
## TYPICAL GEOGRID COVERAGE



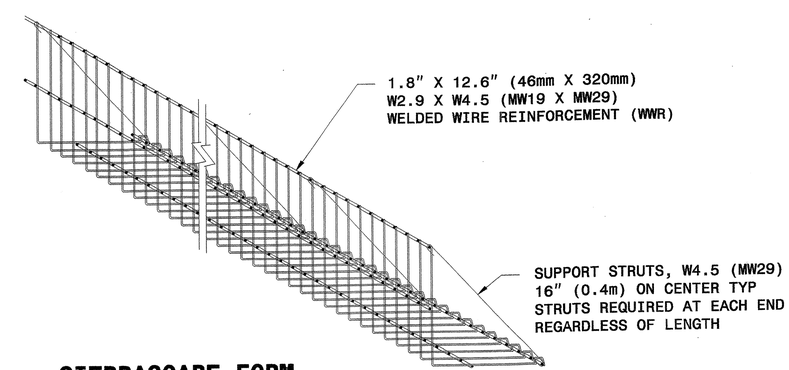

## TYPICAL SECTION




## ELEVATION VIEW




## SUPPORT STRUT




## SIERRASCAPE FORM

## WALL COMPONENTS

TENSAR®
TENSAR EARTH TECHNOLOGIES, INC.

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**RALEIGH**

**STANDARD DRAWING NO. 1801.02**

SIERRASCAPE
TEMPORARY WALL

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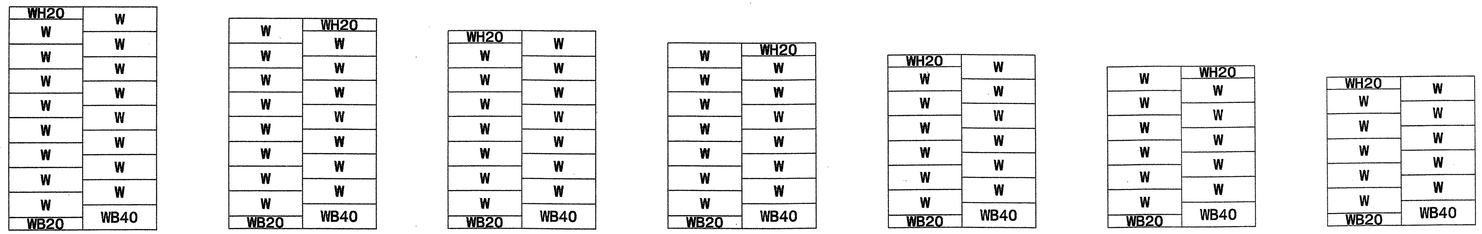
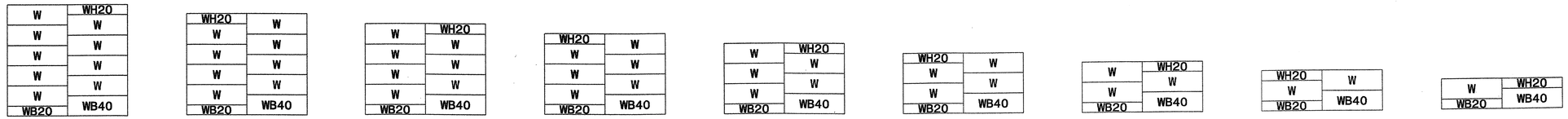
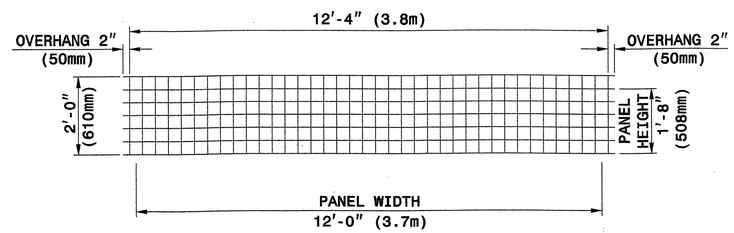
## PANEL LAYOUTS



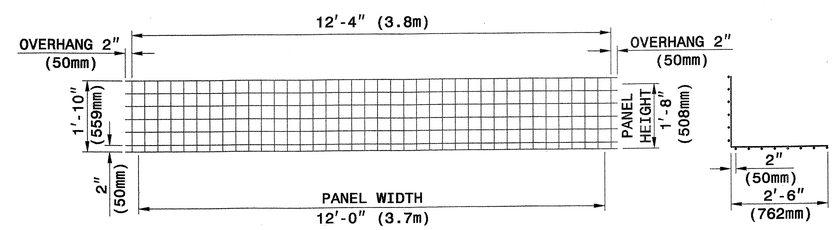

| H - WALL HEIGHT | | | | | | | |
|---|---|---|---|---|---|---|---|
| (FEET-INCHES) | < 28 - 0 | < 27 - 0 | < 25 - 4 | < 23 - 8 | < 22 - 0 | < 20 - 4 | < 18 - 8 |
| (METER) | < 8.5 | < 8.2 | < 7.7 | < 7.2 | < 6.7 | < 6.2 | < 5.7 |




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| (FEET-INCHES) | < 17 - 0 | < 15 - 4 | < 13 - 8 | < 12 - 0 | < 10 - 4 | < 8 - 8 | < 7 - 0 | < 5 - 4 | < 3 - 8 |
| (METER) | < 5.2 | < 4.7 | < 4.2 | < 3.7 | < 3.2 | < 2.6 | < 2.1 | < 1.6 | < 1.1 |

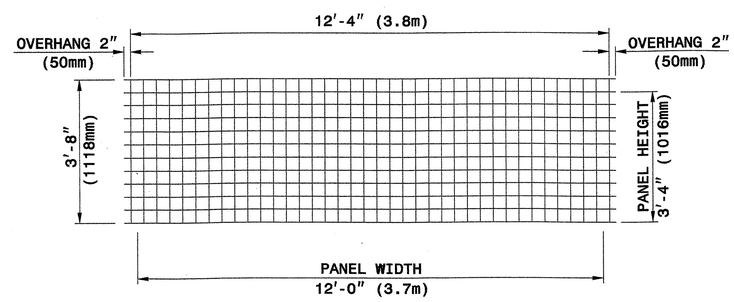



**TYPE WH20**

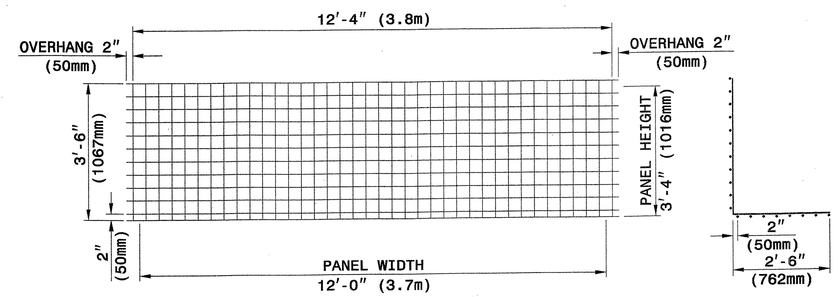



**TYPE WB20**

**SECTION**




**TYPE W**




**TYPE WB40**

**SECTION**

**WELDED WIRE FACINGS**

**WELDED WIRE FORMS**

**PANEL TYPES (WELDED WIRE FACINGS AND FORMS)**

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

The Reinforced Earth Company

*GEOTECHNICAL ENGINEERING UNIT*

*STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH*

*STANDARD DRAWING NO. 1801.02*

RETAINED EARTH TEMPORARY WALL

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GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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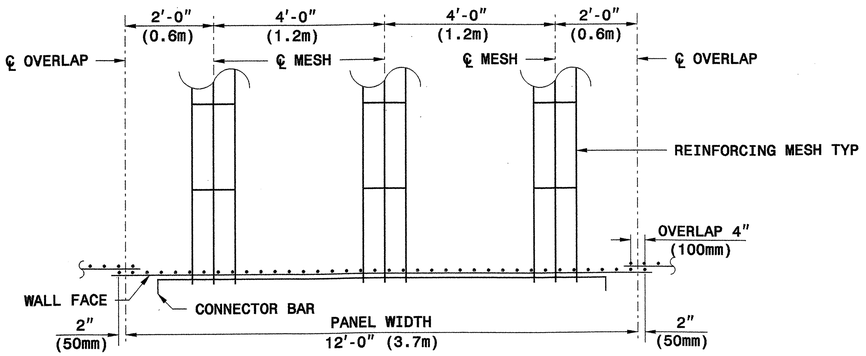
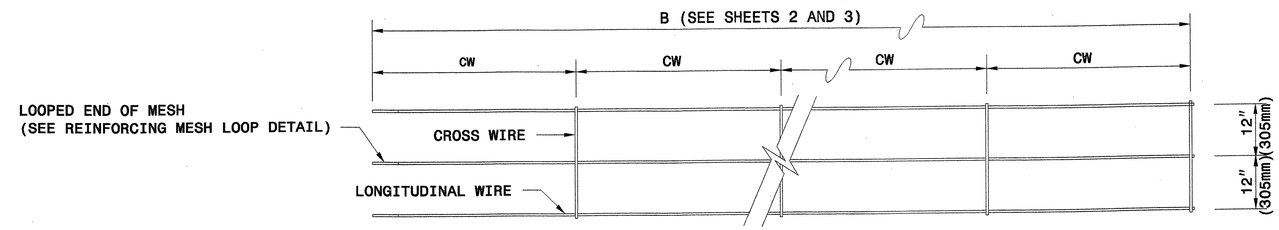



## REINFORCING MESH PLACEMENT DETAIL
## (PLAN VIEW)

½" (13mm) DIA. BAR

## CONNECTOR BAR



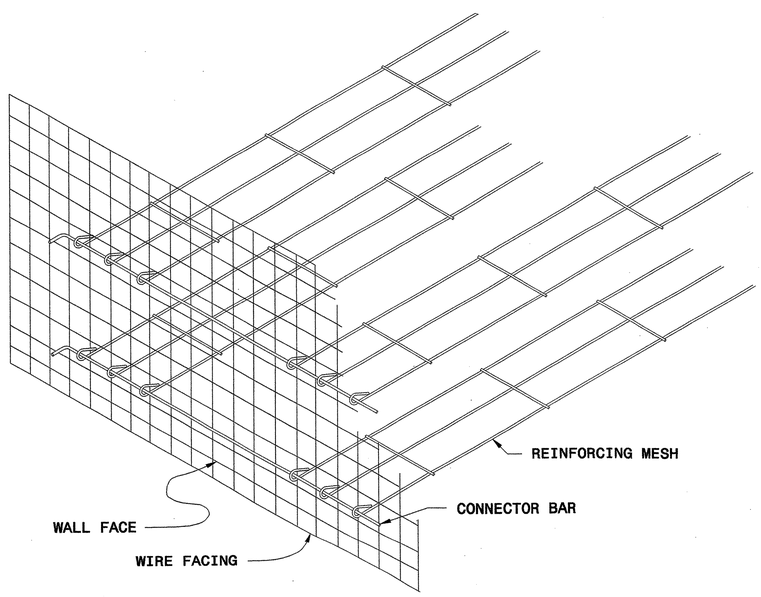

IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

**3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)**

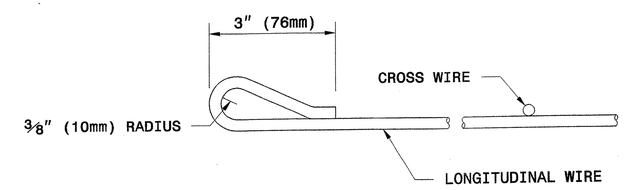
NO. OF LONGITUDINAL WIRES
GAUGE OF LONGITUDINAL WIRES
GAUGE OF CROSS WIRES
SPACING OF CROSS WIRES IN FT (mm), CW

## REINFORCING MESH DESIGNATION

## REINFORCING MESH




## GENERAL ASSEMBLY DETAIL




## REINFORCING MESH LOOP DETAIL

The Reinforced Earth Company

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DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 7 OF 11 DATE: 12-19-06

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GEOTECHNICAL ENGINEER

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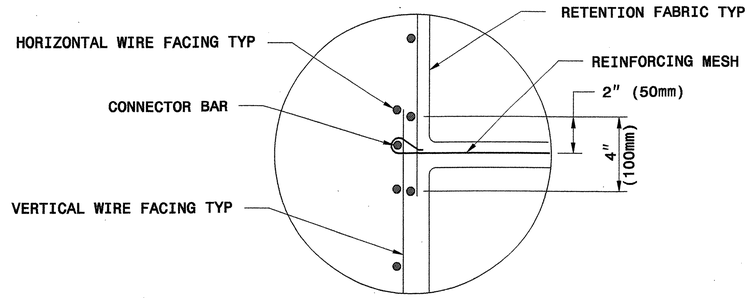
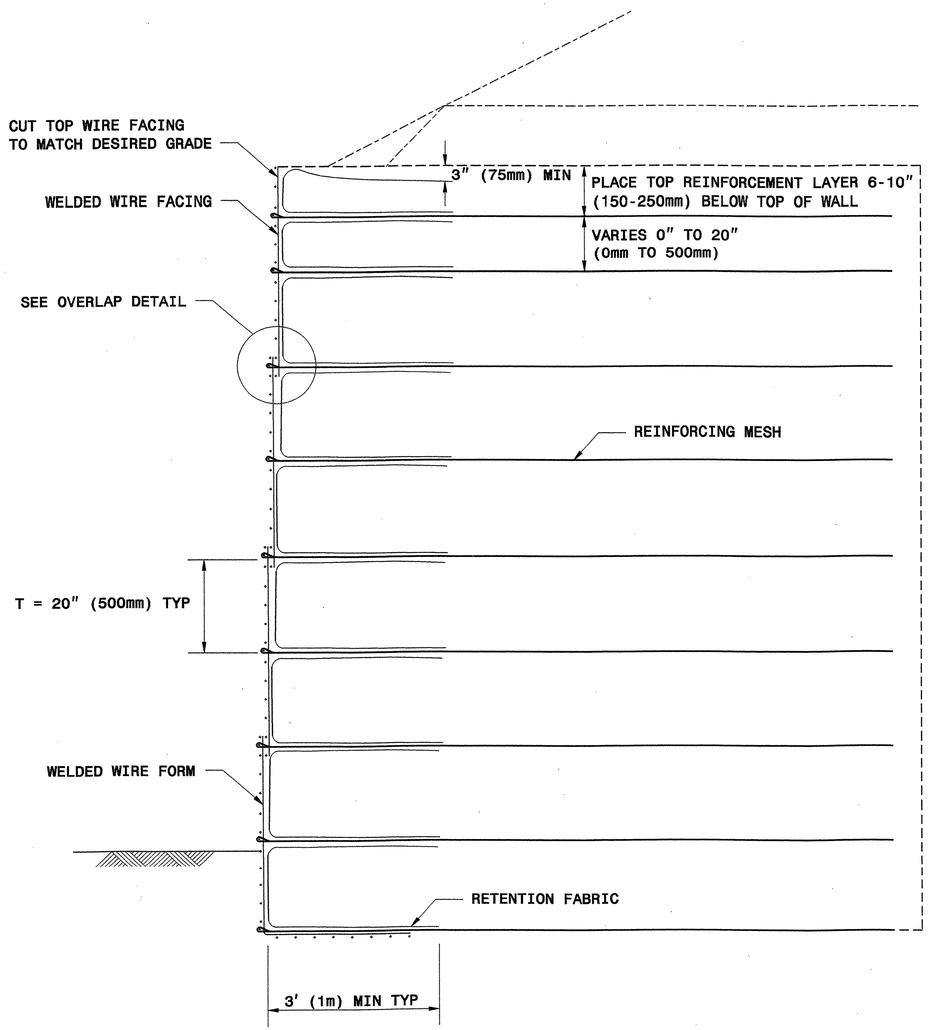
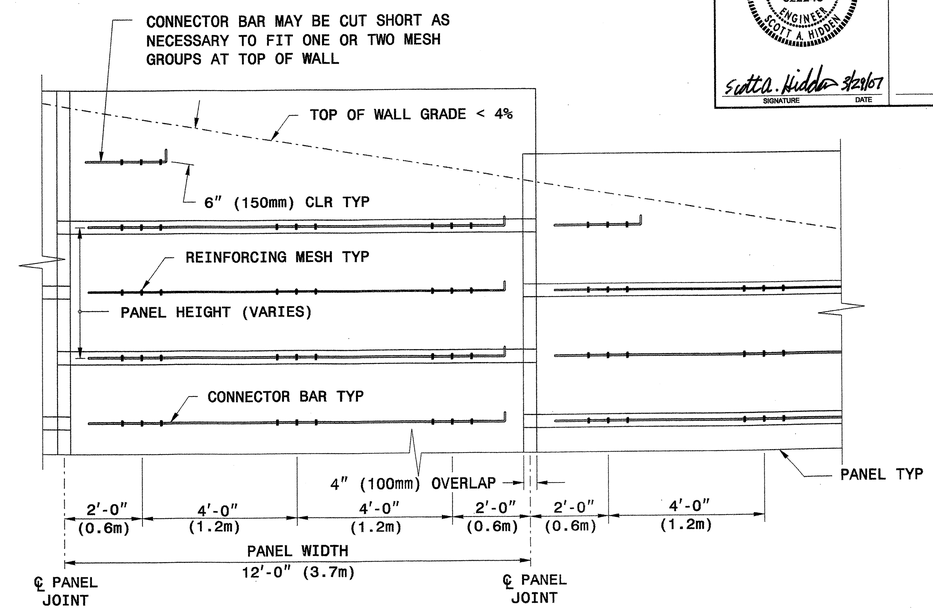


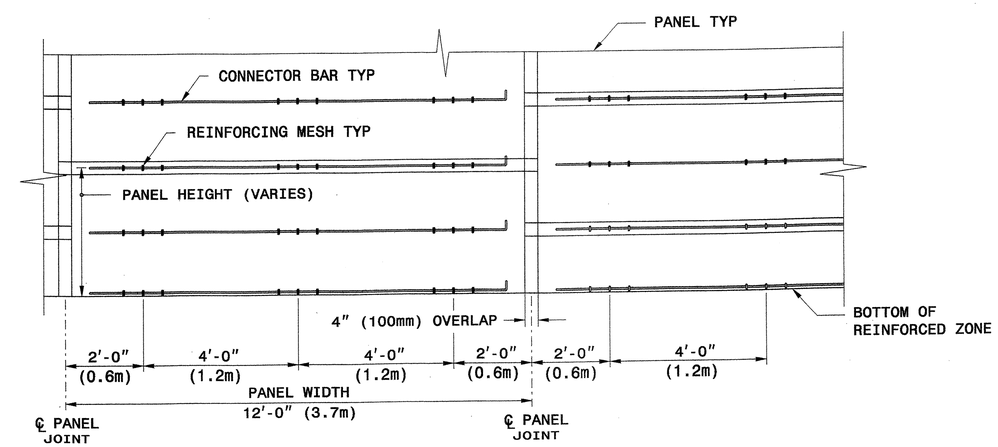

## OVERLAP DETAIL




## TYPICAL SECTION




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




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

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**RALEIGH**

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

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DATE: 12-19-06

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GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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SIGNATURE DATE

ENGINEER

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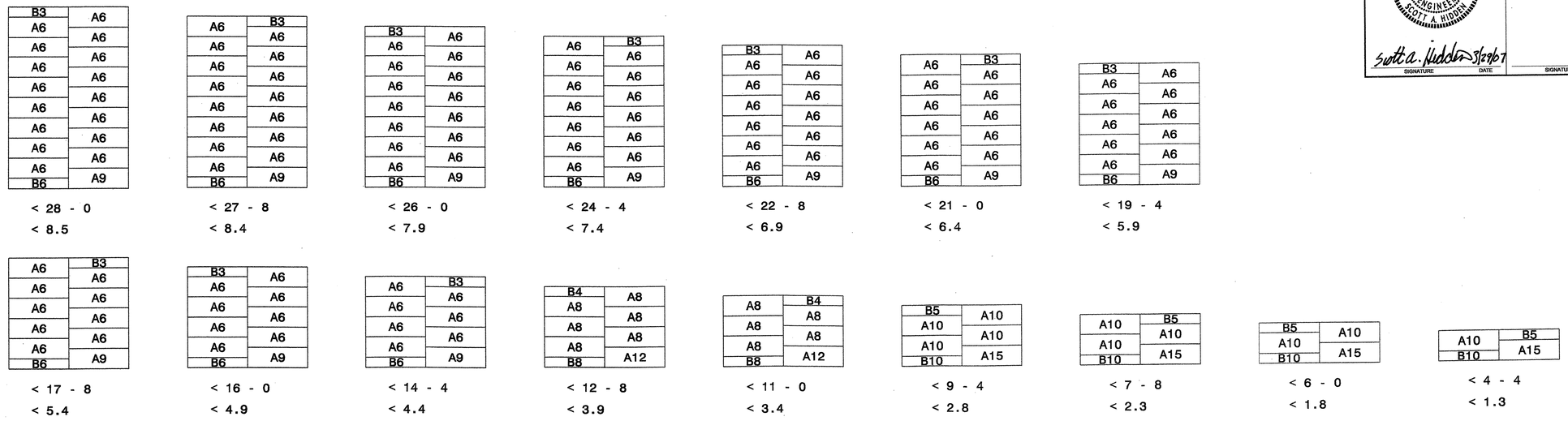
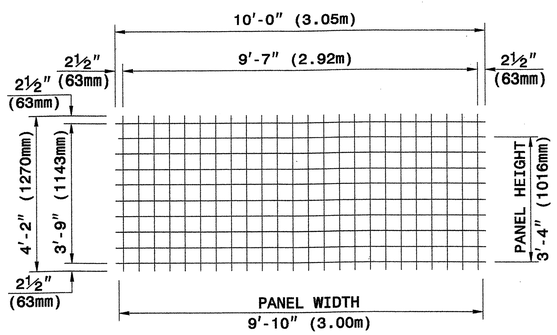
## PANEL LAYOUTS




| H - WALL HEIGHT | | | | | | | |
|---|---|---|---|---|---|---|---|
| (FEET-INCHES) | < 28 - 0 | < 27 - 8 | < 26 - 0 | < 24 - 4 | < 22 - 8 | < 21 - 0 | < 19 - 4 |
| (METER) | < 8.5 | < 8.4 | < 7.9 | < 7.4 | < 6.9 | < 6.4 | < 5.9 |
| (FEET-INCHES) | < 17 - 8 | < 16 - 0 | < 14 - 4 | < 12 - 8 | < 11 - 0 | < 9 - 4 | < 7 - 8 | < 6 - 0 | < 4 - 4 |
| (METER) | < 5.4 | < 4.9 | < 4.4 | < 3.9 | < 3.4 | < 2.8 | < 2.3 | < 1.8 | < 1.3 |

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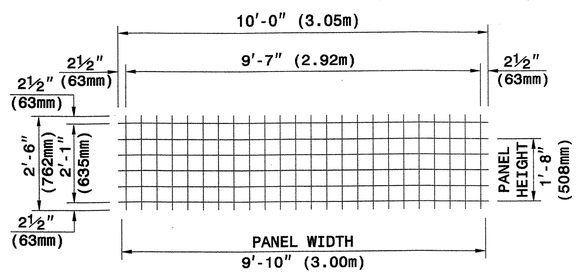


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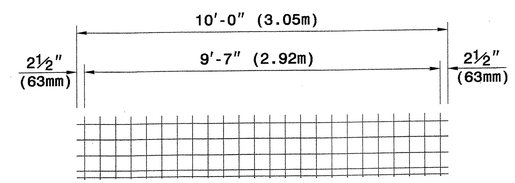
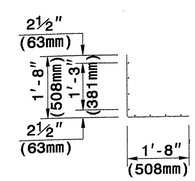



**WELDED WIRE FORM**




**SECTION**

## WELDED WIRE FACINGS

**PANEL TYPES (WELDED WIRE FACINGS AND FORM**

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

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

*GEOTECHNICAL ENGINEERING UNIT*

*STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH*

*STANDARD DRAWING NO. 1801.02*

TERRATREL TEMPORARY WALL

SHEET 9 OF 11

DATE: 12-19-06

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2826A | 2-W |

GEOTECHNICAL ENGINEER

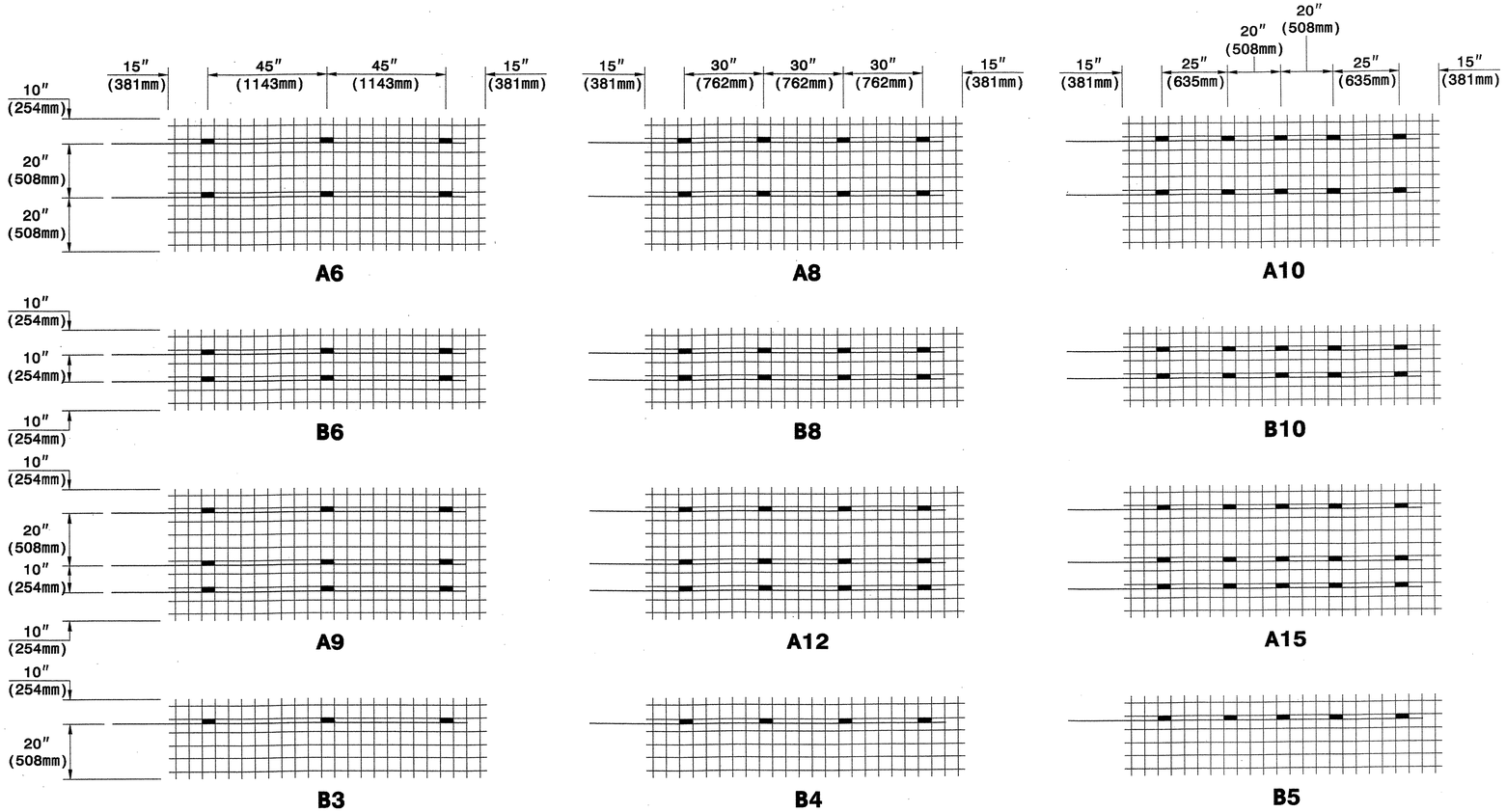
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

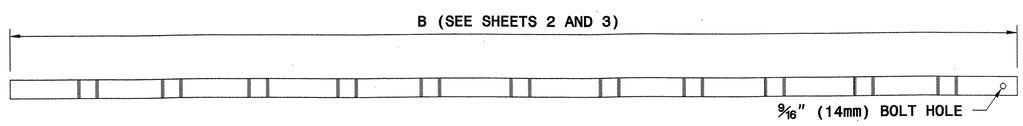



KEY: A8

NUMBER OF REINFORCING STRIPS

PANEL TYPE

## CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



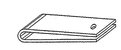

**REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)**

½" (13mm) DIA. ROD

**CONNECTOR ROD**

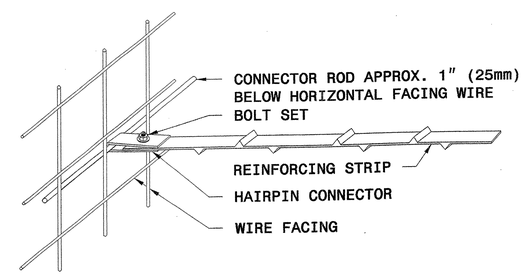
½" (13mm) BOLT WITH NUT AND WASHER

**BOLT SET**



**HAIRPIN CONNECTOR**

**WALL COMPONENTS**




**STRIP TO FACING CONNECTION**

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 10 OF 11

DATE: 12-19-06

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| U-2826A | 2-X |

GEOTECHNICAL ENGINEER

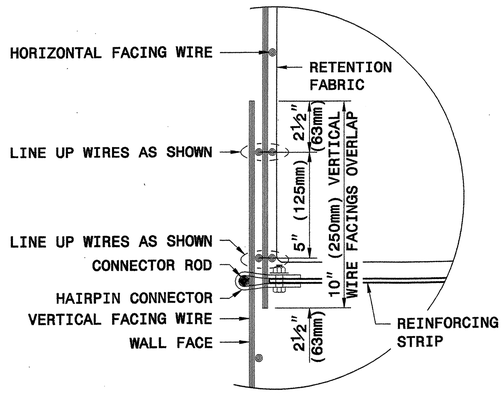
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

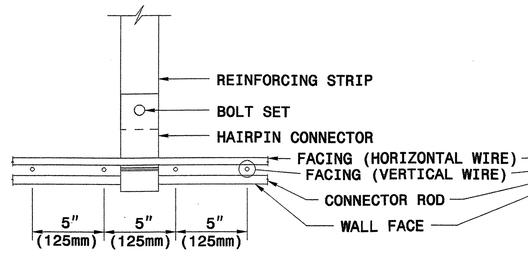
ENGINEER

SIGNATURE DATE



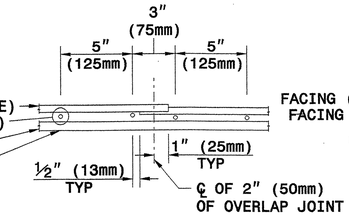

OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

## VERTICAL OVERLAP DETAIL



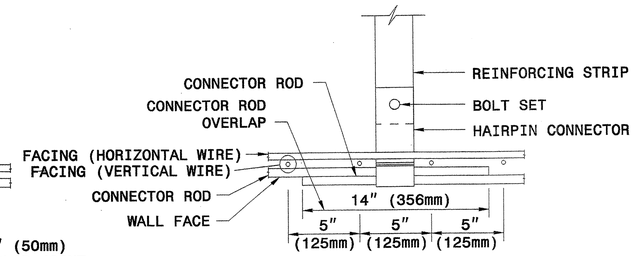

## PLAN DETAIL 'A'

**STRIP CONNECTION**



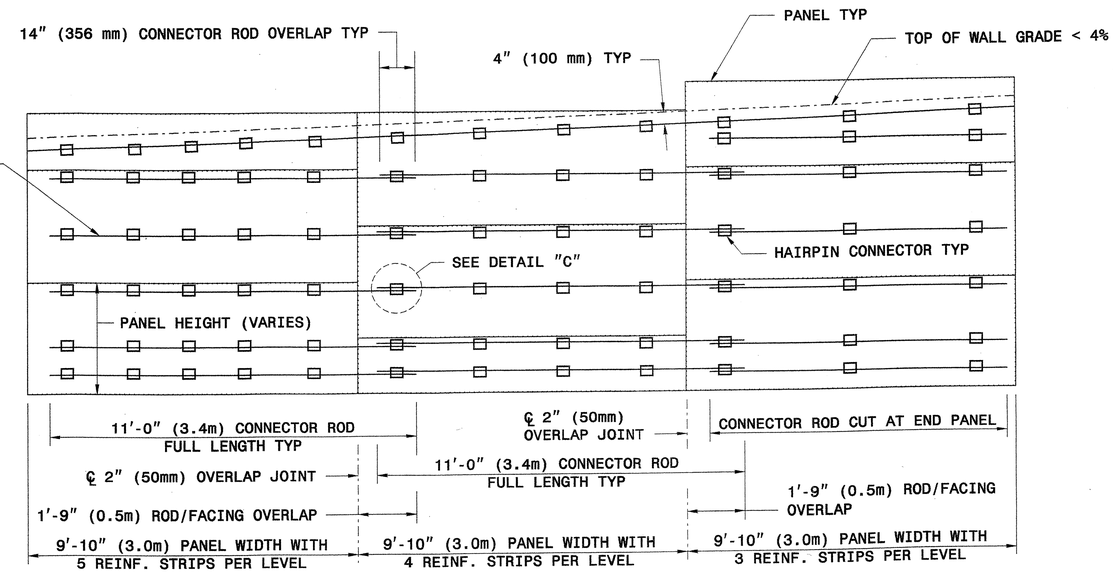

## PLAN DETAIL 'B'

**HORIZONTAL OVERLAP DETAIL**



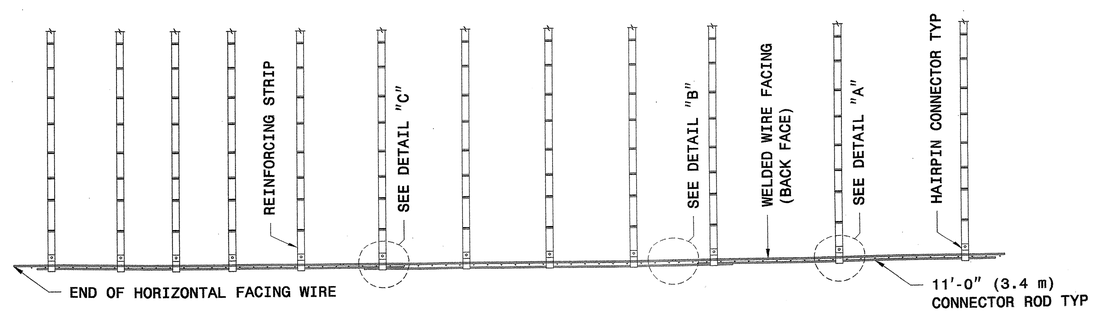

## PLAN DETAIL 'C'

**STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL**

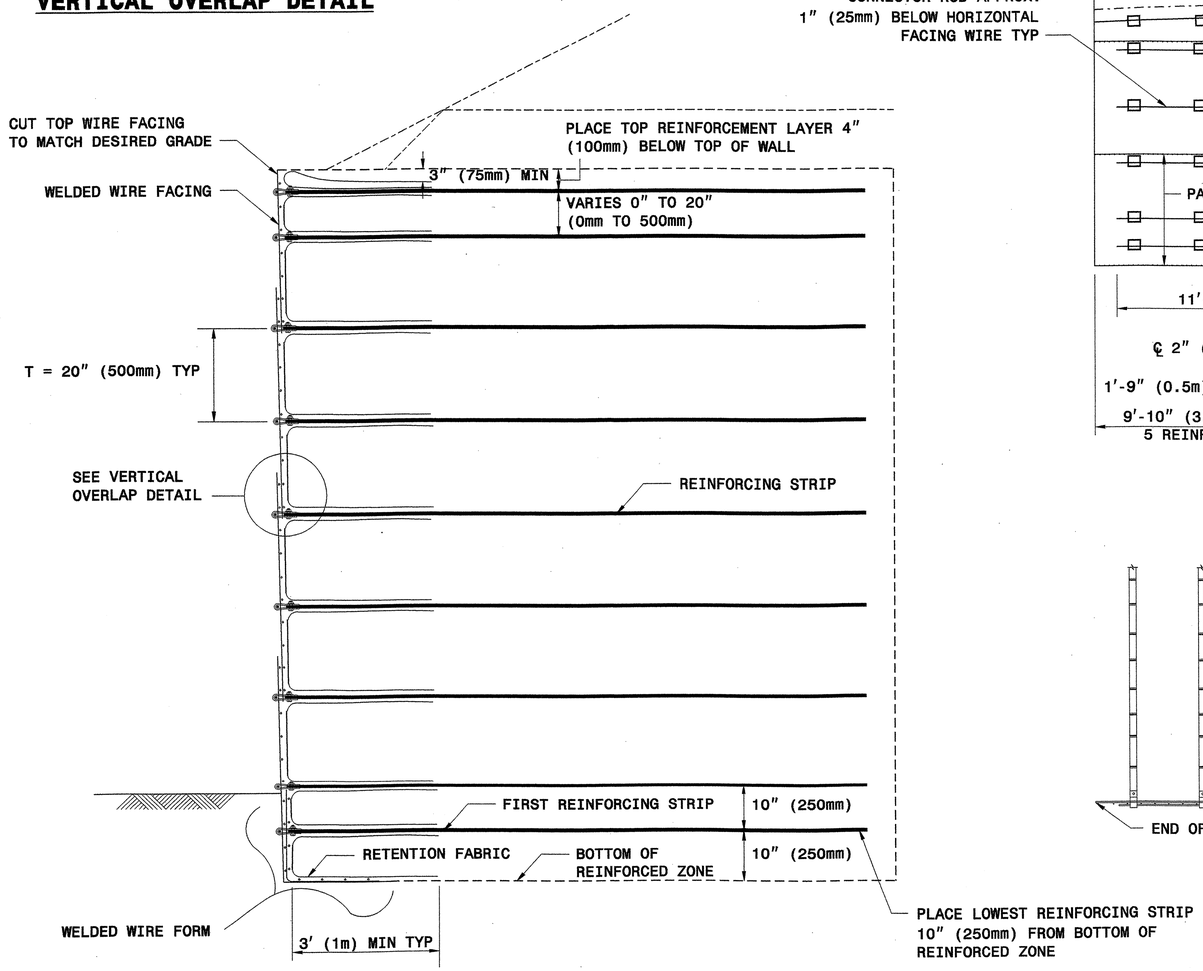



## TYPICAL ELEVATION

**(WIRES NOT SHOWN FOR CLARITY)**




## TYPICAL PLAN




## TYPICAL SECTION

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

**GEOTECHNICAL ENGINEERING UNIT**

**STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH**

**STANDARD DRAWING NO. 1801.02**

TERRATREL TEMPORARY WALL

SHEET 11 OF 11

DATE: 12-19-06

30-JUL-2009 08:48
s:\contracts\contracts\special details\ericward\stds\06' stds to special details\30001\0300d01.dgn
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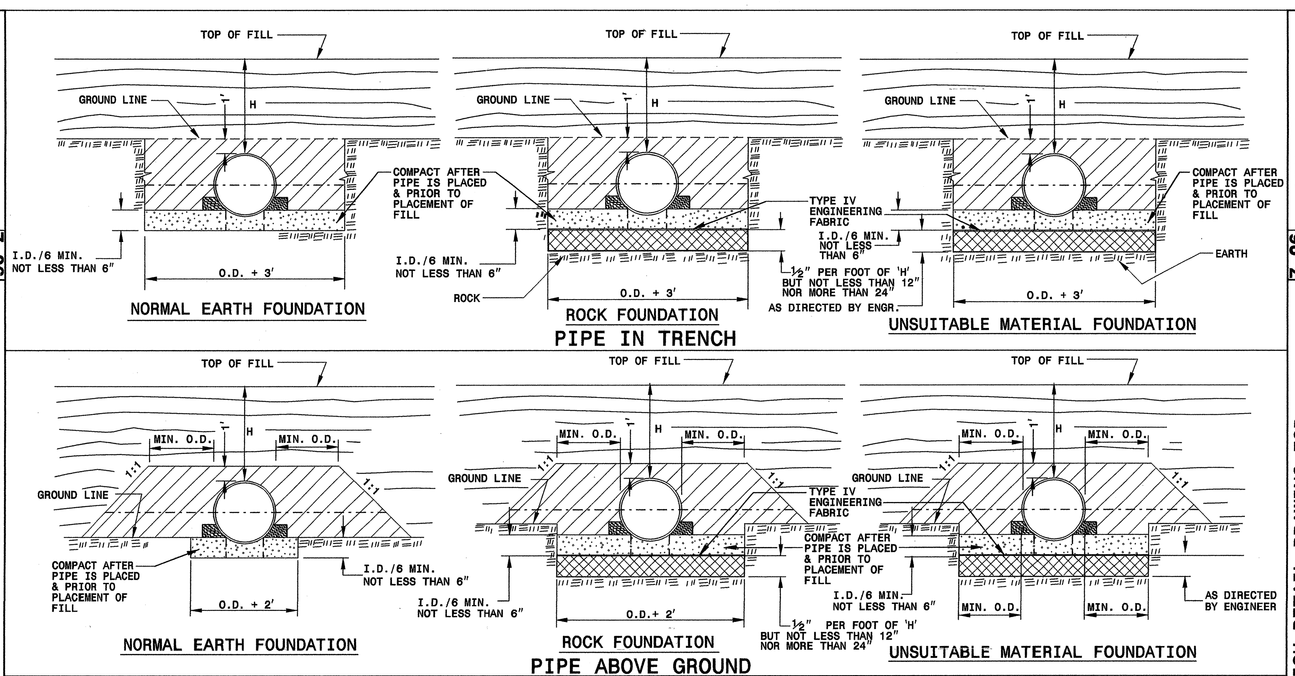
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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.

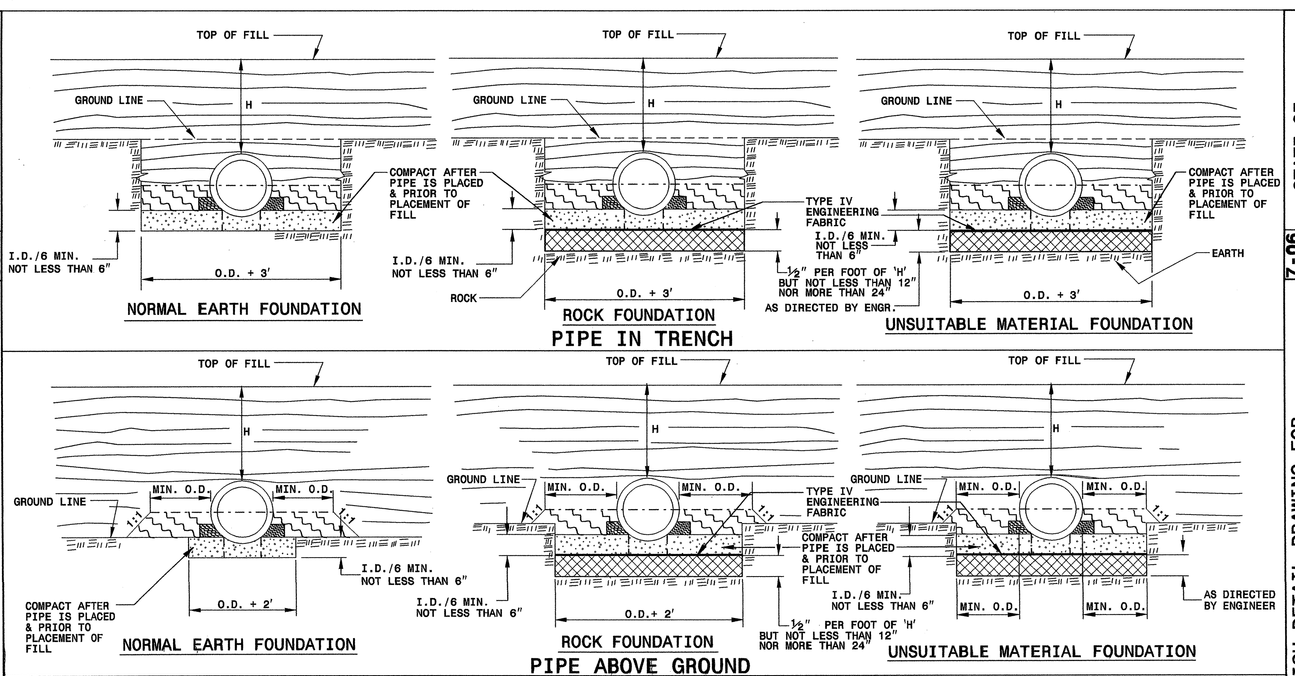
SHEET 1 OF 3
**300D01**

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**

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/9/09
FILE SPEC: s:\contracts\contracts\special details\30001\0300d01.dgn

NORTH CAROLINA PROFESSIONAL SEAL 022566 ENGINEER JOHN D. HOWERTON

PROJECT REFERENCE NO. U-2826A
SHEET NO. 2-Y

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) | Maximum Height of Cover (feet) (Ga) 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) | Maximum Height of Cover (feet) (Ga) 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

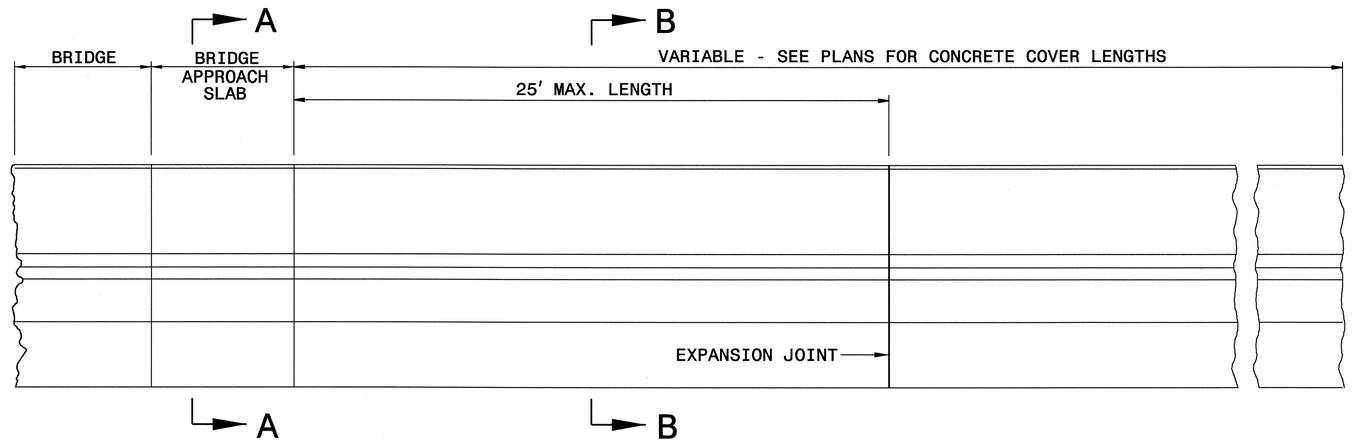
NORTH CAROLINA PROFESSIONAL SEAL 022956 ENGINEER JOHN C. HOWERTON 12/18/08

**SEE PLATE FOR TITLE**

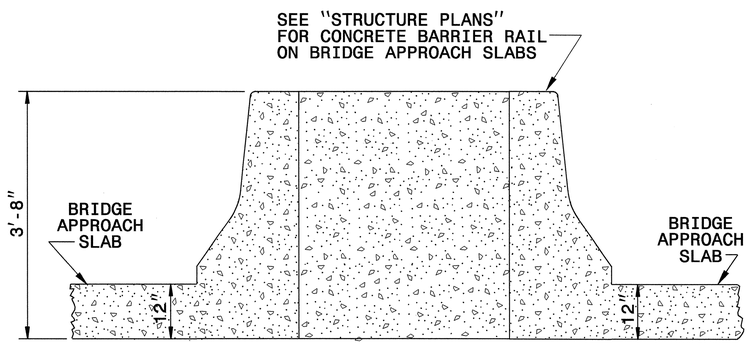
ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/09
FILE SPEC/ericward/stds/stdsto special details/30001/0300d01.dgn

PROJECT REFERENCE NO. U-2826A
SHEET NO. 2-2

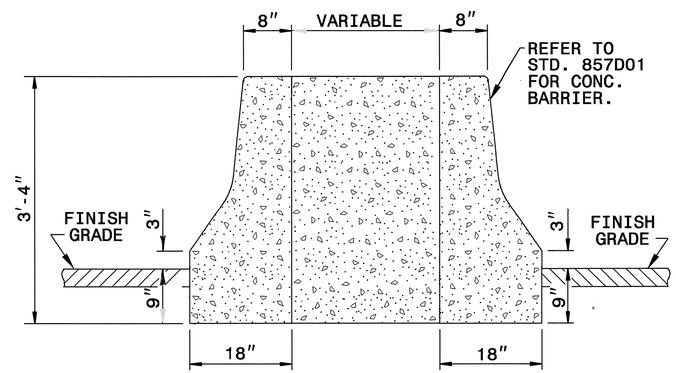
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 2-AA |




## ELEVATION




## SECTION 'A-A'




## SECTION 'B-B'

GENERAL NOTES:

USE CLASS 'AA' CONCRETE TO CONSTRUCT CONCRETE BARRIER TRANSITION.

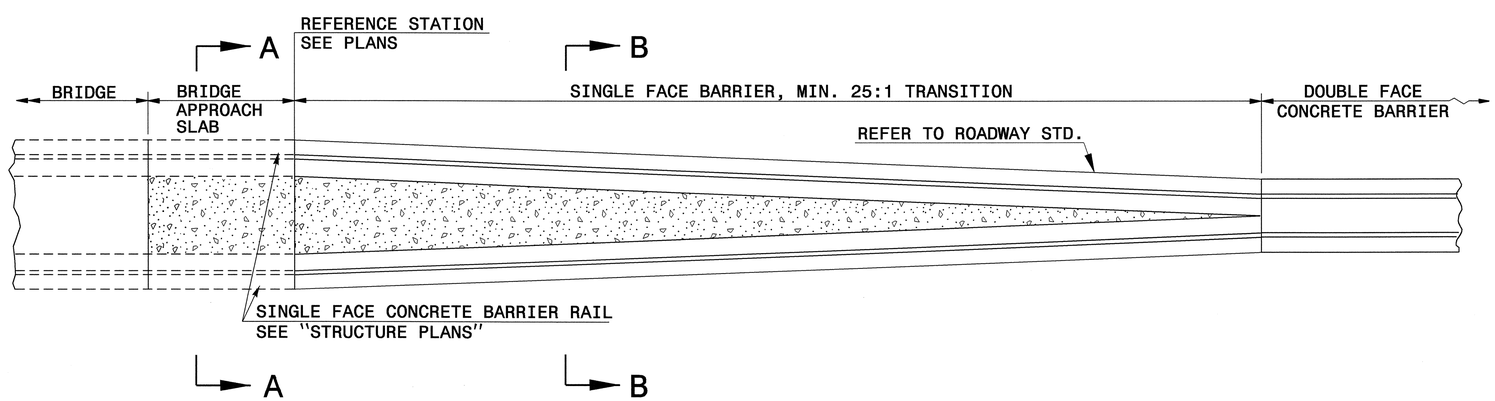
SEAL ALL EXPANSION JOINTS WITH JOINT FILLER (SEE SECTION 1028 OF THE SPECIFICATIONS).

SUBMIT ALTERNATIVE METHODS FOR STEEL FABRICATION FOR REVIEW.

REFER TO PLANS AND TYPICAL SECTION FOR CONCRETE BARRIER TRANSITION LOCATIONS.

PAY FOR CONCRETE BARRIER PER LINEAR FOOT.

BARRIER TRANSITION LOCATED AS FIELD CONDITIONS DICTATE AND AS DIRECTED BY THE ENGINEER.




## TRANSITION FROM SINGLE FACE BRIDGE RAIL TO DOUBLE FACE CONCRETE MEDIAN BARRIER

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


# CONCRETE BARRIER TRANSITION

ORIGINAL BY: T.S.Spell DATE: 4-26-04
MODIFIED BY: DATE:
CHECKED BY: DATE: 11/20/09
FILE SPEC.: w:\tspell\details\stand\barriercover3.dgn


20-NOV-2009 09:08
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jhoverton AT PS237501

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 31 of 2 |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202129

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 0000100000-N | 800 | Lump Sum | | MOBILIZATION |
| 0000400000-N | 801 | Lump Sum | | CONSTRUCTION SURVEYING |
| 0001000000-E | 200 | Lump Sum | | CLEARING & GRUBBING .. ACRE(S) |
| 0008000000-E | 200 | 1 | ACR | SUPPLEMENTARY CLEARING & GRUBBING |
| 0022000000-E | 225 | 30,000 | CY | UNCLASSIFIED EXCAVATION |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ********** (41+55.23 LT) |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ********** (41+74.77 RT) |
| 0036000000-E | 225 | 6,600 | CY | UNDERCUT EXCAVATION |
| 0080000000-E | SP | 22,250 | TON | CLASS IV SUBGRADE STABILIZATION |
| 0106000000-E | 230 | 255,000 | CY | BORROW EXCAVATION |
| 0141000000-E | 240 | 235 | LF | BERM DITCH CONSTRUCTION |
| 0156000000-E | 250 | 14,500 | SY | REMOVAL OF EXISTING ASPHALT PAVEMENT |
| 0163000000-E | 250 | 2,500 | SY | REMOVAL OF EXISTING CONCRETE PAVEMENT |
| 0177000000-E | 250 | 24,000 | SY | BREAKING OF EXISTING ASPHALT PAVEMENT |
| 0195000000-E | 265 | 2,000 | CY | SELECT GRANULAR MATERIAL |
| 0196000000-E | 270 | 34,500 | SY | FABRIC FOR SOIL STABILIZATION |
| 0199000000-E | SP | 28,219 | SF | TEMPORARY SHORING |
| 0320000000-E | SP | 1,770 | SY | FOUNDATION CONDITIONING FABRIC |
| 0330000000-E | SP | 570 | TON | GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS |
| 0343000000-E | 310 | 844 | LF | 15" SIDE DRAIN PIPE |
| 0344000000-E | 310 | 176 | LF | 18" SIDE DRAIN PIPE |
| 0345000000-E | 310 | 28 | LF | 24" SIDE DRAIN PIPE |
| 0366000000-E | 310 | 540 | LF | 15" RC PIPE CULVERTS, CLASS III |
| 0372000000-E | 310 | 48 | LF | 18" RC PIPE CULVERTS, CLASS III |
| 0378000000-E | 310 | 68 | LF | 24" RC PIPE CULVERTS, CLASS III |
| 0448000000-E | 310 | 2,356 | LF | ****" RC PIPE CULVERTS, CLASS IV (15") |
| 0448000000-E | 310 | 416 | LF | ****" RC PIPE CULVERTS, CLASS IV (18") |
| 0582000000-E | 310 | 164 | LF | 15" CS PIPE CULVERTS, 0.064" THICK |
| 0588000000-E | 310 | 208 | LF | 18" CS PIPE CULVERTS, 0.064" THICK |
| 0594000000-E | 310 | 48 | LF | 24" CS PIPE CULVERTS, 0.064" THICK |
| 0636000000-E | 310 | 4 | EA | **" CS PIPE ELBOWS, *****" THICK (15", 0.064") |
| 0636000000-E | 310 | 6 | EA | **" CS PIPE ELBOWS, *****" THICK (18", 0.064") |
| 0973100000-E | SP | 508 | LF | **" WELDED STEEL PIPE, ****" THICK, GRADE ** IN SOIL (30",0.50", B) |
| 0995000000-E | 340 | 2,513 | LF | PIPE REMOVAL |
| 1011000000-N | 500 | Lump Sum | | FINE GRADING |
| 1121000000-E | 520 | 6,400 | TON | AGGREGATE BASE COURSE |
| 1220000000-E | 545 | 300 | TON | INCIDENTAL STONE BASE |
| 1297000000-E | 607 | 1,375 | SY | MILLING ASPHALT PAVEMENT, ***" DEPTH (1-1/2") |
| 1489000000-E | 610 | 9,300 | TON | ASPHALT CONC BASE COURSE, TYPE B25.0B |
| 1498000000-E | 610 | 2,000 | TON | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B |
| 1503000000-E | 610 | 1,800 | TON | ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C |
| 1519000000-E | 610 | 2,800 | TON | ASPHALT CONC SURFACE COURSE, TYPE S9.5B |
| 1523000000-E | 610 | 2,275 | TON | ASPHALT CONC SURFACE COURSE, TYPE S9.5C |
| 1525000000-E | 610 | 2,300 | TON | ASPHALT CONC SURFACE COURSE, TYPE SF9.5A |
| 1560000000-E | 620 | 900 | TON | ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22 |
| 1565000000-E | 620 | 140 | TON | ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22 |
| 1693000000-E | 654 | 200 | TON | ASPHALT PLANT MIX, PAVEMENT REPAIR |
| 1840000000-E | 665 | 4,050 | LF | MILLED RUMBLE STRIPS (ASPHALT CEMENT CONCRETE) |
| 1847000000-E | 710 | 25,500 | SY | *****" PORT CEM CONC PAVEMENT, THROUGH LANES (WITH DOWELS) (12") |
| 1902000000-N | 710 | Lump Sum | | SURFACE TESTING CONCRETE PAVEMENT |
| 1924000000-N | 725 | Lump Sum | | FIELD LABORATORY RENTAL, PORT CEM CONC PAVEMENT |
| 2000000000-N | 806 | 28 | EA | RIGHT OF WAY MARKERS |
| 2099000000-E | 816 | 1,550 | LF | SHOULDER DRAIN |
| 2110000000-E | 816 | 1,550 | LF | 4" SHOULDER DRAIN PIPE |
| 2121000000-E | 816 | 40 | LF | 4" OUTLET PIPE FOR SHOULDER DRAINS |
| 2253000000-E | 840 | 1.244 | CY | PIPE COLLARS |
| 2275000000-E | SP | 1 | CY | FLOWABLE FILL |
| 2286000000-N | 840 | 78 | EA | MASONRY DRAINAGE STRUCTURES |
| 2308000000-E | 840 | 50 | LF | MASONRY DRAINAGE STRUCTURES |
| 2364000000-N | 840 | 2 | EA | FRAME WITH TWO GRATES, STD 840.16 |
| 2364200000-N | 840 | 28 | EA | FRAME WITH TWO GRATES, STD 840.20 |
| 2365000000-N | 840 | 20 | EA | FRAME WITH TWO GRATES, STD 840.22 |
| 2366000000-N | 840 | 3 | EA | FRAME WITH TWO GRATES, STD 840.24 |
| 2374000000-N | 840 | 3 | EA | FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E) |
| 2374000000-N | 840 | 8 | EA | FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F) |
| 2374000000-N | 840 | 4 | EA | FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G) |
| 2396000000-N | 840 | 4 | EA | FRAME WITH COVER, STD 840.54 |
| 2451000000-N | 852 | 1 | EA | CONCRETE TRANSITIONAL SECTION FOR DROP INLETS |
| 2549000000-E | 846 | 4,675 | LF | 2'-6" CONCRETE CURB & GUTTER |
| 2556000000-E | 846 | 6,120 | LF | SHOULDER BERM GUTTER |
| 2591000000-E | 848 | 1,065 | SY | 4" CONCRETE SIDEWALK |
| 2605000000-N | 848 | 24 | EA | CONCRETE WHEELCHAIR RAMPS |
| 2612000000-E | 848 | 80 | SY | 6" CONCRETE DRIVEWAY |
| 2619000000-E | 850 | 11 | SY | 4" CONCRETE PAVED DITCH |
| 2655000000-E | 852 | 160 | SY | 5" MONOLITHIC CONCRETE ISLANDS (KEYED IN) |
| 2703000000-E | 854 | 1,175 | LF | CONCRETE BARRIER, TYPE ******* (III) |
| 2703000000-E | 854 | 1,575 | LF | CONCRETE BARRIER, TYPE ******* (IV) |
| 2710000000-N | 854 | 6 | EA | CONCRETE BARRIER TRANSITION SECTION |
| 2752000000-E | SP | 4,050 | LF | GENERIC PAVING ITEM MILL RUMBLE STRIP IN CONCRETE SHOULDER |
| 2875000000-N | 859 | 1 | EA | CONVERT EXISTING CATCH BASIN TO DROP INLET |
| 3030000000-E | 862 | 6,100 | LF | STEEL BM GUARDRAIL |
| 3105000000-N | 862 | 2 | EA | STEEL BM GUARDRAIL TERMINAL SECTIONS |
| 3150000000-N | 862 | 10 | EA | ADDITIONAL GUARDRAIL POSTS |
| 3317000000-N | 862 | 6 | EA | GUARDRAIL ANCHOR UNITS, TYPE B-77 |
| 3360000000-E | 863 | 4,300 | LF | REMOVE EXISTING GUARDRAIL |
| 3380000000-E | 862 | 1,925 | LF | TEMPORARY STEEL BM GUARDRAIL |
| 3387000000-N | 862 | 3 | EA | GUARDRAIL ANCHOR UNITS, TYPE ********** TEMPORARY (B-77) |
| 3387000000-N | 862 | 1 | EA | GUARDRAIL ANCHOR UNITS, TYPE ********** TEMPORARY (CAT-1) |
| 3387000000-N | 862 | 1 | EA | GUARDRAIL ANCHOR UNITS, TYPE ********** TEMPORARY (W-BEAM) |
| 3389100000-N | SP | 3 | EA | GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY |
| 3533000000-E | 866 | 1,560 | LF | CHAIN LINK FENCE, **" FABRIC (60") |
| 3533000000-E | 866 | 6,100 | LF | CHAIN LINK FENCE, **" FABRIC (72") |
| 3539000000-E | 866 | 130 | EA | METAL LINE POSTS FOR **" CHAIN LINK FENCE (60") |
| 3539000000-E | 866 | 600 | EA | METAL LINE POSTS FOR **" CHAIN LINK FENCE (72") |
| 3545000000-E | 866 | 16 | EA | METAL TERMINAL POSTS FOR **" CHAIN LINK FENCE (60") |
| 3545000000-E | 866 | 36 | EA | METAL TERMINAL POSTS FOR **" CHAIN LINK FENCE (72") |
| 3554000000-E | 866 | 2 | EA | METAL GATE POSTS FOR **" CHAIN LINK FENCE, DOUBLE GATE (72") |
| 3565000000-E | 866 | 1 | EA | DOUBLE GATES, **" HIGH, **" WIDE, **' OPENING (72", 6', 12') |
| 3595000000-E | 869 | 425 | LF | RELAPPING GUARDRAIL |
| 3649000000-E | 876 | 125 | TON | RIP RAP, CLASS B |
| 3656000000-E | 876 | 1,745 | SY | FILTER FABRIC FOR DRAINAGE |
| 4048000000-E | 902 | 4 | CY | REINFORCED CONCRETE SIGN FOUNDATIONS |
| 4057000000-E | SP | 24 | CY | OVERHEAD FOOTING |
| 4066000000-E | 903 | 2,296 | LB | SUPPORTS, SIMPLE STEEL BEAM |
| 4072000000-E | 903 | 555 | LF | SUPPORTS, 3-LB STEEL U-CHANNEL |
| 4078000000-E | 903 | 2 | EA | SUPPORTS, 2-LB STEEL U-CHANNEL |
| 4082000000-E | 903 | 440 | LF | SUPPORTS, WOOD |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (20+00 NBL -L-) |
| 4082100000-N | SP | Lump Sum | | SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (9+80 NBL -L-) |
| 4096000000-N | 904 | 7 | EA | SIGN ERECTION, TYPE D |
| 4102000000-N | 904 | 23 | EA | SIGN ERECTION, TYPE E |
| 4108000000-N | 904 | 3 | EA | SIGN ERECTION, TYPE F |
| 4110000000-N | 904 | 11 | EA | SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A) |
| 4110000000-N | 904 | 7 | EA | SIGN ERECTION, TYPE *** (GROUND MOUNTED) (B) |
| 4114000000-N | 904 | 2 | EA | SIGN ERECTION, MILEMARKERS |
| 4116000000-N | 904 | 1 | EA | SIGN ERECTION, OVERLAY (GROUND MOUNTED) |
| 4116100000-N | 904 | 3 | EA | SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (A) |
| 4116100000-N | 904 | 2 | EA | SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E) |
| 4116100000-N | 904 | 1 | EA | SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (F) |
| 4149000000-N | 907 | 1 | EA | DISPOSAL OF SIGN SYSTEM, OVERHEAD |
| 4152000000-N | 907 | 8 | EA | DISPOSAL OF SIGN SYSTEM, STEEL BEAM |
| 4155000000-N | 907 | 20 | EA | DISPOSAL OF SIGN SYSTEM, U-CHANNEL |
| 4158000000-N | 907 | 11 | EA | DISPOSAL OF SIGN SYSTEM, WOOD |
| 4400000000-E | 1110 | 2,364 | SF | WORK ZONE SIGNS (STATIONARY) |
| 4405000000-E | 1110 | 272 | SF | WORK ZONE SIGNS (PORTABLE) |
| 4410000000-E | 1110 | 190 | SF | WORK ZONE SIGNS (BARRICADE MOUNTED) |
| 4415000000-N | 1115 | 2 | EA | FLASHING ARROW PANELS, TYPE C |
| 4420000000-N | 1120 | 12 | EA | CHANGEABLE MESSAGE SIGN |
| 4430000000-N | 1130 | 275 | EA | DRUMS |
| 4435000000-N | 1135 | 100 | EA | CONES |

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# STATE OF NORTH CAROLINA
# SUMMARY OF QUANTITIES

| PROJECT REFERENCE No. | SHEET No. |
|---|---|
| U-2826 A | 3 (2 of 2) |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 4445000000-E | 1145 | 320 | LF | BARRICADES (TYPE III) |
| 4450000000-N | 1150 | 600 | HR | FLAGGER |
| 4465000000-N | 1160 | 8 | EA | TEMPORARY CRASH CUSHIONS |
| 4470000000-N | 1160 | 6 | EA | RESET TEMPORARY CRASH CUSHIONS |
| 4480000000-N | 1165 | 2 | EA | TMIA |
| 4485000000-E | 1170 | 5,410 | LF | PORTABLE CONCRETE BARRIER |
| 4490000000-E | 1170 | 3,710 | LF | PORTABLE CONCRETE BARRIER (ANCHORED) |
| 4495000000-E | 1170 | 1,810 | LF | PORTABLE CONCRETE BARRIER (DRAINAGE) |
| 4500000000-E | 1170 | 4,280 | LF | RESET PORTABLE CONCRETE BAR-RIER |
| 4505000000-E | 1170 | 300 | LF | RESET PORTABLE CONCRETE BAR-RIER (ANCHORED) |
| 4506000000-E | 1170 | 1,430 | LF | RESET PORTABLE CONCRETE BAR-RIER (DRAINAGE) |
| 4507000000-E | SP | 1,056 | LF | WATER FILLED BARRIER |
| 4508000000-E | SP | 459 | LF | RESET WATER FILLED BARRIER |
| 4510000000-N | SP | 210 | HR | LAW ENFORCEMENT |
| 4516000000-N | 1180 | 100 | EA | SKINNY DRUM |
| 4520000000-N | 1266 | 3 | EA | TUBULAR MARKERS (FIXED) |
| 4600000000-N | SP | 2 | EA | GENERIC TRAFFIC CONTROL ITEM PEDESTRIAN BARRICADE |
| 4650000000-N | 1251 | 222 | EA | TEMPORARY RAISED PAVEMENT MARKERS |
| 4770000000-E | 1205 | 1,000 | LF | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV) |
| 4780000000-E | 1205 | 300 | LF | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (8") (IV) |
| 4795000000-E | 1205 | 100 | LF | COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (24") (IV) |
| 4800000000-N | 1205 | 8 | EA | COLD APPLIED PLASTIC PAVEMENT MARKING CHARACTER, TYPE ** (IV) |
| 4805000000-N | 1205 | 6 | EA | COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (IV) |
| 4810000000-E | 1205 | 116,654 | LF | PAINT PAVEMENT MARKING LINES (4") |
| 4820000000-E | 1205 | 3,526 | LF | PAINT PAVEMENT MARKING LINES (8") |
| 4835000000-E | 1205 | 914 | LF | PAINT PAVEMENT MARKING LINES (24") |
| 4840000000-N | 1205 | 24 | EA | PAINT PAVEMENT MARKING CHARAC-TER |
| 4845000000-N | 1205 | 56 | EA | PAINT PAVEMENT MARKING SYMBOL |
| 4847000000-E | 1205 | 28,066 | LF | POLYUREA PAVEMENT MARKING LINES (4", **********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4847110000-E | 1205 | 1,312 | LF | POLYUREA PAVEMENT MARKING LINES (8", **********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4847140000-E | 1205 | 352 | LF | POLYUREA PAVEMENT MARKING LINES (24", **********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4847200000-N | 1205 | 28 | EA | POLYUREA PAVEMENT MARKING CHARACTER (**********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4847220000-N | 1205 | 43 | EA | POLYUREA PAVEMENT MARKING SYMBOL (**********) (HIGHLY REFLECTIVE ELEMENTS) |
| 4850000000-E | 1205 | 40,000 | LF | REMOVAL OF PAVEMENT MARKING LINES (4") |
| 4860000000-E | 1205 | 305 | LF | REMOVAL OF PAVEMENT MARKING LINES (8") |
| 4870000000-E | 1205 | 164 | LF | REMOVAL OF PAVEMENT MARKING LINES (24") |
| 4875000000-N | 1205 | 30 | EA | REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS |
| 4880000000-E | 1205 | 30,000 | LF | CURING COMPOUND REMOVAL, LINES |
| 4885000000-N | 1205 | 23 | EA | CURING COMPOUND REMOVAL, SYM-BOLS & CHARACTERS |
| 4900000000-N | 1251 | 24 | EA | PERMANENT RAISED PAVEMENT MARKERS |
| 4905000000-N | 1253 | 277 | EA | SNOWPLOWABLE PAVEMENT MARKERS |
| 4915000000-E | 1264 | 3 | EA | 7' U-CHANNEL POSTS |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 4955000000-N | 1264 | 3 | EA | OBJECT MARKERS (END OF ROAD) |
| 5005000000-E | 1401 | 3 | EA | 80' HIGH MOUNT STANDARD |
| 5020000000-N | 1401 | 1 | EA | PORTABLE DRIVE UNIT |
| 5025000000-E | 1402 | 13.8 | CY | HIGH MOUNT FOUNDATIONS |
| 5030000000-N | 1403 | 12 | EA | HIGH MOUNT LUMINAIRES ******** (400W HPS) |
| 5120000000-N | 1407 | 1 | EA | ELECTRIC SERVICE POLE **** ******** (30' CLASS 4) |
| 5125000000-E | 1407 | 130 | LF | ELECTRIC SERVICE LATERAL ********** (3 #1/0 USE) |
| 5145000000-N | 1408 | 1 | EA | LIGHT CONTROL EQUIPMENT, TYPE RW ********** (240/480 VOLT) |
| 5155000000-E | 1409 | 123 | LF | ELECTRICAL DUCT, TYPE BD, SIZE ***** (2") |
| 5155000000-E | 1409 | 20 | LF | ELECTRICAL DUCT, TYPE BD, SIZE ***** (4") |
| 5160000000-E | 1409 | 153 | LF | ELECTRICAL DUCT, TYPE JA, SIZE ***** (3") |
| 5160000000-E | 1409 | 93 | LF | ELECTRICAL DUCT, TYPE JA, SIZE ***** (4") |
| 5170000000-E | 1410 | 1,890 | LF | ** #8 W/G FEEDER CIRCUIT (2) |
| 5205000000-E | 1410 | 260 | LF | ** #8 W/G FEEDER CIRCUIT IN ***** CONDUIT (2, 1.5"C) |
| 5240000000-N | 1411 | 7 | EA | ELECTRICAL JUNCTION BOXES ********** (PC18) |
| 5240000000-N | 1411 | 1 | EA | ELECTRICAL JUNCTION BOXES ********** (PC36) |
| 5252000000-N | 1412 | 7 | EA | UNDERPASS LUMINARIES ********* (TYPE WM 150W HPS) |
| 5253000000-N | 1412 | Lump Sum | | UNDERPASS CIRCUITRY AT ******* (UPL-1, 28TH STREET) |
| 5253000000-N | 1412 | Lump Sum | | UNDERPASS CIRCUITRY AT ******* (UPL-2, 25TH STREET) |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 5255000000-N | 1413 | Lump Sum | | PORTABLE LIGHTING |
| 6000000000-E | 1605 | 26,000 | LF | TEMPORARY SILT FENCE |
| 6006000000-E | 1610 | 800 | TON | STONE FOR EROSION CONTROL, CLASS A |
| 6009000000-E | 1610 | 3,095 | TON | STONE FOR EROSION CONTROL, CLASS B |
| 6012000000-E | 1610 | 2,320 | TON | SEDIMENT CONTROL STONE |
| 6015000000-E | 1615 | 22 | ACR | TEMPORARY MULCHING |
| 6018000000-E | 1620 | 450 | LB | SEED FOR TEMPORARY SEEDING |
| 6021000000-E | 1620 | 1.75 | TON | FERTILIZER FOR TEMPORARY SEED-ING |
| 6024000000-E | 1622 | 1,400 | LF | TEMPORARY SLOPE DRAINS |
| 6027000000-N | 1622 | 9 | EA | INLET PROTECTION AT TEMPORARY SLOPE DRAINS |
| 6029000000-E | SP | 460 | LF | SAFETY FENCE |
| 6030000000-E | 1630 | 3,500 | CY | SILT EXCAVATION |
| 6036000000-E | 1631 | 10,000 | SY | MATTING FOR EROSION CONTROL |
| 6042000000-E | 1632 | 4,500 | LF | 1/4" HARDWARE CLOTH |
| 6071030000-E | SP | 1,000 | LF | COIR FIBER BAFFLES |
| 6084000000-E | 1660 | 30 | ACR | SEEDING & MULCHING |
| 6087000000-E | 1660 | 29 | ACR | MOWING |
| 6090000000-E | 1661 | 250 | LB | SEED FOR REPAIR SEEDING |
| 6093000000-E | 1661 | 1 | TON | FERTILIZER FOR REPAIR SEEDING |
| 6096000000-E | 1662 | 675 | LB | SEED FOR SUPPLEMENTAL SEEDING |
| 6108000000-E | 1665 | 19.75 | TON | FERTILIZER TOPDRESSING |
| 6114500000-N | SP | 10 | MHR | SPECIALIZED HAND MOWING |
| 6117000000-N | SP | 27 | EA | RESPONSE FOR EROSION CONTROL |
| 7000000000-E | 1705 | 10 | EA | PEDESTRIAN SIGNAL HEAD (**", ** SECTION) (16", 1 SECTION WITH COUNT-DOWN) |
| 7060000000-E | 1705 | 4,120 | LF | SIGNAL CABLE |
| 7120000000-E | 1705 | 14 | EA | VEHICLE SIGNAL HEAD (12", 3 SECTION) |

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 7132000000-E | 1705 | 2 | EA | VEHICLE SIGNAL HEAD (12", 4 SECTION) |
| 7144000000-E | 1705 | 2 | EA | VEHICLE SIGNAL HEAD (12", 5 SECTION) |
| 7252000000-E | 1710 | 900 | LF | MESSENGER CABLE (1/4") |
| 7264000000-E | 1710 | 1,020 | LF | MESSENGER CABLE (3/8") |
| 7288000000-E | 1715 | 10 | LF | PAVED TRENCHING (**********) (2, 2") |
| 7300000000-E | 1715 | 630 | LF | UNPAVED TRENCHING (**********) (2, 2") |
| 7301000000-E | 1715 | 165 | LF | DIRECTIONAL DRILL (**********) (1, 2") |
| 7324000000-N | 1716 | 11 | EA | JUNCTION BOX (STANDARD SIZE) |
| 7360000000-N | 1720 | 8 | EA | WOOD POLE |
| 7372000000-N | 1721 | 23 | EA | GUY ASSEMBLY |
| 7396000000-E | 1722 | 2 | EA | 1/2" RISER WITH WEATHERHEAD |
| 7408000000-E | 1722 | 2 | EA | 1" RISER WITH WEATHERHEAD |
| 7420000000-E | 1722 | 10 | EA | 2" RISER WITH WEATHERHEAD |
| 7444000000-E | 1725 | 1,460 | LF | INDUCTIVE LOOP SAWCUT |
| 7456000000-E | 1726 | 3,510 | LF | LEAD-IN CABLE (**********) (14-2) |
| 7504000000-E | SP | 900 | LF | COMMUNICATIONS CABLE (** TWISTED-PAIR) (12) |
| 7624000000-N | 1743 | 2 | EA | SIGNAL PEDESTAL WITH FOUNDA-TION |
| 7636000000-N | 1745 | 9 | EA | SIGN FOR SIGNALS |
| 7684000000-N | 1750 | 2 | EA | SIGNAL CABINET FOUNDATION |
| 7828000000-N | 1751 | 2 | EA | CONTROLLER WITH CABINET (NEMA TS-2, TYPE 2 CONTROLLER, TYPE 1 CABINET, BASE MOUNTED) |
| 7852000000-N | 1751 | 8 | EA | DETECTOR CARD (NEMA TS-2) |

COMPUTED BY: S. K. RAGLAND DATE: 1-8-09
CHECKED BY: J. B. JAVELLANA DATE: 3-10-09

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 3-A |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

| STATION | LOCATION (LT, RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12" | 15" | 18" | 24" | 30" | 36" | 15" CLASS IV | 18" CLASS IV | C.S. PIPE (UNLESS NOTED OTHERWISE) 12" .064 | 15" .064 | 18" .064 | 24" .064 | 24" | 30" .079 | 30" | 36" .079 | 36" | 42" .109 | 42" | 48" .109 | 48" | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, OR PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | 30" WELDED STEEL PIPE, 0.5" THICK, GRADE B | | | ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P. | C.S.P. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -Y1- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+70 | RT | 1 | | 942.64 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+83 | CL | 1 | 2 | | 938.89 | 932.25 | | | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+70 | RT | 1 | 3 | | 938.89 | 943.78 | | | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+00 | RT | 3 | | 946.78 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+00 | RT | 3 | 4 | | 943.78 | 944.46 | | | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+00 | CL | 4 | | 947.63 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+50 | RT | 5 | | 950.68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+50 | RT | 5 | 6 | | 947.93 | 946.78 | | | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+65 | RT | 6 | | 949.90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+65 | RT | 6 | 6A | | 946.78 | | | | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+66 | RT | 6A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+02 | LT | 7 | | 954.04 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+02 | LT | 7 | 9 | | 951.29 | 947.97 | | | 36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+15 | LT | 9 | | 951.47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+62 | LT | 8 | | 951.00 | 947.06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+67 | LT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y2- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+00 | RT | 10 | | 952.03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+00 | RT | 10 | 9 | | 949.28 | 947.97 | | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+87 | LT | 11 | | 950.98 | 944.33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18+75 | RT | 12 | | 953.00 | 949.90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+92 | LT | 13 | | 951.55 | 942.53 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -L- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29+51 | RT | 14 | | 969.54 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29+51 | RT | 14 | 15 | | 966.79 | 963.82 | | | | | | | | 132 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30+83 | RT | 15 | | 966.57 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30+83 | RT | 15 | 16 | | 963.82 | 947.20 | | | | | | | | | | | | | | | | | | | | | | | | | | 36 | | | | | | | | | | | |
| 30+76 | RT | 16 | | 949.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30+76 | RT | 16 | 17 | | 946.95 | 956.02 | | | | | | | | | | | | | | | | | | | | | | | | | | | 100 | | | | | | | | | | |
| 31+70 | RT | 17 | | 965.51 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31+70 | RT | 17 | 18 | | 956.02 | 956.26 | | | | | | | | | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31+70 | CL | 17 | 20 | | 962.36 | 962.64 | | | | | | | | 96 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32+06 | CL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32+50 | RT | 18 | | 965.51 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32+43 | CL | 18 | 21 | | 956.26 | 956.60 | | | | | | | | | 112 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30+62 | LT | 19 | | 966.94 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30+62 | LT | 19 | 20 | | 964.19 | 962.64 | | | | | | | | 108 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31+70 | LT | 20 | | 965.39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32+34 | LT | 21 | | 959.60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32+34 | LT | 21 | 24 | | 956.85 | 957.25 | | | | | | | | | | | | | | | | | | | | | | | | | | 104 | | | | | | | | | | | |
| 32+62 | LT | 22 | | 964.81 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32+62 | LT | 22 | 23 | | 962.06 | 961.83 | | | | | | | | 88 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUBTOTALS | | | | | | | | | 236 | 12 | | | | 424 | 192 | | | | | | | | | | | | | | | 140 | 100 | | | | | | | | | | |

| STATION | LOCATION | STRUCTURE NO. FROM | STRUCTURE NO. TO | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | LIN. *FT. A 5.0' THRU 10.0' | LIN. *FT. B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME & 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 | T.B.D.I. STD. 840.35 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | T.B.J.B. STD. 840.34 | J.B. STD. 840.31 OR 840.32 | M.H. FRAME & COVER STD. 840.54 | 4" CONCRETE PAVED DITCH (SQ. YDS.) | C.B. STD. 840.04 OR 840.05 | CONV. EXIST. C.B. TO D.I. (SEE DETAIL 2-H) | PIPE PLUG, FLOWABLE FILL (CU YDS.) | CONC. TRANS. SECTION FOR D.I. | CORR. STEEL ELBOWS NO. & SIZE | CONC. COLLARS CL. "B" C.Y. STD 840.72 | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -Y1- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+70 | RT | 1 | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+83 | CL | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+70 | RT | 1 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+00 | RT | 3 | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+00 | RT | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11+00 | CL | 4 | | 1 | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | 1 | | | | | |
| -Y- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+50 | RT | 5 | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+50 | RT | 5 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 17 | REMOVE CB |
| 12+65 | RT | 6 | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| 12+65 | RT | 6 | 6A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | REMOVE DI |
| 12+66 | RT | 6A | | | | | | | | | | | | | | | | | | | | | | | | | | | | .446 | | | |
| 12+02 | LT | 7 | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| 12+02 | LT | 7 | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+15 | LT | 9 | | 1 | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| 12+62 | LT | 8 | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | REMOVE DI |
| 12+67 | LT | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | REMOVE CB |
| -Y2- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+00 | RT | 10 | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+00 | RT | 10 | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+87 | LT | 11 | | 1 | 1.65 | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | EX. DEPTH, REMOVE CB |
| 18+75 | RT | 12 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| 20+92 | LT | 13 | | 1 | 4.02 | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | EX. DEPTH |
| -L- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29+51 | RT | 14 | | 1 | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI |
| 29+51 | RT | 14 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30+83 | RT | 15 | | 1 | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | 92 | 2GI, REMOVE CB, FILL OR REMOVE PIPE |
| 30+83 | RT | 15 | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 34 | FILL OR REMOVE PIPE |
| 30+76 | RT | 16 | | 1 | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | OTCB, REMOVE DI |
| 30+76 | RT | 16 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 99 | FILL OR REMOVE PIPE |
| 31+70 | RT | 17 | | 1 | 4.49 | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | EX. DEPTH 2GI, REMOVE CB |
| 31+70 | RT | 17 | 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31+70 | CL | 17 | 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 88 | FILL OR REMOVE PIPE |
| 32+06 | CL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 126 | FILL OR REMOVE PIPE |
| 32+50 | RT | 18 | | 1 | 4.25 | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | EX. DEPTH 2GI, |
| 32+43 | CL | 18 | 21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30+62 | LT | 19 | | 1 | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI, REMOVE CB |
| 30+62 | LT | 19 | 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31+70 | LT | 20 | | 1 | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI, REMOVE CB |
| 32+34 | LT | 21 | | 1 | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI, REMOVE DI |
| 32+34 | LT | 21 | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32+62 | LT | 22 | | 1 | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI |
| 32+62 | LT | 22 | 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUBTOTALS | | | | 20 | 14.41 | | 9 | 1 | 5 | 3 | | 2 | 2 | | 1 | | 7 | 7 | 1 | | | | | | 1 | 1 | 1 | 1 | | .446 | | 456 | |

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

ABBREVIATIONS

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

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COMPUTED BY: S. K. RAGLAND DATE: 1-8-09
CHECKED BY: J. B. JAVELLANA DATE: 3-10-09

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 3-B |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

**Table A: station, location, structure numbers, elevations and Class III R.C. pipe**

| STATION (-L-) | LOCATION (LT, RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12" | 15" | 18" | 24" | 30" | 36" | 15" CLASS IV | 18" CLASS IV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33+50 | LT | 23 | | 964.58 | | | | | | | | | | | |
| 33+50 | LT | 23 | 26 | | 961.83 | 961.68 | | | | | | | | 52 | |
| 33+37 | LT | 24 | | 960.00 | | | | | | | | | | | |
| 33+37 | LT | 24 | 25 | | 957.25 | 959.58 | | | | | | | | | |
| 35+36 | LT | 25 | | 962.33 | | | | | | | | | | | |
| 33+43 | RT | 26 | | 965.36 | | | | | | | | | | | |
| 33+43 | RT | 26 | 27 | | 961.68 | 961.25 | | | | | | | | 104 | |
| 34+50 | RT | 27 | | 965.79 | | | | | | | | | | | |
| 34+50 | LT | 27 | 28 | | 961.25 | 961.68 | | | | | | | | 48 | |
| 34+50 | RT | 27 | 29 | | 961.25 | 961.00 | | | | | | | | 48 | |
| 34+50 | LT | 28 | | 964.43 | | | | | | | | | | | |
| 34+67 | LT | | | | | | | | | | | | | | |
| 35+00 | RT | 29 | | 966.26 | | | | | | | | | | | |
| 35+00 | RT | 29 | 31 | | 961.00 | 960.70 | | | | | | | | | 100 |
| 35+85 | RT | | | | | | | | | | | | | | |
| 36+00 | LT | 30 | | 965.66 | | | | | | | | | | | |
| 36+00 | LT | 30 | 31 | | 962.91 | 962.41 | | | | | | | | 52 | |
| 36+00 | RT | 31 | | 967.76 | | | | | | | | | | | |
| 36+00 | RT | 31 | 32 | | 960.70 | 959.50 | | | | | | | | | 44 |
| 36+00 | RT | 32 | | 970.51 | | | | | | | | | | | |
| 36+00 | RT | 32 | 33 | | 959.50 | 944.71 | | | | | | | | | |
| 35+70 | RT | 33 | | 952.56 | | | | | | | | | | | |
| 38+60 | LT | 34 | | 972.88 | | | | | | | | | | | |
| 38+60 | LT | 34 | 35 | | 970.13 | 967.96 | | | | | | | | 76 | |
| 39+01 | LT | | | | | | | | | | | | | | |
| 39+06 | RT | 35 | | 976.69 | | | | | | | | | | | |
| 39+06 | RT | 35 | 36 | | 967.96 | 946.88 | | | | | | | | | 80 |
| 39+18 | RT | 36 | | 967.02 | | | | | | | | | | | |
| 46+11 | CL | | | | | | | | | | | | | | |
| 47+00 | RT | 37 | | 989.61 | | | | | | | | | | | |
| 47+00 | RT | 37 | 38 | | 986.86 | 986.71 | | | | | | | | 52 | |
| 47+01 | RT | 38 | | 990.81 | | | | | | | | | | | |
| 47+01 | RT | 38 | 42 | | 986.71 | 980.92 | | | | | | | | 300 | |
| 50+00 | LT | 39 | | 966.83 | | | | | | | | | | | |
| 50+00 | LT | 39 | 40 | | 963.06 | 969.02 | | | | | 68 | | | | |
| 49+92 | CL | 39 | 43 | | 963.06 | 944.45 | | | | | | | | | |
| 50+00 | LT | 41 | | 983.92 | | | | | | | | | | | |
| 50+00 | CL | 41 | 42 | | 981.17 | 980.92 | | | | | | | | 84 | |
| 50+33 | LT | | | | | | | | | | | | | | |
| 50+17 | RT | | | | | | | | | | | | | | |
| SUBTOTALS | | | | | | | | | | | 68 | | | 816 | 224 |

**Table B: C.S. pipe, side drain pipe, welded steel pipe, endwalls, drainage structure quantities and frames/grates**

| STATION | STRUCTURE NO. | C.S. PIPE (UNLESS NOTED OTHERWISE) 12" .064 | 15" .064 | 18" .064 | 24" .064 | 30" .079 | 36" .079 | 42" .109 | 48" .109 | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, OR PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | 30" WELDED STEEL PIPE, 0.5" THICK, GRADE B | ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | LIN. *FT. A 5.0' THRU 10.0' | B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33+50 | 23 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 33+50 | 23-26 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33+37 | 24 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 33+37 | 24-25 | | | | | | | | | | 188 | | | | | | | | | | | | | | | | |
| 35+36 | 25 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 33+43 | 26 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 33+43 | 26-27 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34+50 | 27 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 34+50 | 27-28 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34+50 | 27-29 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34+50 | 28 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 34+67 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35+00 | 29 | | | | | | | | | | | | | | | | | | | | 1 | 0.26 | | | | | |
| 35+00 | 29-31 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35+85 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36+00 | 30 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 36+00 | 30-31 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36+00 | 31 | | | | | | | | | | | | | | | | | | | | 1 | 2.06 | | | | | |
| 36+00 | 31-32 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36+00 | 32 | | | | | | | | | | | | | | | | | | | | 1 | 5 | 1.01 | | | | |
| 36+00 | 32-33 | | | | | | | | | | | 76 | | | | | | | | | | | | | | | |
| 35+70 | 33 | | | | | | | | | | | | | | | | | | | | 1 | 2.85 | | | | | |
| 38+60 | 34 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 38+60 | 34-35 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39+01 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39+06 | 35 | | | | | | | | | | | | | | | | | | | | 1 | 3.73 | | | | | |
| 39+06 | 35-36 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39+18 | 36 | | | | | | | | | | | | | | | | | | | | 1 | 5 | 10.14 | | | | |
| 46+11 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47+00 | 37 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 47+00 | 37-38 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47+01 | 38 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 47+01 | 38-42 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50+00 | 39 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 50+00 | 39-40 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 49+92 | 39-43 | | | | | | | | | | | | | | | | | 184 | | | | | | | | | |
| 50+00 | 41 | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| 50+00 | 41-42 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50+33 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50+17 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUBTOTALS | | | | | | | | | | | 188 | 76 | | | | | | 184 | | | 18 | 18.9 | 11.15 | | | | |

**Table C: drainage structures, pipe removal and remarks**

| STATION | STRUCTURE NO. | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME & 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 | T.B.D.I. STD. 840.35 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | T.B.J.B. STD. 840.34 | J.B. STD. 840.31 OR 840.32 | M.H. FRAME & COVER STD. 840.54 | 4" CONCRETE PAVED DITCH (SQ. YDS.) | C.B. STD. 840.04 OR 840.05 | CONV. EXIST. C.B. TO D.I. (SEE DETAIL 2-H) | PIPE PLUG, FLOWABLE FILL (CU YDS.) | CONC. TRANS. SECTION FOR D.I. | CORR. STEEL ELBOWS NO. & SIZE | CONC. COLLARS CL. "B" C.Y. STD 840.72 | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | PIPE REMOVAL LIN.FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33+50 | 23 | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI |
| 33+50 | 23-26 | | | | | | | | | | | | | | | | | | | | | | |
| 33+37 | 24 | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI |
| 33+37 | 24-25 | | | | | | | | | | | | | | | | | | | | | | |
| 35+36 | 25 | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI |
| 33+43 | 26 | | | | | | | 1 | 1 | | | | | | | | | | | | | 76 | 2GI, REMOVE CB |
| 33+43 | 26-27 | | | | | | | | | | | | | | | | | | | | | 11 | REMOVE 2 CB'S |
| 34+50 | 27 | | | | | | | 1 | 1 | | | | | | | | | | | | | | EX. DEPTH 2GI |
| 34+50 | 27-28 | | | | | | | | | | | | | | | | | | | | | | |
| 34+50 | 27-29 | | | | | | | | | | | | | | | | | | | | | 117 | |
| 34+50 | 28 | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI |
| 34+67 | | | | | | | | | | | | | | | | | | | | | | 126 | REMOVE CB, FILL OR REMOVE PIPE |
| 35+00 | 29 | | | | | | | 1 | 1 | | | | | | | | | | | | | | EX. DEPTH 2GI |
| 35+00 | 29-31 | | | | | | | | | | | | | | | | | | | | | 63 | REMOVE CB |
| 35+85 | | | | | | | | | | | | | | | | | | | | | | 115 | REMOVE JB, FILL OR REMOVE PIPE |
| 36+00 | 30 | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI |
| 36+00 | 30-31 | | | | | | | | | | | | | | | | | | | | | 53 | REMOVE CB, FILL OR REMOVE PIPE |
| 36+00 | 31 | | | | | | | 1 | 1 | | | | | | | | | | | | | 15 | EX. DEPTH 2GI, REM. CB, FILL OR REM. PIPE |
| 36+00 | 31-32 | | | | | | | | | | | | | | | | | | | | | | |
| 36+00 | 32 | | | | | | | | | | | 1 | 1 | | | | | | | | | | EX. DEPTH JB |
| 36+00 | 32-33 | | | | | | | | | | | | | | | | | | | | | | |
| 35+70 | 33 | | | | | | | | | | | 1 | 1 | | | | | | | | | | EX. DEPTH JB |
| 38+60 | 34 | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI |
| 38+60 | 34-35 | | | | | | | | | | | | | | | | | | | | | | |
| 39+01 | | | | | | | | | | | | | | | | | | | | | | 124 | REMOVE CB, FILL OR REMOVE PIPE |
| 39+06 | 35 | | | | | | | 1 | 1 | | | | | | | | | | | | | | EX. DEPTH 2GI |
| 39+06 | 35-36 | | | | | | | | | | | | | | | | | | | | | | |
| 39+18 | 36 | | | | | | | | | | | 1 | 1 | | | | | | | | | | EX. DEPTH JB, REMOVE CB |
| 46+11 | | | | | | | | | | | | | | | | | | | | | | 80 | REMOVE 2 CB'S, FILL OR REMOVE PIPE |
| 47+00 | 37 | | | | | | | 1 | 1 | | | | | | | | | | | | | | 2GI |
| 47+00 | 37-38 | | | | | | | | | | | | | | | | | | | | | | |
| 47+01 | 38 | | | | | | 1 | 1 | | | | | | | | | | | | | | | EX. DEPTH 2GI |
| 47+01 | 38-42 | | | | | | | | | | | | | | | | | | | | | | |
| 50+00 | 39 | | | | | | | | | | | 1 | | | | | | | | | | | |
| 50+00 | 39-40 | | | | | | | | | | | | | | | | | | | | | | |
| 49+92 | 39-43 | | | | | | | | | | | | | | | | | | | | | | TRENCHLESS INSTALLATION |
| 50+00 | 41 | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI |
| 50+00 | 41-42 | | | | | | | | | | | | | | | | | | | | | | |
| 50+33 | | | | | | | | | | | | | | | | | | | | | | 28 | REMOVE CB, FILL OR REMOVE PIPE |
| 50+17 | | | | | | | | | | | | | | | | | | | | | | 121 | REM. CB & 2 PIPES, FILL OR REM. PIPE |
| SUBTOTALS | | | | | 2 | | 6 | 12 | 8 | | | 4 | 3 | | | | | | | | | 929 | |

ABBREVIATIONS

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

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$$$$USERNAME$$$$

COMPUTED BY: S. K. RAGLAND DATE: 1-8-09
CHECKED BY: J. B. JAVELLANA DATE: 3-10-09

PROJECT REFERENCE NO.: U-2826A SHEET NO.: 3-C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

-L-

| Station | Location (LT, RT, or CL) | Structure No. From | Structure No. To | Top Elevation | Invert Elevation | Invert Elevation | Slope Critical | Class III R.C. Pipe (Unless Noted Otherwise) 12" | 15" | 18" | 24" | 30" | 36" | 15" Class IV | 18" Class IV | C.S. Pipe (Unless Noted Otherwise) 12" .064 | 15" .064 | 18" .064 | 24" .064 | 24" | 30" .079 | 30" | 36" .079 | 36" | 42" .109 | 42" | 48" .109 | 48" | Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | 30" Welded Steel Pipe, 0.5" Thick, Grade B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|50+01|RT|42||983.92||||||||||||||||||||||||||||||||
|50+01|RT|42|42A||980.92|944.45||||||||||||76||||||||||||||||||||
|53+50|LT|44||960.47||||||||||||||||||||||||||||||||
|53+50|LT|44|45||956.97|954.58|||||||||||||48|||||||||||||||||||
|53+50|LT|45||958.08||||||||||||||||||||||||||||||||
|||||||||||||||||||||||||||||||||||||||
|53+50|LT|45|49||954.58|940.00||||||||||||||||||||||||||||||164|
|53+35|LT||||||||||||||||||||||||||||||||||||||
|53+38|LT||||||||||||||||||||||||||||||||||||||
|53+50|LT|46||970.76||||||||||||||||||||||||||||||||
|53+50|LT|46|47||968.01|967.76||||||||84||||||||||||||||||||||||
|||||||||||||||||||||||||||||||||||||||
|53+53|RT|47||970.76||||||||||||||||||||||||||||||||
|53+53|RT|47|48||967.76|940.00|||||||||||52|||||||||||||||||||||
|56+50|LT|50||949.93||||||||||||||||||||||||||||||||
|56+50|LT|50|53||947.18|941.30||||||||||||||||||||||||200||||||||
|57+00|LT|51||957.60||||||||||||||||||||||||||||||||
|||||||||||||||||||||||||||||||||||||||
|57+00|CL|51|52||954.85|954.61||||||||84||||||||||||||||||||||||
|57+00|RT|52||957.60||||||||||||||||||||||||||||||||
|57+00|RT|52|56||954.61|952.14||||||||128||||||||||||||||||||||||
|58+50|LT|53||944.05||||||||||||||||||||||||||||||||
|58+25|LT||||||||||||||||||||||||||||||||||||||
|58+41|LT||||||||||||||||||||||||||||||||||||||
|58+50|LT|53|54||940.55|943.96||||||||||||||||||||||||||28||||||
|58+38|CL|53|58||940.55|930.53||||||||||||||||||||||||||||||160|
|58+50|LT|54||947.46||||||||||||||||||||||||||||||||
|58+50|LT|54|55||944.46|951.72||||||||||||20||||||||||||||||||||
|58+50|LT|54|56A||944.46|948.40|||84|||||||||||||||||||||||||||||
|58+50|LT|55||||951.72||||||||||||||||||||||||||||||||
|58+28|RT|56||954.89||||||||||||||||||||||||||||||||
|57+70|LT|56A||951.15||||||||||||||||||||||||||||||||
|58+28|RT|56|57||949.22|930.53||||||||||||52||||||||||||||||||||
|58+28|RT|56|60||949.28|949.68||||||||136||||||||||||||||||||||||
|59+01|LT|59||953.80||||||||||||||||||||||||||||||||
|||||||||||||||||||||||||||||||||||||||
|59+01|LT|59|61||951.05|949.95||||||||100||||||||||||||||||||||||
|59+75|LT||||||||||||||||||||||||||||||||||||||
|59+63|RT|60||953.20||||||||||||||||||||||||||||||||
|59+81|CL|60|61||949.68|949.95||||||||92||||||||||||||||||||||||
|60+00|LT|61||952.90||||||||||||||||||||||||||||||||
|||||||||||||||||||||||||||||||||||||||
|60+83|LT|62||952.70||||||||||||||||||||||||||||||||
|60+83|LT|62|63||949.95|950.12||||||||68||||||||||||||||||||||||
|60+83|CL|62|64||949.95|949.70||||||||84||||||||||||||||||||||||
|61+50|LT|63||952.87||||||||||||||||||||||||||||||||
|60+83|RT|64||952.70||||||||||||||||||||||||||||||||
|||||||||||||||||||||||||||||||||||||||
|||||||||||||||||||||||||||||||||||||||
|SUBTOTALS||||||||||84|||||776|||52|148|48|||||||||||200||28|||||324|

| Station | Structure No. From | Structure No. To | | | Endwalls Std. 838.01, Std. 838.11 or Std. 838.80 (Unless Noted Otherwise) Cu. Yds. R.C.P. | C.S.P. | Quantities for Drainage Structures Per Each (0' thru 5.0') | Lin. *Ft. A 5.0' thru 10.0' | B 10.0' and above | C.B. Std. 840.01 or Std. 840.02 | Frame, Grates and Hood Standard 840.03 Type of Grate E | F | G | | D.I. Std. 840.14 or Std. 840.15 | D.I. Frame & 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 | T.B.D.I. Std. 840.35 | G.D.I. Frame with Two Grates Std. 840.22 | G.D.I. (N.S.) Frame with Two Grates Std. 840.24 | T.B.J.B. Std. 840.34 | J.B. Std. 840.31 or 840.32 | M.H. Frame & Cover Std. 840.54 | 4" Concrete Paved Ditch (Sq. Yds.) | C.B. Std. 840.04 or 840.05 | Conv. Exist. C.B. to D.I. (See Detail 2-H) | Pipe Plug, Flowable Fill (Cu Yds.) | Conc. Trans. Section for D.I. | Corr. Steel Elbows No. & Size | Conc. Collars Cl. "B" C.Y. Std 840.72 | Conc. & Brick Pipe Plug, C.Y. Std. 840.71 | Pipe Removal Lin.Ft. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|50+01|42|||||||1|||||||||||||||1|1|||||||||||||||2GI|
|50+01|42|42A||||||||||||||||||||||||||||||2@18||||
|53+50|44|||||||1|||||||||||||1|||||1||||||||||||2GI|
|53+50|44|45|||||||||||||||||||||||||||||||||||
|53+50|45|||||||1|||||||||||||1|||||1||||||||||||2GI|
||||||||||||||||||||||||||||||||||||||
|53+50|45|49|||||||||||||||||||||||||||||||||TRENCHLESS INSTALLATION|
|53+35||||||||||||||||||||||||||||||||||9|REMOVE DI, FILL OR REMOVE PIPE|
|53+38||||||||||||||||||||||||||||||||||22|REMOVE CB, FILL OR REMOVE PIPE|
|53+50|46|||||||1|||||||||||||||1|1||||||||||||||83|2GI, FILL OR REMOVE PIPE|
|53+50|46|47|||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||
|53+53|47|||||||1|||||||||||||||1|1||||||||||||||35|EX. DEPTH 2GI, REM. CB, FILL OR REM. PIPE|
|53+53|47|48||||||||||||||||||||||||||||||2@15||||
|56+50|50|||||||1|||||||||||||1||||1|||||||||||||2GI|
|56+50|50|53|||||||||||||||||||||||||||||||||||
|57+00|51|||||||1|||||||||||||||1|1|||||||||||||||2GI|
||||||||||||||||||||||||||||||||||||||
|57+00|51|52|||||||||||||||||||||||||||||||||82|REMOVE CB, FILL OR REMOVE PIPE|
|57+00|52|||||||1|||||||||||||||1|1|||||||||||||||EX. DEPTH 2GI|
|57+00|52|56|||||||||||||||||||||||||||||||||125|REMOVE CB|
|58+50|53|||||||1|||||||||||||1||||1|||||||||||||EX. DEPTH 2GI|
|58+25||||||||||||||||||||||||||||||||||28|REMOVE DI, FILL OR REMOVE PIPE|
|58+41||||||||||||||||||||||||||||||||||83|REMOVE CB, FILL OR REMOVE PIPE|
|58+50|53|54|||||||||||||||||||||||||||||||||||
|58+38|53|58|||||||||||||||||||||||||||||||||TRENCHLESS INSTALLATION|
|58+50|54|||||||1|||||||||||||1|||||1||||||||||||2GI|
|58+50|54|55|||||||||||||||||||||||||||||||||||
|58+50|54|56A|||||||||||||||||||||||||||||||||||
|58+50|55||||||||||||||||||||||||||||11||||||||||BDO|
|58+28|56|||||||1|0.67|||||||||||||1|1|||||||||||||||EX. DEPTH 2GI, REM. CB|
|57+70|56A|||||||1|||||||||||||1|||||1||||||||||||2GI|
|58+28|56|57||||||||||||||||||||||||||||||2@18|||53|FILL OR REM. PIPE|
|58+28|56|60|||||||||||||||||||||||||||||||||135|REMOVE CB, FILL OR REMOVE PIPE|
|59+01|59|||||||1|||||||||||||||1|1|||||||||||||||2GI|
||||||||||||||||||||||||||||||||||||||
|59+01|59|61|||||||||||||||||||||||||||||||||||
|59+75||||||||||||||||||||||||||||||||||81|REMOVE CB, FILL OR REMOVE PIPE|
|59+63|60|||||||1|||||||||||||||1|1|||||||||||||||EX. DEPTH 2GI, REM. CB|
|59+81|60|61|||||||||||||||||||||||||||||||||||
|60+00|61|||||||1|||||||||||||||1|1|||||||||||||||2GI|
||||||||||||||||||||||||||||||||||||||
|60+83|62|||||||1|||||||||||||||1|1|||||||||||||||2GI|
|60+83|62|63|||||||||||||||||||||||||||||||||||
|60+83|62|64|||||||||||||||||||||||||||||||||||
|61+50|63|||||||1|||||||||||||||1|1|||||||||||||||2GI|
|60+83|64|||||||1|||||||||||||||1|1|||||||||||||||2GI|
||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||
|SUBTOTALS|||||||18|0.67||||||||||6||12|12|3|3||||11|||||2@15 4@18|||736||

ABBREVIATIONS

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

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COMPUTED BY: S. K. RAGLAND DATE: 1-8-09
CHECKED BY: J. B. JAVELLANA DATE: 3-10-09

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 3-D |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

| Station (Size / Thickness or Gauge) | Location (LT,RT, or CL) | Structure No. From | Structure No. To | Top Elevation | Invert Elevation | Invert Elevation | Slope Critical | Class III R.C. Pipe (Unless Noted Otherwise) 12" | 15" | 18" | 24" | 30" | 36" | 15" Class IV | 18" Class IV | C.S. Pipe (Unless Noted Otherwise) 12" .064 | 15" .064 | 18" .064 | 24" .064 | 24" | 30" .079 | 30" | 36" .079 | 36" | 42" .109 | 42" | 48" .109 | 48" | Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -L- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60+83 | RT | 64 | 65 | | 949.70 | 949.35 | | | | | | | | 116 | | | | | | | | | | | | | | | | | | | | | | |
| 62+00 | RT | 65 | | 953.18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 62+00 | RT | 65 | 68 | | 949.35 | 948.88 | | | | | | | | 156 | | | | | | | | | | | | | | | | | | | | | | |
| 63+32 | LT | 66 | | 955.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63+32 | LT | 66 | 67 | | 952.75 | 952.80 | | | | | | | | 8 | | | | | | | | | | | | | | | | | | | | | | |
| 63+32 | LT | 66 | 68 | | 952.75 | 952.02 | | | | | | | | 52 | | | | | | | | | | | | | | | | | | | | | | |
| 63+40 | LT | 67 | | 955.55 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63+56 | RT | 68 | | 954.87 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63+56 | RT | 68 | 69 | | 952.02 | 952.15 | | | | | | | | 8 | | | | | | | | | | | | | | | | | | | | | | |
| 63+56 | RT | 68 | 70 | | 948.63 | 927.00 | | | | | | | | | | | | 60 | | | | | | | | | | | | | | | | | | |
| 63+66 | RT | 69 | | 954.90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -Y3- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19+78 | RT | 71 | | 953.72 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19+78 | RT | 71 | 72 | | 950.72 | 950.64 | | | 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19+78 | RT | 72 | | 954.47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19+78 | RT | 72 | 73 | | 950.64 | 950.56 | | | 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19+65 | RT | 73 | 73A | | 950.56 | 954.76 | | | 48 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19+65 | RT | 73 | | 953.83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19+65 | RT | 73 | 74 | | 950.56 | 950.46 | | | | 36 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20+02 | RT | 74 | | 953.74 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+23 | RT | 75 | | 956.17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+23 | RT | 75 | 76 | | 952.54 | 955.20 | | | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+23 | RT | 75 | 75A | | 952.54 | | | | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+16 | RT | 75A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+20 | RT | 76 | | 958.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23+00 | RT | 77 | | 942.92 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23+00 | RT | 77 | 78 | | 939.92 | 938.28 | | | 48 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23+50 | RT | 78 | | 941.28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23+50 | RT | 78 | 79 | | 938.28 | 937.60 | | | 36 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23+87 | RT | 79 | | 940.10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUBTOTALS | | | | | | | | | 220 | 36 | | | | 340 | | | | 60 | | | | | | | | | | | | | | | | | | |
| SHEET 3-E TOTALS | | | | | | | | | | | | | | | | | 112 | | | | | | | | | | | | | 316 | | | | | | |
| PROJECT TOTAL | | | | | | | | | 540 | | 68 | | | 2356 | | | 164 | | 48 | | | | | | | | | | | 844 | | 28 | | | | |
| | | | | | | | | | | 48 | | | | | 416 | | | 208 | | | | | | | | | | | | | 176 | | | | | |

| Station | Structure No. | 30" Welded Steel Pipe, 0.5" Thick, Grade B | | | Endwalls Std. 838.01, Std. 838.11 or Std. 838.80 (Unless Noted Otherwise) Cu. Yds. R.C.P. | C.S.P. | Quantities for Drainage Structures Per Each (0' thru 5.0') | Lin. *Ft. A 5.0' thru 10.0' | B 10.0' and above | C.B. Std. 840.01 or Std. 840.02 | Frame, Grates and Hood Standard 840.03 Type of Grate E | F | G | | D.I. Std. 840.14 or Std. 840.15 | D.I. Frame & 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 | T.B.D.I. Std. 840.35 | G.D.I. Frame with Two Grates Std. 840.22 | G.D.I. (N.S.) Frame with Two Grates Std. 840.24 | T.B.J.B. Std. 840.34 | J.B. Std. 840.31 or 840.32 | M.H. Frame & Cover Std. 840.54 | 4" Concrete Paved Ditch (Sq. Yds.) | C.B. Std. 840.04 or 840.05 | Conv. Exist. C.B. to D.I. (See Detail 2-H) | Pipe Plug, Flowable Fill (Cu Yds.) | Conc. Trans. Section for D.I. | Corr. Steel Elbows No. & Size | Conc. Collars Cl. "B" C.Y. Std 840.72 | Conc. & Brick Pipe Plug, C.Y. Std. 840.71 | Pipe Removal Lin.Ft. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62+00 | 65 | | | | | | 1 | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | EX. DEPTH 2GI |
| 63+32 | 66 | | | | | | 1 | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | 2GI |
| 63+32 | 66-68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 48 | REMOVE DI, FILL OR REMOVE PIPE |
| 63+40 | 67 | | | | | | 1 | | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | 2GI |
| 63+56 | 68 | | | | | | 1 | 1.24 | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | EX. DEPTH 2GI, REMOVE CB |
| 63+56 | 68-70 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2@18 | | | 28 | FILL OR REM. PIPE |
| 63+66 | 69 | | | | | | 1 | | | | | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | 2GI |
| 19+78 | 71 | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 19+78 | 72 | | | | | | 1 | | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| 19+65 | 73-73A | | | | | | 1 | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| 20+02 | 74 | | | | | | 1 | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | REMOVE DI |
| 12+23 | 75 | | | | | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12+16 | 75A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.399 | | | REMOVE CB |
| 12+20 | 76 | | | | | | 1 | | | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23+00 | 77 | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 23+50 | 78 | | | | | | 1 | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 23+87 | 79 | | | | | | 1 | | | | | | | | | | | | | | | | | 1 | | 1 | | | | | | | | | | REMOVE CB |
| SUBTOTALS | | | | | | | 14 | 1.24 | | 6 | 2 | 3 | 1 | | | | | | | 3 | 5 | 2 | | 1 | 2 | 1 | | | | | | 2@18 | | | 76 | |
| SHEET 3-E TOTALS | | | | | | | 8 | | | | | | | | | | | 6 | | | | 6 | | | 2 | | | | | | | | 0.399 | | 316 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2@15 | | | | |
| PROJECT TOTAL | | 508 | | | | | 78 | | 11.15 | 15 | 3 | 8 | 4 | | 2 | 2 | | 15 | | 28 | 36 | 20 | 3 | 1 | 8 | 4 | 11 | 1 | 1 | 1 | 1 | | 1.244 | | 2513 | |
| | | | | | | | | 35.22 | | | | | | | | | | | | | | | | | | | | | | | | 4@15 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6@18 | | | | |
| | | | | | | | | 49.72 LF | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | SAY 50 LF | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

ABBREVIATIONS

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

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4/04/06

| COMPUTED BY: S. K. RAGLAND | DATE: 1-8-09 |
|---|---|
| CHECKED BY: J. B. JAVELLANA | DATE: 3-10-09 |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 3-E |

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

| STATION / SIZE / THICKNESS OR GAUGE | LOCATION (LT,RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -L- | | | | | | | | | | | | | | | |
| 38+05 | LT | 34T | | 973.19 | | | | | | | | | | | |
| 38+05 | LT | 34T | 36T | | 970.44 | 955.06 | | | | | | | | | |
| 38+05 | LT | 34T | 35T | | 970.44 | 970.87 | | | | | | | | | |
| 38+14 | LT | 35T | | 973.62 | | | | | | | | | | | |
| 44+00 | LT | 37T | | | 985.63 | 961.71 | | | | | | | | | |
| 50+11 | LT | 39T | | 972.95 | | | | | | | | | | | |
| 50+11 | LT | 39T | 39 | | 970.20 | 963.06 | | | | | | | | | |
| 53+50 | LT | 45T | | 958.08 | | | | | | | | | | | |
| 53+50 | LT | 45T | 46T | | 955.33 | 957.72 | | | | | | | | | |
| 53+72 | LT | 46T | | 960.47 | | | | | | | | | | | |
| 58+84 | LT | 53T | 54T | | 941.30 | 943.71 | | | | | | | | | |
| 58+84 | LT | 54T | | 946.46 | | | | | | | | | | | |
| 59+28 | LT | 55T | | 947.19 | | | | | | | | | | | |
| 59+28 | LT | 55T | 54T | | 944.44 | 943.71 | | | | | | | | | |
| 58+50 | LT | 53T | | 944.05 | | | | | | | | | | | |
| 57+70 | LT | 56T | 56A | | 953.94 | 948.40 | | | | | | | | | |
| TOTAL | | | | | | | | | | | | | | | |

| STATION | C.S. PIPE (UNLESS NOTED OTHERWISE) 12" .064 | 15" .064 | 18" .064 | 24" .064 | 24" | 30" .079 | 30" | 36" .079 | 36" | 42" .109 | 42" | 48" .109 | 48" | SIDE DRAIN PIPE (RCP, CSP, CAAP, HDPE, OR PVC) 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38+05 | | | | | | | | | | | | | | | | | | | | | |
| 38+05 | | | | | | | | | | | | | | | 44 | | | | | | |
| 38+05 | | | | | | | | | | | | | | | 8 | | | | | | |
| 38+14 | | | | | | | | | | | | | | | | | | | | | |
| 44+00 | | 112 | | | | | | | | | | | | | | | | | | | |
| 50+11 | | | | | | | | | | | | | | | | | | | | | |
| 50+11 | | | | | | | | | | | | | | | 12 | | | | | | |
| 53+50 | | | | | | | | | | | | | | | | | | | | | |
| 53+50 | | | | | | | | | | | | | | | 20 | | | | | | |
| 53+72 | | | | | | | | | | | | | | | | | | | | | |
| 58+84 | | | | | | | | | | | | | | | 36 | | | | | | |
| 58+84 | | | | | | | | | | | | | | | | | | | | | |
| 59+28 | | | | | | | | | | | | | | | | | | | | | |
| 59+28 | | | | | | | | | | | | | | | 56 | | | | | | |
| 58+50 | | | | | | | | | | | | | | | | | | | | | |
| 57+70 | | | | | | | | | | | | | | | 28 | | | | | | |
| TOTAL | | 112 | | | | | | | | | | | | | 204 | | | | | | |

| STATION | | | | ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0' | B 10.0' AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38+05 | | | | | | 1 | | | | | | | |
| 38+05 | | | | | | | | | | | | | |
| 38+05 | | | | | | | | | | | | | |
| 38+14 | | | | | | 1 | | | | | | | |
| 44+00 | | | | | | | | | | | | | |
| 50+11 | | | | | | 1 | | | | | | | |
| 50+11 | | | | | | | | | | | | | |
| 53+50 | | | | | | 1 | | | | | | | |
| 53+50 | | | | | | | | | | | | | |
| 53+72 | | | | | | 1 | | | | | | | |
| 58+84 | | | | | | | | | | | | | |
| 58+84 | | | | | | 1 | | | | | | | |
| 59+28 | | | | | | 1 | | | | | | | |
| 59+28 | | | | | | | | | | | | | |
| 58+50 | | | | | | 1 | | | | | | | |
| 57+70 | | | | | | | | | | | | | |
| TOTAL | | | | | | 8 | | | | | | | |

| STATION | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME & 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 | T.B.D.I. STD. 840.35 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | T.B.J.B. STD. 840.34 | J.B. STD. 840.31 OR 840.32 | M.H. FRAME & COVER STD. 840.54 | 4" CONCRETE PAVED DITCH (SQ. YDS.) | C.B. STD. 840.04 OR 840.05 | CONV. EXIST. C.B. TO D.I. (SEE DETAIL 2-H) | PIPE PLUG, FLOWABLE FILL (CU YDS.) | CONC. TRANS. SECTION FOR D.I. | CORR. STEEL ELBOWS NO. & SIZE | CONC. COLLARS CL. "B" C.Y. STD 840.72 | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | PIPE REMOVAL LIN.FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38+05 | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI |
| 38+05 | | | | | | | | | | | | | | | | | | | | | 44 | |
| 38+05 | | | | | | | | | | | | | | | | | | | | | 8 | |
| 38+14 | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI |
| 44+00 | | | | | | | | | | | | | | | | | | 2@15 | | | 112 | |
| 50+11 | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI |
| 50+11 | | | | | | | | | | | | | | | | | | | | | 12 | |
| 53+50 | | | | | | | | | | | 1 | | | | | | | | | | | CONVERT TO PERM. 2GI |
| 53+50 | | | | | | | | | | | | | | | | | | | | | 20 | |
| 53+72 | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI |
| 58+84 | | | | | | | | | | | | | | | | | | | | | 36 | |
| 58+84 | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI |
| 59+28 | | | | 1 | | | | 1 | | | | | | | | | | | | | | 2GI |
| 59+28 | | | | | | | | | | | | | | | | | | | | | 56 | |
| 58+50 | | | | | | | | | | | 1 | | | | | | | | | | | CONVERT TO PERM. 2GI |
| 57+70 | | | | | | | | | | | | | | | | | | | | | 28 | NO RCP |
| TOTAL | | | | 6 | | | | 6 | | | 2 | | | | | | | 2@15 | | | 316 | |

ABBREVIATIONS

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

# *SUMMARY OF SHOULDER DRAINS*

| SURVEY LINE | STATION TO STATION | LOCATION | SHOULDER DRAIN (FT) | 4" SHOULDER DRAIN (FT) | 4" OUTLET PIPE (FT) | CONCRETE PADS (EA) | OUTLET LOCATIONS |
|---|---|---|---|---|---|---|---|
| -L- | 30+00 TO 31+72 | RT., OUTSIDE | 172 | 172 | 7 | 0 | 30+85 (2GI), 31+72 (2GI) |
| -L- | 31+85 TO 34+45 | RT., MEDIAN | 260 | 260 | 4 | 0 | 33+42 (2GI) - 2 OUTLETS |
| -L- | 31+75 TO 36+00 | LT., OUTSIDE | 425 | 425 | 5.5 | 0 | 33+50 (2GI) - 2 OUTLETS, 34+50 (2GI) |
| -L- | 58+40 TO 62+20 | RT., OUTSIDE | 380 | 380 | 8.5 | 0 | 59+65 (2GI), 60+83 (2GI) - 2 OUTLETS |
| -L- | 59+00 TO 62+00 | LT., OUTSIDE | 300 | 300 | 13 | 0 | 60+00 (2GI), 60+83 (2GI) - 2 OUTLETS, 61+50 (2GI) |
| | | TOTAL | 1537 | 1537 | 38 | 0 | |
| | | SAY | 1550 | 1550 | 40 | 0 | |

NOTES: SEE SHOULDER DRAIN DETAILS ON SHEET NO. 2-D

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COMPUTED BY: J. B. JAVELLANA DATE: 2-16-09
CHECKED BY: S. K. RAGLAND DATE: 3-23-09

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 3-F |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

"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 SHOULDER WIDTH | FLARE LENGTH | | W | | ANCHORS | | | | | | | | | IMPACT ATTENUATOR TYPE 350 | | | | | REMOVE EXISTING GUARDRAIL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | STRAIGHT | SHOP CURVED | DOUBLE FACED | APPROACH END | TRAILING END | | | APPROACH END | TRAILING END | APPROACH END | TRAILING END | TYPE B-77 | TES | CAT-1 | TYPE 350 | | | | | | NO. | PERMITTED G | PERMITTED NG | | | | |
| -L- | 28+92.21 | 39+98.49 | RT | 1112.50' | | | BRIDGE | BRIDGE | 6' | 9' | 60' | 50' | 4' | 1' | 2 | | | | | | | | | | | | | | | |
| -L- | 44+37.06 | 64+02.32 | RT | 1962.50' | | | BRIDGE | TIE TO EX. GR | 13' | 16' | | 45' | | 3' | 1 | | | | | | | | | | | | | | | |
| -L- | 29+59.50 | 39+08.35 | LT | 925' | | | BRIDGE | BRIDGE | 6' | 9' | | 60' | | 4' | 2 | | | | | | | | | | | | | | | |
| -L- | 42+90.68 | 64+02.32 | LT | 2100' | | | TIE TO EX. GR | BRIDGE | 13' | 16' | 45' | | 3' | | 1 | | | | | | | | | | | | | | | |
| -Y2- | 21+81.50 | 22+01.50 | RT | 25' | | | | | | | | | | | | 2 | | | | | | | | | | | | | | |
| | | | SUB-TOTAL | 6125' | | | | | | | | | | | 6 | 2 | | | | | | | | | | | | | | |
| | | | DEDUCTION FOR ANCHORS: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 6 TYPE B-77 @ 18.75' | -112.50' | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | PROJECT TOTAL | 6012.50' | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | SAY | 6100' | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | ADDITIONAL GUARDRAIL POSTS (10 EACH) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -L- | 28+94 | 39+11.5 | RT | | | | | | | | | | | | | | | | | | | | | | | | | 1053' | | |
| -L- | 36+25 | 40+11 | RT | | | | | | | | | | | | | | | | | | | | | | | | | 398' | | |
| -L- | 44+36 | 51+45 | RT | | | | | | | | | | | | | | | | | | | | | | | | | 709' | | |
| -L- | 56+63 | 59+20 | RT | | | | | | | | | | | | | | | | | | | | | | | | | 257' | | |
| -L- | 62+20 | 64+02.32 | RT | | | | | | | | | | | | | | | | | | | | | | | | | 183' | | |
| -L- | 43+31 | 47+53 | LT | | | | | | | | | | | | | | | | | | | | | | | | | 421' | | |
| -L- | 57+86 | 59+73 | LT | | | | | | | | | | | | | | | | | | | | | | | | | 187' | | |
| -L- | 63+56 | 64+02.32 | LT | | | | | | | | | | | | | | | | | | | | | | | | | 182' | | |
| -L- | 43+98 | 44+84 | MED | | | | | | | | | | | | | | | | | | | | | | | | | 87' | | |
| -L- | 43+72 | 44+66 | MED | | | | | | | | | | | | | | | | | | | | | | | | | 94' | | |
| -L- | 38+99 | 39+80 | MED | | | | | | | | | | | | | | | | | | | | | | | | | 82' | | |
| -L- | 38+81 | 39+72 | MED | | | | | | | | | | | | | | | | | | | | | | | | | 91' | | |
| -L- | 37+11 | 39+40 | LT | | | | | | | | | | | | | | | | | | | | | | | | | 223' | | |
| -L- | 29+59 | 31+68 | LT | | | | | | | | | | | | | | | | | | | | | | | | | 209' | | |
| -Y- | 11+93.4 | 12+70 | RT | | | | | | | | | | | | | | | | | | | | | | | | | 77' | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | TOTAL | 4253' | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | SAY | 4300' | |

# TEMPORARY GUARDRAIL SUMMARY

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | LENGTH | | | WARRANT POINT | | "N" DIST. FROM E.O.L. | TOTAL SHOULDER WIDTH | FLARE LENGTH | | W | | ANCHORS | | | | | | | | | IMPACT ATTENUATOR TYPE 350 | | | IMPACT ATTENUATOR TYPE 350 (TEMPORARY) | RELAPPING GUARDRAIL | REMOVE EXISTING GUARDRAIL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | STRAIGHT | SHOP CURVED | DOUBLE FACED | APPROACH END | TRAILING END | | | APPROACH END | TRAILING END | APPROACH END | TRAILING END | TYPE B-77 | TES | CAT-1 | TYPE 350 | TYPE W-BEAM | | | | | NO. | PERMITTED G | PERMITTED NG | | | | |
| -SBDET- | 29+59.50 (-L-) | 32+80 | LT | 325' | | | BRIDGE | | N/A | N/A | N/A | | N/A | | | | | 1 | | | | | | | | | | | | SEE SHEET 2-G (TEMPORARY PAVEMENT) |
| -SBDET- | 36+37 | 38+21.5 | LT | 175' | | | | BRIDGE | 8' | 11' | | 150' | | 4' | 1 | | 1 | | | | | | | | | | | | | |
| -SBDET- | 43+87 | 53+87 | RT | 1000' | | | BRIDGE | | 8' | 11' | 200' | | 4' | | 1 | | | 1 | | | | | | | | | | | | |
| -SBDET- | 43+51 | 49+51 | LT | 600' | | | BRIDGE | | 8' | 11' | 200' | | 4' | | 1 | | | 1 | | | | | | | | | | | | |
| -SBDET- | 38+29 | | RT | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | SEE DETAIL 2-I |
| -L- | 43+32 | 47+53 | LT | | | | | | | | | | | | | | | | | | | | | | | | | 421' | | SEE TRAFFIC CONTROL PLANS |
| | | | SUB-TOTAL | 2100' | | | | | | | | | | | 3 | | 1 | 3 | 1 | | | | | | | | | 425' | | |
| | | | DEDUCTION FOR ANCHORS: | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3 TEMP. TYPE B-77 @ 18.75' | -56.25' | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 3 TEMP. GRAU 350 @ 50' | -150' | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 TEMP. CAT-1 @ 6.25' | -6.25' | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | TEMPORARY GUARDRAIL PROJECT TOTAL | 1887.5' | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | SAY | 1925' | | | | | | | | | | | | | | | | | | | | | | | | | | |

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# SUMMARY OF EARTHWORK
## IN CUBIC YARDS

| LOCATION | | | UNCLASSIFIED EXCAVATION | EMBANKMENT + % | BORROW | WASTE |
|---|---|---|---|---|---|---|
| LINE | STATION | STATION | | | | |
| | PHASE I | | | | | |
| -Y- | 10+10.00 | 12+85.50 | 270 | 242 | | 28 |
| -Y1- | 10+28.91 | 15+00.00 | 51 | 3524 | 3473 | |
| -Y2- | 11+77.50 | 14+16.00 | 605 | 8 | | 597 |
| -Y2- | 18+07.00 | 22+39.00 | 136 | 462 | 326 | |
| -Y3- | 12+00.00 | 14+13.00 | 136 | 31 | | 105 |
| | | SUBTOTAL 1 | 1198 | 4267 | 3799 | 730 |
| -SBDET- | 31+31.70 | 38+21.00 | 876 | 7403 | 6527 | |
| | | (BEG. BRIDGE) | | | | |
| | (END BRIDGE) | | | | | |
| -SBDET- | 43+00.00 | 63+24.76 | 11422 | 59959 | 48537 | |
| -DR1TEMP- | 10+68.50 | 16+13.00 | 4067 | 17 | | 4050 |
| | | SUBTOTAL 2 | 16365 | 67379 | 55064 | 4050 |
| | PHASE II | | | | | |
| -L- NB | 29+92.21 | 39+59.70 | 1023 | 15582 | 14559 | |
| | | (BEG. BRIDGE) | | | | |
| | (END BRIDGE) | | | | | |
| -L- NB | 43+70.29 | 64+02.32 | 357 | 92549 | 92192 | |
| | | SUBTOTAL 3 | 1380 | 108131 | 106751 | |
| | PHASE III | | | | | |
| -L- SB | 29+59.50 | 39+51.81 | 124 | 7270 | 7146 | |
| | | (BEG. BRIDGE) | | | | |
| | (END BRIDGE) | | | | | |
| -L- SB | 43+57.45 | 64+02.32 | 182 | 51155 | 50973 | |
| | | SUBTOTAL 4 | 306 | 58425 | 58119 | |
| | PHASE IV (FINAL PHASE - WASTE NOT USED) | | | | | |
| -SBDET- REMOVAL | 36+00.00 | 58+50.00 | 7600 | | | 7600 |
| -DR1- | 10+64.00 | 16+18.00 | 1128 | 137 | | 991 |
| -Y3- | 14+49.00 | 26+00.00 | 993 | 144 | | 849 |
| | | SUBTOTAL 5 | 9721 | 281 | | 9440 |
| PROJECT SUBTOTALS | | | 28970 | 238483 | 223733 | 14220 |
| LOSS DUE TO CLEARING & GRUBBING (PER GEOTECH REPORT) | | | -500 | | 500 | |
| SHOULDER CONSTRUCTION | | | | 1800 | 1800 | |
| EST. UNDERCUT (PER GEOTECH) | | | | 6000 | 6000 | 5000 |
| EST. SHALLOW UNDERCUT (PER GEOTECH) | | | | 1920 | 1920 | 1600 |
| WASTE IN LIEU OF BORROW (PHASE I, II, III) | | | | | -4780 | -4780 |
| FILL TO REPLACE CONTAMINATED SOIL REMOVED BY OTHERS (PER GEOTECH) | | | | 12000 | 12000 | |
| PROJECT TOTAL | | | 28470 | 260203 | 241173 | 16040 |
| EST 5% TO REPLACE TOP SOIL ON BORROW PIT | | | | | 12059 | |
| GRAND TOTAL | | | 28470 | | 253232 | 16040 |
| SAY | | | 30000 | | 255000 | |

# REMOVAL OF EXISTING ASPHALT PAVEMENT

| LINE | BEGIN STATION | END STATION | LOCATION | SQUARE YARDS |
|---|---|---|---|---|
| -Y1- | 10+27.23 | 10+77.22 | RT | 314.36 |
| -Y- | 11+94.25 | 12+92.36 | RT | 207.91 |
| -L- | 30+50.00 | 31+80.00 | CL | 2,006.21 |
| -L- | 61+15.00 | 62+20.00 | CL | 2,609.62 |
| -SBDET- | 32+47.58 | 38+73.86 | CL | 2,444.68 |
| -SBDET- | 42+95.54 | 61+84.96 | CL | 6,349.76 |
| | | | TOTAL | 13,932.54 |
| | | | SAY | 14,500 |

**NOTE:** NBDET Pavement Removal is included in the calculation for -L-.

# REMOVAL OF EXISTING CONCRETE PAVEMENT

| LINE | BEGIN STATION | END STATION | LOCATION | SQUARE YARDS |
|---|---|---|---|---|
| -Y2- | 18+47.14 | 18+87.11 | RT | 532.85 |
| -Y3- | 22+67.80 | 24+09.61 | RT | 1,891.61 |
| | | | TOTAL | 2,424.46 |
| | | | SAY | 2,500 |

# BREAKING OF EXISTING ASPHALT PAVEMENT

| LINE | BEGIN STATION | END STATION | LOCATION | SQUARE YARDS |
|---|---|---|---|---|
| -L- | 31+75.00 | 40+10.58 | CL | 7,555.61 |
| -L- | 43+33.01 | 61+25.00 | CL | 16,173.24 |
| | | | TOTAL | 23,728.85 |
| | | | SAY | 24,000 |

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COMPUTED BY: S. K. RAGLAND DATE: 1-8-09
CHECKED BY: J. B. JAVELLANA DATE: 3-10-09

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 3-H |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

# SUMMARY OF CONCRETE BARRIER

| SURVEY LINE | STATION TO STATION | LOCATION | TRANS. SECTIONS | DOUBLE FACED TYPE III | DOUBLE FACED TYPE IV | SINGLE FACED | REMARKS |
|---|---|---|---|---|---|---|---|
| -L- | 29+50 TO 29+75 | MEDIAN | 1@25' | | | | |
| -L- | 29+75 TO 32+25 | MEDIAN | | | 250' | | |
| -L- | 32+25 TO 38+02 | MEDIAN | | 577' | | | |
| -L- | 38+02 TO 39+27 | MEDIAN LT. | 1@125' | | | | |
| -L- | 38+10 TO 39+35 | MEDIAN RT. | 1@125' | | | | |
| -L- | 43+82.5 TO 45+07.5 | MEDIAN LT. | 1@125' | | | | |
| -L- | 43+95 TO 45+20 | MEDIAN RT. | 1@125' | | | | |
| -L- | 45+07.5 TO 48+50 | MEDIAN | | 342.5' | | | |
| -L- | 48+50 TO 61+50 | MEDIAN | | | 1300' | | |
| -L- | 61+50 TO 63+77.32 | MEDIAN | | 227.32' | | | |
| -L- | 63+77.32 TO 64+02.32 | MEDIAN | 1@25' | | | | |
| | | TOTAL | 6 EA | 1146.82' | 1550' | | |
| | | SAY | 6 EA | 1175' | 1575' | | |

# SUMMARY OF 60" CHAIN LINK FENCE

| SURVEY LINE | STATION TO STATION | LOCATION | FABRIC L.F. | END BRACE | CORNER BRACE | LINE BRACE | LINE POSTS | TERMINAL POSTS |
|---|---|---|---|---|---|---|---|---|
| -Y2- | 22+06 TO 23+68.71 | RIGHT | 284.82 | 2 | 2 | | 23.74 | 4 |
| -L- | 28+92.21 TO 38+20 | RIGHT | 1066.13 | 3 | 1 | 4 | 89.18 | 8 |
| -L- | 39+98.5 TO 40+00.6 | RIGHT | 85 | 2 | | | 6.75 | 2 |
| -Y3- | 24+32.39 TO 25+41 | RIGHT | 108.54 | 2 | | | 8.71 | 2 |
| | | TOTAL | 1544.49 | | | | 128.38 | 16 |
| | | SAY | 1560 | | | | 130 | 16 |

# SUMMARY OF 72" CHAIN LINK FENCE

| SURVEY LINE | STATION TO STATION | LOCATION | FABRIC L.F. | END BRACE | CORNER BRACE | LINE BRACE | LINE POSTS | TERMINAL POSTS | DOUBLE GATES 72" X 6' 12' OPENING | METAL GATE POSTS FOR DOUBLE GATE |
|---|---|---|---|---|---|---|---|---|---|---|
| -L- | 29+78.17 TO 39+08.35 | LEFT | 931.30 | 2 | 1 | 3 | 92.13 | 6 | | |
| -L- | 42+90.68 TO 63+14 | LEFT | 2566.20 | 2 | 4 | 7 | 254.92 | 13 | | |
| -DR1- | 10+75.76 TO 15+96.71 | LEFT | 530.50 | 3 | 4 | 3 | 51.45 | 10 | | |
| -L- | 44+37.06 TO 64+06.41 | RIGHT | 2006 | 2 | 1 | 4 | 199.5 | 7 | | |
| -L- | 48+05 | RIGHT | | | | | | | 1 | 2 |
| | | TOTAL | 6034 | | | | 598 | 36 | 1 | 2 |
| | | SAY | 6100 | | | | 600 | 36 | 1 | 2 |

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| PROJ. REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 3-Z |

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

## *PARCEL INDEX SHEET*

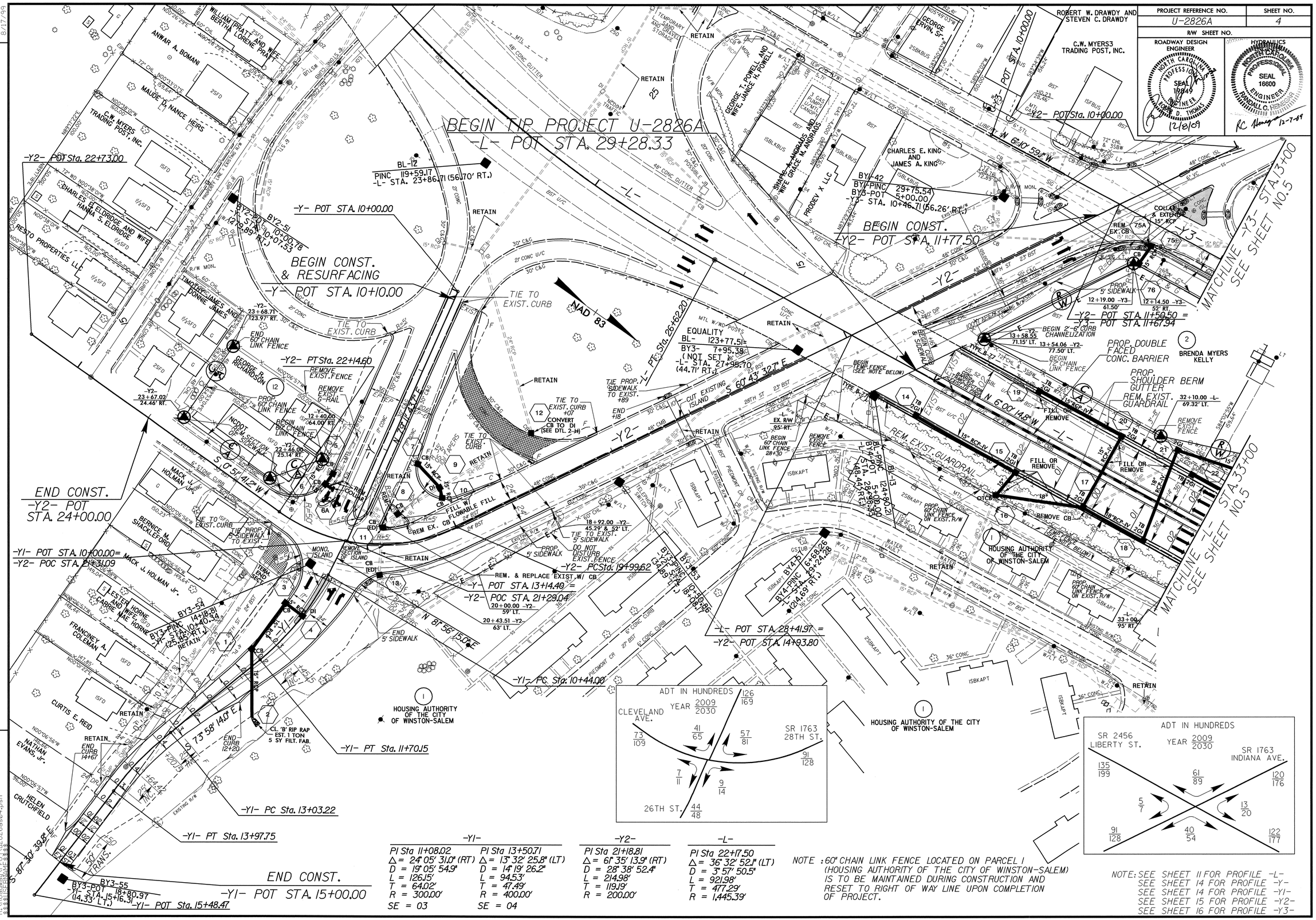
| PARCEL No. | SHEET No. | PROPERTY OWNER NAME |
|---|---|---|
| 1 | 4 & 5 | HOUSING AUTHORITY OF THE CITY OF WINSTON-SALEM |
| 2 | 4 & 5 | BRENDA MYERS KELLY |
| 3 | 5 | RICHARD D. KELLY |
| 4 | 5 | HEIRS OF ANSEL J. RAKESTRAW |
| 5 | 5 | CURTIS RAY HANES AND PEARLINE HANES WHITE |
| 6 | 5 | TRI-CITY INVESTMENTS INC |
| 7 | 5 | CITY OF WINSTON - SALEM |
| 8 | 5 & 6 | WASTE MANAGEMENT OF CAROLINAS INC. |
| 9 | 6 & 7 | RECYCLING INDUSTRIES OF WINSTON-SALEM |
| 10 | 6 & 7 | ROYSTER-CLARK AGRIBUSINESS, INC. |
| 11 | 7 | WASTE MANAGEMENT OF CAROLINAS INC. |

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

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 4 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROBERT D. THOMAS
12/8/09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENEGAR
RC Henegar 12-7-09




| -Y1- | | -Y2- | -L- |
|---|---|---|---|
| PI Sta 11+08.02 | PI Sta 13+50.71 | PI Sta 21+18.81 | PI Sta 22+17.50 |
| Δ = 24° 05' 31.0" (RT) | Δ = 13° 32' 25.8" (LT) | Δ = 61° 35' 13.9" (RT) | Δ = 36° 32' 52.1" (LT) |
| D = 19° 05' 54.9" | D = 14° 19' 26.2" | D = 28° 38' 52.4" | D = 3° 57' 50.5" |
| L = 126.15' | L = 94.53' | L = 214.98' | L = 921.98' |
| T = 64.02' | T = 47.49' | T = 119.19' | T = 477.29' |
| R = 300.00' | R = 400.00' | R = 200.00' | R = 1,445.39' |
| SE = 03 | SE = 04 | | |

NOTE: 60" CHAIN LINK FENCE LOCATED ON PARCEL 1 (HOUSING AUTHORITY OF THE CITY OF WINSTON-SALEM) IS TO BE MAINTAINED DURING CONSTRUCTION AND RESET TO RIGHT OF WAY LINE UPON COMPLETION OF PROJECT.

NOTE: SEE SHEET 11 FOR PROFILE -L-
SEE SHEET 14 FOR PROFILE -Y-
SEE SHEET 14 FOR PROFILE -Y1-
SEE SHEET 15 FOR PROFILE -Y2-
SEE SHEET 16 FOR PROFILE -Y3-

REVISIONS

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 5 |
| R/W SHEET NO. | |

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER — FORK D. THOMAS — 12/8/09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER — RANDALL C. HENEGAR — 12-7-09

-RR1-

| PI Sta 10+65.63 | PI Sta 11+96.91 | PI Sta 13+94.15 | PI Sta 15+58.10 |
|---|---|---|---|
| Δ = 2° 08' 54.1" (RT) | Δ = 5° 34' 13.3" (LT) | Δ = 15° 02' 59.2" (RT) | Δ = 9° 24' 03.4" (LT) |
| D = 1° 38' 13.3" | D = 4° 14' 38.9" | D = 11° 27' 33.0" | D = 4° 46' 28.7" |
| L = 131.24' | L = 131.25' | L = 131.33' | L = 196.89' |
| T = 65.63' | T = 65.68' | T = 66.05' | T = 98.67' |
| R = 3,500.00' | R = 1,350.00' | R = 500.00' | R = 1,200.00' |

-RR2A-

| PI Sta 10+65.70 | PI Sta 11+68.99 |
|---|---|
| Δ = 6° 32' 21.2" (LT) | Δ = 2° 52' 57.5" (RT) |
| D = 4° 58' 56.1" | D = 3° 49' 11.0" |
| L = 131.25' | L = 75.47' |
| T = 65.70' | T = 37.74' |
| R = 1,150.00' | R = 1,500.00' |

-RR1A-

| PI Sta 10+65.70 |
|---|
| Δ = 6° 50' 11.8" (RT) |
| D = 5° 12' 31.3" |
| L = 131.25' |
| T = 65.70' |
| R = 1,100.00' |

-RR3-

| PI Sta 10+32.82 |
|---|
| Δ = 2° 30' 23.7" (LT) |
| D = 3° 49' 11.0" |
| L = 65.62' |
| T = 32.82' |
| R = 1,500.00' |

-RR3A-

| PI Sta 10+37.10 | PI Sta 12+36.95 |
|---|---|
| Δ = 6° 31' 58.6" (LT) | Δ = 8° 29' 19.3" (RT) |
| D = 8° 48' 53.0" | D = 6° 44' 26.4" |
| L = 74.11' | L = 125.93' |
| T = 37.10' | T = 63.08' |
| R = 650.00' | R = 850.00' |

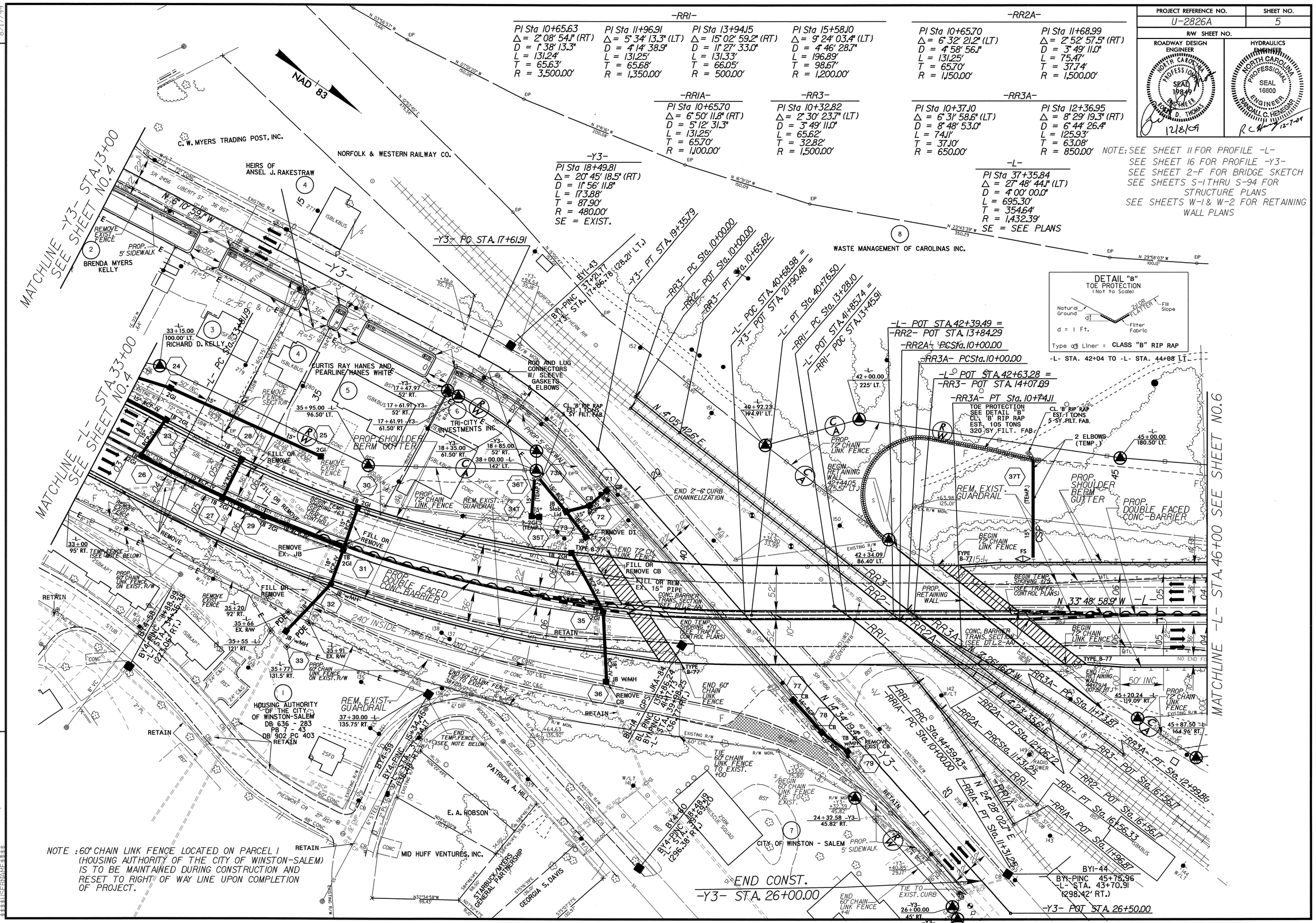
-Y3-

| PI Sta 18+49.81 |
|---|
| Δ = 20° 45' 18.5" (RT) |
| D = 11° 56' 11.8" |
| L = 173.88' |
| T = 87.90' |
| R = 480.00' |
| SE = EXIST. |

-L-

| PI Sta 37+35.84 |
|---|
| Δ = 27° 48' 44.1" (LT) |
| D = 4° 00' 00.0" |
| L = 695.30' |
| T = 354.64' |
| R = 1,432.39' |
| SE = SEE PLANS |

NOTE: SEE SHEET 11 FOR PROFILE -L-
SEE SHEET 16 FOR PROFILE -Y3-
SEE SHEET 2-F FOR BRIDGE SKETCH
SEE SHEETS S-1 THRU S-94 FOR STRUCTURE PLANS
SEE SHEETS W-1 & W-2 FOR RETAINING WALL PLANS




NOTE: 60" CHAIN LINK FENCE LOCATED ON PARCEL 1 (HOUSING AUTHORITY OF THE CITY OF WINSTON-SALEM) IS TO BE MAINTAINED DURING CONSTRUCTION AND RESET TO RIGHT OF WAY LINE UPON COMPLETION OF PROJECT.

REVISIONS

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 6 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROBERT D. THOMAS 12/8/09

NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENDRICKS 12-7-09

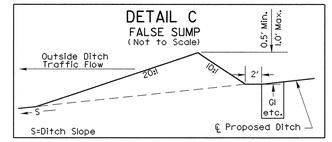
NOTE: SEE SHEET 12 FOR PROFILE -L-
SEE SHEET 17 FOR PROFILE -DRI-

NAD 83

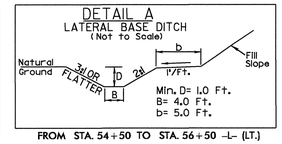
-DRI-

| PI Sta 11+51.84 | PI Sta 13+34.51 | PI Sta 14+97.01 |
|---|---|---|
| Δ = 27° 49' 32.8" (LT) | Δ = 16° 22' 34.0" (RT) | Δ = 12° 46' 27.6" (LT) |
| D = 19° 45' 25.8" | D = 7° 15' 09.5" | D = 12° 43' 56.6" |
| L = 140.84' | L = 225.80' | L = 100.33' |
| T = 71.84' | T = 113.67' | T = 50.37' |
| R = 290.00' | R = 790.00' | R = 450.00' |

DETAIL C
FALSE SUMP
(Not to Scale)

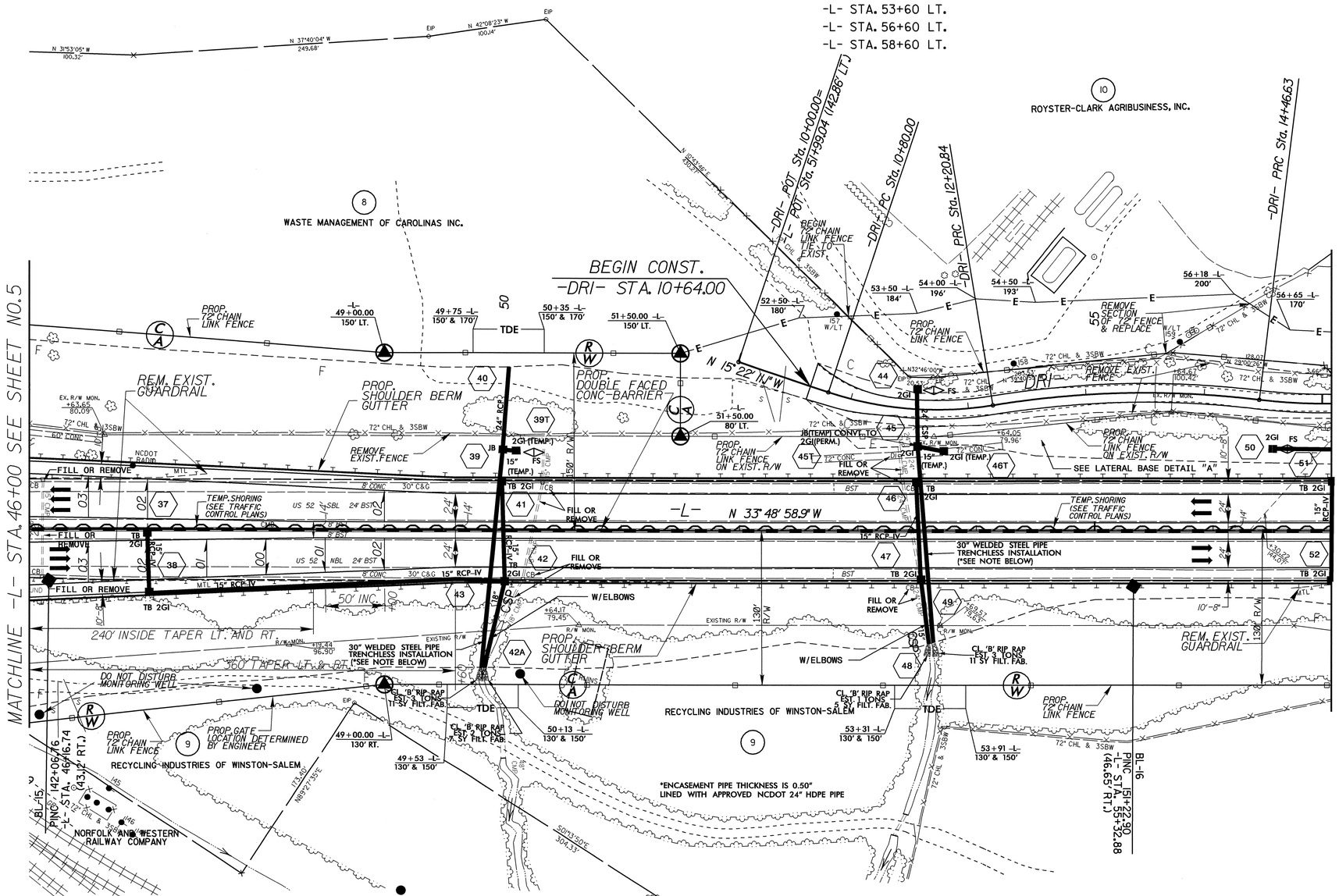



DETAIL A
LATERAL BASE DITCH
(Not to Scale)




FROM STA. 54+50 TO STA. 56+50 -L- (LT.)

-L- STA. 43+90 LT.
-L- STA. 50+25 LT.
-L- STA. 53+60 LT.
-L- STA. 56+60 LT.
-L- STA. 58+60 LT.

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 7 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

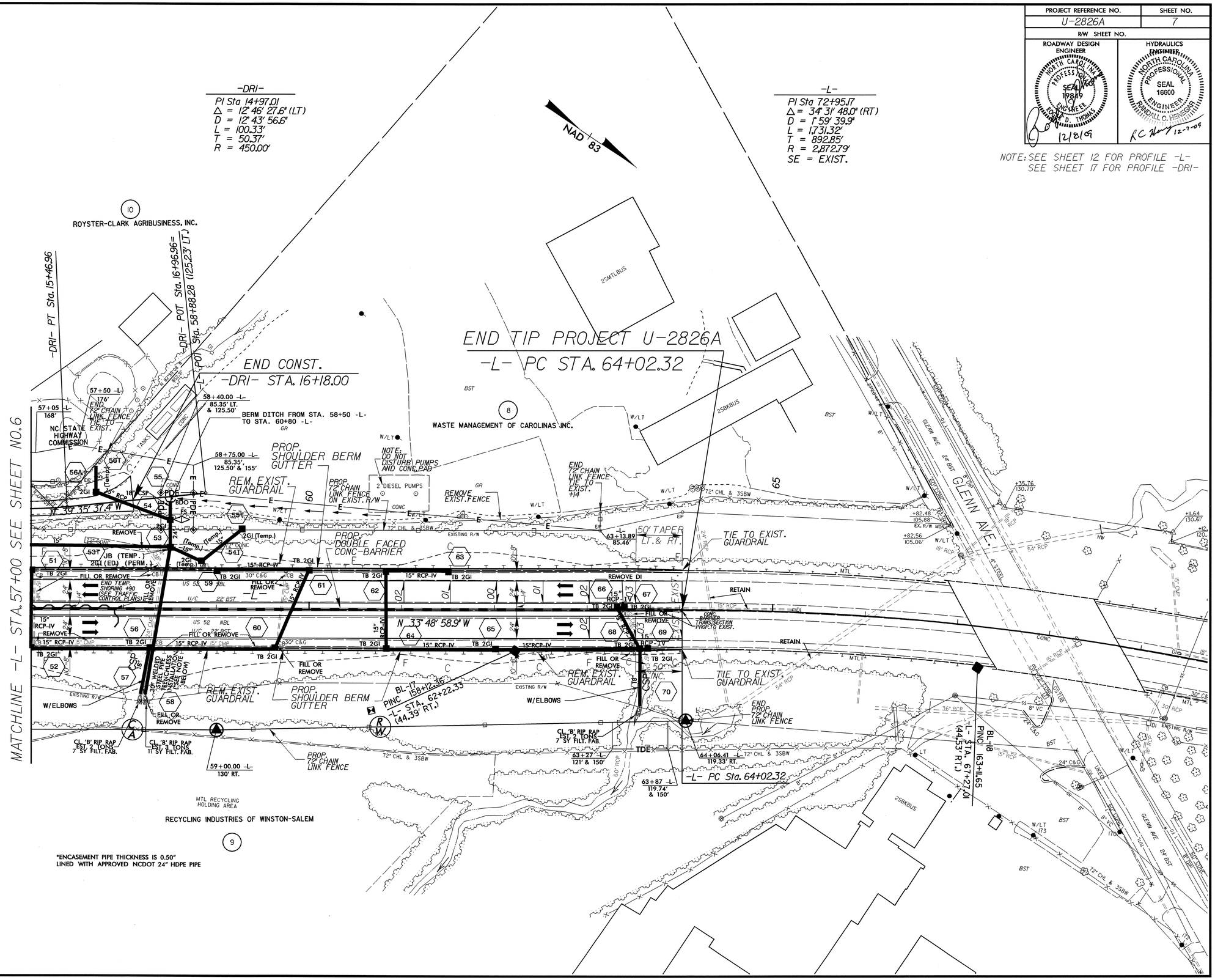
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER TODD D. THOMAS 12/8/09

NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENSLEY 12-7-09

NOTE: SEE SHEET 12 FOR PROFILE -L-
SEE SHEET 17 FOR PROFILE -DRI-

REVISIONS

8/17/99

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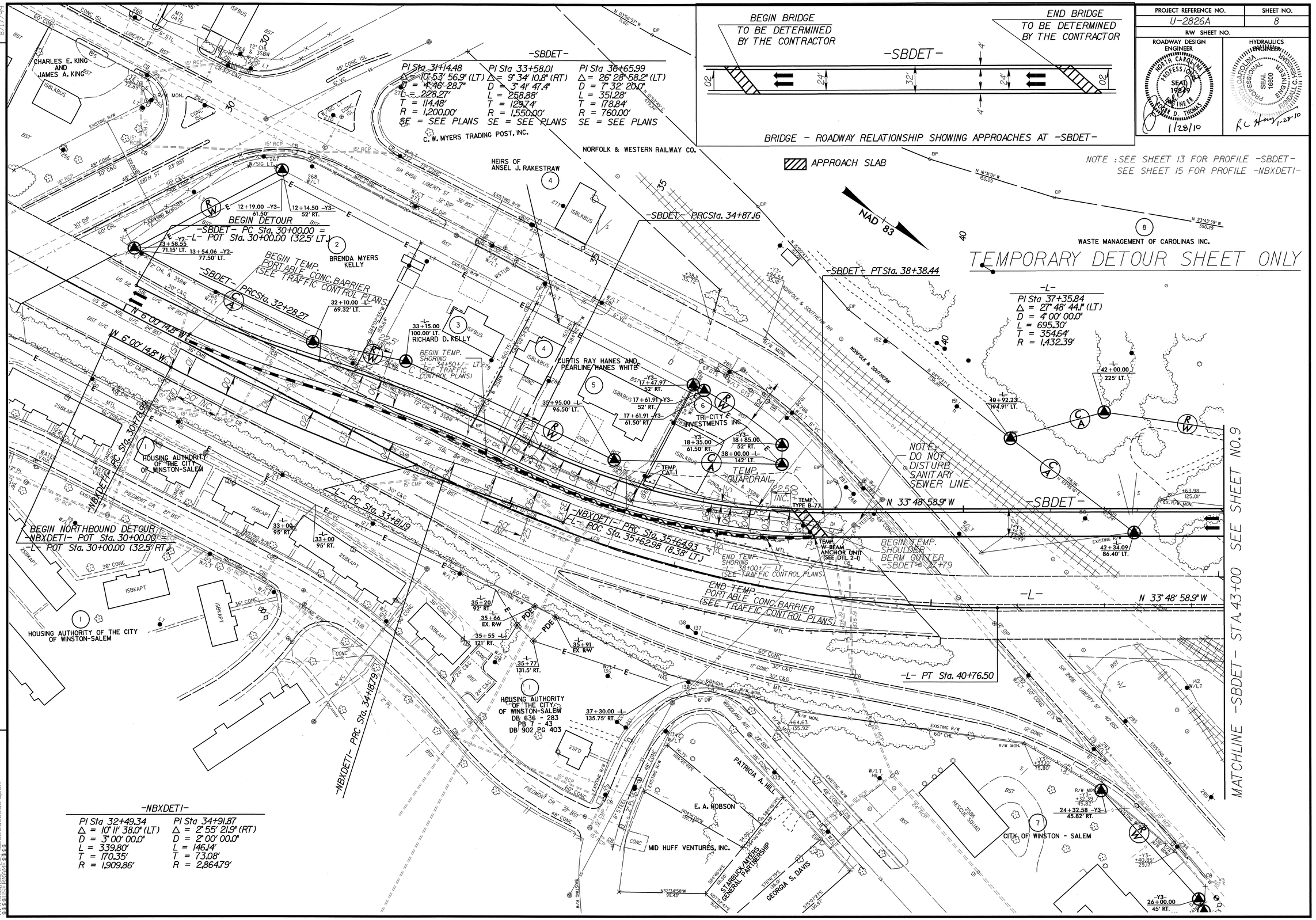
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 8 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

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| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| U-2826A | 9 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROBB D. THOMAS 12/3/09 | NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENEGAR 12-3-09 |

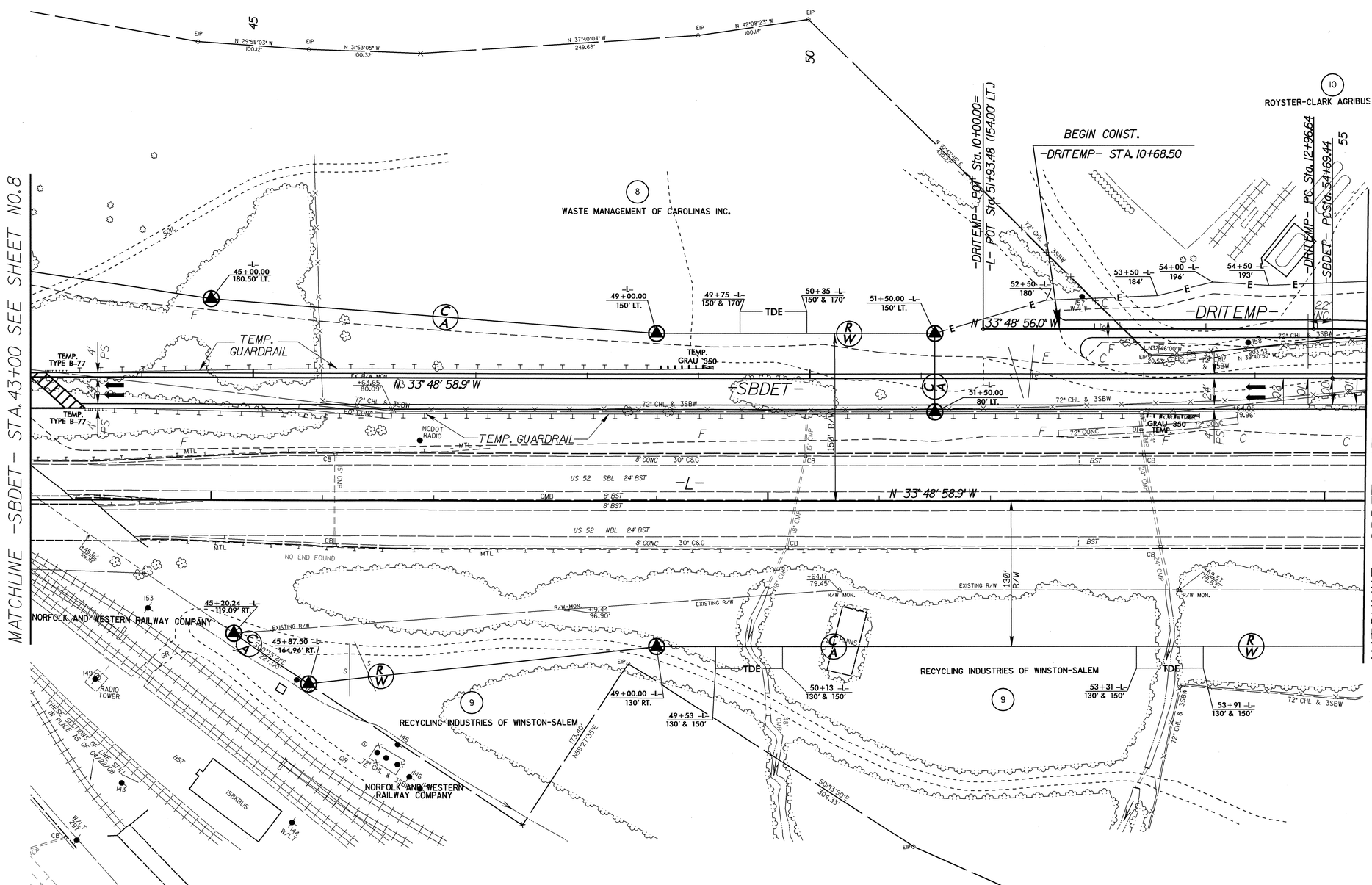
NOTE : SEE SHEET 13 FOR PROFILE -SBDET-
SEE SHEET 17 FOR PROFILE -DRITEMP-

# TEMPORARY DETOUR SHEET ONLY

NAD 83

-SBDET-
PI Sta 56+94.03
Δ = 8° 57' 55.4" (RT)
D = 2° 00' 00.0"
L = 448.27'
T = 224.59'
R = 2,864.79'
SE = SEE PLANS

-DRITEMP-
PI Sta 13+63.79
Δ = 5° 07' 35.0" (RT)
D = 3° 49' 11.0"
L = 134.21'
T = 67.15'
R = 1,500.00'

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|---|---|
| U-2826A | 10 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROGER D. THOMAS 12/3/09

NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HEMEGAR 12-3-09

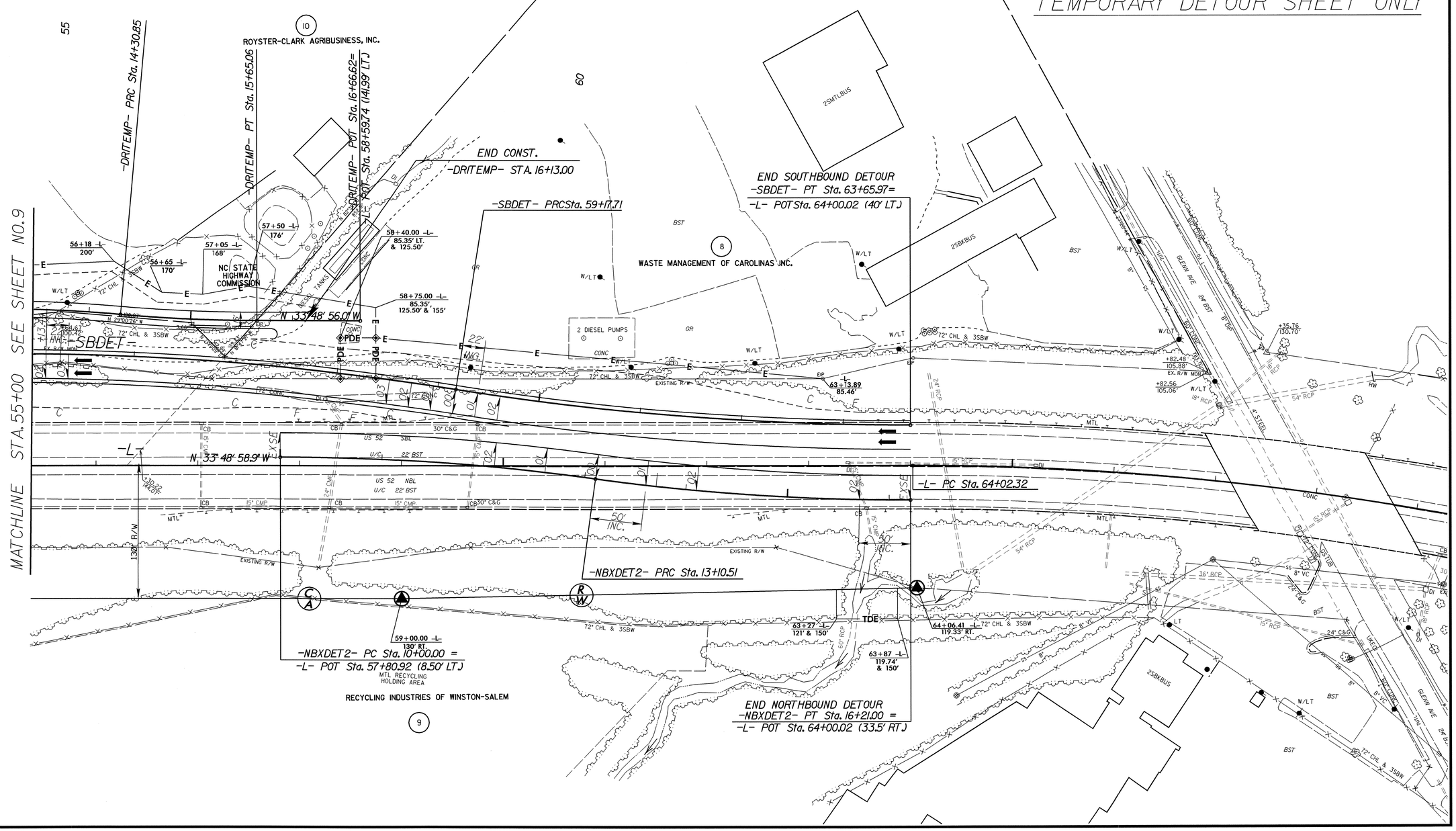
NOTE : SEE SHEET 14 FOR PROFILE -SBDET-
SEE SHEET 15 FOR PROFILE -NBXDET2-
SEE SHEET 17 FOR PROFILE -DRITEMP-

# TEMPORARY DETOUR SHEET ONLY

| -SBDET- | |
|---|---|
| PI Sta 56+94.03 | PI Sta 61+42.30 |
| Δ = 8° 57' 55.4" (RT) | Δ = 8° 57' 55.3" (LT) |
| D = 2° 00' 00.0" | D = 2° 00' 00.0" |
| L = 448.27' | L = 448.27' |
| T = 224.59' | T = 224.59' |
| R = 2,864.79' | R = 2,864.79' |
| SE = SEE PLANS | SE = SEE PLANS |

| -DRITEMP- | |
|---|---|
| PI Sta 13+63.79 | PI Sta 14+98.00 |
| Δ = 5° 07' 35.0" (RT) | Δ = 5° 07' 35.0" (LT) |
| D = 3° 49' 11.0" | D = 3° 49' 11.0" |
| L = 134.21' | L = 134.21' |
| T = 67.15' | T = 67.15' |
| R = 1,500.00' | R = 1,500.00' |

| -NBXDET2- | |
|---|---|
| PI Sta 11+55.49 | PI Sta 14+65.99 |
| Δ = 7° 45' 45.6" (RT) | Δ = 7° 45' 44.6" (LT) |
| D = 2° 30' 00.0" | D = 2° 30' 00.0" |
| L = 310.51' | L = 310.50' |
| T = 155.49' | T = 155.49' |
| R = 2,291.83' | R = 2,291.83' |




REVISIONS

8/17/99

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| U-2826A | 11 |

ROADWAY DESIGN ENGINEER

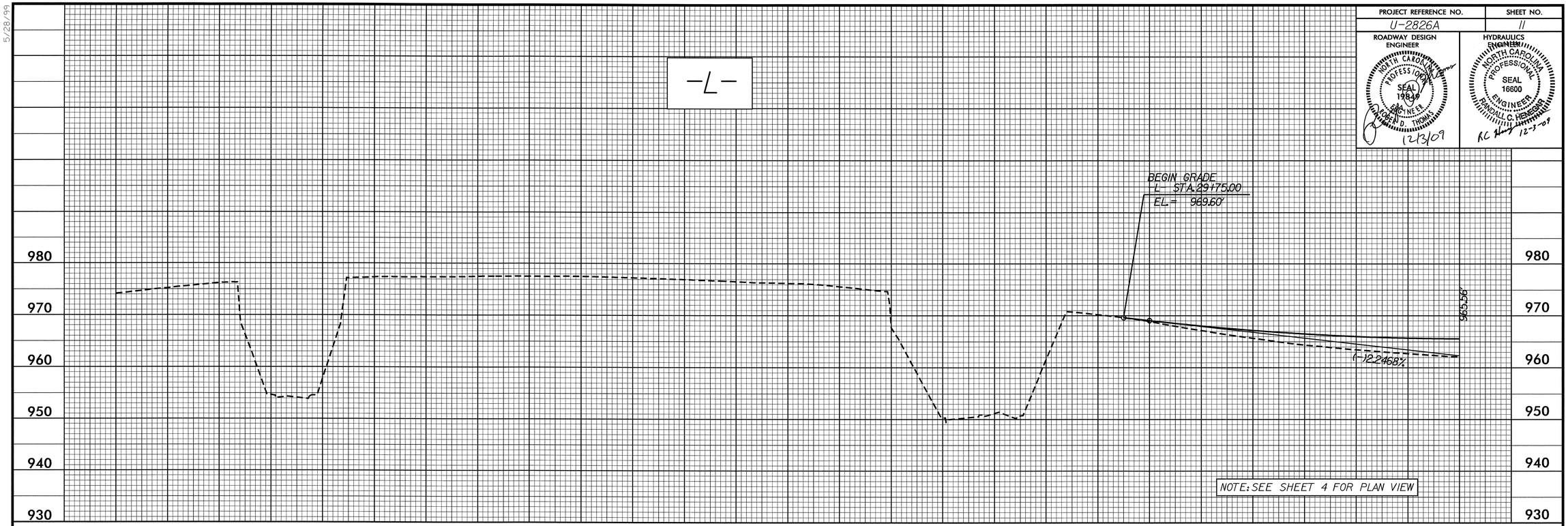
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER RICHARD D. THOMAS

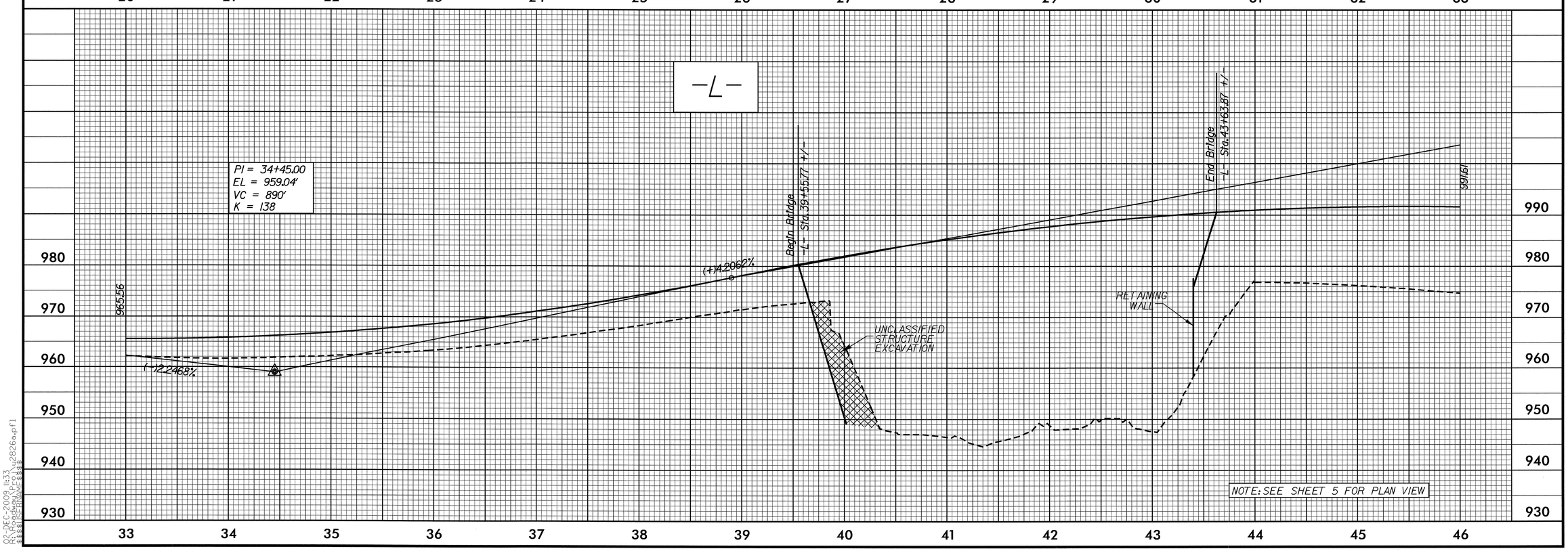
12/3/09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENEGAR

RC Henegar 12-3-09




5/28/99

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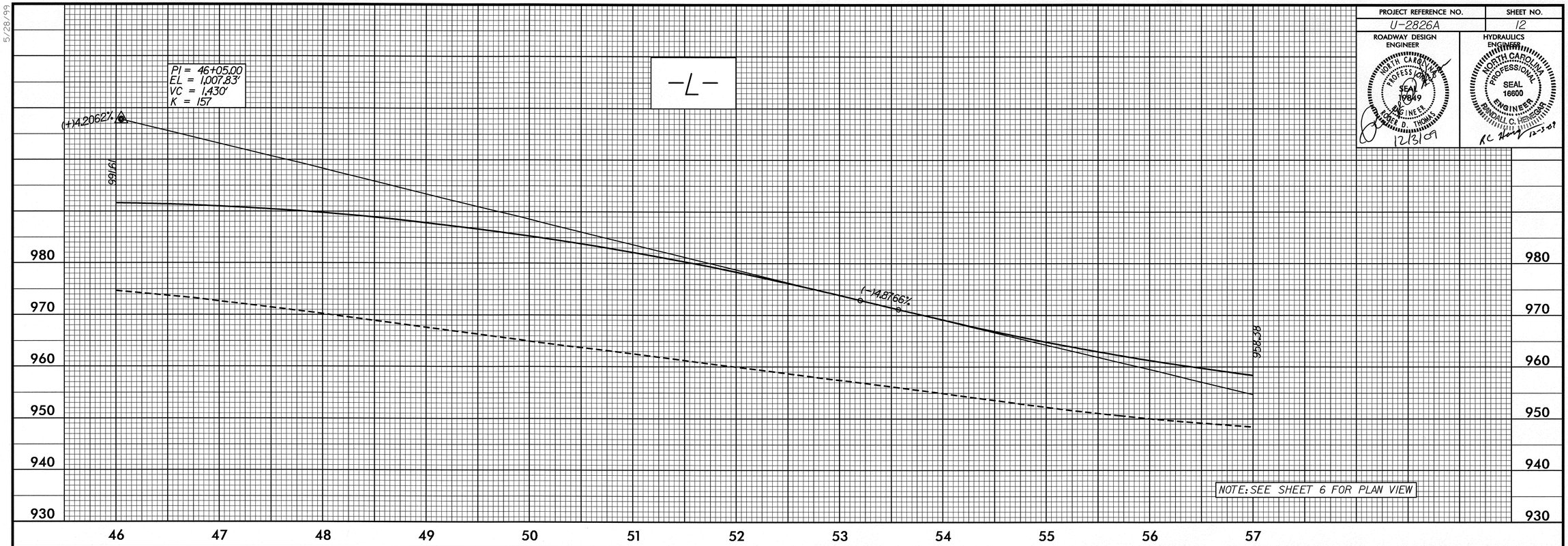
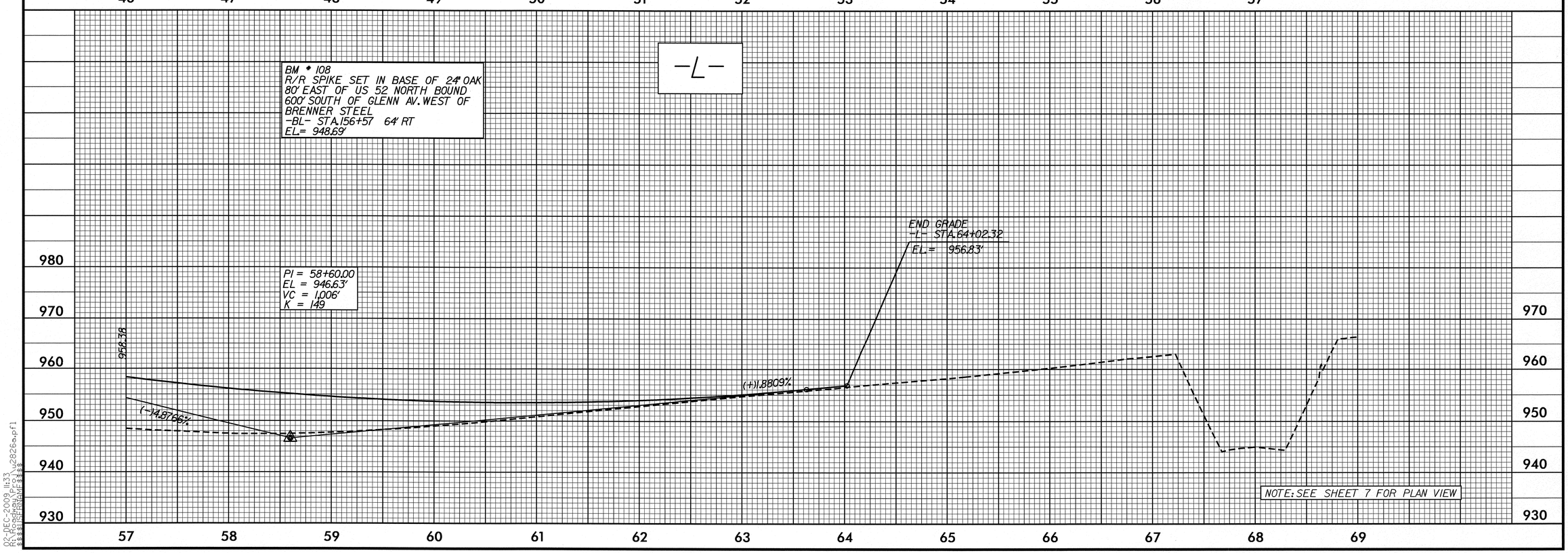
| U-2826A | 12 |

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROBERT D. THOMAS
12/3/09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENDRICK
12-3-09

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| U-2826A | 13 |

ROADWAY DESIGN ENGINEER

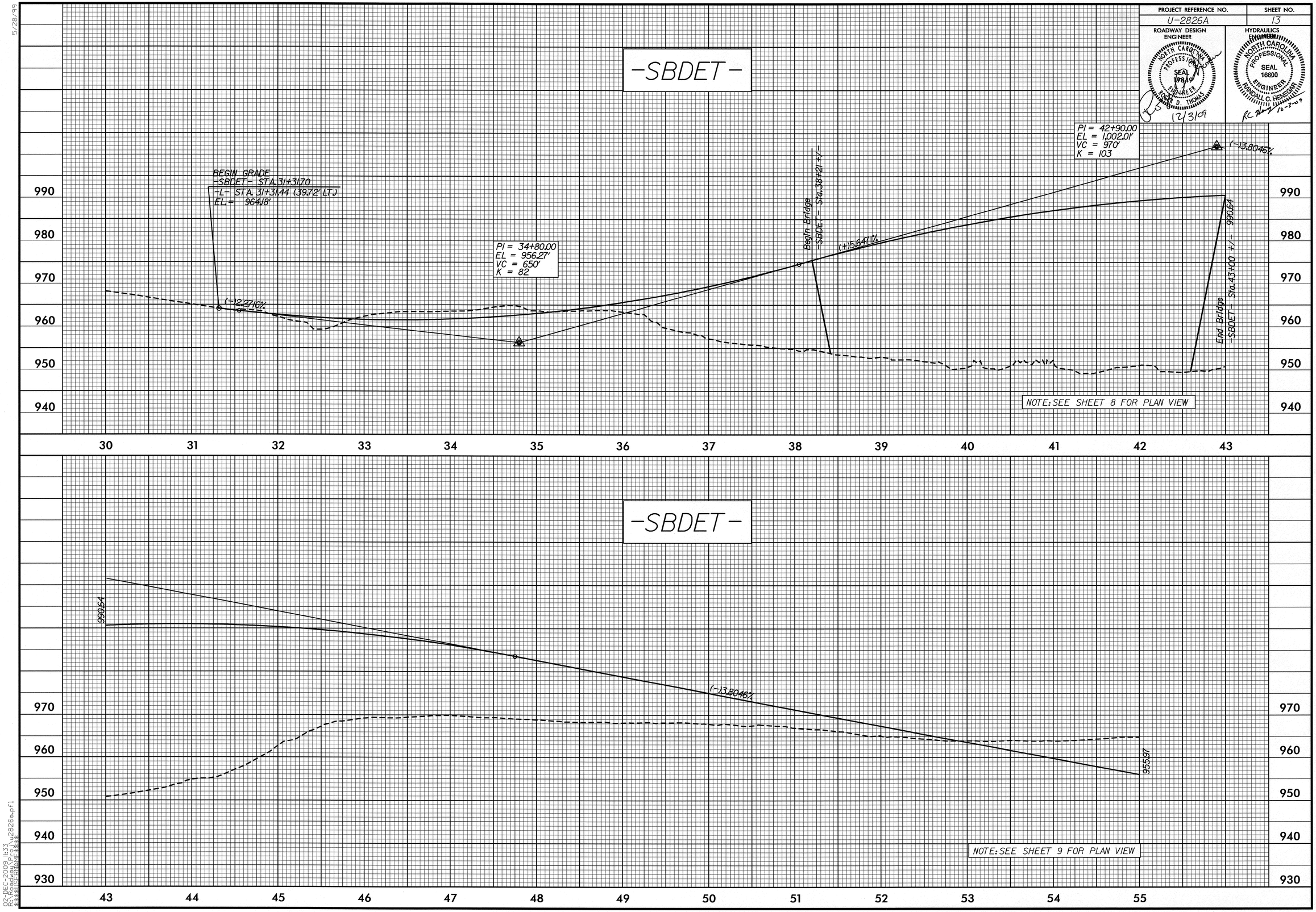
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROGER D. THOMAS

12/3/09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENEGAR

12-3-09

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ROADWAY DESIGN ENGINEER

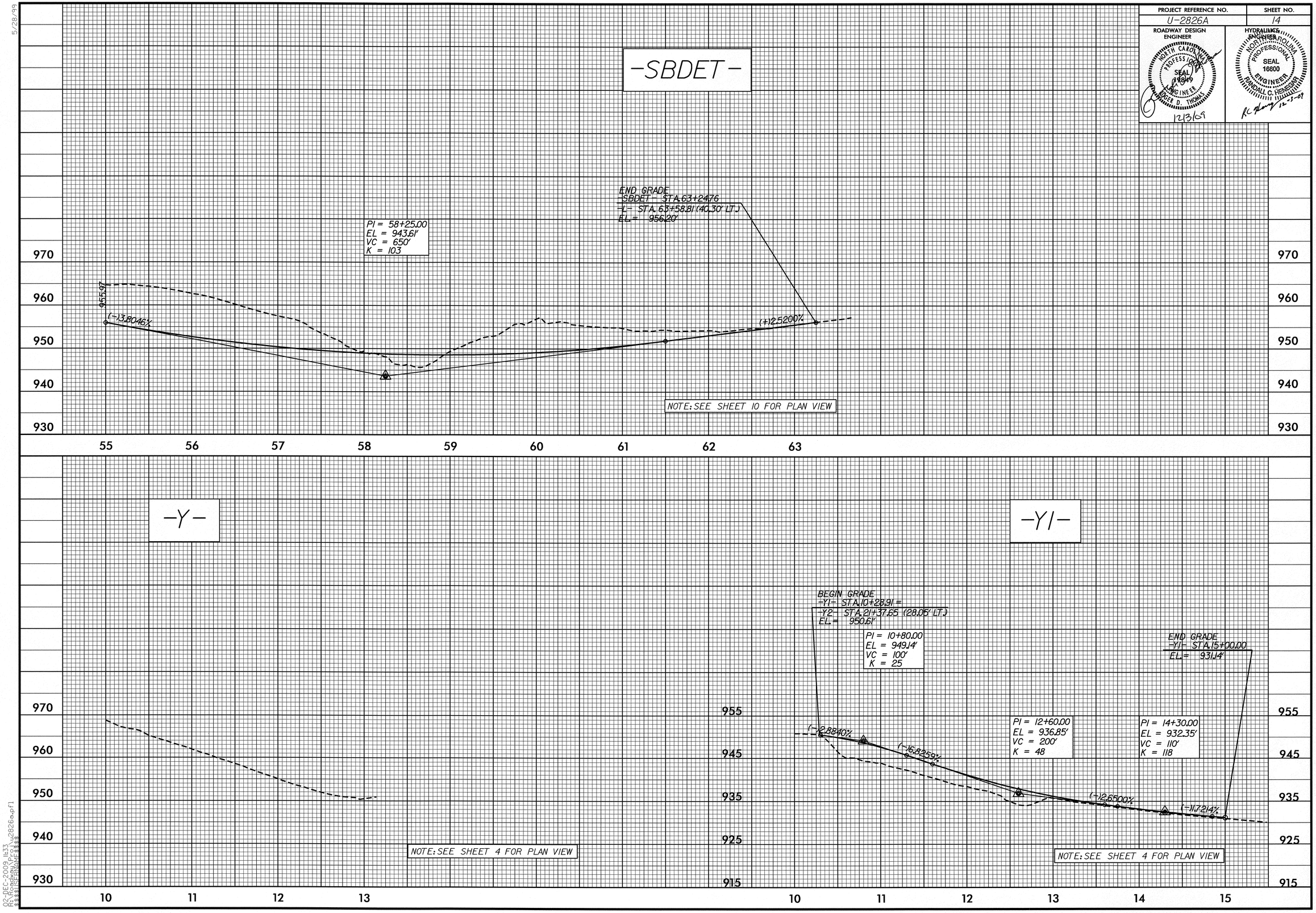
NORTH CAROLINA PROFESSIONAL SEAL 019849 ENGINEER ROGER D. THOMAS

12/3/09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENEGAR

12-3-09

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| U-2826A | 15 |

ROADWAY DESIGN ENGINEER

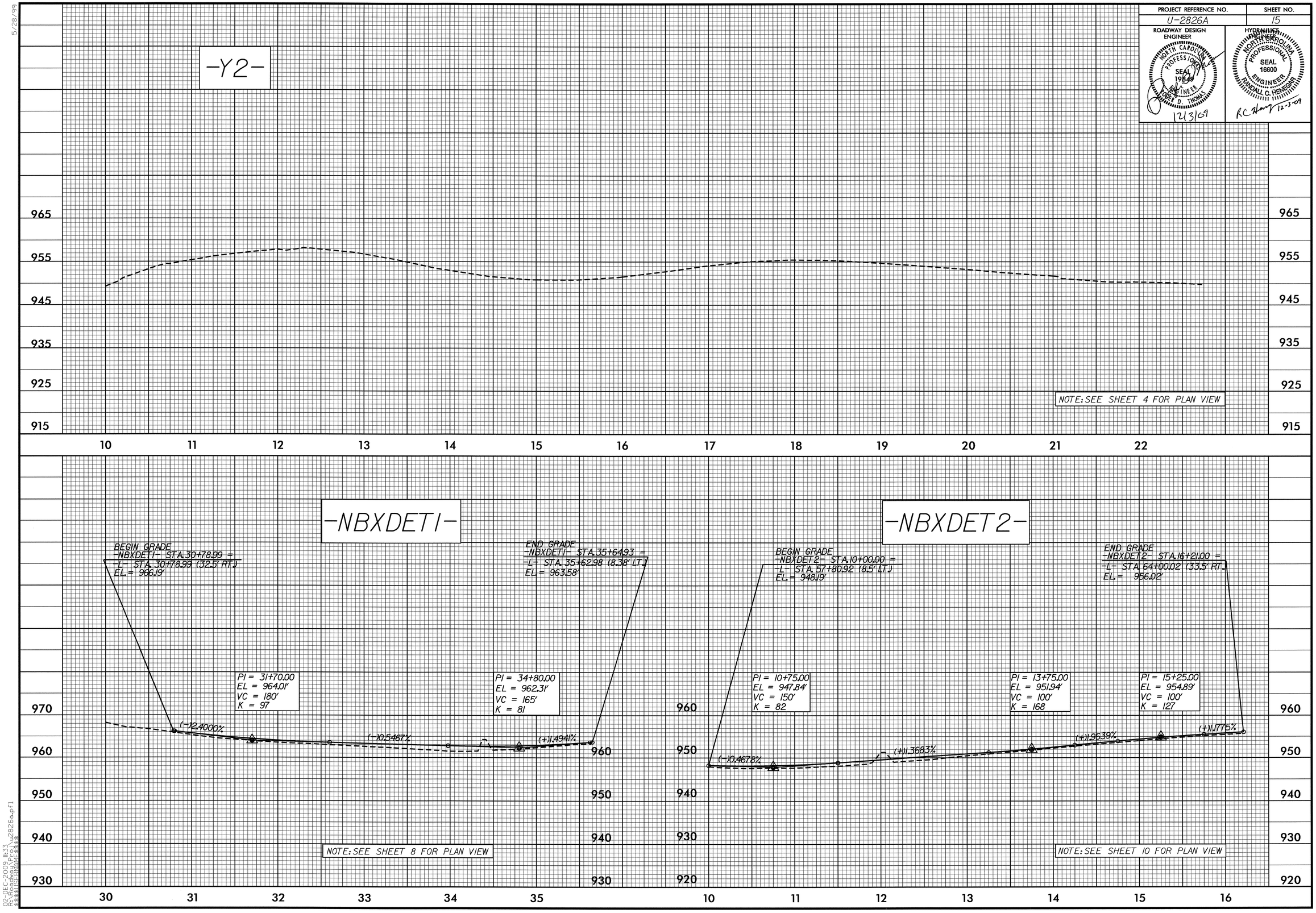
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER JAMES D. THOMAS

12/3/09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENEGAR

12-3-09

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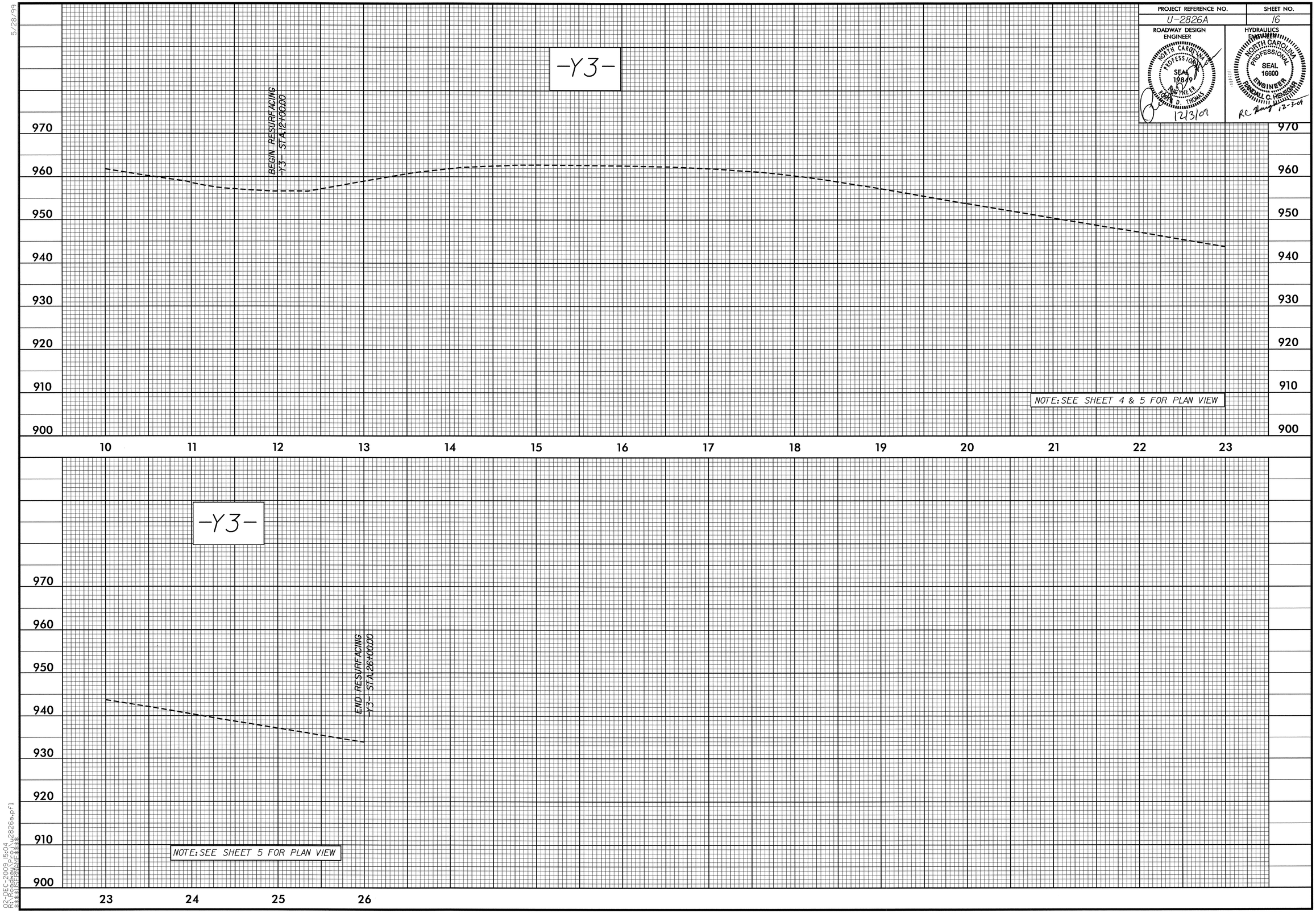
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER RUBEN D. THOMAS
12/3/09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENEGAR
RC Henegar 12-3-09

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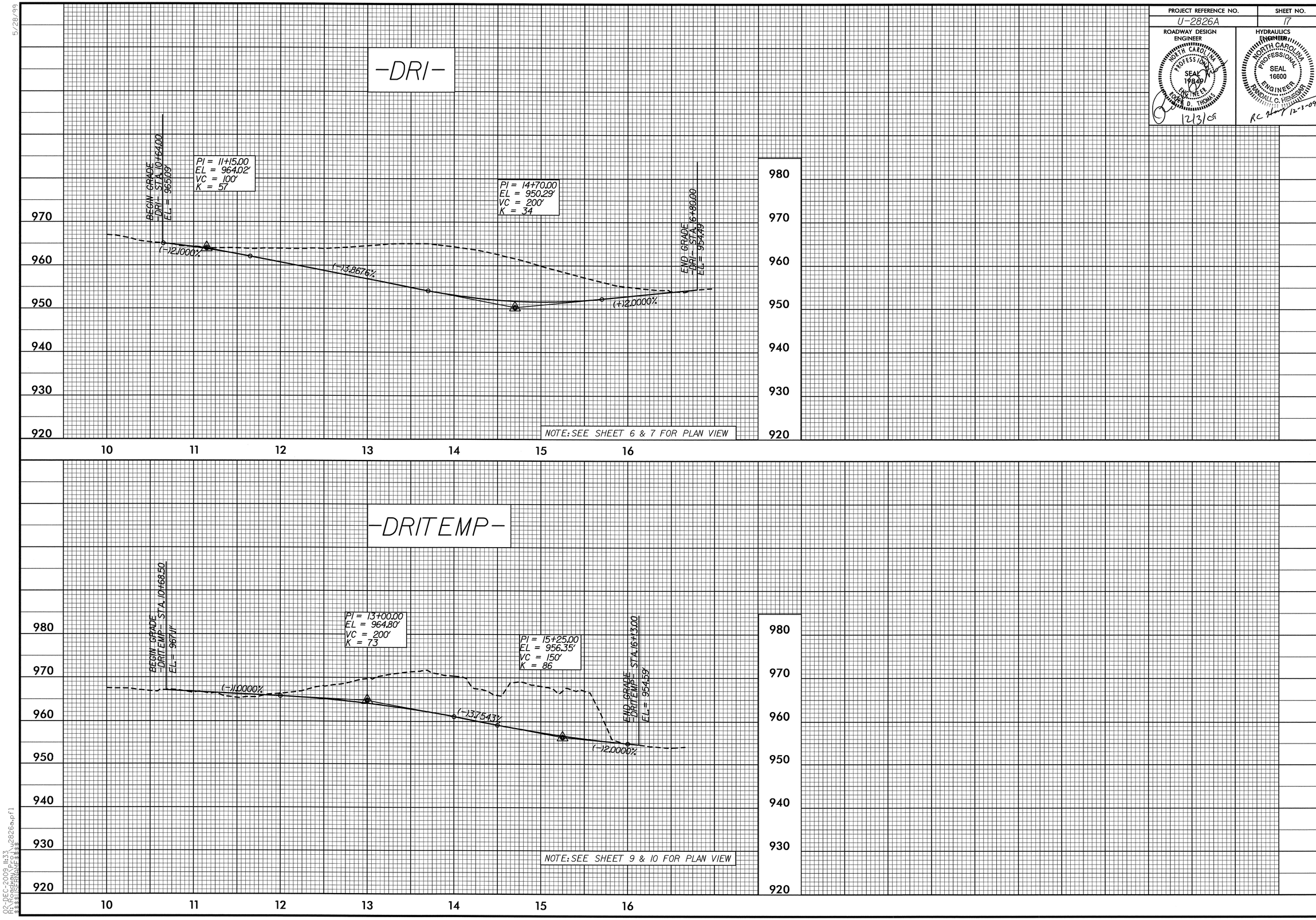
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19849 ENGINEER ROGER D. THOMAS
12/3/09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HEMBREE
RC 12-3-09

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