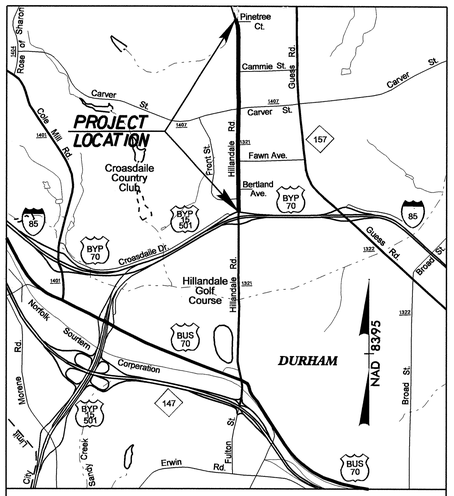
09/08/99

TIP PROJECT: U-3804

CONTRACT: C202340

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DURHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3804	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34972.1.1	STP-0505(14)	P.E.
34972.3.1	STP-0505(32)	R/W & UTIL
34972.2.ST1	STM-0505(50)	CONST.

LOCATION: HILLANDALE ROAD (SR 1321) FROM I-85 TO NORTH OF SR 1407 (CARVER STREET)

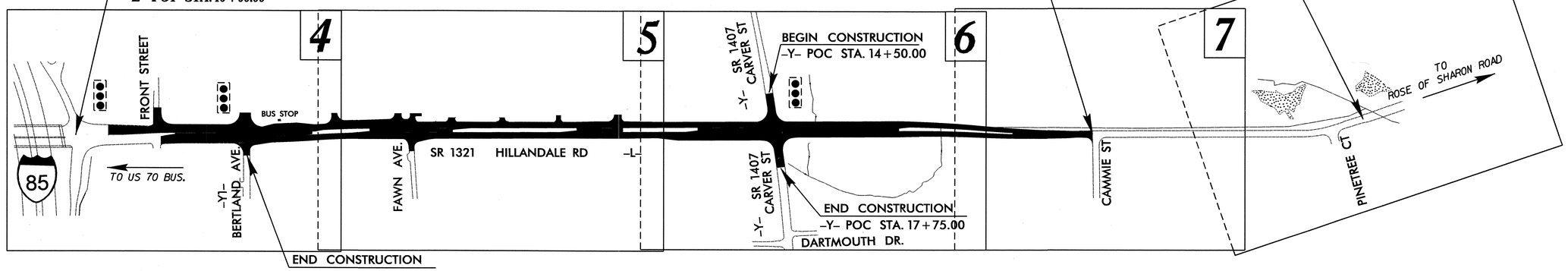
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND SIGNALS

NAD 83/95

BEGIN TIP PROJECT U-3804
-L- POT STA. 10+00.00

END TIP PROJECT U-3804
-L- POT STA 66+50.00

END PAVING
-L- POT STA. 54+15.50



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 2010	=	30,700
ADT 2030	=	37,800
DHV	=	10 %
D	=	70 %
T	=	3 % *
V	=	40 MPH

SUB-REGIONAL TIER

* TTST 1 DUAL 2

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3804 = 1.070 MILES

TOTAL LENGTH OF TIP PROJECT U-3804 = 1.070 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 20, 2009

LETTING DATE: JULY 20, 2010

JASON MOORE, P.E.
PROJECT ENGINEER

BRYAN KEY, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20670 ENGINEER MARSHA L. SHOWN
SIGNATURE: 2-10-10 P.E.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN D. KEY
SIGNATURE: 2-10-10 P.E.

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

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY

5-17-10

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-E	SURVEY CONTROL SHEETS
2 THRU 2-B	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-C THRU 2-F	INTERSECTION DETAILS
2-G	DETAIL FOR ANCHORAGE FOR FRAMES
2-H THRU 2-I	DETAIL FOR METHOD OF PIPE INSTALLATION
2-J THRU 2-K	DETAIL FOR SPECIAL DRAINAGE STRUCTURES CONFLICTING WITH UTILITIES
2-L	DETAIL FOR CONCRETE RIGHT-OF-WAY MARKER FLUSH TO SIDEWALK
2-M THRU 2-N	DETAIL FOR WHEELCHAIR RAMP
2-O	DETAIL OF SUBSURFACE DRAIN
3 (2 SHEETS)	SUMMARY OF QUANTITIES
3-A THRU 3-G	DRAINAGE SUMMARY
3-H	EARTHWO1RK SUMMARY AND PAVEMENT REMOVAL SUMMARY
3-I	PARCEL INDEX SHEET
4 THRU 8	PLAN SHEETS
9 THRU 11	PROFILE SHEET
TCP-1 THRU TCP-28	TRAFFIC CONTROL, MARKING, AND DELINEATION PLANS
PMP-1 THRU PMP-6	PAVEMENT MARKING PLANS
EC-1 THRU EC-14	EROSION CONTROL PLANS
RF-1 THRU RF-2	REFORESTATION PLANS
SD-1 THRU SD-2	SPECIAL SIGN DESIGN
SIGN-1 THRU SIGN-5	SIGNING PLANS
SIG-1 THRU SIG-39	SIGNAL PLANS
UC-1 THRU UC-9	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-6	UTILITIES BY OTHERS PLANS
X	CROSS-SECTION SUMMARY
X-1 THRU X-35	CROSS-SECTIONS

GENERAL NOTES:

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

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

CLEARING:
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II AND III.(Method III to be us used for ditch work North of Sta 51+00 on left.)

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

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

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

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

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

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE Durham Power Company, GTE, City of Durham
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

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

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

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

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	
200.02	Method of Clearing - Method II
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
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
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
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
840.24	Frames and Narrow Slot Sag Grates
840.29	Frame and Narrow Slot Flat Grates
840.30	Driveway Drop Inlet
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
876.02	Guide for Rip Rap at Pipe Outlets

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3/15/06

PROJECT REFERENCE NO.	SHEET NO.
U-3804	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

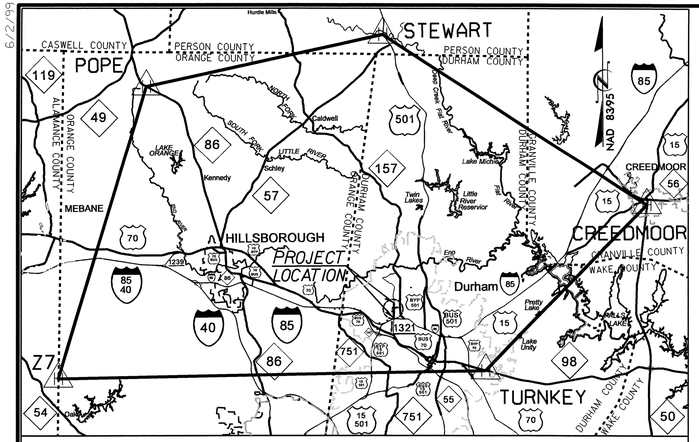
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	1-C
Location and Surveys	

SURVEY CONTROL SHEET U-3804

DURHAM COUNTY

LOCATION: HILLANDALE ROAD (SR 1321) FROM I-85 TO NORTH OF SR 1407 (CARVER STREET)



GPS CONTROL NETWORK
NOT TO SCALE

NCDOT GPS STATION U3804-1
LOCALIZED PROJECT COORDINATES

N=828914.9710
E=2017649.2590

NCDOT GPS STATION U3804-3
LOCALIZED PROJECT COORDINATES

N=832211.3620
E=2017211.3480

NAD 83/95

NCDOT GPS STATION U3804-4
LOCALIZED PROJECT COORDINATES

N=832449.7860
E=2018183.0440

END TIP PROJECT U-3804
-L- POT STA 54+15.50

NCDOT GPS STATION U3804-2
LOCALIZED PROJECT COORDINATES

N=829549.6960
E=2018886.9130

FRONT STREET
BY-202
BY-201
BY1-300
BY-203
BM 51
BY-204
BL-99
BL-100 (DESTROYED)
I-85
TO I-85

BEGIN TIP PROJECT U-3804
-L- POT STA. 10+00.00

BL-101
BL-102
BM 52
BL-103
BERTLAND AVE.
BY2-400
FAWN AVE.
BY3-500
HILLANDALE RD (SR 1321) -L-

BEGIN CONSTRUCTION
-Y- POC STA. 14+50.00

BL-104
BL-105
BM 53
TO COLE MILL ROAD
BL-106
CAMMIE ST
NCDOT GPS STATION U3804-6
LOCALIZED PROJECT COORDINATES
N=833996.6690
E=2019130.0440

SR 1407 CARVER ST -Y-
END CONSTRUCTION
-Y- POC STA. 17+50.00
DARTMOUTH DR.
BY4-600
BY6-800
BY5-700
DARTMOUTH DR.
NCDOT GPS STATION U3804-5
LOCALIZED PROJECT COORDINATES
BM 54
N=832644.9060
E=2019866.9090

NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.*

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

THE FILES TO BE FOUND ARE AS FOLLOWS:
U3804_ls_gpscalib_080207. tml
U3804_ls_wgs84_080207.txt
U3804_ls_local_080207.txt
U3804_ls_control_080410.txt

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

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

NOTE: DRAWING NOT TO SCALE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3804-4" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 832449.7860(ft) EASTING: 2018183.0440(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995107 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3804-4" TO -L- STATION 10+00.00 IS S 15°06'03.6" E 3021.17' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	1-D
Location and Surveys	

SURVEY CONTROL SHEET U-3804

GPS CALIBRATION REPORT

PROJECT : 34972.1.1

TIP NUMBER : U3804

USER NAME	ASPIELVOGEL	DATE & TIME	9:58:48 AM 1/17/2008
COORDINATE SYSTEM	US STATE PLANE 1983	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	NAD 1983/95 (CONUS)		
VERTICAL DATUM		GEOID MODEL	GEOID03 (CONUS) NC SUB GRID
COORDINATE UNITS	US SURVEY FEET		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	US SURVEY FEET		

LOCAL SITE INFORMATION

LOCALIZED AROUND :	U3804-4
LATITUDE	36°02'13.96022" N
LONGITUDE	78°56'18.60288" W
SITE SCALE FACTOR	1.00004893
HEIGHT	327.591

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

DATUM TRANSFORMATION PARAMETERS

DATUM TRANSFORMATION COMPUTATION NOT REQUESTED

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION

UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ROTATION CENTER	831627.933SFT
EASTING COORDINATE OF ROTATION CENTER	2018487.911SFT
ROTATION ABOUT THE CENTER POINT	0°00'00"
TRANSLATION NORTH	-0.035SFT
TRANSLATION EAST	0.008SFT
SCALE FACTOR	1.00004850

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	828914.968SFT
EASTING COORDINATE OF ORIGIN POINT	2017649.262SFT
VERTICAL SEPARATION AT ORIGIN	0.389SFT
SLOPE NORTH	-13.699PPM
SLOPE EAST	2.146PPM

GEOID MODEL DEFINITION

GEOID03 (CONUS) NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.005SFT	0.001	U3804-1 WGS84
VERTICAL	0.003SFT	0.000	U3804-6 WGS84
THREE-DIMENSIONAL	0.005SFT	0.001	U3804-3 WGS84

POINT RESIDUALS

WGS84 COORDINATES		CALCULATED POINT FOR DISPLAY ONLY		LOCAL COORDINATES	
POINT	U3804-1 WGS84	NORTHING	828914.968SFT	POINT	U3804-1 LOCAL
LATITUDE	36°01'39.00801"N	EASTING	2017649.262SFT	NORTHING	828914.971SFT
LONGITUDE	78°56'25.12770"W	ELEVATION	391.868SFT	EASTING	2017649.259SFT
HEIGHT	289.445SFT	HORZ ERROR	0.005SFT	ELEVATION	391.867SFT
		VERT ERROR	0.001SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.005SFT	QUALITY	SURVEY QUALITY
POINT	U3804-2 WGS84	NORTHING	829549.695SFT	POINT	U3804-2 LOCAL
LATITUDE	36°01'45.27715"N	EASTING	2018886.909SFT	NORTHING	829549.696SFT
LONGITUDE	78°56'10.05567"W	ELEVATION	416.243SFT	EASTING	2018886.913SFT
HEIGHT	313.792SFT	HORZ ERROR	0.004SFT	ELEVATION	416.243SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.004SFT	QUALITY	SURVEY QUALITY
POINT	U3804-3 WGS84	NORTHING	832211.365SFT	POINT	U3804-3 LOCAL
LATITUDE	36°02'11.60828"N	EASTING	2017211.352SFT	NORTHING	832211.362SFT
LONGITUDE	78°56'30.43527"W	ELEVATION	429.870SFT	EASTING	2017211.348SFT
HEIGHT	327.572SFT	HORZ ERROR	0.005SFT	ELEVATION	429.872SFT
		VERT ERROR	0.002SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.005SFT	QUALITY	SURVEY QUALITY
POINT	U3804-4 WGS84	NORTHING	832449.788SFT	POINT	U3804-4 LOCAL
LATITUDE	36°02'13.96022"N	EASTING	2018183.044SFT	NORTHING	832449.786SFT
LONGITUDE	78°56'18.60280"W	ELEVATION	429.921SFT	EASTING	2018183.044SFT
HEIGHT	327.591SFT	HORZ ERROR	0.002SFT	ELEVATION	429.921SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.002SFT	QUALITY	SURVEY QUALITY
POINT	U3804-5 WGS84	NORTHING	832644.905SFT	POINT	U3804-5 LOCAL
LATITUDE	36°02'15.87892"N	EASTING	2019866.905SFT	NORTHING	832644.906SFT
LONGITUDE	78°55'58.09947"W	ELEVATION	414.775SFT	EASTING	2019866.909SFT
HEIGHT	312.385SFT	HORZ ERROR	0.004SFT	ELEVATION	414.777SFT
		VERT ERROR	0.002SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.005SFT	QUALITY	SURVEY QUALITY
POINT	U3804-6 WGS84	NORTHING	833996.670SFT	POINT	U3804-6 LOCAL
LATITUDE	36°02'29.25117"N	EASTING	2019130.044SFT	NORTHING	833996.669SFT
LONGITUDE	78°56'07.06040"W	ELEVATION	394.350SFT	EASTING	2019130.044SFT
HEIGHT	292.030SFT	HORZ ERROR	0.001SFT	ELEVATION	394.347SFT
		VERT ERROR	0.003SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.003SFT	QUALITY	SURVEY QUALITY

NOTES:

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

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

THE FILES TO BE FOUND ARE AS FOLLOWS:
U3804_ls_gpscalib_080207. tml
U3804_ls_wgs84_080207.txt
U3804_ls_local_080207.txt
U3804_ls_control_080207.txt

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

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

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3804-4"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 832449.7860(ft) EASTING: 2018183.0440(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995107
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"U3804-4" TO -L- STATION 10+00.00 IS
S 15°06'03.6" E 3021.17'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

29-DEC-2009 10:40
F:\roadway\prj\u3804_ls_ld.dgn
$$$$USERNAME$$$$

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	1-E
Location and Surveys	

SURVEY CONTROL SHEET U-3804

CONTROL DATA

BASELINE

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
2	U3804-2	829549.6960	2018886.9130	416.24	10+14.16	83.69 LT
100	DESTROYED	829912.5270	2018937.1590	415.15	13+78.38	44.76 LT
101	BL-101	830293.4830	2018964.8510	411.47	17+60.36	28.56 LT
102	BL-102	830973.7230	2018984.1980	419.62	24+40.97	10.32 LT
103	BL-103	831576.1670	2018994.2980	423.31	30+43.45	17.87 LT
104	BL-104	832604.4910	2019032.1360	420.91	40+72.44	10.17 LT
105	BL-105	832998.3210	2019059.7120	418.95	44+66.91	5.86 RT
6	U3804-6	833996.6690	2019130.0440	394.34	54+67.55	20.29 RT
106	BL-106	834896.8860	2019110.6403	380.59	63+68.65	25.08 LT

SUPPLEMENTAL POINT FOR BL-100

99	BL-99	829848.9070	2018925.8510	415.28	13+14.44	54.08 LT

BY

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
300	BY1-300	829931.1280	2018628.0190	419.24	13+87.35	354.32 LT
201	BY-201	829762.5100	2018624.1570	415.30	12+18.70	352.94 LT
202	BY-202	829530.3260	2018624.1760	413.75	OUTSIDE PROJECT LIMITS	
203	BY-203	829524.6150	2018804.2020	410.12	OUTSIDE PROJECT LIMITS	
204	BY-204	829631.1740	2018906.5000	414.28	10+96.21	66.65 LT

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
300	BY1-300	829931.1280	2018628.0190	419.24	13+87.35	354.32 LT
100	BL-100	829912.5270	2018937.1590	415.15	13+78.38	44.76 LT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	830293.4830	2018964.8510	411.47	17+60.36	28.56 LT
400	BY2-400	830290.7160	2019335.8990	398.85	17+64.38	342.47 RT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
102	BL-102	830973.7230	2018984.1980	419.62	24+40.97	10.32 LT
500	BY3-500	831021.0570	2019491.0000	419.22	25+03.13	494.88 RT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
4	U3804-4	832449.7860	2018183.0440	429.92	OUTSIDE PROJECT LIMITS	
104	BL-104	832604.4910	2019032.1360	420.91	16+03.86	38.03 LT
600	BY4-600	832631.3840	2019524.4220	418.10	20+94.74	23.81 LT
5	U3804-5	832644.9060	2019866.9090	414.77	24+37.02	25.25 LT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
700	BY5-700	832272.8520	2019544.9710	418.14	20+97.20	335.30 RT
600	BY4-600	832631.3840	2019524.4220	418.10	20+94.74	23.81 LT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
600	BY4-600	832631.3840	2019524.4220	418.10	20+94.74	23.81 LT
800	BY6-800	832975.3630	2019513.2990	415.31	21+00.76	367.91 LT

BENCHMARK DATA

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**********************************************
BM51     ELEVATION = 414.49
N 829595      E 2018900
L STATION 10+60 72 LEFT
CHISELED SQUARE IN CONCRETE PAD AT
TRAFFIC SIGNAL CABINET BASE
**********************************************
**********************************************
BM52     ELEVATION = 423.21
N 831552      E 2018923
L STATION 30+17 88 LEFT
R/R SPIKE IN 14 INCH PINE

**********************************************
**********************************************
BM53     ELEVATION = 397.90
N 833781      E 2019077
L STATION 52+50 26 LEFT
R/R SPIKE IN 8 INCH SWEET GUM

**********************************************
**********************************************
BM54     ELEVATION = 414.53
N 832570      E 2019878
L STATION 40+63 836 RIGHT
CHISELED SQUARE IN CONCRETE, SOUTH OF
INTERSECTION OF ALABAMA AND W. CARVER
ST.
**********************************************
```

NOTES:

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

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

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   U3804_ls_gpscalib_080207. tml
   U3804_ls_wgs84_080207.txt
   U3804_ls_local_080207.txt
   U3804_ls_control_080410.txt

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

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

DATUM DESCRIPTION

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WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 832449.7860(ft) EASTING: 2018183.0440(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995107
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"U3804-4" TO -L- STATION 10+00.00 IS
S 15°06'03.6" E 3021.17'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

29-DEC-2009 10:40
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$$$$USERNAME$$$$

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26947 ENGINEER BRYAN C. KEY

5-5-10

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON

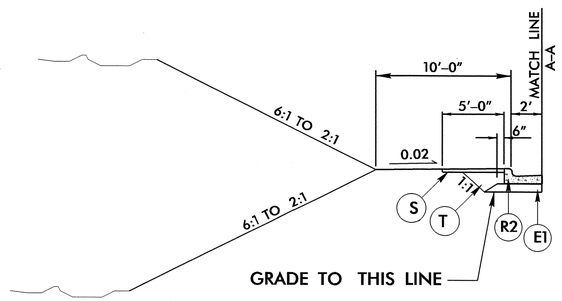
5/5/10

PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	R1	1'-6" CONCRETE CURB.
C3	PROP. APPROX.1" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD.	R2	2'-6" CONCRETE CURB AND GUTTER.
C4	PROP. APPROX. 1 ½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	R3	5" MONOLITHIC CONCRETE ISLAND
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	S	4" CONCRETE SIDEWALK.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 ½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	T	EARTH MATERIAL.
D3	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	V1	MILLING BITUMINOUS PAVEMENT. 1½"DEPTH.
E2	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V2	MILLING BITUMINOUS PAVEMENT. 0-1½"DEPTH.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V3	MILLING BITUMINOUS PAVEMENT. 2½"DEPTH.
J	PROP. 4" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

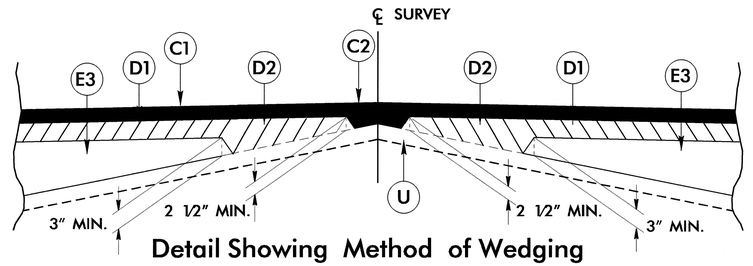
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

USE WITH TYPICAL SECTION 3

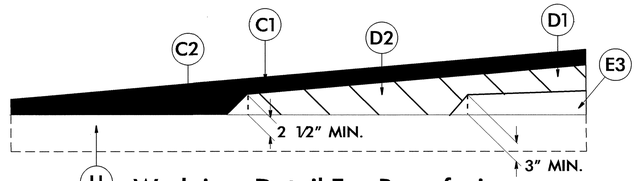


INSET A

–L– STA. 17+50.00 TO 21+25.00 LT.

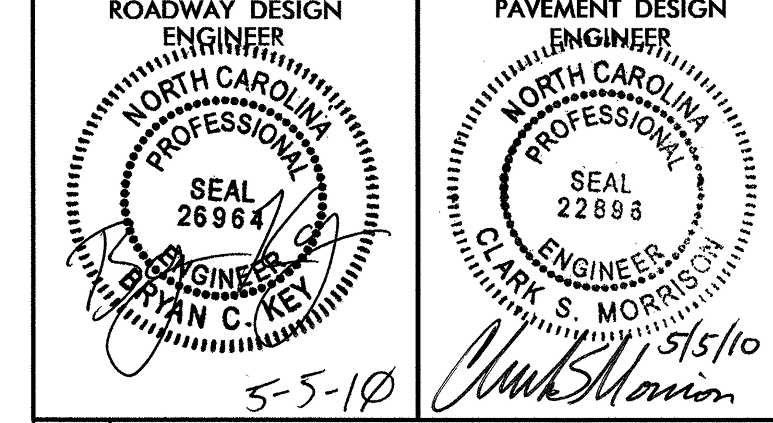


Detail Showing Method of Wedging

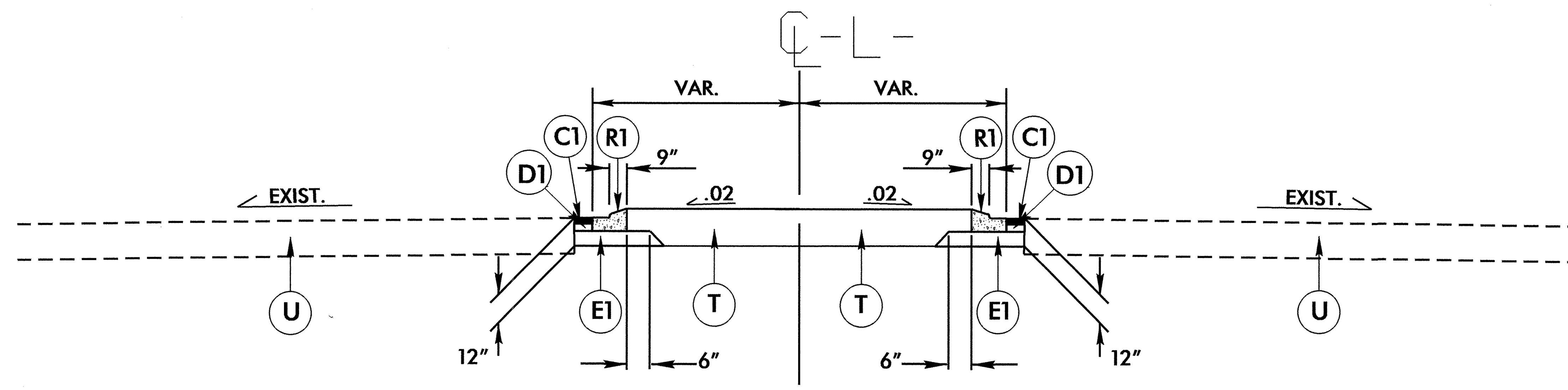


Wedging Detail For Resurfacing

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

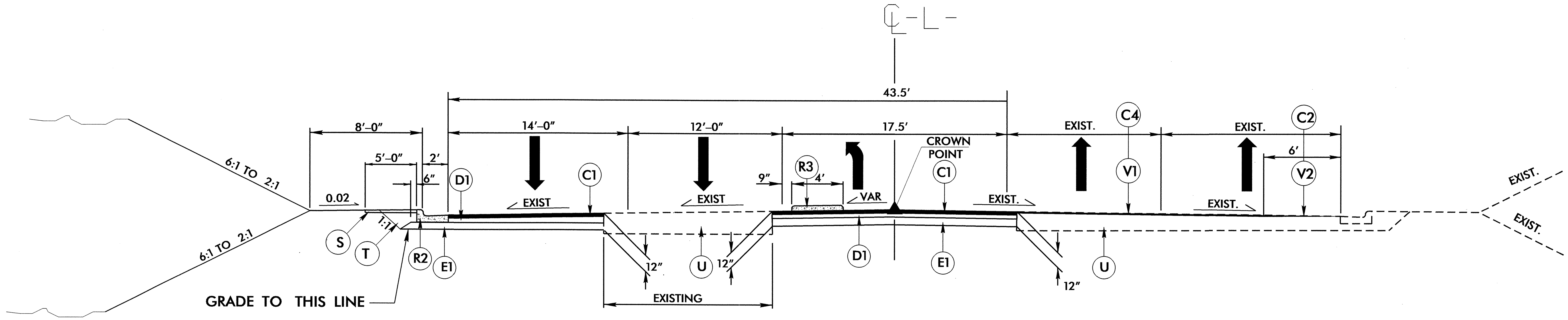


C1	3" ACSC, TYPE S9.5B
C2	VAR DEPTH ACSC, TYPE S9.5B
C3	1" ACSC, TYPE SF9.5A
C4	1½" ACSC, TYPE S9.5B
D1	4" ACIC, TYPE I19.0B
D2	VAR DEPTH ACIC, TYPE I19.0B
D3	2½" ACIC, TYPE I19.0B
E1	5" ACBC, TYPE B25.0B
E2	4" ACBC, TYPE B25.0B
E3	VAR DEPTH ACBC, TYPE B25.0B
J	PROP. 4" ABC
P	PRIME COAT
R1	1'-6" CONCRETE CURB
R2	2'-6" CONCRETE CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	1½" MILLING
V2	0-1½" MILLING
V3	2½" MILLING
W	WEDGING



TYPICAL SECTION NO. 1

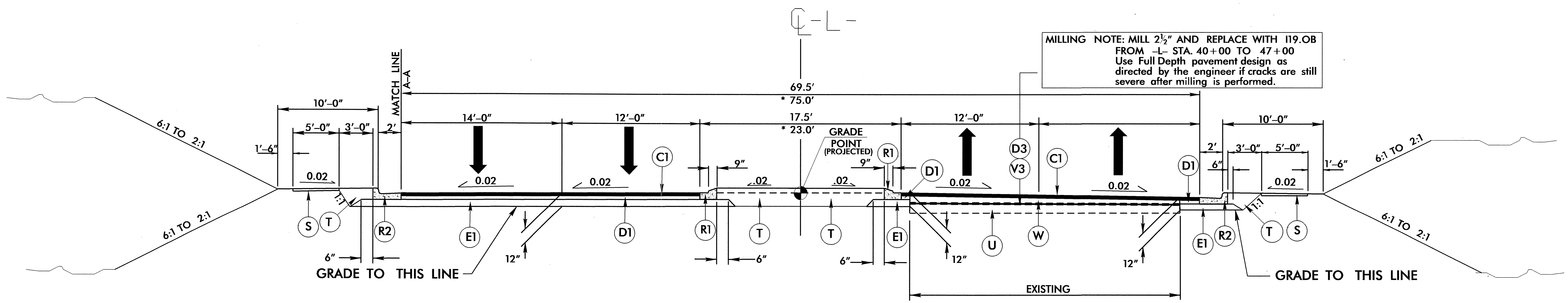
USE TYPICAL SECTION NO. 1
-L- STA. 11+40.00 TO 13+13.00



TYPICAL SECTION NO. 2

NOTE: TRANSITION FROM TYPICAL NO. 1 TO TYPICAL NO. 2
-L- STA. 13+13+00 TO -L- STA. 13+70.00

USE TYPICAL SECTION NO. 2
-L- STA. 13+70.00 TO 16+77.70



TYPICAL SECTION NO. 3

NOTE: TRANSITION FROM TYPICAL NO. 2 TO TYPICAL NO. 3
-L- STA. 16+77.70 TO -L- STA. 17+00.00

NOTE: TRANSITION FROM TYPICAL NO. 3 TO EXISTING
-L- STA. 45+70.00 TO -L- STA. 54+15.50

USE TYPICAL SECTION NO. 3
-L- STA. 17+00.00 TO 53+50.00
* -L- STA. 23+50.89 TO 34+00.00
(NOTE: USE INSET A -L- STA. 17+50.00 TO 21+25.00 LT.)

6/2/99

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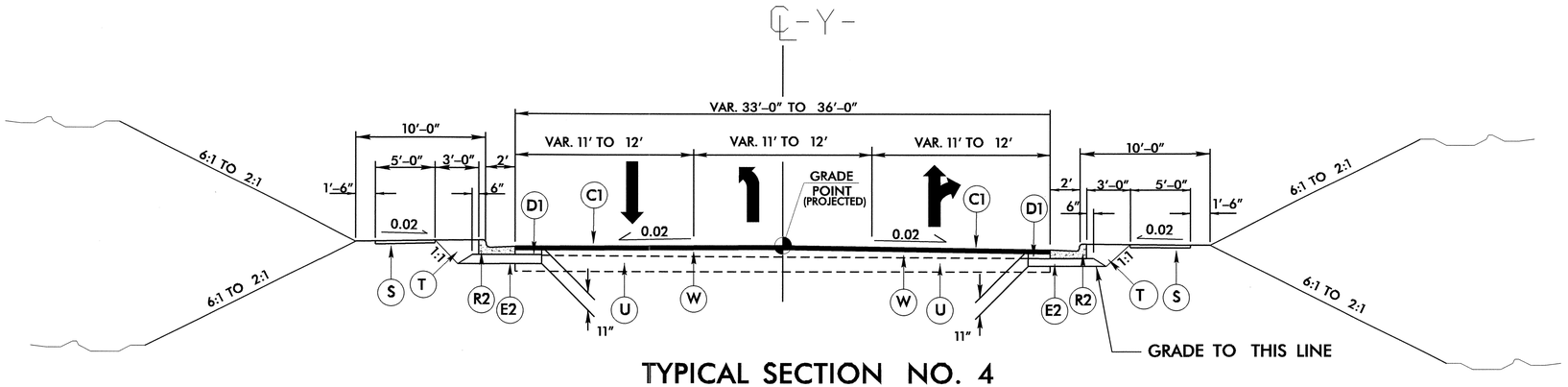
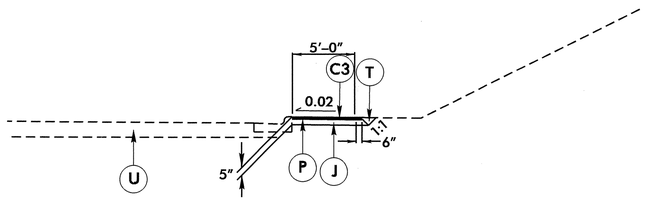


TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

-Y- STA. 14+50.00 TO 15+73.43
-Y- STA. 16+55.79 TO 17+75.00



TYPICAL SECTION NO. 5

TEMPORARY SIDEWALK

USE TYPICAL SECTION NO. 5

SEE TCP-6 AND TCP-7 FOR LOCATION

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-B

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER RYAN C. KEY
2-18-10

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22996 ENGINEER CLARK S. MORRISON
2/11/2010

C1	3" ACSC, TYPE S9.5B
C2	VAR DEPTH ACSC, TYPE S9.5B
C3	1" ACSC, TYPE SF9.5A
C4	1½" ACSC, TYPE S9.5B
D1	4" ACIC, TYPE I19.0B
D2	VAR DEPTH ACIC, TYPE I19.0B
D3	2½" ACIC, TYPE I19.0B
E1	5" ACBC, TYPE B25.0B
E2	4" ACBC, TYPE B25.0B
E3	VAR DEPTH ACBC, TYPE B25.0B
J	PROP. 4" ABC
P	PRIME COAT
R1	1'-6" CONCRETE CURB
R2	2'-6" CONCRETE CURB AND GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	1½" MILLING
V2	0-1½" MILLING
V3	2½" MILLING
W	WEDGING

6/2/99

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$$$$USERNAME$$$$

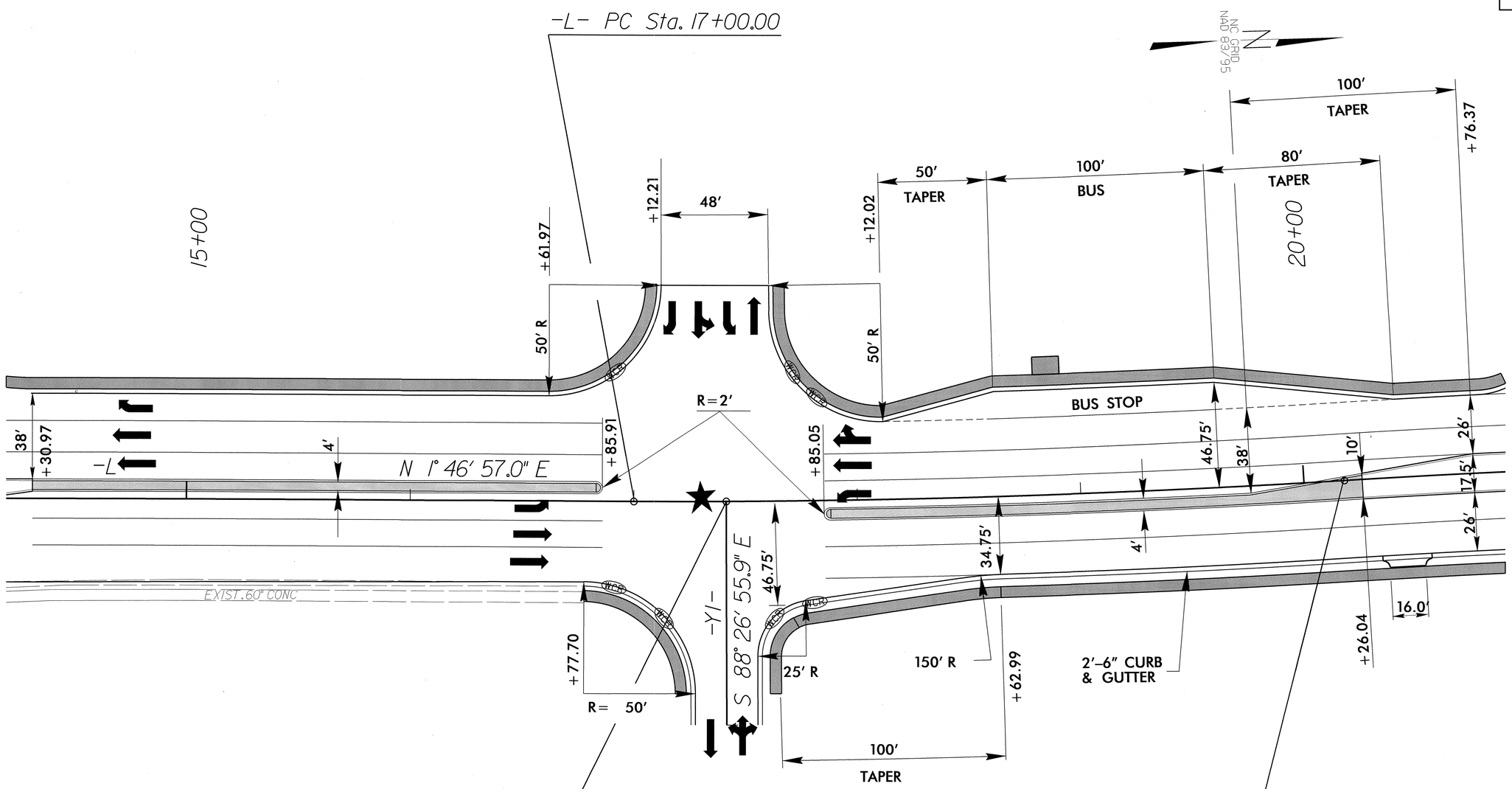
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-C
R/W SHEET NO.	

NOT TO SCALE

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER ALBERT N.C. KEY
5-5-10

INTERSECTION DETAIL
-L- (HILLANDALE RD.) AND -Y1- (BERTLAND AVE.)



ALL ISLAND RADIUS 2' UNLESS NOTED

MONOLITHIC ISLAND
SIDEWALK
BUS STOP SHELTER PAD
NEW SIGNAL

SEE SHEET 4 FOR PLAN VIEW
SEE PAVEMENT MARKING PLANS FOR WCR LOCATIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-D
R/W SHEET NO.	

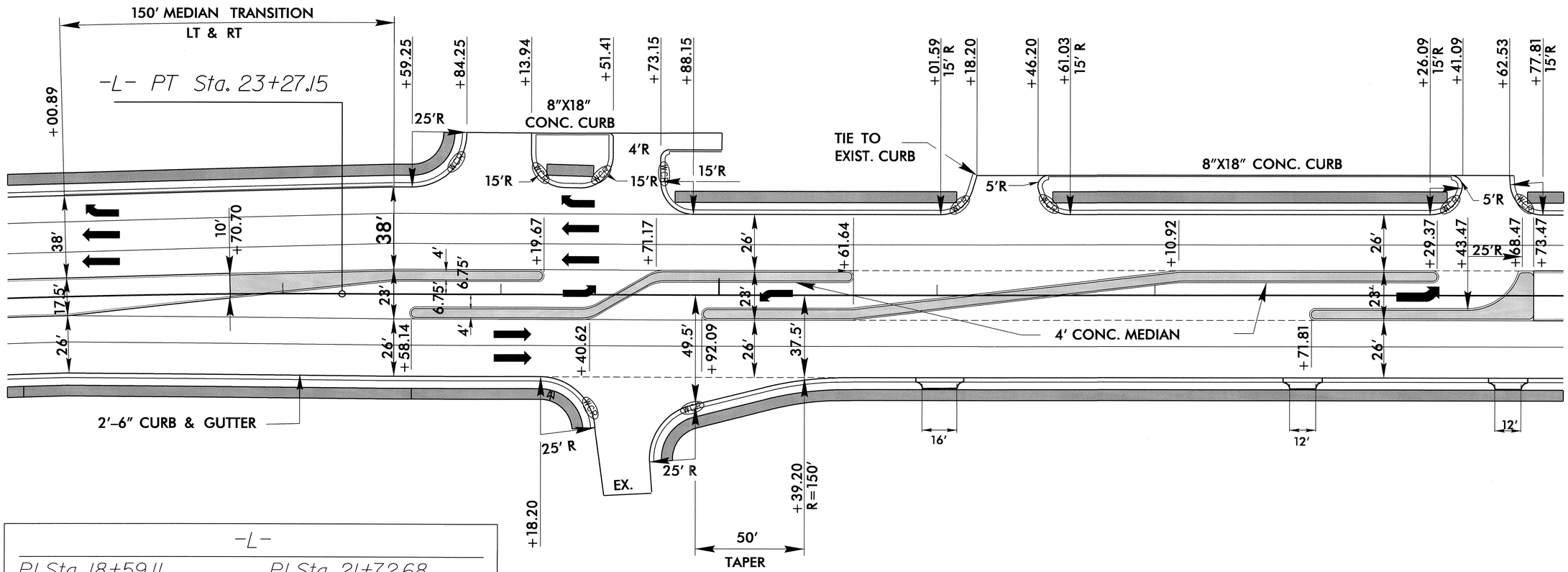
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN D. KEY
2-10-18

INTERSECTION DETAIL
–L– (HILLANDALE RD.) AND (FAWN AVE.)

NOT TO SCALE

25+00

N
NC GRID
NAD 83/95



–L–	
PI Sta 18+59.11	PI Sta 21+72.68
△ = 3° 38' 43.1" (LT)	△ = 3° 32' 28.5" (RT)
D = 1° 08' 45.3"	D = 1° 08' 45.3"
L = 318.11'	L = 309.03'
T = 159.11'	T = 154.57'
R = 5,000.00'	R = 5,000.00'
V_D = 40 mph	V_D = 40 mph
SE = NC	SE = NC

ALL ISLAND RADIUS 2' UNLESS NOTED

MONOLITHIC ISLAND

SIDEWALK

SEE SHEET 5 FOR PLAN VIEW

SEE PAVEMENT MARKING PLANS FOR WCR LOCATIONS

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$$$$ICEENGR$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-E
RW SHEET NO.	

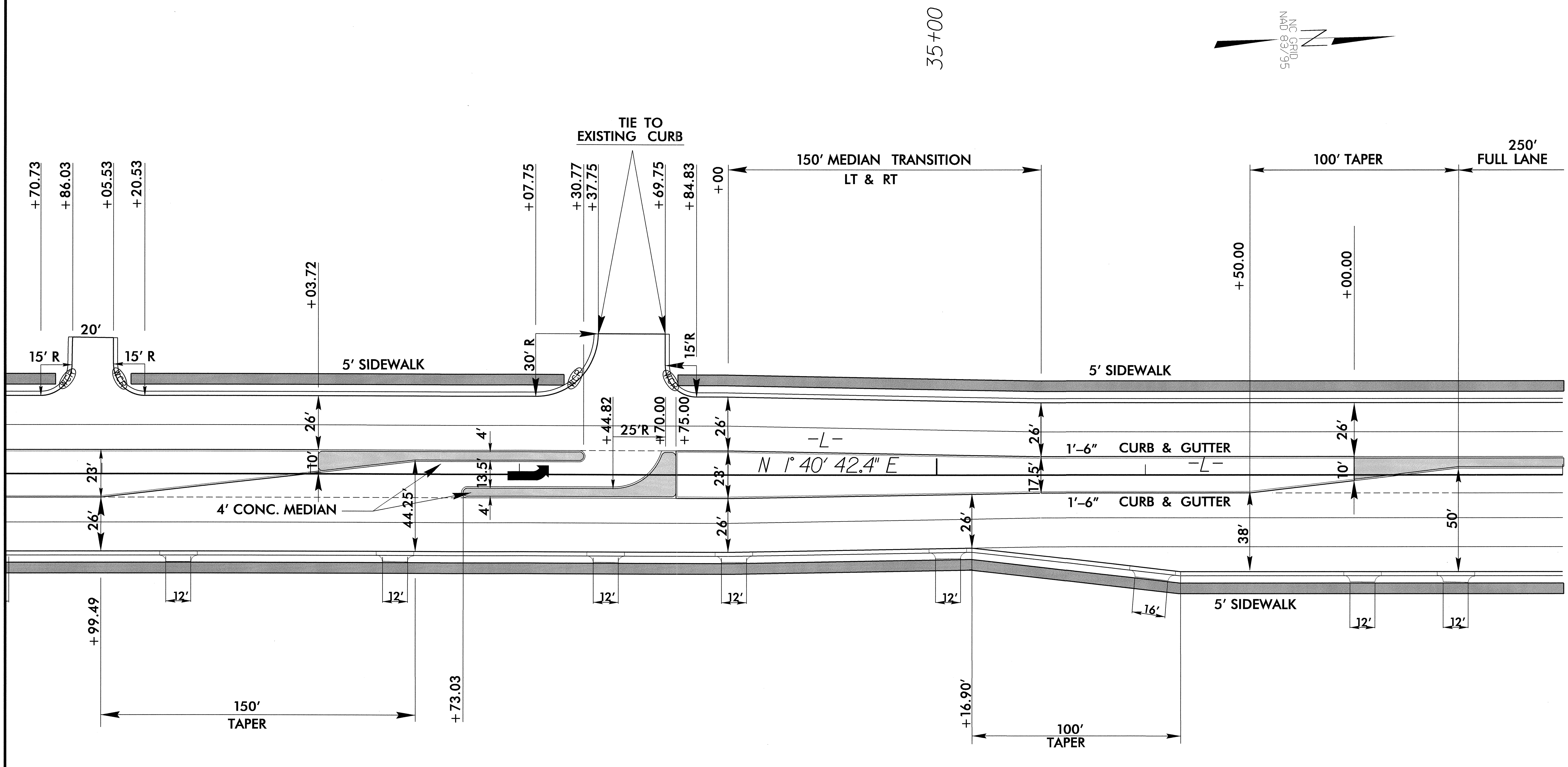
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26984 BRYAN C. KEY

2-10-10

ISLAND DETAIL
-L- (HILLANDALE RD.)

NOT TO SCALE



MONOLITHIC ISLAND

SIDEWALK

SEE SHEET 5&6 FOR PLAN VIEW

SEE PAVEMENT MARKING PLANS FOR WCR LOCATIONS

5/14/99

29-DEC-2009 10:40
u3804_rdy_psh2e.dgn

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-F
R/W SHEET NO.	

NOT TO SCALE

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY
2-18-10

INTERSECTION & ISLAND DETAIL
-L- (HILLANDALE RD.) AND -Y- (CARVER ST.)

-L-
PI Sta 47+52.12
△ = 4° 10' 19.1" (RT)
D = 1° 08' 45.3"
L = 364.07'
T = 182.12'
R = 5,000.00'
V_D = 40 mph
SE = NC

40+00

45+00

NC GRID NAD 83/95

-L- STA 40+35.49
-Y- STA 16+08.56

100' TAPER

780' TRANSITION LT & RT

5' SIDEWALK

+53.56 R=50'

+89.36 R=50'

.02 .02 .01 .01 .00 .00 25'

4' CONC. MEDIAN

-L-

38.75' 17.5' 4' 26.75' 10' 25.29'

50'

+88.00

R=2'

+81.00

+73.76

5' SIDEWALK

16'

+81.46 R=50'

+17.71 R=50'

.00 .00 .01 .01 .02 .02 25'

-Y-

12'

12' 12' 12' 12' 12' 12'

-L- PC Sta. 45+70.00

ALL ISLAND RADIUS 2' UNLESS NOTED

☆ UPGRADE SIGNAL

MONOLITHIC ISLAND

SIDEWALK

SEE SHEET 6 FOR PLAN VIEW

SEE PAVEMENT MARKING PLANS FOR WCR LOCATIONS

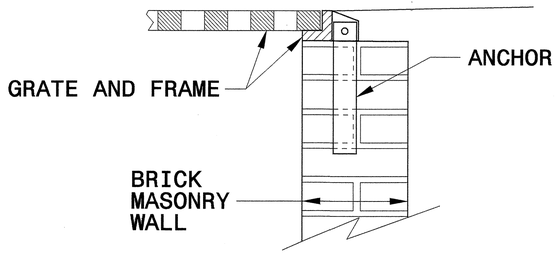
07-JAN-2010 16:54
e:\projects\projects\u3804_rdy_psh2f.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-G

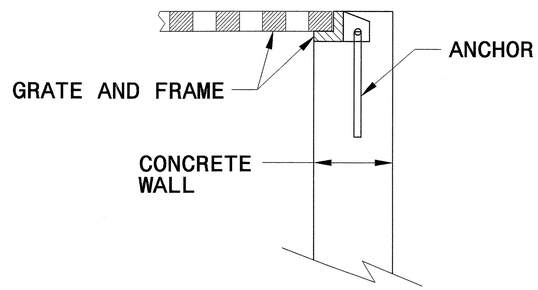
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

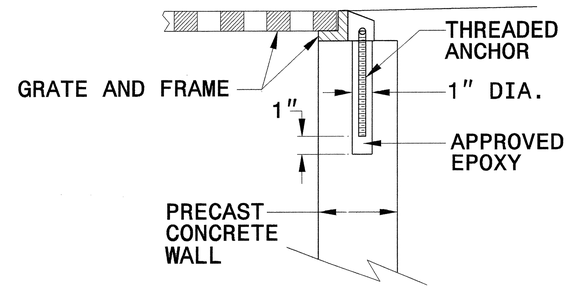
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



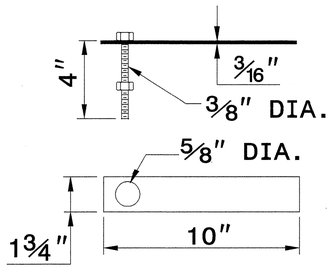
CONCRETE CONSTRUCTION



PRECAST CONCRETE CONSTRUCTION

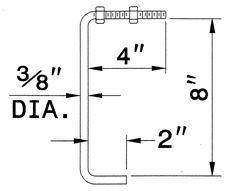
DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

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



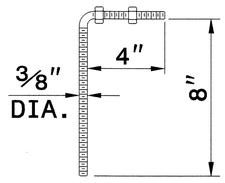
MASONRY ANCHOR

3⁄8" DIA. BOLT WITH PLATE



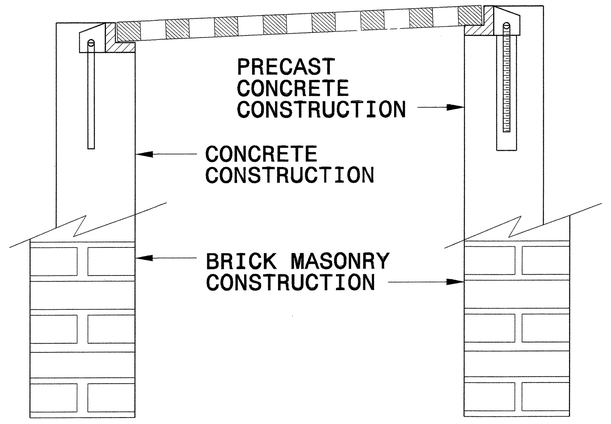
CONCRETE ANCHOR

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

SEAL 022966
JOEL S. HOWERTON
2/11/10

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: Joel S Howert DATE: 11/13/08
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-H

5/14/99

30-JUL-2009 08:48
s:\contracts\projects\special details\ericward\stds\06' stds to special details\30001\0300d01.dgn
jhowerton AT PS23750

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

7-06

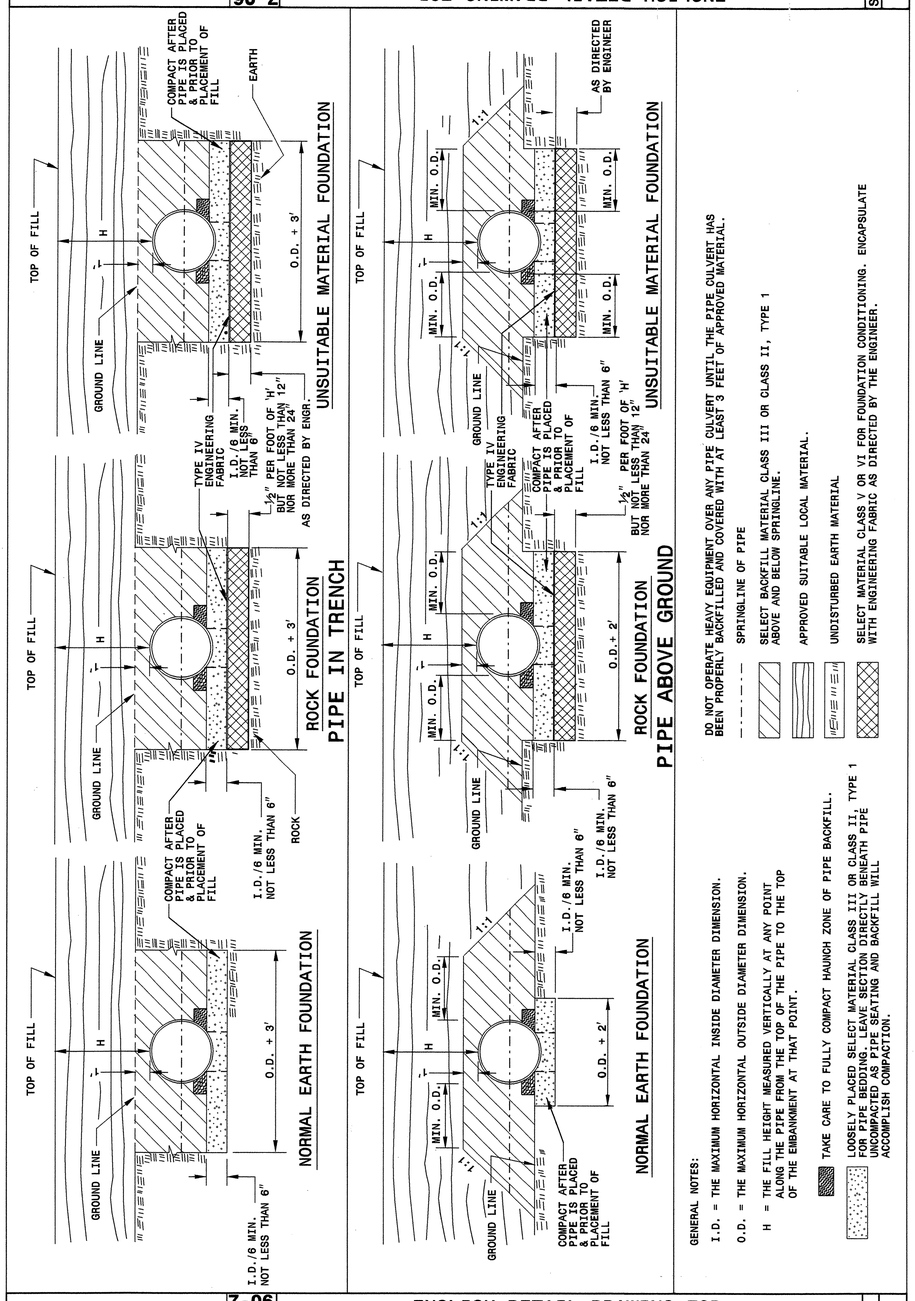
ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3

300D01



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.

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.

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.

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

7-06

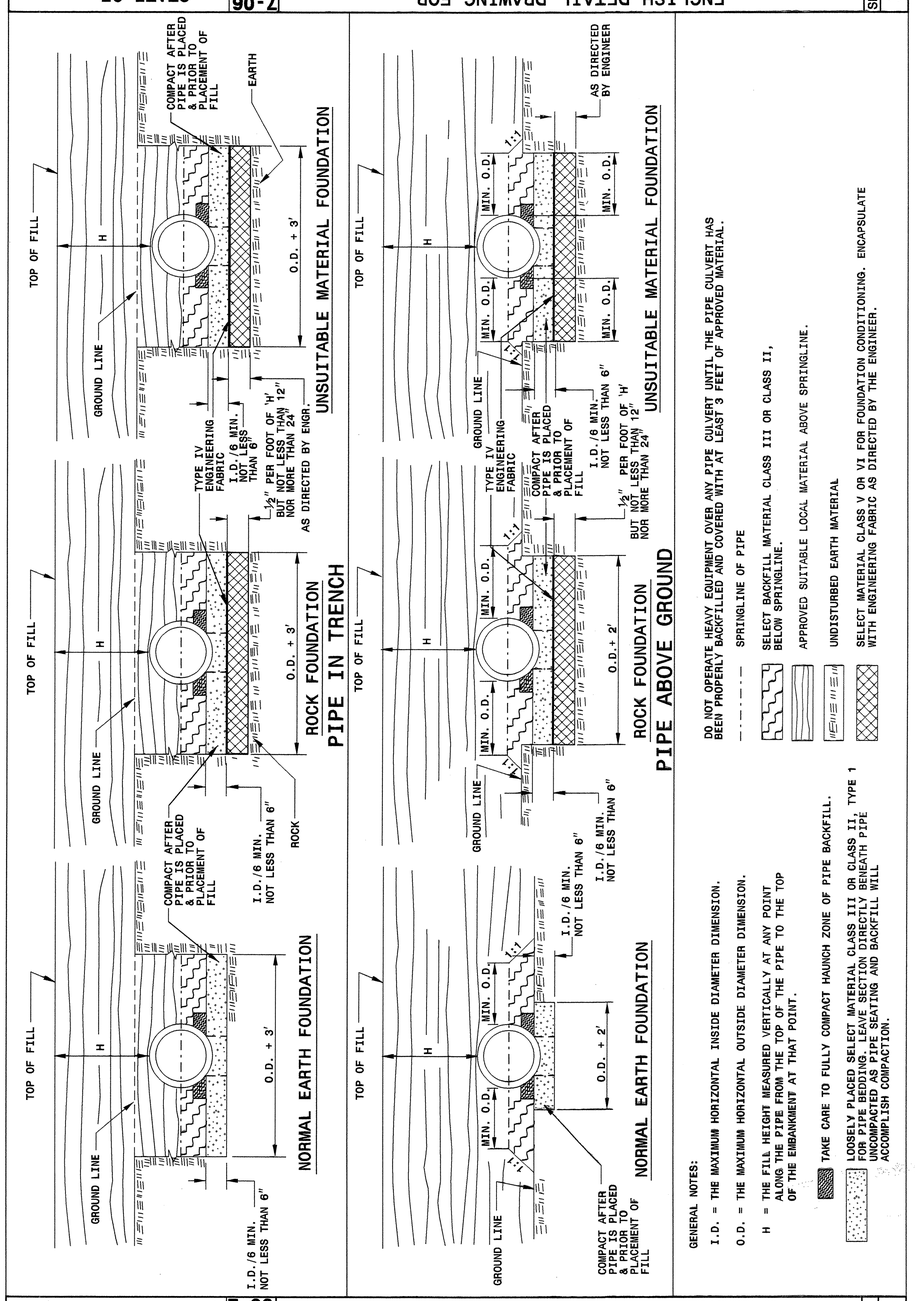
ENGLISH DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3

300D01



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.

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.

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.

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: 7/29/09
FILE SPEC: c:/ericward/stds/stdstodetails/30001/0300d01.dgn

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

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

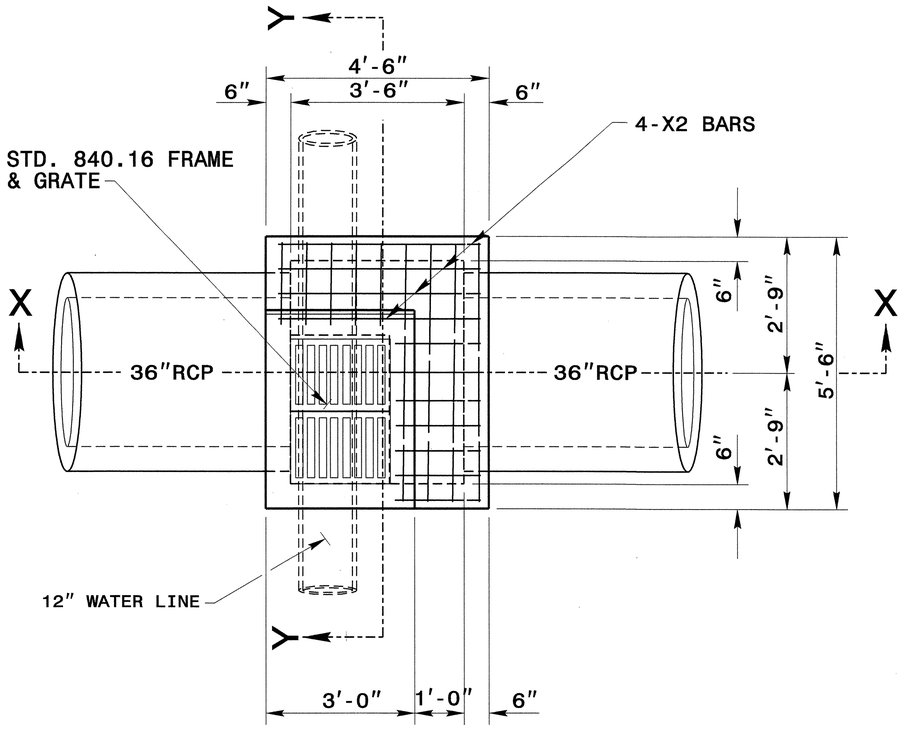
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

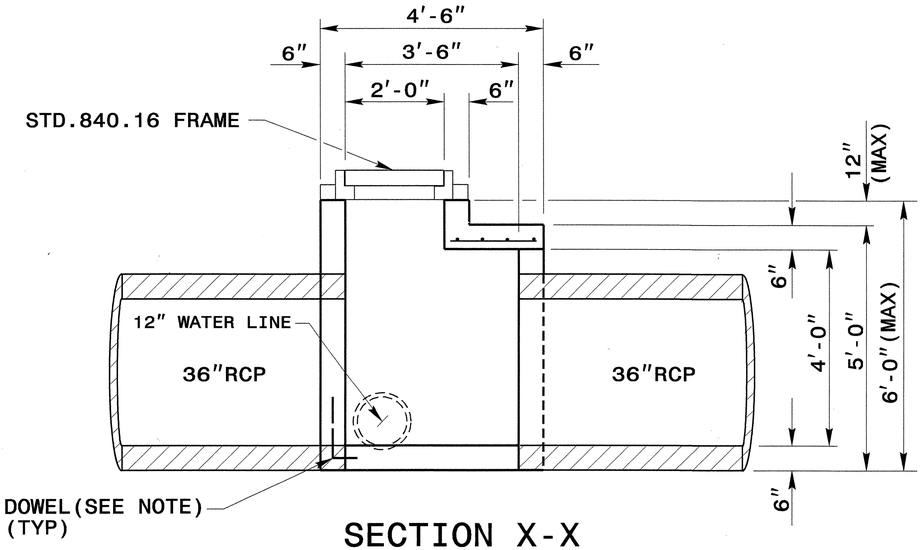
ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE: 7/30/09
FILE SPEC: /ericward/stds/stdstodetails/30001/0300d01.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-I

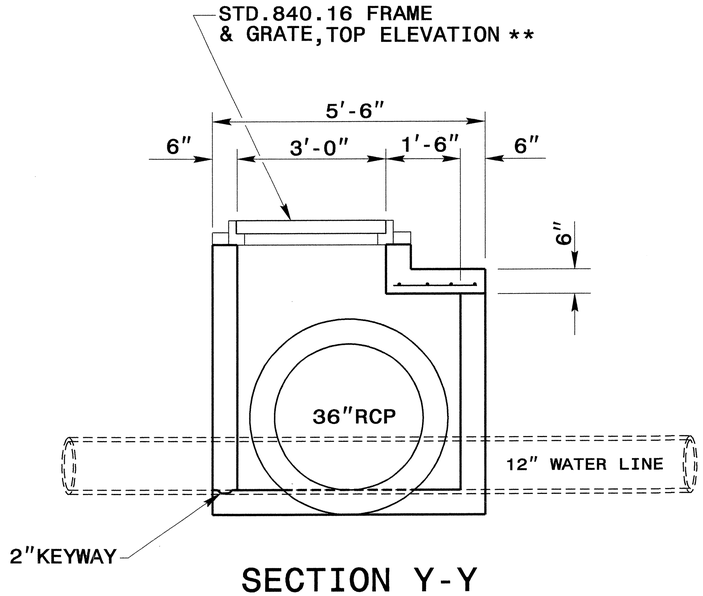
PROJ. REFERENCE NO.	SHEET NO.
U-3804	2-J



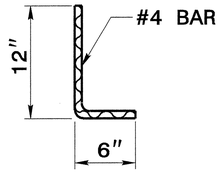
PLAN



SECTION X-X



SECTION Y-Y



DOWEL

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

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

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

CONSTRUCT WITH PIPE CROWNS MATCHING.

INSTALL 2" WEEPHOLES AS DIRECTED BY THE ENGINEER.

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

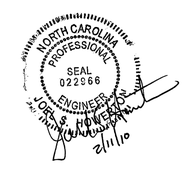
CHAMFER ALL EXPOSED CORNERS 1".

DIMENSIONS MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.

BILL OF MATERIAL

BAR	SIZE	NO.	LENGTH	WEIGHT
X	#6	12	1'-8"	30
X2	#6	4	4'-2"	26
Y	#6	4	5'-2"	32
TOTAL REINF. STEEL (lbs.)				88
CLASS "B" CONC. (cu. yds.)				2.6
NO DEDUCTIONS MADE FOR PIPES				
DEDUCTION FOR 2-36"RCP				-0.4 CY
DEDUCTION FOR 2-12"WATER PIPE				-0.04 CY

** NO CONCRETE DEDUCTION MADE FOR GRATE OPENING.



STA. -L- 19+63.00

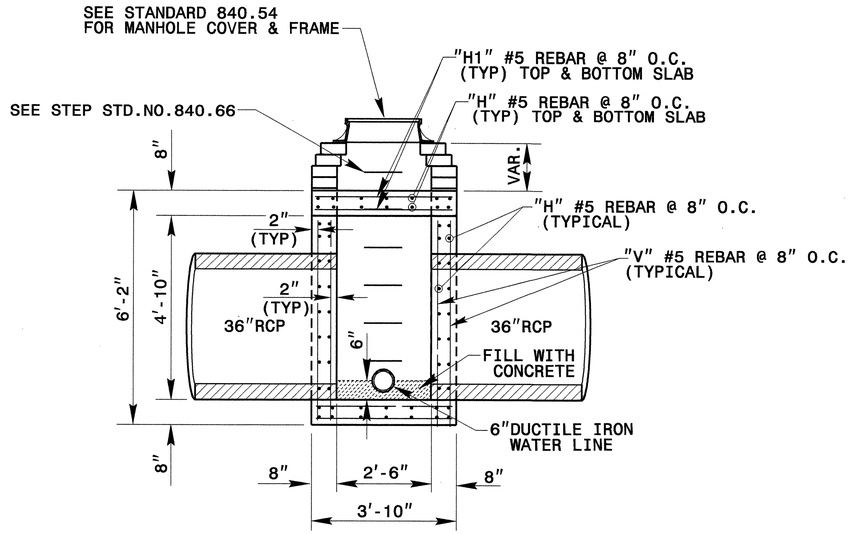
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DRAINAGE STRUCTURE DETAIL

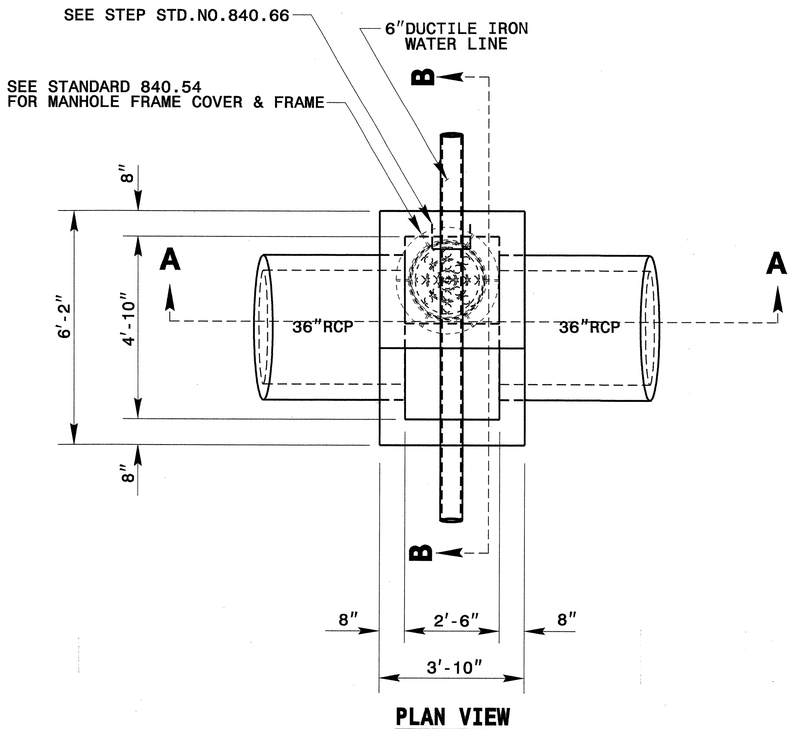
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 09-18-09
CHECKED BY: _____ DATE: 11/20/09
FILE SPEC.: detail/nbritt/english/urban/u3804mdi36rcp.dgn

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-K



SECTION A-A



PLAN VIEW

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

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

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

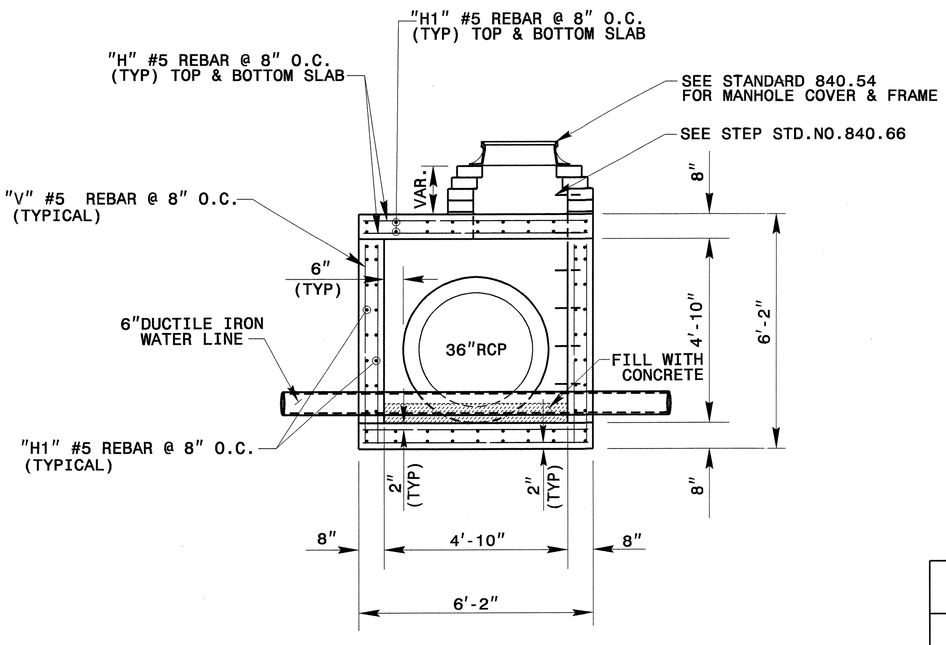
CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	60	#5	5'-10"	366
H1	68	#5	3'-6"	249
V	64	#5	5'-2"	345
TOTAL REINF. STEEL (LBS.)				960
TOTAL CONC. (CU. YDS.)				3.4

* 0.30 CU.YD. PER FOOT OF RISER HEIGHT
* 0.57 CU.YD. DEDUCTION FOR 2-36" RC PIPE
* 0.02 CU.YD. DEDUCTION FOR 6" DUCTILE IRON PIPE
* NO DEDUCTION HAS BEEN MADE FOR PIPES



SECTION B-B

STA.17+38-Y-

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

36" TRAFFIC BEARING JUNCTION BOX

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: nbritt DATE: 09/18/09
CHECKED BY: _____ DATE: 9/23/09
FILE SPEC.: detail/nbritt/english/urban/u3804conflictbox.dgn

23-SEP-2009 12:06
s:\contracts\contracts\special details\nbritt\english\urban\u3804 conflict box.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-L

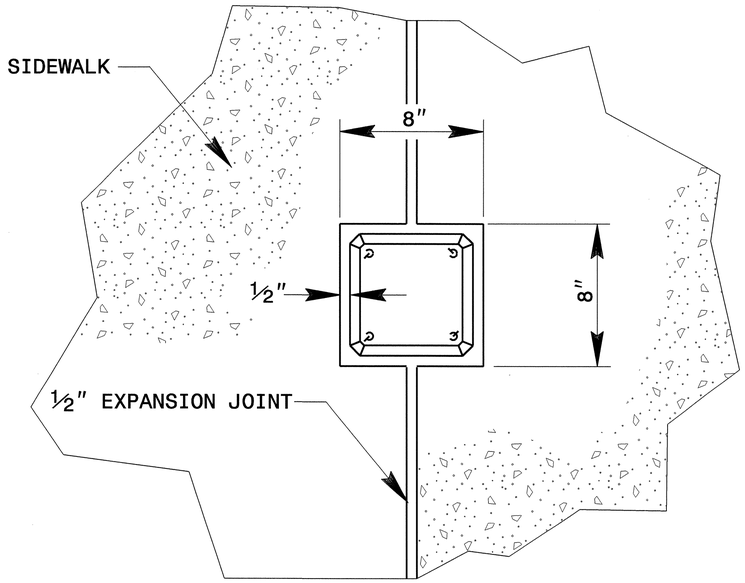
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

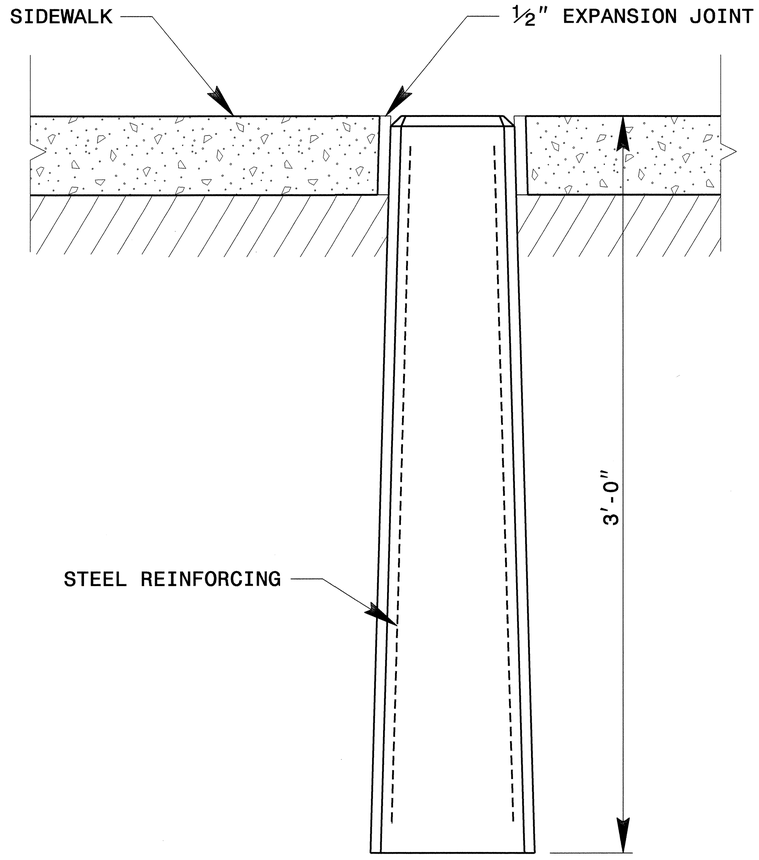
ENGLISH DETAIL DRAWING FOR

CONCRETE RIGHT-OF-WAY MARKER FLUSH TO SIDEWALK

SHEET 1 OF 1

806D01





NOTES:

INSTALL RIGHT-OF-WAY MARKER FLUSH WITH TOP OF SIDEWALK.

USE STANDARD RIGHT-OF-WAY MARKER 806.01.

SEE STANDARD DRAWING 848.01 FOR CONCRETE SIDEWALK.

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

ENGLISH DETAIL DRAWING FOR

CONCRETE RIGHT-OF-WAY MARKER FLUSH TO SIDEWALK

SHEET 1 OF 1

806D01

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWARD
2/11/10

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

SEE PLATE FOR TITLE

ORIGINAL BY: K. KEMPF DATE: 1/7/10
MODIFIED BY: DATE:
CHECKED BY: John S. Howard DATE: 1/8/10
FILE SPEC.: details\kkempf\english\806d01.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-M

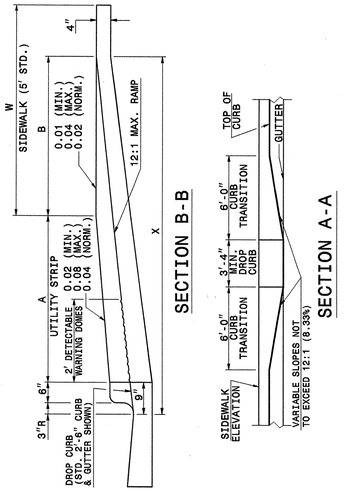
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

WHEELCHAIR RAMP

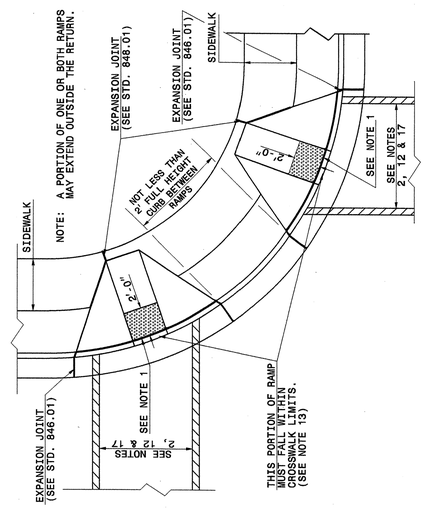
PROPOSED CURB AND GUTTER

SHEET 1 OF 3 **848D05**



SECTION B-B

SECTION A-A

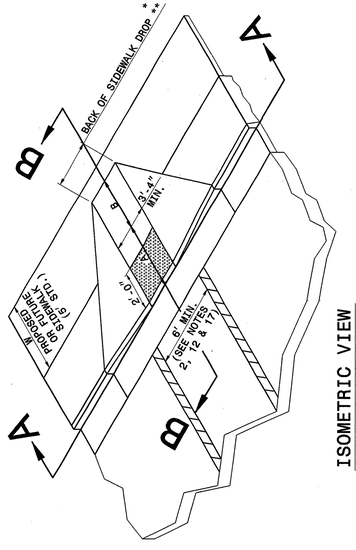


PLAN VIEW

DUAL RAMPS
AND RADII
(40" MIN. FLOOR WIDTH)

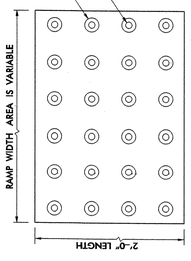
W	A	W+A+9"	X	B
5'	0.0'	5.8'	5.8'	5.0'*
6'	0.0'	6.8'	6.8'	6.0'**
7'	0.0'	7.8'	7.3'	6.5'**
8'	0.0'	8.8'	7.3'	6.5'**
5'	2.0'	7.8'	7.8'	5.0'
5'	2.5'	8.3'	8.1'	4.8'
5'	3.0'	8.8'	8.3'	4.4'
5'	3.5'	9.3'	8.4'	4.1'
5'	4.0'	9.8'	8.6'	3.8'
5'	4.5'	10.3'	8.7'	3.4'
5'	5.0'	10.8'	8.9'	3.1'

B = X-(A+9")
B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.
* BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES.
** BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES ≥ 0.04.



ISOMETRIC VIEW

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



DETECTABLE WARNING DOMES

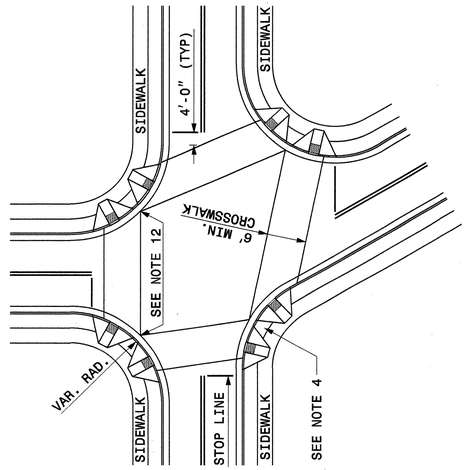
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

WHEELCHAIR RAMP

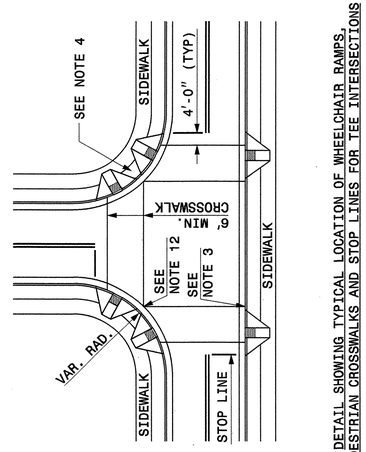
PROPOSED CURB AND GUTTER

SHEET 2 OF 3 **848D05**



DETAIL SHOWING TYPICAL LOCATION OF WHEELCHAIR RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES

ALLOWABLE LOCATIONS
DUAL RAMP RADII.....ANY



DETAIL SHOWING TYPICAL LOCATION OF WHEELCHAIR RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS

ROADWAY PLAN SYMBOL
(WCR)
FOR PROPOSED WHEELCHAIR RAMP

PROPOSED WHEELCHAIR RAMP
PROPOSED OR FUTURE SIDEWALK

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER S. HOWARD WARD
4/22/10

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

SEE PLATE FOR TITLE

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

22-APR-2010 09:59
S:\Contracts\Special Details\ericward\stds\06 Stds to Special Details\84805 Prop.Wheelchair Ramp\0848d05.dgn
tspell AT PS244552

22-APR-2010 09:58
S:\Contracts\Contracts\Special Details\ericward\stds\06' Stds to Special Details\84805 Prop. Wheelchair Ramp\0848d05.dgn
.tspell AT PS244552

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

ENGLISH DETAIL DRAWING FOR

WHEELCHAIR RAMP

PROPOSED CURB AND GUTTER

SHEET 3 OF 3
848D05

NOTES:

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

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

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

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

ENGLISH DETAIL DRAWING FOR

WHEELCHAIR RAMP

PROPOSED CURB AND GUTTER

SHEET 3 OF 3
848D05

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-N

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022866 JOEL S. HOWERTON 4/22/10

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

SEE PLATE FOR TITLE

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

PROJECT REFERENCE NO.	SHEET NO.
U-3804	2-0

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

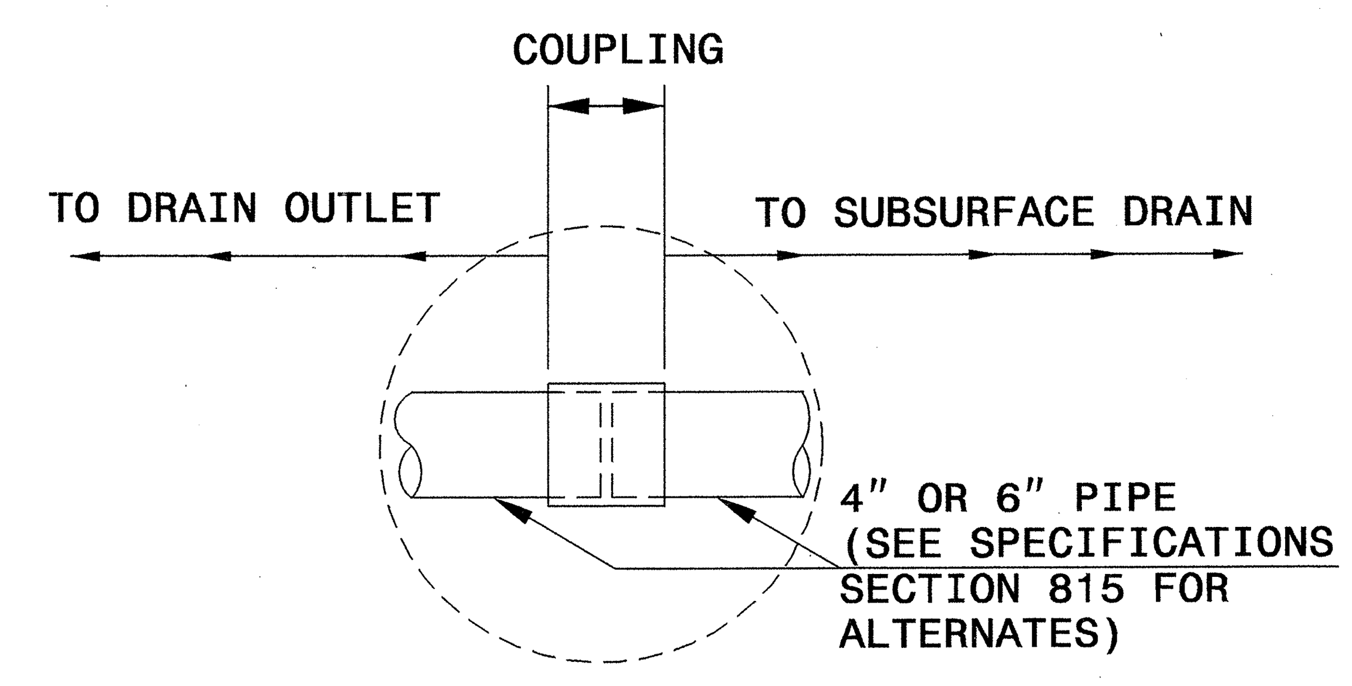
ENGLISH DETAIL DRAWING FOR

SUBSURFACE DRAIN

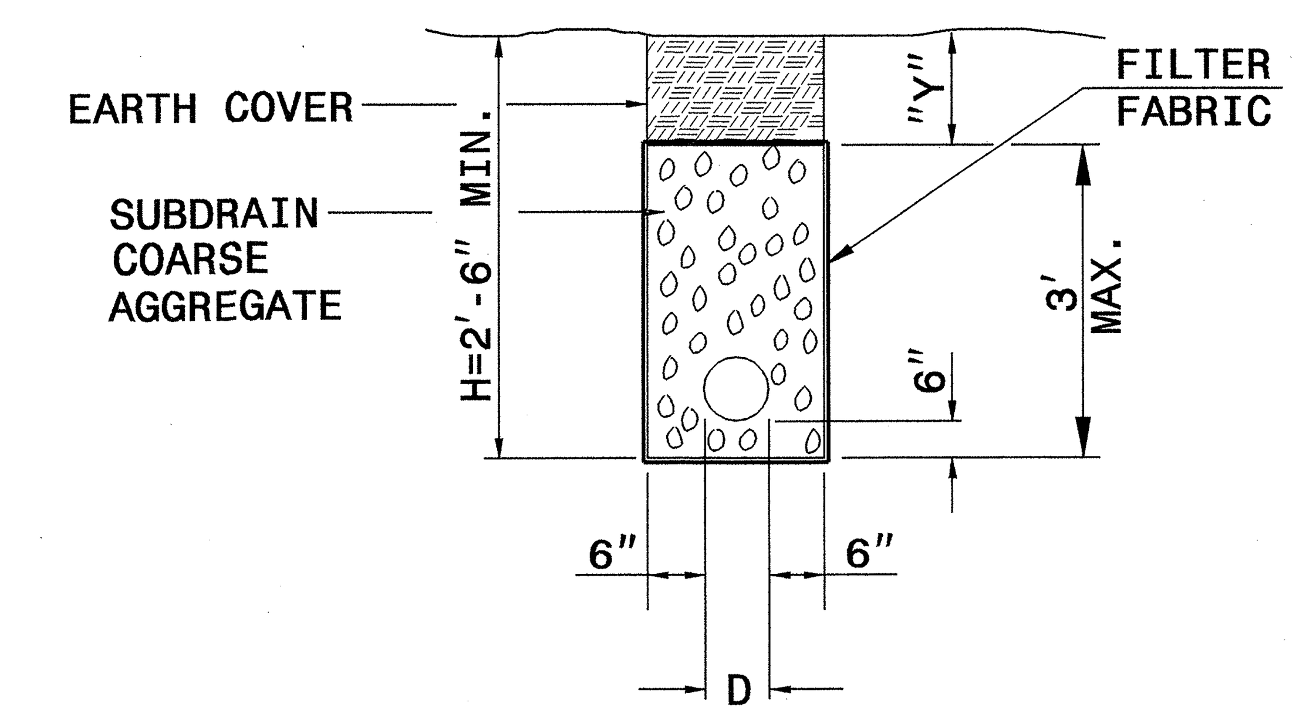
NOTES:

WHEN PROOF ROLLING IS REQUIRED, PLACE PIPE FOR SUBSURFACE DRAINS A MINIMUM OF 6' BELOW SUBGRADE ELEVATION.

CONNECT PIPE OUTLET INTO DRAINAGE STRUCTURE WHEREVER POSSIBLE. IF NOT CONNECTED TO DRAINAGE STRUCTURE, PROTECT END OF PIPE BY CONCRETE PAD FOR OUTLET END OF DRAIN. PADS ARE NEEDED AT LOCATIONS WHERE PIPE IS NOT PLACED IN DRAINAGE STRUCTURE TO FACILITATE MAINTENANCE AND AID IN IDENTIFICATION. OUTLETS ARE REQUIRED EVERY 500' OR AS DIRECTED BY THE ENGINEER

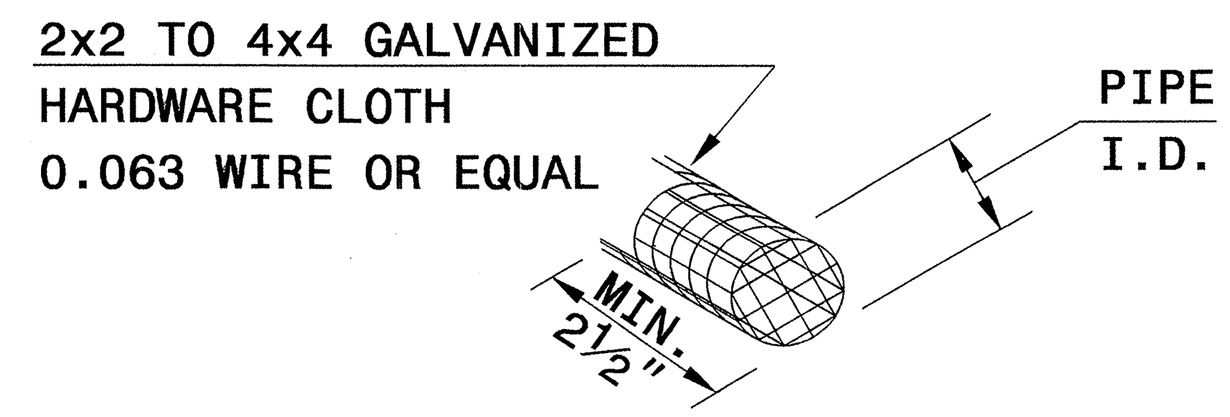


AUXILIARY VIEW

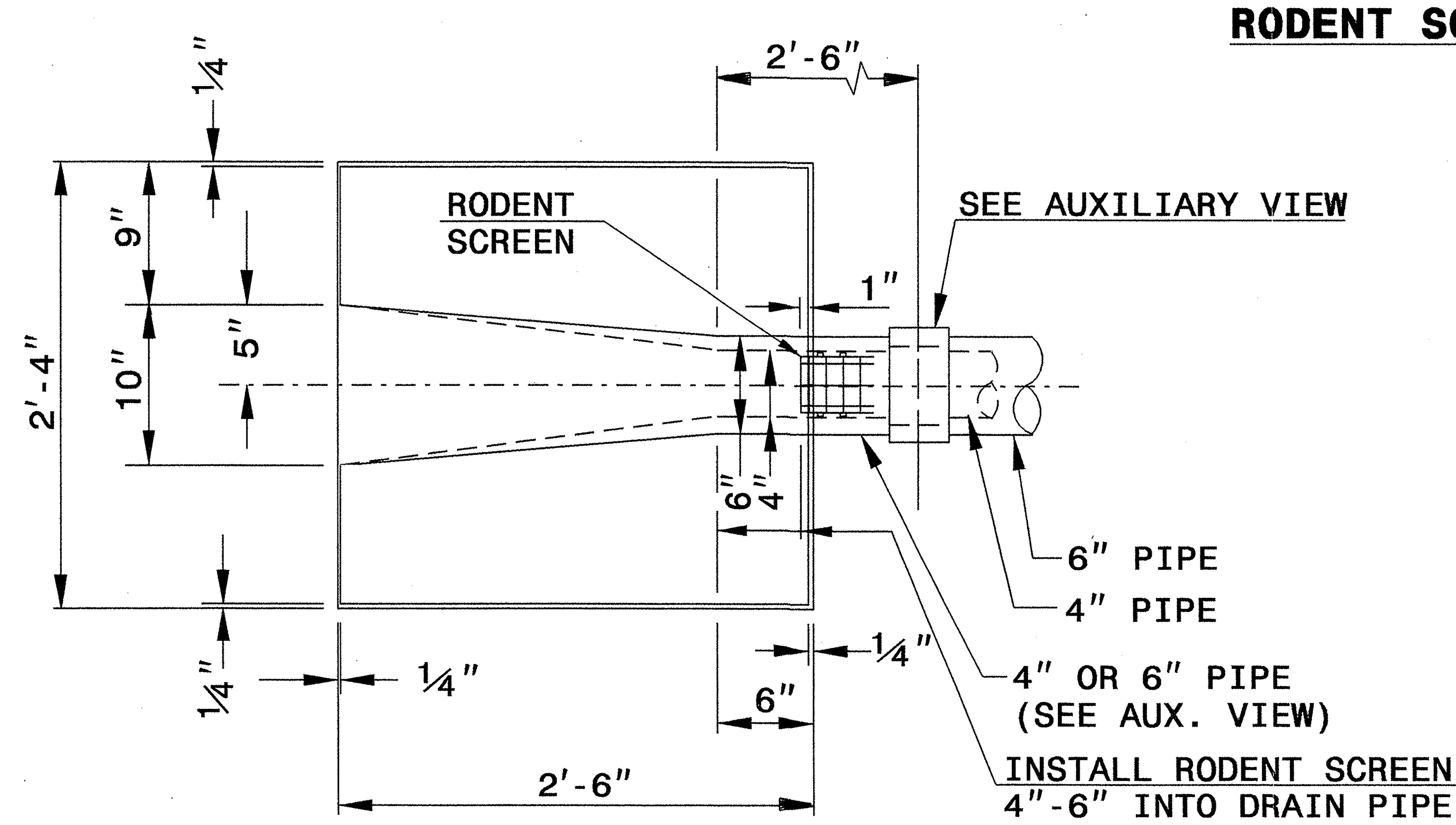


SUBSURFACE DRAIN

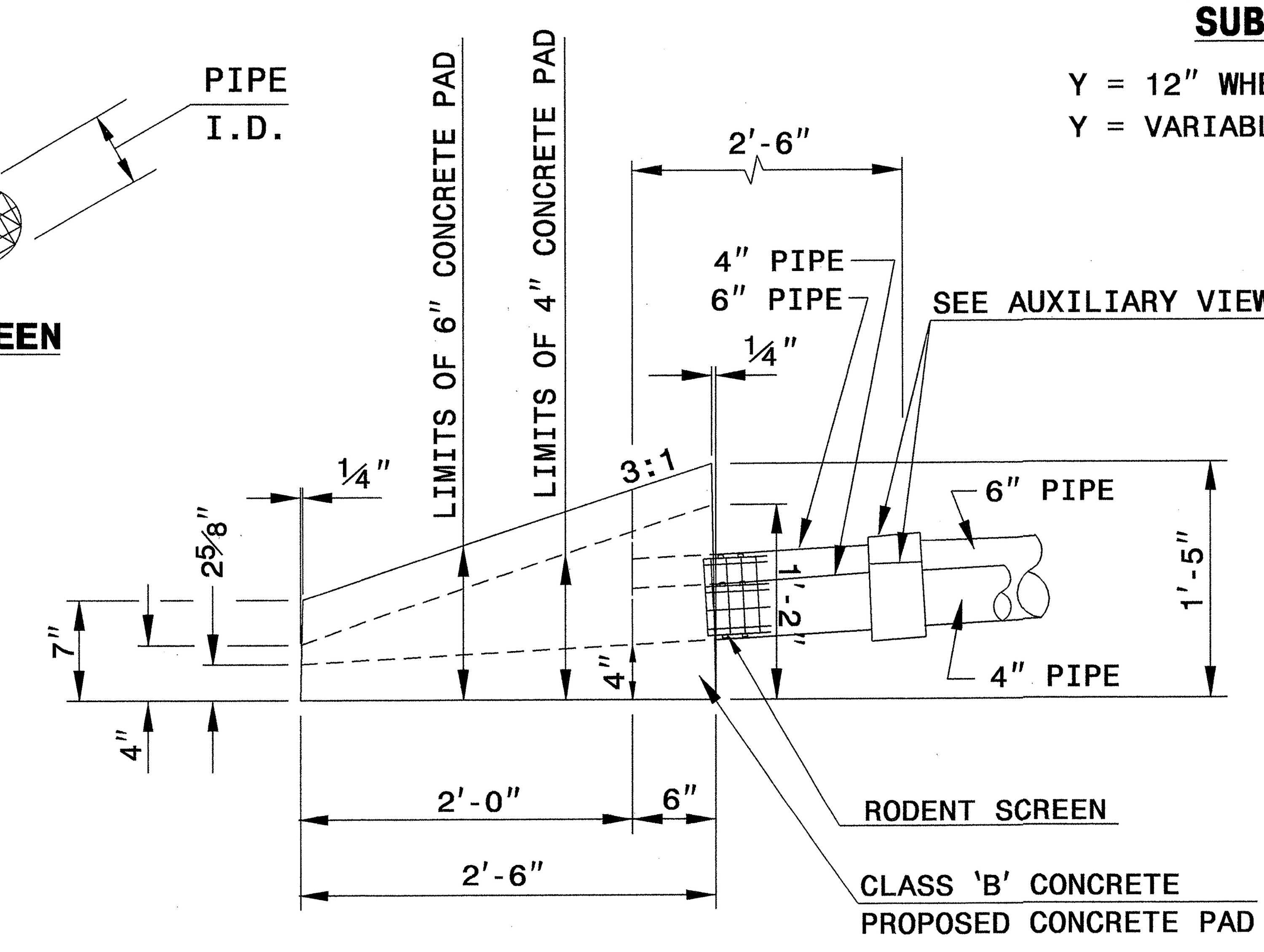
Y = 12" WHEN "H" IS 4'-0" OR LESS
Y = VARIABLE WHEN "H" IS OVER 4'-0"



RODENT SCREEN



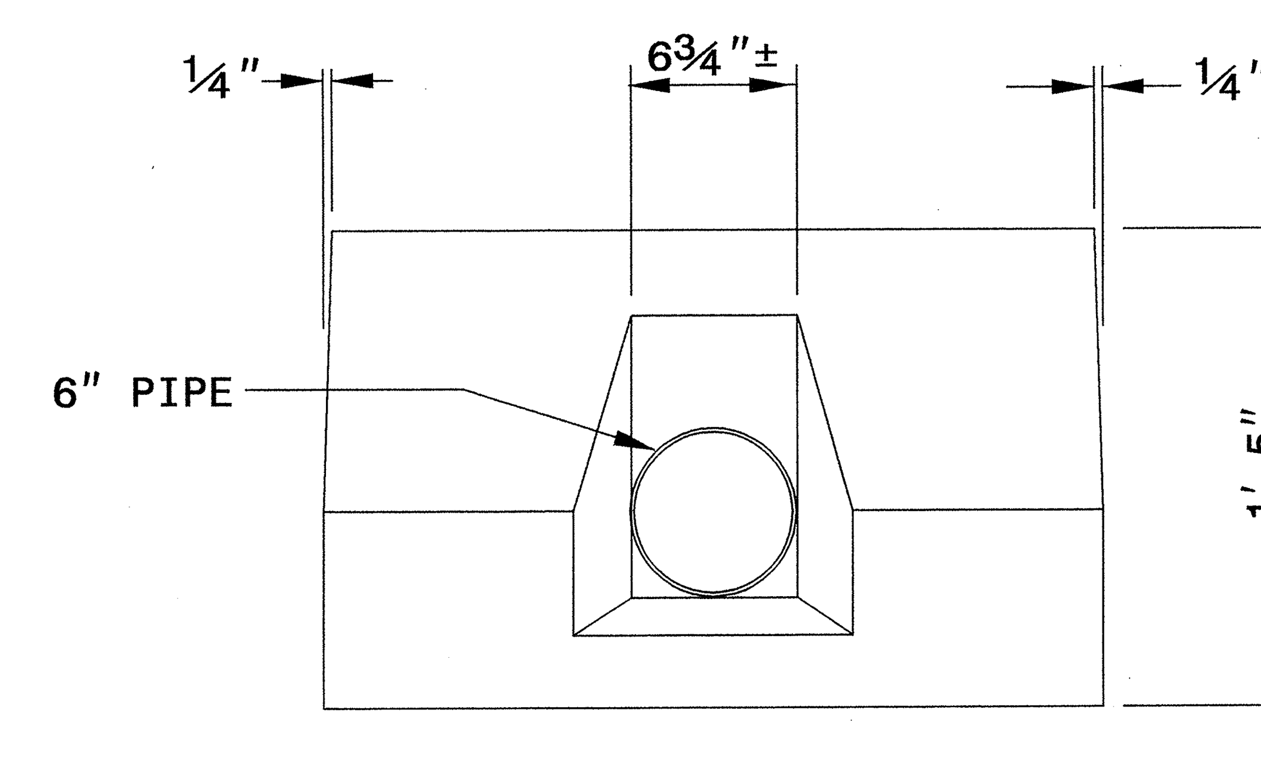
PLAN VIEW



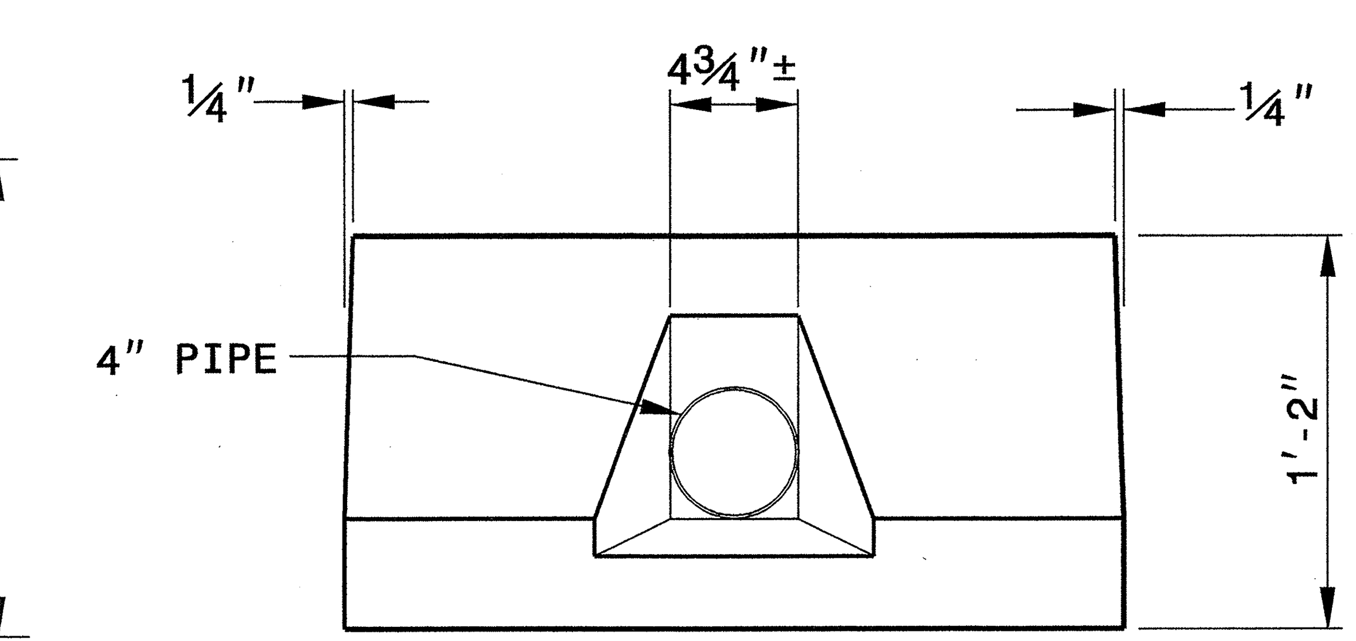
ELEVATION VIEW

SUBDRAIN QUANTITIES
EXCAV. OR COURSE AGGREGATE CU. YDS. PER FT. DEPTH/LIN. FT.
0.056

THE CONCRETE PAD CONSISTS OF 4" DRAIN 0.137 CUBIC YARDS, 6" DRAIN 0.177 CUBIC YARDS CLASS "B" CONCRETE.



END ELEVATION VIEW



END ELEVATION VIEW

SHEET 1 OF 1
815D02

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

SEE PLATE FOR TITLE

ORIGINAL BY: STD.815.02 DATE:
MODIFIED BY: T.SPELL DATE: 11-10-09
CHECKED BY: DATE: 3/25/10
FILE SPEC.: s:tspell/details/815d02.dgn

NORTH CAROLINA PROFESSIONAL SEAL 022066 ENGINEER JOEL S. HOWERTON 5/17/10

25-MAR-2010 07:40
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jhowerton AT PS23750I

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-3804	3 (1 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 - C202340

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0022000000-E	225	6,700	CY	UNCLASSIFIED EXCAVATION
0036000000-E	225	700	CY	UNDERCUT EXCAVATION
0038000000-E	SP	1,900	CY	SHALLOW UNDERCUT
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0080000000-E	SP	3,600	TON	CLASS IV SUBGRADE STABILIZATION
0106000000-E	230	3,200	CY	BORROW EXCAVATION
0134000000-E	240	4,060	CY	DRAINAGE DITCH EXCAVATION
0156000000-E	250	3,690	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0196000000-E	270	6,100	SY	FABRIC FOR SOIL STABILIZATION
0234000000-E	SP	400	CY	GENERIC GRADING ITEM SELECT GRANULAR MATERIAL
0320000000-E	SP	2,500	SY	FOUNDATION CONDITIONING FABRIC
0330000000-E	SP	855	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0335200000-E	SP	52	LF	15" DRAINAGE PIPE
0448000000-E	SP	88	LF	****" RC PIPE CULVERTS, CLASS IV (48")
0448000000-E	SP	592	LF	****" RC PIPE CULVERTS, CLASS IV (54")
0448200000-E	SP	3,628	LF	15" RC PIPE CULVERTS, CLASS IV
0448300000-E	SP	1,134	LF	18" RC PIPE CULVERTS, CLASS IV
0448400000-E	SP	468	LF	24" RC PIPE CULVERTS, CLASS IV
0448500000-E	SP	748	LF	30" RC PIPE CULVERTS, CLASS IV
0448600000-E	SP	800	LF	36" RC PIPE CULVERTS, CLASS IV
0995000000-E	340	1,432	LF	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1110000000-E	510	500	TON	STABILIZER AGGREGATE
1121000000-E	520	105	TON	AGGREGATE BASE COURSE
1220000000-E	545	500	TON	INCIDENTAL STONE BASE
1275000000-E	600	151	GAL	PRIME COAT
1297000000-E	607	1,600	SY	MILLING ASPHALT PAVEMENT, ***" DEPTH (2-1/2")
1308000000-E	607	1,300	SY	MILLING ASPHALT PAVEMENT, ***" TO ******" DEPTH (0" TO 1-1/2")
1489000000-E	610	8,330	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	6,900	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	3,600	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1525000000-E	610	25	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-E	620	905	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	241	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	54	EA	RIGHT OF WAY MARKERS
2026000000-E	SP	12	SY	FILTER FABRIC FOR SUBSURFACE DRAINS
2036000000-E	SP	84	CY	SUBDRAIN COARSE AGGREGATE
2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS
2209000000-E	838	8.8	CY	ENDWALLS
2264000000-E	840	0.161	CY	PIPE PLUGS
2275000000-E	SP	232	CY	FLOWABLE FILL
2286000000-N	840	120	EA	MASONRY DRAINAGE STRUCTURES
2297000000-E	840	12	CY	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	7.1	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	19	EA	FRAME WITH TWO GRATES, STD 840.16
2366000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	14	EA	FRAME WITH TWO GRATES, STD 840.29
2374000000-N	840	8	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	37	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	32	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	8	EA	FRAME WITH COVER, STD 840.54
2418000000-E	SP	48	LF	FRAME WITH GRATES, DRIVEWAY DROP INLET
2451000000-N	852	13	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLETS
2484000000-E	SP	6	LF	GENERIC DRAINAGE ITEM 6" OUTLET PIPE (SUBDRAINS)
2484000000-E	SP	500	LF	GENERIC DRAINAGE ITEM 6" PERFORATED SUBDRAIN PIPE
2495000000-E	SP	112	CY	GENERIC DRAINAGE ITEM SUBDRAIN EXCAVATION
2495000000-E	SP	84	CY	GENERIC DRAINAGE ITEM SUBDRAIN FINE AGGREGATE
2535000000-E	846	190	LF	**"X **" CONCRETE CURB (8" X 18")
2542000000-E	846	4,200	LF	1'-6" CONCRETE CURB & GUTTER
2549000000-E	846	7,870	LF	2'-6" CONCRETE CURB & GUTTER
2591000000-E	848	4,300	SY	4" CONCRETE SIDEWALK
2605000000-N	848	32	EA	CONCRETE WHEELCHAIR RAMPS
2612000000-E	848	320	SY	6" CONCRETE DRIVEWAY
2655000000-E	852	1,200	SY	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)
2800000000-N	858	3	EA	ADJUSTMENT OF CATCH BASINS
2830000000-N	858	27	EA	ADJUSTMENT OF MANHOLES
2845000000-N	858	63	EA	ADJUSTMENT OF METER BOXES OR VALVE BOXES
3628000000-E	876	75	TON	RIP RAP, CLASS I
3649000000-E	876	90	TON	RIP RAP, CLASS B
3656000000-E	876	1,440	SY	FILTER FABRIC FOR DRAINAGE
4072000000-E	903	1,390	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4096000000-N	904	1	EA	SIGN ERECTION, TYPE D
4102000000-N	904	72	EA	SIGN ERECTION, TYPE E
4108000000-N	904	2	EA	SIGN ERECTION, TYPE F
4116100000-N	904	4	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)
4155000000-N	907	18	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4192000000-N	907	4	EA	DISPOSAL OF SUPPORT, U-CHANNEL
4400000000-E	1110	853	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	408	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	152	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C
4422000000-N	1120	3	DAY	CHANGEABLE MESSAGE SIGN (SHORT TERM)
4430000000-N	1130	550	EA	DRUMS
4435000000-N	1135	70	EA	CONES
4445000000-E	1145	590	LF	BARRICADES (TYPE III)
4450000000-N	1150	1,500	HR	FLAGGER
4480000000-N	1165	1	EA	TMIA
4510000000-N	SP	120	HR	LAW ENFORCEMENT
4516000000-N	1180	55	EA	SKINNY DRUM
4685000000-E	1205	8,554	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	7,818	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4695000000-E	1205	343	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4710000000-E	1205	1,586	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4721000000-E	1205	19	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4725000000-E	1205	61	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4810000000-E	1205	60,525	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	1,668	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	1,494	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	16	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	100	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-E	1205	7,260	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4860000000-E	1205	205	LF	REMOVAL OF PAVEMENT MARKING LINES (8")
4870000000-E	1205	252	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4875000000-N	1205	19	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1251	143	EA	PERMANENT RAISED PAVEMENT MARKERS
5326200000-E	1510	70	LF	12" WATER LINE
5326600000-E	1510	40	LF	16" WATER LINE
5648000000-N	1515	37	EA	RELOCATE WATER METER
5656800000-E	1515	1	EA	8" RPZ BACK-FLOW PREVENTOR
5666000000-E	1515	5	EA	FIRE HYDRANT
5691300000-E	1520	979	LF	8" SANITARY GRAVITY SEWER
5768000000-N	1520	30	EA	SANITARY SEWER CLEAN-OUT
5775000000-E	1525	5	EA	4' DIA UTILITY MANHOLE
5781000000-E	1525	11	LF	UTILITY MANHOLE WALL, 4' DIA
5801000000-E	1530	963	LF	ABANDON 8" UTILITY PIPE
5815000000-N	1530	1	EA	REMOVE WATER METER
5815500000-N	1530	5	EA	REMOVE FIRE HYDRANT
5816000000-N	1530	2	EA	ABANDON UTILITY MANHOLE
6000000000-E	1605	8,900	LF	TEMPORARY SILT FENCE

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STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
4-3804	3 (2 of 2)

ItemNumber	Sec #	Quantity	Unit	Description
6006000000-E	1610	675	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	500	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	1,220	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	10	ACR	TEMPORARY MULCHING
6018000000-E	1620	250	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	16,000	LF	SAFETY FENCE
6030000000-E	1630	800	CY	SILT EXCAVATION
6036000000-E	1631	18,000	SY	MATTING FOR EROSION CONTROL
6042000000-E	1632	5,500	LF	1/4" HARDWARE CLOTH
6071020000-E	SP	20	LB	POLYACRYLAMIDE (PAM)
6084000000-E	1660	6	ACR	SEEDING & MULCHING
6087000000-E	1660	6	ACR	MOWING
6090000000-E	1661	100	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	150	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	4.25	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	30	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL
6126000000-E	SP	0.89	ACR	STREAMBANK REFORESTATION
7000000000-E	1705	35	EA	PEDESTRIAN SIGNAL HEAD (**", ** SECTION) (16", 1 SECTION W/ COUNTDOWN)
7060000000-E	1705	12,500	LF	SIGNAL CABLE
7120000000-E	1705	21	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7132000000-E	1705	2	EA	VEHICLE SIGNAL HEAD (12", 4 SECTION)
7144000000-E	1705	14	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7264000000-E	1710	1,000	LF	MESSENGER CABLE (3/8")
7288000000-E	1715	60	LF	PAVED TRENCHING (**********) (1, 2")
7300000000-E	1715	1,580	LF	UNPAVED TRENCHING (**********) (1, 2")
7301000000-E	1715	650	LF	DIRECTIONAL DRILL (**********) (2, 2")
7324000000-N	1716	8	EA	JUNCTION BOX (STANDARD SIZE)
7348000000-N	1716	11	EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
7360000000-N	1720	8	EA	WOOD POLE
7372000000-N	1721	16	EA	GUY ASSEMBLY
7396000000-E	1722	9	EA	1/2" RISER WITH WEATHERHEAD
7420000000-E	1722	8	EA	2" RISER WITH WEATHERHEAD
7432000000-E	1722	10	EA	2" RISER WITH HEAT SHRINK TUBING
7444000000-E	1725	3,650	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	7,600	LF	LEAD-IN CABLE (**********) (14-2)
7528000000-E	1730	1,000	LF	DROP CABLE
7552000000-N	1731	2	EA	INTERCONNECT CENTER
7564100000-N	1732	1	EA	FIBER-OPTIC TRANSCEIVER, SELF-HEALING RING
7588000000-N	SP	4	EA	METAL POLE WITH SINGLE MAST ARM
7590000000-N	SP	2	EA	METAL POLE WITH DUAL MAST ARM
7613000000-N	SP	6	EA	SOIL TEST
7614100000-E	SP	35	CY	DRILLED PIER FOUNDATION
7624000000-N	1743	9	EA	SIGNAL PEDESTAL WITH FOUNDATION
7631000000-N	SP	6	EA	MAST ARM WITH METAL POLE DESIGN
7636000000-N	1745	5	EA	SIGN FOR SIGNALS
7684000000-N	1750	2	EA	SIGNAL CABINET FOUNDATION
7720000000-N	1751	2	EA	CONTROLLER WITH CABINET (TYPE 170E, BASE MOUNTED)
7744000000-N	1751	30	EA	DETECTOR CARD (TYPE 170)
7901000000-N	1753	2	EA	CABINET BASE EXTENDER

COMPUTED BY: REO DATE: 12/2/2009

CHECKED BY: TMW DATE: 12/9/2009

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3804	3-A

RD248662

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

STATION (All Stations are for -L- alignment unless otherwise noted)	LOCATION (LT, RT, OR CL)*	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE	DRAINAGE PIPE THICKNESS OR GAUGE	C.S. PIPE (UNLESS NOTED OTHERWISE) SIZE	C.S. PIPE THICKNESS OR GAUGE	CLASS III R.C. PIPE (*UNLESS NOTED OTHERWISE) SIZE	CLASS III R.C. PIPE THICKNESS OR GAUGE	** Contractor Design Pipe	** Contractor Design Pipe	** Contractor Design Pipe	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') PER EACH (0' THRU 5.0')	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. A 5.0' THRU 10.0'	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') 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	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE F	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE G	CONCRETE TRANSITIONAL SECTION DROP INLET	CONCRETE TRANSITIONAL SECTION CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	MANHOLE STD. 840.51	UTILITY PAY ITEM, M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER STD. 840.54	OPEN THROAT CATCH BASIN	UTILITY PAY ITEM, TBJB	T.B.D.I. STD. 840.35	DRIVEWAY D.I. STD. 840.30	DRIVEWAY D.I., FRAME WITH GRATES	Masonary Drainage Structure, Cubic Yards, Driveway D.I. STD. 840.30	Traffic Bearing Precast Drainage Structure STD. 840.46	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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
13+70	LT	1		414.8															1																		X								REMOVE EXIST. CB
13+70	LT	2		416.6															1			1			1												X								
13+70	LT	1	2		410.6	413.6						48																					1														
14+00	LT	3		414.2															1			1	1																								
13+70	LT	1	3		410.6	411.2						28																					1														
14+30	CL	4		415.1															1							1																				
14+00	RT	5		414.4															1	1.2		1			1												X								
14+00	RT	5	4		408.2	412						48																																			REMOVE EXIST. CB's AND FILL EXIST. PIPE
see sheet 3-E for drainage items 6 thru 9																																													
16+60	LT	11		412.1															1			1			1																				
18+00	LT	12		410.2															1			1			1																				
16+60	LT	11	12		409.1	407.2						144																					1														
18+65	LT	13		409															1			1			1																				
18+00	LT	12	13		407	405.8	X					52																																			
16+60	LT	14		408.4															1			1			1																				
18+65	LT	13	14		405.3	404.6						96																																			
19+90	LT	15		408.5															1			1		1																				
16+60	LT	14	15		404	404.3						32																																			
20+50	LT	16		409.1															1			1		1																				
19+90	LT	15	16		404.3	404.9						60																																			
22+00	LT	17		412.2															1			1		1																				36
20+50	LT	16	17		405.4	408.4	X					148																																		
22+00	LT	18		412.8															1								1	1																
22+00	LT	17	18		408.4	408.9						16																																			
23+30	LT	19		416.5															1			1		1																				36
22+00	LT	17	19		408.9	413.3						136																																		
23+30	CL	20		417.7															1							1																			
23+30	CL	19	20		413.5	414.6						48																																		
23+65	CL	21		418.8															1							1																				64
23+30	CL	20	21		414.6	415.6						36																																		
24+32	LT	22		419.8															1			1																								
23+30	LT	19	22		413.5	416.8						100																																		
24+32	LT	23		420.2															1			1	1																								
24+30	LT	22	23		416.8	417.2						28																																		66
24+90	LT	24		421.7															1			1			1																				48
24+30	LT	22	24		416.8	418.7						60																																		
24+90	CL	25		422.6															1							1																				34
24+90	CL	24	25		418.7	419.4						36																																		
25+00	CL	26		422.8															1							1																				
24+90	CL	25	26		419.4	419.7						16																																		
25+75	LT	27		423.6															1			1			1																				
24+90	LT	24	27		418.7	419.5						88																																		26 remove existing system
25+75	LT	28		421.8															1								1	1																
25+75	LT	27	28		419.5	419.6						16																																		
26+25	CL																																												78
16+95	CL	29		413.7															1							1																				
16+78	RT	30		413.2															1			1			1																				remove existing catch basin
16+95	CL	29	30		410.6	410.2						44																																		
18+50	RT	33		409.5															1			1			1																				
SHEET TOTALS												740	188	260	92				26	1.2		17	2	9	6	5		2	2								6	1		1		6										388	

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

RD248662

COMPUTED BY:	REO	DATE:	12/2/2009
CHECKED BY:	TMW	DATE:	12/9/2009

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3804	3-B

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

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

STATION (All Stations are for -L- alignment unless otherwise noted)	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	C.S. PIPE (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C.P. PIPE (*UNLESS NOTED OTHERWISE) 12"	15" CLASS IV	18" CLASS IV	24" CLASS IV	30" CLASS IV	36" CLASS IV	42" CLASS IV	48" CLASS IV	** " Contractor Design Pipe	** " Contractor Design Pipe	** " Contractor Design Pipe	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
16+75	RT	30	33		410.2	406.5																			176											
19+63	RT	34		408.6																																
18+50	RT	33	34		406.5	405.6																			112											
19+63	RT	34	35		403.2	403.4																							32							
19+63	CL	35		409.5																																
19+63	CL	35	14		403.4	403.6																							52							
20+07	RT	31		409.5																																
19+60	RT	34	31		403.2	402.3																							44							
20+17	RT	36		408.8																																
20+07	RT	31	36		403.4	403.5	X																				12									
20+04	RT	37		405.8																																
20+17	RT	36	37		403.5	403.6	X																		32											
21+47	RT	38		410.9																																
20+17	RT	36	38		405.6	407.2	X																			128										
21+45	RT	39		409.5																																
21+47	RT	38	39		407.2	407.3	X																		12											
22+83	RT	40		415.2																					24											
21+50	RT	38	40		417.7	411.9																				136										
23+73	RT	41		418.2																					16											
22+83	RT	40	41		412.2	415.2	X																		92											
24+40	RT	42		420.4																																
23+73	RT	41	42		415.2	417.4																			72											
24+44	RT	43		420.8																																
24+40	RT	42	43		417.4	418.1																			32											
24+40	RT	42	44		417.4	417.8																			32											
24+70	RT	44		420.8																																
24+70	RT	44	out		417.8				16																											
25+00	RT	45		421.7																																
24+70	RT	44	45		417.8	418.7																			40											
25+03	RT	46		421																																
25+00	RT	45	46		418.7	418.8																			16											
28+45	CL	47		426.6																																
28+35	RT	48		425.7																																
28+45	CL	47	48		423.5	422.6																			28											
28+34	RT	49		424.8																																
28+34	RT	48	49		422.5	422.6	X																		16											
29+26	RT	50		425.2																																
28+34	RT	48	50		422.5	422.1	X																		92											
29+26	RT	51		423.8																																
29+26	RT	50	51		421.5	421.6	X																		24											
30+24	RT	52		424.5																																
29+26	RT	50	52		421.5	421.2	X																		100											
30+24	RT	53		423																																
30+24	RT	52	53		420.7	420.8	X																		20											
31+19	RT	54		423.8																																
30+24	RT	52	54		420.7	420.3	X																		96											
31+19	RT	55		423																																
31+19	RT	54	55		420.3	420.8																			16											
31+00	CL																																			
32+28	RT	56		423.1																																
SHEET TOTALS									16																1048	264	12		128							

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	MANHOLE STD. 840.51	UTILITY PAY ITEM, M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER STD. 840.54	OPEN THROAT CATCH BASIN	UTILITY PAY ITEM, TBJB	T.B.D.I. STD. 840.35	DRIVEWAY D.I. STD. 840.30	DRIVEWAY D.I., FRAME WITH GRATES	Masonary Drainage Structure, Cubic Yards, Driveway D.I. STD. 840.30	Traffic Bearing Precast Drainage Structure STD. 840.46	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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
16+75	RT	30	33																																									
19+63	RT	34		1			1	1																																				
18+50	RT	33	34																																									
19+63	RT	34	35																																									
19+63	CL	35		1	1.1						1												1								1													see detail sheet 2-J
19+63	CL	35	14																																									
20+07	RT	31		1	2.2																				1			1																
19+60	RT	34	31																																									
20+17	RT	36		1	0.3		1			1																																		
20+07	RT	31	36																																									
20+04	RT	37		1									1	1																														remove existing pipe
20+17	RT	36	37																																								32	remove existing pipe
21+47	RT	38		1			1			1																																		
20+17	RT	36	38																																									remove existing drainage
21+45	RT	39		1									1	1																														
21+47	RT	38	39																																									remove existing system
22+83	RT	40		1			1			1																																		remove and tie to existing system
21+50	RT	38	40																																									
23+73	RT	41		1			1			1																																		remove and tie to existing system
22+83	RT	40	41																																									
24+40	RT	42		1			1			1																																		
23+73	RT	41	42																																								64	
24+44	RT	43		1																		1									1													
24+40	RT	42	43																																									
24+40	RT	42	44																																									
24+70	RT	44		1			1		1																																			
24+70	RT	44	out																																	x								
25+00	RT	45		1			1			1																																		
24+70	RT	44	45																																									
25+03	RT	46		1									1	1																														
25+00	RT	45	46																																									
28+45	CL	47		1							1												1								1												36	
28+35	RT	48		1			1		1																																			
28+45	CL	47	48																																									
28+34	RT	49		1									1	1																														
28+34	RT	48	49																																									
29+26	RT	50		1			1		1																																			
28+34	RT	48	50																																									
29+26	RT	51		1									1	1																														
29+26	RT	50	51																																									
30+24	RT	52		1			1		1																																			
29+26	RT	50	52																																									
30+24	RT	53		1									1	1																														
30+24	RT	52	53																																									
31+19	RT	54		1			1		1																																			
30+24	RT	52	54																																									
31+19	RT	55		1									1	1																														
31+19	RT	54	55																																									
31+00	CL																																										84	
32+28	RT	56		1			1		1																																			
SHEET TOTALS				24	3.6		13	1	6	6	2		7	7							1	2		1			1			3													216	

RD248662

COMPUTED BY: REO DATE: 12/2/2009
CHECKED BY: TMW DATE: 12/9/2009

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3804	3-C

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

STATION (All Stations are for -L- alignment unless otherwise noted)	LOCATION (LT, RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)								C.S. PIPE (UNLESS NOTED OTHERWISE)													CLASS III R.C.P. PIPE (*UNLESS NOTED OTHERWISE)								** " Contractor Design Pipe	** " Contractor Design Pipe	** " Contractor Design Pipe	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	
SIZE								12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"		30"		36"		42"		48"		12"	15"	18"	24"	30"	36"	42"	48"				CU. YARDS	
THICKNESS OR GAUGE		FROM	TO													.064	.064	.064	.064		.079		.079		.109		.109			CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV				R.C.P.	C.S.P.
31+19	RT	54	56		420.3	419.8																								104											
32+30	RT	57		422.5																																					
32+30	RT	56	57		420.1	420.3																								16											
33+65	RT	58		422.8																																					
32+30	RT	56	58		419.8	419.3	X																								138										
34+15	RT	59		422.9																																					
33+65	RT	58	59		419.3	419.9																								52											
33+45	CL	60		423.7																																					
33+65	RT	58	60		419.1	418.9	X																									36									
33+23	CL	61		423.8																																					
33+45	CL	60	61		420.5	420.6	X																							24											
33+45	CL	60	66		418.9	418.8	X																									60									
30+00	LT	62		424.7																																					
30+00	LT	62	63		421.7	421.2																								68											
30+68	LT	63		424.2																																					
30+68	LT	63	64		421.2	420.1																								156											
32+28	LT	64		423.1																																					
32+28	LT	64	65		420.1	419.9	X																							56											
32+88	LT	65		422.9																																					
32+88	LT	65	66		419.9	419.7	X																							96											
33+87	LT	66		422.8																																					
33+87	LT	66	67		418.8	418.5	X																									60									
34+51	LT	67		423																																					
34+51	LT	67	68		419.9	420.7																								16											
34+51	LT	68		423.7																																					
34+51	LT	68	68A		420.7	420.9	X																							56											
35+10	LT	68A		423.9																																					
34+51	LT	67	69		418.5	418.2	X																										96								
35+50	LT	69		423.5																																					
35+50	LT	69	out		418.2	418	X																										56								
37+00	LT	69A		423.2																																					
37+00	LT	69A	69B		420.9	418.6																									228										
39+30	LT	69B		422.5																																					
39+30	LT	69B	out		418.6	416.7																									32										
38+36	LT	70		422.7																																					
38+36	LT	70	71		419.7	419.3																								76											
39+13	LT	71		422.3																																					
39+13	LT	71	72		419.3	420																								32											
39+12	CL	72		423.2																																					
39+13	LT	71	77		419.3	418.3																								64											
38+36	RT	73		422.4																																					
38+36	RT	73	74		419.4	419																								72											
39+12	RT	74		422																																					
39+12	RT	74	75		417.6	417.7	X																							20											
39+11	RT	75		419.9																																					
39+12	RT	74	76		417.6	417.4	X																							64											
39+77	RT	76		421.6																																					
39+77	RT	76	81A		417.4	417.3	X																							36											
40+10	RT	81A		421.3																																					
SHEET TOTALS																														1008	398	156	152								

STATION	LOCATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	MANHOLE STD. 840.51	UTILITY PAY ITEM, M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER STD. 840.54	OPEN THROAT CATCH BASIN	UTILITY PAY ITEM, TBJB	T.B.D.I. STD. 840.35	DRIVEWAY D.I. STD. 840.30	DRIVEWAY D.I., FRAME WITH GRATES	Masonary Drainage Structure, Cubic Yards, Driveway D.I. STD. 840.30	Traffic Bearing Precast Drainage Structure STD. 840.46				DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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
31+19	RT	54	56																																												
32+30	RT	57		1									1	1																																	
32+30	RT	56	57																																												
33+65	RT	58		1			1	1																																							
32+30	RT	56	58																																												
34+15	RT	59		1			1			1																																					
33+65	RT	58	59																																												
33+45	CL	60		1							1												1								1																
33+65	RT	58	60																																												
33+23	CL	61		1							1												1								1																
33+45	CL	60	61																																											100	
33+45	CL	60	66																																												
30+00	LT	62		1			1			1																																					
30+00	LT	62	63																																												
30+68	LT	63		1			1			1																																					
30+68	LT	63	64																																												
32+28	LT	64		1			1			1																																					
32+28	LT	64	65																																												
32+88	LT	65		1			1			1																																					
32+88	LT	65	66																																												
33+87	LT	66		1			1		1																																						
33+87	LT	66	67																																											12	
34+51	LT	67		1			1		1																																					33	
34+51	LT	67	68																																												
34+51	LT	68		1			1	1																																							
34+51	LT	68	68A																																												
35+10	LT	68A		1			1	1																																							
34+51	LT	67	69																																												
35+50	LT	69		1	0.3		1		1																																						
35+50	LT	69	out																																												
37+00	LT	69A		1			1			1																			1																	17	
37+00	LT	69A	69B																																												
39+30	LT	69B		1																				1				1																			
39+30	LT	69B	out																																												
38+36	LT	70		1			1			1																																					
38+36	LT	70	71																																												
39+13	LT	71		1			1			1																																					
39+13	LT	71	72																																												
39+12	CL	72		1							1												1								1																
39+13	LT	71	77																																												
38+36	RT	73		1			1		1																																						
38+36	RT	73	74																																												
39+12	RT	74		1			1		1																																					5	
39+12	RT	74	75																																												
39+11	RT	75		1									1	1																																	
39+12	RT	74	76																																											82	
39+77	RT	76		1			1		1																																						
39+77	RT	76	81A																																											18	
40+10	RT	81A		1			1		1																																						
SHEET TOTALS				24	0.3		18	3	7	8	3		2	2								3	1				1	1		3																267	

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

RD248662

COMPUTED BY: REO DATE: 12/2/2009
CHECKED BY: TMW DATE: 12/9/2009

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3804	3-D

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

STATION (All Stations are for -L- alignment unless otherwise noted)	LOCATION (LT, RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)								C.S. PIPE (UNLESS NOTED OTHERWISE)								CLASS III R.C. PIPE (*UNLESS NOTED OTHERWISE)							
SIZE								12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE		FROM	TO													.064	.064	.064	.064	.079	.079	.109	.109		CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV
40+10	RT	81A	82		417.6	417.7	X																		12						
39+99	RT	82		419.9																											
40+10	RT	81A	81		417.3	416.7																				12					
40+23	RT	81		421.4																											
40+23	RT	81	79		415.7	416	X																					60			
40+11	CL	79		422.4																											
																												20			
40+11	CL	79	80		418.5	419.5																			12						
39+98	CL	80		422.7																											
40+11	CL	79	78		416	416.2	X																					52			
40+04	LT	78		421.6																											
40+04	LT	78	77		416.2	416.4																						28			
39+75	LT	77		421.3																											
39+75	LT	77	IN		416.4	416.6	X																					36			
40+23	RT	81	83		416	415.5	X																					60			
-Y- 17+28	RT	83		420.4																											
-Y- 17+28	RT	83	84		416.7	416.8																			12						
-Y- 17+28	RT	84		419																											
-Y- 17+28	RT	83	83A		415.5	415.5	X																						20		
-Y- 17+39	CL	83A		420.68																											
-Y- 17+39	CL	83A	85		415.5	415.4	X																						28		
-Y- 17+53	LT	85		420																											
-Y- 17+53	LT	85	out		415.4	414.5																							20		
-Y- 14+85	LT	88		421.8																											
-Y- 14+85	LT	88	out		418.8	418.7	X																		28						
-Y- 14+95	RT	86		421.7																											
-Y- 14+95	RT	86	87		417.4	417.3	X																					36			
-Y- 14+95	LT	87		421.7																											
-Y- 14+95	LT	87	89		417.3	417.1	X																					52			
40+55	LT	89		421.4																											
40+55	LT	89	90		417.1	416.8																						60			
41+12	LT	90		421.1																											
41+12	LT	90	91		416.8	416.5	X																					100			
42+12	LT	91		420.8																											
42+12	LT	91	92		416.1	417.7																							16		
42+13	LT	92																													
42+12	LT	91	93		416.1	416	X																						16		
42+31	LT	93		420.8																											
42+31	LT	93	94		417.6	417.7	X																		36						
42+31	CL	94		421.7																											
42+31	CL	94	95		417.7	417.8	X																		32						
42+30	RT	95		420.8																											
42+31	LT	93	96		416	414.8	X																						188		
44+21	LT	96		419.7																											
44+21	LT	96	97		414.8	411.9																							96		
45+19	LT	97		416.7																											
45+19	LT	97	98		413.7	414.4																			36						
45+19	CL	98		417.6																											
SHEET TOTALS																									168	12		504	384		

STATION	FROM	TO	** " Contractor Design Pipe	** " Contractor Design Pipe	** " Contractor Design Pipe	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
40+10	81A	82														
39+99	82							1								
40+10	81A	81														
40+23	81							1	0.7							
40+23	81	79														
40+11	79							1								
40+11	79	80														
39+98	80							1							1	
40+11	79	78														
40+04	78							1	0.4							
40+04	78	77														
39+75	77							1			1		1			
39+75	77	IN														
40+23	81	83														
-Y- 17+28	83							1			1		1			
-Y- 17+28	83	84														
-Y- 17+28	84							1								
-Y- 17+28	83	83A														
-Y- 17+39	83A															
-Y- 17+39	83A	85														
-Y- 17+53	85							1			1			1		
-Y- 17+53	85	out														
-Y- 14+85	88							1			1			1		
-Y- 14+85	88	out														
-Y- 14+95	86							1			1		1			
-Y- 14+95	86	87														
-Y- 14+95	87							1			1			1		
-Y- 14+95	87	89														
40+55	89							1			1			1		
40+55	89	90														
41+12	90							1			1			1		
41+12	90	91														
42+12	91							1			1			1		
42+12	91	92														
42+13	92						2.8									
42+12	91	93														
42+31	93							1			1	1				
42+31	93	94														
42+31	94							1							1	
42+31	94	95														
42+30	95							1			1	1				
42+31	93	96														
44+21	96							1			1			1		
44+21	96	97														
45+19	97							1			1			1		
45+19	97	98														
45+19	98							1							1	
SHEET TOTALS							2.8		21	1.1		13	2	3	8	3	

STATION	FROM	TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	MANHOLE STD. 840.51	UTILITY PAY ITEM, M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER STD. 840.54	OPEN THROAT CATCH BASIN	UTILITY PAY ITEM, TBJB	T.B.D.I. STD. 840.35	DRIVEWAY D.I. STD. 840.30	DRIVEWAY D.I., FRAME WITH GRATES	Masonary Drainage Structure, Cubic Yards, Driveway D.I. STD. 840.30	Traffic Bearing Precast Drainage Structure STD. 840.46	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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
40+10	81A	82																																
39+99	82		1	1																														
40+10	81A	81																															6	
40+23	81													1			1																	
40+23	81	79																															56	
40+11	79													1			1																	
40+11	79	80																															56	
39+98	80											1								1														
40+11	79	78																															97	
40+04	78													1			1																	
40+04	78	77																																
39+75	77																																	
39+75	77	IN																																
40+23	81	83																															66	
-Y- 17+28	83																																	
-Y- 17+28	83	84																															6	
-Y- 17+28	84		1	1																														
-Y- 17+28	83	83A																																
-Y- 17+39	83A															1			1															see detail sheet 2-K
-Y- 17+39	83A	85																															43	
-Y- 17+53	85																																	
-Y- 17+53	85	out																															17	
-Y- 14+85	88																																	
-Y- 14+85	88	out																																
-Y- 14+95	86																																	
-Y- 14+95	86	87																																
-Y- 14+95	87																																	
-Y- 14+95	87	89																																
40+55	89																																	
40+55	89	90																																
41+12	90																																	
41+12	90	91																															117	
42+12	91																																	
42+12	91	92																																
42+13	92																																	
42+12	91	93																																
42+31	93																																	
42+31	93	94																																
42+31	94											1								1													8	
42+31	94	95																															37	
42+30	95																																12	
42+31	93	96																																
44+21	96																																	
44+21	96	97																																
45+19	97																																	
45+19	97	98																																
45+19	98											1								1														
SHEET TOTALS			2	2								3		3		1	3		1	3													521	

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

COMPUTED BY: REO DATE: 12/2/2009

CHECKED BY: TMW DATE: 12/9/2009

PROJECT NO.	SHEET NO.
U-3804	3-E

RD248652

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

STATION (All Stations are for -L- alignment unless otherwise noted)	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE	12"	15"	18"	24"	30"	36"	42"	48"
								THICKNESS OR GAUGE								
45+19	LT	97	99		411.9	399.1										
53+03	LT	119	101		390.2	390.4										
53+03	LT	101		395.5												
53+03	LT	101	116		390.4	390.5										
46+59	RT	102		409.6												
46+59	RT	102	103		406.6	406.8										
46+59	RT	103		409												
46+59	RT	102	104		406.6	402.1										
47+69	RT	104		405.1												
47+69	RT	104	105		399.3	400.5										
47+61	RT	105														
47+69	RT	104	99		399.3	398.1										
47+99	RT	106		404.1												
47+99	RT	106	107		401.1	401.3										
47+99	RT	107		403.5												
47+99	RT	106	108		401.1	399.8										
48+60	RT	109		402.5												
48+55	RT	108		402.8												
48+60	RT	108	109		399.8	400.3										
49+50	RT	110		401.3												
45+55	RT	108	110		399.8	398.3										
49+55	RT	111		401.4												
49+50	RT	110	111		398.3	399.2										
50+35	RT	112		400												
49+50	RT	110	112		398.3	397										
51+15	RT	113		398.6												
50+35	RT	112	113		397	395.6										
52+00	RT	114		397.1												
51+15	RT	113	114		395.6	394.1										
52+00	RT	115		398.3												
52+00	RT	114	115		394.1	396.1					18					
53+00	RT	116		395.3												
52+00	RT	114	116		393.9	392.1										
53+00	RT	117		398.8												
53+00	RT	116	117		392.3	396.6					18					
53+80	RT	118		393.7												
53+00	RT	116	118		390.5	390.7	X									
15+85	LT	6		415.1												
15+85	LT	6	7		411.8	411.3										
16+90	LT	7		414.5												
16+90	LT	7	8		411.3	410.6										
17+63	LT	8		414.6												
17+63	LT	8	9		411.2	411.2										
17+62	LT	9		414.7												
SHEET TOTALS											36					

STATION (All Stations are for -L- alignment unless otherwise noted)	C.S. PIPE (UNLESS NOTED OTHERWISE) SIZE	.064	.064	.064	.064	.079	.079	.109	.109	CLASS III R.C. PIPE (*UNLESS NOTED OTHERWISE) SIZE	12"	15"	18"	24"	30"	36"	42"	48"
	THICKNESS OR GAUGE										CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV	CLASS IV	
45+19																288		
53+03														8				
53+03																		
53+03														32				
46+59																		
46+59											12							
46+59																		
46+59											108							
47+69																		
47+69																		20
47+61																		
47+69																		68
47+99																		
47+99											16							
47+99																		
47+99											56							
48+60																		
48+55																		
48+60											16							
49+50																		
45+55											100							
49+55																		
49+50											12							
50+35																		
49+50											84							
51+15																		
50+35											84							
52+00																		
51+15											88							
52+00																		
52+00																		
53+00																		
52+00														100				
53+00																		
53+00																		
53+80																		
53+00											80							
15+85																		
15+85														104				
16+90														68				
16+90																		
17+63																		
17+63														8				
17+62																		
SHEET TOTALS											664	272	40	288	88			

STATION (All Stations are for -L- alignment unless otherwise noted)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL. "B") 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	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
45+19											
53+03											
53+03			1	0.1		1			1		
53+03											
46+59			1			1		1			
46+59											
46+59			1								1
46+59											1
47+69											
47+69			1	0.8		1		1			
47+61	6										
47+69											
47+99			1			1		1			
47+99											
47+99			1								1
47+99											
48+60			1								1
48+55			1			1		1			
48+60											
49+50			1			1		1			
45+55											
49+55			1								1
49+50											
50+35			1			1		1			
49+50											
51+15			1			1		1			
50+35											
52+00			1			1		1			
51+15											
52+00			1								1
52+00											
53+00			1			1		1			
52+00											
53+00			1								1
53+00											
53+80			1			1		1			
53+00											
15+85			1			1		1			
15+85											
16+90			1			1		1			
16+90											
17+63			1			1			1		
17+63											
17+62			1							1	48
SHEET TOTALS	6		21	0.9		14		12	2	1	48

STATION (All Stations are for -L- alignment unless otherwise noted)	MASONARY DRAINAGE STRUCTURE, CUBIC YARDS, DRIVEWAY D.I. STD. 840.30	TRAFFIC BEARING PRECAST DRAINAGE STRUCTURE STD. 840.46	DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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
45+19												
53+03												
53+03		X										
53+03												
46+59												
46+59												
46+59												
46+59												
47+69												
47+69												
47+61												
47+69											40	
47+99												
47+99												
47+99												
47+99												
48+60												
48+55												
48+60												
49+50												
45+55												
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51+15												
50+35												
52+00												
51+15												
52+00												
52+00												
53+00												
52+00												
53+00												
53+00												
53+80											0.045	REMOVE EXIST. CB
53+00												
15+85												
15+85												
16+90												
16+90												
17+63											0.118	
17+63												
17+62												
SHEET TOTALS											0.161	40

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

RD248662

COMPUTED BY:	REO	DATE:	12/2/2009
CHECKED BY:	TMW	DATE:	12/9/2009

PROJECT NO.	SHEET NO.
U-3804	3-F

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

STATION (All Stations are for -L- alignment unless otherwise noted)	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) 54" CLASS IV	60"	66"	72"	78"	84"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 54" .109	54" .138	54" .168	54" SHOP ELON-GATED .138	54" SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	72" .139	72" .168	STRUCTURAL PLATE PIPE 60" 12	60" 10	66" 12	66" 10	72" 12	72" 10	PER EACH (0' THRU 5')	MASONRY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR 840.02	FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	M.H. FRAME AND COVER STD. 840.54	T.B.J.B.	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & Size	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
48+09	LT	99		403.9																											1	2.132	1			1										
48+09	LT	99	100		397.6	392.7		288																																						
51+00	LT	100		398.9																											1	2.275	1			1										
51+00	LT	100	119		392.7	388.2		200																																						
53+03	LT	119		396.2																											1	5.591							1	1						
53+03	LT	119	out		388.2	387.3		104																																						
SHEET TOTALS								592																							3	10.0	2			2			1	1						
SHEET TOTALS																																														

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

RD248662

COMPUTED BY:	REO	DATE:	12/2/2009
CHECKED BY:	TMW	DATE:	12/9/2009

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3804	3-G

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	C.S. PIPE (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109
SHEET 3-A TOTALS																							
SHEET 3-B TOTALS									16														
SHEET 3-C TOTALS																							
SHEET 3-D TOTALS																							
SHEET 3-E TOTALS									36														
SHEET 3-F TOTALS																							
PROJECT TOTALS									52														
SHEET TOTALS																							

STATION	CLASS III R.C.P. PIPE (*UNLESS NOTED OTHERWISE) 12"	15" CLASS IV	18" CLASS IV	24" CLASS IV	30" CLASS IV	36" CLASS IV	42" CLASS IV	48" CLASS IV	** " Contractor Design Pipe	** " Contractor Design Pipe	** " Contractor Design Pipe	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
SHEET 3-A TOTALS		740	188	260	92								
SHEET 3-B TOTALS		1048	264	12		128							
SHEET 3-C TOTALS		1008	398	156	152								
SHEET 3-D TOTALS		168	12		504	384						2.8	
SHEET 3-E TOTALS		664	272	40		288		88				6	
SHEET 3-F TOTALS													
PROJECT TOTALS		3628	1134	468	748	800		88				8.8	
SHEET TOTALS													

STATION	QUANTITIES FOR DRAINAGE STRUCTURES: PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL."B") LIN. FT. A: 5.0' THRU 10.0'	B: 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION: DROP INLET	CATCH BASIN
SHEET 3-A TOTALS	26	1.2		17	2	9	6	5	
SHEET 3-B TOTALS	24	3.6		13	1	6	6	2	
SHEET 3-C TOTALS	24	0.3		18	3	7	8	3	
SHEET 3-D TOTALS	21	1.1		13	2	3	8	3	
SHEET 3-E TOTALS	21	0.9		14		12	2		
SHEET 3-F TOTALS	3			2			2		
PROJECT TOTALS	119	7.1		77	8	37	32	13	
SHEET TOTALS									

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	MANHOLE STD. 840.51	UTILITY PAY ITEM, M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER STD. 840.54	OPEN THROAT CATCH BASIN, STD. 840.04 OR 840.05	UTILITY PAY ITEM, TBJB	T.B.D.I. STD. 840.35	DRIVEWAY D.I. STD. 840.30	DRIVEWAY D.I., FRAME WITH GRATES	Masonary Drainage Structure, Cubic Yards, Driveway D.I. STD. 840.30	Masonary Drainage Structure, Cubic Yards, From 3-F
SHEET 3-A TOTALS	2	2								6		1			1			6				
SHEET 3-B TOTALS	7	7							1	2		1			1			3				
SHEET 3-C TOTALS	2	2								3	1				1	1		3				
SHEET 3-D TOTALS	2	2								3		3		1	3		1	3				
SHEET 3-E TOTALS	6	6																	1	48	2	
SHEET 3-F TOTALS															1							10
PROJECT TOTALS	19	19							1	14	1	5		1	7	1	1	15	1	48	2	10
SHEET TOTALS																						

STATION				DO NOT USE PVC	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	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
SHEET 3-A TOTALS												388	
SHEET 3-B TOTALS												216	
SHEET 3-C TOTALS												267	
SHEET 3-D TOTALS												521	
SHEET 3-E TOTALS											0.161	40	
SHEET 3-F TOTALS													
PROJECT TOTALS											0.161	1432	
SHEET TOTALS													

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

5/28/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

SUMMARY OF EARTHWORK IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- LT 13+00.00	40+00.00	3698	1088	0	2610
-Y- RT 14+50.00	15+61.30	110	6	0	104
SUBTOTALS 1:		3808	1094	0	2714
-Y- LT 14+50.00	15+61.30	147	11	0	136
-L- LT 40+00.00	54+00.00	1961	1170	0	791
SUBTOTALS 2:		2108	1181	0	927
-L- RT 16+50.00	40+00.00	550	2407	1857	0
-Y- RT 16+55.79	17+75.00	32	61	29	0
SUBTOTALS 3:		582	2468	1886	0
-Y- LT 16+55.79	17+75.00	60	47	0	13
-L- RT 40+00.00	54+00.00	359	485	126	0
SUBTOTALS 4:		419	532	126	13
-L- MED 13+00.00	40+00.00	263	1243	980	0
-L- MED 40+00.00	51+00.00	533	173	0	360
SUBTOTALS 5:		796	1416	980	360
PROJECT TOTALS:		7713	6691	2992	4014
ADDITIONAL UNDERCUT		0	0	0	0
		0	0	0	0
LOSS DUE TO CLEARING & GRUBBING		-1015	0	0	-1015
LESS SELECT GRANULAR MATERIAL		0	0	0	0
EST. SHOULDER MATERIAL		0	0	0	0
PROJECT TOTALS		6698	6691	2992	2999
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				150	
GRAND TOTALS:		6698		3142	2999
SAY:		6700		3200	3000

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

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
-L-	40+84	50+07	CL	792.46
-L-	48+77	50+68	CL	105.12
-L-	33+75	36+91	CL	212.34
-L-	28+74	31+75	CL	286.45
-L-	20+26	22+64	CL	276.87
-L-	11+40	14+31	CL	455.61
PAVEMENT REPAIR CONTINGENCY				
-L-	40+00	40+60	LT	71.70
-L-	40+00	47+00	RT	1488.44
			TOTAL:	3689
			SAY:	3690

PROJ. REFERENCE NO.	SHEET NO.
U-3804	3-I

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
3	4	CENTRAL CAROLINA BANK AND TRUST COMPANY
4	4	CAROLINA CROASDAILE, L.L.C.
5	4	GLENWOOD HILLANDALE COMPANY, L.L.C.
6	4	CAROLINA HILLANDALE, L.L.C.
7	4, 5	LIONS CLUB OF DURHAM, N.C. INC.
8	5	MARTIN G. LINDSEY ARALU LINDSEY
9	5	1858 HILLANDALE OWNERS ASSOCIATION, INC.
12	5	HW ASPEN, LLC, PW ASPEN, LLC
13	5	ADA C. FOSTER
16, 18	5	ADA C. FOSTER
19	5	JERRY B. CLAYTON, JR.
20	5	LANNY R. O'NEAL, JR., SHARON C. O'NEAL
21	5, 6	DURHAM PUBLIC SCHOOLS, BOARD OF EDUCATION
22	5	HARRIET DULA O'NEAL
23	5	W. M. McCAULEY , DORIS J. McCAULEY
24	5	LISA DERGAZARIAN
25	5	NANCI C. GIBBS
26	5	CONSTANCE PAYNE
27	5, 6	CLINTON TINGEN, BARBARA TINGEN
28	6	RONALD ALLEN LOUKS, MARY C. LOUKS
29	6	WILLIAM R. OLDHAM, ELIZABETH OLDHAM
30	6	WILLIAM R. OLDHAM, ELIZABETH OLDHAM
31	6	LILLIE D. MERRITT, MURRAY B. MERRITT
32	6	FOUAD YOUSE, FAWZIA YOUSEF
33	6	SUSAN FOX BEISCHER, RANDOLPH DUDLEY FOX
34	6	CROASDAILE FARM MASTER, HOMEOWNERS ASSOC., INC
35	6	ROBERT S. CLARKE, MARGARET M. CLARKE
36	6	THOMAS D. LEE
37	6	GEORGE M. ANDREWS, TONIA A. ANDREWS
38	6	BENNIE C. GLENN, JR.
39	6	HUGH D. PATRICK, JR., SUSAN T. PATRICK
40	6	WALTER G. GUNTER, EDITH B. GUNTER
41	6	LONNIE C. HARRIS, JR, DEMETRE R. HARRIS
42	6	ROBERT W. BASS, CAROLYN T. BASS
43	6	JOHN R. IREDALE, BEVERLY W. IREDALE
44	6	BENJAMIN S. SWADLEY, CHARLES E. SWADLEY, SUSAN S. SWADLEY
45	6,7	PETER W. CHAUNCEY , AMELIA R. CHAUNCEY
46	6,7	OSCAR OSORIO, EDITH ALFARO-IGIESIAS
47	7	DONALD L. WATT, JR., KELLIE J. WATT
48	7	DUNG NGUYEN TU, THANH THI BUI
49	7	ROSS M. TRAVIS, JANICE M. TRAVIS
50	7	FOYE W. COLE
51	7	JOHN NICHOLSON, DARE NICHOLSON
52	7	CHARLES M. RENN, MADELYN W. RENN
53	6	CROASDAILE FARM MASTER, HOMEOWNERS ASSOC., INC
82	7	CROASDAILE FARM MASTER, HOMEOWNERS ASSOC., INC.
83	7, 8	THE METHODIST RETIREMENT HOME, INC.
84	7	SHERRILL J. SMITH LIVING TRUST

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
U-3804	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26960 ENGINEER BRYAN C. KEY — 6-18-10

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 29870 ENGINEER MARC T. SHOWN — 6-7-10

REVISIONS

8/17/99

-BY-202 9+00.84 PINC

-BY-203 10+80.96 PINC

-BY-205 12+14.66 PINC

-BY-204 12+28.67 POT

-BY-A205 12+14.66 PINC=

-L- POT Sta. 10+00.00

-BL- 2 POT 5+00.00
GPS MON\ U3804-2 =
-L- STA\ 10+14.16
OFFSET 83.69' LT

-BY-206 8+68.66 PINC

-BY-A300 5+00.00 POT

-BY3-300 5+00.00 POT=

-BL-99 9+01.72 PINC

LARGO SPE, LLC
D.B. 5080 P. 507
D.B. 5080 P. 513
P.B. 72, P. 78
P.B. 136, P. 178

SHONEY'S PROPERTIES GROUP 3, LLC
D.B. 2932, P. 424
P.B. 72, P. 78
PSD 078-03-L

BFP LIMITED PARTNERSHIP
D.B. 1976, P. 1552
P.B. 128, P. 66
PSD 073-03-L

CENTRAL CAROLINA BANK AND TRUST COMPANY
D.B. 2761, P. 2761

GLENWOOD HILLANDALE COMPANY, L.L.C.
D.B. 2748, P. 765
P.B. 51, P. 85

WINN LIMITED PARTNERSHIP
D.B. 1988, P. 115
P.B. 111, P. 177

CAROLINA CROASDAILE, L.L.C.
D.B. 2564, P. 620
P.B. 142, P. 99

CAROLINA HILLANDALE, L.L.C.
D.B. 2695, P. 807
P.B. 144, P. 67

LIONS CLUB OF DURHAM, N.C. INC.
D.B. 353, P. 659
P.B. 55, P. 114

SR 1321 HILLANDALE RD. & FRONT ST.

5400 / 6400		2010 ADT / 2030 ADT
4300 / 5300	FRONT ST.	1000 / 1000
30600 / 37800	SR 1321 –L– HILLANDALE RD	27300 / 33500

–L–	
PI Sta 18+59.11	PI Sta 21+72.68
Δ = 3° 38' 43.1" (LT)	Δ = 3° 32' 28.5" (RT)
D = 1° 08' 45.3"	D = 1° 08' 45.3"
L = 318.11'	L = 309.03'
T = 159.11'	T = 154.57'
R = 5,000.00'	R = 5,000.00'
V_D = 40 mph	V_D = 40 mph
SE = NC	SE = NC

NAD 83/95 NC GRID

-BY2- A101 POT 5+00.00
-BL- 101 PINC 12+48.25=
-L- STA 17+60.36
OFFSET = 28.56' LT.

-L- PC Sta. 17+00.00

-L- PRC Sta. 20+18.11

-L- POT Sta. 17+41.36

-Y1- POT Sta. 10+00.00

-Y1- POT Sta. 13+26.46

TIE TO EXISTING CURB

TIE TO EXISTING ISLAND

DO NOT DISTURB CANOPY

-BL- 100 PINC 8+66.29 =
-L- STA 13+78.38
OFFSET = 44.76' LT.

-BY1- A100 POT 8+09.70

END CONST.
-Y1- POT STA 10+90.00

-BY2-400 POT 8+71.06

MATCHLINE –L– STA 21+00.00 SEE SHEET NO. 5

BEGIN PROJECT
–L– POT STA 10+00.00

★ *EXISTING SIGNAL*
★ *NEW SIGNAL*
SEE SHEET 2-C FOR DETAILS OF ISLAND
MONOLITHIC ISLAND
SIDEWALK
BUS STOP SHELTER PAD
SEE SHEET 9 FOR –L– PROFILE
SEE PAVEMENT MARKING PLANS FOR WCR LOCATIONS

07-JUN-2010 10:11 R:\Roadway\Proj\u3804_rdy_psh4.dgn
$$$$USERNAME$$$$

RD248662 6/7/2010 u3804_rdy_psh4 reodell RD-Oce860-34

PROJECT REFERENCE NO.	SHEET NO.
U-3804	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY — 5-5-10

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER OMARC T. SHOWN — 4-1-10

SR 1321 HILLANDALE RD. & FAWN AVE.

27300 / 33500 — SR 1321 –L– HILLANDALE RD — 25900 / 32200

1825 / 1900 — FAWN AVE. — 625 / 700

2625 / 2700 — 2010 ADT / 2030 ADT

–L–	
PI Sta 18+59.11	PI Sta 21+72.68
Δ = 3° 38' 43.1" (LT)	Δ = 3° 32' 28.5" (RT)
D = 1° 08' 45.3"	D = 1° 08' 45.3"
L = 318.11'	L = 309.03'
T = 159.11'	T = 154.57'
R = 5,000.00'	R = 5,000.00'
V_D = 40 mph	V_D = 40 mph
SE = NC	SE = NC

NC GRID NAD 83/95

REVISIONS

8/17/99

MATCHLINE –L– STA 21+00.00 SEE SHEET NO. 4

MATCHLINE –L– STA 35+00.00 SEE SHEET NO. 6

-BY3- AI02 POT 5+00.00
-BL- I02 PINC I9+28.77 =
-L- STA 24+40.97
OFFSET = 10.32 LT.

-L- PT Sta. 23+27.15

-BL- I03 PINC 25+31.30
-L- STA 30+43.45
OFFSET = 17.87 LT.

25+00

30+00

35+00

5 GLENWOOD HILLANDALE COMPANY, L.L.C.
D.B. 2748, P. 765
P.B. 51, P. 85

12 HW ASPEN, LLC
PW ASPEN, LLC
D.B. 2882, P. 887
P.B. 101, P. 58

17 CROASDAILE, INC.
D.B. 310, P. 287
P.B. 103, P. 184

21 DURHAM PUBLIC SCHOOLS BOARD OF EDUCATION
D.B. 1736, P. 594
P.B. 126, P. 129

8 MARTIN G. LINDSEY
ARALU LINDSEY
D.B. 4446, P. 596
P.B. 26, P. 193

7 LIONS CLUB OF DURHAM, N.C. INC.
D.B. 353, P. 659
P.B. 55, P. 114

9 1858 HILLANDALE OWNERS ASSOCIATION, INC.
D.B. 2415, P. 91
P.B. 5, P. 148

10 VIRGIL H. GARNES
MARGARET F. GARNES
D.B. 1734, P. 992
P.B. 20, P. 162

11 NORMAN T. HORTON
LOUISE C. HORTON
D.B. 1306, P. 843
P.B. 20, P. 162

13 ADA C. FOSTER
D.B. 2238, P. 701
P.B. 29, P. 69

14 ADA C. FOSTER
D.B. 2238, P. 701
P.B. 29, P. 69

15 KESSLER K. POWELL
LOUISE POWELL
P.B. 29, P. 69

16 ADA C. FOSTER
D.B. 2238, P. 701
P.B. 29, P. 69

18 ADA C. FOSTER
D.B. 2238, P. 701
P.B. 29, P. 69

19 LANNY R. O'NEAL, JR.
SHARON C. O'NEAL
D.B. 1544, P. 475
P.B. 6, P. 23

19 JERRY B. CLAYTON, JR.
D.B. 371, P. 844
P.B. 6, P. 23

20 HARRIET DULA O'NEAL
D.B. 3747, P. 442
P.B. 6, P. 23

22 W. M. McCAULEY
DORIS J. McCAULEY
D.B. 282, P. 41
P.B. 6, P. 23

23 LISA DERGAZARIAN
D.B. 4300, P. 793
P.B. 6, P. 23

24 NANCI C. GIBBS
D.B. 2219, P. 173
P.B. 6, P. 23

25 CONSTANCE PAYNE
D.B. 4247, P. 867
P.B. 61, P. 23

26 CLINTON TINGEN
BARBARA TINGEN
D.B. 388, P. 837
P.B. 6, P. 23

150' MEDIAN TRANSITION LT & RT

2'-6" CURB & GUTTER

TIE TO EXISTING CURB

5' SIDEWALK

8"X18" CONC. CURB

4' CONC. MEDIAN

TIE CURB TO EXISTING EOP

FILL W/FLOWABLE MATERIAL

MONOLITHIC ISLAND

SIDEWALK

SEE SHEET 2-D FOR DETAIL OF ISLANDS

SEE SHEET 9 FOR –L– PROFILE

SEE PAVEMENT MARKING PLANS FOR WCR LOCATIONS

04-MAY-2010 11:34
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PROJECT REFERENCE NO.	SHEET NO.
U-3804	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L-		-Y-
PI Sta 47+52.12	PI Sta 51+14.24	PI Sta 17+07.97
Δ = 4° 10' 19.1" (RT)	Δ = 4° 07' 37.6" (LT)	Δ = 8° 10' 37.0" (RT)
D = 1° 08' 45.3"	D = 1° 08' 45.3"	D = 0° 45' 50.2"
L = 364.07'	L = 360.16'	L = 1,070.36'
T = 182.12'	T = 180.16'	T = 536.09'
R = 5,000.00'	R = 5,000.00'	R = 7,500.00'
V_D = 40 mph	V_D = 40 mph	V_D = 40 mph
SE = NC	SE = NC	SE = NC

☆ UPGRADE EXISTING SIGNAL

MONOLITHIC CONCRETE ISLAND

SIDEWALK

SEE SHEET 2-F FOR DETAIL OF ISLANDS

SEE SHEET 9 & 10 FOR -L- PROFILE

SEE SHEET 11 FOR -Y- PROFILE

SEE PAVEMENT MARKING PLANS FOR WCR LOCATIONS

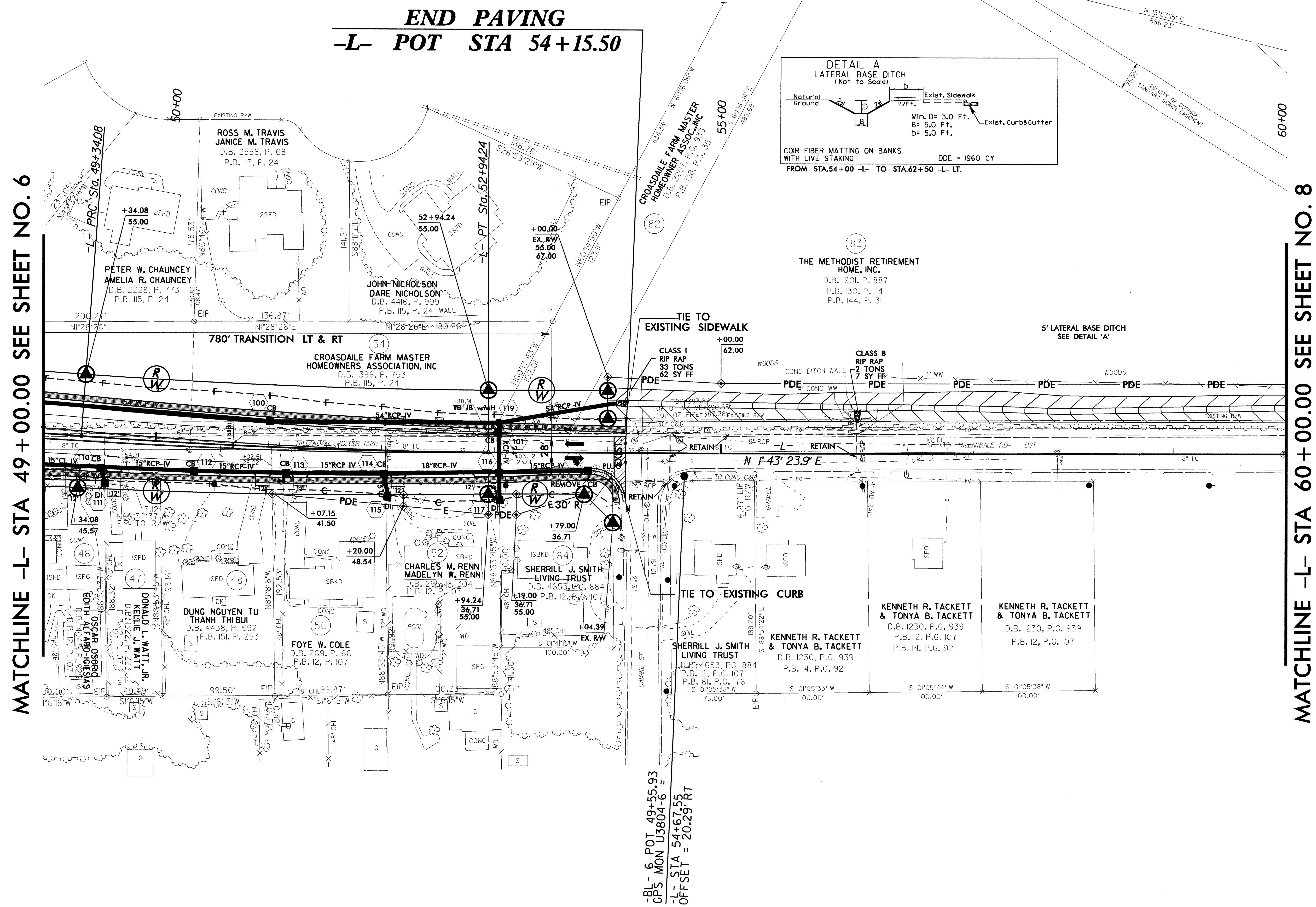
PROJECT REFERENCE NO.	SHEET NO.
U-3804	7
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY — 2-10-10

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN — 2-9-10

-L-	
PI Sta 47+52.12	PI Sta 51+14.24
Δ = 4° 10' 19.1" (RT)	Δ = 4° 07' 37.6" (LT)
D = 1° 08' 45.3"	D = 1° 08' 45.3"
L = 364.07'	L = 360.16'
T = 182.12'	T = 180.16'
R = 5,000.00'	R = 5,000.00'
V_D = 40 mph	V_D = 40 mph
SE = NC	SE = NC

END PAVING
-L- POT STA 54+15.50



MATCHLINE -L- STA 49+00.00 SEE SHEET NO. 6
MATCHLINE -L- STA 60+00.00 SEE SHEET NO. 8
NC GRID NAD 83/95
DETAIL A
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Exist. Sidewalk
Exist. Curb&Gutter
Min. D= 3.0 Ft.
B= 5.0 Ft.
b= 5.0 Ft.
COIR FIBER MATTING ON BANKS WITH LIVE STAKING
DDE = 1960 CY
FROM STA.54+00 -L- TO STA.62+50 -L- LT.
ROSS M. TRAVIS
JANICE M. TRAVIS
D.B. 2558, P. 68
P.B. 115, P. 24
PETER W. CHAUNCEY
AMELIA R. CHAUNCEY
D.B. 2228, P. 773
P.B. 115, P. 24
JOHN NICHOLSON
DARE NICHOLSON
D.B. 4416, P. 999
P.B. 115, P. 24
CROASDAILE FARM MASTER HOMEOWNER ASSOC.,INC
THE METHODIST RETIREMENT HOME, INC.
D.B. 1901, P. 887
P.B. 130, P. 114
P.B. 144, P. 31
780' TRANSITION LT & RT
CROASDAILE FARM MASTER
HOMEOWNERS ASSOCIATION, INC
D.B. 1396, P. 753
P.B. 115, P. 24
TIE TO EXISTING SIDEWALK
5' LATERAL BASE DITCH
SEE DETAIL 'A'
CLASS I RIP RAP 33 TONS 62 SY FF
CLASS B RIP RAP 2 TONS 7 SY FF
N 1° 43' 23.9" E
TIE TO EXISTING CURB
DUNG NGUYEN TU
THANH THI BUI
D.B. 4438, P. 592
P.B. 151, P. 253
FOYE W. COLE
D.B. 269, P. 66
P.B. 12, P. 107
CHARLES M. RENN
MADELYN W. RENN
SHERRILL J. SMITH
LIVING TRUST
D.B. 4653, P.G. 884
P.B. 12, P.G. 107
KENNETH R. TACKETT
& TONYA B. TACKETT
D.B. 1230, P.G. 939
P.B. 14, P.G. 92
D.B. 1230, P.G. 939
P.B. 12, P.G. 107
-BL- 6 POT 49+55.93
GPS MON U3804-6 =
-L- STA 54+67.55
OFFSET = 20.29' RT
50+00
55+00
60+00

SIDEWALK

SEE SHEET 10 FOR -L- PROFILE

SEE PAVEMENT MARKING PLANS FOR WCR LOCATIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
U-3804	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26964 ENGINEER BRYAN C. KEY

2-18-10

HYDRAULICS ENGINEER

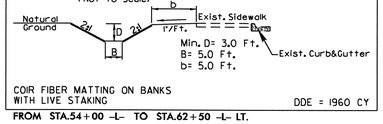
NORTH CAROLINA PROFESSIONAL SEAL 40570 ENGINEER MARC T. SHOWN

2-1-10

-L-

PI Sta 64+07.09
△ = 18° 30' 34.8" (LT)
D = 13° 19' 28.6"
L = 138.91'
T = 70.07'
R = 430.00'
V_D = N/A
SE = EXIST.

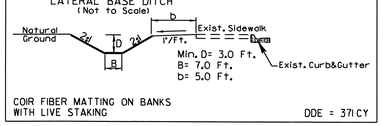
DETAIL A
LATERAL BASE DITCH
(Not to Scale)



COIR FIBER MATTING ON BANKS WITH LIVE STAKING DDE = 1960 CY

FROM STA.54+00 -L- TO STA.62+50 -L- LT.

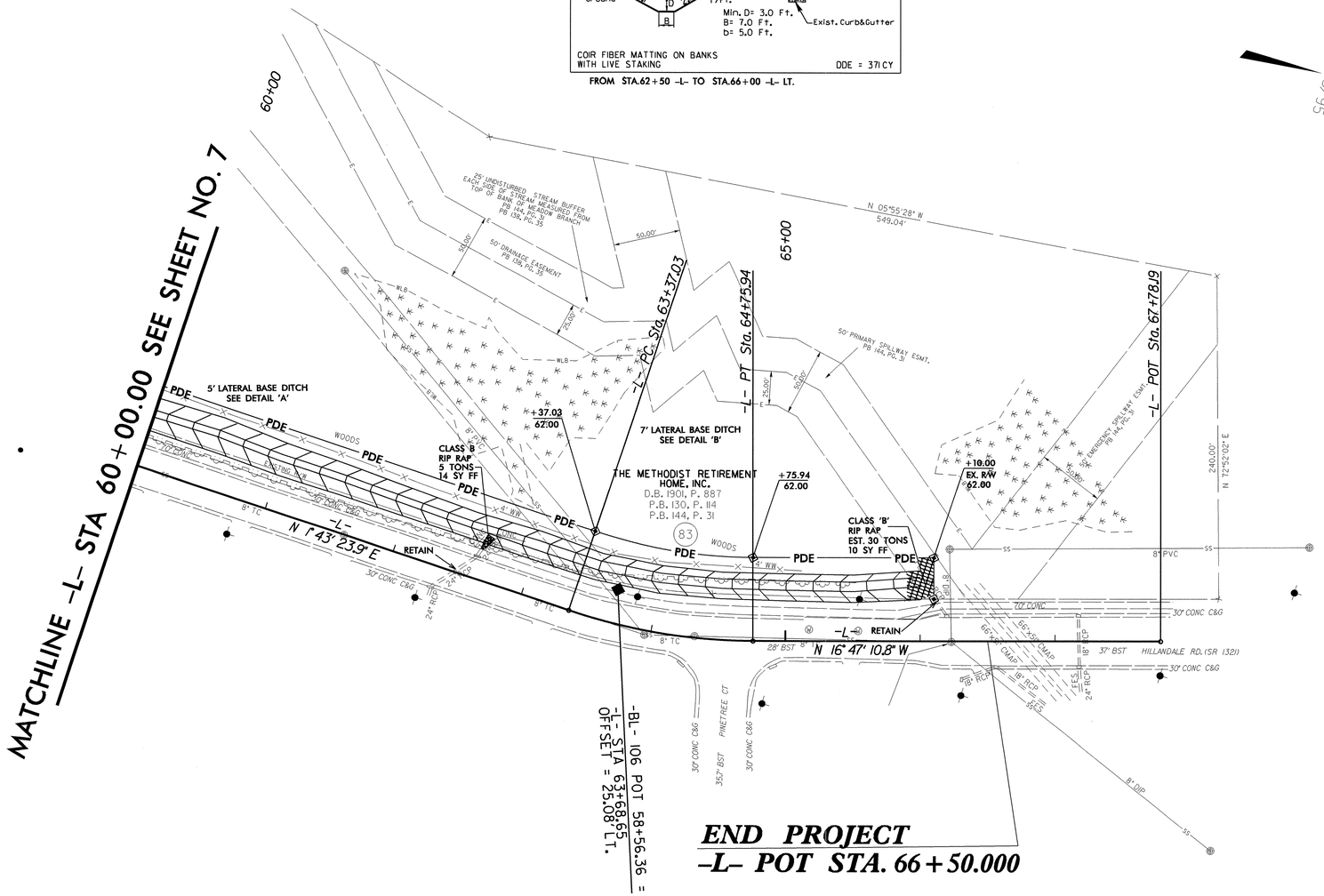
DETAIL B
LATERAL BASE DITCH
(Not to Scale)



COIR FIBER MATTING ON BANKS WITH LIVE STAKING DDE = 371 CY

FROM STA.62+50 -L- TO STA.66+00 -L- LT.

NAD 83 GRID N



END PROJECT
-L- POT STA. 66+50.000

SEE SHEET 10 FOR -L- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
U-3804	9

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26984 ENGINEER JERRY C. KEY — 2-18-10

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN — 2-9-10

BM NO. 51
EL = 414.49'
CHISELED SQUARE IN CONCRETE PAD
AT TRAFFIC SIGNAL CABINENT BASE
72.29' LT OF -L- STA 10+60.16

FRONT ST.
-L- STA 13+54.99

BERTLAND AVE.
-L- STA 17+41.48

PI = 20+00.00
EL = 406.92'
VC = 400'
K = 72
V_b = 40+ MPH

(-)2.2500% (+)3.2892%

BEGIN PROJECT
-L- STA 10+00.00

BEGIN 1.5" RESURF
-L- STA 14+00.00
EL = 414.76 FT

END 1.5" RESURF
BEGIN GRADE
-L- STA 17+00.00
EL = 413.67 FT

SEE SHEETS 4 & 5 FOR -L- PLANS

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

450 440 430 420 410 400 390 380 370

FAWN AVE.
-L- STA 24+56.13

PI = 26+50.00
EL = 428.30'
VC = 500'
K = 124
V_b = 40+ MPH

(+)3.2892% (-)0.7314%

PI = 33+50.00
EL = 423.18'
VC = 400'
K = 294
V_b = 40+ MPH

(-)0.7314% (+)0.6296%

PI = 36+20.00
EL = 424.88'
VC = 120'
K = 101
V_b = 40+ MPH

(+)0.6296% (-)0.5638%

(-)0.3889%

BM NO. 52
EL = 423.21'
R/R SPIKE IN 14" PINE
88.47' LT OF -L- STA 30+17.70

BEG. LT DITCH GRADE
-L- STA. 35+90.00
EL = 418.00

SEE SHEETS 5 & 6 FOR -L- PLANS

LEFT DITCH -·-·-·-·-

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00

460 450 440 430 420 410 400 390 380 370

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PROJECT REFERENCE NO.
U-3804
SHEET NO.
10
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26961 ENGINEER BRIAN C. KEY
2-10-10
NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T. SHOWN
2-9-10
5/28/99
-L-
-L- STA 40+35.49 =
-Y- STA 16+08.56
CARVER ST.
PI = 42+00.00
EL = 421.61'
VC = 200'
K = 232
V₀ = 40+ MPH
PI = 44+50.00
EL = 422.36'
VC = 300'
K = 49
V₀ = 40 MPH
PI = 47+50.00
EL = 404.90'
VC = 300'
K = 68
V₀ = 40 MPH
PI = 50+00.00
EL = 401.45'
VC = 200'
K = 459
V₀ = 40+ MPH
(-) 0.3889%
(-) 0.5638%
(-) 0.5357%
(+) 0.3000%
(+) 0.3000%
(-) 5.8200%
(-) 5.8200%
(-) 1.3800%
(-) 1.3800%
(-) 1.8160%
END LT DITCH GRADE
-L- STA.39+50.00
El = 416.60
BEG. LT DITCH GRADE
-L- STA.41+00.00
-Y- STA 15+50
El = 418.30
END LT DITCH GRADE
-L- STA.42+12.00
El = 417.76
SEE SHEETS 6 & 7 FOR -L- PLANS
LEFT DITCH
450
440
430
420
410
400
390
380
370
360
38+00
39+00
40+00
41+00
42+00
43+00
44+00
45+00
46+00
47+00
48+00
49+00
50+00
51+00
52+00
-L-
BM NO. 53
EL = 397.90'
R/R SPIKE IN 8" SWEET GUM
26.37' LT OF -L- STA 52+50.46
CAMMIE ST.
-L- STA 54+31.67
(-) 0.4750%
(-) 2.8800%
(-) 0.3600%
(-) 0.8533%
(-) 2.0800%
END GRADE
-L- STA 53+50.00
EL = 395.09 FT
BEG. LT DITCH GRADE
-L- STA.54+00.00
EL = 387.40
END PROJECT
-L- STA 54+15.50
EL = 394.26 FT
PI =58+00.000
El = 385.50
PI =60+50.000
El = 378.30
PI =62+50.000
El = 377.60
PI =65+50.000
El = 375.04
END LT DITCH GRADE
-L- STA.66+00.00
El = 374.00
SEE SHEETS 7 & 8 FOR -L- PLANS
LEFT DITCH
440
430
420
410
400
390
380
370
360
350
52+00
53+00
54+00
55+00
56+00
57+00
58+00
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60+00
61+00
62+00
63+00
64+00
65+00
66+00
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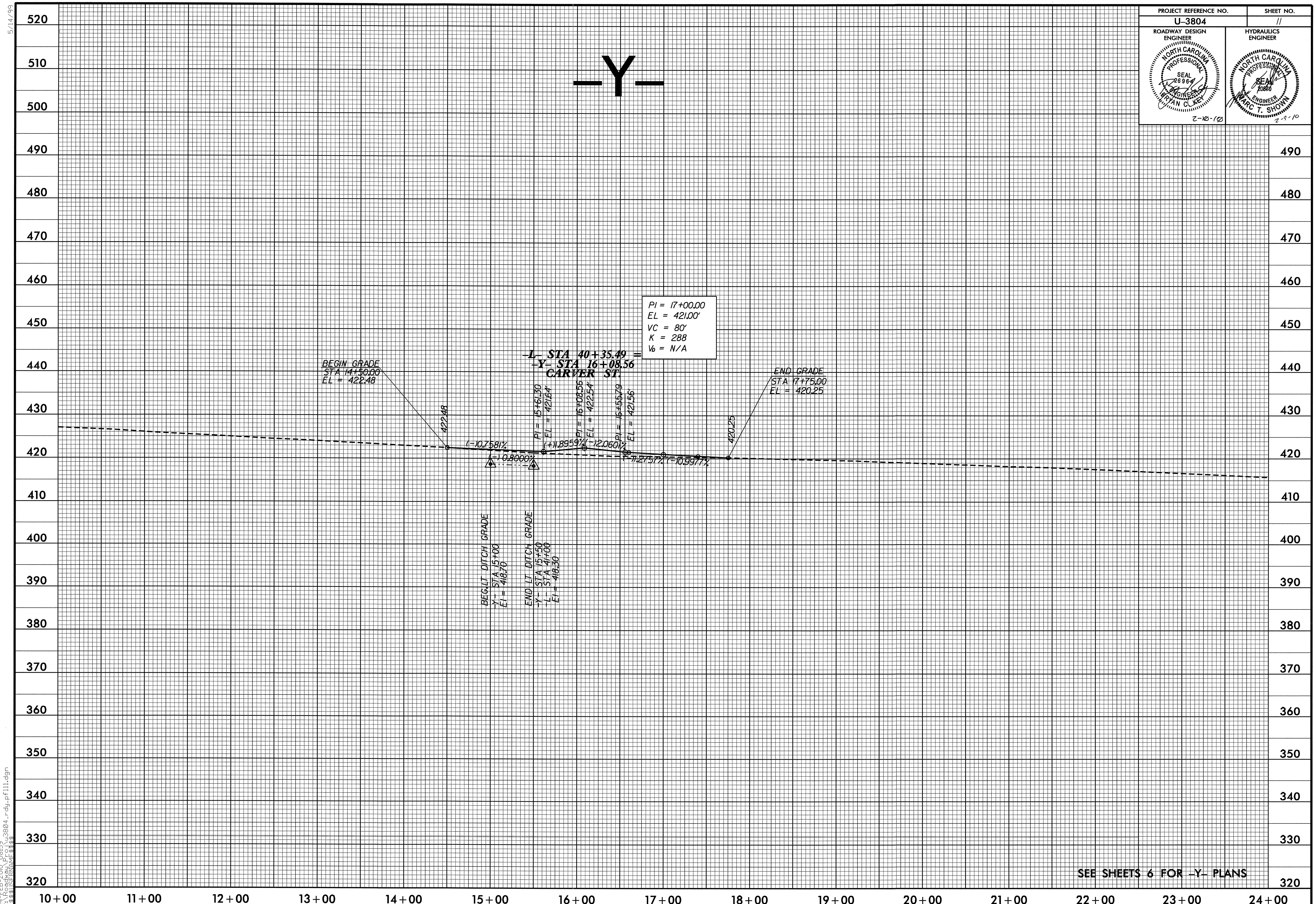
PROJECT REFERENCE NO.	SHEET NO.
U-3804	11

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26964 BRYAN C. KEY — 2-10-10

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20870 MARC T. SHOWN — 2-9-10



-Y-
PI = 17+00.00
EL = 421.00'
VC = 80'
K = 288
V0 = N/A
-L- STA 40+35.49 =
-Y- STA 16+08.56
CARVER ST.
BEGIN GRADE
STA 14+50.00
EL = 422.48
422.48
(-)0.7581%
PI = 15+61.30
EL = 421.64'
(+)1.8959%
PI = 16+08.56
EL = 422.54'
(-)2.0601%
PI = 16+55.79
EL = 421.56'
(-)1.2757%
(-)0.9977%
420.25
END GRADE
STA 17+75.00
EL = 420.25
(-)0.8000%
BEG.LT DITCH GRADE
-Y- STA 15+00
El = 418.70
END LT DITCH GRADE
-Y- STA 15+50
-L- STA 41+00
El = 418.30
520
510
500
490
480
470
460
450
440
430
420
410
400
390
380
370
360
350
340
330
320
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
SEE SHEETS 6 FOR -Y- PLANS

5/14/99

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