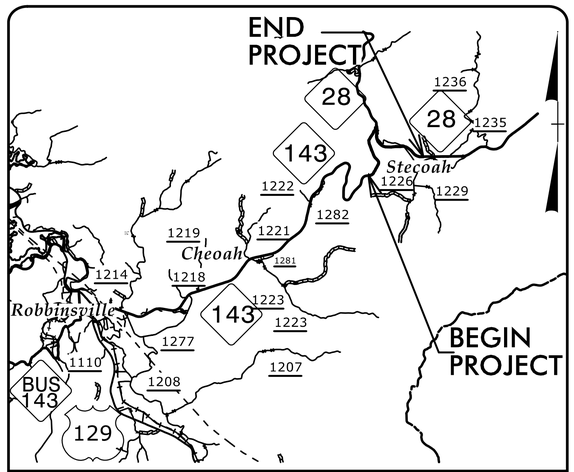
09/08/99

TIP PROJECT: A–0009CC

CONTRACT: C204812

See Sheet 1A For Index of Sheets



VICINITY MAP

3R GUIDELINES WERE USED FROM
–L– 414+50 TO –L– STA 474+20
AND FROM –Y2– 12+60± TO 23+00±
TO MINIMIZE IMPACTS TO USFS PROPERTY
AND NATURAL RESOURCES.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GRAHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	A–0009CC	1	

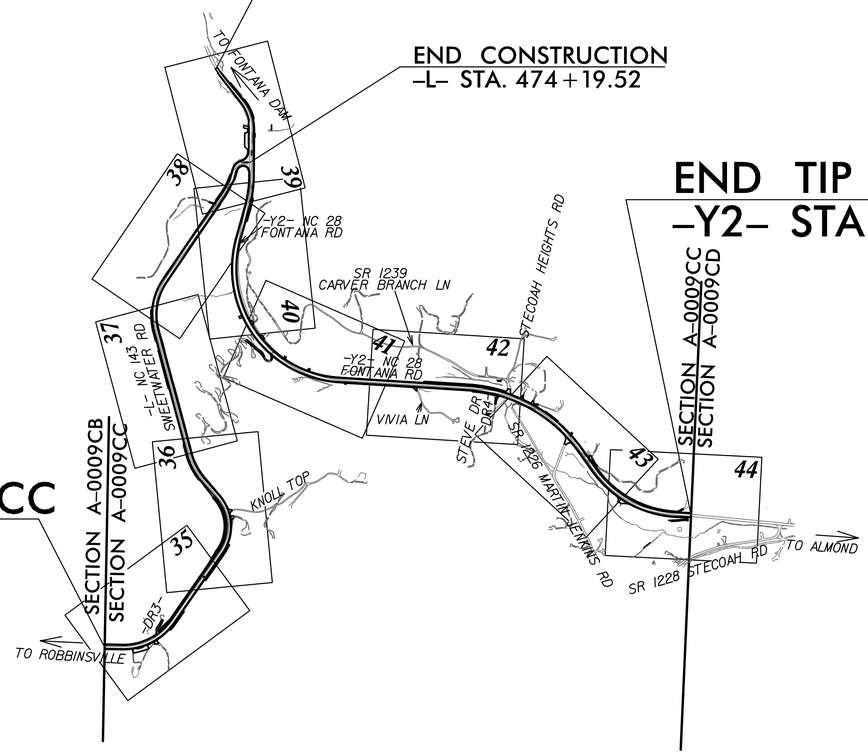
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
32572.1.FS10	APD–0074(178)	PE
32572.2.15	0143011	ROW
32572.2.17	0143011	UTIL.
32572.3.15	0143011	CONST.

LOCATION:
UPGRADE NC 143 FROM 0.5 MILES NORTH OF APPALACHIAN TRAIL TO NC 28
UPGRADE NC 28 FROM 0.2 MILES WEST OF NC 143 TO 0.2 MILES WEST OF SR 1228 (STECOAH RD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, CULVERTS, & RETAINING WALLS

BEGIN CONSTRUCTION
–Y2– STA. 12+60.00

END CONSTRUCTION
–L– STA. 474+19.52



END TIP PROJECT A–0009CC
–Y2– STA. 89+80.00

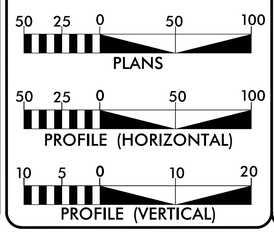
NAD 83/2011

BEGIN TIP PROJECT A–0009CC
–L– STA. 414+50.00

DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVATURE AND HORIZONTAL SSD.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



–L– DESIGN DATA

ADT 2022 = 6590
ADT 2045 = 8800
K = 11 %
D = 57.5 %
T = 7 % *
V = 60 MPH
* TTST = 2% DUAL = 5%
FUNC CLASS =
RURAL ARTERIAL
REGIONAL TIER

–Y2– DESIGN DATA

ADT 2022 = 3800
ADT 2045 = 5200
K = 11 %
D = 67.5 %
T = 7 % *
V = 50 MPH
* TTST = 2% DUAL = 5%
FUNC CLASS =
RURAL ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP
PROJECT A–0009CC
–L– = 1.131 MILES
–Y2– = 1.462 MILES

TOTAL LENGTH TIP
PROJECT A–0009CC = 2.593 MILES

NCDOT CONTACT: WANDA H. AUSTIN, PE

PLANS PREPARED BY:
TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PLANS PREPARED FOR:
NORTH CAROLINA DEPARTMENT
OF TRANSPORATION
DIVISION 14
252 Webster Rd
Sylva, NC 28779

RIGHT OF WAY DATE:
AUGUST 12, 2021

LETTING DATE:
DECEMBER 20, 2022

2018 STANDARD SPECIFICATIONS

JIMMY L. TERRY, PE
PROJECT ENGINEER

AUSTIN TURNER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
10/26/2022
DocuSigned by: David B. Petty 400EFF4863B5465
P.E.
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 038697 ENGINEER DAVID B. PETTY

ROADWAY DESIGN ENGINEER
10/25/2022
DocuSigned by: Jimmy Terry 1D24B3B8B3B34D0...
P.E.
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/25/2022
X:\NCDOT\A-0009\Roadway\Proj\A-0009CC Plan Sheets\A-0009CC_Rdy_tsh.dgn
User:smelvin

8/17/99

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	ROADWAY DETAIL - LAYOUT OF MONO. CONC. ISLAND, 8" CONC. CURB AND MISC. DRIVES
2B-2	ROADWAY DETAIL - WOVEN WIRE FENCE ON RETAINING WALL
2C-1	SPECIAL DETAILS - GUARDRAIL INSTALLATION (W BEAM RAIL SECTION)
2C-2	SPECIAL DETAILS - 8'GUARDRAIL POST
2C-3	SPECIAL DETAILS - GUARDRAIL AT-1 END UNIT
2C-4	SPECIAL DETAILS - HANDRAIL ON WALL
2C-5	SPECIAL DETAILS - GUARDRAIL ANCHOR UNIT TYPE B-77SC
2D-1	DRAINAGE DETAIL - CONC GRATED DI TYPE 'A' MINIMUM DEPTH
2D-2	DRAINAGE DETAIL - TRAFFIC BEARING DROP INLET TYPE "A"
2D-3	DRAINAGE DETAIL - GUIDE FOR BERM DRAINAGE OUTLET - 36" PIPE
2D-4	DRAINAGE DETAIL - GUIDE FOR BERM DRAINAGE OUTLET - 42" PIPE
2D-5	DRAINAGE DETAIL - CONCRETE CATCH BASIN (3 OR 4 SIDE OPEN THROAT)
2G-1	GEOTECHNICAL DETAILS - ROCK EMBANKMENTS- WIDENED FILL DETAIL
2G-2	GEOTECHNICAL DETAILS - TOE SHEAR KEY
2G-3	GEOTECHNICAL DETAILS - HORIZONTAL DRAINS
3B-1	EARTHWORK SUMMARY & ASPHALT PAVEMENT REMOVAL & BREAKING SUMMARY
3B-2	GUARDRAIL SUMMARY
3D-1 THRU 3D-8	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
35 THRU 44	PLAN SHEETS
69 THRU 74	PROFILE SHEETS
RW-01 THRU RW-44	SURVEY CONTROL SHEETS
TMP-1 THRU TMP-18	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-7	PAVEMENT MARKING PLANS
EC-1 THRU EC-24	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
RF-2 & RF-3	STREAMBANK REFORESTATION DETAIL SHEETS
SIGN-1 THRU SIGN-11	SIGNING PLANS
UO-1 THRU UO-11	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION INDEX
X-1B THRU X-1C	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-209	CROSS-SECTIONS
STRUCTURE TITLE SHEET	
STRUCTURE - INDEX OF SHEETS	
C1-1 THRU C1-7	CULVERT PLANS - SINGLE 6 FT X 6 FT CONC BOX CULVERT EXT.
STANDARD NOTES	
W21-1 THRU W21-5	RETAINING WALL #21
W22-1 THRU W22-3	RETAINING WALL #22
W23-1 THRU W23-3	RETAINING WALL #23
W24-1 THRU W24-3	RETAINING WALL #24
W25-1 THRU W25-3	RETAINING WALL #25
W26-1 THRU W26-3	RETAINING WALL #26
W27-1 THRU W27-8	RETAINING WALL #27
W30-1 THRU W30-7	RETAINING WALL #30
W32-1 THRU W32-7	RETAINING WALL #32
W33-1 THRU W33-3	RETAINING WALL #33
W34-1 THRU W34-2	RETAINING WALL #34
W35-1 THRU W35-4	RETAINING WALL #35
W39_40-1 THRU W39_40-3	RETAINING WALLS #39 & #40

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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.

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

BERM DITCHES:

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

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

.
GUARDRAIL:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, FRONTIER, AND ZITO MEDIA.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS,

RIGHT-OF-WAY MARKERS:

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

ROCK

ROCK IS ANTICIPATED BETWEEN -L- STA 430+75 TO 434+75, -L- STA 451+25 TO 451+75, -L- STA 472+75 TO 473+75, -Y2- STA 16+75 TO 18+25, -Y2- STA 21+75 TO 22+75, -Y2- STA 40+75 TO 41+25, -Y2- STA 64+75 TO 65+75 BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

THE CONTRACTOR SHOULD BE ADVISED THAT ANY CLEARING WITHIN THE PERMANENT EASEMENT (PE) ALONG USFS PROPERTY SHALL ADHERE TO THE AGREEMENT BETWEEN NCDOT AND THE USFS. THE CONTRACTOR IS TO COORDINATE WITH THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER PRIOR TO STARTING CLEARING OPERATIONS TO ENSURE COMPLIANCE.
SEE PLAN SHEETS 35 THRU 39.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	1A

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
10/28/2022

STANDARD DRAWINGS

EFF. 01-16-2018
REV.

2018 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 January, 2018 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
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
	DIVISION 3 - PIPE CULVERTS
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
	DIVISION 6 - ASPHALT BASES AND PAVEMENTS
654.01	Pavement Repairs
	DIVISION 8 - INCIDENTALS
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.22	Reinforced Concrete Endwall - for Double and Triple 54" Pipes 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.52	Reinforced Brick Endwall - for Double and Triple 54" Pipes 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.14	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
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.41	Spring Box - Concrete or Brick
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

10/28/2022
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jterry.vin

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — 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
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

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 & PROJECT CONTROL:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage/Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

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:

** SUE – Subsurface Utility Engineering*
LOS – Level of Service – A,B,C or D (Accuracy)

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
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)* — P
- U/G Power Line (SUE – LOS C)* — P
- U/G Power Line (SUE – LOS D)* — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Test Hole (SUE – LOS A)*
- U/G Telephone Cable (SUE – LOS B)* — T
- U/G Telephone Cable (SUE – LOS C)* — T
- U/G Telephone Cable (SUE – LOS D)* — T
- U/G Telephone Conduit (SUE – LOS B)* — TC
- U/G Telephone Conduit (SUE – LOS C)* — TC
- U/G Telephone Conduit (SUE – LOS D)* — TC
- U/G Fiber Optics Cable (SUE – LOS B)* — T FO
- U/G Fiber Optics Cable (SUE – LOS C)* — T FO
- U/G Fiber Optics Cable (SUE – LOS D)* — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE – LOS A)*
- U/G Water Line (SUE – LOS B)* — W
- U/G Water Line (SUE – LOS C)* — W
- U/G Water Line (SUE – LOS D)* — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Test Hole (SUE – LOS A)*
- U/G TV Cable (SUE – LOS B)* — TV
- U/G TV Cable (SUE – LOS C)* — TV
- U/G TV Cable (SUE – LOS D)* — TV
- U/G Fiber Optic Cable (SUE – LOS B)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS C)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS D)* — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE – LOS A)*
- U/G Gas Line (SUE – LOS B)* — G
- U/G Gas Line (SUE – LOS C)* — G
- U/G Gas Line (SUE – LOS D)* — 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
- SS Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)* — FSS
- SS Force Main Line (SUE – LOS C)* — FSS
- SS Force Main Line (SUE – LOS D)* — FSS

MISCELLANEOUS:

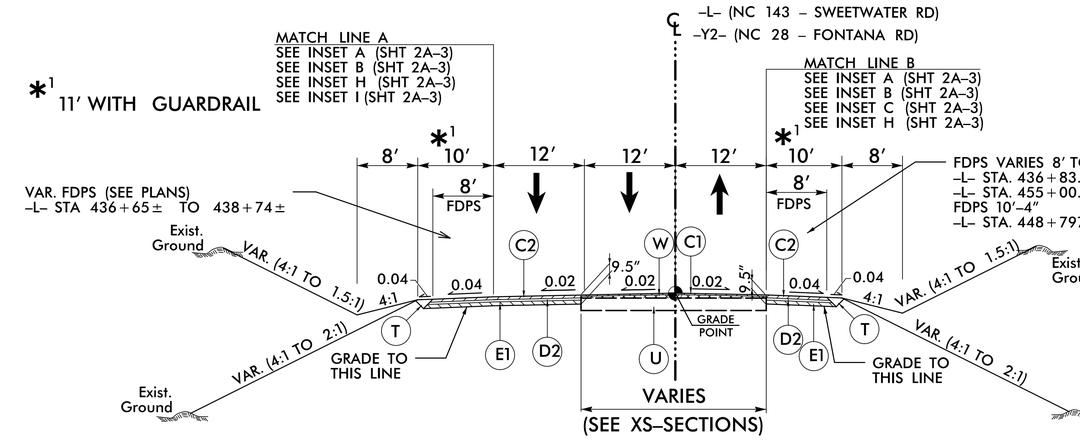
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line (SUE – LOS B)* — 2UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

6/2/99

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 ½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 ½" IN DEPTH.
D2	PROP. APPROX. 2 ½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LSSS THAN 2 ½" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5 ½" IN DEPTH.
K	CLASS IV SUBGRADE STABILIZATION
J1	PROP. 6" AGGREGATE BASE COURSE.
J2	PROP. 4" AGGREGATE BASE COURSE.
N	GEOTEXTILE FOR PAVEMENT STABILIZATION
R2	EXPRESSWAY GUTTER
R4	SHOULDER BERM GUTTER
R5	5"MONOLITHIC CONCRETE ISLAND (SURFACE-MOUNT)
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	MILLING, 0 TO 3" DEPTH, SEE THIS SHEET FOR DETAIL
W	WEDGING EXISTING PAVEMENT, SEE THIS SHEET FOR DETAILS
Y1	5 1/2" CONCRETE OVERLAY

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

–L– STA. 414+50.00 TO –L– STA. 468+65.00
–Y2– STA. 23+94.34 TO –Y2– STA. 78+67.46

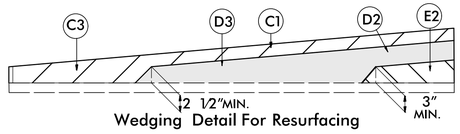
NOTE: USE FULL DEPTH PAVEMENT AS FOLLOWS:
–Y2– STA. 33+11.10 TO –Y2– STA. 41+50.00

TYPICAL SECTION NO. 1A

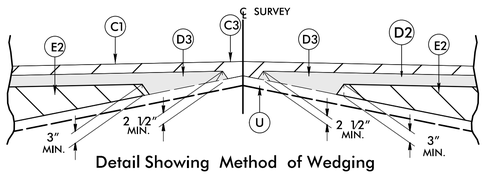
USE TYPICAL SECTION NO. 1A

–L– STA. 468+65.00 TO –L– STA. 474+19.52

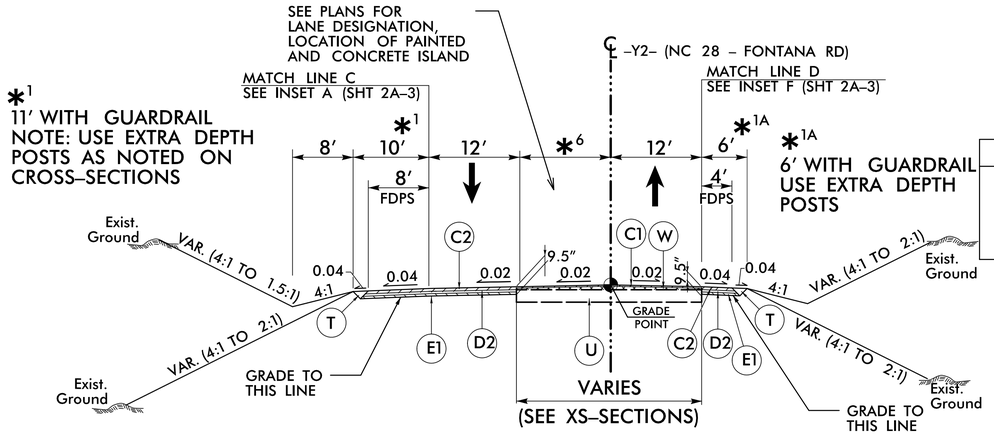
	WIDTH	STA TO STA
*5A	12′ TO 0′	–L– STA. 468+65.00 TO –L– STA. 472+25.36, LT
	0′	–L– STA. 472+25.36 TO –L– STA. 474+19.52, LT
*5B	12′	–L– STA. 468+65.00 TO –L– STA. 472+25.36, LT
	12′ TO 20′	–L– STA. 472+25.36 TO –L– STA. 473+57.81, LT
	20′	–L– STA. 473+57.81 TO –L– STA. 474+19.52, LT
*5C	0′ TO 12′	–L– STA. 470+50.00 TO –L– STA. 471+50.00, RT
	12′	–L– STA. 471+50.00 TO –L– STA. 474+19.52, RT



Wedging Detail For Resurfacing



Detail Showing Method of Wedging



TYPICAL SECTION NO. 2

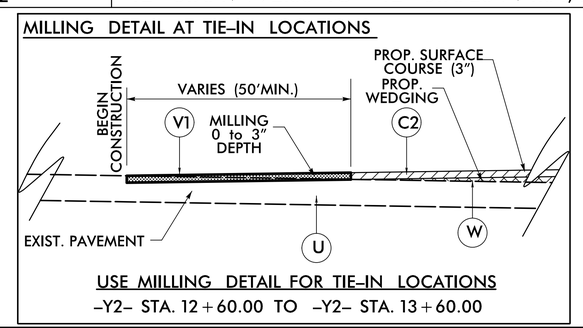
USE TYPICAL SECTION NO. 2

–Y2– STA. 13+60.00 TO –Y2– STA. 23+94.34

NOTE:
TRANSITION BETWEEN EXISTING AND TYP. SECT. NO 2 AS FOLLOWS:
–Y2– STA. 12+60.00 TO –Y2– STA. 13+60.00

	WIDTH	STA TO STA
*6	0′	–Y2– STA. 13+60.00 TO –Y2– STA. 14+32.33, LT
	0′ TO 12′	–Y2– STA. 14+32.33 TO –Y2– STA. 19+72.33, LT
	12′	–Y2– STA. 19+72.33 TO –Y2– STA. 23+94.34, LT

MILLING DETAIL AT TIE–IN LOCATIONS



USE MIILLING DETAIL FOR TIE–IN LOCATIONS

–Y2– STA. 12+60.00 TO –Y2– STA. 13+60.00

NOTE:
ANYWHERE ALONG THE PROJECT IN WHICH LESS THAN 3" OF OVERLAY HAS BEEN CALLED FOR THE CONTRACTOR SHALL MILL EXISTING PAVEMENT AND PROVIDE A MINIMUM OF TWO FULL LAYERS OF S9.5C TO SATISFY RIDEABILITY REQUIREMENTS PER CONTRACT FOR –L– AND –Y2–.

PROJECT REFERENCE NO.	SHEET NO.
A–0009CC	2A–1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035018 JIMMY L. TERRY
11/15/2022

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041986 MATTHEW D. BREWER
11/15/2022

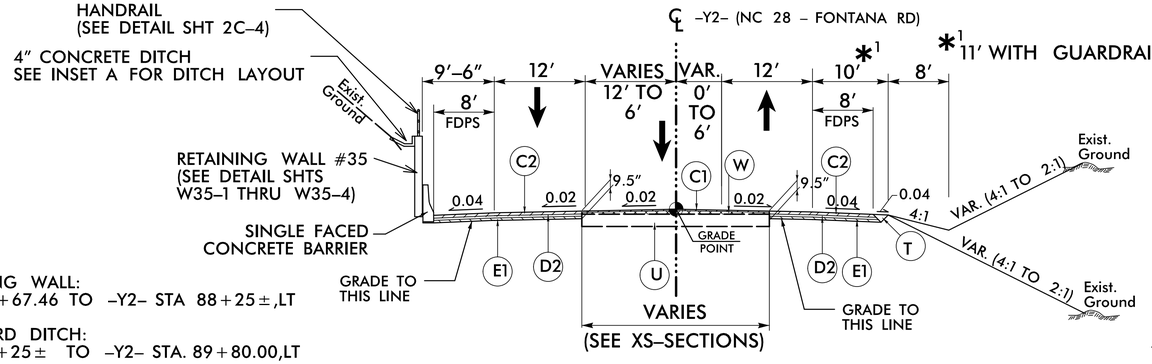
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

6/2/99

PAVEMENT SCHEDULE	
C1	1.5″ S9.5C
C2	3″ S9.5C
D2	2 ½″ I19.0C
E1	4″ B25.0C
K	CL IV SUBGRADE STABILIZATION
J1	6″ ABC
N	GEOTEXTILE FOR PAVEMENT STABILIZATION
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
SEE SHEET 2A-1 FOR DETAILED PAVEMENT SCHEDULE.

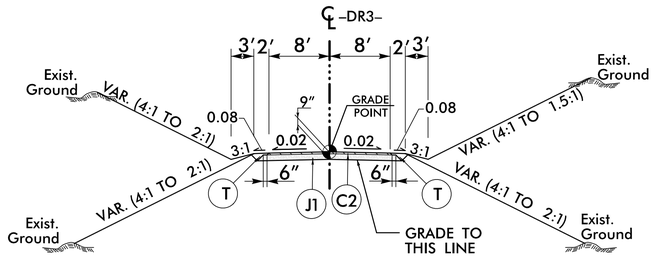


NOTE:
USE RETAINING WALL:
–Y2– STA 78+67.46 TO –Y2– STA 88+25±,LT

USE STANDARD DITCH:
–Y2– STA. 88+25± TO –Y2– STA. 89+80.00,LT

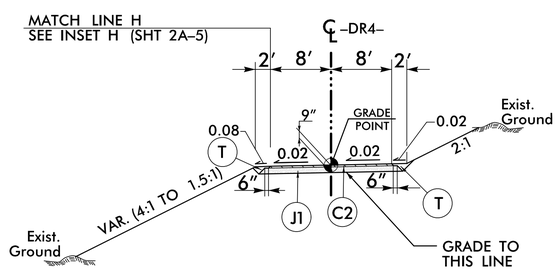
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
–Y2– STA. 78+67.46 TO –Y2– STA. 89+80.00



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
–DR3– STA. 10+20.00 TO –DR3– STA. 11+72.03

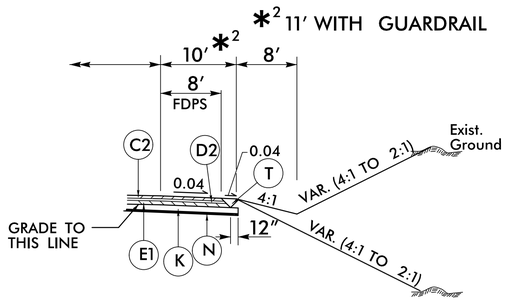


TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
–DR4– STA. 10+12.13 TO –DR4– STA. 11+10.00

NOTE: ROCK EMBANKMENT
–DR4– STA 10+45 TO –DR4– STA. 11+25, LT
SEE XS–SECT AND DETAIL SHT 2G–2

GEOTEXTILE FOR PAVEMENT STABILIZATION DETAIL



STA TO STA		LOC
–Y2– STA. 23+50	TO –Y2– STA. 28+00	LT & RT
–Y2– STA. 32+50	TO –Y2– STA. 33+00	LT & RT
–Y2– STA. 35+75	TO –Y2– STA. 36+25	LT & RT
–Y2– STA. 47+50	TO –Y2– STA. 52+50	LT & RT
–Y2– STA. 55+00	TO –Y2– STA. 70+00	LT & RT
–Y2– STA. 85+00	TO –Y2– STA. 88+50	RT

AREAS WILL BE INVESTIGATED DURING CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2A-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 ENGINEER JIMMY L. TERRY
11/4/2022

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041986 ENGINEER MATTHEW BREWER
11/3/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

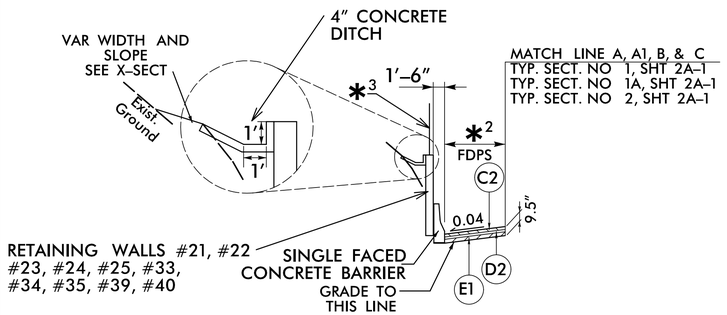
TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

6/2/99

PAVEMENT SCHEDULE	
C1	1.5″ S9.5C
C2	3″ S9.5C
D2	2 ½″ I19.0C
E1	4″ B25.0C
J2	4″ ABC
R2	EXPRESSWAY GUTTER
R4	SHOULDER BERM GUTTER
R5	5″ MONOLITHIC CONCRETE ISLAND
Y1	5 1/2″ CONC. OVERLAY

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE. SEE SHEET 2A-1 FOR DETAILED PAVEMENT SCHEDULE.

INSET A:



USE INSET A

SEE TABLE FOR ✱2 WIDTH:
–L– STA. 420+39± TO –L– STA. 436+65±, LT

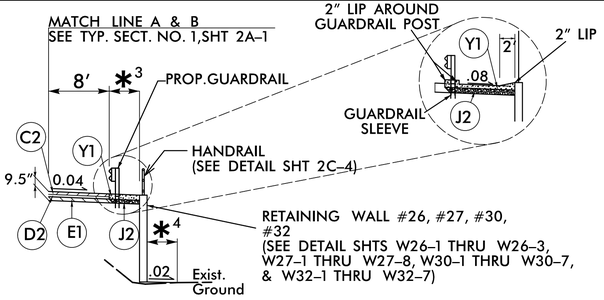
	STATION TO STATION	SHOULDER WIDTH
✱2	–L– STA 420+39± TO 422+13±	VARIES 18′–1″ TO 8′–0″
	–L– STA 422+13± TO 428+94±	8′–0″
	–L– STA 428+94± TO 430+25±	VARIES 8′–0″ TO 19′–6″
	–L– STA 430+25± TO 436+65±	19′–6″

✱2 = 8′–0″:
–L– STA. 438+97± TO –L– STA. 442+58±, LT
–L– STA. 448+40± TO –L– STA. 452+25±, LT
–L– STA. 453+25± TO –L– STA. 456+25±, LT
–L– STA. 468+75± TO –L– STA. 471+75±, LT
–Y2– STA. 14+59± TO –Y2– STA. 16+25±, LT
–Y2– STA. 16+75± TO –Y2– STA. 18+70±, LT
–Y2– STA. 63+75± TO –Y2– STA. 66+03±, RT
–Y2– STA. 71+25± TO –Y2– STA. 72+75±, LT
–Y2– STA. 77+94± TO –Y2– STA. 78+67.46, LT

✱3	5′ WOVEN WIRE FENCE	#21, #22, #23, #24, #25 SEE DETAIL SHT 2B–2
	HANDRAIL	#33, #34, #35, #39, #40 SEE DETAIL SHT 2C–4

(FOR RETAINING WALLS SEE DETAIL SHTs W21–1 THRU W21–5, W22–1 THRU W22–3, W23–1 THRU W23–3, W24–1 THRU W24–3, W25–1 THRU W25–3, W33–1 THRU W33–3, W34–1 THRU W34–2, W35–1 THRU W35–4, & W39_40–1 THRU W39_40–3)

INSET B:



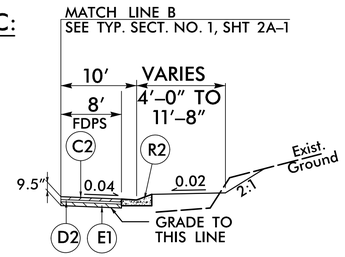
USE INSET B

(✱3=6′, ✱4=4′)
–L– STA. 421+36± TO –L– STA. 423+54±, RT
(✱3=VARIES 7′ TO 9′–10″ ✱4=10′)
–L– STA. 427+36± TO –L– STA. 431+45±, RT

} EXISTING RETAINING WALL TO REMAIN AND NEW WALL CONSTRUCTED IN FRONT WITH MIN. 1′ SEPARATION.

(✱3=5′–6″, ✱4=10′)
–Y2– STA. 26+50± TO –Y2– STA. 28+75±, LT
–Y2– STA. 63+22± TO –Y2– STA. 66+83±, LT

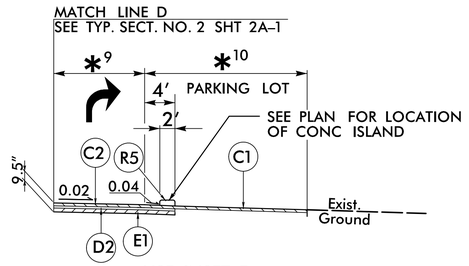
INSET C:



USE INSET C

–Y2– STA. 51+25.00 TO –Y2– STA. 57+76±, RT

INSET F:

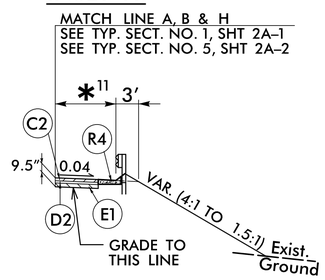


USE INSET F

–Y2– STA. 18+90.00 TO –Y2– STA. 21+91.72, RT

	WIDTH	STA TO STA
✱9	0′ TO 12′	–Y2– STA. 18+75.00 TO –Y2– STA. 19+25.00
	12′	–Y2– STA. 19+25.00 TO –Y2– STA. 21+91.72
✱10	0′ TO 21.45′	–Y2– STA. 19+41± TO –Y2– STA. 20+07±
	40.35′	–Y2– STA. 20+07± TO –Y2– STA. 21+43±
	40.35′ TO 0′	–Y2– STA. 21+43± TO –Y2– STA. 21+91.72

INSET H:

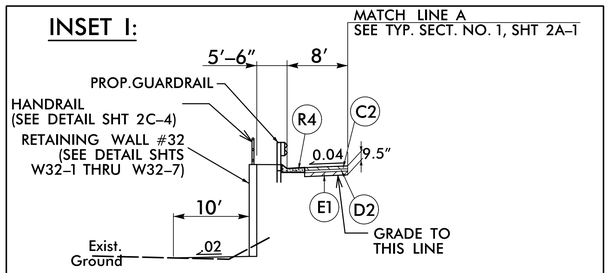


USE INSET H

✱11 – 10′–3″
–L– STA. 438+00± TO –L– STA. 448+97±, RT
–L– STA. 451+86± TO –L– STA. 453+62±, RT

✱11 – 8′
–Y2– STA. 27+00± TO –Y2– STA. 28+25±, RT
–Y2– STA. 47+50± TO –Y2– STA. 52+57±, LT
–DR4– STA. 10+36±, LT TO –Y2– STA. 70+50±, RT

INSET I:



USE INSET I

–Y2– STA. 58+90± TO –Y2– STA. 63+22±, LT

PROJECT REFERENCE NO.	SHEET NO.
A–0009CC	2A–3

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
10/18/2022

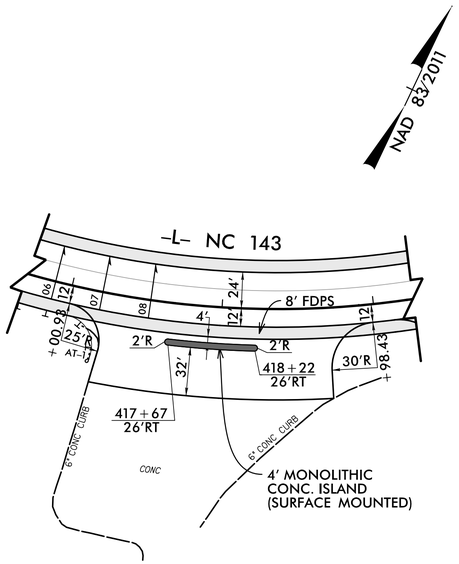
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041986 MATTHEW D. BREWER
10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

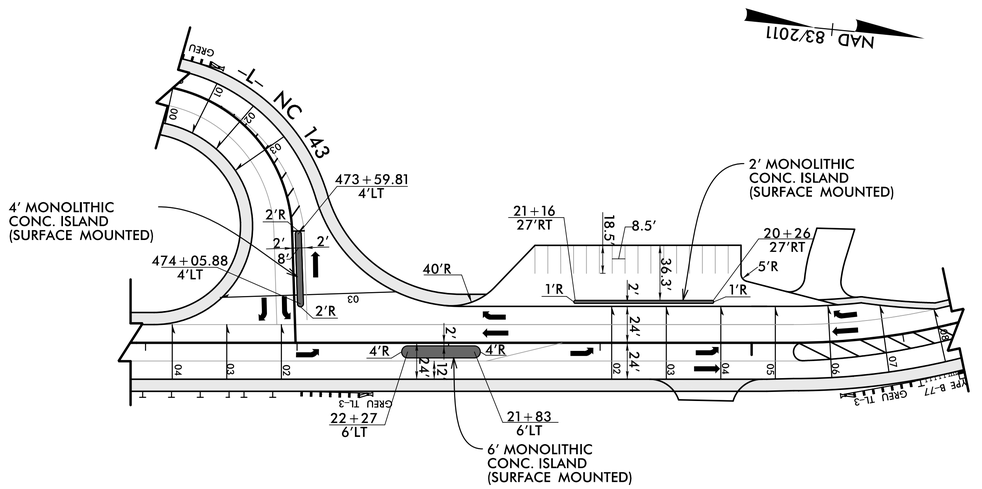
TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

8/17/99

REVISIONS



SEE PLAN SHEET NO. 35 FOR PLAN



SEE PLAN SHEET NO. 39 FOR PLAN

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L TERRY

10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

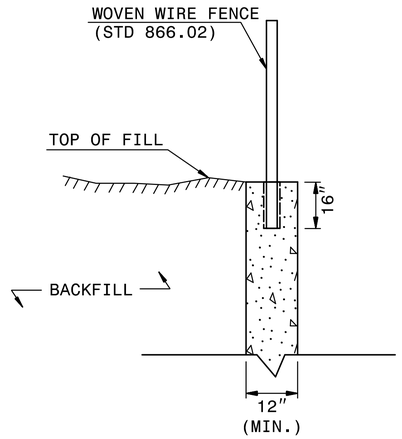
TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

50' 0' 50' 100'
25'

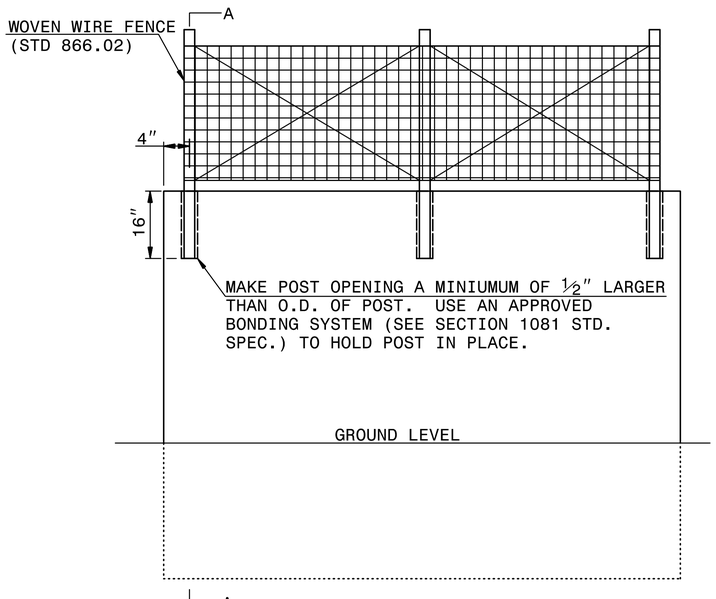
LAYOUT OF MONOLITHIC CONCRETE ISLANDS, 8" CONCRETE CURB AND MISC. DRIVES

10/17/2022
N:\NCDOT\A-0009\Roadway\Proj\A-0009CC Plan Sheets\A-0009CC_Rdy_Detail Sht_02B-1(Conc Island Layout).dgn
User:jmelvin

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2B-2



SECTION A-A
RETAINING WALL



ELEVATION VIEW
OF RETAINING WALL

EMBED WOVEN WIRE FENCE 16″ INTO PROPOSED WALL IN A SLEEVE OR BLOCKOUT WITH EPOXY OR CONCRETE GROUT ANCHORING SYSTEM. PRE-MEASURE AND CENTER THE PROPOSED FENCE ON TOP OF WALL FOR POST SPACINGS. IF DRILLING THE HOLES FOR POSTS, USE A ROTARY DRILL TO DRILL HOLES IN THE CONCRETE. NO IMPACT DRILLS WILL BE ALLOWED, TO ELIMINATE ANY POSSIBILITY OF STRUCTURAL DAMAGES TO THE PROPOSED WALL.

10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WOVEN WIRE FENCE ON RETAINING WALL

ORIGINAL BY:	C.B. PRUETT	DATE:	MAY 2022
MODIFIED BY:	S. G. MELVIN	DATE:	JUNE 2022
CHECKED BY:		DATE:	
FILE SPEC.:			

10/17/2022
X:\NCDOT\A-0009\Roadway\Proj\A-0009CC Plan Sheets\A-0009CC_Rdy_Detail Sht_02B-2\Woven Wire Fence on Retaining Wall.dgn
User:smelvin

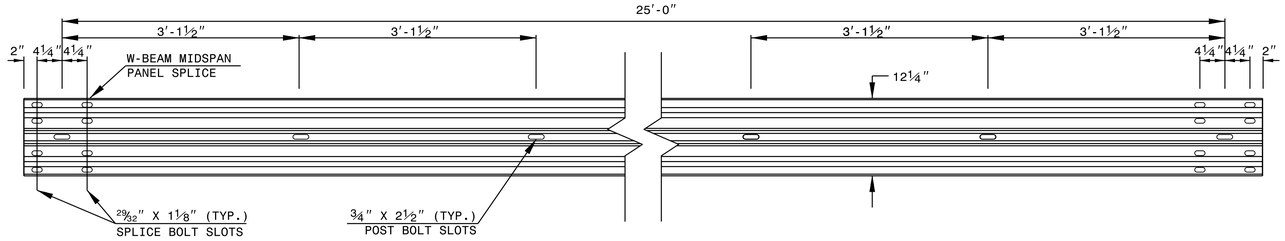
PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2C-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

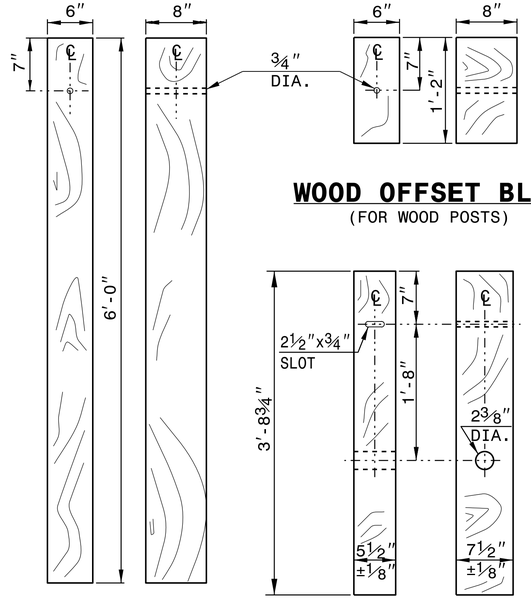
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



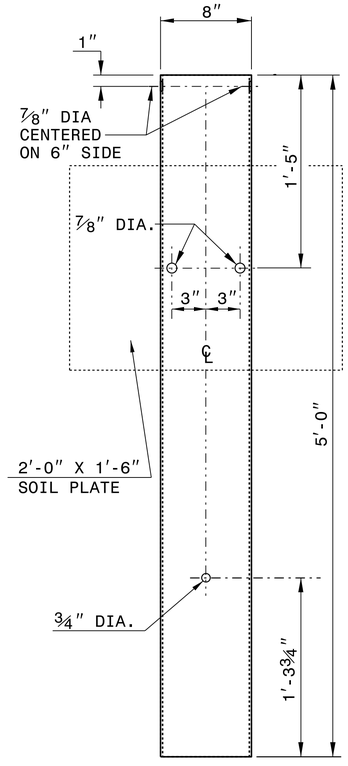
STANDARD W-BEAM GUARDRAIL



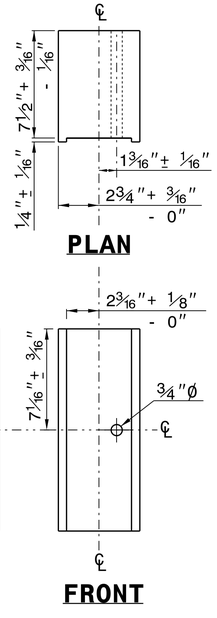
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



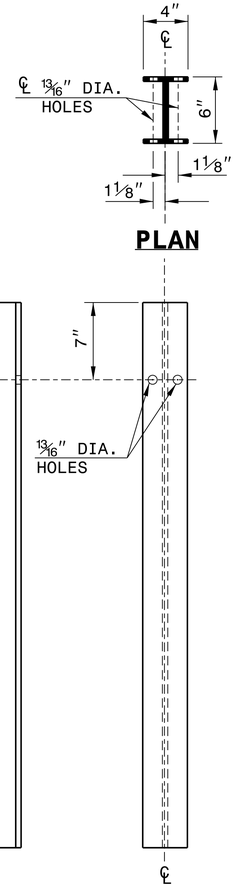
STEEL TUBE
TS 6"x8"x0.1875"



PLAN

SIDE **FRONT**

ROUTED OFFSET BLOCK



PLAN

SIDE **FRONT**

"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

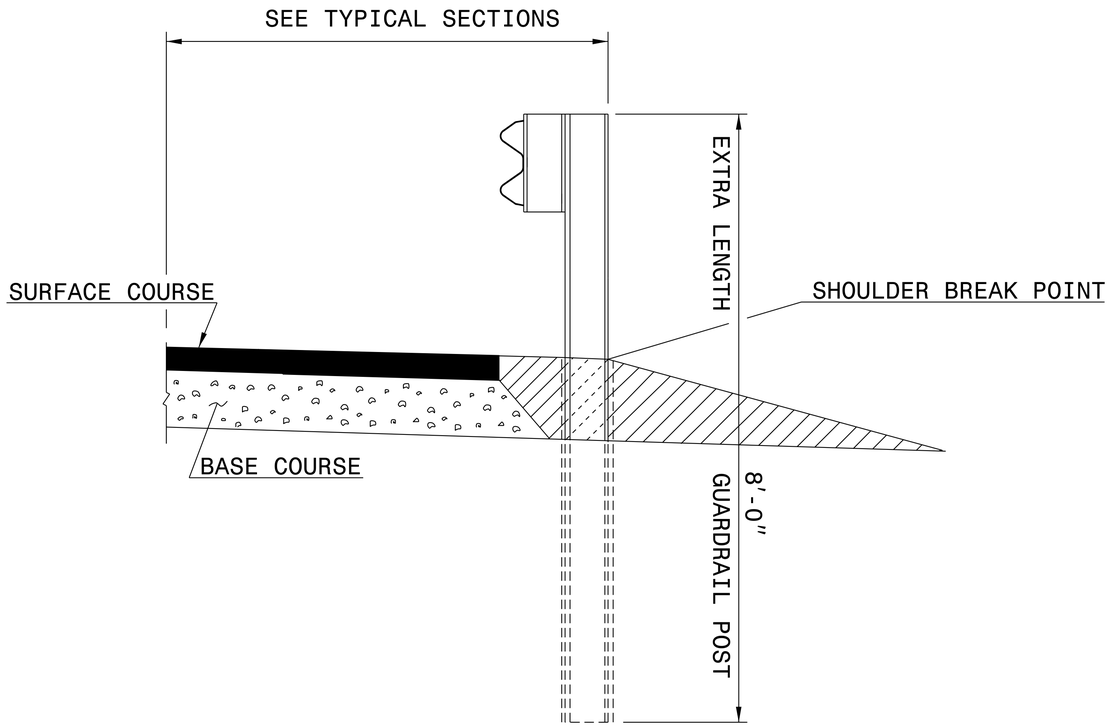
10/18/2022

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

SEE TITLE BLOCK

ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2C-2



NORTH CAROLINA
PROFESSIONAL
Ryan Davenport
SEAL
022071
ENGINEER
RYAN DAVENPORT JR

10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

8' GUARDRAIL POST

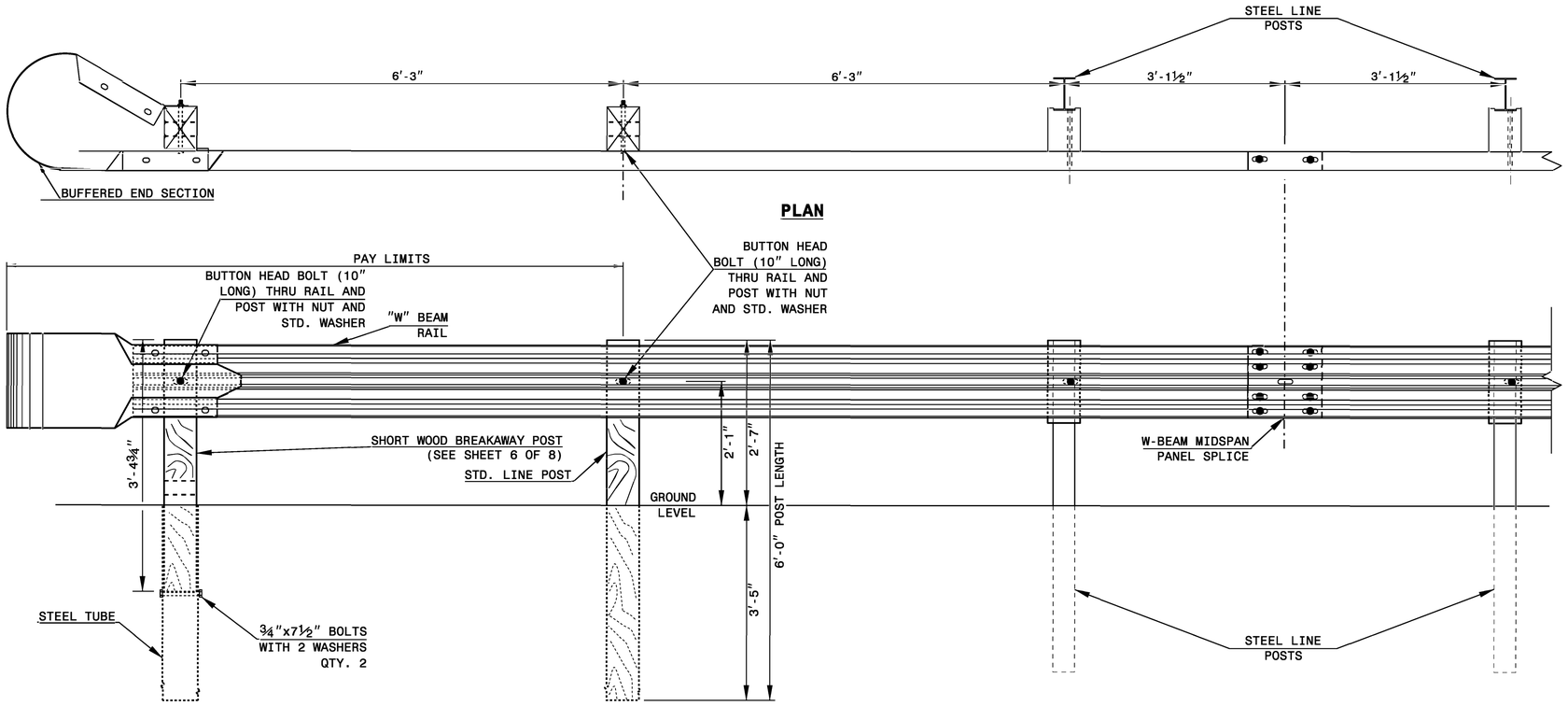
ORIGINAL BY: L. Robinson DATE: 1995
MODIFIED BY: L. Robinson DATE: Feb. 1996
CHECKED BY: DATE:
FILE SPEC.: s:7'postguardrail.dgn

09-MAY-2018 14:21
S:\Contracts\Contracts\Special Details\jhowerton\7'postguardrail.dgn
jhowerton AT CSD-242595

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2C-3

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

SHEET OF

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

NORTH CAROLINA
PROFESSIONAL
SEAL
022071
ENGINEER
RONALD ELTON DAVENPORT JR.

10/18/2022

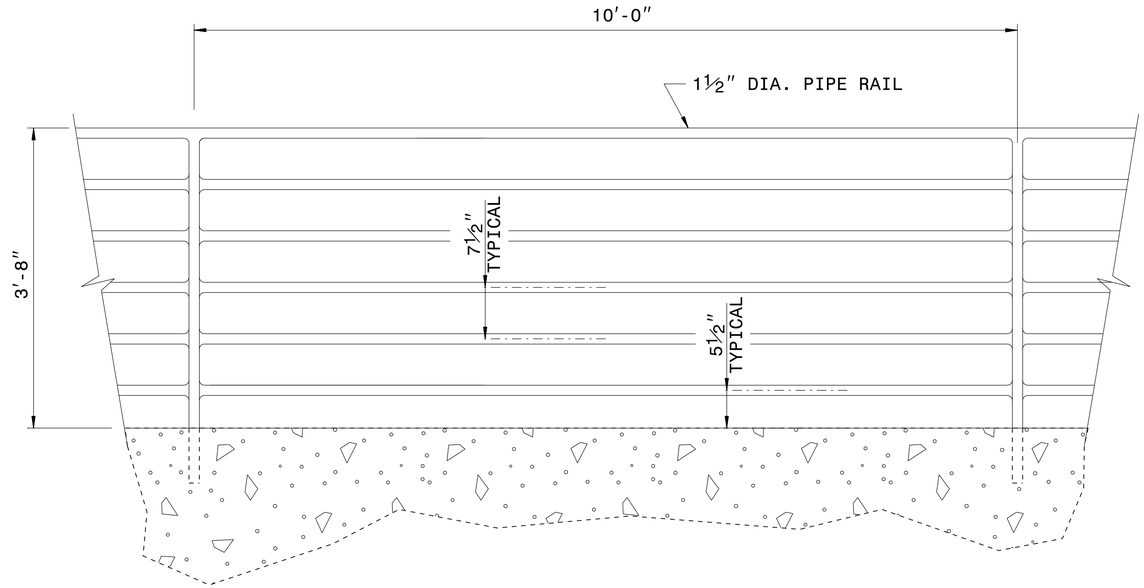
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

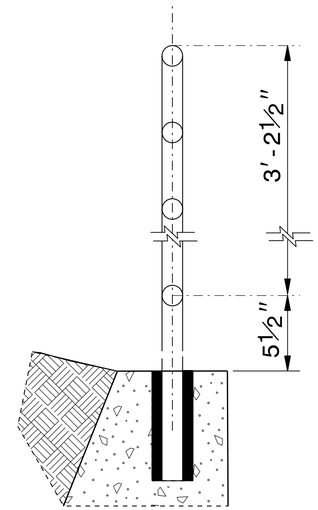
A.T.-1 SYSTEM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

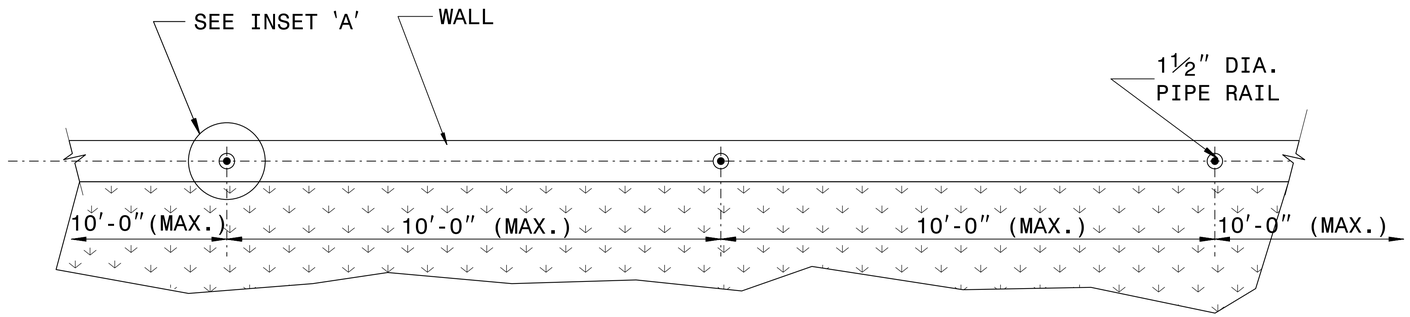
PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2C-4



ELEVATION OF HANDRAIL



INSET 'A'



PLAN VIEW

NOTES:

CONSTRUCT PROPOSED STEEL PIPE RAIL 1½″ DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53.

EMBED PIPE RAIL INTO PROPOSED WALL WITH CHEMICAL OR CONCRETE GROUT ANCHORING SYSTEM PER THE WALL MANUFACTURER'S RECOMMENDATIONS.

REPAIR GALVANIZING IN ACCORDANCE WITH SECTION 1076 OF THE NCDOT STANDARD SPECIFICATIONS.

PAINT, IF REQUIRED BY THE ENGINEER, IN ACCORDANCE WITH SECTION 1080 OF THE STANDARD SPECIFICATIONS.

CENTER THE PROPOSED RAILING ON TOP OF THE WALL WITH POST SPACING SYMMETRICAL ABOUT THE CENTER-LINE OF THE WALL.

WELD IN ACCORDANCE WITH ARTICLE 1072-18 OF THE STANDARD SPECIFICATIONS.

SUBMIT THE ATTACHMENT OF THE HANDRAIL TO THE RETAINING WALL TO THE CONTRACTS AND STANDARDS OFFICE FOR APPROVAL.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA — PROFESSIONAL ENGINEER SEAL 022071 — Ron Vaughan — ROWAN-COOLEEMEE-MOCKSVILLE-YADKINVILLE-STATESVILLE-MOORESVILLE-TROUTMAN-DAVIDSON

10/18/2022

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

DETAIL OF PIPE HANDRAIL MOUNTED ON A WALL

ORIGINAL BY: E.E. WARD DATE: 12-99
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: jhowerton/handrail on retaining wall.dgn

24-MAY-2018 14:10
S:\Contracts\Contracts\Special Details\jhowerton\Handrail on Retaining Wall.dgn
jhowerton AT CSD-292595

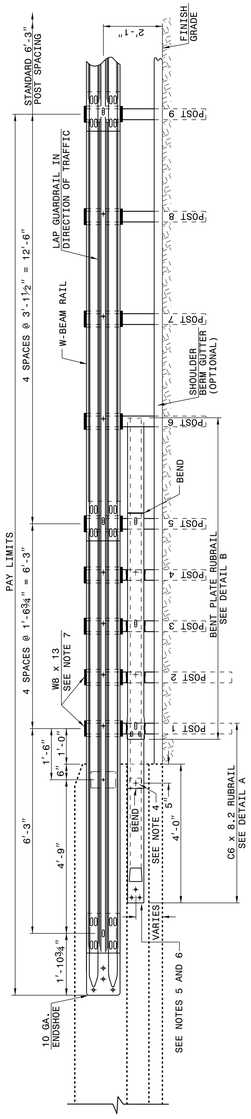
PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2C-5

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

ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT
TYPE B-77 SHOP CURVED

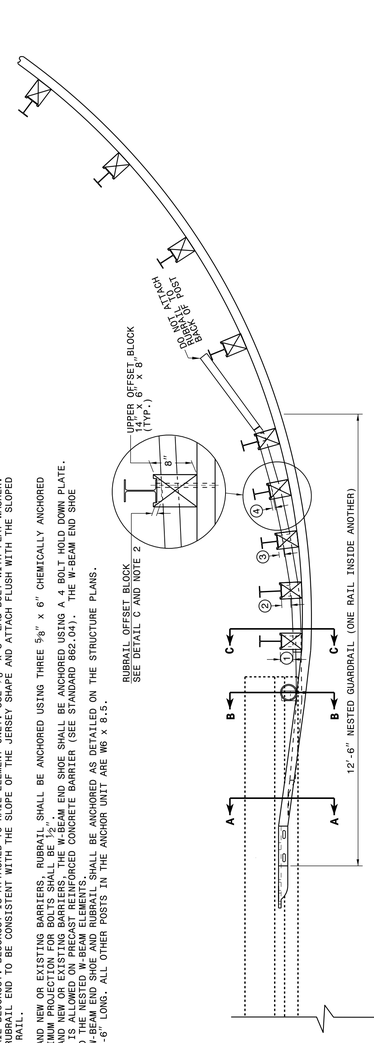
SHEET 1 OF 2
B-77SC

ELEVATION



GENERAL NOTES:
1) POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL; DRILL HOLE AS DETAILED ON STANDARD 862.04.
2) RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH ⅝" BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4; SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3. RUBRAIL IS SECURED TO POST 5 WITH A ⅝" x 4½" BUTTONHEAD BOLT. RUBRAIL IS ATTACHED TO BACK OF POSTS 6 AND 7 WITH A ⅝" x 2½" BUTTONHEAD BOLT.
3) STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH ⅝" x 1¼" LONG BUTTONHEAD BOLT AND RECTANGULAR PLATE WASHER.
4) SEE DETAIL C FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE ⅜" x 3" LAG BOLT WITH FLAT WASHER. SHOP FABRICATE THE 6 x 8.2 RUBRAIL TO BE CONSISTENT WITH THE SLOPE OF THE JERSEY SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
5) ANCHORAGE:
   (a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, RUBRAIL SHALL BE ANCHORED USING THREE ⅝" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHER. MAXIMUM PROJECTION FOR BOLT SHALL BE 2". USE 3" MINIMUM EMBEDMENT.
   (b) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, THE W-BEAM END SHOE SHALL BE ANCHORED USING A 4 BOLT HOLD DOWN PLATE. A 4 BOLT INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (SEE STANDARD 862.04). THE W-BEAM END SHOE SHALL BE INSTALLED BEHIND THE NESTED W-BEAM ELEMENTS.
   (c) AT FREE STANDING BRIDGE RAIL, THE RUBRAIL SHALL BE ANCHORED AS DETAILED ON THE STANDARD.
6) POSTS 1 AND 2 ARE W8 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.

SEE ROADWAY PLANS FOR END TREATMENT



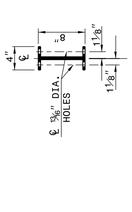
PLAN

GUARDRAIL ANCHOR UNIT TYPE B-77

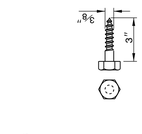
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

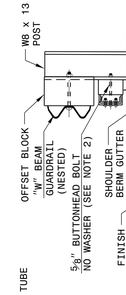
ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT
TYPE B-77 SHOP CURVED

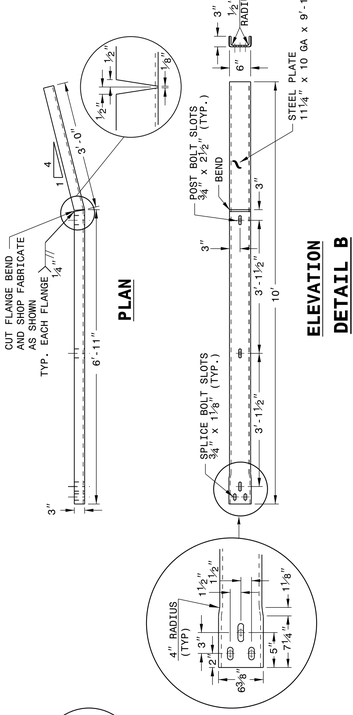
SHEET 2 OF 2
B-77SC

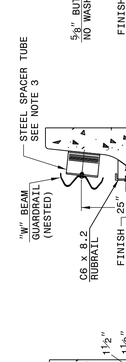


DETAIL F STEEL POST "W8 X 13 X 7'-6"



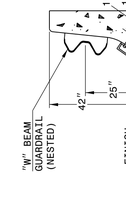




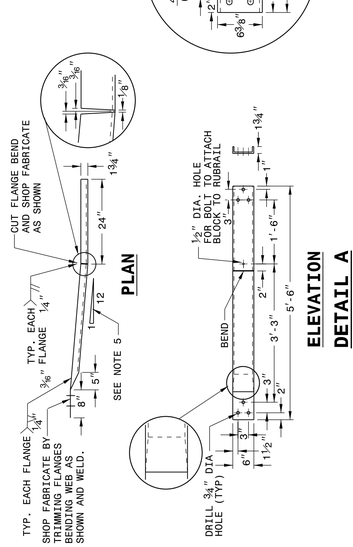


RUBRAIL BLOCKS 7" HIGH x 4" WIDE		
POST	THICKNESS	BOLT LENGTH
①	4¼"	9"
②	3¼"	5"*
③	2"	6"
④	1"	3"*

* BOLTS FOR POSTS 2 AND 4 ARE USED TO ATTACH BLOCK TO POST. RUBRAIL NOT ATTACHED TO BLOCK.



DETAIL C
RUBRAIL BLOCKOUT



GUARDRAIL ANCHOR UNIT TYPE B-77

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE: 06-04-04
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: miscguardrail/NCHRP350approved/B-77.dgn

10-SEP-2019 11:42
S:\Contracts\Special Details\jhowerton\B-77 Shop Curved.dgn
jhowerton
AT CSD-292595

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2D-1

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL GRATED 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. 840.01.

CONSTRUCT WITH PIPE CROWNS MATCHING.

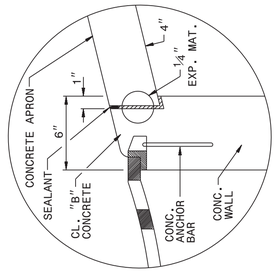
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20 (NOT SHOWN) OR 840.29 (NOT SHOWN).

SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES.

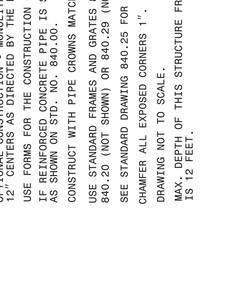
CHAMFER ALL EXPOSED CORNERS 1".

DRAWING NOT TO SCALE.

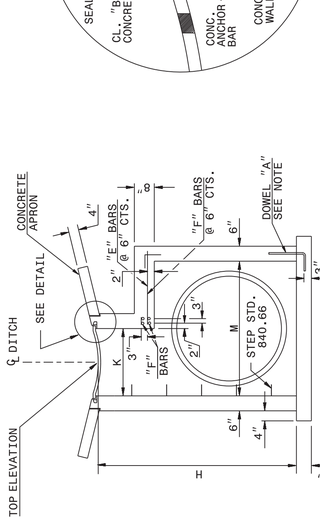
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.



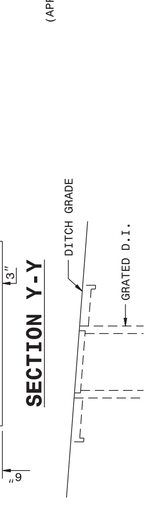
DETAIL
(APRON SUPPORT NOTCH)

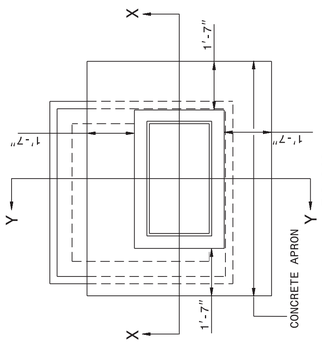


DOWEL-A

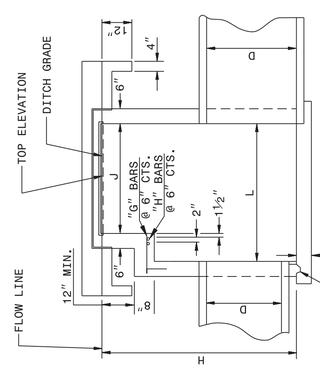


SECTION Y-Y



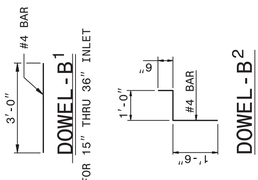


PLAN



SECTION X-X

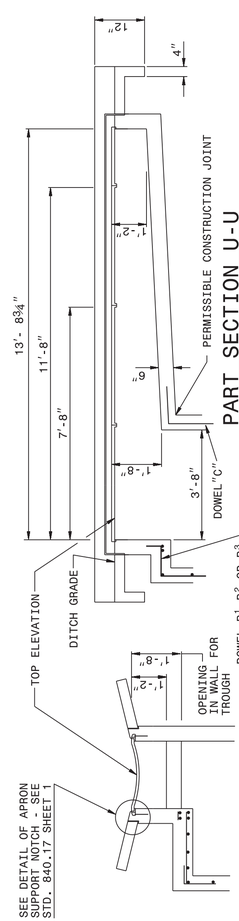
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH** 12" THRU 72" PIPE	SHEET 1 OF 2 **840d17**



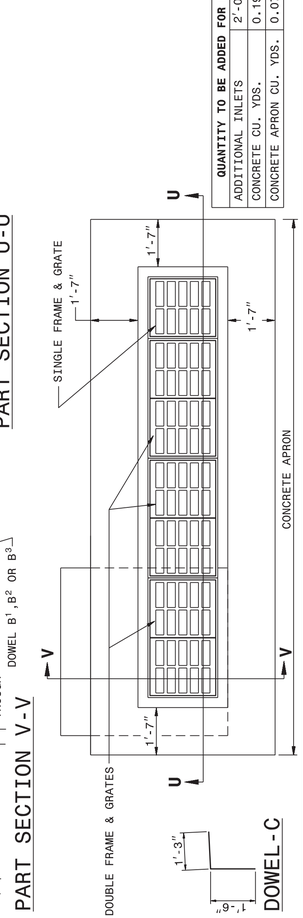
DOWEL-B¹
FOR 15" THRU 36" INLET

DOWEL-B²
FOR 42" INLET

DOWEL-B³



PART SECTION V-V



PART SECTION U-U

DOWEL-C

QUANTITY TO BE ADDED FOR EACH 2' INCREMENT INLET OPENING

	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	12'-0"
ADDITIONAL INLETS						
CONCRETE CU. YDS.	0.191	0.417	0.665	0.897	1.145	1.380
CONCRETE APRON CU. YDS.	0.074	0.148	0.222	0.296	0.370	0.444

MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE GRATED DROP INLET(BASED ON MIN. HEIGHT, H)

DIMENSIONS OF BOX AND PIPE						REINFORCING STEEL - NO. 4 BARS								CU YDS CONC. IN BOX			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	SPAN	WIDTH	HEIGHT	BARS E		BARS F		BARS G		BARS H		TOTAL LBS.	BOTTOM SLAB	H TOTAL	H PER FT HT	APRON TOTAL	C.S.	R.C.
D	J	K	L	M	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH							
12"	3'-8"	2'-0"	3'-8"	2'-0"	2'-3"	—	—	—	—	—	—	—	—	—	0.362	0.926	0.247	0.395	1.683	0.015	0.024
15"	3'-8"	2'-0"	3'-8"	2'-0"	2'-5"	—	—	—	—	—	—	—	—	—	0.362	0.988	0.247	0.395	1.745	0.023	0.036
18"				2'-0"	2'-8"	—	—	—	—	—	—	—	—	—	0.362	1.050	0.247		1.807	0.033	0.049
24"				2'-10"	3'-3"	8	1'-5"	6	4'-9"	—	—	—	—	27	0.444	1.362	0.278		2.201	0.059	0.085
30"			3'-8"	3'-5"	3'-10"	8	2'-0"	7	4'-9"	—	—	—	—	33	0.502	1.644	0.288		2.541	0.092	0.127
36"			4'-0"	4'-0"	4'-4"	8	2'-5"	8	4'-11"	4	0'-9"	2	4'-11"	47	0.560	1.931	0.321		2.920	0.132	0.178
42"			4'-10"	4'-10"	5'-0"	10	3'-1"	9	5'-7"	4	1'-5"	3	5'-7"	67	0.704	2.500	0.370		3.677	0.180	0.243
48"			5'-4"	5'-4"	5'-6"	11	3'-7"	10	6'-1"	4	1'-11"	4	6'-1"	87	0.823	3.013	0.407		4.315	0.235	0.317
54"			6'-0"	6'-0"	6'-0"	12	4'-1"	11	6'-7"	5	2'-5"	5	6'-7"	107	0.951	3.589	0.444		5.072	0.297	0.401
60"			6'-6"	6'-6"	6'-7"	13	4'-9"	12	7'-3"	5	3'-1"	6	7'-3"	135	1.311	4.539	0.494		6.170	0.367	0.495
66"			7'-2"	7'-2"	7'-1"	14	5'-4"	14	7'-10"	7	3'-7"	7	7'-10"	168	1.136	5.061	0.537		6.901	0.444	0.599
72"	3'-8"	2'-0"	7'-8"	7'-8"	7'-8"	15	5'-11"	15	8'-5"	4	4'-3"	8	8'-5"	199	1.500	5.860	0.580	0.395	7.868	0.528	0.713

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH** 12" THRU 72" PIPE	SHEET 2 OF 2 **840d17**

Kevin Howerton
SEAL 022071
ENGINEER
KEVIN HOWERTON DAVENPORT, JR.
8/2/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

ORIGINAL BY: J. Howerton DATE: 1/22/14
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: jhowerton\minimum depth type A.dgn

11-SEP-2017 11:55
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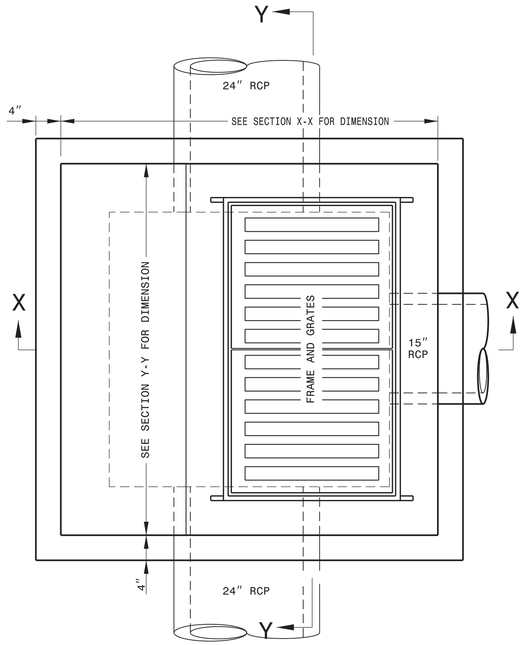
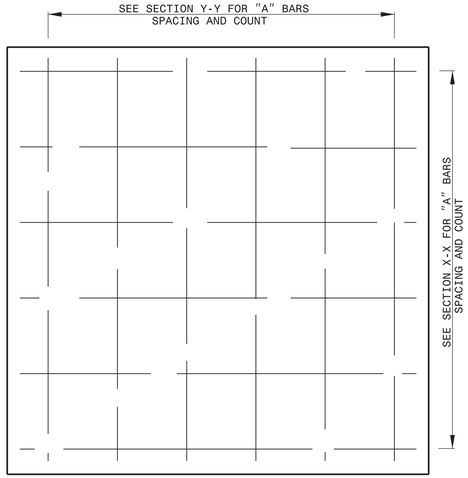
jhowerton AT CSD-2126P5

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2D-2



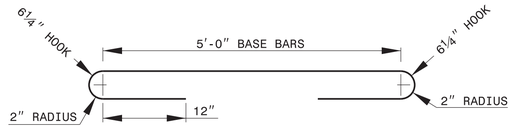
PLAN



PLAN OF BASE

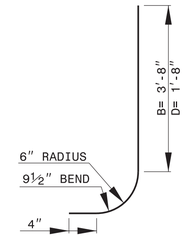
GENERAL NOTES:
-USE CLASS 'AA' CONCRETE FOR CAST IN PLACE CONCRETE BOX.
-USE CLASS 'M' CONCRETE IN THE WALL CAVITY FOR REINFORCED BRICK CONSTRUCTION AND CLASS 'AA' FOR THE FOOTING BASE.
-CHAMFER ALL EXPOSED CONCRETE CORNERS 1".
-USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
-IF PIPES ARE SET IN THE BASE FOLLOW CONSTRUCTION PROCEDURES SHOWN BY STD. DWG. 840.00.
-PRECAST UNITS MADE OF CLASS 'AA' CONCRETE MAY BE USED IN LIEU OF BRICK MASONRY CONSTRUCTION.
-INCLUDE REINFORCING STEEL COST IN THE UNIT OR LINEAR FOOT BID PRICE FOR "MASONRY DRAINAGE STRUCTURE".
-REFERENCE STD. DWG. 840.25 FOR FRAME ANCHORAGE.
-CONCRETE BRICK, JUMBO BRICK AND 4" SOLID CONCRETE BLOCK WILL BE PERMITTED.
-CONCRETE FOR BRICK BOX REFER TO SECTION 832 OF THE STANDARD SPECIFICATIONS.
-PROVIDE GRATED DROP INLETS OVER 3'-6" DEEP WITH STEPS SPACED 12" ON CENTER AS DIRECTED BY STD. DWG. 840.66.
-FRAME AND GRATES ARE SEPARATE CONTRACT ITEMS.

STRAIGHT BARS

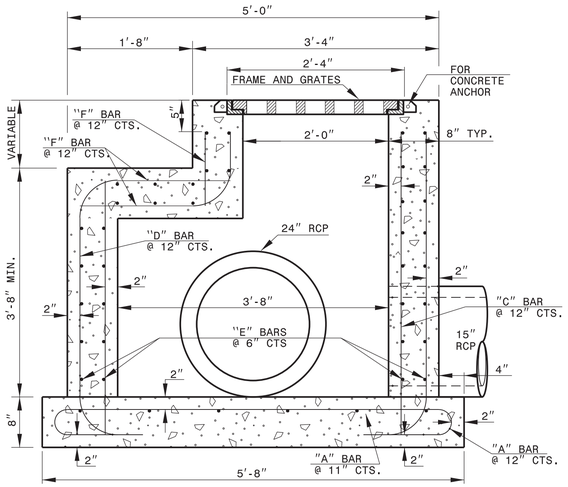


BASE BARS

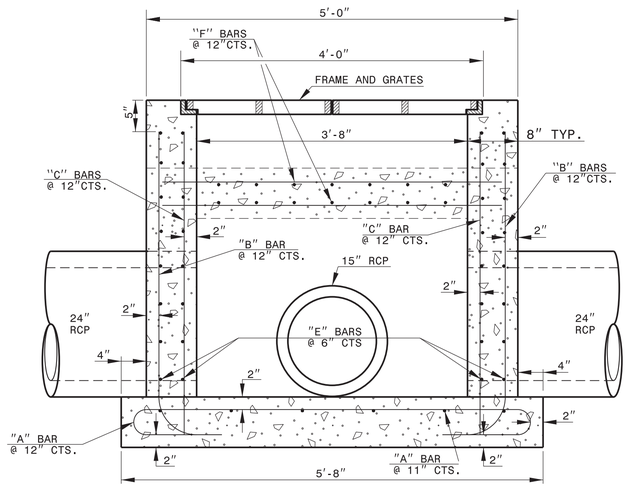
"A" BARS



CORNER BARS



SECTION X-X



SECTION Y-Y

BILL OF MATERIALS

BAR	SIZE	LENGTH	QUANTITY	WEIGHT
A	#5	8'-0½"	12	100.6
B	#5	4'-9½"	20	99.6
C	#5	5'-6"	20	114.7
D	#5	2'-9½"	16	46.6
E	#5	4'-8"	68	331.0
F	#5	2'-0"	44	91.8
REINF. STEEL (TOTAL WEIGHT LBS.)				784.3
CONCRETE IN BASE CLASS 'AA' (CUBIC YARDS)				0.79
CONCRETE IN WALLS CLASS 'AA' (CUBIC YARDS)				2.30
CONCRETE TOTAL (CUBIC YARDS)				3.09
CONC. CUBIC YARDS IN WALL/FOOT OF HEIGHT				0.46
LBS. OF REINF. STEEL IN WALL/FOOT OF HEIGHT				128.9

* PIPE DEDUCTIONS AND INLET OPENING DEDUCTION HAVE BEEN MADE.

NOTES:
-HORIZONTAL AND VERTICAL DIMENSIONS MAY BE ADJUSTED AS THE FIELD CONDITIONS AND/OR ALTERNATE DESIGN REQUIRE.
-MAXIMUM HEIGHT FOR THIS STRUCTURE SHALL BE 20'-0".
-ALL ADJUSTMENTS ARE TO BE MADE AS DIRECTED BY THE ENGINEER.
-DEPTH OF STEEL GRATE WILL REQIURE DEEPER SEAT ALONG SHORT WALLS.

8/2/2022

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

TRAFFIC BEARING DROP INLET TYPE "A"

ORIGINAL BY: tsspell DATE: 7-15-08
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: s:tspell/details/840d35_a0011bb.dgn

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

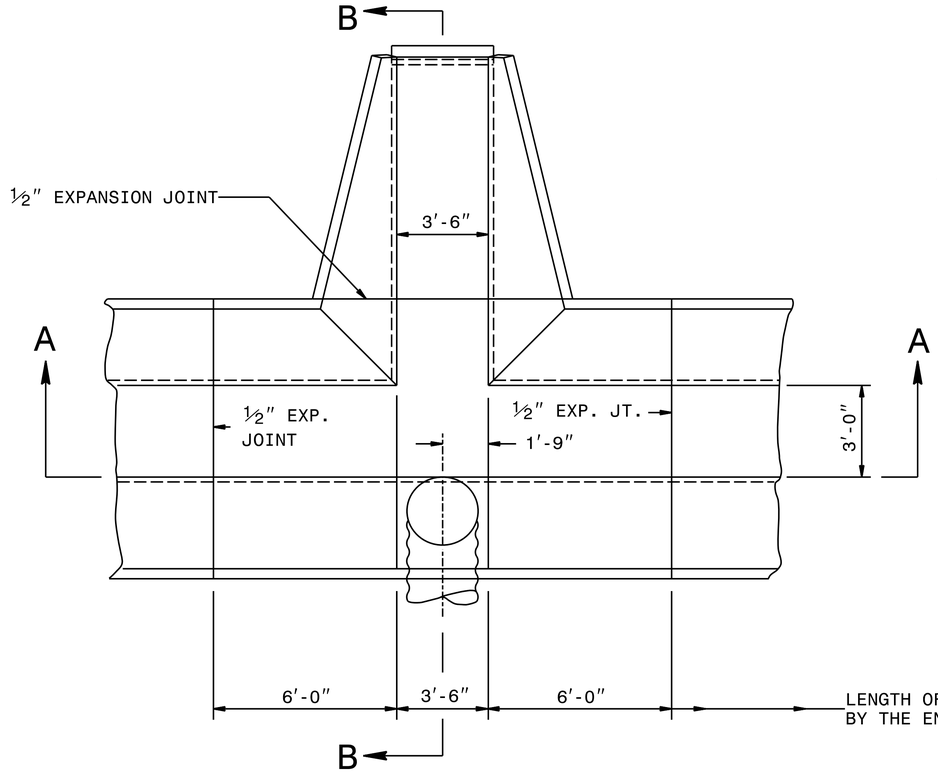
PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2D-3

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

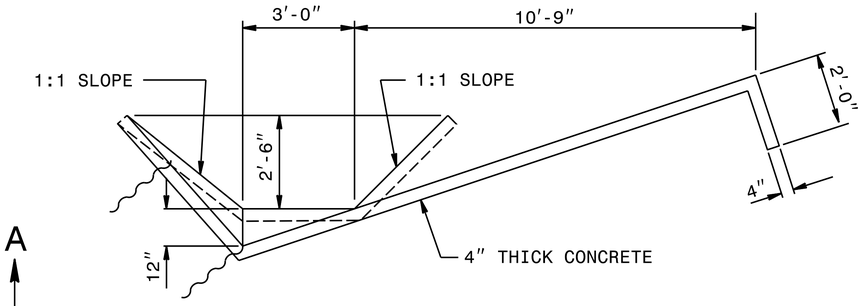
ENGLISH DETAIL DRAWING FOR

GUIDE FOR BERM DRAINAGE OUTLET

36" PIPE



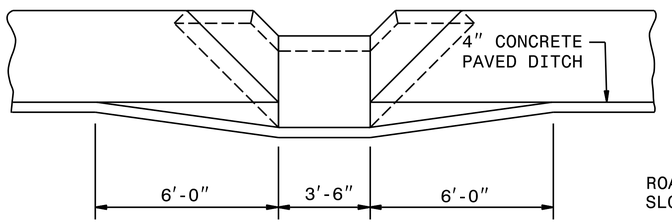
PLAN



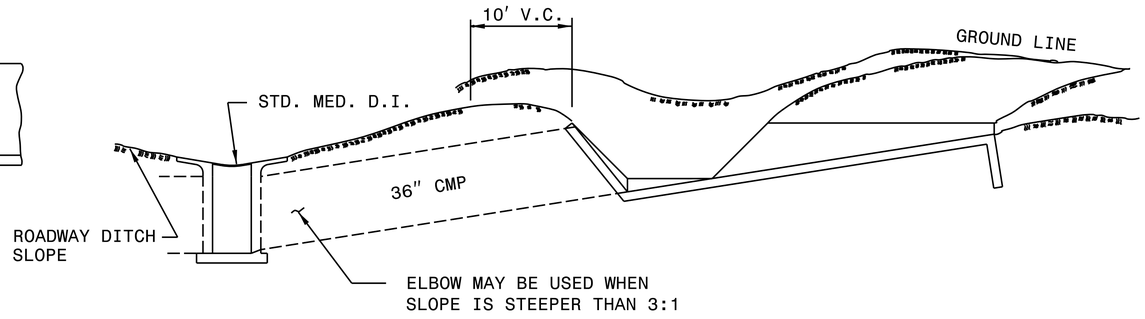
SECTION BB

GENERAL NOTES:

WHERE NECESSARY, ELBOWS MAY BE USED TO SKEW PIPE TO FIT INLETS WHERE THERE IS OFFSET BETWEEN THE INLET END AT BERM AND THE D.I.



SECTION AA



ELEVATION

SHEET 1 OF 1

DETAIL PREPARED BY:	DETAIL PREPARED FOR:
TGS ENGINEERS 706 HILLSBOROUGH ST SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	NORTH CAROLINA DEPARTMENT OF TRANSPORATION DIVISION 14 252 Webster Rd Sylva, NC 28779

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY
8/1/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
MODIFIED BY: DAVID B. PETTY DATE: 3-16-22
CHECKED BY: DATE:
FILE SPEC.: usr/details/stand/850d01.dgn

3/18/2022
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User:rrichard

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2D-4

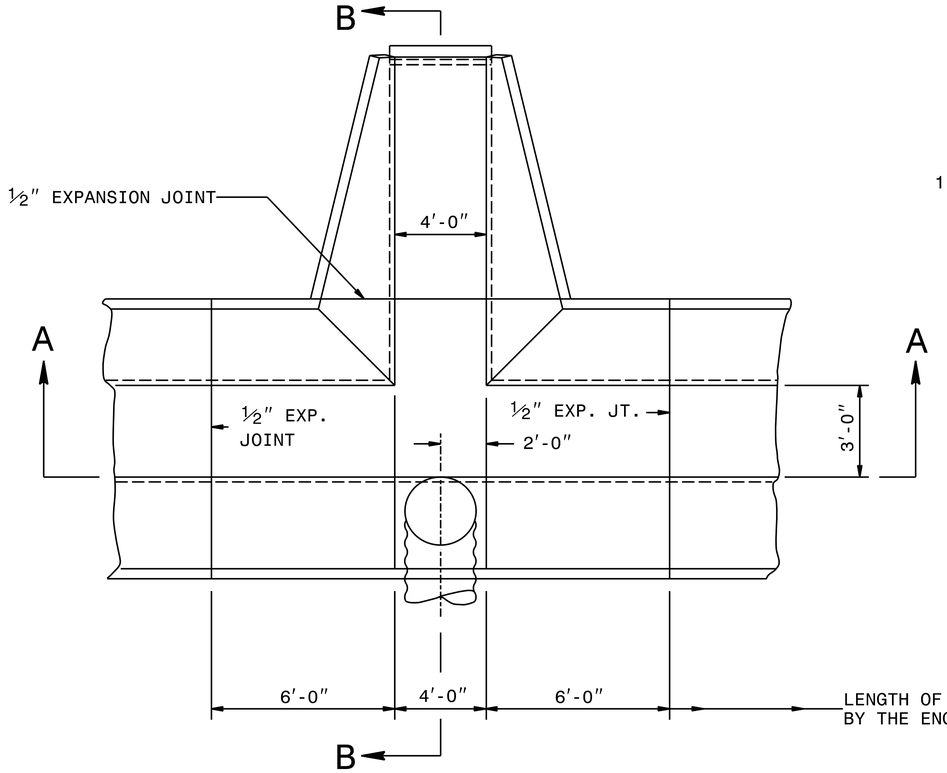
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

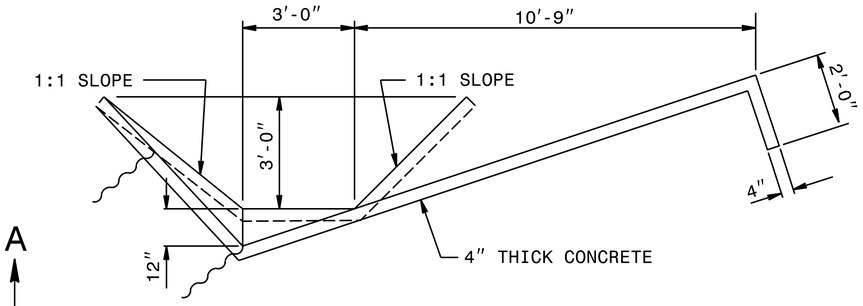
GUIDE FOR BERM DRAINAGE OUTLET

42" PIPE

SHEET 1 OF 1



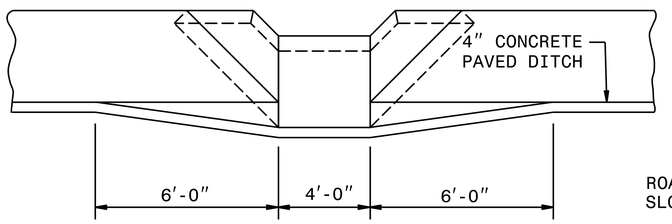
PLAN



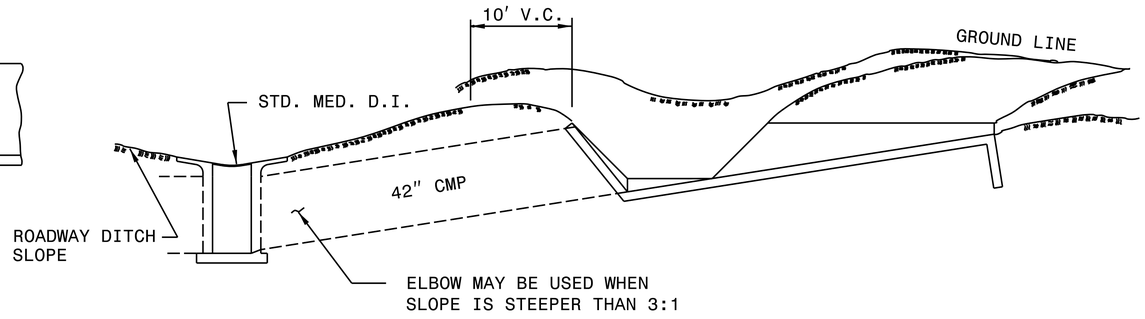
SECTION BB

GENERAL NOTES:

WHERE NECESSARY, ELBOWS MAY BE USED TO SKEW PIPE TO FIT INLETS WHERE THERE IS OFFSET BETWEEN THE INLET END AT BERM AND THE D.I.



SECTION AA



ELEVATION

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

ENGLISH DETAIL DRAWING FOR

GUIDE FOR BERM DRAINAGE OUTLET

42" PIPE

SHEET 1 OF 1

DETAIL PREPARED BY:	DETAIL PREPARED FOR:
TGS ENGINEERS 706 HILLSBOROUGH ST SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	NORTH CAROLINA DEPARTMENT OF TRANSPORATION DIVISION 14 252 Webster Rd Sylva, NC 28779

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY
8/1/2022

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STANDARDS DATE: 01-15-02
MODIFIED BY: DAVID B. PETTY DATE: 3-16-22
CHECKED BY: DATE:
FILE SPEC.: usr/details/stand/850d01.dgn

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/18/2022
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User:rrichard

24-APR-2019 07:24
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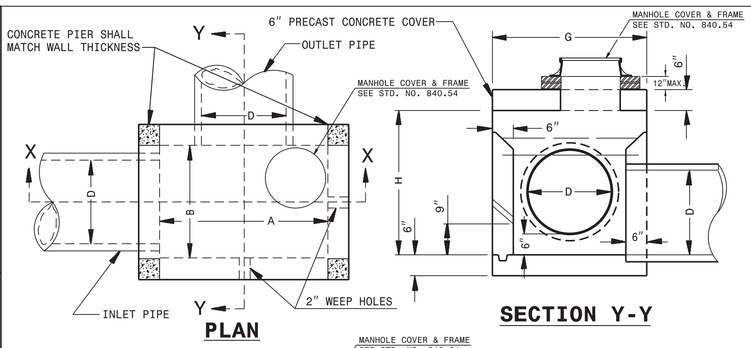
jhowerton AT CSD-292595

5/14/99

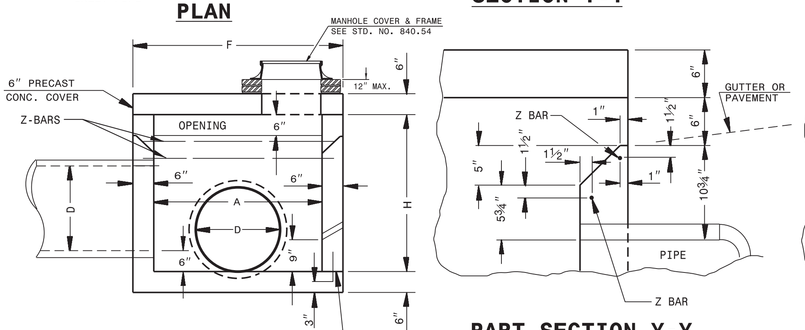
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
(3 OR 4 SIDE OPEN THROAT)
(MANHOLE OPTIONAL)



GENERAL NOTES:

ALL CATCH BASINS OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 12" ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH STD. 840.66.
ALL EXPOSED CORNERS TO BE CHAMFERED 1".
CLASS "B" CONCRETE TO BE USED THROUGHOUT.
2" PIPE WEEPHOLES TO BE PLACED AS DIRECTED BY ENGINEER.
THE 6" OPENING SHOWN MAY BE INCREASED TO 8" MAXIMUM IF DEEMED TO BE NECESSARY BY THE ENGINEER.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #5 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STD. DWG. 840.00.
A STONE DRAIN CONSISTING OF 1 CUBIC FOOT OF NO. 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT EACH WEEP HOLE.
FOR 8' IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8' IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. QUANTITIES TO BE ADJUSTED ACCORDINGLY.
DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.



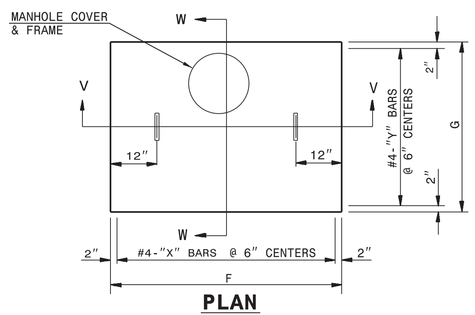
MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, H)

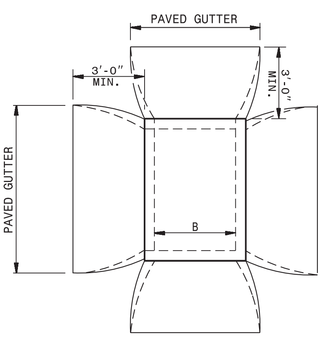
DIM'S OF BOX & PIPE				*REINFORCING*						*TOP & BOT. SLAB DIMENSIONS*		*CU. YDS. CONC. IN BOX*			*TOTAL QUANTITIES BOX & SLABS*		*DEDUCTION ONE PIPE*		*DED. ONE 6" THROAT OPENING*
PIPE	*SPAN*	*WIDTH*	*HEIGHT*	*BARS – X*		*BARS – Y*		*BARS – Z*											
D	A	B	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	F	G	TOP SLAB	BOT. SLAB	WALL/FT. HT.	LBS. REINF.	YD^3 (MIN H)	C.S.	R.C.	YD^3
12"	3'-6"	2'-3"	1'-10"	4	3'-0"	6	4'-3"	2	4'-3"	4'-6"	3'-3"	0.181	0.271	0.250	27	1.046	0.015	0.032	0.046
15"	3'-6"	2'-3"	2'-1"	4	3'-0"	6	4'-3"	2	4'-3"	4'-6"	3'-3"	0.181	0.271	0.250	27	1.108	0.023	0.036	0.046
18"	4'-0"	2'-8"	2'-4"	5	3'-5"	7	4'-9"	2	4'-9"	5'-0"	3'-8"	0.226	0.340	0.284	35	1.379	0.033	0.049	0.053
24"	4'-0"	2'-8"	2'-10"	5	3'-5"	7	4'-9"	2	4'-9"	5'-0"	3'-8"	0.226	0.340	0.284	35	1.521	0.059	0.085	0.053
30"	4'-0"	3'-6"	3'-4"	5	4'-3"	9	4'-9"	2	4'-9"	5'-0"	4'-6"	0.278	0.417	0.315	43	1.916	0.092	0.127	0.053
36"	4'-6"	4'-0"	3'-10"	5	4'-9"	10	5'-3"	2	5'-3"	5'-6"	5'-0"	0.340	0.510	0.352	51	2.390	0.132	0.178	0.059
42"	5'-0"	4'-6"	4'-4"	5	5'-3"	12	5'-9"	2	5'-9"	6'-0"	5'-6"	0.407	0.611	0.389	64	2.914	0.180	0.243	0.066
48"	5'-0"	5'-0"	4'-10"	5	5'-9"	13	5'-9"	2	5'-9"	6'-0"	6'-0"	0.444	0.666	0.407	68	3.298	0.235	0.317	0.066

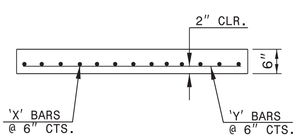
SHEET 1 OF 2
840D04

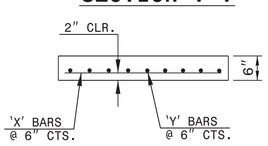
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

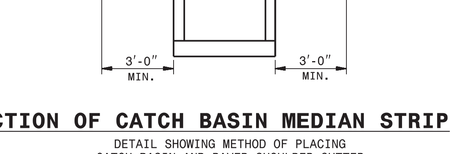
ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
(3 OR 4 SIDE OPEN THROAT)
(MANHOLE OPTIONAL)

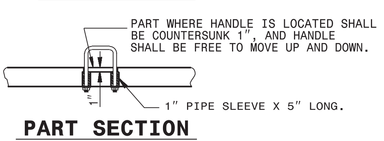


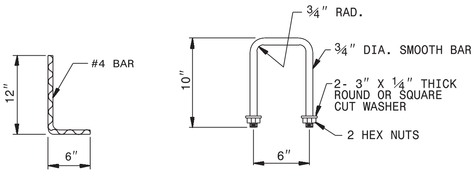












SHEET 2 OF 2
840D04

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

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
(3 OR 4 SIDE OPEN THROAT)
(MANHOLE OPTIONAL)

SEE PLATE FOR TITLE

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 07-03-2014
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/rbritt/english/hydro/840d04.dgn

PROJECT REFERENCE NO. A-0009CC
SHEET NO. 2D-5

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 041986 ENGINEER D. MATTHEW BREWER

DocuSigned by: D. Matthew Brewer 10/17/22
3861229C5A... SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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FOR USE IN THE FOLLOWING LOCATIONS, OR AS DIRECTED BY THE ENGINEER.

STATIONS:

-DR4- 10+45 TO 11+25, LT

NOTES:

FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS SPECIAL PROVISION

CONSTRUCT ROCK EMBANKMENTS AS SHOWN IN THE DETAIL AND IN ACCORDANCE WITH THE ROCK EMBANKMENTS SPECIAL PROVISION

USE SELECT MATERIAL, CLASS VII, RIP RAP CLASS A, RIP RAP CLASS B, AND SELECT MATERIAL, CLASS VI TO CONSTRUCT ROCK EMBANKMENTS AS SHOWN. RIP RAP CLASS A AND SHALL BE USED TO CHOKE OFF VOIDS IN SELECT MATERIAL, CLASS VII BEFORE PLACING SEPARATION GEOTEXTILES AND SELECT MATERIAL, CLASS IV.

SELECT MATERIAL, CLASS VII AND RIP RAP CLASS A AND B SHALL MEET THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS

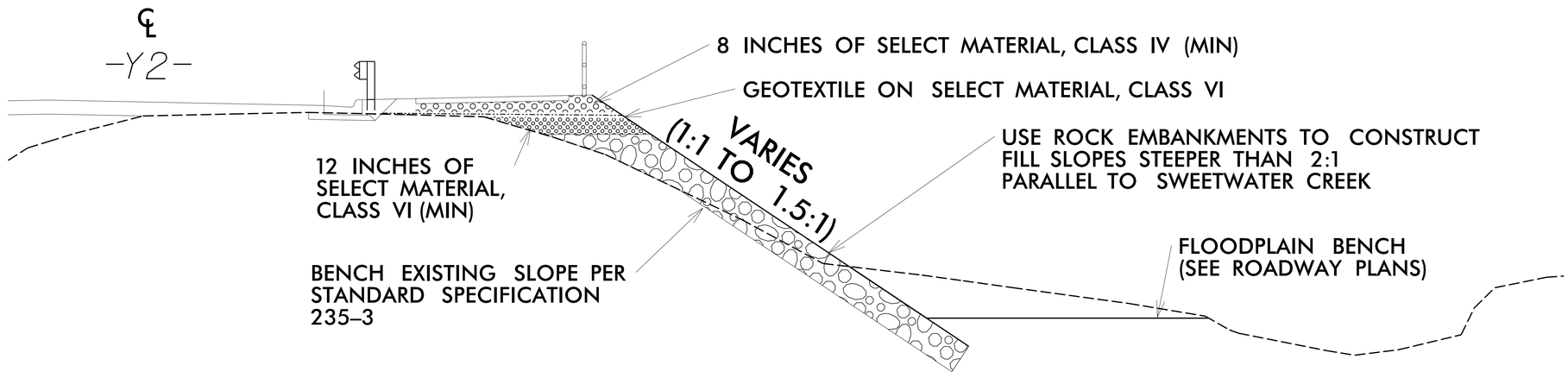
SELECT MATERIAL, CLASS VI SHALL MEET THE GRADATION REQUIREMENTS IN SECTION 1016 OF THE STANDARD SPECIFICATIONS

SELECT MATERIAL, CLASS IV SHALL MEET THE GRADATION REQUIREMENTS IN SECTION 1016 OF THE STANDARD SPECIFICATIONS

INSTALL SEPARATION GEOTEXTILE ON TOP OF ROCK EMBANKMENTS IN ACCORDANCE WITH THE ROCK EMBANKMENTS SPECIAL PROVISION AND ARTICLE 270-3 OF THE STANDARD SPECIFICATIONS

ESTIMATED QUANTITIES
ROCK EMBANKMENTS

SELECT MATERIAL, CLASS VII FOR ROCK EMBANKMENTS	2,130 TON
SELECT MATERIAL, CLASS VI FOR ROCK EMBANKMENTS	670 TON
SELECT MATERIAL, CLASS IV FOR ROCK EMBANKMENTS	650 TON
RIP RAP CLASS B	320 TON
RIP RAP CLASS A	320 TON
GEOTEXTILE FOR ROCK EMBANKMENTS	140 SY



PREPARED BY: D. MATTHEW BREWER, P.E.	DATE: 6/27/22
REVIEWED BY: ROBERT E. KRAL, P.E.	DATE: 6/27/22

Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684

GEOTECHNICAL CONSTRUCTION DETAILS - ROCK EMBANKMENTS - WIDENED FILL DETAIL

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 041986 ENGINEER D. MATTHEW BREWER

DocuSigned by: D. Matthew Brewer 10/17/22
3861229C5A... SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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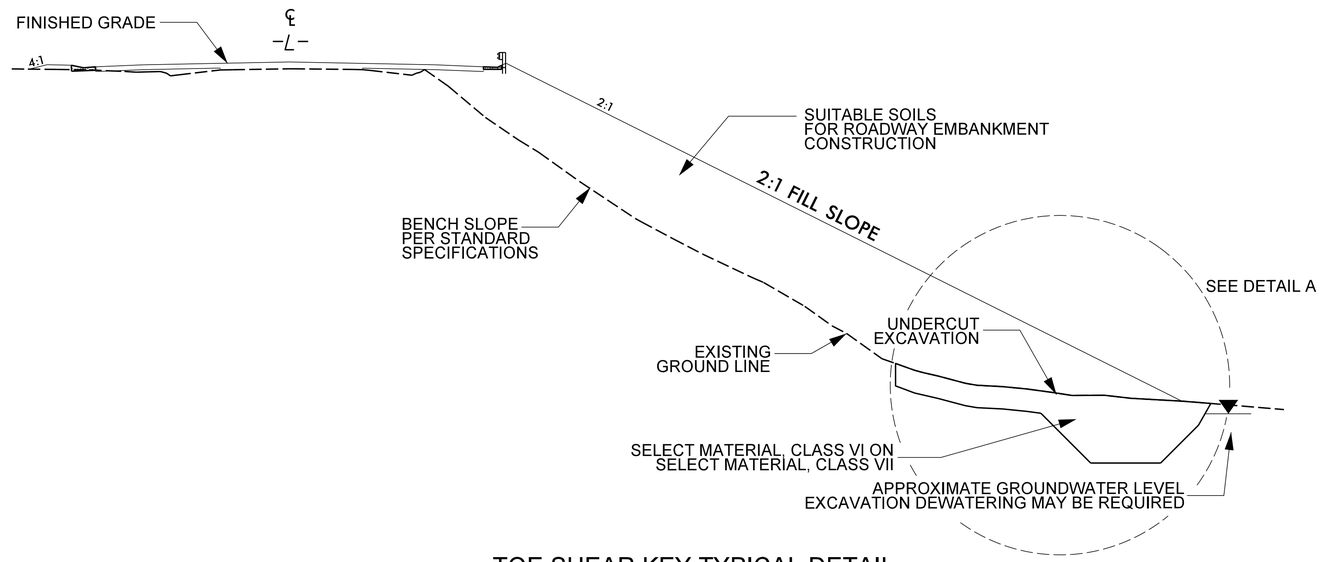
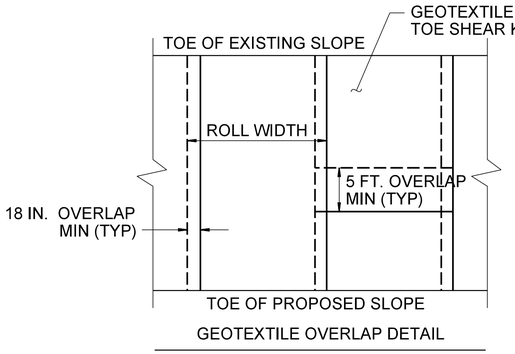
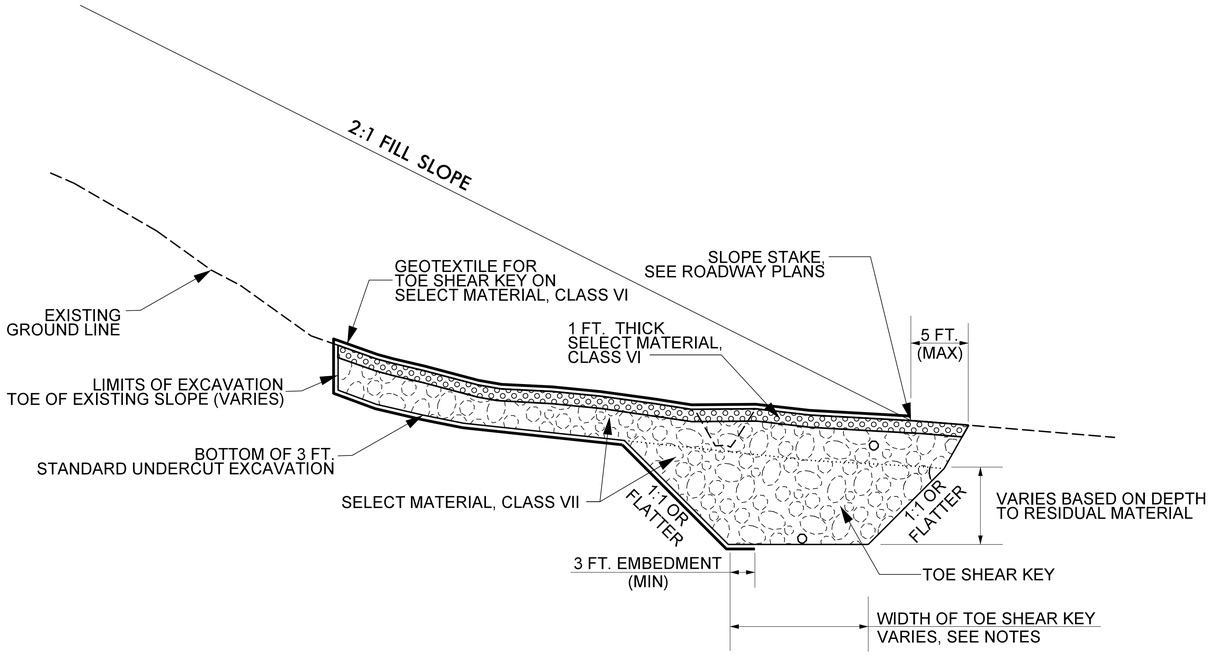


TOE SHEAR KEY TYPICAL DETAIL
NOT TO SCALE



GEOTEXTILE OVERLAP DETAIL



DETAIL A - TOE SHEAR KEY ADDITIONAL DETAILS AND DIMENSIONS
NOT TO SCALE

FOR USE IN THE FOLLOWING LOCATIONS, OR AS DIRECTED BY THE ENGINEER

STATION: -Y2-, 23+50 to 26+50, LT
-Y2-, 48+00 to 53+00, LT
-Y2-, 55+00 to 60+00, LT
-Y2-, 66+40 to 70+00, RT
-DR4-, 10+35 to 11+25, LT

NOTES:

FOR TOE SHEAR KEY, SEE TOE SHEAR KEY SPECIAL PROVISION

PERFORM UNDERCUT EXCAVATION IN THE AREAS NOTED. UNDERCUT SHALL EXTEND FROM TOE OF EXISTING SLOPE TO FIVE FEET BEYOND OF TOE OF PROPOSED SLOPE. UNDERCUT EXCAVATION SHALL EXTEND TO A DEPTH OF 3 FEET BELOW EXISTING GRADE.

FOR SELECT MATERIAL, CLASS VII, SEE TOE SHEAR KEY SPECIAL PROVISION.

FOR SELECT MATERIAL, CLASS VI, SEE TOE SHEAR KEY SPECIAL PROVISION.

FOR GEOTEXTILE FOR TOE SHEAR KEY AND SELECT MATERIAL, CLASS VI, SEE TOE SHEAR KEY SPECIAL PROVISION

WIDTH OF TOE SHEAR KEY AT -Y2-, 23+50 to 26+50, LT IS 5 FT.
WIDTH OF TOE SHEAR KEY AT -Y2-, 48+00 to 53+00, LT IS 10 FT.
WIDTH OF TOE SHEAR KEY AT -Y2-, 55+00 to 60+00, LT IS 10 FT.
WIDTH OF TOE SHEAR KEY AT -Y2-, 66+40 to 70+00, RT IS 10 FT.
WIDTH OF TOE SHEAR KEY AT -DR4-, 10+35 to 11+25, LT IS 10 FT.

ESTIMATED QUANTITIES
TOE SHEAR KEY

SELECT MATERIAL, CLASS VII FOR TOE SHEAR KEY	36,220 TON
SELECT MATERIAL, CLASS VI FOR TOE SHEAR KEY	5,630 TON
GEOTEXTILE FOR TOE SHEAR KEY	21,890 SY
UNDERCUT EXCAVATION FOR TOE SHEAR KEY	22,600 CY

PREPARED BY: D. MATTHEW BREWER, P.E.	DATE: 7/14/22
REVIEWED BY: ROBERT E. KRAL, P.E.	DATE: 7/14/22

Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684

GEOTECHNICAL CONSTRUCTION DETAILS - TOE SHEAR KEY

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	2G-3

GEOTECHNICAL ENGINEER

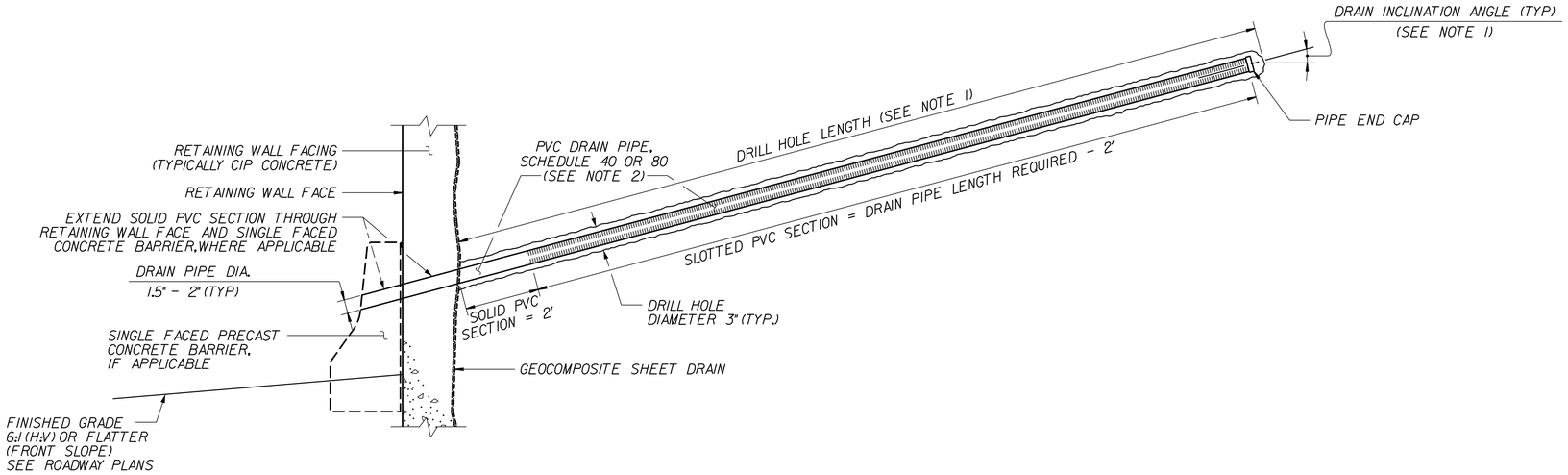
NORTH CAROLINA PROFESSIONAL SEAL 041986 ENGINEER D. MATTHEW BREWER

DocuSigned by: D. Matthew Brewer 10/17/22
SIGNATURE DATE

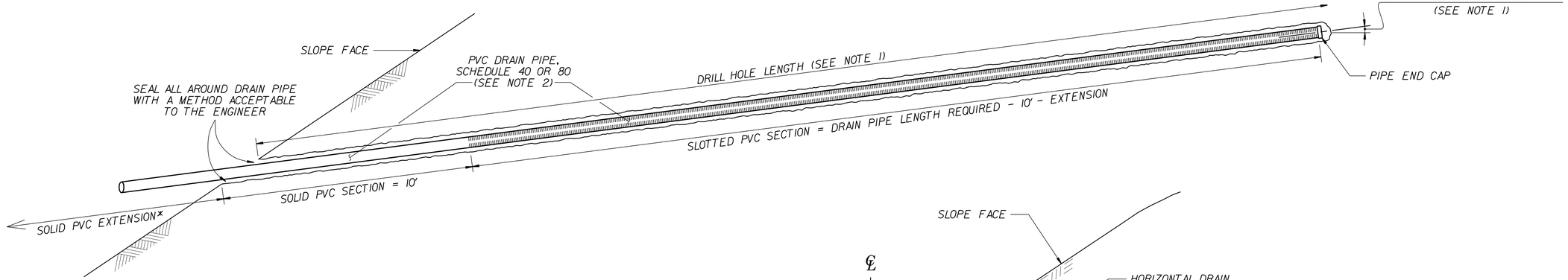
ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

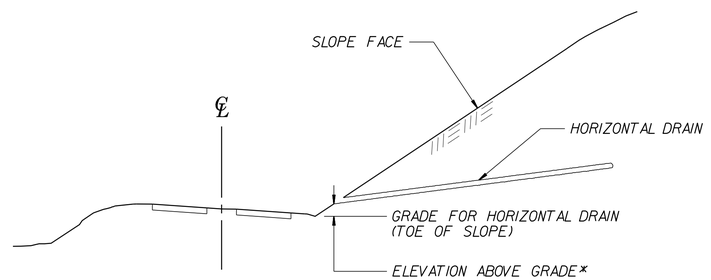


RETAINING WALL HORIZONTAL DRAIN



SLOPE HORIZONTAL DRAIN

*EXTEND SOLID PVC SECTION TO CONNECT PIPE TO A DRAINAGE SYSTEM OR DISCHARGE WATER AS DIRECTED



EXAMPLE CROSS-SECTION WITH SLOPE HORIZONTAL DRAIN

*SEE NOTE 1 FOR DRAIN ELEVATIONS ABOVE (OR BELOW) GRADE

NOTES:

1. SEE ROADWAY SUMMARY SHEETS FOR APPROXIMATE KNOWN HORIZONTAL DRAIN LOCATIONS,ELEVATIONS, INCLINATION AND LENGTHS. ADDITIONAL DRAINS MAY BE REQUIRED AS DETERMINED BY THE ENGINEER.
2. DRAIN PIPES MAY BE OMITTED FOR SOME HORIZONTAL DRAINS. SEE ROADWAY SUMMARY SHEETS FOR DRAIN PIPE REQUIREMENTS INCLUDING THOSE DRAINS WITHOUT PIPES.
3. FOR HORIZONTAL DRAINS,SEE HORIZONTAL DRAINS SPECIAL PROVISION (GT-6).

PREPARED BY: D. MATTHEW BREWER, P.E.	DATE: 7/14/22
REVIEWED BY: ROBERT E. KRAL, P.E.	DATE: 7/14/22

Prepared in the Office of:

CAROLINAS GEOTECHNICAL GROUP
2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GEOTECHNICAL CONSTRUCTION DETAILS - HORIZONTAL DRAINS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

COMPUTED BY: SGM DATE: 7/8/2022
CHECKED BY: JLT DATE: 7/8/2022

PROJECT NO.	SHEET NO.
A-0009CC	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Undercut	Embank. +%	Borrow	Waste
-L- 414+50.00	-L- 444+50.00	22,650		1,105		21,545
Retaining Wall # 27			560			560
-DR3- 10+20.00	-DR3- 11+72.03	4,055				4,055
SUBTOTAL 1		**26,705**	**560**	**1,105**		**26,160**
-L- 444+50.00	-L- 474+19.52	13,476		2,208		11,268
SUBTOTAL 2		**13,476**		**2,208**		**11,268**
-Y2-12+60.00	-Y2- 40+00.00	90,331		23,786		66,545
Retaining Wall # 30			2,850			2,850
SUBTOTAL 3		**90,331**	**2,850**	**23,786**		**69,395**
-Y2- 40+00.00	-Y2- 70+00.00	24,372		62,375	38,003	
Retaining Wall # 32			8,150			8,150
-DR4- 10+12.13	DR4- 11+10.00	57		3,950	3,893	
SUBTOTAL 4		**24,429**	**8,150**	**66,325**	**41,896**	**8,150**
-Y2- 70+00.00	-Y2- 90+00.00	11,189		5,920		5,269
SUBTOTAL 5		**11,189**		**5,920**		**5,269**
TOTAL		166,130	11,560	99,344	41,896	120,242
UNSUITABLE WASTE (PER GEOTECH)		0				0
LOSS DUE TO CLEARING & GRUBBING		-7,000				-7,000
ADDITIONAL UNDERCUT (PER GEOTECH)			2,300			2,300
ADDITIONAL UNDERCUT (PER CFI)			3,150			3,150
HARD ROCK WASTE TO REPLACE BORROW					-3,290	-3,290
ADJUST ROCK SWELL				-823	-823	
ELIMINATE EARTH SHRINKAGE FACTOR				-5,465	-5,465	
EARTH WASTE TO REPLACE BORROW					-32,318	**-32,318**
GRAND TOTALS:		**159,130**	**17,010**	**93,056**	**0**	**83,084**
SAY		**161,000**	**17,010**			

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

EST. DDE = 1,870 CUBIC YARDS
SELECT GRANULAR MATERIAL, CLASS III = 6,670 CY
EST. SHALLOW UNDERCUT = 1,200 CY

PER GEOTECH RECOMMENDATION, ESTIMATED 22,600 CUBIC YARDS OF UNDERCUT FOR TOE SHEAR KEY.

PAVEMENT STRUCTURE VOLUME = 4,150 CY

Quantities are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	414+50	455+73	RT	3,717.65			
-L-	456+92	464+09	LT	666.76			
-L-	466+27	471+30	RT	565.69			
-L-	471+91	474+10	LT	315.82			
-L-	472+90	474+17	RT	102.54			
-Y2-	13+98	19+12	RT	136.85			
-Y2-	23+94	27+40	RT	252.12			
-Y2-	29+10	47+10	LT	3,419.84			
-Y2-	49+45	57+75	RT	805.97			
-Y2-	58+22	65+11	RT	649.30			
-Y2-	66+31	66+98	LT	46.76			
-Y2-	67+52	72+85	LT	501.34			
-Y2-	75+08	84+60	RT	980.65			
-Y2-	86+67	88+55	LT	39.59			
		TOTAL:		12,200.88			
		SAY:		**12,210**			

COMPUTED BY: SGM DATE: 6/17/2022

CHECKED BY: JLT DATE: 7/1/2022

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	3B-2

GUARDRAIL SUMMARY

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOC	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS							IMPACT ATTENUATOR		EXTRA LENGTH GUARDRAIL POSTS (8' STEEL)	REMOVE & RESET EXISTING GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END		B-77	GREU, TL-3	GREU, TL-2	CAT-1	AT-1	B-77 SC	END SECTION	G	NG				
-L-	414+25.00	417+20.00	RT	256.250	68.75				8'	11'										2							275.8	
-L-	420+25.00	432+75.00	RT	1250.000					8'	11'	50'	50'	1'	1'			2										908.8	
-L-	434+81.25	455+00.00	RT	2018.750					8'	11'	50'	50'	1	1'			2										1,930.9	SHOULDER GUTTER INSTALLATION (438+00 TO 448+97,451+86 TO 453+62)
-L-	436+64.00	438+97.25	LT	233.250					19.5' - 8'	22.5' - 11'							2											TIE TO SGL FACED CONCRETE BARRIER
-L-	442+58.42	443+62.55	LT	104.125					8'	11'	50'		1'			1	1											TIE TO SGL FACED CONCRETE BARRIER
-L-	445+73.38	448+40.00	LT	266.625					8'	11'		50'		1'		1	1											TIE TO SGL FACED CONCRETE BARRIER
-L-	452+24.00	453+26.00	LT	102.000					8'	11'						2												TIE TO SGL FACED CONCRETE BARRIER
-L-	456+25.00	459+47.88	LT	322.875					8'	11'	50'		1'			1	1										213.4	TIE TO SGL FACED CONCRETE BARRIER
-L-	465+75.00	470+50.00	RT	475.000					8'	11'	50'	50'	1'	1'			2										385.3	
-L-	471+75.00	472+54.13	LT	79.125					8'	11'	50'		1'			1	1											TIE TO SGL FACED CONCRETE BARRIER
-Y2-	12+61.13	14+59.00	LT	197.875					4' - 8'	7' - 11'		50'		1'		1	1								35			TIE TO SGL FACED CONCRETE BARRIER; **USE EXTRA DEPTH GUARDRAIL POSTS: 197.88@ 6.25=31.7, SAY 35 EA**
-Y2-	12+60.00	14+47.50	RT	187.500					4'	7'	50'	50'	1'	1'			2								35			**USE EXTRA DEPTH GUARDRAIL POSTS: 187.5@ 6.25=30, SAY 35 EA**
-Y2-	16+24.00	16+76.00	LT	52.000					8'	11'						2												TIE TO SGL FACED CONCRETE BARRIER
-Y2-	18+70.00	19+43.40	LT	79.125					8'	11'	50'		1'			1	1											TIE TO SGL FACED CONCRETE BARRIER
-Y2-	22+50.00	39+18.75	LT	1668.750					8'	11'	50'	50'	1'	1'			2										1,157.7	SHOULDER GUTTER INSTALLATION (27+00 TO 28+25)
-Y2-	26+24.00	37+24.00	RT	1100.000					8'	11'	50'	50'	1'	1'			2										151.9	
-Y2-	46+00.00	51+00.00	RT	500.000					8'	11'	50'	50'	1'	1'			2										376.1	
-Y2-	47+44.00	67+00.00	LT	1906.250	87.5				8'	11'										2							1,723.4	SHOULDER GUTTER INSTALLATION (47+50 TO 52+57, 58+90 TO 63+22)
-Y2-	58+27.00	63+75.00	RT	535.375	37.5				8'	11'										1							250.6	TIE TO SGL FACED CONCRETE BARRIER
-Y2-	66+03.00	66+18.00	RT	15.000	35.375				8'	11'										1	1							TIE TO SGL FACED CONC BARRIER; TYPE B-77 SC = 15'R
-Y2-	66+40.00	71+25.00	RT	462.500	37.5				8'	11'		50'		1'			1			1							303.5	SHOULDER GUTTER INSTALLATION
-Y2-	67+38.00	68+55.00	LT	50.000	81.25				8'	11'										2								
-Y2-	70+45.88	71+25.00	LT	79.125					8'	11'		50'		1'		1	1											TIE TO SGL FACED CONCRETE BARRIER
-Y2-	72+75.00	73+54.13	LT	79.125					8'	11'	50'		1'			1	1											TIE TO SGL FACED CONCRETE BARRIER
-Y2-	75+49.50	81+99.50	RT	650.000					8'	11'	50'	50'	1'	1'			2											
-Y2-	83+82.50	89+20.00	RT	537.500					8'	11'	50'	50'	1'	1'			2											
-Y2-	88+25.00	88+45.00	LT		29.125				8'	11'										1	1							TIE TO SGL FACED CONC BARRIER; TYPE B-77 SC = 20'R
SUB-TOTALS				13,208.125	377.000											12	29			10	2				70		7,677.4	
LESS ANCHOR DEDUCTIONS																												
	TYPE B-77	12@22.875 FT		274.500																								
	TYPE TL-3	29 @ 50.00 FT		1,450.000																								
	AT-1	10 @ 6.25 FT			62.500																							
	TYPE B-77 SC	2@22.875 FT			45.750																							
ANCHOR TOTAL				1,724.500	108.250																							
GRAND-TOTALS				11,483.625	268.75											12	29			10	2				70		7,677.40	
SAY				**11,500**	**275**											**12**	**29**			**10**	**2**				**70**		**7,678**	
ADDITIONAL GUARDRAIL POSTS =				**10 EA**																								
TEMPORARY GUARDRAIL																												
-Y2-	25+10.00	29+10.00	LT	400.00													1		1									TEMPORARY ANCHOR UNITS
-Y2-	64+30.00	66+97.00	LT	250.00	37.5															1								TEMPORARY ANCHOR UNIT; TIE TO EXIST. GUARDRAIL
SUB-TOTALS				650.00	37.50												1		1	1								
LESS ANCHOR DEDUCTIONS																												
	TEMP. TYPE TL-3	1 @ 50.00 FT		50.00																								
	TEMP. TYPE CAT-1	1@ 6.25 FT		6.25																								
	TEMP. TYPE AT-1	1 @ 6.25 FT			6.25																							
ANCHOR TOTAL				56.25	6.25																							
GRAND-TOTALS				593.75	31.25												1		1	1								
SAY				**600**	**37.5**												**1**		**1**	**1**								

TGSZJR-LAPTOP

COMPUTED BY:	Zachary Richard, PE	**DATE:**	10/12/2022
CHECKED BY:	David Petty, PE	**DATE:**	11/17/2022

PROJECT NO.	SHEET NO.
A-0009CC	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)						DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C. S. PIPE							R. C. PIPE CLASS III						R. C. PIPE CLASS IV						36" CAAP, 0.075" THICK	42" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	24" PIPE REHABILITATION CIPP LINER	36" PIPE REHABILITATION CIPP LINER	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE			4-SIDED OTCB, SEE DETAIL SHEET 2D-5	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17, 840.26, OR 840.45	G.D.I. TYPE "B" STD. 840.18, 840.27, OR 840.45	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	6" PVC PIPE (SPRING BOX)	SPRING BOX STD. 840.41	M.H. FRAME AND COVER STD. 840.54	PRECAST 4' DIA MH STD 840.52	T.B. G.D.I TYPE "A" SEE SHEET 2D-2	MIN DEPTH TYPE A SPECIAL DSN SEE SHEET 2D-1	15" C.S. ELBOW, 0.064" THICK	18" C.S. ELBOW, 0.064" THICK	24" C.S. ELBOW, 0.064" THICK	30" C.S. ELBOW, 0.064" THICK	36" C.S. ELBOW, 0.064" THICK	42" C.S. ELBOW, 0.064" THICK	48" C.S. ELBOW, 0.064" THICK	15" ELBOW	18" ELBOW	24" ELBOW	36" ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	BERM DRAINAGE OUTLET 36" DSN, SHT 2D-3 (SY)	BERM DRAINAGE OUTLET 42" DSN, SHT 2D-4 (SY)	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE		FROM	TO					15	18	24	30	36	42					15	18	24	30	36	42	48	18	24	30	36	42	48	15	18	24	30	36	42								0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE																																								
THICKNESS OR GAUGE				FT.	FT.	FT.	%											.064	.064	.064	.079	.079	.109	.109																			CY	EACH	LIN. FT.	LIN. FT.		E	F	G																																				CY	CY	LIN. FT.	
L 414+79	43 LT	3501		2937.5																																	1									1				1																											
		3501	3502		2934.5	2923.0	2.5		144						X	X																																																																					
L 416+25	43 LT	3502		2926.1																																	1									1				1																											
		3502	3503		2922.5	2904.6	0.9													108																																																			2															
L 417+94	43 LT	3504		2913.5																																	1									1				1																											
		3504	3506		2910.7	2901.3	0.4	128							X	X																																																																				
L 419+34	91 LT	3505		2933.8																																																																									31						24" BDO
		3505	3506		2931.2	2900.6	1.0													48																																																				1															
L 419+34	43 LT	3506		2904.1																																	1	1.1								1				1																											
		3506	3508		2898.0	2895.5																					116																																																									
L 419+90	43 LT	3507		2900.3																																	1										1			1																											
		3507	3506		2898.3	2898.0		52							X	X																																																																				
DR3 11+20	13 LT	3509		2906.9																																	1									1				1																											
		3509	3507		2901.9	2898.3		56							X	X																																																																				
L 420+90	31 RT	3510		2897.3																																	1								1	1																																			
		3510	3511		2895.0	2894.7		44							X	X																																																																				
L 422+67	35 LT	3512		2889.0																																	1	2.0								1				1																											
		3512	3513		2882.0	2881.9																									4																																																								
L 422+67	32 LT	3513		2885.4																																	1											1					1																								
		3513	3514		2881.9	2874.0	0.4																								136																																																							
L 424+05	32 LT	3514		2877.3																																	1											1					1																								
		3514	3520		2873.8	2873.3																										48																																																						
L 426+04	35 LT	3516		2869.9																																	1	3.7								1				1																											
		3516	3517		2861.2	2861.1																										4																																																						
L 426+04	32 LT	3517		2864.9																																	1											1					1																								
		3517	3518		2861.1	2860.3																										60																																																							
L 426+04	31 RT	3518		2863.3																																	1									1				1																											
		3518	3519		2858.3	2857.0			12					X																																																																							
L 424+05	20 RT	3520		2877.7																																	1											1					1																								
		3520	3515		2873.3	2858.0	0.9												64																																																		2																
L 429+00	36 LT	3601		2850.6																																	1	2.4								1				1																											
		3601	3602		2843.2	2843.1	0.5																								4																																																							
L 429+00	33 LT	3602		2846.6																																	1											1					1																								
		3602	3624		2843.1	2834.6	0.7																								120																																																										
L 431+50	47 LT	3603		2851.6																																	1	5.0	17.1												1							1																					
		3603	3604		2824.5	2824.4																									4																																																								
L 431+50	43 LT	3604		2828.0																																	1											1					1																								
		3604	3605		2824.0	2823.6																											68																																																				
L 431+56	28 RT	3605		2831.0																																	1	2.4								1				1																											
		3605	3606		2823.6	2817.0	0.6													36																																																			2															
L 433+56	43 LT	3608		2814.4																																	1											1					1																								
		3608	3609		2811.1	2810.5																									100																																																									
L 433+74	57 RT	3609		2815.2																																	1									1				1																											
L 436+50	47 LT	3610		2798.6																																	1	0.9								1				1																											
		3610	3612		2792.7	2789.1																									52																																																										
L 436+50	43 LT	3611		2796.1																																	1											1					1																								
		3611	3610		2792.8	2792.7																									4																																																										
L 437+68	11 RT	3613			2786.1	2756.0													128																																																	2																
L 430+89	44 LT	3614		2832.6																																	1											1					1																								
		3614	3604		2829.4	2824.7	1.0																								52																																																										
SHEET TOTALS								280	156										192	192							116				476	112	68											24	17.5	17.1						1	1		12	1	9		14			9				1				4	5										31						

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSZJR-LAPTOP

COMPUTED BY:	Zachary Richard, PE	DATE:	10/12/2022
CHECKED BY:	David Petty, PE	DATE:	11/17/2022

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
A-0009CC	3D-2

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)										C. S. PIPE							R. C. PIPE CLASS III						R. C. PIPE CLASS IV						36" CAAP, 0.075" THICK	42" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	24" PIPE REHABILITATION CIPP LINER	36" PIPE REHABILITATION CIPP LINER	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03			4-SIDED OTCB, SEE DETAIL SHEET 2D-5	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17, 840.26, OR 840.45	G.D.I. TYPE "B" STD. 840.18, 840.27, OR 840.45	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	6" PVC PIPE (SPRING BOX)	SPRING BOX STD. 840.41	M.H. FRAME AND COVER STD. 840.54	PRECAST 4' DIA MH STD 840.52	T.B. G.D.I TYPE "A" SEE SHEET 2D-2	MIN DEPTH TYPE A SPECIAL DSN SEE SHEET 2D-1	15" C.S. ELBOW, 0.064" THICK	18" C.S. ELBOW, 0.064" THICK	24" C.S. ELBOW, 0.064" THICK	30" C.S. ELBOW, 0.064" THICK	36" C.S. ELBOW, 0.064" THICK	42" C.S. ELBOW, 0.064" THICK	48" C.S. ELBOW, 0.064" THICK	15" ELBOW	18" ELBOW	24" ELBOW	36" ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	BERM DRAINAGE OUTLET 36" DSN, SHT 2D-3 (SY)	BERM DRAINAGE OUTLET 42" DSN, SHT 2D-4 (SY)	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
SIZE								15	18	24	30	36	42					15	18	24	30	36	42	48	18	24	30	36	42	48	15	18	24	30	36	42									A	B		GRATE TYPE																																										
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%							DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	.064	.064	.064	.079	.079	.109	.109																			CY	0' THRU 5' EACH	5' THRU 10' LIN. FT.	10' AND ABOVE LIN. FT.		E	F	G																																		CY	CY	LIN. FT.	
L 438+55	43 LT	3616		2782.7																																																																																			
		3616	3617		2780.2	2775.3				52					X																																																																									
L 439+03	35 LT	3617		2780.4																																									1	0.1									1					1																											
		3617	3618		2775.3	2771.9																				52																																																														
L 439+54	35 LT	3618		2778.3																																									1	1.4									1					1																											
		3618	3619		2771.9	2768.5																				48																																																															
L 440+00	35 LT	3619		2774.9																																									1	1.4									1					1																											
		3619	3620		2768.5	2763.8																											56																																																										
L 440+00	22 RT	3620		2768.6																																									1												1										1																					
		3620	3621		2763.8	2756.4																											92																																																										
L 440+97	22 RT	3621		2761.2																																									1												1										1																					
		3621	3623		2756.4	2741.3	0.8													56																																																						2																
L 430+20	43 LT	3624		2837.9																																									1												1					1																										
		3624	3614		2834.6	2829.4	0.9																								64																																																													
L 442+48	35 LT	3701		2753.3																																									1	2.0										1				1																											
		3701	3702		2746.3	2736.5	1.7		100						X																																																																											
L 443+49	43 LT	3702		2740.0																																									1								1																																							4-Sided OTCB Special Detail, See Sheet 2D-5
		3702	3703		2736.0	2728.0	2.2			100					X	X																																																																									
L 444+50	43 LT	3703		2731.5																																									1															1									1																			Min Depth 2GI-A, See Sheet 2D-1. Tie 8" into 2GI
		3703	3704		2727.5	2726.9																					64																																																													
L 444+50	22 RT	3704		2733.8																																									1	1.9											1					1																										
		3704	3705		2726.9	2703.7	1.0														60																																																						2															
L 446+50	43 LT	3706		2715.4																																									1										1				1																											
		3706	3707		2712.6	2699.2	0.6											100																																																																						
L 447+52	56 LT	3708		2700.2																																								2.300																																														
		3708	3709		2697.7	2697.3																					76																																																													
L 447+52	22 RT	3709		2709.7																																									1	5.0	2.4										1										1																					
		3709	3710		2697.3	2694.7																					136																																																													
L 448+90	22 RT	3710		2700.0																																									1	0.3											1										1																					
		3710	3711		2694.7	2660.0	0.5														88																																																						2															
L 448+26	45 LT	3712		2702.1																																																																																						
		3712	3713		2700.6	2699.6																										24																																																											
L 448+43	32 LT	3713		2703.1																																									1												1					1																										
		3713	3714		2699.6	2686.5																										188																																																											
L 450+33	32 LT	3714		2690.0																																									1												1					1																										
		3714	3716		2686.5	2673.8																										188																																																											
L 452+23	32 LT	3716		2677.3																																									1												1					1																										
		3716	3717		2673.8	2673.7																										4																																																											
L 452+23	35 LT	3717		2677.0																																									1										1				1																											
		3717	3718		2673.7	2672.2	0.6		28						X	X																																																																									
L 452+82	40 LT	3719		2671.0																																								3.400																																														
		3719	3722		2668.0	2667.1																													64																																																										
L 452+82	22 RT	3722		2672.9																																									1	0.8											1										1																					
		3722	3723		2667.1	2661.9																													72																																																									
L 453+55	22 RT	3723		2667.7																																									1	0.8											1										1																					
		3723	3721		2661.9	2591.5	0.6															120																																																						2														
L 456+22	35 LT	3801		2650.6																																									1											1			1																											
		3801	3802		2647.8	2647.6	0.4																		28																																																																	
L 458+25	0 CL	3803	3804																																						327																																															Reline 36" CMP
L 458+27	229 RT	3804																																																																																				0.7640		
SHEET TOTALS									128	152								100		56	148	120			28	100	276				64	404	148		136						327		5.700	20	13.7	2.4					1			3	3	1	11		8			5					6	1			2	4	2												0.7640		

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSZJR-LAPTOP

COMPUTED BY:	Zachary Richard, PE	**DATE:**	10/12/2022
CHECKED BY:	David Petty, PE	**DATE:**	11/17/2022

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
A-0009CC	3D-3

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)						DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C. S. PIPE							R. C. PIPE CLASS III						R. C. PIPE CLASS IV					
SIZE								15	18	24	30	36	42					15	18	24	30	36	42	48	18	24	30	36	42	48	15	18	24	30	36	42
THICKNESS OR GAUGE																		.064	.064	.064	.079	.079	.109	.109												
		3804	3805		2548.9	2547.0	2.8																													
L 464+50	43 LT	3806		2585.8																																
		3806	3807		2582.8	2582.1																			72											
L 464+50	31 RT	3807		2586.1																																
		3807	3808		2582.1	2566.1	0.5		196						X	X																				
L 466+49	31 RT	3808		2569.1																																
		3808	3809		2566.1	2560.0	0.8												40																	
L 467+72	0 CL	3810	3811																																	
L 468+00	43 LT	3812		2555.9																																
		3812	3813		2553.1	2547.7	0.4	80							X	X																				
L 468+82	31 LT	3813		2550.9																																
		3813	3815		2547.5	2539.6																										84				
L 468+82	35 LT	3814		2551.8																																
		3814	3813		2547.8	2547.7																									4					
L 469+70	29 LT	3815		2543.0																																
		3815	3816		2539.6	2538.0																										84				
L 468+71	57 LT	3817		2555.9																																
		3817	3814		2548.9	2547.8	0.5	24							X	X																				
L 473+53	44 LT	3901		2509.7																																
		3901	3919		2504.9	2504.6																				60										
Y2 24+00	30 RT	3902		2505.3																																
		3902	3903		2500.5	2493.6	1.2			120					X	X																				
Y2 25+25	30 RT	3903		2498.4																																
		3903	3922		2493.6	2493.2	0.4																										64			
Y2 19+67	48 LT	3904		2516.0																																
		3904	3906		2505.0	2502.5	2.6				96				X	X																				
Y2 18+80	42 LT	3905		2513.9																																
		3905	3906		2510.5	2510.0		12							X	X																				
Y2 18+80	29 LT	3906		2515.9																																
		3906	3907		2502.5	2501.4	0.7																				124									
Y2 17+61	29 LT	3907		2510.4																																
		3907	3910		2501.4	2495.6	0.7																				116									
Y2 16+50	39 LT	3908		2498.0																																
		3908	3910		2496.0	2495.0	0.4		16						X	X																				
Y2 16+57	33 LT	3909																																		
		3909	3910		2494.0	2493.5																														
Y2 16+50	26 LT	3910		2501.2																																
		3910	3911		2493.5	2481.2	0.3																					148								
Y2 15+00	22 LT	3911		2487.4																																
		3911	3912		2481.2	2480.8	0.3																					72								
Y2 13+28	0 CL	3913																																		
L 471+70	26 LT	3914		2525.7																																
		3914	3915		2522.6	2522.5																									4					
L 471+70	22 LT	3915		2526.1																																
		3915	3916		2522.5	2522.1																									64					
L 471+70	42 RT	3916		2524.9																																
		3916	3917		2522.1	2514.4	0.5	72						X																						
L 472+50	42 RT	3917		2517.2																																
		3917	3918		2514.4	2503.6	0.6	76						X																						
L 473+82	55 RT	3918		2507.6																																
SHEET TOTALS								264	212	120	96								40						72	60	240	220			72	168	64			

STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	36" CAAP, 0.075" THICK	42" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	24" PIPE REHABILITATION CIPP LINER	36" PIPE REHABILITATION CIPP LINER	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	4-SIDED OTCB, SEE DETAIL SHEET 2D-5	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17, 840.26, OR 840.45	G.D.I. TYPE "B" STD. 840.18, 840.27, OR 840.45	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	6" PVC PIPE (SPRING BOX)	SPRING BOX STD. 840.41	M.H. FRAME AND COVER STD. 840.54	PRECAST 4' DIA MH STD 840.52	T.B. G.D.I TYPE "A" SEE SHEET 2D-2	MIN DEPTH TYPE A SPECIAL DSN SEE SHEET 2D-1	15" C.S. ELBOW, 0.064" THICK	18" C.S. ELBOW, 0.064" THICK	24" C.S. ELBOW, 0.064" THICK	30" C.S. ELBOW, 0.064" THICK	36" C.S. ELBOW, 0.064" THICK	42" C.S. ELBOW, 0.064" THICK	48" C.S. ELBOW, 0.064" THICK	15" ELBOW	18" ELBOW	24" ELBOW	36" ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	BERM DRAINAGE OUTLET 36" DSN, SHT 2D-3 (SY)	BERM DRAINAGE OUTLET 42" DSN, SHT 2D-4 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
3804	3805	20																																																		
3806									1											1				1																												
3806	3807																																																			
3807									1											1				1																												
3807	3808																																																			
3808									1											1				1																												
3808	3809																																																			
3810	3811					221																																														Reline 36" CMP
3812									1											1				1																												
3812	3813																																																			
3813									1													1					1																									
3813	3815																																																			
3814									1											1				1																												
3814	3813																																																			
3815									1													1					1																									
3815	3816																																																			
3817									1	2.0										1				1																												
3817	3814																																																			
3901									1										1				1	1																												3GI
3901	3919																																																			
3902									1										1					1																												
3902	3903																																																			
3903									1										1					1																												
3903	3922																																																			
3904									1	5.0	1.0						1	1																																		Field verify UG stream elev prior to ordering box.
3904	3906																																																			
3905									1											1				1																												
3905	3906																																																			
3906									1	5.0	3.4															1				1																						
3906	3907																																																			
3907									1	4.0												1										1																				
3907	3910																																																			
3908																																																				
3908	3910																																																			
3909									1																				1																							
3909	3910																											8																								Tie 6" into 2GI 3910
3910									1	2.7												1										1																				
3910	3911																																																			
3911									1	1.2												1										1																				
3911	3912																																																			
3913						94																																														Reline 36" CMP
3914									1											1				1																												
3914	3915																																																			
3915									1													1					1																									
3915	3916																																																			
3916									1											1				1																												
3916	3917																																																			
3917									1											1				1																												
3917	3918																																																			
3918									1										1					1																												
SHEET TOTALS		20				315			23	19.9	4.4						1	1	4	10		6	1	14		1	3	8	1	1		3																				

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSZJR-LAPTOP

COMPUTED BY: Zachary Richard, PE **DATE:** 10/12/2022

CHECKED BY: David Petty, PE **DATE:** 11/17/2022

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
A-0009CC	3D-4

**Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
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LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)										C. S. PIPE							R. C. PIPE CLASS III						R. C. PIPE CLASS IV					
SIZE								15	18	24	30	36	42					15	18	24	30	36	42	48	18	24	30	36	42	48	15	18	24	30	36	42
THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%							DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	.064	.064	.064	.079	.079	.109	.109												
		3918	3902		2502.8	2500.5	1.1			44					X	X																				
L 473+95	4 LT	3919		2511.3																																
		3919	3918		2504.6	2502.8																				60										
Y2 23+25	39 LT	3920																																		
Y2 24+46	78 LT	3921																																		
Y2 25+50	28 LT	3922		2502.7																																
		3922	4022		2493.2	2492.8	0.4																			72										
Y2 27+87	70 RT	4002		2462.3																																
		4002	4003		2458.3	2456.1	1.4																	24												
Y2 27+80	49 RT	4003		2461.9																																
		4003	4004																																	
Y2 28+19	20 RT	4005		2482.4																																
		4005	4006		2479.2	2462.0		56																												
Y2 31+75	31 RT	4011		2461.0																																
		4011	4012		2458.0	2443.0													92																	
Y2 32+63	49 RT	4013		2447.0																																
		4013	4014		2445.4	2441.4	0.6		144						X	X																				
Y2 34+00	31 RT	4014		2444.5																																
		4014	4015		2441.4	2429.7	1.1		152						X	X																				
Y2 35+50	31 RT	4015		2432.7																																
		4015	4016		2429.7	2422.0	1.4		52					X																						
Y2 36+00	47 RT	4017		2422.6																																
		4017	4018		2418.6	2417.5																								92						
Y2 36+00	44 LT	4018		2426.5																																
		4018	4019		2417.5	2389.0	1.1																	76												
Y2 39+50	68 RT	4020		2416.0																																
		4020	4021		2412.0	2395.1	1.1																40													
Y2 39+50	30 RT	4021		2401.4																																
		4021	4101		2395.1	2381.4	1.2						176		X	X																				
Y2 26+21	28 LT	4022		2498.4																																
		4022	4001		2492.8	2429.0	1.5													144																
Y2 38+48	30 RT	4024						40																												
Y2 41+25	30 RT	4101		2387.7																																
		4101	4102		2381.4	2366.4	1.3						192		X	X																				
Y2 43+15	30 RT	4102		2372.7																																
		4102	4104		2366.4	2360.9	1.3						68		X	X																				
Y2 43+83	61 RT	4103		2375.5																																
		4103	4104		2372.0	2361.4	0.7					32		X																						
Y2 43+83	30 RT	4104		2367.2																																
Y2 47+27	43 LT	4107						40																												
Y2 49+54	67 RT	4108		2306.6																																
		4108	4109		2302.6	2298.9																		40												
Y2 49+82	45 RT	4109		2310.9																																
		4109	4110																																	
Y2 50+89	56 LT	4110		2283.1																																
		4110	4111		2277.8	2253.7																	136													
Y2 50+50	32 LT	4112		2312.4																																
		4112	4113		2309.2	2272.7												84																		
Y2 52+36	43 RT	4114		2305.0																																
		4114	4115		2303.5	2295.0			24					X																						
SHEET TOTALS								136	372	44		32	436					84	92	144			176	140		132				92						

FROM	TO	36" CAAP, 0.075" THICK	42" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	24" PIPE REHABILITATION CIPP LINER	36" PIPE REHABILITATION CIPP LINER	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE			4-SIDED OTCB, SEE DETAIL SHEET 2D-5	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17, 840.26, OR 840.45	G.D.I. TYPE "B" STD. 840.18, 840.27, OR 840.45	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	6" PVC PIPE (SPRING BOX)	SPRING BOX STD. 840.41	M.H. FRAME AND COVER STD. 840.54	PRECAST 4' DIA MH STD 840.52	T.B. G.D.I TYPE "A" SEE SHEET 2D-2	MIN DEPTH TYPE A SPECIAL DSN SEE SHEET 2D-1	15" C.S. ELBOW, 0.064" THICK	18" C.S. ELBOW, 0.064" THICK	24" C.S. ELBOW, 0.064" THICK	30" C.S. ELBOW, 0.064" THICK	36" C.S. ELBOW, 0.064" THICK	42" C.S. ELBOW, 0.064" THICK	48" C.S. ELBOW, 0.064" THICK	15" ELBOW	18" ELBOW	24" ELBOW	36" ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	BERM DRAINAGE OUTLET 36" DSN, SHT 2D-3 (SY)	BERM DRAINAGE OUTLET 42" DSN, SHT 2D-4 (SY)	FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	PIPE REMOVAL	REMARKS
								CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		E	F	G																																		CY	CY	LIN. FT.	
3918	3902																																																			
3919									1	1.7												1										1																				
3919	3918																																																			
3920									1																			28	1																							
3921									1																			48	1																							
3922									1	4.5																1				1																						
3922	4022																																																			
4002								4.900																																												
4002	4003																																																			
4003									1	0.8															1																											
4003	4004						144																																													Reline 42" CMP
4005									1													1					1																									
4005	4006																																								2											
4011									1											1				1																												
4011	4012																																		2																	
4013																																																				
4013	4014																																																			
4014									1											1				1																												
4014	4015																																																			
4015									1											1				1																												
4015	4016																																																			
4017								6.000																																												
4017	4018																																																			
4018									1	4.0															1					1																						
4018	4019																																							2												
4020																																																31				42" BDO SPECIAL DSN SEE SHEET 2D-4
4020	4021																																						1													
4021									1	1.3									1					1																												
4021	4101																																																			
4022									1	0.6																1				1																						
4022	4001																																			4																
4024																																																				
4101									1	1.3									1					1																												
4101	4102																																																			
4102									1	1.3									1					1																												
4102	4104																																																			
4103																																															31					36" BDO SPECIAL DSN SEE SHEET 2D-3
4103	4104																																											1								
4104									1	2.3									1					1																												
4107																																																				
4108								4.900																																												
4108	4109																																																			
4109									1	5.0	2.0														1					1																						
4109	4110						152																																													Reline 42" CMP
4110									1	0.3															1																											JB with slab lid
4110	4111																																																			
4112									1													1					1																									
4112	4113																																	2																		
4114																																													11							18" BDO
4114	4115																																									1										
SHEET TOTALS							296	15.800	18	23.1	2.0								4	3		3		7	4	2	2	76	2	4		1		2	2	4			1	2	2	1		1	11		31	31				

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSZJR-LAPTOP

COMPUTED BY:	Zachary Richard, PE	DATE:	10/12/2022
CHECKED BY:	David Petty, PE	DATE:	11/17/2022

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
A-0009CC	3D-5

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)										C. S. PIPE						
SIZE								15	18	24	30	36	42					15	18	24	30	36	42	48
THICKNESS OR GAUGE														DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	.064	.064	.064	.079	.079	.109	.109
Y2 52+36	21 RT	4115		2298.6																				
		4115	4116		2295.0	2293.6																		
Y2 52+50	32 LT	4116		2297.1																				
		4116	4117		2293.6	2247.0	0.6												108					
Y2 52+40	82 LT	4118																						
Y2 41+38	49 LT	4119						60																
Y2 55+00	21 RT	4201		2277.1																				
		4201	4203		2273.9	2269.8																		
Y2 55+50	46 RT	4202		2285.2																				
		4202	4203		2282.6	2269.1	0.5			24				X										
Y2 55+50	21 RT	4203		2273.1																				
		4203	4204		2269.1	2254.0	0.8													96				
Y2 57+68	21 RT	4205		2255.7																				
		4205	4206		2252.5	2246.0		76							X	X								
Y2 59+53	60 RT	4207		2224.3																				
		4207	4208		2222.3	2220.1	0.7			12				X										
Y2 59+57	49 RT	4208		2222.1																				
		4208	4209																					
Y2 62+79	32 LT	4210		2216.4																				
		4210	4220		2213.2	2210.7																		
Y2 61+50	28 RT	4211		2223.0																				
		4211	4212		2220.2	2204.4		196							X	X								
Y2 63+50	26 RT	4212		2207.2																				
		4212	4213		2204.4	2204.2	1.2	8							X	X								
Y2 63+50	19 RT	4213		2208.8																				
		4213	4215		2204.2	2196.5	0.5																	
Y2 64+50	24 RT	4214		2203.0																				
		4214	4215		2196.6	2196.5																		
Y2 64+50	20 RT	4215		2200.2																				
		4215	4217		2196.5	2183.5	1.4																	
Y2 65+95	24 RT	4216		2186.4																				
		4216	4217		2183.6	2183.5																		
Y2 65+95	20 RT	4217		2187.4																				
		4217	4218		2183.3	2167.7	0.8																	
Y2 67+83	20 RT	4218		2171.2																				
		4218	4219		2167.7	2134.7	3.7												88					
Y2 63+15	32 LT	4220		2213.9																				
		4220	4213		2210.7	2205.6																		
Y2 59+03	105 LT	4224																						
Y2 69+56	59 LT	4301		2159.1																				
		4301	4302		2156.3	2153.4		40							X	X								
Y2 69+95	56 LT	4302		2155.4																				
		4302	4303		2153.2	2150.4	0.5																	
Y2 69+95	20 RT	4303		2153.9																				
		4303	4304		2150.4	2146.4	0.7																	
Y2 70+44	20 RT	4304		2149.9																				
		4304	4305		2146.4	2141.2	2.9		60						X	X								
Y2 74+00	42 LT	4306		2124.1																				
		4306	4307		2121.1	2114.1																		
Y2 74+00	44 RT	4307		2118.4																				
SHEET TOTALS								380	60	36									196	96				

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 18	R. C. PIPE CLASS III 24	R. C. PIPE CLASS III 30	R. C. PIPE CLASS III 36	R. C. PIPE CLASS III 42	R. C. PIPE CLASS III 48	R. C. PIPE CLASS IV 15	R. C. PIPE CLASS IV 18	R. C. PIPE CLASS IV 24	R. C. PIPE CLASS IV 30	R. C. PIPE CLASS IV 36	R. C. PIPE CLASS IV 42	36" CAAP, 0.075" THICK	42" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	24" PIPE REHABILITATION CIPP LINER	36" PIPE REHABILITATION CIPP LINER	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G
Y2 52+36	4115																					1						
	4115	4116								52																		
Y2 52+50	4116																					1						
	4116	4117																										
Y2 52+40	4118																					1						
Y2 41+38	4119																											
Y2 55+00	4201																					1						
	4201	4203							48																			
Y2 55+50	4202																											
	4202	4203																										
Y2 55+50	4203																					1						
	4203	4204																										
Y2 57+68	4205																					1						
	4205	4206																										
Y2 59+53	4207																											
	4207	4208																										
Y2 59+57	4208																											
	4208	4209																144										
Y2 62+79	4210																					1						
	4210	4220							36																			
Y2 61+50	4211																					1						
	4211	4212																										
Y2 63+50	4212																					1						
	4212	4213																										
Y2 63+50	4213																					1						
	4213	4215							96																			
Y2 64+50	4214																					1	1.4					
	4214	4215							4																			
Y2 64+50	4215																					1						
	4215	4217							140																			
Y2 65+95	4216																					1						
	4216	4217							4																			
Y2 65+95	4217																					1						
	4217	4218								184																		
Y2 67+83	4218																					1						
	4218	4219																										
Y2 63+15	4220																					1						
	4220	4213							60																			
Y2 59+03	4224																					1						
Y2 69+56	4301																					1						
	4301	4302																										
Y2 69+95	4302																					1						
	4302	4303								76																		
Y2 69+95	4303																					1						
	4303	4304								48																		
Y2 70+44	4304																					1						
	4304	4305																										
Y2 74+00	4306																					1						
	4306	4307	84																									
Y2 74+00	4307																					1						
SHEET TOTALS			84						388	360								144				23	1.4					

LINE & STATION	FROM	TO	4-SIDED OTCB, SEE DETAIL SHEET 2D-5	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17, 840.26, OR 840.45	G.D.I. TYPE "B" STD. 840.18, 840.27, OR 840.45	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	6" PVC PIPE (SPRING BOX)	SPRING BOX STD. 840.41	M.H. FRAME AND COVER STD. 840.54	PRECAST 4' DIA MH STD 840.52	T.B. G.D.I TYPE "A" SEE SHEET 2D-2	MIN DEPTH TYPE A SPECIAL DSN SEE SHEET 2D-1
Y2 52+36	4115						1		1											
	4115	4116																		
Y2 52+50	4116								1					1						
	4116	4117																		
Y2 52+40	4118														64	1				
Y2 41+38	4119																			
Y2 55+00	4201						1		1											
	4201	4203																		
Y2 55+50	4202																			
	4202	4203																		
Y2 55+50	4203						1		1											
	4203	4204																		
Y2 57+68	4205						1		1											
	4205	4206																		
Y2 59+53	4207																			
	4207	4208																		
Y2 59+57	4208																			
	4208	4209																		
Y2 62+79	4210								1					1						
	4210	4220																		
Y2 61+50	4211						1				1									
	4211	4212																		
Y2 63+50	4212						1				1									
	4212	4213																		
Y2 63+50	4213						1		1											
	4213	4215																		
Y2 64+50	4214						1				1									
	4214	4215																		
Y2 64+50	4215								1					1						
	4215	4217																		
Y2 65+95	4216						1				1									
	4216	4217																		
Y2 65+95	4217								1					1						
	4217	4218																		
Y2 67+83	4218								1					1						
	4218	4219																		
Y2 63+15	4220								1					1						
	4220	4213																		
Y2 59+03	4224														76	1				
Y2 69+56	4301			1	1															
	4301	4302																		
Y2 69+95	4302							1			1									
	4302	4303																		
Y2 69+95	4303								1					1						
	4303	4304																		
Y2 70+44	4304								1					1						
	4304	4305																		
Y2 74+00	4306						1				1									
	4306	4307																		
Y2 74+00	4307					1					1									
SHEET TOTALS				1	1	1	10	1	13		7			8	140	2				

LINE & STATION	FROM	TO	15" C.S. ELBOW, 0.064" THICK	18" C.S. ELBOW, 0.064" THICK	24" C.S. ELBOW, 0.064" THICK	30" C.S. ELBOW, 0.064" THICK	36" C.S. ELBOW, 0.064" THICK	42" C.S. ELBOW, 0.064" THICK	48" C.S. ELBOW, 0.064" THICK	15" ELBOW	18" ELBOW	24" ELBOW	36" ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	BERM DRAINAGE OUTLET 36" DSN, SHT 2D-3 (SY)	BERM DRAINAGE OUTLET 42" DSN, SHT 2D-4 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
Y2 52+36	4115																				
	4115	4116																			
Y2 52+50	4116																				
	4116	4117		2																	
Y2 52+40	4118																				
Y2 41+38	4119																				
Y2 55+00	4201																				
	4201	4203																			
Y2 55+50	4202															31						24" BDO
	4202	4203										1									
Y2 55+50	4203																				
	4203	4204																			
Y2 57+68	4205																				
	4205	4206																			
Y2 59+53	4207																				
	4207	4208																			
Y2 59+57	4208																			0.5526		24" Pipe Collar
	4208	4209																			Reline 24" CMP
Y2 62+79	4210																				
	4210	4220																			
Y2 61+50	4211																				
	4211	4212																			
Y2 63+50	4212																				
	4212	4213																			
Y2 63+50	4213																				
	4213	4215																			
Y2 64+50	4214																				
	4214	4215																			
Y2 64+50	4215																				
	4215	4217																			
Y2 65+95	4216																				
	4216	4217																			
Y2 65+95	4217																				
	4217	4218																			
Y2 67+83	4218																				
	4218	4219		2																	
Y2 63+15	4220																				
	4220	4213																			
Y2 59+03	4224																				
Y2 69+56	4301																				
	4301	4302																			
Y2 69+95	4302																				
	4302	4303																			
Y2 69+95	4303																				
	4303	4304																			
Y2 70+44	4304																				
	4304	4305																			
Y2 74+00	4306																				
	4306	4307																			
Y2 74+00	4307																				
SHEET TOTALS				4								1			31				0.5526		

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSZJR-LAPTOP

COMPUTED BY:	Zachary Richard, PE	**DATE:**	10/12/2022
CHECKED BY:	David Petty, PE	**DATE:**	11/17/2022

PROJECT NO.	SHEET NO.
A-0009CC	3D-6

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C. S. PIPE 15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109	R. C. PIPE CLASS III 18	24	30	36	42	48	R. C. PIPE CLASS IV 15	18	24	30	36	42
		4307	4308		2113.6	2092.0	1.1													164																
Y2 76+00	91 LT	4309																																		
		4309	4310		2087.6	2086.8																							80							
Y2 76+00	12 LT	4310																																		
		4310	4311		2086.8	2086.1																														
Y2 77+24	61 LT	4312		2097.0																																
		4312	4314		2094.0	2092.3		64							X	X																				
Y2 77+86	68 LT	4313		2097.5																																
		4313	4314		2096.0	2092.3	1.6		32					X																						
Y2 77+86	37 LT	4314		2095.3																																
		4314	4315		2092.3	2092.1	2.1		8						X	X																				
Y2 77+86	30 LT	4315		2096.5																																
		4315	4317		2092.1	2078.5	0.5																									220				
Y2 80+12	35 LT	4316		2090.5																																
		4316	4317		2078.7	2078.5																										4				
Y2 80+12	31 LT	4317		2082.8																																
		4317	4402		2078.0	2070.6																											196			
Y2 82+18	34 LT	4401		2096.5																																
		4401	4402		2071.7	2071.6																										4				
Y2 82+18	30 LT	4402		2075.4																																
		4402	4403		2070.6	2069.4	0.4																										100			
Y2 86+72	30 LT	4404		2066.0																																
		4404	4405		2057.5	2057.4																										4				
Y2 86+72	27 LT	4405		2061.4																																
		4405	4406		2057.4	2047.0	0.7												92																	
Y2 88+23	26 LT	4407		2056.8																																
		4407	4408		2053.3	2052.5		16							X	X																				
Y2 88+36	37 LT	4408		2055.3																																
		4408	4409		2052.5	2051.9	0.7	88							X	X																				
Y2 76+68	63 LT																																			
Y2 43+34	8 RT																																			
Y2 44+14	22 LT																																			
Y2 68+18	77 LT																																			
Y2 68+00	10 LT																																			
Y2 77+90	11 RT																																			
Y2 78+21	61 RT																																			
Y2 15+80	21 RT																																			
Y2 16+40	20 LT																																			
L 473+69	5 RT																																			
L 473+55	36 LT																																			
L 473+83	44 RT																																			
Y2 25+21	3 RT																																			
Y2 31+62	33 LT																																			
Y2 34+64	47 LT																																			
Y2 35+72	51 LT																																			
Y2 47+18	29 LT																																			
Y2 46+88	6 RT																																			
Y2 52+57	4 RT																																			
Y2 55+79	8 RT																																			
Y2 58+11	32 RT																																			
SHEET TOTALS								168	40										92	164									80			232	296			

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	36" CAAP, 0.075" THICK	42" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	24" PIPE REHABILITATION CIPP LINER	36" PIPE REHABILITATION CIPP LINER	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	4-SIDED OTCB, SEE DETAIL SHEET 2D-5	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17, 840.26, OR 840.45	G.D.I. TYPE "B" STD. 840.18, 840.27, OR 840.45	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	6" PVC PIPE (SPRING BOX)	SPRING BOX STD. 840.41	M.H. FRAME AND COVER STD. 840.54	PRECAST 4' DIA MH STD 840.52	T.B. G.D.I TYPE "A" SEE SHEET 2D-2	MIN DEPTH TYPE A SPECIAL DSN SEE SHEET 2D-1
		4307	4308																																
Y2 76+00	91 LT	4309								4.500																									
		4309	4310																																
Y2 76+00	12 LT	4310																																	
		4310	4311		35	35																													
Y2 77+24	61 LT	4312									1								1	1															
		4312	4314																																
Y2 77+86	68 LT	4313																																	
		4313	4314																																
Y2 77+86	37 LT	4314									1											1				1									
		4314	4315																																
Y2 77+86	30 LT	4315									1																	1				1			
		4315	4317																																
Y2 80+12	35 LT	4316									1	5.0	1.8									1				1									
		4316	4317																																
Y2 80+12	31 LT	4317									1													1										1	
		4317	4402																																
Y2 82+18	34 LT	4401									1	5.0	14.8													1							1		
		4401	4402																																
Y2 82+18	30 LT	4402									1													1										1	
		4402	4403																																
Y2 86+72	30 LT	4404									1	3.5										1				1									
		4404	4405																																
Y2 86+72	27 LT	4405									1													1					1						
		4405	4406																																
Y2 88+23	26 LT	4407									1													1					1						
		4407	4408																																
Y2 88+36	37 LT	4408									1											1				1									
		4408	4409																																
Y2 76+68	63 LT																																		
Y2 43+34	8 RT																																		
Y2 44+14	22 LT																																		
Y2 68+18	77 LT																																		
Y2 68+00	10 LT																																		
Y2 77+90	11 RT																																		
Y2 78+21	61 RT																																		
Y2 15+80	21 RT																																		
Y2 16+40	20 LT																																		
L 473+69	5 RT																																		
L 473+55	36 LT																																		
L 473+83	44 RT																																		
Y2 25+21	3 RT																																		
Y2 31+62	33 LT																																		
Y2 34+64	47 LT																																		
Y2 35+72	51 LT																																		
Y2 47+18	29 LT																																		
Y2 46+88	6 RT																																		
Y2 52+57	4 RT																																		
Y2 55+79	8 RT																																		
Y2 58+11	32 RT																																		
SHEET TOTALS					35	35				4.500	11	13.5	16.6						1	1		4		4		5		1	2			1	1	2	

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	15" C.S. ELBOW, 0.064" THICK	18" C.S. ELBOW, 0.064" THICK	24" C.S. ELBOW, 0.064" THICK	30" C.S. ELBOW, 0.064" THICK	36" C.S. ELBOW, 0.064" THICK	42" C.S. ELBOW, 0.064" THICK	48" C.S. ELBOW, 0.064" THICK	15" ELBOW	18" ELBOW	24" ELBOW	36" ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	BERM DRAINAGE OUTLET 36" DSN, SHT 2D-3 (SY)	BERM DRAINAGE OUTLET 42" DSN, SHT 2D-4 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
		4307	4308			2																
Y2 76+00	91 LT	4309																				
		4309	4310																			Bury 0.7'
Y2 76+00	12 LT	4310																		0.8856		42" Pipe Collar
		4310	4311																			Bury 0.7'; TRENCHLESS INSTALLATION L=70'
Y2 77+24	61 LT	4312																				
		4312	4314																			
Y2 77+86	68 LT	4313																				
		4313	4314																			
Y2 77+86	37 LT	4314																				
		4314	4315																			
Y2 77+86	30 LT	4315																				
		4315	4317																			
Y2 80+12	35 LT	4316																				
		4316	4317																			
Y2 80+12	31 LT	4317																				
		4317	4402																			
Y2 82+18	34 LT	4401																				
		4401	4402																			
Y2 82+18	30 LT	4402																				
		4402	4403																			
Y2 86+72	30 LT	4404																				
		4404	4405																			
Y2 86+72	27 LT	4405																				
		4405	4406		2																	
Y2 88+23	26 LT	4407																				
		4407	4408																			
Y2 88+36	37 LT	4408																				
		4408	4409																			
Y2 76+68	63 LT																		17			
Y2 43+34	8 RT																				60	
Y2 44+14	22 LT																		7			
Y2 68+18	77 LT																				32	
Y2 68+00	10 LT																		49			
Y2 77+90	11 RT																		15			
Y2 78+21	61 RT																				41	
Y2 15+80	21 RT																		9			
Y2 16+40	20 LT																				15	
L 473+69	5 RT																		5			
L 473+55	36 LT																				16	
L 473+83	44 RT																				12	
Y2 25+21	3 RT																		3			
Y2 31+62	33 LT																		3			
Y2 34+64	47 LT																		7			
Y2 35+72	51 LT																		38			
Y2 47+18	29 LT																				18	
Y2 46+88	6 RT																				20	
Y2 52+57	4 RT																		4			
Y2 55+79	8 RT																		5			
Y2 58+11	32 RT																				60	
SHEET TOTALS					2	2													162	0.8856	274	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

TGSZJR-LAPTOP

COMPUTED BY:	Zachary Richard, PE	**DATE:**	10/12/2022
CHECKED BY:	David Petty, PE	**DATE:**	10/12/2022

PROJECT NO.	SHEET NO.
A-0009CC	3D-7

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
Y2 65+98	11	RT									41	
Y2 69+73	53	LT									35	
Y2 69+89	2	RT							7			
Y2 73+87	26	RT									11	
Y2 73+76	2	LT							3			
Y2 78+09	35	LT									40	
Y2 82+18	33	RT									79	
Y2 86+75	1	LT									49	
Y2 88+44	23	LT									33	
L 415+97	18	RT							5			
L 419+40	20	RT							6			
L 420+15	23	LT									73	
L 423+63	30	RT							9			
L 425+98	1	LT							3			
L 431+46	0	CL							3			
L 431+46	43	RT									39	
L 433+57	19	RT							4			
L 440+60	28	RT							8			
L 430+72	17	RT									152	
L 440+38	28	RT									10	
L 446+13	40	RT									29	
L 448+85	63	RT									74	
L 444+45	24	RT							6			
L 448+22	25	RT							25			
L 452+47	19	RT							15			
L 453+47	70	RT									87	
L 458+27	238	RT									20	
L 464+16	9	LT							5			
L 468+44	18	LT									32	
L 469+53	23	RT							5			
L 437+81	62	RT									15	
L 437+45	3	RT							8			
Y2 27+40	127	LT									20	
Y2 78+43	53	RT									5	
L 452+75	51	LT									25	
L 426+05	36	RT									21	

	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C. S. PIPE 15 .064	18 .064	24 .064	30 .064	36 .064	42 .064	48	R. C. PIPE CLASS III 18	24	30	36	42	48	R. C. PIPE CLASS IV 15	18	24	30	36	42	36" CAAP, 0.075" THICK	42" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	42" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	24" PIPE REHABILITATION CIPP LINER	36" PIPE REHABILITATION CIPP LINER	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	4-SIDED OTCB, SEE DETAIL SHEET 2D-5	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17, 840.26, OR 840.45	G.D.I. TYPE "B" STD. 840.18, 840.27, OR 840.45	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	J.B. STD. 840.31 OR STD. 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	6" PVC PIPE (SPRING BOX)	SPRING BOX STD. 840.41	M.H. FRAME AND COVER STD. 840.54	PRECAST 4' DIA MH STD 840.52	T.B. G.D.I TYPE "A" SEE SHEET 2D-2	MIN DEPTH TYPE A SPECIAL DSN SEE SHEET 2D-1	15" C.S. ELBOW, 0.064" THICK	18" C.S. ELBOW, 0.064" THICK	24" C.S. ELBOW, 0.064" THICK	30" C.S. ELBOW, 0.064" THICK	36" C.S. ELBOW, 0.064" THICK	42" C.S. ELBOW, 0.064" THICK	48" C.S. ELBOW, 0.064" THICK	15" ELBOW	18" ELBOW	24" ELBOW	36" ELBOW	BERM DRAINAGE OUTLET STD. 850.10 (SY)	BERM DRAINAGE OUTLET STD. 850.11 (SY)	BERM DRAINAGE OUTLET 36" DSN, SHT 2D-3 (SY)	BERM DRAINAGE OUTLET 42" DSN, SHT 2D-4 (SY)	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.
SHEET TOTALS																																																																													112		890
PROJECT TOTALS	1228	968	352	96	32	436					184	612	652	148	120	176	140	184	292	632	220	80	92	1000	1276	576		136		20	35	35	144	642	296	26.000	119	144.4						1	4	4	12	42	3	46	1	55	4	4	29	224	5	6	2	12	1	2	12	13	4	2	1	2	2	1	1	1	11	62	31	31	274	2.2022	1164

TGSZJR-LAPTOP

COMPUTED BY: Zachary Richard, PE **DATE:** 10/12/2022

CHECKED BY: David Petty, PE **DATE:** 10/12/2022

PROJECT NO.	SHEET NO.
A-0009CC	3D-8

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC)											C. A. A. PIPE						R. C. PIPE CLASS III						66" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	66" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.04 OR STD. 838.14 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.				54" C.A.A. ELBOW, 0.105" THICK		FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE		FROM	TO					54	60	66	72	78	84	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	54	60	66	72	78	84	54	60	66	72	78	84					MASONRY	0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE		GRATE TYPE				D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																																												
THICKNESS OR GAUGE				FT.	FT.	FT.	%												.105	.135	.164												CY	CY	CY	EACH	LIN. FT.	LIN. FT.		E	F	G																																												CY	CY	CY	LIN. FT.	
Y2 27+42	117 LT	4023						24																										5.200																																																					
		4104	4105		2359.9	2352.9																			80																																																																	
Y2 44+11	45 LT	4105		2360.2																															4.400															1						1																														
		4105	4106		2352.9	2329.5	0.8												160																																																															2						
Y2 67+96	68 LT	4221																																6.600																																																							
		4221	4222		2150.4	2134.8																									58	58																																																								TRENCHLESS INSTALLATION, L=116'
Y2 67+72	47 RT	4222		2142.1																															5.000																												1																					JB with Slab Lid
		4222	4223		2134.8	2129.2															56																																																																		
SHEET TOTALS								24											160		56				80						58	58		11.800	9.400															1						1							1															2						
PROJECT TOTALS								24											160		56				80						58	58		11.800	9.400															1						1							1															2						

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY: D. Matthew Brewer DATE: 10/17/22
CHECKED BY: Robert E. Kral DATE: 10/17/22

(12-17-19)

PROJECT NO.	SHEET NO.
A-0009CC	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-L-	417+50	418+50	LT to RT	SD	200
-L-	454+50	455+50	LT to RT	SD	200
-Y2-	16+50	18+00	LT to RT	SD	300
-Y2-	20+00	21+00	LT to RT	SD	200
-Y2-	25+50	26+50	LT to RT	SD	200
-Y2-	42+50	44+50	LT to RT	SD	400
-Y2-	63+50	65+00	LT to RT	SD	300
-Y2-	75+50	76+50	LT to RT	SD	200
-Y2-	77+50	78+50	LT to RT	SD	200
-Y2-	79+50	80+50	LT to RT	SD	200
CONTINGENCY				SD	350
				TOTAL LF:	2750

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
-Y2-	23+50	28+00	1670	730
-Y2-	32+50	33+00	540	240
-Y2-	35+75	36+25	300	130
-Y2-	47+50	52+50	1930	840
-Y2-	55+00	70+00	5250	2210
-Y2-	85+00	88+50	900	390
CONTINGENCY				
		TOTAL SY/TONS:	10590	4540*

*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU (1)	12	1200	2400	3600	450	0
			TOTAL CY/TONS/SY:		1200	2400**	3600**	450	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
-L-	1.5:1	415+75	1.5:1	419+75	LT			3260	
-L-	1.5:1	419+75	1.5:1	420+25	RT			100	
-L-	1.5:1	442+25	1.5:1	446+25	LT			3700	
-Y2-	1.5:1	20+75	1.5:1	22+75	LT			3240	
-Y2-	1.5:1	28+25	1.5:1	32+25	RT			5510	
-Y2-	1.5:1	33+25	1.5:1	33+75	RT			520	
-Y2-	1.5:1	34+25	1.5:1	35+25	RT			1270	
-Y2-	1.5:1	40+25	1.5:1	42+75	RT			1450	
-Y2-	1.5:1	43+25	1.5:1	46+25	RT			1610	
-Y2-	1.5:1	54+75	1.5:1	55+75	RT			90	
-Y2-	1.5:1	67+75	1.5:1	68+25	LT			80	
-Y2-	1.5:1	72+75	1.5:1	74+25	RT			1150	
-Y2-	1.5:1	75+75	1.5:1	76+25	RT			50	
					TOTAL SY:	0	0	22030*	0

*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.
**Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

SUMMARY OF HORIZONTAL DRAINS

LINE	Approximate Station	Location LT/RT	Elevation Above or Below Grade (+/-) FT	Inclination Angle DEGREES	PVC Pipe Schedule 40/80 or NO PIPE	Horizontal Drain FT	Horizontal Drain W/O Pipe FT
CONTINGENCY						3340	
					TOTAL FT:	3340	0

PROJ. REFERENCE NO.	SHEET NO.
A-0009CC	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

REVISIONS

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
115	35	US FOREST SERVICE TRACT N-599 (Add. Take on A-0009CB)
116	35	NOT USED
117	35	DELMAR L. HOLDER, ET AL (Add. Take on A-0009CB)
118 & 119		NOT USED
120	35 & 36	MARCIA G. WILLIAMS
121	36 &41	BARBARA LAKEY
122	36 & 37	US FOREST SERVICE TRACT N-676
123	36	CIRCLE G MANAGEMENT
124	37, 38 & 39	US FOREST SERVICE TRACT N-668
125	36, 37, 40 & 41	ROBERT K. NORCROSS
126	37 - 40	PAMELA WACHACHA
127	39	KATHY D. BRUCE, ET AL
128	39 & 40	BARBARA LAKEY
129	40	PAMELA WACHACHA
130	41	DAVID M. HOLDER
131	41 & 42	JAMES P. EWING, TRUSTEE, ET AL
132		NOT USED
133	42 & 43	JOHN B. NORCROSS
134	42	CREWS BROTHERS, LLC
134A	42	DEAN A. HORNING
135	42 & 43	ROBERT K. NORCROSS
136	43	JAMES M. JENKINS
137	43	RICKEY D. MCCRACKEN
138	43	ROBERT K. NORCROSS
139	43 & 44	THOMAS E. SCHIESSLE
140	43	GLEN MCCOY
141	43	LESTER A. JENKINS, ET AL
142		NOT USED
144	44	FLOYD J. CODY
145	44	LEON CABLE

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

8/17/99

–L– CURVE DATA
PI Sta 419+44.60
△ = 56° 20' 44.5" (LT)
D = 9° 32' 57.5"
L = 590.05'
T = 321.35'
R = 600.00'
DS = 45 MPH
SE = 0.08

–DR3– CURVE DATA
PI Sta 10+68.68
△ = 13° 52' 12.2" (RT)
D = 22° 55' 05.9"
L = 60.52'
T = 30.41'
R = 250.00'
SE = SEE PLANS

PI Sta 11+40.26
△ = 75° 57' 23.4" (LT)
D = 114° 35' 29.6"
L = 66.28'
T = 39.03'
R = 50.00'
SE = SEE PLANS

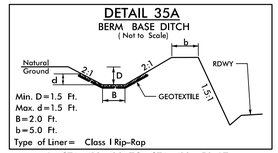
(B1) S 33° 09' 58.9" W
(1) –DR3– PC 11+01.23
(2) –DR3– PT 11+67.51
(B2) S 42° 47' 24.5" E

PAVEMENT REMOVAL

PROP MONOLITHIC CONC ISLAND – SURFACE MOUNTED

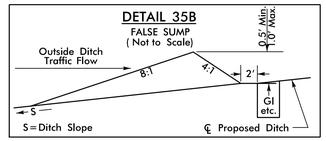
NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED. END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE–IN PER CROSS–SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

DETAIL 35A
BERM BASE DITCH
(Not to Scale)



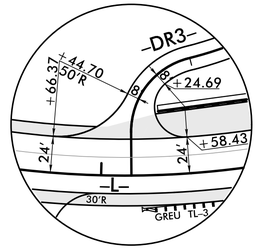
–L– STA. 419+00 TO STA. 419+50 LT

DETAIL 35B
FALSE SUMP
(Not to Scale)



–L– STA. 414+93 LT
–L– STA. 416+37 LT
–L– STA. 418+09 LT
–L– STA. 419+48 LT

THE CONTRACTOR SHOULD BE ADVISED THAT ANY CLEARING WITHIN THE PERMANENT EASEMENT (PE) ALONG USFS PROPERTY SHALL ADHERE TO THE AGREEMENT BETWEEN NCDOT AND THE USFS. THE CONTRACTOR IS TO COORDINATE WITH THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER PRIOR TO STARTING CLEARING OPERATIONS TO ENSURE COMPLIANCE.



–L–/–DR3– INTERSECTION

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
A–0009CC	35
R/W SHEET NO.	

ROADWAY DESIGN
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
10/18/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY
10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

END SECTION A–0009CB
BEGIN SECTION A–0009CC

BEGIN TIP PROJECT A–0009CC
–L– STA. 414+50.00

–L– PC 416+23.25

–L– POC 420+20.00 =
–DR3– POT 11+96.03

–DR3– PC 10+38.28
–DR3– PT 10+98.80

–DR3– POT 10+00.00

–L– PT 422+13.30

BEGIN CONSTRUCTION
–DR3 STA. 10+20.00

MATCH LINE STA –L– 428+00.00
MATCH TO SHEET NO. 36

117 DELMAR LOWELL HOLDER & WIFE MARTHA HOLDER; AND THEODORE C. HOLDER, SINGLE
DB 118 PG 76
DB 118 PG 233

115 U.S. FOREST SERVICE
TRACT N–599
DB 82 PG 603

120 MARCIA G. WILLIAMS
DB 289 PG 738

PROP. RETAINING WALL #21 W/CONCRETE DITCH
BEGIN –L– STA. 420+39.25
END –L– STA. 436+64.65

PROP. RETAINING WALL #26
BEGIN –L– STA. 421+36.10
END –L– STA. 423+54.00

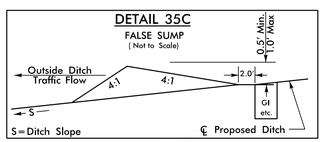
PROP. RETAINING WALL #27
BEGIN –L– STA. 427+36.11
END –L– STA. 431+45.17

PROP. CONCRETE DRIVE

PROP. DRIVE

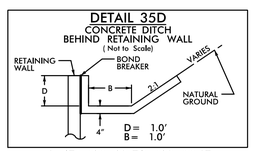
FOR CONCRETE ISLAND & DRIVE LAYOUT SEE DETAIL SHT 2B–1

DETAIL 35C
FALSE SUMP
(Not to Scale)



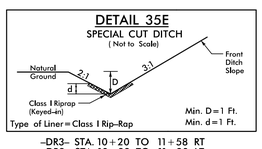
–L– STA. 421+00 RT
–L– STA. 426+19 RT

DETAIL 35D
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)



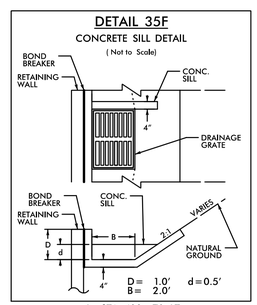
–L– STA. 420+39 TO 428+00 LT
(SEE WALL ENVELOPES FOR DITCH GRADE)

DETAIL 35E
SPECIAL CUT DITCH
(Not to Scale)



–DR3– STA. 10+20 TO 11+58 RT
–DR3– STA. 10+38 TO 11+20 LT
(SEE XSCs FOR TYPICAL DITCH GRADE)

DETAIL 35F
CONCRETE SILL DETAIL
(Not to Scale)



–L– STA. 422+70 LT
–L– STA. 426+07 LT

FOR –L– PROFILE, SEE SHEET NO.69

FOR –DR3– PROFILE, SEE SHEET NO. 74

10/17/2022
K:\NCDOT\A-0009\Roadway\Proj\A-0009CC_Plan Sheets\A-0009CC_Rdy_psh_35.dgn
USER:jsinel

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	36
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
10/18/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETH
10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

NAD 83/2011

-L- CURVE DATA

PI Sta 434+01.05	PI Sta 440+11.67
Δ = 75° 56' 44.8" (LT)	Δ = 26° 10' 50.5" (RT)
D = 12° 43' 56.6"	D = 8° 48' 53.0"
L = 596.48'	L = 297.01'
T = 351.24'	T = 151.14'
* R = 450.00'	R = 650.00'
SE = 0.08	SE = 0.08
DS = 40 MPH	DS = 45 MPH

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED. END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHOULD BE ADVISED THAT ANY CLEARING WITHIN THE PERMANENT EASEMENT (PE) ALONG USFS PROPERTY SHALL ADHERE TO THE AGREEMENT BETWEEN NCDOT AND THE USFS. THE CONTRACTOR IS TO COORDINATE WITH THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER PRIOR TO STARTING CLEARING OPERATIONS TO ENSURE COMPLIANCE.

MATCH LINE STA -L- 428+00.00
MATCH TO SHEET NO. 35

MATCH LINE STA -L- 442+00.00
MATCH TO SHEET NO. 37

120 MARCIA G. WILLIAMS DB 289 PG 738

121 BARBARA LAKEY DB 204 PG 740

122 U.S. FOREST SERVICE TRACT N-676 DB 102 PG 614

123 CIRCLE G MANAGEMENT, LLC DB 359 PG 483 DB 359 PG 486

125 ROBERT K. NORCROSS DB 329 PG 466

ROBERT L. LINN DB 234 PG 200

PROP. RETAINING WALL #21
W/CONCRETE DITCH
BEGIN -L- STA. 420+39.25
END -L- STA. 436+64.65

PROP. RETAINING WALL #22
W/CONCRETE DITCH
BEGIN -L- STA. 438+96.72
END -L- STA. 442+58.42

PROP. RETAINING WALL #27
BEGIN -L- STA. 427+36.11
END -L- STA. 431+45.17

PROP. SINGLE FACED CONCRETE BARRIER

CONC. DITCH BEHIND RETAINING WALL SEE DETAIL 36A

-L- PC 430+49.81

-L- PT 436+46.29

-L- PT 441+57.53

-L- PC 438+60.52

PROP. DRIVE

DO NOT DISTURB SIGN

SPECIAL CUT DITCH SEE DETAIL 36B CLASS I RIPRAP 60 TONS, 85 SY GEO

CLASS I RIPRAP 40 TONS, 55 SY GEO

FALSE SUMP SEE DETAIL 36C

186.33' SHOULDER TAPER 19.5' TO 8'

PRECAST 4' DIA MH w/2GI STD 840.52

FILL WITH FLOWABLE FILL EST 4 CY

FILL WITH FLOWABLE FILL EST 3 CY

FILL WITH FLOWABLE FILL EST 8 CY

REMOVE HW

REMOVE 15 LF

REMOVE

ROD AND LUG WITH GASKETS (ELBOWS)

MAX 1.0% PIPE SLOPE THIS SIDE OF ELBOW

MIN 1.6% PIPE SLOPE THIS SIDE OF ELBOW

CLASS B RIPRAP 2 TONS, 7 SY GEO

CLASS I RIPRAP 7 TONS, 15 SY GEO

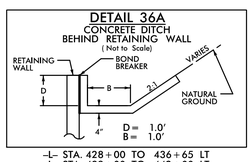
CLASS I RIPRAP 4 TONS, 10 SY GEO

CLASS I RIPRAP (KEYED-IN) 18 TONS

SHOULDER BERM GUTTER -L- STA. 438+00 TO 448+97, RT

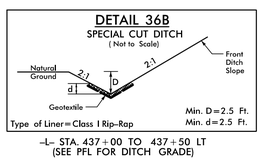
BM#21 ELEV. 2806.49'
-BL- STA. 432+42.00 78' RT.
SPIKE NAIL IN BASE OF 24" PRINCESS TREE

DETAIL 36A
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)



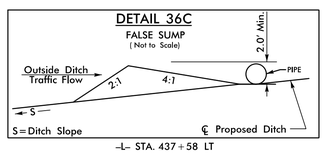
-L- STA. 428+00 TO 436+65 LT
-L- STA. 439+00 TO 442+00 LT
(SEE WALL ENVELOPES FOR DITCH GRADE)

DETAIL 36B
SPECIAL CUT DITCH
(Not to Scale)



-L- STA. 437+00 TO 437+50 LT
(SEE PFL FOR DITCH GRADE)

DETAIL 36C
FALSE SUMP
(Not to Scale)



-L- STA. 437+58 LT

* DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVATURE AND HORIZONTAL STOPPING SIGHT DISTANCE.

FOR -L- PROFILE, SEE SHEET NO. 69

10/17/2022
K:\NCDOT\A-0009\Roadway\Proj\A-0009CC Plan Sheets\A-0009CC_Rdy_psh_36.dgn
User:jsmelvin

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	37
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
10/18/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B PETTY
10/18/2022

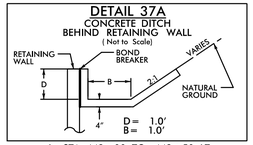
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

-L- CURVE DATA

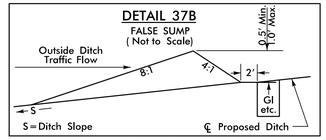
PI Sta 456+91.51
Δ = 49° 15' 00.2" (RT)
D = 9° 32' 57.5"
L = 515.75'
T = 275.02'
R = 600.00'
SE = 0.08
DS = 45 MPH

DETAIL 37A
CONCRETE DITCH BEHIND RETAINING WALL (Not to Scale)



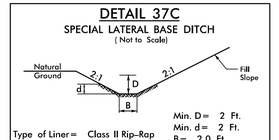
-L- STA. 442+00 TO 442+50 LT
-L- STA. 448+40 TO 452+25 LT
-L- STA. 453+25 TO 456+00 LT
(SEE WALL ENVELOPES FOR DITCH GRADE)

DETAIL 37B
FALSE SUMP (Not to Scale)



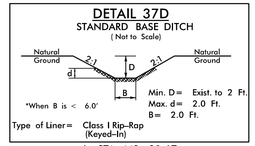
-L- STA. 443+62 LT
-L- STA. 444+63 LT
-L- STA. 446+64 LT

DETAIL 37C
SPECIAL LATERAL BASE DITCH (Not to Scale)



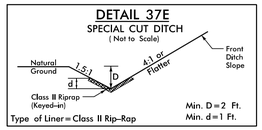
-L- STA. 452+50 TO 453+00 LT

DETAIL 37D
STANDARD BASE DITCH (Not to Scale)



-L- STA. 448+20 LT

DETAIL 37E
SPECIAL CUT DITCH (Not to Scale)



-L- STA. 442+50 TO 443+50 LT
(SEE XSCs FOR TYPICAL DITCH GRADE)

NAD 83/2011

THE CONTRACTOR SHOULD BE ADVISED THAT ANY CLEARING WITHIN THE PERMANENT EASEMENT (PE) ALONG USFS PROPERTY SHALL ADHERE TO THE AGREEMENT BETWEEN NCDOT AND THE USFS. THE CONTRACTOR IS TO COORDINATE WITH THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER PRIOR TO STARTING CLEARING OPERATIONS TO ENSURE COMPLIANCE.

MATCH LINE STA -L- 442+00.00
MATCH TO SHEET NO. 36

445

122
U.S. FOREST SERVICE
TRACT N-676
DB 102 PG 614

PROP. RETAINING WALL #22
W/CONCRETE DITCH
BEGIN -L- STA. 438+96.22
END -L- STA. 442+58.42

CONC. DITCH BEHIND RETAINING WALL SEE DETAIL 37A
+44.00 113.00'
+03.00 58.50'
+85.00 137.00'
+52.00 133.00'
WOODS
36' TYP
24'
+65.53'
+65.00 58.50'
+65.00 50.00'
SPECIAL CUT DITCH SEE DETAIL 37E CLASS II RIPRAP (KEYED-IN) 50 TONS, NO GEO
MIN DEPTH 2GI-A SPEC DSN
FALSE SUMP SEE DETAIL 37B
TIE 8" INTO 2GI (3703).
FALSE SUMP SEE DETAIL 37B
+82.00 57.00'
+82.00 50.00'
+36.00 55.00'
+36.00 50.00'
FALSE SUMP SEE DETAIL 37B
+06.00 112.00'
+45.00 70.00'
+19.00 90.00'
REMOVE HW
+50.00 77.00'
+06.00 78.00'
+25.00 66.50'
+25.00 50.00'
STANDARD BASE DITCH SEE DETAIL 37D CL 'I' RIP-RAP 16 TONS, NO GEO
CLASS I RIPRAP (KEYED-IN) 12 TONS, NO GEO
PROP. SINGLE FACED CONCRETE BARRIER
BM#22 ELEV. 2715.62'
-BL- STA. 444+50.00 72' LT.
SPIKE NAIL IN BASE OF 12" POPLAR
2GI (Top Wall)
OTCB-4
18" 24"
15" CSP
SPRING
BLOCK HW
PLUG
18" RCP-IV
CONC. DITCH BEHIND RETAINING WALL SEE DETAIL 37A
CLASS I RIPRAP (KEYED-IN) 16 TONS, NO GEO
PE
PDE
3702 3703 3704 3705 3706 3707 3708 3712 3713 3714 3716 3717 3718 3719 3722 3723
R/W
TRACT LINE
450
SPECIAL LATERAL BASE DITCH SEE DETAIL 37C CL 'II' RIP-RAP 80 TONS, NO GEO
+49.00 75.00'
+40.00 66.50'
+40.00 50.00'
REMOVE 25 LF
REMOVE HW
+90.00 75.00'
+10.00 58.50'
+10.00 50.00'
+25.00 58.50'
+16.49 58.50'
+16.49 50.00'
+64.81 EX. R/W
PROP. RETAINING WALL #23
W/CONCRETE DITCH
BEGIN -L- STA. 448+40.00
END -L- STA. 452+25.00
PROP. RETAINING WALL #24
W/CONCRETE DITCH
BEGIN -L- STA. 453+25.00
END -L- STA. 456+25.00
124
U.S. FOREST SERVICE
TRACT N-668
DB 96 PG 738
455
8'FDPS
TYPE B-77
GREU TL-3
10'-3" FDPS
30" RCP-III
36" RCP-IV
N 21° 00' 49.8" W
BL-67
BL-68
NC 143 (SWEETWATER RD)
24"BST
BST SHOULDER
CONC CURB
REMOVE
REMOVE 29 LF
2.4" CMP
8" CMP
30" CSP
36" CSP
ROD AND LUG WITH GASKETS (ELBOWS)
FILL WITH FLOWABLE FILL EST 6 CY
FILL WITH FLOWABLE FILL EST 25 CY
FILL WITH FLOWABLE FILL EST 15 CY
PLUG
3705 3710 3711 3721
+95.00 EX. R/W
+77.00 EX. R/W
+77.00 108.00'
+61.00 EX. R/W
+20.00 EX. R/W
+61.00 140.00'
+20.00 140.00'
+11.00 EX. R/W
+44.00 EX. R/W
+11.00 83.00'
+30.00 90.00'
+33.00 EX. R/W
+75.00 EX. R/W
+38.00 170.00'
+75.00 170.00'
+21.00 53.60'
+48.00 65.00'
+69.20 EX. R/W
SHOULDER BERM GUTTER -L- STA. 438+00 TO 448+97, RT
SHOULDER BERM GUTTER -L- STA. 451+86 TO 453+62, RT
CLASS II RIPRAP (KEYED-IN) 25 TONS, NO GEO
+55.00 108.00'
CLASS II RIPRAP (KEYED-IN) 30 TONS, NO GEO
CLASS II RIPRAP (KEYED-IN) 30 TONS, NO GEO
WOODS
SOIL
125
ROBERT K. NORCROSS
DB 329 PG 466
126
PAMELA WACHACHA
DB 189 PG 493
S 62°30'29" W 7.50'
N 61°43'30" E 256.96'
N 68°56'47" E 956.08'
-L- PC 454+16.49

MATCH LINE STA -L- 456+00.00
MATCH TO SHEET NO. 38

FOR -L- PROFILE, SEE SHEET NO. 70

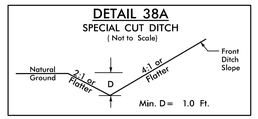
10/17/2022
X:\NCDOT\A-0009\Roadway\Proj\A-0009CC_Plan Sheets\A-0009CC_Rdy_psh_37.dgn
User:jsmelvin

8/17/99

–L– CURVE DATA

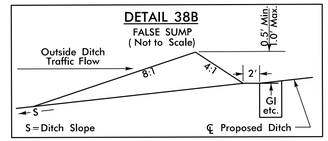
PI Sta 456+91.51	PI Sta 470+84.26
Δ = 49° 15' 00.2" (RT)	Δ = 21° 31' 55.6" (LT)
D = 9° 32' 57.5"	D = 7° 32' 20.1"
L = 515.75'	L = 285.61'
T = 275.02'	T = 144.51'
R = 600.00'	R = 760.00'
SE = 0.08	SE = 0.04
DS = 45 MPH	DS = 45 MPH

DETAIL 38A
SPECIAL CUT DITCH
(Not to Scale)



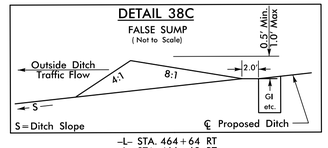
–L– STA. 461+50 TO STA. 464+00 LT
SEE PFL FOR DITCH GRADES

DETAIL 38B
FALSE SUMP
(Not to Scale)



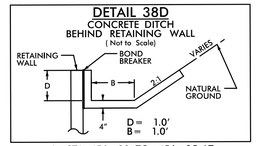
–L– STA. 464+64 LT

DETAIL 38C
FALSE SUMP
(Not to Scale)



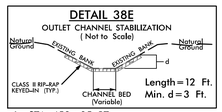
–L– STA. 464+64 RT
–L– STA. 466+63 RT

DETAIL 38D
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



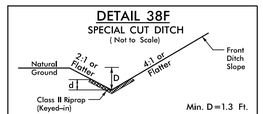
–L– STA. 456+00 TO 456+25 LT
–L– STA. 468+75 TO 470+00 LT
(SEE WALL ENVELOPES FOR DITCH GRADE)

DETAIL 38E
OUTLET CHANNEL STABILIZATION
(Not to Scale)



–L– STA 458+35 RT
–L– STA 468+04 RT

DETAIL 38F
SPECIAL CUT DITCH
(Not to Scale)



–L– STA. 456+50 TO STA. 457+50 LT
SEE PFL FOR DITCH GRADES

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	38
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. PERRY ENGINEER
11/8/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY ENGINEER
11/8/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.
END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE–IN PER CROSS–SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHOULD BE ADVISED THAT ANY CLEARING WITHIN THE PERMANENT EASEMENT (PE) ALONG USFS PROPERTY SHALL ADHERE TO THE AGREEMENT BETWEEN NCDOT AND THE USFS. THE CONTRACTOR IS TO COORDINATE WITH THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER PRIOR TO STARTING CLEARING OPERATIONS TO ENSURE COMPLIANCE.

PROP. RETAINING WALL #24
W/CONCRETE DITCH
BEGIN –L– STA. 453+25.00
END –L– STA. 456+25.00

PROP. RETAINING WALL #25
W/CONCRETE DITCH
BEGIN –L– STA. 468+75.00
END –L– STA. 471+75.00

PROP. SINGLE FACED CONCRETE BARRIER

–L– PC 469+39.75

–L– PT 459+32.23

CONC. DITCH BEHIND RETAINING WALL SEE DETAIL 38D

TRANSITION STONE CLASS II RIPRAP (KEYED–IN) 55 TONS, NO GEO

TIE TO EXISTING DITCH

SPECIAL CUT DITCH SEE DETAIL 38F CLASS II RIPRAP (KEYED–IN) 105 TONS, NO GEO

CLASS I RIPRAP (KEYED–IN) 25 TONS, NO GEO

DO NOT DISTURB SIGN

REMOVE SEPARATED PIPE (20 LF)

CONCRETE COLLAR

36" CAAP

DO NOT BURY INVERT

OUTLET CHANNEL STABILIZATION SEE DETAIL 38E CLASS II RIPRAP 14 TONS, NO GEO

SPECIAL CUT DITCH SEE DETAIL 38A

FALSE SUMP SEE DETAIL 38B

REMOVE CONC. DITCH

REMOVE CONC. DITCH

FILL WITH FLOWABLE FILL EST 5 CY

DO NOT DISTURB SIGNS

PERMANENT EASEMENT FOR WARBLER HABITAT ESTABLISHMENT

FALSE SUMP SEE DETAIL 38C

REMOVE CONC DITCH

FALSE SUMP SEE DETAIL 38C

OUTLET CHANNEL STABILIZATION SEE DETAIL 38E CLASS II RIPRAP 14 TONS, NO GEO

CLASS I RIPRAP (KEYED–IN) 12 TONS, NO GEO

FILL WITH FLOWABLE FILL EST 5 CY

CLASS I RIPRAP 4 TONS, 10 SY GEO

CONC. DITCH BEHIND RETAINING WALL SEE DETAIL 38D

PROP. DRIVE

PROP. DRIVE

360.36' TAPER

(124) U.S. FOREST SERVICE TRACT N–668 DB 96 PG 738

(126) PAMELA WACHACHA DB 189 PG 493

MATCH LINE STA –L– 456+00.00 SHEET NO. 37

MATCH LINE STA –L– 470+00.00 SHEET NO. 39

MATCH TO SHEET NO. 40

FOR –L– PROFILE, SEE SHEET NO. 70

8/17/99

REVISIONS

-Y2- CURVE DATA

PI Sta 11+99.45	PI Sta 18+27.84	PI Sta 25+91.41
Δ = 19° 44' 48.4" (LT)	Δ = 38° 45' 19.5" (RT)	Δ = 15° 17' 06.5" (RT)
D = 5° 00' 00.0"	D = 12° 52' 31.6"	D = 4° 46' 28.7"
L = 394.94'	L = 301.00'	L = 320.13'
T = 199.45'	T = 156.51'	T = 161.02'
R = 1,145.92'	R = 445.00'	R = 1,200.00'
SE = 0.08	SE = 0.08	SE = 0.08
DS = 55 MPH	DS = 40 MPH	DS = 60 MPH

① -Y2- PC 24+30.38

-L- CURVE DATA

PI Sta 470+84.26	PI Sta 473+03.33
Δ = 21° 31' 55.6" (LT)	Δ = 75° 53' 24.9" (RT)
D = 7° 32' 20.1"	D = 57° 17' 44.8"
L = 285.61'	L = 132.45'
T = 144.51'	T = 77.97'
R = 760.00'	R = 100.00'
SE = 0.04	SE = 0.03
DS = 45 MPH	DS = 20 MPH

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.
END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	39
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 035018 ENGINEER JIMMY L TERRY — 10/18/2022

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 038697 ENGINEER DAVID B PETTY — 10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

CONTRACTOR TO LOCATE AS DIRECTED BY ENGINEER.

CONTRACTOR TO LOCATE AS DIRECTED BY ENGINEER.

CONTRACTOR TO FIELD VERIFY UNDERGROUND STREAM ELEVATION & DIMENSIONS & COORDINATE WITH ENGINEER PRIOR TO ORDERING STRUCTURE #3904.

NAD 83/2011

-L- POT 474+31.52 = -Y2- POT 23+00.94

END CONSTRUCTION
-L- STA. 474+19.52
FOR CONCRETE ISLAND LAYOUT SEE DETAIL SHT 2B-1

PROP. RETAINING WALL #40 W/CONCRETE DITCH
BEGIN -Y2- STA. 16+75±
END -Y2- STA. 18+70±

PROP. RETAINING WALL #39 W/CONCRETE DITCH
BEGIN -Y2- STA. 14+59±
END -Y2- STA. 16+25±

-Y2- PT 13+94.94

540' LANE DROP TAPER

BEGIN CONSTRUCTION
-Y2- STA. 12+60.00

-Y2- PC 16+71.33

PROP. DRIVE
-Y2- PT 19+72.33

FOR CONCRETE ISLAND & PARKING AREA LAYOUT SEE DETAIL SHT 2B-1

FOR CONCRETE ISLAND LAYOUT SEE DETAIL SHT 2B-1

-L- PRC 472+25.36

-L- PT 473+57.81

(127) KATHY D. BRUCE, ET AL DB 242 PG 80

(128) BARBARA LAKEY DB 189 PG 490

(124) U.S. FOREST SERVICE TRACT N-668 DB 96 PG 738

(126) ALLEN H. LAKEY DB 189 PG 493

BM#23 ELEV. 2523.73'
-BL- STA. 470+19.00 70' LT.
SPIKE NAIL IN BASE OF 15" POPLAR

THE CONTRACTOR SHOULD BE ADVISED THAT ANY CLEARING WITHIN THE PERMANENT EASEMENT (PE) ALONG USFS PROPERTY SHALL ADHERE TO THE AGREEMENT BETWEEN NCDOT AND THE USFS. THE CONTRACTOR IS TO COORDINATE WITH THE RESIDENT ENGINEER AND DIVISION ENVIRONMENTAL OFFICER PRIOR TO STARTING CLEARING OPERATIONS TO ENSURE COMPLIANCE.

DETAIL 39A
SPECIAL CUT DITCH
(Not to Scale)
-Y2- STA. 13+73 TO 14+50 LT
SEE PFL FOR DITCH GRADE (9.0%)

DETAIL 39B
STANDARD "V" DITCH
(Not to Scale)
-Y2- STA 18+80 TO 18+91 LT
SEE PFL FOR CHANNEL CHANGE GRADE (17.5%)

DETAIL 39C
TOE PROTECTION
(Not to Scale)
Type of Liner=See Below
-L- STA. 471+75 TO 472+50 LT (Class B Rip-Rap)
-Y2- STA. 22+75 TO 26+45 LT (Class I Rip-Rap)

DETAIL 39F
BANK STABILIZATION
(Not to Scale)
Length=12 Ft.
Min. d=3 Ft.
-Y2- STA 13+06 LT

DETAIL 39D
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)
D= 1.0'
B= 1.0'
-L- STA. 470+00 TO 471+75 LT
-Y2- STA. 14+59 TO 16+25 LT
-Y2- STA. 16+75 TO 18+70 LT
(SEE WALL ENVELOPES FOR DITCH GRADE)

DETAIL 39E
FALSE SUMP
(Not to Scale)
-Y2- STA. 25+39 RT

PROP. RETAINING WALL #25 W/CONCRETE DITCH
BEGIN -L- STA. 468+75.00
END -L- STA. 471+75.00

AVERAGE DAILY TRAFFIC

-Y2- NC 28		-NC- NC 28
1,930 / 2,900	740 / 1,000	2,600 / 3,300
	-L- NC 143	3,330 / 4,330
3,790 / 5,200		

2022 ADT
2045 ADT

MATCH LINE STA -L- 470+00.00
MATCH TO SHEET NO. 38

MATCH LINE STA -Y2- 26+00.00
MATCH TO SHEET NO. 40

FOR -L- PROFILE, SEE SHEET NO. 71

FOR -Y2- PROFILE, SEE SHEET NO. 71

10/17/2022
K:\NCDOT\A-0009\Roadway\Proj\A-0009CC Plan Sheets\A-0009CC_Rdy_psh_39.dgn
User:smelvin

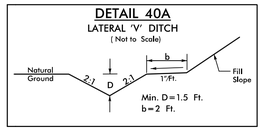
PAVEMENT REMOVAL

-Y2- CURVE DATA

PI Sta 25+91.41
△ = 15° 17' 06.5" (RT)
D = 4° 46' 28.7"
L = 320.13'
T = 161.02'
R = 1,200.00'
SE = 0.08
DS = 60 MPH

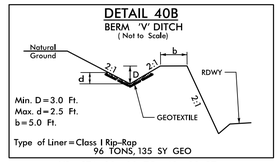
PI Sta 44+39.36
△ = 102° 05' 50.9" (LT)
D = 5° 09' 42.4"
L = 1,977.95'
T = 1,373.12'
R = 1,110.00'
SE = 0.08
DS = 55 MPH

DETAIL 40A
LATERAL 'V' DITCH
(Not to Scale)



-Y2- STA. 32+40 TO 32+63 RT
SEE PFL FOR DITCH GRADE (1.4%)

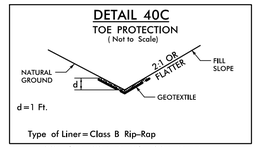
DETAIL 40B
BERM 'V' DITCH
(Not to Scale)



Type of Liner = Class I Rip-Rap
96 TONS, 135 SY GEO

-Y2- STA. 39+00 TO 40+00 RT
SEE PFL FOR DITCH GRADES

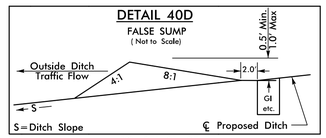
DETAIL 40C
TOE PROTECTION
(Not to Scale)



Type of Liner = Class B Rip-Rap

-Y2- STA. 29+75 TO 30+45 LT
-Y2- STA. 32+70 TO 33+00 RT

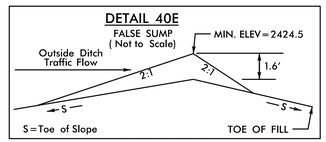
DETAIL 40D
FALSE SUMP
(Not to Scale)



S=Ditch Slope

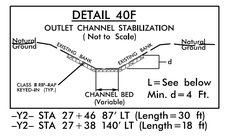
-Y2- STA. 31+85 RT
-Y2- STA. 34+12 RT
-Y2- STA. 35+62 RT
-Y2- STA. 39+63 RT

DETAIL 40E
FALSE SUMP
(Not to Scale)



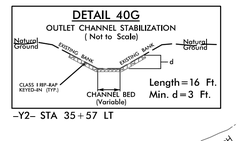
-L- STA. 36+50 RT

DETAIL 40F
OUTLET CHANNEL STABILIZATION
(Not to Scale)



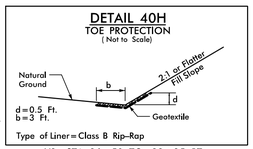
-Y2- STA 27+46 87' LT (Length=30 ft)
-Y2- STA 27+38 140' RT (Length=18 ft)

DETAIL 40G
OUTLET CHANNEL STABILIZATION
(Not to Scale)



-Y2- STA 35+57 LT

DETAIL 40H
TOE PROTECTION
(Not to Scale)



Type of Liner = Class B Rip-Rap

-Y2- STA. 36+50 TO 38+25 RT

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	40
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 ENGINEER JIMMY L TERRY
10/18/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 ENGINEER DAVID B PETTY
10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

8/17/99
REVISIONS

MATCH LINE STA -Y2- 26+00.00 MATCH TO SHEET NO. 39

MATCH LINE STA -Y2- 40+00.00 MATCH TO SHEET NO. 41

MATCH TO SHEET NO. 38

TOE PROTECTION SEE DETAIL 39C CLASS I RIPRAP
DO NOT DISTURB
ELECTRIC
+05.00 185.00'
I 1/5 ROCK D
+61.00 157.00'
MAX 0.5% PIPE SLOPE THIS SIDE OF ELBOW
OUTLET CHANNEL STABILIZATION SEE DETAIL 40F CLASS I RIPRAP 20 TONS, NO GEO
ISBW
CARVER BRANCH
ROBERT K. NORCROSS DB 329 PG 466
S 10°41'19" E 185.75'
S 09°10'36" W 45.78'
S 29°57'00" W 32.63'
S 36°23'08" E 86.02'
S 52°09'54" E 51.01'
S 58°39'42" E 65.01'
REMOVE
OUTLET CHANNEL STABILIZATION SEE DETAIL 40F CLASS II RIPRAP 30 TONS, NO GEO
+47.00 170.00'
PROP. RETAINING WALL #30 BEGIN -Y2- STA. 26+50± END -Y2- STA. 28+75±
30
128
BARBARA LAKEY DB 189 PG 490
ROD AND LUG WITH GASKETS (ELBOWS)
+58.47 110.00'
WOODS
ELECTRIC
24" CSP
+65.00 EX. R/W
TB JB w/MH
4022
4023
4001
4004
34" CMP
HW
12" RCP
GREU TL-3
B-EDPS
32' TYP
+52.38
BY27-122
4003
JB w/Slab Lid
48" CSP
+87.00 EX. R/W
-Y2- PT 27+50.52
S 9°41' 37.7" W
+59.00 EX. R/W
DO NOT BURY INVERT +95.00 88.00'
HW 4007
ELBOWS
+28.00 EX. R/W
CLASS B RIPRAP 2 TONS 7 SY GEO
SHOULDER BERM GUTTER -Y2- STA. 27+00 TO 28+25, RT
FILL WITH FLOWABLE FILL EST 3 CY
+76.12 50.00'
REMOVE HW
4011
2GI
ALLEN H. LAKEY DB 124 PG 251
-Y2- PC 30+66.24
CLASS I RIPRAP 4 TONS, 10 SY GEO
CLASS B RIPRAP 2 TONS, 7 SY GEO
TOE PROTECTION SEE DETAIL 40C CLASS B RIPRAP 14 TONS, 31 SY GEO
S 18°02'56" E 108.02'
S 13°24'46" E 62.02'
S 14°06'32" W 36.43'
S 27°32'52" W 44.08'
S 20°51'39" W 39.61'
S 34°27'30" W 39.80'
N 05°38'04" W 39.37'
N 13°29'25" E 44.43'
N 11°31'03" W 136.22'
N 35°50'16" W 241.36'
N 41°48'34" W 47.58'
3.00°S.R.S. N
36" CMP
EXISTING R/W
+28.00 160.00'
+58.00 130.00'
+76.00 EX. R/W
+73.00 EX. R/W
+17.00 EX. R/W
+22.00 EX. R/W
PLUG 4019
18" CSP
4018
4012
CPLUG
4017
4016
4015
4014
4013
18"
FILL WITH FLOWABLE FILL EST 7 CY
MAX 1% PIPE SLOPE THIS SIDE OF ELBOW
ROD AND LUG WITH GASKETS (ELBOWS)
CONC HW
REMOVE HW
BY27-124
BY27-125
BY27-126
FNC 28 (FONT ANA ROD)
129
PAMELA WACHACHA DB 124 PG 251
2 S F BARN
DRAIN LINES
SEPTIC TANK
PROP. DRIVE
DECK
WD STEPS
FALSE SUMP SEE DETAIL 40D
ROCK WALL
ROCK BBQ
ROCK CHIMNEY
40' R
OUTLET CHANNEL STABILIZATION SEE DETAIL 40G CLASS I RIPRAP 20 TONS, NO GEO
DO NOT BURY INVERT
CLASS I RIPRAP 4 TONS, NO GEO
+10.00 69.00'
+42.00 50.00'
+27.00 50.00'
+88.00 76.00'
+88.00 50.00'
+69.00 50.00'
+50.00 50.00'
+25.00 50.00'
+92.00 75.00'
+63.00 67.00'
+25.00 66.00'
+50.00 135.00'
+44.00 116.00'
+00.00 137.00'
+54.00 112.00'
FALSE SUMP SEE DETAIL 40D
FILL WITH FLOWABLE FILL EST 38 CY
FALSE SUMP SEE DETAIL 40E
PROP. DRIVE
BERM 'V' DITCH SEE DETAIL 40B
TOE PROTECTION SEE DETAIL 40H CLASS B RIPRAP 45 TONS, 100 SY GEO
BDO SPEC DSN
ROBERT K. NORCROSS DB 329 PG 466 PART OF DB 64 - PG 240 PLAT BOOK DB - PAGE 726
BERM 'V' DITCH SEE DETAIL 40B
LATERAL 'V' DITCH SEE DETAIL 40A DDE=10 CY
TOE PROTECTION SEE DETAIL 40C CLASS B RIPRAP 7 TONS, 15 SY GEO
126
PAMELA WACHACHA DB 189 PG 493
125
35

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.
END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

FOR -Y2- PROFILE, SEE SHEET NO. 72

10/17/2022
K:\NCDOT\A-0009\Roadway\Proj\A-0009CC Plan Sheets\A-0009CC_Rdy_psh_40.dgn
User:smelvin

METES & BOUNDS OLD NC 28			
From	To	Direction	Distance
A	B	S 41° 15' 05" E	90.11'
B	C	S 50° 40' 15" E	37.42'
C	D	S 85° 45' 59" E	39.64'
D	E	N 58° 32' 14" E	42.05'
E	F	N 25° 05' 07" E	37.05'
F	G	N 2° 03' 42" E	39.94'
G	H	N 2° 07' 51" W	84.63'
H	J	N 3° 00' 57" E	66.88'

PAVEMENT REMOVAL

-Y2- CURVE DATA
PI Sta 44+39.36
Δ = 102° 05' 50.9" (LT)
D = 5° 09' 42.4"
L = 1,977.95'
T = 1,373.12'
R = 1,110.00'
SE = 0.08
DS = 55 MPH

MATCH LINE STA -Y2- 40+00.00
MATCH TO SHEET NO. 40

MATCH LINE STA -Y2- 54+00.00
MATCH TO SHEET NO. 42

8/17/99 REVISIONS

NAD 83/2011

DETAIL 41A
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, B, 2:1, Natural Ground
Min. D=3 Ft.
Min. d=3 Ft.
B=5 Ft.
*When B is < 6.0'
Type of Liner=Class II Rip-Rap

-Y2- STA. 44+80 TO 44+83 LT
DAYLIGHT AT 3.5% SLOPE

DETAIL 41B
TOE PROTECTION
(Not to Scale)

NATURAL GROUND, d, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE
d=1.5 Ft.
Type of Liner=Class I Rip-Rap

-Y2- STA. 48+00 TO 50+50 LT

DETAIL 41C
CHANNEL CHANGE
(Not to Scale)

NATIVE MATERIAL SHALL FILL VOIDS IN RIPRAP, Natural Ground, 2:1, d, D, B, 2:1, 1½Ft., b, Proposed Fill Slope, Natural Ground, Exist. Channel, CLASS II RIP-RAP KEYED-IN (TYP.)
Min. D=2 Ft.
Min. d=2 Ft.
B=5 Ft.
b=5 Ft.
Type of Liner=Class II Rip-Rap

NOTES:
1) CLASS II RIP-RAP SHALL BE EMBEDDED IN ORDER TO NOT IMPEDE AQUATIC ORGANISM PASSAGE. NATIVE MATERIAL SHALL BE PLACED ON TOP OF CLASS II RIP-RAP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT PROJECT SITE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER.

-Y2- STA. 46+95 TO 49+50 RT
-Y2- STA. 52+00 TO 53+00 LT
SEE PFL FOR CHANNEL CHANGE GRADE

DETAIL 41D
TOE PROTECTION
(Not to Scale)

Natural Ground, b, 2:1 or Flatter Fill Slope, d, Geotextile
d=1 Ft.
b=3 Ft.
Type of Liner=Class B Rip-Rap

-Y2- STA. 49+50 TO 51+00 RT

DETAIL 41E
FALSE SUMP
(Not to Scale)

Outside Ditch Traffic Flow, 4:1, 8:1, 2.0', 0.5' Min. 1.0' Max, GI elc., S, ℄ Proposed Ditch
S=Ditch Slope

-Y2- STA. 41+38 RT
-Y2- STA. 44+00 RT

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	41
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY ENGINEER
10/18/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY ENGINEER
10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

JOHN M. STUART, III
DB 216 PG 210

DANNY K. JORDAN
DB 330 PG 600

(130) DAVID M. HOLDER
DB 302 PG 398
PART OF DB 64 PG 240
PLAT BOOK DB - PAGE 726

(131) JAMES P. EWING, TRUSTEE, ET AL
DB 178 PG 650
PART OF
DB 67 PG 495

(125) ROBERT K. NORCROSS
DB 329 PG 466
PART OF DB 64 - PG 240
PLAT BOOK DB - PAGE 726

(121) BARBARA LAKEY
DB 204 PG 740
DB 54 PG 275
EXCEPTION DEED = DB 67 - PG 495

CREWS BROTHERS, LLC
DB 282 PG 705
(DB 185 PG 130)

-Y2- PT 50+44.19

BM#37 ELEV. 2238.93'
-BY28- STA. 41+11.00 2' LT.
SPIKE NAIL IN BASE OF 12" TRIPLE POPLAR

BM#30 ELEV. 2373.76'
-BY27- STA. 44+90.00 30' RT.
SPIKE NAIL IN BASE OF 30" POPLAR

STANDARD BASE DITCH SEE DETAIL 41A CLASS II RIPRAP 38 TONS, NO GEO DDE=12 CY

DO NOT BURY INVERT +59.00 209.00'

+93.00 229.00'

+14.00 215.00'

MAX 1.0% PIPE SLOPE THIS SIDE OF ELBOW

ROD AND LUG WITH GASKETS (ELBOWS)

MIN 1.5% PIPE SLOPE THIS SIDE OF ELBOW

+08.00 EX. R/W

+65.00 EX. R/W

PROP. DRIVE

REMOVE DI

FILL WITH FLOWABLE FILL EST 7 CY

FALSE SUMP SEE DETAIL 41E

REMOVE HW

+08.62 EX. R/W ELBOW

+98.00 50.00'

BDO SPEC DSN

+98.00 80.00'

CUT TO FILL TRANSITION CLASS B RIPRAP 8 TONS, 18 SY GEO

+67.00 80.00'

+47.00 134.00'

+67.00 50.00'

GRADE TO DRAIN

REALIGN SOIL DRIVE

RELOCATE GATE BY OWNER

+60.00 112.00'

+02.00 140.00'

+07.00 102.00'

+18.00 50.00'

PROP. DRIVE

GRADE TO DRAIN

PROP. DRIVE

GRADE TO DRAIN

CHANNEL CHANGE SEE DETAIL 41C CLASS II RIPRAP 153 TONS, NO GEO DDE=185 CY

CLASS I RIPRAP 3 TONS, 7 SY GEO

TOE PROTECTION SEE DETAIL 41B CLASS I RIPRAP 115 TONS, 160 SY GEO

DO NOT BURY INVERT +34.00 158.00'

+12.00 144.00'

+92.00 99.00'

+03.00 157.00'

ROD AND LUG WITH GASKETS (ELBOWS) +76.00 EX. R/W

MAX 1.0% PIPE SLOPE THIS SIDE OF ELBOW

SHOULDER BERM GUTTER -Y2- STA. 47+50 TO 52+57, LT

CUT TO FILL TRANSITION CLASS I RIPRAP 25 TONS, 35 SY GEO

+02.00 EX. R/W

+77.00 EX. R/W

+31.00 EX. R/W

+31.00 87.00'

+00.00 93.00'

+50.00 97.00'

+16.00 94.00'

+60.00 95.00'

+27.00 EX. R/W

FILL EXISTING CHANNEL W/ COMPACTED BACKFILL

CHANNEL CHANGE SEE DETAIL 41C CLASS II RIPRAP 420 TONS, NO GEO DDE=835 CY

DO NOT BURY INVERT

TOE PROTECTION SEE DETAIL 41D CLASS B RIPRAP 44 TONS, 98 SY GEO

SPRING BOX

JB w/Slab Lid

JB w/MH

FILL WITH FLOWABLE FILL EST 4 CY

ELBOW

BDO REMOVE HW

EXPRESSWAY GUTTER -Y2- STA. 51+25 TO 57+76±, RT

GRADE TO DRAIN

PROP. DRIVE

PLAT BOOK DB - PAGE 726

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED.
END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

FOR -Y2- PROFILE, SEE SHEET NO. 72

K:\NCDOT\A-0009\Roadway\Proj\A-0009CC Plan Sheets\A-0009CC_Rdy_psh_41.dgn
User:smelvin
©NCDOT 2022

8/17/99

REVISIONS

–Y2– 54+00.00 SHEET NO. 41

MATCH LINE STA –Y2– 54+00.00
MATCH TO SHEET NO. 41

–Y2– CURVE DATA

PI Sta 70+28.18
△ = 50° 56' 38.0" (RT)
D = 3° 53' 51.6"
L = 1,307.03'
T = 700.27'
R = 1,470.00'
SE = 0.08
DS = 60 MPH

–DR4– CURVE DATA

PI Sta 10+77.95
△ = 24° 42' 06.2" (LT)
D = 57° 17' 44.8"
L = 43.11'
T = 21.90'
R = 100.00'

PI Sta 11+22.09
△ = 10° 28' 29.8" (RT)
D = 22° 55' 05.9"
L = 45.71'
T = 22.92'
R = 250.00'

① –DR4– PC 10+56.06
② –DR4– PRC 10+99.17
③ –DR4– PT 11+44.88

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	42
R/W SHEET NO.	

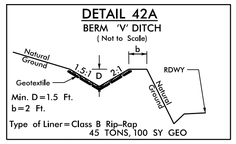
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
10/18/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTIS
10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

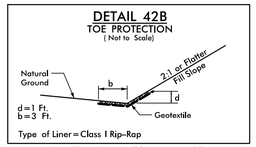
DETAIL 42A
BERM 'V' DITCH
(Not to Scale)



Type of Liner=Class B Rip–Rap
45 TONS, 100 SY GEO

–Y2– STA. 55+00 TO 55+71 RT
SEE PFL FOR DITCH GRADES

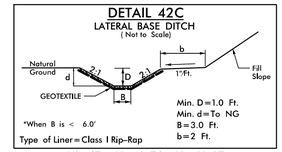
DETAIL 42B
TOE PROTECTION
(Not to Scale)



Type of Liner=Class I Rip–Rap

–Y2– STA. 58+49 TO 59+18 RT

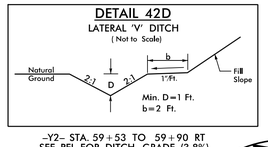
DETAIL 42C
LATERAL BASE DITCH
(Not to Scale)



Type of Liner=Class I Rip–Rap

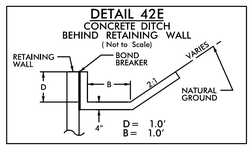
–Y2– STA. 59+18 TO 59+53 RT
SEE PFL FOR DITCH GRADE (18.6%)

DETAIL 42D
LATERAL 'V' DITCH
(Not to Scale)



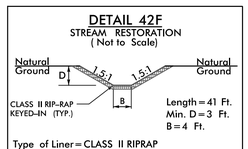
–Y2– STA. 59+53 TO 59+90 RT
SEE PFL FOR DITCH GRADE (3.8%)

DETAIL 42E
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



–Y2– STA. 63+75 TO 66+02 RT
(SEE WALL ENVELOPES FOR DITCH GRADE)

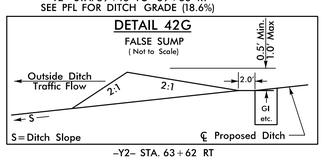
DETAIL 42F
STREAM RESTORATION
(Not to Scale)



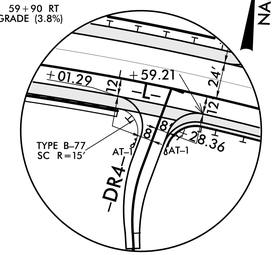
Type of Liner=CLASS II RIPRAP
120 TONS

–Y2– STA 67+96(68' LT) TO 68+26(90' LT)
SEE PFL FOR CHANNEL GRADE (4.9%)

DETAIL 42G
FALSE SUMP
(Not to Scale)



–Y2– STA. 63+62 RT



–L–/–DR4– INTERSECTION

PROP. RETAINING WALL #32
BEGIN –Y2– STA. 58+90±
END –Y2– STA. 66+83±

131
JAMES P. EWING, TRUSTEE, ET AL
DB 178 PG 650
PART OF DB 67 PG 495

OUTLET CHANNEL STABILIZATION
SEE DETAIL 42H
CLASS II RIPRAP
8 TONS, NO GEO

CLASS I RIPRAP
4 TONS, 12 SY GEO

+00.00 157.00'
+12.00 170.00'
DO NOT BURY INVERT
+84.00 121.00'
+40.00 94.00'
+66.00 94.00'
+66.00 EX. R/W
+40.00 EX. R/W
+90.00 115.00'
+90.00 EX. R/W
+23.00 93.00'
+12.00 EX. R/W
SPRING BOX
6" PVC
SHOULDER BERM GUTTER
–Y2– STA. 58+90 TO 63+22, LT
FILL WITH FLOWABLE FILL
EST 5 CY
36' TYP
+63.91
8'FDPS
24" CSP
PLUG
24" CMP
N 87° 35' 46.8" E
100' R
20'R
15" RCP–IV 2GI
TB 2GI
15" RCP–IV
TYPE B–77 SC R=15'
REMOVE HW
REMOVE
24" COLLAR AND EXTEND
CONC. HW
EXPRESSWAY GUTTER
–Y2– STA. 51+25 TO 57+76±, RT
BERM 'V' DITCH
SEE DETAIL 42A
PROP. DRIVE
+21.00 EX. R/W
+44.00 107.00'
+76.00 EX. R/W
+61.00 107.00'
LATERAL 'V' DITCH
SEE DETAIL 42D
DDE=35 CY
TOE PROTECTION
SEE DETAIL 42J
CLASS I RIPRAP
68 TONS, 95 SY GEO
–Y2– PC 63+27.91
FALSE SUMP
SEE DETAIL 42G
SINGLE FACED CONCRETE BARRIER
CONC. DITCH BEHIND RETAINING WALL
SEE DETAIL 42E
–Y2– POC 66+35.13 =
–DR4– POT 10+00.00
+60.31 EX.R/W
+00.00 EX. R/W
+09.00 91.00'
+19.00 122.00'
+69.94 112.94'
SHOULDER BERM GUTTER
–DR4– STA. 10+36, LT
TO –Y2– STA. 70+50, RT
CULVERT OUTLET CHANNEL
SEE DETAIL 421
44 TONS CLASS II
+71.86 143.15'
APPROX. LOCATION OF 4" MTL WATER PIPE
END CONSTRUCTION
–DR4– STA. 11+10.00
DO NOT DISTURB EXISTING WATERLINE
ROCK EMBANKMENT –DR4– 10+35 TO 11+30 LT
SEE DETAIL SHEET 2G–2. TRANSITION FROM TYPICAL AT 10+35 TO 1.5:1 AT 10+60.
MAINTAIN 1.5:1 FROM 10+60 TO 11+30.
–DR4– POT 12+00.26

134
CREWS BROTHERS, LLC
DB 282 PG 705
(DB 185 PG 131)

134A
DEAN A. HORNING
DB 266 PG 26

135
ROBERT K. NORCROSS
DB 195 PG 244
DB 326 PG 483
DO NOT BURY INVERT
CLASS I RIPRAP
2 TON, 8 SY GEO

CREWS BROTHERS, LLC
DB 282 PG 705
(DB 185 PG 131)

EUGENE R. WIECZOREK
DB 260 PG 239

ROBERT K. NORCROSS
DB 334 PG 306
DB 334 PG 309

ROBERT PEASE
DB 211PG 718

JOHN B. NORCROSS
DB 182 PG 238

133
STREAM RESTORATION
SEE DETAIL 42F
DDE=160 CY

CLASS B RIPRAP
2 TONS, 7 CY GEO
RETAIN AND EXTEND
1@6'x6' RCBC
AT OUTLET

BM=3I ELEV. 2I78.05'
–BY27– STA. 68+35.00 30' LT.
SPIKE NAIL IN BASE OF 26" POPLAR

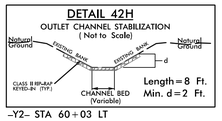
40'R
50'R
60' ROCK WALL
6'X6' SINGLE BARREL CONC. BOX CULVERT
REMOVE TB 2GI
18" RCP–IV
18" CMP
18" CSP
JB w/Slab Lid TB 2GI
ROD AND LUG WITH GASKETS (ELBOWS)
2 S F BARN
I S F BUS
GONC
SHED
NC 28 (FONTANA RD)
SR 1239 CARVER BRANCH LN, 2LI2
STEVE CREEK RD
CARVER BRANCH
UT TO CARVER BRANCH (SFM)
SPRING
SPRING BOX
WOODS
BST
GR
MTL
JS
SFI
SFM
SFN
SFV
SFR
SFK
EIP
ROCK HW

N 46°34'24" E 166.68'
N 46°34'30" E 62.75'
N 46°34'39" E 191.56'
S 39°29'13" W 266.62'
S 25°47'10" W 250.00'
S 29°08'01" W 18.18'
S 27°00'22" W 32.06'
N 84°05'45" W 40.62'
S 03°52'26" W 212.12'
N 12°48'27" W 57.24'
N 01°00'15" E 32.77'
S 01°46'46" E 222.76'

NOTE:
PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550–3(B) OF THE STANDARD SPECIFICATIONS.

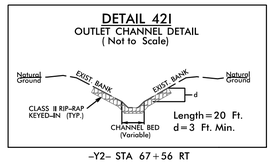
NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED. END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE–IN PER CROSS–SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

DETAIL 42H
OUTLET CHANNEL STABILIZATION
(Not to Scale)



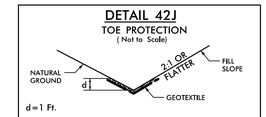
–Y2– STA 60+03 LT

DETAIL 42I
OUTLET CHANNEL DETAIL
(Not to Scale)



–Y2– STA 67+56 RT

DETAIL 42J
TOE PROTECTION
(Not to Scale)



Type of Liner=Class I Rip–Rap

–Y2– STA. 61+50 TO 63+50 RT

MATCH LINE STA –Y2– 68+00.00
MATCH TO SHEET NO. 43

FOR –Y2– PROFILE, SEE SHEET NO. 73
FOR –DR4– PROFILE, SEE SHEET NO. 74

10/17/2022
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User:tsmelvin

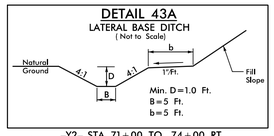
8/17/99

REVISIONS

-Y2- CURVE DATA

PI Sta 70+28.18	PI Sta 83+84.46
Δ = 50° 56' 38.0" (RT)	Δ = 52° 00' 01.9" (LT)
D = 3° 53' 51.6"	D = 5° 24' 18.9"
L = 1,307.03'	L = 962.04'
T = 700.27'	T = 517.00'
R = 1,470.00'	R = 1,060.00'
SE = 0.08	SE = 0.08
DS = 60 MPH	DS = 55 MPH

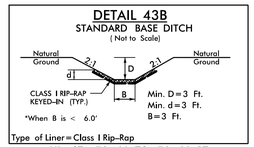
DETAIL 43A
LATERAL BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
B=5 Ft.
b=5 Ft.

-Y2- STA. 71+00 TO 74+00 RT
SEE PFL FOR DITCH GRADES

DETAIL 43B
STANDARD BASE DITCH
(Not to Scale)

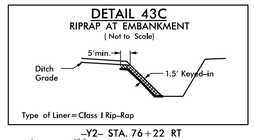


Min. D=3 Ft.
Min. d=3 Ft.
B=3 Ft.

*When B is < 6.0'
Type of Liner=Class I Rip-Rap

-Y2- STA. 76+00 TO 76+22 RT
SEE PFL FOR DITCH GRADE (0.3%)

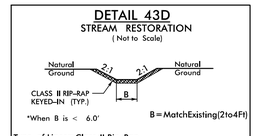
DETAIL 43C
RIPRAP AT EMBANKMENT
(Not to Scale)



Type of Liner=Class I Rip-Rap

-Y2- STA. 76+22 RT

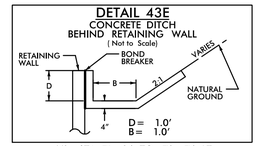
DETAIL 43D
STREAM RESTORATION
(Not to Scale)



*When B is < 6.0'
B=MatchExisting(2to4Ft)
Type of Liner=Class II Rip-Rap

-Y2- STA 78+00 TO 78+46 RT

DETAIL 43E
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



D= 1.0'
B= 1.0'

-Y2- STA. 71+26 TO 72+76 LT
-Y2- STA. 77+92 TO 82+00 LT
(SEE WALL ENVELOPES FOR DITCH GRADE)

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	43
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035018 JIMMY L. TERRY ENGINEER
10/18/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETIT ENGINEER
10/28/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

133 JOHN B. NORCROSS DB 182 PG 238

136 JAMES M. JENKINS DB 326 PG 480

137 RICKEY D. McCRACKEN DB 199 PG 380

138 ROBERT K. NORCROSS DB 348 PG 340

139 THOMAS E. SCHIESSLE DB 354 PG 449

140 GLEN McCOY DB 331PG 359

141 LESTER A. JENKINS, ET AL DB 326 PG 477

135 ROBERT K. NORCROSS DB 195 PG 244 DB 326 PG 483

ARNOLD D. CODY DB 307 PG 915

FLOYD J. CODY DB 70 PG 83

MATCH LINE STA -Y2- 68+00.00 MATCH TO SHEET NO. 42

MATCH LINE STA -Y2- 82+00.00 SHEET NO. 44

-Y2- PC 78+67.46

-Y2- PT 76+34.95

PROP. RETAINING WALL #34 W/CONCRETE DITCH
BEGIN -Y2- STA. 71+25±
END -Y2- STA. 72+75±

PROP. RETAINING WALL #35 W/CONCRETE DITCH
BEGIN -Y2- STA. 77+94±
END -Y2- STA. 88+25±

962.03' TAPER

PROP. DRIVE

DO NOT DISTURB

REMOVE 42" CMP & DI AFTER PROPOSED SYSTEM IS IN SERVICE
FILL 48" CMP AFTER PROPOSED SYSTEM IS IN SERVICE EST 4 CY

CONC. DITCH BEHIND RETAINING WALL SEE DETAIL 43E

CLASS B RIP-RAP 5 TONS, 12 SY GEO

FALSE SUMP SEE DETAIL 43F

REMOVE HW

CLASS I RIPRAP 2 TONS, NO GEO

FILL WITH FLOWABLE FILL EST 17 CY

REMOVE DI

SINGLE FACED CONCRETE BARRIER

GRADE TO DRAIN

REMOVE

STREAM RESTORATION SEE DETAIL 42F

SHOULDER BERM GUTTER -DR4- STA. 10+36, LT TO 70+50, RT

MARTIN JENKINS RD.(PRIVATE ROAD)

CARVER BRANCH

LATERAL BASE DITCH SEE DETAIL 43A DDE=200 CY

FILL WITH FLOWABLE FILL EST 3 CY

REMOVE 11 LF

FALSE SUMP SEE DETAIL 43F

ROD AND LUG WITH GASKETS (ELBOWS)

MAX 1.0% PIPE SLOPE THIS SIDE OF ELBOW

CLASS B RIPRAP 3 TONS, 11 SY GEO

RIPRAP AT EMBANKMENT SEE DETAIL 43C CLASS I RIPRAP 6 TONS, NO GEO

STANDARD BASE DITCH SEE DETAIL 43B CLASS I RIPRAP 18 TONS, NO GEO DDE=30 CY

REMOVE FLOODPLAIN BENCH SEE DETAIL 43G 570 SY COIR FIBER MATTING DDE=210 CY

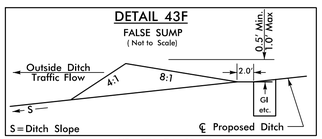
STREAM RESTORATION SEE DETAIL 43D CLASS II RIPRAP 80 TONS DDE=80 CY

SR 1226 STEDOM RD.

BURY INVERT 0.7' WOODS FILL WITH FLOWABLE FILL EST 15 CY

REMOVE 5 LF

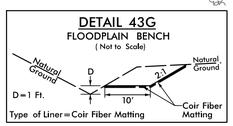
DETAIL 43F
FALSE SUMP
(Not to Scale)



S=Ditch Slope

-Y2- STA. 74+13 LT
-Y2- STA. 74+15 RT

DETAIL 43G
FLOODPLAIN BENCH
(Not to Scale)



D=1 Ft.
Type of Liner=Coir Fiber Matting

-Y2- STA. 76+25 TO 80+10 RT

NOTE:
PRIOR TO COMMENCING WORK ON ANY TRENCHLESS INSTALLATION, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED. END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

FOR -Y2- PROFILE, SEE SHEET NO. 73

10/17/2022
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User:smelvin

8/17/99

REVISIONS

-Y2- CURVE DATA
PI Sta 83+84.46
△ = 52° 00' 01.9" (LT)
D = 5° 24' 18.9"
L = 962.04'
T = 517.00'
R = 1,060.00'
SE = 0.08
DS = 55 MPH

NOTE:
ALL DRIVEWAYS ARE TO BE ASPHALT UNLESS OTHERWISE NOTED. END LOCATION OF DRIVEWAY SHOWN ON PLANS REPRESENTS TIE-IN PER CROSS-SECTIONS, THE CONTRACTOR SHALL EXTEND THE DRIVES AND PAVE UP TO THE RIGHT OF WAY LINE. FROM ROW POINT ON MATCH DRIVEWAY IN KIND, UNLESS OTHERWISE NOTED.

DETAIL 44A
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)
RETAINING WALL, BOND BREAKER, D, B, 2:1, VARIES, NATURAL GROUND, 4", D= 1.0', B= 1.0'
-Y2- STA. 82+00 TO 88+25 LT
(SEE WALL ENVELOPES FOR DITCH GRADE)

DETAIL 44C
CONCRETE SILL DETAIL
(Not to Scale)
BOND BREAKER, RETAINING WALL, CONC. SILL, 4", DRAINAGE GRATE, B, d, D, 2:1, VARIES, NATURAL GROUND, D= 1.0' d=0.5' B= 2.0'
-Y2- STA. 86+74 LT

NAD 83/2011

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	44
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L TERRY
10/18/2022

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B PETTY
10/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

MATCH LINE STA -Y2- 82+00.00
MATCH TO SHEET NO. 43

PROP. RETAINING WALL #35 W/CONCRETE DITCH
BEGIN -Y2- STA. 77+94±
END -Y2- STA. 88+25±

-Y2- PT 88+29.49

962.03' TAPER

PRECAST 4' DIA MH w/ 2GI STD 840.52

SINGLE FACED CONCRETE BARRIER

CONC. DITCH BEHIND RETAINING WALL SEE DETAIL 44A

PROP. DRIVE
CLASS B RIPRAP 3 TONS, 8 SY GEO

CONCRETE SILL SEE DETAIL 44C

36" TYP

TYPE B-77 SC R=20

2GI (Top Wall)

TB 2GI

2GI AT-3

GTD

REMOVE 7'R

REMOVE HW

REMOVE 24" RCP-IV

REMOVE 18" CMP I

18" RCP-IV

24" RCP-IV

SPEC DSN TB 2GI-A

8' FDPS

BM#32 ELEV. 2055.94'
-BY27- STA. 88+22.00 37' RT.
SPIKE NAIL IN BASE OF 36" POPLAR

ROD AND LUG WITH GASKETS (ELBOWS)

MAX 1.0% PIPE SLOPE THIS SIDE OF ELBOW

CLASS I RIPRAP 7 TONS, 15 SY GEO

CLASS B RIPRAP 3 TONS, 10 SY GEO

WOODEN FENCE POSTS

UT TO CARVER BRANCH (SBU)

END TIP PROJECT A-0009CC
-Y2- STA. 89+80.00

END SECTION A-0009CC

BEGIN SECTION A-0009CD

139
THOMAS E. SCHIESSLE
DB 354 PG 449

LEON CABLE
DB 90 PG 759

ROOT CELLAR, ROCK WALL, 2 S F&BR D, PORCH, SEPTIC TANK, BRICK PATIO, FLAG POLE, DRAIN LINES, W/LT, BST

N 62°33'29" E 310.81'
S 19°26'57" E 50.00'
N 19°26'57" W 178.74'
S 62°34'49" W 206.34'
S 19°26'57" E 187.24'
S 19°08'50" E 17.88'

NC 28 (FONTANA RD)

144
FLOYD J. CODY
DB 70 PG 83

145
LEON CABLE
DB 186 PG 245

POND PJ, MTL BARN, POLE SHED CARPORT, 2 SFD

WALLACE D. JENKINS
DB 111 PG 790

JAMIE A. LAIL ET AL
DB 316 PG 711

1 SBR BUS, SHED, CARVER BRANCH

BY27-136, TECOAH AZ M

GREU TL-3

S 75°17'29" E 50.67'
S 75°46'04" E 109.75'
S 88°09'04" W 202.99'
S 25°54'41" W 58.62'
S 27°08'07" W 43.58'
S 62°22'13" E 241.41'
S 25°30'45" E 316.60'
S 23°12'43" E 229.50'
S 25°30'45" E 186.38'
N 86°38'22" E

FOR -Y2- PROFILE, SEE SHEET NO. 74

10/17/2022
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User:emelvin

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
A-0009CC	69

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018 JIMMY L. TERRY
10/18/2022

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697 DAVID B. PETTY
10/18/2022

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TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

-L-

BEGIN GRADE SECTION CC
-L- STA 414+50.00
EL 2941.91'

PI = 415+75.00
EL = 2,932.82'
VC = 180'
K = 314
DS = 80 MPH

(-)1.2698%

(-)6.6962%

-L- STA 419+33.80 LT
EL=2931.20

(-) 6.6864%

BEGIN BERM BASE DITCH
-L- STA 419+00.00 LT
EL=2933.46

(+) 0.6790%

END BERM BASE DITCH
-L- STA 419+50.00 LT
EL=2931.31

PI = 422+40.00
EL = 2,888.29'
VC = 180'
K = 357
DS = 80 MPH

(-)6.6962%

(-)6.1925%

FOR -L- PLAN, SEE SHEET NO. 35

PI = 430+40.00
EL = 2,838.75'
VC = 300'
K = 703
DS = 80 MPH

(-)6.1925%

(-)6.6193%

PIPE HYDRAULIC DATA
•3613 -L- Sta. 437+65

DRAINAGE AREA	= 2.7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 7.1	CFS
DESIGN HW ELEVATION	= 2787.9	FT
100 YEAR DISCHARGE	= 7.8	CFS
100 YEAR HW ELEVATION	= 2788.0	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 8.3	CFS
OVERTOPPING ELEVATION	= 2788.1	FT

PI = 436+10.00
EL = 2,801.02'
VC = 180'
K = 146
DS = 55 MPH

(-)6.6193%

(-)7.8490%

(-)6.00%

BEGIN SPECIAL CUT DITCH
-L- STA 437+00.00 LT
EL=2789.10

END SPECIAL CUT DITCH
-L- STA 437+50.00 LT
EL=2786.10

PROPOSED 18" CSP

PI = 441+00.00
EL = 2,762.56'
VC = 180'
K = 935
DS = 80 MPH

(-)7.8490%

(-)8.0415%

FOR -L- PLAN, SEE SHEET NO. 36

10/17/2022
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User:jmurphy