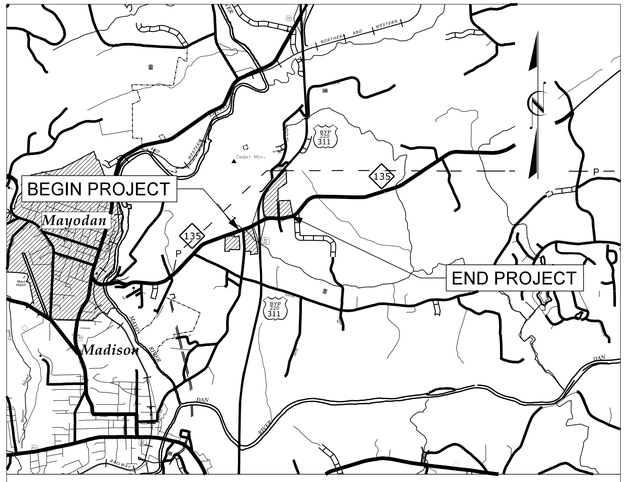
09/08/99

TIP PROJECT: I-5898

CONTRACT: C205018

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



VICINITY MAP (NTS)

MAYODAN MUNICIPAL BOUNDARIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

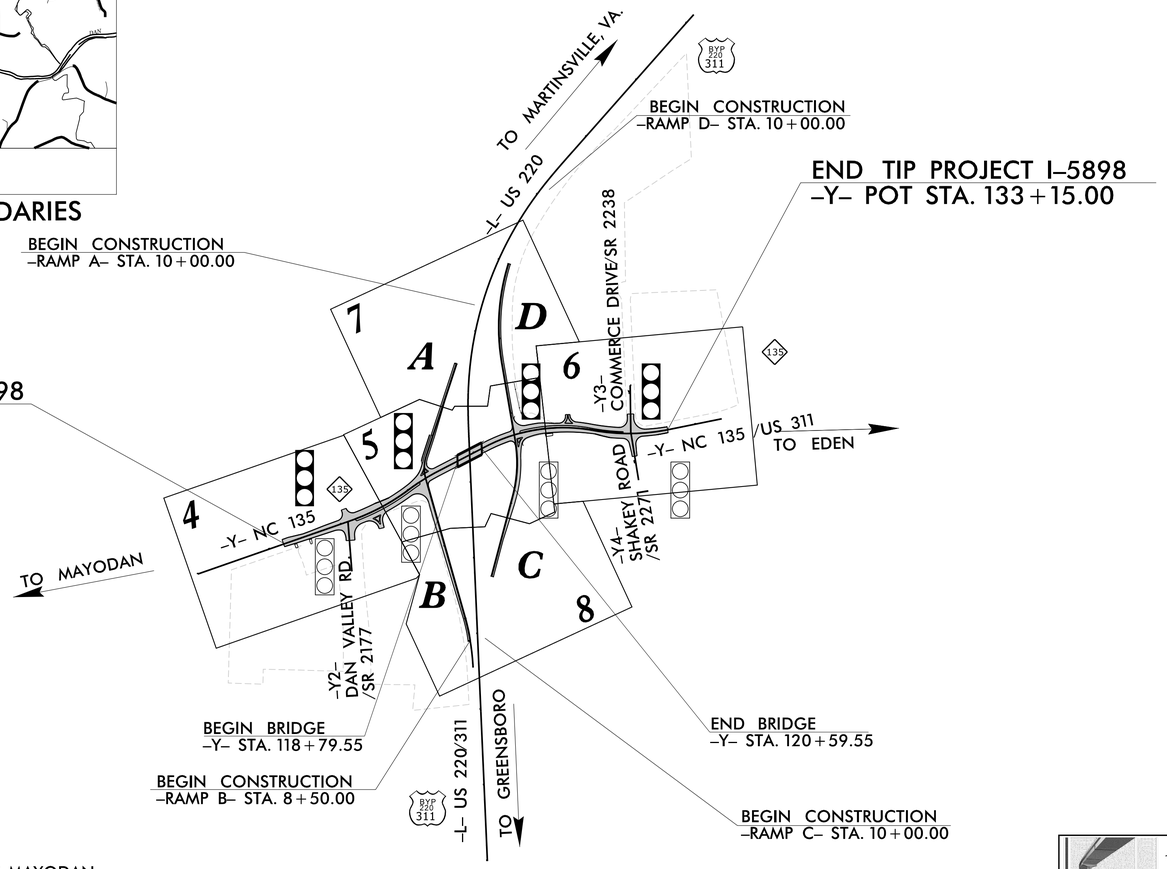
ROCKINGHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5898	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
46860.1.1		PE
46860.2.1		R / W
46860.2.2		UTIL
46860.3.1		CONST

LOCATION: FUTURE I-73/US220 AT US 311/NC 135 INTERCHANGE

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



NAD 83
NA 2011

PROPOSED SIGNAL

EXISTING SIGNAL

– THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF MAYODAN.
– THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2025 = 17,325
ADT 2045 = 20,675
K = 11 %
D = 55 %
T = 15 % *
V = 40 MPH
* TTST = 5% DUAL 10%
FUNC CLASS =
RURAL MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5898	=	0.480 MILES
LENGTH BRIDGE TIP PROJECT I-5898	=	0.034 MILES
TOTAL LENGTH OF TIP PROJECT I-5898	=	0.514 MILES

NCDOT POINT OF CONTACT:

BRANDON GREEN, PE
PROJECT ENGINEER

Prepared In the Office of:
JOHNSON, MIRMIRAN, & THOMPSON, INC.
4700 Falls of Neuse Road, Suite 100,
Raleigh NC, 27609
NC License No. C-3097

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 15, 2022

LETTING DATE:
DECEMBER 16, 2025

CHARLES J. YOUNG, PE, PMP
PROJECT ENGINEER

JOSHUA Q. ROEMER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 5025 ENGINEER KAREN HEFNER

DocuSigned by: Karen Hefner
SIGNATURE: P.E. 11/4/2025

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG

Signed by:
SIGNATURE: P.E. 11/4/2025

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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6/17/99

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd. Suite 100.
Raleigh, NC. 27609
License No: C-3097

PROJECT REFERENCE NO.	SHEET NO.
I-5898	IA

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES YORK

11/7/2025

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INDEX OF SHEETS

GENERAL NOTES

2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADE LINE:
GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

DRIVEWAYS:

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

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY (POWER),

BRIGHTSPEED (COMM), CHARTER (COMM), AND THE TOWN OF MAYODAN (WATER & SEWER)

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.06.

STANDARD DRAWINGS

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 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
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
	DIVISION 3 - PIPE CULVERTS
300.01	Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)
310.10	Driveway Pipe Construction
	DIVISION 4 - MAJOR STRUCTURES
423.03	Bridge Approach Fills - Type 2 Approach Fill for Bridge Abutment with MSE Wall
	DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
	DIVISION 8 - INCIDENTALS
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation In Shoulder Berm Gutter
848.03	Driveway Turnout - Drop Curb Type
848.06	Curb Ramp (Use Details in Lieu of Standards for Sheet 9 of 13)
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
854.07	Single Slope Concrete Barrier
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, and 12)
862.02	Guardrail Installation (Use Detail in Lieu of Standards for Sheet 5)
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - for B-77 and B-83 Anchor Units
866.01	Chain Link Fence - 4', 5' and 6' High Fence
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
I-5898	I-B

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 — Vineyard

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

** 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)* — ?UTL
- 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.

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036694 AMY L. SIMPSON

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG

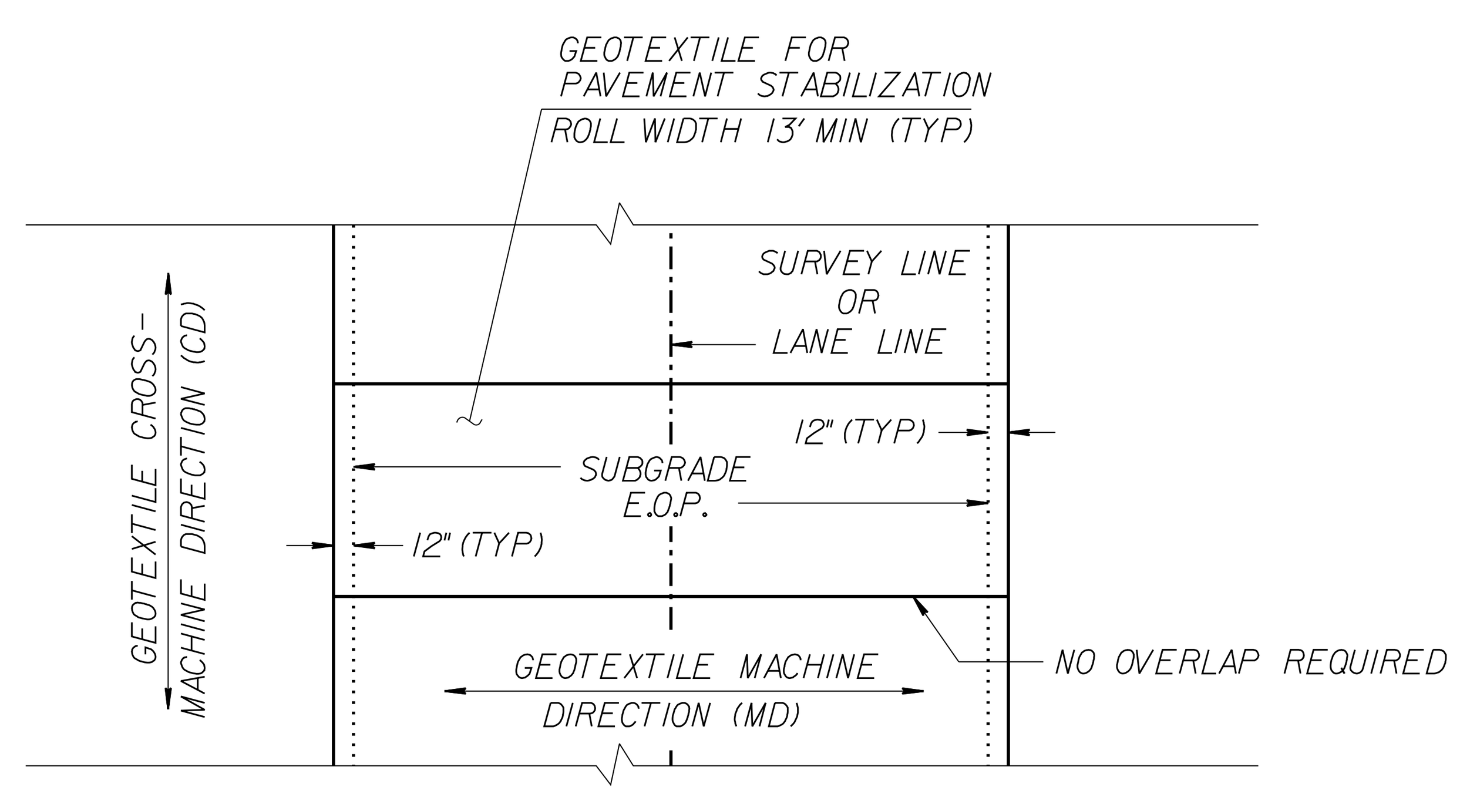
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

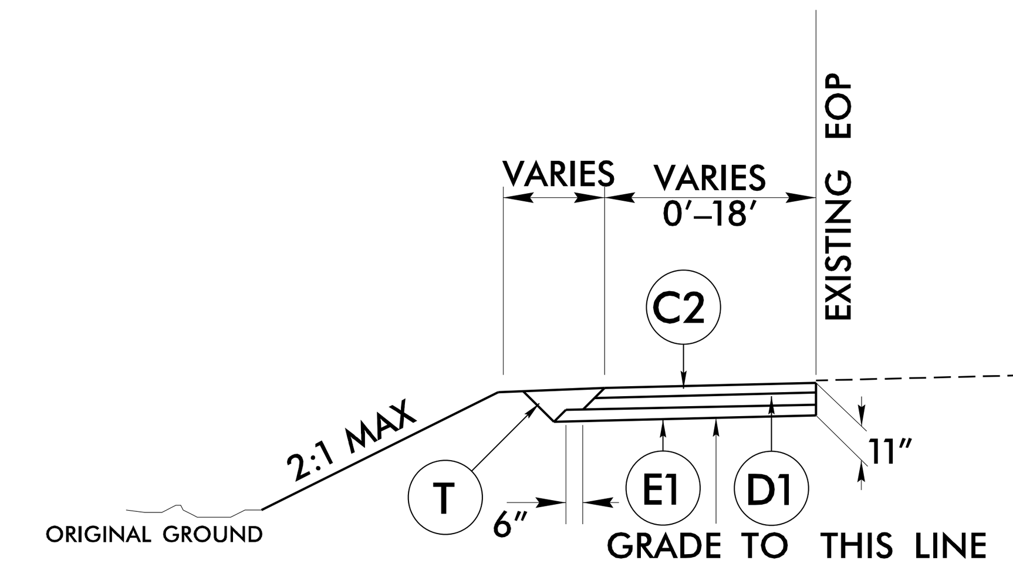
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	R1	1'-6" CONCRETE CURB AND GUTTER.
C2	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. PER LAYER PLACED IN TWO LAYERS.	R2	2'-6" CONCRETE CURB AND GUTTER.
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 LESS THAN 1" IN DEPTH OR GREATER THAN 1.5" IN DEPTH.	R3	5" MONOLITHIC CONCRETE ISLAND.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	SHOULDER BERM GUTTER
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4.0" IN DEPTH.	S1	4" CONCRETE SIDEWALK
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
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" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	U	EXISTING PAVEMENT.
E3	PROP. APPROX. 9.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD. PER LAYER PLACED IN TWO LAYERS.	V1	MILLING 3.0"
J1	PROP. 8" AGGREGATE BASE COURSE	V2	MILLING VAR. 0 TO 1.5"
K1	PROP. 12" CLASS IV SUBGRADE STABILIZATION	V3	MILLING 1.5"
N1	GEOTEXTILE FOR SUBGRADE STABILIZATION	W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE DETAIL SHOWING METHOD OF WEDGING No. 1. SEE SHEET 2A-1)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
IN AREAS OF NARROW WIDENING,THE 8 INCHES OF AGGREGATE BASE COURSE MAY BE REPLACED WITH 4" OF B25.0C.



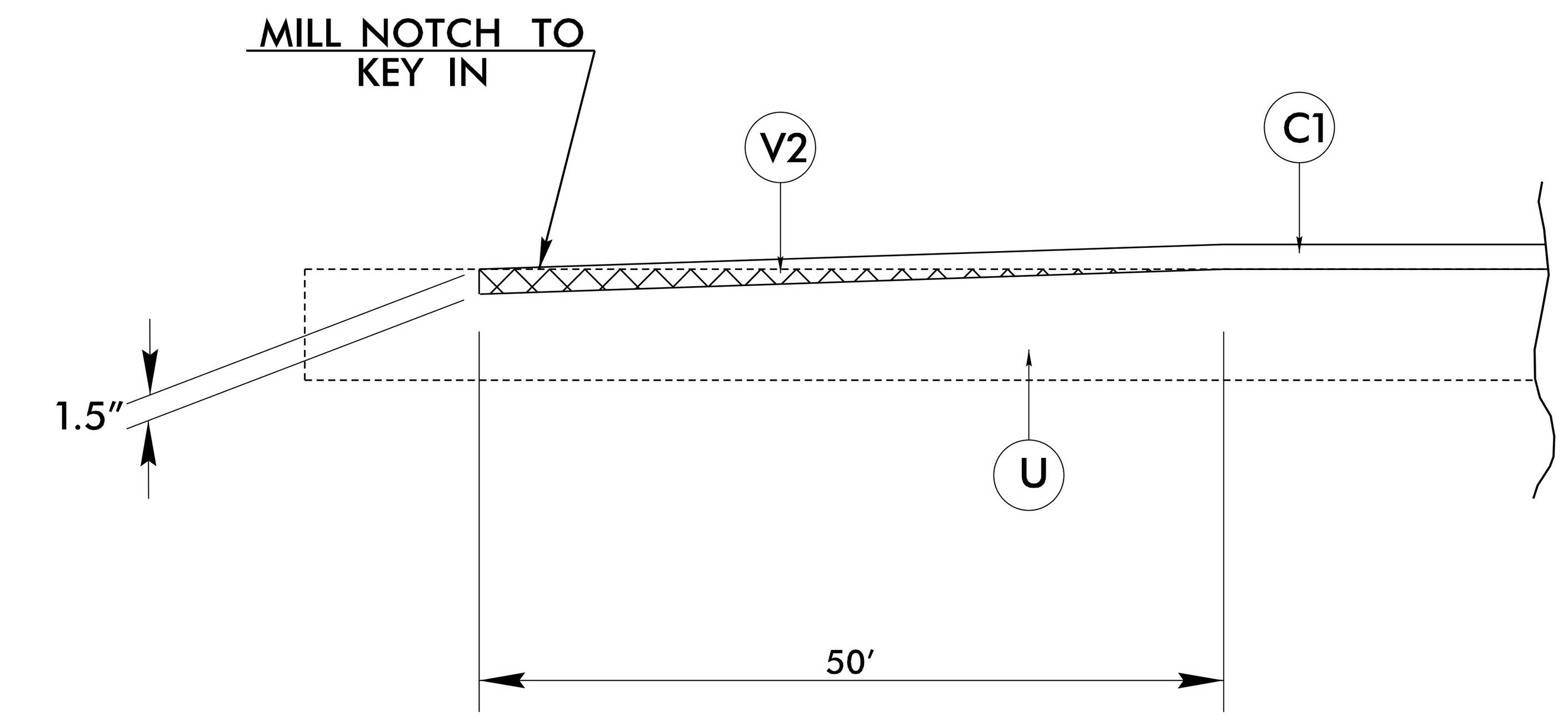
GEOTEXTILE FOR SUBGRADE STABILIZATION
(PLAN VIEW)
(100% COVERAGE REQUIRED)



TEMPORARY PAVEMENT DETAIL

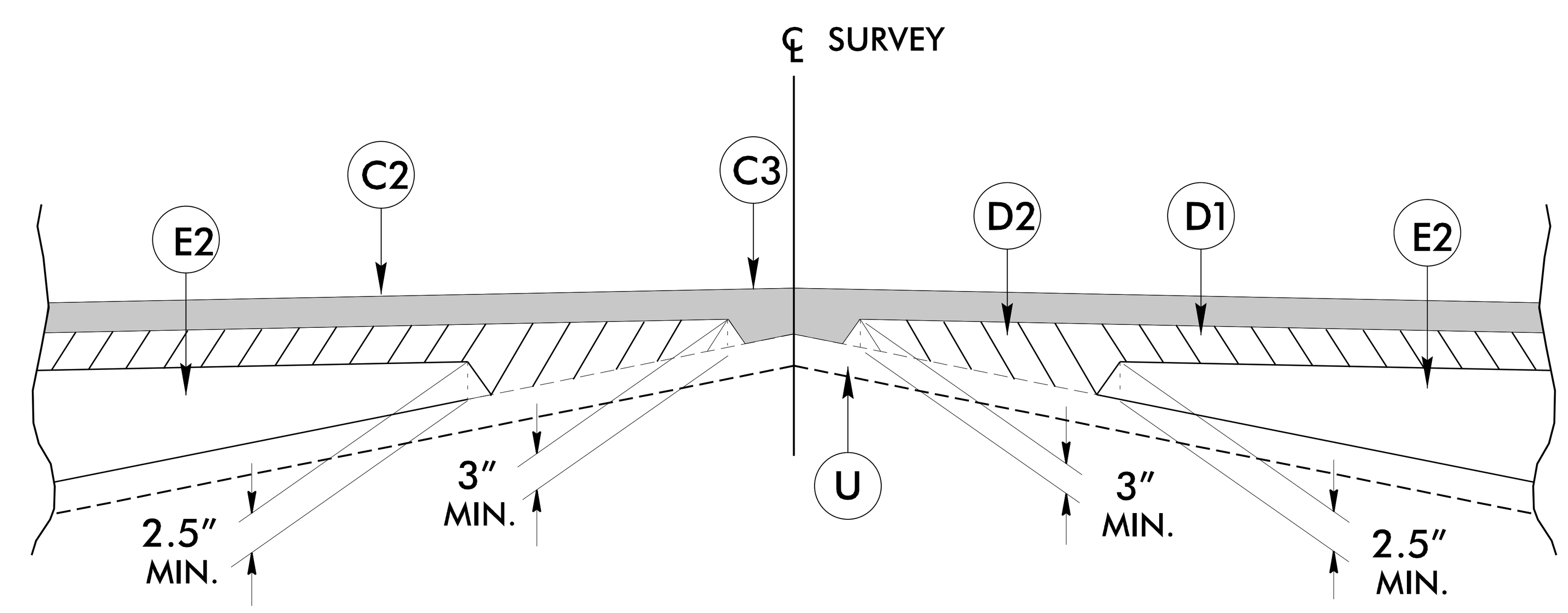
-Y- 112+20.00 TO 113+61.00 LT
-Y- 126+41.00 TO 129+30.00 RT
-Y- 123+33.00 TO 130+19.00 CENTER
-RPB- 10+00.00 TO 18+55.00 RT
-RPC- 10+00.00 TO 16+50.00 RT

NOTE:
SEE PLANS FOR TURN LANE, TAPERS, TRANSITIONS MONOLITHIC ISLANDS AND CURB AND GUTTER

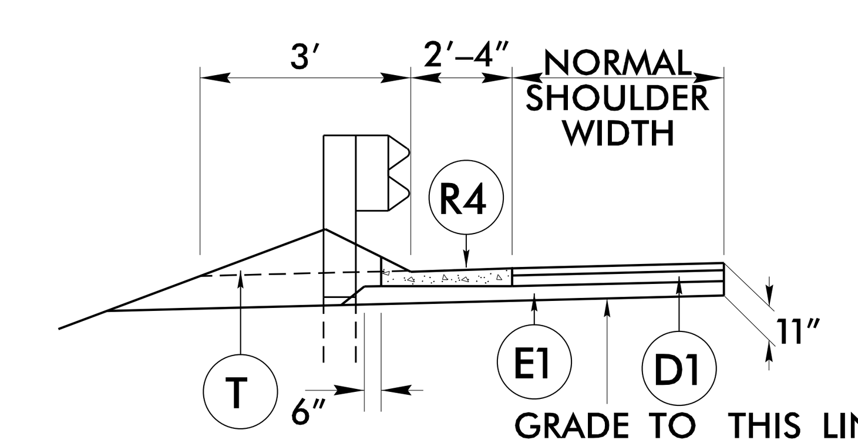


Detail of Milling at Pavement Tie-ins, 0" to 1 1/2"

-Y- STA. 106+00.00 TO STA. 106+50.00
-Y- STA. 132+65.00 TO STA. 133+15.00
-Y2- STA. 10+75.00 TO STA. 11+25.00
-Y3- STA. 11+40.00 TO STA. 11+90.00
-Y4- STA. 11+02.50 TO STA. 11+52.50

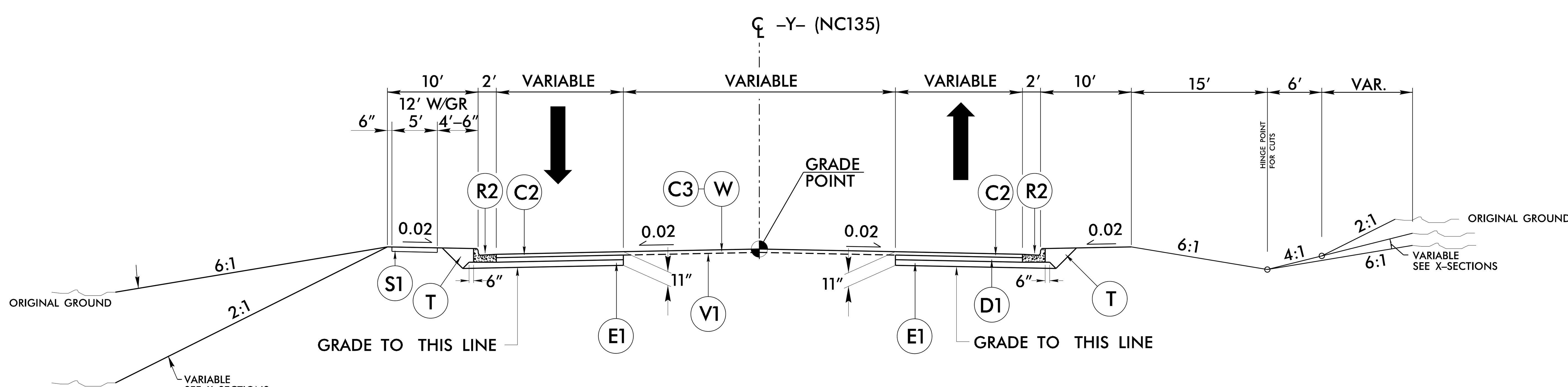


Detail Showing Method of Wedging No. 1



SHOULDER BERM GUTTER

RAMP A 15+00 TO 16+79.70

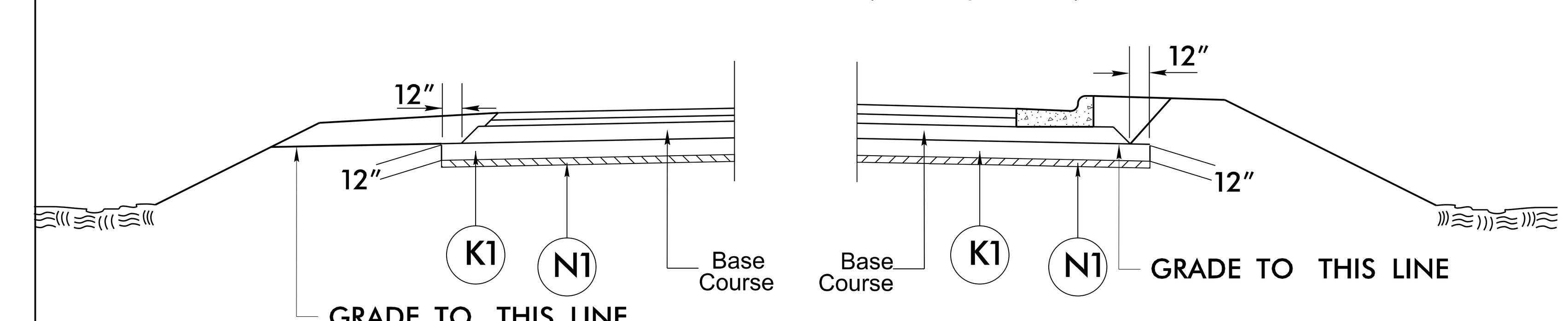


TYPICAL SECTION NO. 1

-Y- STA. 106+00.00 TO -Y- STA. 111+02.20
-Y- STA. 130+18.89 TO -Y- STA. 133+10.00

SHALLOW UNDERCUT DETAILS

W (Per Design Manual)



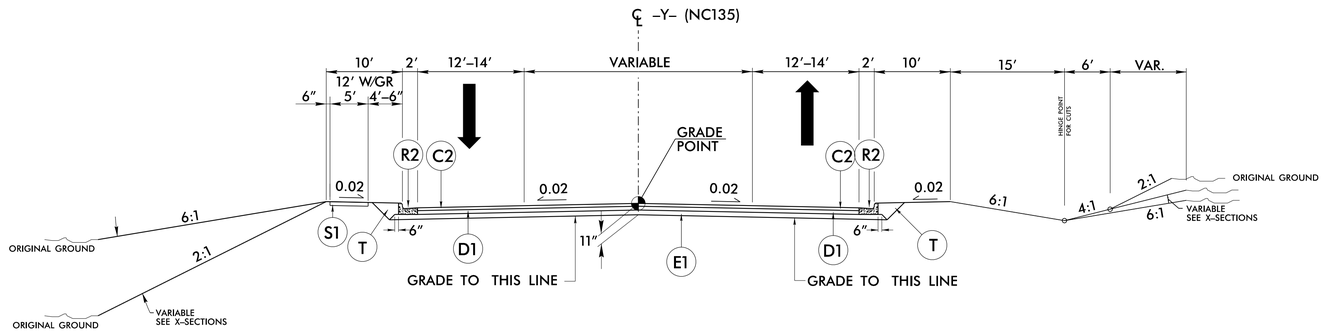
-Y- STA. 106+00 TO STA. 107+25 LT & RT

8/17/99

REVISIONS

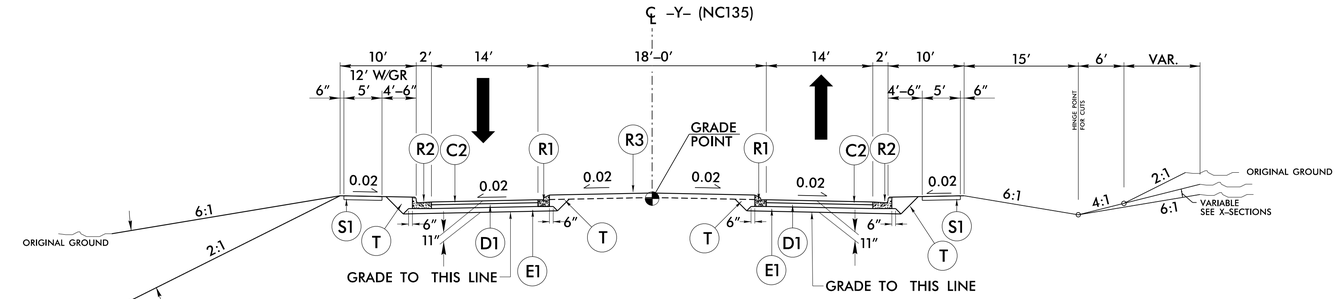
FINAL PAVEMENT SCHEDULE	
C2	PROP. APPROX. 3.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. PER LAYER PLACED IN TWO LAYERS.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
J1	PROP. 8″ AGGREGATE BASE COURSE
R1	1′-6″ CONCRETE CURB AND GUTTER.
R2	2′-6″ CONCRETE CURB AND GUTTER.
R3	5″ MONOLITHIC CONCRETE ISLAND.
S1	4″ CONCRETE SIDEWALK
T	EARTH MATERIAL.
V1	MILLING 3.0″

NOTES:
1. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE. IN AREAS OF NARROW WIDENING,THE 8 INCHES OF AGGREGATE
2. BASE COURSE MAY BE REPLACED WITH 4″ OF B25.0C.



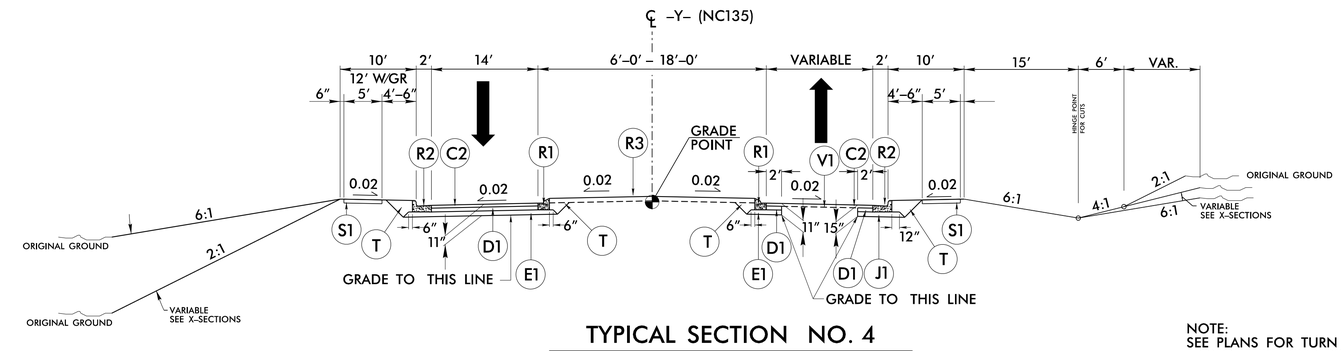
TYPICAL SECTION NO. 2

–Y– STA. 115+91.09 TO –Y– STA. 118+79.50 (Begin Bridge)
–Y– STA. 120+59.55 (End Bridge) TO –Y– STA. 122+33.05



TYPICAL SECTION NO. 3

–Y– STA. 111+02.20 TO –Y– STA. 115+91.09
–Y– STA. 122+33.05 TO –Y– STA. 124+50.00



TYPICAL SECTION NO. 4

–Y– STA. 124+50.00 TO –Y– STA. 130+18.89

NOTE:
SEE PLANS FOR TURN LANE, TAPERS, TRANSITIONS MONOLITHIC ISLANDS AND CURB AND GUTTER

Johnson, Mirmiran, & Thompson Inc.
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Raleigh, NC, 27609
License No: C-3097

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2A-2
R/W SHEET NO.	

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046694 AMY L. SIMPSON
10/30/2025

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG
10/29/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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User: ddavis

8/17/99

REVISIONS

FINAL PAVEMENT SCHEDULE	
C2	PROP. APPROX. 3.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. PER LAYER PLACED IN TWO LAYERS.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R2	2′-6″ CONCRETE CURB AND GUTTER.
S1	4″ CONCRETE SIDEWALK
T	EARTH MATERIAL.

NOTES:
1. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE. IN AREAS OF NARROW WIDENING,THE 8 INCHES OF AGGREGATE
2. BASE COURSE MAY BE REPLACED WITH 4″ OF B25.0C.

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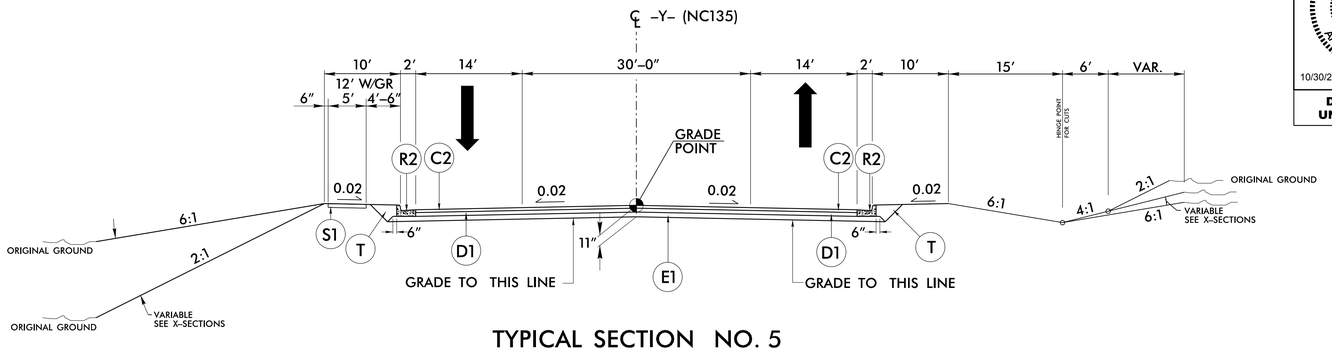
Raleigh, NC. 27609
License No: C-3097

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2A-3
R/W SHEET NO.	

PAVEMENT DESIGN ENGINEER
SEAL 036694 AMY L. SIMPSON NORTH CAROLINA PROFESSIONAL ENGINEER
Signed by: Amy L. Simpson
10/30/2025

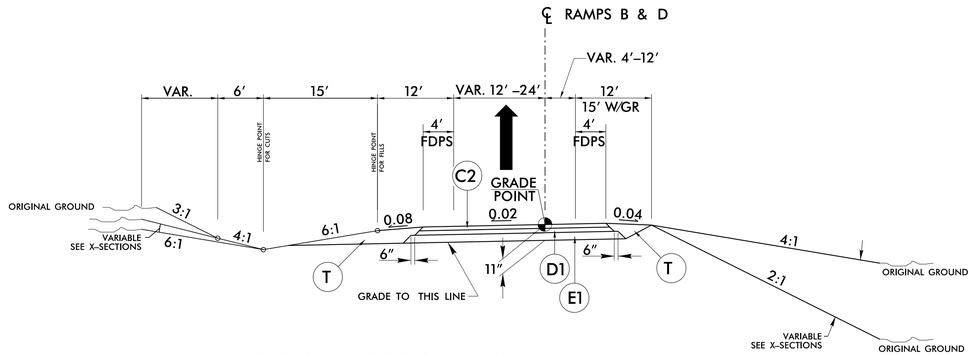
ROADWAY DESIGN ENGINEER
SEAL 046062 CHARLES J. YOUNG NORTH CAROLINA PROFESSIONAL ENGINEER
10/29/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



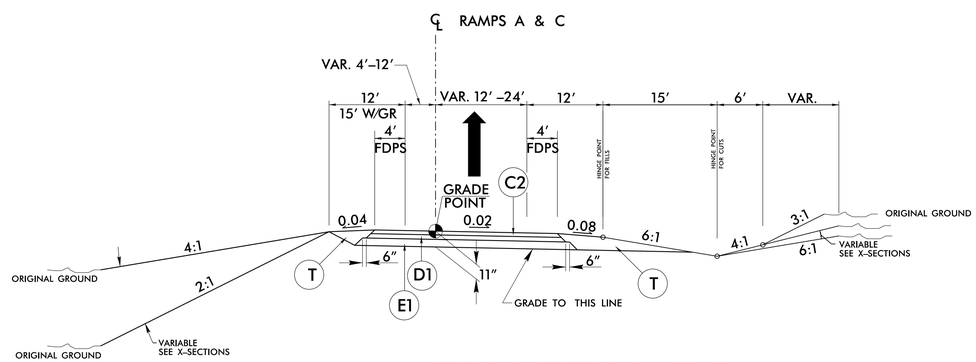
TYPICAL SECTION NO. 5

–Y– STA. 115+91.22 TO –Y– STA. 118+87.00
–Y– STA. 120+52.00 TO –Y– STA. 123+33.00



TYPICAL SECTION NO. 6

RAMP B STA. 8+50.00 TO STA. 19+32.02
RAMP D STA. 10+00.00 TO STA. 21+15.85



TYPICAL SECTION NO. 7

RAMP A STA. 10+00.00 TO STA. 17+59.39
RAMP C STA. 10+00.00 TO STA. 19+27.07

NOTE:
SEE PLANS FOR TURN LANE, TAPERS, TRANSITIONS MONOLITHIC ISLANDS AND CURB AND GUTTER

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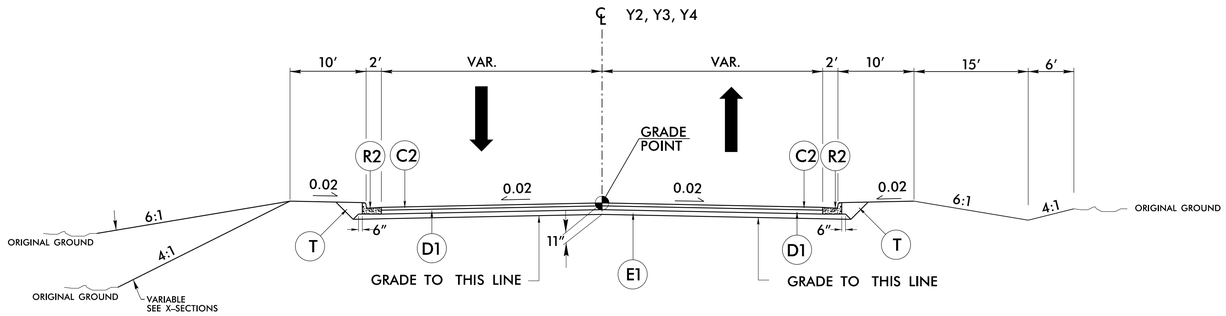
barr.siddoway

8/17/99

REVISIONS

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. PER LAYER PLACED IN TWO LAYERS.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E3	PROP. APPROX. 9.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD. PER LAYER PLACED IN TWO LAYERS.
R2	2′-6″ CONCRETE CURB AND GUTTER.
T	EARTH MATERIAL.
V3	MILLING 1.5″

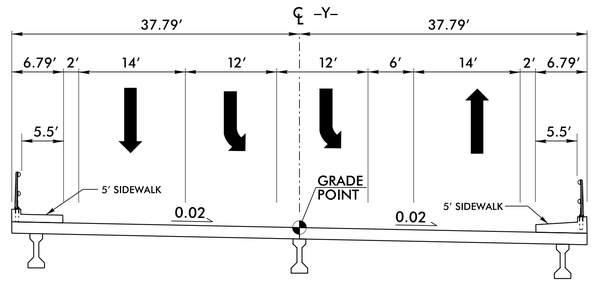
NOTES:
1. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE. IN AREAS OF NARROW WIDENING,THE 8 INCHES OF AGGREGATE
2. AGGREGATE BASE COURSE MAY BE REPLACED WITH 4″ OF B25.0C.



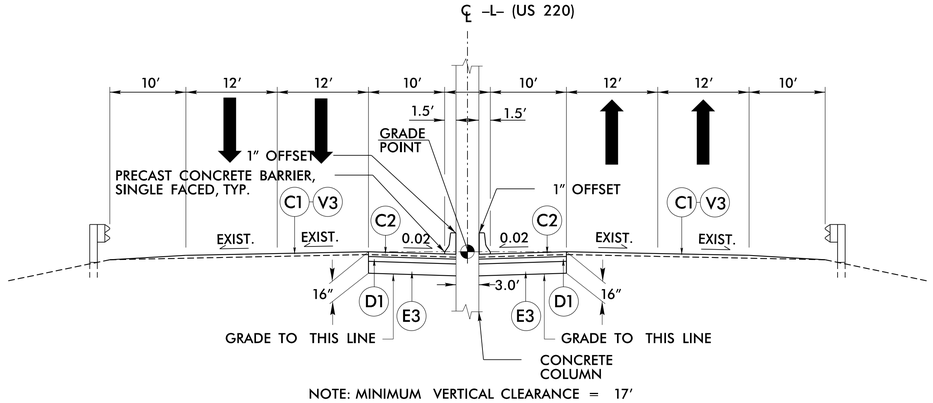
TYPICAL SECTION NO. 8

–Y2– (SR 2177) STA. 10+29.02 TO –Y2– STA. 11+25.00
–Y3– (SR 2283) STA. 11+90.00 TO –Y3– STA. 12+93.80
–Y4– (SR 2271) STA. 10+20.20 TO –Y4– STA. 11+52.00

BRIDGE AT –Y– NC 135 /US 311 POT STA 119+69.55 OVER –L– US 220 POT STA. 131+78.78



TYPICAL SECTION NO. 9 (BRIDGE)



NOTE: MINIMUM VERTICAL CLEARANCE = 17′

TYPICAL SECTION NO. 10 (UNDER BRIDGE)

–L– STA. 130+52.91 TO –L– STA. 133+12.60

NOTE:
SEE PLANS FOR TURN LANE, TAPERS, TRANSITIONS MONOLITHIC ISLANDS AND CURB AND GUTTER

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Raleigh, NC. 27609
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PROJECT REFERENCE NO.	SHEET NO.
I-5898	2A-4
R/W SHEET NO.	

PAVEMENT DESIGN ENGINEER*
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036694 AMY L. SIMPSON
Signed by: [illegible]
10/30/2025

PAVEMENT DESIGN ENGINEER**
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044500 ANDREW D. WARDO
Signed by: [illegible]
10/31/2025

* SEALING TYPICALS 8 AND 9 ONLY
** SEALING TYPICAL 10 ONLY

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG
Signed by: [illegible]
10/29/2025

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PROJECT REFERENCE NO.	SHEET NO.
I-5898	2B-1
R/W SHEET NO.	

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ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG

10/20/2025

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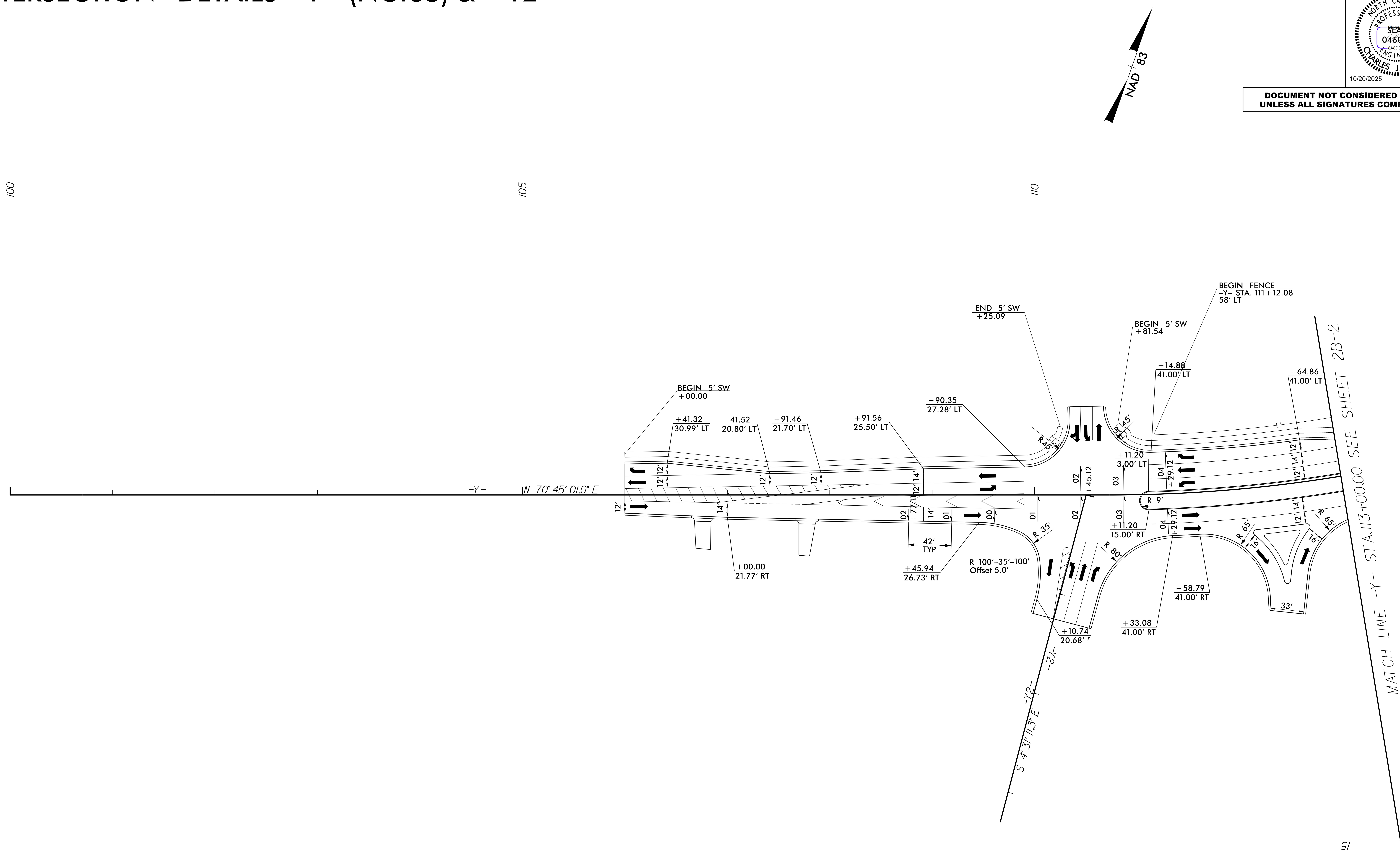
INTERSECTION DETAILS -Y- (NC135) & -Y2-



SEE SHEET 10 FOR -Y- PROFILE
SEE SHEET 12 FOR -Y2- PROFILE

REVISIONS

8/17/99

8/17/99

REVISIONS

INTERSECTION DETAILS –Y1– (NC135) & –RP A–, –RP B–, –RP C– AND –RP D–

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PROJECT REFERENCE NO.	SHEET NO.
I-5898	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG

10/20/2025

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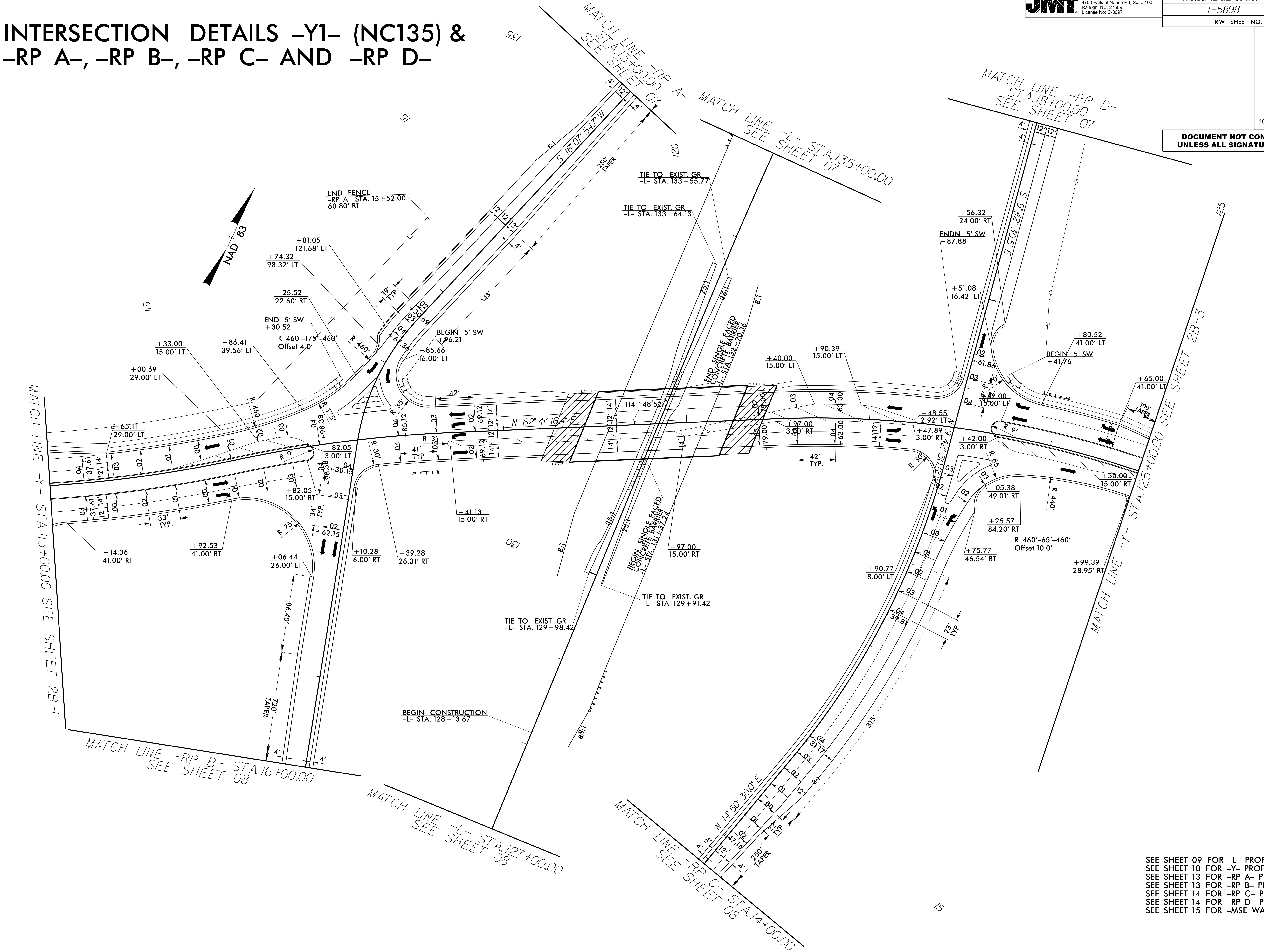

SEE SHEET 09 FOR –L– PROFILE
SEE SHEET 10 FOR –Y– PROFILE
SEE SHEET 13 FOR –RP A– PROFILE
SEE SHEET 13 FOR –RP B– PROFILE
SEE SHEET 14 FOR –RP C– PROFILE
SEE SHEET 14 FOR –RP D– PROFILE
SEE SHEET 15 FOR –MSE WALL– PROFILE

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8/17/99

REVISIONS

INTERSECTION DETAILS –Y– (NC135) & –Y3– AND –Y4–

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Raleigh, NC. 27609
License No: C-3097

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2B-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG

10/20/2025

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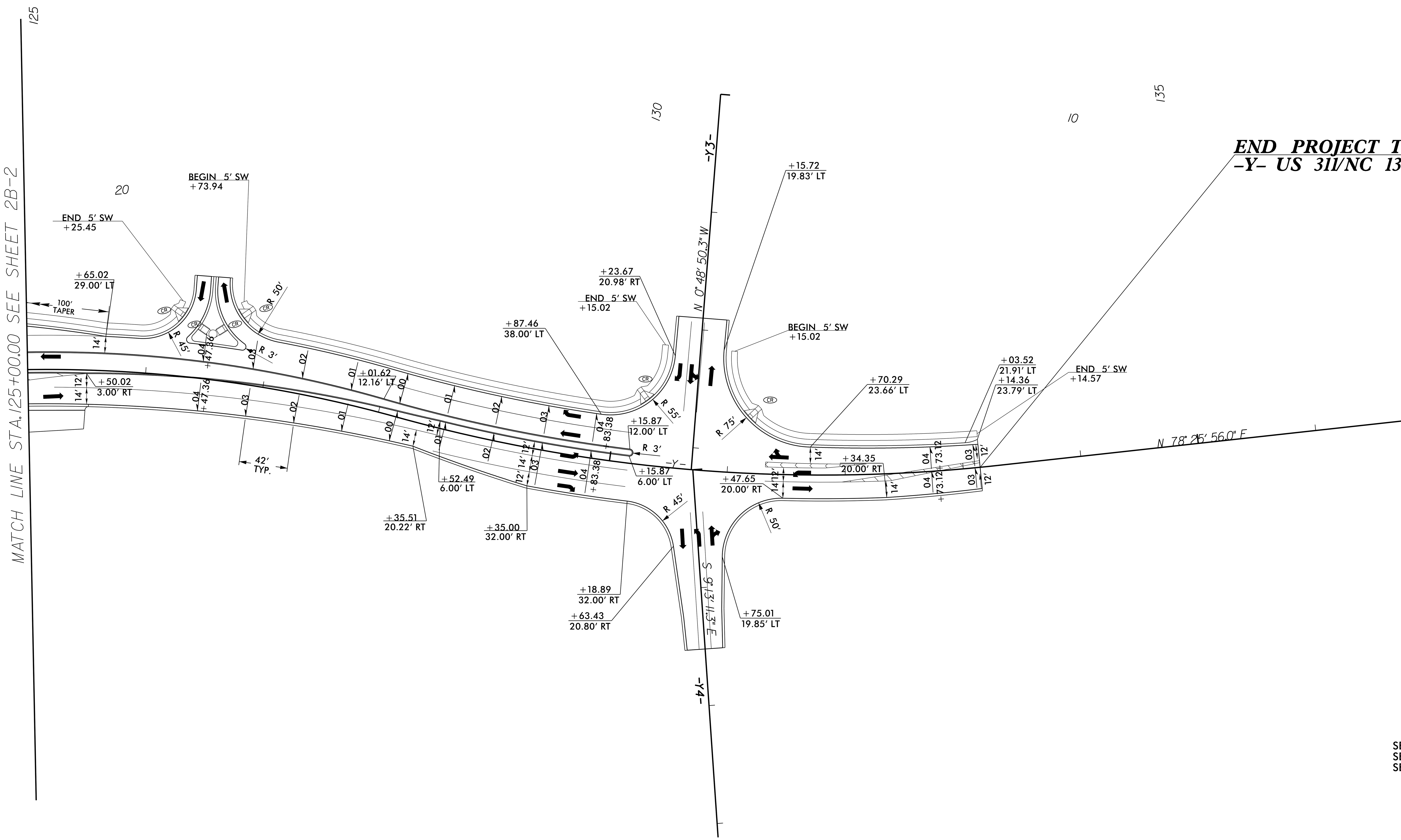
NAD 83



SEE SHEET 10-11 FOR -Y- PROFILE
SEE SHEET 12 FOR -Y3- PROFILE
SEE SHEET 12 FOR -Y4- PROFILE

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-1

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

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

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

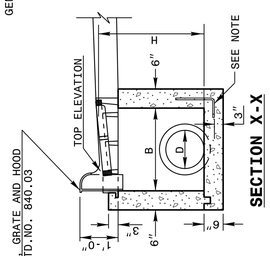
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

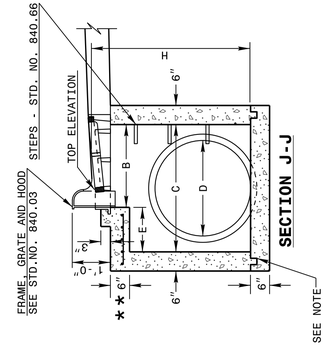
FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

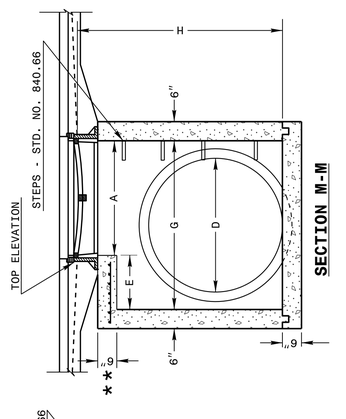
CONSTRUCT WITH PIPE CROWNS MATCHING.

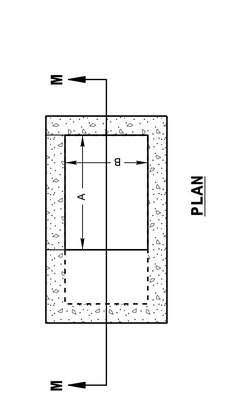
CHAMFER ALL EXPOSED CORNERS 1".

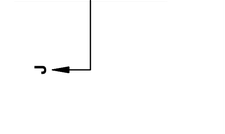
** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.

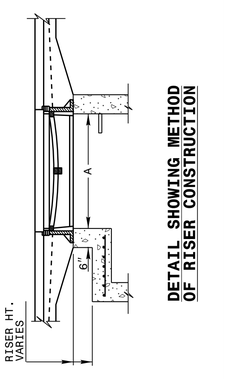










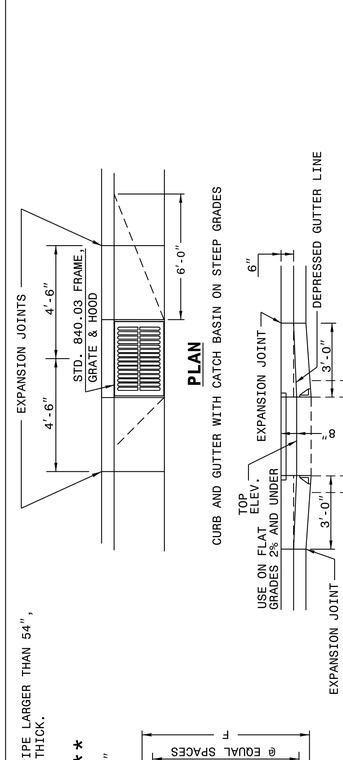


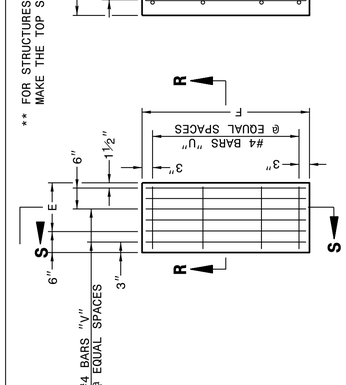
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **MINIMUM DEPTH CONCRETE CATCH BASIN** 12" THRU 84" PIPE	SHEET 1 OF 2 **840D02**

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

ENGLISH DETAIL DRAWING FOR **MINIMUM DEPTH CONCRETE CATCH BASIN** 12" THRU 84" PIPE

SHEET 2 OF 2 **840D02**



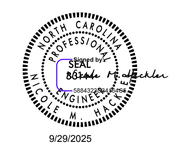


* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

PIPE D	DIMENSIONS OF BOX AND PIPE COVER DIMENSION SPAN A	WIDTH B	WIDTH C	SPAN G	MIN. HEIGHT H	BARS-U NO.	BARS-U LENGTH	BARS-U E	BARS-U F	BARS-V NO.	BARS-V LENGTH	TOTAL LBS.	CU.YDS. CONC. IN BOX TOP SLAB	CU.YDS. CONC. IN BOX BOTTOM SLAB	CU.YDS. CONC. IN BOX TOT. CONC. FOR MINIMUM HEIGHT H	DEDUCTIONS ONE PIPE C.M.	DEDUCTIONS ONE PIPE R.C.
12"	3'-0"	2'-2"	--	--	2'-0"	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15"	3'-0"	2'-2"			2'-3"									0.235	0.829	0.023	0.036
18"	3'-0"	2'-2"			2'-6"									0.235	0.887	0.033	0.049
24"	3'-0"	2'-2"			3'-1"									0.235	1.001	0.059	0.085
30"	3'-0"	2'-2"	3'-4"	3'-4"	3'-10"	4	1'-2"	1'-2"	4'-4"	4	1'-6"	39	0.123	0.347	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"	3'-10"	4'-6"	4	1'-8"	1'-8"	4'-10"	4	1'-11"	43	0.161	0.432	1.714	0.132	0.178
42"	3'-0"	2'-2"	4'-5"	4'-5"	4'-11"	5	2'-2"	2'-2"	5'-5"	5	2'-5"	47	0.200	0.543	1.738	0.160	0.243
48"	3'-0"	2'-2"	5'-0"	5'-0"	5'-6"	5	2'-10"	2'-10"	6'-0"	5	3'-1"	51	0.235	0.667	2.052	0.235	0.317
54"	3'-0"	2'-2"	5'-7"	5'-7"	6'-0"	6	3'-5"	3'-5"	6'-7"	6	3'-8"	56	0.289	0.802	2.387	0.297	0.401
60"	3'-0"	2'-2"	6'-3"	6'-3"	6'-6"	6	4'-1"	4'-1"	7'-3"	6	4'-4"	61	0.340	0.973	2.722	0.363	0.546
66"	3'-0"	2'-2"	6'-11"	6'-11"	7'-0"	7	4'-9"	4'-9"	7'-11"	7	5'-0"	66	0.391	1.160	3.057	0.440	0.655
72"	3'-0"	2'-2"	7'-6"	7'-6"	7'-6"	7	5'-3"	5'-3"	8'-6"	7	5'-6"	72	0.442	1.340	3.392	0.524	0.774
78"	3'-0"	2'-2"	8'-1"	8'-1"	8'-0"	8	5'-11"	5'-11"	9'-1"	8	6'-2"	78	0.493	1.530	3.727	0.615	0.893
84"	3'-0"	2'-2"	8'-9"	8'-9"	8'-6"	8	6'-7"	6'-7"	9'-9"	8	6'-10"	84	0.544	1.760	4.062	0.713	1.010

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **MINIMUM DEPTH CONCRETE CATCH BASIN** 12" THRU 84" PIPE	SHEET 2 OF 2 **840D02**



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

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 Std.840.01 DATE:
MODIFIED BY: E.E. WARD DATE: 3-1-02
CHECKED BY: DATE:
FILE SPEC.: s:Special Details/jhowerton/840d02.dgn

10-AUG-2017 10:11
S:\Contracts\Special Details\jhowerton\840d02 Min Depth CB.dgn
jhowerton
AT CSD-292595

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-2

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

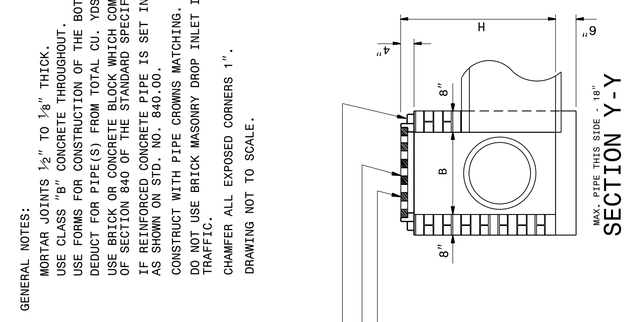
ENGLISH DETAIL DRAWING FOR

MINIMUM DEPTH BRICK DROP INLET

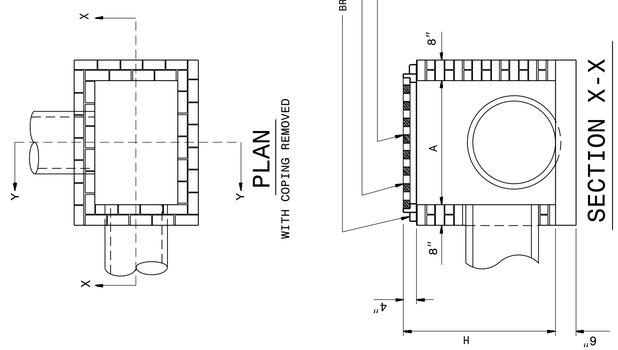
12" THRU 30" PIPE

SHEET 1 OF 1 **840D15**

GENERAL NOTES:
MORTAR JOINTS ½" TO ⅛" THICK.
USE CLASS "B" CONCRETE THROUGHOUT.
USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
DEDUCT FOR PIPE(S) FROM TOTAL CU. YDS. OF BRICK MASONRY.
USE BRICK OR CONCRETE BLOCK WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
CONSTRUCT WITH PIPE CROWNS MATCHING.
DO NOT USE BRICK MASONRY DROP INLET IN LOCATIONS SUBJECT TO TRAFFIC.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.



SECTION Y-Y



SECTION X-X

PLAN
WITH COPING REMOVED

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

DIMENSIONS OF BOX & PIPE				CUBIC YARDS CONCRETE	CUBIC YARDS BRICK MASONRY		DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	MIN. HEIGHT					
D	A	B	H	BOTTOM SLAB	WALL PER FOOT HT.	TOTAL BRICK MASONRY FOR MIN. HEIGHT, H	C.S.	R.C.
12"	3'-0"	2'-0"	1'-8"	0.268	0.313	0.470	0.020	0.032
15"			1'-11"	0.268	0.313	0.548	0.031	0.047
18"			2'-1"	0.268	0.313	0.626	0.044	0.065
24"			2'-9"	0.268	0.313	0.835	0.078	0.113
30"	3'-0"	2'-0"	3'-2"	0.268	0.313	0.991	0.122	0.170

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

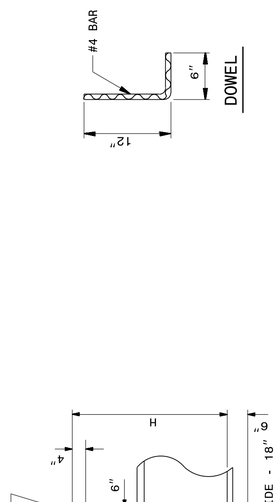
ENGLISH DETAIL DRAWING FOR

MINIMUM DEPTH CONCRETE DROP INLET

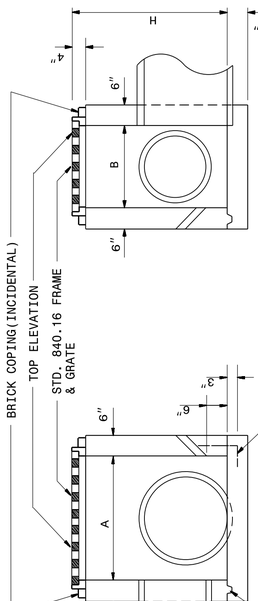
12" THRU 30" PIPE

SHEET OF **840D14**

GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
CONSTRUCT WITH PIPE CROWNS MATCHING.
INSTALL 2" WEEPHOLES AS DIRECTED BY THE ENGINEER.
INSTALL STONE DRAINS, OF A MINIMUM OF 1 CUBIC FOOT OF NO. 78M STONE IN A POROUS FABRIC BAG OR WRAP, AT EACH WEEP HOLE OR AS DIRECTED BY THE ENGINEER.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.

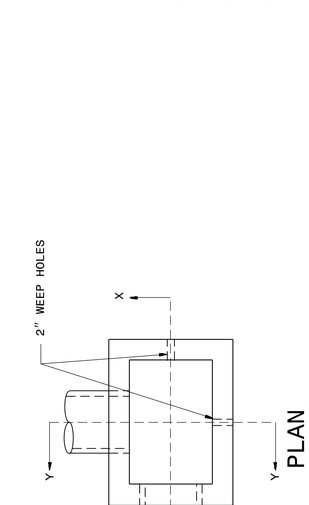


DOWEL



SECTION Y-Y

SECTION X-X



PLAN
WITH GRATE & FRAME REMOVED

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

DIMENSIONS OF BOX & PIPE				CUBIC YARDS CONCRETE	CUBIC YARDS BRICK MASONRY		DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	MIN. HEIGHT					
D	A	B	H	BOTTOM SLAB	WALL PER FOOT HT.	TOTAL BRICK MASONRY FOR MIN. HEIGHT, H	C.M.	R.C.
12"	3'-0"	2'-0"	1'-8"	0.222	0.222	0.555	0.015	0.026
15"			1'-11"			0.611	0.023	0.036
18"			2'-1"			0.667	0.033	0.049
24"			2'-9"			0.814	0.059	0.085
30"	3'-0"	2'-0"	3'-2"	0.222	0.222	0.925	0.092	0.127

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

ENGLISH DETAIL DRAWING FOR

MINIMUM DEPTH CONCRETE DROP INLET

12" THRU 30" PIPE

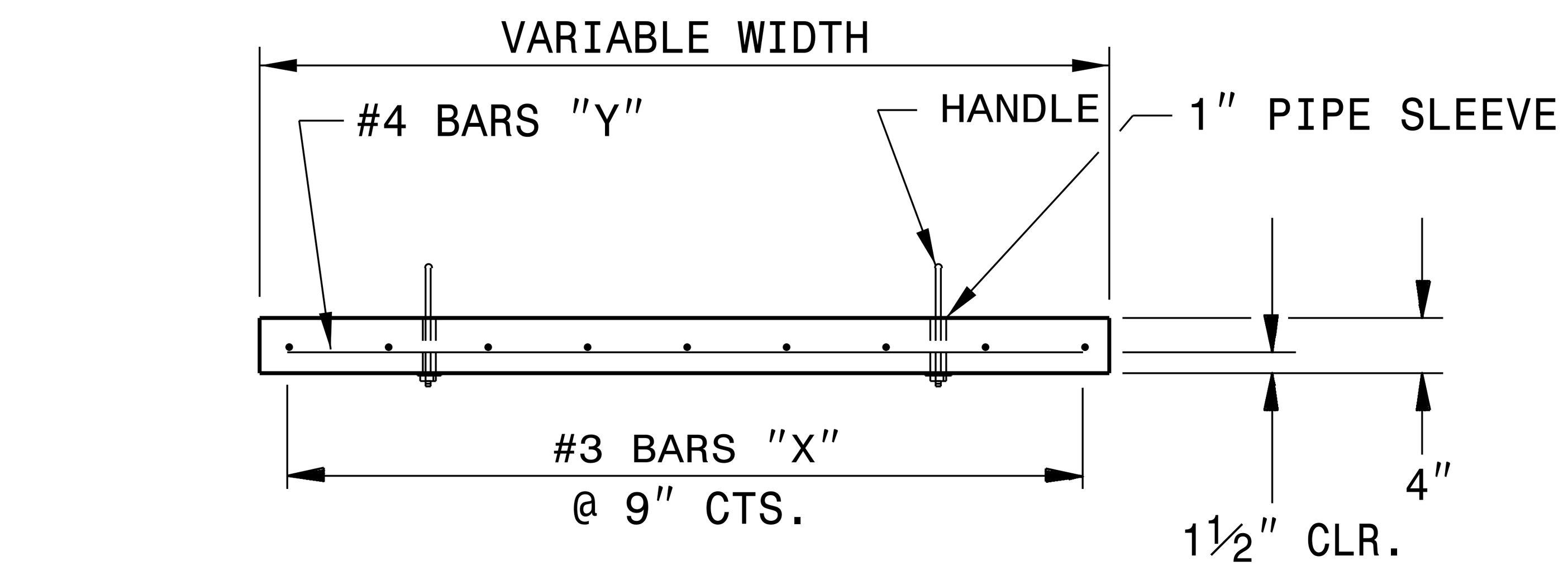
SHEET 1 OF 1 **840D14**

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

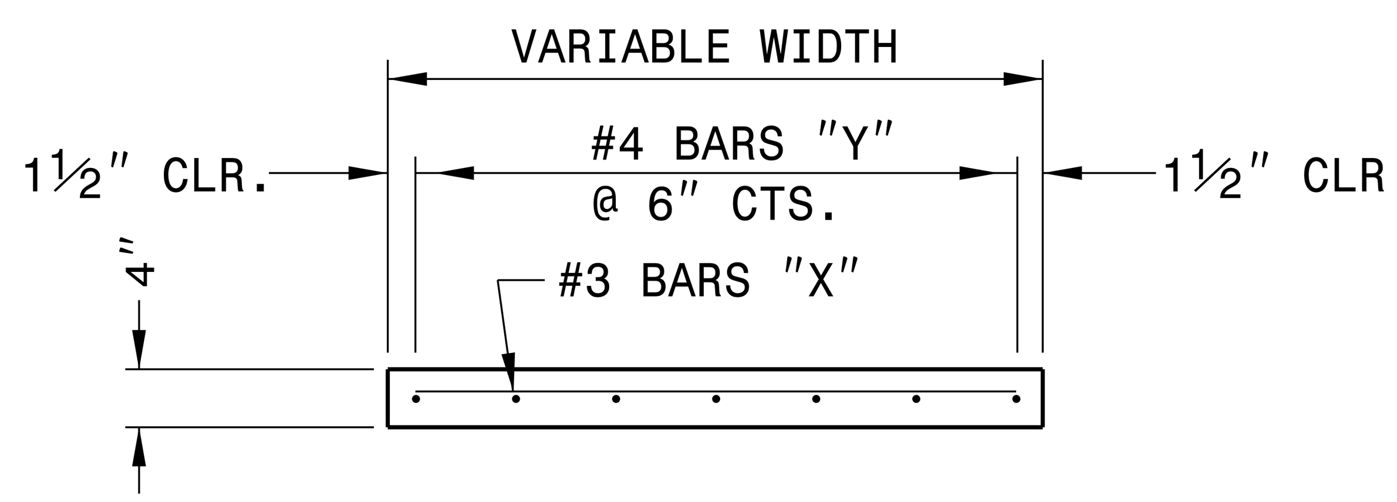
SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD. 840.14 DATE:
MODIFIED BY: E.E. WARD DATE: 3-4-02
CHECKED BY: DATE:
FILE SPEC.:

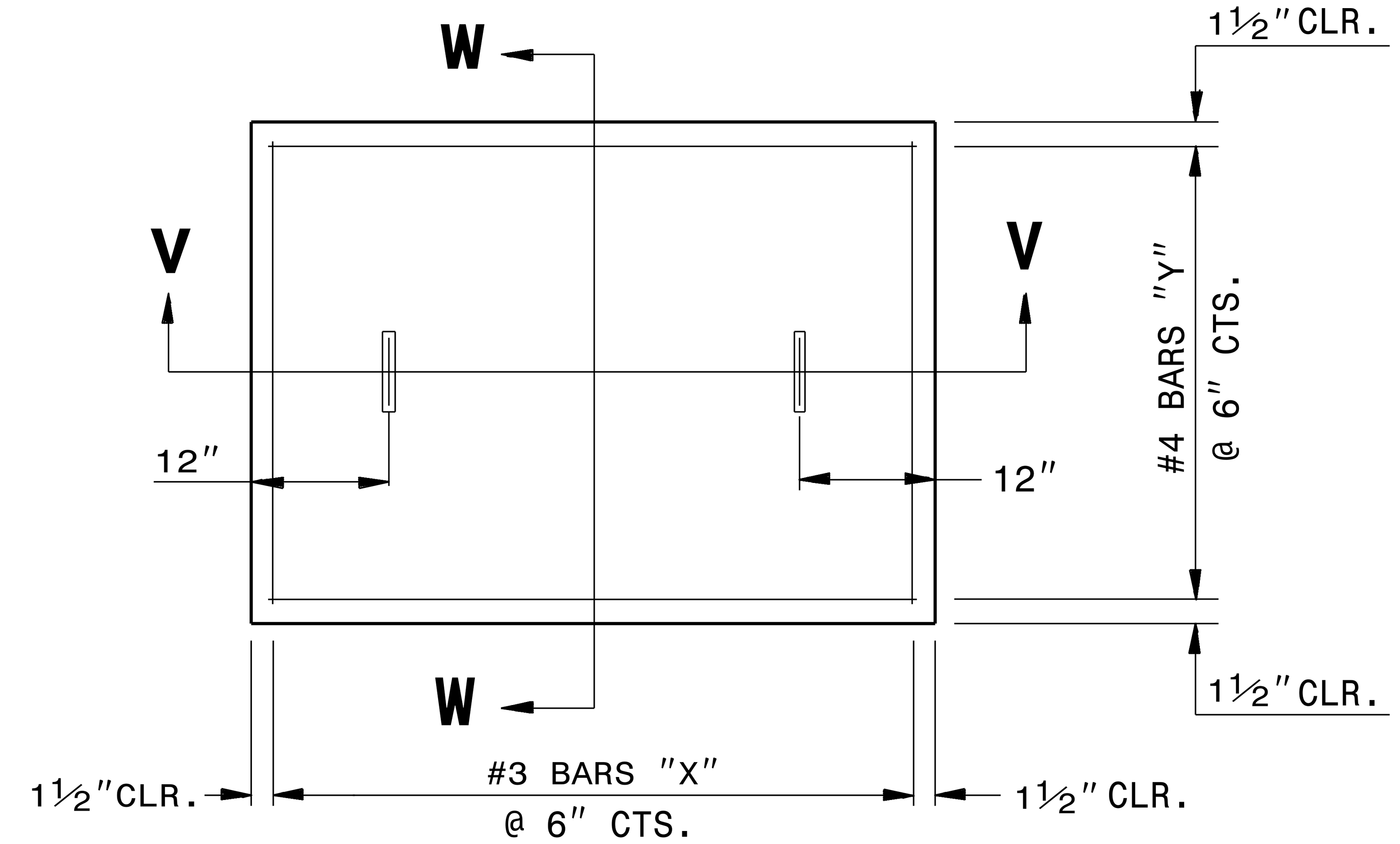
PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-3



SECTION V-V

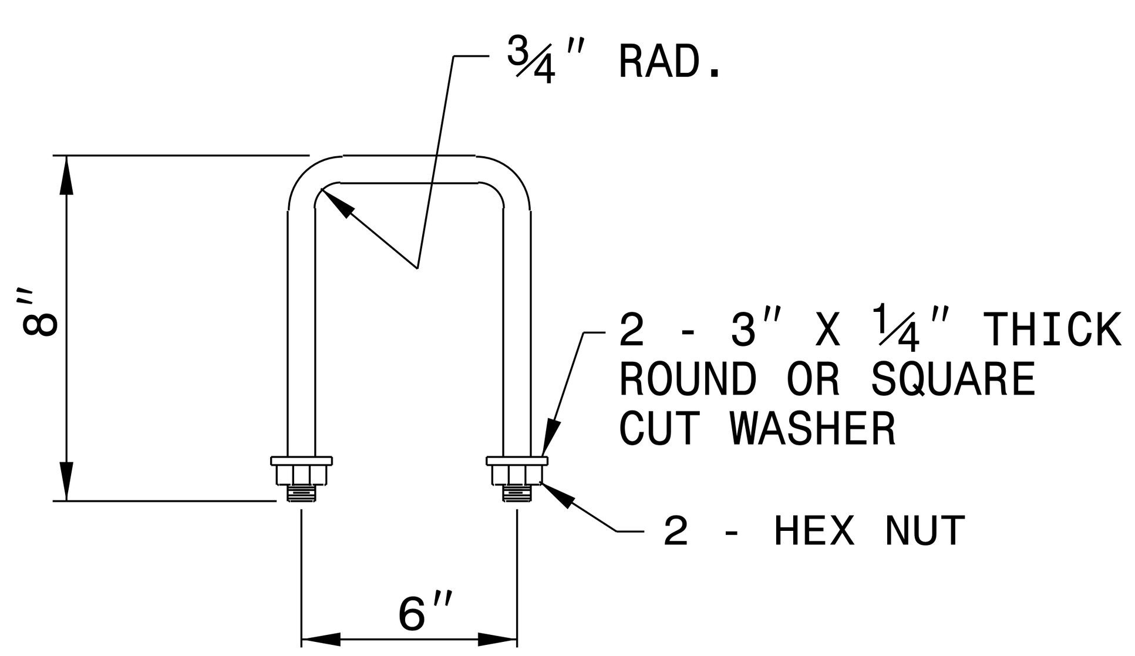


SECTION W-W

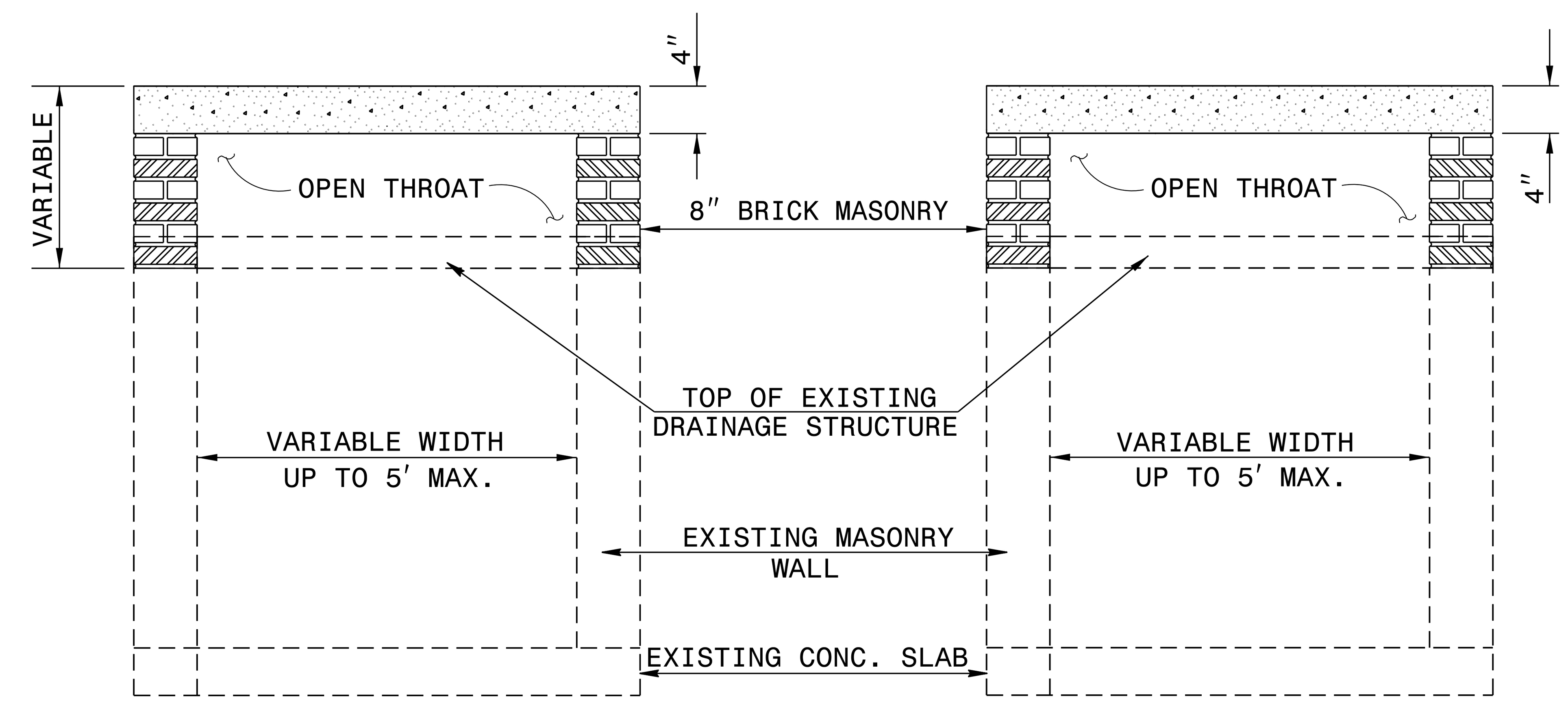


PLAN

PRECAST OR CAST IN PLACE TOP SLAB



DETAIL OF HANDLE



SECTION W-W **SECTION V-V**

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

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

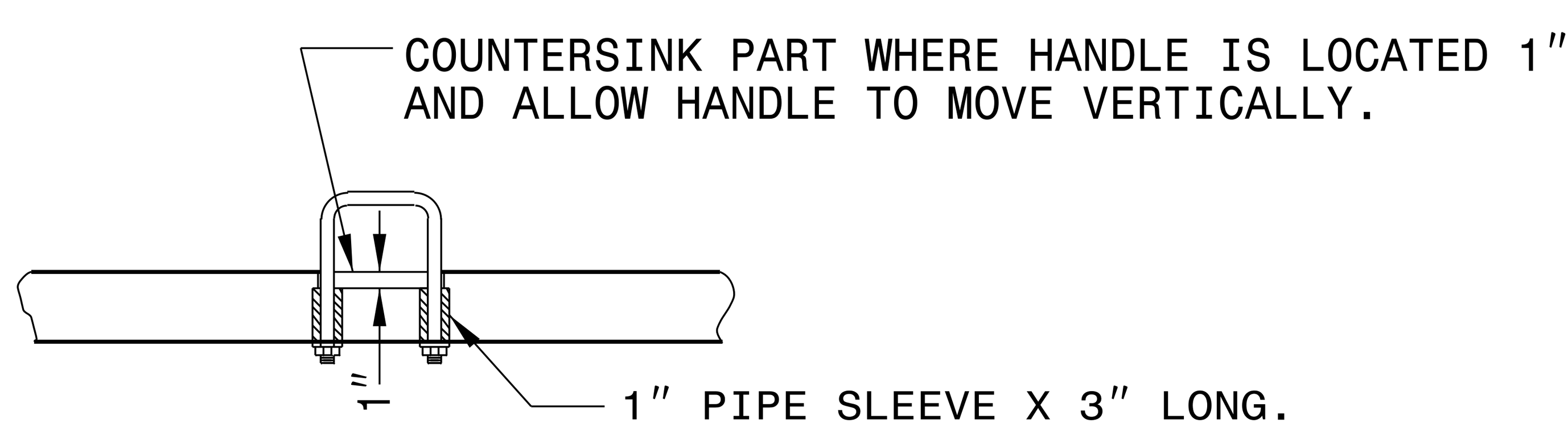
DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

BILL OF MATERIALS

REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL lbs.
X	#3	9	3'-1"	10.4
Y	#4	7	4'-1"	19.1
			TOTAL	29.5 *
MASONRY				CY
TOP SLAB CONCRETE CLASS "B"				0.1783 *
BRICK MASONRY PER FT HT (MIN)				0.3127 *

NO DEDUCTIONS HAVE BEEN TAKEN FOR OPEN THROAT OPENINGS

* NOTE:
QUANTITIES BASED ON 3'-0" X 2'-0" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES.



PART SECTION

THRU COVER SHOWING HANDLE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039144 NICOLE M. HACKLER

9/29/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

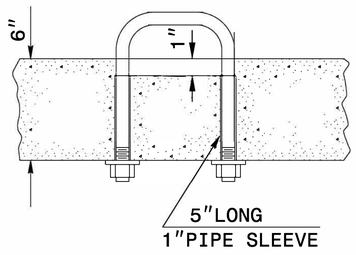
DETAIL TO CONVERT EXISTING DRAINAGE BOX TO OPEN THROAT CATCH BASIN

ORIGINAL BY: E.E. WARD DATE: 9-02-03
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: s:usr/details/stand/cbto_openthrt.dgn

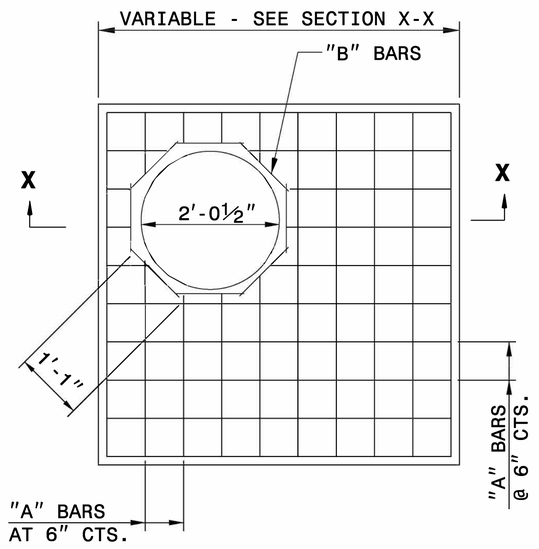
5/14/99

16-JUN-2017 09:57
S:\Contracts\Contracts\Special Details\jhowerton\Convert Box to OTCB.dgn
jhowerton AT CSD-242595

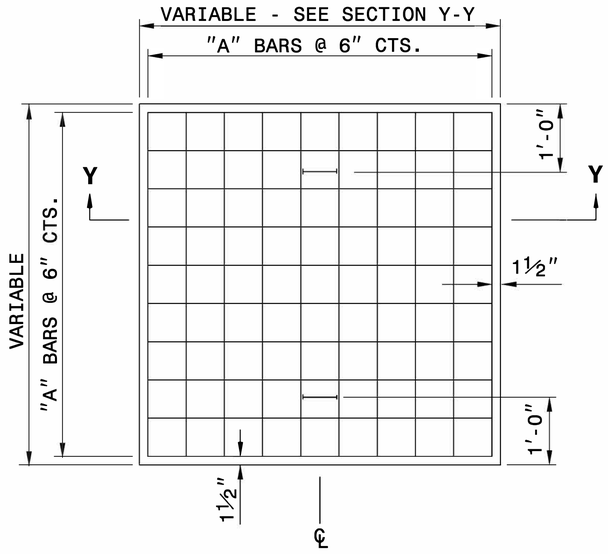
PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-4



PARTIAL SECTION



PLAN



PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

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

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

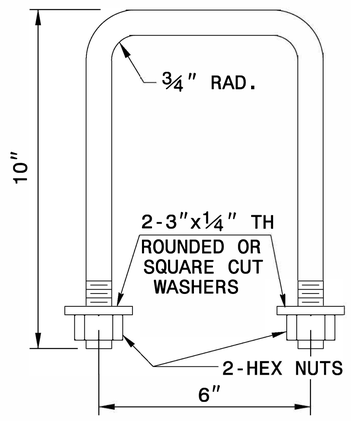
BILL OF MATERIALS

REINFORCING STEEL

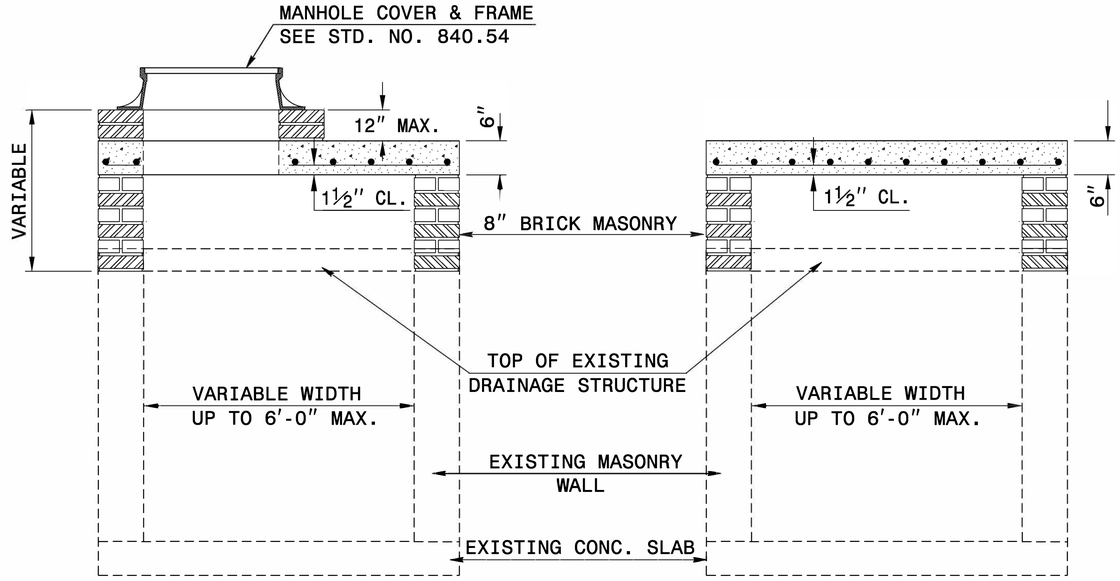
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *

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

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



DETAIL OF HANDLE



SECTION X-X

SECTION Y-Y

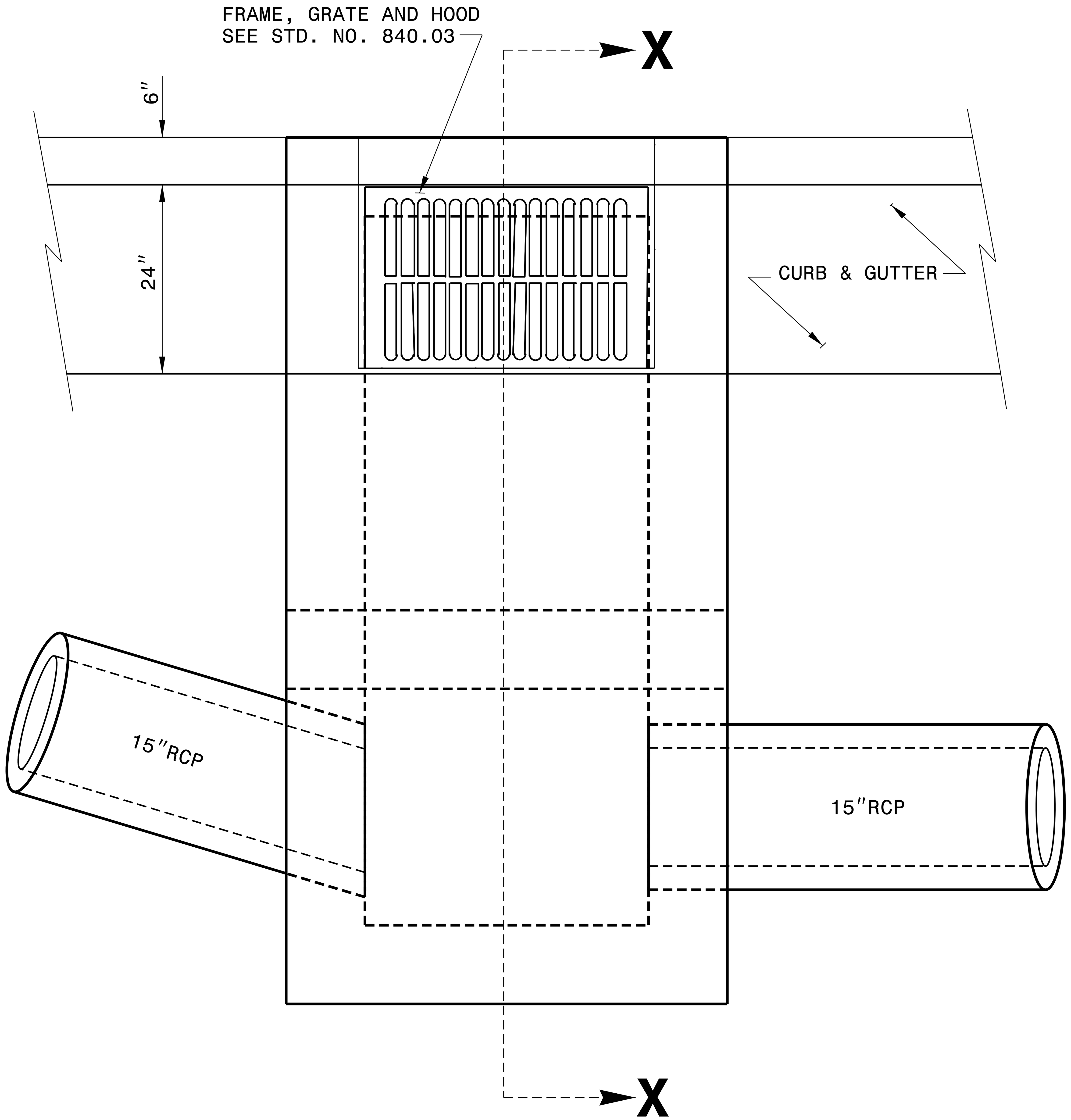
NICOLE M. HACKLER
NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER
Signed by: Nicole Hackler
9/29/2025

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

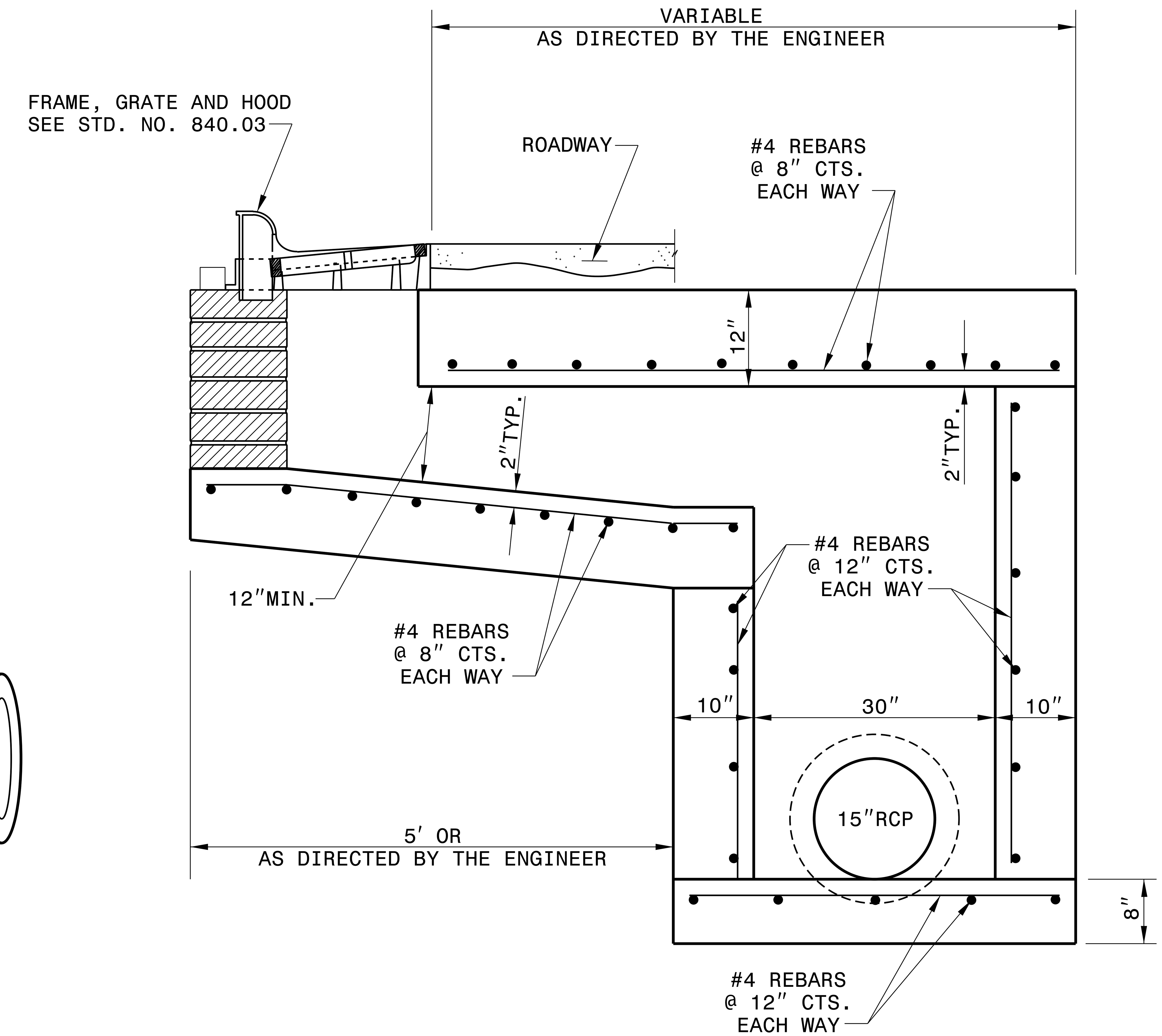
DETAIL TO CONVERT EXISTING DI, CB, OTCB or GI TO JUNCTION BOX (MANHOLE OPTIONAL)

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

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-5



PLAN



SECTION X-X

NOTES:

MORTAR JOINTS ½″ TO ¼″ THICK.

USE CLASS "B" CONCRETE THROUGHOUT.

USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

USE BRICK OR CONCRETE BLOCK WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.

CHAMFER ALL EXPOSED CORNERS 1″.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144 NICOLE M. HACKLER
9/29/2025

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

PROPOSED OFFSET CATCH BASIN

ORIGINAL BY: DATE:
MODIFIED BY: rnbritt DATE: 10-30-2012
CHECKED BY: DATE:
FILE SPEC.: nbritt/english/hydro/840d06.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-6

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

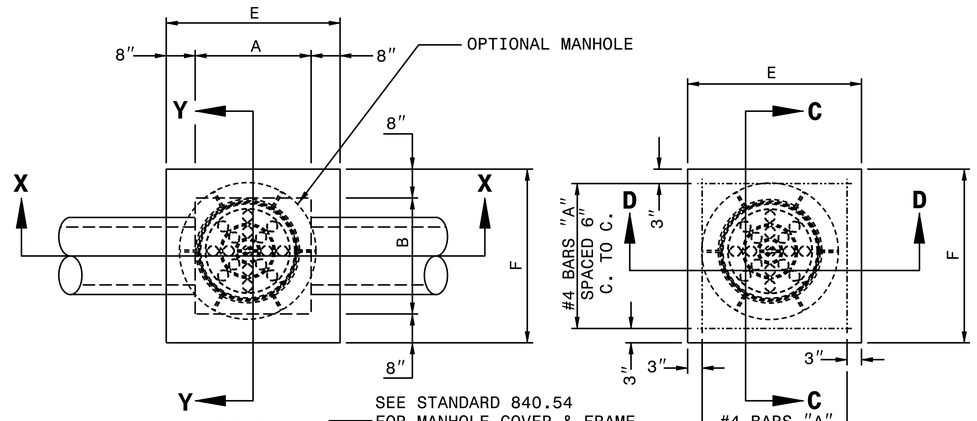
ROADWAY DETAIL DRAWING FOR

CONCRETE JUNCTION BOX

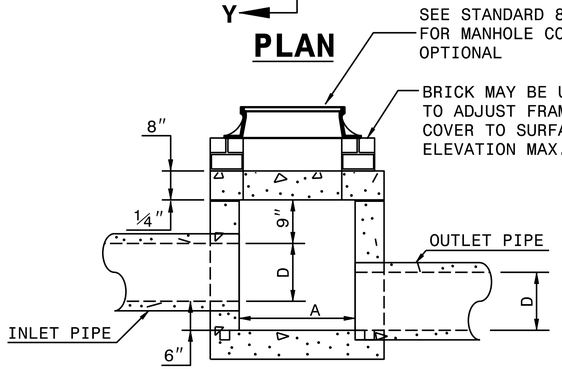
(WITH OPTIONAL MANHOLE)
UP TO 30′ IN HEIGHT

SHEET 1 OF 1

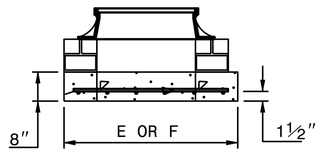
840D31



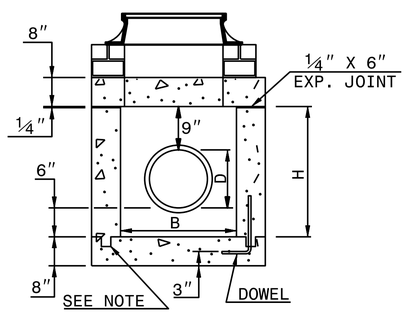
PLAN



SECTION X-X



SECTION C-C OR D-D



SECTION Y-Y

GENERAL NOTES:

CHAMFER ALL EXPOSED CORNERS 1″.

USE CLASS "B" CONCRETE THROUGHOUT.

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

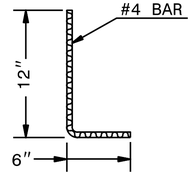
USE FORMS TO CONSTRUCT THE BOTTOM SLAB.

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

PROVIDE ALL JUNCTION BOXES OVER 3′-6″ IN DEPTH WITH STEPS 12″ ON CENTERS IN ACCORDANCE WITH STD. NO. 840.66.

ADJUST THE STEEL, CONCRETE AND BRICK MASONRY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB, ADDITIONAL VARIABLE HEIGHT BRICK MASONRY, OPENING IN TOP SLAB.)

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 25 FEET.



DOWEL

DIMENSIONS AND QUANTITIES FOR CONCRETE JUNCTION BOXES

DIMENSIONS OF BOX AND PIPE				REINFORCEMENT BARS "A"		TOP SLAB DIMENSIONS		CUBIC YARDS IN BOX			TOTAL QUANTITIES BOX AND SLABS		DEDUCTIONS FOR ONE PIPE CU.YDS.	
PIPE	SPAN	WIDTH	HEIGHT					TOP SLAB	BOTTOM SLAB	WALL/ FT. OF HT.	LBS. REINF	CU. YDS. MIN. "H"	C.S.	R.C.
D	A	B	H	NO.	LENGTH	E	F							
12″	2′-0″	2′-0″	2′-3″	12	2′-9″	3′-0″	3′-0″	0.222	0.222	0.246	22	0.998	0.015	0.024
15″	2′-3″	2′-3″	2′-6″	12	3′-0″	3′-3″	3′-3″	0.261	0.261	0.271	24	1.200	0.023	0.036
18″	2′-6″	2′-6″	2′-9″	14	3′-3″	3′-6″	3′-6″	0.302	0.302	0.295	30	1.416	0.033	0.049
24″	3′-0″	3′-0″	3′-3″	16	3′-9″	4′-0″	4′-0″	0.394	0.394	0.344	40	1.907	0.059	0.085
30″	3′-6″	3′-6″	3′-9″	18	4′-3″	4′-6″	4′-6″	0.499	0.499	0.394	51	2.474	0.092	0.127
36″	4′-0″	4′-0″	4′-3″	20	4′-9″	5′-0″	5′-0″	0.616	0.616	0.443	64	3.114	0.132	0.178
42″	4′-6″	4′-6″	4′-9″	22	5′-3″	5′-6″	5′-6″	0.745	0.745	0.492	77	3.828	0.180	0.243
48″	5′-4″	5′-4″	5′-3″	26	6′-3″	6′-4″	6′-4″	0.988	0.988	0.541	111	4.819	0.235	0.317
54″	5′-10″	5′-10″	5′-9″	28	6′-7″	6′-10″	6′-10″	1.150	1.150	0.591	126	5.696	0.297	0.401
60″	6′-6″	6′-6″	6′-3″	30	7′-3″	7′-6″	7′-6″	1.386	1.386	0.640	145	6.770	0.367	0.495
66″	7′-1″	7′-1″	6′-9″	32	7′-10″	8′-1″	8′-1″	1.609	1.609	0.689	169	7.870	0.444	0.589

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

ROADWAY DETAIL DRAWING FOR

CONCRETE JUNCTION BOX

(WITH OPTIONAL MANHOLE)
UP TO 30′ IN HEIGHT

SHEET 1 OF 1

840D31

$$$$SYSTIME$$$$
$$$$USERNAME$$$$ON $$$$ $$$$ $$$$ $$$$ $$$$ $$$$

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

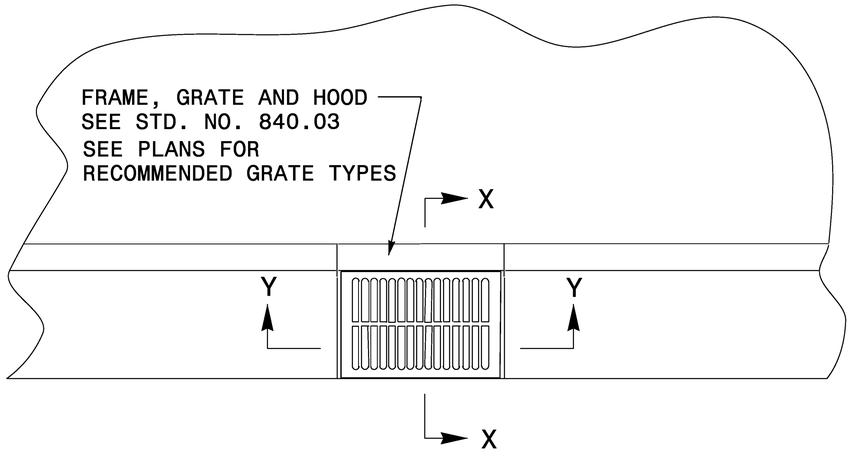
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: J. HOWERTON DATE: 12/30/19
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: jhowerton/840d31 up to 30ft of fill.dgn

5/14/99

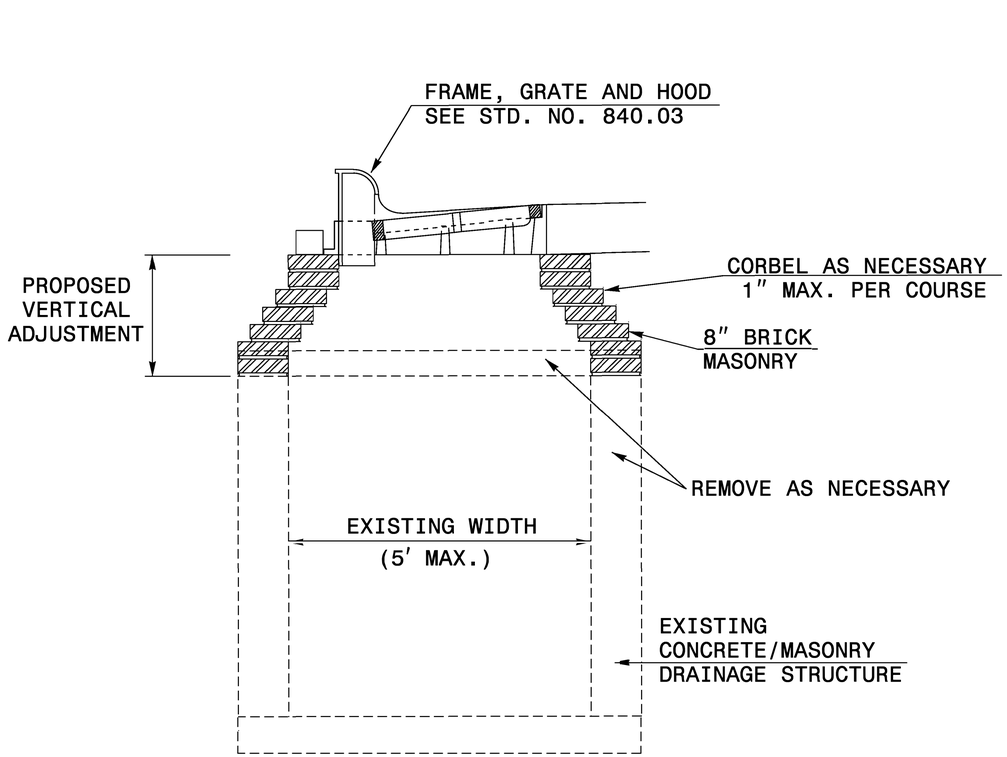
PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-7



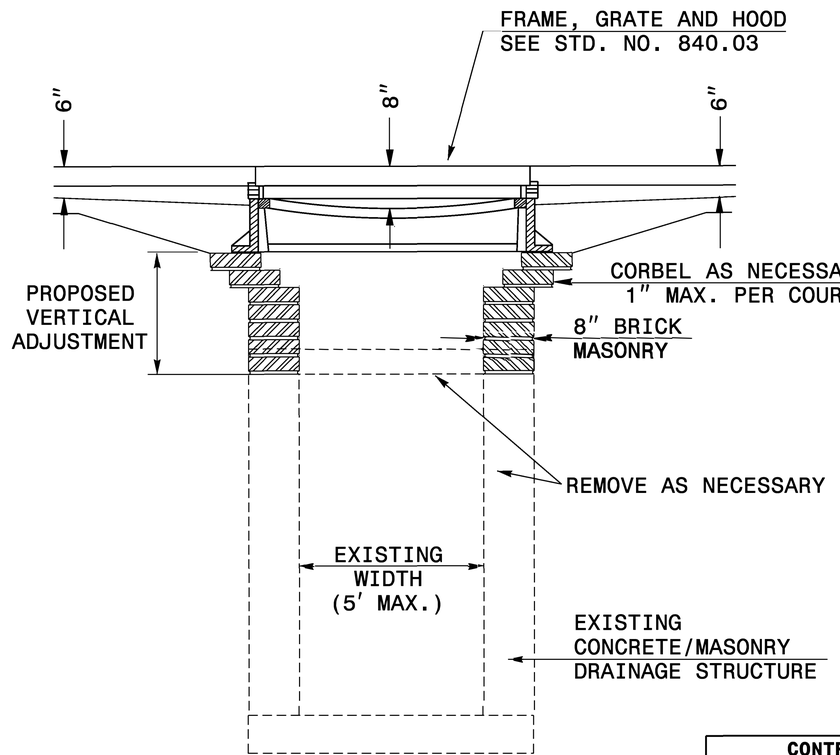
PLAN

GENERAL NOTES:

- THE ROADWAY PLANS INDICATE STRUCTURES TO BE CONVERTED.
- AFTER REMOVAL, STORE GRATES AND FRAMES AS DIRECTED BY THE ENGINEER.
- 4″ SOLID CLAY BRICK, JUMBO BRICK, CONCRETE, OR 4″ SOLID CONCRETE BLOCK MAY BE USED FOR VERTICAL ADJUSTMENT OF THE STRUCTURE.
- CONVERT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.



SECTION X-X



SECTION Y-Y

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 53144 NICOLE M. HICKLIN
9/29/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DETAIL TO CONVERT DROP INLET OR JB TO CATCH BASIN

ORIGINAL BY: E.E. WARD DATE: 11-97
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: DS37:usr\details\stand\jbtocb.dgn

26-JUN-2017 10:42
S:\Contracts\Contracts\Special Details\jhowerton\convert DI or JB to CB.dgn
jhowerton
AT CSD-292595

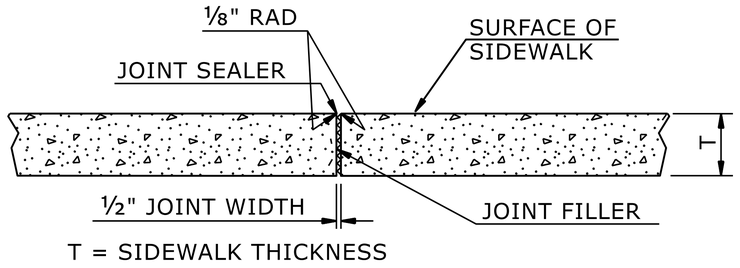
PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-8

NOTES:

CONSTRUCT STANDARD SIDEWALK 5' WIDE AND 4" THICK UNLESS OTHERWISE DENOTED ON PLANS.

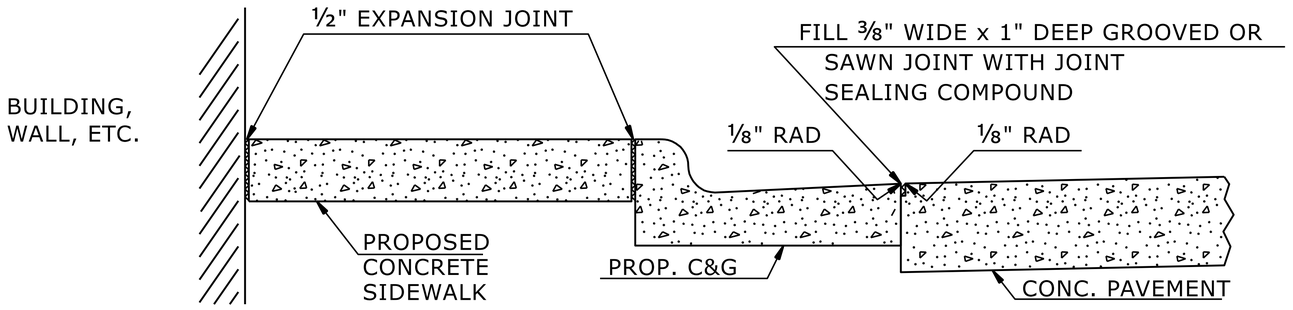
PLACE A GROOVE JOINT 1" DEEP WITH ⅛" RADII IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE ½" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS. A ½" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.

SEE STD. DWG. 848.06 FOR CURB RAMP LOCATION REQUIREMENTS AND CONSTRUCTION GUIDELINES.



T = SIDEWALK THICKNESS

TRANSVERSE EXPANSION JOINT IN SIDEWALK



DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

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

ROADWAY DETAIL DRAWING FOR

CONCRETE SIDEWALK

SEAL
033444
NORTH CAROLINA PROFESSIONAL ENGINEER
NICOLE M. HACKETT
9/29/2025

SHEET 1 OF 1

848D01

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

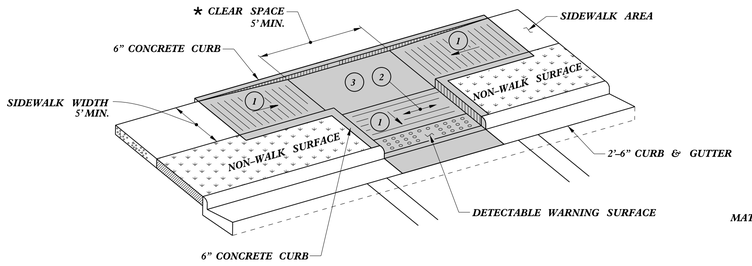
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

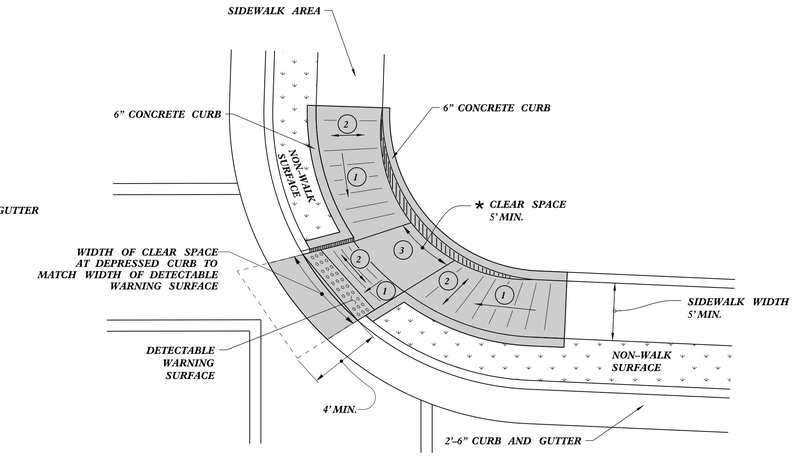
ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-9

* – *WHERE CLEAR SPACE IS CONSTRAINED ON TWO OR MORE SIDES, THE CLEAR SPACE SHALL BE 4'MINIMUM X 5'MINIMUM, WITH 5' PROVIDED IN THE DIRECTION OF THE PEDESTRIAN STREET CROSSING.*



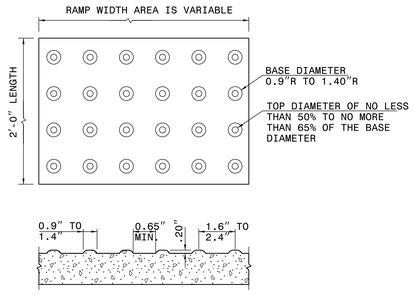
TYPE 3



TYPE 3 MODIFIED
INSTALLATION IN A RADIUS

NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.

DETECTABLE WARNING SURFACE SHALL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



DETECTABLE WARNING SURFACE

(1) *8.33% (12:1) MAX RAMP SLOPE*

(2) *CROSS SLOPE: 2.00%*

(3) *MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00%.*

PAY LIMITS FOR 1 CURB RAMP

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ROADWAY DETAIL DRAWING FOR
CURB RAMP
PARALLEL RAMP

SHEET 9 OF13

848D06

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 083444 NICOLE M HACKLER
SEAL
083444
9/29/2025

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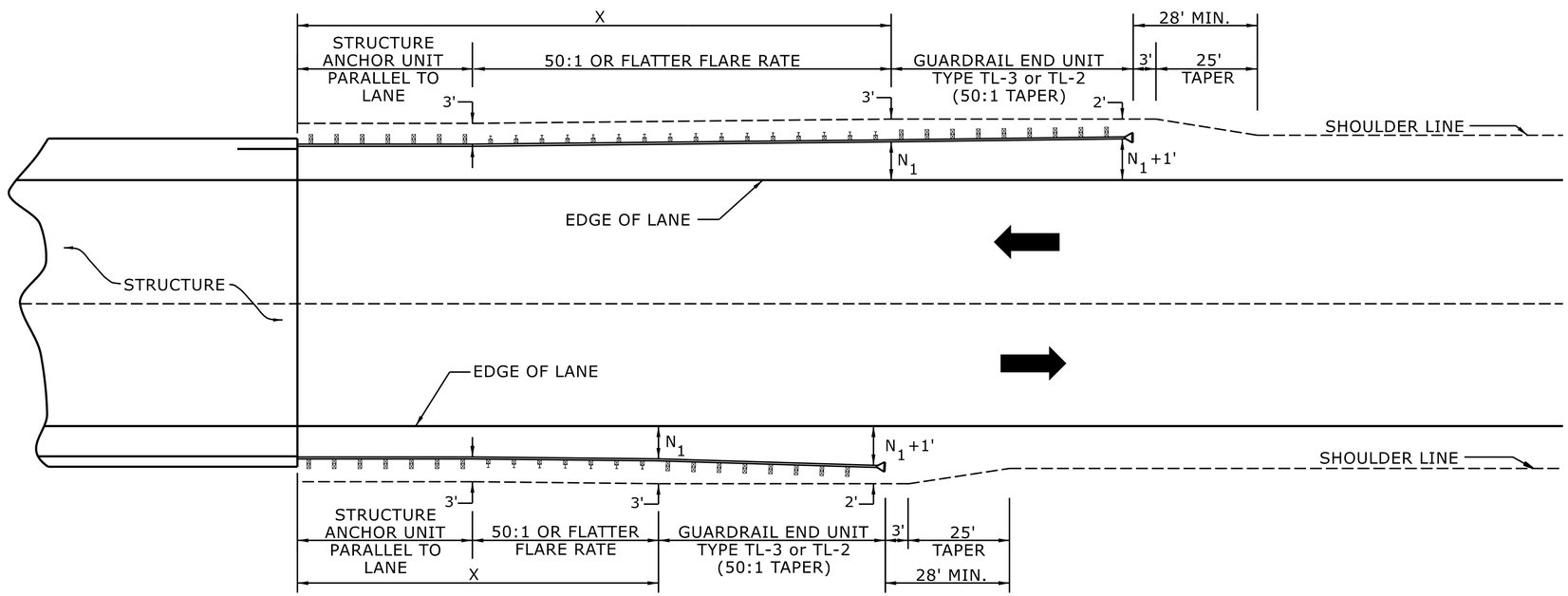
I-5898	2C-10



USE FLARE RATE AS THE CONTROL IF THE "N_1" DISTANCE IS NOT OBTAINED.
("N_1" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 45MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45MPH USE GREU TYPE TL-2

GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER
10/20/2025

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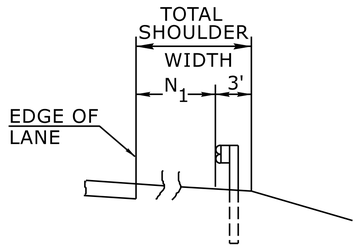
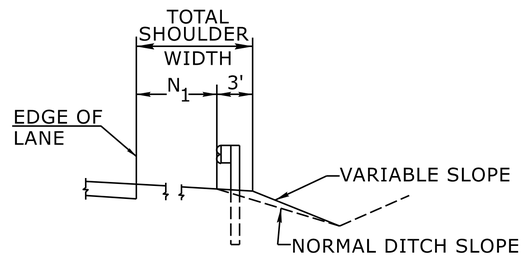
PROJECT REFERENCE NO.	SHEET NO.
I-5898	2C-11

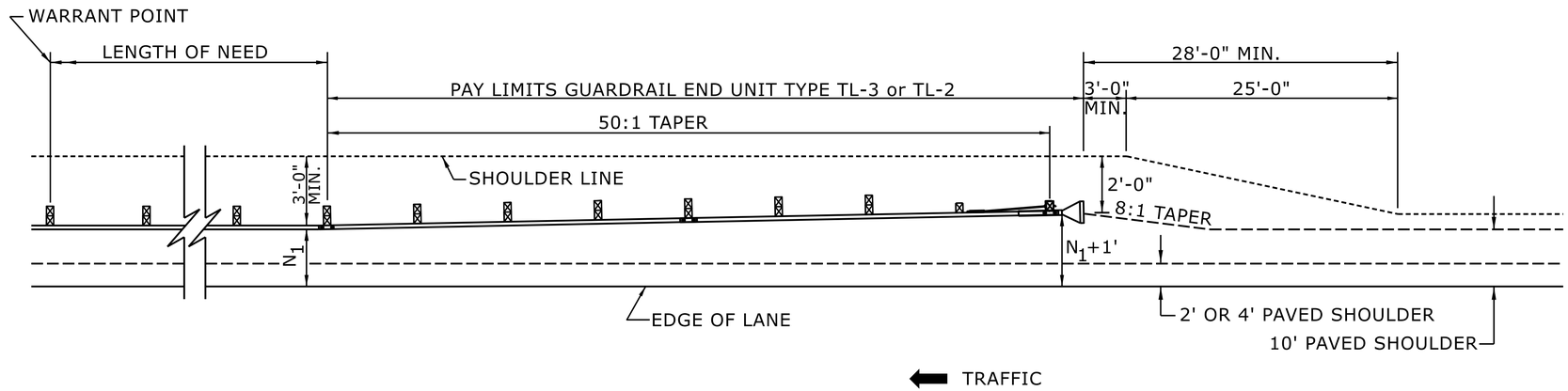


FILL SECTION



CUT SECTION

"N_1"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037444 NICOLE M. HACKLEY
10/20/2025

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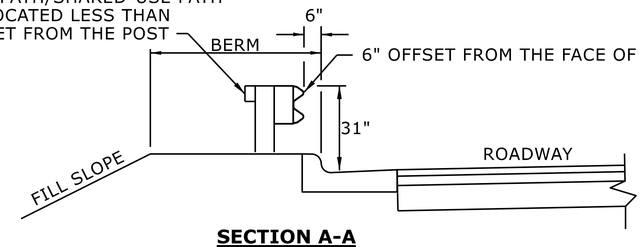
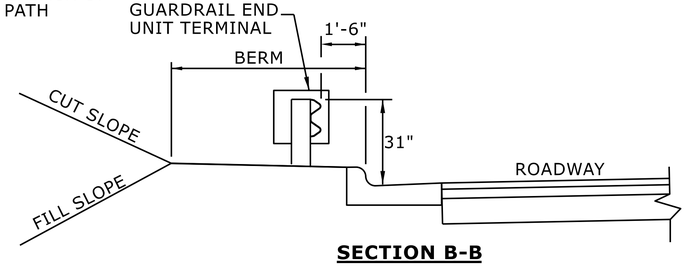
I-5898	2C-12

PLACE APPROVED BICYCLE FRIENDLY RAILINGS, FENCE, OR RUB RAILS IF SIDEPATH/SHARED-USE PATH IS LOCATED LESS THAN 4 FEET FROM THE POST

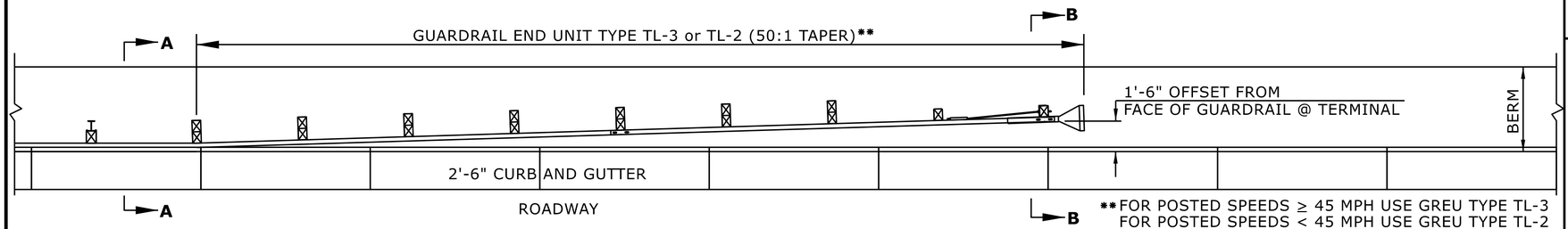
SEE THE ROADWAY DESIGN MANUAL (PART I CHAPTER 4 SECTION 4.14) FOR OFFSET DISTANCES FROM FACE OF GUARDRAIL AND BACK OF GUARDRAIL TO SIDEWALK OR SIDEPATH/SHARED-USE PATH



SECTION A-A



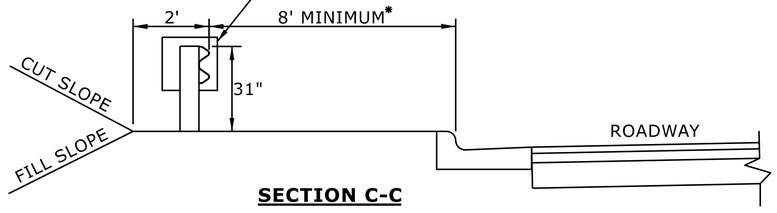
SECTION B-B



GUARDRAIL 6" FROM THE FACE OF CURB

** FOR POSTED SPEEDS ≥ 45 MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45 MPH USE GREU TYPE TL-2

BICYCLE FRIENDLY RAILINGS, FENCE OR RUB RAIL SHOULD NOT BE PLACED WITHIN THE LIMITS OF THE STRUCTURAL ANCHOR OR END UNITS



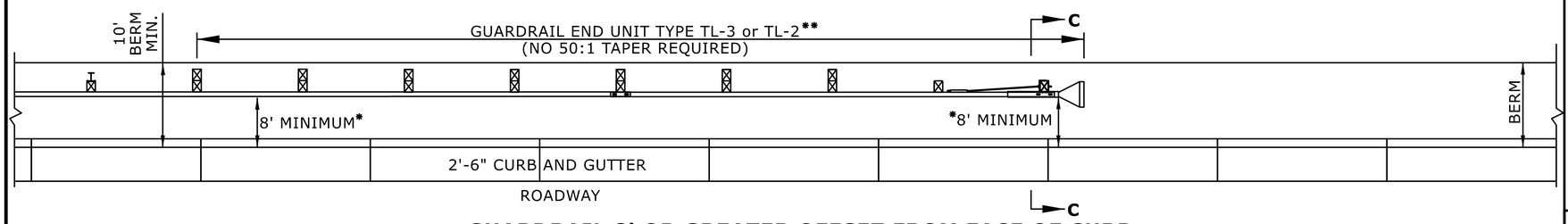
SECTION C-C

* FOR POSTED SPEED ≥ 40 MPH USE 13' MINIMUM OFFSET

SEE THE ROADWAY DESIGN MANUAL (PART I CHAPTER 4 SECTION 4.14) FOR OFFSET DISTANCES FROM FACE OF GUARDRAIL AND BACK OF GUARDRAIL TO SIDEWALK OR SIDEPATH/SHARED-USE PATH

** FOR POSTED SPEEDS ≥ 45 MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45 MPH USE GREU TYPE TL-2

BICYCLE FRIENDLY RAILINGS, FENCE OR RUB RAIL SHOULD NOT BE PLACED WITHIN THE LIMITS OF THE STRUCTURAL ANCHOR OR END UNITS



GUARDRAIL 8' OR GREATER OFFSET FROM FACE OF CURB

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

GUARDRAIL PLACEMENT

GUARDRAIL TREATMENT AT CURB AND GUTTER

SHEET 12 OF 15

862D01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER
10/20/2025

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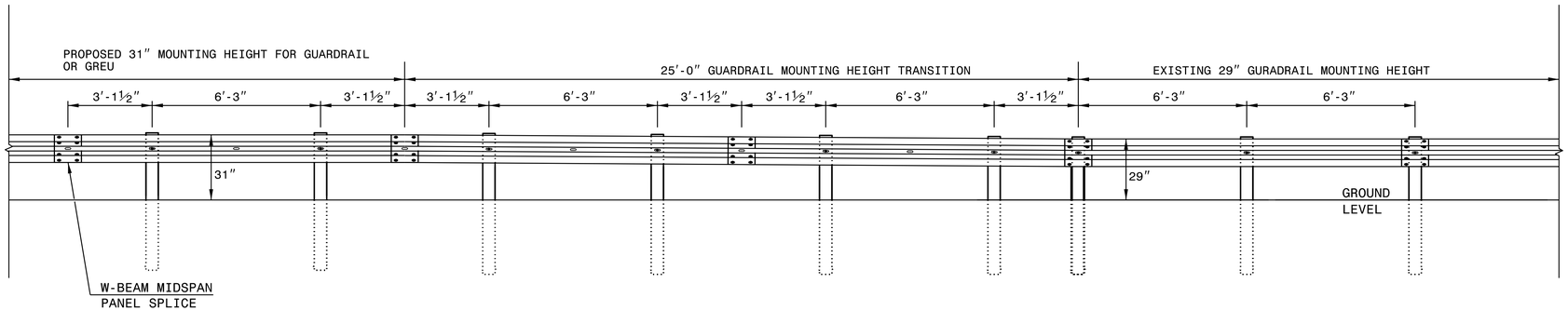
I-5898	2C-13

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 29″, USE AN ADDITIONAL 12′-6″ LONG SECTION OF GUARDRAIL, FOR EVERY 1″ OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 31″ GUARDRAIL.



ELEVATION VIEW

TRANSITION FROM 29″ TO 31″ W-BEAM GUARDRAIL MOUNTING HEIGHT

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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 9

862D02

SEAL 033444 — NORTH CAROLINA PROFESSIONAL ENGINEER — NICOLE M. HACKLE

10/20/2025

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05-FEB-2025 07:53
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$$$$USERNAME$$$$

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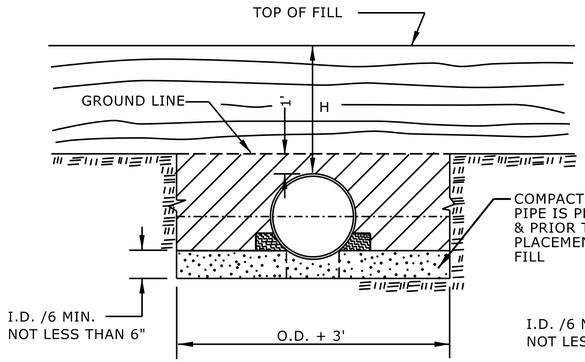
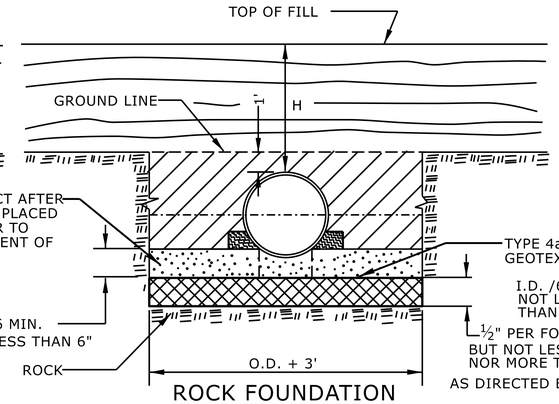
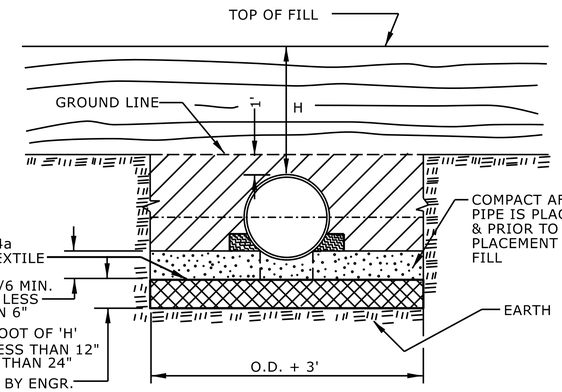
I-5898	2C-14



NORMAL EARTH FOUNDATION

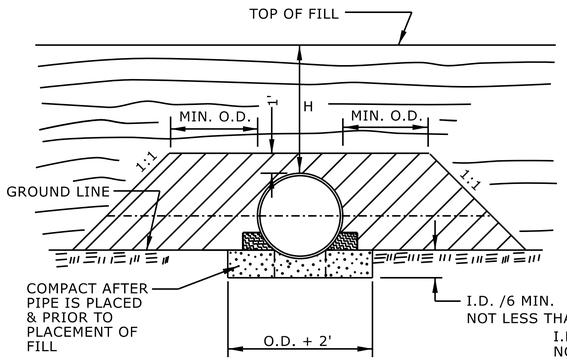


ROCK FOUNDATION

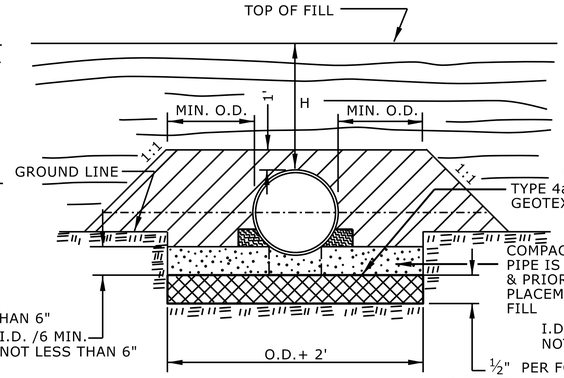


UNSUITABLE MATERIAL FOUNDATION

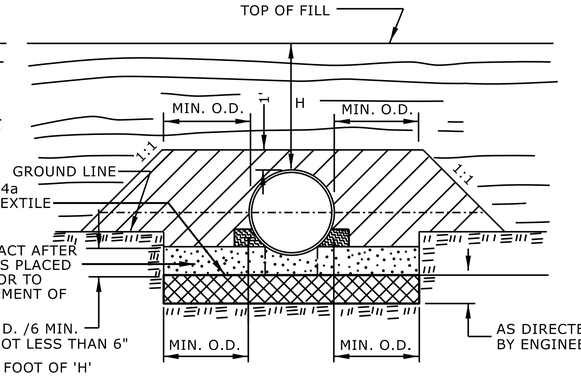
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

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

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 083144 NICOLE M. HACKETT
10/20/2025

SHEET 1 OF 2

300.01

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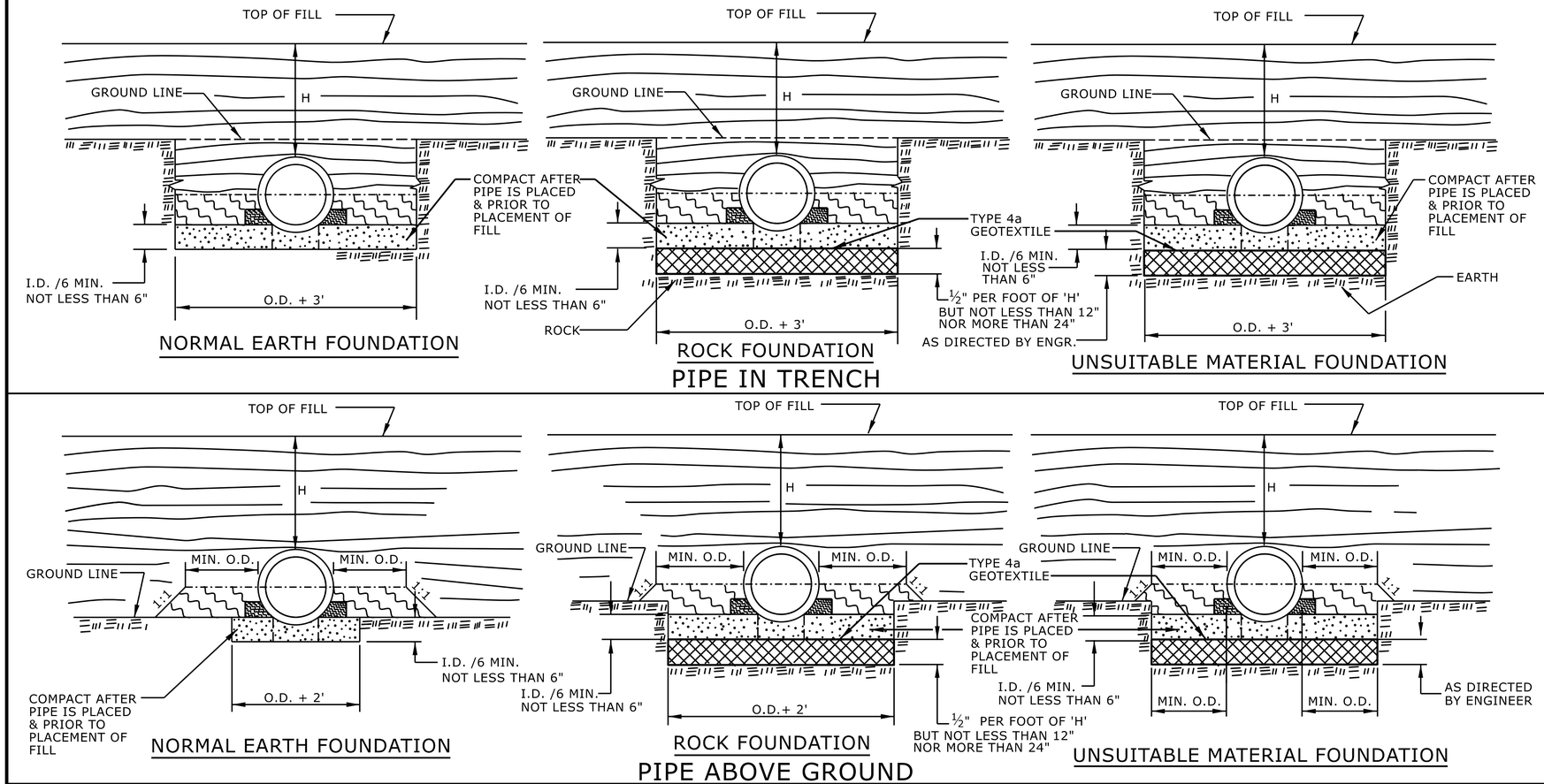
I-5898	2C-15



GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

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

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 2

300.01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKETT

10/20/2025

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4700 Falls of Neuse Rd. Suite 100,
Raleigh, NC. 27609
License No: C-3097

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2D-1

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL KAREN HEFNER
10/20/2025	10/20/2025

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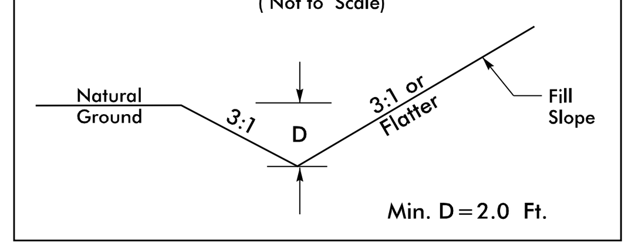
REVISIONS

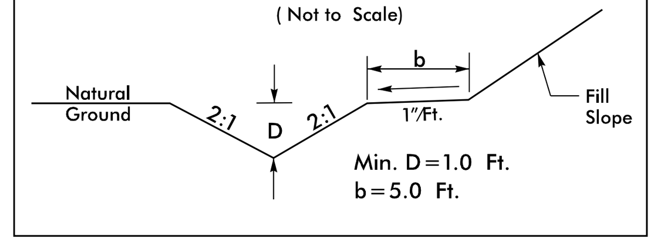
8/17/99

DETAIL 05A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



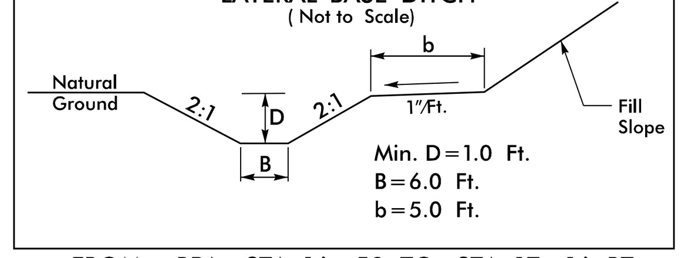
FROM -RPA- STA. 13+00 TO STA. 15+00 RT

DETAIL 05B
LATERAL 'V' DITCH
(Not to Scale)



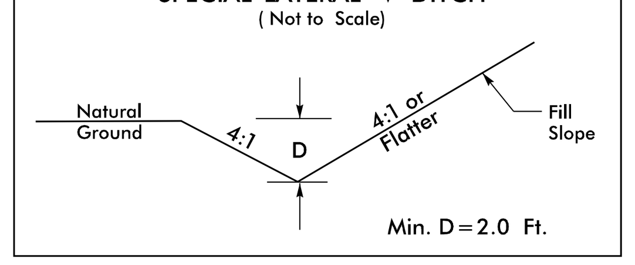
FROM -RPA- STA. 15+00 TO STA. 16+50 RT

DETAIL 05C
LATERAL BASE DITCH
(Not to Scale)



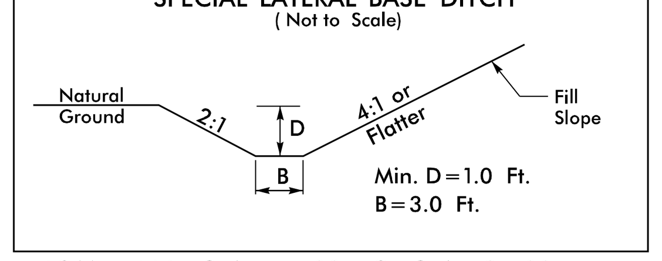
FROM -RPA- STA. 16+50 TO STA. 17+16 RT

DETAIL 05D
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



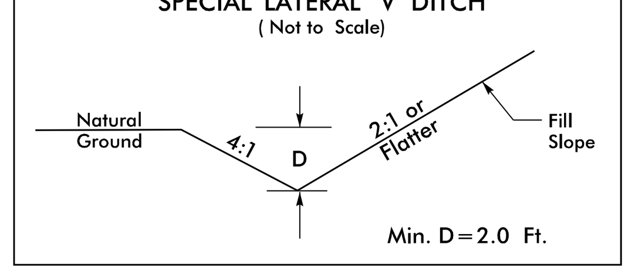
FROM -RPA- STA. 13+50 TO STA. 16+00 LT
FROM -RPA- STA. 15+00 TO STA. 20+50 RT

DETAIL 05E
SPECIAL LATERAL BASE DITCH
(Not to Scale)



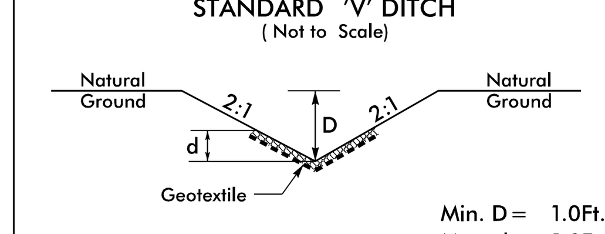
FROM -RPD- STA. 17+00 TO STA. 19+00 LT

DETAIL 05F
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



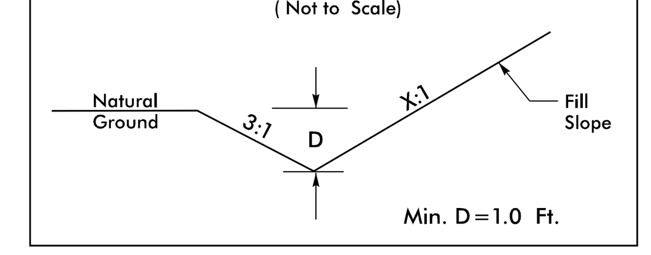
FROM -Y- STA. 121+00 TO STA. 122+28 LT

DETAIL '5G'
STANDARD 'V' DITCH
(Not to Scale)



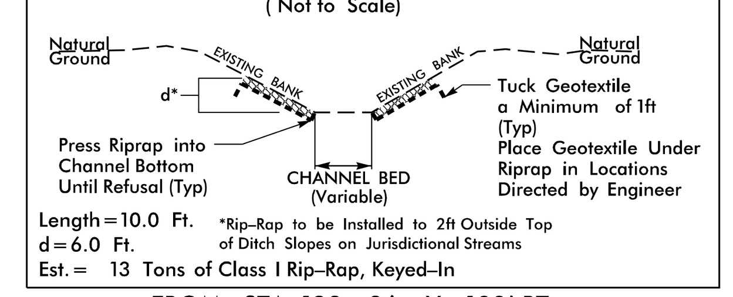
STA. 116+85 -Y- Rt
STA. 18+04 -RpB- Lt

DETAIL 06A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



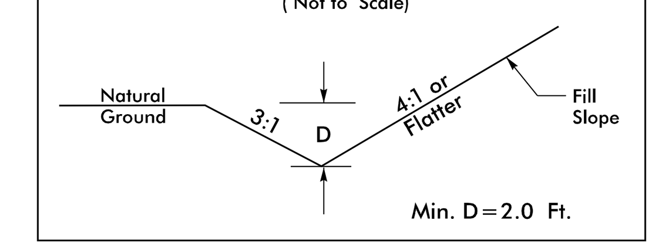
FROM -Y- STA. 124+50 TO STA. 125+50 LT, X=3:1
FROM -Y- STA. 125+50 TO STA. 126+00 LT, X=4:1

DETAIL 06B
PIPE OUTLET BANK STABILIZATION
(Not to Scale)



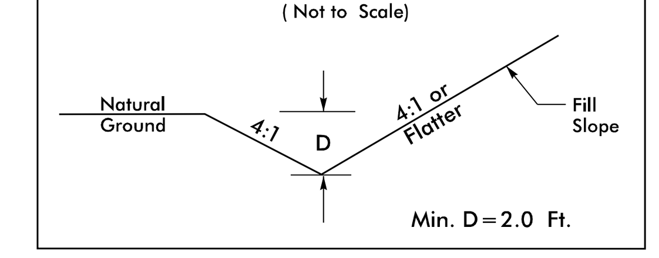
FROM STA. 123+86 -Y- 100' RT

DETAIL 07A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



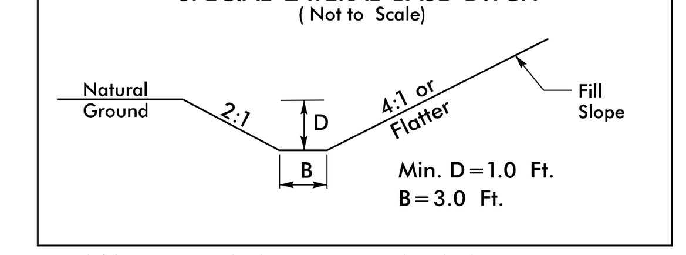
FROM -RPA- STA. 10+00 TO STA. 13+00 RT

DETAIL 07B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



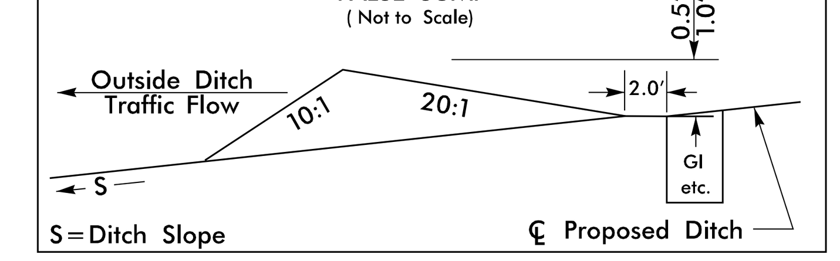
FROM -RPA- STA. 15+00 TO STA. 20+50 RT

DETAIL 07C
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM -RPD- STA. 17+00 TO STA. 19+00 LT

DETAIL 07D
FALSE SUMP
(Not to Scale)



FROM -RPA- STA. 12+00 TO STA. 12+10 LT

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047389 ENGINEER CHIEN-TING TANG

DocuSigned by: Chien-Ting Tang 407191037OEE41F...

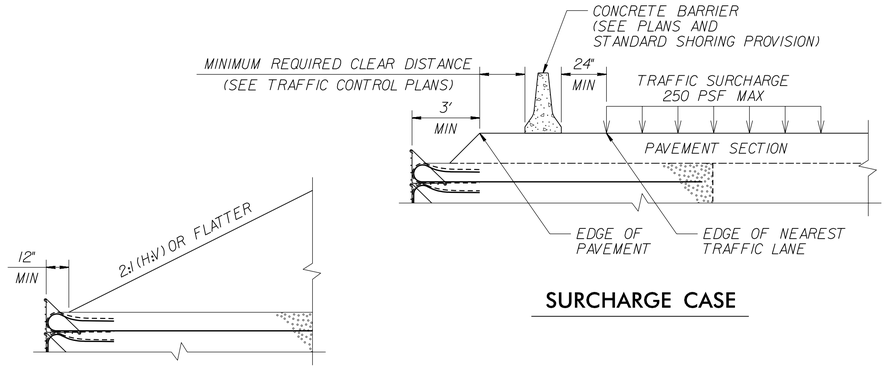
10/21/2025

SIGNATURE DATE

ENGINEER

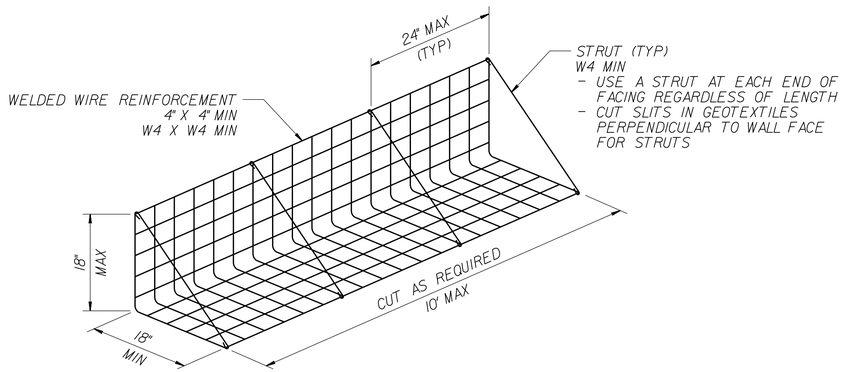
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

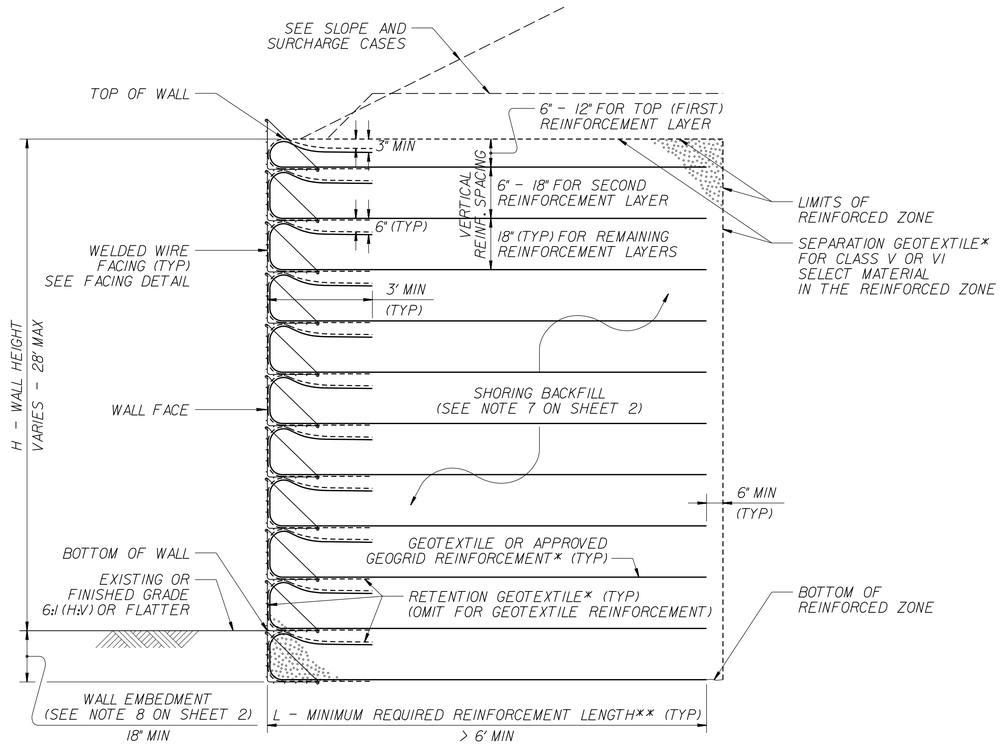


SURCHARGE CASE

SLOPE CASE

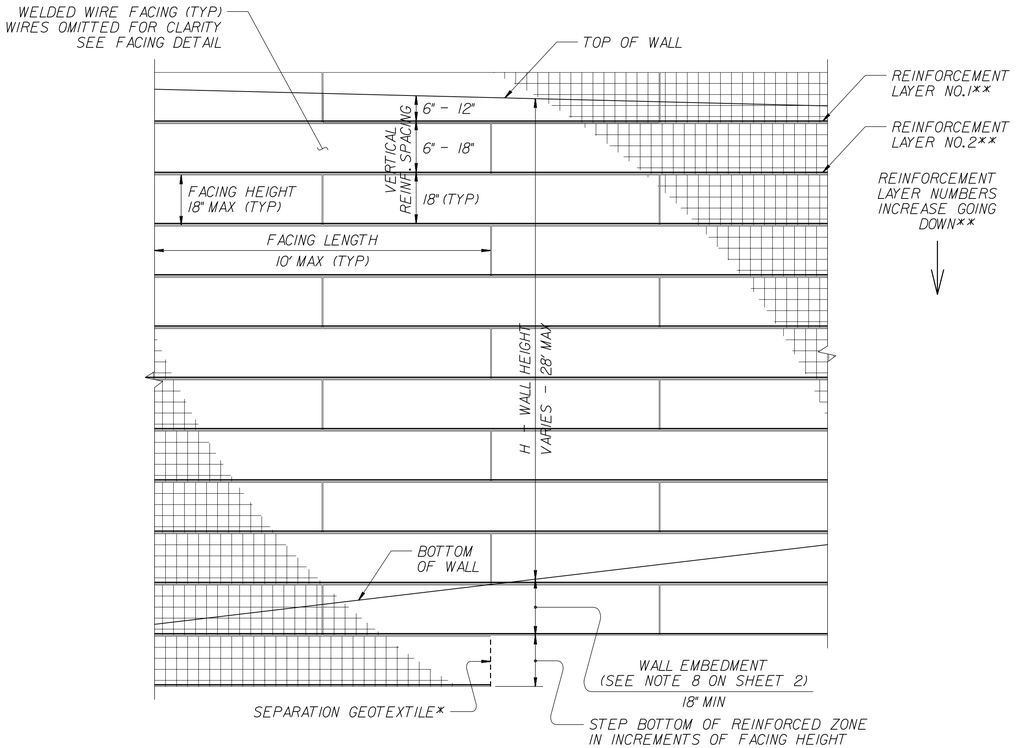


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047389 ENGINEER CHIEN-TING TANG

DocuSigned by: Chien-Ting Tang 4071910370EE41F... 10/21/2025

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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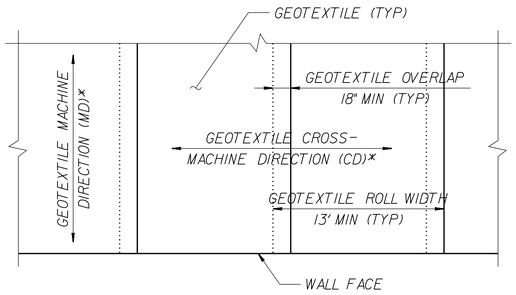
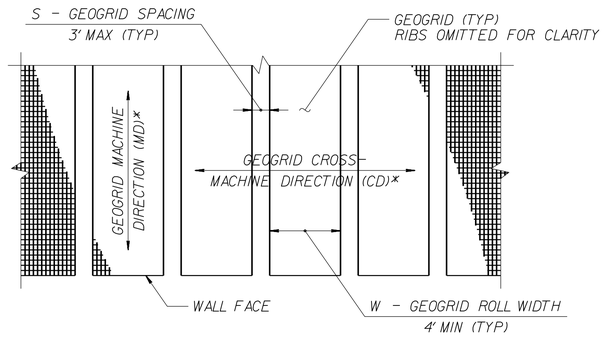


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

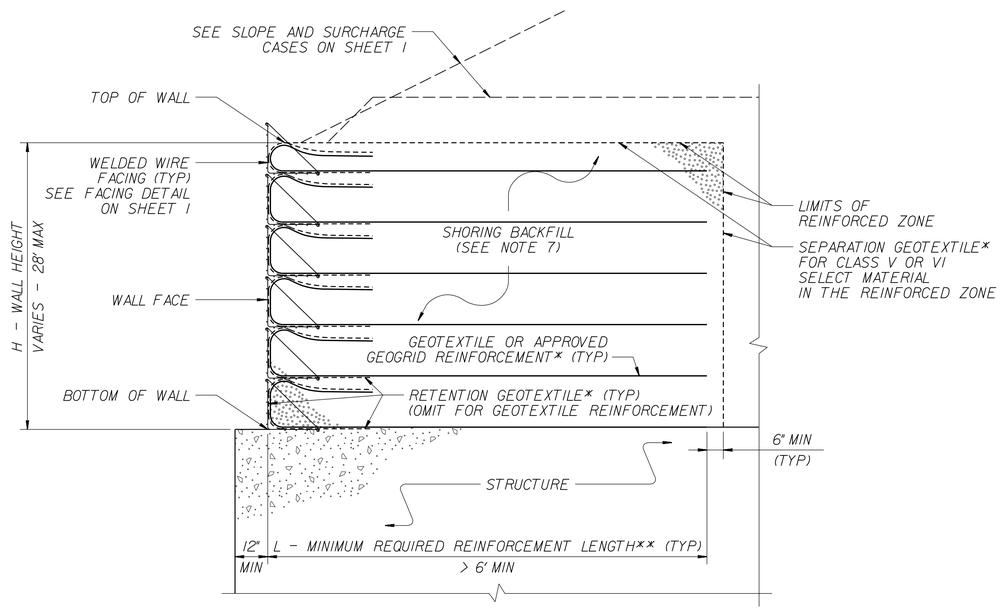


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 $\geq$ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER OR FLOOD ELEVATION IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. WALL EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS FOR GEOGRID REINFORCEMENT ARE APPROVED FOR SHORT TERM DESIGN STRENGTHS (3-YEAR DESIGN LIFE) IN THE MD AND CD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Products.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) $\geq$ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD $\geq$ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	STANDARD DETAIL NO. 1801.01
GEOTECHNICAL ENGINEERING UNIT	STANDARD TEMPORARY SHORING
	DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
I-5898	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047389 ENGINEER CHIEN-TING TANG

DocuSigned by: Chien-Ting Tang 4071910370EE41F...

10/21/2025

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + WALL EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)

(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD
TEMPORARY SHORING

DATE: 11-19-13

6/21/08

COMPUTED BY: CRB DATE: 9/27/2024
CHECKED BY: CJY DATE: 9/27/2024

PROJECT REFERENCE NO.	SHEET NO.
I-5898	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	UNDERCUT	EMBANK. +%	BORROW	WASTE
–L– 128+50	–L– 135+50	178		136		42
–Y– 106+00	–Y– 118+79.50 (BRIDGE)	997	2,150	19,841	18,844	2,150
–Y– 120+59.55 (BRIDGE)	–Y– 133+00	854	900	20,573	19,719	900
–Y2– 10+50	–Y2– 11+00	255		0		255
–Y3– 12+00	–Y3– 12+50	146		8		138
–Y4– 10+50	–Y4– 11+50	126		44		82
SUBTOTAL:		2,556	3,050	40,602	38,563	3,567
–RAMP A– 10+00	–RAMP A– 17+00	650		14,899	14,549	
–RAMP B– 10+00	–RAMP B– 19+00	862		3,275	2,413	
–RAMP C– 10+00	–RAMP C– 19+00	741		3,817	3,076	
–RAMP D– 10+00	–RAMP D– 21+00	382		11,228	10,846	
SUBTOTAL:		2,635	0	33,219	30,884	0
TOTALS:		5,191	3,050	73,821	69,447	3,567
LOSS DUE TO CLEARING & GRUBBING						
EARTH WASTE TO REPLACE BORROW					–517	–517
ADDITIONAL UNDERCUT			1,100	1,320	1,320	1,100
ESTIMATE FOR SHOULDER MATERIAL						
PROJECT TOTALS:		5,191	4,150	73,821	70,250	3,050
EST. 5% TO REPLACE BORROW PIT					3,513	
GRAND TOTALS:					73,762	
SAY:		5,200	4,150		74,000	

EXISTING PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	ASPHALT REMOVAL YD²
–Y–	113+39	115+51	RT	392.61
–Y–	116+53	118+32	RT	385.28
–Y–	120+65	122+32	RT	222.30
–Y–	123+55	124+10	RT	23.77
		TOTAL:		1,023.96
		SAY:		1,030

Earthwork quantities are calculated by the Roadway Designer. These quantities are based in part on subsurface data provided by the Geotechnical Engineer.

EST. SHALLOW UNDERCUT = 200 CY
EST. SHALLOW UNDERCUT BY STATIONS = 1,280 CY
TOTAL SHALLOW UNDERCUT = 1,480 CY
CLASS IV SUBGRADE STABILIZATION = 2,805 TONS
PER GEOTECH RECOMMENDATION, ESTIMATED 1,100 CY OF UNDERCUT TO BE USED IN THE DESCRETION OF THE RESIDENT ENGINEER.

SUMMARY OF CHAIN LINK FENCE, 72" FABRIC

STATION TO STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E LINE POSTS	F TERMINAL POSTS
–Y– 111+18.16 LT. TO –RAMP A– 15+52.00 RT.	LT	687.99	2	4	6	58.67	12
TOTAL		687.99				58.67	12
SAY		688				59	12

SUMMARY OF WOVEN WIRE FENCE, 48" FABRIC

STATION TO STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
–RAMP D– 18+05.48 TO –RAMP D– 20+31.46	LT	227.13	2	1	4	6	19
TOTAL		227.13				6	19
SAY		230				6	19

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS TL-3	TYPE-III	CAT-1	TL-2	B-77	TEMP TL-3				IMPACT ATTENUATOR TYPE 350 NO.	PERMITTED G	PERMITTED NG	REMOVE EXISTING GUARDRAIL	SINGLE FACED CONCRETE BARRIER RAIL		REMARKS
–L–	128+60.00	133+16.25	RT	456.25			131+14.09 (WALL)		VAR.	VAR.	50		1		1		1													
–L–	130+55.00	135+30.00	LT	218.75			134+70.00	130+52.91 (WALL)	VAR.	VAR.	50		1		1		1													
–L–	128+00.00	133+55.77	RT	472.88					VAR.	VAR.									2							555.77	83		TIE TO EXISTING GUARDRAIL
–L–	129+98.42	135+29.82	LT	448.46					VAR.	VAR.									2							531.40	83		TIE TO EXISTING GUARDRAIL
–Y–/–RPA–	114+50.00	14+25.00	LT	256.25	250.00		14+75.00	114+62.00	VAR.	VAR.	50		1		1		1													
–Y–	116+76.25	118+62.07	RT	185.82				118+62.07 (BRIDGE)	12	15	50		1			1		1								312				
–Y–	117+17.50	118+97.02	LT	179.52			118+97.02 (BRIDGE)		12	15						1	1													
–Y–	120+77.02	122+81.19	LT	179.17	25.00		120+77.02 (BRIDGE)		12	15						1	1									322				
–RPD–/–Y–	15+25.00	124+27.00	LT	518.75	100.00		123+80.00	15+50.00	VAR.	VAR.							1	1												
–RPC–	15+25.00	18+85.00	RT	360.00			16+23.00	18+75.00	12	15	50		1		1		1													
			SUBTOTALS	3,275.85	375.00										4	3	7	2	4							2,053	166			
			ANCHOR DEDUCTION	441.50	0																									
			TOTAL	2,834.35	375.00																									
			SAY	2,837.50	387.50																									
TEMPORARY GUARDRAIL																														
–L–	128+00.00	128+50.00	RT	50.00				128+50.00	VAR.	VAR.	50		1							1										TEMP TL-3 USED WITH EXISTING GUARDRAIL
–L–	134+80.00	135+30.00	LT	50.00			134+80.00		VAR.	VAR.	50		1							1										TEMP TL-3 USED WITH EXISTING GUARDRAIL
			SUBTOTALS	100.00																2										
			ANCHOR DEDUCTION	100.00																										
			TOTAL	0																										
			SAY	0																										

ANCHOR DEDUCTIONS
TL-3: 4 @ 50 = 200
TYPE-III: 3 @ 18.75 = 56.25
CAT-1: 7 @ 6.25 = 43.75
TL-2: 2 @ 25 = 50
TEMP TL-3: 2 @ 50 = 100
B-77: 4 @ 22.875 = 91.5
GRAND TOTAL = 441.50
ADDITIONAL GUARDRAIL POSTS = 10

10/29/2025 12:29:18 PM
C:\Projects\I-5898\Roadway\Sheets\I5898_Rdy_sum.dgn
User:jmhall

HERB082023

COMPUTED BY:	Karen Hefner, PE	DATE:	2/9/2022; rev 10/6/2025
CHECKED BY:	Herb Turner, PE	DATE:	rev 10/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
I-5898	3D-1

**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

QUANTITIES FOR DRAINAGE STRUCTURES — NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)

LINE & STATION (SIZE / THICKNESS OR GAUGE)	OFFSET	STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, HDPE, PVC, or PP PIPE) 12	15	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE	R. C. PIPE CLASS III 12	15		R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54	60		R. C. PIPE CLASS V 12	15		STRUCTURAL PLATE PIPE 60	66	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	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		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	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	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER FOR O.T.C.B STD 840.55	CONVERT EXISTING BOX TO O.T.C.B.	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 C.B	ADJUST C.B.	ADJUST D.I.		15" DRAINAGE PIPE ELBOW			FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
Y 107+50	25 RT	0401		688.1																																			1			1		1																																											
		0401	0402		685.1	679.5														152																																																																						200	
Y 109+00	28 RT	0402		682.5																																			1			1		1																																											
		0402	0403		679.5	678.1														48																																																																									
Y 109+45	29 RT	0403		681.1																																			1			1		1																																											
		0403	0415		677.9	676.5	0.7													68																																																																						37	
Y2 10+57	44 RT	0404		677.5																																			1			1		1																																											
		0404	0403		675.2	674.7														52																																																																									
Y 111+77	40 RT	0405		679.3	671.7																																			1	2.6		1	1																																												
Y 112+35	13 RT	0406		678.3																																			1			1		1				1																																										
		0406	0407		675.3	674.1														64																																																																									
Y 111+74	13 RT	0407		678.1																																			1			1	1					1																																										
		0407	0408		674.1	673.8														8																																																																									
Y 111+70	13 RT	0408		678.1																																			1			1	1					1																																										
		0408	0411		674.8	671.5													56																																																																									
Y 112+00	43 LT	0409		675.7																																			1			1		1																																											
		0409	0410		672.7	672.0														28																																																																						60	
Y 111+74	43 LT	0410		678.1																																			1	1.1		1	1																																												
		0410	0411		672.0	671.7														4																																																																									
Y 111+70	43 LT	0411		678.1																																			1	1.4		1	1																																												
		0411	0412		671.5	671.0	0.7													56																																																																						85	
Y 112+20	98 RT	0421		675.8	672.2																																	1			1			1																																											See Special Detail 2C-5
Y 109+75	29 LT	0415		679.7																																			1			1			1																																												
		0415	0416		676.5	672.1	1.1													44																																																																						152	
Y 109+85	70 LT	0416		675.6																																			1														1							1																											
		0416	0417		672.1	672.0	0.7													48																																																																						45	
Y 110+33	72 LT	0417		675.2																																			1			1	1																																													
		0417	0419		672.0	671.7	1.1													40																																																																						38	
Y 110+33	75 LT	0418		675.2																																			1			1	1																																													
		0418	0417		672.2	672.0														4																																																																									
Y 110+71	75 LT	0419		675.2																																			1			1	1																																													
		0419	0412		671.7	671.0	1.4													56																																																																							
Y 110+70	79 LT	0420		675.2																																			1			1	1																																													
		0420	0419		672.2	672.0														8																																																																						48	
Y2 10+62	37 RT	0430		677.7																																			1			1		1																																											
		0430	0404		675.4	675.2														12																																																																									
Y 116+85	31 RT	0501		689.7																																			1			1			1																																											Min Depth; See Special Detail 2C-1
		0501	0502		686.9	686.0														32																																																																									
RAMP_B_INT 18+08	26 LT	0503		683.4																																			1			1			1																																												
RAMP_B_INT18+08	64 LT	0504		680.7																																			1	5.0	2.3																										1						1																	Extra Depth JB; See Special Detail 2C-6
		0503	0504		680.4	668.4			36	X																																																																								2								
Y 113+15	13 RT	0505		679.5																																			1			1		1				1																																										
		0505	0406		676.8	675.3														84																																																																									
Y 113+70	31 LT	0506		679.3																																			1			1		1																																											
		0506	0409		676.3	672.7														168																																																																									
RAMP_A_INT 15+00	66 LT	0507		679.7																																																																																				
		0507	0534		678.5	678.1													92																																																																									
Y 115+72	38 LT	0508		689.0																																			1	5.0	6.0	1		1																																											
RAMP_B_INT 17+36	57 LT	0509		672.0																																			1	0.5																													1						1																		
		0509	0801		666.5	666.0																	148																																																																						
SHEET TOTALS										36										664	460				148													26	15.6	8.3	23	9	10	4			4						1						1					2						2										2						665	

HERB082023

COMPUTED BY:	Karen Hefner, PE	DATE:	2/9/2022; rev 10/6/2025
CHECKED BY:	Herb Turner, PE	DATE:	rev 10/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
I-5898	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 / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, HDPE, PVC, or PP PIPE) 12	15	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE	R. C. PIPE CLASS III 12	15	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54	60	R. C. PIPE CLASS V 12	15	STRUCTURAL PLATE PIPE 60	66	42" PIPE REHABILITATION CIPP LINER
Y 115+85	83	LT	0510		679.6																											
			0510	0508		675.4	673.0																	48								
Y 121+86	82	LT	0512		677.9																											
			0512	0513		676.2	675.8													32												
Y 121+85	53	LT	0513		693.0																											
			0513	0514		675.8	675.3													60												
Y 122+39	37	LT	0514		677.0																											
			0504	0509		668.4	666.5																									72
Y 124+42	33	RT	0520		684.6																											
			0520	0530		681.7	681.0												24													
Y 115+20	1	LT	0521		685.8																											
			0521	0522		682.8	682.0												48													
			0508	0522		673.0	672.0																									40
Y 115+64	1	LT	0522		687.5																											
			0522	0504		672.0	668.4																									140
RAMP_A_INT 17+45	36	RT	0523		690.7																											
			0523	0508		687.6	686.0												60													
Y 122+48	31	RT	0524		691.8																											
			0524	0533		688.6	686.4												24													
RAMP_D_INT 19+00	57	LT	0525		684.6																											
			0525	0527		677.6	677.3	0.4													24											
RAMP_D_INT 19+22	49	LT	0527		680.2																											
			0527	0528		677.1	676.0															132										
RAMP_D_INT 20+50	48	LT	0528		683.5																											
			0528	0515		676.0	675.3															60										
RAMP_C_INT 18+80	47	RT	0531		687.6																											
			0531	0532		685.4	684.4												24													
RAMP_A_INT 15+00	23	RT	0534		689.7																											
			0534	0511		678.1	678.0													32												
Y 125+75	13	LT	0601		682.2																											
			0601	0641		680.0	676.5												128													
Y 127+30	12	LT	0602		678.0																											
			0602	0616		675.5	674.4													44												
Y 129+83	40	LT	0603		672.2																											
			0603	E603		669.7	669.2													32												
Y3 12+48	29	RT	0604		671.2																											
Y3 12+34	24	RT	0605		671.3																											
Y3 12+14	23	RT	0606		671.4																											
Y3 12+08	23	RT	0607		671.5																											
Y3 12+35	24	LT	0608		671.3																											
Y3 12+35	29	LT	0609		672.0																											
Y 131+66	40	LT	0610		670.5																											
Y 133+11	33	LT	0611		670.2																											
			0611	0632		667.9	667.3														40											
Y 131+12	53	LT	0612		670.2																											
			0612	E601		667.2	666.9												20													
Y 126+00	61	LT	0613			678.0																										
			0613	0614		678.0	677.3													48												
Y 126+36	37	LT	0614		681.9																											
			0614	0615		677.3	675.6													64												
							SHEET TOTALS												328	312	64	192		48								252

FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY 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	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	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
0510		1.043																										
0510	0508																											
0512																												
0512	0513																											
0513					1	5.0	7.2																					
0513	0514																											
0514																												
0504	0509																											
0520					1			1		1																		
0520	0530																											
0521					1			1		1			1															
0521	0522																											
0508	0522																											
0522					1	5.0	5.5	1		1			1															
0522	0504																											
0523					1			1		1																		
0523	0508																											
0524					1			1		1																		
0524	0533																											
0525																												
0525	0527																											
0527					1																							
0527	0528																											
0528					1	2.5																						
0528	0515																											
0531					1			1		1																		
0531	0532																											
0534					1	5.0	1.5													1			1						
0534	0511																											
0601					1			1			1		1															
0601	0641																											
0602					1			1		1			1															
0602	0616																											
0603					1			1			1																	
0603	E603																											
0604									1																			
0605																												
0606																												
0607																												
0608					1	0.8		1			1																	
0609																												
0610																												
0611																												
0611	0632																											
0612					1			1			1																	
0612	E601																											
0613																												
0613	0614																											
0614					1							1				1	1											
0614	0615																											
SHEET TOTALS		1.043			16	18.3	14.2	11	1	7	4	1	4			1	1		1			1						

FROM	TO	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	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER FOR O.T.C.B STD 840.55	CONVERT EXISTING BOX TO O.T.C.B.	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 C.B	ADJUST C.B.	ADJUST D.I.	15" DRAINAGE PIPE ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0510																								
0510	0508																							
0512																								
0512	0513																							
0513				1						1														Extra Depth JB; See Special Detail 2C-6
0513	0514																							
0514																					0.4465			
0504	0509																							RETAIN EXIST. 42" RCP & LINE W/ CIPP
0520																								
0520	0530																							
0521																								
0521	0522																							
0508	0522																							RETAIN EXIST. 42" RCP & LINE W/ CIPP
0522																								
0522	0504																							RETAIN EXIST. 42" RCP & LINE W/ CIPP
0523																								
0523	0508																							
0524																								
0524	0533																							
0525																								
0525	0527																							
0527				1						1														
0527	0528																							
0528				1						1														
0528	0515																							
0531																								
0531	0532																							
0534																								
0534	0511																							
0601																								Min Depth; See Detail 2C-1
0601	0641																							
0602																								Min Depth; See Detail 2C-1
0602	0616																							
0603																								Min Depth; See Detail 2C-1
0603	E603																						45	
0604																1								See Special Detail 2C-7, Convert DI or JB to CB
0605																	1							
0606																	1							
0607																	1							
0608																								
0609										1			1											See Special Detail 2C-4
0610										1					1								25	See Special Detail 2C-4
0611																								
0611	0632																							
0612																								
0612	E601																							
0613																								
0613	0614																							
0614																								
0614	0615																						170	
SHEET TOTALS				3						5			1		1	1	3				0.4465		240	

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

HERB082023

COMPUTED BY: Karen Hefner, PE DATE: 2/9/2022; rev 11/6/2025

CHECKED BY: Herb Turner, PE DATE: rev 11/6/25

PROJECT NO.	SHEET NO.
I-5898	3D-3

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, HDPE, PVC, or PP PIPE) 12	15	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE	R. C. PIPE CLASS III 12	15		R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54	60		R. C. PIPE CLASS V 12	15		STRUCTURAL PLATE PIPE 60	66	42" PIPE REHABILITATION CIPP LINER	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY 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	
Y 126+95	44 LT	0615		679.7																																		1			1			1	
		0615	0616		675.6	674.4														36																									
Y 127+26	53 LT	0616		679.1																																									
Y 126+39	30 RT	0617		678.3																																		1			1		1		
		0617	0618		675.3	673.8													112																										
Y 127+50	26 RT	0618		676.9																																		1			1		1		
		0618	0619		673.8	673.5													36																										
Y 127+83	25 RT	0619		676.5																																		1			1		1		
		0619	0621		673.5	672.9	0.5												52																										
Y 128+34	22 RT	0621		675.9																																		1			1		1		
		0621	0630		672.9	672.3	0.5												104																										
Y 129+80	8 LT	0622		673.7																																		1			1			1	
		0622	0603		670.4	669.7														36																									
Y 131+76	25 LT	0623		670.6																																		1	1.6		1			1	
Y4 10+75	22 RT	0624		671.8																																									
Y4 10+71	22 LT	0625		671.0																																									
Y4 11+45	37 RT	E609	E610		667.0	666.5														24																									
Y 126+00	45 RT	0626		696.0																																									
		0626	0617		676.0	675.3													44																										
Y 130+53	21 RT	0627		674.1																																									
Y 129+33	34 RT	0630		675.3																																		1			1		1		
		0630	0631		672.3	669.0	0.5												84																										
Y 130+18	34 RT	0631		674.8																																		1	0.8		1		1		
		0631	0624		671.8	668.8	0.5												64																										
Y 132+75	23 LT	0632		670.3																																		1			1			1	
		0632	0623		667.3	664.0															100																								
Y 127+00	12 LT	0641		678.8																																		1			1		1		
		0641	0602		675.8	675.0													32																										
RAMP_A_INT 12+00	42 RT	0701		687.0																																		1							
		0701	0702		685.0	684.6														88																									
RAMP_D_INT 12+38	15 RT	0703		704.6																																									
		0703	0704		702.9	702.5	1.4													68																									
RAMP_B_INT 15+90	56 LT	0801		669.9																															1.043										
RPA 17+55	CL																																												
L 131+40 - 132+50	CL																																												
Y 123+86	7 LT																																												
Y 123+91	CL																																												
Y 130+00	17 RT																																												
L 131+40	27 LT																																												
L 131+55	28 RT																																												
L 132+55	64 RT	0540		675.1	672.9																																	1							
L 132+55	0 Med	0541		676.1	672.0																																	1							
L 132+55	60 LT	0542		675.8	671.8																																	1							
L 131+33	55 Lt	0543		671.5	666.1																																	1	0.4						
L 132+55	64 RT	0540	0541		672.9	672.0														64																									
L 132+55	0 M	0541	0542		672.0	671.8														60																									
L 132+55	60 LT	0542	0543		671.8	666.1														120																									
SHEET TOTALS																			528	496	100														1.043			16	2.8		11		7	4	
PROJECT TOTALS									36										1520	1268	164	192		196										252	2.086			58	66.0		45	10	24	12	

LINE & STATION	FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	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	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	M.H. FRAME AND COVER FOR O.T.C.B STD 840.55	CONVERT EXISTING DRAINAGE BOX TO O.T.C.B.	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 C.B	ADJUST C.B.	ADJUST D.I.		15" DRAINAGE PIPE ELBOW			FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
Y 126+95	0615																																												
	0615	0616																																											
Y 127+26	0616							1																												1									
Y 126+39	0617																																												
	0617	0618																																										110	
Y 127+50	0618																																												
	0618	0619																																										32	
Y 127+83	0619																																												
	0619	0621																																										50	
Y 128+34	0621																																												
	0621	0630																																											
Y 129+80	0622			1																																									
	0622	0603																																											
Y 131+76	0623																																												
Y4 10+75	0624																																		1										
Y4 10+71	0625																																		1										
Y4 11+45	E609	E610																																										20	Pipe Removal
Y 126+00	0626																																									0.3990			
	0626	0617																																										40	
Y 130+53	0627																																												Adjust MH
Y 129+33	0630																																												
	0630	0631																																											
Y 130+18	0631																																												
	0631	0624																																											
Y 132+75	0632																																												
	0632	0623																																											
Y 127+00	0641			1																																									Min Depth; See Detail 2C-1
	0641	0602																																											
RAMP_A_INT 12+00	0701										1				1																														Min Depth; See Detail 2C-2
	0701	0702																																										58	
RAMP_D_INT 12+38	0703																																									0.4465			
	0703	0704																																											
RAMP_B_INT 15+90	0801																																												
RPA 17+55																																												116	Pipe Removal
L 131+40 - 132+50																																												110	Pipe Removal
Y 123+86																																									1				Flowable Fill - 18" pipe
Y 123+91																																									26				Flowable Fill - 42" pipe
Y 130+00																																									3				Flowable Fill - 15" pipe 130+00 Y RT
L 131+40																																									4				Flowable Fill - 18" pipe near Sta 131+40 LT
L 131+55																																									4				Flowable Fill - 18" pipe near Sta 131+55 RT
L 132+55	0540										1				1																														Min Depth; See Detail 2C-2
L 132+55	0541									1					1																														
L 132+55	0542									1					1																														
L 131+33	0543									1					1																														
L 132+55	0540	0541																																											
L 132+55	0541	0542																																											
L 132+55	0542	0543																																											
SHEET TOTALS				2				1		3	2				5																				2	1					38	0.8455		536	
PROJECT TOTALS			1	10			1	2		5	2		1		5		1					5							7			1		1	1	5	1		2			38	1.2920		1441	

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

HERB082023

COMPUTED BY:	Karen Hefner, PE	DATE:	2/9/2022; rev 10/6/2025
CHECKED BY:	Herb Turner, PE	DATE:	rev 10/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
I-5898	3D-4

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 / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	R. C. PIPE CLASS IV 54	60	66	72	78	84	R. C. PIPE CLASS V 54	60	66	72	78	84	STRUCTURAL PLATE PIPE 60	66	72
Y 111+15	43 LT	0412		675.9																		
		0412	0413		663.5	662.9	1.4	16														
Y 111+17	31 LT	0413		667.9																		
Y 111+45	74 LT	0414		669.6																		
		0414	0412		664.1	663.5	1.1	44														
Y 123+78	43 LT	0515		689.8																		
		0515	0517		674.3	673.9		36														
Y 123+98	75 LT	0516		690.5																		
		0516	0515		676.0	675.1		40														
Y 123+78	8 LT	0517		688.7																		
		0517	0518		673.8	672.9		108														
SHEET TOTALS								244														
PROJECT TOTALS								244														

LINE & STATION	FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY 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	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	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	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54
Y 111+15	0412				2.889				1			1																										
	0412	0413																																				
Y 111+17	0413																																					
Y 111+45	0414		1.043																																			
	0414	0412																																				
Y 123+78	0515				3.567				1			1																										
	0515	0517																																				
Y 123+98	0516			5.000																																		
	0516	0515																																				
Y 123+78	0517				7.544																											1						1
	0517	0518																																				
SHEET TOTALS			1.043	5.000	14.000				2			2																				1						1
PROJECT TOTALS			1.043	5.000	14.000				2			2																				1						1

LINE & STATION	FROM	TO	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.	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
Y 111+15	0412												
	0412	0413											
Y 111+17	0413									2.5793			
Y 111+45	0414												
	0414	0412										36	
Y 123+78	0515												
	0515	0517											
Y 123+98	0516												
	0516	0515											
Y 123+78	0517												
	0517	0518										60	
SHEET TOTALS										2.5793		96	
PROJECT TOTALS										2.5793		96	

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: Chien-Ting Tang DATE: 09-04-2025
CHECKED BY: Stephen Woods DATE: 09-04-2025

(9-17-24)

PROJECT NO.	SHEET NO.
I-5898	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
CONTINGENCY				SD	300
				TOTAL LF:	300

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

SUMMARY OF GEOTEXTILE FOR SUBGRADE STABILIZATION

LINE	Station	Station	Geotextile for Subgrade Stabilization SY
-Y-	115+75	118+80	2355
-Y-	120+60	122+75	1605
-Y-	123+25	124+75	530
-RPA-	14+25	17+25	820
-RPD-	20+25	20+75	170
CONTINGENCY			
		TOTAL SY:	5480*

*Total square yards of "Geotextile for Subgrade Stabilization" is only the estimated quantity for subgrades and may only represent a portion of the geotextile 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 Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
-Y-	106+00	107+25	ASU(1)	12	50	100	150		
CONTINGENCY			ASU(1)	12	200	400	600		
CONTINGENCY			AST					50	
			TOTAL CY/TONS/SY:		250	500**	750**	50	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 Subgrade 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 ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-RPC-	1.5:1	15+25	1.5:1	16+75	RT	1		180
							TOTAL SY:	180

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

COMPUTED BY: Chien-Ting Tang DATE: 10-16-2025
CHECKED BY: Stephen Woods DATE: 10-16-2025

(9-17-24)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
I-5898	3G-2

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 Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
-Y-	115+75	118+80	AST	12	525	990	2355		
-Y-	120+60	122+75	AST	12	360	675	1605		
-Y-	123+25	124+75	AST	12	120	225	530		
-RPA-	14+25	17+25	AST	12	185	345	820		
-RPD-	20+25	20+75	AST	12	40	70	170		
CONTINGENCY			AST					50	
			TOTAL CY/TONS/SY:		1230	2305**	5480**	50	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 Subgrade 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.**

8/17/99

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd. Suite 100,
Raleigh, NC. 27609
License No: C-3097

PROJECT REFERENCE NO.	SHEET NO.
I-5898	3P-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG

10/20/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4,5,7	ROCKINGHAM COUNTY SCHOOLS
2	4	SAMUEL RICHARDS
3	4	JOSE G. DIAZ
4	4	RAKESTRAW INVESTMENT COMPANY. INC
5	4	COREY M. CAPLE, KAREN A. CAPLE, NICHOLAS D. CAPLE, DARIEN M. CAPLE
6	4	AUTOZONE DEVELOPMENT
7	4,5	JOHNSON & CASEY INC
8	5,6,7	MURPHY OIL USA INC
9	5,6	PSI MAYODAN
10	6	PBK PROPERTY MANAGEMENT NC LLC
11	6	DAN VALLEY BAPTIST CHURCH
12	5,6,8	MCMICHAEL MILLS INC
13	6	ROMA REALTY LLC
14	6	STORCH REALTY NC LLC
15	5,6,7	WALMART REAL ESTATE
16	6	McDONALDS REAL ESTATE COMPANY
17	6	REMINGTON ARMS COMPANY LLC

REVISIONS

2/20/2025 2:47:38 PM
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Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
License No: C-3097

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
I-5898	04

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG
10/20/2025

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER KAREN HEFNER
Docusigned by: Karen Hefner
10/20/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/17/99

REVISIONS

BEGIN PROJECT TIP I-5898
-Y- NC 135 STA. 106+00.00

-Y-
PI Sta 112+91.11
△ = 17° 42' 02.1" (LT)
D = 4° 05' 33.2"
L = 432.51'
T = 217.99'
R = 1,400.00'
e = 0.040
RO = 168'
DS = 40mph

PI Sta 116+23.66
△ = 9° 38' 17.5" (RT)
D = 4° 05' 33.2"
L = 235.51'
T = 118.03'
R = 1,400.00'
e = 0.040
RO = 132'
DS = 40mph

NAD 83

POT Sta. 100+00.00

-Y- PC Sta. 110+73.12

-Y- NC 135/ US 311 POT STA 110+50.33
-Y2- SR 2177 (DAN VALLEY ROAD) POT STA. 10+00.00

-Y- N 70° 45' 01.0" E

-Y2- POT STA. 13+30.27

-Y2- S 4° 31' 11.3" E

-Y- STA. 113+00.00 SEE SHEET 05

MATCH LINE

ROCKINGHAM COUNTY SCHOOLS
DB 764 PG 591

ROBESON ASSISTED LIVING OF ROCKINGHAM, INC
DB 1314 PG 2390
PB 18 PG 48

LLEWELLYN CEMETERY
PB 18 PG 48

SAMUEL RICHARDS
DB 1481 PG 2995
PB 18 PG 48

JOSE G. DIAZ
DB 746 PG 70
PB 18 PG 48

RAKESTRAW INVESTMENT CO INC
DB 1358 PG 1356
PB 18 PG 48

COREY M. CAPLE
KAREN A. CAPLE
NICHOLAS D. CAPLE
DARIEN M. CAPLE
DB 1529 PG 579
PB 18 PG 48

RUTH ANN MARTIN
(NO CURRENT DEED REFERENCE FOUND)
DB 733 PG 903
DB 781 PG 791
PB 18 PG 48

AUTOZONE DEVELOPMENT
DB 1430 PG 2094
PB 63 PG 44

JOHNSON & CASEY INC
DB 1517 PG 1984
DB 1341 PG 2349
PB 77 PG 55
PB 63 PG 44

OREO LLC
DB 1513 PG 968
PB 77 PG 55
PB 63 PG 44

DO NOT DISTURB EXISTING SIGN

DO NOT DISTURB LOWES SIGN

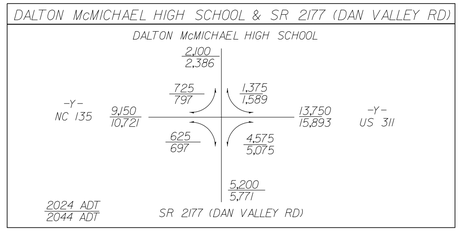
DO NOT DISTURB EXISTING SIGN

END CONSTRUCTION
-Y2- POT STA. 11+25.00

RETAIN 2GI & DO NOT DISTURB

APPROX. VISUAL LOCATION OF JUNCTION BOXES 54" RCP BENDS

DALTON McMICHAEL HIGH SCHOOL & SR 2177 (DAN VALLEY RD)



SEE SHEET 10 FOR -Y- PROFILE
SEE SHEET 12 FOR -Y2- PROFILE
SEE SHEET 2B-1 THRU 2B-3 FOR INTERSECTION DETAILS
SEE SHEET 2D-1 FOR DITCH DETAILS

10/8/2025 8:03:14 PM
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User:jdavis

PROJECT REFERENCE NO.	SHEET NO.
I-5898	05
R/W SHEET NO.	

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100, Raleigh, NC 27609
License No: C-3097

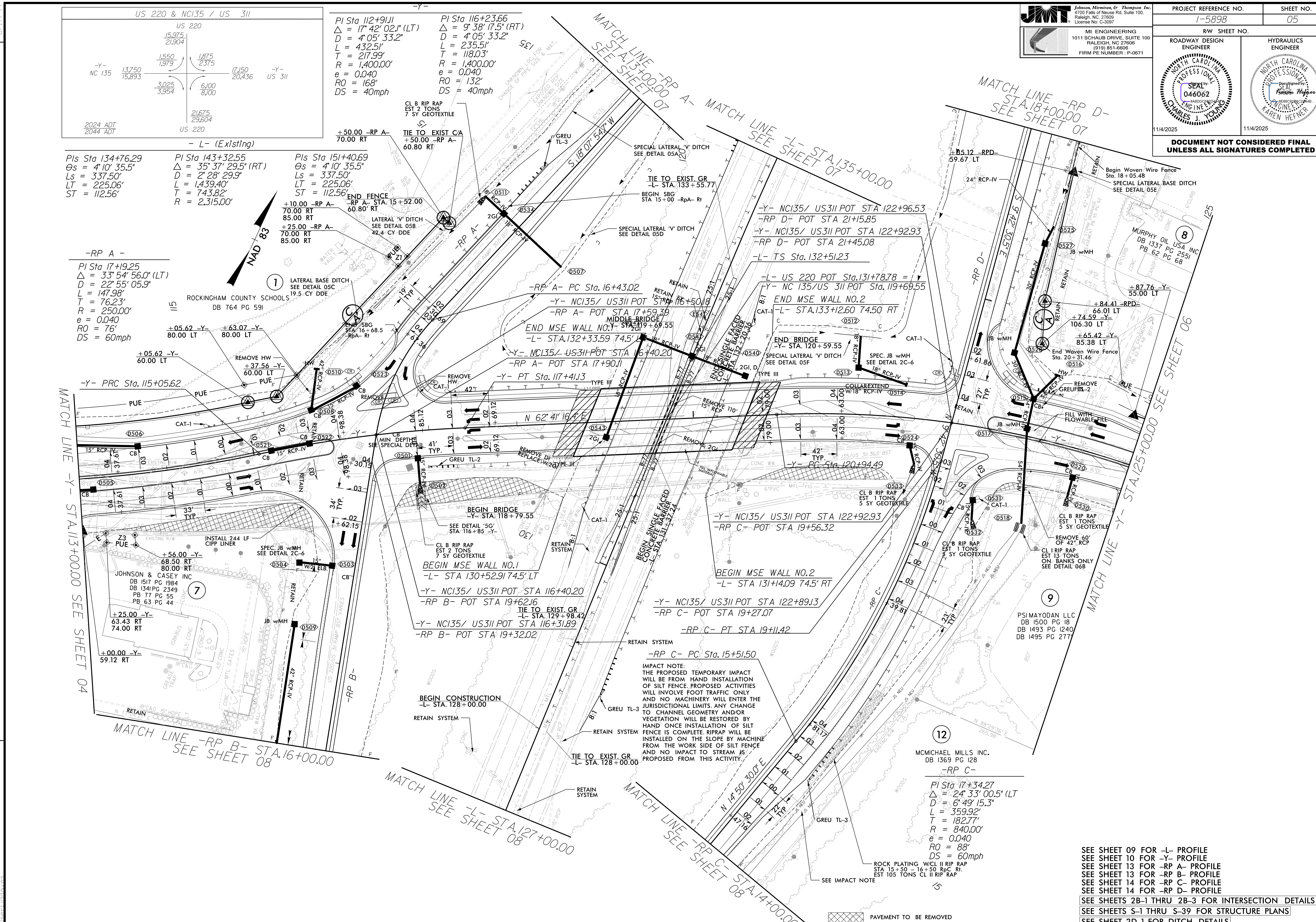
MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG
11/4/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER KAREN HEFNER
11/4/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



PI Sta 112+91.11
Δ = 17° 42' 02.1" (LT)
D = 4° 05' 33.2"
L = 432.51'
T = 217.99'
R = 1,400.00'
e = 0.040
RO = 168'
DS = 40mph

PI Sta 116+23.66
Δ = 9° 38' 17.5" (RT)
D = 4° 05' 33.2"
L = 235.51'
T = 118.03'
R = 1,400.00'
e = 0.040
RO = 132'
DS = 40mph

PIs Sta 134+76.29
Θs = 4° 10' 35.5"
Ls = 337.50'
LT = 225.06'
ST = 112.56'

PI Sta 143+32.55
Δ = 35° 37' 29.5" (RT)
D = 2° 28' 29.9"
L = 1,439.40'
T = 743.82'
R = 2,315.00'

PIs Sta 151+40.69
Θs = 4° 10' 35.5"
Ls = 337.50'
LT = 225.06'
ST = 112.56'

-RP A-
PI Sta 17+19.25
Δ = 33° 54' 56.0" (LT)
D = 22° 55' 05.9"
L = 147.98'
T = 76.23'
R = 250.00'
e = 0.040
RO = 76'
DS = 60mph

-RP C-
PI Sta 17+34.27
Δ = 24° 33' 00.5" (LT
D = 6° 49' 15.3"
L = 359.92'
T = 182.77'
R = 840.00'
e = 0.040
RO = 88'
DS = 60mph

IMPACT NOTE:
THE PROPOSED TEMPORARY IMPACT WILL BE FROM HAND INSTALLATION OF SILT FENCE. PROPOSED ACTIVITIES WILL INVOLVE FOOT TRAFFIC ONLY AND NO MACHINERY WILL ENTER THE JURISDICTIONAL LIMITS. ANY CHANGE TO CHANNEL GEOMETRY AND/OR VEGETATION WILL BE RESTORED BY HAND ONCE INSTALLATION OF SILT FENCE IS COMPLETE. RIPRAP WILL BE INSTALLED ON THE SLOPE BY MACHINE FROM THE WORK SIDE OF SILT FENCE AND NO IMPACT TO STREAM IS PROPOSED FROM THIS ACTIVITY.

PAVEMENT TO BE REMOVED

SEE SHEET 09 FOR -L- PROFILE
SEE SHEET 10 FOR -Y- PROFILE
SEE SHEET 13 FOR -RP A- PROFILE
SEE SHEET 13 FOR -RP B- PROFILE
SEE SHEET 14 FOR -RP C- PROFILE
SEE SHEET 14 FOR -RP D- PROFILE
SEE SHEETS 2B-1 THRU 2B-3 FOR INTERSECTION DETAILS
SEE SHEETS S-1 THRU S-39 FOR STRUCTURE PLANS
SEE SHEET 2D-1 FOR DITCH DETAILS

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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
I-5898	06

R/W SHEET NO.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG
11/7/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 39325 ENGINEER KAREN HEFNER
Docusigned by: Karen Hefner
11/7/2025

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REVISIONS

8/17/99

MATCH LINE STA. 125+00.00 SEE SHEET 05

NAD 83

DO NOT DISTURB SIGN

DO NOT DISTURB WALMART SIGN

DO NOT DISTURB MCDONALDS SIGN

-Y-
PI Sta 124+68.41
Δ = 37° 32' 55.4" (RT)
D = 5° 12' 31.3"
L = 720.88'
T = 373.92'
R = 1,100.00'
e = 0.040
RO = 168'
DS = 40mph

PI Sta 130+75.39
Δ = 21° 48' 15.8" (LT)
D = 4° 14' 38.9"
L = 513.75'
T = 260.02'
R = 1,350.00'
e = 0.040
RO = 148'
DS = 40mph

-Y3- POT STA. 10+00.00

END CONSTRUCTION
-Y3- POT STA. 11+90.00

END PROJECT TIP I-5898
-Y- US 311/NC 135 POC STA. 133+15.00

-Y- NC 135/ US 311 POT STA. 130+69.46
-Y3- SR 2283 (COMMERCE DR.) POT STA. 12+93.80
-Y- NC 135/ US 311 POT STA. 130+69.57
-Y3- SR 2283 (COMMERCE DR.) POT STA. 13+18.56
-Y- NC 135/ US 311 POT STA. 130+70.85
-Y4- SR 2271 (SHAKEY LN.) POT STA. 10+00.00
-Y- NC 135/ US 311 POT STA. 130+73.54
-Y4- SR 2271 (SHAKEY LN.) POT STA. 10+20.20

END CONSTRUCTION
-Y4- SR 2271 (SHAKEY LN)
POT STA. 11+52.50

-Y4- POT STA. 13+11.79

-Y- POT Sta. 136+78.77

-Y- PRC Sta. 128+15.37

-Y- PT Sta. 133+29.12

15 WALMART REAL ESTATE
DB 1227 PG 1476
PB 55 PG 62

8 MURPHY OIL USA INC
DB 1337 PG 2551
PB 62 PG 68

10 PBK PROPERTY MANAGEMENT NC LLC
DB 1475 PG 1322
PB 61 PG 80

13 ROMA REALTY LLC
DB 1467 PG 2500
PB 70 PG 92

14 STORCH REALTY NC LLC
DB 1441 PG 853
PB 70 PG 92

16 MCDONALDS REAL ESTATE COMPANY
DB 1410 PG 2392
PB 67 PG 86

IDK LLC
DB 1294 PG 309
PB 67 PG 86

ACEDEUCE PROPERTIES LLC
DB 1541 PG 20
PB 67 PG 86
PB 70 PG 91

GOODWILL INDUSTRIES OF CENTRAL NORTH CAROLINA INC
DB 1441 PG 1501
PB 70 PG 91

9 PSI MAYODAN LLC
DB 1500 PG 18
DB 1493 PG 1240
DB 1495 PG 2779

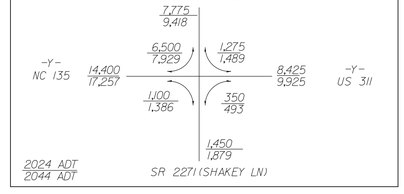
11 DAN VALLEY BAPTIST CHURCH
DB 750 PG 242
DB 924 PG 198
DB 930 PG 2215
DB 1328 PG 1643

12 MCMICHAEL MILLS INC
DB 1369 PG 128

17 REMINGTON ARMS COMPANY LLC
DB 1435 PG 1037
DB 1435 PG 1043
PB 34 PG 5

ADELL ROBERTS SCALES HEIRS
DB 1063 PG 2103
DB 381 PG 63
PB 34 PG 5

SR 2283 (COMMERCE DR.) & SR 2271 (SHAKEY LANE)



SEE SHEET 10-11 FOR -Y- PROFILE
SEE SHEET 12 FOR -Y3- PROFILE
SEE SHEET 12 FOR -Y4- PROFILE
SEE SHEET 2B-1 THRU 2B-3 FOR INTERSECTION DETAILS
SEE SHEET 2D-1 FOR DITCH DETAILS

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License No: C-3097

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
I-5898	07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG — 10/20/2025	NORTH CAROLINA PROFESSIONAL ENGINEER KAREN HEFNER — 10/20/2025

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REVISIONS

US 220 & NC135 / US 311

US 220 (north)	15,975 / 21,904
-Y- NC 135	13,750 / 15,893
-Y- US 311	17,150 / 20,436
US 220 (south)	21,675 / 29,604
Turns	1,550 / 1,979; 1,875 / 2,375; 3,025 / 3,954; 6,100 / 8,100

2024 ADT / 2044 ADT

NAD 83

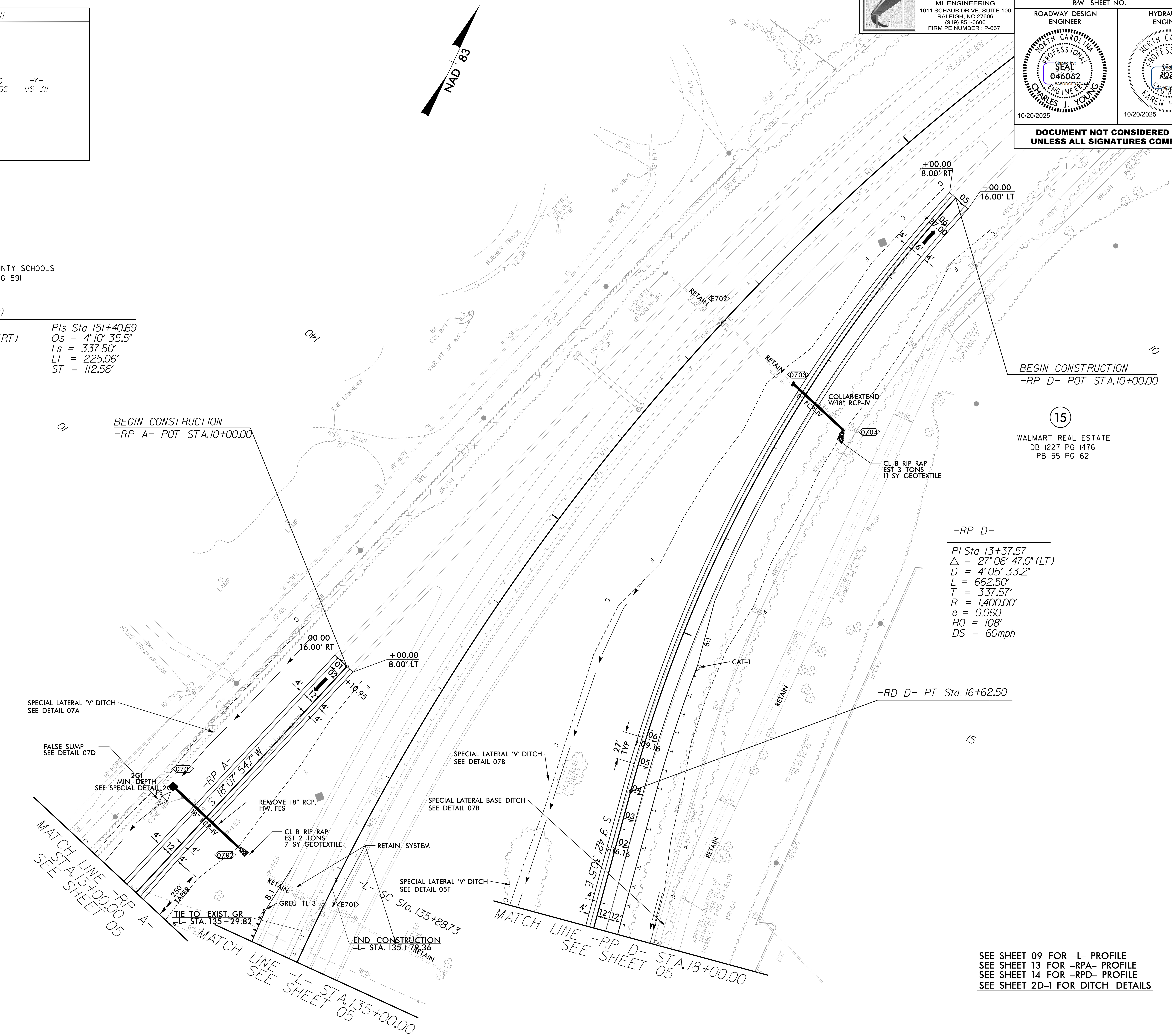
① ROCKINGHAM COUNTY SCHOOLS
DB 764 PG 591

- L- (Existing)

PIs Sta 134+76.29	PI Sta 143+32.55	PIs Sta 151+40.69
Θs = 4° 10′ 35.5″	Δ = 35° 37′ 29.5″ (RT)	Θs = 4° 10′ 35.5″
Ls = 337.50′	D = 2° 28′ 29.9″	Ls = 337.50′
LT = 225.06′	L = 1,439.40′	LT = 225.06′
ST = 112.56′	T = 743.82′	ST = 112.56′
	R = 2,315.00′	

⑮ WALMART REAL ESTATE
DB 1227 PG 1476
PB 55 PG 62

-RP D-
PI Sta 13+37.57
Δ = 27° 06′ 47.0″ (LT)
D = 4° 05′ 33.2″
L = 662.50′
T = 337.57′
R = 1,400.00′
e = 0.060
RO = 108′
DS = 60mph



SEE SHEET 09 FOR -L- PROFILE
SEE SHEET 13 FOR -RPA- PROFILE
SEE SHEET 14 FOR -RPD- PROFILE
SEE SHEET 2D-1 FOR DITCH DETAILS

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License No: C-3097

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RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
I-5898	08

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG — Signed by: 8A8DDCF32D44421... — 10/20/2025	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL KAREN HEFNER — DocuSigned by: Karen Hefner 8E66C92D1C2A44B... — 10/20/2025

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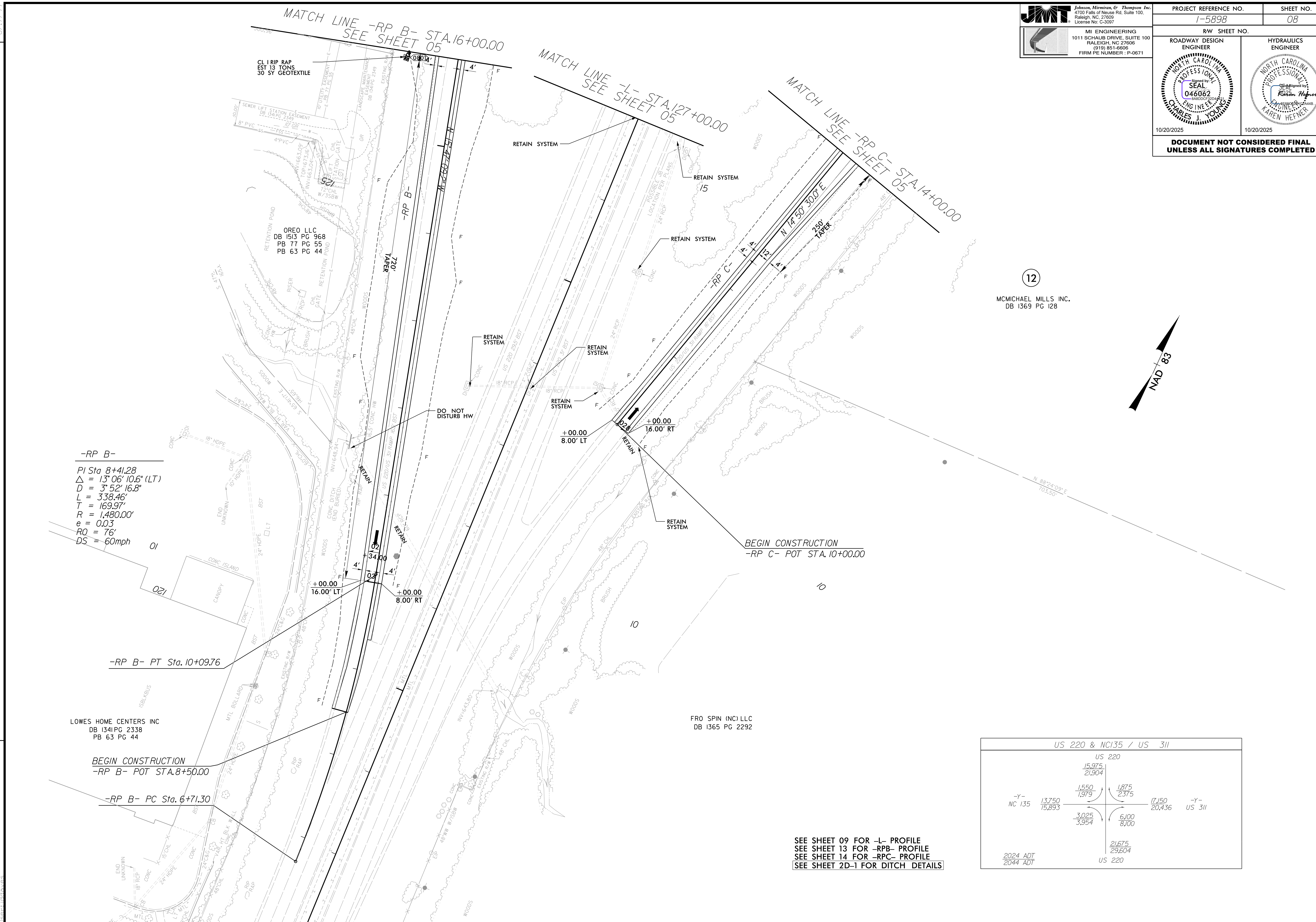
REVISIONS



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FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
I-5898	09
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG — 10/20/2025	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL KAREN HEFNER — 10/20/2025

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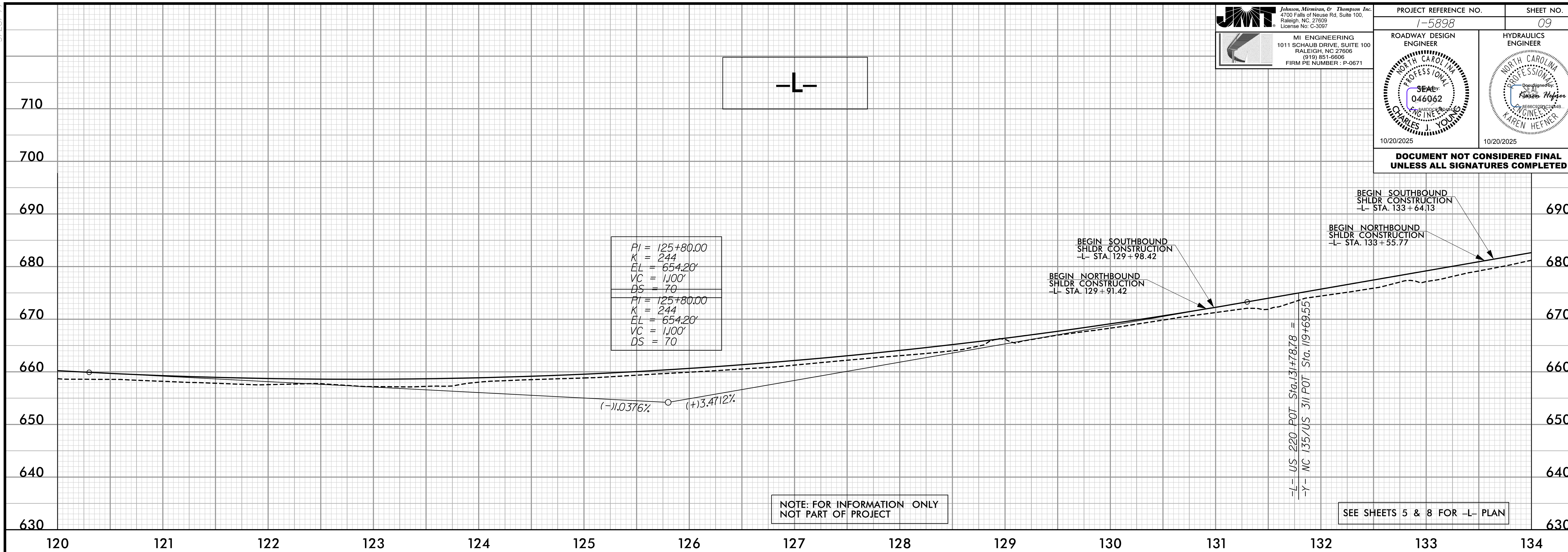

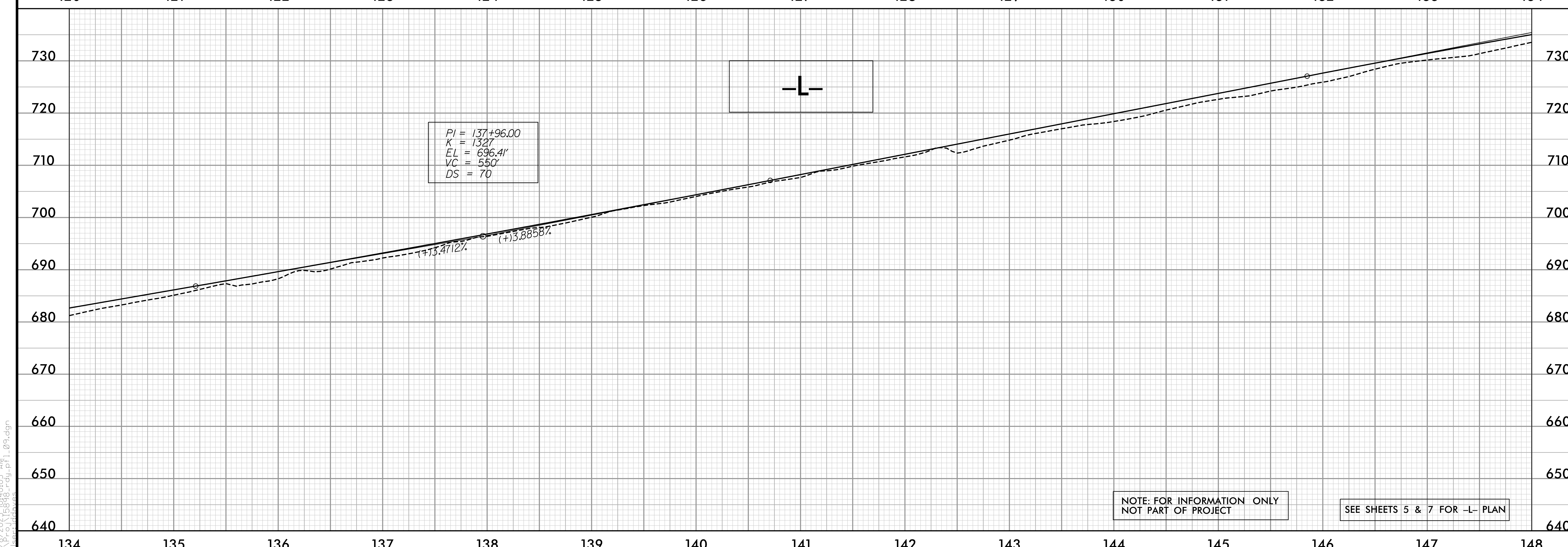

PROJECT REFERENCE NO.	SHEET NO.
I-5898	10

Johnson, Mirmiran, & Thompson Inc.
4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC 27609
License No: C-3097

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG — 10/20/2025

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL KAREN HEFNER — 10/20/2025

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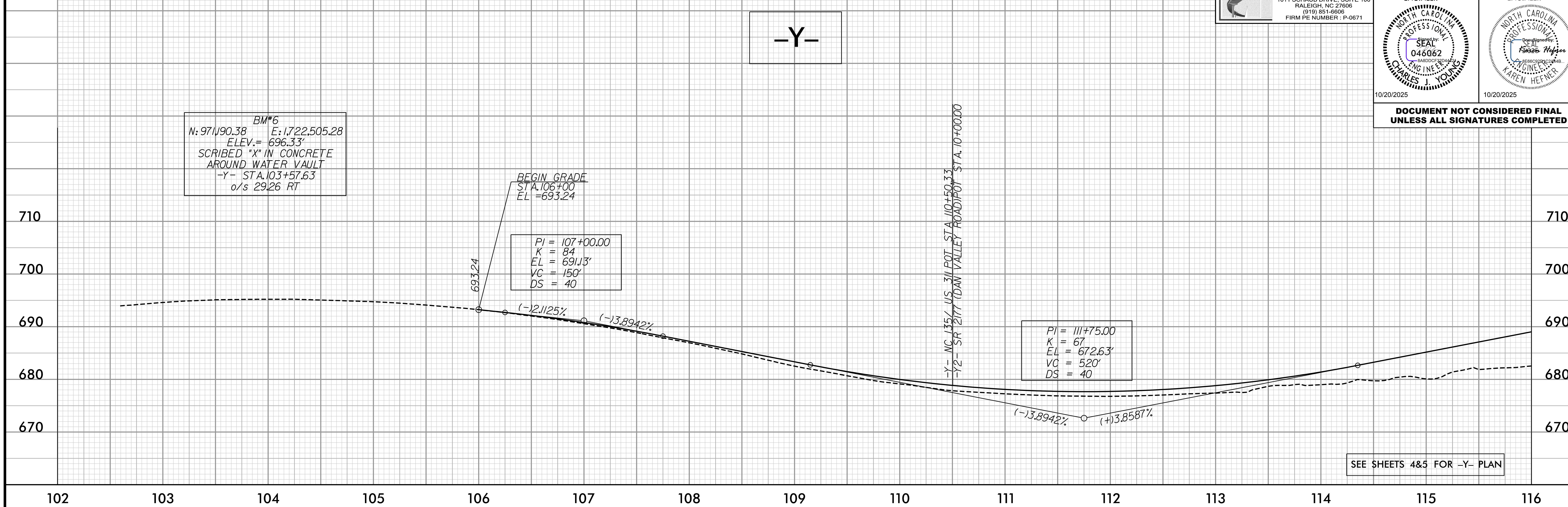

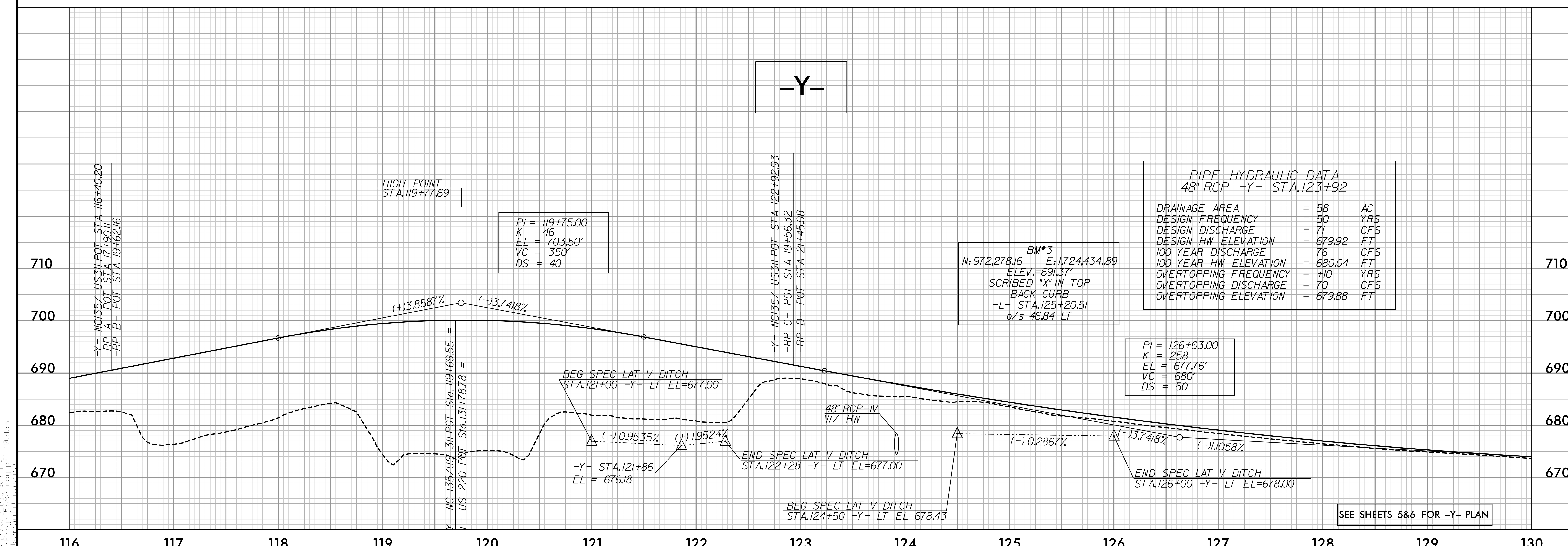

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Raleigh, NC, 27609
License No: C-3097

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
I-5898	11

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046062 CHARLES J. YOUNG — Signed by: 8A8DDCF32D4442 ... — 10/20/2025	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL KAREN HEFNER — DocuSigned by: Karen Hefner 8E66C92D1C2A44B... — 10/20/2025

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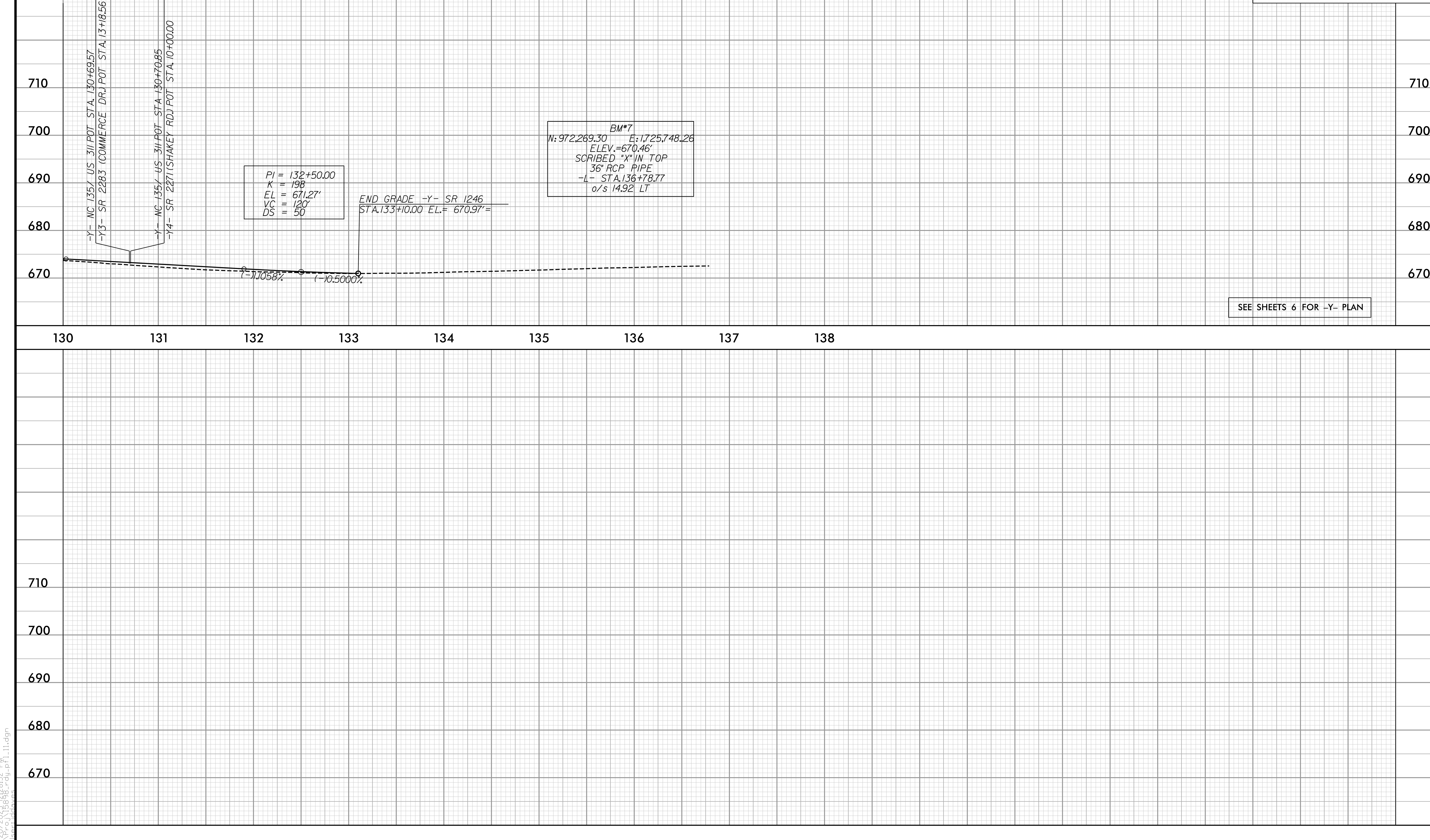
-Y-



5/28/99

–Y2–

BEGIN GRADE –Y2–
STA.10+29.02 EP EL.= 678.33'=
–Y– NC 135/US 311 POT Sta.110+42.95

PI = 10+80.00
K = 52
EL = 678.78'
VC = 80'
DS = 35

END GRADE
STA.11+25
EL = 679.87

(+)0.8844%

(+)2.4288%

SEE SHEET 4 FOR –Y2– PLAN

–Y3–

LOW POINT
STA.12+50.22

BEGIN GRADE
STA.11+90
EL = 672.41

PI = 12+30.00
K = 41
EL = 671.87'
VC = 70'
DS = 25

END GRADE –Y3–
STA.12+93.80 EP EL.= 672.10'=
–Y– NC 135/US 311 POT Sta.130+69.46

(–)1.3567%

(+)0.3632%

SEE SHEET 6 FOR –Y3– PLAN

–Y4–

BEGIN GRADE –Y4–
STA.10+20.20 EP EL.= 673.81'=
–Y– NC 135/US 311 POT Sta.130+73.54

PI = 10+55.00
EL = 673.37'
K = 20
VC = 60
DS = 25

END GRADE
STA.11+52.50
EL = 669.96

(–)1.2644%

(–)4.3002%

(–)1.8000%

PI = 11+21.00
EL = 670.53'
K = 24
VC = 60
DS = 25

SEE SHEET 6 FOR –Y4– PLAN

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RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
I-5898	12

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046062 ENGINEER CHARLES J. YOUNG
10/20/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER KAREN HETNER
Digitally signed by K.E.H.
10/20/2025

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