09/08/99

TIP PROJECT: R-2707D/R-2707E

CONTRACT: C204851

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

VICINITY MAP NTS

100% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

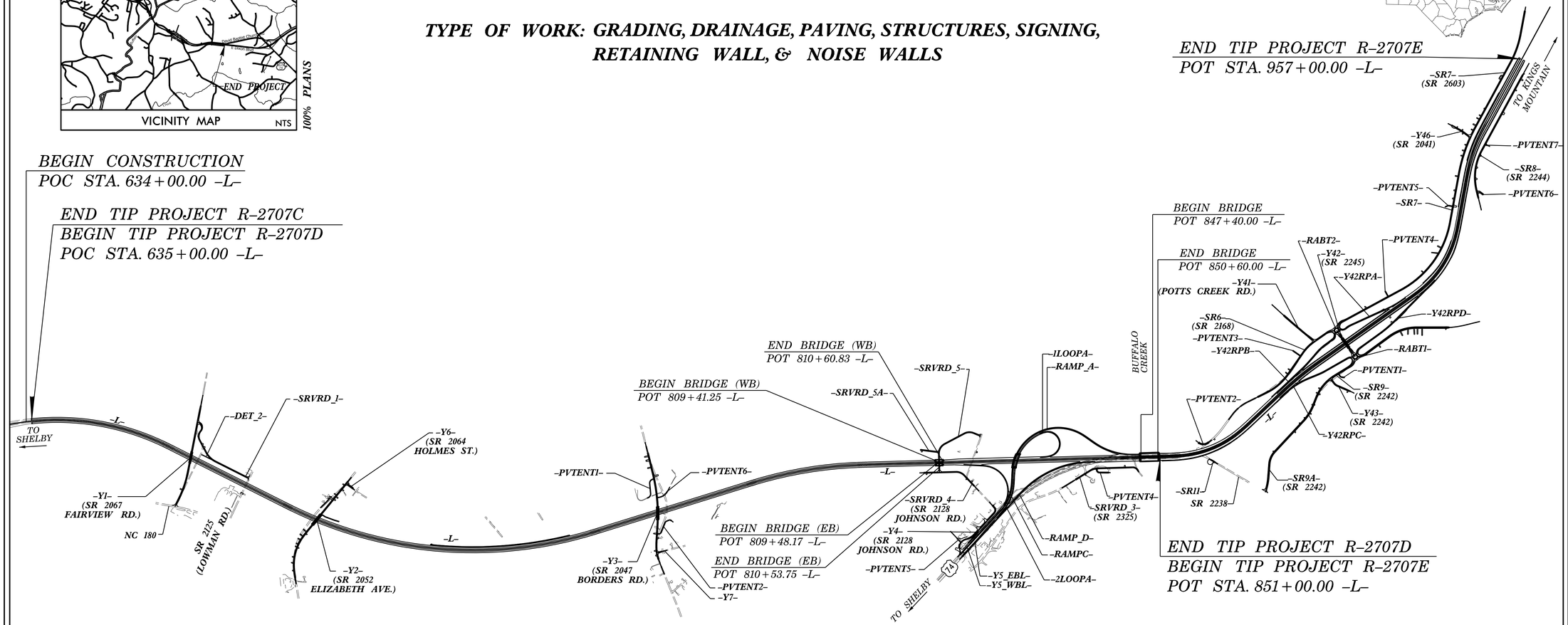
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707D/R-2707E	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
	R-2707D	
34497.1.FS6	NHS-0074(164)	P.E.
34497.2.13	N/A	R/W & UTIL
34497.3.12	N/A	CONST.
	R-2707E	
34497.1.FS7	NHS-0074(165)	P.E.
34497.2.15	N/A	R/W & UTIL
34497.3.12	N/A	CONST.

NAD 83/95

LOCATION: US 74, SHELBY BYPASS FROM EAST OF NC 150 TO WEST OF SR 1001 (STONEY POINT RD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNING, RETAINING WALL, & NOISE WALLS



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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2707D	=	*4.008 MI.*
LENGTH OF STRUCTURE TIP PROJECT R-2707D	=	*0.083 MI.*
TOTAL LENGTH OF TIP PROJECT R-2707D	=	*4.091 MI.*
STRUCTURE LENGTHS BASED ON WB LANES		
LENGTH OF ROADWAY TIP PROJECT R-2707E	=	*2.008 MI.*
TOTAL LENGTH OF TIP PROJECT R-2707E	=	*2.008 MI.*
TOTAL LENGTH OF TIP PROJECTS R-2707D/R-2707E	=	*6.099 MI.*

PREPARED IN THE OFFICE OF:
Stantec
Stantec Consulting Services Inc. Tel. (919) 851-6866
801 Jones Franklin Road Fax. (919) 851-7024
Suite 300 www.stantec.com
Raleigh, NC 27606 License No. F-0672

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
01/10/2019

LETTING DATE:
07/18/2023

JOSEPH T. KELVINGTON, P.E.
PROJECT ENGINEER

MATTHEW FERGUSON, P.E.
PROJECT DESIGN ENGINEER

BRYAN SOWELL, P.E.
NCDOT DIVISON 12

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

5/17/2023
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mferguson

8/17/99

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
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1B	CONVENTIONAL SYMBOLS
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2B-1	DETOUR SHEET
2B-2	SHEAR POINT DIAGRAM
2B-3	INTERSECTION DETAIL
2C-1	DETAIL OF TEMPORARY STEEL COVER OVER DRAINAGE STRUCTURE
2C-2	DETAIL OF CONVERT EXISTING DI, CB, OTCB OR GI TO JUNCTION BOX
2C-3	DETAIL OF GUARDRAIL IMPACT ATTENUATOR
2C-4	DETAIL OF W BEAM RAIL SECTION
2C-5	DETAIL OF TEMPORARY ANCHOR UNIT CONNECTING TUBULAR BEAM GUARDRAIL TO PORTABLE CONCRETE BARRIER
2C-6	DETAIL OF CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH
2D-1 THRU 2D-7	DRAINAGE DETAILS
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3D-1 THRU 3D-15	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 26	PLAN SHEETS
27 THRU 54	PROFILE SHEETS
RW-01 THRU RW-26	SURVEY CONTROL, EXISTING CENTERLINES AND RIGHT OF WAY SHEETS
TMP-1 THRU TMP-51	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP -37	PAVEMENT MARKING PLANS
EC-1 THRU EC-60	EROSION CONTROL PLANS
NS-1 THRU NS-31	NATURAL STREAM RESTORATION PLANS
RF-1 THRU RF-6	REFORESTATION PLANS
SIGN-1 THRU SIGN-54	SIGNING PLANS
UC-1 THRU UC-5	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-17	UTILITY BY OTHERS PLANS
X-A	CROSS SECTION INDEX OF SHEETS
X-1A THRU X-1D	CROSS SECTION SUMMARY
X-1 THRU X-511	CROSS SECTIONS
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S5-01 THRU S5-55	STRUCTURE PLANS US 74 WB (-L-) OVER BUFFALO CREEK
S6-01 THRU S6-55	STRUCTURE PLANS US 74 EB (-L-) OVER BUFFALO CREEK
S8-01 THRU S8-30	STRUCTURE PLANS US 74 WB (-L-) OVER SR 2128 (-SRVRD_5-)
S9-01 THRU S9-30	STRUCTURE PLANS US 74 EB (-L-) OVER SR 2128 (-SRVRD_5-)
C1-01 THRU C1-05	CULVERT PLANS US 74 (-L-) STA. 717+13.00
C2-01 THRU C2-05	CULVERT PLANS US 74 (-L-) STA. 743+18.00
C3-01 THRU C3-05	CULVERT PLANS US 74 (-L-) STA. 796+86.00
W-1 THRU W-7	WALL PLANS
SW3A-1 THRU SW3A-4	NOISE WALL PLANS

PART 2 R-2707E

1	TITLE SHEET
2A-1 THRU 2A-7	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	SHEAR POINT DIAGRAM
2B-2	INTERSECTION DETAILS
2C-1	DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE
2C-2	DETAIL OF CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH
2C-3	DETAIL OF CONVERT EXISTING DI, CB, OTCB OR GI TO JUNCTION BOX
2C-4	DETAIL OF W BEAM RAIL SECTION
2D-1 THRU 2D-3	DRAINAGE DETAILS
2G-1	GEOTECHNICAL DETAILS TEMPORARY SHORING
2G-2 THRU 2G-3	GEOTECHNICAL DETAILS STANDARD REINFORCED SOIL SLOPE
2N-1	NOISE WALL ENVELOPE
3B-1 THRU 3B-3	ROADWAY SUMMARIES
3D-1 THRU 3D-9	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
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16 THRU 46	PROFILE SHEETS
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PMP-1 THRU PMP -16	PAVEMENT MARKING PLANS
EC-1 THRU EC-35	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-23	SIGNING PLANS
UC-1 THRU UC-5	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-13	UTILITY BY OTHERS PLANS
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X-1 THRU X-381	CROSS SECTIONS
S7-01 THRU S7-34	STRUCTURE PLANS
SW10A-1 THRU SW10A-4	NOISE WALL PLANS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 & STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

BERM DITCHES:

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

SUBSURFACE DRAINS:

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

UNDERDRAINS:

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

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.02 AND DETAILS IN PLANS AT LOCATIONS 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 WATER/SEWER - CITY OF SHELBY, CITY OF KINGS MOUNTAIN, AND CLEVELAND COUNTY

POWER - DUKE ENERGY

TELECOMMUNICATIONS - AT&T, RST GLOBAL, SEGRA, CONTERRA, SPECTRUM

GAS - SHELBY GAS

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.

ROCK

ROCK IS ANTICIPATED BETWEEN -SR7- 29+40 - 31+00. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.02	Bridge Approach Fills - Type II Modified Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges - Method III
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
815.03	Pipe Underdrain and Blind Drain
816.01	Concrete Pads - for Shoulder Drain Installation
816.02	Aggregate Shoulder Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.33	Reinforced Concrete Endwall - for Single 66" Pipe 90 Skew
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.63	Reinforced Brick Endwall - for Single 66" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.41	Spring Box - Concrete or Brick
840.45	Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
852.01	Concrete Islands
852.02	Concrete Mountable Median - for Use with Rigid or Flexible Pavement
852.06	Method for Placement of Drop Inlets in Concrete Islands
854.02	Double Faced Concrete Barrier - Types 'T', 'T1' and 'T2'
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
865.01	Cable Guiderail
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

PROJECT REFERENCE NO.	SHEET NO.
R-2707D/R-2707E	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044480 ENGINEER MATTHEW B. FERGUSON

5/2/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/2/2023
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mferguson

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
R-2707D/R-2707E	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge

- Woods Line
- Orchard
- Vineyard — 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.

09/08/09

TIP PROJECT: R-2707D

CONTRACT: C204851

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

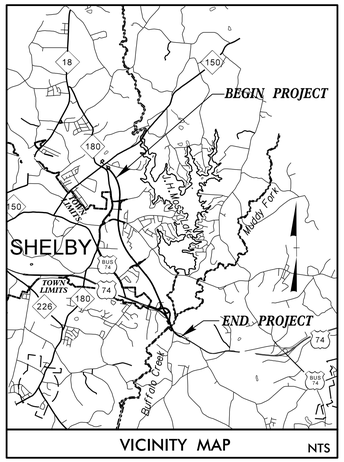
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707D	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34497.1.FS6	NHS-0074(164)	P.E.
34497.2.13	N/A	R/W & UTIL.
34497.3.12	N/A	CONST.

PART 1

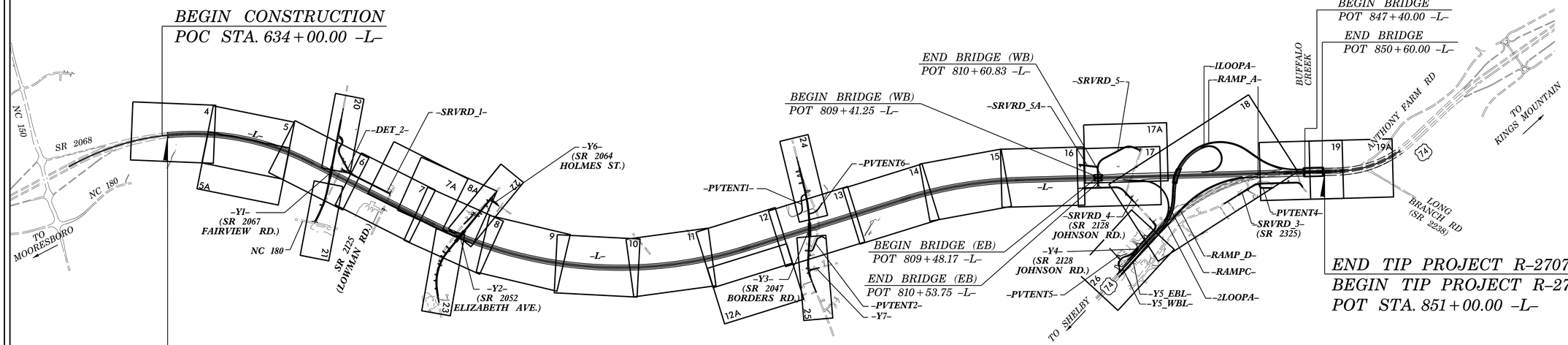
LOCATION: US 74, SHELBY BYPASS FROM EAST OF NC 150 TO EXISTING US 74, WEST OF SR 2238 (LONG BRANCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNING, RETAINING WALL, & NOISE WALL



VICINITY MAP NTS

NAD 83/ 95



END TIP PROJECT R-2707C
BEGIN TIP PROJECT R-2707D
POC STA. 635+00.00 -L-

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 2019 = 41,600
ADT 2043 = 61,700
K = 11 %
D = 55 %
T = 15 % *
V = 70 MPH
* TTST = 10% DUAL 5%

FUNC CLASS = FREEWAY
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2707D = 4.008 MI.
LENGTH OF STRUCTURE TIP PROJECT R-2707D = 0.083 MI.
TOTAL LENGTH OF TIP PROJECT R-2707D = 4.091 MI.

STRUCTURE LENGTHS BASED ON WB LANES

PREPARED IN THE OFFICE OF:

Stantec
Stantec Consulting Services Inc. Tel. (919) 851-6866
801 Jones Franklin Road Fax. (919) 851-7024
Suite 300 www.stantec.com
Raleigh, NC 27606 License No. F-0672

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
01 /10 /2019

LETTING DATE:
07 /18 /2023

JOSEPH T. KELVINGTON, P.E.
PROJECT ENGINEER

MATTHEW FERGUSON, P.E.
PROJECT DESIGN ENGINEER

BRYAN SOWELL, P.E.
NCDOT DIVISON 12

HYDRAULICS ENGINEER

DocuSigned by: Joshua G. Dalton
SIGNATURE:
P.E. 4/21/2023

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

ROADWAY DESIGN ENGINEER

DocuSigned by: Matthew Ferguson
SIGNATURE:
P.E. 4/21/2023

NORTH CAROLINA PROFESSIONAL SEAL 044480 ENGINEER MATTHEW D. FERGUSON

4/18/2023
c:\users\mferguson\documents\pw_working\dms42562\R2707D_RDY_TSH.dgn
mferguson

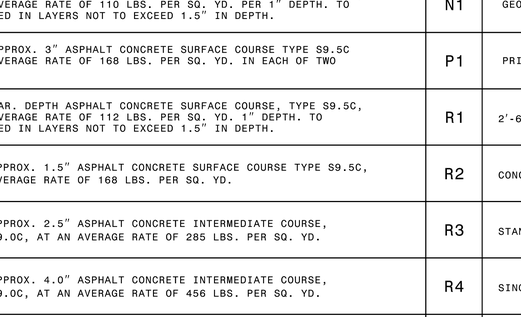
6/2/99

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	J1	PROP. 8" DEPTH AGGREGATE BASE COURSE.
C2	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	K1	PROP. CHEMICAL STABILIZATION (7" SOIL-CEMENT BASE/8" LIME-TREATED SOIL). BASE TREADED WITH CEMENT AT A RATE OF 56 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER OR SOIL TREADED WITH LIME AT A RATE OF 24 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER @ 50% EACH
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	K2	PROP 12" CLASS IV SUBGRADE STABILZATION
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.	N1	GEOTEXTILE FOR SUBGRADE STABILIZATION
C5	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	P1	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YARD.
C6	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.	R1	2'-6" CONCRETE CURB AND GUTTER
C7	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	R2	CONCRETE EXPRESSWAY GUTTER
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R3	STANDARD CONCRETE MEDIAN BARRIER (T SERIES)
D2	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	SINGLE FACE CONCRETE BARRIER
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R5	SHOULDER BERM GUTTER.
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. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E3	PROP. APPROX. 5.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	V	MILLING EXISTING PAVEMENT, 1.5" DEPTH.
E4	PROP. APPROX. 7.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL No. 2).
E5	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.	W3	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL No. 3).

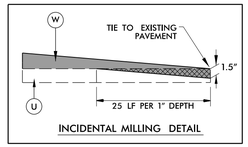
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



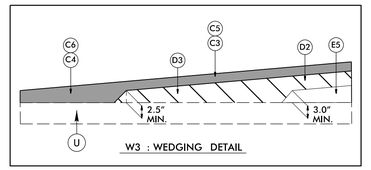
GEOTEXTILE FOR SUBGRADE STABILIZATION PLACEMENT (PLAN VIEW)

(100% COVERAGE REQUIRED)

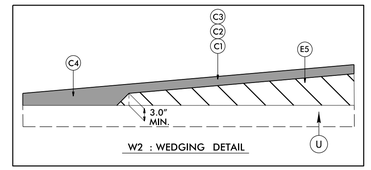
*INSTALL GEOTEXTILE FOR SUBGRADE STABILIZATION WITH MINIMUM ROLL WIDTH UNDER ROADWAY EDGES AND SHOULDERS ADJACENT TO FILL SLOPES



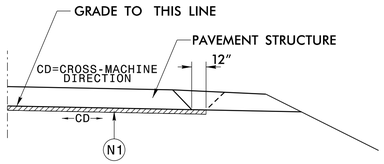
INCIDENTAL MILLING DETAIL



W3 : WEDGING DETAIL



W2 : WEDGING DETAIL



GEOTEXTILE FOR SUBGRADE STABILIZATION

USE ON:

LINE	STATION	STATION	LOCATION
–L–	636+50	638+00	RT/LT
–L–	638+00	643+00	LT
–L–	643+00	648+00	RT/LT
–L–	648+00	649+00	LT
–L–	651+00	655+50	RT/LT
–L–	655+50	658+00	LT
–L–	668+50	672+00	RT/LT
–L–	681+50	682+50	LT
–L–	682+50	687+00	RT/LT
–L–	714+50	719+00	RT/LT
–L–	719+00	722+00	LT
–L–	722+00	730+50	RT/LT
–L–	730+50	732+50	LT
–L–	734+50	741+00	LT
–L–	741+00	745+00	RT/LT
–L–	763+50	765+00	RT/LT
–L–	774+00	782+50	RT/LT
–L–	784+00	798+50	RT/LT
–L–	804+50	805+00	LT
–L–	813+00	817+50	RT/LT
–L–	843+00	843+50	LT
–L–	845+00	846+50	LT
–L–	846+50	847+50	RT/LT
–L–	850+60	851+00	RT/LT
–LOOP A–	15+00	17+75	CL
–RAMP_A–	16+00	16+50	CL
–RAMP_A–	23+50	27+50	CL
–RAMP_A–	27+50	36+00	RT/LT
–SRVRD1–	17+00	19+50	CL
–SRVRD3–	15+00	17+00	CL
SRVRD4	17+00	18+00	CL
–Y1–	15+50	19+00	CL
–Y1–	20+80	21+00	CL
–Y2–	17+00	19+50	CL

SEE SHEET 3G–1 FOR ADDITIONAL INFORMATION

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044480 MATTHEW B. FERGUSON
DocuSigned by: Matthew B. Ferguson
4/24/2023

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024964 JOSEPH T. HOLLAND
DocuSigned by: Joseph T. Holland
4/25/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/2/99

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5", TYPE S9.5B
C2	PROP. APPROX. 2.5", TYPE S9.5B
C3	PROP. APPROX. 3.0", TYPE S9.5B
C4	PROP. VAR. DEPTH, TYPE S9.5B
C5	PROP. APPROX. 3.0", TYPE S9.5C
C6	PROP. VAR. DEPTH, TYPE S9.5C
C7	PROP. APPROX. 1.5", TYPE S9.5C
D1	PROP. APPROX. 2.5", I19.0C
D2	PROP. APPROX. 4.0", I19.0C
D3	PROP. VAR. DEPTH, TYPE I19.0C
E1	PROP. APPROX. 4.0", TYPE B25.0C
E2	PROP. APPROX. 4.5", TYPE B25.0C
E3	PROP. APPROX. 5.0", TYPE B25.0C
E4	PROP. APPROX. 7.0", TYPE B25.0C
E5	PROP. VAR. DEPTH, TYPE B25.0C
J1	PROP. 8" DEPTH AGGREGATE BASE COURSE.
J2	VARIABLE AGGREGATE BASE COURSE
K1	SUBGRADE STABILZATION
K2	PROP CLASS IV SUBGRADE STABILZATION
N1	GEOTEXTILE FOR SUBGRADE STABILIZATION
P1	PRIME COAT
R1	2'-6" CONCRETE CURB AND GUTTER
R2	CONCRETE EXPRESSWAY GUTTER
R3	STANDARD CONCRETE MEDIAN BARRIER (T SERIES)
R4	SINGLE FACED CONCRETE BARRIER
R5	SHOULDER BERM GUTTER.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	1.5" MILLING
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)
W3	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)

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

NOTES:
1. DISTANCE WILL VARY TO REACH THE DESIRED ELEVATION AS ESTABLISHED BY THE DITCH GRADE. (SEE PROFILES AND CROSS SECTIONS)

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PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044480 MATTHEW B FERGUSON
DocuSigned by: Matthew Ferguson
4/24/2023

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024964 JOSEPH T HOLLAND
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4/25/2023

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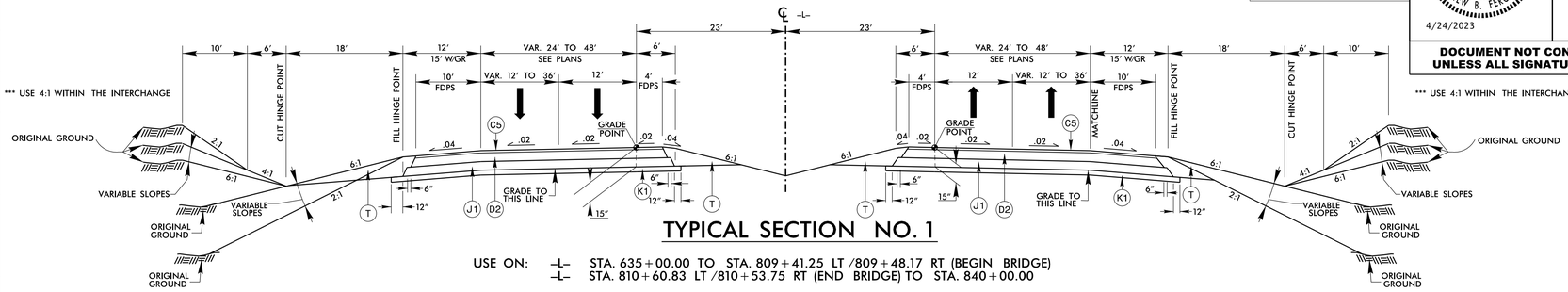
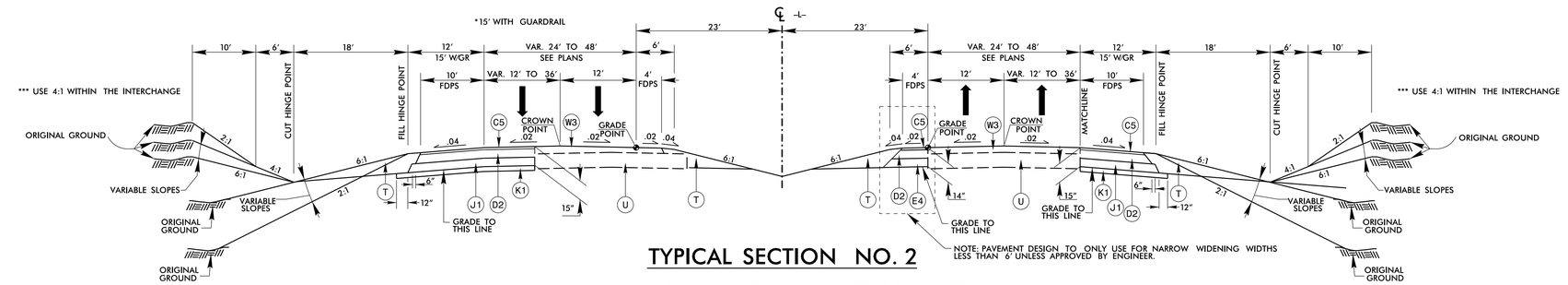


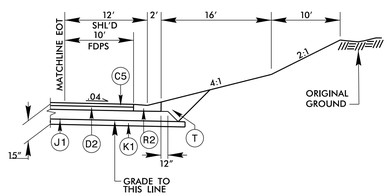
TYPICAL SECTION NO. 1

USE ON: –L– STA. 635+00.00 TO STA. 809+41.25 LT /809+48.17 RT (BEGIN BRIDGE)
–L– STA. 810+60.83 LT /810+53.75 RT (END BRIDGE) TO STA. 840+00.00



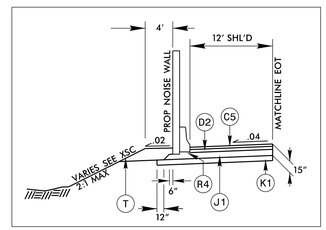
TYPICAL SECTION NO. 2

USE ON: –L– STA. 840+00.00 TO STA. 847+40.00 (BEGIN BRIDGE)
–L– STA. 850+60.00 (END BRIDGE) TO STA. 851+00.00



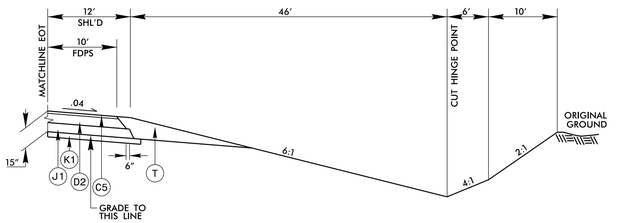
TYPICAL SECTION NO. 1A

USE ON:
–L– STA. 673+25.00 TO STA. 677+30.00 (RIGHT)
–L– STA. 756+75.00 TO STA. 761+06.00 (RIGHT)
–L– STA. 765+24.00 TO STA. 772+00.00 (RIGHT)
–L– STA. 839+50.00 TO STA. 843+75.00 (RIGHT)



PARTIAL TYPICAL SECTION NO. 1D

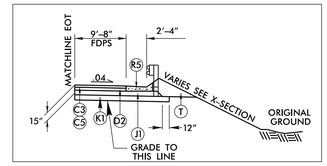
USE PARTIAL TYPICAL SECTION NO. 1D IN CONJUCTION WITH TYPICAL SECTION NO. 1 FOR
–L– STA. 713+50.00 TO STA. 739+81.06 (LT)



TYPICAL SECTION NO. 1B

NOTE: MAINTAIN DITCH GRADE 6' BELOW SUBGRADE DUE TO GROUNDWATER

USE ON: –L– STA. 747+00.00 TO STA. 754+00.00 (RIGHT & LEFT)
–L– STA. 766+00.00 TO STA. 771+00.00 (LEFT)



PARTIAL TYPICAL SECTION NO. 1C

USE PARTIAL TYPICAL SECTION NO. 1C IN CONJUCTION WITH TYPICAL SECTION NO. 1, 2 & 4 FOR SBG LOCATIONS

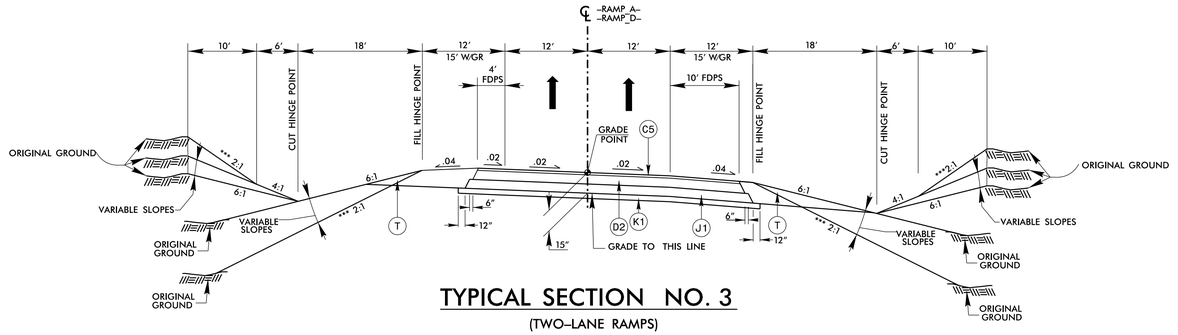
–L– STA. 642+50.00 TO STA. 647+10.00 (RT)
–L– STA. 654+45.00 TO STA. 660+00.00 (RT)
–L– STA. 668+00.00 TO STA. 671+50.00 (RT)
–L– STA. 668+50.00 TO STA. 672+00.00 (LT)
–L– STA. 681+00.00 TO STA. 688+00.00 (LT)
–L– STA. 668+50.00 TO STA. 672+00.00 (LT)
–L– STA. 681+90.00 TO STA. 685+90.00 (RT)
–L– STA. 739+81.06 TO STA. 744+50.00 (LT)
–L– STA. 762+50.00 TO STA. 764+50.00 (RT)
–L– STA. 763+00.00 TO STA. 765+55.00 (LT)
–L– STA. 773+00.00 TO STA. 798+00.00 (RT)
–L– STA. 797+00.00 TO STA. 799+00.00 (LT)
–L– STA. 804+50.00 TO STA. 805+50.00 (LT)
–L– STA. 808+75.00 TO STA. 809+17.08 (LT)
–L– STA. 809+00.00 TO STA. 809+24.00 (RT)
–L– STA. 810+85.00 TO STA. 818+00.00 (LT)
–L– STA. 810+77.92 TO STA. 816+00.00 (RT)
–LOOPA– STA. 28+29.88 TO STA. 29+00.00 (LT)

6/2/99

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5", TYPE S9.5B
C2	PROP. APPROX. 2.5", TYPE S9.5B
C3	PROP. APPROX. 3.0", TYPE S9.5B
C4	PROP. VAR. DEPTH, TYPE S9.5B
C5	PROP. APPROX. 3.0", TYPE S9.5C
C6	PROP. VAR. DEPTH, TYPE S9.5C
C7	PROP. APPROX. 1.5", TYPE S9.5C
D1	PROP. APPROX. 2.5", I19.0C
D2	PROP. APPROX. 4", I19.0C
D3	PROP. VAR. DEPTH, TYPE I19.0C
E1	PROP. APPROX. 4.0", TYPE B25.0C
E2	PROP. APPROX. 4.5", TYPE B25.0C
E3	PROP. APPROX. 5.0", TYPE B25.0C
E4	PROP. APPROX. 7.0", TYPE B25.0C
E5	PROP. VAR. DEPTH, TYPE B25.0C
J1	PROP. 8" DEPTH AGGREGATE BASE COURSE.
J2	VARIABLE AGGREGATE BASE COURSE
K1	SUBGRADE STABILZATION
K2	PROP CLASS IV SUBGRADE STABILZATION
N1	GEOTEXTILE FOR SUBGRADE STABILIZATION
P1	PRIME COAT
R1	2'-6" CONCRETE CURB AND GUTTER
R2	CONCRETE EXPRESSWAY GUTTER
R3	STANDARD CONCRETE MEDIAN BARRIER (T SERIES)
R4	SINGLE FACED CONCRETE BARRIER
R5	SHOULDER BERM GUTTER.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	1.5" MILLING
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)
W3	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)

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

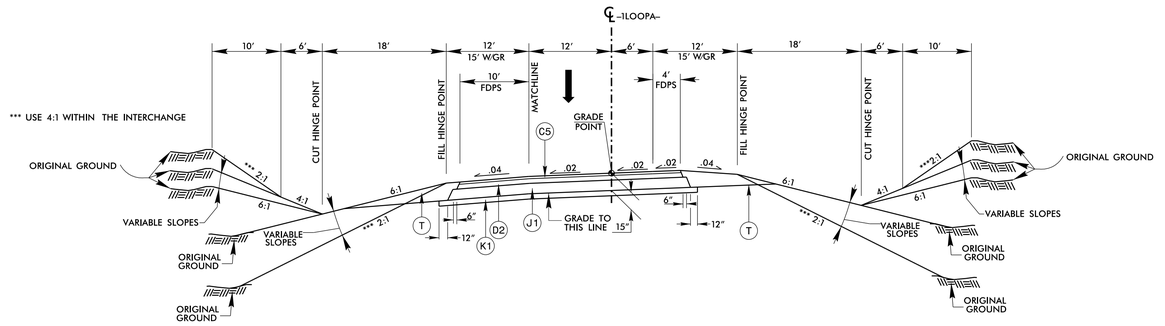
NOTES:
1. DISTANCE WILL VARY TO REACH THE DESIRED ELEVATION AS ESTABLISHED BY THE DITCH GRADE. (SEE PROFILES AND CROSS SECTIONS)



TYPICAL SECTION NO. 3

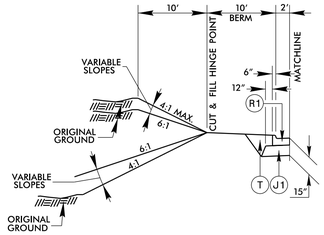
(TWO–LANE RAMPS)

USE ON: –RAMP_A– STA. 9+71.05 TO STA. 28+03.13
–RAMP_D– STA. 10+00 TO STA. 28+42.99 (MIRRORED)



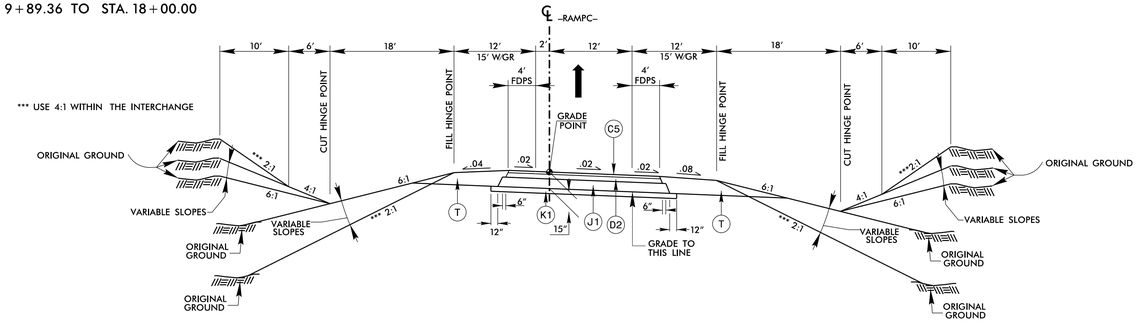
TYPICAL SECTION NO. 4

USE ON: –1LOOP_A– STA. 9+89.36 TO STA. 18+00.00



TYPICAL SECTION NO. 4A

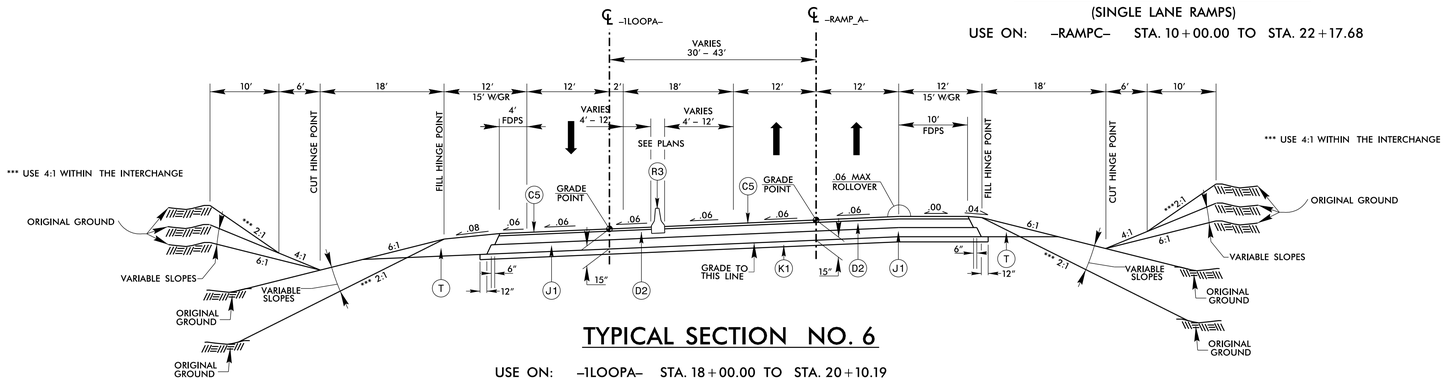
USE ON: –1LOOP_A– STA. 12+25.33 TO STA. 20+10.19



TYPICAL SECTION NO. 5

(SINGLE LANE RAMPS)

USE ON: –RAMPC– STA. 10+00.00 TO STA. 22+17.68



TYPICAL SECTION NO. 6

USE ON: –1LOOPA– STA. 18+00.00 TO STA. 20+10.19

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-3

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
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Tel. (919) 851-6866
Fax. (919) 851-7024
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ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044480 MATTHEW B. FERGUSON
4/24/2023

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024964 JOSEPH T. HOLLAND
4/25/2023

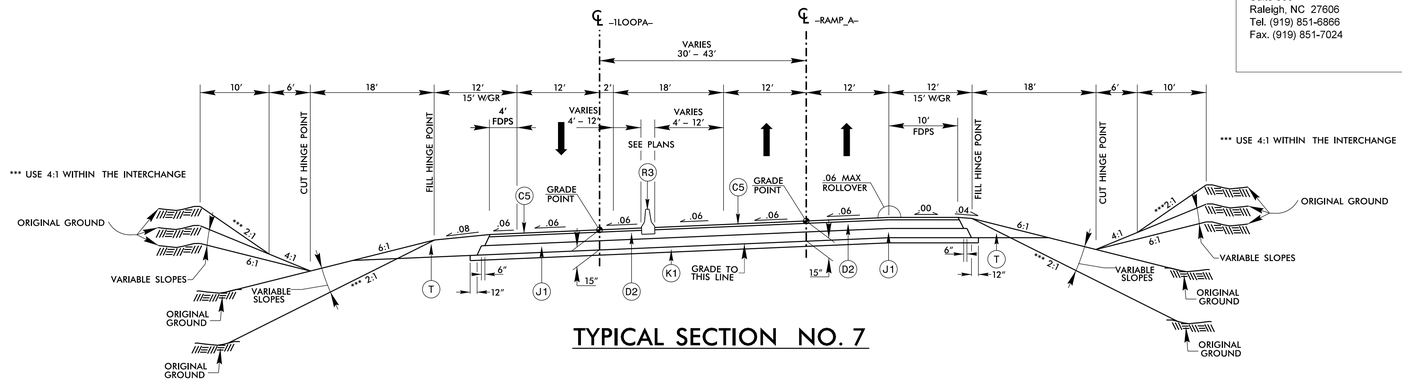
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/2/99

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5", TYPE S9.5B
C2	PROP. APPROX. 2.5", TYPE S9.5B
C3	PROP. APPROX. 3.0", TYPE S9.5B
C4	PROP. VAR. DEPTH, TYPE S9.5B
C5	PROP. APPROX. 3.0", TYPE S9.5C
C6	PROP. VAR. DEPTH, TYPE S9.5C
C7	PROP. APPROX. 1.5", TYPE S9.5C
D1	PROP. APPROX. 2.5", I19.0C
D2	PROP. APPROX. 4", I19.0C
D3	PROP. VAR. DEPTH, TYPE I19.0C
E1	PROP. APPROX. 4.0", TYPE B25.0C
E2	PROP. APPROX. 4.5", TYPE B25.0C
E3	PROP. APPROX. 5.0", TYPE B25.0C
E4	PROP. APPROX. 5.0", TYPE B25.0C
E5	PROP. VAR. DEPTH, TYPE B25.0C
J1	PROP. 8" DEPTH AGGREGATE BASE COURSE.
J2	VARIABLE AGGREGATE BASE COURSE
K1	SUBGRADE STABILZATION
K2	PROP CLASS IV SUBGRADE STABILZATION
N1	GEOTEXTILE FOR SUBGRADE STABILIZATION
P1	PRIME COAT
R1	2'-6" CONCRETE CURB AND GUTTER
R2	CONCRETE EXPRESSWAY GUTTER
R3	STANDARD CONCRETE MEDIAN BARRIER (T SERIES)
R4	SINGLE FACED CONCRETE BARRIER
R5	SHOULDER BERM GUTTER.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	1.5" MILLING
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)
W3	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)

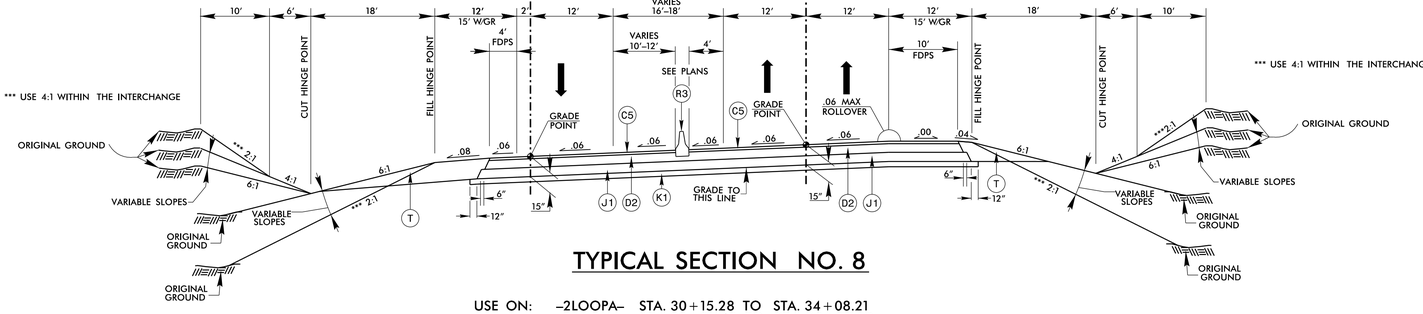
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

NOTES:
1. DISTANCE WILL VARY TO REACH THE DESIRED ELEVATION AS ESTABLISHED BY THE DITCH GRADE. (SEE PROFILES AND CROSS SECTIONS)



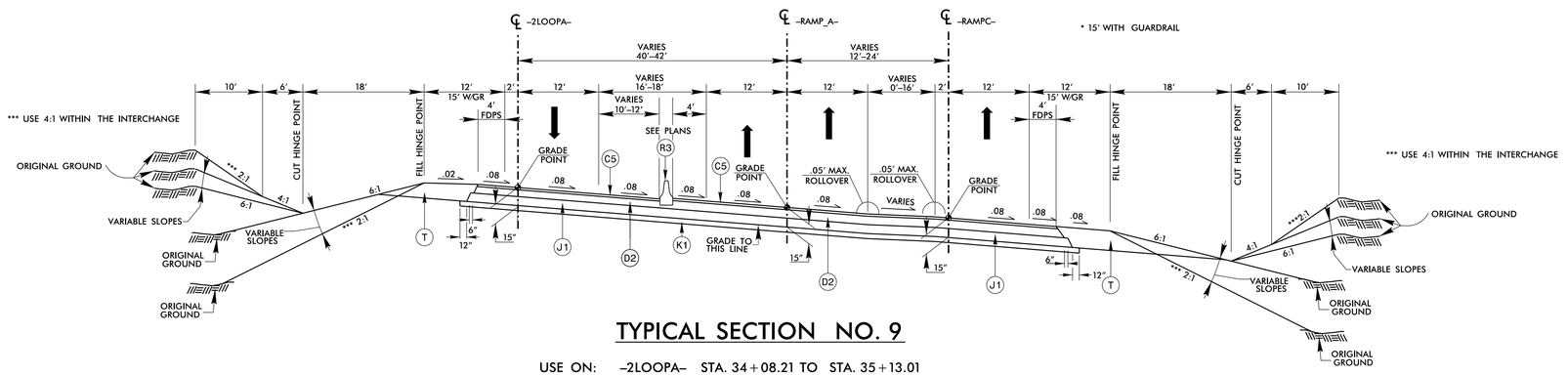
TYPICAL SECTION NO. 7

USE ON: –1LOOPA– STA. 18+60.19 TO STA. 20+10.19
–RAMP_A– STA. 28+03.13 TO STA. 35+63.63 (BEGIN BRIDGE)
–RAMP_A– STA. 37+95.88 (END BRIDGE) TO STA. 39+98.69



TYPICAL SECTION NO. 8

USE ON: –2LOOPA– STA. 30+15.28 TO STA. 34+08.21
–RAMP_A– STA. 39+98.69 TO STA. 43+77.89



TYPICAL SECTION NO. 9

USE ON: –2LOOPA– STA. 34+08.21 TO STA. 35+13.01
–RAMP_A– STA. 43+77.89 TO STA. 44+77.18
–RAMPC– STA. 22+17.68 TO STA. 23+14.98

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PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-4

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 044480 ENGINEER MATTHEW B FERGUSON
4/24/2023

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T HOLLAND
4/25/2023

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6/2/99

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C5	PROP. APPROX. 3.0", TYPE S9.5C
C6	PROP. VAR. DEPTH, TYPE S9.5C
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R5	SHOULDER BERM GUTTER.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	1.5" MILLING
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)
W3	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)

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

NOTES:
1. DISTANCE WILL VARY TO REACH THE DESIRED ELEVATION AS ESTABLISHED BY THE DITCH GRADE. (SEE PROFILES AND CROSS SECTIONS)

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PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-5

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044480 MATTHEW B FERGUSON
4/24/2023

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024964 JOSEPH T HOLLAND
4/25/2023

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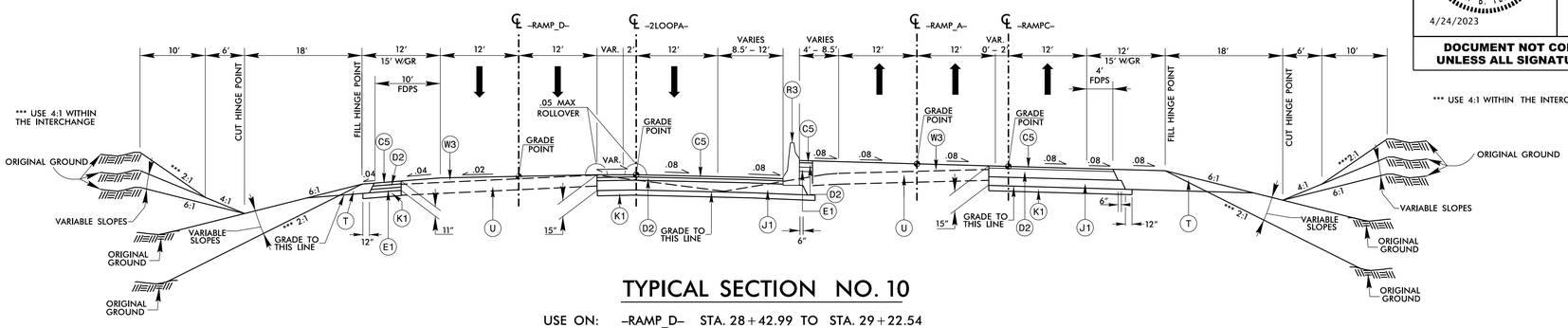
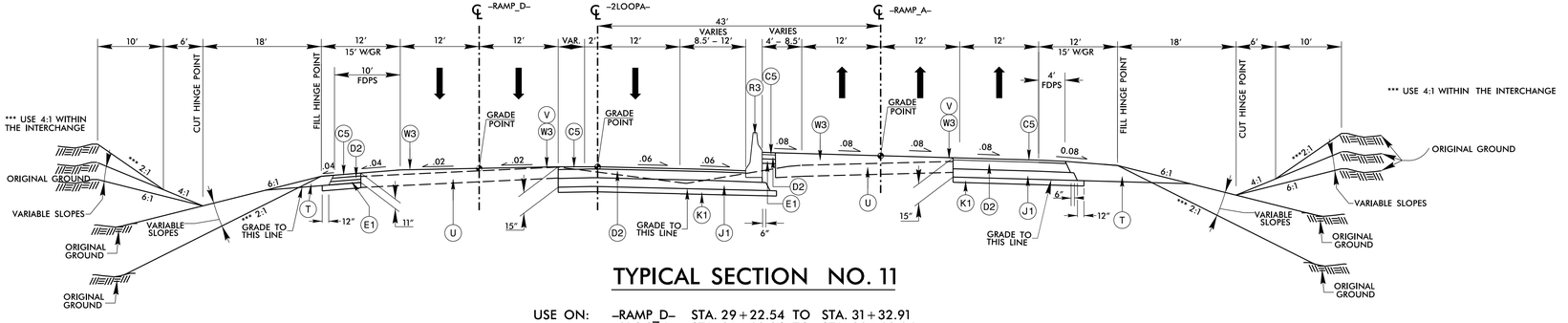


TYPICAL SECTION NO. 10

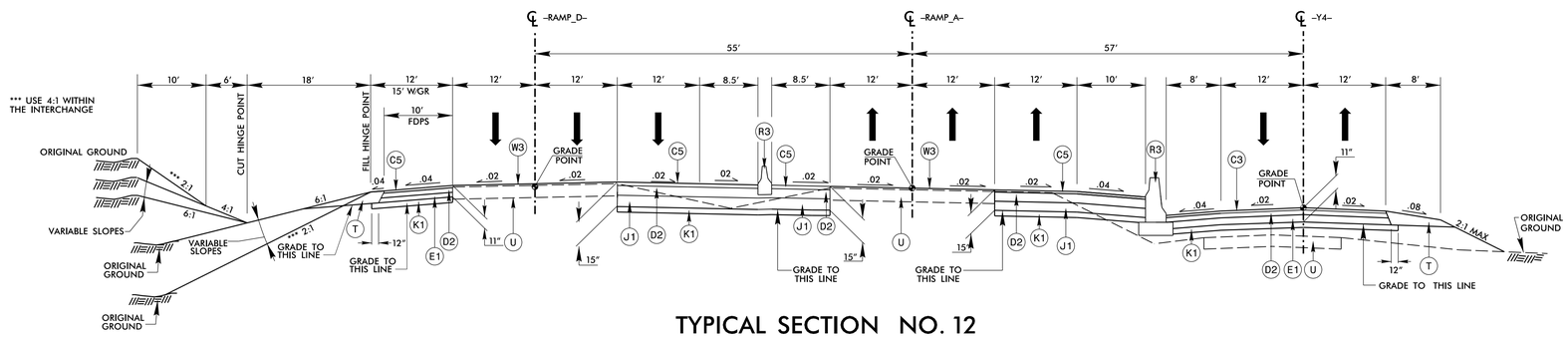
USE ON:
–RAMP_D– STA. 28+42.99 TO STA. 29+22.54
–2LOOPA– STA. 35+13.01 TO STA. 35+92.36
–RAMP_A– STA. 44+77.18 TO STA. 45+52.43
–RAMPC– STA. 23+14.98 TO STA. 23+88.90

NOTE: SEE PLANS FOR VARIABLE WIDTHS AND LOCATIONS FOR TYPICAL SECTION NO. 10 AND 11.



TYPICAL SECTION NO. 11

USE ON:
–RAMP_D– STA. 29+22.54 TO STA. 31+32.91
–2LOOPA– STA. 35+92.36 TO STA. 38+02.84
–RAMP_A– STA. 45+52.43 TO STA. 47+57.25



TYPICAL SECTION NO. 12

USE ON:
–RAMP_D– STA. 31+32.91 TO STA. 32+50.00
–RAMP_A– STA. 47+57.25 TO STA. 48+74.34
–Y4–STA. 11+47.94 TO STA. 16+00.00

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PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-6

ROADWAY DESIGN ENGINEER
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4/24/2023

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024964 JOSEPH T. HOLLAND
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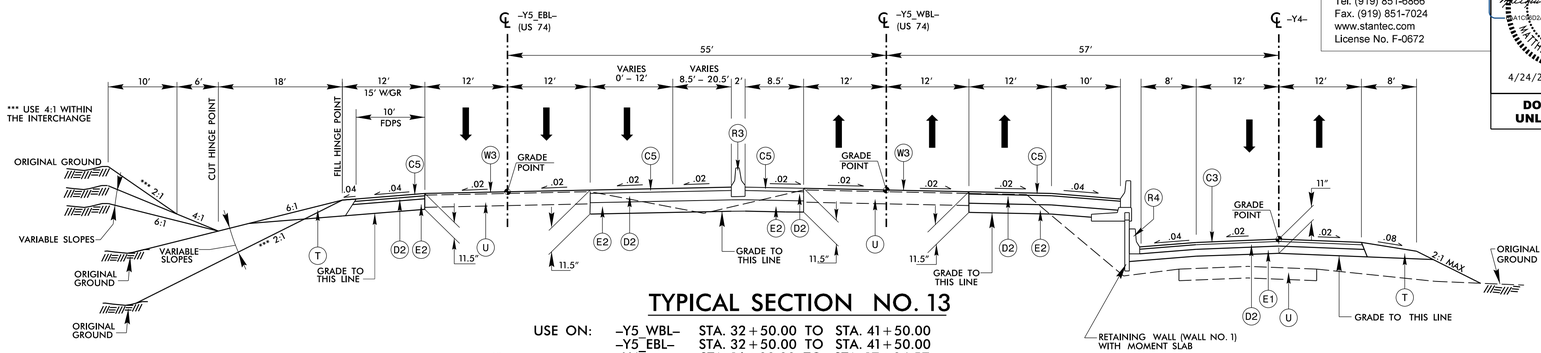
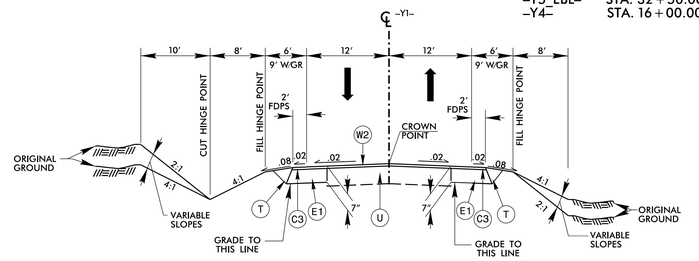


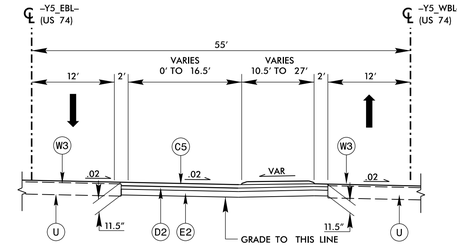
TYPICAL SECTION NO. 13

USE ON: –Y5_WBL– STA. 32+50.00 TO STA. 41+50.00
–Y5_EBL– STA. 32+50.00 TO STA. 41+50.00
–Y4– STA. 16+00.00 TO STA. 17+04.57



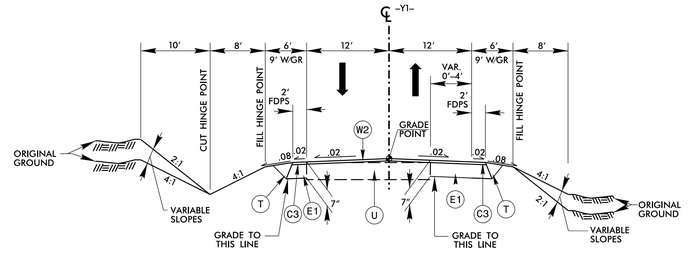
TYPICAL SECTION NO. 14

–Y1– STA. 10+00.00 TO STA. 12+50.00



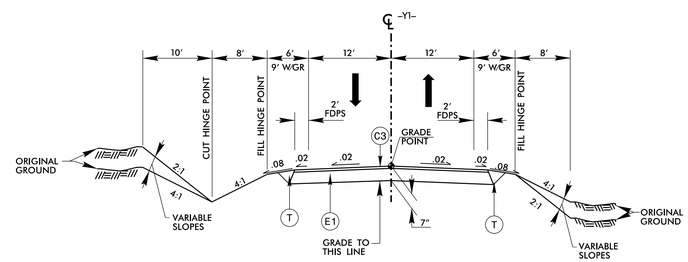
TYPICAL SECTION NO. 13A

USE ON: –Y5_WBL– (US 74) STA. 37+00.87 TO STA. 40+76.25
–Y5_EBL– (US 74) STA. 37+00.87 TO STA. 40+86.49



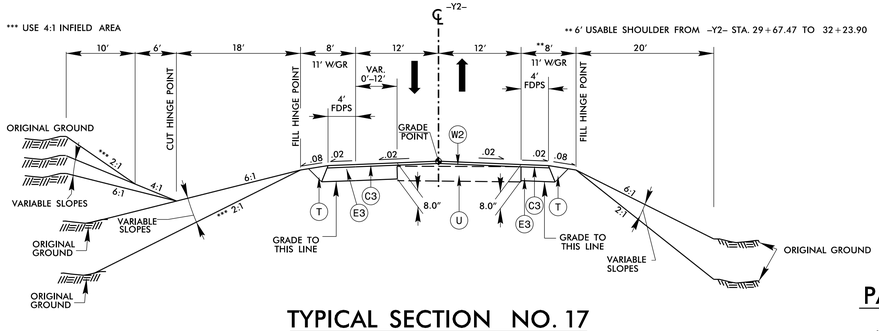
TYPICAL SECTION NO. 15

–Y1– STA. 12+50.00 TO STA. 14+87.68
STA. 24+99.01 TO STA. 29+30.30



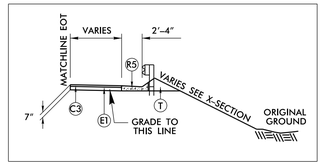
TYPICAL SECTION NO. 16

–Y1– STA. 14+87.68 TO STA. 18+82.63 (BEGIN BRIDGE)
STA. 20+80.38 (END BRIDGE) TO STA. 24+99.01



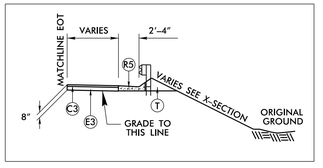
TYPICAL SECTION NO. 17

–Y2– STA. 11+00.00 TO STA. 14+03.91
STA. 26+31.59 TO STA. 32+23.90



PARTIAL TYPICAL SECTION NO. 15A

USE PARTIAL TYPICAL SECTION NO. 15A IN CONJUCTION WITH TYPICAL SECTION NO. 15 FOR SBG LOCATIONS
–Y1– STA. 18+50.00 TO STA. 18+68.49 (LT & RT)
–Y1– STA. 20+94.51 TO STA. 21+15.00 (LT & RT)



PARTIAL TYPICAL SECTION NO. 17A

USE PARTIAL TYPICAL SECTION NO. 17A IN CONJUCTION WITH TYPICAL SECTION NO. 17 FOR SBG LOCATIONS
–Y2– STA. 18+75.00 TO STA. 18+92.68 (LT & RT)

6/2/99

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C4	PROP. VAR. DEPTH, TYPE S9.5B
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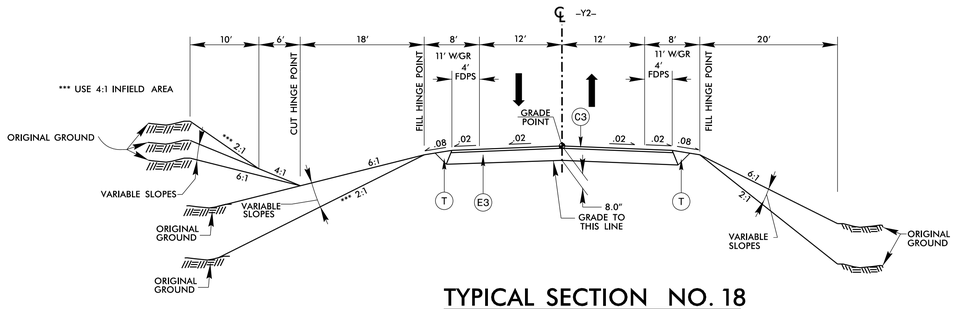
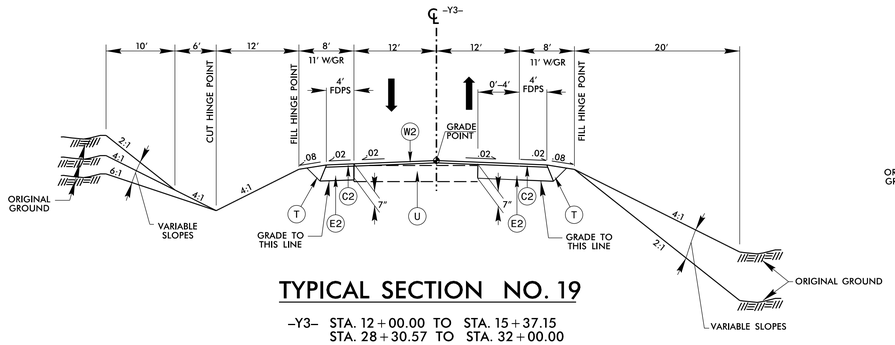


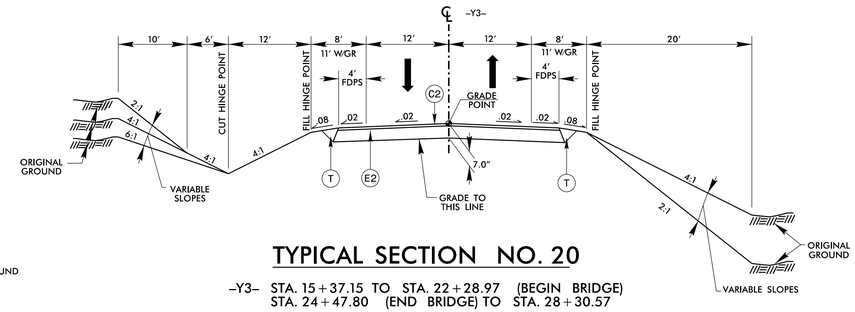
TYPICAL SECTION NO. 18

–Y2– STA. 14+03.91 TO STA. 19+16.80 (BEGIN BRIDGE)
STA. 21+18.64 (END BRIDGE) TO STA. 26+31.59



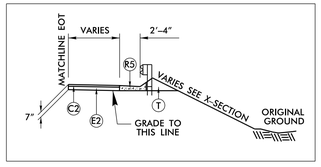
TYPICAL SECTION NO. 19

–Y3– STA. 12+00.00 TO STA. 15+37.15
STA. 28+30.57 TO STA. 32+00.00



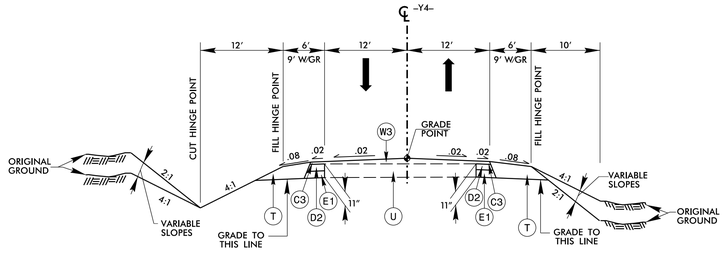
TYPICAL SECTION NO. 20

–Y3– STA. 15+37.15 TO STA. 22+28.97 (BEGIN BRIDGE)
STA. 24+47.80 (END BRIDGE) TO STA. 28+30.57



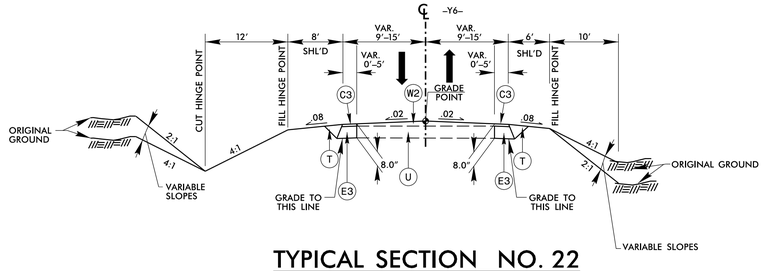
PARTIAL TYPICAL SECTION NO. 19A

USE PARTIAL TYPICAL SECTION NO. 19A IN CONJUCTION
WITH TYPICAL SECTION NO. 19 FOR SBG LOCATIONS
–Y3– STA. 21+45.00 TO STA. 22+15.01 (RT)



TYPICAL SECTION NO. 21

–Y4– STA. 9+90.00 TO STA. 11+47.94
–Y4– STA. 17+04.57 TO STA. 21+77.40



TYPICAL SECTION NO. 22

–Y6– STA. 8+35.00 TO STA. 9+88.00

NOTES:
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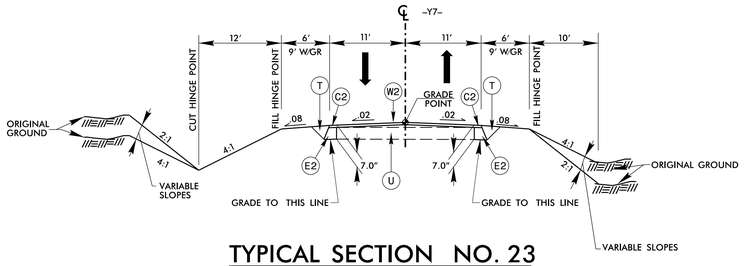
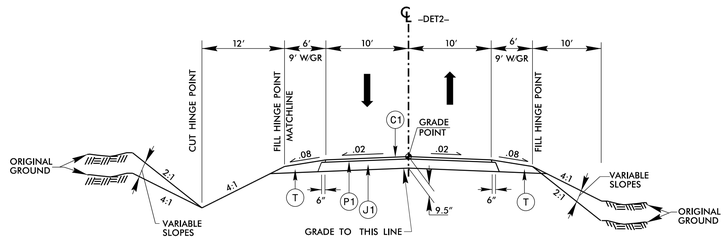
D1	PROP. APPROX. 2.5", I19.0C
D2	PROP. APPROX. 4", I19.0C
D3	PROP. VAR. DEPTH, TYPE I19.0C
E1	PROP. APPROX. 4.0", TYPE B25.0C
E2	PROP. APPROX. 4.5", TYPE B25.0C
E3	PROP. APPROX. 5.0", TYPE B25.0C
E4	PROP. APPROX. 7.0", TYPE B25.0C
E5	PROP. VAR. DEPTH, TYPE B25.0C
J1	PROP. 8" DEPTH AGGREGATE BASE COURSE.
J2	VARIABLE AGGREGATE BASE COURSE
K1	SUBGRADE STABILZATION
K2	PROP CLASS IV SUBGRADE STABILZATION
N1	GEOTEXTILE FOR SUBGRADE STABILIZATION
P1	PRIME COAT
R1	2'-6" CONCRETE CURB AND GUTTER
R2	CONCRETE EXPRESSWAY GUTTER
R3	STANDARD CONCRETE MEDIAN BARRIER (T SERIES)
R4	SINGLE FACED CONCRETE BARRIER
R5	SHOULDER BERM GUTTER.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	1.5" MILLING
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)
W3	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)

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



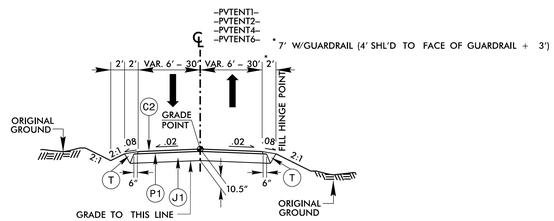
TYPICAL SECTION NO. 23

–Y7– STA. 9+10.00 TO STA. 9+88.00



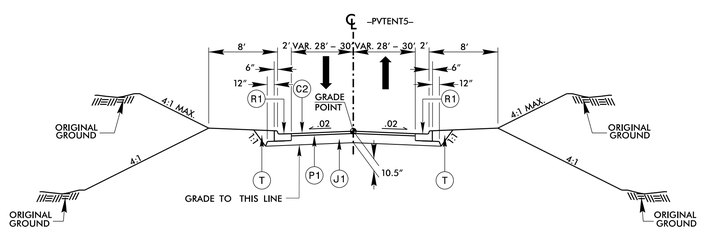
TYPICAL SECTION NO. 25

USE ON: –DET2– STA. 10+00.00 TO STA. 12+94.38



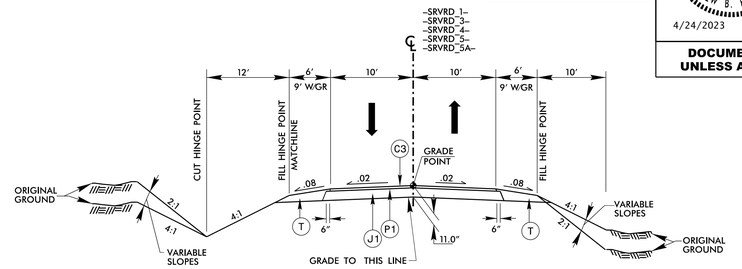
TYPICAL SECTION NO. 26

USE ON:	–PVTENT1–	STA. 05+65.72 TO STA. 09+88.00
	–PVTENT2–	STA. 10+12.00 TO STA. 14+20.00
	–PVTENT4–	STA. 10+10.00 TO STA. 12+80.00
	–PVTENT6–	STA. 10+12.00 TO STA. 12+50.00



TYPICAL SECTION NO. 27

USE ON: –PVTENT5– STA. 10+12.18 TO STA. 10+85.00

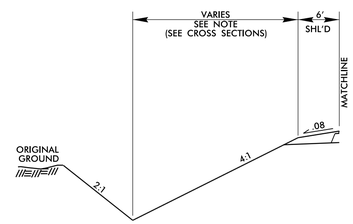


TYPICAL SECTION NO. 24

USE ON:

–SRVRD_1–	STA. 10+12.03	TO STA. 25+80.19 (SEE NOTE BELOW)
–SRVRD_3–	STA. 12+00.00	TO STA. 24+50.00 (5' SHOULDER 15+00 – 17+30 LT)
–SRVRD_4–	STA. 9+78.55	TO STA. 20+20.00 (END ASPHALT PAVEMENT AT R/W)
–SRVRD_5–	STA. 10+10.00	TO STA. 22+96.49 (USE 8' DITCH WIDTH)
–SRVRD_5A–	STA. 10+00.00	TO STA. 13+38.14

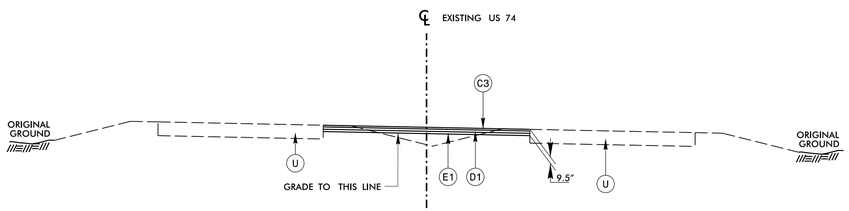
NOTE: USE 8' TOTAL SHOULDER (6' PAVED SHOULDER) –SRVRD_1– 10+12.00 TO 13+00.00



PARTIAL TYPICAL SECTION NO. 24A

USE PARTIAL TYPICAL SECTION NO. 24A IN CONJUCTION WITH TYPICAL SECTION NO. 24
NOTE: MAINTAIN DITCH GRADE 6' BELOW SUBGRADE DUE TO GROUNDWATER

USE ON:	–SRVRD_4–	STA. 13+50.00 TO STA. 16+00.00 (LEFT)
	–SRVRD_5–	STA. 13+00.00 TO STA. 18+00.00 (LEFT)
	–SRVRD_5–	STA. 13+50.00 TO STA. 18+00.00 (RIGHT)



TYPICAL SECTION NO. 28

NOTE: FOR MAINTENANCE OF TRAFFIC ONLY (SEE TMP PLANS)

NOTES:
1. DISTANCE WILL VARY TO REACH THE DESIRED ELEVATION AS ESTABLISHED BY THE DITCH GRADE. (SEE PROFILES AND CROSS SECTIONS)

Stantec
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License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-8

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 044480 ENGINEER MATTHEW B FERGUSON
4/24/2023

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T HOLLAND
4/25/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/2/99

SUMMARY OF SHOULDER DRAIN, SHOULDER DRAIN PIPE, & CONCRETE OULET PADS

STATION	STATION	LOCATION	OUTLET LOCATION	SHOULDER DRAIN PIPE (FT)	SHOULDER DRAIN (FT)	OUTLET PIPE (FT)	CONCRETE PAD	REMARKS
662+33.39	696+00.00	LT. OUTSIDE		3367	3367			
			662+33.39			18	1	
			665+00			4	1	
			667+00			28		TIE TO 2GI 613
			669+85			48		TIE TO 2GI 617
			671+00			28	1	
			673+30			20		TIE TO 2GI 701
			676+00			18	1	
			677+60			23		TIE TO 2GI 704
			680+00			32	1	
			682+00			N/A		TIE TO 2GI 708
			687+50			N/A		TIE TO 2GI 806
			690+00			18	1	
			691+10			20		TIE TO 2GI 801
			694+00			18	1	
			696+00			20		TIE TO 2GI 814
737+00.00	765+50.00	LT. OUTSIDE		2850	2850			
			739+00			N/A		TIE TO 2GI 1201
			741+10			N/A		TIE TO 2GI 1208
			741+20			N/A		TIE TO 2GI 1207
			744+00			65	1	
			747+00			46	1	
			750+00			48		TIE TO 2GI 1210
			756+00			7		TIE TO 2GI 1301
			759+00			18	1	
			762+00			18	1	
			764+40			N/A		TIE TO 2GI 1312
			765+50			N/A		TIE TO 2GI 1401
796+30.00	809+00.00	LT. OUTSIDE		1270	1270			
			796+30			19	1	
			797+05			N/A		TIE TO 2GI 1608
			798+50			18		TIE TO 2GI 1605
			801+50			18	1	
			804+65			N/A		TIE TO 2GI 1601
			807+00			22	1	
811+00.00	830+50.00	LT. OUTSIDE		1950	1950			
			811+00			N/A		TIE TO 2GI 1714
			813+00			N/A		TIE TO 2GI 1719
			816+00			70	1	
			818+00			15	1	
			821+00			18	1	
			823+30			21		TIE TO 2GI 1811
			826+00			18	1	
			828+00			20		TIE TO 2GI 1822
			830+50			19		TIE TO 2GI 1826
843+50.00	847+00.00	LT. OUTSIDE		350	350			
			846+50			N/A		TIE TO 2GI 1915
			847+00			N/A		TIE TO 2GI 1916
640+00.00	685+40.00	RT. OUTSIDE		4540	4540			
			641+00			17		TIE TO 2GI 402
			644+00			82	1	
			646+75			N/A		TIE TO 2GI 501
			647+10			N/A		TIE TO 2GI 502
			648+40			20		TIE TO 2GI 505
			651+00			27		TIE TO 2GI 508
			652+00			64	1	
			654+50			N/A		TIE TO 2GI 510
			656+00			N/A		TIE TO 2GI 511
			658+50			39	1	
			660+50			20		TIE TO 2GI 601
			663+00			18	1	
			665+00			18	1	
			667+00			23		TIE TO 2GI 611
			668+50			N/A		TIE TO 2GI 609
			671+50			25	1	
			673+30			N/A		TIE TO 2GI 702
			675+00			16	1	
			677+50			18.5		TIE TO 2GI 705
			680+00			21	1	
			682+00			N/A		TIE TO 2GI 711

STATION	STATION	LOCATION	OUTLET LOCATION	SHOULDER DRAIN PIPE (FT)	SHOULDER DRAIN (FT)	OUTLET PIPE (FT)	CONCRETE PAD	REMARKS
745+00.00	764+40.00	RT. OUTSIDE		1940	1940			
			745+00			32	1	
			745+50			20		TIE TO 2GI 1214
			748+00			18	1	
			750+00			48		TIE TO 2GI 1212
			752+50			18	1	
			755+50			8		TIE TO 2GI 1305
			759+00			N/A		TIE TO 2GI 1308
			760+00			N/A		TIE TO 2GI 1309
			761+00			N/A		TIE TO 2GI 1310
			763+00			28	1	
			764+40			N/A		TIE TO 2GI 1313
785+00.00	809+00.00	RT. OUTSIDE		2400	2400			
			787+50			N/A		TIE TO 2GI 1506
			790+50			40	1	
			791+90			N/A		TIE TO 2GI 1509
			792+50			N/A		TIE TO 2GI 1510
			793+10			N/A		TIE TO 2GI 1611
			796+00			90	1	
			798+50			20		TIE TO 2GI 1606
			800+00			18	1	
			802+00			20		TIE TO 2GI 1603
			804+00			18	1	
			805+50			20		TIE TO 2GI 1615
			807+00			18	1	
811+00.00	817+50.00	RT. OUTSIDE		650	650			
			811+00			N/A		TIE TO 2GI 1713
			816+00			34	1	
819+00.00	830+00.00	RT. OUTSIDE		1100	1100			
			821+20			20		TIE TO 2GI 1814
			822+75			20		TIE TO 2GI 1812
			825+15			20		TIE TO 2GI 1820
			828+00			20		TIE TO 2GI 1821
			830+00			18	1	
841+00.00	847+00.00	RT. OUTSIDE		600	600			
			841+50			N/A		TIE TO 2GI 1901
			843+50			N/A		TIE TO 2GI 1903
			845+00			18	1	
			847+00			30		TIE TO 2GI 1913
640+00	662+33.39	LT. MEDIAN		2233	2233			
			641+00			19		TIE TO 2GI 403
			642+90			20		TIE TO 2GI 404
			647+05			19		TIE TO 2GI 503
			648+40			21		TIE TO 2GI 504
			651+00			19		TIE TO 2GI 507
			656+00			19		TIE TO 2GI 512
			660+50			19		TIE TO 2GI 602
785+50	796+30	LT. MEDIAN		1080	1080			
			787+50			19		TIE TO 2GI 1505
			792+50			19		TIE TO 2GI 1508
			793+10			19		TIE TO 2GI 1610
841+00.00	847+00.00	LT. MEDIAN		600	600			
			843+50			19		TIE TO 2GI 1904
			847+00			19		TIE TO 2GI 1912
685+40.00	696+00.00	RT. MEDIAN		1060	1060			
			687+95			19		TIE TO 2GI 804
			690+70			20		TIE TO 2GI 803
			696+00			19		TIE TO 2GI 815
737+00.00	745+00.00	RT. MEDIAN		800	800			
			741+10			20		TIE TO 2GI 1206
			742+00			19		TIE TO 2GI 1205
841+00.00	847+00.00	RT. MEDIAN		600	600			
			843+50			19		TIE TO 2GI 1904
			847+00			17		TIE TO 2GI 1912

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-9

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044480 ENGINEER MATTHEW B FERGUSON

4/24/2023

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T HOLLAND

4/25/2023

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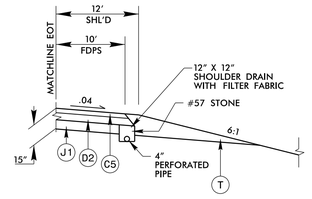
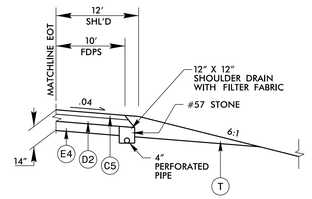
PAVEMENT SCHEDULE	
C5	PROP. APPROX. 3.0", TYPE S9.5C
D2	PROP. APPROX. 4.0", I19.0C
E4	PROP. APPROX. 7.0", TYPE B25.0C
J1	PROP. 8" AGGREGATE BASE COURSE.
T	EARTH MATERIAL



SHOULDER DRAIN DETAIL

NEW CONSTRICTION – ABC DESIGN



SHOULDER DRAIN DETAIL

NARROW WIDENING

4/24/2023
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mferguson

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-10

ROADWAY DESIGN ENGINEER — 4/24/2023

PAVEMENT DESIGN ENGINEER — 4/25/2023

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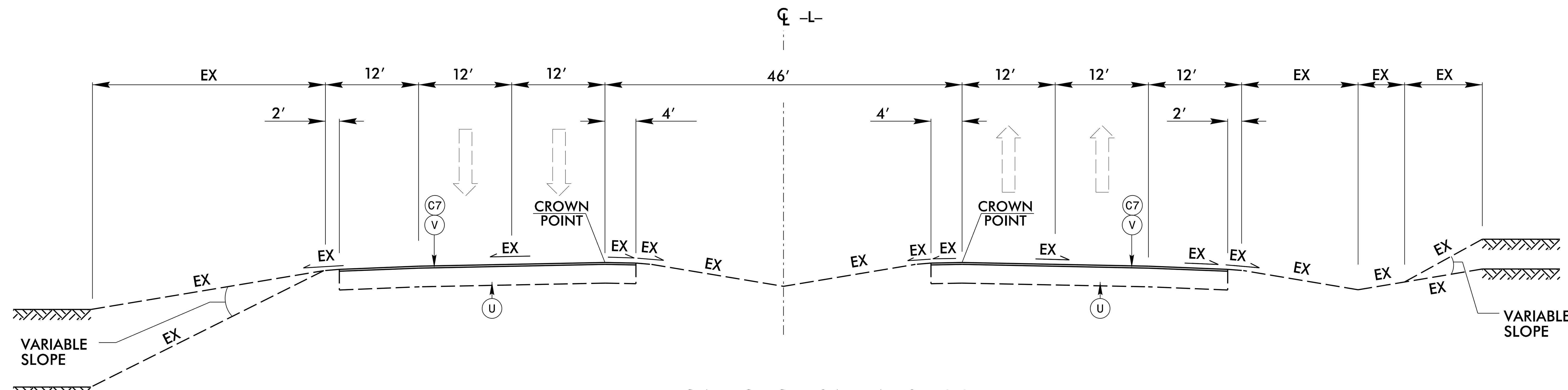
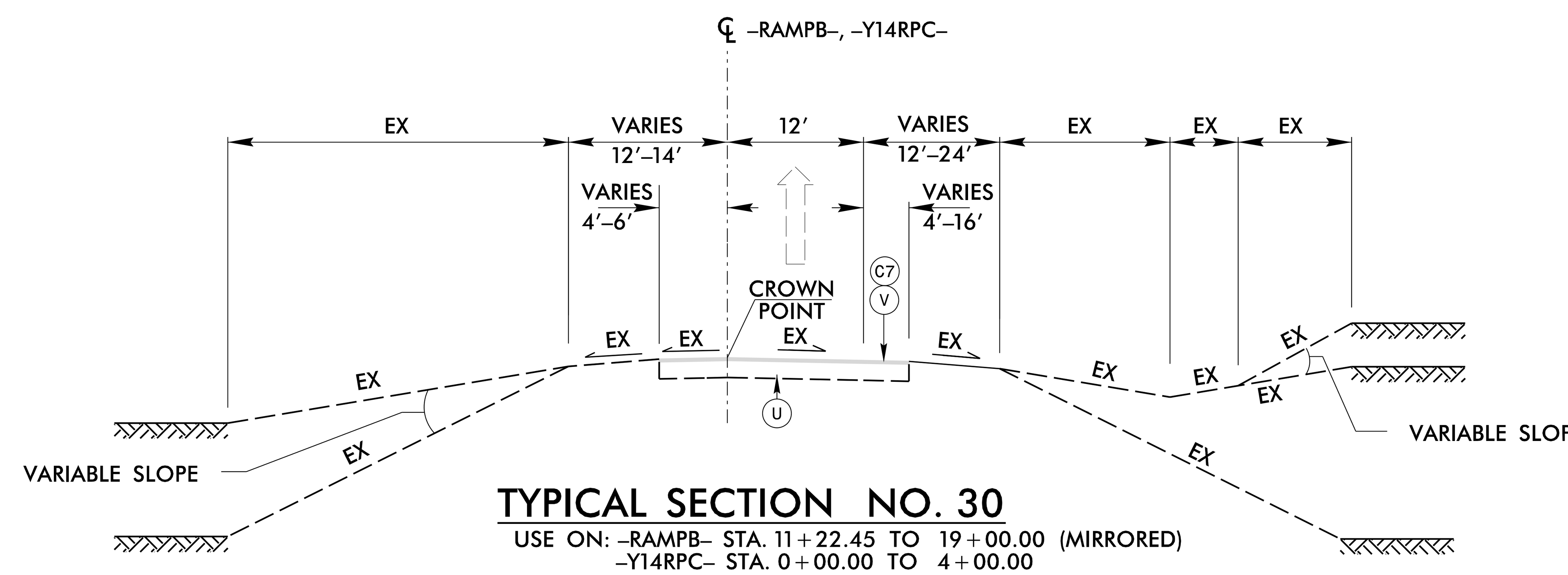
PAVEMENT SCHEDULE	
C7	PROP. APPROX. 1.5", TYPE S9.5C
U	EXISTING PAVEMENT
V	1.5" MILLING



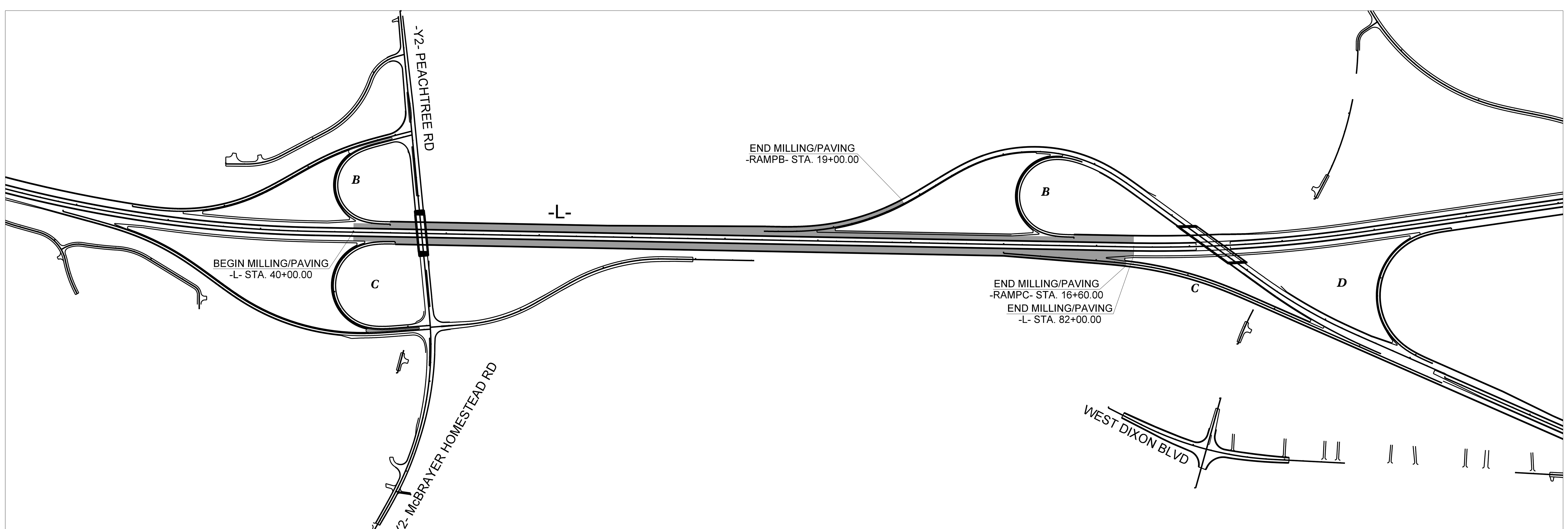
TYPICAL SECTION NO. 29

USE ON: -L- STA. 40+00.00 TO 82+00.00



TYPICAL SECTION NO. 30

USE ON: -RAMPB- STA. 11+22.45 TO 19+00.00 (MIRRORED)
-Y14RPC- STA. 0+00.00 TO 4+00.00

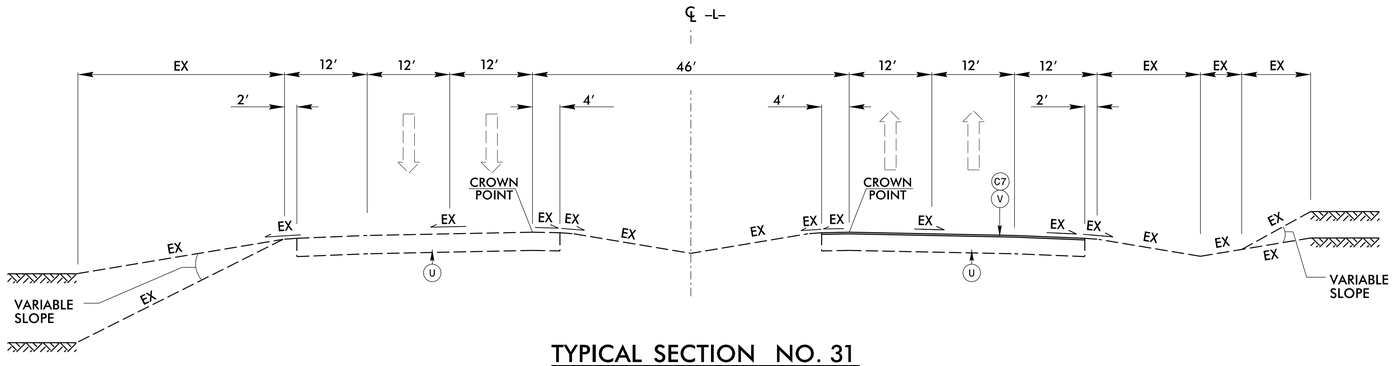


SCHEMATIC MAP

MILLING AND PAVING LIMITS

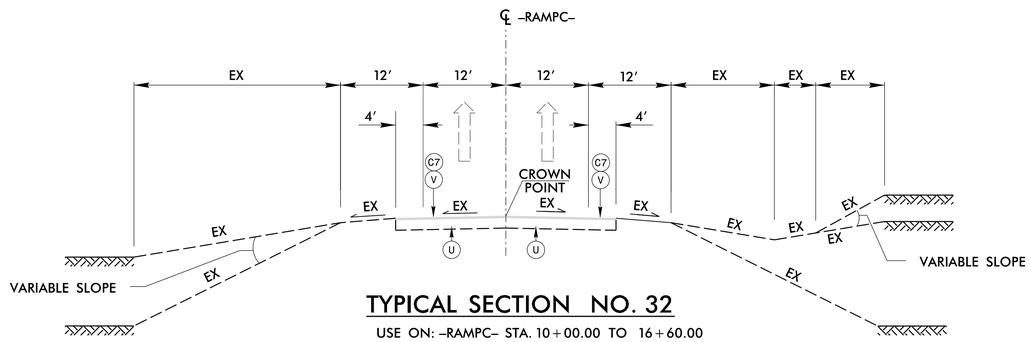
6/2/99

PAVEMENT SCHEDULE	
C7	PROP. APPROX. 1.5", TYPE S9.5C
U	EXISTING PAVEMENT
V	1.5" MILLING



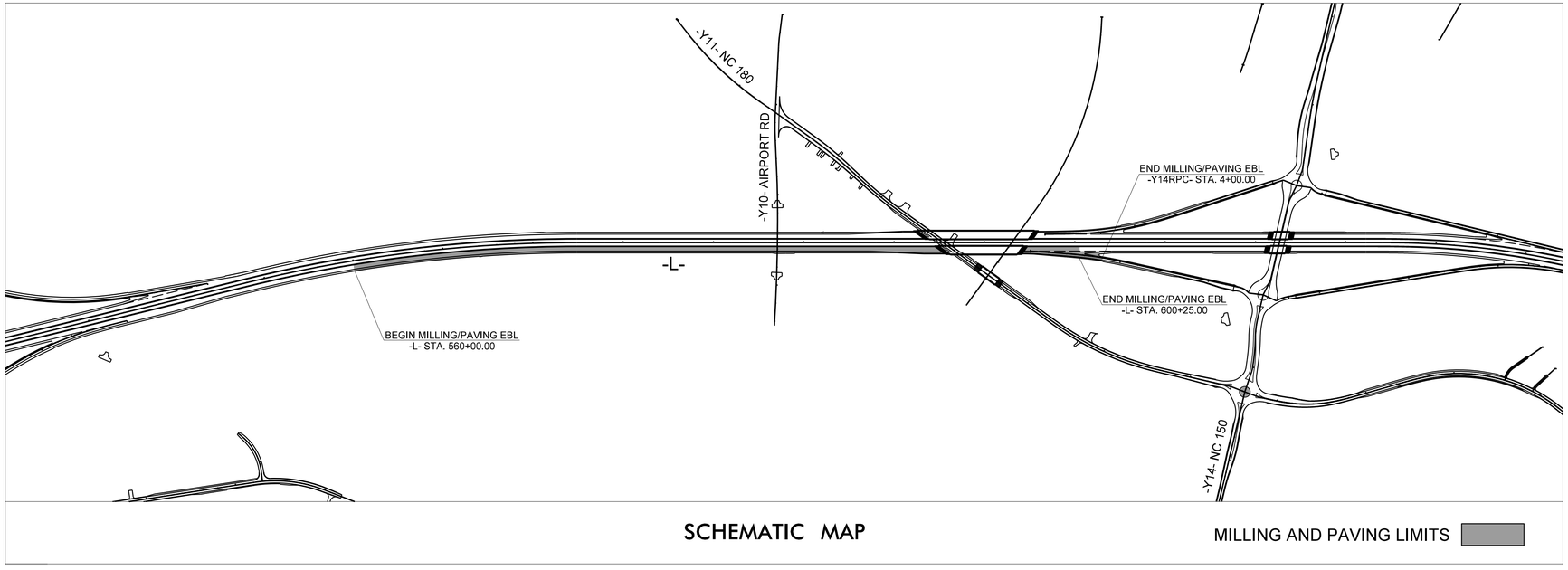
TYPICAL SECTION NO. 31

USE ON: –L– STA. 560+00.00 TO 592+27.99 BRIDGE (EBL)
–L– BRIDGE STA. 597+35.97 TO 600+25.00 (EBL)



TYPICAL SECTION NO. 32

USE ON: –RAMPC– STA. 10+00.00 TO 16+60.00



SCHEMATIC MAP

MILLING AND PAVING LIMITS

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2A-11

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044480 ENGINEER MATTHEW B FERGUSON

4/24/2023

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH T HOLLAND

4/25/2023

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4/21/2023
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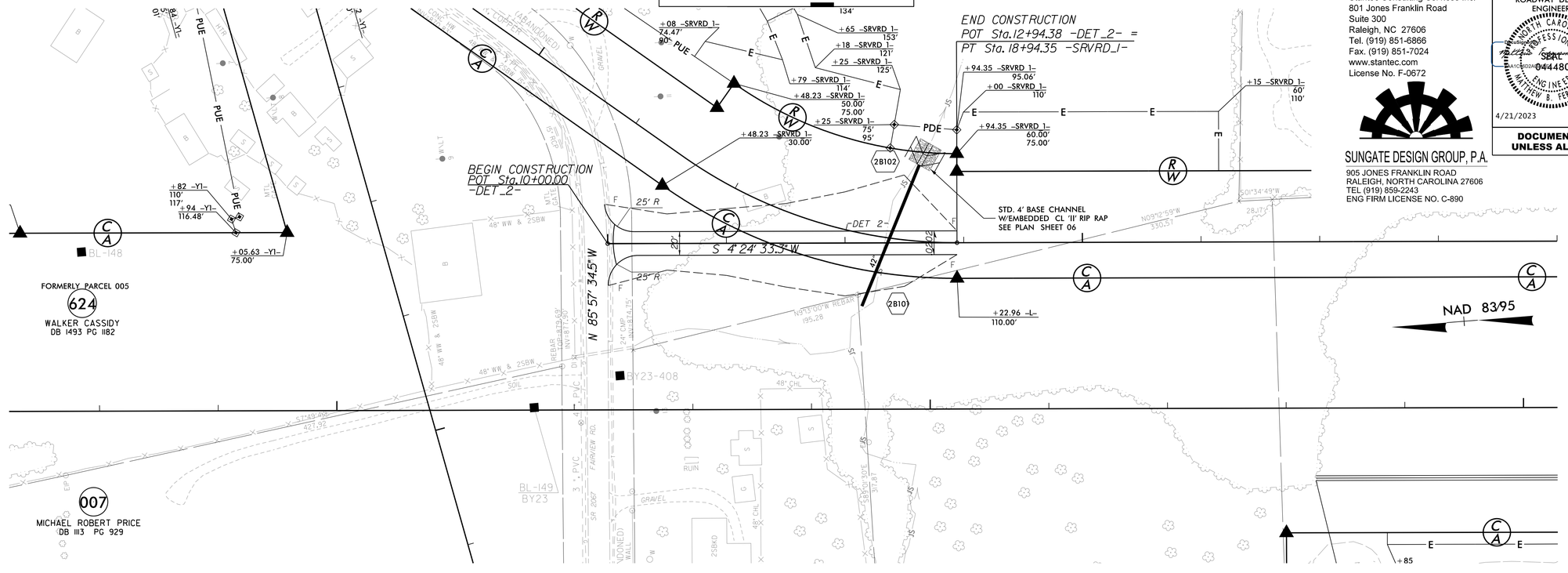
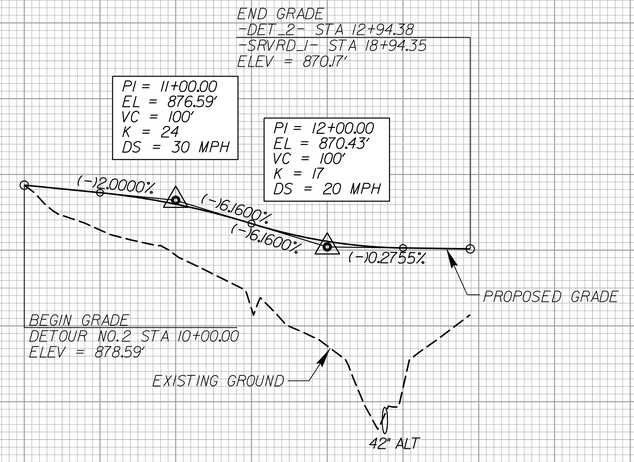
mferguson

-DET_2-





PIPE HYDRAULIC DATA

42" ALTERNATE Sta. 12+38-DET 2-

DRAINAGE AREA	= 34.6	AC
DESIGN FREQUENCY	= 10	YRS
DESIGN DISCHARGE	= 70	CFS
DESIGN HW ELEVATION	= 851.0	FT
100 YEAR DISCHARGE	= 85	CFS
100 YEAR HW ELEVATION	= 851.59	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 110	CFS
OVERTOPPING ELEVATION	= 863.0	FT

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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 044480 ENGINEER MATTHEW B. FERGUSON
4/21/2023

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
4/21/2023

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REVISIONS

8/17/99

4/4/2023
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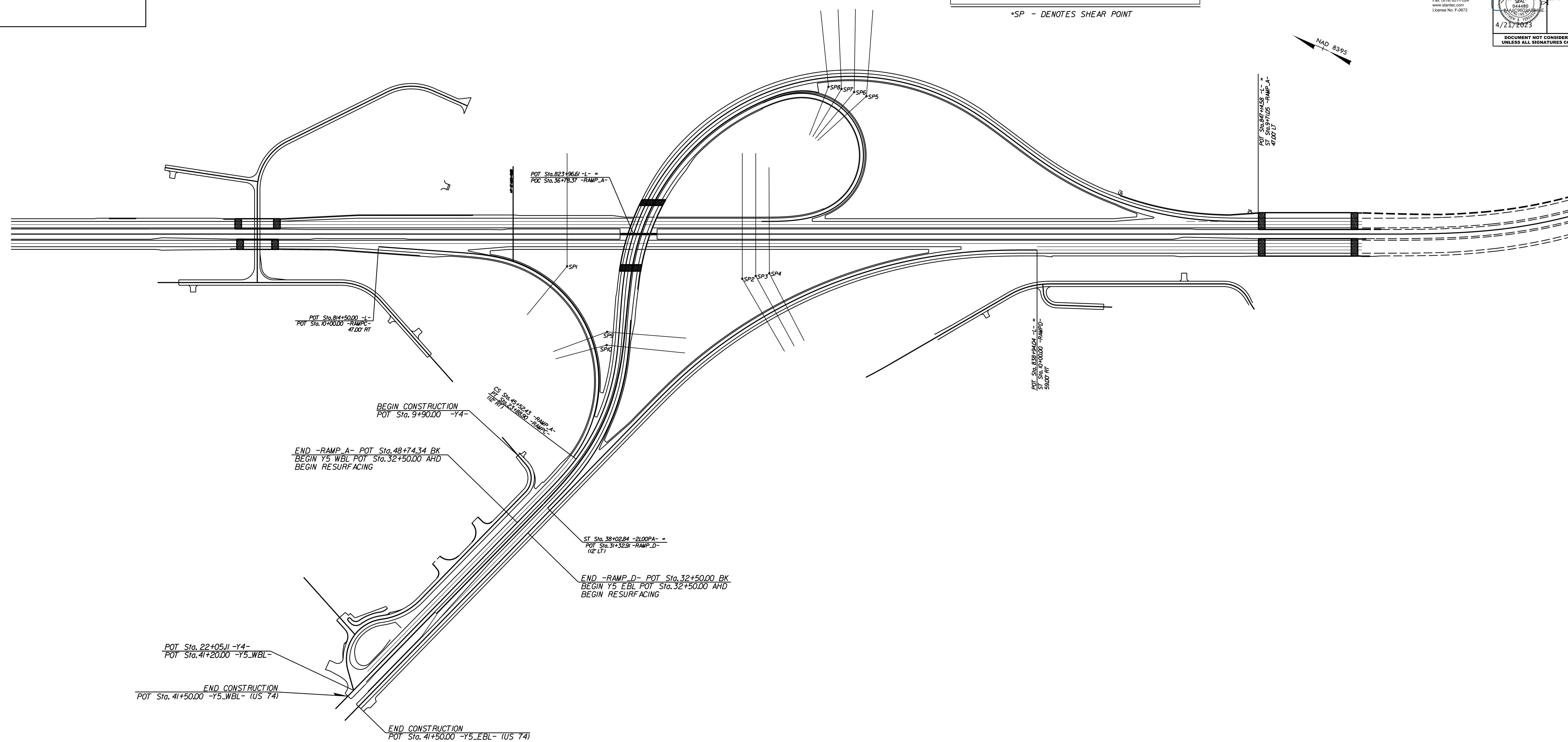
mferguson

REVISIONS

SHEAR POINT DIAGRAM

•SP - DENOTES SHEAR POINT



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www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2B-2

ROADWAY DESIGN ENGINEER

DocuSigned by: Matthew Ferguson
6AA1C96D2A0B4BE...
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044480 MATTHEW B. FERGUSON
4/21/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION:
SHELBY BYPASS
TRUMPET INTERCHANGE
SHEAR POINT DIAGRAM

TIP NO.: R-2707D COUNTY: CLEVELAND

DESIGNED BY: JW

CHECKED BY: SS DATE: 11/14/22

8/17/99

Stantec
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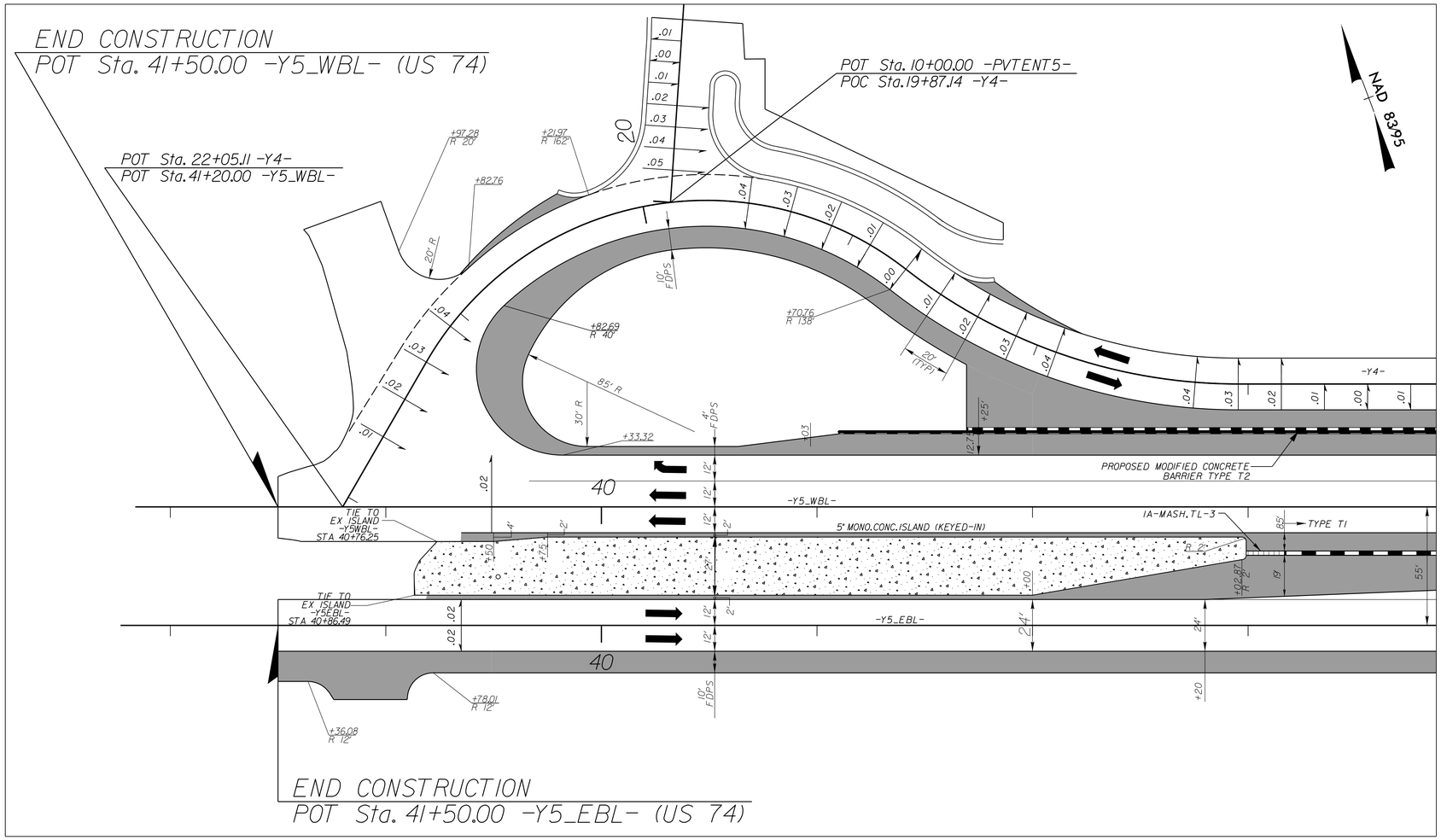
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2B-3

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044480 MATTHEW B. FERGUSON
4/21/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INTERSECTION DETAILS



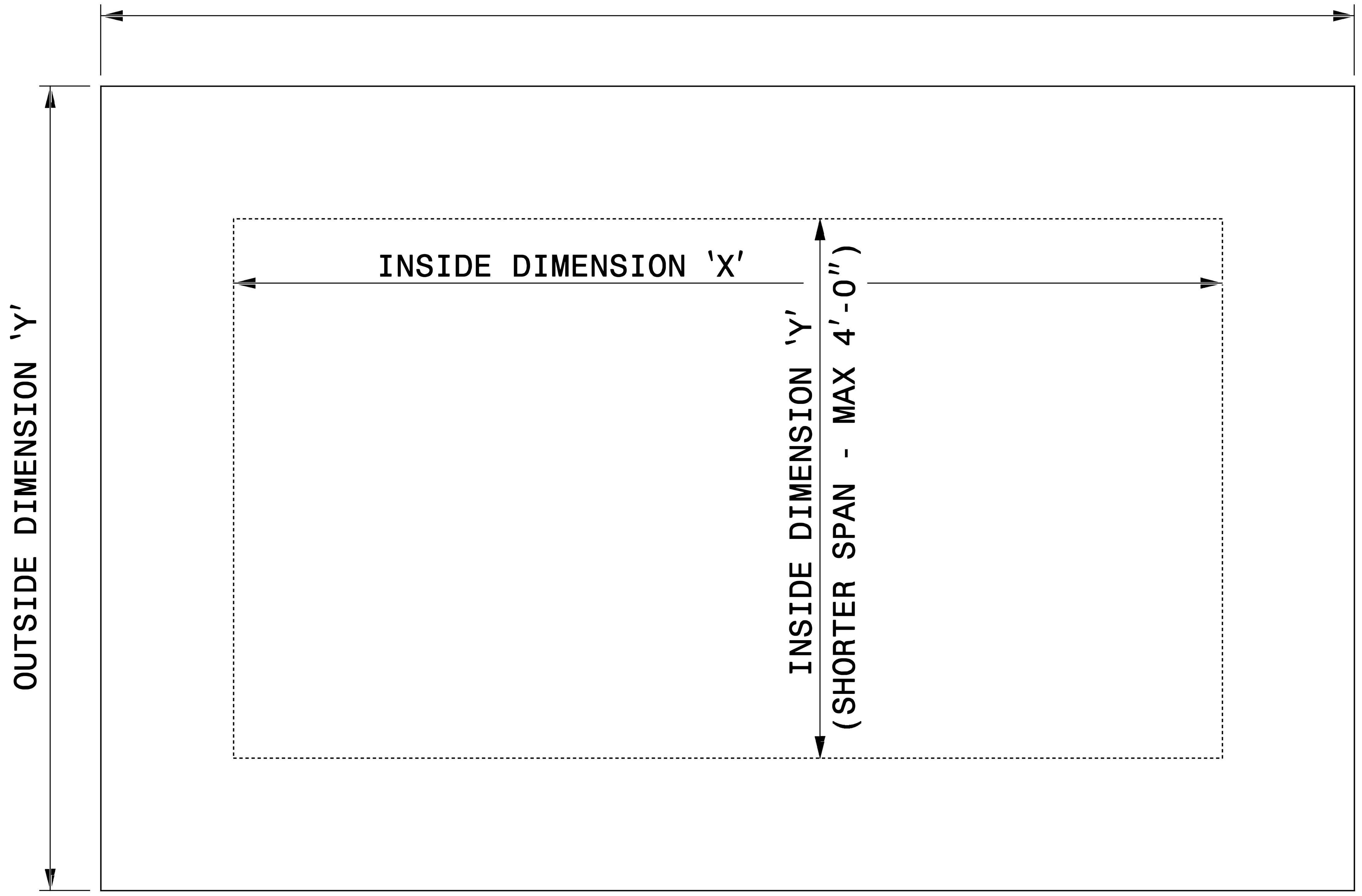
–Y5–

INTERSECTION DETAIL SHOWN FROM PLAN SHEET 26

30 15 0 30 60

4/4/2023
C:\Users\mferguson\Documents\pw_working\dms42562\R2707D_RDY_PSH_02B-3.dgn
mferguson

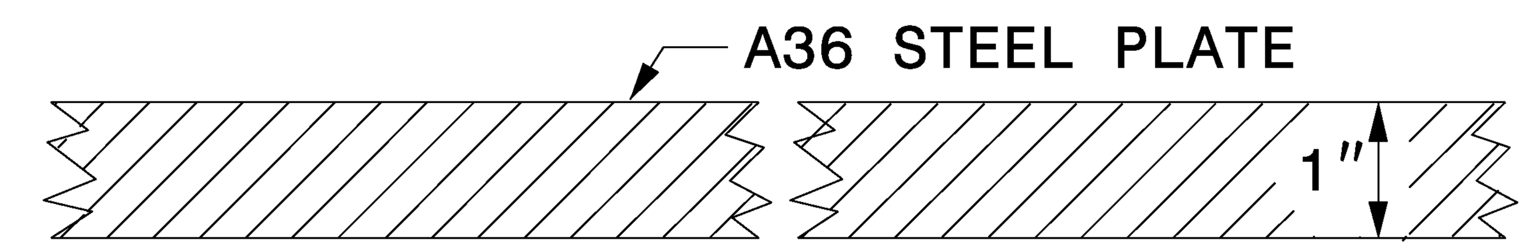
PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2C-1



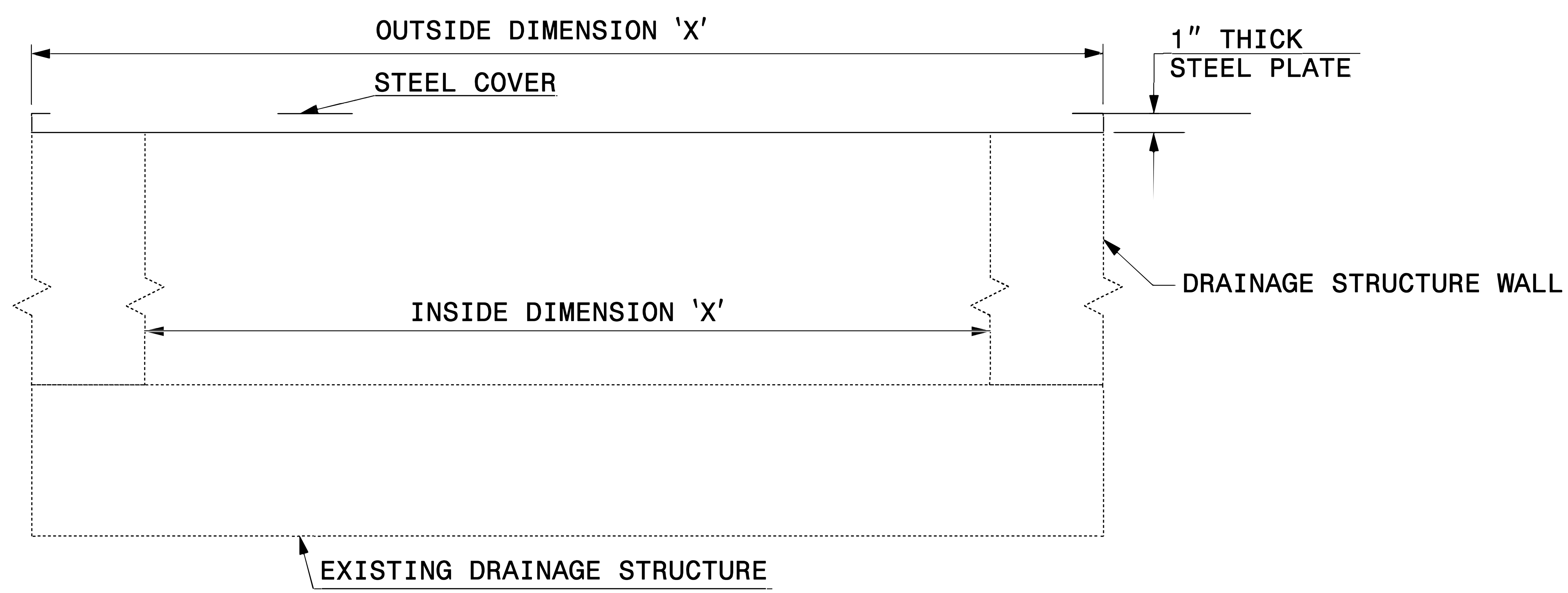
PLAN VIEWS

GENERAL NOTES:

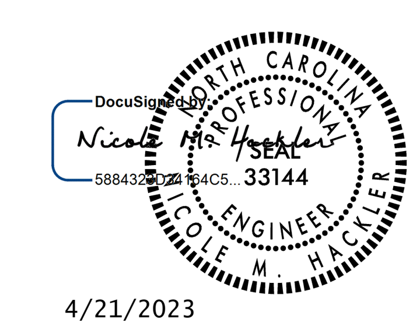
- -USE GRADE A36 STEEL
- -STEEL COVERS ARE FOR TEMPORARY USE DURING PHASE CONSTRUCTION.
- -FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
- -SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
- -QUANTITES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



SECTION VIEW OF STEEL TOP PLATE



ELEVATION VIEWS



4/21/2023

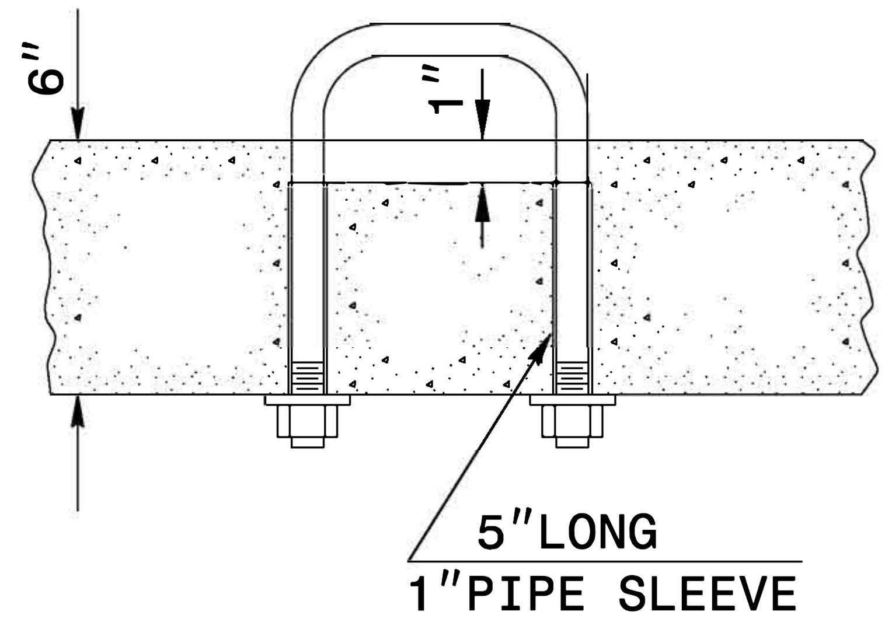
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

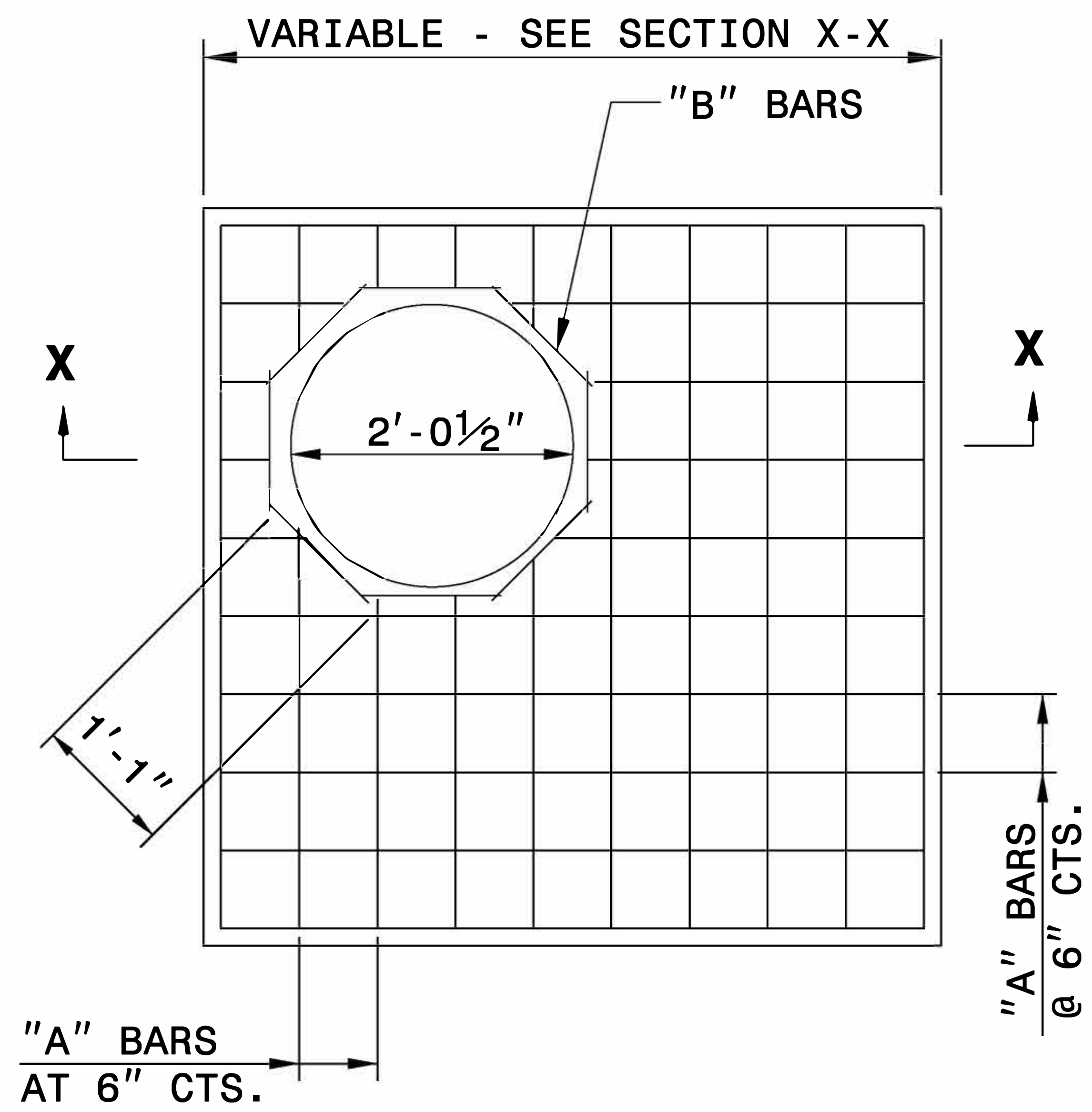
DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE

ORIGINAL BY: E.E. WARD DATE: 2-2-98
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: eric:/usr/details/metric/stand/stlcvr2.dgn

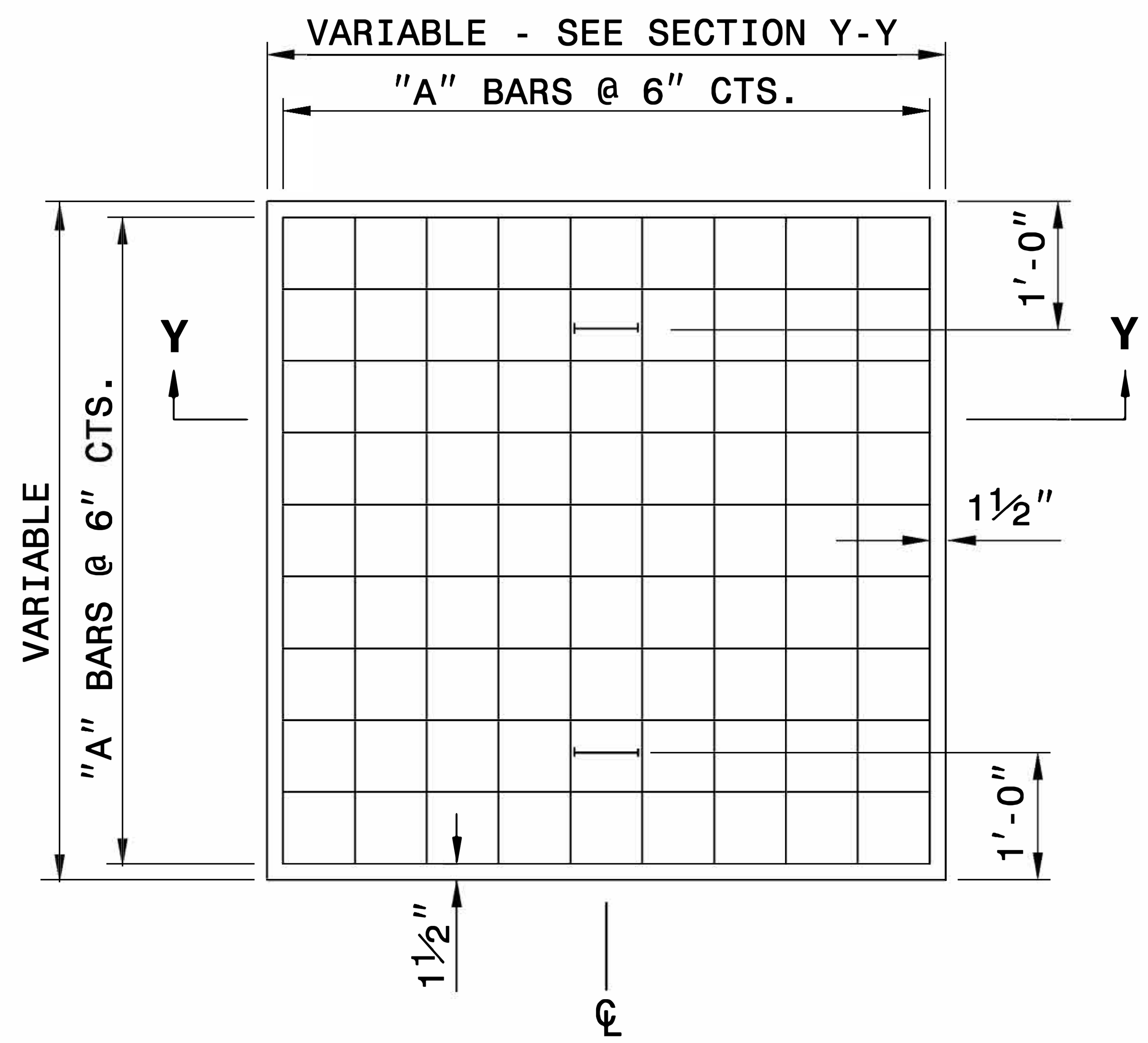
$$$$$$SYSTIME$$$$$$ $$$$$$DGN$$$$$$ $$$$$$USERNAME$$$$$$



PARTIAL SECTION



PLAN



PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

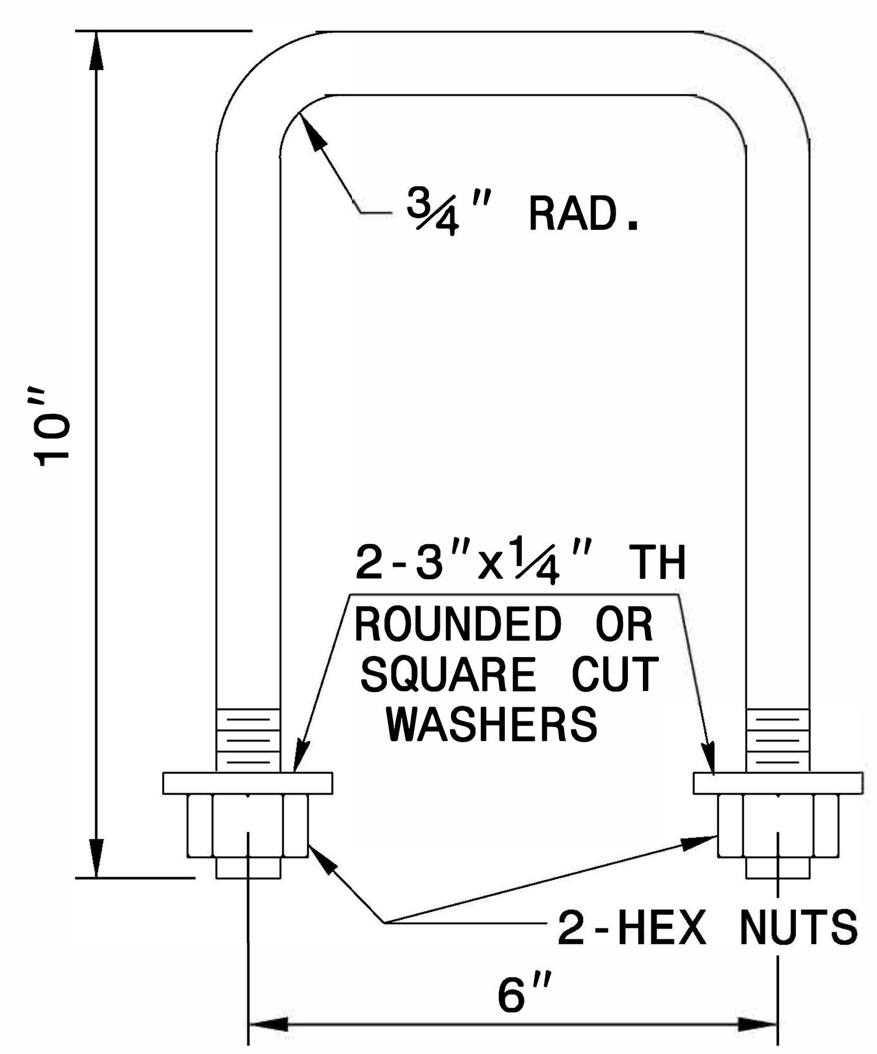
THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

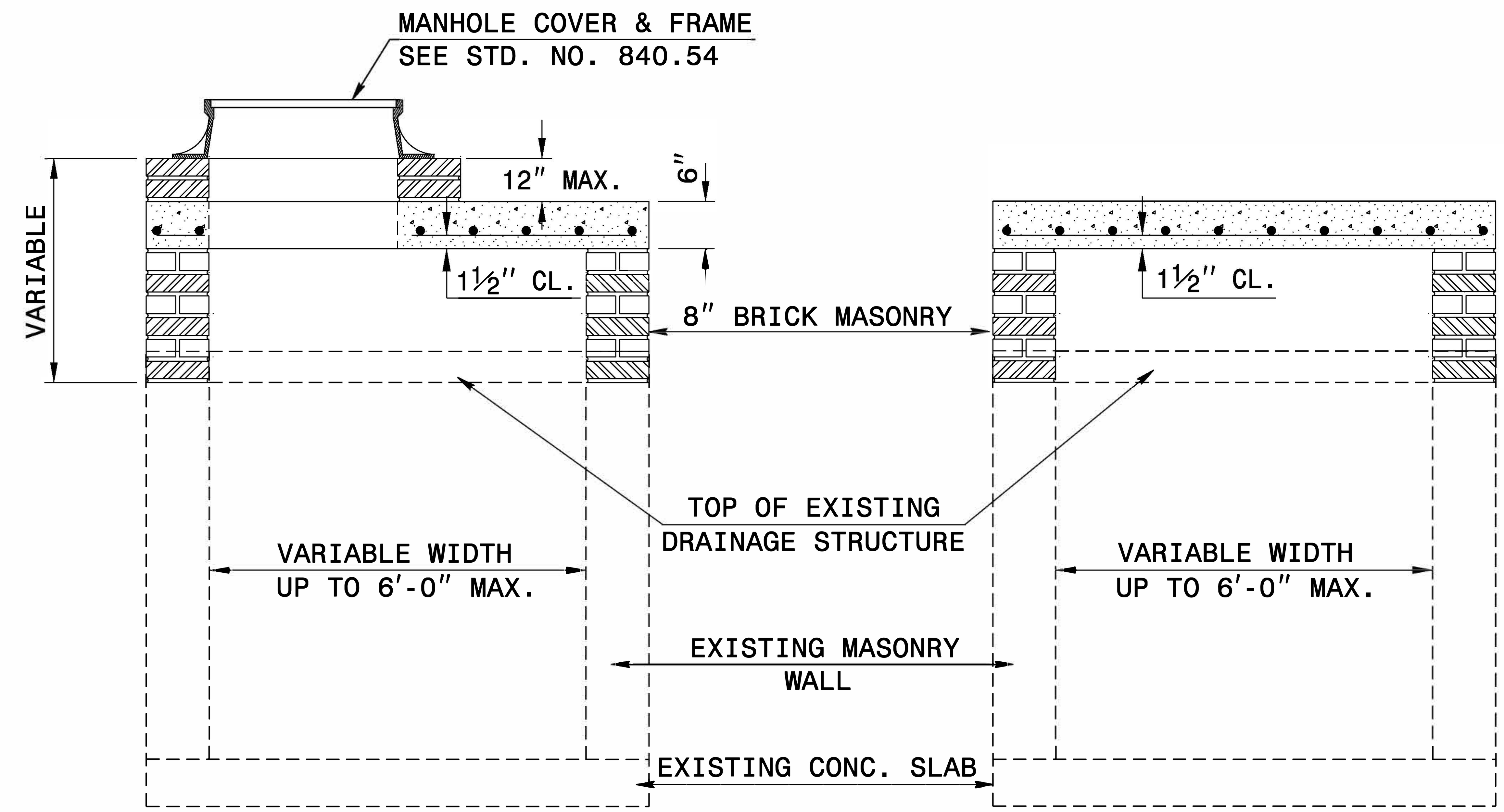
BILL OF MATERIALS

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

4/21/2023

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

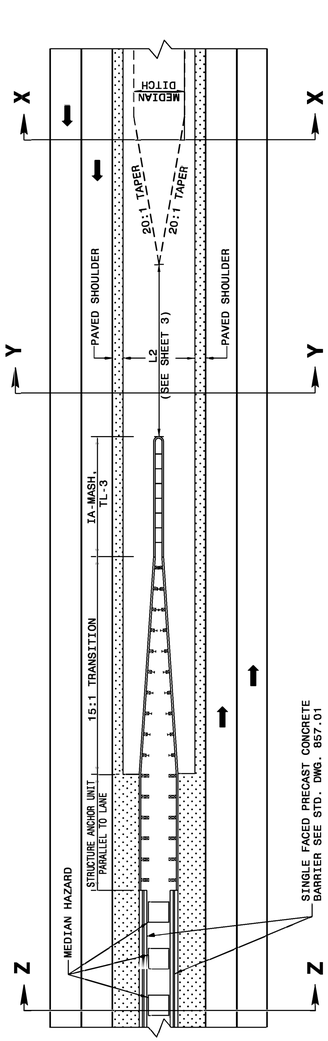
ORIGINAL BY: T.S.S. DATE: NOV.1997
MODIFIED BY: T.S.S. DATE: FEB.2000
CHECKED BY: DATE:
FILE SPEC.: ds174:/usr/details/stand/boxtojbe.dgn

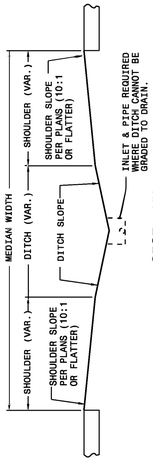
PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2C-3

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

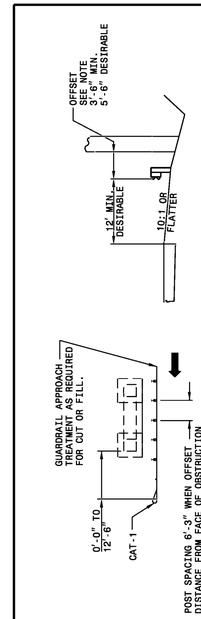
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01





DETAIL OF MEDIAN TREATMENT AT UNDERPASS



NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-1½" POST SPACING AT A POINT 25' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

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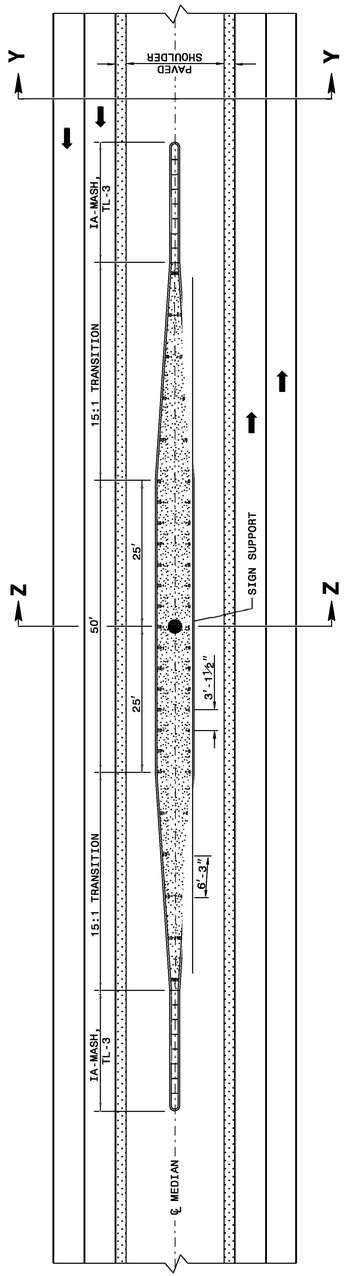
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

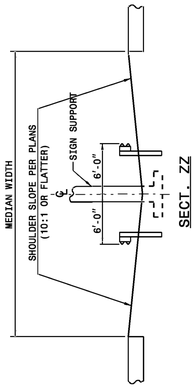
SHEET 1 OF 11
862D01

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

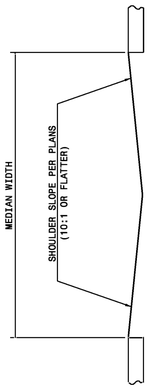
SHEET 2 OF 11
862D01





NOTE SPECIAL LAYER OF PAVEMENT .....

USE 3'-1½" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.
GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STARDARD 862.01 SHEET 1 OF 12).



DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01

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

SEE TITLE BLOCK

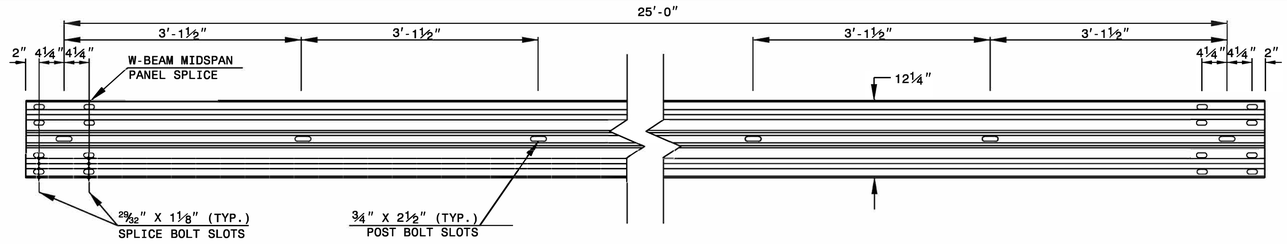
ORIGINAL BY: J HOWERTON DATE: 08-23-18
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2C-4
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

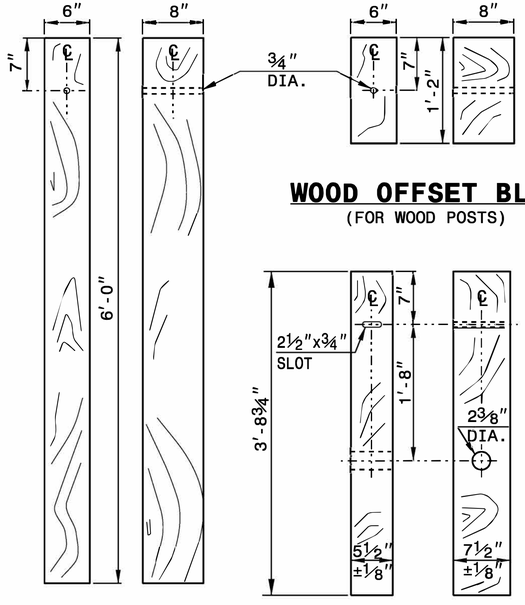
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



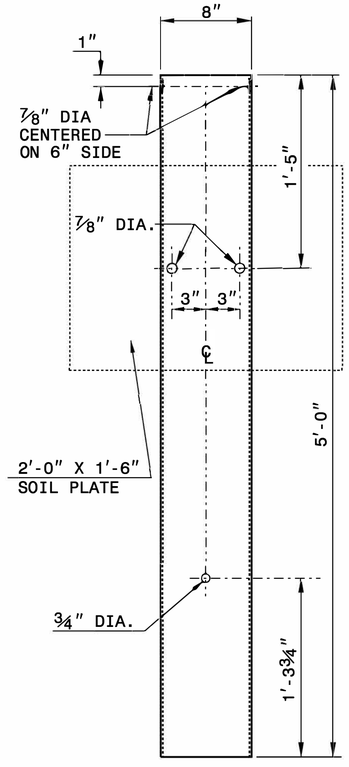
STANDARD W-BEAM GUARDRAIL



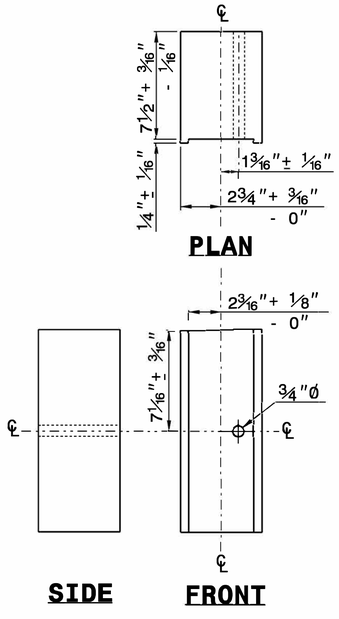
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



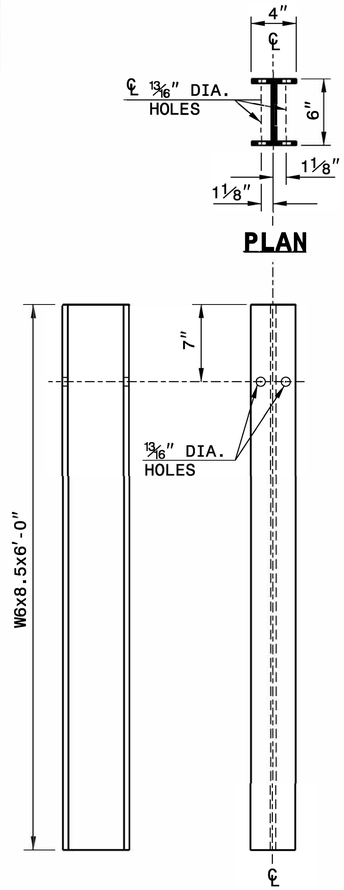
STEEL TUBE
TS 6"x8"x0.1875"



PLAN

SIDE **FRONT**

ROUTED OFFSET BLOCK



PLAN

SIDE **FRONT**

"W6" STEEL POST

SYSTEM PARTS

STATE OF
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

4/21/2023

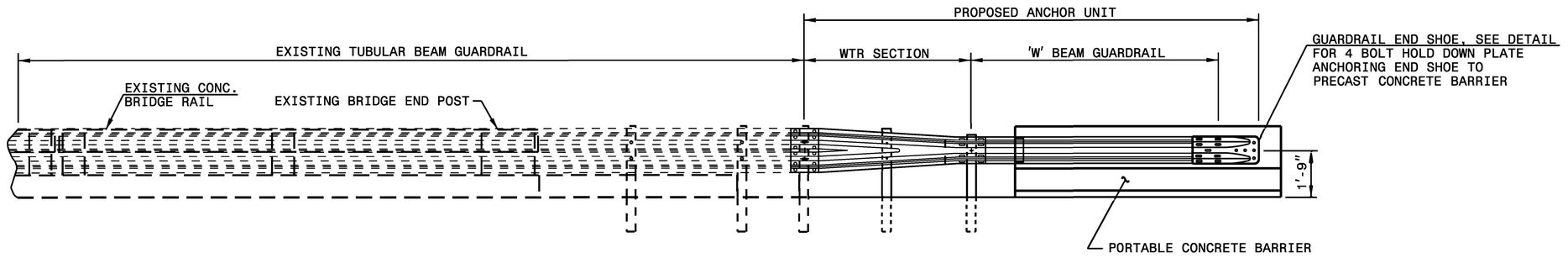
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

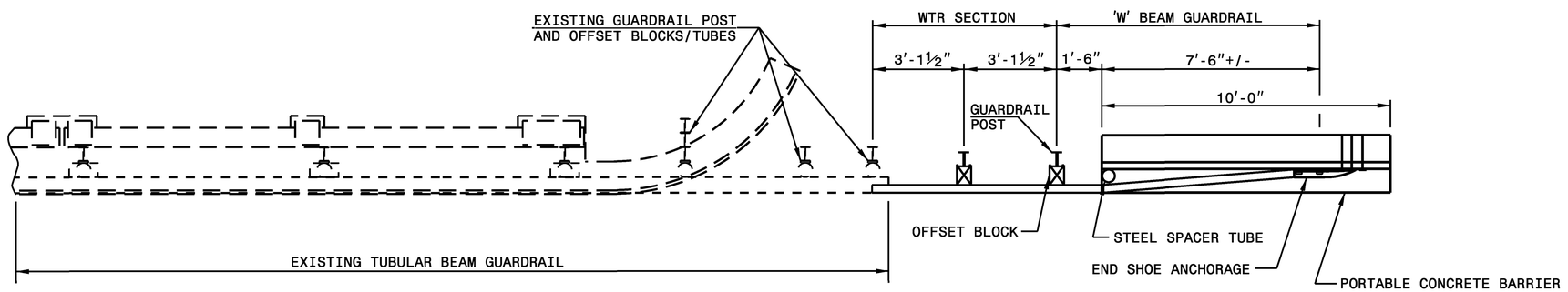
ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

5/14/99

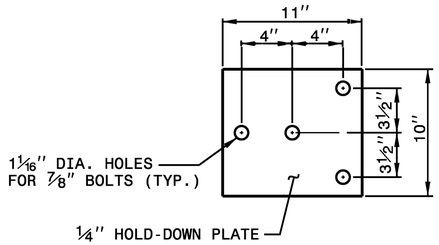
PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2C-5



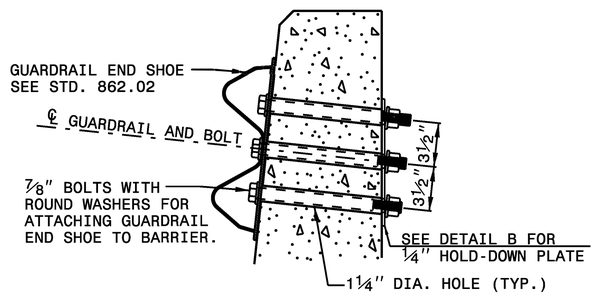
ELEVATION VIEW



PLAN VIEW



4 BOLT HOLD DOWN PLATE



PART SECTION OF BARRIER

THRU END SHOE SECTION AND
4 BOLT HOLD DOWN PLATE

NOTES FOR 4 BOLT HOLD DOWN PLATE

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 4 - ⅞" DIA. BOLTS WITH NUTS AND WASHERS.

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

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. DRILL 1¼" DIA. HOLES WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER MARK E. HARKINS
4/21/2023

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

TEMPORARY ANCHOR UNIT CONECTING TUBULAR BEAM GUARDRAIL TO PORTABLE CONCRETE BARRIER

ORIGINAL BY: E.E. WARD DATE: 9-9-04
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: \usr\details\stand\862stds\anc.dgn

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

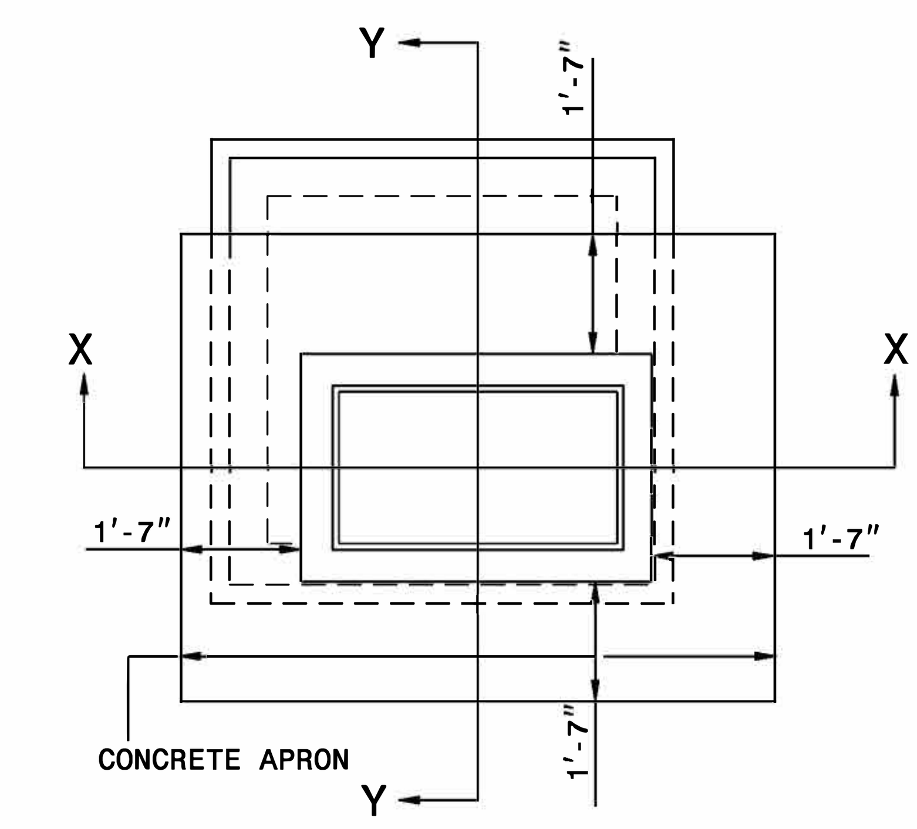
11-SEP-2017 11:55
S:\Contracts\Contracts\Special Details\jhowerton\840D17 Minimum Depth Type A.dgn
jhowerton AT CSD-292595

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2C-6

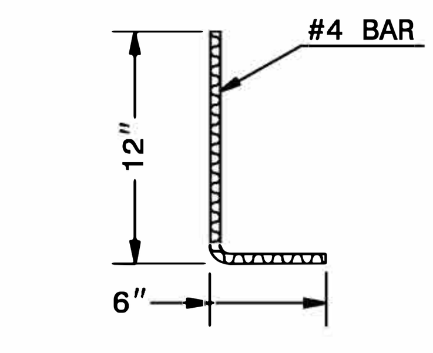
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH
12" THRU 72" PIPE

SHEET 1 OF 2
840d17



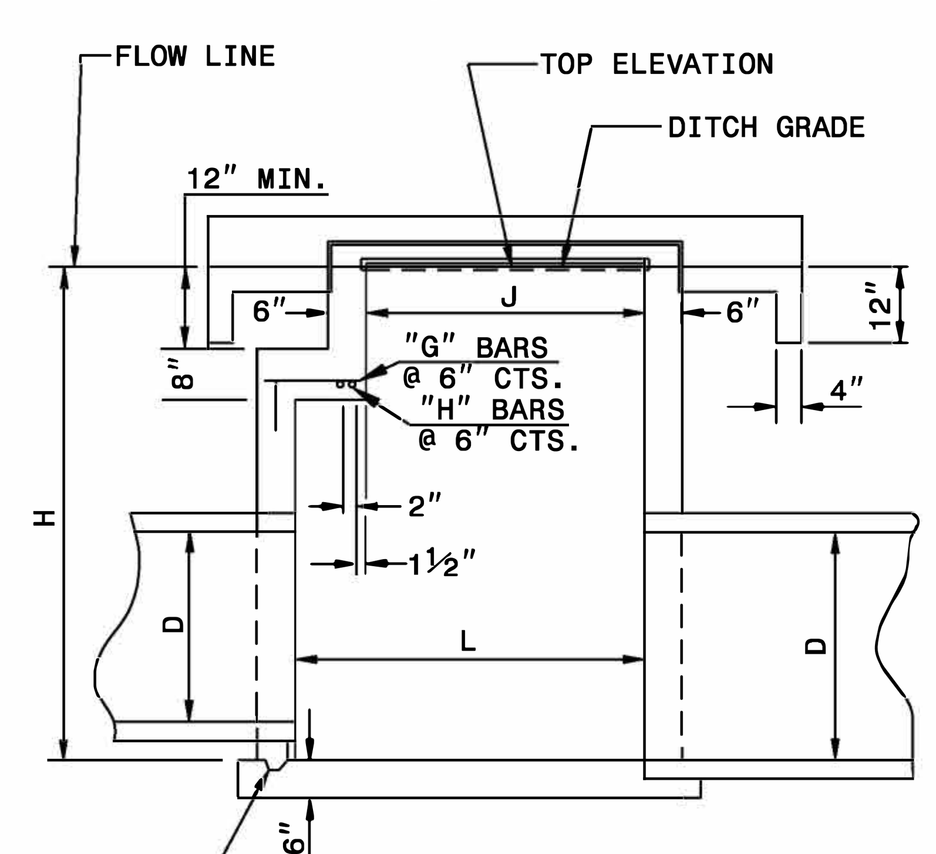
PLAN



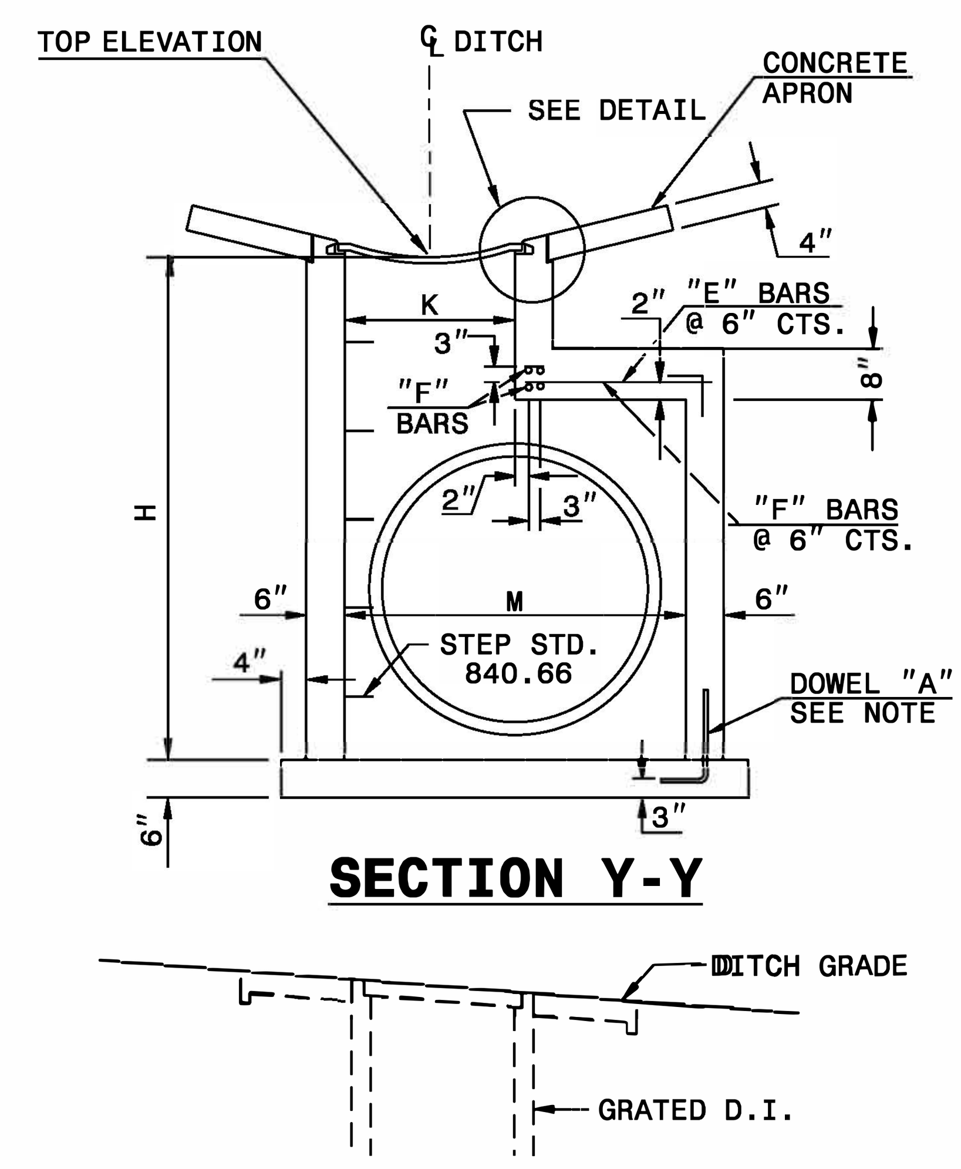
DOWEL-A

GENERAL NOTES:

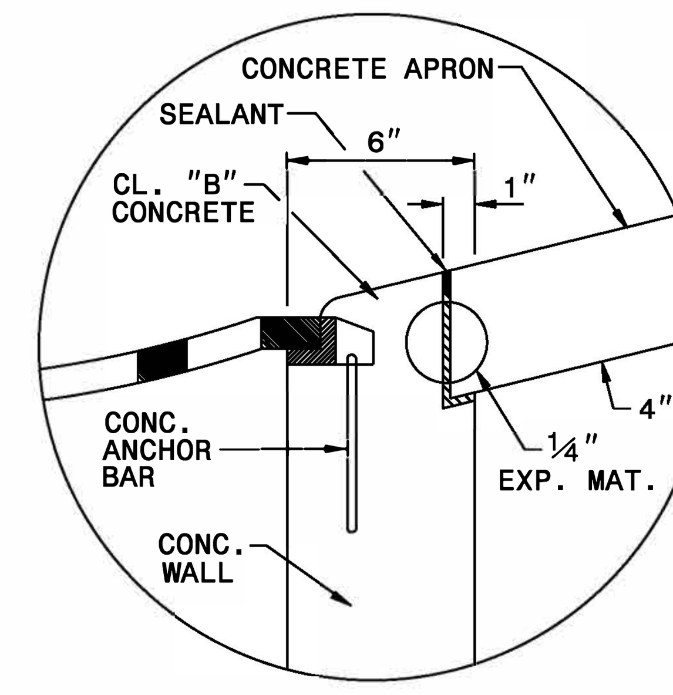
- USE CLASS "B" CONCRETE THROUGHOUT.
- PROVIDE ALL GRATED DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
- OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
- USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
- IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
- CONSTRUCT WITH PIPE CROWNS MATCHING.
- USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20 (NOT SHOWN) OR 840.29 (NOT SHOWN).
- SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES.
- CHAMFER ALL EXPOSED CORNERS 1".
- DRAWING NOT TO SCALE.
- MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.



SECTION X-X



SECTION Y-Y



DETAIL
(APRON SUPPORT NOTCH)

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

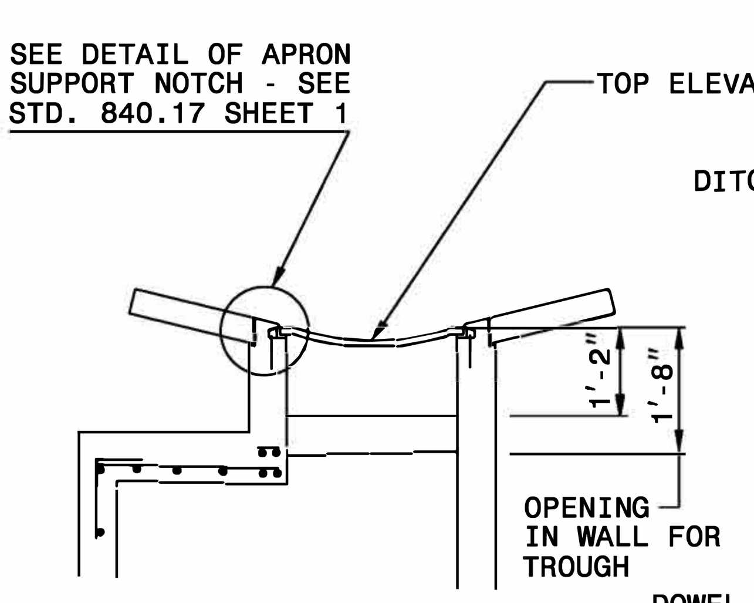
ENGLISH DETAIL DRAWING FOR
CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH
12" THRU 72" PIPE

SHEET 1 OF 2
840d17

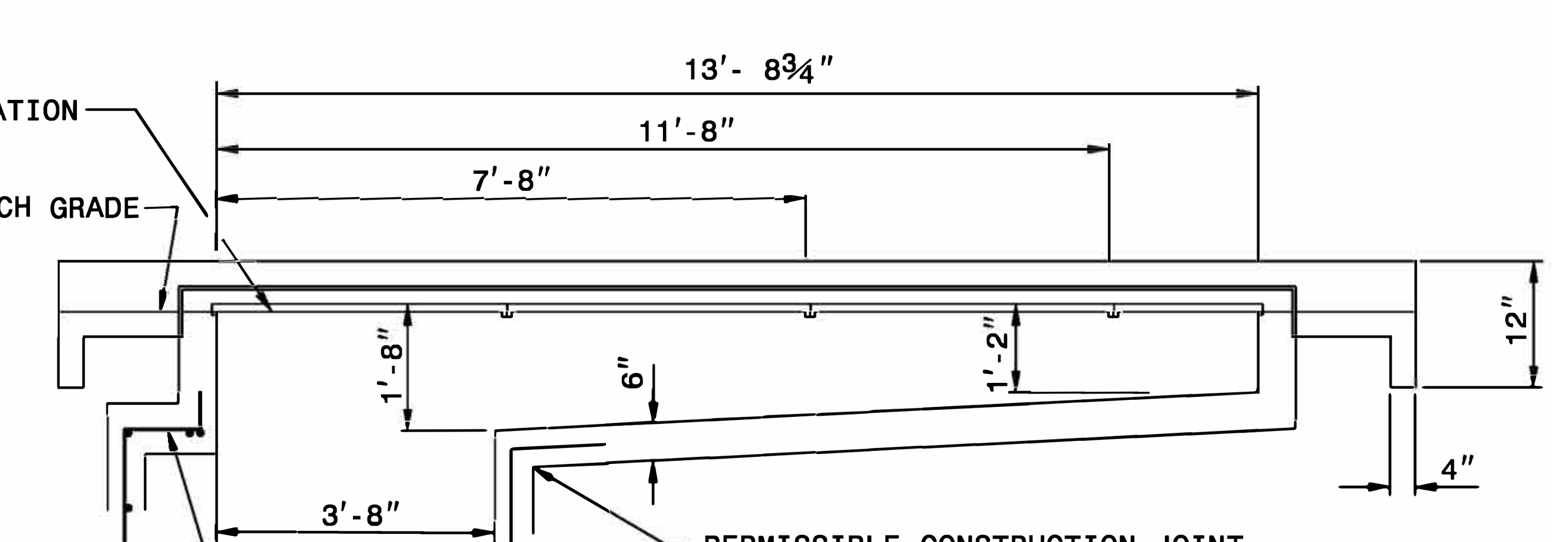
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH
12" THRU 72" PIPE

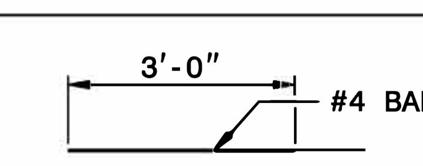
SHEET 2 OF 2
840d17



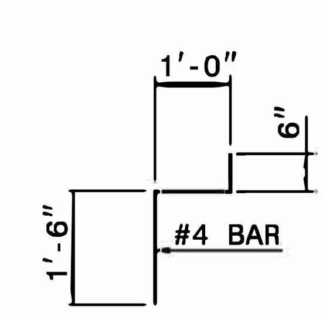
PART SECTION V-V



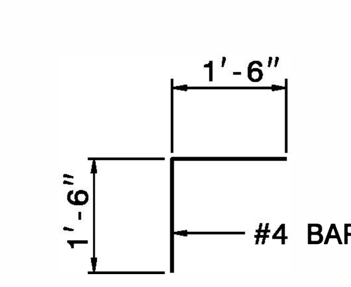
PART SECTION U-U



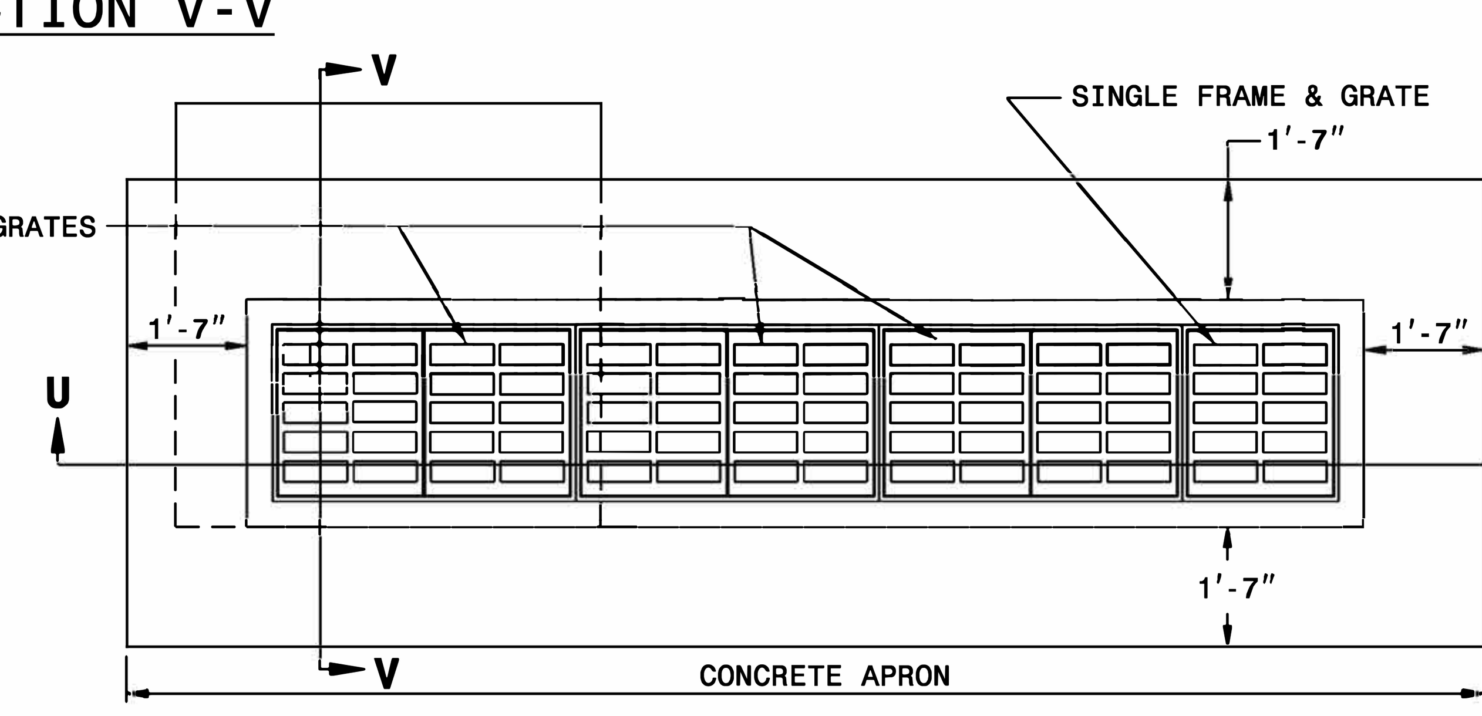
DOWEL-B[1]
FOR 15" THRU 36" INLET

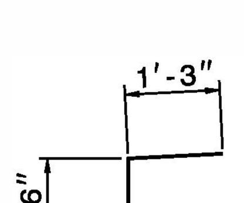


DOWEL-B[2]
FOR 42" INLET



DOWEL-B[3]





DOWEL-C

QUANTITY TO BE ADDED FOR EACH 2' INCREMENT INLET OPENING						
ADDITIONAL INLETS	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	12'-0"
CONCRETE CU. YDS.	0.191	0.417	0.665	0.897	1.145	1.380
CONCRETE APRON CU. YDS.	0.074	0.148	0.222	0.296	0.370	0.444

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

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

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

ENGLISH DETAIL DRAWING FOR
CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH
12" THRU 72" PIPE

SHEET 2 OF 2
840d17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

4/21/2023

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

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2D-1

HYDRAULICS ENGINEER

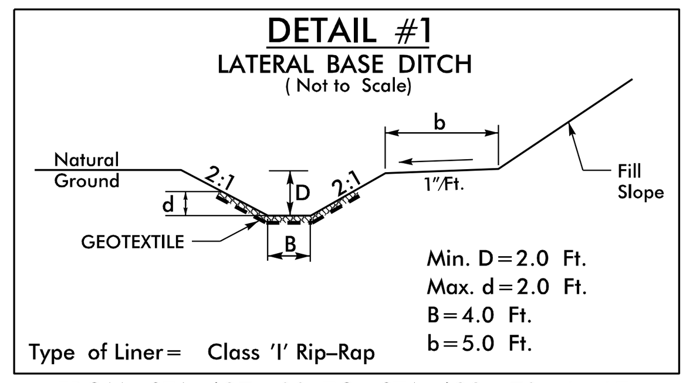
NORTH CAROLINA PROFESSIONAL ENGINEER 26971 JOSHUA G. DALTON

4/21/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

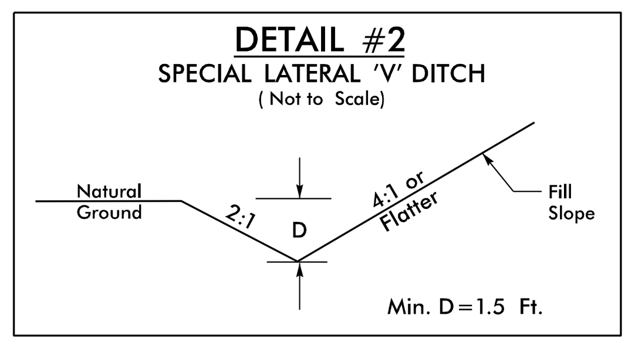
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

DETAIL #1
LATERAL BASE DITCH (Not to Scale)



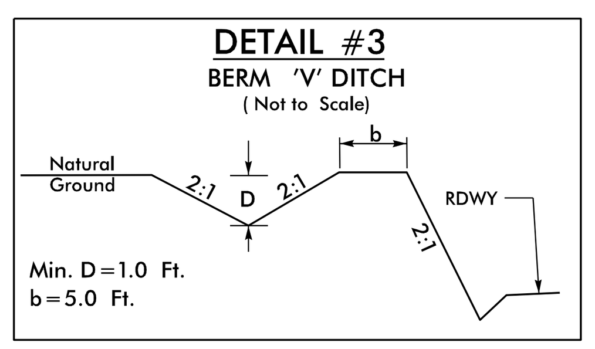
FROM STA. 637+00 TO STA. 639+70 -L- LT
FROM STA. 714+00 TO STA. 715+00 -L- LT
FROM STA. 741+00 TO STA. 743+65 -L- RT

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



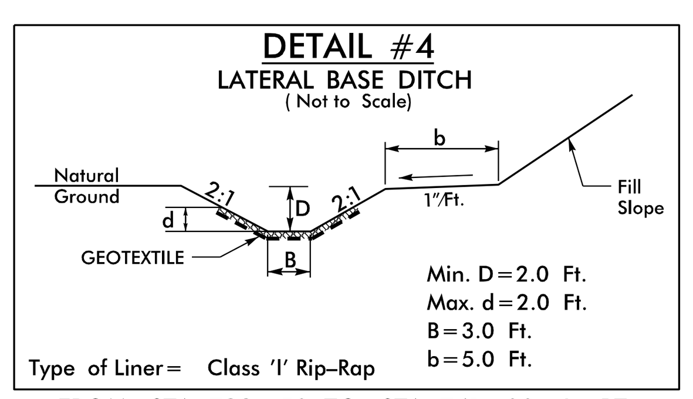
FROM STA. 635+50 TO STA. 637+00 -L- RT
FROM STA. 817+50 TO STA. 818+00 -L- RT
FROM STA. 23+73 TO STA. 25+25 -Y1- RT
FROM STA. 11+00 TO STA. 13+00 -Y2- RT
FROM STA. 32+50 TO STA. 36+50 -Y5- LT
FROM STA. 44+50 TO STA. 46+50 -RAMP_A- RT
FROM STA. 47+50 TO STA. 48+74 -RAMP_A- LT
FROM STA. 14+00 TO STA. 15+45 -SRVRD_1- RT
FROM STA. 14+30 TO STA. 16+00 -SRVRD_3- RT
FROM STA. 23+00 TO STA. 24+00 -SRVRD_3- LT

DETAIL #3
BERM 'V' DITCH (Not to Scale)



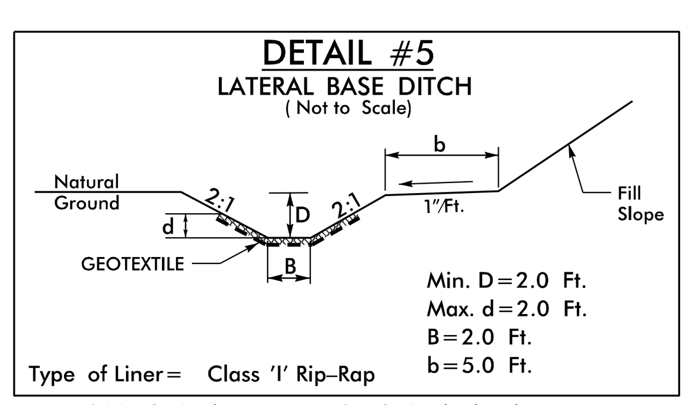
FROM STA. 637+00 TO STA. 638+00 -L- RT
FROM STA. 664+00 TO STA. 665+70 -L- RT
FROM STA. 674+00 TO STA. 675+50 -L- RT
FROM STA. 690+00 TO STA. 691+00 -L- RT
FROM STA. 751+00 TO STA. 754+00 -L- RT
FROM STA. 14+50 TO STA. 16+75 -SRVRD_5- RT

DETAIL #4
LATERAL BASE DITCH (Not to Scale)



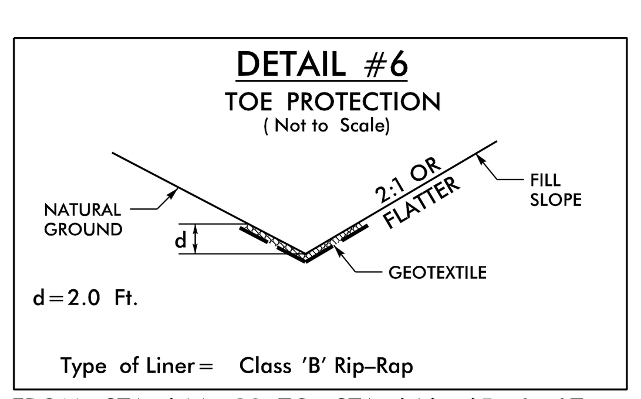
FROM STA. 739+50 TO STA. 741+00 -L- RT
FROM STA. 742+60 TO STA. 743+50 -L- LT
FROM STA. 777+50 TO STA. 779+75 -L- RT
FROM STA. 787+50 TO STA. 789+40 -L- RT
FROM STA. 795+50 TO STA. 796+90 -L- RT

DETAIL #5
LATERAL BASE DITCH (Not to Scale)



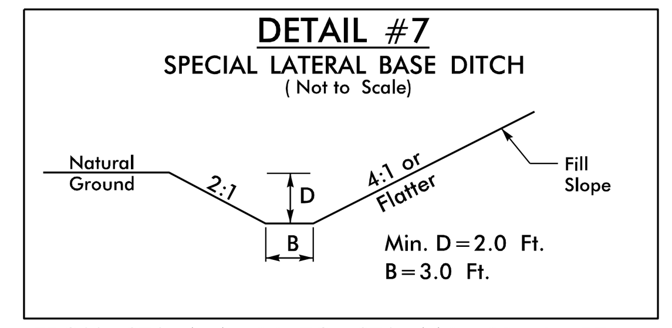
FROM STA. 645+00 TO STA. 646+60 -L- RT
FROM STA. 655+80 TO STA. 658+50 -L- LT

DETAIL #6
TOE PROTECTION (Not to Scale)



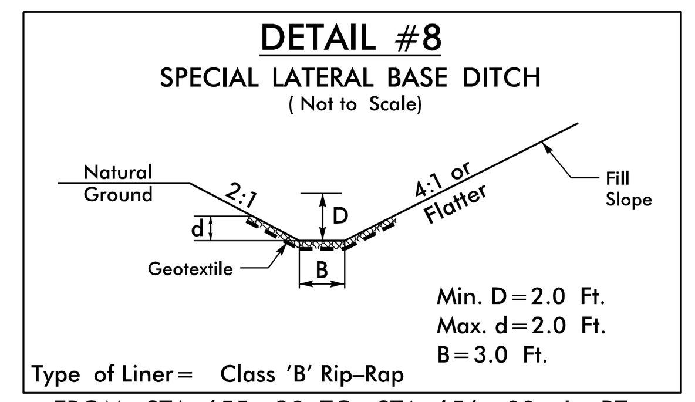
FROM STA. 644+30 TO STA. 646+65 -L- LT
FROM STA. 682+70 TO STA. 684+55 -L- LT
FROM STA. 683+40 TO STA. 684+00 -L- LT
FROM STA. 684+70 TO STA. 686+50 -L- RT
FROM STA. 721+50 TO STA. 725+00 -L- RT
FROM STA. 743+50 TO STA. 744+50 -L- LT
FROM STA. 744+00 TO STA. 745+00 -L- RT
FROM STA. 776+50 TO STA. 778+35 -L- LT
FROM STA. 776+70 TO STA. 777+50 -L- RT
FROM STA. 797+05 TO STA. 798+00 -L- RT
FROM STA. 13+30 TO STA. 15+25 -RAMP_A- RT
FROM STA. 33+50 TO STA. 35+55 -RAMP_A- RT
FROM STA. 16+50 TO STA. 17+20 -SRVRD_4- RT
FROM STA. 19+60 TO STA. 20+50 -SRVRD_5- LT

DETAIL #7
SPECIAL LATERAL BASE DITCH (Not to Scale)



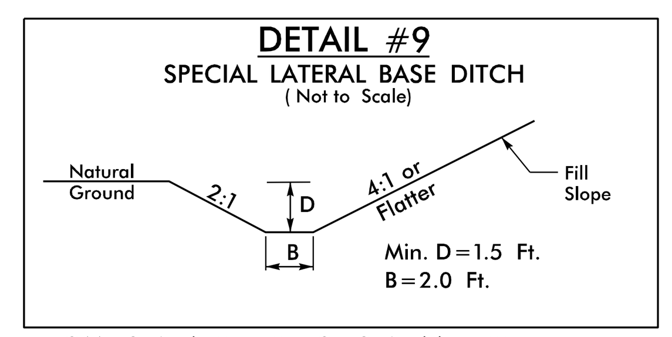
FROM STA. 656+00 TO STA. 660+00 -L- RT

DETAIL #8
SPECIAL LATERAL BASE DITCH (Not to Scale)



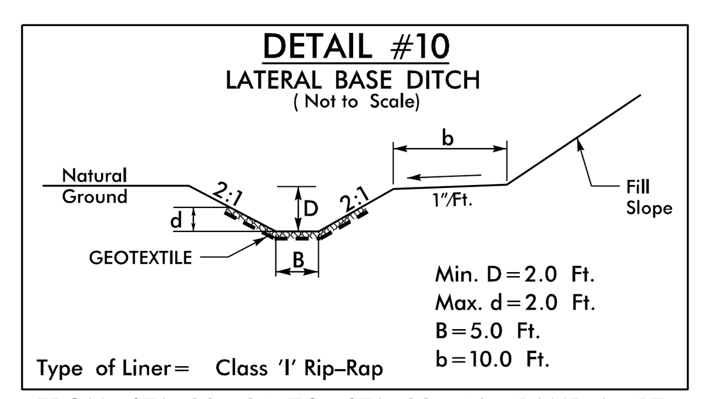
FROM STA. 655+20 TO STA. 656+00 -L- RT

DETAIL #9
SPECIAL LATERAL BASE DITCH (Not to Scale)



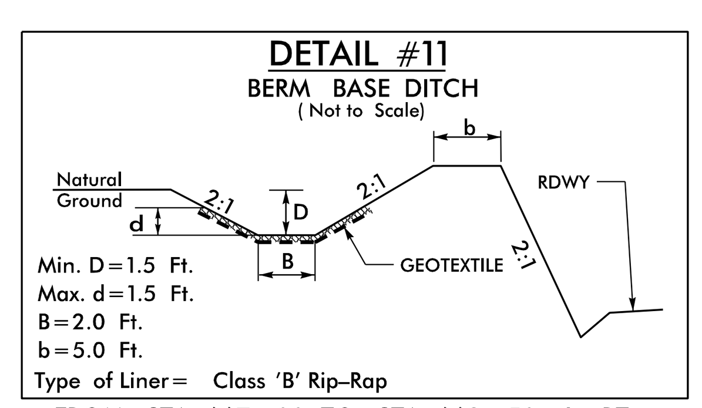
FROM STA. 658+50 TO STA. 660+00 -L- LT
FROM STA. 686+50 TO STA. 687+50 -L- RT
FROM STA. 725+00 TO STA. 728+50 -L- RT

DETAIL #10
LATERAL BASE DITCH (Not to Scale)



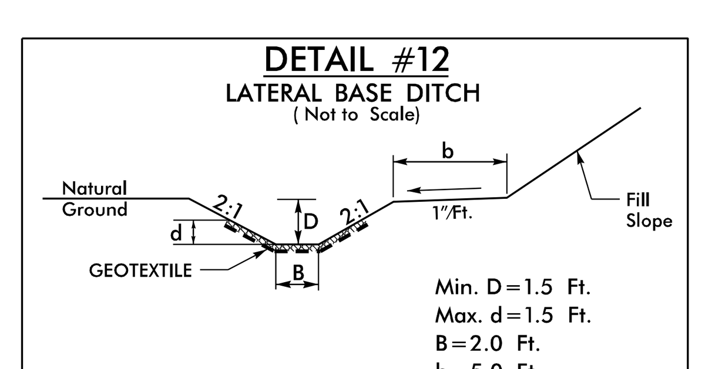
FROM STA. 29+35 TO STA. 33+50 -RAMP_A- RT

DETAIL #11
BERM BASE DITCH (Not to Scale)



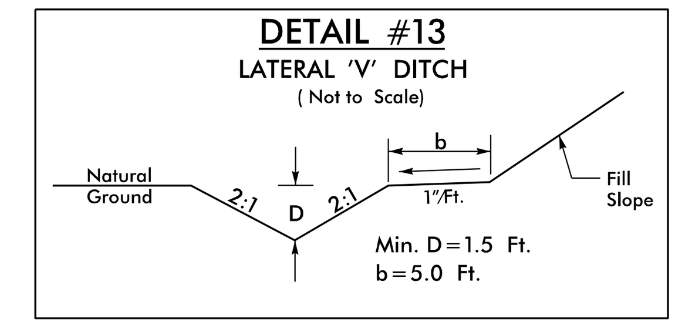
FROM STA. 667+00 TO STA. 668+50 -L- RT
FROM STA. 718+00 TO STA. 718+50 -L- RT
FROM STA. 729+50 TO STA. 732+00 -L- RT
FROM STA. 734+50 TO STA. 739+50 -L- RT

DETAIL #12
LATERAL BASE DITCH (Not to Scale)



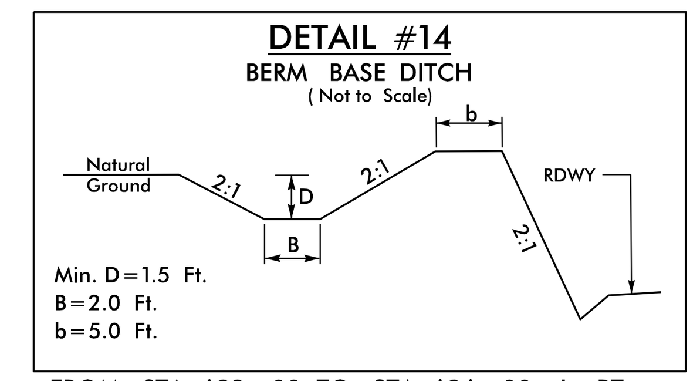
FROM STA. 668+50 TO STA. 669+85 -L- RT
FROM STA. 715+75 TO STA. 718+00 -L- RT

DETAIL #13
LATERAL 'V' DITCH (Not to Scale)



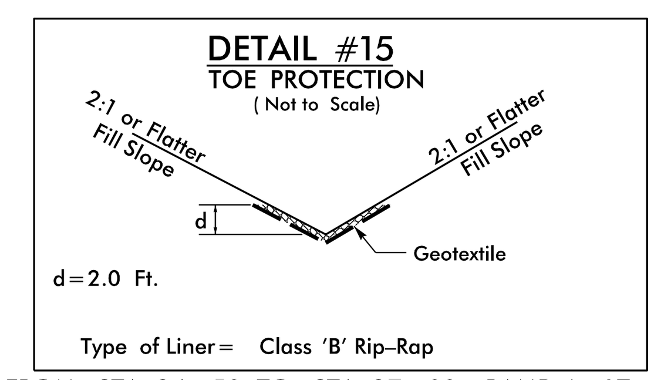
FROM STA. 669+85 TO STA. 671+00 -L- RT
FROM STA. 21+10 TO STA. 22+00 -Y1- RT

DETAIL #14
BERM BASE DITCH (Not to Scale)



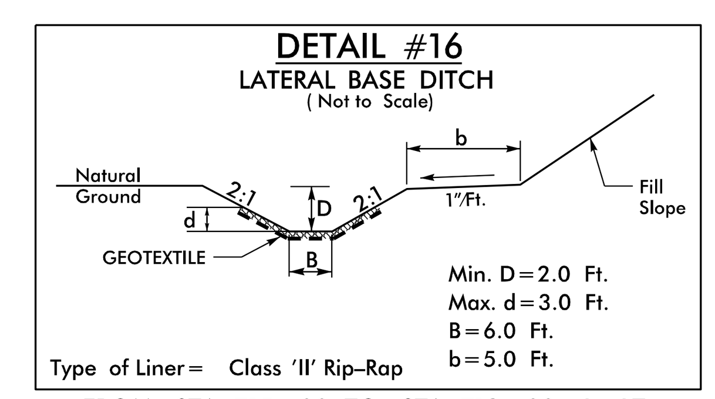
FROM STA. 692+00 TO STA. 696+00 -L- RT

DETAIL #15
TOE PROTECTION (Not to Scale)



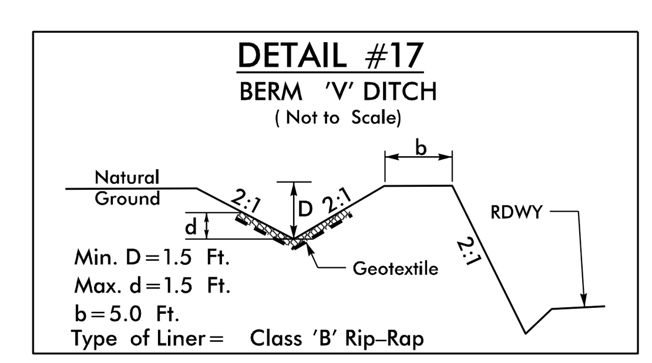
FROM STA. 24+50 TO STA. 27+00 -RAMP_A- LT

DETAIL #16
LATERAL BASE DITCH (Not to Scale)



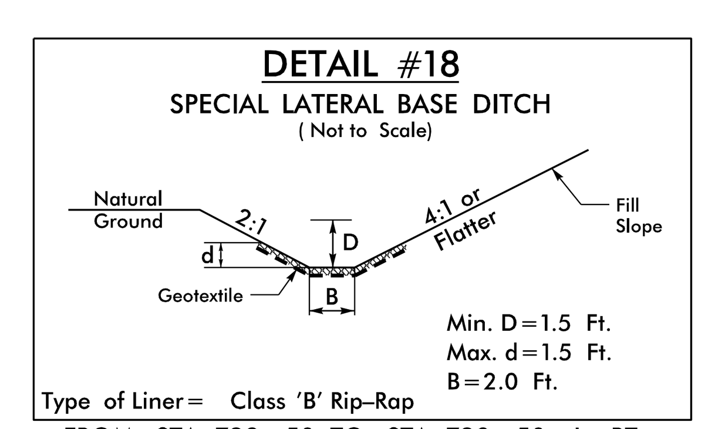
FROM STA. 715+00 TO STA. 719+00 -L- LT

DETAIL #17
BERM 'V' DITCH (Not to Scale)



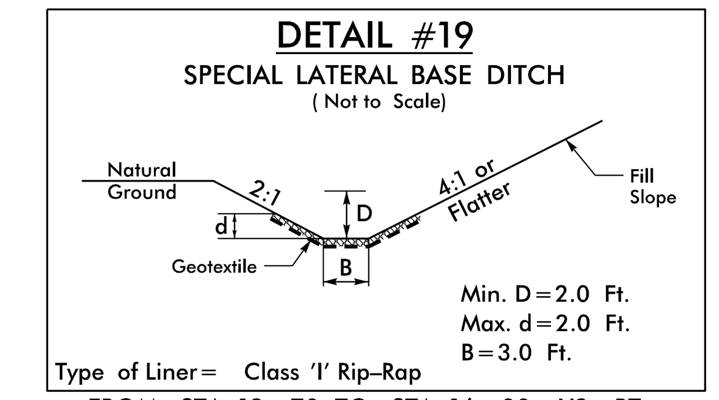
FROM STA. 732+00 TO STA. 734+50 -L- RT
FROM STA. 747+70 TO STA. 751+00 -L- RT
FROM STA. 805+00 TO STA. 807+00 -L- RT
FROM STA. 17+50 TO STA. 21+00 -RAMP_A- LT
FROM STA. 21+50 TO STA. 24+00 -SRVRD_3- RT
FROM STA. 11+80 TO STA. 12+50 -SRVRD_4- RT

DETAIL #18
SPECIAL LATERAL BASE DITCH (Not to Scale)



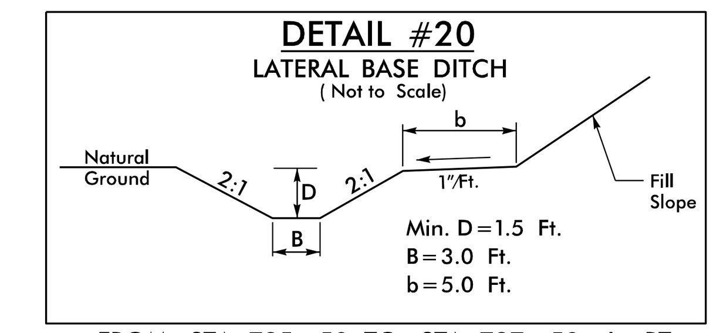
FROM STA. 728+50 TO STA. 729+50 -L- RT
FROM STA. 16+00 TO STA. 16+80 -Y3- RT
FROM STA. 18+00 TO STA. 20+20 -SRVRD_4- LT
FROM STA. 38+00 TO STA. 40+00 -RAMP_A- LT

DETAIL #19
SPECIAL LATERAL BASE DITCH (Not to Scale)



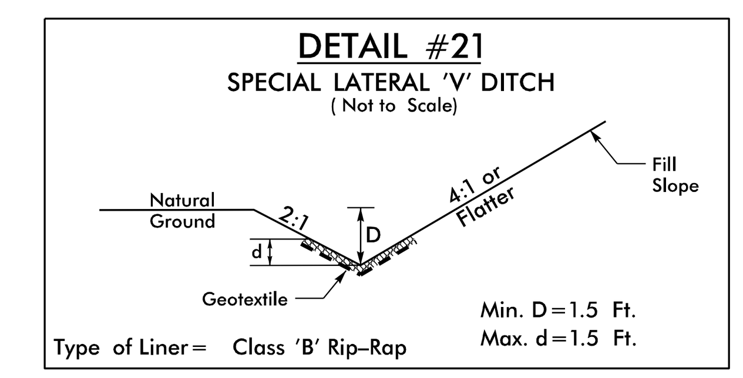
FROM STA. 13+70 TO STA. 16+00 -Y3- RT
FROM STA. 14+00 TO STA. 16+20 -LOOP_A- RT

DETAIL #20
LATERAL BASE DITCH (Not to Scale)



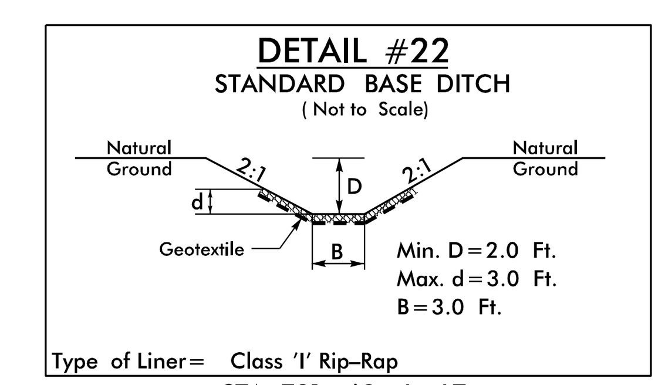
FROM STA. 785+50 TO STA. 787+50 -L- RT
FROM STA. 793+00 TO STA. 795+50 -L- RT

DETAIL #21
SPECIAL LATERAL 'V' DITCH (Not to Scale)



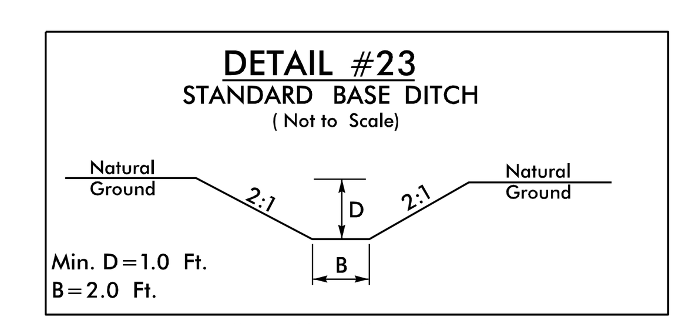
FROM STA. 10+00 TO STA. 14+50 -Y1- RT
FROM STA. 25+25 TO STA. 29+00 -Y1- RT
FROM STA. 16+00 TO STA. 16+50 -RAMP_A- RT
FROM STA. 27+50 TO STA. 34+00 -RAMP_A- LT
FROM STA. 46+00 TO STA. 47+50 -RAMP_A- LT
FROM STA. 14+50 TO STA. 18+00 -LOOP_A- LT

DETAIL #22
STANDARD BASE DITCH (Not to Scale)



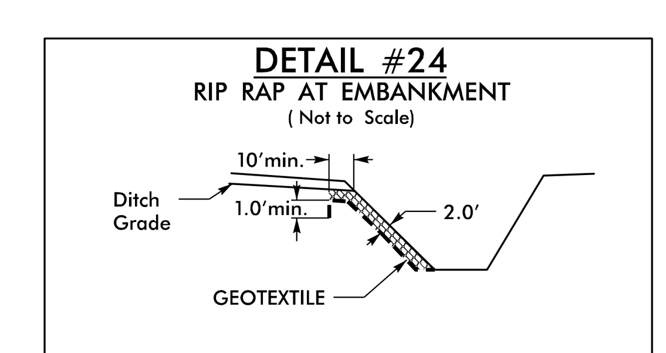
STA. 791+60 -L- LT
STA. 804+55 -L- LT
FROM STA. 847+75 TO STA. 848+55 -L- RT
FROM STA. 849+30 TO STA. 850+60 -L- RT
STA. 19+30 -SRVRD_5- RT

DETAIL #23
STANDARD BASE DITCH (Not to Scale)



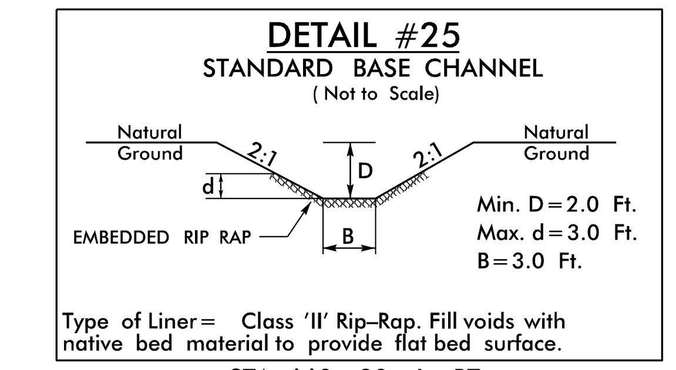
STA. 28+90 -Y2- LT

DETAIL #24
RIP RAP AT EMBANKMENT (Not to Scale)



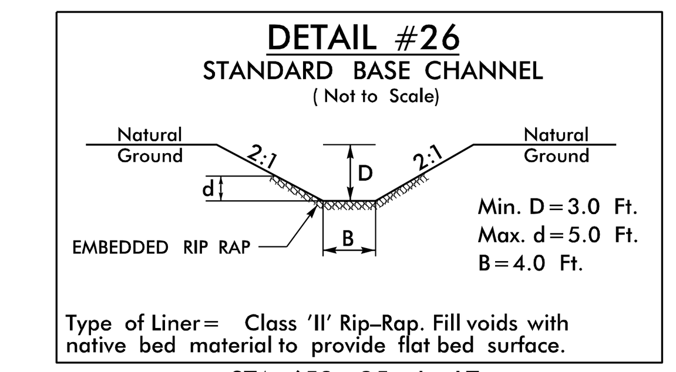
STA. 848+55 -L- RT
STA. 849+25 -L- RT

DETAIL #25
STANDARD BASE CHANNEL (Not to Scale)



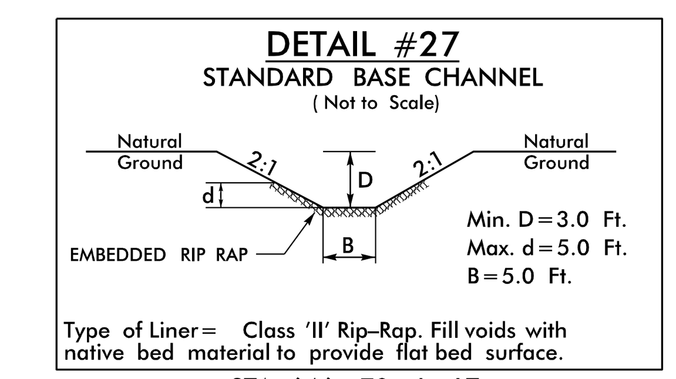
STA. 669+80 -L- RT
STA. 684+60 -L- RT
STA. 764+43 -L- LT

DETAIL #26
STANDARD BASE CHANNEL (Not to Scale)



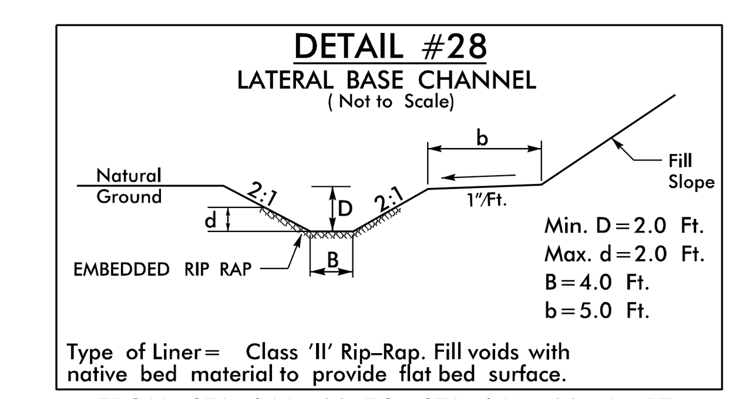
STA. 653+25 -L- LT
STA. 683+30 -L- LT
STA. 778+40 -L- LT
STA. 18+50 -SRVRD_1- LT

DETAIL #27
STANDARD BASE CHANNEL (Not to Scale)



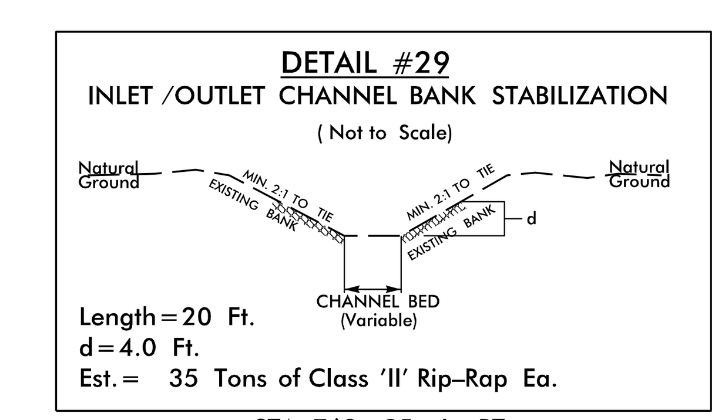
STA. 646+70 -L- LT
STA. 815+60 -L- LT
FROM STA. 843+50 TO STA. 849+40 -L- LT
STA. 19+50 -SRVRD_5- LT

DETAIL #28
LATERAL BASE CHANNEL (Not to Scale)



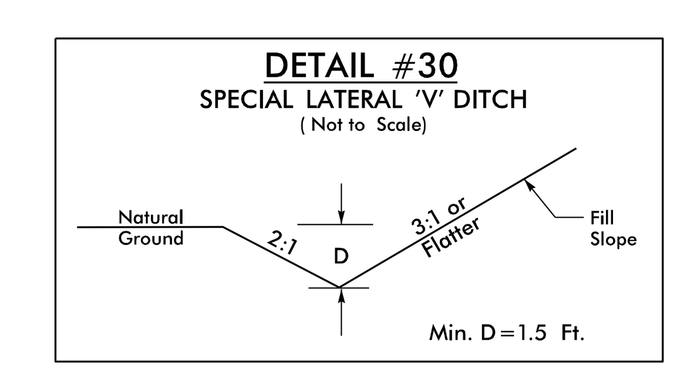
FROM STA. 644+00 TO STA. 645+00 -L- RT

DETAIL #29
INLET /OUTLET CHANNEL BANK STABILIZATION (Not to Scale)



STA. 763+85 -L- RT
STA. 776+65 -L- RT
STA. 17+40 -SRVRD_4- RT

DETAIL #30
SPECIAL LATERAL 'V' DITCH (Not to Scale)



FROM STA. 31+00 TO STA. 32+00 -Y2- RT

5/14/99
4/20/2023
...\documents\pw_working\dms42388\R2707D_Detail_Drainage_2D1-2D6.dgn

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2D-2

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

4/21/2023

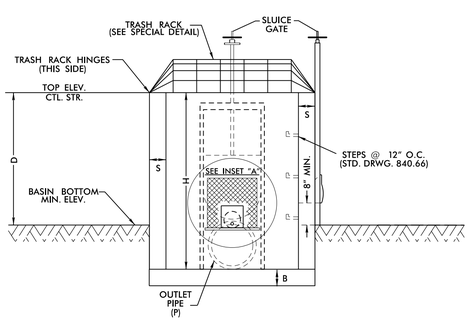
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

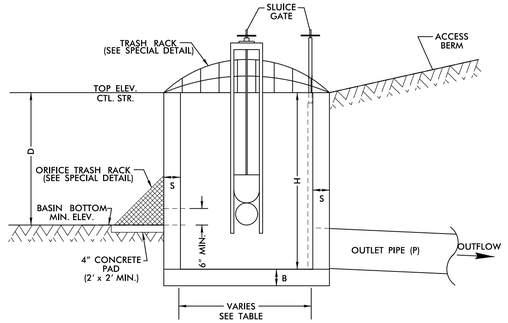
DETAIL #31

DRY DETENTION/HAZARDOUS SPILL BASIN DRAWDOWN STRUCTURE

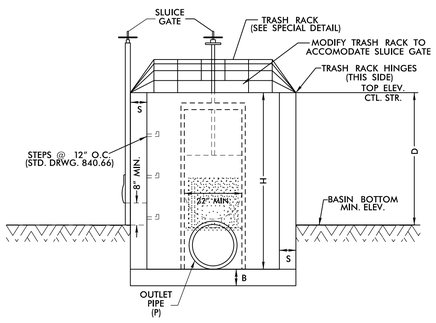
NOT TO SCALE



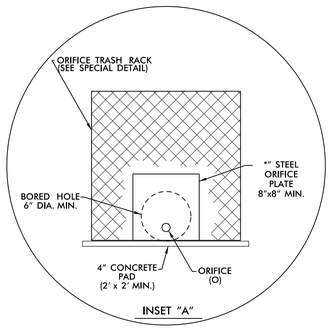
SIDE 1



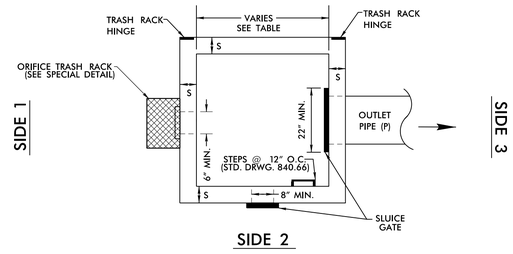
SIDE 2



SIDE 3



INSET "A"



SIDE 2

PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES:
1. THE BASIN SHOULD BE DESIGNED TO HOLD THE HAZARDOUS SPILL VOLUME ABOVE THE WATER QUALITY VOLUME (WQv) ELEVATION.
2. TOP ELEVATION OF CONTROL STRUCTURE (WEIR ELEVATION) SHOULD BE SET AT THE WQv ELEVATION.
3. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
4. 2" MINIMUM DIAMETER ORIFICE. IF ORIFICE IS GREATER THAN 6", A STEEL PLATE IS NOT REQUIRED.
5. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
6. 8" MIN. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
7. 22" MIN. SLUICE GATE AT THE OUTLET PIPE IS FOR SPILL CONTAINMENT AND SHOULD REMAIN OPEN DURING NORMAL OPERATION.
8. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
9. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
10. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.
11. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION.
12. PAYMENT OF TRASH RACKS ARE INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.
13. 4" CONCRETE ORIFICE TRASH RACK PAD INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.

MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
641+74 –L– LT	0406	6"	18"	854.0	858.0	4.0'	852.0	5.0' X 5.0' X 6.0'	2.5"	854.0	30"
668+44 –L– LT	0615	6"	18"	867.0	870.0	3.0'	865.0	5.0' X 5.0' X 5.0'	2.0"	867.0	24"

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

4/21/2023

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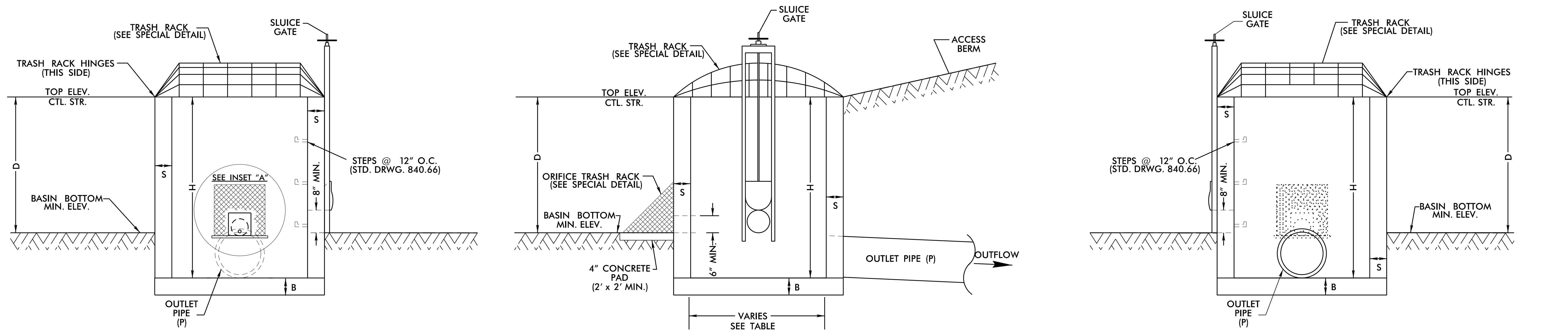
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

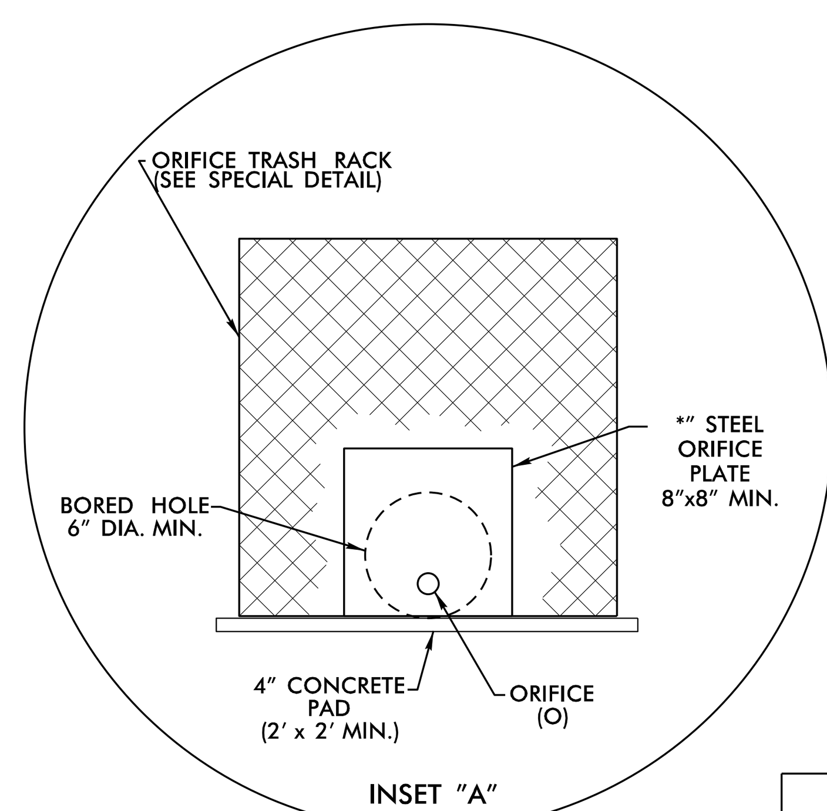
DETAIL #32

DRY DETENTION BASIN DRAWDOWN STRUCTURE

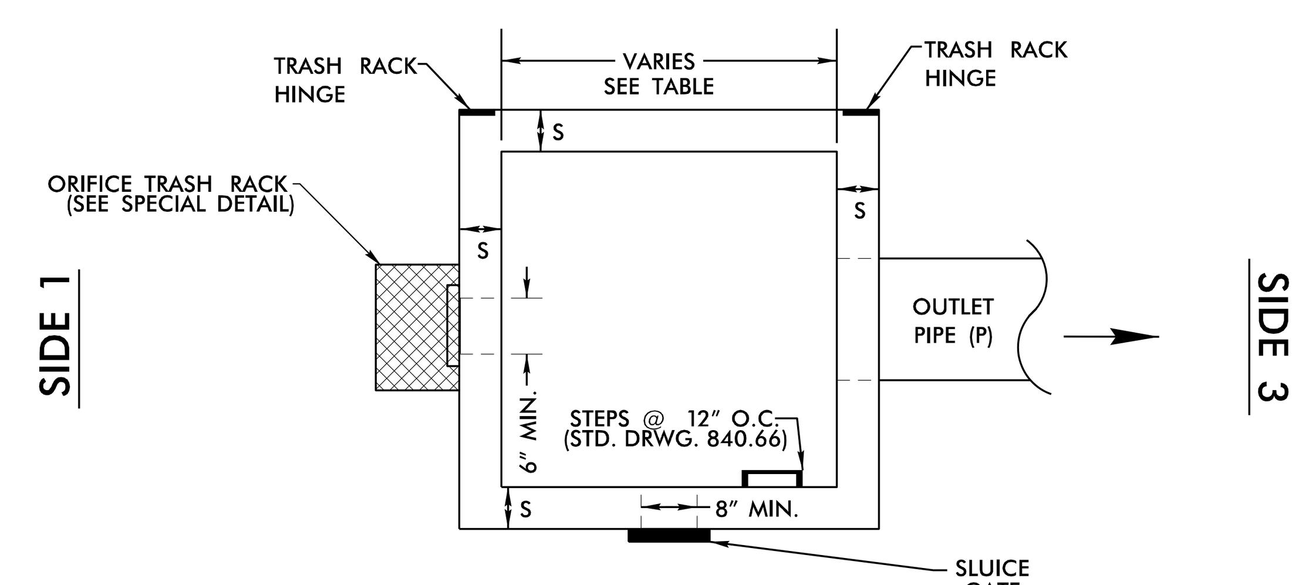
NOT TO SCALE



SIDE 1 SIDE 2 SIDE 3



INSET "A"



PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES:

1. TOP ELEVATION OF CONTROL STRUCTURE (WEIR ELEVATION) SHOULD BE SET AT THE WQv ELEVATION.
2. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
3. 2" MINIMUM DIAMETER ORIFICE. IF ORIFICE IS GREATER THAN 6", A STEEL PLATE IS NOT REQUIRED.
4. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
5. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
6. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
7. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
8. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
9. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI–FLOTATION.
10. PAYMENT OF TRASH RACKS ARE INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.
11. 4" CONCRETE ORIFICE TRASH RACK PAD INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.

MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
780+44 -L- RT	1511	6"	18"	726.0	730.0	4.0'	724.0	5.0' X 5.0' X 6.0'	2.5"	726.0	30"
813+94 -L- LT	1728	6"	18"	714.0	719.0	5.0'	712.0	5.0' X 5.0' X 7.0'	3.0"	714.0	36"

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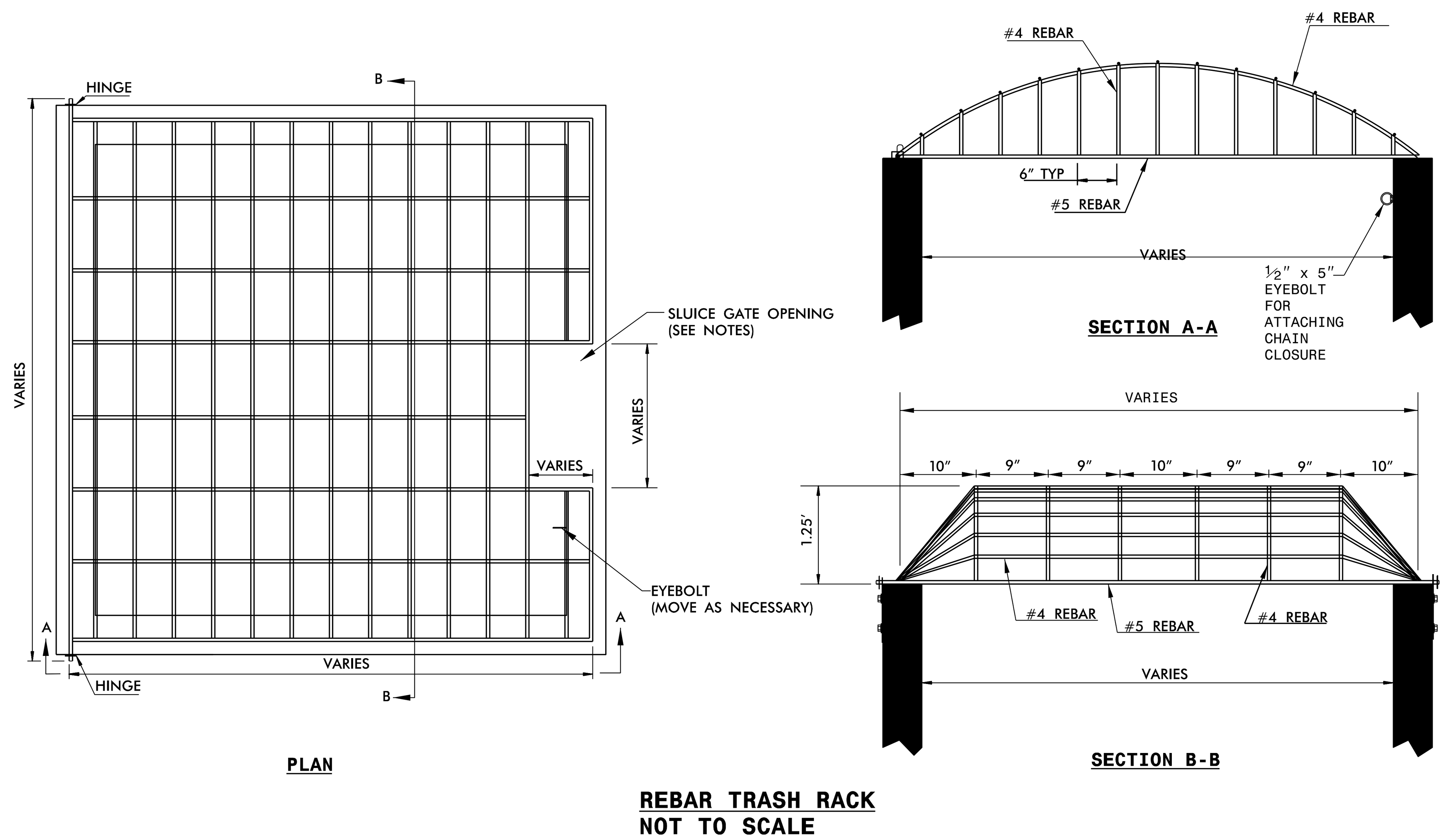
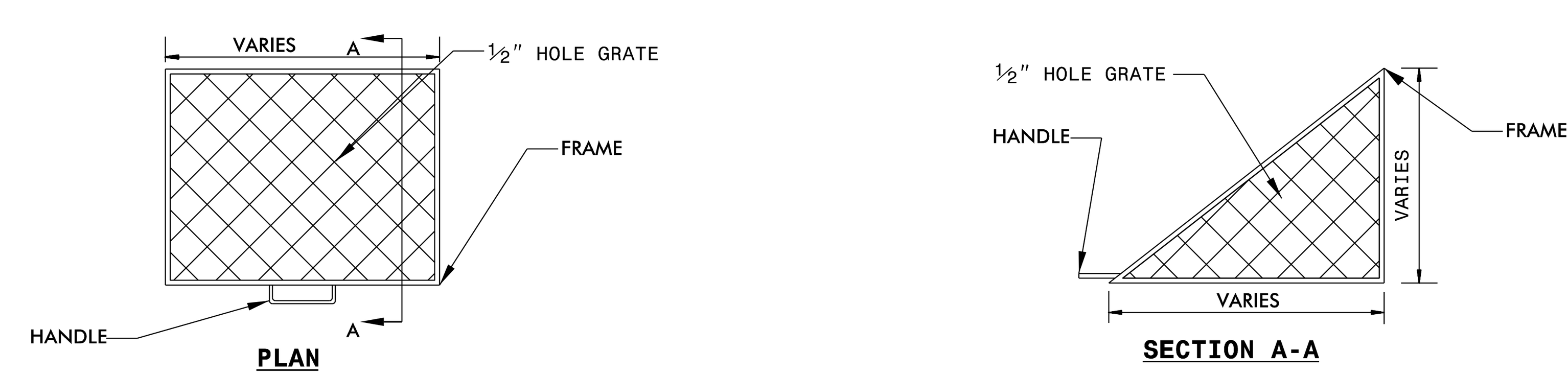
DETAIL #33
REMOVABLE ORIFICE TRASH RACK
NOT TO SCALE



REBAR TRASH RACK
NOT TO SCALE

RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A-153.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



ORIFICE TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A *" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A-153.

DETAIL #35
(NOT TO SCALE)

SINGLE BARREL CULVERT SKEWED W/SILLS AND BAFFLES

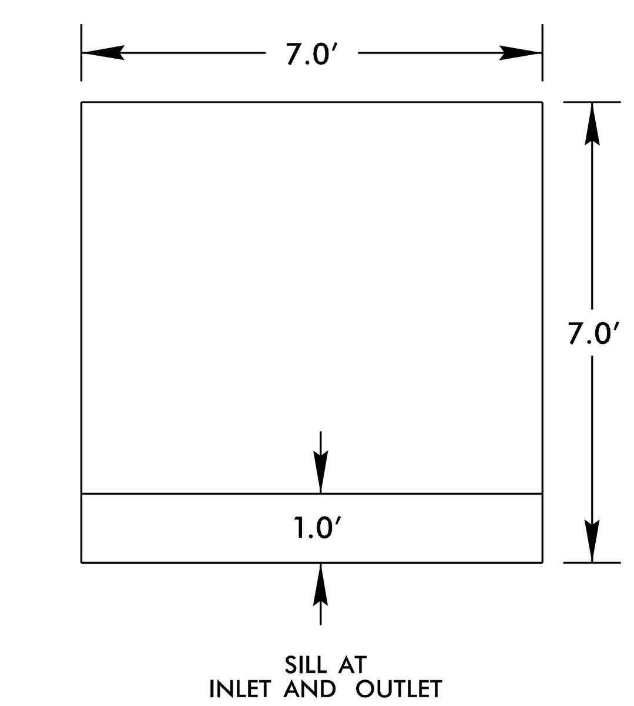
*NOTES:

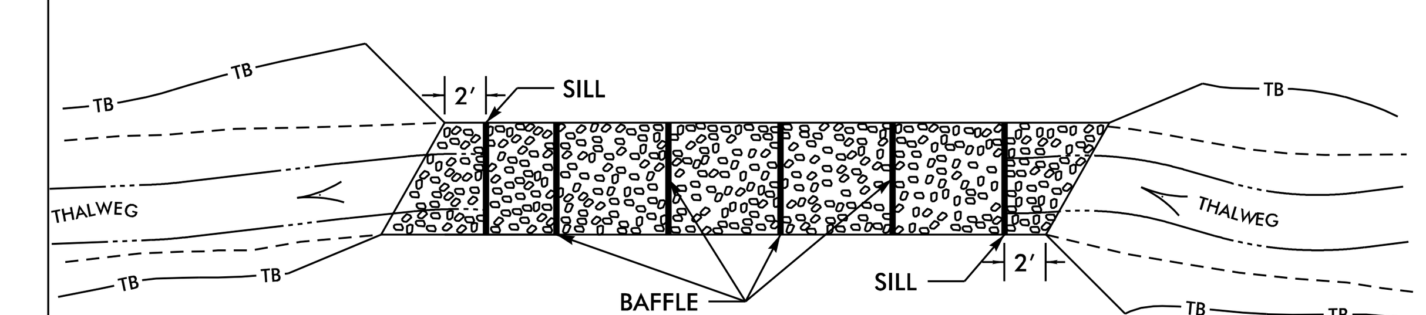
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE CULVERT BARREL. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.





NUMBER OF BAFFLES=30
ON 12 FT CENTERS FROM DOWNSTREAM SILL
(SEE STRUCTURE PLANS)

PLAN VIEW

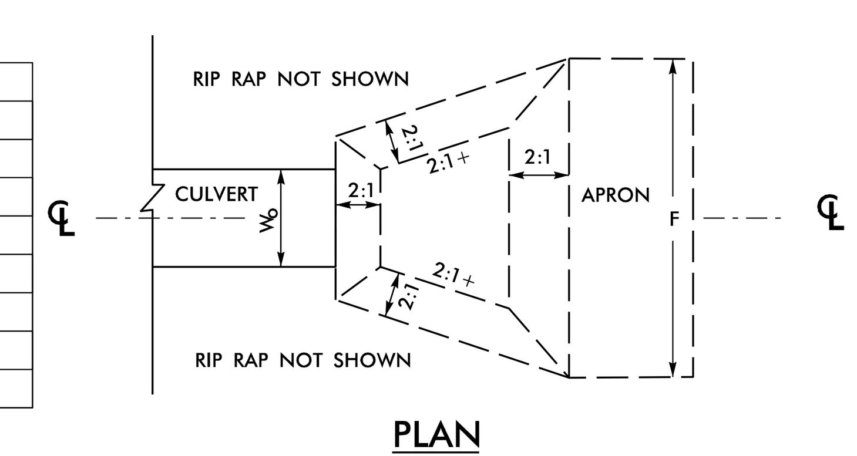
9/13

1@7' X 7' RCBC AT STA. 717+13 -L-

DETAIL #34
RIP-RAPPED ENERGY DISSIPATOR BASIN
(OUTLET TO NATURAL GROUND)

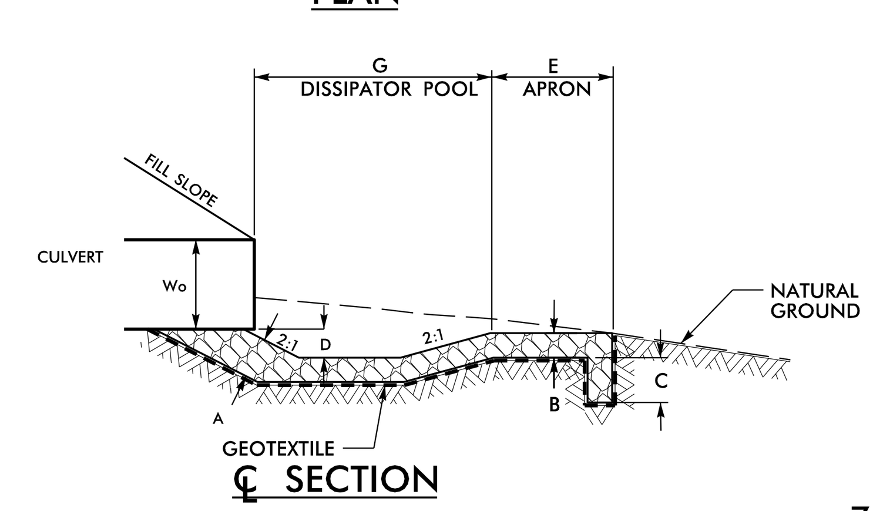
DIM. (ft)	RIP RAP BASIN # 1	2	3	4	5
A	2.0'				
B	1.5'				
C	1.5'				
D	1.0'				
E	4.0'				
F	12.0'				
G	10.0'				

ALL DIMENSIONS APPROXIMATE



BASIN #	LOCATION (AT OUTLET)
1	726+50 -L- LT

BASIN(S) #1
CLASS 'I' RIP RAP
EST. 30 TONS
EST. 50 SY GF
EST. 20 CY DDE



7/08

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PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2D-5

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON
DocuSigned by: Joshua G. Dalton
4/21/2023

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DETAIL #36
(NOT TO SCALE)
SKEWED MULTI–BARREL CULVERT LOW FLOW CHANNEL,SILLS AND FLOOD PLAIN

*NOTES:

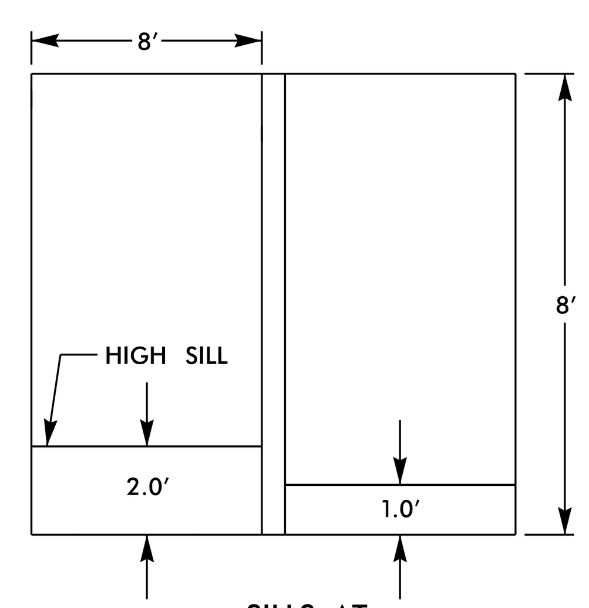
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

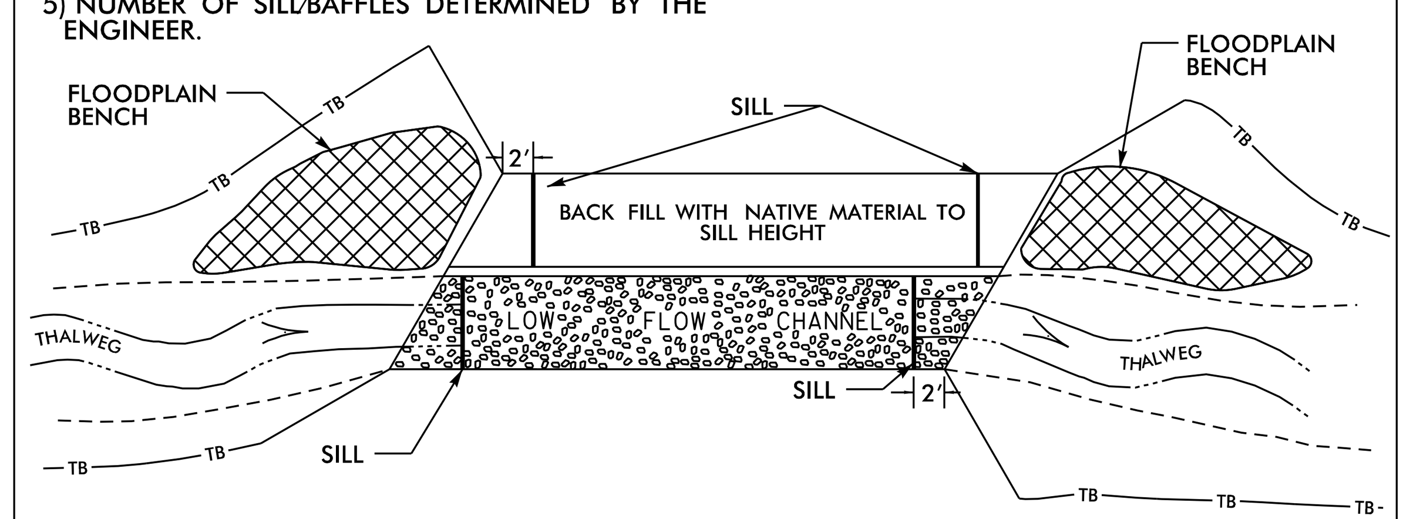
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.



SILLS AT INLET AND OUTLET



PLAN VIEW

9/13

2@8' X 8' RCBC AT STA. 743+19 –L–

DETAIL #38
(NOT TO SCALE)
SINGLE BARREL CULVERT LOW FLOW CHANNEL AND SILLS

*NOTES:

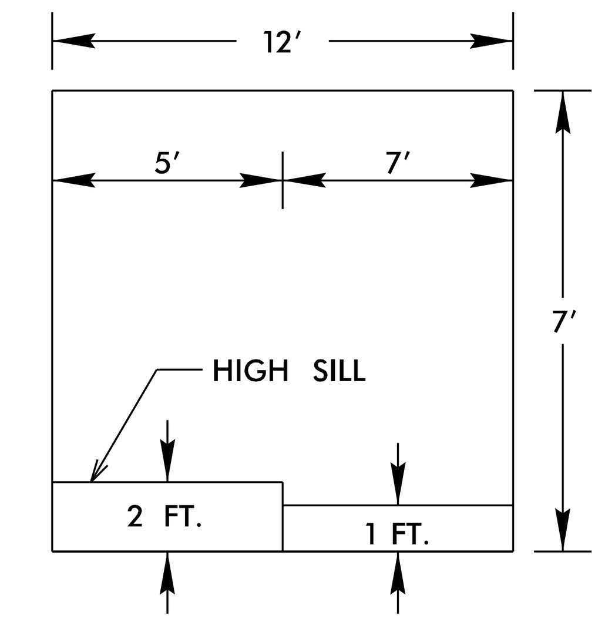
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

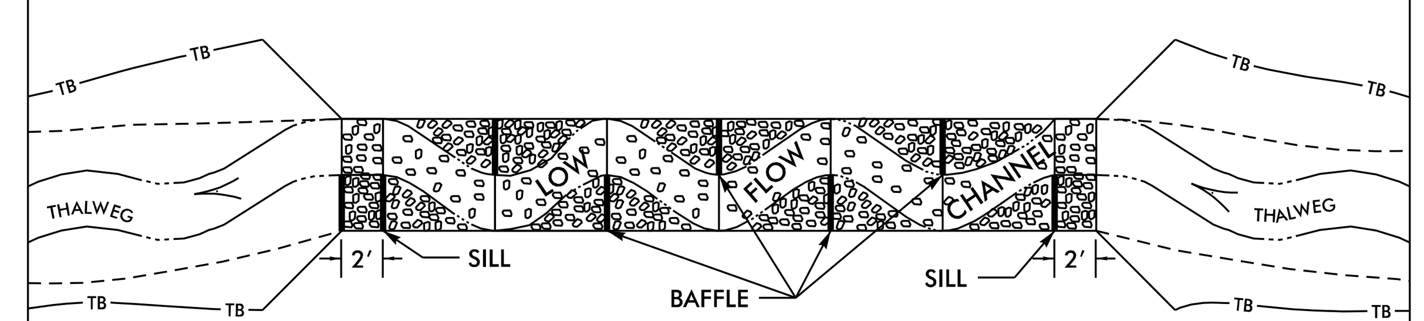
3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.



SILLS AT INLET AND OUTLET



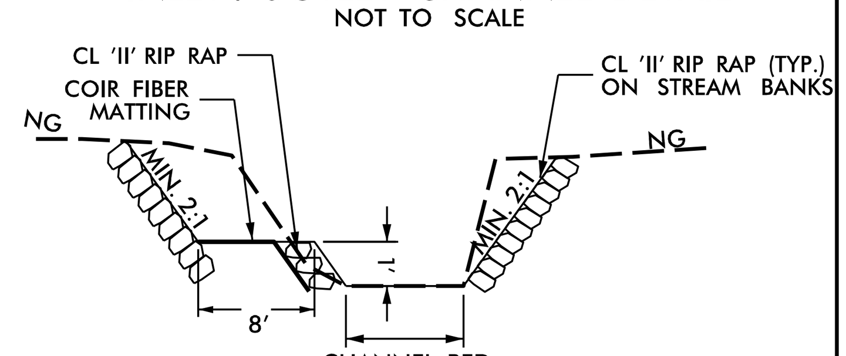
NUMBER OF BAFFLES=11 ON 24FT CENTERS FROM DOWNSTREAM SILL

PLAN VIEW

9/13

1@12' X 7' RCBC AT STA. 796+86 –L–

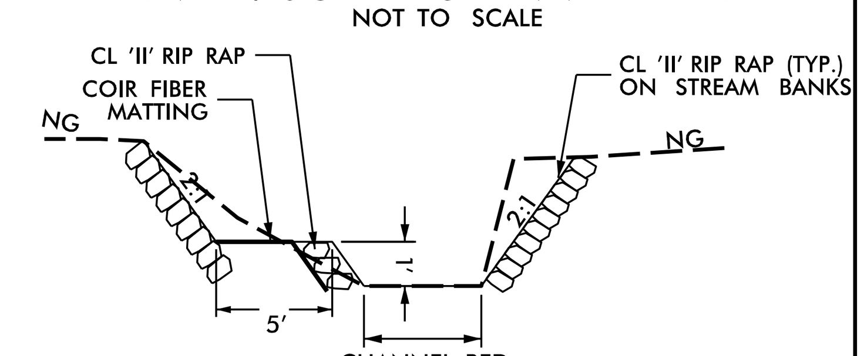
DETAIL #37
INLET /OUTLET CHANNEL DETAIL
NOT TO SCALE



Length=50 Ft.
Est.= 110 Tons of Class 'II' Rip–Rap

STA. 742+50 –L– LT
STA. 743+50 –L– RT

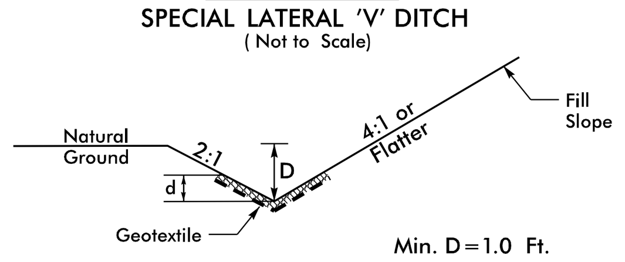
DETAIL #39
INLET /OUTLET CHANNEL DETAIL
NOT TO SCALE



Length=50 Ft.
Est.= 110 Tons of Class 'II' Rip–Rap

STA. 796+75 –L– LT
STA. 796+95 –L– RT

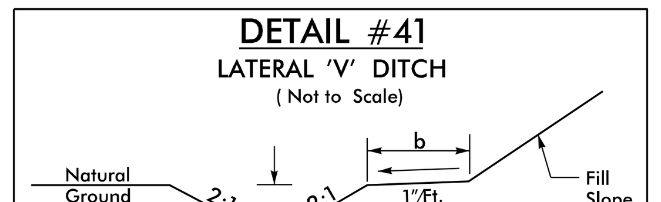
DETAIL #40
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.
Max. d=1.0 Ft.
Type of Liner= Class B Rip–Rap

FROM STA. 10+00 TO STA. 12+75 –Y1– LT
FROM STA. 20+00 TO STA. 23+00 –SRVRD_1– LT
FROM STA. 18+50 TO STA. 20+20 –SRVRD_4– RT

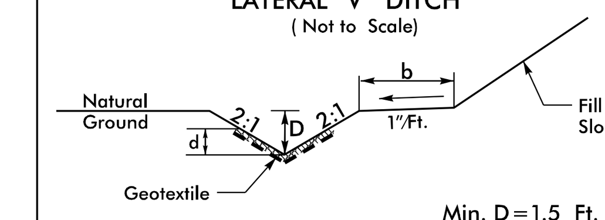
DETAIL #41
LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.5 Ft.
b=3.0 Ft.

FROM STA. 15+00 TO STA. 17+00 –Y1– RT
FROM STA. 16+00 TO STA. 19+00 –Y2– RT

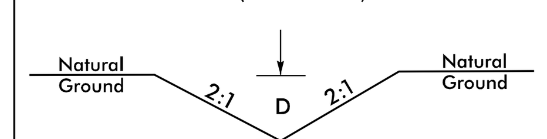
DETAIL #42
LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.5 Ft.
Max. d= Ft.
b=3.0 Ft.
Type of Liner= Class B Rip–Rap

FROM STA. 17+00 TO STA. 18+50 –Y1– RT
FROM STA. 23+00 TO STA. 25+20 –SRVRD_1– LT
FROM STA. 21+35 TO STA. 22+50 –Y2– LT

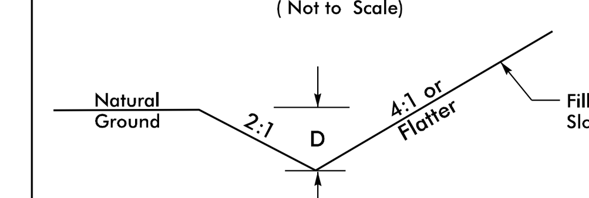
DETAIL #43
STANDARD 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.

STA. 16+70 –Y1– LT

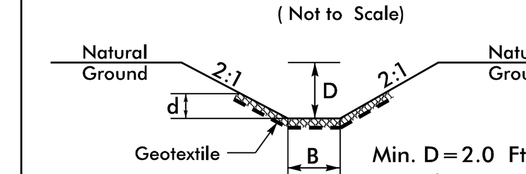
DETAIL #44
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.

FROM STA. 26+50 TO STA. 29+00 –Y1– LT
FROM STA. 24+50 TO STA. 26+30 –Y2– RT
FROM STA. 26+60 TO STA. 29+25 –Y2– RT
FROM STA. 26+60 TO STA. 29+00 –Y2– LT
FROM STA. 28+00 TO STA. 30+00 –Y3– LT
FROM STA. 28+00 TO STA. 32+00 –Y3– RT
FROM STA. 9+90 TO STA. 13+00 –Y4– RT
FROM STA. 20+00 TO STA. 21+00 –SRVRD_1– RT

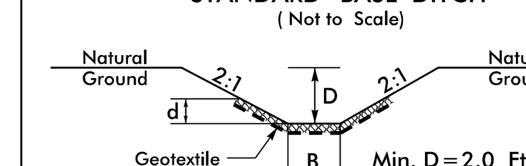
DETAIL #45
STANDARD BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=3.0 Ft.
B=4.0 Ft.
Type of Liner= Class 'I' Rip–Rap

STA. 640+50 –L– LT

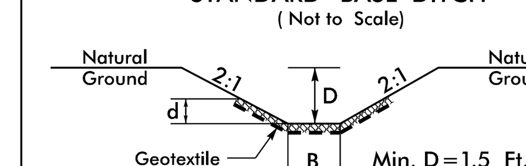
DETAIL #46
STANDARD BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=2.0 Ft.
Type of Liner= Class 'I' Rip–Rap

STA. 641+00 –L– LT

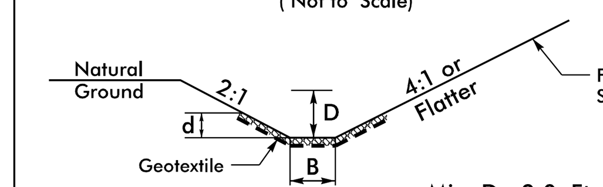
DETAIL #47
STANDARD BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.
Type of Liner= Class 'B' Rip–Rap

STA. 722+50 –L– LT
STA. 16+80 –Y3– LT
STA. 18+00 –SRVRD_4– LT
STA. 10+60 –SRVRD_5A– RT

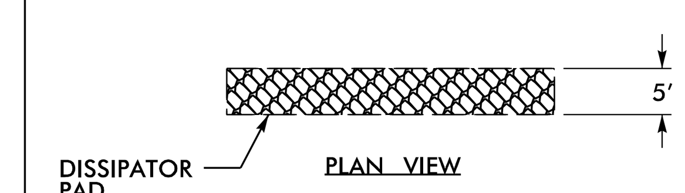
DETAIL #48
SPECIAL LATERAL BASE DITCH
(Not to Scale)



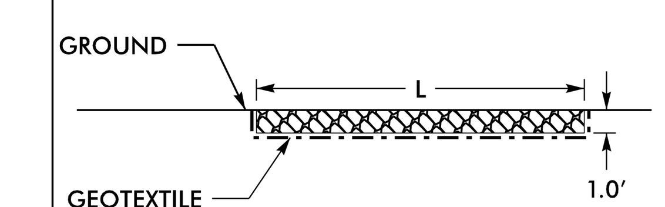
Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=4.0 Ft.
Type of Liner= Class 'I' Rip–Rap

FROM STA. 14+00 TO STA. 16+20 –LOOP_A– RT

DETAIL #49
DECK DRAIN DISSIPATOR PAD
(Not to Scale)



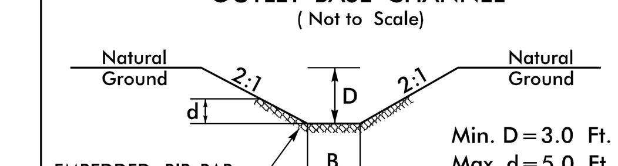
*NOTE: CENTER PAD DIRECTLY BELOW DECK DRAINS



Type of Liner= Class B Rip–Rap

FROM STA. 847+60 TO STA. 848+45 –L– LT (EST. 21 TONS, EST. 89 SY GF)
FROM STA. 847+60 TO STA. 848+45 –L– RT (EST. 21 TONS, EST. 89 SY GF)
FROM STA. 847+97 TO STA. 848+33 –L– MED LT (EST. 9 TONS, EST. 38 SY GF)
FROM STA. 847+97 TO STA. 848+33 –L– MED RT (EST. 9 TONS, EST. 38 SY GF)
FROM STA. 850+11 TO STA. 850+37 –L– MED LT (EST. 7 TONS, EST. 27 SY GF)
FROM STA. 850+11 TO STA. 850+37 –L– MED RT (EST. 7 TONS, EST. 27 SY GF)
FROM STA. 850+11 TO STA. 850+37 –L– LT (EST. 7 TONS, EST. 27 SY GF)
FROM STA. 850+11 TO STA. 850+37 –L– RT (EST. 7 TONS, EST. 27 SY GF)

DETAIL #50
OUTLET BASE CHANNEL
(Not to Scale)



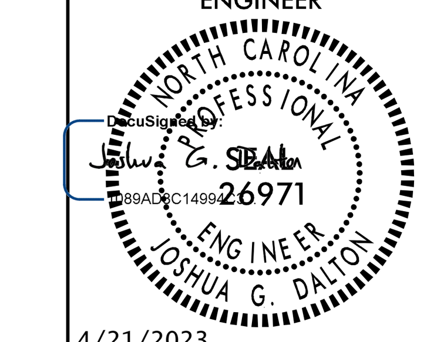
Min. D=3.0 Ft.
Max. d=5.0 Ft.
B=7.0 Ft.
Type of Liner= Class 'II' Rip–Rap. Fill voids with native bed material to provide flat bed surface.

STA. 719+20 –L– LT

5/14/99

4/20/2023
...\documents\pw_working\dms42388\R2707D_Detail_Drainage_2D1-2D6.dgn

HYDRAULICS ENGINEER



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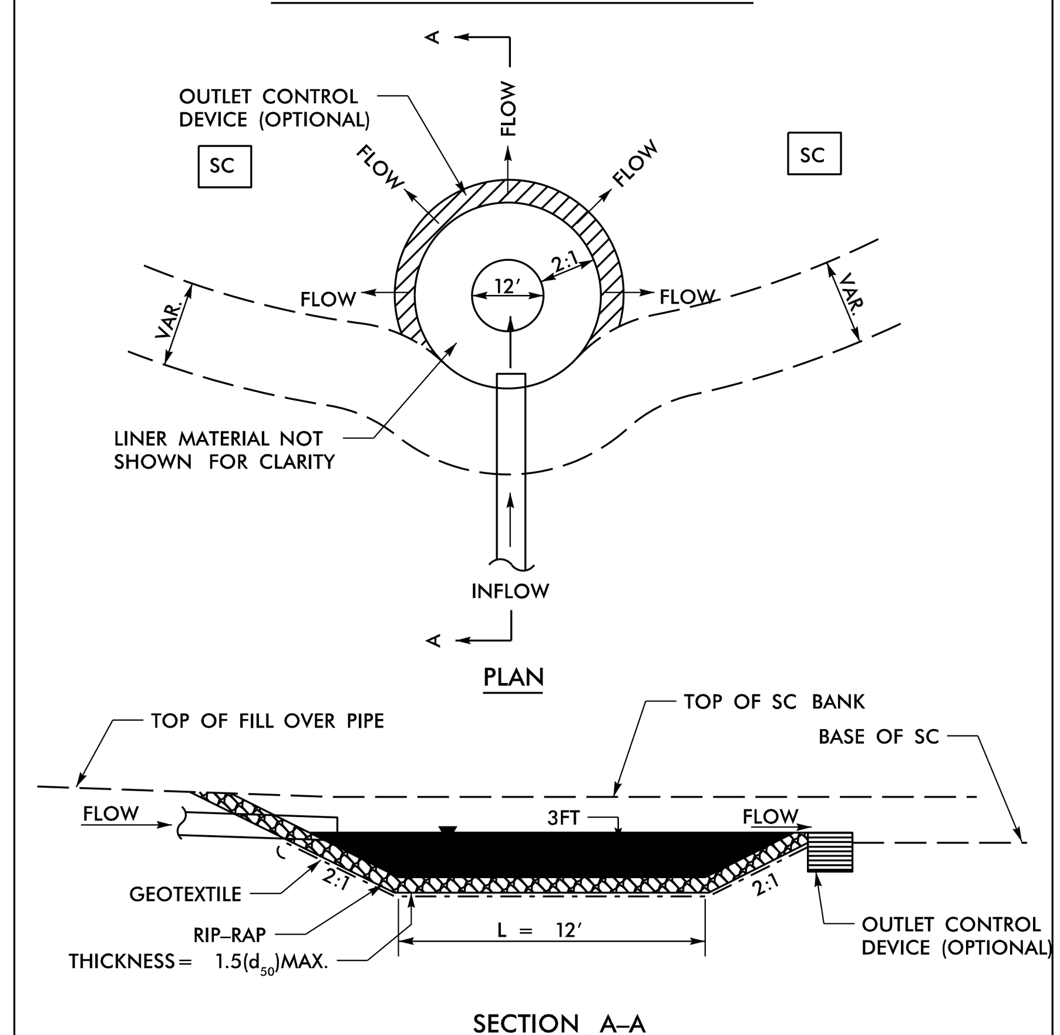
DETAIL #51
CIRCULAR FOREBAY

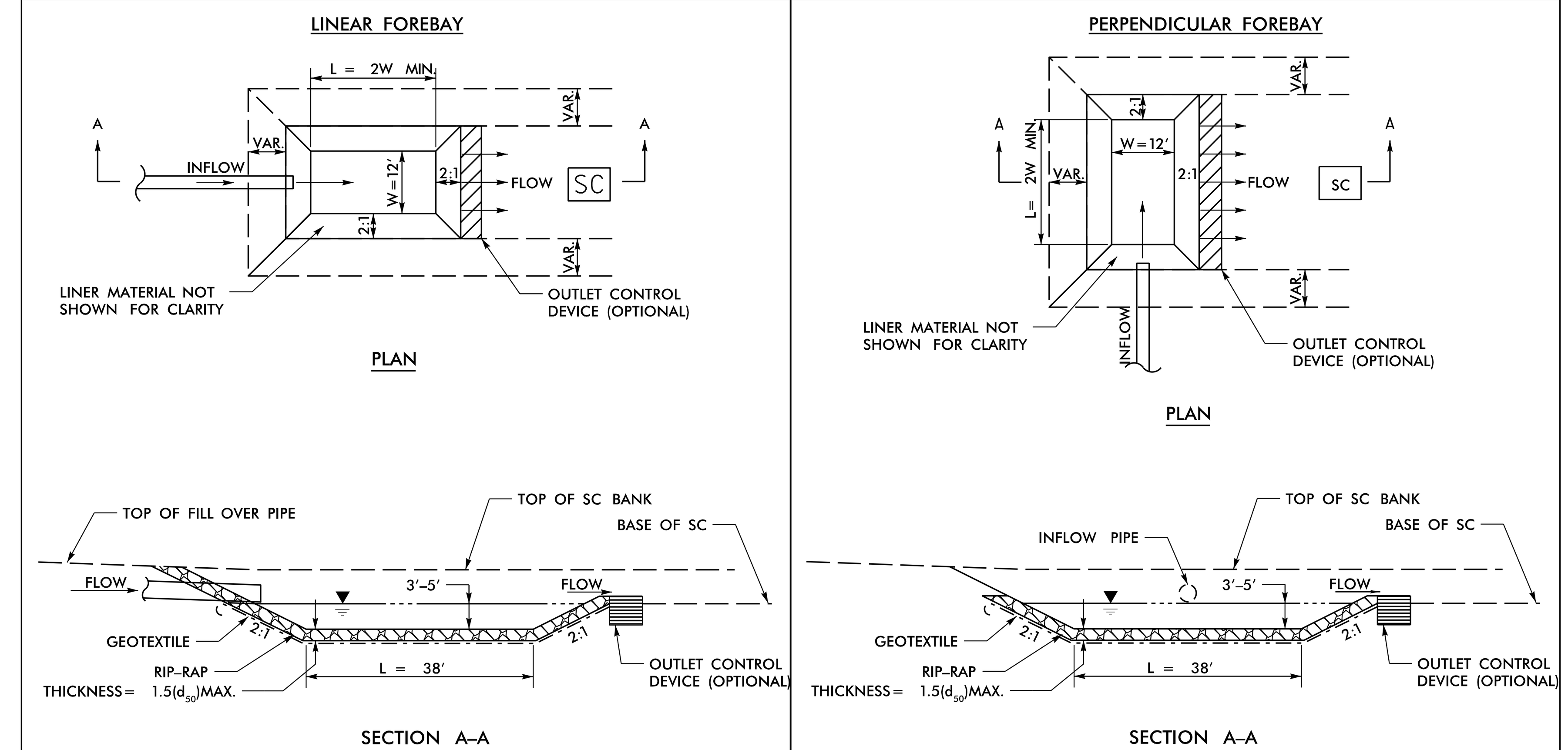


NOTES:
1) LINER MATERIAL TO BE SPECIFIED BY ENGINEER.
2) CIRCULAR FOREBAYS TO BE USED ONLY WITH PIPE INLETS, UNLESS OTHERWISE DIRECTED BY ENGINEER.
3) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

Type of Liner = Class 'I' Rip-Rap

STA. 642+95 -L- LT
STA. 667+62 -L- LT

DETAIL #52
RECTANGULAR FOREBAYS WITH PIPE

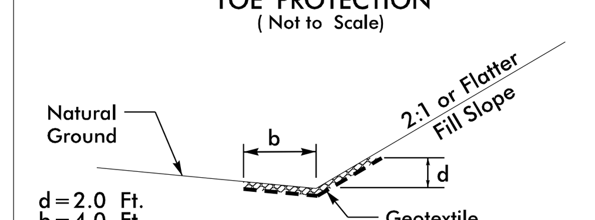


NOTES:
1) LINER MATERIAL TO BE SPECIFIED BY ENGINEER.
2) CIRCULAR FOREBAYS TO BE USED ONLY WITH PIPE INLETS, UNLESS OTHERWISE DIRECTED BY ENGINEER.
3) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

Type of Liner = Class 'I' Rip-Rap

STA. 782+40 -L- RT
STA. 813+00 -L- LT

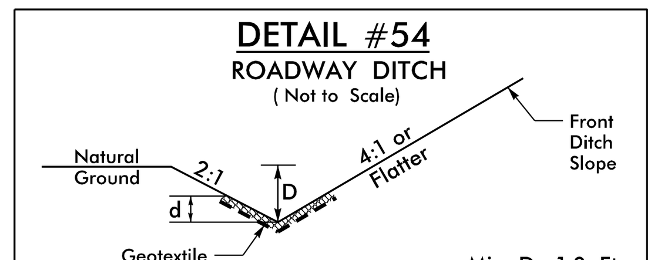
DETAIL #53
TOE PROTECTION
(Not to Scale)



Type of Liner = Class 'B' Rip-Rap

FROM STA. 24+50 TO STA. 28+00 -RAMP_A- RT

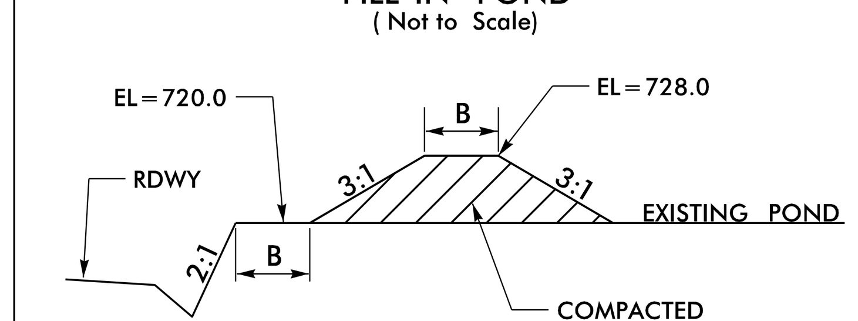
DETAIL #54
ROADWAY DITCH
(Not to Scale)



Type of Liner = Class 'B' Rip-Rap

FROM STA. 10+00 TO STA. 12+00 -SRVRD4- RT
FROM STA. 10+00 TO STA. 12+40 -SRVRD4- LT
FROM STA. 10+25 TO STA. 10+95 -SRVRD5- LT
FROM STA. 10+25 TO STA. 12+00 -PVTENT4- RT

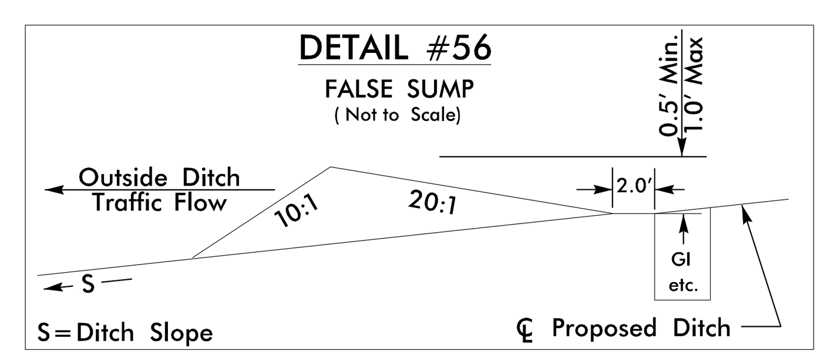
DETAIL #55
FILL IN POND
(Not to Scale)



B = 10.0 Ft.

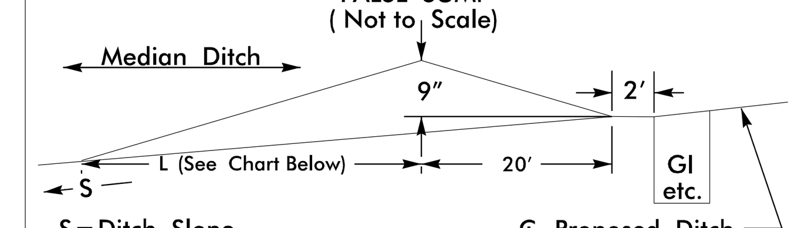
FROM STA. 14+25 TO STA. 15+25 -SRVRD4- RT

DETAIL #56
FALSE SUMP
(Not to Scale)



STA. 641+13 -L- RT   STA. 651+13 -L- RT   STA. 673+17 -L- LT
STA. 677+37 -L- LT   STA. 696+13 -L- RT   STA. 700+63 -L- RT
STA. 705+13 -L- RT   STA. 709+63 -L- RT   STA. 739+13 -L- RT
STA. 744+88 -L- LT   STA. 749+88 -L- LT   STA. 798+38 -L- LT
STA. 821+33 -L- RT   STA. 828+13 -L- RT   STA. 832+13 -L- RT
STA. 839+13 -L- RT   STA. 23+74 -Y1- RT   STA. 24+88 -Y3-LT
STA. 20+14 -SRVRD_1- LT   STA. 11+88 -SRVRD_4- RT
STA. 25+17 -RAMP_D- LT   STA. 25+17 -RAMP_D- RT
STA. 21+87 -RAMP_D- LT   STA. 21+88 -RAMP_D- RT
STA. 18+37 -RAMP_D- LT   STA. 18+38 -RAMP_D- RT
STA. 14+28 -RAMP_D- LT   STA. 30+50 -RAMP_A- LT

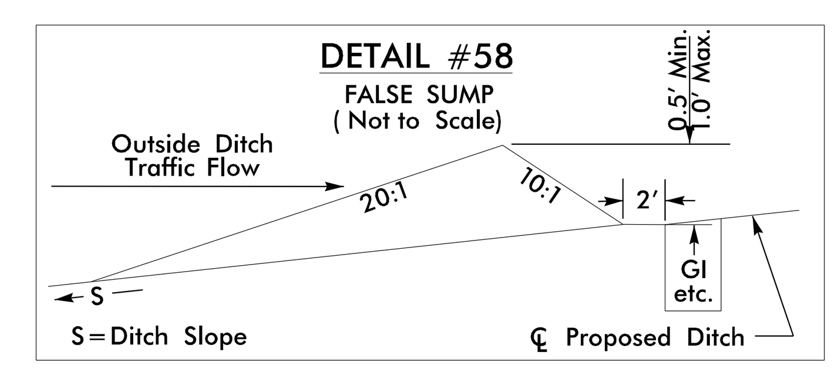
DETAIL #57
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 637+63 -L- MED   STA. 641+13 -L- MED   STA. 643+08 -L- MED
STA. 647+18 -L- MED   STA. 650+88 -L- MED   STA. 655+88 -L- MED
STA. 660+37 -L- MED   STA. 668+43 -L- MED   STA. 673+17 -L- MED
STA. 677+37 -L- MED   STA. 681+87 -L- MED   STA. 688+08 -L- MED
STA. 696+13 -L- MED   STA. 700+63 -L- MED   STA. 705+13 -L- MED
STA. 709+63 -L- MED   STA. 713+13 -L- MED   STA. 718+63 -L- MED
STA. 722+63 -L- MED   STA. 726+63 -L- MED   STA. 730+63 -L- MED
STA. 734+63 -L- MED   STA. 739+13 -L- MED   STA. 741+88 -L- MED
STA. 745+38 -L- MED   STA. 749+88 -L- MED   STA. 761+13 -L- MED
STA. 764+58 -L- MED   STA. 768+63 -L- MED   STA. 772+63 -L- MED
STA. 777+63 -L- MED   STA. 782+63 -L- MED   STA. 787+63 -L- MED
STA. 792+98 -L- MED   STA. 796+93 -L- MED   STA. 798+38 -L- MED
STA. 801+88 -L- MED   STA. 804+48 -L- MED   STA. 805+38 -L- MED
STA. 810+88 -L- MED   STA. 812+88 -L- MED   STA. 817+38 -L- MED
STA. 821+33 -L- MED   STA. 828+13 -L- MED   STA. 832+13 -L- MED
STA. 835+13 -L- MED   STA. 839+13 -L- MED

DETAIL #58
FALSE SUMP
(Not to Scale)



STA. 637+00 -L- RT   STA. 660+37 -L- RT   STA. 667+13 -L- LT
STA. 696+13 -L- LT   STA. 700+63 -L- LT   STA. 705+13 -L- LT
STA. 709+63 -L- LT   STA. 713+13 -L- LT   STA. 730+00 -L- RT
STA. 745+38 -L- RT   STA. 749+88 -L- RT   STA. 762+63 -L- LT
STA. 768+63 -L- LT   STA. 772+63 -L- LT   STA. 798+38 -L- RT
STA. 801+88 -L- RT   STA. 805+38 -L- RT   STA. 808+93 -L- LT
STA. 828+13 -L- LT   STA. 835+13 -L- LT   STA. 839+13 -L- LT
STA. 25+13 -Y3- RT   STA. 17+38 -RAMP_A- LT
STA. 19+82 -SRVRD_1- RT   STA. 10+79 -SRVRD_5A- RT
STA. 11+88 -SRVRD_4- LT   STA. 16+61 -RAMPC- RT
STA. 16+63 -RAMPC- LT   STA. 18+36 -RAMPC- RT
STA. 20+36 -RAMPC- RT   STA. 22+20 -RAMPC- RT

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2D-7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

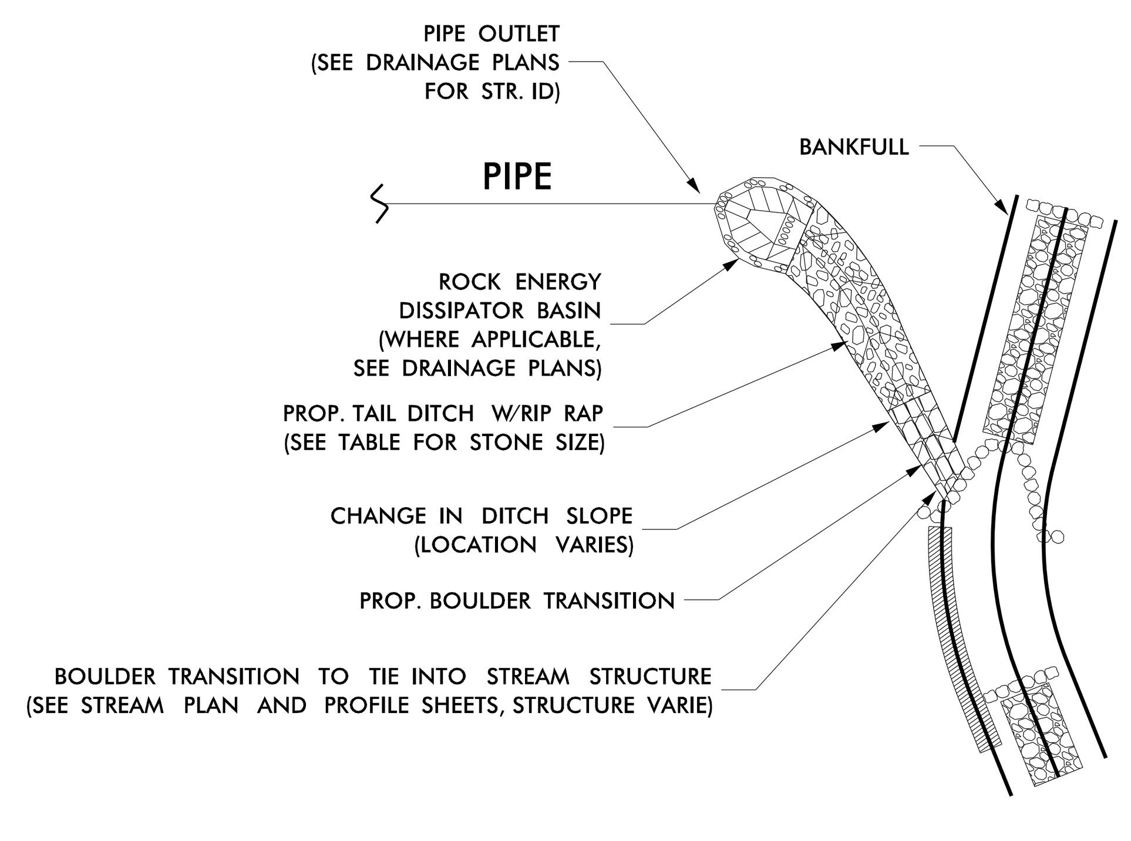
4/21/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

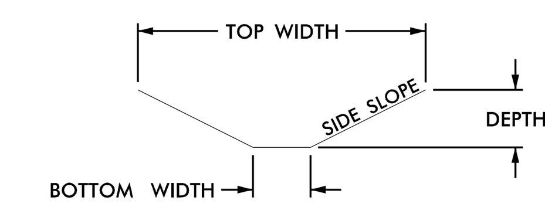
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

DETAIL #60

STORMWATER TIE IN TO STREAM STRUCTURE



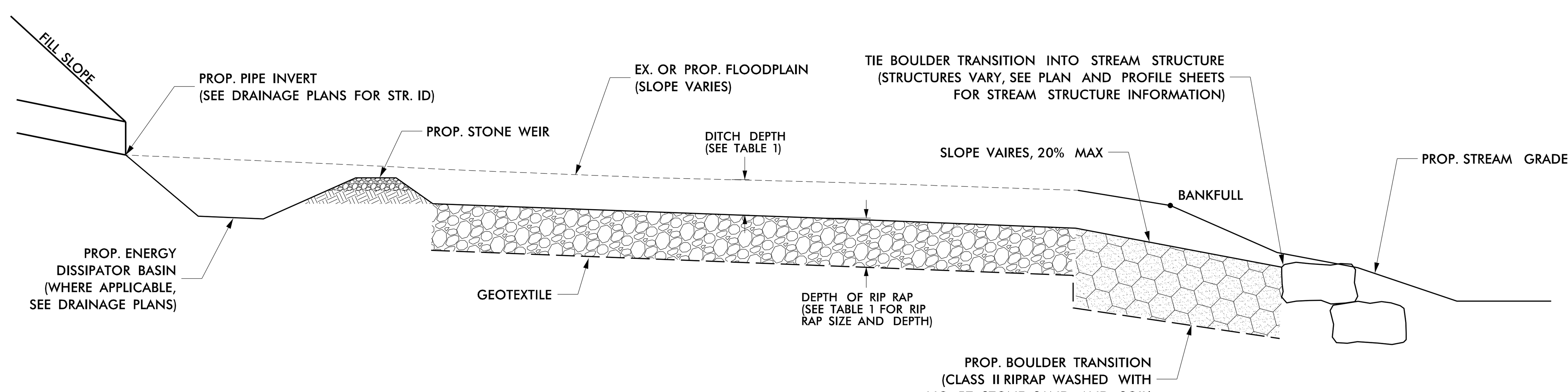
TYPICAL PLAN VIEW
N.T.S.



TYPICAL STORMWATER DITCH CROSS SECTION
N.T.S

Table 1: Stormwater Ditch Cross Section Data

Structure ID	Bottom Width	Side Slopes	Top Width	Depth	Riprap Size	Depth of Riprap	Average Slope of Ditch in Floodplain (ft/ft)
1009	2′	2:1	6′	1′	Class ′B′	16″	0.044
1012	3′	2:1	13′	2.5′	Class ′I′	20″	0.038
1112	3′	2:1	11′	2′	Class ′I′	20″	0.029
1106	2′	2:1	6′	1′	Class ′I′	20″	0.043
1109	2′	2:1	6′	1′	Class ′B′	16″	0.033
1209	2′	2:1	6′	1′	Class ′B′	16″	0.06 – 0.09



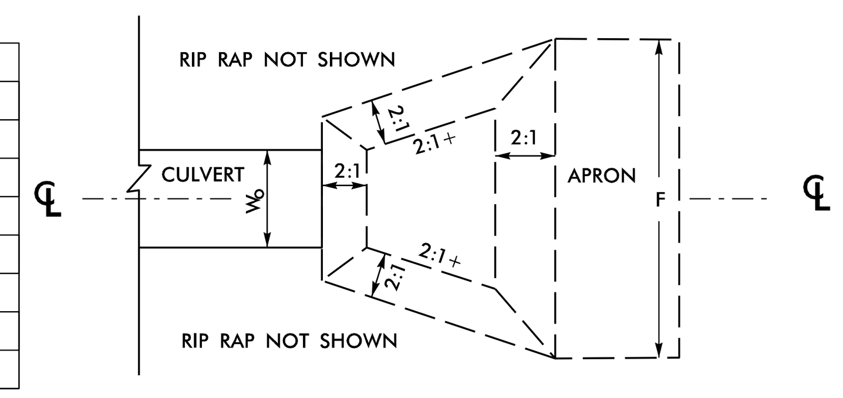
TYPICAL PROFILE VIEW
N.T.S.

DETAIL #59

RIP-RAPPED ENERGY DISSIPATOR BASIN (OUTLET TO TAIL DITCH)

DIM. (ft)	RIP RAP BASIN #				
	2	3	4	5	
A	2.0′	2.0′	2.0′	2.0′	
B	1.5′	1.5′	1.5′	1.5′	
C	1.5′	1.5′	1.5′	1.5′	
D	1.0′	1.0′	1.0′	1.0′	
E	4.0′	4.0′	4.0′	4.0′	
F	12.0′	12.0′	12.0′	12.0′	
G	10.0′	10.0′	10.0′	10.0′	

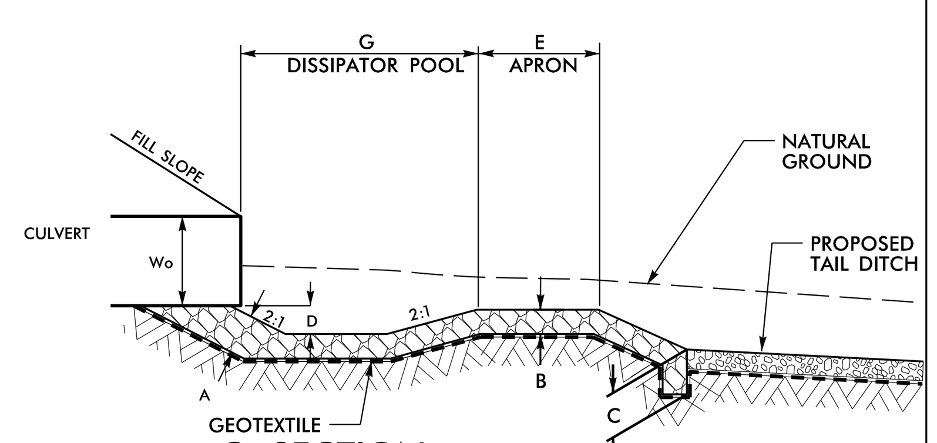
ALL DIMENSIONS APPROXIMATE



PLAN

BASIN #	LOCATION (AT OUTLET)
2	722+50 –L– LT
3	730+50 –L– LT
4	734+50 –L– LT
5	741+08 –L– LT

BASINS #2–5 (QUANTITIES PER EACH)
CLASS ′I′ RIP RAP
EST. 30 TONS
EST. 50 SY GF
EST. 20 CY DDE



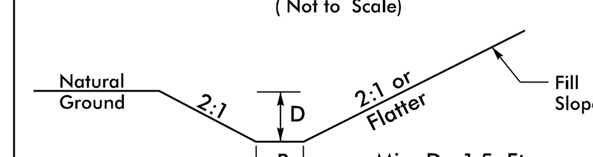
℄ SECTION

7/08

DETAIL #61

SPECIAL LATERAL BASE DITCH

(Not to Scale)



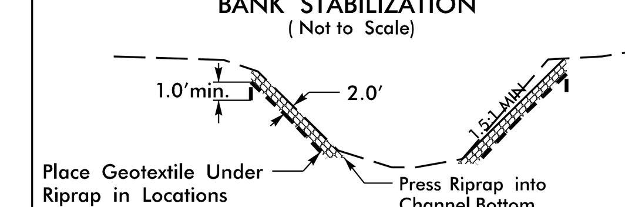
Min. D=1.5 Ft.
B=2.0 Ft.

FROM STA. 29+65 TO STA. 31+00 –Y2– RT

DETAIL #62

BANK STABILIZATION

(Not to Scale)



Place Geotextile Under Riprap in Locations Directed by Engineer

Press Riprap into Channel Bottom Until Refusal

Type of Liner= 1,040 TONS,CL ′II′ Rip–Rap, Keyed–In
EST. 1,650 SY Geotextile

FROM STA. 848+33 TO STA. 850+23 –L–

4/20/2023
\documents\pw_working\dms42388\R2707D_Detail_Drainage_2D1-2D6.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

DocuSigned by: Jeremy Hamm 46220234ABC46A... 3/6/2023

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

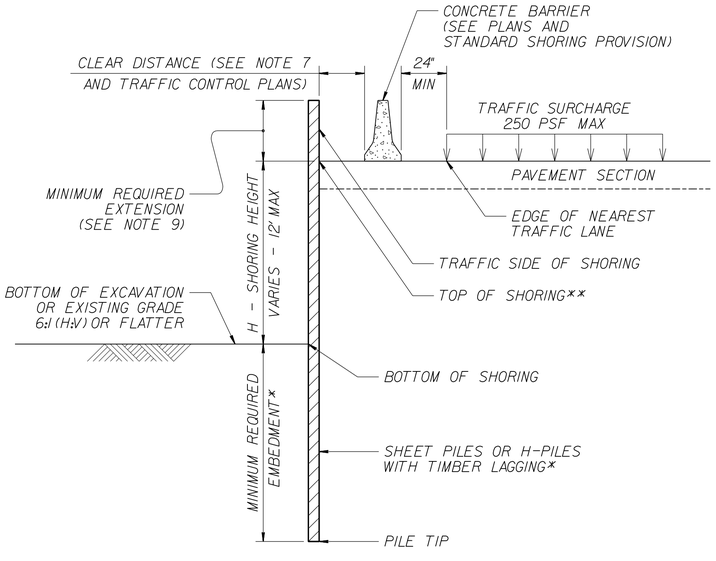
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

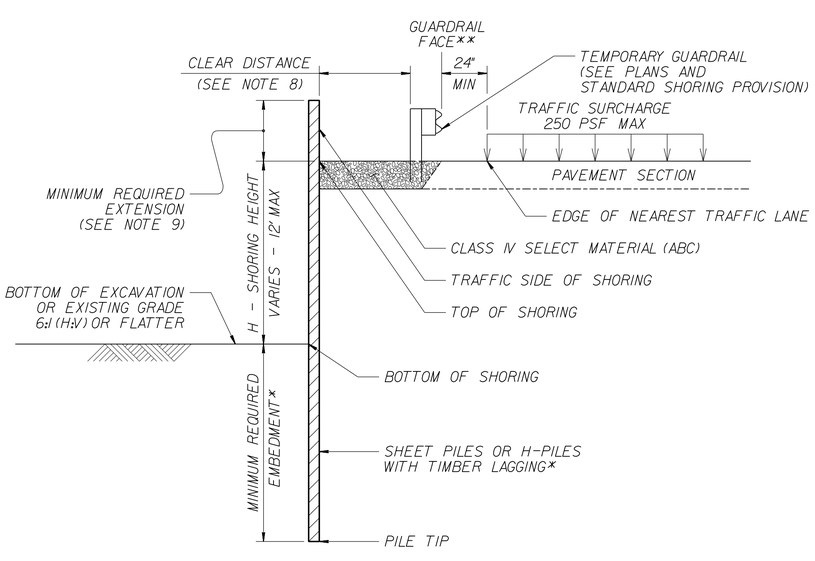
NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS 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 SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



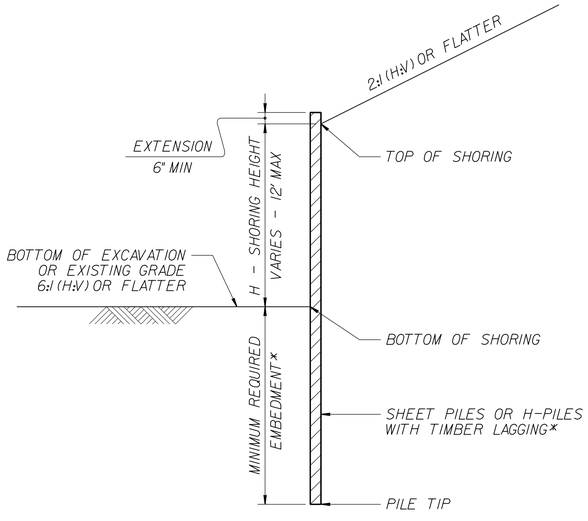
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

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.
R-2707D	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

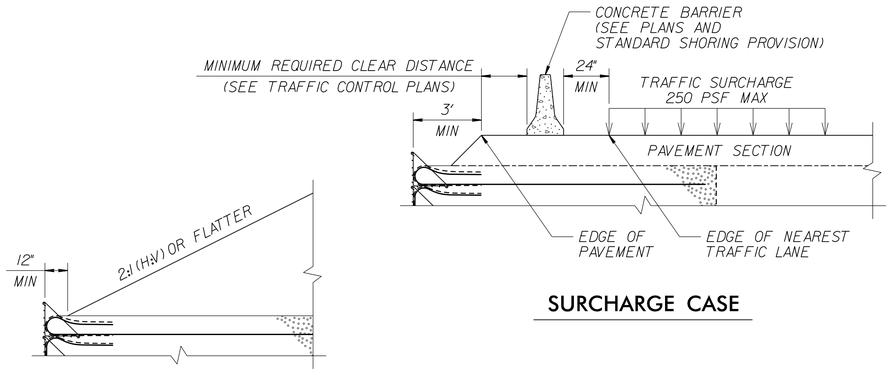
DocuSigned by: Jeremy Hamm 46220234088C46A... 3/6/2023

SIGNATURE DATE

ENGINEER

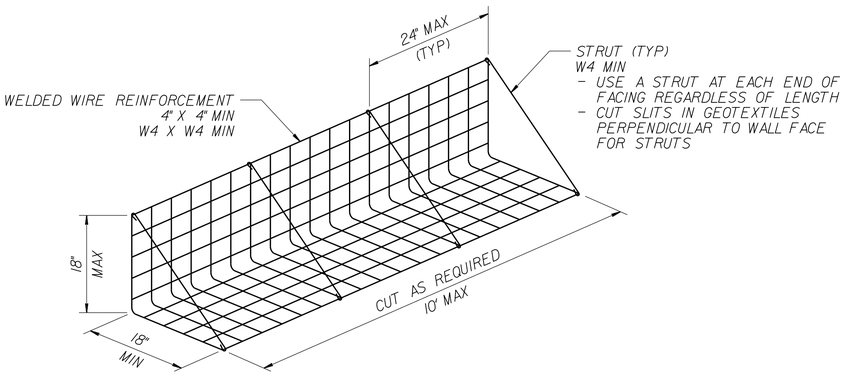
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

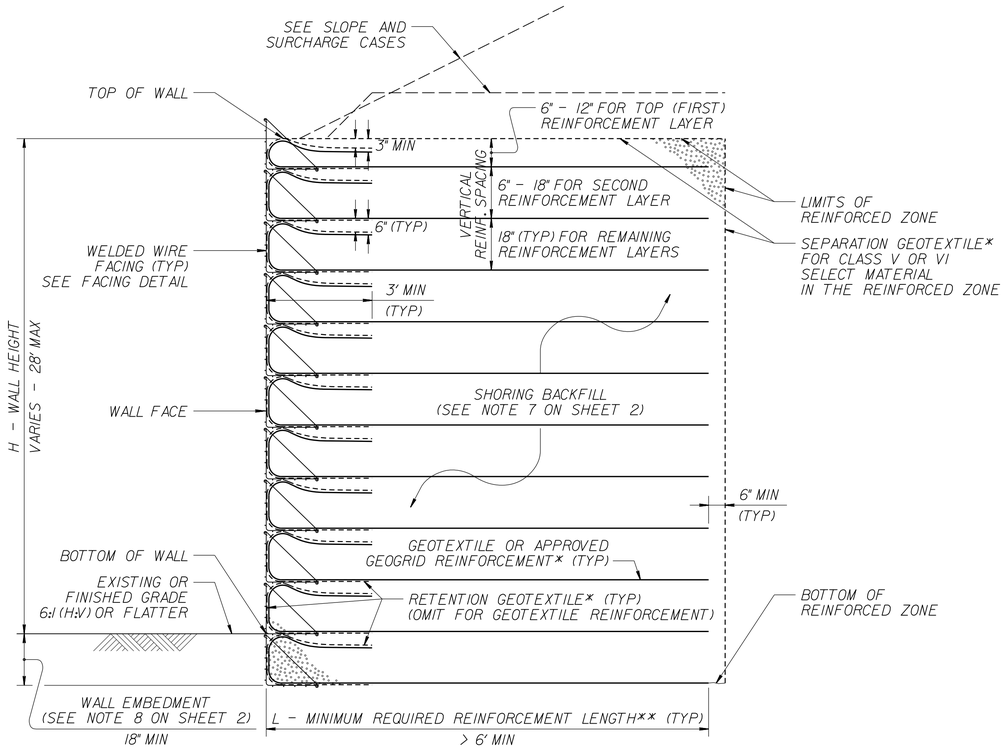


SURCHARGE CASE

SLOPE CASE

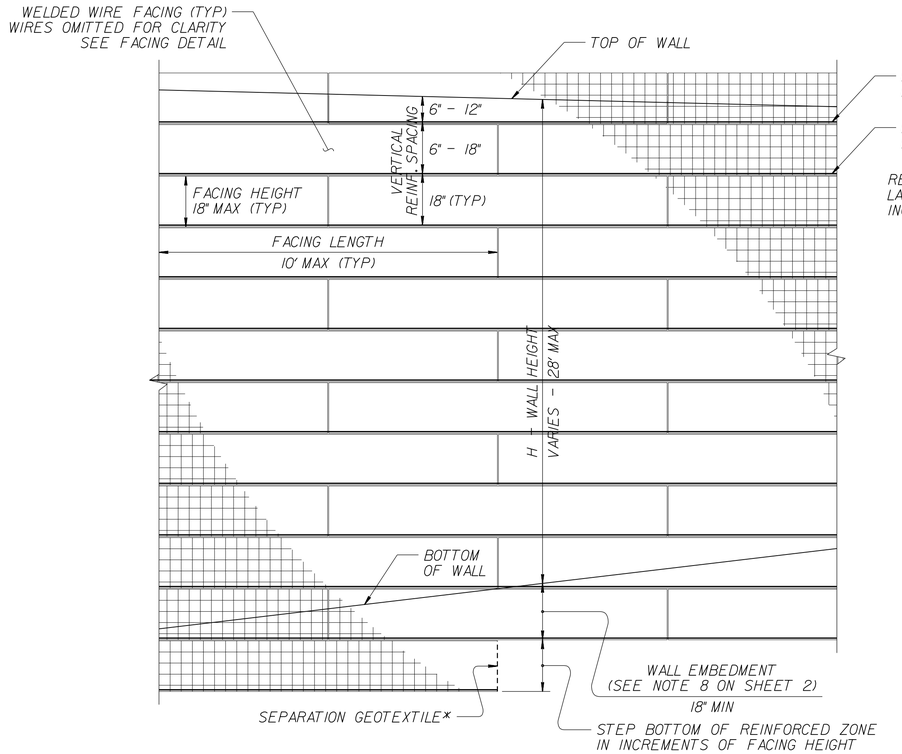


FACING DETAIL



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. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

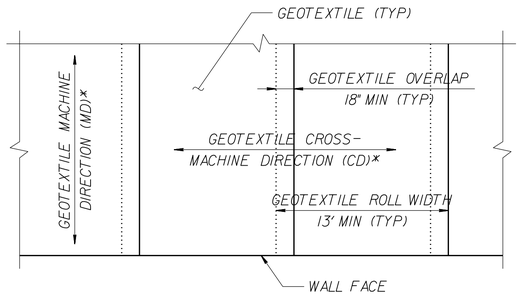
DocuSigned by: Jeremy Hamm 46220234BBC46A... 3/6/2023

SIGNATURE DATE

ENGINEER

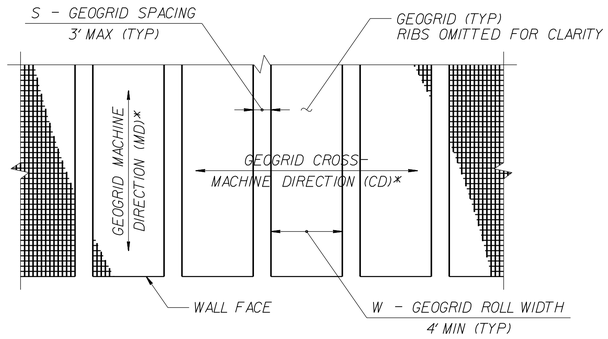
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

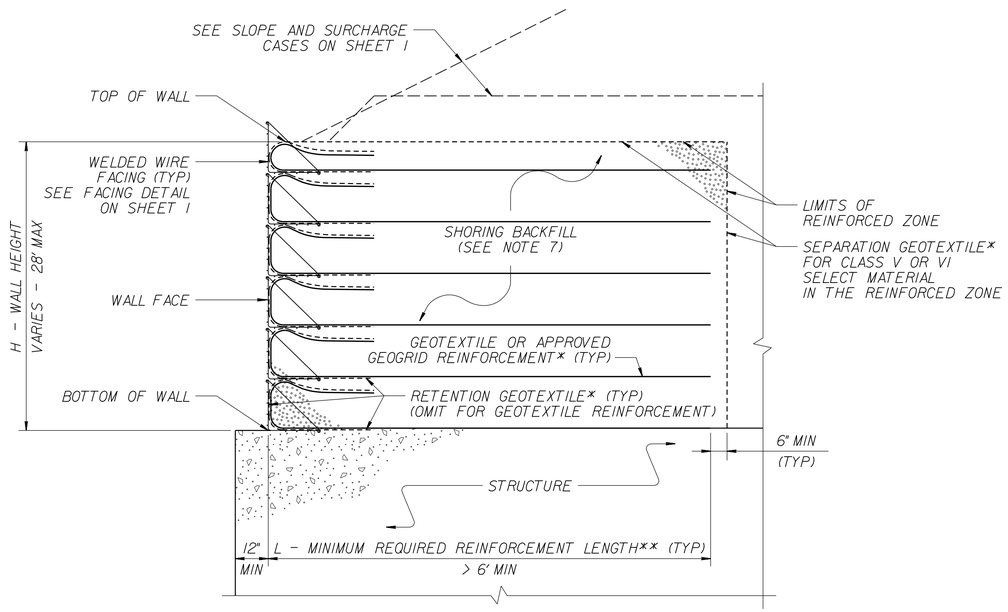


GEOGRID PLACEMENT

(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

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 2 OF 3

DATE: 10-19-21

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R HAMM

DocuSigned by: Jeremy Hamm 46220234B8C46A... 3/6/2023

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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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)

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.)

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.

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. 1801.02

STANDARD
TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2G-5

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 048207 ENGINEER STEPHEN C. CROCKETT

DocuSigned by: Stephen Crockett 4/12/2023
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ENGINEER

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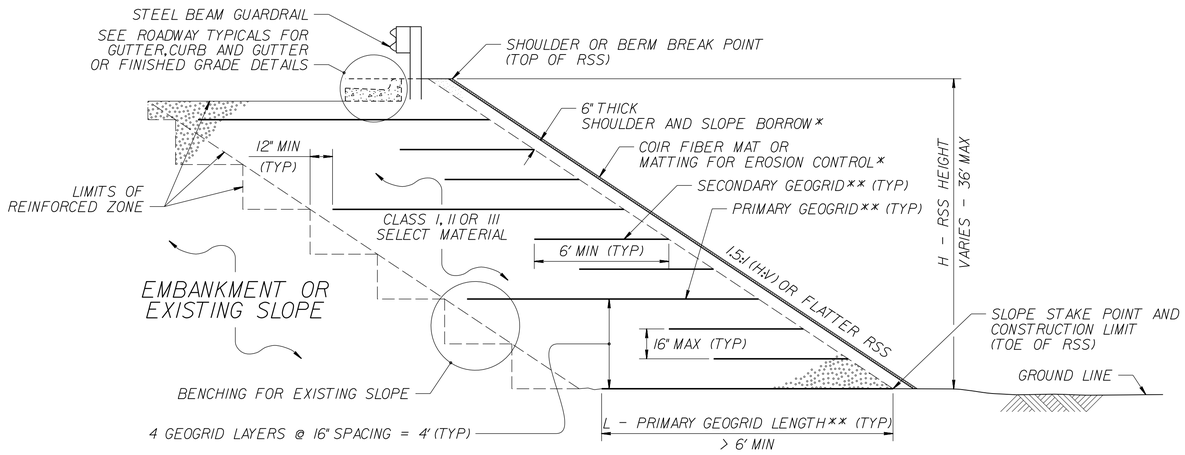
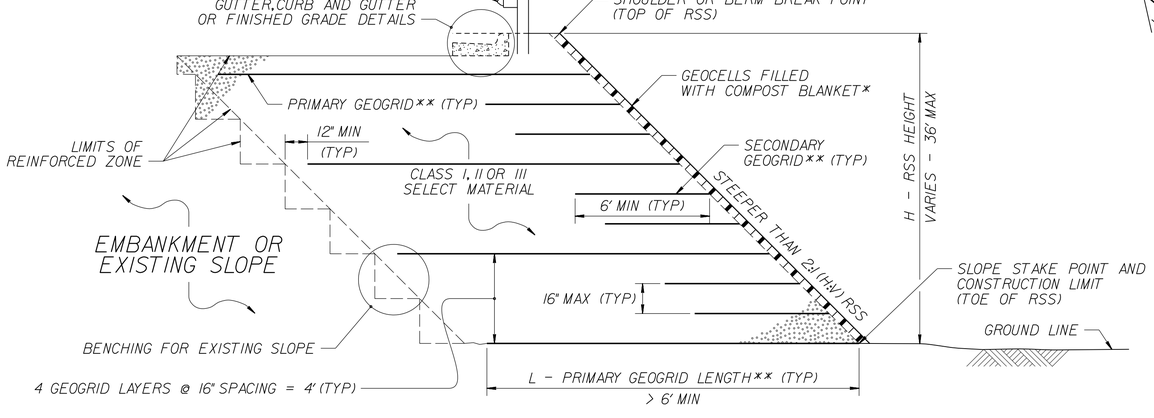


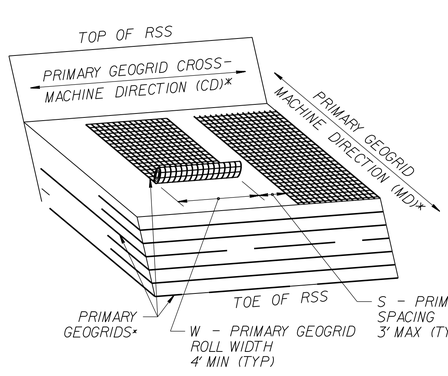
MATTING WITH SHOULDER AND SLOPE BORROW

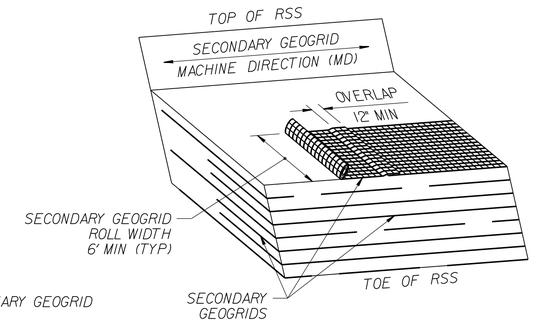
*SEE NOTES 3 AND 10 ON SHEET 2.



GEOCELLS WITH COMPOST BLANKET

*SEE NOTES 3 AND 10 ON SHEET 2.





GEOGRID PLACEMENT DETAILS

(% COVERAGE = $\frac{W}{W+S}$ x 100 $\geq$ 75%)

*SEE NOTE 8 ON SHEET 2. DO NOT OVERLAP PRIMARY GEOGRIDS IN ANY DIRECTION.

STANDARD REINFORCED SOIL SLOPE (RSS)

**SEE TABLES ON SHEET 2 AND GEOGRID PLACEMENT DETAILS. IF RSS ANGLE IS 2:1 (H:V) OR FLATTER, REPLACE PRIMARY GEOGRID WITH SECONDARY GEOGRID PLACED AS SHOWN IN THE GEOGRID PLACEMENT DETAILS.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD REINFORCED SOIL SLOPE (RSS) WITH HIGH GROUNDWATER
SHEET 1 OF 2

DATE: 12-17-19

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2G-6

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 048207 ENGINEER STEPHEN C CROCKETT

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H (FT)	0 - < 12		12 - 24		> 24 - 36	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	900	500	1200	900	1800	1200
1.5:1 TO 1.75:1 (H:V) RSS	500	500	900	500	1400	1000
> 1.75:1 TO < 2:1 (H:V) RSS	500	500	600	500	1000	800

MINIMUM REQUIRED PRIMARY GEOGRID LONG-TERM DESIGN STRENGTH (LTDS, LB/FT) IN MACHINE DIRECTION (MD)

(LTDS IS BASED ON 100% COVERAGE FOR PRIMARY GEOGRID. SEE NOTE 8 FOR LESS THAN 100% COVERAGE.)

NOTES:

1. SEE EROSION CONTROL AND ROADWAY PLANS AND SUMMARY SHEETS FOR REINFORCED SOIL SLOPE (RSS) AND SLOPE EROSION CONTROL LOCATIONS.

2. FOR STANDARD REINFORCED SOIL SLOPES, SEE REINFORCED SOIL SLOPES PROVISION. FOR STEEL BEAM GUARDRAIL, SEE SECTION 862 OF THE STANDARD SPECIFICATIONS.

3. FOR SHOULDER AND SLOPE BORROW, SEE ARTICLE 1019-2 OF THE STANDARD SPECIFICATIONS. FOR GEOCELLS, SEE CELLULAR CONFINEMENT SYSTEMS PROVISION. FOR COIR FIBER MAT, MATTING FOR EROSION CONTROL AND COMPOST BLANKET, SEE EROSION CONTROL PROVISIONS, SECTION 1631 OF THE STANDARD SPECIFICATIONS AND ROADWAY STANDARD DRAWING NO. 1631.01.

4. STANDARD RSS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF

5. DO NOT USE STANDARD RSS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER OR FLOOD ELEVATION IS ABOVE TOE OF RSS.

6. DO NOT USE STANDARD RSS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW RSS.

7. PRIMARY GEOGRIDS ARE APPROVED FOR LTDS FOR A 75-YEAR DESIGN LIFE IN THE MD 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 SELECT MATERIAL AS FOLLOWS:

MATERIAL TYPE	SELECT MATERIAL
BORROW	CLASS I SELECT MATERIAL
FINE AGGREGATE	CLASS II OR III SELECT MATERIAL

8. FOR PRIMARY GEOGRIDS WITH 100% COVERAGE, PLACE PRIMARY GEOGRIDS SO GEOGRIDS ARE ADJACENT TO EACH OTHER IN THE CD. FOR PRIMARY GEOGRIDS WITH 75% TO LESS THAN 100% COVERAGE,

   MINIMUM REQUIRED PRIMARY GEOGRID LTDS = LTDS BASED ON 100% COVERAGE x (W + S) / W

   SEE TABLE FOR LTDS BASED ON 100% COVERAGE AND GEOGRID PLACEMENT DETAILS FOR PRIMARY GEOGRID ROLL WIDTH (W) AND SPACING (S). FOR PRIMARY GEOGRIDS WITH LESS THAN 100% COVERAGE, STAGGER PRIMARY GEOGRIDS SO GEOGRIDS ARE CENTERED OVER GAPS IN THE PRIMARY GEOGRID LAYER BELOW. DO NOT USE LESS THAN 75% COVERAGE FOR PRIMARY GEOGRIDS.

9. DO NOT PLACE ANY GEOGRIDS UNTIL EXCAVATION DIMENSIONS AND IN-SITU MATERIAL ARE APPROVED.

10. FOR SLOPE EROSION CONTROL, USE GEOCELLS OR MATTING ON SLOPE FACES OF RSS AS FOLLOWS:

RSS ANGLE	SLOPE EROSION CONTROL
1:1 TO < 1.5:1 (H:V)	GEOCELLS WITH COMPOST BLANKET
1.5:1 TO < 2:1 (H:V)	GEOCELLS WITH COMPOST BLANKET OR COIR FIBER MAT WITH SHOULDER AND SLOPE BORROW*
2:1 (H:V) OR FLATTER	MATTING FOR EROSION CONTROL WITH SHOULDER AND SLOPE BORROW

*SEE REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL SUMMARY TABLE IN THE ROADWAY SUMMARY SHEETS FOR SLOPE EROSION CONTROL ON SLOPE FACES OF RSS 1.5:1 (H:V) TO STEEPER THAN 2:1.

H (FT)	0 - < 12		12 - 24		> 24 - 36	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	1.25	1.20	1.15	1.10	1.10	1.00
1.5:1 TO 1.75:1 (H:V) RSS	1.10	1.00	0.95	0.90	0.90	0.85
> 1.75:1 TO < 2:1 (H:V) RSS	1.00	0.85	0.80	0.75	0.75	0.70

PRIMARY GEOGRID LENGTH / RSS HEIGHT (L/H) RATIO (L > 6' MIN)

(IF L ≤ 6', USE SECONDARY GEOGRID INSTEAD OF PRIMARY GEOGRID.)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD
REINFORCED SOIL SLOPE (RSS)
WITH HIGH GROUNDWATER
SHEET 2 OF 2

DATE: 12-17-19

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2G-7

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 048207 ENGINEER STEPHEN C. CROCKETT

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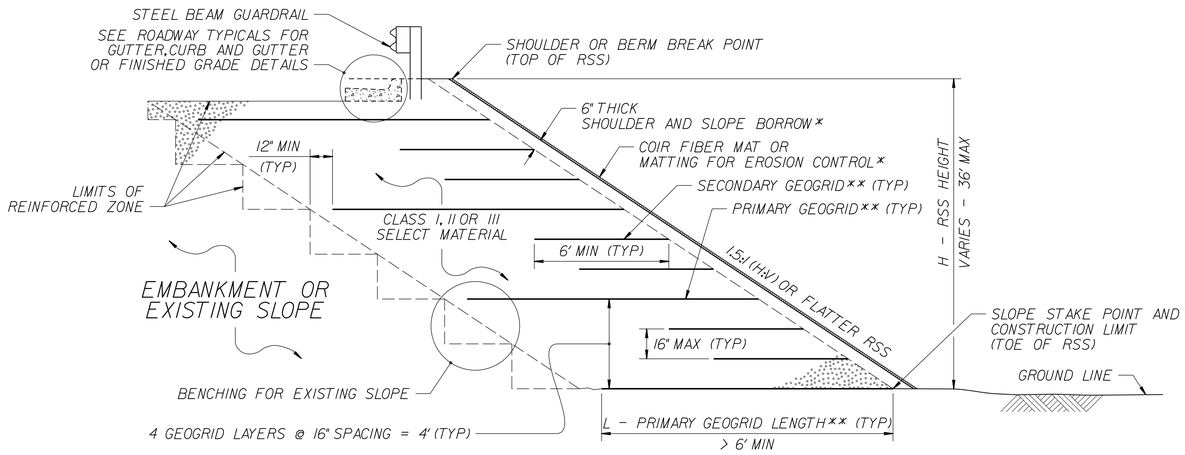
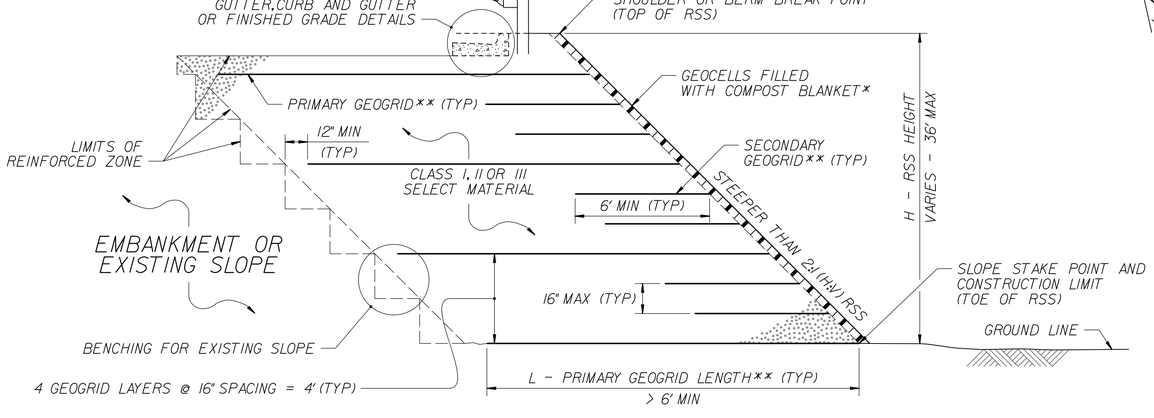


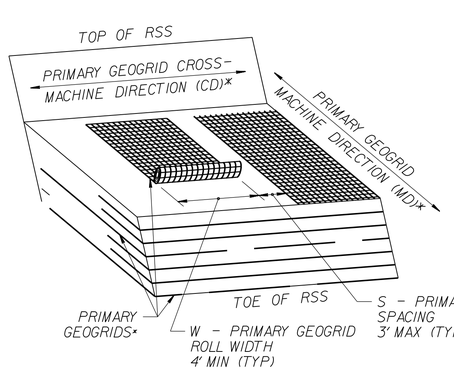
MATTING WITH SHOULDER AND SLOPE BORROW

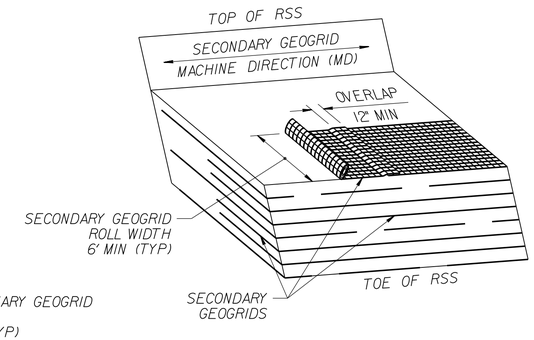
*SEE NOTES 3 AND 10 ON SHEET 2.



GEOCELLS WITH COMPOST BLANKET

*SEE NOTES 3 AND 10 ON SHEET 2.





GEOGRID PLACEMENT DETAILS

(% COVERAGE = $\frac{W}{W+S}$ x 100 $\geq$ 75%)

*SEE NOTE 8 ON SHEET 2. DO NOT OVERLAP PRIMARY GEOGRIDS IN ANY DIRECTION.

STANDARD REINFORCED SOIL SLOPE (RSS)

**SEE TABLES ON SHEET 2 AND GEOGRID PLACEMENT DETAILS. IF RSS ANGLE IS 2:1 (H:V) OR FLATTER, REPLACE PRIMARY GEOGRID WITH SECONDARY GEOGRID PLACED AS SHOWN IN THE GEOGRID PLACEMENT DETAILS.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.02

STANDARD REINFORCED SOIL SLOPE (RSS) WITH LOW GROUNDWATER
SHEET 1 OF 2

DATE: 12-17-19

PROJECT REFERENCE NO.	SHEET NO.
	2G-8

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 048207 ENGINEER STEPHEN C. CROCKETT

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SIGNATURE DATE

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H (FT)	0 - < 12		12 - 24		> 24 - 36	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	900	500	1200	900	1800	1200
1.5:1 TO 1.75:1 (H:V) RSS	500	500	900	500	1400	1000
> 1.75:1 TO < 2:1 (H:V) RSS	500	500	600	500	1000	800

MINIMUM REQUIRED PRIMARY GEOGRID LONG-TERM DESIGN STRENGTH (LTDS, LB/FT) IN MACHINE DIRECTION (MD)

(LTDS IS BASED ON 100% COVERAGE FOR PRIMARY GEOGRID. SEE NOTE 8 FOR LESS THAN 100% COVERAGE.)

NOTES:

1. SEE EROSION CONTROL AND ROADWAY PLANS AND SUMMARY SHEETS FOR REINFORCED SOIL SLOPE (RSS) AND SLOPE EROSION CONTROL LOCATIONS.

2. FOR STANDARD REINFORCED SOIL SLOPES, SEE REINFORCED SOIL SLOPES PROVISION. FOR STEEL BEAM GUARDRAIL, SEE SECTION 862 OF THE STANDARD SPECIFICATIONS.

3. FOR SHOULDER AND SLOPE BORROW, SEE ARTICLE 1019-2 OF THE STANDARD SPECIFICATIONS. FOR GEOCELLS, SEE CELLULAR CONFINEMENT SYSTEMS PROVISION. FOR COIR FIBER MAT, MATTING FOR EROSION CONTROL AND COMPOST BLANKET, SEE EROSION CONTROL PROVISIONS, SECTION 1631 OF THE STANDARD SPECIFICATIONS AND ROADWAY STANDARD DRAWING NO. 1631.01.

4. STANDARD RSS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF

5. DO NOT USE STANDARD RSS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR DEPTH TO GROUNDWATER IS LESS THAN 7 FT.

6. DO NOT USE STANDARD RSS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW RSS.

7. PRIMARY GEOGRIDS ARE APPROVED FOR LTDS FOR A 75-YEAR DESIGN LIFE IN THE MD 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 SELECT MATERIAL AS FOLLOWS:

MATERIAL TYPE	SELECT MATERIAL
BORROW	CLASS I SELECT MATERIAL
FINE AGGREGATE	CLASS II OR III SELECT MATERIAL

8. FOR PRIMARY GEOGRIDS WITH 100% COVERAGE, PLACE PRIMARY GEOGRIDS SO GEOGRIDS ARE ADJACENT TO EACH OTHER IN THE CD. FOR PRIMARY GEOGRIDS WITH 75% TO LESS THAN 100% COVERAGE,

   MINIMUM REQUIRED PRIMARY GEOGRID LTDS = LTDS BASED ON 100% COVERAGE x (W + S) / W

   SEE TABLE FOR LTDS BASED ON 100% COVERAGE AND GEOGRID PLACEMENT DETAILS FOR PRIMARY GEOGRID ROLL WIDTH (W) AND SPACING (S). FOR PRIMARY GEOGRIDS WITH LESS THAN 100% COVERAGE, STAGGER PRIMARY GEOGRIDS SO GEOGRIDS ARE CENTERED OVER GAPS IN THE PRIMARY GEOGRID LAYER BELOW. DO NOT USE LESS THAN 75% COVERAGE FOR PRIMARY GEOGRIDS.

9. DO NOT PLACE ANY GEOGRIDS UNTIL EXCAVATION DIMENSIONS AND IN-SITU MATERIAL ARE APPROVED.

10. FOR SLOPE EROSION CONTROL, USE GEOCELLS OR MATTING ON SLOPE FACES OF RSS AS FOLLOWS:

RSS ANGLE	SLOPE EROSION CONTROL
1:1 TO < 1.5:1 (H:V)	GEOCELLS WITH COMPOST BLANKET
1.5:1 TO < 2:1 (H:V)	GEOCELLS WITH COMPOST BLANKET OR COIR FIBER MAT WITH SHOULDER AND SLOPE BORROW*
2:1 (H:V) OR FLATTER	MATTING FOR EROSION CONTROL WITH SHOULDER AND SLOPE BORROW

*SEE REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL SUMMARY TABLE IN THE ROADWAY SUMMARY SHEETS FOR SLOPE EROSION CONTROL ON SLOPE FACES OF RSS 1.5:1 (H:V) TO STEEPER THAN 2:1.

H (FT)	0 - < 12		12 - 24		> 24 - 36	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	1.10	1.00	0.90	0.85	0.85	0.80
1.5:1 TO 1.75:1 (H:V) RSS	0.90	0.80	0.75	0.70	0.75	0.70
> 1.75:1 TO < 2:1 (H:V) RSS	0.75	0.70	0.65	0.60	0.65	0.60

PRIMARY GEOGRID LENGTH / RSS HEIGHT (L/H) RATIO (L > 6' MIN)

(IF L ≤ 6', USE SECONDARY GEOGRID INSTEAD OF PRIMARY GEOGRID.)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.02

STANDARD
REINFORCED SOIL SLOPE (RSS)
WITH LOW GROUNDWATER
SHEET 2 OF 2

DATE: 12-17-19

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2N-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLAN AND PROFILE OF NOISE WALL 3a

NAD 83/95

BEGIN NOISE WALL
NW3a Sta. 10+00.00 =
-L- Sta. 692+50.00
116.68' LT =
-Y2- Sta. 18+85.68
28.31' LT

NW3a Sta. 10+60.00 =
-L- Sta. 693+09.57
104.31' LT

NW3a Sta. 12+25.00 =
-L- Sta. 694+76.86
104.26' LT

NW3a Sta. 14+80.00 =
-L- Sta. 697+35.34
115.70' LT

NW3a Sta. 18+70.00 =
-L- Sta. 701+30.34
95.81' LT

NW3a Sta. 20+80.00 =
-L- Sta. 703+43.04
98.60' LT

NW3a Sta. 23+35.00 =
-L- Sta. 706+01.31
110.24' LT

695 700 705

ELIZABETH AVE

S 11° 07' 54.4" W
S 1° 35' 27.5" E
S 5° 46' 42.8" E
S 2° 43' 51.6" E
S 8° 41' 49.7" E
S 12° 19' 10.5" E

10 15 20

US 74 WBL

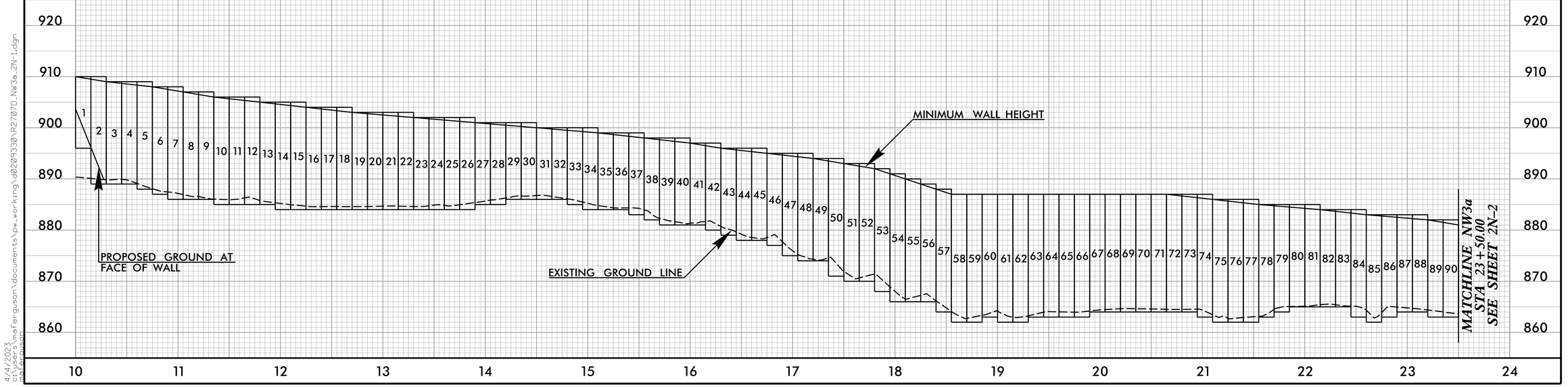
US 74 EBL

MATCHLINE NW3a
STA 23+50.00
SEE SHEET 2N-2

NOTE: OFFSETS SHOWN ARE TO THE ROADWAY FACE OF SOUND BARRIER WALL PILES. SEE SOUND BARRIER WALL SHEETS FOR ADDITIONAL DETAILS.

PANEL NUMBER	1	2	3-4	5	6	7	8-9	10-12	13	14-15	16-18	19-22	23-25	26	27-28	29-30	31-32	33	34	35-36	37	38	39-40	41	42	43	44-45	46	47	48	49	50	51-52	53	54	55	56	57
TOP ELEVATION	910'	910'	909'	909'	908'	908'	907'	906'	905'	905'	904'	903'	902'	902'	901'	901'	900'	900'	900'	899'	899'	898'	898'	897'	897'	896'	896'	895'	895'	895'	894'	894'	893'	892'	891'	890'	889'	888'
PANEL LENGTH	15'	15'	30'	15'	15'	15'	30'	45'	15'	30'	45'	60'	45'	15'	30'	30'	30'	15'	15'	30'	15'	15'	30'	15'	15'	15'	30'	15'	15'	15'	15'	15'	30'	15'	15'	15'	15'	15'
PANEL HEIGHT	14'	21'	20'	21'	21'	22'	21'	21'	20'	21'	20'	19'	18'	18'	16'	15'	14'	15'	16'	15'	16'	16'	17'	16'	17'	17'	18'	18'	20'	21'	20'	23'	23'	24'	25'	24'	23'	24'

PANEL NUMBER	58-59	60	61-62	63-66	67-73	74	75-77	78	79	80-81	82-83	84	85	86	87-88	89-90
TOP ELEVATION	887'	887'	887'	887'	887'	887'	886'	885'	885'	885'	884'	884'	883'	883'	883'	882'
PANEL LENGTH	30'	15'	30'	60'	105'	15'	45'	15'	15'	30'	30'	15'	15'	15'	30'	30'
PANEL HEIGHT	25'	24'	25'	24'	23'	24'	24'	22'	21'	20'	19'	21'	21'	20'	19'	19'



4/4/2023
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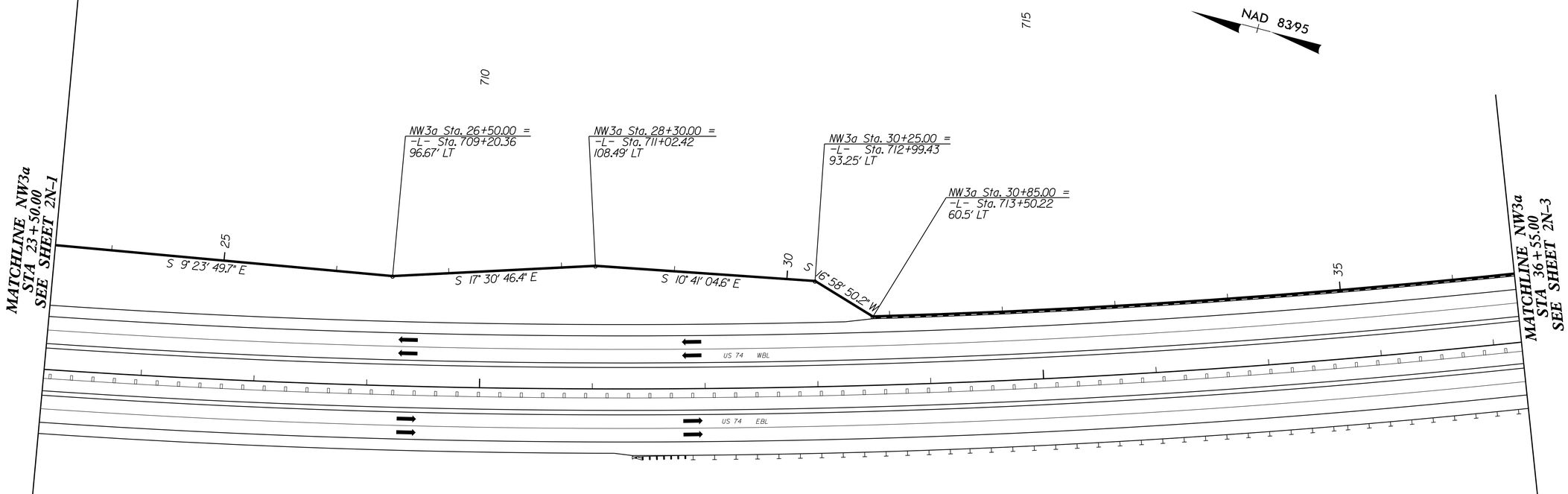
mferguson

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2N-2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

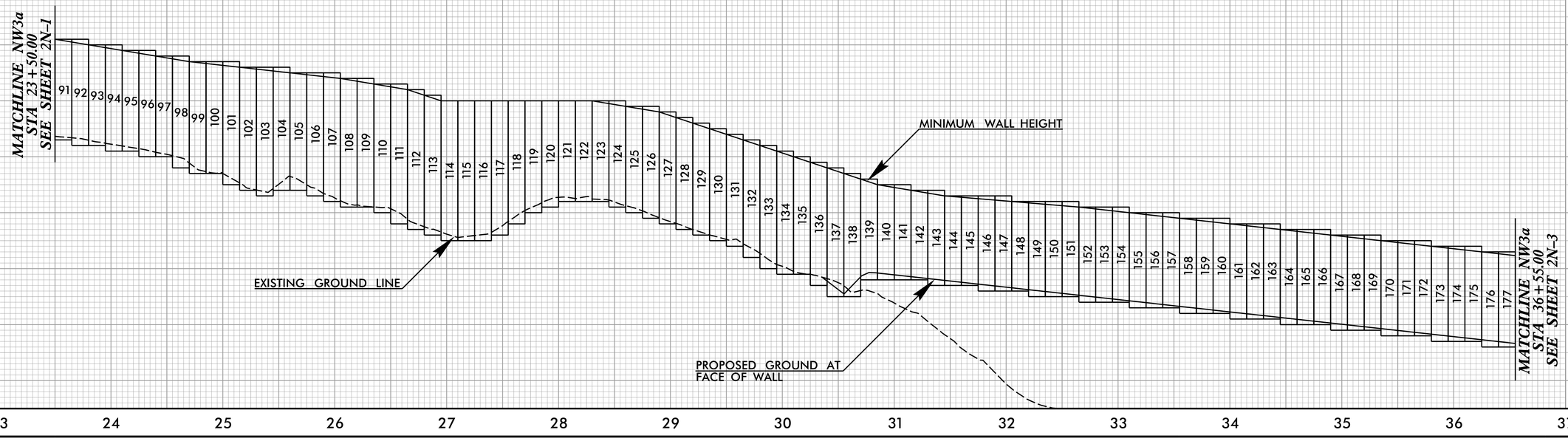
PLAN AND PROFILE OF NOISE WALL 3a



NOTE: OFFSETS SHOWN ARE TO THE ROADWAY FACE OF SOUND BARRIER WALL PILES. SEE SOUND BARRIER WALL SHEETS FOR ADDITIONAL DETAILS.

PANEL NUMBER	91	92	93	94	95	96	97	98	99-100	101	102	103	104	105	106	107	108-109	110	111	112	113	114-116	117	118	119	120	121-123	124	125	126	127	128	129	130	131	132	133
TOP ELEVATION	881'	881'	880'	880'	879'	879'	878'	878'	877'	877'	876'	876'	876'	875'	875'	875'	874'	873'	873'	872'	871'	870'	870'	870'	870'	870'	870'	870'	869'	869'	868'	867'	866'	865'	864'	863'	862'
PANEL LENGTH	15'	15'	15'	15'	15'	15'	15'	15'	30'	15'	15'	15'	15'	15'	15'	15'	30'	15'	15'	15'	15'	45'	15'	15'	15'	15'	45'	15'	15'	15'	15'	15'	15'	15'	15'	15'	15'
PANEL HEIGHT	18'	19'	18'	19'	18'	19'	18'	20'	20'	22'	22'	23'	22'	21'	22'	23'	23'	23'	25'	25'	25'	25'	24'	22'	20'	19'	18'	19'	19'	20'	20'	20'	20'	20'	20'	21'	22'

PANEL NUMBER	134	135	136	137	138	139	140-141	142	143	144-145	146-147	148	149-151	152-154	155-157	158-160	161-163	164-166	167-169	170-172	173-175	176-178
TOP ELEVATION	861'	860'	859'	858'	857'	856'	855'	854'	854'	853'	853'	852'	852'	851'	850'	849'	848'	847'	846'	845'	844'	843'
PANEL LENGTH	15'	15'	15'	15'	15'	15'	30'	15'	15'	30'	30'	15'	45'	45'	45'	45'	45'	45'	45'	45'	45'	45'
PANEL HEIGHT	22'	21'	22'	23'	22'	18'	17'	16'	17'	16'	17'	16'	17'	17'	17'	17'	17'	17'	17'	17'	17'	17'



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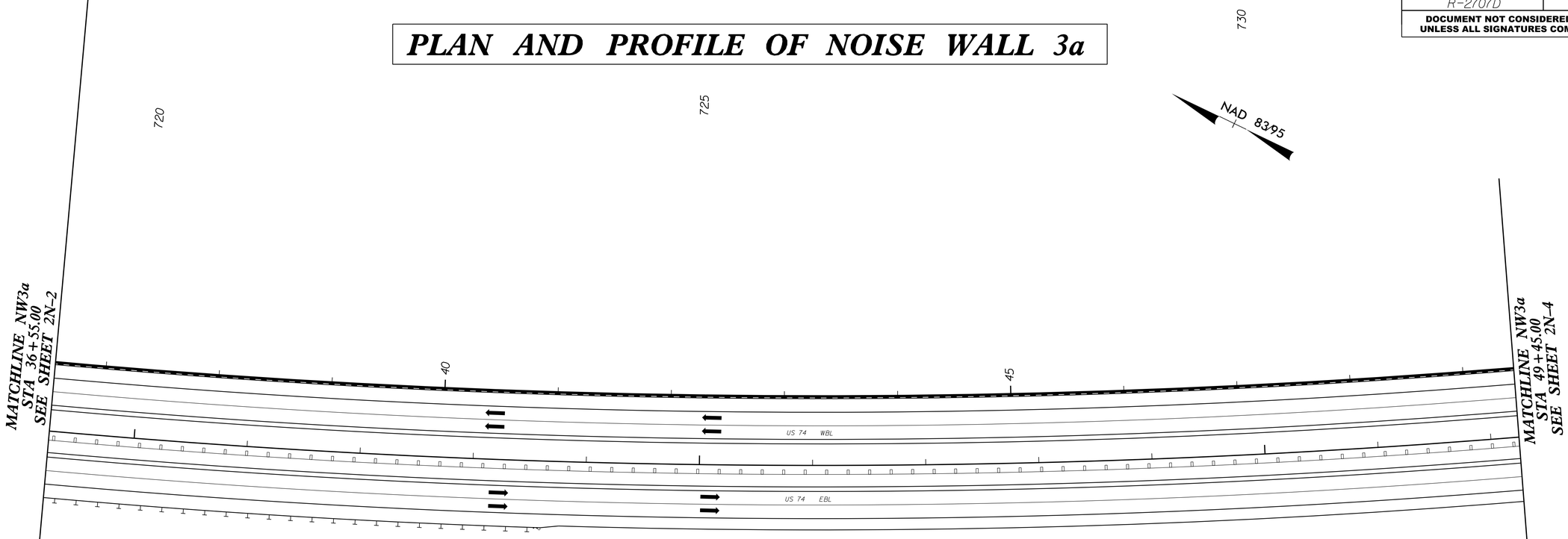
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2N-3
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

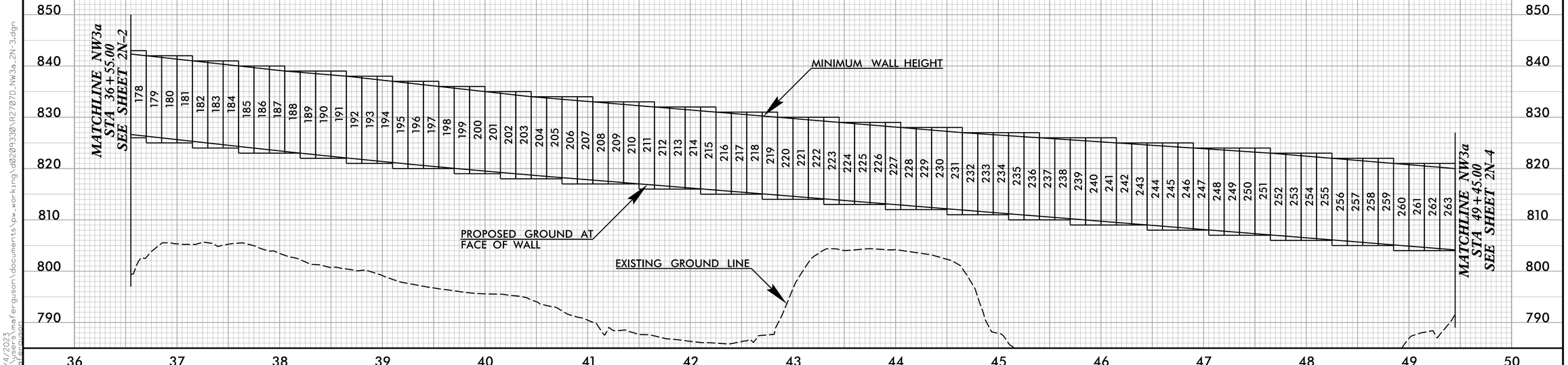
PLAN AND PROFILE OF NOISE WALL 3a



NOTE: OFFSETS SHOWN ARE TO THE ROADWAY FACE OF SOUND BARRIER WALL PILES. SEE SOUND BARRIER WALL SHEETS FOR ADDITIONAL DETAILS.

PANEL NUMBER	176-178	179-181	182-184	185-187	188	189-191	192-194	195-197	198	199-200	201	202-203	204-205	206-207	208-210	211	212-214	215	216-218	219	220-222	223	224-226	227	228-230	231	232-234	235-236
TOP ELEVATION	843'	842'	841'	840'	839'	839'	838'	837'	836'	836'	835'	835'	834'	834'	833'	833'	832'	832'	831'	831'	830'	830'	829'	829'	828'	828'	827'	827'
PANEL LENGTH	45'	45'	45'	45'	15'	45'	45'	45'	15'	30'	15'	30'	30'	30'	45'	15'	45'	15'	45'	15'	45'	15'	45'	15'	45'	15'	45'	30'
PANEL HEIGHT	17'	17	17'	17'	16'	17'	17'	17'	16'	17	16'	17'	16'	17'	16'	17'	16'	17'	16'	17'	16'	17'	16'	17'	16'	17'	16'	17'

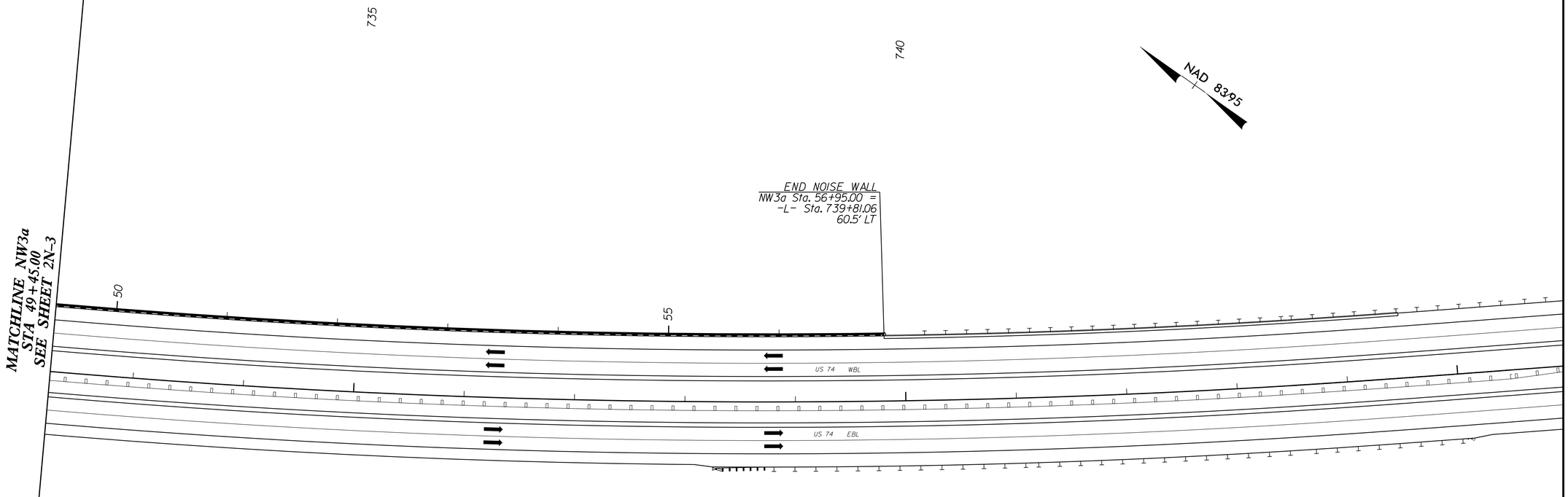
PANEL NUMBER	237-238	239-241	242-243	244-246	247	248-251	252-255	256-259	260-263
TOP ELEVATION	826'	826'	825'	825'	824'	824'	823'	822'	821'
PANEL LENGTH	30'	45'	30'	45'	15'	60'	60'	60'	60'
PANEL HEIGHT	16'	17'	16'	17'	16'	17'	17'	17'	17'



8/17/99

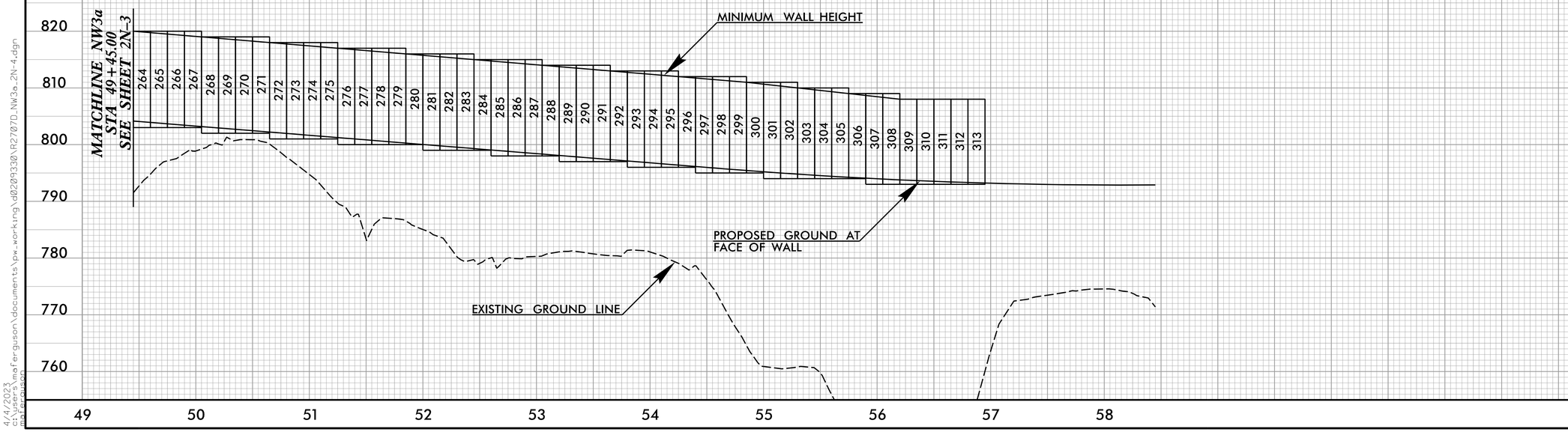
PROJECT REFERENCE NO.	SHEET NO.
R-2707D	2N-4
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PLAN AND PROFILE OF NOISE WALL 3a



NOTE: OFFSETS SHOWN ARE TO THE ROADWAY FACE OF SOUND BARRIER WALL PILES. SEE SOUND BARRIER WALL SHEETS FOR ADDITIONAL DETAILS.

PANEL NUMBER	264-267	268-271	272-275	276-279	280	281-283	284	285-287	288	289-291	292	293-295	296	297-299	300	301-302	303-305	306	307-308	309-313
TOP ELEVATION	820'	819'	818'	817'	816'	816'	815'	815'	814'	814'	813'	813'	812'	812'	811'	811'	810'	809'	809'	808
PANEL LENGTH	60'	60'	60'	60'	15'	45'	15'	45'	15'	45'	15'	45'	15'	45'	15'	30'	45'	15'	30'	75'
PANEL HEIGHT	17'	17'	17'	17'	16'	17'	16'	17'	16'	17'	16'	17'	16'	17'	16'	17'	16'	15'	16'	15'



5/9/06

COMPUTED BY: MBF DATE: 11/11/2022
CHECKED BY: STS DATE: 11/14/2022

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	3B-1

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
–L– 635+00.00 TO 662+00.00	20,699		211,186	190,487	
SUBTOTAL	20,699		211,186	190,487	
–L– 662+00.00 TO 690+00.00	102,372		140,371	37,999	
–Y1– 10+00.00 TO 18+82.63	771		20,235	19,464	
–Y1– 20+80.38 TO 29+30.30	2,669		1,295		1,374
–SRVRD1– 10+12.03 TO 25+80.19	1,402		5,315	3,913	
–DET2– 10+00.00 TO 12+94.38			6,212	6,212	
–DET2– 10+00.00 TO 12+94.38 (REMOVAL)	1,224				1,224
SUBTOTAL	108,438		173,429	67,589	2,598
–L– 690+00.00 TO 720+00.00	179,290		81,162		98,128
–Y2– 11+00.00 TO 19+16.80	2,170		9,347	7,177	
–Y2– 21+18.64 TO 32+23.90	1,518	500	2,064	946	900
–Y6– 8+35.00 TO 9+88.00	147		10		137
SUBTOTAL	183,125	500	92,584	8,123	99,164
–L– 720+00.00 TO 750+00.00	213,415	5,300	302,861	89,846	5,700
SUBTOTAL	213,415	5,300	302,861	89,846	5,700
–L– 750+00.00 TO 780+00.00	683.485		166,935		516,550
–Y3– 12+00.00 TO 22+28.97	36,688		913		35,775
–Y3– 24+47.80 TO 32+00.00	18,640		508		18,132
–Y7– 9+10.00 TO 9+88.00	18				18
–PVTENT1– 5+65.72 TO 9+88.00	1,115		6		1,109
–PVTENT2– 10+12.00 TO 14+20.00	413		58		356
–PVTENT6– 10+12.00 TO 12+50.00	3,107				3,107
SUBTOTAL	743,466		168,420		575,046
–L– 780+00.00 TO 809+41.25	115,313		324,821	209,508	
SUBTOTAL	115,313		324,821	209,508	
–L– 810+60.83 TO 840+50.00	427,535		88,267		339,268
–SRVRD4– 9+78.55 TO 20+20.00	38,382		3,534		34,848
–SRVRD5– 10+10.00 TO 22+96.49	64,814	3,250	4,204		63,860
–SRVRD5A– 10+00.00 TO 13+38.14	14,008		173		13,836
–RAMP C– 16+73.42 TO 19+63.63	31,382				31,382
–RAMP A– 16+00.00 TO 35+63.63	34,798		397,741	362,943	
–RAMP A– 37+95.88 TO 48+50.00	22,699		14,033		8,666
–LOOP A– 13+50.00 TO 17+75.52	1,425		43,936	42,511	
–SRVRD3– 12+00.00 TO 24+50.00	8,834		3,380		5,454
–PVTENT4– 10+25.00 TO 12+80.00	3,420		3		3,417
SUBTOTAL	647,297	3,250	555,272	405,454	500,729
–Y4– 9+90.00 TO 12+50.00	305		41		264
–Y4– 17+50.00 TO 21+50.00	5,135				5,135
–Y5– RT 32+50.00 TO 41+50.00	740		642		98
–PVTENT5– RT 10+25.00 TO 11+10.00	69				69
SUBTOTAL	6,249		683		5,566
–Y5– LT 32+50.00 TO 41+50.00	1,105		189		916
–RAMP D– 19+65.71 TO 27+00.00	54,946		133		54,813
SUBTOTAL	56,051		322		55,729

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
–L– LT 840+50.00 TO 847+40.00			19,631	19,631	
SUBTOTAL			19,631	19,631	
–L– MED 840+50.00 TO 847+40.00			7,105	7,105	
SUBTOTAL			7,105	7,105	
–L– RT 840+50.00 TO 847+40.00	10,435		8,058		2,377
SUBTOTAL	10,435		8,058		2,377
–L– LT 850+60.00 TO 851+00.000			1,209	1,209	
SUBTOTAL			1,209	1,209	
–L– MED 850+60.00 TO 851+00.000			222	222	
SUBTOTAL			222	222	
–L– RT 850+60.00 TO 851+00.000			961	961	
SUBTOTAL			961	961	
PROJECT SUBTOTAL (R–2707D)	2,104,488	9,050	1,867,971	1,000,134	1,246,910
FILL IN EXISTING CHANNEL (R–2707D)			426	426	
LOSS DUE TO CLEARING AND GRUBBING (R–2707D)	–50,000				–50,000
ADDITIONAL UNDERCUT (R–2707D)		11,300	12,995	12,995	11,300
WASTE IN LIEU OF BORROW (R–2707D)				–1,013,555	–1,013,555
PROJECT TOTALS	2,054,488	20,350	1,881,392	–	194,655
R–2707D SAY	2,054,500			–	
R–2707E SAY	246,000			755,000	
MATERIAL FOR SHOULDER CONSTRUCTION (R–2707D)			23,920	23,920	
WASTE IN LIEU OF BORROW (R–2707D)				–194,655	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				1,196	
GRAND TOTAL	2,300,500			585,461	
R–2707D & R–2707E COMBINED SAY	2,310,000			590,000	

EST. DDE = 32,080 CY (R–2707D) + 8,600 CY (R–2707E) = 40,680 CY (GRAND TOTAL)

EST. SHALLOW UNDERCUT = 1,000 CY (R–2707D) + 2,600 CY (R–2707E) = 3,600 CY (GRAND TOTAL)

EST. CLASS IV SUBGRADE STABILIZATION = 2,000 TONS (R–2707D) + 5,200 TONS (R–2707E) = 7,200 TONS (GRAND TOTAL)

PAVEMENT STRUCTURE VOLUME = 128,400 CY (R–2707D) + 28,900 CY (R–2707E) = 157,300 CY (GRAND TOTAL)

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

4/13/2023
dgn\users\stsmallwood\documents\pw_working\dms42562\R2707D_RDY_PSH_03B-01_Earthwork_Summary.dgn
stsmallwood

COMPUTED BY: GMM DATE: 11/11/2022
CHECKED BY: STS DATE: 11/14/2022

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-2707D	3B-2

SUMMARY OF SHOULDER BERM GUTTER

IN LINEAR FEET

LOCATION	SIDE	BEG STATION	END STATION	LENGTH
–L–	RT	642+50.00	647+10.00	460.0
–L–	RT	654+45.00	660+00.00	555.0
–L–	RT	668+00.00	671+50.00	350.0
–L–	LT	668+50.00	672+00.00	350.0
–L–	LT	681+00.00	688+00.00	700.00
–L–	RT	681+95.00	685+90.00	395.0
–L–	LT	739+81.06	744+50.00	468.0
–L–	RT	762+50.00	764+50.00	200.0
–L–	LT	763+50.00	765+55.0	205.0
–L–	RT	773+00.00	798+00.00	2500.0
–L–	LT	797+00.00	799+00.00	200.0
–L–	LT	804+50.00	805+50.00	100.0
–L–	RT	809+00.00	809+24.00	24.0
–L–	LT	808+75.00	809+17.08	42.1
–L–	RT	810+77.92	816+02.90	525.0
–L–	LT	810+85.00	818+00.00	715.0
–L–	LT	850+84.17	851+00.00	15.8
–L–	LT/MED	850+84.17	851+00.00	15.8
–L–	RT/MED	850+84.17	851+00.00	15.8
–L–	RT	850+84.17	851+00.00	15.8
–RAMP_A–	RT	9+71.05	15+00.00	529.0
–RAMP_A–	LT	38+10.66	38+82.50	71.8
–Y1–	LT	18+50.31	18+72.70	22.4
–Y1–	RT	18+50.00	18+64.29	14.3
–Y1–	LT	20+90.30	21+14.73	24.4
–Y1–	RT	20+98.72	21+15.00	16.3
–Y2–	LT	18+75.00	18+86.73	11.5
–Y2–	RT	18+75.00	18+98.82	23.8
–Y3–	RT	21+75.00	22+20.23	45.2
			R–2707D	8,612
			R–2707D SAY:	8,650
			R–2707E SAY:	4,100
			SAY	12,750

SUMMARY OF ASPHALT PAVEMENT REMOVAL

IN SQUARE YARDS

LINE	BEG STATION	END STATION	LOCATION	SQUARE YARDS
–L–	677+09.00	677+31.00	LT	608
–L–	816+42.00	816+76.00	LT	502
–L–	838+18.00	847+16.00	LT/RT	1386
–Y1–	13+15.00	16+18.00	LT/RT	322
–Y1–	17+01.00	26+48.00	LT	819
–Y2–	12+12.00	14+30.00	RT	261
–Y2–	14+45.00	15+32.00	RT	235
–Y2–	15+56.00	23+10.00	RT	1735
–Y2–	23+21.00	24+12.00	RT	249
–Y2–	24+27.00	24+92.00	RT	196
–Y2–	25+07.00	25+84.00	RT	220
–Y2–	25+96.00	26+38.00	RT	107
–Y2–	26+53.00	28+13.00	RT	134
–Y3–	13+35.00	16+38.00	LT	416
–Y3–	16+62.00	20+18.00	LT	923
–Y3–	20+18.00	27+16.00	LT	1858
–Y5_WBL–	38+00.00	40+35.00	RT	861
–RAMPA–	45+52.00	47+37.00	RT	414
–RAMPD–	10+00.00	29+28.00	RT	10528
–RAMPD–	24+18.00	26+65.00	RT	404
–SRVRD_3–	12+00.00	15+17.00	LT	1017
–SRVRD_4–	17+28.00	18+00.00	LT	451
TEMPORARY PAVEMENT REMOVAL				
–DET_2–	10+00.00	12+95.00	RT/LT	684
–L–	842+45.00	845+65.00	RT	84
–RAMP_A–	9+85.00	12+50.00	RT	98
–L–	846+15.00	24+50.00 (–SRVRD_3–)	RT	523
–L–	846+45.00	847+28.00	RT	38
–SRVRD_3–	18+93.00	20+00.00	RT/LT	267
–Y5–	38+75.00	46+75.00	RT	412
–RAMP_D–	16+52.00	842+75.00	RT	1751
–L–	838+05.00	840+30.00	RT	240
			R–2707D	27,744
			R–2707D SAY:	27,800
			R–2707E SAY:	29,100
			SAY	56,900

SUMMARY OF EXPRESSWAY GUTTER

IN LINEAR FEET

LOCATION	SIDE	BEG STATION	END STATION	LENGTH
–L–	RT	673+25.00	677+30.00	405.0
–L–	RT	756+75.00	761+06.00	431.0
–L–	RT	765+24.00	772+00.00	676.0
–L–	RT	839+50.00	843+75.00	425.0
			R–2707D	1,937
			R–2707D SAY	1,940
			R–2707E SAY	0
			SAY	1,940

SUMMARY OF CHAIN LINK FENCE, 48" FABRIC

IN LINEAR FEET AND EACH

STATION TO STATION	LT. or RT.	FABRIC LF	LINE POSTS EA	TERMINAL POSTS EA
–Y5_EBL– 32+52.00 LT to –Y5_EBL– 40+35.00 LT	LT	783	65	4
–RAMP_D– 26+48.00 LT to –RAMP_D– 31+42.00 LT	LT	496	41	4
NOTE: LT. OR RT. INDICATES LEFT OR RIGHT OF THE MAIN LINE.	R–2707D	1,279	106	8
	R–2707D SAY	1,280	107	8
	R–2707E SAY	0	0	0
	SAY	1,280	107	8

SUMMARY OF WOVEN WIRE FENCE 47" FABRIC

IN LINEAR FEET AND EACH

STATION TO STATION	LT. or RT.	FABRIC LF	4" POSTS EA	5" POSTS EA
–L– 635+01.00 TO –L– 666+15.00	RT	4,200	254	84
–L– 636+43.00 TO –L– 663+76.00	LT	4,354	261	92
–L– 667+52.00 TO –L– 690+25.00	RT	2,616	158	53
–Y1– 16+69.00 TO –L– 676+90.00	LT	1,170	72	22
–L– 677+50.00 TO –Y2– 15+75.00	LT	3,436	213	59
–Y2– 15+75.00 TO –L– 742+39.00	LT	7,302	447	136
–L– 691+65.00 TO –L– 715+44.00	RT	2,530	164	31
–L– 715+80.00 TO –L– 754+72.00	RT	6,171	390	93
–L– 742+75.00 TO –Y3– 18+50.00	LT	2,092	125	45
–Y3– 20+65.00 TO –L– 796+65.00	LT	4,959	291	116
–L– 796+65.00 TO –L– 809+40.00	LT	2,511	149	55
–Y3– 27+00.00 TO –L– 809+40.00	RT	7,844	470	166
–L– 810+62.00 TO –L– 815+42.00	LT	638	37	16
–L– 815+80.00 TO –L– 847+40.00	LT	3,831	226	88
–L– 810+62.00 TO –RAMPA– 46+71.00	RT	1,718	105	32
–RAMPD– 26+48.00 TO –L– 847+40.00	RT	2,452	157	34
–L– 850+60.00 TO –L– 851+00.00	RT	156	7	7
–L– 850+60.00 TO –L– 851+00.00	LT	105	4	7
	R–2707D	58,085	3,529	1,136
	R–2707D SAY	58,090	3,529	1,136
NOTE: LT. OR RT. INDICATES LEFT OR RIGHT OF THE MAIN LINE.	R–2707E SAY	22,140	1,367	393
	SAY	80,230	4,896	1,529

SUMMARY OF CONCRETE BARRIER

IN LINEAR FEET

LINE	BEG STATION	END STATION	LOC.	MEDIAN BARRIER TYPE T (LF)	MEDIAN BARRIER TYPE T1 (LF)	MEDIAN BARRIER TYPE T2 (LF)	MODIFIED BARRIER TYPE T2 (LF)	MOMENT SLAB (LF)
–1LOOPA–	18+00.25	20+10.22	RT		215.55			
–RAMP_A–	29+61.00	39+98.69	LT	1010.40				
–RAMP_A–	39+98.69	41+50.00	LT		152.53			
–RAMP_A–	41+50.00	47+25.00	LT			587.21		
–RAMP_A–	47+25.00	48+74.34	LT		149.40			
–Y5_WBL–	32+50.00	36+83.20	LT		433.20			
–RAMP_A–/–Y5_WBL–	–RAMP_A– 47+00.00	–Y5_WBL– 36+00.00	RT				524.34	
–Y5_WBL–	36+00.00	38+90.00	RT					290.00
			R–2707D	1,010.40	950.68	587.21	524.34	290.00
			R–2707D SAY	1,100	1,000	600	525	300
			R–2707E SAY	0	0	0	0	0
			SAY	1,100	1,000	600	525	300

DOUBLE FACED CABLE GUIDERAIL

IN LINEAR FEET AND EACH

LINE	STATION	STATION	LENGTH (LF)	END ANCHOR UNIT (EA)	INTERMEDIATE ANCHOR UNIT (EA)	COMMENTS
–L–	635+00.00	664+43.02	2,948	2	2	
–L–	667+15.05	690+47.48	2,333	2	2	
–L–	693+19.43	755+31.45	6,218	2	6	
–L–	758+03.45	808+95.25	5,094	2	4	
–L–	819+00.00	822+54.00	354	2		
–L–	825+76.00	845+75.00	1,999	2		
		SUBTOTAL	18,946	12	14	
		LESS TERMINAL ANCHOR UNIT	–300			
		GRAND TOTALS	18,646	12	14	
		R–2707D SAY:	19,000	12	14	ADDT'L GUIDERAIL POSTS = 10
		R–2707E SAY:	2,200	2	0	ADDT'L GUIDERAIL POSTS = 10
		SAY	21,200	14	14	ADDT'L GUIDERAIL POSTS = 20

4/25/2023
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