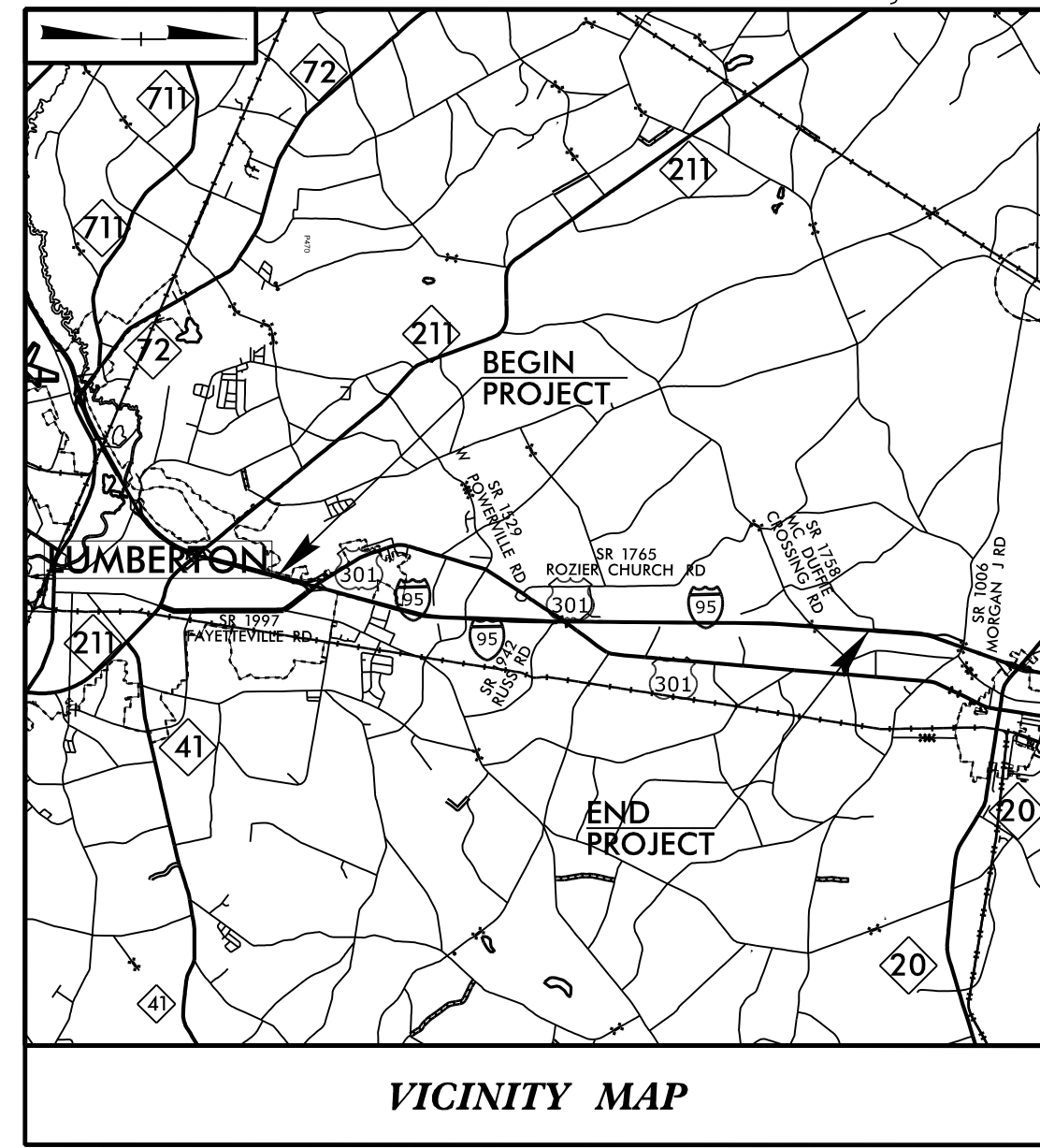


09.08/2019

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROBESON COUNTY

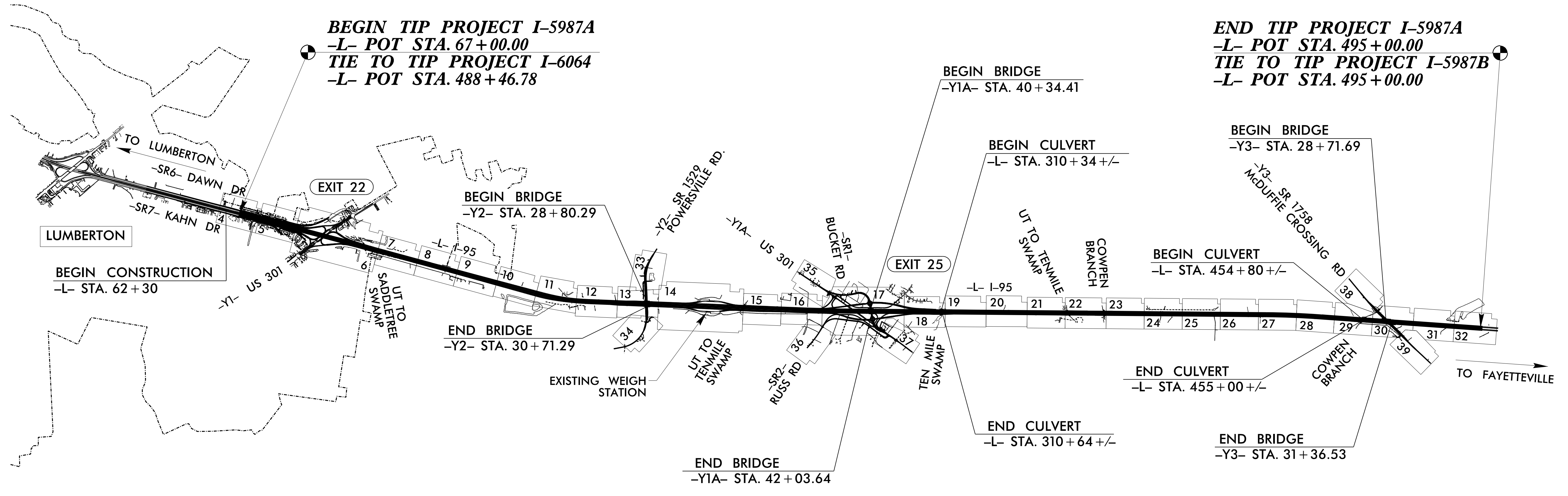
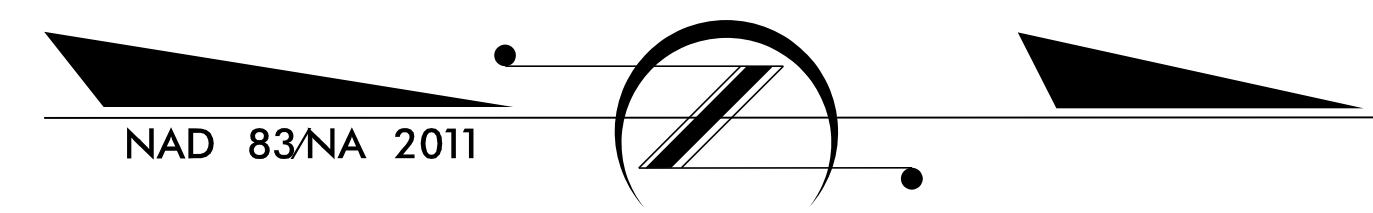
LOCATION: I-95 FROM SOUTH OF US 301 TO SOUTH OF NC 20. WIDEN TO EIGHT LANES.

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, CULVERTS, AND RETAINING WALLS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987A	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47533.1.2		PE	
47533.2.2		RW	
47533.2.6		UTIL	
47533.3.2		CONST	

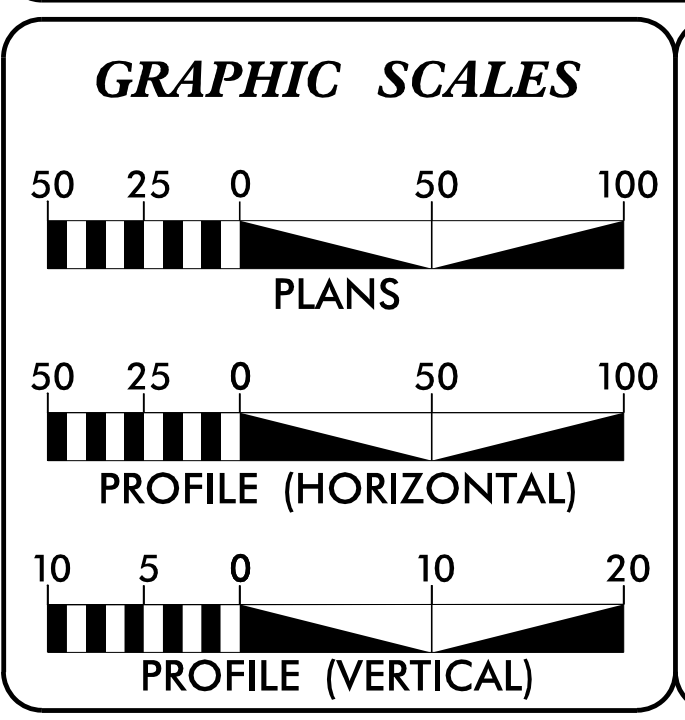
TIP PROJECT: I-5987A

CONTRACT: C204727



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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2022 =	69,300
ADT 2042 =	101,750
DHV =	8 %
D =	55 %
T =	14 % *
V =	75 MPH
* TTST =	11% DUAL 3%
FUNC CLASS =	INTERSTATE STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5987A	=	8.097 MILES
LENGTH STRUCTURES TIP PROJECT I-5987A	=	0.009 MILES
TOTAL LENGTH TIP PROJECT I-5987A	=	8.106 MILES

PREPARED IN THE OFFICE OF:

NIV5 ENGINEERS & CONSULTANTS, INC.
7500 E. INDEPENDENCE BLVD, STE 100
CHARLOTTE, NC 28227
P: 704.533.7300 www.niv5.com
NC License # 41337 formerly CALIX Engineers & Consultants

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
19191781-4626 VOICE 19191781-4869 FAX
NC License NO.: F-0105

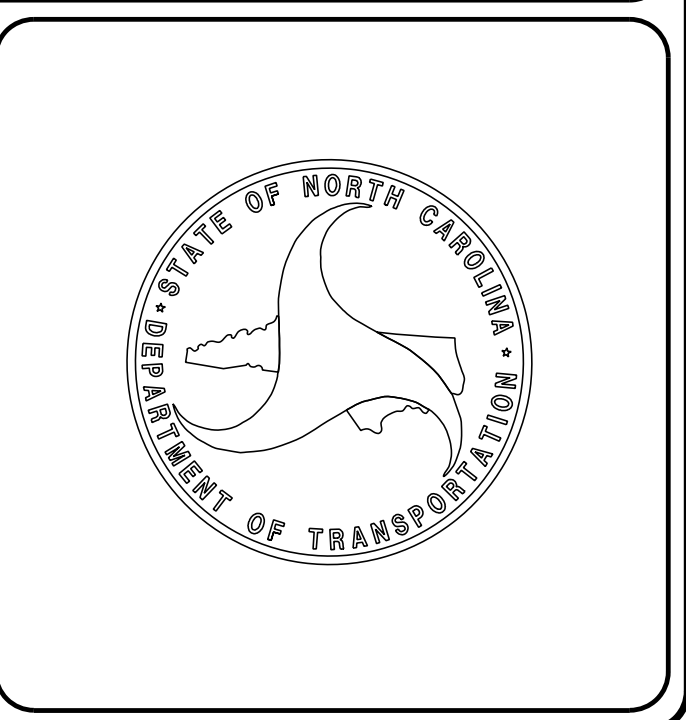
2018 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE:	STEVE A. DRUM, PE PROJECT ENGINEER
MAY 28, 2021	
LETTING DATE:	CHRIS D. ANDERSON, PE PROJECT DESIGN ENGINEER
SEPTEMBER 20, 2022	
NCDOT CONTACT:	CRAIG A. FREEMAN JR., PE DIVISION PROJECT ENGINEER

HYDRAULICS ENGINEER

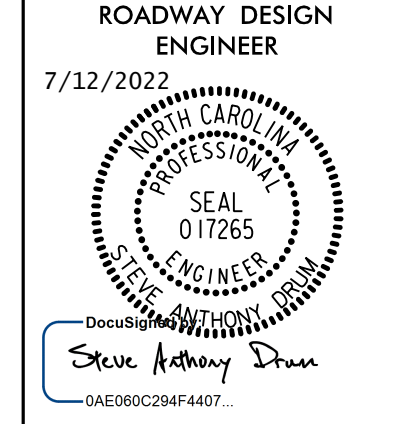
DocuSigned by:
Will Weathershe
SIGNATURE: [Signature]
P.E. 7/8/2022

ROADWAY DESIGN ENGINEER

DocuSigned by:
Steve Drum
SIGNATURE: [Signature]
P.E. 7/8/2022



8/17/99



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-14	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1 THRU 2B-3	INTERSECTION DETAIL SHEETS
2B-4 THRU 2B-5	DETAIL OF TEMPORARY DETOURS
2B-6 THRU 2B-7	DETAIL OF SINGLE SLOPE CONCRETE BARRIER
2C-1	DETAIL OF COAL COMBUSTION PRODUCT PLACEMENT
2C-2	DETAIL OF MEDIAN HAZARD PROTECTION WITH SINGLE SLOPE
2C-3	DETAIL OF MEDIAN HAZARD PIER PROTECTION WITH SINGLE FACE
2C-4	DETAIL OF PRECAST REINFORCED SINGLE FACE SINGLE SLOPE CONCRETE BARRIER RAIL
2C-5	DETAIL OF STRUCTURE ANCHOR UNIT, TYPE III
2C-6	DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE
2C-7	DETAIL OF CONCRETE ENDWALL FOR TRIPLE AND QUADRUPLE PIPE CULVERTS - 15" THRU 48", 90 DEG SKEW
2C-8	DETAIL OF CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS - 15" THRU 48", 60 OR 120 DEG SKEW
2C-9	DETAIL OF CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS - 15" THRU 48", 45 OR 135 DEG SKEW
2C-10	DETAIL OF REINFORCED CONCRETE ENDWALL FOR SINGLE 60" PIPE - 60 OR 120 DEG SKEW
2C-11	DETAIL OF CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH - 12" THRU 72" PIPE
2C-12	DETAIL OF GUARDRAIL INSTALLATION
2C-13	DETAIL OF ROCK PLATING
2D-1 THRU 2D-3	DRAINAGE DETAIL SHEETS
2D-4	DRAINAGE SPECIAL DETAIL - TRAFFIC BEARING GRATED INLET - 60" RCP
2G-1	DETAIL OF STANDARD TEMPORARY SHORING
2G-2 THRU 2G-4	DETAIL OF STANDARD TEMPORARY WALL SHEETS
2G-5 THRU 2G-7	DETAIL OF SPECIAL BRIDGE APPROACH FILLS SHEETS
2N-1	PLAN AND PROFILE OF NOISE WALL NW8
3B-1 THRU 3B-2	SUMMARY OF EARTHWORK
3B-3 THRU 3B-4	SUMMARY OF WOVEN WIRE FENCE, PAVEMENT REMOVAL, SHOULDER BERM GUTTER, CONCRETE BARRIER AND TEMPORARY GUARDRAIL
3B-5 THRU 3B-7	SUMMARY OF GUARDRAIL
3D-1 THRU 3D-26	SUMMARY OF DRAINAGE
3G-1 THRU 3G-2	SUMMARY OF GEOTECHNICAL QUANTITIES
3P-1 THRU 3P-2	PARCEL INDEX SHEETS
4 THRU 39	PLAN SHEETS
40 THRU 97	PROFILE SHEETS
RW01	SURVEY CONTROL TITLE SHEET
RW02C-1 THRU RW02C-22	SURVEY CONTROL SHEETS
RW02D-1	PROPOSED ALIGNMENT CONTROL SHEET
RW03E-1 THRU RW03E-2	RIGHT OF WAY CONTROL SHEETS
RW-04 THRU RW-39	RIGHT OF WAY PLAN SHEETS
TMP-01 THRU TMP-201	TRAFFIC MANAGEMENT PLANS
PMP-01 THRU PMP-39	PAVEMENT MARKING PLANS
E-1 THRU E-7	ELECTRICAL PLANS
EC-1 THRU EC-75	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-48	SIGNING PLANS
ITS-1 THRU ITS-15	ITS PLANS
UC-1 THRU UC-18	UTILITY CONSTRUCTION PLANS
UD-1 THRU UD-17	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTION INDEX
X0-A THRU X0-N	CROSS SECTION SUMMARY SHEETS
X-1 THRU X-411	CROSS-SECTIONS
S1-1 THRU S1-36	STRUCTURE PLANS - SR 1529 (-Y2-) OVER I-95 (-L-)
S2-1 THRU S2-31	STRUCTURE PLANS - US 301 (-Y1A-) OVER I-95 (-L-)
S3-1 THRU S3-29	STRUCTURE PLANS - SR 1758 (-Y3-) OVER I-95 (-L-)
C11-1 THRU C11-14	CULVERT PLANS - I-95 (-L-) STA. 310+73.00
C12-1 THRU C12-8	CULVERT PLANS - I-95 (-L-) STA. 366+29.00
C13-1 THRU C13-8	CULVERT PLANS - I-95 (-L-) STA. 454+90.00
C14-1 THRU C14-10	CULVERT PLANS - I-95 (-Y3-) STA. 24+79.00
C19-1 THRU C19-8	CULVERT PLANS - I-95 (-L-) STA. 111+25.00
C20-1 THRU C20-8	CULVERT PLANS - I-95 (-L-) STA. 242+85.00
C21-1 THRU C21-13	CULVERT PLANS - I-95 (-L-) STA. 354+06.00
W-1 THRU W-11	WALL PLANS
W8-1 THRU W8-4	NOISE WALL PLANS

2018 ROADWAY ENGLISH STANDARD DRAWINGS
 EFF. 01-16-2018
 REV.

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 Super-elevation - Two Lane Pavement
225.05	Method of Obtaining Super-elevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
235.01	Embankment Monitoring
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Super-elevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.04	Guide for Paving Shoulders Under Bridges - Method IV
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS	
700.01	Concrete Pavement Joints - Construction and Contraction Joints
700.02	Expansion Joint Layout - for Rigid Doweled Pavement at Bridges
700.03	Dowel Assembly
700.04	Concrete Pavement Header Board
700.05	Tying Proposed Pavement to Existing
710.01	Concrete Pavement - Station Marking
DIVISION 8 - INCIDENTALS	
815.02	Subsurface 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
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.57	Reinforced Brick Endwall - for Single 60" 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
840.14	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
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.37	Steel Grate and Frame
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
852.01	Concrete Islands
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
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
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

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 OR 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. 560.01 OR 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.

SUBSURFACE DRAINS:
 SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 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.

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

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

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

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

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

UTILITIES:
 UTILITY OWNERS ON THIS PROJECT ARE Duke Energy (Power),
 Lumbee River EMC (Power), City of Lumberton (Power), AT&T (Phone),
 Windstream (Phone), Spectrum (CATV), and Piedmont Natural Gas (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.

CURB RAMPS
 CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
 CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

7/12/2022
 R:\Roadway\Projects\15987A_RDV_TSH.dgn
 Steve Dray

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

Note: Not to Scale

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin (EIP)	○
Computed Property Corner	×
Existing Concrete Monument (ECM)	□
Parcel/Sequence Number	(123)
Existing Fence Line	-x-x-x-
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-☠-s-
Potential Contamination Area: Soil	☠-s-☠-s-
Known Contamination Area: Water	☠-w-☠-w-
Potential Contamination Area: Water	☠-w-☠-w-
Contaminated Site: Known or Potential	☠ ?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○
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	WLB
Proposed Lateral, Tail, Head Ditch	→
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
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	-----
Existing Control of Access Line	-----
Proposed Control of Access Line	-----
Proposed ROW and CA Line	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage/Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	-----
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	-----

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	-----
Storm Sewer	-----

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	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	⊕
H-Frame Pole	●
U/G Power Line Test Hole (SUE - LOS A)*	⊕
U/G Power Line (SUE - LOS B)*	-----
U/G Power Line (SUE - LOS C)*	-----
U/G Power Line (SUE - LOS D)*	-----
TELEPHONE:	
Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	⊕
U/G Telephone Test Hole (SUE - LOS A)*	⊕
U/G Telephone Cable (SUE - LOS B)*	-----
U/G Telephone Cable (SUE - LOS C)*	-----
U/G Telephone Cable (SUE - LOS D)*	-----
U/G Telephone Conduit (SUE - LOS B)*	-----
U/G Telephone Conduit (SUE - LOS C)*	-----
U/G Telephone Conduit (SUE - LOS D)*	-----
U/G Fiber Optics Cable (SUE - LOS B)*	-----
U/G Fiber Optics Cable (SUE - LOS C)*	-----
U/G Fiber Optics Cable (SUE - LOS D)*	-----

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line Test Hole (SUE - LOS A)*	⊕
U/G Water Line (SUE - LOS B)*	-----
U/G Water Line (SUE - LOS C)*	-----
U/G Water Line (SUE - LOS D)*	-----
Above Ground Water Line	A/G Water
TV:	
TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	⊕
U/G TV Test Hole (SUE - LOS A)*	⊕
U/G TV Cable (SUE - LOS B)*	-----
U/G TV Cable (SUE - LOS C)*	-----
U/G TV Cable (SUE - LOS D)*	-----
U/G Fiber Optic Cable (SUE - LOS B)*	-----
U/G Fiber Optic Cable (SUE - LOS C)*	-----
U/G Fiber Optic Cable (SUE - LOS D)*	-----

GAS:

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

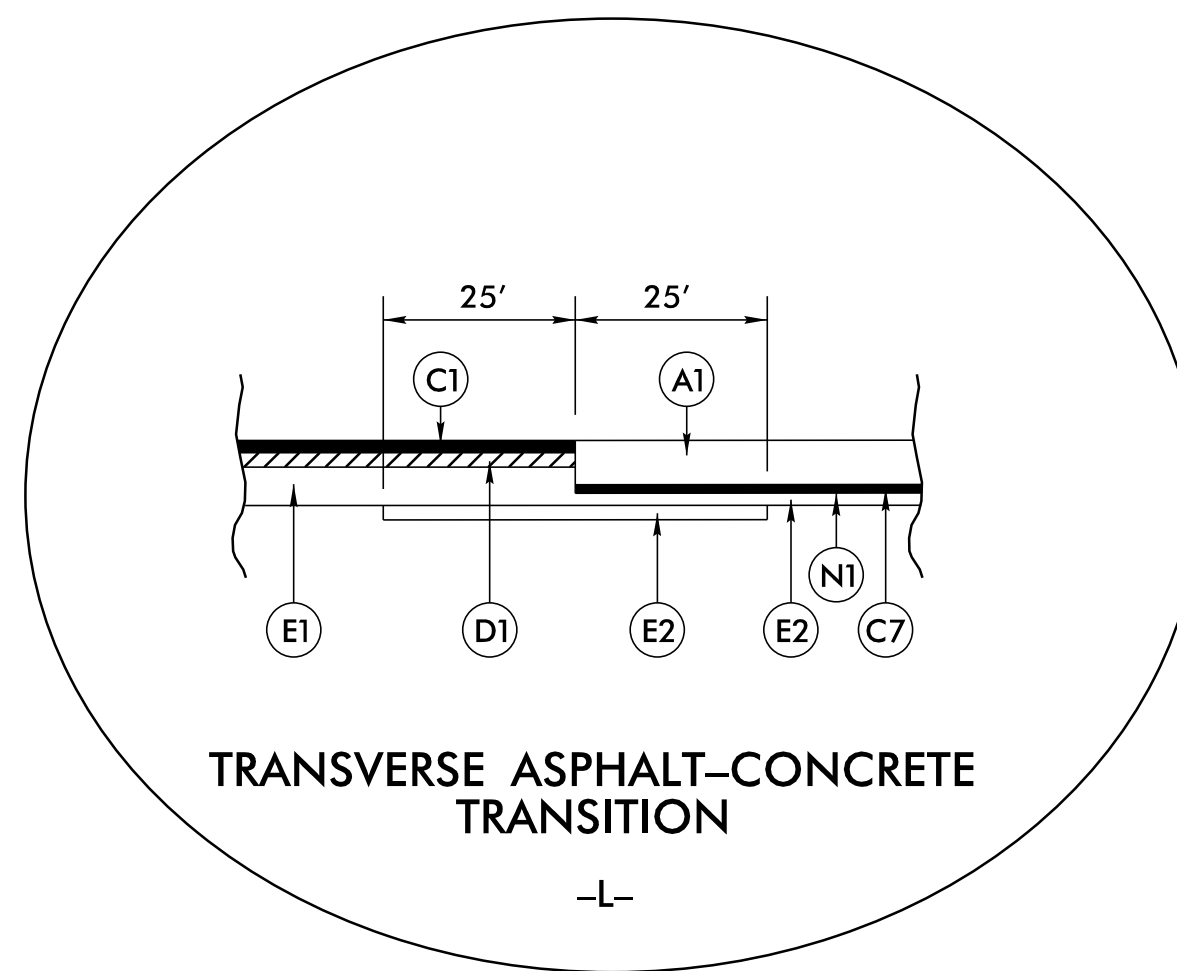
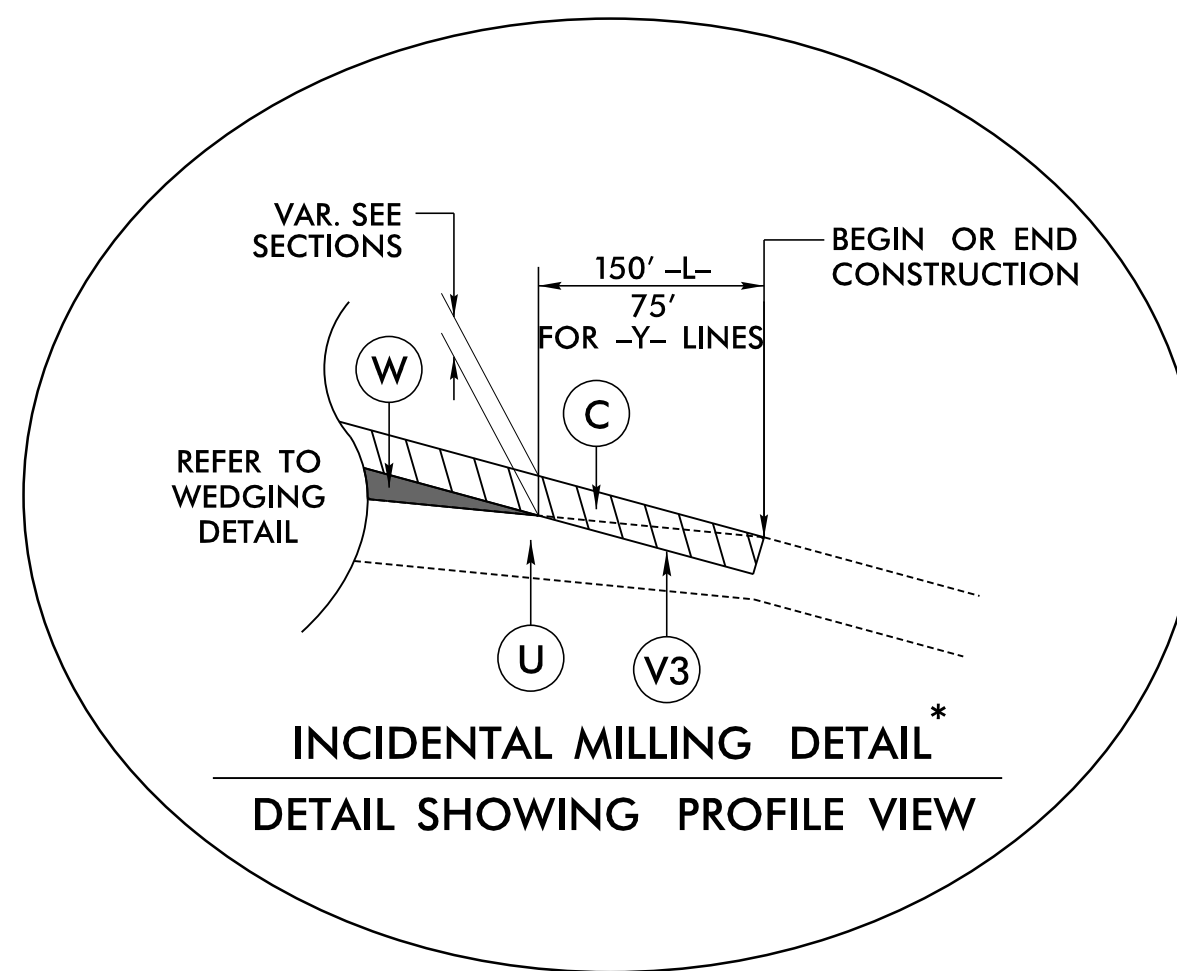
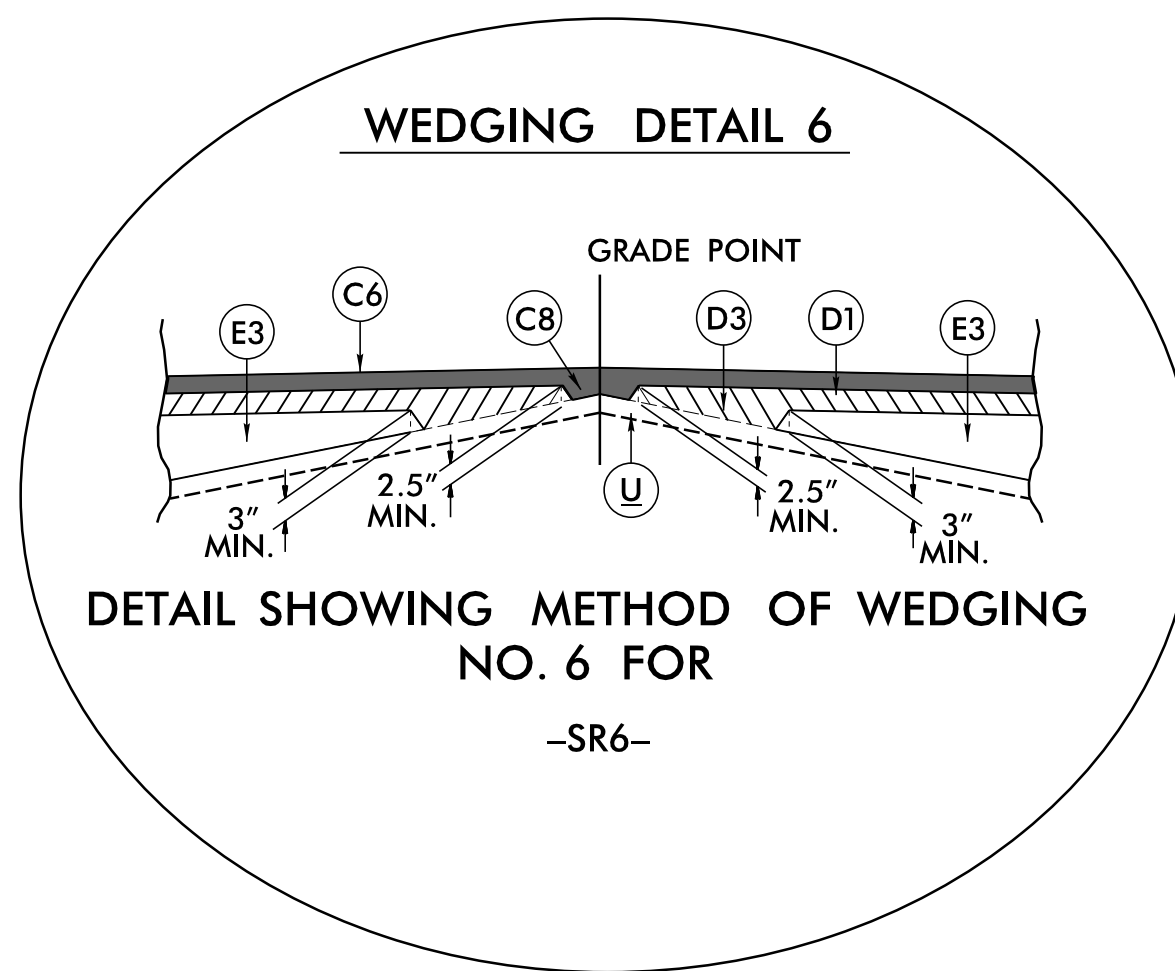
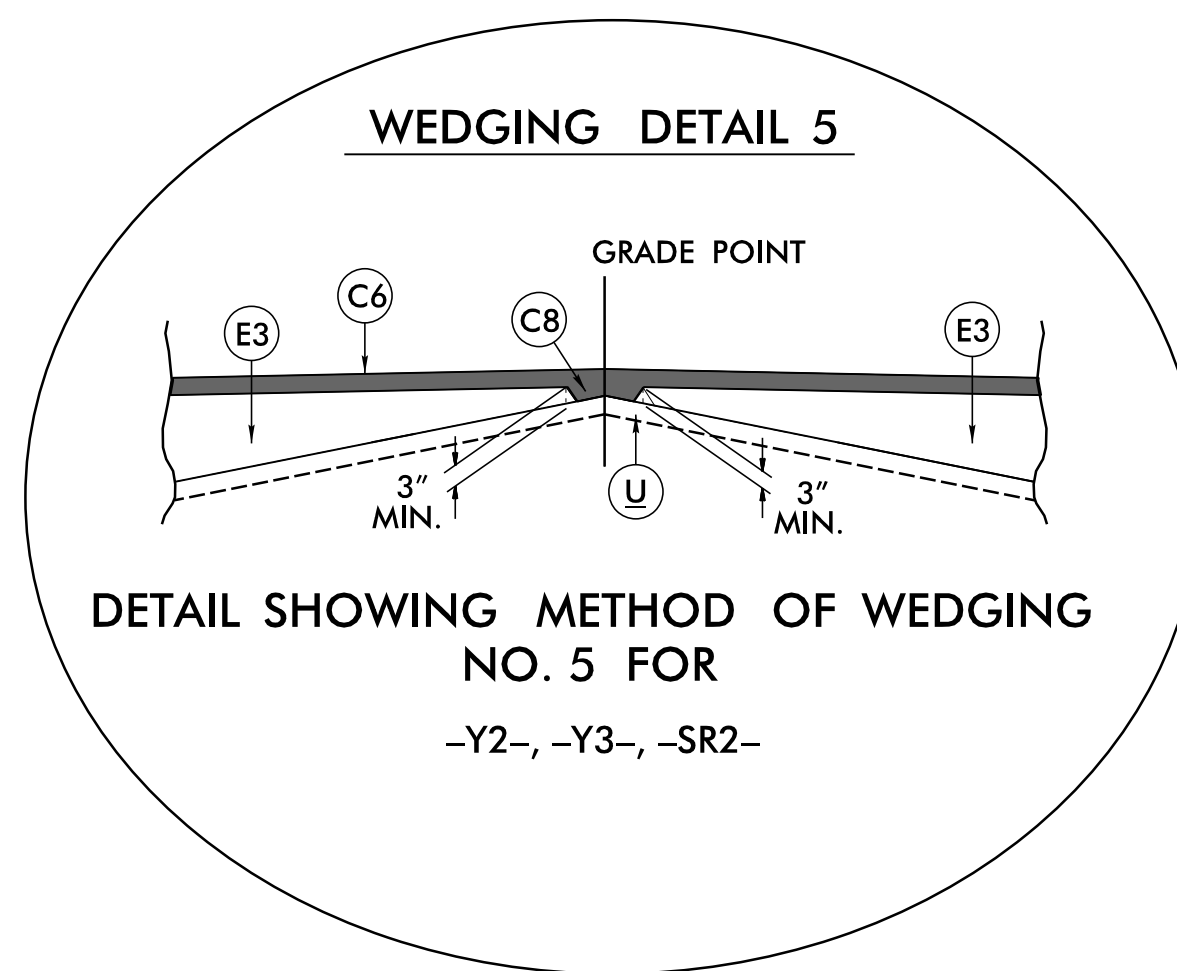
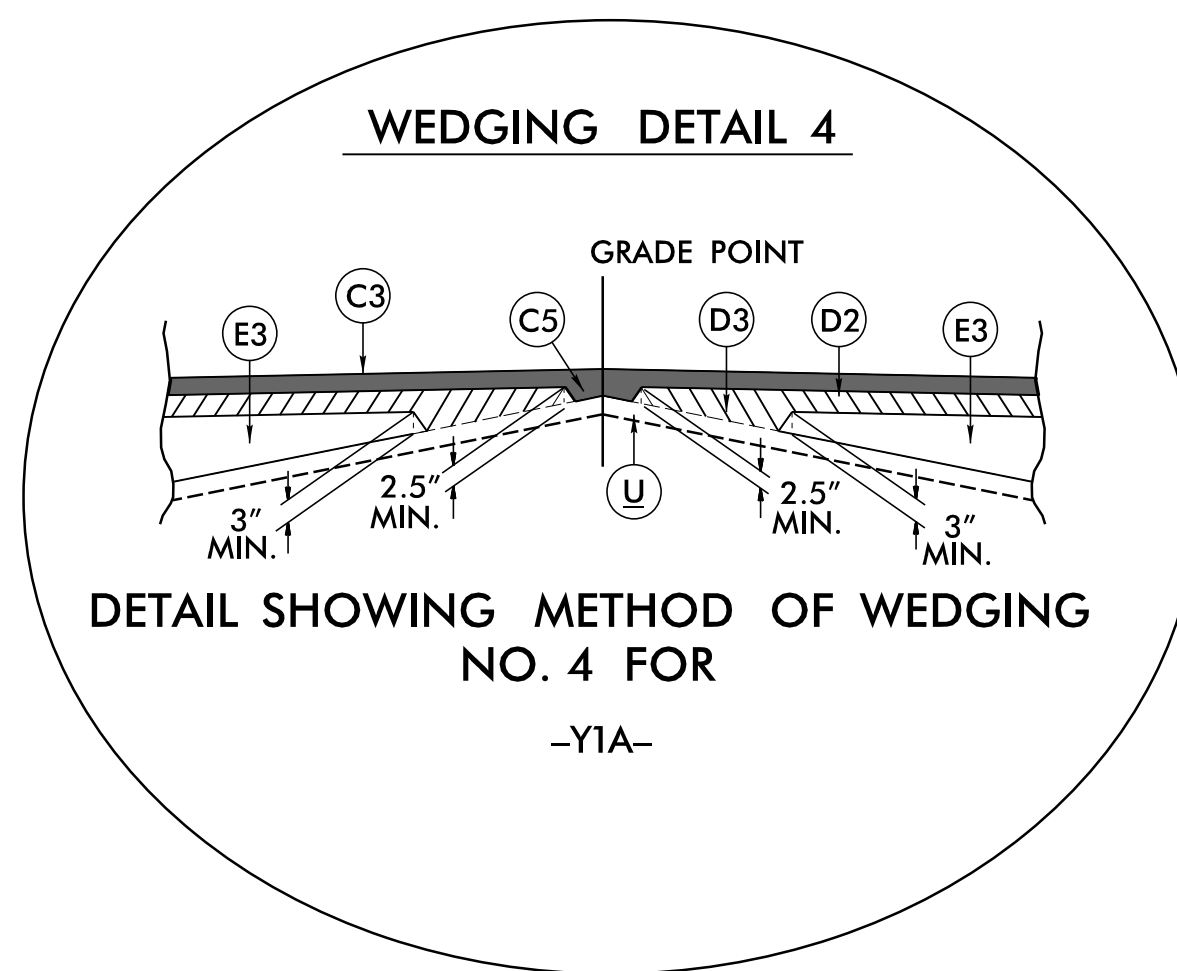
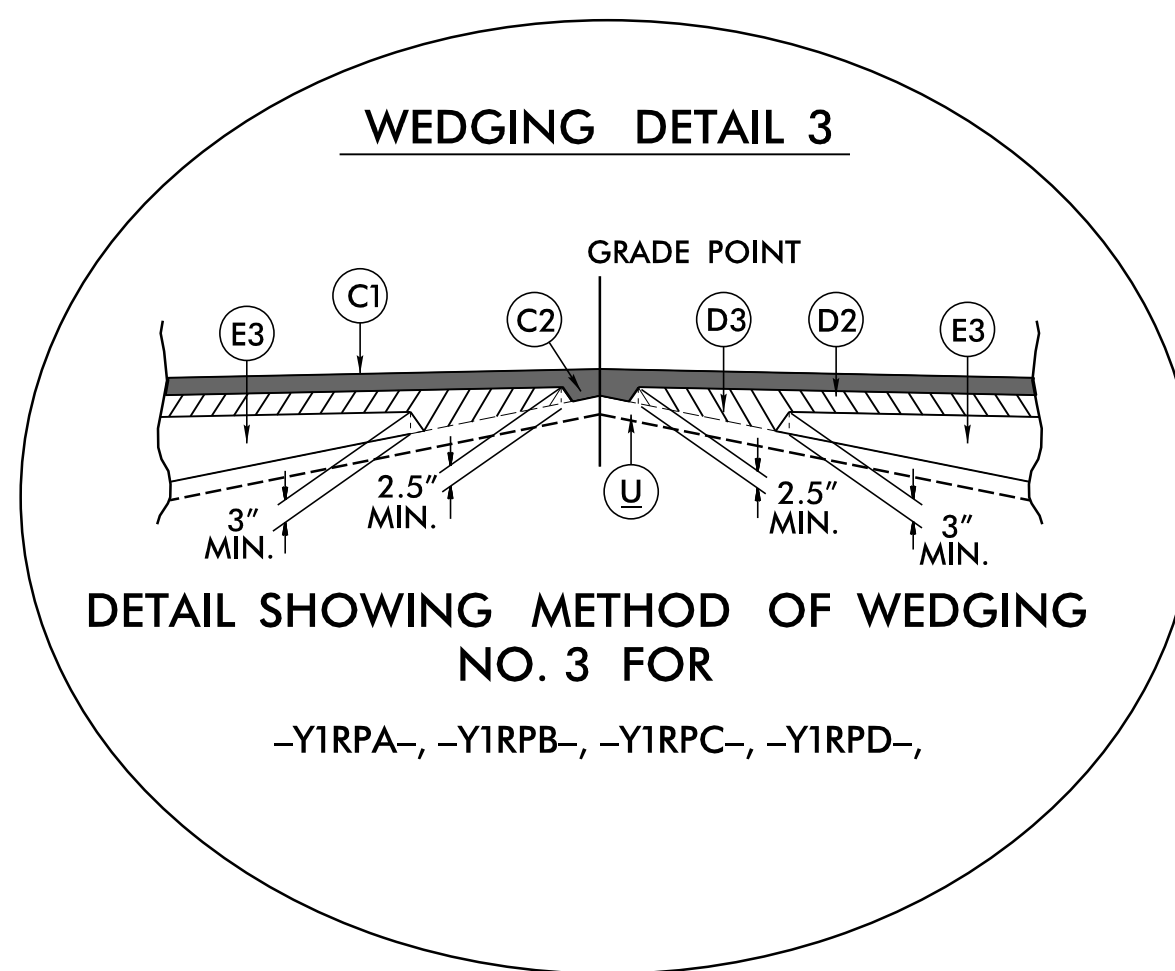
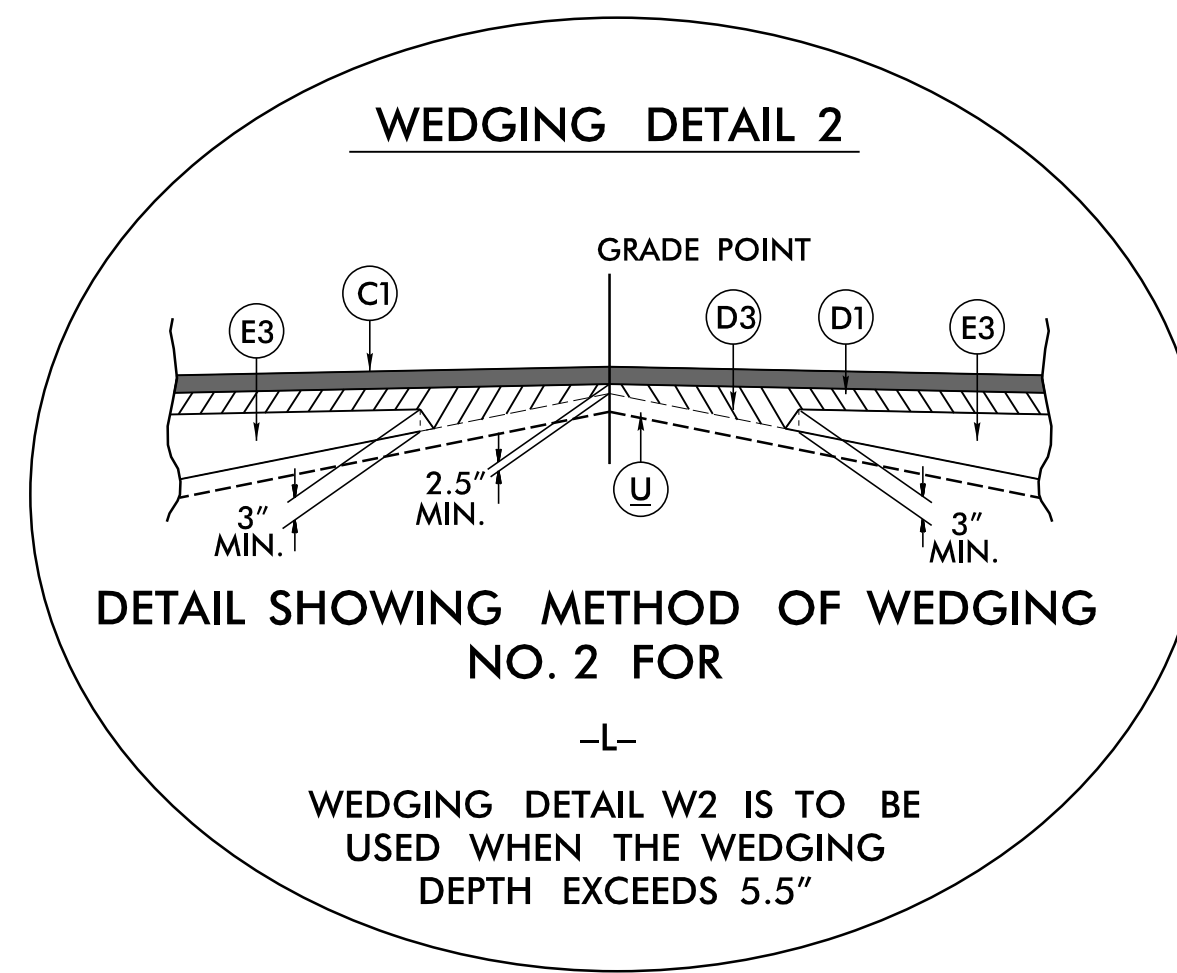
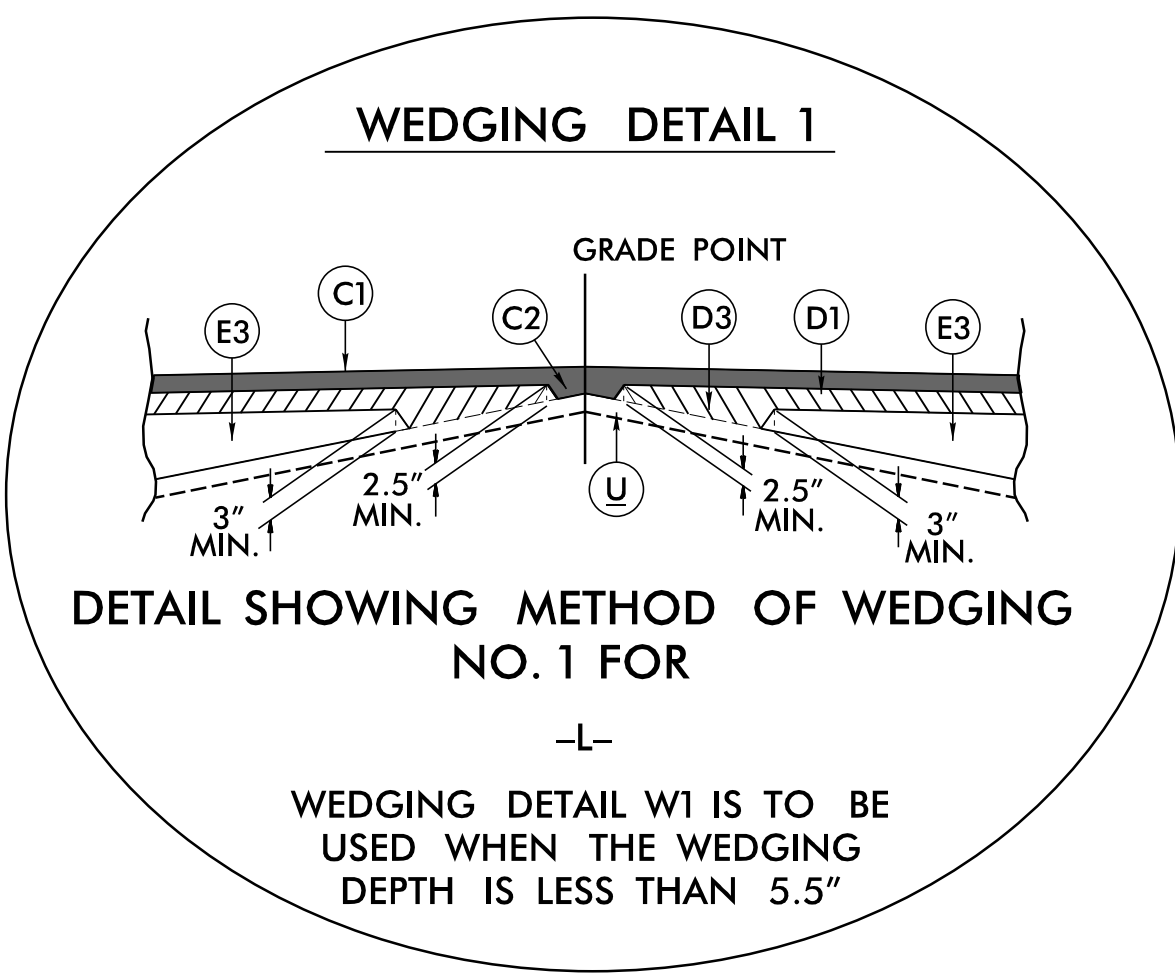
MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line (SUE - LOS B)*	-----
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.

5/14/2022

5/18/2022 15:59:77A_RDY_TYP_SECA1.dgn

PAVEMENT SCHEDULE		
A1	13.5" DOWELED JOINTED PORTLAND CEMENT CONCRETE PAVEMENT, MAX JOINT SPACING 15'.	S 4" CONCRETE MULTI USE PATH
A2	PROP. PORTLAND CEMENT CONCRETE PAVEMENT WITH WELDED WIRE MESH (CONCRETE DRIVEWAY)	T EARTH MATERIAL
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	U EXISTING PAVEMENT
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.	V1 MILLING ASPHALT PAVEMENT, 2" DEPTH
C3	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.	V2 MILLING ASPHALT PAVEMENT, 1.5" DEPTH
C4	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.	V3 INCIDENTAL MILLING
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.	W1 VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL 1)
C6	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.	W2 VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL 2)
C7	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	W3 VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL 3)
C8	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 LESS THAN 1" IN DEPTH OR GREATER THAN 1.5" IN DEPTH.	W4 VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL 4)
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W5 VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL 5)
D2	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	W6 VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL 6)
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 2.5" OR GREATER THAN 4" IN DEPTH.	Y MILLED RUMBLE STRIPS
E1	PROP. APPROX. 12" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF THREE LAYERS.	NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
E2	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	
E3	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 5.5" IN DEPTH.	
E4	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	
E5	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	
J1	PROP. 8" AGGREGATE BASE COURSE	
K2	12" CLASS IV SUBGRADE STABILIZATION. SEE SHEET 3G-2 FOR APPLICABLE LOCATIONS.	
N1	NONWOVEN GEOTEXTILE DRAINAGE INTERLAYER. THE NGI SHOULD BE ELIMINATED IN AREAS WHERE THE CONCRETE LANE DOES NOT SLOPE TOWARDS THE OUTSIDE SHOULDER DRAIN.	
N2	GEOTEXTILE FOR SOIL STABILIZATION. SEE SHEET 3G-2 FOR APPLICABLE LOCATIONS.	
R1	2'-6" CONCRETE CURB & GUTTER	
R2	1'-6" CONCRETE CURB & GUTTER	
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)	
R4	SHOULDER BERM GUTTER	
R5	CONCRETE TRUCK APRON, 12" JOINTED PORTLAND CEMENT CONCRETE WITH A 4x4 WS.5xWS.5 OR 6x6 WS.5xWS.5 OR HEAVIER WIRE MESH. MAX JOINT SPACING 15'.	
R6	SINGLE FACED CONCRETE BARRIER	
R7	TYPE T BARRIER	
R8	SINGLE SLOPE CONCRETE BARRIER, SEE SHEETS 2B-6 AND 2B-7	
R9	4" CONCRETE COVER	
R10	9"x18" CONCRETE CURB	



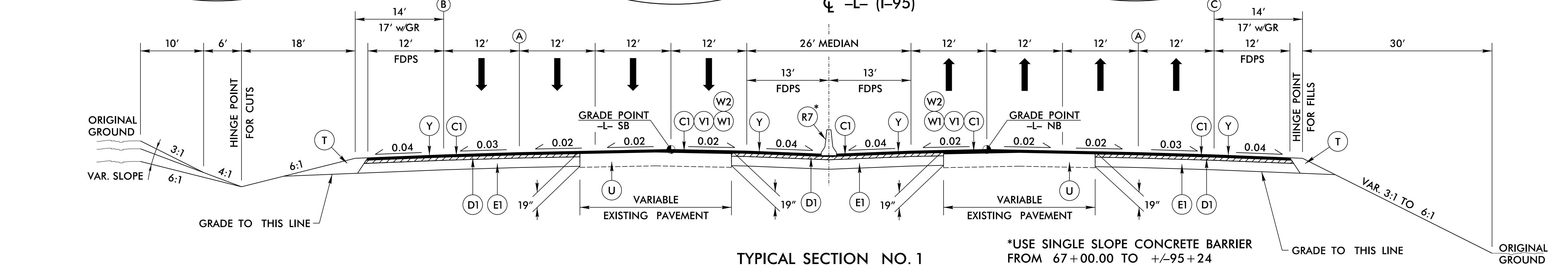
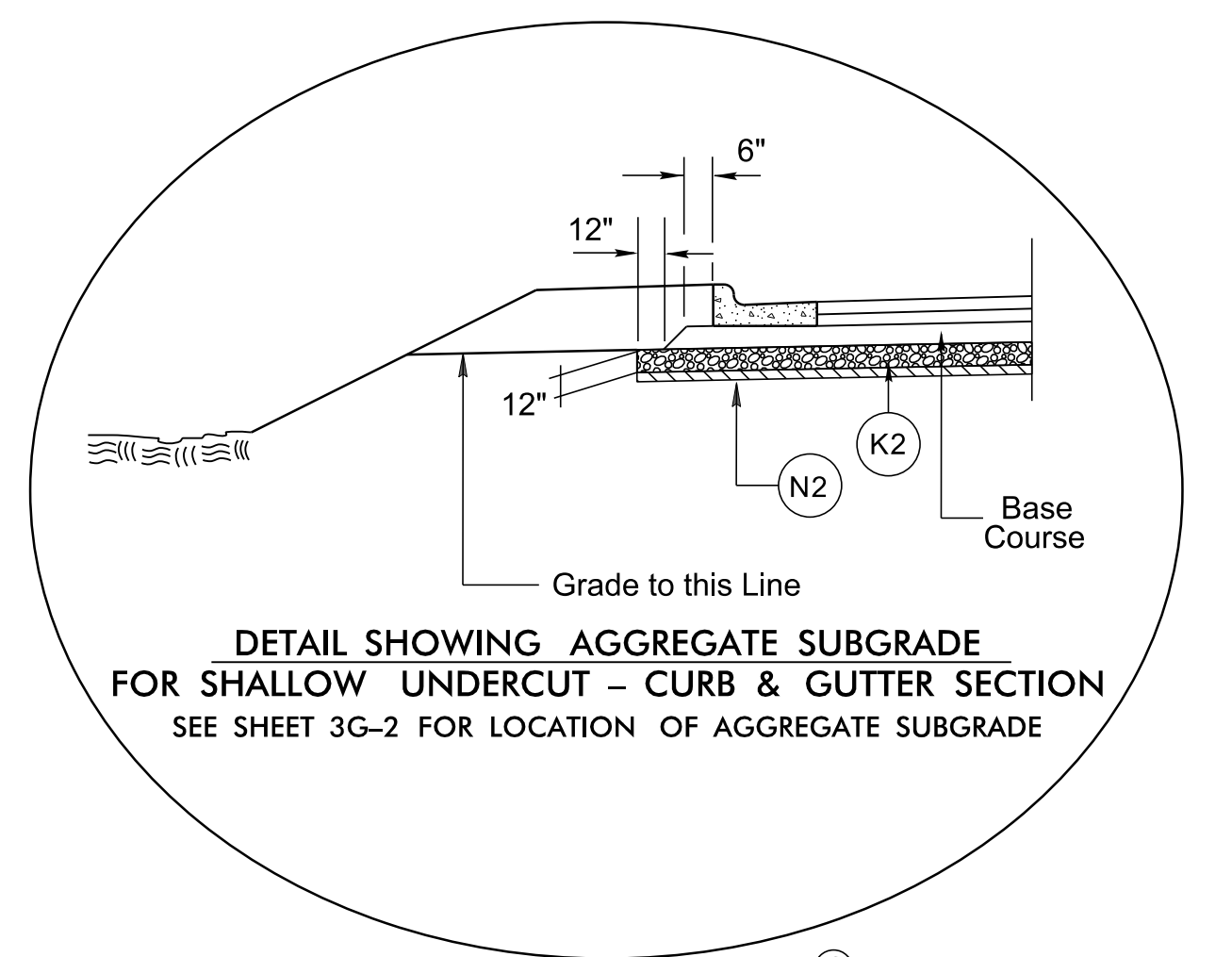
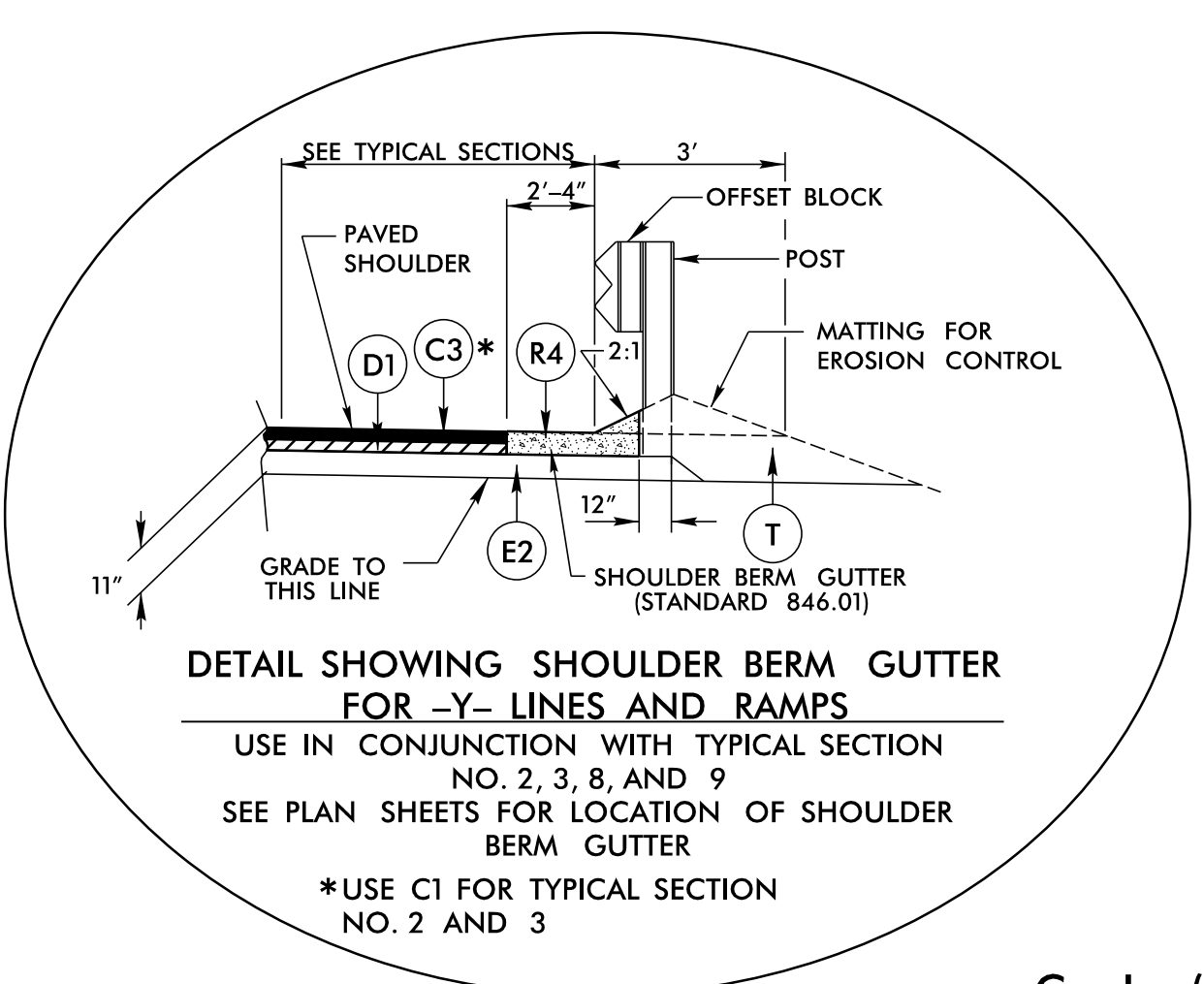
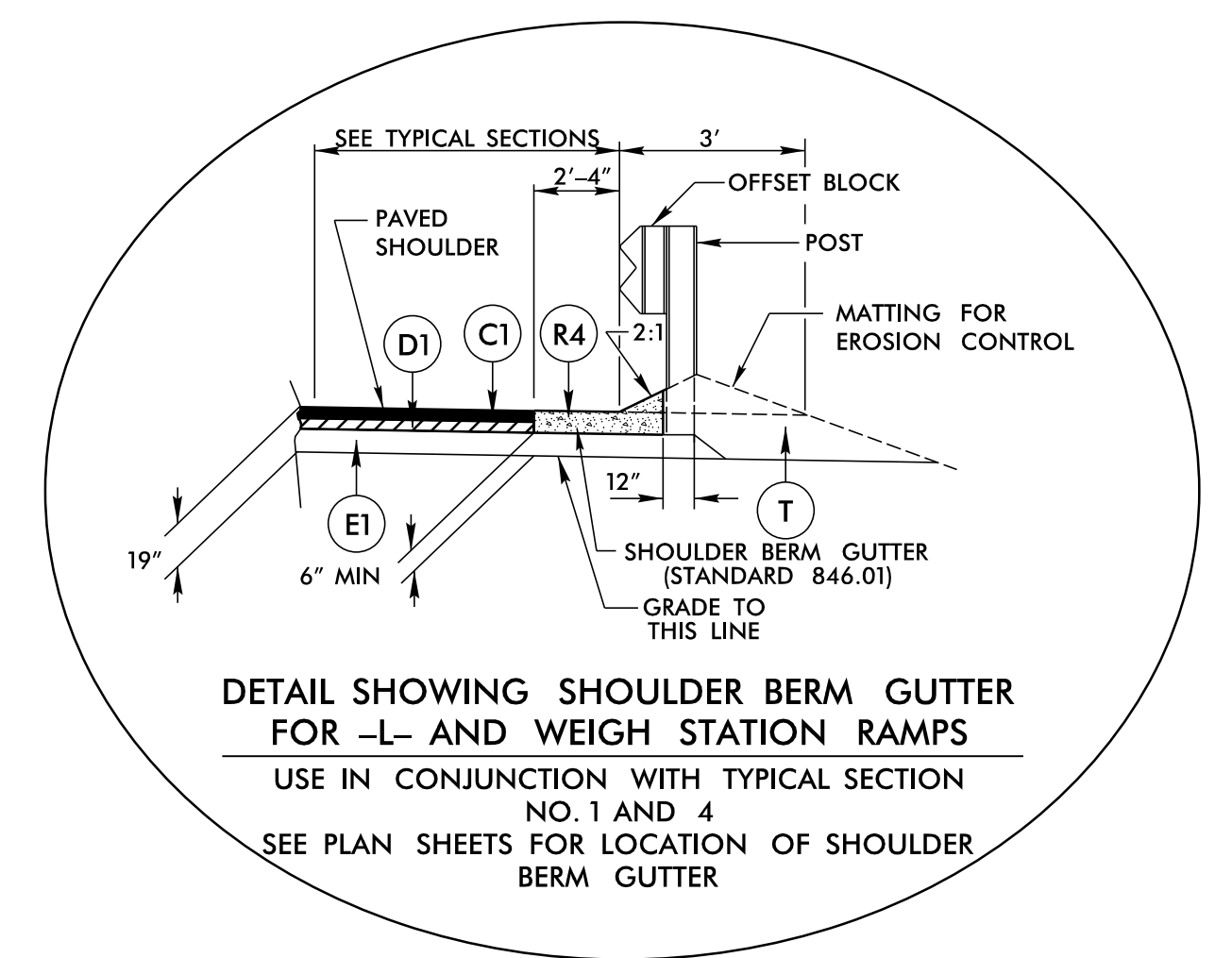
* SEE TYPICAL SECTIONS FOR DEPTHS OF MILLING, SURFACE COURSE THICKNESS AND WEDGING METHOD.

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2A-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022	PAVEMENT DESIGN ENGINEER 5/18/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
NV5 NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-13333	
4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA - 27609 (919) 781-4626 VOICE (919) 781-4869 FAX NC License No. F-0105	

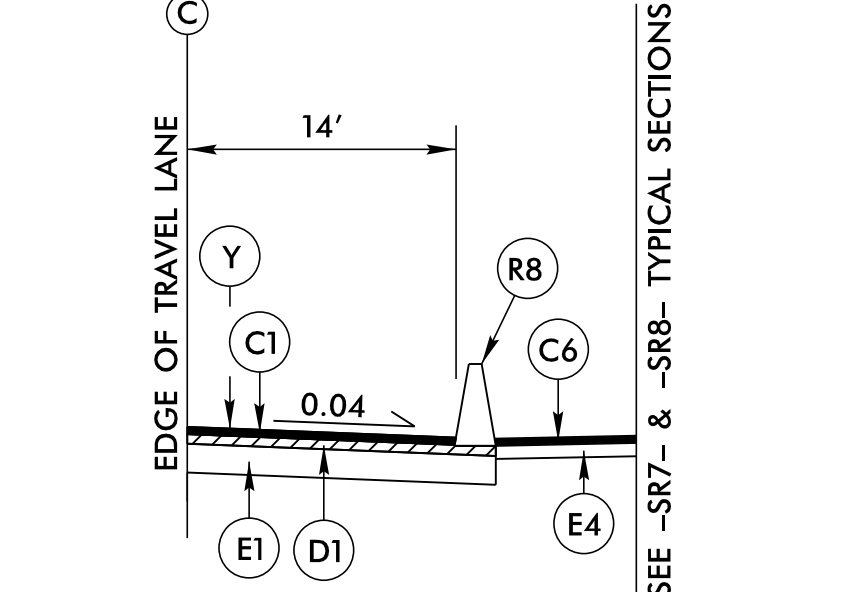
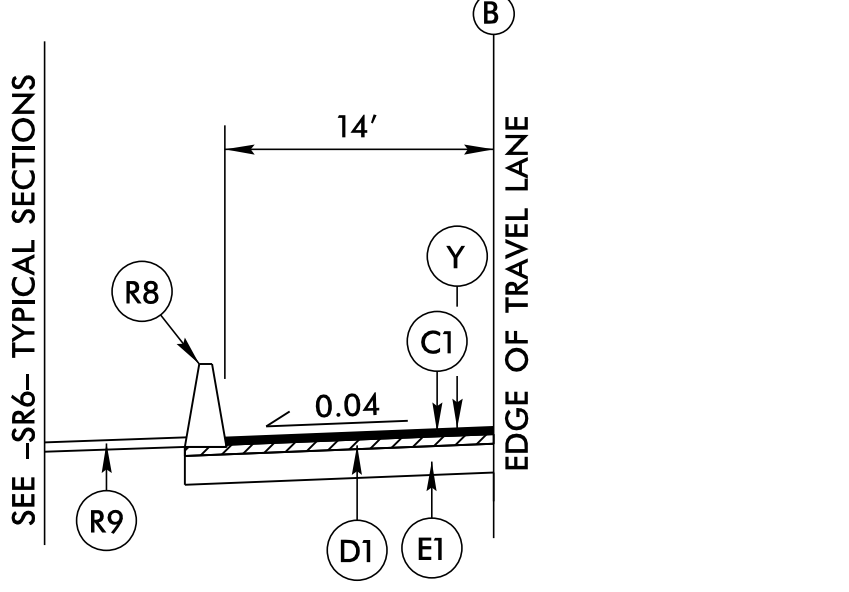
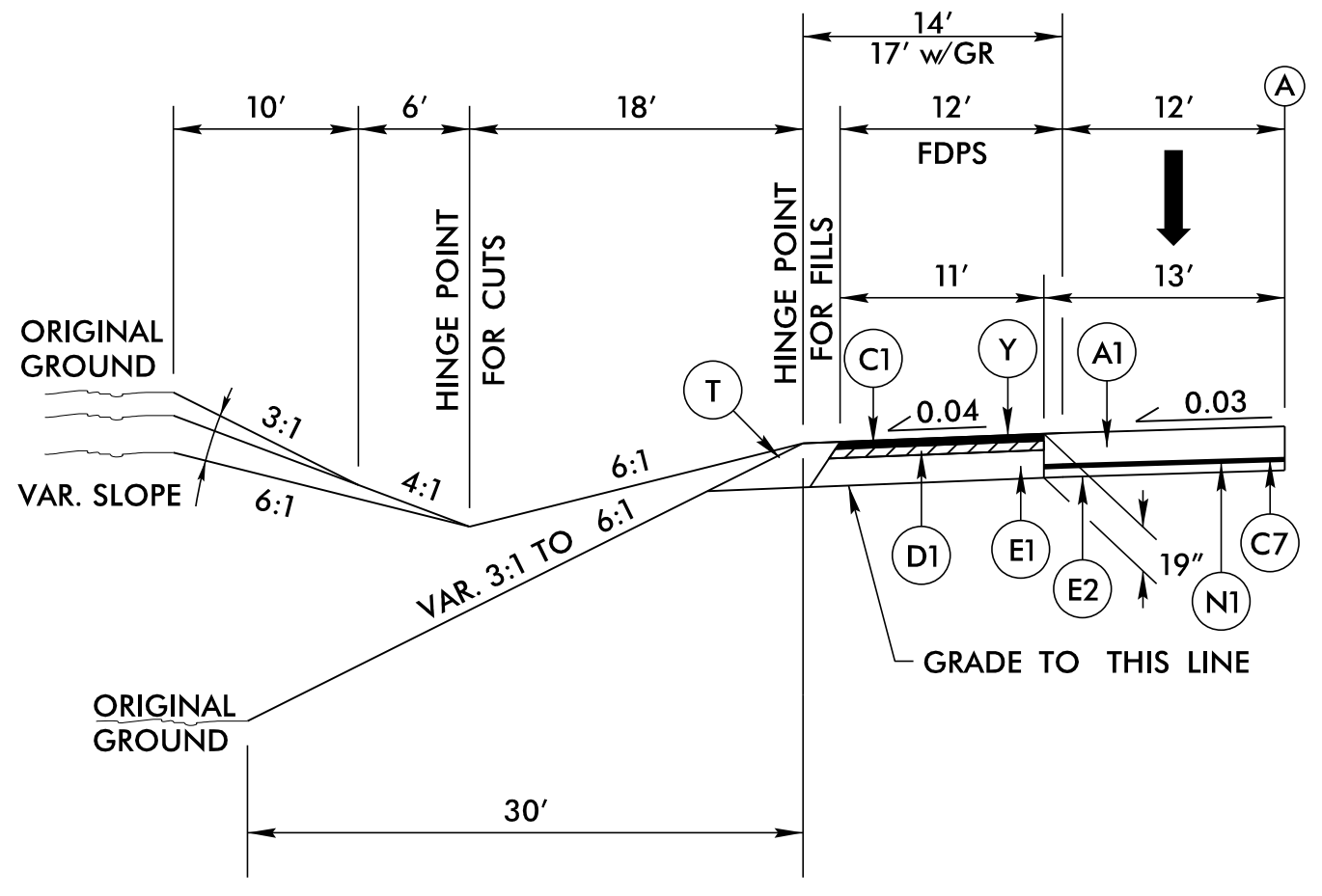
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PAVEMENT SCHEDULE	
A1	13.5" PCCP W/ DOWEL
C1	3" S9.5D
C3	3" S9.5C
C6	3" S9.5B
C7	1.5" S9.5B
D1	4" I19.0C
E1	12" B25.0C
E2	4" B25.0C
E4	5.5" B25.0C
K2	12" CLASS IV SUBGRADE STABILIZATION
N1	NONWOVEN GEOTEXTILE INTERLAYER
N2	GEOTEXTILE FOR SOIL STABILIZATION
R4	SHOULDER BERM GUTTER
R6	SINGLE FACED CONCRETE BARRIER
R7	TYPE T BARRIER
R8	SINGLE SLOPE BARRIER
R9	4" CONCRETE COVER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	2" MILLING
W1	SEE WEDGING DETAIL 1
W2	SEE WEDGING DETAIL 2
Y	MILLED RUMBLE STRIPS

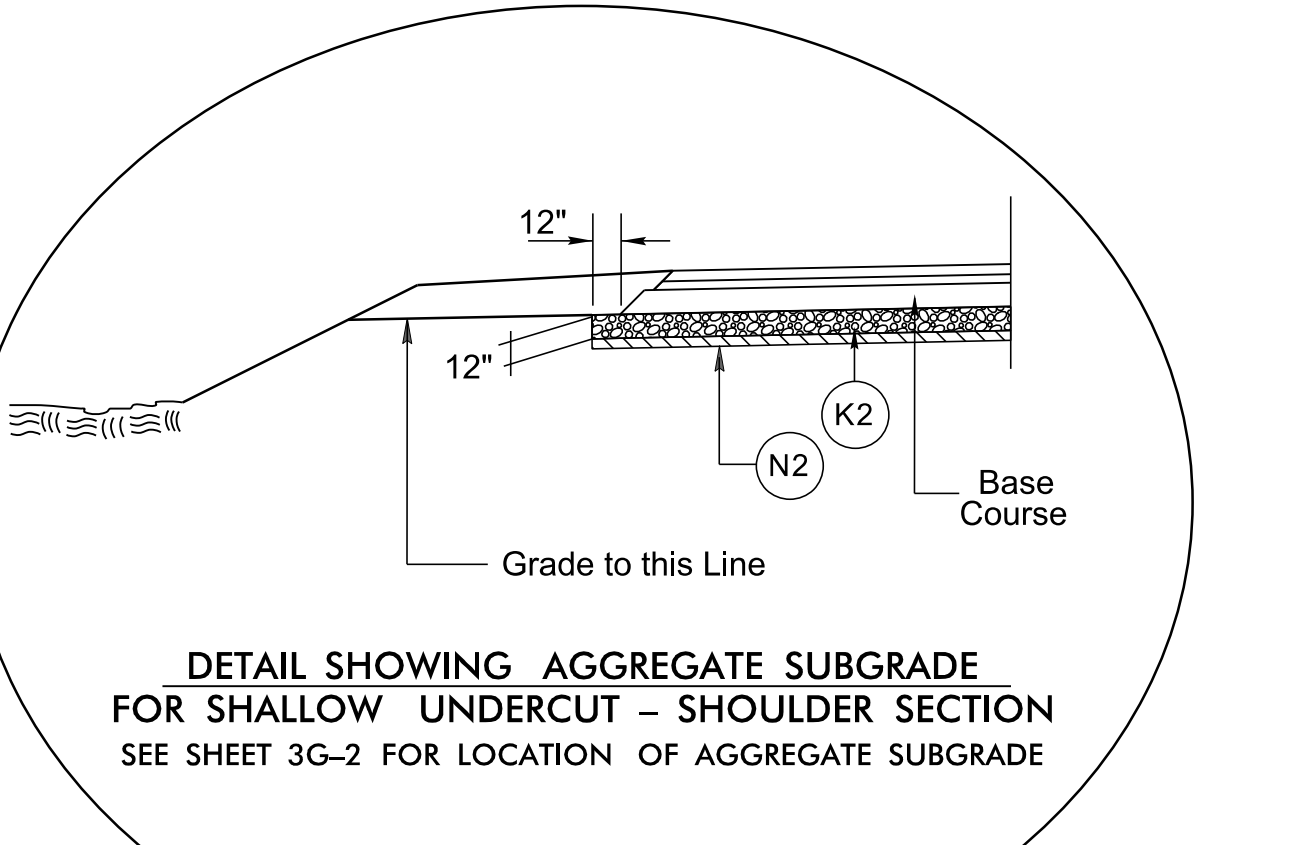
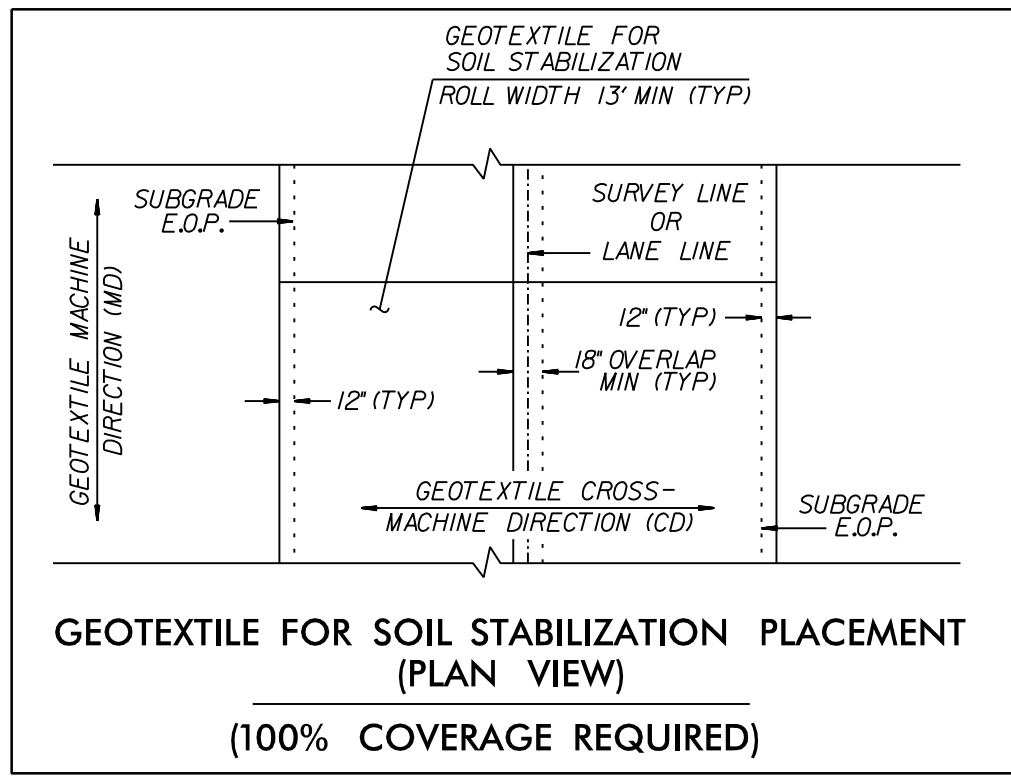
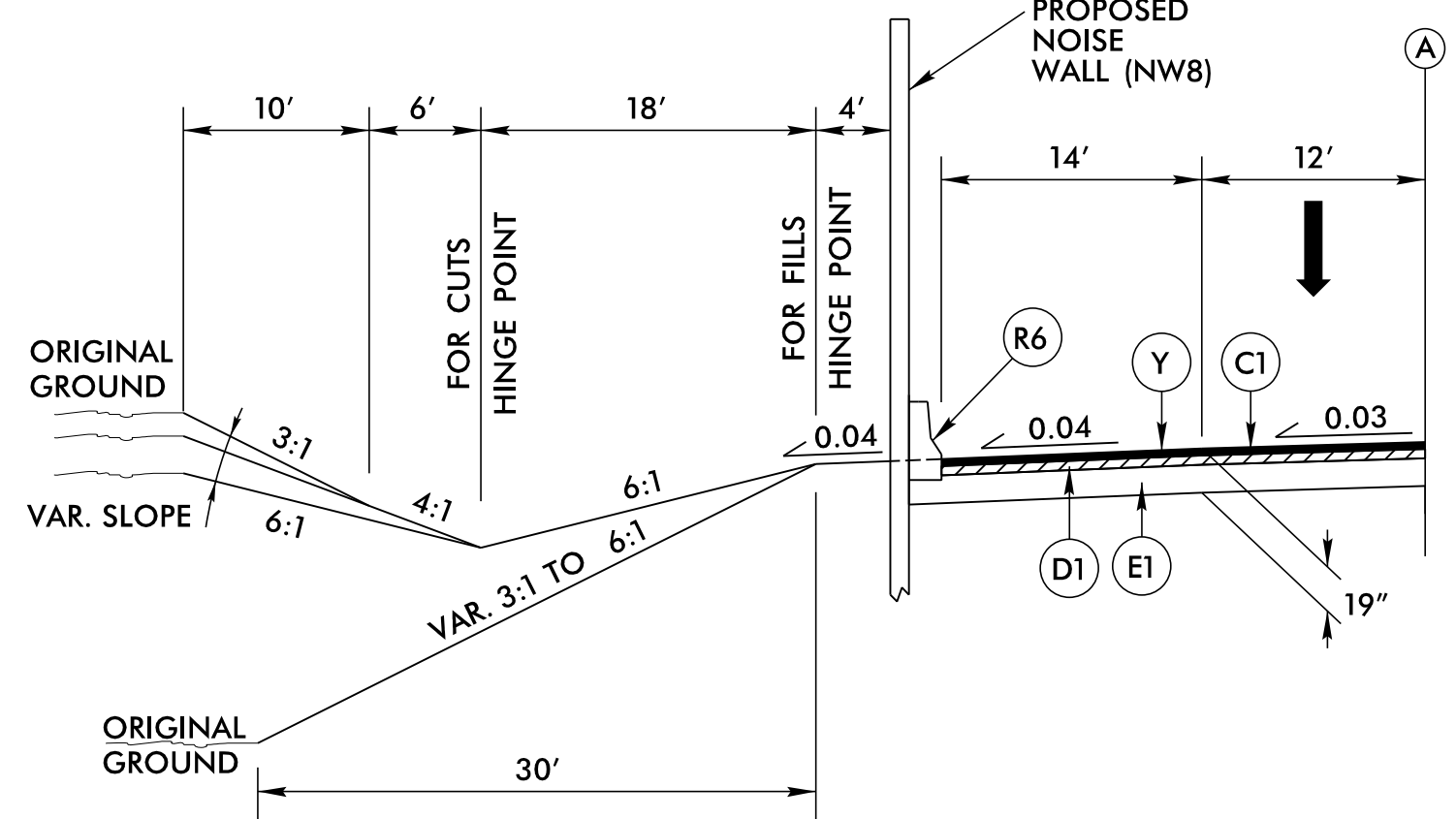
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

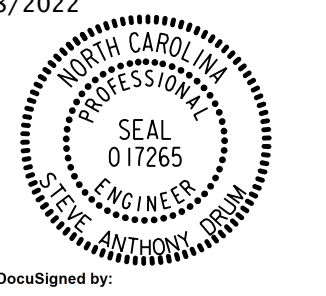
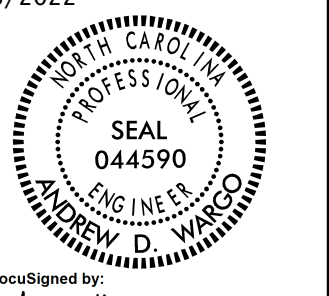

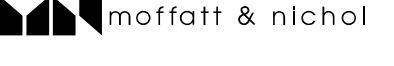


*USE SINGLE SLOPE CONCRETE BARRIER FROM 67+00.00 TO +/-95+24 TIE TO I-6064 AT 67+00.00



NOTE: MIRROR PARTIAL TYPICAL SECTION FOR RIGHT SIDE



PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2A-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022 	PAVEMENT DESIGN ENGINEER 5/18/2022 
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.nv5.com NC License # F-13333	
 4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4868 FAX NC License No. F-0105	

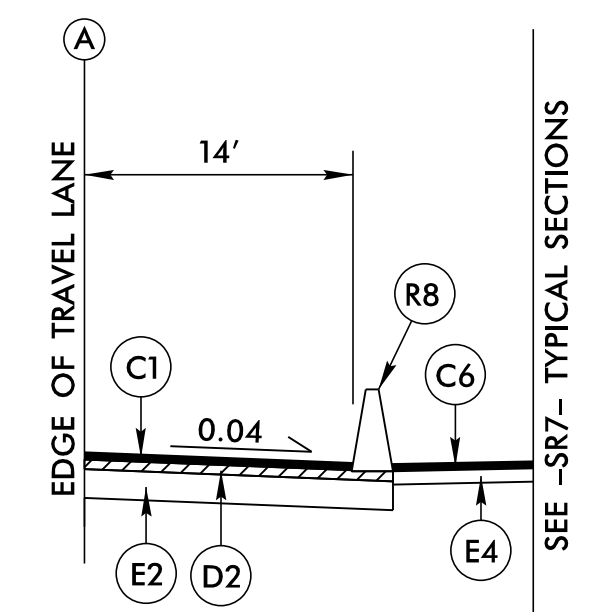
- 2" MILLING LIMITS**
- L- STA. 67+00.00 TO 67+50.00
 - L- STA. 71+50.00 TO 73+00.00
 - L- STA. 78+50.00 TO 80+00.00
 - L- STA. 86+00.00 TO 87+00.00
 - L- STA. 93+00.00 TO 97+00.00
 - L- STA. 97+50.00 TO 101+00.00
 - L- STA. 106+50.00 TO 108+50.00
 - L- STA. 125+50.00 TO 128+50.00
 - L- STA. 142+50.00 TO 149+00.00
 - L- STA. 165+00.00 TO 167+50.00
 - L- STA. 171+50.00 TO 173+50.00
 - L- STA. 174+00.00 TO 175+00.00
 - L- STA. 180+50.00 TO 182+00.00
 - L- STA. 192+00.00 TO 194+50.00
 - L- STA. 227+00.00 TO 229+50.00
 - L- STA. 240+50.00 TO 241+50.00
 - L- STA. 242+00.00 TO 243+50.00
 - L- STA. 253+50.00 TO 258+50.00
 - L- STA. 264+00.00 TO 266+00.00
 - L- STA. 270+50.00 TO 272+50.00
 - L- STA. 291+00.00 TO 292+50.00
 - L- STA. 296+00.00 TO 298+00.00
 - L- STA. 314+00.00 TO 316+00.00
 - L- STA. 322+00.00 TO 324+50.00
 - L- STA. 330+00.00 TO 332+50.00
 - L- STA. 365+60.00 TO 367+50.00
 - L- STA. 384+30.00 TO 388+00.00
 - L- STA. 395+40.00 TO 398+20.00
 - L- STA. 412+80.00 TO 416+58.00
 - L- STA. 436+80.00 TO 439+50.00
 - L- STA. 446+30.00 TO 449+70.00
 - L- STA. 493+80.00 TO 495+00.00

SEE SHEETS 2B-6 AND 2B-7 FOR SINGLE SLOPE CONCRETE BARRIER DETAILS

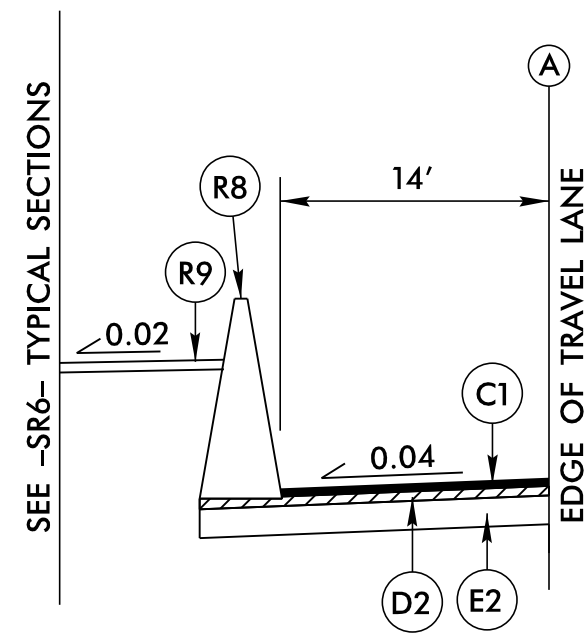
5/14/22

PAVEMENT SCHEDULE	
A1	13.5" PCCP W/ DOWEL
C1	3" S9.5D
C4	2" S9.5C
C6	3" S9.5B
C7	1.5" S9.5B
D1	4" I19.0C
D2	2.5" I19.0C
E1	12" B25.0C
E2	4" B25.0C
E4	5.5" B25.0C
N1	NONWOVEN GEOTEXTILE INTERLAYER
R6	SINGLE FACED CONCRETE BARRIER
R7	TYPE T BARRIER
R8	SINGLE SLOPE BARRIER
R9	4" CONC. COVER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	2" MILLING
W3	SEE WEDGING DETAIL 3

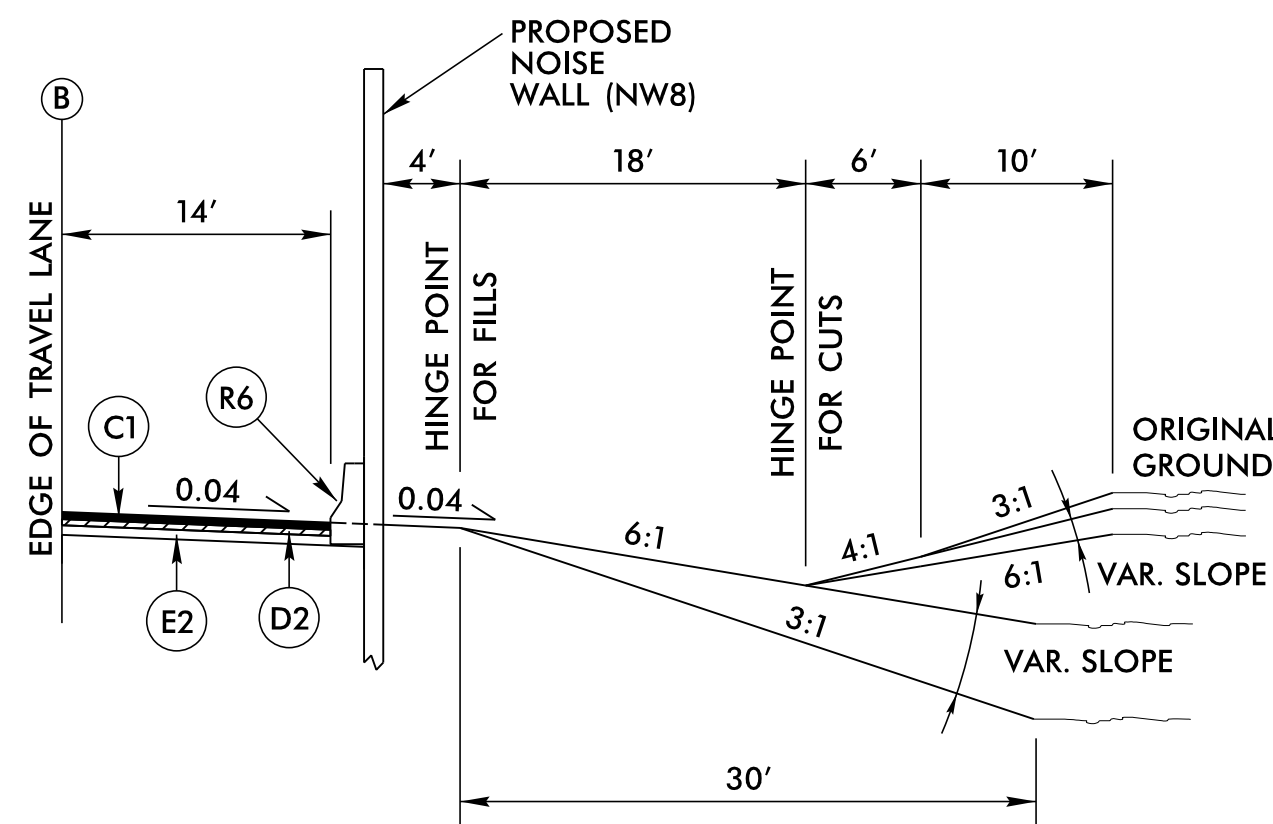
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



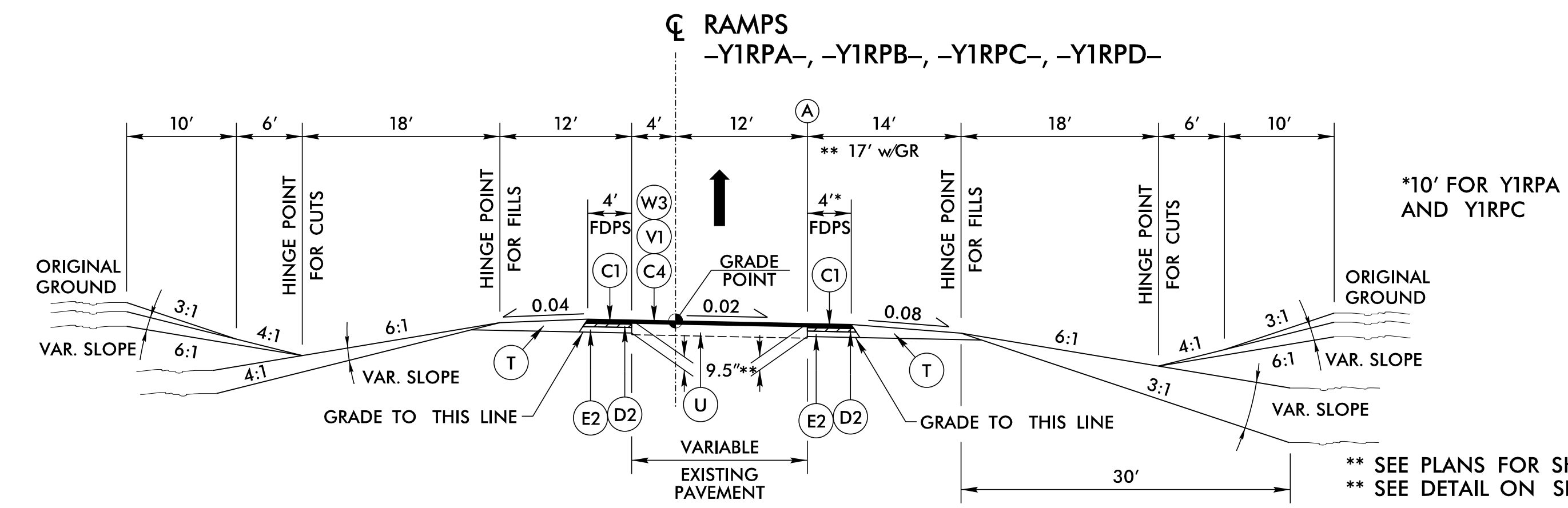
PARTIAL TYPICAL SECTION NO. 2B
-Y1RPC- STA. 10+00.00 TO 16+11.48 RT



PARTIAL TYPICAL SECTION NO. 2A
-Y1RPB- STA. 10+00.00 TO 14+08.57

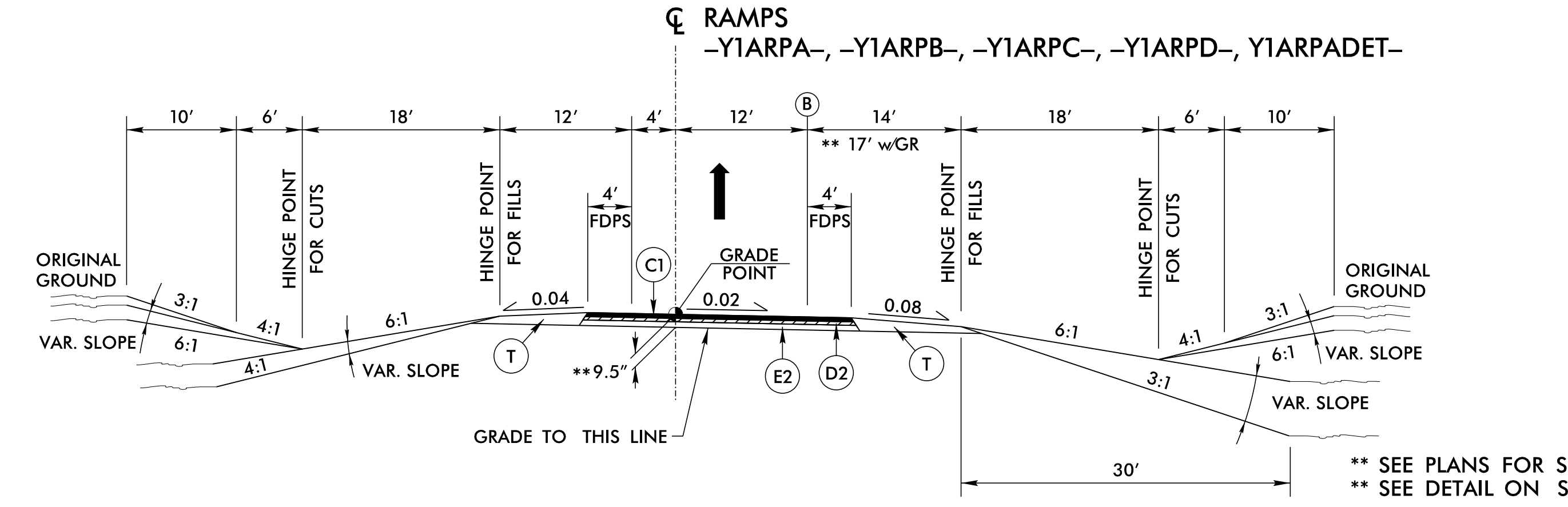


PARTIAL TYPICAL SECTION NO. 3B
-Y1ARPA- STA. 10+00.00 TO 20+80.55 RT



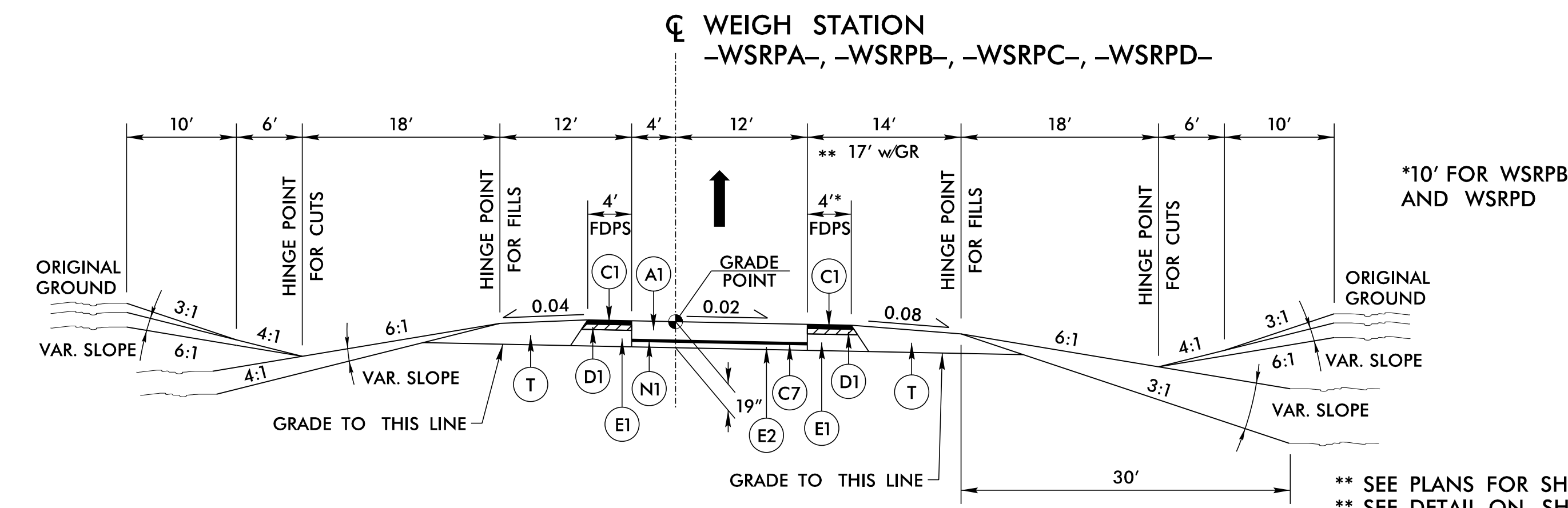
TYPICAL SECTION NO. 2
-Y1RPA- STA. 10+00.00 TO 18+82.00
*-Y1RPB- STA. 10+00.00 TO 19+60.00
-Y1RPC- STA. 10+00.00 TO 18+70.00
-Y1RPD- STA. 10+00.00 TO 19+60.00

NOTE:
MIRROR TYPICAL SECTION FOR Y1RPB AND Y1RPD USE MAINLINE PAVEMENT TO BACK OF GORE



TYPICAL SECTION NO. 3
-Y1ARPA- STA. 10+00.00 TO 29+04.89
-Y1ARPB- STA. 10+00.00 TO 28+30.19
-Y1ARPC- STA. 10+00.00 TO 26+79.68
-Y1ARPD- STA. 10+00.00 TO 26+38.88

NOTE:
MIRROR TYPICAL SECTION FOR Y1ARPB AND Y1ARPD USE MAINLINE PAVEMENT TO BACK OF GORE



TYPICAL SECTION NO. 4
-WSRPA- STA. 10+00.00 TO 16+90.00
-WSRPB- STA. 10+00.00 TO 15+95.00
-WSRPC- STA. 10+00.00 TO 16+50.00
-WSRPD- STA. 10+00.00 TO 16+00.00

NOTE:
MIRROR TYPICAL SECTION FOR WSRPB AND WSRPD USE MAINLINE PAVEMENT TO BACK OF GORE

PROJECT REFERENCE NO. <u>1-5987A</u>	SHEET NO. <u>2A-3</u>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022	PAVEMENT DESIGN ENGINEER 5/18/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.nv5.com NC License # F-1333	

** SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS
** SEE DETAIL ON SHEET 2A-2 SHOWING SHOULDER BERM GUTTER

** SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS
** SEE DETAIL ON SHEET 2A-2 SHOWING SHOULDER BERM GUTTER

** SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS
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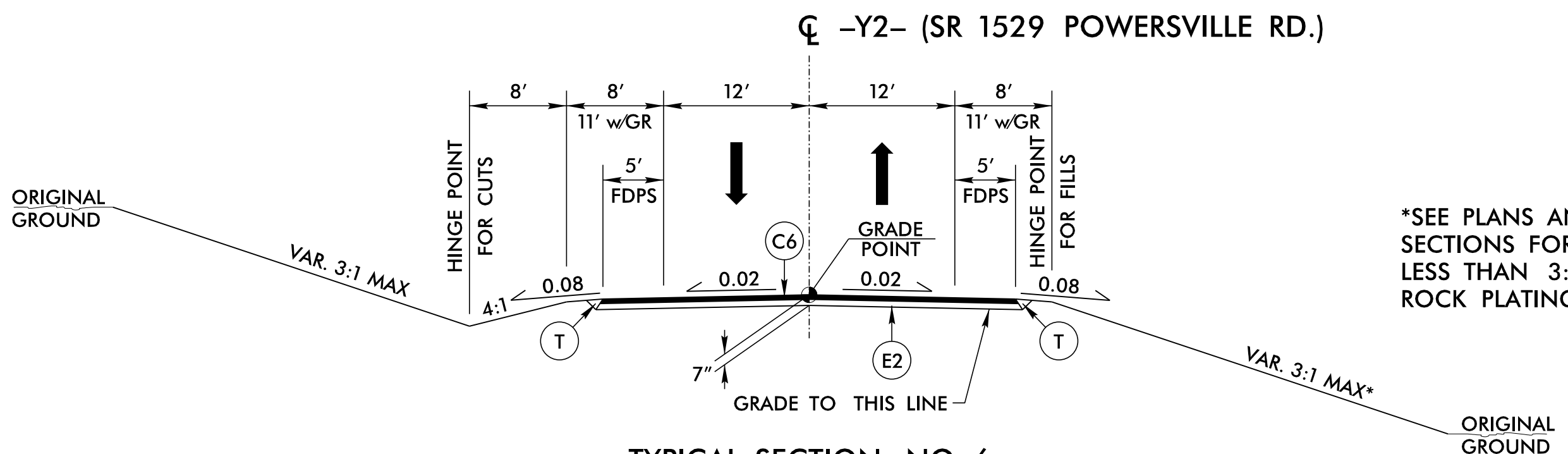
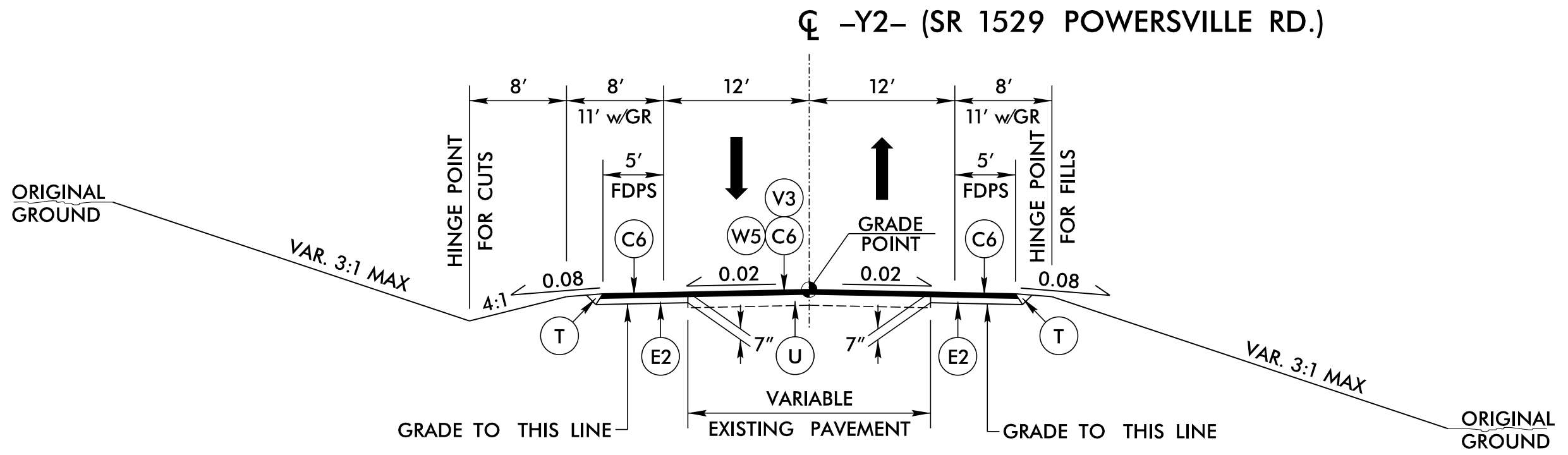
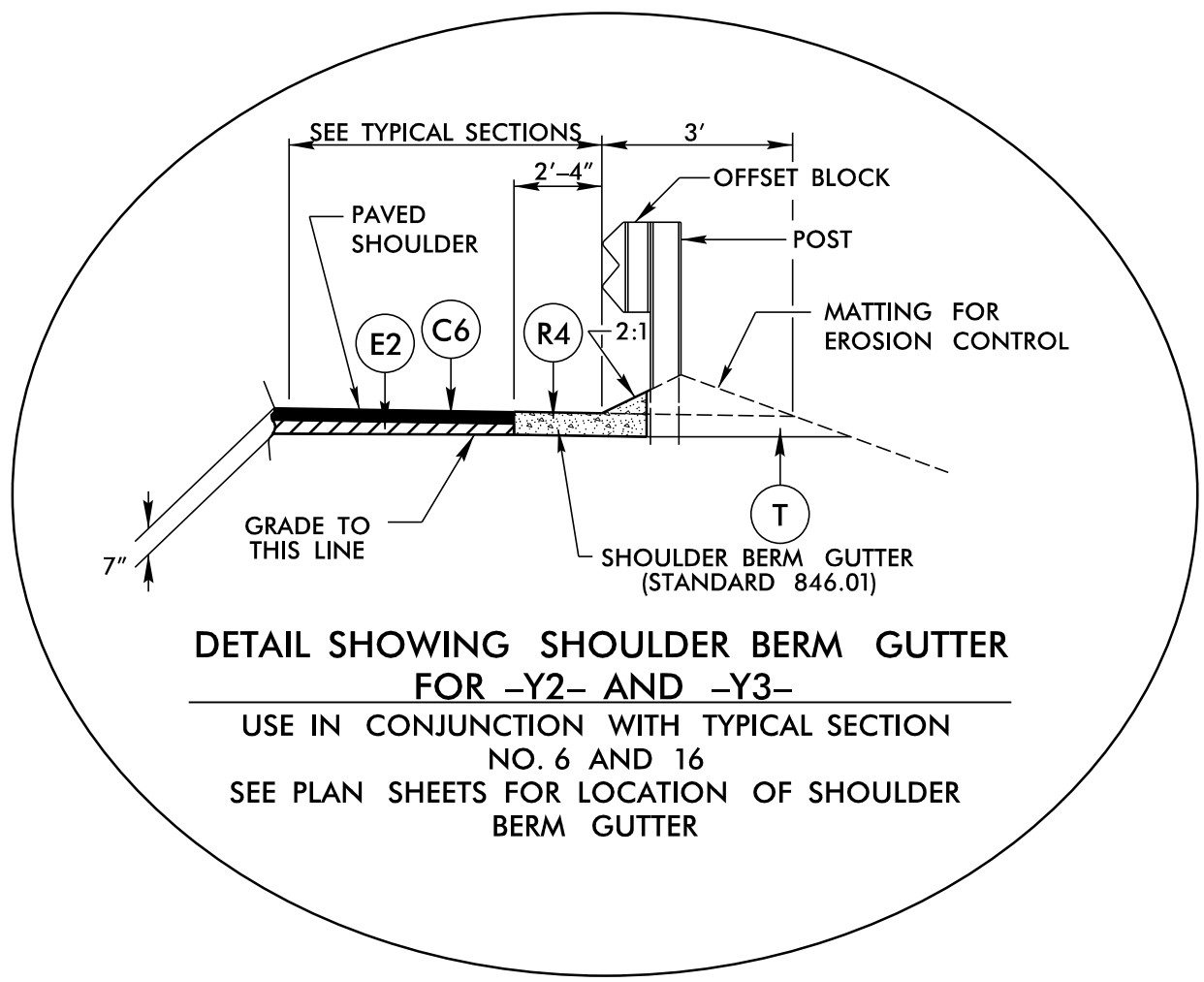
SEE SHEETS 2B-6 AND 2B-7 FOR SINGLE SLOPE CONCRETE BARRIER DETAILS

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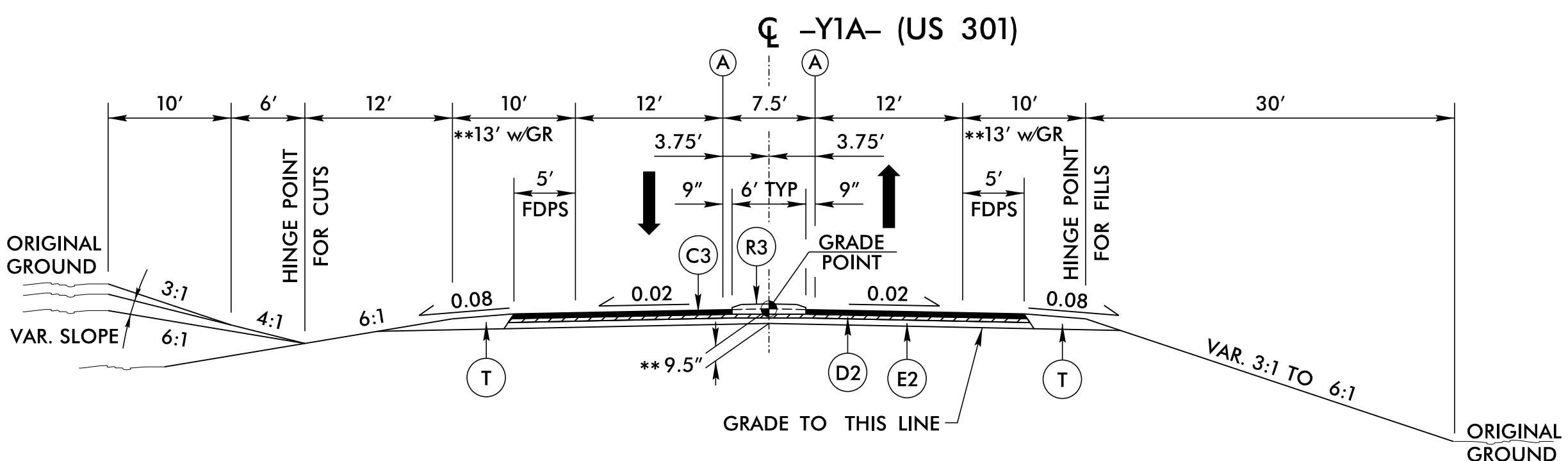
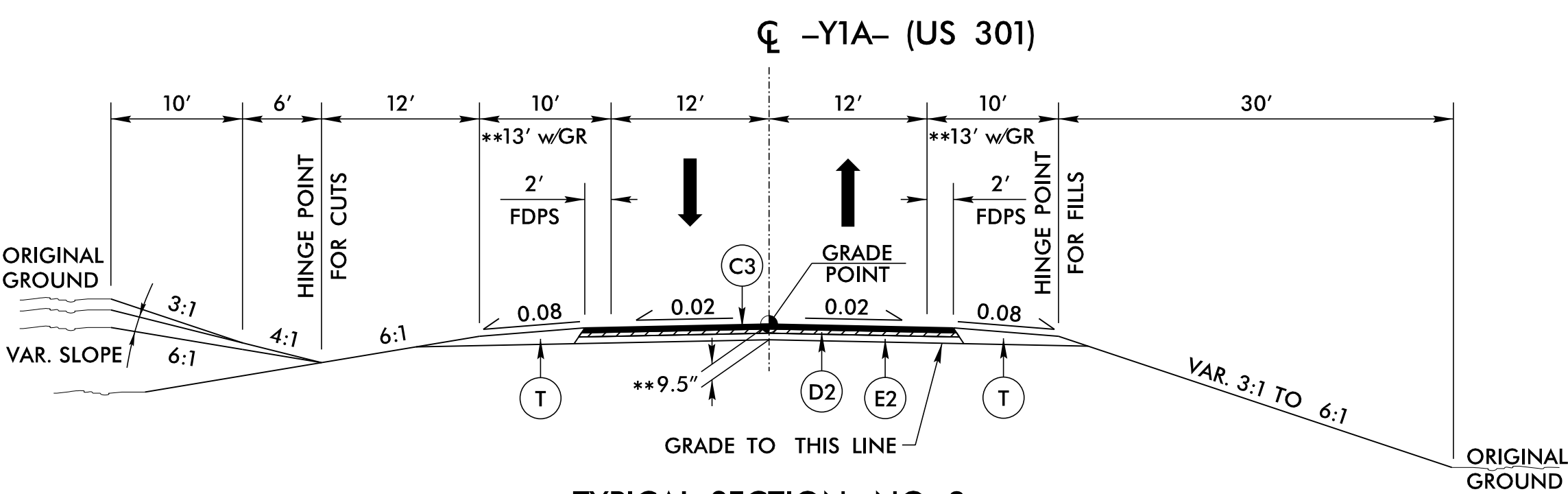
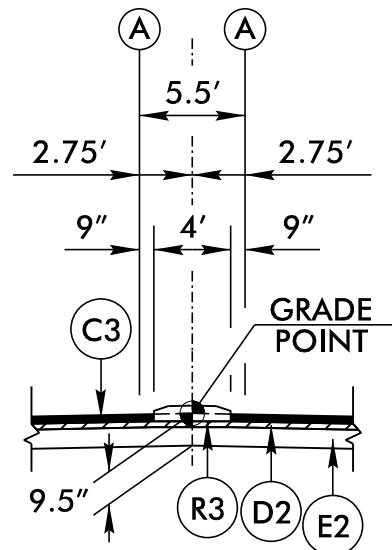
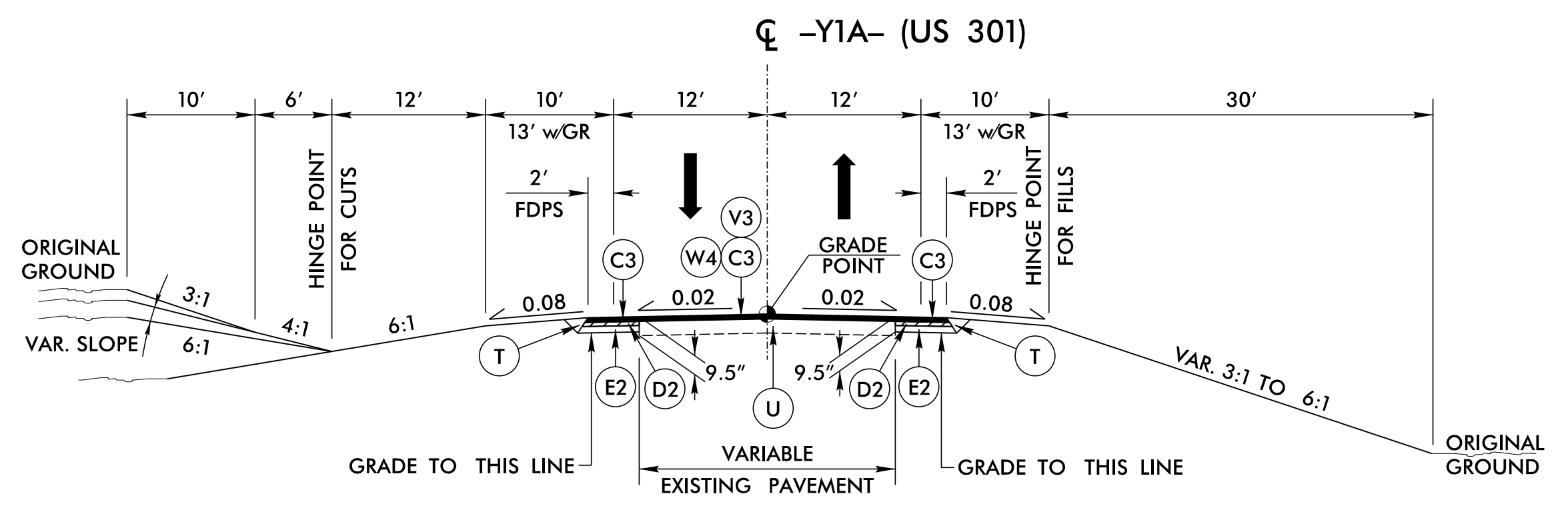
5/14/2022

PAVEMENT SCHEDULE	
C3	3" S9.5C
C6	3" S9.5B
D2	2.5" I19.0C
E2	4" B25.0C
R3	5" MONO. ISLAND
R4	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V3	INCIDENTAL MILLING
W4	SEE WEDGING DETAIL 4
W5	SEE WEDGING DETAIL 5

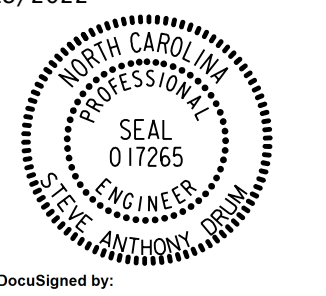
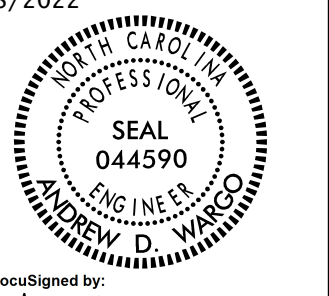
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



*SEE PLANS AND CROSS SECTIONS FOR AREAS THAT ARE LESS THAN 3:1 AND REQUIRE ROCK PLATING



** SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS
** SEE DETAIL ON SHEET 2A-2 SHOWING SHOULDER BERM GUTTER



PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2A-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022	PAVEMENT DESIGN ENGINEER 5/18/2022
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
NV5	
NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	

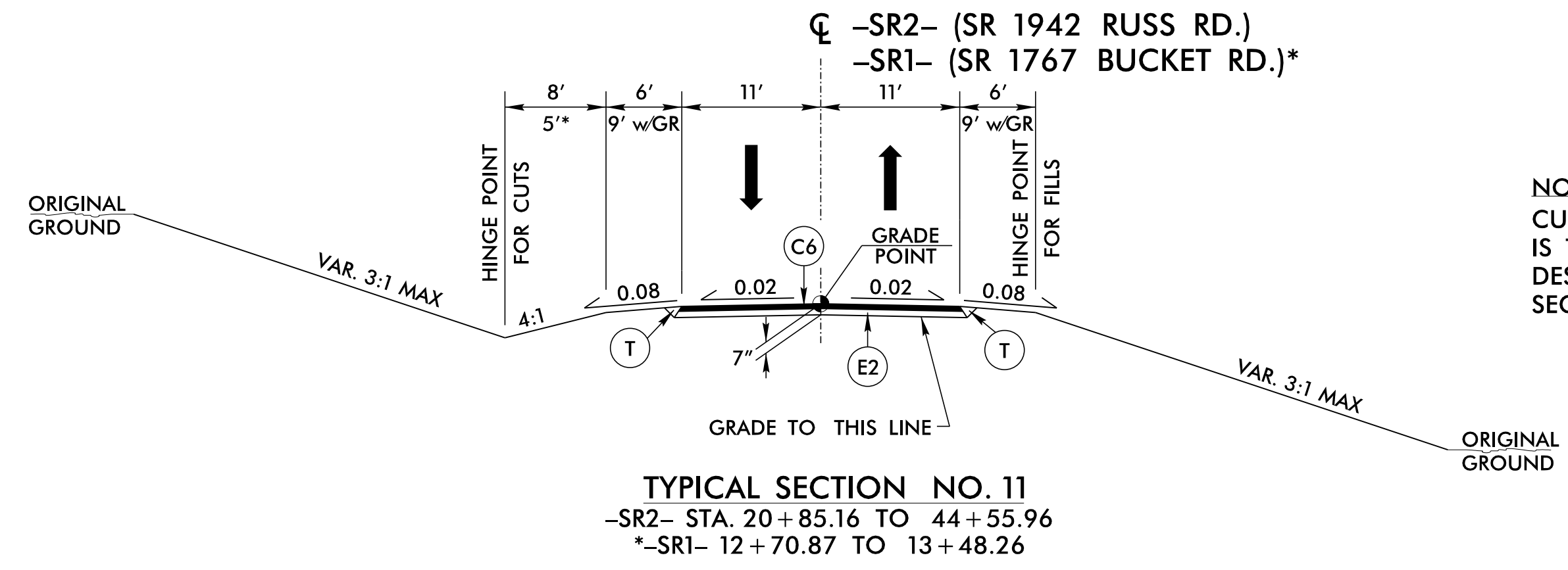
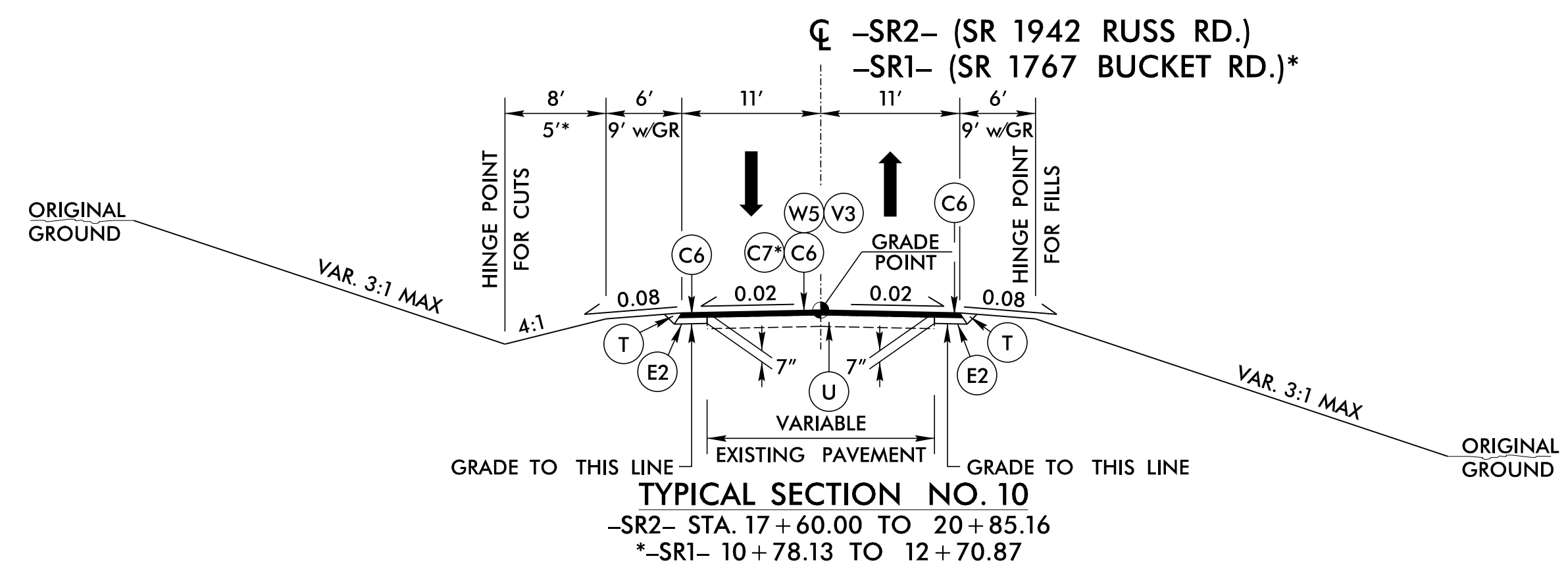
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5/14/2022

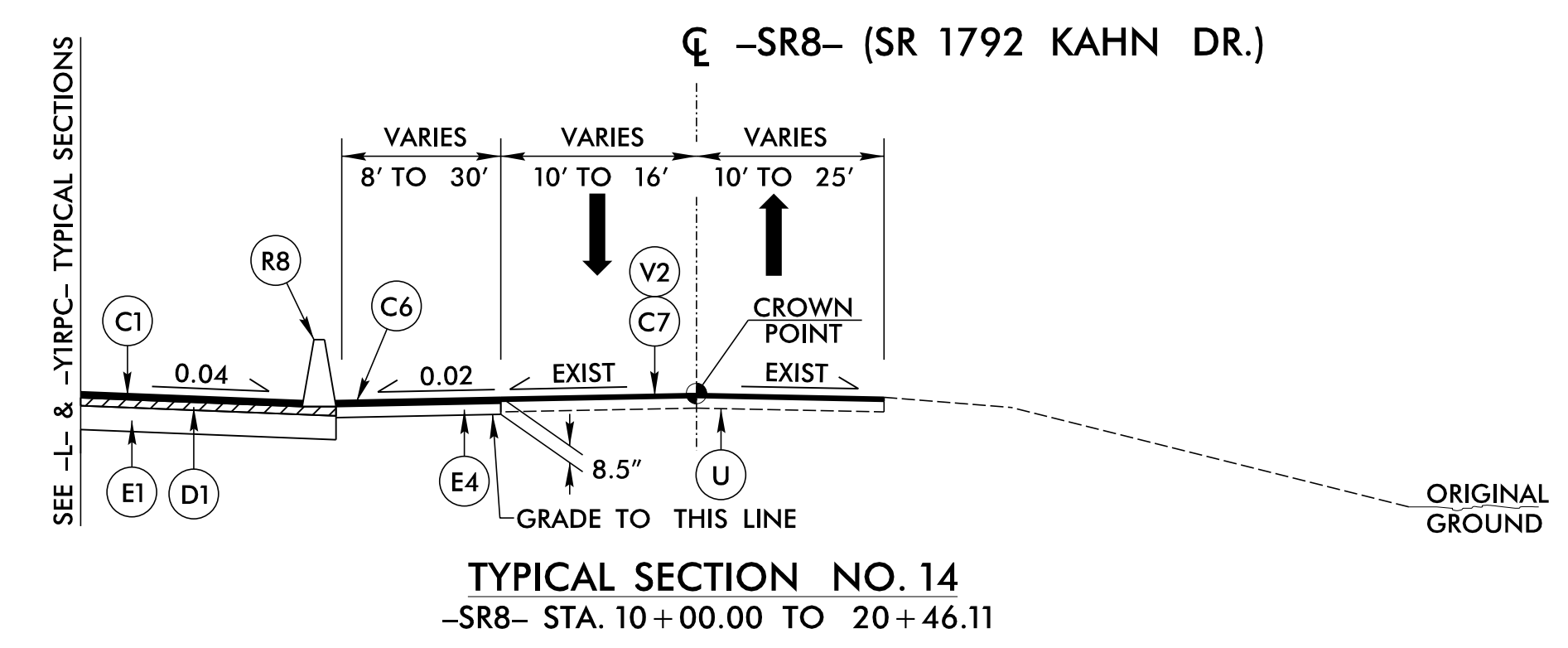
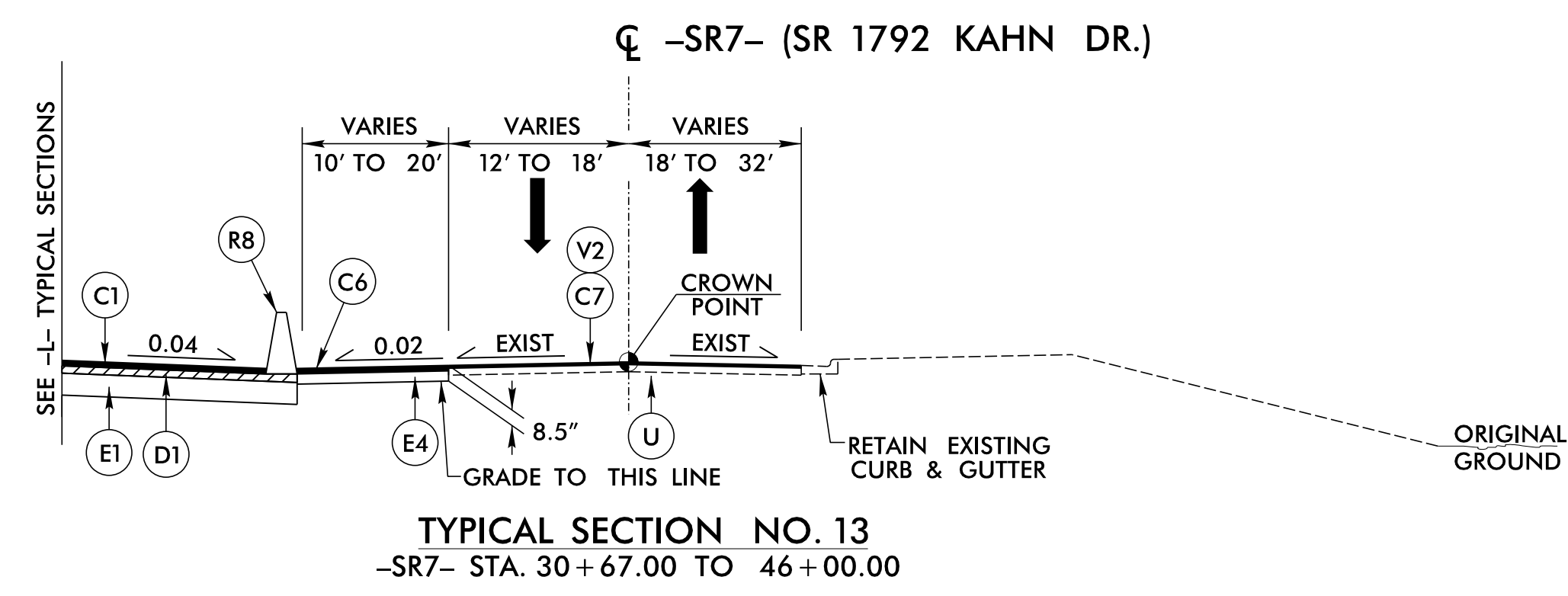
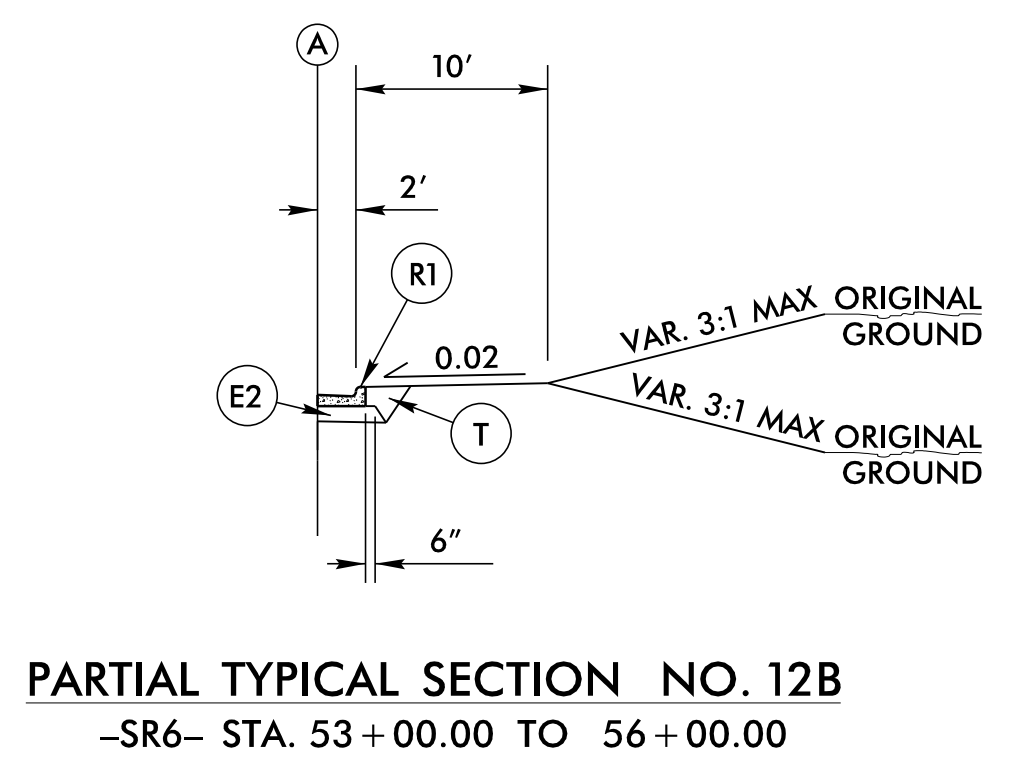
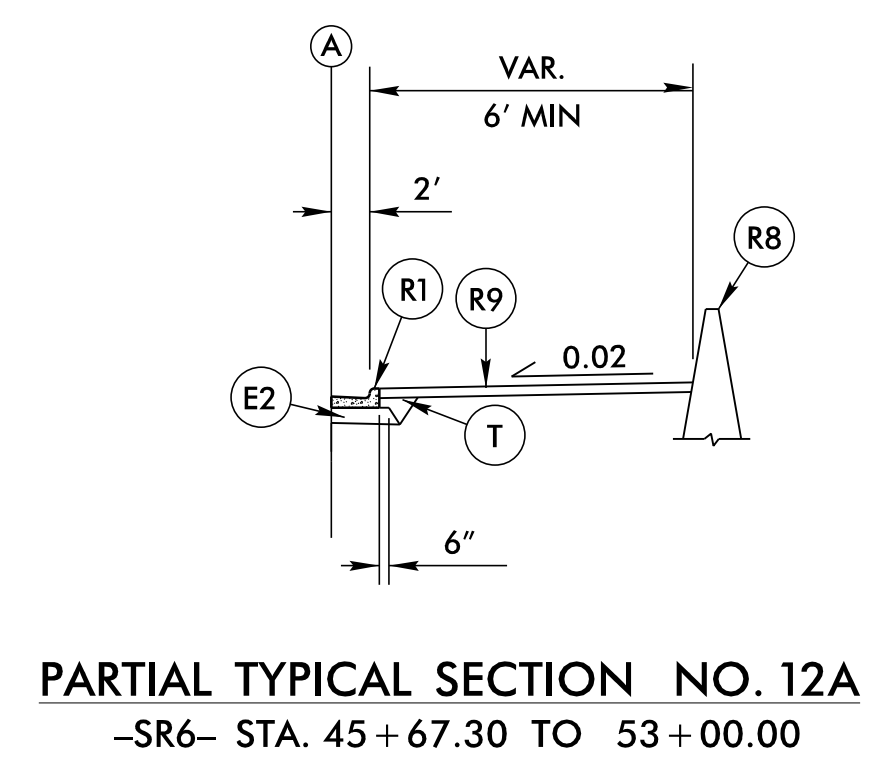
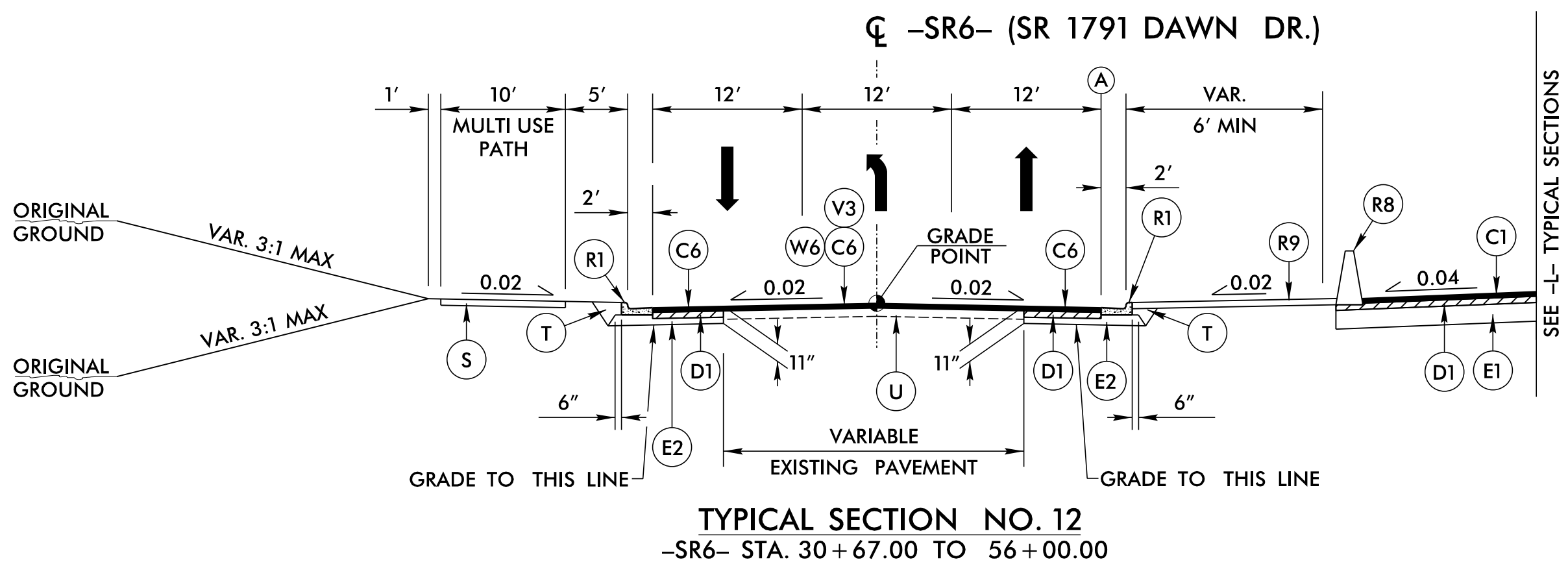
PAVEMENT SCHEDULE	
C1	3" S9.5D
C6	3" S9.5B
C7	1.5" S9.5B
D1	4" I19.0C
E1	12" B25.0C
E2	4" B25.0C
E4	5.5" B25.0C
R1	2'-6" C&G
R8	SINGLE SLOPE BARRIER
R9	4" CONC. COVER
S	4" CONC. MULTI USE PATH
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V2	1.5" MILLING
V3	INCIDENTAL MILLING
W5	SEE WEDGING DETAIL 5
W6	SEE WEDGING DETAIL 6

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

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2A-5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022	PAVEMENT DESIGN ENGINEER 5/18/2022
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
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NOTE:
CUL-DE-SAC ON BUCKET ROAD IS TO USE THE PAVEMENT DESIGN SHOWN ON TYPICAL SECTION NO. 11

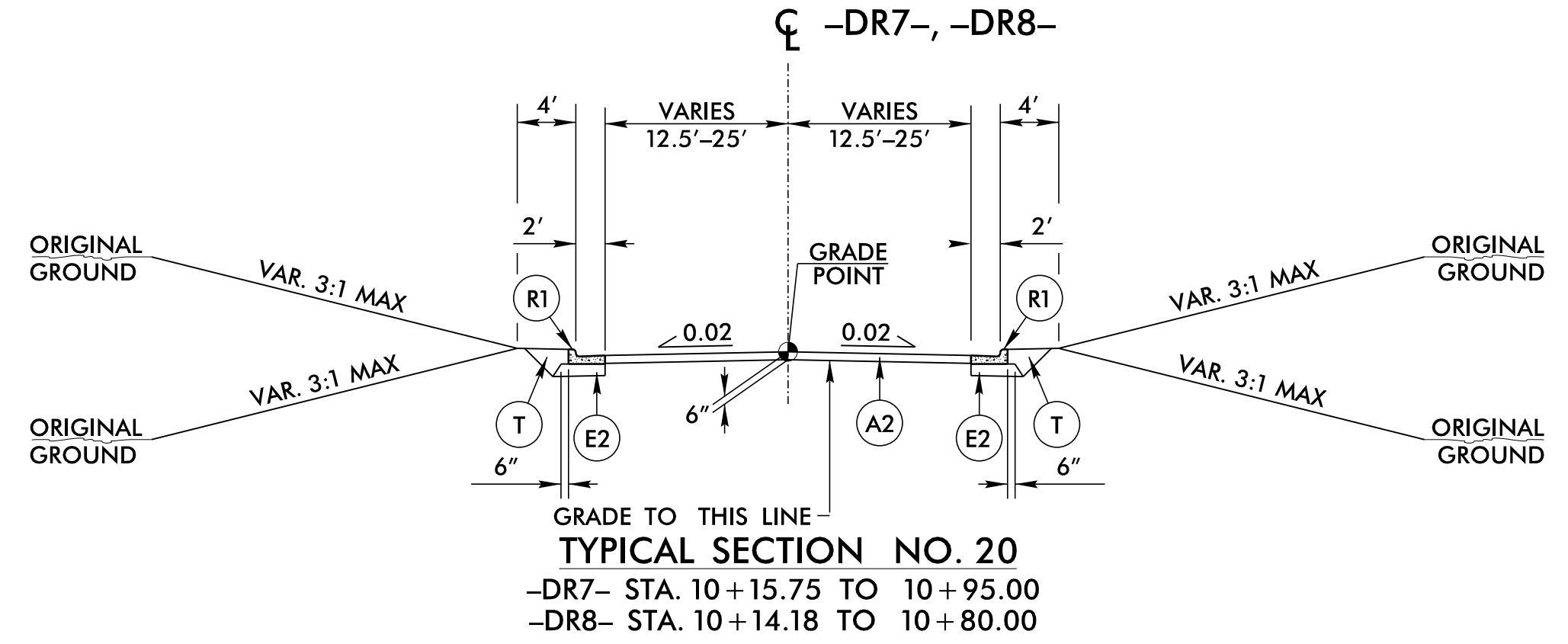
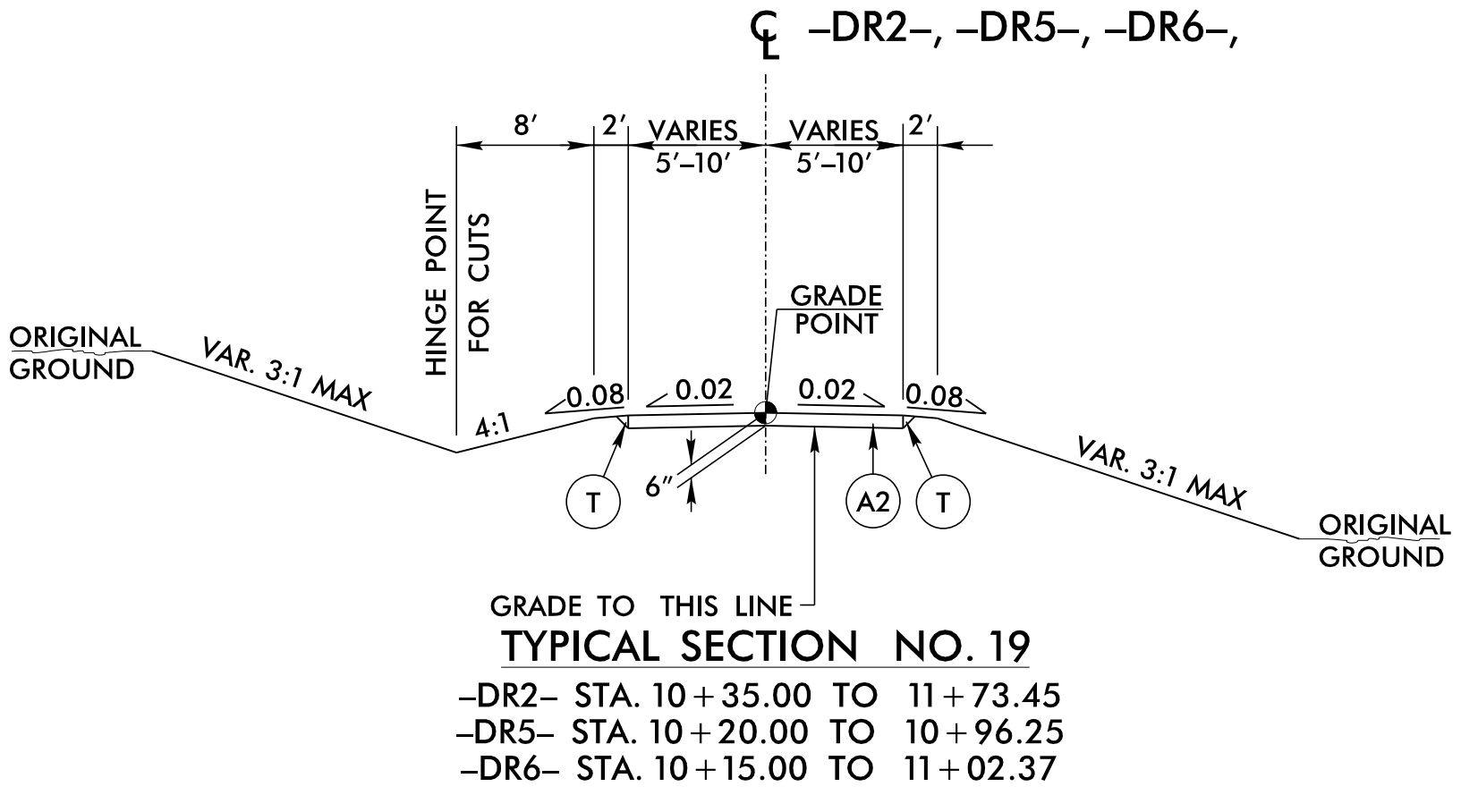
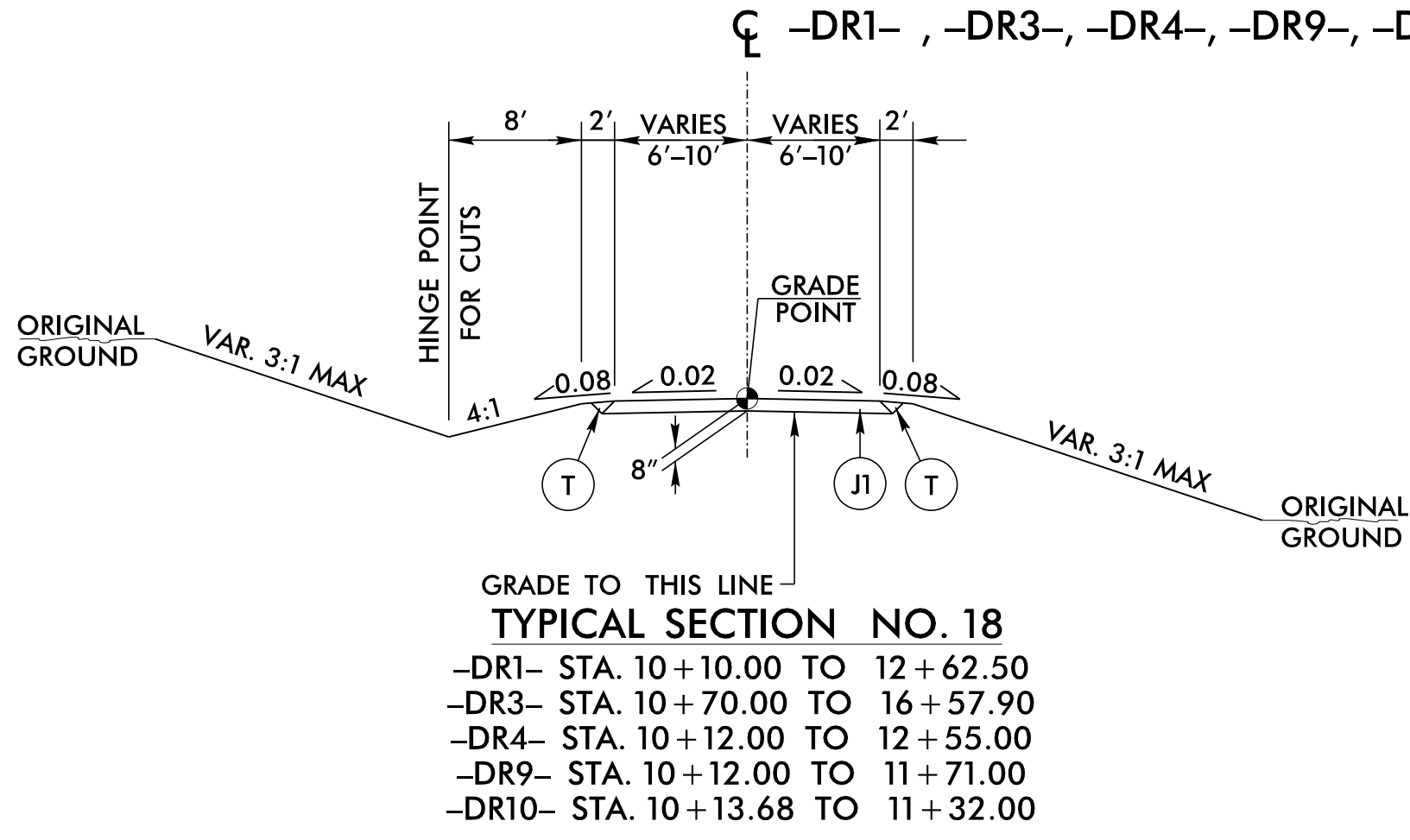
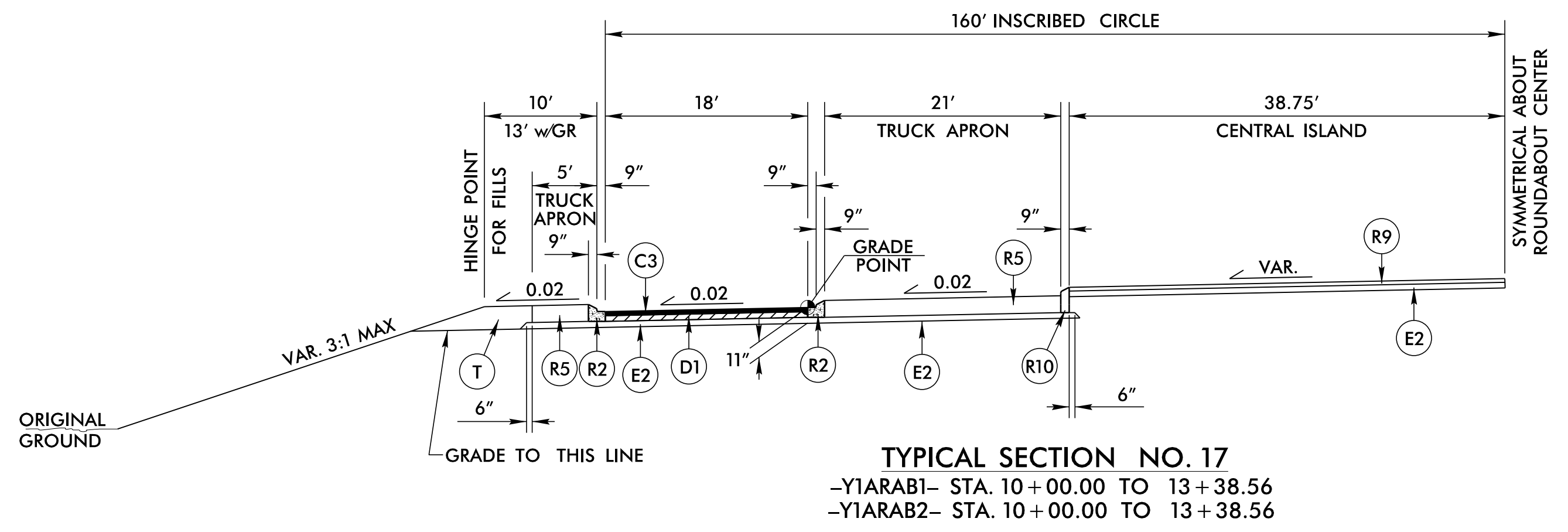
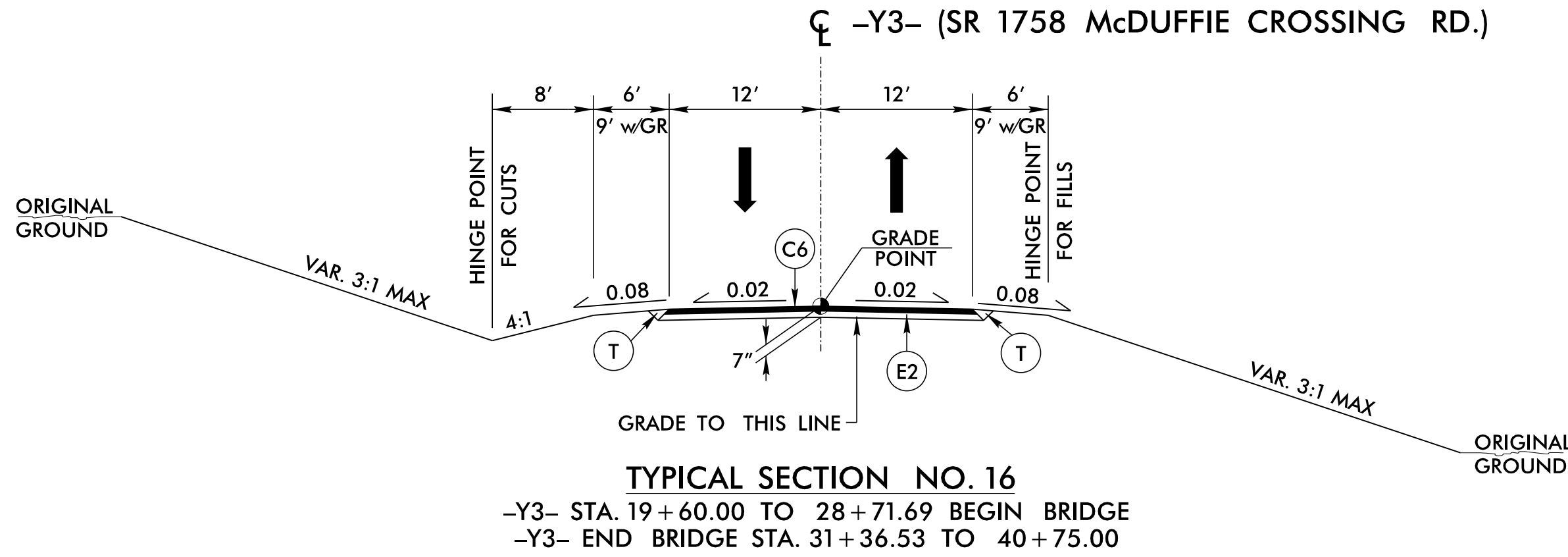
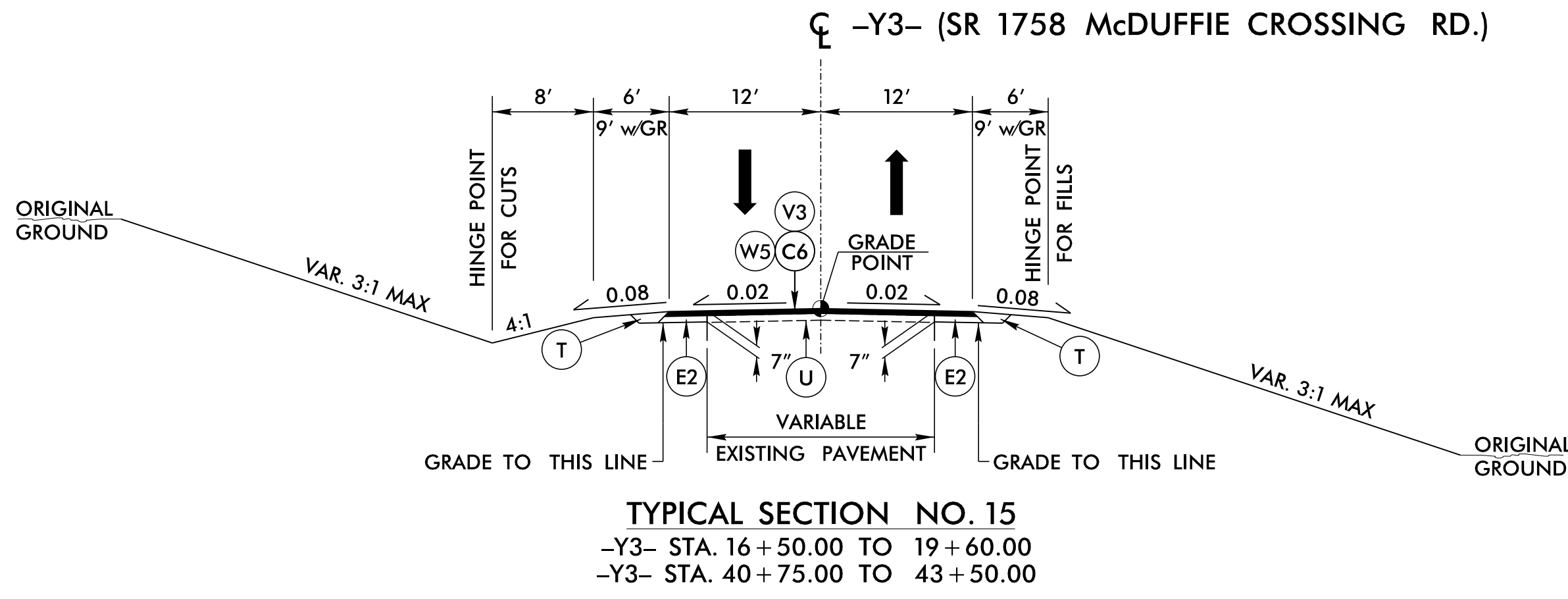
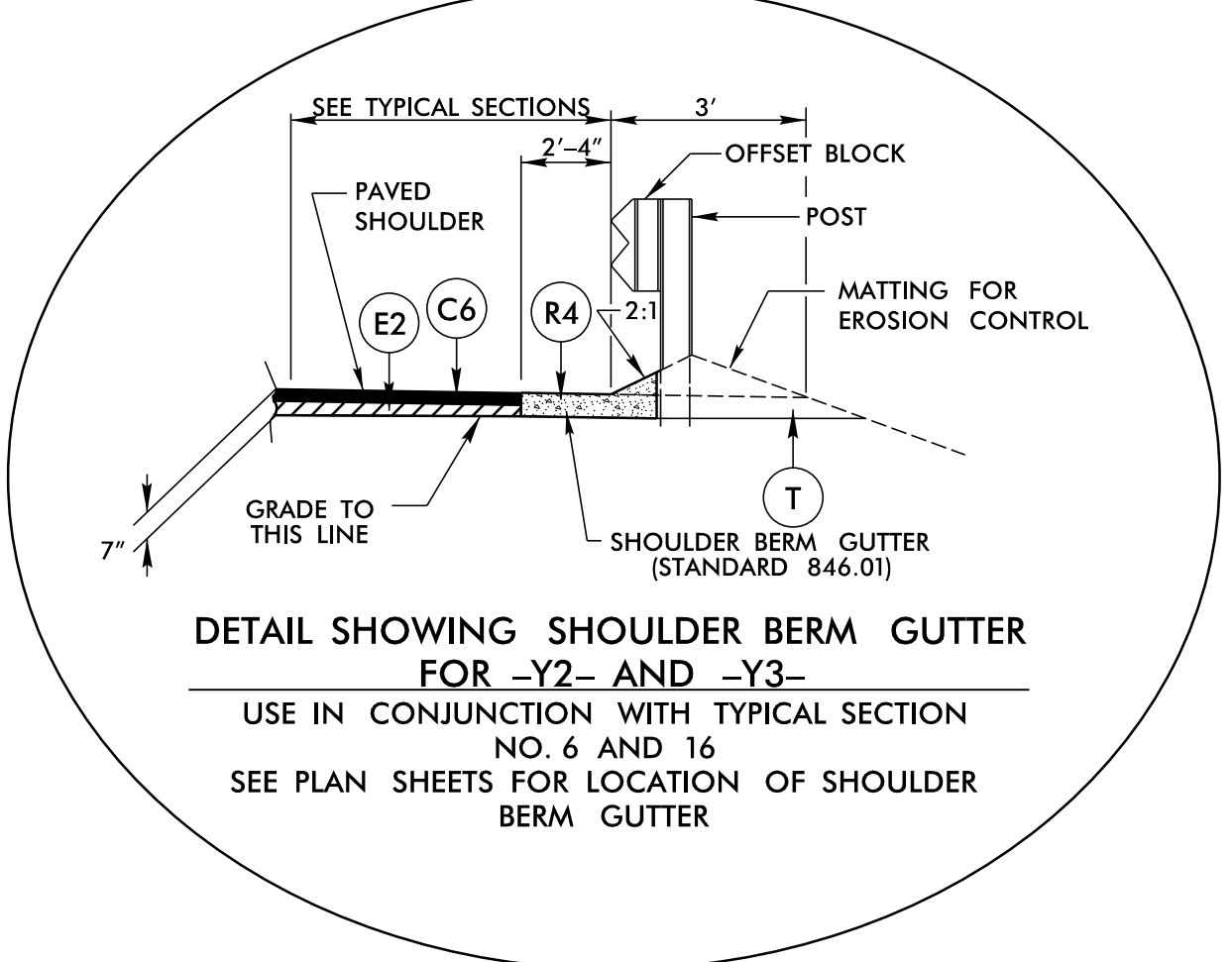


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5/14/2022

PAVEMENT SCHEDULE	
A2	CONCRETE DRIVEWAY
C3	3" S9.5C
C6	3" S9.5B
D1	4" I19.0C
E2	4" B25.0C
J1	8" ABC
R1	2'-6" C&G
R2	1'-6" CURB & GUTTER
R4	SHOULDER BERM GUTTER
R5	12" CONC. TRUCK APRON
R9	4" CONC. COVER
R10	9"x18" CONC. CURB
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V3	INCIDENTAL MILLING
W5	SEE WEDGING DETAIL 5

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



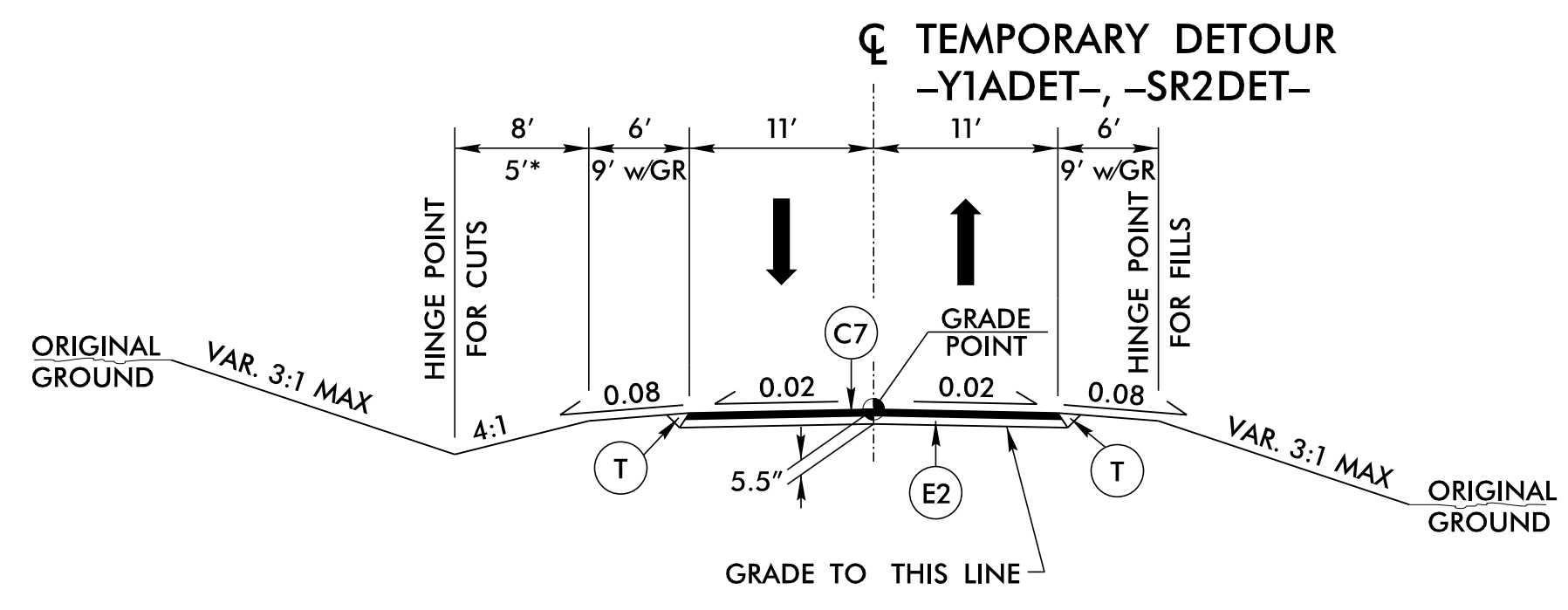
PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2A-6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022	PAVEMENT DESIGN ENGINEER 5/18/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	

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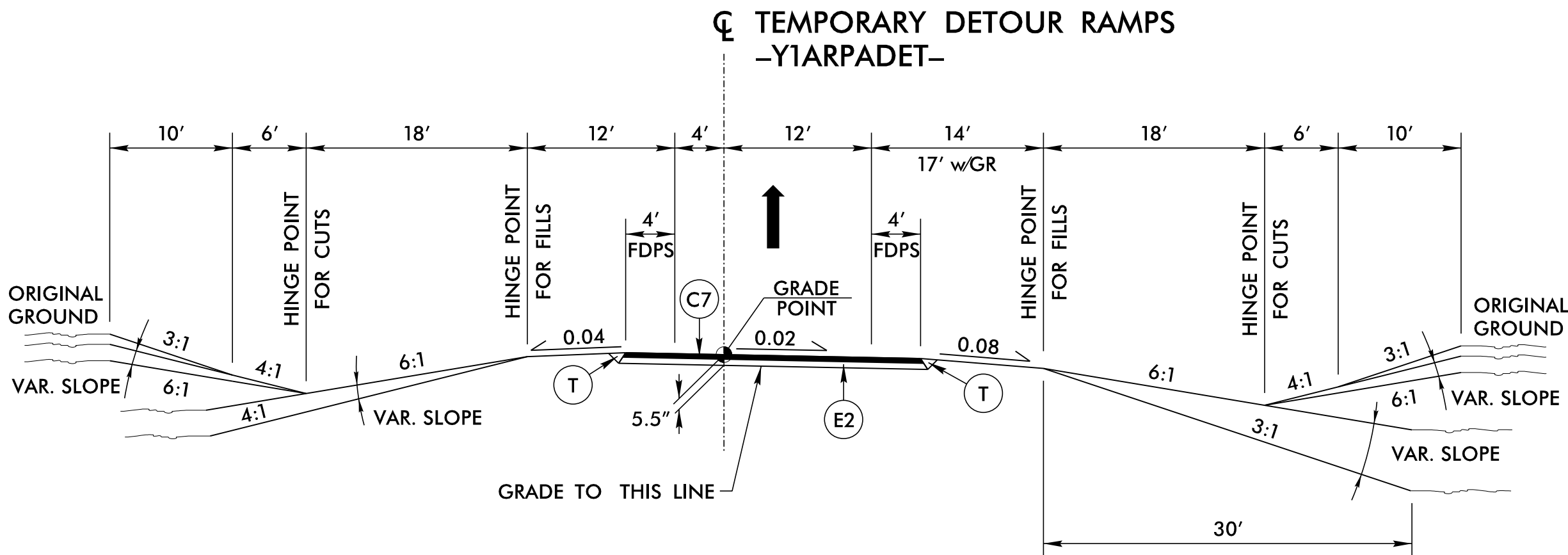
5/14/2022

PAVEMENT SCHEDULE	
C1	3" S9.5D
C3	3" S9.5C
C6	3" S9.5B
C7	1.5" S9.5B
D1	4.0" I19.0C
E2	4" B25.0C
E5	4.5" B25.0C
R6	SINGLE FACED CONCRETE BARRIER
R9	4" CONC. COVER
T	EARTH MATERIAL

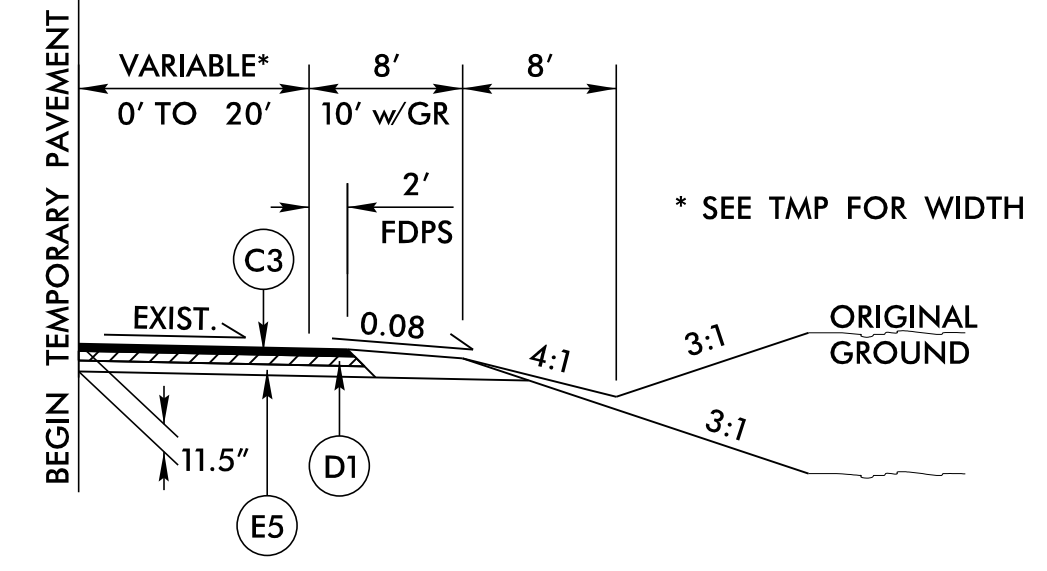
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 21
 -YIADET- STA. 13+27.00 TO 21+12.72
 -SR2DET- STA. 12+08.72 TO 16+00.00

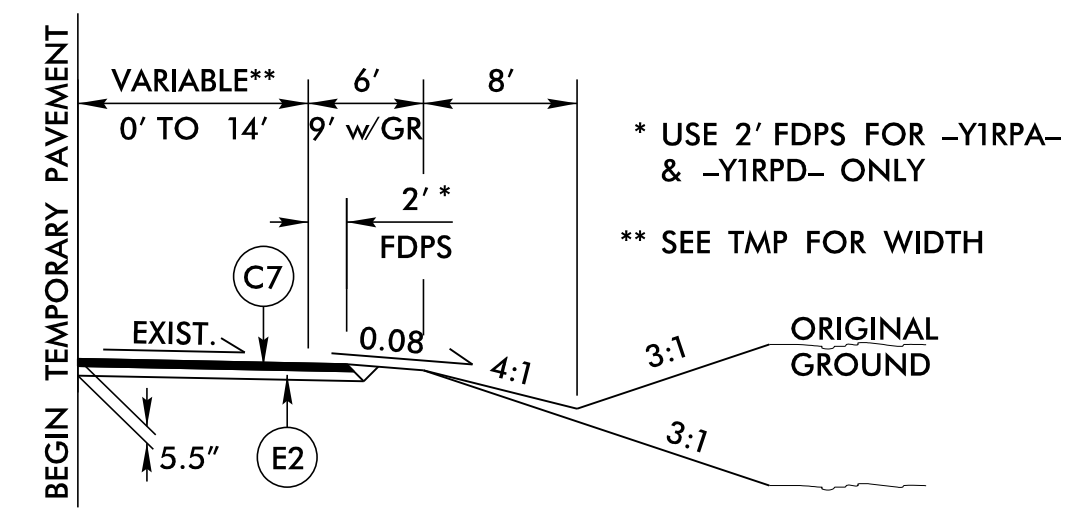


TYPICAL SECTION NO. 22
 -YIARPADET- STA. 10+00.00 TO 21+49.65



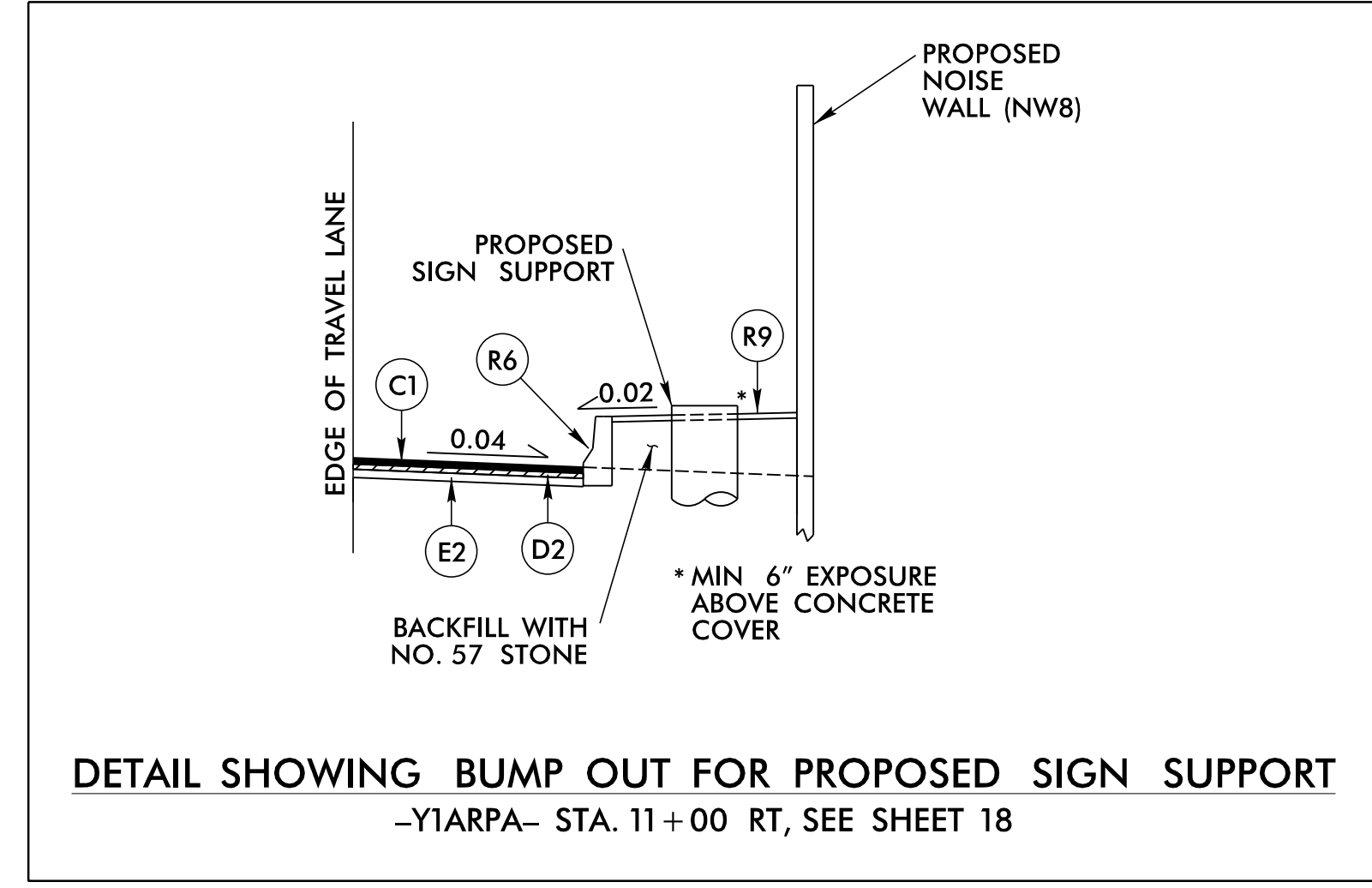
TYPICAL SECTION NO. 23 (TEMPORARY PAVEMENT)

- L- STA. 62+30.00 TO 117+83.00 MED, PHASE 1
- L- STA. 105+39.00 TO 112+40.00 LT, PHASE 1
- L- STA. 113+03.00 TO 145+50.00 RT, PHASE 1
- L- STA. 113+47.00 TO 145+50.00 LT, PHASE 1
- L- STA. 181+00.00 TO 265+50.00 RT, PHASE 1
- L- STA. 181+00.00 TO 261+51.00 LT, PHASE 1
- L- STA. 258+39.00 TO 340+00.00 LT, PHASE 1
- L- STA. 263+00.00 TO 279+50.00 RT, PHASE 1
- L- STA. 281+83.00 TO 340+00.00 RT, PHASE 1
- L- STA. 285+23.00 TO 289+62.00 LT, PHASE 1
- L- STA. 108+95.00 TO 114+45.00 RT, PHASE 1
- L- STA. 340+00.00 TO 462+00.00 MED, PHASE 1
- L- STA. 340+00.00 TO 462+00.00 MED, PHASE 1
- L- STA. 340+00.00 TO 460+50.00 LT, PHASE 1
- L- STA. 458+00.00 TO 468+00.00 RT, PHASE 1
- L- STA. 458+00.00 TO 468+00.00 LT, PHASE 1
- L- STA. 464+00.00 TO 477+00.00 MED, PHASE 1
- L- STA. 464+00.00 TO 477+00.00 MED, PHASE 1
- L- STA. 465+50.00 TO 495+00.00 LT, PHASE 1
- L- STA. 477+00.00 TO 495+00.00 RT, PHASE 1
- L- STA. 477+00.00 TO 495+00.00 RT, PHASE 1
- L- STA. 480+30.00 TO 495+00.00 LT, PHASE 1
- L- STA. 480+30.00 TO 495+00.00 LT, PHASE 1
- L- STA. 259+00.00 TO 270+10.00 LT/RT, PHASE 2B
- L- STA. 477+00.00 TO 495+00.00 MED, PHASE 2B

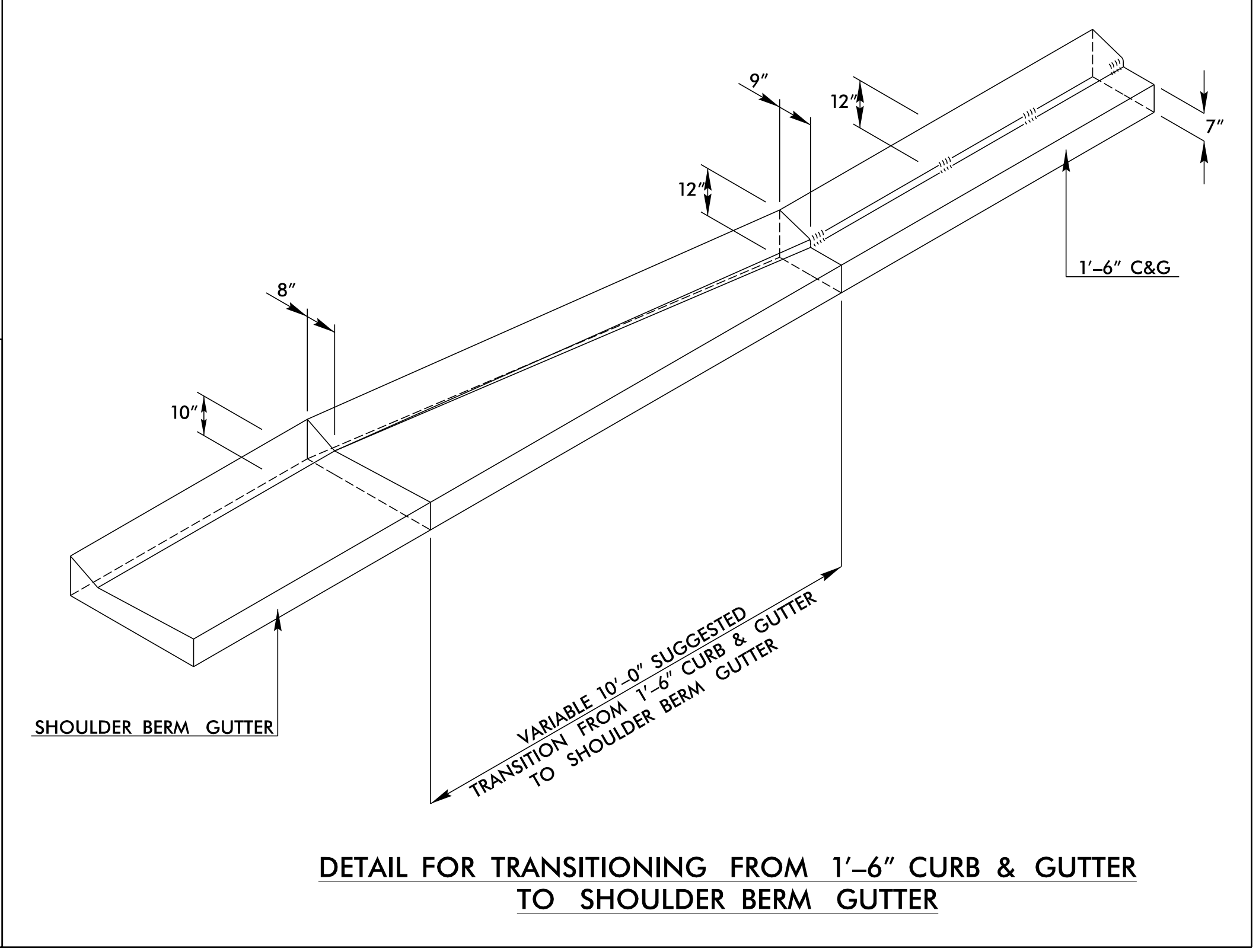


TYPICAL SECTION NO. 24 (TEMPORARY PAVEMENT)

- Y1RPA- STA. 16+06.00 TO 18+82.00 LT, PHASE 1
- Y2- STA. 15+99.00 TO 28+20.00 LT, PHASE 1
- Y2- STA. 31+26.00 TO 35+83.00 LT, PHASE 1
- Y1RPD- STA. 14+02.00 TO 19+60.00 LT, PHASE 1
- Y1A- STA. 23+98.00 TO 25+84.00 RT, PHASE 1
- SR2- STA. 34+21.00 TO 34+77.00 LT/RT, PHASE 2A



DETAIL SHOWING BUMP OUT FOR PROPOSED SIGN SUPPORT
 -Y1ARPA- STA. 11+00 RT, SEE SHEET 18

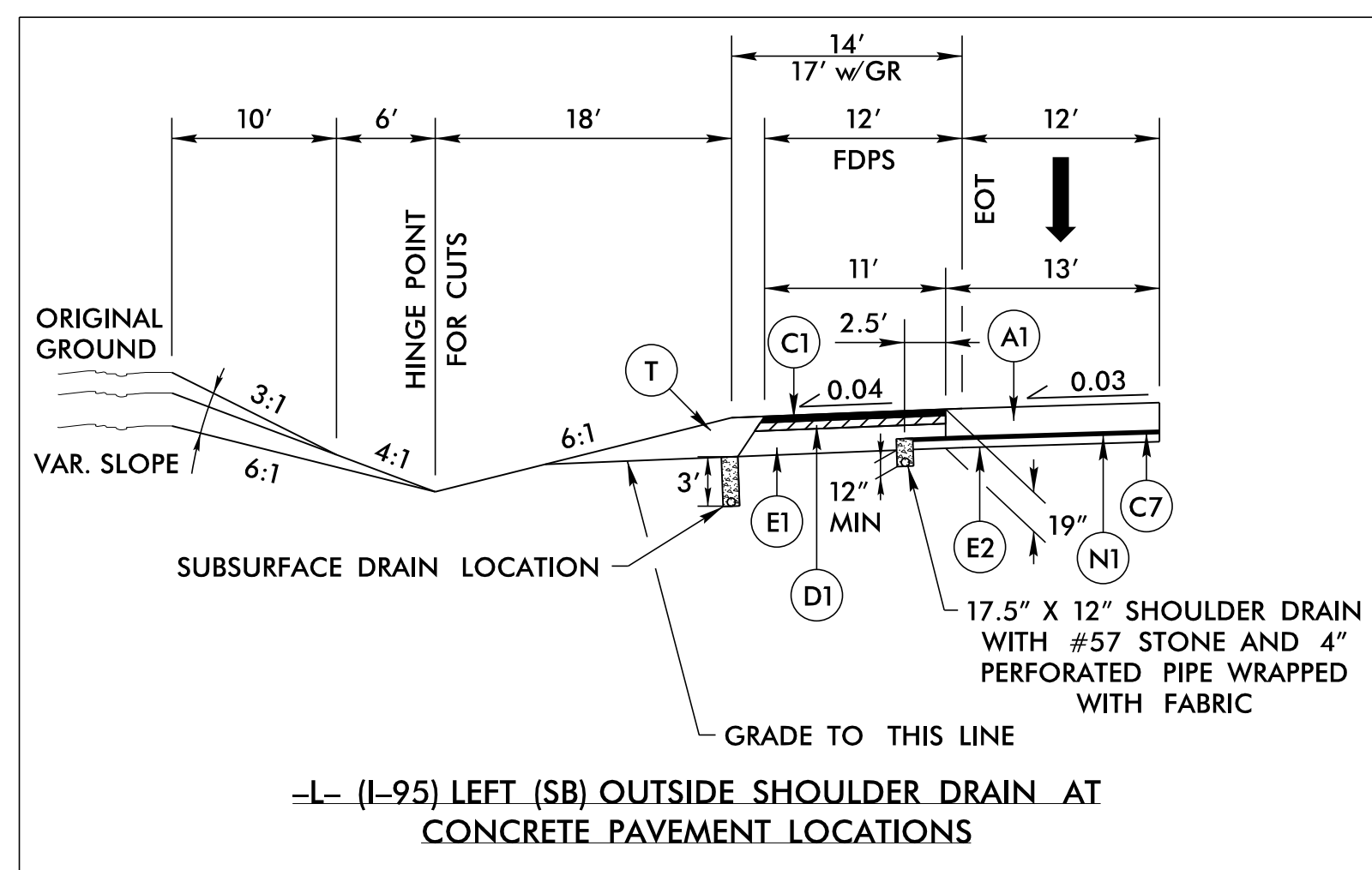
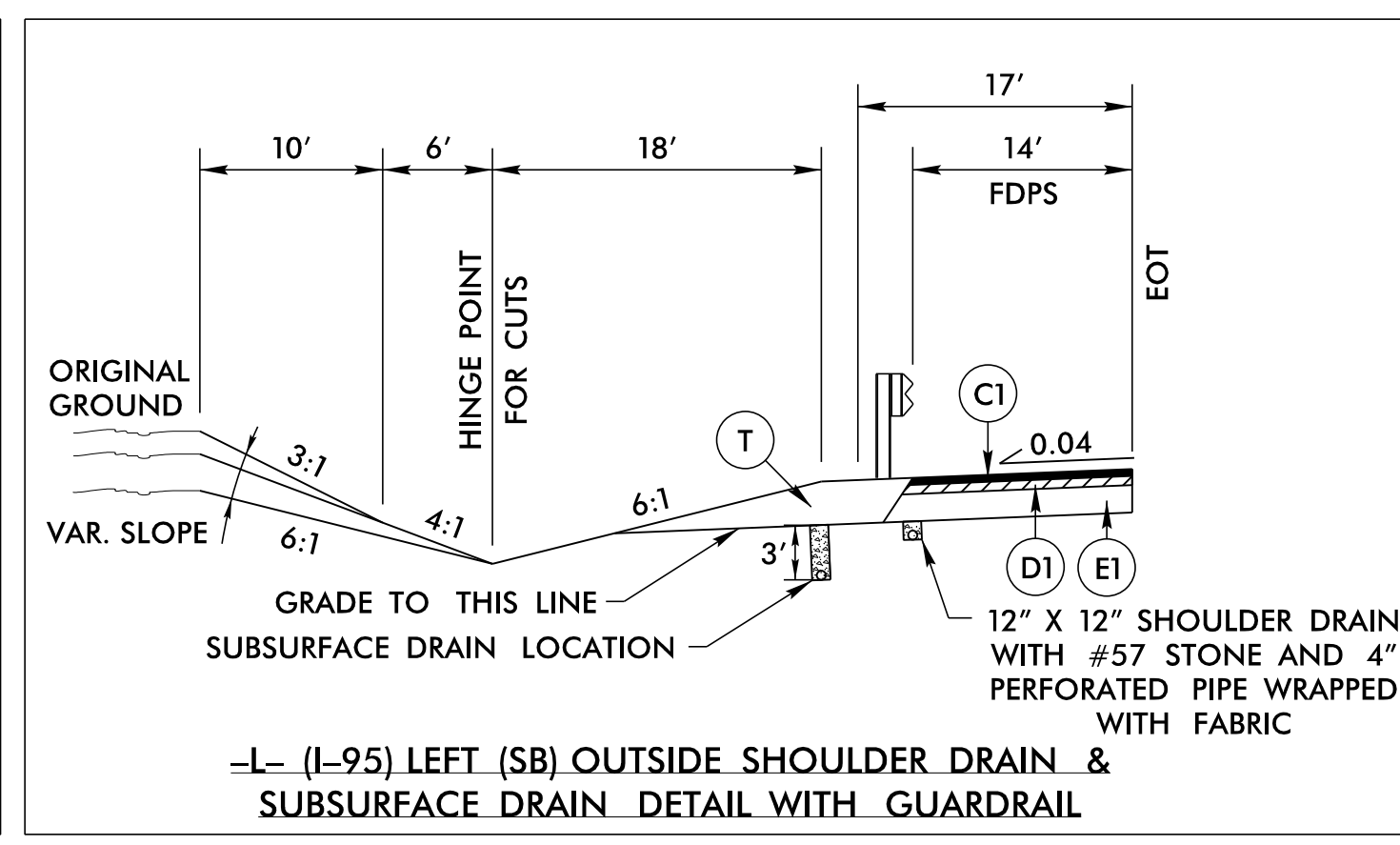
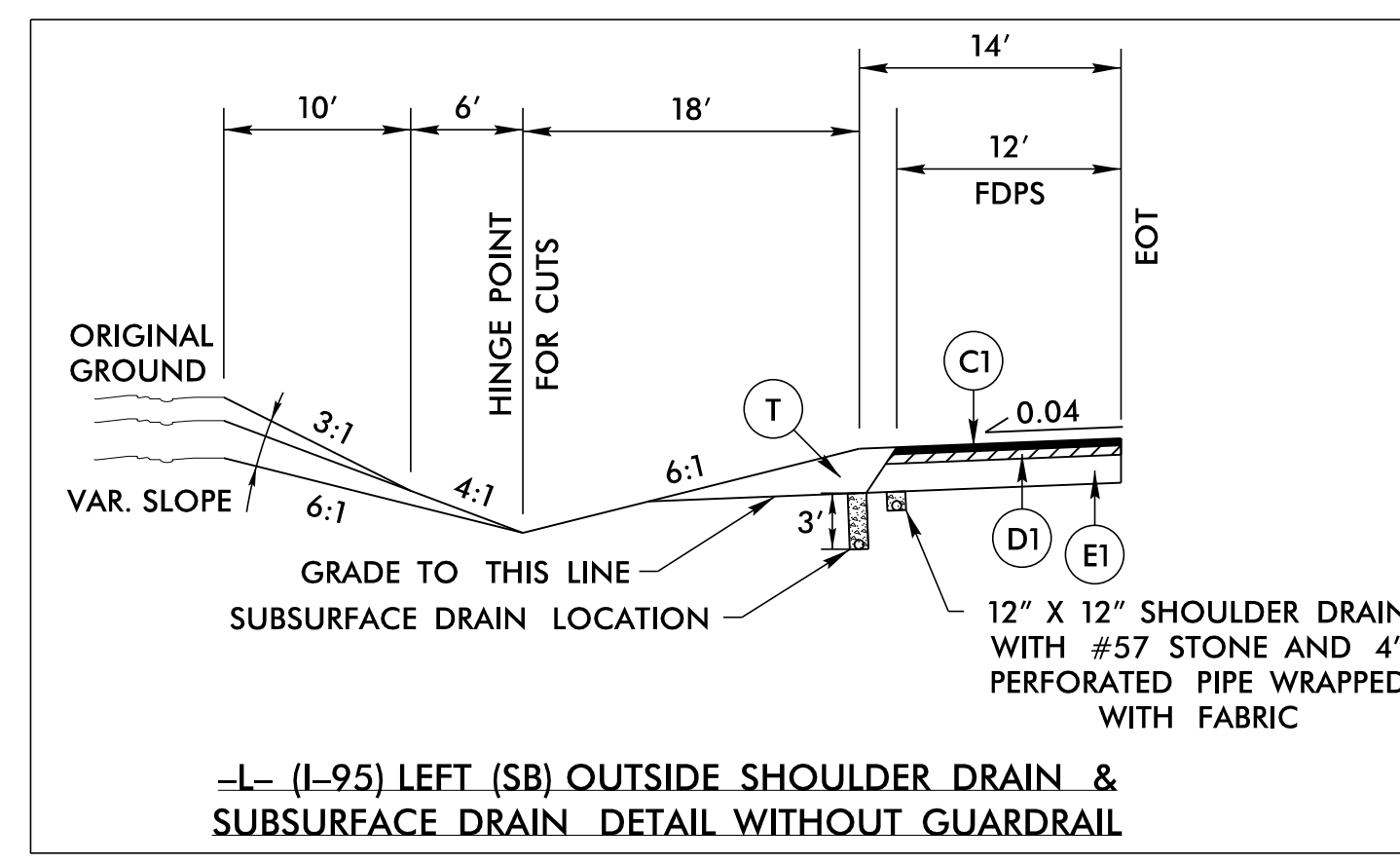


DETAIL FOR TRANSITIONING FROM 1'-6" CURB & GUTTER TO SHOULDER BERM GUTTER

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2A-7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 6/8/2022	PAVEMENT DESIGN ENGINEER 6/13/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	

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5/14/2022



PROJECT REFERENCE NO. 1-5987A SHEET NO. 2A-8
RW SHEET NO. ROADWAY DESIGN ENGINEER 5/18/2022 PAVEMENT DESIGN ENGINEER 5/18/2022
Seal: Steve Anthony Dren, Andrew Wargo
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NIV5 NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.nv5.com
4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4626 VOICE (919) 781-4869 FAX NC License # F-1035

SUMMARY OF SHOULDER DRAIN

ALIGNMENT	BEGIN STATIONING	END STATIONING	LOCATION	OUTLET STATION	DRAINAGE STRUCTURE
				67+40	2GI (0404)
				71+50	2GI (0414)
				71+93	2GI (0419)
				72+10	2GI (0424)
				72+50	2GI (0432)
				78+50	2GI (0504)
				78+94	2GI (0544)
				79+04	2GI (0513)
				79+50	2GI (0515)
				82+00	2GI (0523)
				85+00	2GI (0527)
				86+96	2GI (0546)
				88+38	2GI (0601)
				89+40	2GI (0604)
				90+00	2GI (0605)
				91+00	2GI (0637)
				93+00	2GI
				95+50	2GI (0638)
				95+80	2GI (0611)
				101+00	2GI (0639)
				103+00	2GI (0640)
				106+78	2GI (0656)
				110+00	2GI (0647)
				113+00	CP
				116+00	CP
				119+00	CP
				124+27	CP
				127+27	CP
				130+27	CP
				133+27	CP
				139+65	CP
				142+65	CP
				145+65	CP
				148+65	CP
				151+65	CP
				154+65	CP
				157+65	CP
				163+00	CP
				165+25	CP
				167+40	CP
				170+40	CP
				173+40	CP
				176+40	CP
				179+40	CP
				180+94	CP
				184+00	CP
				188+83	CP
				191+83	CP
				194+83	CP
				197+83	CP
				200+83	CP
				205+60	CP
				209+00	2GI (1315)
				211+50	CP
				215+00	CP
				221+58	CP
				224+58	CP
				226+81	2GI (1423)
				227+16	CP
				230+16	CP
				233+16	CP
				241+98	CP

CP = CONCRETE PAD

SUMMARY OF SHOULDER DRAIN

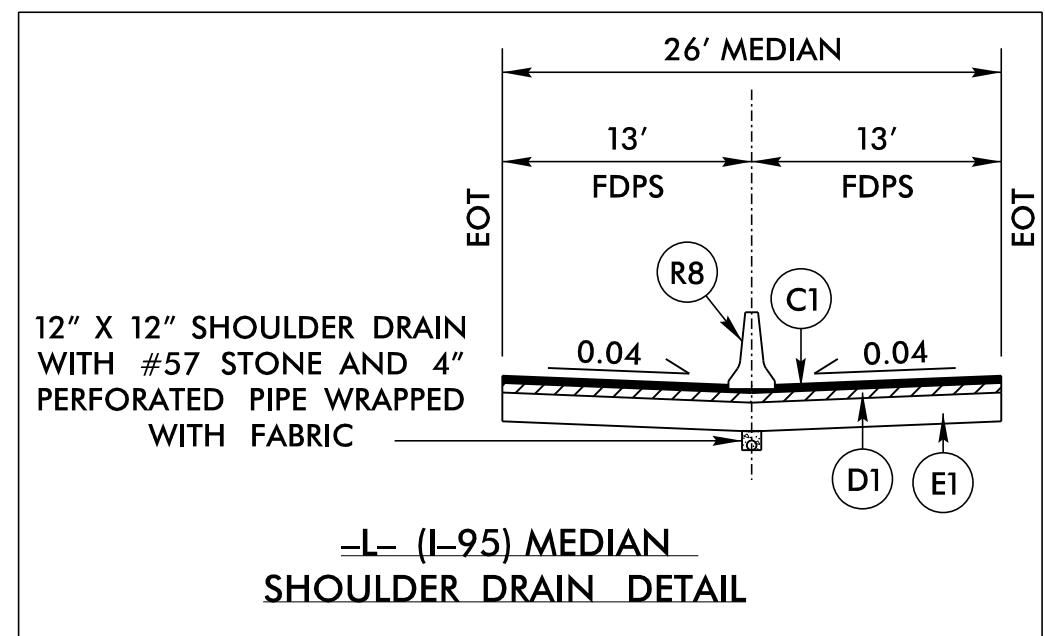
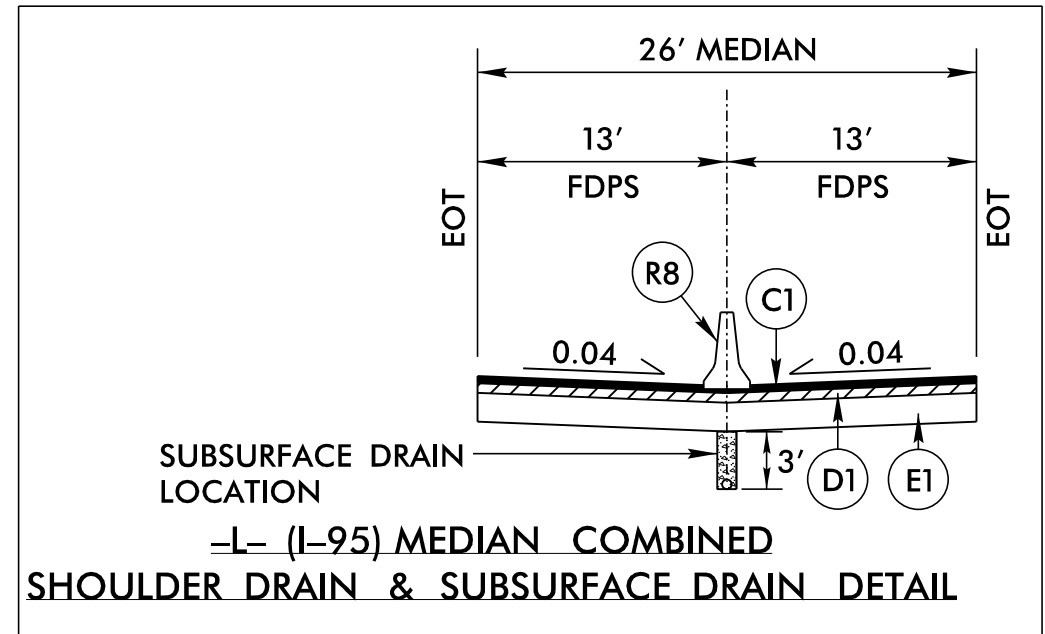
ALIGNMENT	BEGIN STATIONING	END STATIONING	LOCATION	OUTLET STATION	DRAINAGE STRUCTURE
				245+00	CP
				248+00	CP
				252+89	CP
				255+89	CP
				257+69	CP
				259+50	CP
				264+86	CP
				267+25	CP
				276+00	2GI
				278+17	2GI (1734)
				282+90	CP
				291+10	CP
				295+56	CP
				298+96	2GI (1812)
				299+45	2GI (1811)
				302+40	2GI (1814)
				305+89	2GI (1816)
				308+00	2GI (1818)
				308+65	2GI (1819)
				309+65	2GI (1821)
				312+50	CP
				314+64	CP
				317+64	CP
				320+64	CP
				323+64	CP
				326+64	CP
				330+00	CP
				331+85	CP
				337+08	CP
				340+08	CP
				343+00	CP
				345+18	CP
				348+18	CP
				351+00	CP
				353+22	2GI (2218)
				356+01	2GI (2216)
				359+00	CP
				362+00	CP
				365+00	CP
				366+38	2GI (2213)
				366+67	2GI (2214)
				367+17	2GI (2313)
				370+00	CP
				373+00	CP
				376+00	CP
				379+00	CP
				382+10	CP
				385+21	2GI (2413)
				388+21	CP
				391+21	CP
				394+50	CP
				396+49	CP
				399+49	CP
				402+49	CP
				405+49	CP
				408+50	CP
				411+50	CP
				414+50	CP
				416+53	CP
				419+53	CP
				422+53	CP
				425+53	CP

CP = CONCRETE PAD

SUMMARY OF SHOULDER DRAIN

ALIGNMENT	BEGIN STATIONING	END STATIONING	LOCATION	OUTLET STATION	DRAINAGE STRUCTURE
				428+53	CP
				431+53	CP
				434+72	CP
				437+72	CP
				440+72	CP
				445+41	CP
				448+41	CP
				450+50	CP
				453+62	CP
				456+62	2GI (2908)
				457+04	2GI (2909)
				457+46	2GI (2907)
				460+90	2GI (3009)
				462+80	2GI (3010)
				462+91	2GI (3011)
				465+91	CP
				468+95	CP
				475+74	CP
				478+74	CP
				482+20	CP
				485+20	CP
				489+00	CP
				492+00	CP
				67+40	2GI (0443 & 0444)
				71+50	2GI (0415 & 0416)
				71+93	2GI (0420)
				71+99	2GI (0426) & JB (0425)
				72+50	2GI (0433 & 0434)
				78+50	2GI (0505 & 506)
				78+85	2GI (0510)
				79+04	2GI (0514) & JB (0538)
				79+50	2GI (0516 & 0517)
				82+99	2GI (0524)
				85+00	2GI (0528)
				85+73	2GI (0530)
				86+96	2GI (0532 & 0547)
				95+00	2GI (0606 & 0607)
				95+35	2GI (0608 & 0610)
				95+58	2GI (0648)
				96+50	2GI (0613 & 0614)
				101+00	2GI (0615 & 0616)
				105+50	2GI (0617)
				105+93	2GI (0618 & 0619)
				106+78.09	2GI 0620 & 0621
				107+50	2GI 0622
				110+00	2GI (0628)
				113+00	2GI (0623)
				113+48	2GI (0625 0626)
				114+00	2GI 0627
				117+00	2GI (0701)
				123+50	2GI (0702)
				124+27.65	2GI (0703 & 0704)
				124+92	2GI (0705 & 0706)
				125+50	2GI (0707)
				129+50	2GI (0708 & 0709)
				133+00	2GI (0808 & 0809)
				139+00	2GI (0801 & 0802)
				139+65	2GI (0803)
				140+00	JB (0806)
				140+50	2GI (0804 & 0810)
				146+00	2GI (0901 & 0902)
				150+00	2GI (0908 & 0909)

CP = CONCRETE PAD



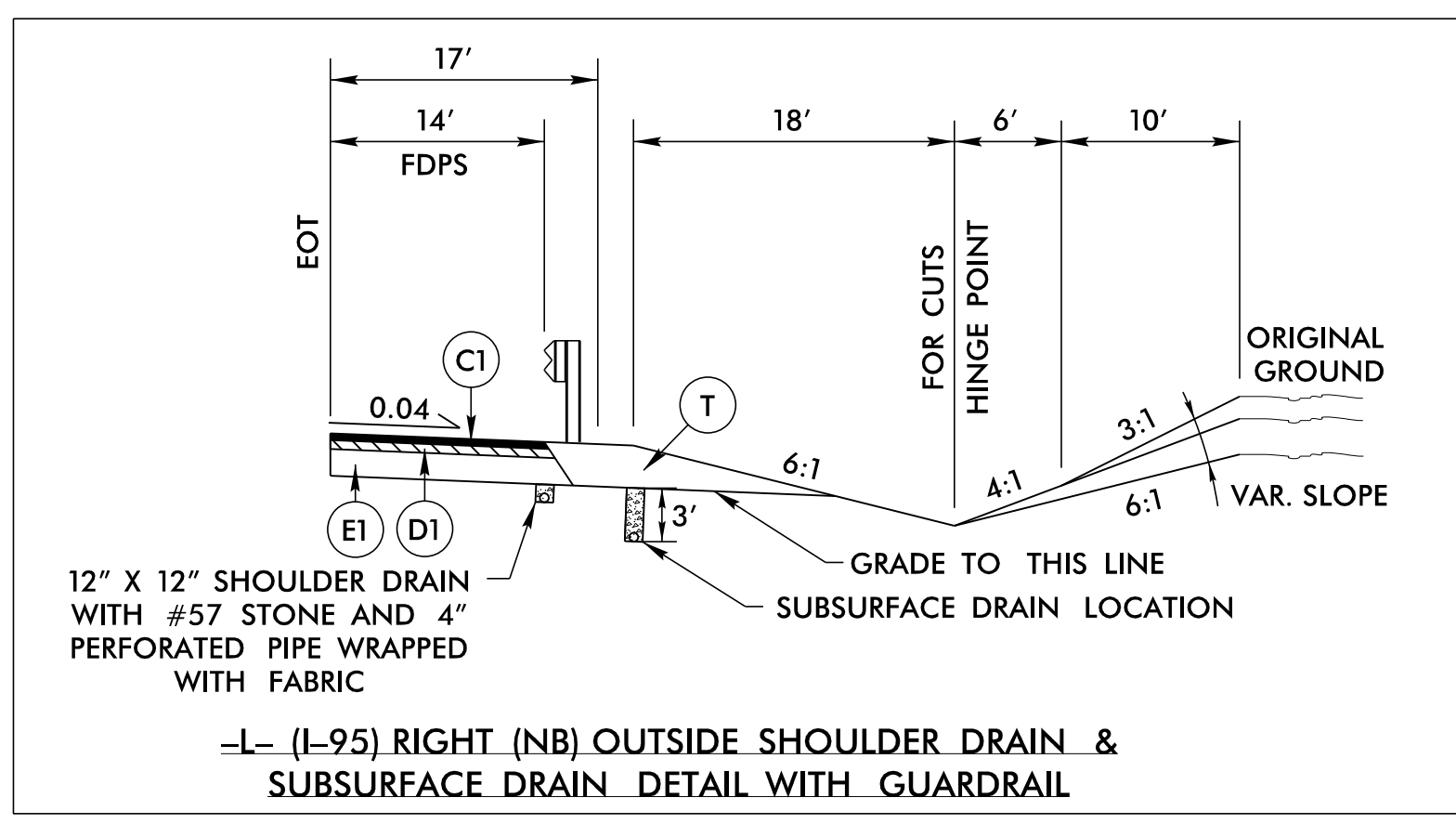
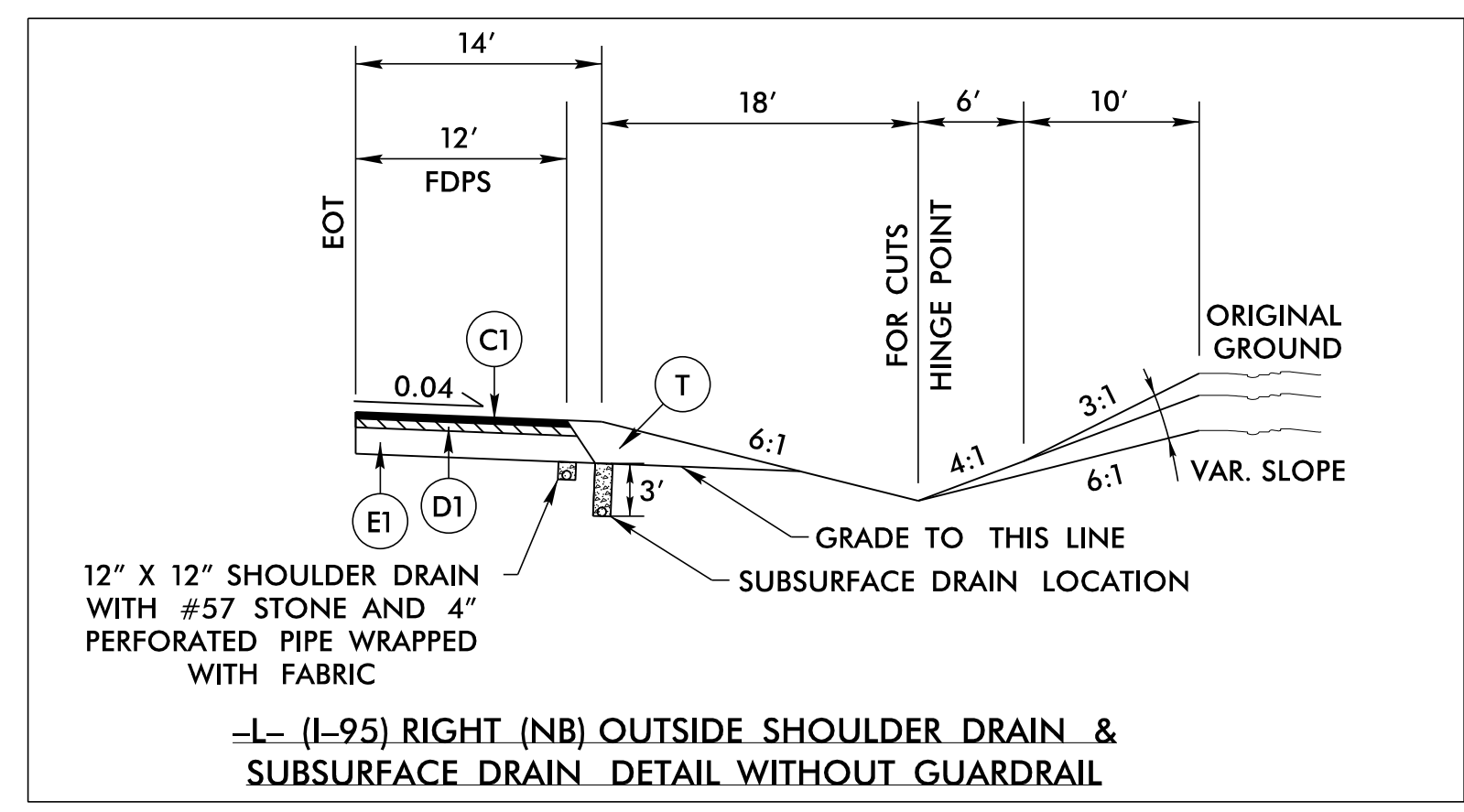
PAVEMENT SCHEDULE

A1	13.5" PCCP W/ DOWEL
C1	3" S9.5D
C7	1.5" S9.5B
D1	4" I19.0C
E1	12" B25.0C
E2	4" B25.0C
N1	NONWOVEN GEOTEXTILE INTERLAYER
R8	TYPE T BARRIER
T	EARTH MATERIAL

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

SEE SHEET 3G-1 FOR LOCATION OF SUBSURFACE DRAIN

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PROJECT REFERENCE NO. 1-5987A SHEET NO. 2A-9

RW SHEET NO.

ROADWAY DESIGN ENGINEER 5/18/2022

PAVEMENT DESIGN ENGINEER 5/18/2022

Seal for Steve Anthony Dren

Seal for Andrew Wargo

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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4700 FALLS OF HOUSE ROAD, SUITE 300 WALEGA, NORTH CAROLINA - 27659 (919) 781-4626 VOICE (919) 781-4868 FAX NC License NO. F-0105

SUMMARY OF SHOULDER DRAIN

ALIGNMENT	BEGIN STATIONING	END STATIONING	LOCATION	OUTLET STATION	DRAINAGE STRUCTURE
-L-	67+00.00	495+00.00	MED	155+00	2GI (0903 & 0904)
				163+00	2GI (1001)
				165+50	2GI (1003)
				166+10	2GI (1004)
				166+50	2GI (1002 & 1005)
				167+00	2GI (1006)
				167+40	2GI (1007)
				168+00	2GI (1008)
				171+00	2GI (1009 & 1010)
				173+50	2GI (1101)
				174+16	2GI (1102)
				174+75	2GI (1104)
				176+00	2GI (1105)
				178+00	2GI (1106)
				180+50	2GI (1107 & 1108)
				180+94	2GI (1109 & 1116)
				181+07	2GI (1110)
				181+50	2GI (1111 & 1112)
				183+00	2GI (1113 & 1114)
				189+00	2GI (1202)
				190+50	2GI (1203)
				191+00	2GI (1204 & 1205)
				191+73.54	2GI (1206)
				191+83.35	2GI (1207)
				192+50	2GI (1208 & 1209)
				195+00	2GI (1210 & 1211)
				199+43	TB2GI
				205+60	TB2GI
				208+30	2GI (1303 & 1304)
				208+66.7	2GI (1302)
				209+00	2GI (1301)
				209+30	2GI (1305 & 1306)
				213+66	2GI (1317)
				214+80	2GI (1405 & 1406)
				222+00	2GI (1425 & 1426)
				226+65	2GI (1407 & 1408)
				227+15	2GI (1401 & 1402)
				227+65	2GI (1409 & 1410)
				232+65	2GI (1417 & 1418)
				241+25	2GI (1411 & 1412)
				241+72	2GI (1404)
				241+98	2GI (1403)
				242+50	2GI (1413 & 1414)
				247+35	2GI (1501 & 1502)
				251+00	2GI (1504)
				253+00	2GI (1503)
257+25	2GI (1605 & 1606)				
257+69	2GI (1601)				
258+03	2GI (1602)				
258+50	2GI (1607 & 1608)				
264+29	2GI (1610)				
264+79	2GI (1603 & 1604)				
265+29	2GI (1611 & 1612)				
271+35	2GI (1720)				
271+85	2GI (1702)				
272+35	2GI (1701 & 1719)				
277+68	2GI (1713 & 1714)				
278+17	2GI (1703 & 1704)				
278+68	2GI (1715 & 1716)				
282+40	2GI (1764 & 1765)				
282+90	2GI (1705 & 1706)				
283+38	2GI (1711 & 1712)				

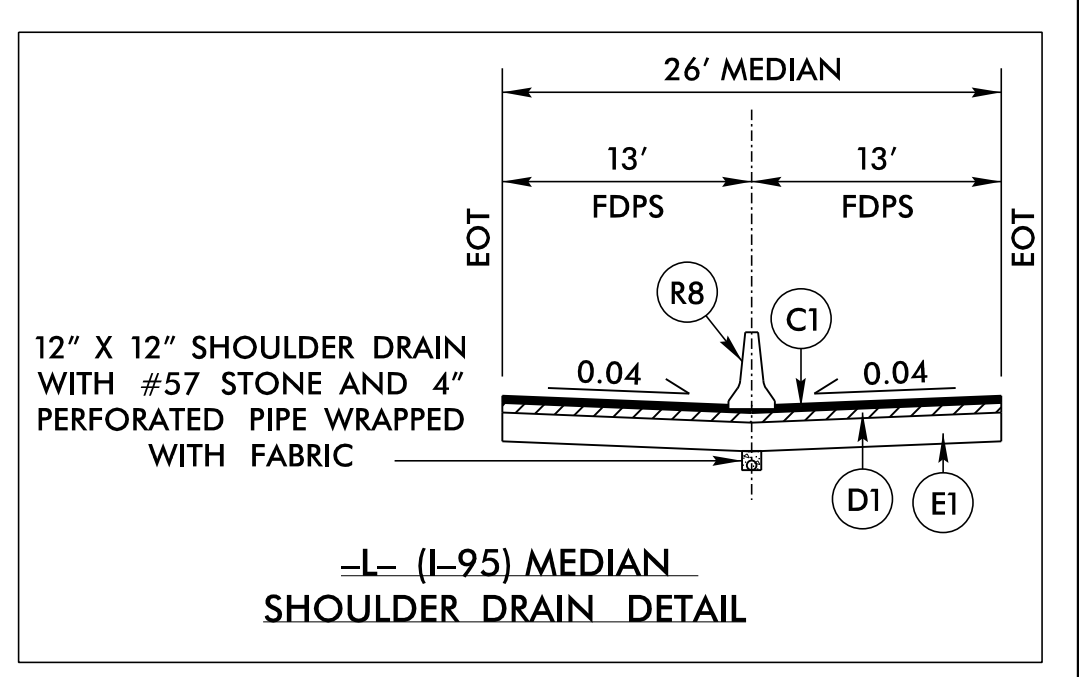
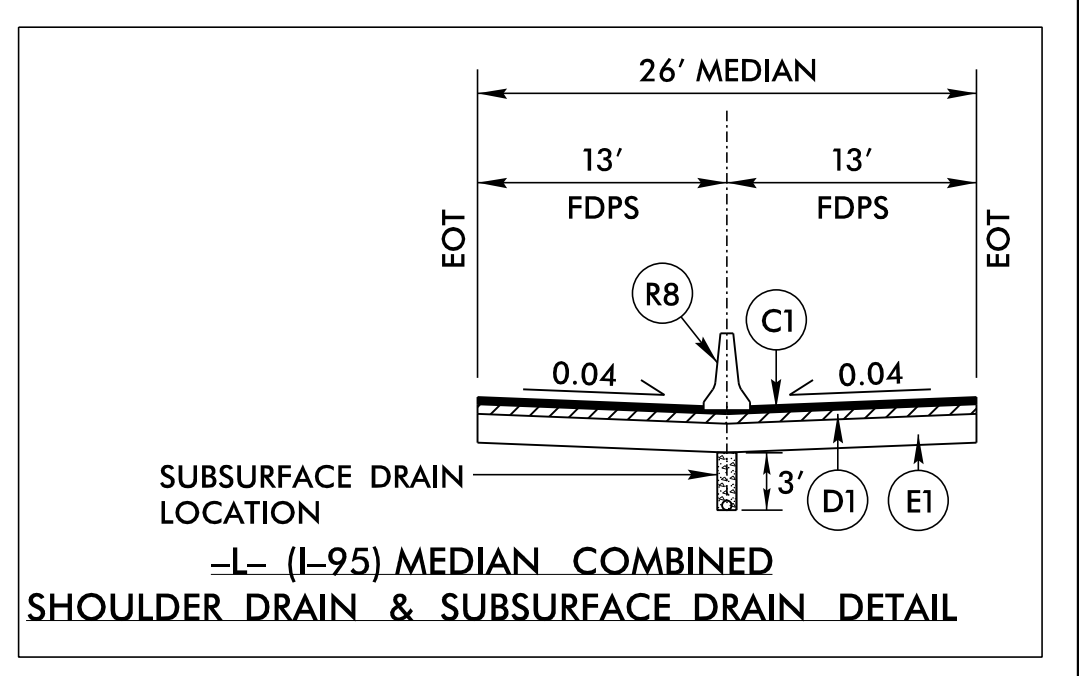
SUMMARY OF SHOULDER DRAIN

ALIGNMENT	BEGIN STATIONING	END STATIONING	LOCATION	OUTLET STATION	DRAINAGE STRUCTURE
-L-	67+00.00	495+00.00	MED	291+11	2GI (1707 & 1708)
				293+50	2GI (1717)
				296+56	2GI (1709 & 1710)
				302+15	2GI (1807 & 1808)
				305+15	TB2GI
				308+15	2GI (1803 & 1804)
				308+65	2GI (1801 & 1802)
				309+15	2GI (1805 & 1806)
				314+15	2GI (1903 & 1904)
				314+65	2GI (1901 & 1902)
				315+15	2GI (1905 & 1906)
				320+50	2GI (1907 & 1908)
				325+00	TB2GI
				331+00	2GI (2004)
				331+57	2GI (2003 & 2002)
				331+85	2GI (2001)
				332+05	2GI (2005 & 2006)
				339+10	2GI (2011 & 2010)
				344+00	2GI (2111 & 2112)
				344+68	2GI (2113 & 2114)
				345+05	2GI (2115 & 2116)
				345+68	2GI (2109 & 2110)
				346+50	2GI (2120 & 2121)
				350+25	2GI (2103 & 2104)
				360+00	2GI (2221 & 2220)
				365+15	2GI (2207 & 2206)
				366+46	2GI (2210 & 2209)
				366+67	2GI (2211 & 2212)
				367+17	2GI (2311 & 2312)
				369+15	2GI (2309 & 2310)
				374+15	2GI (2306 & 2307)
				378+20	2GI (2304 & 2303)
				379+20	2GI (2302)
				381+30	2GI (2412 & 2411)
				386+30	2GI (2406 & 2407)
				387+60	2GI (2403 & 2404)
				396+23	2GI (2504 & 2506)
				396+62	2GI (2507 & 2508)
				397+05	2GI (2503 & 2504)
				399+85	2GI (2501 & 2502)
				402+49	TB2GI
				405+84	2GI (2510 & 2511)
				414+50	2GI (2601 & 2602)
				416+11	2GI (2606)
				416+41	2GI (2609)
				416+53	2GI (2607)
416+83	2GI (2608 & 2611)				
417+25	2GI (2610)				
419+25	2GI (2707 & 2708)				
424+00	2GI (2704 & 2705)				
429+00	2GI (2701 & 2702)				
437+72	2GI (2806)				
438+15	2GI (2803 & 2804)				
439+30	2GI (2801 & 2802)				
447+98	2GI (2920 & 2921)				
448+41	2GI (2924 & 2925)				
448+84	2GI (2923 & 2922)				
456+62	2GI (2903 & 2904)				
457+04	2GI (2905 & 2905)				
457+46	2GI (2902 & 2901)				
462+85	2GI (3012 & 3013)				
467+84	2GI (3003 & 3004)				
468+67	2GI (3002 & 3005)				

SUMMARY OF SHOULDER DRAIN

ALIGNMENT	BEGIN STATIONING	END STATIONING	LOCATION	OUTLET STATION	DRAINAGE STRUCTURE				
-L-	67+00.00	495+00.00	MED	474+17	2GI (3123)				
				474+59	2GI (3124)				
				476+04	2GI (3122)				
				477+00	2GI (3120 & 3121)				
				483+47	2GI (3112)				
				484+79	2GI (3110)				
				485+21	2GI (3108 & 3109)				
				485+63	2GI (3107)				
				486+38	2GI (3204)				
				486+78	2GI (3205)				
				487+19	2GI (3203)				
				492+52	2GI (3201 & 3202)				
				-L-	67+00.00	495+00.00	RT	67+40	2GI (0445)
								69+00	2GI (0407)
								71+40	2GI (0417)
								71+99	2GI (0421)
72+50	2GI (0427)								
78+50	2GI (0507)								
78+85	2GI (0511)								
79+04	2GI (0539)								
79+50	2GI (0518)								
81+00	2GI (0520)								
83+93	2GI (0529)								
86+91	2GI (0545)								
87+85	2GI (0602)								
88+38	2GI (0603)								
91+00	2GI (0645)								
93+00	TBGI								
95+35	2GI (0609)								
96+00	2GI (0612)								
99+00	CP								
102+00	CP								
105+92	CP								
108+92	CP								
113+38	CP								
116+38	CP								
119+38	CP								
124+91	CP								
127+91	CP								
130+91	CP								
133+91	CP								
136+91	CP								
139+91	CP								
142+91	CP								
145+91	CP								
148+91	CP								
151+91	CP								
154+91	CP								
157+91	CP								
163+05	CP								
166+10	CP								
191+73	CP								
194+73	CP								
197+73	CP								
200+73	CP								
205+56	CP								
208+66.7	2GI (1313)								
211+50	CP								
215+00	CP								
220+91	CP								
223+91	CP								
227+08	CP								

CP = CONCRETE PAD



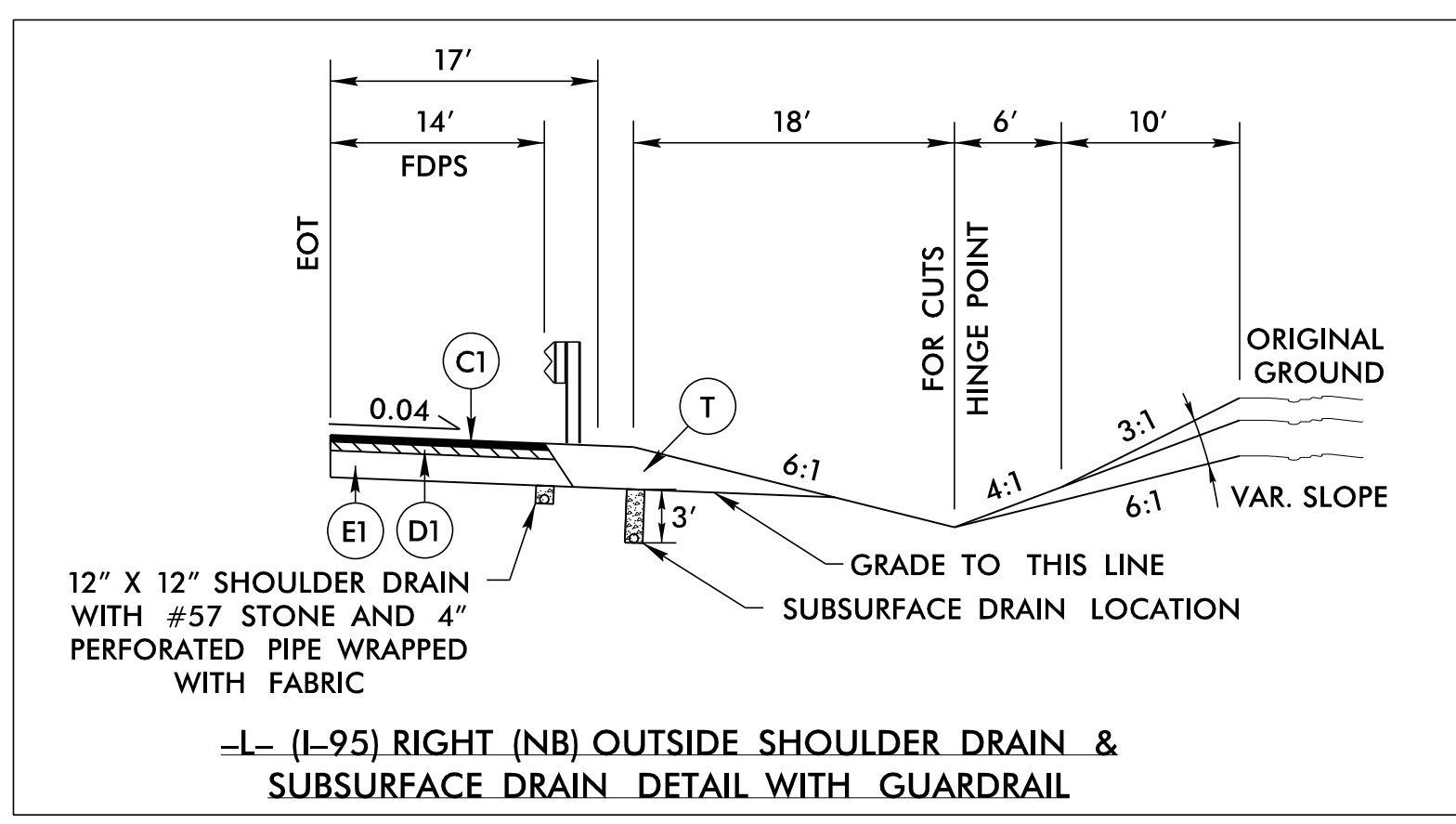
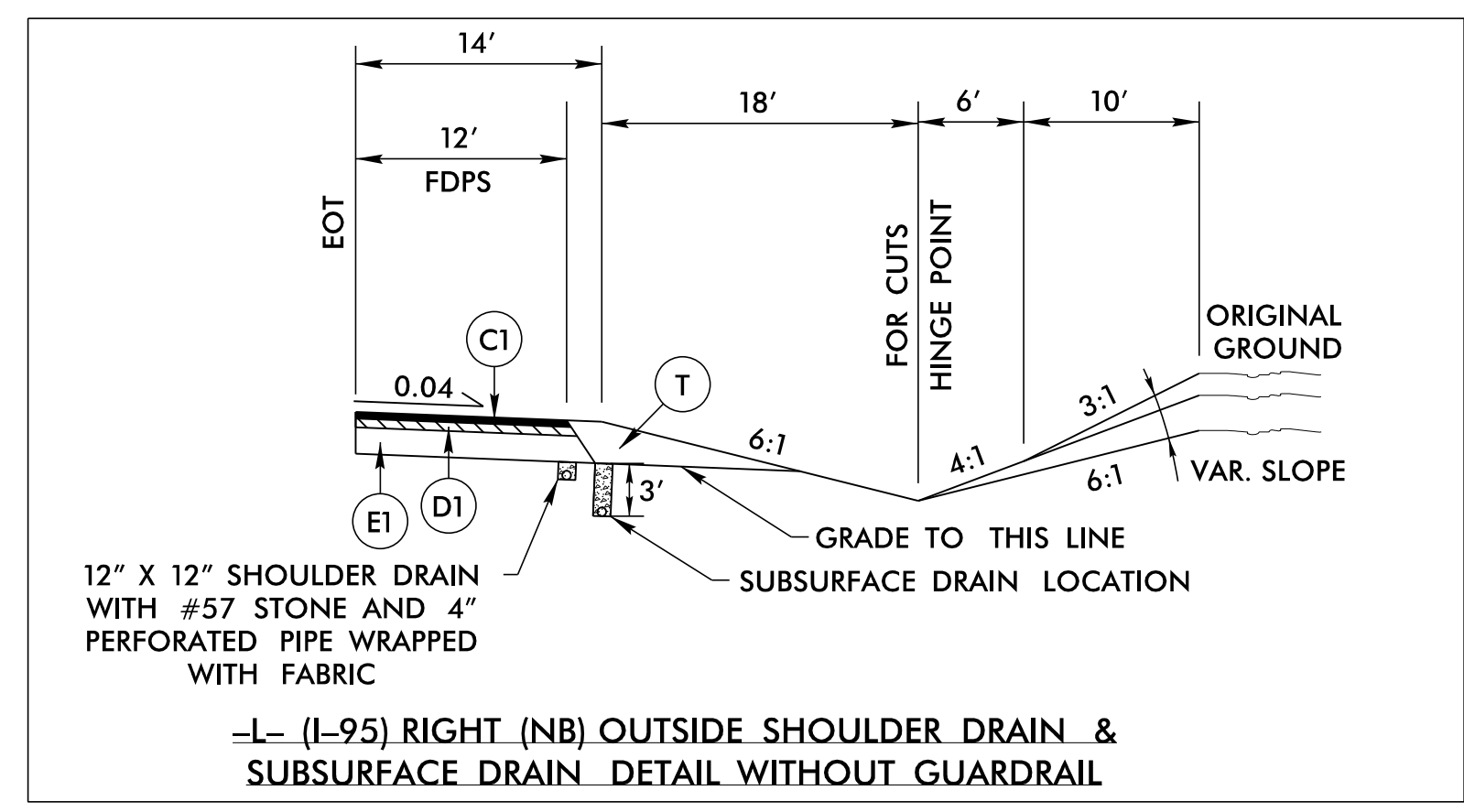
PAVEMENT SCHEDULE

C1	3" S9.5D
D1	4" I19.0C
E1	12" B25.0C
R8	TYPE T BARRIER
T	EARTH MATERIAL

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

SEE SHEET 3G-1 FOR LOCATION OF SUBSURFACE DRAIN

5/14/22



PROJECT REFERENCE NO. I-5987A	SHEET NO. 2A-10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022	PAVEMENT DESIGN ENGINEER 5/18/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.nv5.com NC License # F-1333	
4700 FALLS OF NEUSE ROAD, SUITE 300 WALEGA, NORTH CAROLINA - 27659 (919) 781-4626 VOICE (919) 781-4869 FAX NC License No. F-0105	

SUMMARY OF SHOULDER DRAIN

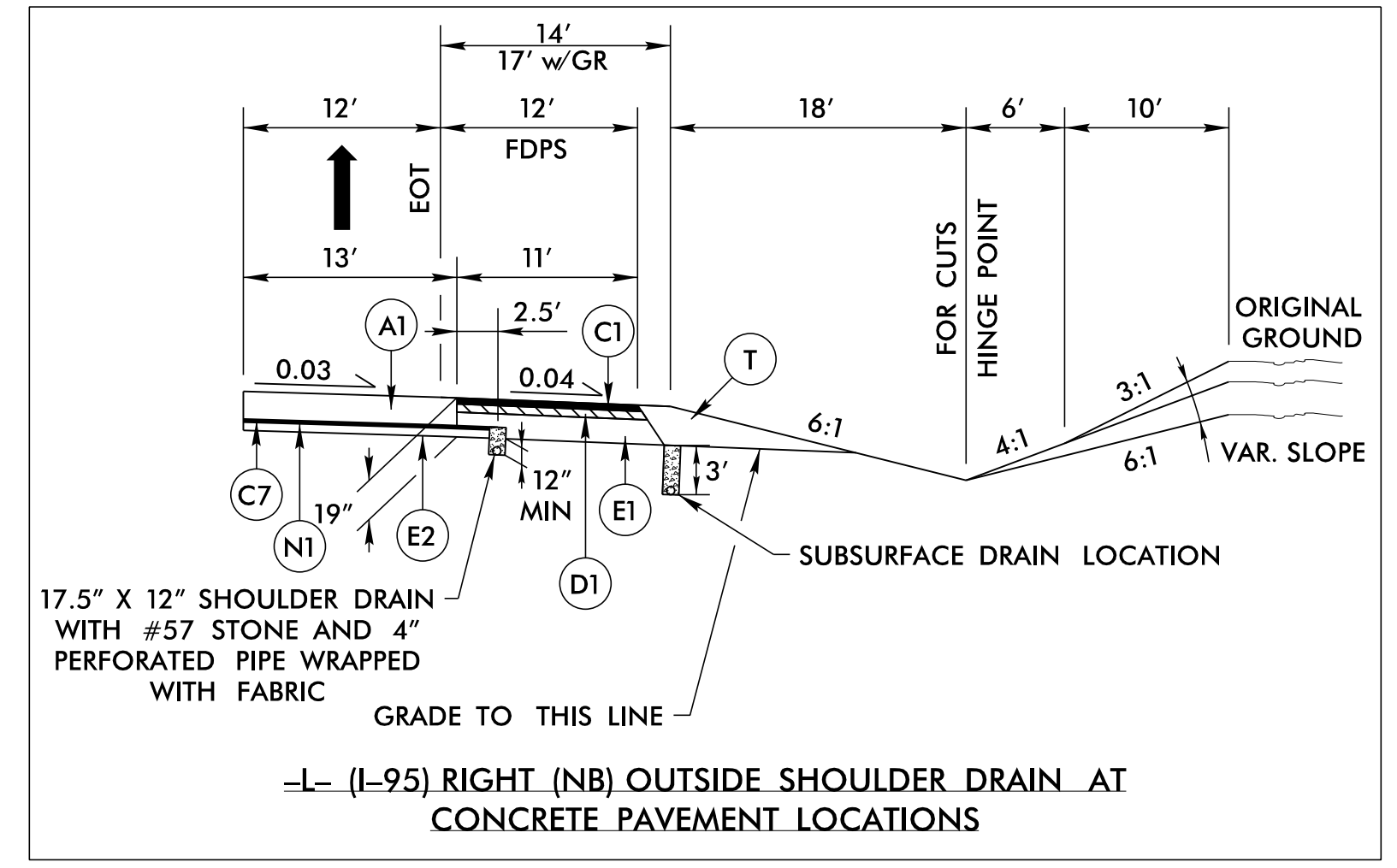
ALIGNMENT	BEGIN STATIONING	END STATIONING	LOCATION	OUTLET STATION	DRAINAGE STRUCTURE
				230+08	CP
				233+08	CP
				236+08	CP
				241+72	CP
				247+72	CP
				250+72	CP
				255+03	CP
				258+03	CP
				264+81	CP
				271+87	CP
				278+15	CP
				281+88	JB (1737)
				282+90	JB (1735)
				291+16	CP
				296+56	CP
				302+31	CP
				305+31	CP
				308+61	CP
				311+64	CP
				314+64	CP
				317+64	CP
				320+64	CP
				323+64	CP
				326+64	CP
				331+57	CP
				336+05	CP
				339+05	CP
				342+05	CP
				345+05	CP
				348+50	CP
-L-	67+00.00	495+00.00	RT	352+12	2GI (2101)
				356+97	CP
				359+97	CP
				362+97	CP
				365+97	2GI (2201)
				366+62	2GI (2203)
				366+80	2GI (2204)
				368+50	CP
				371+35	CP
				374+35	CP
				377+35	CP
				380+35	CP
				383+35	2GI (2415)
				386+35	CP
				389+35	CP
				393+61	CP
				396+61	CP
				399+61	CP
				402+61	CP
				405+61	CP
				408+61	CP
				413+82	CP
				416+82	CP
				419+82	CP
				422+82	CP
				425+82	CP
				428+82	CP
				431+82	CP
				434+73	CP
				437+73	CP
				440+73	CP
				445+40	CP

CP = CONCRETE PAD

SUMMARY OF SHOULDER DRAIN

ALIGNMENT	BEGIN STATIONING	END STATIONING	LOCATION	OUTLET STATION	DRAINAGE STRUCTURE
				448+40	CP
				451+53	2GI (2918)
				453+59	2GI (2916)
				454+49	2GI (2914)
				457+04	CP
				460+04	CP
				462+78	2GI (3014)
-L-	67+00.00	495+00.00	RT	465+78	CP
				468+78	CP
				474+59	CP
				477+59	CP
				480+59	CP
				483+78	CP
				486+78	CP
				492+00	CP

CP = CONCRETE PAD




PAVEMENT SCHEDULE	
A1	13.5" PCCP W/ DOWEL
C1	3" S9.5D
C7	1.5" S9.5B
D1	4" I19.0C
E1	12" B25.0C
E2	4" B25.0C
N1	NONWOVEN GEOTEXTILE INTERLAYER
R8	TYPE T BARRIER
T	EARTH MATERIAL

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

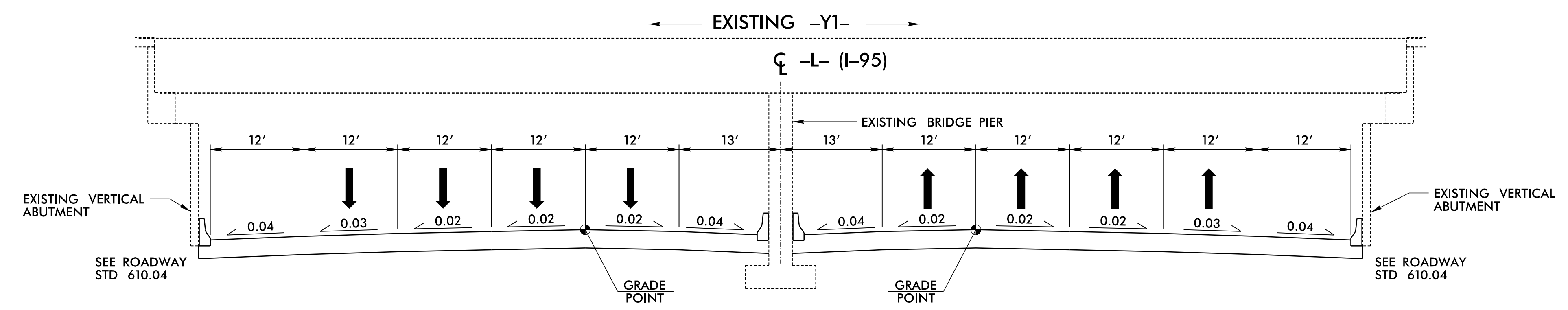
SEE SHEET 3G-1 FOR LOCATION OF SUBSURFACE DRAIN

R:\R\Res\5/18/2022\I5987A_RDV_TYP2_SECA1.dgn

5/14/22

PROJECT REFERENCE NO. 1-5987A		SHEET NO. 2A-11	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 5/18/2022		PAVEMENT DESIGN ENGINEER	
			
Designed by <i>Steve Anthony Drive</i>			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
NV5		NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	

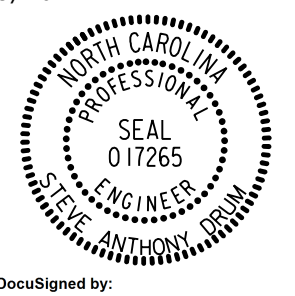
BRIDGE AT EXISTING US 301 (-Y1-) OVER -L- POT STA. 96 + 64.34



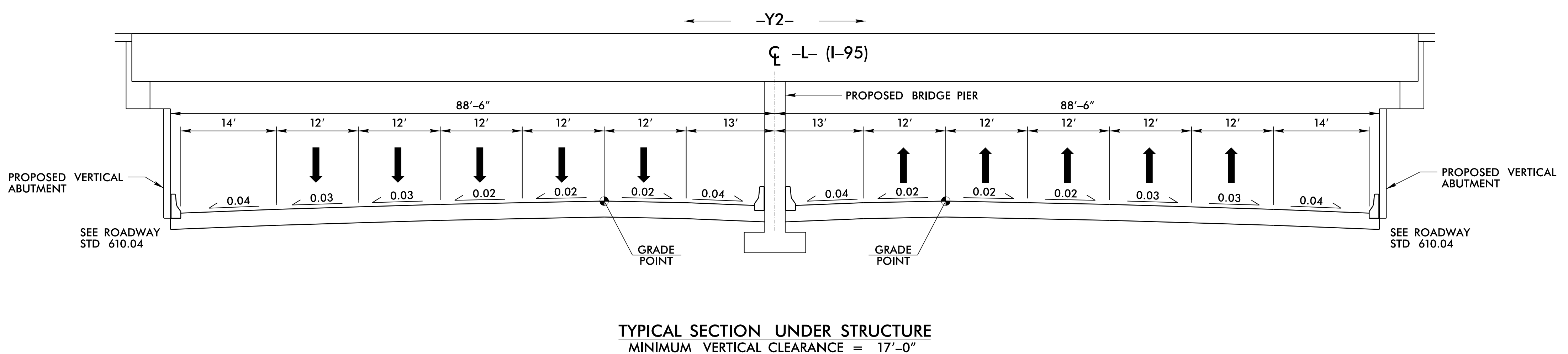
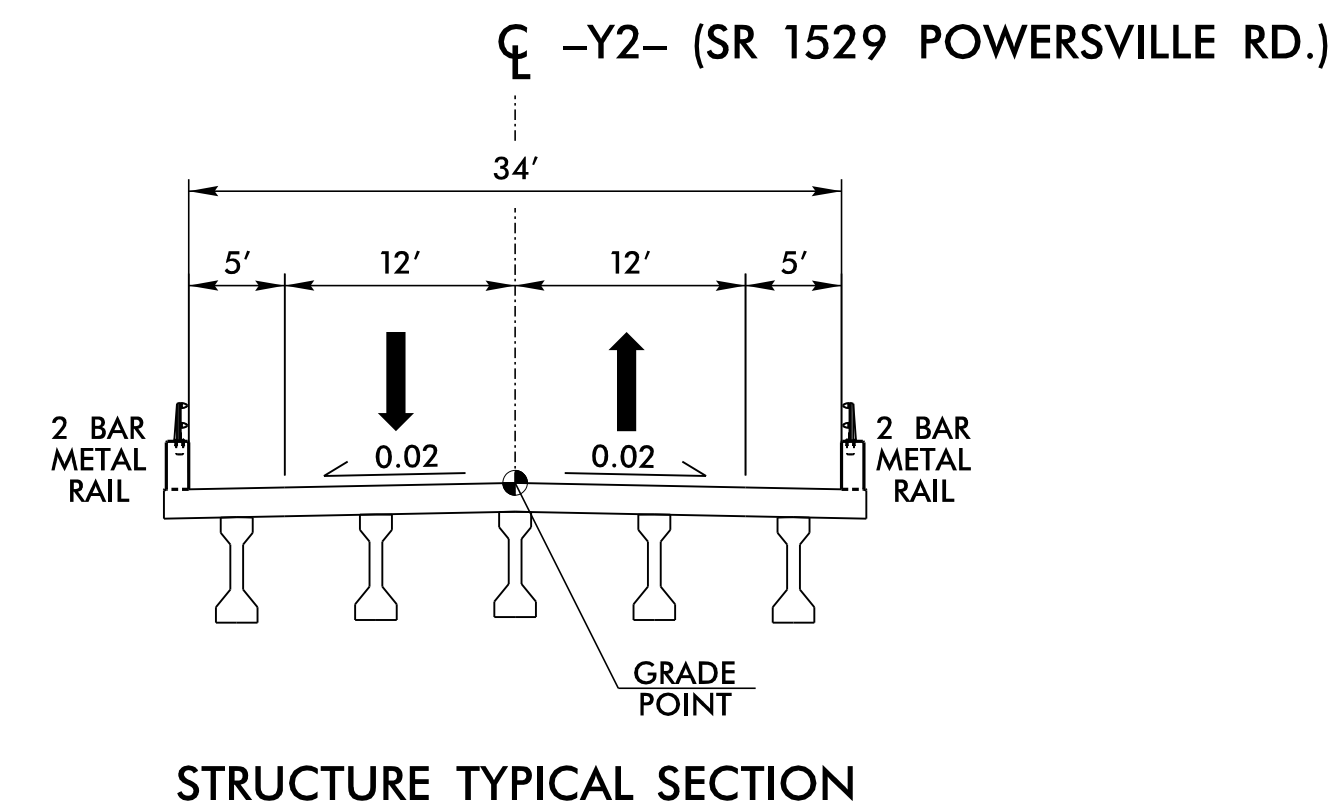
TYPICAL SECTION UNDER STRUCTURE

5/5/2022
 R:\Road\15987A\RDY_TYP_SECA1.dgn
 Steve Anthony Drive

5/14/22

PROJECT REFERENCE NO. 1-5987A		SHEET NO. 2A-12	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 5/18/2022		PAVEMENT DESIGN ENGINEER	
			
DocuSigned by: <i>Steve Anthony Drane</i>			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
NV5		NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	

BRIDGE AT -Y2- STA. 29 + 75.79 OVER -L- STA. 210 + 10.00

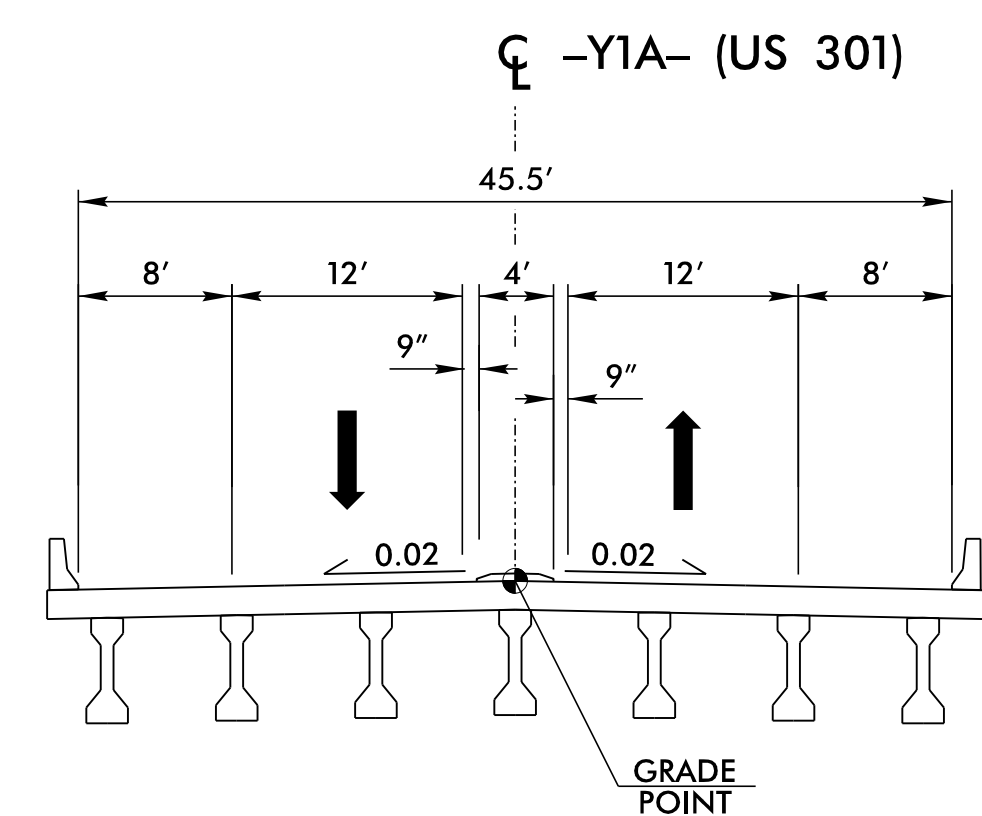


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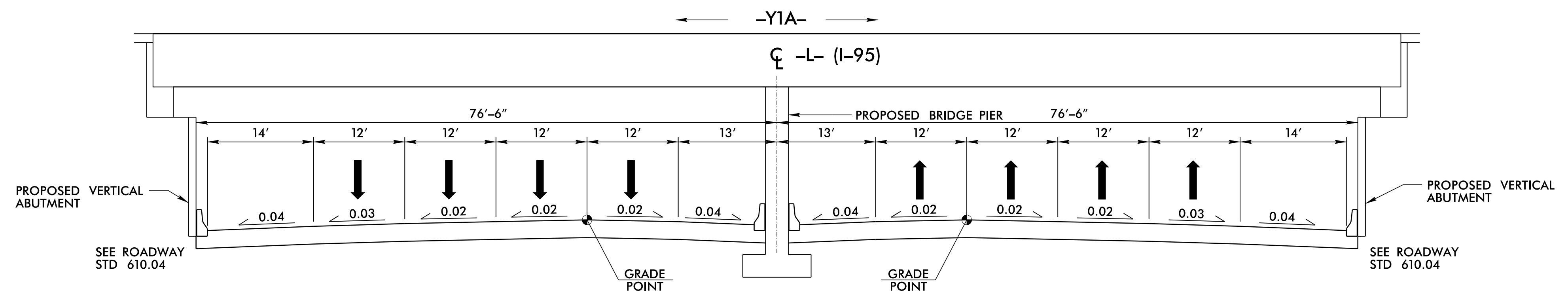
5/14/99

PROJECT REFERENCE NO. 1-5987A		SHEET NO. 2A-13	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 5/18/2022		PAVEMENT DESIGN ENGINEER	
		Documented by <i>Steve Anthony Dean</i>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
		4100 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27617 (919) 781-4626 VOICE (919) 781-4669 FAX NC License NO.: F-0 105	

BRIDGE AT -Y1A- STA. 41+19.02 OVER -L- STA. 286+75.00




STRUCTURE TYPICAL SECTION



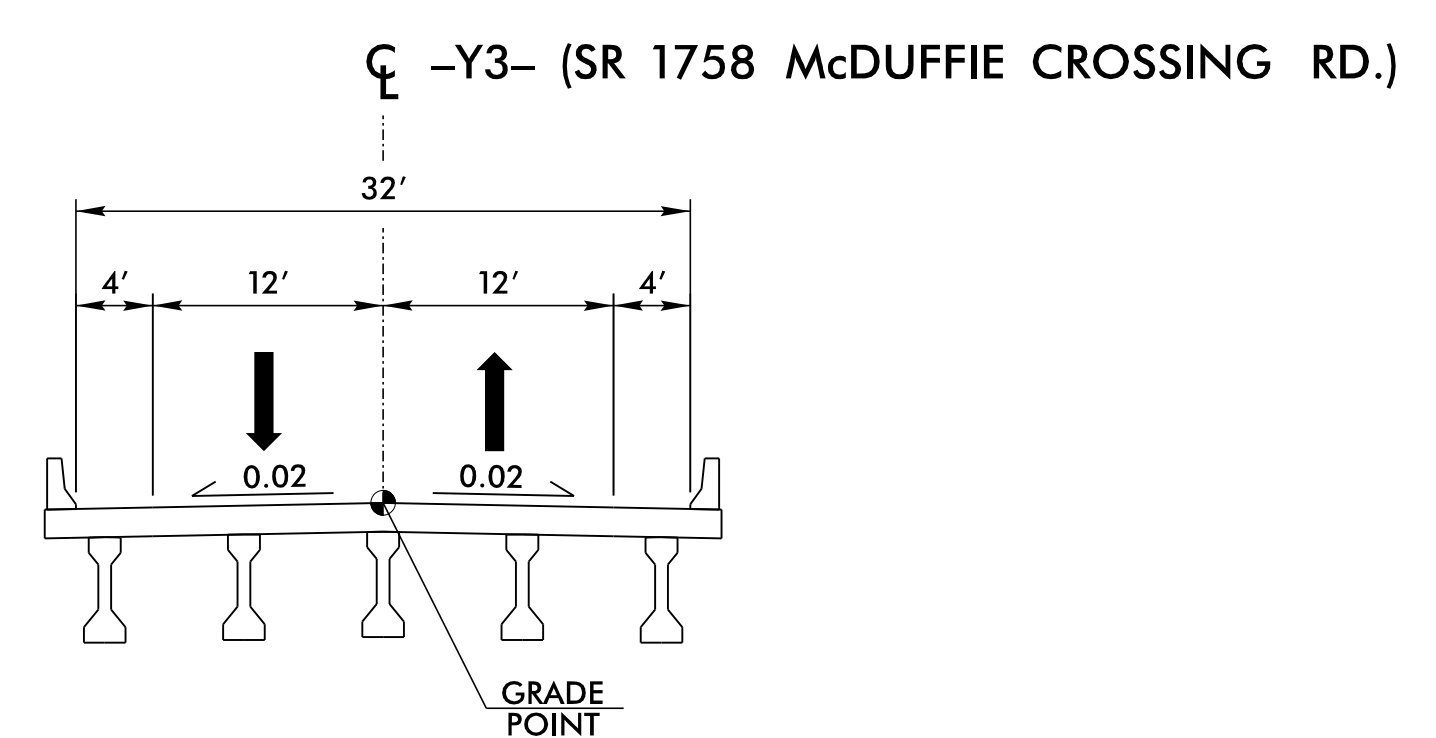
TYPICAL SECTION UNDER STRUCTURE
MINIMUM VERTICAL CLEARANCE = 17'-0"

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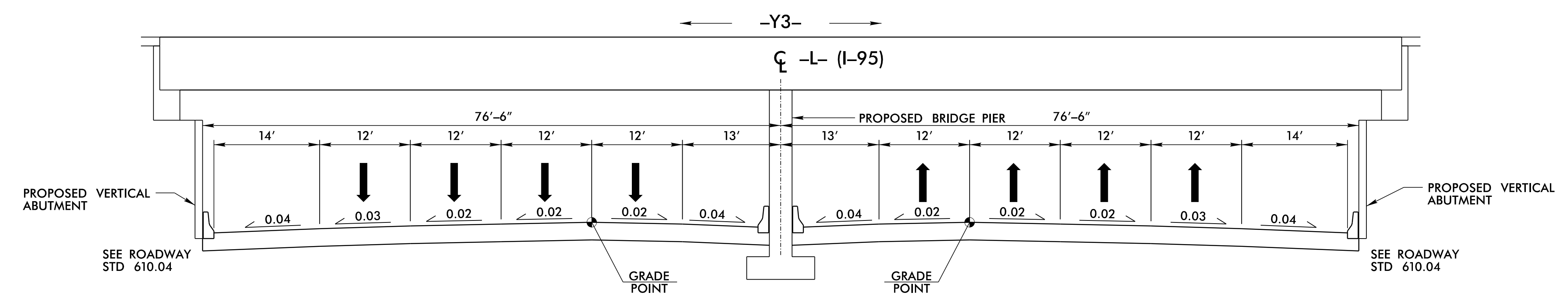
5/14/22

PROJECT REFERENCE NO. 1-5987A		SHEET NO. 2A-14	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 5/18/2022		PAVEMENT DESIGN ENGINEER	
			
DocuSigned by <i>Steve Anthony Dine</i>			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

BRIDGE AT -Y3- STA. 30 + 04.11 OVER -L- STA. 463 + 53.11



STRUCTURE TYPICAL SECTION





TYPICAL SECTION UNDER STRUCTURE
MINIMUM VERTICAL CLEARANCE = 17'-0"

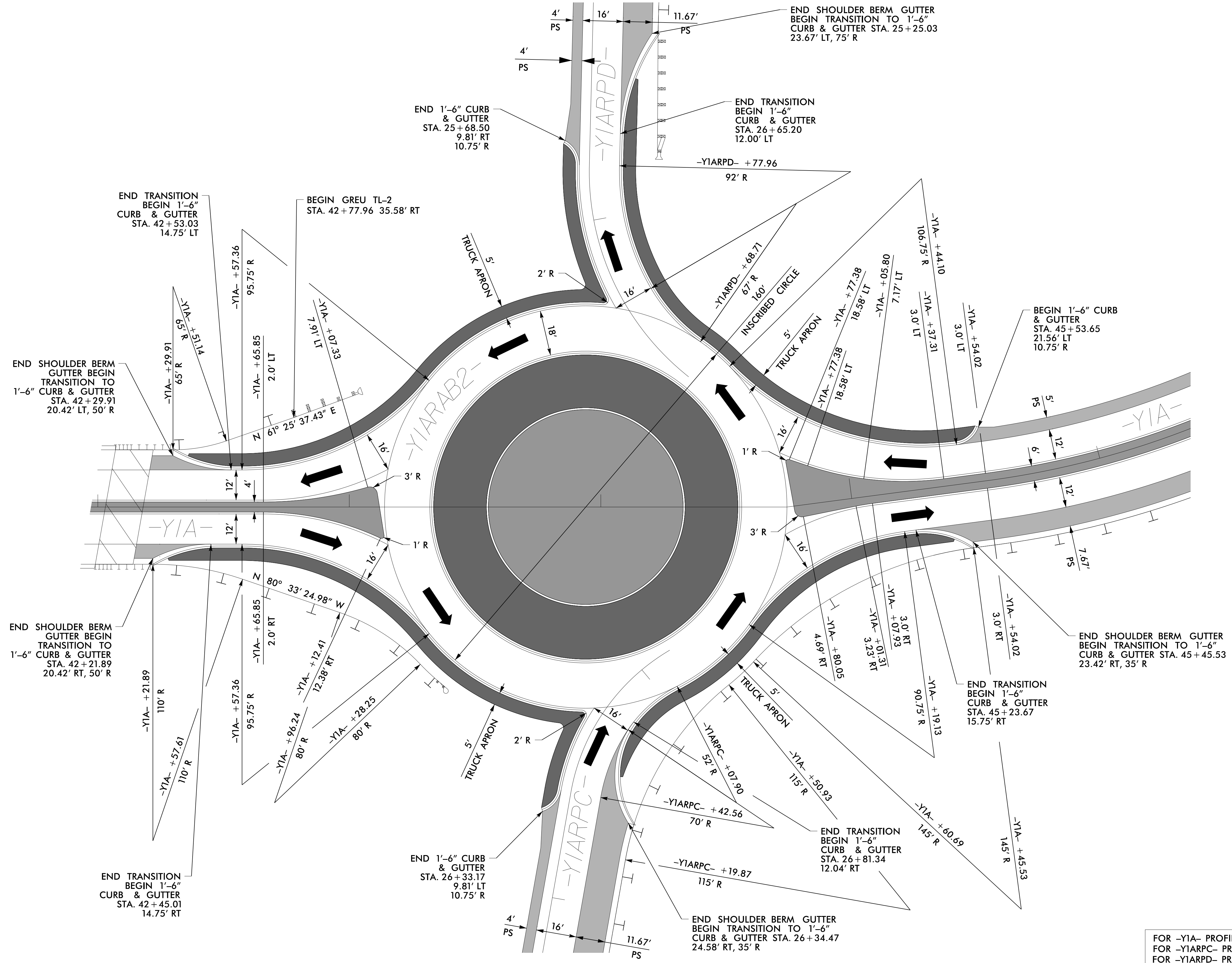
5/5/2022
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 Steve Anthony Dine

INTERSECTION DETAIL SHEET

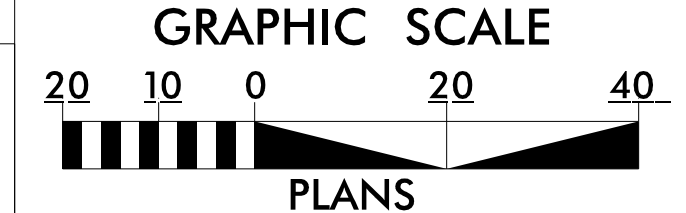
DETAIL SHOWING ROUNDABOUT (-YIARAB2-)
SEE SHEET NO. 17 FOR INTERCHANGE DESIGN

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2B-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022	HYDRAULICS ENGINEER
 Documented by: Steve Anthony Dren	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	
NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	

NAD 83NA 2011



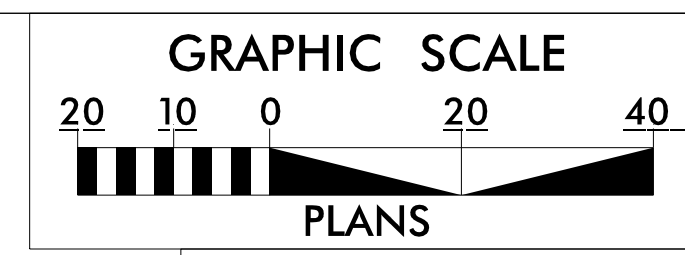
NOTE: GUARDRAIL IS PULLED BACK TO SATISFY SIGHT DISTANCE



FOR -YIA- PROFILE SEE SHEET 74, 75
 FOR -YIARPC- PROFILE SEE SHEET 86
 FOR -YIARPD- PROFILE SEE SHEET 87
 FOR -YIARAB2- PROFILE SEE SHEET 88

INTERSECTION DETAIL SHEET

DETAIL SHOWING INTERSECTIONS (-Y1A-, -SR2-, -DR7-, -DR8-)
SEE SHEET NO. 17 FOR INTERCHANGE DESIGN



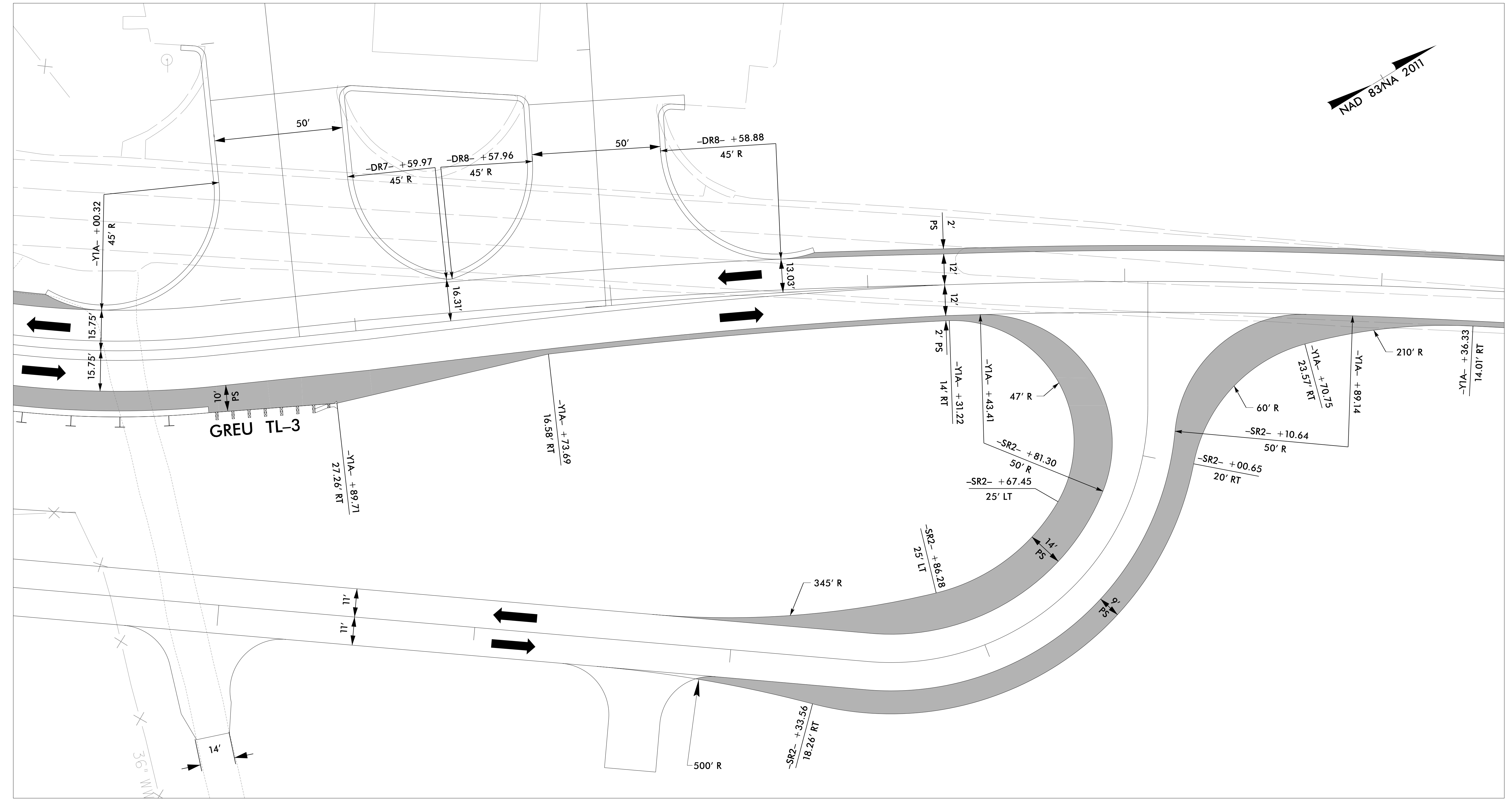
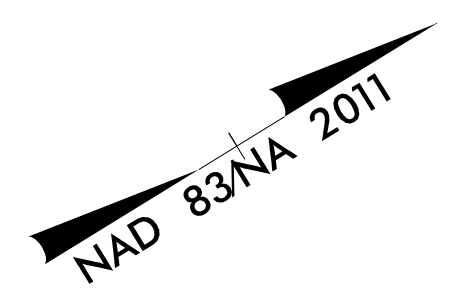
SEE SHEET 17 & 37 FOR ADDITIONAL INFORMATION

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2B-3
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER 5/18/2022	HYDRAULICS ENGINEER

DocuSigned by:
Steve Anthony Dean

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

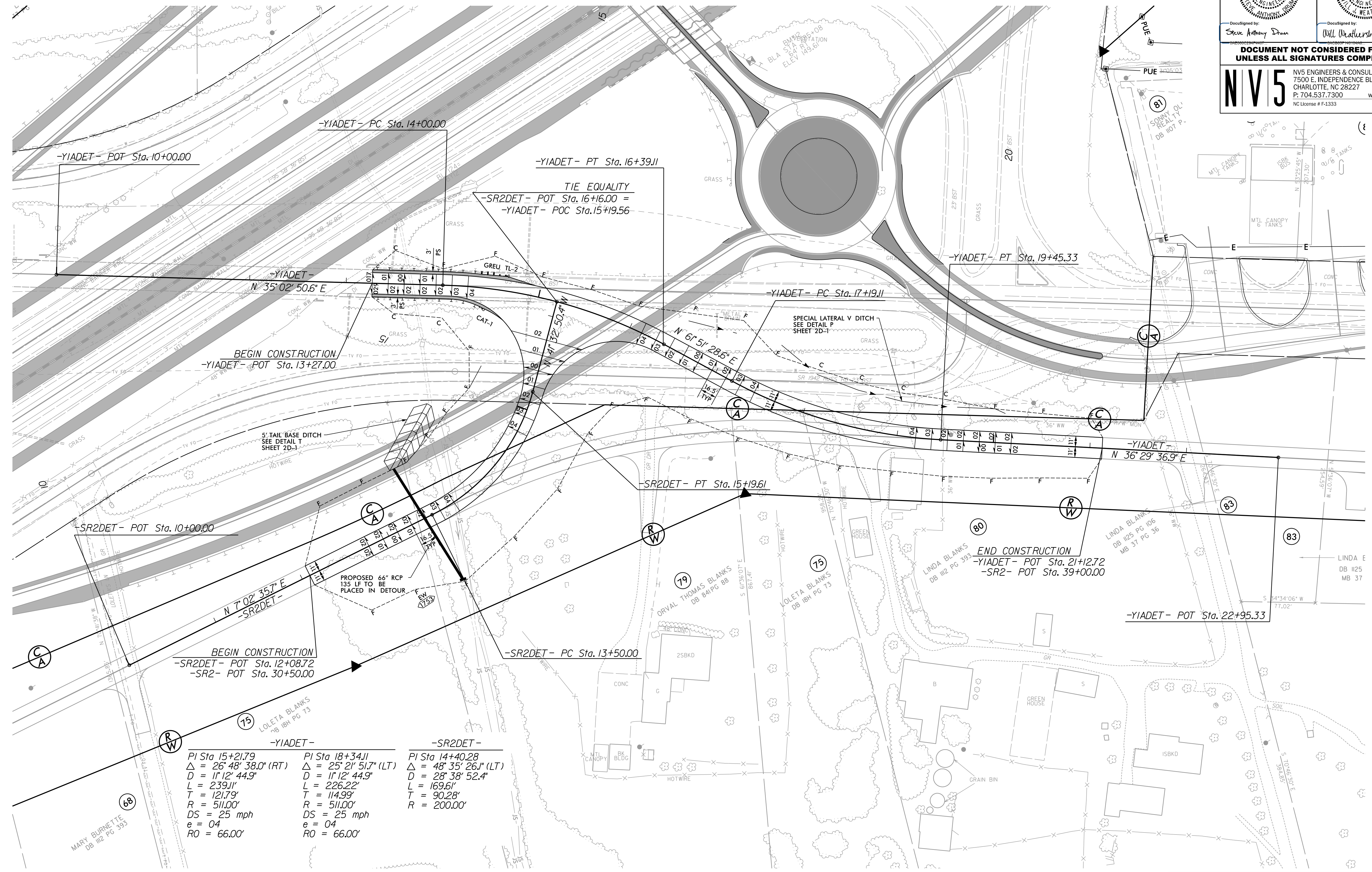
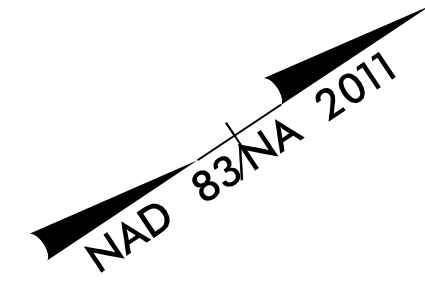
NV5 NV5 ENGINEERS & CONSULTANTS, INC.
7500 E. INDEPENDENCE BLVD, STE 100
CHARLOTTE, NC 28227
P: 704.537.7300 www.NV5.com
NC License # F-1333



8.17.19

DETAIL OF TEMPORARY ON-SITE DETOUR FOR -SR2- & -Y1A- TO BE CONSTRUCTED DURING PHASE 2A

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2B-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 5/18/2022	HYDRAULICS ENGINEER 5/19/2022
DocuSigned by: Steve Anthony Dean	DocuSigned by: Will Weatherly
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
NV5 NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	



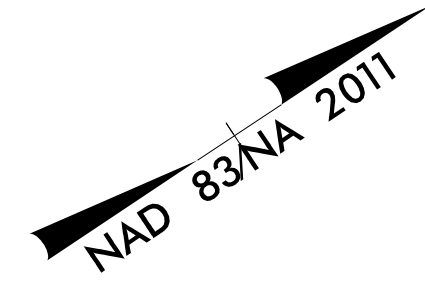
-Y1ADET-		-SR2DET-	
PI Sta 15+21.79	PI Sta 18+34.11	PI Sta 14+40.28	PI Sta 14+40.28
$\Delta = 26^\circ 48' 38.0''$ (RT)	$\Delta = 25^\circ 21' 51.7''$ (LT)	$\Delta = 48^\circ 35' 26.1''$ (LT)	$\Delta = 48^\circ 35' 26.1''$ (LT)
D = 11' 12' 44.9"	D = 11' 12' 44.9"	D = 28' 38' 52.4"	D = 28' 38' 52.4"
L = 239.11'	L = 226.22'	L = 169.61'	L = 169.61'
T = 121.79'	T = 114.99'	T = 90.28'	T = 90.28'
R = 511.00'	R = 511.00'	R = 200.00'	R = 200.00'
DS = 25 mph	DS = 25 mph		
e = 04	e = 04		
RO = 66.00'	RO = 66.00'		

FOR -Y1ADET- AND -SR2DET- PROFILE SEE SHEET 96
FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2

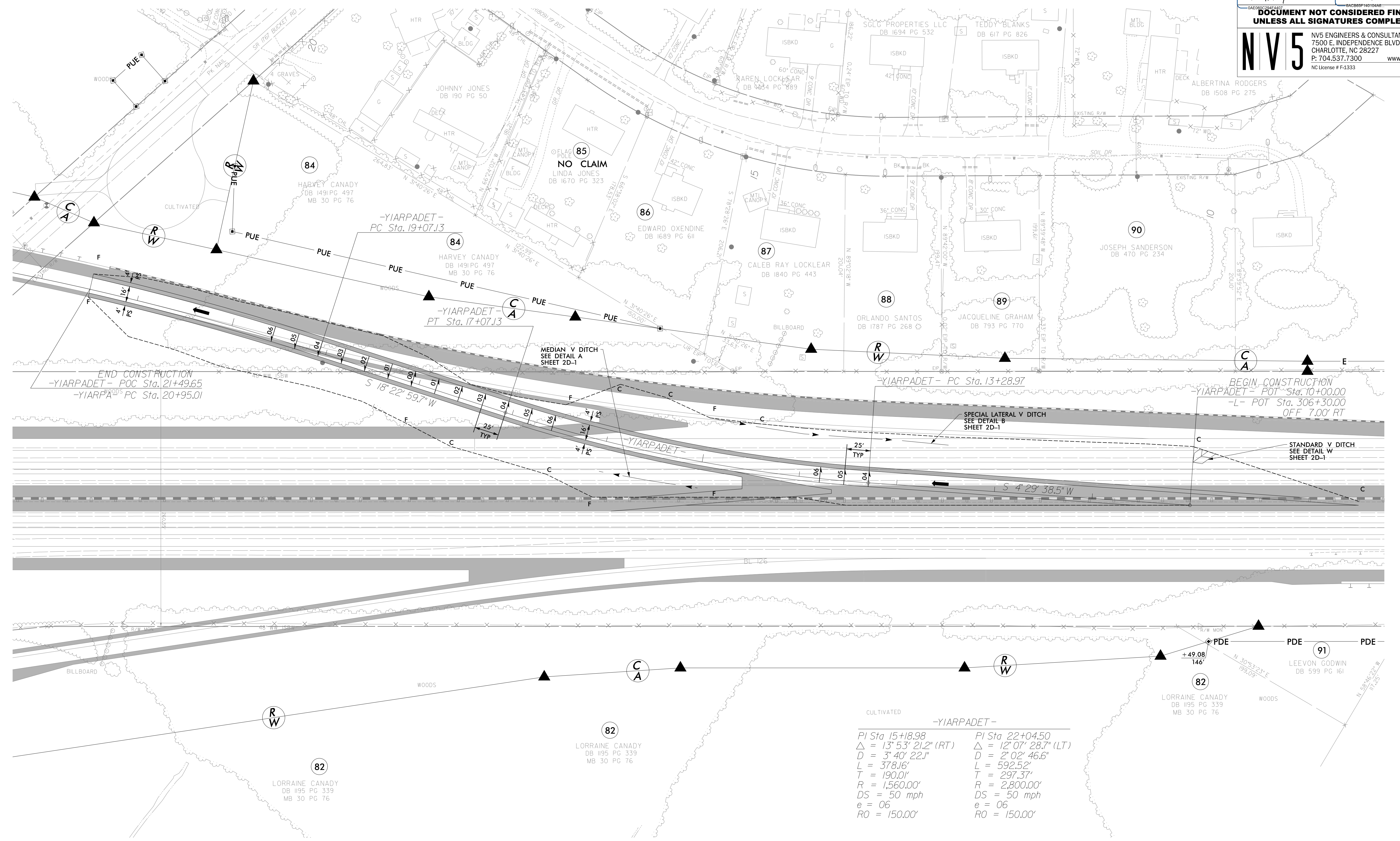
5/14/2022
F:\Projects\15987A_R01_PSH_2B-4.dgn
E:\Projects\15987A_R01_PSH_2B-4.dgn

DETAIL OF TEMPORARY ON-SITE DETOUR FOR -YIARPA-

TO BE CONSTRUCTED DURING TRANSITION BETWEEN PHASE 2B & PHASE 3



PROJECT REFERENCE NO. I-5987A		SHEET NO. 2B-5	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER 5/18/2022		5/19/2022	
Designed by: Steve Anthony Dean		Designed by: Will Weatherly	
DOCUMENT NOT CONSIDERED FINAL			
UNLESS ALL SIGNATURES COMPLETED			
NV5		NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	




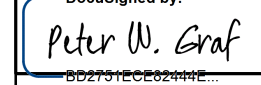

-YIARPADET-	
PI Sta 15+18.98	PI Sta 22+04.50
$\Delta = 13^{\circ} 53' 21.2''$ (RT)	$\Delta = 12^{\circ} 07' 28.7''$ (LT)
$D = 3^{\circ} 40' 22.1''$	$D = 2^{\circ} 02' 46.6''$
$L = 378.16'$	$L = 592.52'$
$T = 190.01'$	$T = 297.37'$
$R = 1,560.00'$	$R = 2,800.00'$
$DS = 50$ mph	$DS = 50$ mph
$e = 06$	$e = 06$
$RO = 150.00'$	$RO = 150.00'$

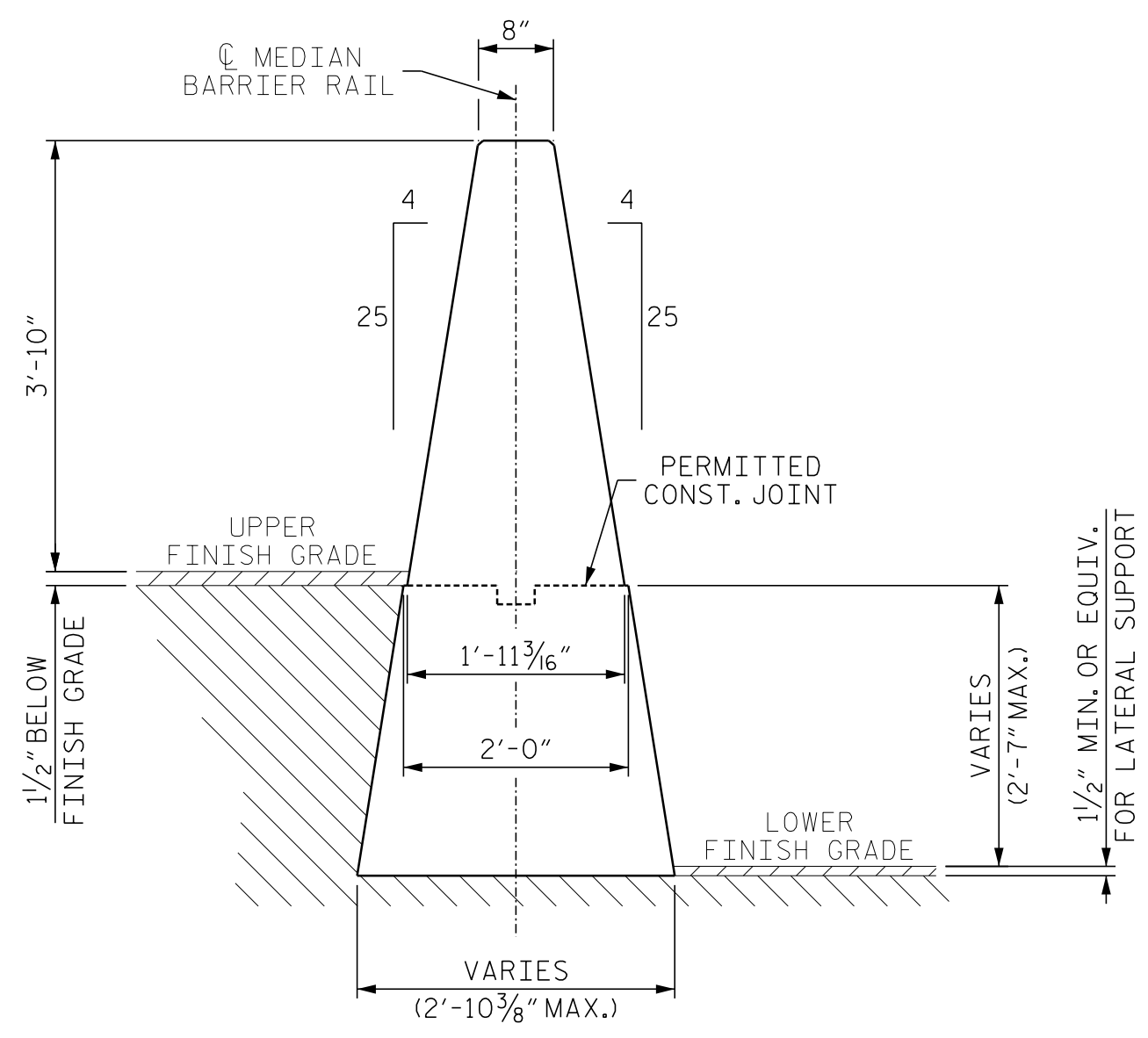
FOR -YIARPADET- PROFILE SEE SHEET 97
FOR DITCH DETAILS SEE SHEETS 2D-1 AND 2D-2

8/17/19

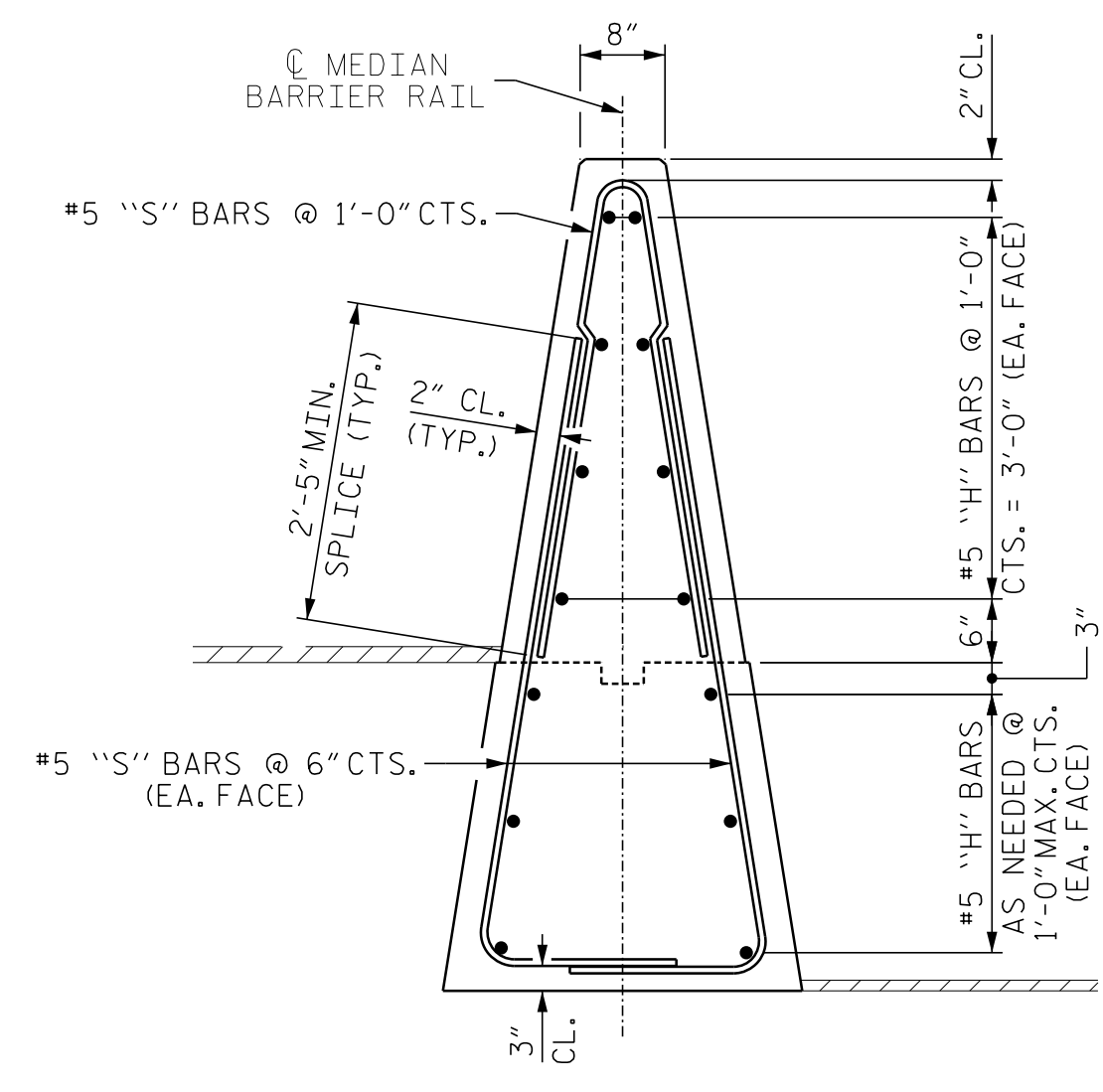
SINGLE SLOPE CONCRETE BARRIER DETAILS

SHEET 1 OF 2

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2B-6
5/18/2022	
	
DocuSigned by: 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	
4505 Falls of Neuse Road, Suite 110 Raleigh, North Carolina 27609 Phone: 803-822-0333 License #: P-0999	



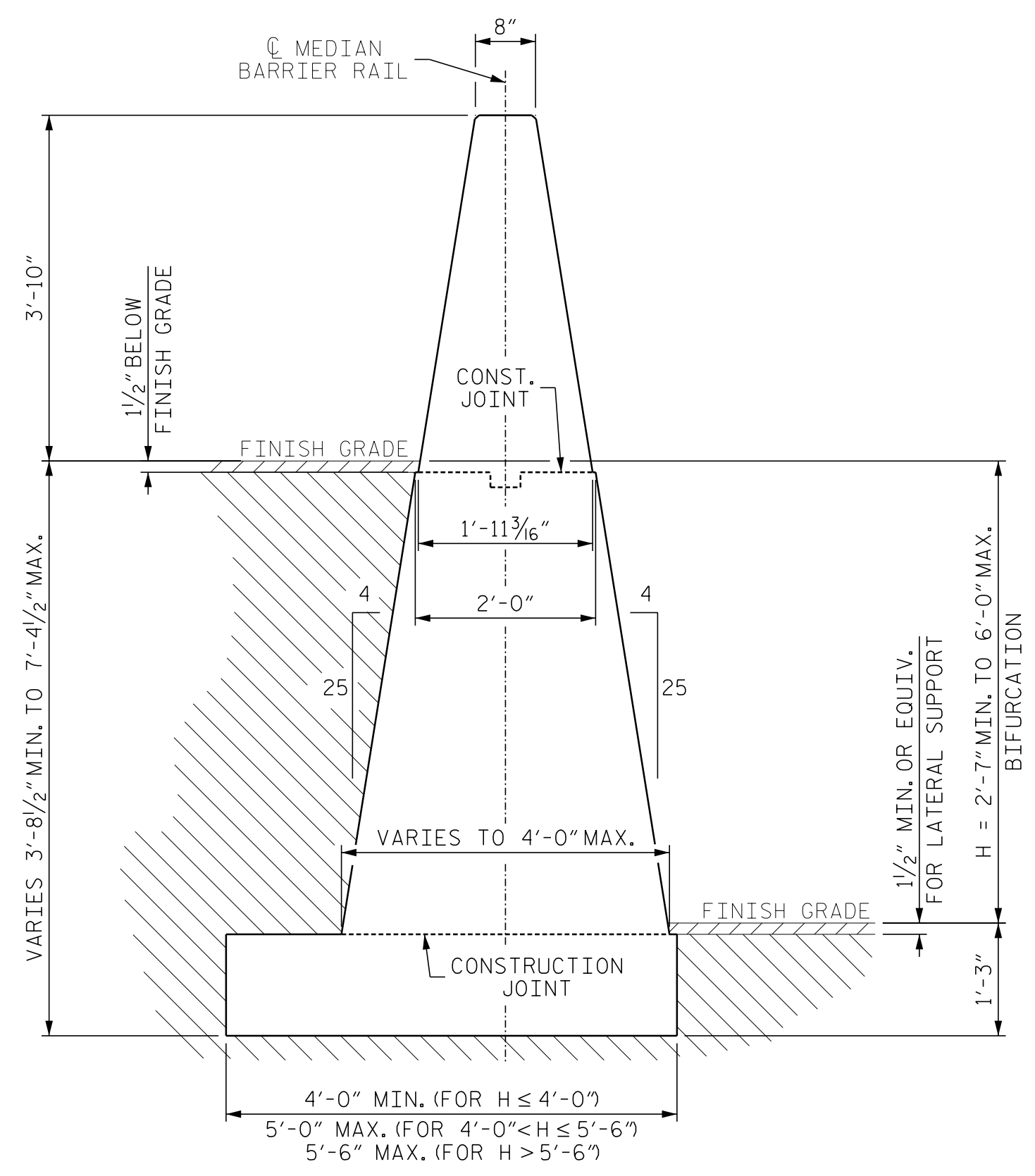
CONCRETE DETAILS



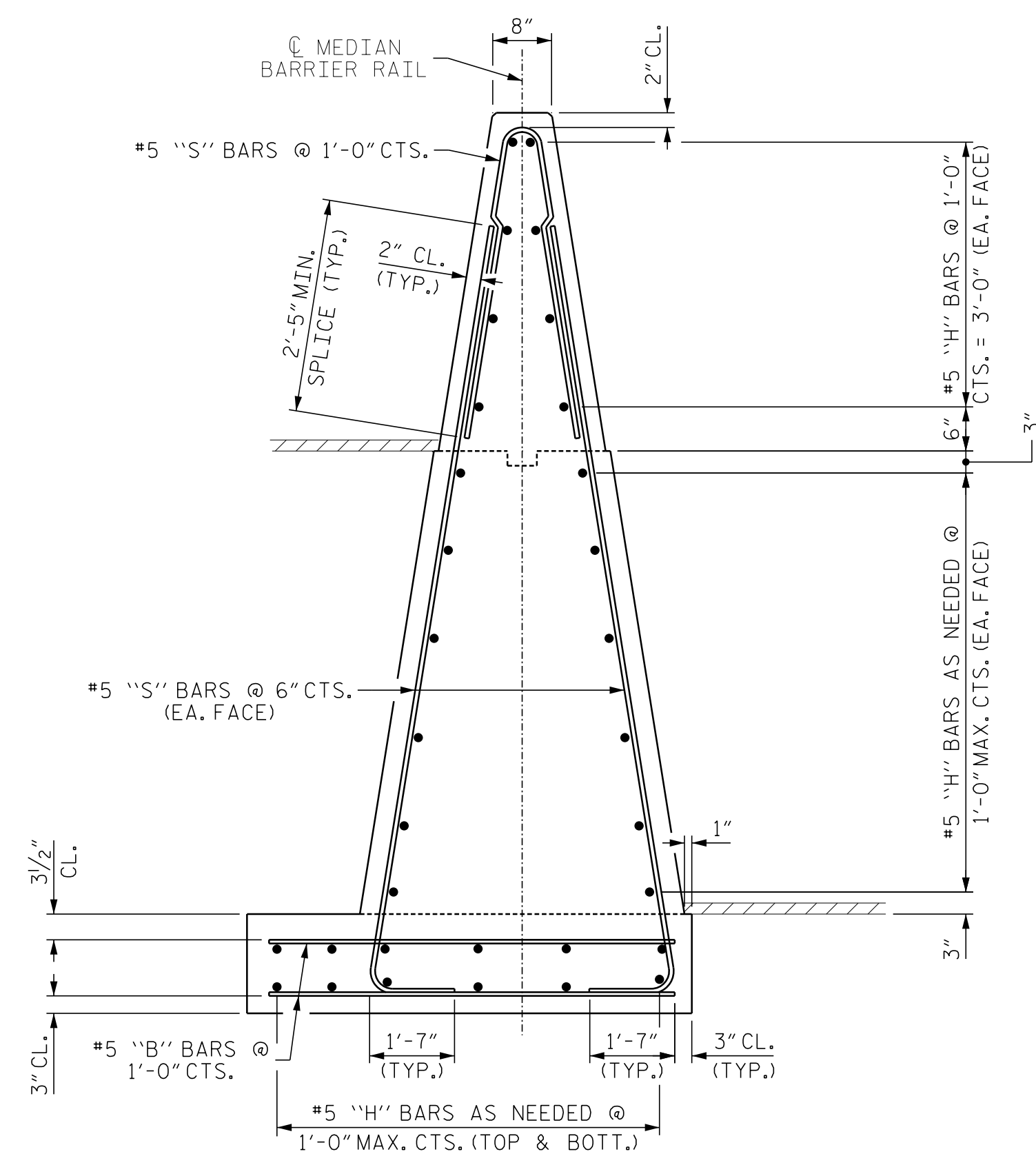
REINFORCEMENT DETAILS

SINGLE SLOPE CONCRETE BARRIER (2'-7" MAX. BIFURCATION)

SECTION SHOWN IS WITH RESPECT TO MAXIMUM 2'-7" BIFURCATION



CONCRETE DETAILS



REINFORCEMENT DETAILS

SINGLE SLOPE CONCRETE BARRIER (2'-7" THRU 6'-0" BIFURCATION)

SECTION SHOWN IS WITH RESPECT TO 2'-7" THRU 6'-0" BIFURCATION

TO BE USED ALONG -L- (LT, MED, RT)
FROM STATION 67+00 TO 95+24+/-.
SEE TYPICAL SECTIONS AND PLAN
SHEETS 4 THRU 6 FOR LOCATIONS.

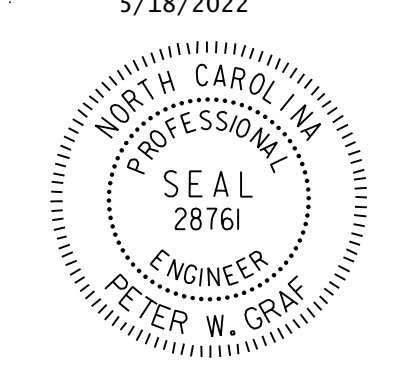

GENERAL NOTES:

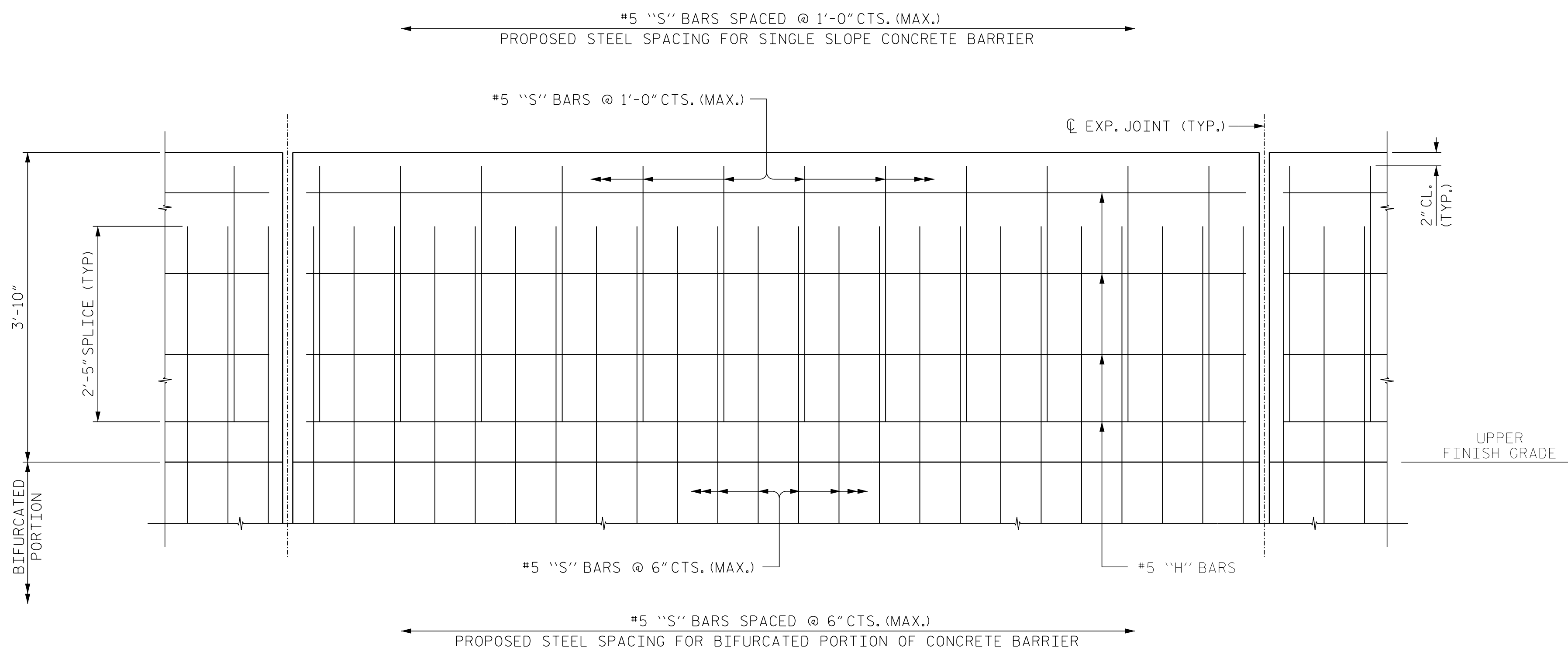
- USE CLASS "AA" CONCRETE.
- ALL REINFORCING STEEL SHALL BE EPOXY COATED.
- MAINTAIN 2" CLEAR COVER FOR ALL REINFORCING STEEL UNLESS NOTED OTHERWISE.
- #5 "S" BAR SPLICE 2'-5"
- #5 "H" BAR SPLICE 3'-2"
- ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT SHALL ASSURE THAT THE LONGITUDINAL ROADWAY STEEL WILL BE POSITIONED 1/2" ± AS DIMENSIONED ON THE PLANS WILL BE DEEMED SATISFACTORY.
- REFER TO ROADWAY STANDARD DRAWING NO. 854.01 FOR EXPANSION AND CONTRACTION JOINT FILLER AND OTHER SPECIFICATIONS

5/18/2022 P:\P\15987A.RDY_PSH_2B-6.dgn

SINGLE SLOPE CONCRETE BARRIER DETAILS

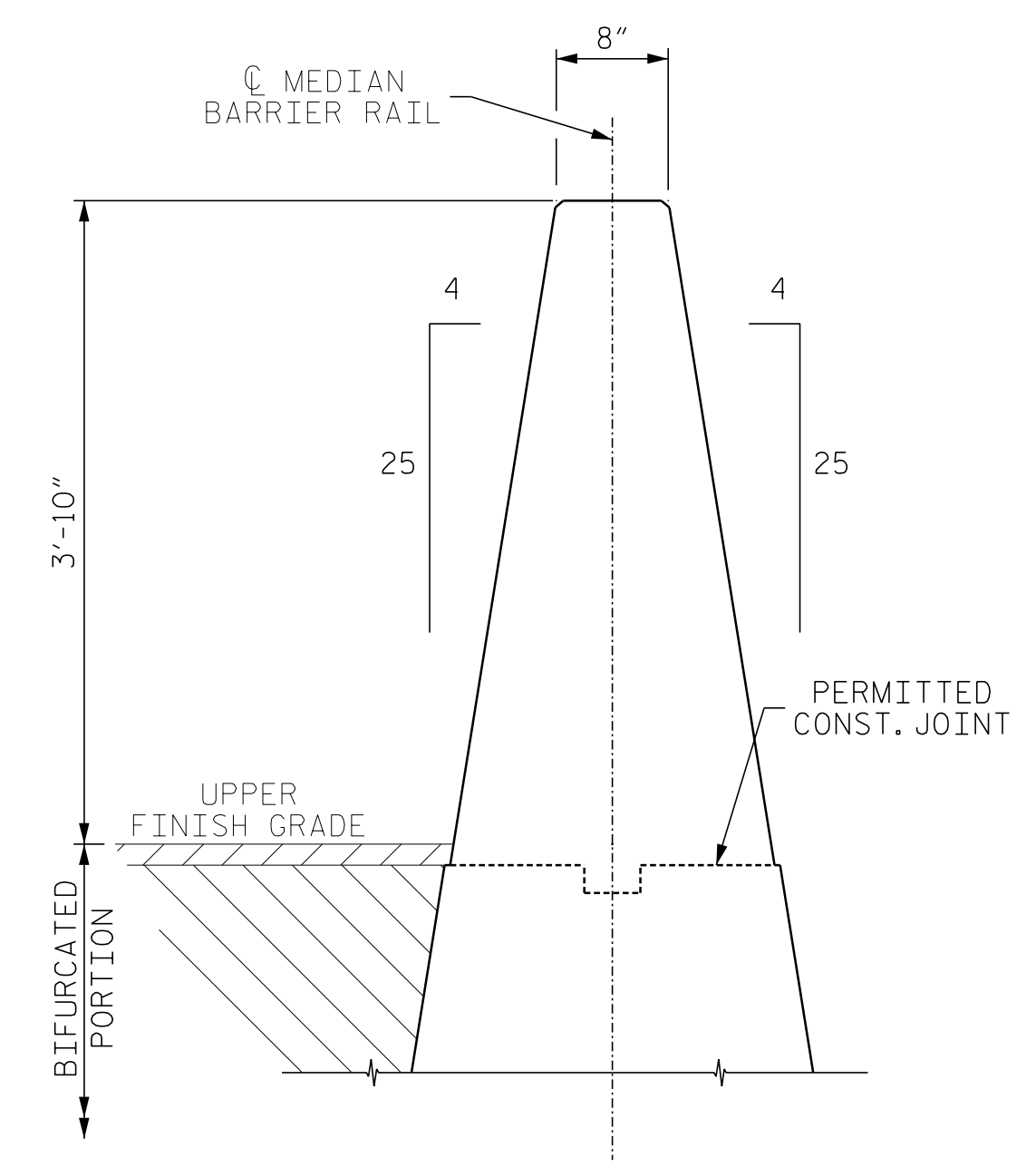
SHEET 2 OF 2

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2B-7
5/18/2022  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28761 PETER W. GRAF	
DocuSigned by: <i>Peter W. Graf</i>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 ICE of CAROLINAS, PLLC 4505 Falls of Neuse Road, Suite 110 Raleigh, North Carolina 27609 Phone: 803-822-0333 License #: P-0999	

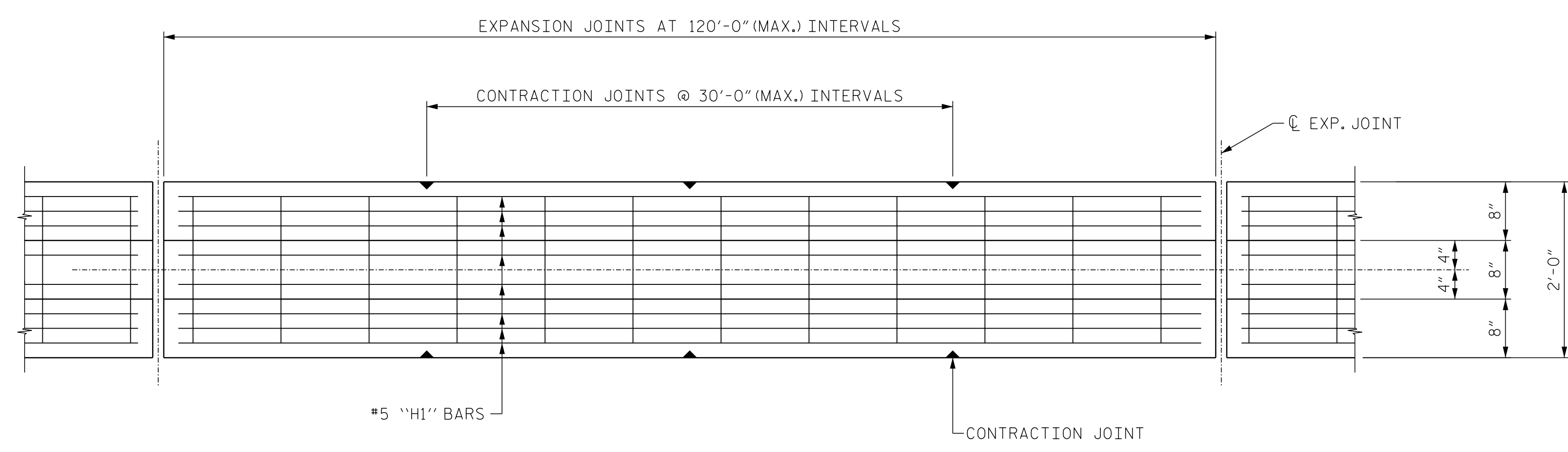


ELEVATION

3'-10" MEDIAN BARRIER REINFORCEMENT SHOWN
FOR REINFORCEMENT IN BIFURCATED SECTION, SEE "SINGLE SLOPE CONCRETE BARRIER DETAILS" SHEET 1 OF 2



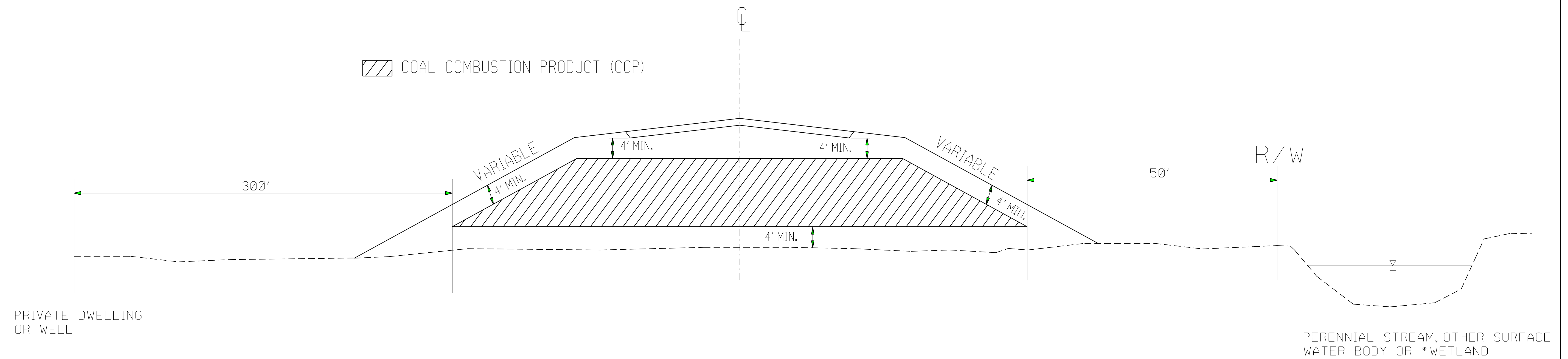
BARRIER SECTION



PLAN VIEW

TO BE USED ALONG -L- (LT, MED, RT)
FROM STATION 67+00 TO 95+24+/-.
SEE TYPICAL SECTIONS AND PLAN
SHEETS 4 THRU 6 FOR LOCATIONS.

COAL COMBUSTION PRODUCT PLACEMENT



PRIVATE DWELLING OR WELL

PERENNIAL STREAM, OTHER SURFACE WATER BODY OR *WETLAND

*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

PLACE CCP IN HATCHED AREA IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS

PLACE CCP A MINIMUM OF 5' ABOVE SEASONAL HIGH GROUND WATER

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

PLACE SOIL BORROW MATERIAL ON THE OUTSIDE OF CCP AS EACH LIFT OF CCP IS PLACED

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
 Ronald Elton Davenport, Jr.
 5/18/2022

CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
COAL COMBUSTION PRODUCT PLACEMENT DETAIL	
ORIGINAL BY: J.S.H.	DATE: 3/16/15
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: joe1/coal combustion material detail.dgn	

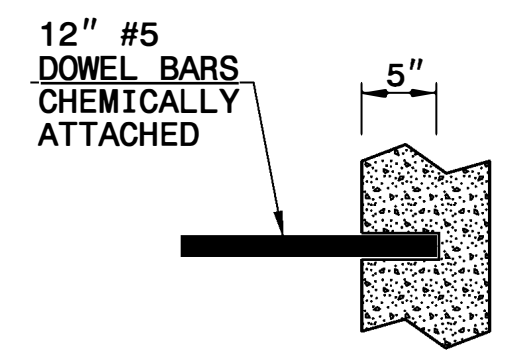
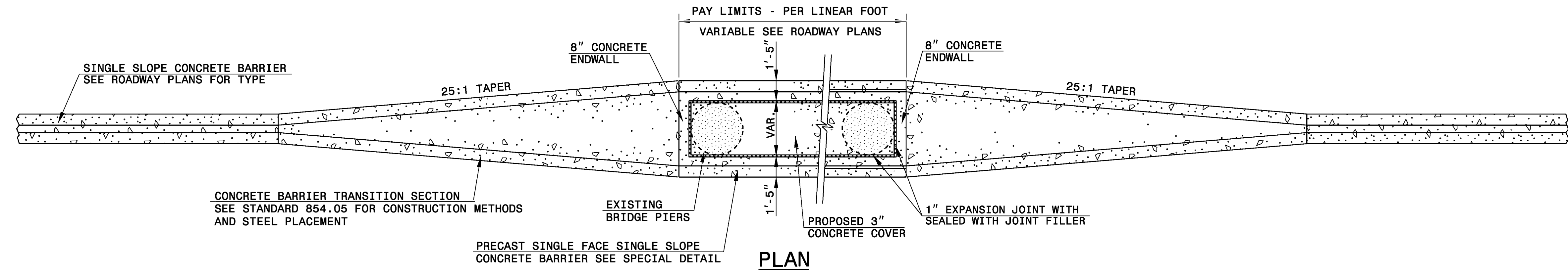
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* DRAWING NOT TO SCALE

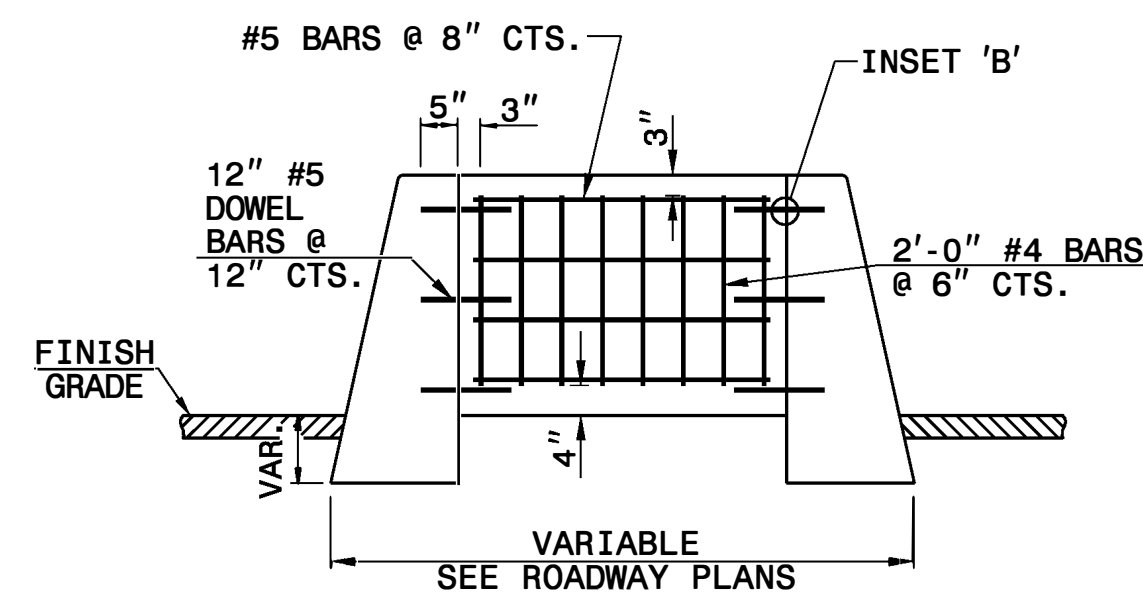
PROJECT REFERENCE NO. I-5987A	SHEET NO. 2C-2
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



DocuSigned by:
Ronald Elton Davenport, Jr.
 F8186038A7A442
 5/18/2022



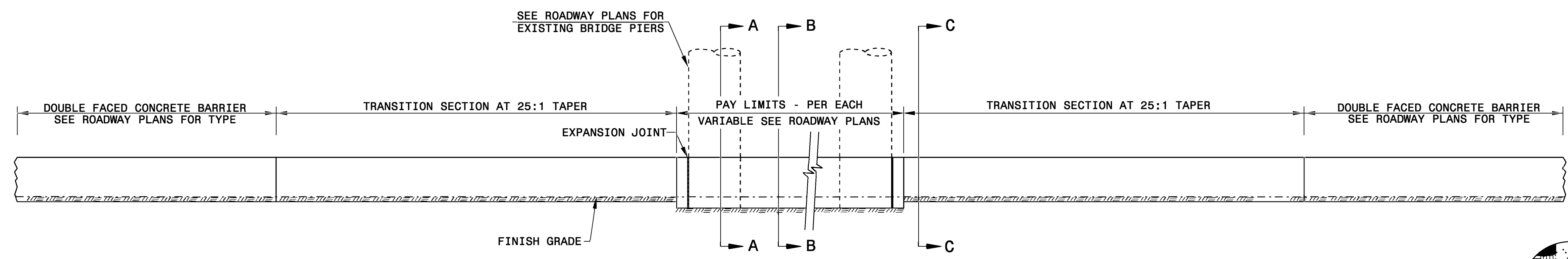
INSET 'B'



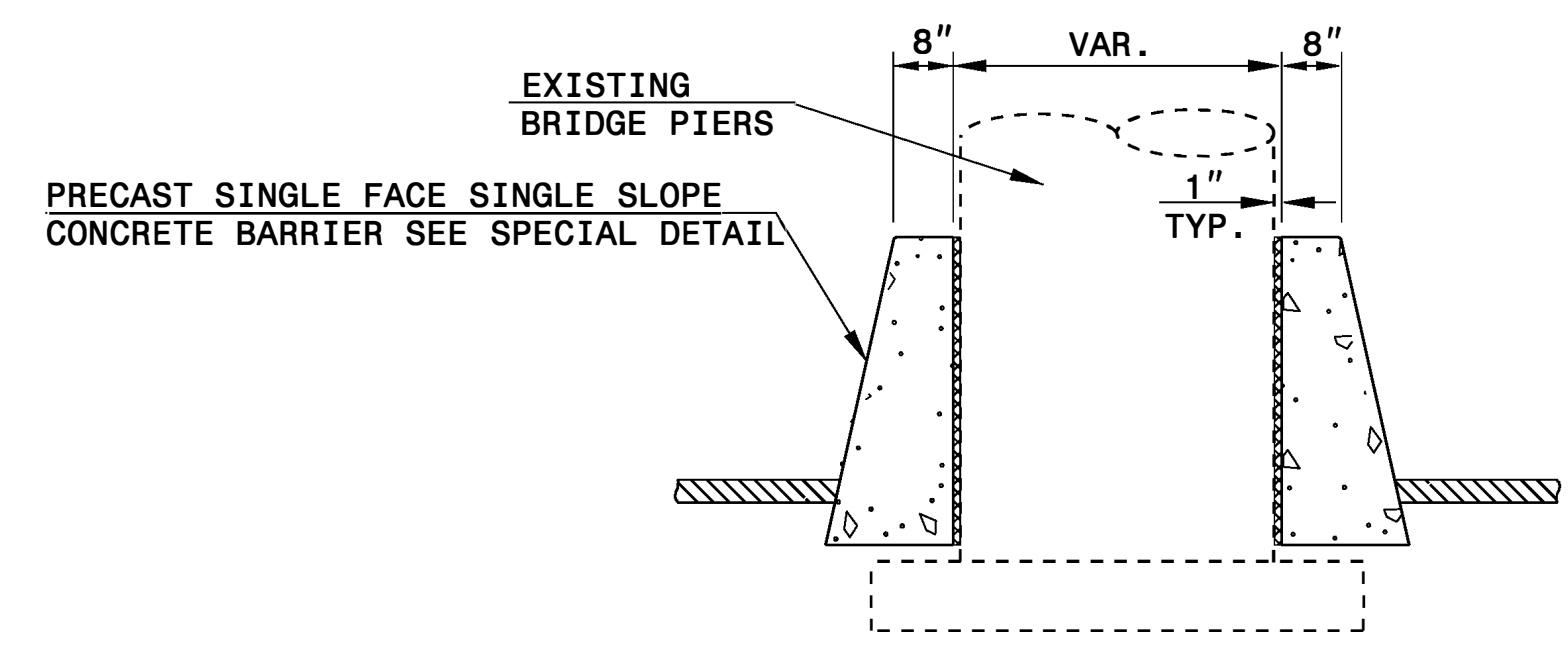
8" CONCRETE ENDWALL

GENERAL NOTES:

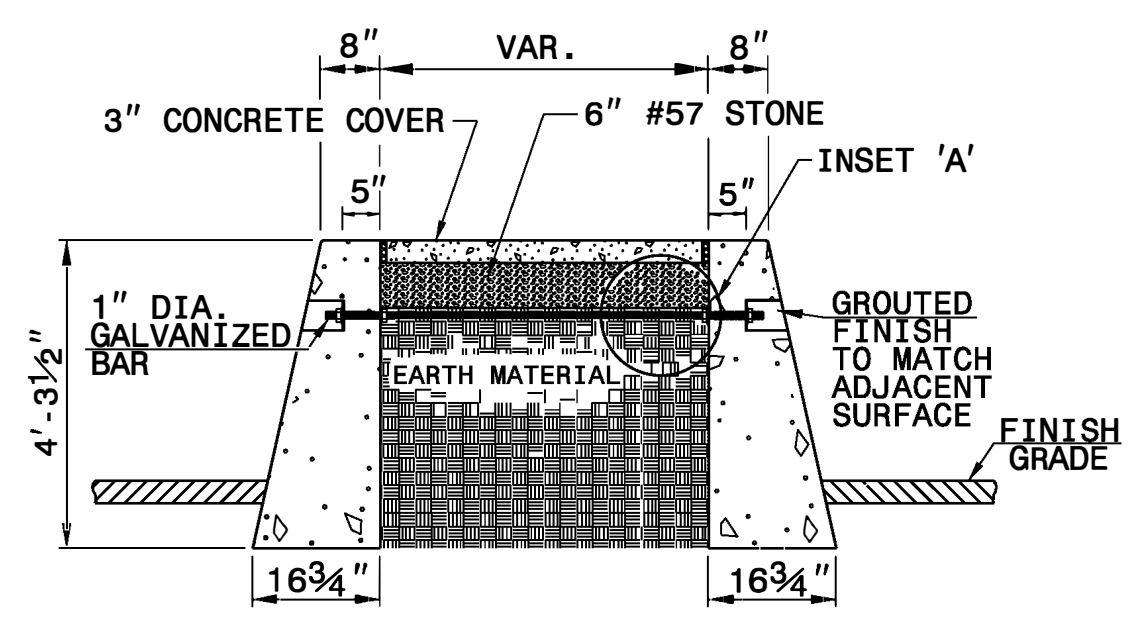
- CONSTRUCT CONCRETE BARRIER WITH CLASS 'AA' CONCRETE. (SEE SPECIFICATIONS SECTION 854).
- CONSTRUCT EXPANSION AND CONTRACTION JOINTS AS SHOWN IN STANDARD DRAWING 854.01.
- SEAL EXPANSION JOINTS WITH JOINT FILLER. (SEE SECTION 1028 OF THE SPECIFICATIONS).
- SEE SPECIAL DETAILS PERTAINING TO SINGLE SLOPE BARRIERS FOR CONSTRUCTION METHODS AND STEEL PLACEMENT.
- SUBMIT ALTERNATIVE METHODS FOR STEEL FABRICATION PLACEMENT FOR REVIEW AND APPROVAL.
- SEE STANDARD DRAWING 854.05 FOR STEEL LAYOUT OF TRANSITION BARRIER.
- *THE 2" DIMENSION FROM FINISH GRADE TO THE BASE IS A MINIMUM DIMENSION.
- INSET FIRST 1" DIA. GALVANIZED BAR 12'-6" AND SPACE THE REMAINING 1' BARS AT 25'-0".
- USE AN APPROVED BONDING SYSTEM IN ACCORDANCE WITH SECTION 1081 OF THE STANDARD SPECIFICATIONS.



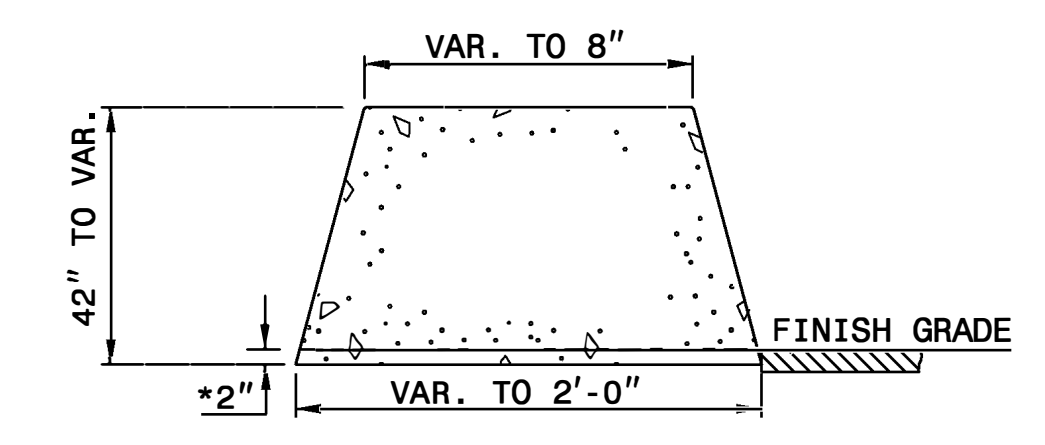
ELEVATION



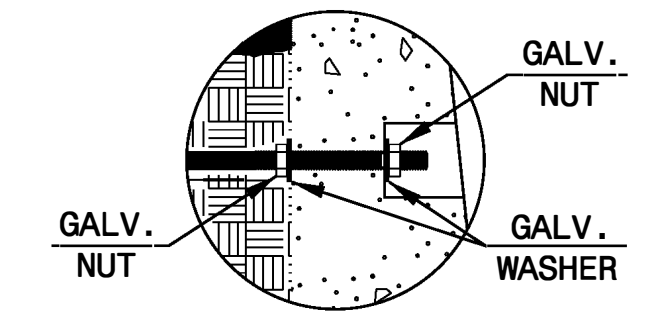
SECTION A-A



SECTION B-B



SECTION C-C



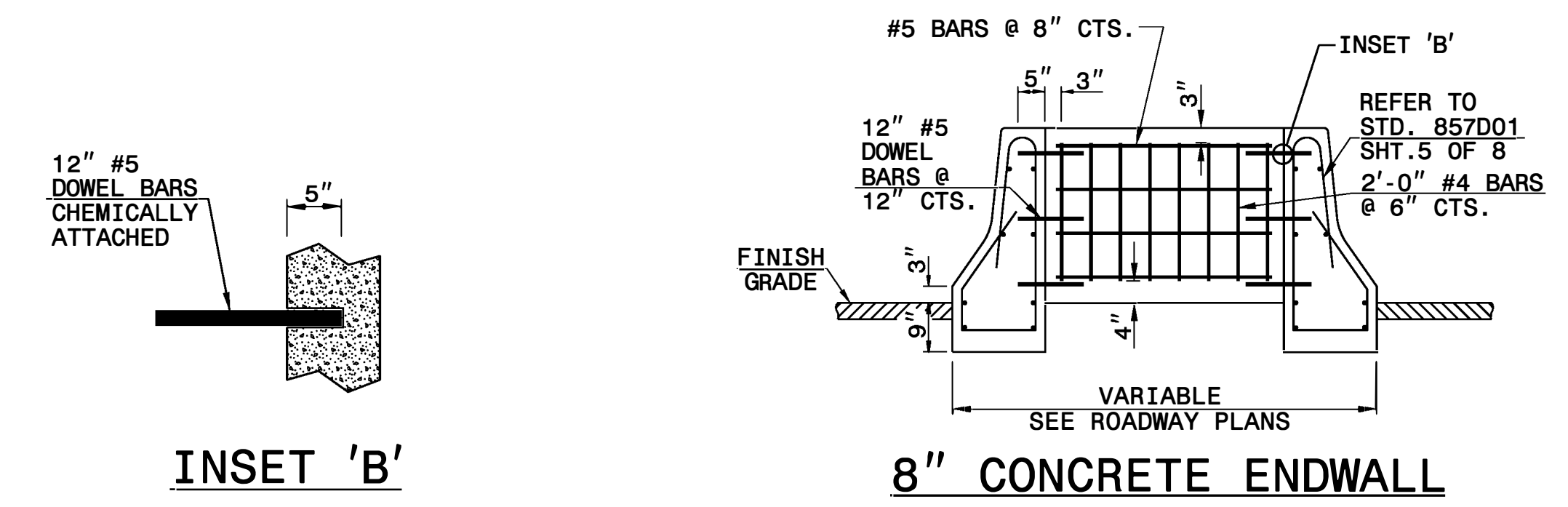
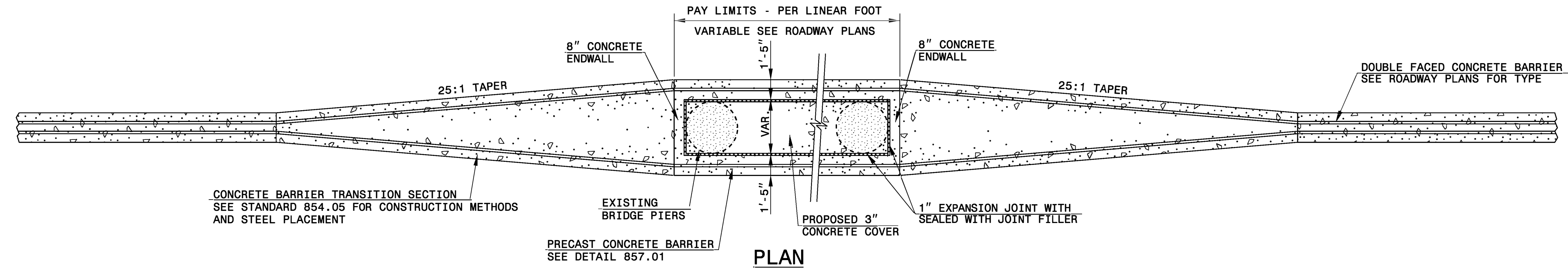
INSET 'A'

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

**MEDIAN HAZARD
PROTECTION**

ORIGINAL BY: E.E. WARD	DATE: 7-28-03
MODIFIED BY: K.A. KEMPF	DATE: 5-08-19
CHECKED BY:	DATE:
FILE SPEC.: brittenglishguardrail/single slope concrete barrier.dgn	

10-MAY-2019 12:09
 S:\Contracts\Special Details\guardrail\single slope concrete barrier.dgn
 Jhoverton AT USD-292595



GENERAL NOTES:

CONSTRUCT CONCRETE BARRIER WITH CLASS 'AA' CONCRETE. (SEE SPECIFICATIONS SECTION 854).

CONSTRUCT EXPANSION AND CONTRACTION JOINTS AS SHOWN IN STANDARD DRAWING 854.01.

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

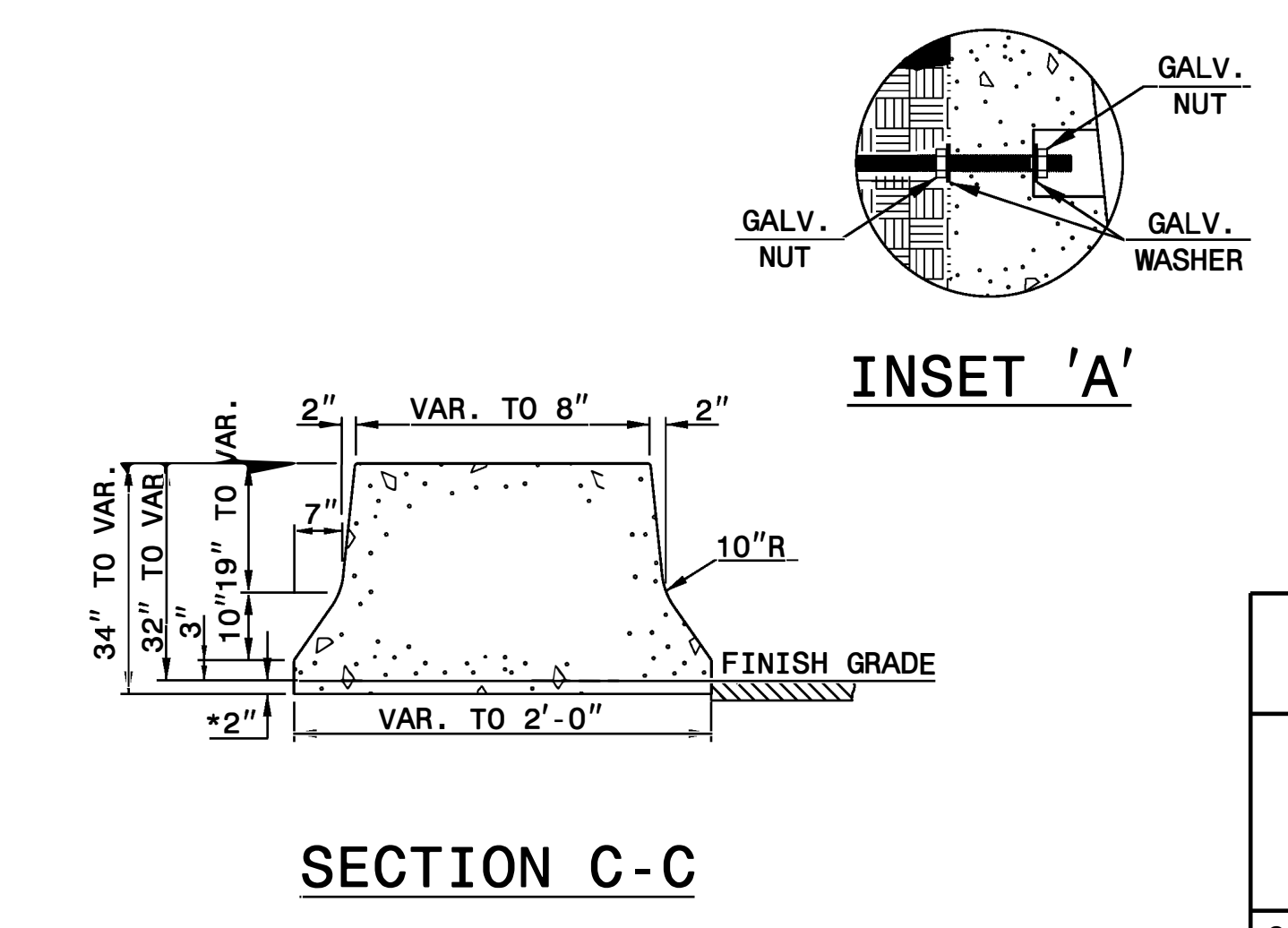
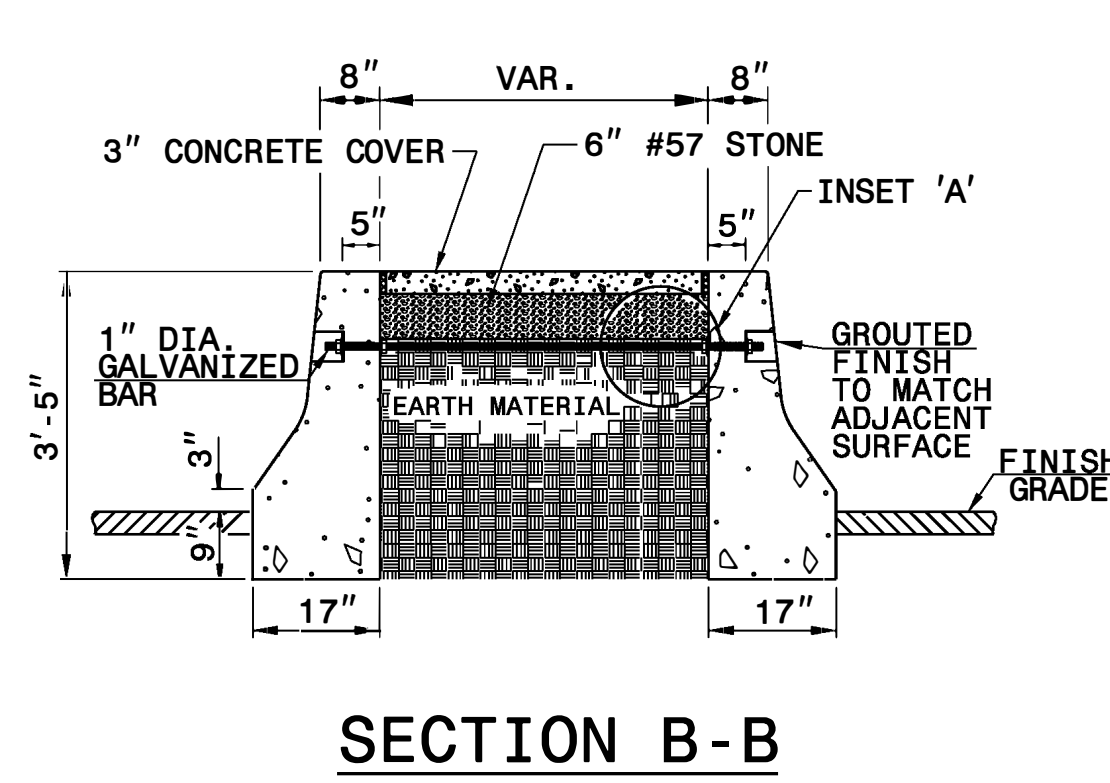
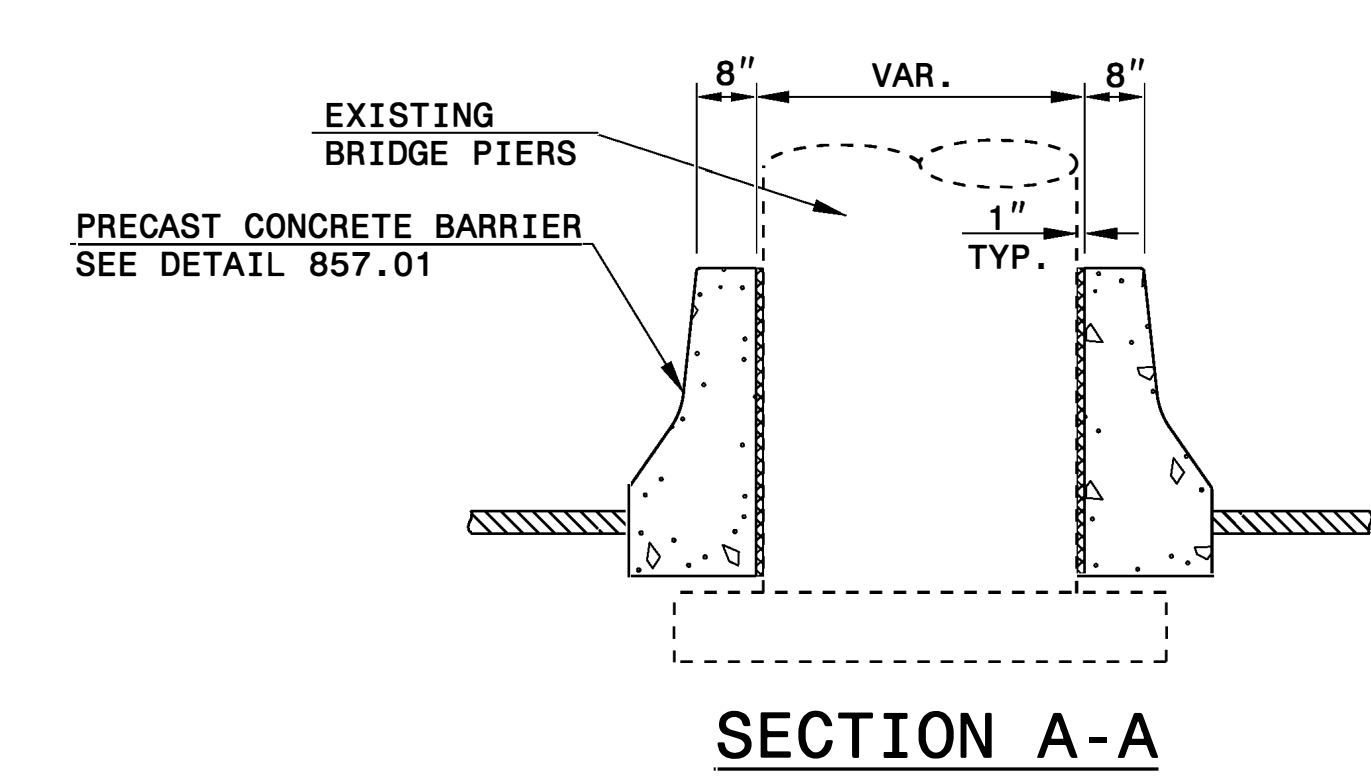
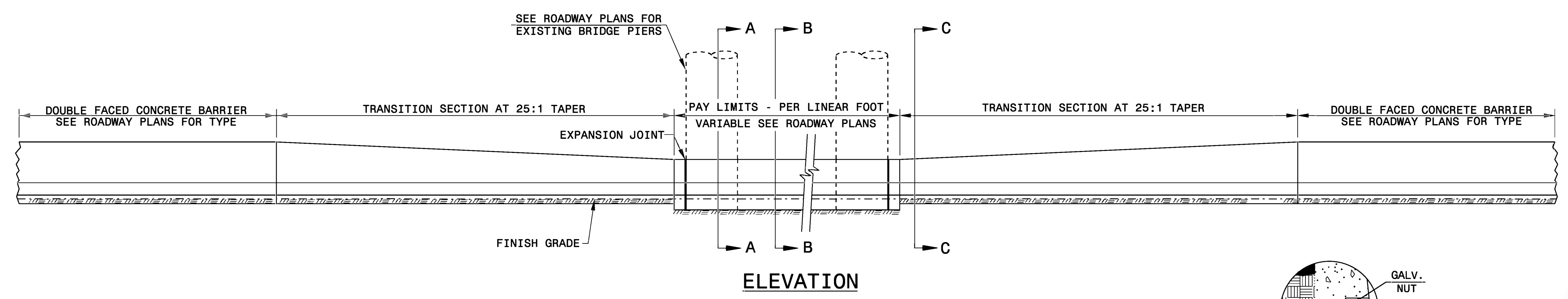
SUBMIT ALTERNATIVE METHODS FOR STEEL FABRICATION PLACEMENT FOR REVIEW AND APPROVAL.

SEE STANDARD DRAWING 854.05 FOR STEEL LAYOUT OF TRANSITION BARRIER.

*THE 2" DIMENSION FROM FINISH GRADE TO THE BASE IS A MINIMUM DIMENSION.

INSET FIRST 1" DIA. GALVANIZED BAR 12'-6" AND SPACE THE REMAINING 1' BARS AT 25'-0".

USE AN APPROVED BONDING SYSTEM IN ACCORDANCE WITH SECTION 1081 OF THE STANDARD SPECIFICATIONS.



Designed by:
Ronald Elton Davenport, Jr.
5/18/2022

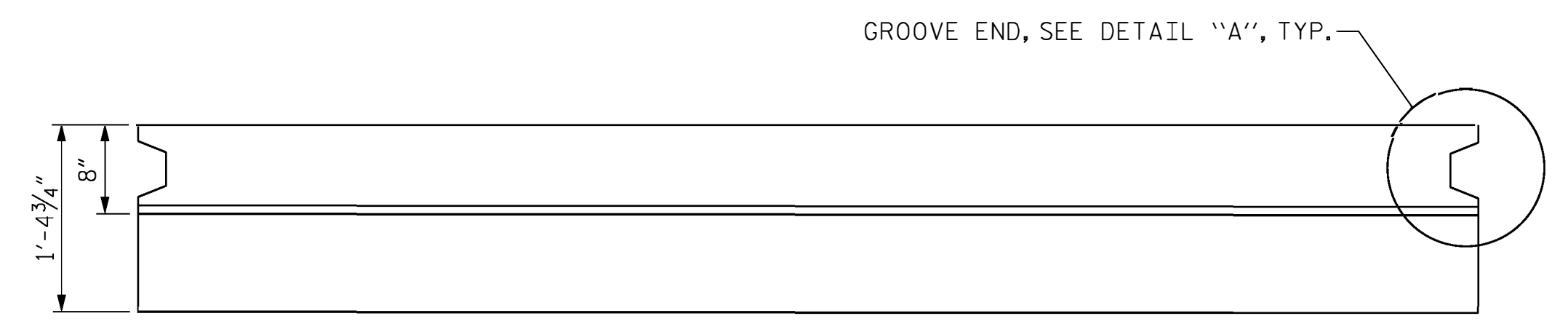
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CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

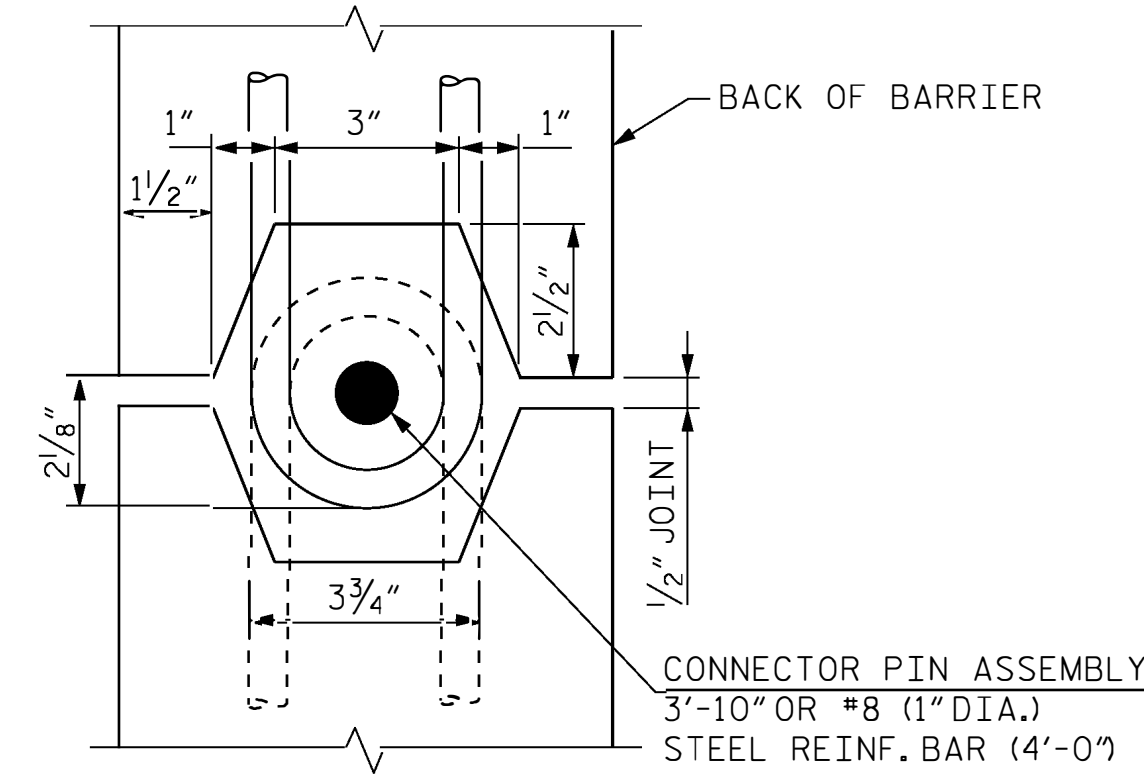
MEDIAN HAZARD PIER PROTECTION

ORIGINAL BY: E.E. WARD DATE: 7-28-03
MODIFIED BY: E.E. WARD DATE: 8-26-04
CHECKED BY: DATE:
FILE SPEC.: \usr\details\stand\transition barrier.dgn

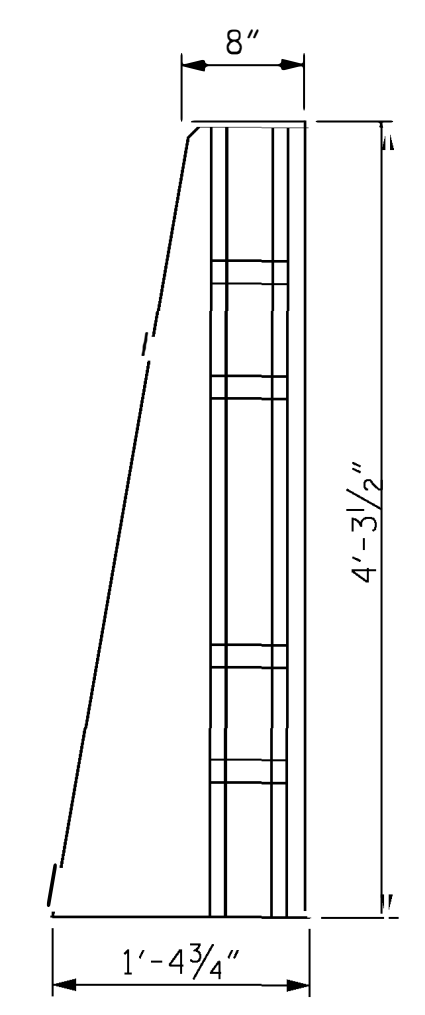
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 J:\overton AT USD-292595



PLAN



DETAIL "A"



SECTION B-B

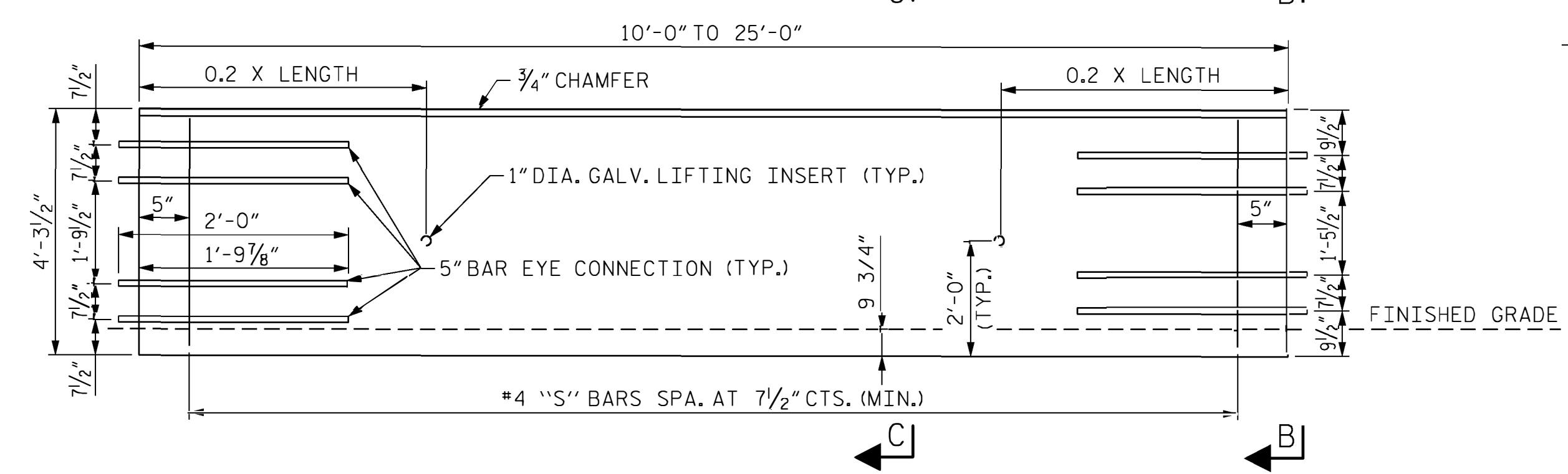


DocuSigned by:
Ronald Elton Davenport, Jr.
F18903847442
5/18/2022

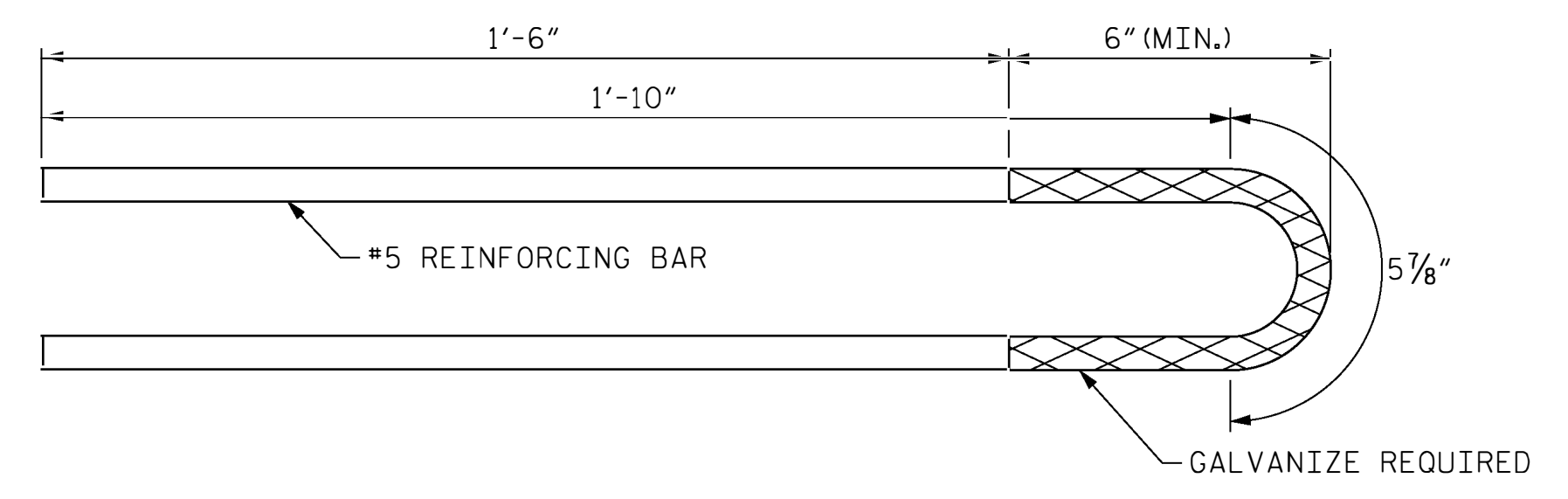
NOTES:

ALL PARTS OF CONNECTOR PIN ASSEMBLY SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-153 SPECIFICATIONS.

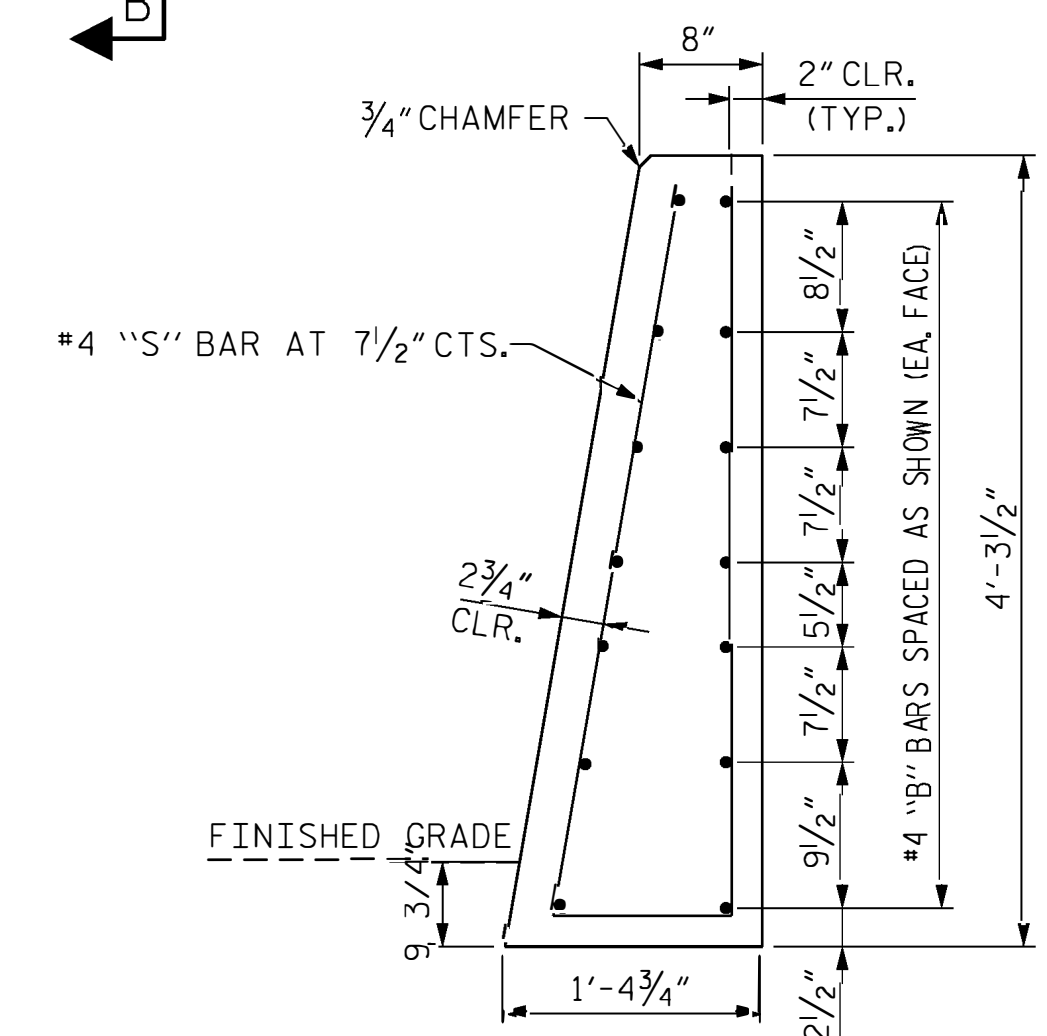
ALL CONCRETE IN PRECAST REINFORCED SINGLE FACE SINGLE SLOPE CONCRETE BARRIER RAIL SHALL BE CLASS AA.



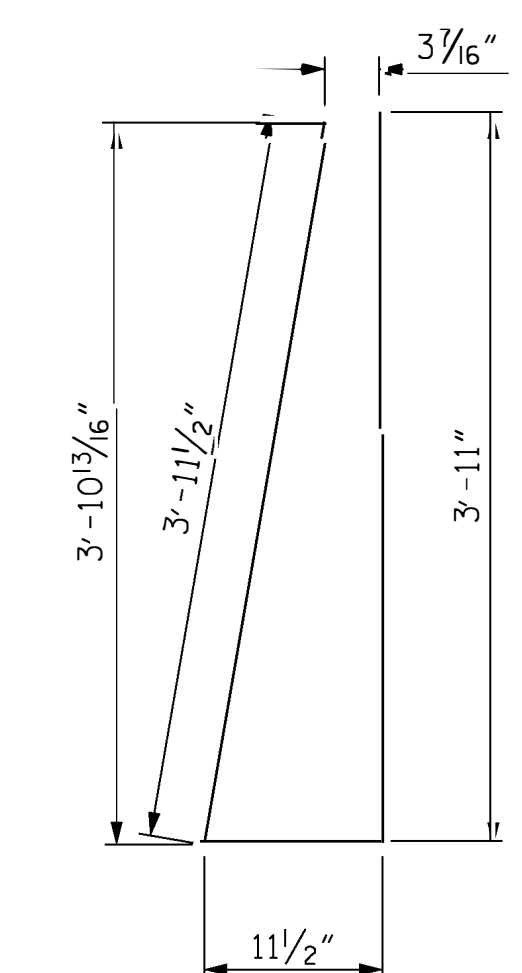
FRONT ELEVATION MIDDLE BARRIER UNIT



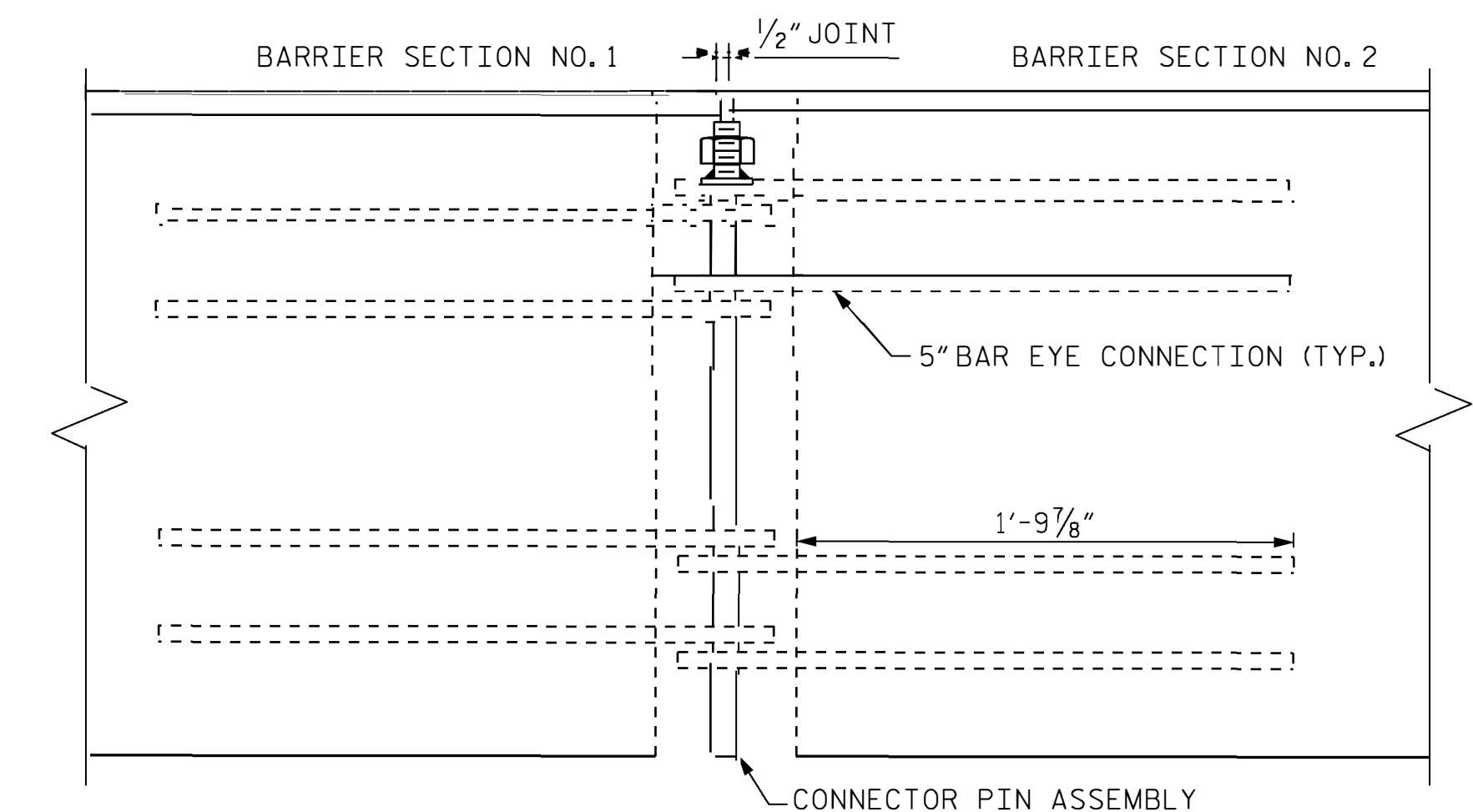
DETAIL OF REINFORCING EYE BAR



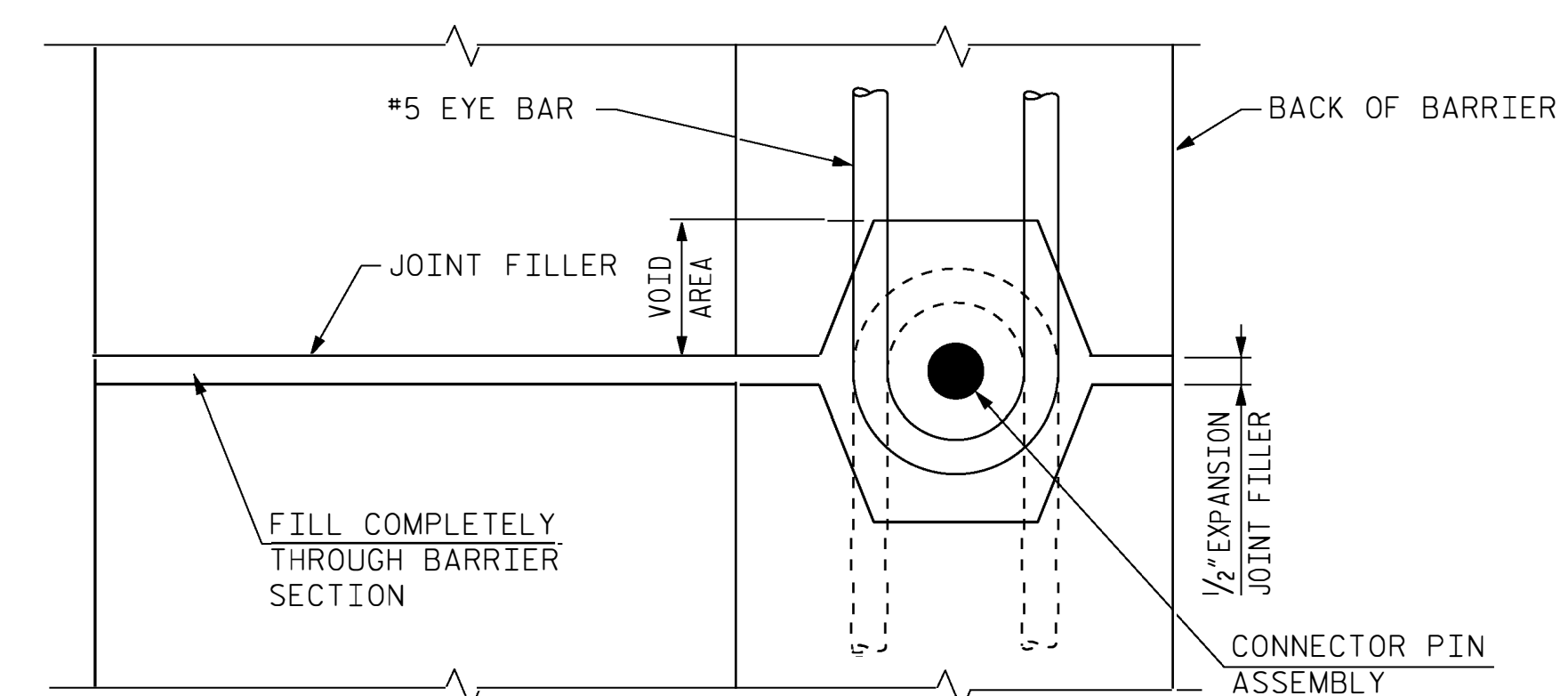
SECTION C-C



"S" BARS

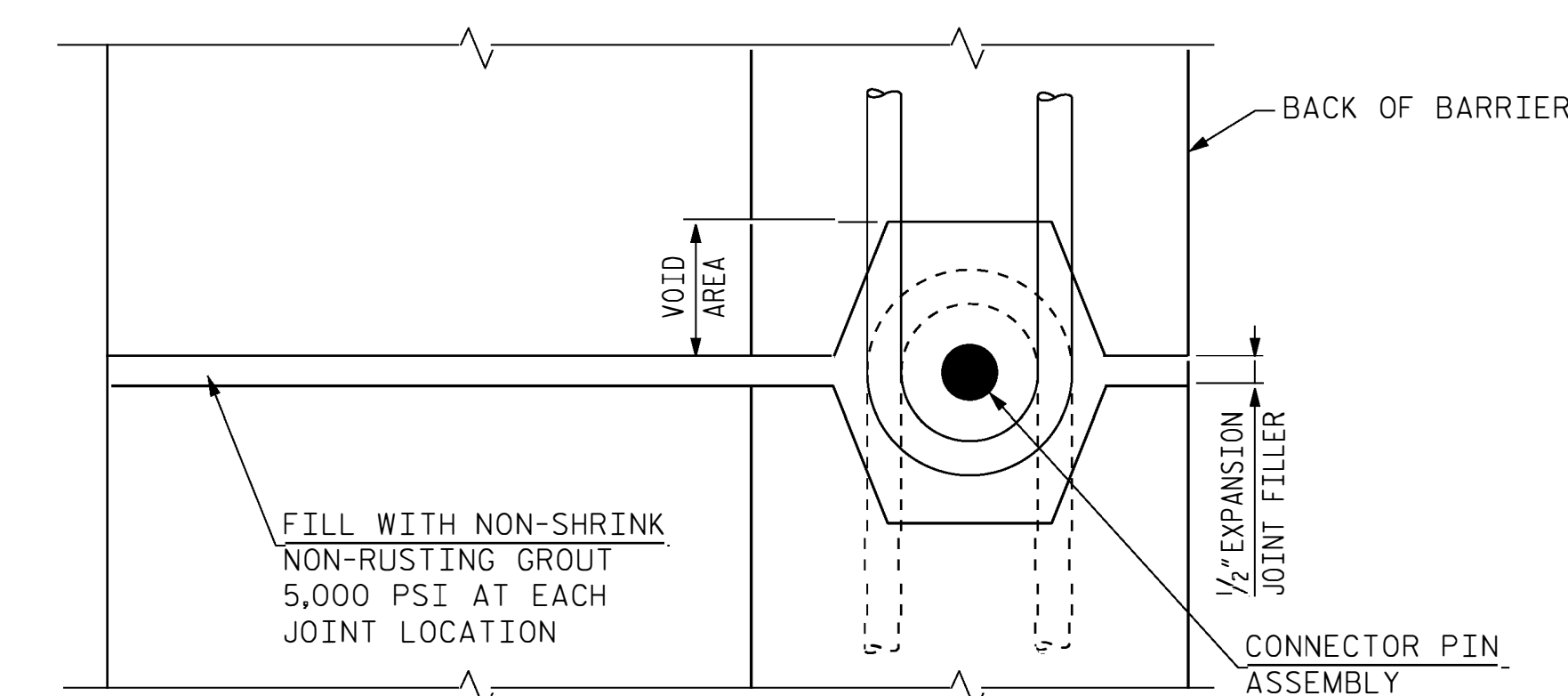


JOINT VIEW ELEVATION

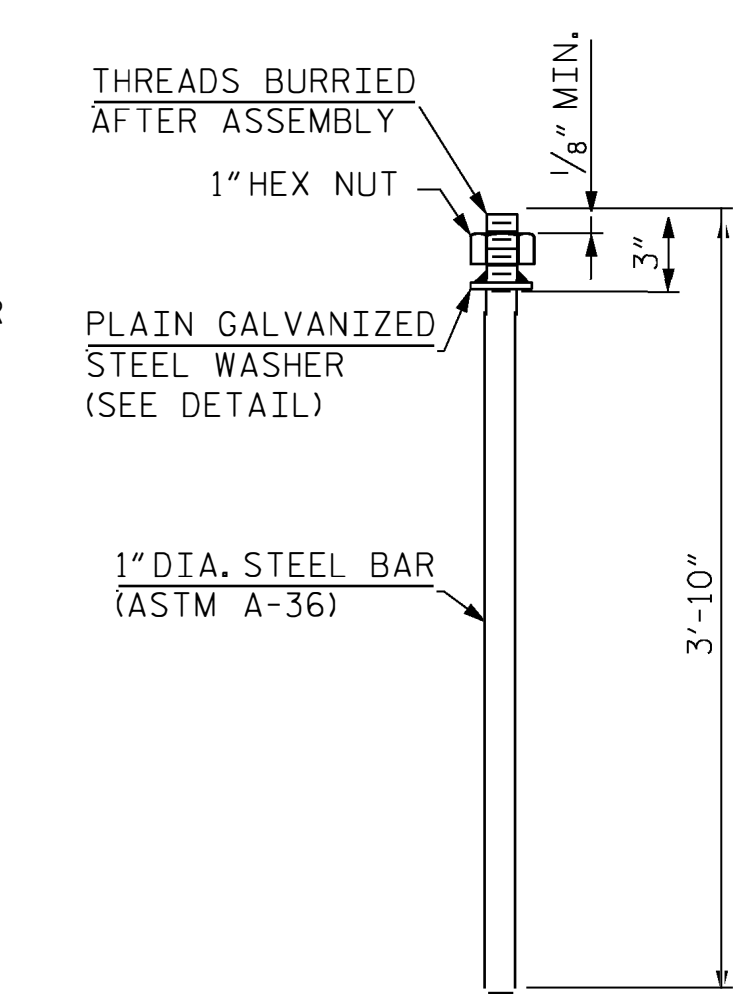


JOINT FILLER DETAIL

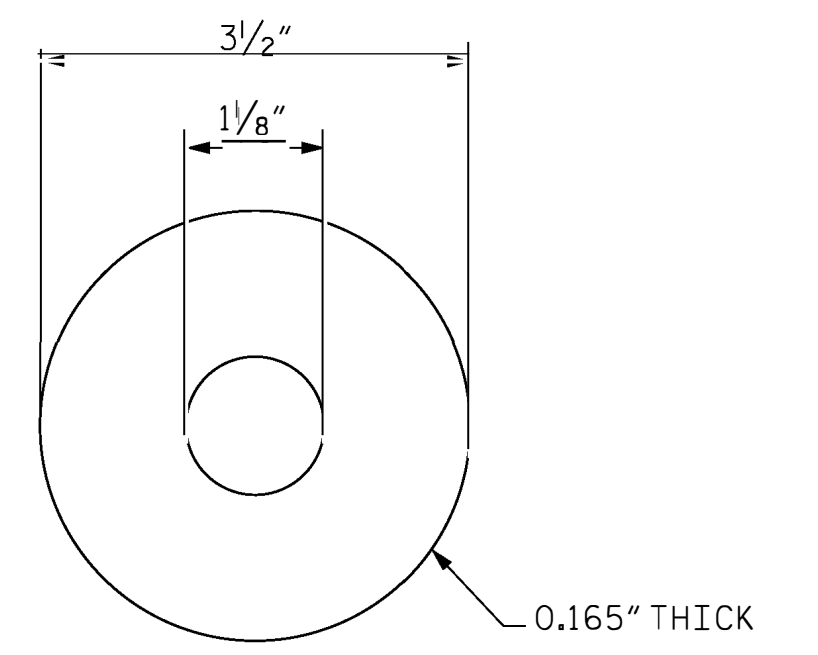
USE JOINT FILLER DETAIL AT 75 FT MAXIMUM SPACINGS



PLAN OF BONDED CONNECTION OF PRECAST UNIT



CONNECTOR PIN ASSEMBLY



PLAIN GALVANIZED STEEL WASHER FOR 1" PIN

CONTRACTS STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
PRECAST REINFORCED SINGLE FACE SINGLE SLOPE CONCRETE BARRIER RAIL	
ORIGINAL BY: J. E. KEENE	DATE: APR 2019
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	kkempf/english/single face single slope barrier rail.dgn

\$\$\$USERNAME\$\$\$
\$\$\$DATE\$\$\$ \$\$\$FILE\$\$\$

14-DEC-2017 10:36 S:\Contracts\2018 Standard Drawings\Special Details\Drawings\Division 8\0862d0301.dgn
Jhowerton AT: CSU-212855

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

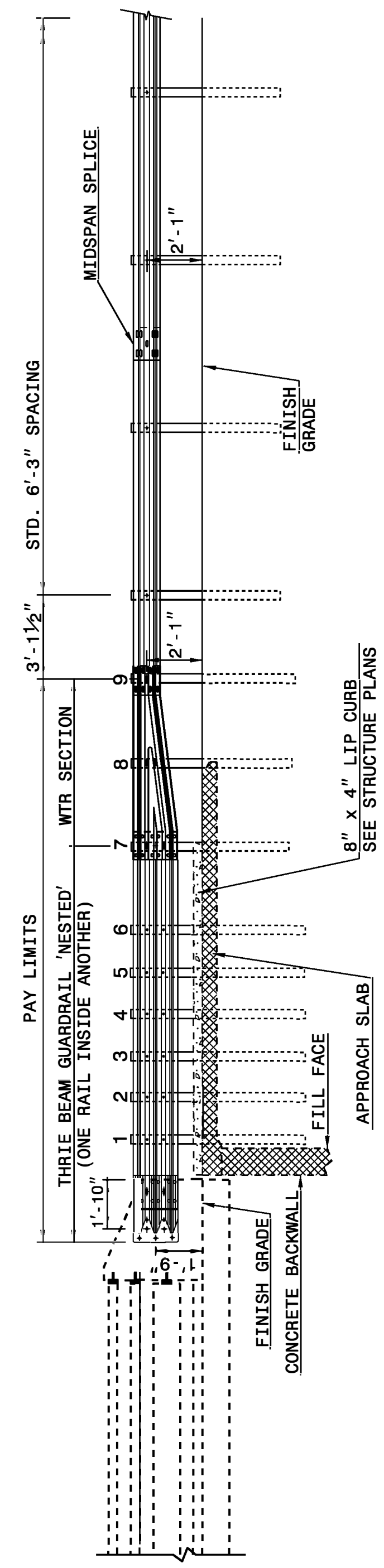
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7 862D03

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

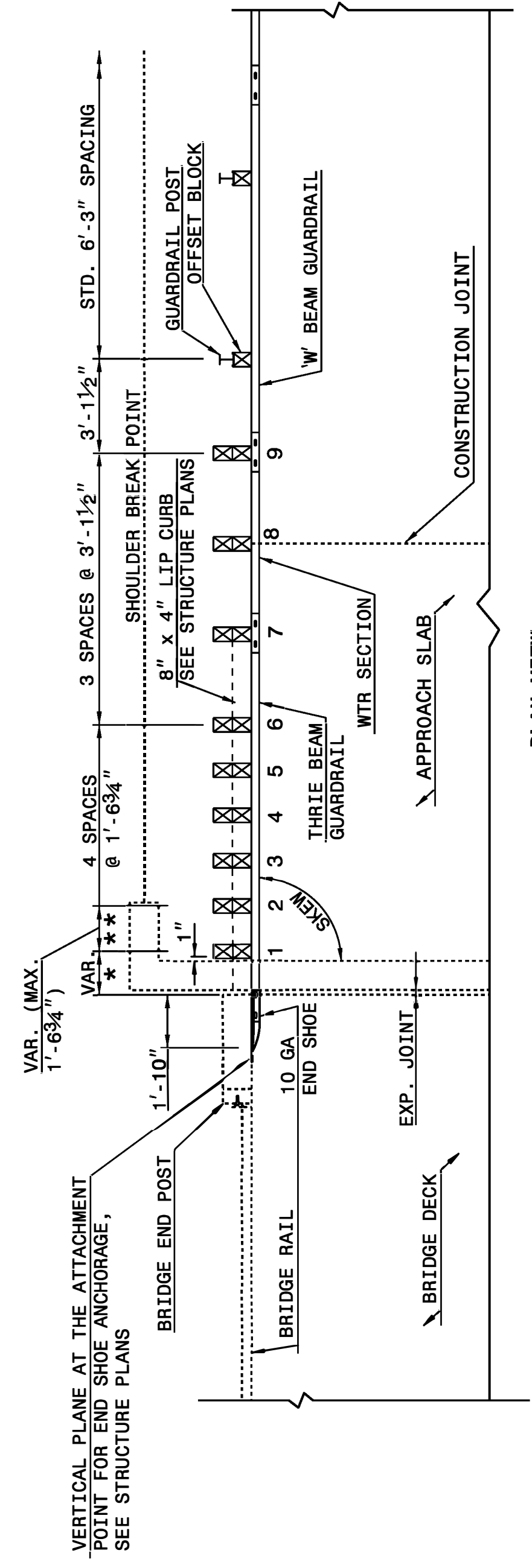
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7 862D03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" X 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

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

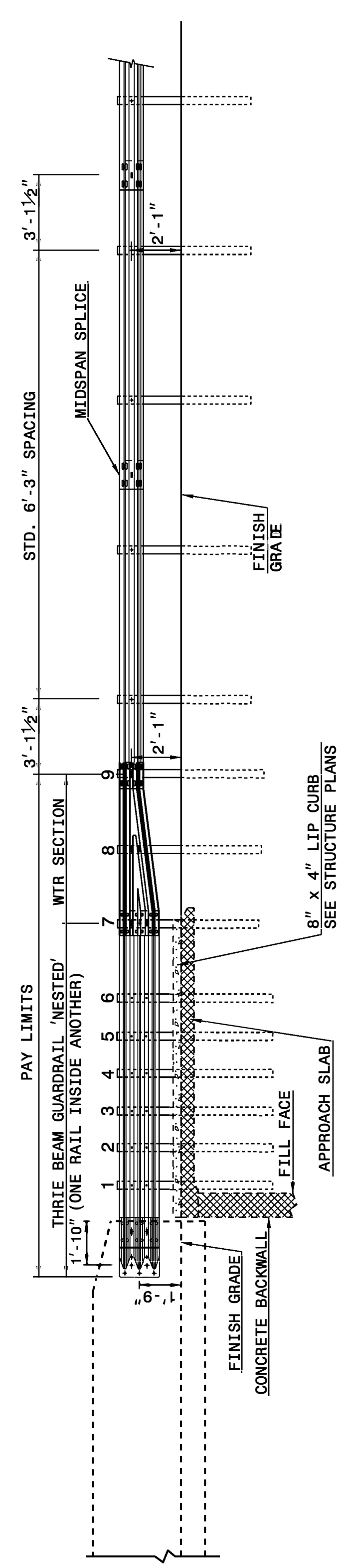
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 862D03

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

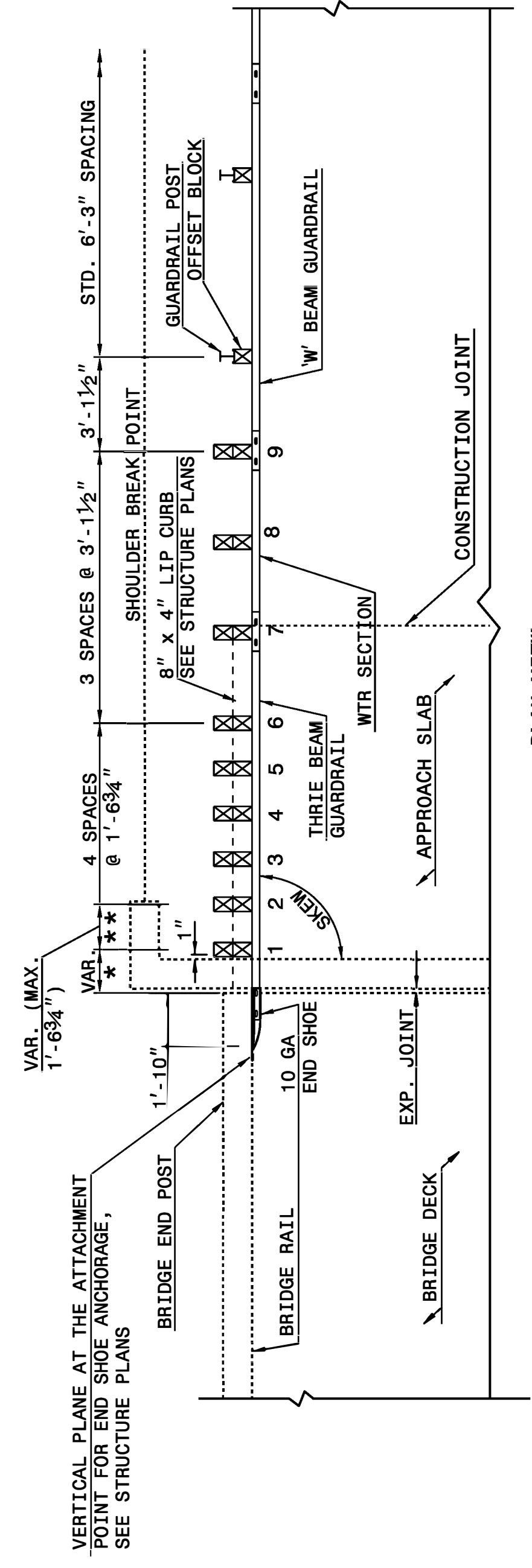
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 862D03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" X 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

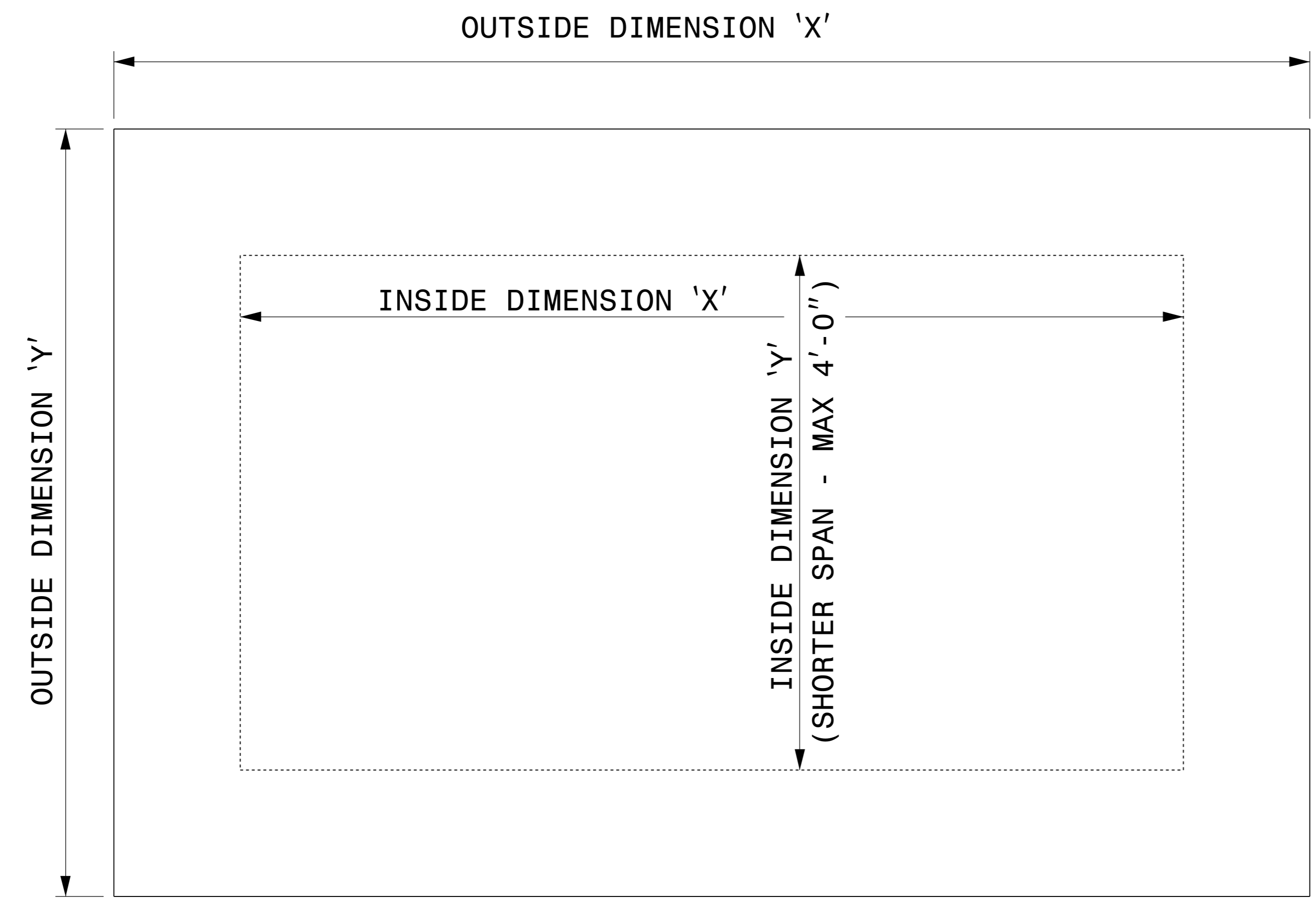
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

CONTRACT STANDARDS AND DEVELOPMENT UNIT Office 919-707-6950 FAX 919-250-4119
SEE TITLE BLOCK
ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:



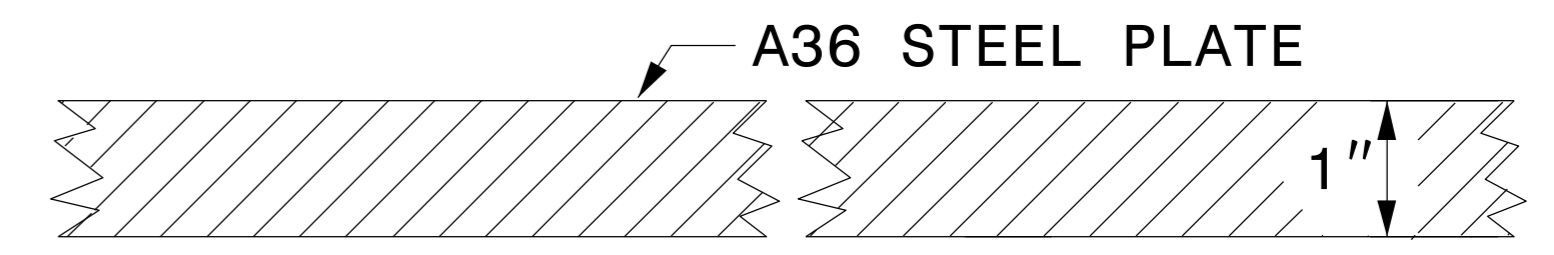
DocuSigned by: Ronald Elton Davenport, Jr. 5/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



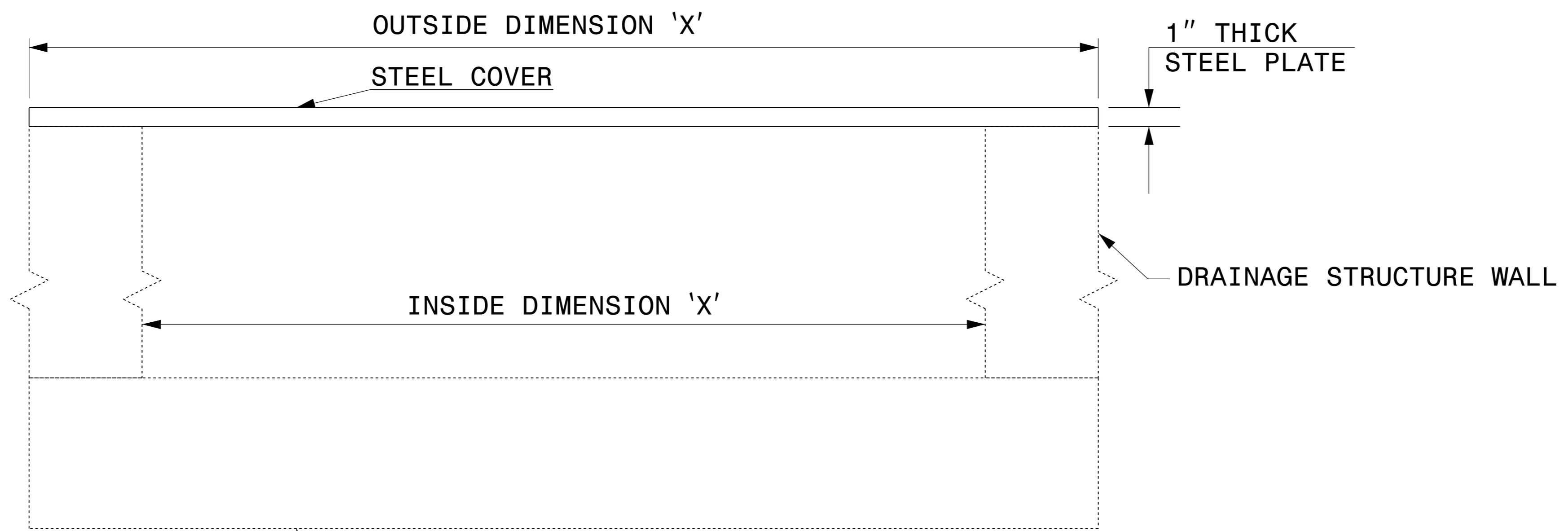
GENERAL NOTES:

- 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
- QUANTITIES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



SECTION VIEW OF STEEL TOP PLATE

PLAN VIEWS



ELEVATION VIEWS



DocuSigned by:
 Ronald Elton Davenport, Jr.
 F8190304474442
 5/18/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

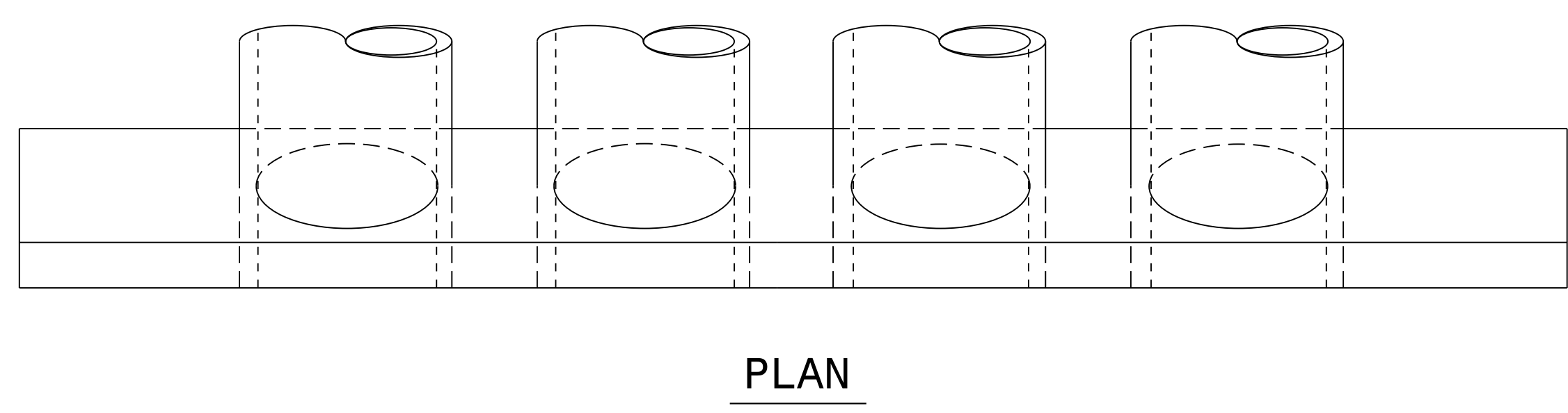
CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE	
ORIGINAL BY: E.E. WARD	DATE: 2-2-98
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: eric:/usr/details/metric/stand/st1cvr2.dgn	

\$\$\$\$\$TIME\$\$\$\$\$
\$\$\$\$\$USER\$\$\$\$\$

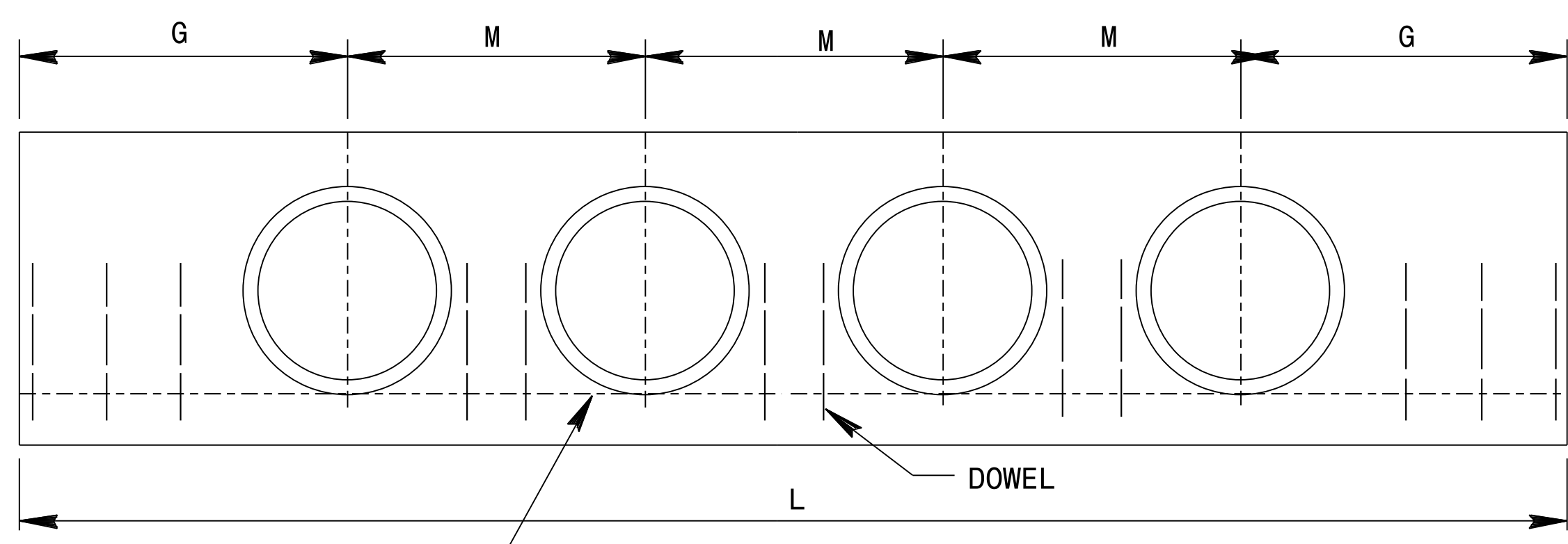
STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
**CONCRETE ENDWALL FOR TRIPLE AND
 QUADRUPLE PIPE CULVERTS**
 15" THRU 48" PIPE - 90° SKEW

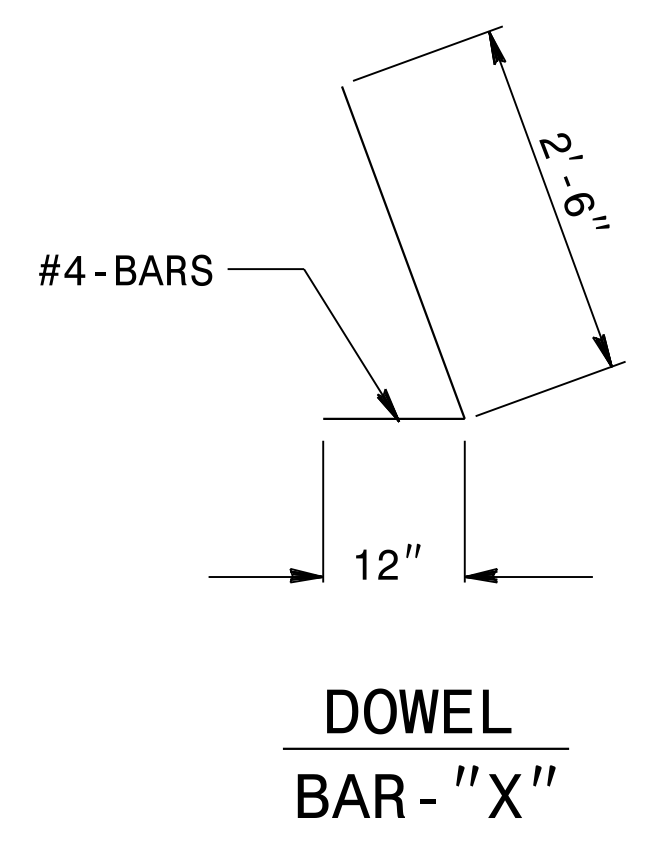
SHEET 1 OF 3
838D01



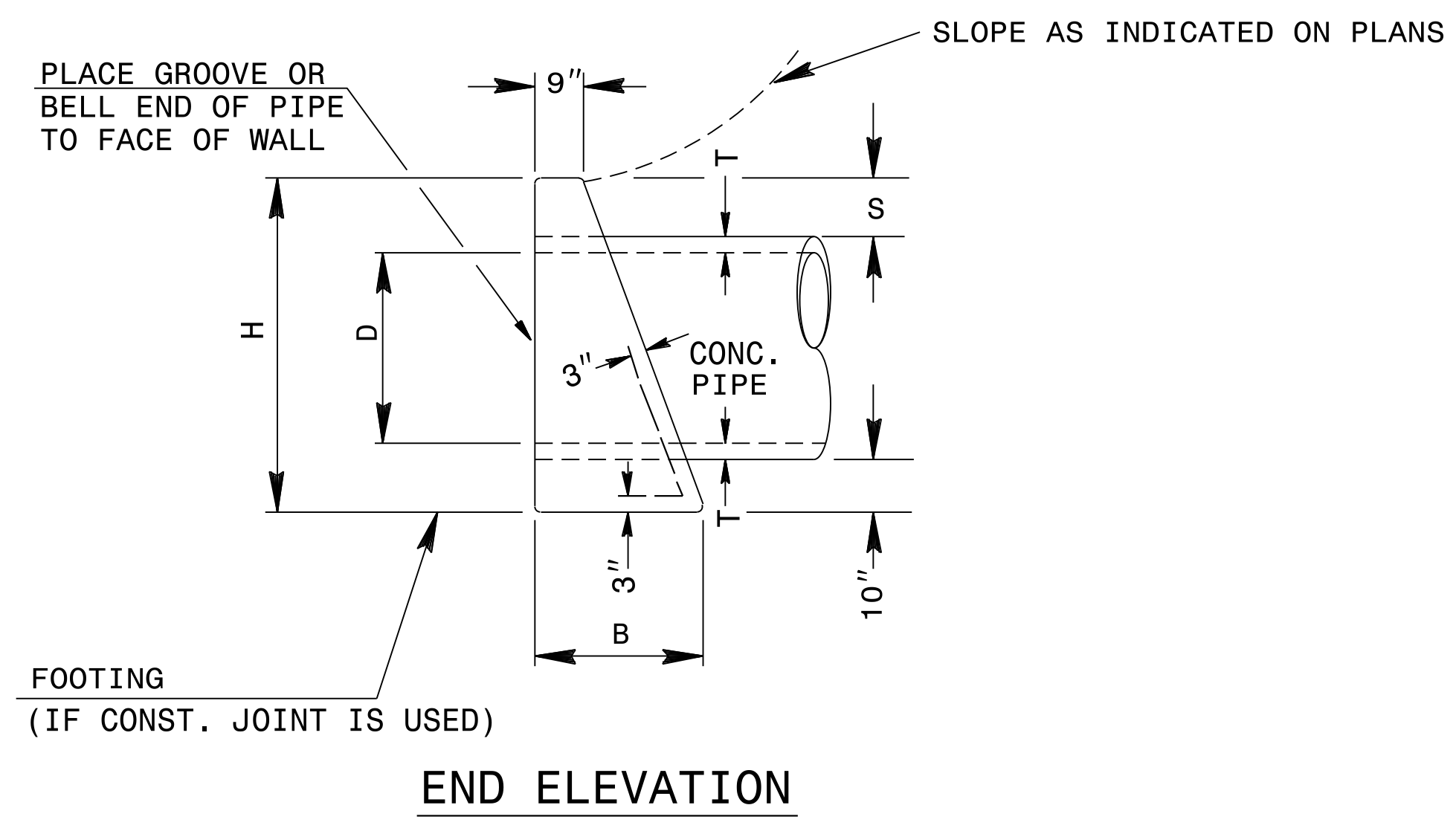
PLAN



ELEVATION



**DOWEL
BAR - "X"**



END ELEVATION

DIMENSIONS AND CONCRETE QUANTITIES										
USING CONCRETE PIPE										
D	COMMON DIMENSIONS					TRIPLE PIPE		QUADRUPLE PIPE		
	H	B	G	T	S	L	YD ³	L	YD ³	M
15"	3'-3"	1'-8"	2'-9"	2 1/4"	9 1/2"	9'-10"	1.3	12'-0"	1.6	2'-2"
18"	3'-7"	1'-10"	3'-2"	2 1/2"	10"	11'-6"	1.6	14'-1"	1.9	2'-7"
24"	4'-2"	2'-1"	4'-0"	3"	10"	14'-10"	2.5	18'-3"	3.0	3'-5"
30"	5'-0"	2'-6"	4'-7"	4 1/4"	11 1/2"	17'-8"	3.9	21'-11"	4.7	4'-3"
36"	5'-8"	2'-8"	5'-6"	4 3/4"	12 1/2"	21'-0"	5.6	26'-0"	6.7	5'-0"
42"	6'-2"	3'-1"	6'-4"	5 1/4"	11 1/2"	24'-4"	7.5	30'-2"	9.0	5'-10"
48"	6'-9"	3'-5"	7'-2"	5 3/4"	11 1/2"	27'-8"	10.0	34'-4"	12.0	6'-8"

* NOTE: SEE ROADWAY STANDARD DRAWING 838.01 SHEET 3 OF 3 FOR GENERAL NOTES

DOWELS IN ENDWALL WITH REINFORCED CONCRETE PIPE																	
LOC.	PIPE DIA.	TRIPLE PIPE						QUADRUPLE PIPE									
		15"	18"	24"	30"	36"	42"	15"	18"	24"	30"	36"	42"	48"			
	BARS	"X"	"X"	"X"	"X"	"X"	Y*	"X"	Y*	"X"	"X"	"X"	"X"	"X"	Y*	"X"	Y*
G	QTY.	2	2	3	3	4	4	5	2	2	3	3	4	4	5		
M(s)	QTY.	2	2	4	4	4	4	6	2	3	3	6	6	6	2	9	2
G	QTY.	2	2	3	3	4	4	5		2	2	3	3	4	5		
	TOTAL LBS.	14	14	23	23	28	100	119		17	17	28	28	33	122	147	

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

ENGLISH DETAIL DRAWING FOR
**CONCRETE ENDWALL FOR TRIPLE AND
 QUADRUPLE PIPE CULVERTS**
 15" THRU 48" PIPE - 90° SKEW

SHEET 1 OF 3
838D01

03-MAY-2018 10:22 S:\Contracts\Projects\Special\Details\kempf\english\838d01.dwg triple and quad pipes.dgn J:\power\ton AT_CSD-252595



Drawn by:
 Ronald Elton Davenport
 5/18/2022

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 Office 919-707-6950 FAX 919-250-4119

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ORIGINAL BY: E.E. WARD DATE: _____
 MODIFIED BY: K.A. Kempf DATE: _____
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: details/kkempf/english/838d01.dwg

09-JAN-2019 07:36 S:\Contracts\Special Details\Jhove-ton\838d02 15in thru 48in 60deg skew.dgn Jhove-ton AT USD-292595

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

ENGLISH DETAIL DRAWING FOR
CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS
15" THRU 48" PIPE

SHEET 2 OF 2
838d02s1

GENERAL NOTES:

- * ALL CORNERS TO BE CHAMFERED 1".
- * THE CONTRACTOR WILL BE REQUIRED TO PLACE 2 - #6 BARS "Y" IN THE TOP OF ALL ENDWALLS FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL.
- * FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
- * WALL THICKNESS (T) SHOWN IS NOT TO BE INTERPRETED TO MEAN THE THICKNESS ACCEPTABLE, BUT ARE USED ONLY IN COMPUTING ENDWALL QUANTITIES.
- * IF CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE, BAR X (DOWELS SHALL BE PLACED IN THE BASE AS SHOWN ON PLANS. SPACING OF BARS TO BE APPROXIMATELY 12" CENTERS UNLESS ENGINEER DIRECTS OTHERWISE.
- * WHEN CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE AND POURS BASE SEPARATELY, THE TOP BASE SHALL BE LEFT ROUGH.
- * WHEN SKEW ANGLE OF PIPE IS OVER/UNDER 30° USE G-1 DIMENSION FOR 30° PLUS/MINUS 3" FOR EACH 5° OVER/UNDER 30°.
- G2 DIMENSION WILL BE THE NEW DIMENSION DIVIDED BY THE COSINE OF THE ANGLE OF PIPE SKEW.
- * CLASS "B" CONCRETE SHALL BE USED.

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

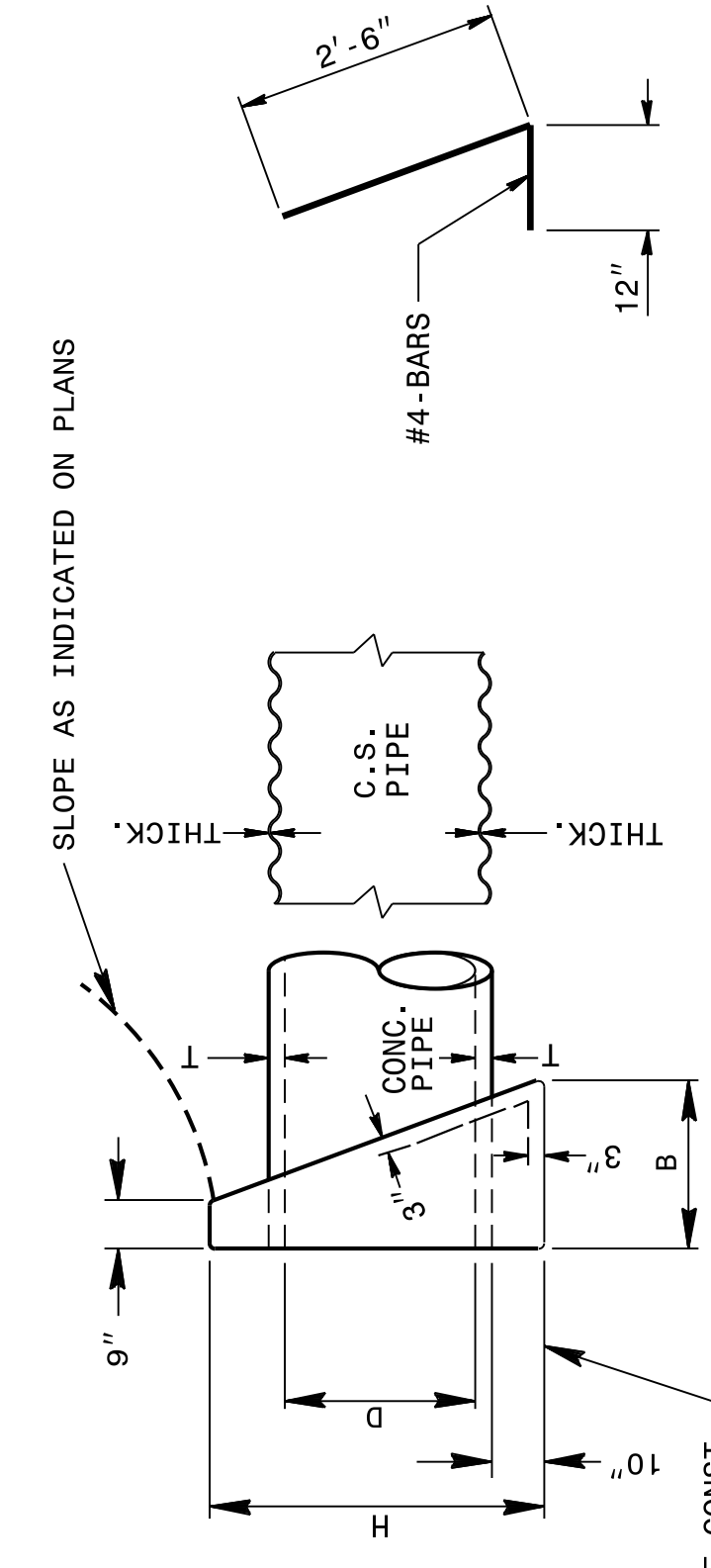
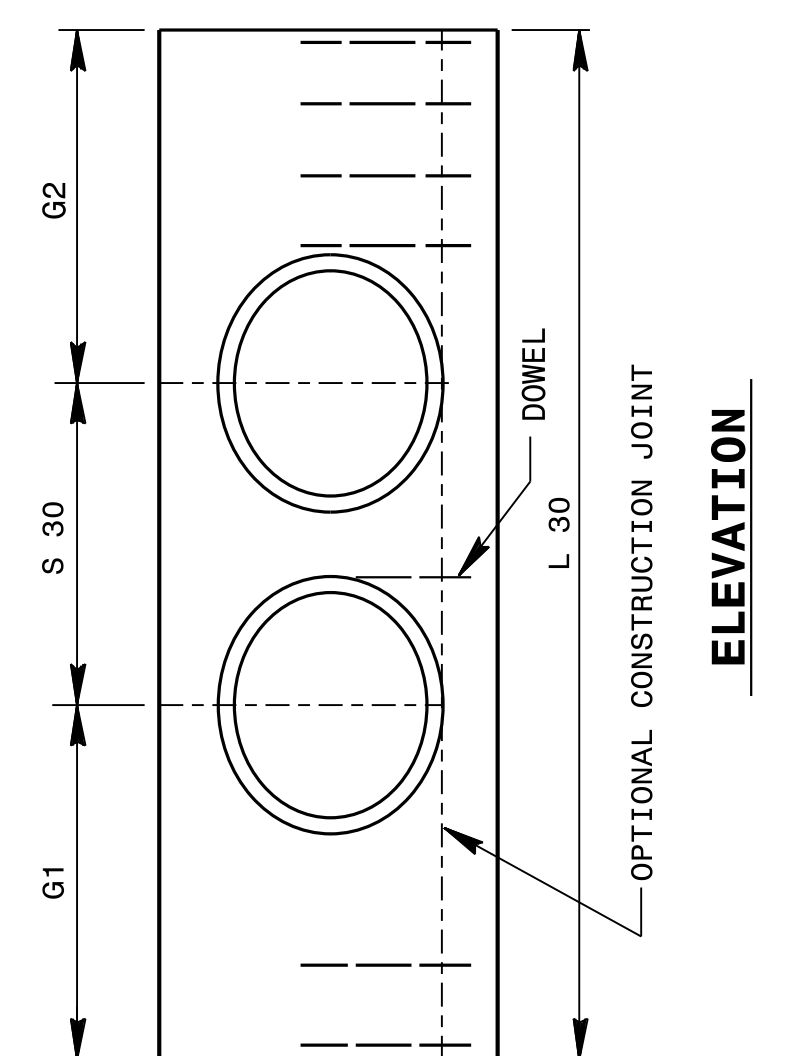
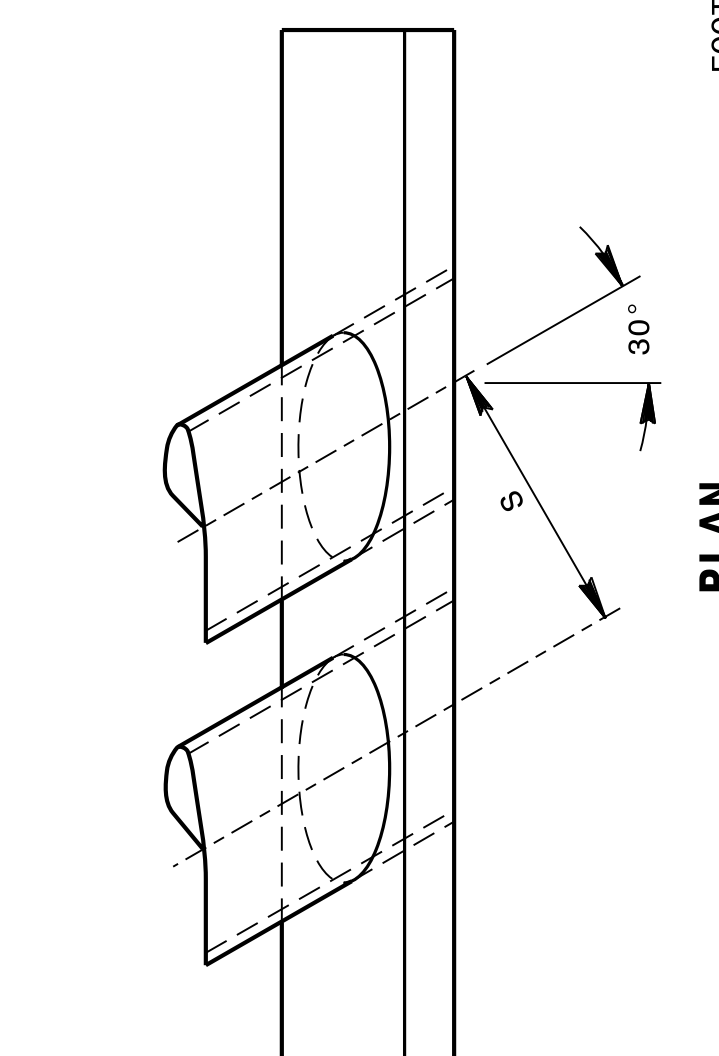
ENGLISH DETAIL DRAWING FOR
CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS
15" THRU 48" PIPE

SHEET 2 OF 2
838p02s1

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

ENGLISH DETAIL DRAWING FOR
CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS
15" THRU 48" PIPE 60° OR 120° SKEW

SHEET 1 OF 2
838d02s1



END ELEVATION

DOWELS IN ENDWALL WITH REINFORCED CONCRETE PIPE															
PIPE DIA.	SINGLE PIPE			DOUBLE PIPE			SINGLE PIPE			DOUBLE PIPE					
	LOC.	15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"
BARS	"X"	"X"	"X"	"X"	"X"	"X"	"X"	Y*	"X"	"X"	"X"	"X"	"X"	"X"	Y*
G1 QTY.	2	2	2	2	3	3	4	4	2	2	2	2	2	3	3
S QTY.	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-
G2 QTY.	3	4	4	5	6	6	7	7	3	4	4	5	6	6	7
TOT. lbs.	11.7	13.9	13.9	16.3	20.9	20.9	25.6	25.6	11.7	13.9	13.9	20.9	25.6	25.6	102.1

DOWELS IN ENDWALL WITH CORRUGATED STEEL PIPE															
PIPE DIA.	SINGLE PIPE			DOUBLE PIPE			SINGLE PIPE			DOUBLE PIPE					
	LOC.	16"	18"	24"	32"	36"	40"	48"	16"	18"	24"	32"	36"	40"	48"
BARS	"X"	"X"	"X"	"X"	"X"	"X"	Y*	"X"	"X"	"X"	"X"	"X"	"X"	"X"	Y*
G1 QTY.	2	2	2	2	3	3	4	4	2	2	2	2	2	3	3
S QTY.	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-
G2 QTY.	3	3	4	5	5	6	7	7	3	3	4	5	5	6	7
TOT. lbs.	11.7	11.7	13.9	16.3	18.5	18.5	23.1	23.1	11.7	5.3	13.9	16.3	23.1	23.1	80.7

DIMENSIONS AND CONCRETE QUANTITIES

D	USING CONCRETE PIPE						USING CORRUGATED STEEL PIPE															
	COMMON DIMS.			SINGLE PIPE			DOUBLE PIPE			SINGLE PIPE			DOUBLE PIPE									
	H	B	T	G1	G2	S	S	30	L	30	YD ³	H	B	G1	G2	S	S	30	L	30	YD ³	
15"	3'-4"	1'-6"	17/8"	2'-9"	3'-2"	2'-2"	2'-9"	3'-2"	3'-2"	3'-2"	1.054	3'-0"	1'-6"	2'-6"	2'-11"	5'-5"	0.616	2'-6"	2'-11"	2'-4"	7'-9"	0.848
18"	3'-7"	1'-10"	2"	3'-2"	3'-8 1/4"	2'-7"	2'-11 3/4"	9'-10"	1.390	3'-3"	1'-8"	2'-11"	3'-4"	6'-3"	0.816	2'-11 1/8"	3'-4 1/8"	2'-3 1/2"	2'-8"	8'-11"	1.109	
24"	4'-2"	2'-1"	2 1/2"	4'-0"	4'-8"	3'-5"	3'-11 1/2"	12'-8"	2.207	3'-9"	1'-11"	3'-8"	4'-3"	7'-11"	1.282	3'-8 1/4"	4'-3 1/4"	3'-0"	3'-5 1/2"	11'-5"	1.747	
30"	4'-9"	2'-5"	2 3/4"	4'-7"	5'-4"	4'-3"	4'-10 3/4"	14'-10"	3.186	4'-3"	2'-2"	4'-5"	5'-1"	9'-6"	1.868	4'-5 1/8"	5'-1 1/8"	3'-8"	4'-2 3/4"	13'-9"	2.551	
36"	5'-3"	2'-8"	3"	5'-6"	6'-4"	5'-0"	5'-9 1/4"	17'-8"	4.447	4'-9"	2'-5"	5'-2"	6'-0"	11'-2"	2.621	5'-2 3/8"	6'-0 3/8"	9'-6"	5'-2 1/4"	16'-5"	3.596	
42"	5'-10"	2'-11"	3 1/2"	6'-4"	7'-4"	5'-10"	6'-8 3/4"	20'-5"	6.012	5'-3"	2'-8"	5'-11"	6'-10"	12'-9"	3.517	5'-11 1/4"	6'-10 1/8"	5'-3"	6'-0 3/4"	18'-10"	4.820	
48"	6'-5"	3'-3"	4"	7'-2"	8'-3 1/4"	6'-8"	7'-8 1/4"	23'-2"	8.062	5'-9"	2'-11"	6'-8"	7'-8"	14'-4"	4.591	6'-6 3/8"	7'-6 3/8"	6'-0"	6'-11 1/4"	21'-4"	6.320	

SHEET 1 OF 2
838p02s1

Disigned by:
Ronald Elton Davenport, Jr.
 5/18/2022

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ORIGINAL BY: STD.NO.838.01 DATE: 4-17-99
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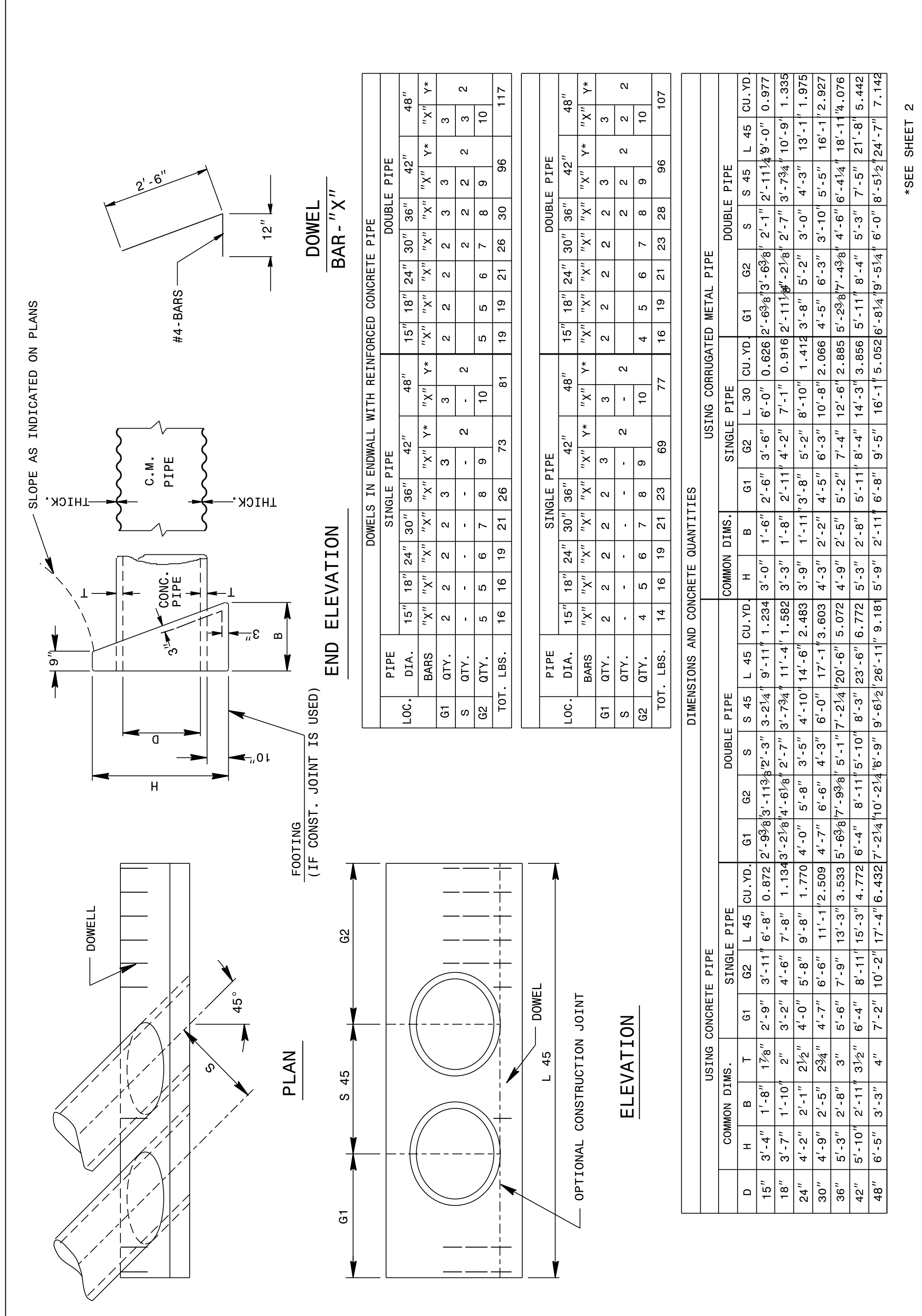
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STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
 ENGLISH DETAIL DRAWING FOR DOUBLE PIPE CULVERTS 15" THRU 48" PIPE
 SHEET 2 OF 2
838D03

GENERAL NOTES:
 ALL CORNERS TO BE CHAMFERED 1".
 * THE CONTRACTOR WILL BE REQUIRED TO PLACE 2 - #6 BARS "Y" IN THE TOP OF ALL ENDWALLS FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL.
 FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
 WALL THICKNESS (T) SHOWN IS NOT TO BE INTERPRETED TO MEAN THE THICKNESS ACCEPTABLE, BUT ARE USED ONLY IN COMPUTING ENDWALL QUANTITIES.
 IF CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE, BAR X (DOWELS SHALL BE PLACED IN THE BASE AS SHOWN ON PLANS. SPACING OF BARS TO BE APPROXIMATELY 12" CENTER UNLESS ENGINEER DIRECTS OTHERWISE.
 WHEN CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE AND POURS BASE SEPARATELY, THE TOP BASE SHALL BE LEFT ROUGH.
 WHEN SKEW ANGLE OF PIPE IS OVER 45° USE G-1 DIMENSION FOR 45° PLUS 6" FOR EACH 5° OVER 45°. G2 DIMENSION WILL BE THE NEW DIMENSION DIVIDED BY THE COSINE OF THE ANGLE OF PIPE SKEW.
 CLASS "B" CONCRETE SHALL BE USED.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
 ENGLISH DETAIL DRAWING FOR CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS 15" THRU 48" PIPE
 SHEET 2 OF 2
838D03

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
 ENGLISH DETAIL DRAWING FOR CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS 15" THRU 48" PIPE 45° OR 135° SKEW
 SHEET 1 OF 2
838D03



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
 ENGLISH DETAIL DRAWING FOR CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS 15" THRU 48" PIPE 45° OR 135° SKEW
 SHEET 1 OF 2
838D03

DIMENSIONS AND CONCRETE QUANTITIES											
USING CONCRETE PIPE				USING CORRUGATED METAL PIPE							
PIPE DIA.	LOC.	COMMON DIMS.	CONCRETE QUANT.	PIPE DIA.	LOC.	COMMON DIMS.	CONCRETE QUANT.	PIPE DIA.	LOC.	COMMON DIMS.	CONCRETE QUANT.
15"	G1	1'-10"	1.234	15"	G1	1'-10"	1.234	15"	G1	1'-10"	1.234
15"	G2	1'-11"	1.234	15"	G2	1'-11"	1.234	15"	G2	1'-11"	1.234
15"	G1	1'-11"	1.234	15"	G1	1'-11"	1.234	15"	G1	1'-11"	1.234
15"	G2	1'-12"	1.234	15"	G2	1'-12"	1.234	15"	G2	1'-12"	1.234
15"	G1	1'-12"	1.234	15"	G1	1'-12"	1.234	15"	G1	1'-12"	1.234
15"	G2	1'-13"	1.234	15"	G2	1'-13"	1.234	15"	G2	1'-13"	1.234
15"	G1	1'-13"	1.234	15"	G1	1'-13"	1.234	15"	G1	1'-13"	1.234
15"	G2	1'-14"	1.234	15"	G2	1'-14"	1.234	15"	G2	1'-14"	1.234
15"	G1	1'-14"	1.234	15"	G1	1'-14"	1.234	15"	G1	1'-14"	1.234
15"	G2	1'-15"	1.234	15"	G2	1'-15"	1.234	15"	G2	1'-15"	1.234
15"	G1	1'-15"	1.234	15"	G1	1'-15"	1.234	15"	G1	1'-15"	1.234
15"	G2	1'-16"	1.234	15"	G2	1'-16"	1.234	15"	G2	1'-16"	1.234
15"	G1	1'-16"	1.234	15"	G1	1'-16"	1.234	15"	G1	1'-16"	1.234
15"	G2	1'-17"	1.234	15"	G2	1'-17"	1.234	15"	G2	1'-17"	1.234
15"	G1	1'-17"	1.234	15"	G1	1'-17"	1.234	15"	G1	1'-17"	1.234
15"	G2	1'-18"	1.234	15"	G2	1'-18"	1.234	15"	G2	1'-18"	1.234
15"	G1	1'-18"	1.234	15"	G1	1'-18"	1.234	15"	G1	1'-18"	1.234
15"	G2	1'-19"	1.234	15"	G2	1'-19"	1.234	15"	G2	1'-19"	1.234
15"	G1	1'-19"	1.234	15"	G1	1'-19"	1.234	15"	G1	1'-19"	1.234
15"	G2	1'-20"	1.234	15"	G2	1'-20"	1.234	15"	G2	1'-20"	1.234
15"	G1	1'-20"	1.234	15"	G1	1'-20"	1.234	15"	G1	1'-20"	1.234
15"	G2	1'-21"	1.234	15"	G2	1'-21"	1.234	15"	G2	1'-21"	1.234
15"	G1	1'-21"	1.234	15"	G1	1'-21"	1.234	15"	G1	1'-21"	1.234
15"	G2	1'-22"	1.234	15"	G2	1'-22"	1.234	15"	G2	1'-22"	1.234
15"	G1	1'-22"	1.234	15"	G1	1'-22"	1.234	15"	G1	1'-22"	1.234
15"	G2	1'-23"	1.234	15"	G2	1'-23"	1.234	15"	G2	1'-23"	1.234
15"	G1	1'-23"	1.234	15"	G1	1'-23"	1.234	15"	G1	1'-23"	1.234
15"	G2	1'-24"	1.234	15"	G2	1'-24"	1.234	15"	G2	1'-24"	1.234
15"	G1	1'-24"	1.234	15"	G1	1'-24"	1.234	15"	G1	1'-24"	1.234
15"	G2	1'-25"	1.234	15"	G2	1'-25"	1.234	15"	G2	1'-25"	1.234
15"	G1	1'-25"	1.234	15"	G1	1'-25"	1.234	15"	G1	1'-25"	1.234
15"	G2	1'-26"	1.234	15"	G2	1'-26"	1.234	15"	G2	1'-26"	1.234
15"	G1	1'-26"	1.234	15"	G1	1'-26"	1.234	15"	G1	1'-26"	1.234
15"	G2	1'-27"	1.234	15"	G2	1'-27"	1.234	15"	G2	1'-27"	1.234
15"	G1	1'-27"	1.234	15"	G1	1'-27"	1.234	15"	G1	1'-27"	1.234
15"	G2	1'-28"	1.234	15"	G2	1'-28"	1.234	15"	G2	1'-28"	1.234
15"	G1	1'-28"	1.234	15"	G1	1'-28"	1.234	15"	G1	1'-28"	1.234
15"	G2	1'-29"	1.234	15"	G2	1'-29"	1.234	15"	G2	1'-29"	1.234
15"	G1	1'-29"	1.234	15"	G1	1'-29"	1.234	15"	G1	1'-29"	1.234
15"	G2	1'-30"	1.234	15"	G2	1'-30"	1.234	15"	G2	1'-30"	1.234
15"	G1	1'-30"	1.234	15"	G1	1'-30"	1.234	15"	G1	1'-30"	1.234
15"	G2	1'-31"	1.234	15"	G2	1'-31"	1.234	15"	G2	1'-31"	1.234
15"	G1	1'-31"	1.234	15"	G1	1'-31"	1.234	15"	G1	1'-31"	1.234
15"	G2	1'-32"	1.234	15"	G2	1'-32"	1.234	15"	G2	1'-32"	1.234
15"	G1	1'-32"	1.234	15"	G1	1'-32"	1.234	15"	G1	1'-32"	1.234
15"	G2	1'-33"	1.234	15"	G2	1'-33"	1.234	15"	G2	1'-33"	1.234
15"	G1	1'-33"	1.234	15"	G1	1'-33"	1.234	15"	G1	1'-33"	1.234
15"	G2	1'-34"	1.234	15"	G2	1'-34"	1.234	15"	G2	1'-34"	1.234
15"	G1	1'-34"	1.234	15"	G1	1'-34"	1.234	15"	G1	1'-34"	1.234
15"	G2	1'-35"	1.234	15"	G2	1'-35"	1.234	15"	G2	1'-35"	1.234
15"	G1	1'-35"	1.234	15"	G1	1'-35"	1.234	15"	G1	1'-35"	1.234
15"	G2	1'-36"	1.234	15"	G2	1'-36"	1.234	15"	G2	1'-36"	1.234
15"	G1	1'-36"	1.234	15"	G1	1'-36"	1.234	15"	G1	1'-36"	1.234
15"	G2	1'-37"	1.234	15"	G2	1'-37"	1.234	15"	G2	1'-37"	1.234
15"	G1	1'-37"	1.234	15"	G1	1'-37"	1.234	15"	G1	1'-37"	1.234
15"	G2	1'-38"	1.234	15"	G2	1'-38"	1.234	15"	G2	1'-38"	1.234
15"	G1	1'-38"	1.234	15"	G1	1'-38"	1.234	15"	G1	1'-38"	1.234
15"	G2	1'-39"	1.234	15"	G2	1'-39"	1.234	15"	G2	1'-39"	1.234
15"	G1	1'-39"	1.234	15"	G1	1'-39"	1.234	15"	G1	1'-39"	1.234
15"	G2	1'-40"	1.234	15"	G2	1'-40"	1.234	15"	G2	1'-40"	1.234
15"	G1	1'-40"	1.234	15"	G1	1'-40"	1.234	15"	G1	1'-40"	1.234
15"	G2	1'-41"	1.234	15"	G2	1'-41"	1.234	15"	G2	1'-41"	1.234
15"	G1	1'-41"	1.234	15"	G1	1'-41"	1.234	15"	G1	1'-41"	1.234
15"	G2	1'-42"	1.234	15"	G2	1'-42"	1.234	15"	G2	1'-42"	1.234
15"	G1	1'-42"	1.234	15"	G1	1'-42"	1.234	15"	G1	1'-42"	1.234
15"	G2	1'-43"	1.234	15"	G2	1'-43"	1.234	15"	G2	1'-43"	1.234
15"	G1	1'-43"	1.234	15"	G1	1'-43"	1.234	15"	G1	1'-43"	1.234
15"	G2	1'-44"	1.234	15"	G2	1'-44"	1.234	15"	G2	1'-44"	1.234
15"	G1	1'-44"	1.234	15"	G1	1'-44"	1.234	15"	G1	1'-44"	1.234
15"	G2	1'-45"	1.234	15"	G2	1'-45"	1.234	15"	G2	1'-45"	1.234
15"	G1	1'-45"	1.234	15"	G1	1'-45"	1.234	15"	G1	1'-45"	1.234
15"	G2	1'-46"	1.234	15"	G2	1'-46"	1.234	15"	G2	1'-46"	1.234
15"	G1	1'-46"	1.234	15"	G1	1'-46"	1.234	15"	G1	1'-46"	1.234
15"	G2	1'-47"	1.234	15"	G2	1'-47"	1.234	15"	G2	1'-47"	1.234
15"	G1	1'-47"	1.234	15"	G1	1'-47"	1.234	15"	G1	1'-47"	1.234
15"	G2	1'-48"	1.234	15"	G2	1'-48"	1.234	15"	G2	1'-48"	1.234
15"	G1	1'-48"	1.234	15"	G1	1'-48"	1.234	15"	G1	1'-48"	1.234
15"	G2	1'-49"	1.234	15"	G2	1'-49"	1.234	15"	G2	1'-49"	1.234
15"	G1	1'-49"	1.234	15"	G1	1'-49"	1.234	15"	G1	1'-49"	1.234
15"	G2	1'-50"	1.234	15"	G2	1'-50"	1.234	15"	G2	1'-50"	1.234
15"	G1	1'-50"	1.234	15"	G1	1'-50"	1.234	15"	G1	1'-50"	1.234
15"	G2	1'-51"	1.234	15"	G2	1'-51"	1.234	15"	G2	1'-51"	1.234
15"	G1	1'-51"	1.234	15"	G1	1'-51"	1.234	15"	G1	1'-51"	1.234
15"	G2	1'-52"	1.234	15"	G2	1'-52"	1.234	15"	G2	1'-52"	1.234
15"	G1	1'-52"	1.234	15"	G1	1'-52"	1.234	15"	G1	1'-52"	1.234
15"	G2	1'-53"	1.234	15"	G2	1'-53"	1.234	15"	G2	1'-53"	1.234
15"	G1	1'-53"	1.234	15"	G1	1'-53"	1.234	15"	G1	1'-53"	1.234
15"	G2	1'-54"	1.234	15"	G2	1'-54"	1.234	15"	G2	1'-54"	1.234
15"	G1	1'-54"	1.234	15"	G1	1'-54"	1.234	15"	G1	1'-54"	1.234
15"	G2	1'-55"	1.234	15"	G2	1'-55"	1.234	15"	G2	1'-55"	1.234
15"	G1	1'-55"	1.234	15"	G1	1'-55"	1.234	15"	G1	1'-55"	1.234
15"	G2	1'-56"	1.234	15"	G2	1'-56"	1.234	15"	G2	1'-56"	1.234
15"	G1	1'-56"	1.234	15"	G1	1'-56"	1.234	15"	G1	1'-56"	1.234
15"	G2	1'-57"	1.234	15"	G2	1'-57"	1.234	15"			

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

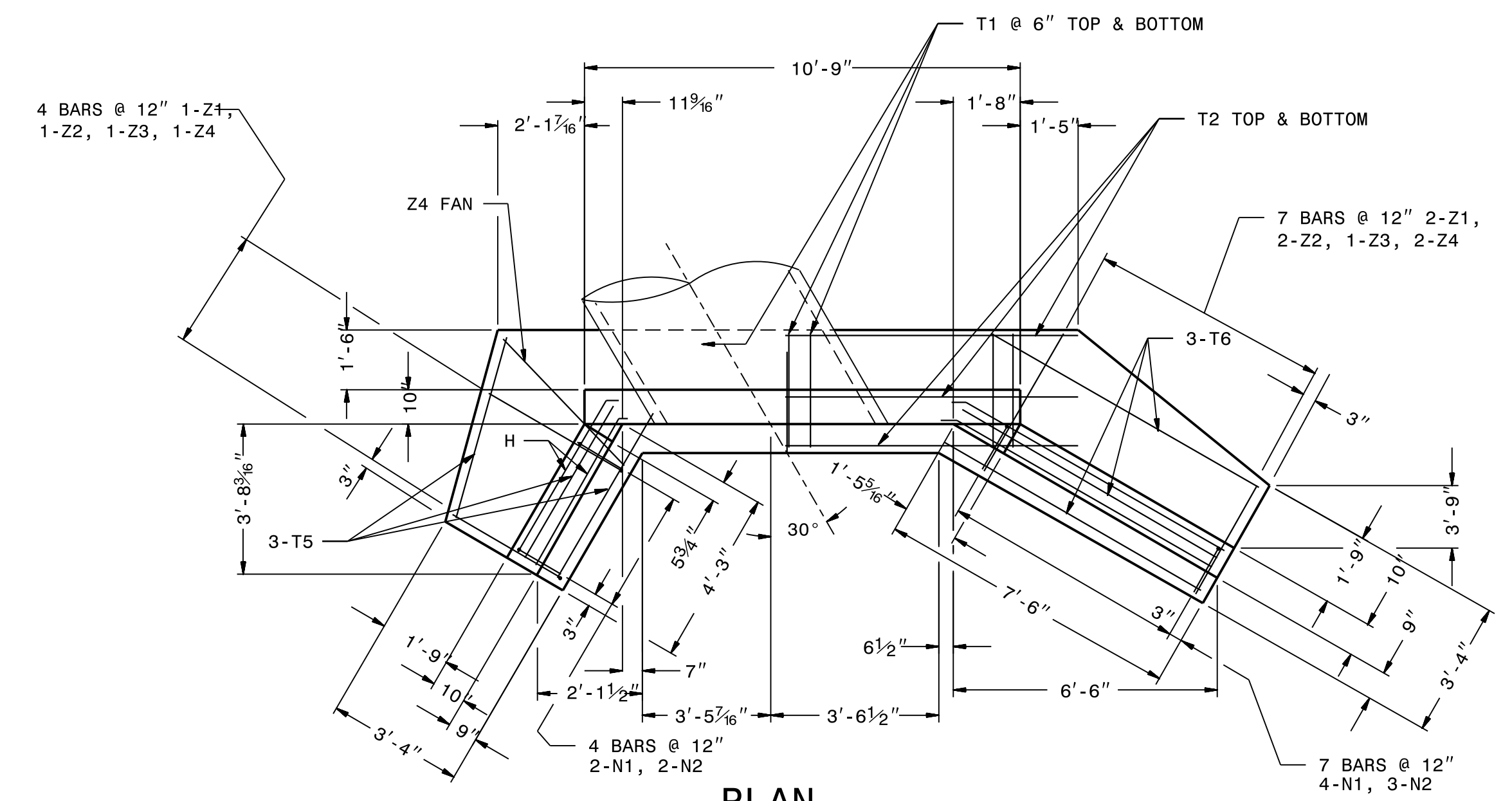
ENGLISH DETAIL DRAWING FOR REINFORCED CONCRETE ENDWALL FOR SINGLE 60° PIPE 60° OR 120° SKEW

SHEET OF 838d27

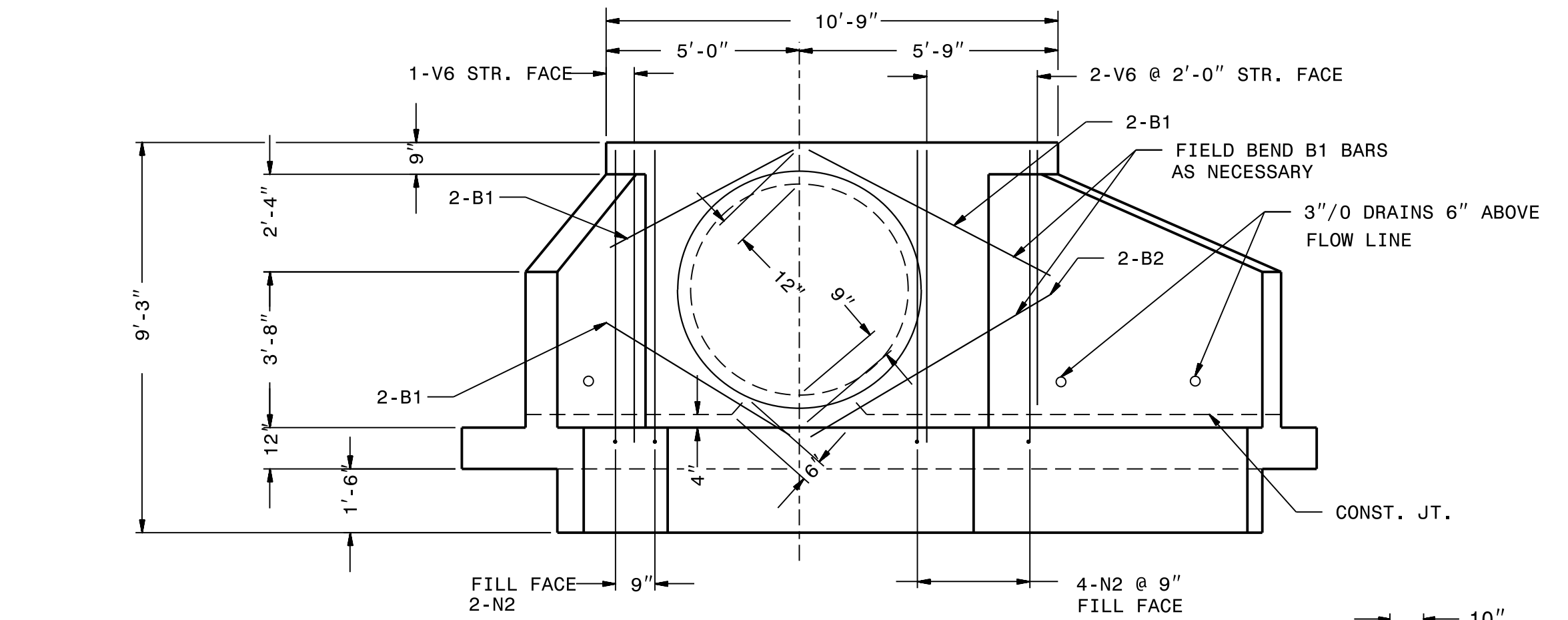
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR REINFORCED CONCRETE ENDWALL FOR SINGLE 60° PIPE 60° OR 120° SKEW

SHEET OF 838d27

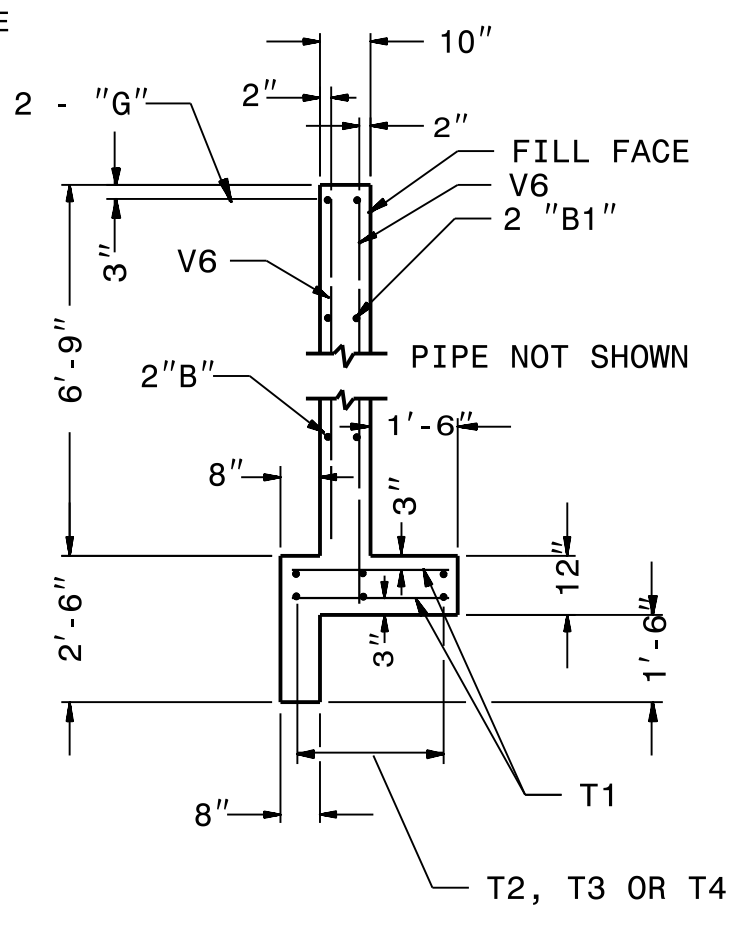
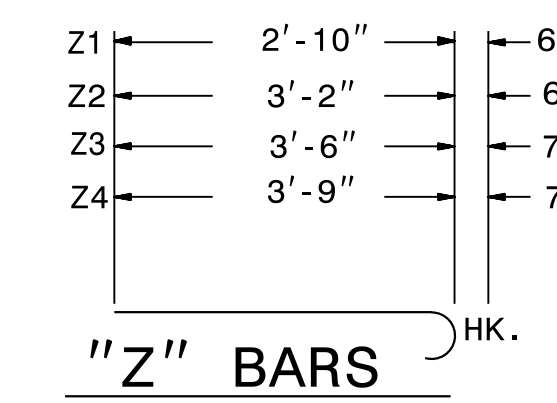
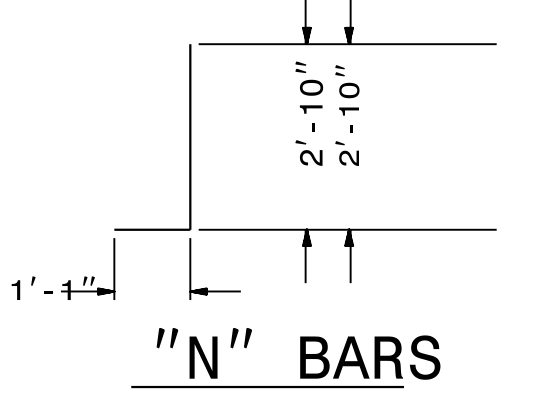
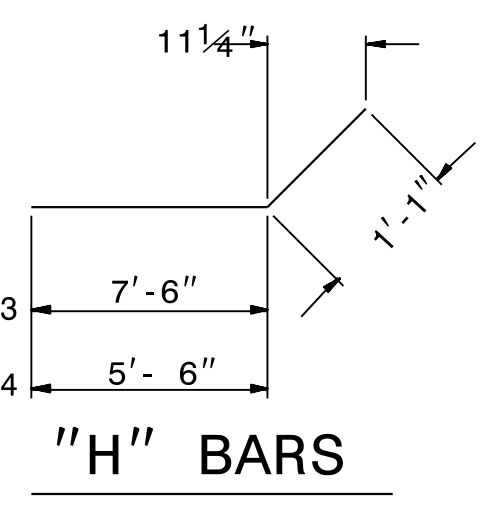
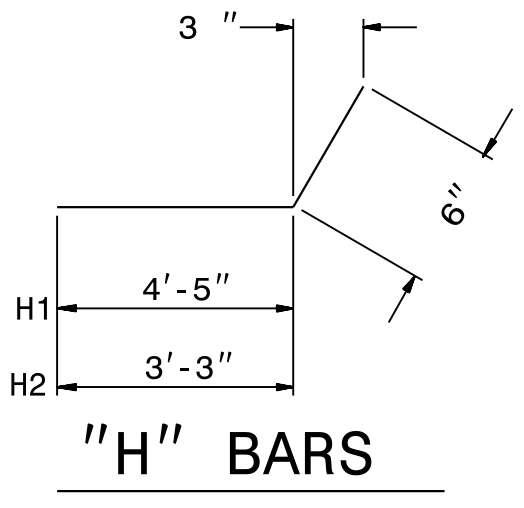


PLAN

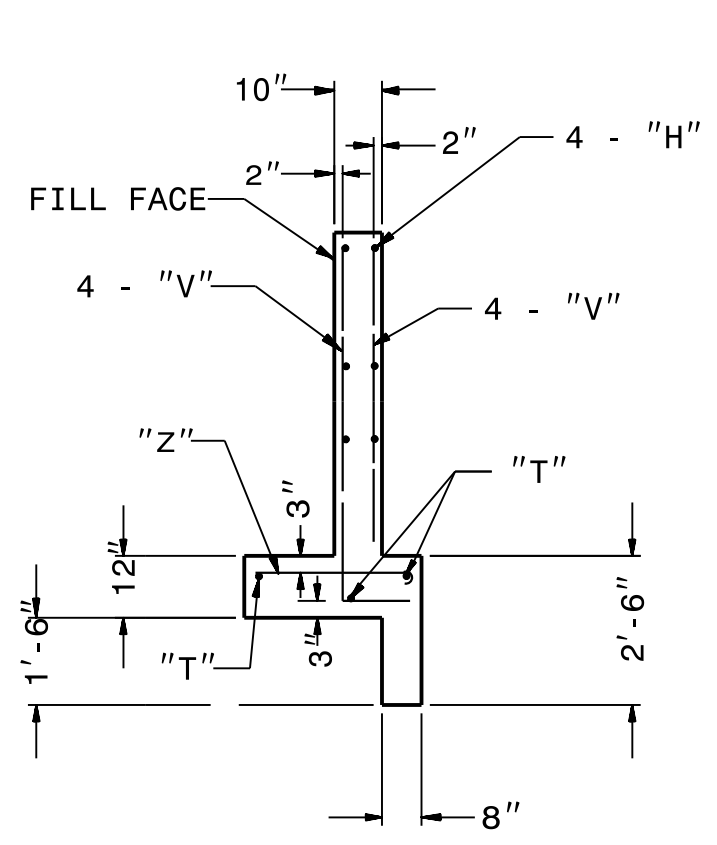


ELEVATION

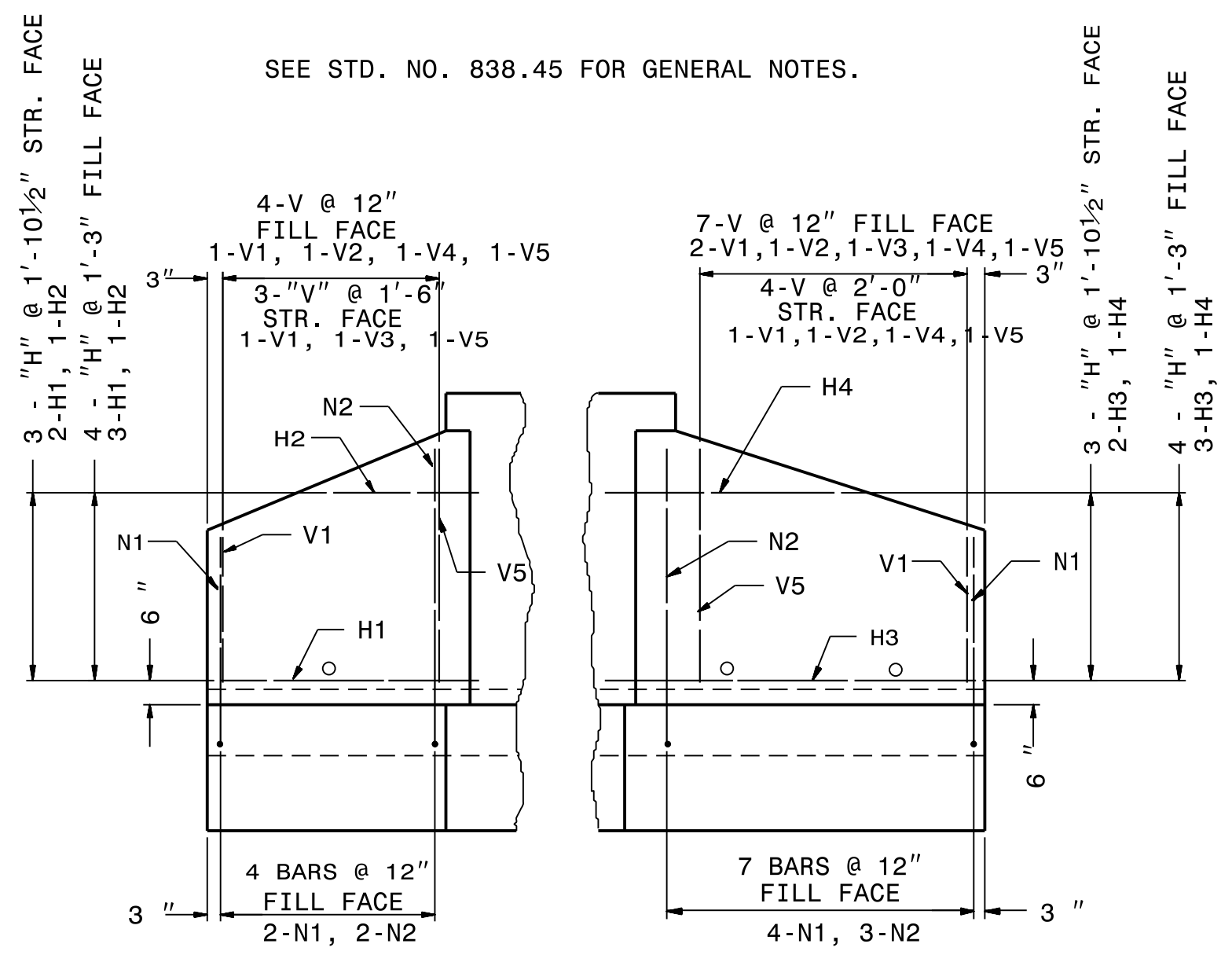
"H", "N", & "Z" BAR DIMENSIONS ARE OUT TO OUT.



SECTION - BB



SECTION - AA



WING ELEVATION

SEE STD. NO. 838.45 FOR GENERAL NOTES.

Table with 5 columns: BAR, SIZE, LENGTH, NO., WEIGHT. It lists materials for endwalls and pipes, including reinforcement steel and concrete quantities.

02-MAY-2018 08:34 S:\Contracts\Projects\Special\English\Hydro\endwalls.dgn J:\power\ton AT_CSD-232595



5/18/2022

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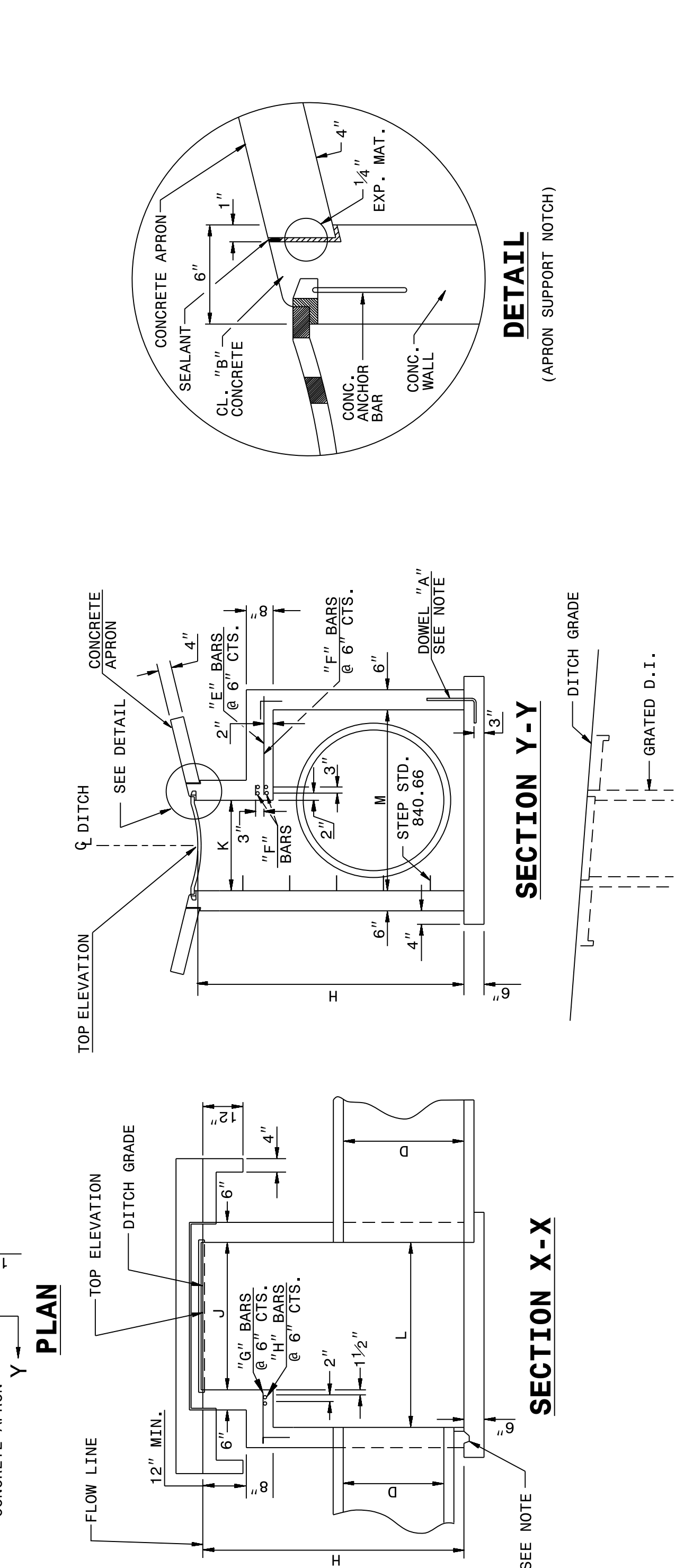
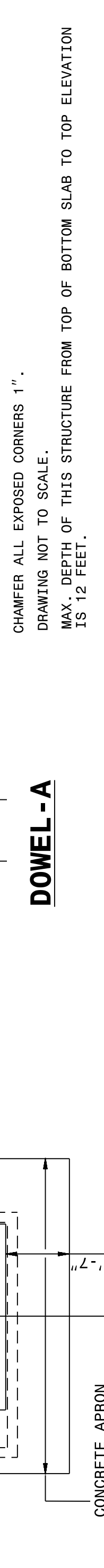
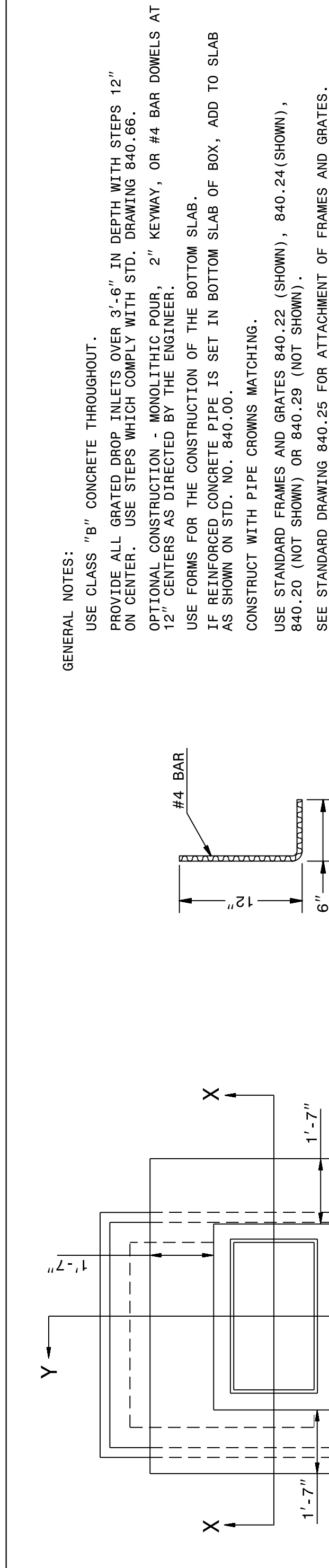
SEE PLATE FOR TITLE

ORIGINAL BY: DATE: MODIFIED BY: rnbritt DATE: 05-08-06 CHECKED BY: DATE: FILE SPEC.: s:nbritt/english/hydro/838d24_54_endwall_60sk.dgn

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

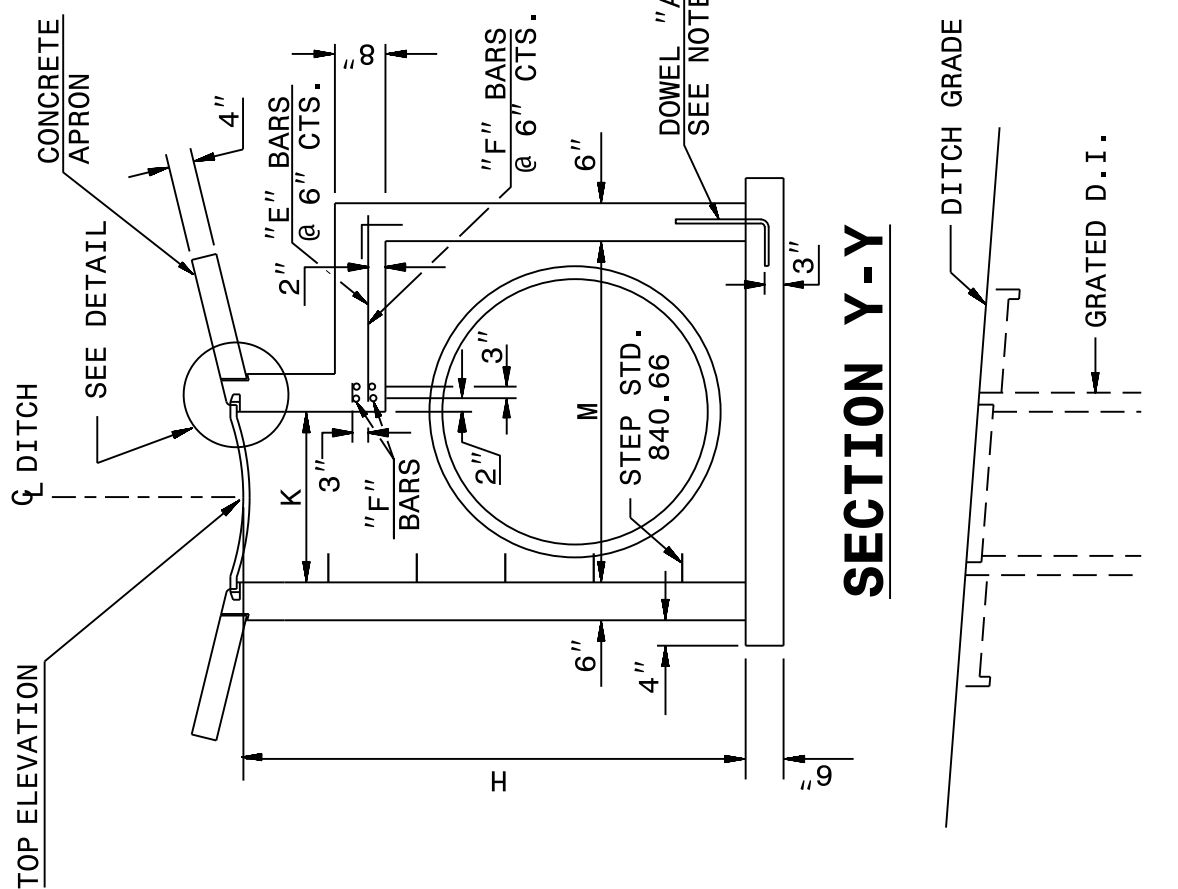


STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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

SHEET 1 OF 2 840d17

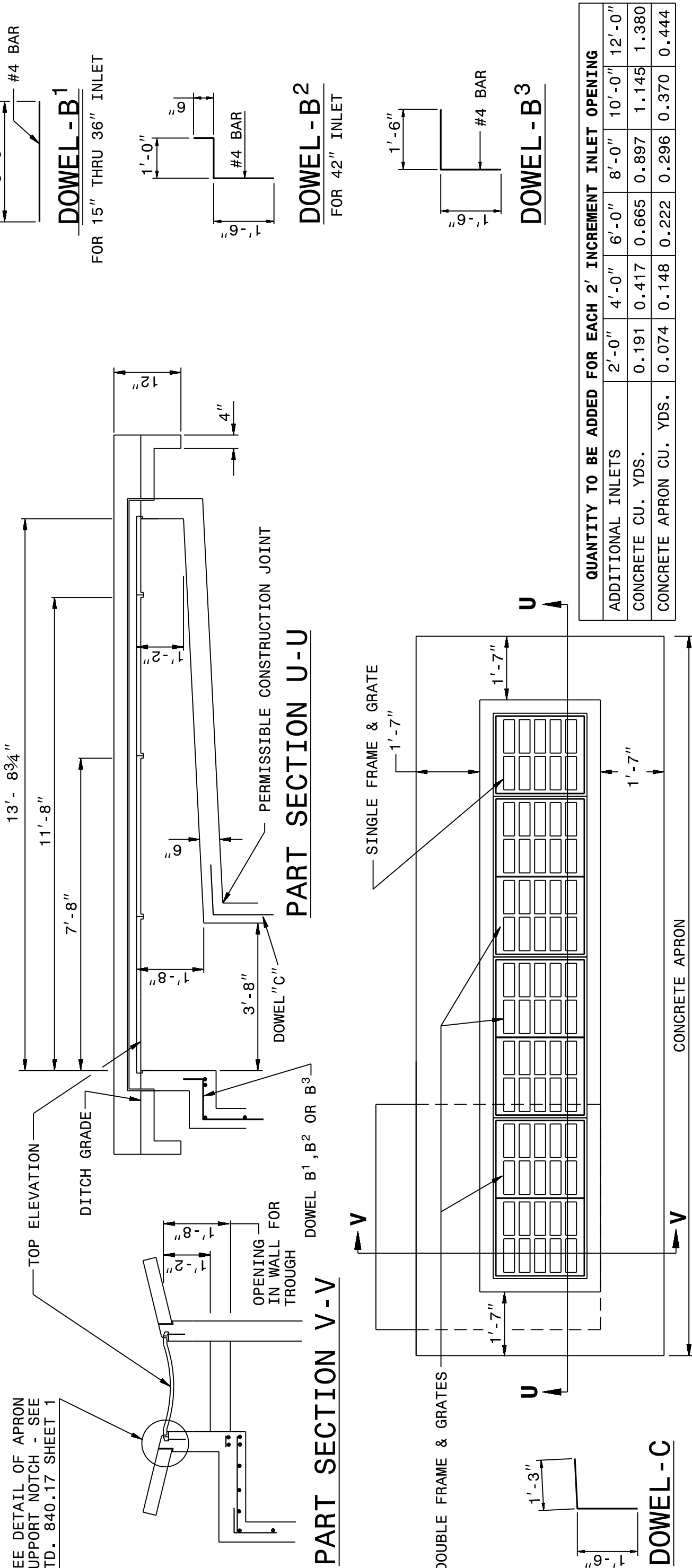
GENERAL NOTES:
 USE CLASS "B" CONCRETE THROUGHOUT.
 PROVIDE ALL GRATED DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
 OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
 USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
 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.



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



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)

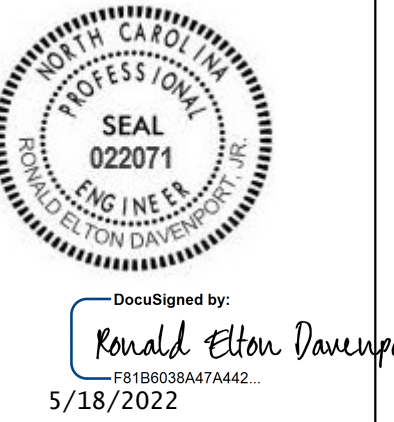
PIPE	DIMENSIONS OF BOX AND PIPE		REINFORCING STEEL - NO. 4 BARS										CU YDS CONC. IN BOX		DEDUCTIONS FOR ONE PIPE						
	SPAN	WIDTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	H	PER FT HT	TOTAL	C.S.	R.C.		
12"	3'-8"	2'-0"	2'-0"	2'-3"	—	—	—	—	—	—	—	—	—	—	0.362	0.926	0.247	0.395	1.683	0.015	0.024
15"	3'-8"	2'-0"	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	2.201	0.033	0.049	
24"	—	—	2'-10"	3'-3"	8	1'-5"	6	4'-9"	—	—	—	—	—	—	0.444	1.362	0.278	2.201	0.059	0.085	
30"	—	—	3'-5"	3'-10"	8	2'-0"	7	4'-9"	—	—	—	—	—	—	0.502	1.644	0.288	2.541	0.082	0.127	
36"	4'-0"	4'-0"	4'-4"	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"	5'-0"	10	3'-1"	9	5'-7"	9	5'-7"	3	5'-7"	67	0.704	2.500	0.370	3.677	0.180	0.243		
48"	5'-4"	5'-4"	5'-6"	5'-6"	11	3'-7"	10	6'-1"	11	6'-1"	4	6'-1"	87	0.823	3.013	0.407	4.315	0.235	0.317		
54"	6'-0"	6'-0"	6'-0"	6'-0"	12	4'-1"	11	6'-7"	12	6'-7"	5	6'-7"	107	0.951	3.589	0.444	5.072	0.287	0.401		
60"	6'-6"	6'-6"	6'-7"	6'-7"	13	4'-9"	12	7'-3"	13	7'-3"	6	7'-3"	135	1.311	4.539	0.494	6.170	0.367	0.495		
66"	7'-2"	7'-2"	7'-1"	7'-1"	14	5'-4"	14	7'-10"	14	7'-10"	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"	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	

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 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: jhowerton\minimum depth type A.dgn

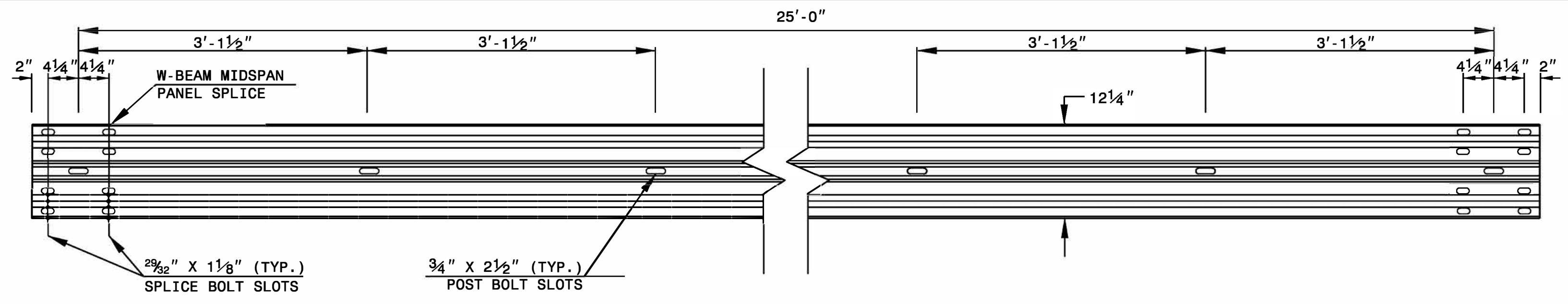


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 jhowerton At CSD 2/25/15

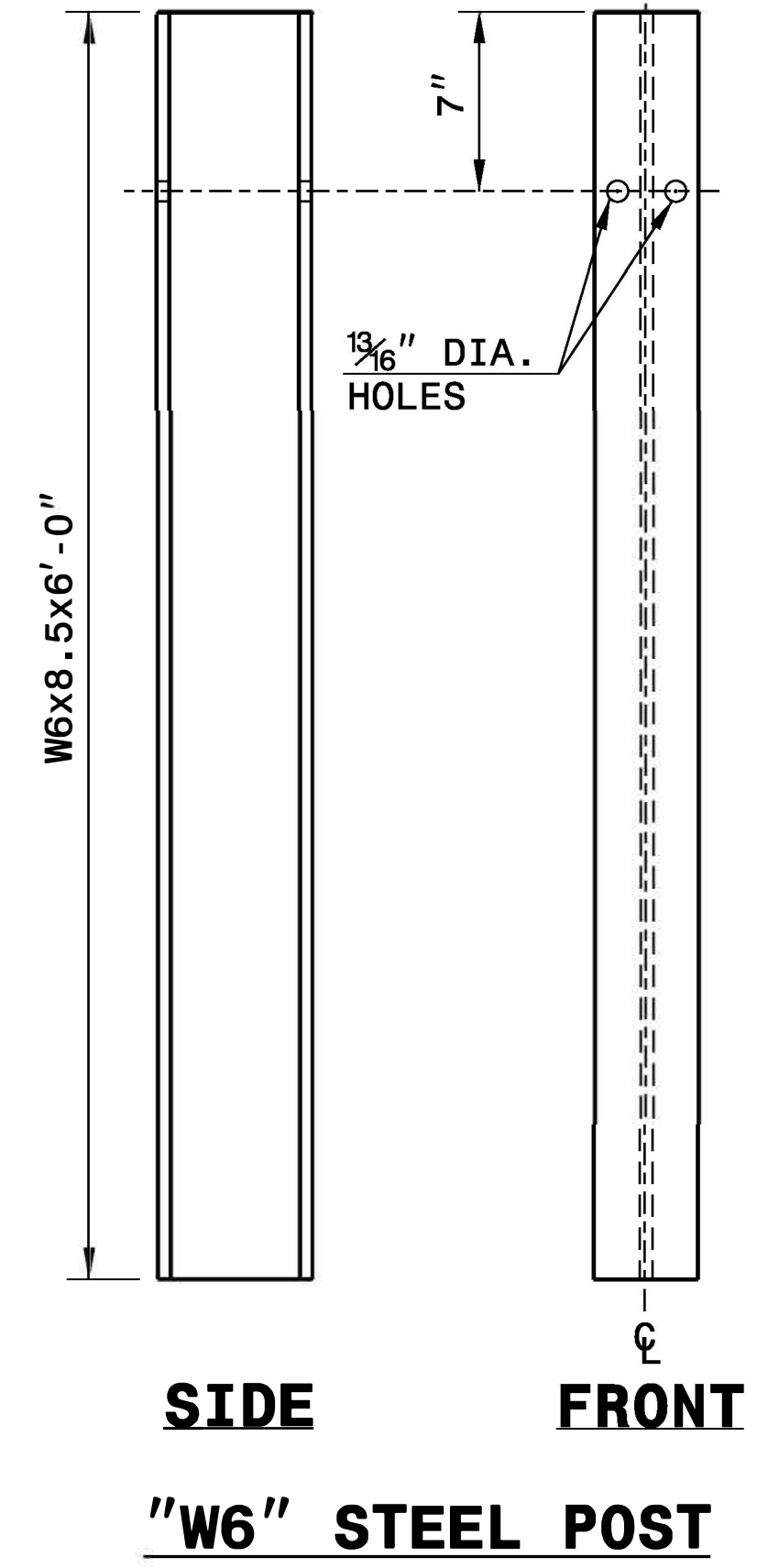
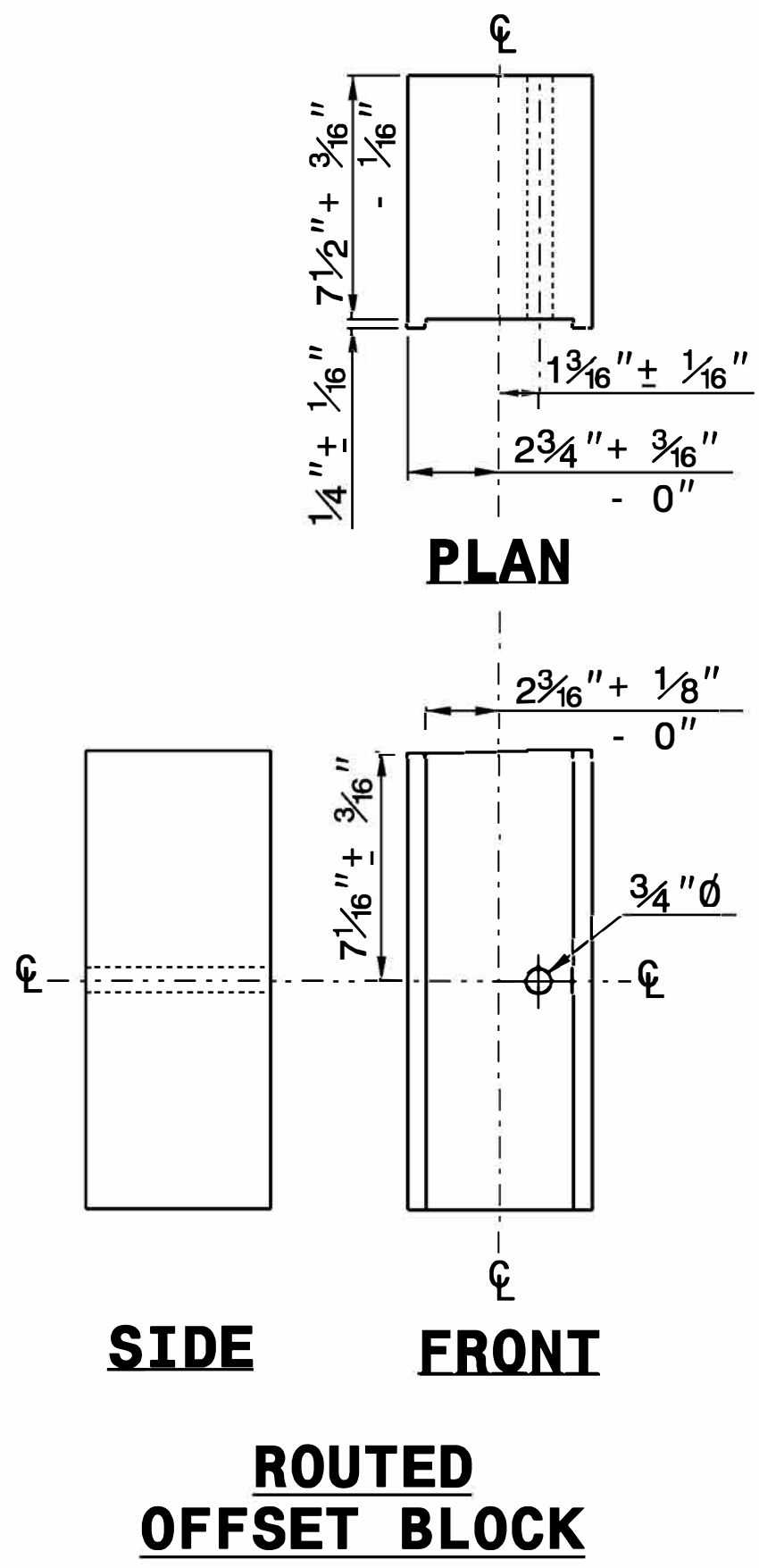
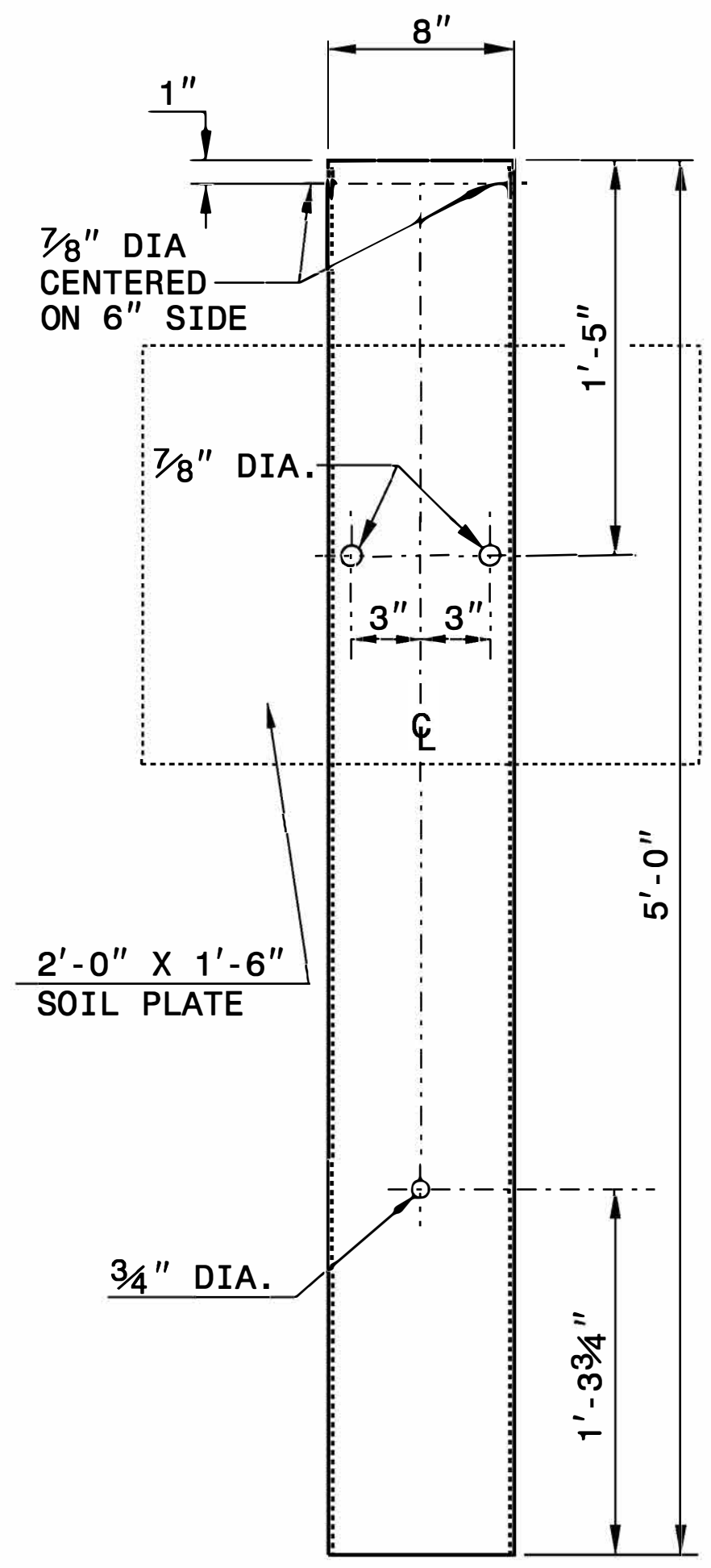
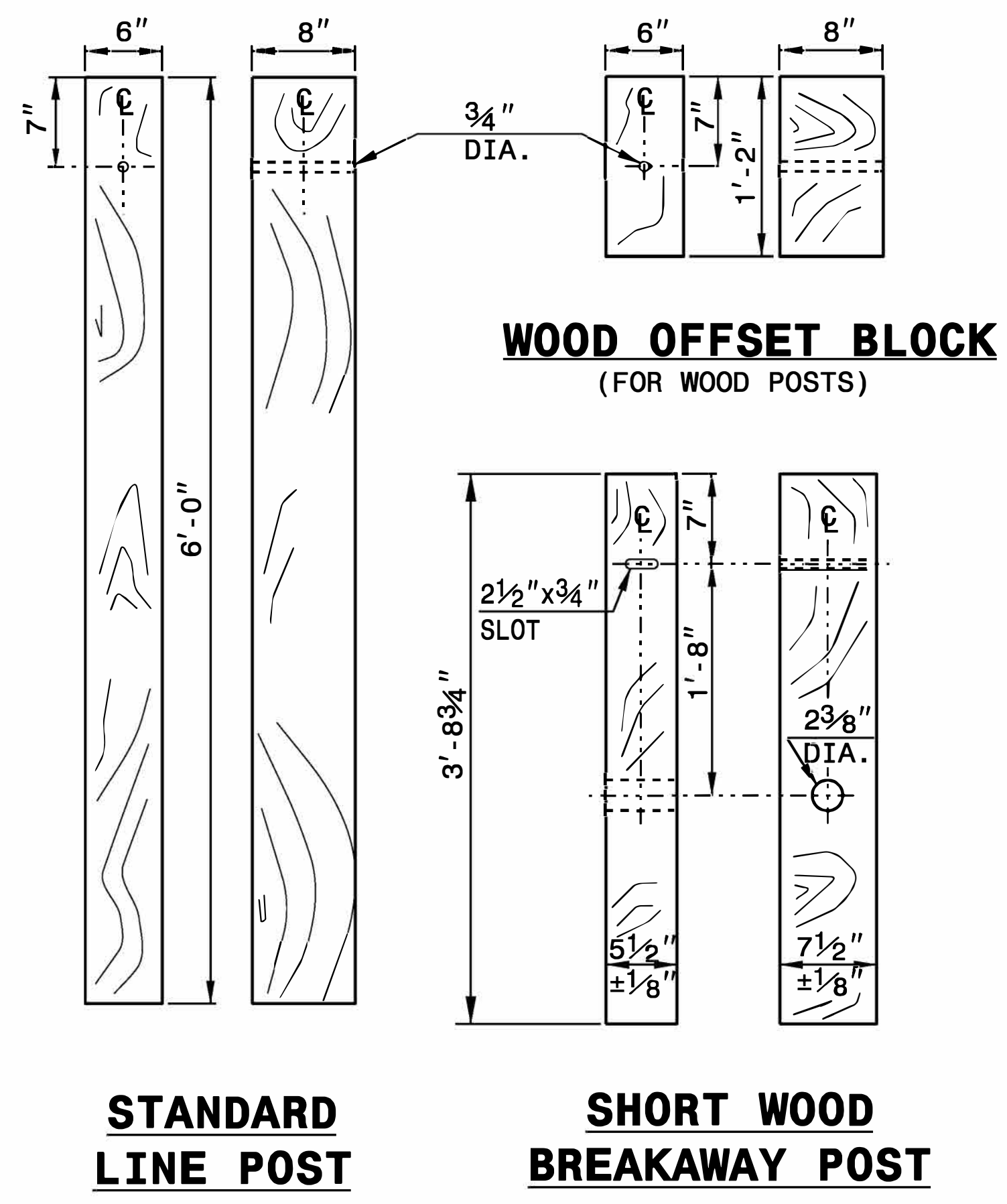
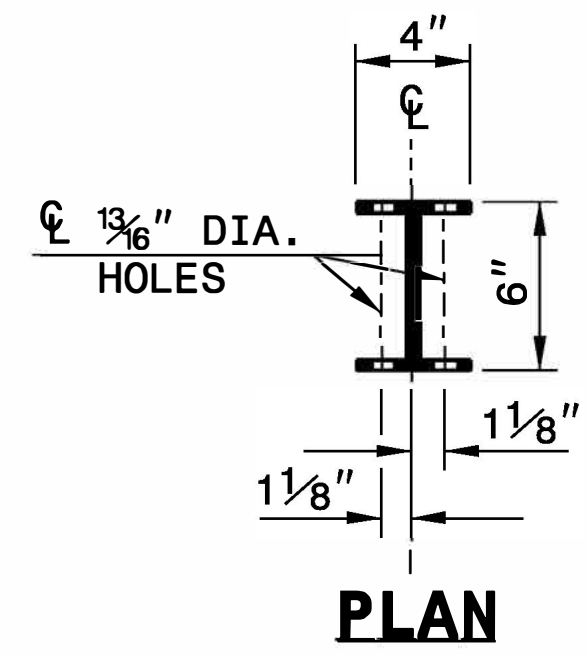
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



STANDARD W-BEAM GUARDRAIL



SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



DocuSigned by:
Ronald Elton Davenport, Jr.
5/18/2022

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

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

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

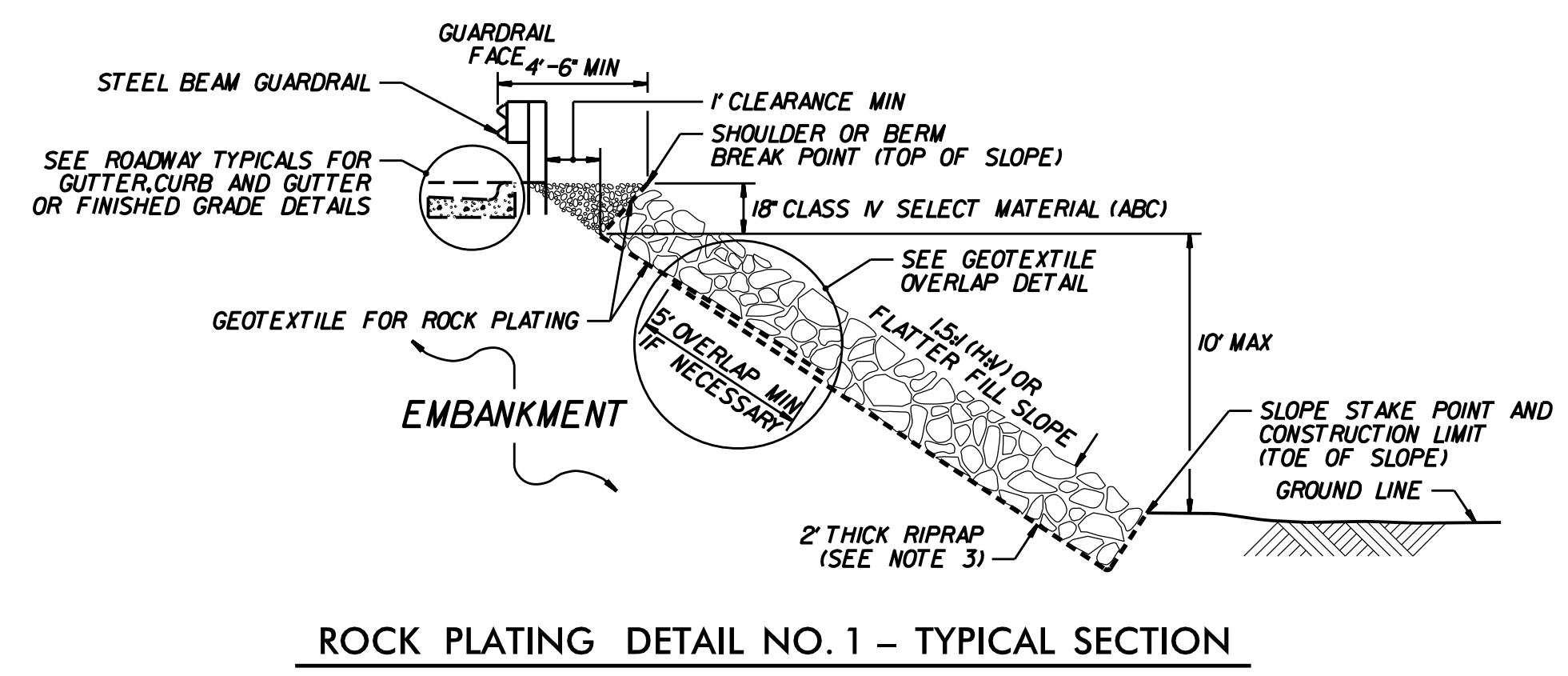
ROADWAY DETAIL DRAWING FOR
ROCK PLATING

SHEET 1 OF 1
275D01

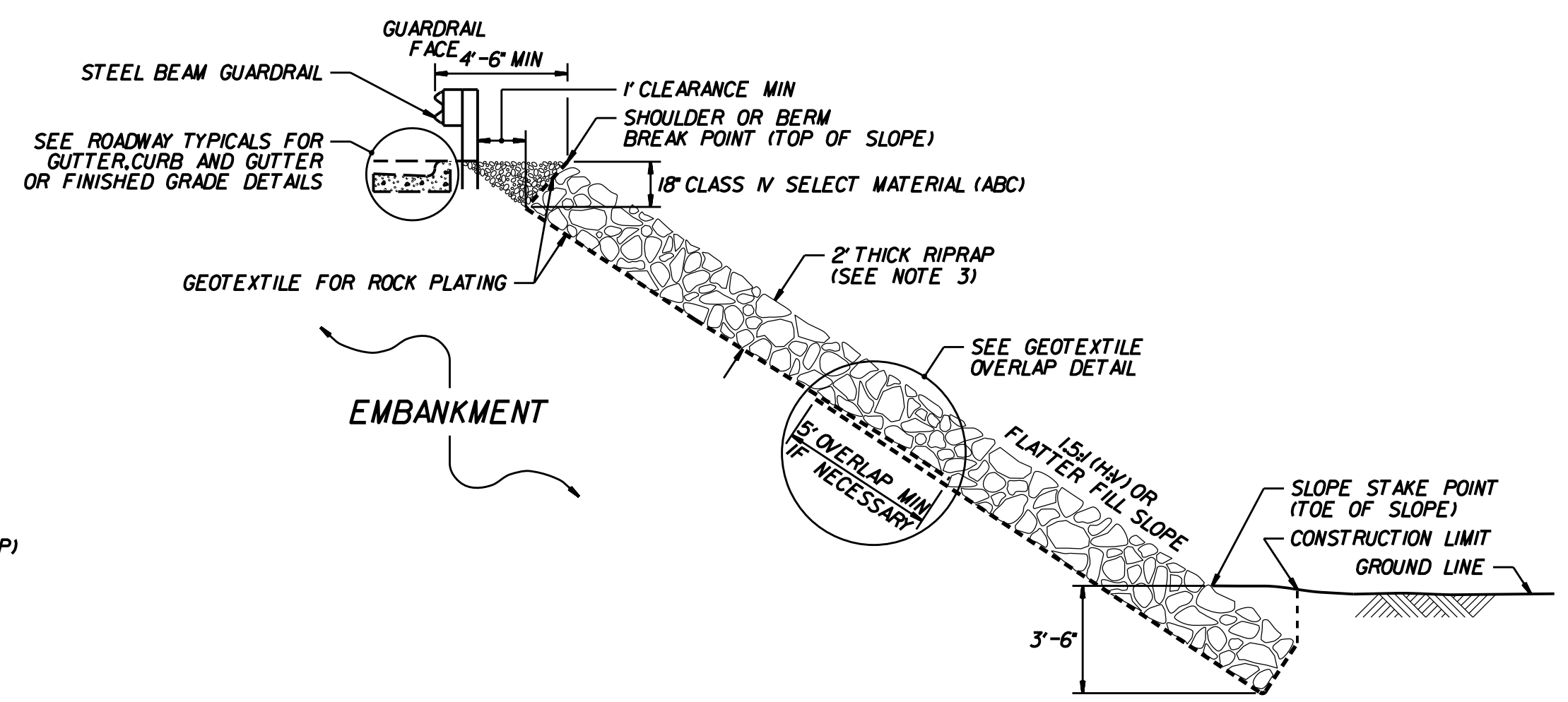
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
ROCK PLATING

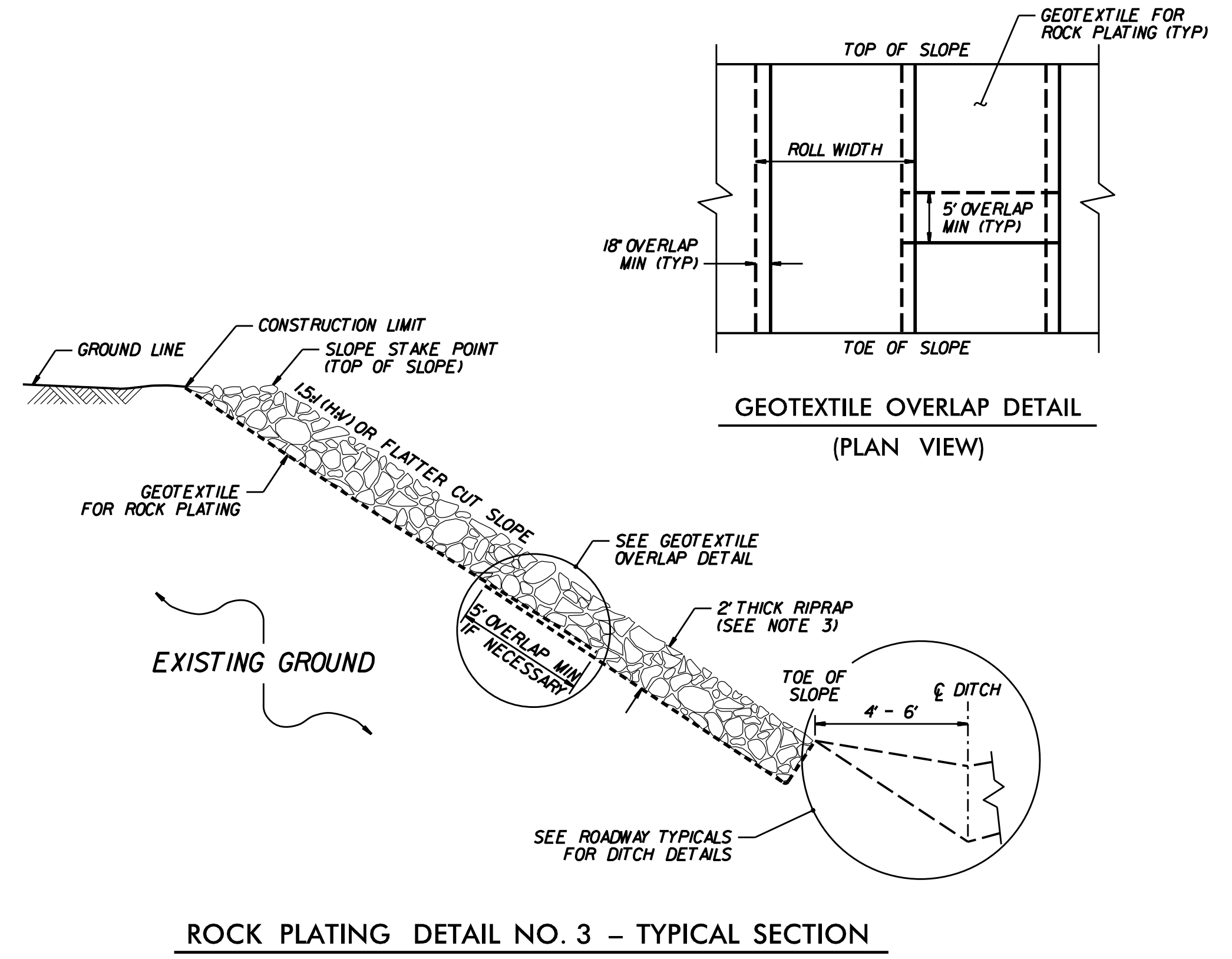
SHEET 1 OF 1
275D01



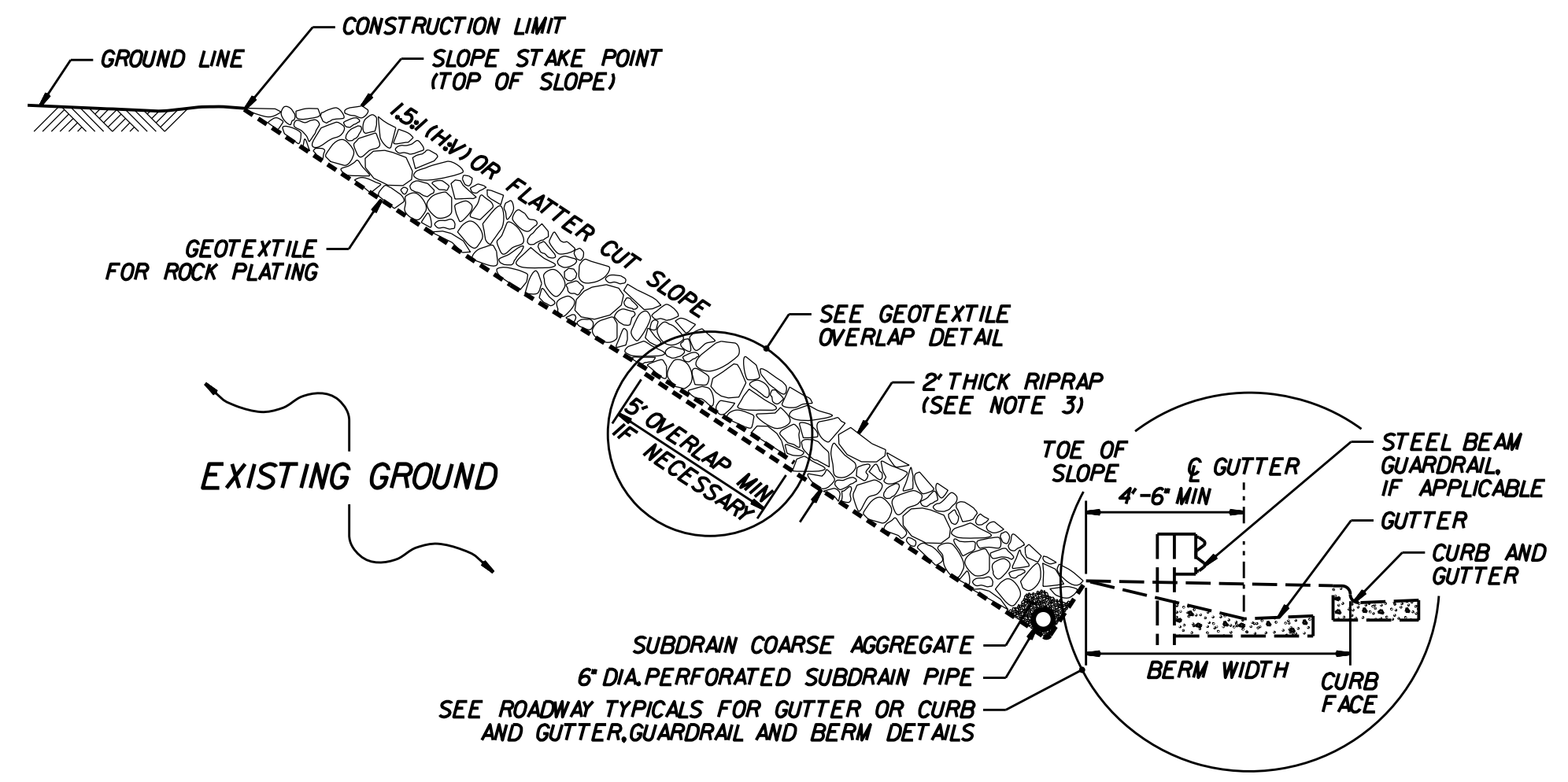
ROCK PLATING DETAIL NO. 1 - TYPICAL SECTION



ROCK PLATING DETAIL NO. 2 - TYPICAL SECTION



ROCK PLATING DETAIL NO. 3 - TYPICAL SECTION



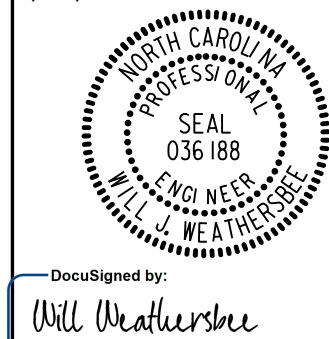

ROCK PLATING DETAIL NO. 4 - TYPICAL SECTION

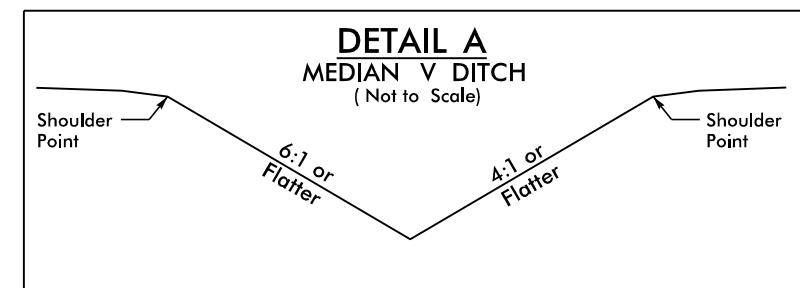
- NOTES:**
1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
 2. FOR ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
 3. USE CLASS I, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.



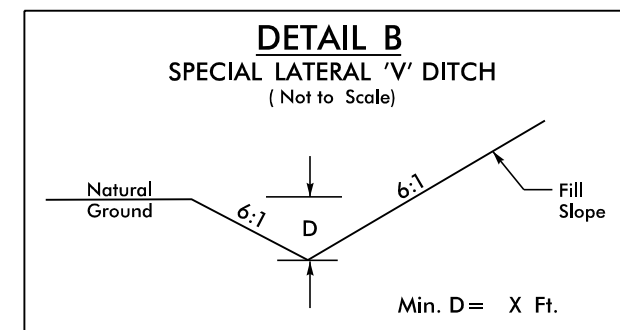
CONTRACT STANDARDS AND DEVELOPMENT UNIT Office 919-707-6900 FAX 919-250-4119	
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ORIGINAL BY: S. HIDDEN	DATE: 03-11-22
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	

SYSTEMS DESIGN USER NAME
 1/18/2022 10:00 AM
 5/18/2022

PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2D-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER 5/19/2022
	
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NIV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.niv5.com NC License # F-1333	

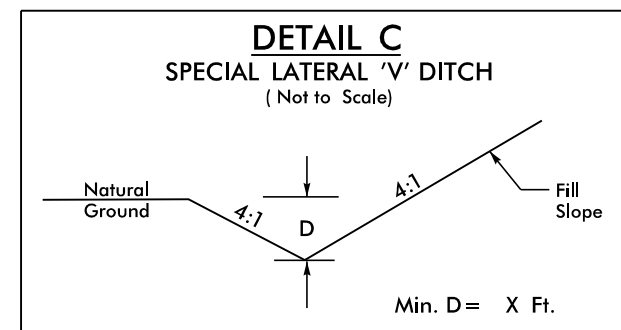


-L- STA. 89+50 TO STA. 91+00 RT
 -YIRPB- STA. 15+00 TO STA. 16+50 LT
 -YIARPA DETOUR- STA. 15+50 TO STA. 16+50 LT



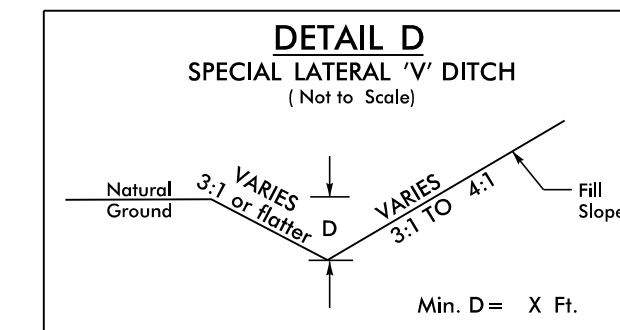
Min. D = X Ft.

-L- STA. 91+00 TO STA. 95+50 LT, X=1
 -L- STA. 97+50 TO STA. 101+00 RT, X=1
 -L- STA. 99+50 TO STA. 102+50 LT, X=1
 -L- STA. 166+50 TO STA. 168+00 RT, X=1
 -L- STA. 174+00 TO STA. 178+00 RT, X=1.5
 -L- STA. 211+50 TO STA. 216+50 LT, X=1
 -L- STA. 217+50 TO STA. 217+50 RT, X=1
 -L- STA. 235+15 TO STA. 236+00 RT, X=1
 -L- STA. 238+00 TO STA. 241+70 RT, X=1
 -L- STA. 242+00 TO STA. 243+00 LT, X=1
 -L- STA. 247+50 TO STA. 250+00 LT, X=1
 -L- STA. 261+50 TO STA. 264+90 LT, X=1
 -YIARPB- STA. 12+00 TO STA. 15+50 LT, X=0.5
 -YIARPB- STA. 15+50 TO STA. 16+00 LT, X=1.0
 -L- STA. 287+50 TO STA. 298+00 LT, X=1.5
 -L- STA. 288+50 TO STA. 293+50 RT, X=0.5
 -L- STA. 320+00 TO STA. 324+00 LT, X=1
 -YIARPC- STA. 14+00 TO STA. 18+00 RT, X=1
 -YIARPA- STA. 14+00 TO STA. 16+50 RT, X=1
 -YIA- STA. 17+65 TO STA. 22+50 LT, X=1
 -YIARPA DETOUR- STA. 12+50 TO STA. 15+00 RT, X=1.5



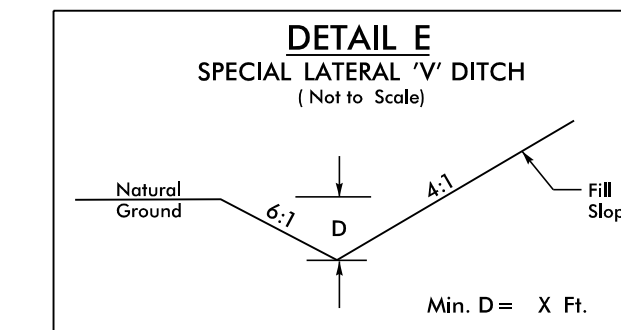
Min. D = X Ft.

-L- STA. 112+00 TO STA. 135+00 LT, X=2
 -L- STA. 120+50 TO STA. 123+50 RT, X=2
 -L- STA. 128+00 TO STA. 137+50 RT, X=2
 -L- STA. 200+00 TO STA. 209+00 RT, X=2
 -L- STA. 317+00 TO STA. 319+00 RT, X=2
 -L- STA. 332+00 TO STA. 332+50 RT, X=2
 -L- STA. 337+50 TO STA. 339+00 RT, X=2
 -L- STA. 319+50 TO STA. 320+00 LT, X=2
 -L- STA. 331+50 TO STA. 332+00 LT, X=2
 -L- STA. 337+50 TO STA. 339+10 LT, X=2
 -YIARPB- STA. 18+85 TO STA. 19+50 LT, X=1
 -YIARPC- STA. 18+25 TO STA. 22+10 LT, X=2



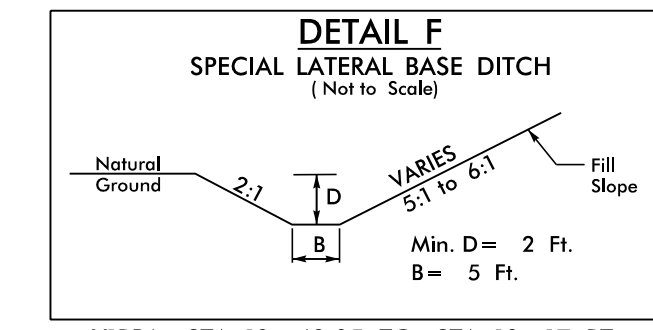
Min. D = X Ft.

-L- STA. 123+50 TO STA. 128+00 RT, X=1
 -L- STA. 180+95 TO STA. 184+50 RT, X=1
 -L- STA. 199+50 TO STA. 208+50 LT, X=3
 -YIARPC- STA. 18+00 TO STA. 18+50 RT, X=1



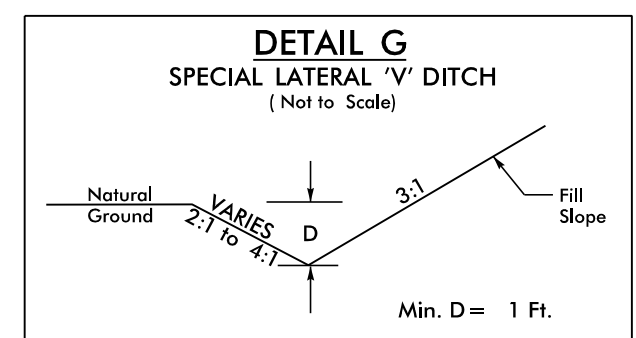
Min. D = X Ft.

-L- STA. 101+00 TO STA. 102+50 RT, X=1
 -L- STA. 135+00 TO STA. 140+00 LT, X=1
 -L- STA. 137+50 TO STA. 140+00 RT, X=1
 -L- STA. 140+00 TO STA. 148+50 LT, X=2
 -L- STA. 140+00 TO STA. 144+00 RT, X=2
 -L- STA. 166+50 TO STA. 168+00 LT, X=1
 -L- STA. 177+00 TO STA. 180+50 LT, X=1
 -L- STA. 178+50 TO STA. 180+95 RT, X=2
 -L- STA. 192+50 TO STA. 197+50 RT, X=1
 -L- STA. 197+50 TO STA. 199+80 RT, X=1
 -L- STA. 198+50 TO STA. 199+50 LT, X=1



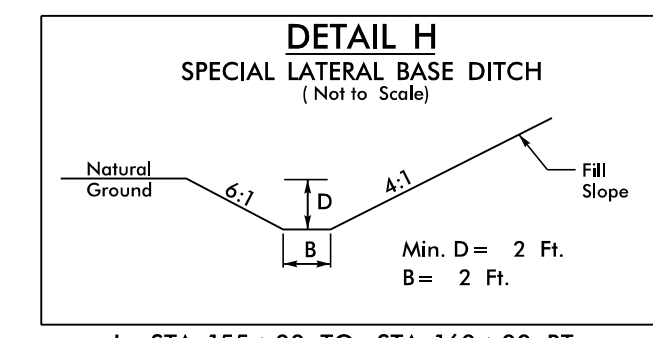
Min. D = 2 Ft.
 B = 5 Ft.

-YIRPA- STA. 12+43.35 TO STA. 13+17 RT



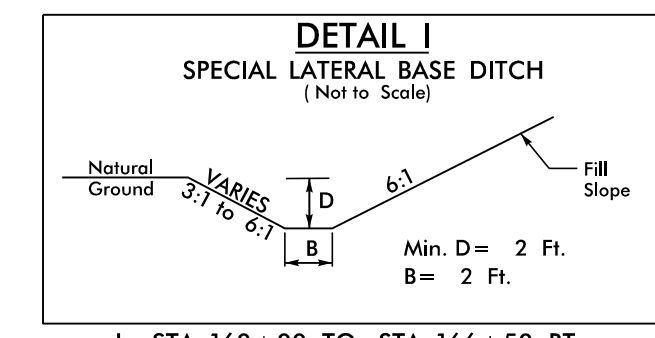
Min. D = 1 Ft.

-DR3- STA. 14+05.64 TO STA. 15+56.14 RT



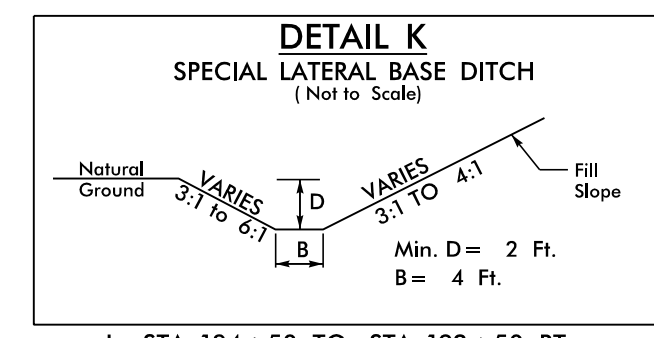
Min. D = 2 Ft.
 B = 2 Ft.

-L- STA. 155+00 TO STA. 160+00 RT
 -L- STA. 183+00 TO STA. 198+50 LT



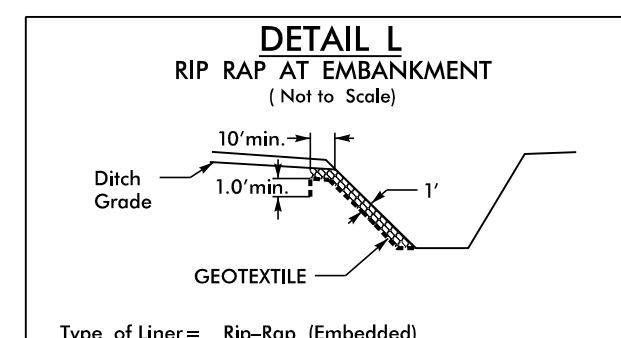
Min. D = 2 Ft.
 B = 2 Ft.

-L- STA. 160+00 TO STA. 166+50 RT



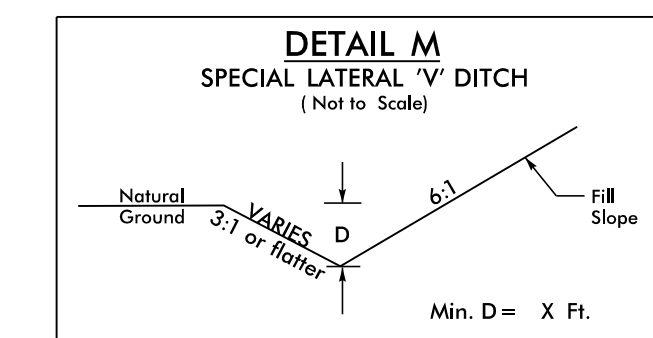
Min. D = 2 Ft.
 B = 4 Ft.

-L- STA. 184+50 TO STA. 192+50 RT



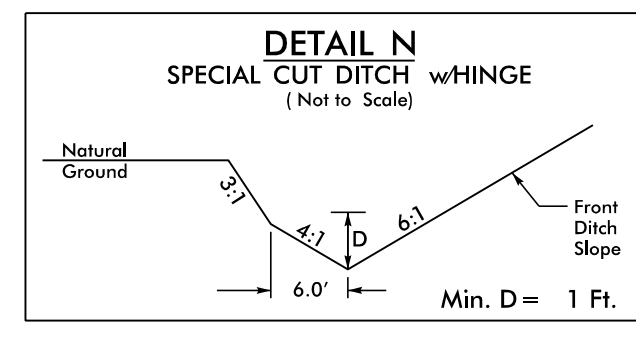
Type of Liner = Rip-Rap (Embedded)

-L- STA. 111+00 LT, 21 Tons CL-B, 45 SY Geotextile
 -L- STA. 112+00 RT, 12 Tons CL-B, 27 SY Geotextile
 -L- STA. 112+50 RT, 20 Tons CL-B, 44 SY Geotextile
 -L- STA. 226+67 RT, 5 Tons CL-B, 11 SY Geotextile
 -L- STA. 241+72 RT, 3 Tons CL-B, 6 SY Geotextile
 -L- STA. 244+95 LT, 21 Tons CL-B, 43 SY Geotextile
 -L- STA. 265+10 LT, 21 Tons CL-B, 43 SY Geotextile
 -L- STA. 265+00 RT, 10 Tons CL-B, 14 SY Geotextile
 -SR2- STA. 31+90 RT, 23 Tons CL-B, 50 SY Geotextile
 -Y2- STA. 17+30 LT, 16 Tons CL-B, 36 SY Geotextile



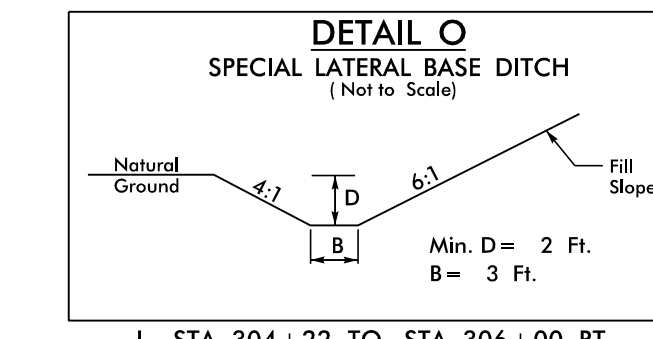
Min. D = X Ft.

-L- STA. 91+00 TO STA. 94+00 RT, X=1
 -L- STA. 178+00 TO STA. 178+50 RT, X=1.5
 -L- STA. 258+00 TO STA. 261+50 LT, X=1
 -L- STA. 265+10 TO STA. 269+34 LT, X=1
 -L- STA. 265+00 TO STA. 270+00 RT, X=1
 -L- STA. 277+00 TO STA. 278+18 RT, X=1
 -L- STA. 278+50 TO STA. 281+00 RT, X=1
 -L- STA. 281+50 TO STA. 285+50 LT, X=1
 -L- STA. 283+00 TO STA. 285+50 RT, X=1
 -L- STA. 319+00 TO STA. 332+00 RT, X=1
 -L- STA. 332+50 TO STA. 337+50 RT, X=1
 -L- STA. 335+00 TO STA. 337+50 LT, X=1
 -YIARPD- STA. 12+10 TO STA. 18+50 LT, X=2.0



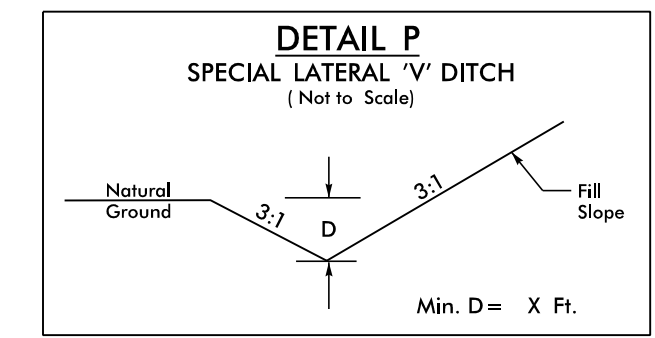
Min. D = 1 Ft.

-L- STA. 282+50 TO STA. 283+00 RT
 -YIARPB- STA. 20+00 TO STA. 20+50 LT



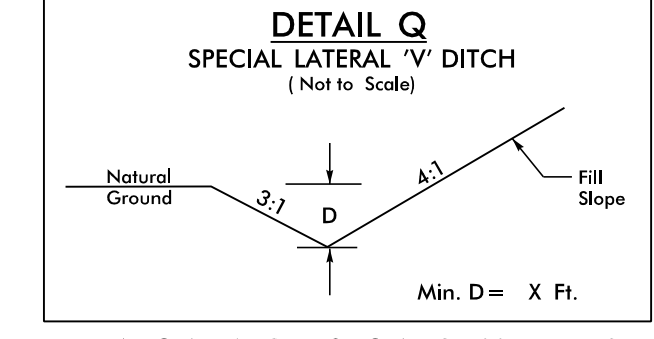
Min. D = 2 Ft.
 B = 3 Ft.

-L- STA. 304+22 TO STA. 306+00 RT
 -YIARPD- STA. 10+00 TO STA. 12+10 LT



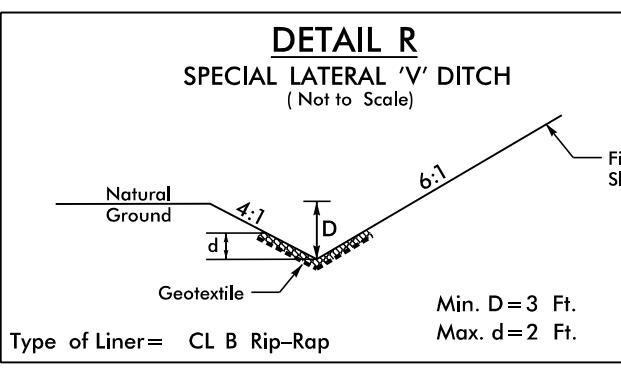
Min. D = X Ft.

-Y2- STA. 12+50 TO STA. 17+00 LT, X=1
 -Y2- STA. 17+50 TO STA. 21+00 LT, X=2
 -Y2- STA. 31+00 TO STA. 35+70 LT, X=1
 -Y2- STA. 36+30 TO STA. 38+30 LT, X=1
 -Y2- STA. 36+50 TO STA. 39+00 RT, X=1
 -DR3- STA. 10+75 TO STA. 16+00 LT, X=1
 -DR3- STA. 11+55 TO STA. 15+56 RT, X=1
 -DR4- STA. 10+29 TO STA. 12+55 RT, X=1
 -SR2- STA. 16+40 TO STA. 18+50 LT, X=1
 -SR2- STA. 18+50 TO STA. 19+00 LT, X=0.5
 -SR2- STA. 19+00 TO STA. 25+50 LT, X=1
 -SR2- STA. 19+00 TO STA. 28+20 RT, X=1
 -SR2- STA. 33+00 TO STA. 34+10 RT, X=1
 -SR2- STA. 39+00 TO STA. 39+90 RT, X=1
 -SR2- STA. 40+20 TO STA. 42+50 RT, X=1
 -SR2- STA. 40+00 TO STA. 43+00 LT, X=1.5
 -YIA- STA. 19+50 TO STA. 21+00 RT, X=1
 -YIA- STA. 26+00 TO STA. 28+00 LT, X=1
 -YIA- STA. 26+00 TO STA. 29+00 RT, X=1
 -YIA- STA. 28+00 TO STA. 32+50 LT, X=0.5
 -YIA- STA. 30+00 TO STA. 32+50 RT, X=0.8
 -YIA- STA. 51+00 TO STA. 56+85 LT, X=1
 -YIA- STA. 53+00 TO STA. 57+10 RT, X=1
 -SR1- STA. 12+00 TO STA. 13+20 LT, X=0.6
 -YIA DETOUR- STA. 16+50 TO STA. 19+50 LT, X=1



Min. D = X Ft.

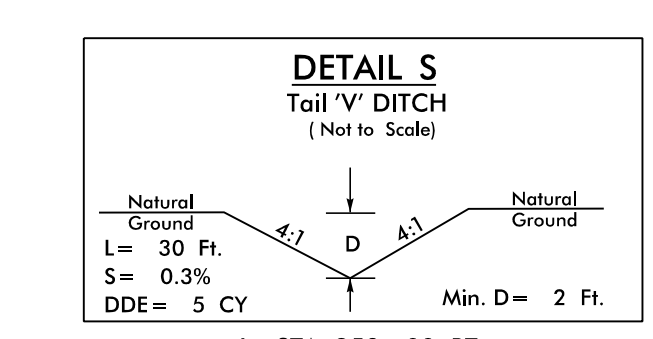
-YIRPA- STA. 14+95 TO STA. 18+00 RT, X=2
 -YIRPD- STA. 13+39 TO STA. 14+50 LT, X=2
 -L- STA. 111+00 TO STA. 112+00 LT, X=2
 -L- STA. 112+50 TO STA. 120+50 RT, X=2
 -L- STA. 250+00 TO STA. 251+00 LT, X=1
 -L- STA. 251+00 TO STA. 258+00 LT, X=1



Min. D = 3 Ft.
 Max. d = 2 Ft.

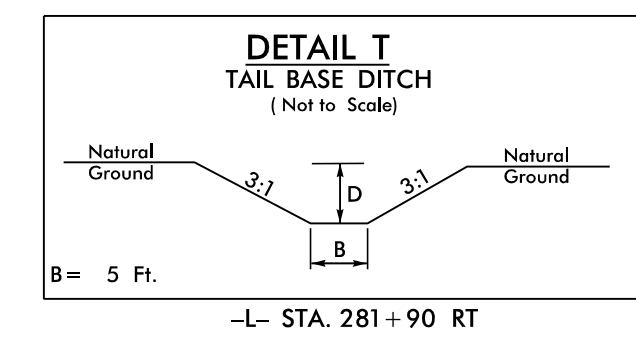
Type of Liner = CL B Rip-Rap

-L- STA. 281+00 TO STA. 281+50 RT



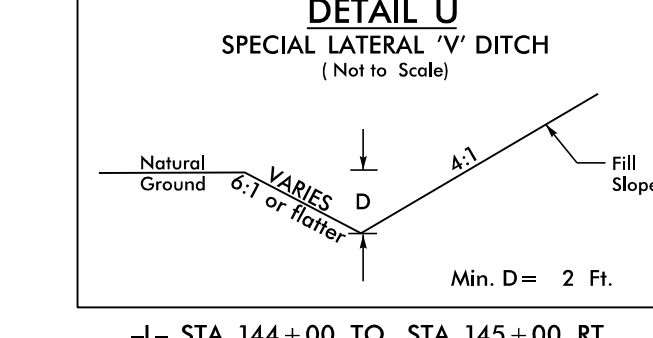
Min. D = 2 Ft.

-L- STA. 258+00 RT



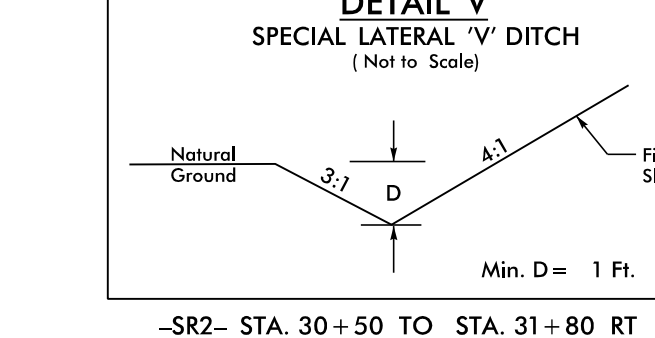
B = 5 Ft.

-L- STA. 281+90 RT
 MIN. D = 5 Ft., L = 50 Ft., S = 0.3%, DDE = 190 CY
 -SR2 DETOUR- STA. 14+45 LT
 MIN. D = 3 Ft., L = 75 Ft., S = 0.2%, DDE = 92 CY



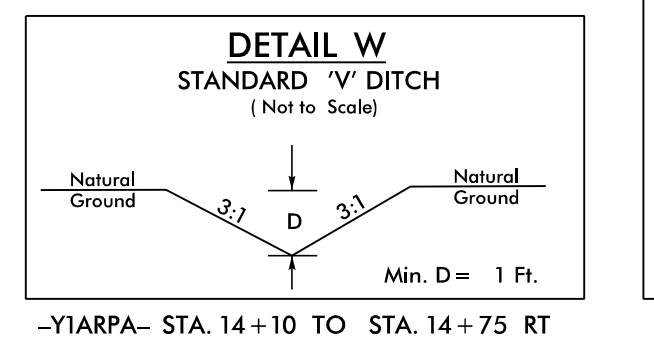
Min. D = 2 Ft.

-L- STA. 144+00 TO STA. 145+00 RT
 -L- STA. 148+50 TO STA. 151+25 LT
 -L- STA. 158+00 TO STA. 166+50 LT
 -L- STA. 168+00 TO STA. 177+00 LT



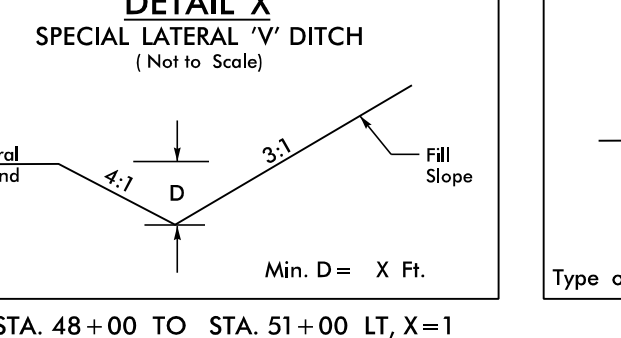
Min. D = 1 Ft.

-SR2- STA. 30+50 TO STA. 31+80 RT
 -SR2- STA. 32+00 TO STA. 33+00 RT



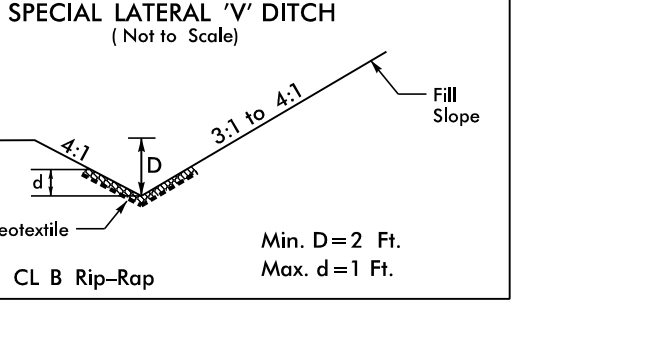
Min. D = 1 Ft.

-YIARPA- STA. 14+10 TO STA. 14+75 RT
 DDE = 4 CY
 -YIARPB- STA. 16+20 TO STA. 17+20 RT
 DDE = 11 CY
 -YIARPA DETOUR- STA. 10+00 RT
 DDE = 2 CY



Min. D = X Ft.

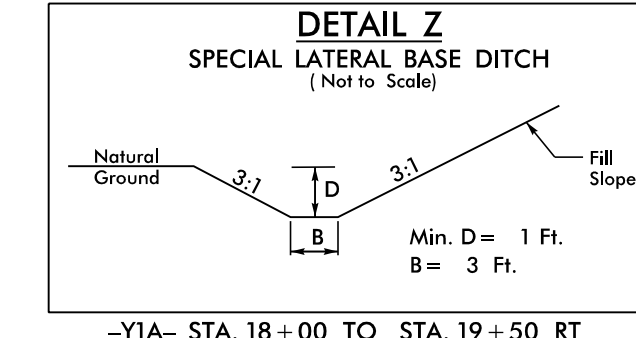
-SR6- STA. 48+00 TO STA. 51+00 LT, X=1



Min. D = 2 Ft.
 Max. d = 1 Ft.

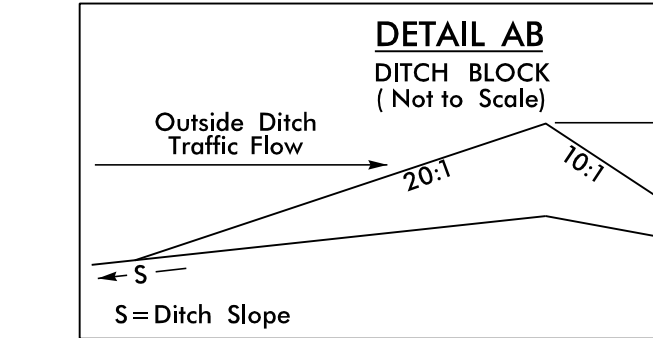
Type of Liner = CL B Rip-Rap

-L- STA. 307+50 TO STA. 308+50 LT
 -YIARPB- STA. 19+50 TO STA. 20+00 LT



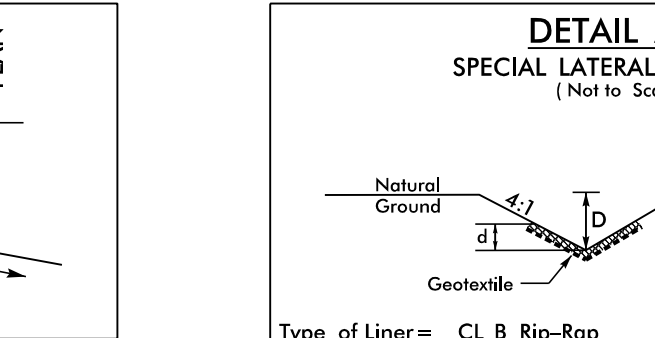
Min. D = 1 Ft.
 B = 3 Ft.

-YIA- STA. 18+00 TO STA. 19+50 RT



S = Ditch Slope

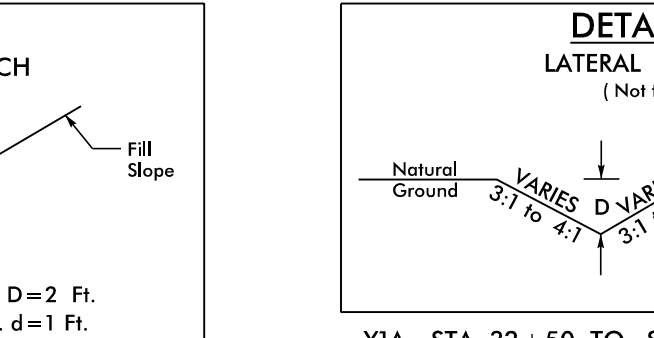
STA. -L- 137+50 RT EL = 136.0'
 STA. -L- 168+50 RT EL = 141.0'
 STA. -L- 197+50 RT EL = 145.0'
 STA. -L- 217+50 RT EL = 146.6'
 STA. -YIA- 25+50 LT EL = 150.0'
 STA. -YIA- 31+00 LT EL = 150.0'
 STA. -SR2- 19+00 LT EL = 149.2'



Min. D = 2 Ft.
 Max. d = 1 Ft.

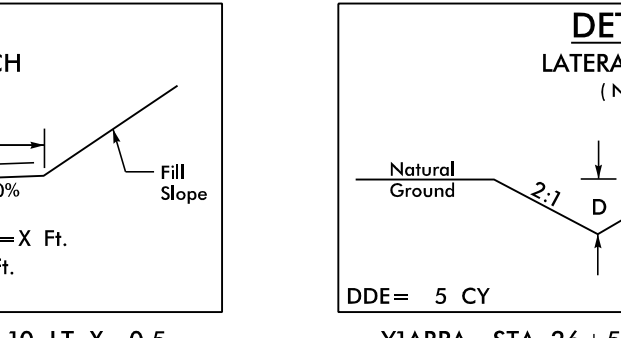
Type of Liner = CL B Rip-Rap

-L- STA. 307+50 TO STA. 308+50 LT



Min. D = X Ft.
 b = 5 Ft.

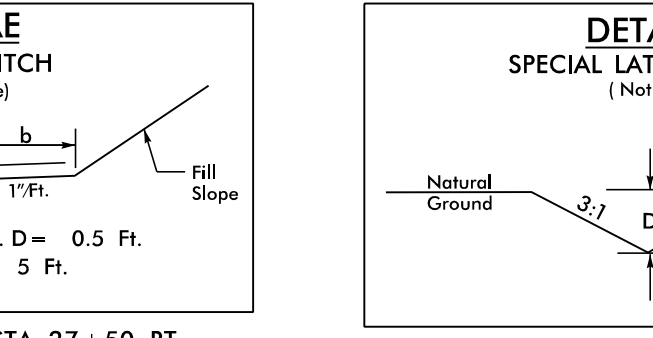
-YIA- STA. 32+50 TO STA. 35+10 LT, X=0.5
 DDE = 29 CY
 -YIA- STA. 45+15 TO STA. 46+90 RT, X=1
 DDE = 49 CY
 -YIARPB- STA. 21+50 TO STA. 24+90 LT, X=1.0
 DDE = 76 CY
 -YIARPD- STA. 18+50 TO STA. 20+50 LT, X=2.5
 DDE = 156 CY
 -Y2- STA. 21+00 TO STA. 28+50 LT, X=1
 DDE = 456 CY



Min. D = 0.5 Ft.
 b = 5 Ft.

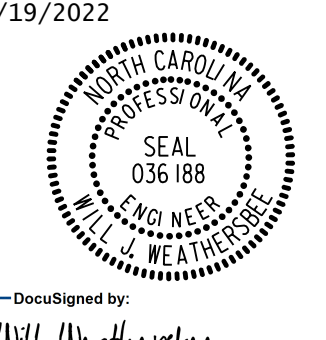

DDE = 5 CY

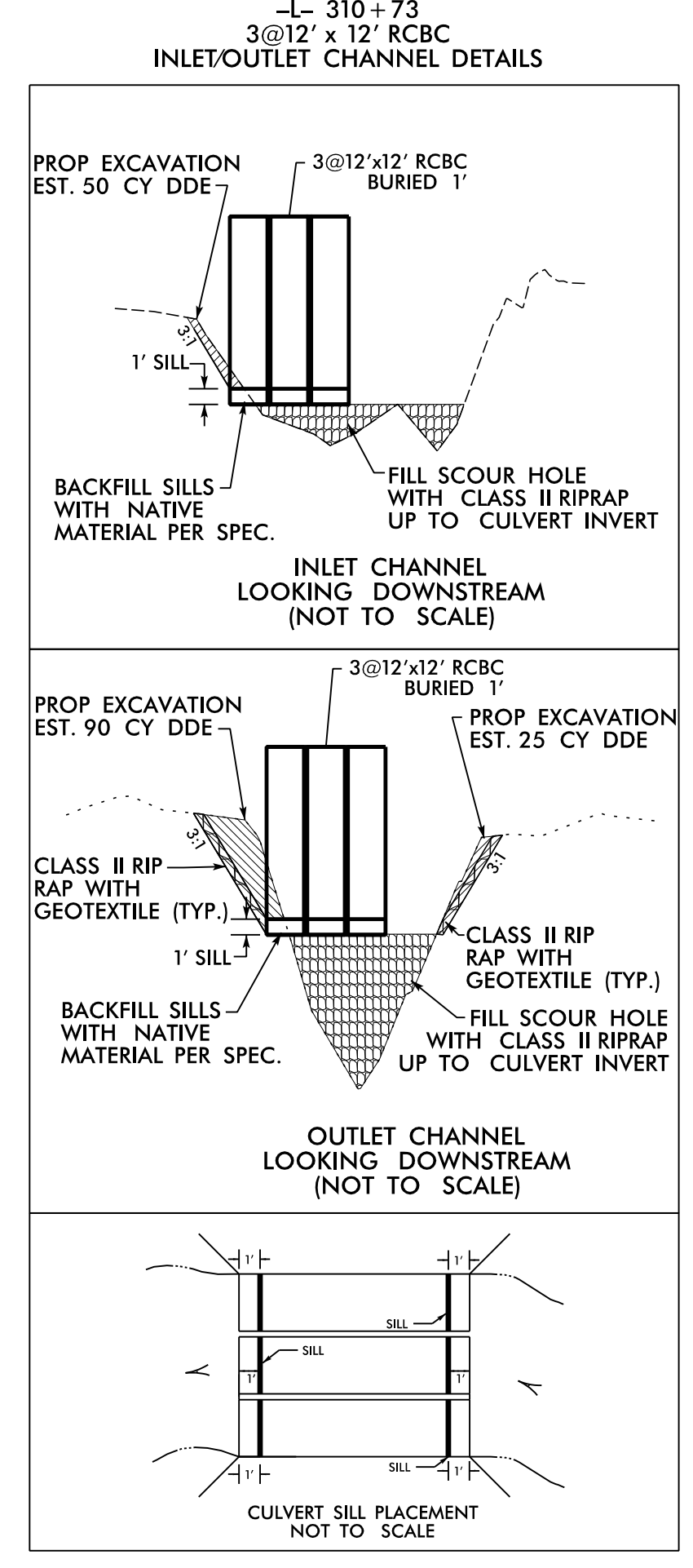
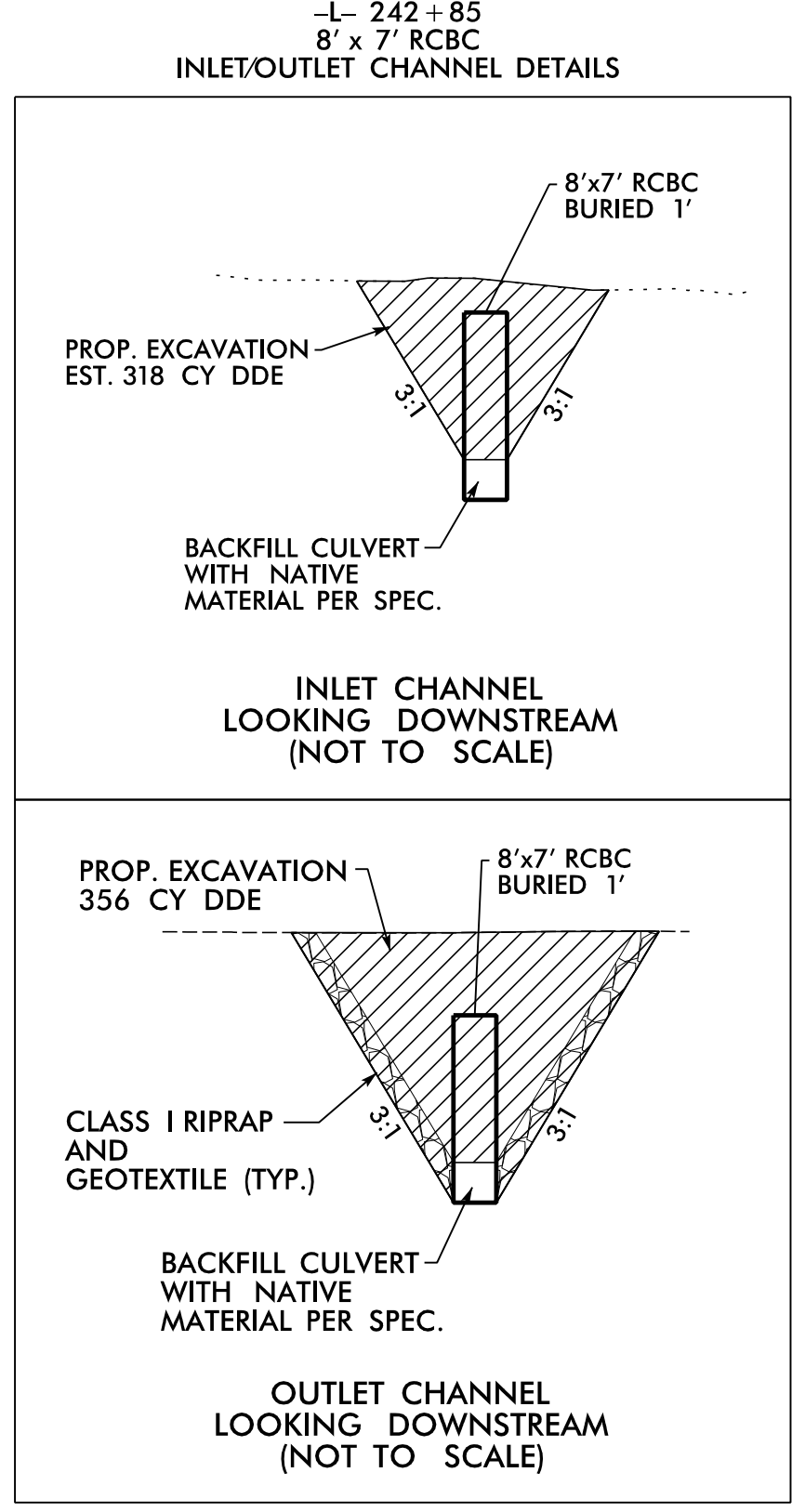
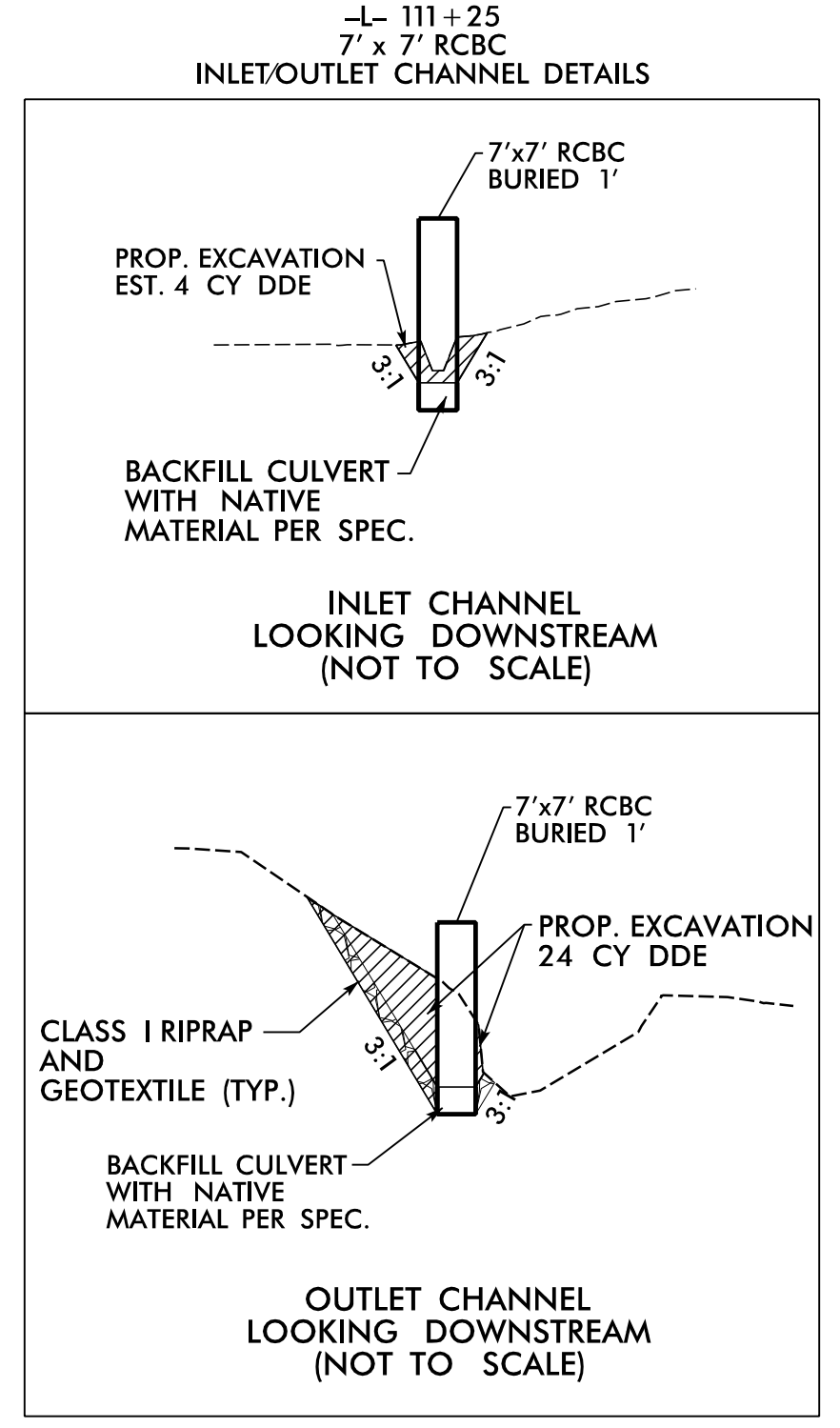
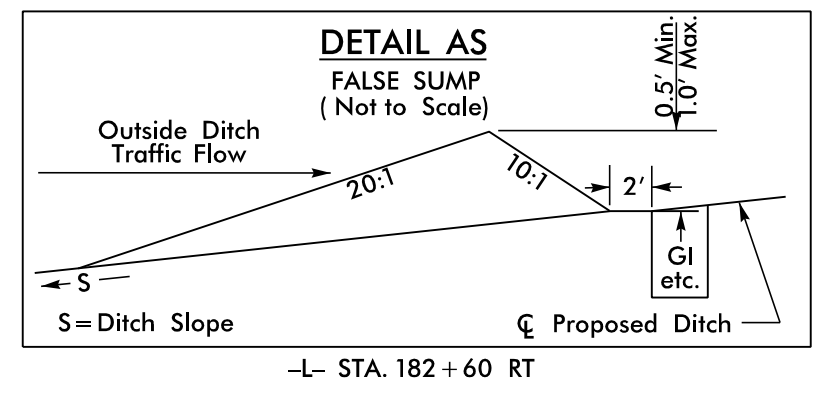
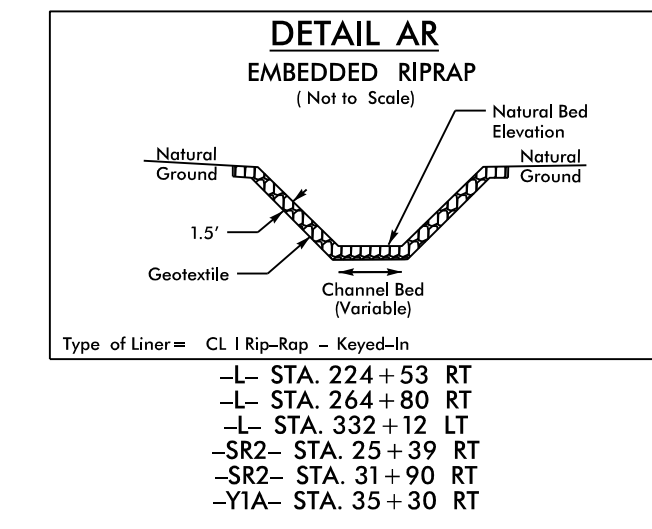
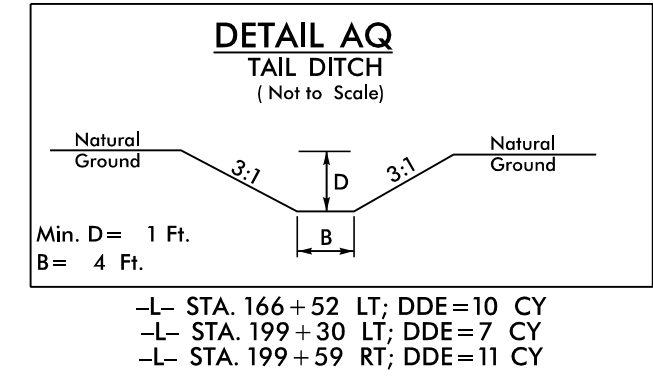
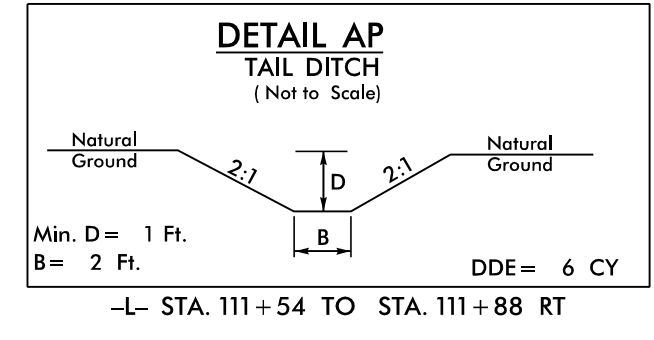
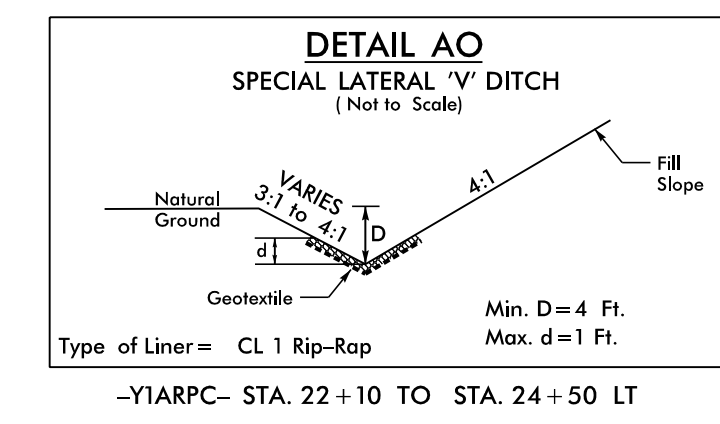
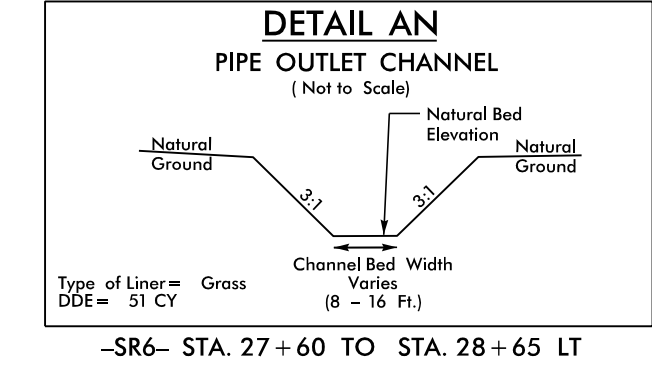
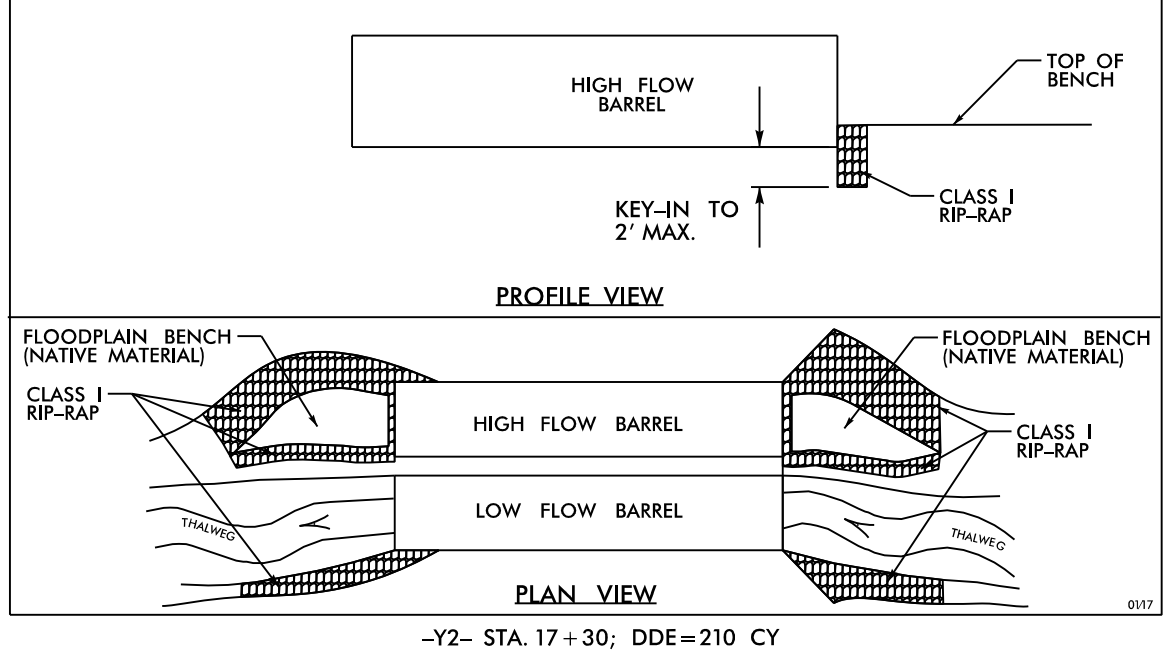
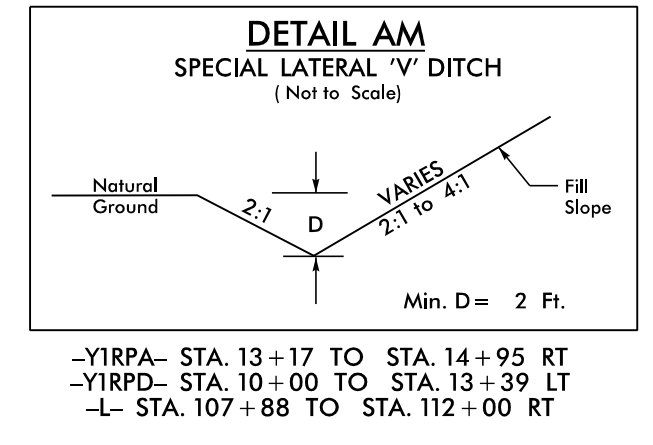
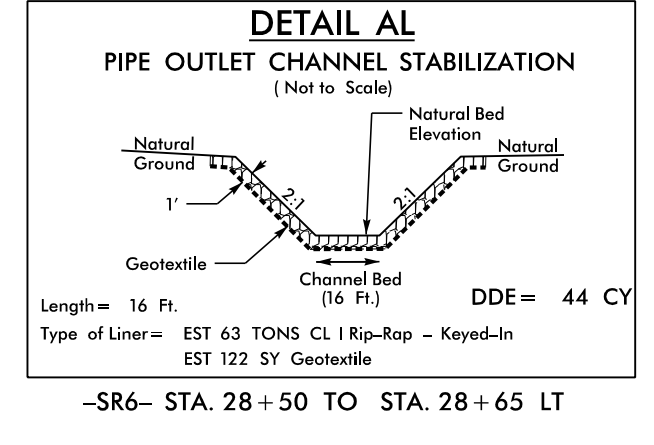
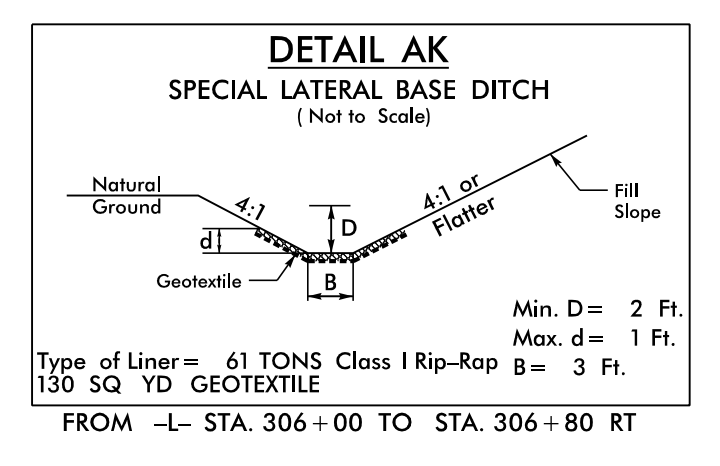
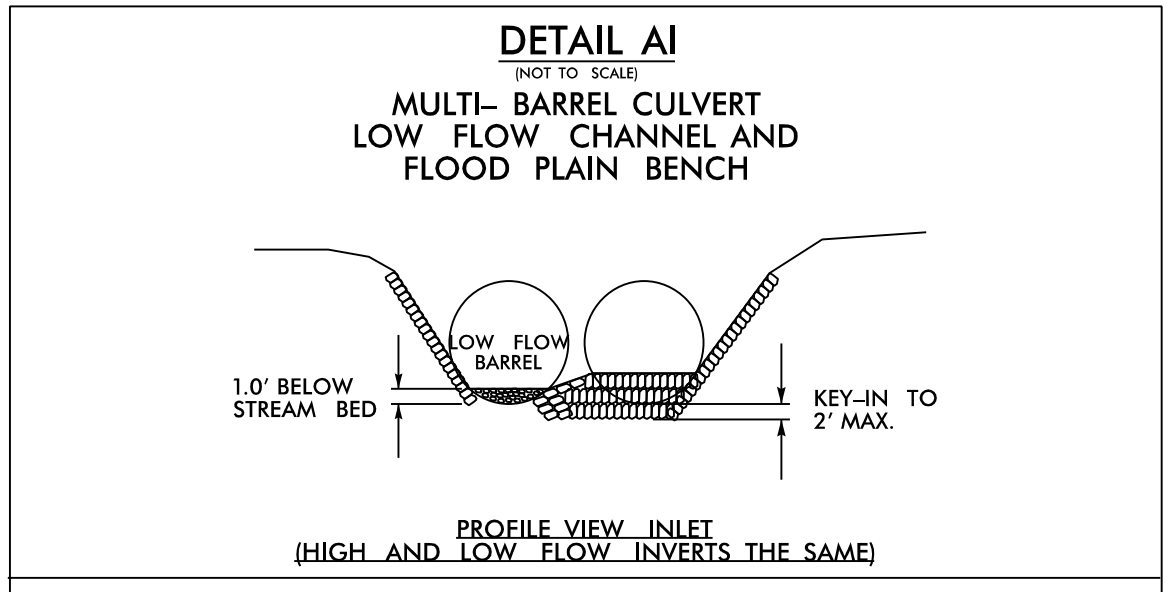
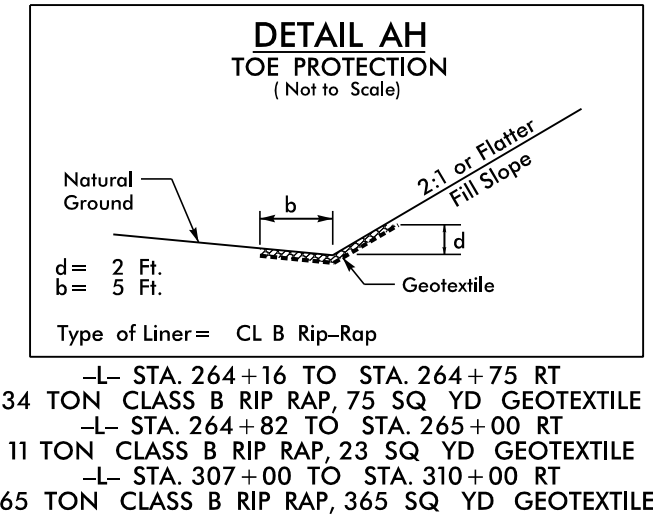
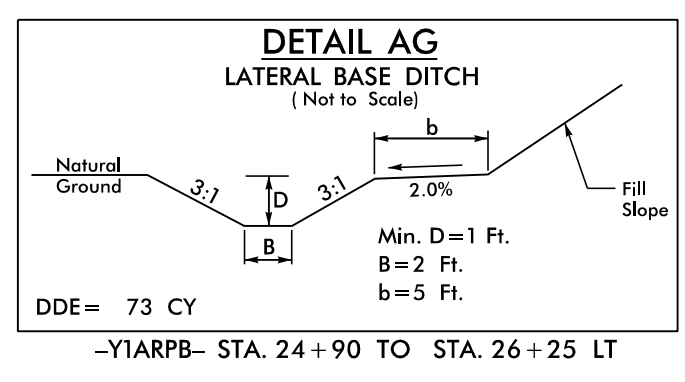
-YIARPA- STA. 26+50 TO STA. 27+50 RT

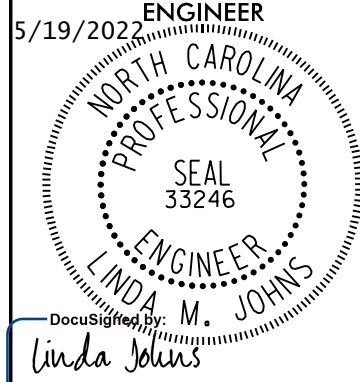



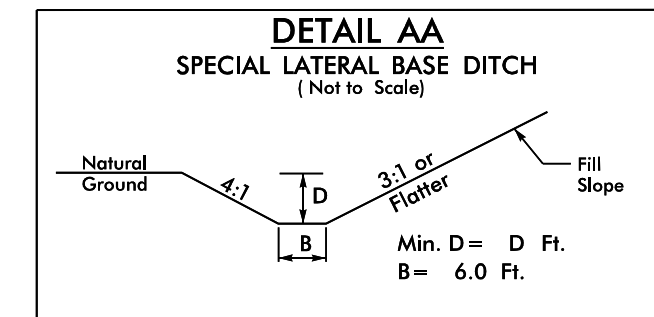
Min. D = 1 Ft.

-Y2- STA. 17+00 TO STA. 17+50 LT

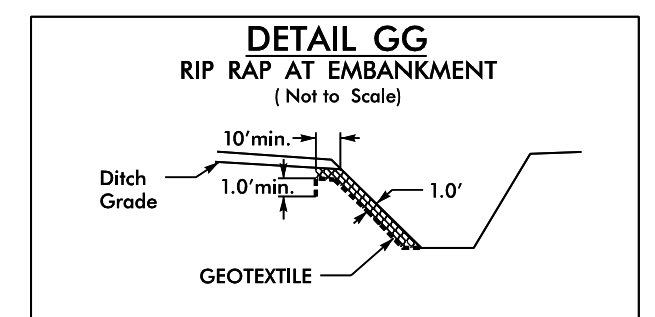
PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2D-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER 5/19/2022
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	
NV5 ENGINEERS & CONSULTANTS, INC. 7500 E. INDEPENDENCE BLVD, STE 100 CHARLOTTE, NC 28227 P: 704.537.7300 www.NV5.com NC License # F-1333	



PROJECT REFERENCE NO. 1-5987A	SHEET NO. 2D-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	5/19/2022
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	
<small>4700 FALLS OF NEUSE ROAD, SUITE 300 RALEIGH, NORTH CAROLINA 27609 (919) 781-4800 VOIC (919) 781-4889 FAX NC License No.: F-0105</small>	
<small>MI ENGINEERING 1011 SCHUBB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 801-6606 FIRM PE NUMBER: P-0671</small>	

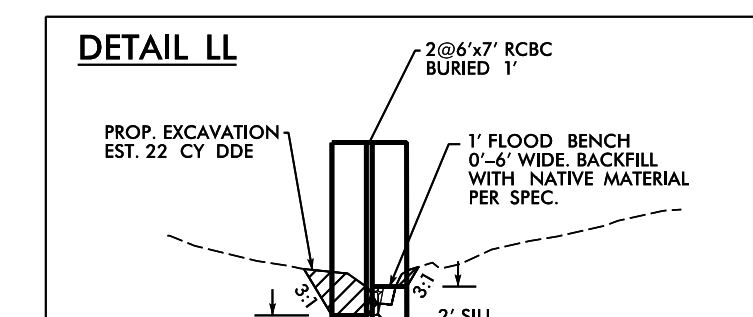


FROM -L- STA. 346+27 TO STA. 354+50 RT, D=1.0
 FROM -L- STA. 354+82 TO STA. 365+16 RT, D=1.0
 FROM -L- STA. 368+42 TO STA. 385+30 RT, D=1.0
 FROM -L- STA. 386+10 TO STA. 389+36 RT, D=1.0
 FROM -L- STA. 389+50 TO STA. 453+69 RT, D=1.0
 FROM -L- STA. 466+50 TO STA. 468+00 RT, D=1.0
 FROM -L- STA. 468+15 TO STA. 482+60 RT, D=1.5
 FROM -L- STA. 483+50 TO STA. 495+00 RT, D=1.6
 FROM -L- STA. 353+74 TO STA. 365+81 LT, D=1.0
 FROM -L- STA. 367+55 TO STA. 455+65 LT, D=2.0
 FROM -L- STA. 455+88 TO STA. 460+50 LT, D=1.0
 FROM -L- STA. 463+65 TO STA. 473+00 LT, D=1.0
 FROM -L- STA. 481+77 TO STA. 495+00 LT, D=1.0



Type of Liner = CL B Rip-Rap

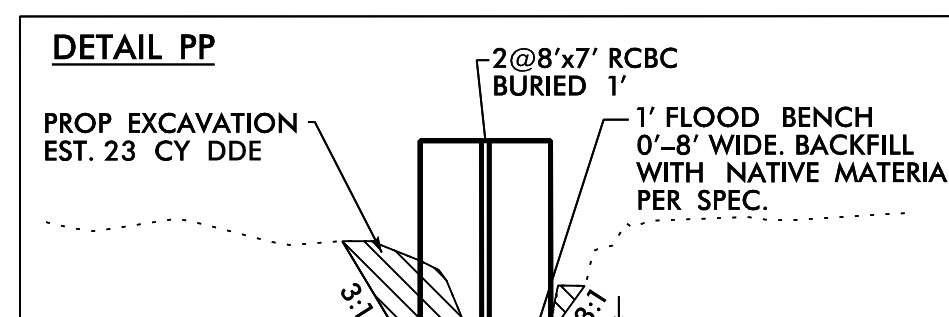
FROM -L- STA. 354+40 TO STA. 354+74 RT
 EST. 12 TON, 28 SY GEOTEXTILE
 FROM -L- STA. 354+64 TO STA. 354+89 RT
 EST. 13 TON, 30 SY GEOTEXTILE
 FROM -L- STA. 453+63 TO STA. 353+81 RT
 EST. 8 TON, 18 SY GEOTEXTILE
 FROM -L- STA. 353+63 TO STA. 353+75 LT
 EST. 9 TON, 21 SY GEOTEXTILE
 FROM -L- STA. 365+74 TO STA. 365+90 LT
 EST. 9 TON, 20 SY GEOTEXTILE
 FROM -L- STA. 403+48 TO STA. 404+24 LT
 EST. 36 TON, 31 SY GEOTEXTILE
 FROM -L- STA. 451+16 TO STA. 451+56 LT
 EST. 36 TON, 82 SY GEOTEXTILE
 FROM -L- STA. 455+44 TO STA. 455+84 LT
 EST. 21 TON, 48 SY GEOTEXTILE
 FROM -L- STA. 455+78 TO STA. 456+00 LT
 EST. 8 TON, 20 SY GEOTEXTILE
 FROM -Y3- STA. 24+66 TO STA. 24+81 LT
 EST. 14 TON, 32 SY GEOTEXTILE
 FROM -Y3- STA. 34+08 TO STA. 34+18 LT
 EST. 3 TON, 8 SY GEOTEXTILE



PROP. EXCAVATION EST. 22 CY DDE

BACKFILL CULVERT WITH NATIVE MATERIAL PER SPEC.

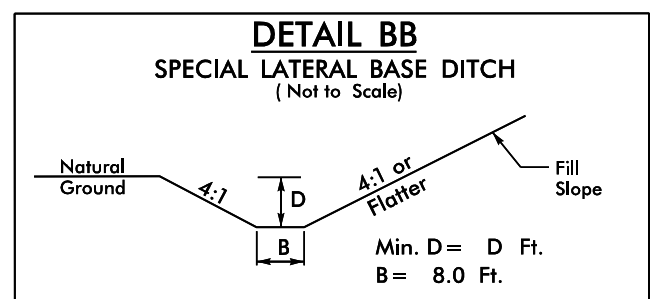
CLASS I FLOOD BENCH BORDER, 1:1 SLOPE



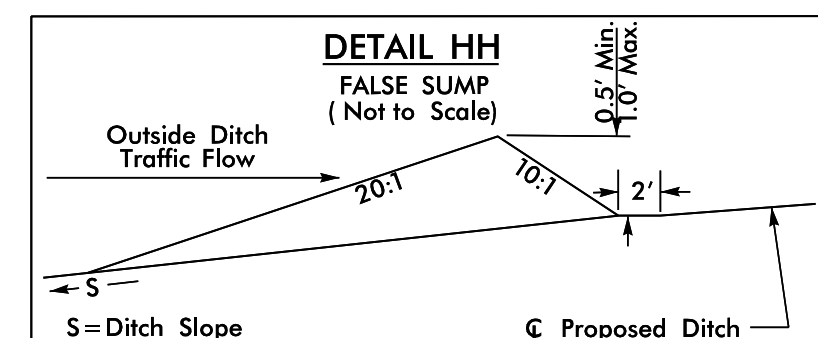
PROP. EXCAVATION EST. 23 CY DDE

BACKFILL CULVERT WITH NATIVE MATERIAL PER SPEC.

CLASS I FLOOD BENCH BORDER, 1:1 SLOPE

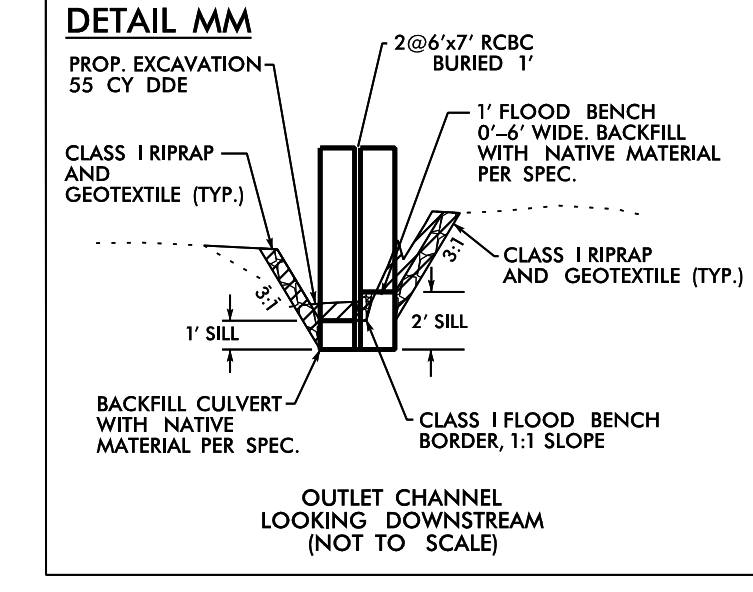


FROM -L- STA. 340+55 TO STA. 341+00 RT, D=1.0
 FROM -L- STA. 342+69 TO STA. 343+09 RT, D=1.0



S = Ditch Slope

-L- STA. 360+18 RT
 -L- STA. 379+12 RT
 -L- STA. 385+30 RT
 -L- STA. 386+58 LT
 -L- STA. 403+30 LT
 -L- STA. 409+17 LT
 -L- STA. 434+60 LT
 -L- STA. 446+40 LT
 -L- STA. 473+00 LT
 -L- STA. 481+77 LT
 -L- STA. 486+15 LT



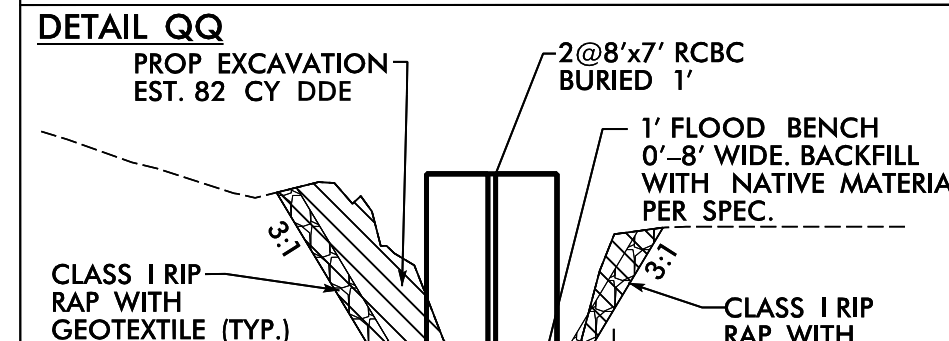
PROP. EXCAVATION EST. 55 CY DDE

CLASS I RIPRAP AND GEOTEXTILE (TYP.)

BACKFILL CULVERT WITH NATIVE MATERIAL PER SPEC.

CLASS I FLOOD BENCH BORDER, 1:1 SLOPE

OUTLET CHANNEL LOOKING DOWNSTREAM (NOT TO SCALE)



PROP. EXCAVATION EST. 82 CY DDE

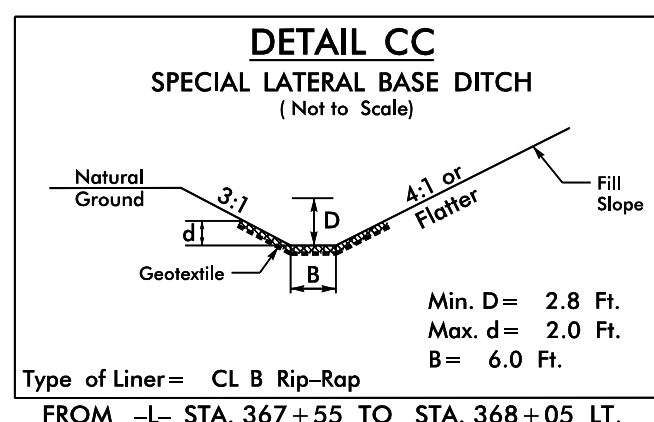
CLASS I RIPRAP WITH GEOTEXTILE (TYP.)

BACKFILL CULVERT WITH NATIVE MATERIAL PER SPEC.

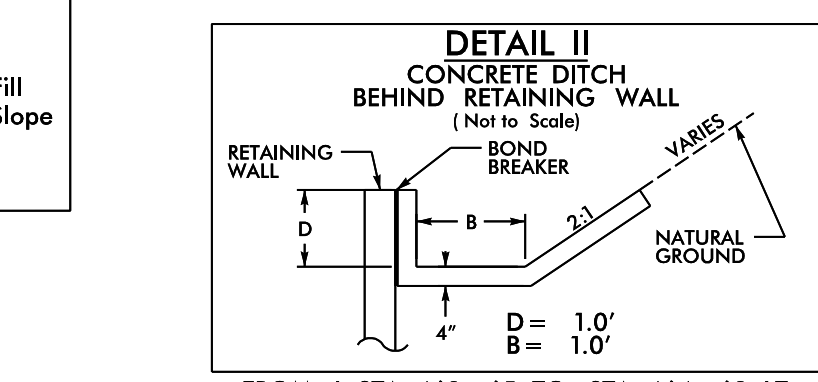
CLASS I FLOOD BENCH BORDER, 1:1 SLOPE

CLASS I RIPRAP WITH GEOTEXTILE (TYP.)

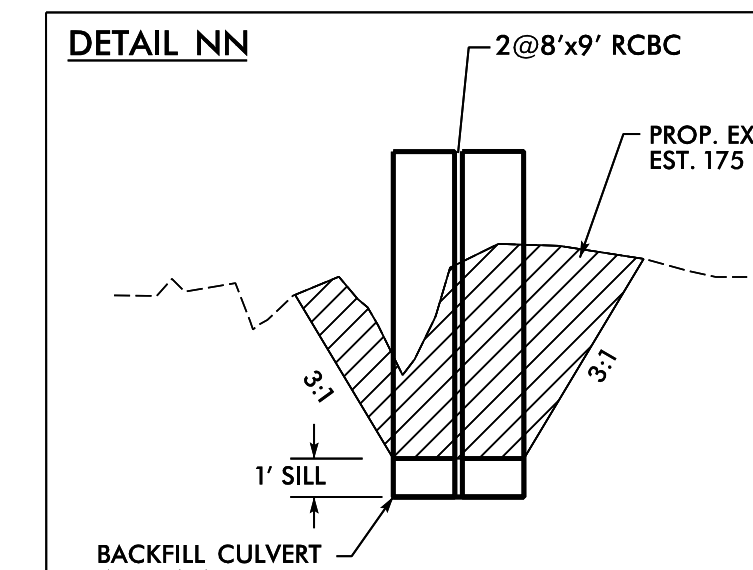
OUTLET CHANNEL LOOKING DOWNSTREAM (NOT TO SCALE)



FROM -L- STA. 367+55 TO STA. 368+05 LT, EST. 44 TON, 111 SY GEOTEXTILE



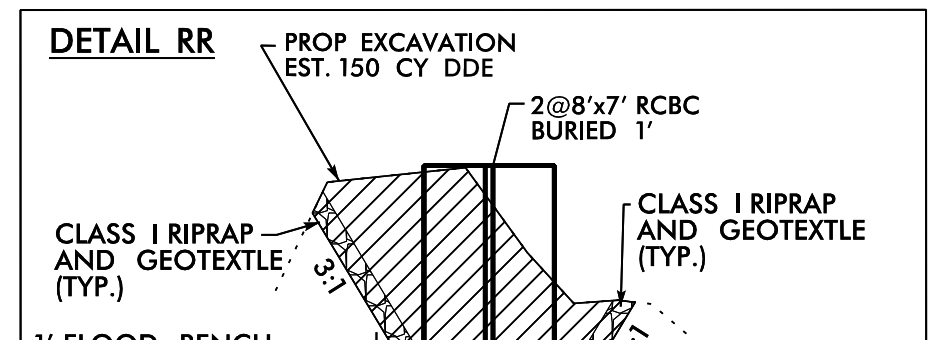
FROM L STA. 463+65 TO STA. 464+69 LT
 FROM L STA. 462+61 TO STA. 466+50 RT



PROP. EXCAVATION EST. 175 CY DDE

BACKFILL CULVERT WITH NATIVE MATERIAL PER SPEC.

INLET CHANNEL LOOKING DOWNSTREAM (NOT TO SCALE)



PROP. EXCAVATION EST. 150 CY DDE

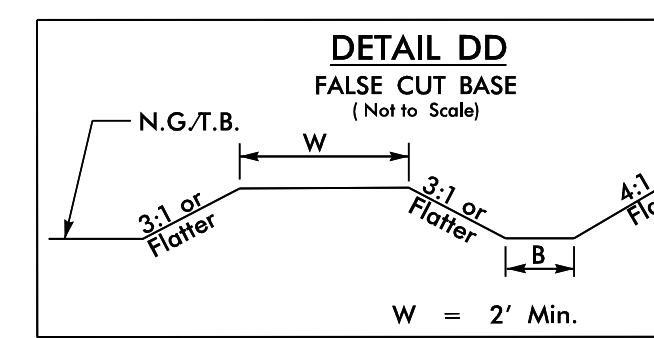
CLASS I RIPRAP AND GEOTEXTILE (TYP.)

1' FLOOD BENCH 0'-8" WIDE, BACKFILL WITH NATIVE MATERIAL PER SPEC.

CLASS I FLOOD BENCH BORDER, 1:1 SLOPE

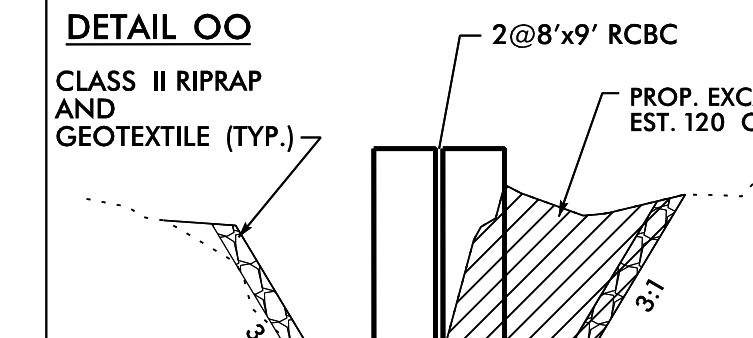
BACKFILL CULVERT WITH NATIVE MATERIAL PER SPEC.

INLET CHANNEL LOOKING DOWNSTREAM (NOT TO SCALE)



W = 2' Min.

FROM -L- STA. 341+00 TO STA. 342+69 RT, B=8.0'
 FROM -L- STA. 473+00 TO STA. 481+77 LT, B=6.0'

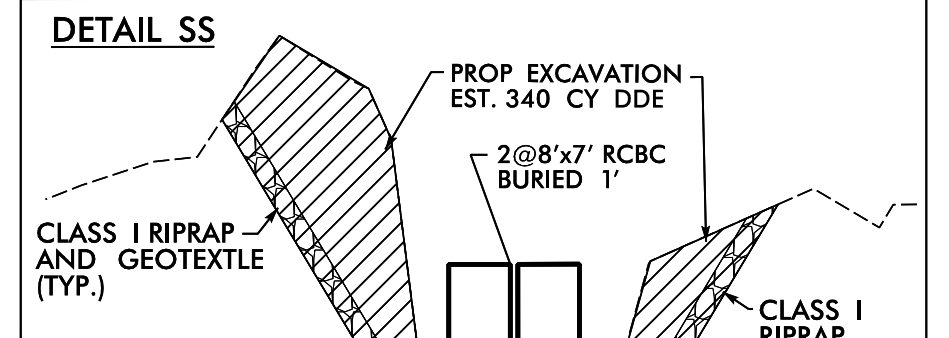


CLASS II RIPRAP AND GEOTEXTILE (TYP.)

PROP. EXCAVATION EST. 120 CY DDE

BACKFILL CULVERT WITH NATIVE MATERIAL PER SPEC.

OUTLET CHANNEL LOOKING DOWNSTREAM (NOT TO SCALE)



PROP. EXCAVATION EST. 340 CY DDE

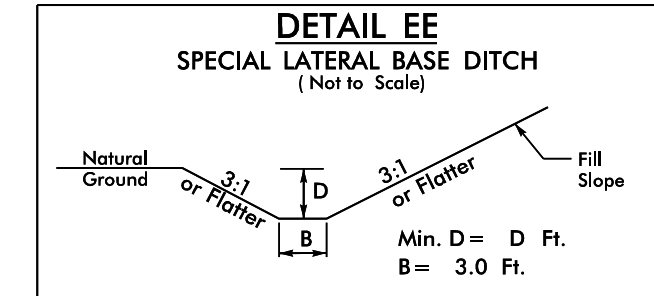
CLASS I RIPRAP AND GEOTEXTILE (TYP.)

1' FLOOD BENCH 0'-8" WIDE, BACKFILL WITH NATIVE MATERIAL PER SPEC.

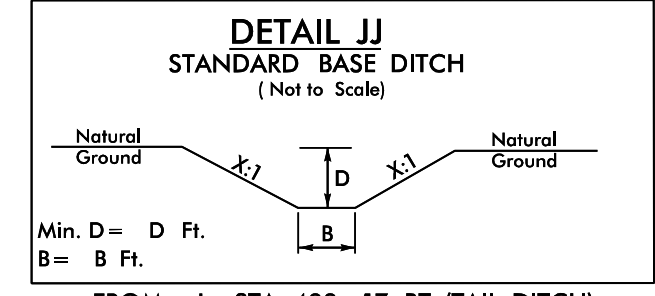
CLASS I FLOOD BENCH BORDER, 1:1 SLOPE

BACKFILL CULVERT WITH NATIVE MATERIAL PER SPEC.

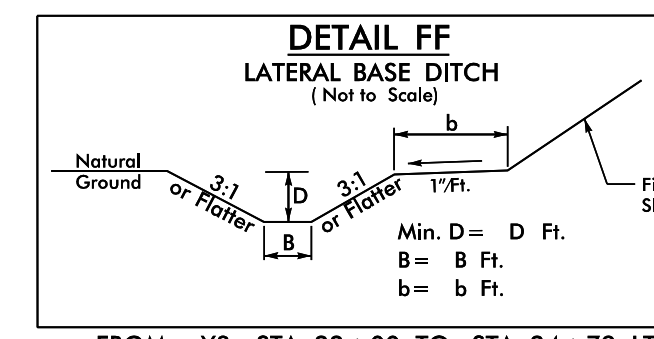
OUTLET CHANNEL LOOKING DOWNSTREAM (NOT TO SCALE)



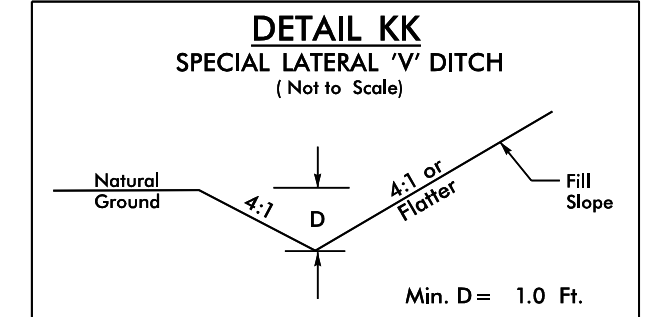
FROM -Y3- STA. 16+50 TO STA. 21+00 RT, D=1.0
 FROM -Y3- STA. 36+81 TO STA. 43+50 RT, D=1.6
 FROM -Y3- STA. 16+50 TO STA. 22+00 LT, D=1.0
 FROM -Y3- STA. 38+00 TO STA. 38+50 LT, D=1.0
 FROM -Y3- STA. 39+30 TO STA. 43+50 LT, D=1.0



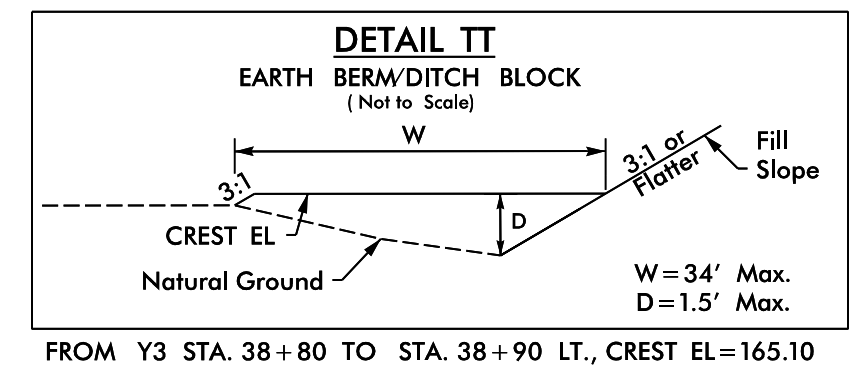
FROM -L- STA. 483+17 RT (TAIL DITCH)
 X=3.0, D=1.5, B=5.0
 S=0.00284H, L=80', DDE=45CY
 FROM -L- STA. 403+98 RT (TAIL DITCH)
 X=4.0, D=4.0, B=10.0
 S=0.00234H, L=660', DDE=1855CY
 BEG. EL. = 150.5', END EL. = 149.0'



FROM -Y3- STA. 22+00 TO STA. 24+79 LT
 D=1.0, B=3.0, b=5.0, DDE=251CY
 FROM -Y3- STA. 34+08 TO STA. 38+00 LT
 D=1.0, B=3.0, b=5.0, DDE=380
 FROM -Y3- STA. 22+25 TO STA. 22+74 RT
 D=1.0, B=4.0, b=VAR., DDE=124CY



FROM -L- STA. 343+09 TO STA. 346+27 RT



FROM Y3 STA. 38+80 TO STA. 38+90 LT, CREST EL.=165.10