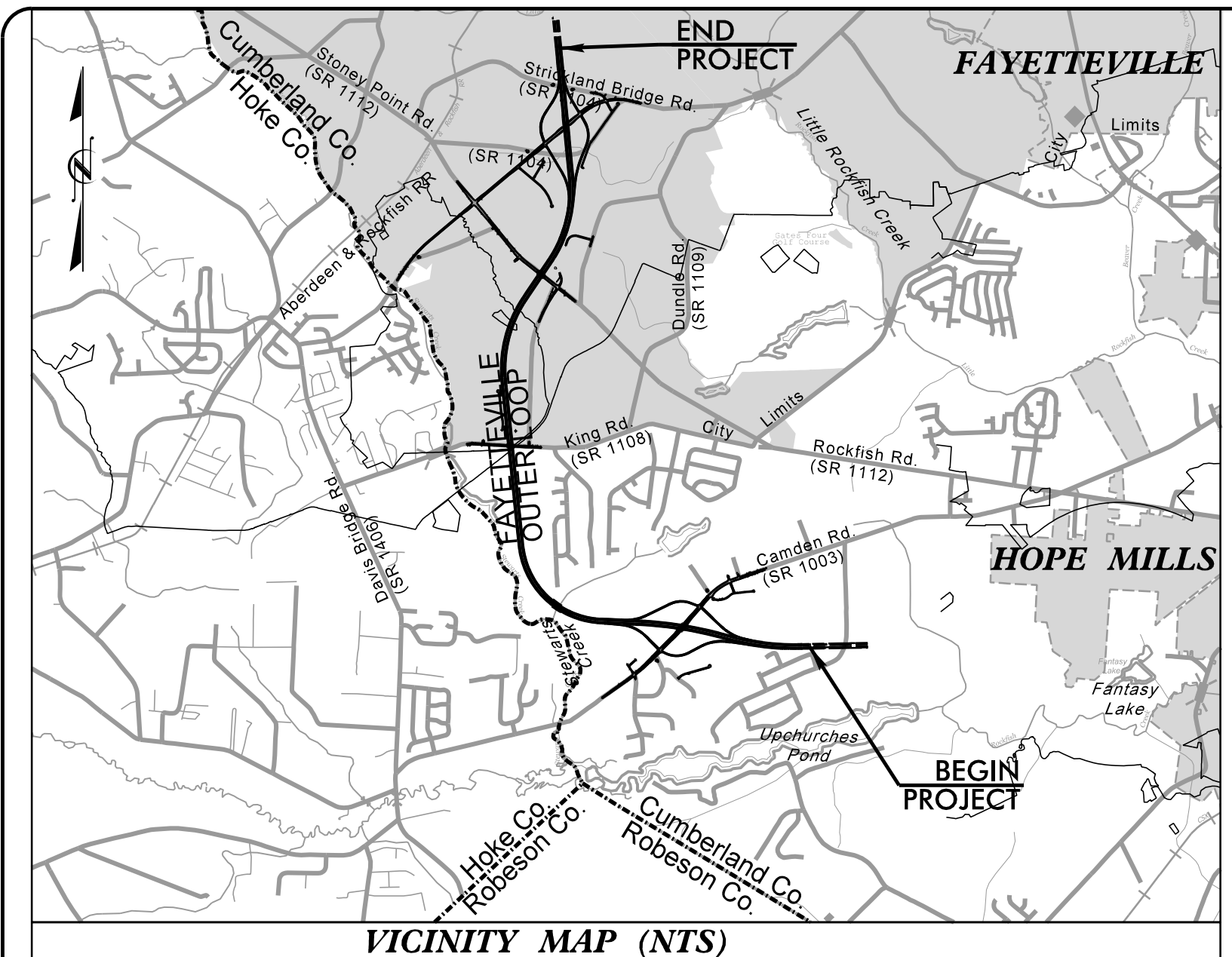


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**This file or an individual page
shall not be considered a certified document.**

CONTRACT: C204110 **TIP PROJECT: U-2519BA/U-2519BB**



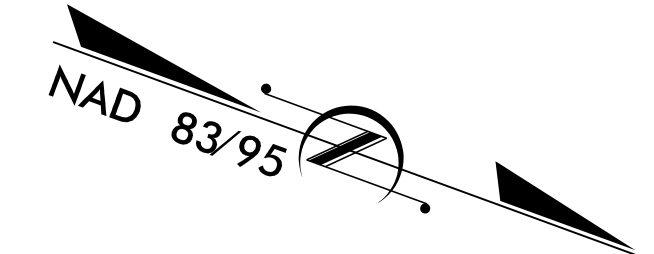
VICINITY MAP (NTS)
See Sheet 1A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

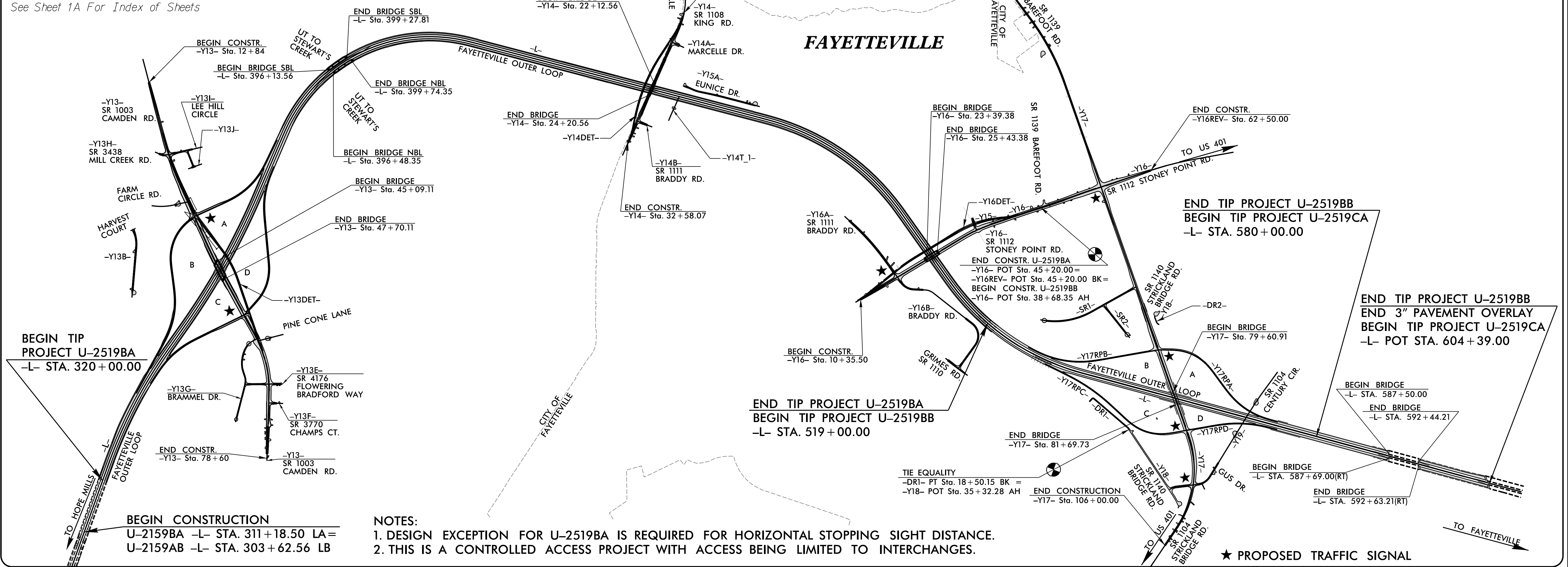
LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1003 (CAMDEN ROAD) TO SOUTH OF US 401

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



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2519BA /U-2519BB	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34817.1.FR7 (U-2519BA)	NHF-0100(24)	P.E.	
34817.2.17 (U-2519BA)	NHF-0100(24)	R/W	
34817.2.FR14 (U-2519BA)	NHF-0100(24)	UTILITIES	
34817.3.14 (U-2519BA)	NHF-0100(24)	CONST	
34817.1.FR8 (U-2519BB)	NHF-0100(25)	P.E.	
34817.1.FR15 (U-2519BB)	NHF-0100(25)	R/W	
34817.2.11 (U-2519BB)	NHF-0100(25)	UTILITIES	
34817.3.15 (U-2519BB)	NHF-0100(24)	CONST	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



- NOTES:**
- DESIGN EXCEPTION FOR U-2519BA IS REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.
 - THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

PROJECT LENGTH

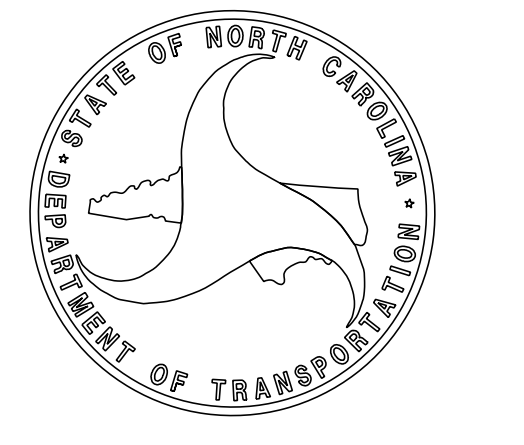
LENGTH ROADWAY TIP PROJECT U-2519BA.....	3.707 miles
LENGTH STRUCTURES TIP PROJECT U-2519BA.....	0.062 miles
TOTAL LENGTH OF TIP PROJECT U-2519BA.....	3.769 miles
LENGTH ROADWAY TIP PROJECT U-2519BB.....	1.524 miles
TOTAL LENGTH TIP PROJECT U-2519BB.....	1.524 miles
TOTAL LENGTH TIP PROJECTS U-2519BA /U-2519BB.....	5.293 miles

PREPARED IN THE OFFICES OF:
RK&K
 8601 SIX FORKS ROAD, FORUM 1, SUITE 700
 RALEIGH, NORTH CAROLINA 27615-3960
 N.C. LICENSE NO. F-2012

NIV15
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: U-2519BA: SEPTEMBER 16, 2016
RIGHT OF WAY DATE: U-2519BB: SEPTEMBER 29, 2016
LETTING DATE: JUNE 21, 2022

NCDOT CONTACT: KHALED ALAKHDAR, PE
 PROJECT ENGINEER - ENGR. COORD.



INDEX of SHEETS, GENERAL NOTES, and LIST of STANDARDS

PROJECT REFERENCE NO. U-2519BA / U-2519BB	SHEET NO. 1A
---	------------------------

ROADWAY DESIGN ENGINEER 6/30/2022
NORTH CAROLINA PROFESSIONAL SEAL 16725
SCOTT D. BLIVINS

LIST OF STANDARD DRAWINGS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.08	Earth Berm Median Pier Protection
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
235.01	Embankment Monitoring
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges - Method III
610.04	Guide for Paving Shoulders Under Bridges - Method IV
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Markers
806.02	Granite Right-of-Way Markers
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.33	Reinforced Concrete Endwall - for Single 66" Pipe 90 Skew
838.39	Reinforced Concrete Endwall - for Single 72" 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
838.63	Reinforced Brick Endwall - for Single 66" Pipe 90 Skew
838.69	Reinforced Brick Endwall - for Single 72" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.41	Spring Box - Concrete or Brick
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
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
850.01	Concrete Paved Ditch 850.11 Guide for Berm Drainage Outlet - 24" and 30" Pipe
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
852.10	Median Construction - with Curb and Gutter
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation (Special Detail for Sheet 6 of 8)
862.03	Structure Anchor Units (Special Detail for Type III Anchor Units Sheets 1 of 7 and 2 of 7)
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
865.01	Cable Guiderail
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap
876.04	Drainage Ditches with Class 'B' Rip Rap

LIST OF GENERAL NOTES

EFF. 01-16-2018
REV.

GRADE LINE:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE DRAINS:

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

DRIVEWAYS:

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

STREET TURNOUT:

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

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 LUMBEE RIVER EMC, CENTURYLINK, SPECTRUM, PIEDMONT NATURAL GAS, AQUA NC, AND FAUETTEVILLE PUBLIC WORKS COMMISSION.

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

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

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	Title Sheet
1A	Index of Sheets, General Notes, and List of Standards
1B	Conventional Symbols
PART 1	
1	TITLE SHEET
2A-1 THRU 2A-10	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1 THRU 2B-7	DETOUR SHEETS
2B-8	SHEAR POINT DETAIL
2B-9	BRIDGE SKETCHES
2B-10 THRU 2B-13	INTERSECTION DETAILS
2C-1 THRU 2C-2	MODIFIED SHOULDER BERM GUTTER DETAILS
2C-3	GUARDRAIL ANCHOR UNIT, TYPE III DETAIL
2C-4	W BEAM RAIL SECTION DETAIL
2C-5	REMOVED SHEET
2C-6	TRIPLE AND QUADRUPLE PIPES DETAIL
2C-7	HEADWALL FOR ALUMINUM PIPE ARCHES
2C-8	COAL CUMBUSTION
2C-9	1'-6" TO 2'-9" CURB AND GUTTER TRANSITION
2C-10	AT-1 GUARDRAIL ANCHOR UNIT
2C-11	SPECIAL DI
2C-12	CONCRETE CATCH BASIN
2D-1 THRU 2D-2	DRAINAGE DETAILS
2G-1	ROCK EMBANKMENT DETAIL
2G-2 THRU 2G-3	REINFORCED SOIL SLOPE DETAILS
2N-1 THRU 2N-4	NOISE WALL ENVELOPES
3B-1 THRU 3B-3	ROADWAY SUMMARIES
3D-1 THRU 3D-19	DRAINAGE SUMMARIES
3G-1	GEO TECHNICAL SUMMARIES
3P-1 THRU 3P-2	PARCEL INDEX SHEETS
4 THRU 30	PLAN SHEETS
31 THRU 52	PROFILE SHEETS
RW3E-1 THRU RW3E-3	RIGHT OF WAY CONTROL SHEETS
TMP-1 THRU TMP-37	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-20	PAVEMENT MARKING PLANS
EC-1 THRU EC-57	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-65	SIGNING PLANS
SIG-1 THRU SIG-M8	SIGNALS PLANS
SCP-1 THRU SCP-6	SIGNAL COMMUNICATION PLANS
UC-1 THRU UC-20	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-20	UTILITY BY OTHERS PLANS
X-1A THRU X-1E	CROSS-SECTION SUMMARY SHEET
X-0 THRU X-213	CROSS-SECTIONS
S-1 THRU S4-35	STRUCTURE PLANS
PART 2	
1	TITLE SHEET
2A-1 THRU 2A-5	PAVEMENT SCHEDULE & TYPICAL SECTIONS
2B-1 THRU 2B-2	STRUCTURE DETAILS AND TYPICAL SECTIONS
2B-3 THRU 2B-4	CROSS SECTION LAYOUT SHEETS
2C-1	STRUCTURE ANCHOR UNITS, TYPE III
2C-2	GUARDRAIL INSTALLATION - W BEAM RAIL SECTION
2C-3	CURB AND GUTTER TRANSITION, 1'-6" TO 2'-9"
2C-4	CURB AND GUTTER TRANSITION, 2'-9" TO 2'-6" FOR CATCH BASIN
2C-5	REINFORCED APPROACH FILLS - TYPE III
2C-6	MINIMUM DEPTH CONCRETE CATCH BASIN
2G-1 THRU 2G-4	GEO TECHNICAL DETAILS
3B-1	SUMMARY OF EARTHWORK AND ROADWAY SUMMARIES
3D-1 THRU 3D-6	DRAINAGE SUMMARIES
3G-1	GEO TECHNICAL SUMMARY TABLES
3P-1	PARCEL INDEX SHEET
4 THRU 17	PLAN SHEETS
18 THRU 33	PROFILE SHEETS
RWO3E-1 THRU RWO3E-3	RIGHT OF WAY CONTROL SHEETS
TMP-1 THRU TMP-27	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-20	PAVEMENT MARKING PLANS SHEET
EC-01 THRU EC-37	EROSION CONTROL PLANS
SIGN-1A THRU SIGN-6J	SIGNING PLANS
SIG-1 THRU SIG-M8	SIGNALS PLANS
SCP-1 THRU SCP-18	SIGNAL COMMUNICATION PLANS
UC-1 THRU UC-19	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-11	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTION INDEX
X-0A THRU X-0C	CROSS-SECTION SUMMARY
X-1A THRU X-102	CROSS-SECTIONS
S-1 THRU S-39	STRUCTURE PLANS
W-1 THRU W-4	WALL PLANS

8/17/99

R:\Roadway\Projects\U2519BA_BB_Rdy_psh\01A.dgn

RK&K
P: (919) 878-9560
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Raleigh, North Carolina 27615-3960
NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed Property Corner	-----
Property 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 ☠
Potential Contamination Area: Soil	☠ S ☠
Known Contamination Area: Water	☠ W ☠
Potential Contamination Area: Water	☠ W ☠
Contaminated Site: Known or Potential	☠ ? ☠

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	⊠
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	-----
New Right of Way Line with Pin and Cap	-----
New Right of Way Line with Concrete or Granite R/W Marker	-----
New Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
New Control of Access	-----
Existing Easement Line	-----
New Temporary Construction Easement	-----
New Temporary Drainage Easement	-----
New Permanent Drainage Easement	-----
New Permanent Drainage / Utility Easement	-----
New Permanent Utility Easement	-----
New Temporary Utility Easement	-----
New Aerial Utility Easement	-----

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	☼
Single Shrub	☼

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

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:

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 LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	-----
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	-----

TV:

TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	-----
U/G TV Cable LOS B (S.U.E.*)	-----
U/G TV Cable LOS C (S.U.E.*)	-----
U/G TV Cable LOS D (S.U.E.*)	-----
U/G Fiber Optic Cable LOS B (S.U.E.*)	-----
U/G Fiber Optic Cable LOS C (S.U.E.*)	-----
U/G Fiber Optic Cable LOS D (S.U.E.*)	-----

GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	-----
U/G Gas Line LOS C (S.U.E.*)	-----
U/G Gas Line LOS D (S.U.E.*)	-----
Above Ground Gas Line	-----

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Forced Main Line LOS B (S.U.E.*)	-----
SS Forced Main Line LOS C (S.U.E.*)	-----
SS Forced Main Line LOS D (S.U.E.*)	-----

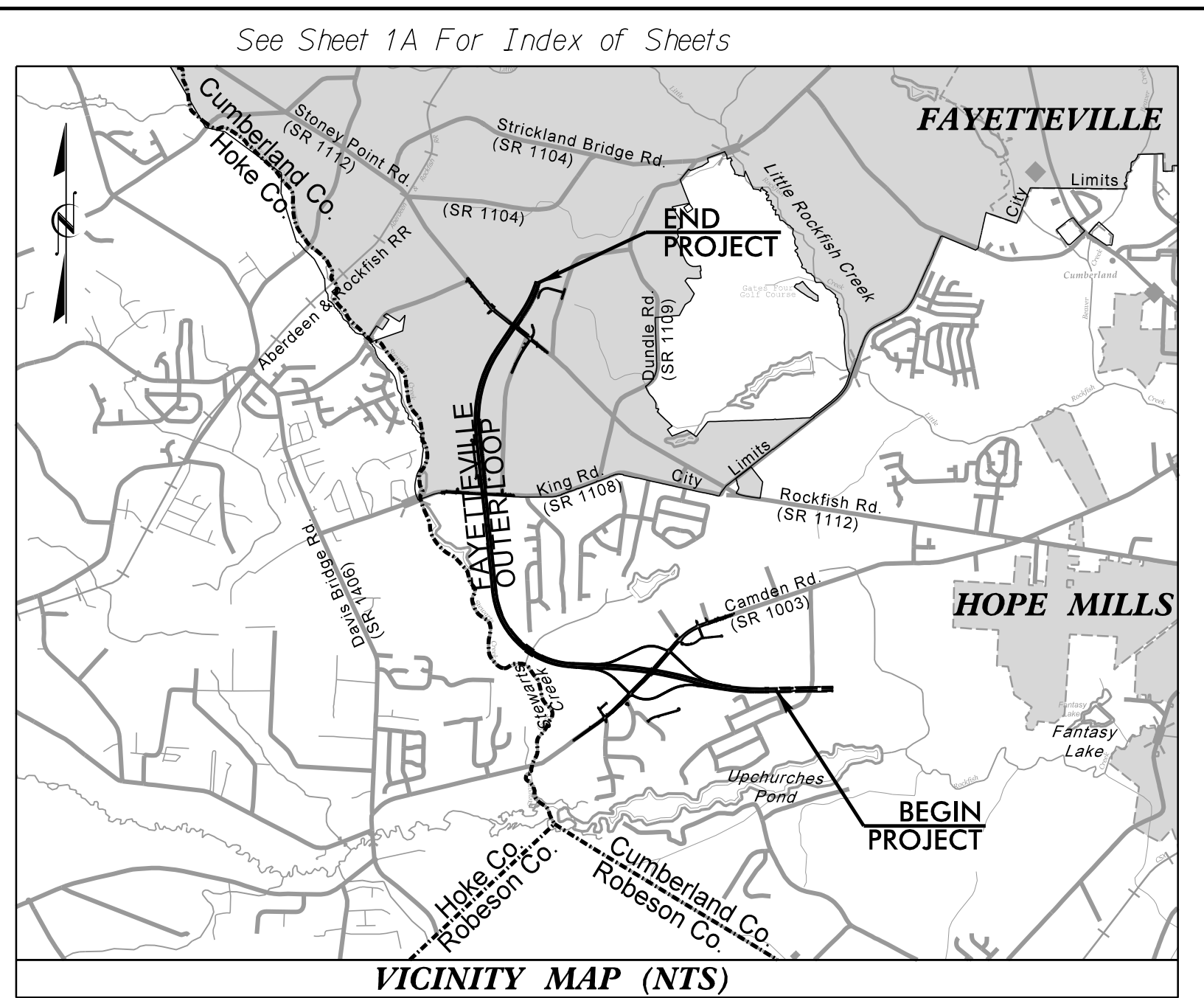
MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	-----
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

09.08/2022

TIP PROJECT: U-2519BA

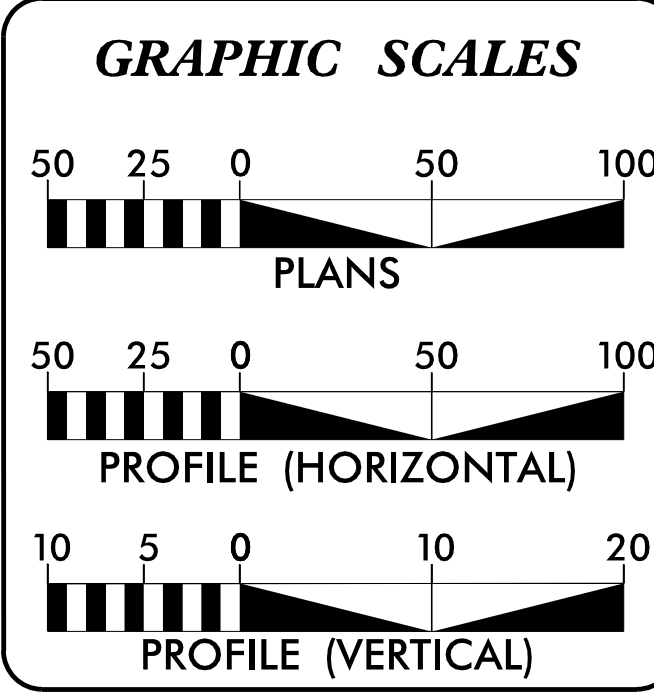
CONTRACT: C204110



BEGIN TIP PROJECT U-2519BA
 -L- Sta. 320 + 00.00

- NOTES:
 1. DESIGN EXCEPTION IS REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.
 2. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

BEGIN CONSTRUCTION
 U-2519BA -L- Sta. 311 + 18.50 LA =
 U-2519AB -L- Sta. 303 + 62.50 LB



DESIGN DATA

ADT 2022 =	28,000
ADT 2042 =	34,600
K =	8%
D =	55%
T =	12% *
V =	70 MPH
FUNC CLASS = INTERSTATE	
* (TTST 4% + DUAL 8%) STATEWIDE TIER	

PROJECT LENGTH (NB LANE)

LENGTH ROADWAY TIP PROJECT U-2519BA.....	3.707 miles
LENGTH STRUCTURES TIP PROJECT U-2519BA.....	0.062 miles
TOTAL LENGTH OF TIP PROJECT U-2519BA.....	3.769 miles

PREPARED IN THE OFFICE OF:
RK&K
 RUMMEL KLEPPER & KAHL, LLP
 8601 SIX FORKS ROAD, FORUM 1, SUITE 700
 RALEIGH, NORTH CAROLINA 27615-3960
 NC LICENSE NO. P-012

2018 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE:
 SEPTEMBER 16, 2016

LETTING DATE:
 JUNE 21, 2022

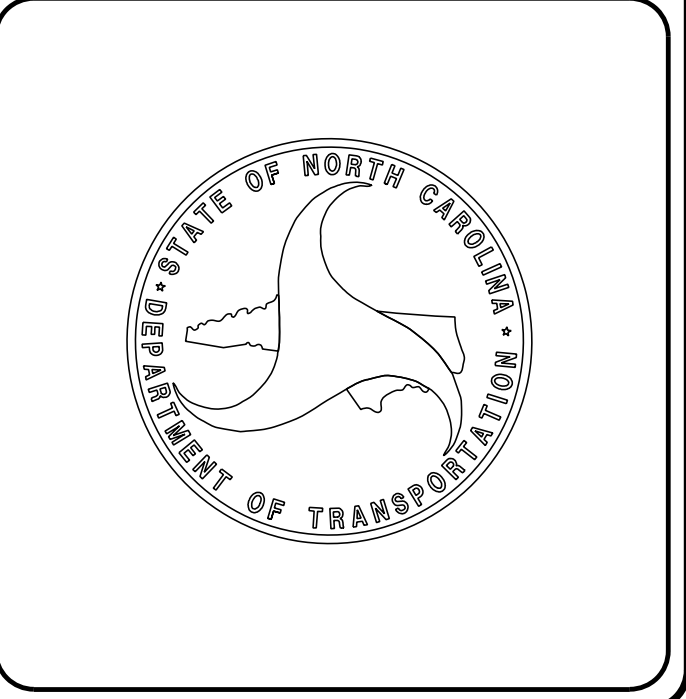
NCDOT CONTACT:
 KHALED ALAKHDAR, PE
 PROJECT ENGINEER - ENGR. COORD.

PROJECT ENGINEER:
 B. KEITH SKINNER, PE
 PROJECT ENGINEER
 RK&K, LLP

PROJECT ENGINEER:
 MICHAEL T. MERRITT, PE
 PROJECT DESIGN ENGINEER
 RK&K, LLP

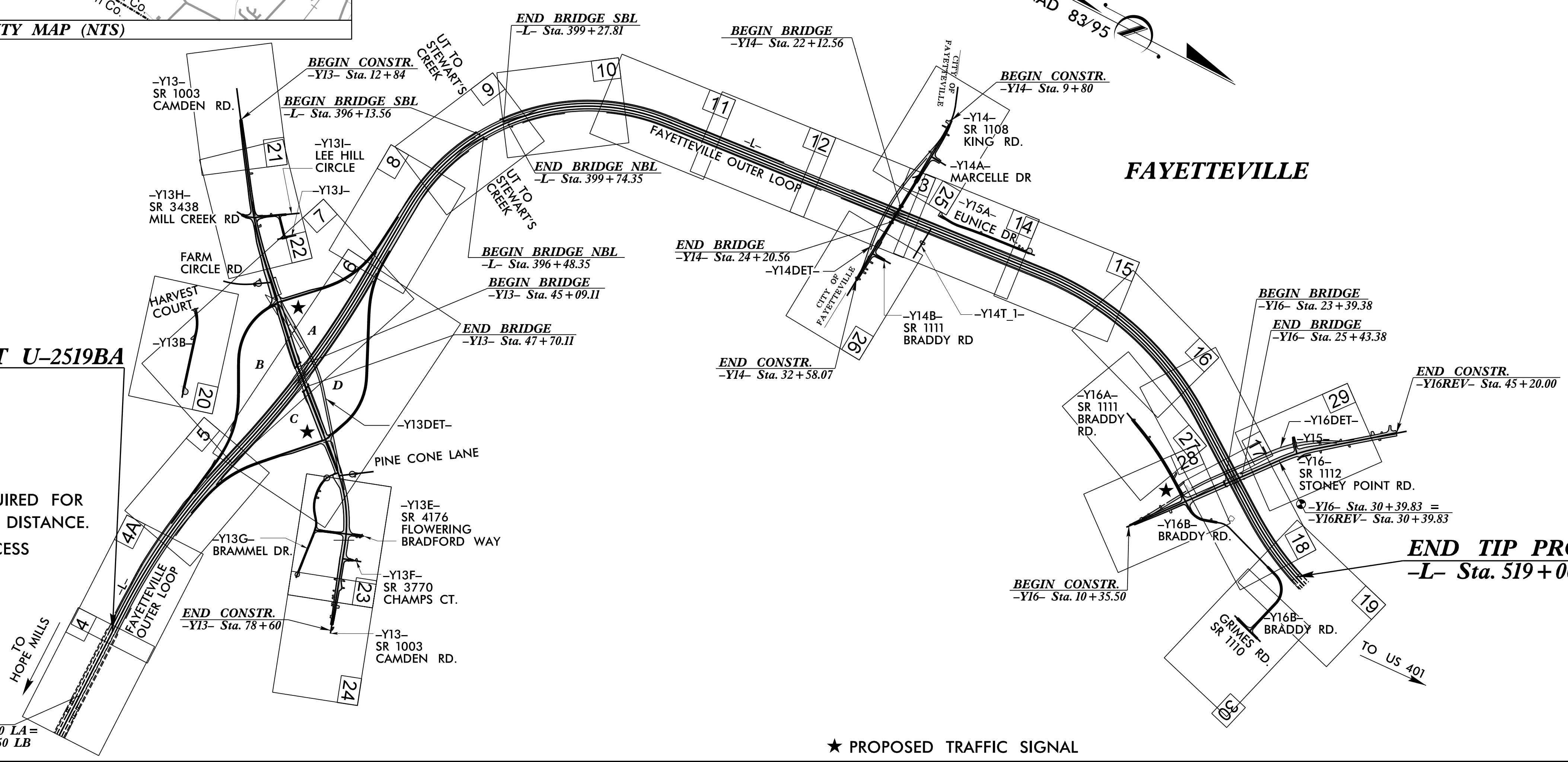
HYDRAULICS ENGINEER
 3/16/2022
 DocuSigned by:
 Jeffrey W. Merritt
 SIGNATURE: [Signature]

ROADWAY DESIGN ENGINEER
 3/17/2022
 DocuSigned by:
 MICHAEL T. MERRITT
 SIGNATURE: [Signature]



STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
CUMBERLAND COUNTY

TYPE OF WORK: DRAINAGE, GRADING, NOISE WALL, RETAINING WALL, PAVING, SIGNALS, STRUCTURES, & SIGNING
LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1003 (CAMDEN ROAD) TO SOUTH OF SR 1104 (STRICKLAND BRIDGE ROAD)



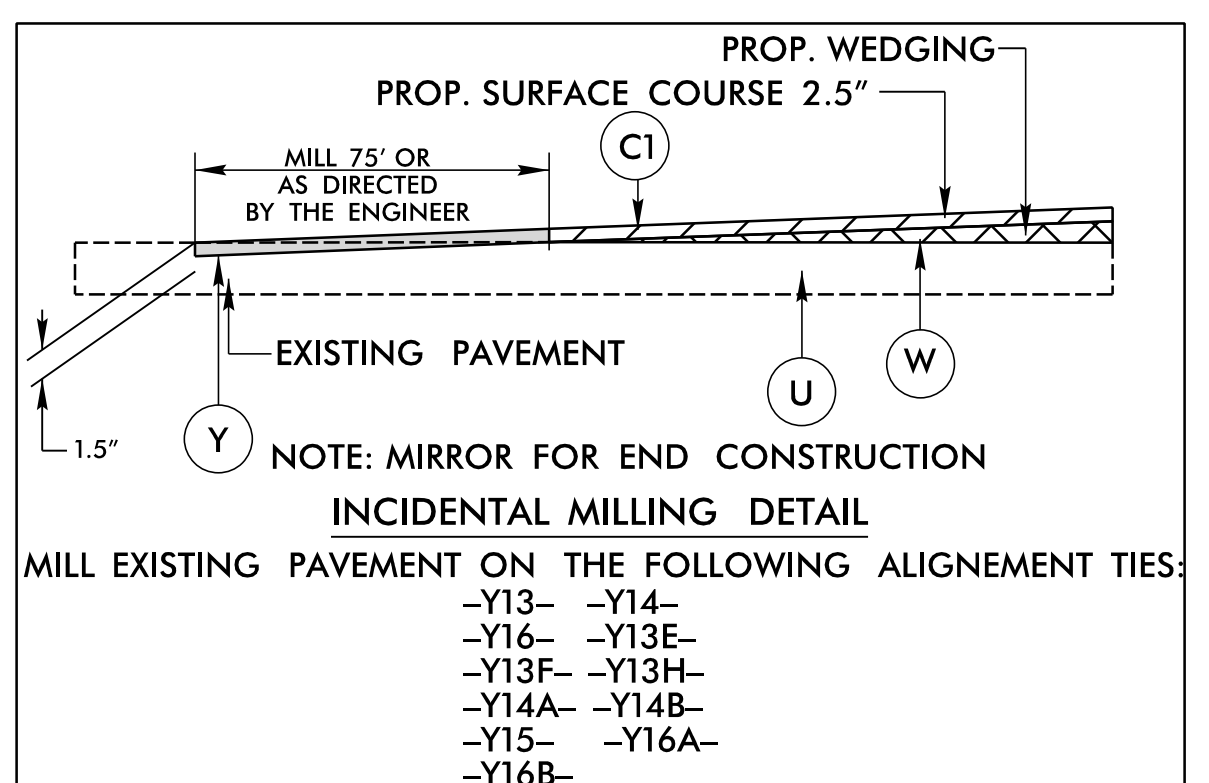
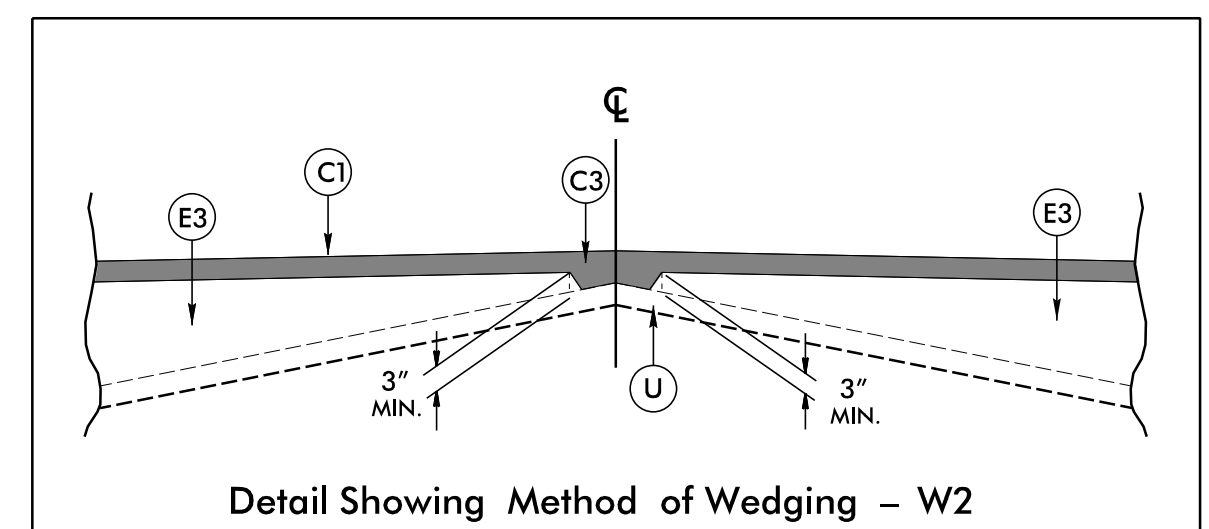
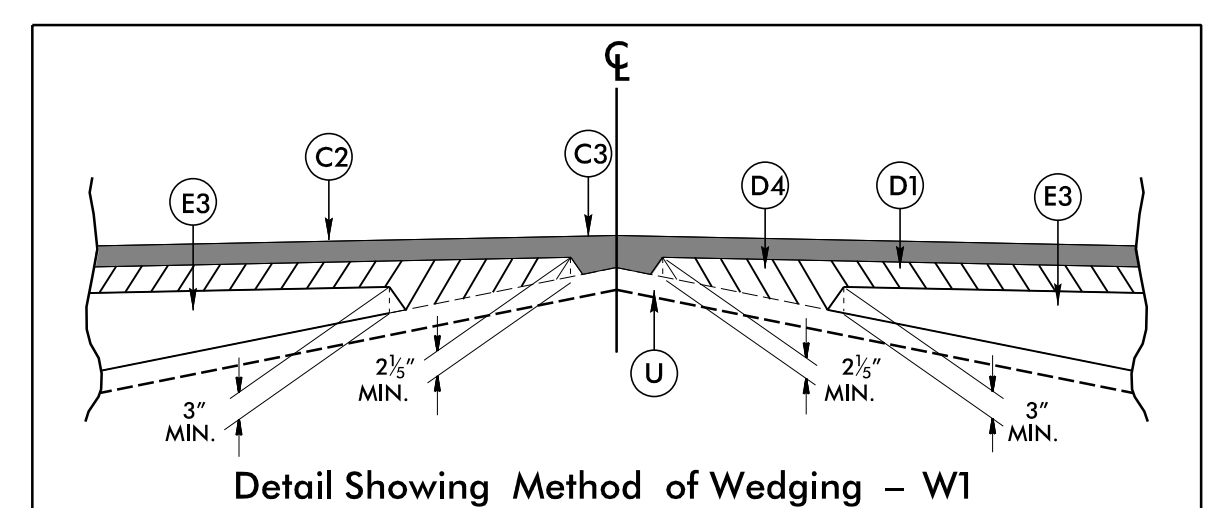
3/8/2022 R:\Roadway\Proj\U2519BA_Rdy_tsh.dgn de-fault

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER 4/11/2022 MICHAEL T. MERRITT	PAVEMENT DESIGN ENGINEER 4/11/2022 CLARK S. MORRISON
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PAVEMENT SCHEDULE

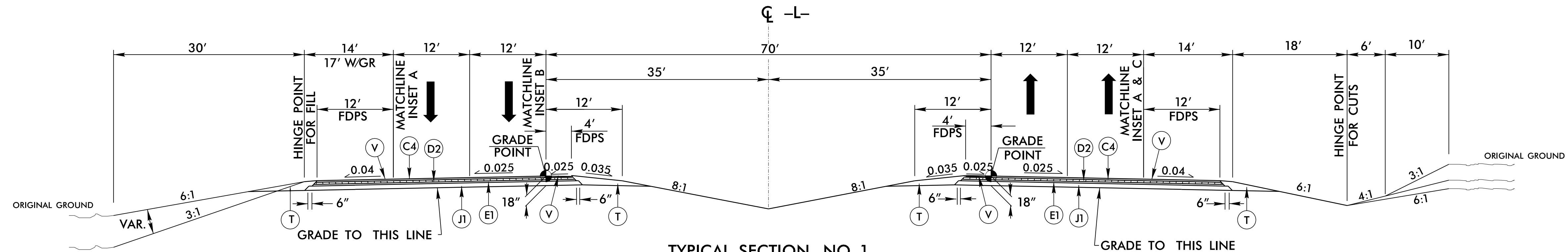
FINAL PAVEMENT DESIGN

A1	6" PORTLAND CEMENT CONCRETE	R2	2'-9" CONCRETE CURB AND GUTTER
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	R3	5" SURFACE MOUNTED MONOLITHIC CONCRETE ISLAND
C2	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.	R4	SHOULDER BERM GUTTER
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.	R5	5" KEYED IN MONOLITHIC CONCRETE ISLAND
C4	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.	R6	SINGLE FACED CONCRETE BARRIER
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R7	2'-6" CONCRETE CURB & GUTTER
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R8	5½" MODIFIED SHOULDER BERM GUTTER (SHEET 2C-1)
D3	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R9	6" MODIFIED SHOULDER BERM GUTTER (SHEET 2C-2)
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	S	4" CONCRETE SIDEWALK
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
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 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V	MILLED RUMBLE STRIPS
J1	PROP. 8" AGGREGATE BASE COURSE	W1	WEDGING EXISTING PAVEMENT
J2	PROP. 6" AGGREGATE BASE COURSE	W2	WEDGING EXISTING PAVEMENT
J3	6" INCIDENTAL STONE	W3	WEDGING EXISTING PAVEMENT
R1	1'-6" CONCRETE CURB AND GUTTER	Y	INCIDENTIAL MILLING



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

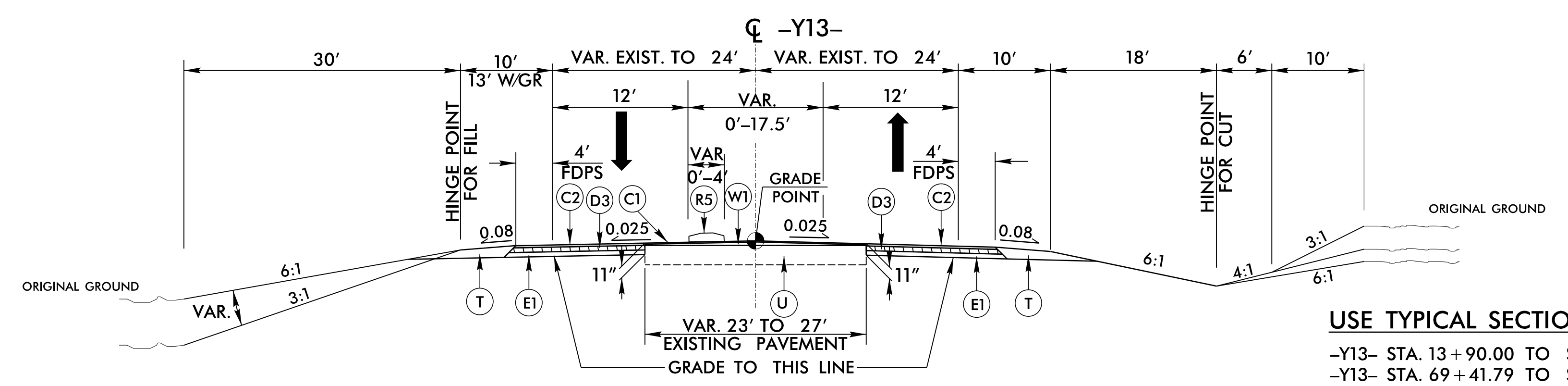
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TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

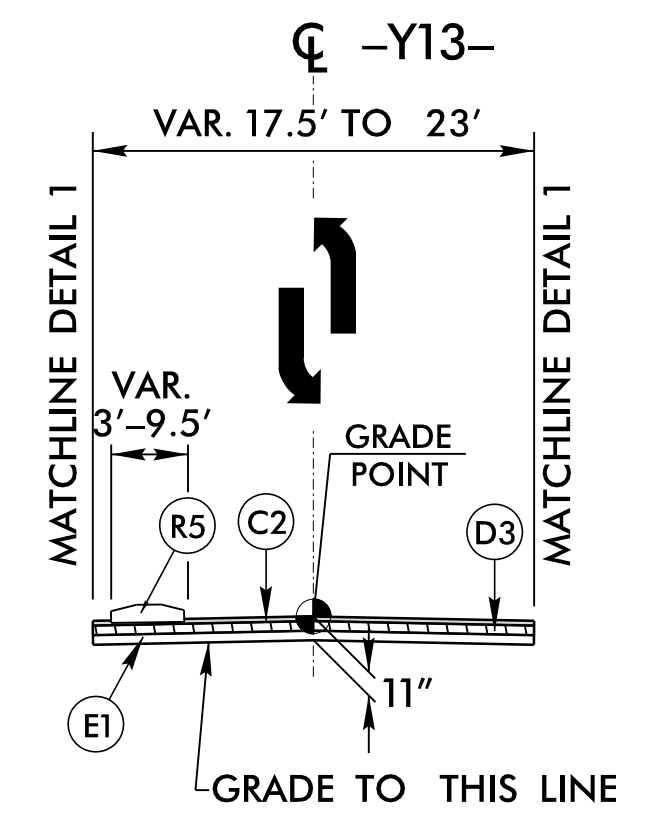
- L- STA. 320+00.00 TO STA. 396+48.35 NBL (BEGIN BRIDGE)
- L- STA. 320+00.00 TO STA. 396+13.56 SBL (BEGIN BRIDGE)
- L- STA. 399+74.35 NBL (END BRIDGE) TO STA. 519+00.00
- L- STA. 399+27.81 SBL (END BRIDGE) TO STA. 519+00.00
- PAVE TO FACE OF GUARDRAIL



TYPICAL SECTION NO. 2

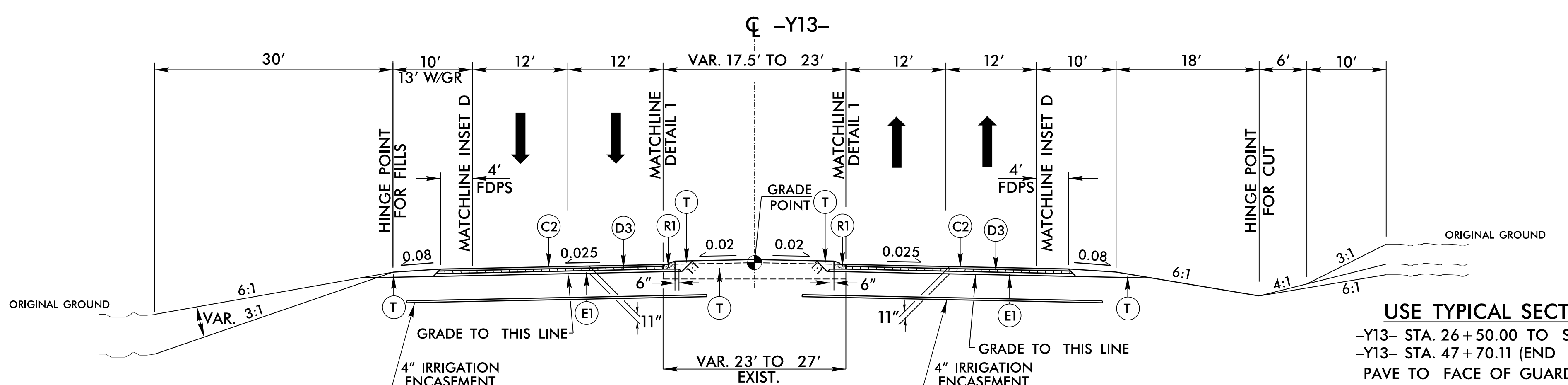
USE TYPICAL SECTION NO. 2

- Y13- STA. 13+90.00 TO STA. 26+50.00
- Y13- STA. 69+41.79 TO STA. 77+83.00



DETAIL NO. 1

- USE DETAIL NO. 1 WITH TYPICAL SECTION NO. 3
- Y13- STA. 26+50.00 TO STA. 32+76.22
 - Y13- STA. 37+55.00 TO STA. 45+09.11 (BEGIN BRIDGE)
 - Y13- STA. 47+70.11 (END BRIDGE) TO STA. 53+90.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

- Y13- STA. 26+50.00 TO STA. 45+09.11 (BEGIN BRIDGE)
- Y13- STA. 47+70.11 (END BRIDGE) TO STA. 54+85.13
- PAVE TO FACE OF GUARDRAIL

TYPICAL SECTION NO. 4
-Y13- STA. 58+26.61 TO STA. 69+41.79

PAVEMENT SCHEDULE	
C1	1 1/2" S9.5B
C2	3" S9.5B
C4	3" S9.5C
D2	3" I19.0C
D3	4" I19.0C
E1	4" B25.0C
J1	8" ABC
R1	1'-6" C&G
R5	5" MCI
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	RUMBLE STRIPS
W1	WEDGING

SEE SHT. 2A-6 FOR INSETS

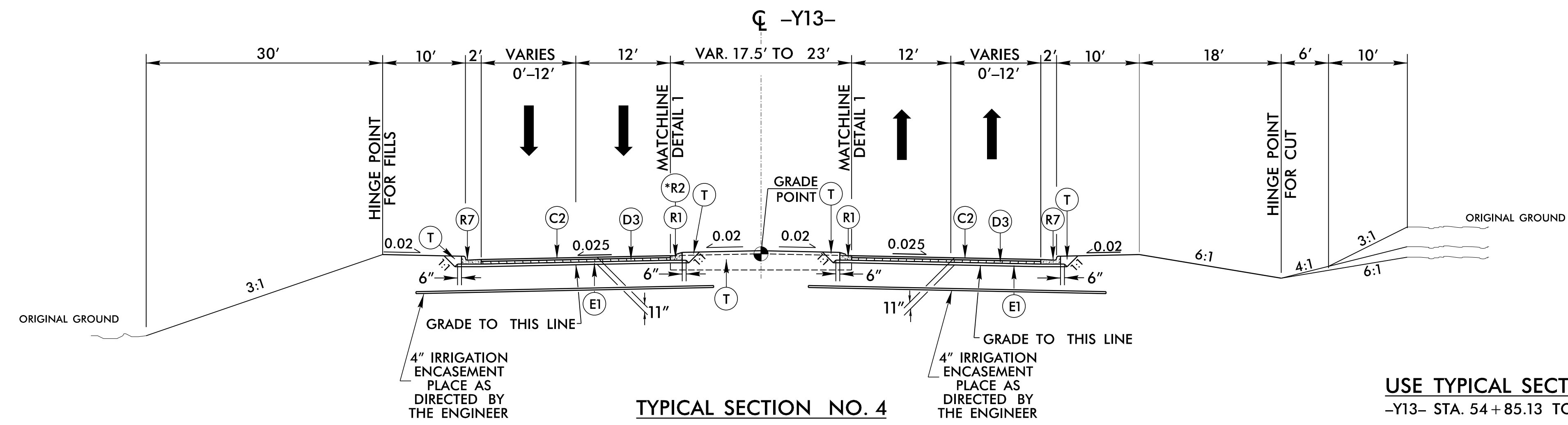
6/2/2022

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6/2/2022

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER 4/1/2022 	PAVEMENT DESIGN ENGINEER 4/1/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 4

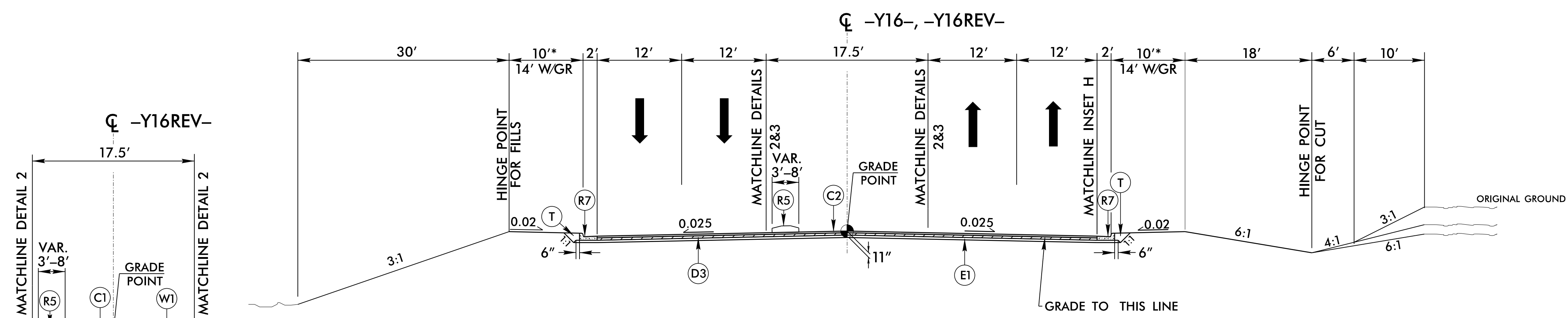
USE TYPICAL SECTION NO. 4

-Y13- STA. 54+85.13 TO STA. 69+41.79

LEFT MEDIAN CURB AND GUTTER CHANGED IN THE FOLLOWING LOCATION:
*-Y13- STA. 56+71.78 TO STA. 58+26.64

PAVEMENT SCHEDULE

C1	1 1/2" S9.5B
C2	3" S9.5B
C4	3" S9.5C
D2	3" I19.0C
D3	4" I19.0C
E1	4" B25.0C
J1	8" ABC
R1	1'-6" C&G
R2	2'-9" C&G
R5	5" MCI
R7	2'-6" C&G
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	RUMBLE STRIPS
W1	WEDGING



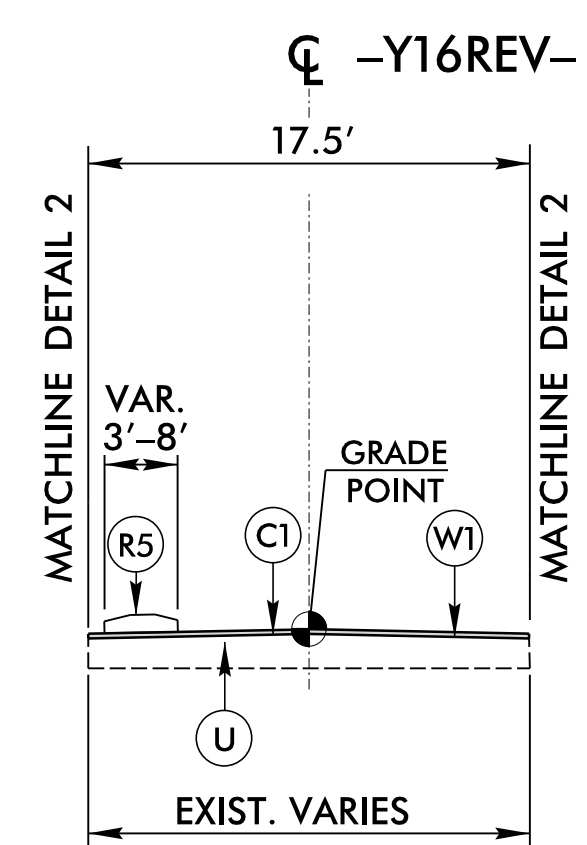
TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

-Y16- STA. 17+91.10 TO 23+39.38 (BEGIN BRIDGE)
-Y16- STA. 25+43.38 (END BRIDGE) TO 30+39.83
-Y16REV- STA. 30+39.83 TO 45+20.00

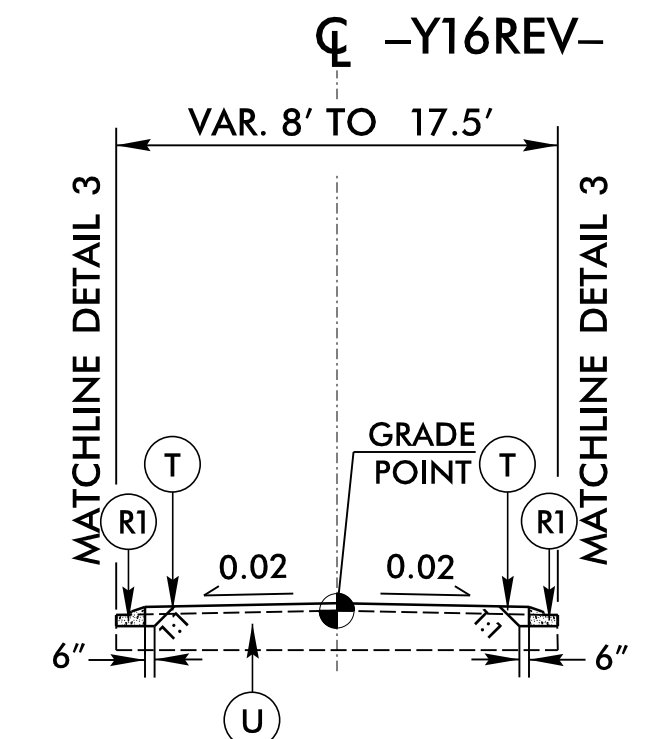
*BERM WIDTH IS 6' IN THE FOLLOWING LOCATIONS:
-Y16REV- STA. 40+16.00 TO STA. 42+60.00 LT
-Y16REV- STA. 34+00.00 TO STA. 36+50.00 RT
-Y16REV- STA. 38+50.00 TO STA. 42+10.00 RT
-Y16REV- STA. 43+70.00 TO STA. 45+20.00 RT

BERM WIDTH IS 4' WITH 2:1 SLOPES IN THE FOLLOWING LOCATIONS:
-Y16REV- STA. 36+50.00 TO 38+50.00 RT
-Y16REV- STA. 42+10.00 TO 43+70.00 RT



DETAIL NO. 2

USE DETAIL NO. 2 WITH TYPICAL SECTION NO. 5
-Y16REV- STA. 36+00.00 TO 42+84.01



DETAIL NO. 3

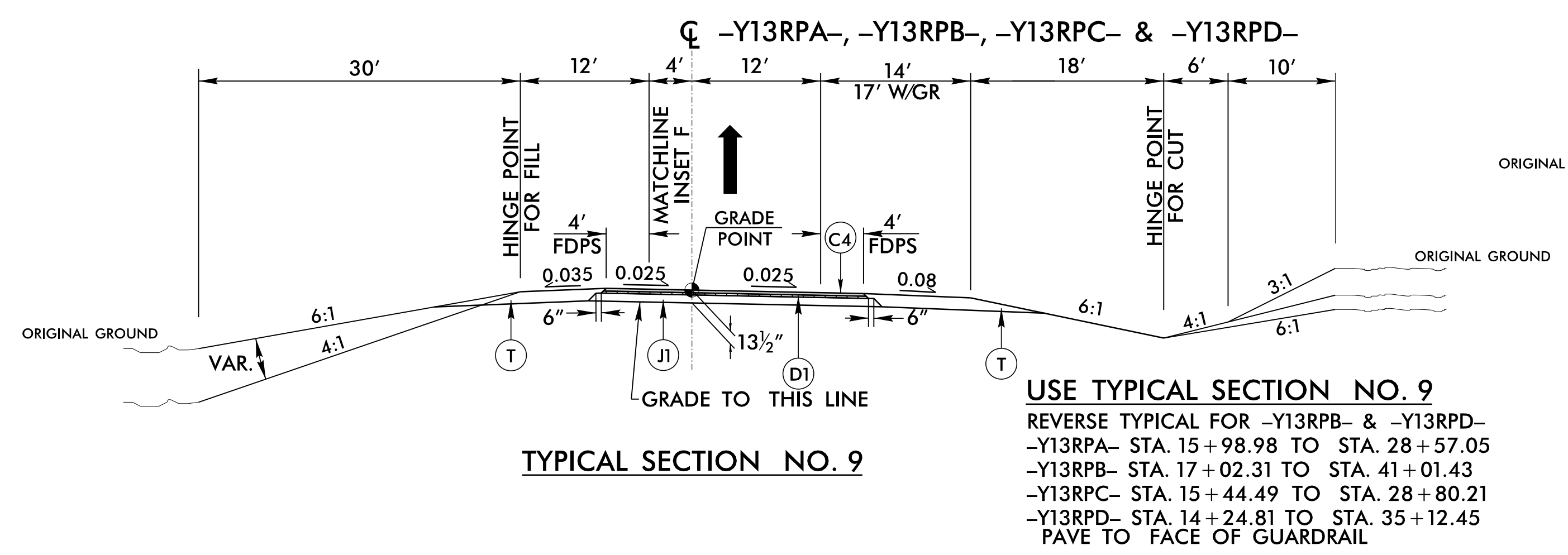
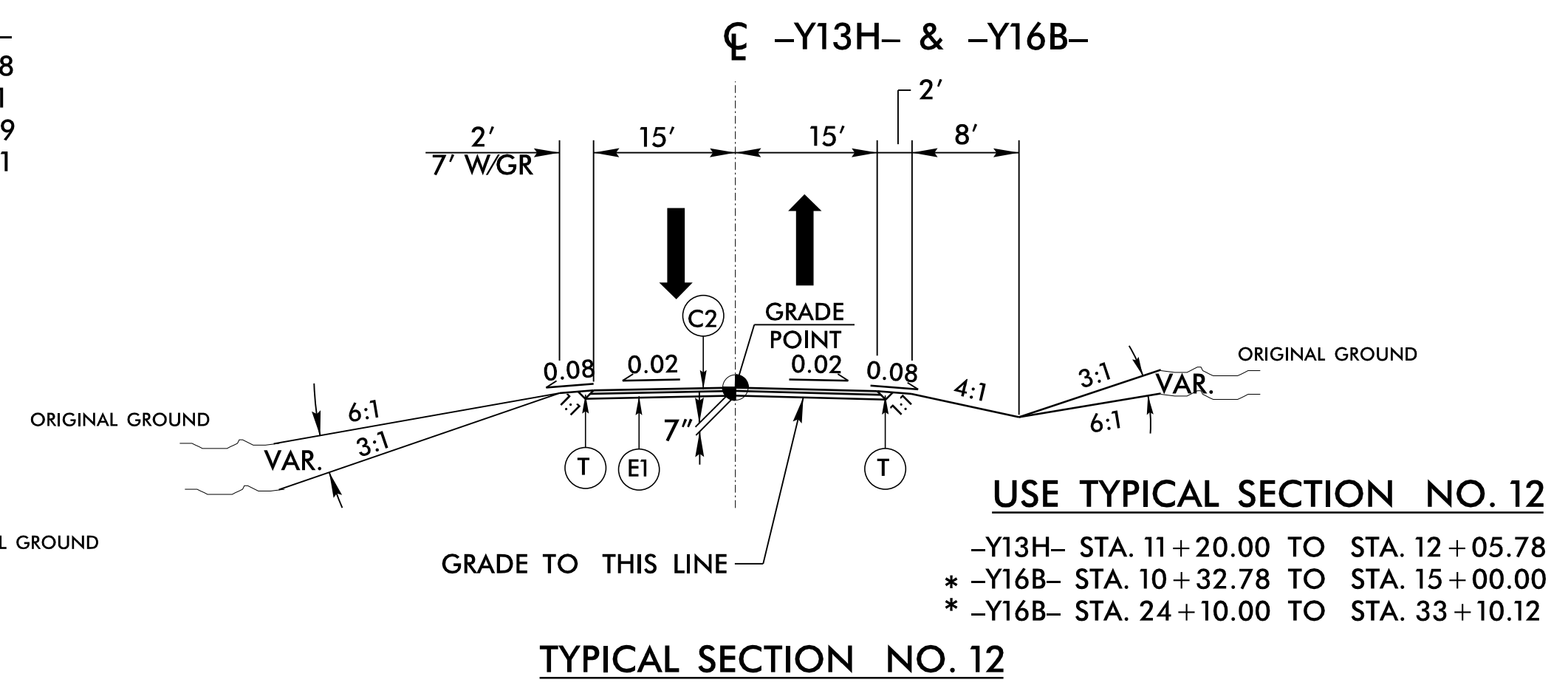
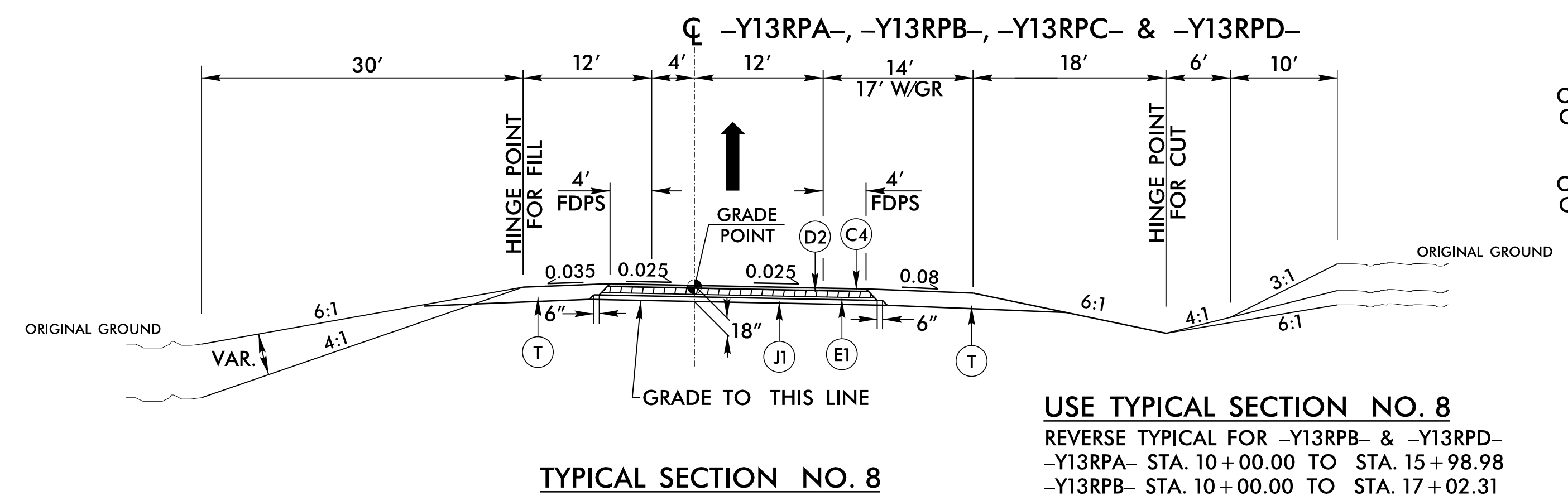
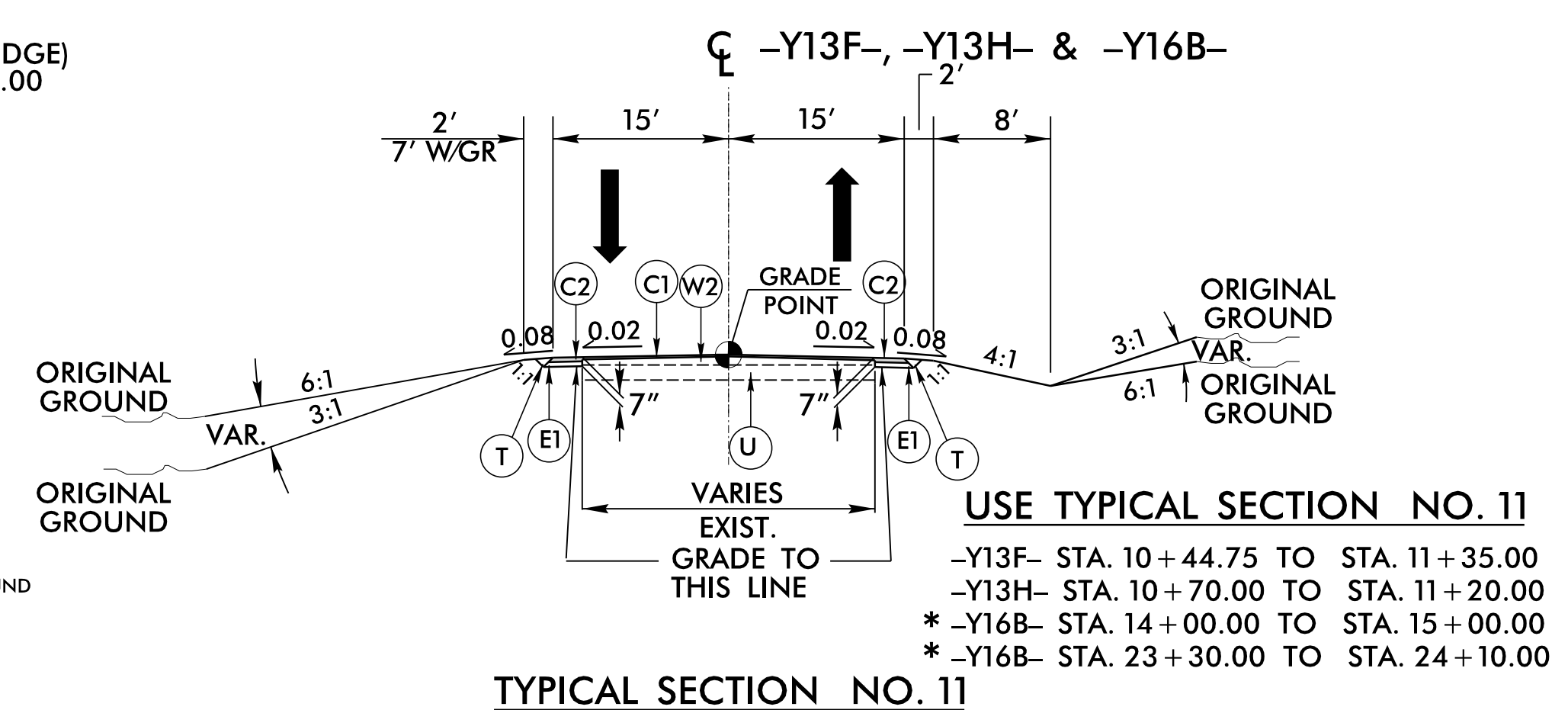
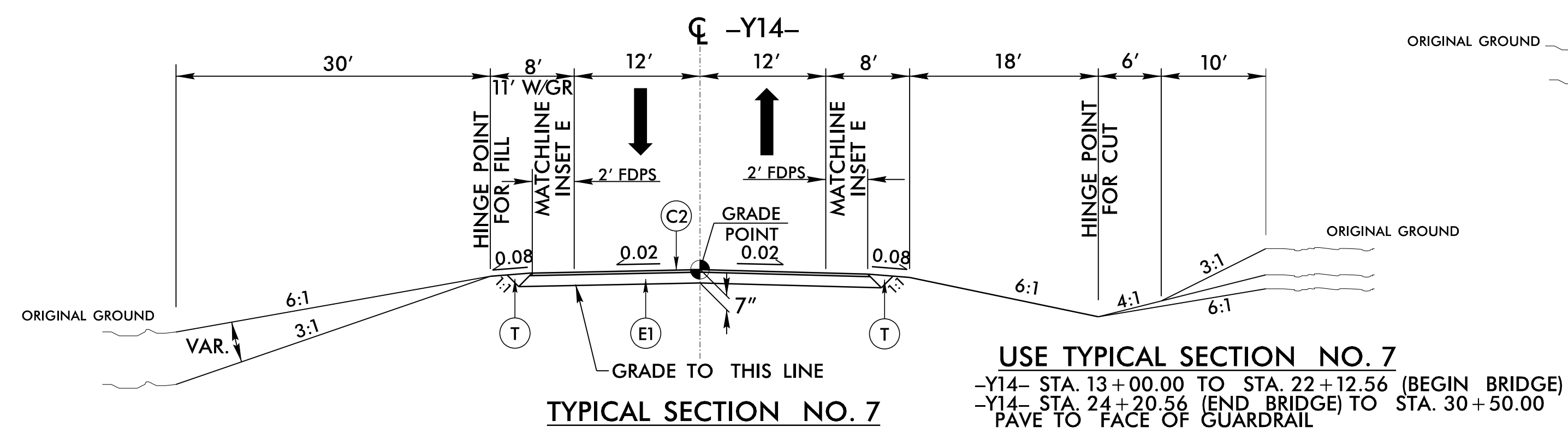
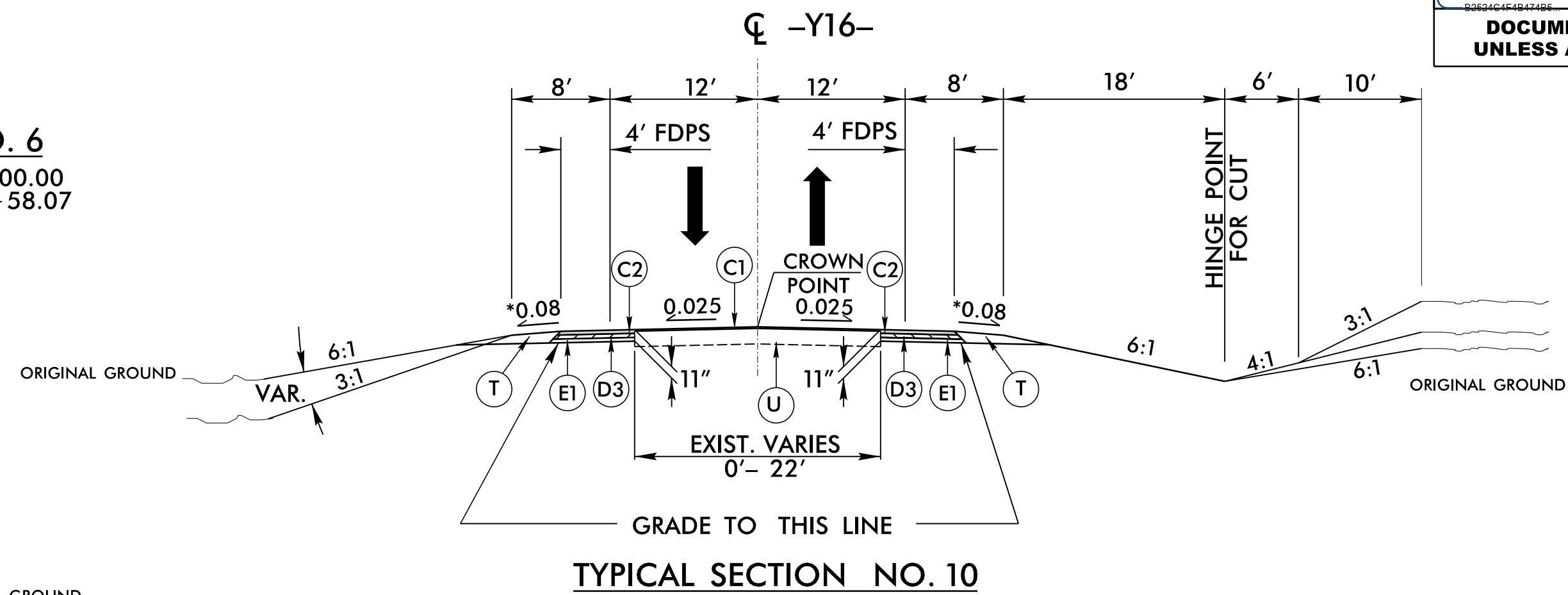
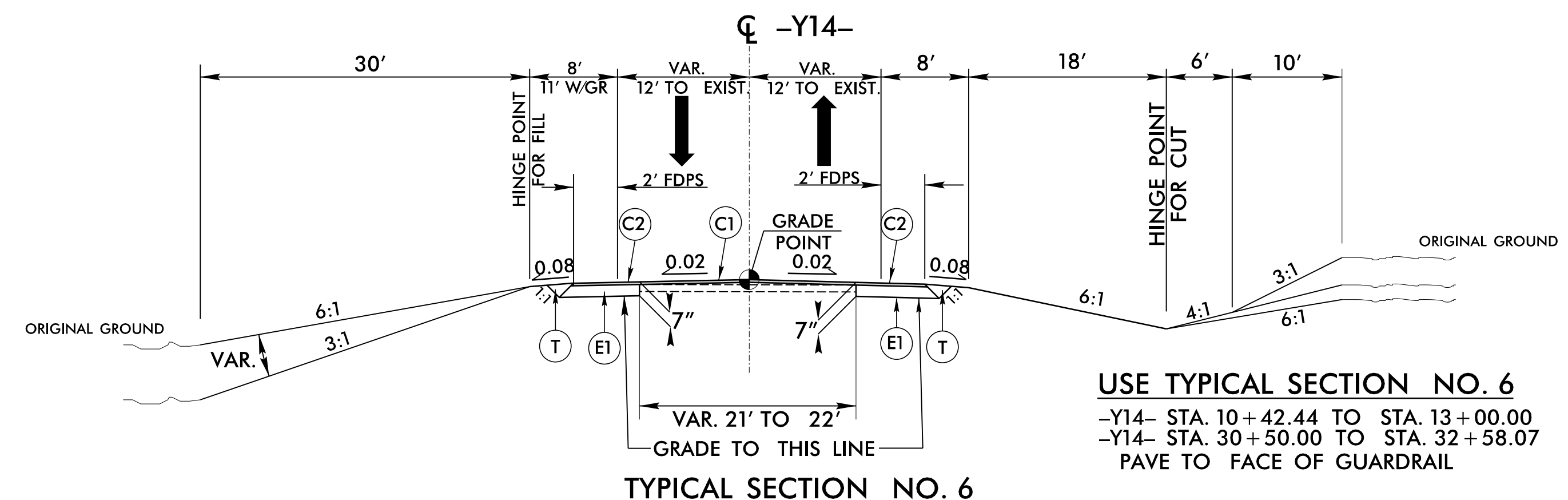
USE DETAIL NO. 2 WITH TYPICAL SECTION NO. 5
-Y16REV- STA. 42+84.01 TO STA. 45+20.00

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SEE SHT. 2A-7 FOR INSETS

7/15/2022
 P:\Projects\2022\U-2519BA\Drawings\2A-3.dwg
 User: tjup
 Plot Date: 7/15/2022

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2A-4
ROADWAY DESIGN ENGINEER 4/11/2022 	PAVEMENT DESIGN ENGINEER 4/11/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

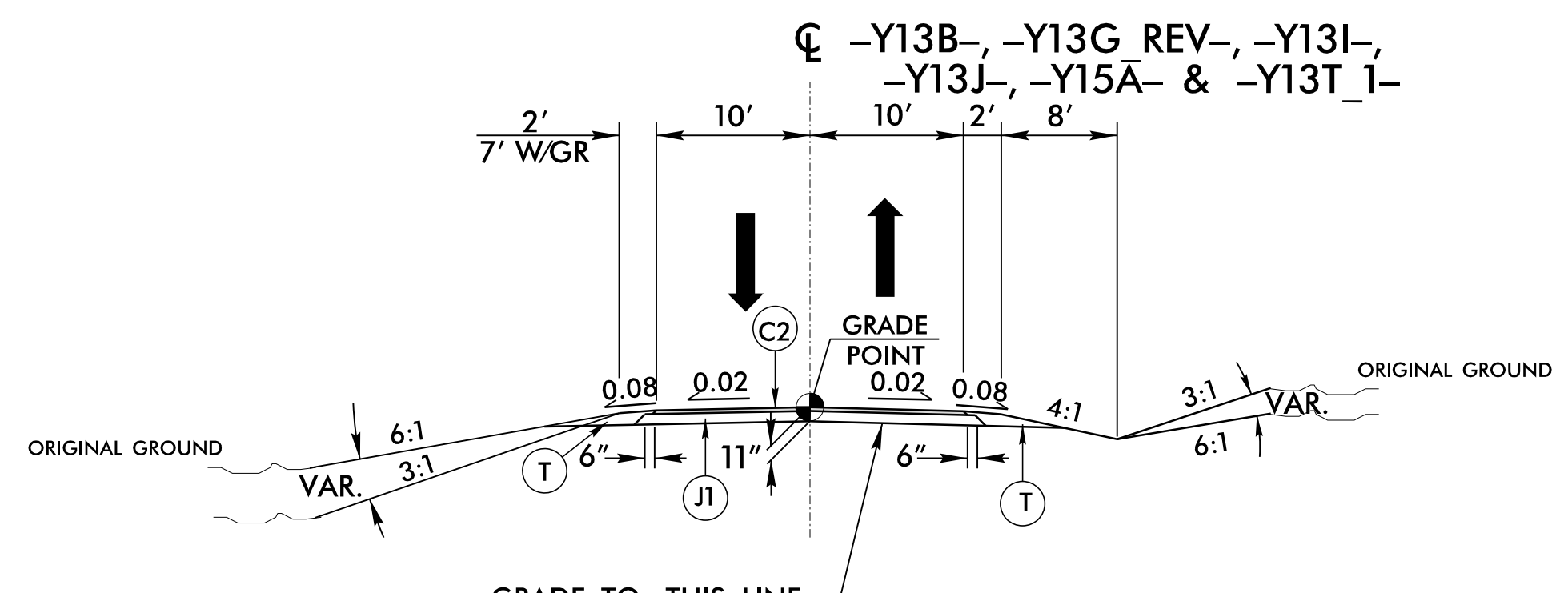


PAVEMENT SCHEDULE

C1	1 1/2" S9.5B
C2	3" S9.5B
C4	3" S9.5C
D1	2 1/2" I19.0C
D2	3" I19.0C
E1	4" B25.0C
J1	8" ABC
U	EXIST. PAVEMENT
T	EARTH MATERIAL
W2	WEDGING

SEE SHT. 2A-7 FOR INSETS

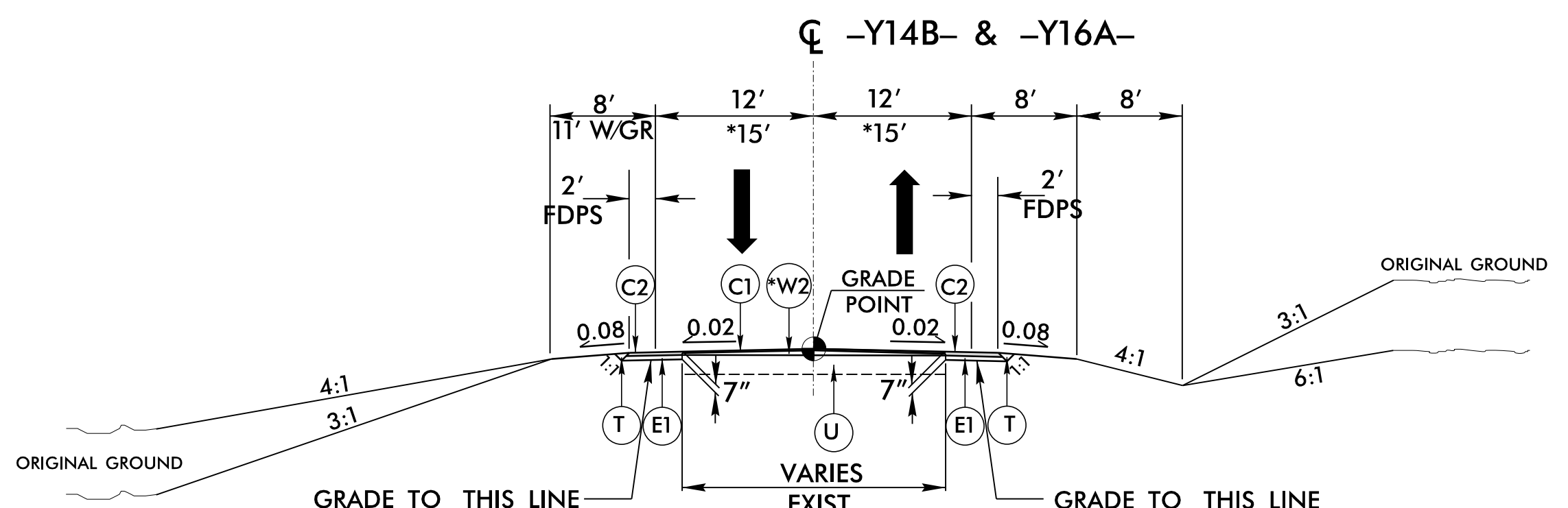
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TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13

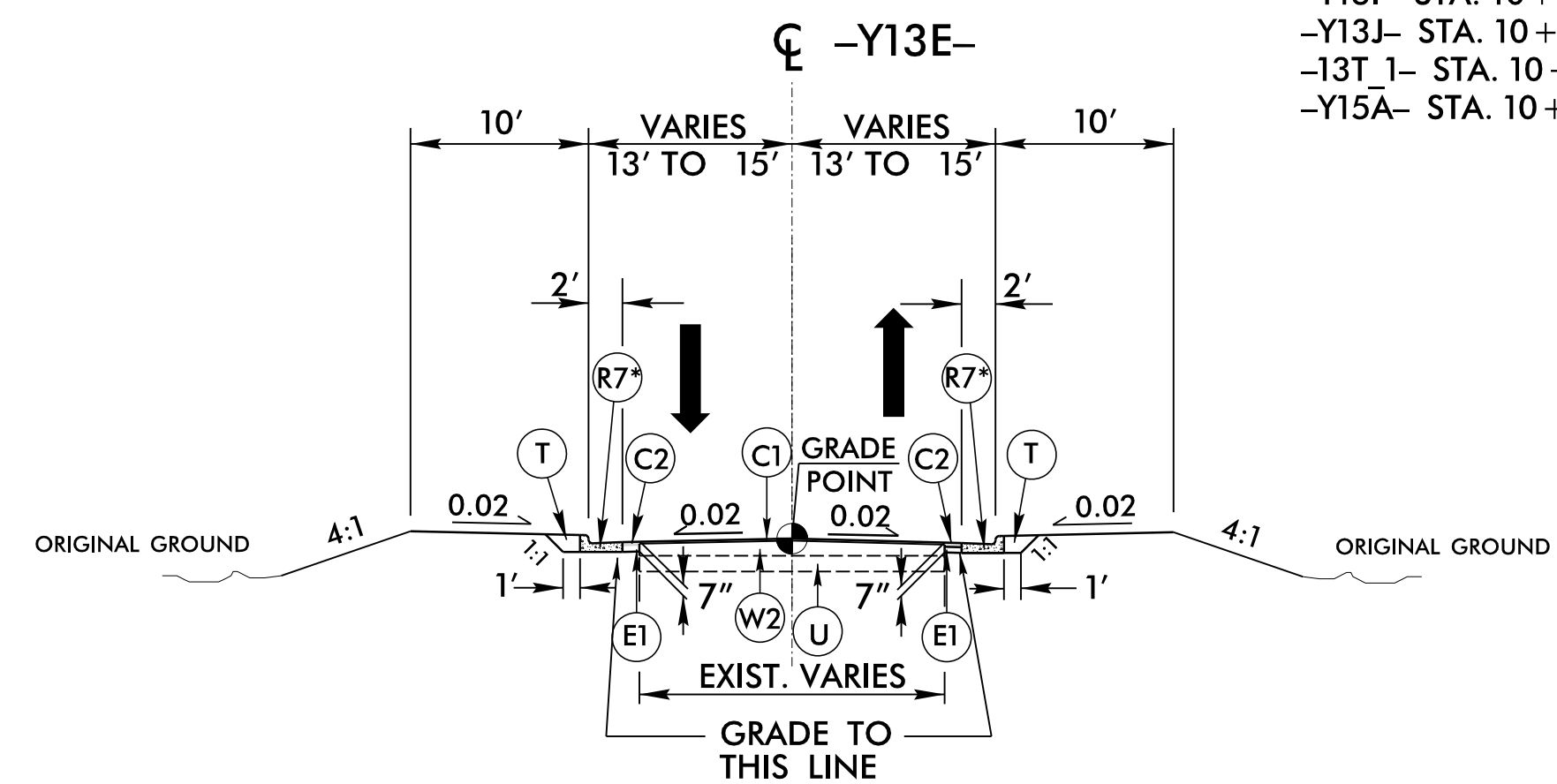
- Y13B- STA. 10+10.06 TO STA. 19.71.83
- Y13G_REV- STA. 10+07.32 TO STA. 13+49.68
- Y13I- STA. 10+20.84 TO STA. 13+96.21
- Y13J- STA. 10+10.12 TO STA. 12+74.87
- Y13T_1- STA. 10+58.48 TO STA. 11+28.53
- Y15A- STA. 10+00.00 TO STA. 21+19.11



TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17

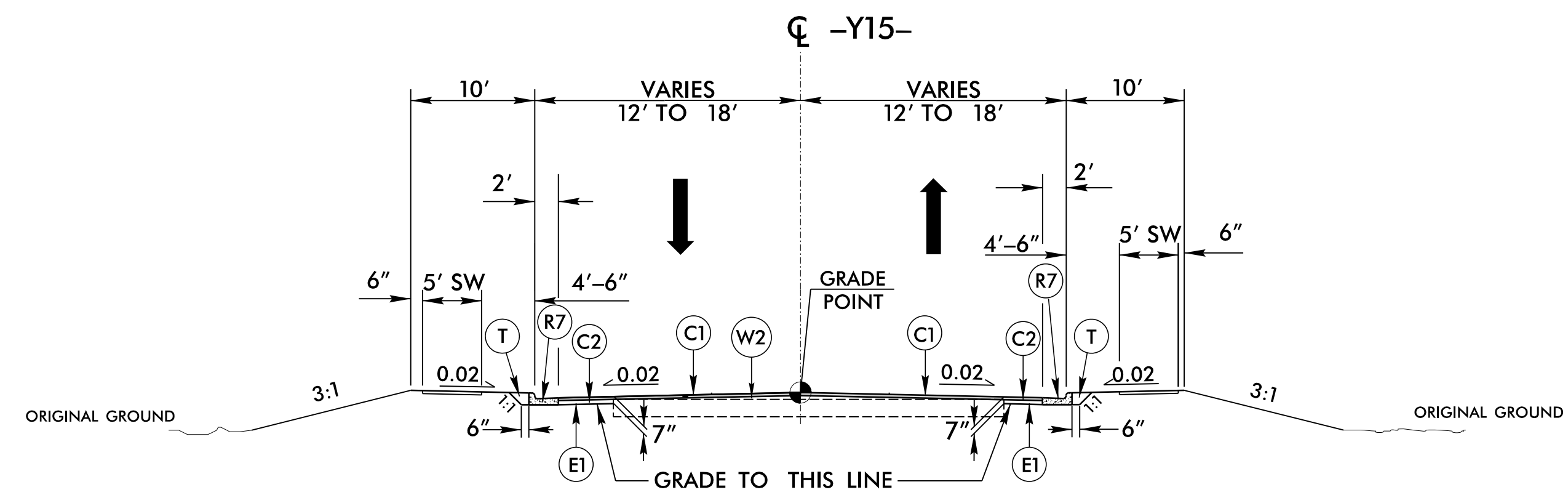
- *-Y14B- STA. 11+00.00 TO STA. 11+70.00
- Y16A- STA. 11+00.00 TO STA. 16+79.87



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14

- Y13E- STA. 10+32.78 TO STA. 12+00.00
- *PLACE C&G ON SUBGRADE

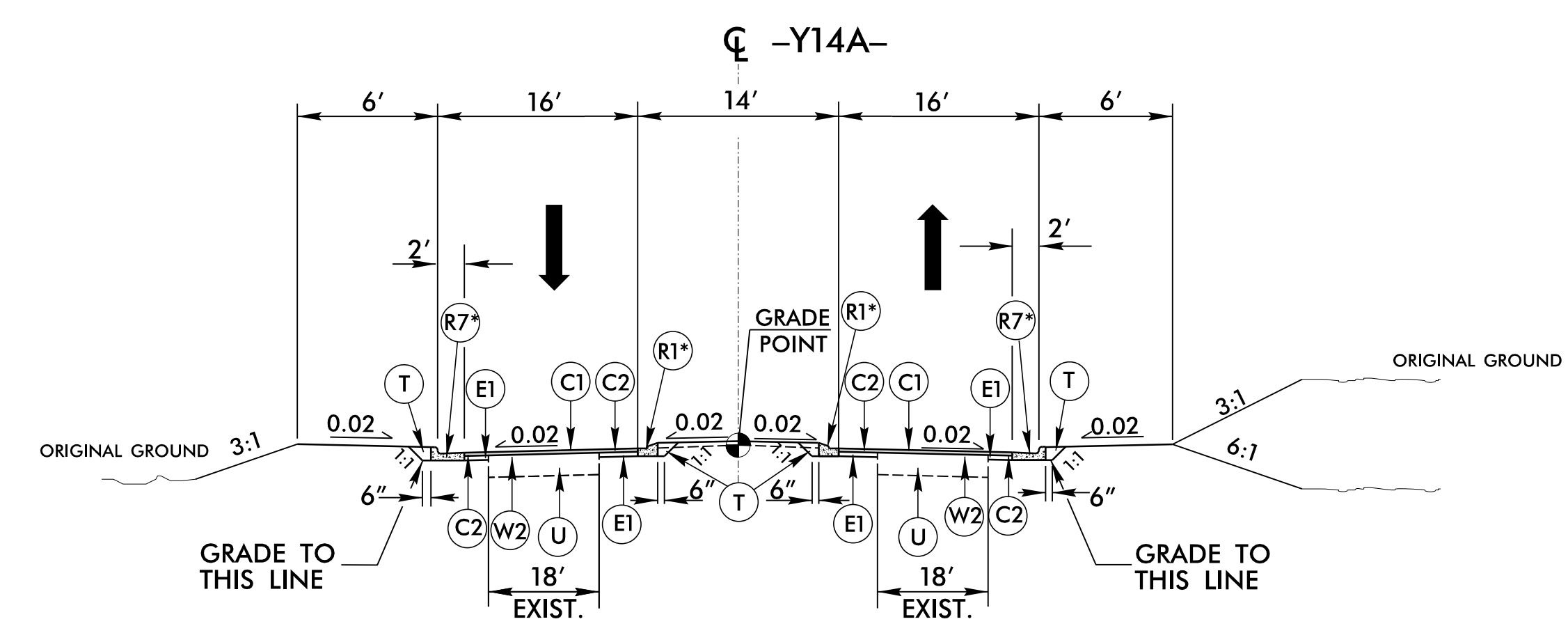


TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18

PLACE C&G ON SUBGRADE

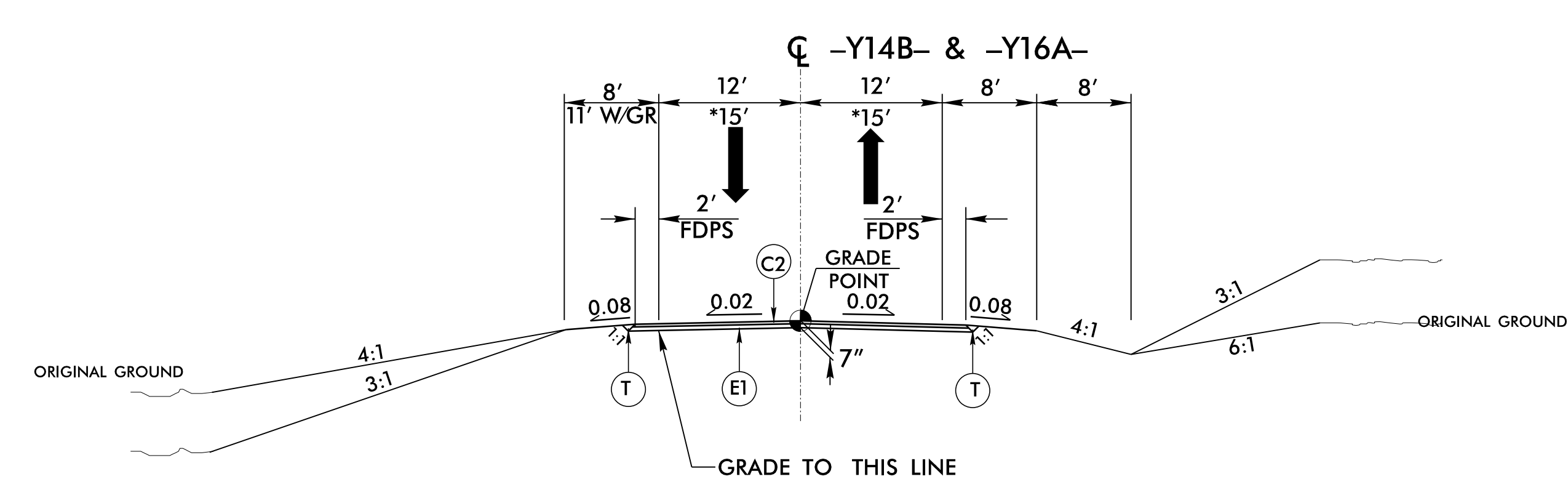
- Y15- STA. 10+05.00 TO STA. 11+68.53



TYPICAL SECTION NO. 15

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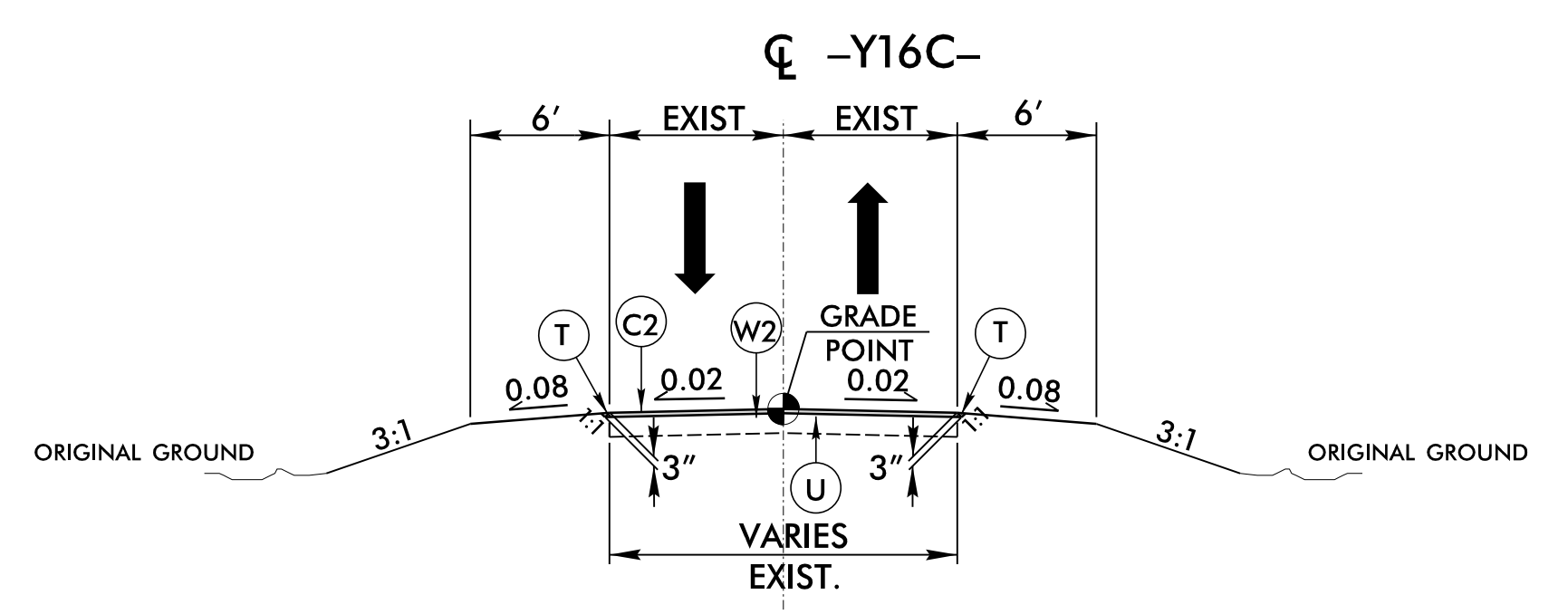
- Y14A- STA. 10+18.00 TO STA. 11+25.00
- *PLACE C&G ON SUBGRADE



TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19

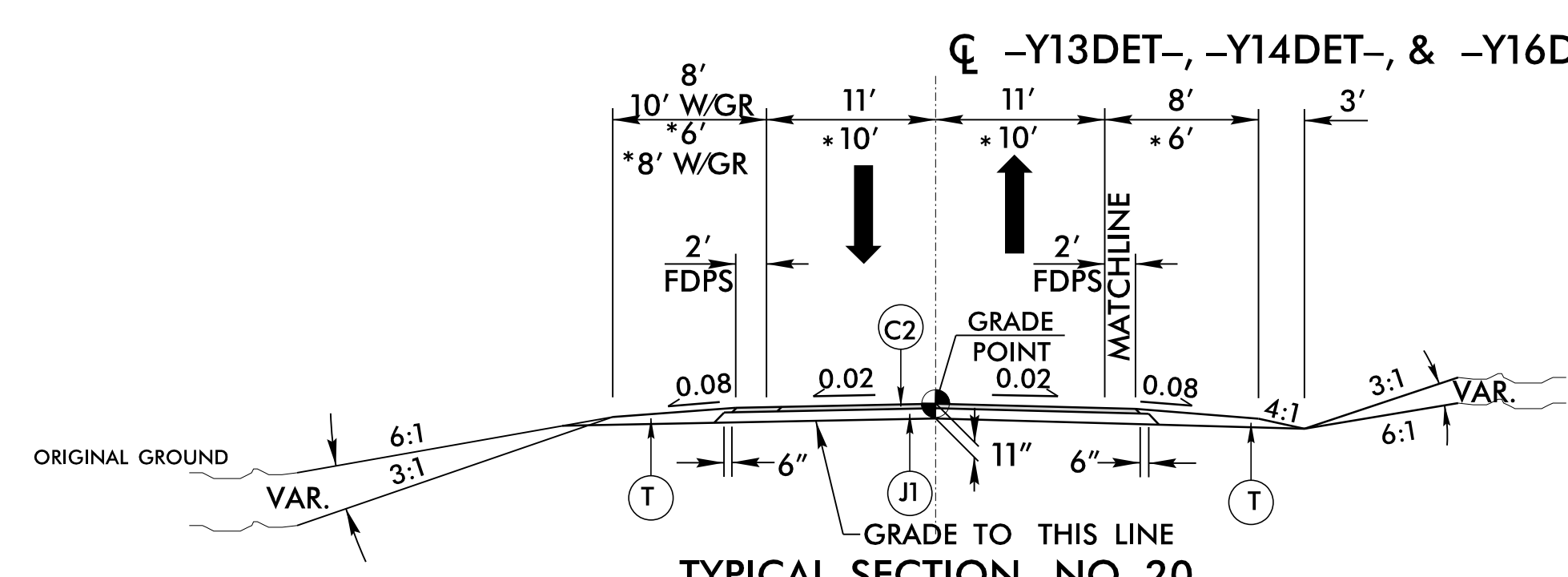
- Y14B- STA. 10+18.01 TO STA. 11+00.00
- Y16A- STA. 16+79.87 TO STA. 22+71.51



TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16

- Y16C- STA. 10+50.00 TO STA. 14+00.00



TYPICAL SECTION NO. 20

USE TYPICAL SECTION NO. 20

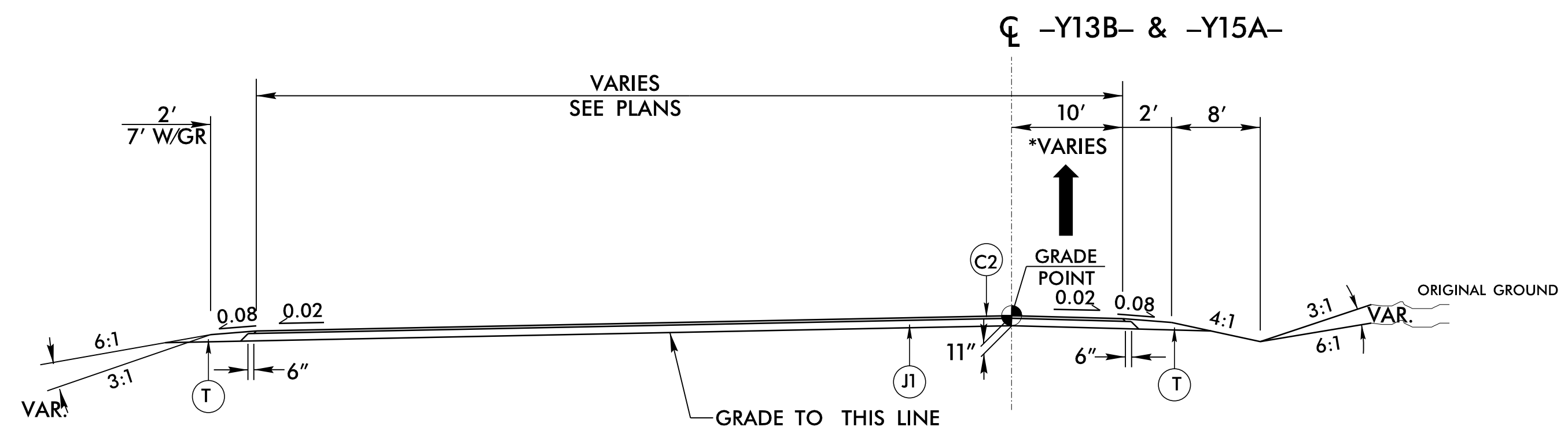
- Y13DET- STA. 12+00.00 TO STA. 35+85.92
- *-Y14DET- STA. 12+06.54 TO STA. 30+04.43
- ** -Y16DET- STA. 12+59.36 TO STA. 36+08.46

**SEE DETAIL G FOR -Y16- TEMPORARY PAVEMENT

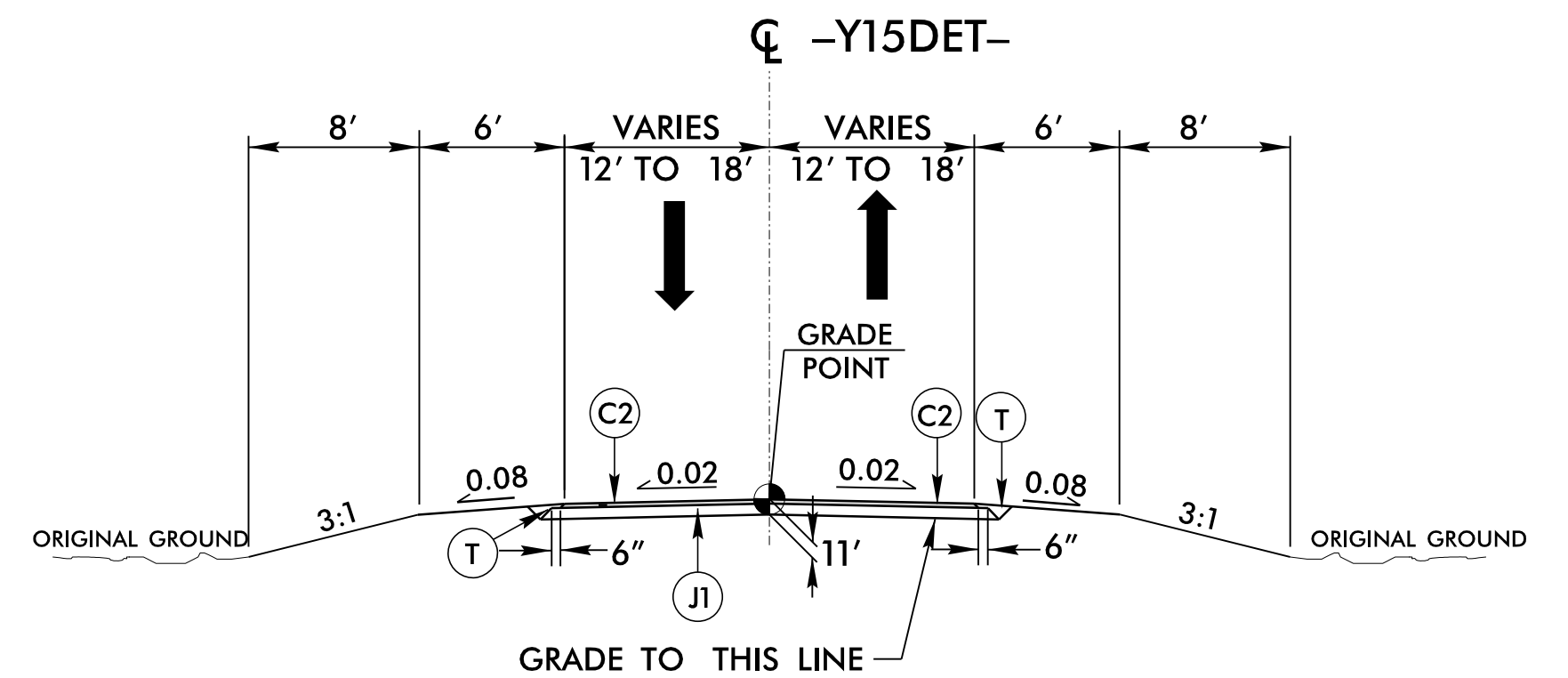
6/2/2019

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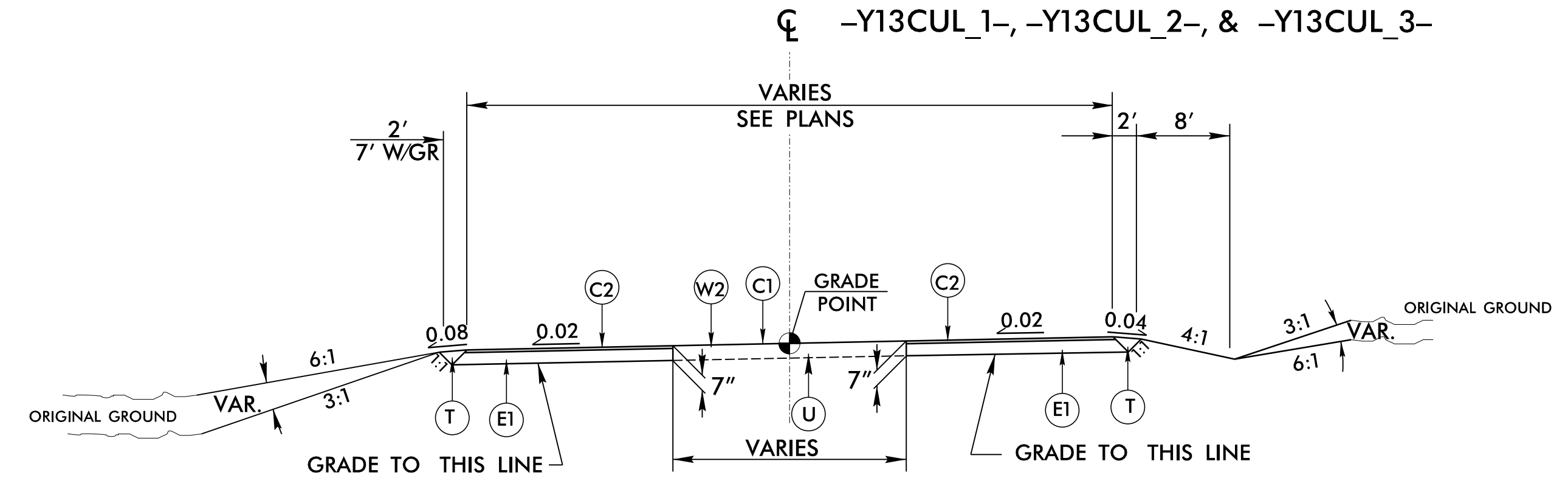
PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2A-6
ROADWAY DESIGN ENGINEER 4/1/2022 MICHAEL T. MERRITT	PAVEMENT DESIGN ENGINEER 4/1/2022 CLARK S. MORRISON
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



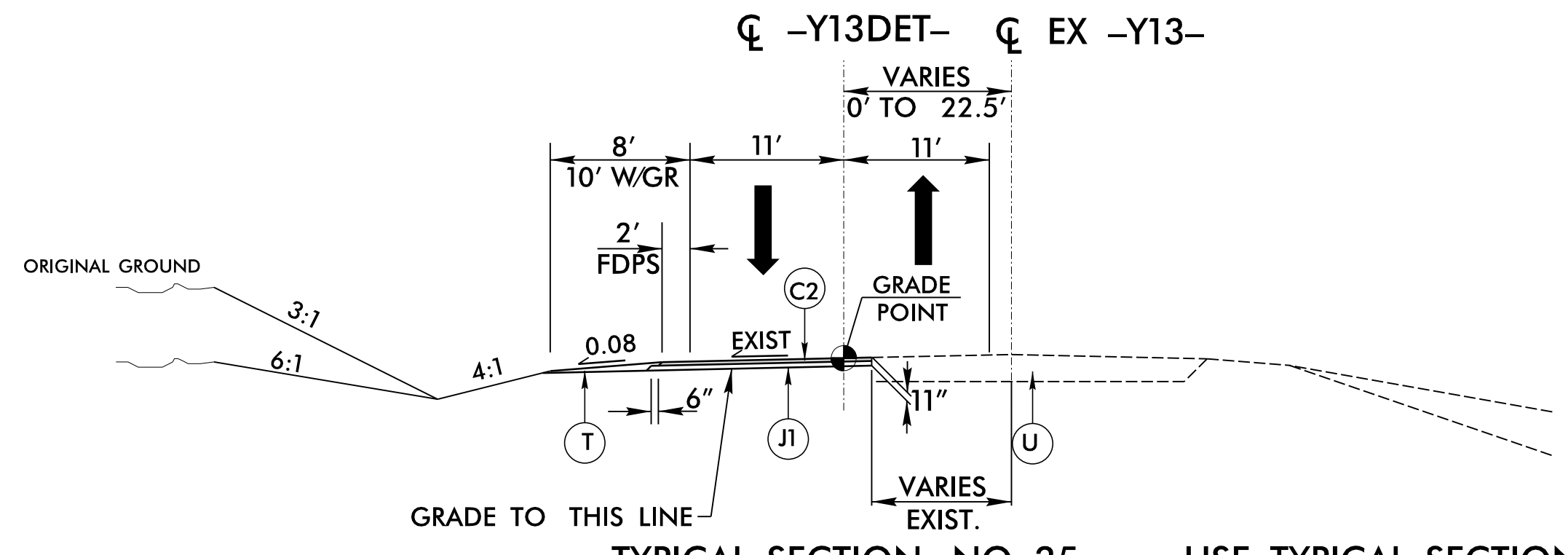
TYPICAL SECTION NO. 21 USE TYPICAL SECTION NO. 21
-Y13B- & -Y15A- CUL-DE-SACS



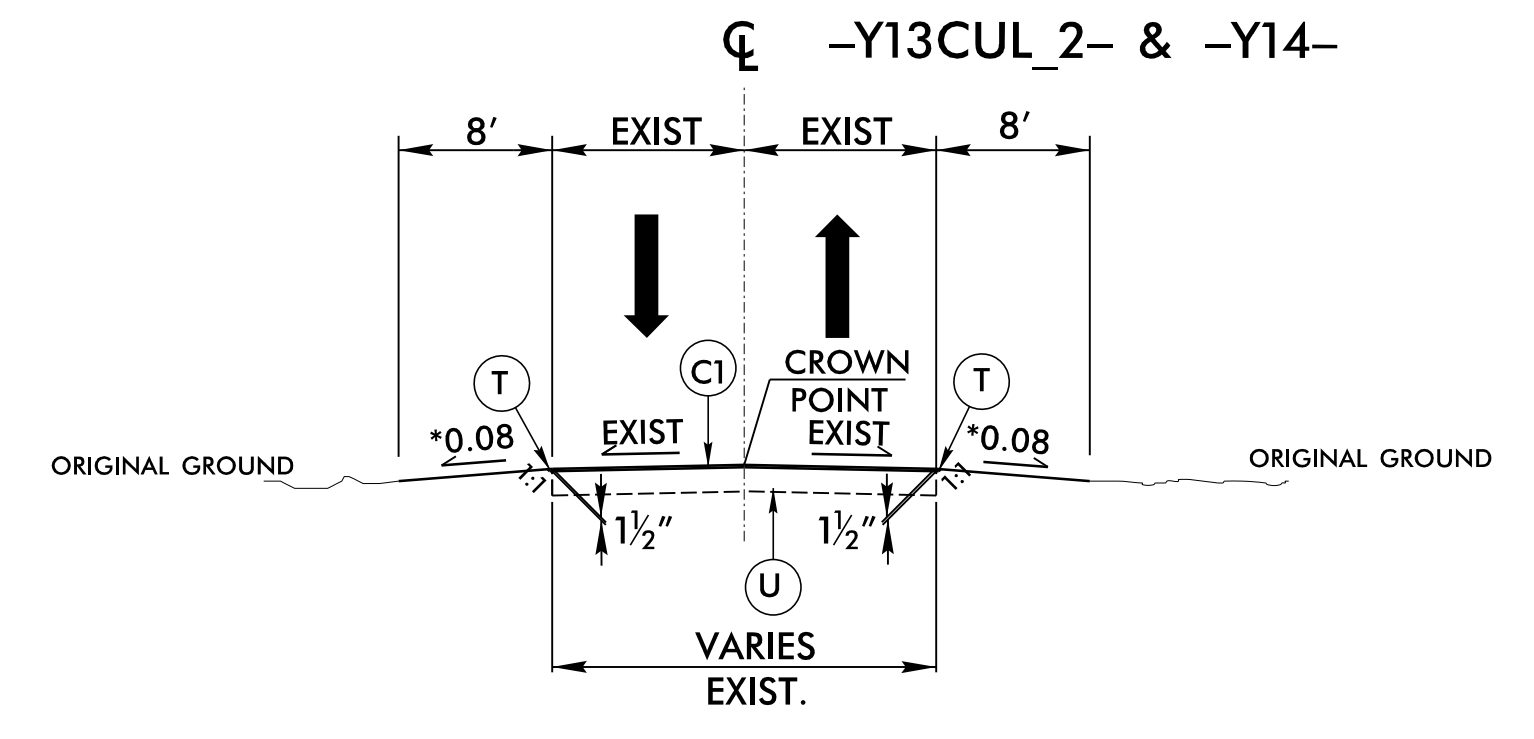
TYPICAL SECTION NO. 24 USE TYPICAL SECTION NO. 24
-Y15DET- STA. 10+05.00 TO STA. 10+88.59



TYPICAL SECTION NO. 22 USE TYPICAL SECTION NO. 22
-Y13CUL_1-, -Y13CUL_2 & -Y13CUL_3- CUL-DE-SACS

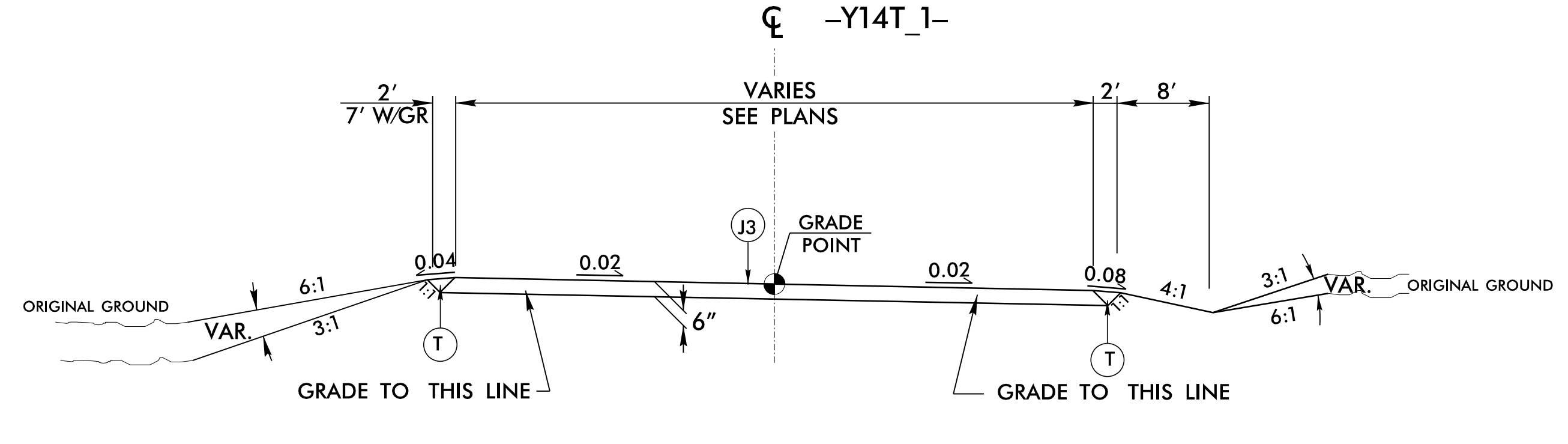


TYPICAL SECTION NO. 25 USE TYPICAL SECTION NO. 25
-Y13DET- STA. 1+04.18 TO STA. 12+24.08

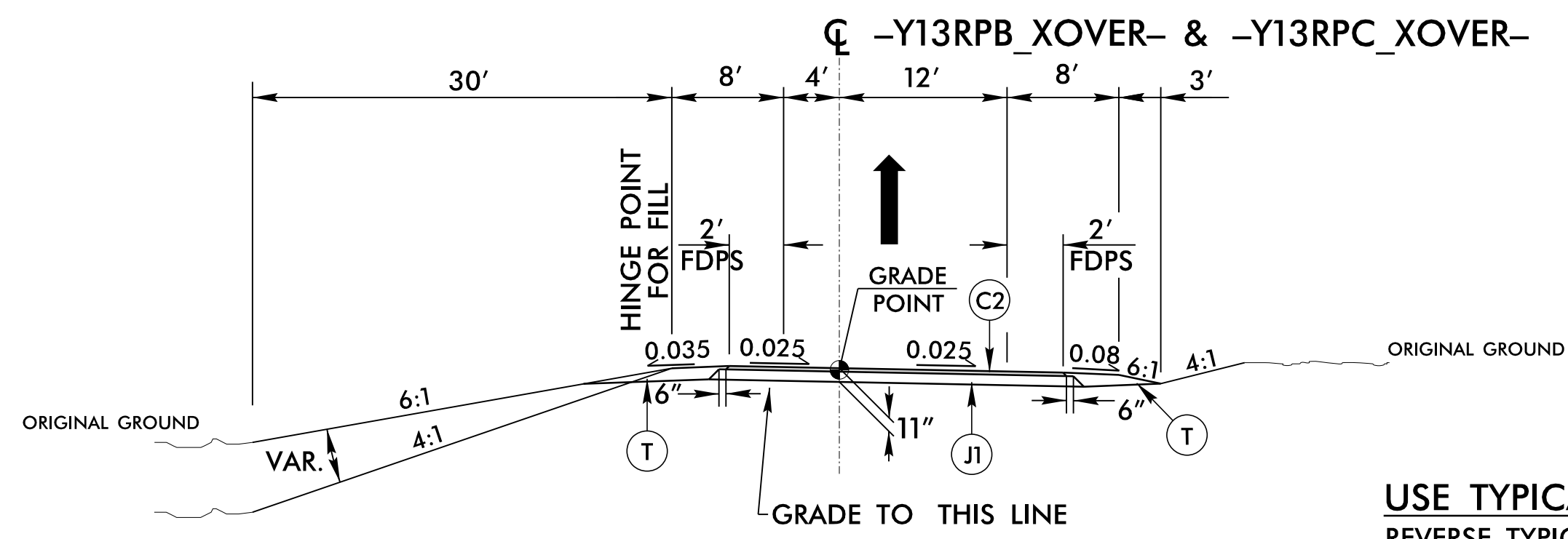


TYPICAL SECTION NO. 23 USE TYPICAL SECTION NO. 23
-Y13CUL_2- STA. 12+03.07 TO STA. 24+54.63
-Y14- STA. 9+80.00 TO STA. 10+42.44

* MAXIMUM ROLLOVER TO TURF SHOULDER IS 6%



TYPICAL SECTION NO. 26 USE TYPICAL SECTION NO. 26
-Y14T_1- STA. 11+84.60 TO STA. 12+34.60



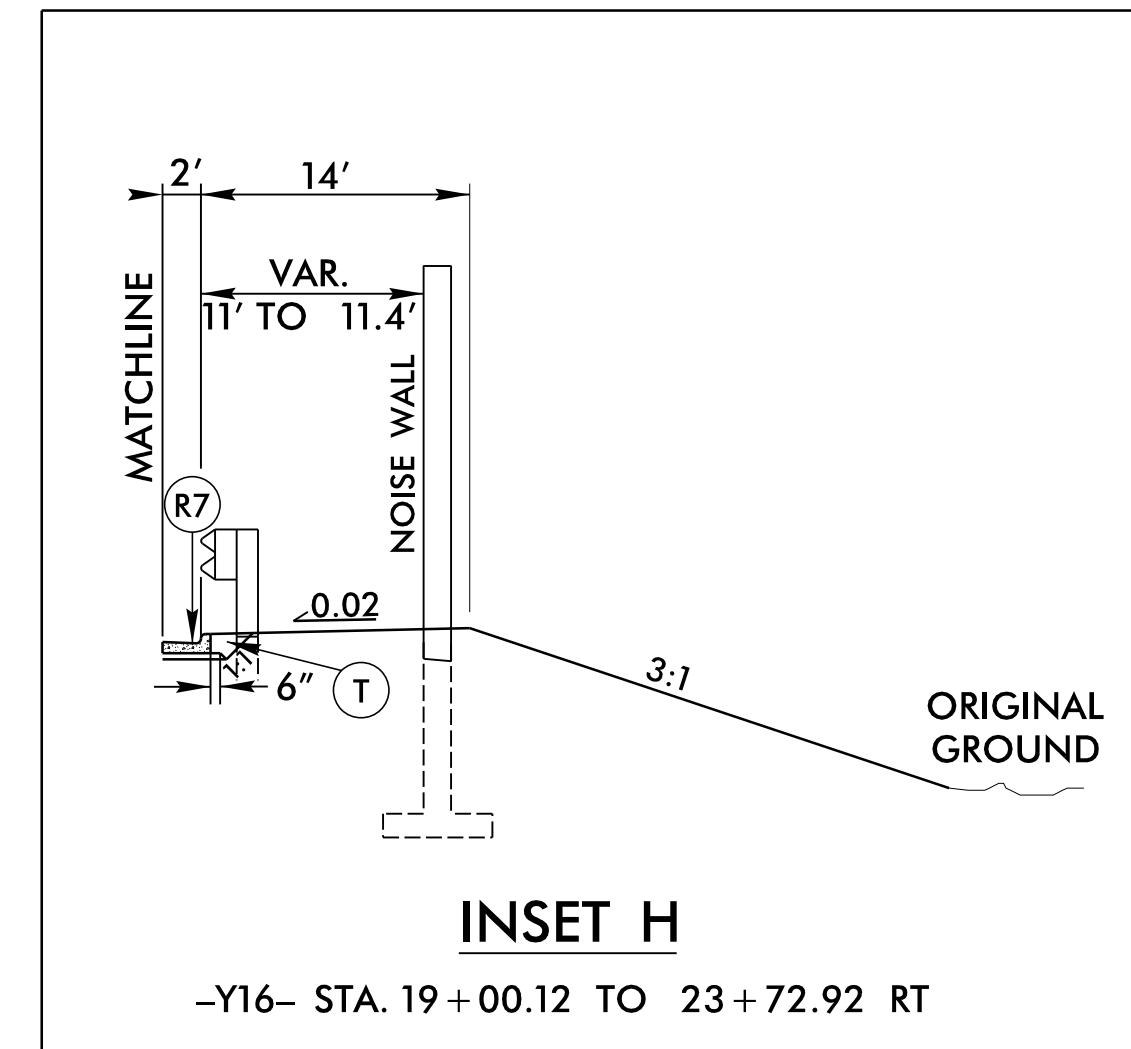
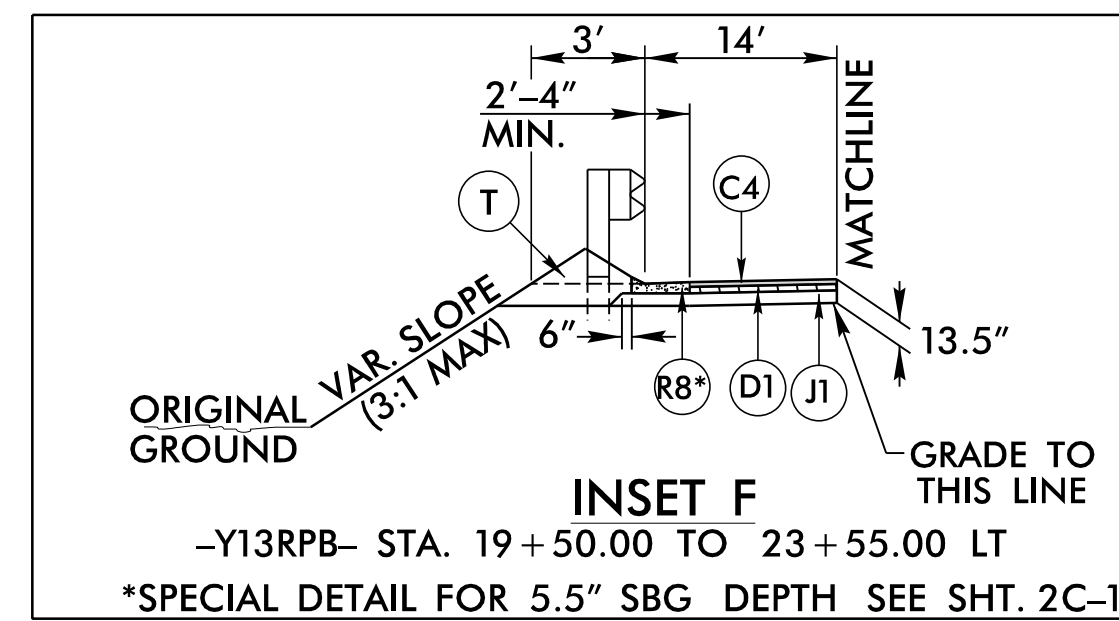
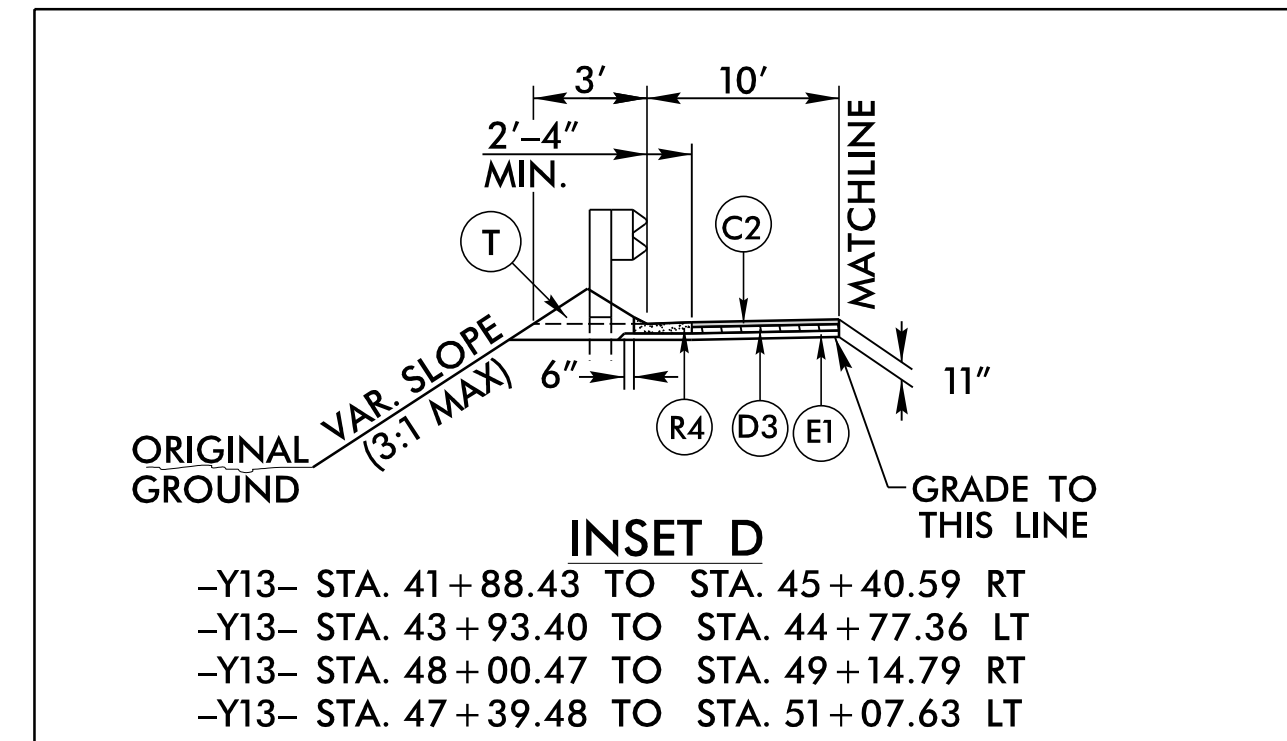
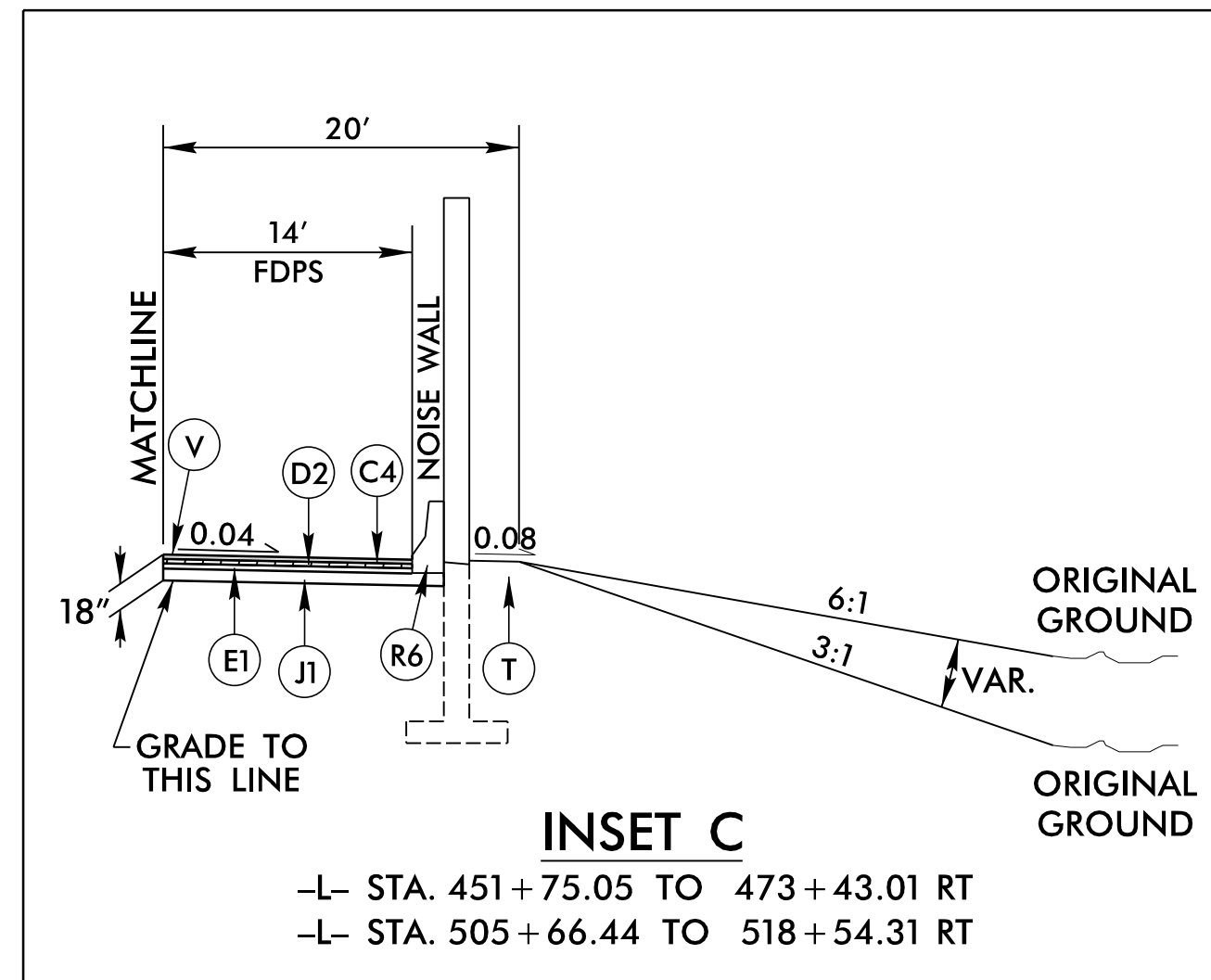
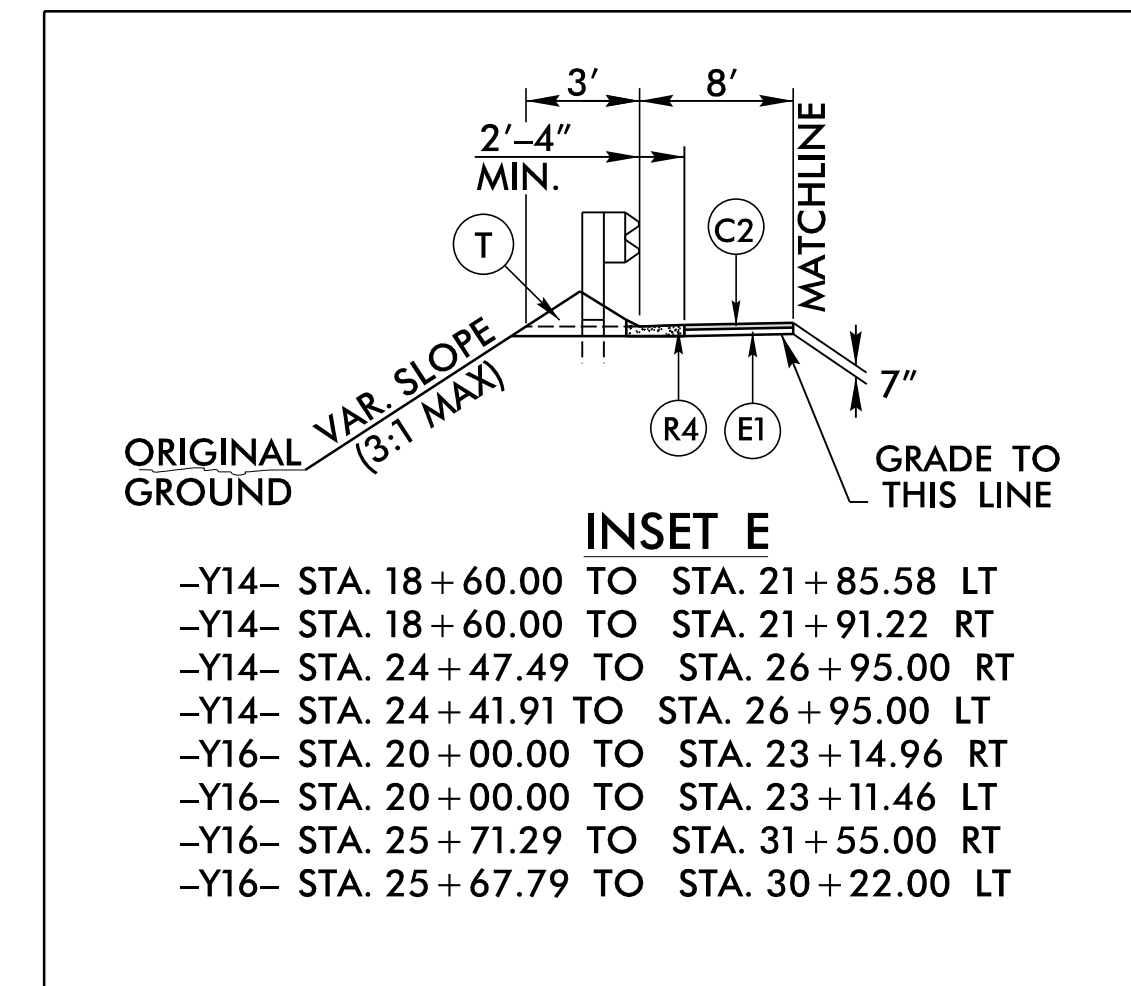
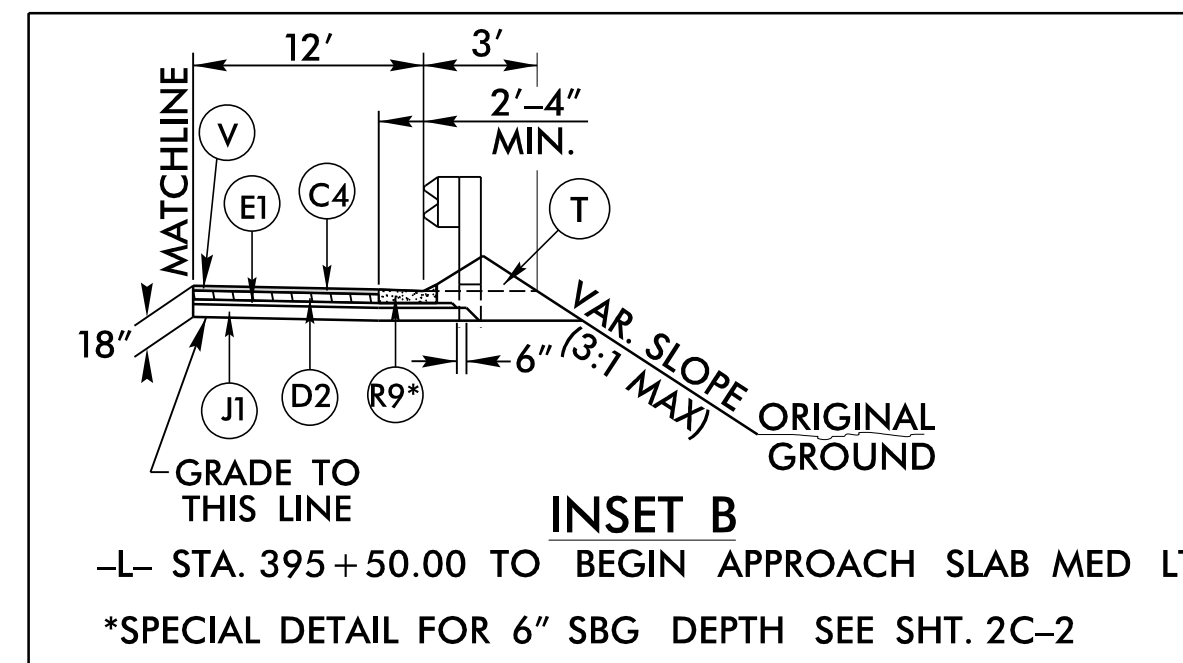
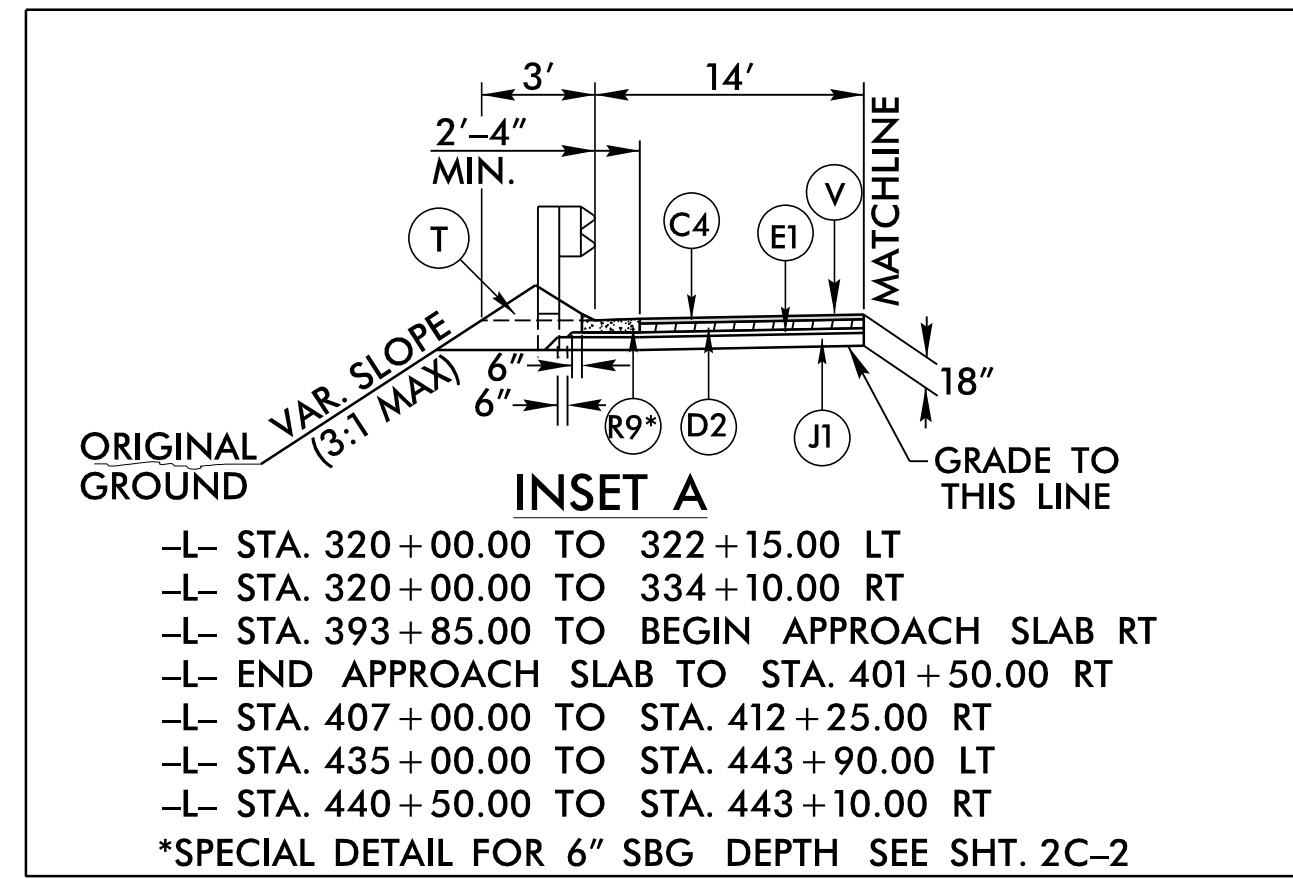
TYPICAL SECTION NO. 27 USE TYPICAL SECTION NO. 27
REVERSE TYPICAL FOR -Y13RPB_XOVER-
-Y13RPB_XOVER- STA. 10+65.00 TO STA. 13+09.41
-Y13RPC_XOVER- STA. 10+80.21 TO STA. 11+94.25

PAVEMENT SCHEDULE	
C1	1 1/2" S9.5B
C2	3" S9.5B
E1	4" B25.0C
J1	8" ABC
J3	6" INCIDENTAL STONE
R7	2'-6" C&G
S	SIDE WALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W2	WEDGING

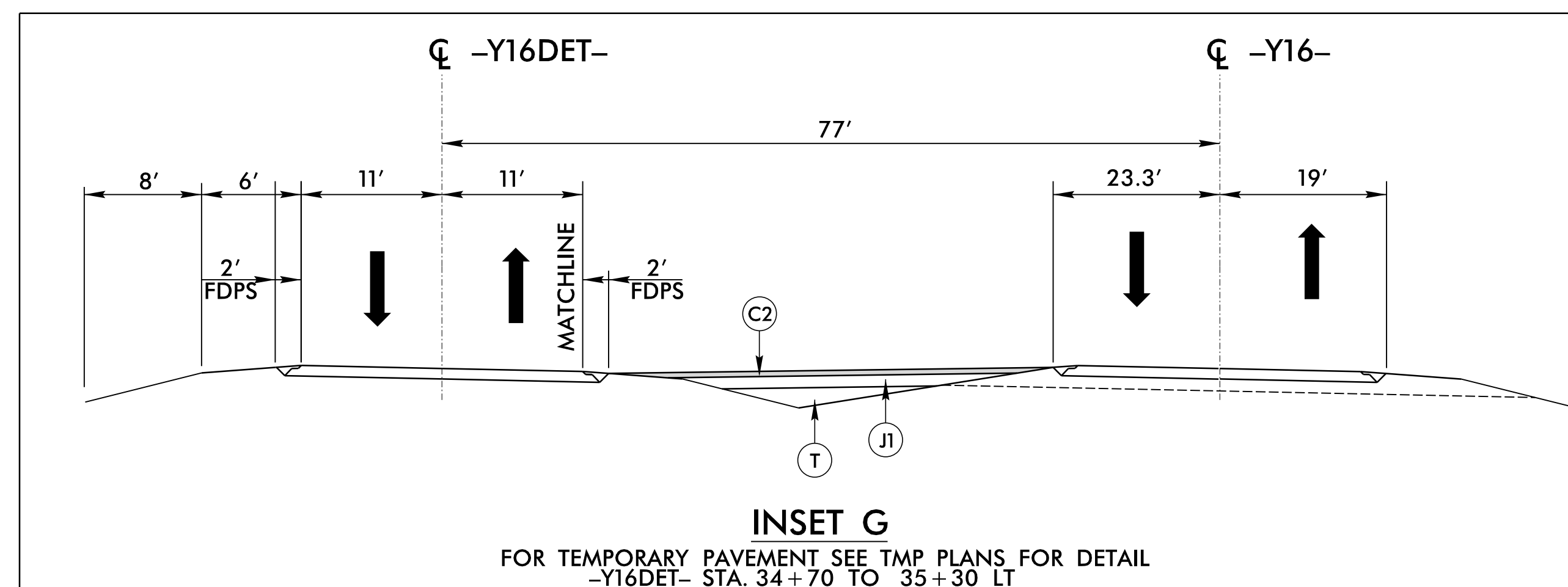
PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

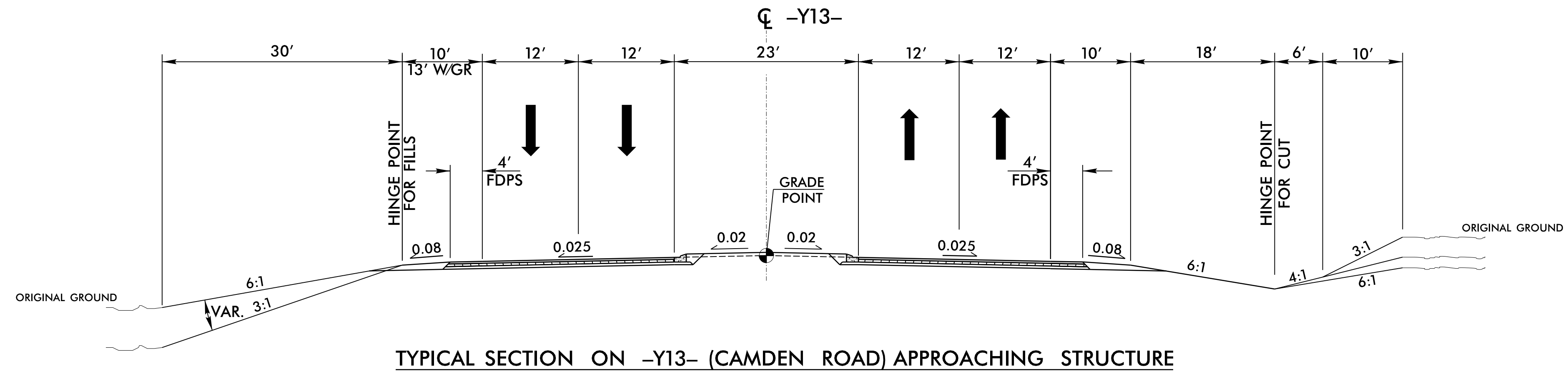
PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2A-7
ROADWAY DESIGN ENGINEER 4/11/2022 	PAVEMENT DESIGN ENGINEER 4/11/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



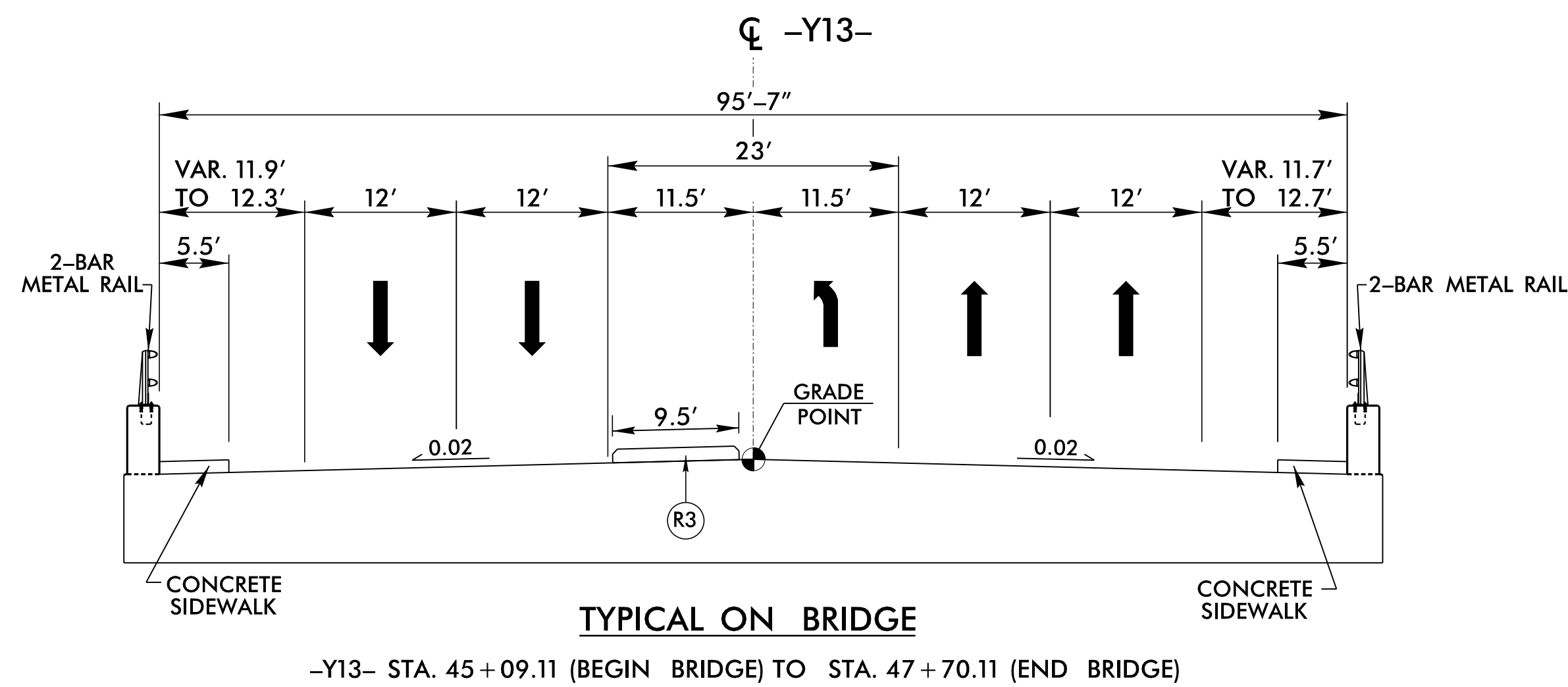
PAVEMENT SCHEDULE	
C2	3" S9.5B
C4	3" S9.5C
D1	2 1/2" I19.0C
D2	3" I19.0C
D3	4" I19.0C
E1	4" B25.0C
J1	8" ABC
R3	5" MCI
R4	SBG
R6	CONC. BARRIER
R8	5.5" MOD. SBG
R9	6" MOD. SBG
T	EARTH MATERIAL
V	RUMBLE STRIPS



BRIDGE SITE #1



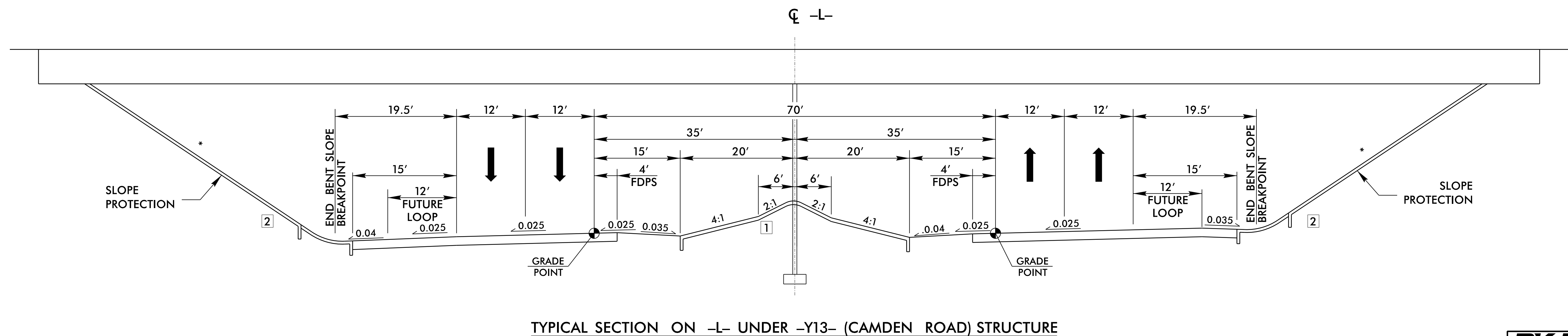
TYPICAL SECTION ON -Y13- (CAMDEN ROAD) APPROACHING STRUCTURE



TYPICAL ON BRIDGE

-Y13- STA. 45+09.11 (BEGIN BRIDGE) TO STA. 47+70.11 (END BRIDGE)

-L- (FAYETTEVILLE OUTER LOOP)	
FUNCTIONAL CLASS: INTERSTATE	
2022 ADT = 28,000	
2042 ADT = 34,600	
K = 8 %	
D = 55 %	
TTST = 4% DUAL = 8%	
V = 70 MPH	
VERTICAL CLEARANCE = 17.5'	
-Y13- (CAMDEN ROAD)	
FUNCTIONAL CLASS: URBAN COLLECTOR	
2022 ADT = 10,700	
2042 ADT = 13,500	
K = 10 %	
D = 55 %	
TTST = 1% DUAL = 4%	
V = 50 MPH	



TYPICAL SECTION ON -L- UNDER -Y13- (CAMDEN ROAD) STRUCTURE

*END BENT SLOPES TO BE DETERMINED BY GEOTECHNICAL UNIT

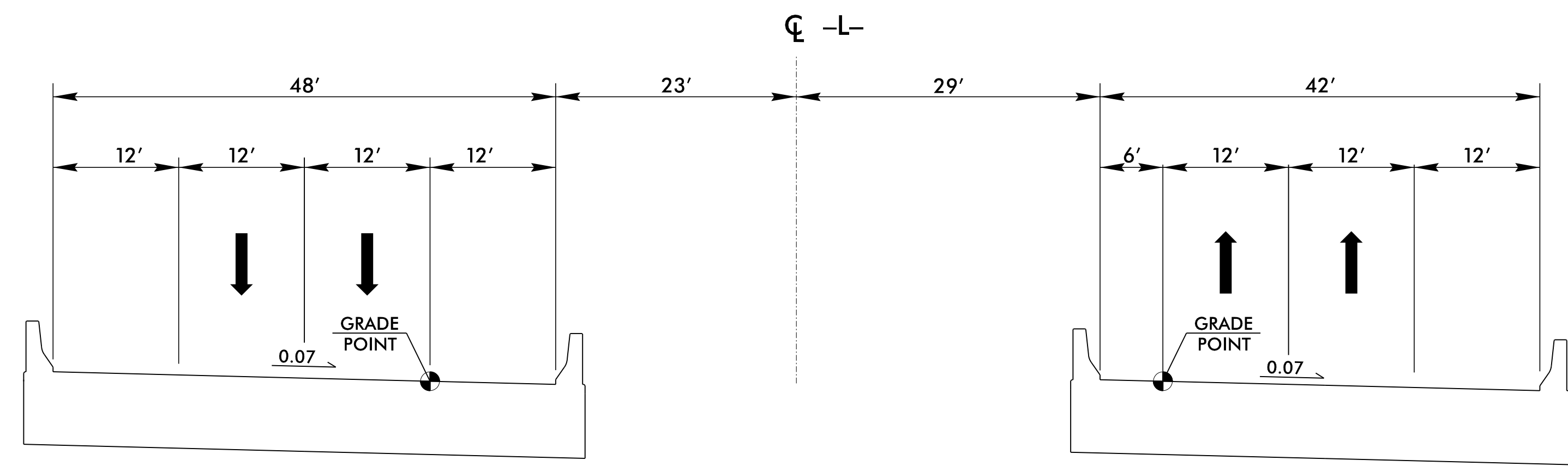
- 1 SEE NCDOT STD. 225.08
- 2 SEE NCDOT STD. 610.03

6/2/2022

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BRIDGE SITE #2

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2A-9
ROADWAY DESIGN ENGINEER 4/1/2022	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

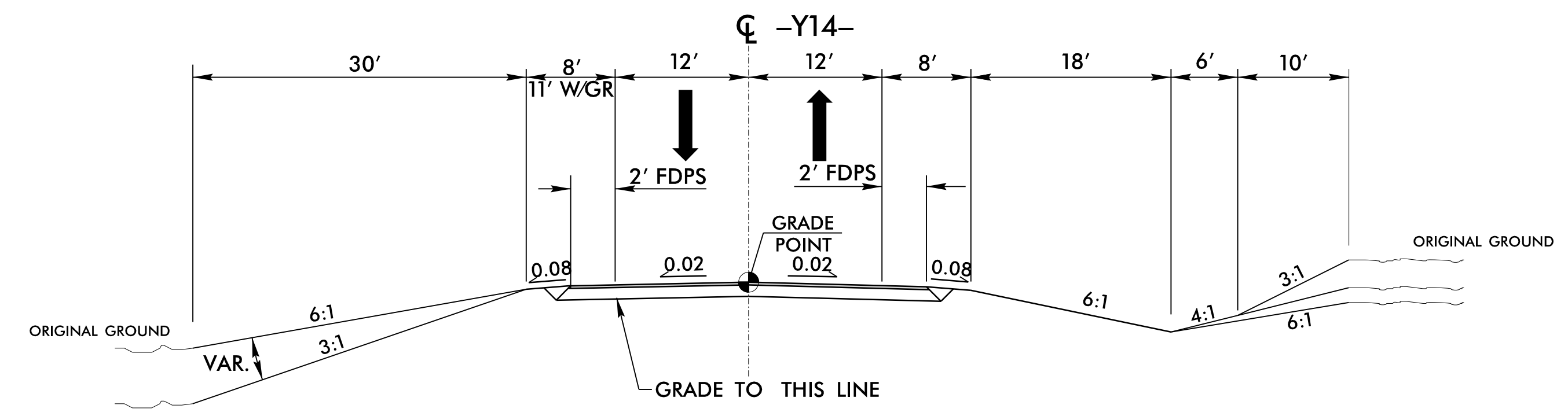


TYPICAL ON BRIDGE

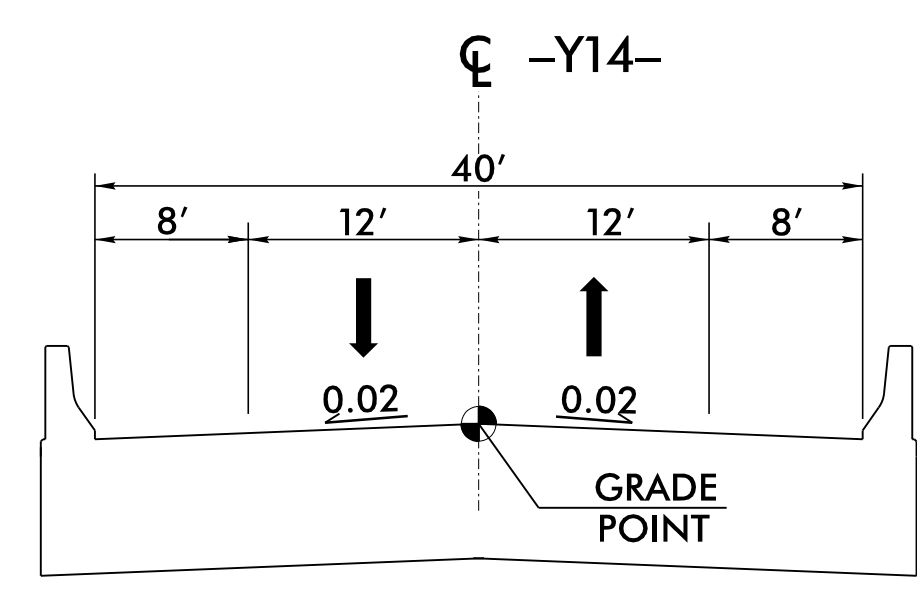
-L- STA. 396+48.35 NBL PGL (BEGIN BRIDGE) TO STA. 399+74.35 NBL PGL (END BRIDGE)
 -L- STA. 396+13.56 SBL PGL (BEGIN BRIDGE) TO STA. 399+27.81 SBL PGL (END BRIDGE)

-L- (FAYETTEVILLE OUTER LOOP)
 FUNCTIONAL CLASS: INTERSTATE
 2022 ADT = 28,000
 2042 ADT = 34,600
 K = 8 %
 D = 55%
 TTST = 4% DUAL = 8%
 V = 70 MPH
 VERTICAL CLEARANCE = 17.5'

BRIDGE SITE #3



TYPICAL SECTION ON -Y14- (KING ROAD) APPROACHING STRUCTURE

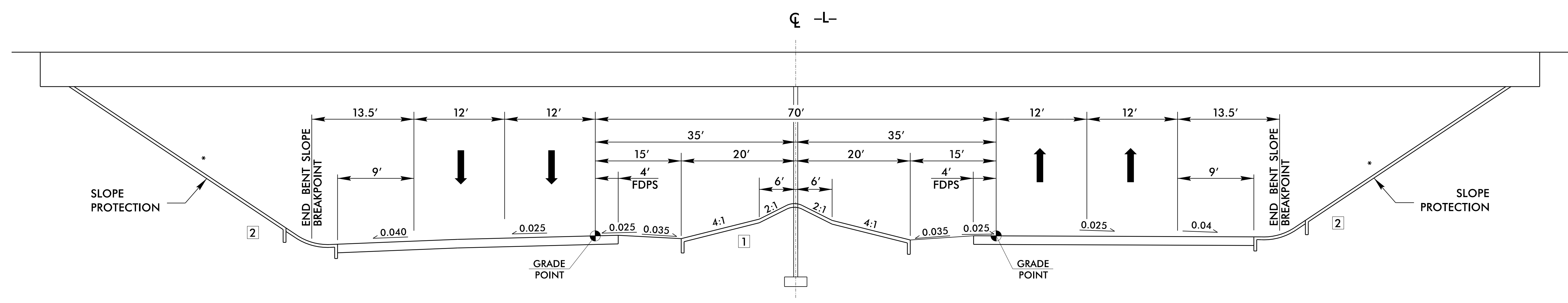


TYPICAL ON BRIDGE

-Y14- STA. 22+12.56 (BEGIN BRIDGE) TO STA. 24+20.56 (END BRIDGE)

-L- (FAYETTEVILLE OUTER LOOP)
 FUNCTIONAL CLASS: INTERSTATE
 2022 ADT = 28,000
 2042 ADT = 34,600
 K = 8 %
 D = 55%
 TTST = 4% DUAL = 8%
 V = 70 MPH
 VERTICAL CLEARANCE = 17.5'

-Y14- (KING ROAD)
 FUNCTIONAL CLASS: URBAN COLLECTOR
 2022 ADT = 4,920
 2042 ADT = 7,240
 K = 10 %
 D = 60%
 TTST = 1% DUAL = 6%
 V = 50 MPH

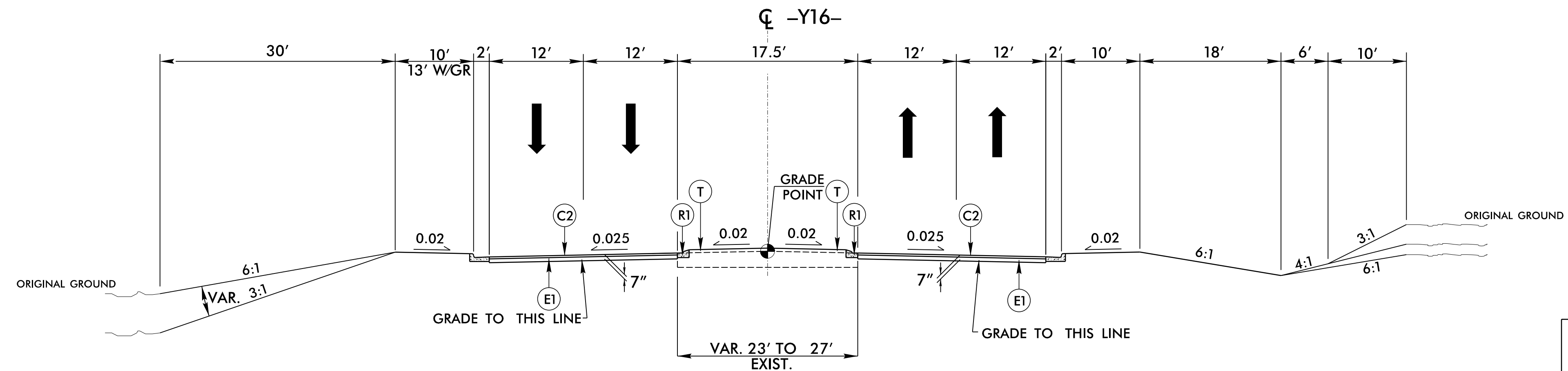


TYPICAL SECTION ON -L- UNDER -Y14- (KING ROAD) STRUCTURE

*END BENT SLOPES TO BE DETERMINED BY GEOTECHNICAL UNIT

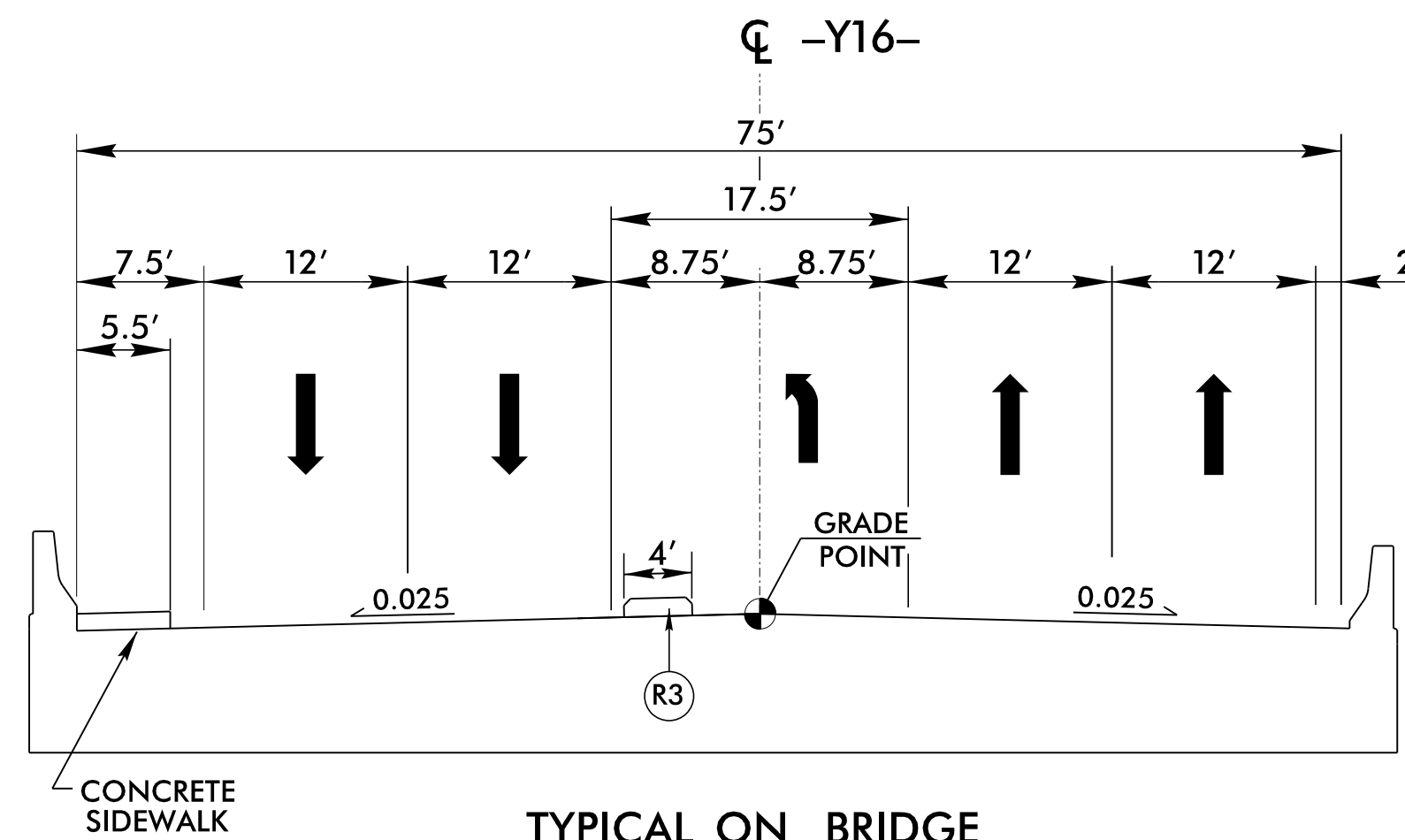
1 SEE NCDOT STD. 225.08
 2 SEE NCDOT STD. 610.03

BRIDGE SITE #4



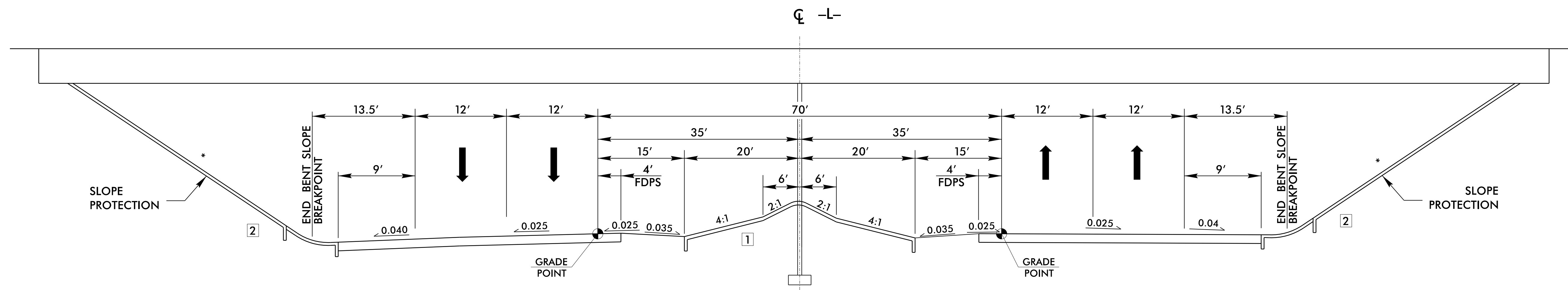
TYPICAL SECTION ON -Y16- (STONEY POINT ROAD) APPROACHING STRUCTURE

-L- (FAYETTEVILLE OUTER LOOP)	
FUNCTIONAL CLASS: INTERSTATE	
2022 ADT = 28,000	
2042 ADT = 34,600	
K = 8 %	
D = 55%	
TTST = 4% DUAL = 8%	
V = 70 MPH	
VERTICAL CLEARANCE = 17.5'	
-Y16- (STONEY POINT ROAD)	
FUNCTIONAL CLASS: URBAN COLLECTOR	
2022 ADT = 13,460	
2042 ADT = 18,180	
K = 9 %	
D = 60%	
TTST = 1% DUAL = 2%	
V = 50 MPH	



TYPICAL ON BRIDGE

-Y16- STA. 23+39.38 (BEGIN BRIDGE) TO STA. 25+43.38 (END BRIDGE)



TYPICAL SECTION ON -L- UNDER -Y16- (KING ROAD) STRUCTURE

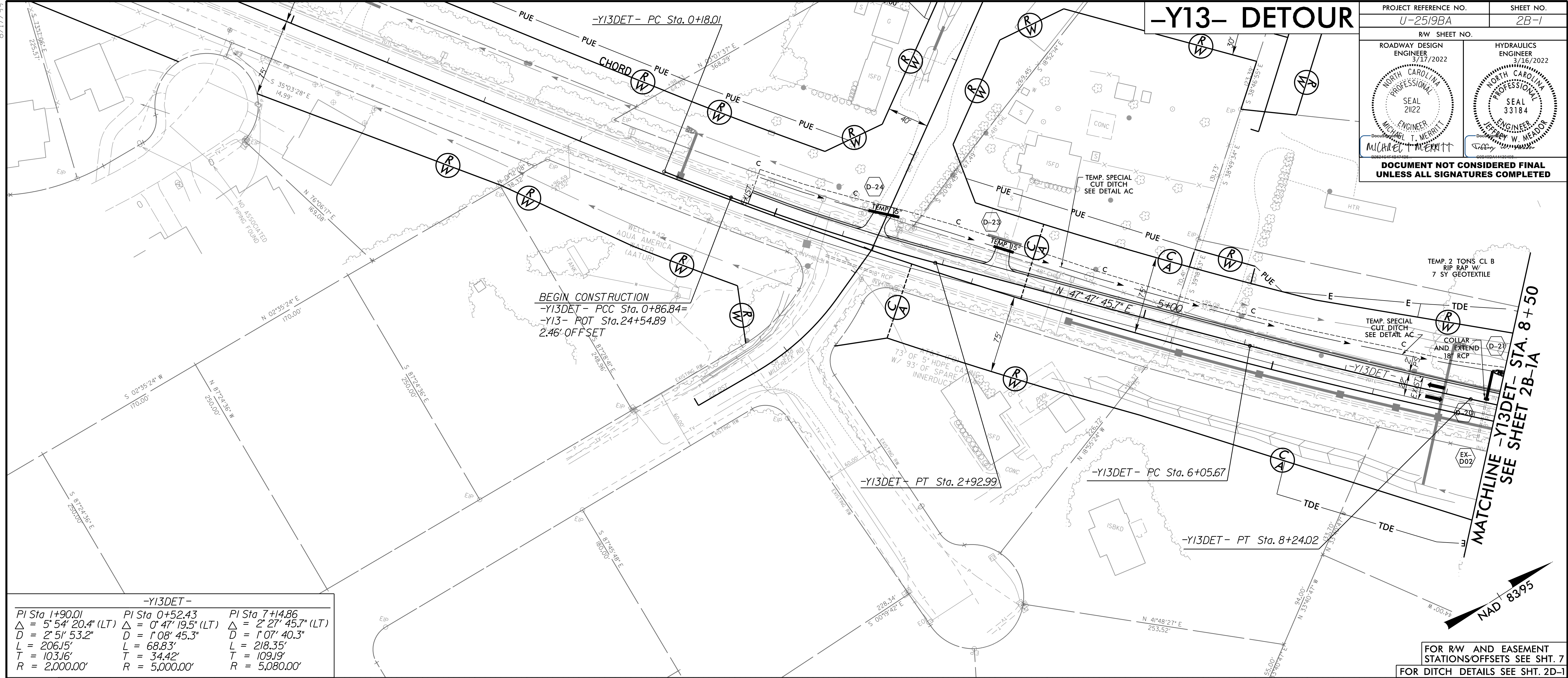
*END BENT SLOPES TO BE DETERMINED BY GEOTECHNICAL UNIT

- 1 SEE NCDOT STD. 225.08
- 2 SEE NCDOT STD. 610.03

-Y13- DETOUR

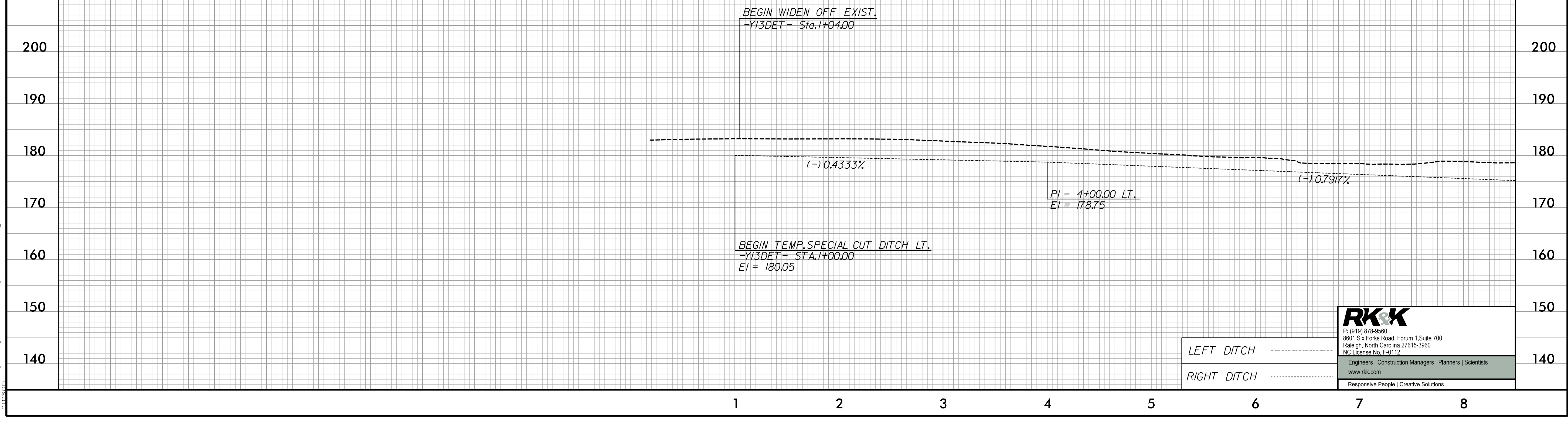
PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 21122 MICHAEL T. MERRITT	HYDRAULICS ENGINEER 3/16/2022 NORTH CAROLINA PROFESSIONAL SEAL 33184 DEBBY W. MEADOR

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UNLESS ALL SIGNATURES COMPLETED



-Y13DET-		
PI Sta 1+90.01	PI Sta 0+52.43	PI Sta 7+14.86
$\Delta = 5' 54" 20.4" (LT)$	$\Delta = 0' 47" 19.5" (LT)$	$\Delta = 2' 27" 45.7" (LT)$
$D = 2' 51" 53.2"$	$D = 1' 08" 45.3"$	$D = 1' 07" 40.3"$
$L = 206.15'$	$L = 68.83'$	$L = 218.35'$
$T = 103.16'$	$T = 34.42'$	$T = 109.19'$
$R = 2,000.00'$	$R = 5,000.00'$	$R = 5,080.00'$

FOR RW AND EASEMENT STATIONS/OFFSETS SEE SHT. 7
FOR DITCH DETAILS SEE SHT. 2D-1



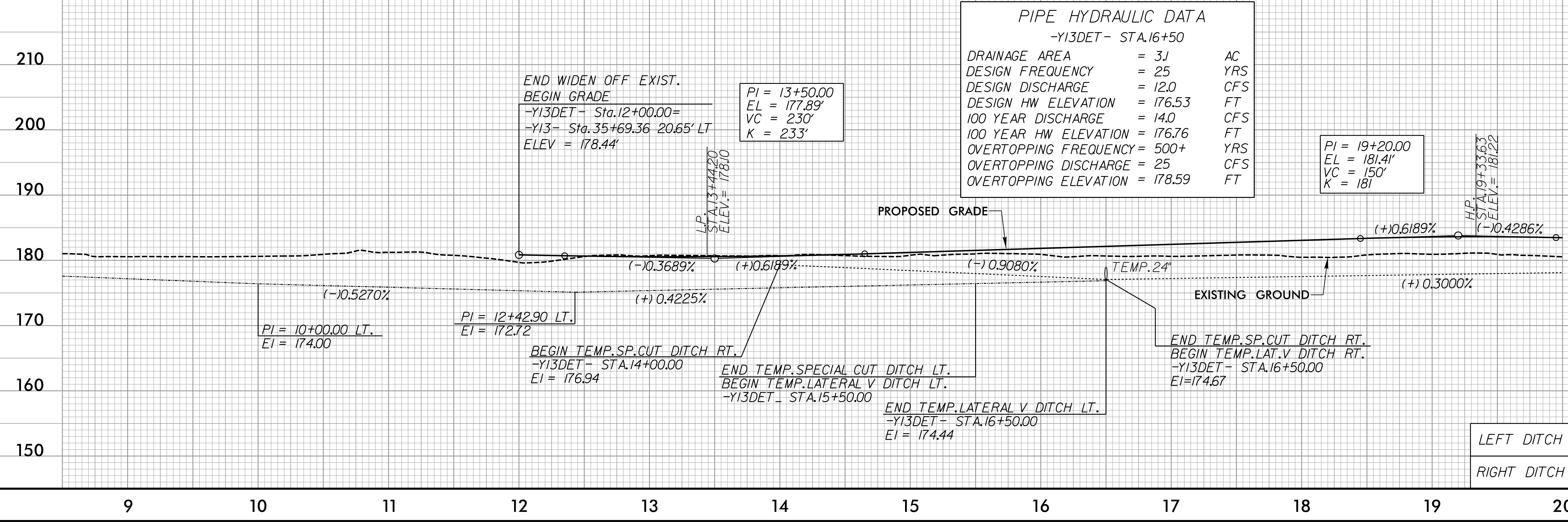
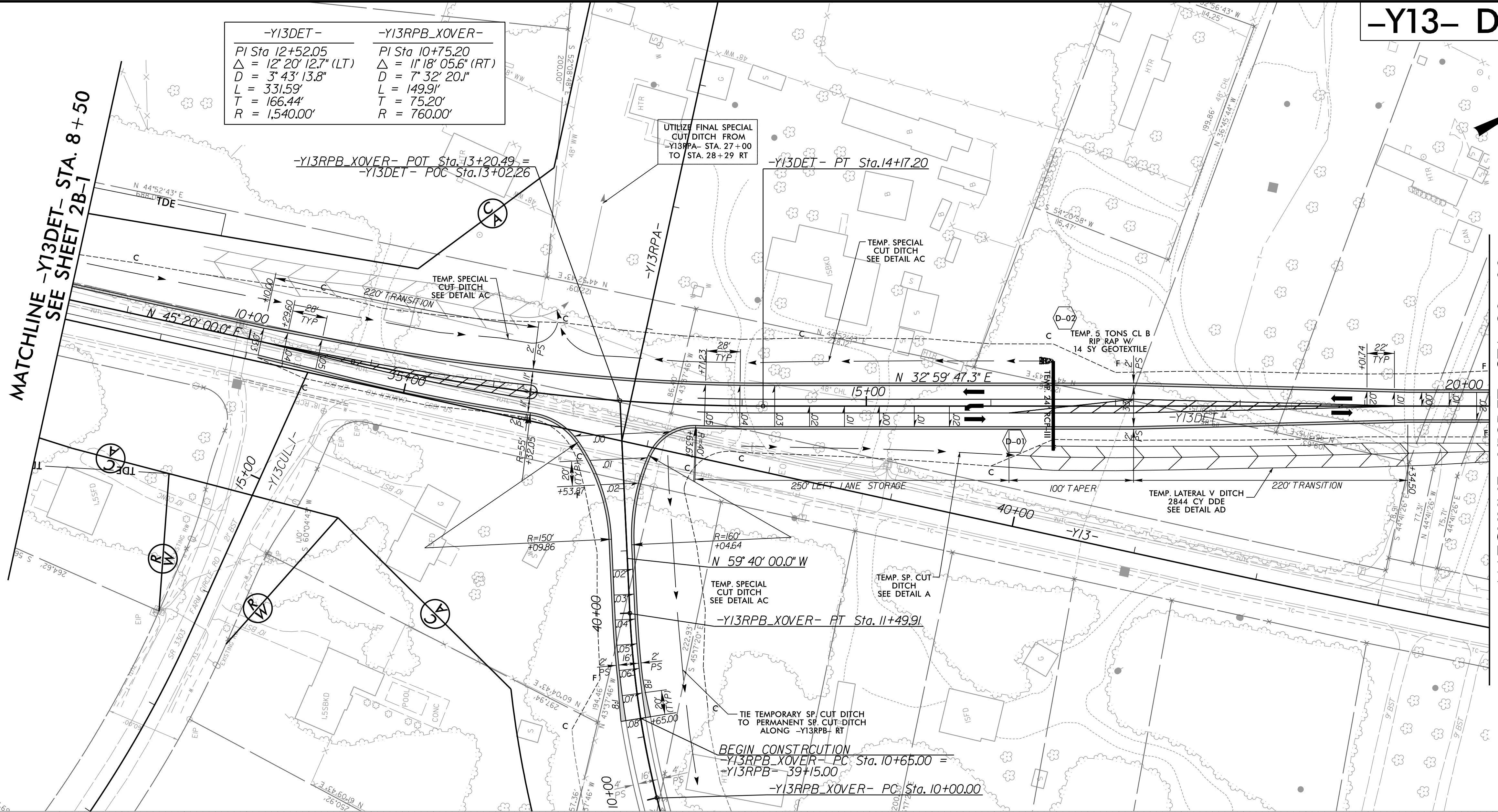
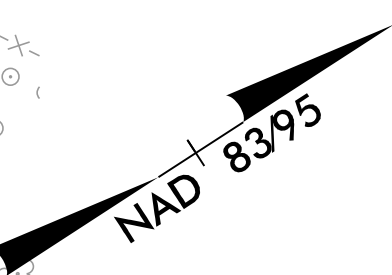
LEFT DITCH
RIGHT DITCH

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-Y13- DETOUR

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-1A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 21122 MICHAEL T. MERRITT	HYDRAULICS ENGINEER 3/16/2022 NORTH CAROLINA PROFESSIONAL SEAL 33184 EFFREW W. MEADOR
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FOR RW AND EASEMENT STATIONS/OFFSETS SEE SHT. 7
FOR PHASING DETAILS SEE TMP PLANS
FOR DITCH DETAILS SEE SHT. 2D-1
FOR -Y13RPB_XOVER- PROFILE SEE SHT. 52

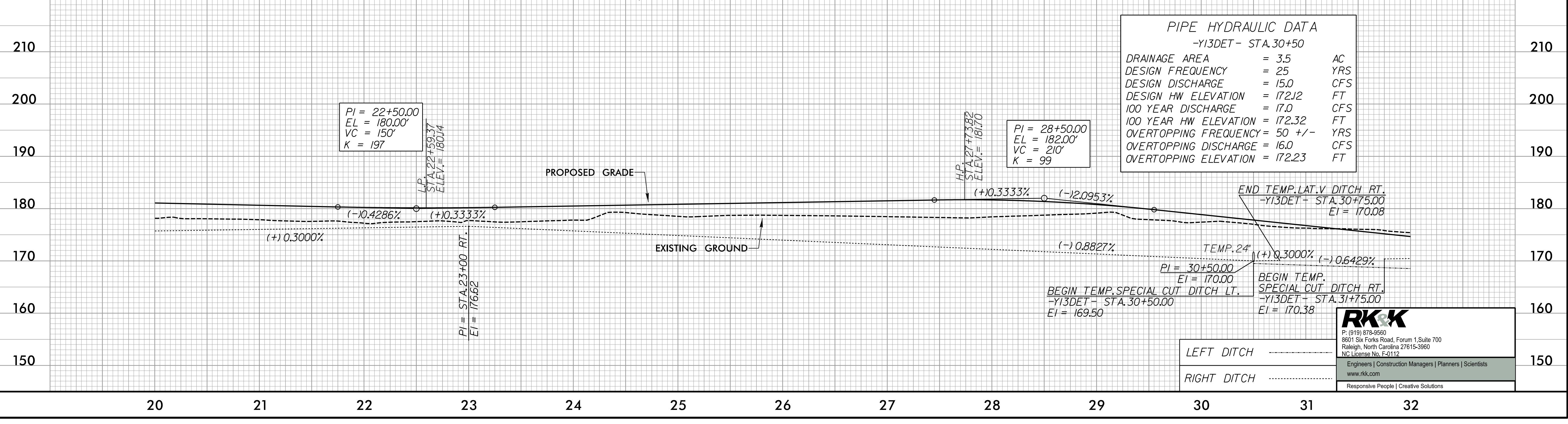
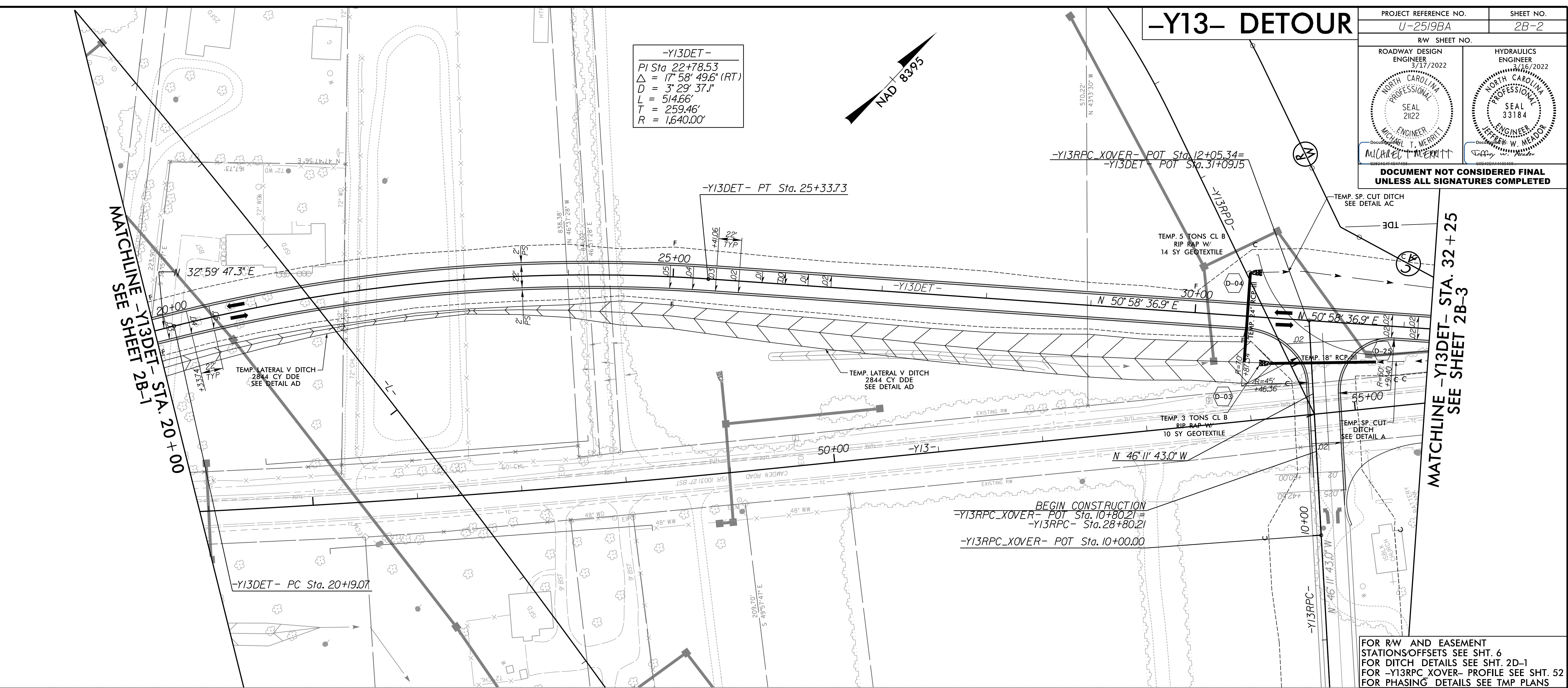
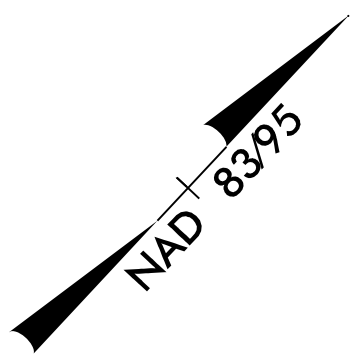
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LEFT DITCH
RIGHT DITCH

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PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 21122 MICHAEL T. MERRITT	HYDRAULICS ENGINEER 3/16/2022 NORTH CAROLINA PROFESSIONAL SEAL 33184 WILLIAM W. MEADOR
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-Y13DET-
 PI Sta 22+78.53
 $\Delta = 17^{\circ} 58' 49.6" (RT)$
 $D = 3^{\circ} 29' 37.1"$
 $L = 514.66'$
 $T = 259.46'$
 $R = 1,640.00'$



PIPE HYDRAULIC DATA	
-Y13DET- STA. 30+50	
DRAINAGE AREA	= 3.5 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 15.0 CFS
DESIGN HW ELEVATION	= 172.12 FT
100 YEAR DISCHARGE	= 17.0 CFS
100 YEAR HW ELEVATION	= 172.32 FT
OVERTOPPING FREQUENCY	= 50 +/- YRS
OVERTOPPING DISCHARGE	= 16.0 CFS
OVERTOPPING ELEVATION	= 172.23 FT

FOR RW AND EASEMENT STATIONS/OFFSETS SEE SHT. 6
 FOR DITCH DETAILS SEE SHT. 2D-1
 FOR -Y13RPC XOVER- PROFILE SEE SHT. 52
 FOR PHASING DETAILS SEE TMP PLANS

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LEFT DITCH
 RIGHT DITCH

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-Y13- DETOUR

PROJECT REFERENCE NO. U-2519BA SHEET NO. 2B-3

RW SHEET NO.

ROADWAY DESIGN ENGINEER 5/17/2022

HYDRAULICS ENGINEER 5/17/2022

NORTH CAROLINA PROFESSIONAL SEAL 2122

NORTH CAROLINA PROFESSIONAL SEAL 33184

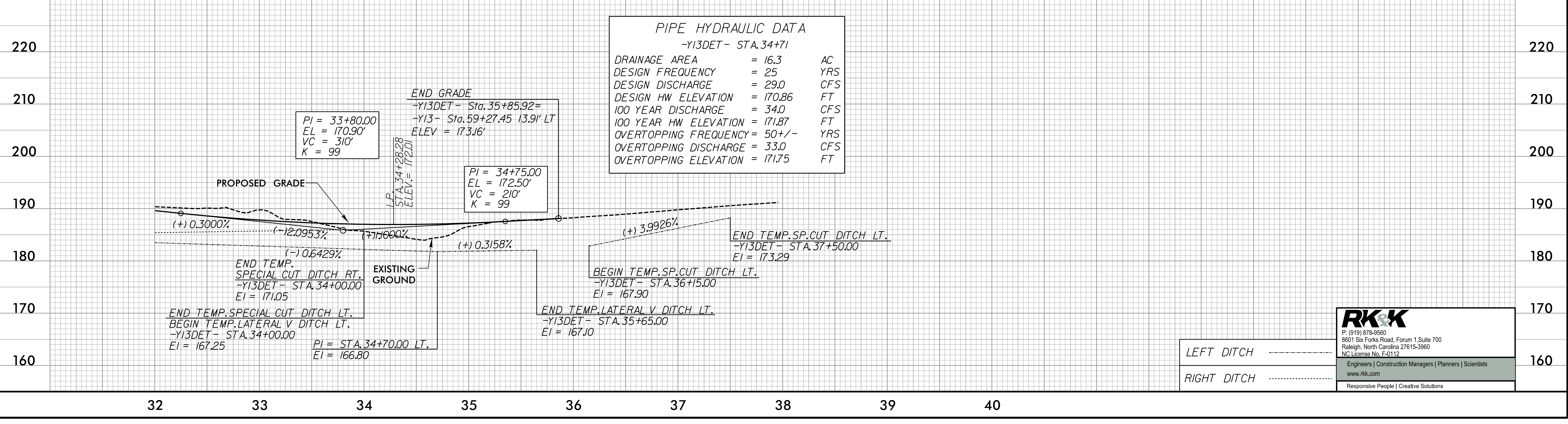
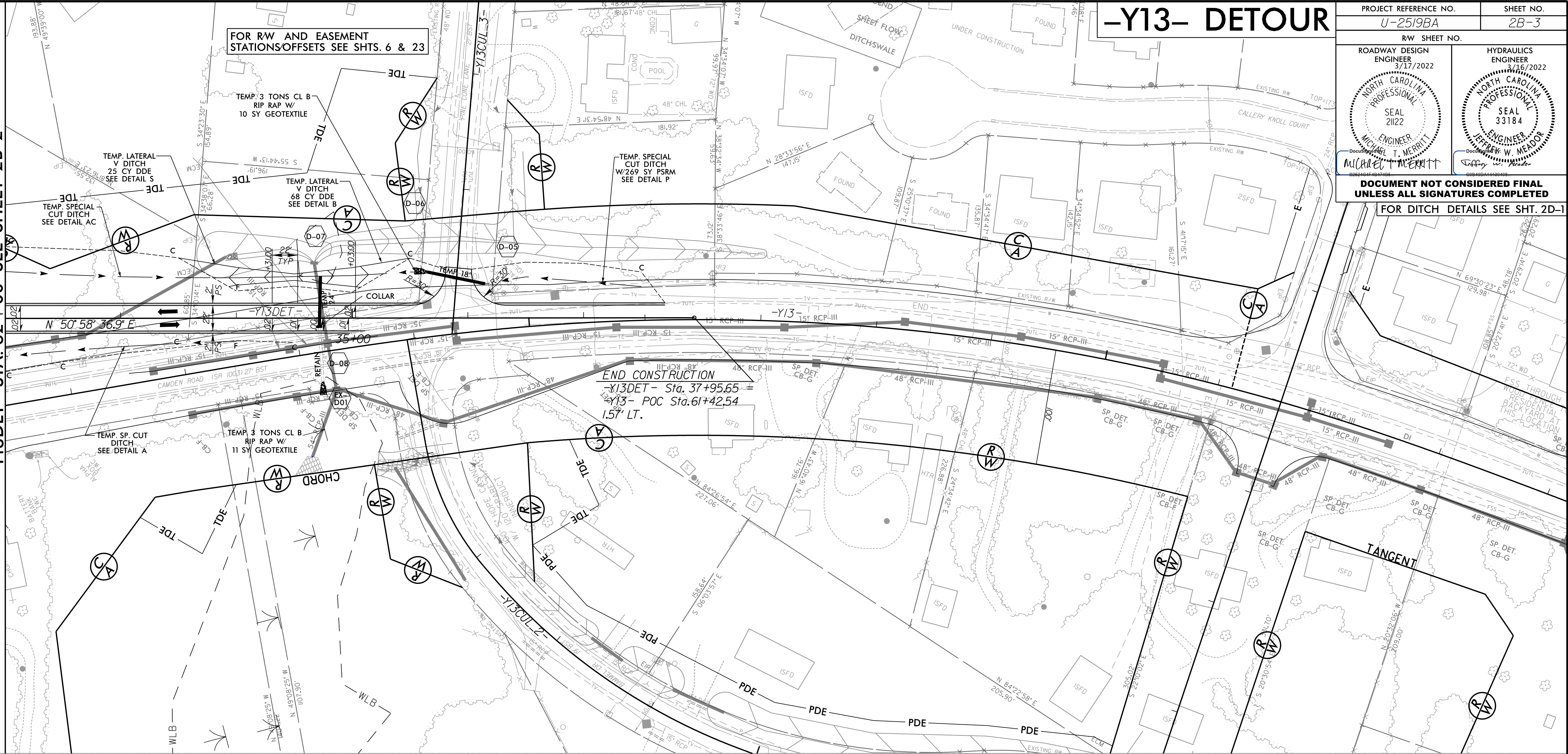
ENGINEER MICHAEL T. MERRITT

ENGINEER STEVEN W. MEADOR

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FOR DITCH DETAILS SEE SHT. 2D-1

MATCHLINE -Y13DET- STA. 32+00 SEE SHEET 2B-2



PIPE HYDRAULIC DATA
-Y13DET- STA. 34+71

DRAINAGE AREA	= 16.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 29.0	CFS
DESIGN HW ELEVATION	= 170.86	FT
100 YEAR DISCHARGE	= 34.0	CFS
100 YEAR HW ELEVATION	= 171.87	FT
OVERTOPPING FREQUENCY	= 50+/-	YRS
OVERTOPPING DISCHARGE	= 33.0	CFS
OVERTOPPING ELEVATION	= 171.75	FT

LEFT DITCH

RIGHT DITCH

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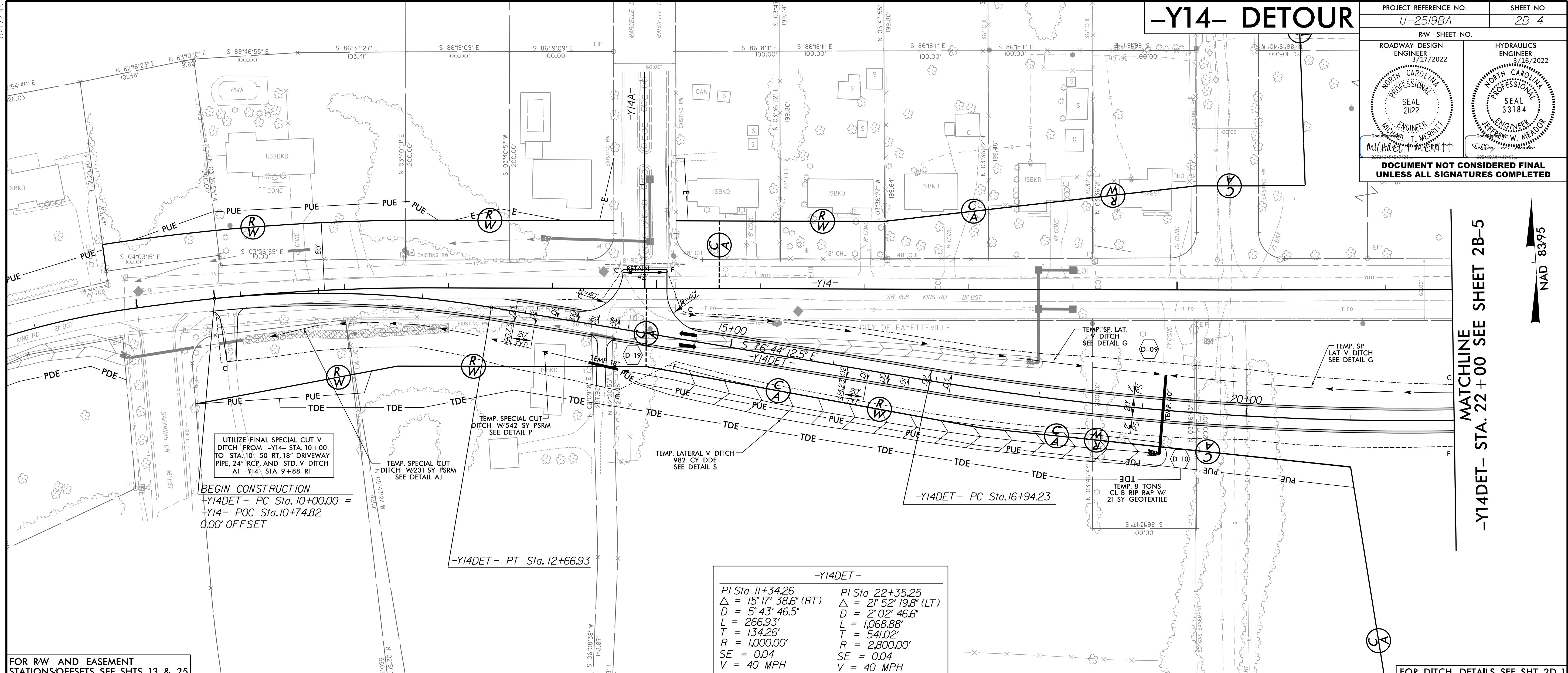
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-Y14- DETOUR

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 2122 MICHAEL T. MERRITT	HYDRAULICS ENGINEER 3/16/2022 NORTH CAROLINA PROFESSIONAL SEAL 33184 DREW W. MEDDOR
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



UTILIZE FINAL SPECIAL CUT V DITCH FROM -Y14- STA. 10+00 TO STA. 10+50 RT. 18" DRIVEWAY PIPE, 24" RCP, AND STD. V DITCH AT -Y14- STA. 9+88 RT

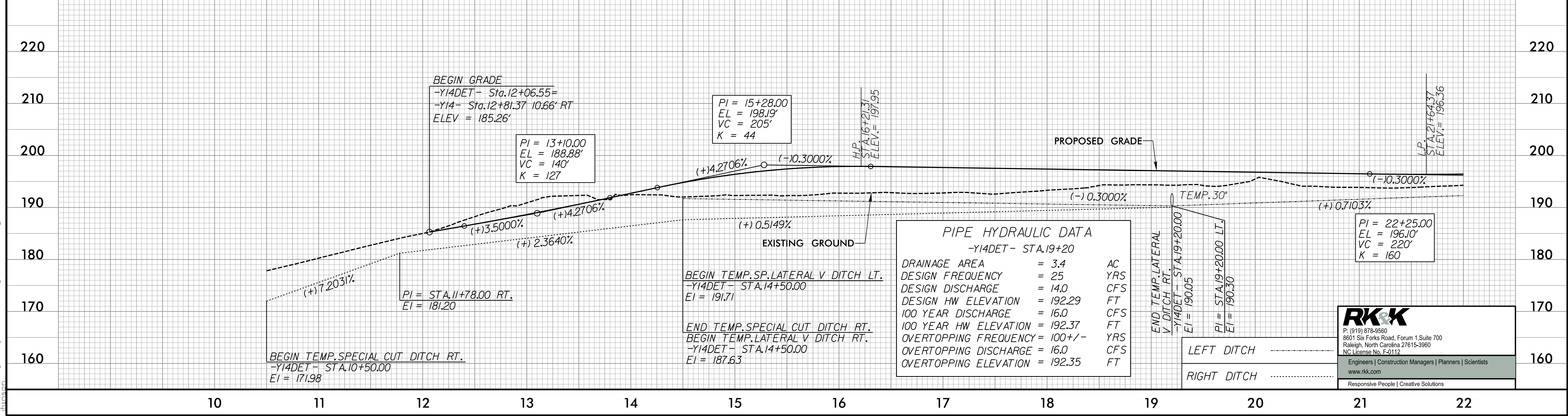
BEGIN CONSTRUCTION
-Y14DET- PC Sta. 10+00.00 =
-Y14- POC Sta. 10+74.82
0.00' OFFSET

-Y14DET- PT Sta. 12+66.93

-Y14DET-	
PI Sta. 11+34.26	PI Sta. 22+35.25
$\Delta = 15' 17" 38.6" (RT)$	$\Delta = 21' 52" 19.8" (LT)$
$D = 5' 43" 46.5"$	$D = 2' 02" 46.6"$
$L = 266.93'$	$L = 1,068.88'$
$T = 134.26'$	$T = 541.02'$
$R = 1,000.00'$	$R = 2,800.00'$
$SE = 0.04$	$SE = 0.04$
$V = 40 MPH$	$V = 40 MPH$

FOR RW AND EASEMENT STATIONS/OFFSETS SEE SHTS. 13 & 25

FOR DITCH DETAILS SEE SHT. 2D-1



PIPE HYDRAULIC DATA		-Y14DET- STA. 19+20	
DRAINAGE AREA	= 3.4	AC	
DESIGN FREQUENCY	= 25	YRS	
DESIGN DISCHARGE	= 14.0	CFS	
DESIGN HW ELEVATION	= 192.29	FT	
100 YEAR DISCHARGE	= 16.0	CFS	
100 YEAR HW ELEVATION	= 192.37	FT	
OVERTOPPING FREQUENCY	= 100 +/-	YRS	
OVERTOPPING DISCHARGE	= 16.0	CFS	
OVERTOPPING ELEVATION	= 192.35	FT	

LEFT DITCH
RIGHT DITCH

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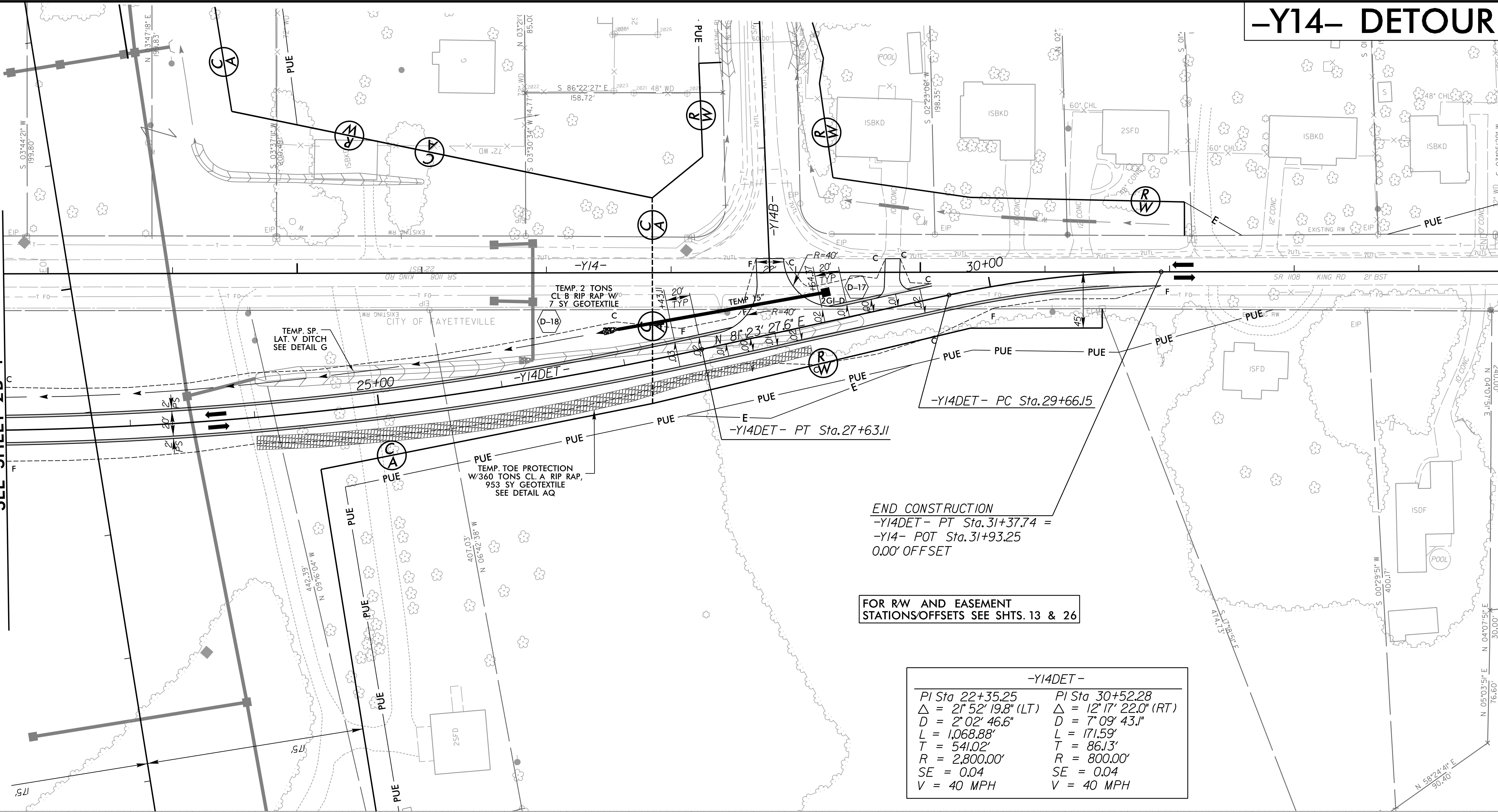
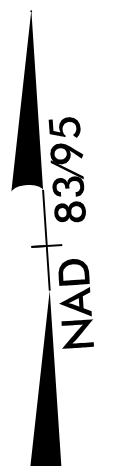
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-Y14- DETOUR

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 21122 MICHAEL T. MERRITT	HYDRAULICS ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 33184 WILLIAM W. MEADOR

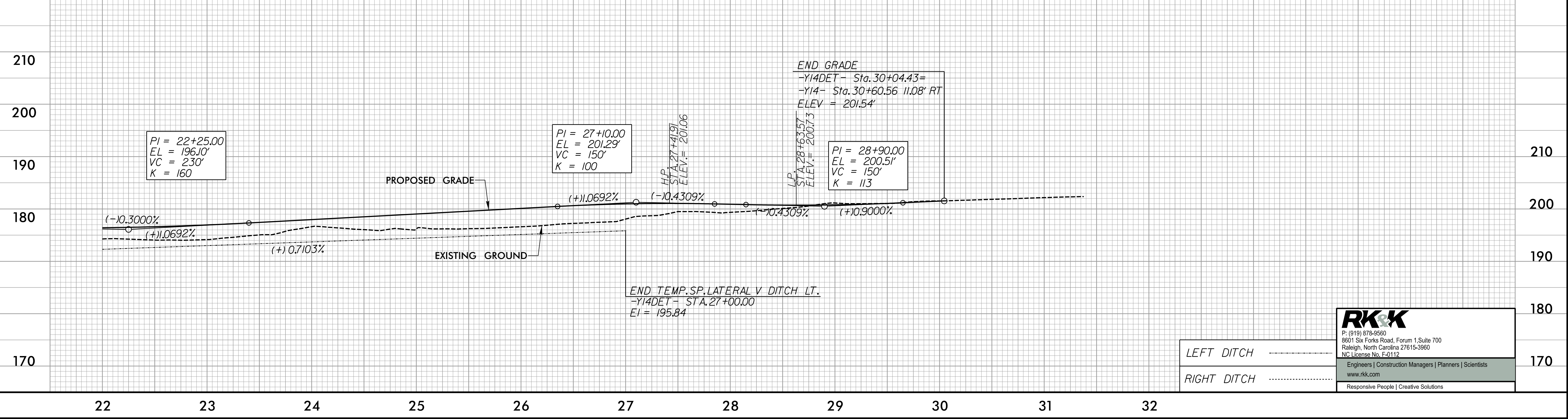
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

MATCHLINE -Y14DET- STA. 22+00
SEE SHEET 2B-4



-Y14DET-	
PI Sta 22+35.25	PI Sta 30+52.28
$\Delta = 21^{\circ} 52' 19.8"$ (LT)	$\Delta = 12^{\circ} 17' 22.0"$ (RT)
D = 2' 02' 46.6"	D = 7' 09' 43.1"
L = 1,068.88'	L = 171.59'
T = 541.02'	T = 86.13'
R = 2,800.00'	R = 800.00'
SE = 0.04	SE = 0.04
V = 40 MPH	V = 40 MPH

FOR DITCH DETAILS SEE SHT. 2D-1



LEFT DITCH

RIGHT DITCH

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-Y16- DETOUR

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 21122 MICHAEL T. MERRITT	HYDRAULICS ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 33184 W. MEADOR

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

FOR DITCH DETAILS SEE SHT. 2D-1

-Y16DET-

PI Sta 10+99.95	PI Sta 19+87.03
$\Delta = 8' 28" 06.8" (LT)$	$\Delta = 7' 59" 54.6" (RT)$
$D = 4' 14" 38.9"$	$D = 1' 54" 35.5"$
$L = 199.54'$	$L = 418.80'$
$T = 99.95'$	$T = 209.74'$
$R = 1,350.00'$	$R = 3,000.00'$
$SE = 0.06$	$SE = 0.04$
$V = 50MPH$	$V = 50MPH$

BEGIN CONSTRUCTION
-Y16DET- PC Sta. 10+00.00 =
-Y16- POT Sta. 10+41.97
0.00' OFFSET

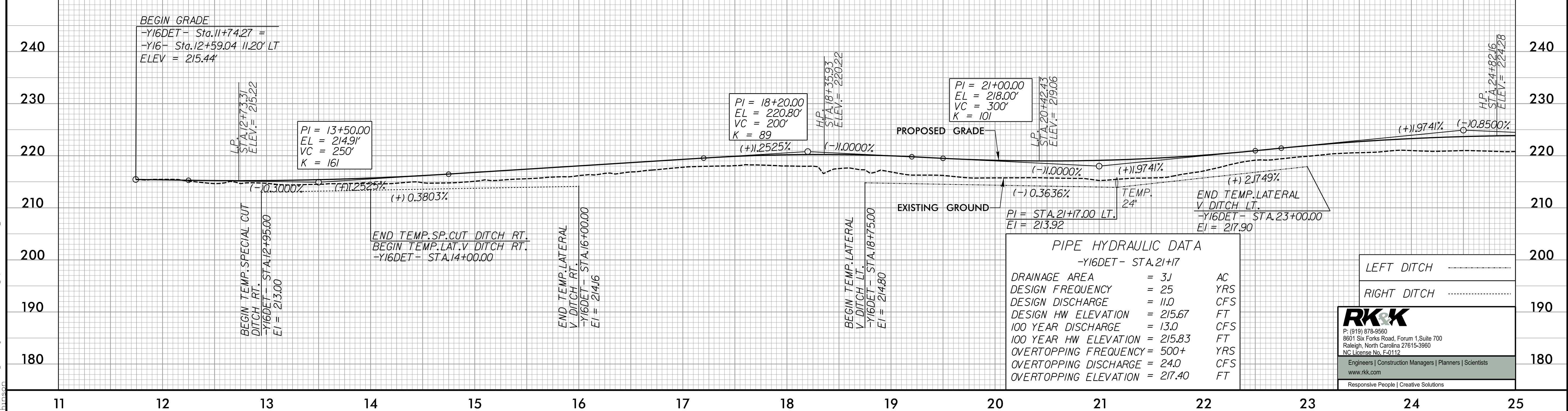
-Y16DET- PT Sta. 11+99.54

-Y16DET- PC Sta. 17+77.29

-Y16DET- PT Sta. 21+96.09

FOR RW AND EASEMENT STATIONS/OFFSETS SEE SHTS. 18 & 28

NOTE: SR 1111 (BRADY ROAD) INTERSECTION WITH SR 1112 (STONE POINT ROAD) WILL BE CLOSED WHILE -Y16- DETOUR IS OPERATIONAL. EXISTING BRADY ROAD TRAFFIC WILL UTILIZE OFFSITE DETOURS.



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MATCHLINE -Y16DET- STA. 24 + 85 SEE SHEET 2B-7

8/17/19 8/8/2022 R:\Projects\2519BA_Rdly_psf\02B_6.dgn

8/17/19

MATCHLINE -Y16DET- STA. 24+85 SEE SHEET 2B-6

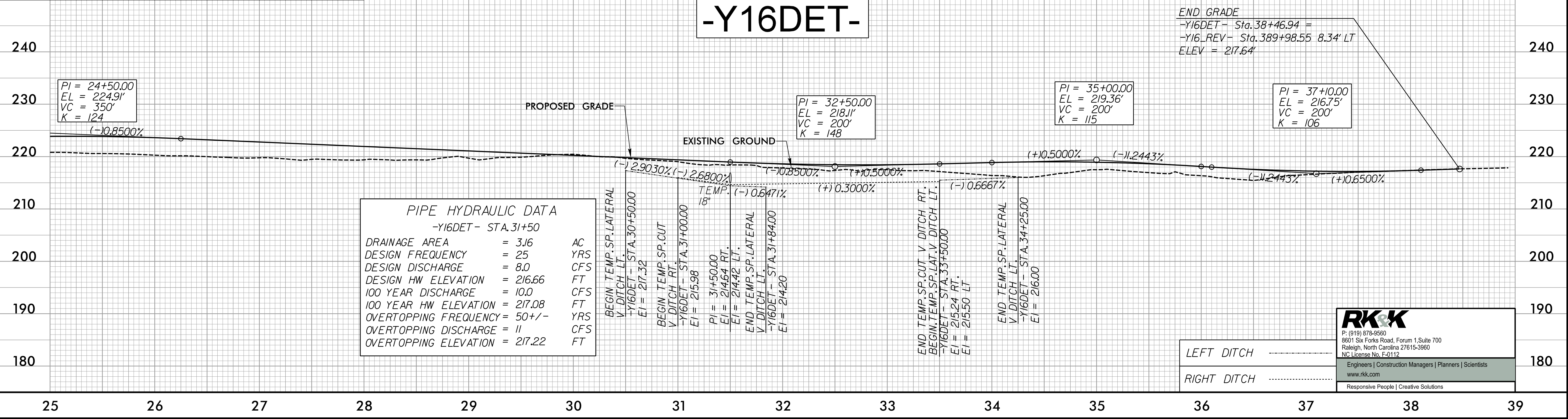
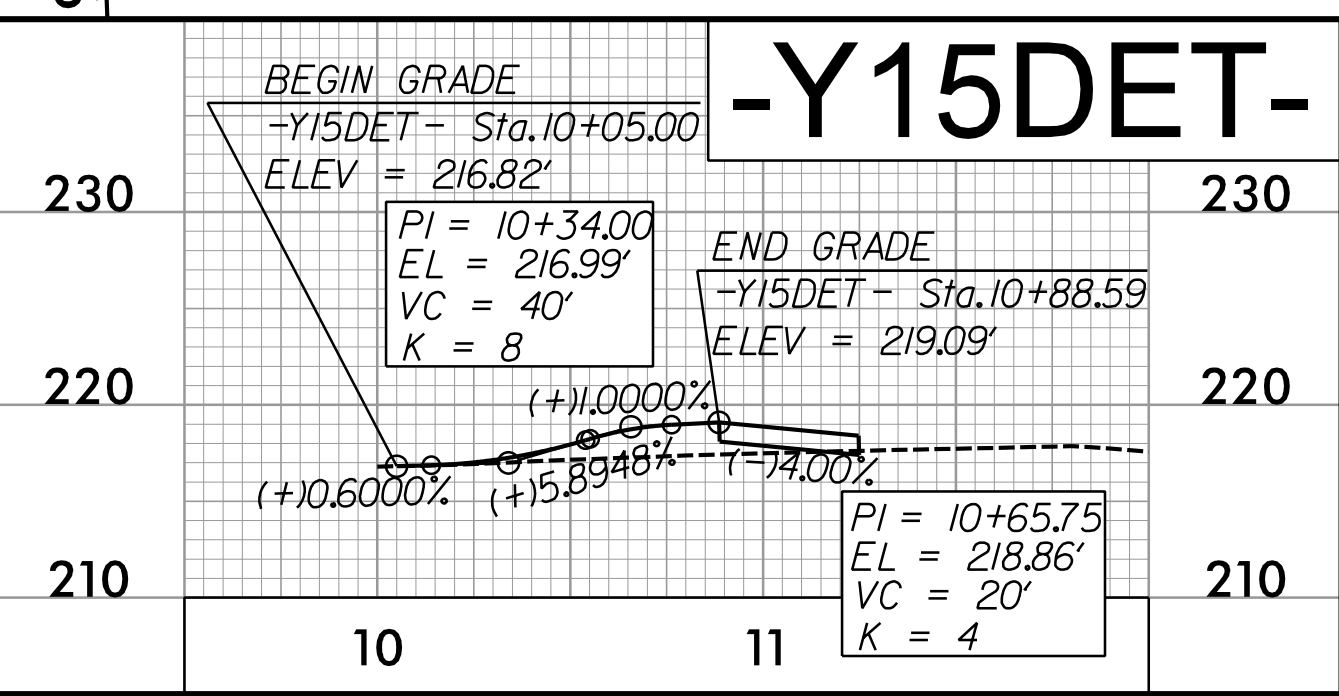
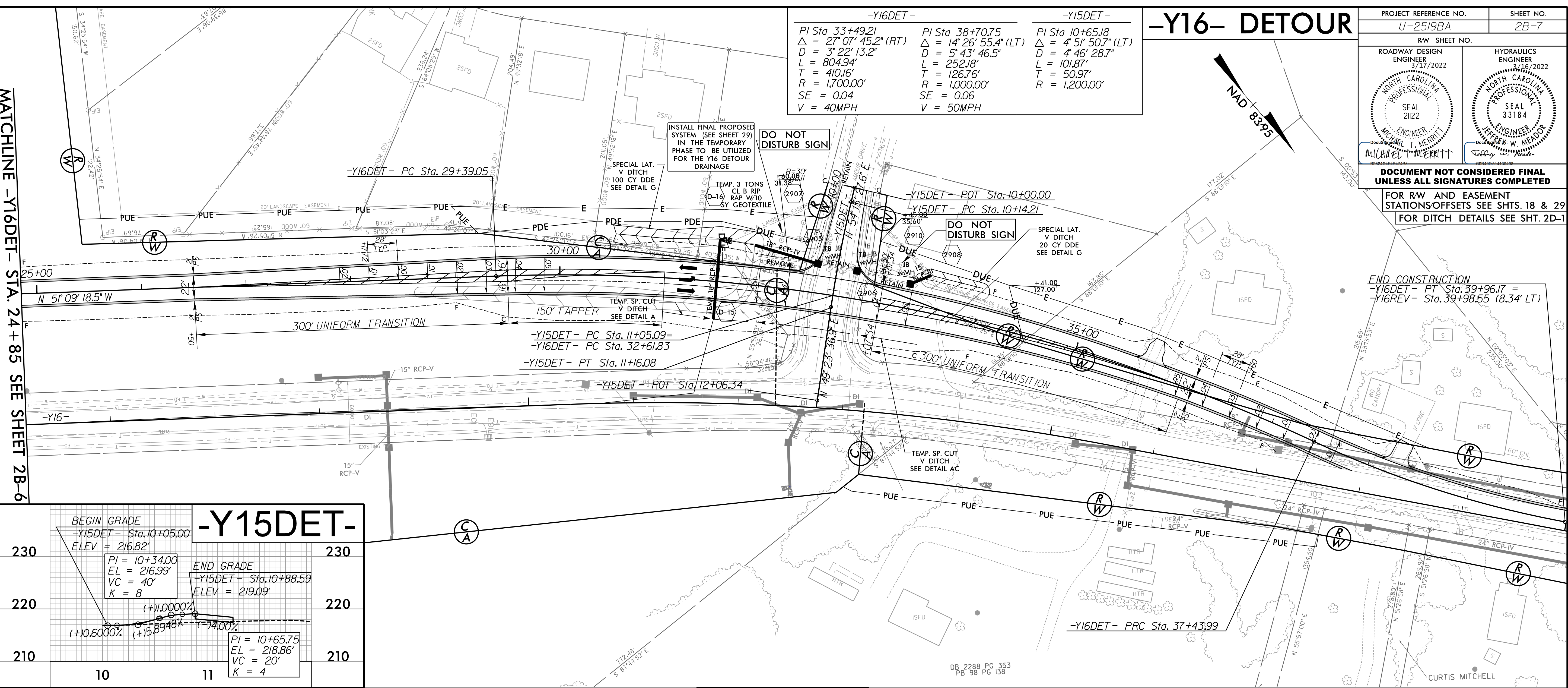
-Y16DET-	-Y15DET-	-Y15DET-
PI Sta 33+49.21	PI Sta 38+70.75	PI Sta 10+65.18
$\Delta = 27' 07' 45.2''$ (RT)	$\Delta = 14' 26' 55.4''$ (LT)	$\Delta = 4' 51' 50.7''$ (LT)
D = 3' 22' 13.2"	D = 5' 43' 46.5"	D = 4' 46' 28.7"
L = 804.94'	L = 252.18'	L = 101.87'
T = 410.16'	T = 126.76'	T = 50.97'
R = 1,700.00'	R = 1,000.00'	R = 1,200.00'
SE = 0.04	SE = 0.06	
V = 40MPH	V = 50MPH	

-Y16- DETOUR

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-7
RW SHEET NO.	HYDRAULICS
ROADWAY DESIGN ENGINEER 5/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 21122 MICHAEL T. MERRITT	ENGINEER 5/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 33184 EFFIE W. MENDOR

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FOR RW AND EASEMENT STATIONS/OFFSETS SEE SHTS. 18 & 29
FOR DITCH DETAILS SEE SHT. 2D-1



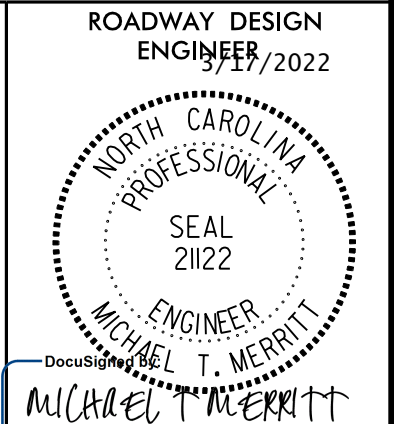
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8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615-3960
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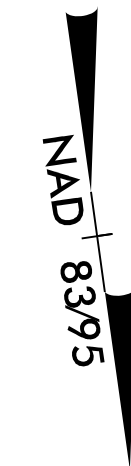
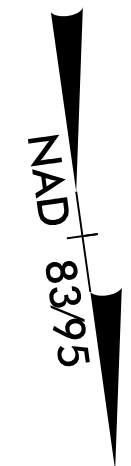
8/17/2022
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SHEAR POINT DETAIL FOR -Y13- INTERCHANGE

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-8
RW SHEET NO.	

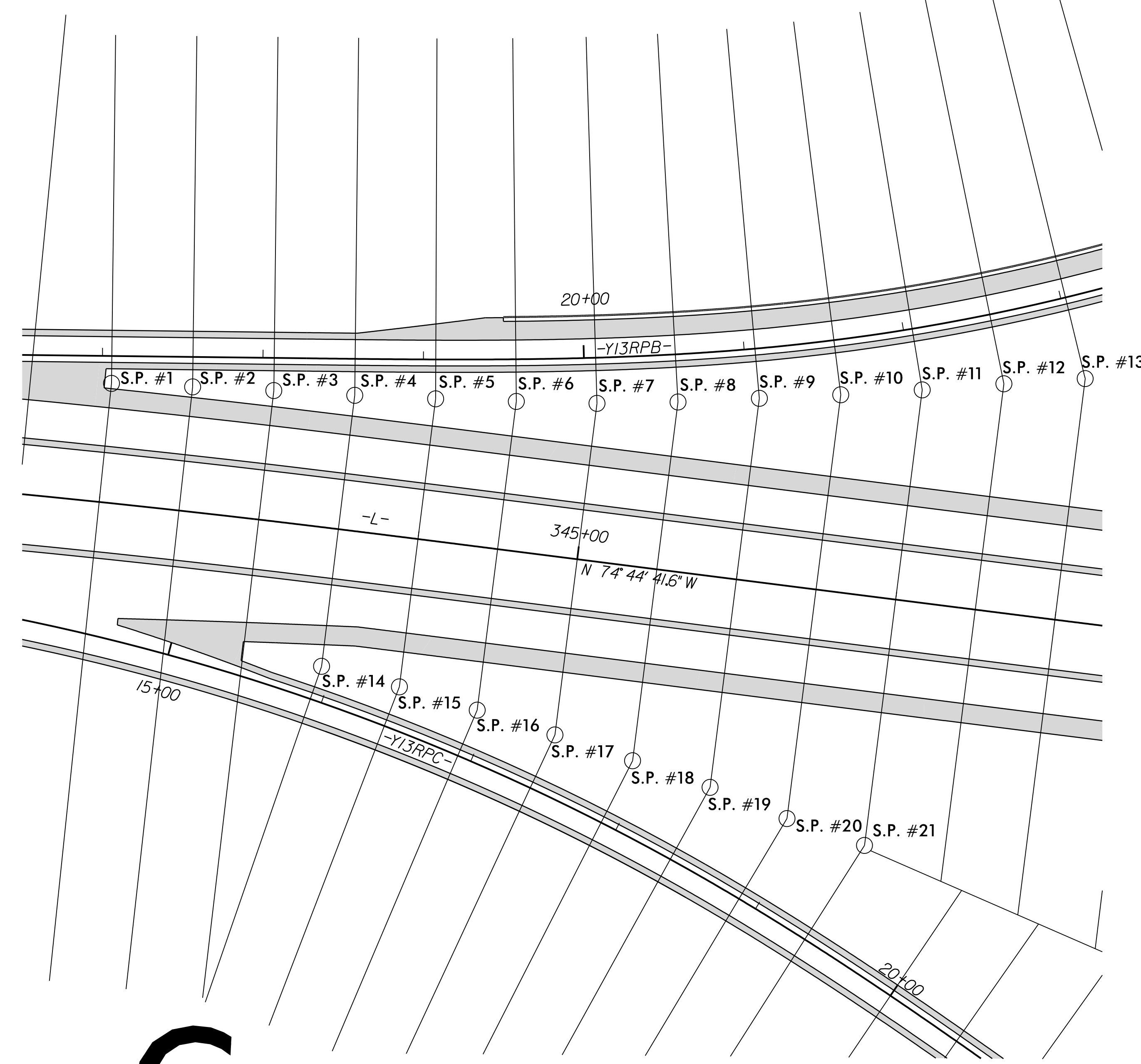


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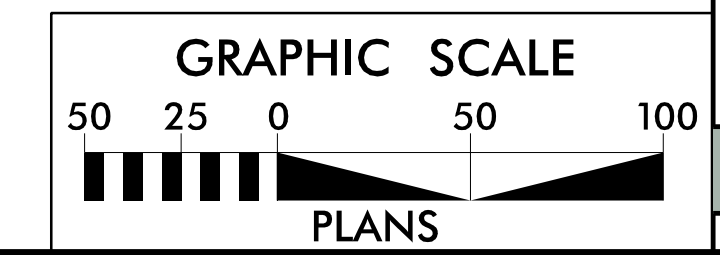


B

A



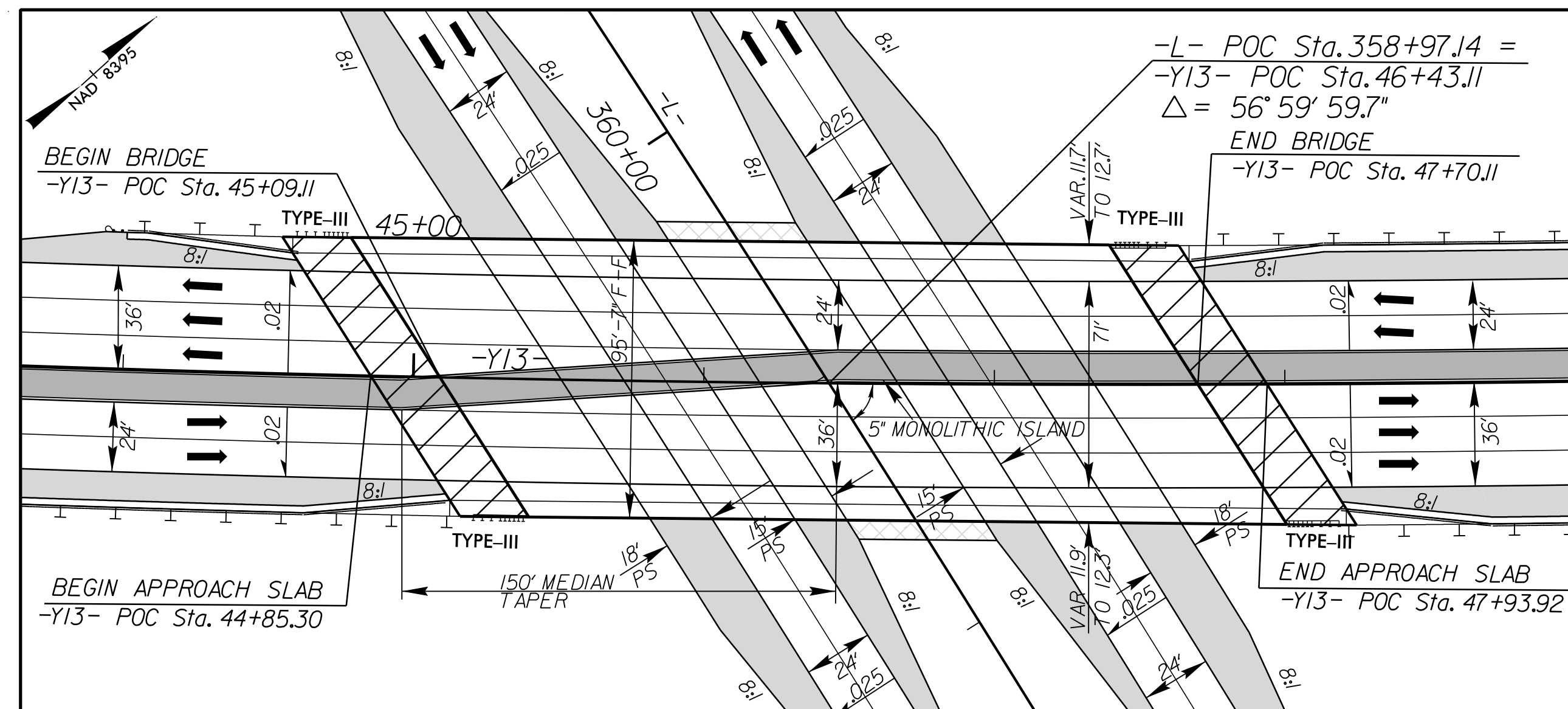
D



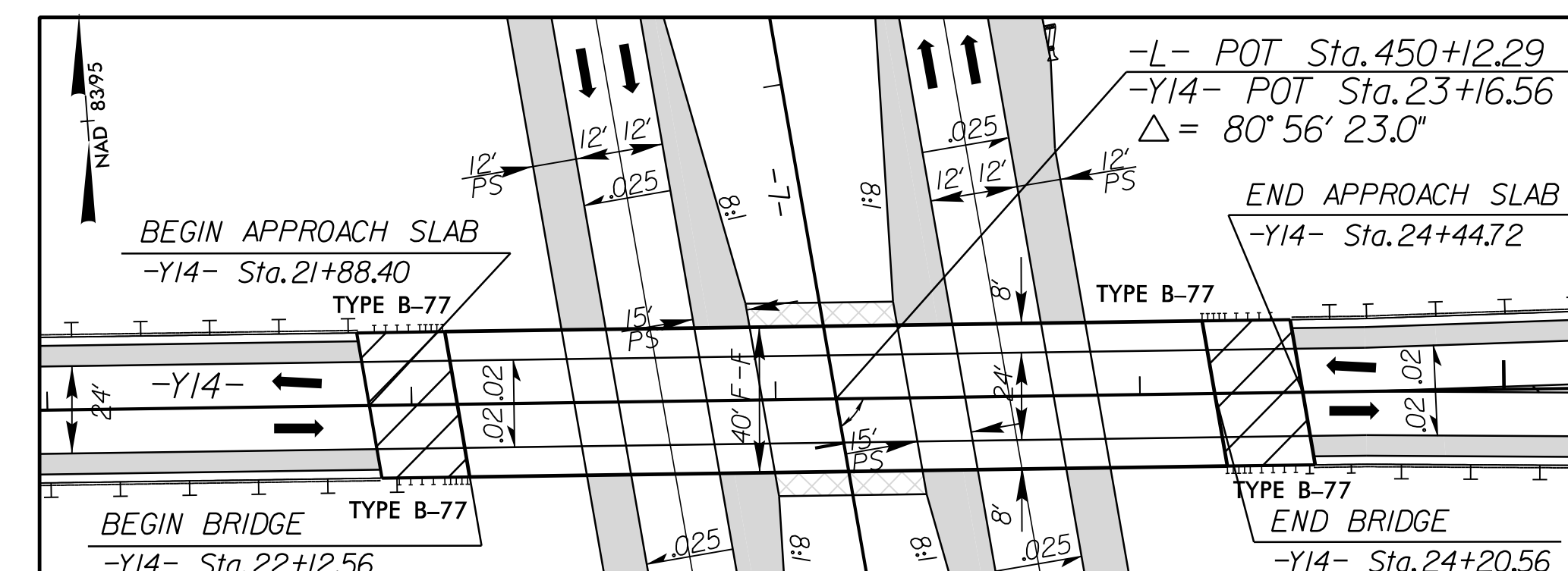
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8/17/99
 8/8/2022
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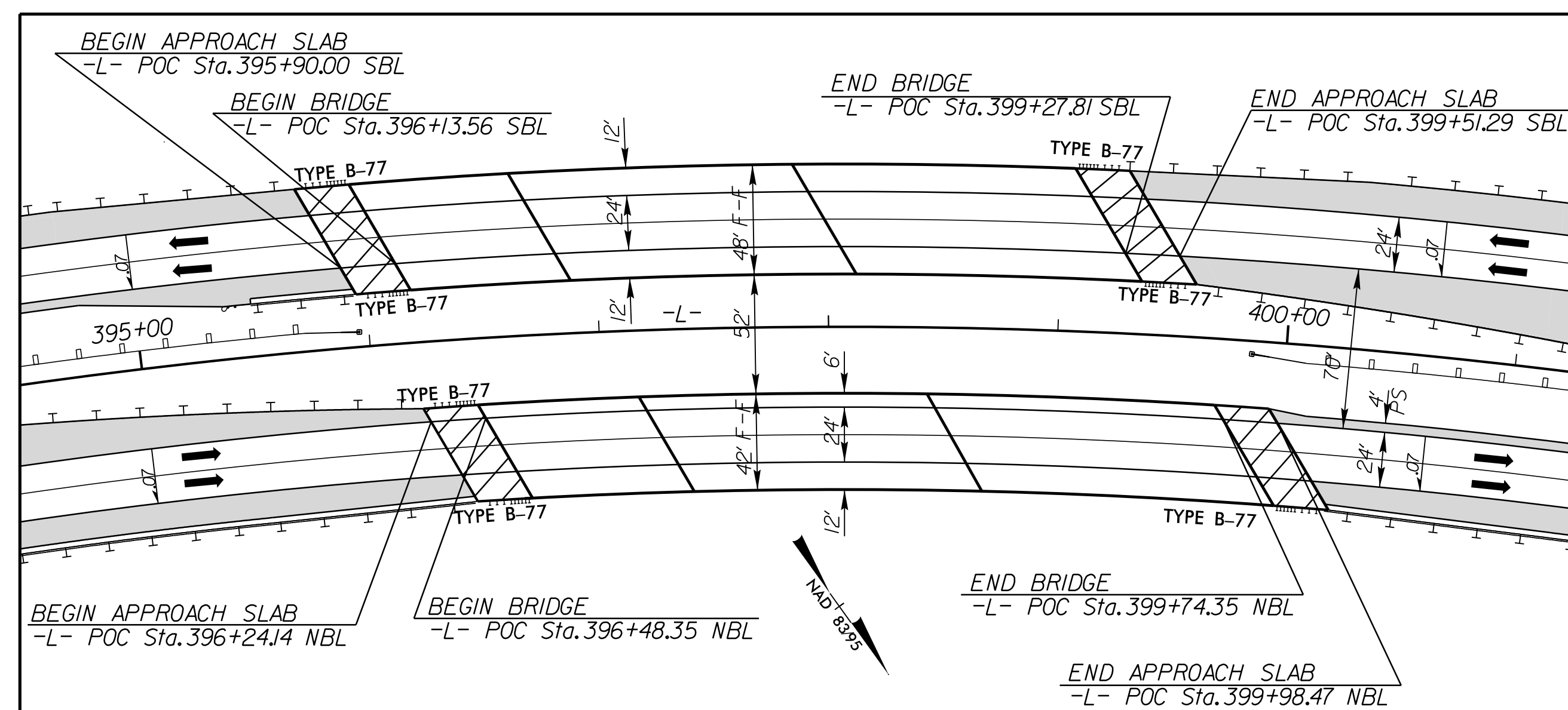
BRIDGE SKETCHES



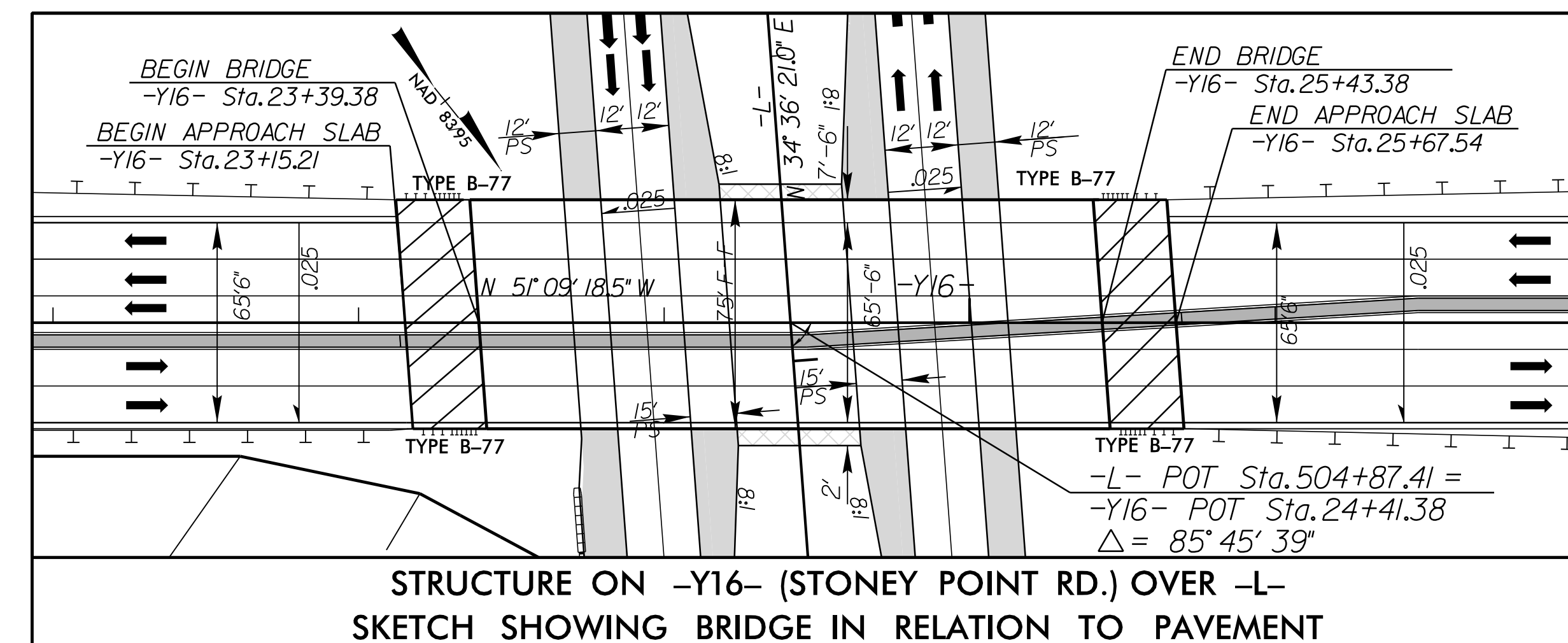
STRUCTURE ON -Y13- (CAMDEN RD.) OVER -L-
SKETCH SHOWING BRIDGE IN RELATION TO PAVEMENT



STRUCTURE ON -Y14- (KIND RD.) OVER -L-
SKETCH SHOWING BRIDGE IN RELATION TO PAVEMENT

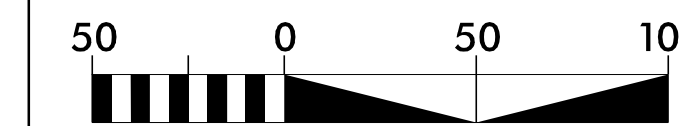


STRUCTURE ON -L-
SKETCH SHOWING BRIDGE IN RELATION TO PAVEMENT

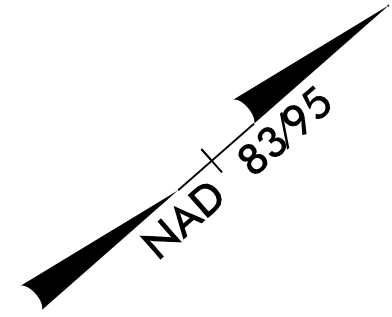


STRUCTURE ON -Y16- (STONE POINT RD.) OVER -L-
SKETCH SHOWING BRIDGE IN RELATION TO PAVEMENT

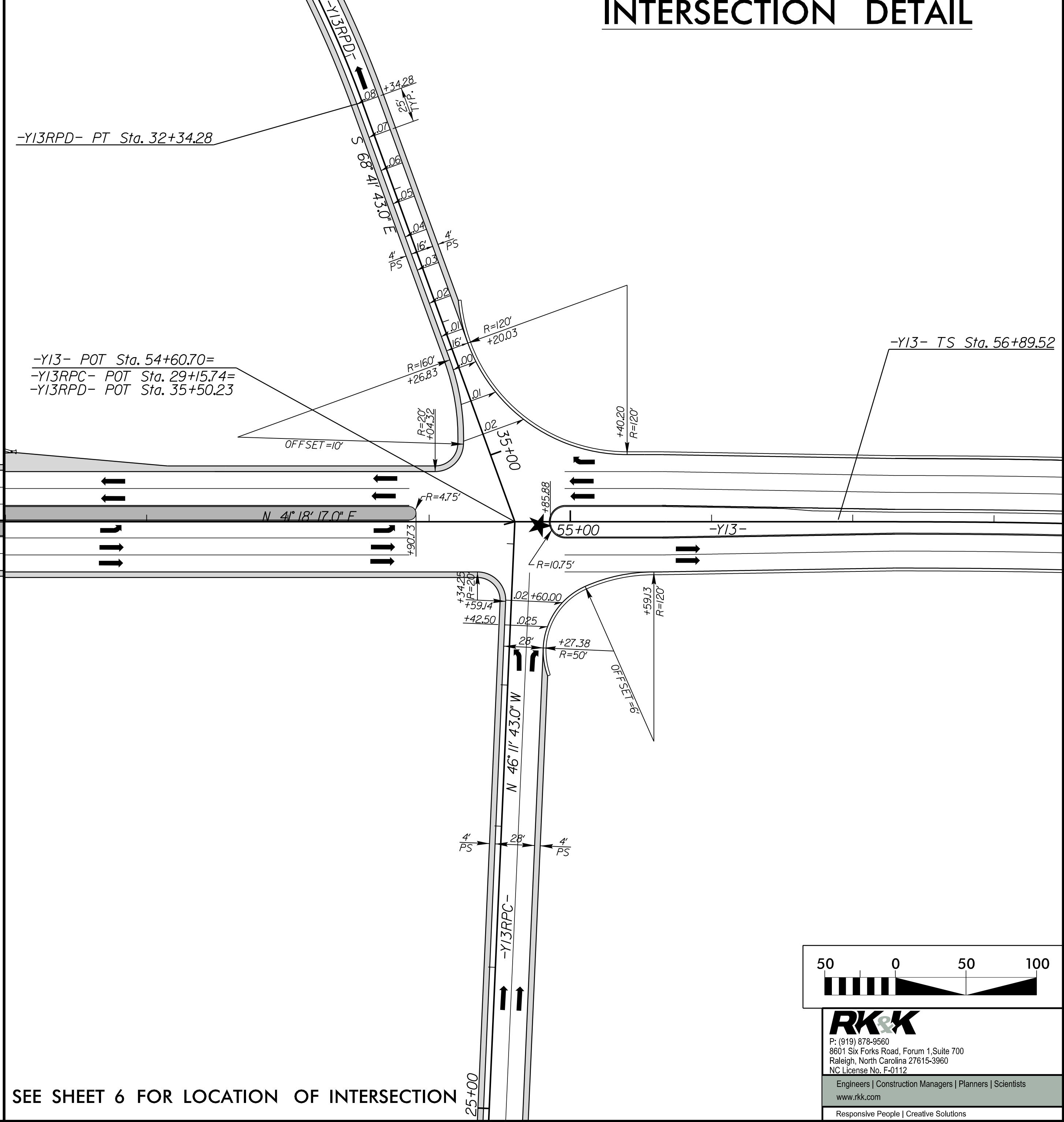
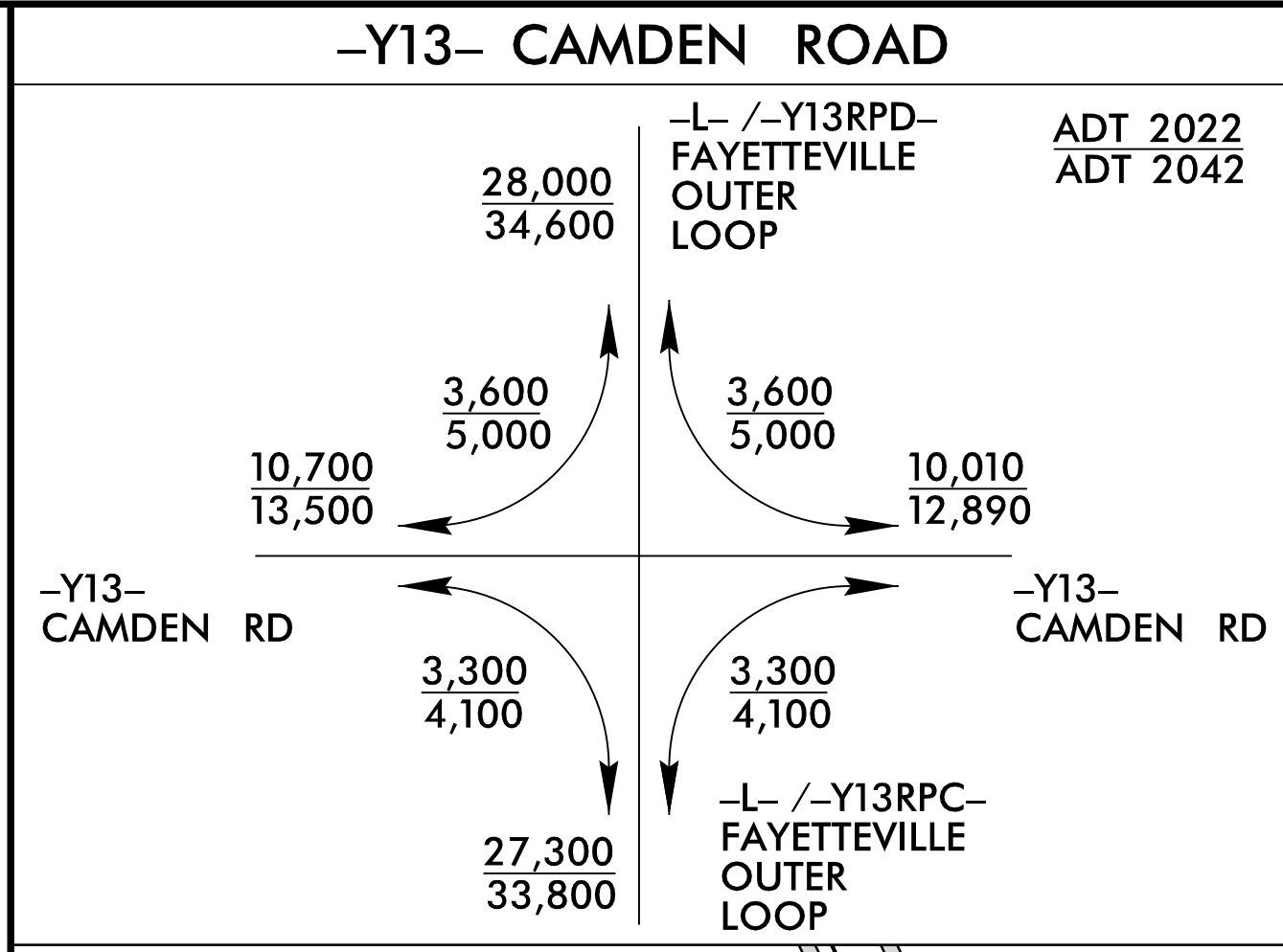
FOR -Y13- PLAN SEE SHEET 6
FOR -L- PLAN SEE SHEET 9
FOR -Y14- PLAN SEE SHEET 13
FOR -Y16- PLAN SEE SHEET 18



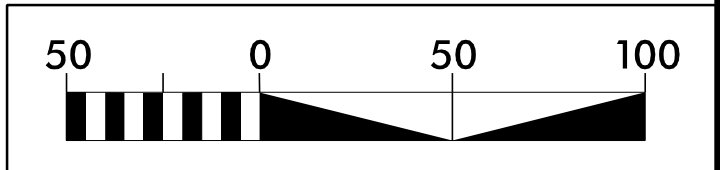
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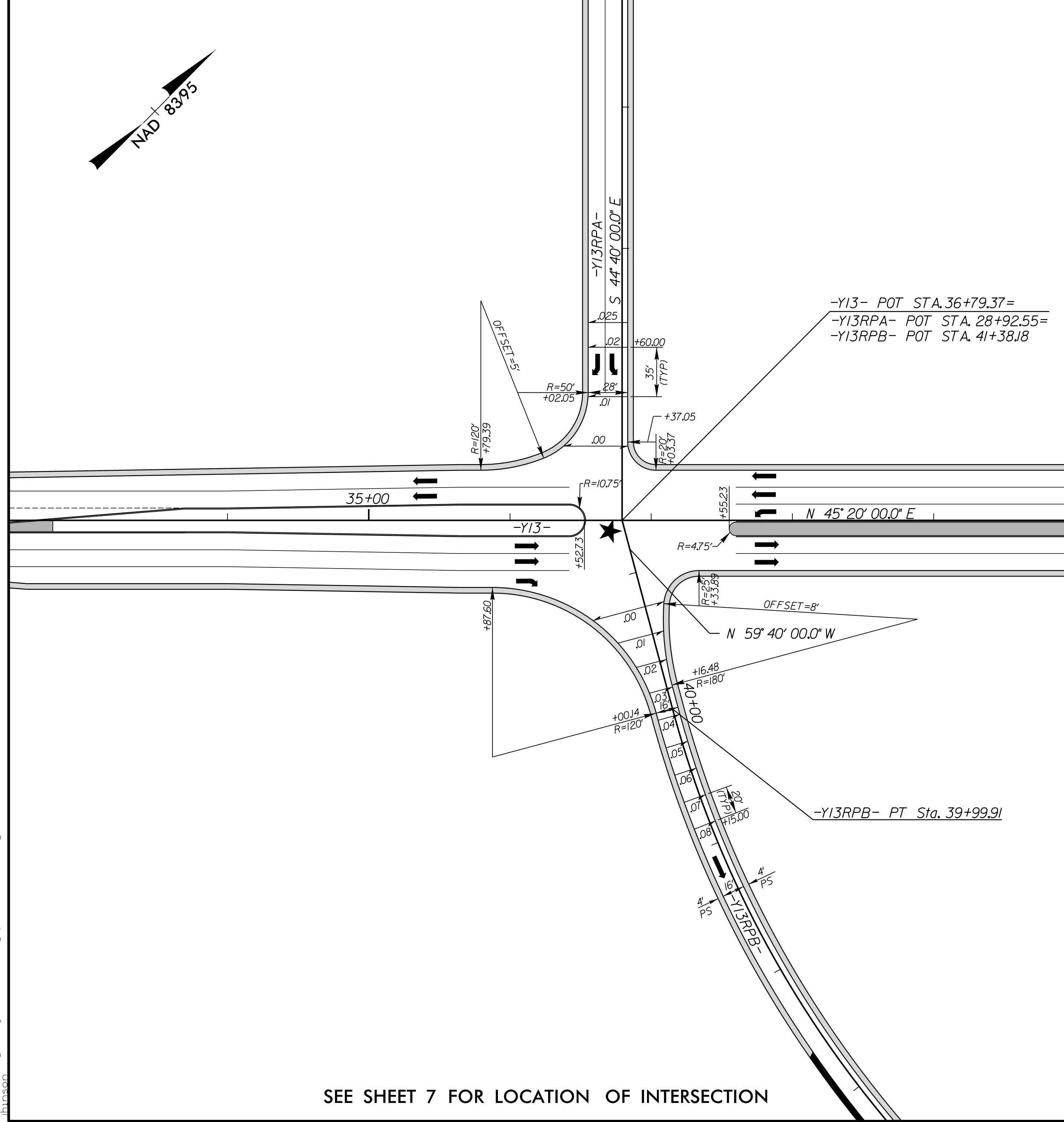
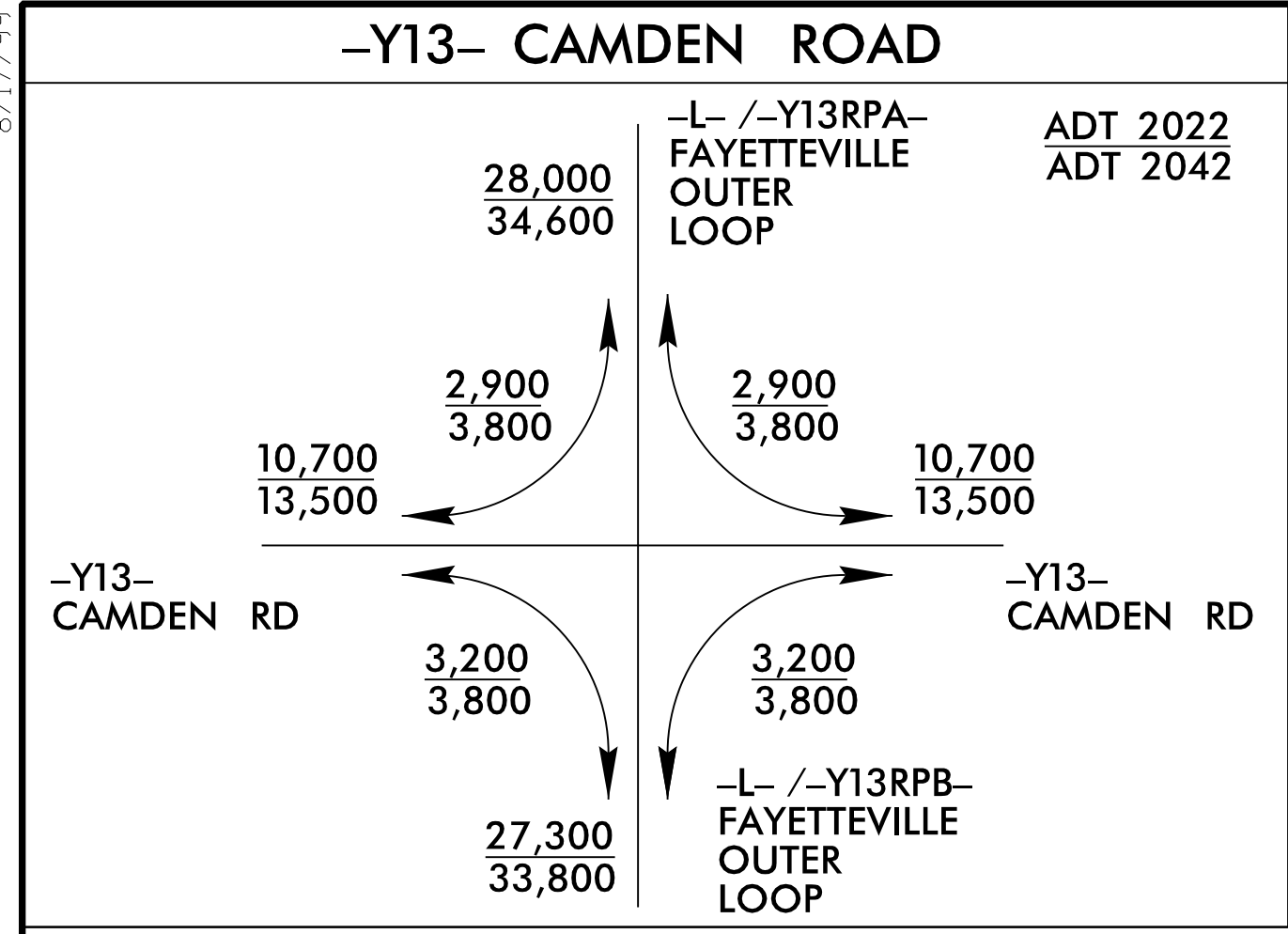
-Y13RPC-/-Y13- & -Y13RPD-/-Y13- INTERSECTION DETAIL



SEE SHEET 6 FOR LOCATION OF INTERSECTION



-Y13RPA-/-Y13- & -Y13RPB-/-Y13- INTERSECTION DETAIL

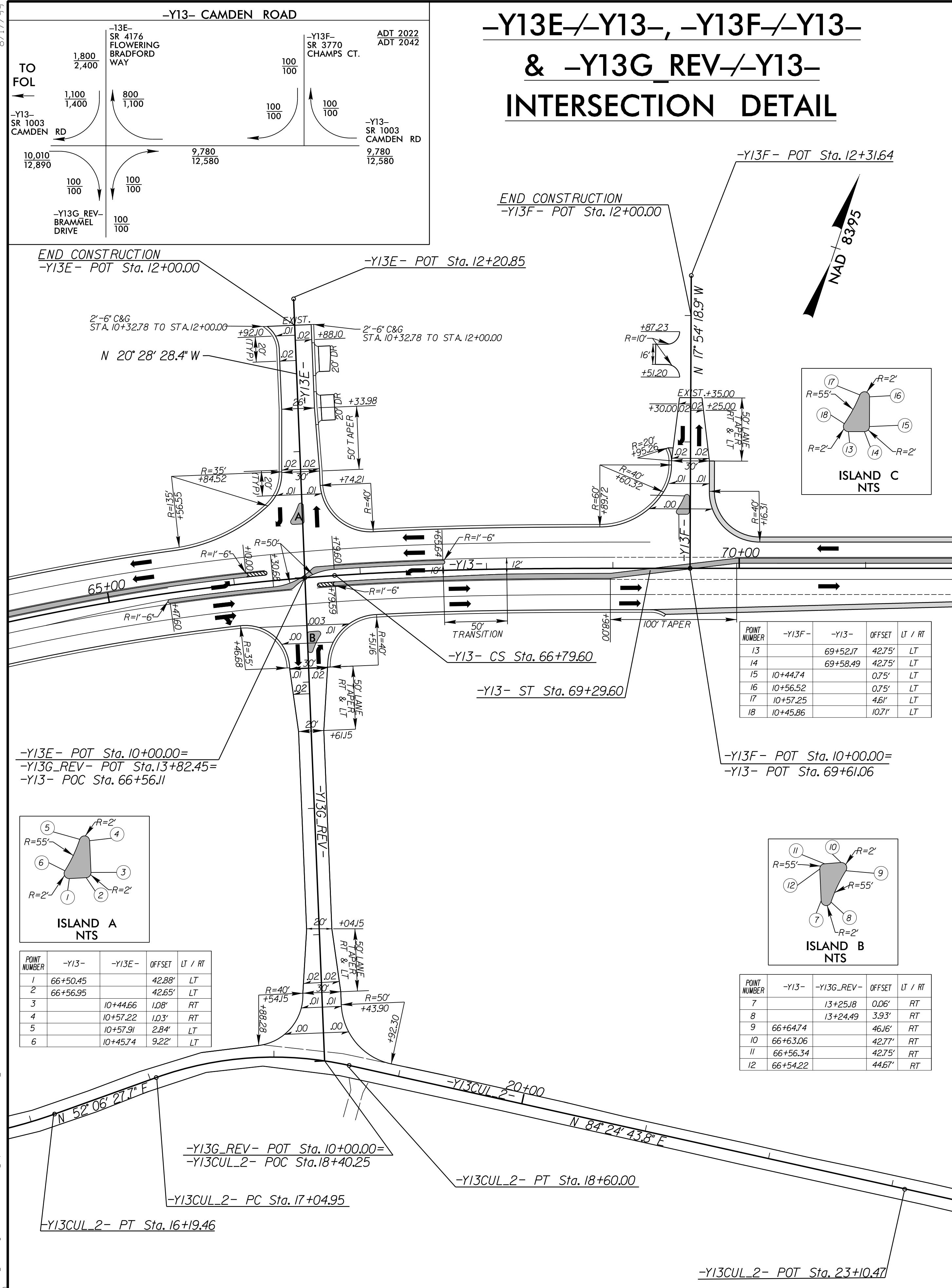


SEE SHEET 7 FOR LOCATION OF INTERSECTION

8/17/199
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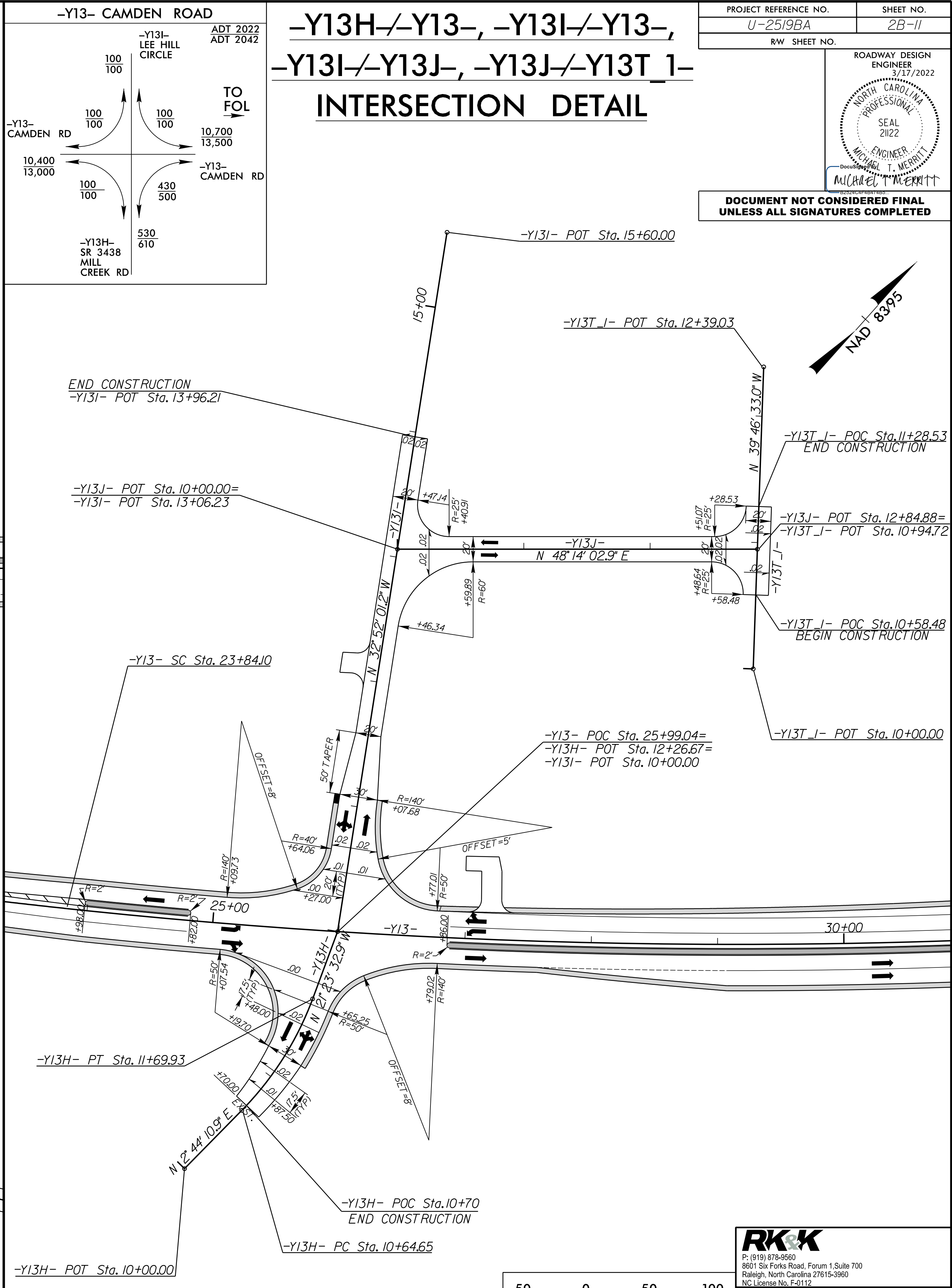
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y13E-/-Y13-, -Y13F-/-Y13- & -Y13G REV-/-Y13- INTERSECTION DETAIL



SEE SHEET 23 FOR LOCATION OF INTERSECTION

-Y13H-/-Y13-, -Y13I-/-Y13-, -Y13J-/-Y13-, -Y13K-/-Y13- INTERSECTION DETAIL

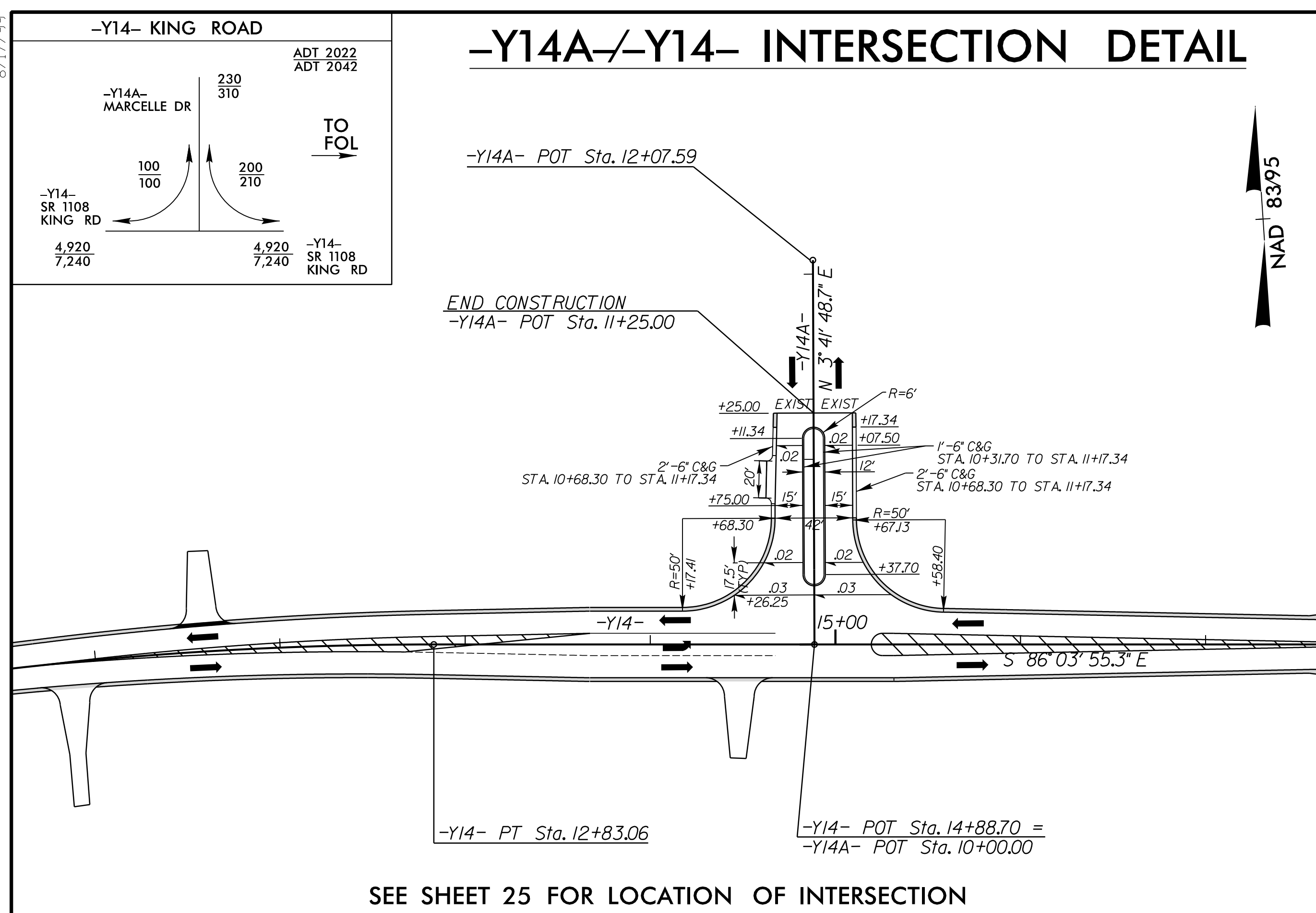


SEE SHEET 22 FOR LOCATION OF INTERSECTION



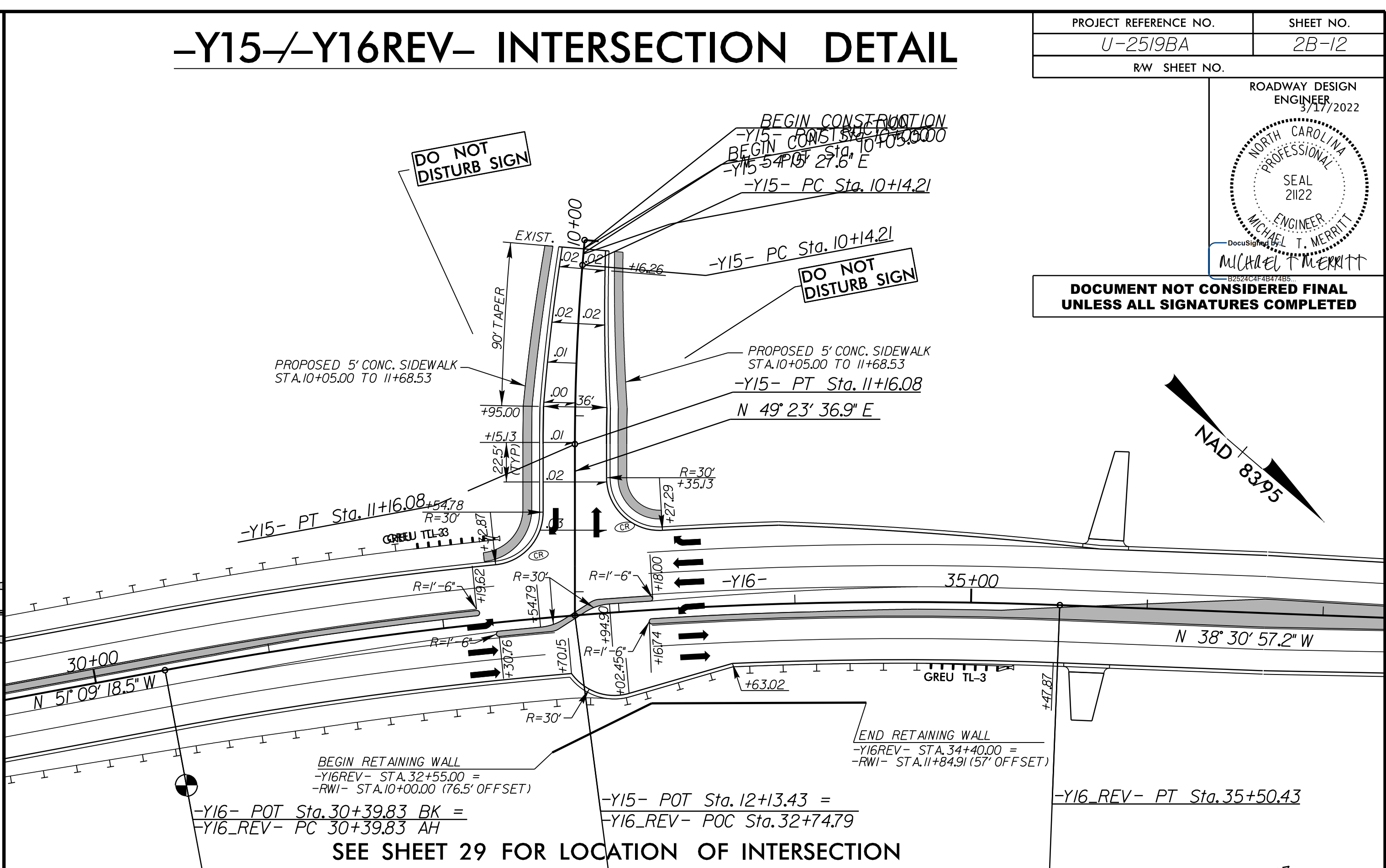
8/17/19 8/17/2022 \\p01\proj\2519BA_Rdy_psh\02B-10-13.dgn

-Y14A-/-Y14- INTERSECTION DETAIL



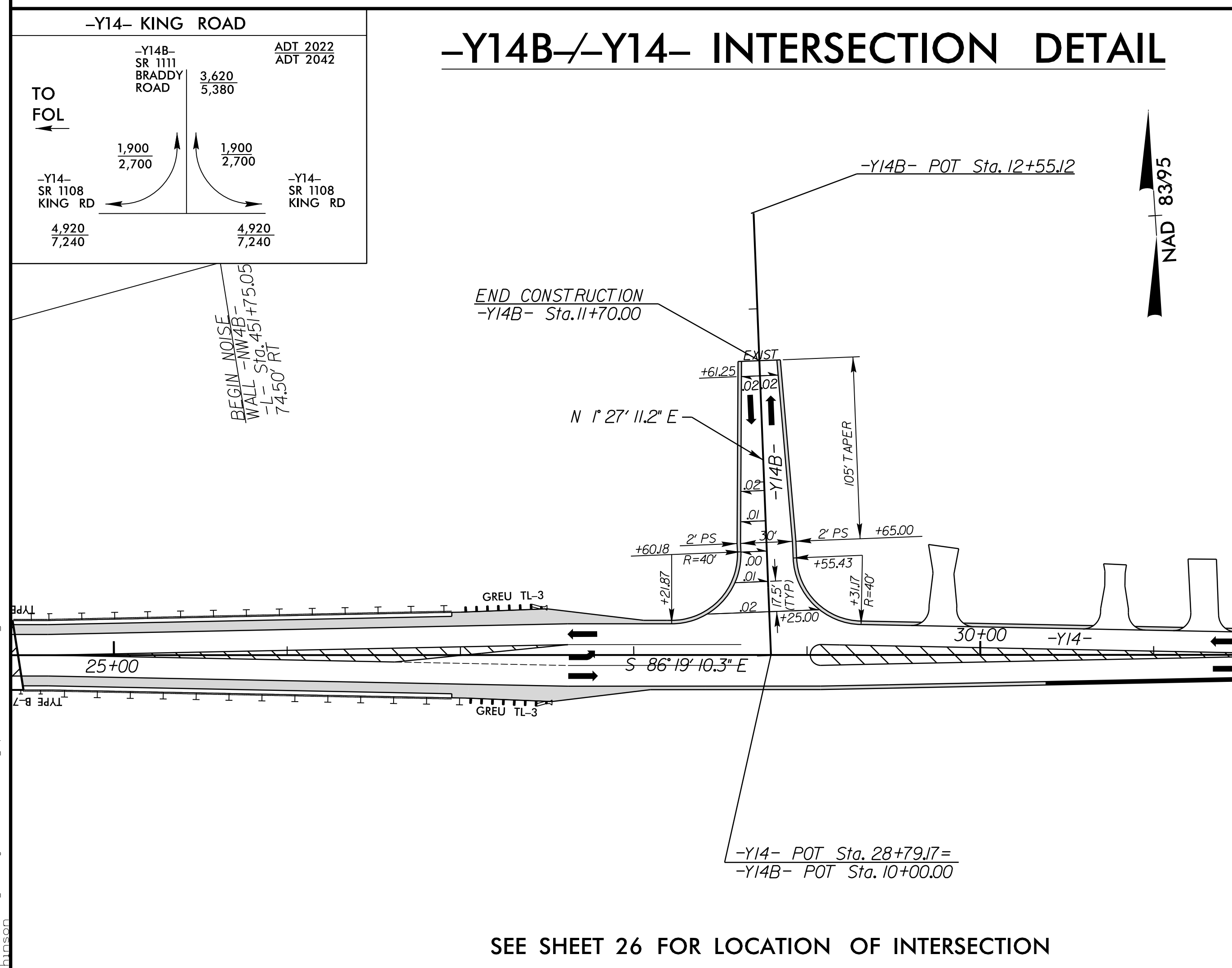
SEE SHEET 25 FOR LOCATION OF INTERSECTION

-Y15-/-Y16REV- INTERSECTION DETAIL



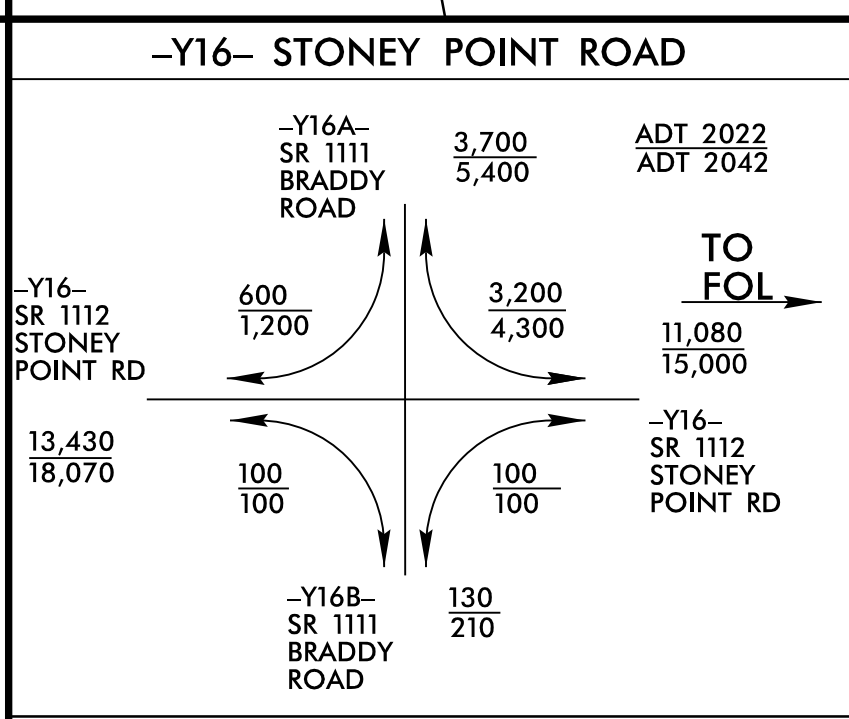
SEE SHEET 29 FOR LOCATION OF INTERSECTION

-Y14B-/-Y14- INTERSECTION DETAIL

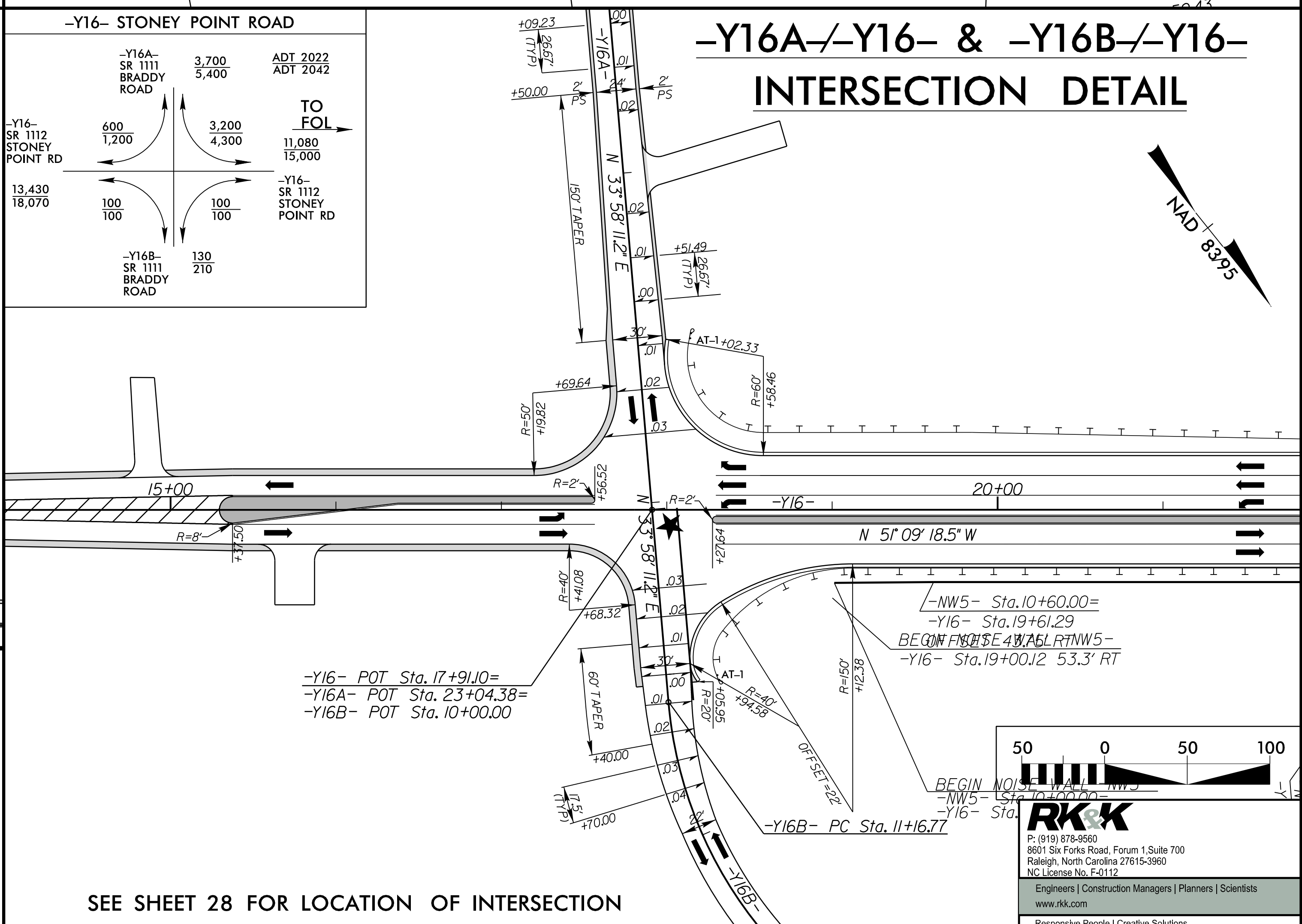


SEE SHEET 26 FOR LOCATION OF INTERSECTION

-Y16- STONEY POINT ROAD



-Y16A-/-Y16- & -Y16B-/-Y16- INTERSECTION DETAIL



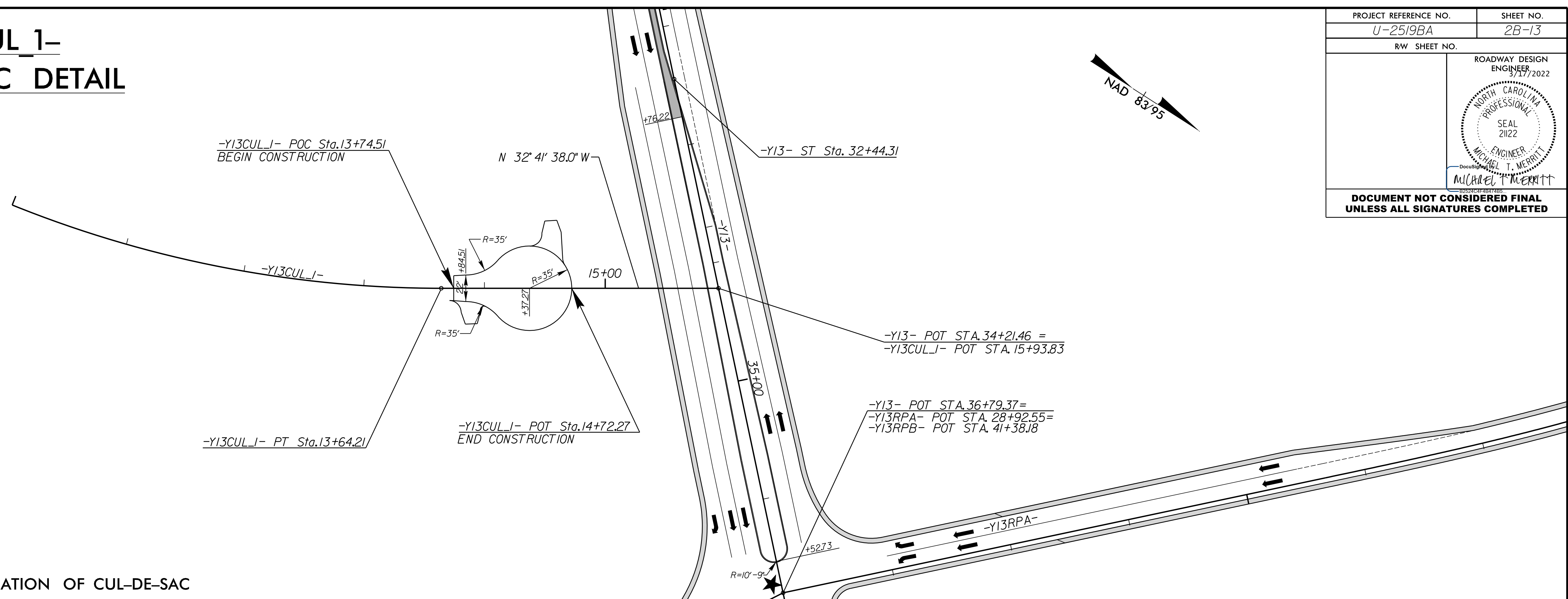
SEE SHEET 28 FOR LOCATION OF INTERSECTION

8/17/19 8/18/2022 R:\Projects\U2519BA_Rdwy_psf\02B-10-13.dgn

8/17/99

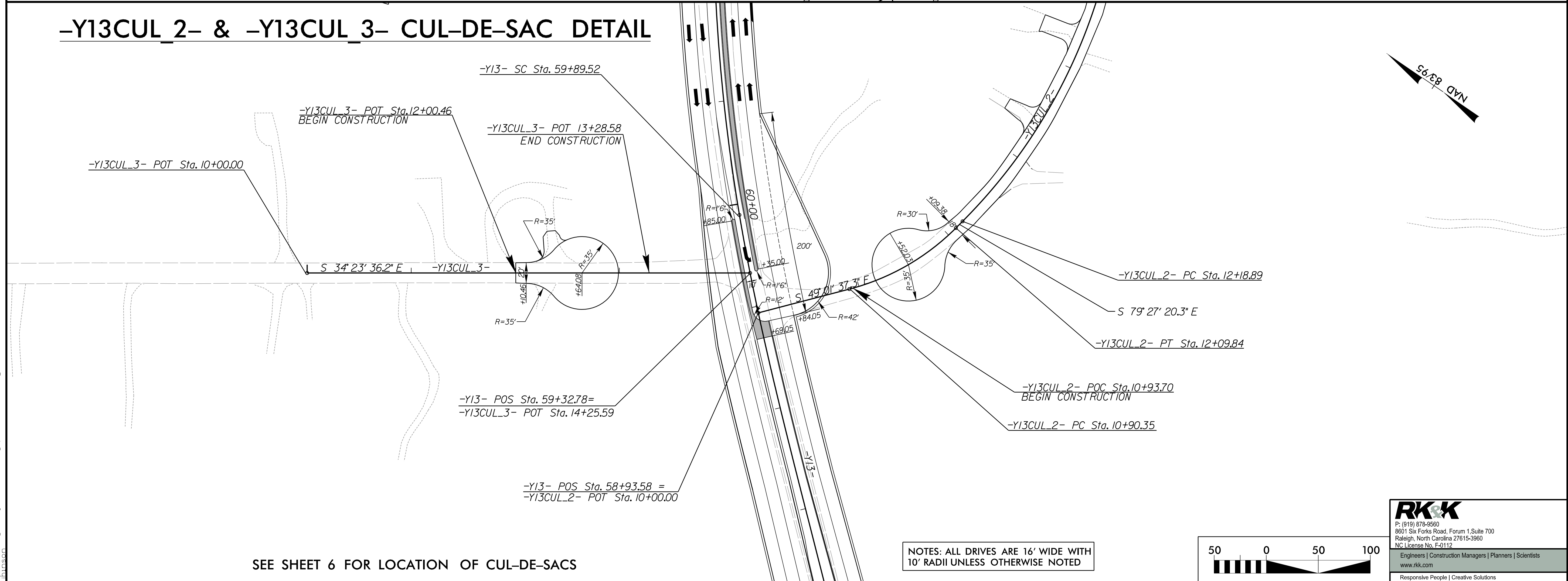
-Y13CUL_1- CUL-DE-SAC DETAIL

PROJECT REFERENCE NO. U-2519BA	SHEET NO. 2B-13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 3/17/2022 NORTH CAROLINA PROFESSIONAL SEAL 21122 MICHAEL T. MERRITT MICHAEL T. MERRITT	
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SEE SHEET 7 FOR LOCATION OF CUL-DE-SAC

-Y13CUL_2- & -Y13CUL_3- CUL-DE-SAC DETAIL



SEE SHEET 6 FOR LOCATION OF CUL-DE-SACS

NOTES: ALL DRIVES ARE 16' WIDE WITH 10' RADII UNLESS OTHERWISE NOTED



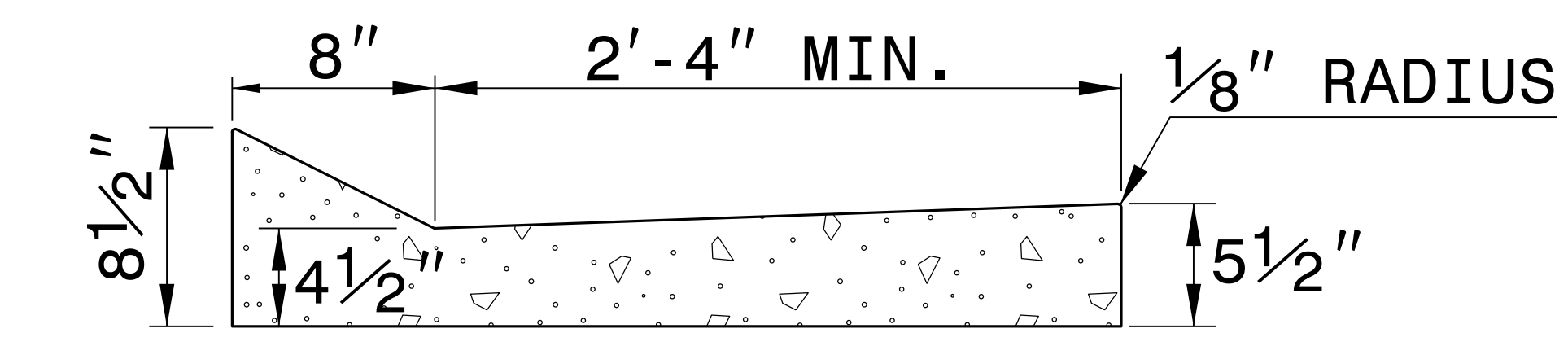
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8/18/2022
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

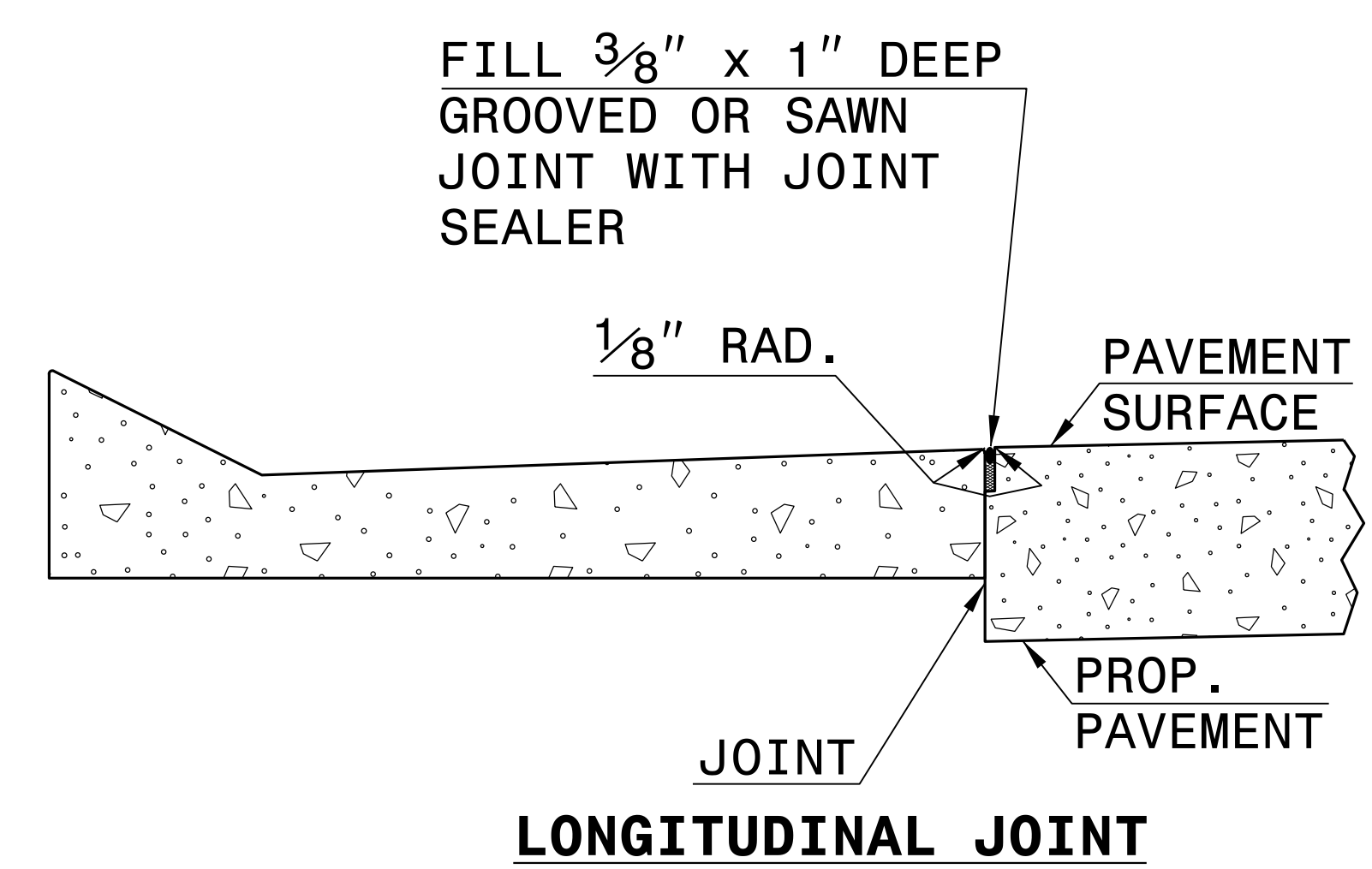
ENGLISH DETAIL DRAWING FOR
**MODIFIED SHOULDER
BERM GUTTER**

SHEET OF
846D01

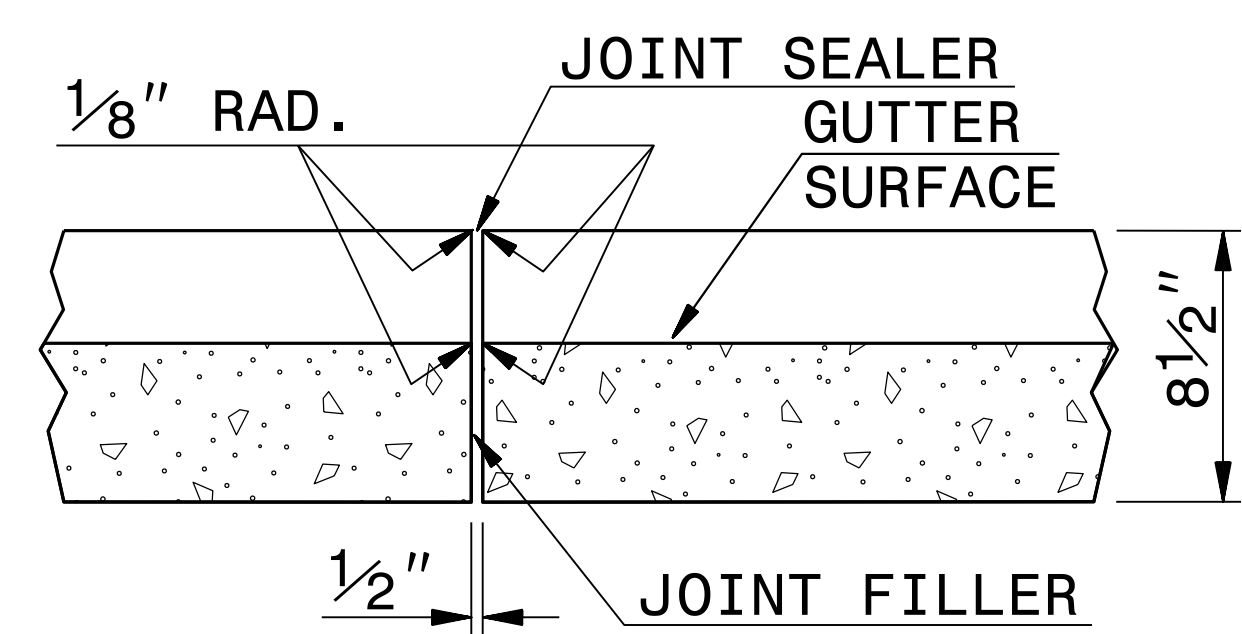


MODIFIED SHOULDER BERM GUTTER

- GENERAL NOTES:
- PLACE CONTRACTION JOINTS AT 10' INTERVALS, EXCEPT THAT A 15' SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10' INTERVALS.
 - JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
 - CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. CONSTRUCT NON-TEMPLATE FORMED JOINTS A MIN. OF 1 1/2" DEEP.
 - FILL ALL CONSTRUCTION JOINTS WITH JOINT FILLER AND SEALER.
 - SPACE EXPANSION JOINTS AT 90' INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.



LONGITUDINAL JOINT



**TRANSVERSE EXPANSION JOINT
IN CURB AND GUTTER**

SECTION VIEW OF JOINTS

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

ENGLISH DETAIL DRAWING FOR
**MODIFIED SHOULDER
BERM GUTTER**

SHEET OF
846D01

24-APR-2018 14:56 S:\Contracts\ContractDetails\Jhewerton\846d01 Modified SBC.dgn Jhewerton AT USD-252595



DocuSigned by:
Ren Daverport
F818038A7A442
3/16/2022

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

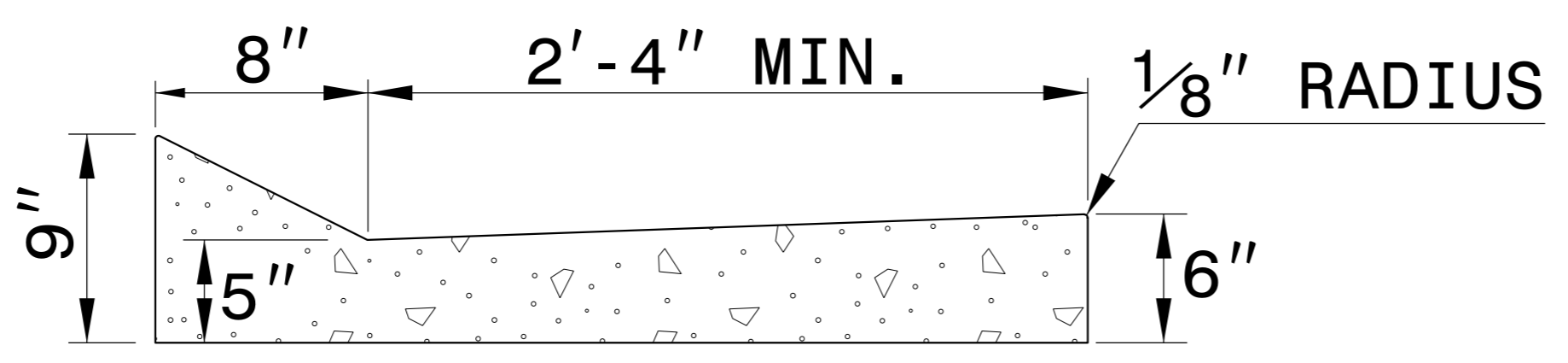
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

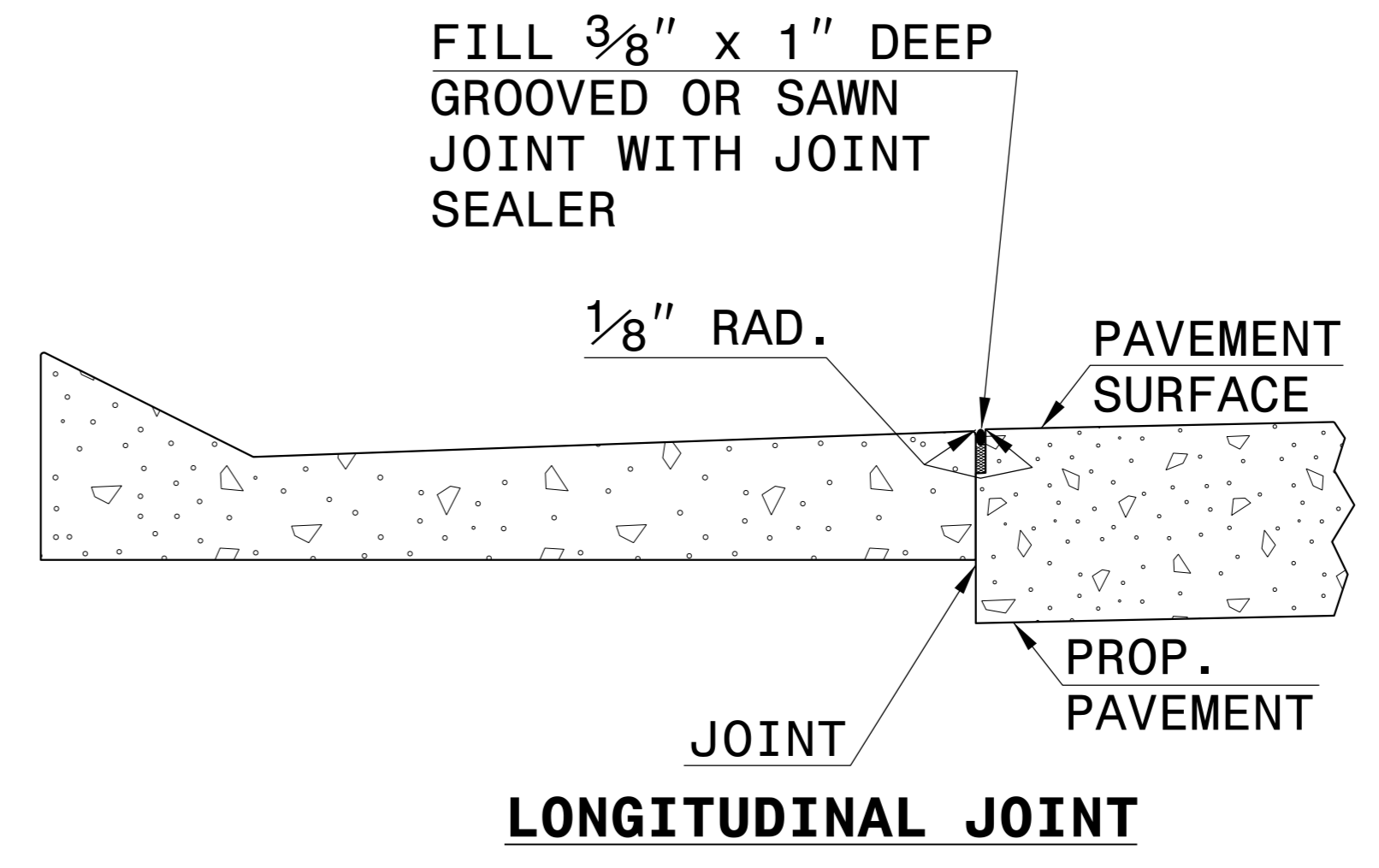
ENGLISH DETAIL DRAWING FOR
MODIFIED SHOULDER BERM GUTTER

SHEET OF
846D01

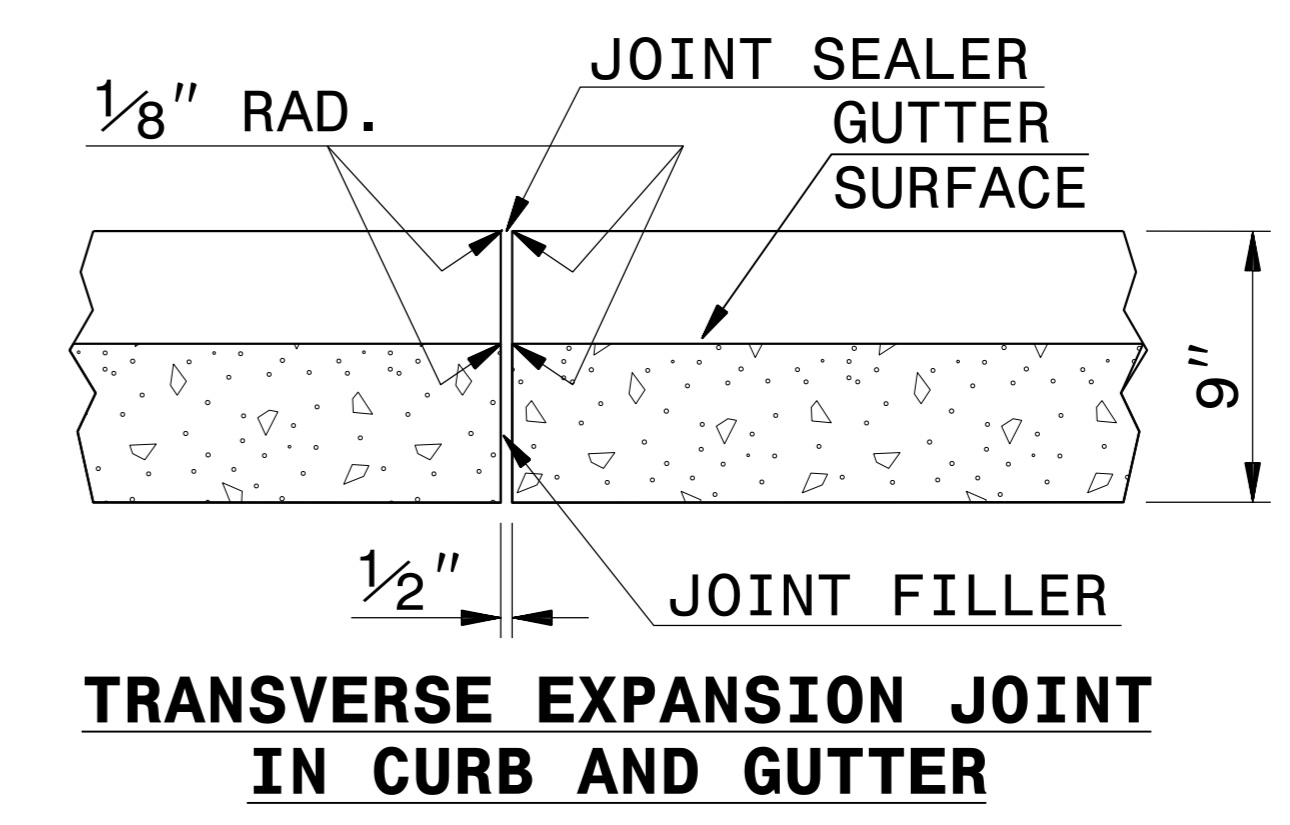


MODIFIED SHOULDER BERM GUTTER

GENERAL NOTES:
 -PLACE CONTRACTION JOINTS AT 10' INTERVALS, EXCEPT THAT A 15' SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10' INTERVALS.
 -JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
 -CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS.
 CONSTRUCT NON-TEMPLATE FORMED JOINTS A MIN. OF 1 1/2" DEEP.
 -FILL ALL CONSTRUCTION JOINTS WITH JOINT FILLER AND SEALER.
 -SPACE EXPANSION JOINTS AT 90' INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.



LONGITUDINAL JOINT



TRANSVERSE EXPANSION JOINT IN CURB AND GUTTER

SECTION VIEW OF JOINTS

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

ENGLISH DETAIL DRAWING FOR
MODIFIED SHOULDER BERM GUTTER

SHEET OF
846D01

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



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 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
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>NOTE:</p> <ul style="list-style-type: none"> **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 11½" 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. </div> </div>		
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
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>NOTE:</p> <ul style="list-style-type: none"> **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 11½" 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. </div> </div>		
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER		



DocSigned by:
 Ron Davisonport
 3/16/2022

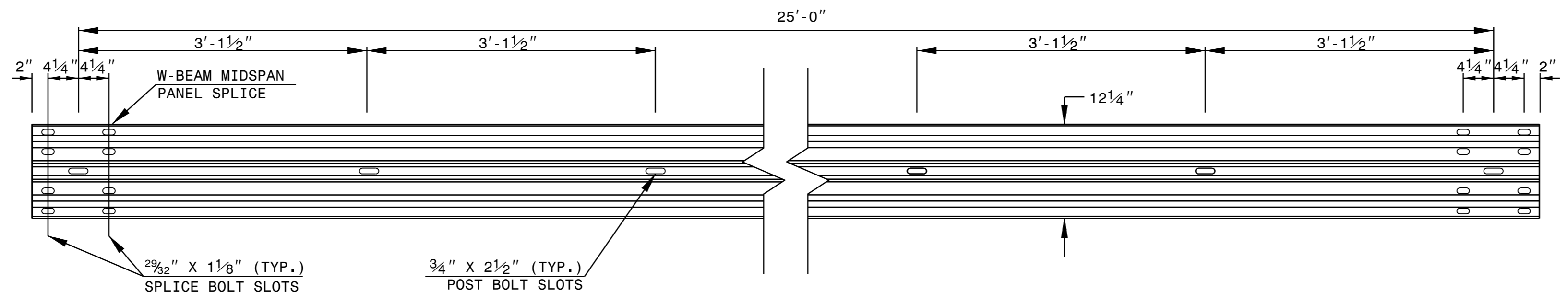
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
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MODIFIED BY:	DATE:
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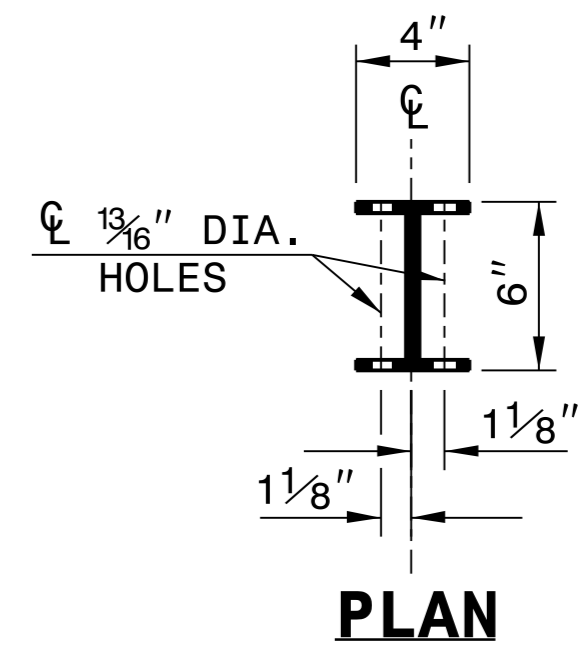
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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

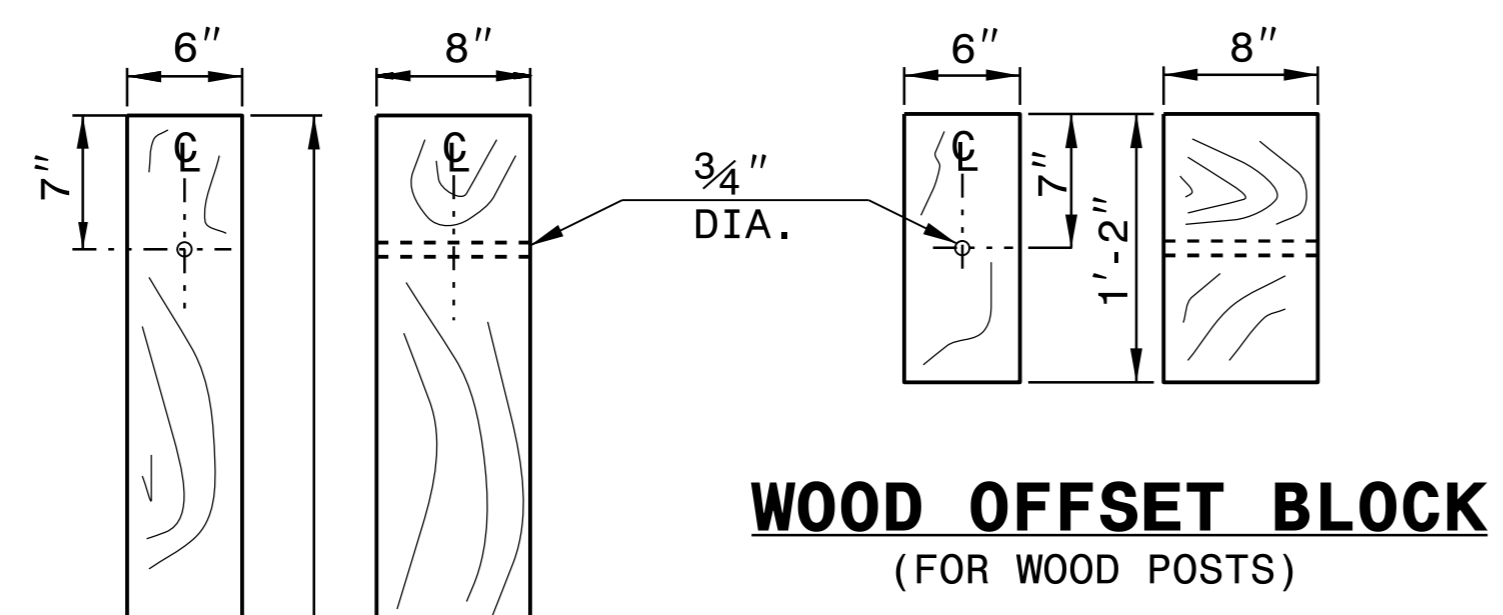
SHEET 6 OF 8
862D02



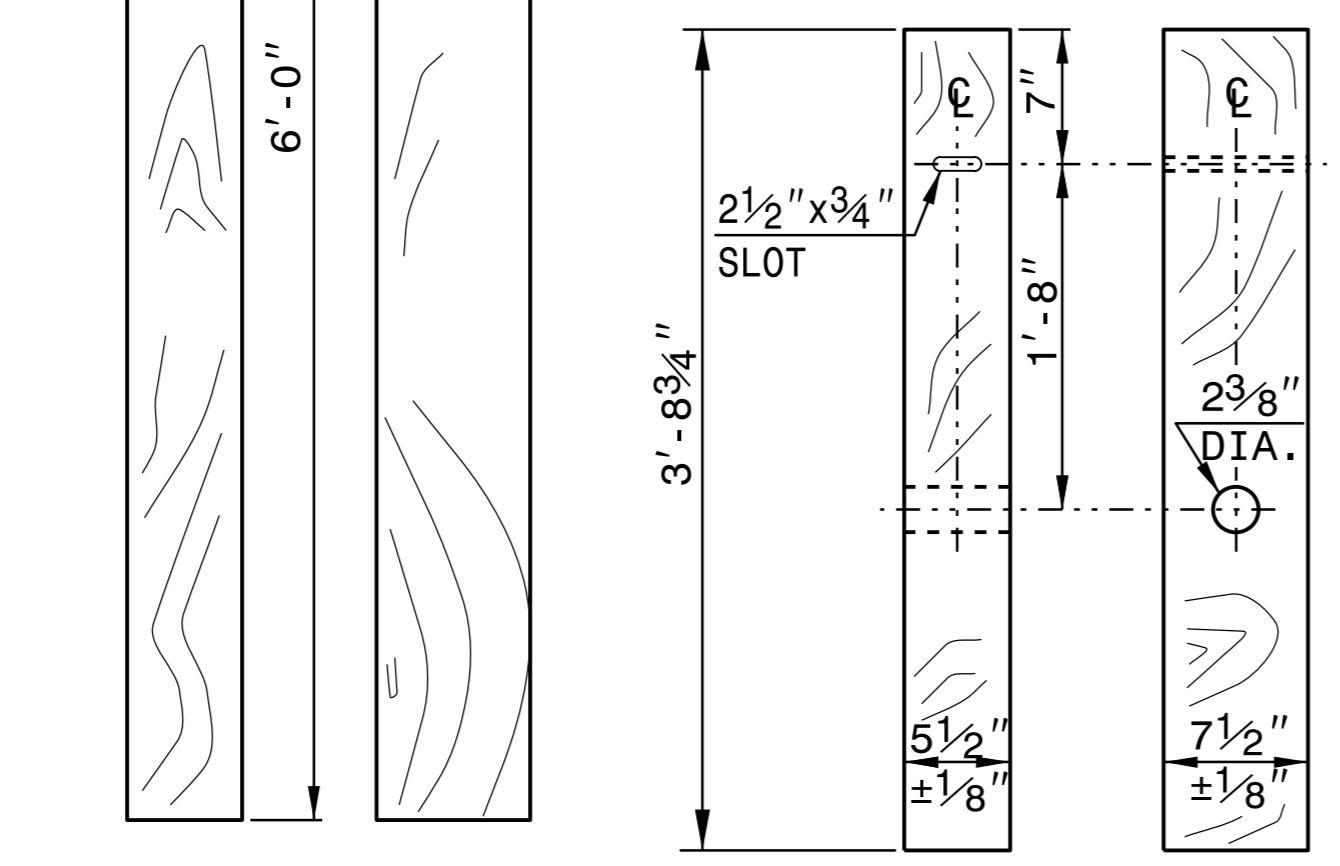
STANDARD W-BEAM GUARDRAIL



PLAN



**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

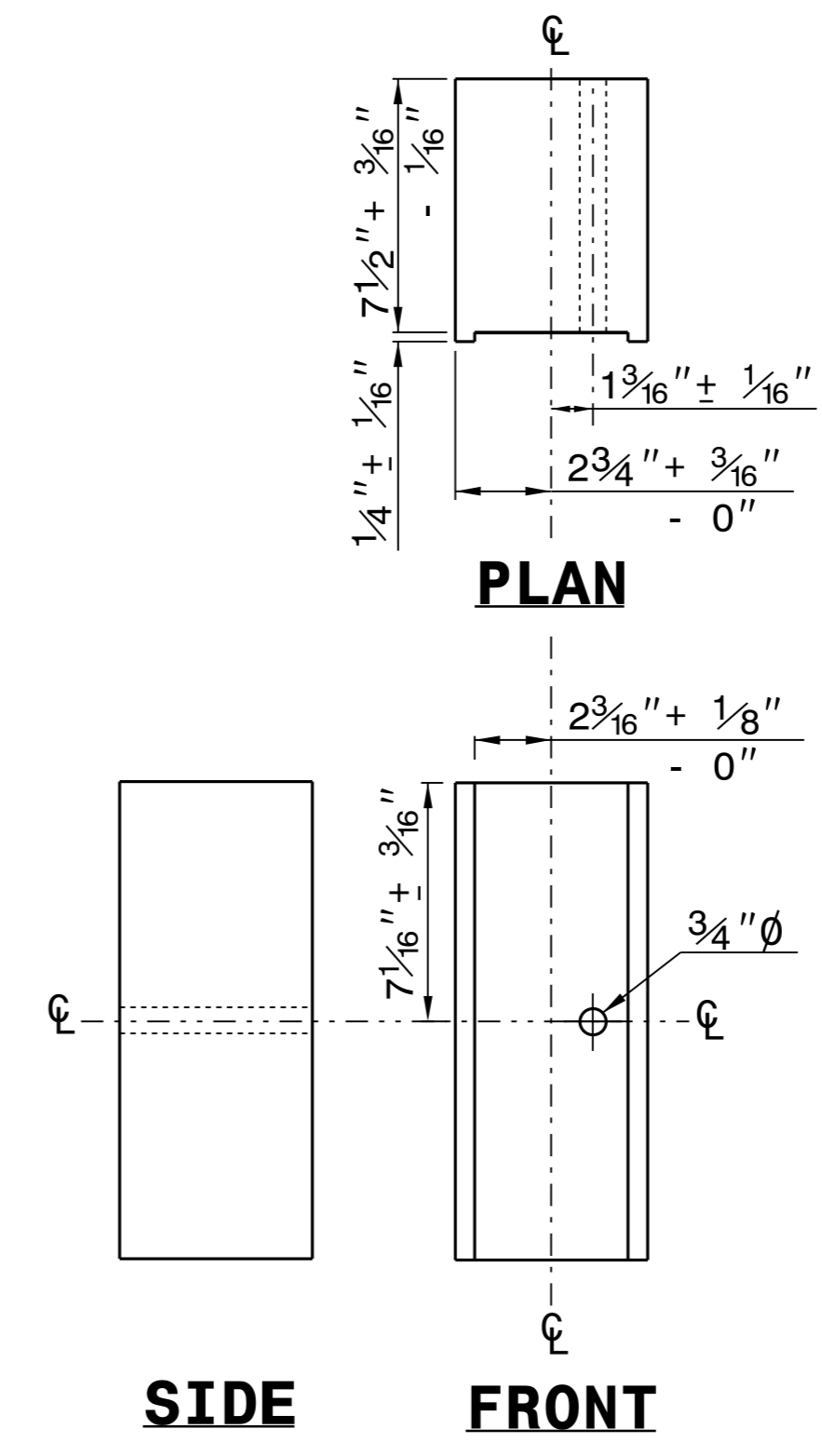


**STANDARD
LINE POST**

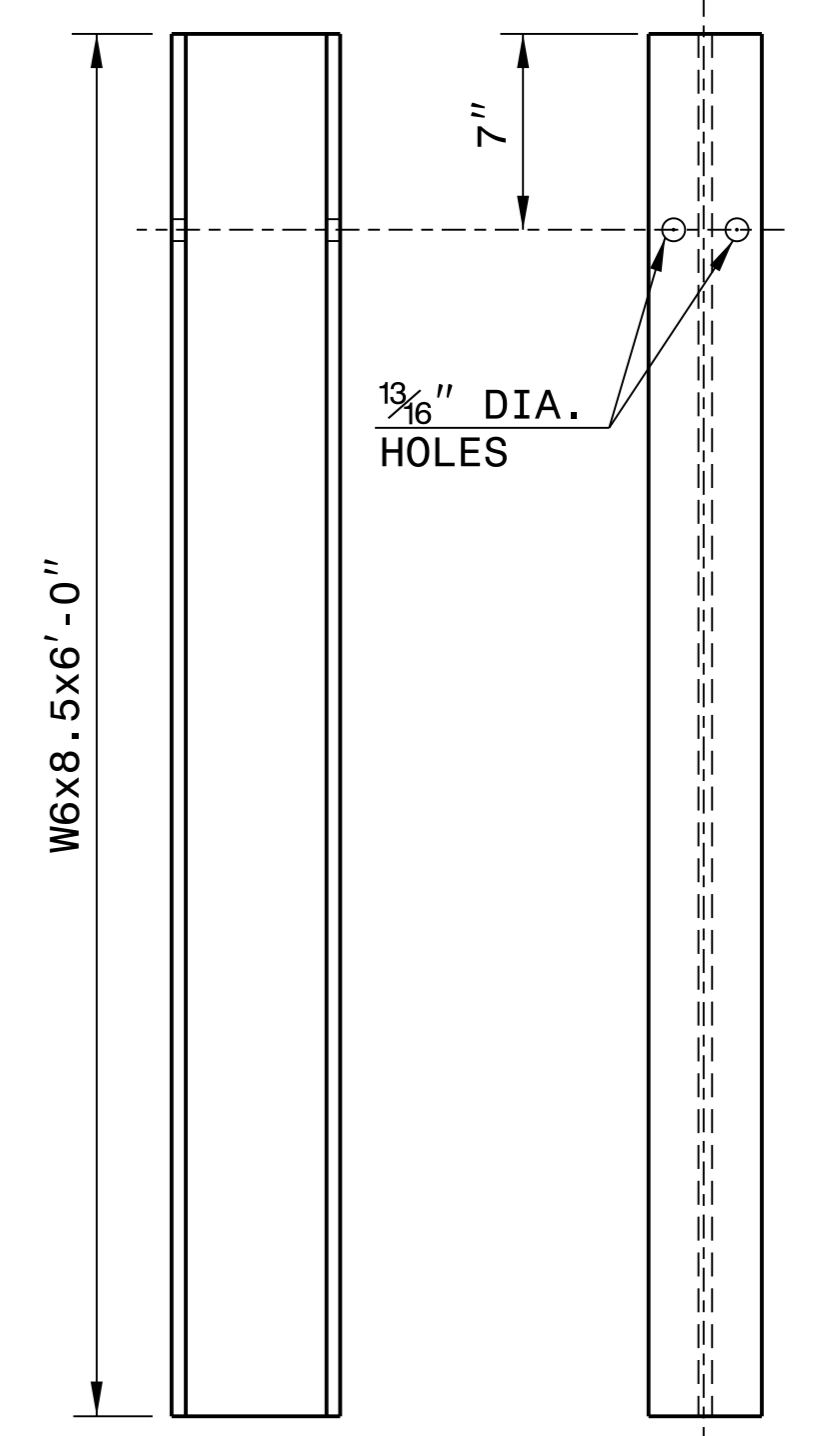
**SHORT WOOD
BREAKAWAY POST**



**STEEL TUBE
TS 6"x8"x0.1875"**



**SIDE
FRONT
ROUTED
OFFSET BLOCK**



**SIDE
FRONT
"W6" STEEL POST**

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



DocuSigned by:
Ron Davison
F186038A42A4C...
3/16/2022

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AND DEVELOPMENT UNIT**
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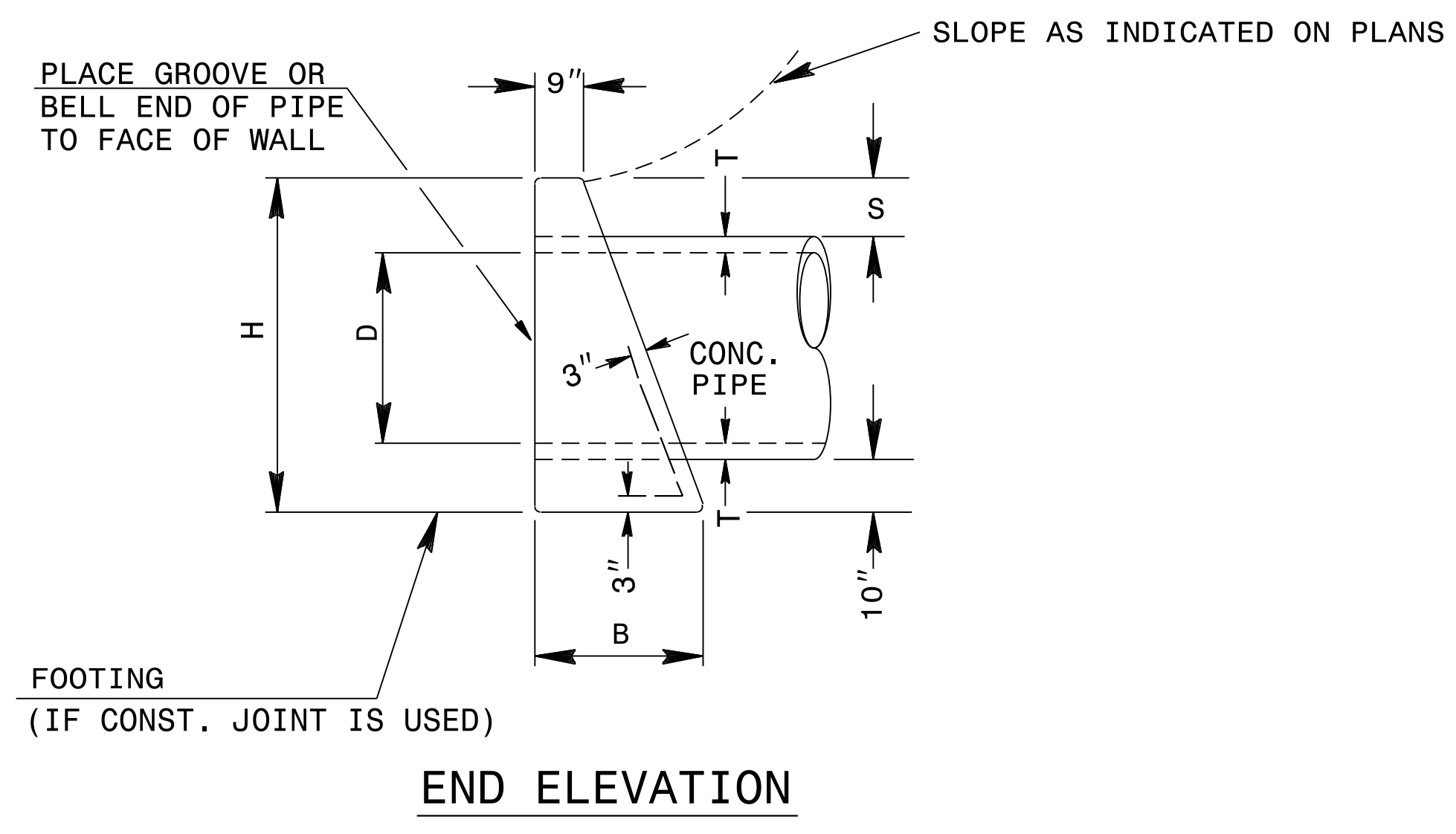
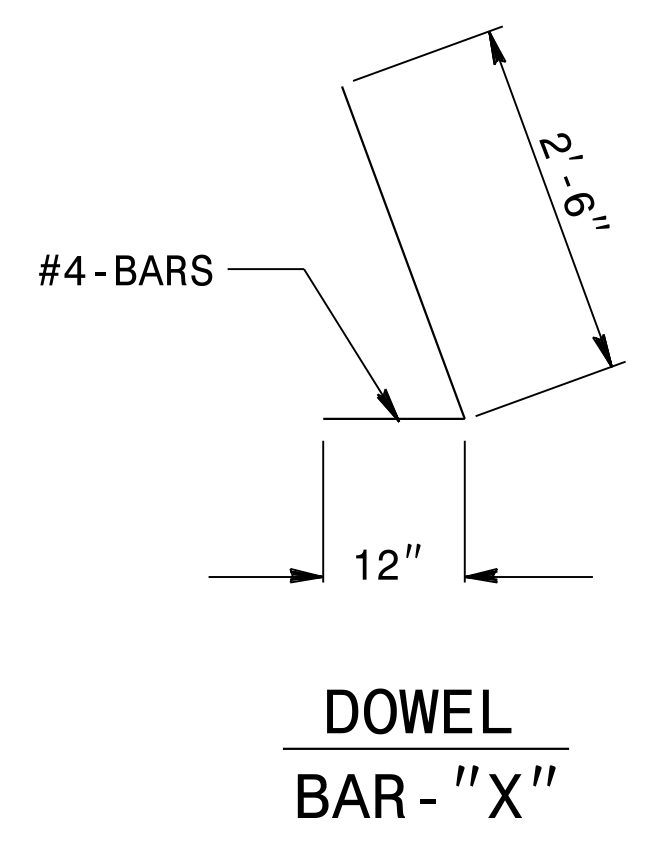
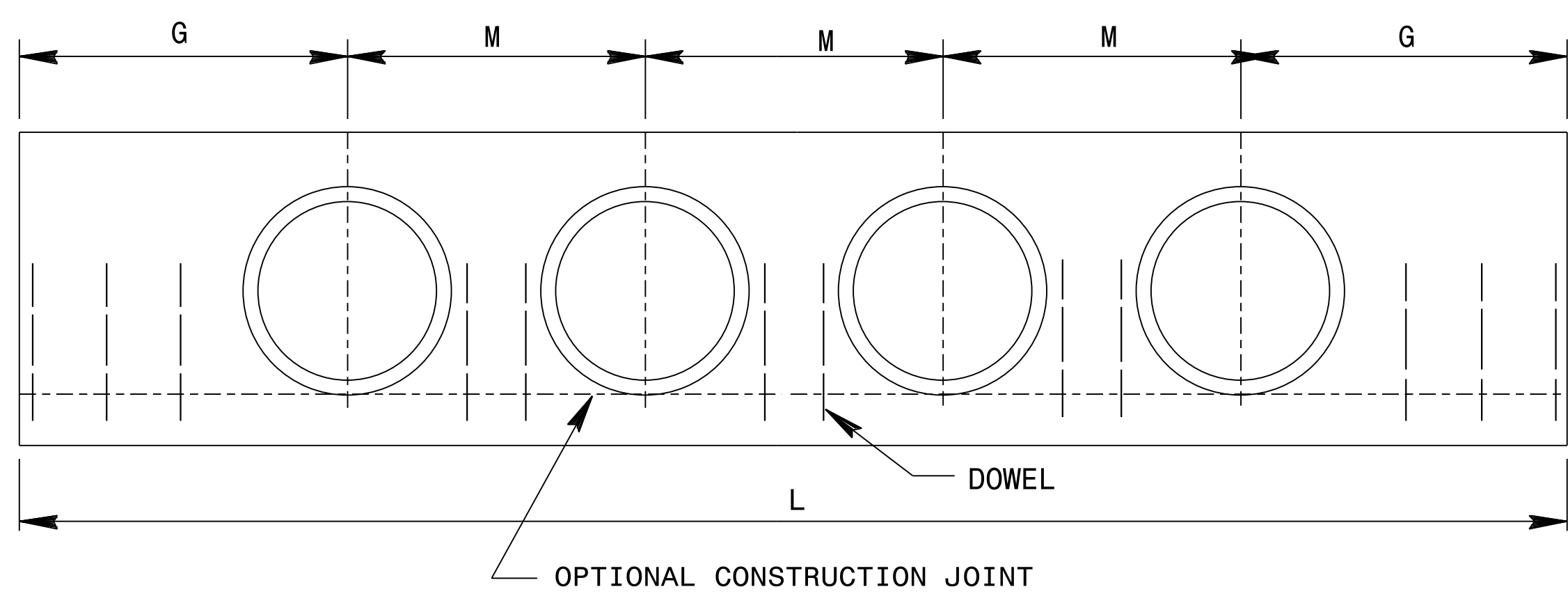
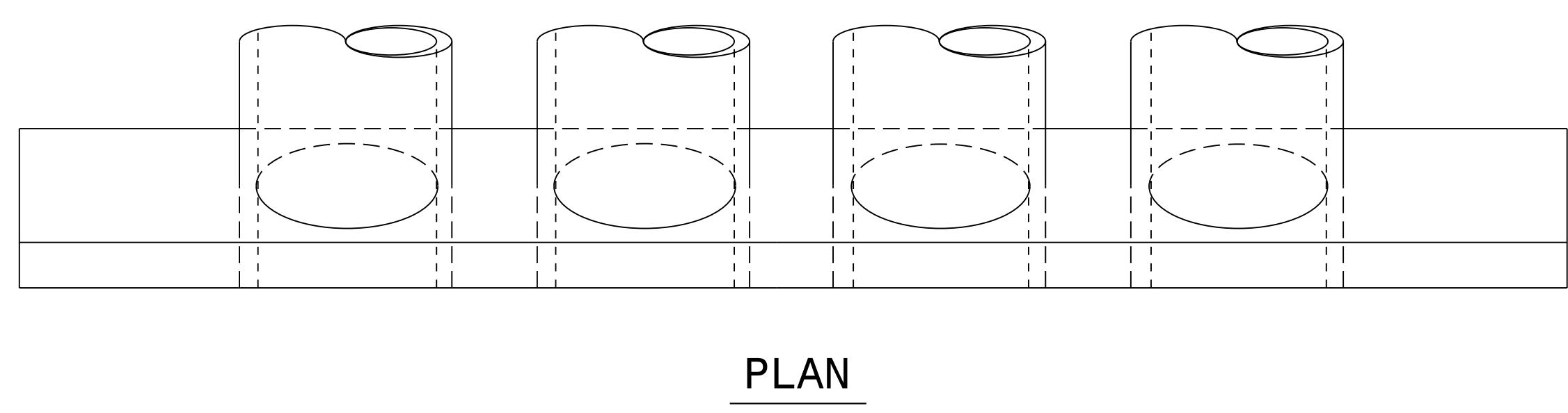
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ORIGINAL BY: J. HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE: _____
CHECKED BY: DATE: _____
FILE SPEC.: _____

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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



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"	"X"	Y*	"X"	Y*	"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	2	6	2	3	3	6	6	6	6	9
G	QTY.	2	2	3	3	4	4		5		2	2	3	3	4	4	5
TOTAL LBS.		14	14	23	23	28	100		119		17	17	28	28	33	122	147

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

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

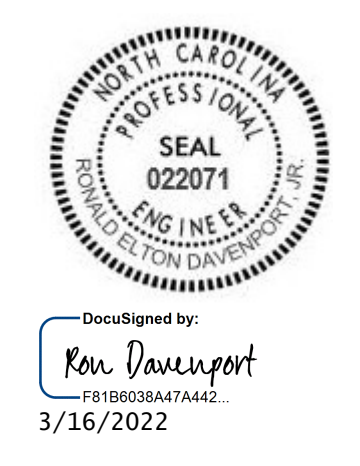
SHEET 1 OF 3
838D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE: _____
 MODIFIED BY: K.A. Kempf DATE: _____
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: details/kkempf/english/838d0101.dgn



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

ROADWAY DETAIL DRAWING FOR
**CONCRETE ENDWALL FOR TRIPLE
AND QUAD PIPE CULVERTS**
17" X 13" THRU 71" X 47" PIPE ARCH 2 2/3" X 1/2" CORRUGATIONS - 90° SKEW

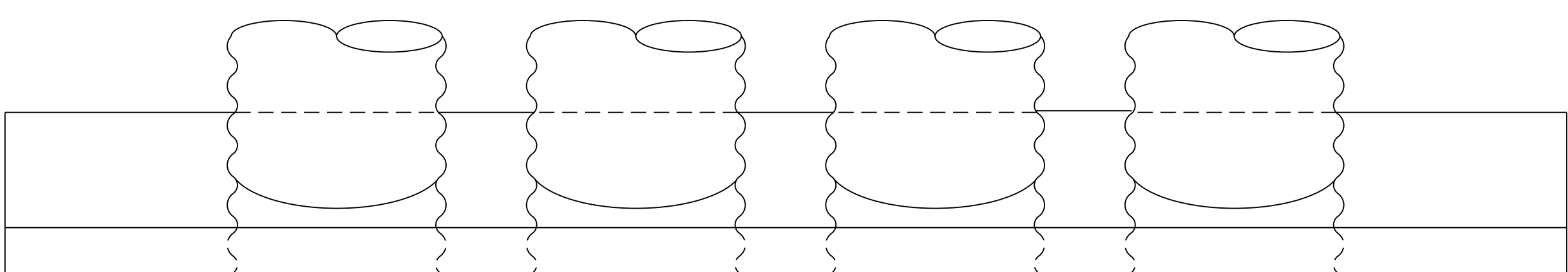
SHEET 1 OF 1
838d04

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RALEIGH, N.C.

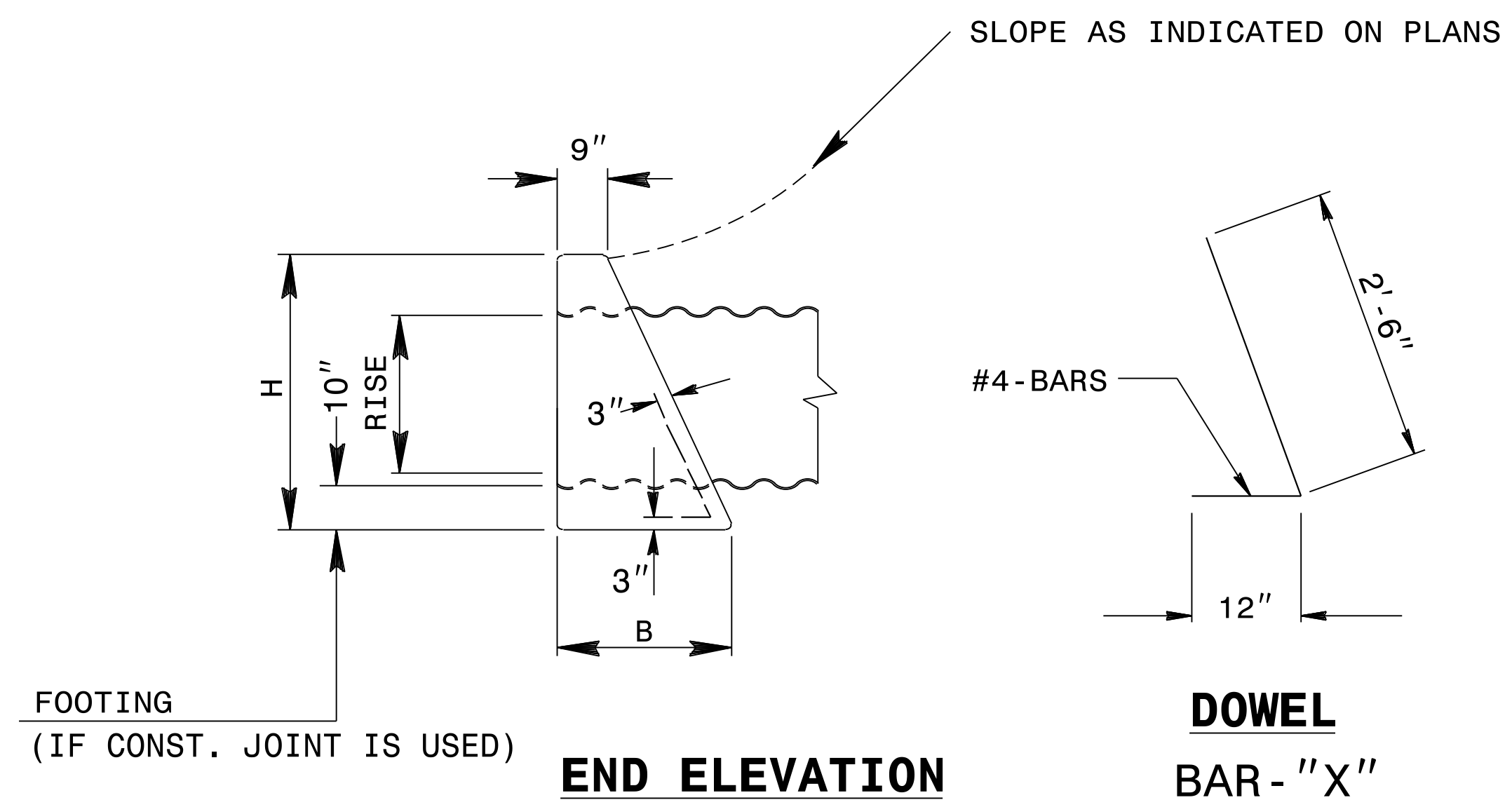
ROADWAY DETAIL DRAWING FOR
**CONCRETE ENDWALL FOR TRIPLE
AND QUAD PIPE CULVERTS**
17" X 13" THRU 71" X 47" PIPE ARCH 2 2/3" X 1/2" CORRUGATIONS - 90° SKEW

SHEET 1 OF 1
838d04

- GENERAL NOTES:
- CHAMFER ALL CORNERS 1". USE CLASS "B" CONCRETE.
 - PLACE 2 #6 "Y" BARS IN THE TOP OF ALL ENDWALL FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL LENGTH.
 - CONSTRUCT BOTTOM SLAB WITH FORMS.
 - WHEN THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT AT THE BOTTOM OF THE PIPE, PLACE BAR "X" DOWELS IN THE BASE AS SHOWN ON PLANS. SPACE BARS APPROXIMATELY ON 12" CENTERS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 - WHEN THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT AT THE BOTTOM OF THE PIPE AND POUR THE BASE SEPARATELY LEAVE THE POUR ROUGH.
 - DO NOT INTERPRET WALL THICKNESS (T) SHOWN FOR THE THICKNESS ACCEPTABLE, BUT IS USED IN COMPUTING ENDWALL QUANTITIES.



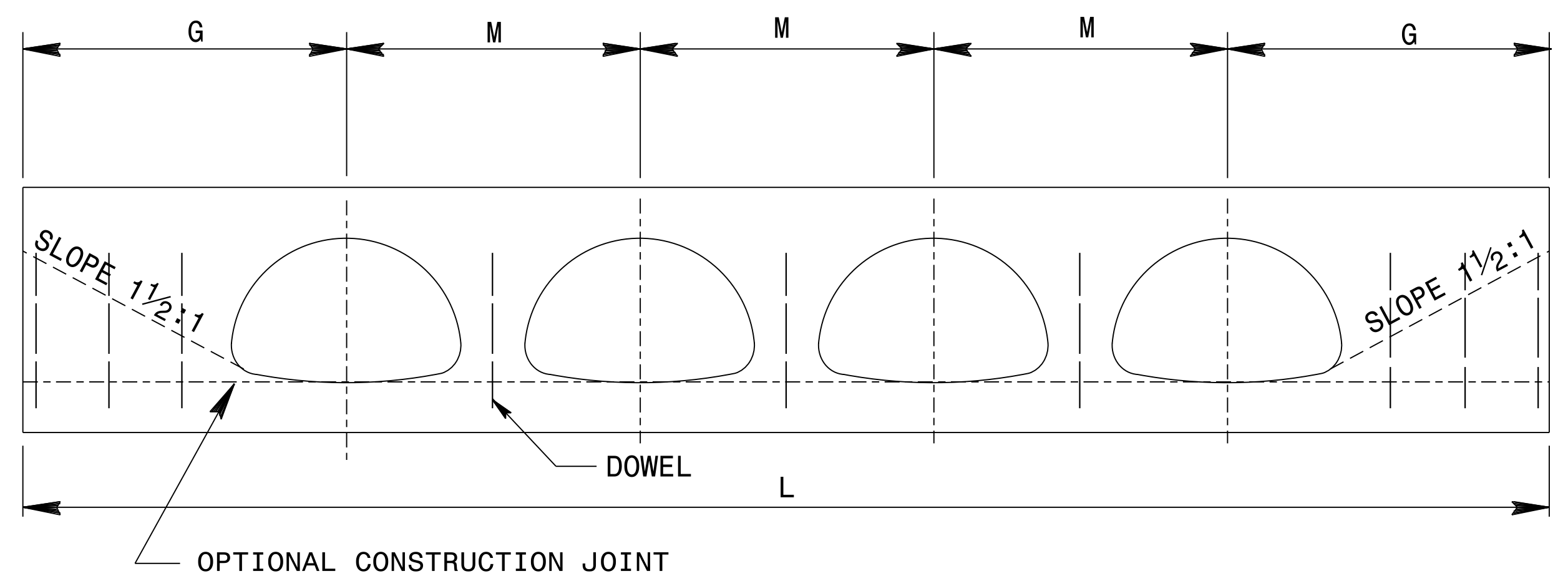
PLAN



FOOTING
(IF CONST. JOINT IS USED)

END ELEVATION

**DOWEL
BAR - "X"**

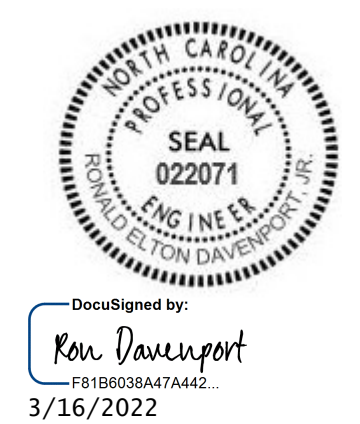


ELEVATION

LOC.	PIPE DIA.	DOWELS IN ENDWALL																			
		TRIPLE PIPE									QUAD PIPE										
		18"	22"	25"	29"	36"	43"	50"	58"	65"	72"	18"	22"	25"	29"	36"	43"	50"	58"	65"	72"
G	QTY.	2	2	2	3	3	4	4	4	5	5	2	2	2	3	3	4	4	4	5	5
M	QTY.	2	2	4	4	4	4	6	6	6	6	3	3	6	6	6	6	6	6	6	6
G	QTY.	2	2	2	3	3	4	4	4	5	5	2	2	2	3	3	4	4	4	5	5
TOTAL LBS.		14	14	23	23	28	28	35	35	42	42	17	17	28	28	35	35	35	42	42	42

DIMENSIONS AND CONCRETE QUANTITIES										
COMMON DIMENSIONS USING PIPE ARCH							TRIPLE PIPE		QUAD PIPE	
SPAN	RISE	THICK.	H	B	G	M	L	YD ³	L	YD ³
17"	13"	0.064	2'-9"	1'-5"	2'-7"	1'-11"	7'-1"	0.721	8'-11"	0.879
21"	15"	0.064	2'-11"	1'-6"	3'-0"	2'-4"	8'-4"	0.921	10'-8"	1.138
24"	18"	0.064	3'-2"	1'-7"	3'-5"	2'-8"	9'-6"	1.168	12'-2"	1.438
28"	20"	0.079	3'-4"	1'-8"	3'-9"	3'-1"	10'-6"	1.402	15'-7"	1.724
35"	24"	0.079	3'-8"	1'-10"	4'-6"	3'-11"	12'-11"	1.976	16'-10"	2.452
42"	29"	0.079	4'-1"	2'-1"	5'-4"	4'-8"	15'-4"	2.803	20'-0"	3.467
49"	33"	0.109	4'-5"	2'-3"	6'-0"	5'-5"	17'-5"	3.589	22'-10"	4.435
57"	38"	0.109	4'-10"	2'-6"	6'-10"	6'-4"	20'-0"	4.815	26'-4"	5.971
64"	43"	0.138	5'-3"	2'-8"	7'-8"	7'-1"	22'-5"	6.132	29'-6"	7.580
71"	47"	0.138	5'-7"	2'-10"	8'-4"	7'-11"	24'-7"	7.410	32'-2"	9.175

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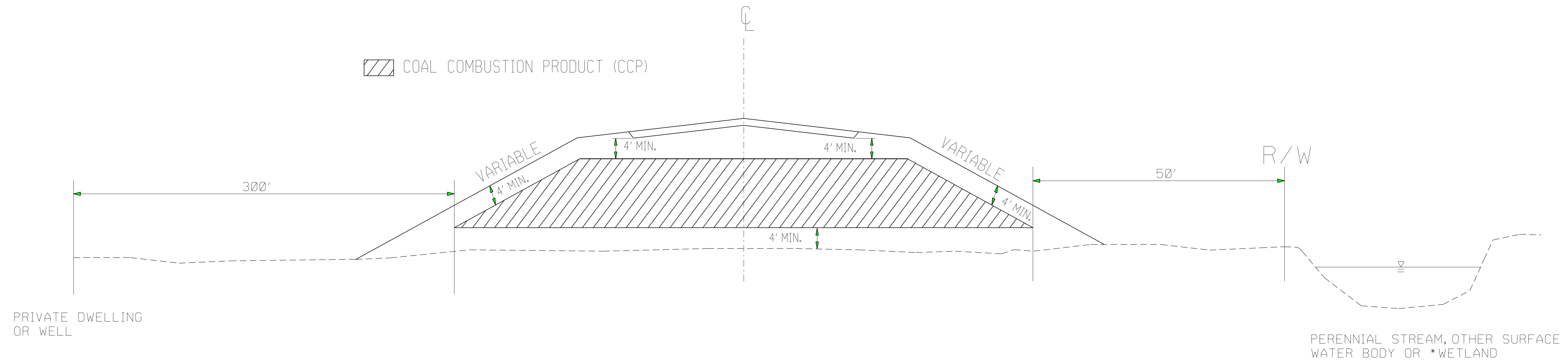
DocuSigned by:
Ken Davenport
3/16/2022

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AND DEVELOPMENT UNIT**
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SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE: _____
 MODIFIED BY: K.A. Kempf DATE: _____
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: details/howerton/838d04 Triple and Quad Arch.dgn

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



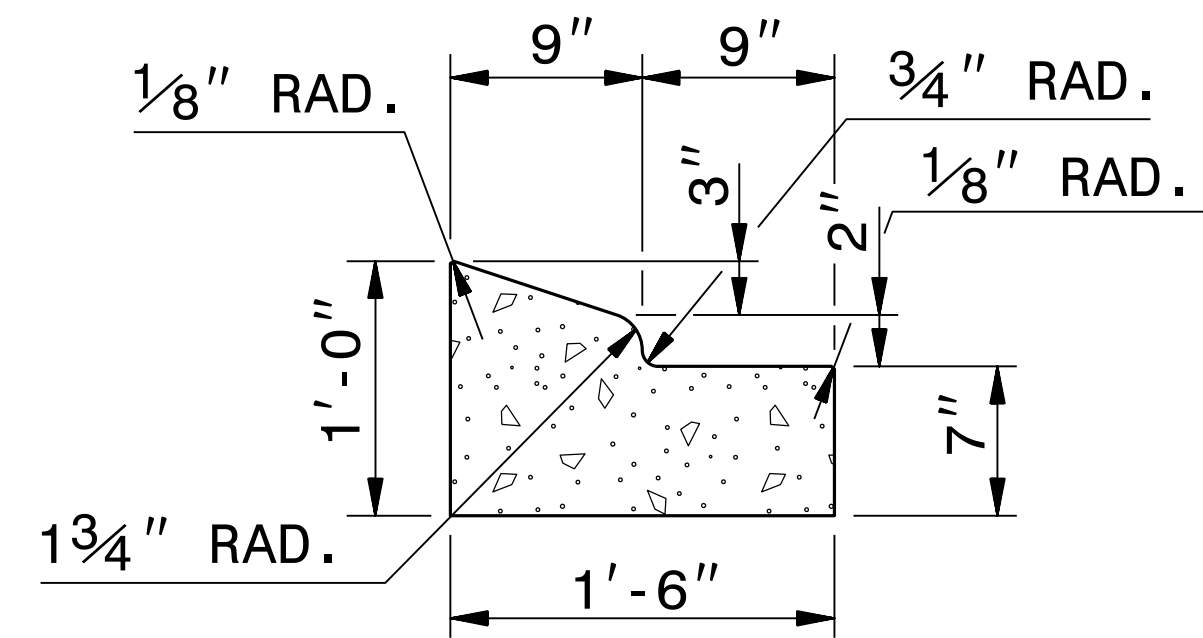
DocuSigned by:
Ron Davenport
3/16/2022

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AND DEVELOPMENT UNIT**
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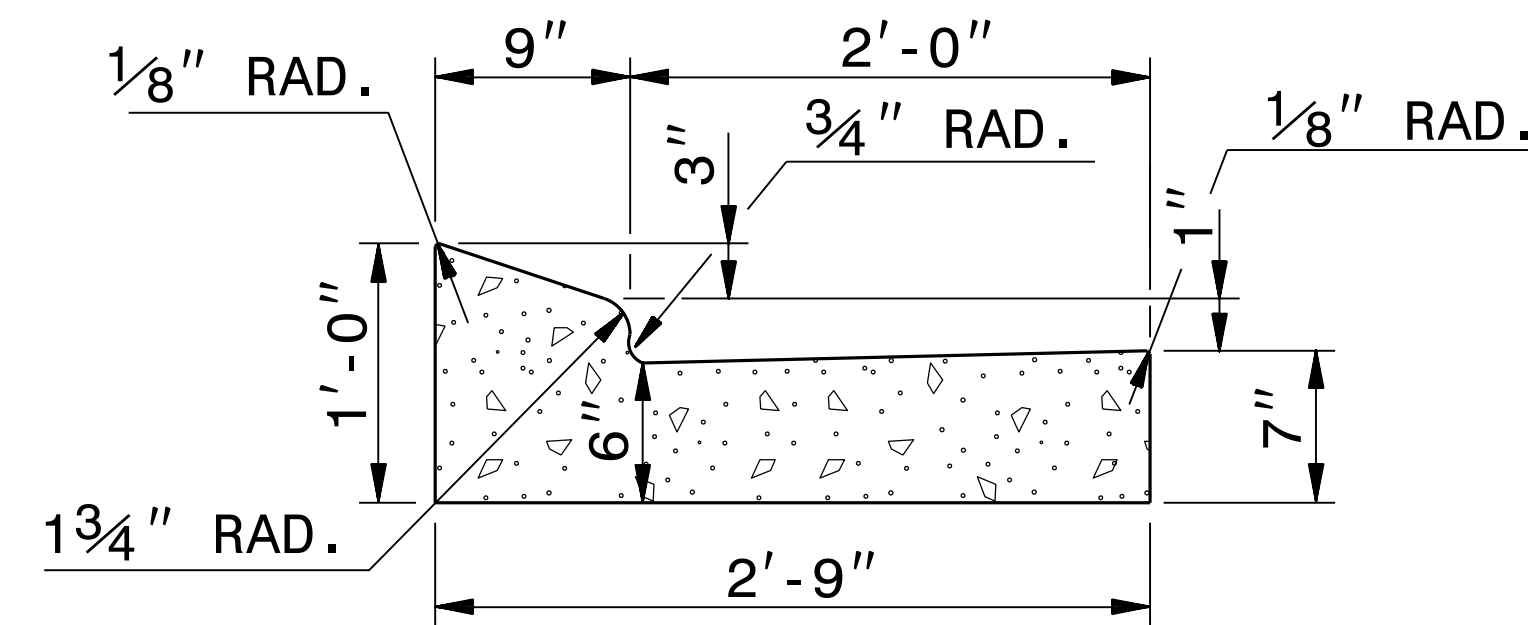
**COAL COMBUSTION
PRODUCT PLACEMENT
DETAIL**

ORIGINAL BY: J.S.H. DATE: 3/16/15
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: joel/coal combustion material detail.dgn

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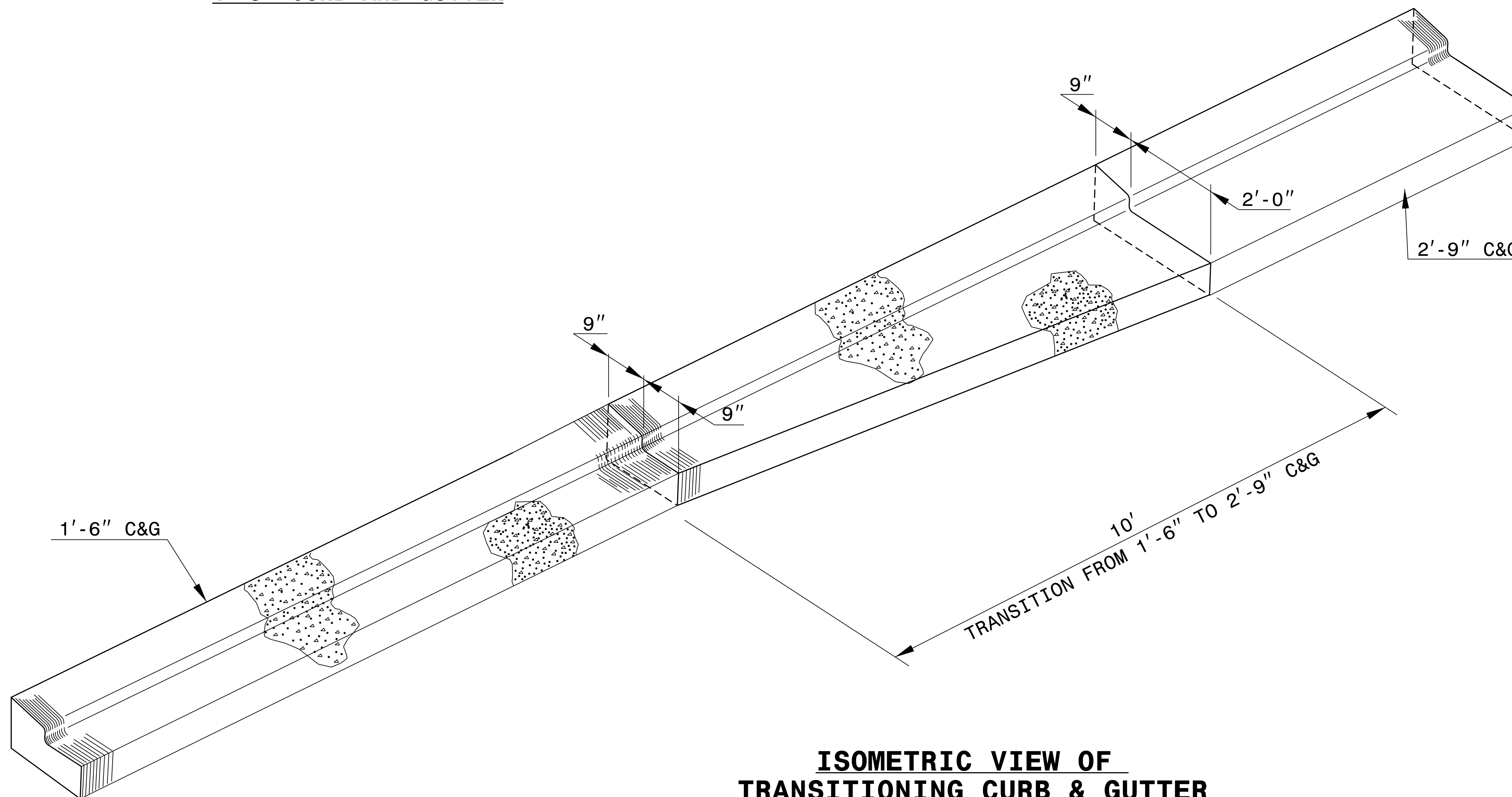
1'-6" CURB AND GUTTER



2'-9" CURB AND GUTTER

NOTE: SEE STD. DWG. 846.01 FOR ADDITIONAL CURB AND GUTTER INFORMATION.

SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.



**ISOMETRIC VIEW OF
TRANSITIONING CURB & GUTTER**



DocuSigned by:
Ken Davenport
3/16/2022

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**CONTRACT STANDARDS
AND DEVELOPMENT UNIT**
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**DETAIL OF 1'-6"
TO 2'-9" CURB & GUTTER
TRANSITION SECTION**

ORIGINAL BY: T.S.SPELL DATE: NOV. 26, 2001
MODIFIED BY: T.S.SPELL DATE: JAN. 23, 2007
CHECKED BY: DATE:
FILE SPEC.: DS174:/usr/details/stand/cqtransit.dgn

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RALEIGH, N.C.

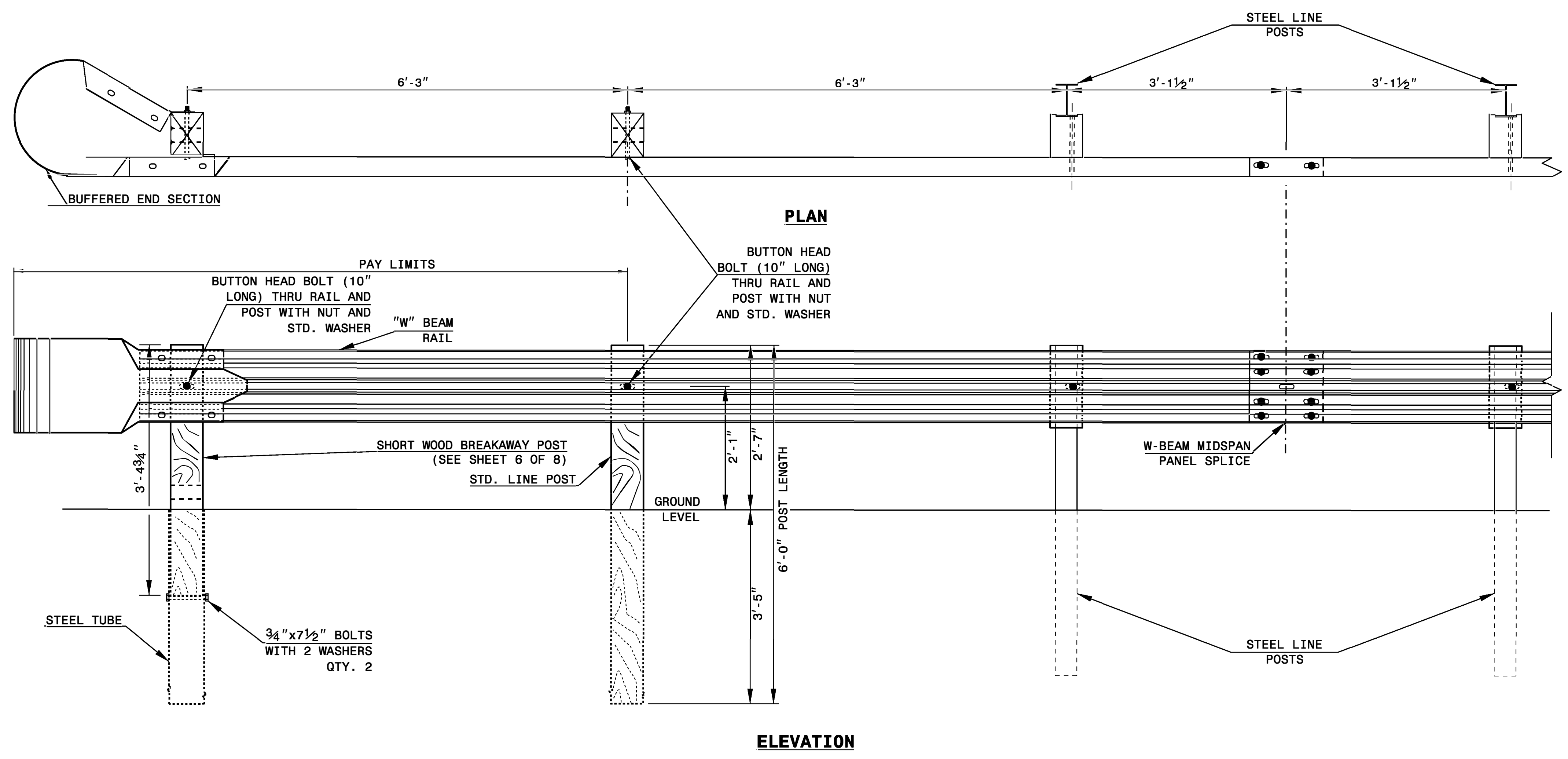
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY
A.T. - 1 SYSTEM

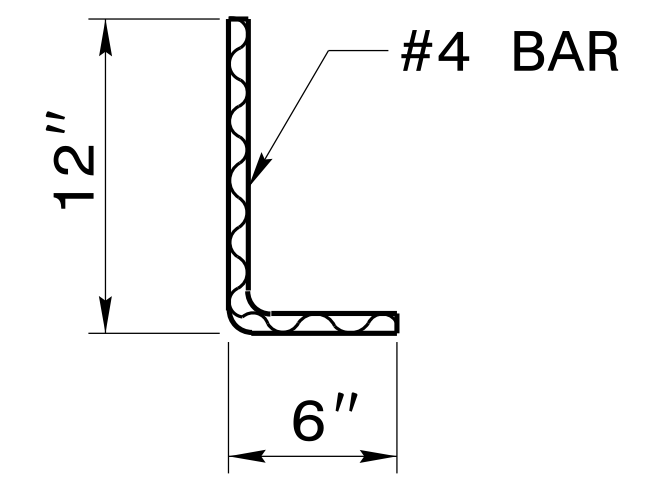
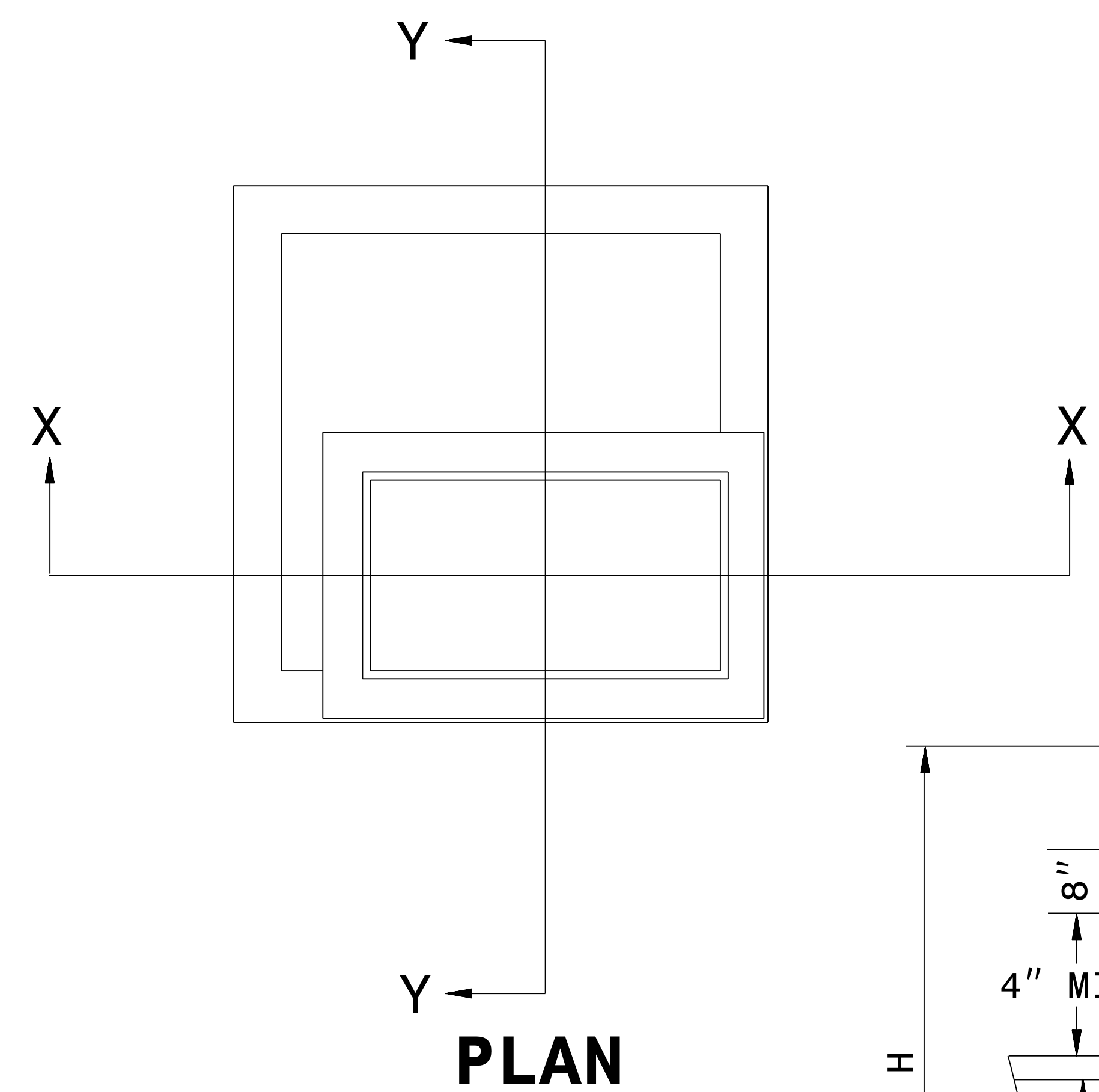


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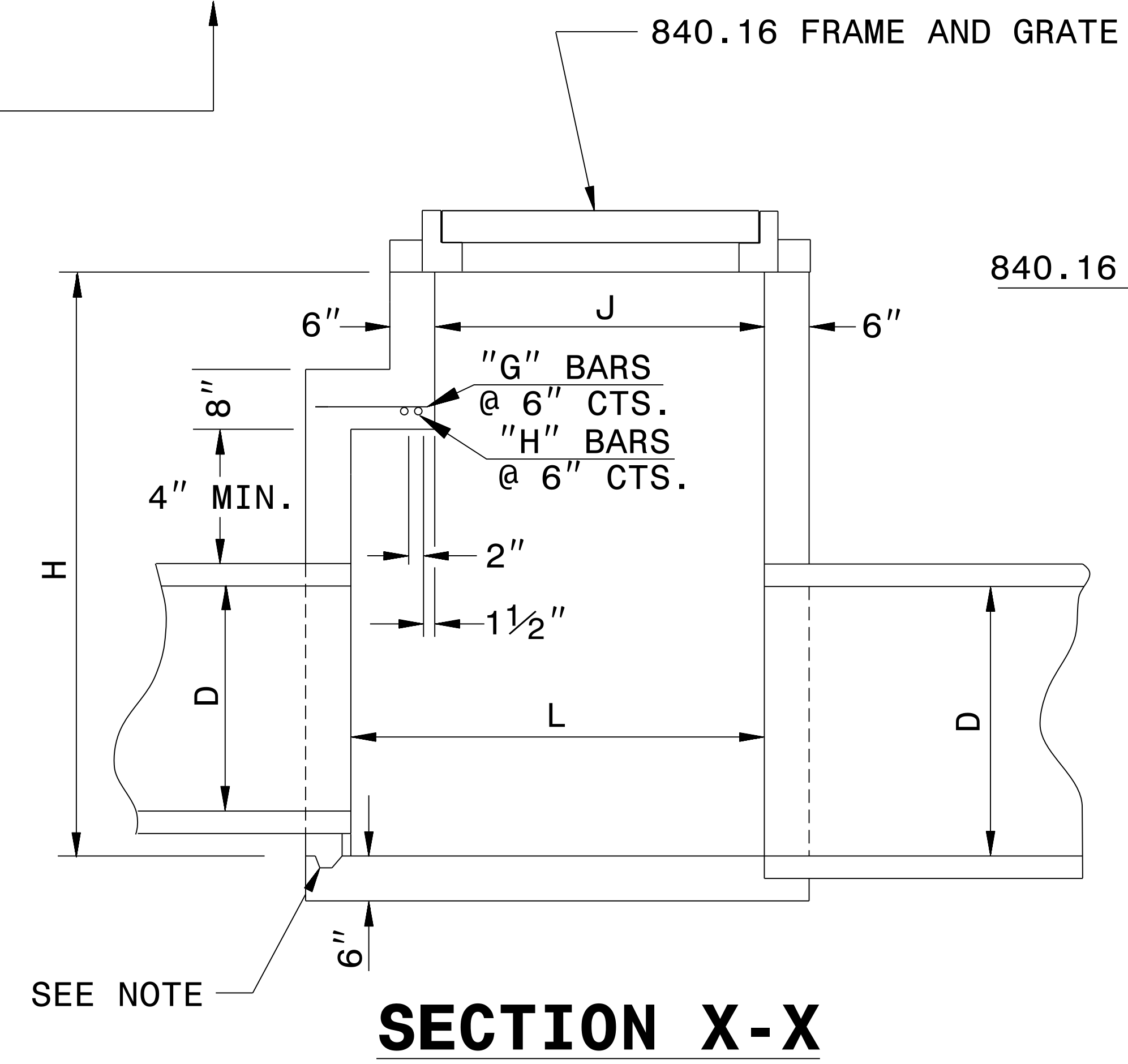
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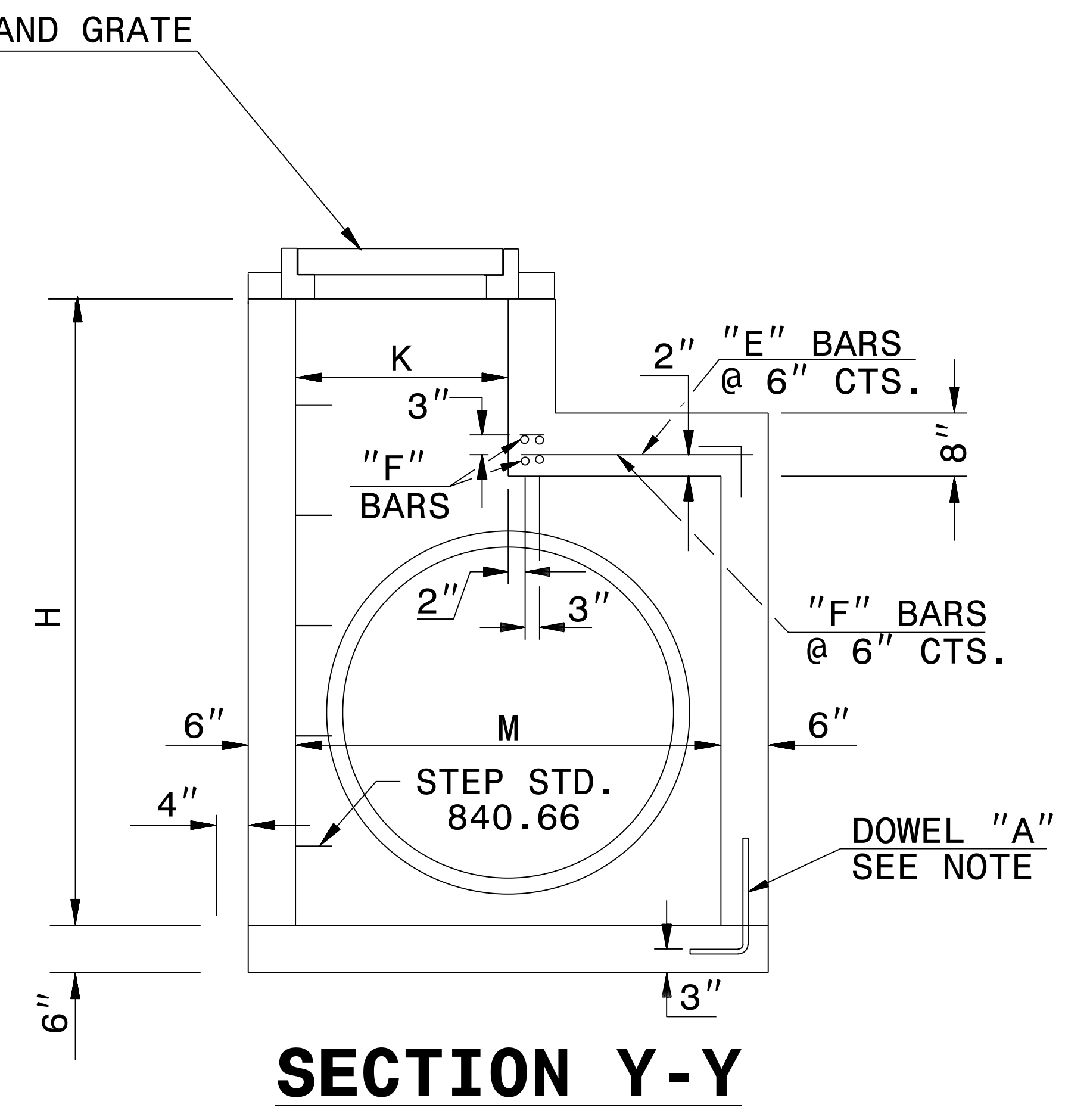
DOWEL

GENERAL NOTES:
 USE CLASS "B" CONCRETE THROUGHOUT.
 PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
 OPTIONAL CONSTRUCTION - MONOLITHIC POUR 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
 USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
 IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
 CONSTRUCT WITH PIPE CROWNS MATCHING.
 INSTALL 2" WEEPHOLES AS DIRECTED BY THE ENGINEER.
 INSTALL STONE DRAINS, OF A MINIMUM OF 1 CUBIC FOOT OF NO. 78M STONE IN A POROUS FABRIC BAG OR WRAP, AT EACH WEEP HOLE OR AS DIRECTED BY THE ENGINEER.
 CHAMFER ALL EXPOSED CORNERS 1".
 DRAWING NOT TO SCALE.
 DIMENSIONS MAY BE FIELD ADJUSTED AS DIRECTED BY THE ENGINEER.



SECTION X-X

840.16 FRAME AND GRATE



SECTION Y-Y

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

DIMENSIONS OF BOX AND PIPE						REINFORCING STEEL - NO. 4 BARS						CU YDS CONC. IN BOX				DEDUCTIONS FOR ONE PIPE				
PIPE	SPAN	WIDTH	SPAN	WIDTH	HEIGHT	BARS E		BARS F		BARS G		BARS H		TOTAL	BOTTOM SLAB	H TOTAL	H PER FT HT	TOTAL	C.S.	R.C.
D	J	K	L	M	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	LBS.						
12"	3'-0"	2'-0"	3'-8"	2'-0"	3'-9"	—	—	—	—	—	—	—	—	—	0.362	0.926	0.247	1.288	0.015	0.024
15"	3'-0"	2'-0"	3'-8"	2'-0"	4'-0"	—	—	—	—	—	—	—	—	—	0.362	0.988	0.247	1.350	0.023	0.036
18"				2'-0"	4'-3"	—	—	—	—	—	—	—	—	—	0.362	1.050	0.247	1.412	0.033	0.049
24"				2'-10"	4'-9"	8	1'-5"	6	4'-9"	—	—	—	—	27	0.444	1.362	0.278	1.806	0.059	0.085
30"			3'-8"	3'-5"	5'-3"	8	2'-0"	7	4'-9"	—	—	—	—	33	0.502	1.644	0.288	2.146	0.092	0.127
36"			4'-0"	4'-0"	5'-9"	8	2'-5"	8	4'-11"	4	0'-9"	2	4'-11"	47	0.560	1.931	0.321	2.525	0.132	0.178
42"			4'-10"	4'-10"	6'-3"	10	3'-1"	9	5'-7"		1'-5"	3	5'-7"	67	0.704	2.500	0.370	3.282	0.180	0.243
48"			5'-4"	5'-4"	6'-9"	11	3'-7"	10	6'-1"		1'-11"	4	6'-1"	87	0.823	3.013	0.407	3.920	0.235	0.317
54"			6'-0"	6'-0"	7'-3"	12	4'-1"	11	6'-7"		2'-5"	5	6'-7"	107	0.951	3.589	0.444	4.677	0.297	0.401
60"			6'-6"	6'-6"	7'-9"	13	4'-9"	12	7'-3"		3'-1"	6	7'-3"	135	1.311	4.539	0.494	5.775	0.367	0.495
66"			7'-2"	7'-2"	8'-3"	14	5'-4"	14	7'-10"		3'-7"	7	7'-10"	168	1.136	5.061	0.537	6.506	0.444	0.599
72"	3'-0"	2'-0"	7'-8"	7'-8"	8'-9"	15	5'-11"	15	8'-5"	4	4'-3"	8	8'-5"	199	1.500	5.860	0.580	7.473	0.528	0.713

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 Jhowerton AT_CSD-251955



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SPECIAL DI 840D14

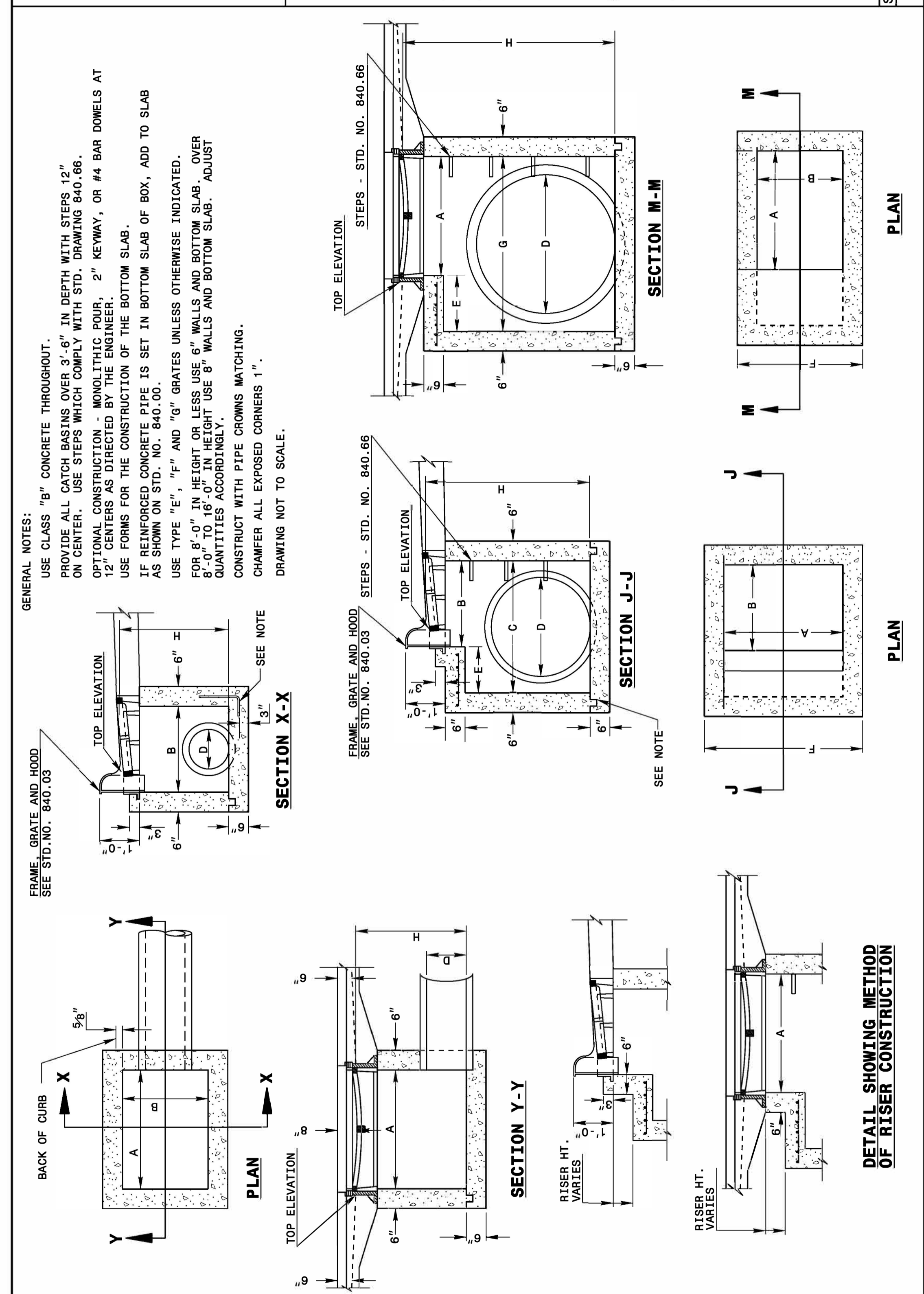
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 CHECKED BY: DATE:
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STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

SHEET 1 OF 2
840D02



STATE OF NORTH CAROLINA
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RALEIGH, N.C.

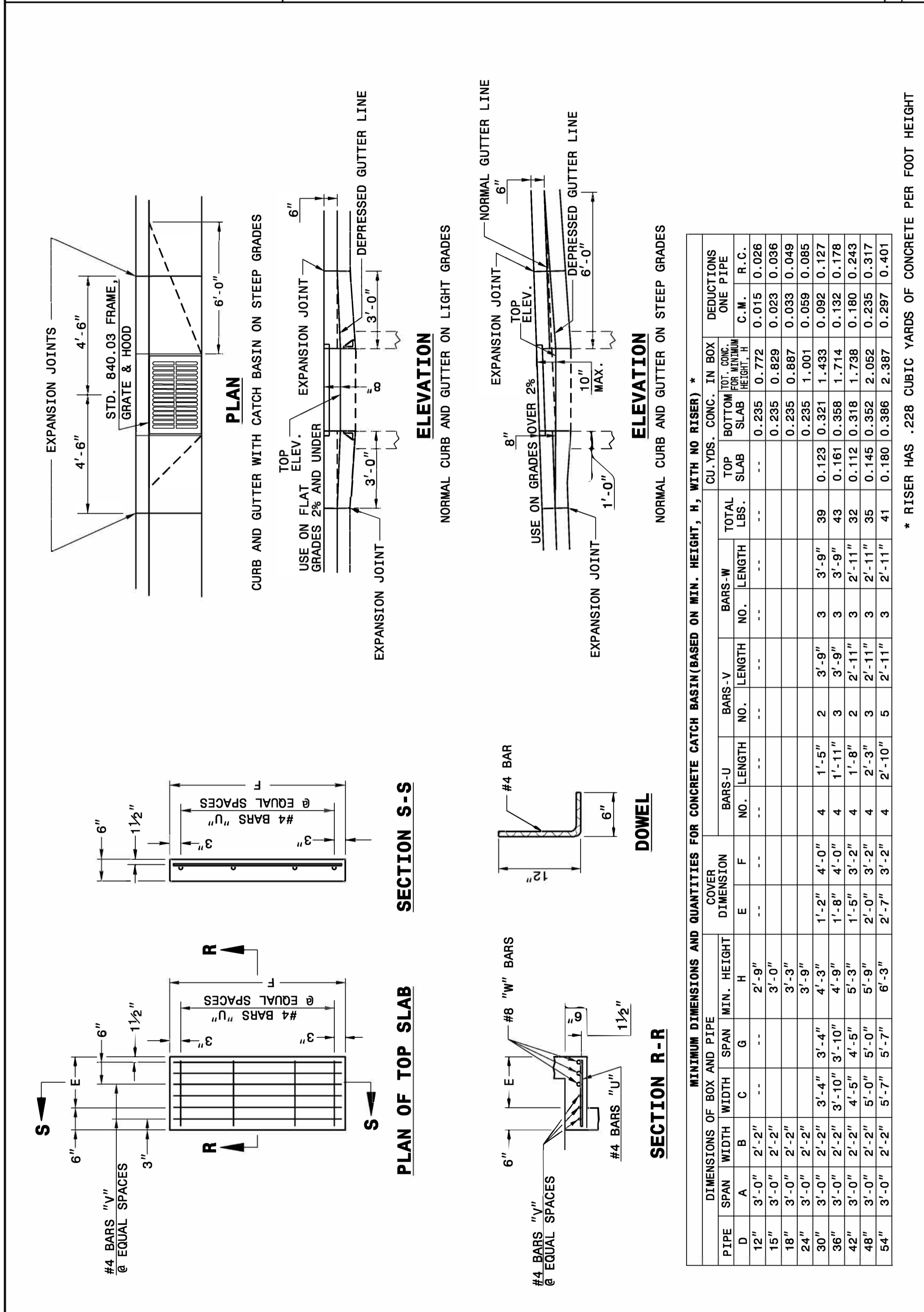
ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

SHEET 1 OF 2
840D02

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

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

SHEET 2 OF 2
840D02

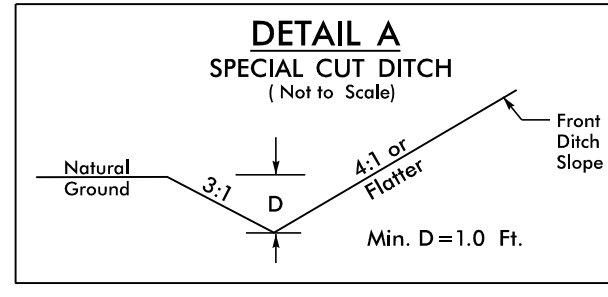


CONTRACT STANDARDS AND DEVELOPMENT UNIT
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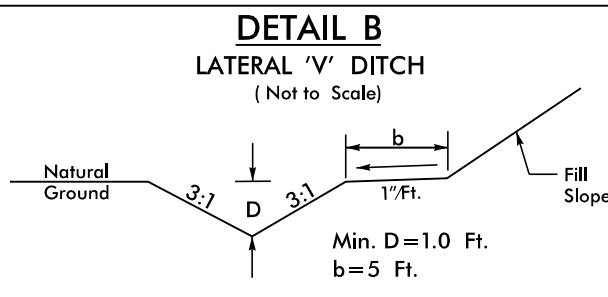
SEE PLATE FOR TITLE

ORIGINAL BY: 2002 Std.840.01 DATE: _____
 MODIFIED BY: E.E. WARD DATE: 3-1-02
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: s:details/stand/840d01.dgn

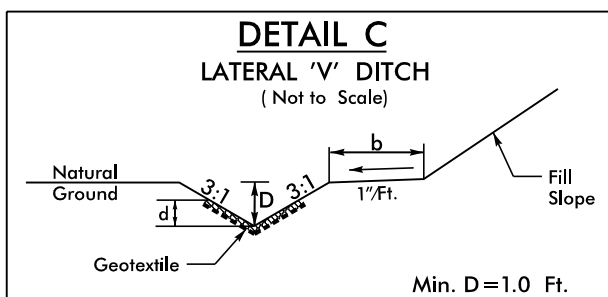
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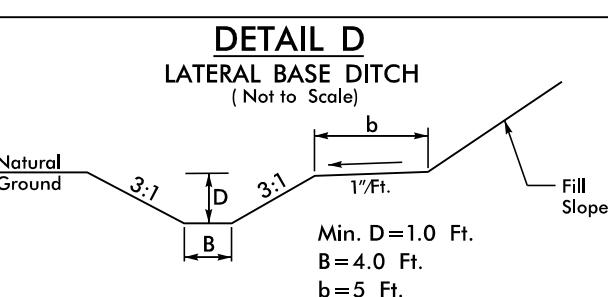
- DETAIL A**
SPECIAL CUT DITCH
(Not to Scale)
- L- STA. 422+00 TO STA. 424+00 RT
 - L- STA. 469+50 TO STA. 472+50 RT
 - Y13- STA. 31+66 TO STA. 34+50 RT
 - Y13- STA. 52+50 TO STA. 53+70 LT
 - Y13B- STA. 20+00 TO STA. 20+50 LT
 - Y13 CUL1- STA. 13+50 TO STA. 14+50 LT
 - Y13 CUL1- STA. 13+50 TO STA. 14+80 RT
 - Y13 CUL3- STA. 12+00 TO STA. 13+43 LT
 - Y13 CUL3- STA. 12+00 TO STA. 13+46 RT
 - Y13DET- STA. 14+00 TO STA. 16+50 RT
 - Y13DET- STA. 31+75 TO STA. 34+00 RT
 - Y16DET- STA. 31+50 TO STA. 34+50 LT
 - Y13F- STA. 10+58 TO STA. 11+50 RT
 - Y13RPD- STA. 11+00 TO STA. 11+50 LT
 - Y13G REV- STA. 10+10 TO STA. 10+75 RT
 - Y13G REV- STA. 10+30 TO STA. 10+75 LT
 - Y13I- STA. 13+25 TO STA. 13+75 LT
 - Y13RPD- STA. 22+50 TO STA. 23+50 LT
 - Y14- STA. 13+00 TO STA. 14+00 LT
 - Y14- STA. 29+18 TO STA. 32+00 LT
 - Y14B- STA. 10+59 TO STA. 11+50 RT
 - Y14B- STA. 10+75 TO STA. 11+50 LT
 - Y16A- STA. 11+00 TO STA. 13+00 LT
 - Y16A- STA. 16+17 TO STA. 20+00 LT
 - Y16A- STA. 11+00 TO STA. 16+50 RT
 - Y16B- STA. 27+00 TO STA. 29+50 LT



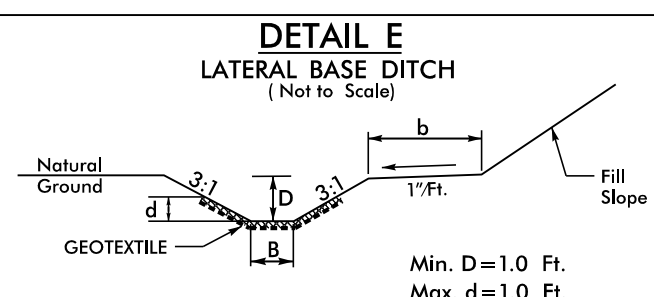
- DETAIL B**
LATERAL 'V' DITCH
(Not to Scale)
- L- STA. 456+00 TO STA. 457+00 LT
 - L- STA. 462+50 TO STA. 464+20 RT
 - L- STA. 468+00 TO STA. 469+00 RT
 - L- STA. 472+50 TO STA. 475+00 RT
 - L- STA. 472+95 TO STA. 477+00 LT
 - L- STA. 517+50 TO STA. 519+00 LT
 - Y13- STA. 28+00 TO STA. 31+66 RT
 - Y13- STA. 49+50 TO STA. 52+50 LT
 - Y13- STA. 60+00 TO STA. 62+00 LT
 - Y13B- STA. 12+17 TO STA. 13+00 LT
 - Y13I- STA. 11+50 TO STA. 13+25 LT
 - Y13I- STA. 13+35 TO STA. 13+75 RT
 - Y13RPD- STA. 19+50 TO STA. 22+00 RT
 - Y14- STA. 24+18 TO STA. 26+00 LT
 - Y14- STA. 26+90 TO STA. 29+50 RT
 - Y16- STA. 18+38 TO STA. 17+40 RT
 - Y16- STA. 18+74 TO STA. 20+12 LT
 - Y16A- STA. 16+50 TO STA. 18+50 RT
 - Y16A- STA. 20+00 TO STA. 22+24 LT
 - Y13DET- STA. 34+70 TO STA. 35+65 LT
 - Y16DET- STA. 21+17 TO STA. 23+00 LT



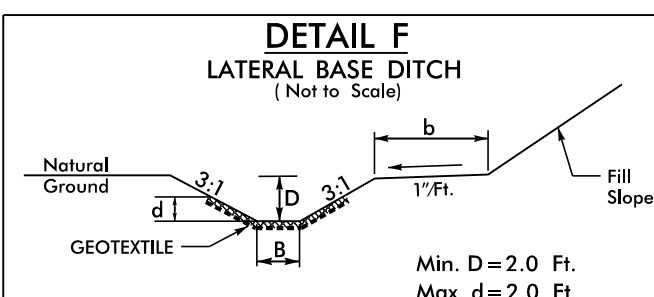
- DETAIL C**
LATERAL 'V' DITCH
(Not to Scale)
- Type of Liner = Class B Rip-Rap
 - L- STA. 420+27 TO STA. 421+50 RT
 - Y13B- STA. 10+50 TO STA. 12+17 LT



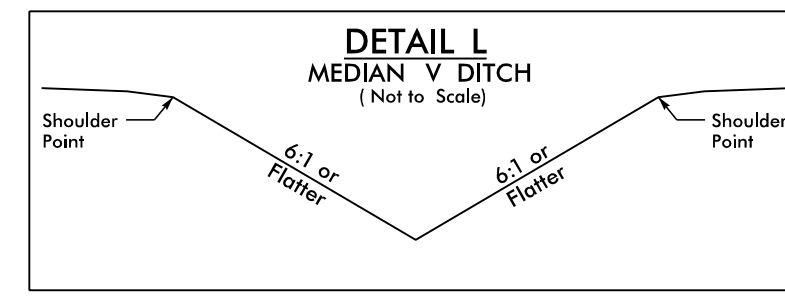
- DETAIL D**
LATERAL BASE DITCH
(Not to Scale)
- L- STA. 376+50 TO STA. 377+00 RT
 - L- STA. 390+50 TO STA. 394+00 LT
 - Y13RPD- STA. 19+00 TO STA. 20+50 LT
 - Y14- STA. 24+65 TO STA. 26+90 RT



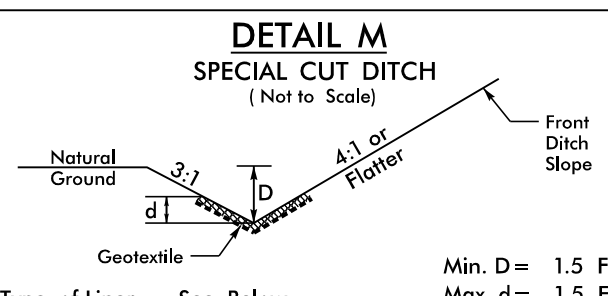
- DETAIL E**
LATERAL BASE DITCH
(Not to Scale)
- L- STA. 327+50 TO STA. 332+50 LT
 - L- STA. 348+00 TO STA. 349+50 LT
 - L- STA. 395+58 TO STA. 397+19 RT
 - L- STA. 399+60 TO STA. 403+00 RT
 - L- STA. 406+00 TO STA. 415+00 RT
 - L- STA. 419+50 TO STA. 420+27 RT
 - Y13RPA- STA. 22+00 TO STA. 23+50 RT
 - Y13RPD- STA. 20+50 TO STA. 22+00 LT
 - Y13B- STA. 18+00 TO STA. 18+80 RT



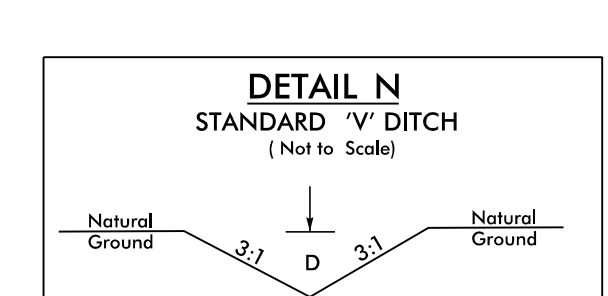
- DETAIL F**
LATERAL BASE DITCH
(Not to Scale)
- Y13RPB- STA. 23+00 TO STA. 23+50 RT



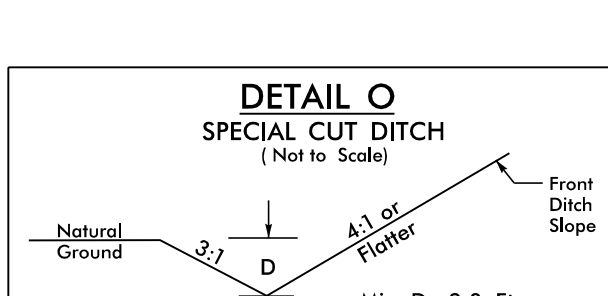
- DETAIL L**
MEDIAN 'V' DITCH
(Not to Scale)
- L- STA. 426+00 TO STA. 431+00 CL
 - L- STA. 518+50 TO STA. 519+00 CL



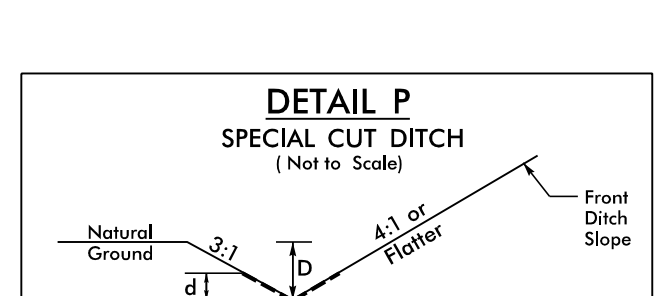
- DETAIL M**
SPECIAL CUT DITCH
(Not to Scale)
- Type of Liner = See Below
 - L- STA. 457+18 TO STA. 458+00 LT, CL 1
 - L- STA. 463+50 TO STA. 465+50 LT, CL B
 - Y13RPB- STA. 23+50 TO STA. 24+50 RT, CL B
 - Y14- STA. 10+50 TO STA. 13+00 RT, CL 1
 - Y15A- STA. 12+17 TO STA. 13+00 RT, CL 1
 - Y15A- STA. 19+17 TO STA. 21+00 LT, CL B
 - Y16A- STA. 18+50 TO STA. 19+50 RT, CL B



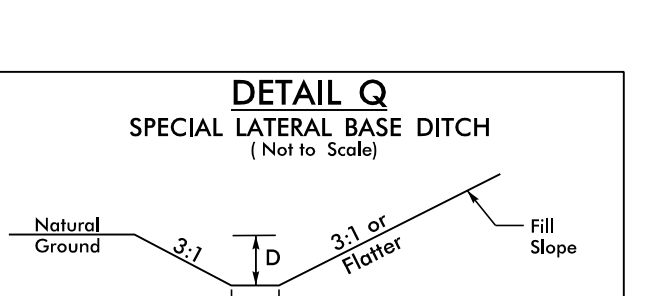
- DETAIL N**
STANDARD 'V' DITCH
(Not to Scale)
- Y13CUL1- STA. 14+50 TO STA. 15+06 LT, L=56'
S=0.96%, BEG. ELEV=177.05, END ELEV=176.31
 - Y13CUL1- STA. 14+80 TO STA. 15+14 RT, L=34'
S=0.79%, BEG. ELEV=176.97, END ELEV=176.70
 - Y14- STA. 8+18 TO STA. 9+87 RT, L=170'
S=1.67%, BEG. ELEV=163.16, END ELEV=166.0
 - Y14B- STA. 11+50 TO STA. 12+05 LT, L=55'
S=1.2%, BEG. ELEV=196.95, END ELEV=196.29
 - Y14B- STA. 11+50 TO STA. 12+40 RT, L=90'
S=0.67%, BEG. ELEV=196.52, END ELEV=195.92
 - Y14T- STA. 12+00 LT, L=110', S=1.71%
BEG. ELEV=190.17, END ELEV=188.29
 - Y14T- STA. 12+25 RT, L=135', S=1.67%
BEG. ELEV=189.21, END ELEV=186.95
 - Y15- STA. 10+70 RT, L=31', S=2.58%
BEG. ELEV=214.20, END ELEV=215.00



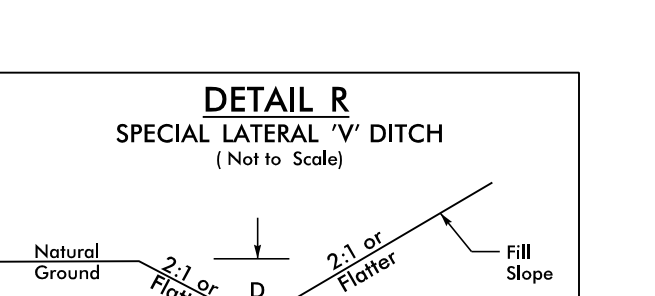
- DETAIL O**
SPECIAL CUT DITCH
(Not to Scale)
- Y13- STA. 21+00 TO STA. 25+50 RT
 - Y13- STA. 12+91 TO STA. 14+00 LT
 - Y13 CUL2- STA. 11+25 TO STA. 12+50 LT
 - Y13 CUL2- STA. 11+25 TO STA. 12+71 RT
 - Y13RPA- STA. 27+00 TO STA. 28+29 RT
 - Y16B- STA. 29+50 TO STA. 33+00 LT



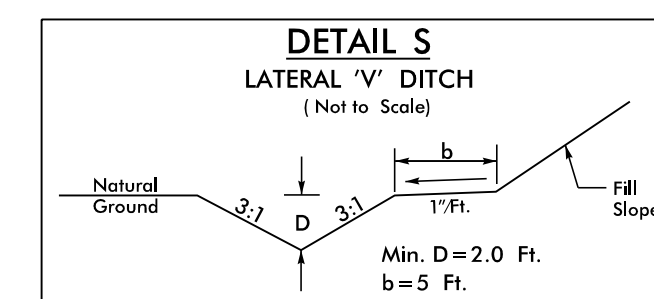
- DETAIL P**
SPECIAL CUT DITCH
(Not to Scale)
- Type of Liner = PSRM
 - L- STA. 415+00 TO STA. 415+50 RT
 - L- STA. 456+80 TO STA. 458+50 RT
 - Y13- STA. 12+91 TO STA. 14+00 LT
 - Y13- STA. 12+84 TO STA. 14+00 RT
 - Y13DET- STA. 36+15 TO STA. 37+50 LT
 - Y14- STA. 10+00 TO STA. 11+00 LT
 - Y14DET- STA. 11+78 TO STA. 14+50 RT
 - Y15A- STA. 12+30 TO STA. 13+00 LT



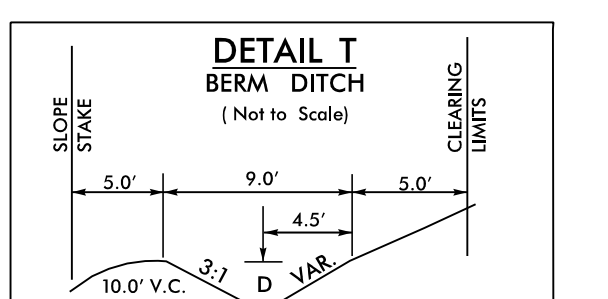
- DETAIL Q**
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
- Y13- STA. 70+00 TO STA. 72+15 LT, MIN D=2.25'
 - Y13- STA. 77+40 TO STA. 78+53 LT, MIN D=1.0'



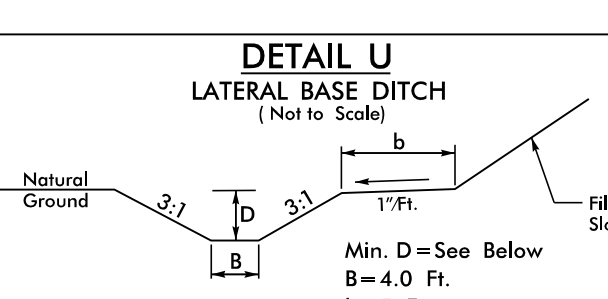
- DETAIL R**
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
- Y16 REV- STA. 36+50 TO STA. 37+60 RT
 - Y16 REV- STA. 43+65 TO STA. 45+20 RT



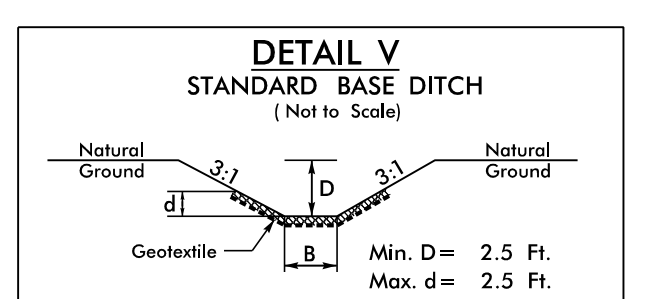
- DETAIL S**
LATERAL 'V' DITCH
(Not to Scale)
- L- STA. 506+00 TO STA. 513+00 RT
 - Y13- STA. 31+66 TO STA. 36+25 LT
 - Y14- STA. 15+00 TO STA. 18+67 RT
 - Y14DET- STA. 14+50 TO STA. 19+20 RT
 - Y16- STA. 21+27 TO STA. 23+56 RT



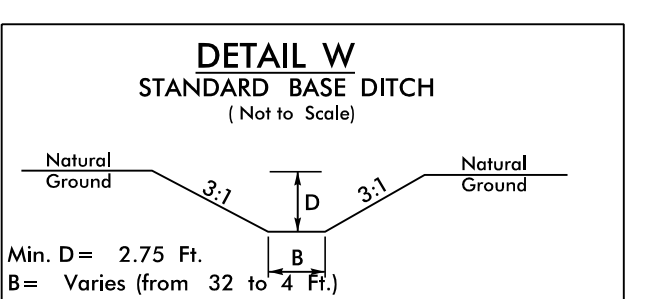
- DETAIL T**
BERM DITCH
(Not to Scale)
- L- STA. 354+00 TO STA. 358+82 LT
 - L- STA. 377+00 TO STA. 380+50 RT
 - L- STA. 431+00 TO STA. 435+50 RT
 - L- STA. 450+90 TO STA. 451+79 RT
 - Y13RPB- STA. 23+50 TO STA. 36+00 RT



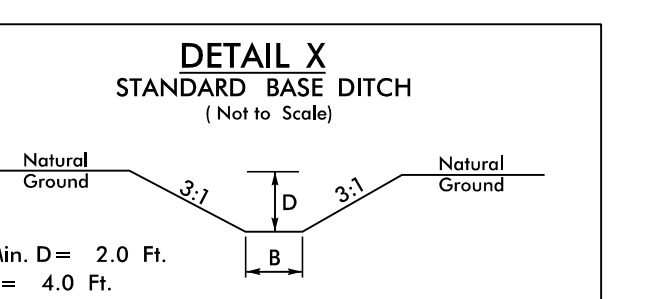
- DETAIL U**
LATERAL BASE DITCH
(Not to Scale)
- L- STA. 372+50 TO STA. 373+29 LT, D=4'
 - Y16B- STA. 26+62 TO STA. 27+50 RT, D=4'



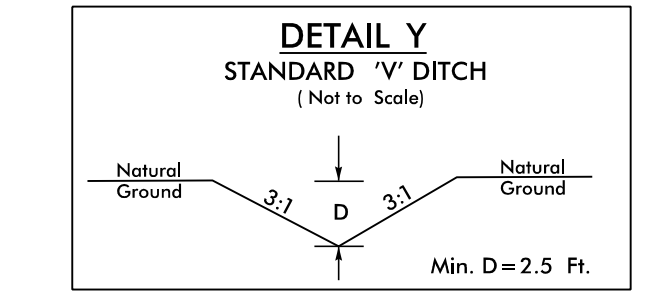
- DETAIL V**
STANDARD BASE DITCH
(Not to Scale)
- Type of Liner = Class I Rip-Rap
 - L- STA. 415+00 TO STA. 415+50 RT
 - L- STA. 457+08 LT, L=41', S=0.34%
BEG. ELEV=184.72, END ELEV=184.58



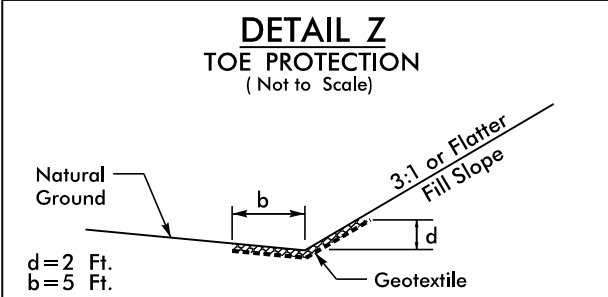
- DETAIL W**
STANDARD BASE DITCH
(Not to Scale)
- Y15A- STA. 12+29 LT, L=139', S=0.39%
BEG. ELEV=184.20, END ELEV=183.66
 - Y13I- STA. 13+75 LT, L=145', S=0.5%
BEG. ELEV=175.85, END ELEV=175.08
 - Y16C- STA. 12+00 RT, L=74', S=0.3%
BEG. ELEV=206.10, END ELEV=205.88



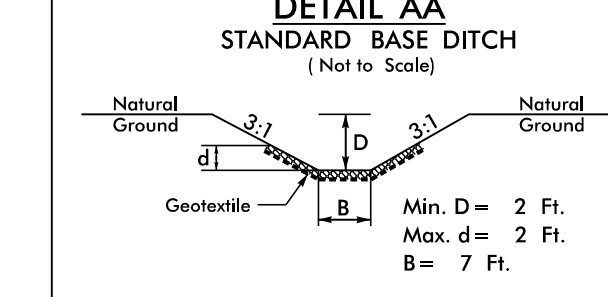
- DETAIL X**
STANDARD BASE DITCH
(Not to Scale)
- Y16DET- STA. 21+17 RT, L=56', S=0.09%
BEG. ELEV=213.70, END ELEV=213.64



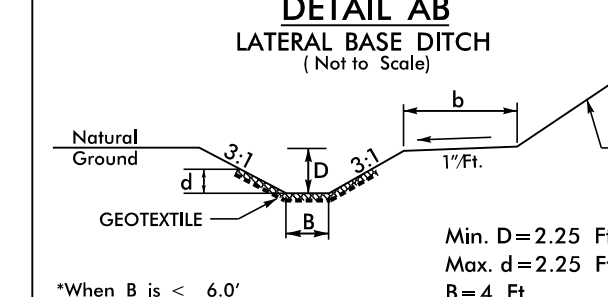
- DETAIL Y**
STANDARD 'V' DITCH
(Not to Scale)
- Y13CUL2- STA. 12+50 LT, L=94', S=0.28%
BEG. ELEV=169.88, END ELEV=172.56



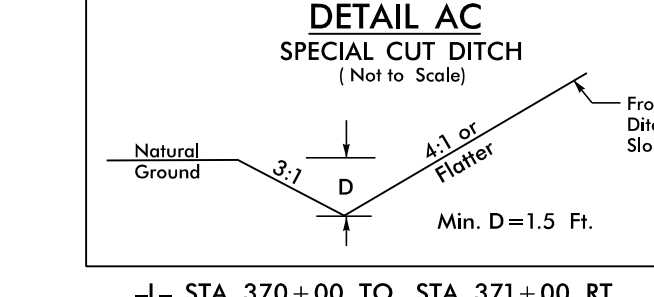
- DETAIL Z**
TOE PROTECTION
(Not to Scale)
- Type of Liner = Class I Rip-Rap
 - L- STA. 328+00 TO STA. 331+50 RT
 - L- STA. 331+50 TO STA. 334+50 LT
 - L- STA. 392+27 TO STA. 393+50 RT
 - L- STA. 440+50 TO STA. 443+35 RT
 - L- STA. 440+50 TO STA. 443+50 LT
 - Y13RPB- STA. 20+00 TO STA. 23+00 LT
 - Y13RPC- STA. 17+00 TO STA. 19+00 RT



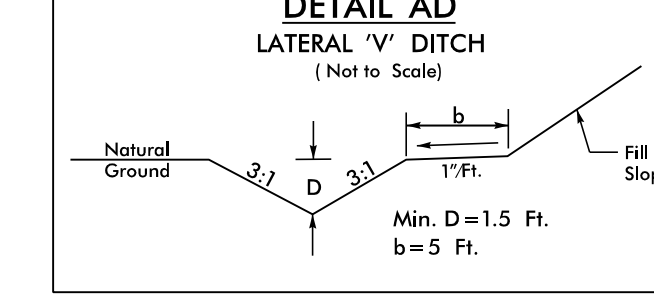
- DETAIL AA**
STANDARD BASE DITCH
(Not to Scale)
- Type of Liner = Class I Rip-Rap
 - L- STA. 420+27 RT, L=116', S=3.82%
BEG. ELEV=175.20, END ELEV=179.63



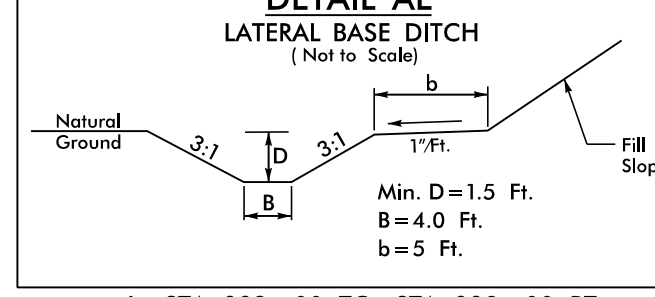
- DETAIL AB**
LATERAL BASE DITCH
(Not to Scale)
- Type of Liner = Class B Rip-Rap
 - L- STA. 331+15 TO STA. 332+00 RT
 - Y13RPA- STA. 16+75 TO STA. 20+00 RT
 - Y13RPD- STA. 12+53 TO STA. 16+50 LT



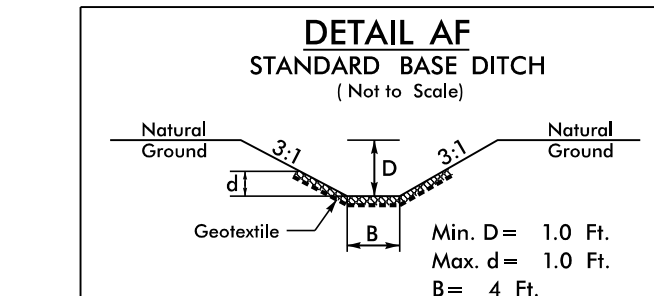
- DETAIL AC**
SPECIAL CUT DITCH
(Not to Scale)
- L- STA. 370+00 TO STA. 371+00 RT
 - Y13- STA. 21+00 TO STA. 25+50 LT
 - Y13- STA. 29+50 TO STA. 31+66 LT
 - Y13DET- STA. 1+00 TO STA. 16+50 LT
 - Y13DET- STA. 30+50 TO STA. 34+00 LT
 - Y13B- STA. 16+25 TO STA. 18+00 LT
 - Y13B- STA. 15+00 TO STA. 18+00 RT
 - Y13RPB- STA. 38+50 TO STA. 40+50 RT
 - Y13RPB XOVER- STA. 11+00 TO STA. 12+75 RT
 - Y14- STA. 14+00 TO STA. 15+00 RT
 - Y16A- STA. 13+00 TO STA. 16+17 LT
 - Y16DET- STA. 12+95 TO STA. 14+00 RT
 - Y16DET- STA. 31+00 TO STA. 33+50 RT



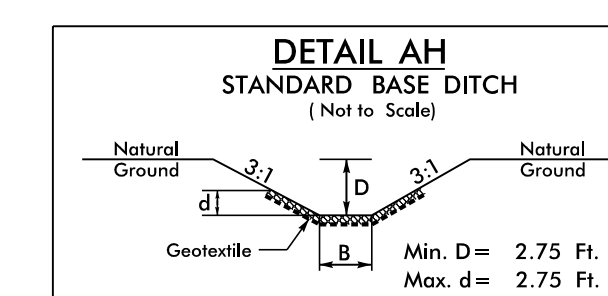
- DETAIL AD**
LATERAL 'V' DITCH
(Not to Scale)
- L- STA. 371+00 TO STA. 371+61 RT
 - L- STA. 375+40 TO STA. 379+00 LT
 - L- STA. 464+20 TO STA. 468+00 RT
 - L- STA. 490+00 TO STA. 496+00 LT
 - Y13- STA. 37+38 TO STA. 45+00 RT
 - Y13B- STA. 10+15 TO STA. 11+56 LT
 - Y13I- STA. 10+50 TO STA. 12+50 LT
 - Y13RPA- STA. 18+50 TO STA. 22+00 LT
 - Y13RPD- STA. 16+15 TO STA. 19+50 RT
 - Y13DET- STA. 16+50 TO STA. 30+75 RT
 - Y15- STA. 11+00 TO STA. 11+50 RT
 - Y16- STA. 29+00 TO STA. 32+00 LT
 - Y16B- STA. 23+00 TO STA. 25+00 LT
 - Y16DET- STA. 14+00 TO STA. 16+00 RT
 - Y16DET- STA. 18+75 TO STA. 21+17 LT



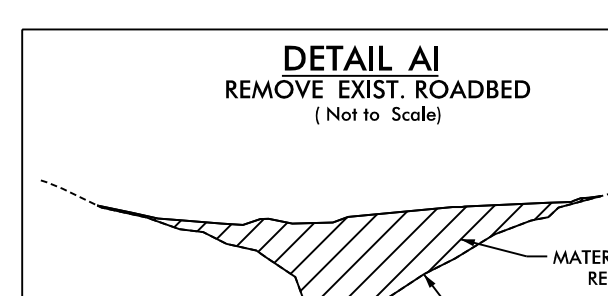
- DETAIL AE**
LATERAL BASE DITCH
(Not to Scale)
- L- STA. 332+00 TO STA. 338+00 RT
 - L- STA. 375+35 TO STA. 376+50 RT
 - L- STA. 489+39 TO STA. 490+00 LT



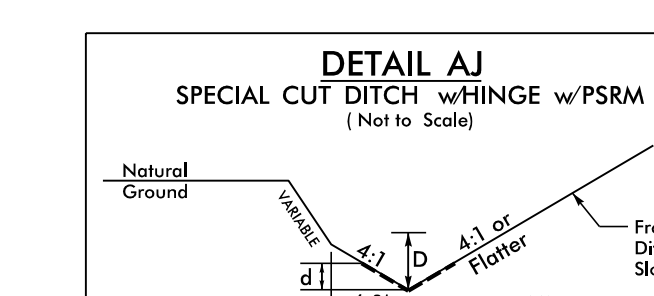
- DETAIL AF**
STANDARD BASE DITCH
(Not to Scale)
- Type of Liner = Class B Rip-Rap
 - Y13B- STA. 20+50 RT, L=57', S=4.9%
BEG. ELEV=154.81, END ELEV=152.00
 - Y13RPD- 18+89 LT, L=44', S=8.3%
BEG. ELEV=160.20, END ELEV=156.57
 - Y13B- STA. 18+80 RT, L=50', S=7.4%
BEG. ELEV=156.70, END ELEV=153.00



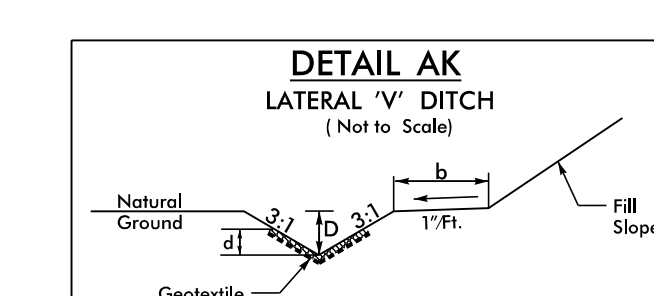
- DETAIL AH**
STANDARD BASE DITCH
(Not to Scale)
- Type of Liner = CL I Rip-Rap
 - Y13I- STA. 13+75 LT, L=15', S=0.5%
BEG. ELEV=175.08, END ELEV=175.00
 - Y15A- STA. 12+20 LT, L=61', S=0.39%
BEG. ELEV=184.44, END ELEV=184.20



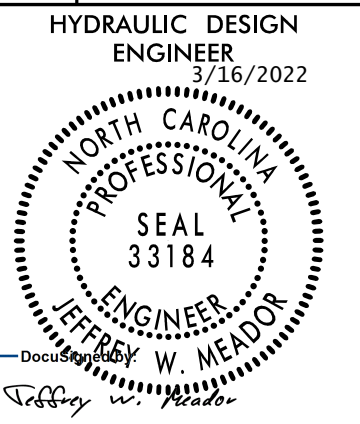
- DETAIL AI**
REMOVE EXIST. ROADBED
(Not to Scale)
- EXCAVATE 400 CY OF EXIST. ROADBED
 - L- STA. 441+93 TO STA. 443+35 RT



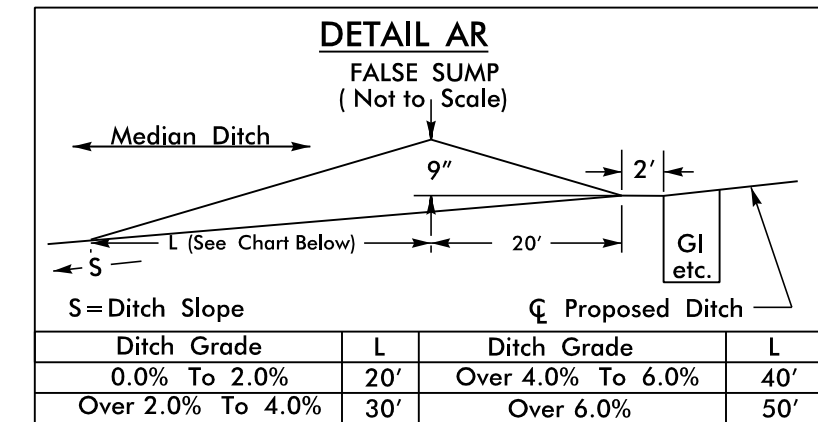
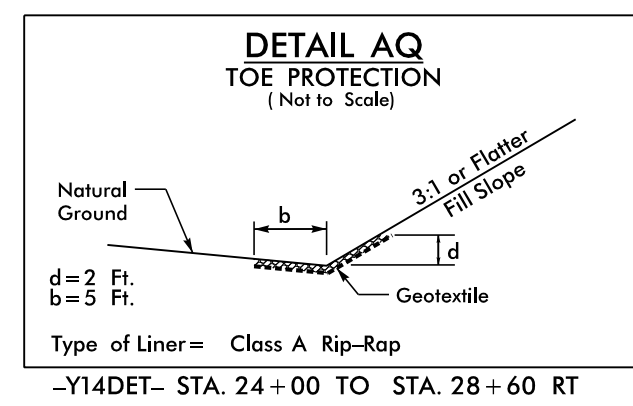
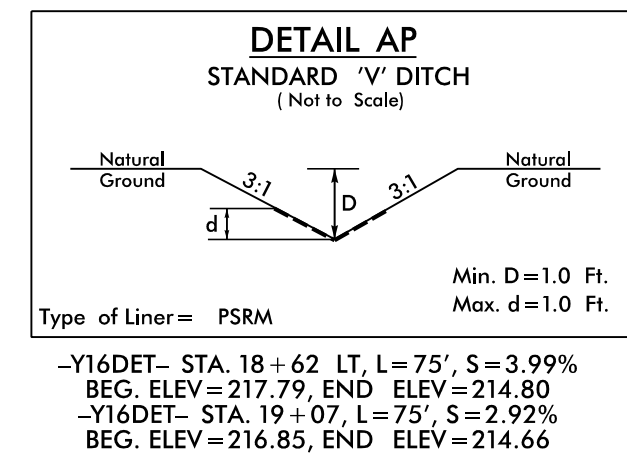
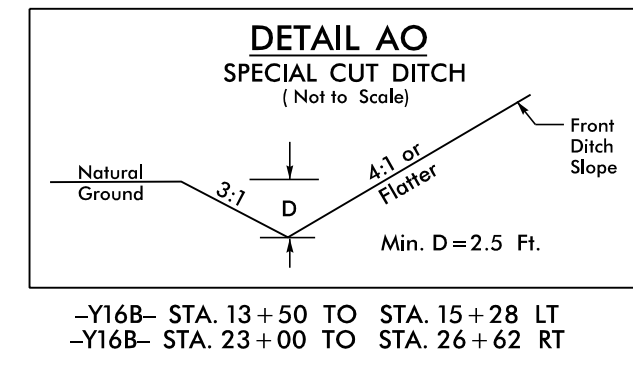
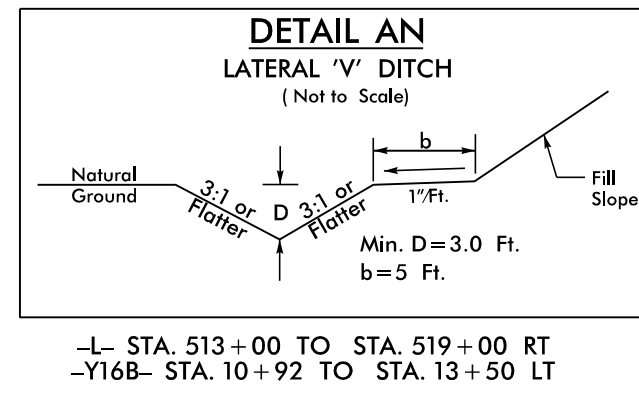
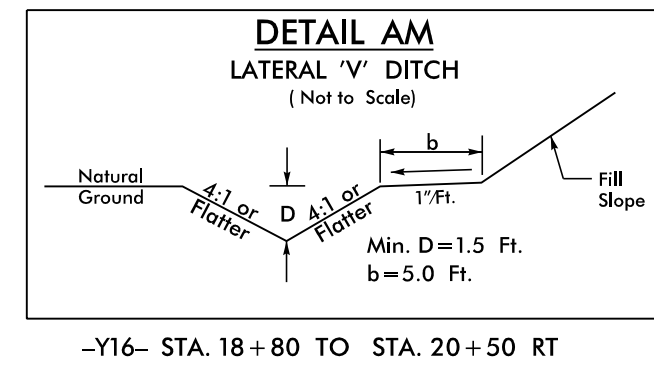
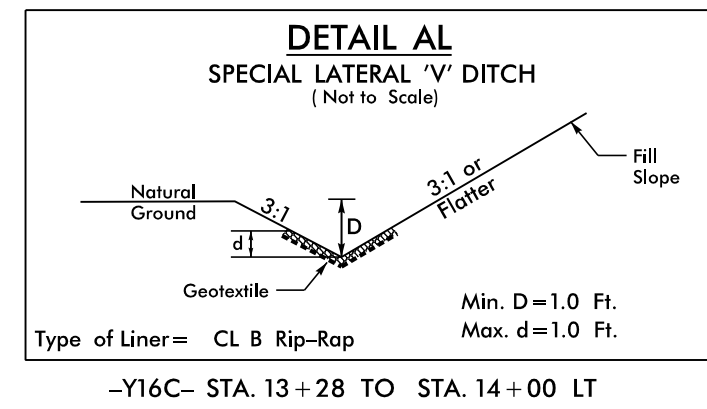
- DETAIL AJ**
SPECIAL CUT DITCH w/PSRM
(Not to Scale)
- Type of Liner = PSRM
 - Y14DET- STA. 10+50 TO STA. 11+78 RT



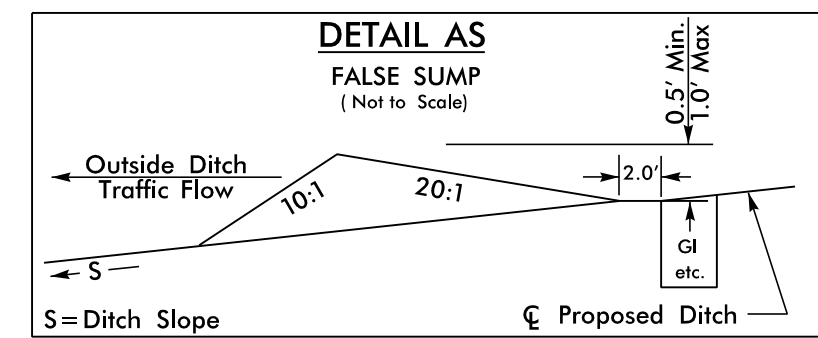
- DETAIL AK**
LATERAL 'V' DITCH
(Not to Scale)
- Type of Liner = CL B Rip-Rap
 - L- STA. 379+00 TO STA. 379+50 LT



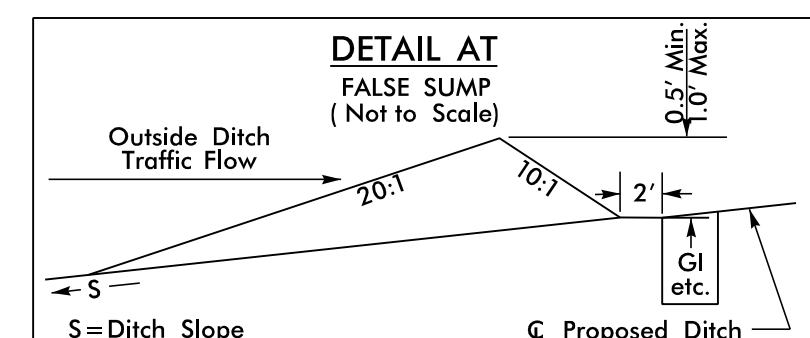
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



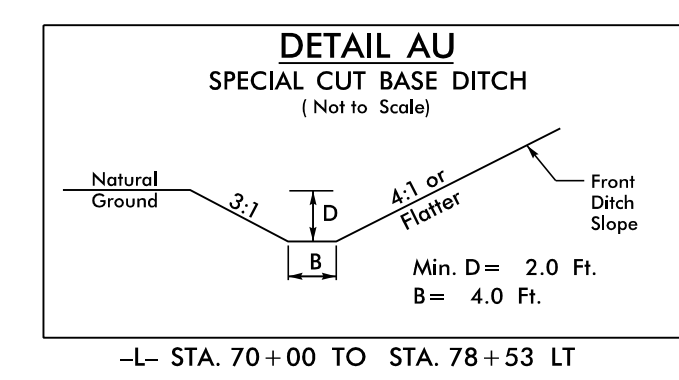
- L- STA. 322+00 MED
- L- STA. 327+50 MED
- L- STA. 334+00 MED
- L- STA. 339+00 MED
- L- STA. 341+00 MED
- L- STA. 347+50 MED
- L- STA. 350+50 MED
- L- STA. 356+50 MED LT
- L- STA. 356+50 MED RT
- L- STA. 364+50 MED
- L- STA. 368+00 MED
- L- STA. 371+50 MED
- L- STA. 375+37 MED
- L- STA. 380+00 MED
- L- STA. 385+00 MED
- L- STA. 387+50 MED
- L- STA. 390+50 MED
- L- STA. 400+00 MED
- L- STA. 405+00 MED
- L- STA. 413+50 MED
- L- STA. 419+50 MED
- L- STA. 422+00 MED
- L- STA. 434+00 MED
- L- STA. 437+00 MED
- L- STA. 440+00 MED
- L- STA. 443+00 MED
- L- STA. 444+00 MED
- L- STA. 451+80 MED LT
- L- STA. 451+80 MED RT
- L- STA. 456+87 MED
- L- STA. 462+00 MED
- L- STA. 464+23 MED
- L- STA. 472+50 MED
- L- STA. 482+00 MED
- L- STA. 485+00 MED
- L- STA. 489+72 MED
- L- STA. 496+50 MED
- L- STA. 499+50 MED
- L- STA. 506+50 MED LT
- L- STA. 506+50 MED RT



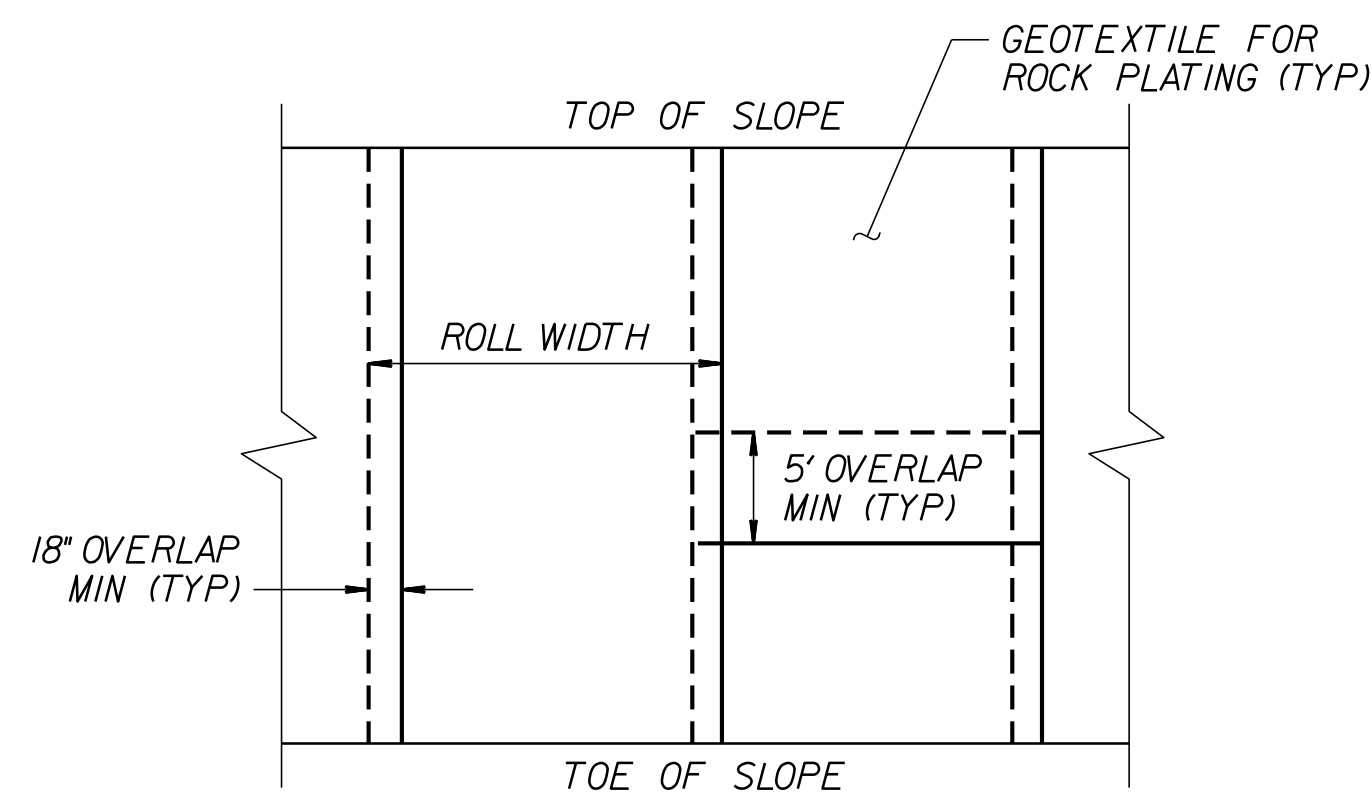
- L- STA. 354+00 LT
- L- STA. 356+50 LT
- L- STA. 358+00 LT
- L- STA. 361+50 LT
- L- STA. 364+50 LT
- L- STA. 368+00 LT
- L- STA. 372+00 LT
- L- STA. 377+50 RT
- L- STA. 380+50 RT
- L- STA. 385+00 RT
- L- STA. 387+50 RT
- L- STA. 390+50 RT
- L- STA. 417+50 RT
- L- STA. 422+00 RT
- L- STA. 425+00 RT
- L- STA. 434+00 LT
- L- STA. 444+00 RT
- L- STA. 446+50 RT
- L- STA. 449+00 RT
- L- STA. 451+80 RT
- L- STA. 454+00 LT
- Y13- STA. 57+00 LT
- Y13RPA- STA. 22+50 LT
- Y13RPD- STA. 22+50 RT
- Y13RPD- STA. 23+50 LT
- Y13RPD- STA. 31+00 RT
- Y13RPD- STA. 34+67 RT
- Y13RPC- STA. 20+00 LT
- Y13RPC- STA. 20+50 RT
- Y13CUL_2- STA. 12+00 RT



- L- STA. 339+00 RT
- L- STA. 341+00 RT
- L- STA. 343+36 RT
- L- STA. 354+00 RT
- L- STA. 355+50 RT
- L- STA. 356+50 RT
- L- STA. 380+00 LT
- L- STA. 385+00 LT
- L- STA. 422+00 LT
- L- STA. 435+00 RT
- L- STA. 437+00 RT
- L- STA. 440+00 RT
- L- STA. 444+00 LT
- L- STA. 446+50 LT
- L- STA. 451+80 LT
- L- STA. 454+00 LT
- L- STA. 496+50 LT
- Y13RPB- STA. 24+50 LT
- Y13B- STA. 17+27 LT



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**GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)**

ESTIMATED MATERIAL QUANTITIES FOR ROCK EMBANKMENTS

ROCK EMBANKMENTS = 670 TONS
 RIP RAP, CLASS A = 115 TONS
 *57 STONE (SELECT MATERIAL, CLASS VI) = 260 TONS
 GEOTEXTILE FOR ROCK EMBANKMENTS = 480 SY

ROCK EMBANKMENTS

FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS SPECIAL PROVISION.

USE ROCK EMBANKMENTS AT FOLLOWING LOCATIONS:

-LINE-	APPROX. BEGINNING STATION	APPROX. ENDING STATION	LOCATION LT/RT	N.W.S. ELEVATION	TOP OF ROCK EMBANKMENTS ELEVATION
-L-	440+73 +/-	441+98 +/-	LEFT	158.6'	159.6'

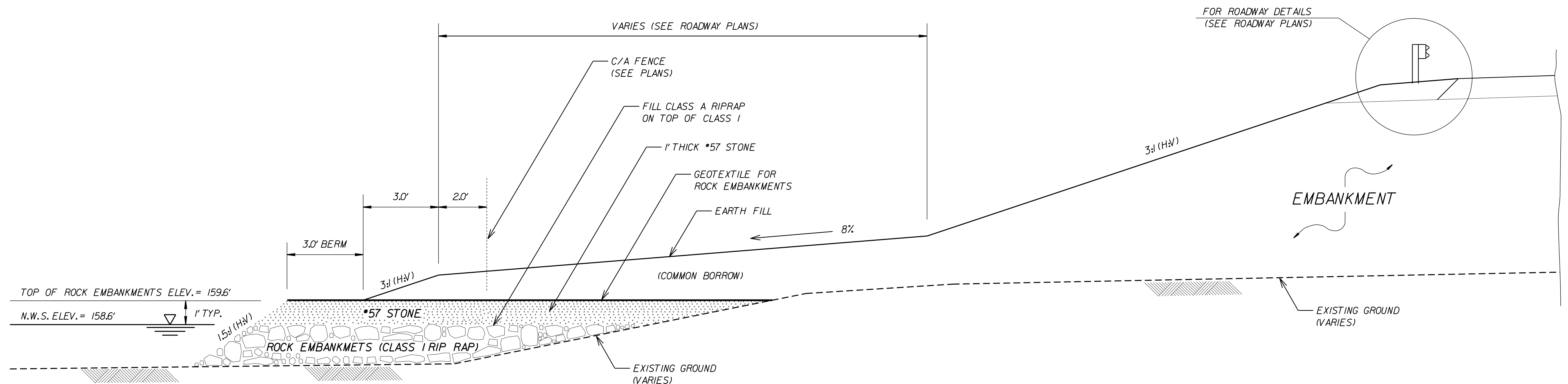
USE CLASS I SELECT MATERIAL FOR ROCK EMBANKMENTS.

CONSTRUCT ROCK EMBANKMENTS TO THE ELEVATION SHOWN IN THE ROCK EMBANKMENTS TYPICAL SECTION AND ACCORDING TO THE ROCK EMBANKMENTS SPECIAL PROVISION.

FILL VOIDS IN THE TOP OF ROCK EMBANKMENTS WITH CLASS A RIP RAP.

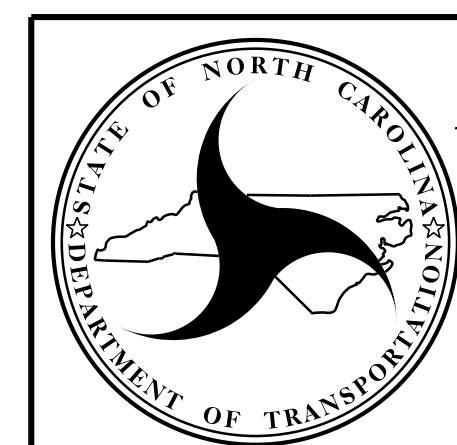
PLACE *57 STONE AS SHOWN IN THE ROCK EMBANKMENTS TYPICAL SECTION.

INSTALL GEOTEXTILE ON TOP OF *57 STONE IN ACCORDANCE WITH THE ARTICLE 270-3 OF THE STANDARD SPECIFICATIONS.



ROCK EMBANKMENTS TYPICAL SECTION

(SEE TABLE FOR LOCATIONS AND ELEVATIONS)
(NOT TO SCALE)



**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

ROCK EMBANKMENTS DETAILS

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