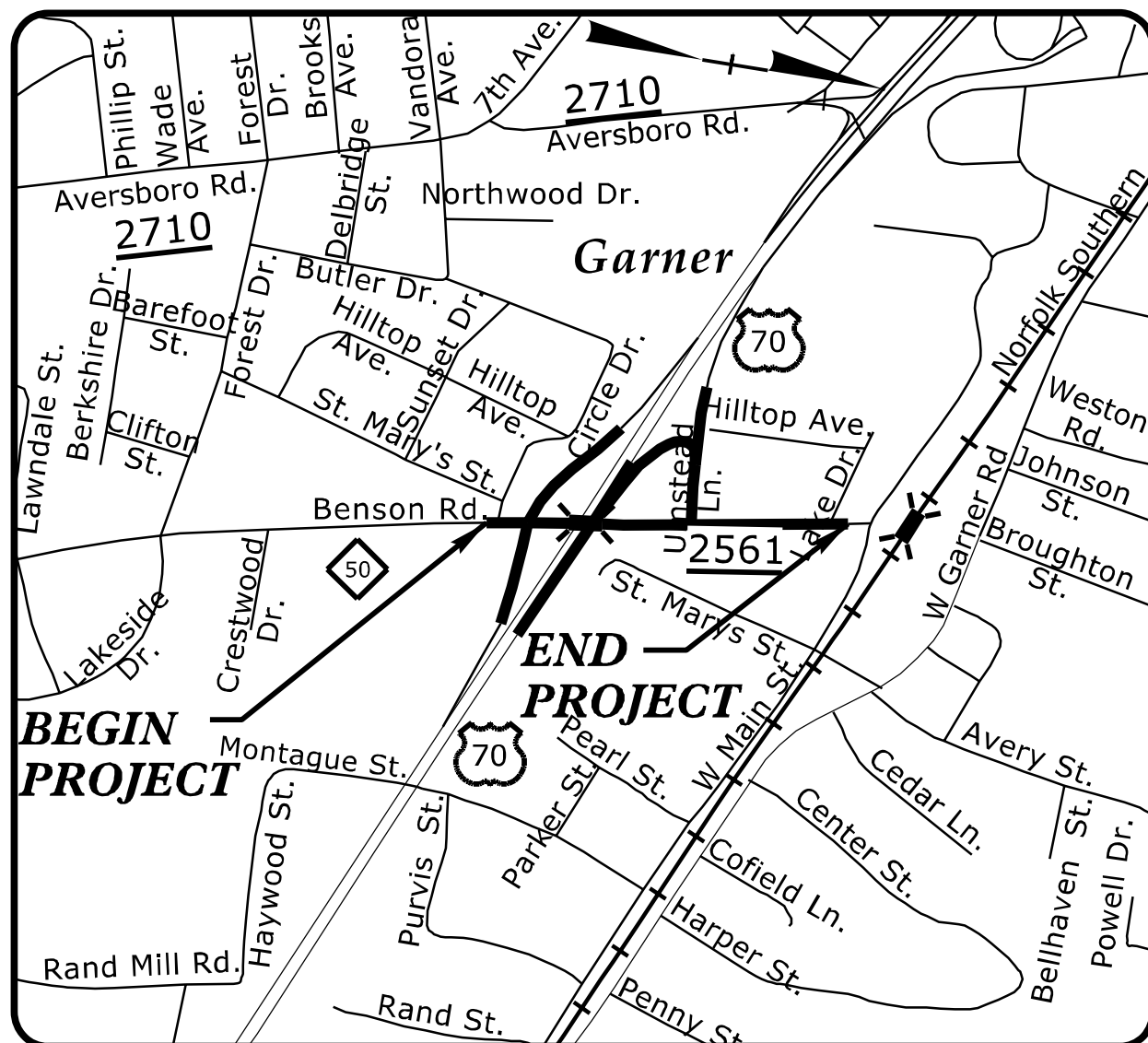


**TIP PROJECT: B-4654**

**CONTRACT: C204410**



**VICINITY MAP**  
NOT TO SCALE

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

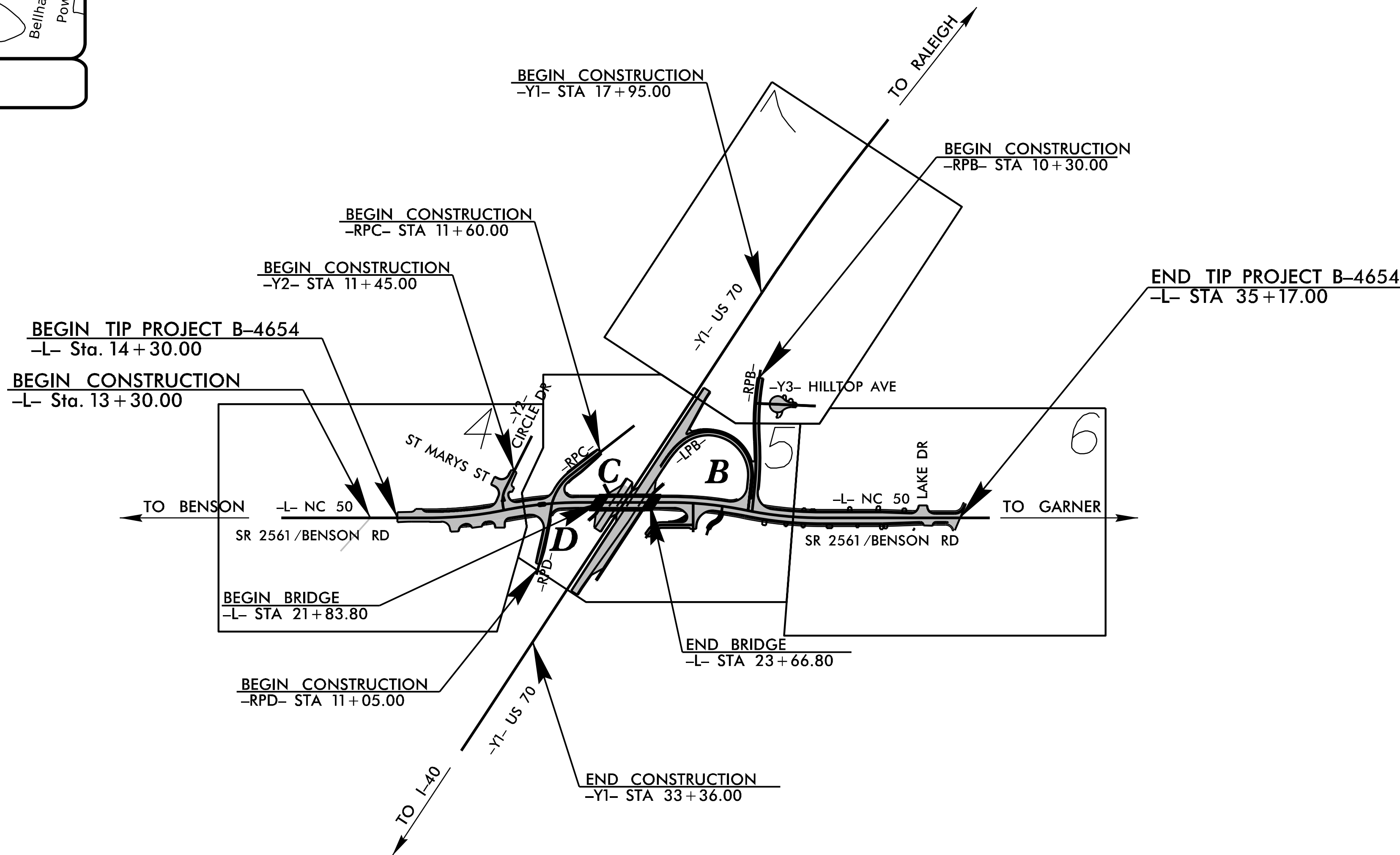
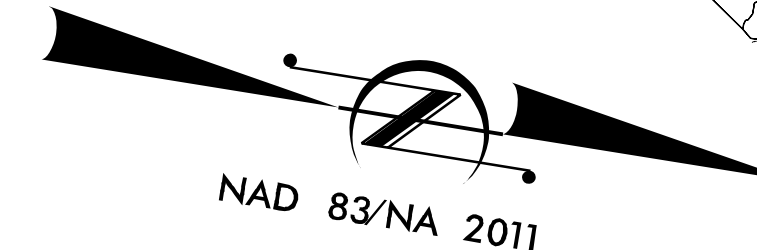
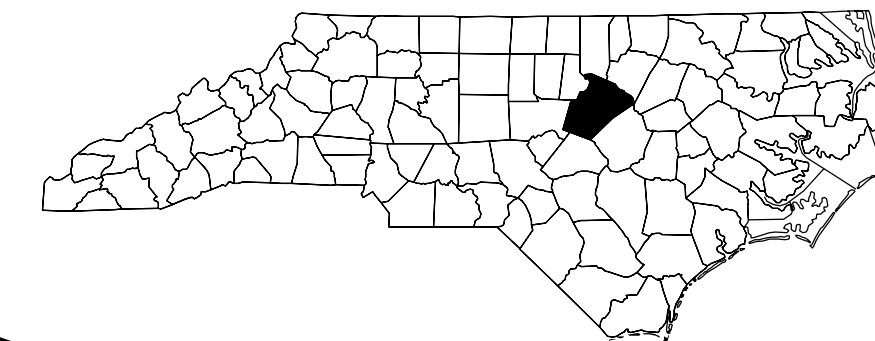
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# WAKE COUNTY

**LOCATION: REPLACE BRIDGE 910069 OVER US 70 ON NC 50 (BENSON ROAD)**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, RETAINING WALLS & STRUCTURES**

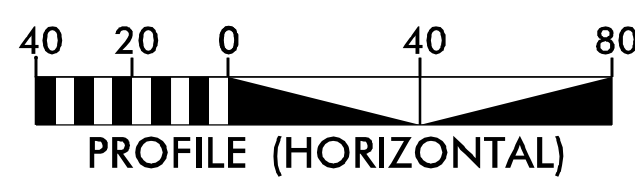
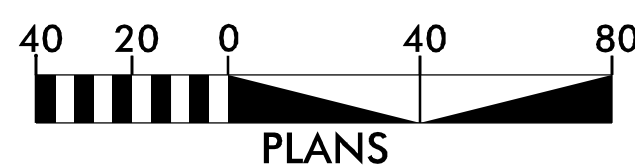
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4654	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38454.1.2		PE	
38454.2.1		RW & UTILITIES	
38454.3.1	0070245	CONSTRUCTION	



\*DESIGN EXCEPTION REQUIRED FOR MIN. K VALUE ON -LPB-  
US 70 IS A CONTROLLED ACCESS FACILITY WITHIN THE PROJECT LIMITS

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2020 = 13,420  
ADT 2040 = 14,700  
K = 10%  
D = 55%  
T = 6 % \*  
V = 40 MPH  
\* TTST = 1% DUAL 5%  
FUNC CLASS = MINOR ARTERIAL REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4654 = 0.361 MILES  
LENGTH BRIDGE TIP PROJECT B-4654 = 0.035 MILES  
TOTAL LENGTH OF TIP PROJECT B-4654 = 0.396 MILES



Prepared in the Office of:  
NC FIRM LICENSE No: F-0342  
5438 Wade Park Boulevard, Suite 200  
Raleigh, NC 27607  
(919) 854-6200 - (919) 854-6259(FAX)

2024 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
NOVEMBER 2, 2018

**LETTING DATE:**  
APRIL 16, 2024

**EDWARD G. EDENS, JR., PE**  
PROJECT ENGINEER

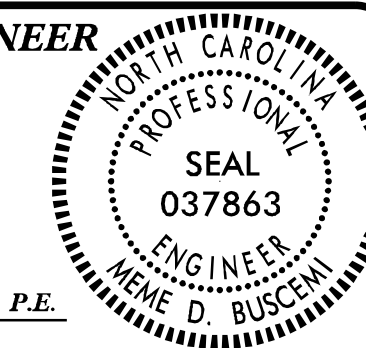
**JOHN C. MORRISON, PE**  
PROJECT DESIGN ENGINEER

**DAVID S. STUTTS, PE**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

1/11/2024

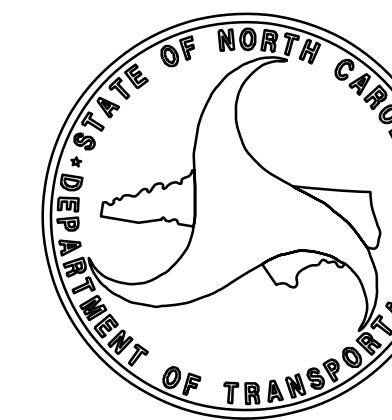
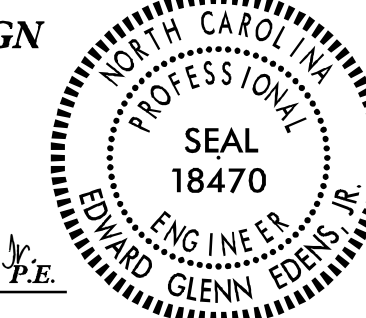
DocuSigned by:  
**W. D. Buscemi**  
SIGNATURE: W. D. BUSCEMI P.E.



**ROADWAY DESIGN ENGINEER**

1/11/2024

DocuSigned by:  
**Edward Glenn Edens, Jr.**  
SIGNATURE: EDWARD GLENN EDENS, JR. P.E.



STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

# INDEX OF SHEETS, GENERAL NOTES AND 2024 ROADWAY ENGLISH STANDARD DRAWINGS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-4	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	BRIDGE RELATIONSHIP DETAIL
2B-2 THRU 2B-3	INTERSECTION DETAILS
2C-1	CONCRETE FLUME IN 2'-6" C&G DETAIL
2C-2	DETAIL OF 1'-6" TO 2'-6" C&G TRANSITION SECTION DETAIL
2C-3	CONVERT EXISTING D1 TO JUNCTION BOX W/ MANHOLE
2D-1	PROPOSED OFFSET CATCH BASIN DETAIL
2D-2	PROPOSED OFFSET ZG1
2G-1	STANDARD TEMPORARY SHORING DETAIL
2G-2 THRU 2G-4	STANDARD TEMPORARY WALL DETAIL
3B-1	ROADWAY SUMMARIES
3D-1 THRU 3D-3	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARIES
4 THRU 7	PLAN SHEETS
8 THRU 11	PROFILE SHEETS
RW-01 THRU RW-07	RIGHT OF WAY PLANS
TMP-1 THRU TMP-15	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-4	PAVEMENT MARKING PLANS
L-1 THRU L-3	ELECTRICAL PLANS
ECS-1	ELECTRICAL CONDUIT SYSTEM PLANS
EC-1 THRU EC-11	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-11	SIGNING PLANS
SIG-1.0 THRU SCP-3	SIGNAL PLANS
UC-1 THRU UC-9	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-5	UTILITIES BY OTHERS PLANS
X-1A	CROSS SECTION SUMMARY SHEET
X-1 THRU X-25	CROSS SECTIONS
TS, S-1 THRU S-49, SN	STRUCTURE PLANS
W-1 THRU W-5	WALL PLANS

EFF. 01-16-2024  
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2024 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 Superlevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
423.03	Bridge Approach Fills - Type 2 Approach Fill for Bridge Abutment with MSE Wall
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS	
700.01	Concrete Pavement Joints - Construction and Contraction Joints
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
806.03	Concrete Control of Access Marker
815.02	Subsurface Drain
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
840.17	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
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.37	Steel Grate and Frame
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
852.01	Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
866.02	Woven Wire Fence - with Wood Post
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES: 2024 SPECIFICATIONS  
EFFECTIVE: 01-16-2024  
REVISED:

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

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

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

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

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

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

DRIVEWAYS:  
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADIUS OR RADIUS 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 RADIUS 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 PSNC (Gas), Duke Energy (Power), City of Raleigh (Water and Sewer), Charter Spectrum (CATV), Windstream/Telecom, AT&T (Telecom).  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

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

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

12/2/2016

# 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	----- x
Property Monument	□ ECM
Parcel/Sequence Number	⑩ 23
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	⊙ CSX TRANSPORTATION MILEPOST 35
Switch	▭ SWITCH
RR Abandoned	-----
RR Dismantled	-----

Note: Not to Scale \*S.U.E. = Subsurface Utility Engineering

## 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	----- R W
New Right of Way Line with Pin and Cap	----- R W ▲
New Right of Way Line with Concrete or Granite R/W Marker	----- R W ▲
New Control of Access Line with Concrete C/A Marker	----- R W ▲
Existing Control of Access	----- C/A
New Control of Access	----- C/A
Existing Easement Line	----- E
New Temporary Construction Easement	----- E
New Temporary Drainage Easement	----- TDE
New Permanent Drainage Easement	----- PDE
New Permanent Drainage / Utility Easement	----- DUE
New Permanent Utility Easement	----- PUE
New Temporary Utility Easement	----- TUE
New Aerial Utility Easement	----- AUE

## ROADS AND RELATED FEATURES:

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

## VEGETATION:

Single Tree	☼
Single Shrub	☼

Hedge	-----
Woods Line	-----
Orchard	☼ ☼ ☼ ☼
Vineyard	▭ Vineyard

## EXISTING STRUCTURES:

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

## UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊙ P
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	●
H-Frame Pole	●
U/G Power Line LOS B (S.U.E.*)	----- P
U/G Power Line LOS C (S.U.E.*)	----- P
U/G Power Line LOS D (S.U.E.*)	----- P

## TELEPHONE:

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

## WATER:

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

## TV:

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

## GAS:

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

## SANITARY SEWER:

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

## MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	----- 7U/L
U/G Tank; Water, Gas, Oil	▭
Underground Storage Tank, Approx. Loc.	⊠ UST
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.

6/12/2024

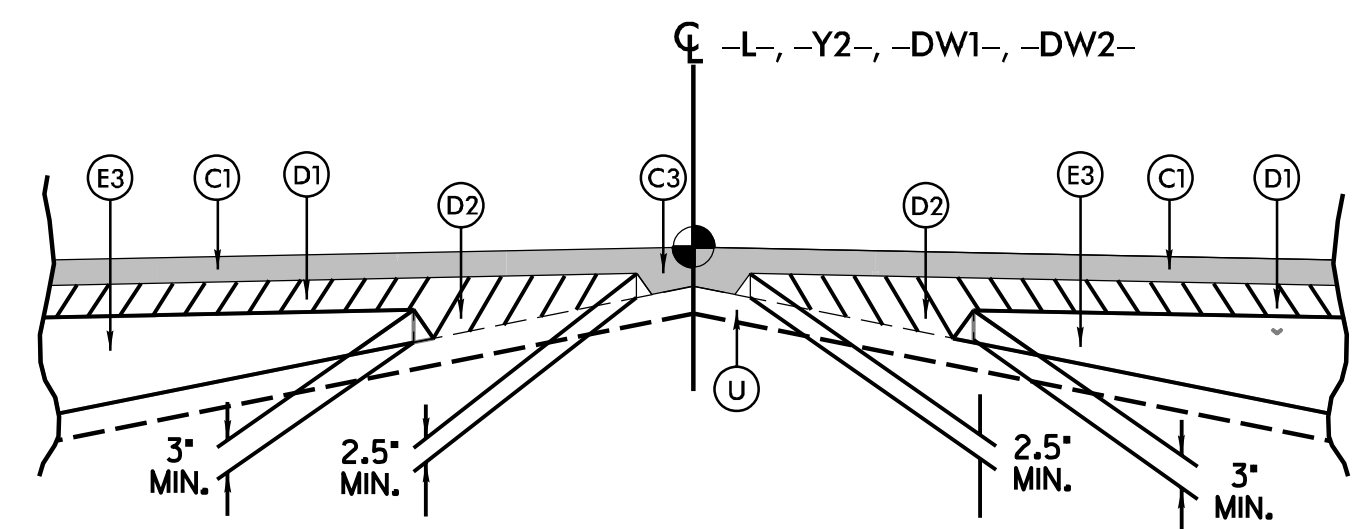
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3/1/2024

PAVEMENT SCHEDULE FINAL PAVEMENT DESIGN	
A1	6" CONCRETE TRUCK APRON WITH WIRE.
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 110 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
C4	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C5	PROP. APPROX 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF 2 LAYERS
C6	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2.0" IN DEPTH.
D1	PROP. APPROX 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD
E2	PROP. APPROX. 5.0" ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT GREATER THAN 3.0" IN DEPTH OR LESS THAN 5.5" IN DEPTH.
J1	4" AGGREGATE BASE COURSE.
R1	2'-6" CONCRETE CURB AND GUTTER.
R2	1'-6" CONCRETE CURB AND GUTTER.
R3	PRECAST REINFORCED SINGLE FACED CONCRETE BARRIER.

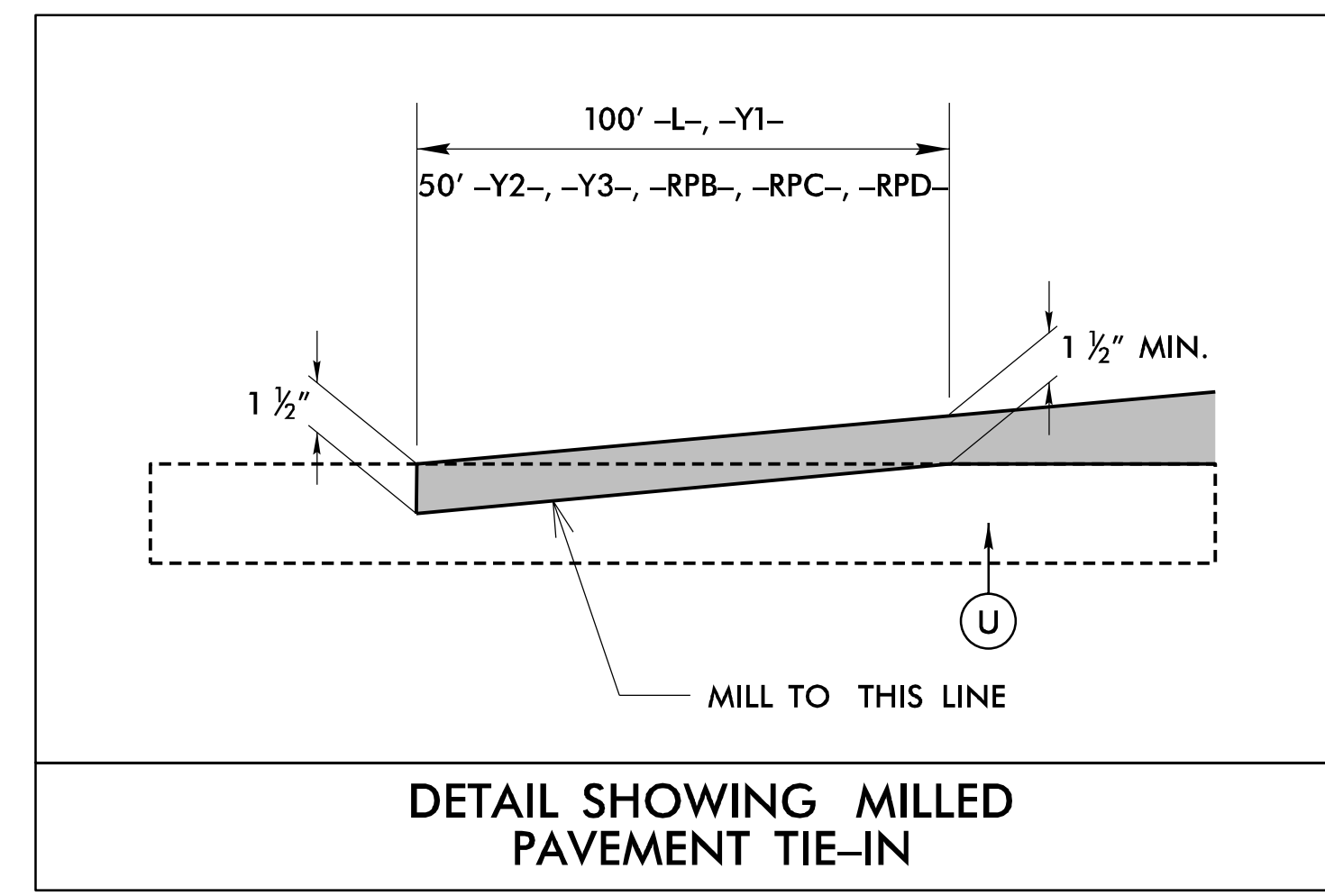
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING W1).
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING W2).

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

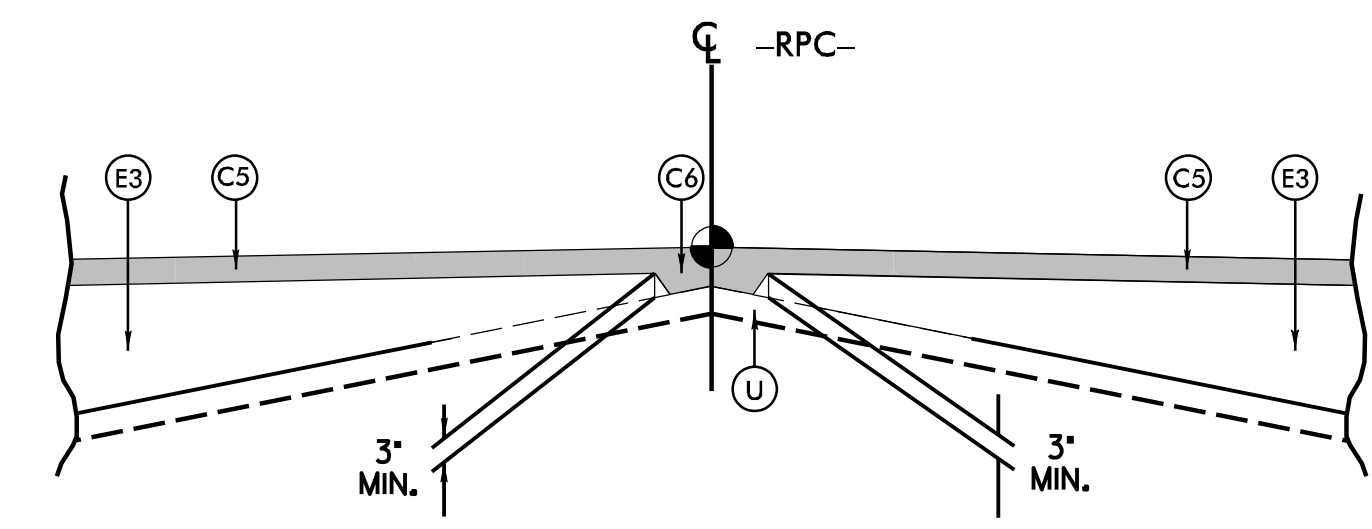


W1: Detail Showing Method of Wedging

USE THIS DETAIL IN CONJUNCTION WITH TYPICAL SECTIONS #1, 2, 7, 11, 12

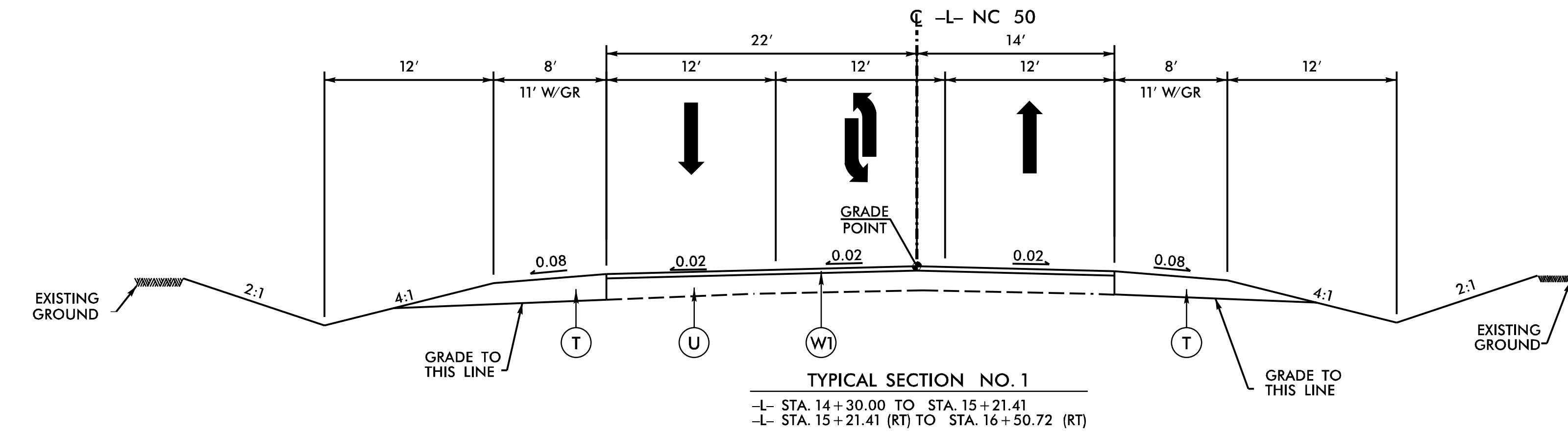


DETAIL SHOWING MILLED PAVEMENT TIE-IN

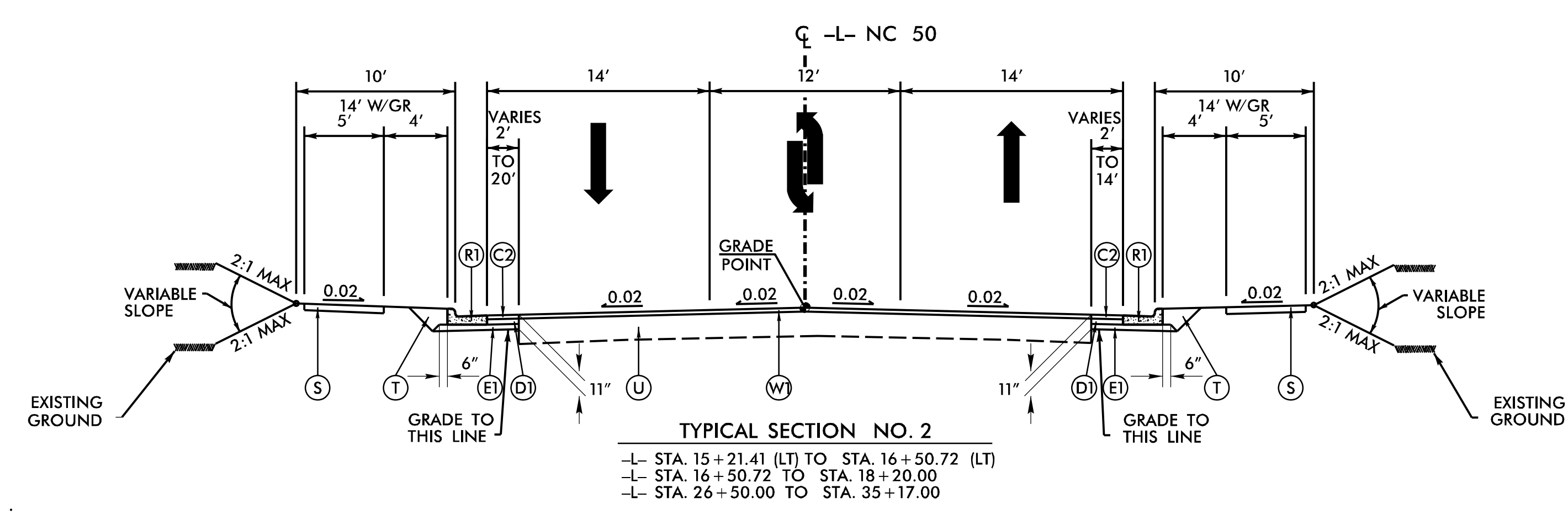


W2: Detail Showing Method of Wedging

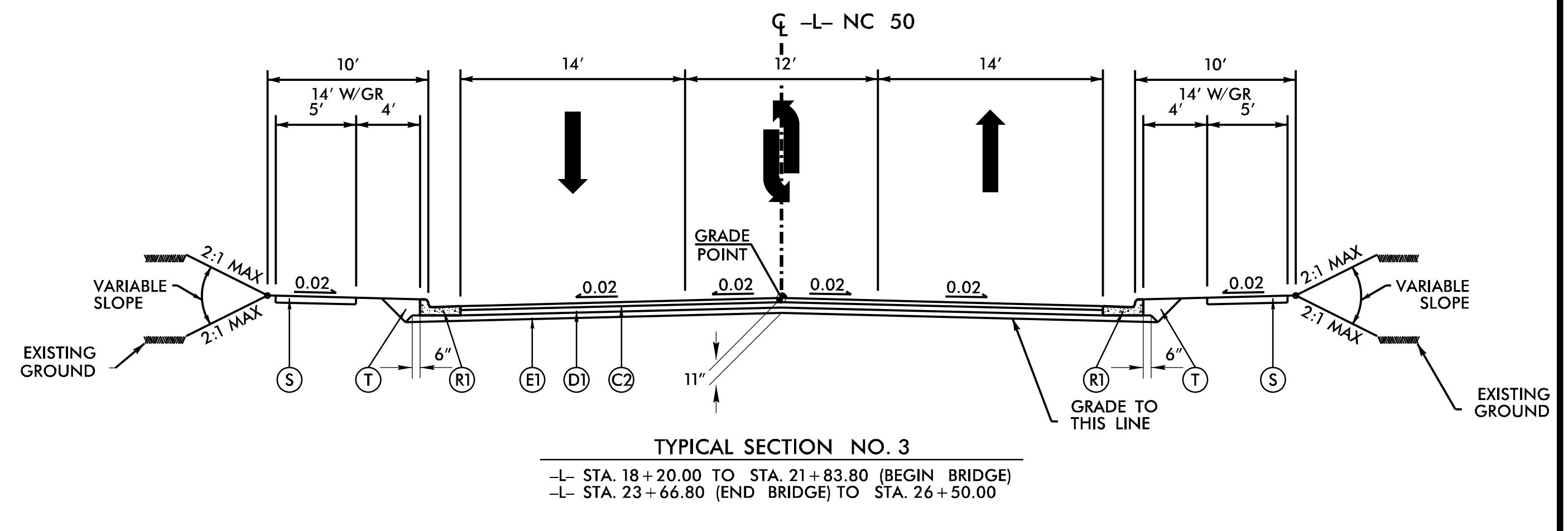
USE THIS DETAIL IN CONJUNCTION WITH TYPICAL SECTION #17



TYPICAL SECTION NO. 1  
-L- STA. 14+30.00 TO STA. 15+21.41  
-L- STA. 15+21.41 (RT) TO STA. 16+50.72 (RT)



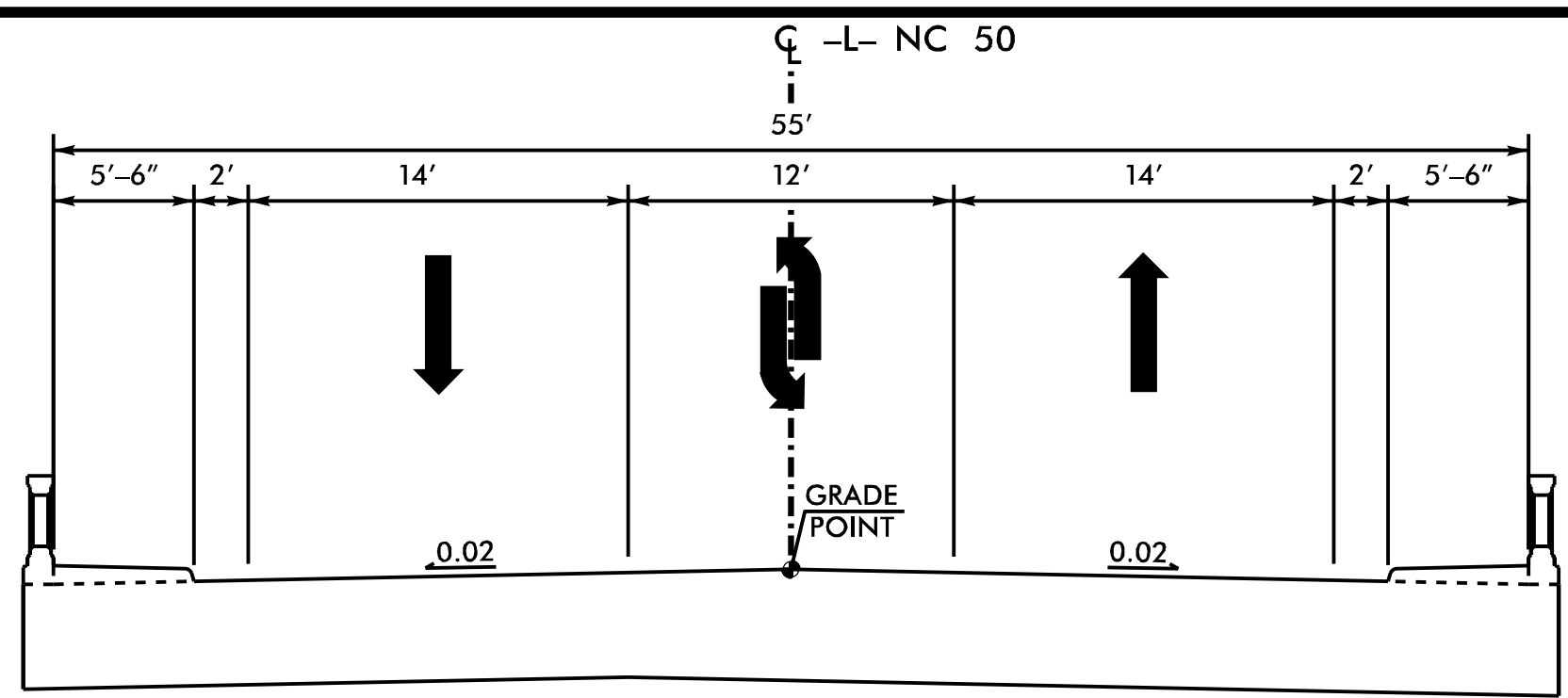
TYPICAL SECTION NO. 2  
-L- STA. 15+21.41 (LT) TO STA. 16+50.72 (LT)  
-L- STA. 16+50.72 TO STA. 18+20.00  
-L- STA. 26+50.00 TO STA. 35+17.00



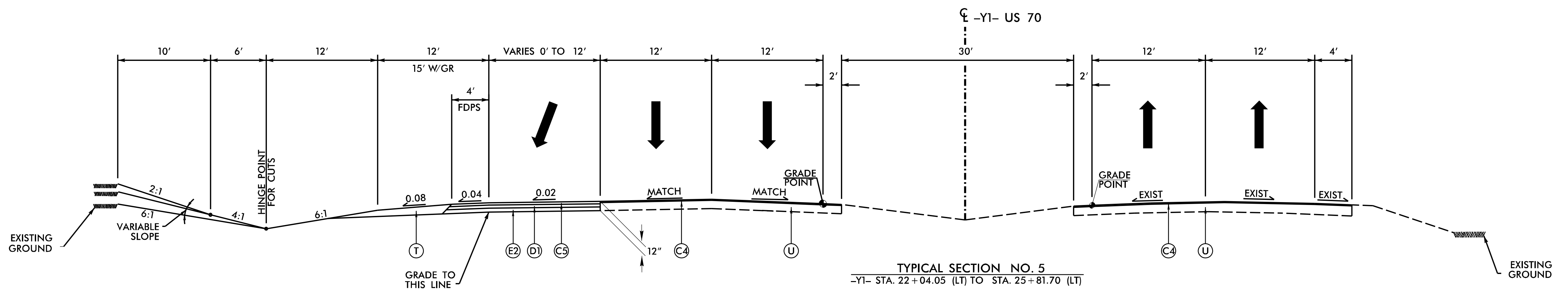
TYPICAL SECTION NO. 3  
-L- STA. 18+20.00 TO STA. 21+83.80 (BEGIN BRIDGE)  
-L- STA. 23+66.80 (END BRIDGE) TO STA. 26+50.00

PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>2A-1</b>
ROADWAY DESIGN ENGINEER 3/11/2024 MOHAMMED FAHMI SEAL 049634	PAVEMENT DESIGN ENGINEER 3/11/2024 SHIHAI ZHANG SEAL 038176
Prepared in the Office of: <b>AECOM</b>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

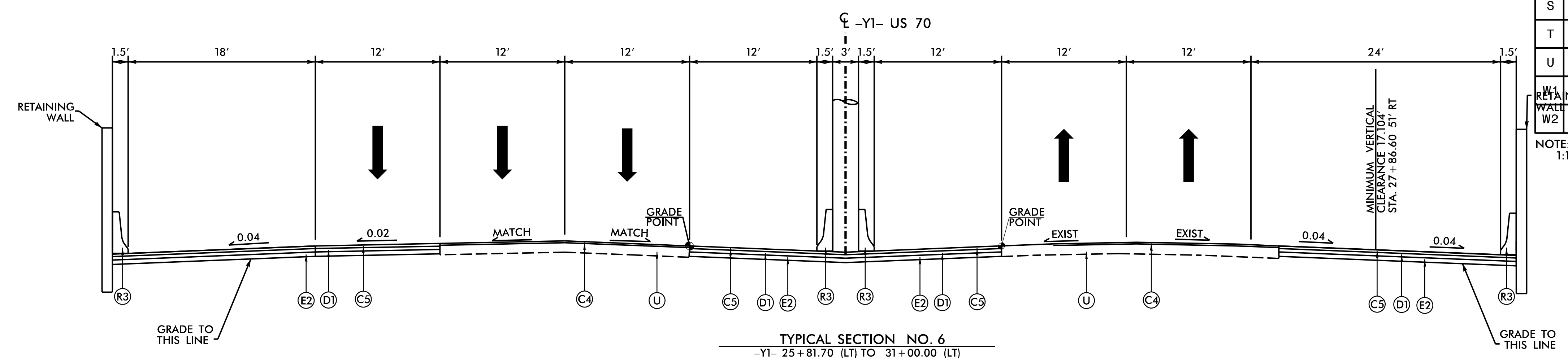
6/22/24  
 3/11/2024  
 L:\Legacy\Projects\60436195-B-4654\9000\_Work\9100\_CAD\70\_NCDOT\_TIP\Roadway\Proj\B4654\_rdy\_ttp.dgn  
 mhammad.falaha



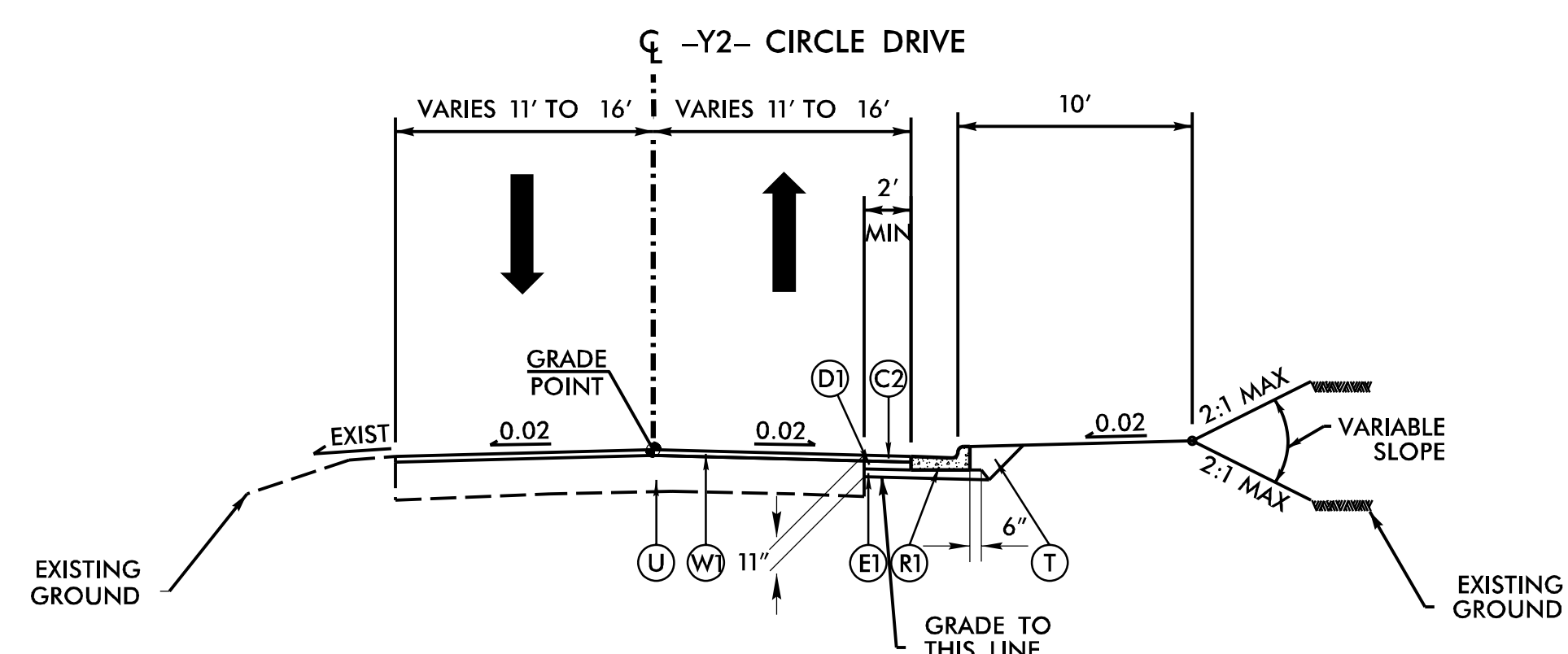
**TYPICAL SECTION NO. 4**  
 -L- STA. 21+83.80 (BEGIN BRIDGE) TO STA. 23+66.80 (END BRIDGE)



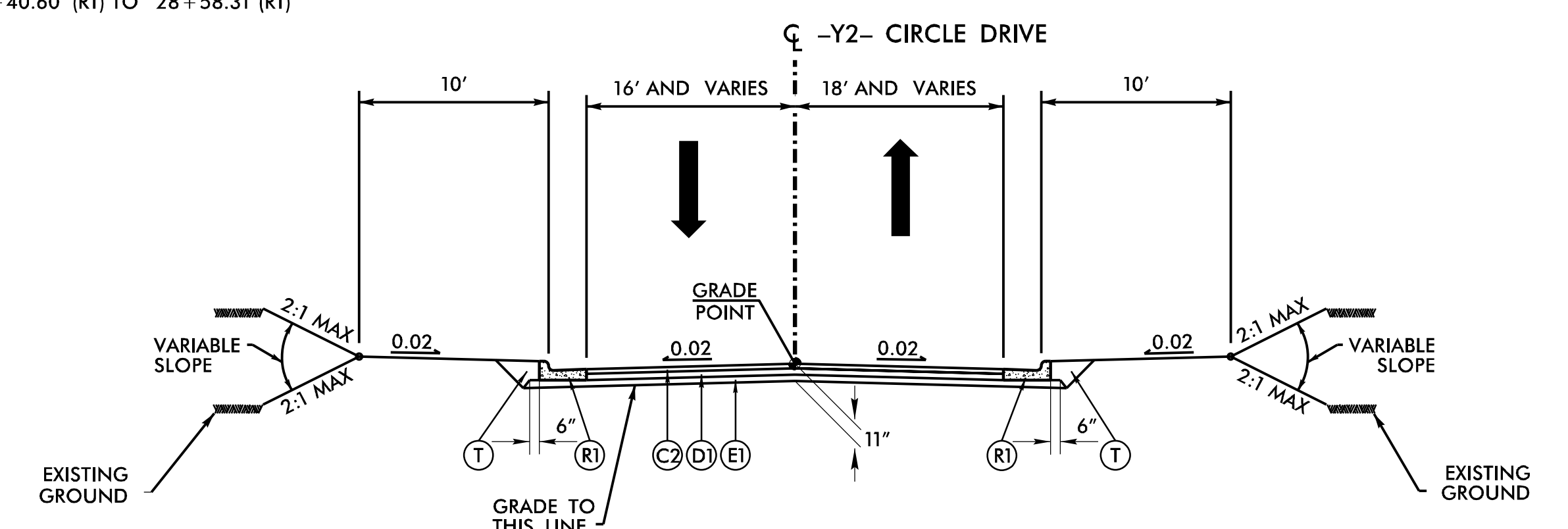
**TYPICAL SECTION NO. 5**  
 -Y1- STA. 22+04.05 (LT) TO STA. 25+81.70 (LT)



**TYPICAL SECTION NO. 6**  
 -Y1- 25+81.70 (LT) TO 31+00.00 (LT)  
 -Y1- 26+64.60 (MED) TO 27+75.86 (MED)  
 -Y1- 26+40.60 (RT) TO 28+58.31 (RT)



**TYPICAL SECTION NO. 7**  
 -Y2- STA. 11+45.00 TO STA. 12+20.00



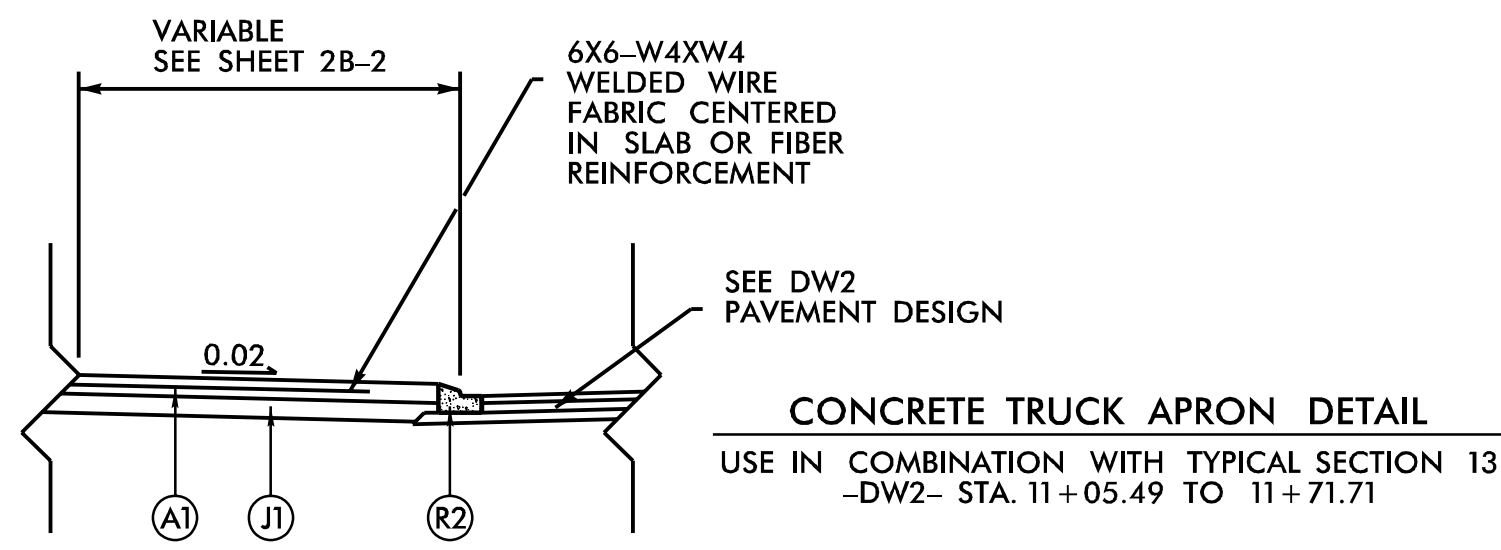
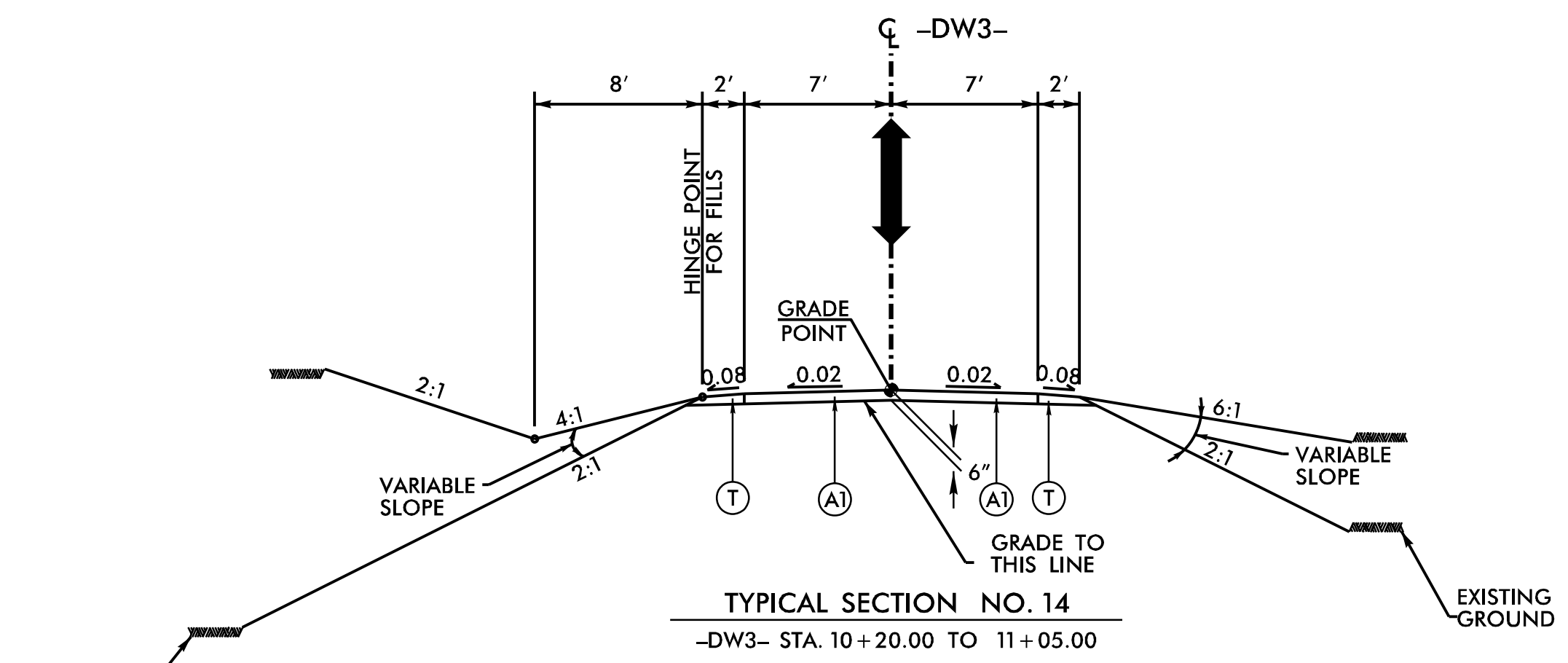
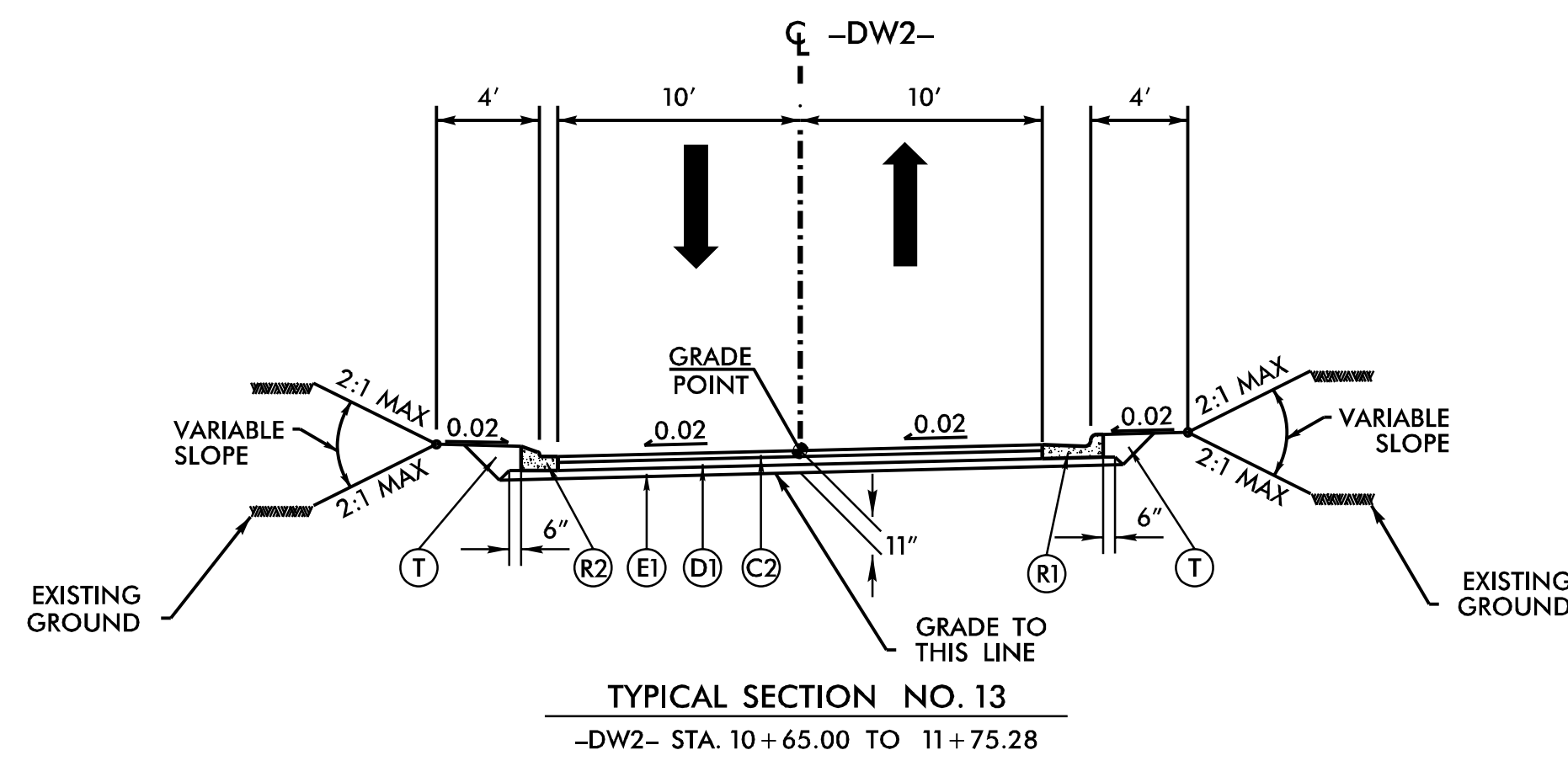
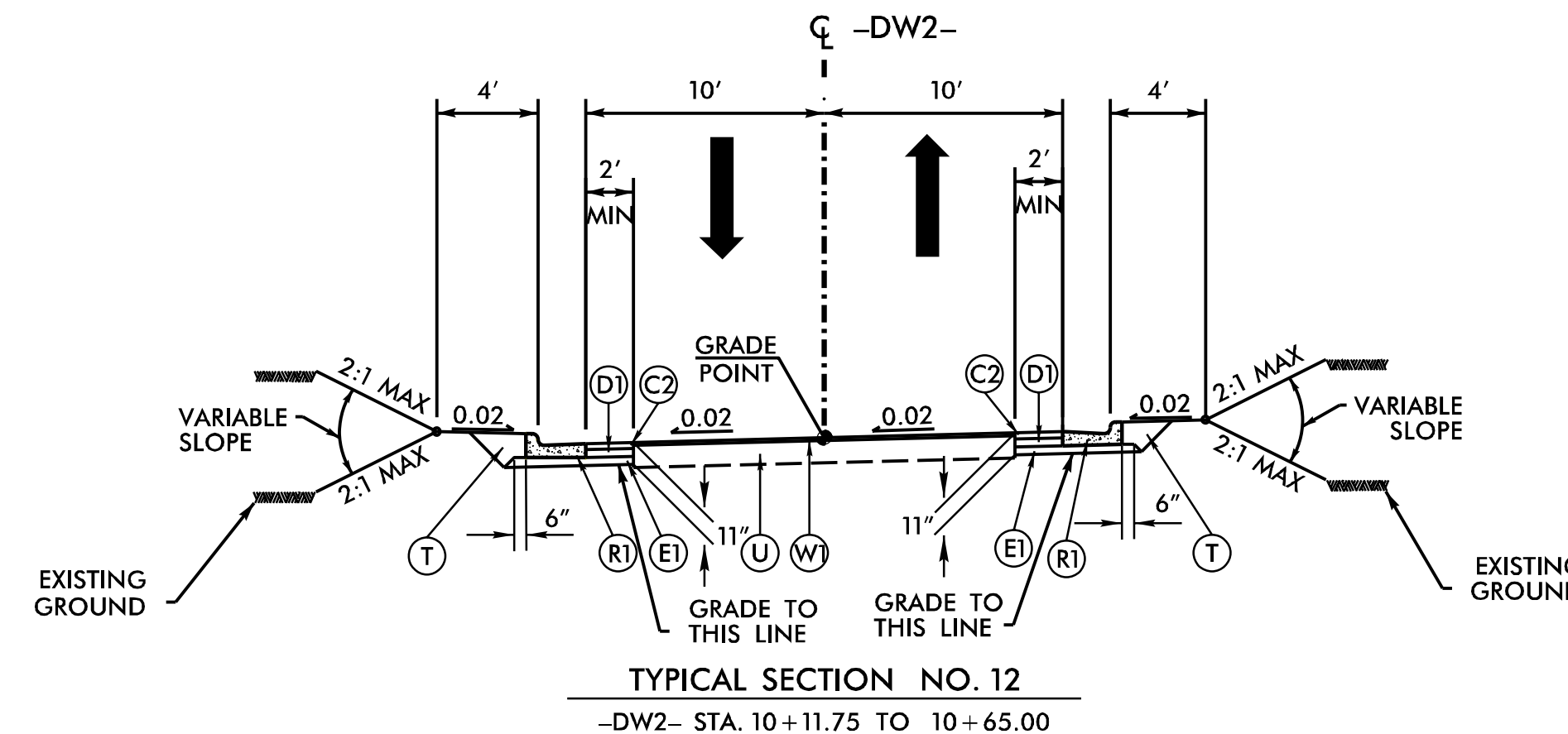
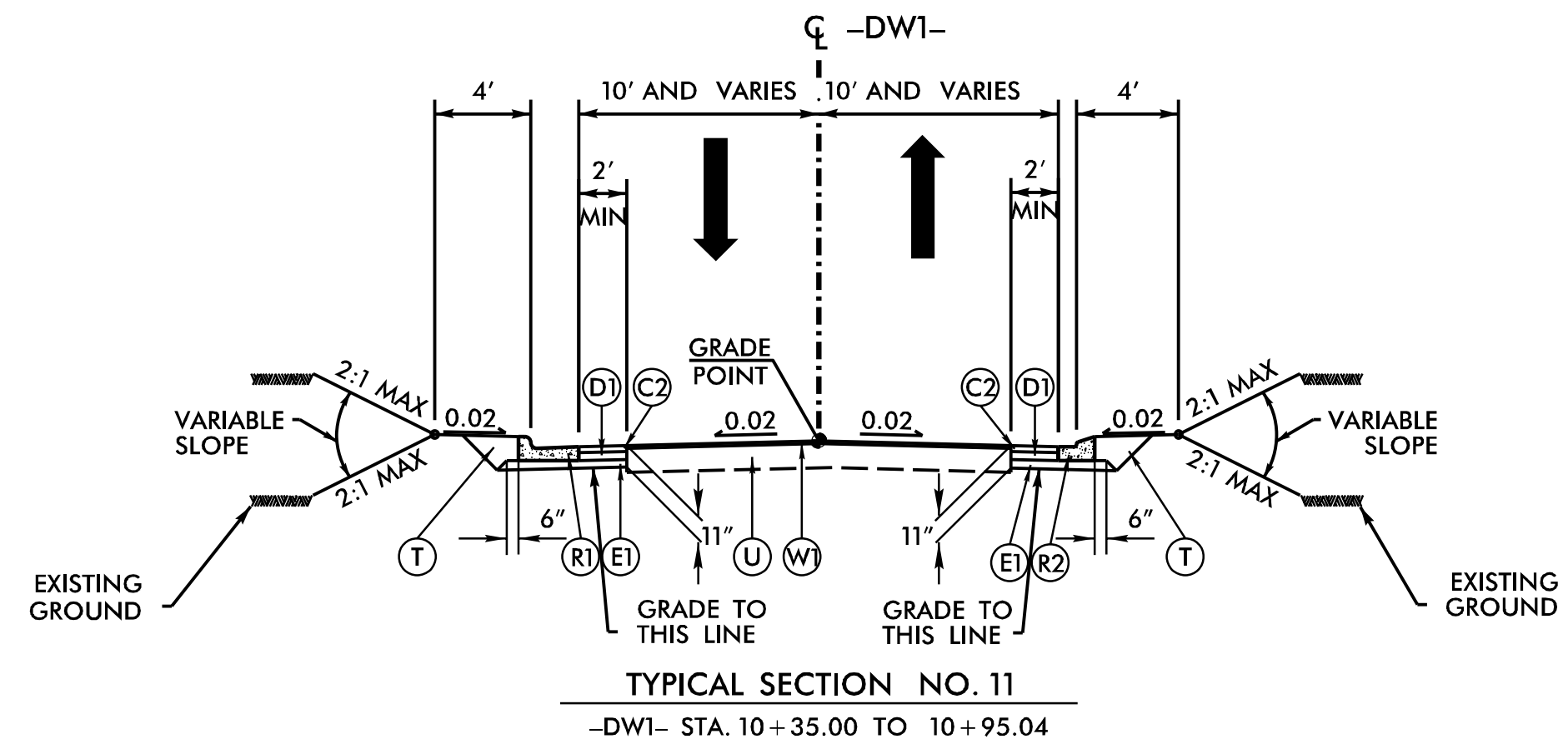
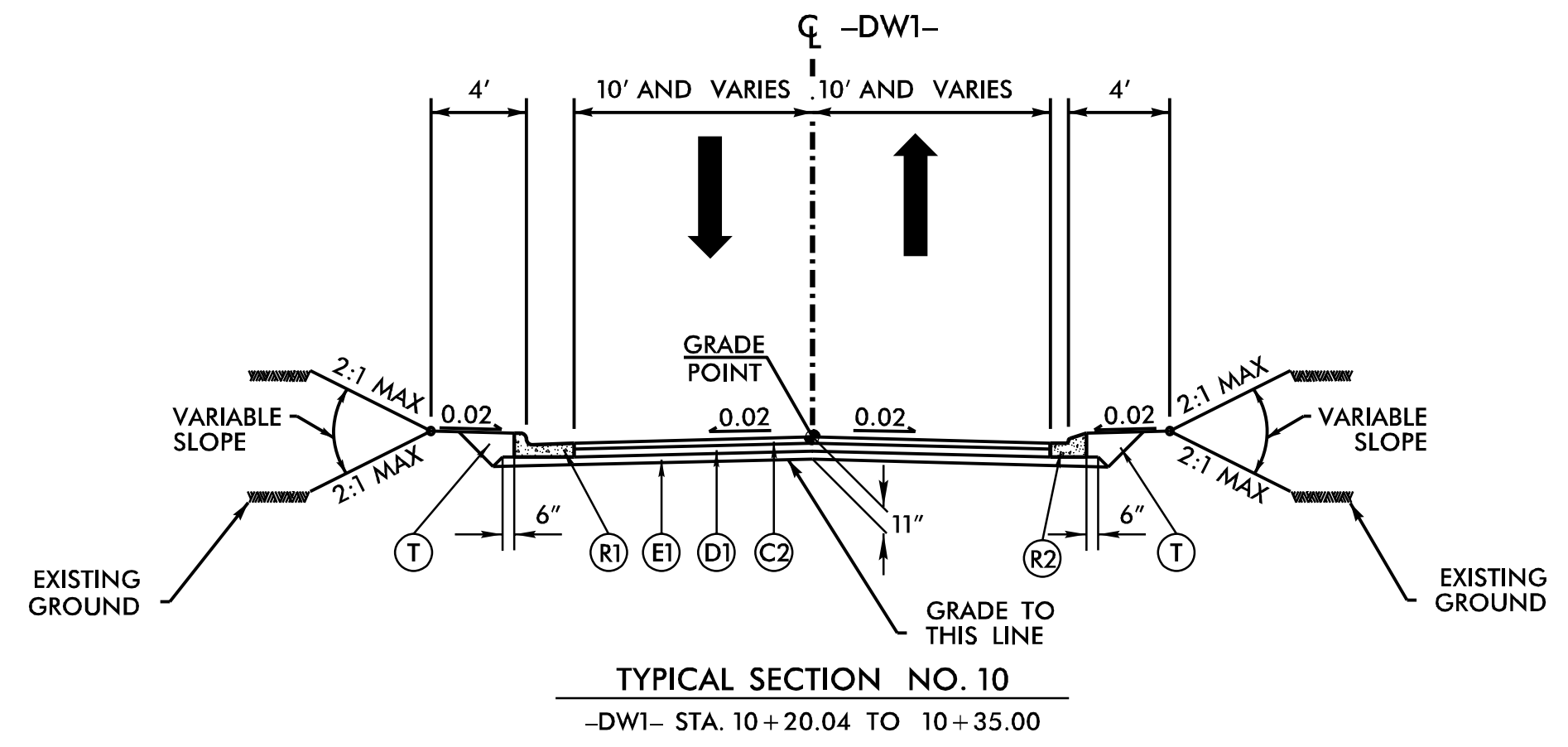
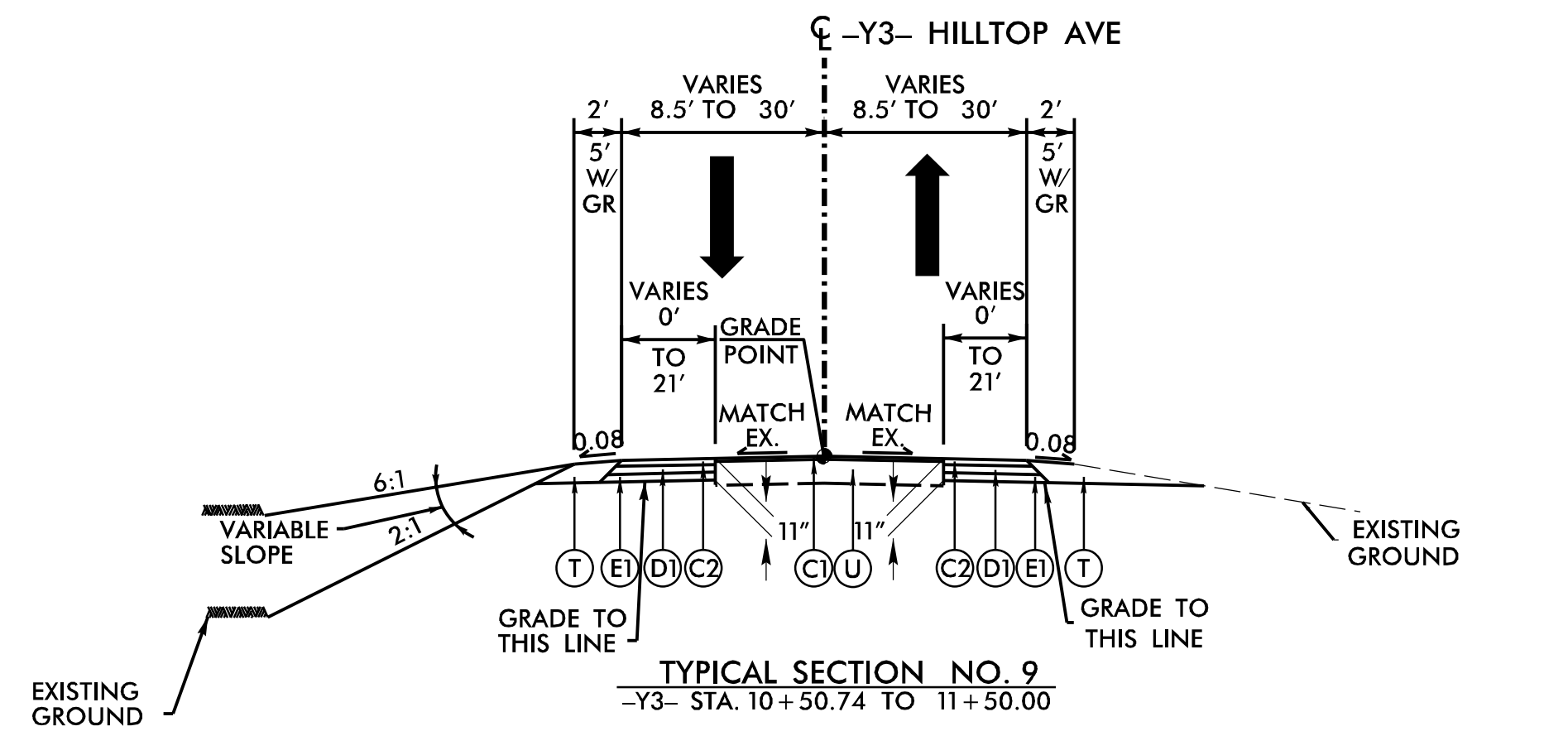
**TYPICAL SECTION NO. 8**  
 -Y2- STA. 12+20.00 TO STA. 12+79.34

PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>2A-2</b>
ROADWAY DESIGN ENGINEER 3/11/2024 NORTH CAROLINA PROFESSIONAL SEAL 049634 MOHAMMED FALAHA	PAVEMENT DESIGN ENGINEER 3/11/2024 NORTH CAROLINA PROFESSIONAL SEAL 038176 SHAHABUZZAMAN
Prepared in the Office of: <b>AECOM</b>	NC FIRM LICENSE No F-0342 5483 Hope Park Blvd, Suite 200 Raleigh, NC 27603 (919) 460-0000
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

A1	6" CONC. TRUCK APRON W/WIRE
C1	1.5" S9.5B
C2	3.0" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3.0" S9.5C
C6	VAR. S9.5C
D1	4.0" I19.0C
D2	VAR. I19.0C
E1	4.0" B25.0C
E2	5.0" B25.0C
E3	VAR. B25.0C
J1	4" ABC
R1	2'-6" C&G
R2	1'-6" C&G
R3	CONC. BARRIER
S	4" CONC. SDWLK.
T	EARTH MATERIAL
U	EXIST. PVMNT.
W1	WEDGE DET. NO. 1
W2	WEDGE DET. NO. 2

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

6/22/24  
 3/11/2024  
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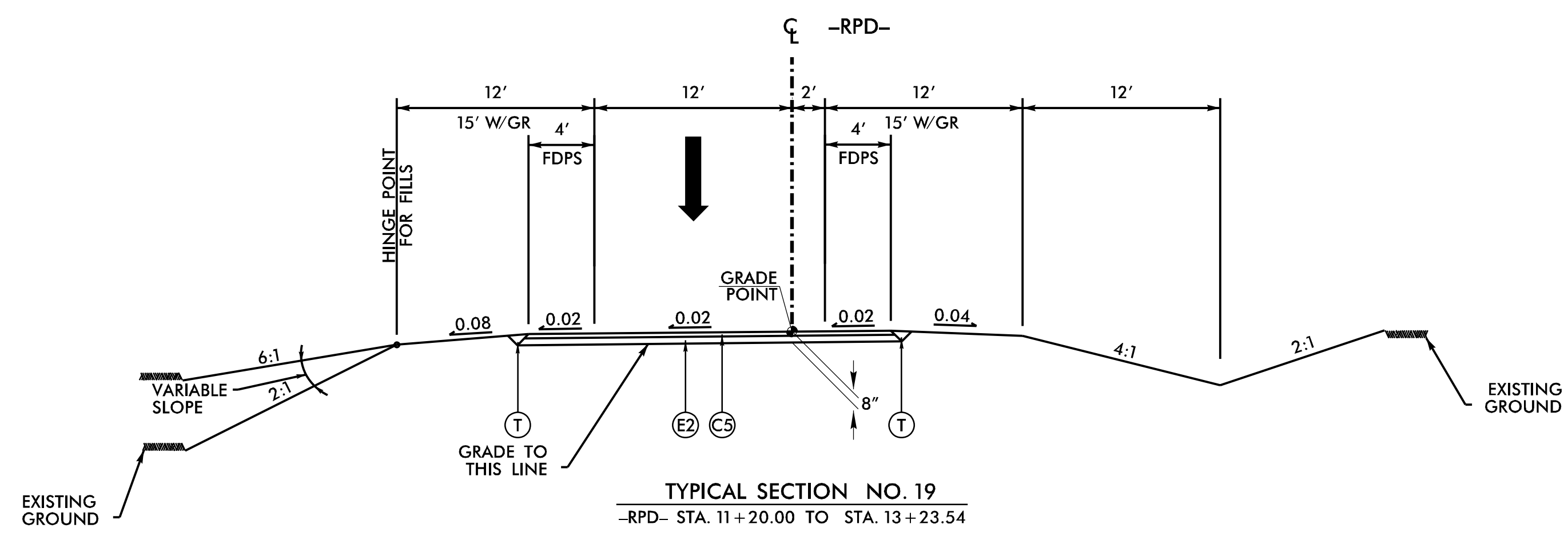
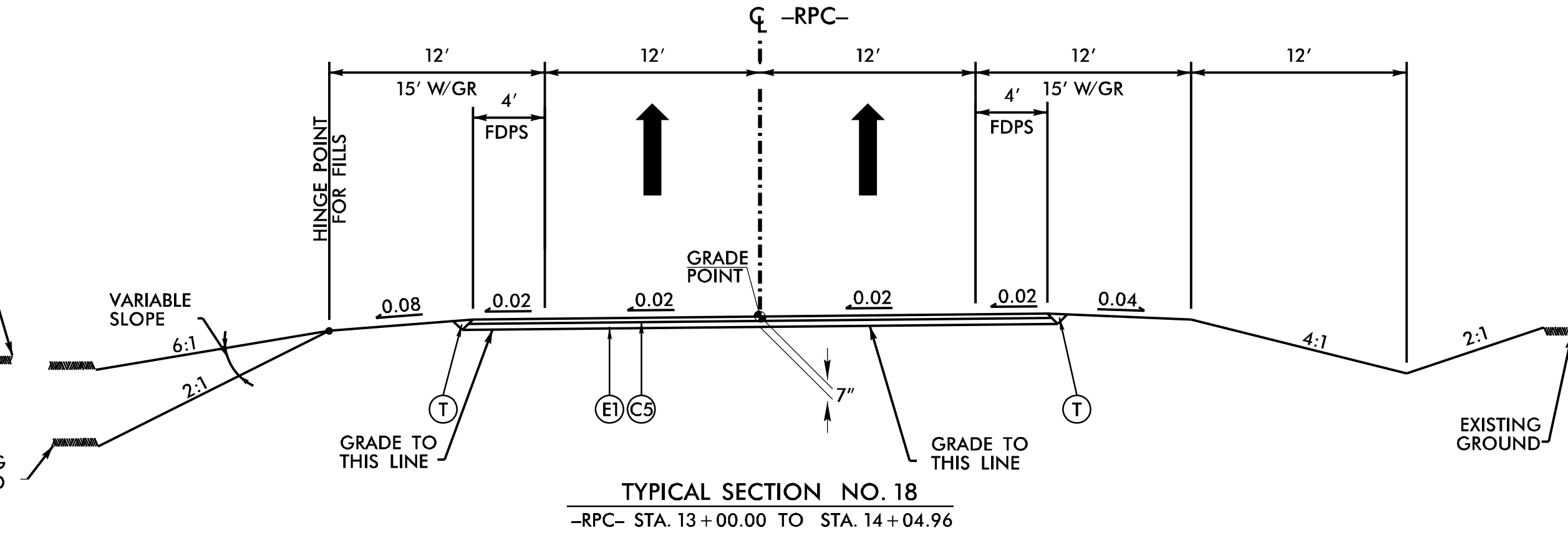
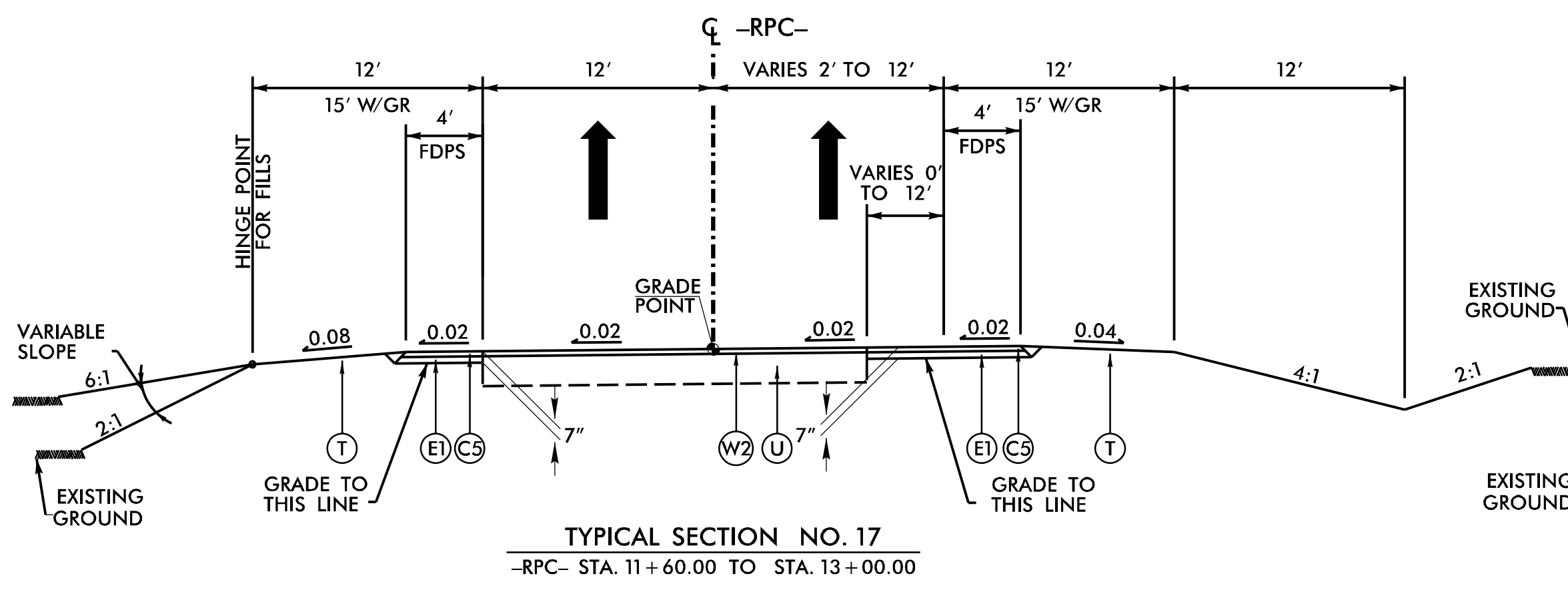
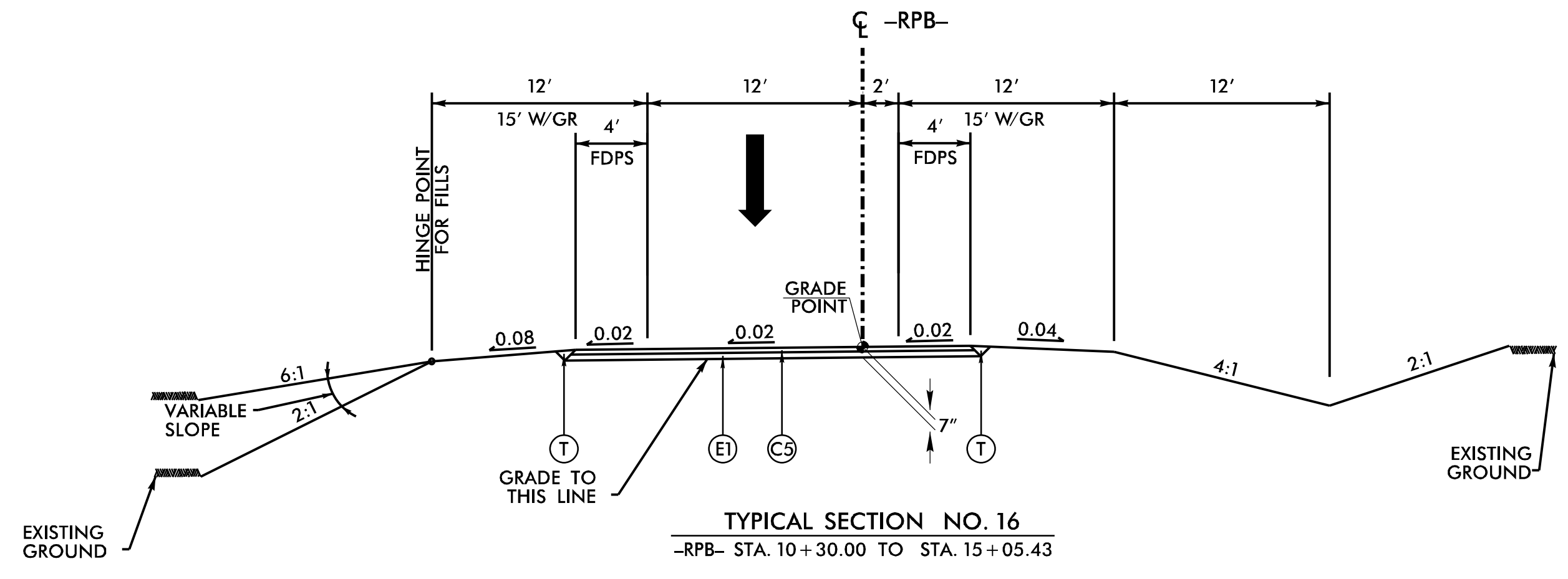
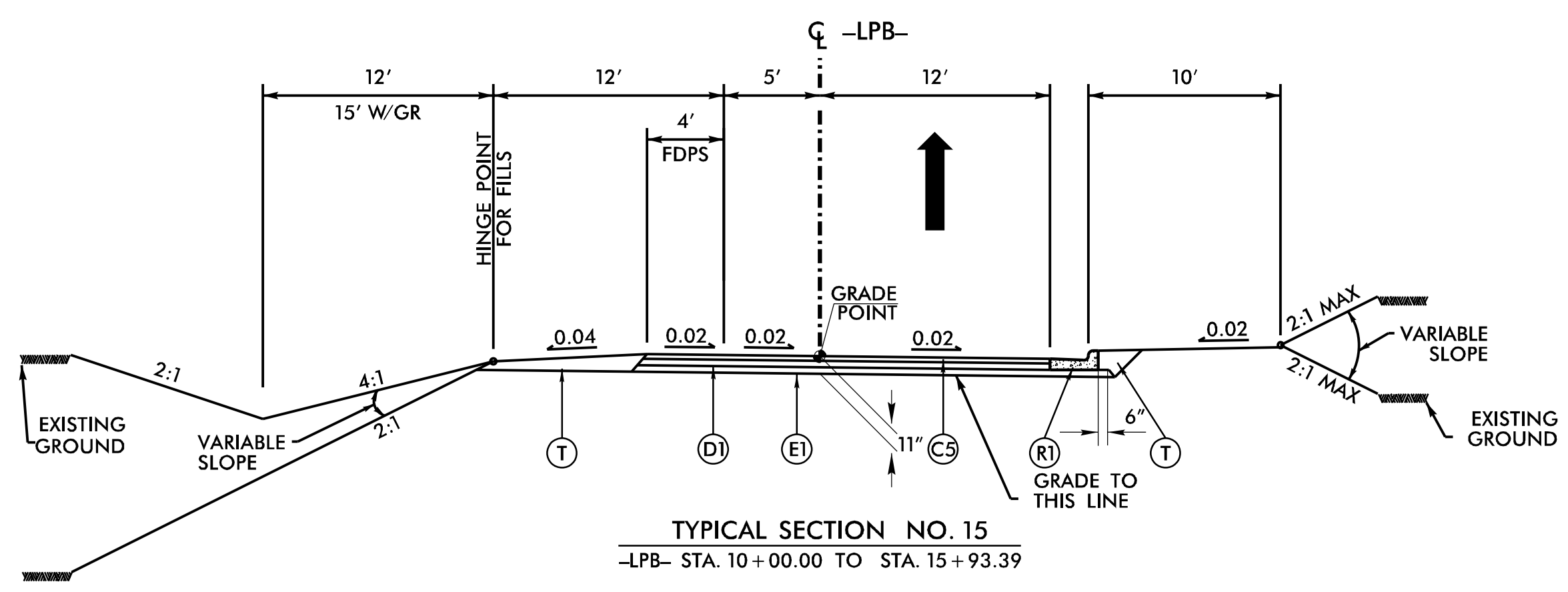
PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>2A-3</b>
ROADWAY DESIGN ENGINEER 3/11/2024 NORTH CAROLINA PROFESSIONAL SEAL 049634 MAMMAD ALI	PAVEMENT DESIGN ENGINEER 3/11/2024 NORTH CAROLINA PROFESSIONAL SEAL 038176 SUNIL K. BHARGAVA
Prepared in the Office of: <b>AECOM</b>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

A1	6" CONC. TRUCK APRON W/WIRE
C1	1.5" S9.5B
C2	3.0" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3.0" S9.5C
C6	VAR. S9.5C
D1	4.0" I19.0C
D2	VAR. I19.0C
E1	4.0" B25.0C
E2	5.0" B25.0C
E3	VAR. B25.0C
J1	4" ABC
R1	2'-6" C&G
R2	1'-6" C&G
R3	CONC. BARRIER
S	4" CONC. SDWLK.
T	EARTH MATERIAL
U	EXIST. PVMNT.
W1	WEDGE DET. NO. 1
W2	WEDGE DET. NO. 2

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

3/11/2024  
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 6/12/99

PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>2A-4</b>
ROADWAY DESIGN ENGINEER 3/11/2024 NORTH CAROLINA PROFESSIONAL SEAL 049634 MOHAMMED EALIMIA	PAVEMENT DESIGN ENGINEER 3/11/2024 NORTH CAROLINA PROFESSIONAL SEAL 038176 SHIHAI ZHANG
Prepared in the Office of: <b>AECOM</b>	
NC FIRM LICENSE No: F-0342 5483 Wood Park Blvd, Suite 200 Raleigh, NC 27607 919.462.0000	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

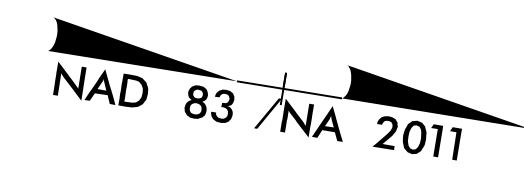


A1	6" CONC. TRUCK APRON W/WIRE
C1	1.5" S9.5B
C2	3.0" S9.5B
C3	VAR. S9.5B
C4	1.5" S9.5C
C5	3.0" S9.5C
C6	VAR. S9.5C
D1	4.0" I19.0C
D2	VAR. I19.0C
E1	4.0" B25.0C
E2	5.0" B25.0C
E3	VAR. B25.0C
J1	4" ABC
R1	2'-6" C&G
R2	1'-6" C&G
R3	CONC. BARRIER
S	4" CONC. SDWLK.
T	EARTH MATERIAL
U	EXIST. PVMNT.
W1	WEDGE DET. NO. 1
W2	WEDGE DET. NO. 2

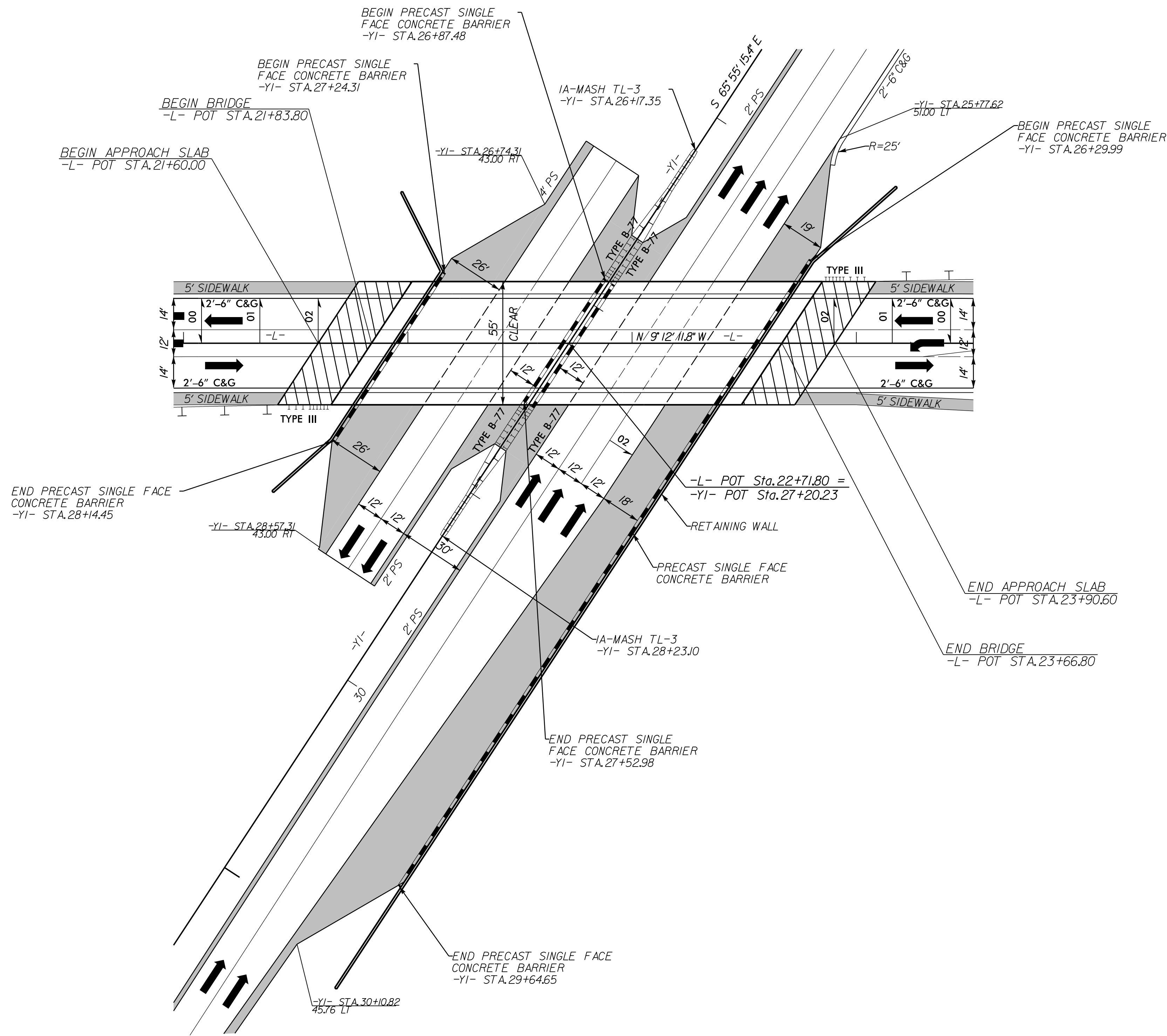
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

5/14/99

PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>2B-1</b>
ROADWAY DESIGN ENGINEER 5/24/2023	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L- (NC 50) OVER -YI- (US 70) BRIDGE PAVEMENT RELATIONSHIP SKETCH (N.T.S.)



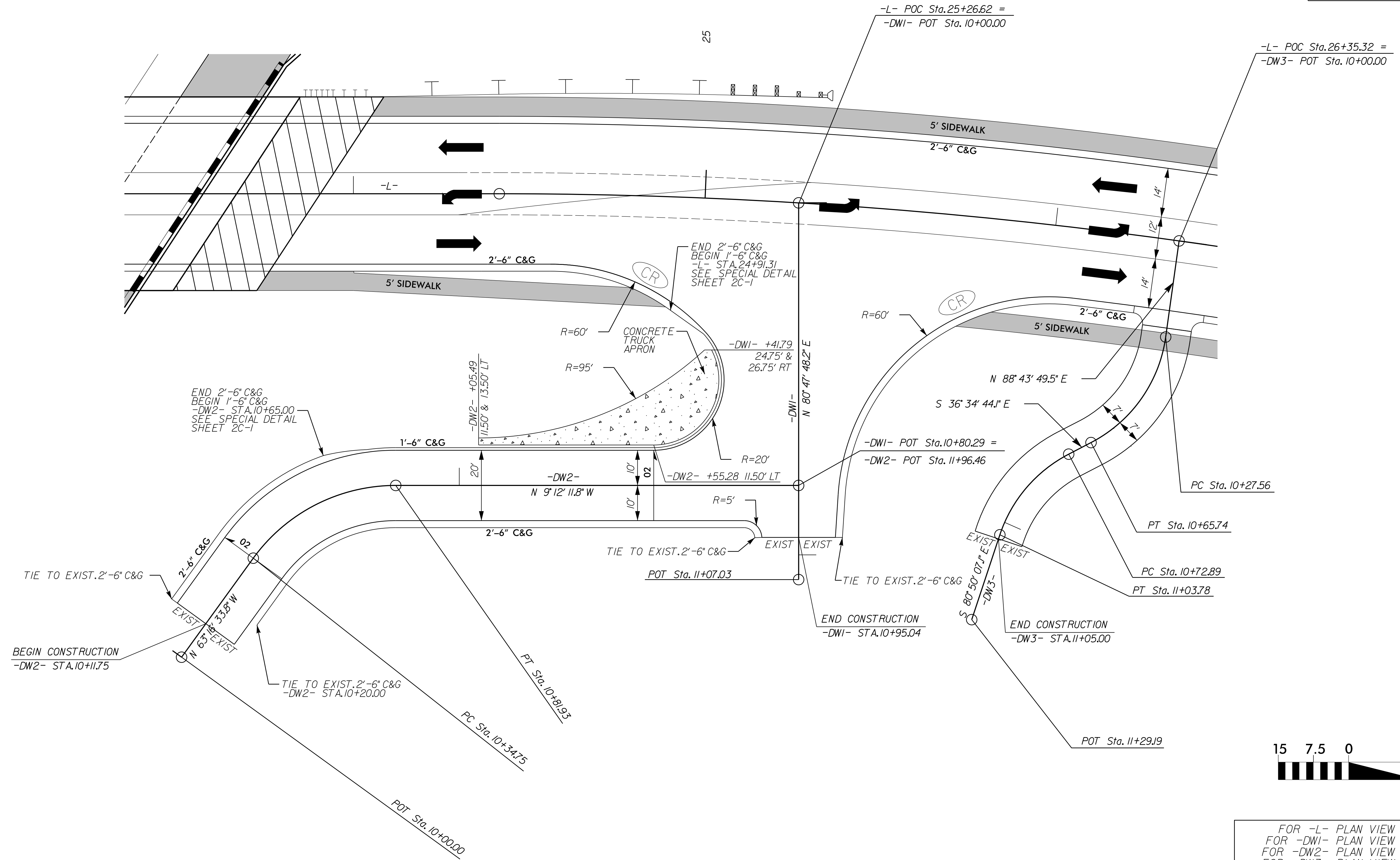
FOR -L- PLAN VIEW SEE SHEET 5  
FOR -YI- PROFILE VIEW SEE SHEET 8

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PROJECT REFERENCE NO. B-4654	SHEET NO. 2B-2
ROADWAY DESIGN ENGINEER 5/24/2023	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

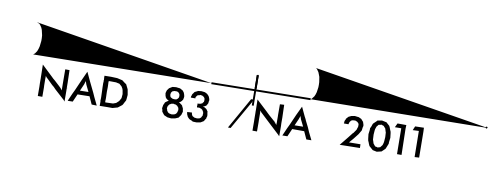
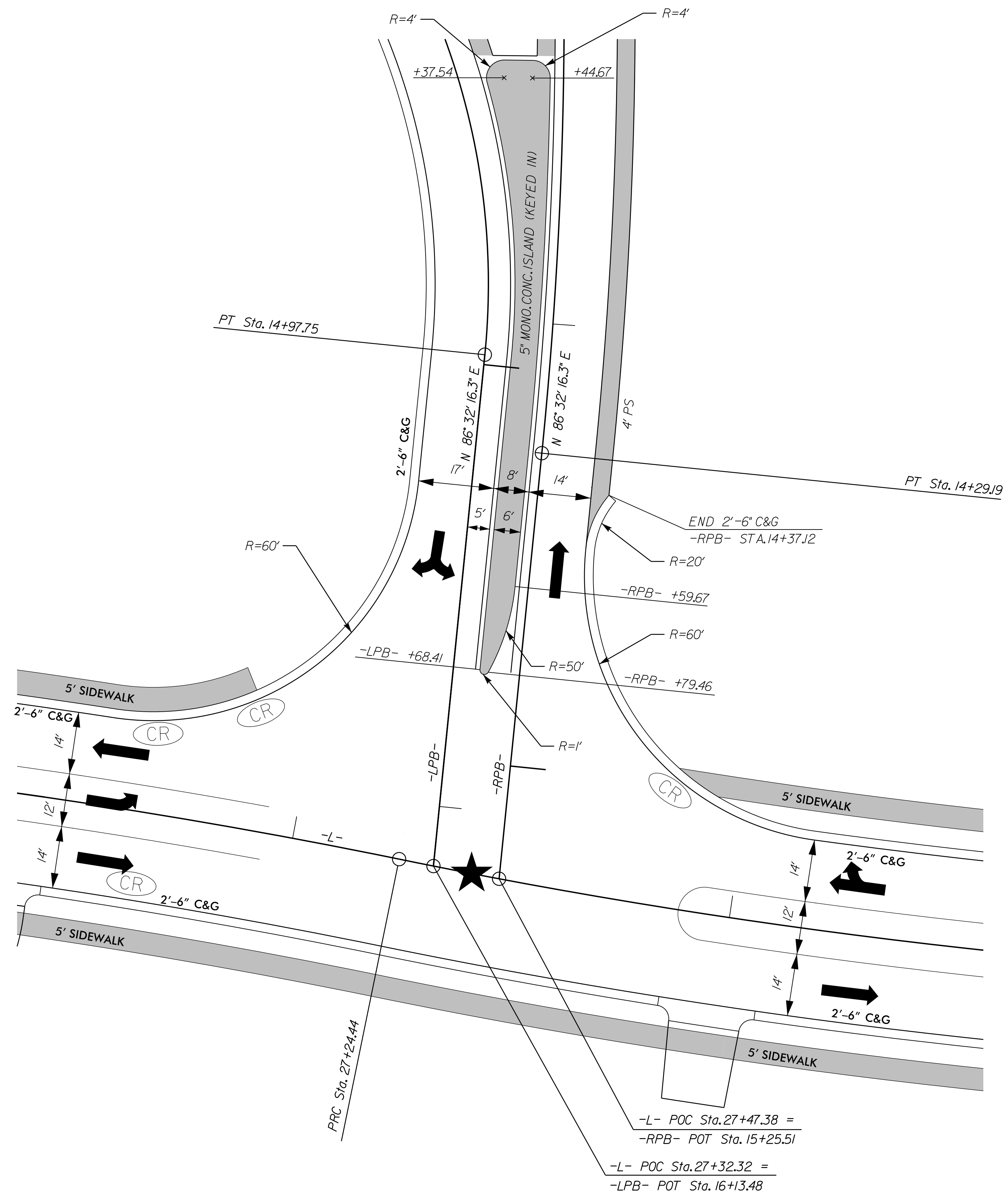
**INTERSECTION DETAIL OF -L- (NC 50)  
WITH -DW1-, -DW2-, AND -DW3-**



FOR -L- PLAN VIEW SEE SHEET 5  
 FOR -DW1- PLAN VIEW SEE SHEET 5  
 FOR -DW2- PLAN VIEW SEE SHEET 5  
 FOR -DW3- PLAN VIEW SEE SHEET 5  
 FOR -L- PROFILE VIEW SEE SHEET 8  
 FOR -DW1- PROFILE VIEW SEE SHEET 10  
 FOR -DW2- PROFILE VIEW SEE SHEET 10  
 FOR -DW3- PROFILE VIEW SEE SHEET 10

5/14/2023  
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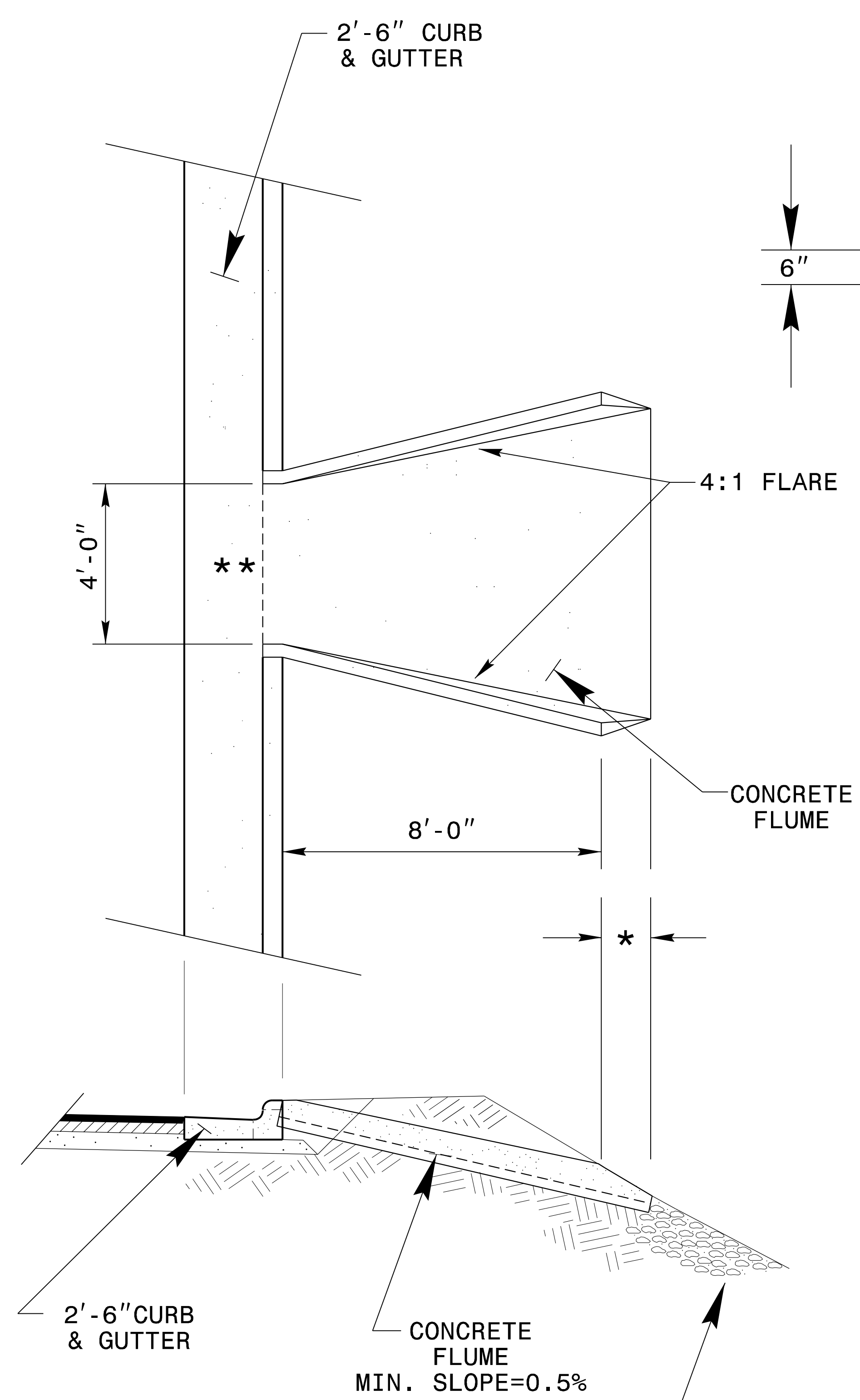
### INTERSECTION DETAIL OF -L- (NC 50) WITH -RPB- AND -LPB-



PROJECT REFERENCE NO. B-4654	SHEET NO. 2B-3
ROADWAY DESIGN ENGINEER 5/24/2023	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

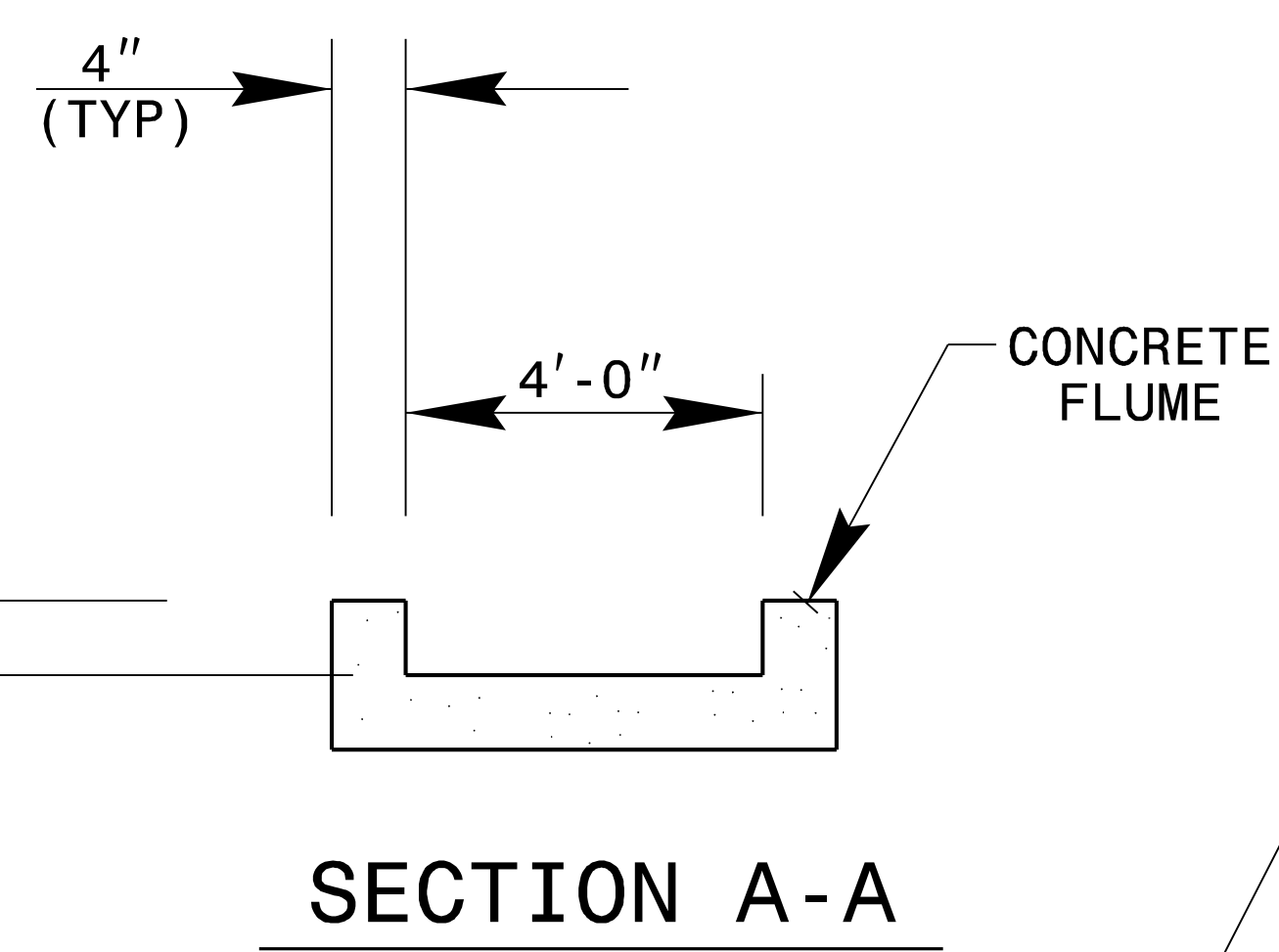


- ★ PROPOSED SIGNAL
- FOR -L- PLAN VIEW SEE SHEET 5
- FOR -LPB- PLAN VIEW SEE SHEET 5
- FOR -RPB- PLAN VIEW SEE SHEET 5
- FOR -L- PROFILE VIEW SEE SHEET 8
- FOR -LPB- PROFILE VIEW SEE SHEET 11
- FOR -RPB- PROFILE VIEW SEE SHEET 11



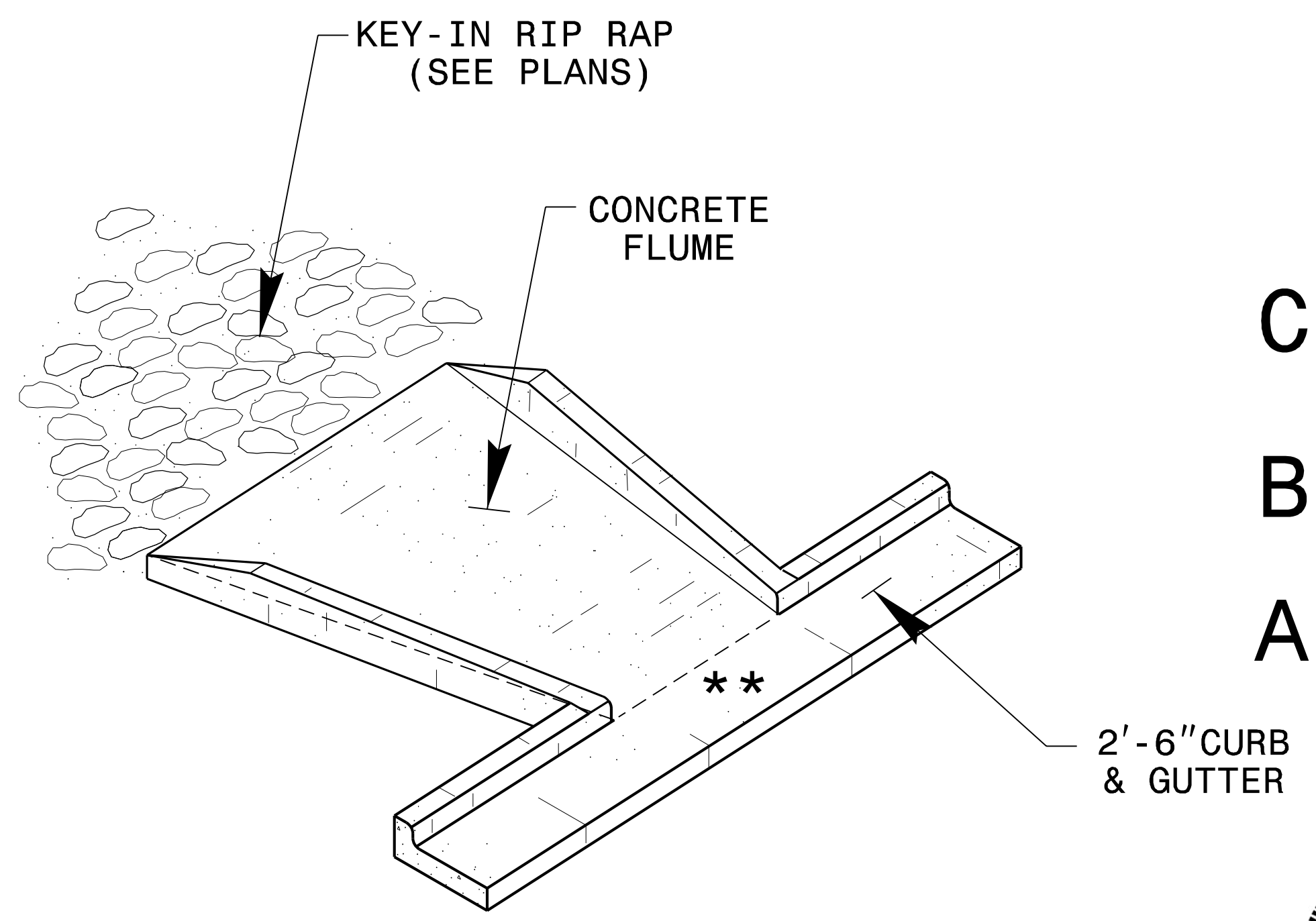
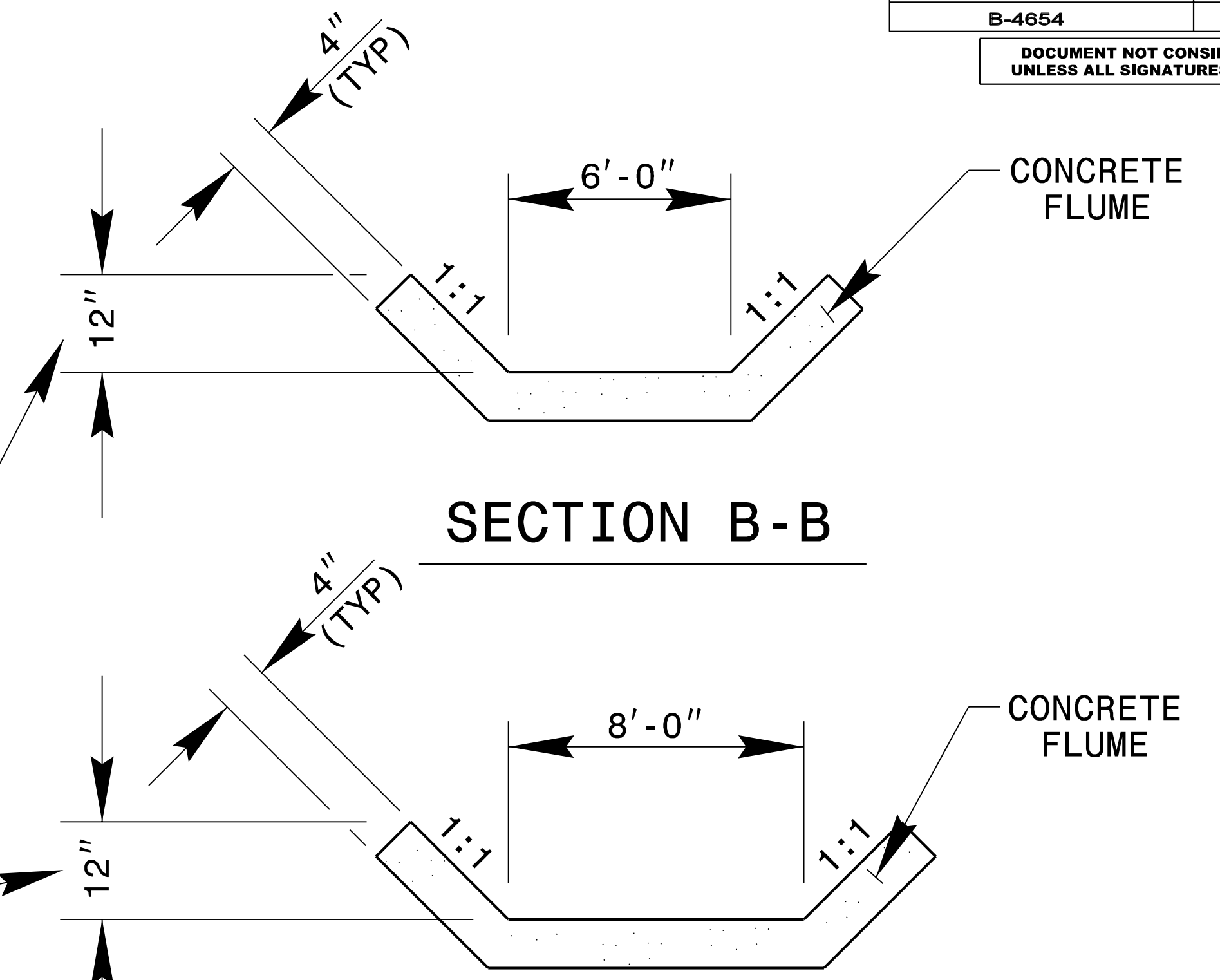
**ELEVATION**

- \* LENGTH VARIABLE WITH DITCH SLOPE
- \*\* DEPRESS THE GUTTER IN THIS AREA TO PREVENT BYPASS

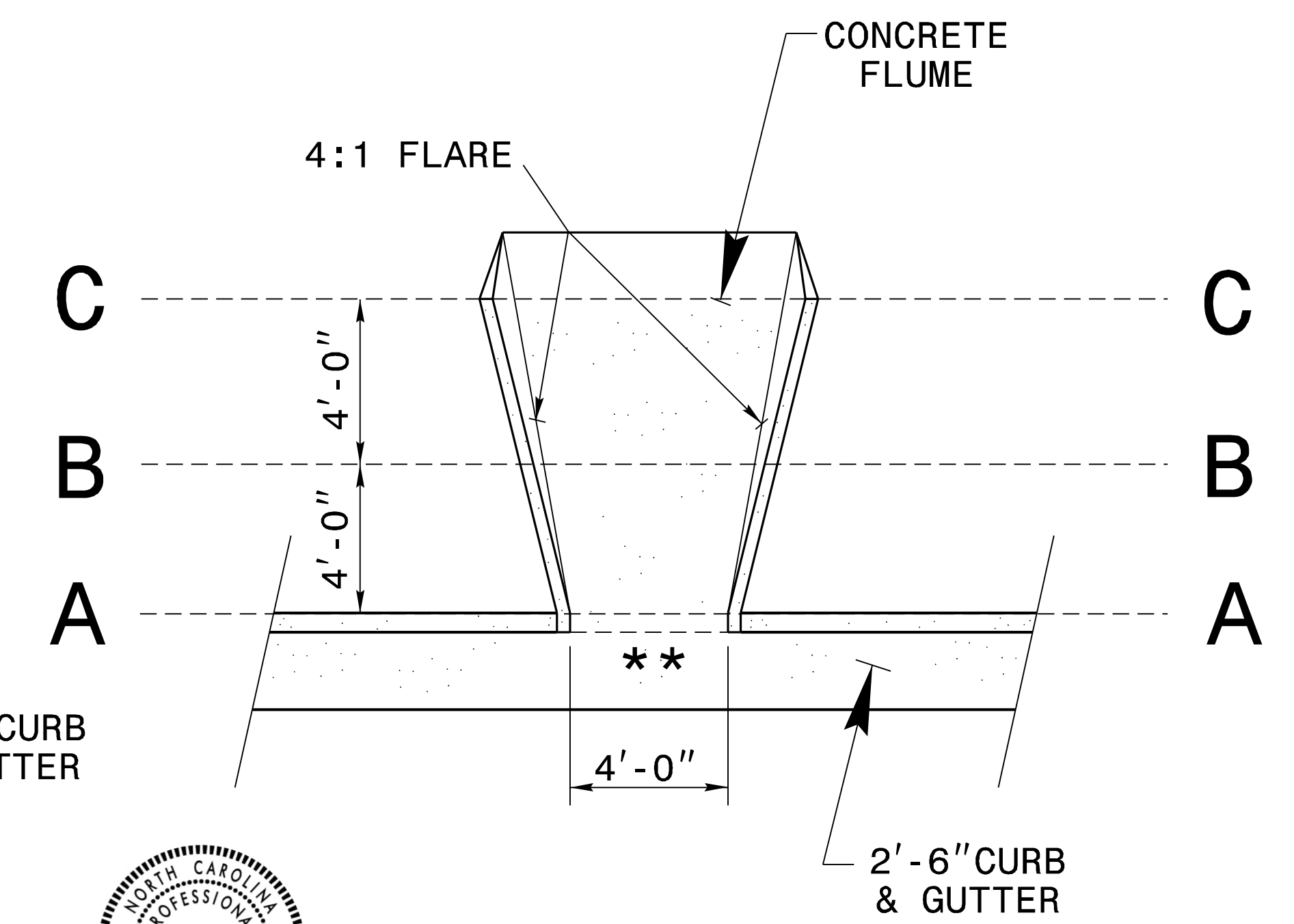


**SECTION A-A**

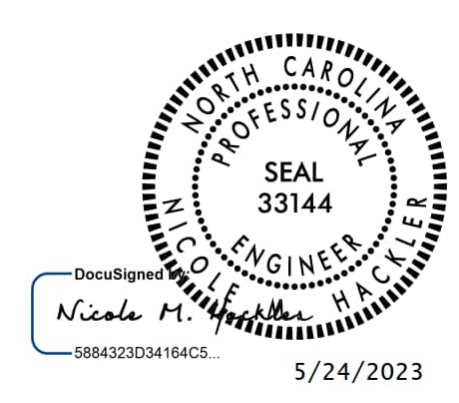
FLUME SIDES SHOULD BE FLUSH WITH ADJACENT GROUND LINE TO A MAX. HEIGHT OF 12"



**PERSPECTIVE**



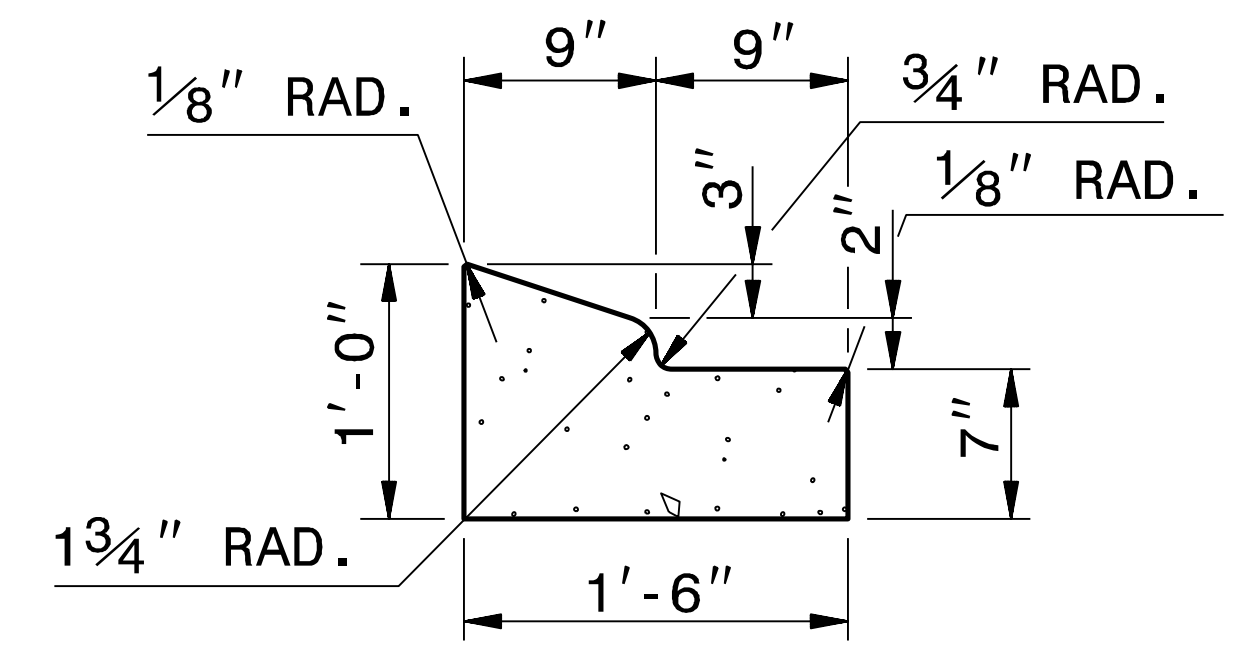
**PLAN**



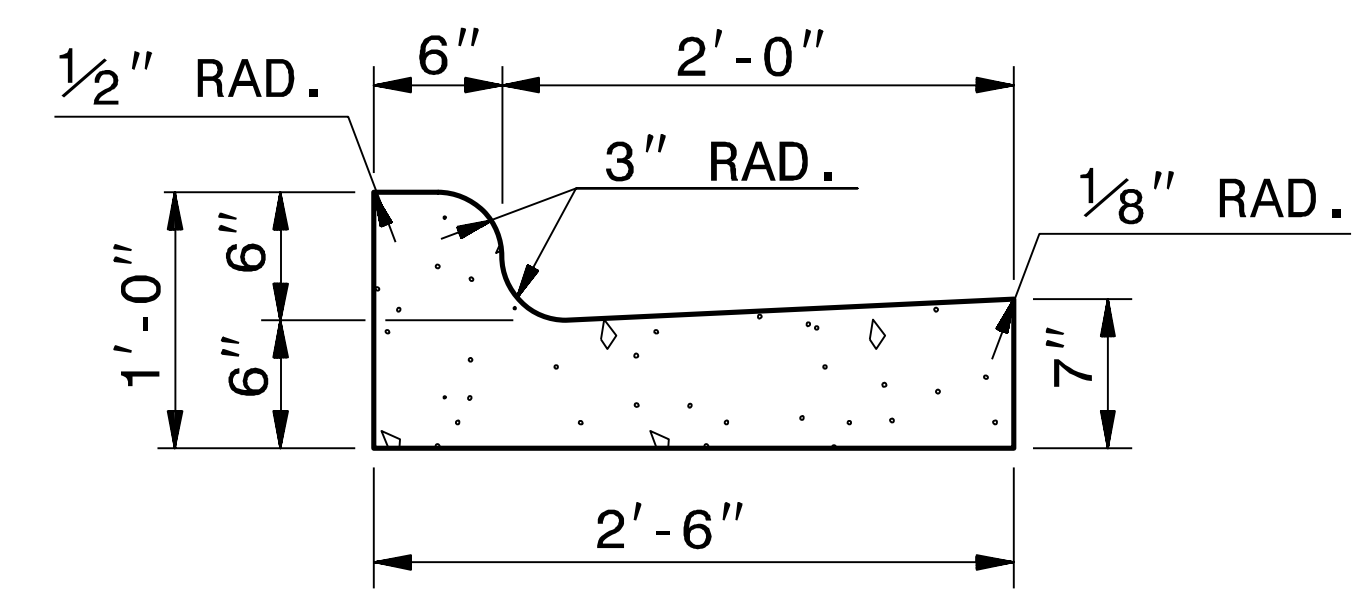
- NOTES:
- CONSTRUCT CONCRETE FLUME IN ACCORDANCE WITH THIS DETAIL.
  - RIP RAP LINED DITCH WILL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18" PIPE.
  - MODIFICATIONS MAY BE MADE AS DIRECTED BY THE ENGINEER.

<b>CONTRACT STANDARDS &amp; DEVELOPMENT UNIT</b> STANDARDS AND SPECIAL DESIGN	
Office 919-707-6950	FAX 919-250-4119
<b>CONCRETE FLUME</b> IN 2'-6" C&G	
ORIGINAL BY: _____	DATE: _____
MODIFIED BY: nbritt	DATE: 05-11-04
CHECKED BY: _____	DATE: _____
FILE SPEC.: details\nbritt\metricr2201modifiedflume.dgn	

5/24/2023  
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 J:\power.ten  
 C:\SD-2\2595  
 At CSD-2\2595  
 Details\nbritt\metricr2201spectal  
 modified flume.dgn



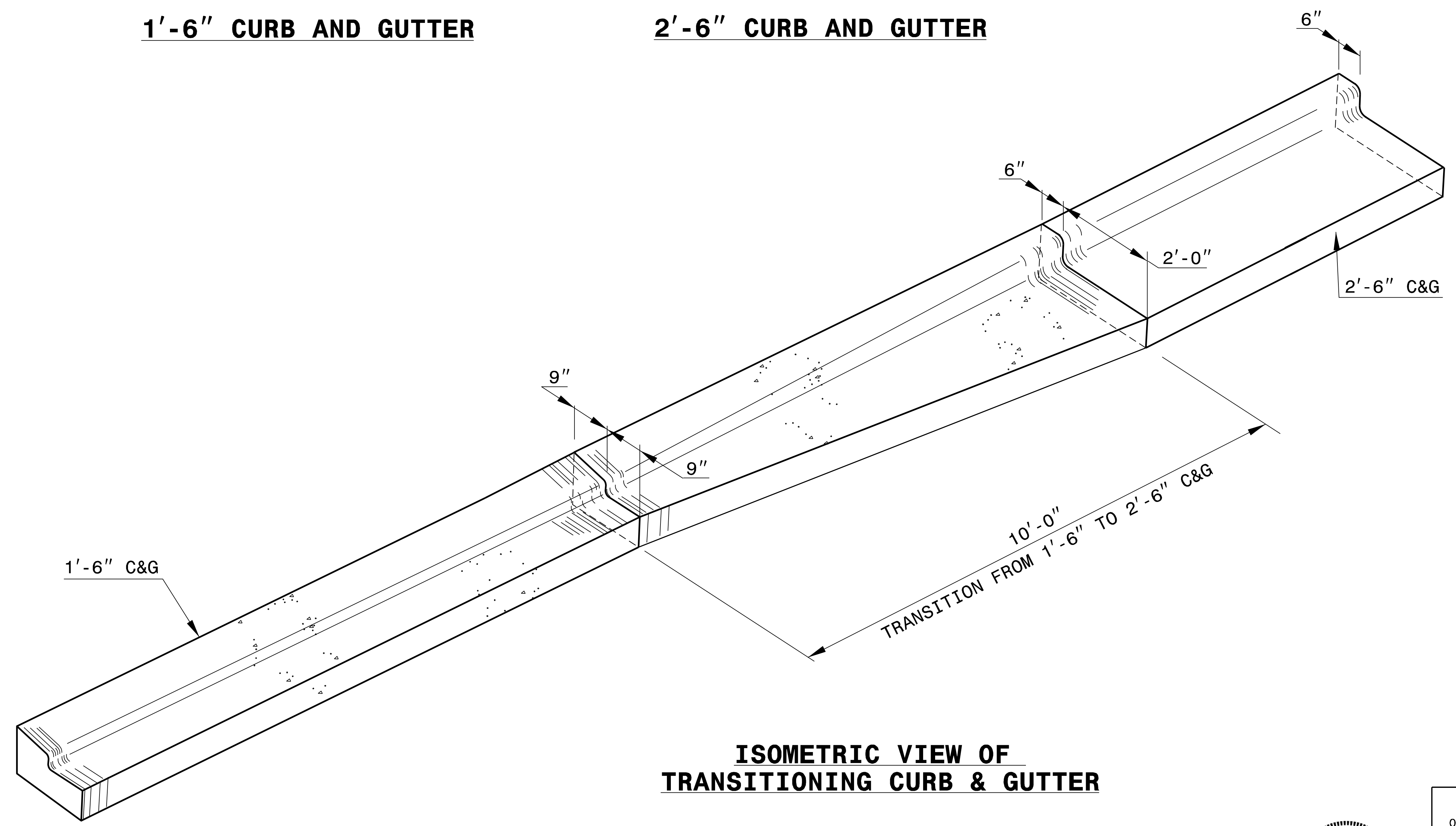
**1'-6" CURB AND GUTTER**



**2'-6" CURB AND GUTTER**

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

SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.



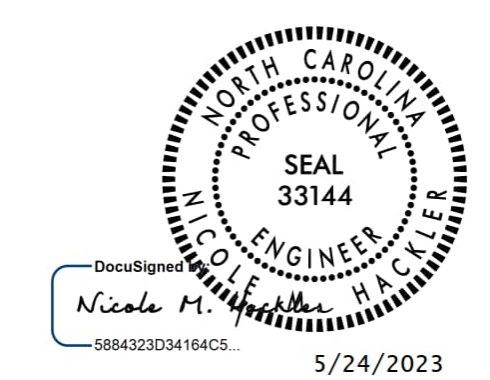
**ISOMETRIC VIEW OF TRANSITIONING CURB & GUTTER**

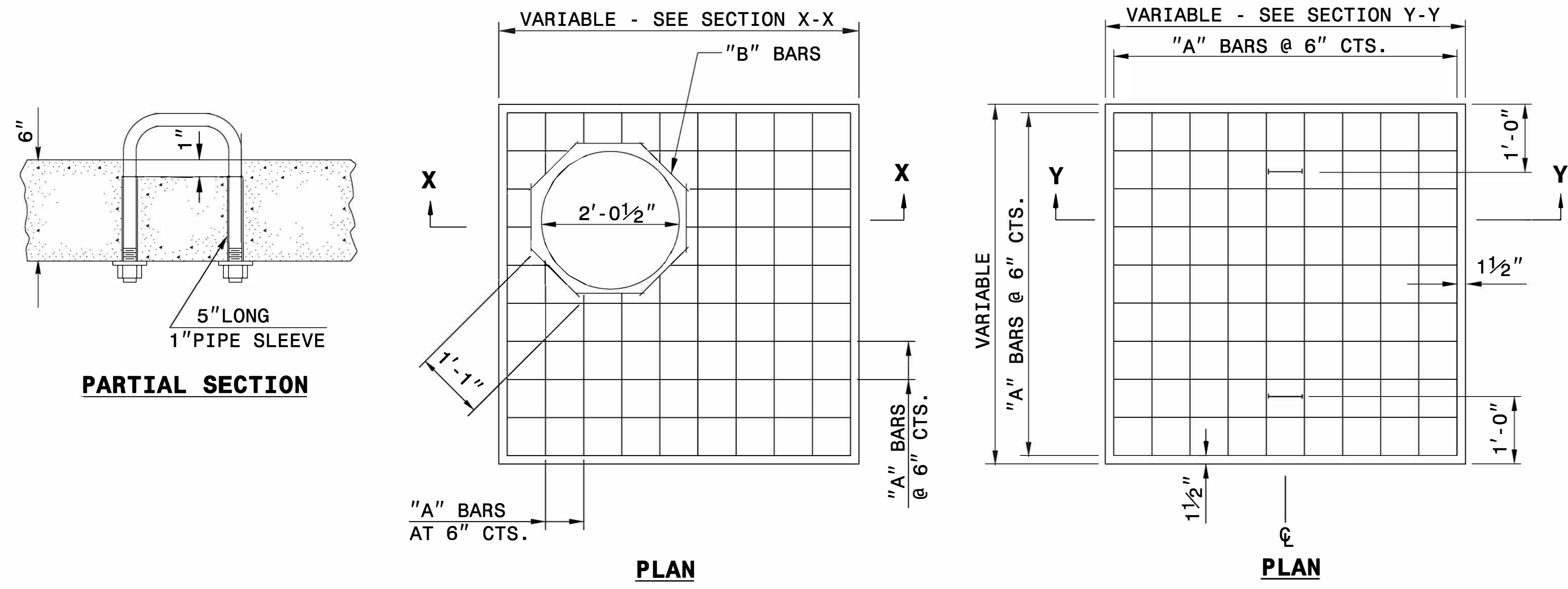
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

**DETAIL OF 1'-6" TO 2'-6" CURB & GUTTER TRANSITION SECTION**

ORIGINAL BY: T.S. SPELL DATE: MARCH 3, 2000  
 MODIFIED BY: DATE: \_\_\_\_\_  
 CHECKED BY: DATE: \_\_\_\_\_  
 FILE SPEC.: \_DS174:/usr/details/stand/cgtransit.dgn



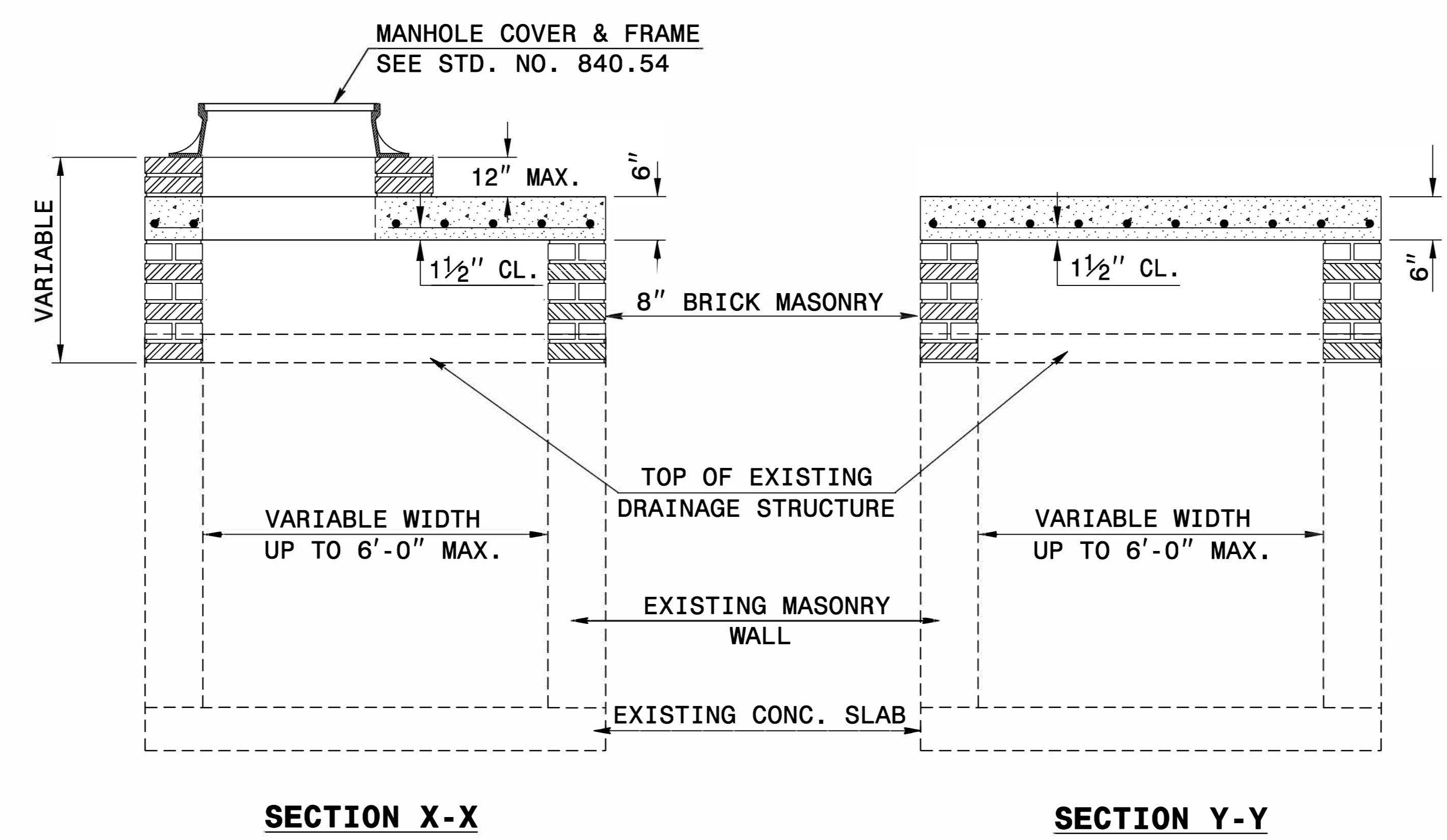
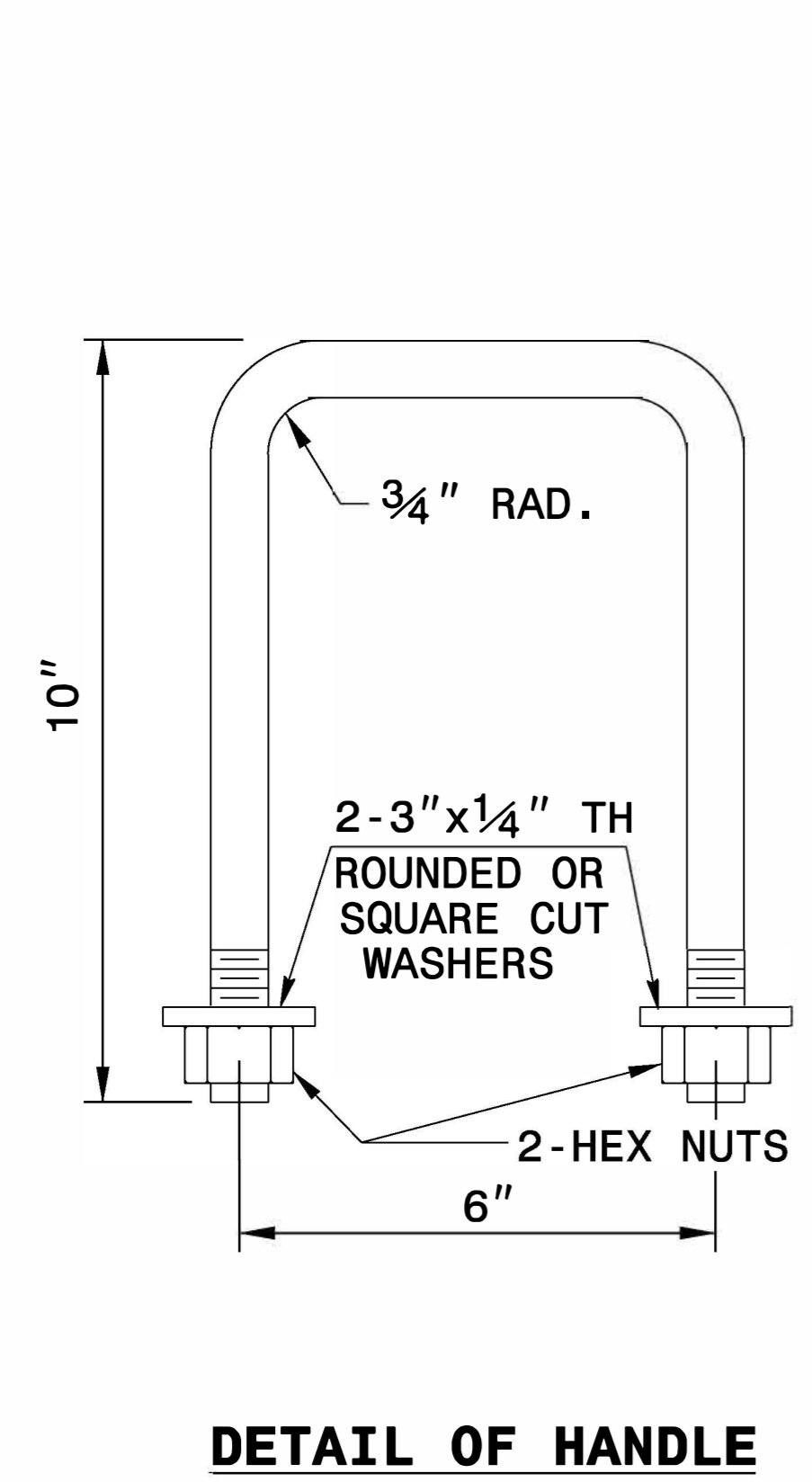
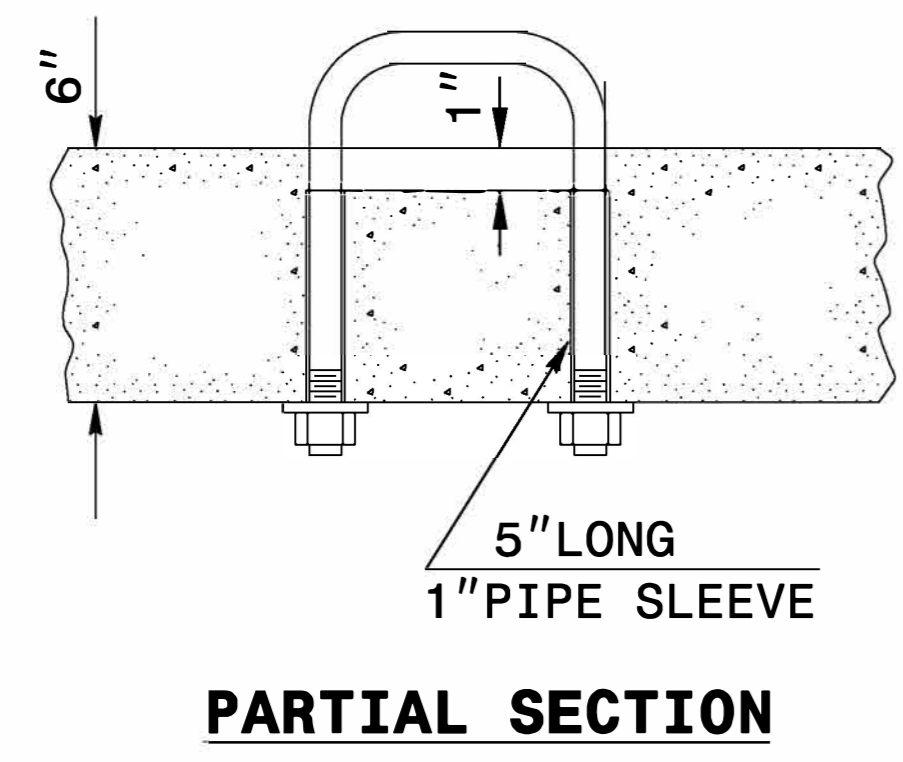


**GENERAL NOTES:**

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

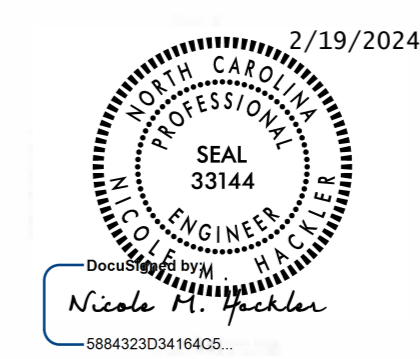
THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.



<b>BILL OF MATERIALS</b>				
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *
MASONRY				CU YDS
TOP SLAB CONCRETE CLASS "B"				.4326 *
BRICK MASONRY PER FT HT (MIN)				.4111

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



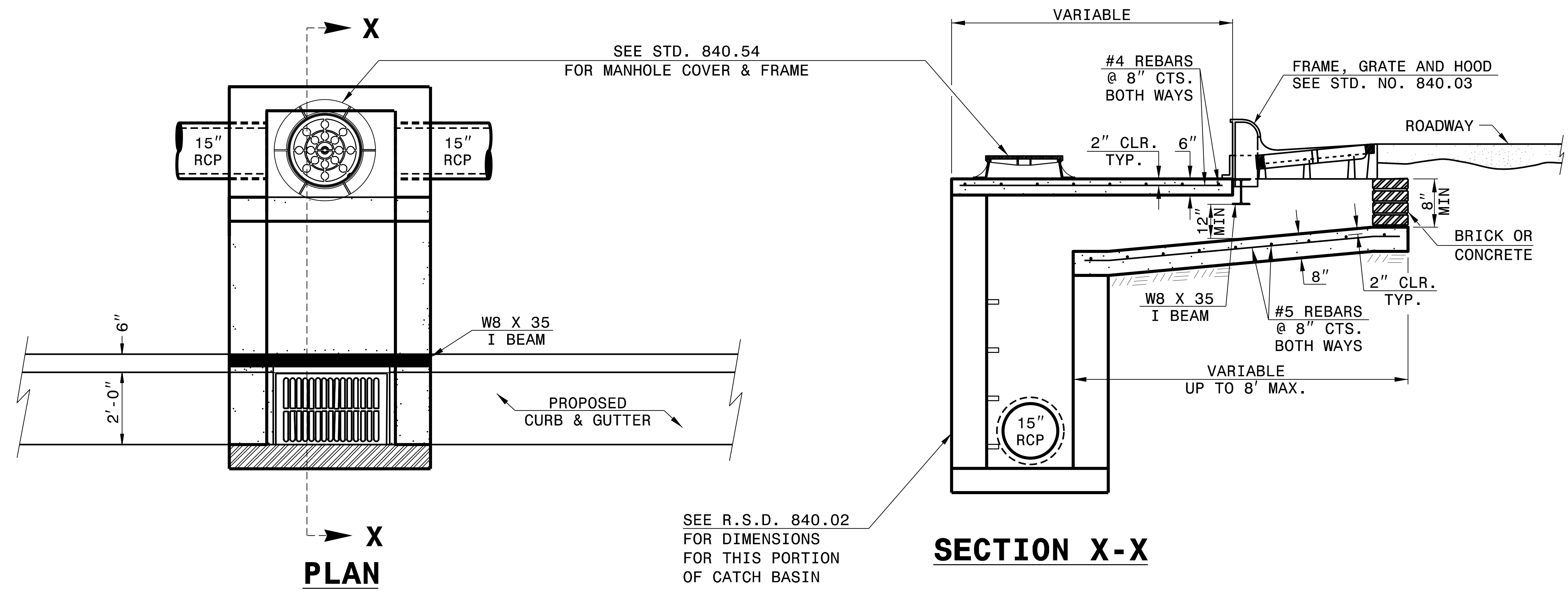
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

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

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

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

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**NOTES:**

MORTAR JOINTS 1/2" TO 1/4" THICK.

USE CLASS "B" CONCRETE THROUGHOUT.

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

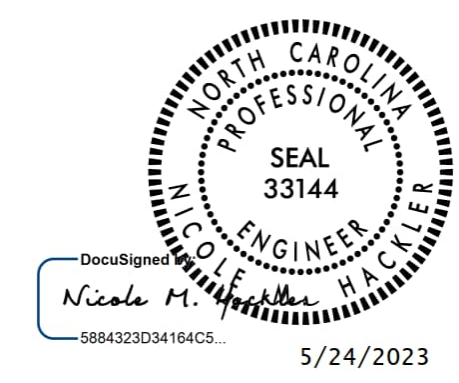
USE BRICK OR CONCRETE BLOCK WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.

CHAMFER ALL EXPOSED CORNERS 1".

DRAWING NOT TO SCALE.

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

Q:\AUG-2018 11:56  
 S:\Contracting\Cent5955\Special Details\nbritt\english\hydro\840d06\_offset\_boxes.dgn  
 Kempf AT CSD-292596

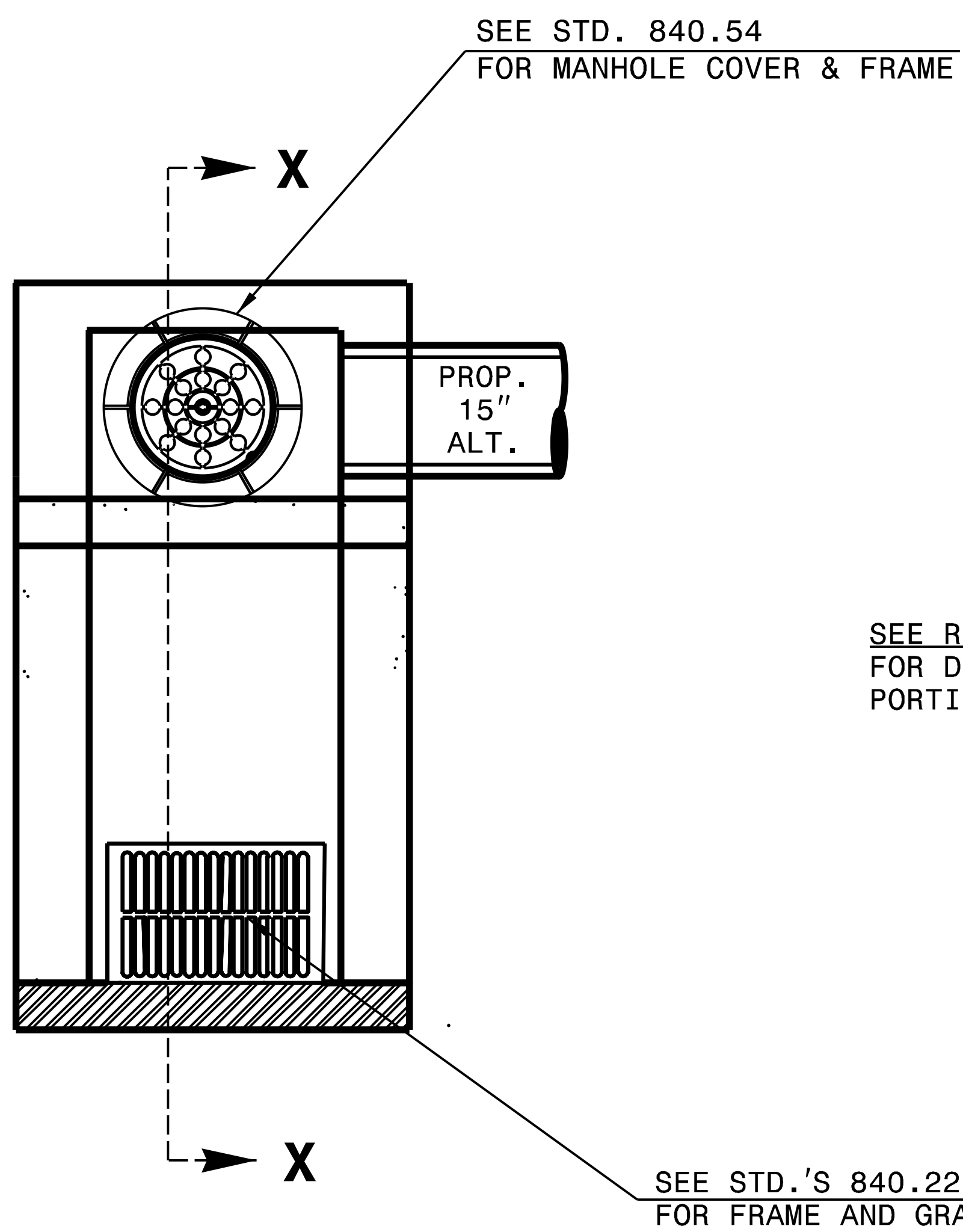


**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

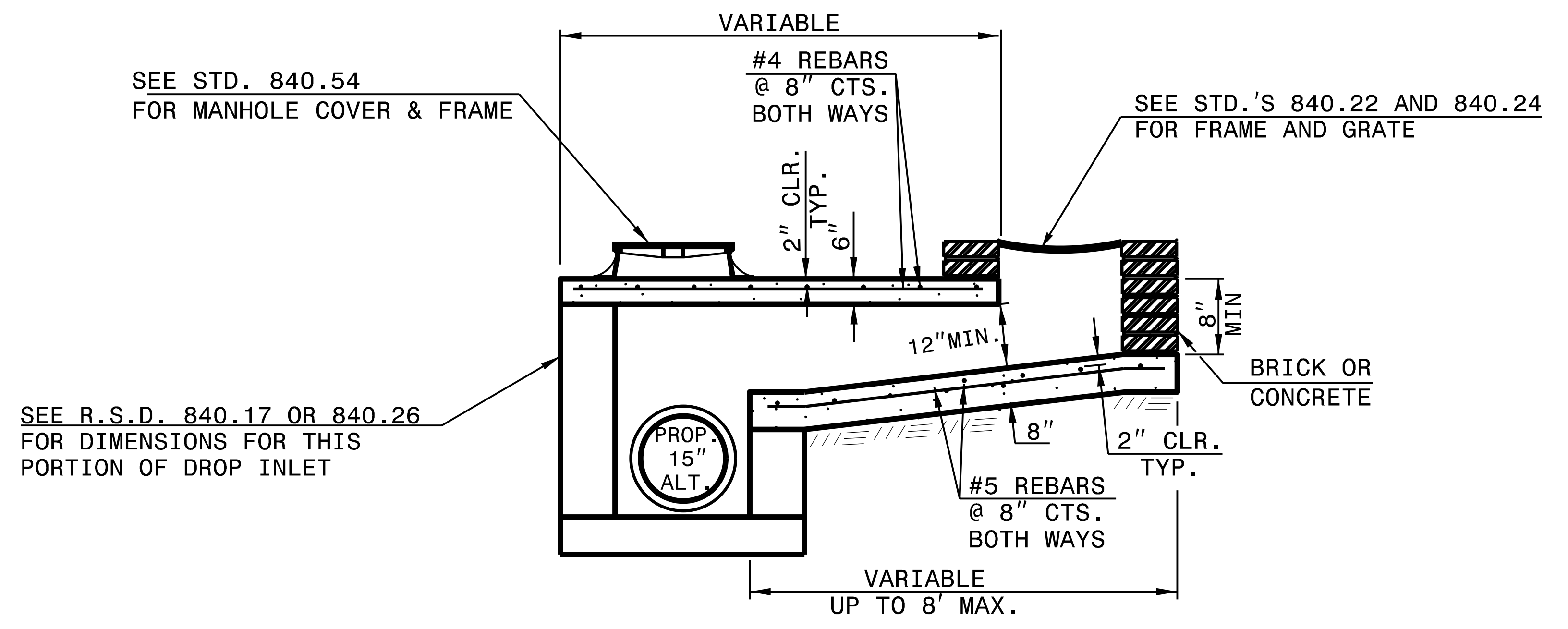
**CONTRACT STANDARDS  
AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**PROPOSED  
OFFSET CATCH BASIN**

ORIGINAL BY:	DATE:
MODIFIED BY: K. KEMPF	DATE: 11/13/15
CHECKED BY:	DATE:
FILE SPEC.: nbritt/english/hydro/840d06_offset_boxes.dgn	



**PLAN**



**SECTION X-X**

**NOTES:**  
 MORTAR JOINTS  $\frac{1}{2}$ " TO  $\frac{1}{4}$ " THICK.  
 USE CLASS "B" CONCRETE THROUGHOUT.  
 USE BRICK OR CONCRETE BLOCK WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.  
 CHAMFER ALL EXPOSED CORNERS 1".  
 DRAWING NOT TO SCALE.  
 PROVIDE ALL DROP INLET OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WITH COMPLY WITH STD. DRAWING 840.66



<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950 FAX 919-250-4119	
<b>PROPOSED OFFSET DROP INLET</b>	
ORIGINAL BY:	DATE:
MODIFIED BY: <u>Karen Sloan</u>	DATE: <u>1/27/2023</u>
CHECKED BY: <u>Casey Morrison</u>	DATE: <u>1/27/2023</u>
FILE SPEC.:	

I:\30\2023\Nra\agcommet.com\1Fs\AMER\Rel\High-USRAL3\Legacy\Projects\60436195-B-4654\900\_Work\910\_CAD\70\_NCDOT\_TIP\Drainage\Special\_Details\100\_051\_B4654\_RDY\_FP\_PSH02D-2.dgn  
 Karen Sloan

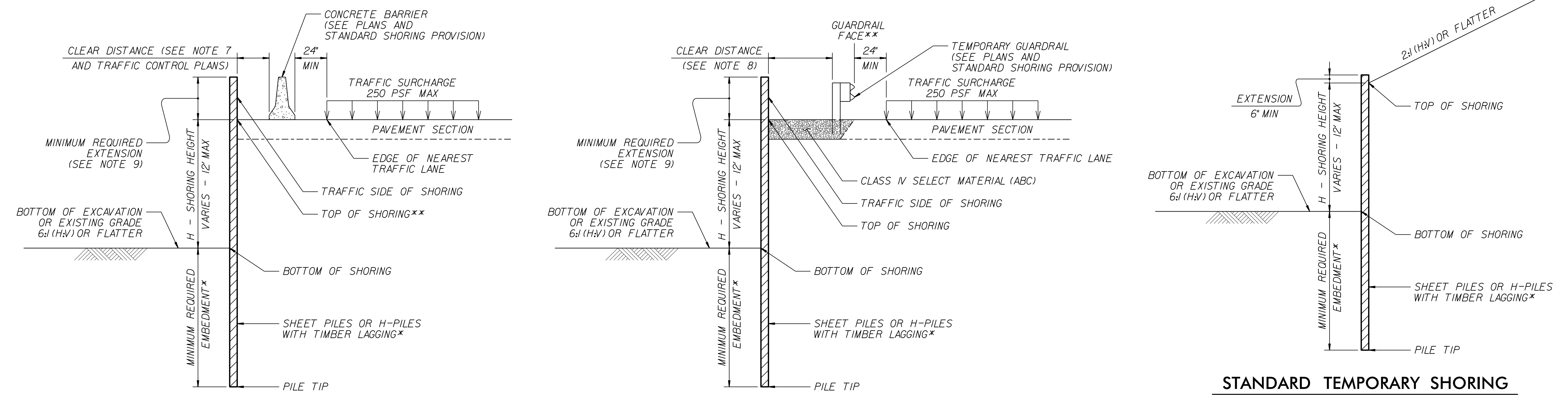
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

**MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS**

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

**NOTES:**

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  PCF  
FRICTION ANGLE,  $\phi = 30$  DEGREES  
COHESION,  $c = 0$  PSF
- DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
- SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:  
[connect.ncdot.gov/resources/Geological/Pages/Geotech\\_Forms\\_Details.aspx](http://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx)
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

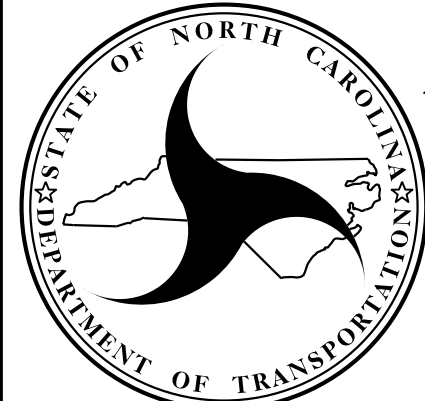


**CONCRETE BARRIER**  
\*\*TOP OF SHORING =  
EDGE OF PAVEMENT

**TEMPORARY GUARDRAIL**  
\*\*GUARDRAIL FACE =  
EDGE OF PAVEMENT

**STANDARD TEMPORARY SHORING**  
(SLOPE CASE)  
\*SEE TABLE ABOVE.

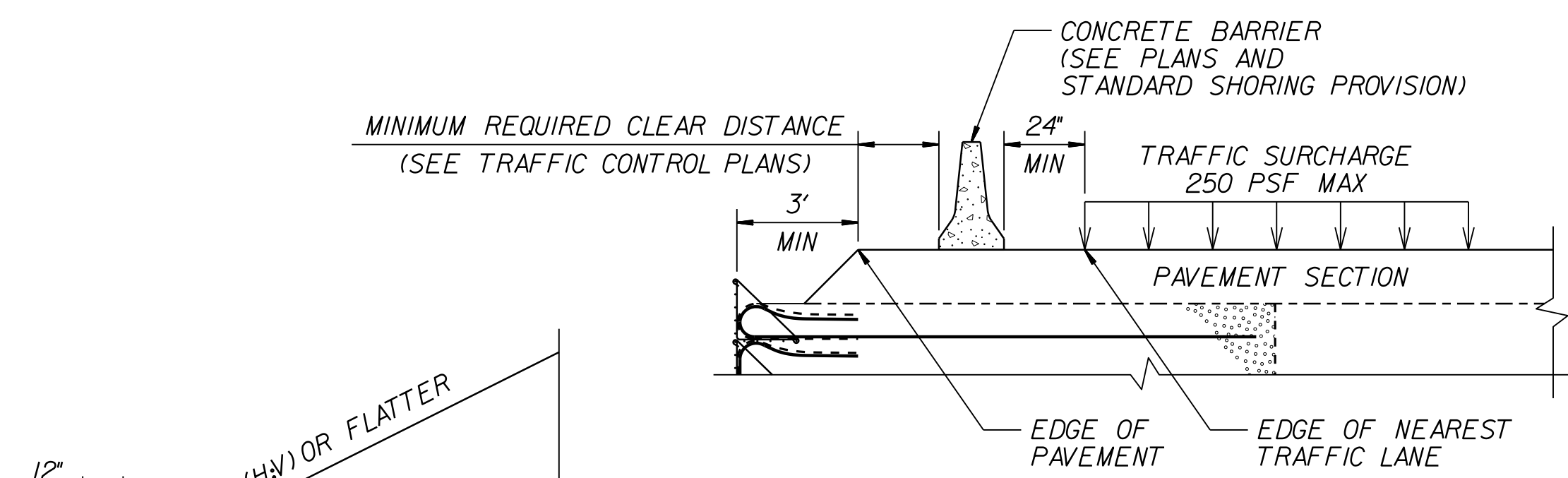
**STANDARD TEMPORARY SHORING**  
(SURCHARGE CASE)  
\*SEE TABLE ABOVE.



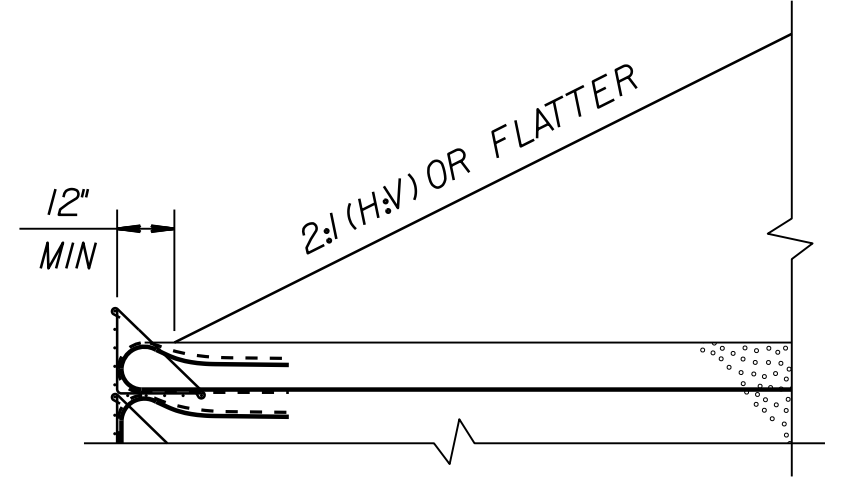
**NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
  
**GEOTECHNICAL**  
**ENGINEERING UNIT**

**STANDARD DETAIL NO. 1801.01**  
  
**STANDARD**  
**TEMPORARY SHORING**  
  
 DATE: 11-19-13

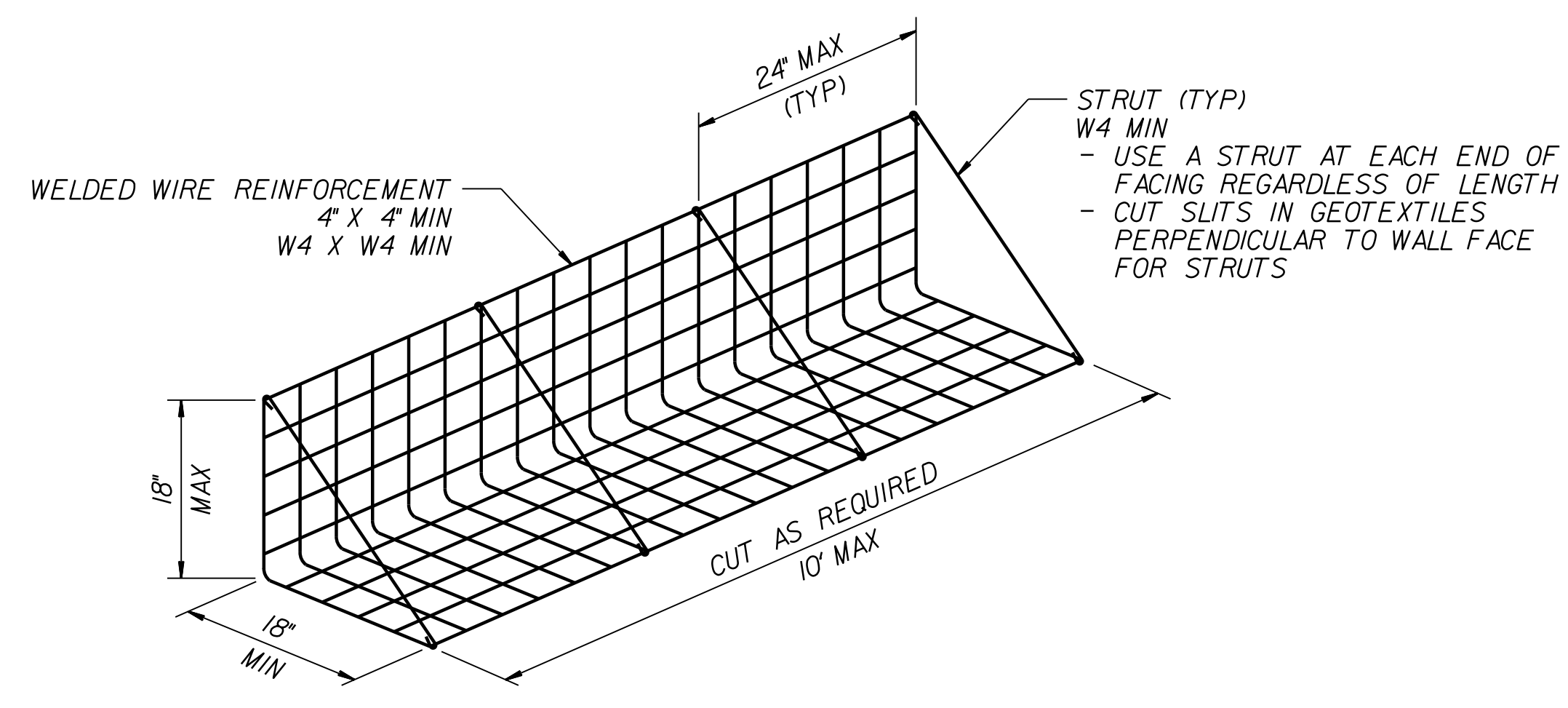




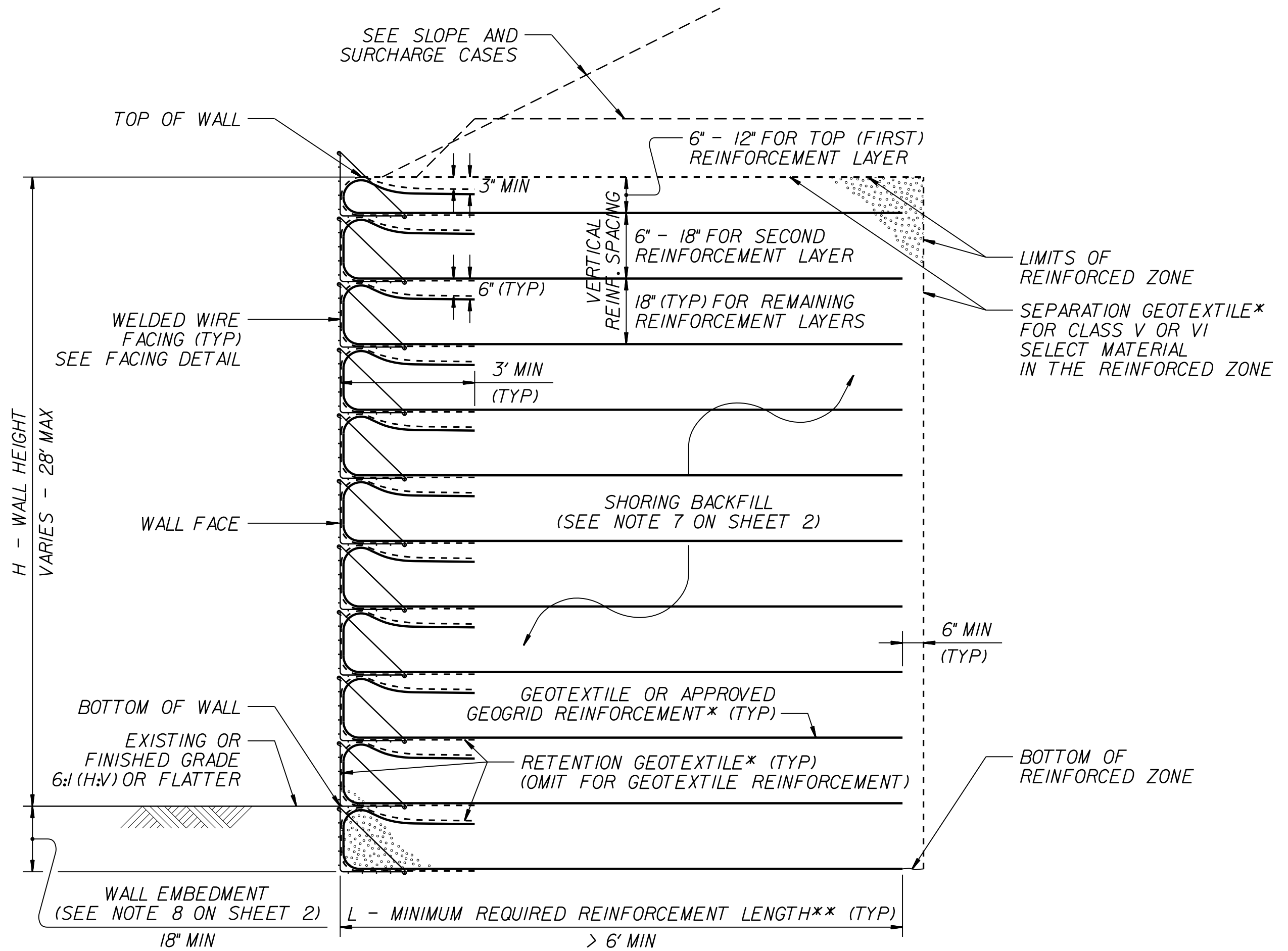
**SURCHARGE CASE**



**SLOPE CASE**

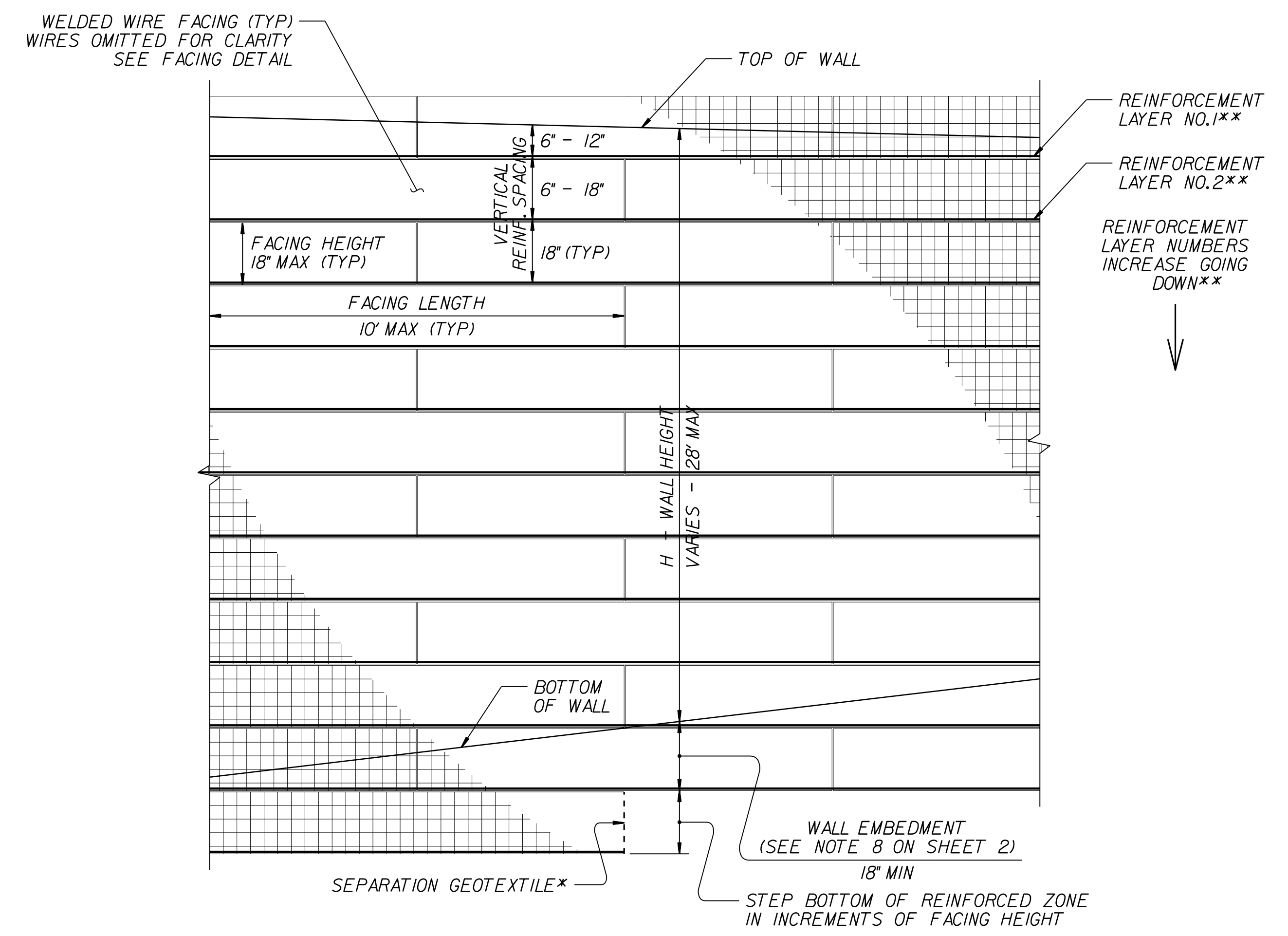


**FACING DETAIL**



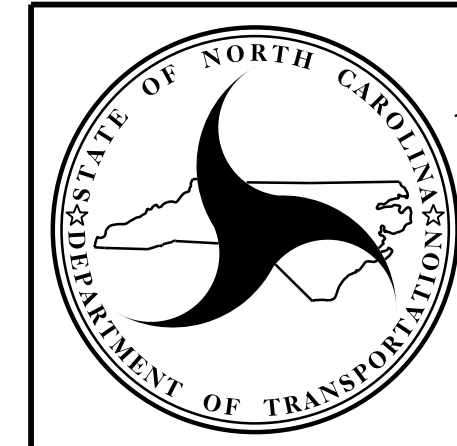
**STANDARD TEMPORARY WALL**

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



**STANDARD TEMPORARY WALL – PARTIAL ELEVATION**

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



NORTH CAROLINA  
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 ENGINEERING UNIT**

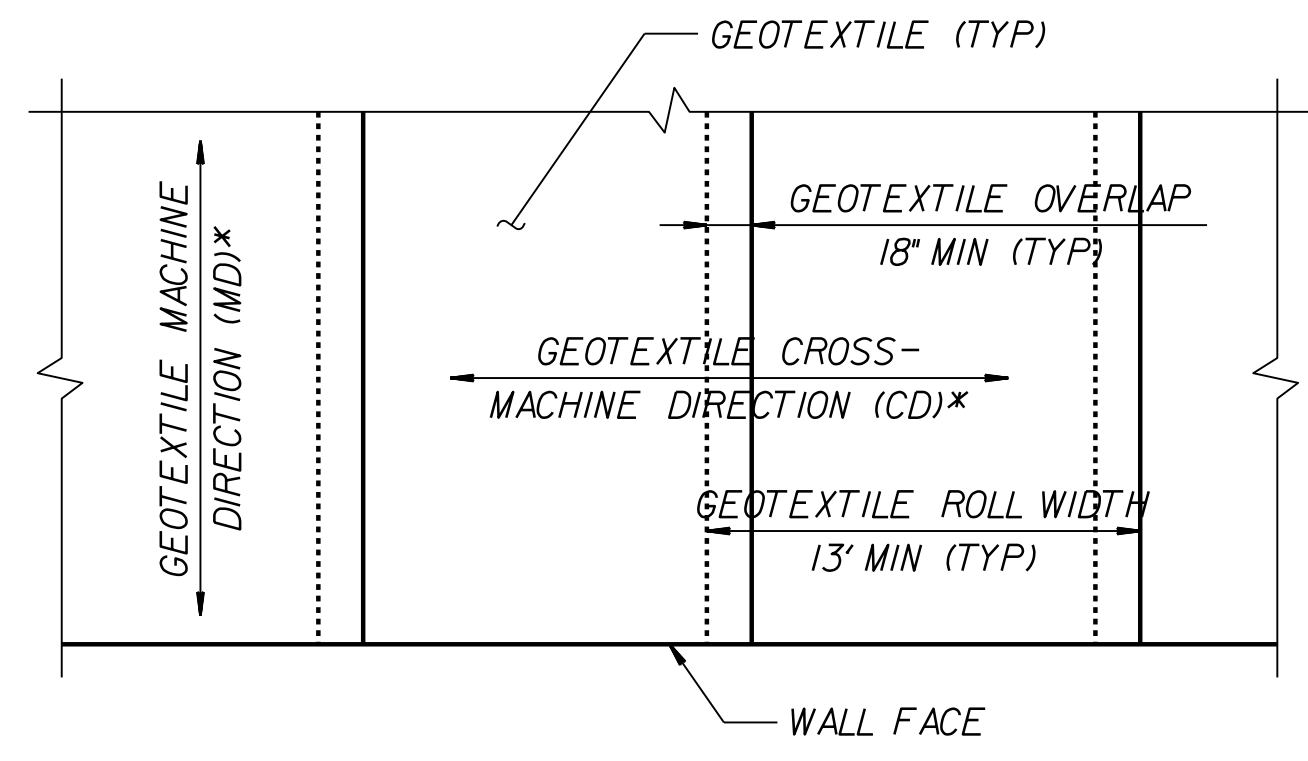
STANDARD DETAIL NO. 1801.02

STANDARD  
 TEMPORARY WALL  
 SHEET 1 OF 3

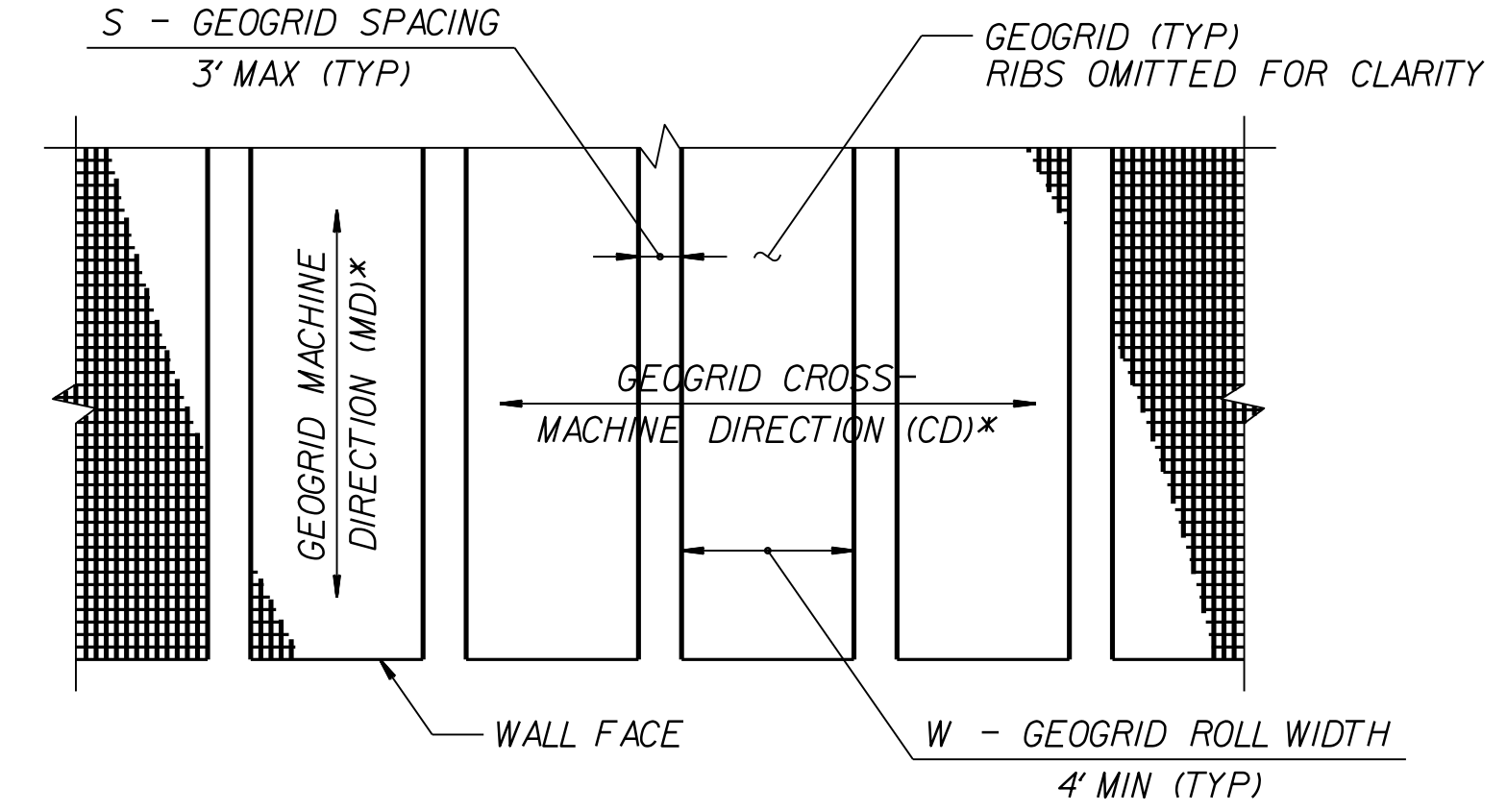
GEOTECHNICAL ENGINEER ENGINEER

DocuSigned by: Scott A. Hidden 06/14/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

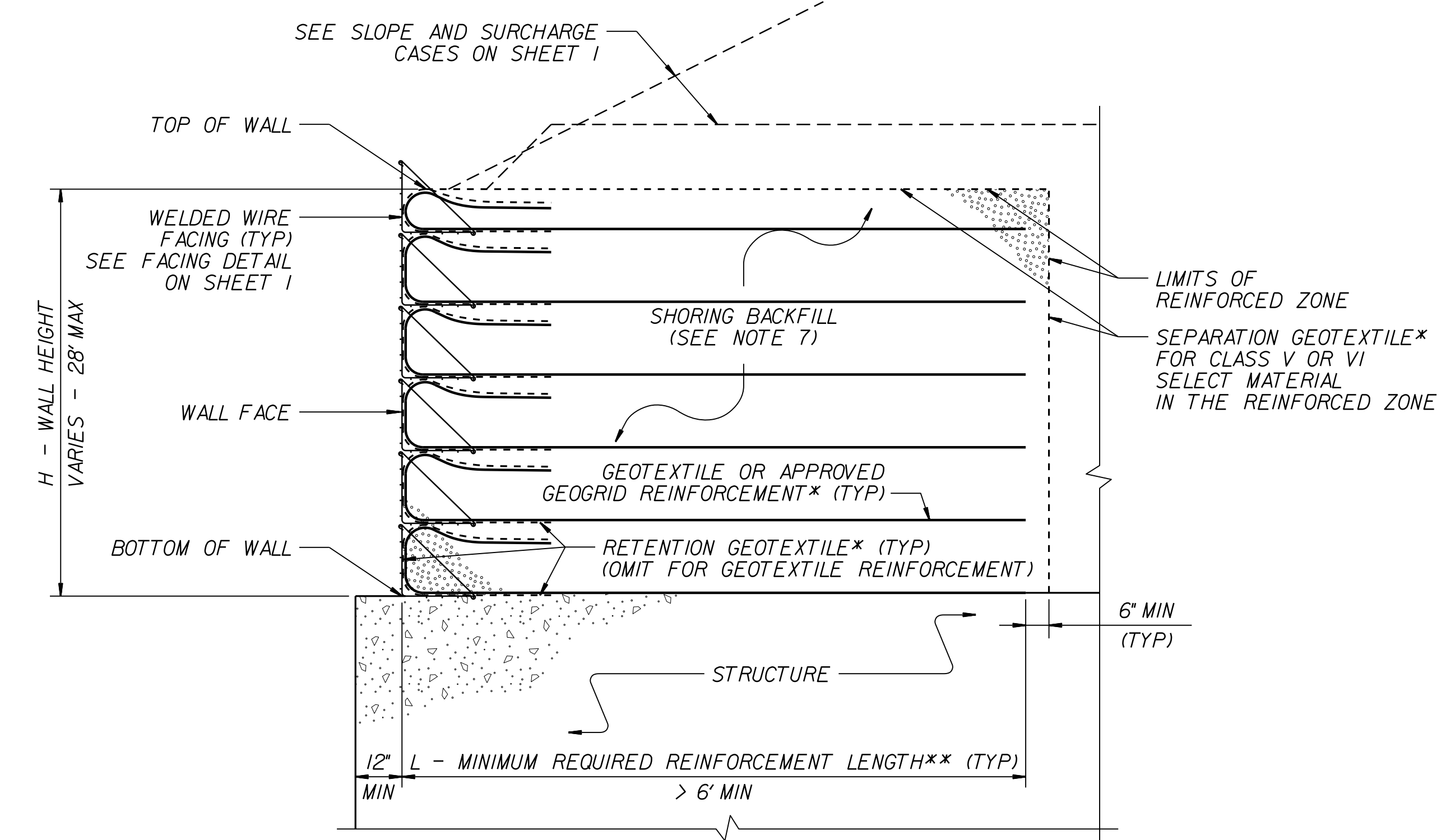


**GEOTEXTILE PLACEMENT**  
 (100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



**GEOGRID PLACEMENT**  
 (80% COVERAGE MIN FOR GEOGRID REINFORCEMENT -  $\frac{W}{W+S} \times 100 \geq 80\%$ , SEE NOTE 11)

**GEOSYNTHETIC PLACEMENT DETAILS**  
 (PLAN VIEW)  
 \*SEE NOTE 12.



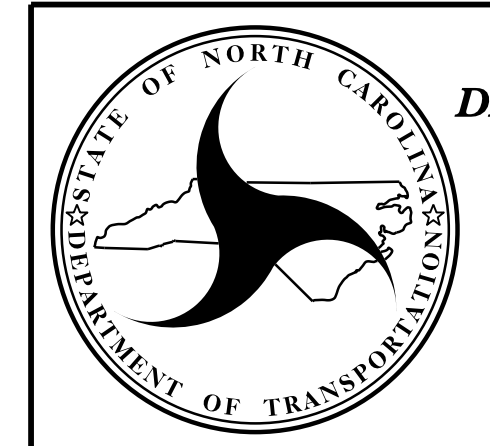
**TEMPORARY WALL ON STRUCTURE DETAIL**  
 \*SEE GEOSYNTHETIC PLACEMENT DETAILS.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 3.

**NOTES:**

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

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

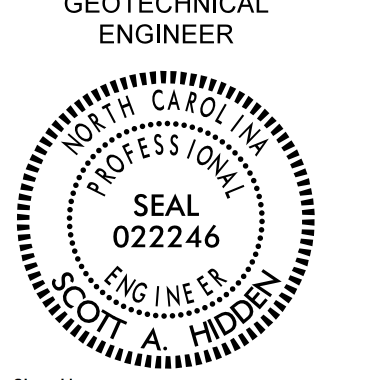
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:  
 - 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



NORTH CAROLINA  
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 GEOTECHNICAL  
 ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD  
 TEMPORARY WALL  
 SHEET 2 OF 3

<b>PROJECT REFERENCE NO.</b> B-4654	<b>SHEET NO.</b> 2G-4
 GEOTECHNICAL ENGINEER ENGINEER	GEOTECHNICAL ENGINEER ENGINEER DATE: 06/14/2022 SIGNATURE: Scott A. Holden
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

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

**L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)**  
(FOR ALL REINFORCEMENT TYPES)

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

\*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

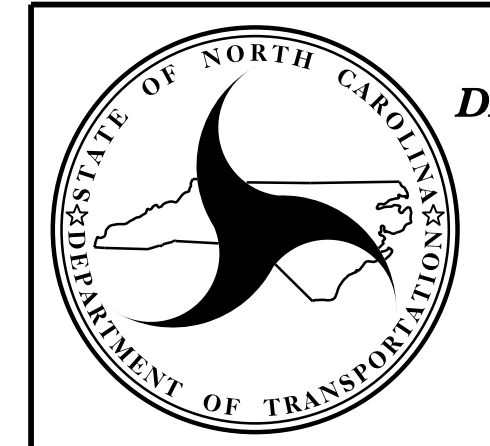
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400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

**GEOTEXTILE REINFORCEMENT**  
ULTIMATE TENSILE STRENGTH (LB/FT)

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

**GEOGRID REINFORCEMENT**  
SHORT-TERM DESIGN STRENGTH (LB/FT)  
(SEE NOTE 10 ON SHEET 2.)

**MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD**  
(SEE NOTE 9 ON SHEET 2.)  
\*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.



NORTH CAROLINA  
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**GEOTECHNICAL  
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02  
  
STANDARD  
TEMPORARY WALL  
SHEET 3 OF 3  
  
DATE: 11-19-13



USORL7B0NNA

COMPUTED BY: AECOM DATE: 05/21/2019  
CHECKED BY: AECOM DATE: 09/13/2023

PROJECT NO. SHEET NO.  
B-4654 3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

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

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

Table with columns: LINE & STATION, OFFSET, STRUCTURE NUMBER, INVERT ELEVATION, MINIMUM REQUIRED SLOPE, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C. S. PIPE, R. C. PIPE CLASS IV, R. C. PIPE CLASS V, ENDWALLS, REINFORCED ENDWALLS, DRAINAGE STRUCTURE, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD, CONCRETE TRANSITIONAL SECTION, GRATE TYPE, and REMARKS. Includes a SHEET TOTALS row at the bottom.

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

SHEET TOTALS

COMPUTED BY: AECOM DATE: 05/21/2019
CHECKED BY: AECOM DATE: 09/13/2023

PROJECT NO. B-4654 SHEET NO. 3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

Table with columns for Line & Station, Offset, Structure Number, Invert Elevation, Minimum Required Slope, Pipe Type (RCP, CSP, HDPE, PVC, C.S. PIPE, R.C. PIPE CLASS IV/V), Endwalls, Drainage Structures, Frame/Grate, and Remarks. Includes a summary row at the bottom labeled 'SHEET TOTALS'.

ABBREVIATIONS table listing various materials and components such as C.A.A. CORRUGATED ALUMINIUM ALLOY, C.B. CATCH BASIN, C.S. CORRUGATED STEEL, etc.

USOR/L7B0NNA3

COMPUTED BY: AECOM DATE: 05/21/2019
CHECKED BY: AECOM DATE: 09/13/2023

PROJECT NO. B-4654 SHEET NO. 3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

Main data table with columns for Line & Station, Offset, Structure Number, Drainage Pipe, C.S. Pipe, R.C. Pipe Class IV, R.C. Pipe Class V, Quantities for Drainage Structures, Frame/Grates/Hood, and Remarks. Includes summary rows for SHEET TOTALS and PROJECT TOTALS.

ABBREVIATIONS table listing materials like CORRUGATED ALUMINIUM ALLOY, CATCH BASIN, CORRUGATED STEEL, DROP INLET, etc.

REMARKS

SHEET TOTALS and PROJECT TOTALS summary rows with numerical values for various categories.

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	2200
				<b>TOTAL LF:</b>	2200

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU (1)	12"	200	400	600		
<b>TOTAL CY/TONS/SY:</b>					200	400**	600**	0	0

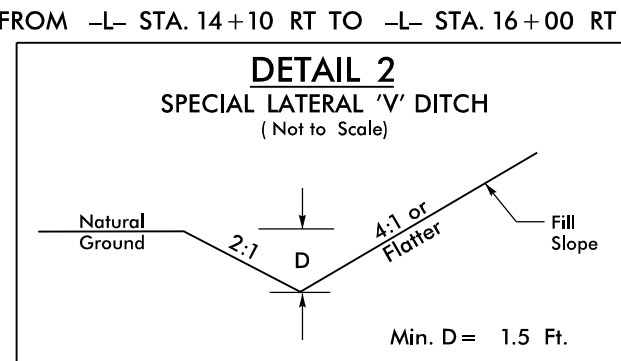
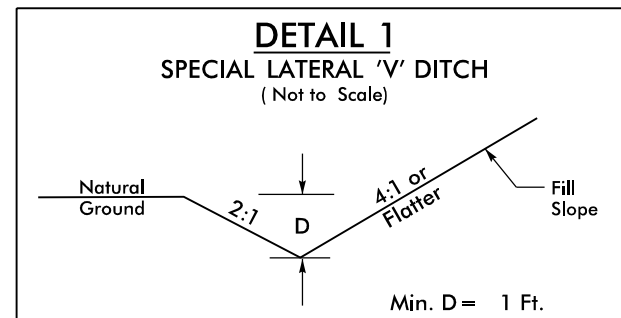
\*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)  
 \*AST = Aggregate Stabilization  
 \*\*Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade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



PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>4</b>
ROADWAY DESIGN ENGINEER 5/24/2023 NORTH CAROLINA PROFESSIONAL SEAL 18470 EDWARD G. GLENN, JR.	HYDRAULICS ENGINEER 5/24/2023 NORTH CAROLINA PROFESSIONAL SEAL 037863 MORRIS B. BUSCH
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

**-L-**  
 PI Sta 16+82.64  
 $\Delta = 11' 34" 50.6" (LT)$   
 $D = 4' 05" 33.2"$   
 $L = 282.97'$   
 $T = 141.97'$   
 $R = 1,400.00'$   
 $e = 3\%$   
 RUNOFF = 78'

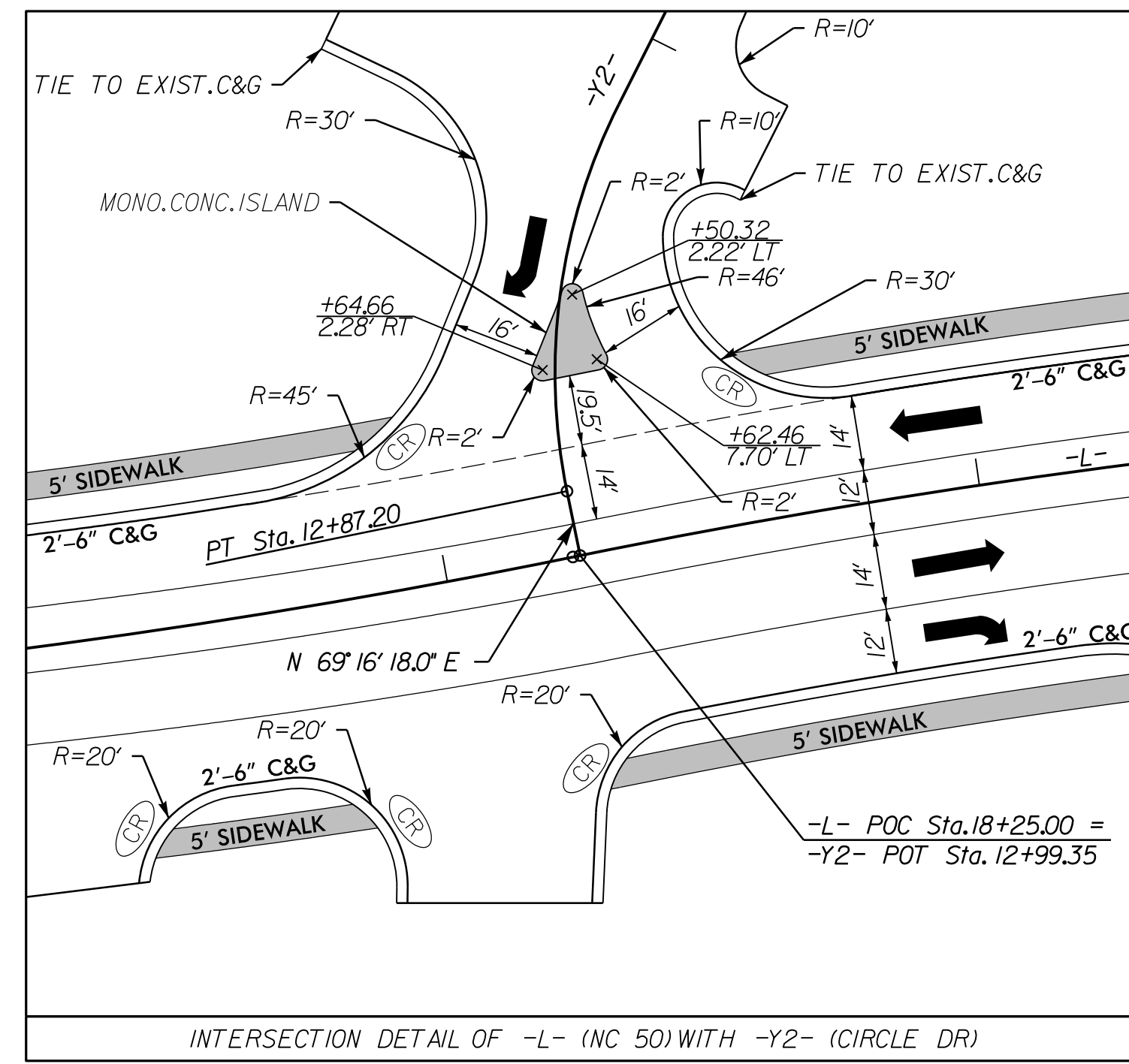
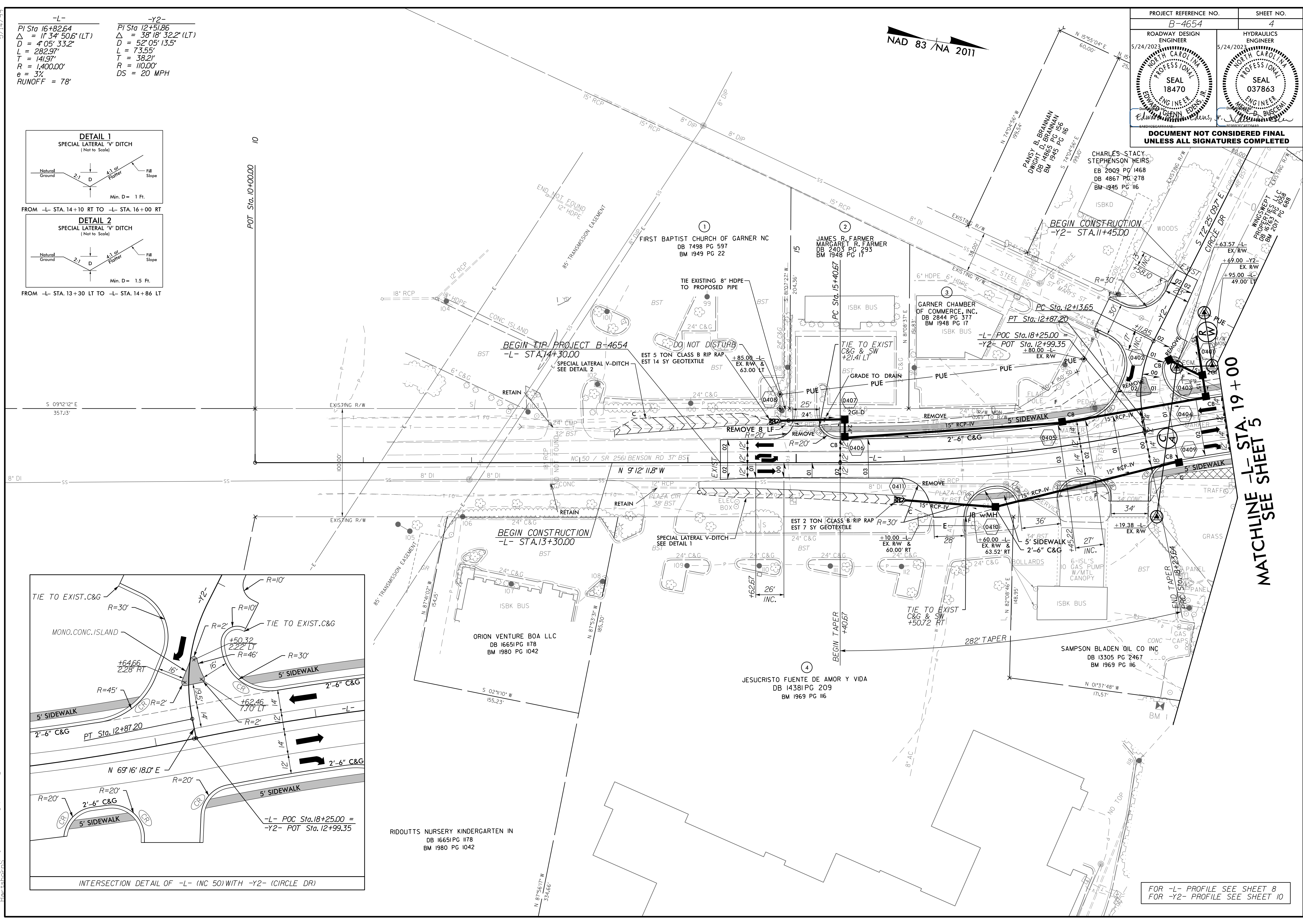
**-Y2-**  
 PI Sta 12+51.86  
 $\Delta = 38' 18" 32.2" (LT)$   
 $D = 52' 05" 13.5"$   
 $L = 73.55'$   
 $T = 38.21'$   
 $R = 110.00'$   
 $DS = 20 MPH$



FROM -L- STA. 14+10 RT TO -L- STA. 16+00 RT

FROM -L- STA. 13+30 LT TO -L- STA. 14+86 LT

REVISIONS



MATCHLINE -L- STA. 19+00  
SEE SHEET 5

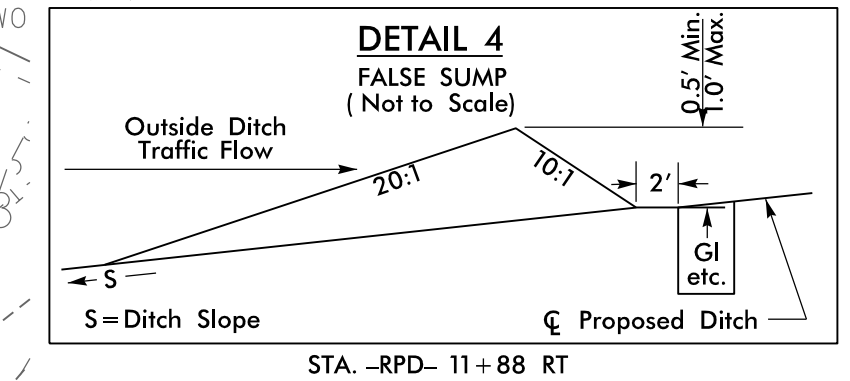
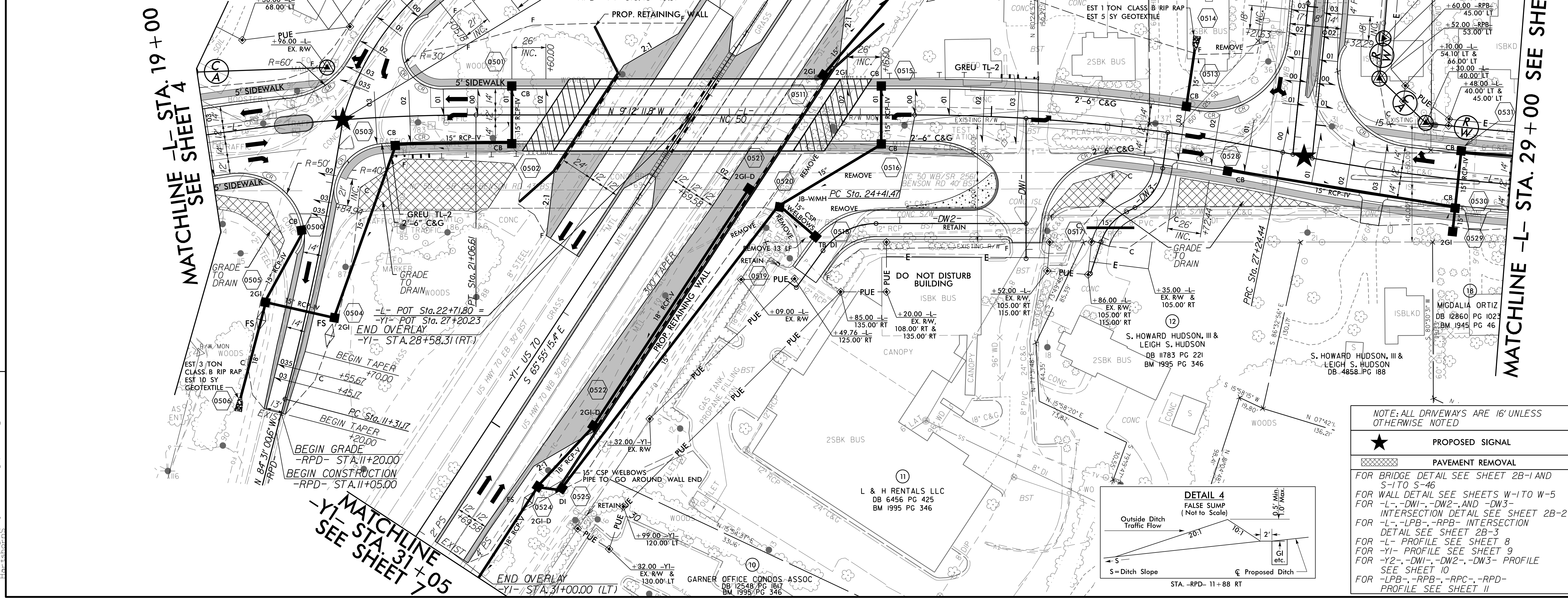
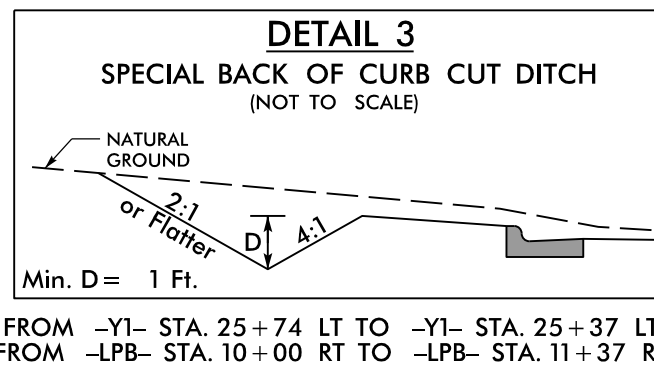
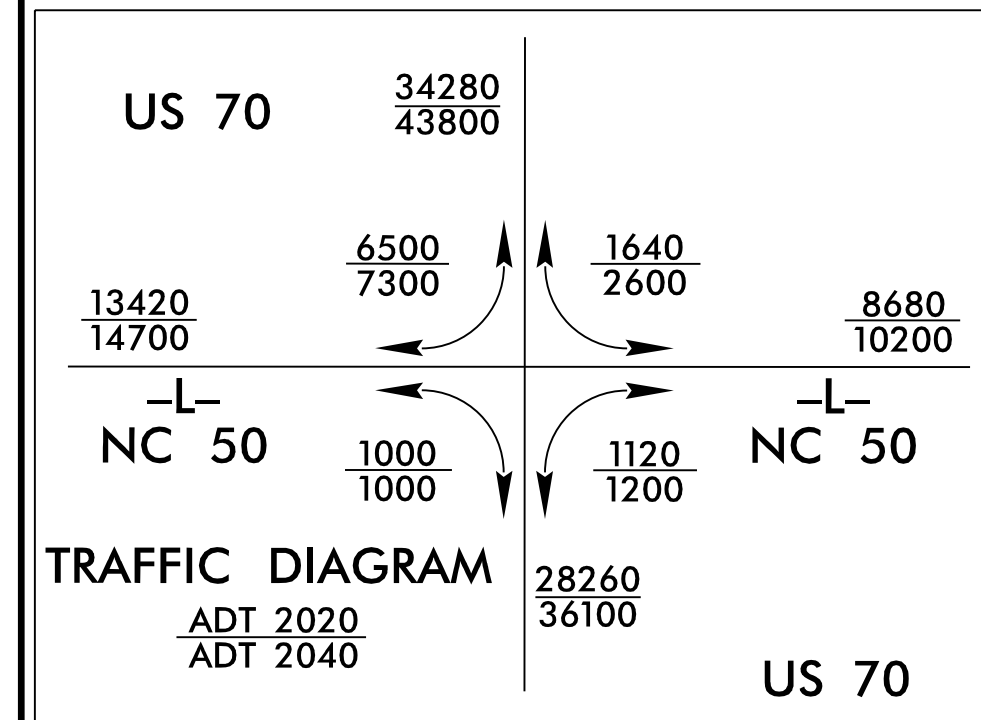
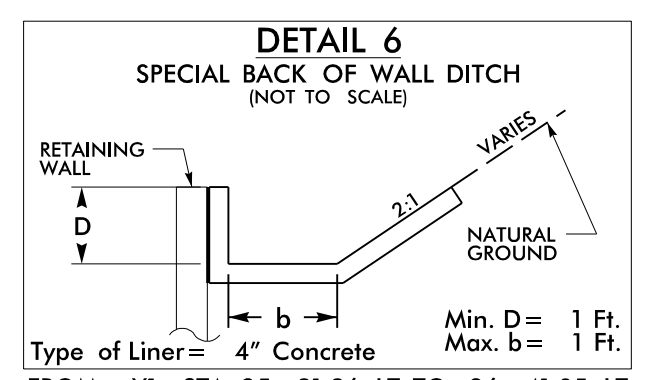
FOR -L- PROFILE SEE SHEET 8  
FOR -Y2- PROFILE SEE SHEET 10

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PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER 5/24/2023	HYDRAULICS ENGINEER 5/24/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NAD 83 / NA 2011

-L-		-LPB-		-DW3-	
PI Sta 16+82.64 Δ = 11' 34" 50.6" (LT) D = 4' 05" 33.2" L = 282.97' T = 141.97' R = 1,400.00' e = 3% RUNOFF = 78'	PI Sta 19+65.61 Δ = 11' 34" 50.6" (RT) D = 4' 05" 33.2" L = 282.97' T = 141.97' R = 1,400.00' e = 3% RUNOFF = 78'	PI Sta 25+83.43 Δ = 11' 34" 50.6" (RT) D = 4' 05" 33.2" L = 282.97' T = 141.97' R = 1,400.00' e = 3% RUNOFF = 78'	PI Sta 28+66.41 Δ = 11' 34" 50.6" (LT) D = 4' 05" 33.2" L = 282.97' T = 141.97' R = 1,400.00' e = 3% RUNOFF = 78'	PI Sta 10+97.04 θ s = 25' 46" 59.2" Ls = 144.00' LT = 97.04' ST = 48.95'	PI Sta 14+62.65 Δ = 126' 40" 32.5" (RT) D = 35' 48" 35.5" L = 353.75' T = 318.65' R = 160.00' e = 8% RUNOFF = 144'
-RPC-		-RPB-		-DW2-	
PI Sta 13+63.90 Δ = 37' 15" 31.6" (LT) D = 28' 38" 52.4" L = 130.06' T = 67.42' R = 2,000.00' DS = 25 MPH	PI Sta 12+40.12 Δ = 5' 56" 23.4" (LT) D = 2' 43" 42.1" L = 217.71' T = 108.95' R = 2,100.00' e = 3.5% RUNOFF = 73.5'	PI Sta 11+49.35 Δ = 13' 25" 12.9" (LT) D = 5' 43" 46.5" L = 234.23' T = 117.65' R = 1,000.00' e = 6% RUNOFF = 126'	PI Sta 13+47.74 Δ = 9' 21" 15.3" (RT) D = 5' 43" 46.5" L = 163.26' T = 81.81' R = 1,000.00' e = 4% DS = 25 MPH	PI Sta 10+60.26 Δ = 54' 04" 21.9" (RT) D = 114' 35" 29.6" L = 47.19' T = 25.52' R = 50.00'	PI Sta 10+48.24 Δ = 54' 41" 26.4" (RT) D = 143' 14" 22.0" L = 38.18' T = 20.69' R = 40.00'



NOTE: ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED

★ PROPOSED SIGNAL

PAVEMENT REMOVAL

FOR BRIDGE DETAIL SEE SHEET 2B-1 AND S-1 TO S-46

FOR WALL DETAIL SEE SHEETS W-1 TO W-5

FOR -L-, -DW1-, -DW2-, AND -DW3- INTERSECTION DETAIL SEE SHEET 2B-2

FOR -L-, -LPB-, -RPB- INTERSECTION DETAIL SEE SHEET 2B-3

FOR -L- PROFILE SEE SHEET 8

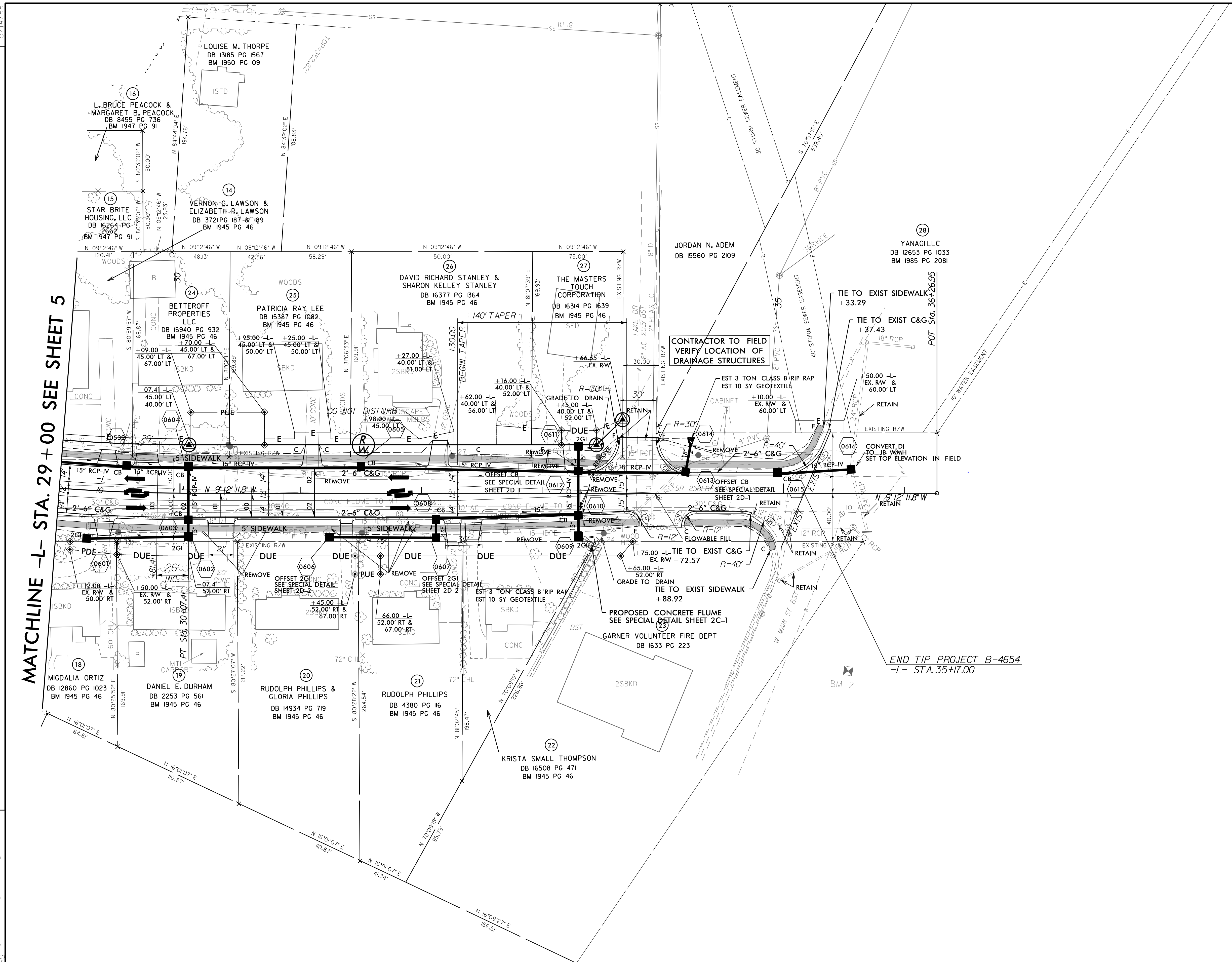
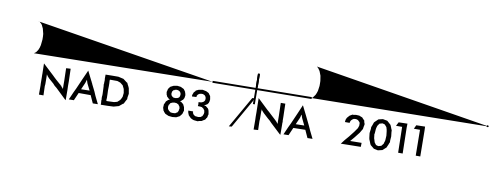
FOR -YI- PROFILE SEE SHEET 9

FOR -Y2-, -DW1-, -DW2-, -DW3- PROFILE SEE SHEET 10

FOR -LPB-, -RPB-, -RPC-, -RPD- PROFILE SEE SHEET 11

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 REVISIONS  
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PROJECT REFERENCE NO. B-4654	SHEET NO. 6
ROADWAY DESIGN ENGINEER 5/24/2023 NORTH CAROLINA PROFESSIONAL SEAL 18470 EDWARD J. CLANN EDWARDS, JR.	HYDRAULICS ENGINEER 5/24/2023 NORTH CAROLINA PROFESSIONAL SEAL 037863 MORRIS B. BUSCEMI
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

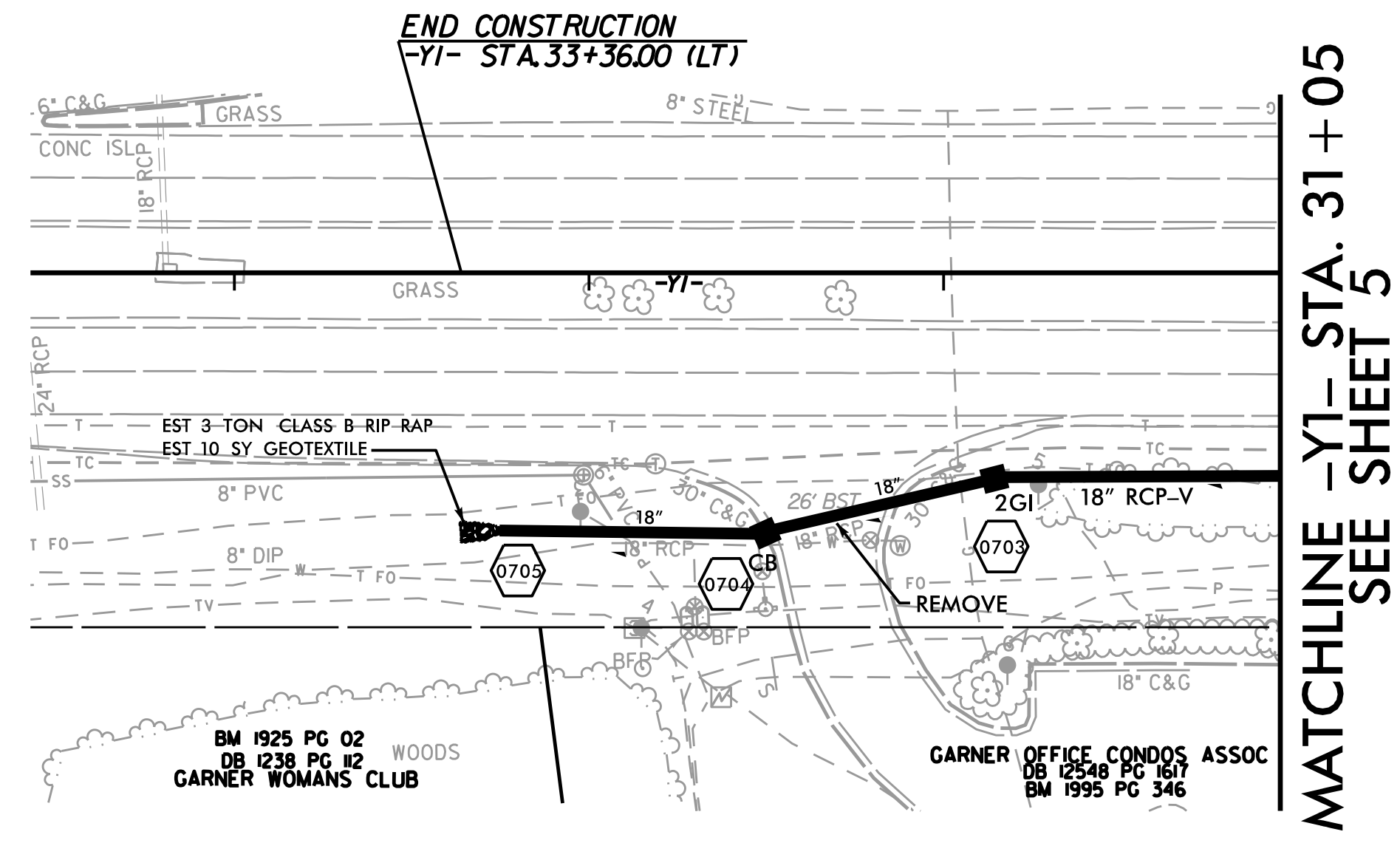
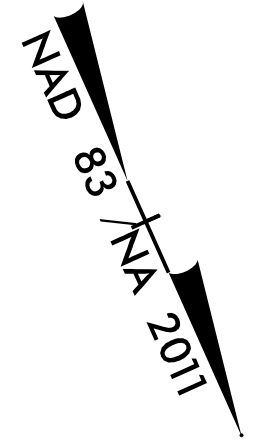


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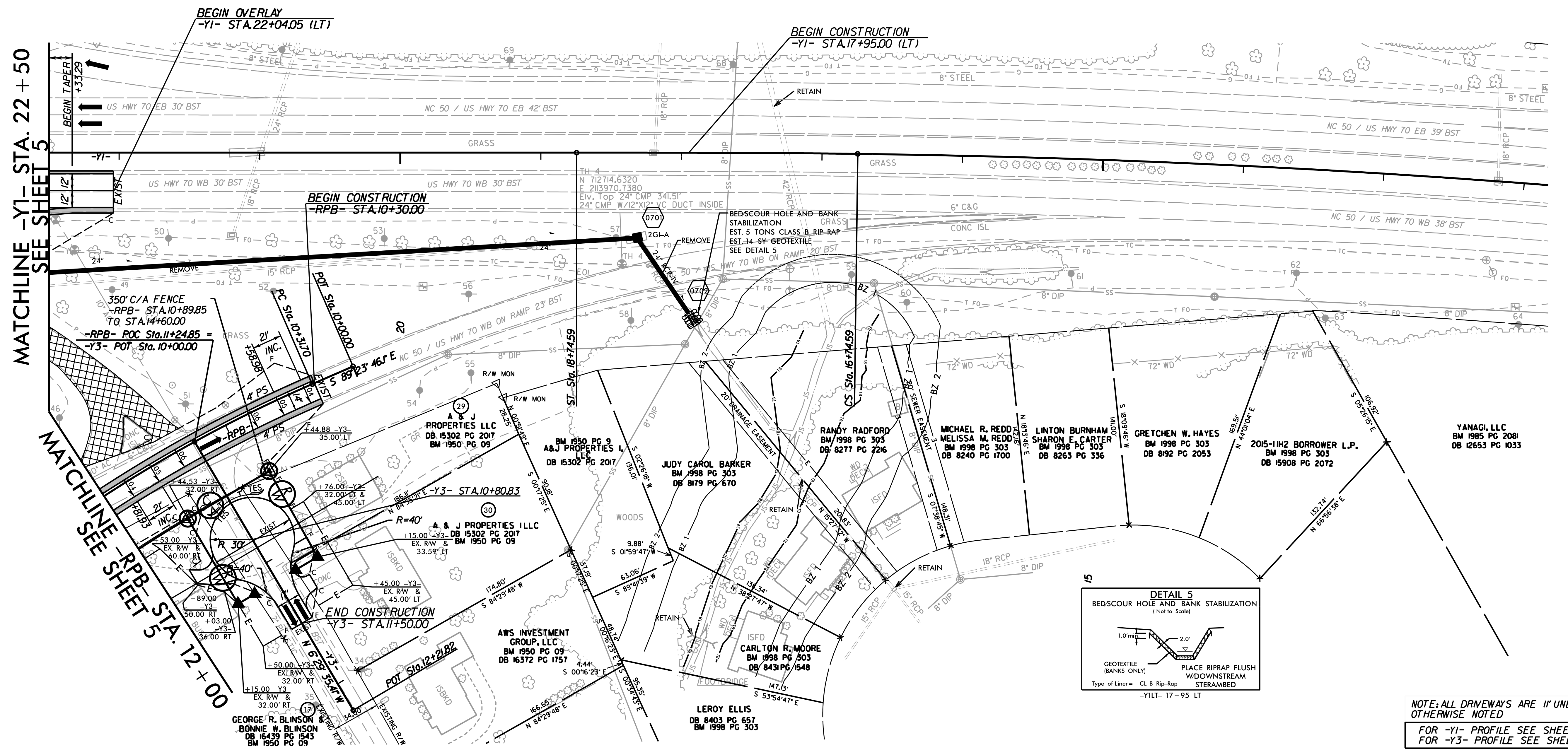
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NOTE: ALL DRIVEWAYS ARE 16' UNLESS OTHERWISE NOTED  
FOR -L- PROFILE SEE SHEET 8

PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>7</b>
ROADWAY DESIGN ENGINEER 7/7/2023 NORTH CAROLINA PROFESSIONAL SEAL 18470 EDWARD GLENN EDWARDS, JR.	HYDRAULICS ENGINEER 7/7/2023 NORTH CAROLINA PROFESSIONAL SEAL 037863 MAYOR B. BUSCHMANN
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

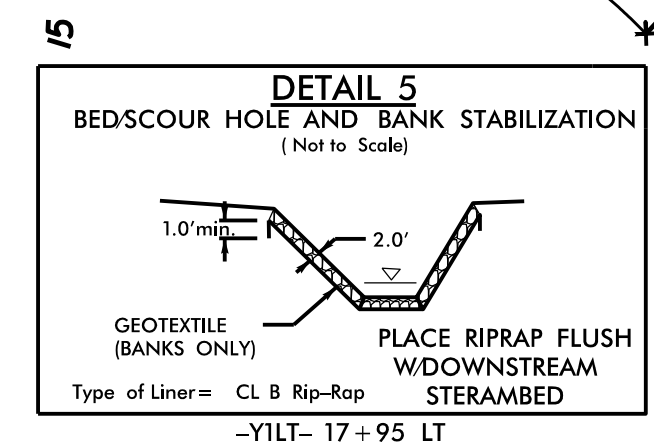


MATCHLINE -Y1- STA. 31+05  
SEE SHEET 5



MATCHLINE -Y1- STA. 22 + 50  
SEE SHEET 5

MATCHLINE -RPB- STA. 12 + 00  
SEE SHEET 5



NOTE: ALL DRIVEWAYS ARE 11' UNLESS OTHERWISE NOTED  
FOR -Y1- PROFILE SEE SHEET 9  
FOR -Y3- PROFILE SEE SHEET 10

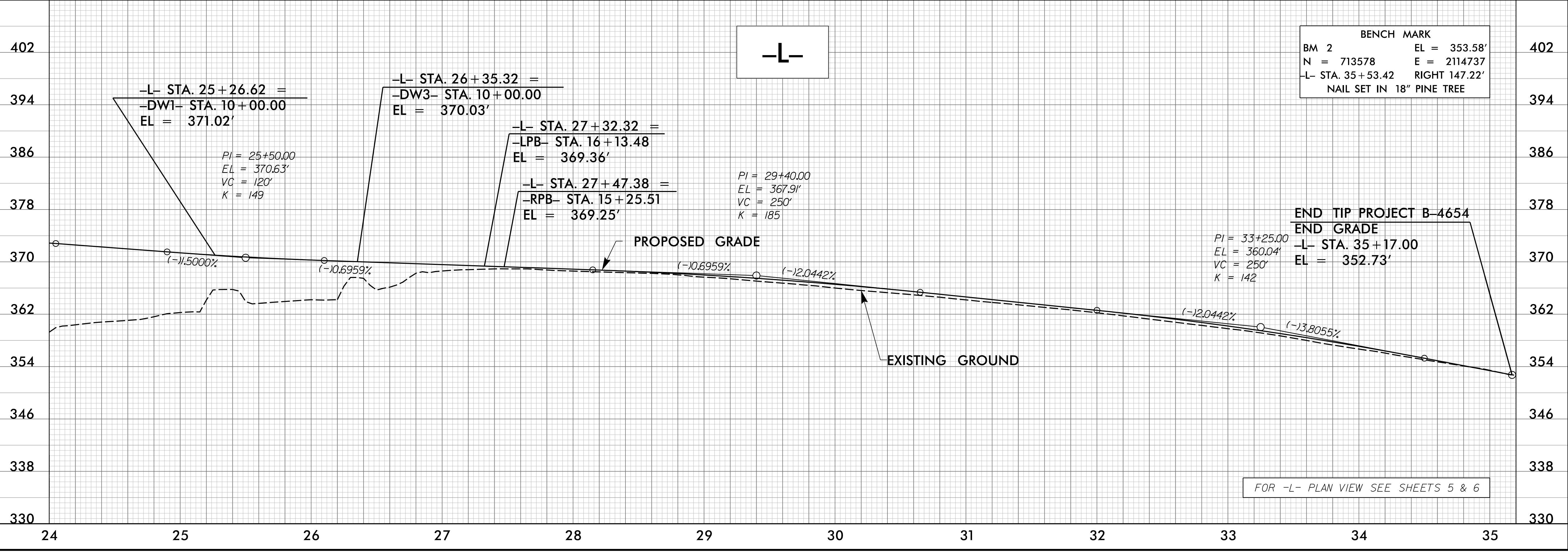
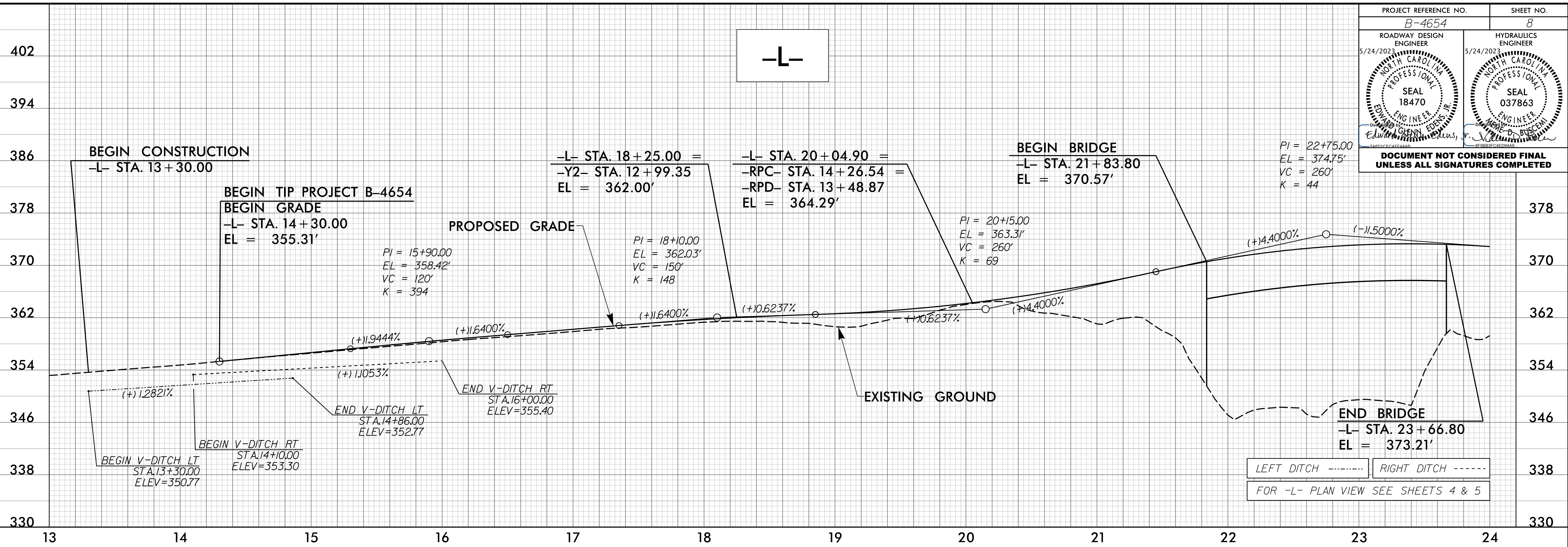
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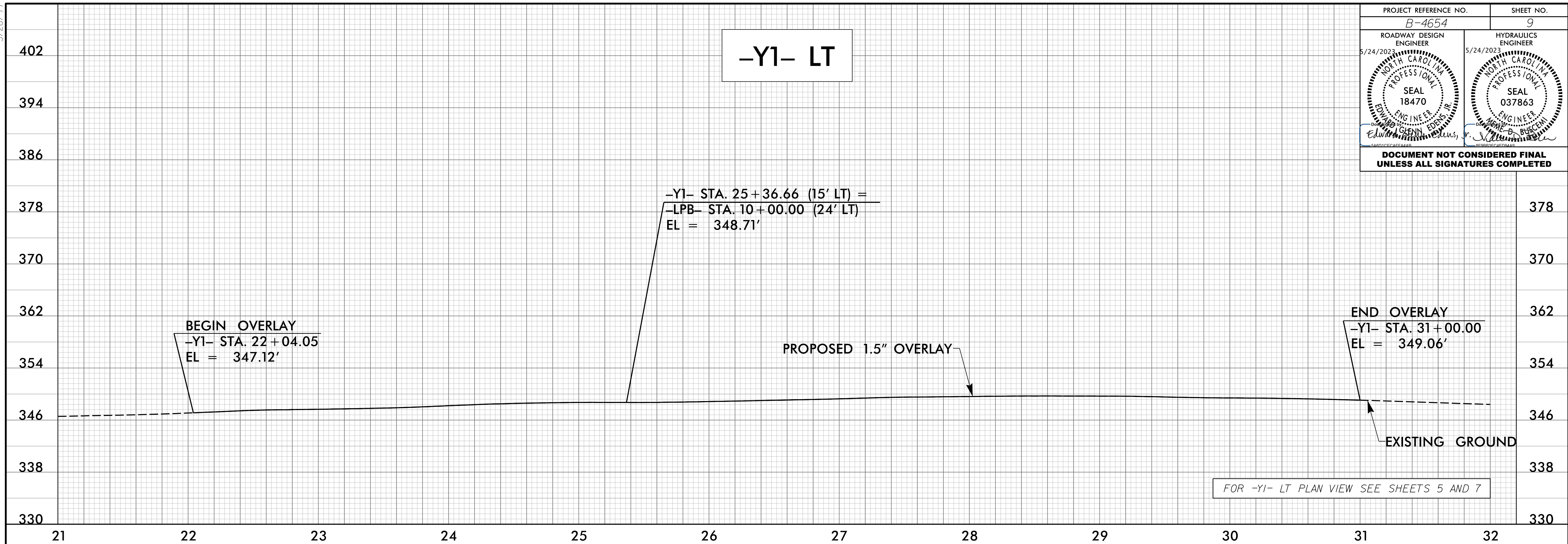
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ROADWAY DESIGN ENGINEER 5/24/2023	HYDRAULICS ENGINEER 5/24/2023
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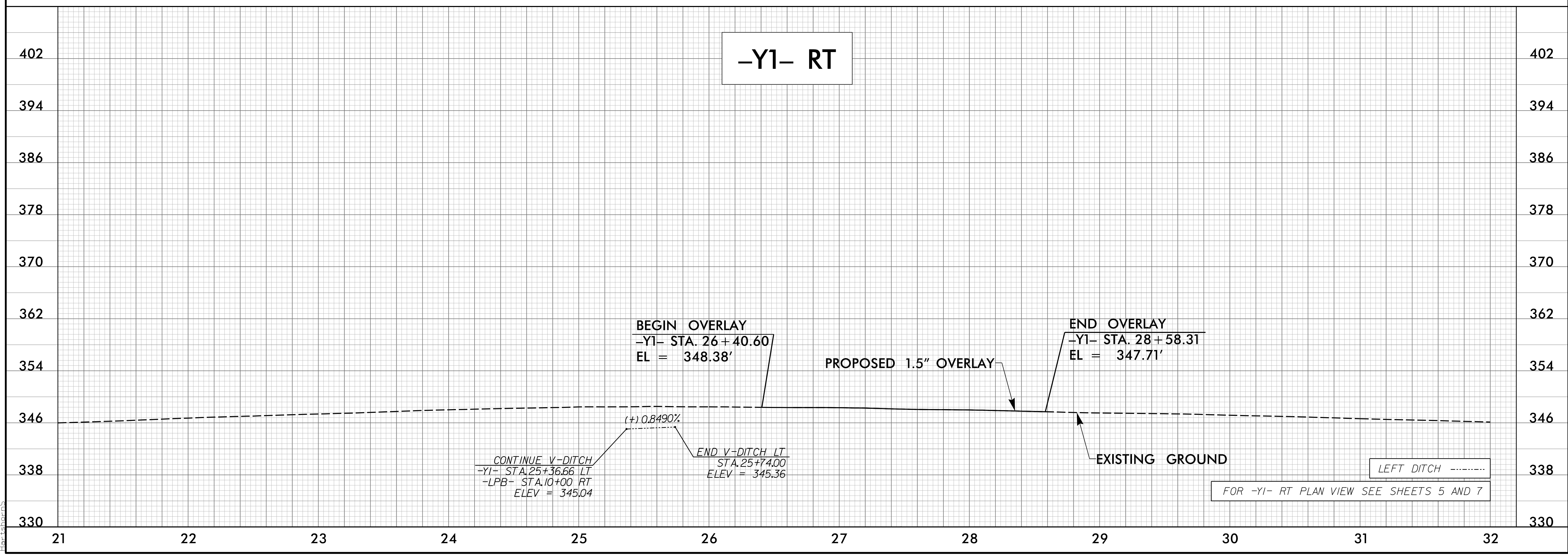
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PROJECT REFERENCE NO. B-4654	SHEET NO. 9
ROADWAY DESIGN ENGINEER 5/24/2023 EDWARD GLENN EDWARDS, JR. SEAL 18470	HYDRAULICS ENGINEER 5/24/2023 MORE-BUSCHMI SEAL 037863
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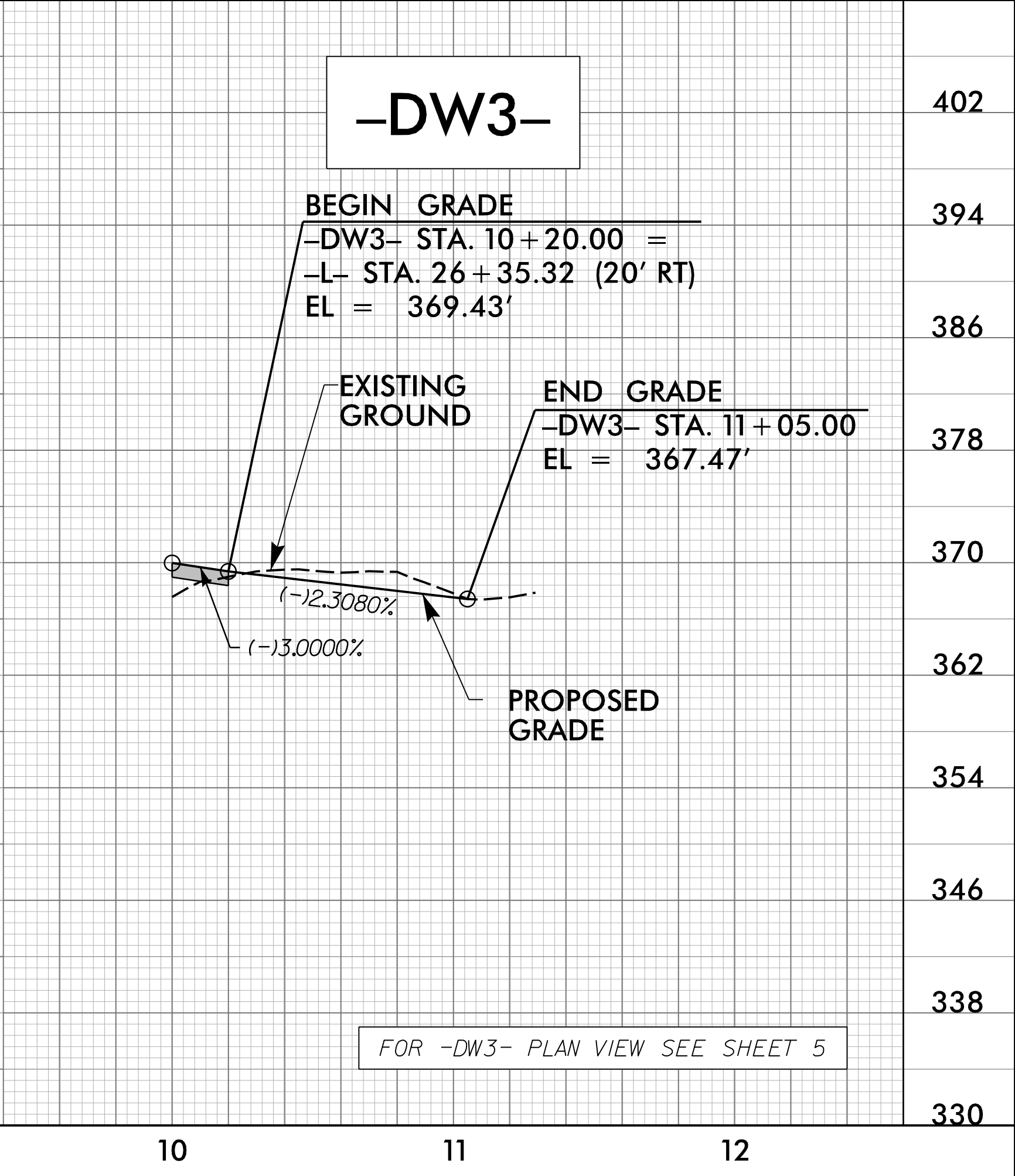
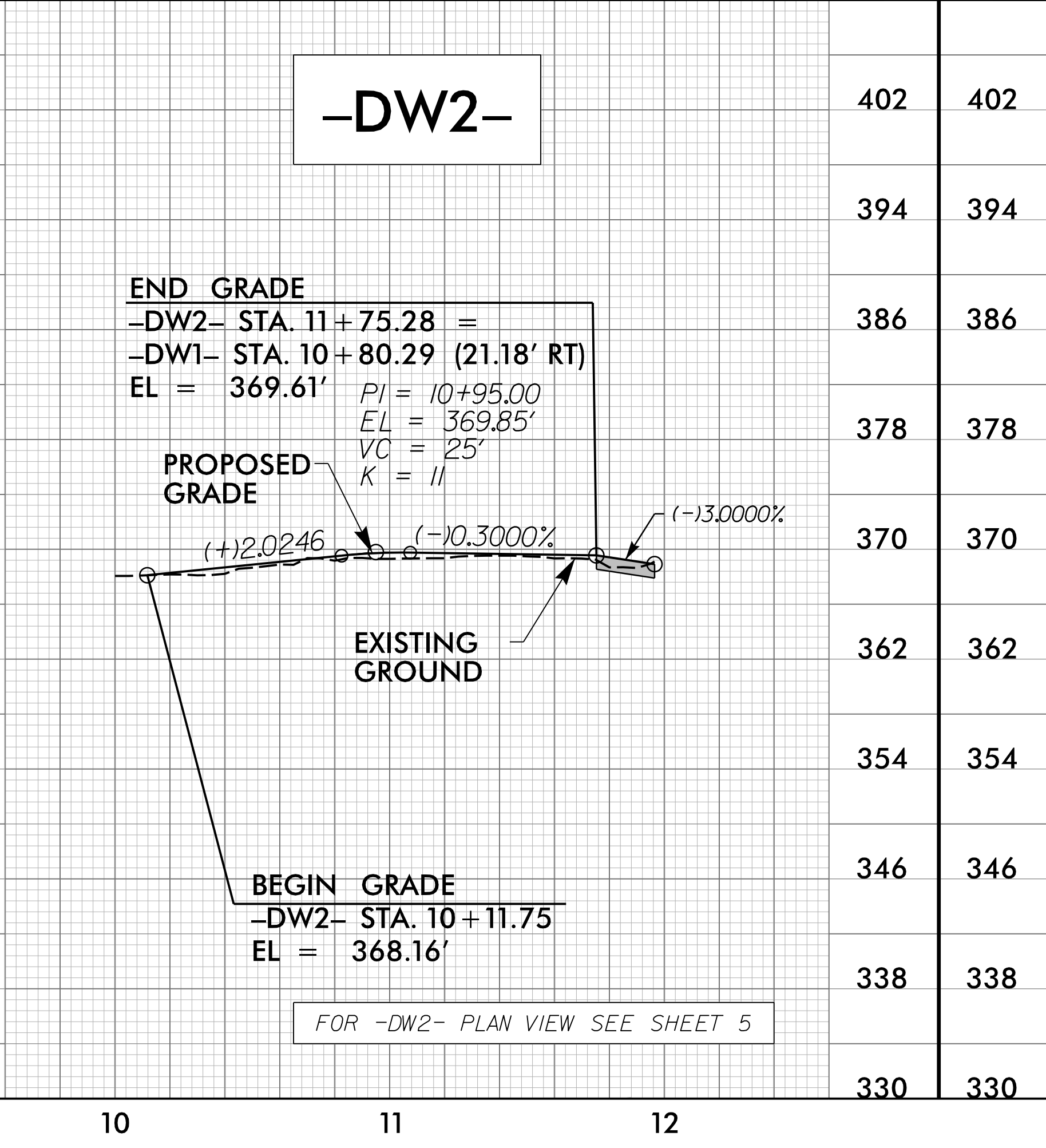
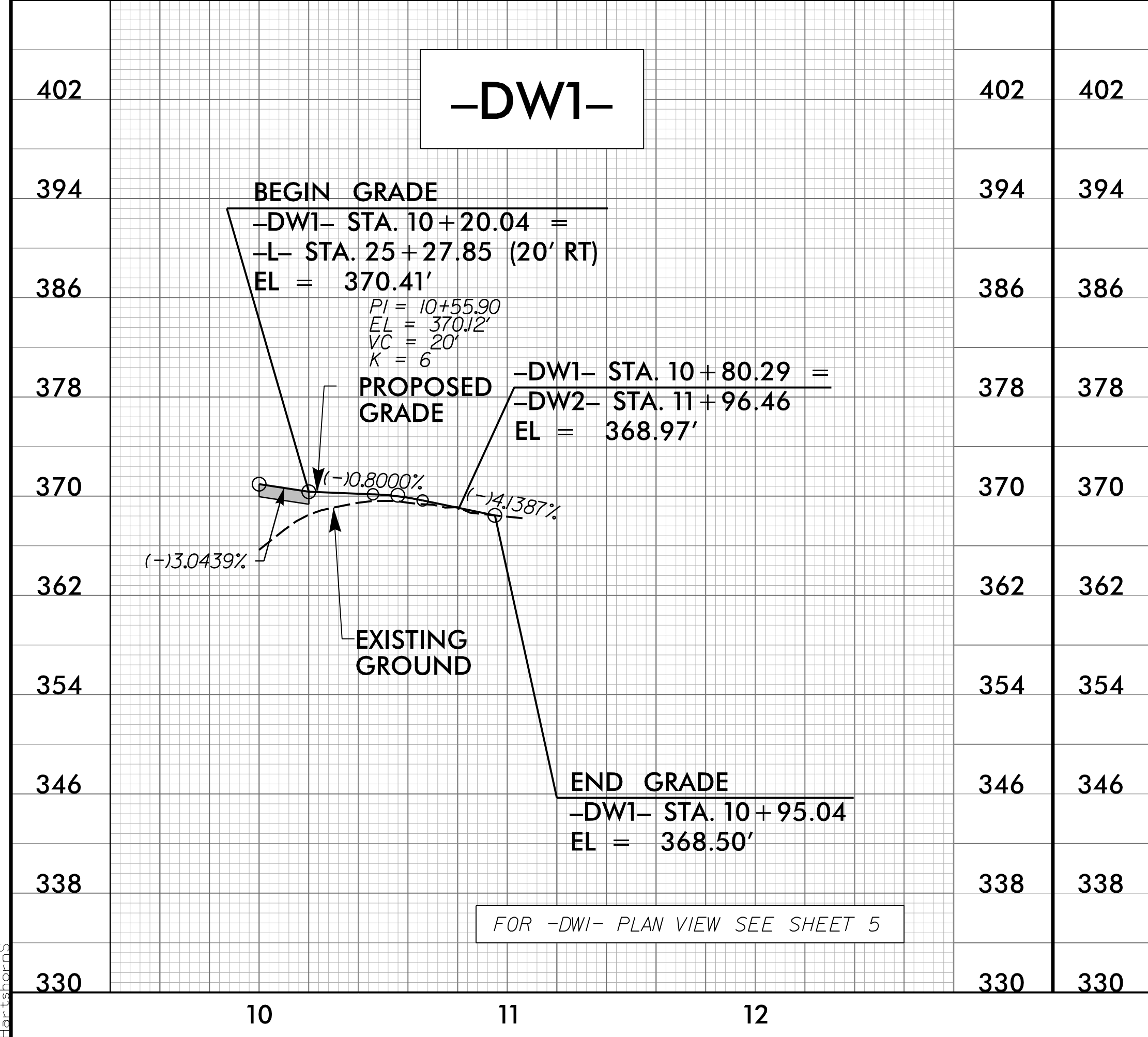
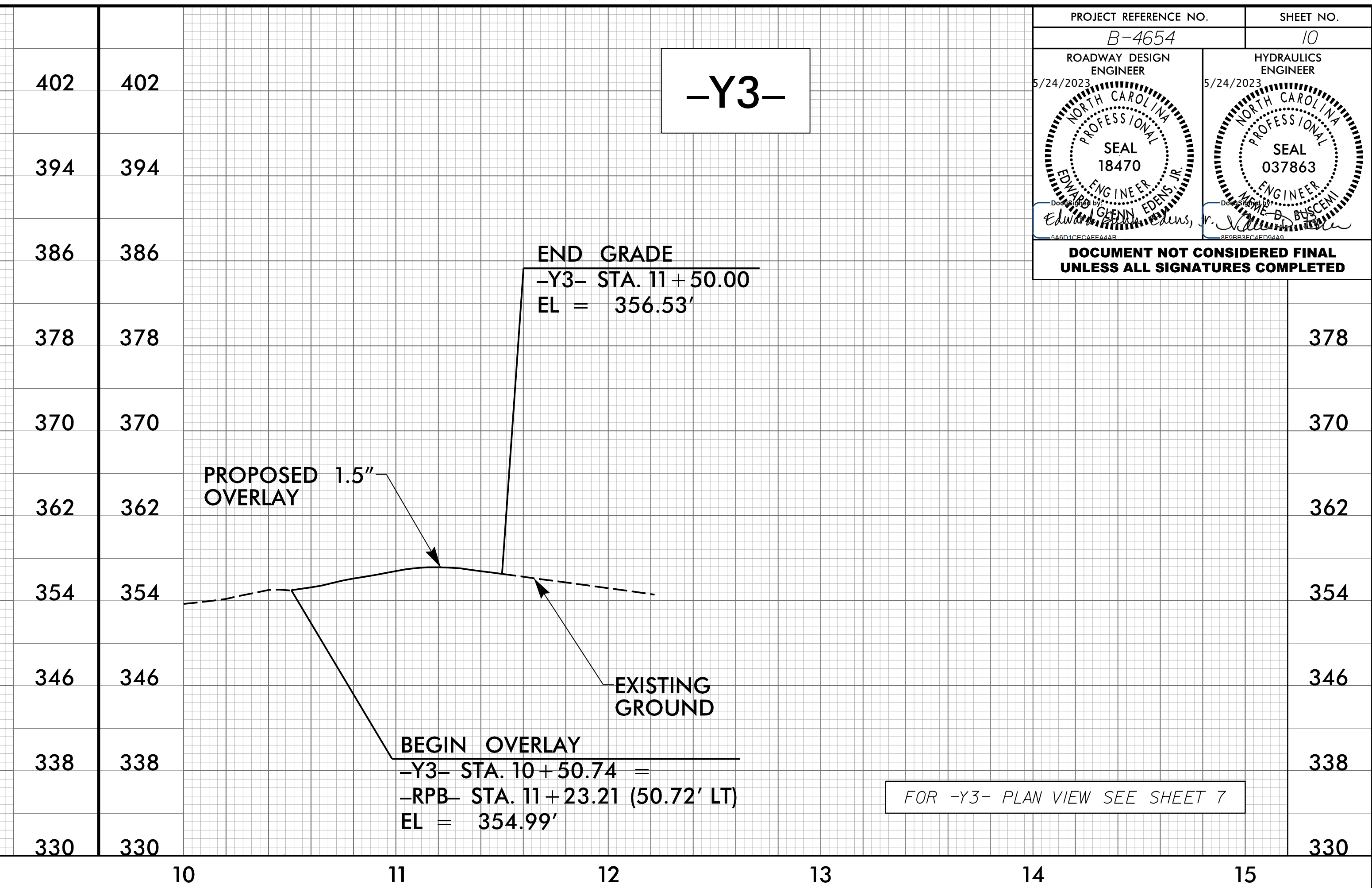
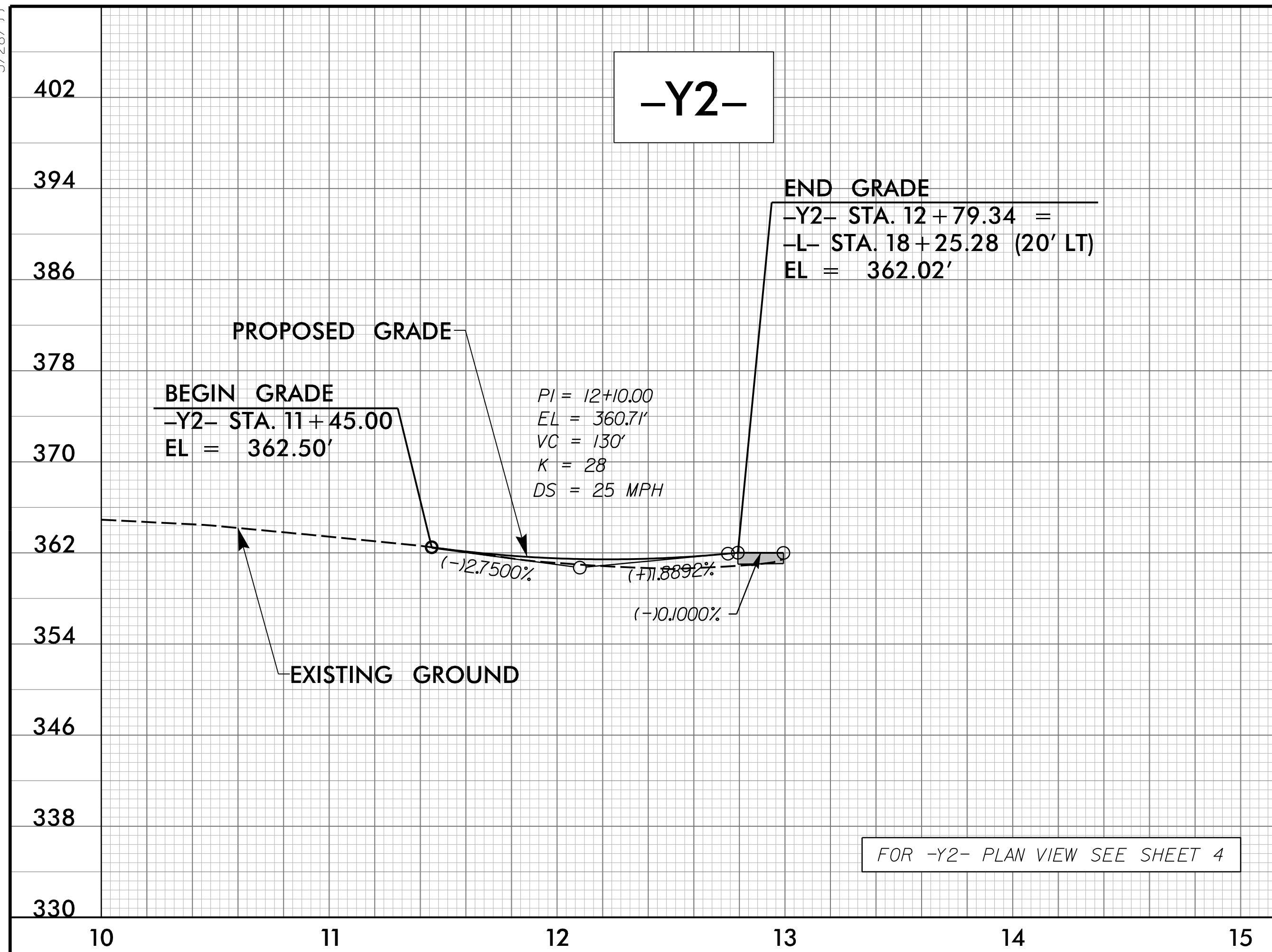


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Harrisburg





5/28/23

PROJECT REFERENCE NO. B-4654	SHEET NO. 10
ROADWAY DESIGN ENGINEER 5/24/2023 NORTH CAROLINA PROFESSIONAL SEAL 18470 EDWARD GLENN EDWARDS, JR.	HYDRAULICS ENGINEER 5/24/2023 NORTH CAROLINA PROFESSIONAL SEAL 037863 MORRIS B. BUSCH
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

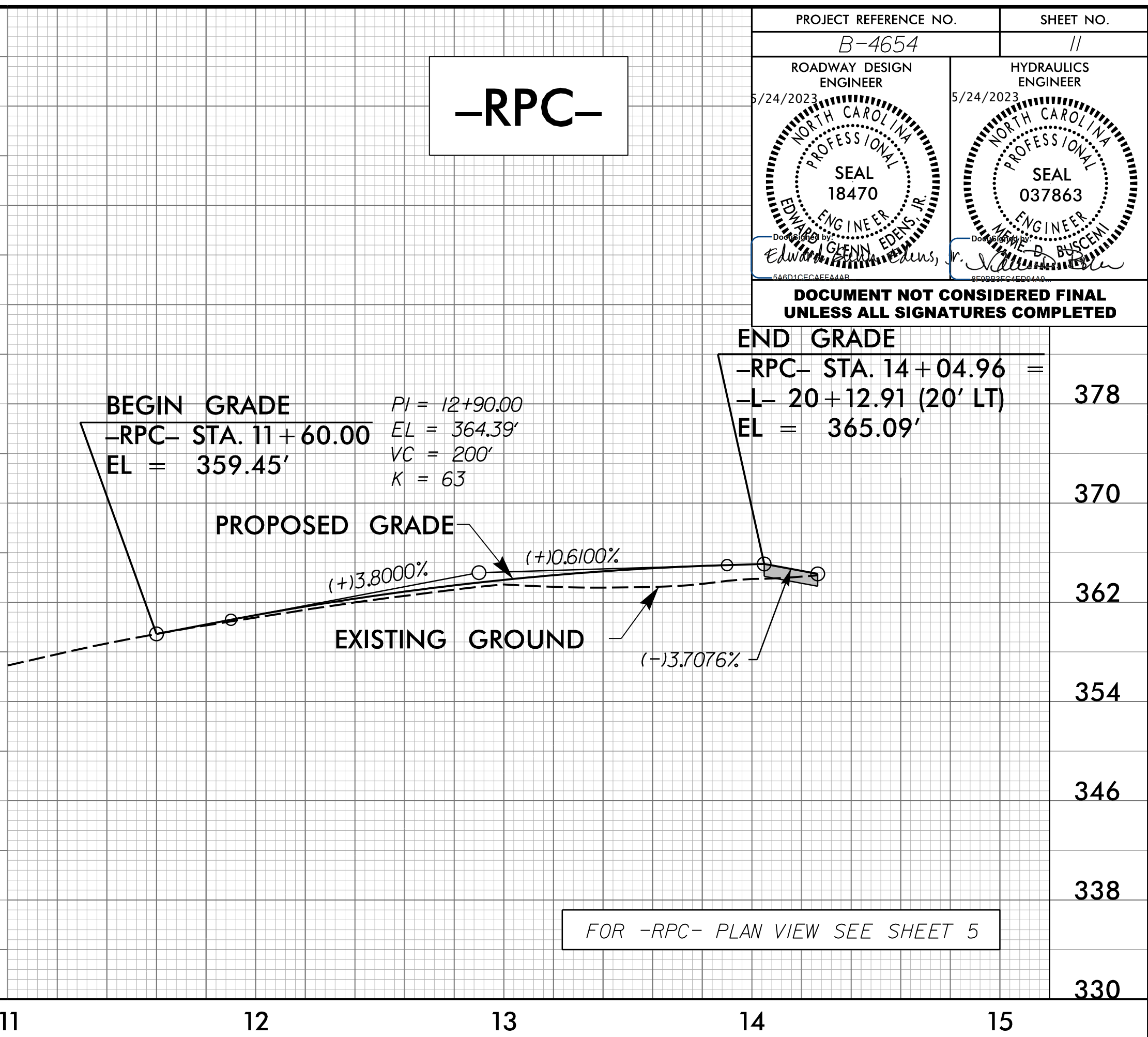
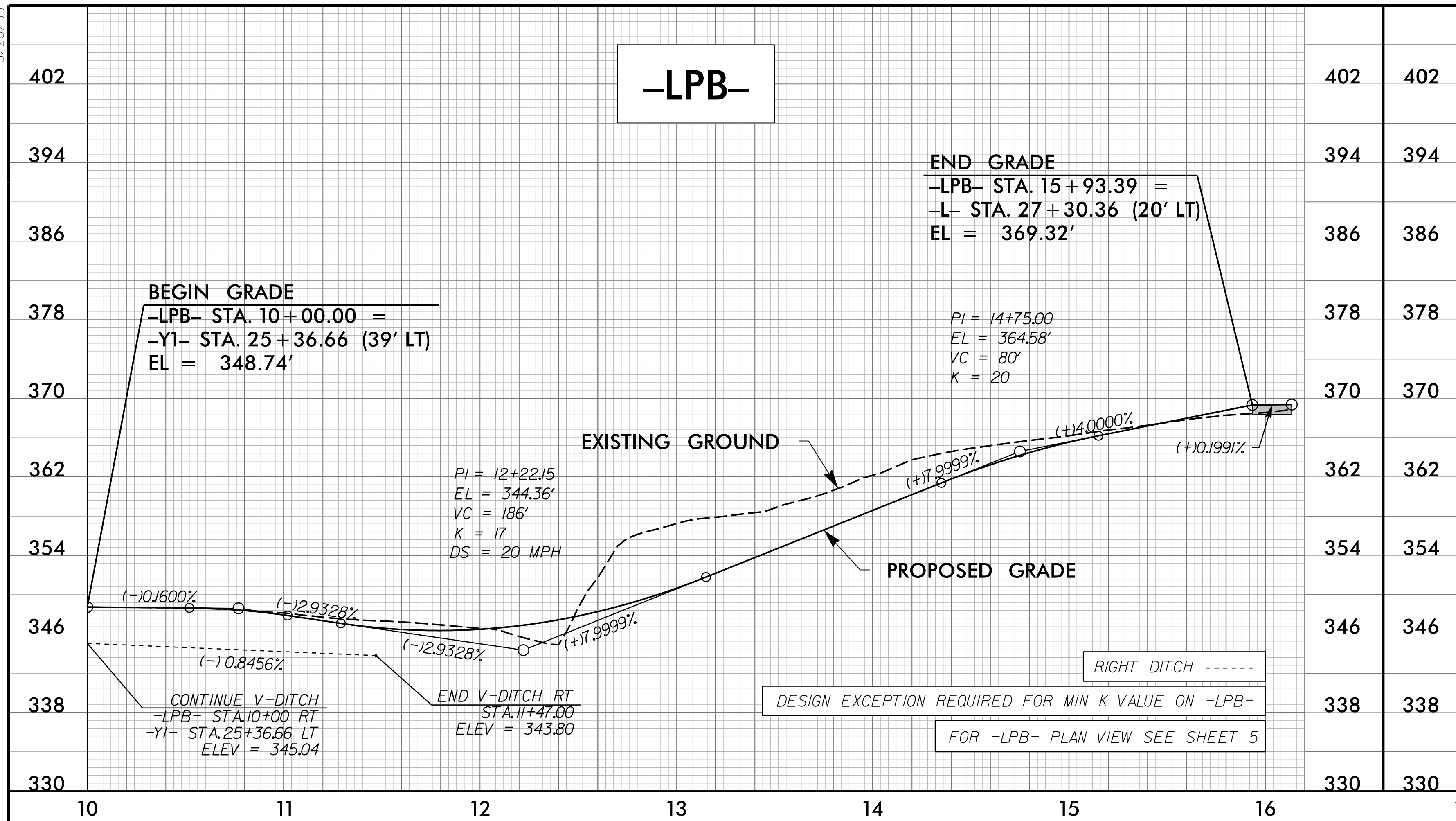


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PROJECT REFERENCE NO. <b>B-4654</b>	SHEET NO. <b>11</b>
ROADWAY DESIGN ENGINEER 5/24/2023 	HYDRAULICS ENGINEER 5/24/2023 

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