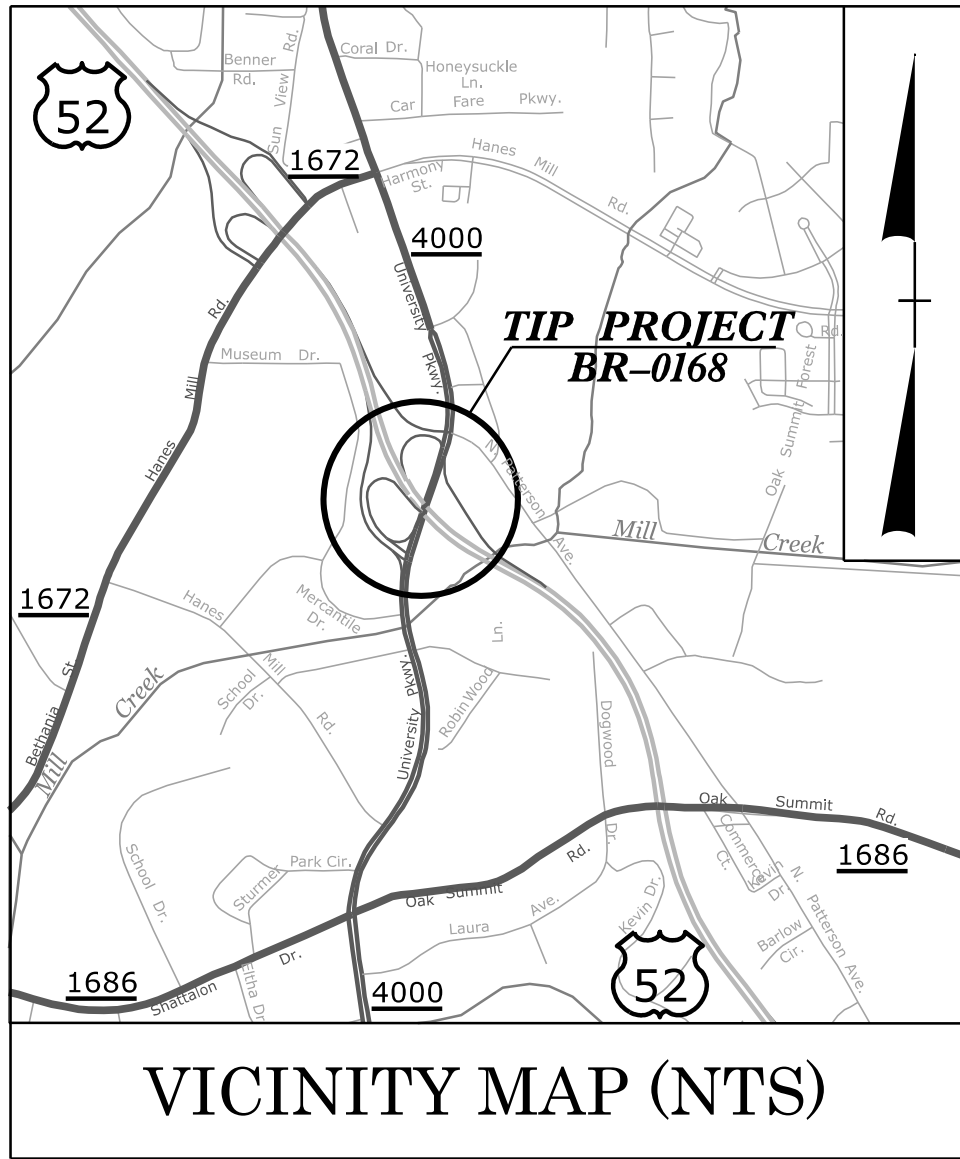


TIP PROJECT: BR-0168

CONTRACT: C205160

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



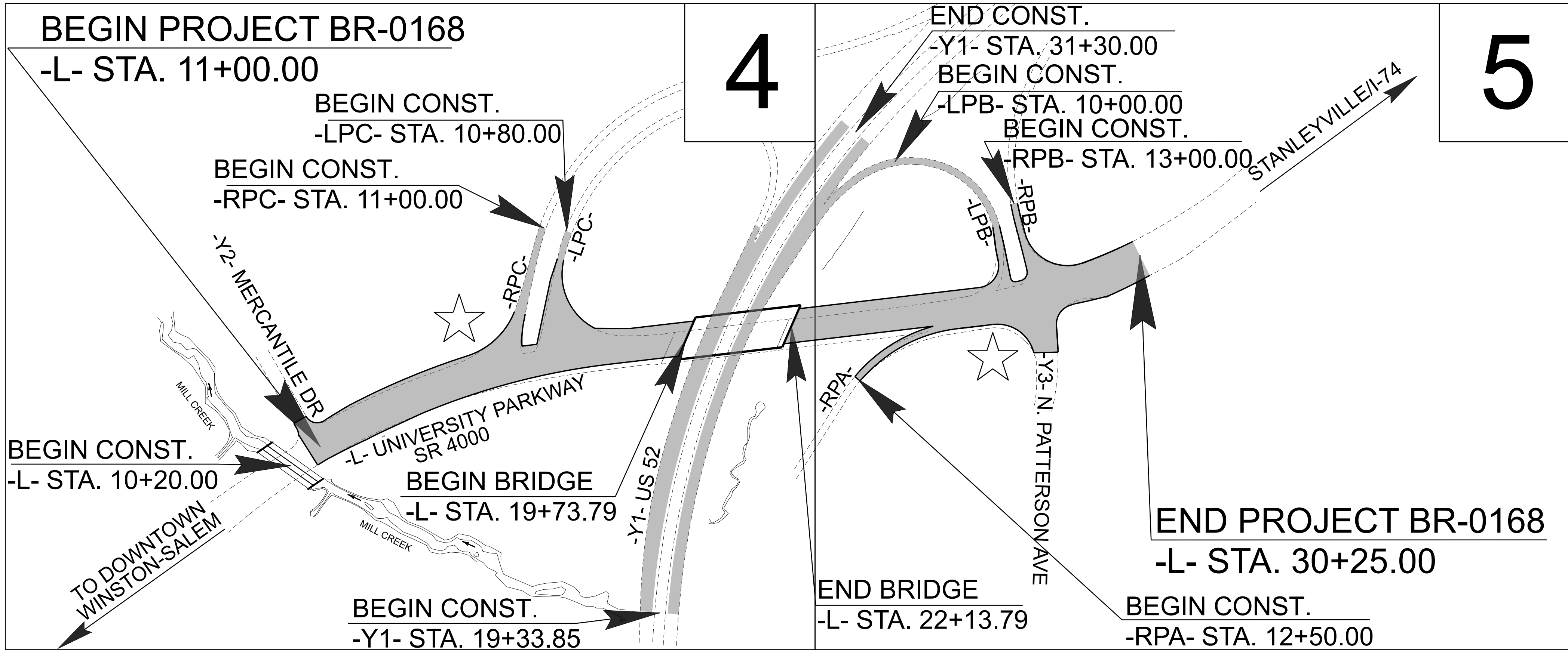
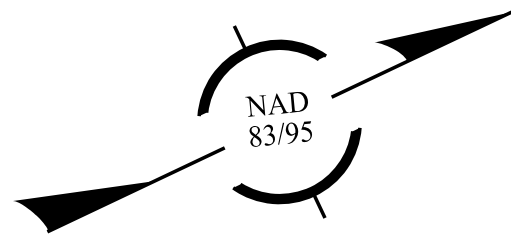
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

LOCATION: *REPLACE BRIDGE 330289 ON SR 4000 (UNIVERSITY PARKWAY) OVER US 52*

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0168	11	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
67168.1.1		P.E.	
67168.2.1		ROW	
67168.2.2		UTILITIES	
67168.3.1		CONST.	



THIS PROJECT HAS FULL CONTROLLED ACCESS THROUGH THE INTERCHANGE.

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2026 = 32800
ADT 2046 = 31550
K = 9 %
D = 65 %
T = 4 % *
V = 50 MPH
* TTST =1% DUAL 3%
FUNC CLASS =
PRINCIPAL ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BR-0168 = 0.320 MILES
LENGTH OF STRUCTURE TIP PROJECT BR-0168 = 0.045 MILES
TOTAL LENGTH OF TIP PROJECT BR-0168 = 0.365 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 22, 2024

LETTING DATE:
JUNE 16, 2026

JOEL P. PERLIN
PROJECT MANAGER

PIOTR J. STOJDA
PROJECT TEAM LEAD

BRYAN E. HOUGH, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Signed by: *Matthew York*
E0B27B30696141D...
SIGNATURE: 05/19/2026

ROADWAY DESIGN ENGINEER

Signed by: *Bryan Hough*
3D10B87FB93142C...
SIGNATURE: 05/19/2026

BR-0168

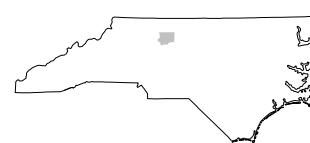
FP

IA

NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

FORSYTH COUNTY



ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER



03/04/2026

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETE

GENERAL NOTES:

2024 SPECIFICATIONS

EFFECTIVE: 01-16-2024

REVISED:

EFF. 01-16-2024

REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.

TITLE

DIVISION 2 - EARTHWORK

200.03 Method of Clearing - Method III

225.01 Guide for Grading Subgrade - Interstate and Freeway

225.02 Guide for Grading Subgrade - Secondary and Local

225.04 Method of Obtaining Superelevation - Two Lane Pavement

235.01 Embankment Monitoring

DIVISION 3 - PIPE CULVERTS

300.01 Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)

310.10 Driveway Pipe Construction

DIVISION 4 - MAJOR STRUCTURES

423.03 Bridge Approach Fills - Type 2 Approach Fill for Bridge Abutment with MSE Wall

423.04 Bridge Approach Fills - Type 2A Alternate Approach Fill for Integral Bridge Abutment with MSE Wall

DIVISION 5 - SUBGRADE, BASES AND SHOULDERS

560.02 Method of Shoulder Construction - High Side of Superelevated Curve - Method II

DIVISION 6 - ASPHALT BASES AND PAVEMENTS

654.01 Pavement Repairs

DIVISION 8 - INCIDENTALS

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

838.27 Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew

838.33 Reinforced Concrete Endwall - for Single 66" Pipe 90 Skew

838.45 Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40

838.57 Reinforced Brick Endwall - for Single 60" Pipe 90 Skew

838.63 Reinforced Brick Endwall - for Single 66" Pipe 90 Skew

838.75 Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70

838.80 Precast Endwalls - 12" thru 72" Pipe 90 Skew

840.00 Concrete Base Pad for Drainage Structures

840.01 Brick Catch Basin - 12" thru 54" Pipe

840.02 Concrete Catch Basin - 12" thru 54" Pipe

840.03 Frame, Grates and Hood - for Use on Standard Catch Basin

840.04 Concrete Open Throat Catch Basin - 12" thru 48" Pipe

840.05 Brick Open Throat Catch Basin - 12" thru 48" Pipe

840.14 Concrete Drop Inlet - 12" thru 30" Pipe

840.15 Brick Drop Inlet - 12" thru 30" Pipe

840.16 Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15

840.17 Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe

840.18 Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe

840.19 Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe

840.22 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

840.45 Precast Drainage Structure

840.54 Manhole Frame and Cover

840.66 Drainage Structure Steps

846.01 Concrete Curb, Gutter and Curb & Gutter

848.01 Concrete Sidewalk (Use Detail in Lieu of Standard for Sheet 1 of 1)

848.04 Street Turnout

848.06 Curb Ramp (Use Details in Lieu of Standards for Sheets 9 and 10 of 13)

852.01 Concrete Islands

852.06 Method for Placement of Drop Inlets in Concrete Islands

862.01 Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15)

862.02 Guardrail Installation

862.03 Structure Anchor Units (Use Detail in Lieu of Standard for Sheet 8 of 9)

876.01 Rip Rap in Channels and Ditches

876.02 Guide for Rip Rap at Pipe Outlets

876.04 Drainage Ditches with Class 'B' Rip Rap

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. 560.02

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY,

SEGRA COMMUNICATION, CITY OF WINSTON SALEM, VERIZON COMMUNICATION,

NCDOT ITS

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

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

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

INDEX OF SHEETS

SHEET NUMBER

SHEET

1

TITLE SHEET

1A

INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS

1B

CONVENTIONAL SYMBOLS

2A-1 THRU 2A-4

PAVEMENT SCHEDULE AND TYPICAL SECTIONS

2B-1

INTERSECTION DETAILS

2C-1 THRU 2C-2

METHOD OF PIPE INSTALLATION DETAILS

2C-3

CONCRETE SIDEWALK DETAILS

2C-4

GUARDRAIL PLACEMENT DETAILS

2C-5

TRANSITION 2'-6" C&G TO PAVED SHOULDER DETAIL

2C-6 THRU 2C-7

MINIMUM DEPTH CATCH BASIN DETAILS

2C-8

CONCRETE JUCTION BOX DETAIL

2D-1

DRAINAGE DETAILS

2G-1 THRU 2G-4

TEMPORARY SHORING DETAILS

3B-1

ROADWAY SUMMARIES

3D-1 THRU 3D-4

DRAINAGE SUMMARIES

3G-1

GEOTECHNICAL SUMMARIES

3P-1

PARCEL INDEX SHEET

4 THRU 5

PLAN SHEETS

6 THRU 8

PROFILE SHEETS

RW-1 THRU RW-5

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASMENT AND PROPERTY TIES

TMP-1 THRU TMP-5.2

TRAFFIC MANAGEMENT PLANS

PMP-1 THRU PMP-4

PAVEMENT MARKING PLANS

EC-1 THRU EC-7

EROSION CONTROL PLANS

SIGN-1 THRU SIGN-9A

SIGNING PLANS

SIG-1 THRU SIG-7.5

SIGNAL PLANS

SIG M-1A THRU SIG M-9

STANDARD METAL POLE PLANS

SCP-1 THRU SCP-7

SIGNAL COMMUNICATIONS PLANS

ITS-1 THRU ITS-12

ITS PLANS

UO-1 THRU UO-3

UTILITIES BY OTHERS PLANS

X-1

CROSS-SECTION INDEX

X-1A

CROSS-SECTION SUMMARY SHEET

X-2 THRU X-30

CROSS-SECTIONS

S-1 THRU S-53

STRUCTURE PLANS

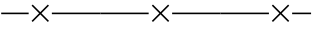
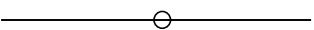
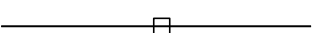
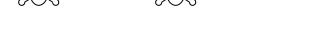
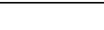
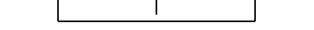
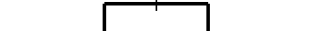
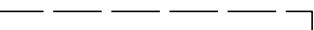
W-1 THRU W-5

WALL PLANS

REVISIONS

Note: Not to Scale

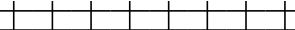
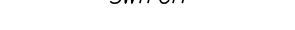
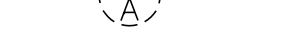
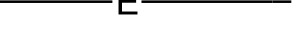
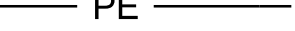
BOUNDARIES AND PROPERTY:

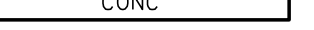
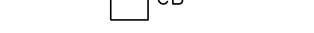
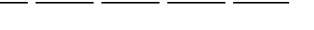
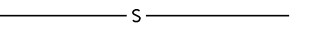
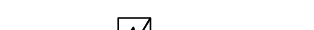
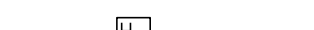
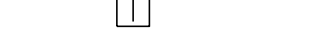
State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin (EIP)	
Computed Property Corner	
Existing Concrete Monument (ECM)	
Parcel / Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	
BUILDINGS AND OTHER CULTURE:	
Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	
HYDROLOGY:	
Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

RAILROADS:

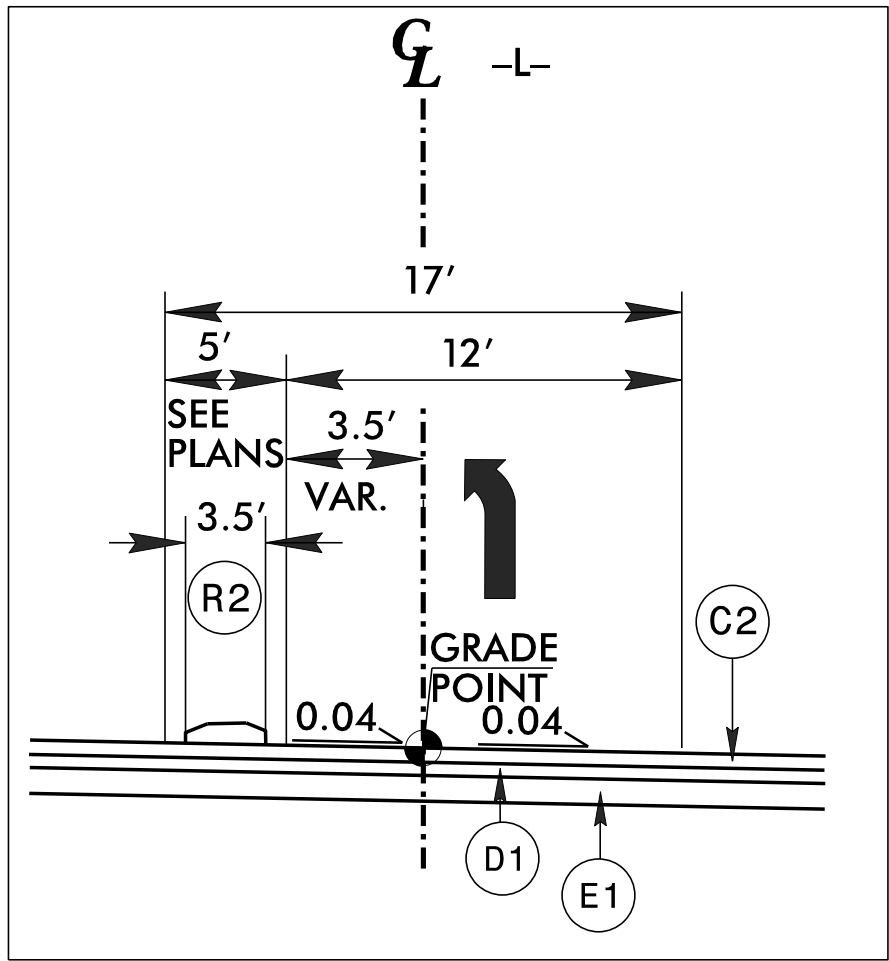
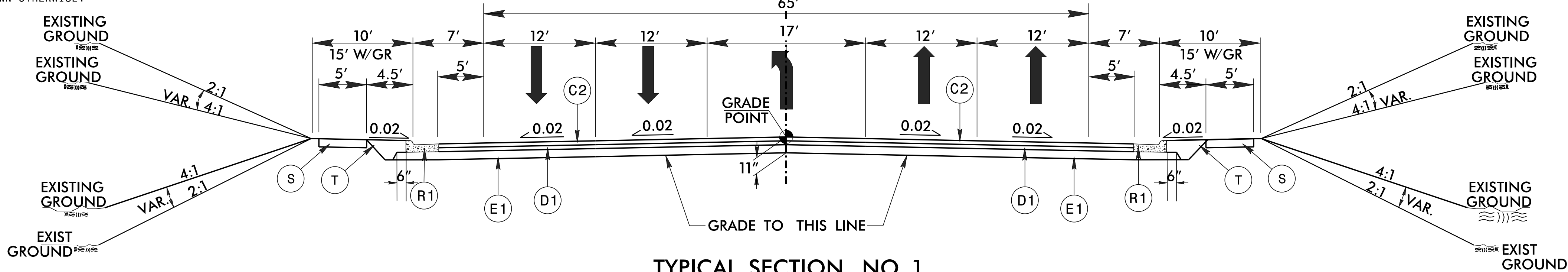
Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	
RIGHT OF WAY & PROJECT CONTROL:	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Secondary Horiz and Vert Control Point	
Vertical Benchmark	
Existing Right of Way Monument	
Proposed Right of Way Monument (Rebar and Cap)	
Proposed Right of Way Monument (Concrete)	
Existing Permanent Easement Monument	
Proposed Permanent Easement Monument (Rebar and Cap)	
Existing C/A Monument	
Proposed C/A Monument (Rebar and Cap)	
Proposed C/A Monument (Concrete)	
Existing Right of Way Line	
Proposed Right of Way Line	
Existing Control of Access Line	
Proposed Control of Access Line	
Proposed ROW and CA Line	
Existing Easement Line	
Proposed Temporary Construction Easement	
Permanent Construction Easement	
Proposed Temporary Drainage Easement	
Proposed Permanent Drainage Easement	
Proposed Permanent Drainage/Utility Easement	
Proposed Permanent Utility Easement	
Proposed Temporary Utility Easement	
Proposed Aerial Utility Easement	
ROADS AND RELATED FEATURES:	
Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	
VEGETATION:	
Single Tree	
Single Shrub	

Hedge	
Woods Line	
Orchard	
Vineyard	
EXISTING STRUCTURES:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	
UTILITIES:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line Test Hole (SUE - LOS A)*	
U/G Power Line (SUE - LOS B)*	
U/G Power Line (SUE - LOS C)*	
U/G Power Line (SUE - LOS D)*	
TELEPHONE:	
Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Test Hole (SUE - LOS A)*	
U/G Telephone Cable (SUE - LOS B)*	
U/G Telephone Cable (SUE - LOS C)*	
U/G Telephone Cable (SUE - LOS D)*	
U/G Telephone Conduit (SUE - LOS B)*	
U/G Telephone Conduit (SUE - LOS C)*	
U/G Telephone Conduit (SUE - LOS D)*	
U/G Fiber Optics Cable (SUE - LOS B)*	
U/G Fiber Optics Cable (SUE - LOS C)*	
U/G Fiber Optics Cable (SUE - LOS D)*	

WATER:	
Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line Test Hole (SUE - LOS A)*	
U/G Water Line (SUE - LOS B)*	
U/G Water Line (SUE - LOS C)*	
U/G Water Line (SUE - LOS D)*	
Above Ground Water Line	
TV:	
TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Test Hole (SUE - LOS A)*	
U/G TV Cable (SUE - LOS B)*	
U/G TV Cable (SUE - LOS C)*	
U/G TV Cable (SUE - LOS D)*	
U/G Fiber Optic Cable (SUE - LOS B)*	
U/G Fiber Optic Cable (SUE - LOS C)*	
U/G Fiber Optic Cable (SUE - LOS D)*	
GAS:	
Gas Valve	
Gas Meter	
U/G Gas Line Test Hole (SUE - LOS A)*	
U/G Gas Line (SUE - LOS B)*	
U/G Gas Line (SUE - LOS C)*	
U/G Gas Line (SUE - LOS D)*	
Above Ground Gas Line	
SANITARY SEWER:	
Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Force Main Line Test Hole (SUE - LOS A)*	
SS Force Main Line (SUE - LOS B)*	
SS Force Main Line (SUE - LOS C)*	
SS Force Main Line (SUE - LOS D)*	
MISCELLANEOUS:	
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line (SUE - LOS B)*	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenviromental Boring	
Abandoned According to Utility Records	
End of Information	

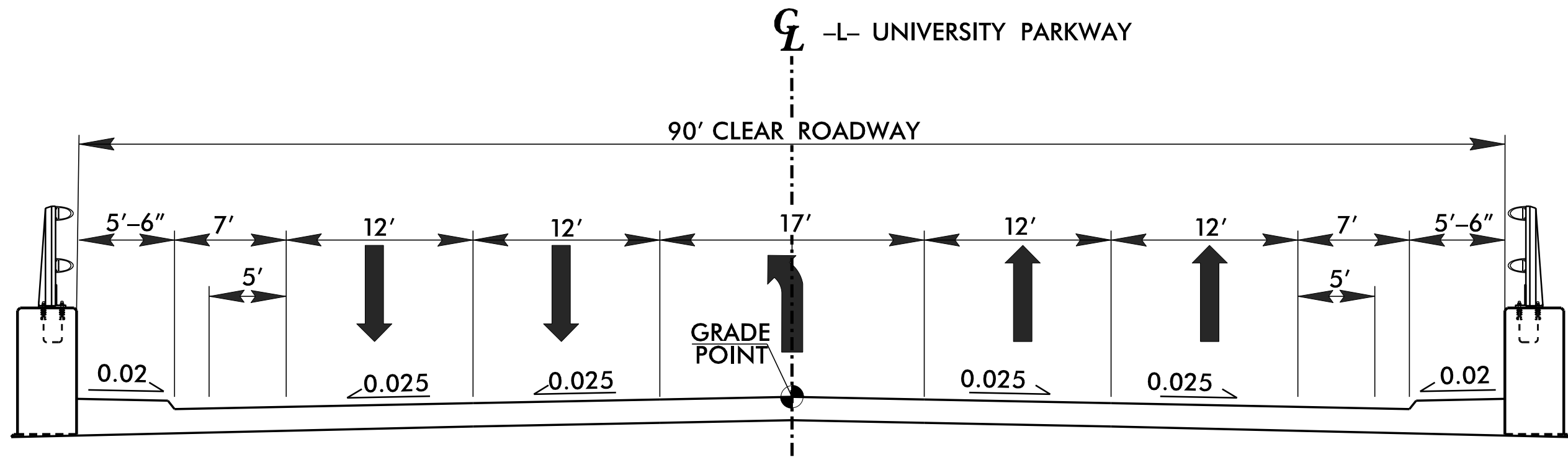
FINAL PAVEMENT SCHEDULE				
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	R1	2'-6" CURB AND GUTTER	
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R2	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)	
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.	S	4" CONCRETE SIDEWALK	
C4	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.	T	EARTH MATERIAL	
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT	
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	V1	5/8" FINE MILLING	
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V2	1.5" FINE MILLING	
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)	
N	PROP. APPROX. 5/8" ULTRATHIN HOT MIX BONDED WEARING SURFACE COURSE, TYPE B, AT AN AVERAGE RATE OF 70 LBS. PER SQ. YD.			

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



USE INSET A WITH
TYPICAL SECTION NO. 1

-L- STA. 11+22.00 TO STA. 15+83.00

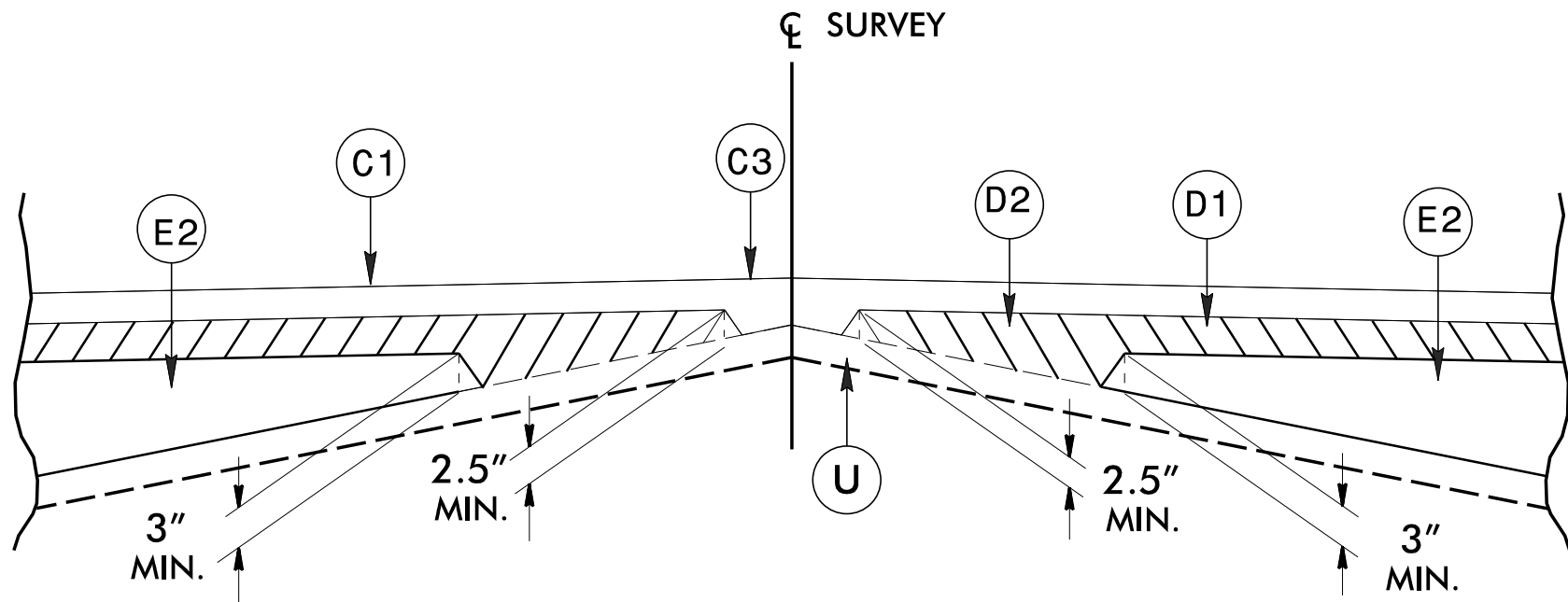


TYPICAL SECTION NO. 2

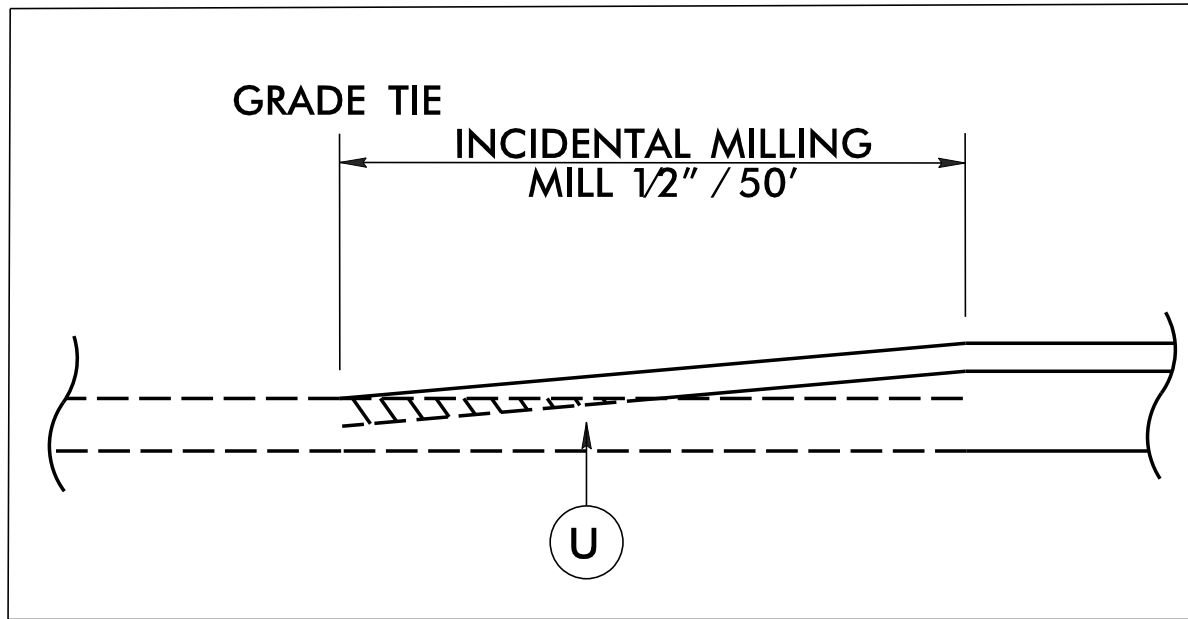
(SEE STRUCTURE PLANS FOR STRUCTURE CONSTRUCTION DETAILS)

USE TYPICAL ON STRUCTURE

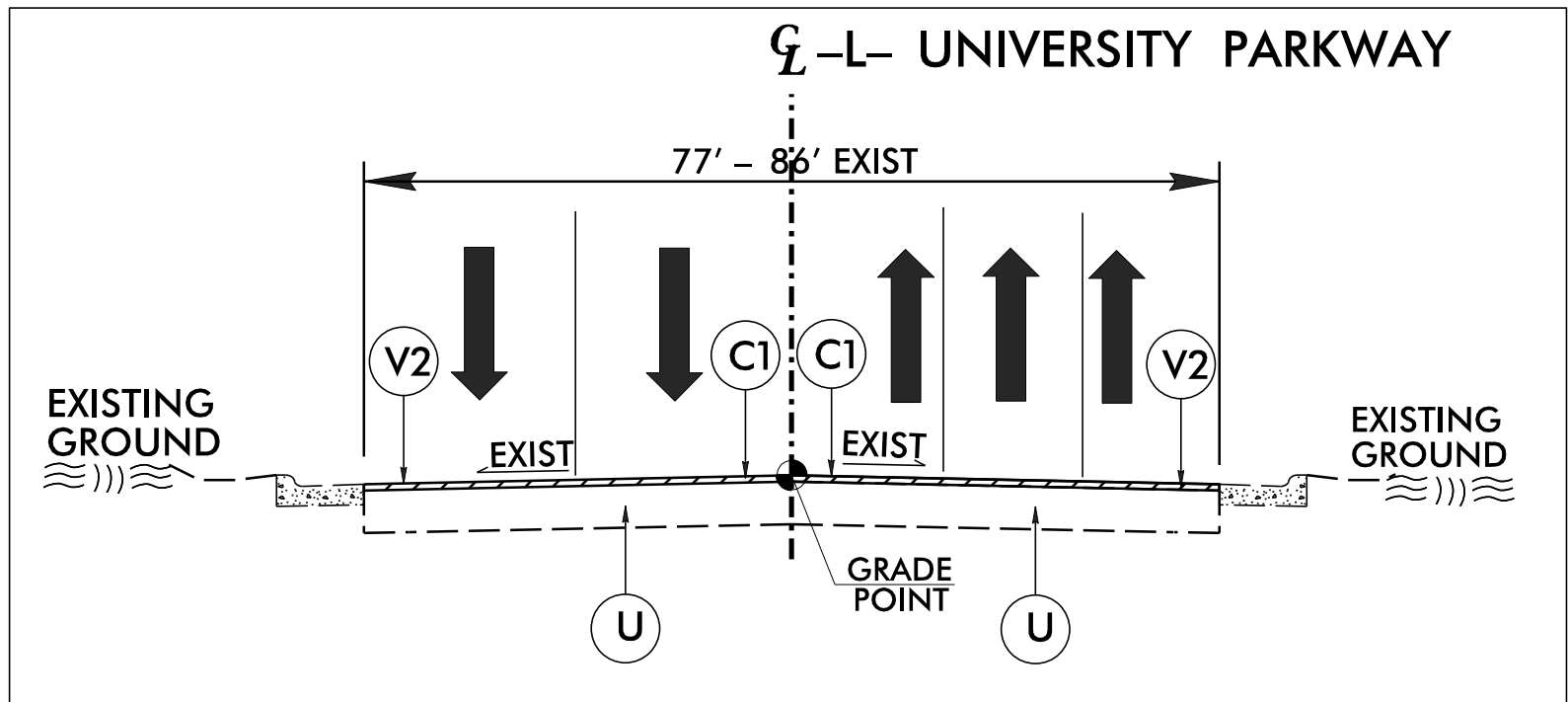
-L- STA. 19+73.79 (BEGIN BRIDGE)
TO 22+13.79 (END BRIDGE)



Detail Showing Method of Wedging



PROFILE TIE-IN DETAIL



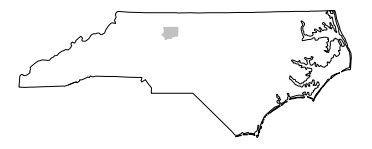
INSET B

FOR 650'± OUTSIDE OF CONSTRUCTION LIMITS
(SEE SHEET 5 AND TMP PLANS FOR DETAILS)

BR-0168

FP 2A-I

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FORSYTH COUNTY



ROADWAY DESIGN UNIT

ROADWAY DESIGN
ENGINEER



PAVEMENT
ENGINEER



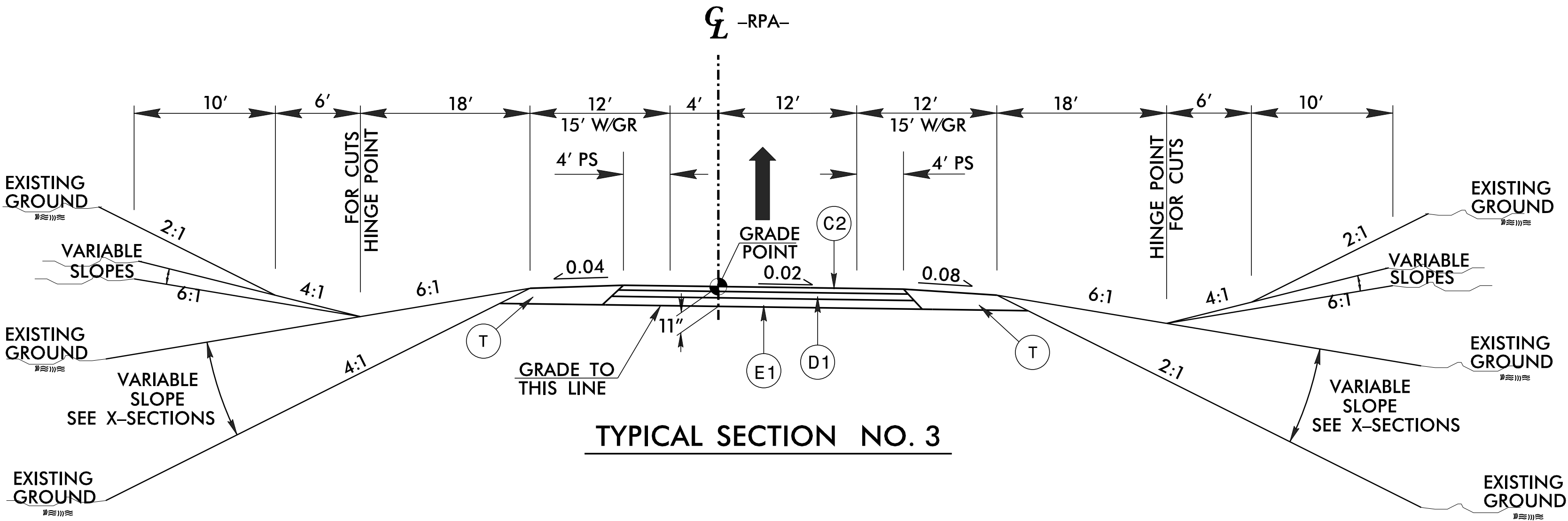
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS

FINAL PAVEMENT SCHEDULE

C1	1.5" S9.5C
C2	3" S9.5C
D1	4" I19.0C
E1	4" B25.0C
R1	2'-6" C&G
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING DETAIL

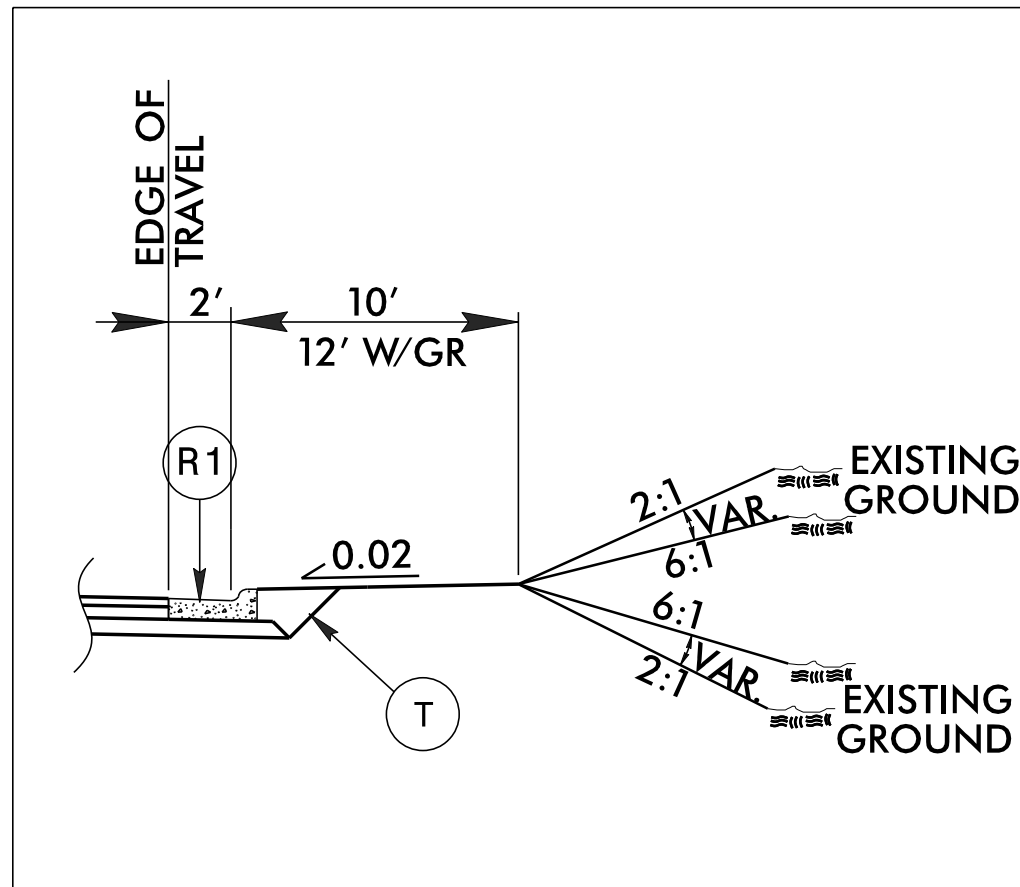
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 3

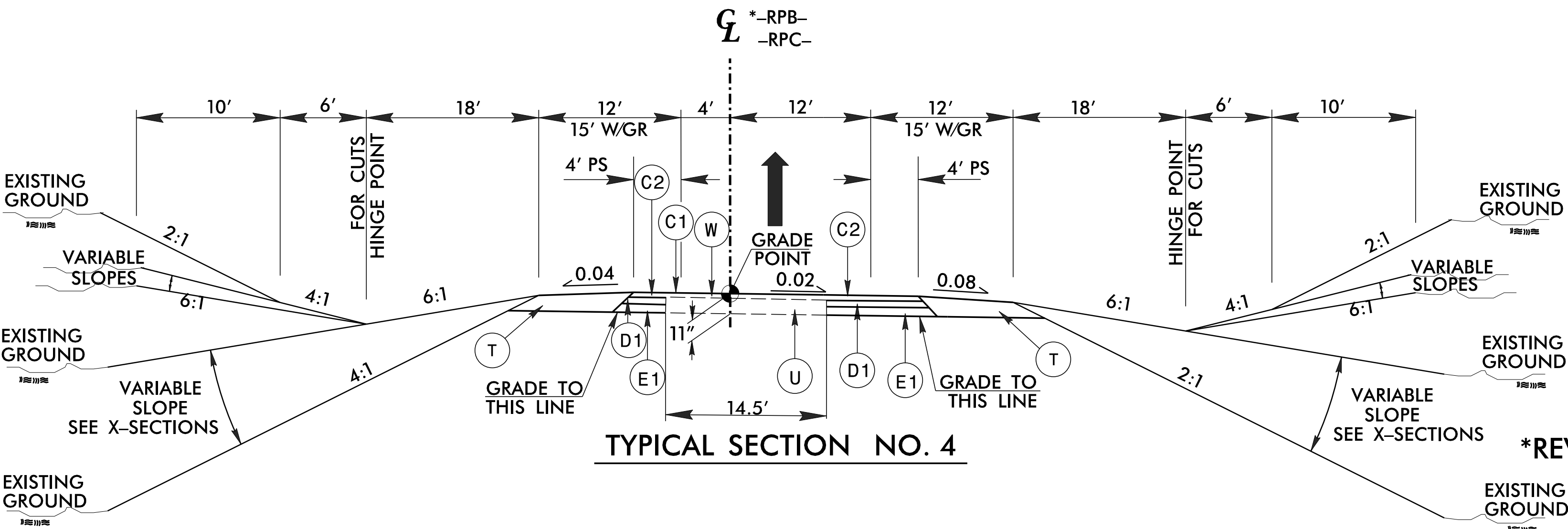
USE TYPICAL SECTION NO. 3

-RPA- STA. 12 + 50.00 TO STA. 15 + 14.96



USE INSET C WITH TYPICAL SECTIONS NO. 3, NO. 4, NO. 5, AND NO. 6

-RPA- STA. 13 + 35.00 TO STA. 15 + 14.96 LT & RT
-RPB- STA. 13 + 70.49 TO STA. 14 + 74.02 LT
-LPB- STA. 13 + 78.20 TO STA. 14 + 31.37 LT
-RPC- STA. 13 + 00.00 TO STA. 13 + 74.94 LT & RT
-LPC- STA. 12 + 55.00 TO STA. 13 + 38.00 RT
-LPCA- STA. 10 + 78.33 TO STA. 11 + 97.60 RT



TYPICAL SECTION NO. 4

*REVERSE OF TYPICAL

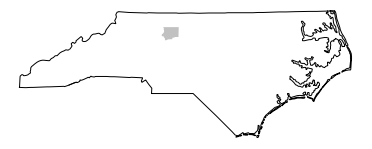
USE TYPICAL SECTION NO. 4

*-RPB- STA. 13 + 00.00 TO STA. 14 + 74.02
-RPC- STA. 13 + 00.00 TO STA. 13 + 74.94

BR-0168

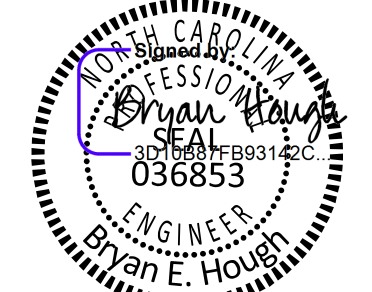
FP 2A-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FORSYTH COUNTY



ROADWAY DESIGN UNIT

ROADWAY DESIGN
ENGINEER



03/03/2026

PAVEMENT
ENGINEER



03/05/2026

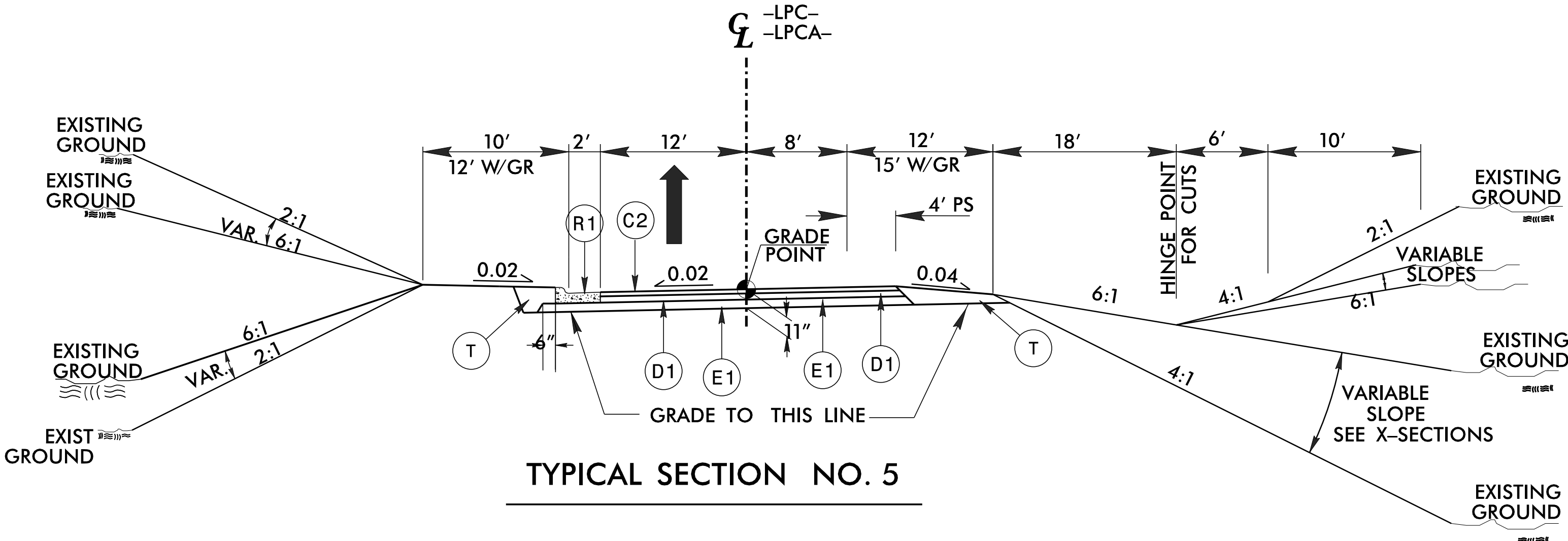
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS

FINAL PAVEMENT SCHEDULE

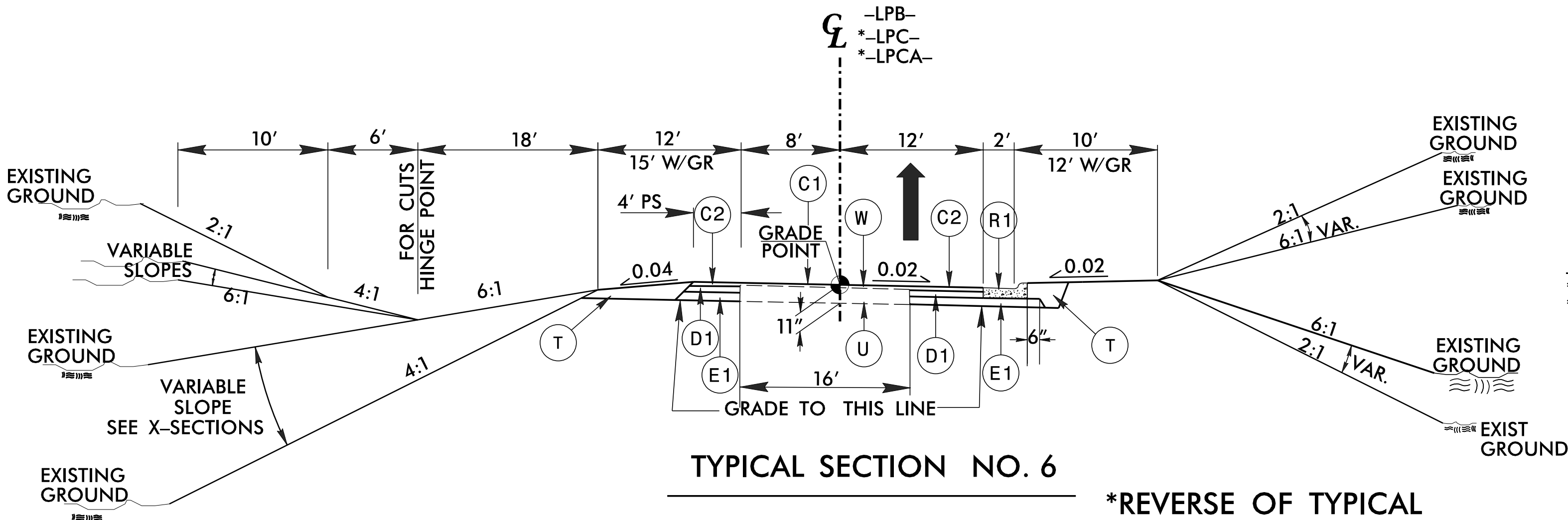
C1	1.5" S9.5C
C2	3" S9.5C
D1	4" I19.0C
E1	4" B25.0C
R1	2'-6" C&G
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING DETAIL

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



USE TYPICAL SECTION NO. 5

-LPC- STA. 12+75.00 TO STA. 13+38.00
-LPCA- STA. 10+80.00 TO STA. 11+96.13



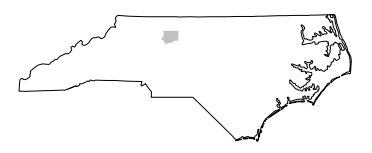
USE TYPICAL SECTION NO. 6

-LPB- STA. 13+00.00 TO STA. 14+31.37
*-LPC- STA. 11+45.00 TO STA. 12+75.00
*-LPCA- STA. 10+69.61 TO STA. 10+80.00

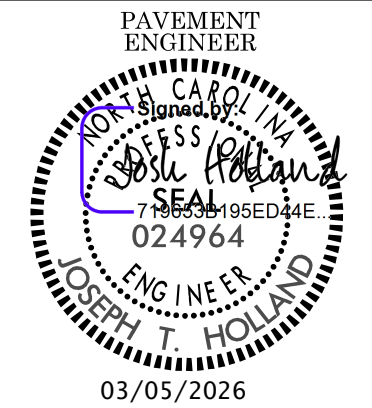
BR-0168

FP 2A-3

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FORSYTH COUNTY



ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS

C2	3" S9.5C
C4	2" S9.5C
D1	4" I19.0C
E1	4" B25.0C
N	5/8" UTBWC, TYPE B
R1	2'-6" C&G
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	5/8" FINE MILLING

The diagrams illustrate the foundation and wall assembly for a building. The left diagram shows a wall with a foundation labeled 'U' and a wall labeled 'N'. The right diagram shows a wall with a foundation labeled 'U' and a wall labeled 'N'. Both diagrams show various dimensions and labels for the foundation and wall assembly.

TYPICAL SECTION NO. 7 (APPROACHING BRIDGE)

USE TYPICAL SECTION NO.7

Diagram illustrating the cross-section of the John Gold Memorial Expressway bridge deck, showing dimensions and structural details.

Dimensions:

- Left Section: 70' total width.
- Right Section: VARIABLE width.
- Internal Dimensions (Left): 12' EX., 12' EX., 12' EX., 6' EX., 4' PS EX., 10' PS EX., 3' EX.
- Internal Dimensions (Right): 12' EX., 12' EX., VAR. 0'-12' EX., 37' EX., VAR. EX., VAR. PS EX.
- Vertical Dimensions: 3:1, 4:1 slopes.

Structural Details:

- EXISTING GROUND (indicated by wavy lines).
- MSE WALL (see structure plans).
- JOHN GOLD MEMORIAL EXPY (indicated by a vertical dashed line).
- Labels: N, V1, U, EX.

USE TYPICAL

TYPICAL SECTION NO. 8 (UNDER THE BRIDGE)

USE TYPICAL SECTION NO.8

70'

12' EX.

10' PS EX.

3:1

EXISTING GROUND

N

V1

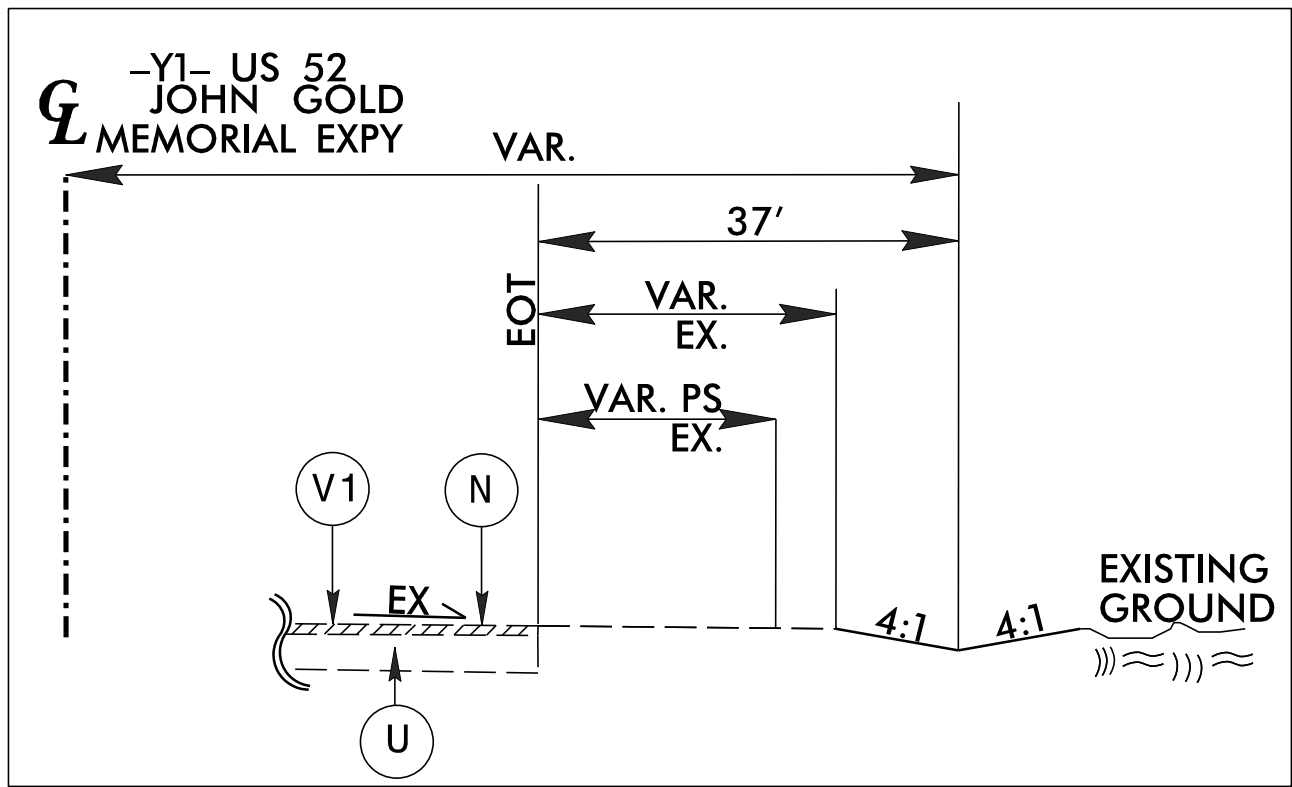
EX

U

Y1- US 52
JOHN GOLD
MEMORIAL EXPY

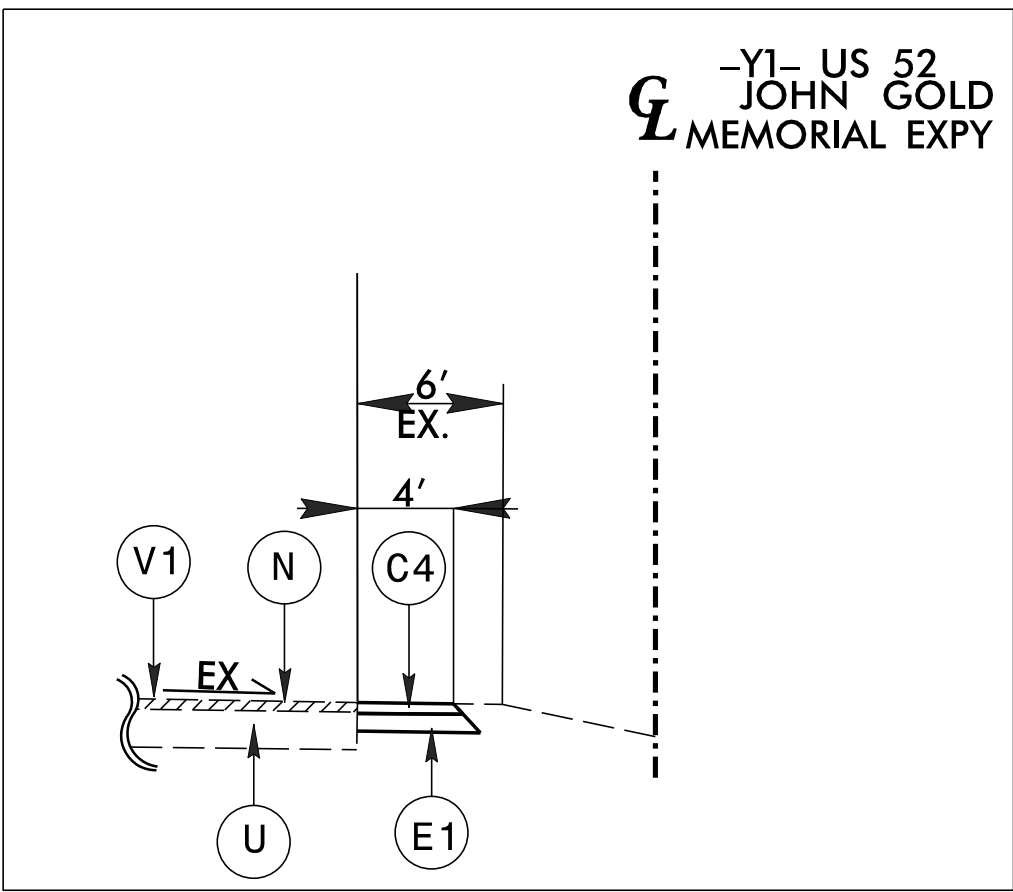
INSET D
(USE WITH TYPICAL SECTIONS NO. 7 & 8
WHERE MSE WALL IS NOT PRESENT)

TRANSITION FROM INSET D TO EXISTING
FROM -Y1- STA. 26+00.00 TO 26+50.00 (LT)



INSET E
(USE WITH TYPICAL SECTIONS NO. 7 & 8
WHERE MSE WALL IS NOT PRESENT)

TRANSITION FROM INSET E TO EXISTING
FROM -Y1- STA. 27+35.00 TO 28+25.00 (RT)

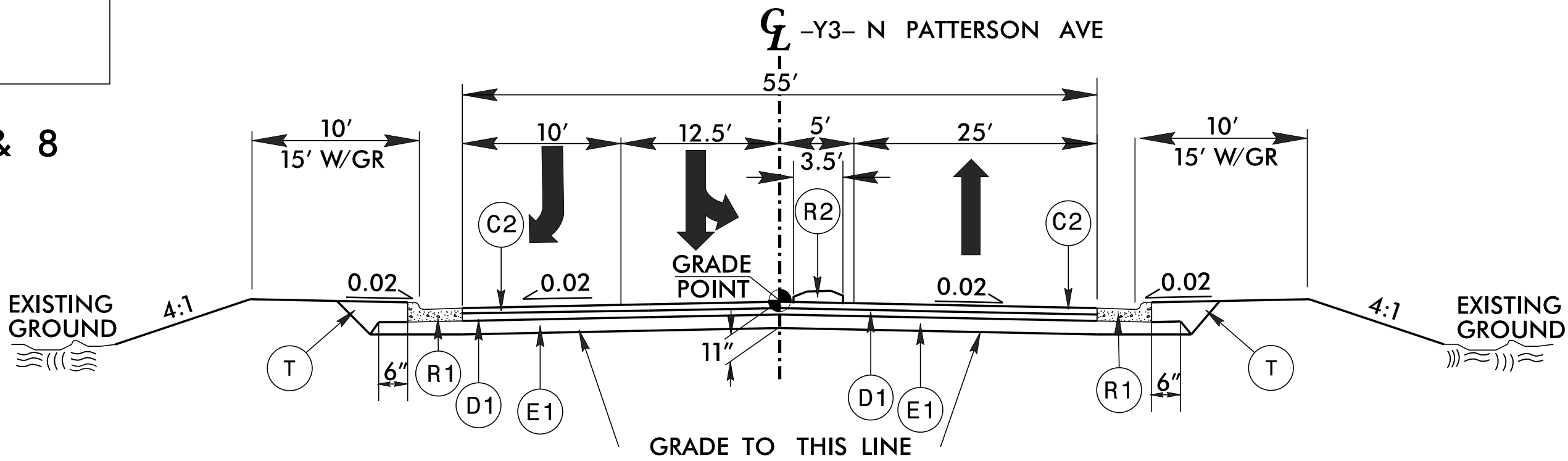


INSET F
(TEMPORARY PAVEMENT WIDENING)

*REVERSE OF TYPICAL
SEE TMP PLANS

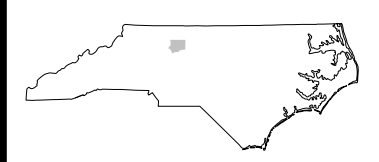
USE TYPICAL SECTION NO. 9

-Y3- STA. 10+46.57 TO -Y3- STA. 11+35.00

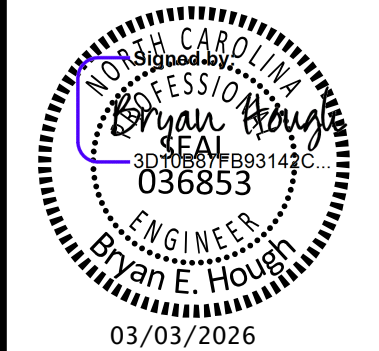
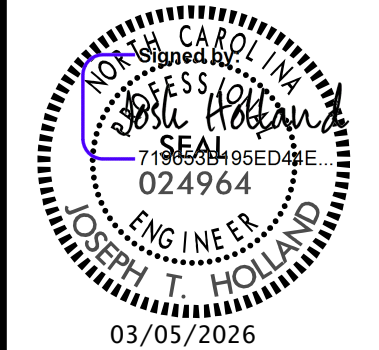


TYPICAL SECTION NO. 9

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FORSYTH COUNTY

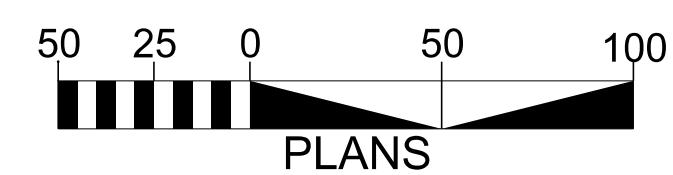
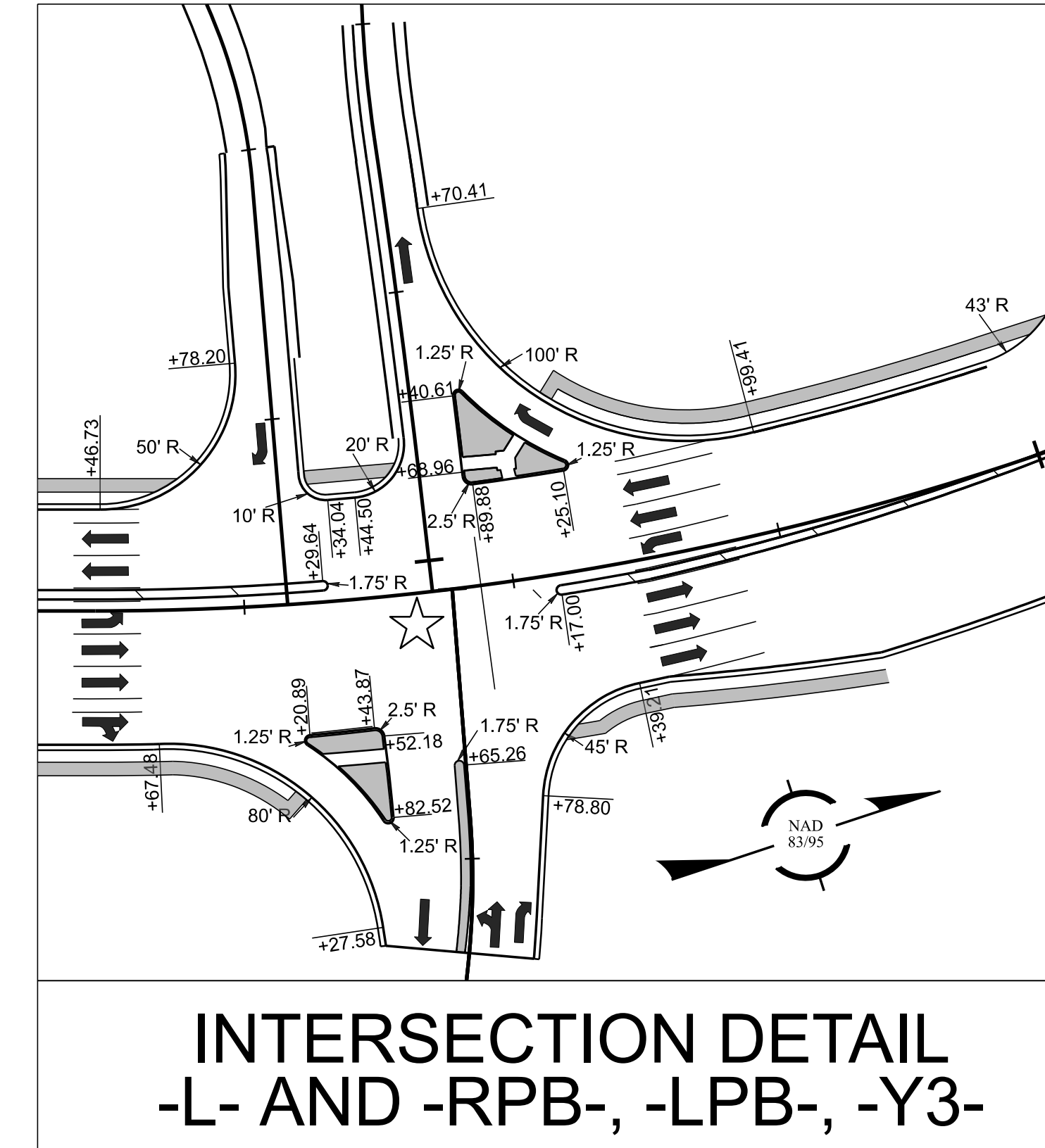
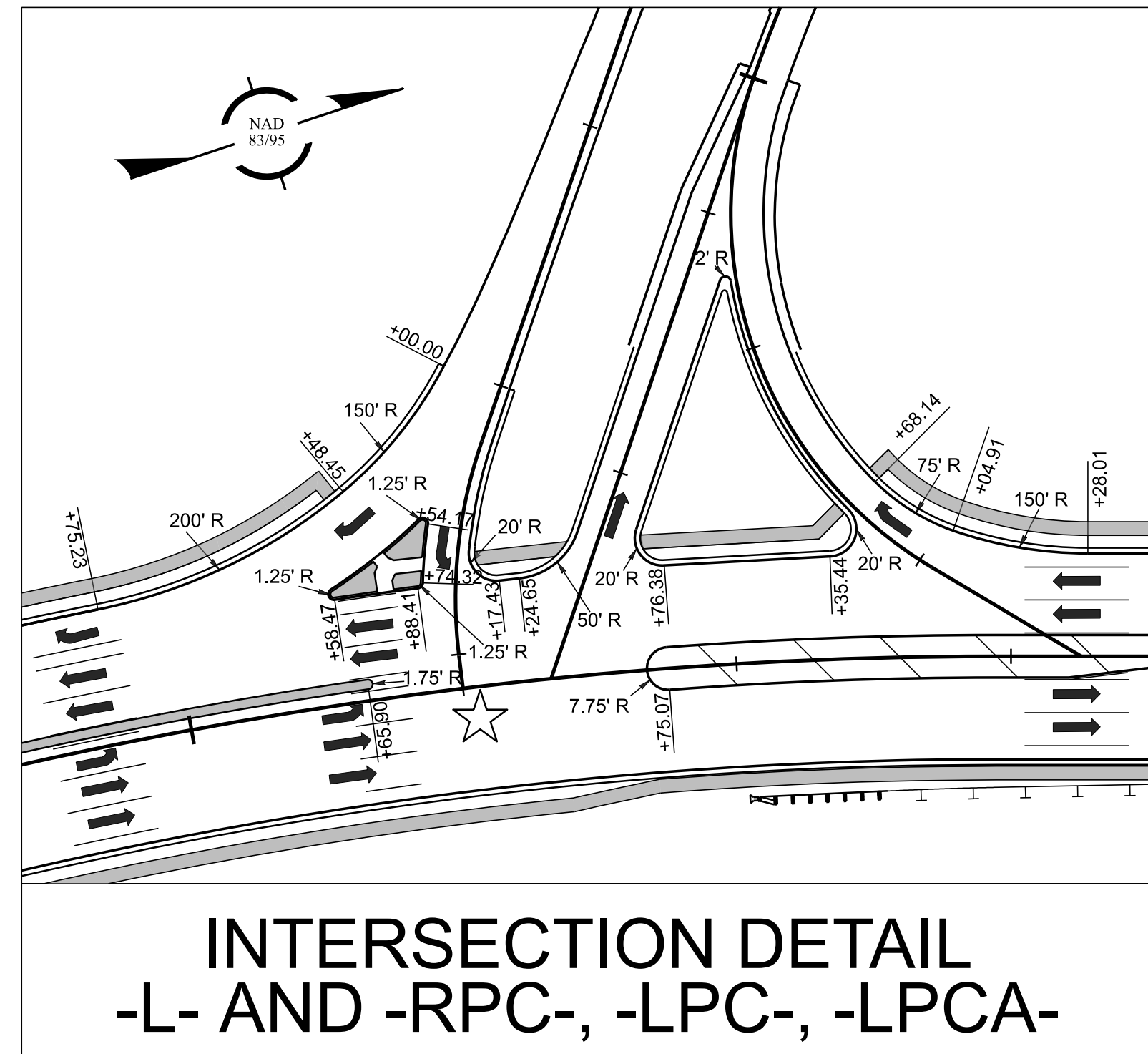


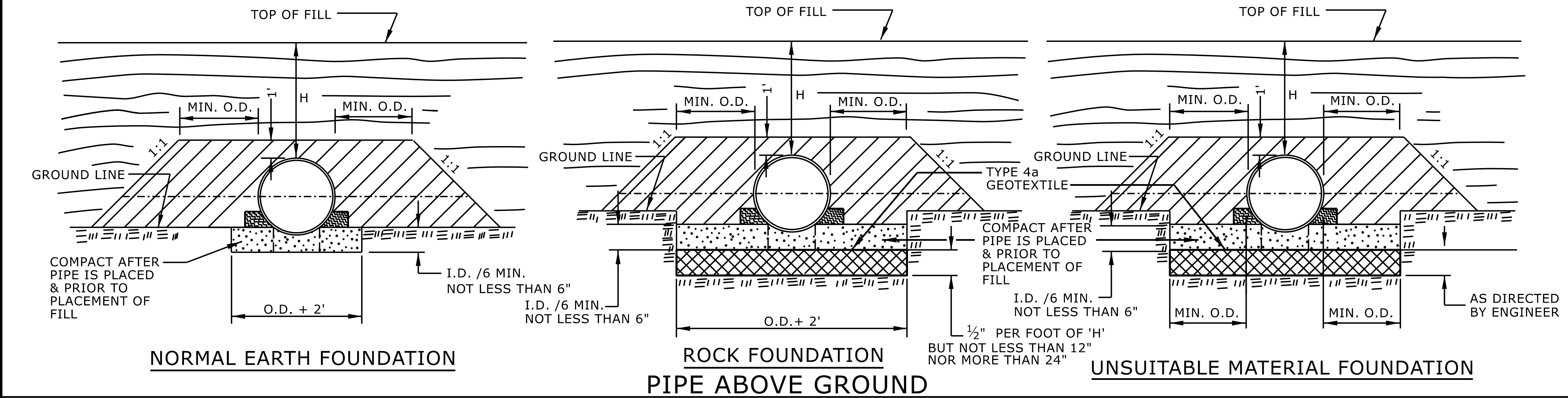
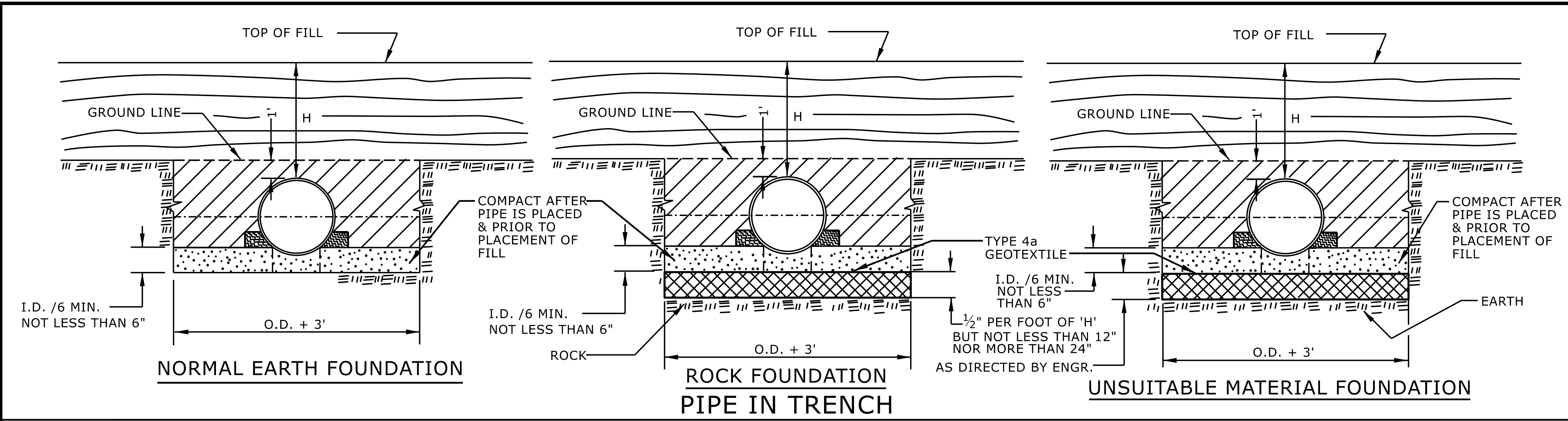
ROADWAY DESIGN UNIT

ROADWAY DESIGN
ENGINEERPAVEMENT
ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS





GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

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

SPRINGLINE OF PIPE

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

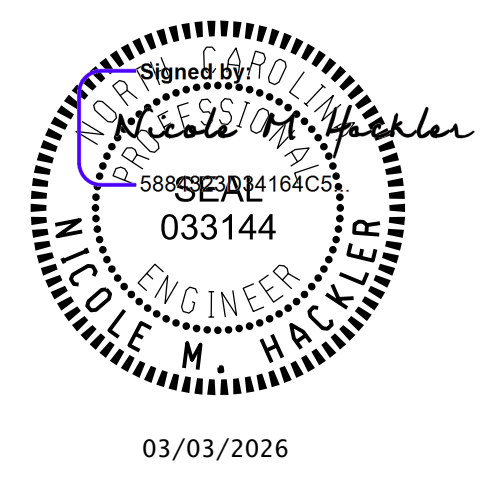
UNDISTURBED EARTH MATERIAL

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

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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 2
300.01



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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE

SHEET 2 OF 2
300.01

TOP OF FILL

GROUND LINE

H

I.D. /6 MIN.
NOT LESS THAN 6"

O.D. + 3'

NORMAL EARTH FOUNDATION

TOP OF FILL

GROUND LINE

H

I.D. /6 MIN.
NOT LESS THAN 6"

ROCK

O.D. + 3'

PIPE IN TRENCH

TYPE 4a
GEOTEXTILE

I.D. /6 MIN.
NOT LESS
THAN 6"

1/2" PER FOOT OF 'H'
BUT NOT LESS THAN 12"
NOR MORE THAN 24"
AS DIRECTED BY ENGR.

TOP OF FILL

GROUND LINE

H

I.D. /6 MIN.
NOT LESS THAN 6"

O.D. + 3'

UNSUITABLE MATERIAL FOUNDATION

COMPACT AFTER
PIPE IS PLACED
& PRIOR TO
PLACEMENT OF
FILL

EARTH

TOP OF FILL

GROUND LINE

H

MIN. O.D.

MIN. O.D.

I.D. /6 MIN.
NOT LESS THAN 6"

O.D. + 2'

NORMAL EARTH FOUNDATION

COMPACT AFTER
PIPE IS PLACED
& PRIOR TO
PLACEMENT OF
FILL

TOP OF FILL

GROUND LINE

H

MIN. O.D.

MIN. O.D.

I.D. /6 MIN.
NOT LESS THAN 6"

O.D. + 2'

PIPE ABOVE GROUND

TYPE 4a
GEOTEXTILE

COMPACT AFTER
PIPE IS PLACED
& PRIOR TO
PLACEMENT OF
FILL

I.D. /6 MIN.
NOT LESS THAN 6"

1/2" PER FOOT OF 'H'
BUT NOT LESS THAN 12"
NOR MORE THAN 24"
AS DIRECTED BY ENGINEER

TOP OF FILL

GROUND LINE

H

MIN. O.D.

MIN. O.D.

I.D. /6 MIN.
NOT LESS THAN 6"

O.D. + 2'

UNSUITABLE MATERIAL FOUNDATION

AS DIRECTED BY ENGINEER

GENERAL NOTES:

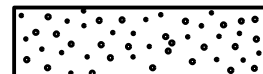
I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

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

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

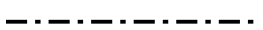
 APPROVED SUITABLE LOCAL MATERIAL.

 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

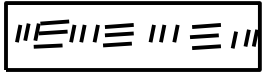
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1
FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE
UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL
ACCOMPLISH COMPACTION.

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

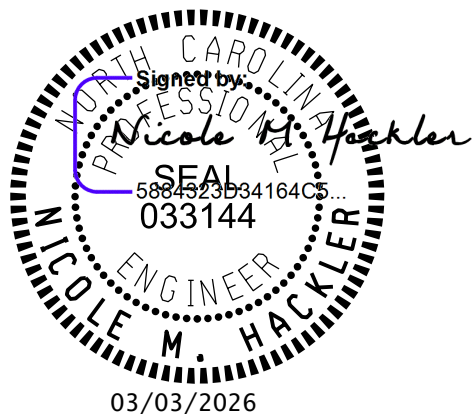
REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS
FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

 SPRINGLINE OF PIPE

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

 UNDISTURBED EARTH MATERIAL

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



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

SEE TITLE BLOCK

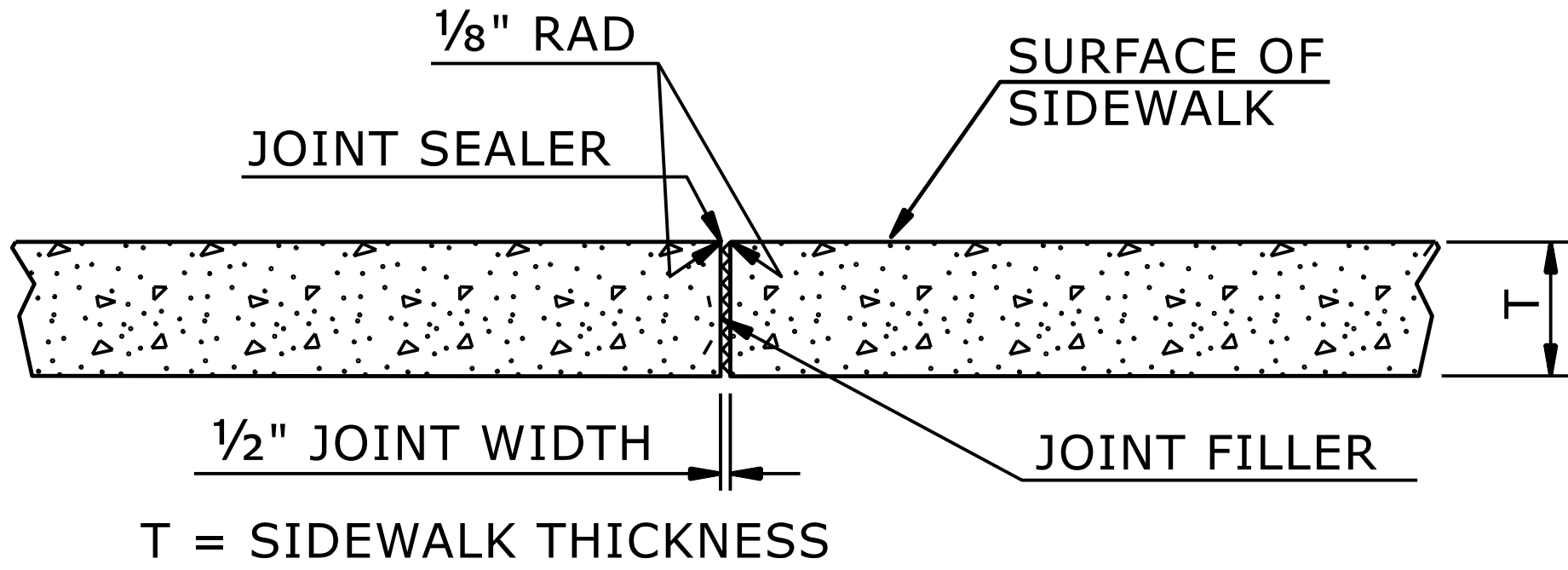
ORIGINAL BY:	S.CALHOUN	DATE:	7-25-2024
MODIFIED BY:		DATE:	
CHECKED BY:		DATE:	
FILE SPEC:			

NOTES:

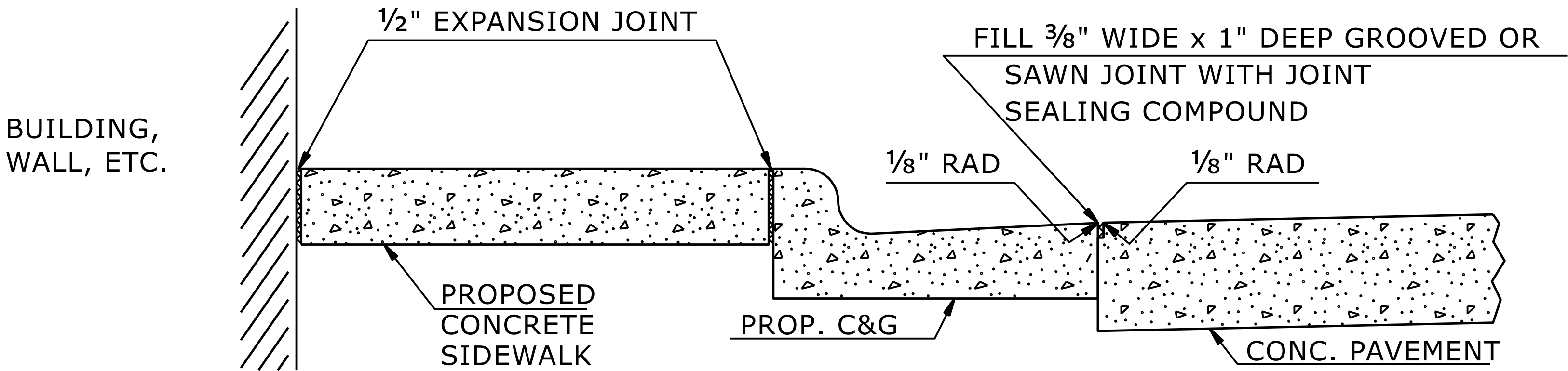
CONSTRUCT STANDARD SIDEWALK 5' WIDE AND 4" THICK UNLESS OTHERWISE DENOTED ON PLANS.

PLACE A GROOVE JOINT 1" DEEP WITH 1/8" RADII IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.

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



TRANSVERSE EXPANSION JOINT
IN SIDEWALK

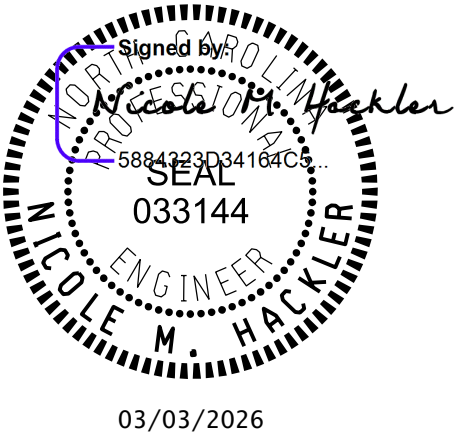


DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

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

ROADWAY DETAIL DRAWING FOR
CONCRETE SIDEWALK

SHEET 1 OF 1
848D01



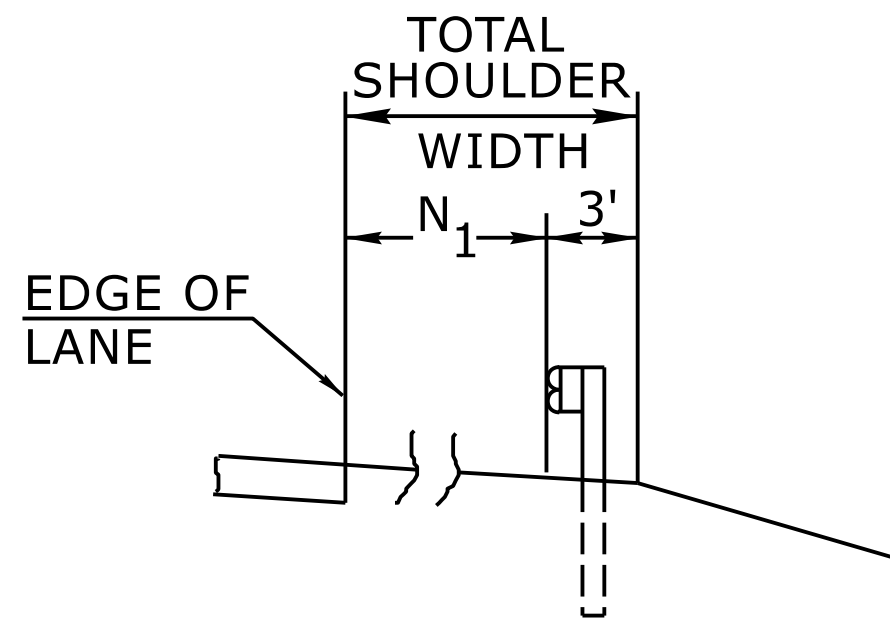
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**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**

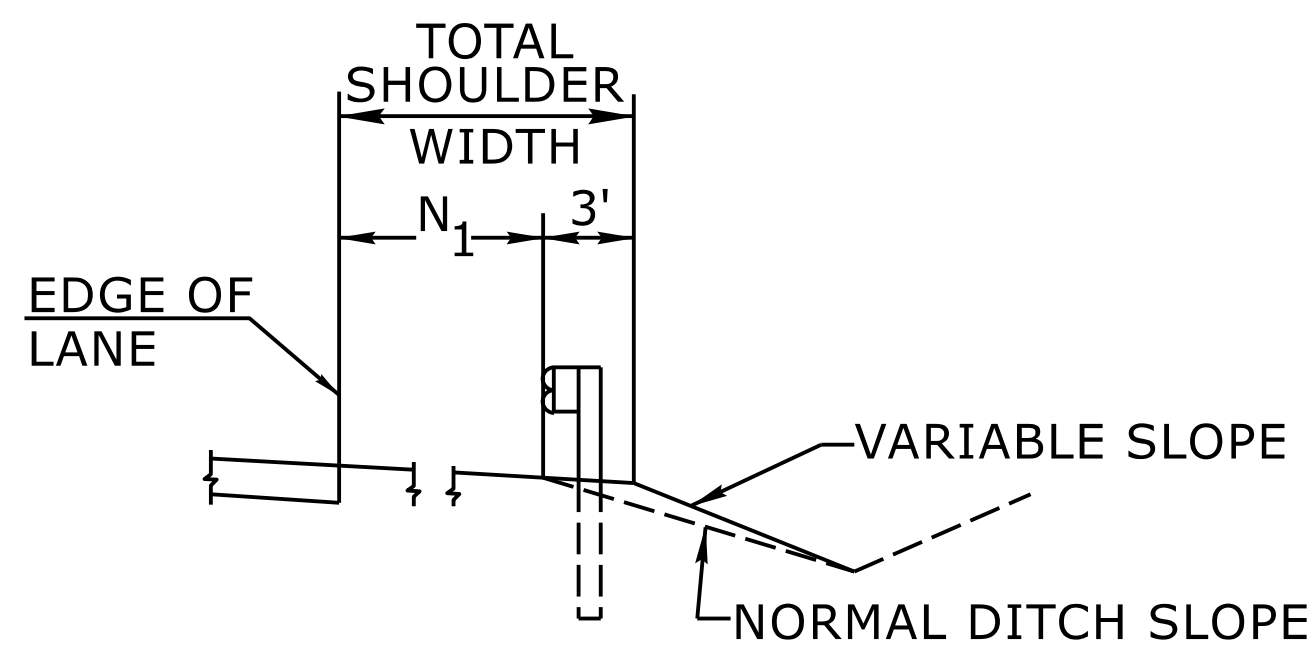
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: DATE:

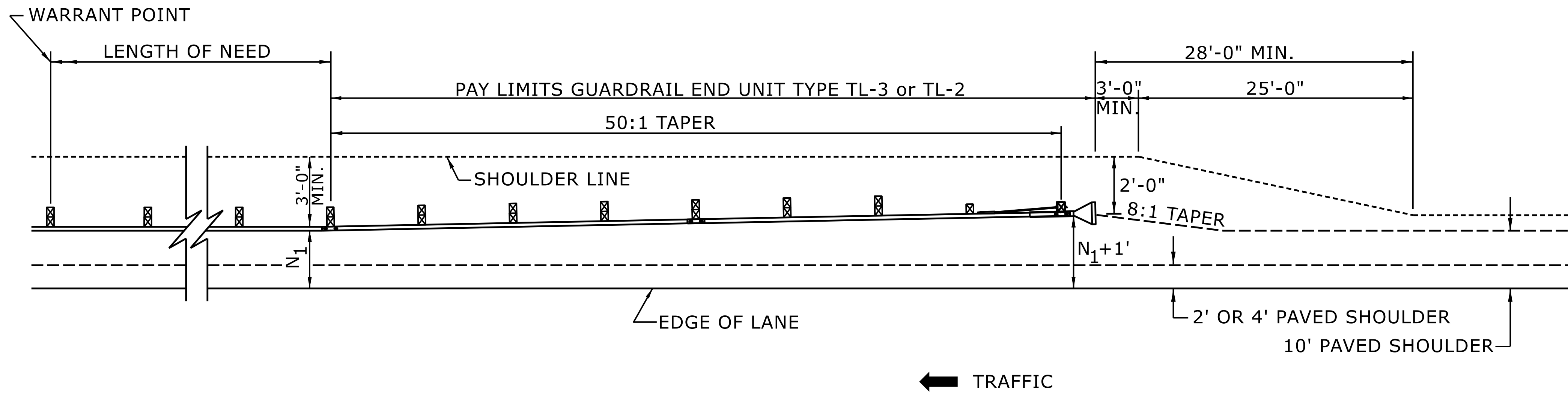


FILL SECTION



CUT SECTION

"N₁"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

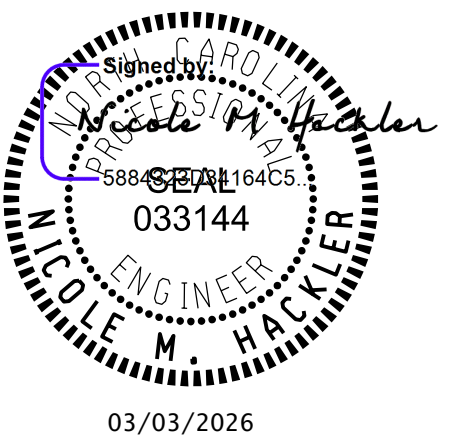


FOR POSTED SPEEDS $\geq$ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS $<$ 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



SHEET 6 OF 15
862D01

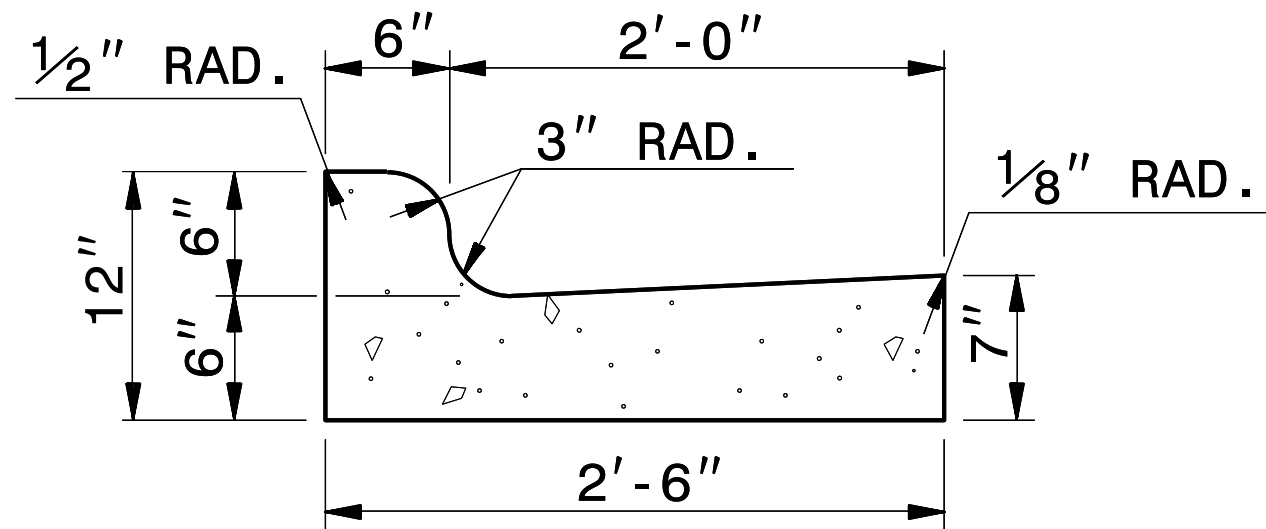
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

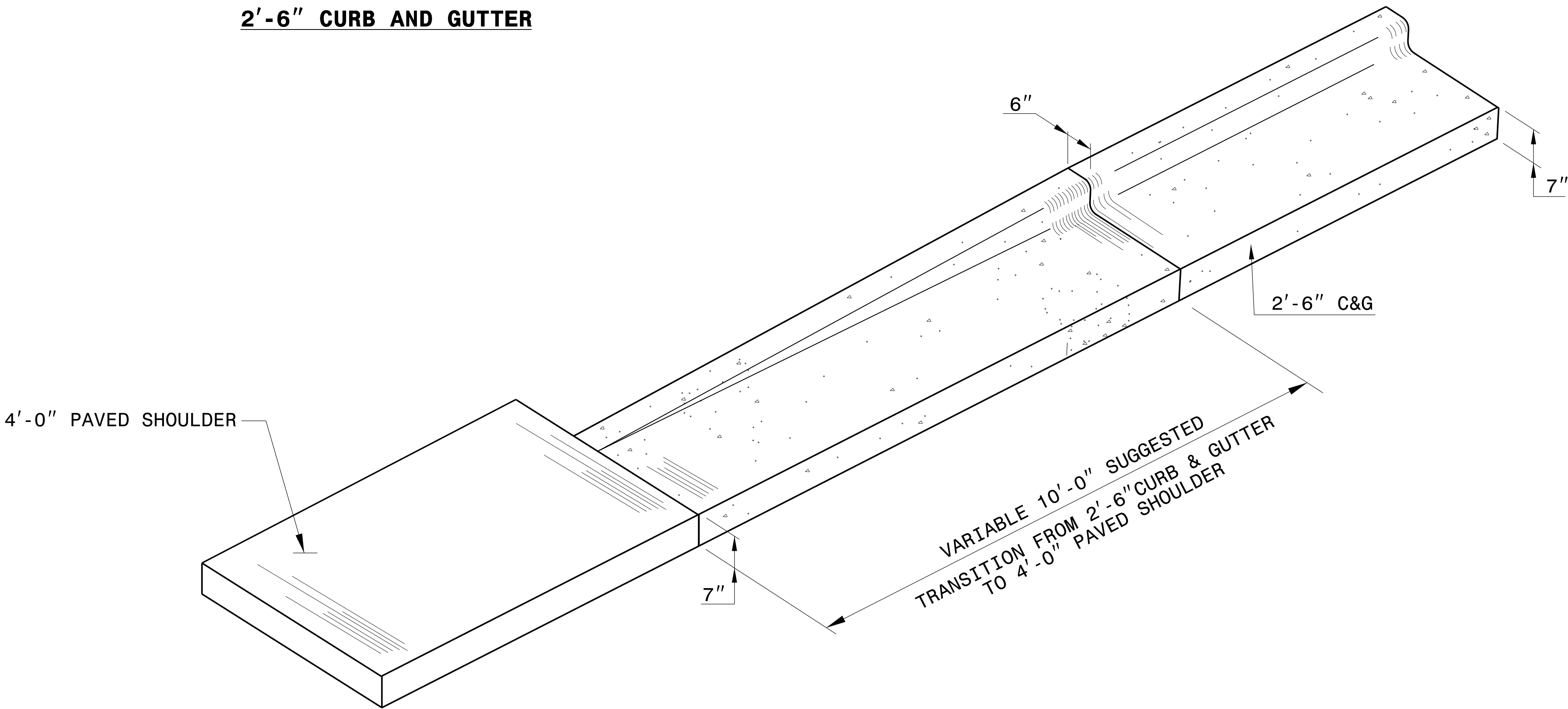
SEE TITLE BLOCK

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

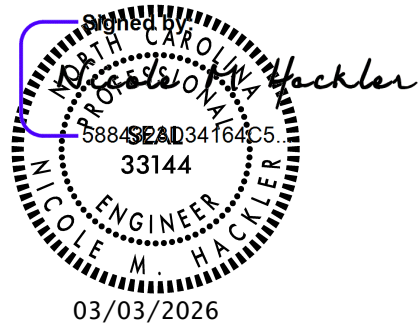
*NOTE: SEE STD. DWG. 846.01
FOR GENERAL NOTES



2'-6" CURB AND GUTTER



ISOMETRIC VIEW OF TRANSITION



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**CONTRACT STANDARDS
AND DEVELOPMENT UNIT**
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**DETAIL OF 10' TRANSITION
FROM 2'-6" CURB & GUTTER
TO 4'-0" PAVED SHOULDER**

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 04-13-2016
CHECKED BY: _____ DATE: _____
FILE SPEC: details/nbritt/english/misc/c&g transition sections.dgn

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

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

SHEET 1 OF 2

840D02

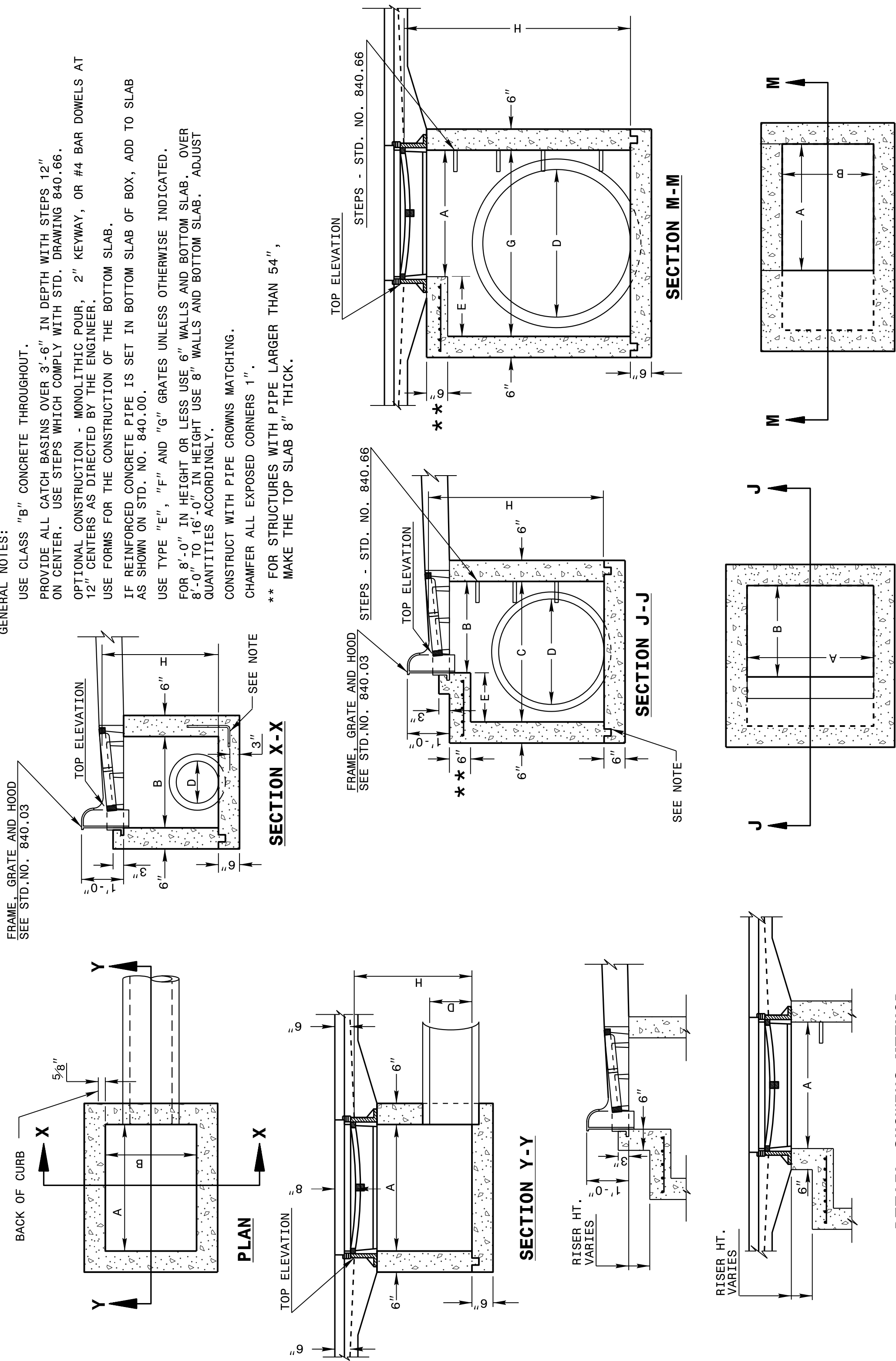
GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
OPTIONAL CONSTRUCTION - MONOLITHIC FOUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.
FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.
CONSTRUCT WITH PIPE CROWNS MATCHING.
CHAMFER ALL EXPOSED CORNERS 1".
** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.

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

SHEET 1 OF 2

840D02



DETAIL SHOWING METHOD
OF RISER CONSTRUCTION

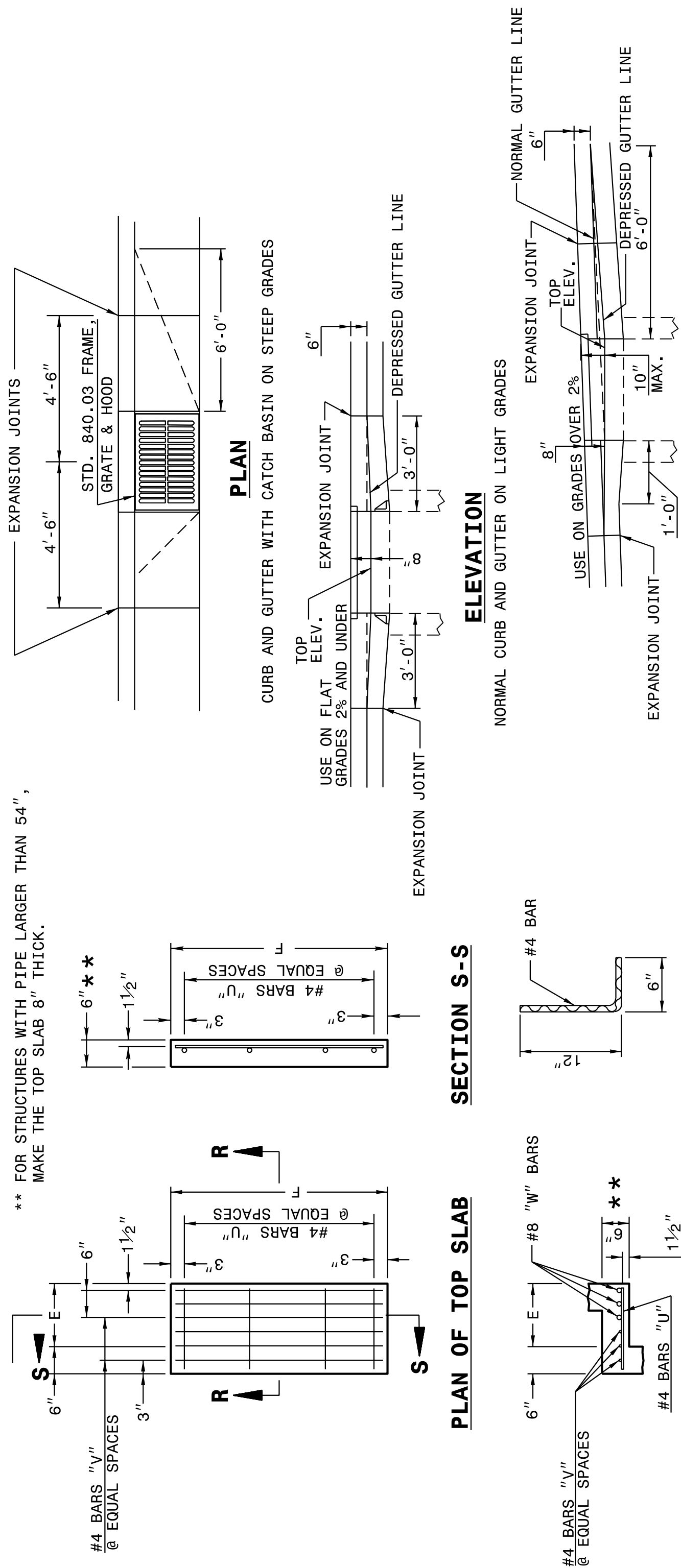
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ENGLISH DETAIL DRAWING FOR
**MINIMUM DEPTH
CONCRETE CATCH BASIN**
12" THRU 84" PIPE

SHEET 2 OF 2

840D02

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



SECTION R-R

DOWEL

ELEVATION

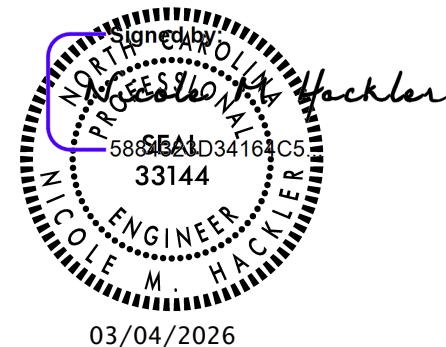
* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, H, WITH NO RISER) *									
DIMENSIONS OF BOX AND PIPE					COVER				
PIPE D.	SPAN	WIDTH	DEPTH	MIN. HEIGHT	COVER DIMENSION	BARS-U NO.	BARS-V NO.	BARS-W NO.	TOTAL LBS.
12"	3'-0"	2'-2"	2'-2"	2'-0"	E	F			
15"	3'-0"	2'-2"	2'-2"	2'-3"					
18"	3'-0"	2'-2"	2'-2"	3'-1"					
24"	3'-0"	2'-2"	3'-4"	3'-10"	1'-2"	4'-4"	4	1'-5"	2
30"	3'-0"	2'-2"	3'-10"	4'-6"	1'-8"	4'-10"	4	1'-11"	3
36"	3'-0"	2'-2"	4'-5"	4'-5"	2'-2"	5'-5"	5	2'-5"	4
42"	3'-0"	2'-2"	5'-0"	5'-6"	2'-10"	6'-0"	5	3'-1"	4
48"	3'-0"	2'-2"	5'-7"	6'-0"	3'-5"	6'-7"	6	3'-8"	5
54"	3'-0"	2'-2"	6'-3"	6'-3"	4'-1"	7'-3"	6	4'-4"	5
60"	3'-0"	2'-2"	6'-11"	7'-0"	4'-9"	7'-11"	7	5'-0"	6
66"	3'-0"	2'-2"	7'-6"	7'-6"	5'-3"	8'-6"	7	5'-6"	6
72"	3'-0"	2'-2"	8'-1"	8'-0"	5'-11"	9'-1"	8	6'-2"	7
78"	3'-0"	2'-2"	8'-9"	8'-9"	6'-7"	9'-9"	8	6'-10"	7
84"	3'-0"	2'-2"	8'-9"	8'-9"					

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

SEE PLATE FOR TITLE

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



03/04/2026

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[illegible]

**CONTRACT STANDARDS
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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

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

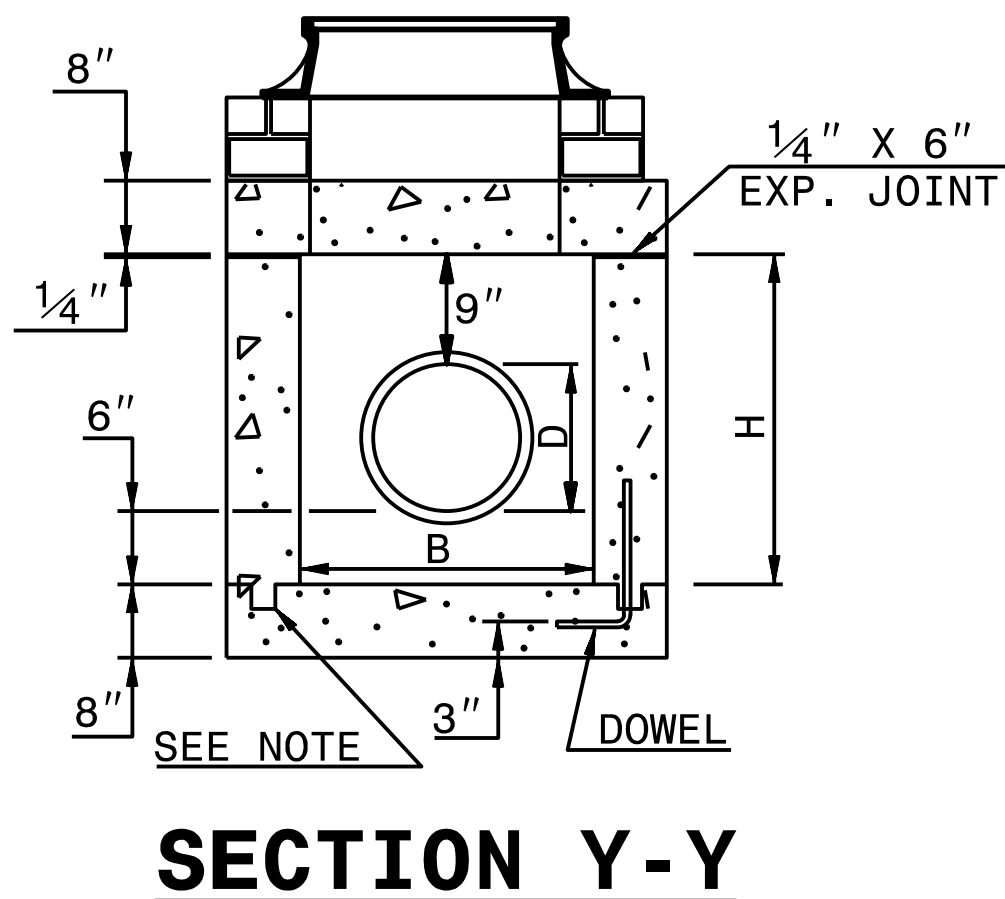
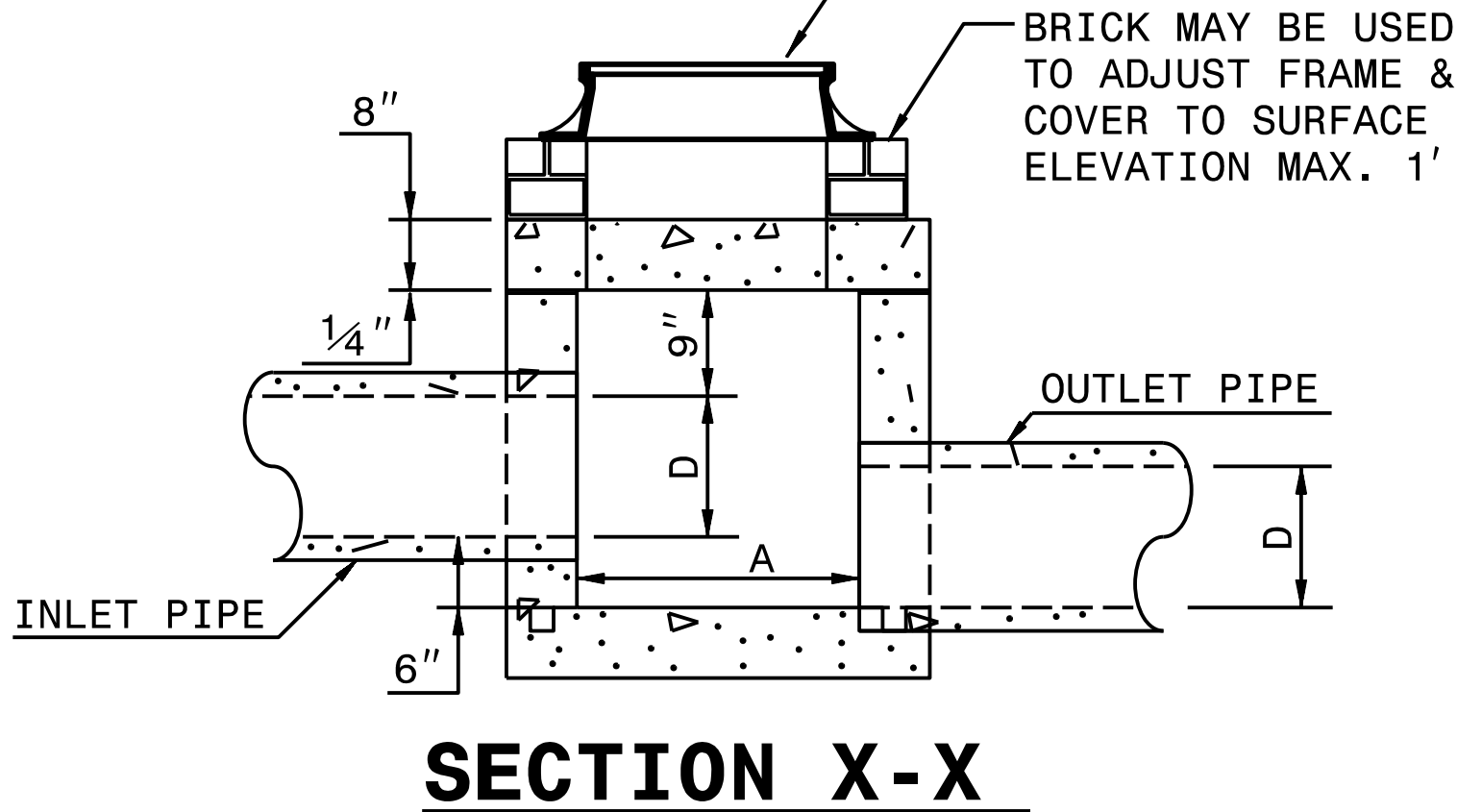
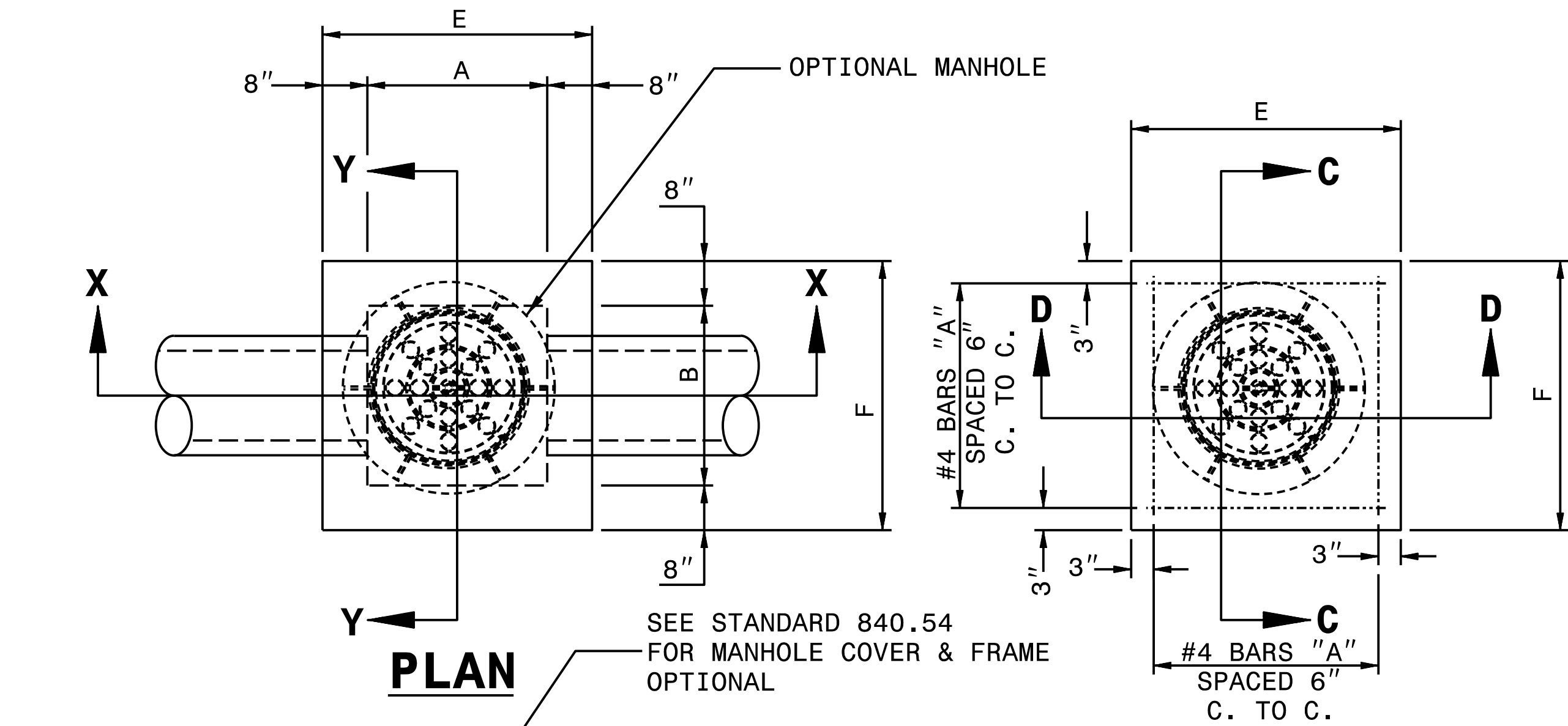
ROADWAY DETAIL DRAWING FOR
CONCRETE JUNCTION BOX
(WITH OPTIONAL MANHOLE)
UP TO 30' IN HEIGHT

SHEET 1 OF 1
840D31

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

ROADWAY DETAIL DRAWING FOR
CONCRETE JUNCTION BOX
(WITH OPTIONAL MANHOLE)
UP TO 30' IN HEIGHT

SHEET 1 OF 1
840D31



GENERAL NOTES:

CHAMFER ALL EXPOSED CORNERS 1".

USE CLASS "B" CONCRETE THROUGHOUT.

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

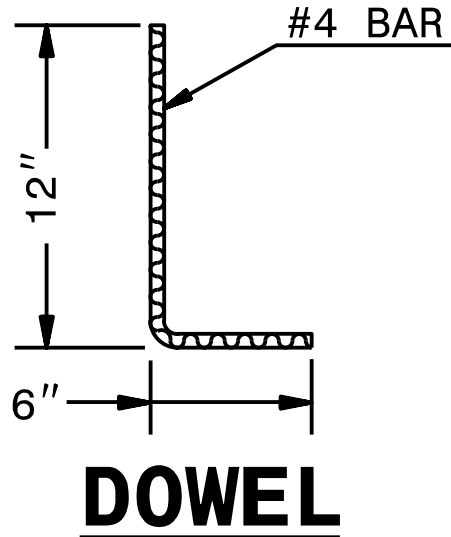
USE FORMS TO CONSTRUCT THE BOTTOM SLAB.

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

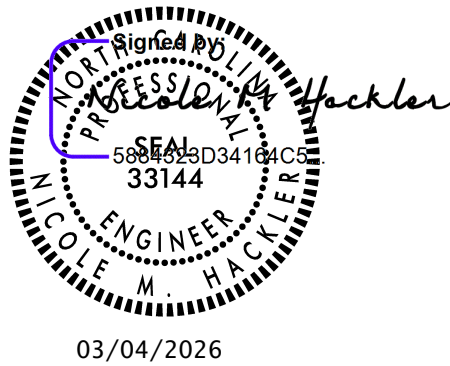
PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTERS IN ACCORDANCE WITH STD. NO. 840.66.

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

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



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



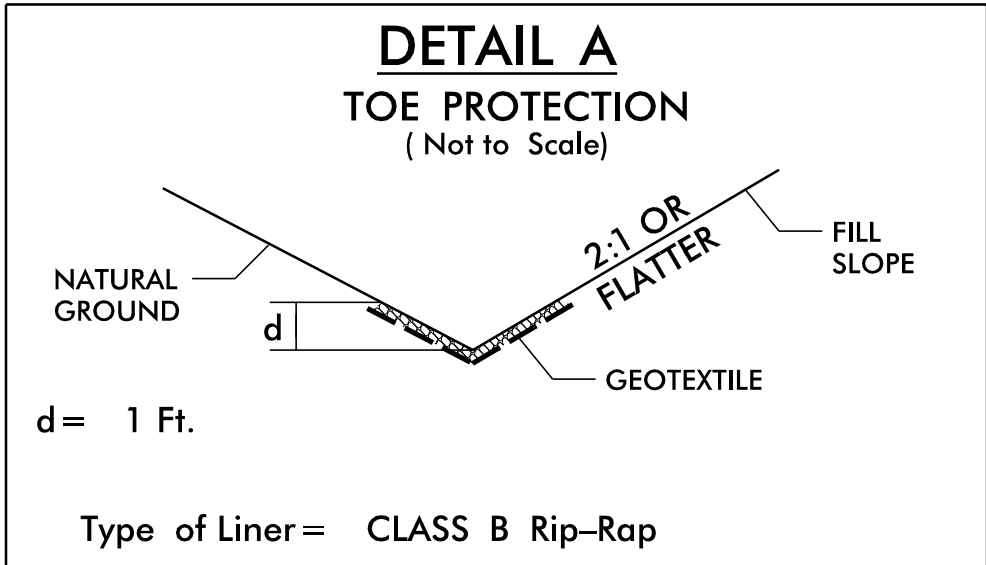
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SEE PLATE FOR TITLE

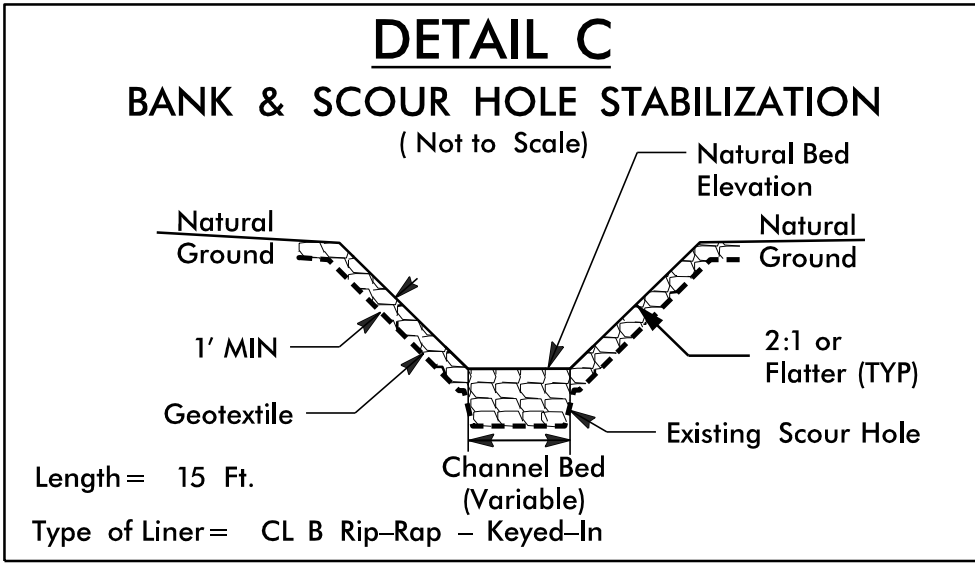
ORIGINAL BY: J. HOWERTON DATE: 12/30/19
MODIFIED BY: DATE:
CHECKED BY: DATE:
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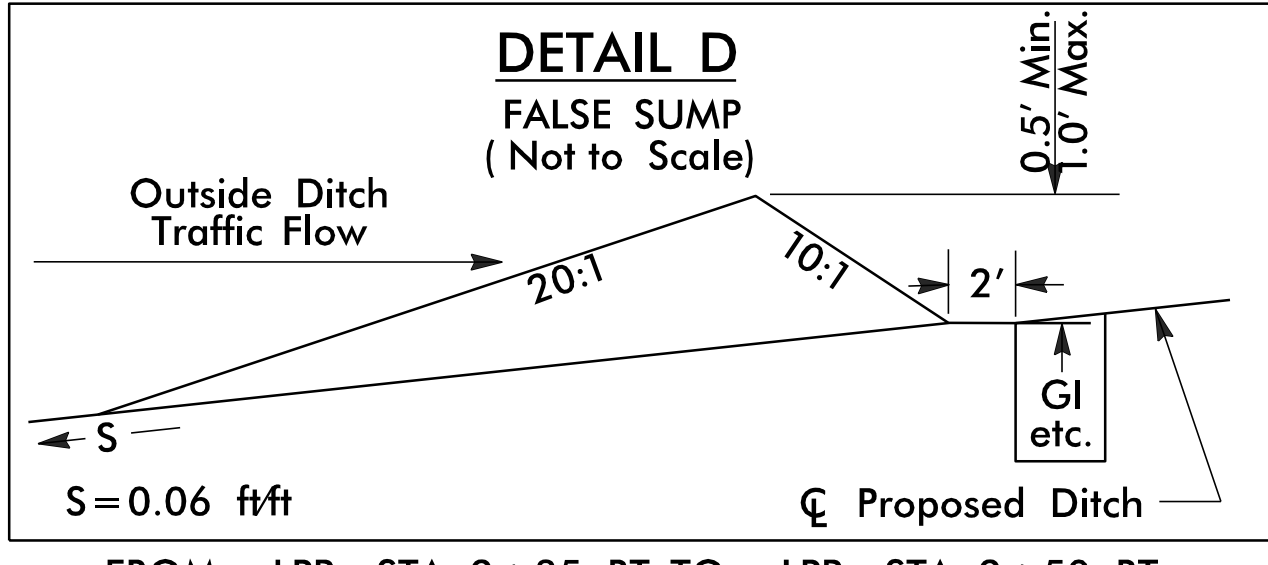
FROM -LPCA- STA. 10+40 LT TO -L- STA. 19+00 LT
EST. 100 TONS CLASS B RIP RAP
EST. 222 SY GEOTEXTILE

FROM -RPC- STA. 13+00 RT TO -RPC- STA. 13+60 RT
EST. 38.5 TONS CLASS B RIP RAP
EST. 86 SY GEOTEXTILE

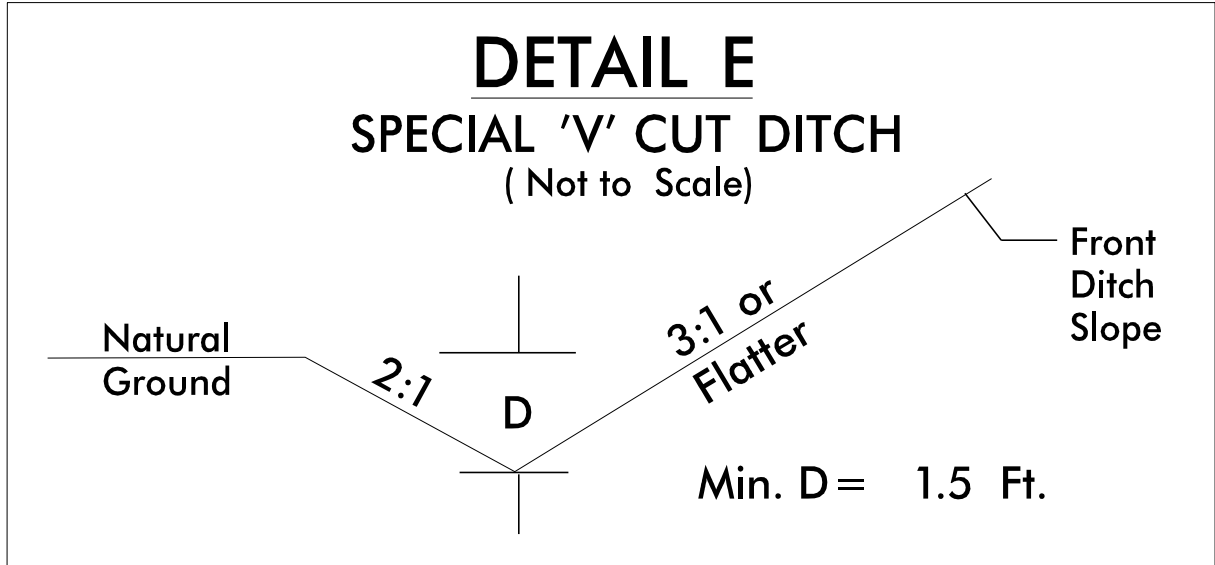
FROM -RPB- STA. 14+00 LT TO -RPB- STA. 14+45 LT
EST. 40 TONS CLASS B RIP RAP
EST. 90 SY GEOTEXTILE



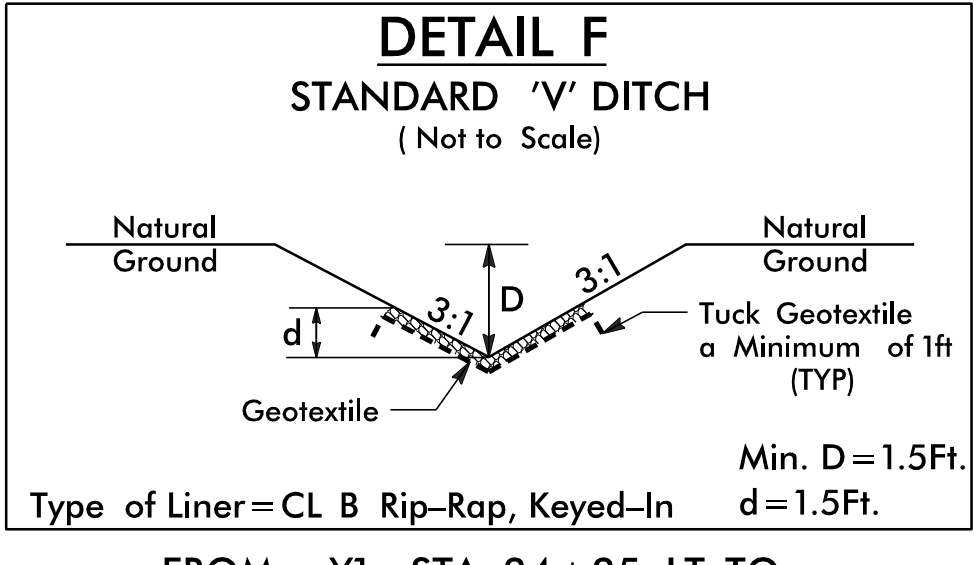
FROM -Y1- STA. 21+65 RT TO
-Y1- STA. 21+80 RT
EST. 100 TONS CLASS B RIP RAP
EST. 225 SY GEOTEXTILE



FROM -LPB- STA. 9+35 RT TO -LPB- STA. 9+50 RT

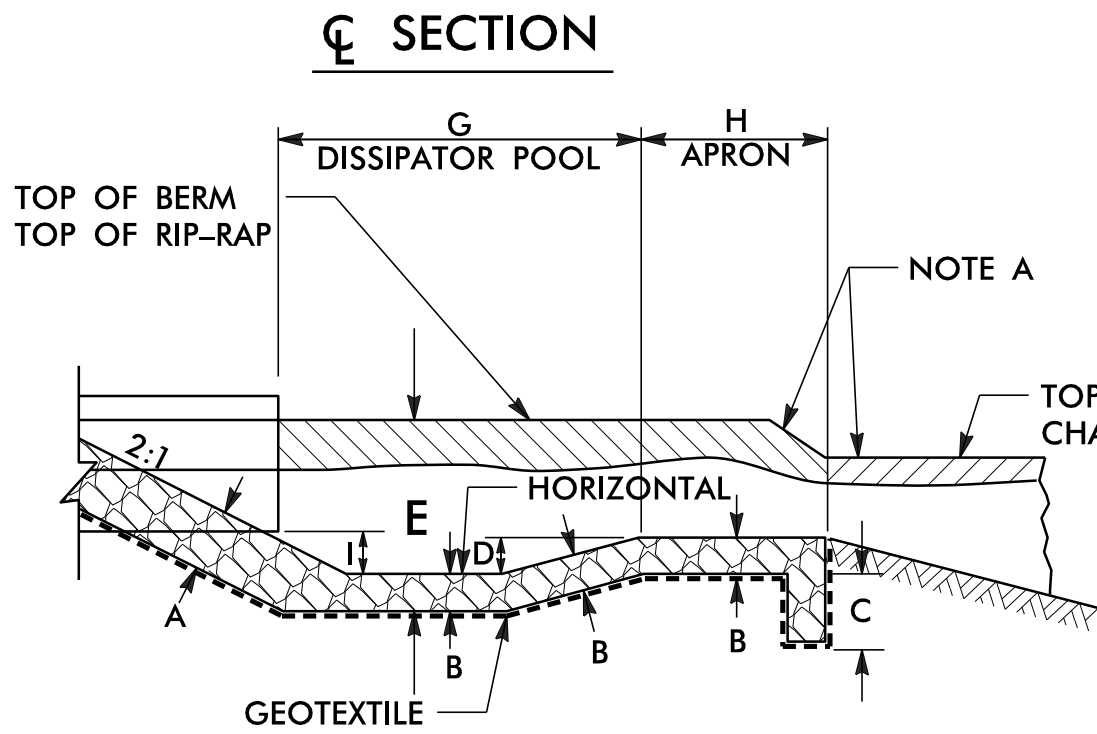


FROM -RPB- STA. 13+50 LT TO
-RPB- STA. 14+10 LT

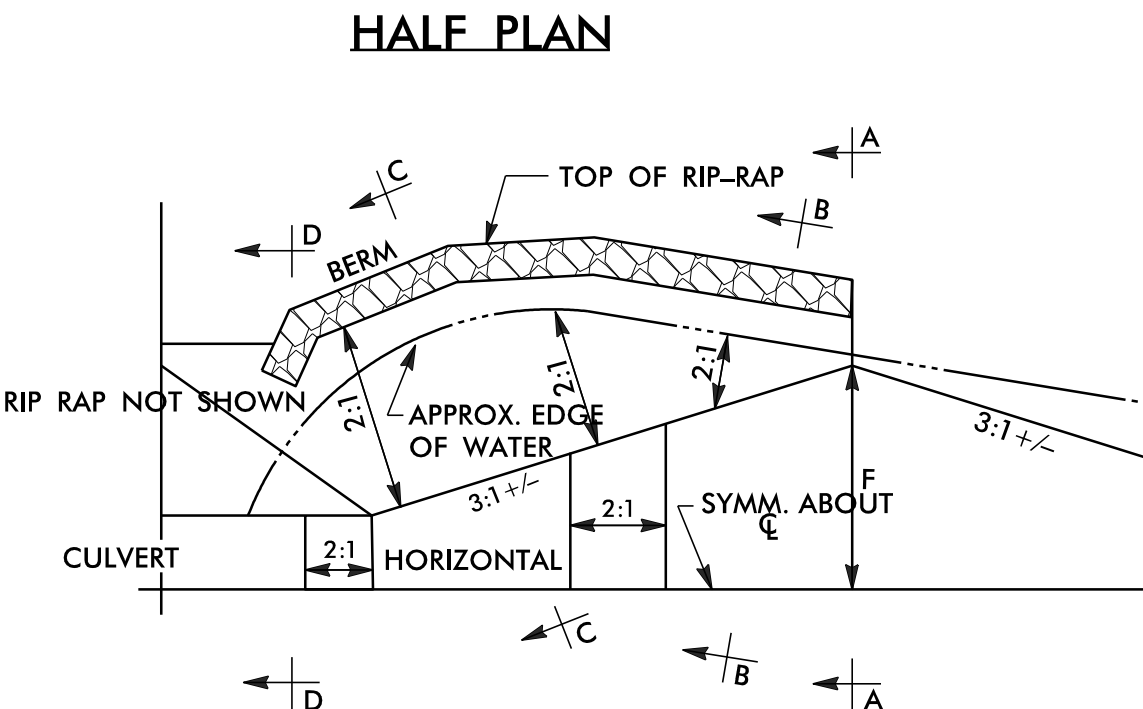


FROM -Y1- STA. 24+25 LT TO
-Y1- STA. 26+50 LT
EST. 102 TONS CLASS B RIP RAP
EST. 225 SY GEOTEXTILE

DETAIL B
RIP-RAPPED ENERGY DISSIPATOR BASIN



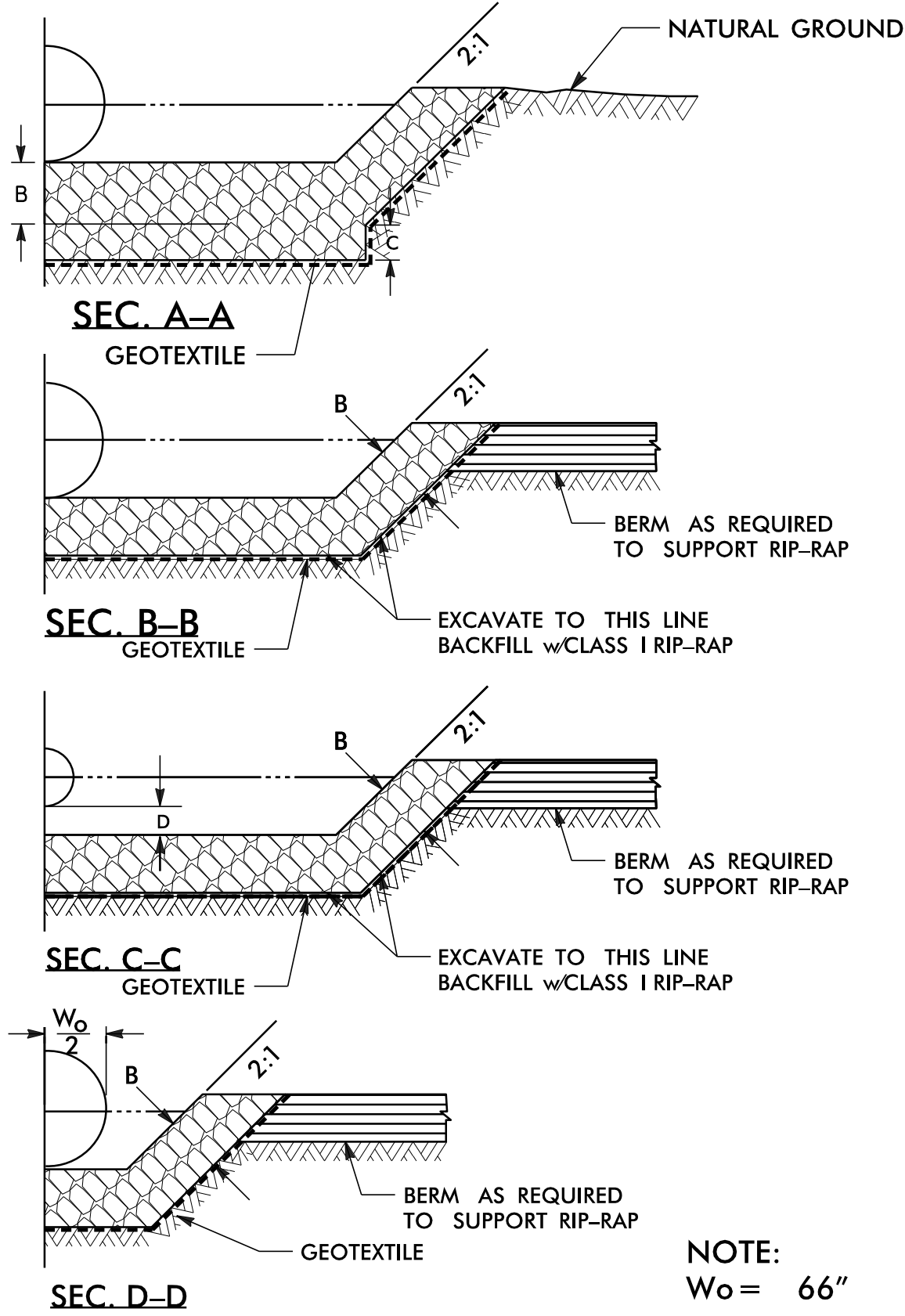
*NOTE A: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A-A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



DIM.	1	2	3	4	5	6	7	8
A	3.0'							
B	2.3'							
C	1.0'							
D	2.4'							
E	13.6'							
F	15.0'							
G	24.0'							
H	12.0'							
I	3.3'							

*ALL DIMENSIONS APPROXIMATE IN FT

BASIN #	LOCATION (AT OUTLET)
1	10+87 -RPA-
2	
3	
4	
5	
6	
7	
8	



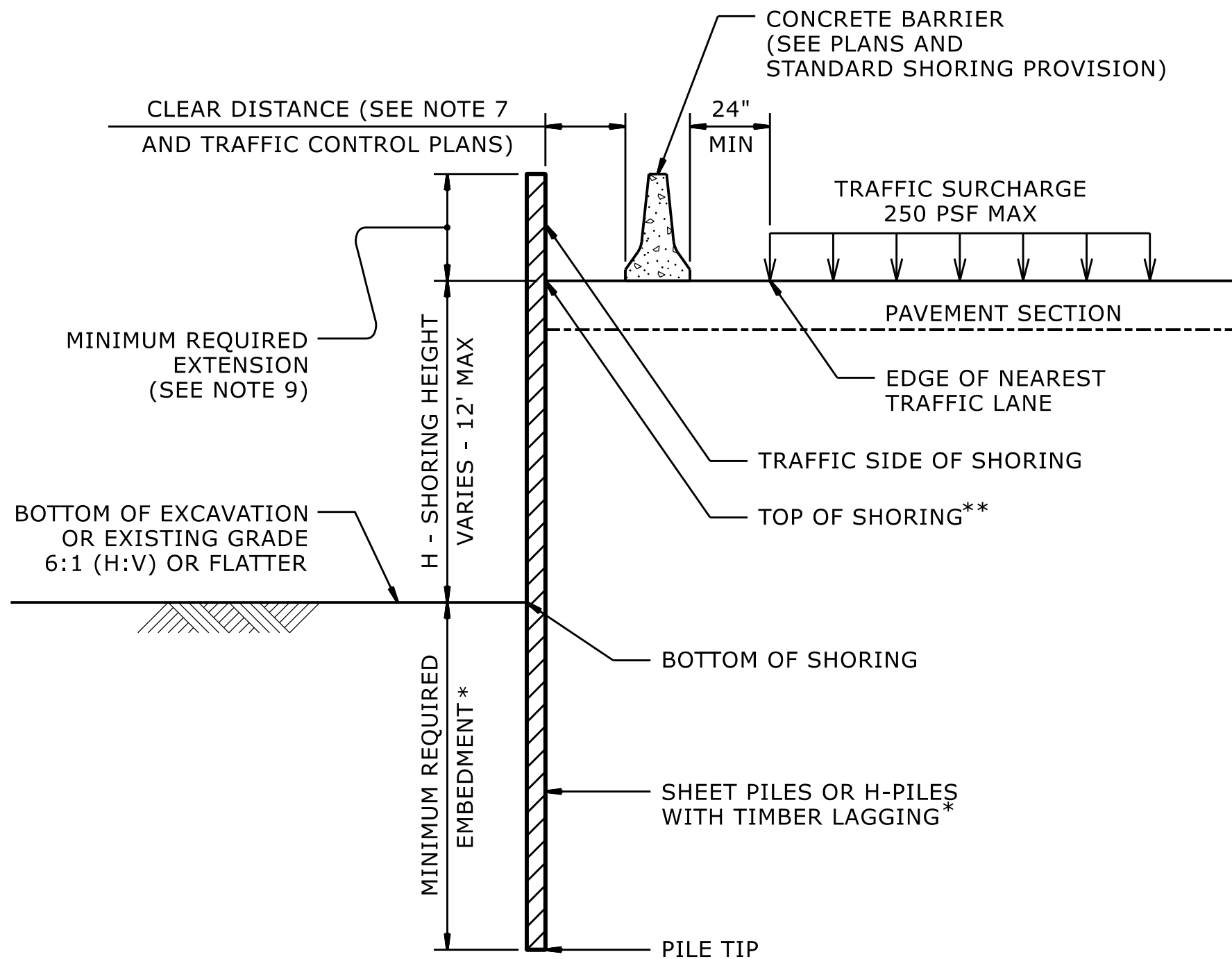
NOTE:
W₀ = 66"

FROM -RPA- STA. 10+50 LT TO -RPA- STA. 10+90 LT

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 ⁴ /FT)	MINIMUM REQUIRED EMBEDMENT * (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ⁴ /FT)	MINIMUM REQUIRED EMBEDMENT * (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

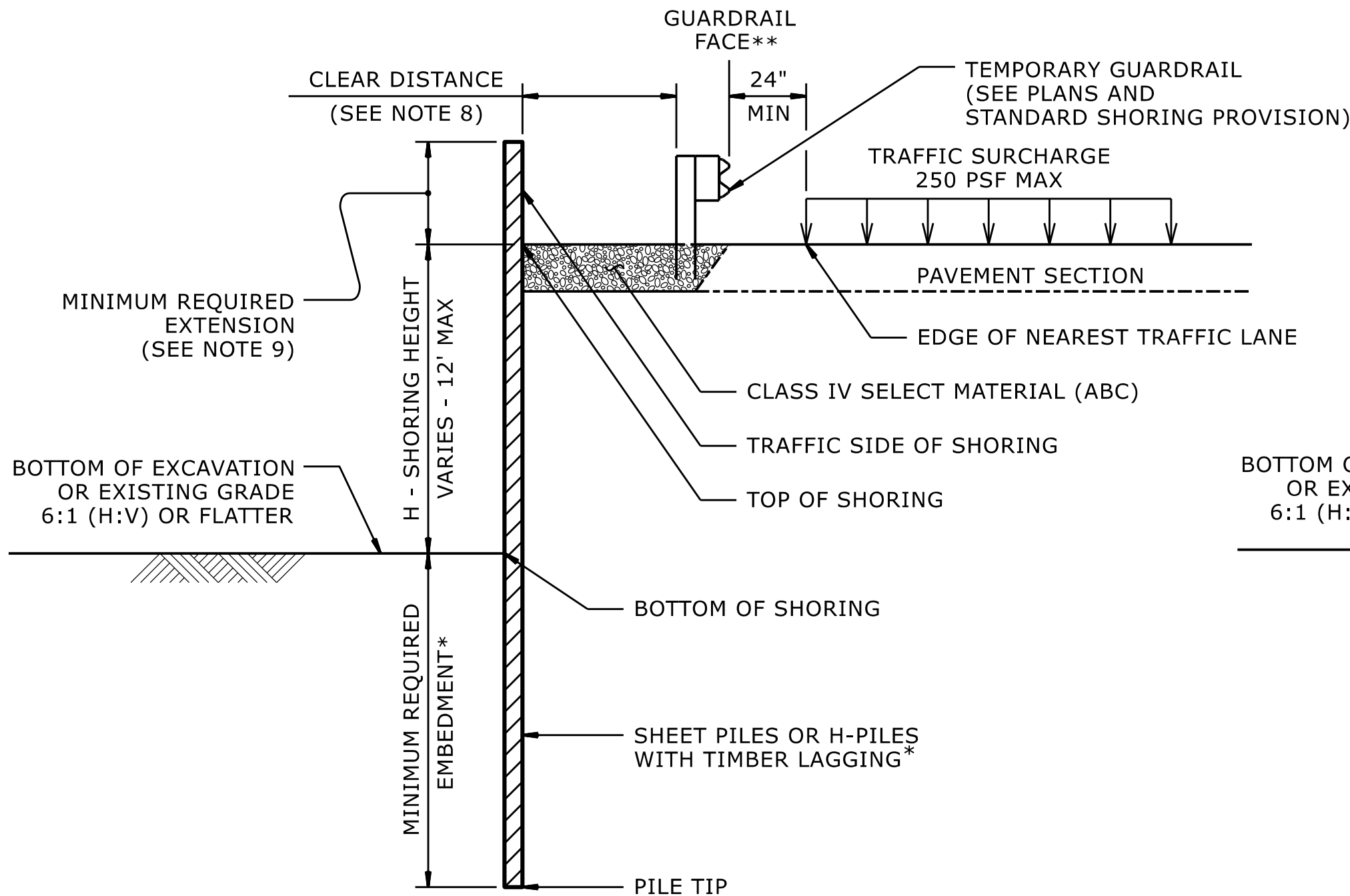
MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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



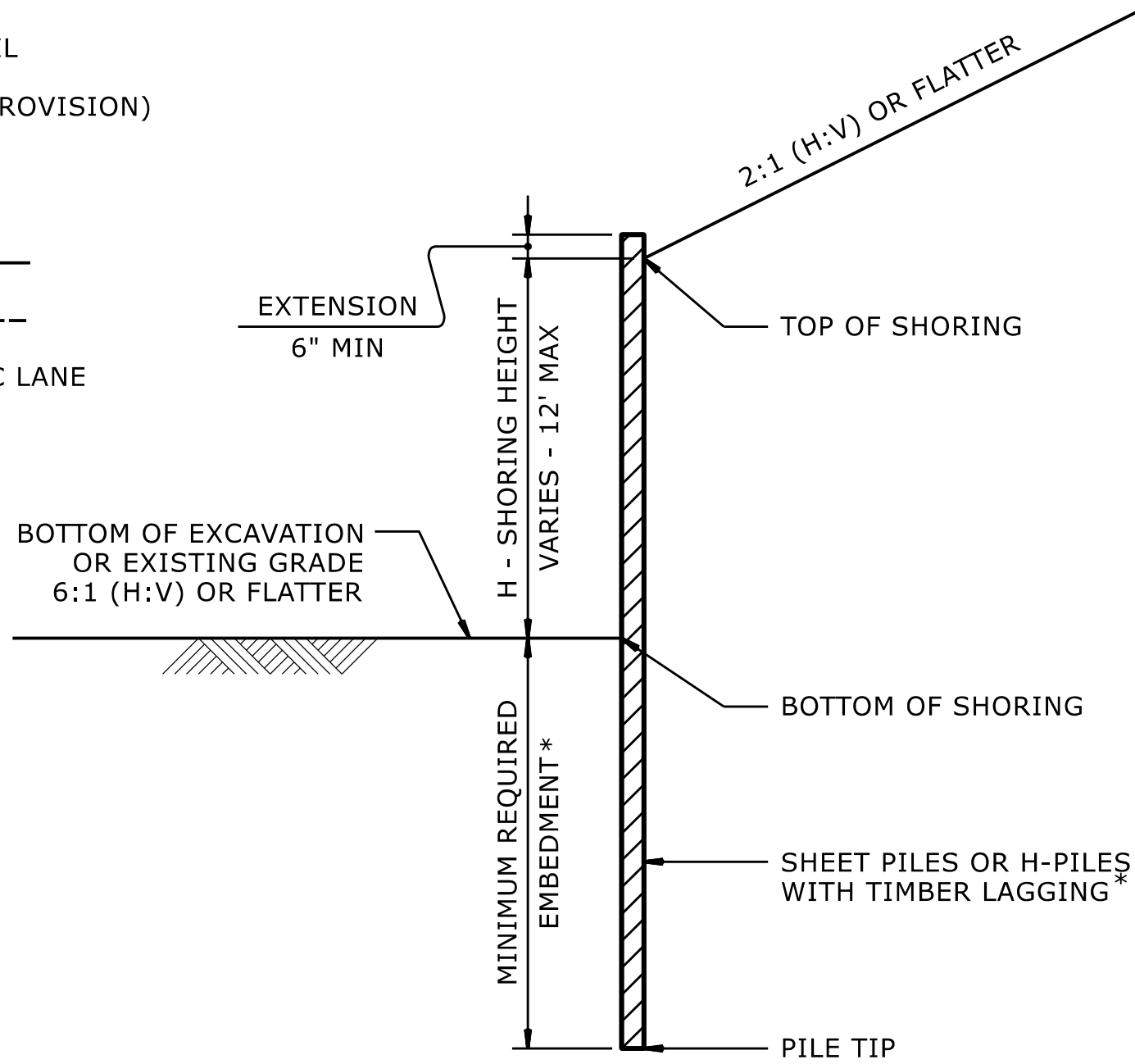
CONCRETE BARRIER

**TOP OF SHORING =
EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE =
EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

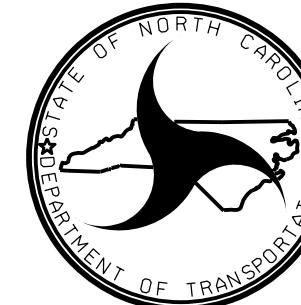
NOTES:

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

BR-0168

2G-1 -

NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION



GEOTECHNICAL
ENGINEERING UNIT

GEOTECHNICAL
ENGINEER

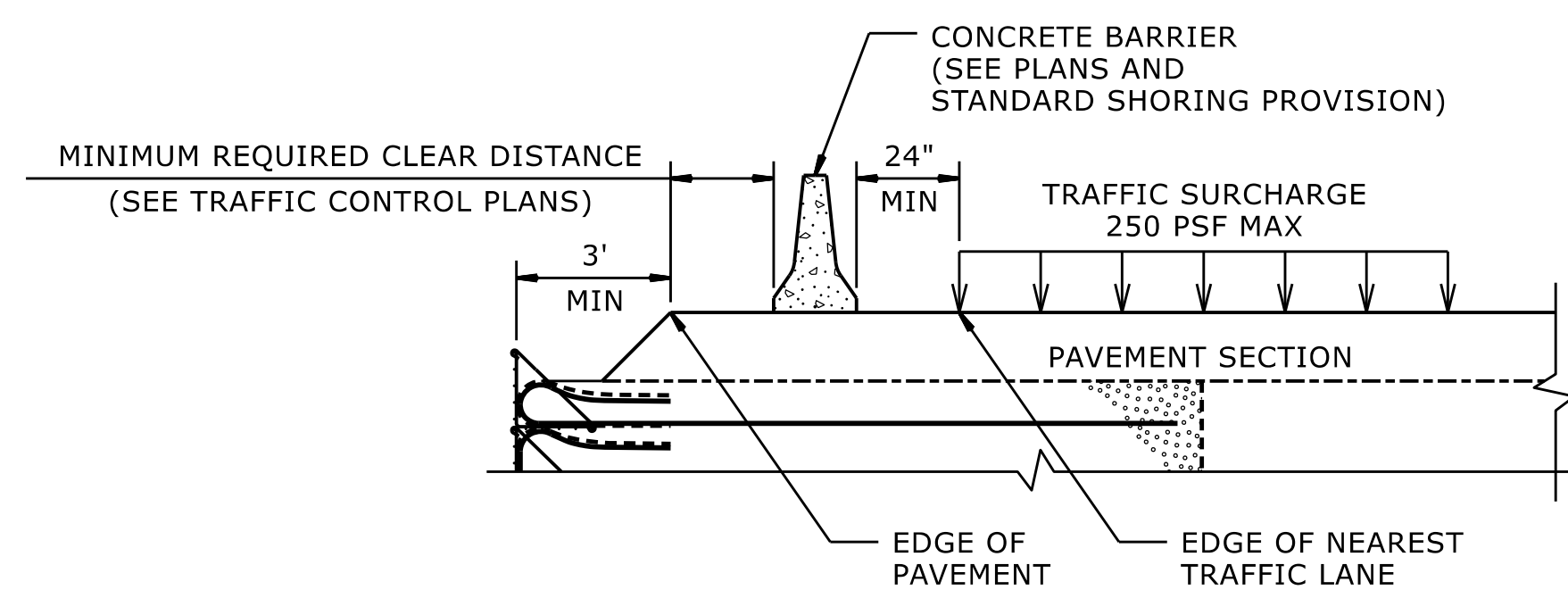
DocuSigned by:
Scott A. Hidden 03/05/2026



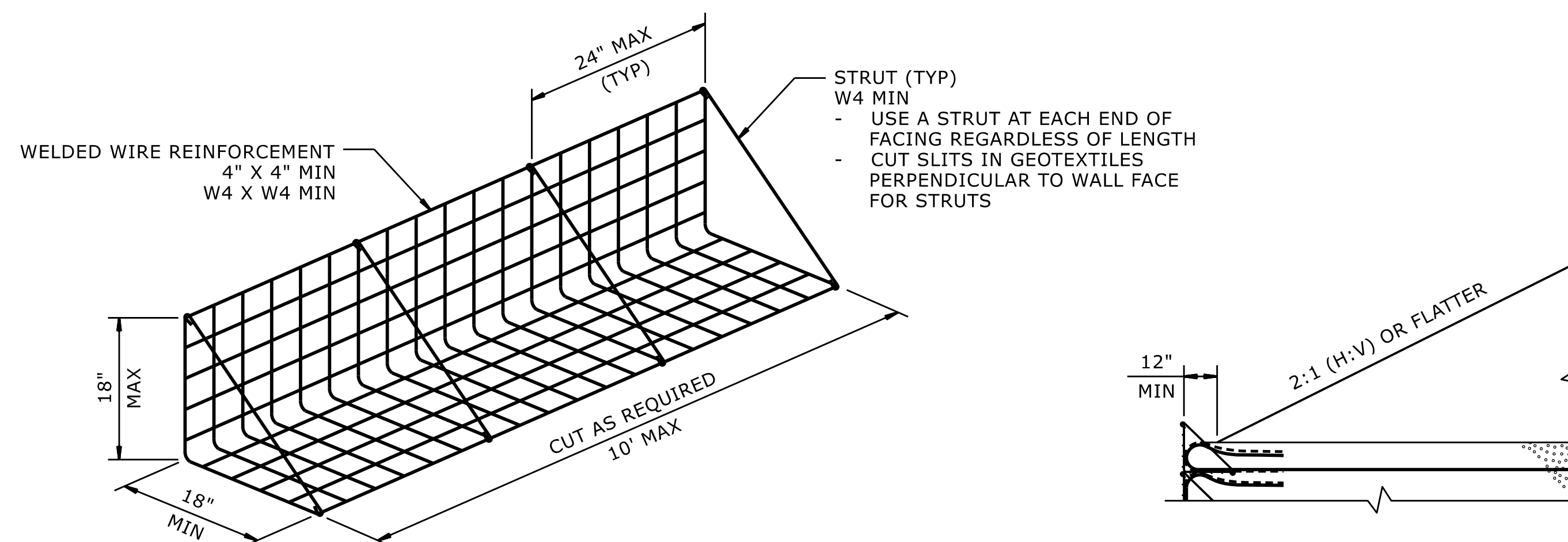
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STANDARD
DETAIL NO. 1801.01

GEOTECHNICAL STANDARD DETAIL FOR
TEMPORARY SHORING

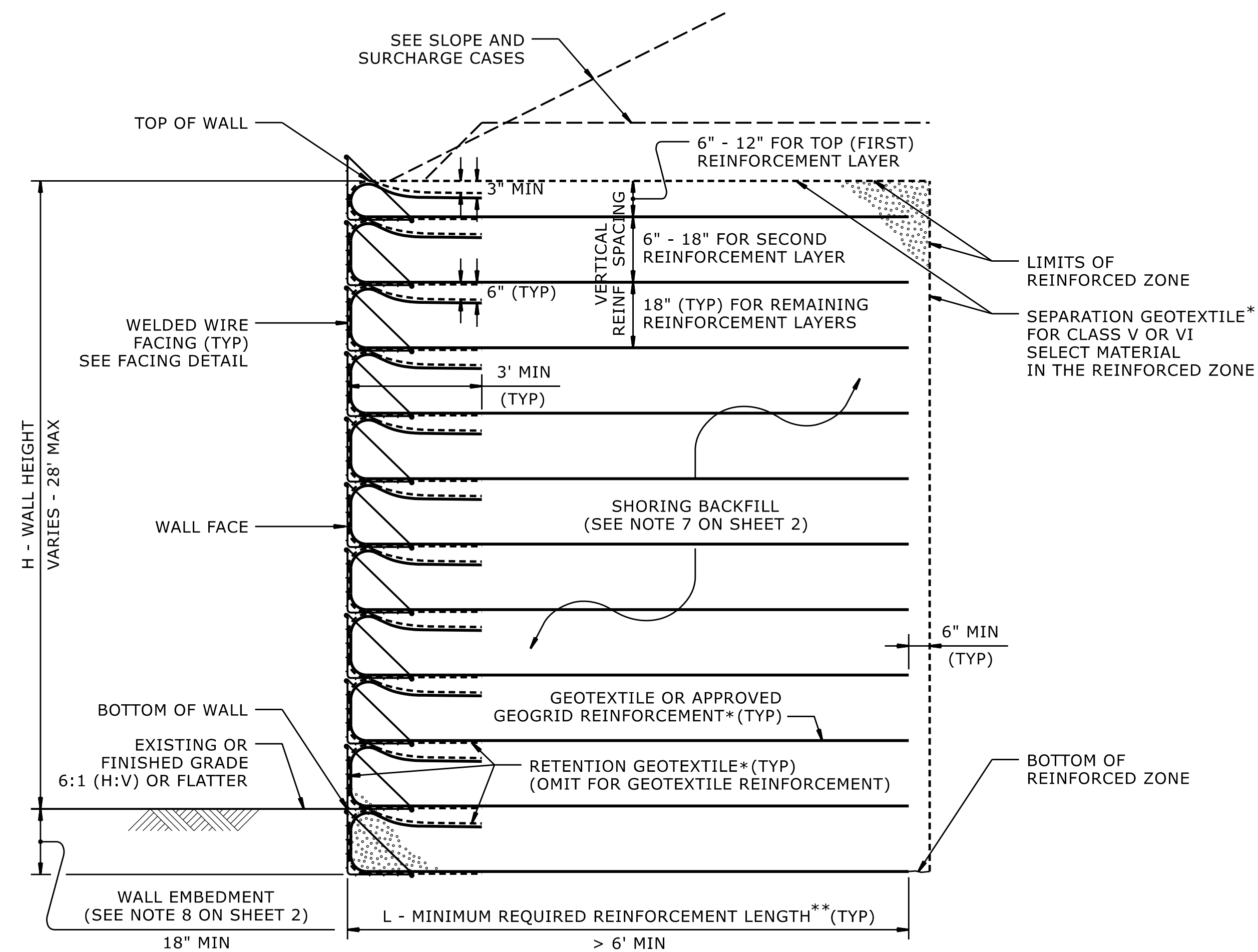


SURCHARGE CASE



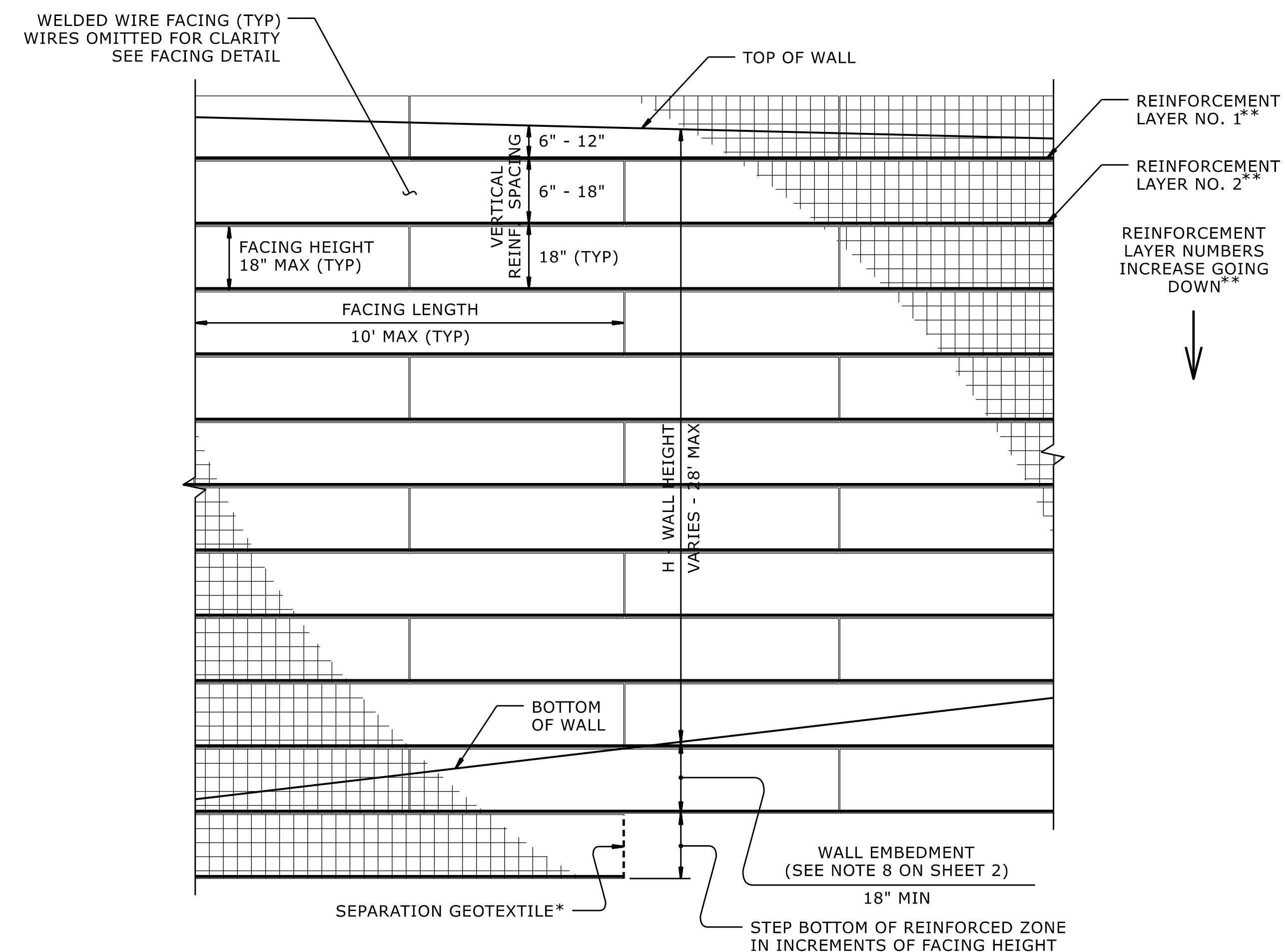
FACING DETAIL

SLOPE CASE



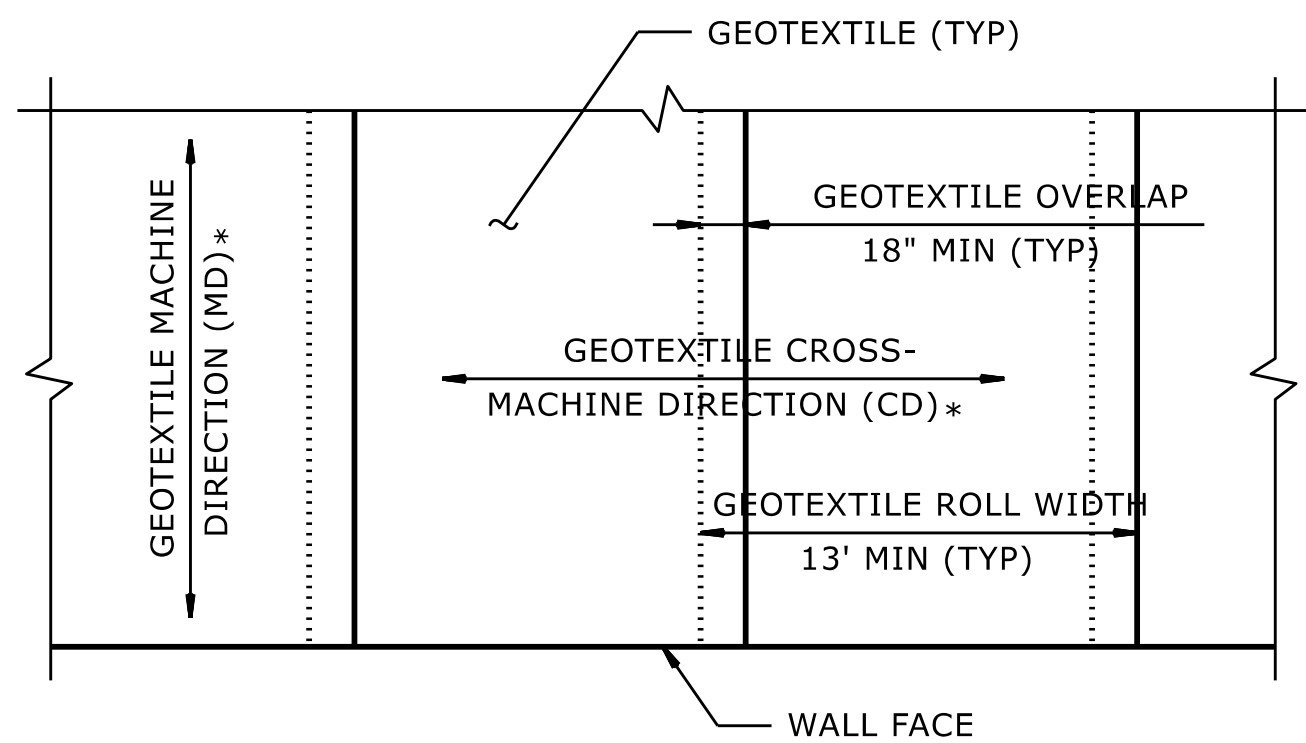
STANDARD TEMPORARY WALL

(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.



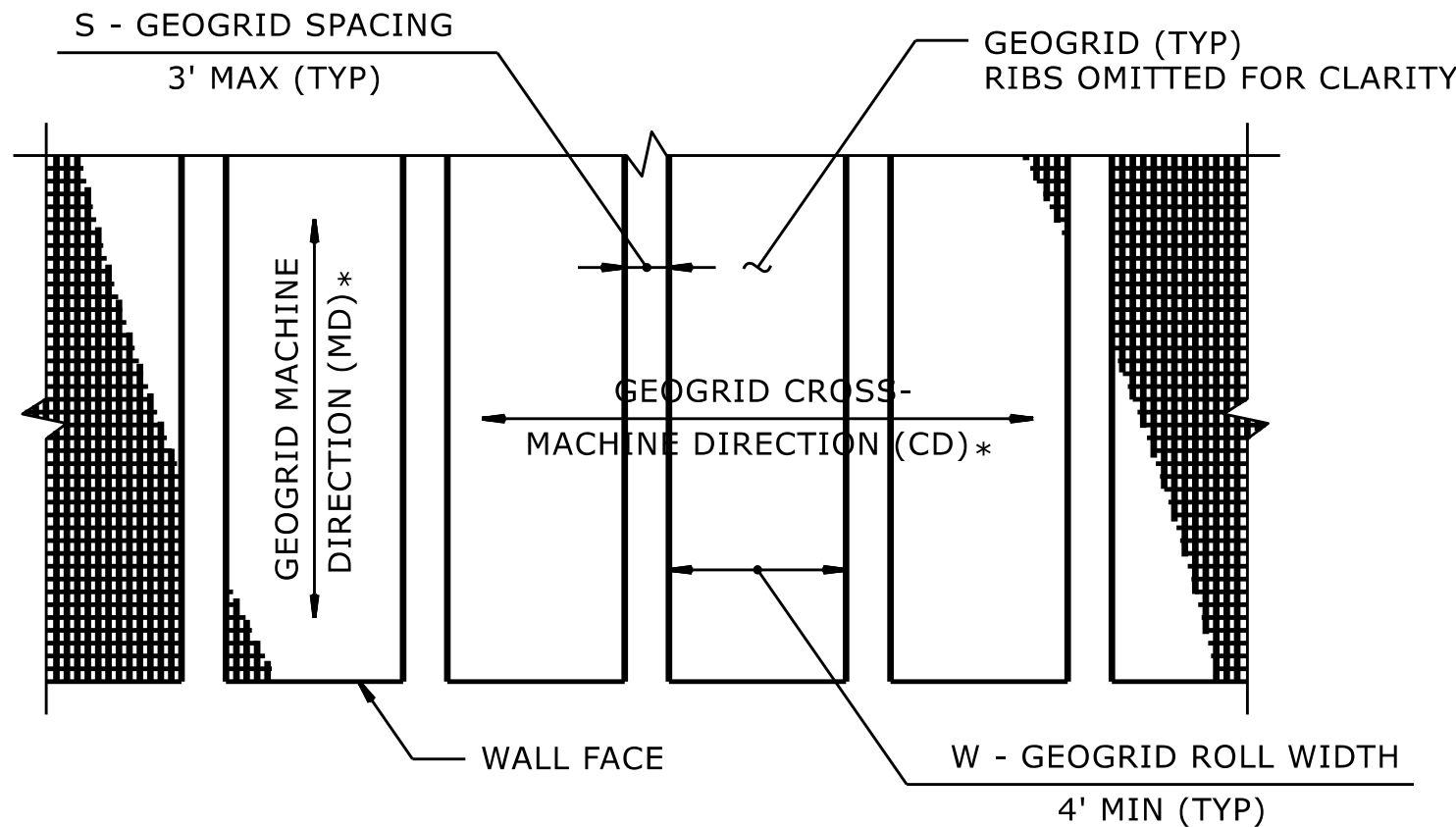
STANDARD TEMPORARY WALL - PARTIAL ELEVATION

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



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR
GEOTEXTILE REINFORCEMENT)

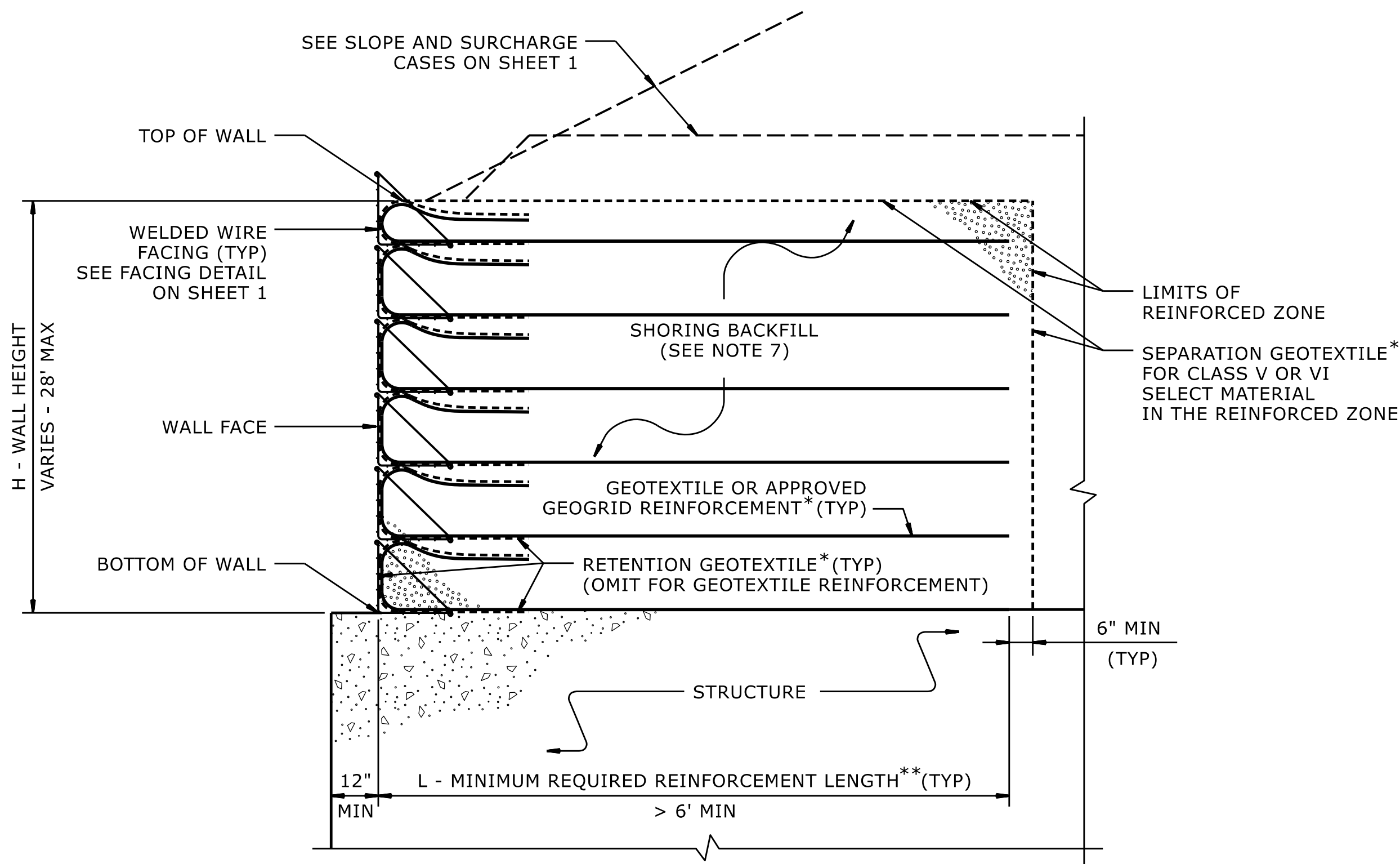


GEOGRID PLACEMENT

(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:

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- 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
- DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- 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.
- 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.
- WALL EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- GEOGRIDS FOR GEOGRID REINFORCEMENT ARE APPROVED FOR SHORT TERM DESIGN STRENGTHS (3-YEAR DESIGN LIFE) IN THE MD AND CD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Products.aspx. DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
- 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) > (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
- REINFORCEMENT STRENGTH IN CD > MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
- 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
- DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
- FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
- DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
- CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
- FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
- 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.

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 1, CLASS III, CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27	
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H > 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	
	> 7 FOR H < 20' > 10 FOR H > 20'	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	
		CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20	
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19	

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

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

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

REINFORCEMENT LAYER NUMBER *	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE 1 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 1 OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE 1 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)

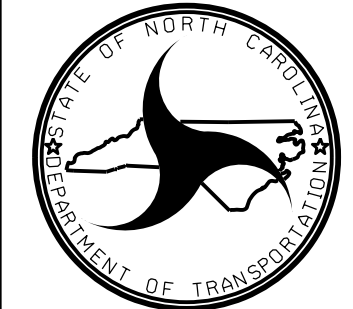
(SEE NOTE 10 ON SHEET 2.)
MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD
(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

BR-0168

2G-4

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NORTH CAROLINA
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GEOTECHNICAL
ENGINEERING UNIT

GEOTECHNICAL
ENGINEER

DocuSigned by:
Scott A. Hidden
2025/02/20 20:26
FROM NORTH CAROLINA
PROFESSIONAL
SEAL
022246
ENGINEER
SCOTT A. HIDDEN

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STANDARD
DETAIL NO. 1801.02

GEOTECHNICAL STANDARD DETAIL FOR
TEMPORARY WALL (SHEET 3 OF 3)

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
STAGE 1					
SUMMARY 1					
L (LT) STA 11+50.00	L (LT) STA 20+50.00	713	4884	4171	
RPC,LPC,LPCA (LT)		155	1958	1803	
SUMMARY 1 TOTAL		868	6842	5974	
SUMMARY 2					
L (LT) STA 22+50.00	L (LT) STA 30+50.00	289	4390	4101	
RPB (LT) STA 13+00.00	RPB (LT) STA 15+00.00	165	110		55
LPB (LT) STA 13+00.00	LPB (LT) STA 14+50.00	53	170	117	
SUMMARY 2 TOTAL		507	4670	4218	55
SUBTOTAL		1375	11512	10192	55
STAGE 2					
SUMMARY 3					
L (RT) STA 11+50.00	L (RT) STA 20+50.00	478	5030.4	4552	
SUMMARY 3 TOTAL		478	5030	4552	
SUMMARY 4					
L (RT) STA 22+00.00	L (RT) STA 30+50.00	692	2459	1767	
RPA 13+00.00	RPA 15+50.00	244	145		99
SUMMARY 4 TOTAL		936	2604	1766	99
SUBTOTAL		1414	7634	6318	99
TOTAL		2789	19146	16510	153
LOSS DUE TO CLEARING & GRUBBING		-900		900	
MATERIAL FOR SHOULDER CONSTRUCTION			132	132	
WASTE IN LIEU OF BORROW				-153	
PROJECT TOTALS:		1889	19278	17389	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				869	
GRAND TOTALS:		1889	19278	8258	
SAY:		2000		18300	

Note: Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for grading.

Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP	Comments
-L-	16+50.00	19+39.61			2246.71			
-L-	22+01.22	25+00.00			1774.67			
-L-	10+72.71	16+50.00		5436.02				
-L-	25+00.00	30+25.00		4494.78				
-RPA-	12+50.00	15+14.97		488.22				
-Y3-	10+46.57	11+35.00		814.69				
-LPC-	12+75.00	13+00.00		54.44				
-LPCA-	10+80.16	11+11.13		43.33				
-Y1-	23+89	27+75		170.34				Temp. Pavement
-Y1-	23+80	27+75		176.80				Temp. Pavement
-L-	15+28	15+95		104.44				Temp. Pavement
-L-	11+20	15+85		499.56				Temp. Pavement
		TOTAL:		12,283	4,021			
		SAY:		12,290	4,030			

N = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

[illegible]

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

SHEET TOTALS (48" or Less)

[illegible]

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

SHEET TOTALS (48" or Less)

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)

[illegible][illegible]

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54 INCHES & GREATER)

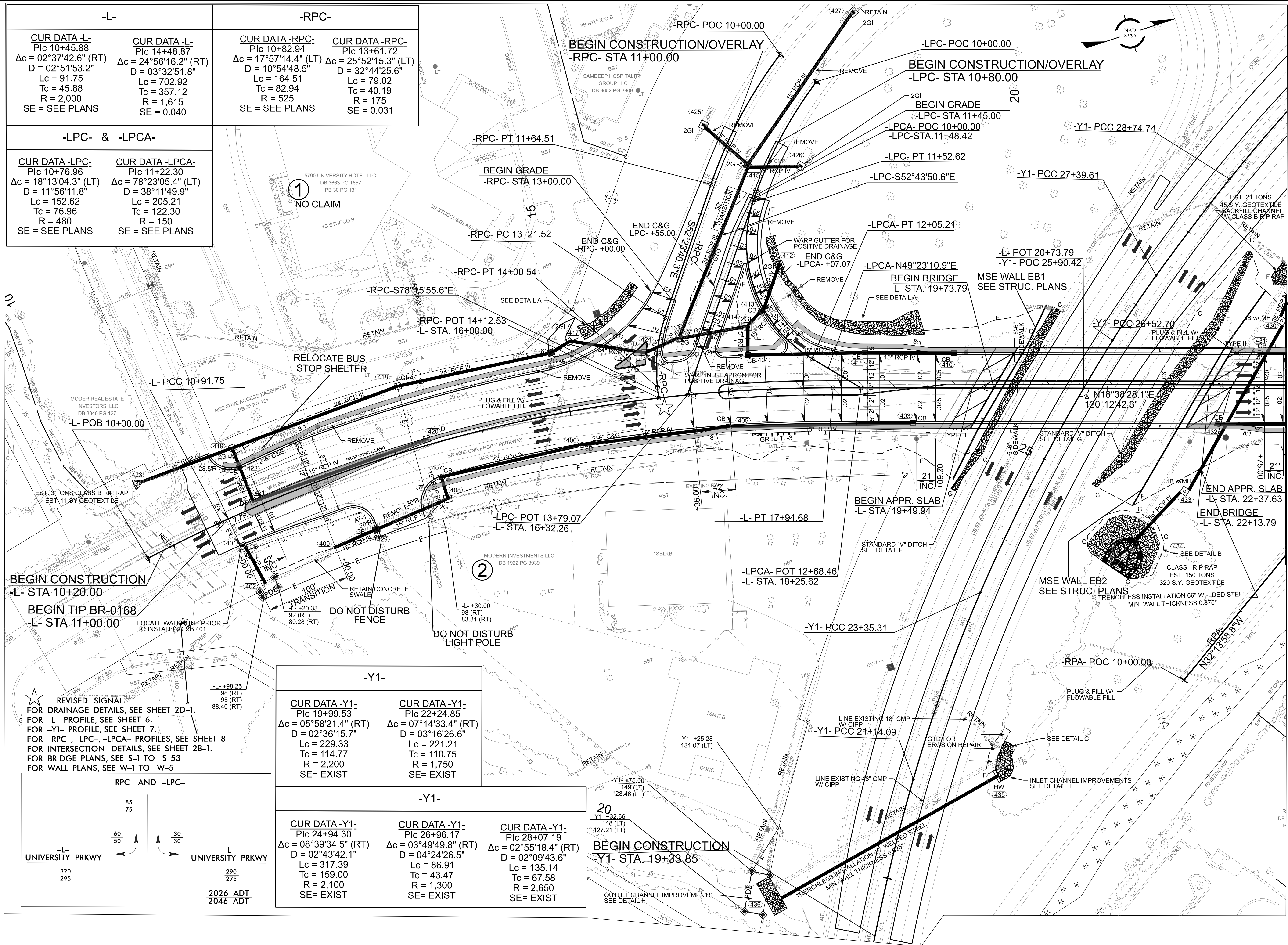
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COMPUTED BY: Hratch A. Agopian, DATE: 07/31/2024 CHECKED BY: Matthew M. Lattin, DATE: 07/31/2024		(2-3-23)					PROJECT NO. 67168.1.1 (BR-0168)		SHEET NO. 3G-1						
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS															
SUMMARY OF SUBSURFACE DRAINAGE						SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION									
LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF	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			SD	200										
				TOTAL LF:	200				ASU1	6	100	200	300		
									TOTAL CY/TONS/SY:		100	200**	300**	0	0
*UD = Underdrain *BD = Blind Drain *SD = Subsurface Drain						*ASU(1/2) = Aggregate Subgrade (Type 1 or 2) *AST = Aggregate Stabilization **Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.									
SUMMARY OF BRIDGE WAITING PERIODS															
Bridge Description												End Bent/ Bent No.	MONTHS		
Bridge No. 289												1	2		
Bridge No. 289												2	2		

[illegible][illegible]

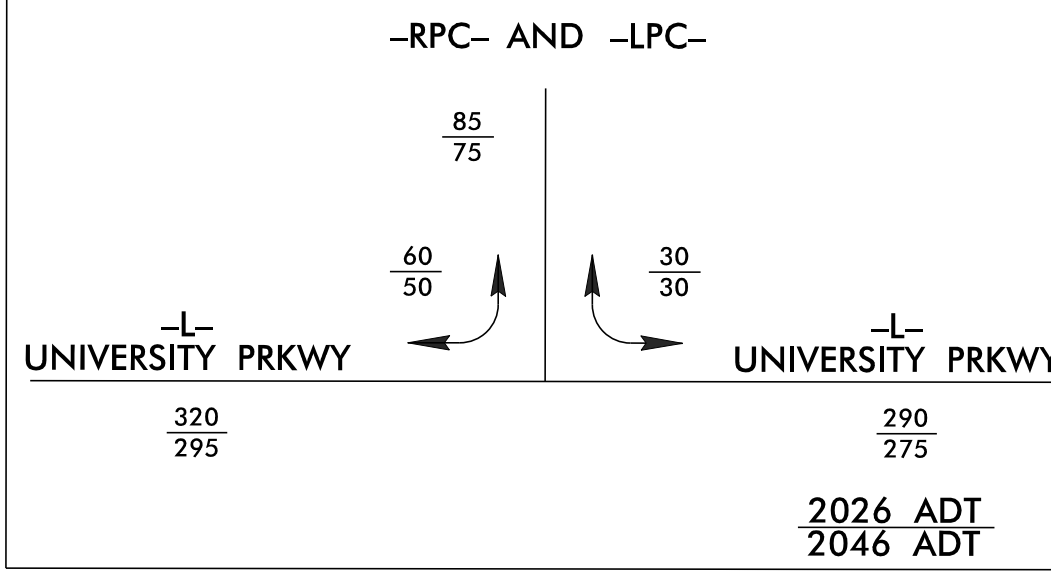
-L-		-RPC-	
<u>CUR DATA -L-</u> Plc 10+45.88 $\Delta c = 02^{\circ}37'42.6''$ (RT) $D = 02^{\circ}51'53.2''$ $Lc = 91.75$ $Tc = 45.88$ $R = 2,000$ SE = SEE PLANS	<u>CUR DATA -L-</u> Plc 14+48.87 $\Delta c = 24^{\circ}56'16.2''$ (RT) $D = 03^{\circ}32'51.8''$ $Lc = 702.92$ $Tc = 357.12$ $R = 1,615$ SE = 0.040	<u>CUR DATA -RPC-</u> Plc 10+82.94 $\Delta c = 17^{\circ}57'14.4''$ (LT) $D = 10^{\circ}54'48.5''$ $Lc = 164.51$ $Tc = 82.94$ $R = 525$ SE = SEE PLANS	<u>CUR DATA -RPC-</u> Plc 13+61.72 $\Delta c = 25^{\circ}52'15.3''$ (LT) $D = 32^{\circ}44'25.6''$ $Lc = 79.02$ $Tc = 40.19$ $R = 175$ SE = 0.031

-LPC- & -LPCA-	
<u>CUR DATA -LPC-</u> Plc 10+76.96 $\Delta c = 18^{\circ}13'04.3''$ (LT) $D = 11^{\circ}56'11.8''$ $Lc = 152.62$ $Tc = 76.96$ $R = 480$ SE = SEE PLANS	<u>CUR DATA -LPCA-</u> Plc 11+22.30 $\Delta c = 78^{\circ}23'05.4''$ (LT) $D = 38^{\circ}11'49.9''$ $Lc = 205.21$ $Tc = 122.30$ $R = 150$ SE = SEE PLANS



-Y1-	
<u>CUR DATA -Y1-</u> Plc 19+99.53 $\Delta c = 05^{\circ}58'21.4''$ (RT) $D = 02^{\circ}36'15.7''$ $Lc = 229.33$ $Tc = 114.77$ $R = 2,200$ SE= EXIST	<u>CUR DATA -Y1-</u> Plc 22+24.85 $\Delta c = 07^{\circ}14'33.4''$ (RT) $D = 03^{\circ}16'26.6''$ $Lc = 221.21$ $Tc = 110.75$ $R = 1,750$ SE= EXIST

-Y1-		
<u>CUR DATA -Y1-</u> Plc 24+94.30 $\Delta c = 08^{\circ}39'34.5''$ (RT) $D = 02^{\circ}43'42.1''$ $Lc = 317.39$ $Tc = 159.00$ $R = 2,100$ SE= EXIST	<u>CUR DATA -Y1-</u> Plc 26+96.17 $\Delta c = 03^{\circ}49'49.8''$ (RT) $D = 04^{\circ}24'26.5''$ $Lc = 86.91$ $Tc = 43.47$ $R = 1,300$ SE= EXIST	<u>CUR DATA -Y1-</u> Plc 28+07.19 $\Delta c = 02^{\circ}55'18.4''$ (RT) $D = 02^{\circ}09'43.6''$ $Lc = 135.14$ $Tc = 67.58$ $R = 2,650$ SE= EXIST



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ROADWAY DESIGN
ENGINEER

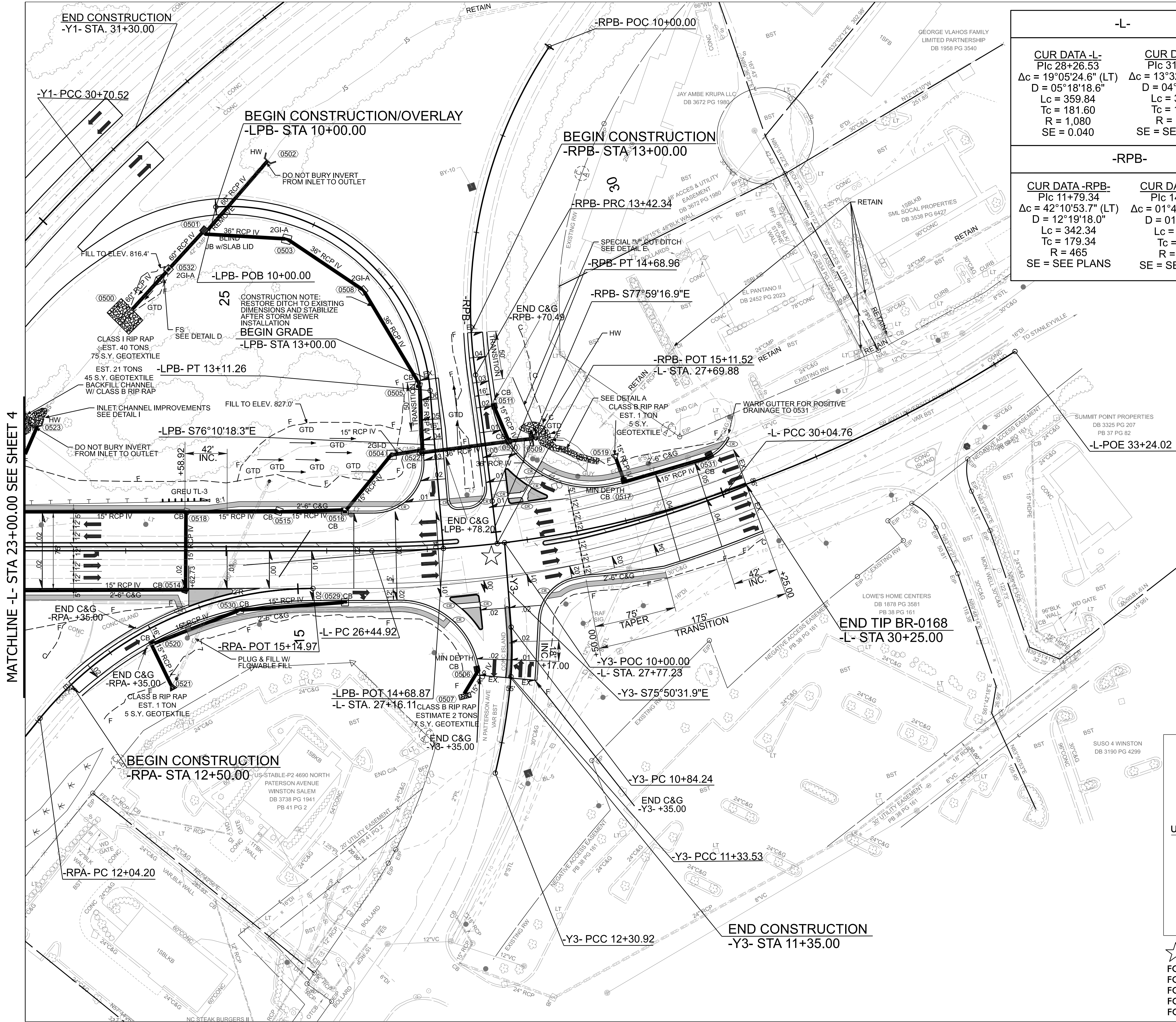
Professional Engineer
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036853
Matthew J. York

HYDRAULICS
ENGINEER

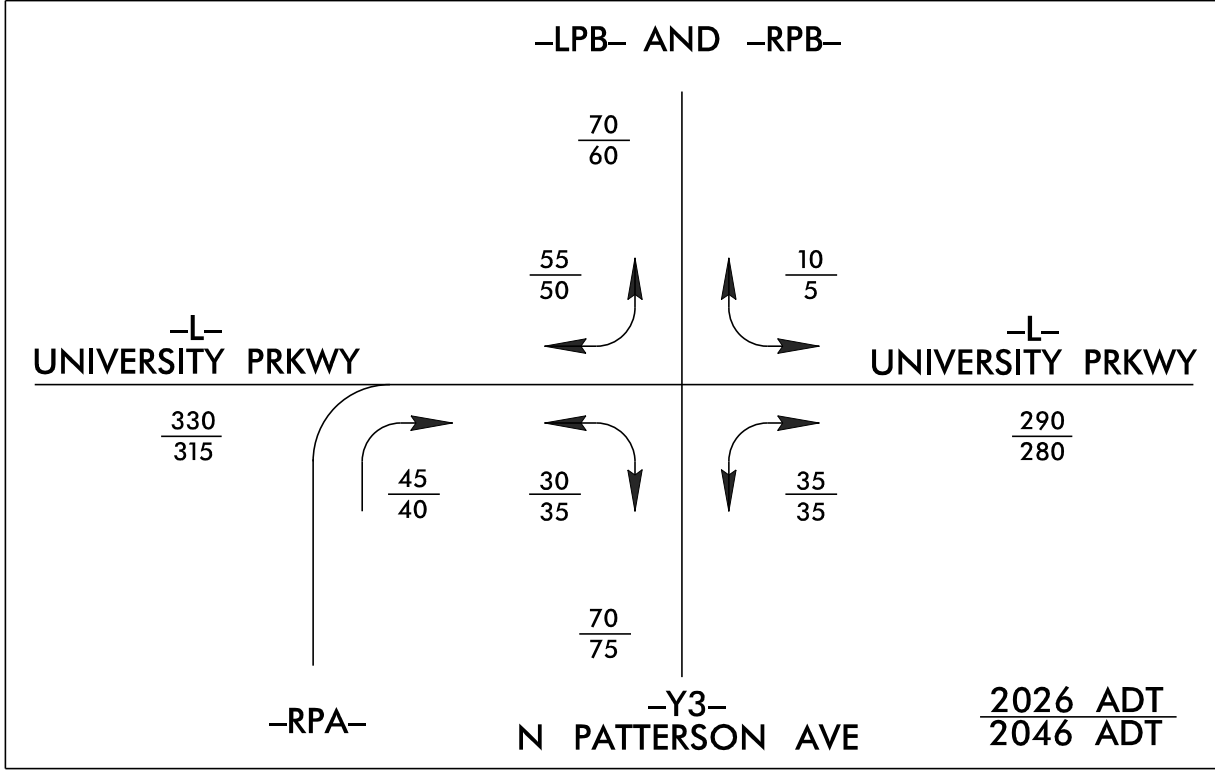
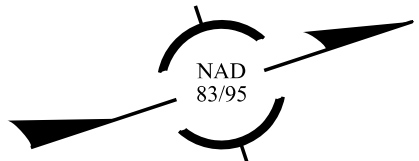
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-L-	-LPB-	-RPA-
<u>CUR DATA -L-</u> Plc 28+26.53 $\Delta c = 19^{\circ}05'24.6''$ (LT) $D = 05^{\circ}18'18.6''$ $Lc = 359.84$ $Tc = 181.60$ $R = 1,080$ $SE = 0.040$	<u>CUR DATA -L-</u> Plc 31+65.14 $\Delta c = 13^{\circ}32'59.3''$ (LT) $D = 04^{\circ}14'38.9''$ $Lc = 319.26$ $Tc = 160.38$ $R = 1,350$ $SE = \text{SEE PLANS}$	<u>CUR DATA -LPB-</u> Plc 11+97.13 $\Delta c = 89^{\circ}10'13.6''$ (RT) $D = 28^{\circ}38'52.4''$ $Lc = 311.26$ $Tc = 197.13$ $R = 200$ $SE = \text{SEE PLANS}$
-RPA-	-Y3-	-Y1-
<u>CUR DATA -RPA-</u> Plc 13+70.67 $\Delta c = 50^{\circ}52'26.9''$ (RT) $D = 16^{\circ}22'12.8''$ $Lc = 310.77$ $Tc = 166.47$ $R = 350$ $SE = \text{SEE PLANS}$	<u>CUR DATA -Y3-</u> Plc 11+08.94 $\Delta c = 09^{\circ}24'43.8''$ (RT) $D = 19^{\circ}05'54.9''$ $Lc = 49.28$ $Tc = 24.70$ $R = 300$ $SE = \text{SEE PLANS}$	<u>CUR DATA -Y1-</u> Plc 11+82.31 $\Delta c = 08^{\circ}35'04.7''$ (RT) $D = 08^{\circ}48'53.0''$ $Lc = 97.39$ $Tc = 48.79$ $R = 650$ $SE = \text{SEE PLANS}$
<u>CUR DATA -Y3-</u> Plc 11+82.31 $\Delta c = 08^{\circ}35'04.7''$ (RT) $D = 08^{\circ}48'53.0''$ $Lc = 97.39$ $Tc = 48.79$ $R = 650$ $SE = \text{SEE PLANS}$	<u>CUR DATA -Y1-</u> Plc 29+72.73 $\Delta c = 06^{\circ}24'35.1''$ (RT) $D = 03^{\circ}16'26.6''$ $Lc = 195.77$ $Tc = 97.99$ $R = 1,750$ $SE = \text{EXIST}$	<u>CUR DATA -Y1-</u> Plc 32+49.93 $\Delta c = 10^{\circ}15'06.7''$ (RT) $D = 02^{\circ}51'53.2''$ $Lc = 357.86$ $Tc = 179.41$ $R = 2,000$ $SE = \text{EXIST}$



★ REVISED SIGNAL
FOR DRAINAGE DETAILS, SEE SHEET 2D-1.
FOR -L- PROFILE, SEE SHEET 6.
FOR -Y1- PROFILE, SEE SHEET 7.
FOR -RPA-, -LPB-, -RPB-, -Y3- PROFILES, SEE SHEET 8.
FOR INTERSECTION DETAILS, SEE SHEET 2B-1.

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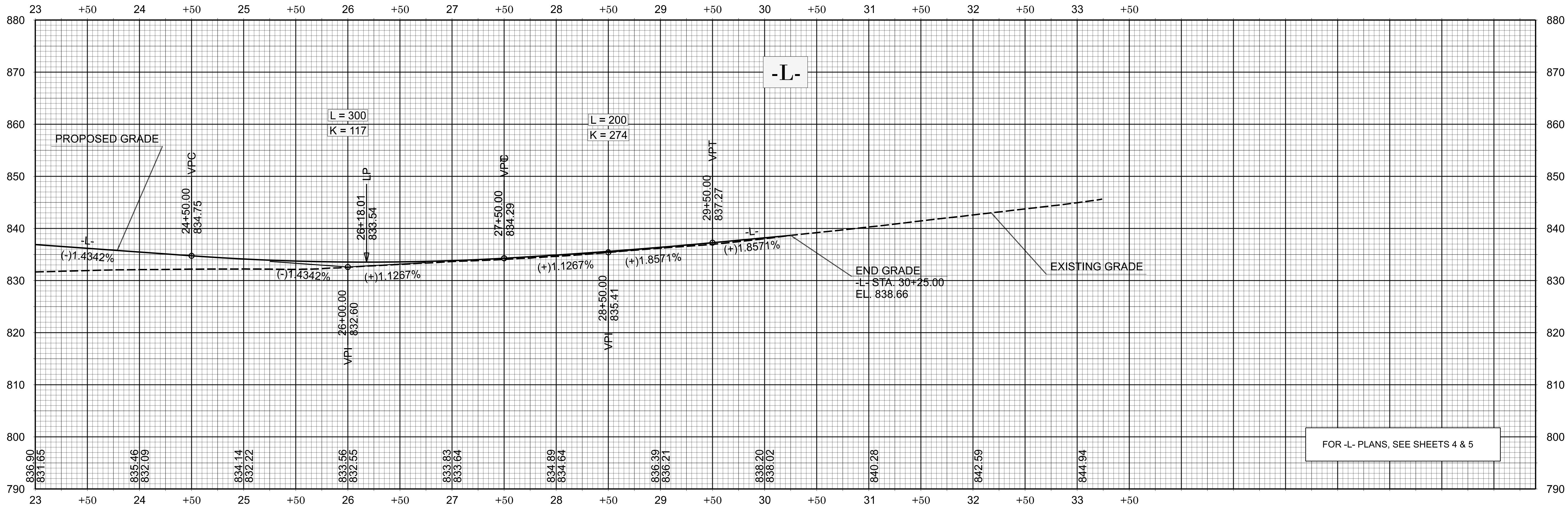
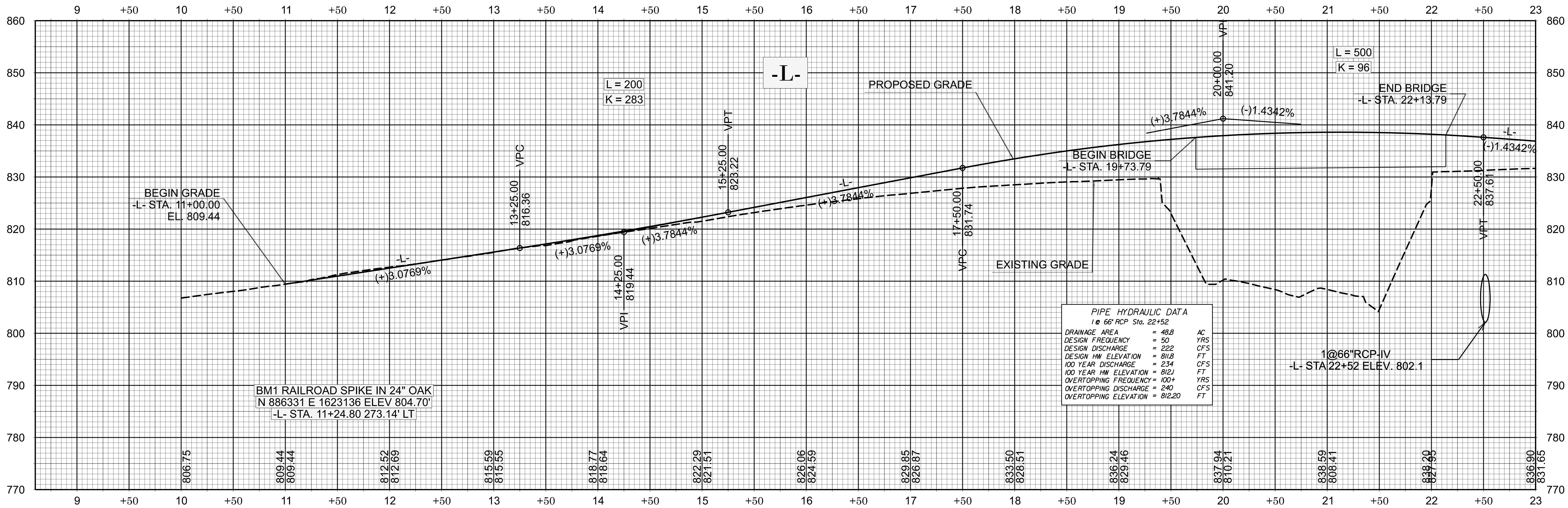
ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

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Bryan E. Hough
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03/03/2026

HYDRAULICS
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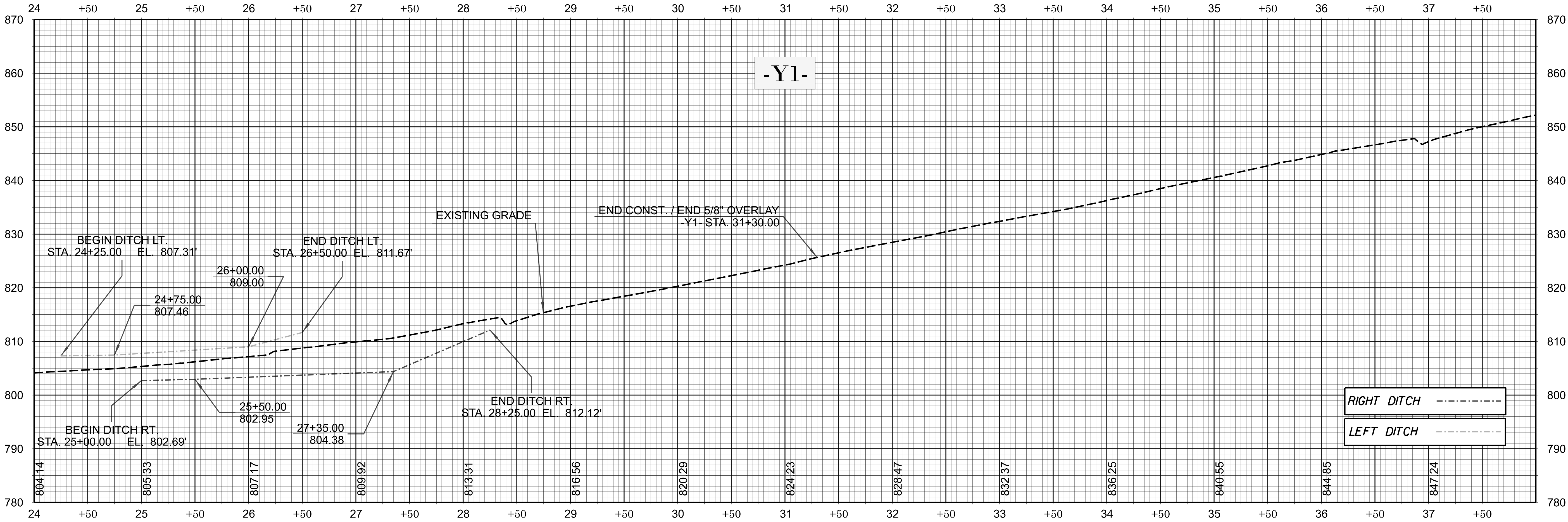
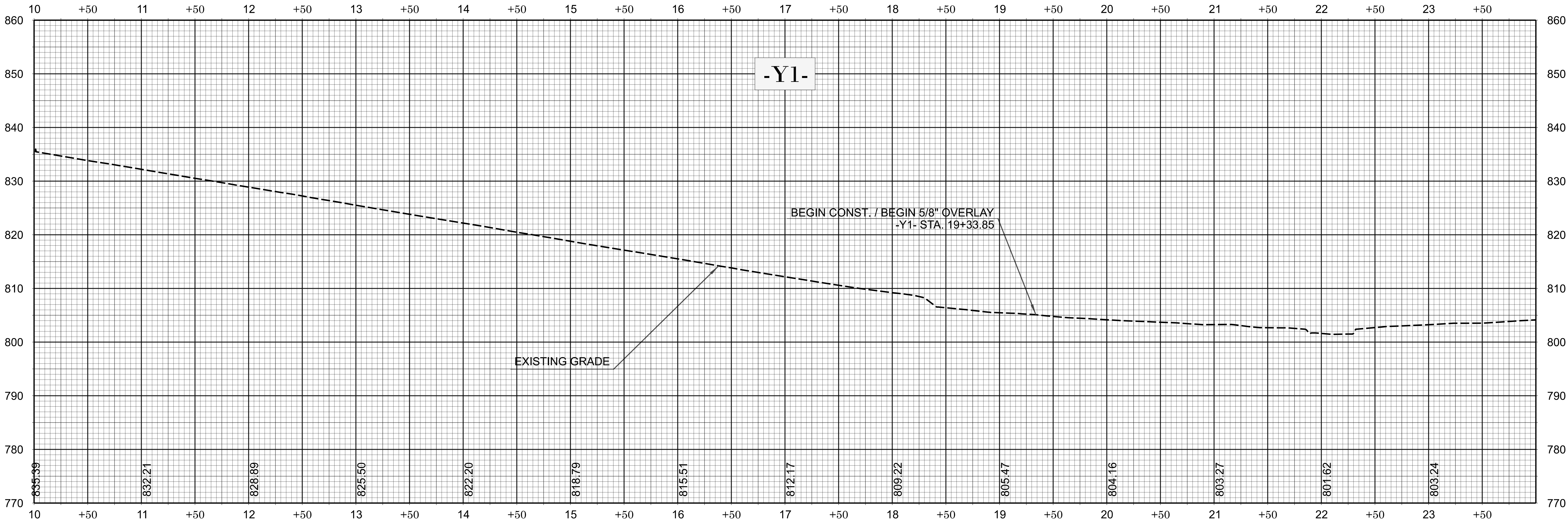
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ROADWAY DESIGN
ENGINEER

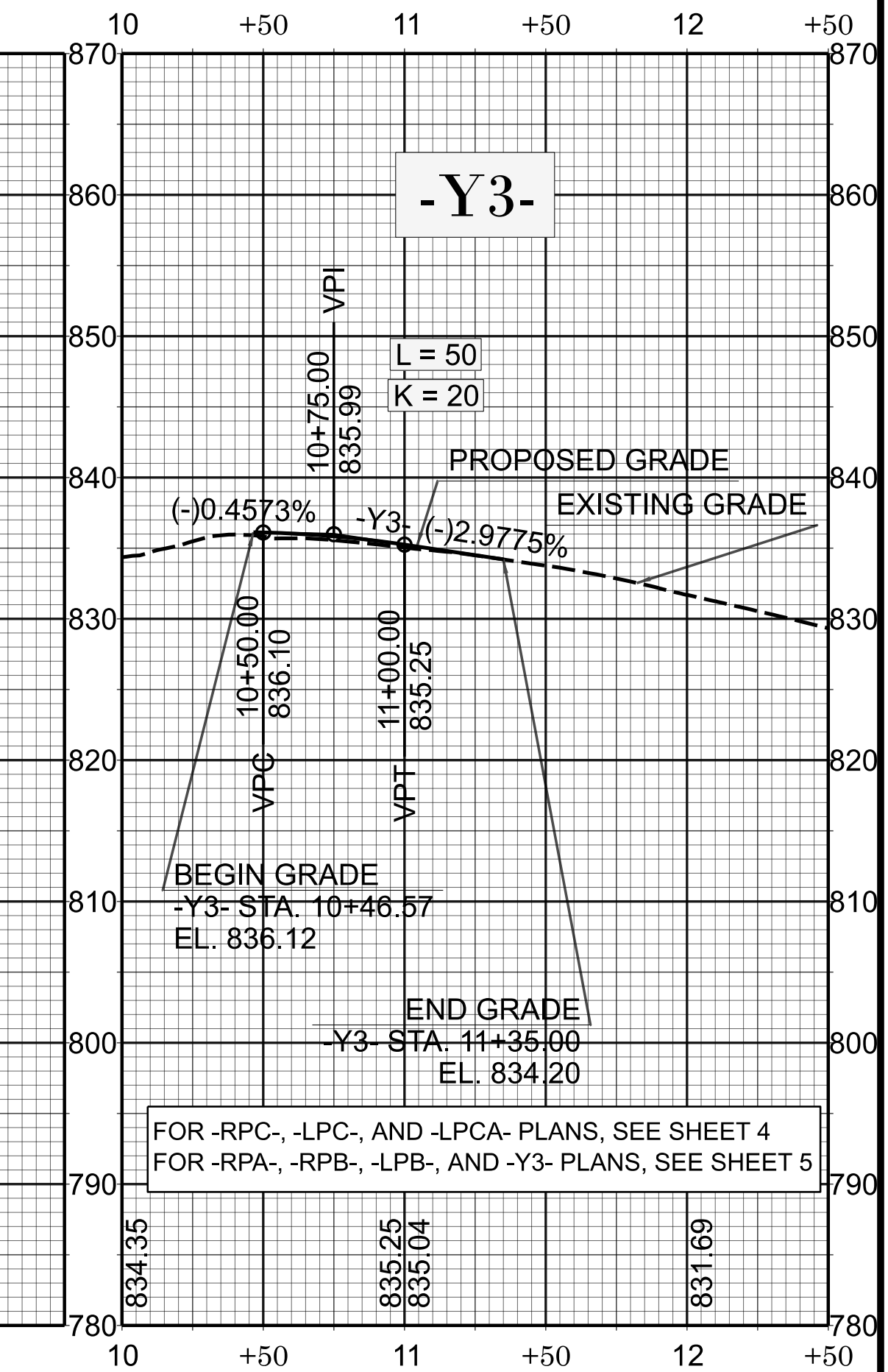
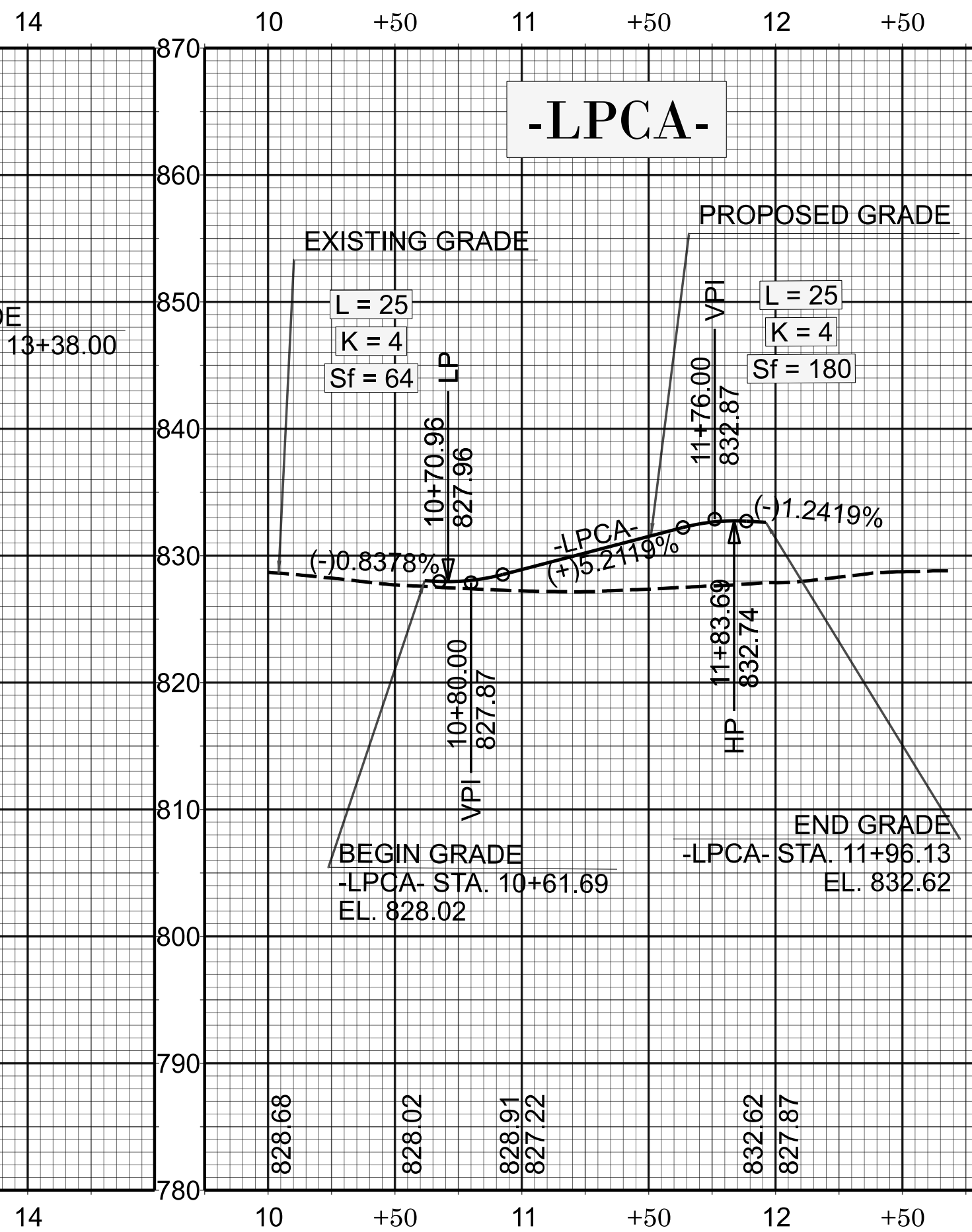
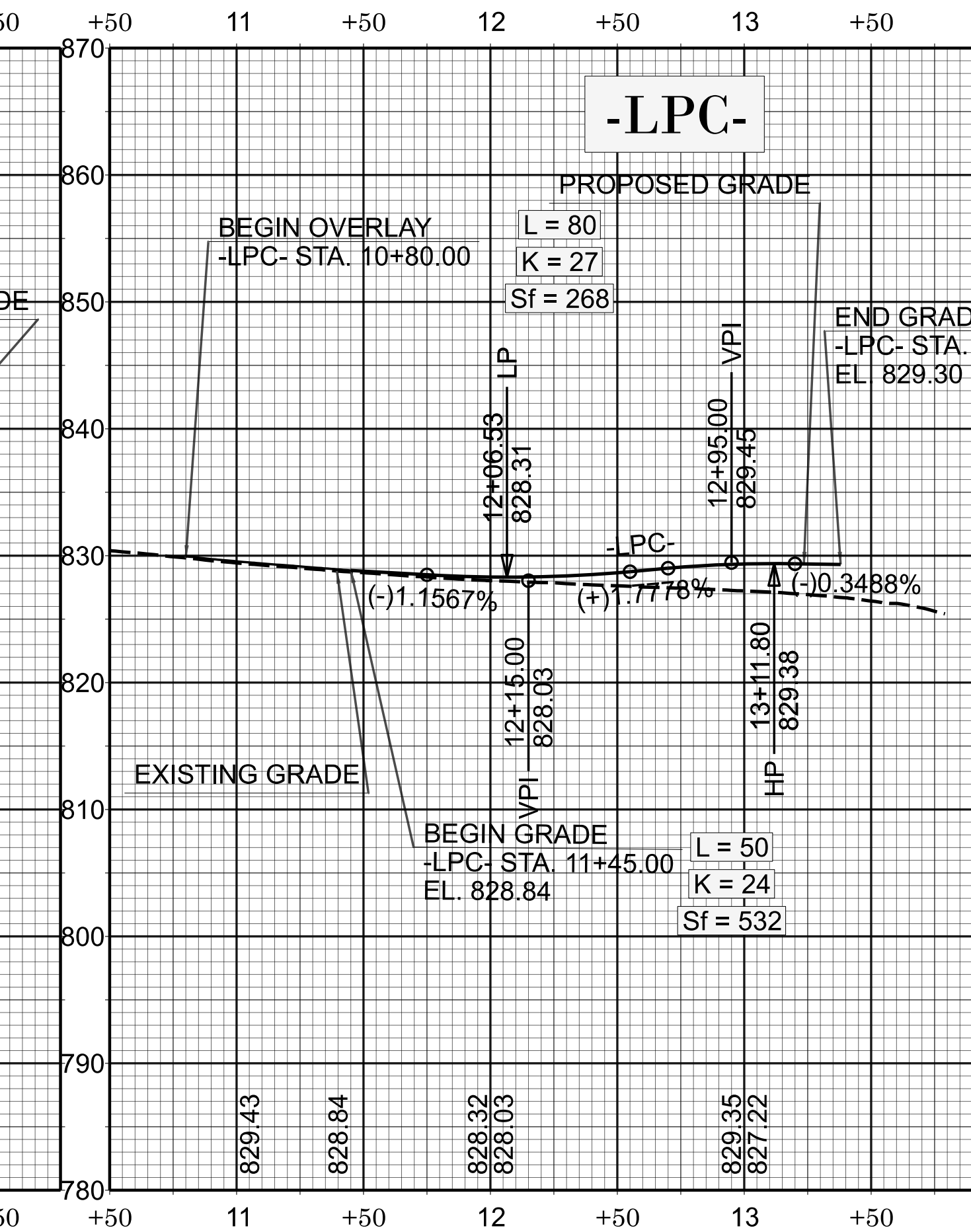
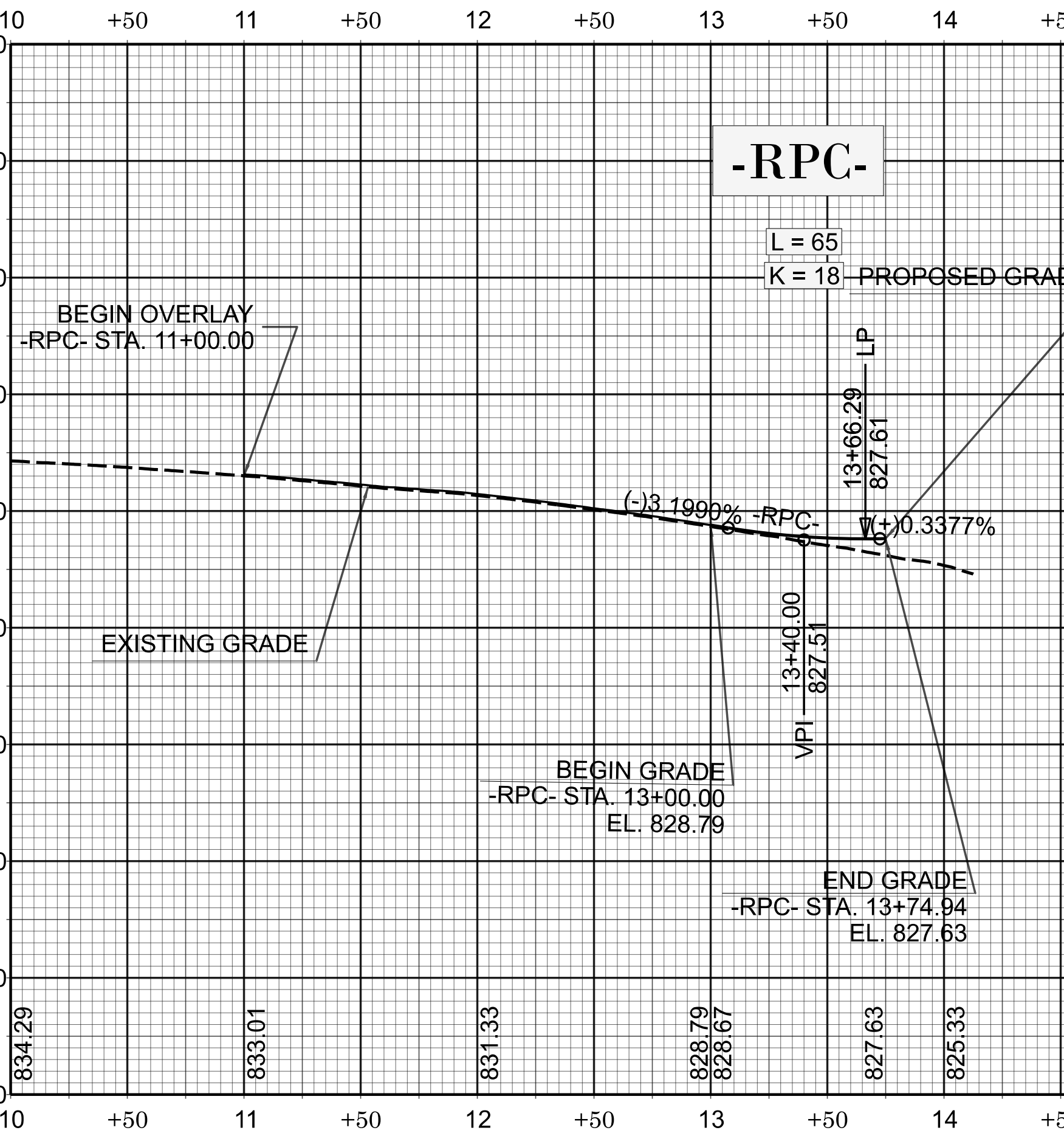
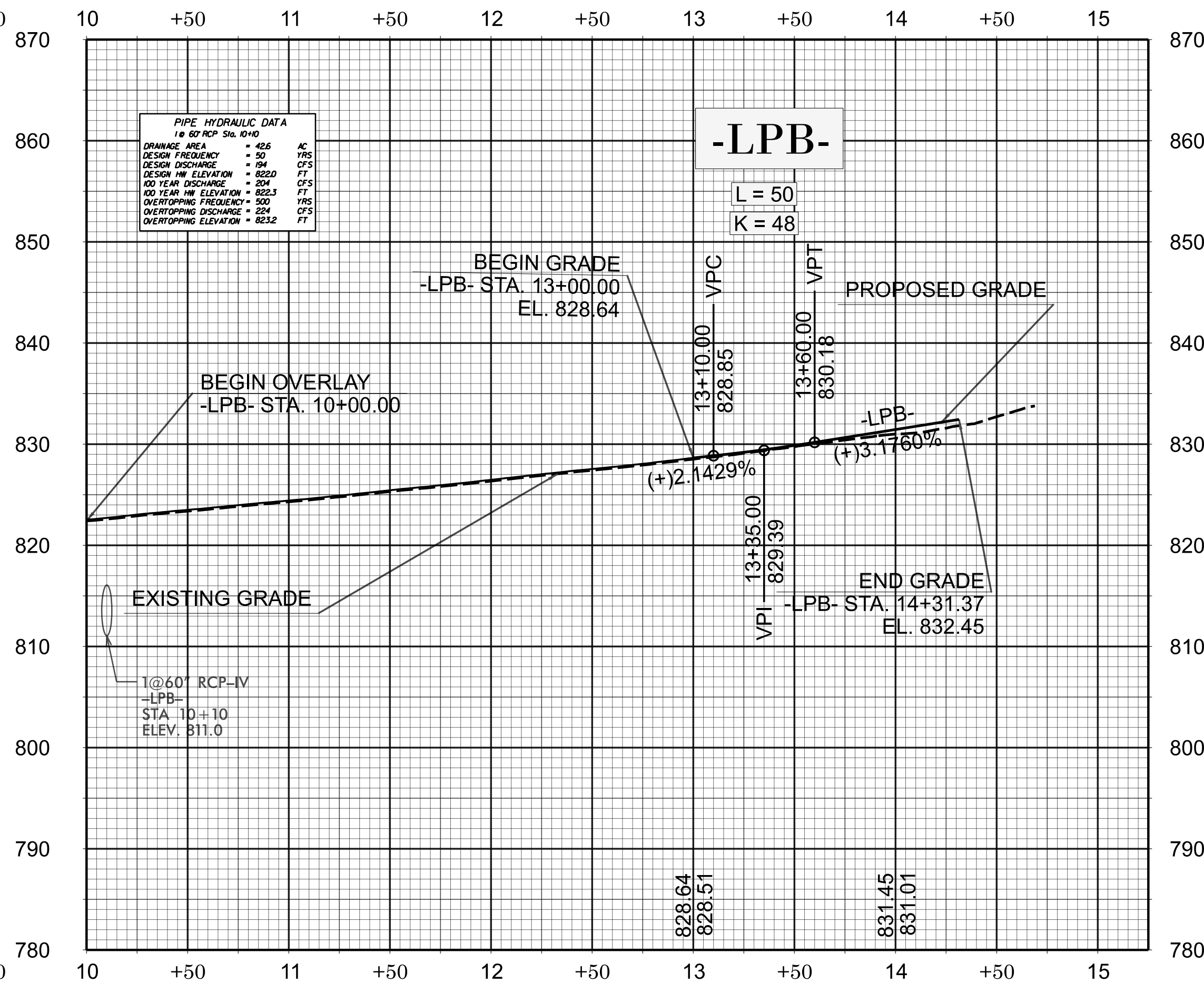
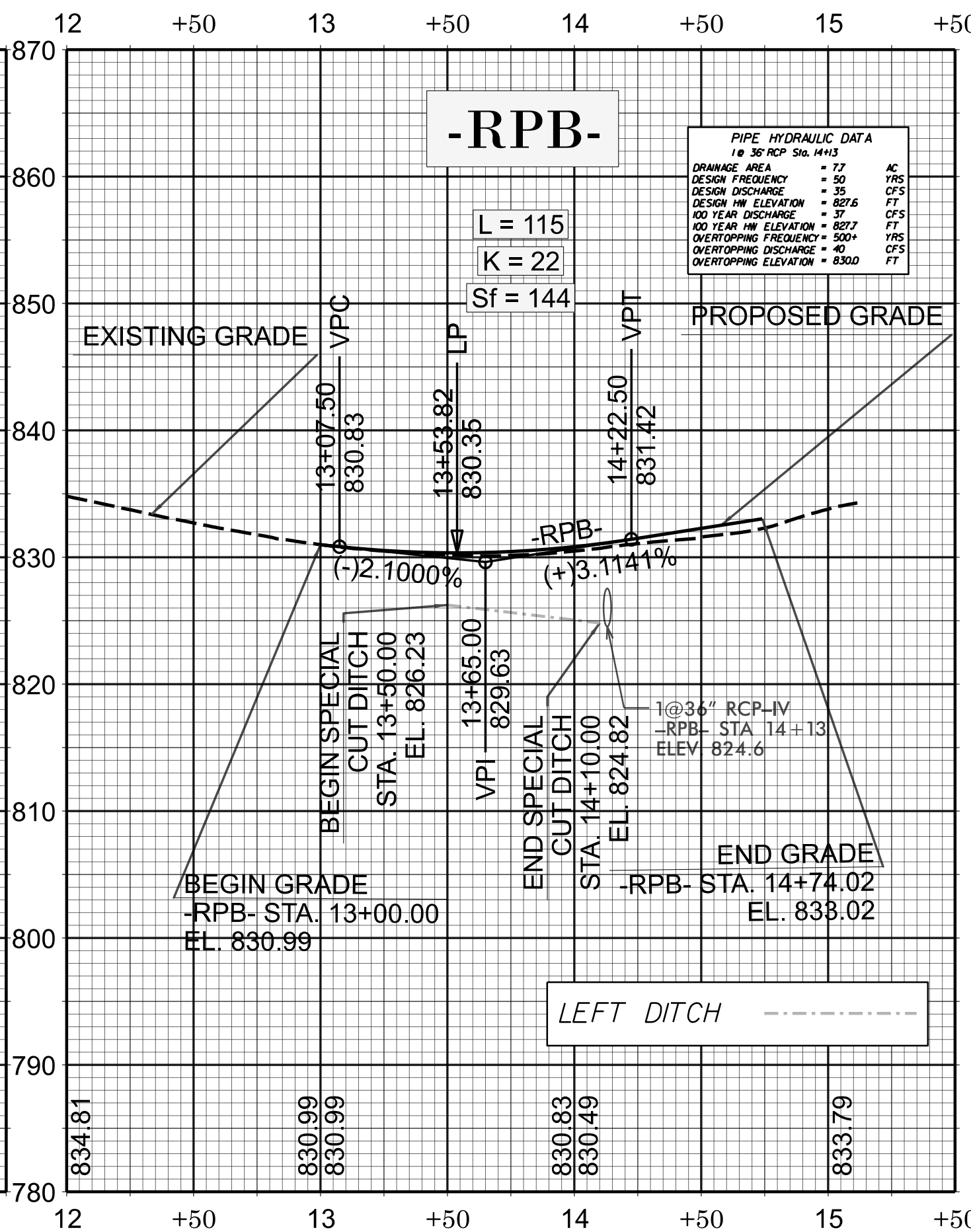
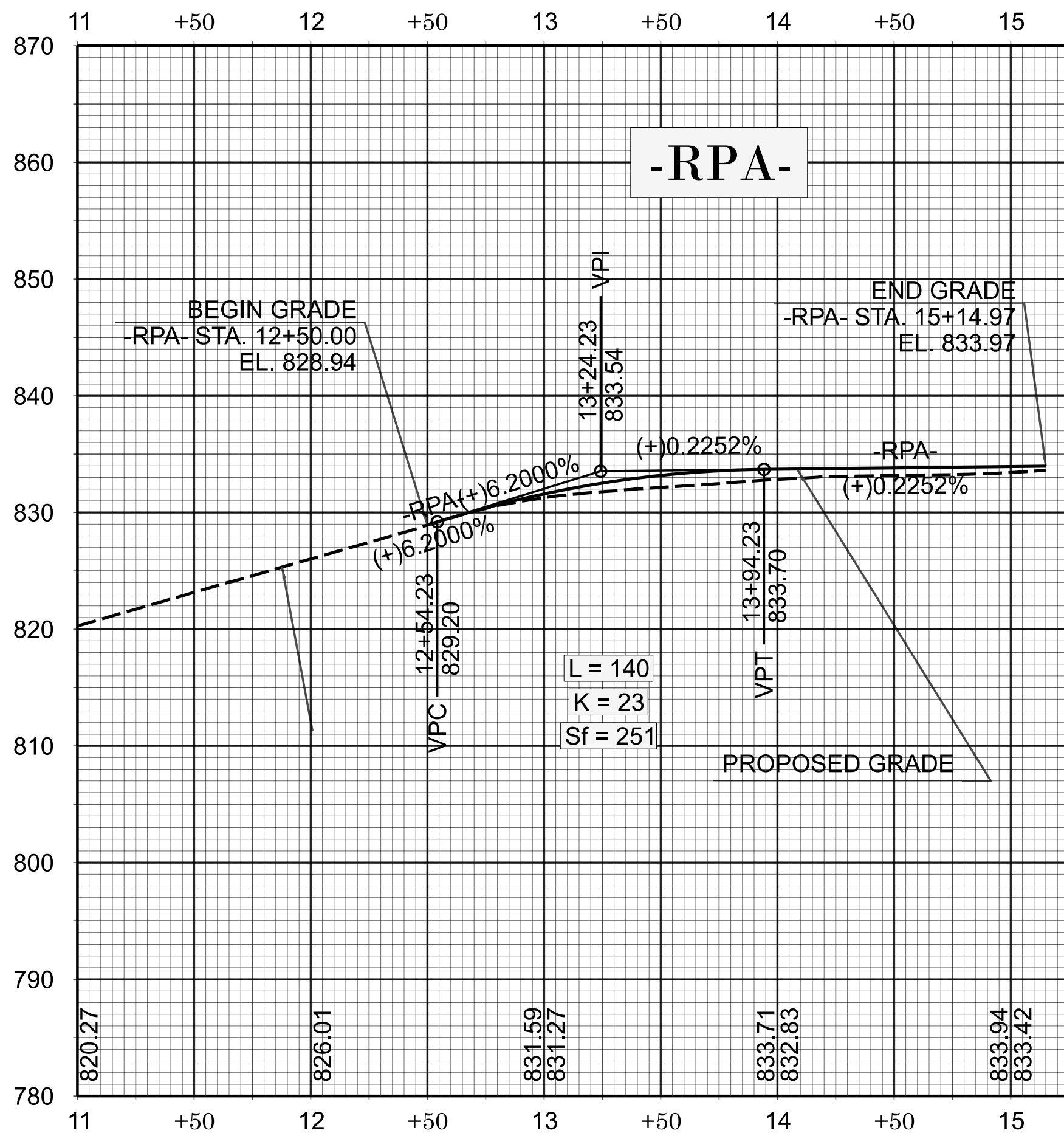
Professional Engineer
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HYDRAULICS
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UNLESS ALL SIGNATURES COMPLETED

REVISIONS



FOR -RPC-, -LPC-, AND -LPCA- PLANS, SEE SHEET 4
FOR -RPA-, -RPB-, -LPB-, AND -Y3- PLANS, SEE SHEET 5

REVISIONS

BR-0168

FP 8

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FORSYTH COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

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