

09_08/2019

See Sheet 1A For Index of Sheets
 See Sheet 1B For Conventional Plan Sheet Symbols
 See Sheets RW01 thru RW05 For Survey Control & Right-of-Way Sheets

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

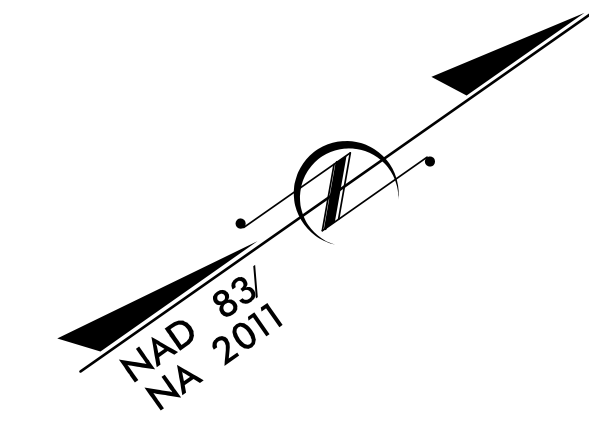
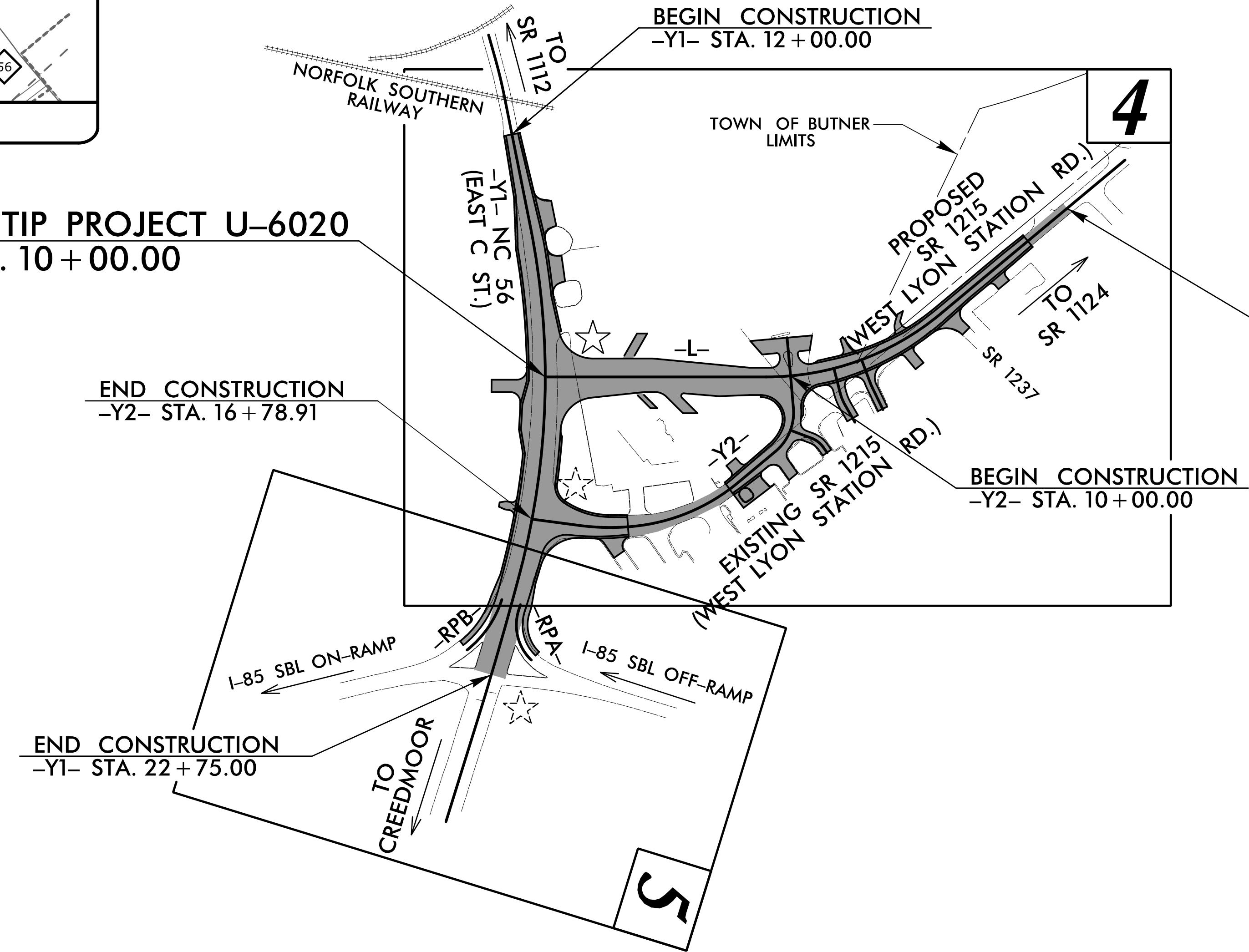
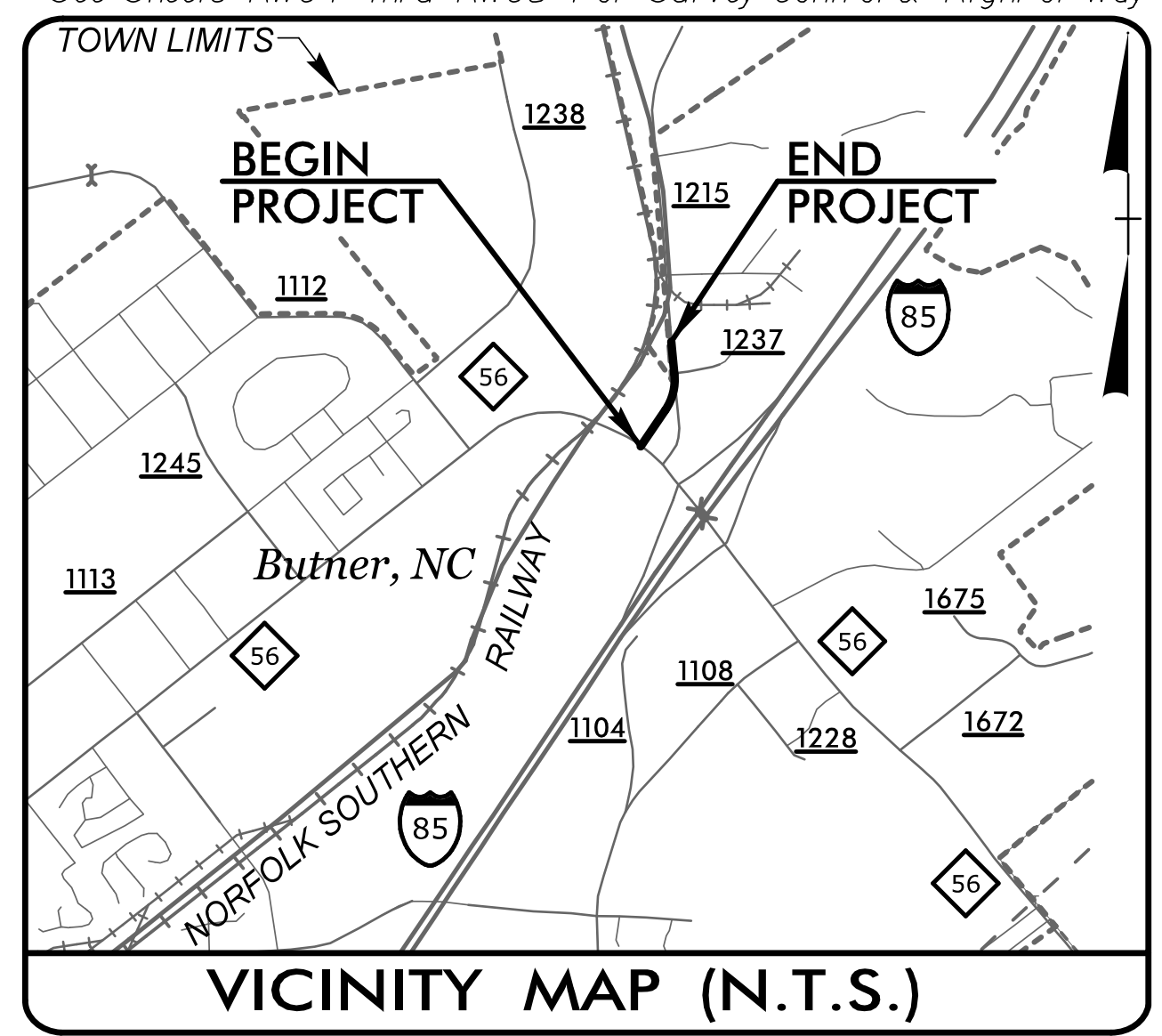
GRANVILLE COUNTY

LOCATION: REALIGNMENT OF SR 1215 (WEST LYON STATION ROAD) AT NC 56 (EAST C STREET) IN BUTNER
TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNAL, AND BRIDGE PRESERVATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6020	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47165.1.1		PE	
47165.2.1		R/W	
47165.2.2		UTIL	
47165.3.1		CONST.	

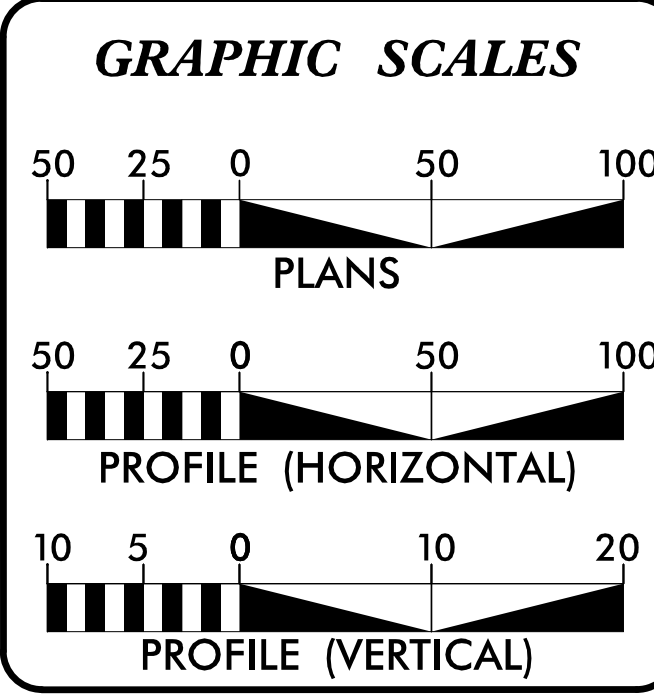
TIP PROJECT: U-6020

CONTRACT: C204944



- ☆ PROPOSED SIGNAL
- ☆ EXISTING SIGNAL

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2024 =	9600
ADT 2044 =	11350
K =	9 %
D =	70 %
T =	7 % *
V =	40 MPH
* (TTST 2% + DUAL 5%)	
FUNC CLASS =	MINOR COLLECTOR
REGIONAL TIER DESIGN	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-6020	=	0.213 mile
TOTAL LENGTH TIP PROJECT U-6020	=	0.213 mile

Prepared For:
DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr., Raleigh NC, 27610

By:
 TGS ENGINEERS
 706 HILLSBOROUGH ST
 SUITE 200
 RALEIGH, NC 27603

PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 SEPTEMBER 14, 2018

LETTING DATE:
 NOVEMBER 19, 2024

V. MARCUS LOWERY, PE
 PROJECT ENGINEER

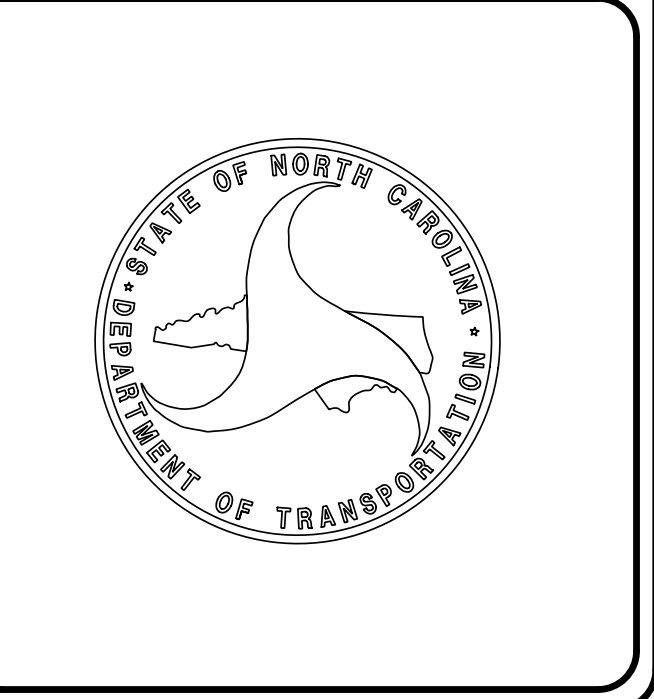
BEN UPSHAW, PE
 NCDOT CONTACT

HYDRAULICS ENGINEER

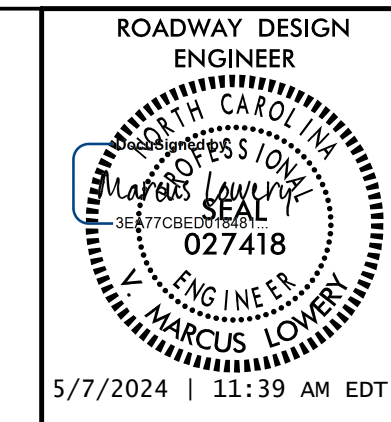
Signed by:
 David B. Petty
 P.E. 038697
 8/28/2024 11:23 AM PDT

ROADWAY DESIGN ENGINEER

DocuSigned by:
 Marcus Lowery
 P.E. 027418
 8/28/2024 1:31:09 AM EDT



8/28/2024 C:\Projects\NCDOT\U-6020\Roadway\Proj\U6020_rdy_tsh.dgn User:mlowery



INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-5	PAVEMENT SCHEDULE, TYPICAL SECTIONS, DETAIL SHOWING METHOD OF WEDGING, AND INCIDENTAL MILLING DETAIL
2B-1	DESIGN DETAILS
2C-1	CONCRETE "L" ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS DETAIL
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3D-1 THRU 3D-2	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARY
04 THRU 05	PLAN SHEETS
06 THRU 08	PROFILE SHEETS
RW01 THRU RW05	SURVEY CONTROL AND RIGHT-OF-WAY SHEETS
TMP-1 THRU TMP-6	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-6	SIGNING PLANS
SIG 1.0 THRU SCP 1	SIGNAL PLANS & SIGNAL COMMUNICATION PLAN
UC-1 THRU UC-6	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-3	UTILITIES BY OTHERS PLANS
X-A	CROSS SECTION INDEX SHEET
X-1A	CROSS SECTION EARTHWORK VOLUME SUMMARY
X-1 THRU X-16	CROSS SECTIONS
1 THRU SN	BRIDGE PRESERVATION PLANS (BRIDGE NO. 45 ON NC 56 OVER I-85)

GENERAL NOTES

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. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

Duke Energy (Power Distribution), PSNC (Gas Distribution),

Telecom (Charter/Spectrum), SGWASA (Water and Sewer)

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 848.06.

STANDARD DRAWINGS

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
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
806.03	Concrete Contol of Access Marker
815.02	Subsurface Drain 840.00 Concrete Base Pad for Drainage Structures
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
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
840.45	Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
848.06	Curb Ramp
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
866.01	Chain Link Fence - 4', 5' and 6' High Fence
866.02	Woven Wire Fence - with Wood Post
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

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
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	

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
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	

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

Hedge	
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

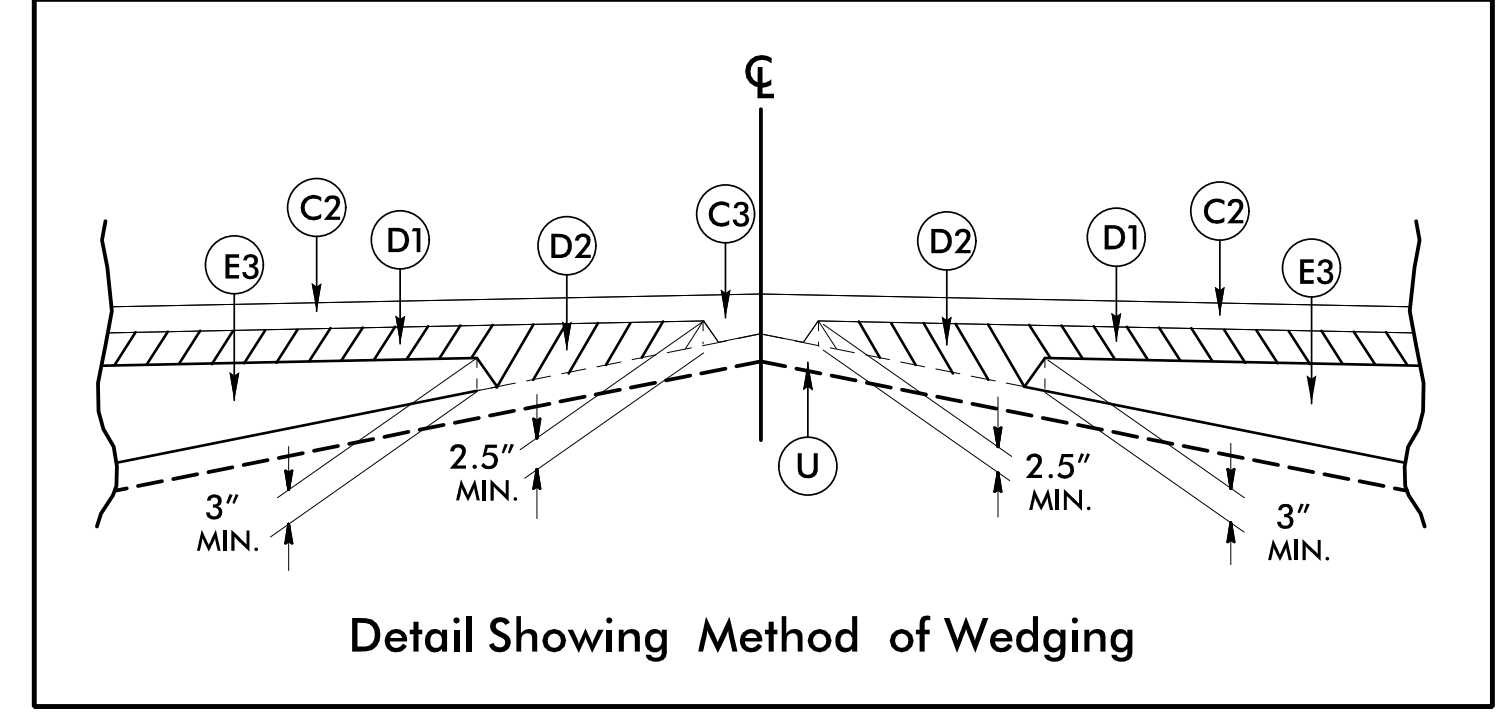
MISCELLANEOUS:

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

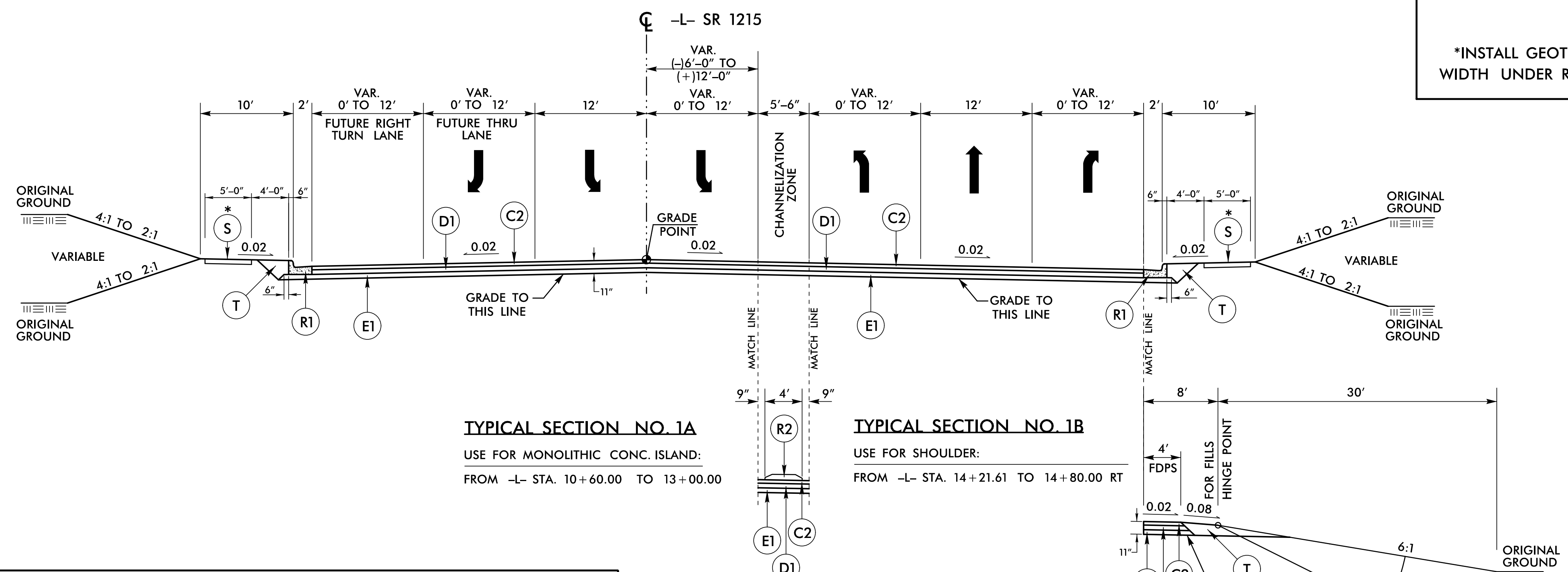
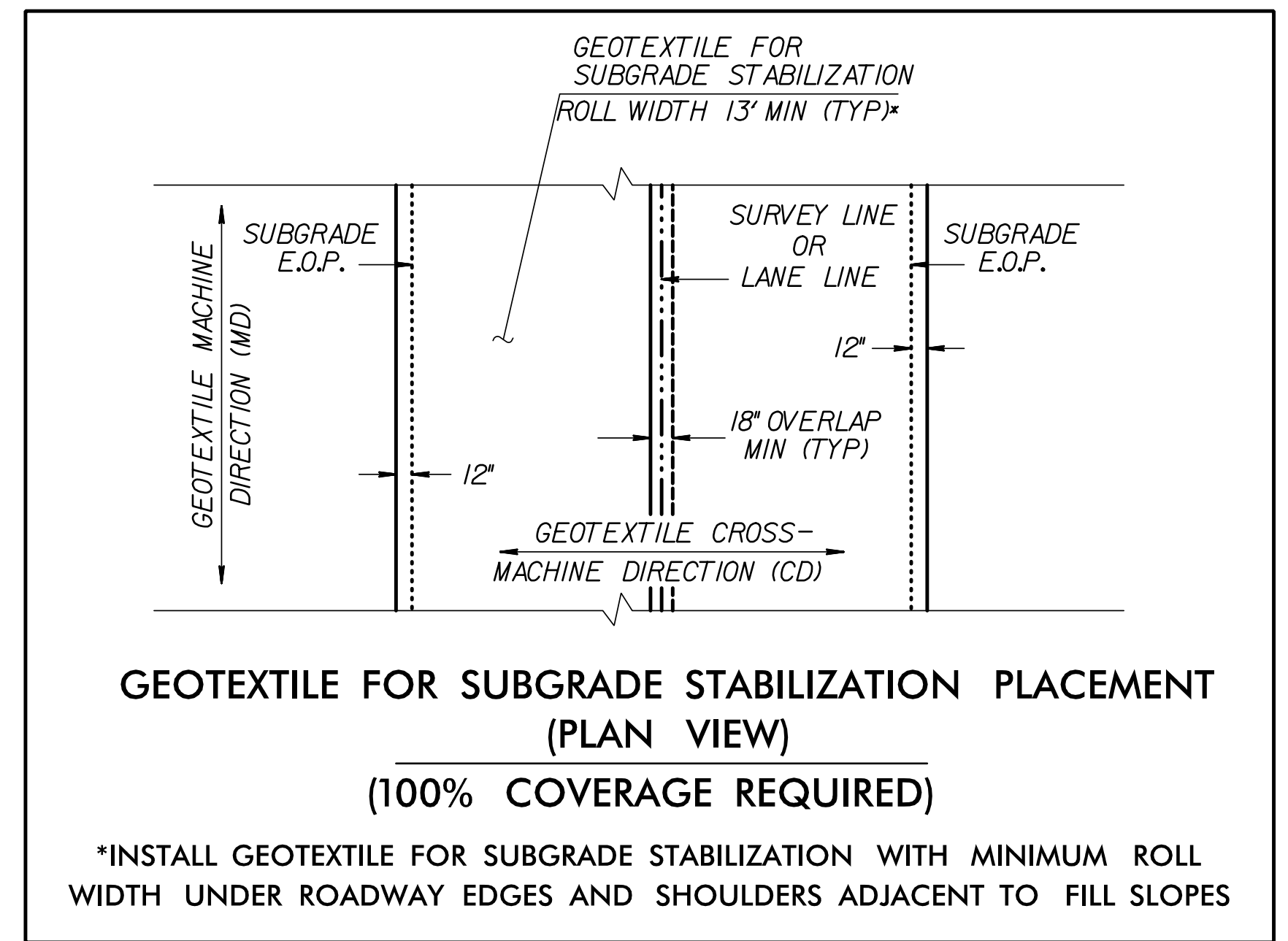
6/2/2024

PAVEMENT SCHEDULE			
FINAL PAVEMENT DESIGN: MAY 24, 2018			
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	N	GEOTEXTILE FOR SUBGRADE STABILIZATION FOR AGGREGATE SUBGRADE
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.	R1	2'-6" CONCRETE CURB AND GUTTER
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 TO EXCEED 2" IN DEPTH.	R2	5" MONOLITHIC CONCRETE ISLAND (SURFACE MOUNTED)
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	S	4" CONCRETE SIDEWALK
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.	T	EARTH MATERIAL.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E2	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	V1	MILLING BITUMINOUS PAVEMENT (VAR. 0"-3" DEPTH - SEE DETAIL THIS SHEET)
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	V2	MILLING BITUMINOUS PAVEMENT. 1.5" DEPTH.
L	CLASS IV SUBGRADE STABILIZATION	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A-1)

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

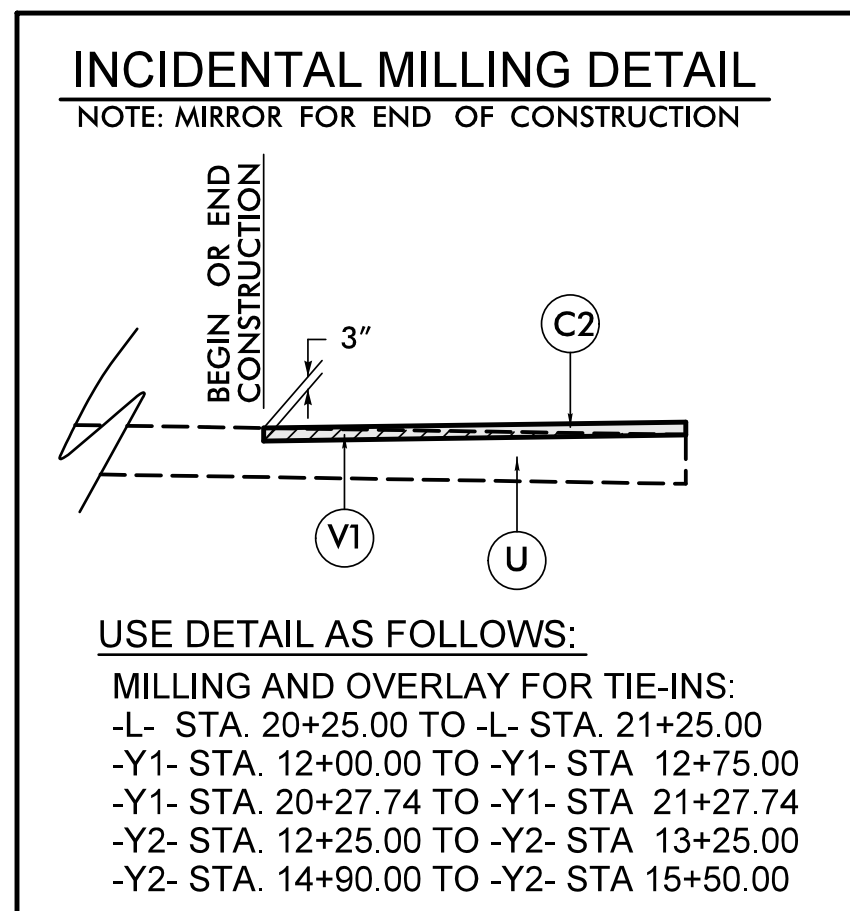
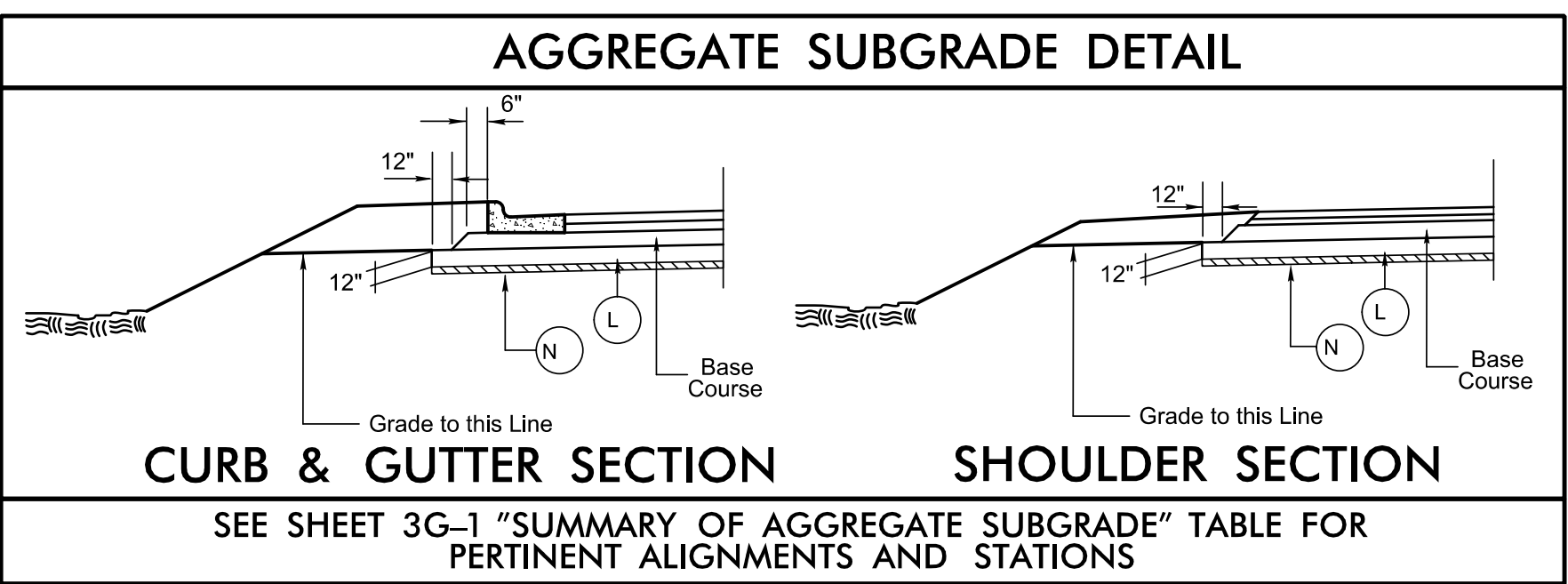


PROJECT REFERENCE NO. U-6020	SHEET NO. 2A-1
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5/1/2024 3:20 PM EDT	5/1/2024 5:59 PM EDT
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 706 HILLSBOROUGH ST. SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	



TYPICAL SECTION NO. 1
USE TYPICAL SECTION NO. 1:
FROM -L- STA. 10+33.50 TO 14+80.00

* SIDEWALK LOCATIONS:
-L- STA. 10+33.69 TO 14+57.36 LT.
-L- STA. 10+36.53 TO 12+36.66 RT.
-L- STA. 12+68.19 TO 14+21.61 RT.



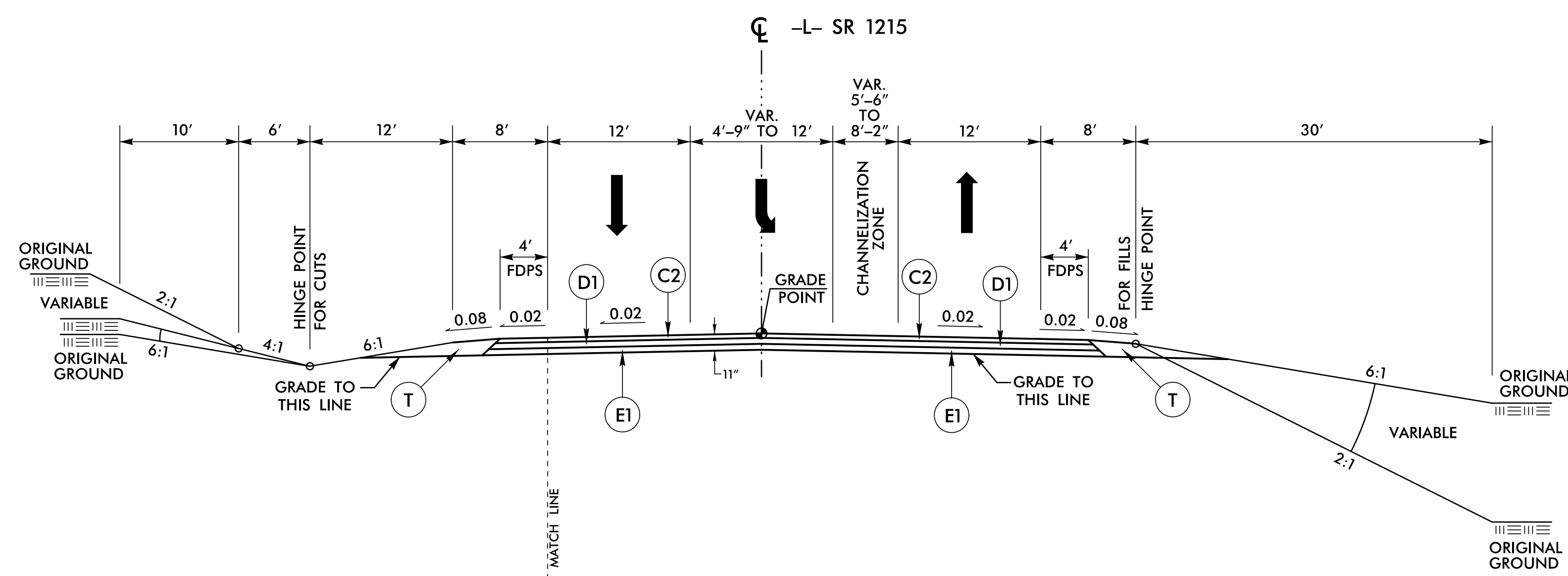
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 5/1/2024

6/2/2024

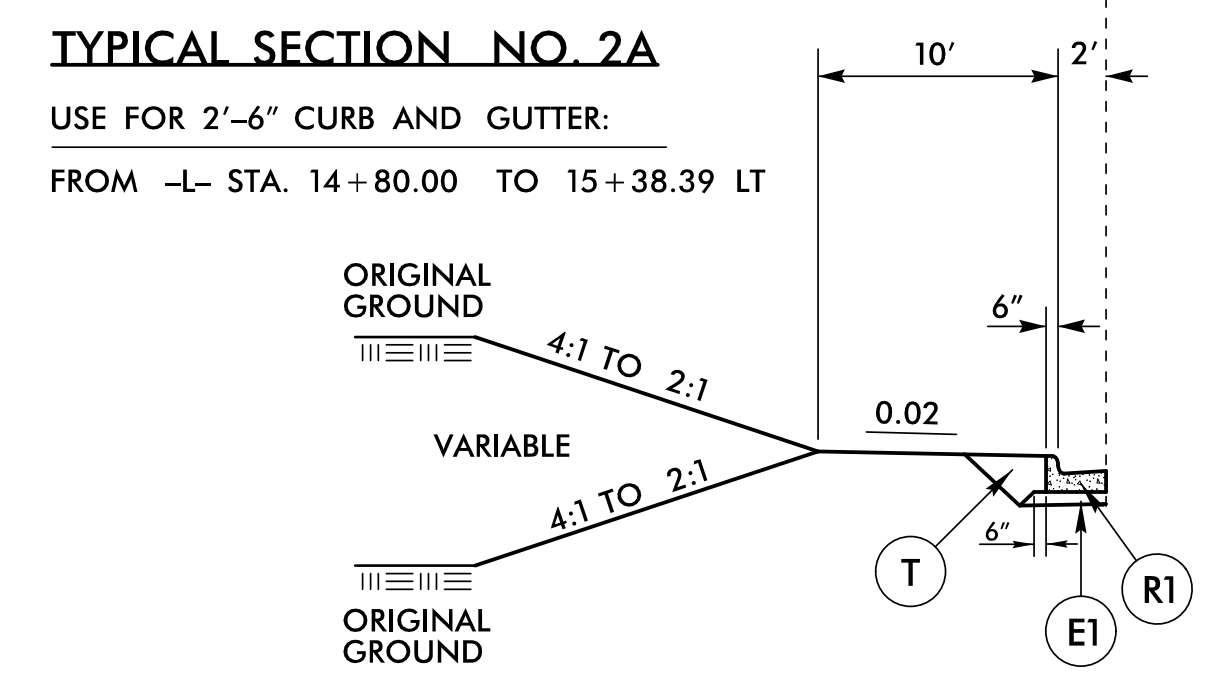
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4/26/2024 9:21 AM EDT	4/26/2024 10:12 AM EDT

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UNLESS ALL SIGNATURES COMPLETED**

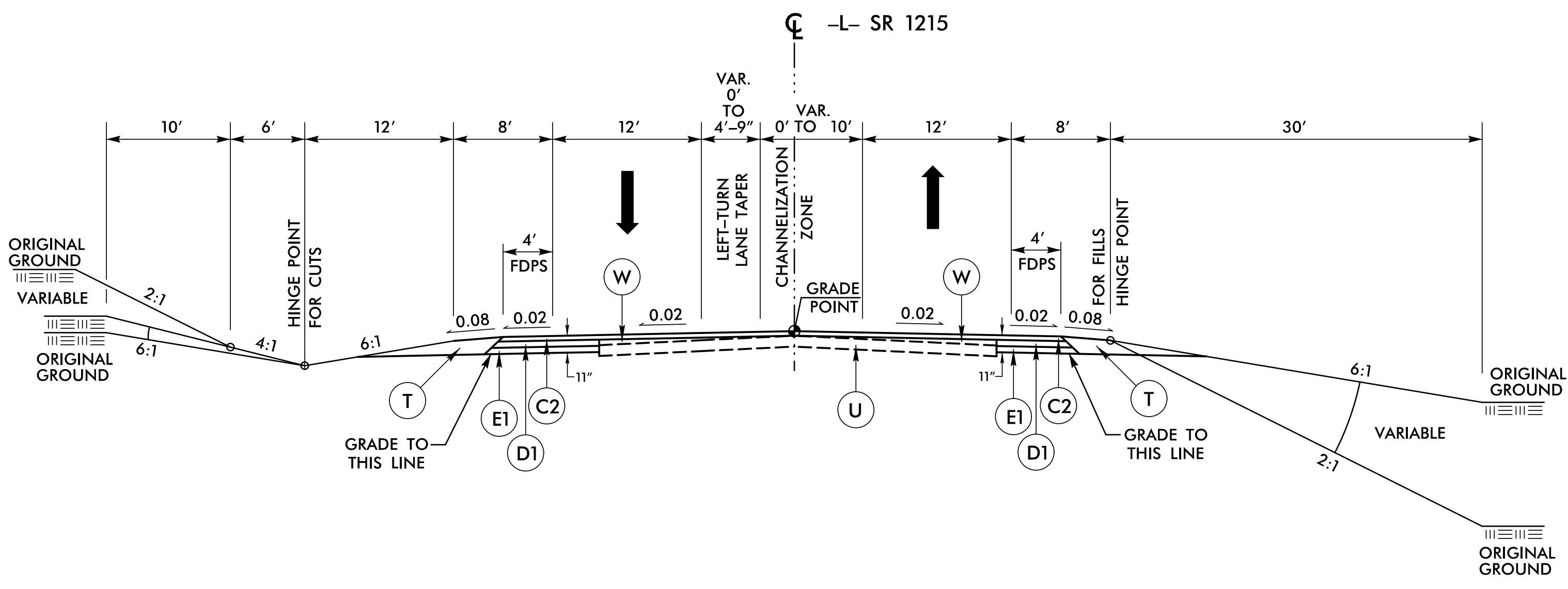
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275



TYPICAL SECTION NO. 2
USE TYPICAL SECTION NO. 2:
FROM -L- STA. 14+80.00 TO 16+20.16



TYPICAL SECTION NO. 2A
USE FOR 2'-6" CURB AND GUTTER:
FROM -L- STA. 14+80.00 TO 15+38.39 LT



TYPICAL SECTION NO. 3
USE TYPICAL SECTION NO. 3:
FROM -L- STA. 16+20.16 TO 20+25.00
NOTE: TRANSITION TO EXIST.
FROM -L- STA. 19+75.00 TO 20+25.00

C1	1 1/2" S9.5C
C2	3" S9.5C
C3	VAR. S9.5C
D1	4" I19.5C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4 1/2" B25.0C
E3	VAR. B25.0C
R1	2'-6" C&G
R2	5" CONC. ISLAND
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	0"- 3" MILLING
V2	1 1/2" MILLING
W	WEDGING

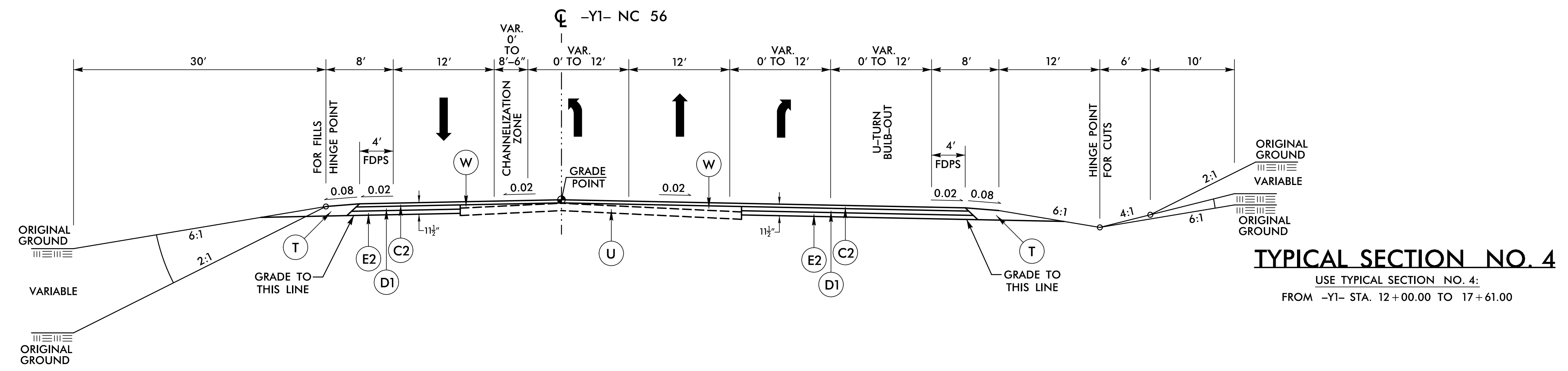
4/26/2024
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User: mloyer

6/2/2024

PROJECT REFERENCE NO. U-6020	SHEET NO. 2A-3
ROADWAY DESIGN ENGINEER MARCUS LOYER 027418	PAVEMENT DESIGN ENGINEER SHIHAI ZHANG 038176
4/26/2024 9:21 AM EDT	4/26/2024 10:12 AM EDT

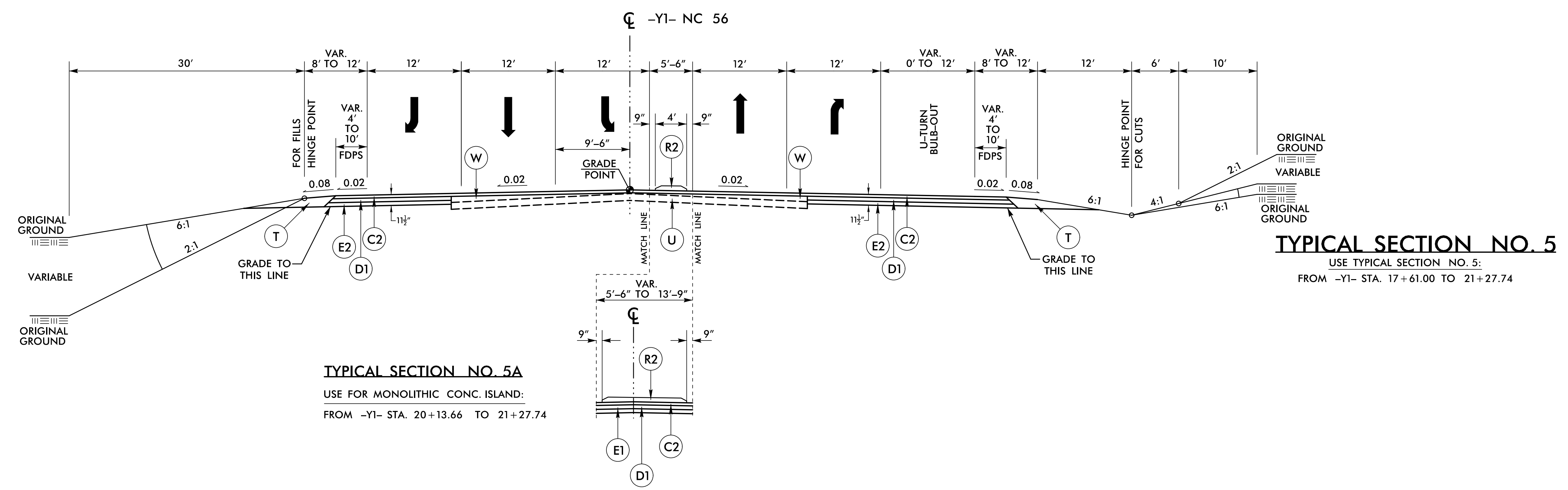
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TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
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CORP. LICENSE NO.: C-0275



TYPICAL SECTION NO. 4

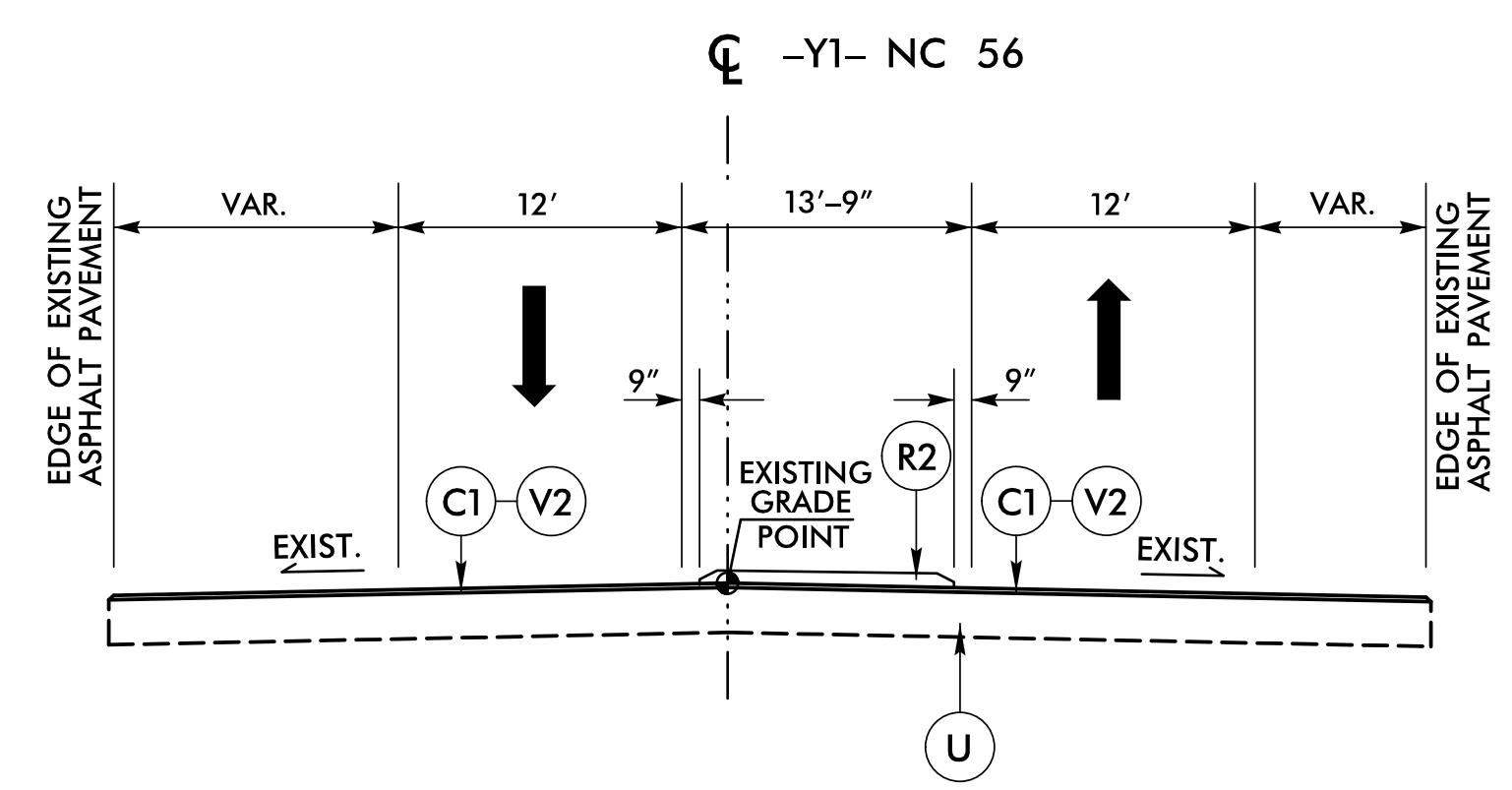
USE TYPICAL SECTION NO. 4:
FROM -Y1- STA. 12+00.00 TO 17+61.00



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5:
FROM -Y1- STA. 17+61.00 TO 21+27.74

TYPICAL SECTION NO. 5A
USE FOR MONOLITHIC CONC. ISLAND:
FROM -Y1- STA. 20+13.66 TO 21+27.74



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6:
FROM -Y1- STA. 21+27.74 TO 22+75.00
NOTE: NO PROP. MONO. CONC. ISLAND
FROM -Y1- STA. 22+67.00 TO 22+75.00

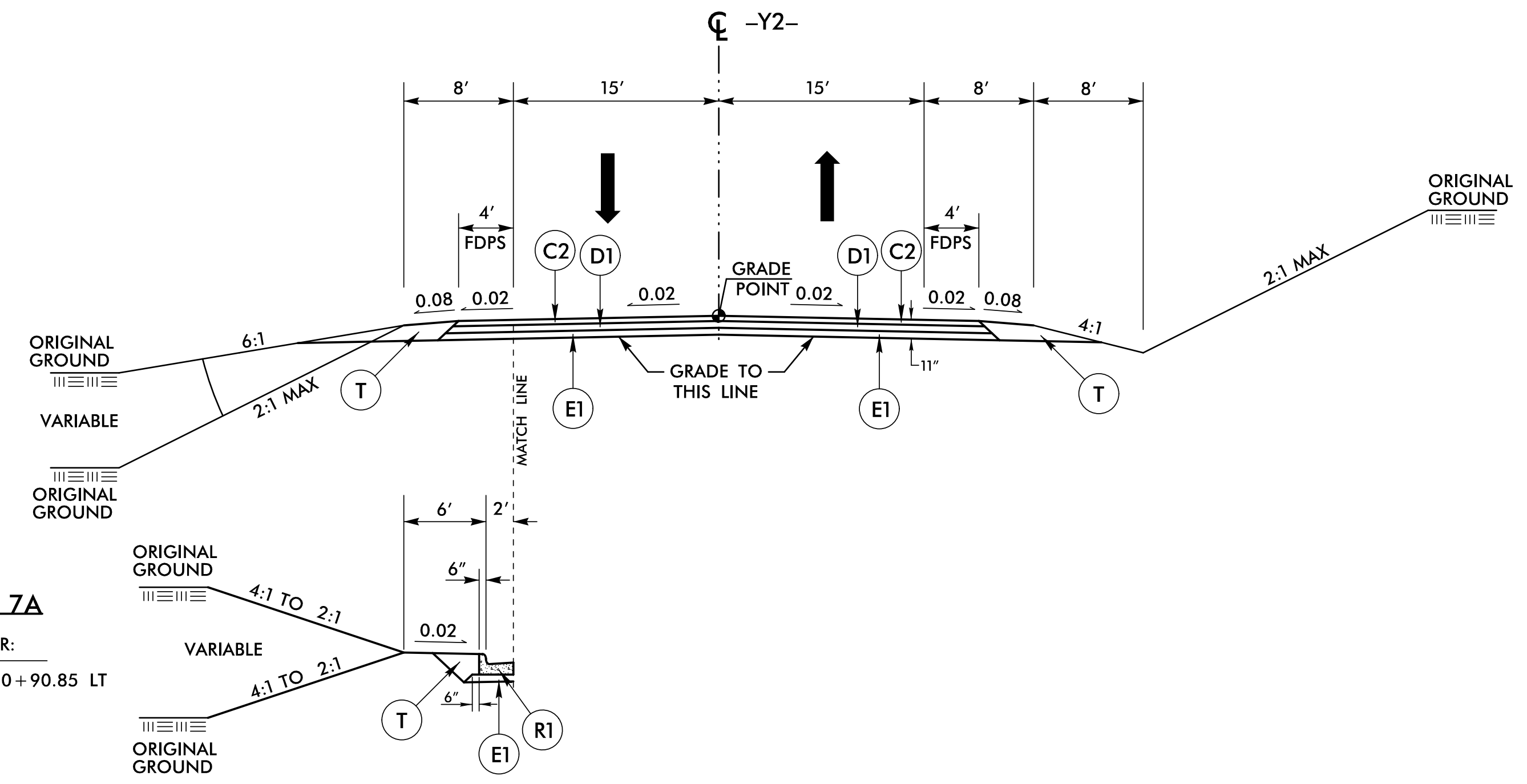
C1	1 1/2" S9.5C
C2	3" S9.5C
C3	VAR. S9.5C
D1	4" I19.5C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4 1/2" B25.0C
E3	VAR. B25.0C
R1	2'-6" C&G
R2	5" CONC. ISLAND
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	0" - 3" MILLING
V2	1 1/2" MILLING
W	WEDGING

4/26/2024
C:\p\c\ts\NCD001\U-6020\Roadway\Proc\U6020_L_rdy_tjlp.dgn
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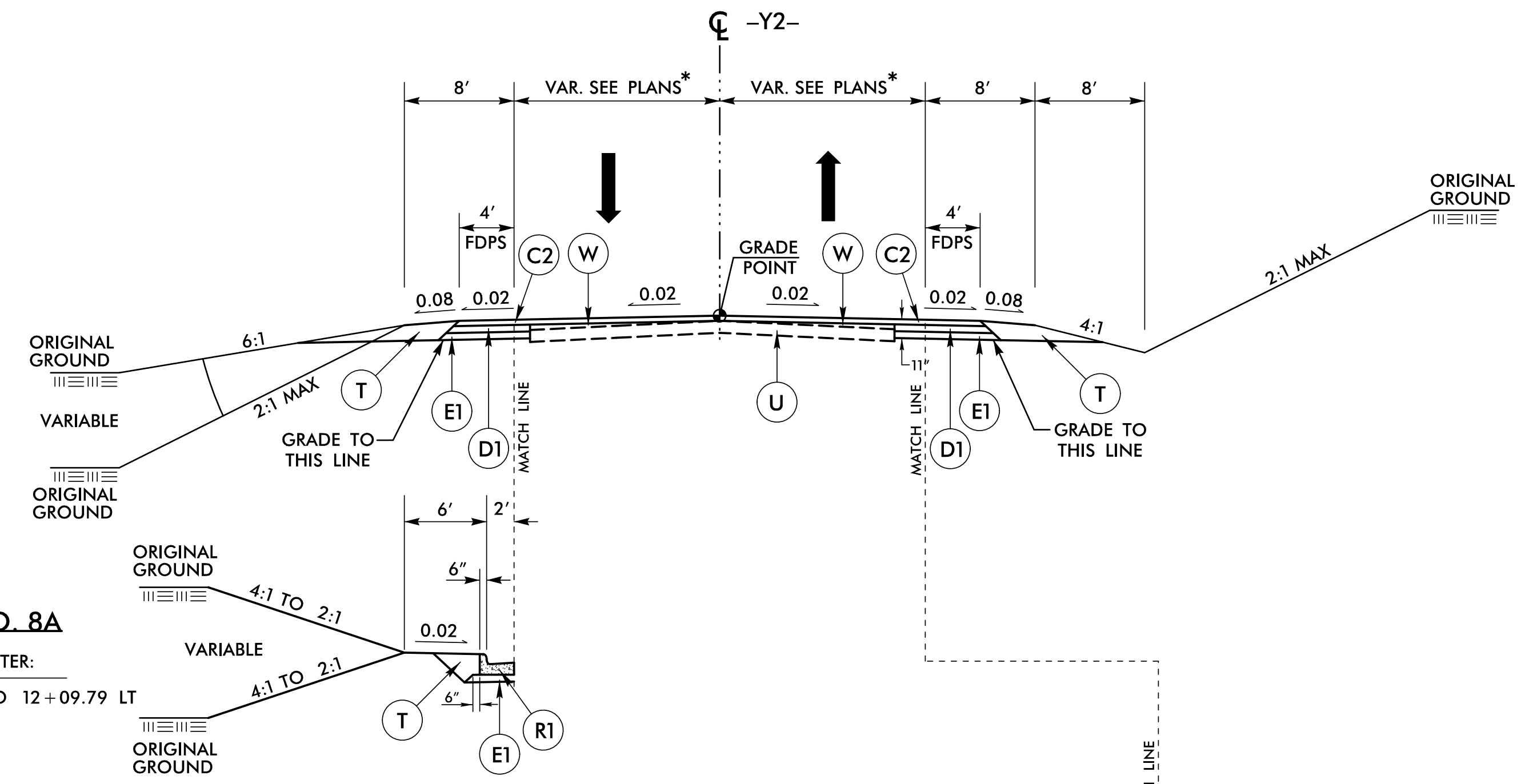
6/2/2024

PROJECT REFERENCE NO. U-6020	SHEET NO. 2A-4
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4/26/2024 9:21 AM EDT	4/26/2024 10:12 AM EDT
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 706 HILLSBOROUGH ST. SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

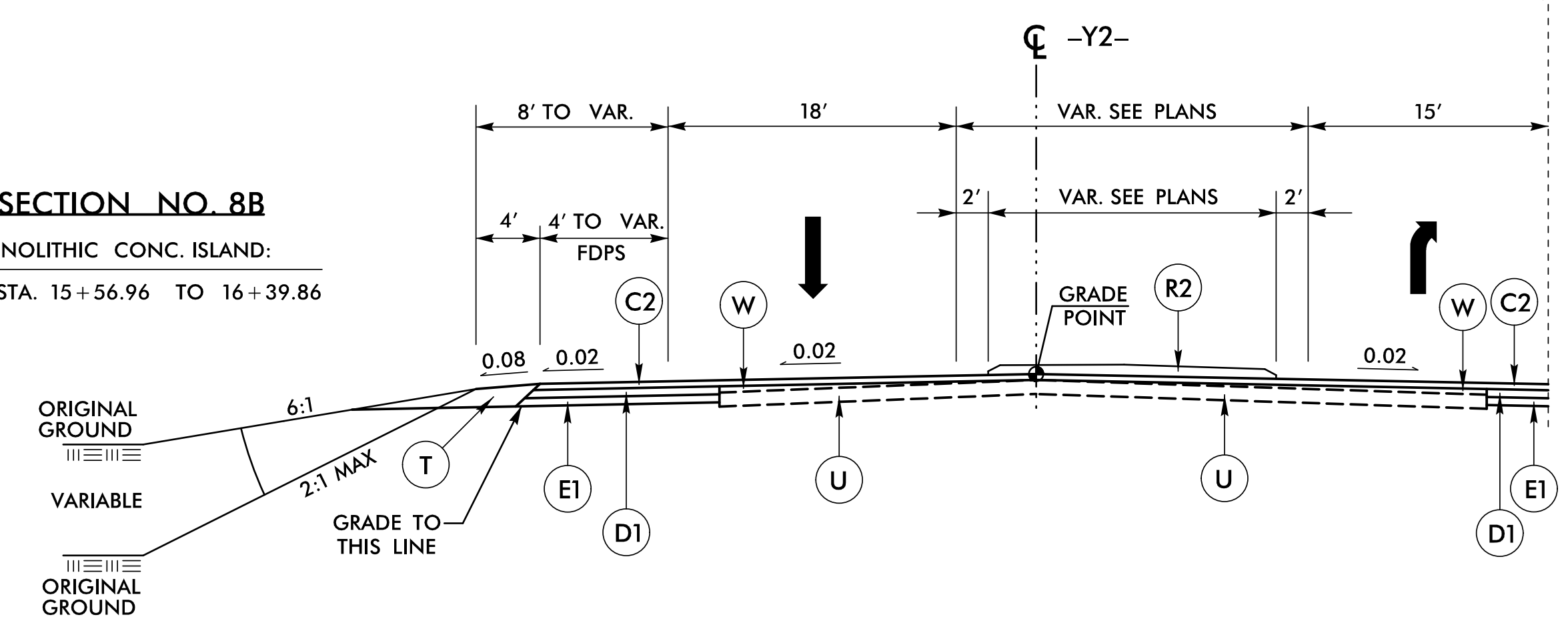
TYPICAL SECTION NO. 7A
USE FOR 2'-6" CURB AND GUTTER:
FROM -Y2- STA. 10+76.01 TO 10+90.85 LT



TYPICAL SECTION NO. 8A
USE FOR 2'-6" CURB AND GUTTER:
FROM -Y2- STA. 10+90.85 TO 12+09.79 LT



TYPICAL SECTION NO. 8B
USE FOR MONOLITHIC CONC. ISLAND:
FROM -Y2- STA. 15+56.96 TO 16+39.86



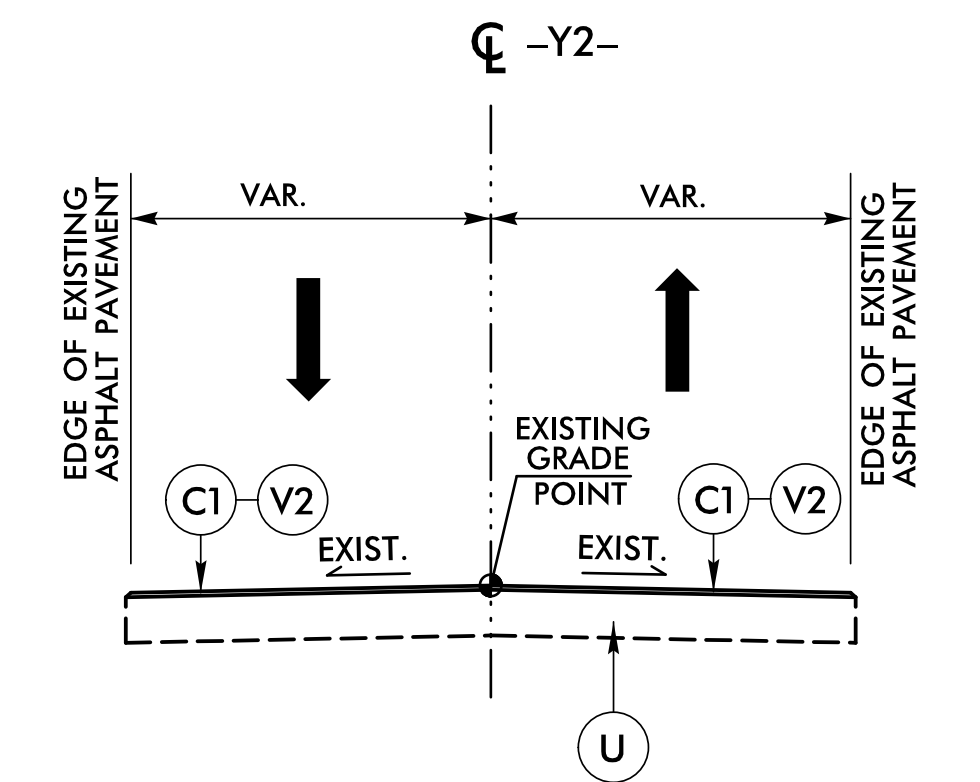
TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7:
FROM -Y2- STA. 10+23.50 TO 10+90.85

TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8:
FROM -Y2- STA. 10+90.85 TO 12+75.00
FROM -Y2- STA. 14+90.00 TO 16+45.36
NOTE: TRANSITION TO EXIST.
FROM -Y2- STA. 11+59.33 TO 12+75.00

* 15' WIDTH FROM -Y2- STA. 11+07.09 TO 11+59.33



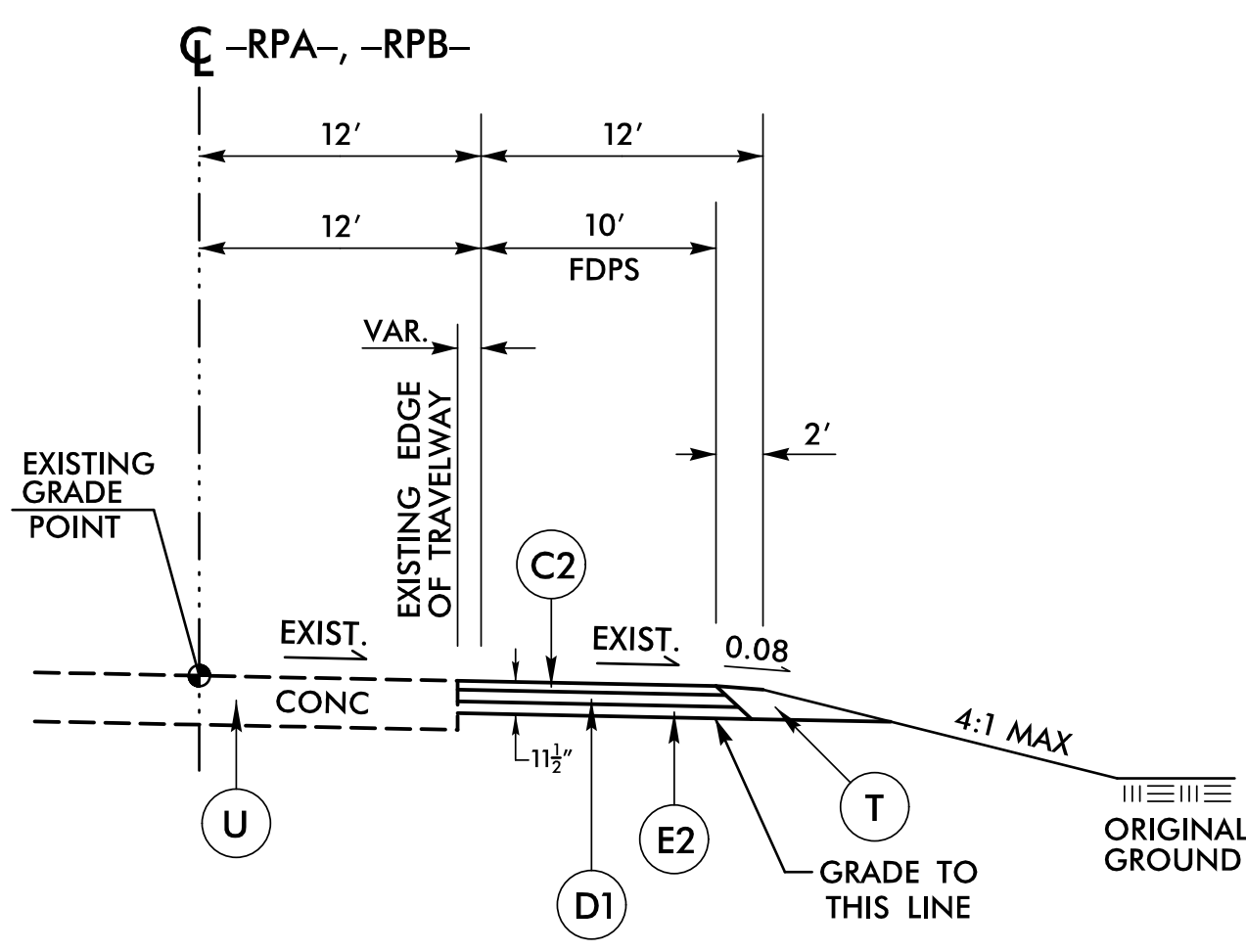
TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9:
FROM -Y2- STA. 13+25.00 TO 14+90.00

C1	1 1/2" S9.5C
C2	3" S9.5C
C3	VAR. S9.5C
D1	4" I19.5C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4 1/2" B25.0C
E3	VAR. B25.0C
R1	2'-6" C&G
R2	5" CONC. ISLAND
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	0" - 3" MILLING
V2	1 1/2" MILLING
W	WEDGING

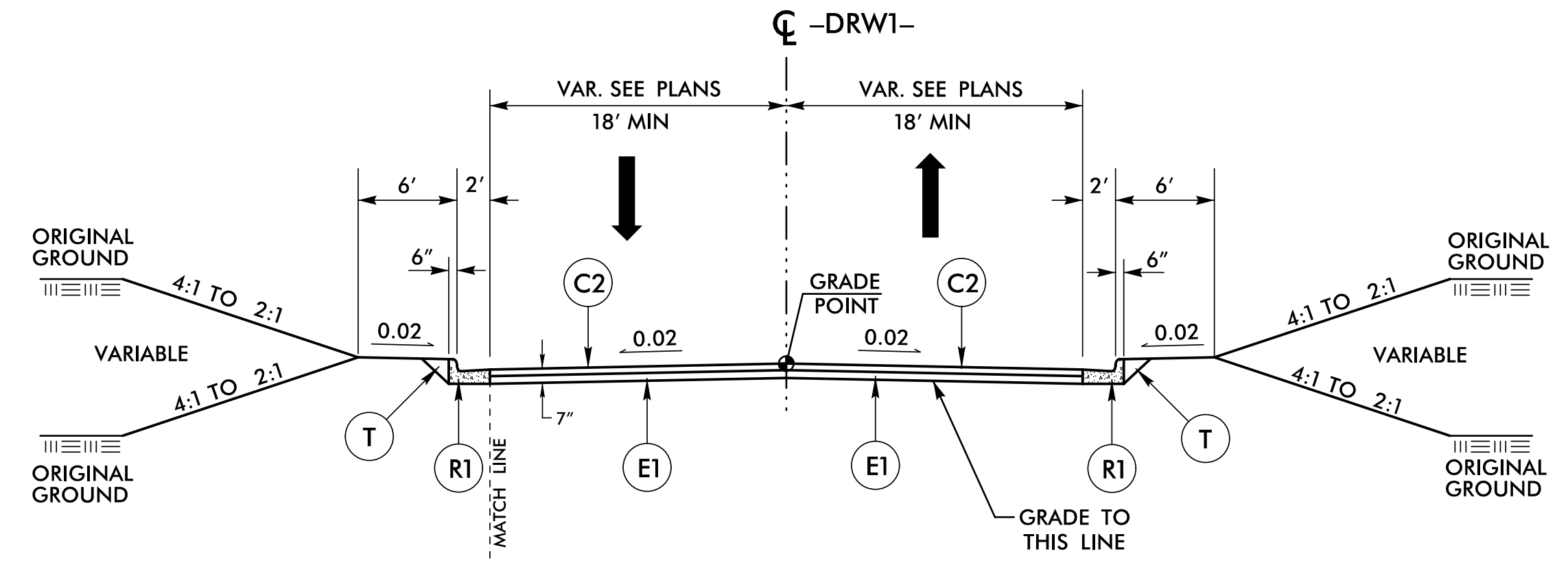
4/26/2024
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 User: mloyer

6/2/2024



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10:
 FROM -RPA- STA. 10+00.00 TO 11+17.33
 FROM -RPB- STA. 10+00.00 TO 11+21.39

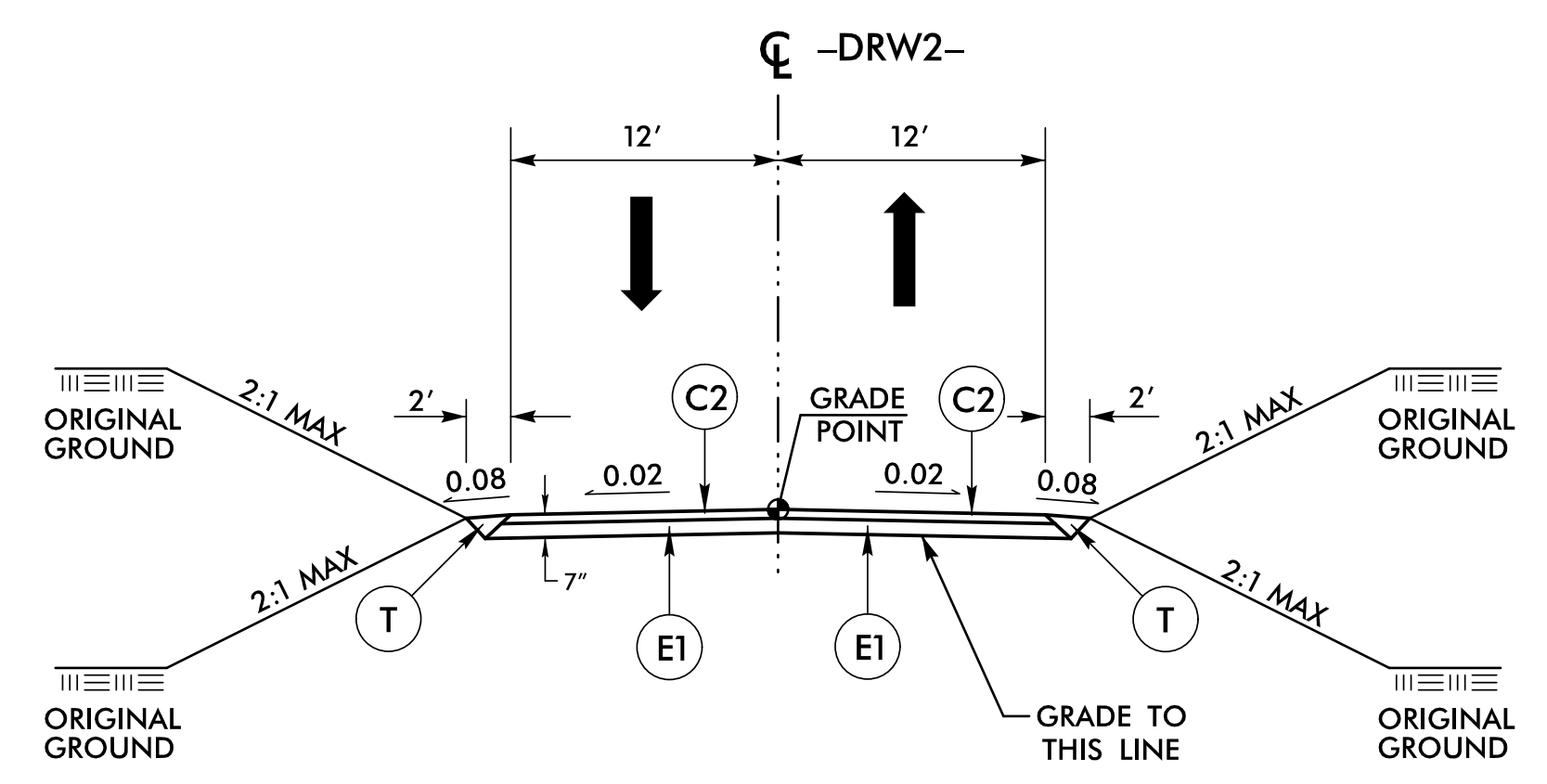


TYPICAL SECTION NO. 11A

USE FOR SHOULDER:
 FROM -DRW1- STA. 10+00.00 TO 10+28.37 LT & RT

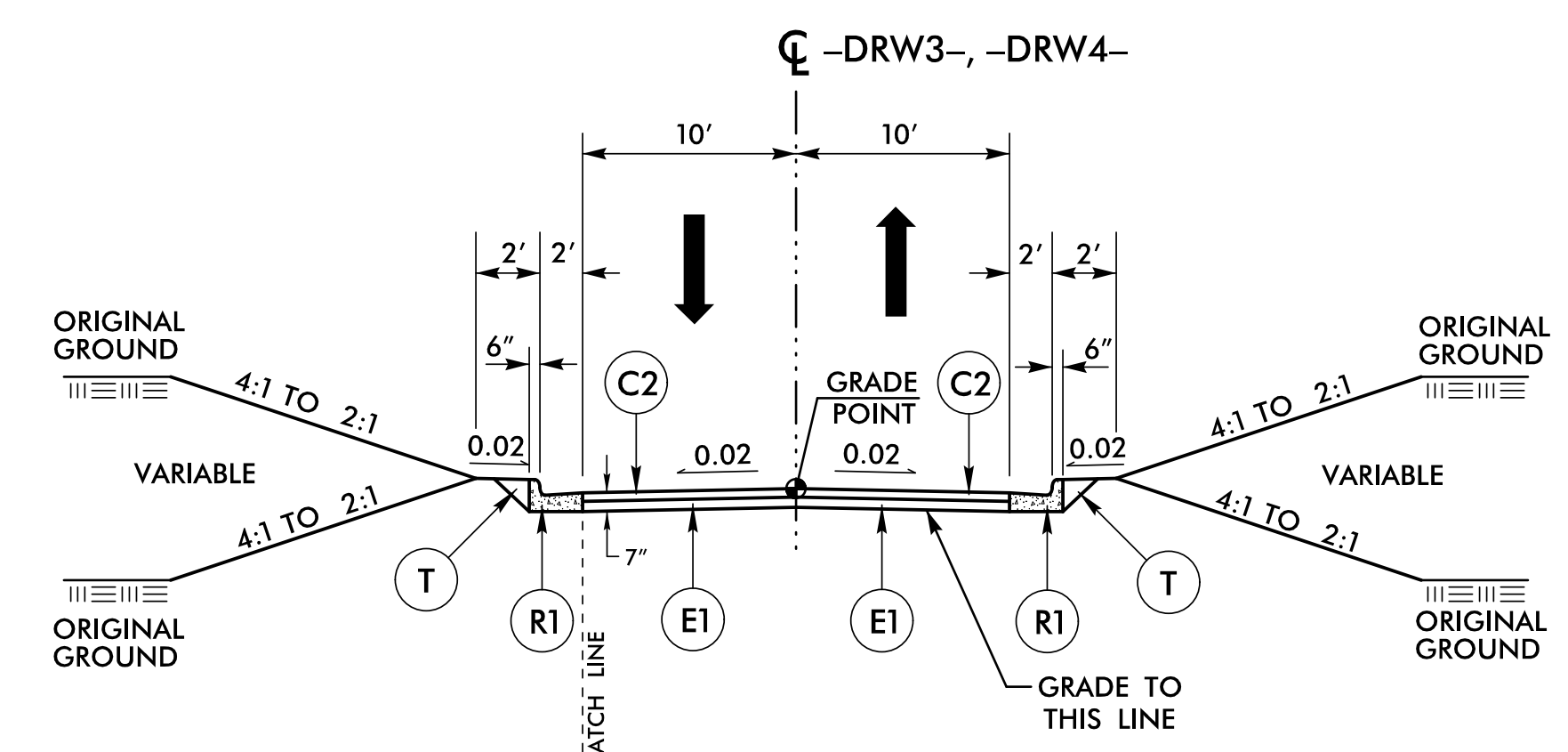
TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11:
 FROM -DRW1- STA. 10+00.00 TO 10+57.00



TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12:
 FROM -DRW2- STA. 10+27.27 TO 11+05.00
 NOTE: USE FOR DRIVEWAY TURNOUT -Y1- STA 17+00 RT



TYPICAL SECTION NO. 13A

USE FOR SHOULDER:
 FROM -DRW3- STA. 10+25.14 TO 10+57.81 LT & RT

TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13:
 FROM -DRW3- STA. 10+25.14 TO 11+05.00
 FROM -DRW4- STA. 10+00.00 TO 10+71.56
 NOTE: USE FOR DRIVEWAY TURNOUT -L- STA 12+45 RT

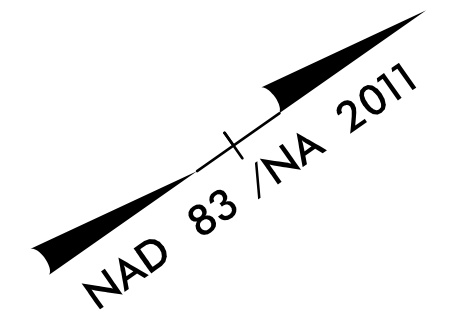
PROJECT REFERENCE NO. U-6020	SHEET NO. 2A-5
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4/26/2024 9:21 AM EDT	4/26/2024 10:12 AM EDT
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 706 HILLSBOROUGH ST. SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

C1	1 1/2" S9.5C
C2	3" S9.5C
C3	VAR. S9.5C
D1	4" I19.5C
D2	VAR. I19.0C
E1	4" B25.0C
E2	4 1/2" B25.0C
E3	VAR. B25.0C
R1	2'-6" C&G
R2	5" CONC. ISLAND
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	0" - 3" MILLING
V2	1 1/2" MILLING
W	WEDGING

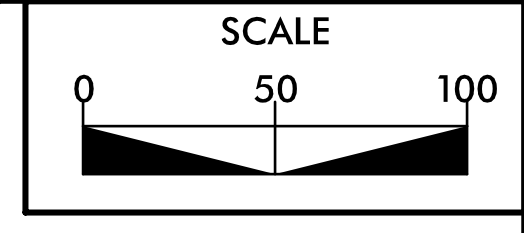
4/26/2024
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 User: mloyer

8/17/99

DESIGN DETAILS



PROJECT REFERENCE NO. U-6020	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	
4/26/2024 9:47 AM EDT	
DOCUMENT NOT CONSIDERED FINAL	
UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	

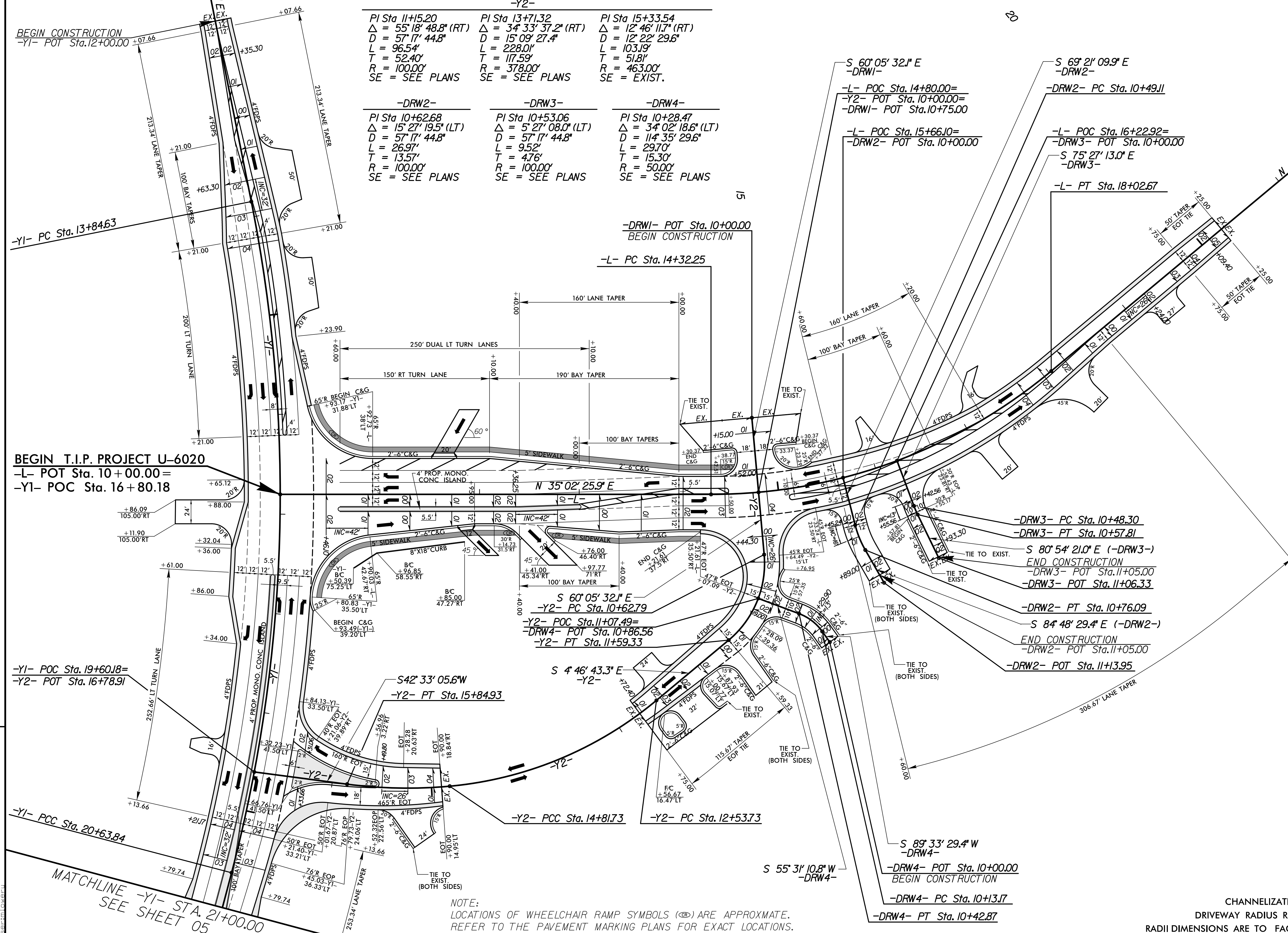


END T.I.P. PROJECT U-6020
-L- POT Sta. 21+25.00

-L-	-Y1-	-Y2-	-Y1-	-Y1-
PI Sta 16+25.30 Δ = 39° 49' 09.2" (LT) D = 10' 44' 58.8" L = 370.42' T = 193.04' R = 533.00' SE = 0.04	PI Sta 10+84.86 Δ = 4° 38' 01.7" (RT) D = 5' 43' 46.5" L = 80.88' T = 40.46' R = 1,000.00'	PI Sta 17+30.16 Δ = 25° 56' 38.5" (RT) D = 3' 49' 11.0" L = 679.21' T = 345.53' R = 1,500.00' SE = 0.04	PI Sta 22+09.36 Δ = 2° 36' 24.9" (RT) D = 0' 53' 45.2" L = 290.99' T = 145.52' R = 6,395.48' SE = SEE PLANS	

-Y2-	-Y2-	-Y2-
PI Sta 11+5.20 Δ = 55° 18' 48.8" (RT) D = 57° 17' 44.8" L = 96.54' T = 52.40' R = 100.00' SE = SEE PLANS	PI Sta 13+71.32 Δ = 34° 33' 37.2" (RT) D = 15° 09' 27.4" L = 228.01' T = 117.59' R = 378.00' SE = SEE PLANS	PI Sta 15+33.54 Δ = 12° 46' 11.7" (RT) D = 12° 22' 29.6" L = 103.19' T = 51.81' R = 463.00' SE = EXIST.

-DRW2-	-DRW3-	-DRW4-
PI Sta 10+62.68 Δ = 15° 27' 19.5" (LT) D = 57° 17' 44.8" L = 26.97' T = 13.57' R = 100.00' SE = SEE PLANS	PI Sta 10+53.06 Δ = 5° 27' 08.0" (LT) D = 57° 17' 44.8" L = 9.52' T = 4.76' R = 100.00' SE = SEE PLANS	PI Sta 10+28.47 Δ = 34° 02' 18.6" (LT) D = 114° 35' 29.6" L = 29.70' T = 15.30' R = 50.00' SE = SEE PLANS



NOTE:
LOCATIONS OF WHEELCHAIR RAMP SYMBOLS (♻️) ARE APPROXIMATE.
REFER TO THE PAVEMENT MARKING PLANS FOR EXACT LOCATIONS.

- SEE SHEET 04 FOR -L-, -Y1-, -Y2-, -DRW1-, -DRW2-, -DRW3-, & -DRW4- PLAN
- SEE SHEET 06 FOR -L- & -Y1- PROFILES
- SEE SHEET 07 FOR -Y2-, -DRW1-, -DRW2-, -DRW3-, & -DRW4- PROFILES

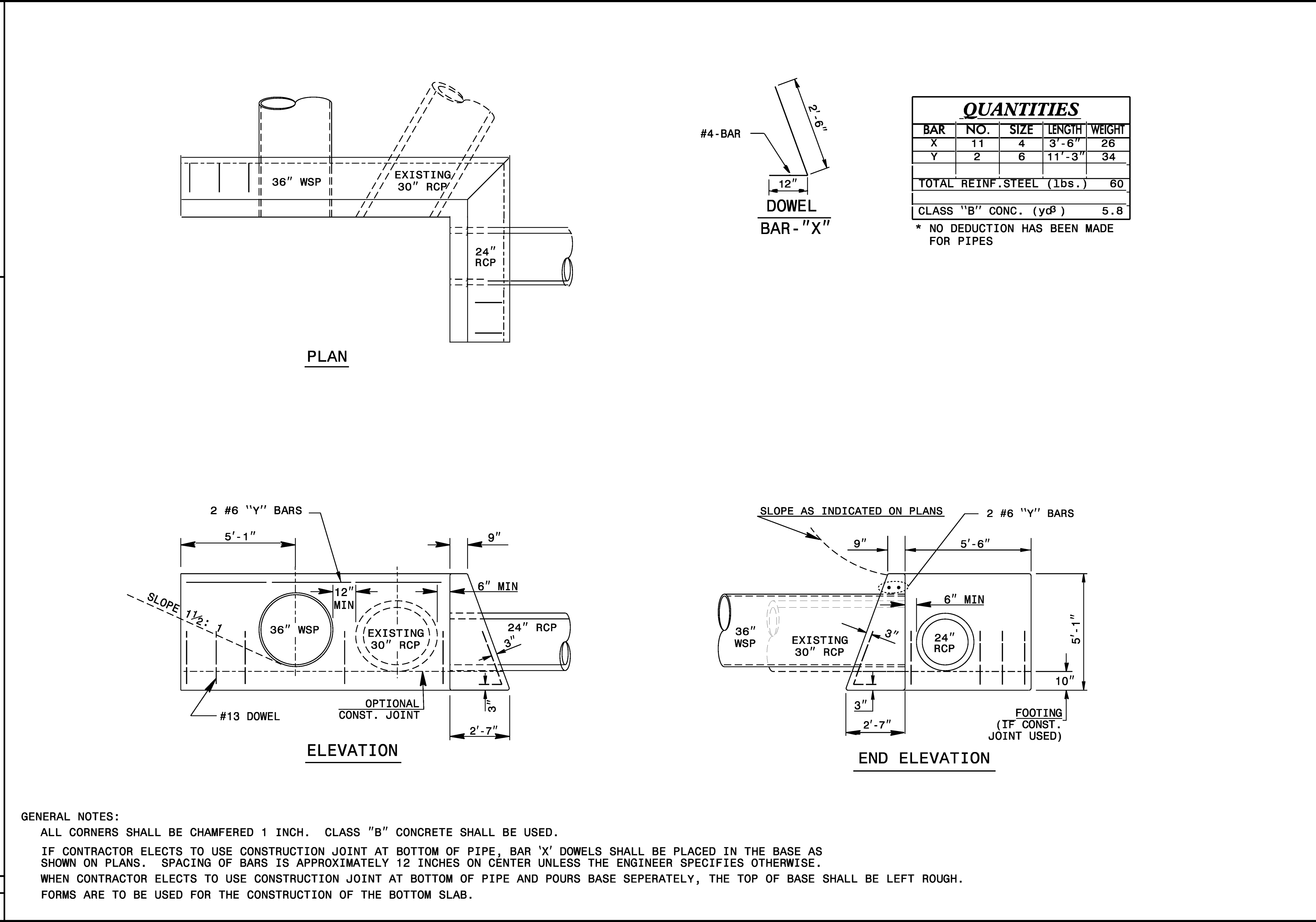
CHANNELIZATION RADII ARE 3' UNLESS OTHERWISE NOTED
DRIVEWAY RADIUS RETURNS ARE 10'R UNLESS OTHERWISE NOTED
RADII DIMENSIONS ARE TO FACE OF CURB (FC) UNLESS OTHERWISE NOTED

REVISIONS

3/8/2024
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User: mlowery

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

ROADWAY STANDARD DRAWING FOR
CONCRETE "L" ENDWALL FOR
SINGLE AND DOUBLE PIPE CULVERTS



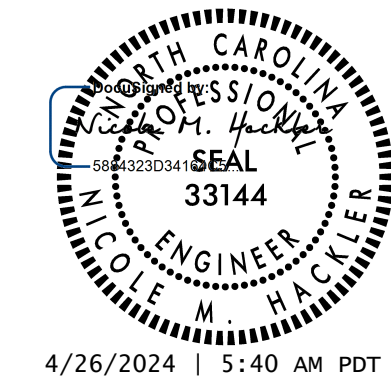
GENERAL NOTES:
 ALL CORNERS SHALL BE CHAMFERED 1 INCH. CLASS "B" CONCRETE SHALL BE USED.
 IF CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE, BAR 'X' DOWELS SHALL BE PLACED IN THE BASE AS SHOWN ON PLANS. SPACING OF BARS IS APPROXIMATELY 12 INCHES ON CENTER UNLESS THE ENGINEER SPECIFIES OTHERWISE.
 WHEN CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE AND POURS BASE SEPERATELY, THE TOP OF BASE SHALL BE LEFT ROUGH.
 FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

ROADWAY STANDARD DRAWING FOR
CONCRETE "L" ENDWALL FOR
SINGLE AND DOUBLE PIPE CULVERTS

SHEET 1 OF 1
838D05

SHEET 1 OF 1
838D05



4/26/2024 | 5:40 AM PDT

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

SEE NAME PLATE

ORIGINAL BY: K. KEMPF DATE: JAN. 17, 2019
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: kkempff/eng1ish/B5980_838d05.dgn

12/06/07

COMPUTED BY: VML DATE: 10 JUNE 2019
 CHECKED BY: ARM DATE: 10 JUNE 2019

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. SHEET NO.
 U-6020 3B-1

SUMMARY OF EARTHWORK
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	*EMBT+%	*BORROW	WASTE
-L- 10+33.50 TO -L- 20+25.00	842	580	5573	4731	580
-Y1- 12+00.00 TO -Y1- 21+27.74	971		1050	79	
-Y2- 10+23.50 TO -Y2- 12+75.00	176		757	581	
-Y2- 14+90.00 TO -Y2- 16+45.36	25		40	15	
-RPA- 10+00.00 TO -RPA- 11+17.33	66				66
-RPB- 10+00.00 TO -RPB- 11+21.39	70				70
-DRW1- 10+00.00 TO -DRW1- 10+57.00	124		4		120
-DRW2- 10+27.27 TO -DRW2- 11+05.00	14		104	90	
-DRW3- 10+25.14 TO -DRW3- 11+05.00	17		97	80	
-DRW4- 10+00.00 TO -DRW4- 10+71.56	11		80	69	
SUBTOTAL	2316	580	7705	5646	836
MATERIAL FOR SHOULDER CONSTRUCTION			840	840	
LOSS DUE TO CLEARING & GRUBBING	-400			400	
ADDITIONAL UNDERCUT		500	600	600	500
SELECT GRANULAR MAT'L IN LIEU OF BORROW			-1296	-1296	
WASTE IN LIEU OF BORROW				-256	-256
PROJECT TOTAL	1916	1080	7849	5933	1080
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				297	
GRAND TOTAL	1916	1080	7849	6230	1080
SAY	2110			6860	

* INCLUDES BACKFILL FOR UNDERCUT
 DDE = 1980 CY
 PER GEOTECHNICAL RECOMMENDATIONS:
 SELECT GRANULAR MATERIAL = 2600 CY TOTAL (500 CY CONTINGENCY + 2100 CY -L- STA 10+75 TO 13+25)
 GEOTEXTILE FOR SOIL STABILIZATION = 2600 SY TOTAL (500 SY CONTINGENCY + 2100 SY -L- STA 10+75 TO 13+25)
 (SEE SHEET 3G-1 FOR OTHER GEOTECHNICAL SUMMARIES)

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

PAVEMENT REMOVAL SUMMARY
 IN SQUARE YARDS

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	15+10	20+25	RT	592
-L-	16+89	20+25	LT	38
-Y1-	12+00	19+03	LT	724
-Y1-	20+26	21+28	LT	48
-Y1-	12+00	21+28	RT	357
-Y2-	11+09	12+75	RT	25
-Y2-	10+73	12+75	LT	169
-Y2-	14+90	16+51	LT	116
-Y2-	14+90	16+43	RT	45
-RPA-	10+00	11+17	RT	55
-RPB-	10+00	11+21	RT	134
TOTAL:				2303
SAY:				2310

MILLING ASPHALT PAVEMENT, 1.5" DEPTH
 IN SQUARE YARDS

SURVEY LINE	STATION	STATION	SY
-Y1-	21+27.74	22+75.00	980
-Y2-	13+25.00	14+90.00	609
TOTAL:			1589
SAY:			1590

CHAIN LINK FENCE, 48" FABRIC SUMMARY

STATION TO STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E LINE POSTS	F TERMINAL POSTS
-Y1- 17+65 TO 19+03	LT	145.00	1	1		12	2
-Y1- 15+52 TO 16+06.83	RT	56.00	1			5	1
-Y1- 19+84.55 TO 20+57.98	LT	117.00	2			9	2
TOTAL:		318.00				26	5
SAY:		318.00				26	5

WOVEN WIRE FENCE, 47" FABRIC SUMMARY

STATION TO STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
-Y1- 19+00 TO 20+69.26	RT	162.00	3			8	6
TOTAL:		162.00				8	6
SAY:		170.00				9	6

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 User: arm

COMPUTED BY: J. L. Love DATE: 3/1/24
 CHECKED BY: J. Park DATE: 3/24/24

(2-3-23)

PROJECT NO.
U-6020

SHEET NO.
3G-1

**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS**

SUMMARY OF SUBSURFACE DRAINAGE

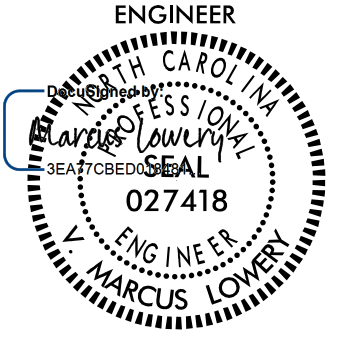
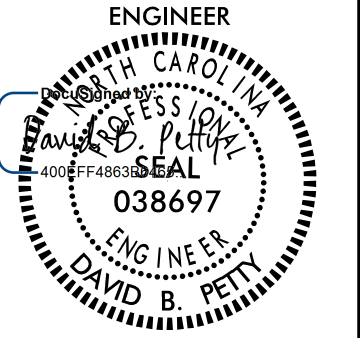
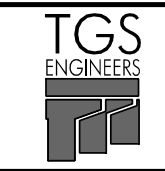
LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	250
				TOTAL LF:	250

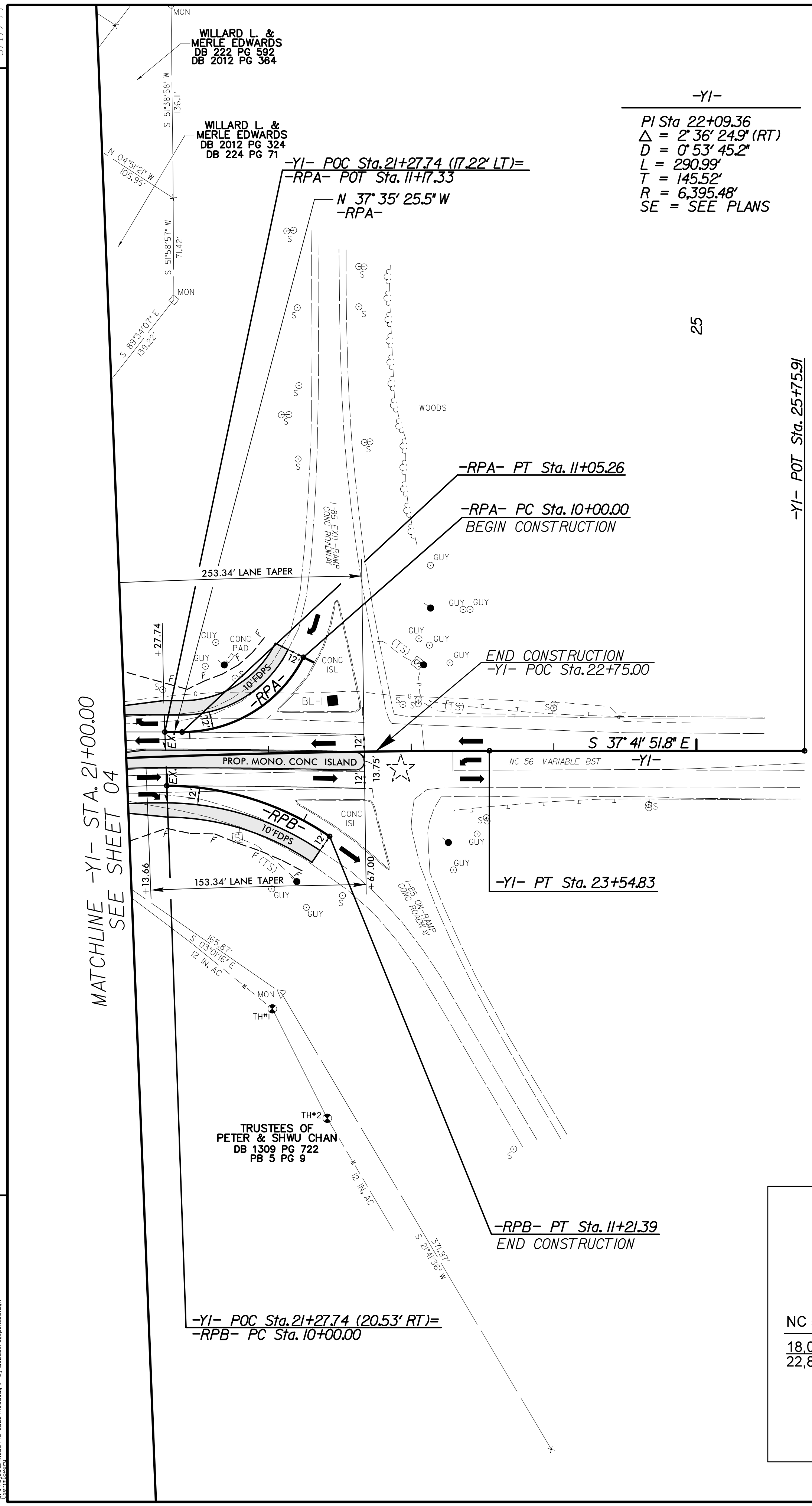
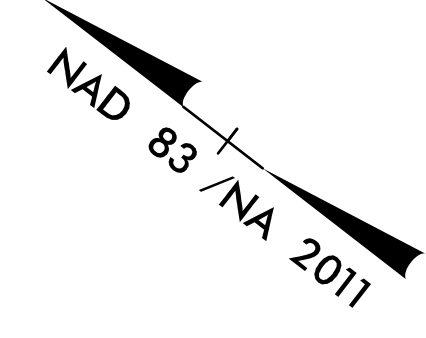
*UD = Underdrain
 *BD = Blind Drain
 *SD = Subsurface Drain

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
-L-	16+75	19+25	ASU (1)	12"	100	200	300		
CONTINGENCY			ASU (1)	12"	300	600	900		
					TOTAL CY/TONS/SY:	400	800**	1200**	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. <i>U-6020</i>	SHEET NO. <i>05</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
4/25/2024 4:34 PM EDT	4/26/2024 5:23 AM PDT
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275	



I-85 SB RAMP (EXIT)	2,900	4,050	
	1,250	1,600	
	1,300	2,750	
NC 56			NC 56
18,000			18,800
22,850	1,550	2,000	25,400
			2,000
			3,150
I-85 SB RAMP (ENTRANCE)	3,600	5,100	
			2024
			2044 ADT

 EXISTING SIGNAL

SEE SHEET 06 FOR -YI- PROFILE

SEE SHEET 08 FOR -RPA- & -RPB- PROFILES

REVISIONS

4/25/2024
 TGS ENGINEERS
 706 HILLSBOROUGH ST., SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

5/28/24

TGS ENGINEERS
 706 HILLSBOROUGH ST. SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

EXISTING GROUND

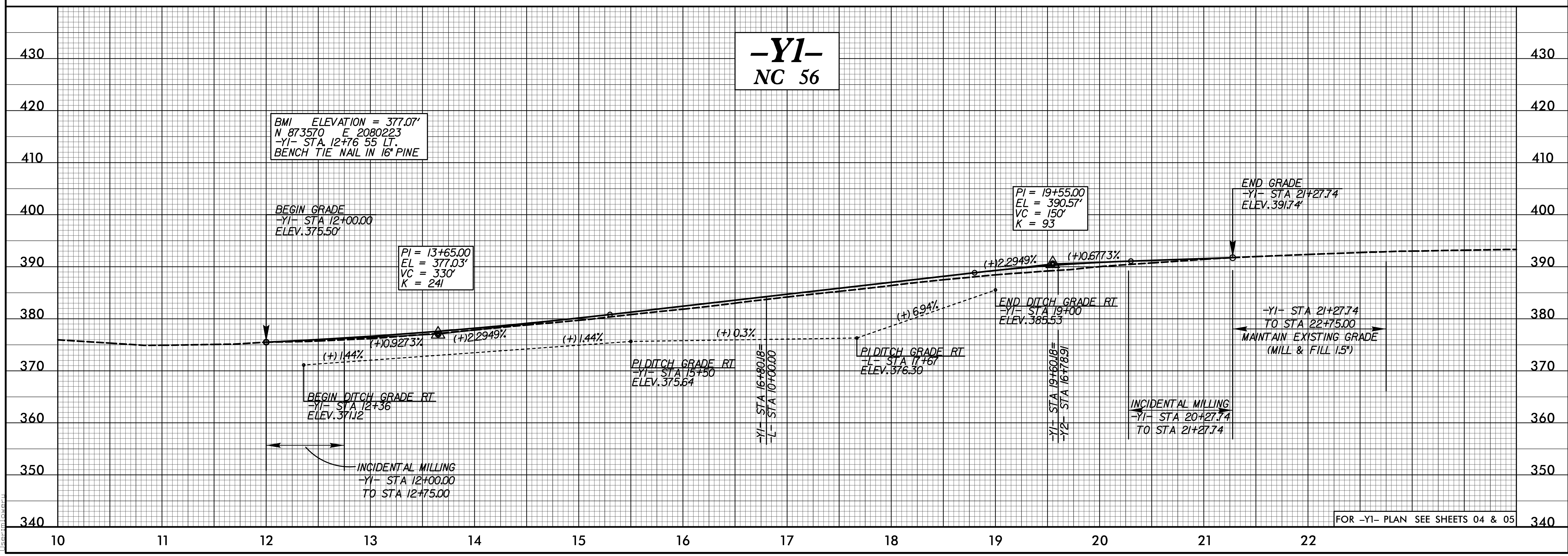
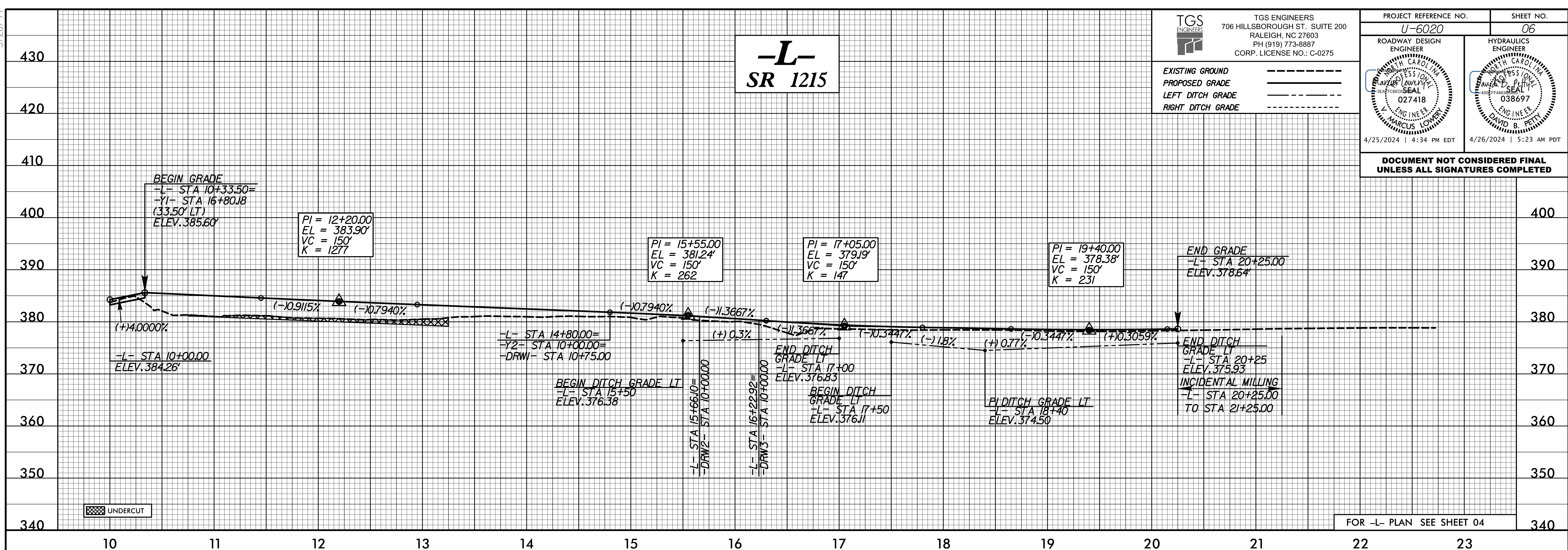
PROPOSED GRADE

LEFT DITCH GRADE

RIGHT DITCH GRADE

PROJECT REFERENCE NO. U-6020	SHEET NO. 06
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
4/25/2024 4:34 PM EDT	4/26/2024 5:23 AM PDT

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



7/8/2024
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 User: dmccarty

5/28/24

TGS ENGINEERS
 706 HILLSBOROUGH ST. SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO. **U-6020** SHEET NO. **07**

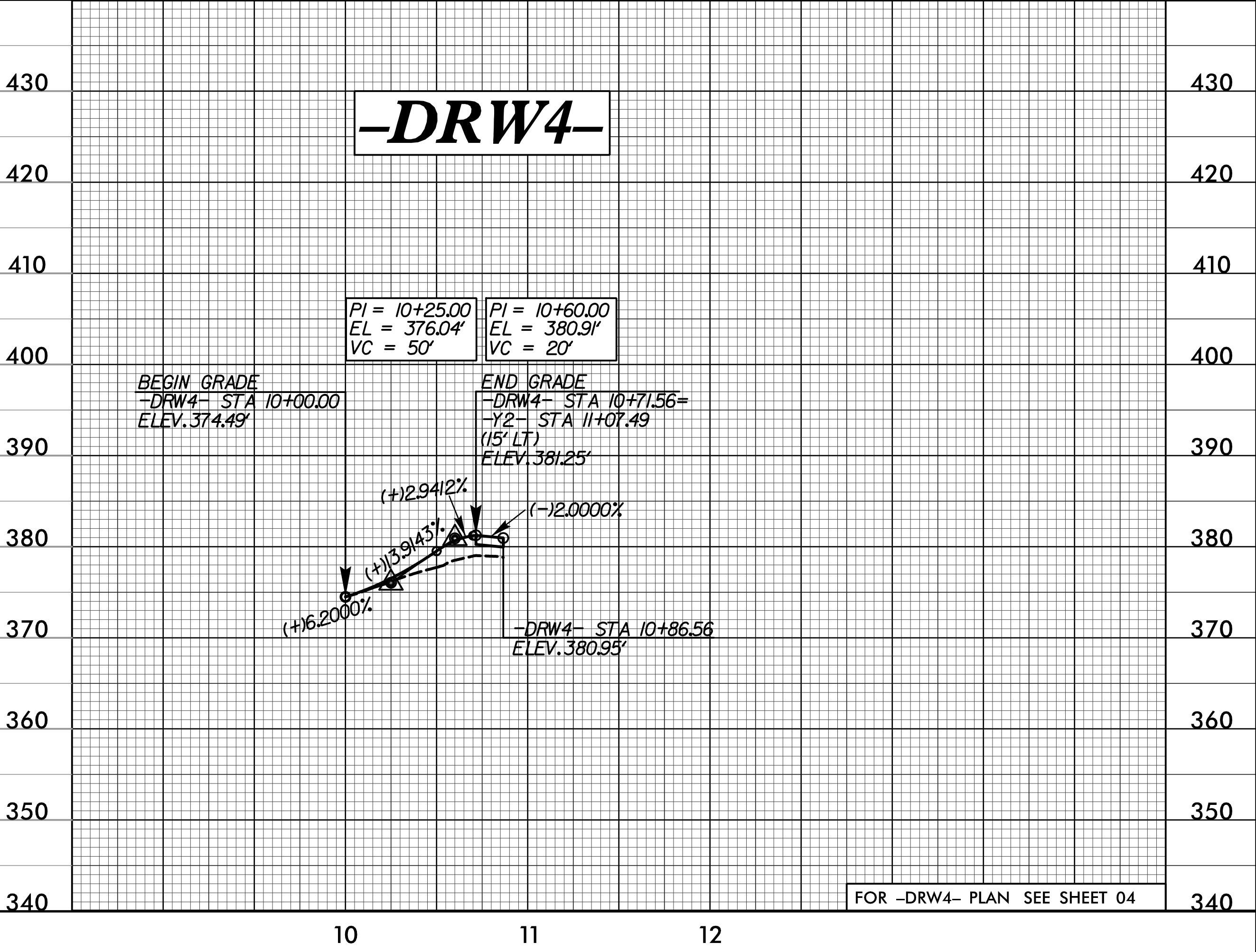
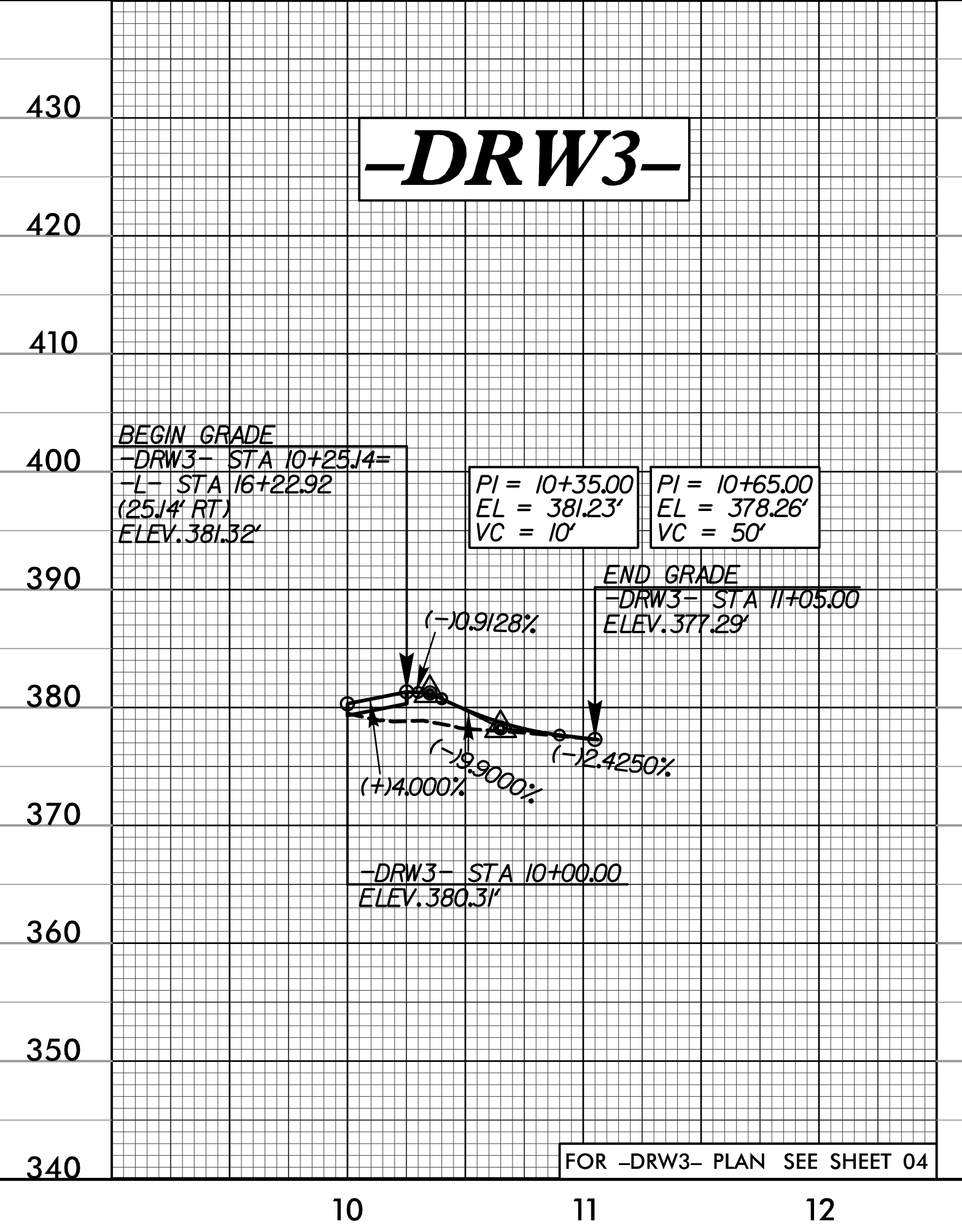
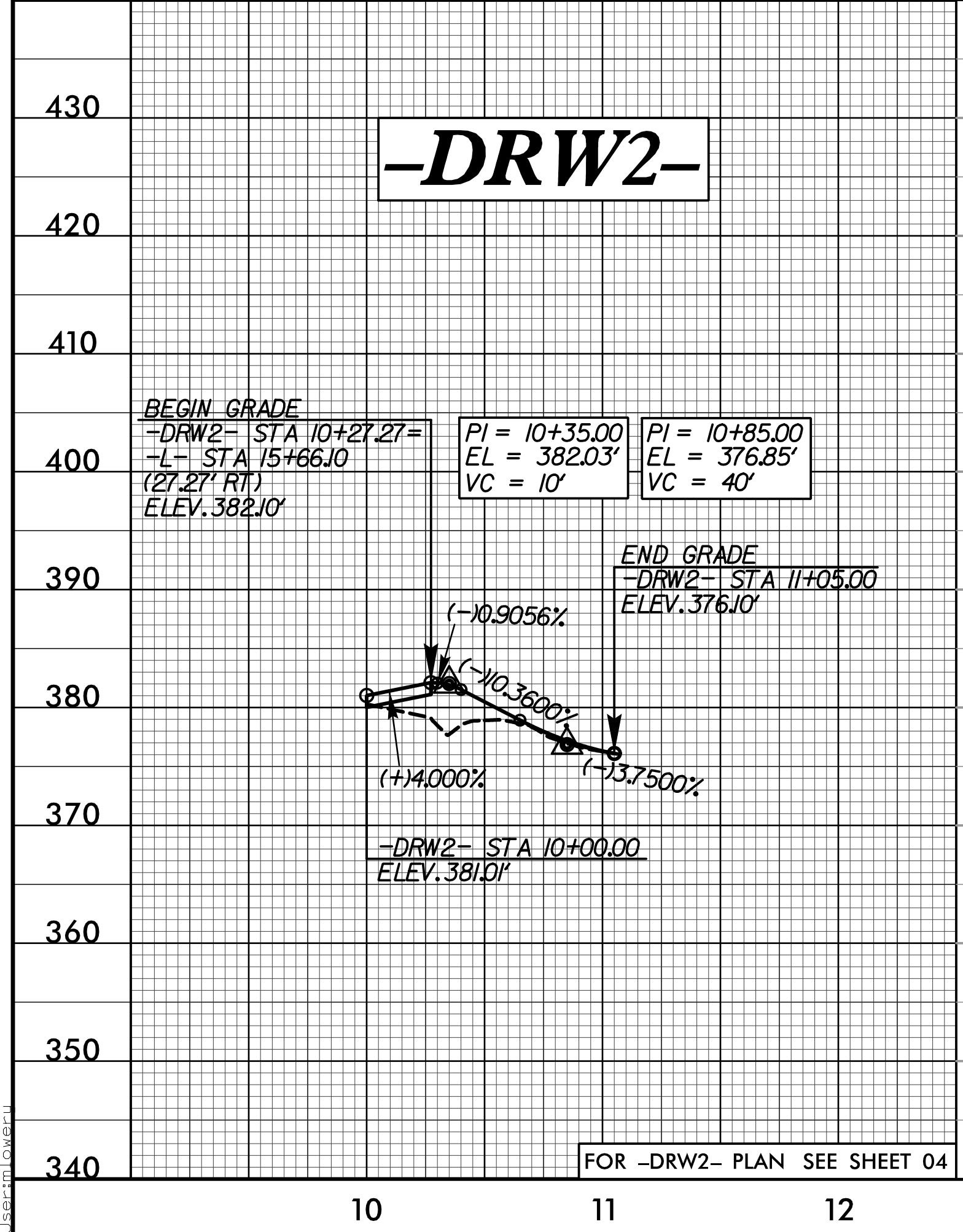
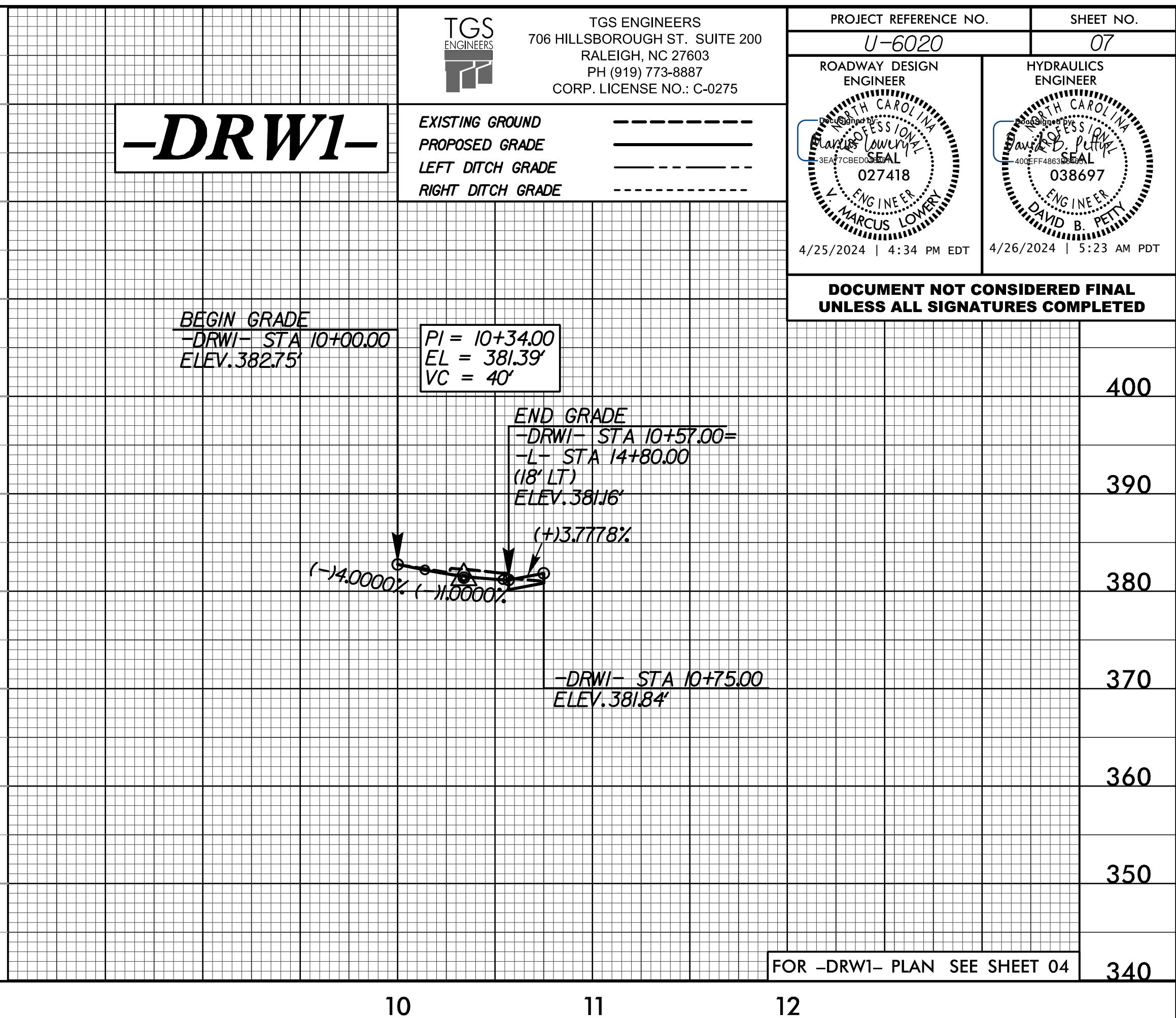
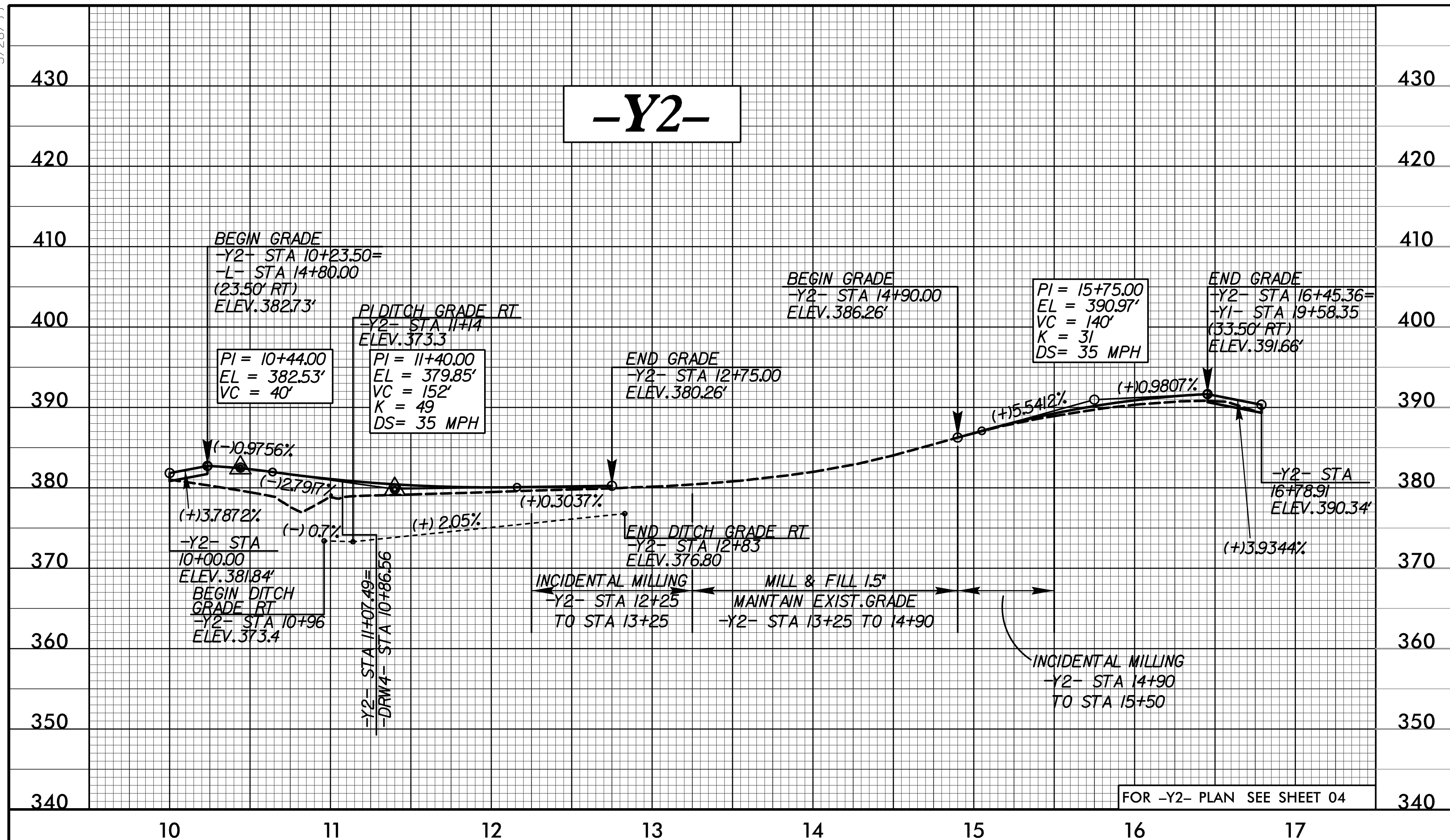
ROADWAY DESIGN ENGINEER
 ENGINEER SEAL
 027418
 L. MARCUS LOVER

HYDRAULICS ENGINEER
 ENGINEER SEAL
 038697
 DAVID B. PETY

4/25/2024 | 4:34 PM EDT 4/26/2024 | 5:23 AM PDT

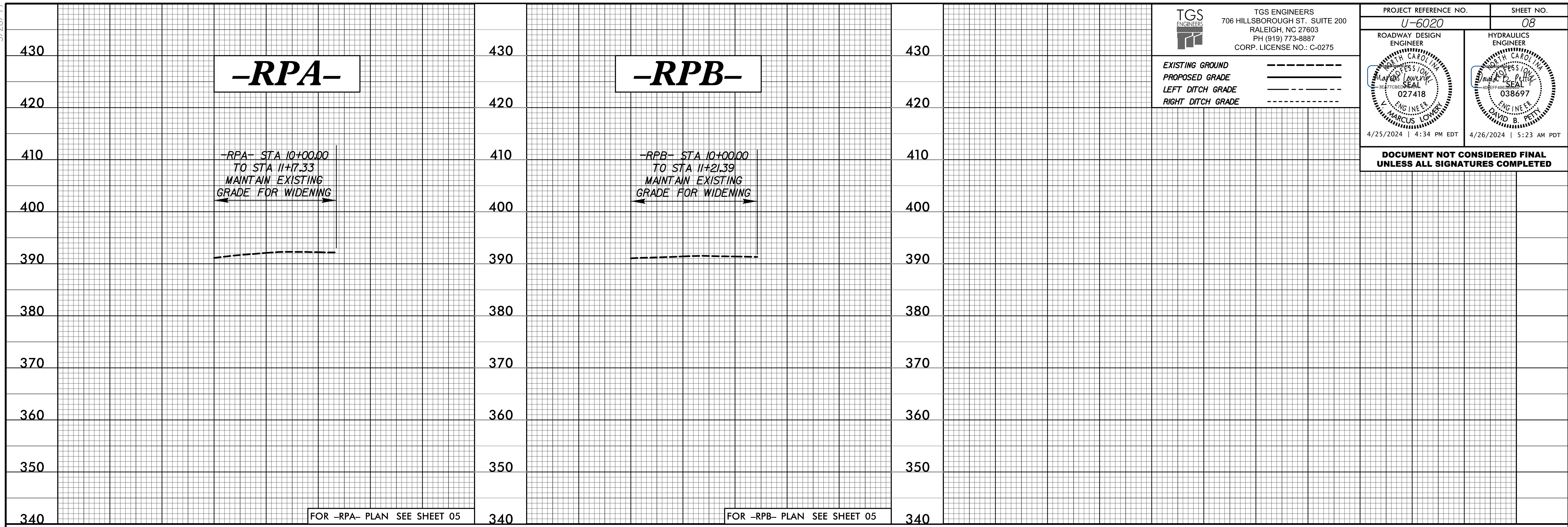
EXISTING GROUND
 PROPOSED GRADE
 LEFT DITCH GRADE
 RIGHT DITCH GRADE

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



3/8/2024
 C:\projects\NCDOT\U-6020\Roadway\Proj\U6020L_rdl.pfl.07.dgn
 User:lmlover

5/28/24



TGS ENGINEERS
 706 HILLSBOROUGH ST. SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

EXISTING GROUND - - - - -
 PROPOSED GRADE —————
 LEFT DITCH GRADE - - - - -
 RIGHT DITCH GRADE - - - - -

PROJECT REFERENCE NO. <i>U-6020</i>	SHEET NO. <i>08</i>
ROADWAY DESIGN ENGINEER 4/25/2024 4:34 PM EDT	HYDRAULICS ENGINEER 4/26/2024 5:23 AM PDT

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

-RPA- STA 10+00.00
 TO STA 11+17.33
 MAINTAIN EXISTING
 GRADE FOR WIDENING

-RPB- STA 10+00.00
 TO STA 11+21.39
 MAINTAIN EXISTING
 GRADE FOR WIDENING

FOR -RPA- PLAN SEE SHEET 05

FOR -RPB- PLAN SEE SHEET 05

10

11

12

10

11

12

3/8/2024 1:19:20 PM C:\Users\mlovese\OneDrive\Documents\Projects\NCDOT\U-6020\Roadway\Proj\U6020_L_rdy.pfl.08.dgn