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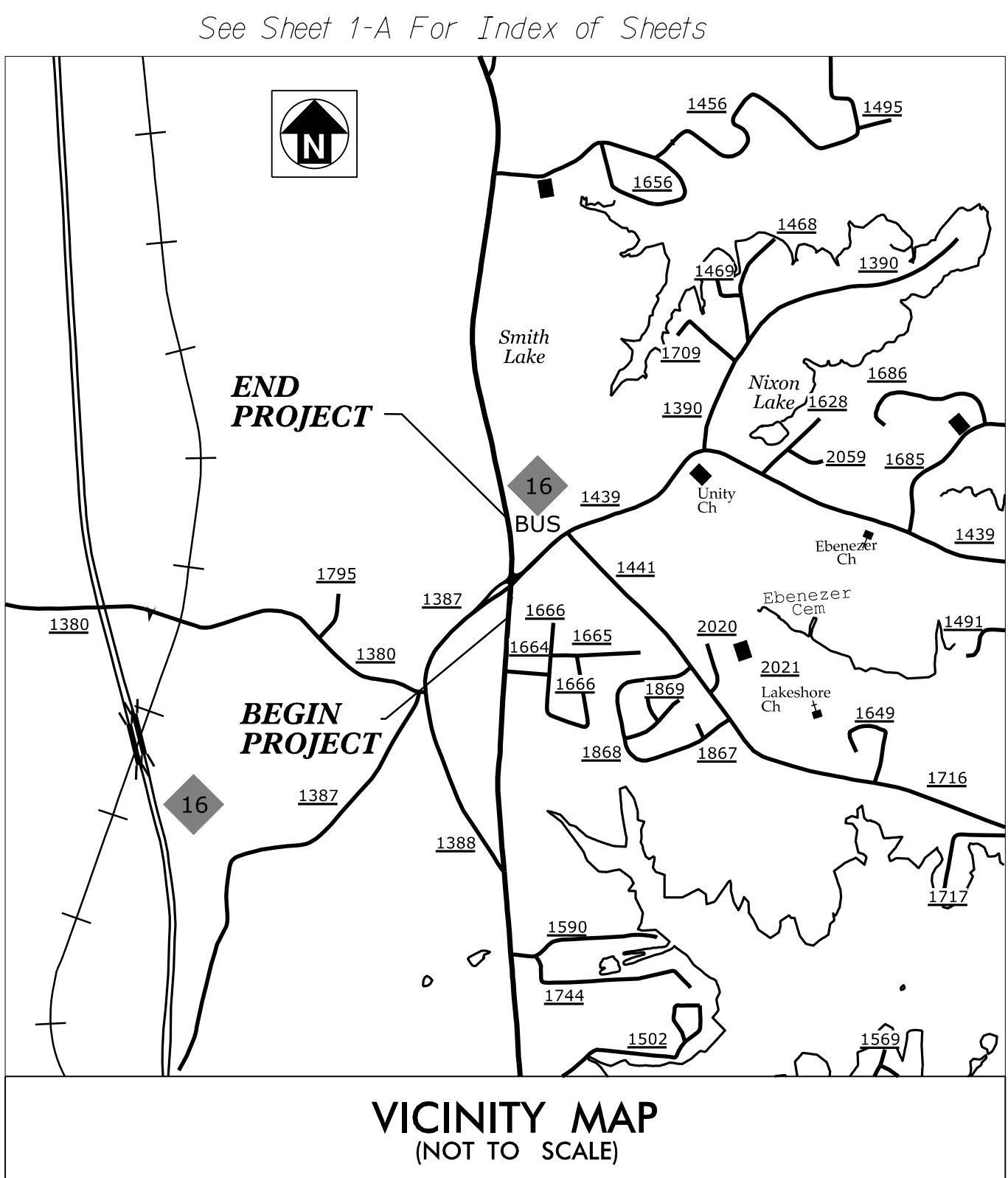
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09/08/25

TIP PROJECT: R-5712

CONTRACT: DL00351

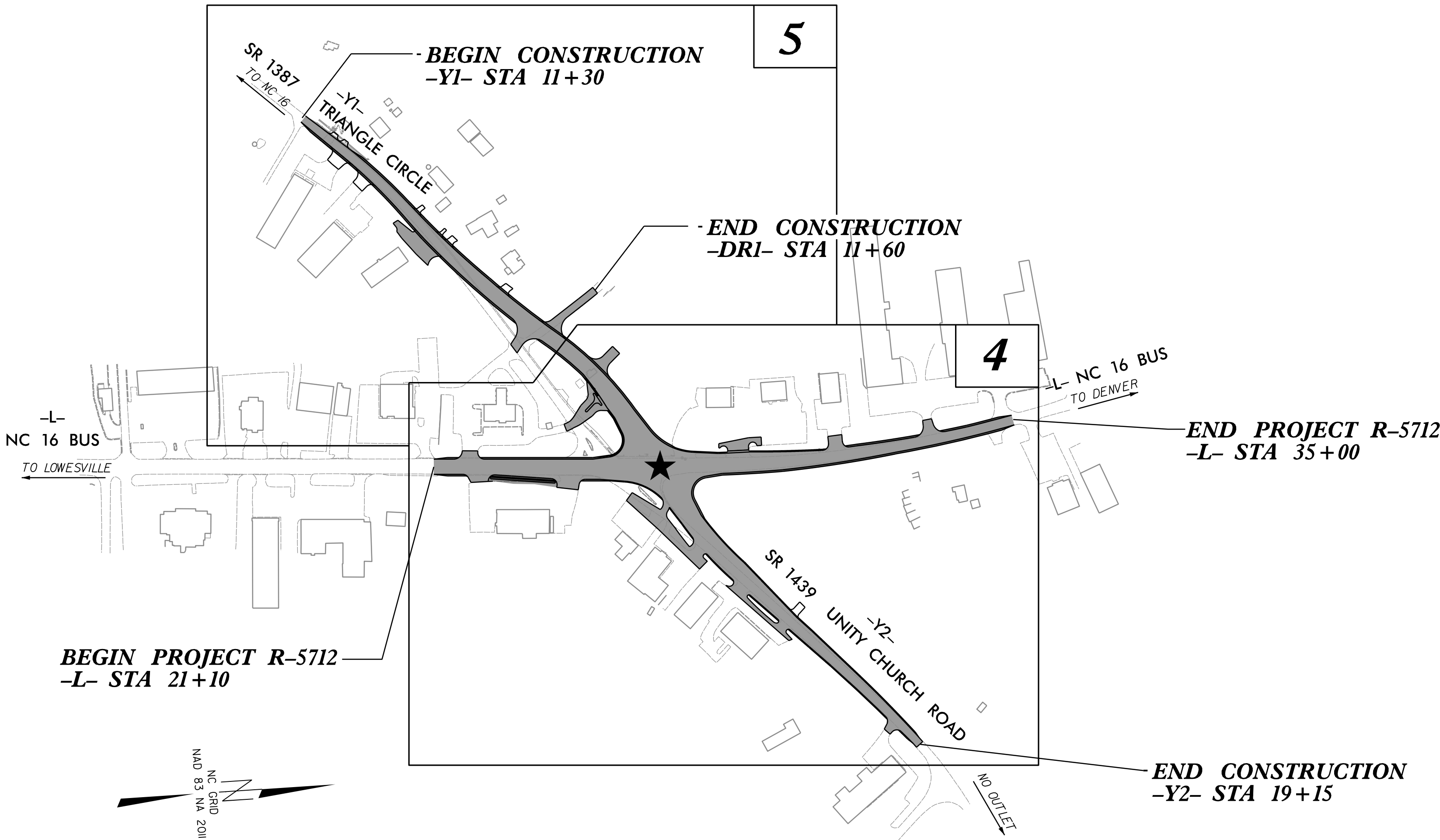


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LINCOLN COUNTY

LOCATION: INTERSECTION OF NC 16 BUS, SR 1387 (TRIANGLE CIRCLE),
AND SR 1439 (UNITY CHURCH ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, & SIGNALS



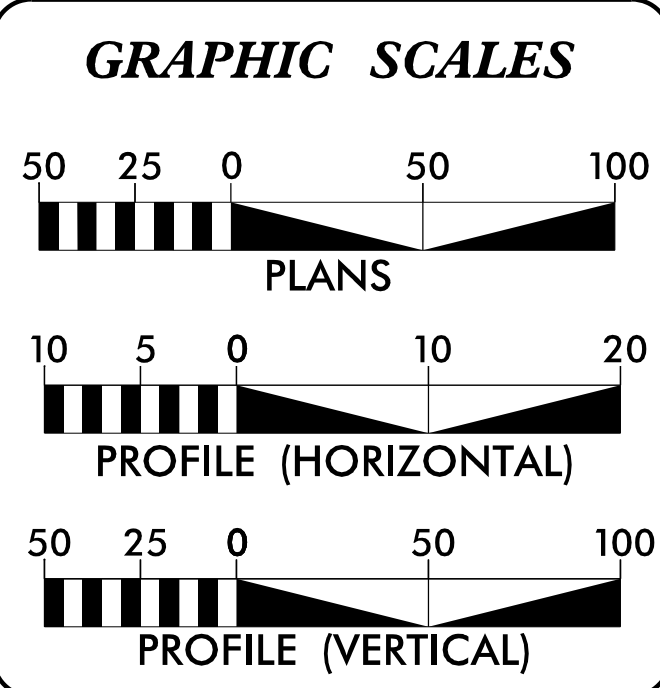
PLANS PREPARED BY:



12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

★ PROPOSED SIGNALIZED INTERSECTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA
ADT 2020 = 19,230
ADT 2040 = 25,500
V = 50 MPH
FUNC CLASS =
RURAL ARTERIAL
REGIONAL TIER

PROJECT LENGTH
TOTAL LENGTH TIP PROJECT R-5712 = 0.263 MILES

Prepared in the Office of:
MATTERN & CRAIG
12 BROAD ST.
ASHEVILLE, NC 28801
FOR NCDOT DIVISION OF HIGHWAYS

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 14, 2019

LETTING DATE:
JUNE 24, 2025

JAMES B. VOSO, PE
PROJECT ENGINEER

AARON C. CARVER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

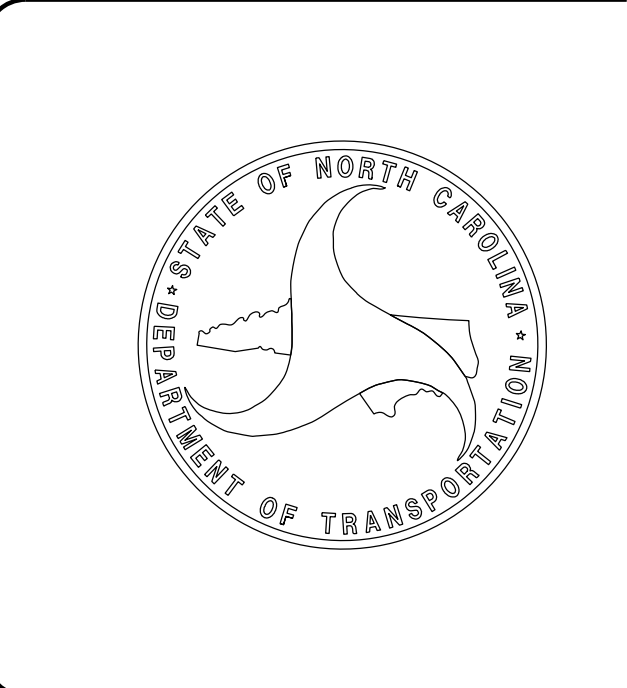
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Aaron C. Carver
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4/1/2025

SIGNATURE:

ROADWAY DESIGN ENGINEER

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Aaron C. Carver
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4/1/2025

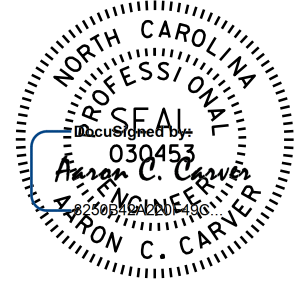
SIGNATURE:



PROJECT REFERENCE NO.
R-5712

SHEET NO.
1A

ROADWAY DESIGN
ENGINEER



4/1/2025

INDEX OF SHEETS

GENERAL NOTES

STANDARD DRAWINGS

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
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	
815.02	Subsurface Drain
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
848.02	Driveway Turnout - Radius Type
852.01	Concrete Islands
876.02	Guide for Rip Rap at Pipe Outlets

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL PLAN SHEET SYMBOLS
2A-1	PAVEMENT SCHEDULE & TYPICAL SECTIONS
3B-1	SUMMARY OF EARTHWORK & PAVEMENT REMOVAL
3D-1	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARY
4 thru 5	PLAN SHEETS
6	PROFILE SHEET
RW01 thru RW05	SURVEY CONTROL AND RIGHT OF WAY SHEETS
TMP-1 thru TMP-9	TRAFFIC MANAGEMENT PLANS
PMP-1 thru PMP-3	PAVEMENT MARKING PLANS
EC-1 thru EC-7	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-4	SIGNING PLANS
SIG-1 thru SIG-5	SIGNAL PLANS
UO-1 thru UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 thru X-22	CROSS SECTIONS

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 II.

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

DRIVEWAYS:

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

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE AT&T CORPORATION, DUKE ENERGY, LINCOLN COUNTY, AND SPECTRUM.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

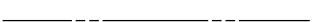
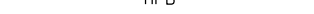
RIGHT-OF-WAY MARKERS:

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

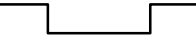
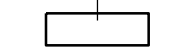
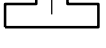
CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

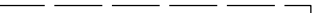
BOUNDARIES AND PROPERTY:

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	

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Secondary Horiz and Vert Control Point	
Vertical Benchmark	
Existing Right of Way Monument	
Proposed Right of Way Monument (Rebar and Cap)	
Proposed Right of Way Monument (Concrete)	
Existing Permanent Easement Monument	
Proposed Permanent Easement Monument (Rebar and Cap)	
Existing C/A Monument	
Proposed C/A Monument (Rebar and Cap)	
Proposed C/A Monument (Concrete)	
Existing Right of Way Line	
Proposed Right of Way Line	
Existing Control of Access Line	
Proposed Control of Access Line	
Proposed ROW and CA Line	
Existing Easement Line	
Proposed Temporary Construction Easement	
Proposed Temporary Drainage Easement	
Proposed Permanent Drainage Easement	
Proposed Permanent Drainage/Utility Easement	
Proposed Permanent Utility Easement	
Proposed Temporary Utility Easement	
Proposed Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	
VEGETATION:	
Single Tree	
Single Shrub	
Hedge	

Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

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

UTILITIES:

* SUE – Subsurface Utility Engineering
LOS – Level of Service – A,B,C or D (Accuracy)

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

TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Test Hole (SUE – LOS A)*	
U/G Telephone Cable (SUE – LOS B)*	
U/G Telephone Cable (SUE – LOS C)*	
U/G Telephone Cable (SUE – LOS D)*	
U/G Telephone Conduit (SUE – LOS B)*	
U/G Telephone Conduit (SUE – LOS C)*	
U/G Telephone Conduit (SUE – LOS D)*	
U/G Fiber Optics Cable (SUE – LOS B)*	
U/G Fiber Optics Cable (SUE – LOS C)*	
U/G Fiber Optics Cable (SUE – LOS D)*	

WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line Test Hole (SUE – LOS A)*	
U/G Water Line (SUE – LOS B)*	
U/G Water Line (SUE – LOS C)*	
U/G Water Line (SUE – LOS D)*	
Above Ground Water Line	

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:

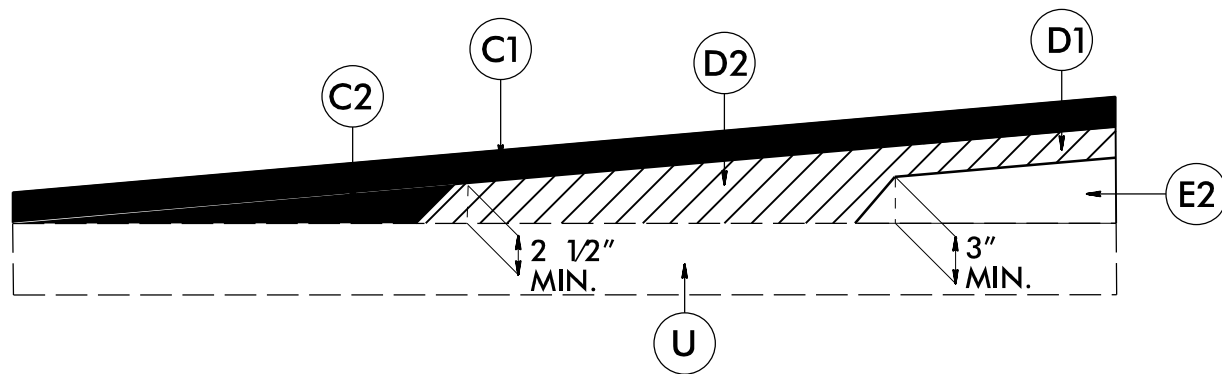
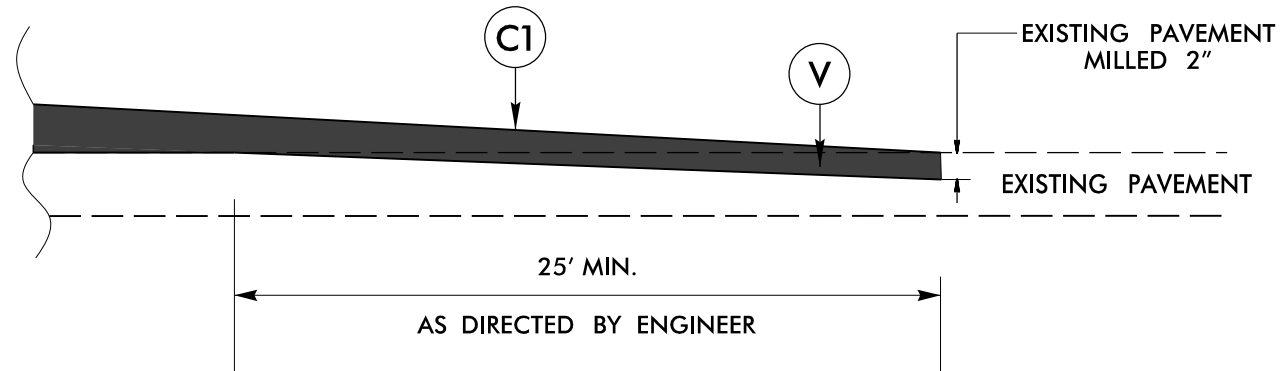
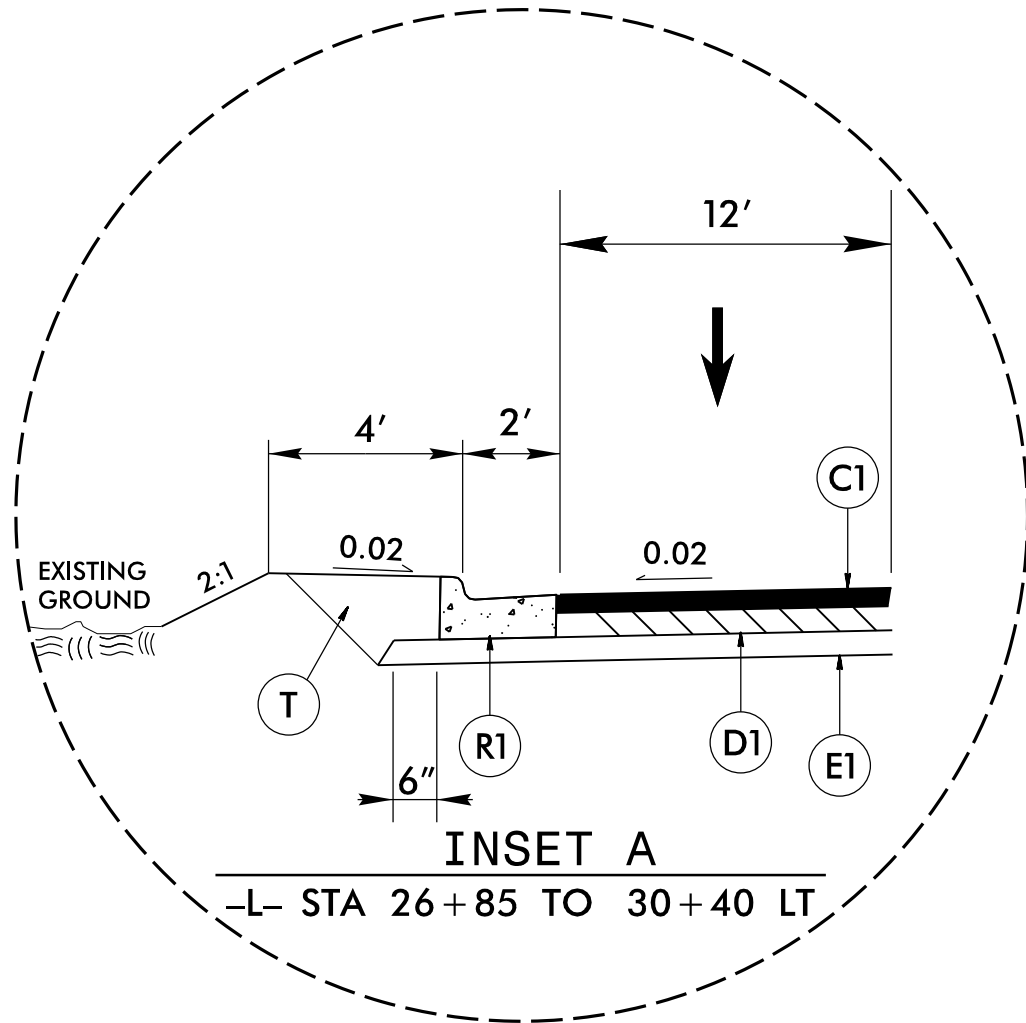
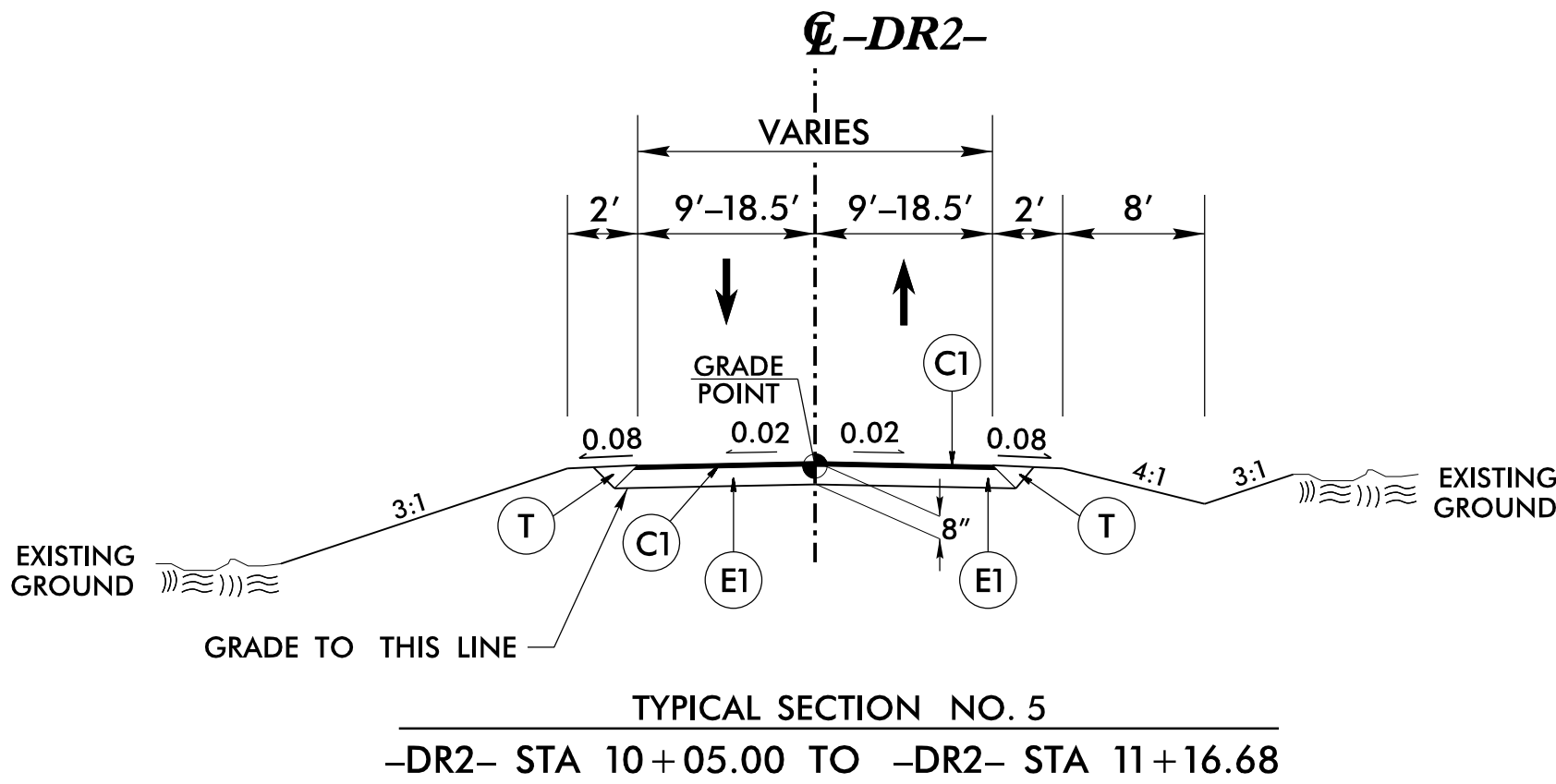
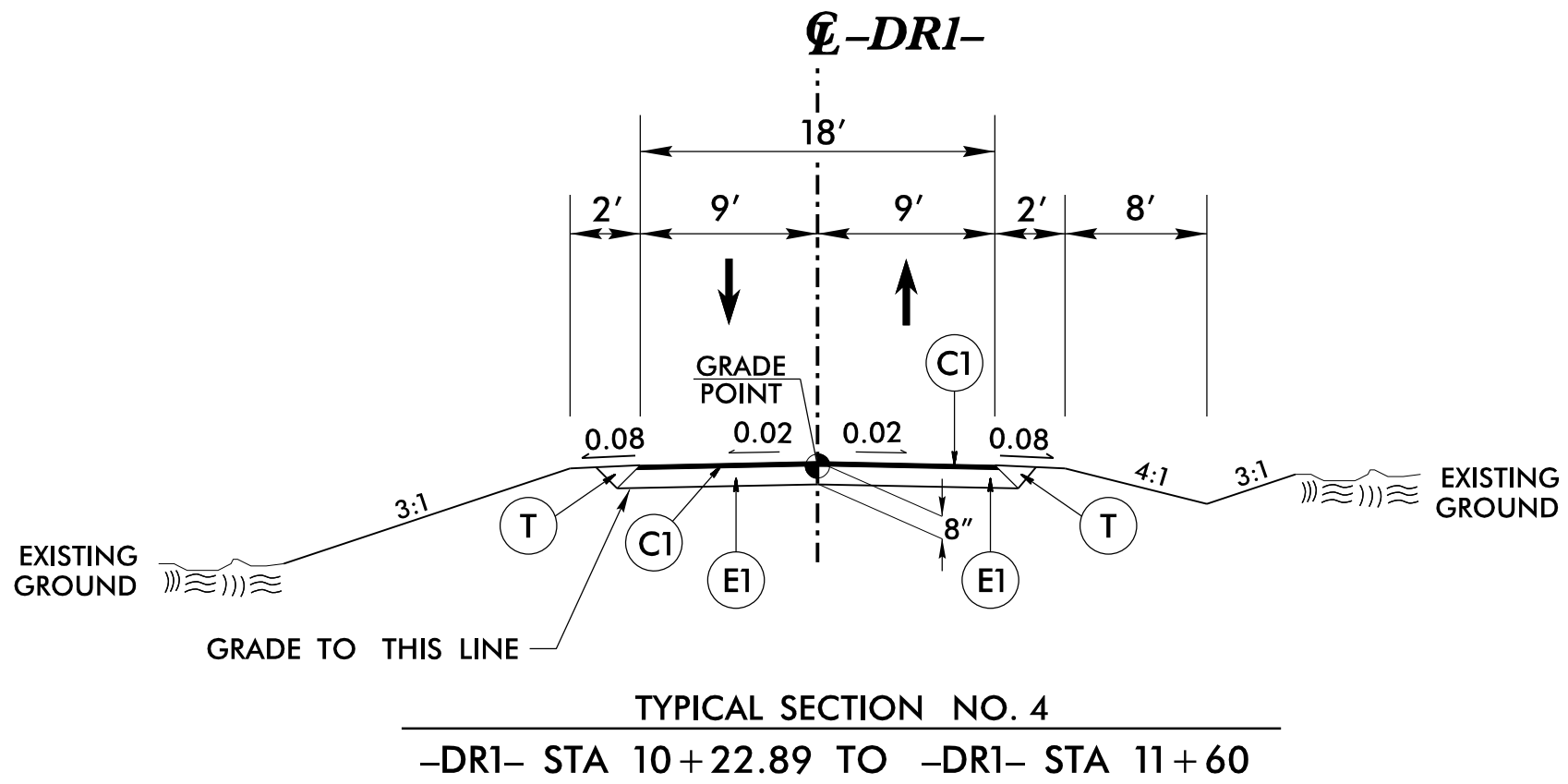
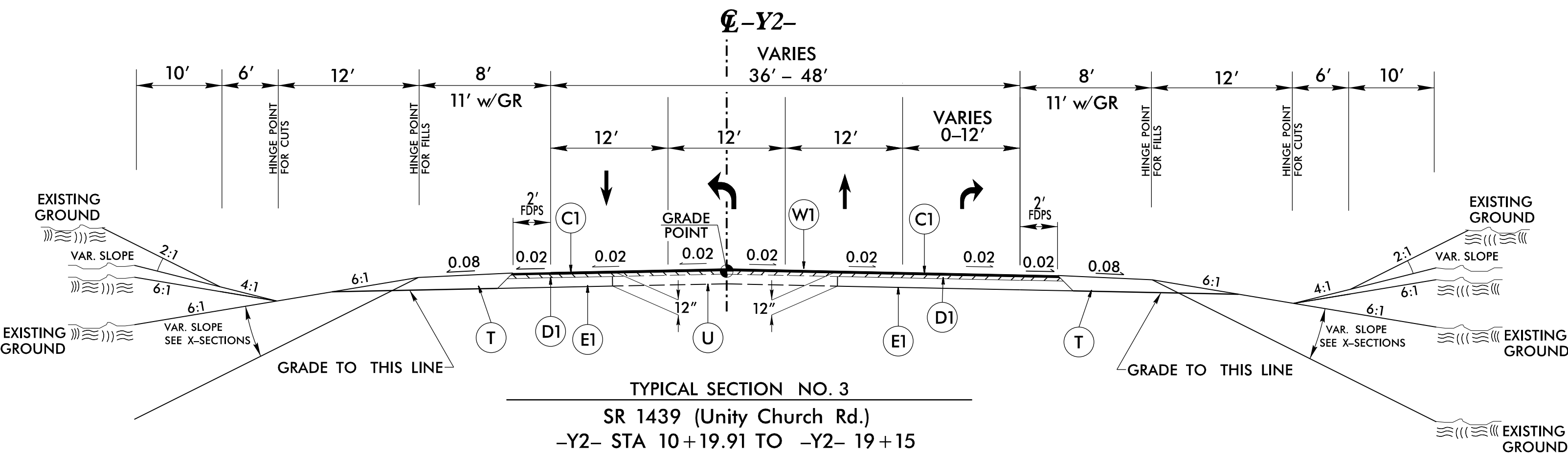
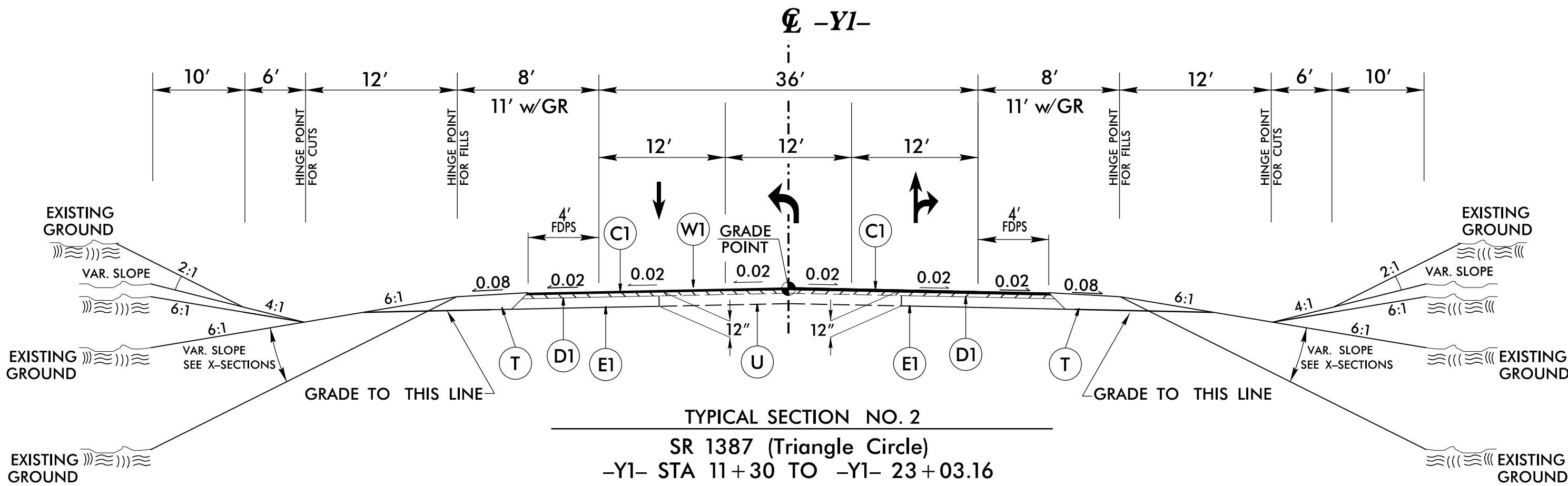
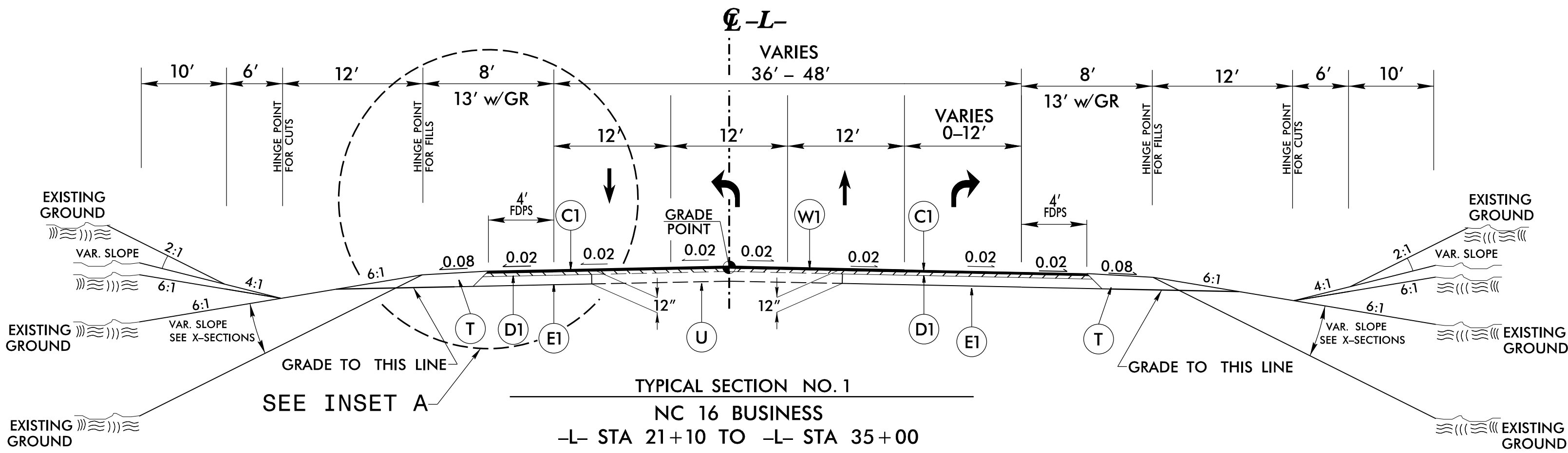
Gas Valve	
Gas Meter	
U/G Gas Line Test Hole (SUE – LOS A)*	
U/G Gas Line (SUE – LOS B)*	
U/G Gas Line (SUE – LOS C)*	
U/G Gas Line (SUE – LOS D)*	
Above Ground Gas Line	

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	
Geoenvironmental Boring	
Abandoned According to Utility Records	
End of Information	



PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO 1½" LAYERS.
C2	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.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
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.
R1	2'-6" CURB AND GUTTER NCDOT STANDARD. DRAWING NO. 846.01
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING BITUMINOUS PAVEMENT. 1.5" DEPTH.
W1	WEDGING

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

6/21/2020

COMPUTED BY: <u>MY</u>	DATE: <u>1-25-23</u>
CHECKED BY: <u>ACC</u>	DATE: <u>1-25-23</u>

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
<i>R-5712</i>	<i>3B-1</i>

SUMMARY OF EARTHWORK

IN CUBIC YARDS					
LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
SUMMARY NO.1					
-L- STA. 21+10 TO STA. 26+50	264		352	88	
-Y1- STA. 11+30 TO STA. 22+95.78	2339		3897	1558	
-DR1- STA 10+22.89 TO STA 11+60	3		695	692	
-DR2- STA 10+05 TO STA 11+16.68	383				383
SUBTOTAL SUMMARY NO.1	2989		4944	2338	383
SUMMARY NO.2					
-L- STA. 26+50 TO STA. 35+00	1185		753		432
-Y2- STA. 10+27.34 TO STA. 19+15	3608		552		3056
SUBTOTAL SUMMARY NO.2	4793		1305		3488
PROJECT SUBTOTAL	7782		6249	2338	3871
EST. SHOULDER CONSTRUCTION			1073	1073	
LOSS DUE TO CLEARING & GRUBBING	-100			100	
WASTE IN LIEU OF BORROW				-3511	-3511
GRAND TOTAL	7682		7322	0	360
SAY	7700				400

DDE=18 CY

CONTINGENCY ITEMS:
INCIDENTAL STONE = 50 TONS
UNDERCUT EXCAVATION = 2860 CY
SELECT GRANULAR MATERIAL = 500 CY

Note: Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "grading".

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS					
LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	3.5"ASPHALT MILLING	
-Y1-	14+50 TO 22+46	1952			
-Y2-	10+20 TO 13+00	631			
	TOTAL	2,583			
	SAY	2600			

COMPUTED BY: K. de Montbrun DATE: 11/09/2018
CHECKED BY: M. Walko DATE: 11/12/2018

(5-15-18)

PROJECT NO.
R-5712

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 GEOTEXTILE
FOR PAVEMENT STABILIZATION

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
	CONTINGENCY			
	TOTAL SY/TONS:		0	0*

*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

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 Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
L	21+10	26+75	ASU	12	250	500	750		
	CONTINGENCY		ASU		200	250	300		
	TOTAL CY/TONS/SY:				450	750**	1050**	0	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil 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 ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
							TOTAL SY:	0

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
					TOTAL SY:	0	0	0*	0**

*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.
**Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

SUMMARY OF PRE-SPLITTING OF ROCK

LINE	Beginning Rock Cut Slope (H:V)	Approx. Station	Ending Rock Cut Slope (H:V)	Approx. Station	Location LT/RT	Pre-splitting of Rock SY
					TOTAL SY:	0

SUMMARY OF SURCHARGES
AND SURCHARGE WAITING PERIODS

LINE	Station	Station	Surcharge Height FT	MONTHS

SUMMARY OF SETTLEMENT GAUGES

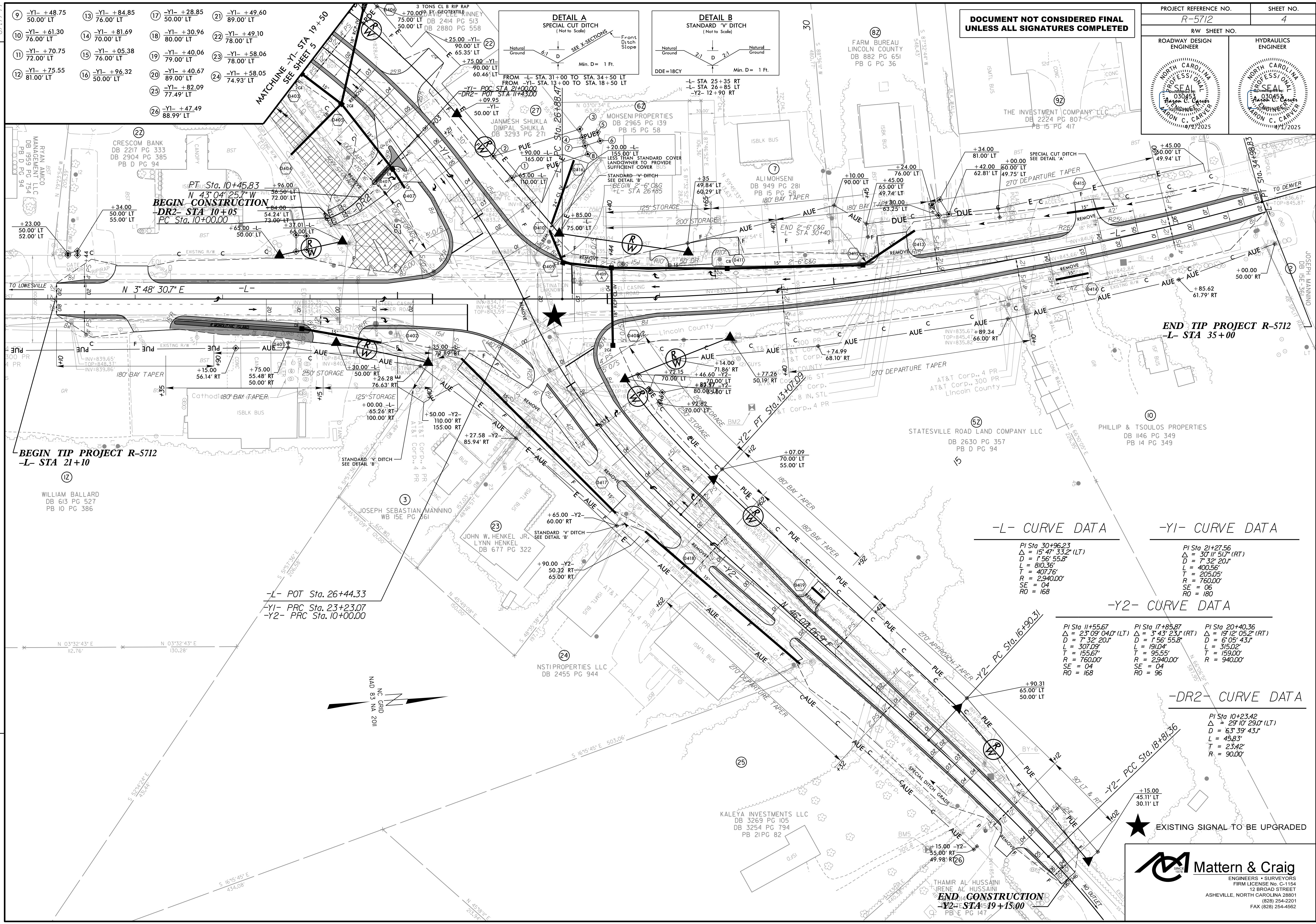
Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
TOTAL GAUGES (EACH):			

SUMMARY OF EMBANKMENT
WAITING PERIODS

LINE	Station	Station	MONTHS

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS

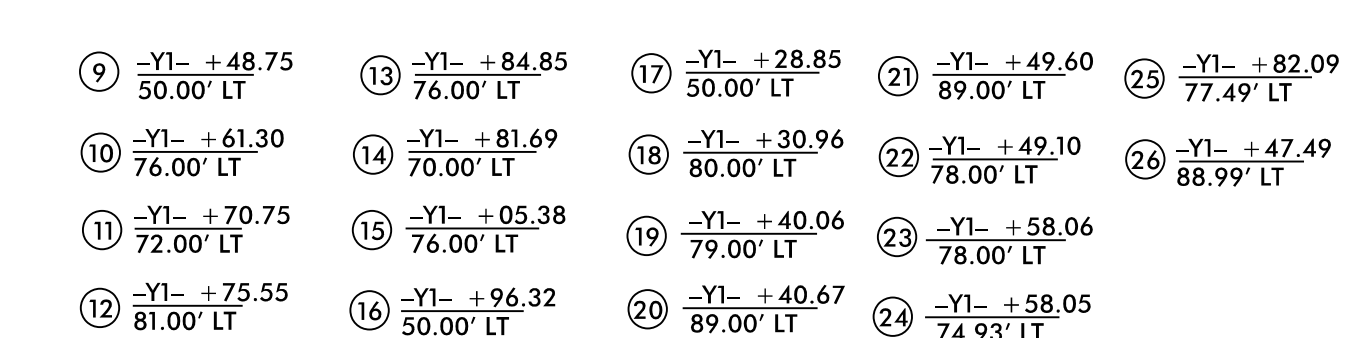


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.		SHEET NO.
R-5712		4
RW SHEET NO.		HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		

REVISIONS

Mattern & Craig
ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562



DETAIL A
SPECIAL CUT DITCH
 (Not to Scale)

↓
 D

5:1

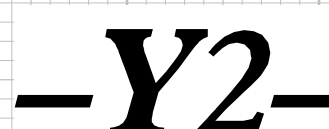
SEE X-SECTIONS

Front
Ditch
Slope

Min. D = 1 Ft.

FROM -L- STA. 31+00	TO STA. 34+50	LT
FROM -YI- STA. 13+00	TO STA. 18+50	LT

-YI- CURVE DATA			-DRI- CURVE DATA		
PI Sta 13+64.75	PI Sta 16+97.32	PI Sta 21+27.56		PI Sta 11+40.77	
Δ = 9' 41" 47.7" (RT)	Δ = 12' 42" 06.6" (LT)	Δ = 30' 11" 51.7" (RT)		Δ = 1' 57" 37.8" (LT)	
D = 4' 35" 01.2"	D = 2' 48" 31.0"	D = 7' 32" 20.1"		D = 4' 05" 33.2"	
L = 211.55'	L = 452.25'	L = 400.56'		L = 47.90'	
T = 106.03'	T = 227.05'	T = 205.05'		T = 23.95'	
R = 1,250.00'	R = 2,040.00'	R = 760.00'		R = 1,400.00'	
SE = 04	SE = 05	SE = 06			
RO = 120	RO = 150	RO = 180			



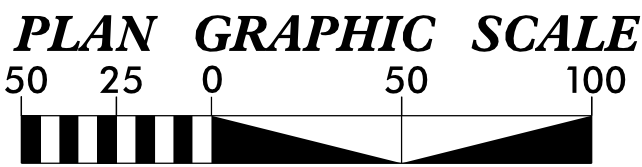
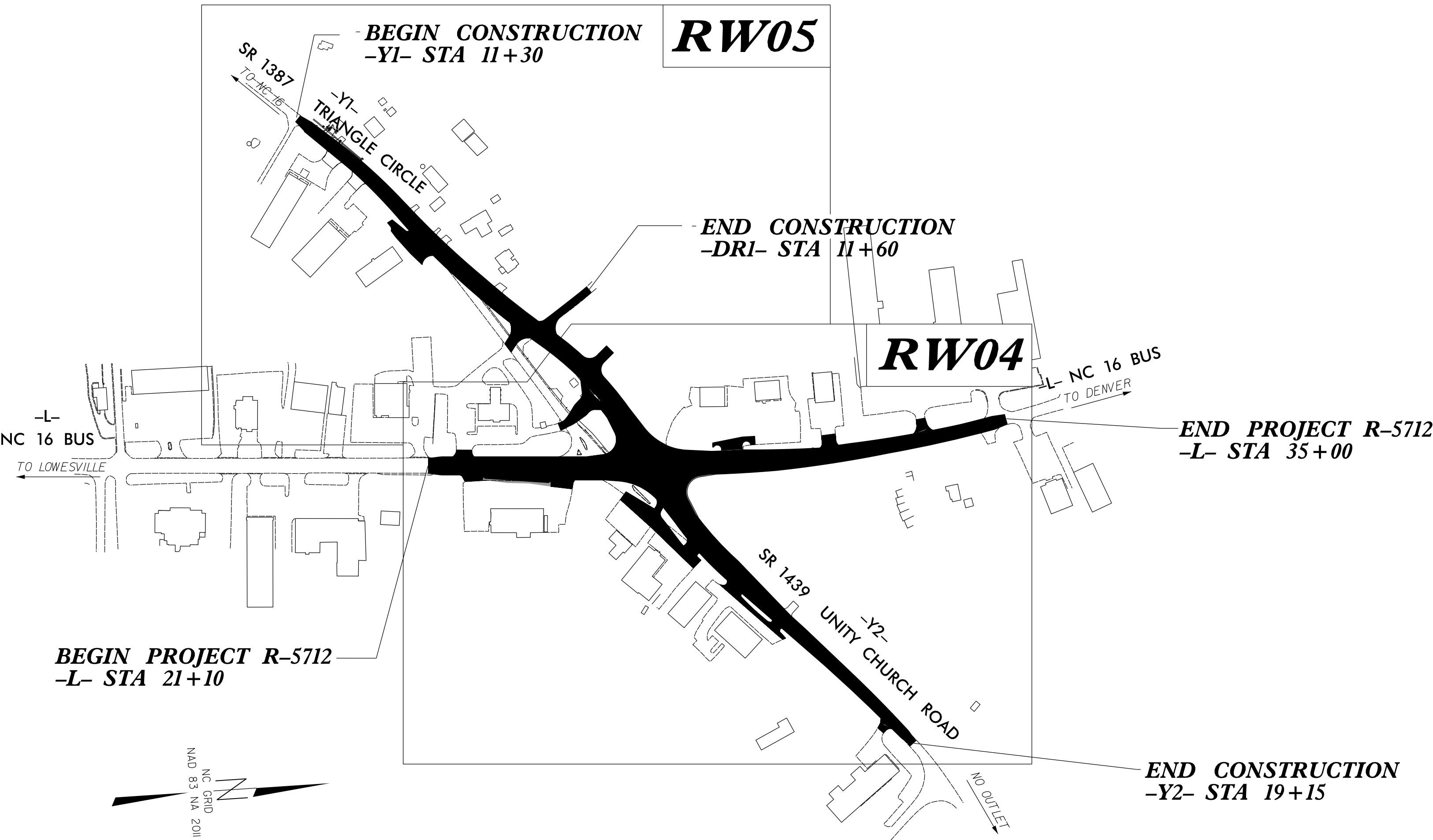
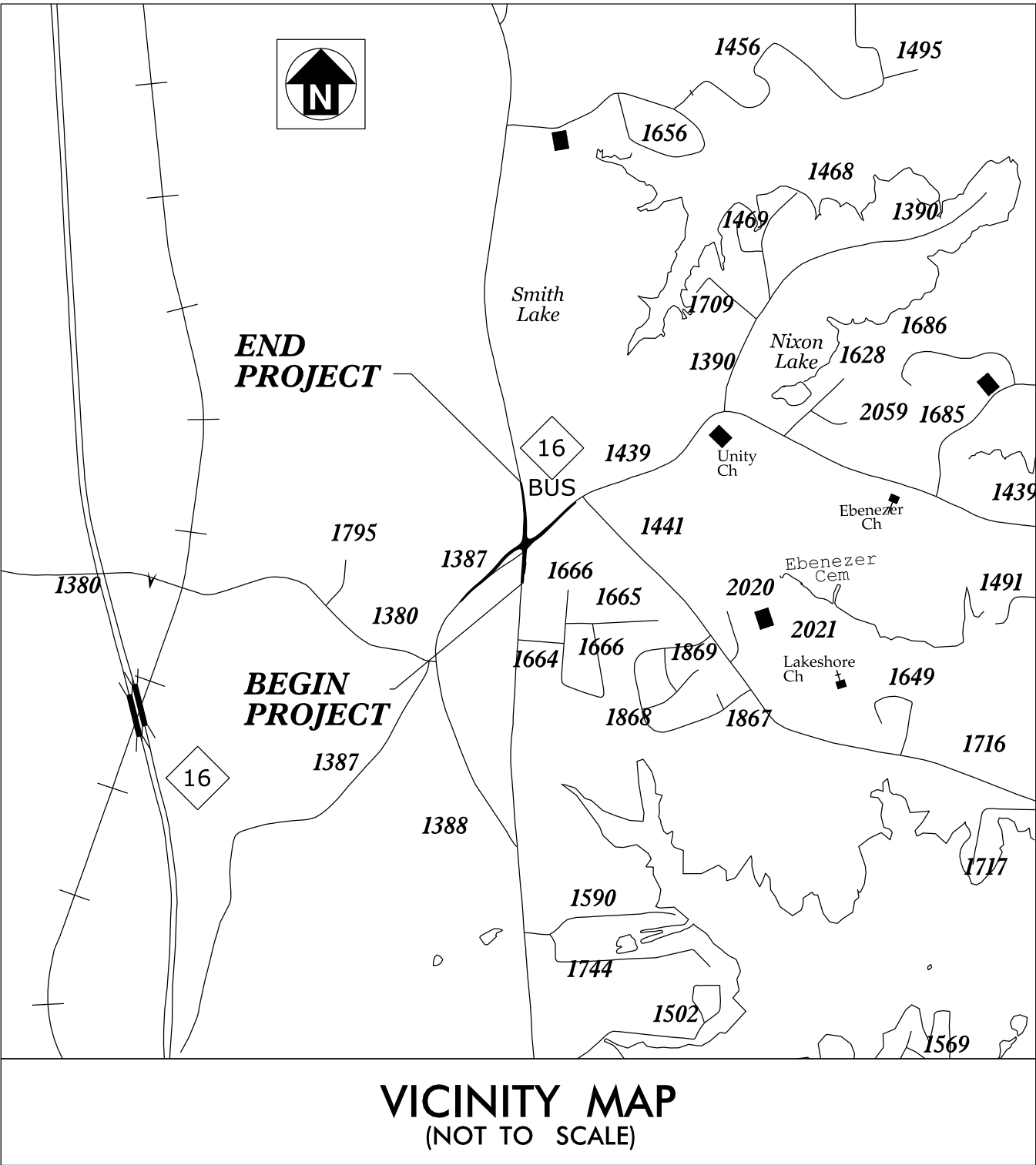
TIP PROJECT: R-5712

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5712	RW01	05

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

LINCOLN COUNTY



DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "R5712-2" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 635,072.331(ft) EASTING: 1,406,594.413(ft) ELEVATION: 842.34(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999845 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "5712-2" TO -L- STATION 10+21.00 IS N 08-16'41" E 366.43(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:
DRMP
DRMP NC, INC.
NC License No: C-4923
8210 University Executive Park Dr, Suite 220
Charlotte, NC 28262
PHONE: (833) 811 3767

2024 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE: 01/14/2019
LETTING DATE: 11/26/2024

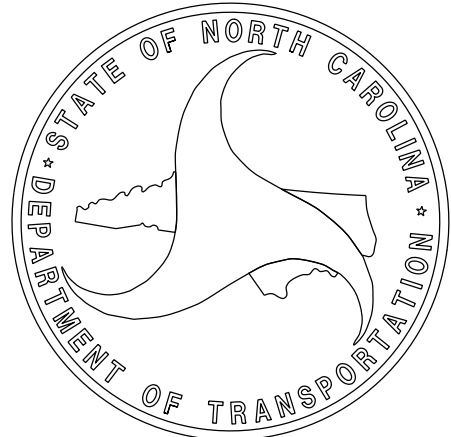
PROFESSIONAL LAND
SURVEYOR



DocuSigned by:

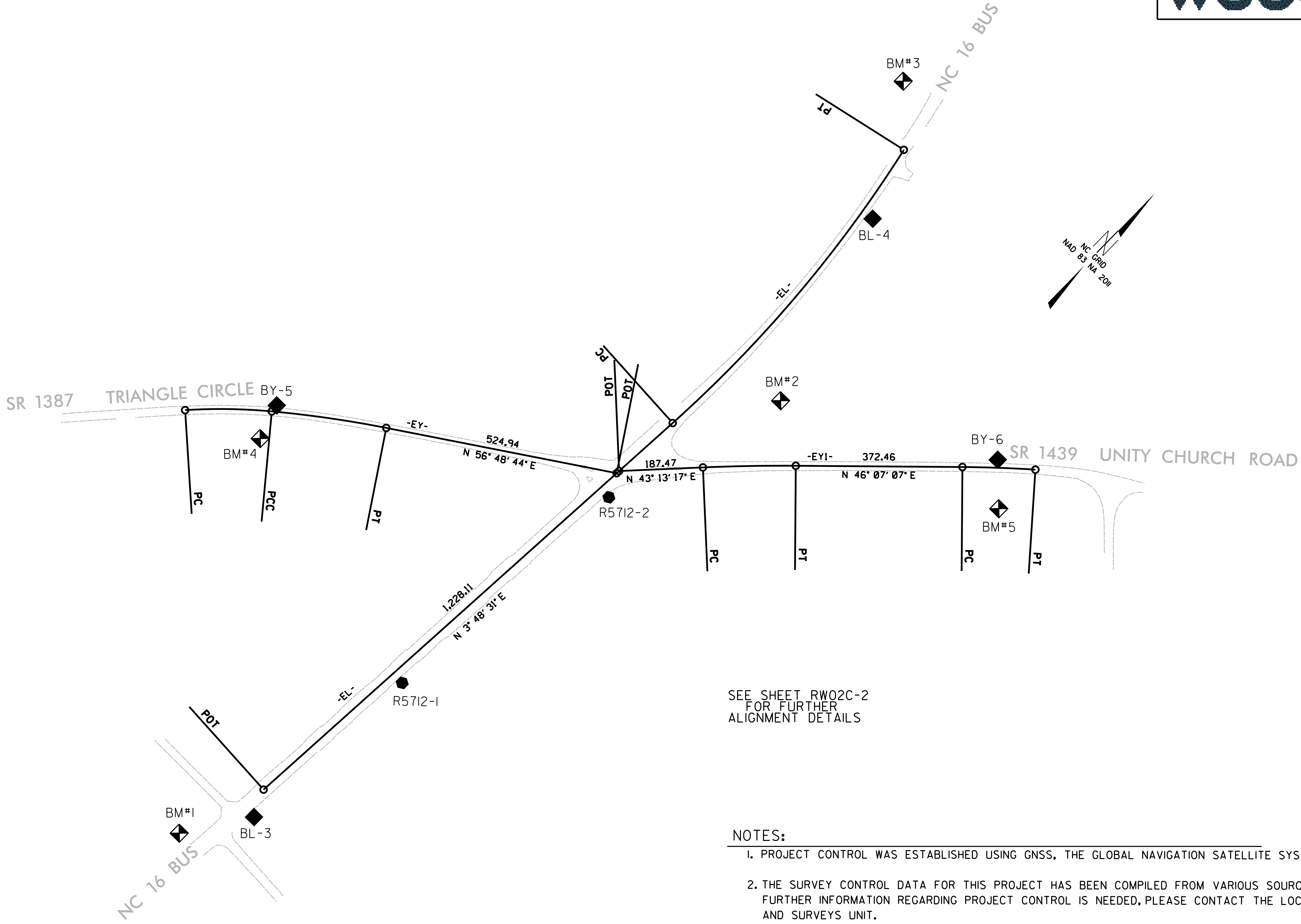
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SIGNATURE:

09/13/2024
Date:



SURVEY CONTROL SHEET
W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
R-5712	RW02C-1
Location and Surveys	



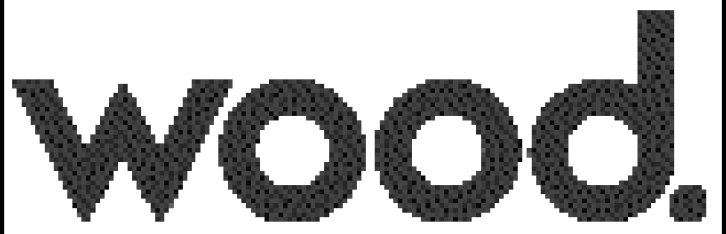
- NOTES:
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
 2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

SURVEY CONTROL SHEET
W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.
R-5712

SHEET NO.
RW02C-2

Location and Surveys



BL	POINT	DESC.	NORTH	EAST	ELEVATION
3		BL-3	634006.6040	1406526.2630	841.13
1		R5712-1	634452.5640	1406553.7390	850.55
2		R5712-2	635072.3310	1406594.4130	842.34
4		BL-4	635930.1460	1406581.0460	845.59

BY	POINT	DESC.	NORTH	EAST	ELEVATION
5		BY-5	634700.8620	1405919.6130	837.63
102		R5712-2	635072.3310	1406594.4130	842.34
6		BY-6	635739.6860	1407157.6330	856.92

.....
BM1 ELEVATION = 835.42
N 633864 E 1406432
BENCH TIE SPIKE IN 24" OAK
.....

.....
BM2 ELEVATION = 849.70
N 635495 E 1406718
BENCH TIE SPIKE IN 12" OAK
.....

.....
BM3 ELEVATION = 846.82
N 636198 E 1406415
BENCH TIE SPIKE IN 15" GUM
.....

.....
BM4 ELEVATION = 840.25
N 634622 E 1405945
BENCH TIE SPIKE IN 18" BIRCH
.....

.....
BM5 ELEVATION = 860.22
N 635663 E 1407236
BENCH TIE SPIKE IN 18" POPLAR
.....

EL	POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT		634065.432	1406498.861	N 03°48'30.7" E	1228.11					
LINE		635290.828	1406580.434							
PC				N 04°05'16.0" W	800.13	15°47'33.2"(L T)	01°58'03.0"	802.67	403.90	2912.11
CURVE		636088.924	1406523.397							
PT										

EY	POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC		634550.209	1405780.520							
CURVE				N 46°31'40.5" E	193.71	08°54'04.8"(RT)	04°35'26.4"	193.90	97.15	1248.09
PCC		634683.478	1405921.094							
CURVE				N 53°53'43.4" E	258.51	05°50'00.8"(RT)	02°15'20.2"	258.63	129.42	2540.15
PT		634835.811	1406129.958							
LINE				N 56°48'43.8" E	524.94					
POT		635123.157	1406569.273							

EY1	POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT		635130.385	1406569.754							
LINE				N 43°13'17.1" E	187.47					
PC		635266.994	1406698.134							
CURVE				N 44°40'12.0" E	207.63	02°53'49.7"(RT)	01°23'42.7"	207.65	103.85	4106.65
PT		635414.653	1406844.103							
LINE				N 46°07'06.9" E	372.46					
PC		635672.833	1407112.565							
CURVE				N 47°44'40.8" E	163.23	03°15'08.0"(RT)	01°59'31.8"	163.25	81.65	2876.06
PT		635782.594	1407233.380							

- NOTES:
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
 - THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

6/2/99

REVISIONS

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PROPOSED ALIGNMENT CONTROL SHEET

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	633602.2259	1406468.0254
PC	26+88.47	635286.9678	1406580.1773
PT	34+98.83	636092.7087	1406522.5940
POT	43+39.22	636914.7867	1406348.0951

Y1			
TYPE	STATION	NORTH	EAST
POT	10+00.00	634358.0536	1405607.0328
PC	12+58.72	634550.0887	1405780.4114
PRC	14+70.27	634694.3916	1405934.7547
PRC	19+22.52	635011.1589	1406256.2331
PT	23+23.07	635242.9289	1406577.2457

Y2			
TYPE	STATION	NORTH	EAST
PC	10+00.00	635242.9289	1406577.2457
PT	13+07.09	635405.9345	1406835.0365
PC	16+90.31	635671.5748	1407111.2568
PCC	18+81.36	635799.4331	1407253.1588
PT	21+96.38	635958.8428	1407523.1614
POT	22+23.47	635968.5326	1407548.4612

DR1			
TYPE	STATION	NORTH	EAST
POT	10+00.00	634989.0240	1406238.0030
PC	11+16.81	635085.6998	1406172.4346
PT	11+64.72	635124.8776	1406144.8728

DR2			
TYPE	STATION	NORTH	EAST
PC	10+00.00	635023.8704	1406471.0885
PT	10+45.83	635063.7158	1406449.4664
POT	11+43.00	635134.6978	1406383.1035

PROJECT REFERENCE NO.
R-5712

SHEET NO.
RW02D-1

Location and Surveys





DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I, August A. Thick, PLS, certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

This 13th day of September, 2024.

DocuSigned by:

Professional Land Surveyor L-5373

NOTES:

- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
- THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

I/13/25
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gdp-offit
AT LS-329852
R-Projects\R-Projects\5712-NC16_TriangleCircle_Lincoln\512-25-001_RW_sheets\R-5712_LS_RW03E-1.dgn
4-RW sheets

RIGHT OF WAY CONTROL SHEET

ROW MARKER IRON PIN AND CAP-E				
ALIGN	STATION	OFFSET	NORTH	EAST
L	23+65.00	-50.00	634967.5326	1406508.8021
L	24+30.00	50.00	635025.7468	1406612.8987
L	24+37.01	-66.00	635040.4422	1406497.6189
L	25+35.00	72.89	635128.9948	1406642.7082
L	26+85.00	-75.00	635288.4864	1406505.1124
L	28+35.00	-49.84	635434.1876	1406536.4274
L	28+77.26	50.19	635475.5016	1406636.8524

ROW MARKER IRON PIN AND CAP-E				
ALIGN	STATION	OFFSET	NORTH	EAST
Y1	11+30.00	-30.00	634474.6490	1405671.8827
Y1	11+30.00	30.00	634434.4411	1405716.4172
Y1	11+30.00	50.00	634421.0384	1405731.2621
Y1	11+30.00	-50.00	634488.0516	1405657.0379
Y1	12+58.72	50.00	634516.5821	1405817.5235
Y1	12+58.72	-50.00	634583.5953	1405743.2993
Y1	14+70.27	-50.00	634733.6703	1405903.8164
Y1	14+70.27	50.00	634655.1129	1405965.6931
Y1	16+87.26	50.00	634801.6878	1406132.6926
Y1	18+81.69	-70.00	635024.9225	1406176.7342
Y1	18+82.09	-77.49	635030.0524	1406171.2606
Y1	18+84.85	-76.00	635031.1214	1406174.1155
Y1	18+96.32	-50.00	635022.9428	1406201.1853
Y1	19+05.38	-76.00	635046.2979	1406186.7787
Y1	19+22.52	-50.00	635042.6737	1406217.4154
Y1	19+28.85	-50.00	635047.8974	1406221.6926
Y1	19+30.96	-80.00	635068.7926	1406200.0450
Y1	19+40.06	-79.00	635075.8435	1406207.2787
Y1	19+40.67	-89.00	635082.8436	1406200.1051
Y1	19+47.49	-88.99	635088.6162	1406205.0839
Y1	21+09.95	-50.00	635180.7464	1406361.0808

ROW MARKER IRON PIN AND CAP-E				
ALIGN	STATION	OFFSET	NORTH	EAST
Y2	11+42.57	-55.00	635352.4772	1406676.3688
Y2	13+07.09	-55.00	635445.5771	1406796.9123
Y2	16+90.31	-50.00	635707.6136	1407076.5984
Y2	19+15.00	-30.11	635844.3582	1407260.6724

ROW MARKER PERMANENT EASEMENT-E				
ALIGN	STATION	OFFSET	NORTH	EAST
L	19+60.00	50.00	634556.7847	1406581.6803
L	19+60.00	60.00	634556.1205	1406591.6582
L	21+23.00	-50.00	634726.0670	1406492.7279
L	21+23.00	-52.00	634726.1998	1406490.7323
L	21+34.00	-50.00	634737.0427	1406493.4586
L	21+34.00	-55.00	634737.3748	1406488.4696
L	23+15.00	56.14	634910.5932	1406611.3830
L	23+75.00	50.00	634970.8683	1406609.2455
L	23+75.00	55.48	634970.5040	1406614.7168
L	23+84.00	-54.24	634986.7725	1406505.8294
L	23+84.00	-73.00	634988.0183	1406487.1149
L	23+96.00	-56.50	634998.8961	1406504.3713
L	23+96.00	-72.00	634999.9254	1406488.9098
L	25+26.28	76.63	635120.0460	1406645.8683
L	28+14.00	71.86	635410.6516	1406657.6828
L	28+35.00	-60.29	635434.3581	1406525.9852
L	29+74.99	68.10	635575.4418	1406653.3282
L	30+10.00	-90.00	635604.4554	1406494.0487
L	30+45.00	-49.74	635640.5485	1406532.5948
L	30+45.00	-65.00	635639.7126	1406517.3546
L	31+24.00	-76.00	635715.8865	1406501.1243
L	31+30.00	-63.25	635722.7724	1406513.3465
L	31+34.00	-81.00	635725.1693	1406495.3312
L	31+42.00	-62.81	635734.5170	1406512.7797
L	31+89.34	66.00	635793.9896	1406636.4645
L	32+00.00	-49.75	635792.4056	1406520.2285
L	32+00.00	-60.00	635791.3058	1406510.0393
L	33+85.62	61.79	635992.0374	1406604.8502
L	35+00.00	50.00	636104.2357	1406571.2612

ROW MARKER PERMANENT EASEMENT-E				
ALIGN	STATION	OFFSET	NORTH	EAST
Y1	16+56.21	66.94	634767.3436	1406121.4202
Y1	16+73.00	-55.00	634867.1521	1406049.3736
Y1	16+73.00	-50.00	634863.5505	1406052.8419
Y1	16+85.00	-52.00	634873.1275	1406059.8541
Y1	16+85.00	-50.00	634871.6951	1406061.2498
Y1	18+20.00	100.00	634866.3776	1406264.0175
Y1	18+20.00	81.58	634878.6895	1406250.3203
Y1	18+48.75	-50.00	634987.6432	1406171.0625
Y1	18+61.30	-76.00	635013.8709	1406159.4027
Y1	18+70.75	-72.00	635018.1769	1406168.3738
Y1	18+75.55	-81.00	635027.5285	1406164.5206
Y1	19+49.10	-78.00	635082.7530	1406214.5488
Y1	19+49.60	-89.00	635090.4029	1406206.6249
Y1	19+50.00	-50.00	635065.0767	1406236.2859
Y1	19+50.00	-75.00	635081.5256	1406217.4594
Y1	19+58.05	-74.93	635088.1089	1406223.3658
Y1	19+58.06	-78.00	635090.1591	1406221.0815
Y1	19+70.00	-75.00	635097.8809	1406232.1331
Y1	19+70.00	-50.00	635080.9423	1406250.5203
Y1	21+69.65	-52.51	635218.9354	1406412.1334
Y1	21+97.37	-151.61	635319.9591	1406387.6028
Y1	21+99.96	-55.71	635238.4786	1406438.2597
Y1	22+05.37	-148.82	635322.3165	1406397.3113
Y1	22+09.31	-166.13	635339.7345	1406392.9386
Y1	22+13.44	-146.12	635324.6762	1406407.0292
Y1	22+17.26	-163.56	635342.1694	1406402.6376
Y1	22+21.56	-143.52	635327.0380	1406416.7556

ROW MARKER PERMANENT EASEMENT-E				
ALIGN	STATION	OFFSET	NORTH	EAST
Y2	11+27.58	85.94	635223.7036	1406735.6469
Y2	11+46.60	-70.00	635367.1845	1406671.6448
Y2	11+72.15	-70.00	635379.7336	1406691.1580
Y2	11+83.97	-80.00	635393.9889	1406694.3588
Y2	11+92.82	-70.00	635390.3569	1406706.6221
Y2	12+65.00	60.00	635332.1328	1406843.0410
Y2	13+07.09	-70.00	635456.3888	1406786.5147
Y2	16+90.31	-65.00	635718.4261	1407066.2000
Y2	18+15.00	55.00	635714.8482	1407239.3420
Y2	18+15.00	49.98	635718.6103	1407236.0192
Y2	19+15.00	-45.11	635856.1607	1407251.4156

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED AUGUST TO SEPTEMBER 2024 BY OTHERS, REVISED JANUARY 2025.

PROJECT REFERENCE NO.
R-5712

SHEET NO.
RW03E-1

Location and Surveys

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION 12 LOCATION AND SURVEYS UNIT
2312 KINGS ROAD EXTENSION
SHELBY, NC 28152
OFFICE: 704.480.5531

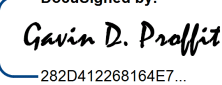
PROJECT SURVEYOR


DocuSigned by:
Gavin D. Proffitt
2820412268164E7...

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I, Gavin D. Proffitt, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed in January 2025, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

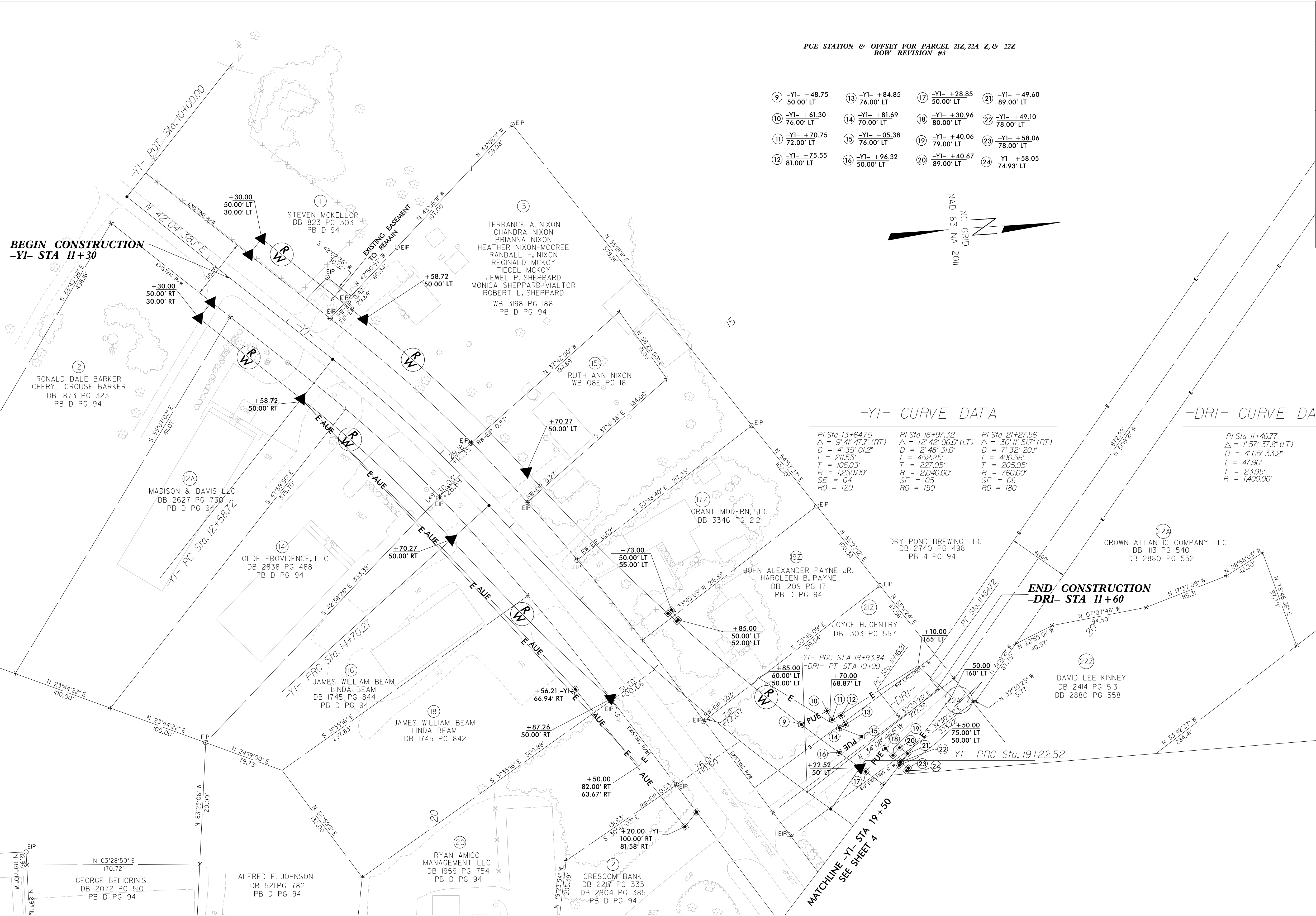
This 14th day of January, 2025.

Professional Land Surveyor L-5298

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6/2/2025

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REVISIONS



PUE STATION & OFFSET FOR PARCEL 21Z, 22A Z, & 22Z
ROW REVISION #3

9	-YI- +48.75 50.00' LT	13	-YI- +84.85 76.00' LT	17	-YI- +28.85 50.00' LT	21	-YI- +49.60 89.00' LT
10	-YI- +61.30 76.00' LT	14	-YI- +81.69 70.00' LT	18	-YI- +30.96 80.00' LT	22	-YI- +49.10 78.00' LT
11	-YI- +70.75 72.00' LT	15	-YI- +05.38 76.00' LT	19	-YI- +40.06 79.00' LT	23	-YI- +58.06 78.00' LT
12	-YI- +75.55 81.00' LT	16	-YI- +96.32 50.00' LT	20	-YI- +40.67 89.00' LT	24	-YI- +58.05 74.93' LT

NAD 83 NA 2011

-YI- CURVE DATA

PI Sta 13+64.75 Δ = 9' 41' 47.7" (RT) D = 4' 35' 01.2" L = 211.55' T = 106.03' R = 1,250.00' SE = 04 RO = 120	PI Sta 16+97.32 Δ = 12' 42' 06.6" (LT) D = 2' 48' 31.0" L = 452.25' T = 227.05' R = 2,040.00' SE = 05 RO = 150	PI Sta 21+27.56 Δ = 30' 11' 51.7" (RT) D = 7' 32' 20.1" L = 400.56' T = 205.05' R = 760.00' SE = 06 RO = 180
--	---	---

-DRI- CURVE DATA

PI Sta 11+40.77 Δ = 1' 57' 37.8" (LT) D = 4' 05' 33.2" L = 47.90' T = 23.95' R = 1,400.00'

END CONSTRUCTION
-DRI- STA 11+60

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED AUGUST TO SEPTEMBER 2024.

I, August A. Thick, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from August to September 2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

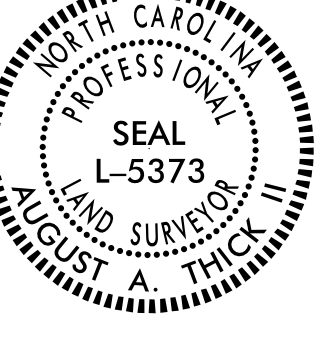
This 24th day of September, 2024.

Professional Land Surveyor L-5373

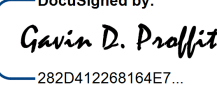
PROJECT REFERENCE NO. R-5712 SHEET NO. RW05

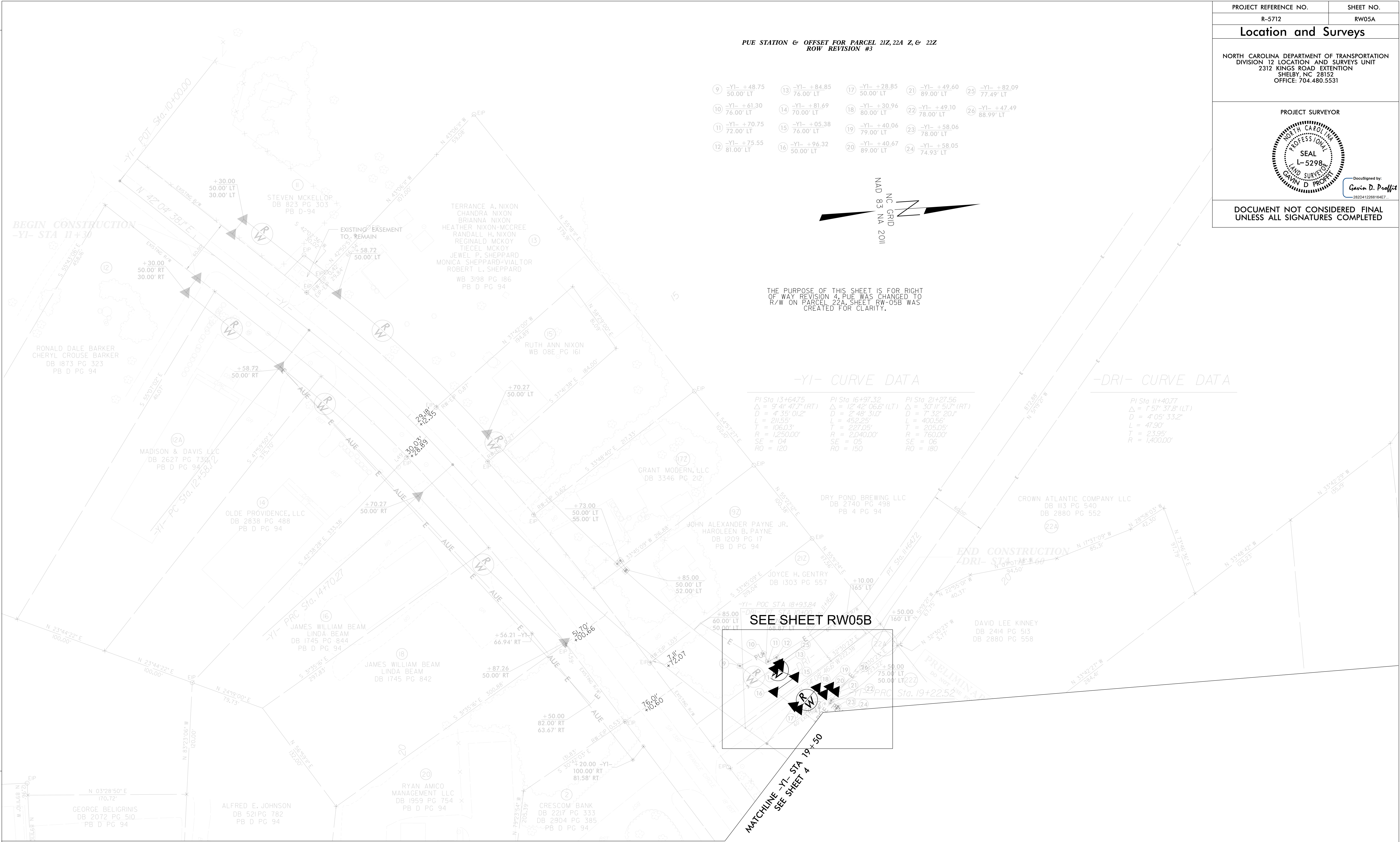
Location and Surveys





DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
R-5712	RW05A
Location and Surveys	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 12 LOCATION AND SURVEYS UNIT 2312 KINGS ROAD EXTENSION SHELBY, NC 28152 OFFICE: 704.480.5531	
PROJECT SURVEYOR	
	
DocuSign by:  2820D412268164E7	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 12 LOCATION AND SURVEYS UNIT 2312 KINGS ROAD EXTENSION SHELBY, NC 28152 OFFICE: 704.480.5531	

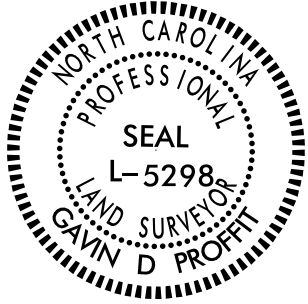


I, Gavin D. Proffitt, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed in January 2025, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 13th day of January, 2025.

DocuSigned by:
Gavin D. Proffitt
262D412268164E7...

Professional Land Surveyor L-5298



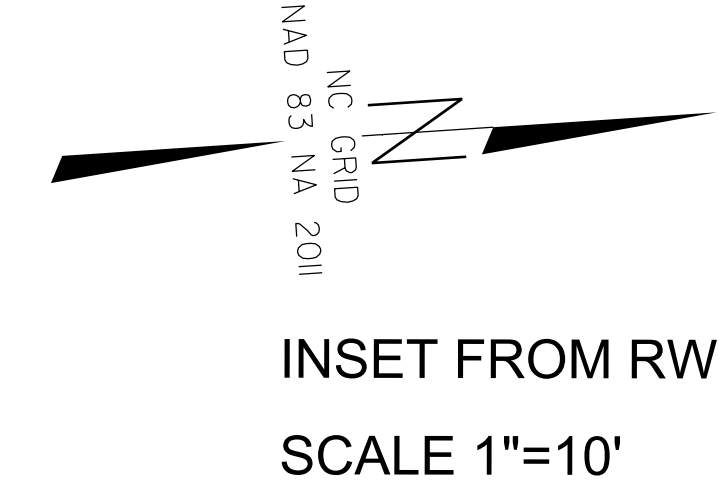
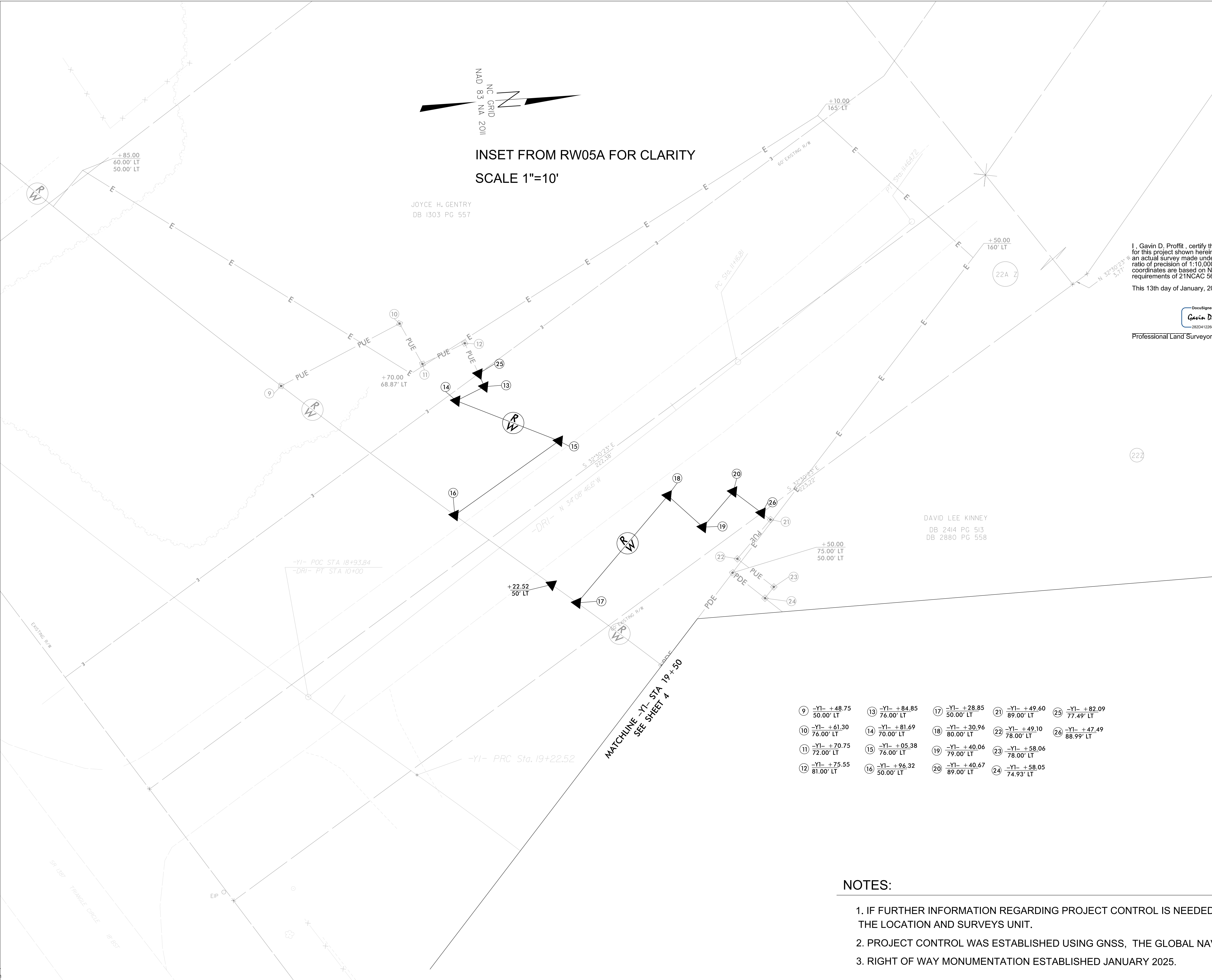
NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED AUGUST TO SEPTEMBER 2024 BY OTHERS, REVISED JANUARY 2025

1/14/25

14-JAN-2025 12:48
S:\Projects\Lincoln\LS12-25-001_Rw_Revision 4_Rw_sheets\RW05B 10 SCALE\RW-5712.LS.RW05B.dgn
gdp:offit AT LS-329852

REVISIONS



PROJECT REFERENCE NO.	SHEET NO.
R-5712	RW05B
Location and Surveys	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 12 LOCATION AND SURVEYS UNIT 2312 KINGS ROAD EXTENSION SHELBY, NC 28152 OFFICE: 704.480.5531	
PROJECT SURVEYOR DocuSigned by: Gavin D. Proffitt 282D41228B164E7	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, Gavin D. Proffitt, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed in January 2025, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 13th day of January, 2025.

DocuSigned by:
Gavin D. Proffitt
282D41228B164E7
Professional Land Surveyor L-5298

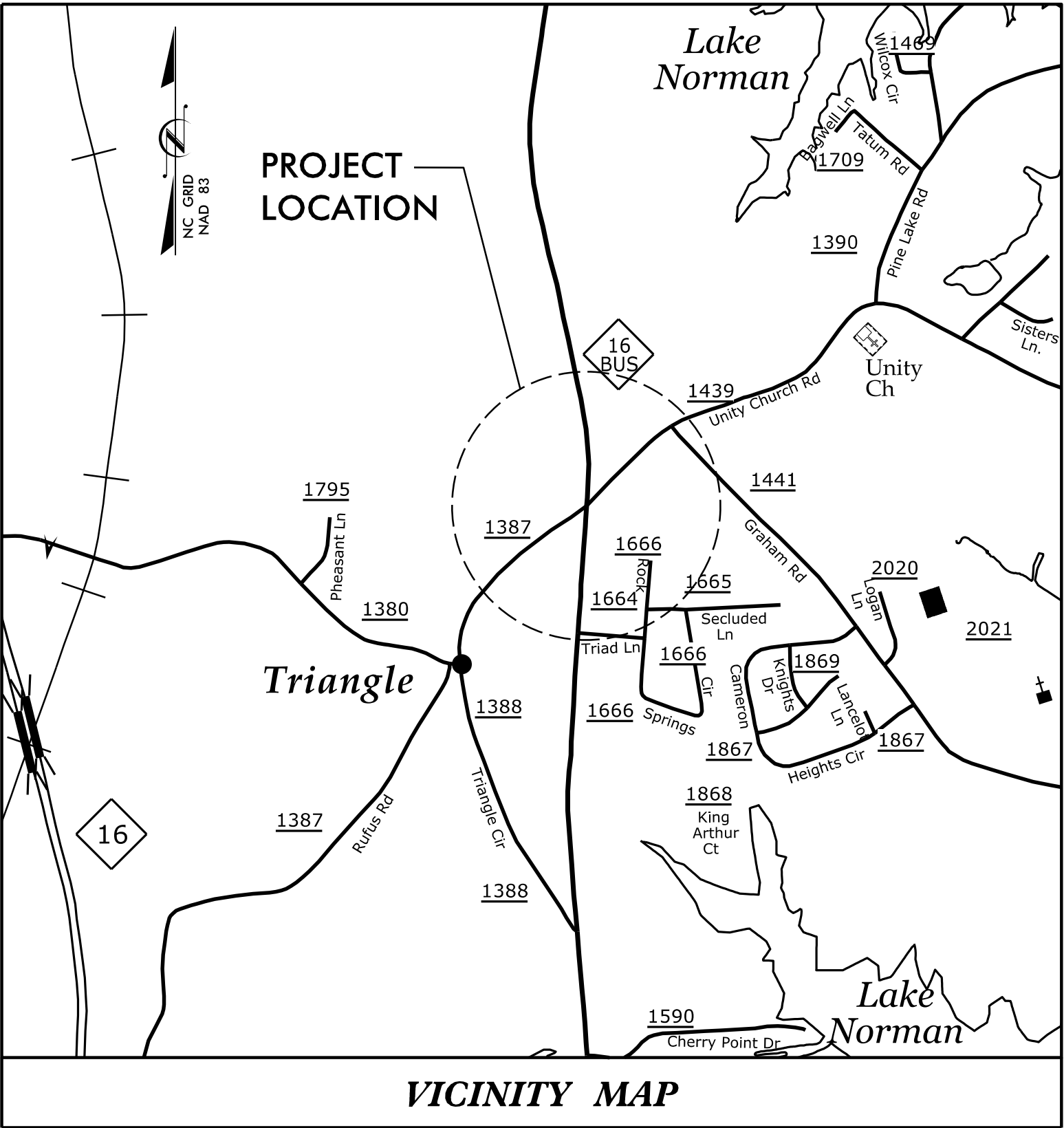
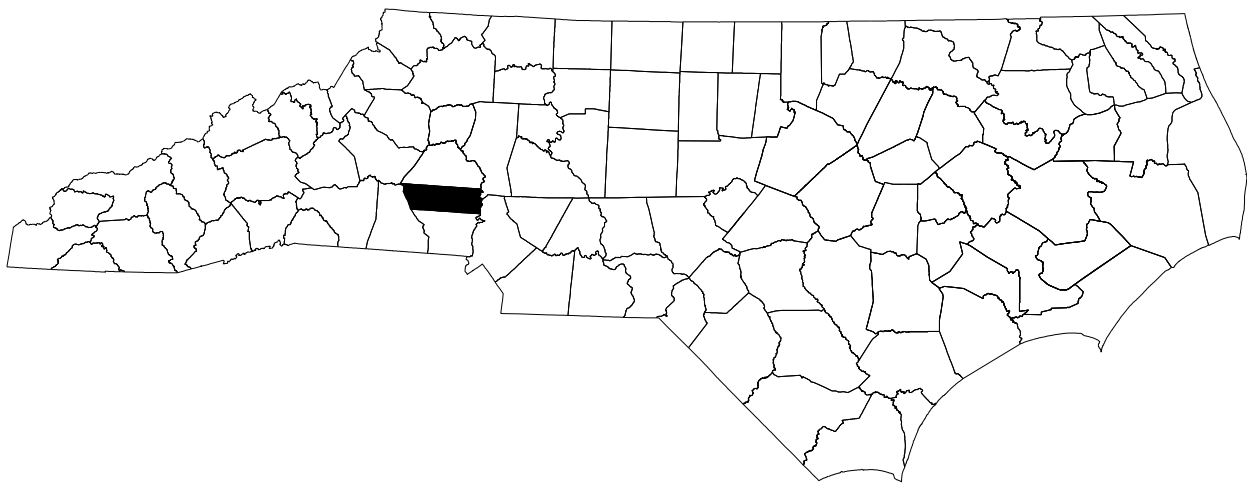
9	-Y1- +48.75 50.00' LT	13	-Y1- +84.85 76.00' LT	17	-Y1- +28.85 50.00' LT	21	-Y1- +49.60 89.00' LT	25	-Y1- +82.09 77.49' LT
10	-Y1- +61.30 76.00' LT	14	-Y1- +81.69 70.00' LT	18	-Y1- +30.96 80.00' LT	22	-Y1- +49.10 78.00' LT	26	-Y1- +47.49 88.99' LT
11	-Y1- +70.75 72.00' LT	15	-Y1- +05.38 76.00' LT	19	-Y1- +40.06 79.00' LT	23	-Y1- +58.06 78.00' LT		
12	-Y1- +75.55 81.00' LT	16	-Y1- +96.32 50.00' LT	20	-Y1- +40.67 89.00' LT	24	-Y1- +58.05 74.93' LT		

- NOTES:
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
 2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
 3. RIGHT OF WAY MONUMENTATION ESTABLISHED JANUARY 2025.

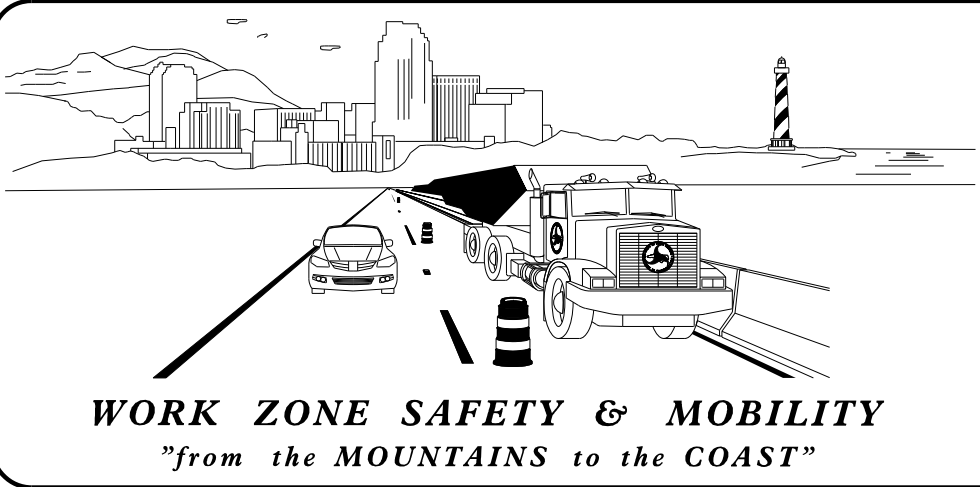
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

LINCOLN COUNTY



LOCATION: NC 16 BUSINESS AT SR 1387 (TRIANGLE CIRCLE) /SR 1439 (UNITY CHURCH ROAD)



PLANS PREPARED BY:

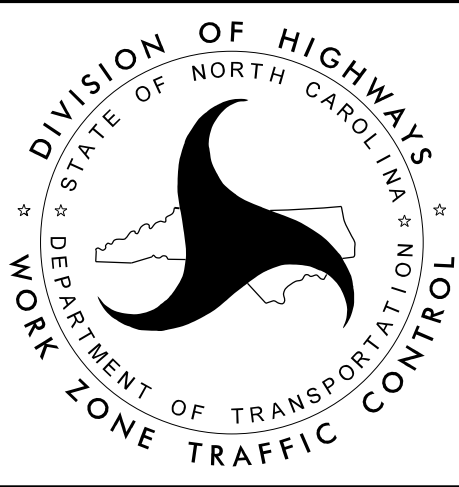
JAMES B. VOSO, PE

AARON C. CARVER, PE

NCDOT CONTACTS:

BRYAN SOWELL, PE
PROJECT ENGINEER

PROJECT DESIGN ENGINEER



PLANS PREPARED BY:

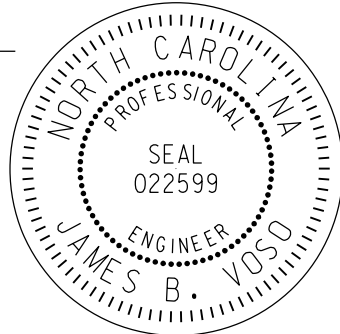
Mattern & Craig
ENGINEERS & SURVEYORS

12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

APPROVED: James B. Voso, PE
DATE: 3/13/2025

SEAL



SHEET NO.
TMP-1

R-5712

TIP PROJECT:

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	TRUCK MOUNTED ATTENUATOR
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

LEGEND

GENERAL

	DIRECTION OF TRAFFIC FLOW
	DIRECTION OF PEDESTRIAN TRAFFIC FLOW
	EXIST. PVMT.
	NORTH ARROW
	PROPOSED PVMT.
	WORK AREA
	TEMPORARY PAVEMENT
	WEDGING
	PAVEMENT REMOVAL

TRAFFIC CONTROL DEVICES

	BARRICADE (TYPE III)
	CONE
	DRUM
	SKINNY DRUM
	TUBULAR MARKER
	TEMPORARY CRASH CUSHION
	FLASHING ARROW PANEL (TYPE C)
	FLAGGER
	LAW ENFORCEMENT
	TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
	CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

	PORTABLE SIGN
	STATIONARY SIGN
	STATIONARY OR PORTABLE SIGN

SIGNALS

	EXISTING
	PROPOSED
	TEMPORARY
	PORTABLE TRAFFIC SIGNAL

PAVEMENT MARKINGS

	EXISTING LINES
	TEMPORARY LINES

EXISTING PAVEMENT MARKING SYMBOLS

	PAVEMENT MARKING SYMBOLS
--	--------------------------

PAVEMENT MARKING SYMBOLS

	PAVEMENT MARKING SYMBOLS
--	--------------------------

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION
	PAINT
PA	WHITE EDGE LINE (4")
PD	3FT. - 9FT./SP WHITE MINISKIP (4")
PE	WHITE SOLID LANE LINE (4")
PI	YELLOW DOUBLE CENTER (4")
PV	YELLOW DIAGONAL (12")
P2	WHITE STOP BAR (24")
P8	2FT. - 6FT./SP WHITE MINISKIP (4")

TEMPORARY PAVEMENT MARKING SYMBOLS

SYMBOL	DESCRIPTION
	PAINT
QA	LEFT TURN ARROW
QB	RIGHT TURN ARROW
QC	STRAIGHT ARROW
QE	COMBO, RIGHT/STRAIGHT ARROW

TEMPORARY RAISED PAVEMENT MARKERS

SYMBOL	DESCRIPTION
	MARKER
ME	YELLOW & YELLOW
MF	CRYSTAL & RED

PHASING

NOTES:
BEFORE BEGINNING ANY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS AND TRAFFIC CONTROL DEVICES. FIELD VERIFY LCOATIONS WITH THE RESIDENT ENGINEER PRIOR TO INSTALLATION.

MAINTAIN VEHICULAR ACCESS TO ALL RESIDENCES AND BUSINESSES DURING THE LIFE OF THE CONTRACT UNLESS OTHERWISE NOTED IN THE PHASING OR DIRECTED BY THE ENGINEER.

COMPLETE ANY PROPOSED OR TEMPORARY WIDENING IN SUCH A MANNER THAT NO PONDING OF WATER WILL OCCUR WITHIN THE TRAVEL LANE.

COMPLETE PAVING UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE UNTIL STATED TO PLACE FINAL LAYER IN THE PHASING

PHASE I

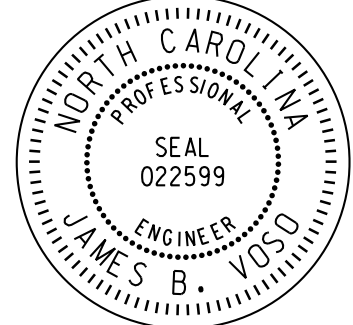
- STEP 1: INSTALL WORK ZONE ADVANCED WARNING SIGNS ON ALL -L- AND -Y- LINES ACCORDING TO RDWY STD. 1101.01.
- STEP 2: INSTALL AND ACTIVATE TEMPORARY SIGNALS. REMOVE EXISTING SIGNALS. (SEE SIGNAL PLANS)
- STEP 3: USING ROADWAY STANDARD DRAWING NO. 1101.02 SHEET 2 OF 14, CONSTRUCT THE FOLLOWING UP TO, BUT NOT INCLUDING THE FINAL PAVEMENT LAYER (SEE SHEET TMP-4 AND TMP-5):
- Y1- SR 1439 (UNITY CHURCH ROAD) FROM STA 18+30 +/- TO STA 22+96 +-.
-DR1- FROM STA 10+22 +/- TO STA 11+60.
- STEP 4: USING ROADWAY STANDARD DRAWING NO. 1101.02 SHEET 2 OF 14, CONSTRUCT THE FOLLOWING:
- THE WESTSIDE OF -L- NC 16 BUS. UP TO, BUT NOT INCLUDING THE FINAL SURFACE LAYER AS SHOWN ON TMP-4.
- PROPOSED DRAINAGE STRUCTURES ON SOUTHBOUND NC 16 BUS. AND PROPOSED AND TEMPORARY DRAINAGE STRUCTURES ON SR 1387 (TRIANGLE CIRCLE) AS SHOWN ON TMP-4 AND TMP-5.
- STEP 5: USING ROADWAY STANDARD DRAWING NO. 1101.02 SHEET 1 OF 14 AND FLAGGERS, REMOVE EXISTING WESTBOUND PAVEMENT FROM -Y1- STA 14+00+- TO -Y1- STA 17+42+- AND CONSTRUCT THE NORTHSIDE OF -Y1- FROM 11+30+- TO STA 18+30+- UP TO, BUT NOT INCLUDING THE FINAL SURFACE LAYER AS SHOWN ON TMP-5.

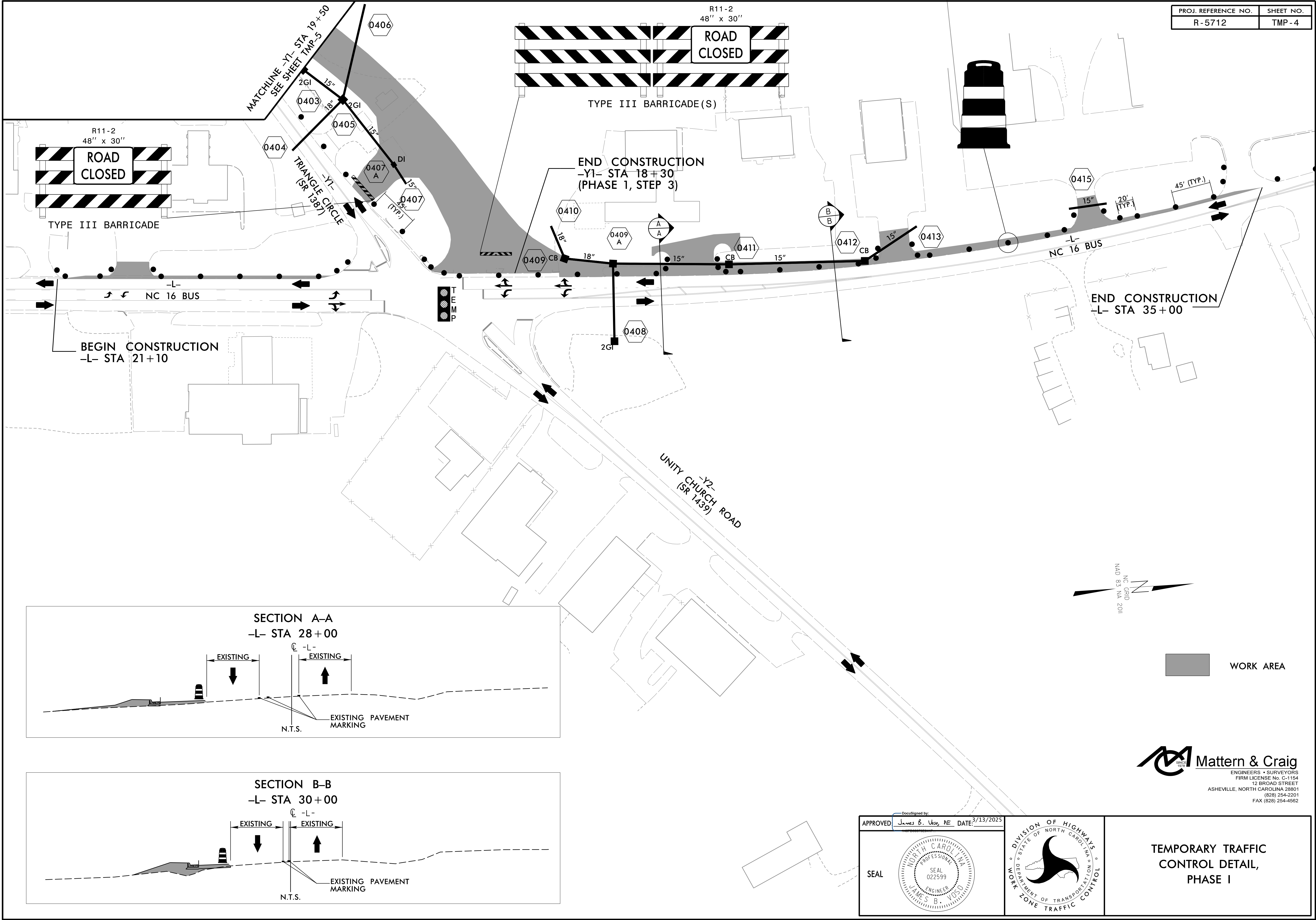
PHASE II

- STEP 1: INSTALL AND ACTIVATE TEMPORARY SIGNALS. REMOVE EXISTING SIGNALS. (SEE SIGNAL PLANS)
- STEP 2: USING ROADWAY STANDARD DRAWING NO. 1101.02 SHEETS 1 AND 2 OF 14, CONSTRUCT THE EASTSIDE OF -L- NC 16 BUS. AND THE NORTHSIDE OF -Y2- SR 1439 (UNITY CHURCH ROAD) ALONG WITH PROPOSED DRAINAGE STRUCTURES AS SHOWN ON TMP-6 AND TMP 7.

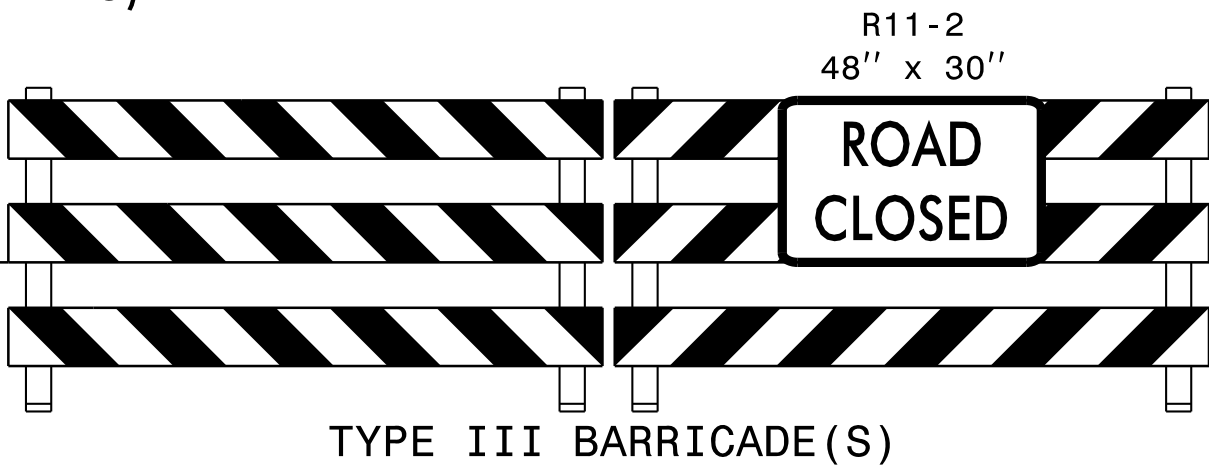
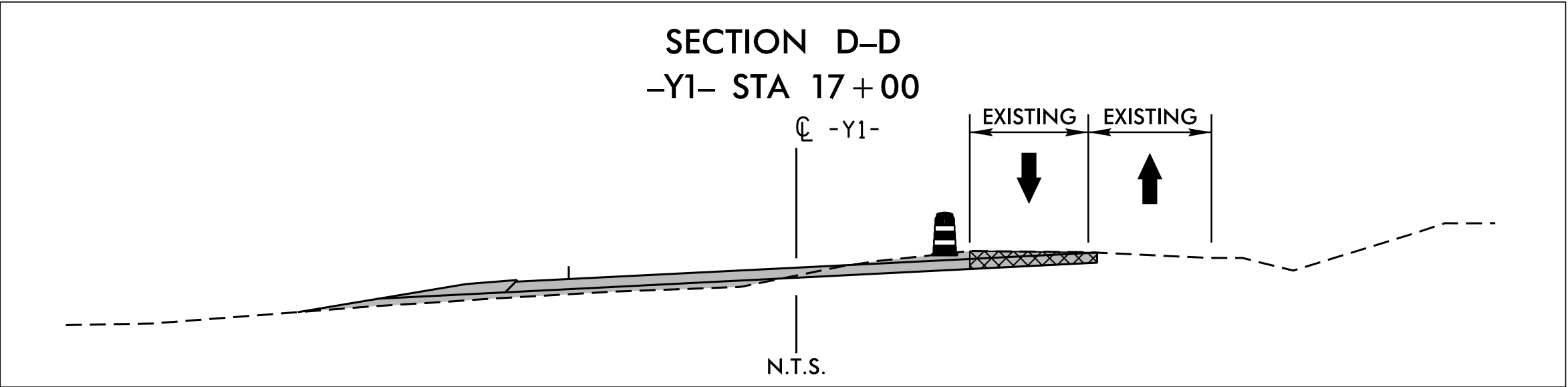
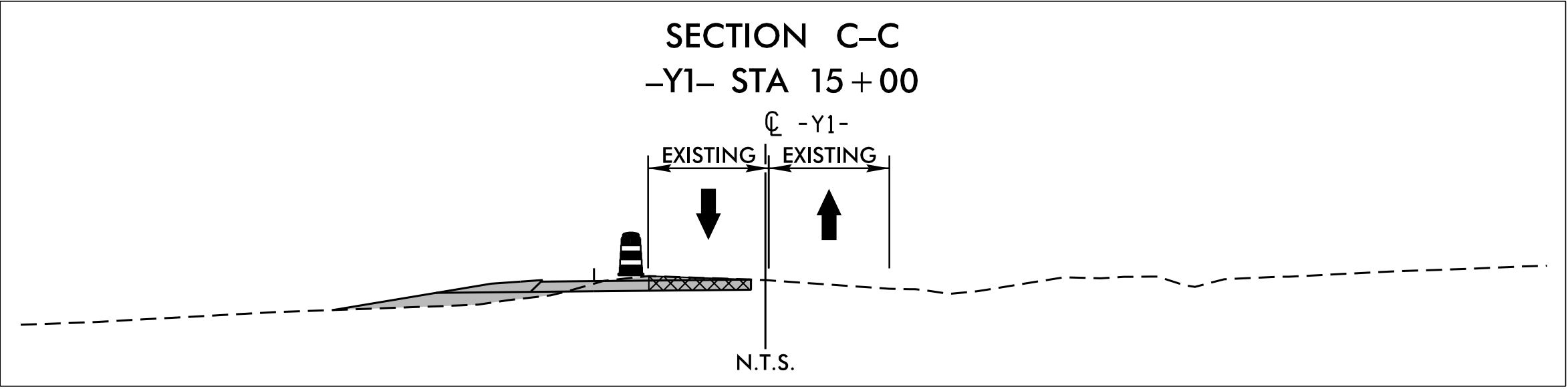
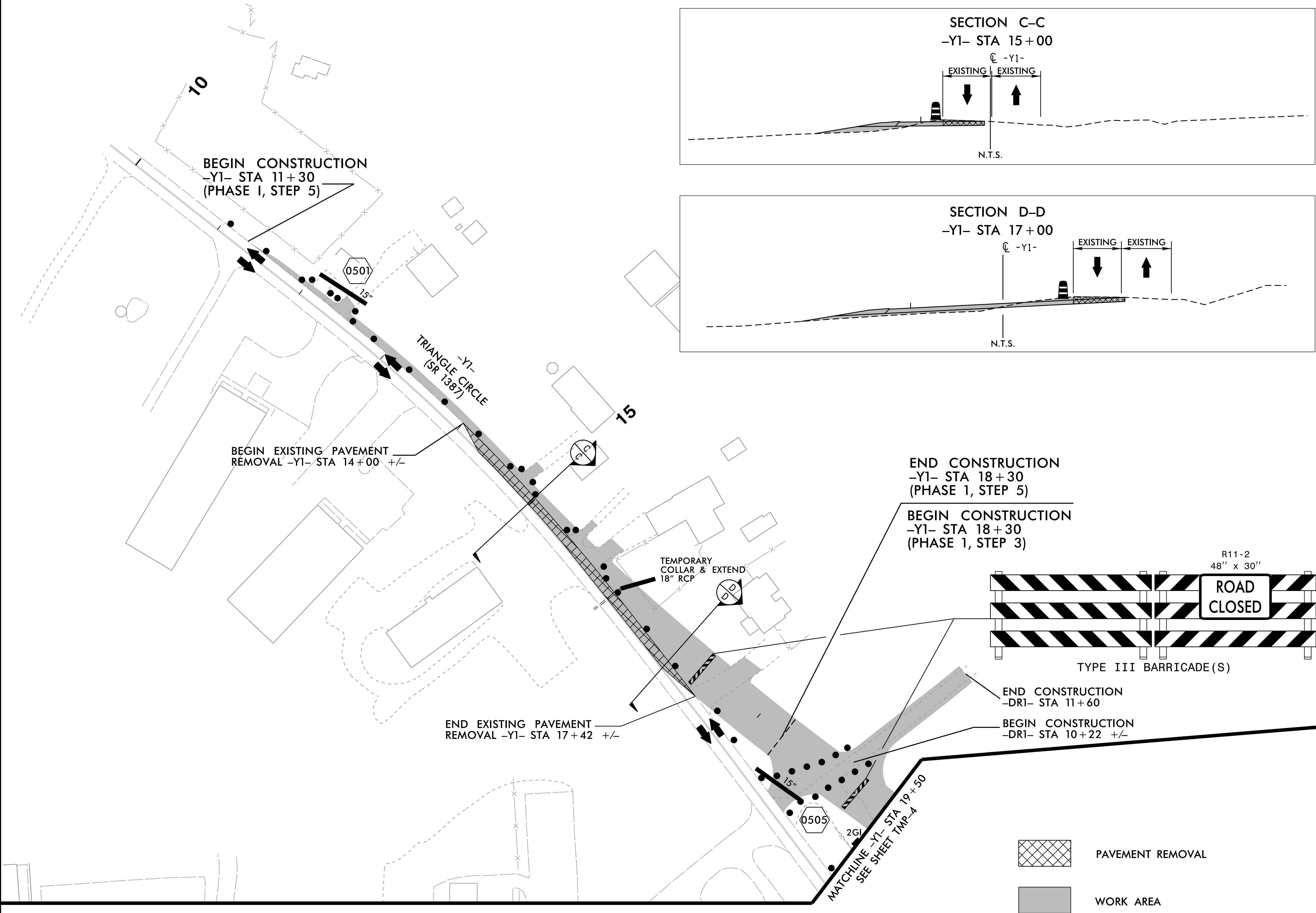
PHASE III

- STEP 1: USING ROADWAY STANDARD DRAWING NO. 1101.02 SHEETS 1 AND 2 OF 14, COMPLETE WEDGING UP TO, BUT NOT INCLUDING THE FINAL SURFACE LAYER AND PLACE TEMPORARY PAVEMENT MARKINGS AND MARKERS AS SHOWN ON TMP-8 AND TMP-9 AT THE FOLLOWING:
- L- NC 16 BUS.
-Y1- SR 1387 (TRIANGLE CIRCLE)
-Y2- SR 1439 (UNITY CHURCH ROAD) (TEMPORARY TRAFIC PATTERN)
- STEP 2: USING ROADWAY STANDARD DRAWING NO. 1101.02 SHEETS 1 AND 2 OF 14, INSTALL AND ACTIVATE THE TEMPORARY SIGNALS, REMOVE THE EXISTING SIGNALS, AND SHIFT TRAFFIC ONTO NEW PATTERN.
- STEP 3: USING ROADWAY STANDARD DRAWING NO. 1101.02 SHEET 1 OF 14, CONSTRUCT THE SOUTHSIDE OF -Y1- SR 1387 (TRIANGLE CIRCLE) AND -Y2- SR 1439 (UNITY CHURCH ROAD) AS SHOWN ON TMP-8 AND TMP-9.
- STEP 4: REMOVE EXISTING PAVEMENT ON SR 1387 (TRIANGLE CIRCLE) AND SR 1439 (UNITY CHURCH ROAD) AS SHOWN ON TMP-8 AND TMP-9.
- STEP 5: INSTALL PROPOSED SIGNALS. (SEE SIGNAL PLANS)
- STEP 6: USING ROADWAY STANDARD DRAWING NO. 1101.02 SHEETS 1 AND 2 OF 14, PLACE FINAL PAVEMENT LAYER, PERMANENT PAVEMENT MARKINGS AND MARKERS AS SHOWN IN THE PAVEMENT MARKING PLANS, AND SHIFT TRAFFIC ONTO FINAL TRAFFIC PATTERN.
- ACTIVATE THE PROPOSED SIGNALS AND REMOVE TEMPORARY SIGNALS. (SEE SIGNAL PLANS)
- STEP 7: REMOVE TEMPORARY TRAFFIC CONTROL DEVICES.

DocuSigned by: APPROVED: James B. Voss, PE DATE: 07/13/2023			PHASING
SEAL			



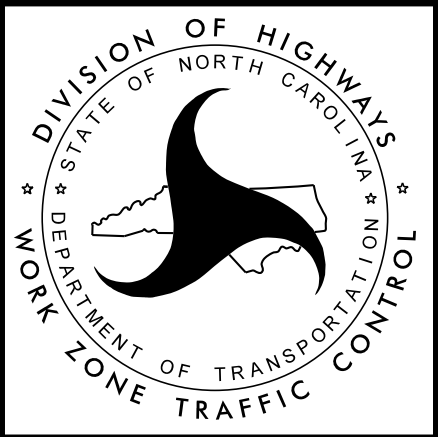
PROJ. REFERENCE NO.	SHEET NO.
R-5712	TMP-5



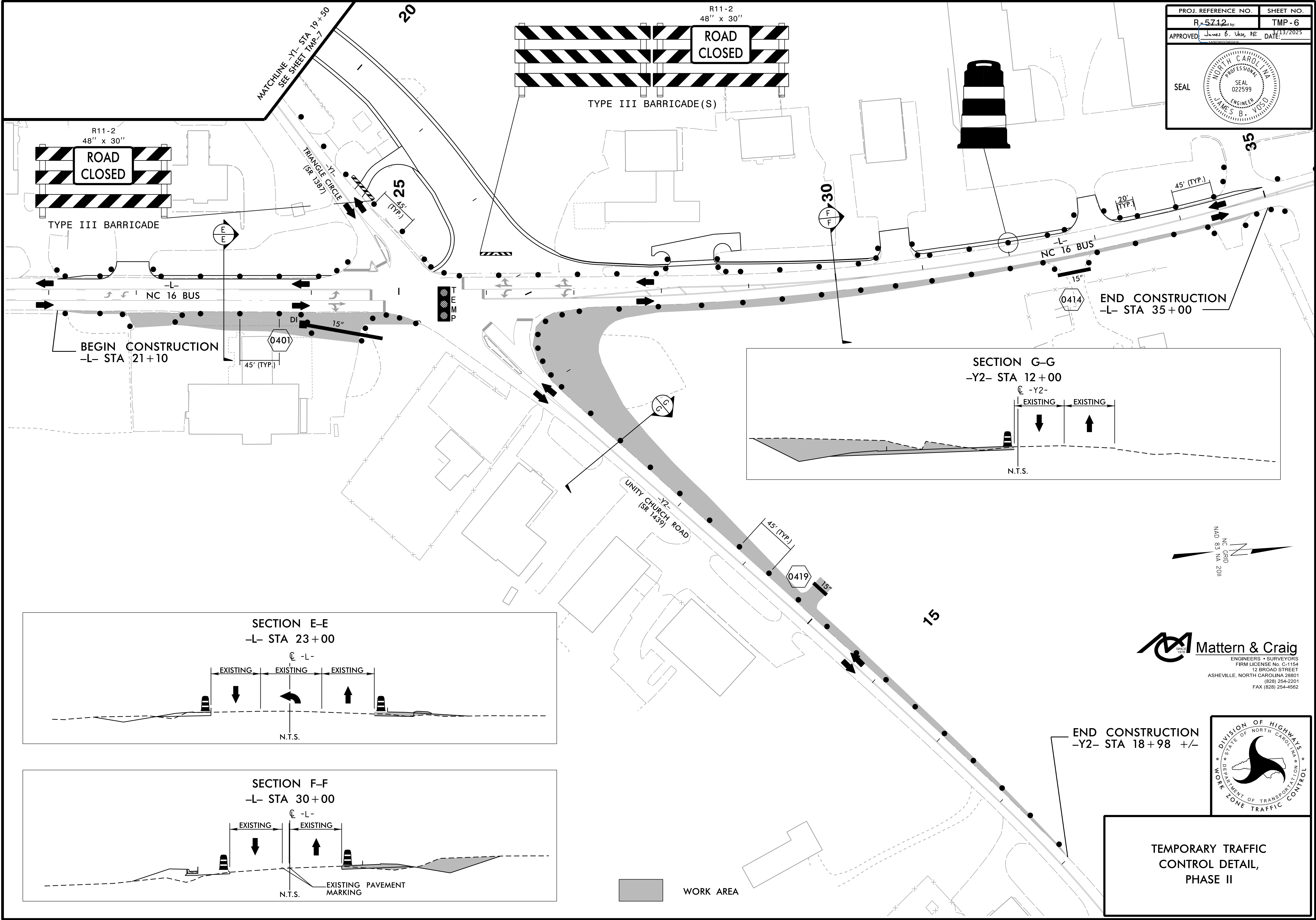
- PAVEMENT REMOVAL
- WORK AREA

Mattern & Craig
ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28601
(828) 254-2201
FAX (828) 254-4562

APPROVED DATE: 3/13/2025



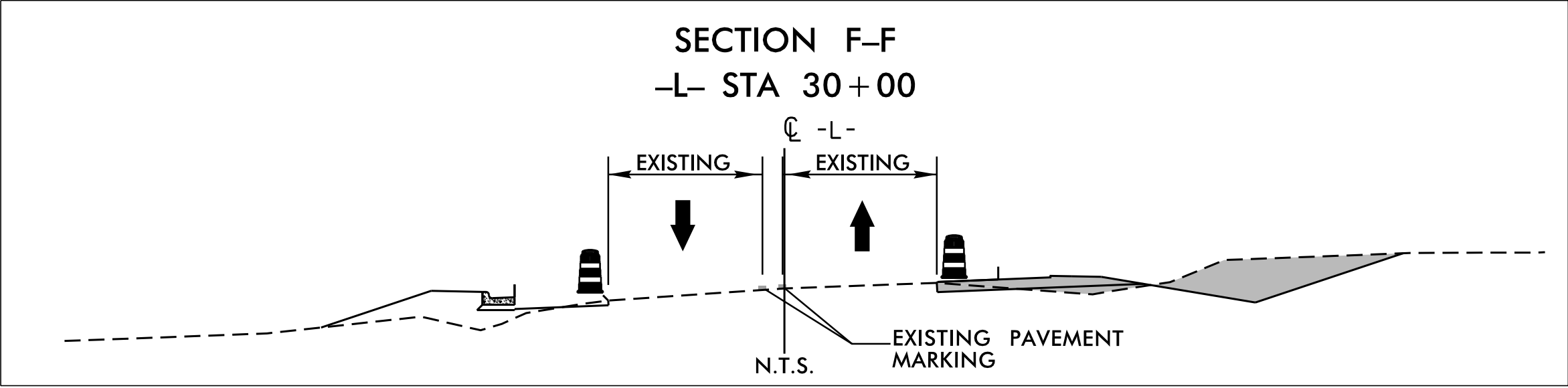
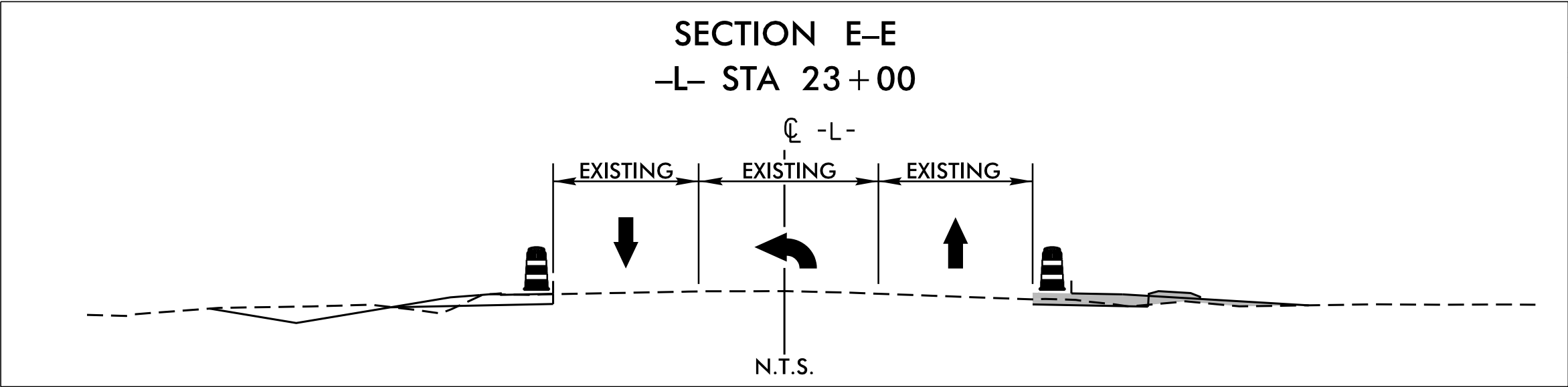
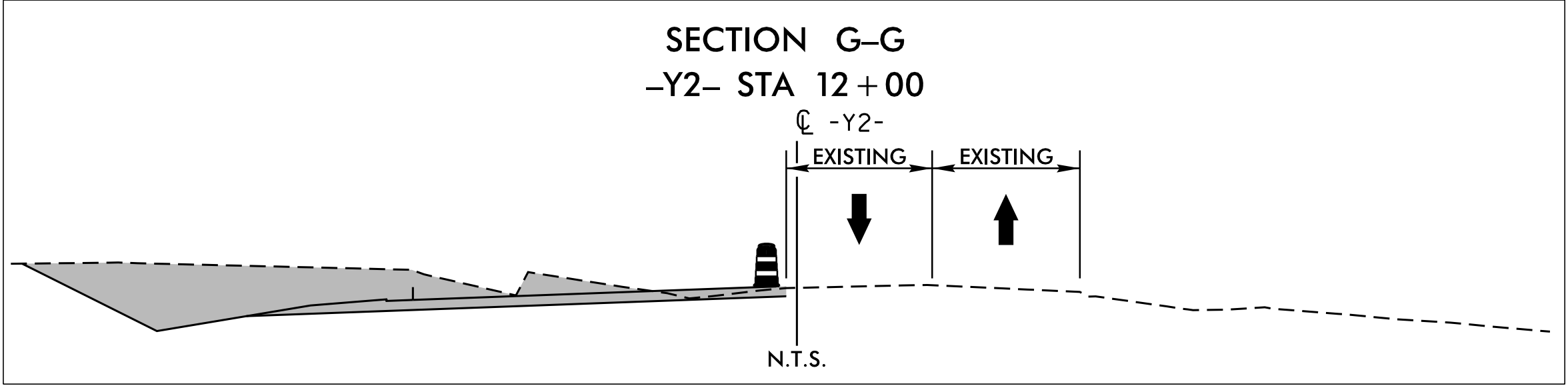
TEMPORARY TRAFFIC CONTROL DETAIL, PHASE I



PROJ. REFERENCE NO.	SHEET NO.
R-5712	TMP-6
APPROVED <i>James B. Vose, PE</i>	DATE: 1/13/2025

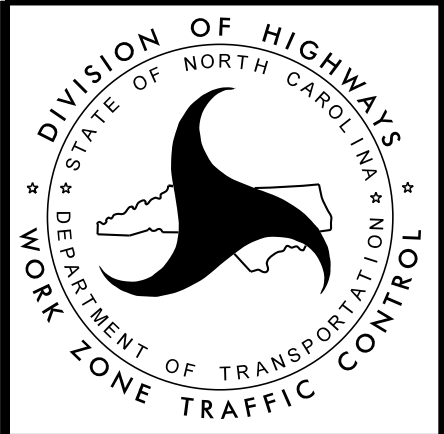
SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER
JAMES B. VOSE
022599



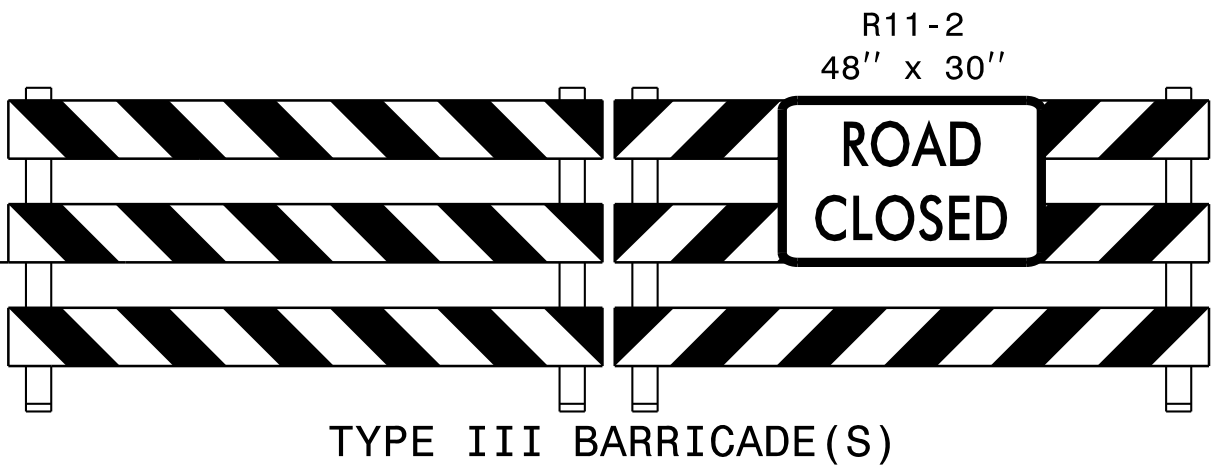
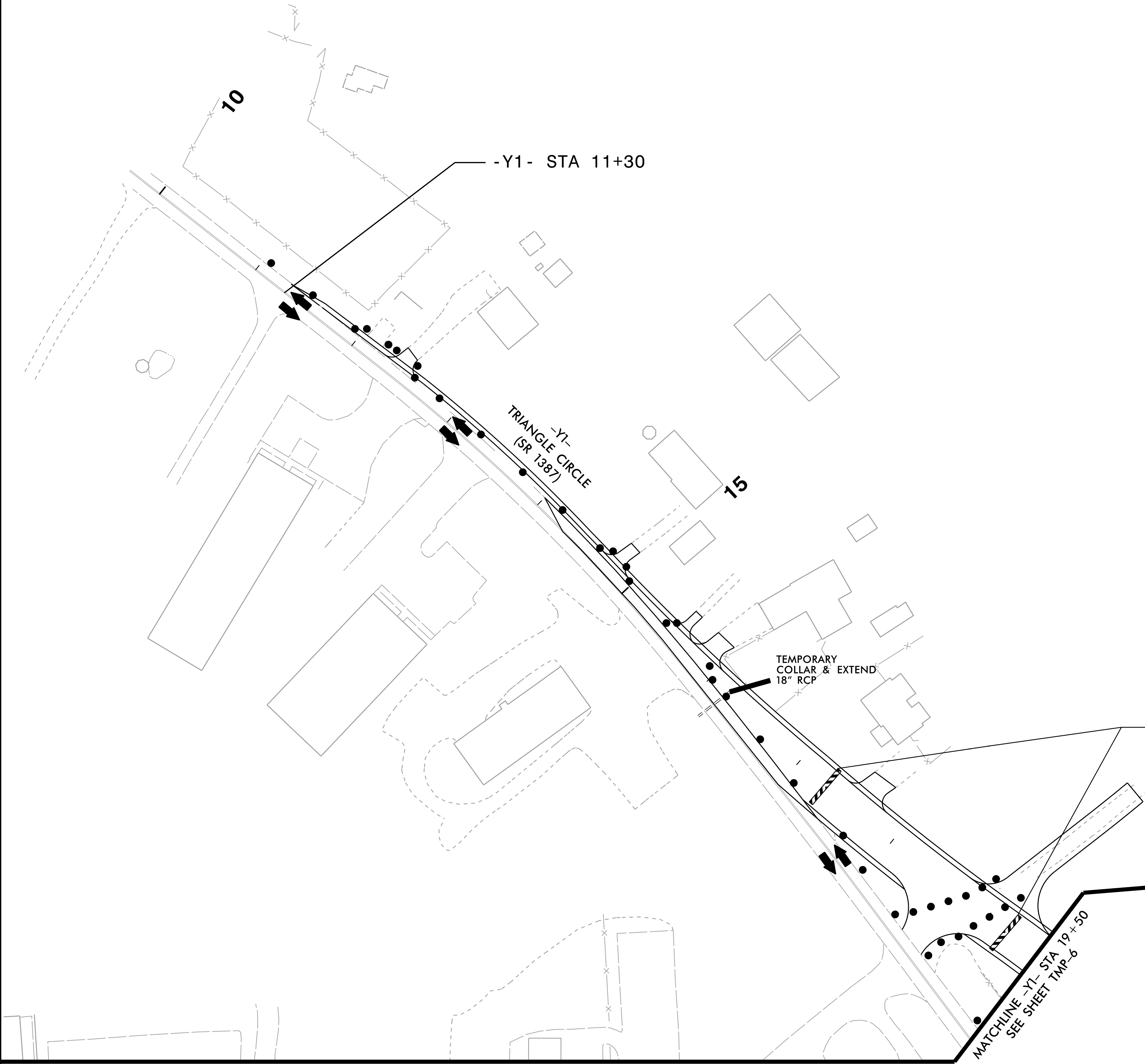
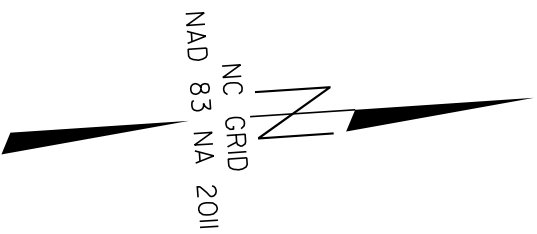
WORK AREA

Mattern & Craig
ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562



TEMPORARY TRAFFIC CONTROL
PHASE II

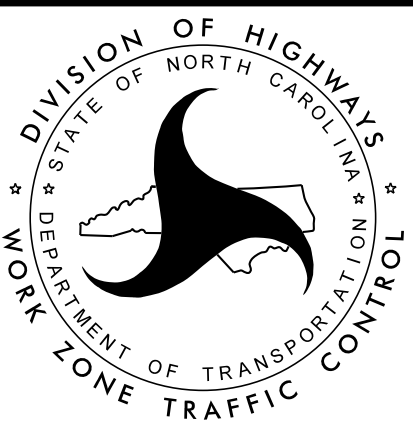
PROJ. REFERENCE NO.	SHEET NO.
R-5712	TMP-7



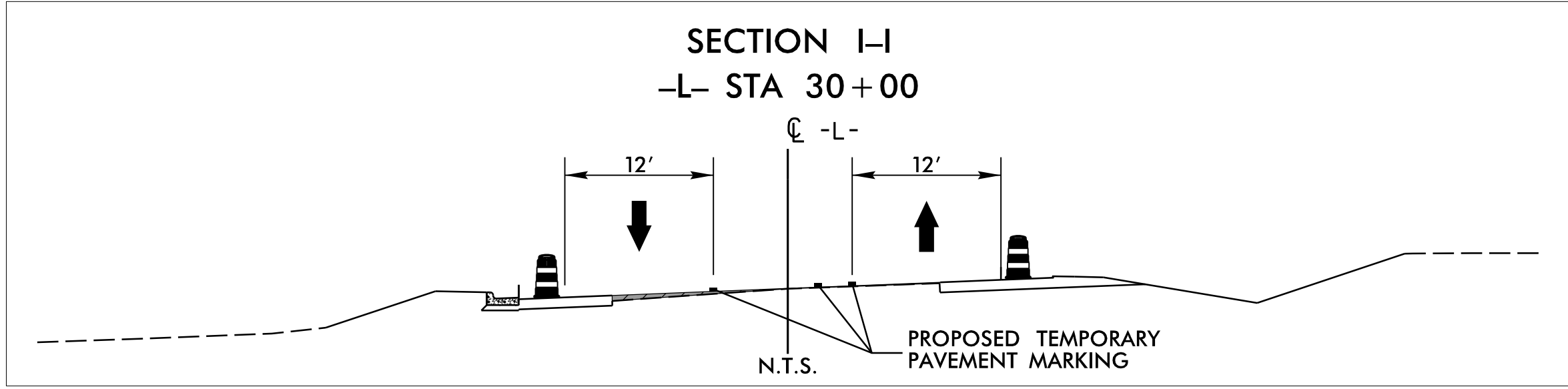
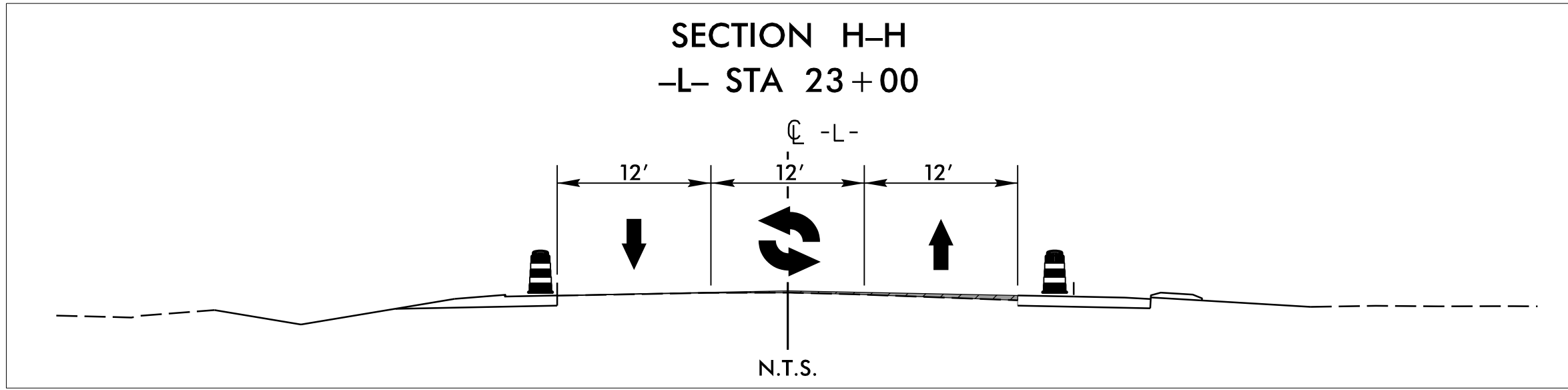
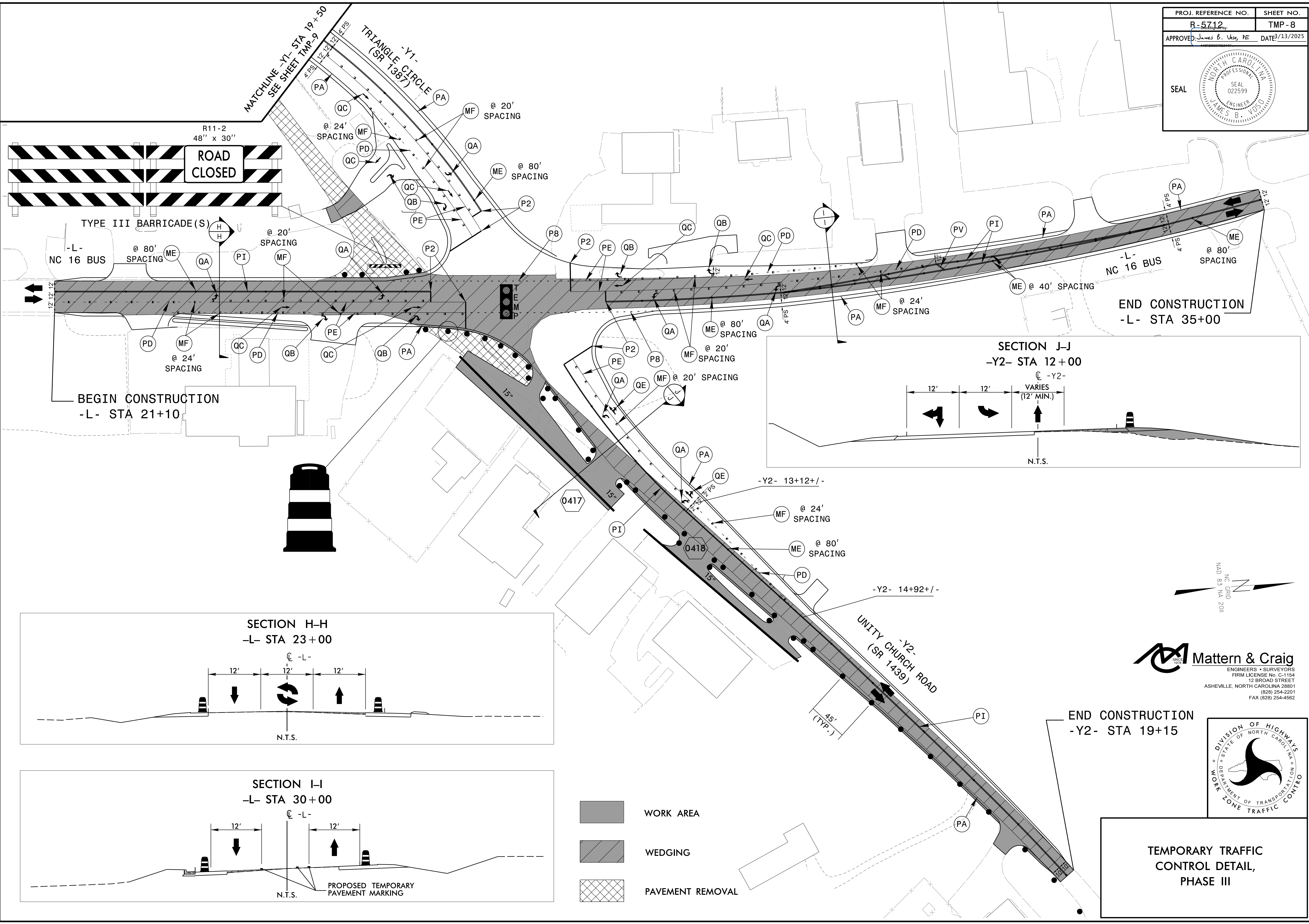
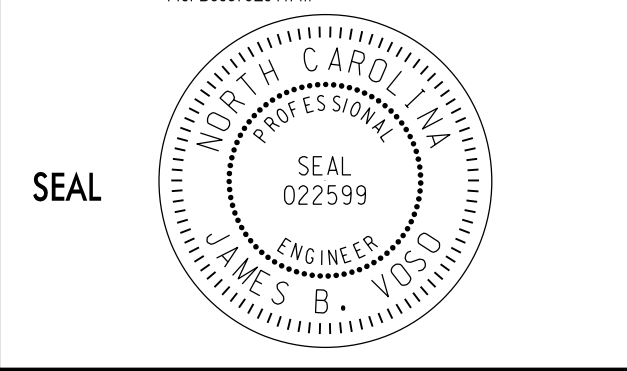
Mattern & Craig
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12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28601
(828) 254-2201
FAX (828) 254-4562

DocuSigned by:
APPROVED: James B. Voso, PE DATE: 3/13/2025

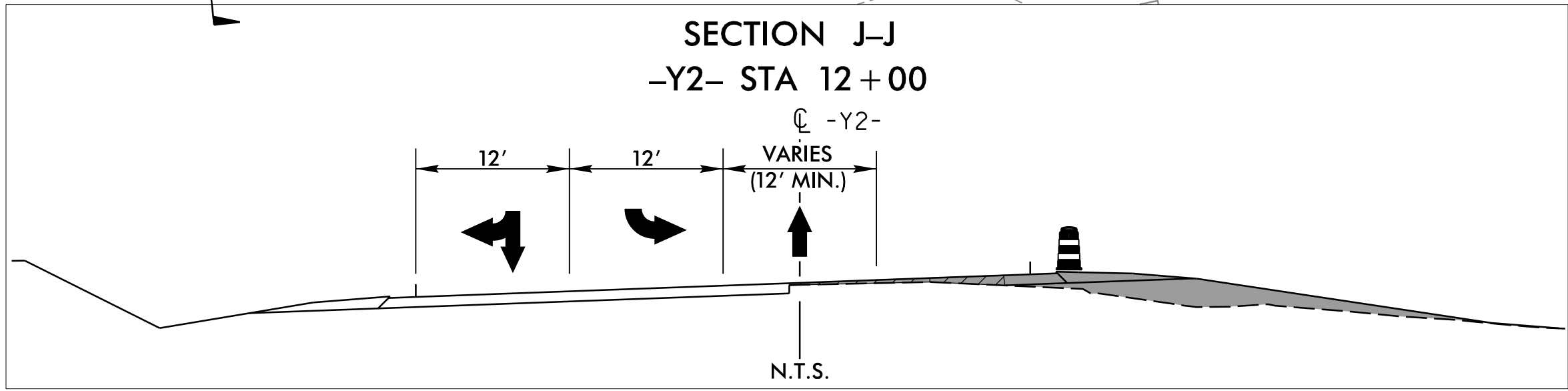
SEAL



TEMPORARY TRAFFIC
CONTROL DETAIL,
PHASE II

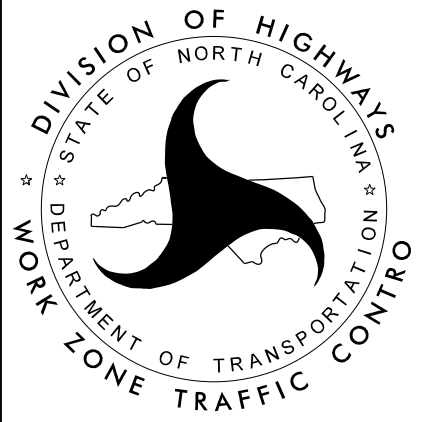


- WORK AREA
- WEDGING
- PAVEMENT REMOVAL

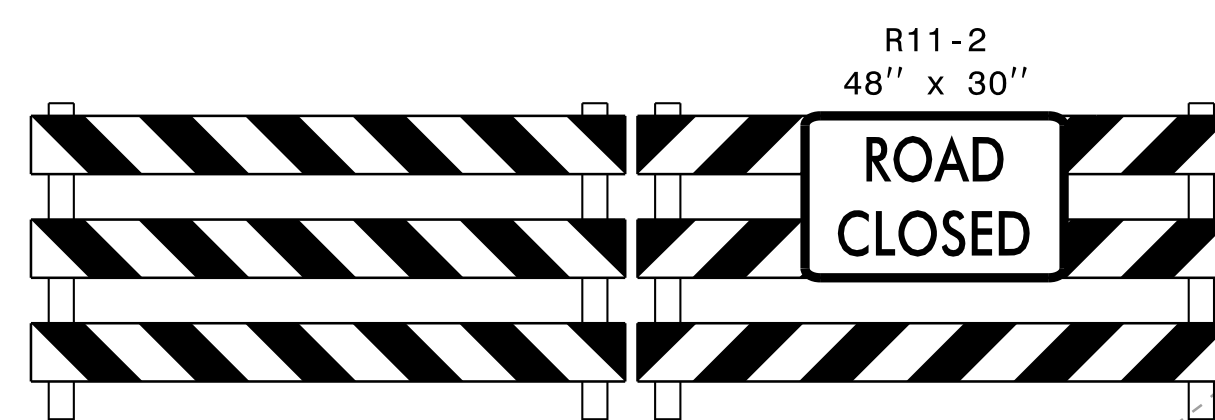
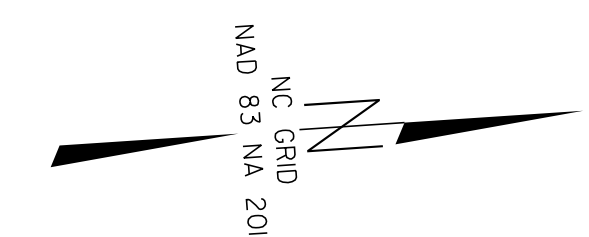
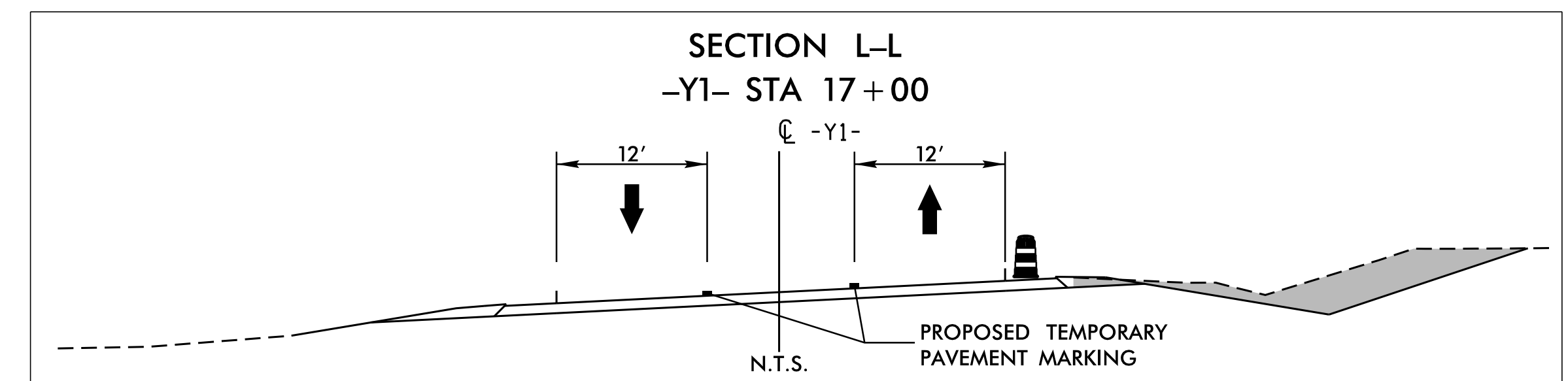
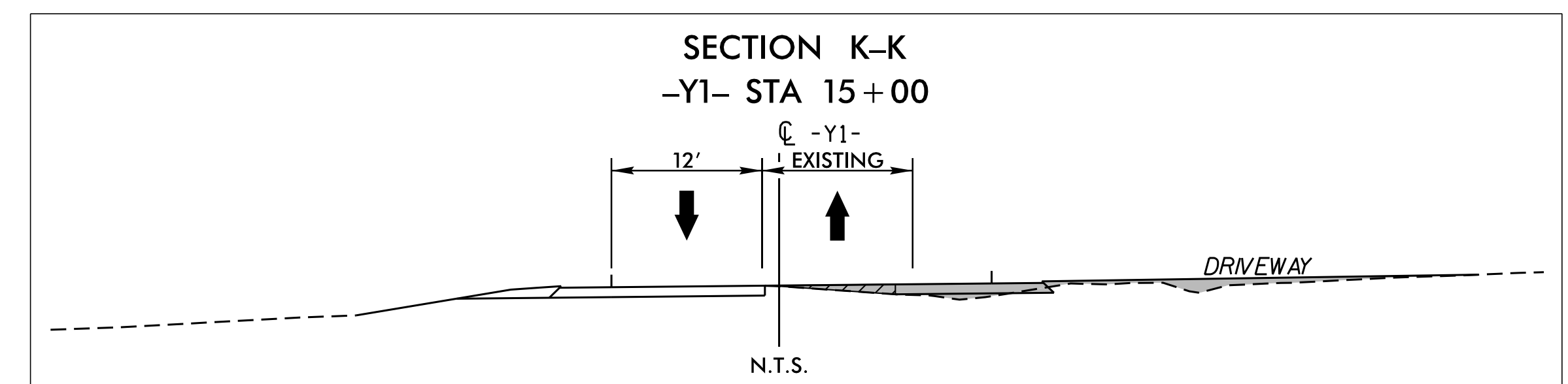


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FAX (828) 254-4562

END CONSTRUCTION
-Y2- STA 19+15



TEMPORARY TRAFFIC
CONTROL DETAIL,
PHASE III



TYPE III BARRICADE(S)

- | | |
|---|------------------|
|  | WORK AREA |
|  | WEDGING |
|  | PAVEMENT REMOVAL |



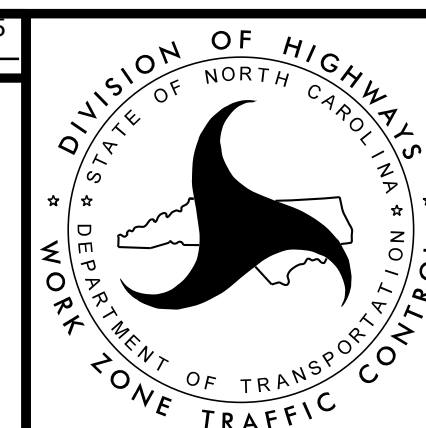
TEMPORARY TRAFFIC CONTROL DETAIL, PHASE III

DocuSigned by:
James B. Vose, PE

APPROVED: _____ DATE: 7/13/2021
THIS DOCUMENT IS NOT VALID WITHOUT THE SEAL



SEAL



CONTRACT: TIP PROJECT: R-5712

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
LINCOLN COUNTY

LOCATION: INTERSECTION OF NC 16 BUS, SR 1387 (TRIANGLE CIRCLE),
AND SR 1439 (UNITY CHURCH ROAD)

PROJECT REFERENCE NO.	SHEET NO.
R-5712	PMP-1
APPROVED: DocuSigned by: Aaron C. Carver 8250B42A220F49C...	
DATE: 5/12/2025	
SEAL	
Professional Engineer AARON C. CARVER 030453 NORTH CAROLINA	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE SHEET
PMP-2	PAVEMENT MARKING DETAIL
PMP-3	PAVEMENT MARKING DETAIL

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

- A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
-L- NC 16 BUS	THERMOPLASTIC	SNOWPLOWABLE
-Y1- SR 1387 TRIANGLE CIRCLE	THERMOPLASTIC	SNOWPLOWABLE
-Y2- SR 1439 UNITY CHURCH ROAD	THERMOPLASTIC	SNOWPLOWABLE

- B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- C) REFER TO APPROVED SIGNAL PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS.
- D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
- E) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR STOP BARS, SYMBOLS, CHARACTERS AND DIAGONALS. IF HEATED-IN-PLACE IS USED, IT SHALL BE PAID FOR USING THE EXTRUDED THERMOPLASTIC PAY ITEM.

PAVEMENT
MARKING SCHEDULE

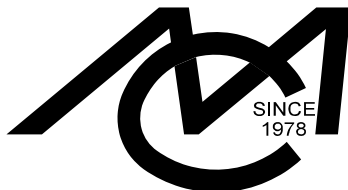
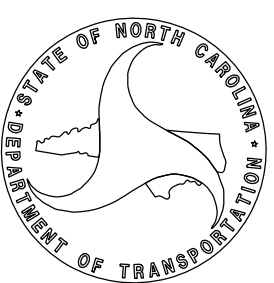
SYMBOL	MARKINGS
THERMOPLASTIC	
T2	WHITE STOPBAR (24", 120 MIL)
T8	2 FT.-6FT./SP WHITE MINISKIP (4", 90 MIL)
TA	WHITE EDGELINE (4", 90 MIL)
TD	3FT.-9 FT./SP WHITE MINISKIP (4", 90 MIL)
TE	WHITE SOLID LANE LINE (4", 90 MIL)
TI	YELLOW DOUBLE CENTER (4", 90 MIL)
TV	YELLOW DIAGONAL (12", 90 MIL)
UA	LEFT TURN ARROW (90 MIL)
UB	RIGHT TURN ARROW (90 MIL)
UC	STRAIGHT ARROW (90 MIL)

PAVEMENT MARKERS	
ME	SNOW PLOWABLE MARKER (YELLOW/YELLOW)
MF	SNOW PLOWABLE MARKER (CRYSTAL/RED)

1-5-2020 REVIEWED BY ERIC WARD

PLAN PREPARED FOR: N.C.D.O.T. SIGNING AND DELINEATION UNIT

JAMES B. VOSO, PE SIGNING & DELINEATION PROJECT DESIGN ENGINEER



Mattern & Craig

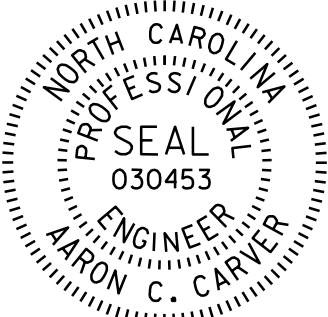
CONSULTING ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

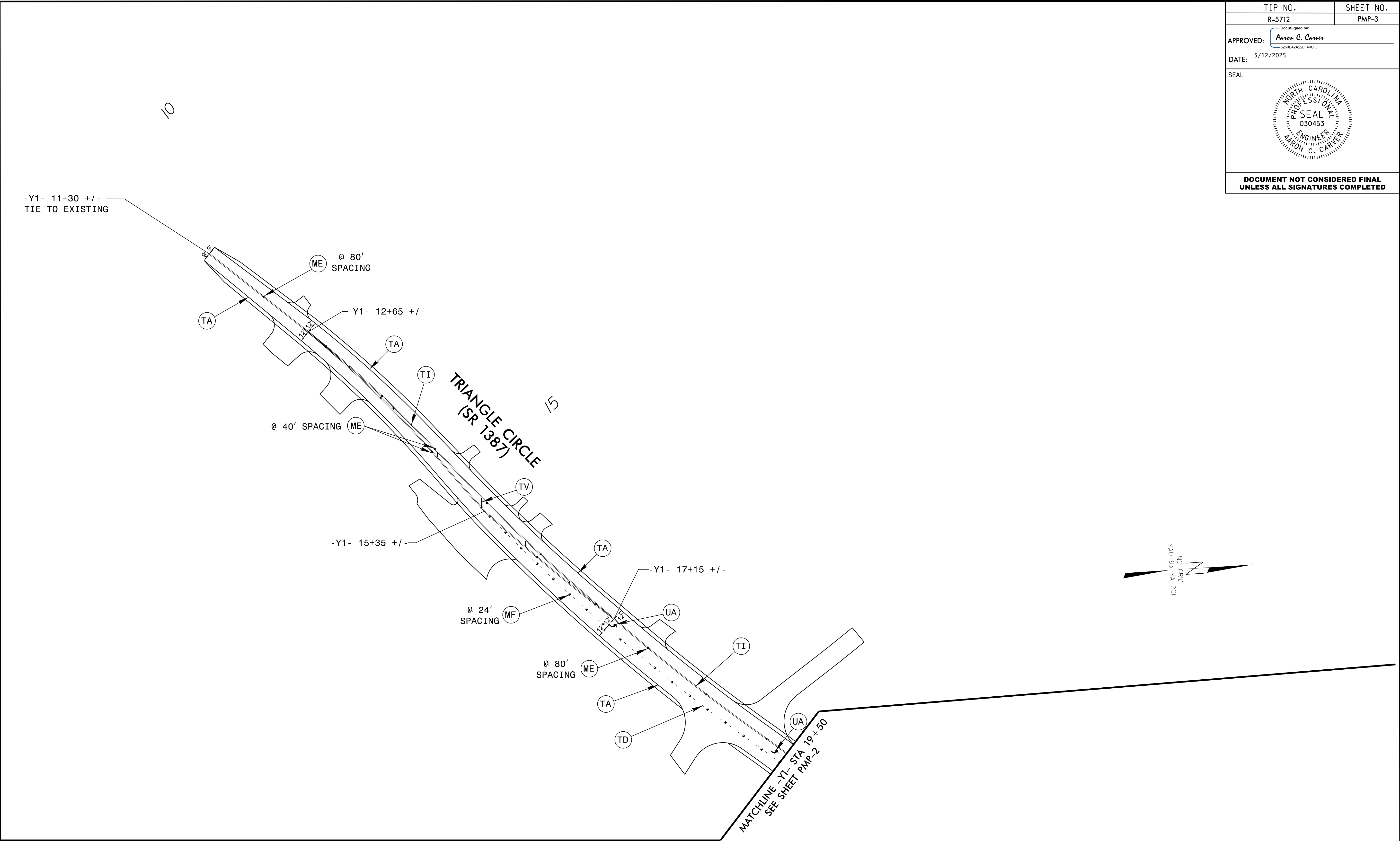


★ EXISTING SIGNAL TO BE UPGRADED

SEE SHEET PMP-1 FOR PAVEMENT
MARKING SCHEDULE

PAVEMENT MARKING DETAIL

TIP NO.	SHEET NO.
R-5712	PMP-3
DocuSigned by: Arson C. Carver 8250B42A220F49C...	
APPROVED:	
DATE: 5/12/2025	
SEAL	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PROJECT NOTES

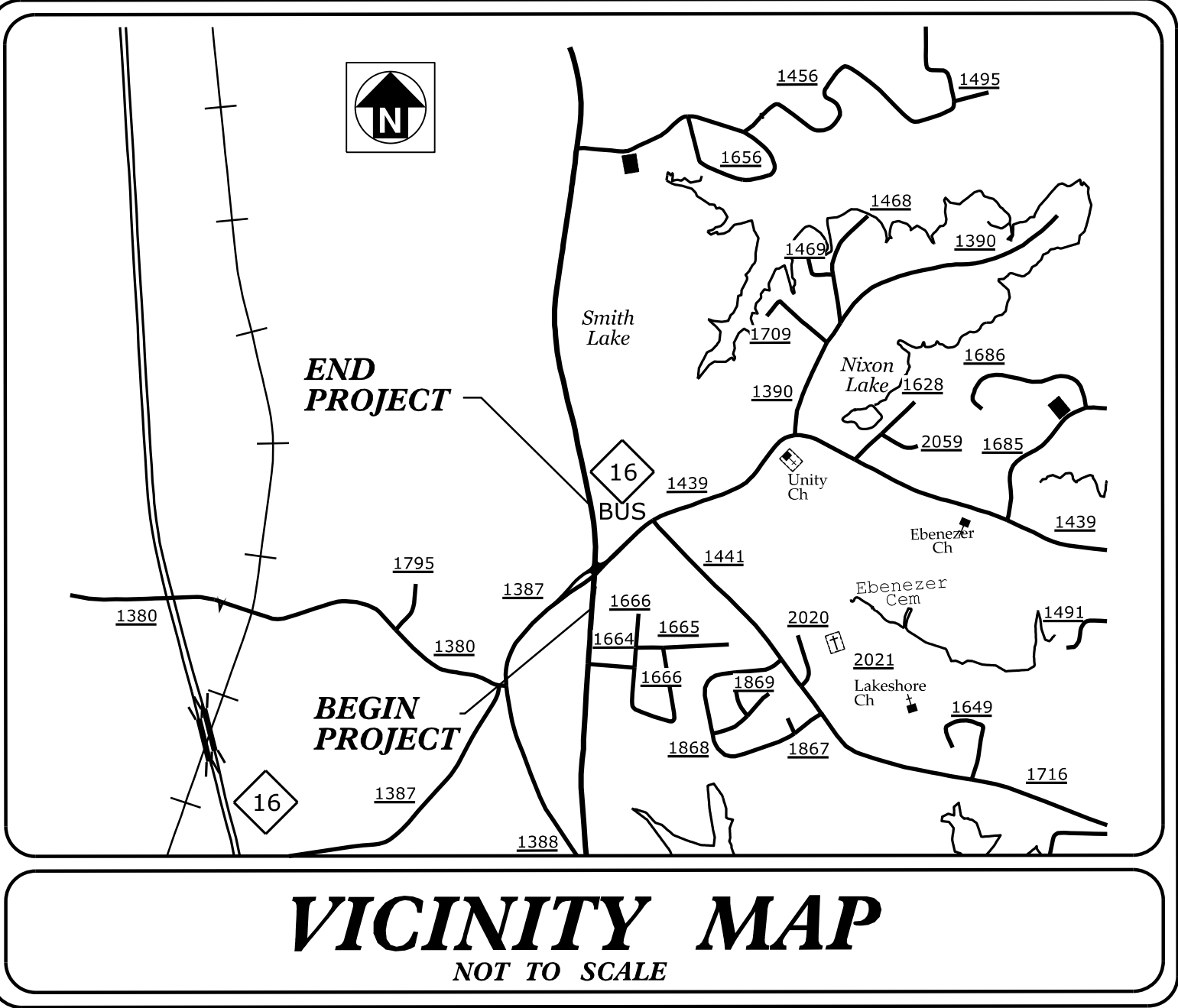
SEE SHEET PMP-1 FOR PAVEMENT MARKING SCHEDULE



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12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
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FAX (828) 254-4562

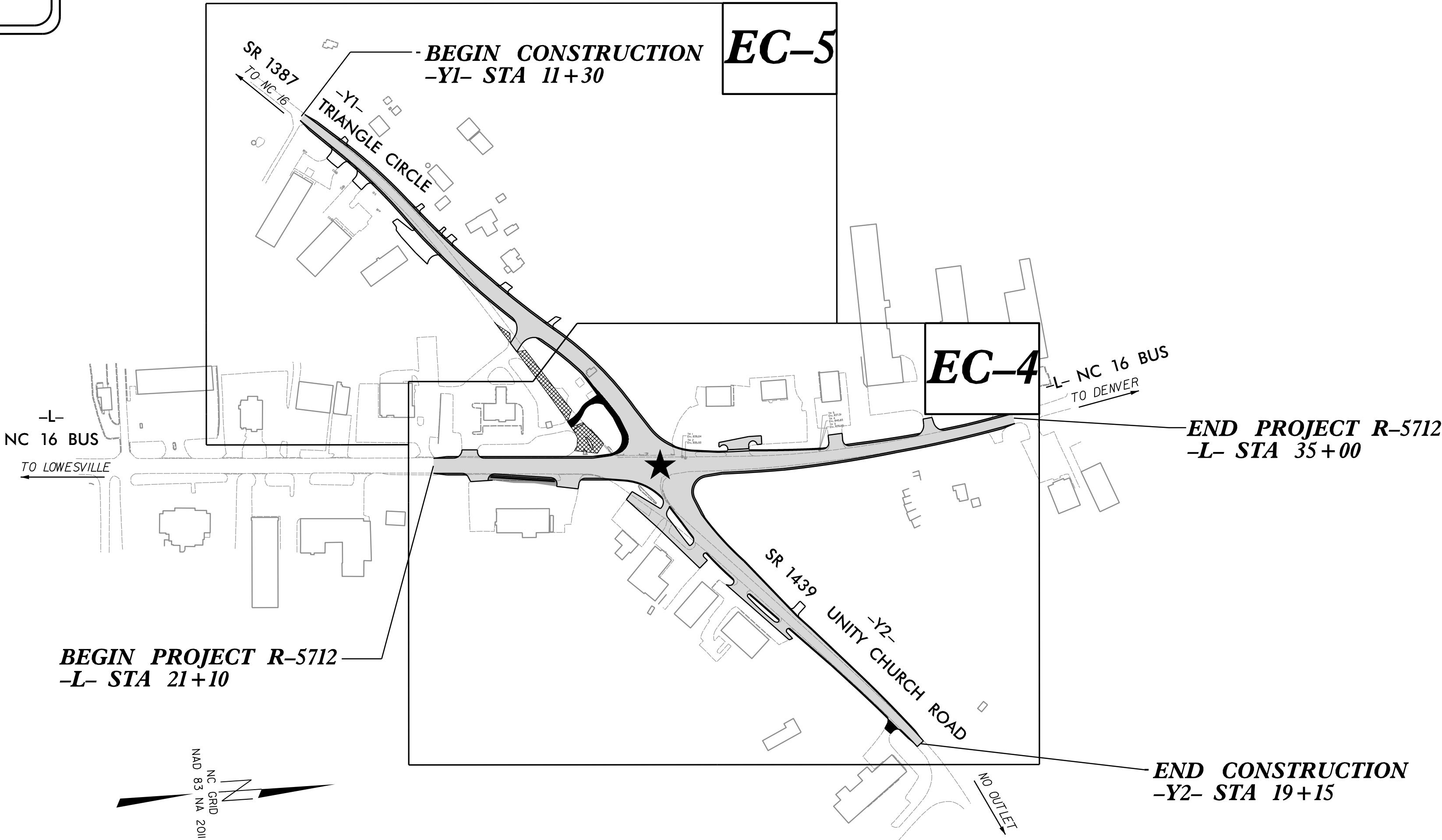
PAVEMENT MARKING DETAIL

TIP PROJECT: R-5712



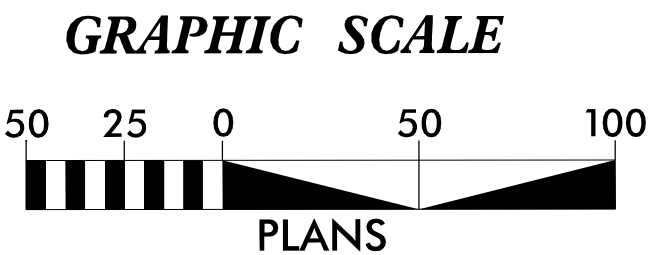
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
LINCOLN COUNTY

LOCATION: INTERSECTION OF NC 16 BUS, SR 1387 (TRIANGLE CIRCLE),
AND SR 1439 (UNITY CHURCH ROAD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & SIGNALS



THIS PROJECT CONTAINS
EROSION CONTROL PLANS
FOR CLEARING AND
GRUBBING PHASE OF
CONSTRUCTION.

THIS PROJECT HAS
BEEN DESIGNED TO
SENSITIVE WATERSHED
STANDARDS.



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY
WITH THE REGULATIONS SET FORTH BY THE
NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019
ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND
NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared in the Office of:
MATTERN & CRAIG
12 Broad St.
Asheville NC, 28801
2024 STANDARD SPECIFICATIONS
Designed by:
MENG YANG, PE **4149**
NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings
The "Roadway Standard Drawings"- Roadway Design Unit - N. C.
Department of Transportation - Raleigh, N. C., dated January 2024
and the latest revision thereto are applicable to this project and by
reference hereby are considered a part of these plans.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5712	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
U-5712	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	
1630.04	Stilling Basin	
1630.05	Temporary Diversion	
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	
1632.02	Type B	
1632.03	Type C	

Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	
1635.02	Rock Pipe Inlet Sediment Trap Type B	
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	
	Silt Fence Coir Fiber Wattle Break	
1636.03	Excelsior Wattle Barrier	
1636.03	Coir Fiber Wattle Barrier	

PROJECT REFERENCE NO.	SHEET NO.
<i>R-5712</i>	<i>EC-3</i>
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL STABILIZATION SUMMARY SHEET

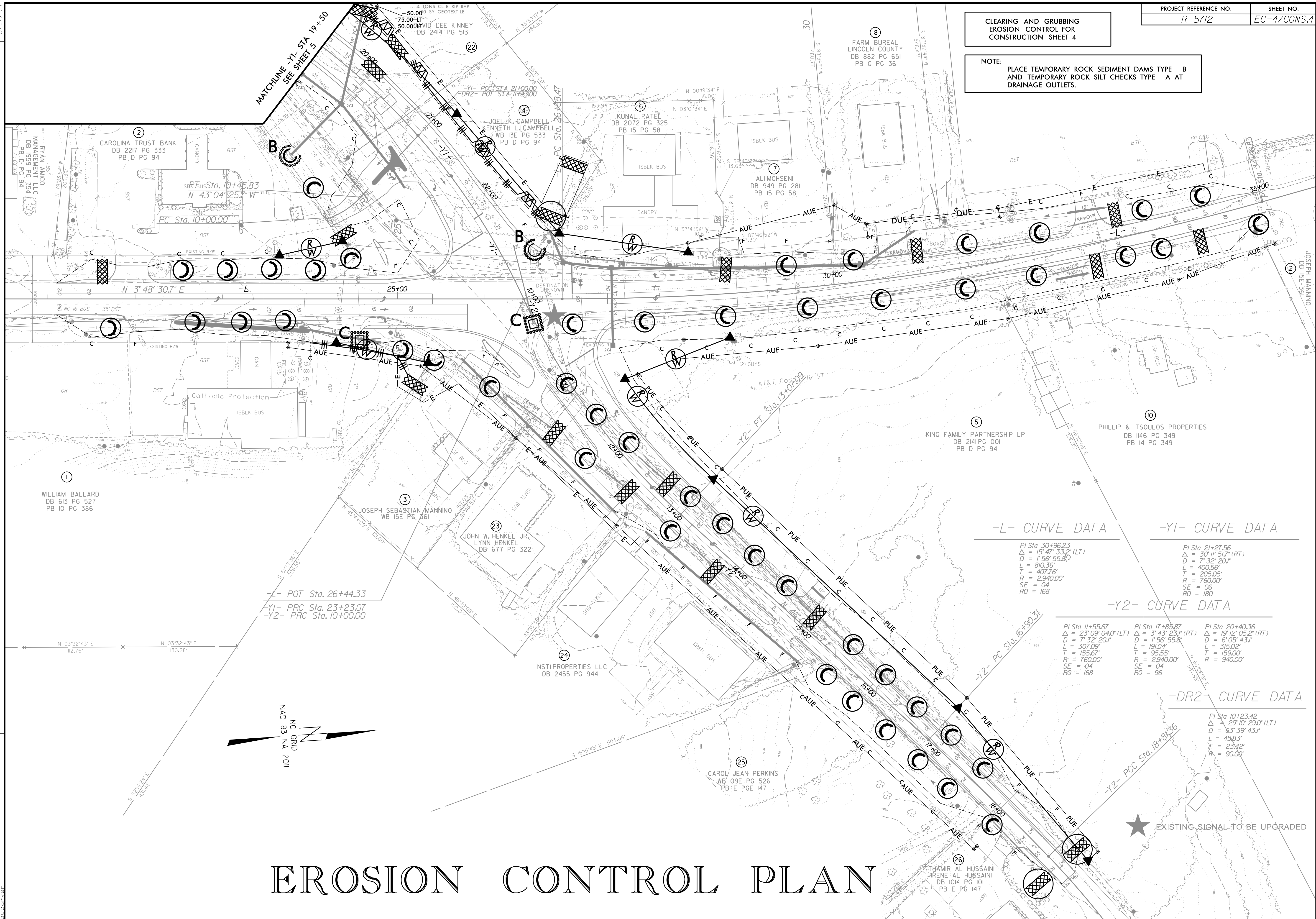
MATting FOR Erosion Control
PERMANENT SOIL REINFORCEMENT MAT

[illegible]

8/17/99

REVISIONS

12/8/47 PM
153761
R5712 for NCDOT Division 12/R-5712/Environmental/EC4.dgn
R5712



CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

PROJECT REFERENCE NO.	SHEET NO.
R-5712	EC-4/CONS.4

MATCHLINE -Y1- STA 19+50
SEE SHEET 5

-L- POT Sta. 26+44.33
-Y1- PRC Sta. 23+23.07
-Y2- PRC Sta. 10+00.00

-L- CURVE DATA
PI Sta 30+96.23
 $\Delta = 15^{\circ} 47' 33.2''$ (LT)
D = 7' 56" 55.8"
L = 810.36'
T = 407.76'
R = 2,940.00'
SE = 04
RO = 168

-Y1- CURVE DATA
PI Sta 21+27.56
 $\Delta = 30^{\circ} 11' 51.7''$ (RT)
D = 7' 32" 20.1"
L = 400.56'
T = 205.05'
R = 760.00'
SE = 06
RO = 180

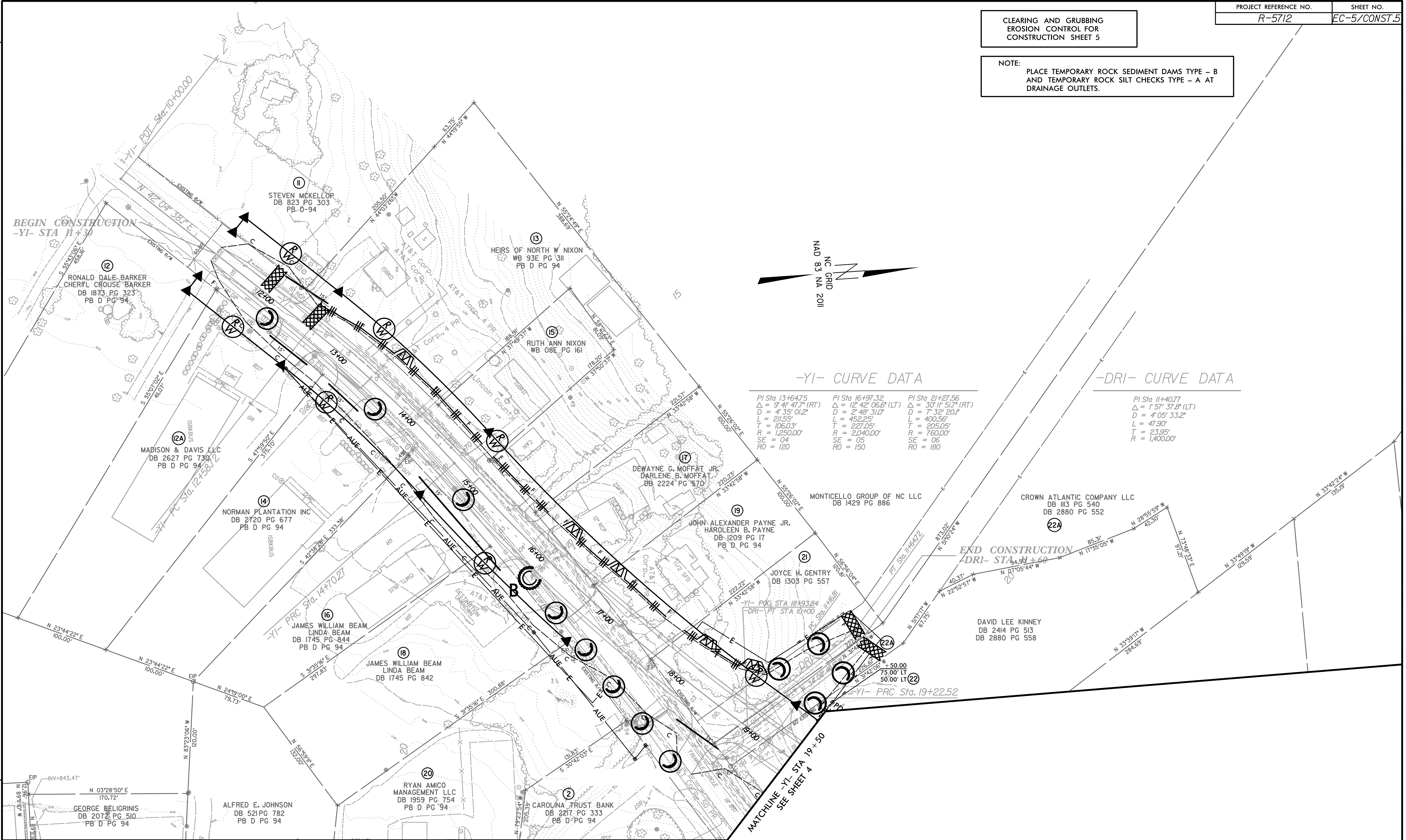
-Y2- CURVE DATA
PI Sta 11+55.67
 $\Delta = 23^{\circ} 09' 04.0''$ (LT)
D = 7' 32" 20.1"
L = 307.09'
T = 155.67'
R = 760.00'
SE = 04
RO = 168
PI Sta 17+85.87
 $\Delta = 3^{\circ} 43' 23.1''$ (RT)
D = 7' 56" 55.8"
L = 191.04'
T = 95.55'
R = 2,940.00'
SE = 04
RO = 96
PI Sta 20+40.36
 $\Delta = 19^{\circ} 12' 05.2''$ (RT)
D = 6' 05" 43.1"
L = 315.02'
T = 159.00'
R = 940.00'

-DR2- CURVE DATA
PI Sta 10+23.42
 $\Delta = 29^{\circ} 10' 29.0''$ (LT)
D = 6' 33" 43.1"
L = 49.83'
T = 23.42'
R = 90.00'

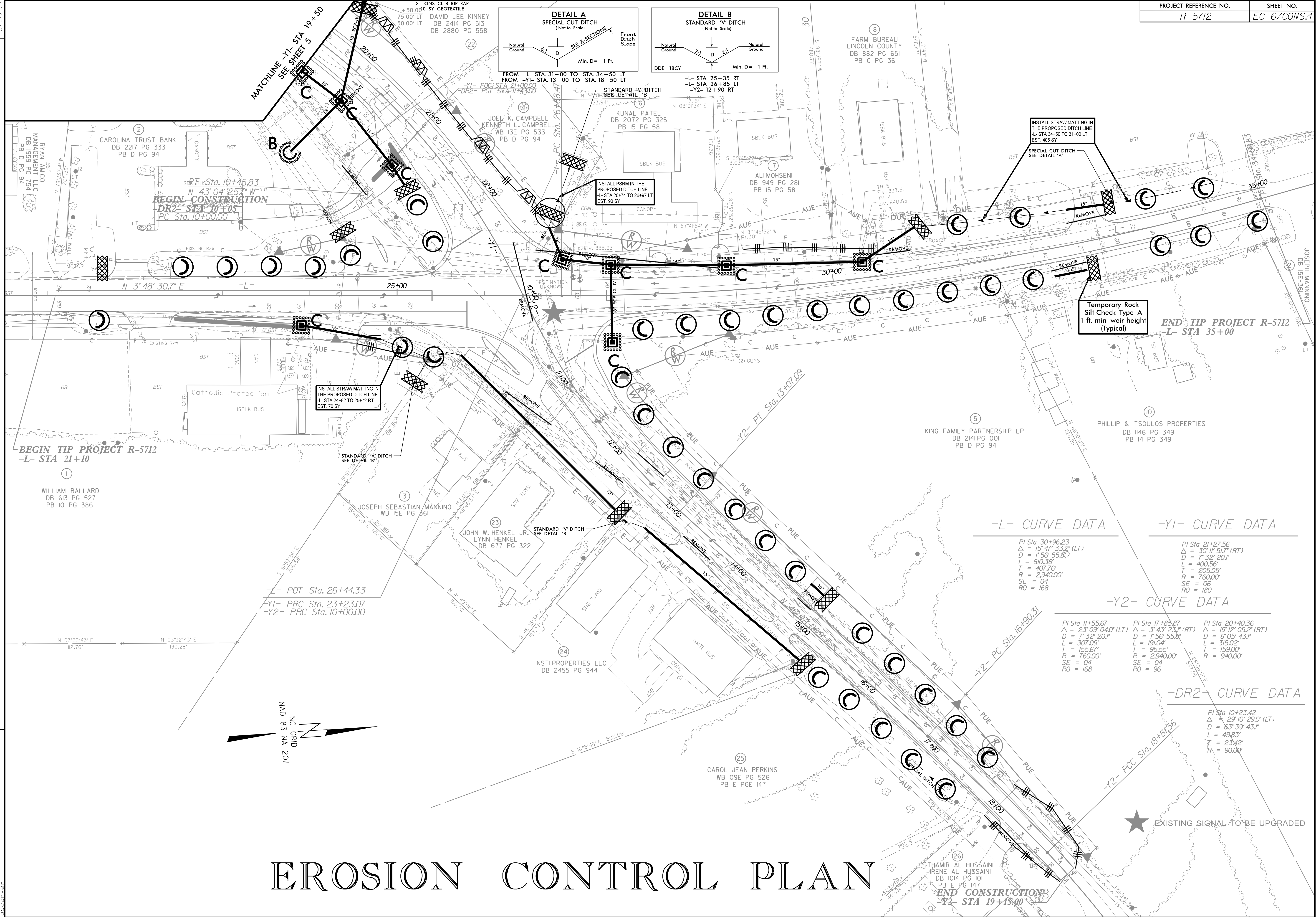
EROSION CONTROL PLAN

8/17/99

REVISIONS



EROSION CONTROL PLAN



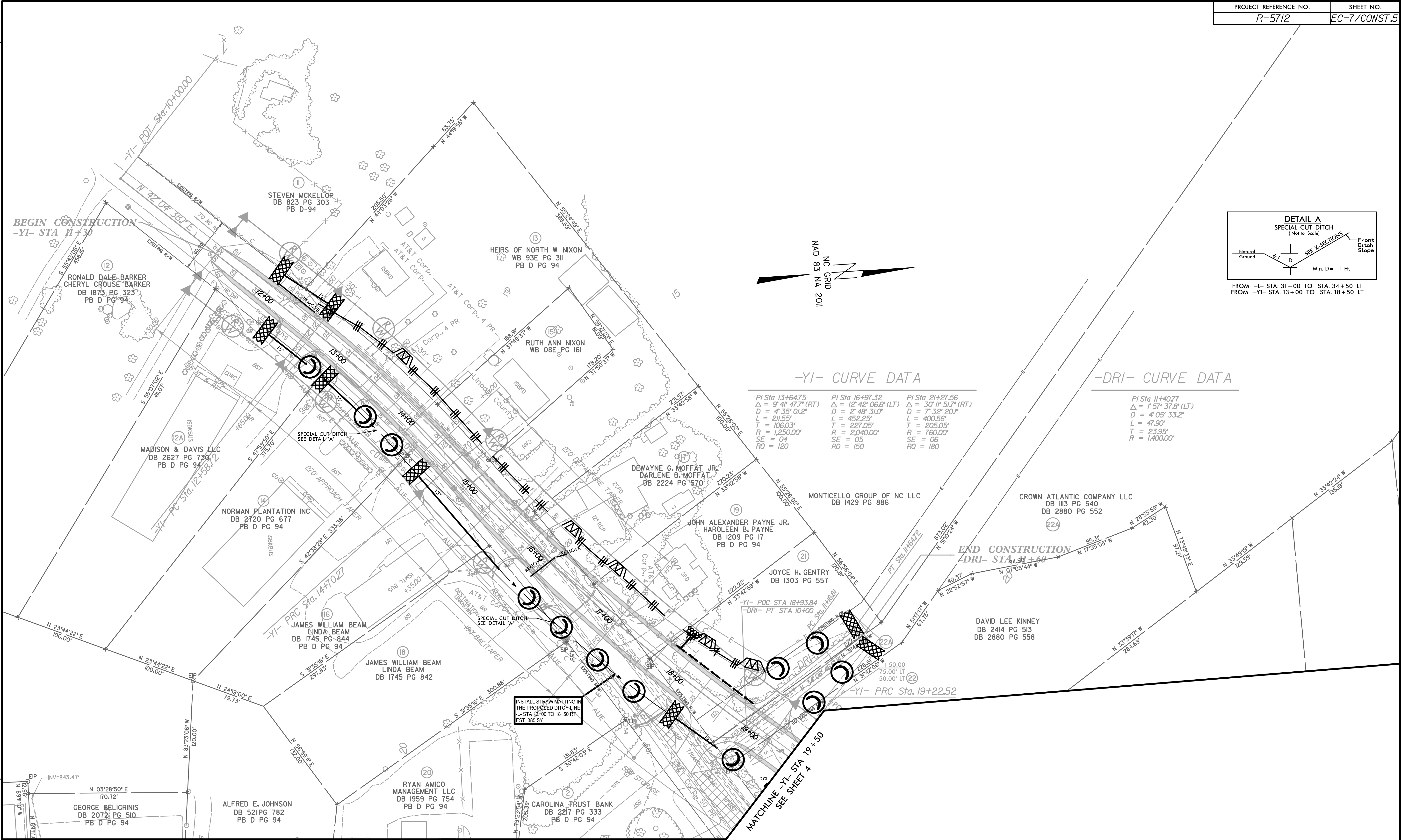
REVISIONS

8/17/99

12/24/55 PM 15712 for NCDOT Division 12/R-5712/Environmental/EC6.dgn

8/17/99

REVISIONS



EROSION CONTROL PLAN

CONTRACT: DL00351

SIGNING PLAN LINCOLN COUNTY

ROADWAY STANDARD DRAWING

<u>STD. NO.</u>	<u>TITLE</u>
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

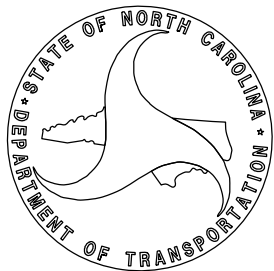
1. DISPOSAL OF SIGN SYSTEM, U CHANNEL
2. SIGN ERECTION, RELOCATED, TYPE "D" SIGN
3. SIGN ERECTION, RELOCATED, TYPE "E" SIGN
4. DISPOSAL OF SUPPORT, U CHANNEL

- . SIGNS FURNISHED BY STATE
- . IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.
- . SIGNING PLANS DO NOT INCLUDE TEMPORARY CONSTRUCTION SIGNING OR PAVEMENT MARKING. SEE TRAFFIC MANAGEMENT PLANS.
- . WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- . WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.
- . THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
- . SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

SUMMARY OF QUANTITIES				
ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	182	L.F.
4102000000	904	SIGN ERECTION, TYPE E	11	EA.
4116100000	904	SIGN ERECTION, RELOCATE SIGN TYPE D (GROUND MOUNTED)	3	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	10	EA.
4192000000	907	DISPOSAL OF SUPPORT, U-CHANNEL	3	EA.

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
SIGN-1	TITLE SHEET
SIGN-2	E & F SHEET
SIGN-3-4	SIGNING PLAN SHEETS

JAMES B. VOSO, PE SIGNING & DELINEATION PROJECT ENGINEER
AARON C. CARVER, PE SIGNING & DELINEATION PROJECT DESIGN ENGINEER



PROJECT REFERENCE NO.	SHEET NO.
R-5712	SIGN-1

DocuSigned by:
James B. Vose, PE
140FD60379ED41F...

APPROVED:

DATE: 3/13/2025

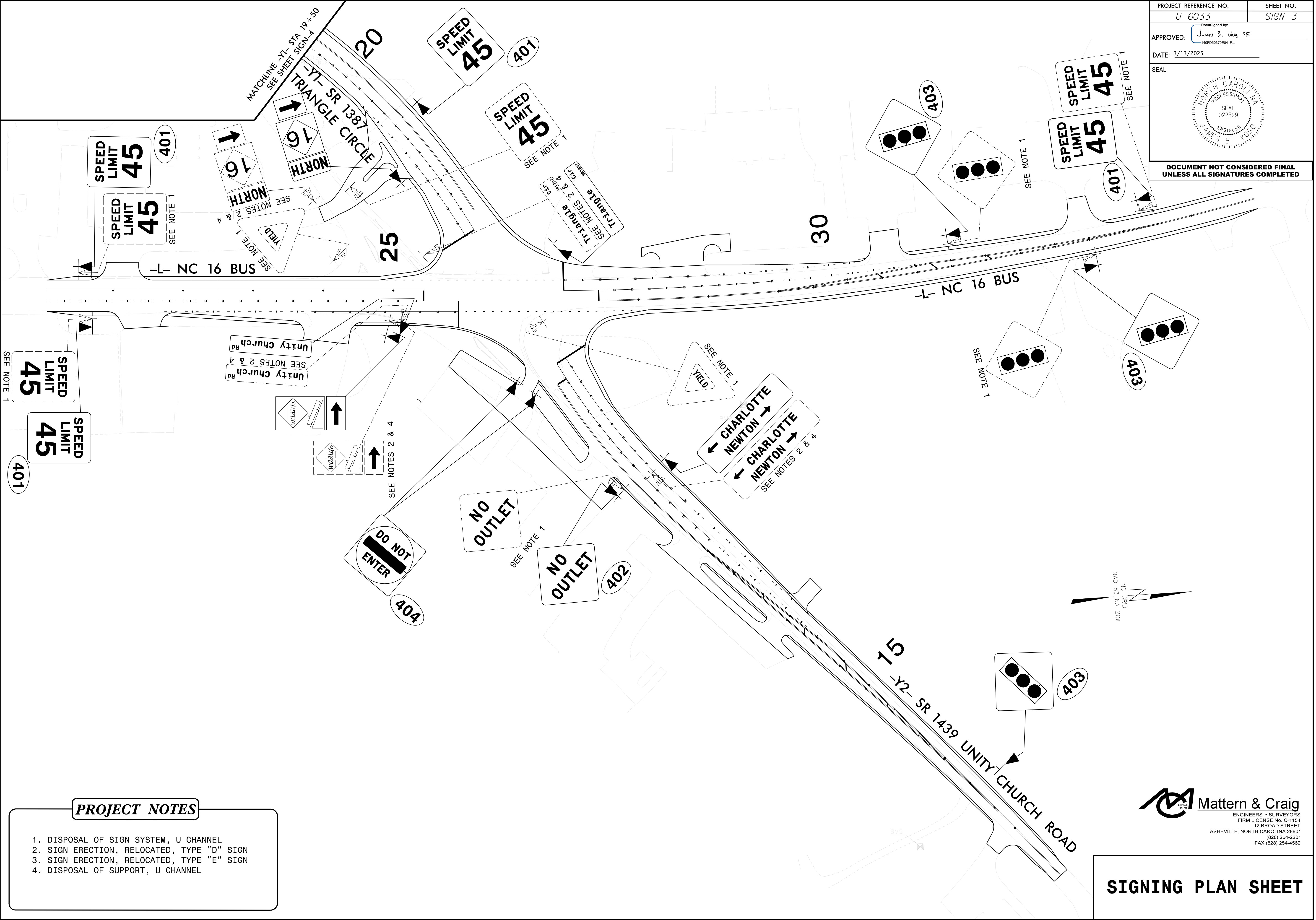
SEAL

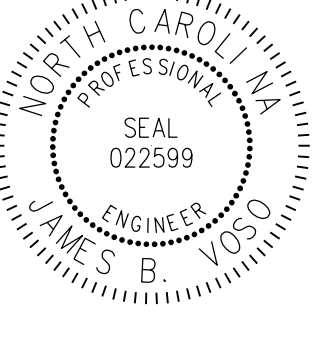
A circular professional engineer seal for the State of North Carolina. The outer ring contains the text "NORTH CAROLINA" at the top and "JAMES B. VOSE" at the bottom. Inside the ring, the words "PROFESSIONAL" and "ENGINEER" are positioned at the top and bottom respectively. In the center of the seal, it reads "SEAL" and "022599".

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

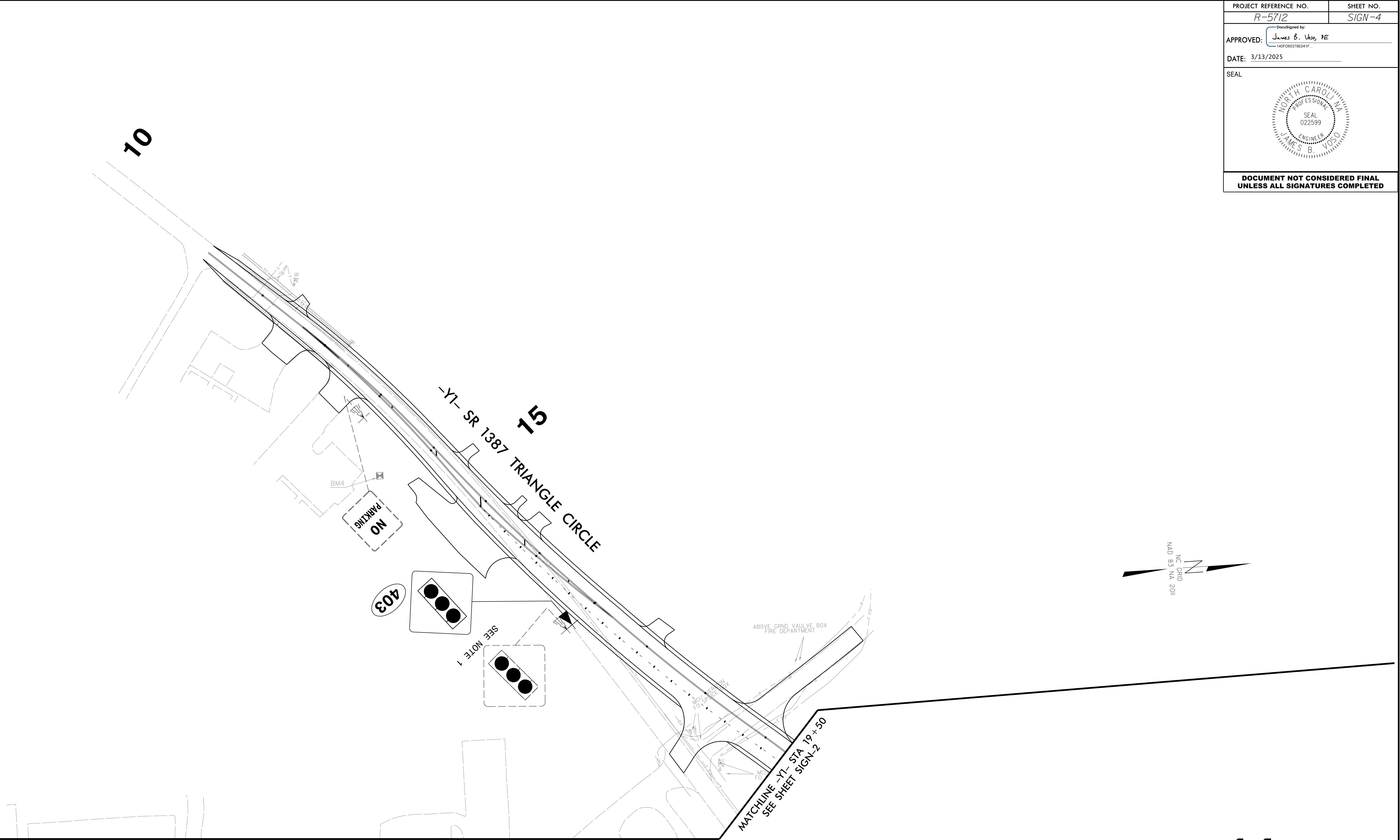


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CONSULTING ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-220
FAX (828) 254-4562



PROJECT REFERENCE NO. <i>U-6033</i>	SHEET NO. <i>SIGN-3</i>
DocuSigned by: <i>James B. Vaso, PE</i> 140FD00370E041F	
APPROVED:	
DATE: 3/13/2025	
SEAL	
	
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PROJECT REFERENCE NO.	SHEET NO.
R-5712	SIGN-4
APPROVED: DocuSigned by: James B. Veto, PE 140FD60379E041F...	
DATE: 3/13/2025	
SEAL	
North Carolina Professional Engineer Seal 022599 James B. Veto	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

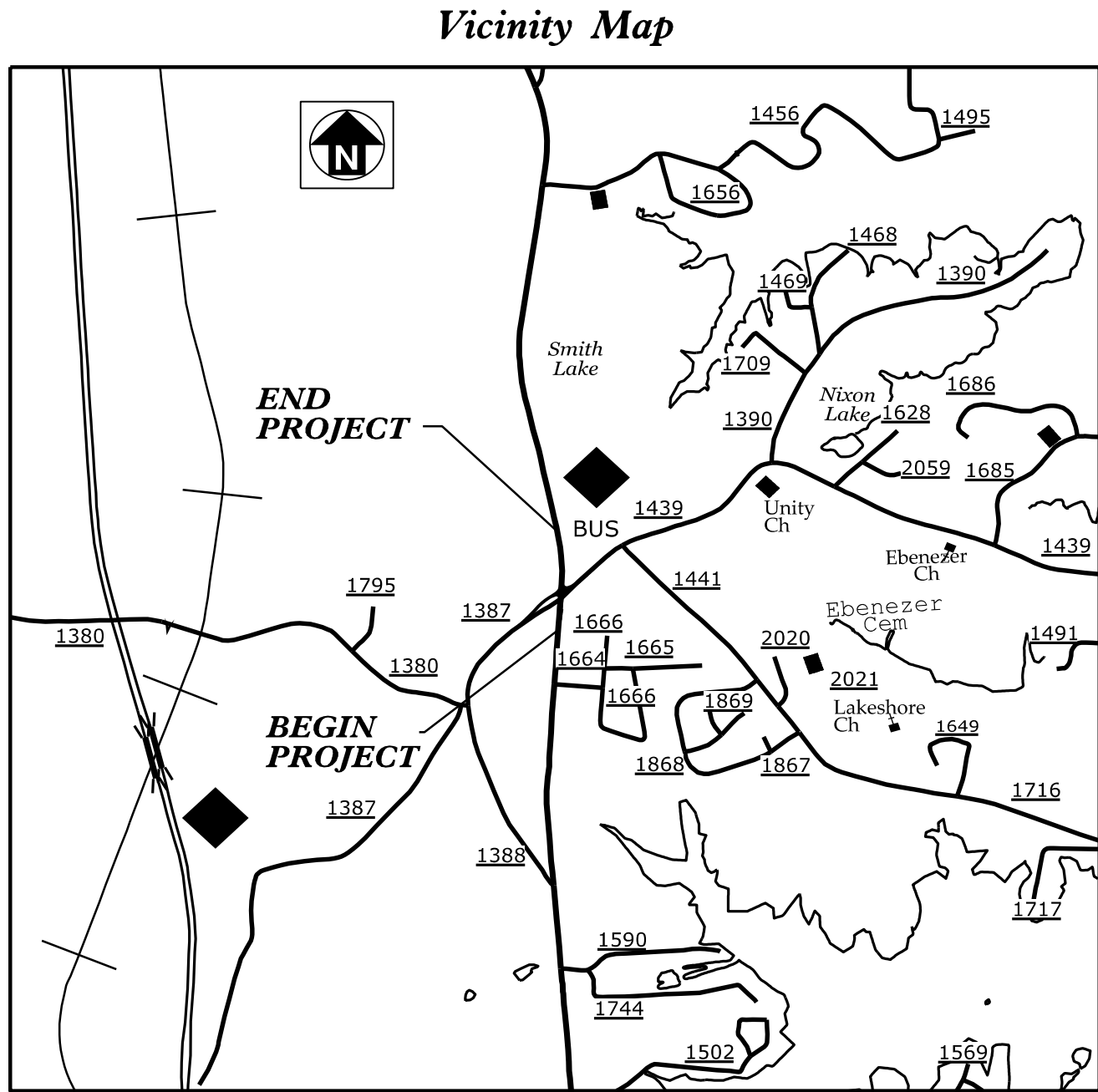


PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U CHANNEL
2. SIGN ERECTION, RELOCATED, TYPE "D" SIGN
3. SIGN ERECTION, RELOCATED, TYPE "E" SIGN
4. DISPOSAL OF SUPPORT, U CHANNEL

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ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

SIGNING PLAN SHEET

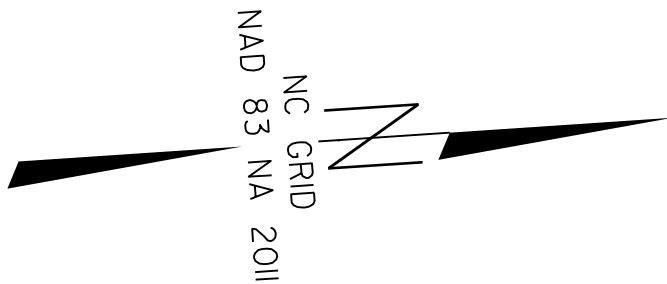


N.T.S.

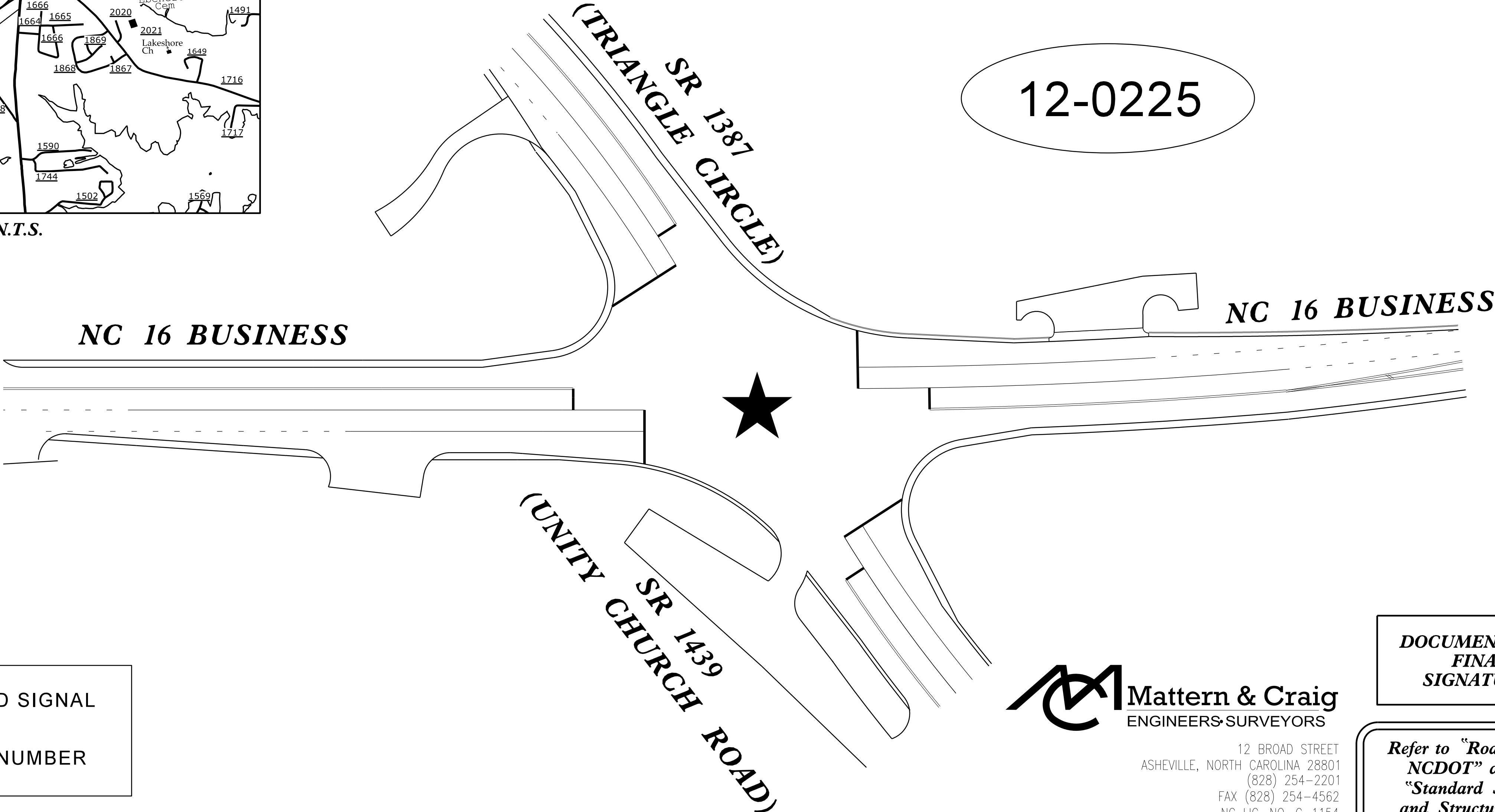
LINCOLN COUNTY

LOCATION: INTERSECTION OF NC 16 BUSINESS AT SR 1387
(TRIANGLE CIRCLE) /SR 1439 (UNITY CHURCH ROAD)

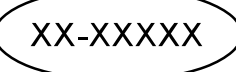
TYPE OF WORK: TRAFFIC SIGNALS

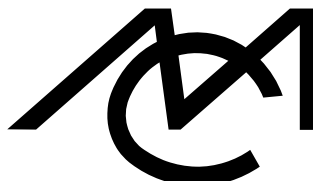


12-0225



 PROPOSED SIGNAL

 SIGNAL ID NUMBER

 **Mattern & Craig**
ENGINEERS-SURVEYORS

12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

Refer to "Roadway Standard Drawings
NCDOT" dated January 2024 and
"Standard Specifications for Roads
and Structures" dated January 2024.

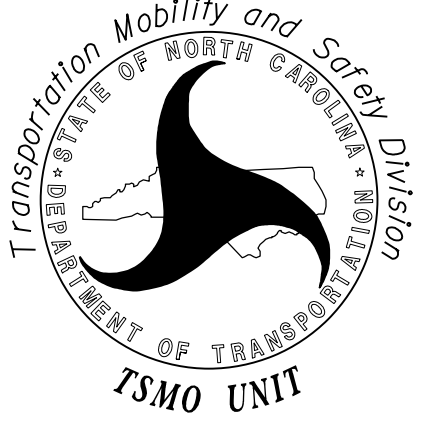
Index of Plans		Location/Description
Sheet #	Reference #	Title Sheet
Sig. 1.0	-----	NC 16 BUSINESS at SR 1387 (Triangle Circle) /SR 1349 (Unity Church Road)
Sig. 2.0-5.2	12-0225	

TRANSPORTATION SYSTEMS
MANAGEMENT & OPERATIONS

Contacts:

R. N. Zinser, PE - Western Region Signals Engineer
Todd Joyce, PE - Signal Equipment Design Engineer

Prepared for the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION

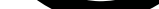


750 N. Greenfield Parkway, Garner, NC 27529

SIGNAL FACE I.D.

	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



Mattern & Craig
ENGINEERS-SURVEYORS

12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2200
FAX (828) 254-4562
NC LIC. NO. C-1154

*Microwave Detection Zone

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Abandon all existing loops.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Pavement markings are existing, except as noted.
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	
	Construction Zone	N/A
	Detection Zone	

Temporary Signal - TCP Phase I

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Prepared for the Offices of:

The seal of the North Carolina Department of Transportation is circular. It features a stylized map of North Carolina in the center, with a large, dark, curved shape (possibly representing a road or a bridge) overlaid on it. The text "TRANSPORTATION MOBILITY AND SAFETY DIVISION" is written in a circle around the top, and "DEPARTMENT OF TRANSPORTATION" is written around the bottom. Below the seal, the text "Signal Design Section" is printed.

Signal Design Section

750 N. Greenfield Pkwy., Garner, NC 27529

NC 16 Business
at
SR 1387 (Triangle Circle)/
SR 1439 (Unity Church Road)

PLAN DATE: April 2025	REVIEWED BY: JB Voso
PREPARED BY: Menga Yang	REVIEWED BY:

DocuSign Envelope ID: 8A0A0A0A-0A0A-0A0A-0A0A-0A0A0A0A0A0A

140FD60379E041F... 5/28/2025

SIGNATURE	DATE
SIG. INVENTORY NO.	12-0225T

3:21:52 PM
I:\3761A - R-5712 Phase 1\ Serv\cases\06 Working Folders\Traffic\Signal\Signal\12-0225\Electrical T1.dgn
c:\eaudy

PROJECT REFERENCE NO.	SHEET NO.
R-5712	Sig. 2.2

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3
Type	FYA 4 - Section	FYA 4 - Section
Included Phases	2	6
Modifier Phases	1	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

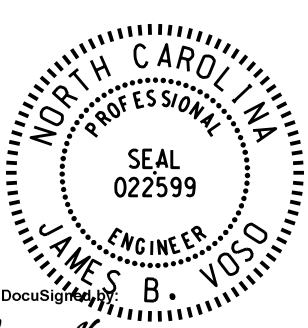
Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0225 T1
DESIGNED: April 2025
SEALED: 5/28/2025
REVISED: NA

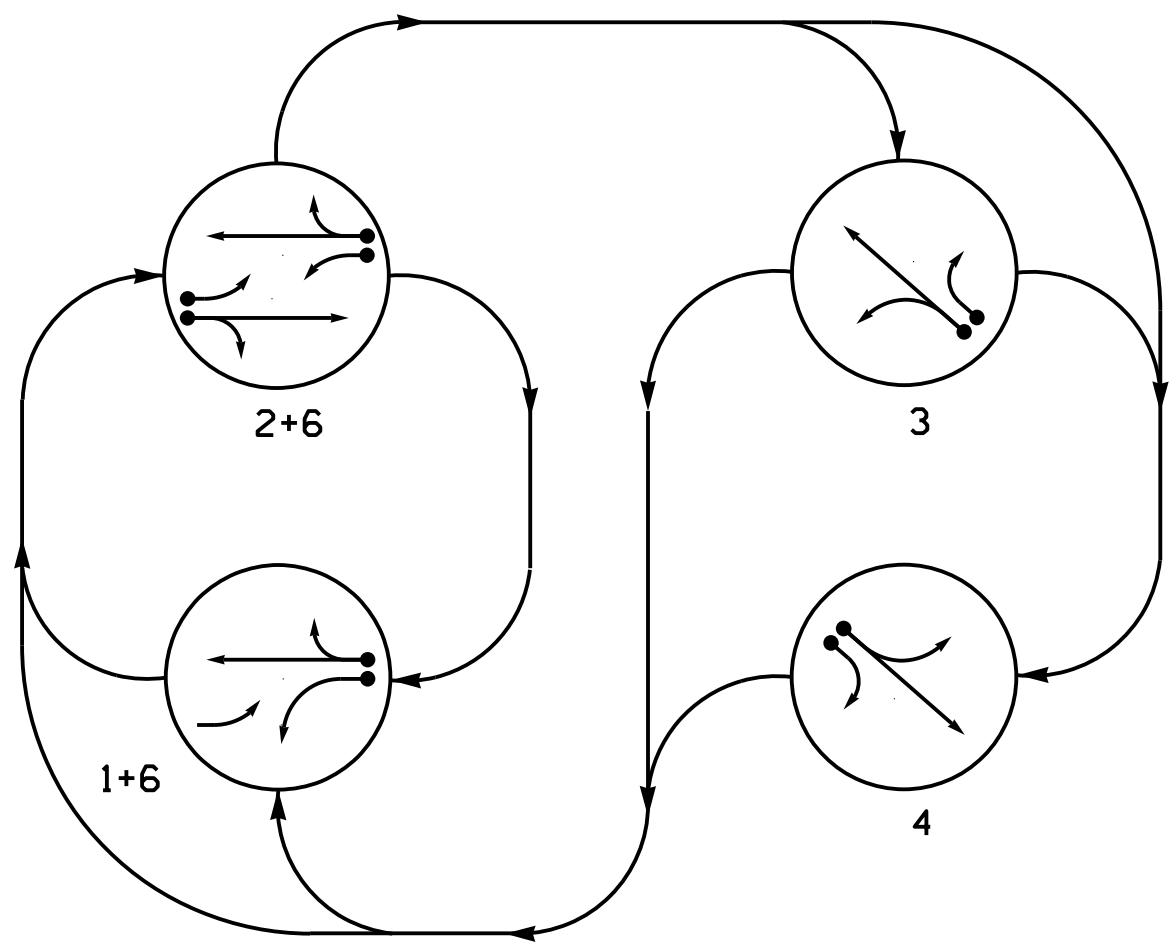
Mattern & Craig
ENGINEERS & SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

Electrical Detail - Temp 1 (TCP Phase I) - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	NC 16 Business at SR 1387 (Triangle Circle) / SR 1439 (Unity Church Road)		SEAL  SEAL 022599 JAMES B. VOSO ENGINEER NORTH CAROLINA 140FD60376D41F 5/28/2025 DATE
	PLAN DATE: April 2025	REVIEWED BY: JB Voso	
	PREPARED BY: Meng Yang	REVIEWED BY:	
	REVISIONS	INIT. DATE	
SIG. INVENTORY NO. 12-0225 T1			

PHASING DIAGRAM



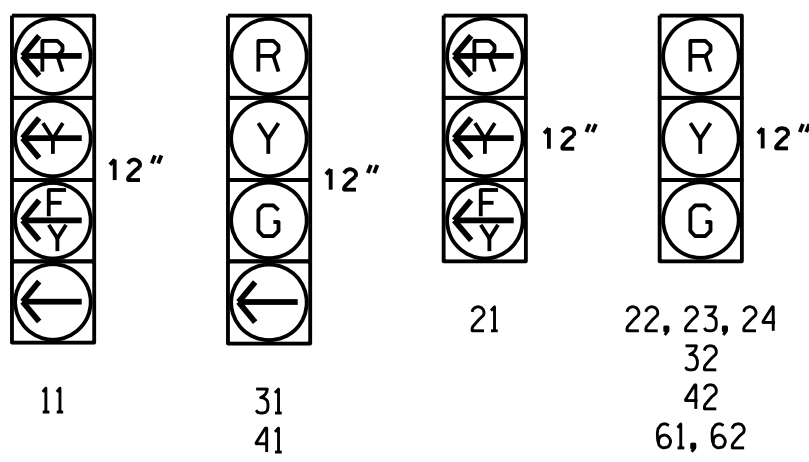
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE				
	1 + 6	2 + 6	3	4	FLASH
11	Y	R	R	R	R
21	Y	Y	R	R	R
22, 23, 24	R	G	R	R	R
31	R	R	G	R	R
32	R	R	G	R	R
41	R	R	R	G	R
42	R	R	R	G	R
61, 62	G	G	R	R	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	INITIAL	CALL	NEW CARD
1A	*	0	*	-	1	15.0	-	X	-	X	-
2B	*	0	*	-	6	3.0	-	X	-	X	-
3A	*	0	*	-	3	3.0	-	X	-	X	-
3B	*	0	*	-	3	15.0	-	X	-	X	-
4A	*	0	*	-	4	3.0	-	X	-	X	-
4B	*	0	*	-	4	15.0	-	X	-	X	-

*Microwave Detection Zone

4 Phase Fully Actuated (Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Pavement Markings are existing.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

LEGEND

- PROPOSED
- Traffic Signal Head
 - Modified Signal Head
 - Sign
 - Pedestrian Signal Head With Push Button & Sign
 - Signal Pole with Guy
 - Signal Pole with Sidewalk Guy
 - Inductive Loop Detector
 - Controller & Cabinet
 - Junction Box
 - 2-in Underground Conduit
 - Right of Way
 - Directional Arrow
 - Construction Zone
 - Detection Zone
- EXISTING
- N/A
 - N/A
 - N/A
 - N/A
 - N/A
 - N/A
 - N/A
 - N/A
 - N/A
 - N/A
 - N/A
 - N/A

MAXTIME TIMING CHART						
FEATURE	PHASE					
	1	2	3	4	6	
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Min Green *	7	12	7	7	12	
Passage *	2.0	6.0	2.0	2.0	6.0	
Max I *	15	90	30	30	90	
Yellow Change	3.0	4.8	4.9	4.6	4.8	
Red Clear	1.9	2.6	2.4	3.2	2.6	
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	
Time To Reduce *	-	45	-	-	45	
Minimum Gap	-	3.0	-	-	3.0	
Advance Walk	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	-	
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	
Dual Entry	-	-	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Advance Microwave Detection

FUNCTION	Sensor 1 (2A)		Sensor 2 (6A)	
Channel	1		1	
Phase	2		6	
Direction of Travel	NB		SB	
Type	Priority		Priority	
Level	2	QUEUE	2	QUEUE
Discovery Zone (ft)	<750		<750	
Detection Zone (ft)	600-100		600-100	
Enable Speed	Y	Y	Y	Y
Speed Range (mph)	35-100		35-100	
Enable Estimated Time of Arrival	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5-6.5		2.5-6.5	



12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

Temporary Signal - TCP Phase II

Prepared For the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 0 40 1" = 40'

NC 16 Business at SR 1387 (Triangle Circle) / SR 1439 (Unity Church Road)

Division 12 Lincoln County Denver

PLAN DATE: April 2025 REVIEWED BY: JB Voso

PREPARED BY: Meng Yang REVIEWED BY:

REVISIONS

INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

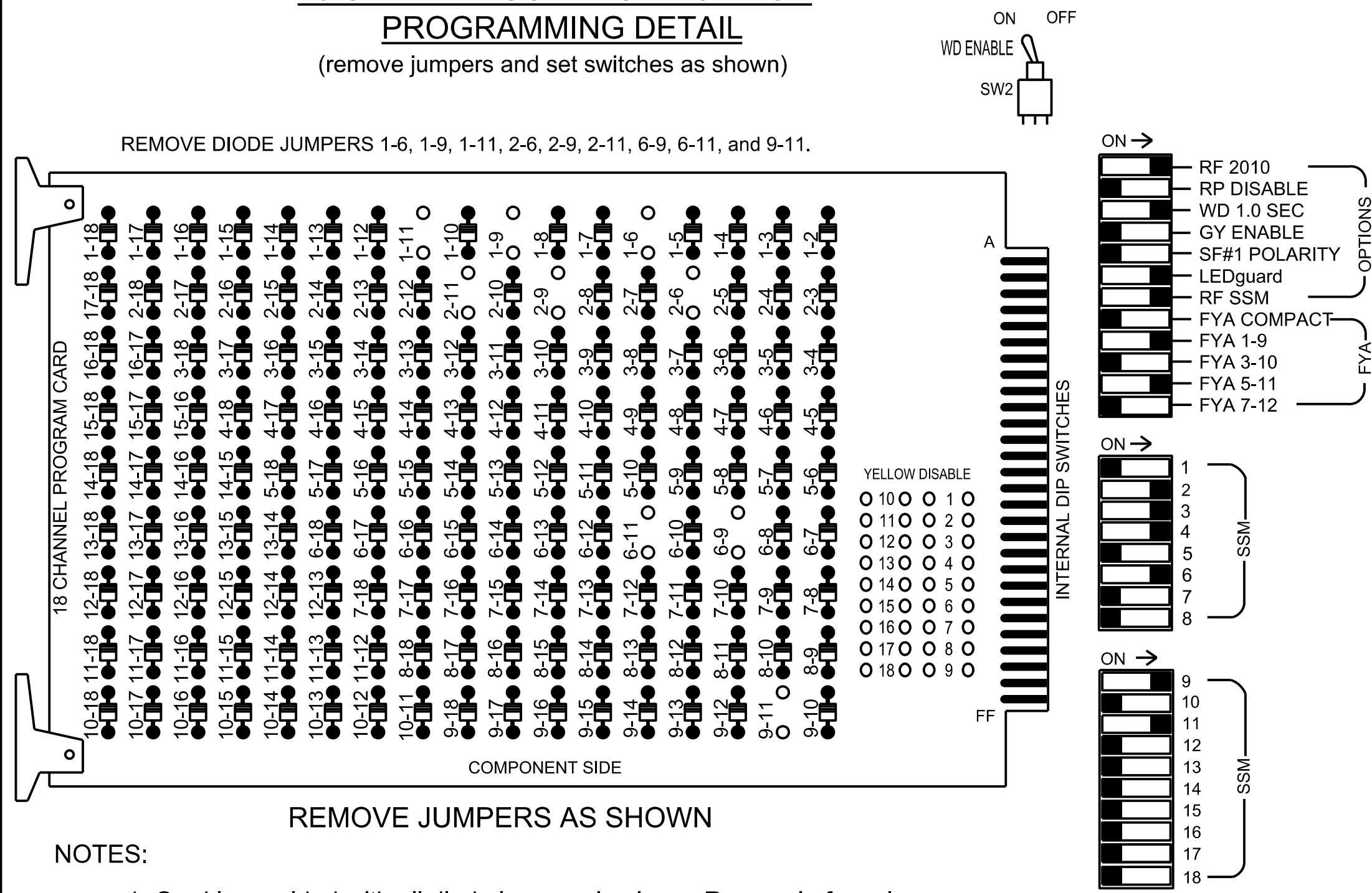
James Voso

5/28/2025

SIG. INVENTORY NO. 12-022512

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S4, S5, S8, AUX S1, AUX S4
Phases Used.....	1, 2, 3, 4, 6
Overlap "1".....	*
Overlap "2".....	Not Used
Overlap "3".....	*
Overlap "4".....	Not Used

*See overlap programming detail on sheet 2

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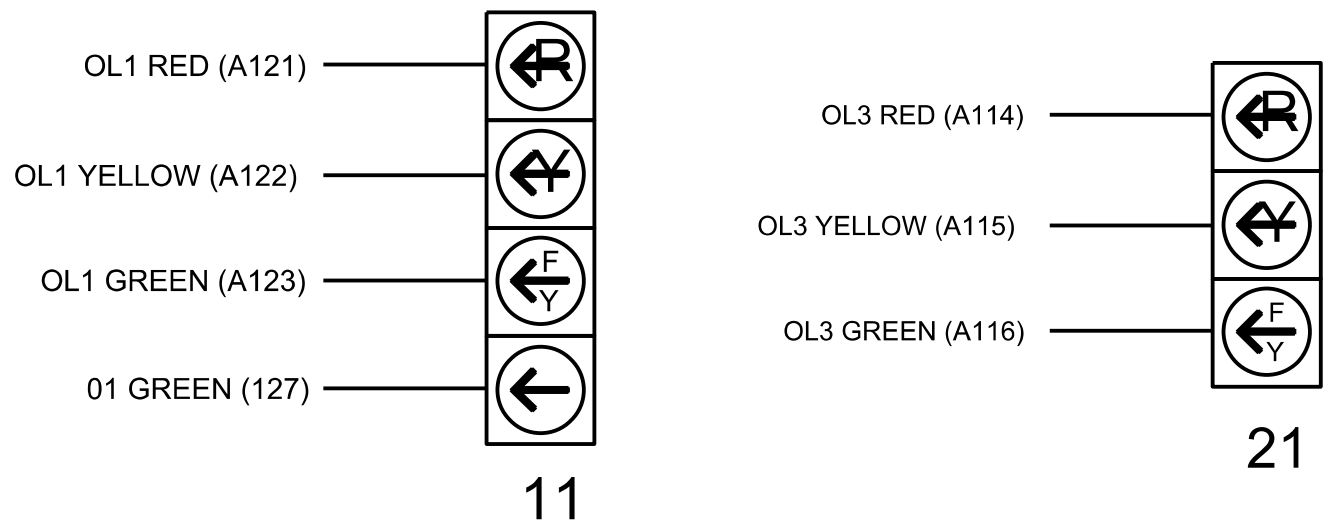
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

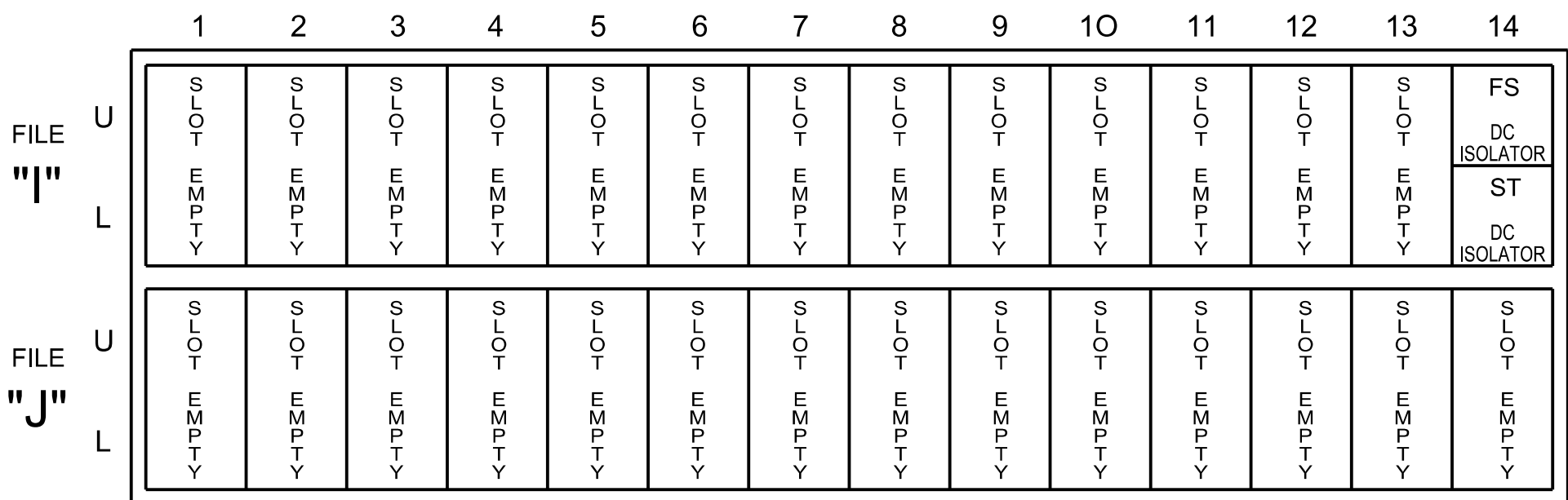
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

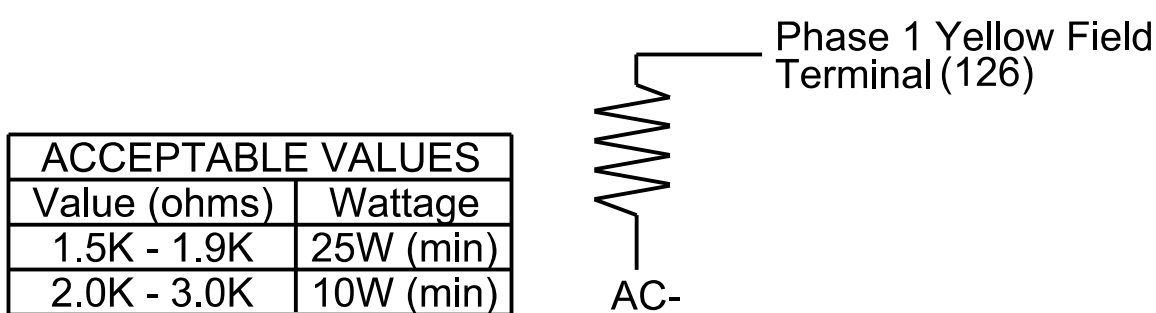


EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

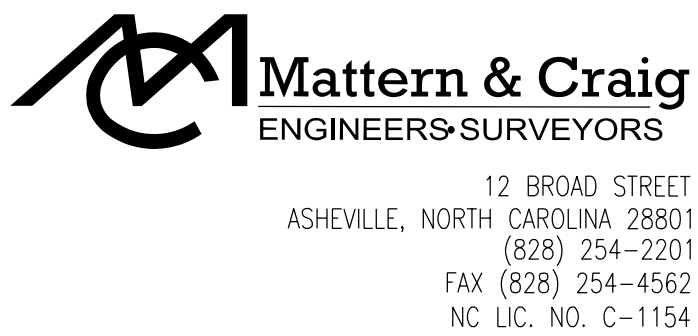
(install resistors as shown)



SPECIAL DETECTOR NOTE

Install a multi-zone microwave detection system for all vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0225 T2
DESIGNED: April 2025
SEALED: 5/28/2025
REVISED: NA



Electrical Detail - Temp 2 (TCP Phase II) - Sheet 1 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

NC 16 Business

at
SR 1387 (Triangle Circle) /
SR 1439 Unity Church Road

Division 12 Lincoln County Denver

PLAN DATE:	April 2025	REVIEWED BY:	JB Voso
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PREPARED BY: Meng Yang	REVIEWED BY:
------------------------	--------------

REVISIONS	INIT.	
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SEAL



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James Voso

140FD80379E041F... 5/28/2025

DATE 10-00005 TO

5/22/25 2:12 PM
11:43:16 AM - R-5712 Phase II Serv/ices.dwg Working Folder\\R-5712\\R-5712\\Signal\\Signal\\2-0225\\Electrical\\T2.dwg
cckaudy

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3
Type	FYA 4 - Section	FYA 4 - Section
Included Phases	2	6
Modifier Phases	1	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

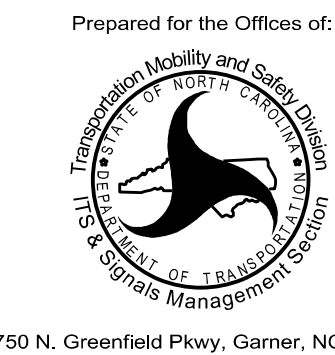
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0225 T2
DESIGNED: April 2025
SEALED: 5/28/2025
REVISED: NA

Mattern & Craig
ENGINEERS-SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

Electrical Detail - Temp 2 (TCP Phase II) - Sheet 2 of 2

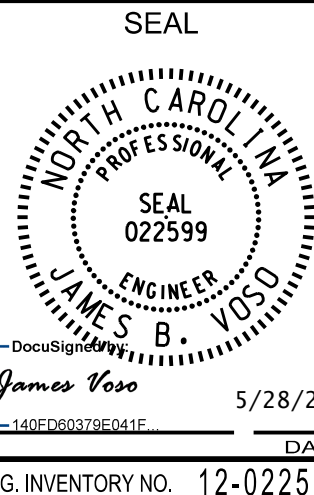
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

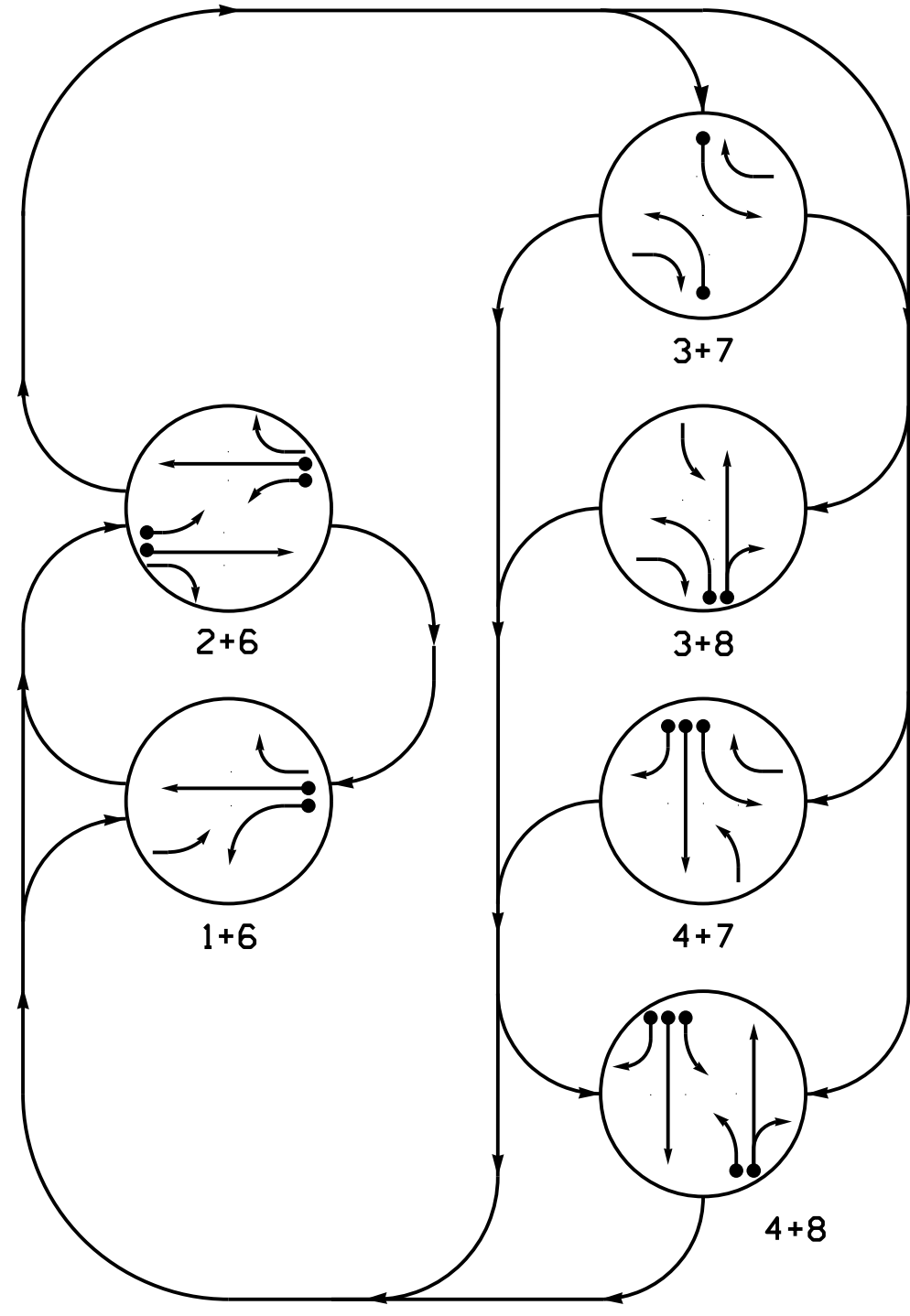


NC 16 Business
at
SR 1387 (Triangle Circle) /
SR 1439 (Unity Church Road)

PLAN DATE: April 2025	REVIEWED BY: JB Voso
PREPARED BY: Meng Yang	REVIEWED BY:
REVISIONS	INIT. DATE



PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

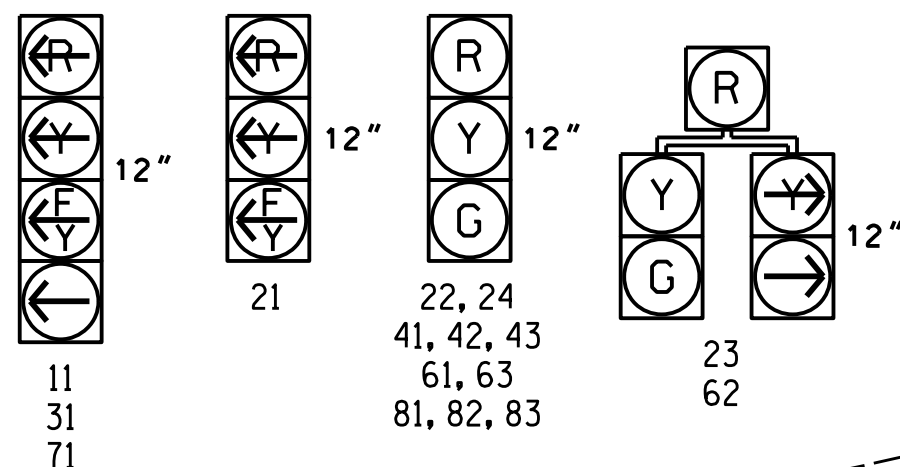
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	1 + 6	2 + 6	3 + 7	3 + 8	4 + 7	4 + 8	FLASH	
11	—	—	—	—	—	—	—	
21	—	—	—	—	—	—	—	
22, 24	R	G	R	R	R	R	R	
23	R	G	R	R	R	R	R	
31	—	—	—	—	—	—	—	
41, 42, 43	R	R	R	R	G	G	R	
61, 63	G	G	R	R	R	R	R	
62	G	G	R	R	R	R	R	
71	—	—	—	—	—	—	—	
81, 82, 83	R	R	R	G	R	G	R	

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

DETECTOR				PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	INITIAL ADDED	CALL DURING GREEN	NEW CARD
1A	*	0	*	X	1	15.0	-	X	-	X	-
2B	*	0	*	X	2	3.0	-	X	-	X	-
3A	*	0	*	X	3	15.0	-	X	-	X	-
4B	*	0	*	X	4	15.0	-	X	-	X	-
7A	*	0	*	X	7	15.0	-	X	-	X	-
					4	3.0	-	X	-	X	*

*Microwave Detection Zone

6 Phase Fully Actuated (Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- See pavement marking plans for proposed stop bar locations.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	3	4	6	7	8	
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Min Green *	7	12	7	7	12	7	7	-
Passage *	2.0	6.0	2.0	2.0	6.0	2.0	2.0	-
Max 1 *	15	90	15	30	90	15	30	-
Yellow Change	3.0	4.8	3.0	4.6	4.8	3.0	4.6	-
Red Clear	2.9	2.6	3.8	2.6	2.6	3.9	2.6	-
Added Initial *	-	-	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-	-	-
Time To Reduce *	-	45	-	-	45	-	-	-
Minimum Gap	-	3.0	-	-	3.0	-	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	-	X	X	-
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-	-	-
Dual Entry	-	-	-	X	-	-	X	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Advance Microwave Detection

FUNCTION	Sensor 1 2A		Sensor 2 6A		Sensor 3 4A		Sensor 4 8A	
Channel	1		1		2		2	
Phase	2		6		4		8	
Direction of Travel	NB		SB		EB		WB	
Type	Priority		Priority		Priority		Priority	
Level	2		2		2		2	
Discovery Zone (ft)	<750		<750		<750		<750	
Detection Zone (ft)	600-100		600-100		600-100		600-100	
Enable Speed	Y		Y		Y		Y	
Speed Range (mph)	35-100		1-35		35-100		35-100	
Enable Estimated Time of Arrival	Y		Y		Y		Y	
Estimated Time of Arrival (sec)	2.5-6.5		2.5-6.5		2.5-6.5		2.5-6.5	

Wood Pole Sta. 25+98 -L- +/- 57' RT +/-

Wood Pole Sta. 26+68 -L- +/- 72' LT +/-

LEGEND

- PROPOSED: Traffic Signal Head, Modified Signal Head, Sign, Pedestrian Signal Head With Push Button & Sign, Signal Pole with Guy, Signal Pole with Sidewalk Guy, Inductive Loop Detector, Controller & Cabinet, Junction Box, 2-in Underground Conduit, Right of Way, Directional Arrow, Construction Zone, Detection Zone.
- EXISTING: N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A.

Temporary Signal - TCP Phase III

Mattern & Craig ENGINEERS-SURVEYORS

12 BROAD STREET ASHEVILLE, NORTH CAROLINA 28801 (828) 254-2201 FAX (828) 254-4562 NC LIC. NO. C-1154

NC 16 Business at SR 1387 (Triangle Circle)/ SR 1439 (Unity Church Road)

Division 12 Lincoln County Denver

PLAN DATE: April 2025 REVIEWED BY: JB Voso

PREPARED BY: Meng Yang REVIEWED BY:

REVISIONS: INIT. DATE

James Voso 5/28/2025

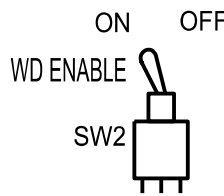
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SIGNATURE DATE

SIG. INVENTORY NO. 12-022513

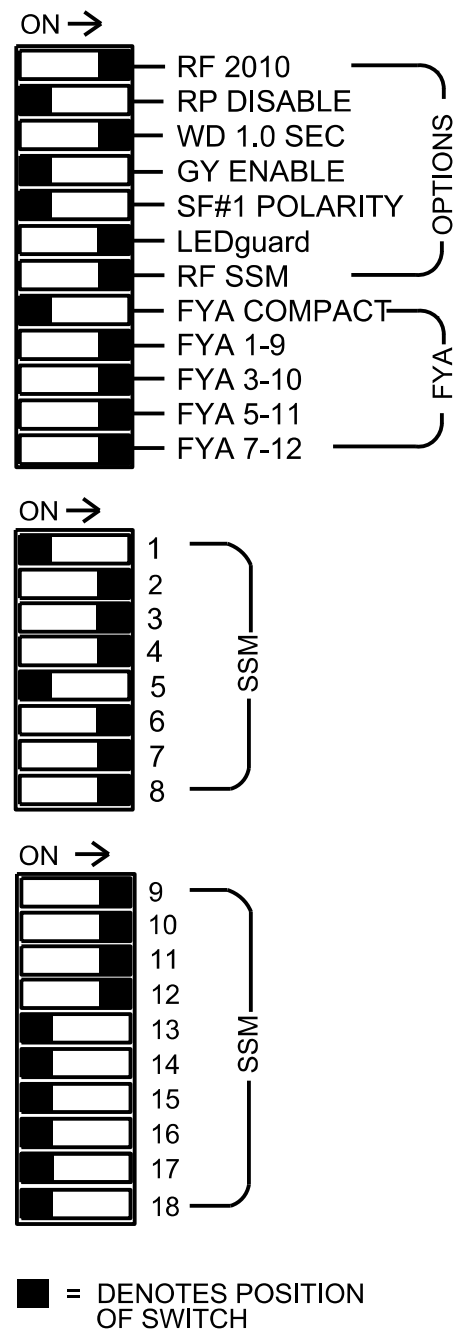
(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 2-6, 2-9, 2-11, 3-7, 3-8,
3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 6-9, 6-11,
7-10, 7-12, 8-10, 8-12, 9-11, and 10-12.



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.



1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S4, S5, S8, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....	1, 2, 3, 4, 6, 7, 8
Overlap "1".....	*
Overlap "2".....	*
Overlap "3".....	*
Overlap "4".....	*

*See overlap programming detail on sheet 2

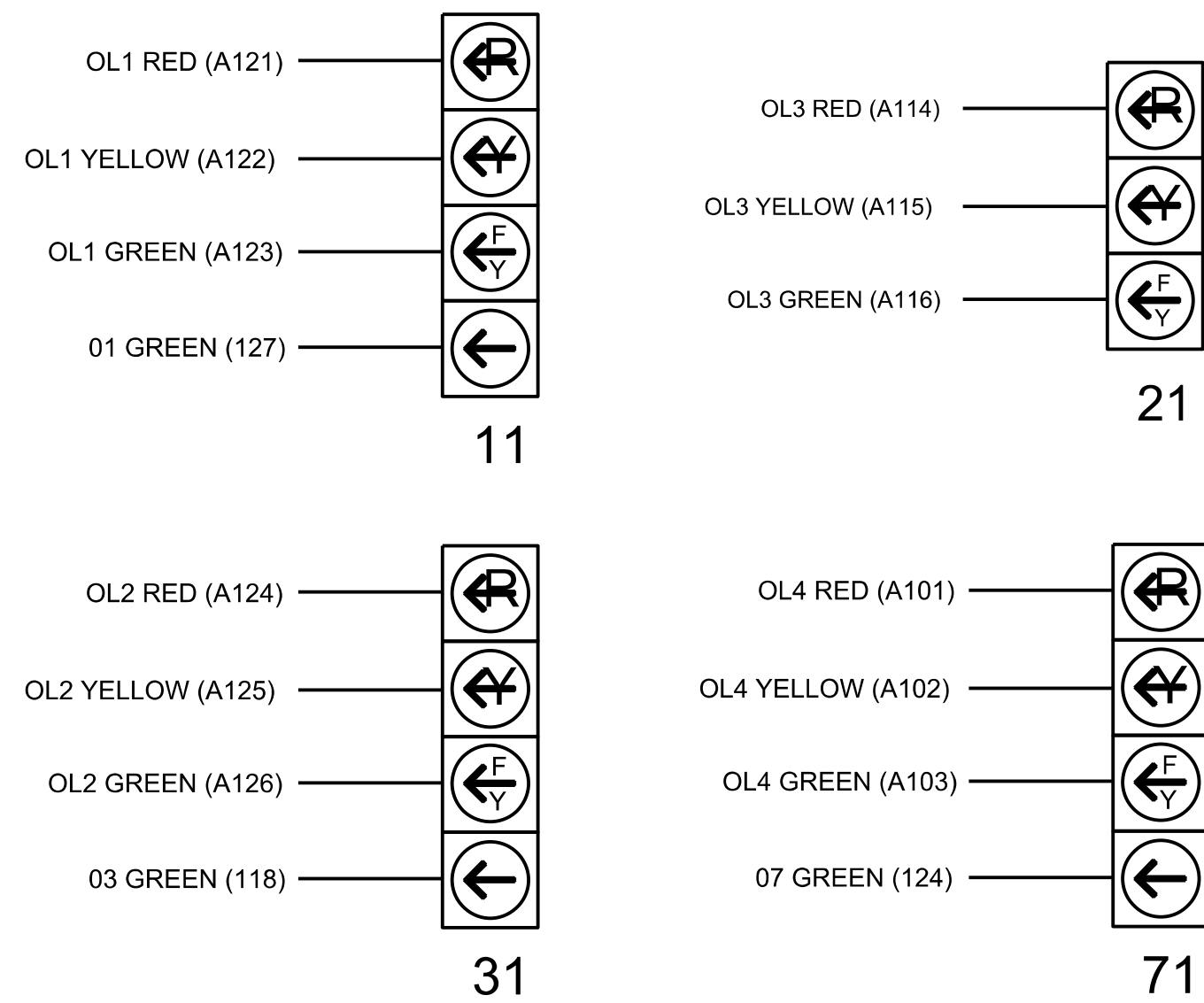
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NU = Not Used

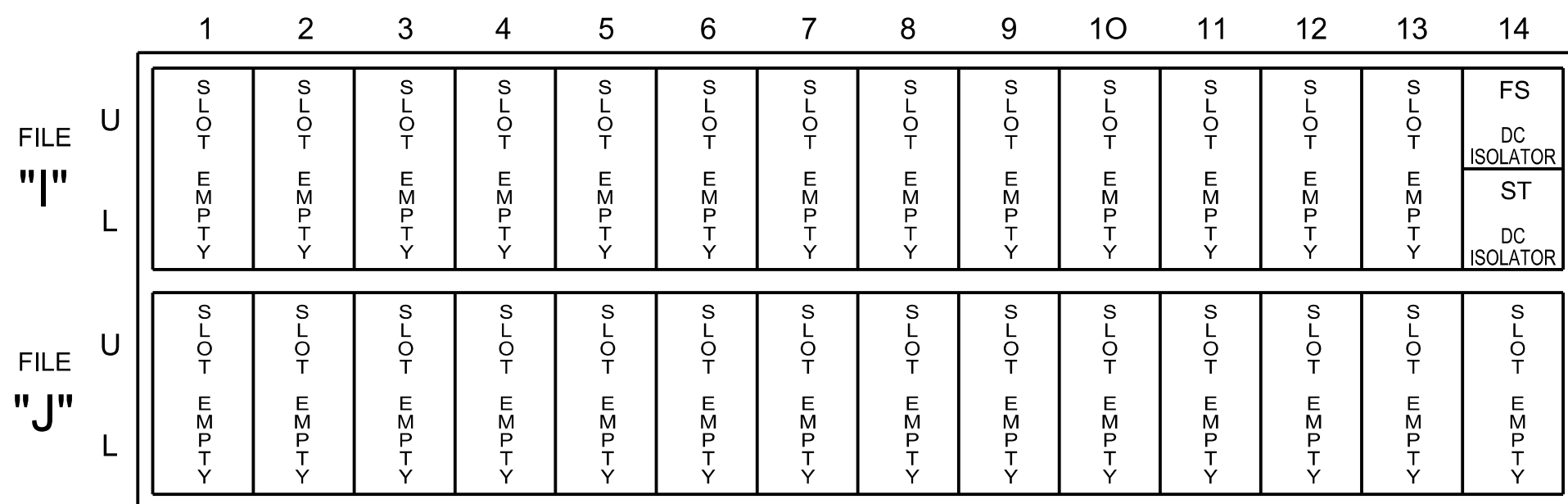
* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

(wire signal heads as shown)



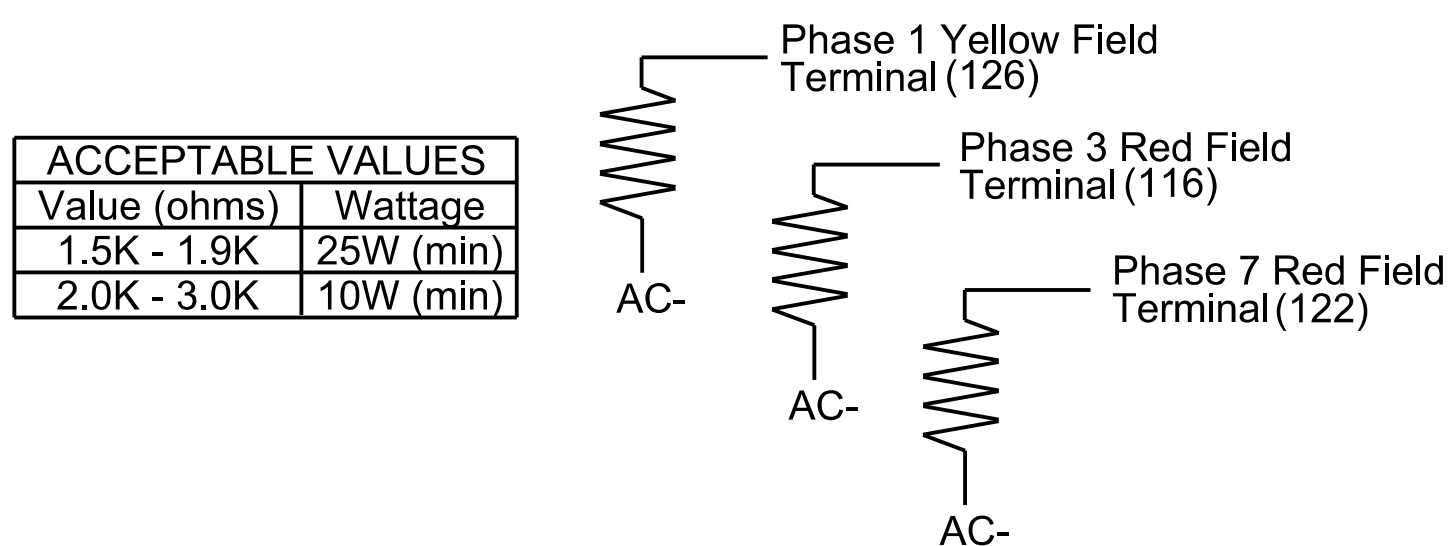
(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

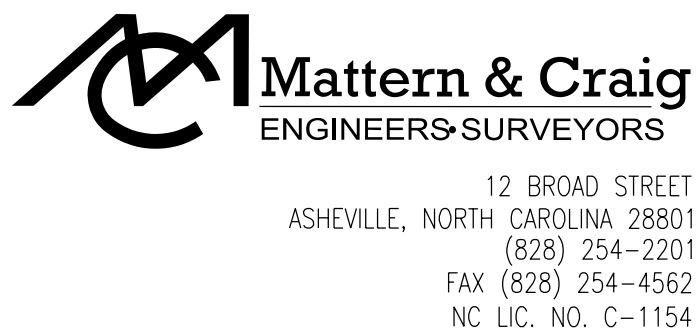
FS = FLASH SENSE
ST = STOP TIME

(install resistors as shown)



Install a multi-zone microwave detection system for all vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0225 T3
DESIGNED: April 2025
SEALED: 5/28/2025
REVISED: NA



Electrical Detail - Temp 3 (TCP Phase III) - Sheet 1 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

NC 16 Business

at
SR 1387 (Triangle Circle) /
SR 1439 (Unity Church Road)

Division 12 Lincoln County Denver

PLAN DATE: April 2025	REVIEWED BY: JB Voso
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PREPARED BY: Meng Yang	REVIEWED BY:
------------------------	--------------

REVISIONS	INIT.	DATE
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SEAL

DocuSign, Inc.

James Voso

140FD60379E041F... 5/2

SIG. INVENTORY NO. 12-022

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	3	*	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6	Overlap	X		18

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0225 T3
DESIGNED: April 2025
SEALED: 5/28/2025
REVISED: NA

 **Mattern & Craig**
ENGINEERS & SURVEYORS

12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

Electrical Detail - Temp 3 (TCP Phase III) - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 16 Business
at
1387 (Triangle Circle) /
439 (Unity Church Road)

Division 12 Lincoln County Denver

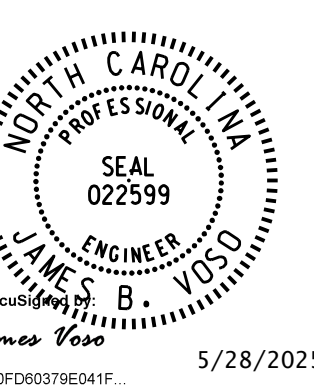
PLAN DATE:	April 2025	REVIEWED BY:	JB Voso
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PREPARED BY: JB Voso	REVIEWED BY:
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REVISIONS	INIT.	DATE
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29			
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REAL



28/2025

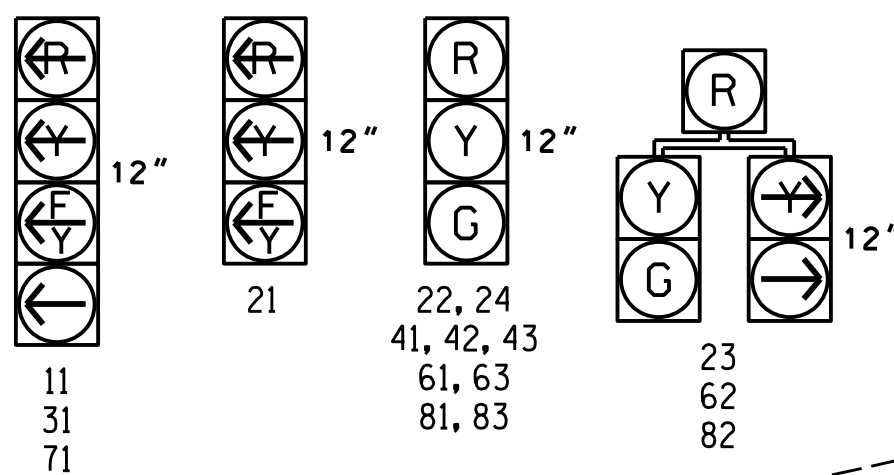
140FD50379E041F... DATE

SIG. INVENTORY NO. 12-0225 T3

	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE						
	1 + 6	2 + 6	3 + 7	3 + 8	4 + 7	4 + 8	F L A S H
11	—	$\frac{F}{Y}$	R	R	R	R	R
21	$\frac{F}{Y}$	$\frac{F}{Y}$	R	R	R	R	R
22, 24	R	G	R	R	R	R	R
23	R	G	$\frac{R}{\text{diagonal}}$	$\frac{R}{\text{diagonal}}$	R	R	R
31	R	R	—	—	$\frac{F}{Y}$	$\frac{F}{Y}$	R
41, 42, 43	R	R	R	R	G	G	R
61, 63	G	G	R	R	R	R	R
62	G	G	$\frac{R}{\text{diagonal}}$	$\frac{R}{\text{diagonal}}$	R	R	R
71	R	R	—	$\frac{F}{Y}$	—	$\frac{F}{Y}$	R
81, 83	R	R	R	G	R	G	R
82	$\frac{R}{\text{diagonal}}$	R	R	G	R	G	R

All Heads L.E.D.



DETECTOR					PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD	
1A	*	0	*	-	1 6	15.0 3.0	-	X	-	X	-	-	
1B	*	0	*	X	1	15.0	-	X	-	X	X	-	
2B	*	0	*	-	2	3.0	-	X	-	X	X	*	
3A	*	0	*	X	3 8	15.0 3.0	-	X	-	X	-	-	
4B	*	0	*	-	4	3.0	-	X	-	X	-	-	
7A	*	0	*	-	7 4	15.0 3.0	-	X	-	X	-	-	

* Microwave Detection Zone

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. See pavement marking plans for proposed stop bar locations.
7. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

FEATURE	PHASE						
	1	2	3	4	6	7	8
Walk *	–	–	–	–	–	–	–
Ped Clear	–	–	–	–	–	–	–
Min Green *	7	12	7	7	12	7	7
Passage *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	15	90	15	30	90	15	30
Yellow Change	3.0	4.4	3.0	4.6	4.4	3.0	4.6
Red Clear	3.3	2.6	3.9	2.6	2.6	3.9	2.6
Added Initial *	–	2.5	–	–	2.5	–	–
Maximum Initial *	–	34	–	–	34	–	–
Time Before Reduction *	–	15	–	–	15	–	–
Time To Reduce *	–	45	–	–	45	–	–
Minimum Gap	–	3.0	–	–	3.0	–	–
Advance Walk	–	–	–	–	–	–	–
Non Lock Detector	X	–	X	X	–	X	X
Vehicle Recall	–	MIN RECALL	–	–	MIN RECALL	–	–
Dual Entry	–	–	–	X	–	–	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

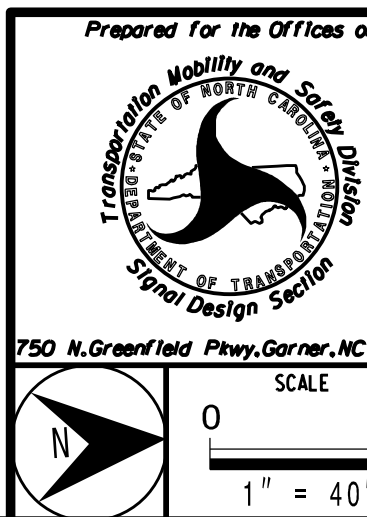
FUNCTION	Sensor 1 (2A)		Sensor 2 (6A)		Sensor 3 (4A)		Sensor 4 (8A)	
Channel	1		1		2		2	
Phase	2		6		4		8	
Direction of Travel	NB		SB		EB		WB	
Type	Priority		Priority		Priority		Priority	
Level	2	QUEUE	2	QUEUE	2	QUEUE	2	QUEUE
Discovery Zone (ft)	<750	NA	<750	NA	<750	NA	<750	NA
Detection Zone (ft)	600-100	150-100	600-100	150-100	600-100	150-100	600-100	150-100
Enable Speed	Y	Y	Y	Y	Y	Y	Y	Y
Speed Range (mph)	35-100	1-35	35-100	1-35	35-100	1-35	35-100	1-35
Enable Estimated Time of Arrival	Y	N	Y	N	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5-6.5	-	2.5-6.5	-	2.5-6.5	-	2.5-6.5	-

<u>PROPOSED</u>		<u>EXISTING</u>
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	N/A
	Directional Drill	
	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	
	Detection Zone	

Signal Upgrade - Final



12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

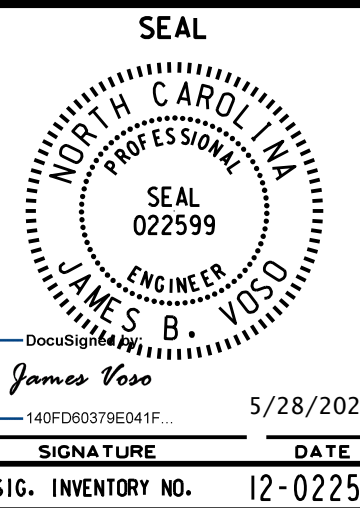


NC 16 Business
at
SR 1387 (Triangle Circle) /
SR 1439 (Unity Church Road)

PLAN DATE: April 2025	REVIEWED BY: JB Voso
PREPARED BY: Meng Yang	REVIEWED BY:

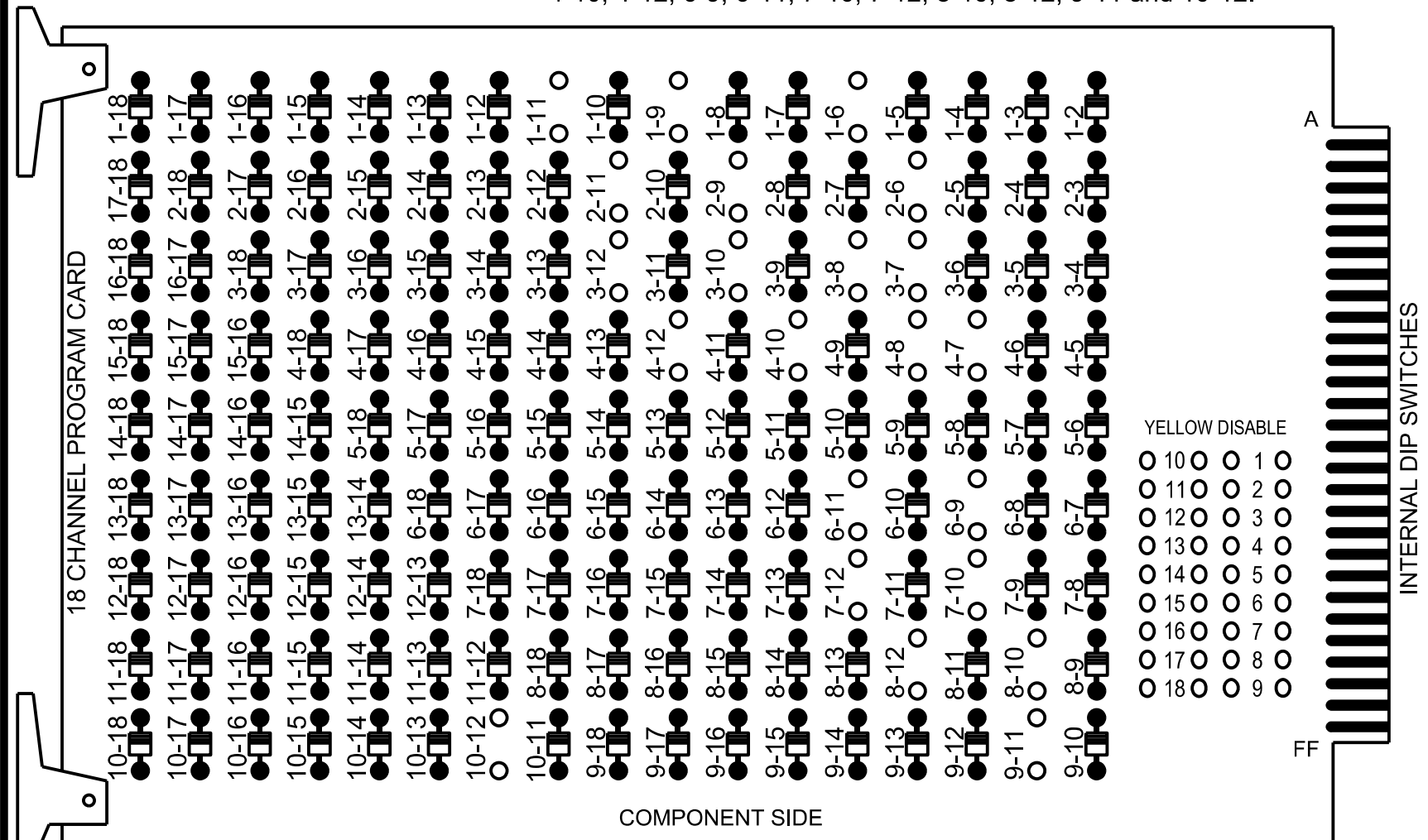
REVISIONS	INIT.	DATE
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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



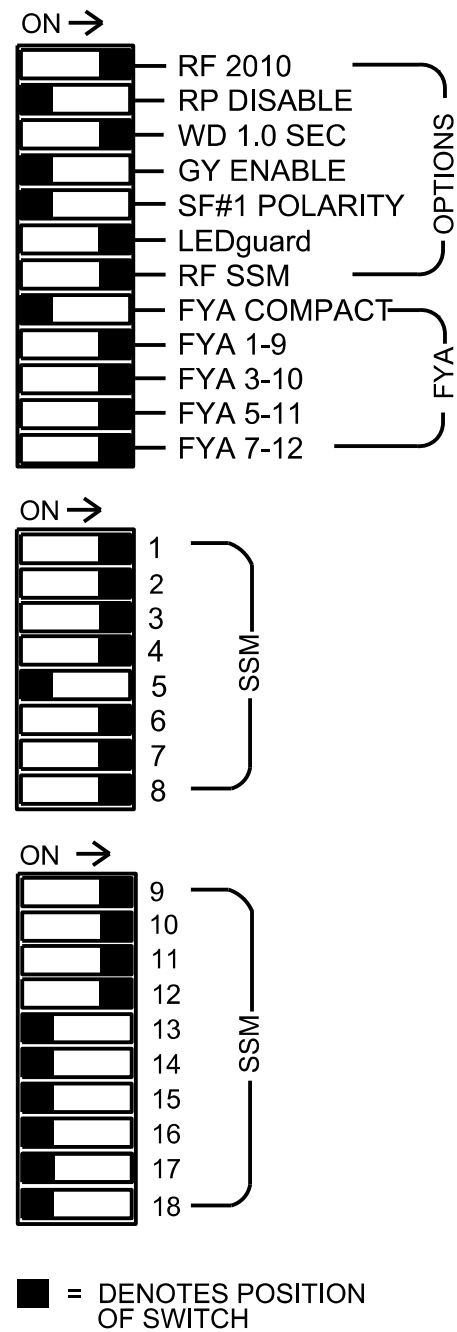
(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.



1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S4, S5, S8, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....	1, 2, 3, 4, 6, 7, 8
Overlap "1".....	*
Overlap "2".....	*
Overlap "3".....	*
Overlap "4".....	*

*See overlap programming detail on sheet 2

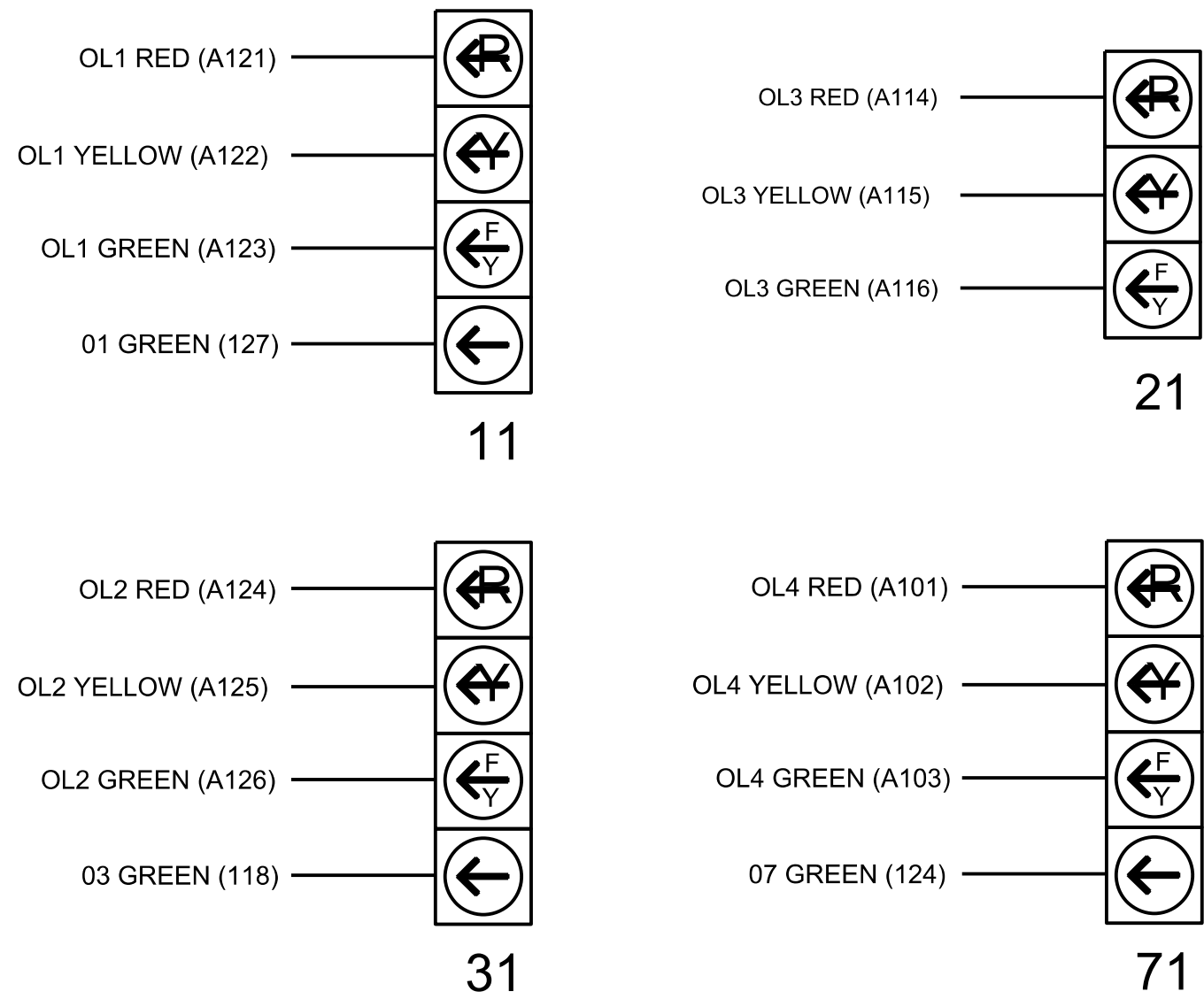
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6			
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18			
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE			
SIGNAL HEAD NO.	82	11★	22, 23, 24	NU	23	31★	41, 42	NU	NU	61, 62, 63	NU	62	71★	81, 82, 83	NU	11★	31★	NU	21★	71★	NU
RED	*		128		*		101			134		*		107							
YELLOW			129				102			135				108							
GREEN			130				103			136				109							
RED ARROW														A121	A124		A114	A101			
YELLOW ARROW	126				117						123			A122	A125		A115	A102			
FLASHING YELLOW ARROW														A123	A126		A116	A103			
GREEN ARROW	127	127			118	118						124	124								

NU = Not Used

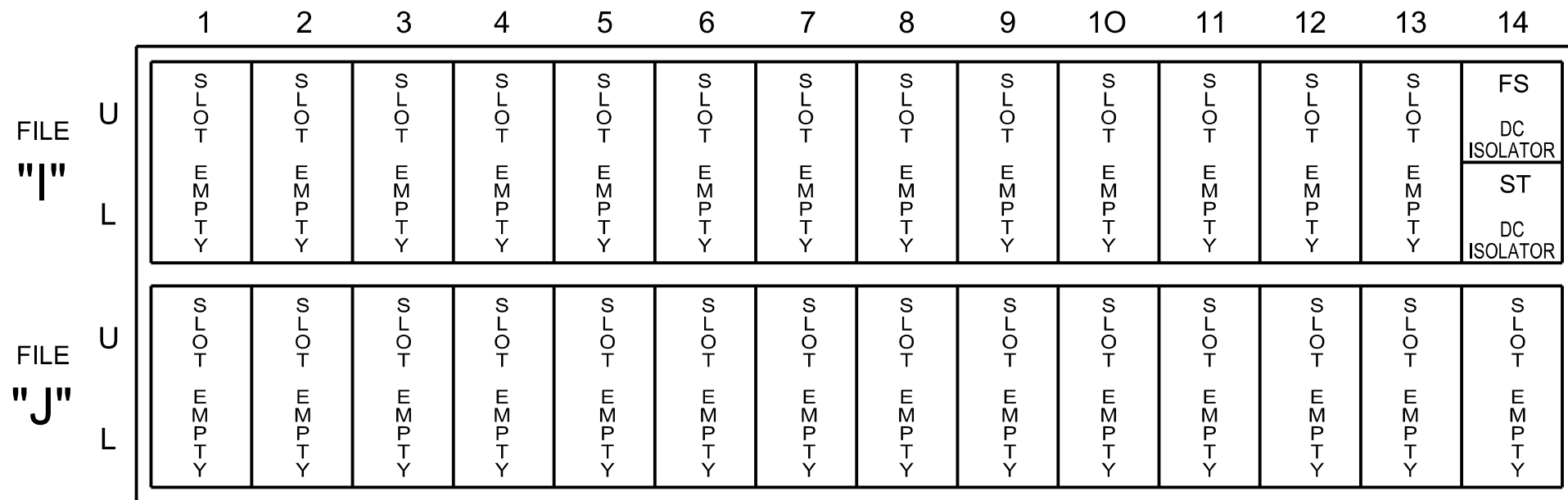
* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

(wire signal heads as shown)



(front view)

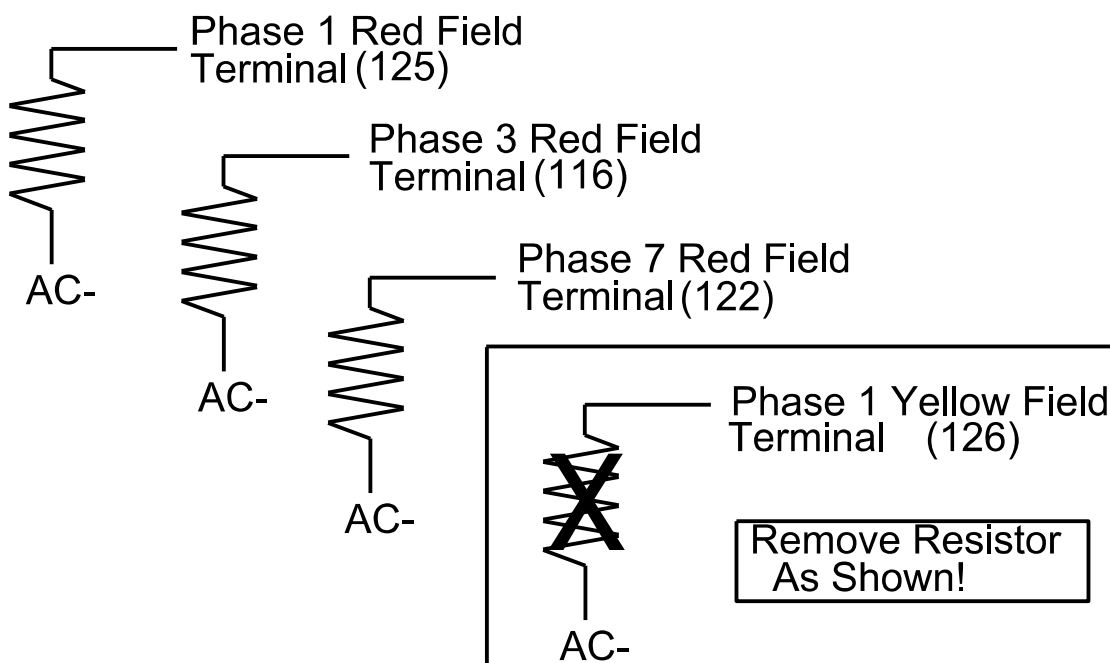


EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

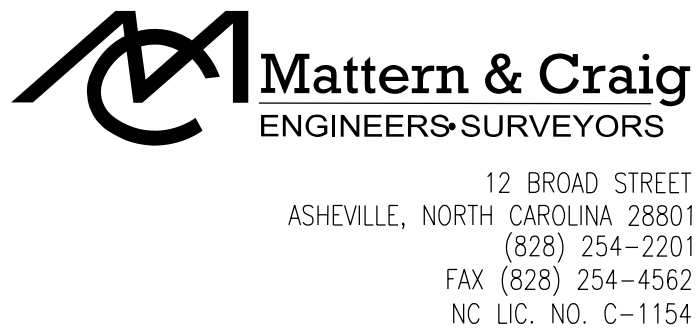
(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



Install a multi-zone microwave detection system for all vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0225
DESIGNED: April 2025
SEALED: 5/28/2025
REVISED: NA



Electrical Detail - Final - Sheet 1 of 2

Electrical and Programming
Details For:

Prepared for the Offices of:



The seal of the North Carolina Department of Transportation is circular. It features a stylized black and white graphic of a road or path curving through a landscape. The text "TRANSPORTATION MOBILITY AND SAFETY DIVISION" is written in a circle around the top, and "DEPARTMENT OF TRANSPORTATION" is written around the bottom. The words "ITS & Signal" are written vertically on the left, and "ment Section" is written vertically on the right.

750 N. Greenfield Pkwy, Garner, NC 27529

NC 16 Business
at
387 (Triangle Circle) /
39 (Unity Church Road)

Division 12 Lincoln County Denver

PLAN DATE: April 2025	REVIEWED BY: JB Voso
-----------------------	----------------------

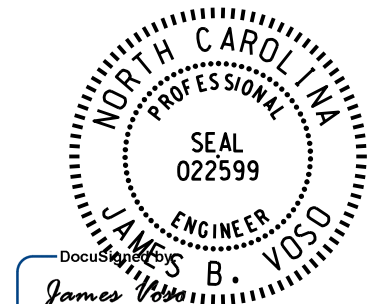
PREPARED BY: Meng Yang	REVIEWED BY:
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REVISIONS	INIT.	DATE
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FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



140FD50379E041F... 5/28/202

_____ DATE _____

SIG. INVENTORY NO. 12-0225

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	3	-	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0:0	0:0	0:0	0:0
Trail Red	0:0	0:0	0:0	0:0

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

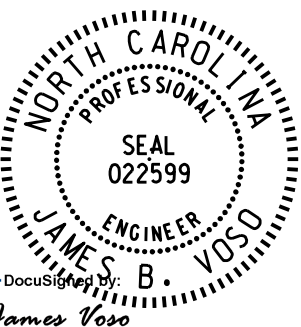


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ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

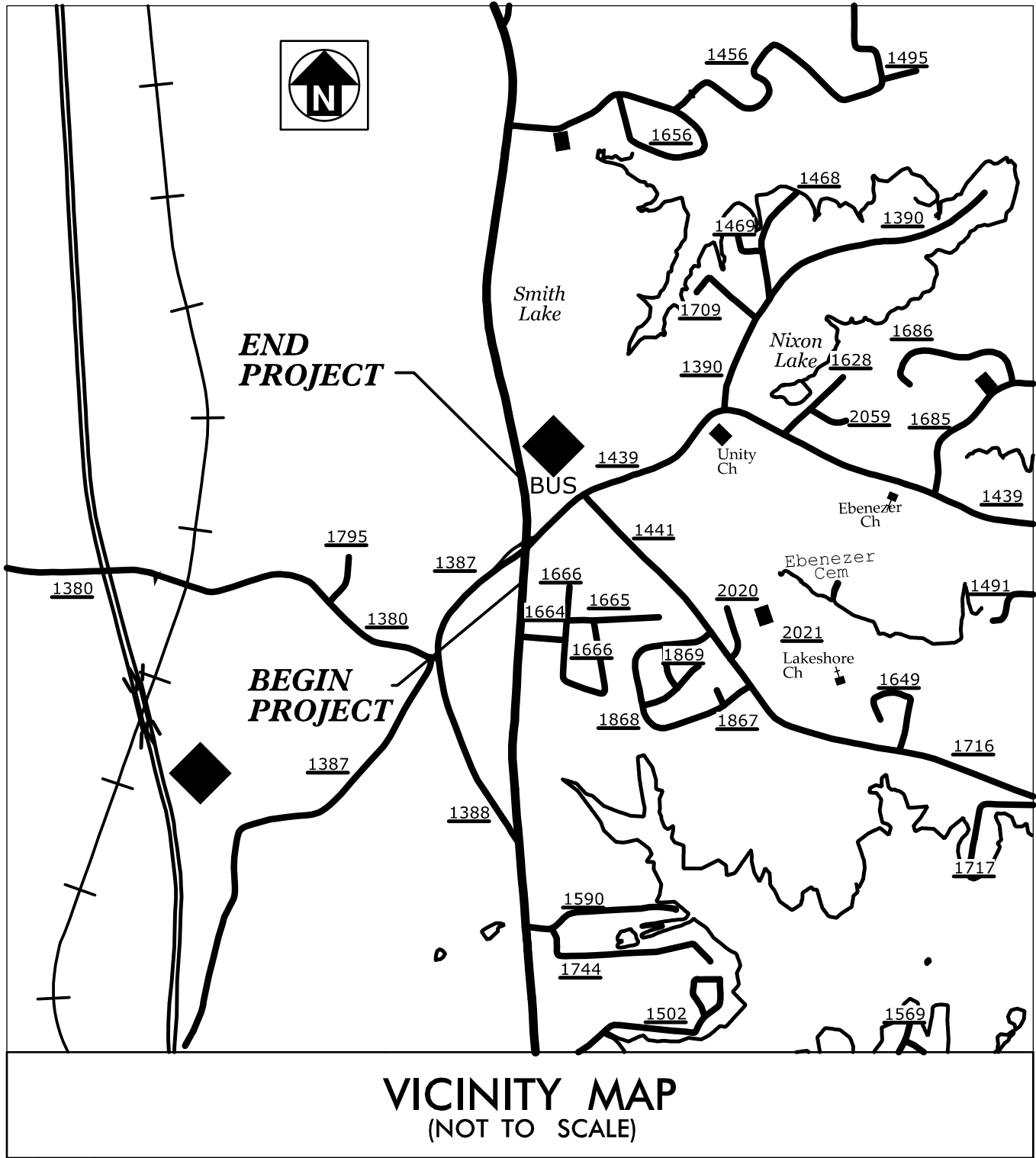
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0225
DESIGNED: April 2025
SEALED: 5/28/2025
REVISED: NA

Electrical Detail - Final - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	NC 16 Business at SR 1387 (Triangle Circle) / SR 1439 (Unity Church Road)				SEAL  SEAL 022599 JAMES B. VOSO ENGINEER 5/28/2025 140FD80379E041F DATE 12-0225
	Division 12 Lincoln County Denver				
	PLAN DATE: April 2025		REVIEWED BY: JB Voso		
	PREPARED BY: Meng Yang		REVIEWED BY:		
	REVISIONS		INIT.	DATE	

TIP PROJECT: R-5712



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.

R-5712

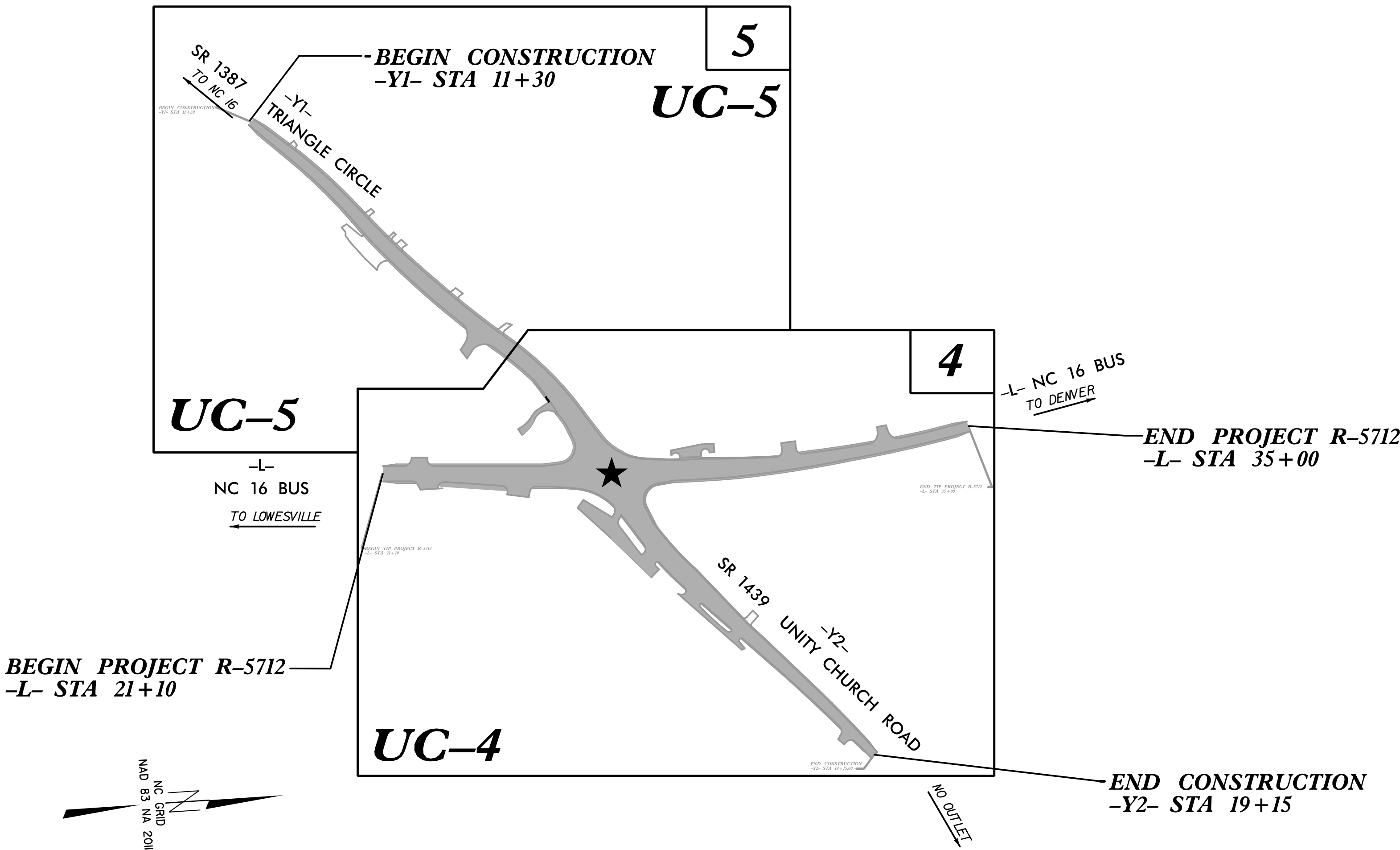
SHEET NO.

UC-1

UTILITY CONSTRUCTION PLANS
LINCOLN COUNTY

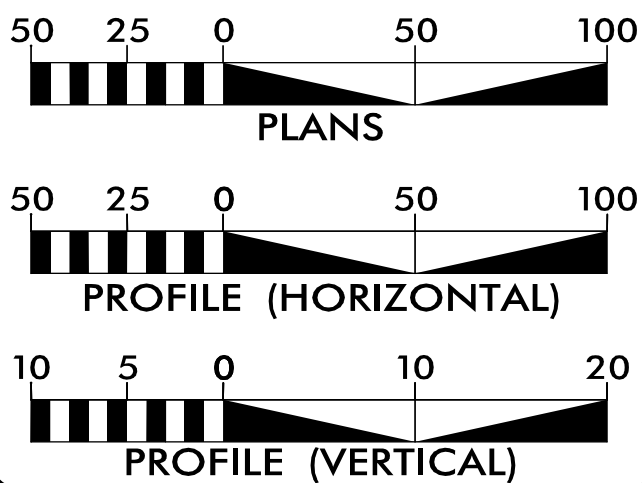
LOCATION: INTERSECTION OF NC 16 BUS, SR 1387 (TRIANGLE CIRCLE),
AND SR 1439 (UNITY CHURCH ROAD)

TYPE OF WORK: WATER LINE RELOCATION



DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:

DESCRIPTION:

UC-1

TITLE SHEET

UC-2

UTILITY SYMBOLOGY

UC-3

NOTES

UC-3A TO UC-3B

DETAILS

UC-4 THRU UC-5

UTILITY CONSTRUCTION SHEETS

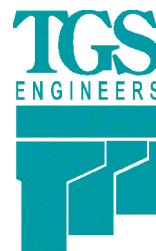
UC-6

PROFILE SHEETS

WATER AND SEWER
OWNERS ON PROJECT

(A) WATER - LINCOLN COUNTY
(B) SANITARY SEWER - LINCOLN COUNTY

PREPARED IN THE OFFICE OF

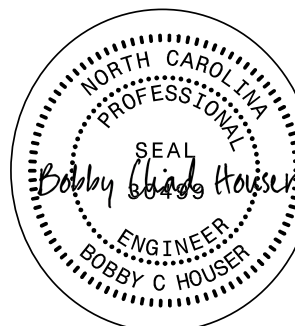


TGS ENGINEERS
201 W. MARION ST
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

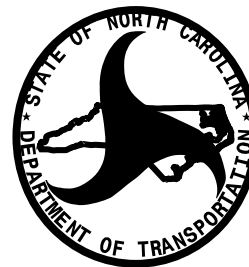
B. CHAD HOUSER, PE PLS

UTILITY DESIGN ENGINEER

SEAL



2/18/2025



DIVISION OF HIGHWAYS
DIVISION 12

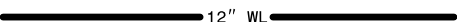
1710 E. MARION ST.
SHELBY, NC 28151
704-480-9020

BRIAN SOWELL, PE DIVISION PROJECT TEAM LEAD

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11¼ Degree Bend	
22½ Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	
Water Meter	
Relocate Water Meter	
Remove Water Meter	
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

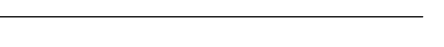
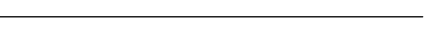
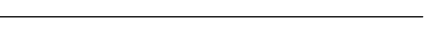
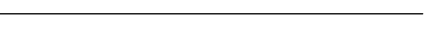
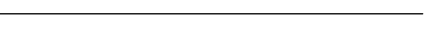
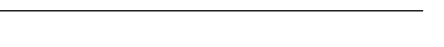
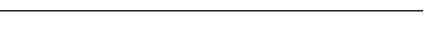
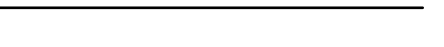
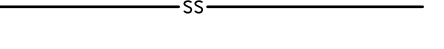
PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

EXISTING UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Utility Pole	
Utility Pole with Base	
H-Frame Pole	
Power Transmission Line Tower	
Water Manhole	
Power Manhole	
Telephone Manhole	
Sanitary Sewer Manhole	
Hand Hole for Cable	
Power Transformer	
Telephone Pedestal	
CATV Pedestal	
Gas Valve	
Gas Meter	
Located Miscellaneous Utility Object	
Abandoned According to Utility Records	
End of Information	

*Underground Power Line	
*Underground Telephone Cable	
*Underground Telephone Conduit	
*Underground Fiber Optics Telephone Cable	
*Underground TV Cable	
*Underground Fiber Optics TV Cable	
*Underground Gas Pipeline	
Aboveground Gas Pipeline	
*Underground Water Line	
Aboveground Water Line	
*Underground Gravity Sanitary Sewer Line	
Aboveground Gravity Sanitary Sewer Line	
*Underground SS Forced Main Line	
Underground Unknown Utility Line	
SUE Test Hole	
Water Meter	
Water Valve	
Fire Hydrant	
Sanitary Sewer Cleanout	

*For Existing Utilities
Utility Line Drawn from Record (Type as Shown)
Designated Utility Line (Type as Shown)

DEAD END THRUST - WALL BLOCKING AND IN SERVICE GATE VALVE
8-INCH THROUGH 12-INCH MAINS

NO. DESCRIPTION

1. TAPPING VALVE (SEE LCPW TYPICAL TAPPING SLEEVE INSTALLATION DETAIL SHEET 11)
2. DIP (PE FIB) - REMOVE BELL - LENGTH = 11 FT. - 19 FT.
3. TAPPING SLEEVE (SEE LCPW TYPICAL TAPPING SLEEVE INSTALLATION DETAIL SHEET 11)
4. CONCRETE THRUST BLOCK (SEE LCPW THRUST BLOCK DETAIL SHEET 11)
5. REBARs (SEE LCPW THRUST BLOCK DETAIL FOR PLACEMENT AND SCHEDULE)
6. WEDGE ACTION RESTRAINT GLAND
7. MECHANICAL JOINT CAP
8. STANDARD VALVE BOX PROTECTOR - SEE LCPW VALVE BOX AND VALVE DETAIL SHEET 11)
9. IN SERVICE CUT IN GATE VALVE
10. AWG #12 GAUGE COPPER TIEBARS WIRE - WITH BLUE INSULATION (30AL HOLES TERMINATING WITH 24-INCH EXCESS WIRE COILED IN VALVE BOX (TYP.))
11. UNDISTURBED SOIL
12. HIGH DENSITY CROSS LAMINATED POLYETHYLENE FILM TUBE (HDPE) AWWA C105 - 4 MILS EACH - 2 LAYER - 8 MILS TOTAL
13. HIGH ADHESIVE TAPE OR HDPE JOINT LOCK TIES
14. PLYWOOD FORM
15. 3" X 7" MECHANICAL JOINT BOLT 7 BOLTS FOR 8" PIPE, 8 BOLTS FOR 12" PIPE)
16. CONCRETE THRUST BLOCK WIDTH (SEE LCPW THRUST BLOCK DETAIL SHEET 11)
17. CONCRETE THRUST BLOCK DEPTH (SEE LCPW THRUST BLOCK DETAIL SHEET 11)
18. 1" SCH 40 PVC ELECTRICAL CONDUIT - LENGTH AS REQUIRED

PLAN VIEW

ELEVATION VIEW

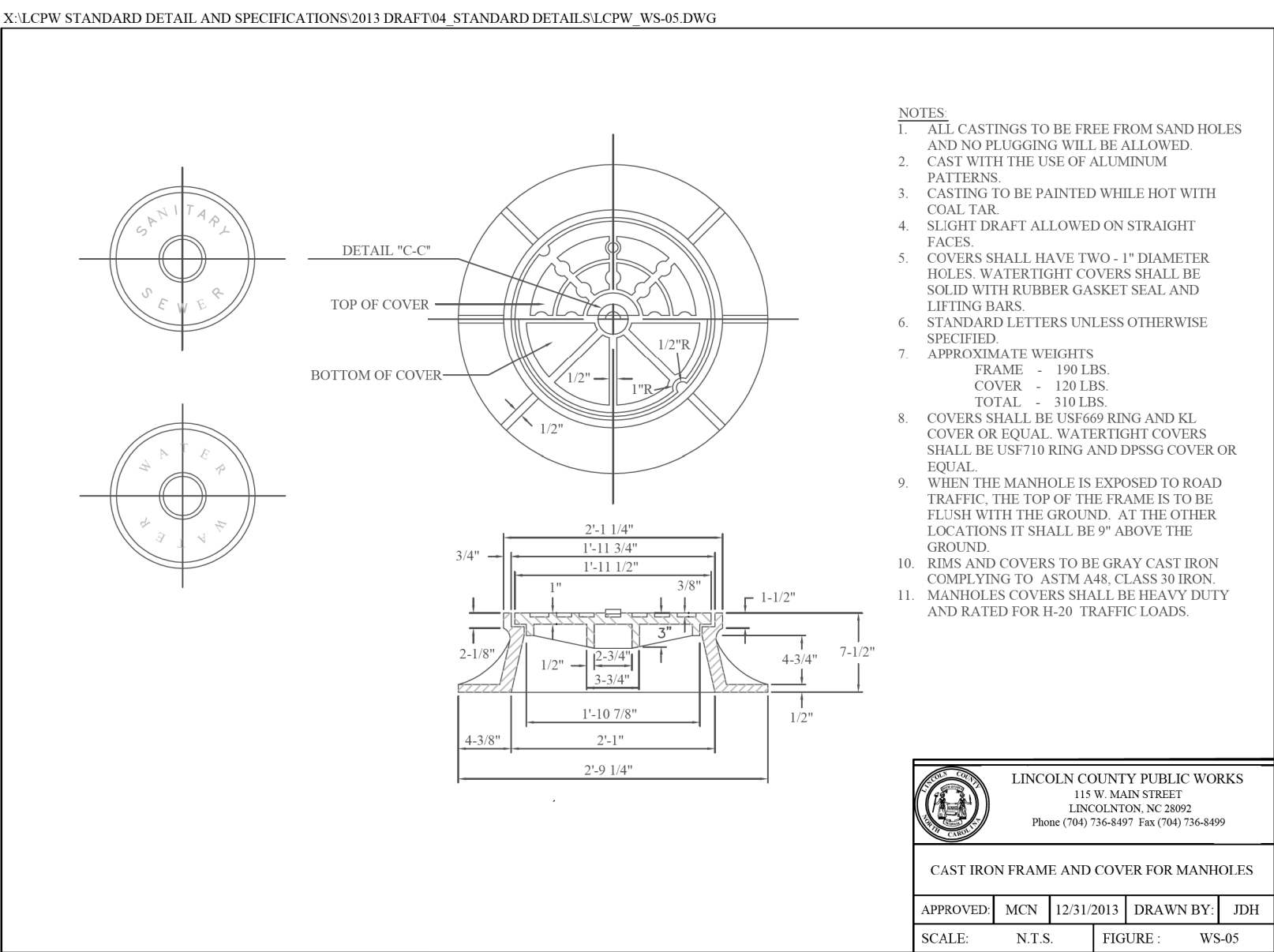
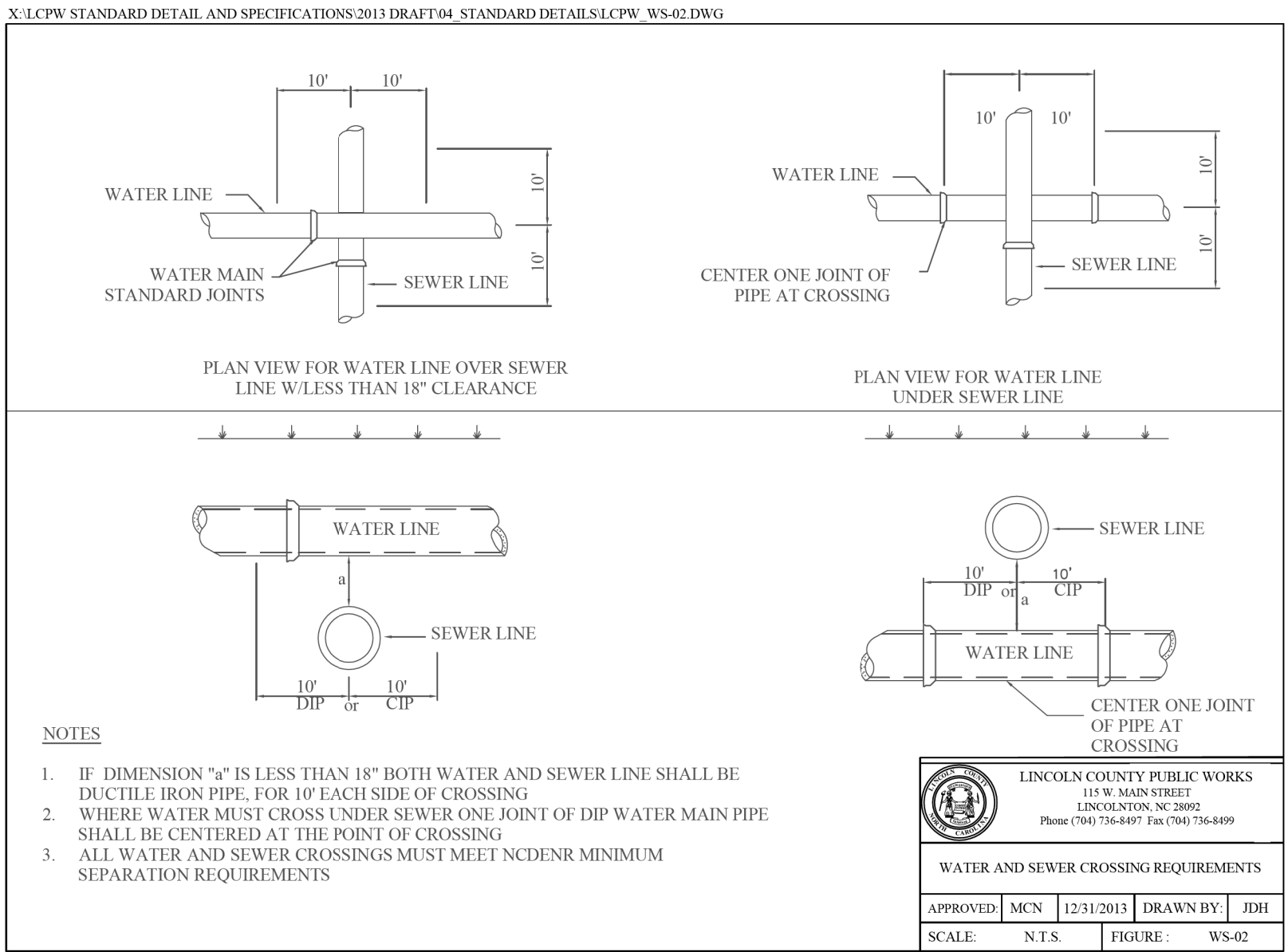
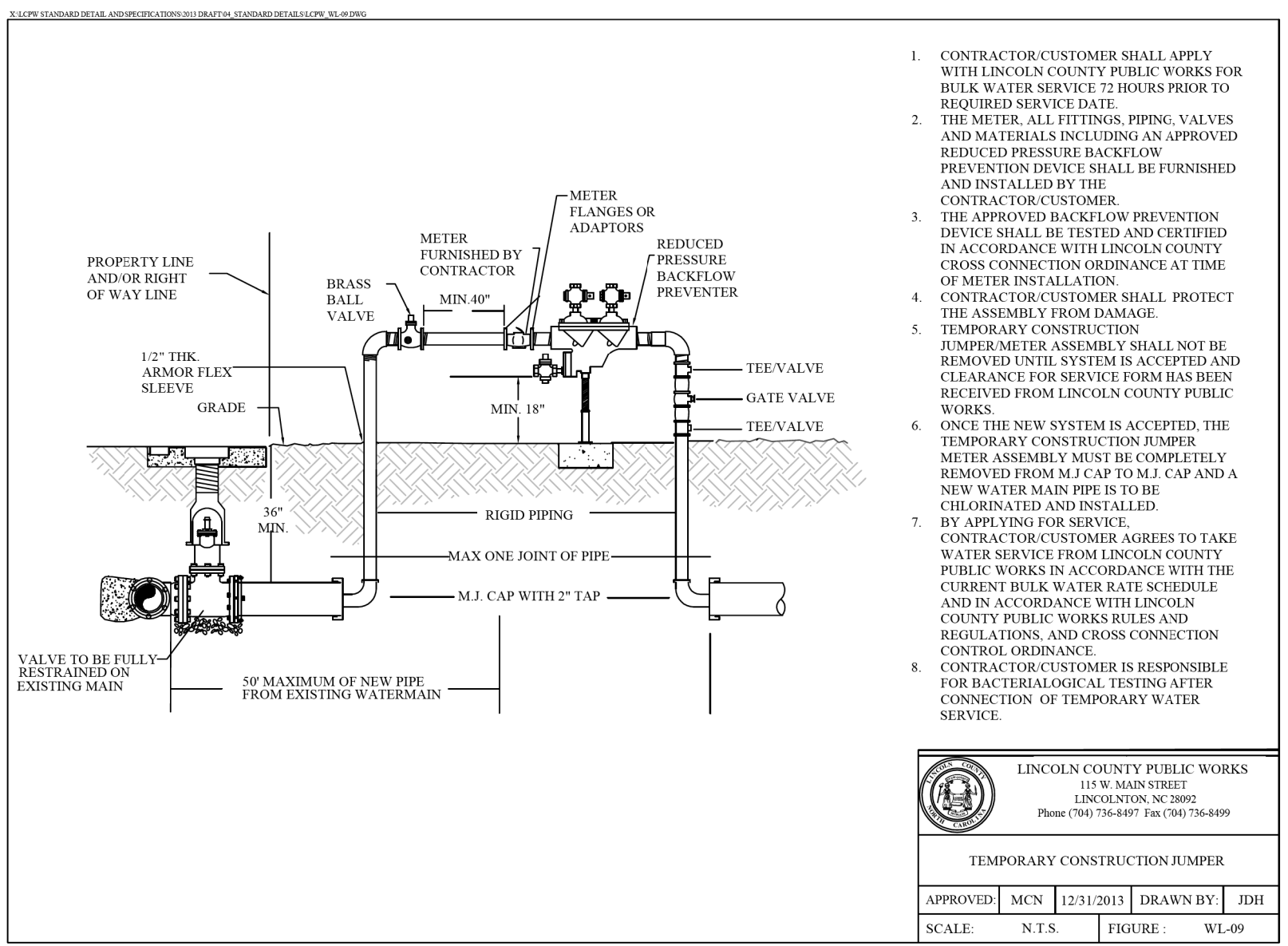
DETAIL "A"

This technical drawing illustrates the standard installation of a fire hydrant. The hydrant is shown in cross-section, with its main body and bonnet assembly. Key dimensions and components are labeled:

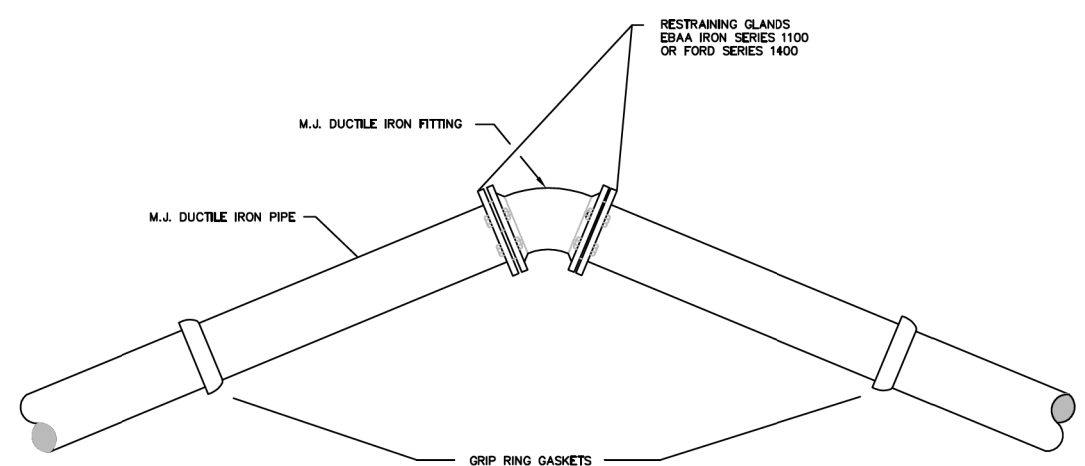
- Dimensions:**
 - 2'-6" (Total height from ground to top of bonnet)
 - 18" MIN. 24" MAX. (Height from ground to top of hydrant body)
 - 42" MIN. OR AS APPROVED (Height from ground to top of hydrant body)
 - 1'-0" (Height from ground to top of hydrant body)
 - 12" (Height from ground to top of hydrant body)
 - VARIABLE (Height from ground to top of hydrant body)
- Components and Materials:**
 - FLANGE SET 2" MIN. OVER FINISHED GRADE
 - COMPACTED EARTH
 - 1/2" C.U.D. MIN. 5/8" WASHED STONE
 - EBBA IRON MEGALUG OR APPROVED EQUAL
 - 6" C.I. GATE VALVE
 - 6" D.I. WATER MAIN
 - DETECTION TAPE OVER PIPE MATERIAL
 - ALL CONCRETE BLOCKING PER LCPW STANDARD DETAIL WS-1
- Notes:**
 - ALL HYDRANTS SHALL BE MUELLER SUPER CENTURION OR KENNEDY K-81A
 - ALL HYDRANTS SHALL BE THREE WAY WITH 1-1/2" PUMPER NOZZLE AND 2-1/2" HOSE NOZZLES WITH NST THREAD
 - ALL HYDRANT SHALL OPEN CCW
 - ALL HYDRANTS SHALL BE PAINTED WITH ENAMEL HYDRANT PAINT SAFETY YELLOW IN COLOR
 - ALL HYDRANTS SHALL BE NEW AND MANUFACTURED WITHIN THE CURRENT YEAR OF CONSTRUCTION.
- Refer to LCPW DETAIL WS-7**

Lincoln County Public Works
 117 W. MAIN STREET
 LINCOLNTON, NC 28092
 Phone: (704) 756-8497 Fax: (704) 756-8499

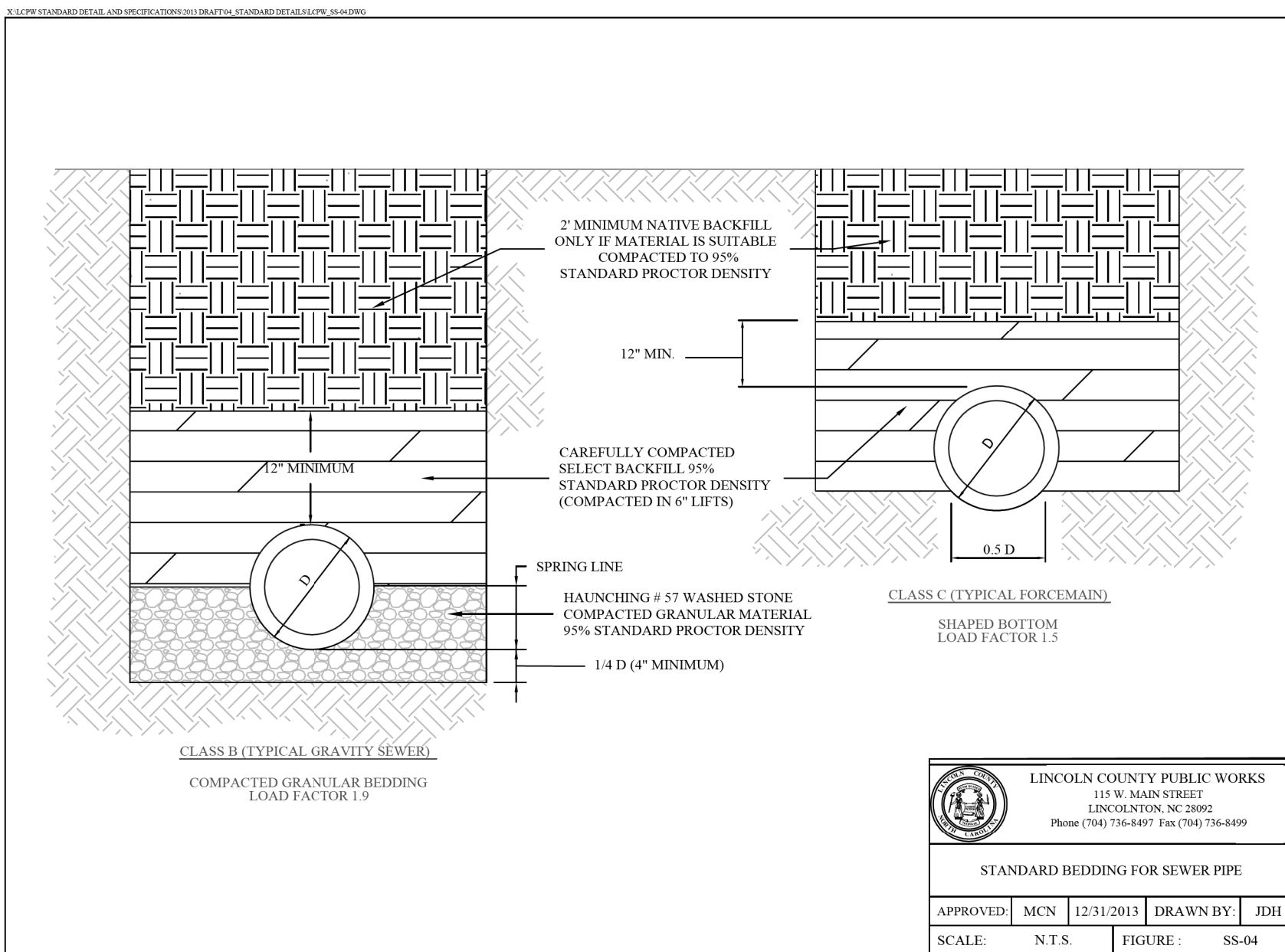
STANDARD HYDRANT INSTALLATION			
APPROVED	MCN	12/31/2011	DRAWN BY: JDI
SCALE:	N.T.S.	FIGURE:	WL-01



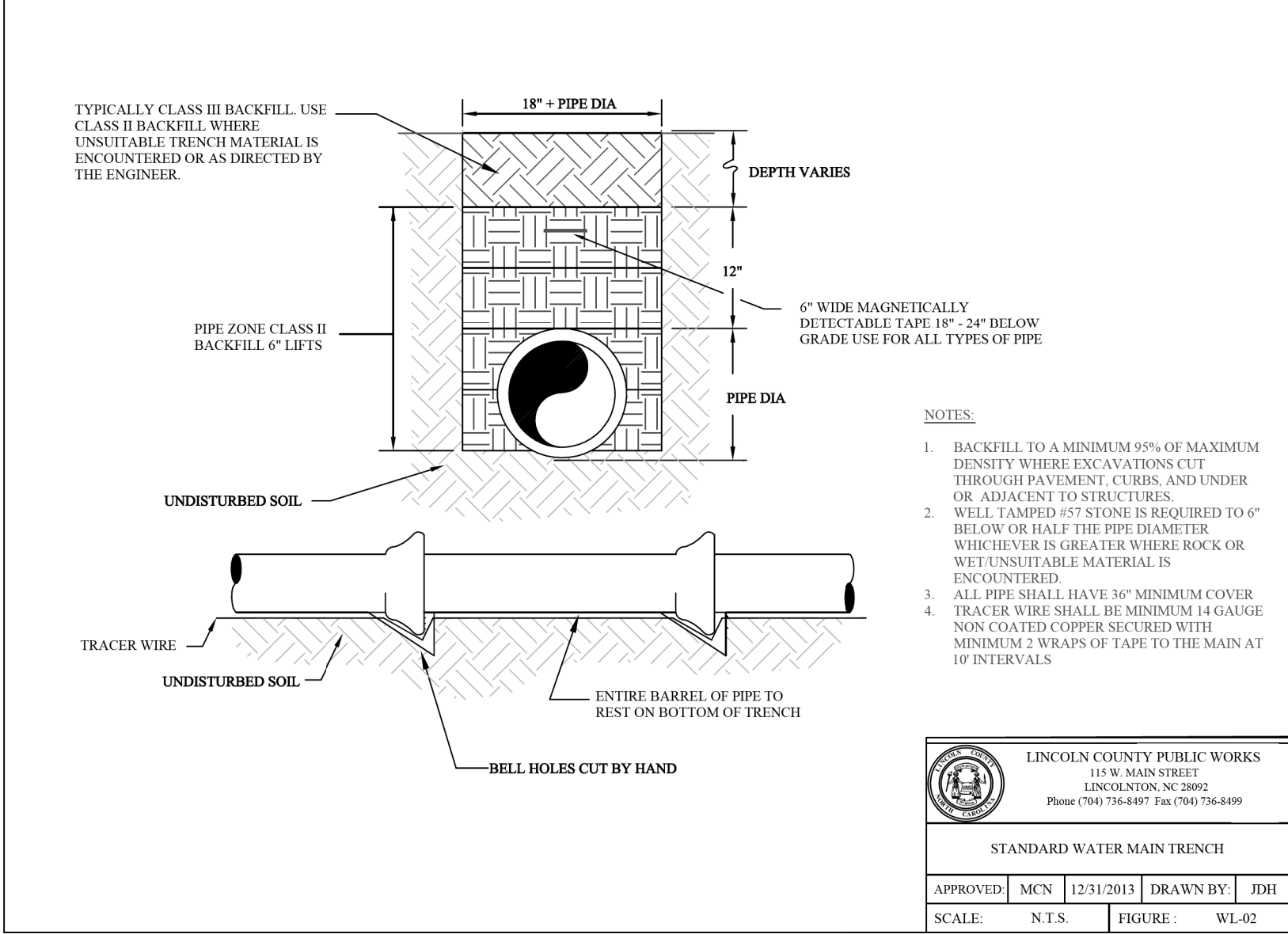
RESTRAINED JOINT TABLE						
ALL JOINTS WITHIN THESE LENGTHS						
NOTE: EACH SIDE OF THE JOINT SHALL BE LESS THAN 90" FULL JOINT OF PIPE						
SIZE	11 1/4" BEND	22 1/2" BEND	45° BEND	90° BEND	TEE BRANCH	REDUCER
6	5.7"	11.6"	24.1	58.1	-	-
8	7.3"	14.8"	30.9	74.5	202.3	86.2
10	8.8"	17.8"	37.1	89.5	245.1	83.4
12	10.3"	20.7"	43.1	104.1	287.6	85.3
16	13"	26.2"	54.6	131.8	369.7	158.5
20	15.5"	31.3	65.1	157.2	446.8	158.2
24	17.8"	36"	74.9	180.8	519.9	156.6



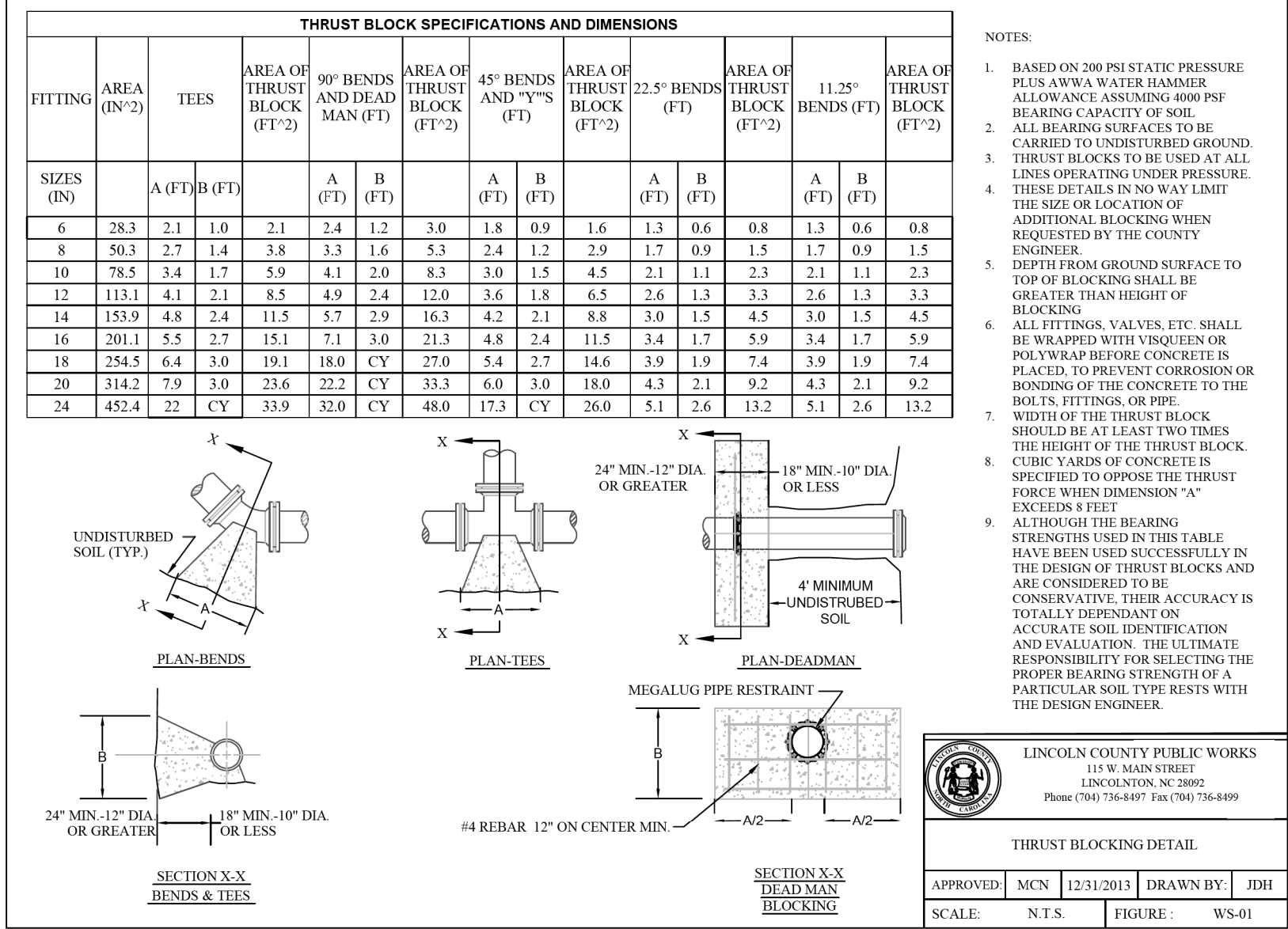
RESTRAINED JOINT FITTING (HORIZONTAL PIPE ONLY)



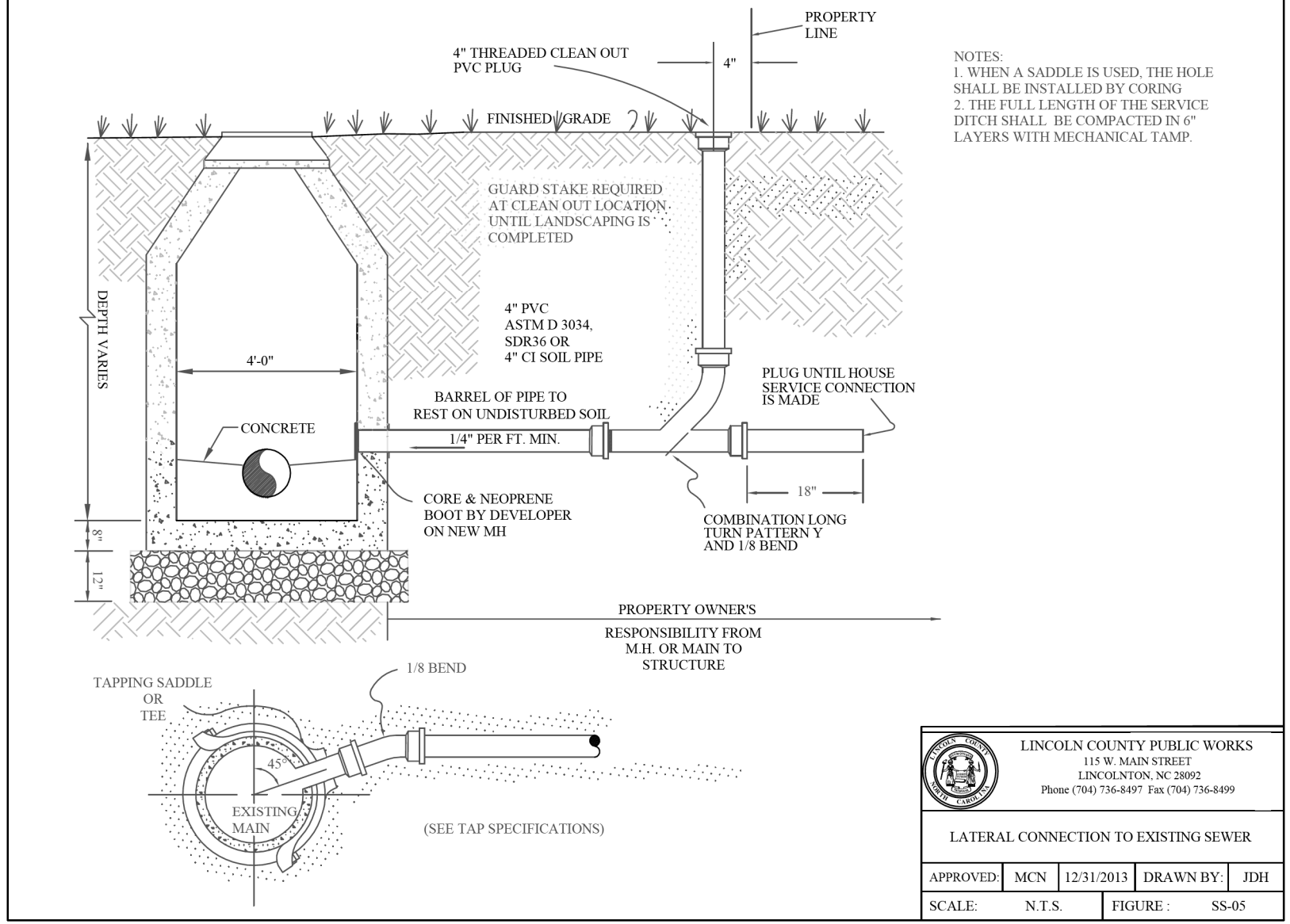
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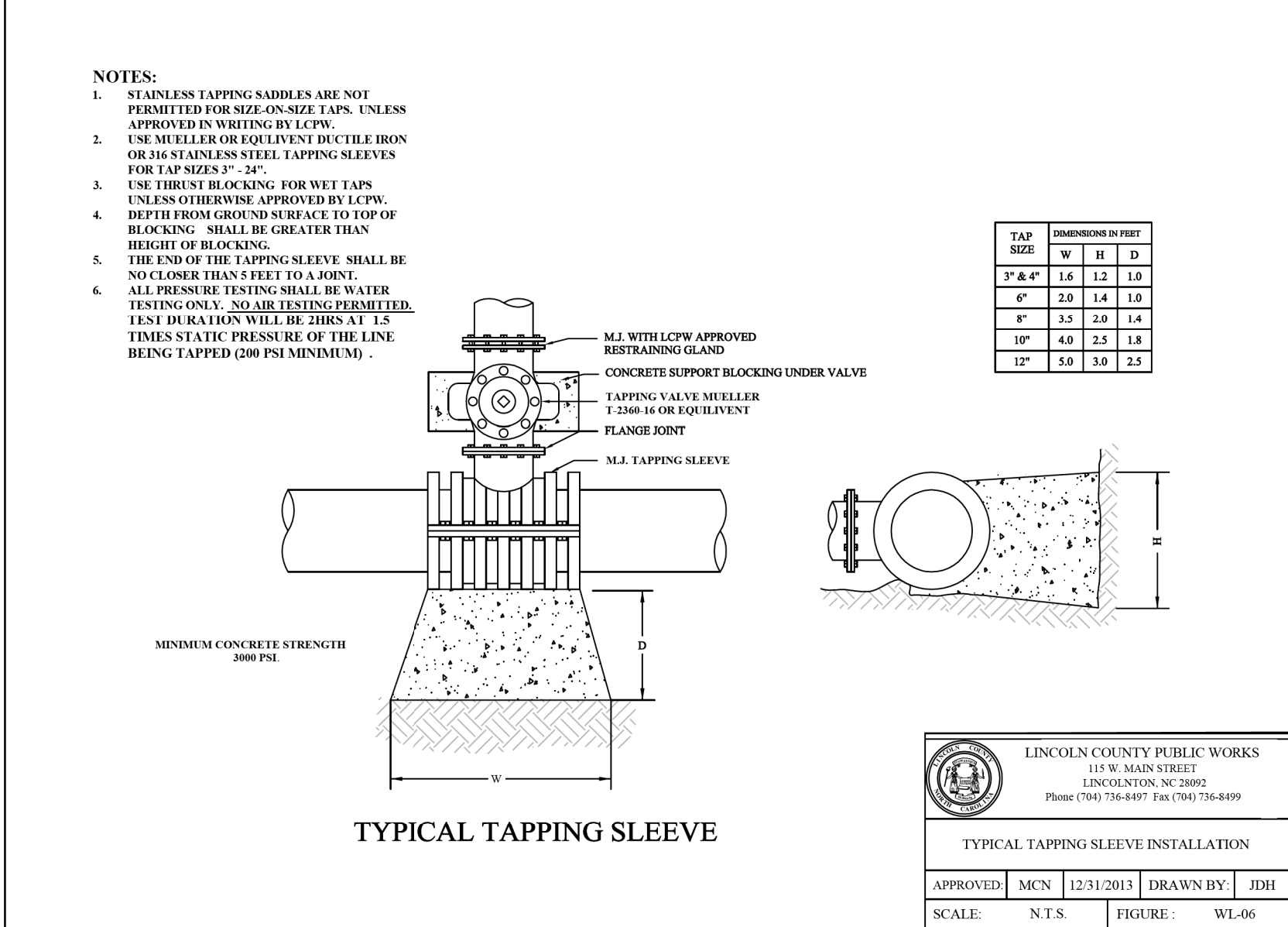
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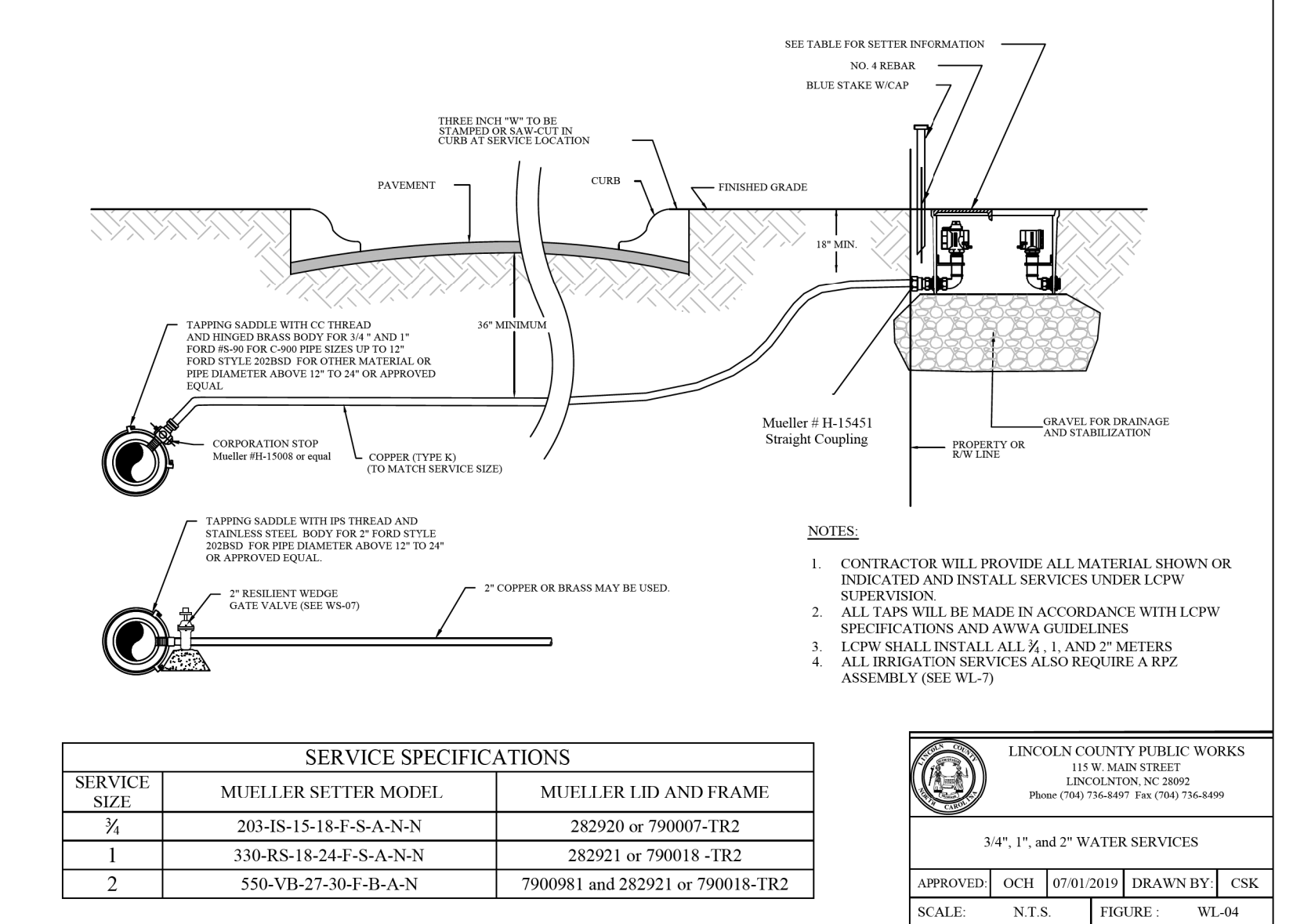
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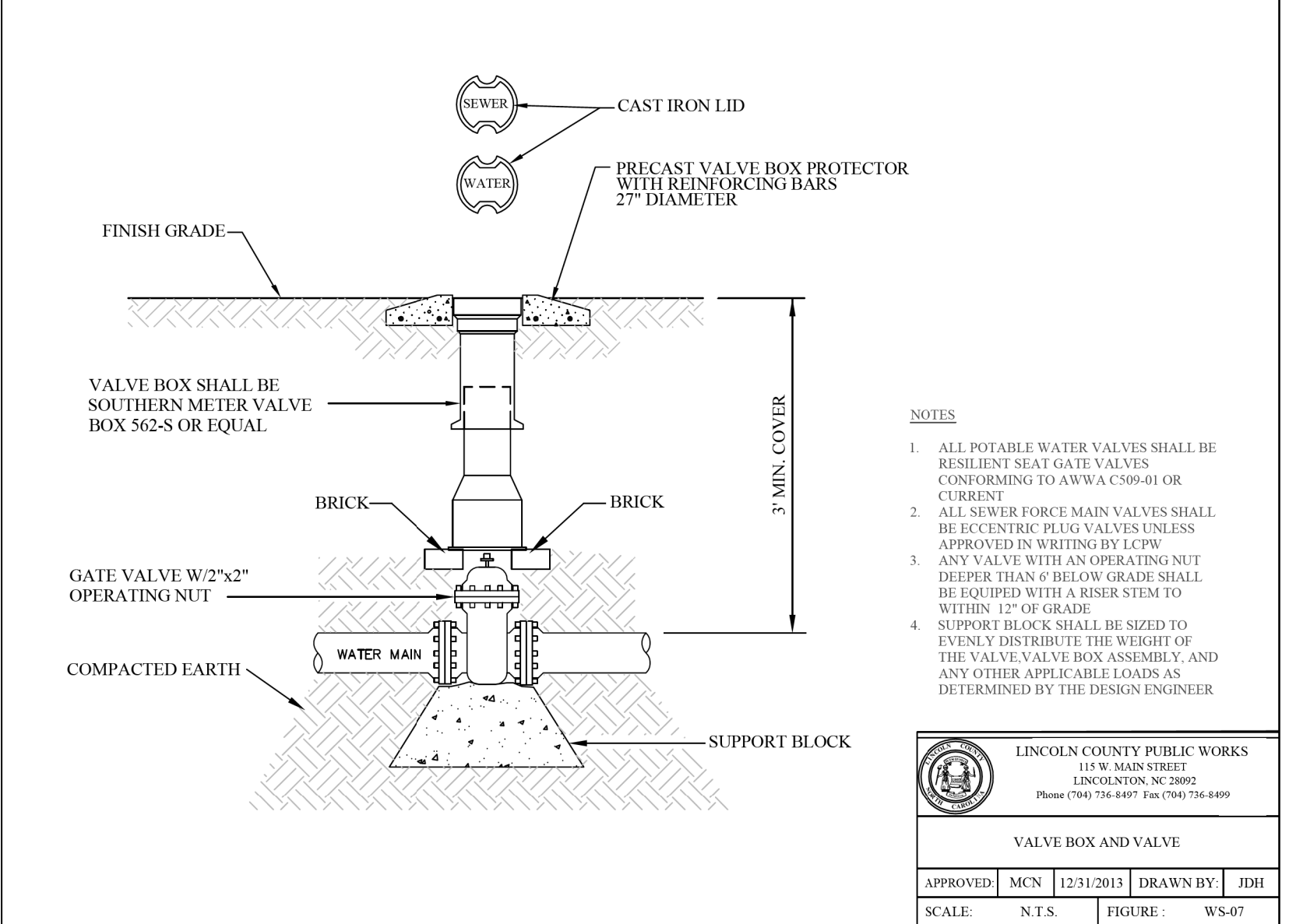
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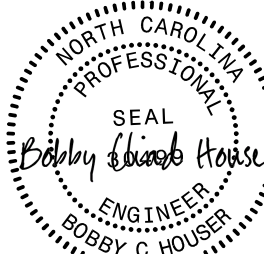


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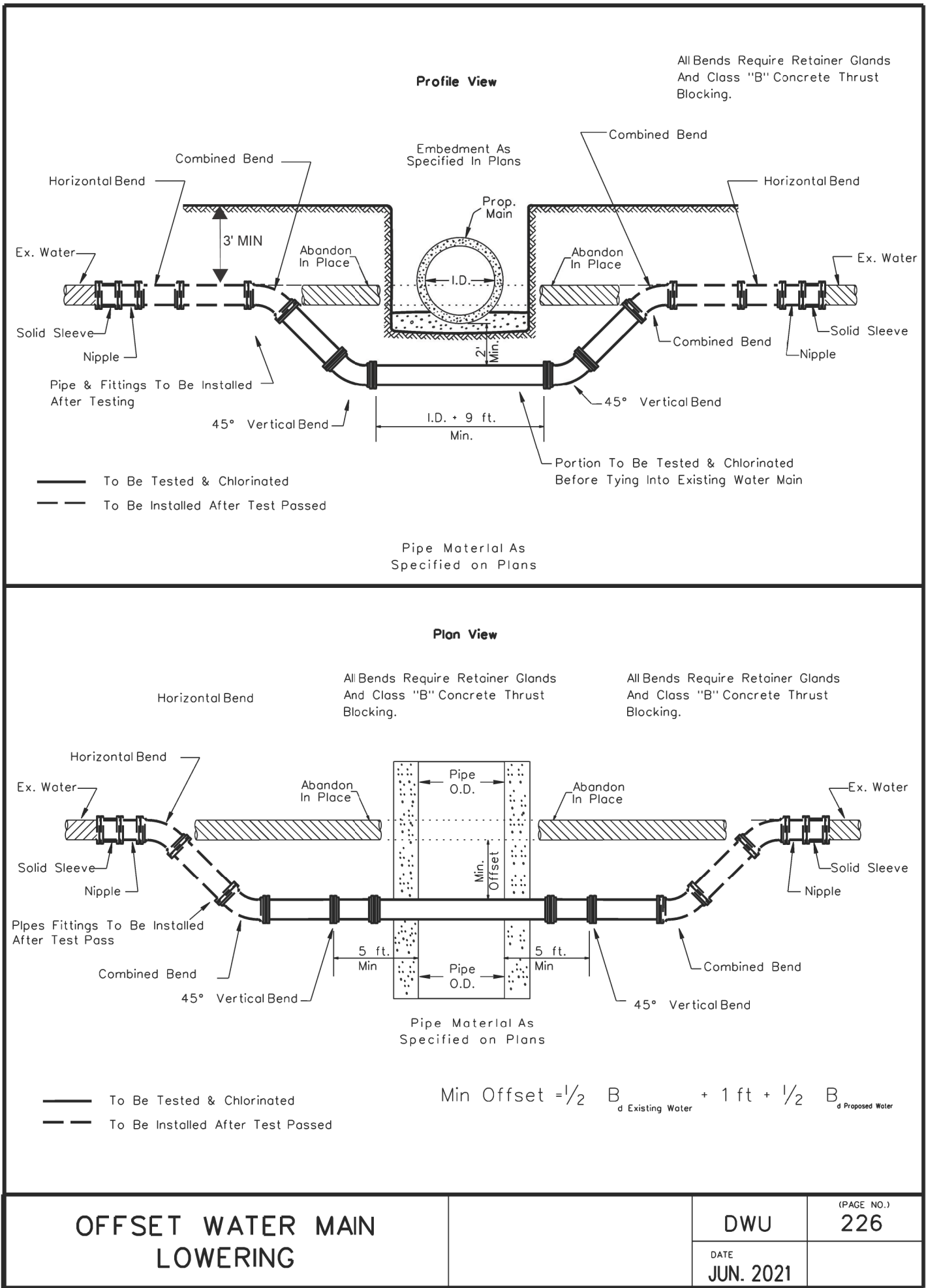


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PROJECT REFERENCE NO.	SHEET NO.
R-5712	UC-3A
DESIGNED BY: BCH	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2/18/2025	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION



GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.

2. THE EXISTING UTILITIES BELONG TO LINCOLN COUNTY.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. WATER SERVICE MUST BE MAINTAINED AT ALL TIMES ALONG NC BUS. 16 AND SR 1387 (TRIANGLE CIRCLE). THE CONTRACTOR SHALL USE TAPPING VALVES, LINE STOPS AND A TEMPORARY BYPASS LINE AS SHOWN ON THE PLANS TO ENSURE NO DISRUPTION TO SERVICE.

2. ALL PROPOSED PVC WATER LINE 4 TO 12 INCHES IN DIAMETER, SHALL BE C900 DR 14 CLASS 200 PVC AND UTILIZE FLEXIBLE PUSH-ON RESTRAINED JOINTS.

ALL PROPOSED DUCTILE IRON WATER LINE 6 TO 24 INCHES IN DIAMETER, SHALL BE THICKNESS CLASS 50 AND UTILIZE FLEXIBLE PUSH-ON RESTRAINED JOINTS.

3. ALL WATER LINE FITTINGS 4 TO 12 INCHES IN DIAMETER, SHALL BE PRESSURE CLASS 350 DUCTILE IRON RESTRAINED JOINT IN ACCORDANCE WITH ANSI A21.10 / AWWA C110 AND ANSI A21.4 / AWWA C104.

4. WATER LINE UTILIZING RESTRAINED JOINTS SHALL BE TYTON JOINT, HP LOK, TR FLEX, USIFLEX OR EQUIVALENT.

5. ALL WATERLINE SHALL HAVE COATED TRACER WIRE NO SMALLER THAN 14 AWG SOLID COPPER.

6. ALL VALVES - 2" THROUGH 12" SHALL BE RESELIENT WEDGE GATE, CAST IRON BODY, CONFORMING TO AWWA C509, LATEST VERSION. SEALING MECHANISM SHALL PROVIDE ZERO LEAKAGE AT THE WATER WORKING PRESSURE AGAINST THE LINE FLOW FROM EITHER DIRECTION AND BE DESIGNED SUCH THAT NO EXPOSED METAL SEAMS, EDGES, SCREWS, ETC. ARE WITHIN THE WATERWAY IN THE CLOSED POSITION. THE GATE SHALL NOT BE WEDGED INTO A POCKET NOR SLIDE ACROSS THE SEATING SURFACE TO OBTAIN TIGHT CLOSURE. ALL INTERNAL AND EXTERNAL FERROUS SURFACES OF THE VALVE, INCLUDING THE INTERIOR OF THE GATE, SHALL BE COATED WITH A PROTECTIVE COATING CONFORMING TO AWWA C550, LATEST VERSION. COATING SHALL BE APPLIED TO CASTINGS PRIOR TO ASSEMBLY TO ASSURE ALL EXPOSED AREAS WILL BE COVERED. VALVES SHALL BE RATED AT 200 PSI WORKING PRESSURE. UNLESS OTHERWISE NOTED, UNDERGROUND VALVES SHALL HAVE AN OPERATING NUT AND EXPOSED VALVES SHALL HAVE A HAND WHEEL OPERATOR. OPERATING NUT SHALL BE 2"X2", OPEN LEFT.

7. EACH VALVE BURIED IN THE GROUND SHALL BE PROVIDED WITH AN APPROVED TYPE OF VALVE BOX AND COVER. THE BOXES SHALL BE ADJUSTABLE SCREW TYPE 24-INCH OR 36-INCH.

8. THE VALVE BOXES SHALL BE MADE OF CLOSE-GRAINED GRAY CAST IRON, IN THREE PIECES, COMPRISING THE LOWER OR BASE PIECES WHICH SHALL BE BELLED AT THE BOTTOM TO FIT AROUND THE STUFFING BOX GLAND AND REST ON HTE VALVE BONNET, THE UPPER PART OF WHICH SHALL BE FLARED ON THE LOWER END TO TELESCOPE ON A SOCKET TO RECEIVE THE CAP OR COVER. THE CAP OR COVER SHALL HAVE THE WORD "WATER" CAST ON THE UPPER SURFACE IN RAISED LETTER. ALL CASTINGS SHALL BE THOROUGHLY CLEANDED AND COATED WITH ASPHALT OR COAL-TAR VARNISH.

9. EACH VALVE BOX SHALL BE PROVIDED WITH A CONCRETE VALVE MARKER/PROTECTOR.

10. EACH VALVE BOX SHALL BE FITTED WITH AN EXTENSION STEM FOR USE WITH THE BURIED SERVICE NON-RISING STEM-VALVES. THE STEM SHALL BE OF METAL AND USED TO EXTEND THE POSITION OF THE 2" OPERATING NUT WITHIN 6 INCHES OF GRADE. EACH STEM SHALL BE FITTED WITH A SELF-CENTERING DISK BELOW THE OPERATING NUT TO KEEP THE STEM ALIGNED IN THE VALVE BOX AND MINIMIZE THE AMOUNT OF GRIT THAT CAN ENTER THE VALVE BOX.

UTILITY CONSTRUCTION

PROJECT REFERENCE NO.		SHEET NO.
R-5712		UC-3
DESIGNED BY: BCH		
DRAWN BY:		
CHECKED BY:		
APPROVED BY:		
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		

11. TAPPING SLEEVES AND VALVES SHALL BE THE TYPE DESIGNED FOR MAKING CONNECTIONS TO EXISTING WATER LINES WITHOUT LOSS OF WATER OR INTERRUPTION OF SERVICE. SLEEVES SHALL BE THE CAST IRON SPLIT REPAIR TYPE SUITABLE FOR 200 PSI WORKING PRESSURE. JOINTS SHALL BE SUITABLE FOR THE INTENDED USE. VALVES SHALL BE THE SAME CONSTRUCTION AS STANDARD AWWA GATE VALVES, COMPLETE WITH OPERATING NUT AND SUITABLE FOR 200 PSI WORKING PRESSURE LESS THAT 12" AND 200 PSI FOR VALVES 12" AND GREATER.

12. PROVIDE THRUST RESTRAINT ON THE EXISTING WATER LINE WHERE TIE-INS ARE MADE AS NECESSARY.

13. CONTRACTOR SHALL NOT OPERATE ANY VALVES ON THE EXISTING UTILITY SYSTEMS. CONTRACTOR SHALL CONTACT THE UTILITY OWNER TO CONDUCT STRATEGIC OPERATION OF VALVES FOR SERVICE INTERRUPTION IN ORDER TO PERFORM SPECIFIC WORK.

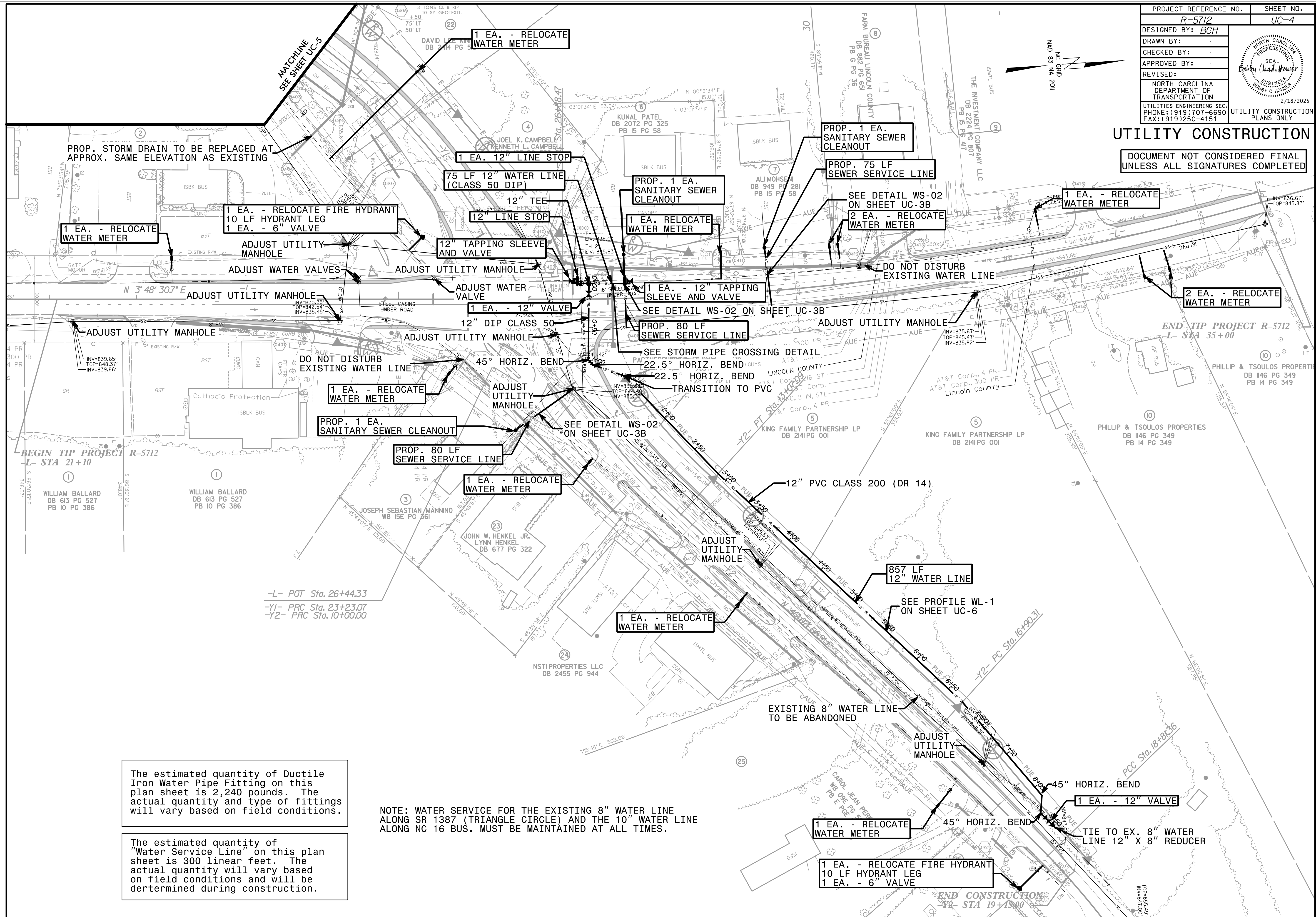
14. ANY BENDS OF PVC WATER PIPE NOT SPECIFICALLY CALLED OUT WITH A 90, 45, 22.5, OR 11.25 DEGREE BEND FITTING, SHALL BE CONSTRUCTED BY A RADIAL BEND OF THE PIPE AS NOTED ON THE PLANS OR IN ACCORDANCE WITH PIPE MANUFACTURER'S SPECIFICATIONS (WHICHEVER IS MORE STRINGENT) - OR A COMBINATION OF BEND FITTINGS AND A RADIAL BEND OF THE PIPE. DEFLECTION OF THE PIPE JOINTS ON PVC PIPE MATERIAL IS NOT AN ACCEPTABLE METHOD OF PIPE BENDING.

15. ALL MATERIALS, EQUIPMENT, LABOR, AND WORKSMANSHIP SHALL BE IN ACCORDANCE WITH LINCOLN COUNTY STANDARDS AND NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES FOR PROPOSED WATER LINES. IN THE EVENT OF CONFLICT BETWEEN STANDARDS, THE MORE RESTRICTIVE REQUIREMENTS SHALL APPLY.

16. UTILITY OWNER MUST BE PRESENT FOR ANY TESTING OR CONNECTIONS TO THE EXISTING SYSTEM INCLUDING BUT NOT LIMITED TO ALL TAPS AND TEMPORARY CONSTRUCTION CONNECTIONS. A NOTICE OF 72 HOURS MUST BE PROVIDED.

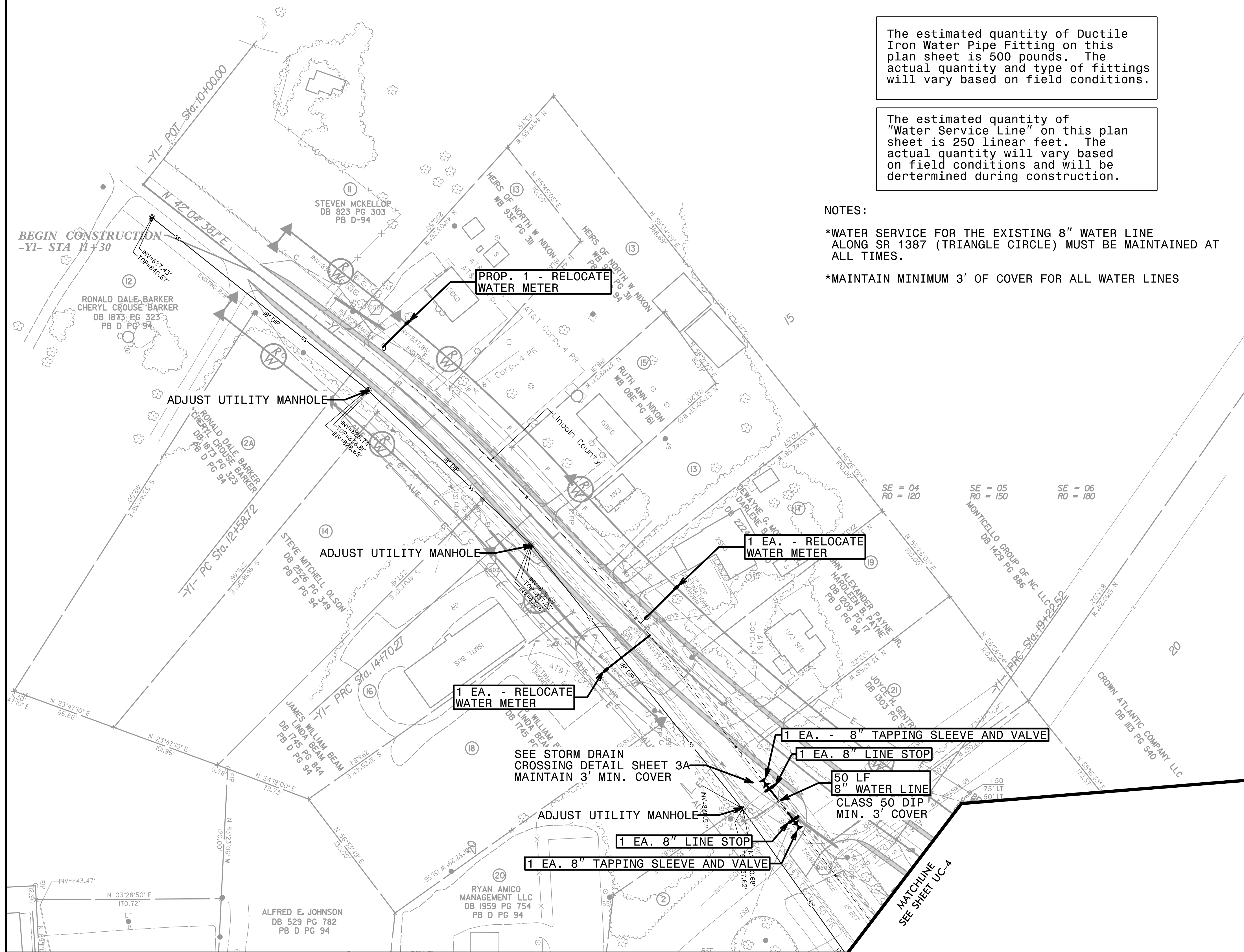
17. IF IT IS DETERMINED THAT ADJUSTING AN EXISTING MANHOLE SHALL CAUSE SIGNIFICANT DAMAGE OR THAT THE STRUCTURAL INTEGRITY OF A GIVEN MANHOLE IS IN QUESTION, THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY.

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



NOTE: WATER SERVICE FOR THE EXISTING 8" WATER LINE
ALONG SR 1387 (TRIANGLE CIRCLE) AND THE 10" WATER LINE
ALONG NC 16 BUS. MUST BE MAINTAINED AT ALL TIMES.

The estimated quantity of "Water Service Line" on this plan sheet is 300 linear feet. The actual quantity will vary based on field conditions and will be determined during construction.



The estimated quantity of "Water Service Line" on this plan sheet is 250 linear feet. The actual quantity will vary based on field conditions and will be determined during construction.



PROJECT REFERENCE NO.		SHEET NO.	
R-5712		UC-5	
DESIGNED BY: BCH			
DRAWN BY:			
CHECKED BY:			
APPROVED BY:			
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		3/13/2025	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	

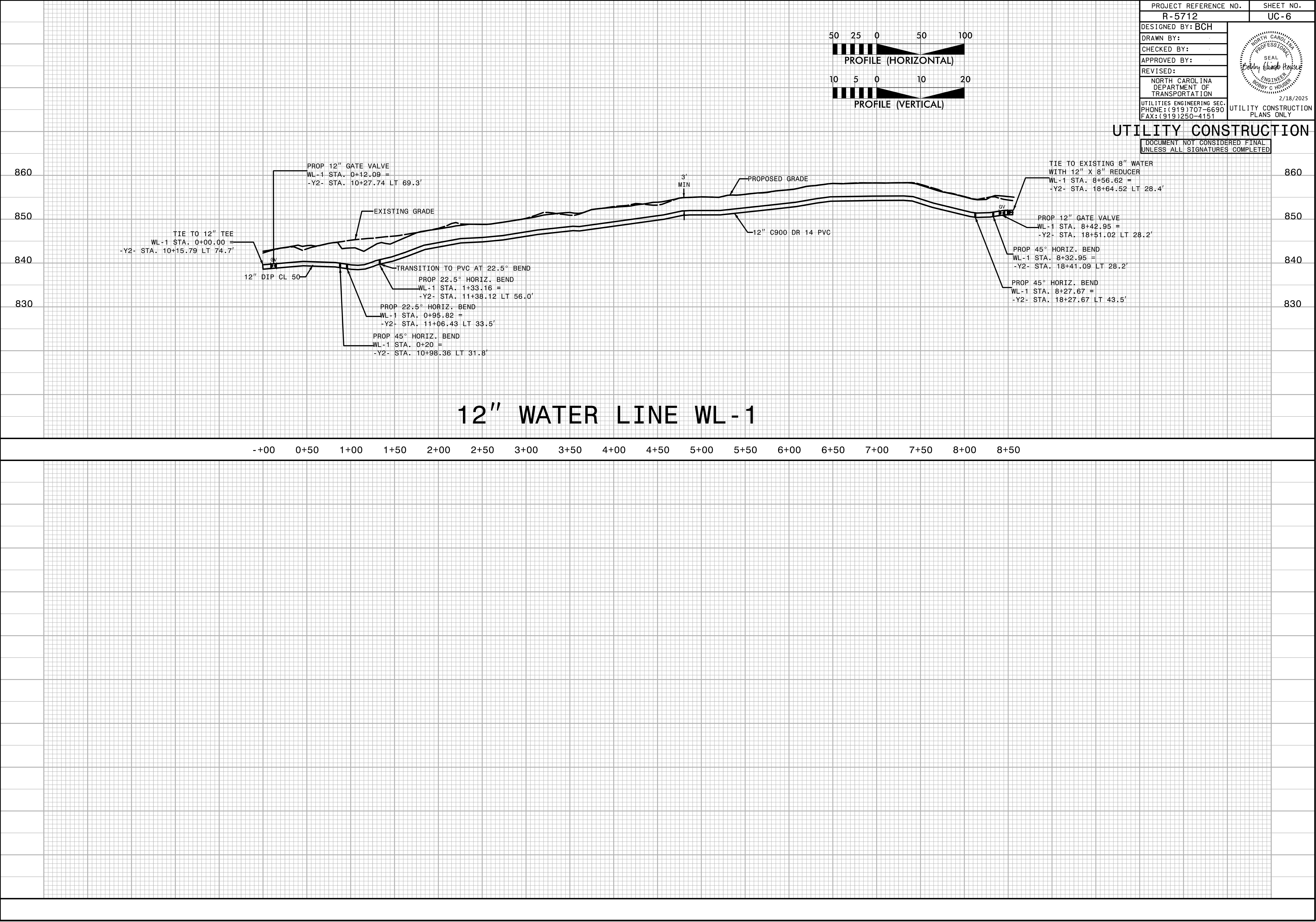
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

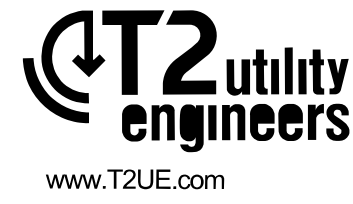
NOTES:

*WATER SERVICE FOR THE EXISTING 8" WATER LINE
ALONG SR 1387 (TRIANGLE CIRCLE) MUST BE MAINTAINED AT
ALL TIMES.

*MAINTAIN MINIMUM 3' OF COVER FOR ALL WATER LINES



10/13/22



PROJECT REFERENCE NO. R-5712 SHEET NO. U0-02

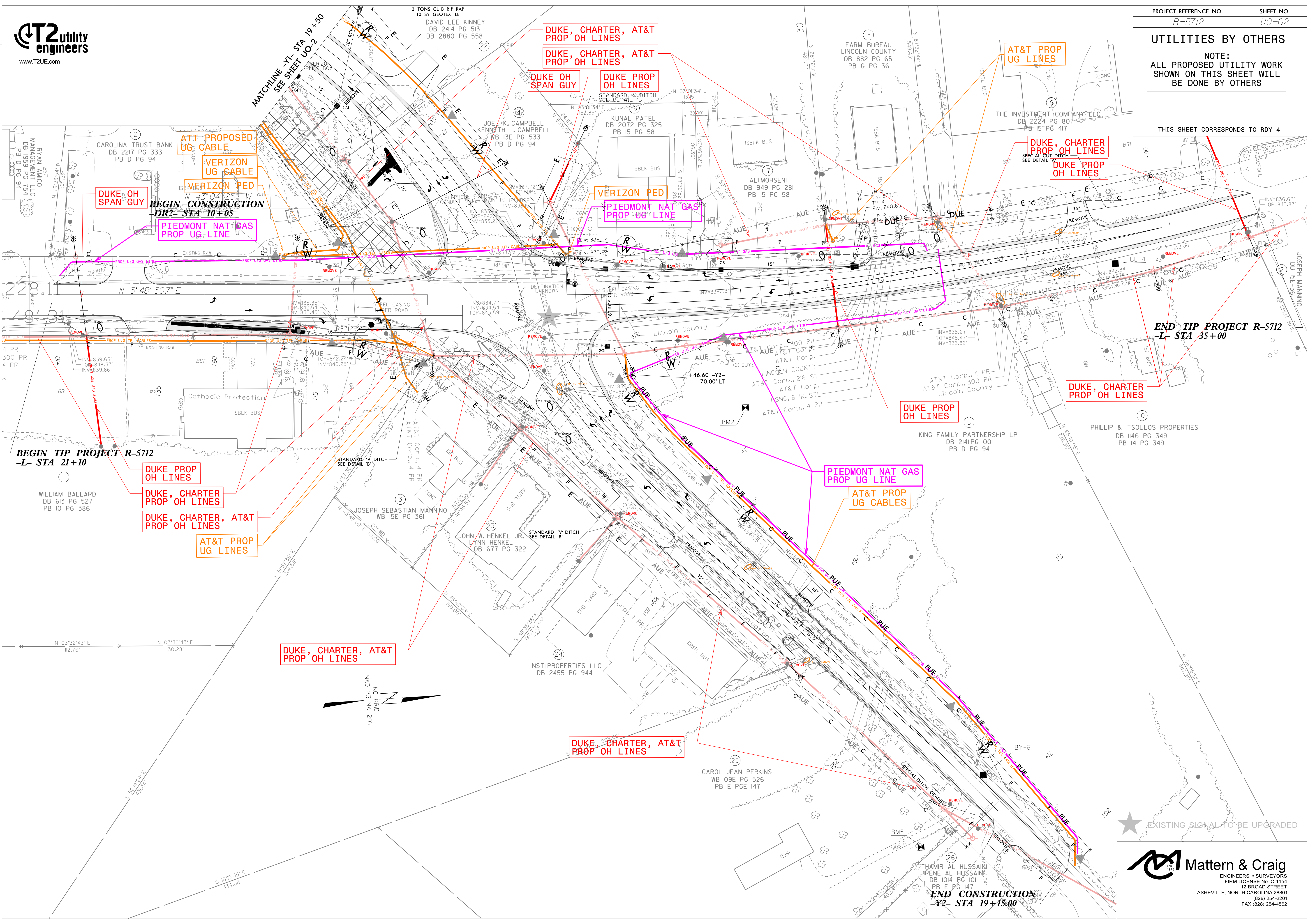
UTILITIES BY OTHERS
NOTE:
ALL PROPOSED UTILITY WORK
SHOWN ON THIS SHEET WILL
BE DONE BY OTHERS

THIS SHEET CORRESPONDS TO RDY-4

END TIP PROJECT R-5712
-L- STA 35+00

EXISTING SIGNAL TO BE UPGRADED

Mattern & Craig
ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562



REVISIONS

10/13/22

REVISIONS

PROJECT REFERENCE NO. R-5712 SHEET NO. UO-03

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK
SHOWN ON THIS SHEET WILL
BE DONE BY OTHERS



www.T2UE.com

THIS SHEET CORRESPONDS TO RDY-5

BEGIN CONSTRUCTION
-YI- STA 11+30

DUKE, CHARTER, AT&T
PROP OH LINES

VERIZON
UG CABLE

AT&T PROP
UG CABLES

DUKE, CHARTER, AT&T
PROP OH LINES

VERIZON
UG CABLE

DUKE, CHARTER, AT&T
PROP OH LINES

AT&T PROP
UG CABLE

VERIZON
UG CABLE

DUKE PROP
HANDHOLE

END CONSTRUCTION
-DRI- STA 11+60

MATCHLINE -YI- STA 19+50
SEE SHEET UO-1

COMPUTED BY: VHW	DATE: 4-27-18
CHECKED BY: ACC	DATE: 4-27-18

PROJECT REFERENCE NO.	SHEET NO.
R-5712	X-0

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

CROSS SECTION SUMMARY
IN CUBIC YARDS

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT.

-L- LOCATION	UNCLASSIFIED EXCAVATION	EMBT
21+10	0	0
21+50	47	3
22+00	34	10
22+50	18	13
23+00	27	13
23+50	31	15
24+00	28	23
24+50	12	41
25+00	5	47
25+50	4	65
26+00	21	59
26+50	40	18
27+00	24	12
27+50	33	26
28+00	54	35
28+50	56	51
29+00	72	73
29+50	81	77
30+00	75	62
30+50	70	43
31+00	101	34
31+50	125	41
32+00	98	47
32+50	78	40
33+00	63	32
33+50	59	32
34+00	68	27
34+50	65	16
35+00	63	8

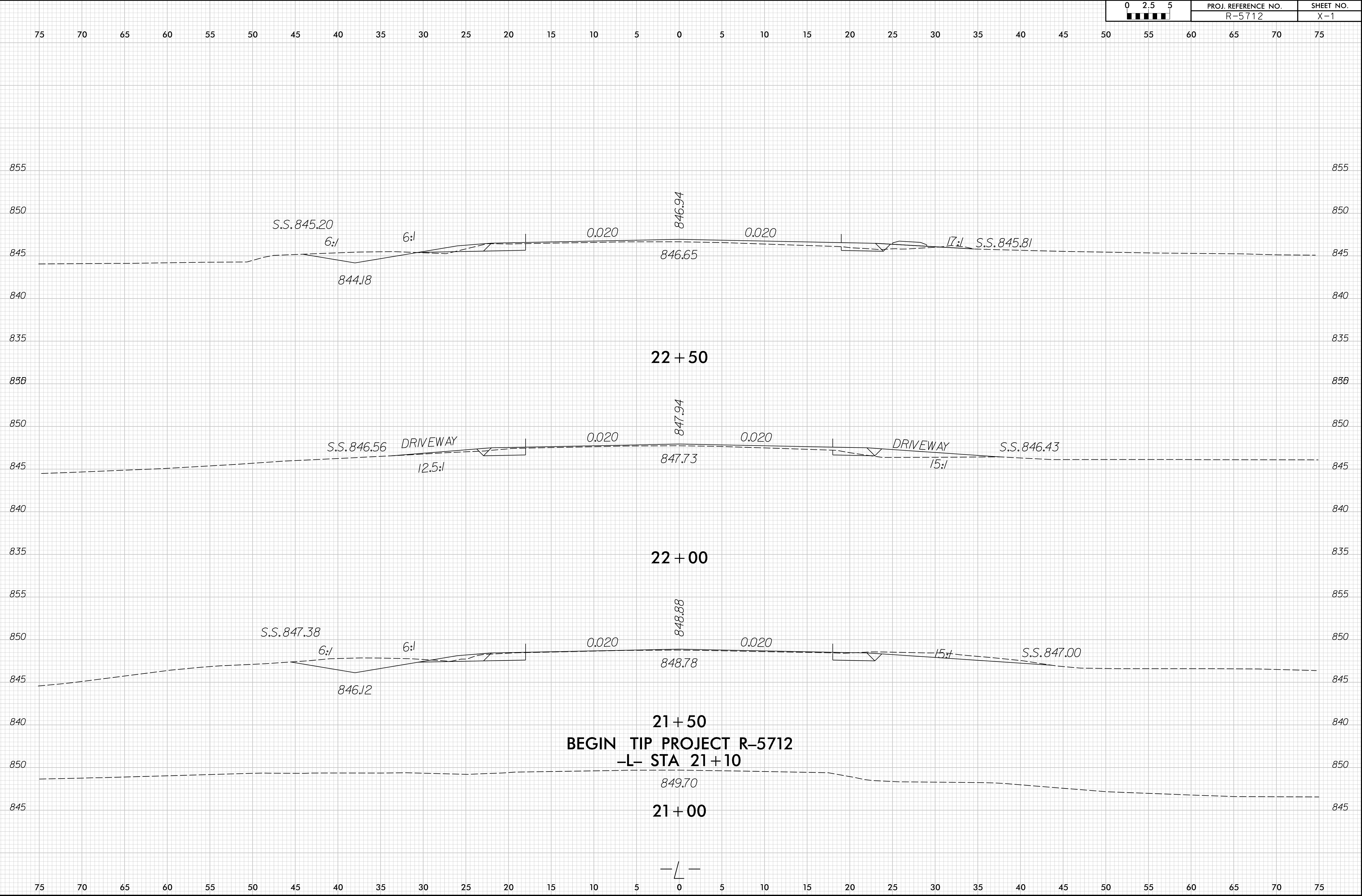
-Y1- LOCATION	UNCLASSIFIED EXCAVATION	EMBT
11+30	0	0
11+50	10	1
12+00	27	6
12+50	18	15
13+00	24	34
13+50	55	46
14+00	75	48
14+50	84	45
15+00	56	45
15+50	29	54
16+00	67	59
16+50	125	69
17+00	143	56
17+50	125	28
18+00	108	104
18+50	76	179
19+00	48	180
19+50	31	444
20+00	11	662
20+50	20	579
21+00	115	311
21+50	233	109
22+00	304	185
22+50	306	125
22+95.78	249	3

-Y2- LOCATION	UNCLASSIFIED EXCAVATION	EMBT
10+19.91	0	0
10+50	5	30
11+00	102	40
11+50	223	21
12+00	261	44
12+50	328	77
13+00	337	62
13+50	268	35
14+00	231	22
14+50	195	22
15+00	170	28
15+50	250	18
16+00	323	5
16+50	305	4
17+00	266	4
17+50	216	6
18+00	106	12
18+50	11	26
19+00	9	21
19+15	2	2

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "grading".

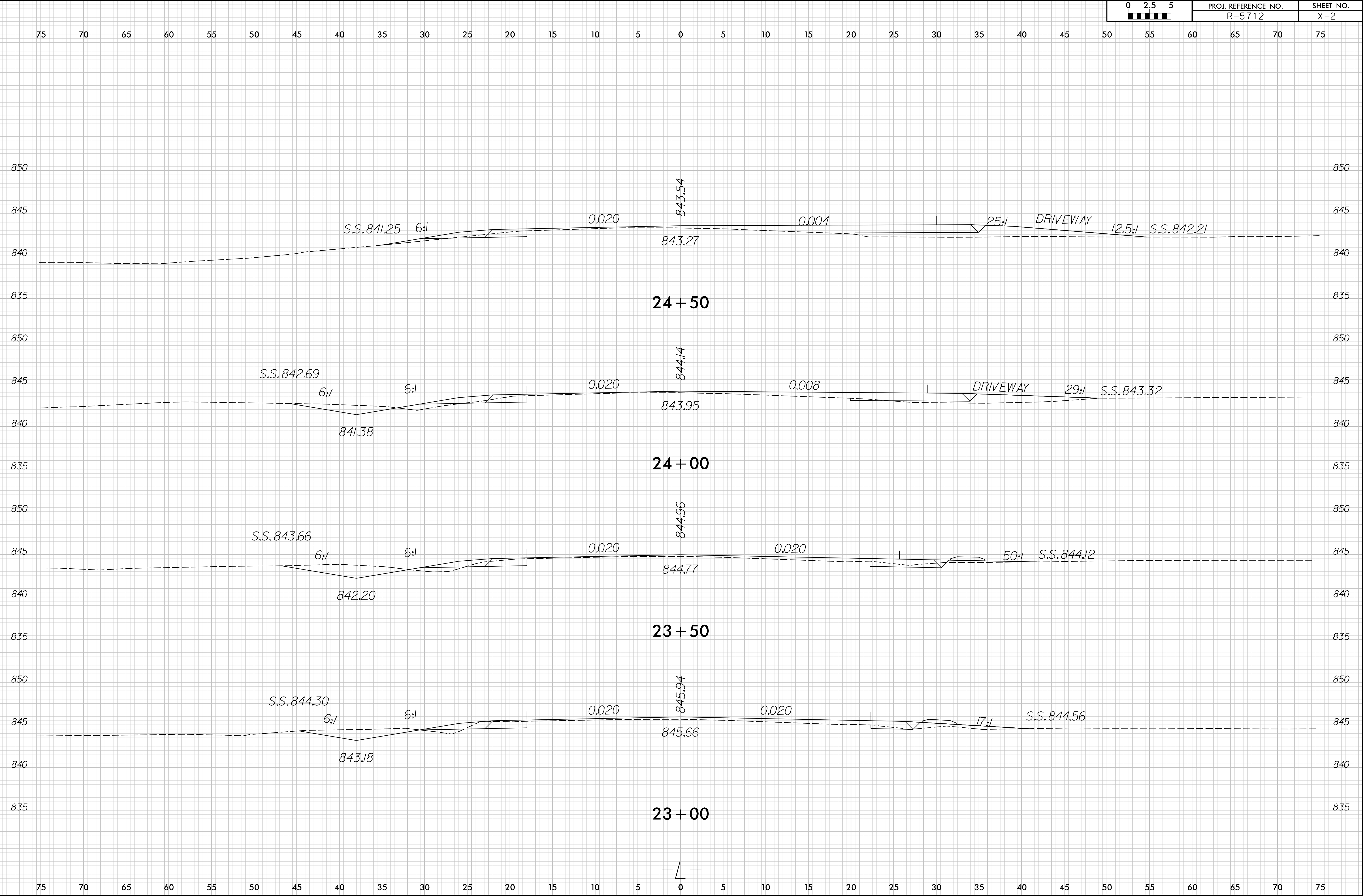
8/23/99

02.55 02.5 0 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-1



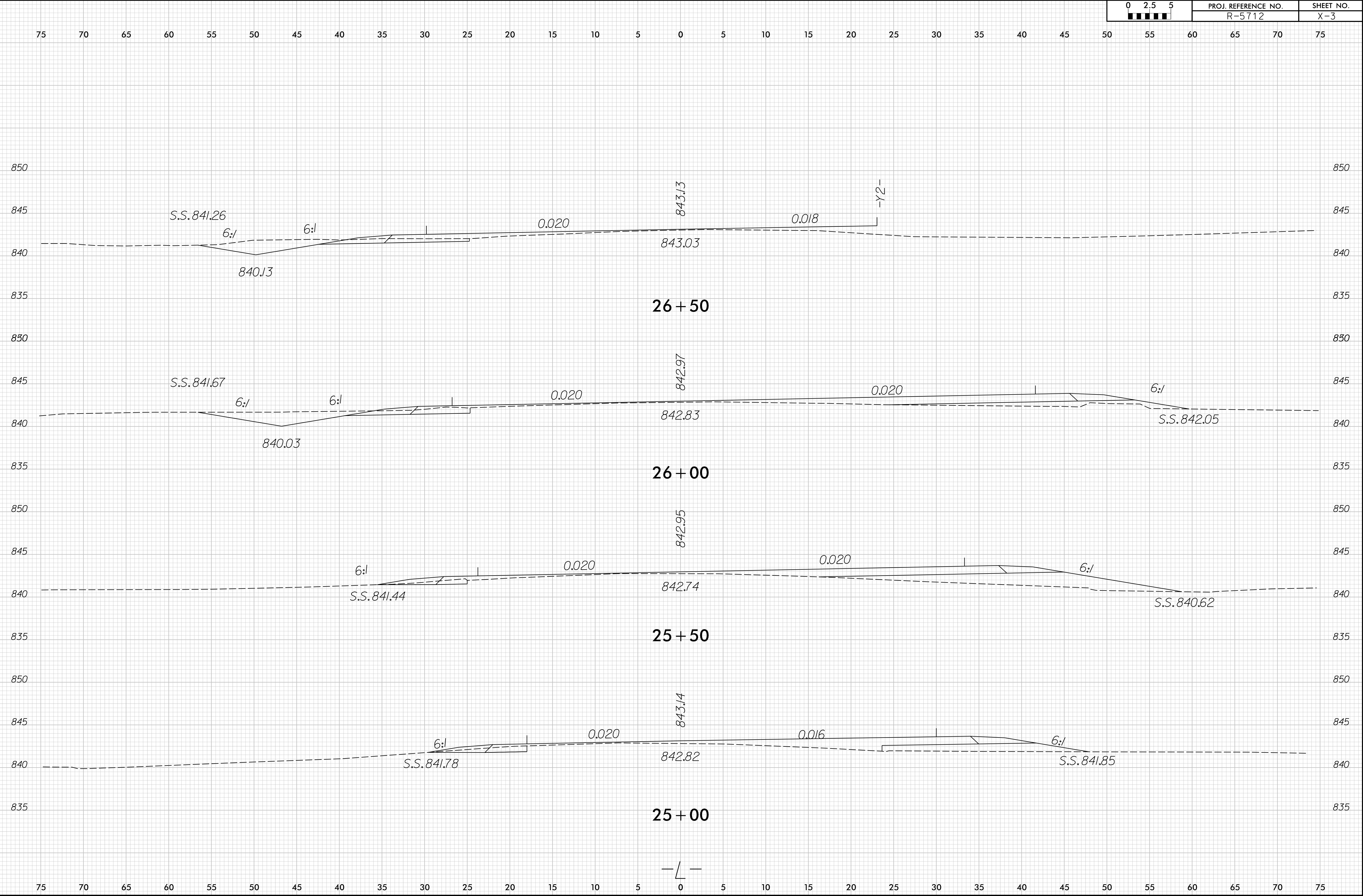
8/23/99

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	R-5712	X-2



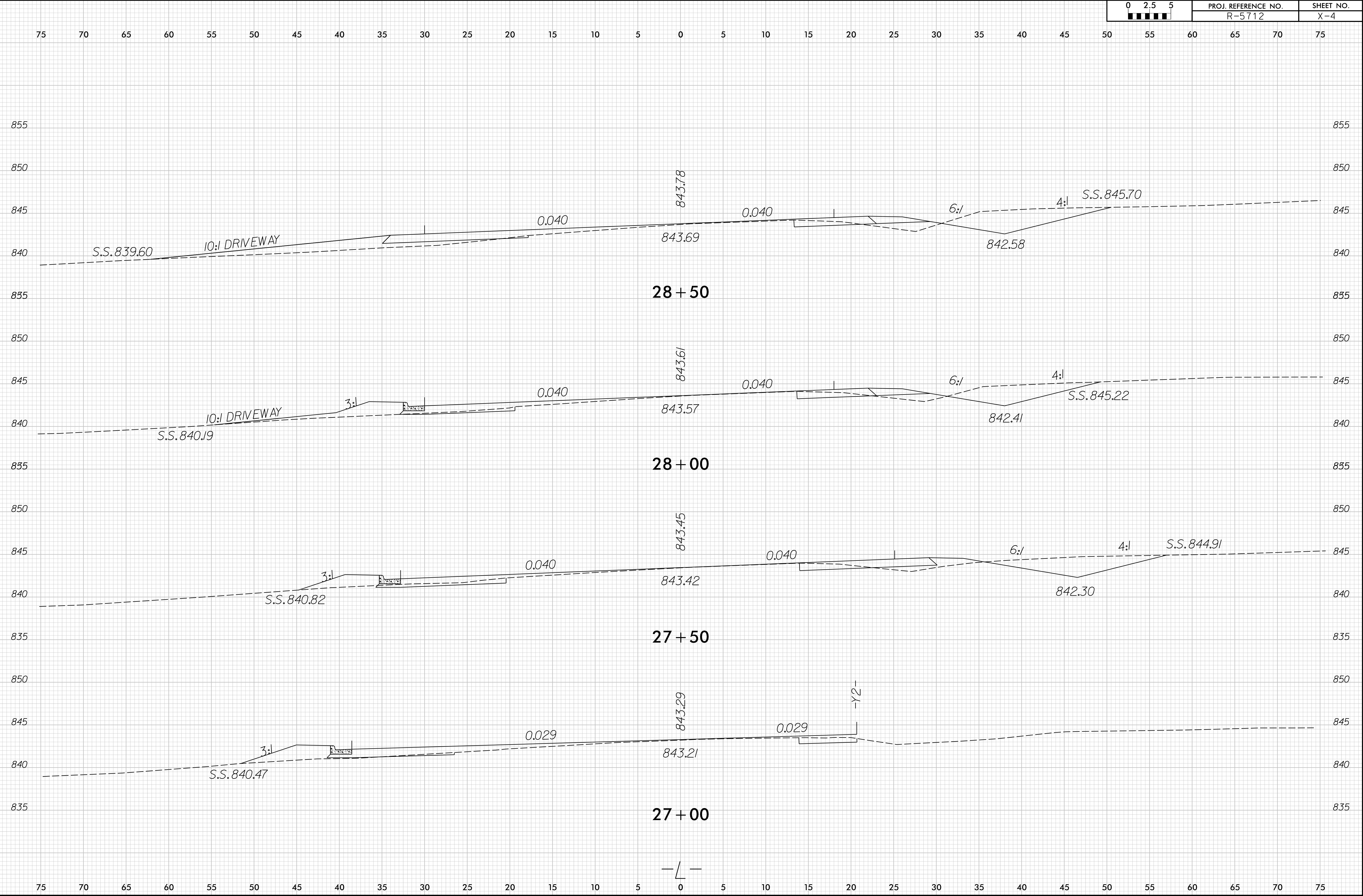
8/23/99

0 2.5 5 	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-3



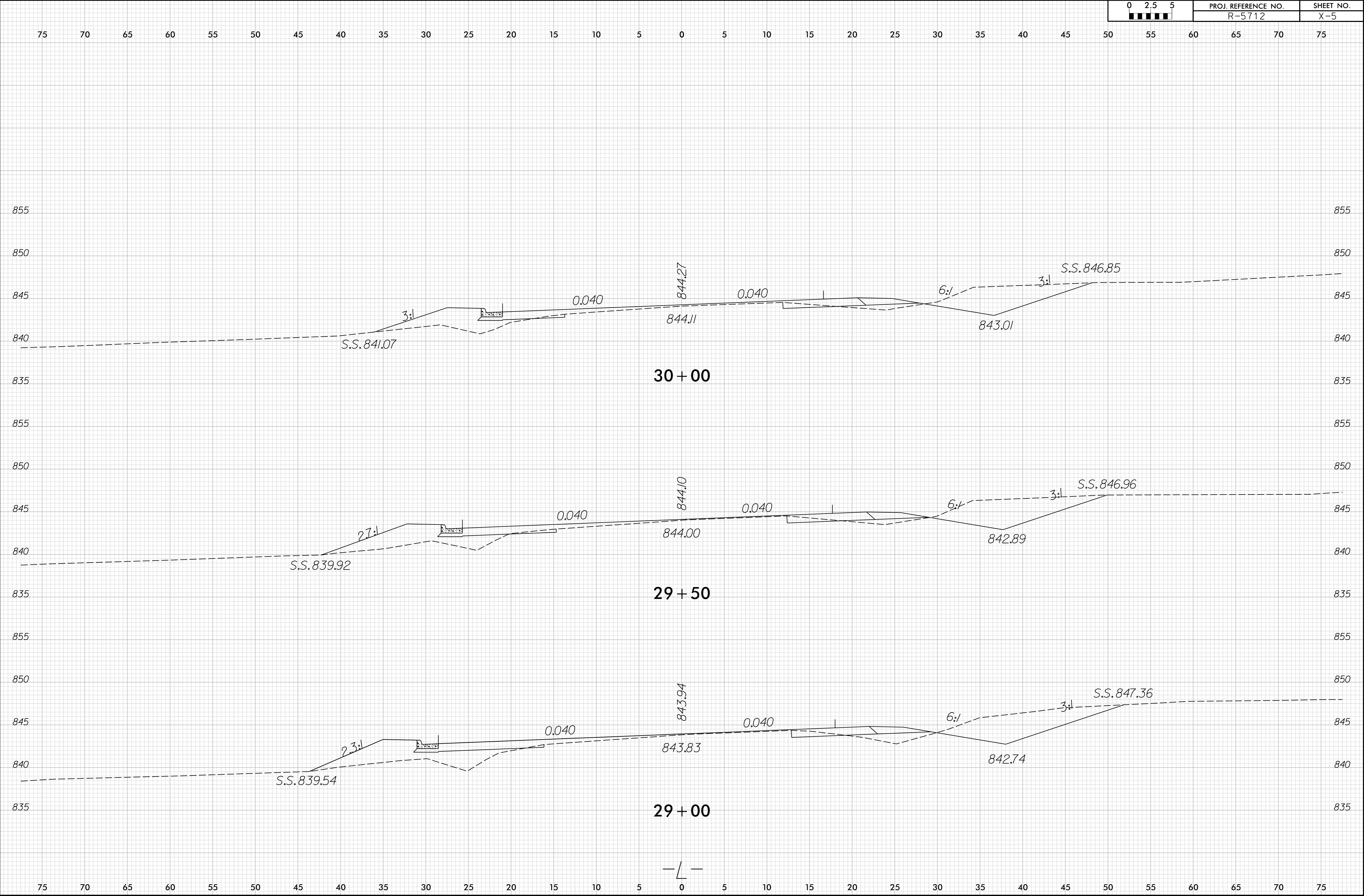
8/23/99

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	R-5712	X-4



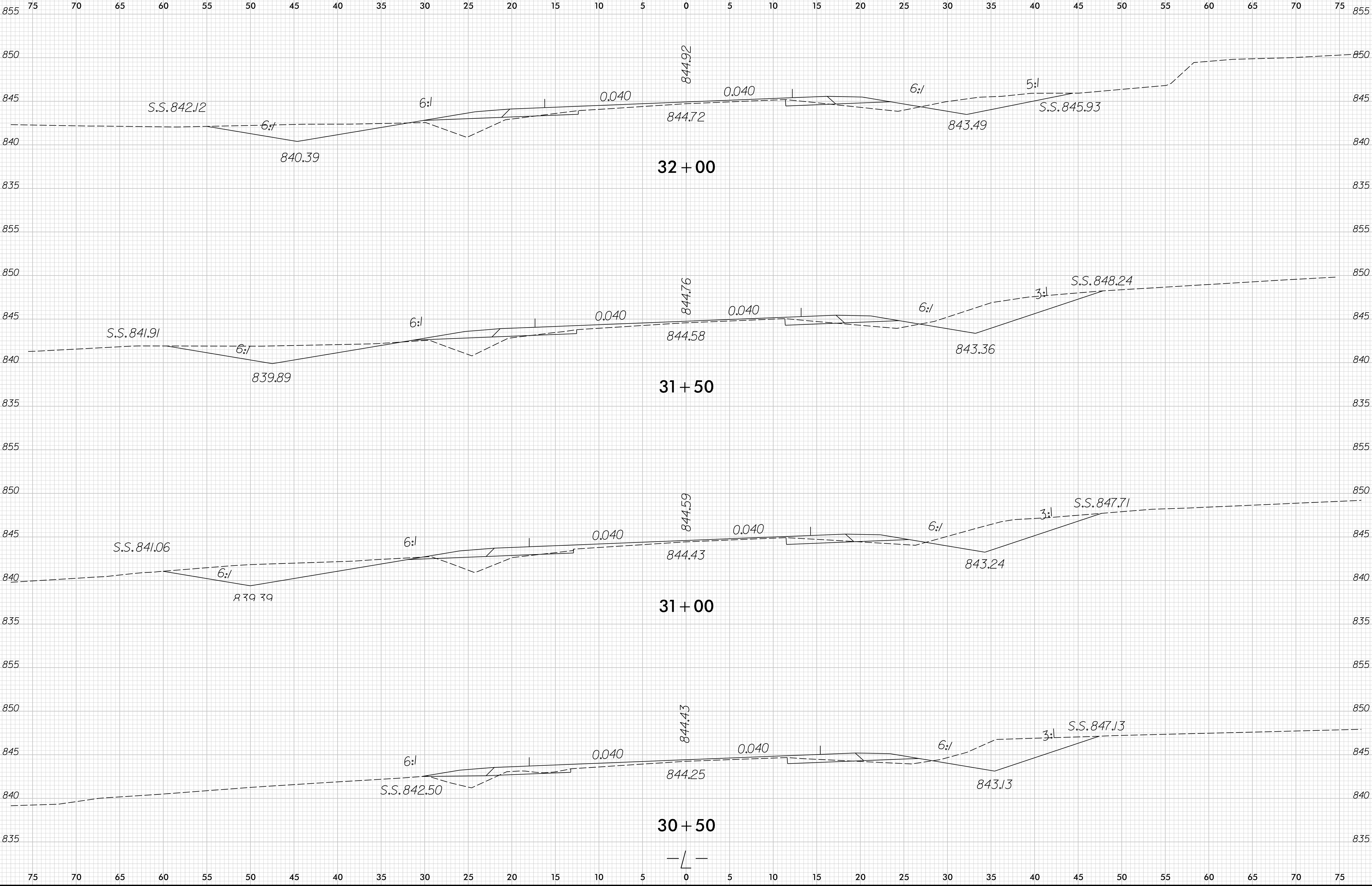
8/23/99

02.55	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-5



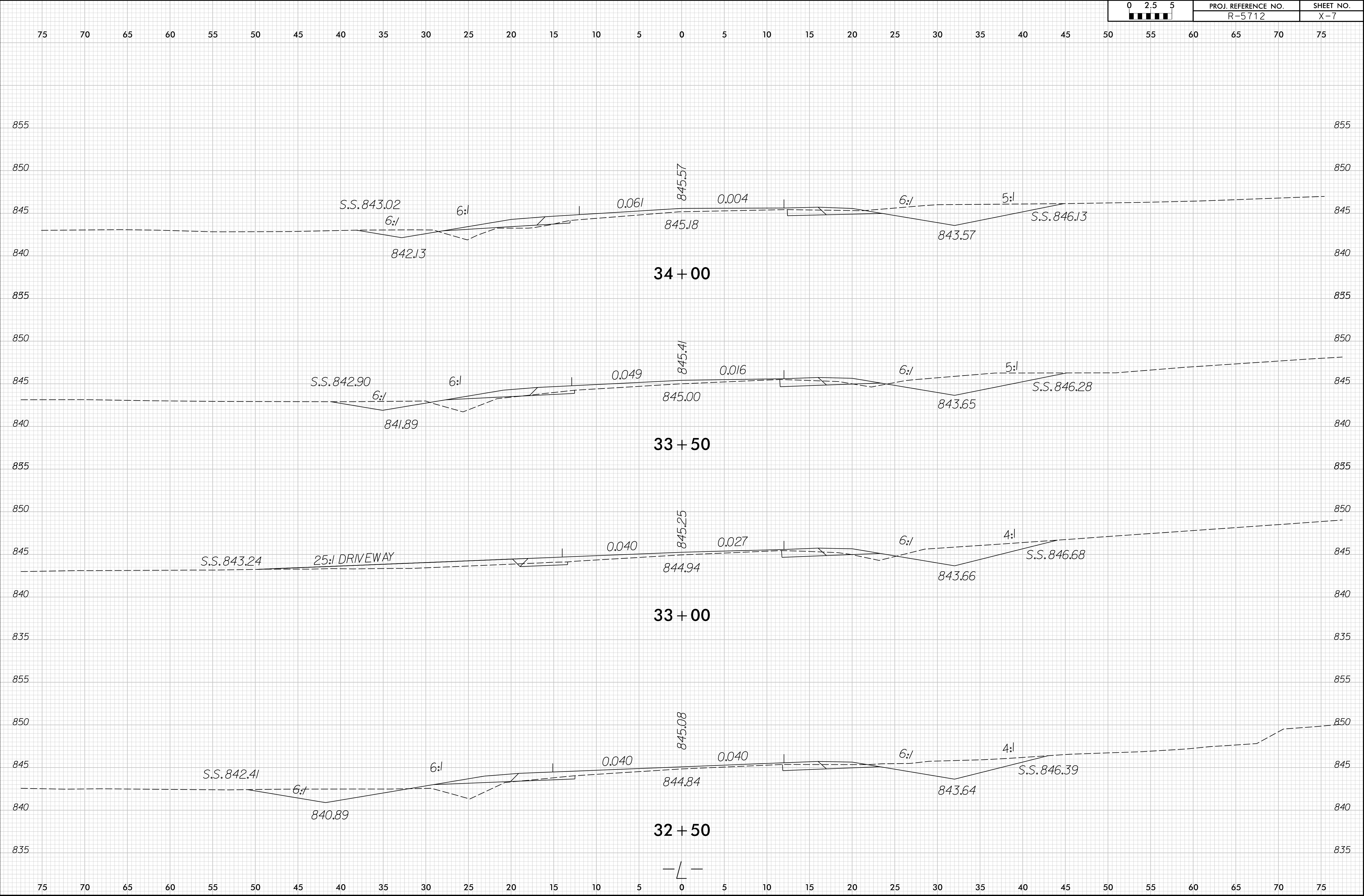
8/23/99

02.55	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-6



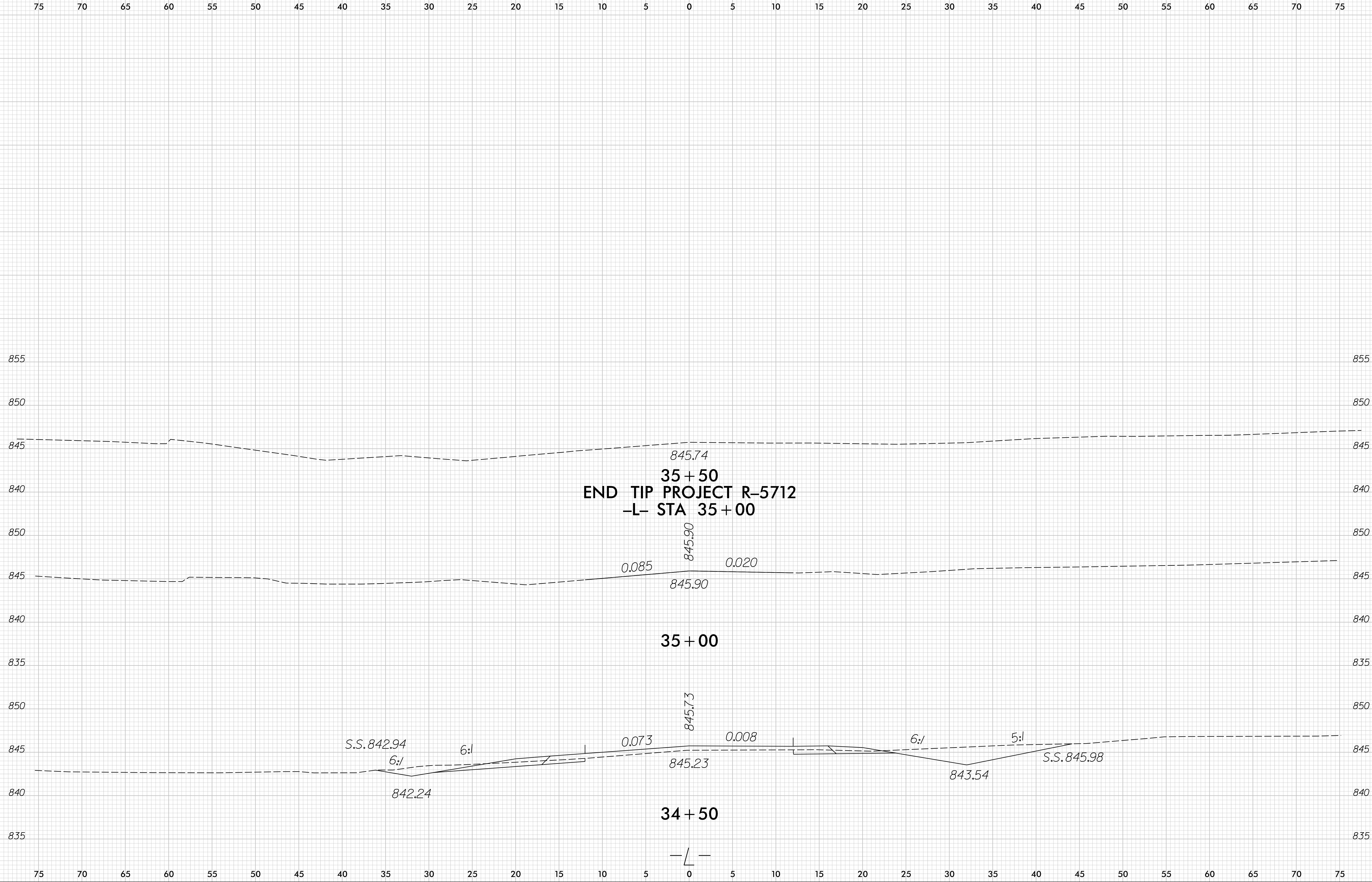
8/23/99

02.55 02.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-7



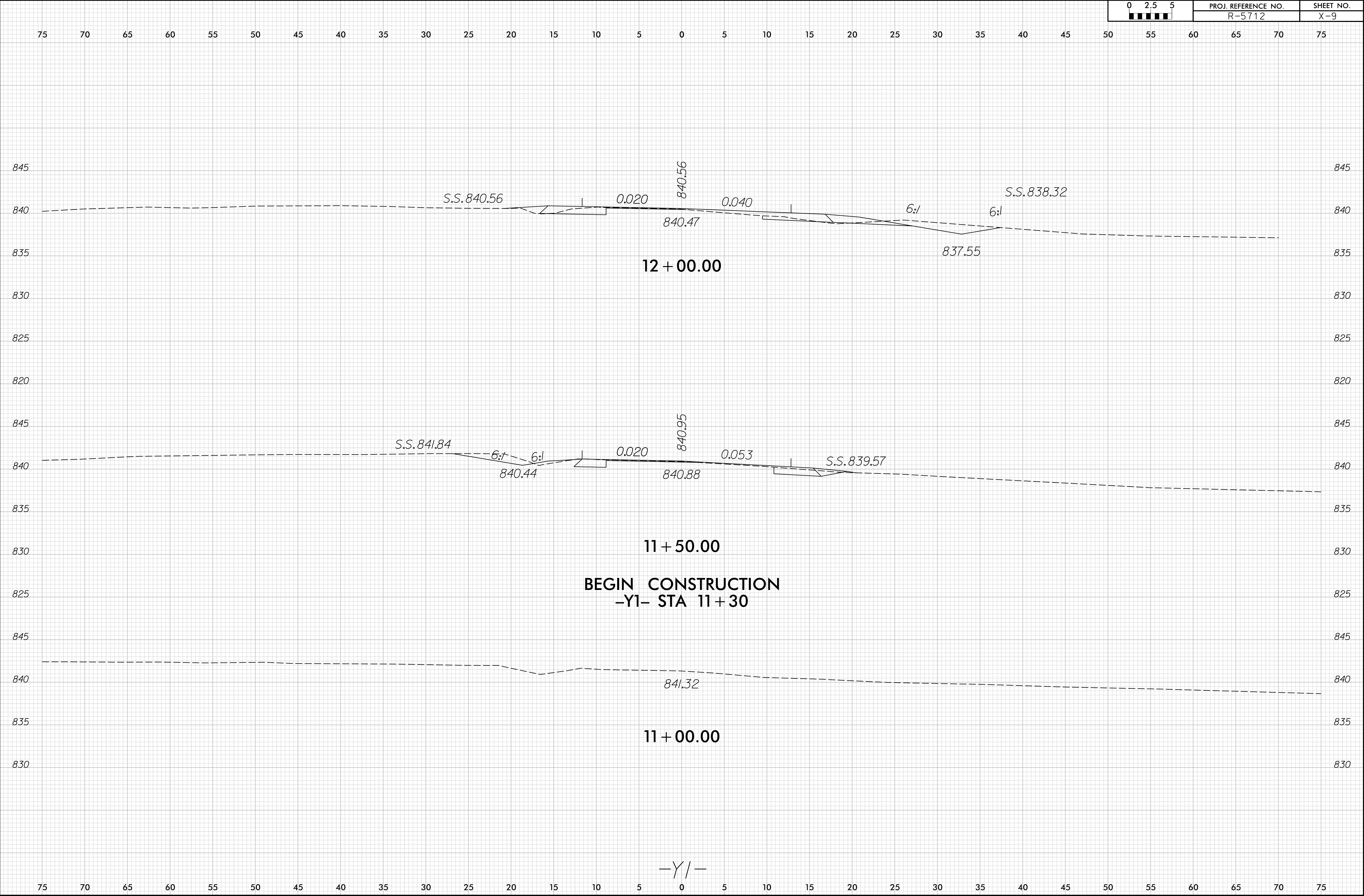
8/23/99

02.55	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-8



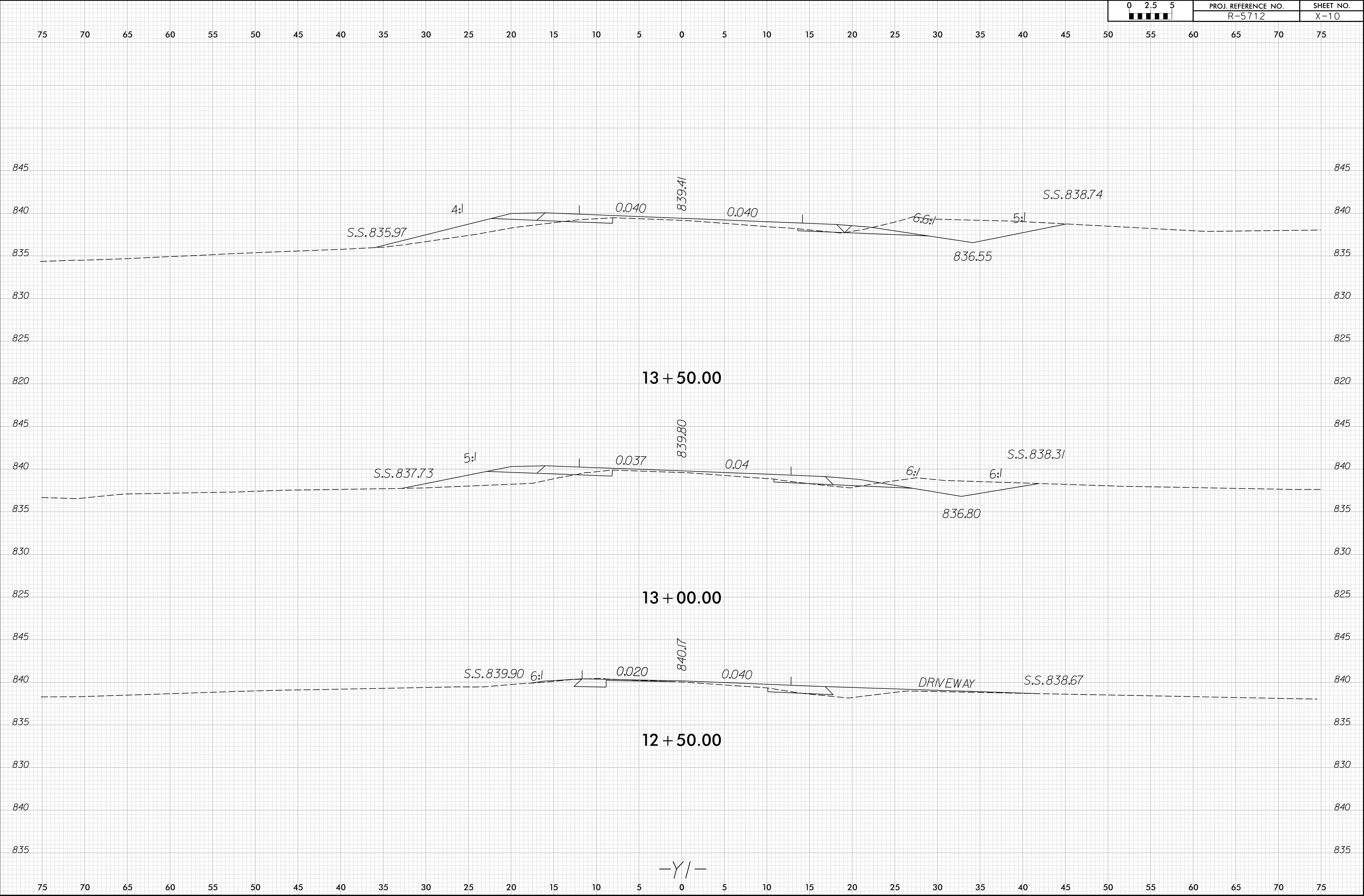
8/23/99

02.55	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-9



8/23/99

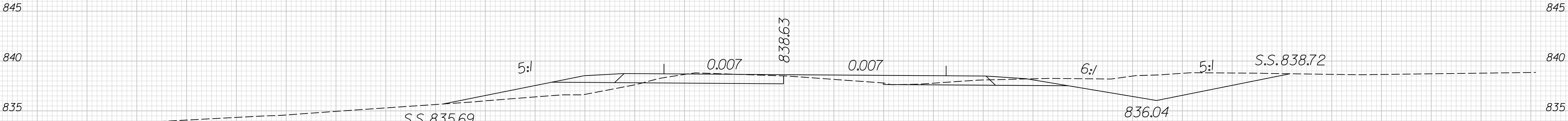
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	R-5712	X-10



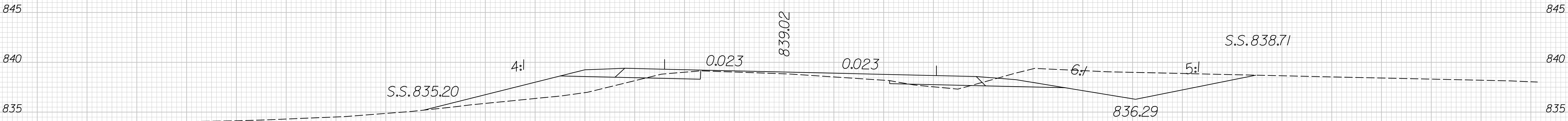
8/23/99

02.55	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-11

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14 + 50.00



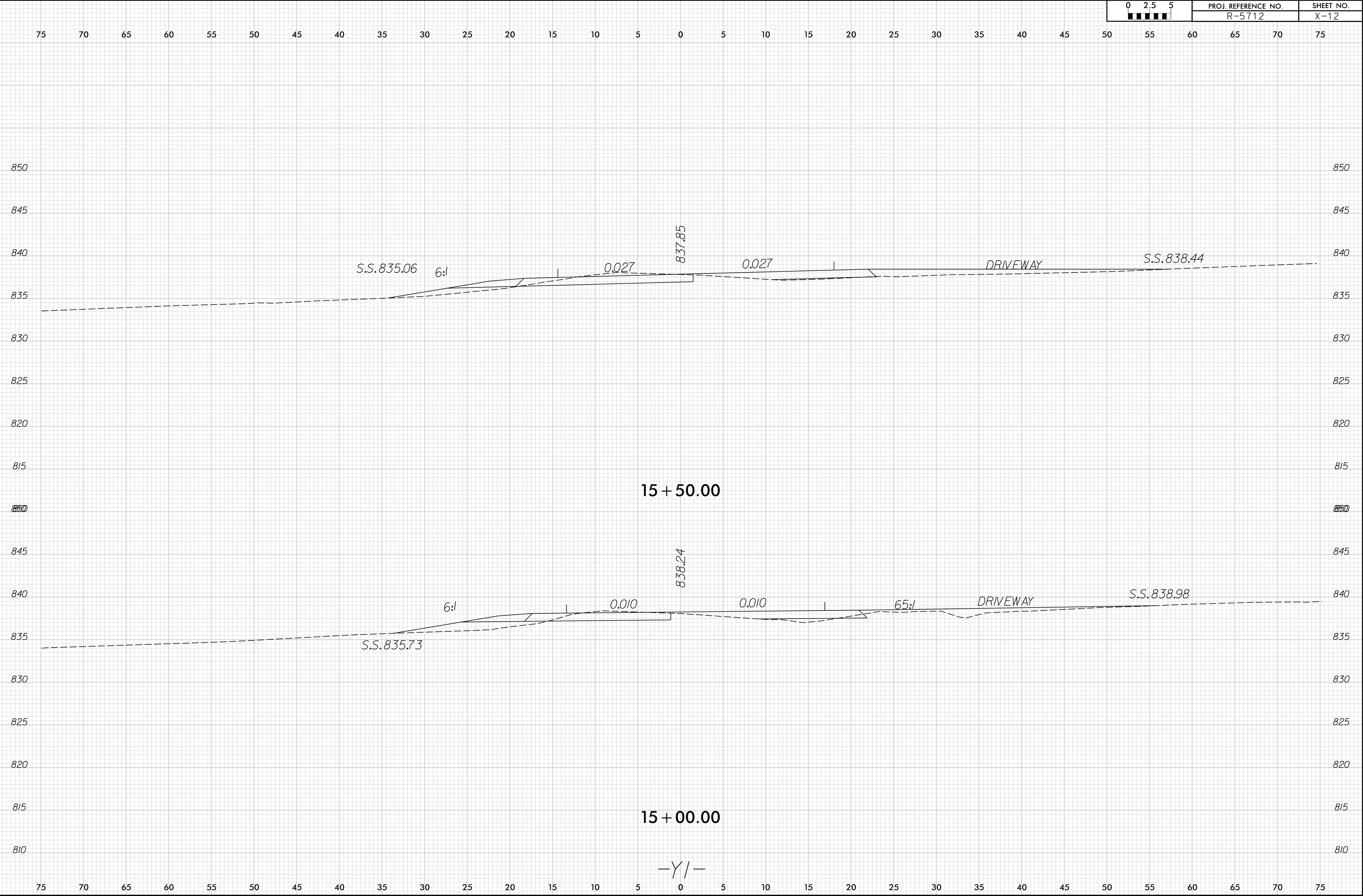
14 + 00.00

-Y/-

757065605550454035302520151050051015202530354045505560657075

8/23/99

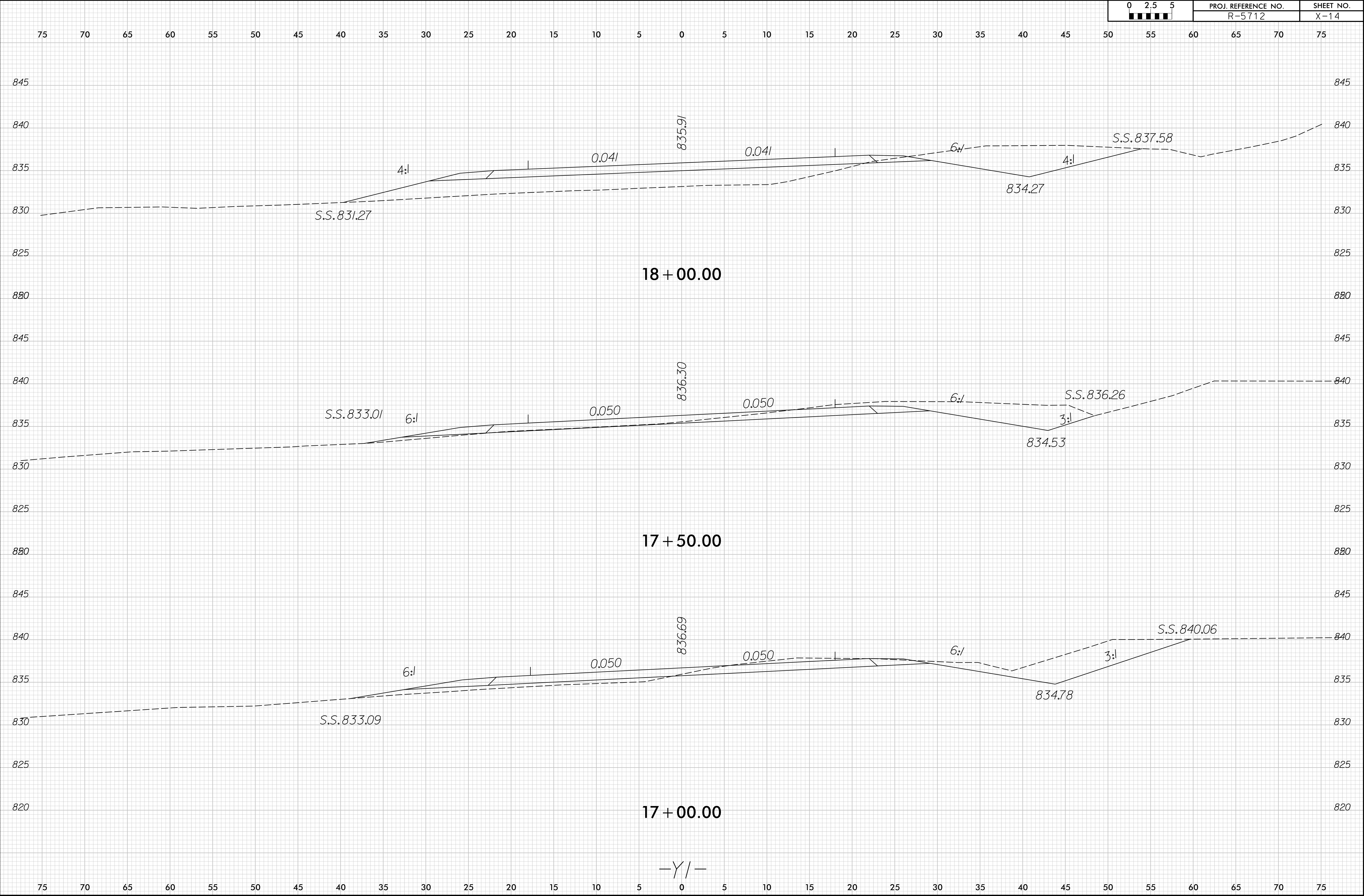
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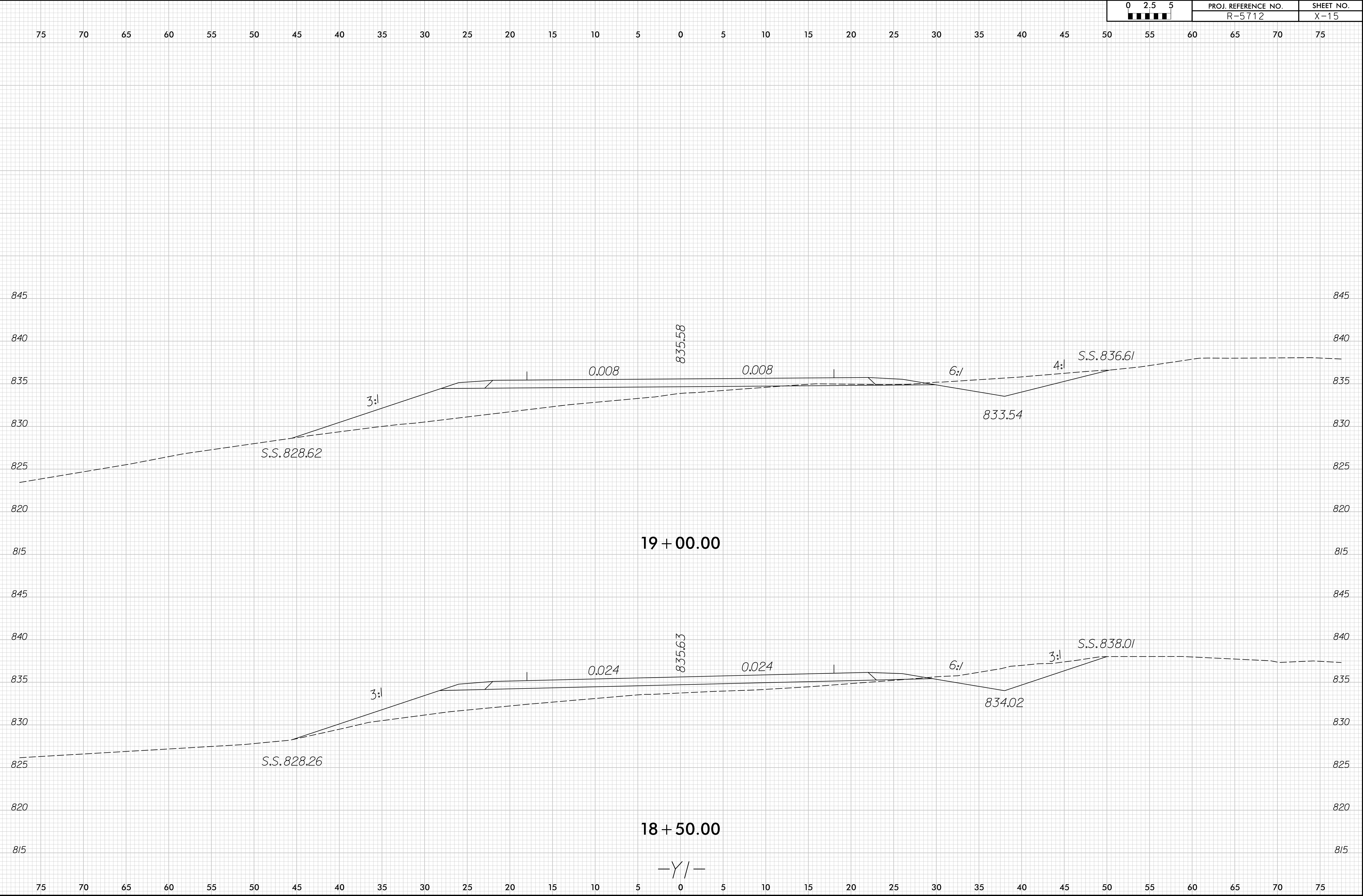
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02.55	PROJ. REFERENCE NO.		SHEET NO.
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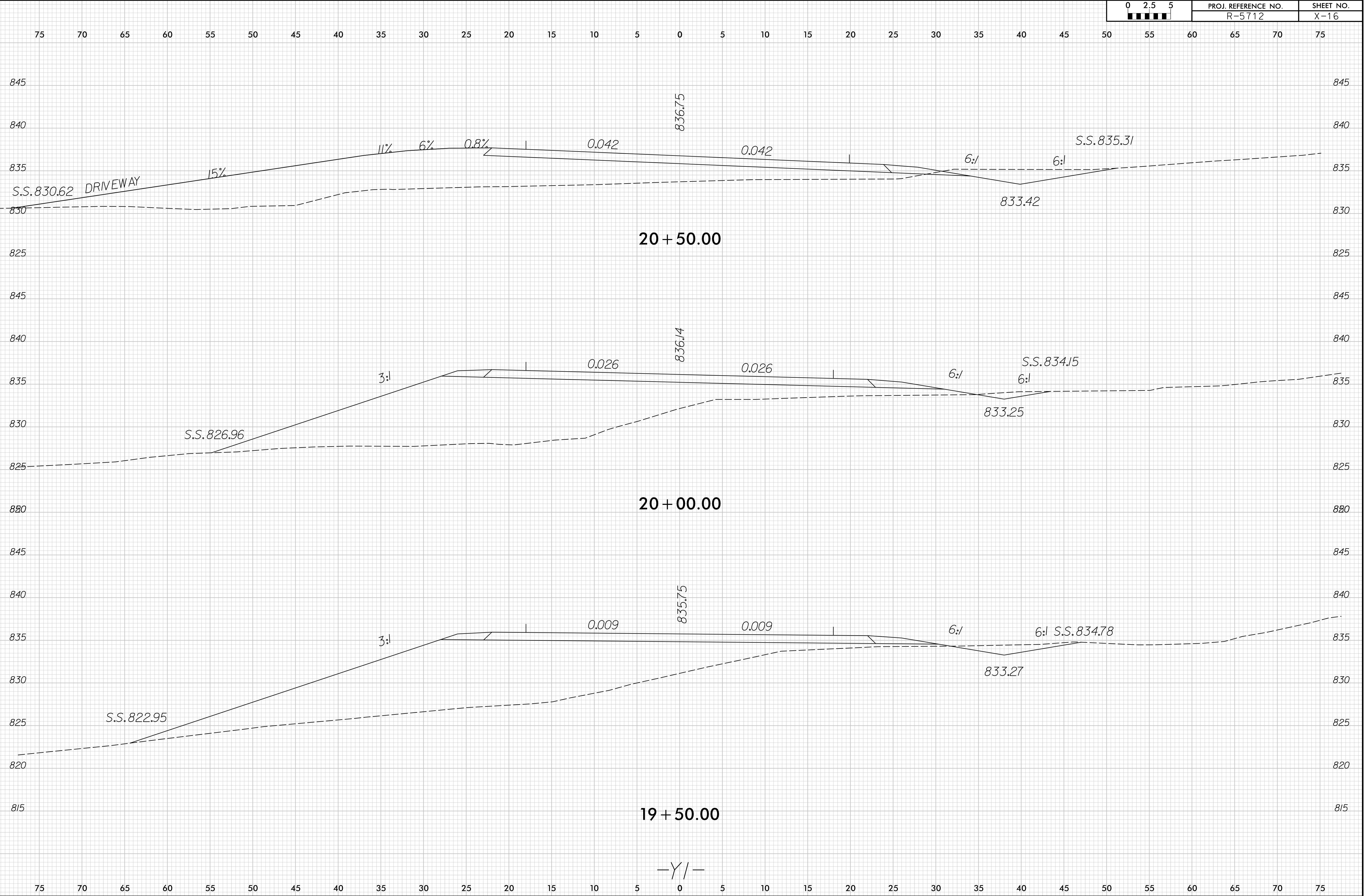
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02.55	PROJ. REFERENCE NO.	SHEET NO.
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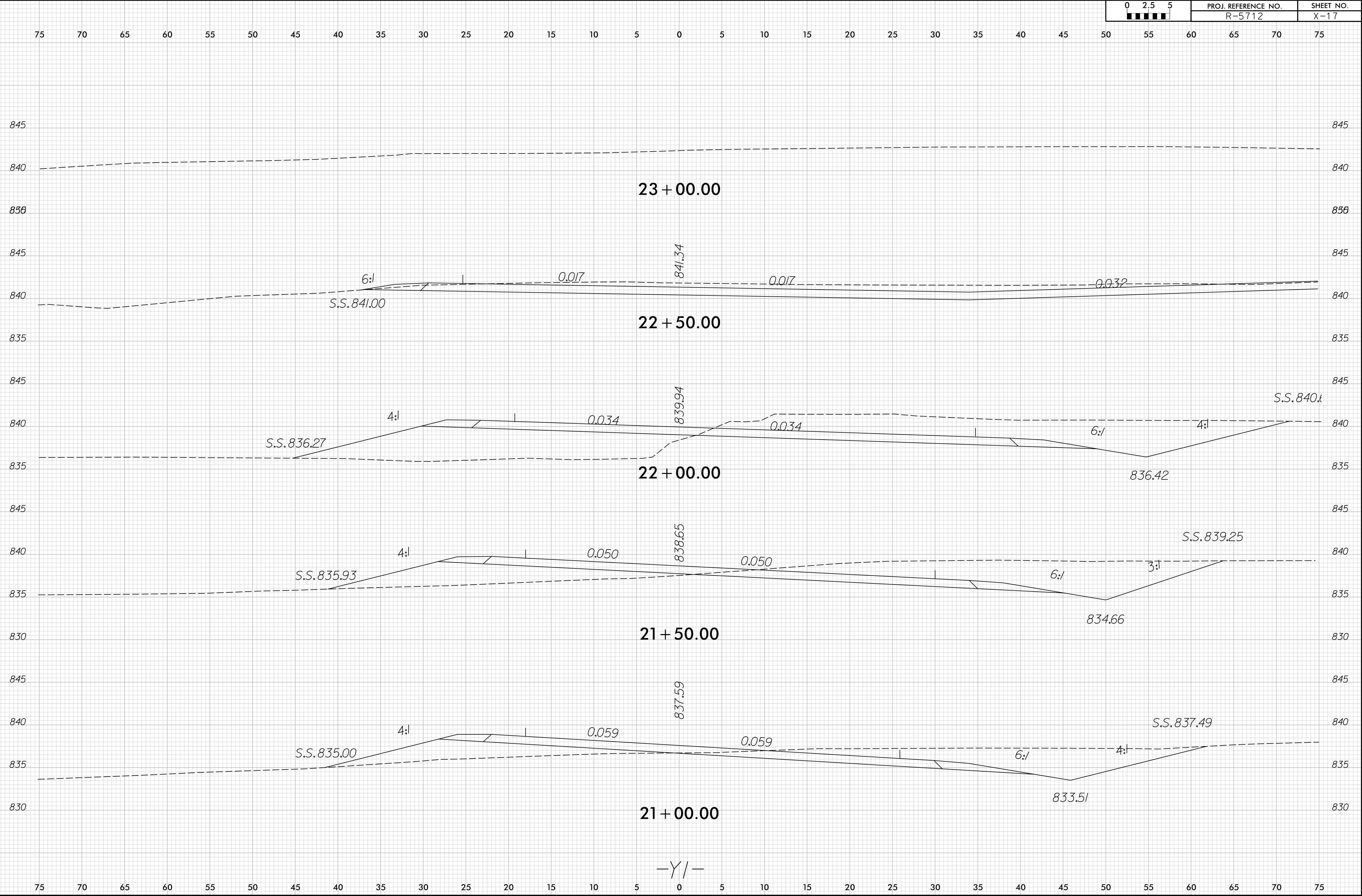
8/23/99

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1: \3761 - R5712 - R5712 for NCDOT Division 12\2-R-5712\Roadway\XSC\R-5712_rdy_XPL_Y1.dgn
mgar



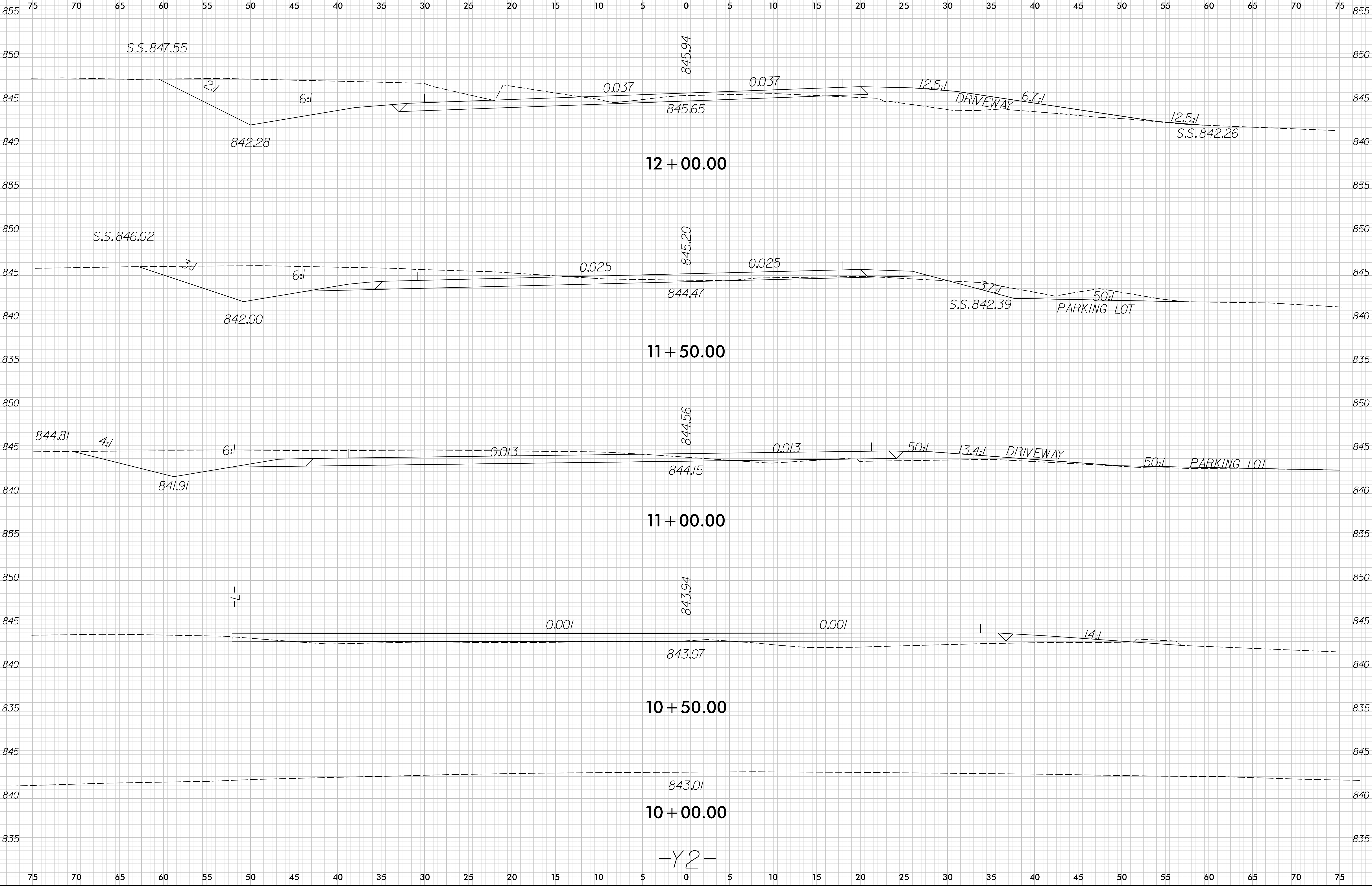
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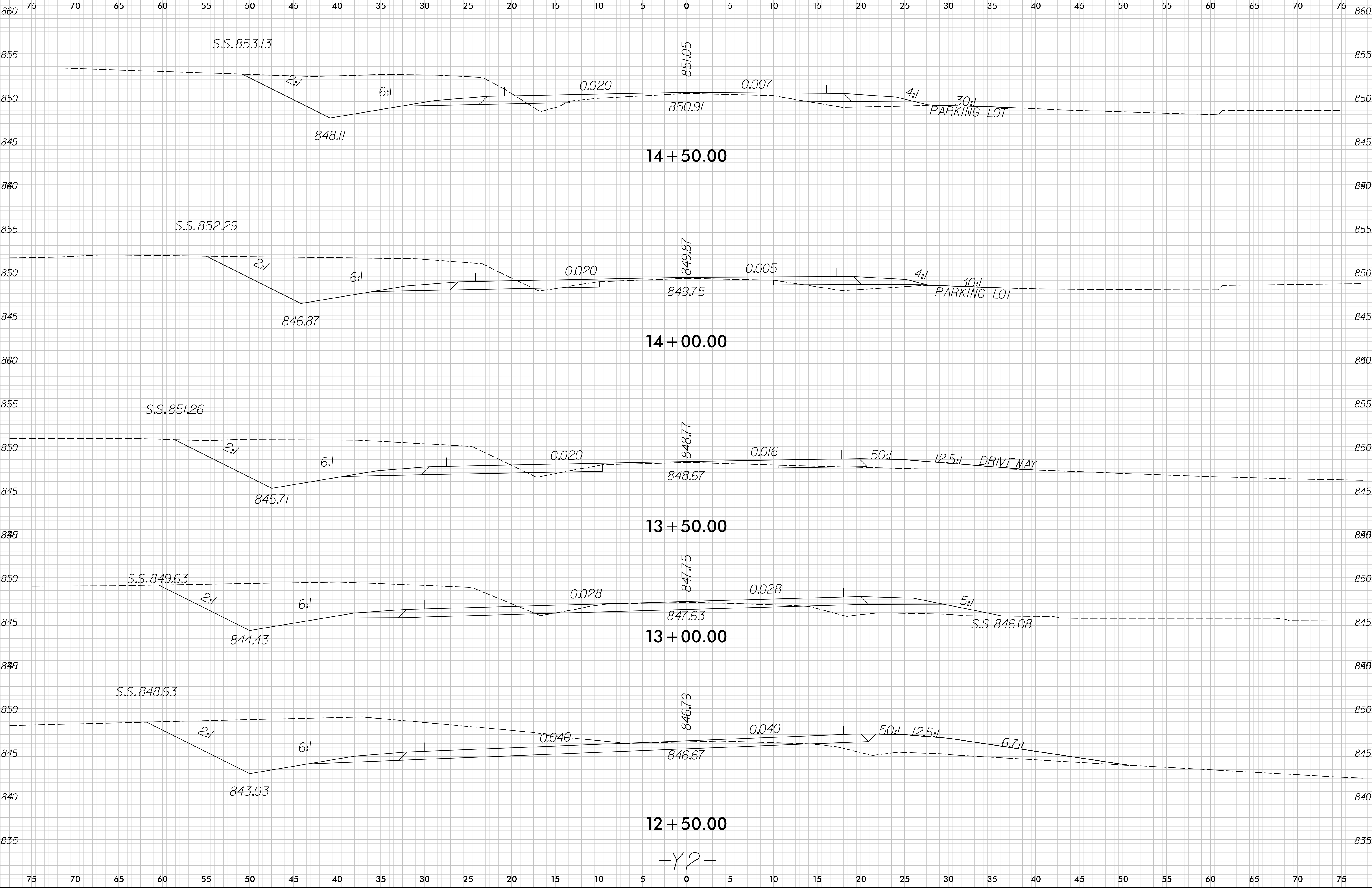
8/23/99

02.55	PROJ. REFERENCE NO.		SHEET NO.	
	R-5712		X-18	



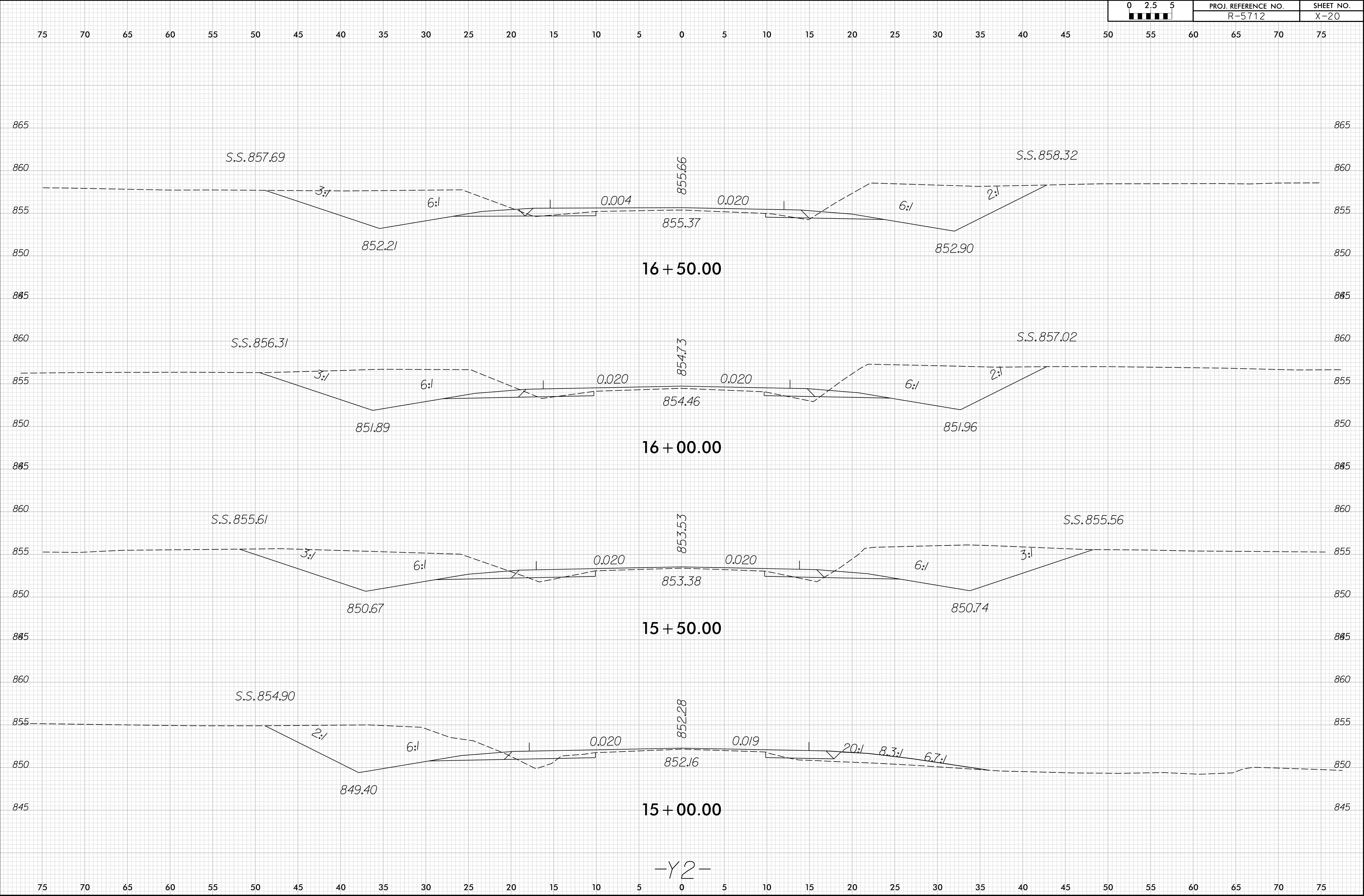
8/23/99

0 2.5 5 [Scale Bar]	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-19



8/23/99

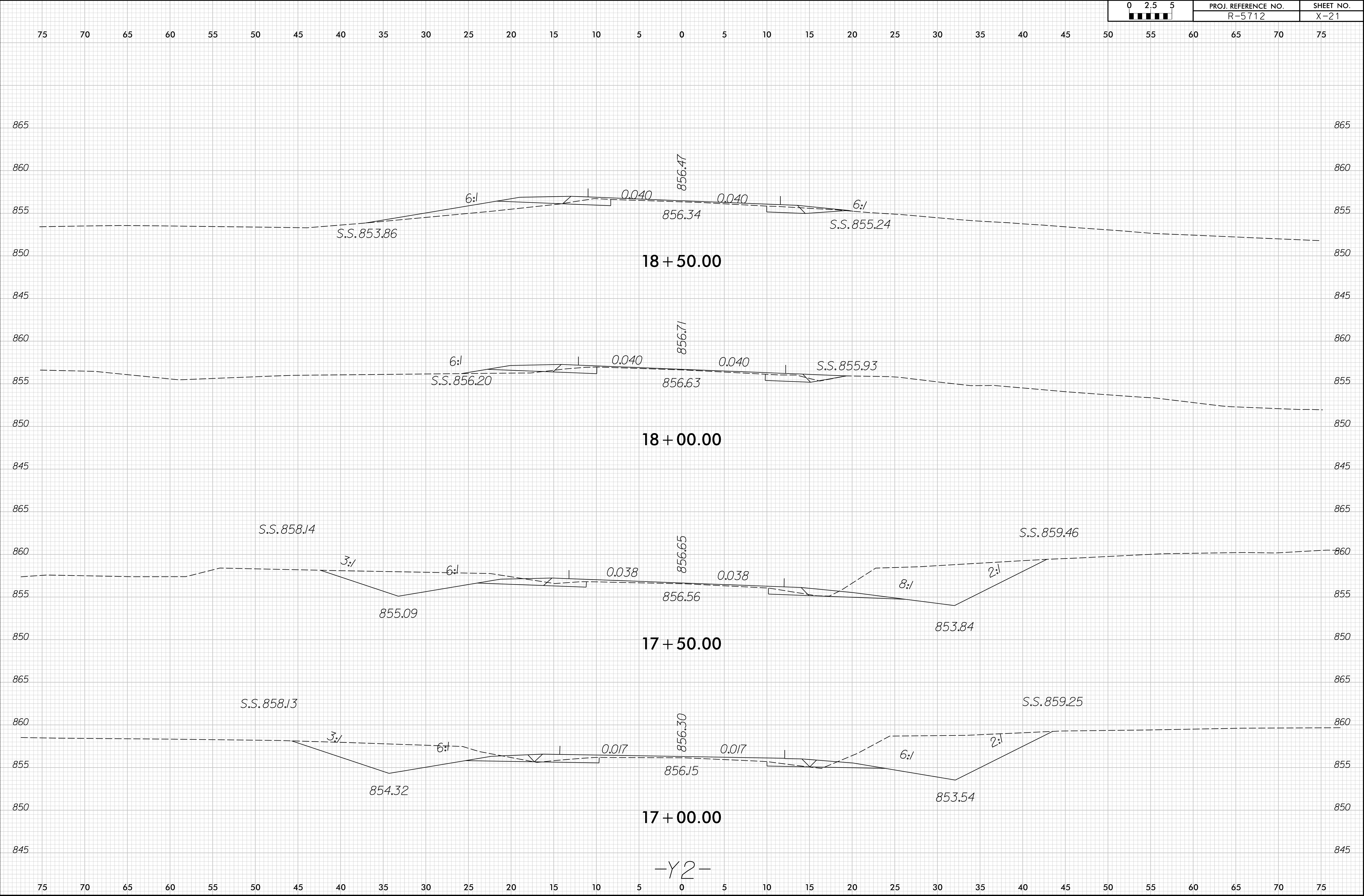
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	R-5712	X-20



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8/23/99

02.55 02.5 05	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-21



8/23/99

02.55	PROJ. REFERENCE NO.	SHEET NO.
	R-5712	X-22

