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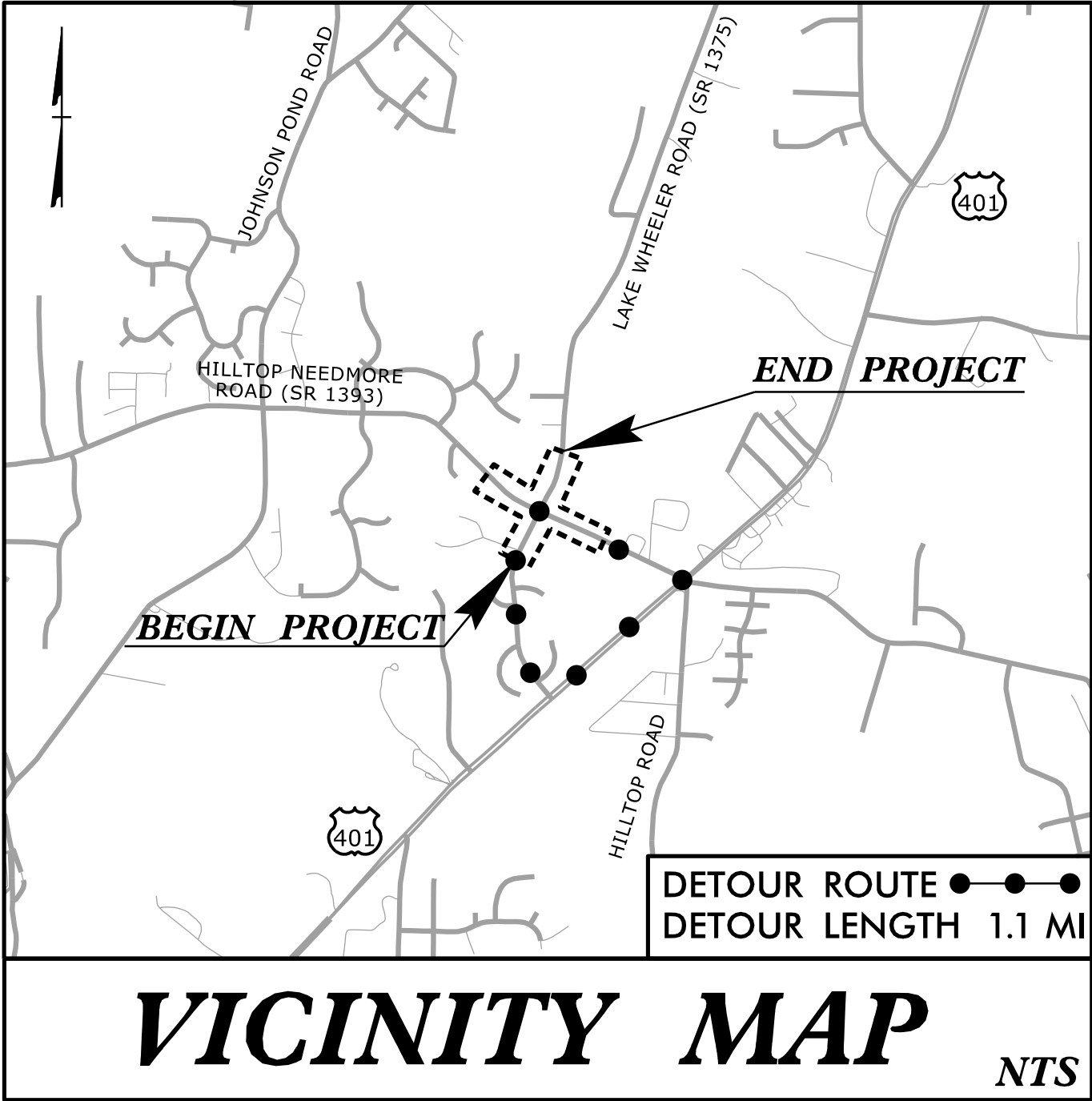
09/08/24

9/15/2026
\\Proj\HL0008G_Rdy_tsh.dgn
User: mlindsey

TIP PROJECT: HL-0008G

CONTRACT: DE00380

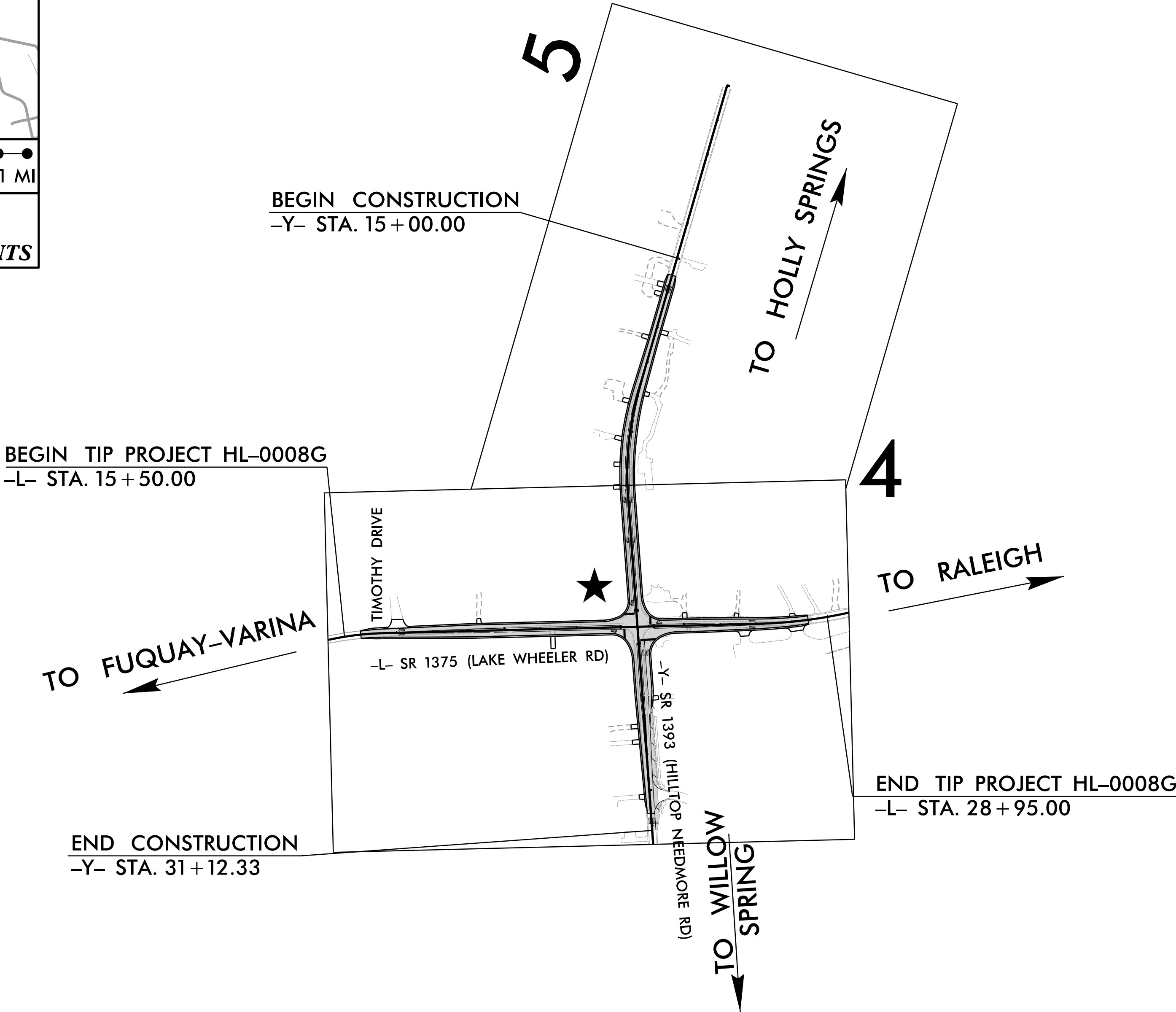
See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

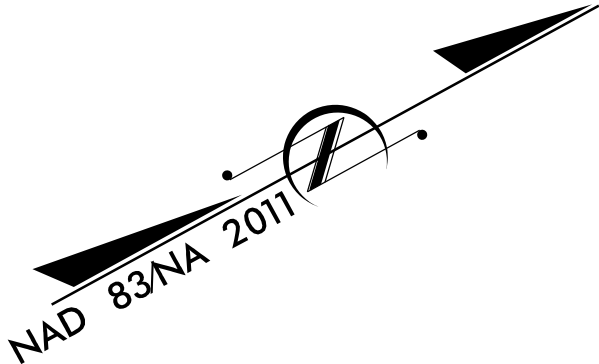
WAKE COUNTY

LOCATION: SR 1375 (LAKE WHEELER ROAD) & SR 1393 (HILLTOP NEEDMORE ROAD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE & SIGNALS

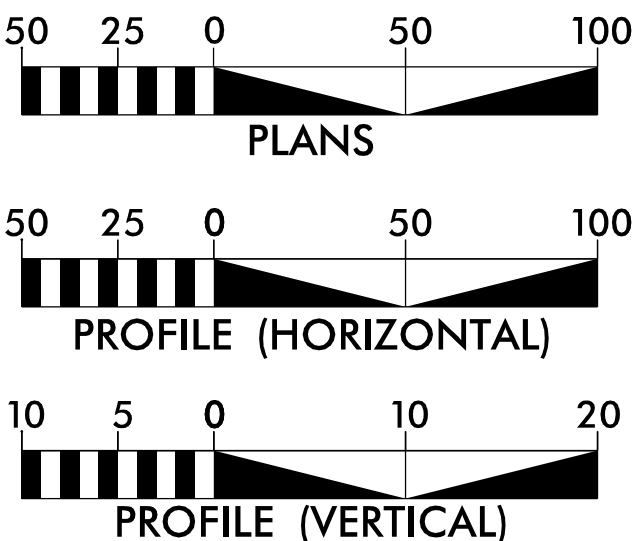


STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0008G	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
49367.1.3		PE	
49367.2.3	1375007	ROW	
49367.3.3	1375007	CONST.	
49367.2.28		UTIL.	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



GRAPHIC SCALES



DESIGN DATA

-L- LAKE WHEELER
ADT 2026 = 6,850
V = 50 MPH

-Y- HILLTOP NEEDMORE
ADT 2026 = 11,500
ADT 2046 = 20,300
V = 50 MPH
FUNCTIONAL CLASS =
MAJOR COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT HL-0008G = 0.254 MILES

NCDOT CONTACT:

MATTHEW J. NOLFO, PE
DIVISION 5 DESIGN ENGINEER
PH: 919-317-4794

Prepared In the Office of:



DRMP, INC.
5808 FARRINGTON PLACE
RALEIGH, NC 27609
PHONE: 919-872-5115
www.drmp.com | NC License No. F-1524

2024 STANDARD SPECIFICATIONS

MAY 16, 2023
RIGHT OF WAY DATE:
OCTOBER 14, 2026
LETTING DATE:

KAYLA M. POULOS, PE
PROJECT ENGINEER

MIKAYLA M. LINDSEY, EI
PROJECT DESIGNER

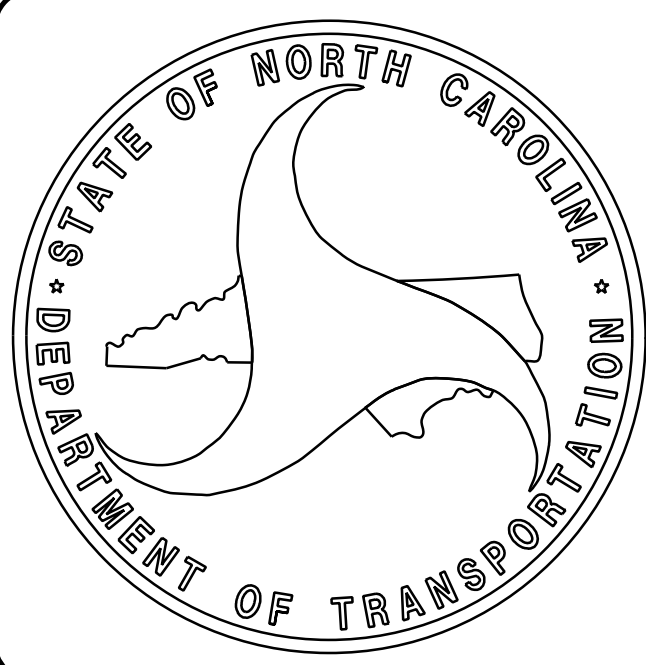
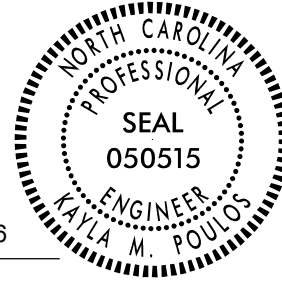
HYDRAULICS ENGINEER

NOT A CERTIFIED DOCUMENT AS TO
THE ORIGINAL DOCUMENT BUT ONLY
AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY
ISSUED AND SEALED BY:
MICHAEL D. BIVALETT
043342 ON 05-07-2024
THIS DOCUMENT IS ONLY CERTIFIED
AS TO THE REVISIONS:
9/15/2026

Signed by: Ryan P. Mitchell
SIGNATURE: ROADWAY DESIGN ENGINEER



Signed by: Kayla M. Poulos
SIGNATURE: 9/15/2026



		PROJECT REFERENCE NO.	SHEET NO.
		HL-0008G	1A
		ROADWAY DESIGN ENGINEER	
		Professional Seal 050515 7/29/2026 7/29/2026 ENGINEER KAYLA M. POULOS	
		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
		PLANS PREPARED BY: DRMP DRMP, INC. 5808 FARMINGTON PLACE RALEIGH, NC 27609 NC LICENSE NO. F-1524 (919) 872-5115	

INDEX OF SHEETS

1

TITLE SHEET

1A

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ROADWAY DETAILS

2C-1

SPECIAL DETAILS

3B-1

ROADWAY SUMMARY SHEET

3D-1

DRAINAGE SUMMARY SHEET

3G-1

GEOTECHNICAL SUMMARY SHEET

3P-1

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PMP-1 THRU PMP-4

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CROSS SECTION INDEX

X-1A

CROSS SECTION SUMMARY SHEET

X-2 THRU X-24

CROSS SECTION SHEETS

GENERAL NOTES

2024 SPECIFICATIONS

EFF. 01-16-2024

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.

STREET TURNOUT:

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

UTILITIES

UTILITY OWNERS ON THIS PROJECT ARE CHARTER, DOMINION, SEGRA, DUKE ENERGY, TOWN OF FUQUAY-VARINA, AND BRIGHTSPEED. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

2024 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-16-2024

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" CONTRACTS STANDARDS AND DEVELOPEMENT UNIT – N.C. DEPARTMENT OF TRANSPORTATION – RALEIGH, N.C., DATED JANUARY 16, 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.

TITLE

DIVISION 2 – EARTHWORK

200.02

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

310.03

CROSS PIPE END SECTION – PRECAST CONCRETE SECTION FOR 18" TO 30" PIPE

310.10

DRIVEWAY PIPE CONSTRUCTION

DIVISION 5 – SUBGRADE, BASES, AND SHOULDERS

560.01

METHOD OF SHOULDER CONSTRUCTION – HIGH SIDE OF SUPERELEVATED CURVE – METHOD I

STD. NO.

TITLE

DIVISION 8 – INCIDENTALS

806.01

CONCRETE RIGHT-OF-WAY MARKER

815.02

SUBSURFACE DRAIN

840.14

CONCRETE DROP INLET – 12’ THRU 30” PIPE

840.18

CONCRETE GRATED DROP INLET TYPE ‘B’ – 12” THRU 36” PIPE

840.19

CONCRETE GRATED DROP INLET TYPE ‘D’ – 12” THRU 36” PIPE

840.24

FRAMES AND NARROW SLOT SAG GRATES

840.29

FRAMES AND NARROW SLOT FLAT GRATES

840.72

PIPE COLLAR

846.01

CONCRETE CURB, GUTTER, AND CURB & GUTTER

848.02

DRIVEWAY TURNOUT – RADIUS TYPE

848.04

STREET TURNOUT

876.02

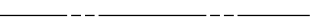
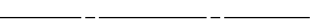
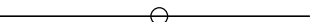
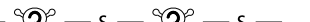
GUIDE FOR RIP RAP AT PIPE OUTLETS

7/23/2026
\\p01\h1\0008G_Rd\1A.dgn
User: m1indsey

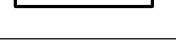
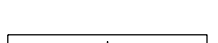
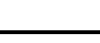
STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS
CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

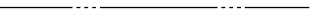
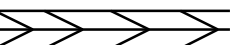
BOUNDARIES AND PROPERTY:

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	

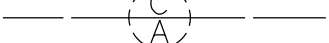
HYDROLOGY:

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	

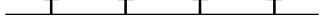
RAILROADS:

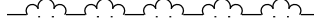
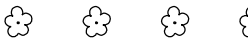
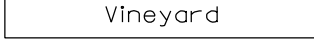
Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

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:

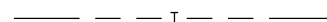
MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

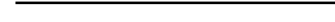
* SUE – Subsurface Utility Engineering
LOS – Level of Service – A,B,C or D (Accuracy)

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)*	

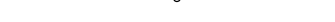
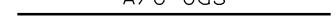
WATER:

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	

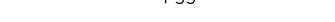
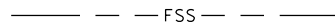
TV:

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)*	

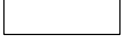
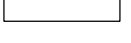
GAS:

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:

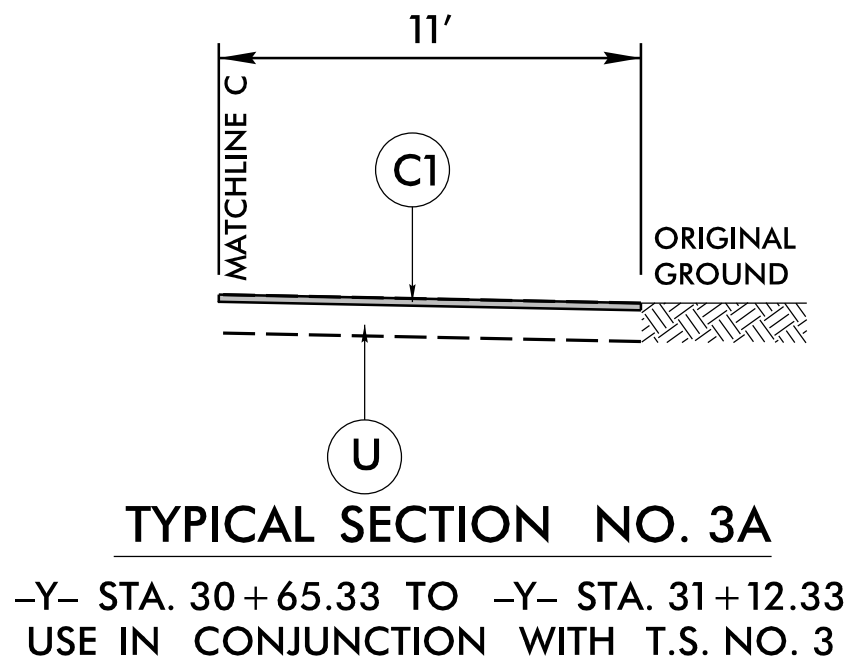
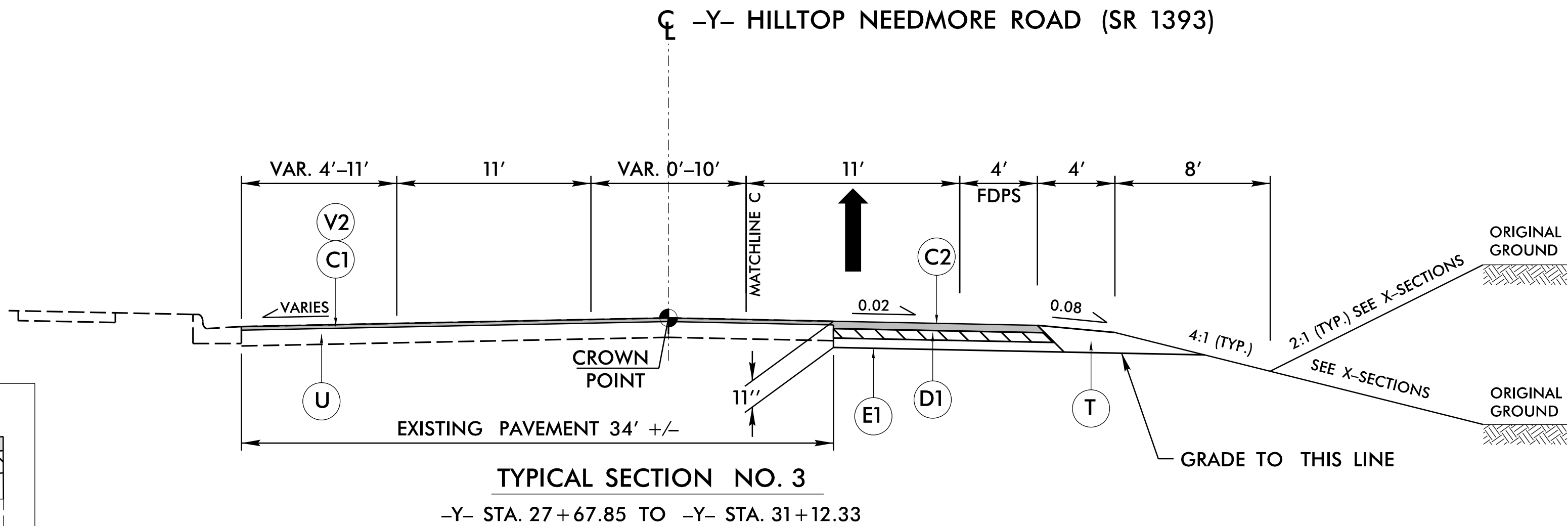
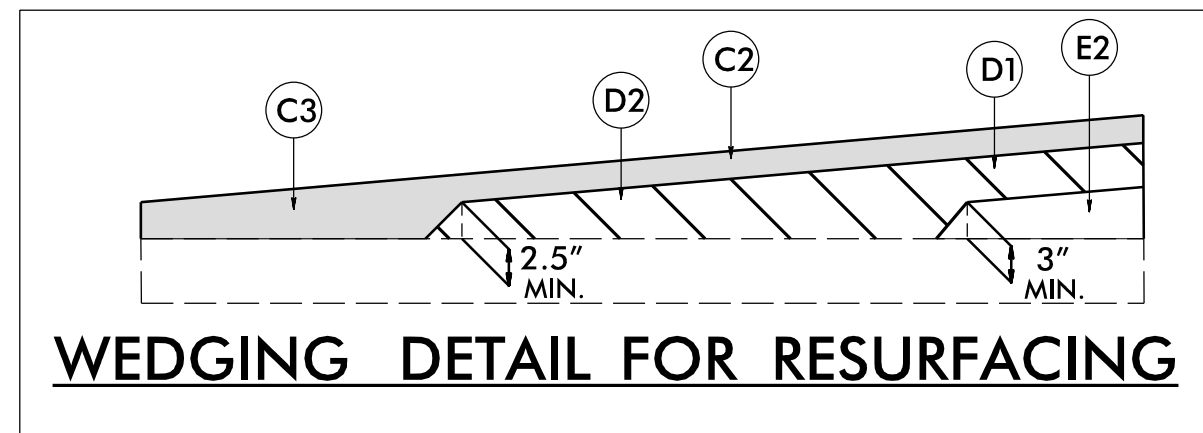
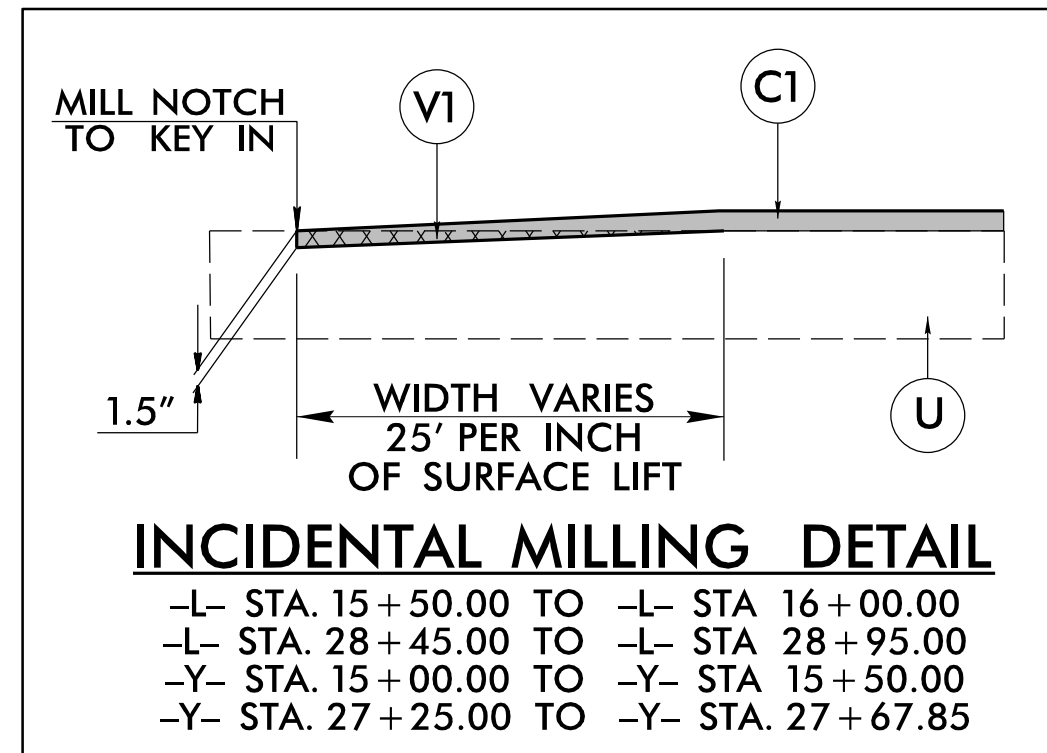
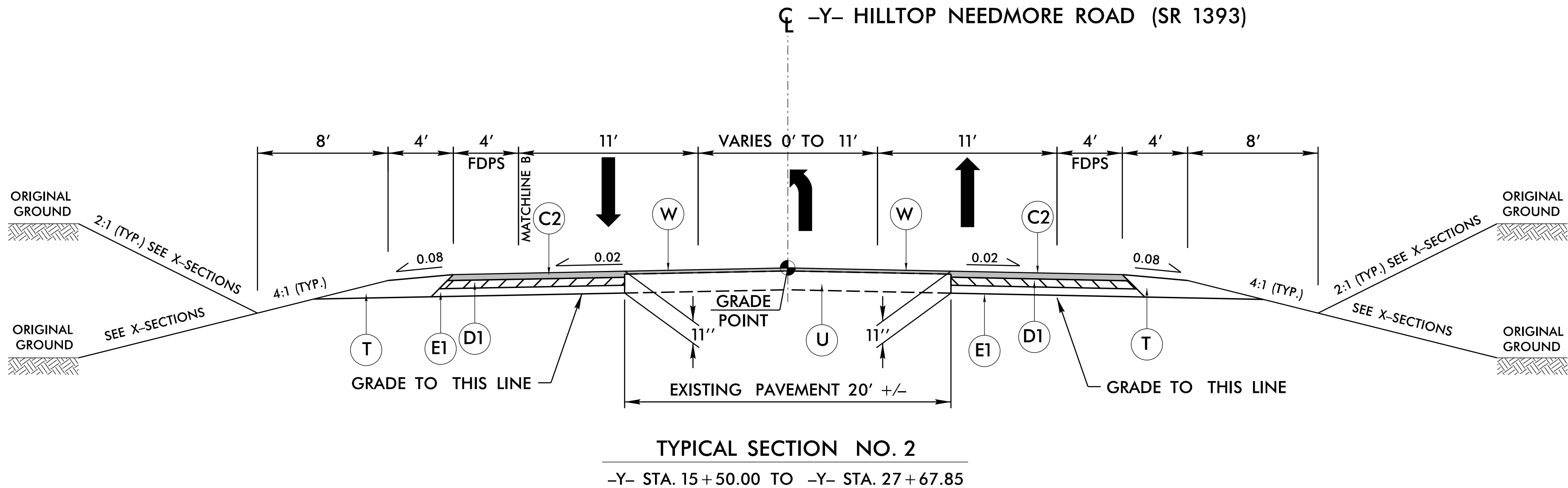
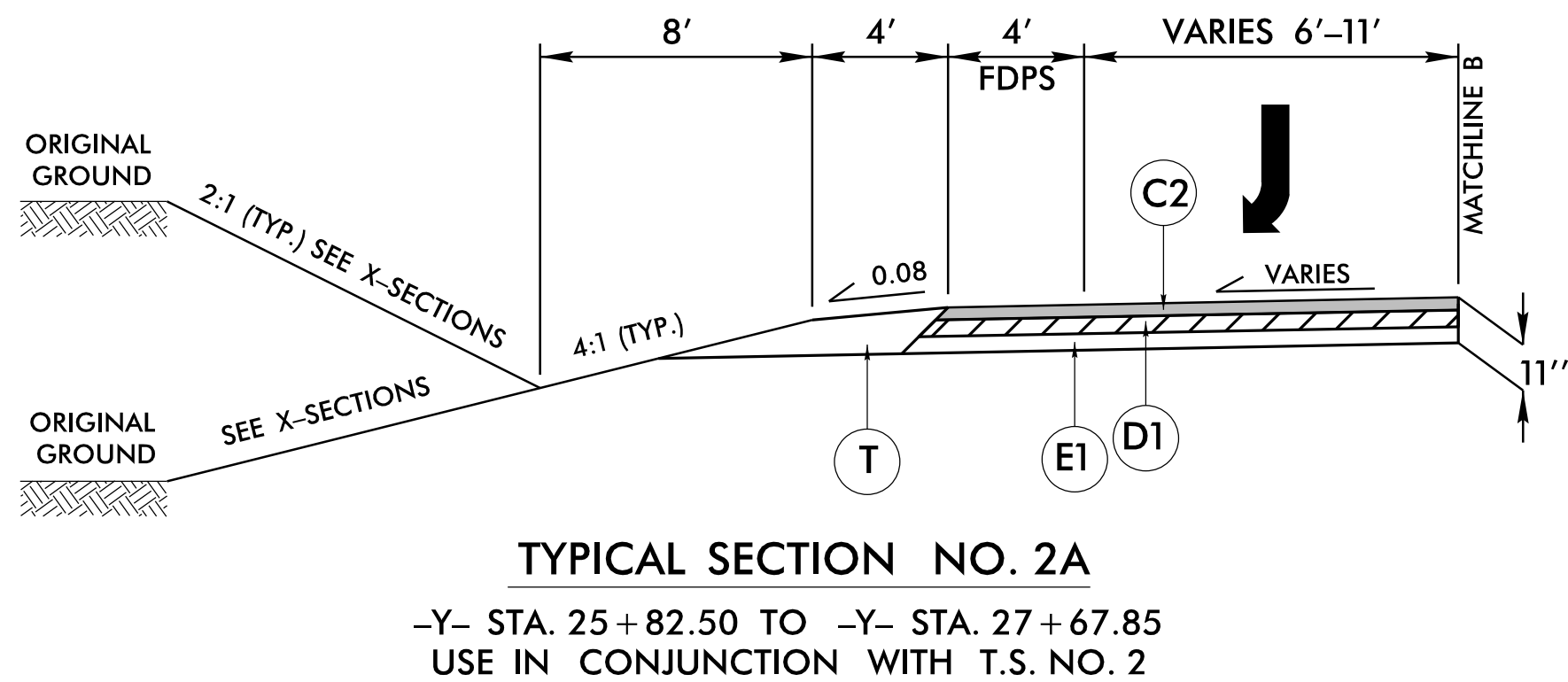
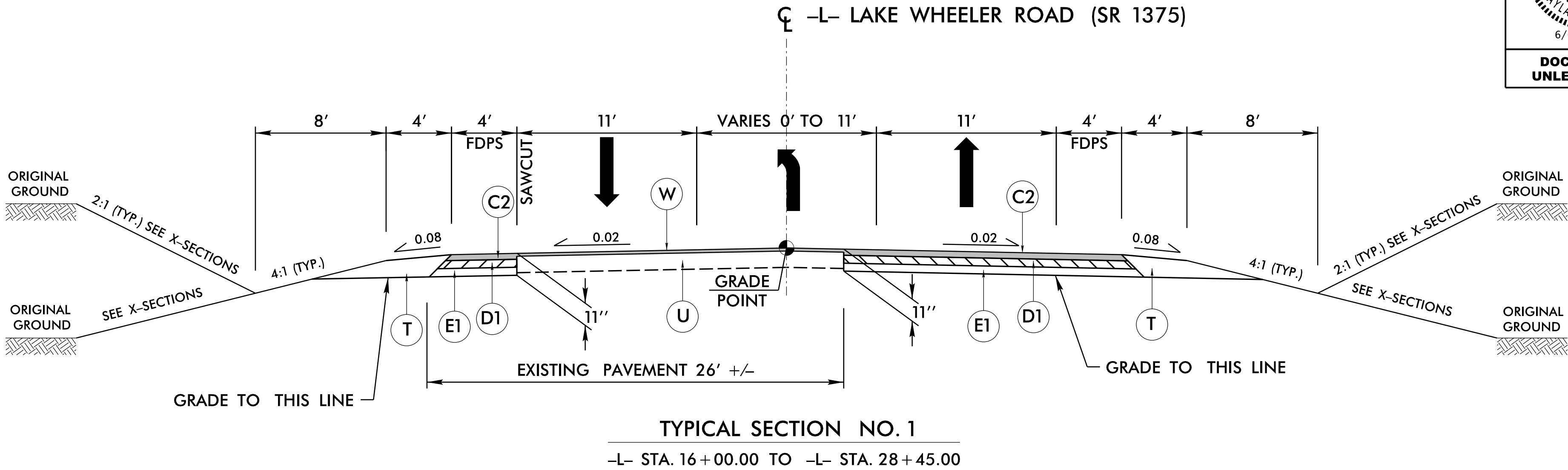
Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Force Main Line Test Hole (SUE – LOS A)*	
SS Force Main Line (SUE – LOS B)*	
SS Force Main Line (SUE – LOS C)*	
SS Force Main Line (SUE – LOS D)*	

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	

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NO NOT TO EXCEED 2.0" IN DEPTH.
D1	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. 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 NO LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. 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 NO LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
R1	2'-6" CURB AND GUTTER
S	4" CONCRETE SIDEWALK
T	COMPACTED EARTH MATERIAL
U	EXISTING PAVEMENT
V1	VARIABLE DEPTH MILLING, VARIES 0"-1.5"
V2	1.5" DEPTH MILLING
W	WEDGING

NOTES: 1. ALL PAVEMENT SLOPES ARE 1:1 UNLESS OTHERWISE SPECIFIED.
2. SEE ROADWAY PLANS FOR LOCATION OF INTERSECTION TURNOUTS AND TURN LANES.



DRMP, INC.
5808 FARMINGTON PLACE
RALEIGH, NC 27609
(919) 872-5115

NC LICENSE NO. F-1524
www.drmp.com

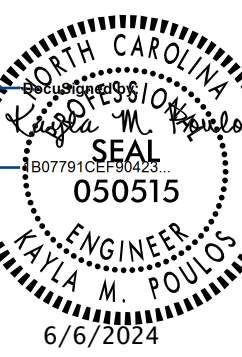
PROJECT REFERENCE NO.

HL-0008G

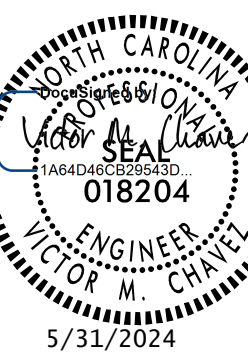
SHEET NO.

2A-1

ROADWAY DESIGN
ENGINEER



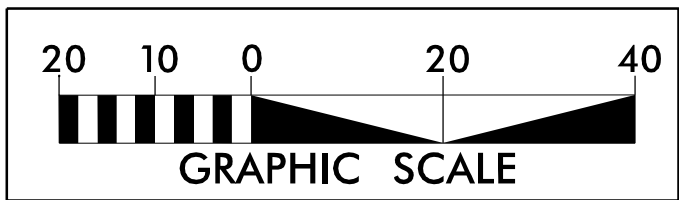
PAVEMENT DESIGN
ENGINEER



DOCUMENT NOT CONSIDERED FINAL
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8/17/99

REVISIONS



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PROJECT REFERENCE NO.

HL-0008G

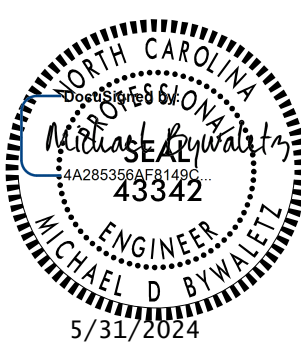
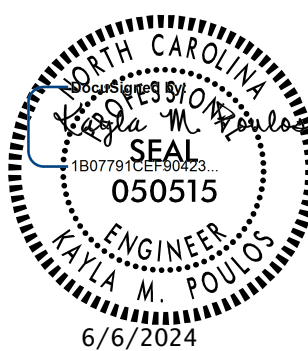
SHEET NO.

2B-1

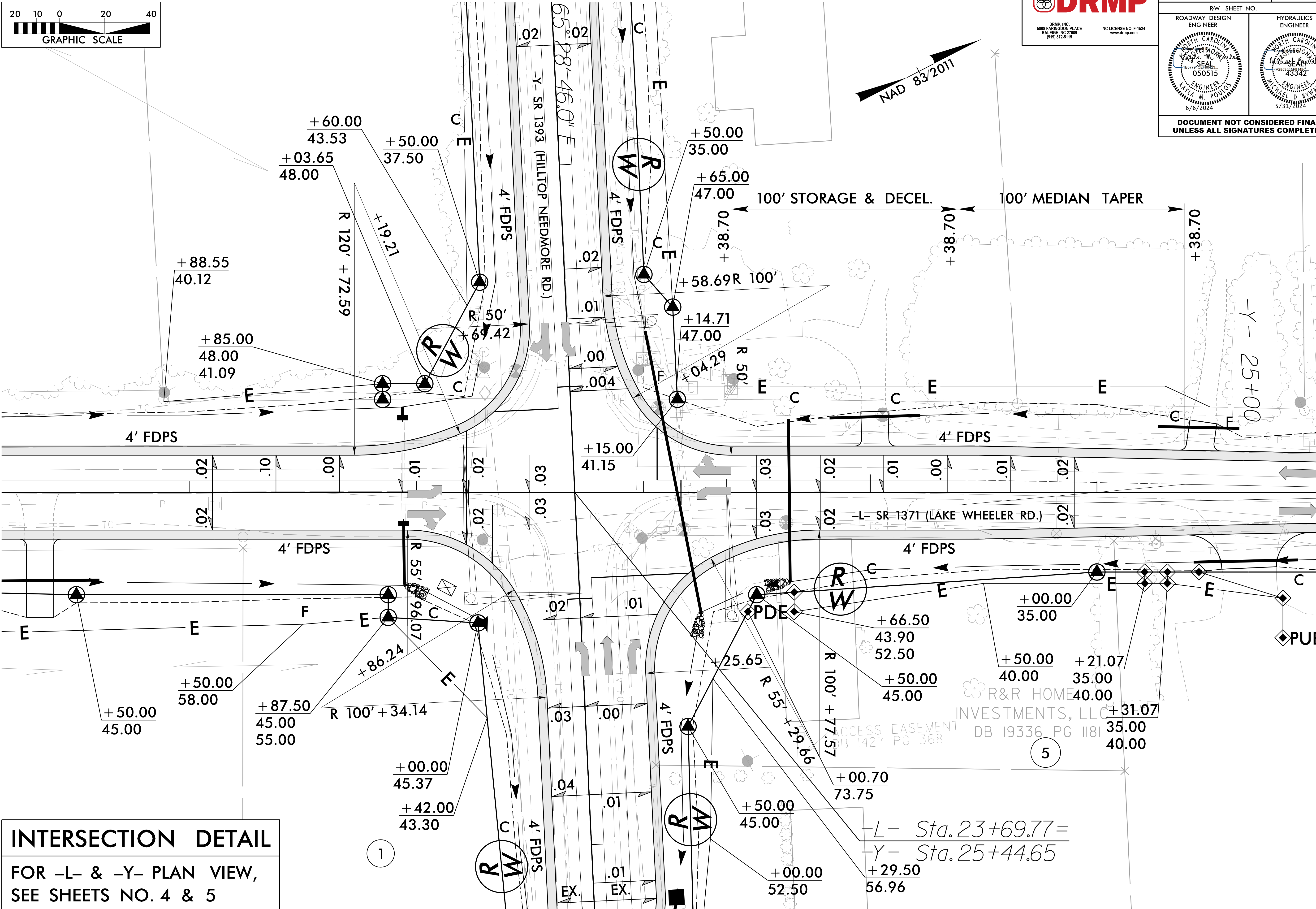
RW SHEET NO.

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER



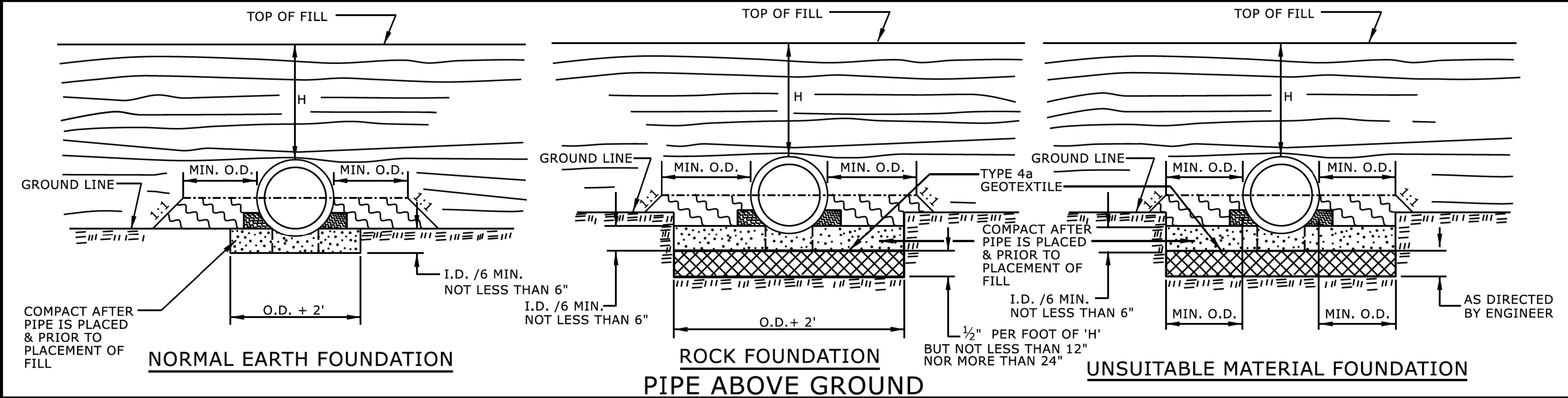
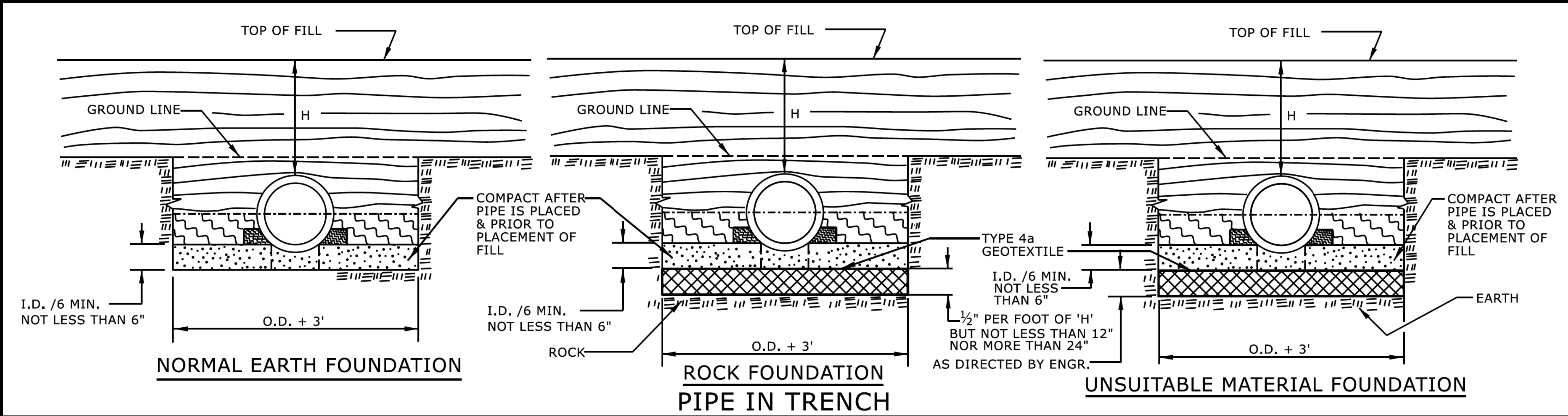
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



INTERSECTION DETAIL

FOR -L- & -Y- PLAN VIEW,
SEE SHEETS NO. 4 & 5

1



GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

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

SPRINGLINE OF PIPE

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

UNDISTURBED EARTH MATERIAL

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

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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE

SHEET 2 OF 2
300.01



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Line	Station	Station	Uncl. Excav.	Embank.	Borrow	Waste
-L- RT	16+00.00	28+95.00	259	1768	1509	0
-L- LT	16+00.00	28+95.00	231	93	0	139
-Y- RT	15+00.00	31+12.33	356	461	105	0
-Y- LT	15+00.00	31+12.33	819	151	0	668
TOTAL			1665	2473	1614	807
ADJUSTMENTS DUE TO						
Est. Loss Due To Clearing And Grubbing			0			0
Eliminate Shrinkage For Mat'l That Is Now Rock						
Earth Waste to Replace Borrow					-807	-807
PROJECT TOTAL			1665	2473	807	0
Est. 5% to Replace Topsoil in Borrow Pits					40	
GRAND TOTAL			1665		847	
SAY			1700		900	
Geotextile For Soil Stab. 300 SY						
Estimate Shallow Undercut 100 CY						
Class IV Subgrade Stab. 200 TONS						

Approximate quantities only. Clearing and grubbing, unclassified excavation, borrow excavation, and fine grading will be paid for at the contract lump sum price for "Grading".
Earthwork quantities are calculated by the roadway designer. These earthwork quantities are based in part on subsurface data from the Geotechnical Engineering Unit.

SUMMARY OF INCIDENTAL MILLING

LINE	Station	Station	Length	Avg. Width	Area (yd ²)
-L-	15+50	16+00	50	22	122.22
-L-	28+45	28+95	50	25	138.89
-Y-	15+00	15+50	50	24	133.33
				TOTAL:	394.44
				SAY:	400

SUMMARY OF 1.5" MILLING

LINE	Station	Station	Length	Area (sf)	Area (yd ²)
-Y-	27+25	31+12	387	8234.38	914.93
				TOTAL:	914.93
				SAY:	1000

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	200
				TOTAL LF:	200

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU 1	12"	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	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.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.
HL-0008G

SHEET NO.
3P-1



DRMP, INC.
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RALEIGH, NC 27609
(919) 872-5115

NC LICENSE NO. F-1524
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PARCEL INDEX

NOTE: ALL AREAS ARE IN SF

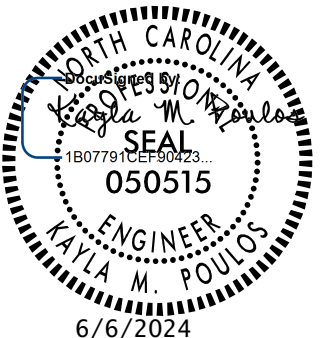
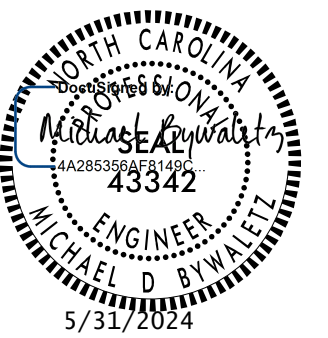
PARCEL NO.	PLAN SHEET NO.	PROPERTY OWNER NAME	R/W AREA TAKEN	TEMP CONST ESMT	PERM UTILITY ESMT	PERM DRAIN ESMT
1	4	LARRY & SHARON BISSETTE	11901	9537	-	-
2	4	PETER & AIMEE ZULLO	683	1262	-	-
3	4	FRANTZ PHILOGENE	11	700	-	-
4	4	ELLIOTT CLAYTON	1421	606	-	-
5	4	R&R HOME INVESTMENTS, LLC	6478	926	-	147
6	4	PLEASANT GROVE BAPTIST CHURCH INC.	1819	651	1114	-
7	4	JERNIGAN COMMERCIAL PROPERTIES, LLC	3737	7133	-	-
8	4	NOORYA PAKTIAWAL	2517	941	-	-
9	5	SAM COCHRANE	-	500	-	-
10	5	LUTHER & LANG MAITH	-	360	-	-
11	5	WILLIAM CLARK & WILLIAM CLARK JR.	-	340	-	-
12	5	MELVIN HEGGIE& GERALDINE THOMPSON	-	668	-	-
13A	5	DELORES WILSON	120	435	-	-
13B	5	DELORES WILSON	455	301	-	-
14	5	JOAN CHAVIS	1078	516	-	-
15	5	AARR INVESTMENTS	764	527	-	-
16A	5	DJB INVESTMENTS, LLC	533	395	-	-
16B	4, 5	DJB INVESTMENTS, LLC	545	351	-	-
17	4	DENNIS BLAKEMORE	-	863	-	-

8/17/2024

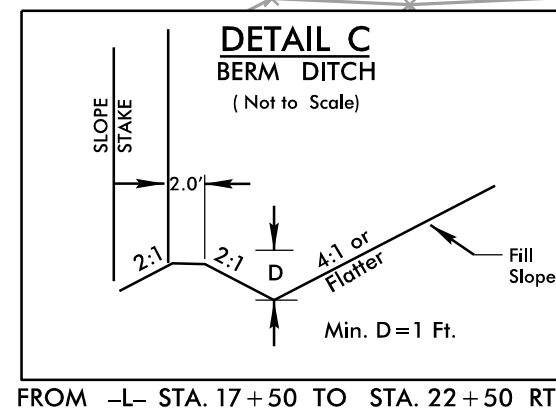
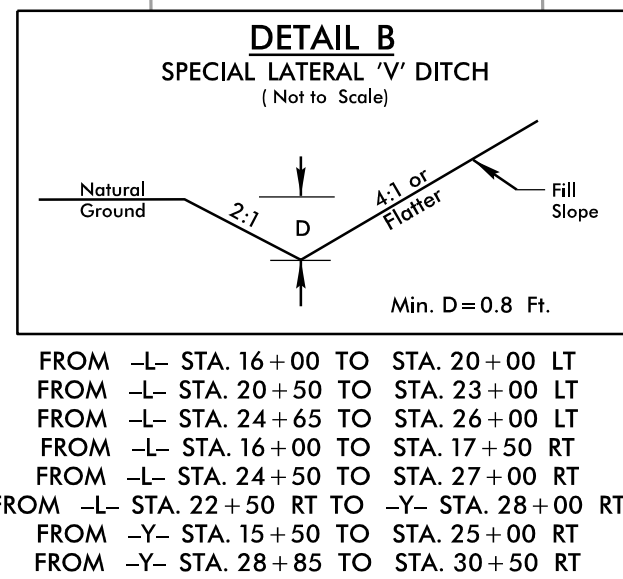
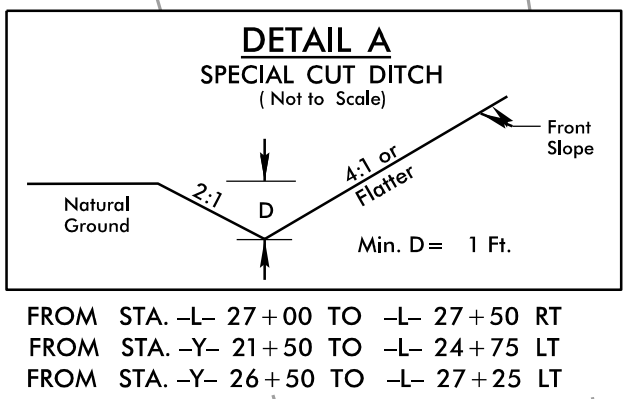
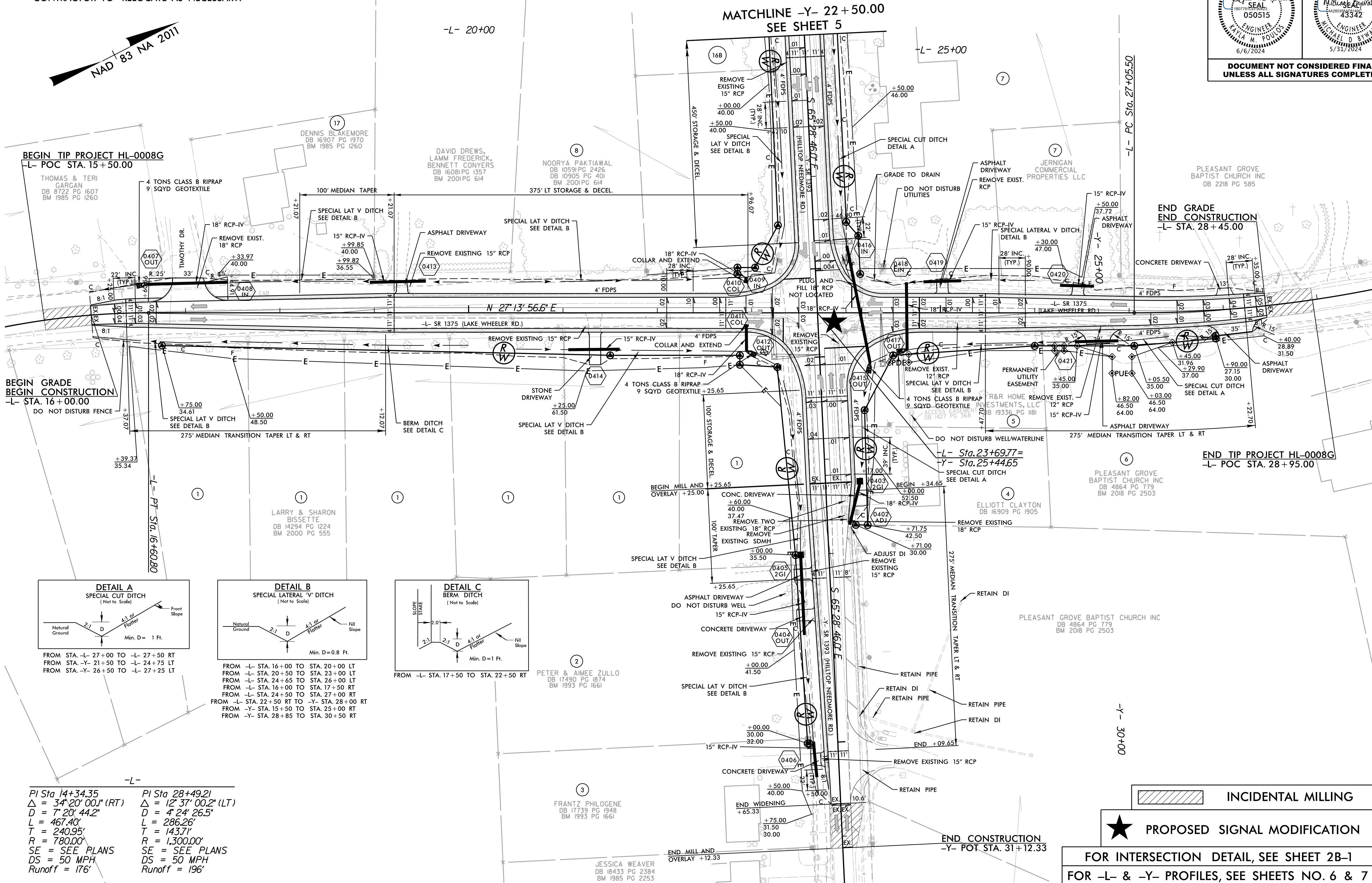


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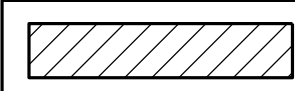
PROJECT REFERENCE NO.		SHEET NO.	
HL-0008G		4	
RW SHEET NO.		RW04	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

- NOTES:
- ALL DRIVEWAYS ARE 12' MIN. UNLESS OTHERWISE NOTED. ALL DRIVEWAY RADII ARE 3' UNLESS OTHERWISE NOTED.
 - ALL DIMENSIONS ARE TO EDGE OF TRAVEL UNLESS OTHERWISE SPECIFIED.
 - MAINTAIN ACCESS TO ALL MAILBOXES WITHIN THE PROJECT LIMITS. CONTRACTOR TO RELOCATE AS NECESSARY.



PI Sta 14+34.35
Δ = 34° 20' 00.0" (RT)
D = 7' 20" 44.2"
L = 467.40'
T = 240.95'
R = 180.00'
SE = SEE PLANS
DS = 50 MPH
Runoff = 176'

PI Sta 28+49.21
Δ = 12° 37' 00.2" (LT)
D = 4' 24" 26.5"
L = 286.26'
T = 143.71'
R = 1,300.00'
SE = SEE PLANS
DS = 50 MPH
Runoff = 196'



INCIDENTAL MILLING



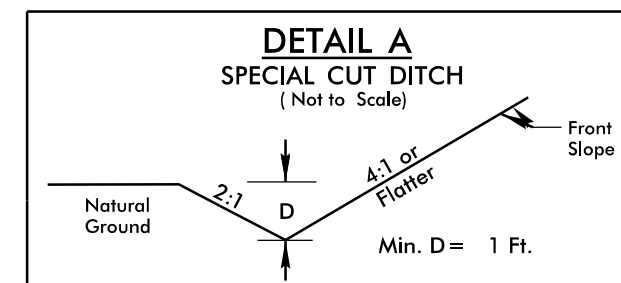
PROPOSED SIGNAL MODIFICATION

FOR INTERSECTION DETAIL, SEE SHEET 2B-1
FOR -L- & -Y- PROFILES, SEE SHEETS NO. 6 & 7

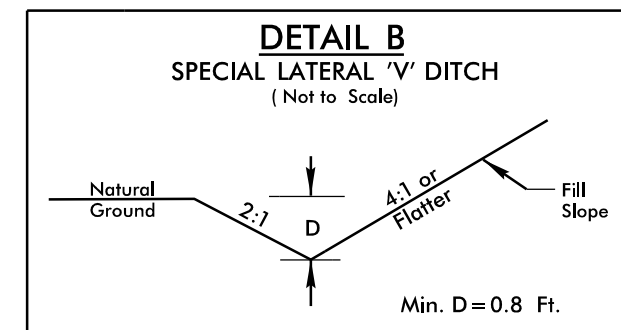
5/31/2024
P:\Projects\HL0008G_RdL_psh04.dgn
User: m.indsey

NOTES:

1. ALL DRIVEWAYS ARE 12' MIN. UNLESS OTHERWISE NOTED. ALL DRIVEWAY RADII ARE 3' UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE TO EDGE OF TRAVEL UNLESS OTHERWISE SPECIFIED.
3. MAINTAIN ACCESS TO ALL MAILBOXES WITHIN THE PROJECT LIMITS. CONTRACTOR TO RELOCATE AS NECESSARY.

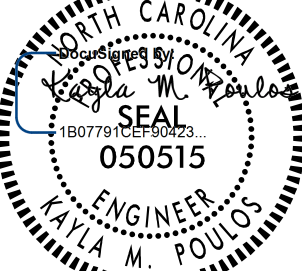
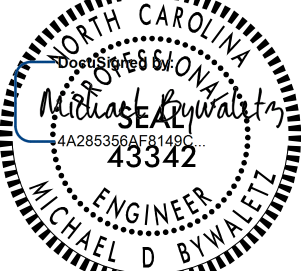


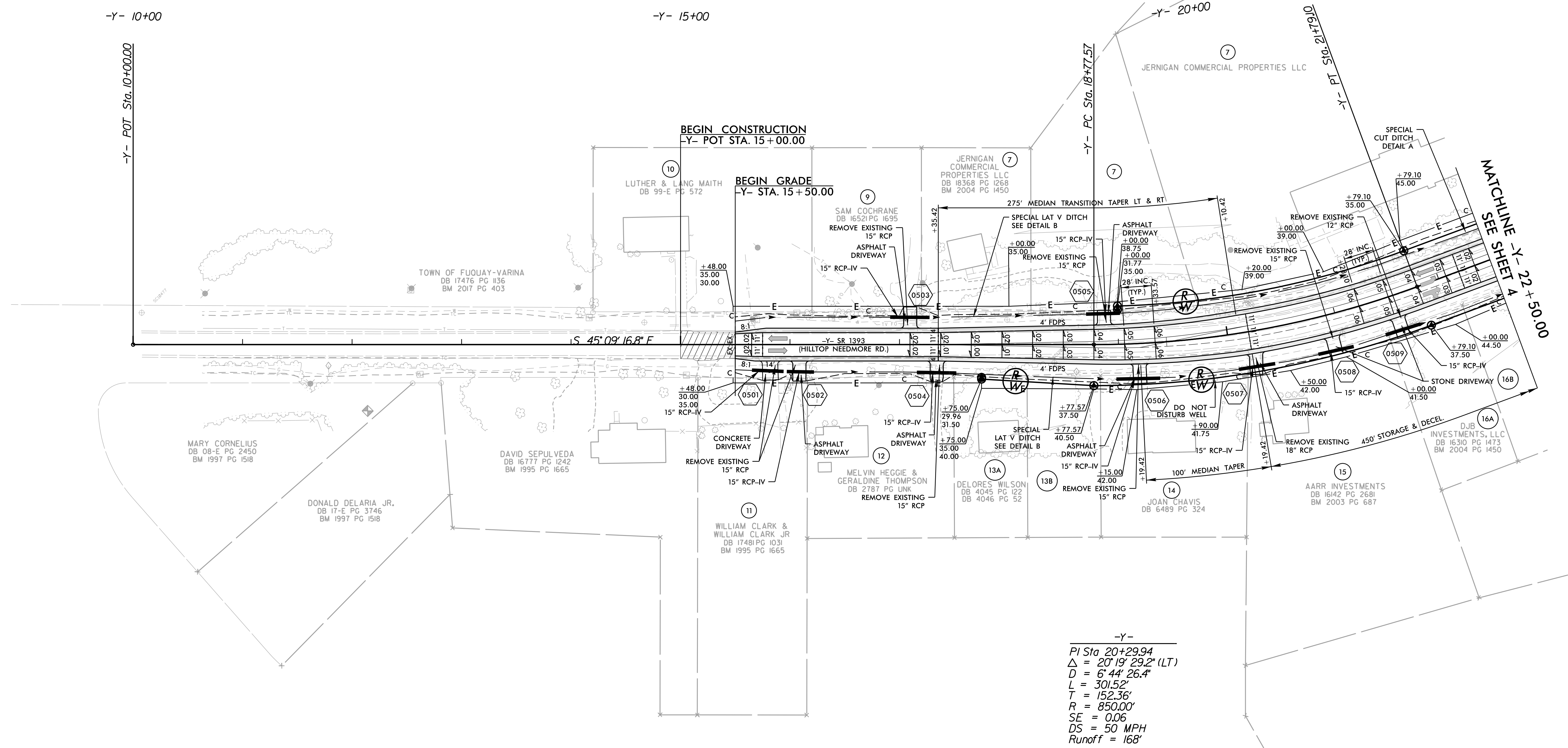
FROM STA. -Y- 21+50 TO -L- 25+00 LT
FROM STA. -Y- 26+50 TO -L- 27+25 LT



FROM -Y- STA. 15+50 TO STA. 21+50 LT
FROM -Y- STA. 15+50 TO STA. 25+00 RT
FROM -Y- STA. 28+85 TO STA. 30+50 RT



PROJECT REFERENCE NO.		SHEET NO.	
HL-0008G		5	
RW SHEET NO.		RW05	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



INCIDENTAL MILLING
FOR -Y- PROFILE, SEE SHEET NO. 6

5/14/24

3/15/2024
H:\0008G_Rdy.p106.dgn
User: jhansen

-L- SR 1375 (LAKE WHEELER ROAD)



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PROJECT REFERENCE NO.

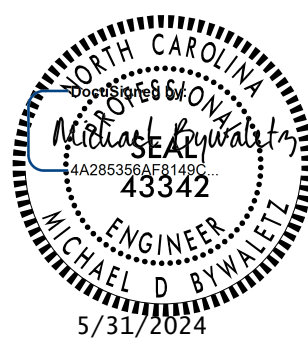
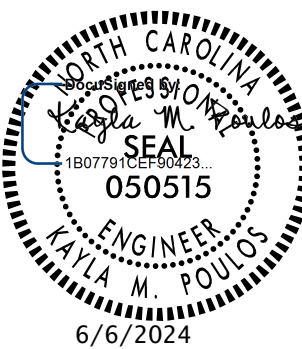
HL-0008G

SHEET NO.

6

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PIPE HYDRAULIC DATA
18" RCP-IV @ -L- 22+94

DRAINAGE AREA	=	3.06 AC
DESIGN FREQUENCY	=	25 YR
DESIGN DISCHARGE	=	10 CFS
DESIGN HW ELEVATION	=	362.6 FT
100 YEAR DISCHARGE	=	11 CFS
100 YEAR HW ELEVATION	=	362.6 FT
OVERTOPPING FREQUENCY	=	500+ YR
OVERTOPPING DISCHARGE	=	15 CFS
OVERTOPPING ELEVATION	=	364.2 FT

PIPE HYDRAULIC DATA
18" RCP-IV @ -L- 24+00

DRAINAGE AREA	=	1.43 AC
DESIGN FREQUENCY	=	25 YR
DESIGN DISCHARGE	=	5.5 CFS
DESIGN HW ELEVATION	=	365.0 FT
100 YEAR DISCHARGE	=	6 CFS
100 YEAR HW ELEVATION	=	364.6 FT
OVERTOPPING FREQUENCY	=	500+ YR
OVERTOPPING DISCHARGE	=	14 CFS
OVERTOPPING ELEVATION	=	365.8 FT

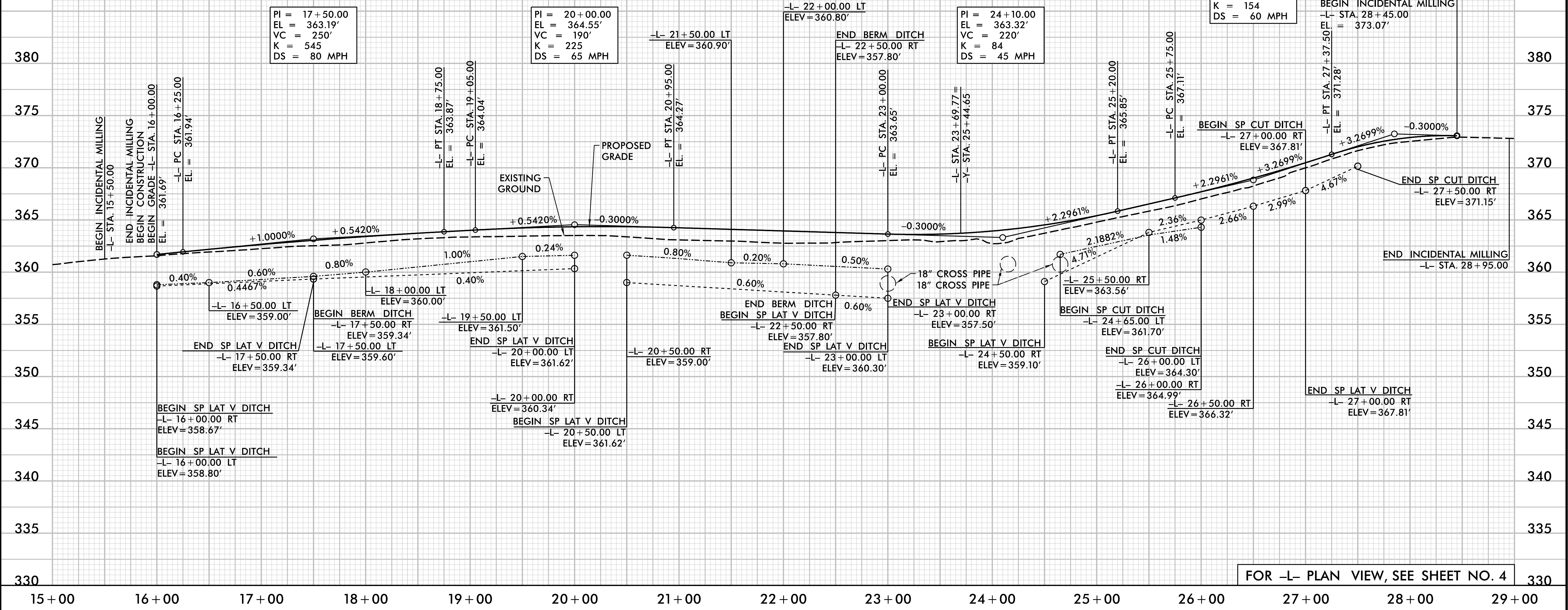
PIPE HYDRAULIC DATA
18" RCP-IV @ -L- 24+65

DRAINAGE AREA	=	1.03 AC
DESIGN FREQUENCY	=	25 YR
DESIGN DISCHARGE	=	3.1 CFS
DESIGN HW ELEVATION	=	365.25 FT
100 YEAR DISCHARGE	=	4 CFS
100 YEAR HW ELEVATION	=	362.75 FT
OVERTOPPING FREQUENCY	=	500+ YR
OVERTOPPING DISCHARGE	=	16 CFS
OVERTOPPING ELEVATION	=	365.25 FT

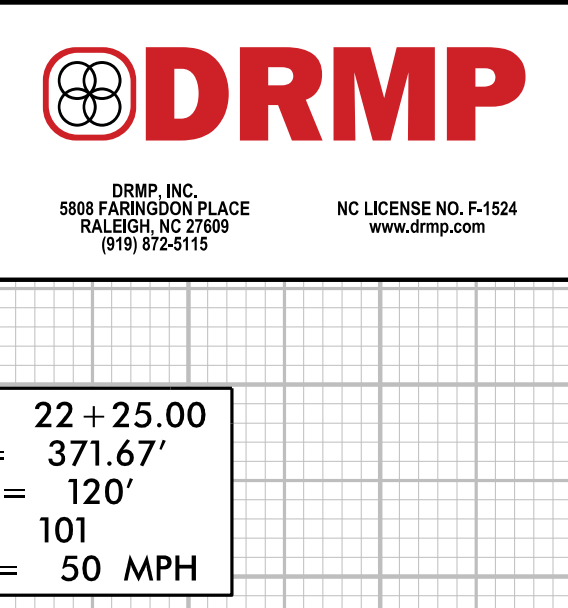
PI = 27+85.00
EL = 373.25'
VC = 120'
K = 33
DS = 35 MPH

PI = 26+50.00
EL = 368.83'
VC = 150'
K = 154
DS = 60 MPH

END GRADE
END CONSTRUCTION
BEGIN INCIDENTAL MILLING
-L- STA. 28+45.00
EL = 373.07'



FOR -L- PLAN VIEW, SEE SHEET NO. 4

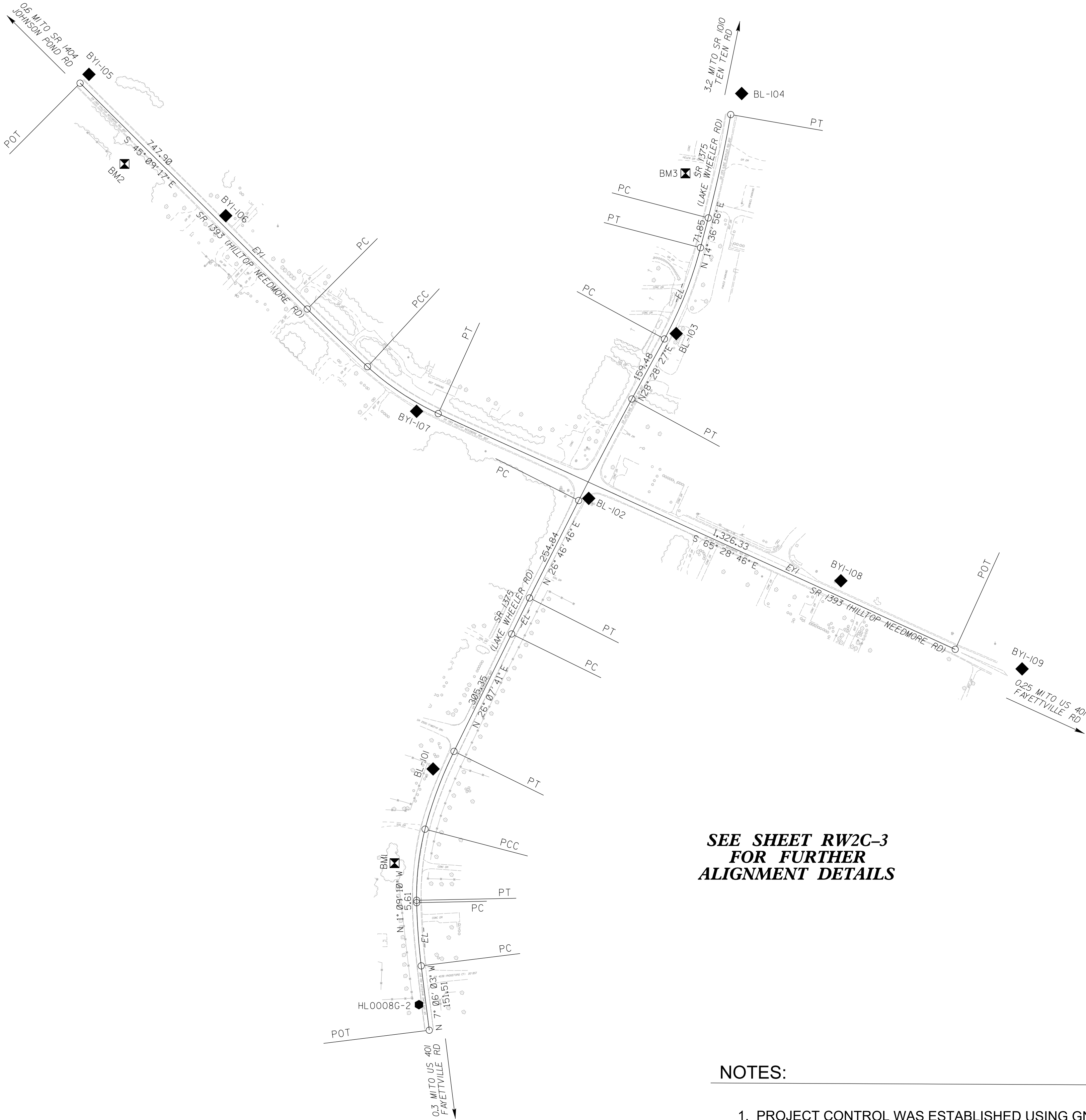


REVISIONS



SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



SEE SHEET RW2C-3
FOR FURTHER
ALIGNMENT DETAILS

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.

PROJECT REFERENCE NO.	SHEET NO.
HL-0008-G	RW02C-1
Location and Surveys	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, Richard A. Mitchell, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: **AA**
Type of GPS field procedure: RTN
Dates of survey: 6/10/2021-6/25/2021
Datum/Epoch: NAD83/NA2011
Published/Fixed-control use: N/A
Localized around: 910405-2
Northing: 682292.654
Easting: 2084093.921
Combined grid factor: 1.00011697
Geoid model: G12NC
Units: US SURVEY FEET

I also certify that the Baseline Control for this project 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 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 6/10/2021 to 6/25/2021, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 28 day of June, 2021.

Professional Land Surveyor

06/28/2021

L-5060

REVISIONS

SURVEY CONTROL SHEET
W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.
HL-0008-G

SHEET NO.
RW02C-2

Location and Surveys





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BL	POINT	DESC.	NORTH	EAST	ELEVATION
1		HL0008G-1	681778.4660	2079735.8310	344.40
2		HL0008G-2	682252.5850	2079689.5770	355.92
101		BL-101	682802.9350	2079722.4470	360.33
102		BL-102	683434.7100	2080085.7060	362.58
103		BL-103	683819.5420	2080289.9700	372.28
104		BL-104	684380.1170	2080442.7170	370.11

BY1	POINT	DESC.	NORTH	EAST	ELEVATION
105		BY1-105	684424.8910	2078919.2410	376.37
106		BY1-106	684094.8510	2079238.5150	374.96
107		BY1-107	683638.0940	2079683.9010	372.67
102		BL-102	683434.7100	2080085.7060	362.58
108		BY1-108	683242.3610	2080674.3090	349.74
109		BY1-109	683036.5800	2081097.2030	355.79

BM1 ELEVATION = 360.45
N 682583 E 2079633
BENCHTIE NAIL SET IN 24" PINE

BM2 ELEVATION = 374.47
N 684216 E 2079002
BENCHTIE NAIL SET IN 18" PINE

BM3 ELEVATION = 370.04
N 684194 E 2080312
BENCHTIE NAIL SET IN 20" PINE

I, Richard A. Mitchell, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
Type of GPS field procedure: RTN
Dates of survey: 6/10/2021-6/25/2021
Datum/Epoch: NAD83/NA2011
Published/Fixed-control use: N/A
Localized around: 910405-2
Northing: 682292.654
Easting: 2084093.921
Combined grid factor: 1.00011697
Geoid model: G12NC
Units: US SURVEY FEET

I also certify that the Baseline Control for this project 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 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 6/10/2021 to 6/25/2021 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 28 day of June, 2021.


Professional Land Surveyor L-5060

06/28/2021

NOTES:

- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
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REVISIONS

SURVEY CONTROL SHEET
W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	682192.865	2079713.592							
LINE			N 07°06'03.5" W	151.51					
PC	682343.213	2079694.863							
CURVE			N 04°07'36.9" W	147.90	05°56'53.3"(RT)	04°01'11.5"	147.97	74.05	1425.32
PT	682490.732	2079684.219							
LINE			N 01°09'10.2" W	5.61					
PC	682496.343	2079684.106							
CURVE			N 06°44'50.4" E	167.16	15°48'01.2"(RT)	09°25'20.2"	167.69	84.38	608.09
PT	682662.346	2079703.746							
LINE			N 14°38'51.0" E	0.00					
PC	682662.346	2079703.746							
CURVE			N 20°23'15.9" E	193.90	11°28'49.8"(RT)	05°54'39.2"	194.23	97.44	969.33
PT	682844.101	2079771.296							
LINE			N 26°07'40.8" E	305.35					
PC	683118.246	2079905.764							
CURVE			N 26°27'13.6" E	93.88	00°39'05.6"(RT)	00°41'38.6"	93.88	46.94	8255.23
PT	683202.292	2079947.583							
LINE			N 26°46'46.4" E	254.84					
PC	683429.802	2080062.405							
CURVE			N 27°37'36.5" E	267.63	01°41'40.3"(RT)	00°37'59.3"	267.64	133.83	9049.52
PT	683666.918	2080186.507							
LINE			N 28°28'26.6" E	159.48					
PC	683807.106	2080262.541							
CURVE			N 21°32'41.6" E	229.11	13°51'30.2"(LT)	06°02'02.6"	229.67	115.40	949.54
PT	684020.208	2080346.677							
LINE			N 14°36'56.5" E	71.85					
PC	684089.728	2080364.806							
CURVE			N 12°15'09.5" E	246.94	04°43'33.9"(LT)	01°54'47.8"	247.01	123.58	2994.62
PT	684331.046	2080417.213							
LINE			N 09°53'22.6" E	0.00					
POT	684331.047	2080417.213							

EY1 POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	684404.414	2078898.529							
LINE			S 45°09'16.8" E	747.90					
PC	683876.997	2079428.801							
CURVE			S 46°15'24.4" E	194.77	02°12'15.1"(LT)	01°07'53.9"	194.78	97.40	5063.13
PT	683742.328	2079569.511							
LINE			N 47°21'32.1" W	0.00					
PC	683742.328	2079569.511							
CURVE			S 56°25'09.0" E	198.11	18°07'14.1"(LT)	09°06'31.2"	198.94	100.31	629.03
PT	683632.751	2079734.558							
LINE			S 65°28'46.0" E	1326.33					
POT	683082.300	2080941.266							

PROJECT REFERENCE NO.
HL-0008-G

SHEET NO.
RW02C-3

Location and Surveys





DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I, Richard A. Mitchell, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
Type of GPS field procedure: RTN
Dates of survey: 6/10/2021-6/25/2021
Datum/Epoch: NAD83/NA2011
Published/Fixed-control use: N/A
Localized around: 910405-2
Northing: 682292.654
Easting: 2084093.921
Combined grid factor: 1.00011697
Geoid model: G12NC
Units: US SURVEY FEET

I also certify that the Baseline Control for this project 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 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 6/10/2021 to 6/25/2021 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 28 day of June, 2021.



6/28/2021

Professional Land SurveyorL-5060

NOTES:

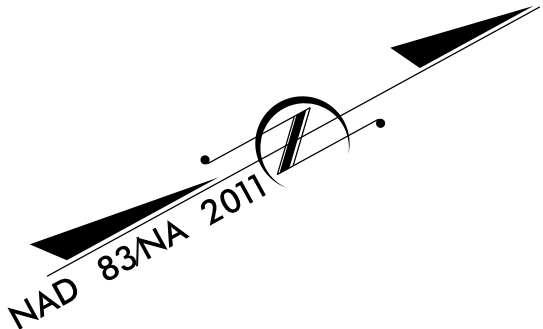
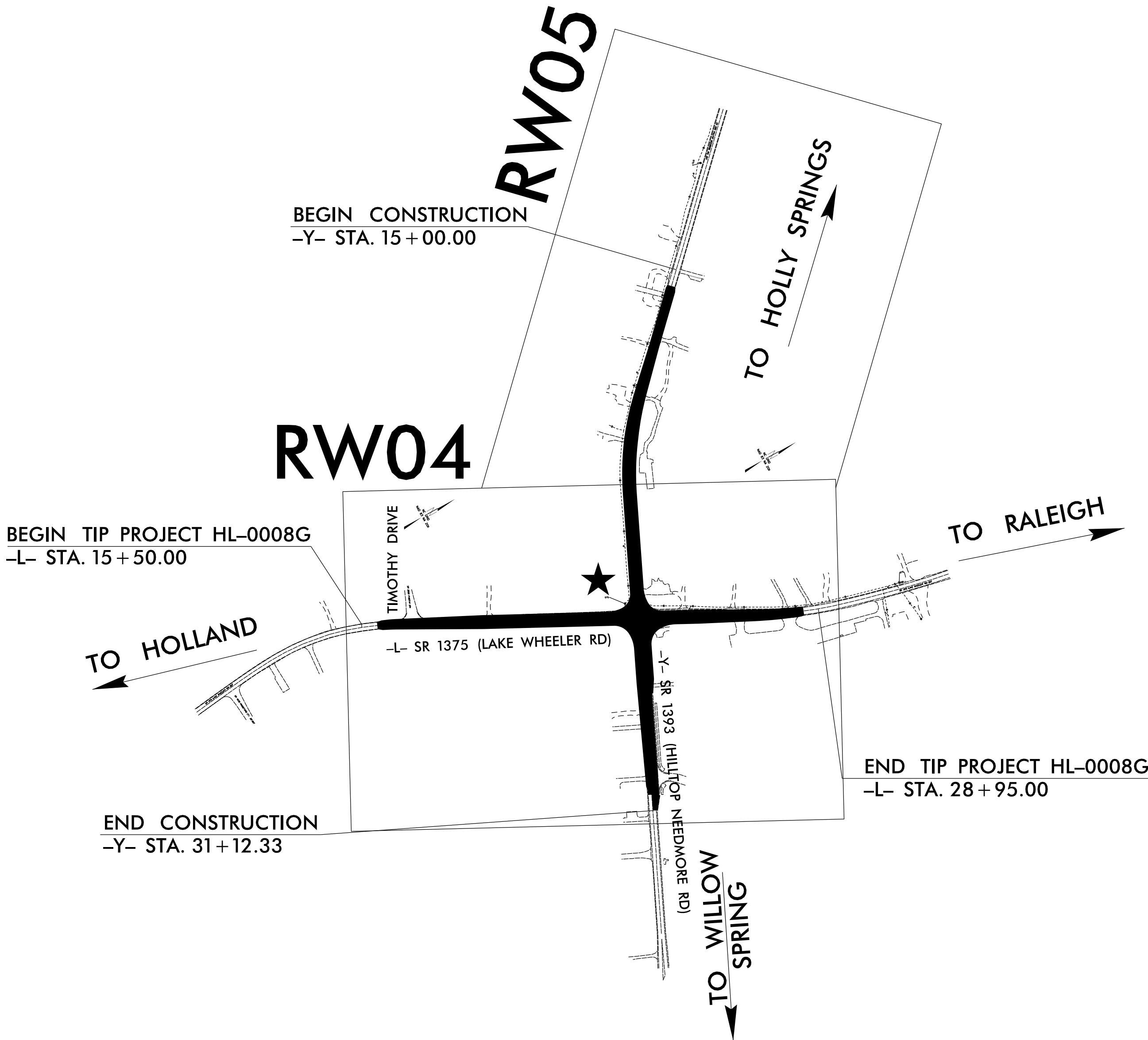
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

TIP PROJECT: HL-0008G

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0008G	RW01	

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

WAKE COUNTY



GRAPHIC SCALE



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "910405-2" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 682292.654(ft) EASTING: 2084093.921(ft) ELEVATION: 328.98(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998830 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "910405-2" TO -L- STATION 16+00 IS N 83°34'02" W 4377.01(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

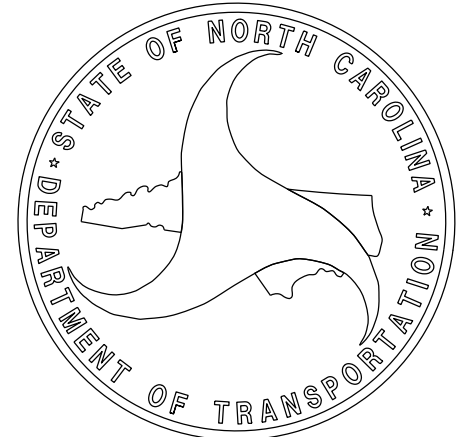


2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
05/16/23

LETTING DATE:

PROFESSIONAL LAND SURVEYOR



Signed by:
Jeff Aker
13883A58770E41D
SIGNATURE:

Date:

PROPOSED ALIGNMENT CONTROL

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	682192.8653	2079713.5922
PC	11+93.40	682384.7794	2079689.6847
PT	16+60.80	682838.1302	2079770.1590
PC	27+05.50	683767.0365	2080248.2161
PT	29+91.76	684033.8829	2080350.2432
PC	30+49.48	684089.7282	2080364.8061
PT	32+96.49	684331.0461	2080417.2130

Y			
TYPE	STATION	NORTH	EAST
POT	10+00.00	684409.7732	2078893.1403
PC	18+77.57	683790.9118	2079515.3522
PT	21+79.10	683620.2323	2079762.0016
POT	34+75.26	683082.2999	2080941.2659

RIGHT OF WAY CONTROL

ROW MARKER IRON PIN AND CAP-E				
ALIGN	STATION	OFFSET	NORTH	EAST
L	16+75.00	34.61	682834.9204	2079807.4338
L	21+50.00	45.00	683252.5168	2080034.0307
L	22+85.00	-48.00	683415.1099	2080013.1151
L	22+85.00	-41.09	683411.9496	2080019.2559
L	22+87.50	45.00	683374.7759	2080096.9508
L	22+87.50	55.00	683370.1999	2080105.8424
L	23+03.65	-48.00	683431.6922	2080021.6491
L	24+15.00	-41.15	683527.5661	2080078.6935
L	24+50.00	45.00	683519.2641	2080171.3109
L	26+00.00	35.00	683657.2138	2080231.0594
L	27+05.50	35.00	683751.0205	2080279.3366
L	27+90.00	27.15	683832.5449	2080309.3082
L	27+90.00	30.00	683831.4067	2080311.9250

ROW MARKER IRON PIN AND CAP-E				
ALIGN	STATION	OFFSET	NORTH	EAST
Y	17+75.00	31.50	683840.9129	2079420.4119
Y	17+75.00	29.96	683842.0029	2079421.4960
Y	18+77.57	37.50	683764.3270	2079488.9042
Y	19+00.00	-31.77	683798.4145	2079553.2581
Y	19+00.00	-35.00	683800.7669	2079555.4775
Y	21+79.10	37.50	683586.1143	2079746.4384
Y	21+79.10	-35.00	683652.0757	2079776.5273
Y	24+50.00	37.50	683473.6850	2079992.9078
Y	24+50.00	-35.00	683539.6464	2080022.9967
Y	24+65.00	-47.00	683544.3389	2080041.6241
Y	26+00.00	45.37	683404.2700	2080126.1162
Y	26+50.00	-45.00	683465.7407	2080209.1094
Y	27+71.00	-30.00	683401.8748	2080312.9744
Y	27+71.75	-42.50	683412.9377	2080318.8412
Y	28+00.00	35.50	683330.2478	2080312.1722
Y	30+00.00	32.00	683250.4283	2080495.5873
Y	30+00.00	30.00	683252.2479	2080496.4173

PERMANENT EASEMENT CONTROL

ROW MARKER PERMANENT EASEMENT-E				
ALIGN	STATION	OFFSET	NORTH	EAST
*L	24+66.50	43.90	683534.4385	2080177.8833
*L	24+66.50	52.50	683530.5032	2080185.5300
L	26+21.07	40.00	683673.6572	2080245.1453
L	26+21.07	35.00	683675.9453	2080240.6995
L	26+31.07	40.00	683682.5488	2080249.7213
L	26+31.07	35.00	683684.8368	2080245.2755
L	26+45.00	35.00	683697.2259	2080251.6515
L	26+82.00	46.50	683724.8623	2080278.8080
L	26+82.00	64.00	683716.8543	2080294.3683
L	27+03.00	64.00	683735.5266	2080303.9779
L	27+03.00	46.50	683743.5346	2080288.4176
L	27+45.00	31.96	683788.6731	2080294.6009

ROW MARKER PERMANENT EASEMENT-E				
ALIGN	STATION	OFFSET	NORTH	EAST
Y	26+00.70	-73.75	683512.3550	2080176.1901

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 06/01/23 TO 06/06/23 .
4. "***" DENOTES POINT NOT SET DUE TO OBSTRUCTION.
5. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
6. 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.

PROJECT REFERENCE NO.
HL-0008G

SHEET NO.
RW02D-1

Location and Surveys



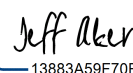
1730 VARSITY DRIVE
RALEIGH, NC 27606
(P) 919-233-8091



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I, Jeffrey D. Aker, 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:
I, 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 06/01/23 to 06/06/23, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 16th day of January, 2025.

DocuSigned by:

13883A58F70E41D
Professional Land Surveyor L-4234



McKIM & CREED
4700 MADISON DRIVE



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 06/01/23 TO 06/06/23 .

I, Jeffrey D. Aker, 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 06/01/23 to 06/06/23, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 16th day of January, 2025.

DocuSigned by:
Jeff Aker
13883459E7DE41D
Professional Land Surveyor L-4234



16-JAN-2025 1648 \\mekinreed.com\nasun\Data\Proj\00482\1158 Ekelvington_AT MC07985-2	Geometrics\80-Drawings\Delivery\250116\H10008g_1s-rw05.dgn
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I, Jeffrey D. Aker, 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 06/01/23 to 06/06/23; coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 16th day of January, 2025.

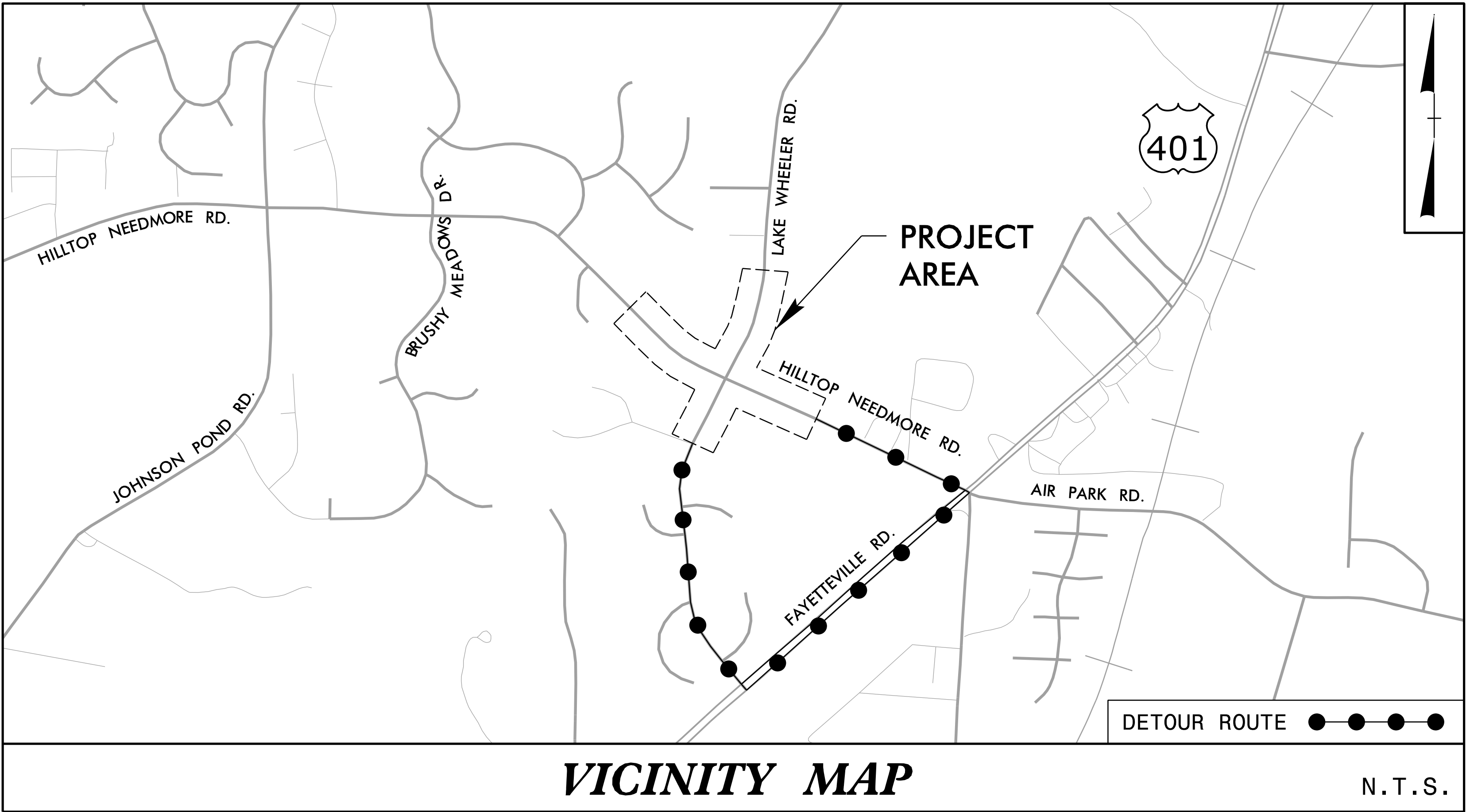
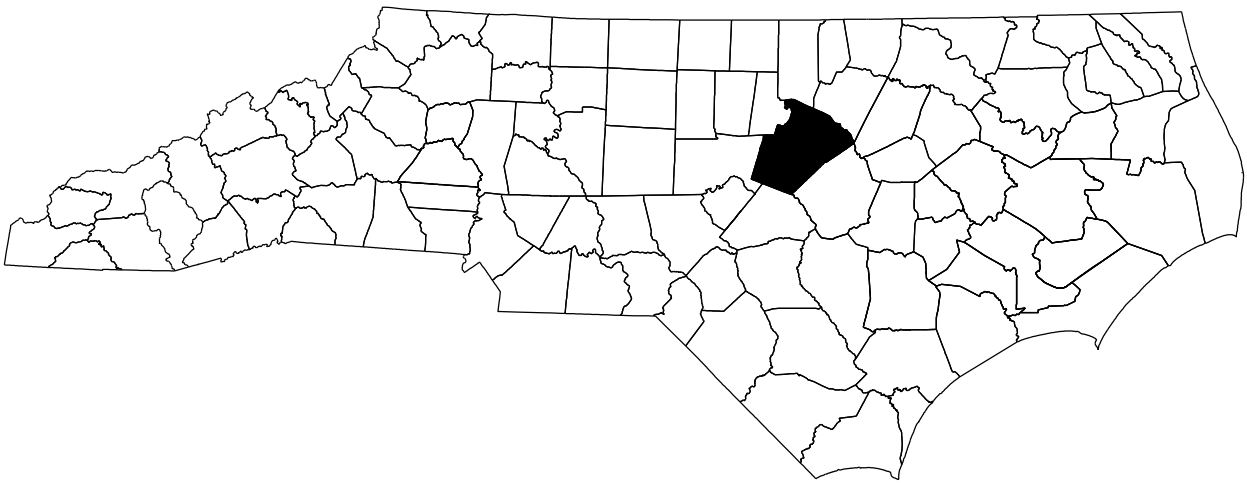
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2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 06/01/23 TO 06/06/23

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY

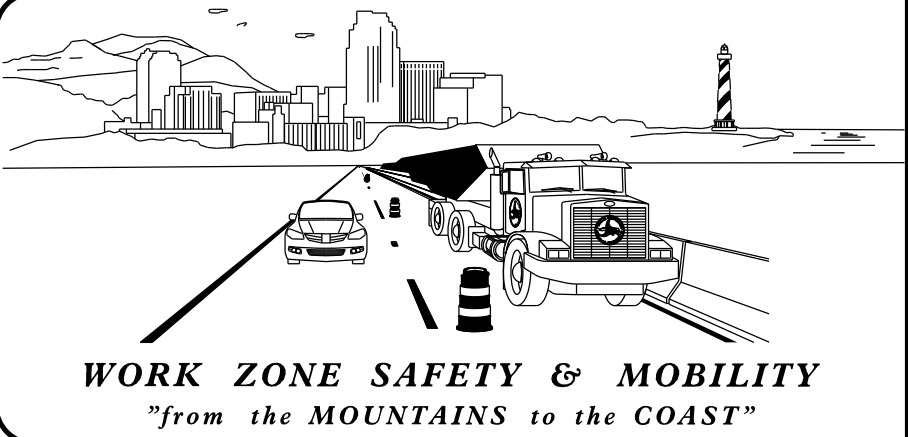
SR 1375 (LAKE WHEELER ROAD) & SR 1393 (HILLTOP NEEDMORE ROAD)



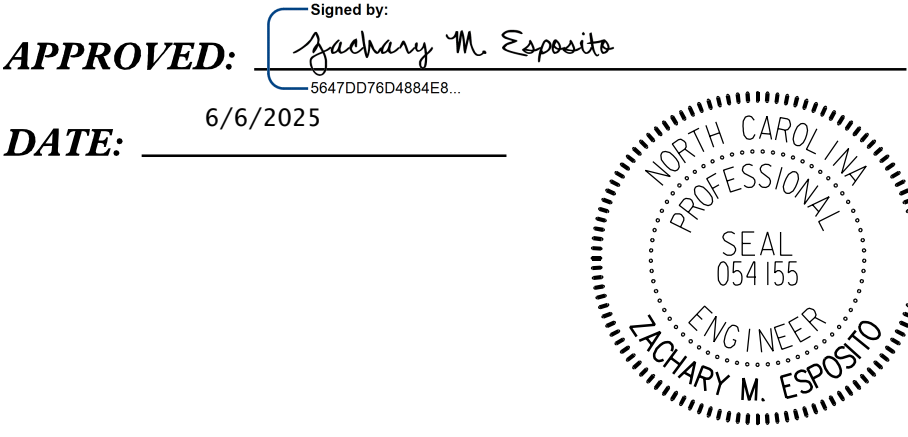
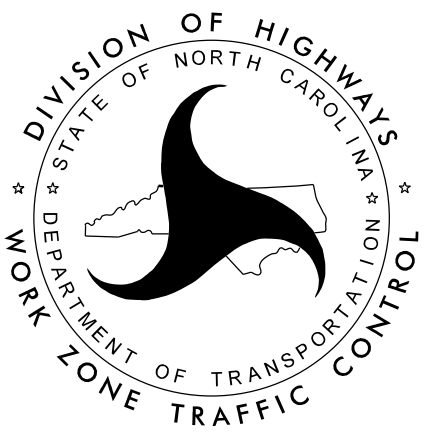
INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-2	ROADWAY STANDARD DRAWINGS & LEGEND
TMP-3A-3B	GENERAL NOTES
TMP-4	DETOUR SIGN DESIGN
TMP-5A-5B	TRANSPORTATION MANAGEMENT STRATEGIES AND PHASING PLAN
TMP-6-7	PHASE I
TMP-8-10	PHASE II - STEP A
TMP-11	PHASE II - STEP B
TMP-12-13	PHASE II - STEP C
TMP-14	PHASE III - STEP A
TMP-15-17	PHASE III - STEP B
TMP-18	DETOUR ROUTE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY:
ZACHARY M. ESPOSITO, PE, TCDS
PROJECT ENGINEER
MIKAYLA M. LINDSEY, EI
PROJECT DESIGN ENGINEER



SHEET NO.
TMP - 1

CONTRACT: DE00380 PROJECT: HL-0008G

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - 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 WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1145.01	BARRICADES
1150.01	FLAGGERS
1180.01	SKINNY DRUMS
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

GENERAL

	DIRECTION OF TRAFFIC FLOW
	DIRECTION OF PEDESTRIAN TRAFFIC FLOW
	EXIST. PVMT.
	NORTH ARROW
	PROPOSED PVMT.
	TEMP. SHORING (LOCATION PURPOSES ONLY)
	WORK AREA
	REMOVAL

SIGNALS

	EXISTING		PROPOSED		TEMPORARY		PORTABLE
--	----------	--	----------	--	-----------	--	----------

PAVEMENT MARKINGS

	EXISTING LINES
	TEMPORARY LINES

PAVEMENT MARKING SYMBOLS

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

TEMPORARY PAVEMENT MARKING

P1	WHITE EDGE LINE	PAINT (4")	LF
P2	WHITE SOLID LANE LINE	PAINT (4")	LF
P4	3FT.-9FT./SP WHITE MINISKIP	PAINT (4")	LF
P5	2FT.-6FT./SP WHITE MINISKIP	PAINT (4")	LF
P13	YELLOW DOUBLE CENTER	PAINT (4")	LF
P42	YELLOW DIAGONAL	PAINT (8")	LF
P61	WHITE STOPBAR	PAINT (24")	LF
P70	LEFT TURN ARROW	PAINT	EA
P71	RIGHT TURN ARROW	PAINT	EA
P72	STRAIGHT ARROW	PAINT	EA

LEGEND

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

	PORTABLE SIGN
	STATIONARY SIGN
	STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

	CRYSTAL/CRYSTAL
	CRYSTAL/RED
	YELLOW/YELLOW

PROJ. REFERENCE NO.

HL-0008G

SHEET NO.

TMP-2

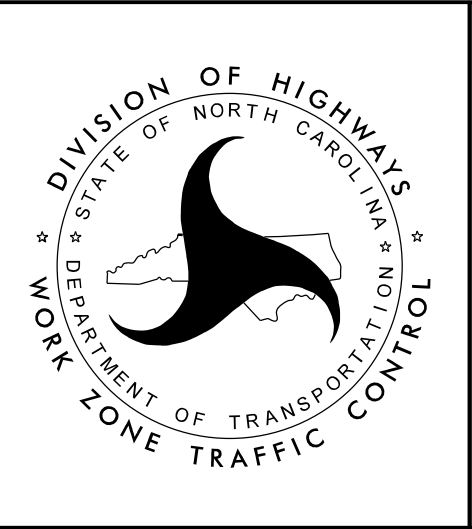
DRMP, INC.
5808 FARRINGTON PLACE
RALEIGH, NC 27609
(919) 872-5115

NC LICENSE NO. P-1524
www.drmp.com

APPROVED:

DATE: 6/6/2025

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



ROADWAY STANDARD
DRAWINGS & LEGEND

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

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.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
-L- SR 1375 (LAKE WHEELER ROAD)	MONDAY THRU FRIDAY 6AM TO 9AM AND 3PM TO 7PM, SUNDAY 6AM TO 2PM
-Y- SR 1393 (HILLTOP NEEDMORE ROAD)	MONDAY THRU FRIDAY 6AM TO 9AM AND 3PM TO 7PM, SUNDAY 6AM TO 2PM

LANE CLOSURE RESTRICTIONS DO NOT APPLY DURING THE PHASE I DETOUR ON SR 1393 (HILLTOP NEEDMORE ROAD). SEE ICTS FOR MORE DETAILS.

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME
ALL ROADS

HOLIDAY

- FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
- FOR NEW YEAR'S, BETWEEN THE HOURS OF 6:00 A.M. DECEMBER 31st TO 7:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 7:00 P.M. THE FOLLOWING TUESDAY.
- FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 7:00 P.M. MONDAY.
- FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 7:00 P.M. TUESDAY.
- FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
- FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 7:00 P.M. TUESDAY.
- FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 7:00 P.M. MONDAY.
- FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 7:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

C) DO NOT CONDUCT ANY HAULING OPERATIONS AGAINST THE FLOW OF TRAFFIC OF AN OPEN TRAVELWAY UNLESS THE HAULING OPERATION IS PROTECTED BY BARRIER OR GUARDRAIL OR AS DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- D) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
- F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
- G) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- H) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.
- I) DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON LAKE WHEELER ROAD AND/OR HILLTOP NEEDMORE ROAD.

PAVEMENT EDGE DROP OFF REQUIREMENTS

J) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

K) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 350FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

PROJ. REFERENCE NO.	SHEET NO.
HL-0008G	TMP-3A



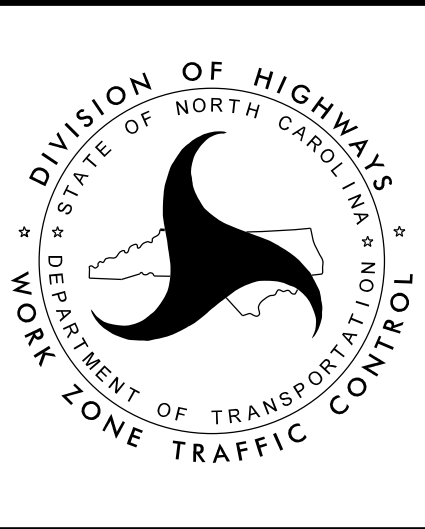
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GENERAL NOTES

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GENERAL NOTES (CONT.)

TRAFFIC PATTERN ALTERATIONS

- L) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- M) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

- N) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

- O) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

- P) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

- Q) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 350FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

- R) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

- S) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGHT TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

- T) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
-L- SR 1375 (LAKE WHEELER ROAD)	PAINT	NONE
-Y- SR 1393 (HILLTOP NEEDMORE ROAD)	PAINT	NONE

- U) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

- V) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

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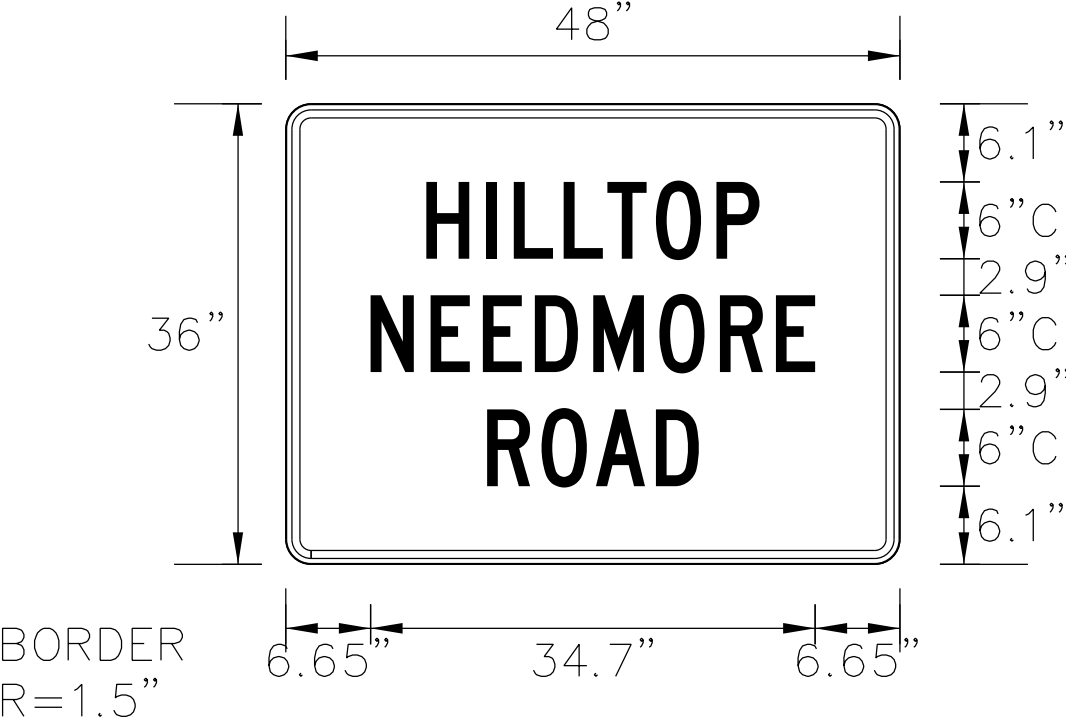
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SIGN NUMBER: SD-1 TYPE: D QUANTITY: 10 SIGN WIDTH: 4'-0" HEIGHT: 3'-0" TOTAL AREA: 12.0 Sq.Ft. BORDER TYPE: RADII: 1.5" NO. Z BARS: LENGTH: BACKG COLOR: Flourescent Orange COPY COLOR: Black <table><thead><tr><th>SYMBOL</th><th>X</th><th>Y</th><th>WID</th><th>HT</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr></tbody></table> MAT'L: 0.125" (3.2 mm) ALUMINUM	SYMBOL	X	Y	WID	HT																																				DESIGN BY: MML PROJECT ID: HL-0008G CHECKED BY: ZME LOCATION: Oct 19, 2023 DIV: 5  Spacing Factor is 1 unless specified otherwise
SYMBOL	X	Y	WID	HT																																					

LETTER POSITIONS

Letter locations are panel edge to lower left corner																									Series/Size	
																									Text Length	
	H	I	L	L	T	O	P																			C 2000
	11	15.7	17.8	21.7	25.1	28.9	33.7																			26
	N	E	E	D	M	O	R	E																		C 2000
	6.6	11.3	15.4	19.5	24	29.2	33.9	38.3																		34.7
	R	O	A	D																						C 2000
	15.7	20	24.2	28.9																						16.6

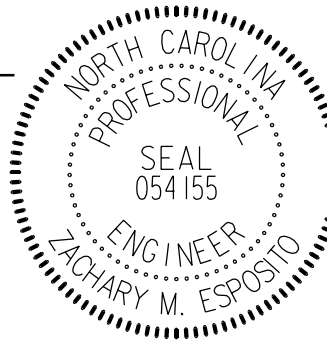
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NORTH CAROLINA D.O.T. SIGN DETAIL

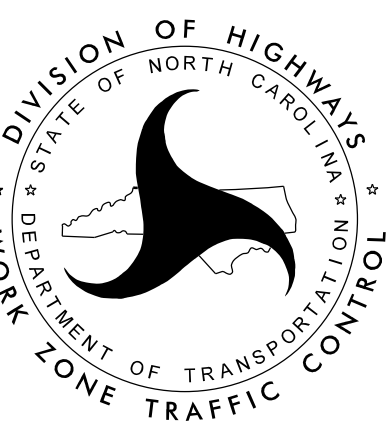
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DETOUR SIGN DESIGN

TRANSPORTATION MANAGEMENT STRATEGIES

THE FOLLOWING LISTED WORK ZONE STRATEGIES ARE RECOMMENDED FOR INCLUSION WITHIN THIS TRANSPORTATION MANAGEMENT PLAN (TMP).

- TRAFFIC MANAGEMENT STRATEGIES:
- FULL ROADWAY CLOSURES

-ONE-LANE, TWO WAY OPERATION (FLAGGING)

-WORK HOUR RESTRICTIONS FOR PEAK TRAVEL

-OFF-SITE DETOURS / USE OF ALTERNATIVE ROUTES

GENERAL TRAFFIC CONTROL NOTES

BEFORE BEGINNING ANY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS AND TRAFFIC CONTROL DEVICES (RSD 1101.01). FIELD VERIFY LOCATIONS WITH THE ENGINEER PRIOR TO INSTALLATION.

MAINTAIN VEHICULAR ACCESS TO ALL RESIDENCES, SCHOOLS, BUS STOPS, EMERGENCY SERVICES, AND BUSINESSES DURING THE LIFE OF THE CONTRACT, PRIOR TO INCORPORATION, OBTAIN WRITTEN APPROVAL FROM THE ENGINEER ON METHOD TO MAINTAIN ACCESS.

THE LAKE WHEELER ROAD/HILLTOP NEEDMORE ROAD IMPROVEMENTS WILL BE CONSTRUCTED USING DETOURS, TEMPORARY TRAFFIC PATTERNS DESIGNATED BY TEMPORARY PAVEMENT MARKINGS AND SIGNING. TEMPORARY LANE AND SHOULDER CLOSURES WILL BE USED AS NECESSARY TO COMPLETE CONSTRUCTION. THE CONTRACTOR WILL BE REQUIRED TO COORDINATE WORK IMPACTING THE INTERSECTION VEHICULAR AND PEDESTRIAN TRAFFIC.

AS CONTRACTOR FINISHES CONSTRUCTION FOR DRIVEWAYS, THEY SHALL REDUCE DOWN THE OVERALL CONSTRUCTION LIMITS, THUS REDUCING THE OVERALL AMOUNT OF FLAGGERS REQUIRED. AT THE END OF EACH WORK PERIOD, DRUMS SHALL BE PULLED BACK TO THE EOP AND TRAFFIC SHALL UTILIZE NORMAL CONDITIONS UNLESS OTHERWISE SPECIFIED.

TRAFFIC CONTROL NOTE #1:

FOR THE DURATION OF CONSTRUCTION, ENSURE ALL DRIVEWAY ACCESS IS MAINTAINED. CONTRACTOR WILL USE SKINNY DRUMS AND FLAGGERS TO MAINTAIN DRIVEWAY ACCESS AS NECESSARY.

TRAFFIC CONTROL NOTE #2

CONTRACTOR SHALL COORDINATE WITH SIGNAL CONTRACTOR THROUGHOUT CONTRUCTION FOR THE INSTALLATION OF BOTH THE TEMPORARY AND FINAL SIGNALS, AND TO ENSURE ALL SIGNAL EQUIPMENT IS INSTALLED AND SIGNALS ARE FULLY OPERATIONAL PRIOR TO COMPLETING PHASE IV.

TRAFFIC CONTROL NOTE #3:

LAW ENFORCEMENT WILL BE UTILIZED THROUGHOUT THIS PROJECT. PUT SIGNAL INTO FLASH AND USE LAW ENFORCEMENT IN CONJUNCTION WITH FLAGGERS TO GUIDE TRAFFIC THROUGH THE INTERSECTION.

TRAFFIC CONTROL NOTE #4:

2 WEEKS PRIOR TO ANY CONSTRUCTION, CONTRACTOR SHALL INSALL CMS BOARDS TO NOTIFY TRAFFIC OF UPCOMING ROAD CLOSURE. CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER TO ENSURE COORDINATION WITH EMERGENCY SERVICES AND WAKE COUNTY PRIOR TO POSTING THE CMS BOARDS.

MESSAGE 1:

NOTICE

HILLTOP

RD CLSD

MESSAGE 2:

FROM

XX/XX -

XX/XX

PHASING PLAN

PHASE I

STEP 1:

INSTALL WORK ZONE ADVANCE WARNING SIGNS (RSD 1101.01).

INSTALL DETOUR SIGNAGE FOR -Y- SR 1393 (HILLTOP NEEDMORE ROAD). ONCE INSTALLED, COVER AND BAG SIGNAGE UNTIL SHIFTING INTO PHASE I TRAFFIC PATTERN. SEE TMP-18 FOR DETOUR SIGNAGE.

SIGNAL CONTRACTOR TO SET UP AND INSTALL PHASE I TEMPORARY SIGNAL AT THE INTERSECTION OF -L- SR 1375 (LAKE WHEELER ROAD) AND -Y- SR 1393 (HILLTOP NEEDMORE ROAD) ACCORDING TO TEMPORARY SIGNAL DESIGN 1. WITH TEMPORARY SIGNAL ACTIVE, BEHIND BARRICADE AND DRUMS AS NEEDED, UNBAG DETOUR SIGNAGE AND SHIFT TRAFFIC TO THE PHASE I TRAFFIC PATTERN.

BEHIND BARRICADES AND AWAY FROM TRAFFIC, ONCE SHIFTED INTO THE PHASE I TRAFFIC PATTERN, COMPLETE ROADWAY AND DRAINAGE IMPROVEMENTS ALONG THE EASTERN SIDE OF -L- SR 1375 (LAKE WHEELER ROAD).

- L- STA. 16+00 +/- TO -L- STA. 28+45 +/-
- Y- STA. 25+45 +/- TO -Y- STA. 30+65 +/-
- (SEE TMP-6 THRU TMP-7)
- (SEE TMP-7)

ICI NOTE:
COMPLETE THE WORK OF PHASE I IN THIRTY (30) CONSECUTIVE CALENDAR DAYS. SEE INTERMEDIATE CONTRACT TIME AND LIQUIDATED DAMAGES.

PROJ. REFERENCE NO.

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ACCESS NOTE:
FOR THE DURATION OF THE PHASE I DETOUR, ENSURE ALL DRIVEWAY ACCESS IS MAINTAINED TO HOMES WITHIN THE PROJECT LIMITS.

DRAINAGE NOTE:
USING FLAGGERS AND LANE CLOSURES AS NEEDED, CONTRACTOR SHALL CONSTRUCT 36’ OF 18” RCP STRUCTURE #417 AND 50’ OF 18” RCP STRUCTURE #415. AT THE END OF EACH WORKDAY, CONTRACTOR SHALL INSTALL ASPHALT BASE COURSE ON TOP OF LOCATION TO ENSURE NORMAL TRAFFIC FLOW.

PHASE II

STEP A (TMP-8 THRU TMP-10):
MAINTAIN ALL NECESSARY WORK ZONE ADVANCE WARNING SIGNS (RSD 1101.01).

REMOVE ALL BARRICADES AND SIGNAGE ASSOCIATED WITH DETOUR FOR -Y- SR 1393 (HILLTOP NEEDMORE ROAD).

SIGNAL CONTRACTOR TO SET UP AND INSTALL PHASE II TEMPORARY SIGNAL AT THE INTERSECTION OF -L- SR 1375 (LAKE WHEELER ROAD) AND -Y- SR 1393 (HILLTOP NEEDMORE ROAD) ACCORDING TO TEMPORARY SIGNAL DESIGN 2.

USING FLAGGERS, COMPLETE ROADWAY AND DRAINAGE IMPROVEMENTS ALONG THE NORTHWESTERN CORNER OF -L- SR 1393 (LAKE WHEELER ROAD). (SEE RSD 1101.02, SHEET 1).

-Y- STA. 15+50 +/- TO -Y- STA. 17+50 +/- (SEE TMP-10)
STEP B (TMP-11):
MAINTAIN ALL NECESSARY WORK ZONE ADVANCE WARNING SIGNS (RSD 1101.01).

MAINTAIN TEMPORARY SIGNAL DESIGN 2 AT THE INTERSECTION OF -L- SR 1375 (LAKE WHEELER ROAD) AND -Y- SR 1393 (HILLTOP NEEDMORE ROAD).

USING FLAGGERS, COMPLETE ROADWAY AND DRAINAGE IMPROVEMENTS ALONG THE NORTHWESTERN CORNER OF -L- SR 1393 (LAKE WHEELER ROAD). (SEE RSD 1101.02, SHEET 1).

-Y- STA. 17+50 +/- TO -Y- STA. 20+00 +/- (SEE TMP-11)
STEP C (TMP-12 THRU TMP-13):
MAINTAIN ALL NECESSARY WORK ZONE ADVANCE WARNING SIGNS (RSD 1101.01).

REMOVE ALL BARRICADES AND SIGNAGE ASSOCIATED WITH DETOUR FOR -Y- SR 1393 (HILLTOP NEEDMORE ROAD).

MAINTAIN TEMPORARY SIGNAL DESIGN 2 AT THE INERSECTION OF -L- SR 1375 (LAKE WHEELER ROAD) AND -Y- SR 1393 (HILLTOP NEEDMORE ROAD).

USING FLAGGERS, COMPLETE ROADWAY AND DRAINAGE IMPROVEMENTS ALONG THE NORTHWESTERN CORNER OF -L- SR 1393 (LAKE WHEELER ROAD). (SEE RSD 1101.02, SHEET 1).

- L- STA. 23+70 +/- TO -L- STA. 28+45 +/-
- Y- STA. 20+00 +/- TO -Y- STA. 25+45 +/-
- (SEE TMP-12)
- (SEE TMP-12 THRU TMP-13)

DRAINAGE NOTE:
USING FLAGGERS AND LANE CLOSURES AS NEEDED, CONTRACTOR SHALL FILL EXISTING 18” RCP, FINISH THE REMAINDER OF 18” RCP STRUCTURE #418, AND FINISH THE REMAINDER OF 18” RCP STRUCTURE #416. AT THE END OF EACH WORKDAY, CONTRACTOR TO INSTALL ASPHALT BASE COURSE ON TOP OF LOCATION TO ENSURE NORMAL TRAFFIC FLOW. ONCE INSTALLATION IS COMPLETED, CONTRACTOR SHALL INSTALL PAVEMENT PER THE PAVEMENT SCHEDULE IN UTILITY CUT.

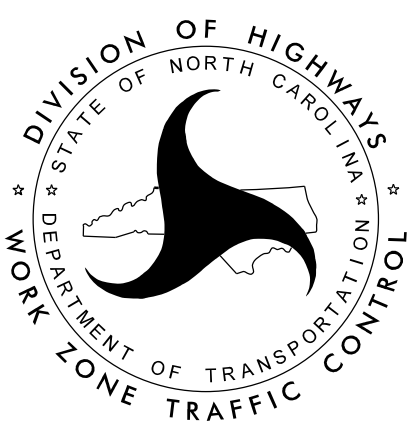
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Signed by: Zachary M. Esposito

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PHASING PLAN (CONTINUED)

PHASE III

STEP A (TMP-14):

MAINTAIN ALL NECESSARY WORK ZONE ADVANCE WARNING SIGNS (RSD 1101.01).

MAINTAIN TEMPORARY SIGNAL DESIGN 2 AT THE INNERSECTION OF -L- SR 1375 (LAKE WHEELER ROAD) AND -Y- SR 1393 (HILLTOP NEEDMORE ROAD).

USING FLAGGERS, COMPLETE ROADWAY AND DRAINAGE IMPROVEMENTS ALONG THE SOUTHWESTERN CORNER OF -L- SR 1375 (LAKE WHEELER ROAD). (SEE RSD 1101.02, SHEET 1).

-Y- STA. 15+50 +/- TO -Y- STA. 19+50 +/- (SEE TMP-14)

STEP B (TMP-15 THRU TMP-17):

MAINTAIN ALL NECESSARY WORK ZONE ADVANCE WARNING SIGNS (RSD 1101.01).

MAINTAIN TEMPORARY SIGNAL DESIGN 2 AT THE INNERSECTION OF -L- SR 1375 (LAKE WHEELER ROAD) AND -Y- SR 1393 (HILLTOP NEEDMORE ROAD).

USING FLAGGERS, COMPLETE ROADWAY AND DRAINAGE IMPROVEMENTS ALONG THE SOUTHWESTERN CORNER OF -L- SR 1375 (LAKE WHEELER ROAD). (SEE RSD 1101.02, SHEET 1).

-L- STA. 16+00 +/- TO -L- STA. 23+70 +/- (SEE TMP-15 THRU TMP-16)

-Y- STA. 19+50 +/- TO -Y- STA. 25+45 +/- (SEE TMP-16 THRU TMP-17)

PHASE IV

STEP 1:

MAINTAIN ALL NECESSARY WORK ZONE ADVANCE WARNING SIGNS (RSD 1101.01).

USING LANE CLOSURES AND FLAGGERS AS NEEDED, COMPLETE REMAINING PAVING, INCLUDING FINAL SURFACE COURSE AND INSTALL FINAL PAVEMENT MARKINGS AND MARKERS.

SIGNAL CONTRACTOR TO FINISH ANY REMAINING SIGNAL EQUIPMENT INSTALLATIONS AND ENSURE ALL SIGNALS ARE IN THEIR FINAL CONDITIONS (SEE SIGNAL PLANS FOR MORE INFORMATION).

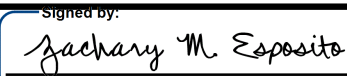
REMOVE ALL REMAINING TRAFFIC CONTROL DEVICES AND ALLOW NORMAL TRAFFIC OPERATION.

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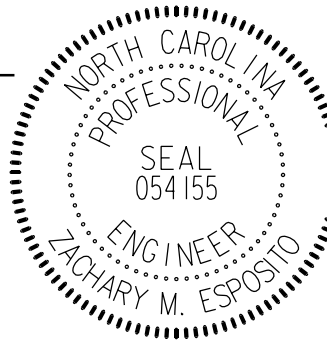
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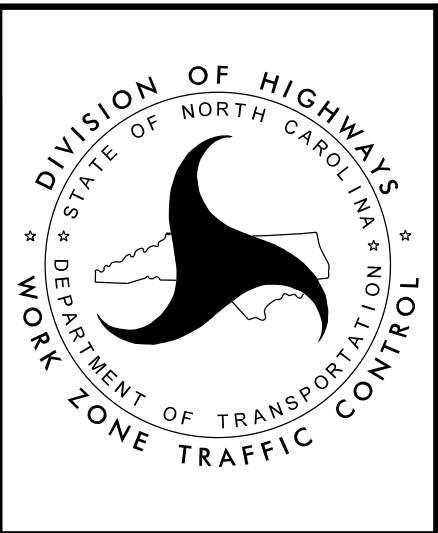
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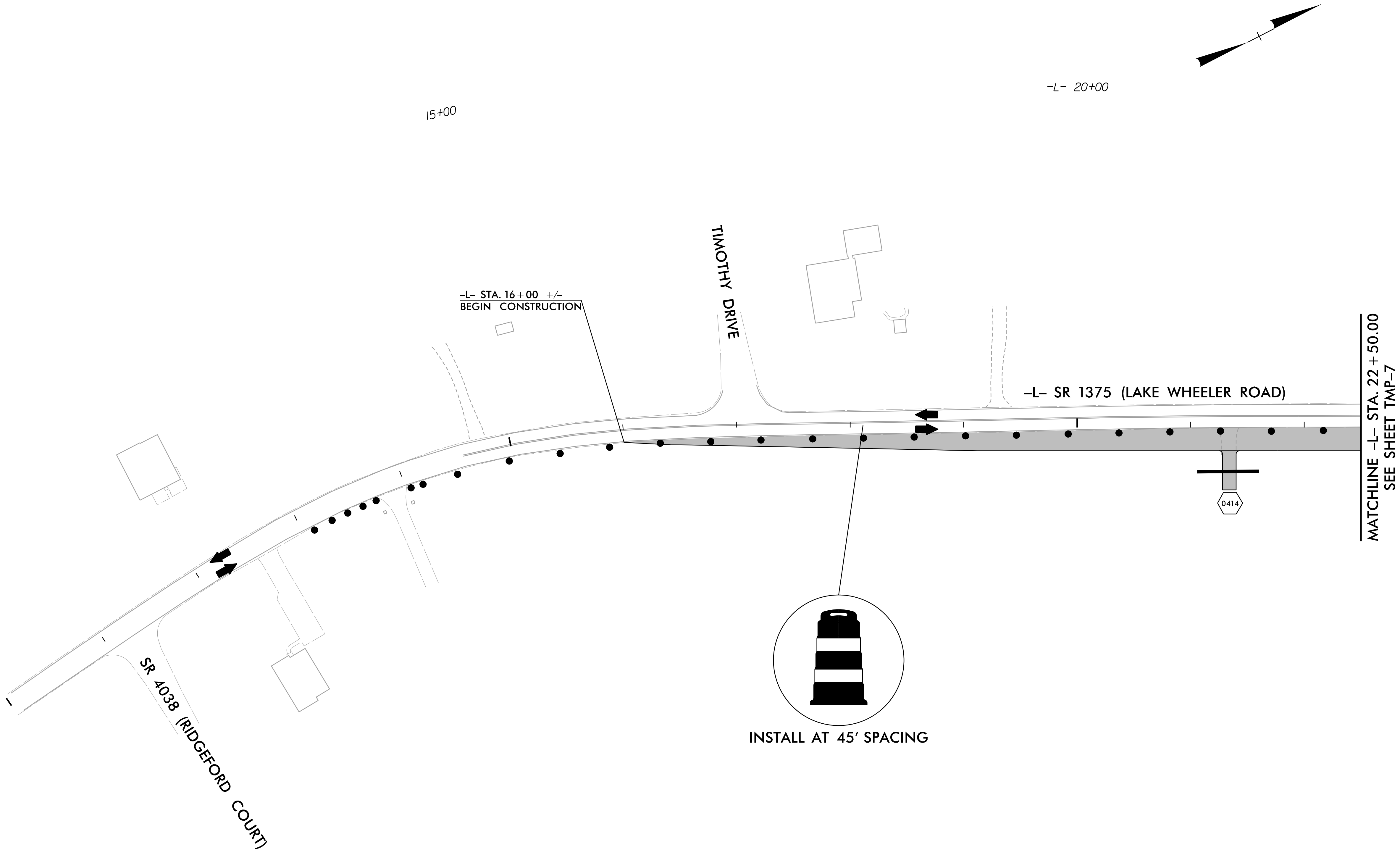
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R11-2
48" x 30"



TYPE III BARRICADE

(A)

R11-2
48" x 30"



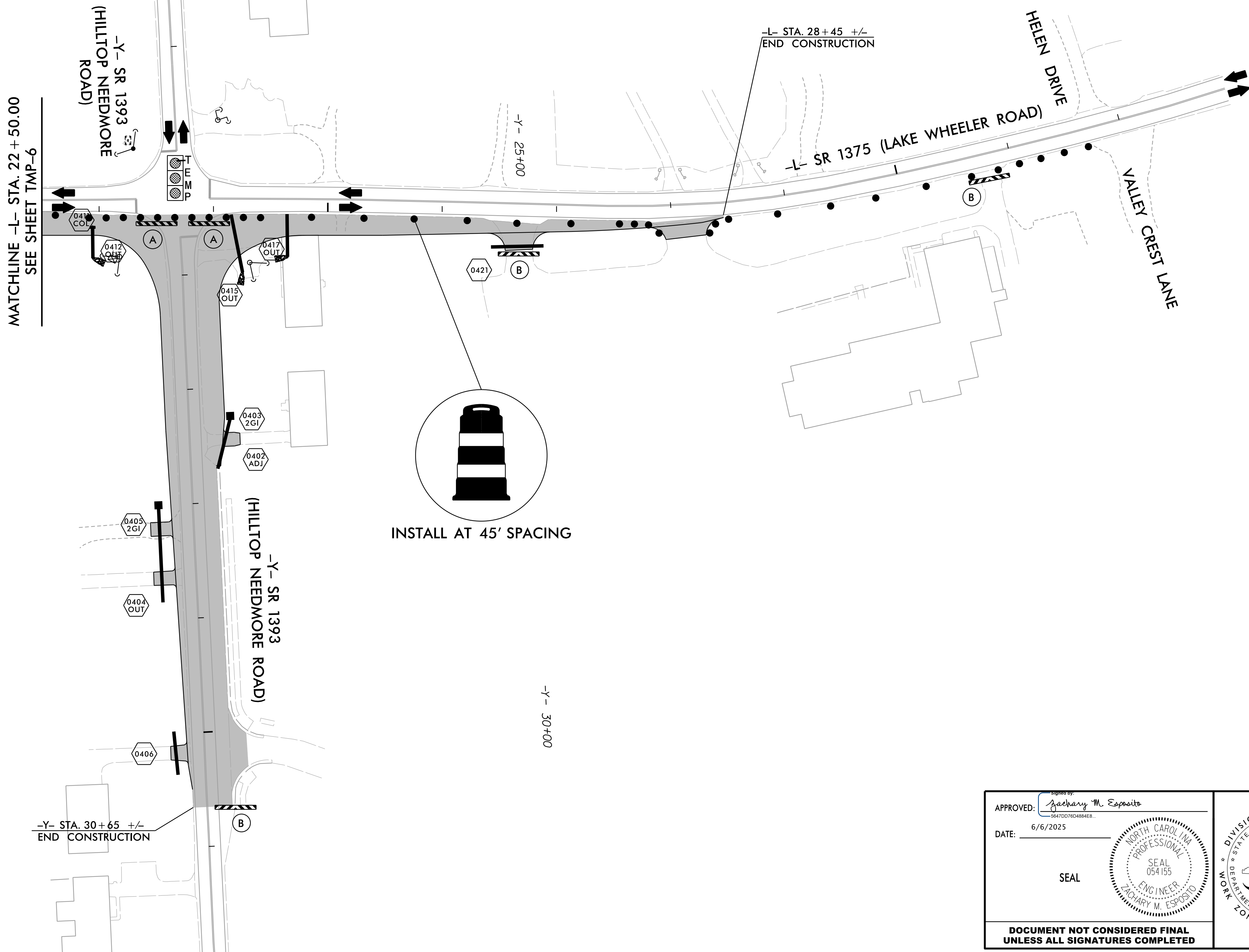
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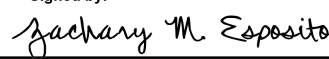
(B)

M4-10R
48" x 18"



SEE DETOUR ROUTE FOR HILLTOP NEEDMORE ROAD ON SHEET TMP-18.



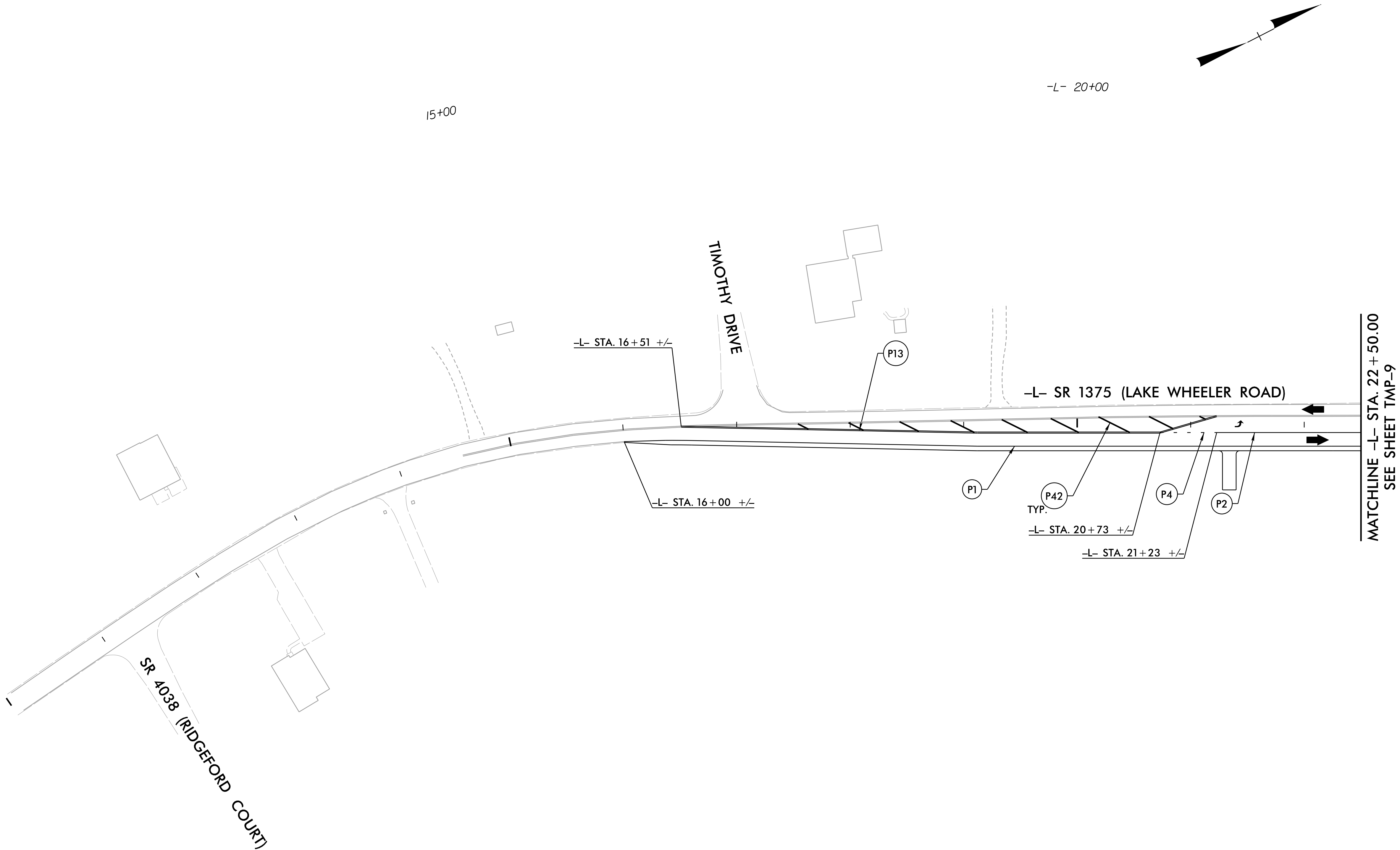
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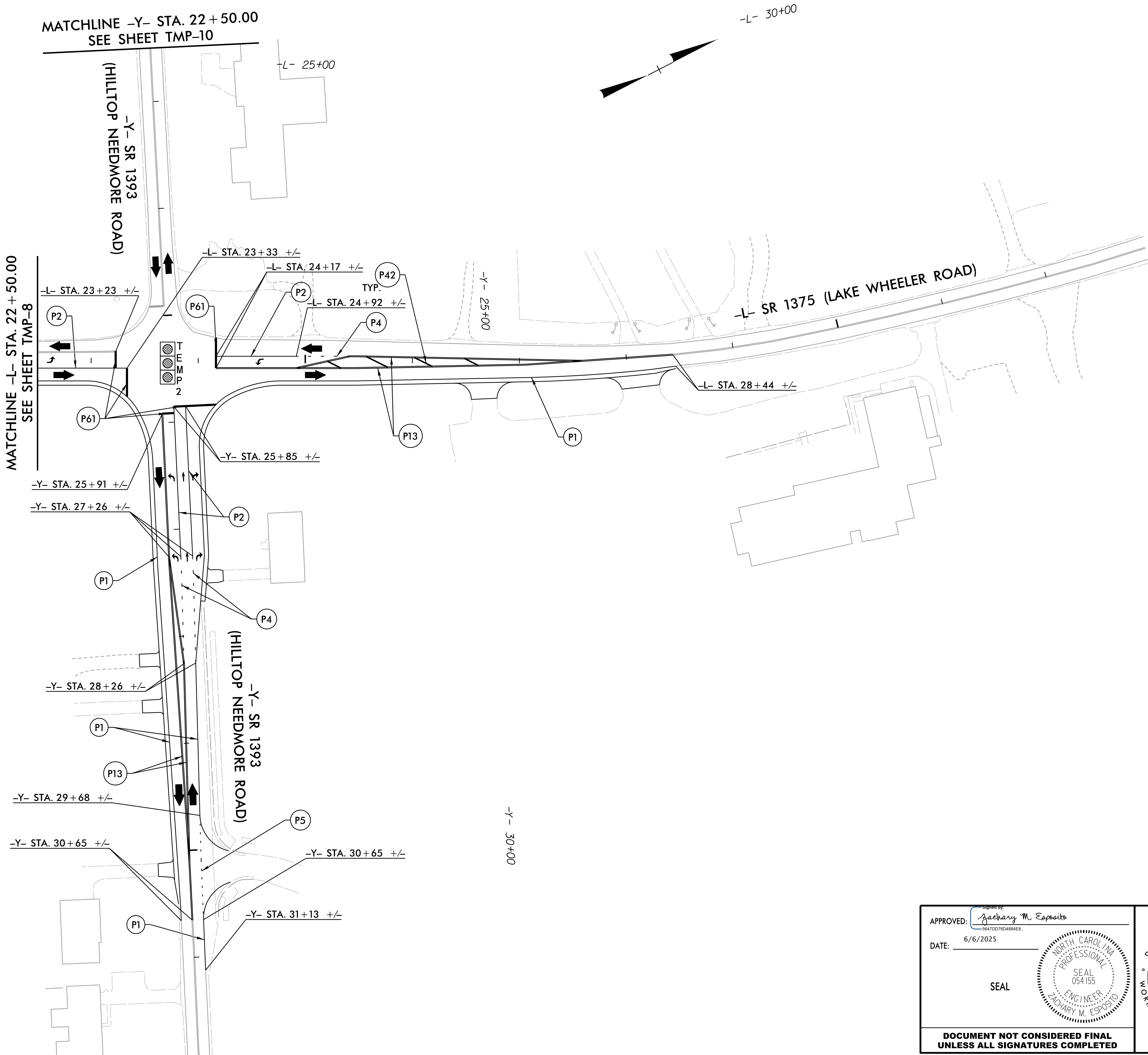
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HOURS

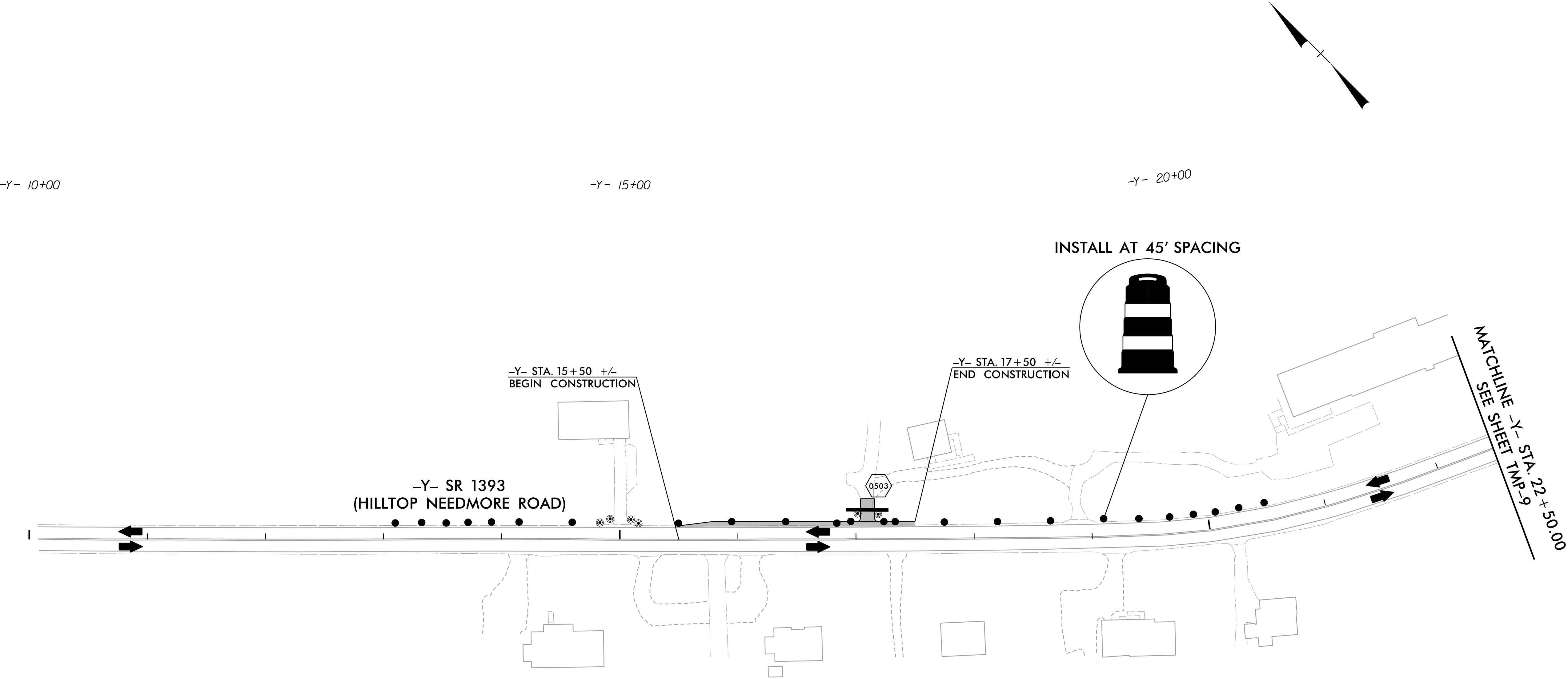
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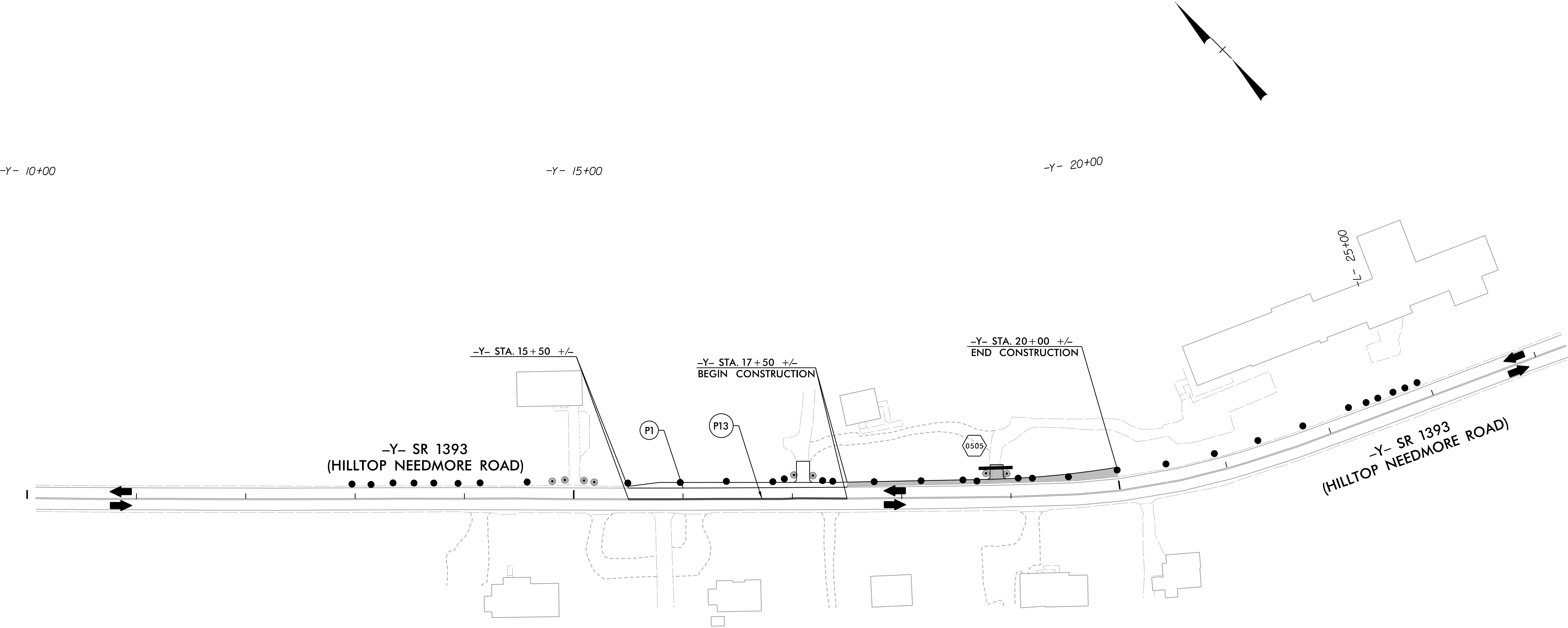
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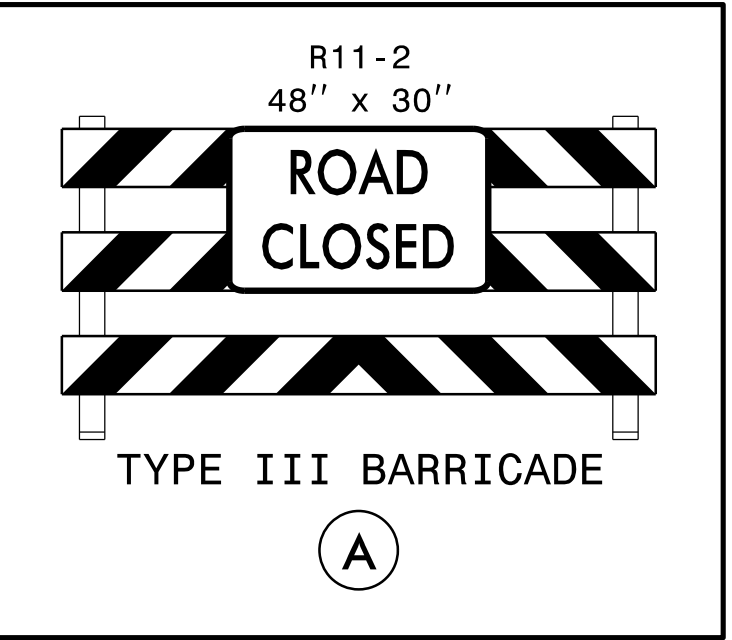
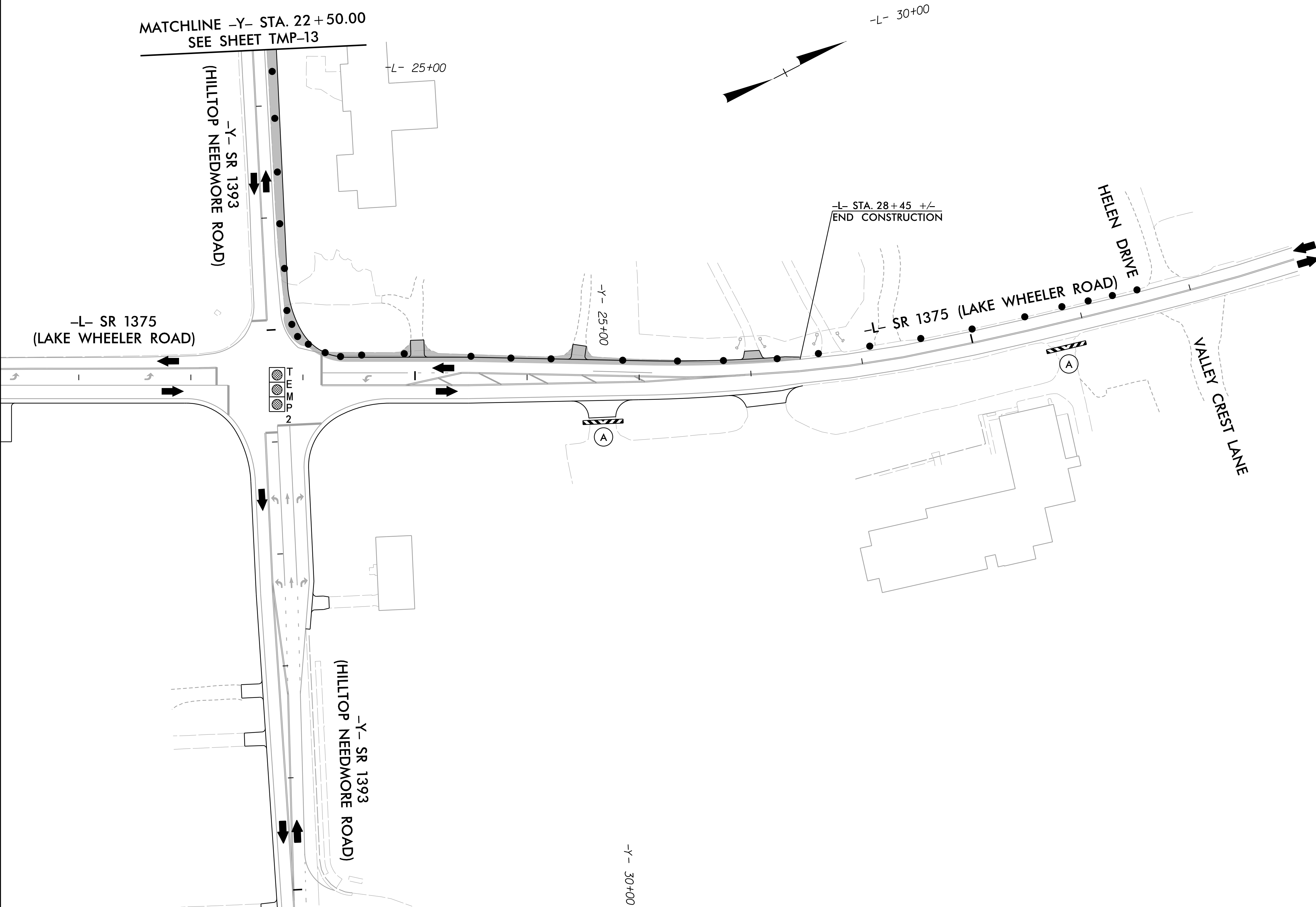
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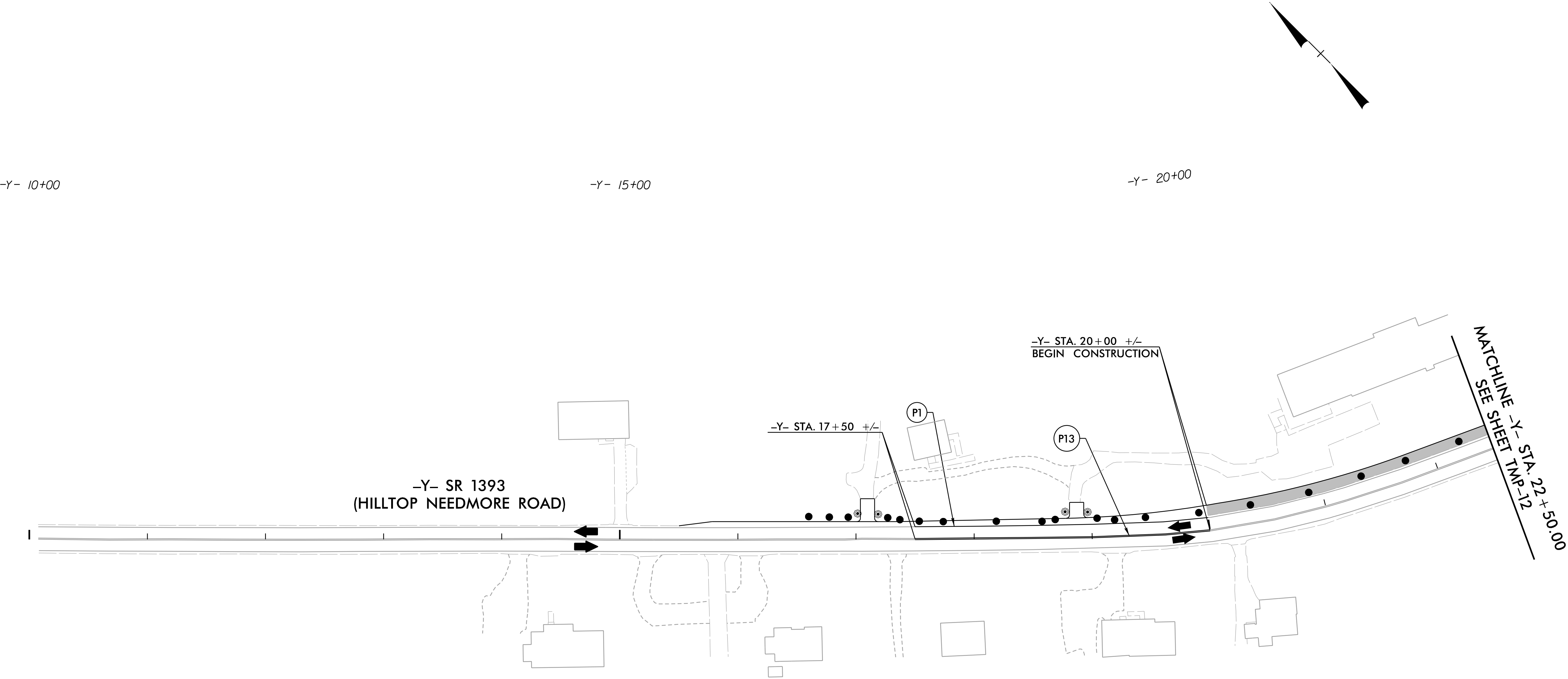
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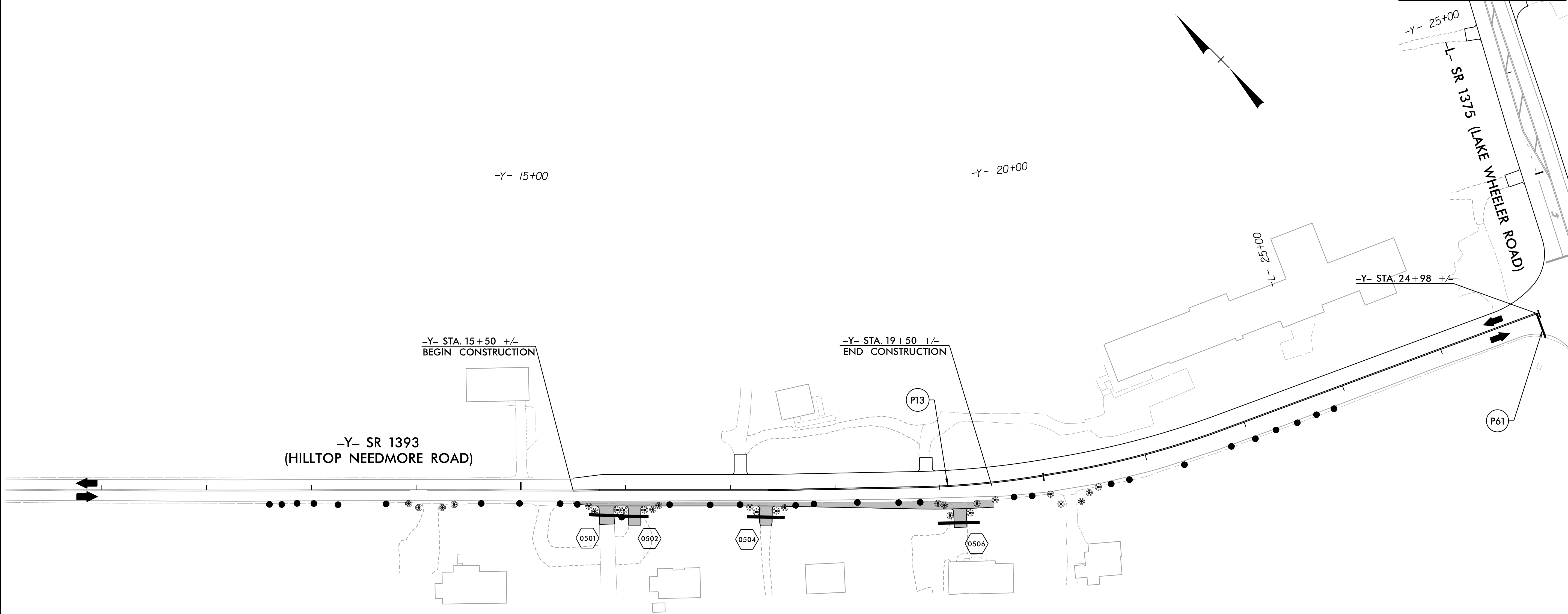
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**PHASE III – STEP A –
OFF-CONSTRUCTION
HOURS**

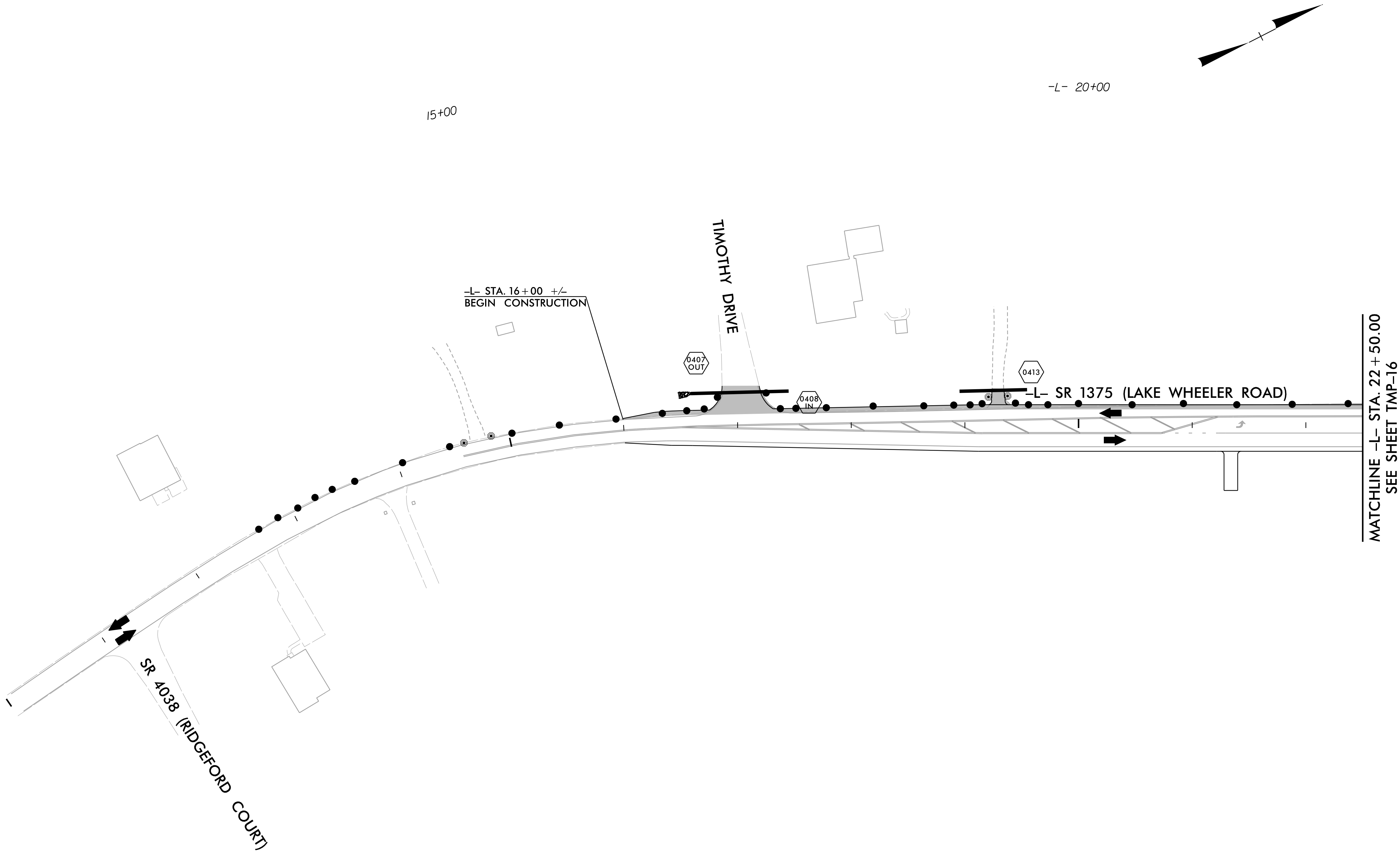
PROJ. REFERENCE NO.	SHEET NO.
HL-0008G	TMP-15



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NC LICENSE NO. F-1624
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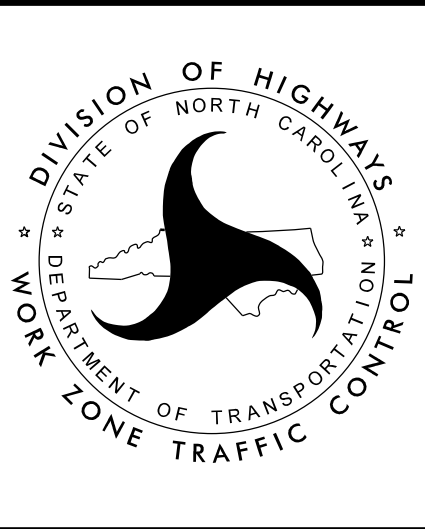
APPROVED: 
5647DD78D4884E8...

DATE: 6/6/2025

SEAL



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**PHASE III – STEP B –
OFF-CONSTRUCTION
HOURS**

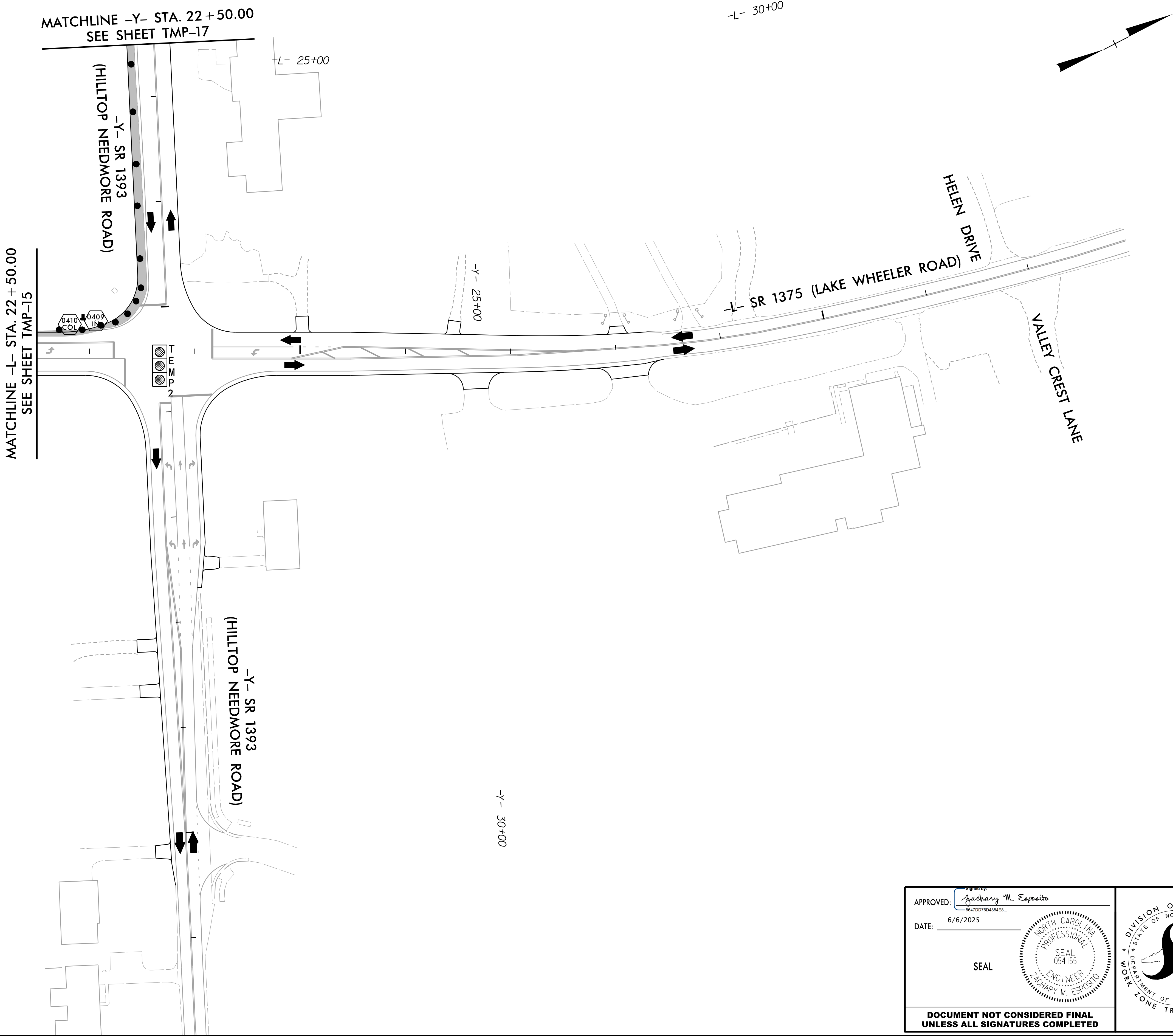
PROJ. REFERENCE NO.	SHEET NO.
HL-0008G	TMP-16



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DATE: 6/6/2025
SEAL

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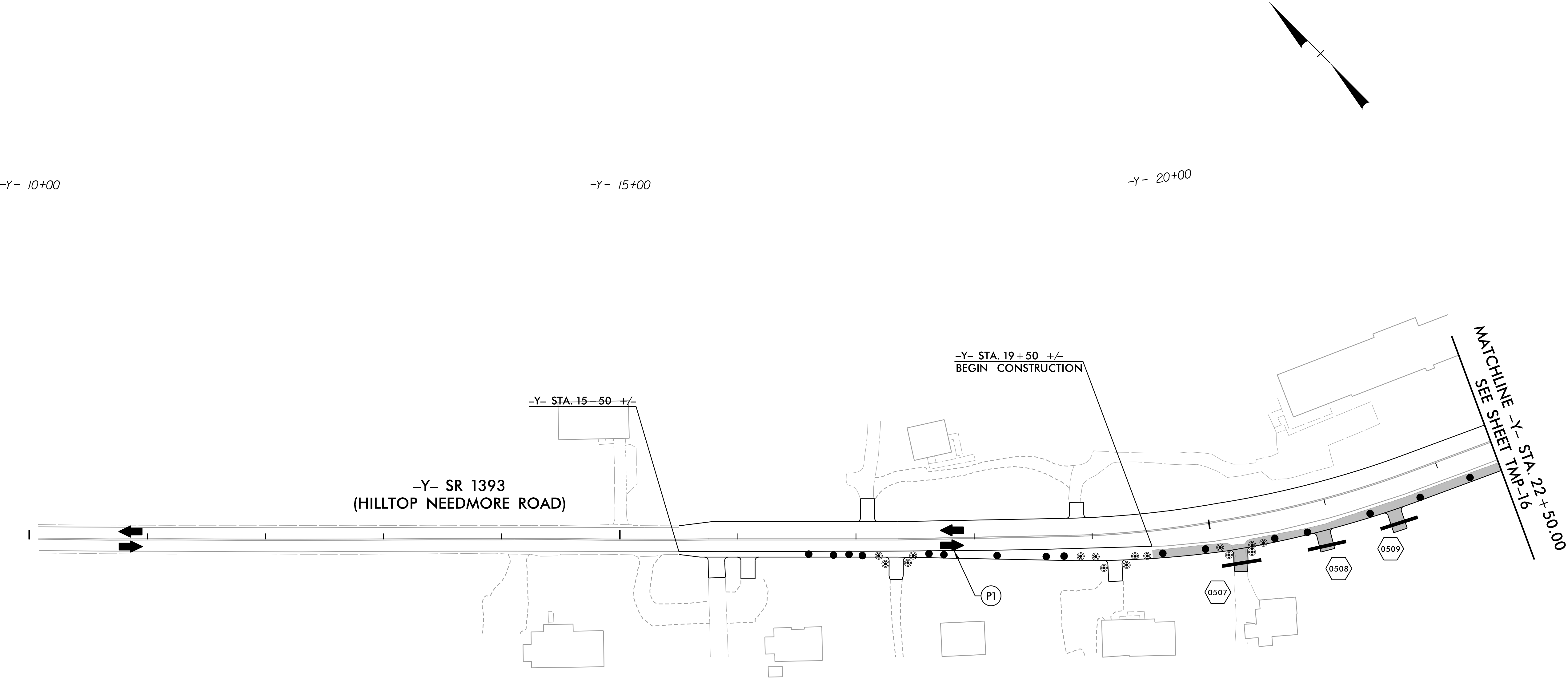
PHASE III – STEP B –
OFF-CONSTRUCTION
HOURS

PROJ. REFERENCE NO.	SHEET NO.
HL-0008G	TMP-17



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DATE: 6/6/2025

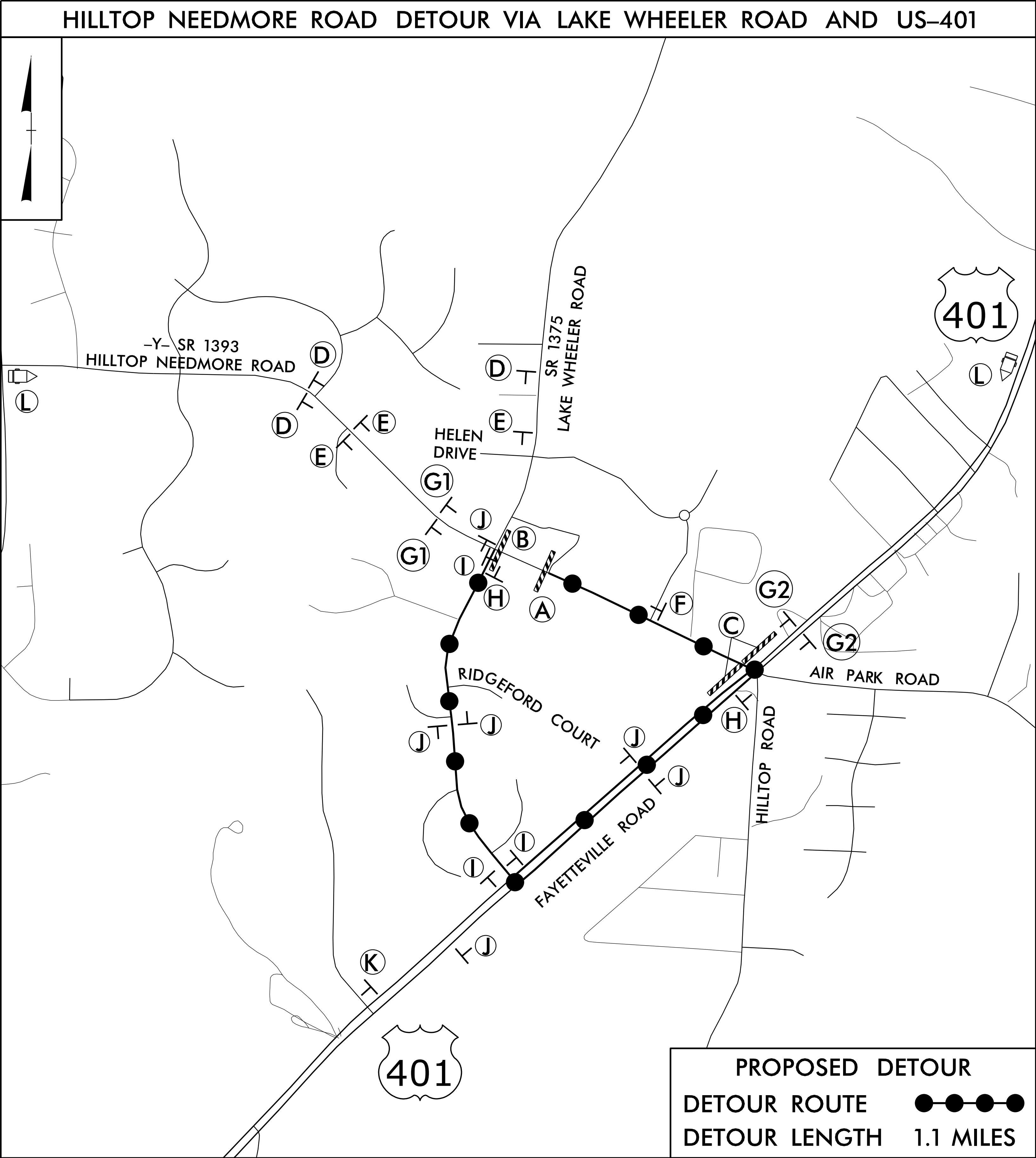
SEAL

SEAL
054155
ENGINEER
ZACHARY M. ESPOSITO

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PHASE III – STEP B –
OFF-CONSTRUCTION
HOURS



PROJ. REFERENCE NO.
HL-0008G

SHEET NO.
TMP-18

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R11-2
48" x 30"

ROAD CLOSED

TYPE III BARRICADE(S)

A

R11-2
48" x 30"

ROAD CLOSED

DETOUR

TYPE III BARRICADE

B

R11-4
60" x 30"

ROAD CLOSED TO THRU TRAFFIC

DETOUR

TYPE III BARRICADE

C

W20-3
48" x 48"

ROAD CLOSED AHEAD

D

W20-2
48" x 48"

DETOUR AHEAD

E

W20-3
48" x 48"

ROAD CLOSED 1000 FT

F

W20-3
48" x 48"

ROAD CLOSED 500 FT

G1

W20-3
48" x 48"

ROAD CLOSED 500 FT

SP-4R
42" x 12"

NEXT RIGHT

G2

M4-8 A
24" x 18"

END DETOUR

H

SD-1
48" x 36"

HILLTOP NEEDMORE ROAD

DETOUR

M4-8
24" x 12"

M6-1
21" x 15"

I

SD-1
48" x 36"

HILLTOP NEEDMORE ROAD

DETOUR

M4-8
24" x 12"

M6-3
21" x 15"

J

SD-1
48" x 36"

HILLTOP NEEDMORE ROAD

DETOUR

M4-8
24" x 12"

M6-S
21" x 21"

K

MESSAGE NO. 1
NOTICE
HILLTOP
RD CLSD

MESSAGE NO. 2
FROM
XX/XX -
XX/XX

CHANGEABLE MESSAGE SIGN

L

APPROVED:

Signed by
Zachary M. Esposito

6/6/2025

DATE: 6/6/2025

SEAL

SEAL

SEAL
054155

ENGINEER
ZACHARY M. ESPOSITO

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DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

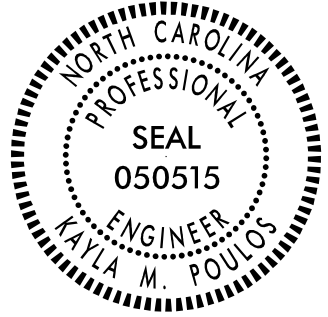
DETOUR ROUTE

T.I.P.: HL-0008G

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING AND SIGNING PLAN
WAKE COUNTY

LOCATION: SR 1375 (LAKE WHEELER ROAD) & SR 1393 (HILLTOP NEEDMORE ROAD)

PROJECT REFERENCE NO.		SHEET NO.	
HL - 0008G		PMP - 1	
APPROVED: DocuSigned by: Kayla M. Poulos 18077910EF90423			
DATE: 6/6/2024			
SEAL 			
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
903.10	GROUND MOUNTED SIGN SUPPORTS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
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

SIGNING GENERAL NOTES

- . SIGNS FURNISHED BY CONTRACTOR
- . 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.
- . WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- . ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
- . THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

PROJECT NOTE

- 1 DISPOSE EXISTING SIGN ASSEMBLY

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	904	SUPPORT, 3-LB STEEL U-CHANNEL	145	L.F.
4102000000	904	SIGN ERECTION, TYPE E	11	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	12	EA.
4685000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	7600	L.F.
4700000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	300	L.F.
4710000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	200	L.F.
4725000000	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	19	EA.

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
ALL ROADS	THERMOPLASTIC	NONE

- B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
D) STOP BAR LOCATION AT NON-SIGNALIZED INTERSECTIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
THERMOPLASTIC(4", 90 MILS)	
T1	WHITE EDGELINE
T2	WHITE SOLID LANE LINE
T4	3 FT. - 9 FT./SP WHITE MINISKIP
T5	2 FT. - 6 FT./SP WHITE MINISKIP
T13	YELLOW DOUBLE CENTER
THERMOPLASTIC(12", 90 MILS)	
T51	WHITE DIAGONAL
T52	YELLOW DIAGONAL
THERMOPLASTIC(24", 90 MILS)	
T61	WHITE STOPBAR
THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MILS)	
T70	LEFT TURN ARROW
T71	RIGHT TURN ARROW
T72	STRAIGHT ARROW
T74	COMBO. RIGHT/STRAIGHT ARROW

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN AND SIGNING PLAN COVER SHEET
PMP-2	TYPE E SIGNS
PMP-3-4	PAVEMENT MARKING AND SIGNING DETAILS

PLANS PREPARED BY: DRMP, INC.

KAYLA M. POULOS, PE PROJECT MANAGER
MIKAYLA M. LINDSEY, EI PROJECT ENGINEER



SYMBOL LEGEND	
	(T70) LEFT ARROW
	(T71) RIGHT ARROW
	(T72) STRAIGHT ARROW
	(T74) COMBO RIGHT / STRAIGHT ARROW

SEE PROJECT NOTE 1 FOR ALL EXISTING SIGN SYSTEMS



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PROJECT REFERENCE NO.

HL - 0008G

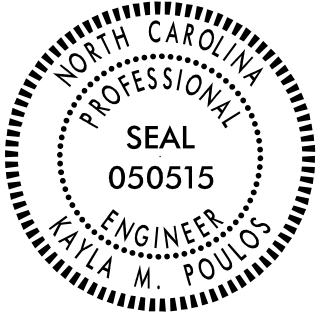
SHEET NO.

PMP - 3

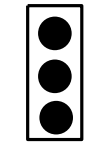
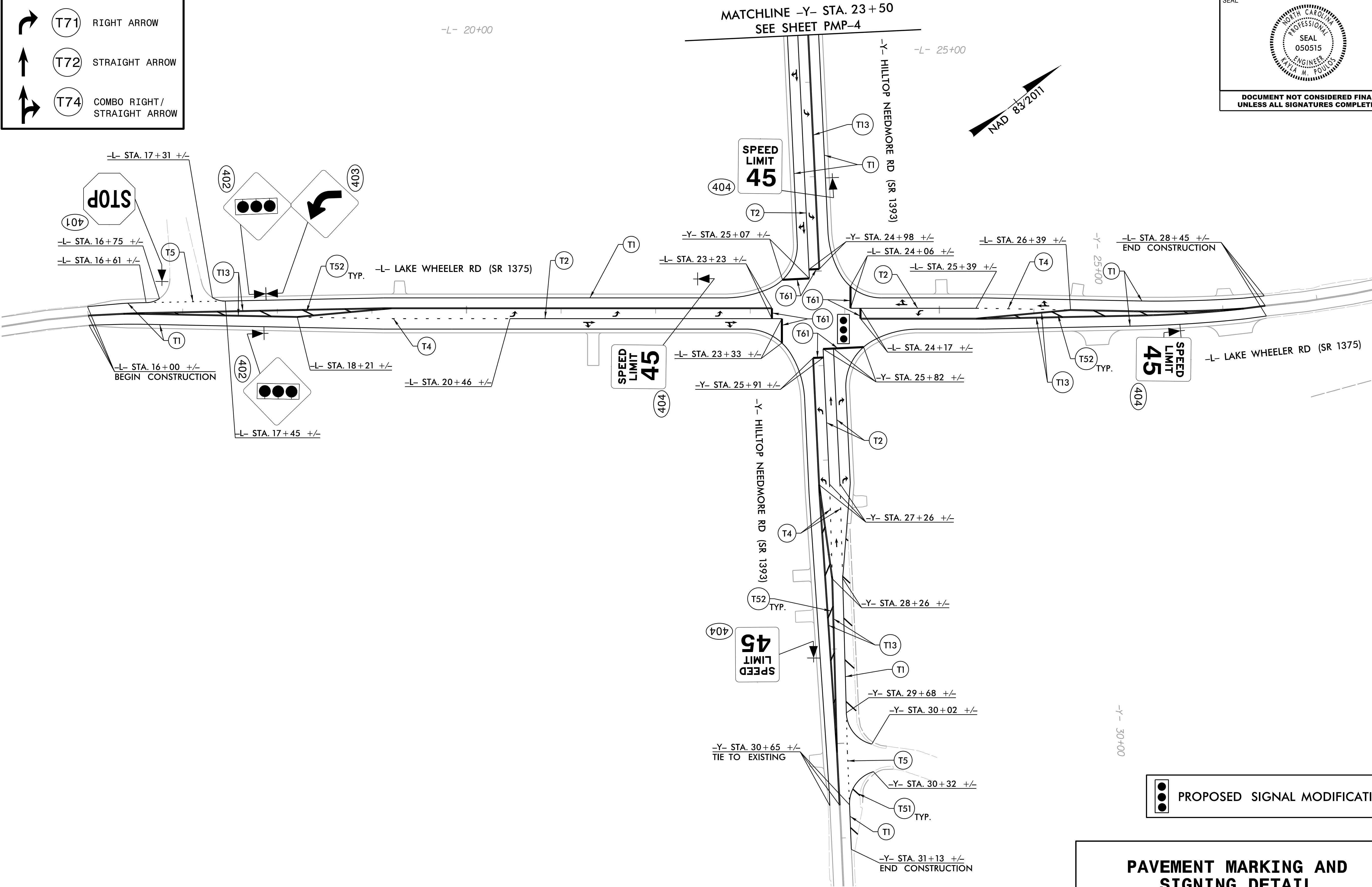
APPROVED: *Kayla M. Poulos*
1807791CEP90433

DATE: 6/6/2024

SEAL



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UNLESS ALL SIGNATURES COMPLETED



PROPOSED SIGNAL MODIFICATION

PAVEMENT MARKING AND
SIGNING DETAIL

SYMBOL LEGEND	
	(T70) LEFT ARROW
	(T74) COMBO RIGHT/ STRAIGHT ARROW

SEE PROJECT NOTE 1 FOR
ALL EXISTING SIGN SYSYEMS.



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PROJECT REFERENCE NO.

HL - 0008G

SHEET NO.

PMP - 4

APPROVED:

DATE: 6/6/2024

SEAL



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UNLESS ALL SIGNATURES COMPLETED

-Y- 10+00

-Y- 15+00

-Y- 20+00

-Y- HILLTOP NEEDMORE RD (SR 1393)

-Y- STA. 15+50 +/-
BEGIN CONSTRUCTION

-Y- STA. 22+19 +/-

-Y- STA. 19+19 +/-

MATCHLINE -Y- STA. 23+50
SEE SHEET PMP-3

SPEED
LIMIT
45

(404)

(T2)

(T13)

(T4)

(T1)

(T13)

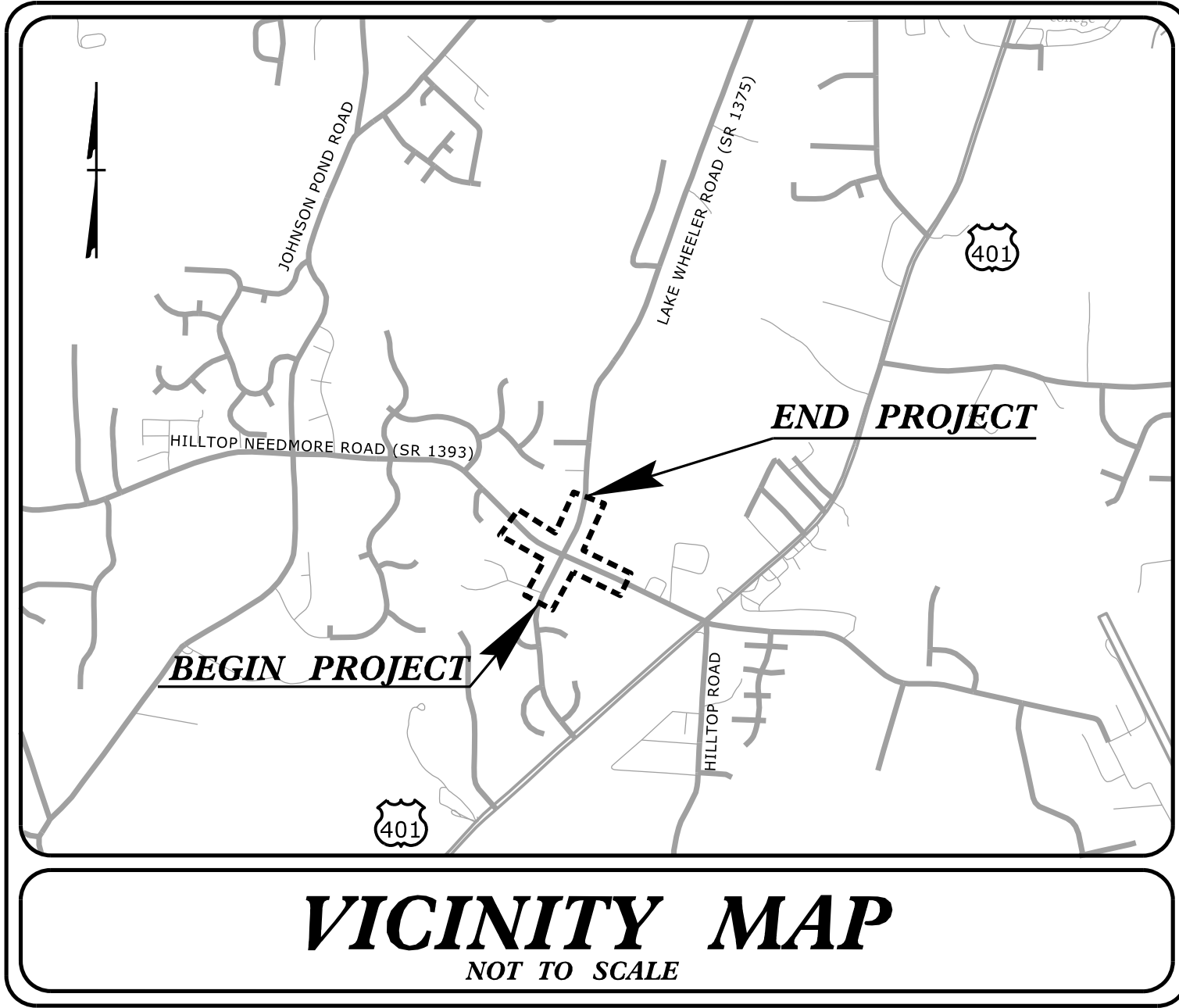
(T52) TYP.

(402)

(402)

PAVEMENT MARKING AND
SIGNING DETAIL

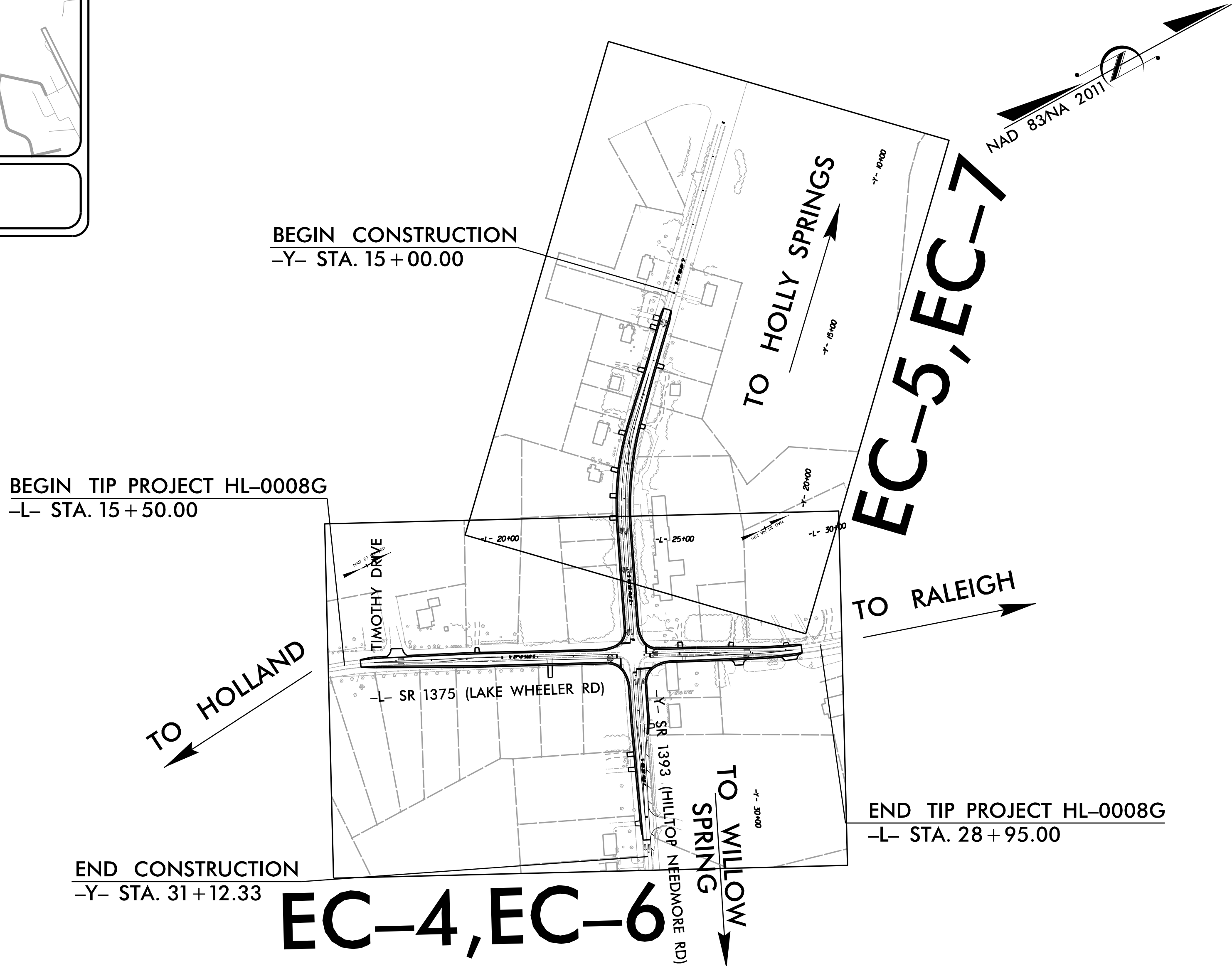
TIP PROJECT: HL-0008G



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

WAKE COUNTY

LOCATION: SR 1375 (LAKE WHEELER ROAD) & SR 1393 (HILLTOP NEEDMORE ROAD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE & SIGNALS

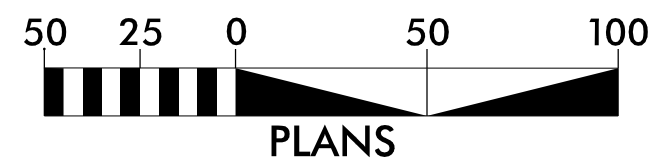


EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSB
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	III III III
1622.01	Temporary Berms and Slope Drains	III III III
1630.02	Silt Basin Type B	III III III
1633.01	Temporary Rock Silt Check Type-A	III III III
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	III III III
1633.02	Temporary Rock Silt Check Type-B	III III III
	Wattle / Coir Fiber Wattle	III III III
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	III III III
1634.01	Temporary Rock Sediment Dam Type-A	III III III
1634.02	Temporary Rock Sediment Dam Type-B	III III III
1635.01	Rock Pipe Inlet Sediment Trap Type-A	III III III
1635.02	Rock Pipe Inlet Sediment Trap Type-B	III III III
1630.04	Stilling Basin	III III III
1630.06	Special Stilling Basin	III III III
	Rock Inlet Sediment Trap:	III III III
1632.01	Type A	III III III
1632.02	Type B	III III III
1632.03	Type C	III III III
	Skimmer Basin	III III III
	Tiered Skimmer Basin	III III III
	Infiltration Basin	III III III

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

GRAPHIC SCALE



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

Prepared in the Office of:



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NC LICENSE NO. F-1524
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ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington Street, Raleigh, NC 27611

2024 STANDARD SPECIFICATIONS

Designed by:

FORREST BROOKS, PE
NAME

4039
LEVEL III CERTIFICATION NO.

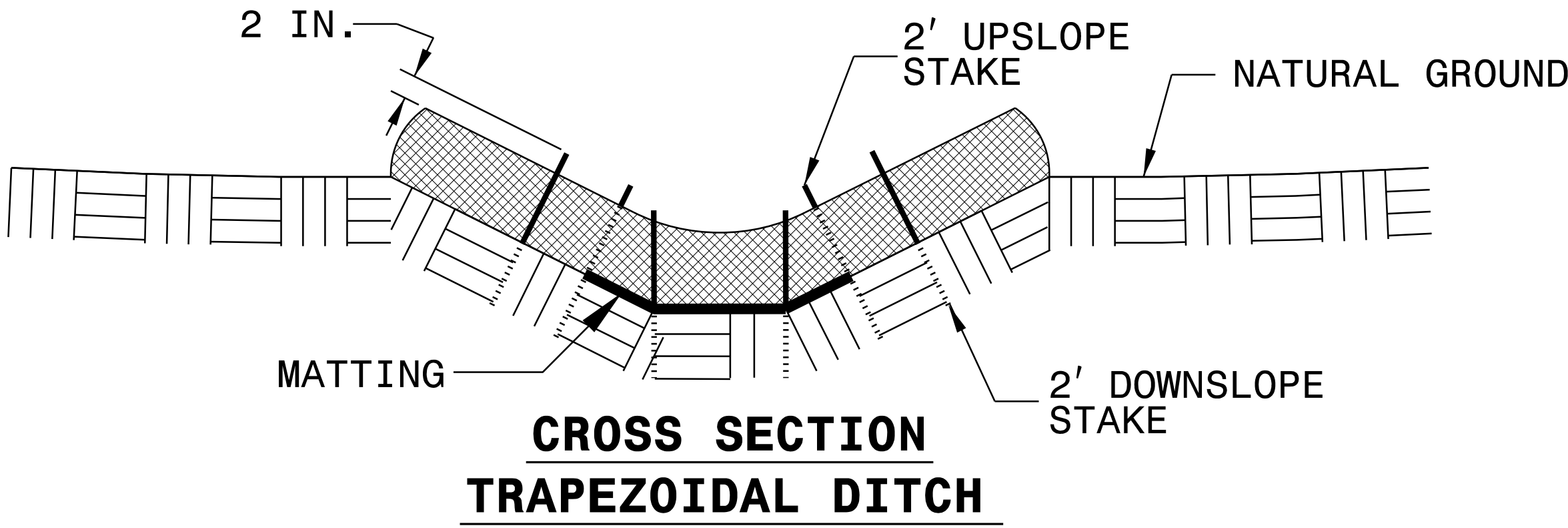
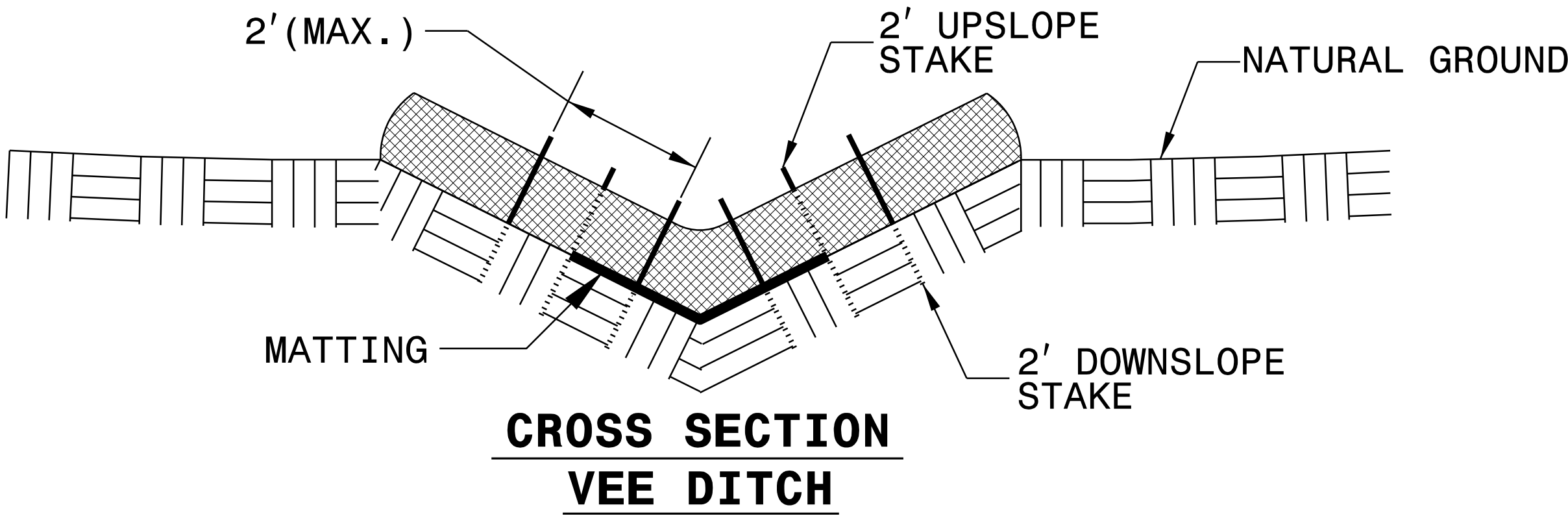
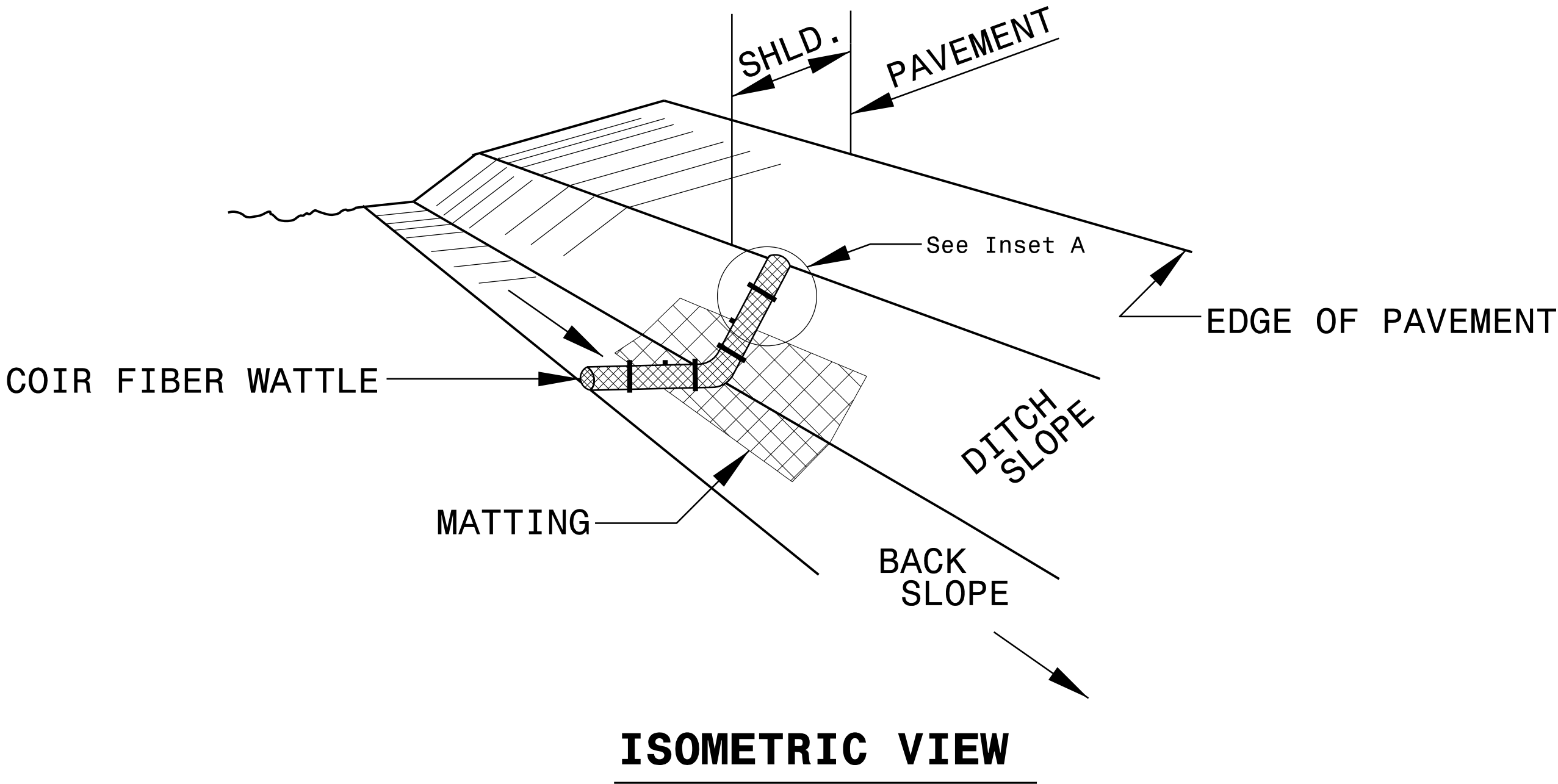
Roadway Standard Drawings

The following roadway english standards as appear in "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.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

COIR FIBER WATTLE DETAIL

PROJECT REFERENCE NO.	SHEET NO.
H10008G	EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

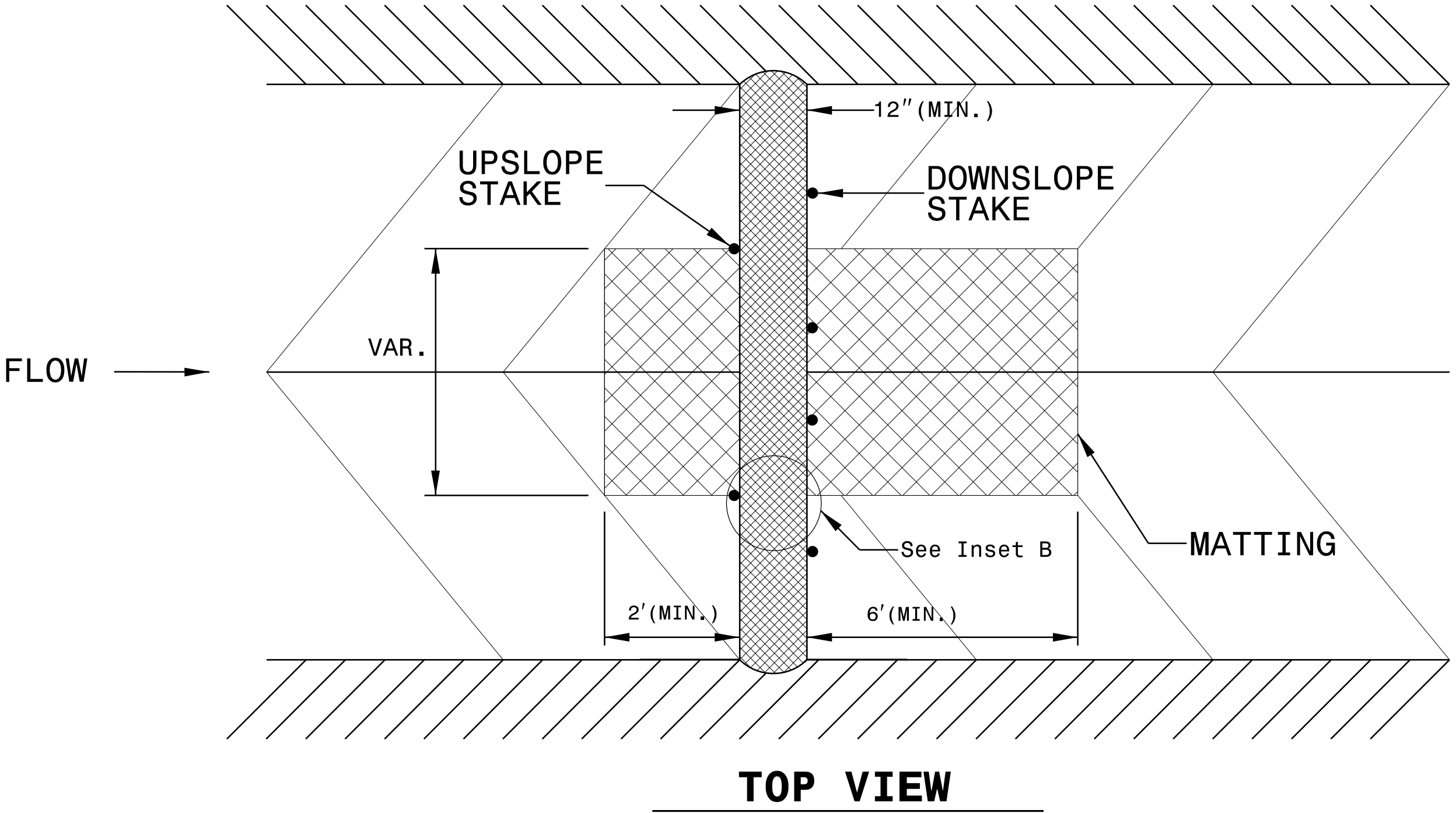
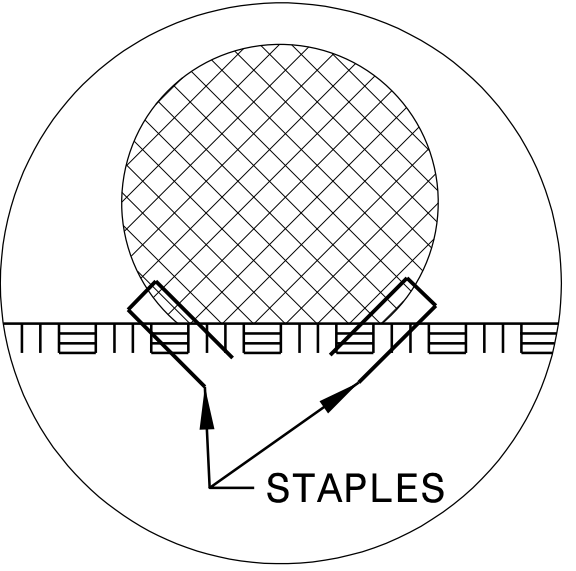
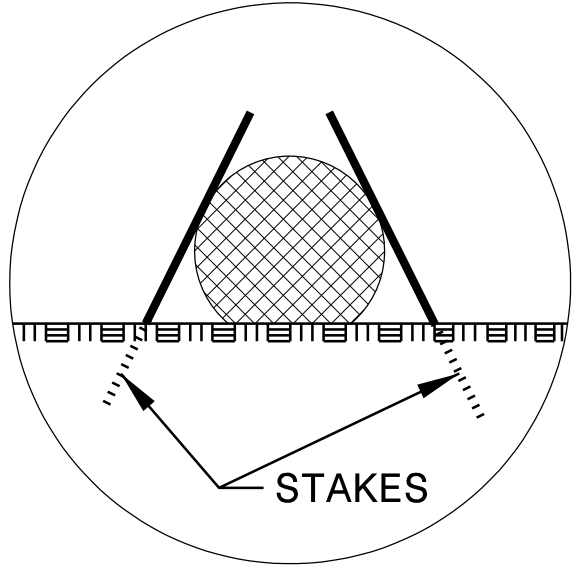
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



OF EXCEL 81

	FROM	TO		
--	------	----	--	--

[illegible]

	FROM	TO		
--	------	----	--	--

[illegible]

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
HL0008G	EC-3B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

8/17/99

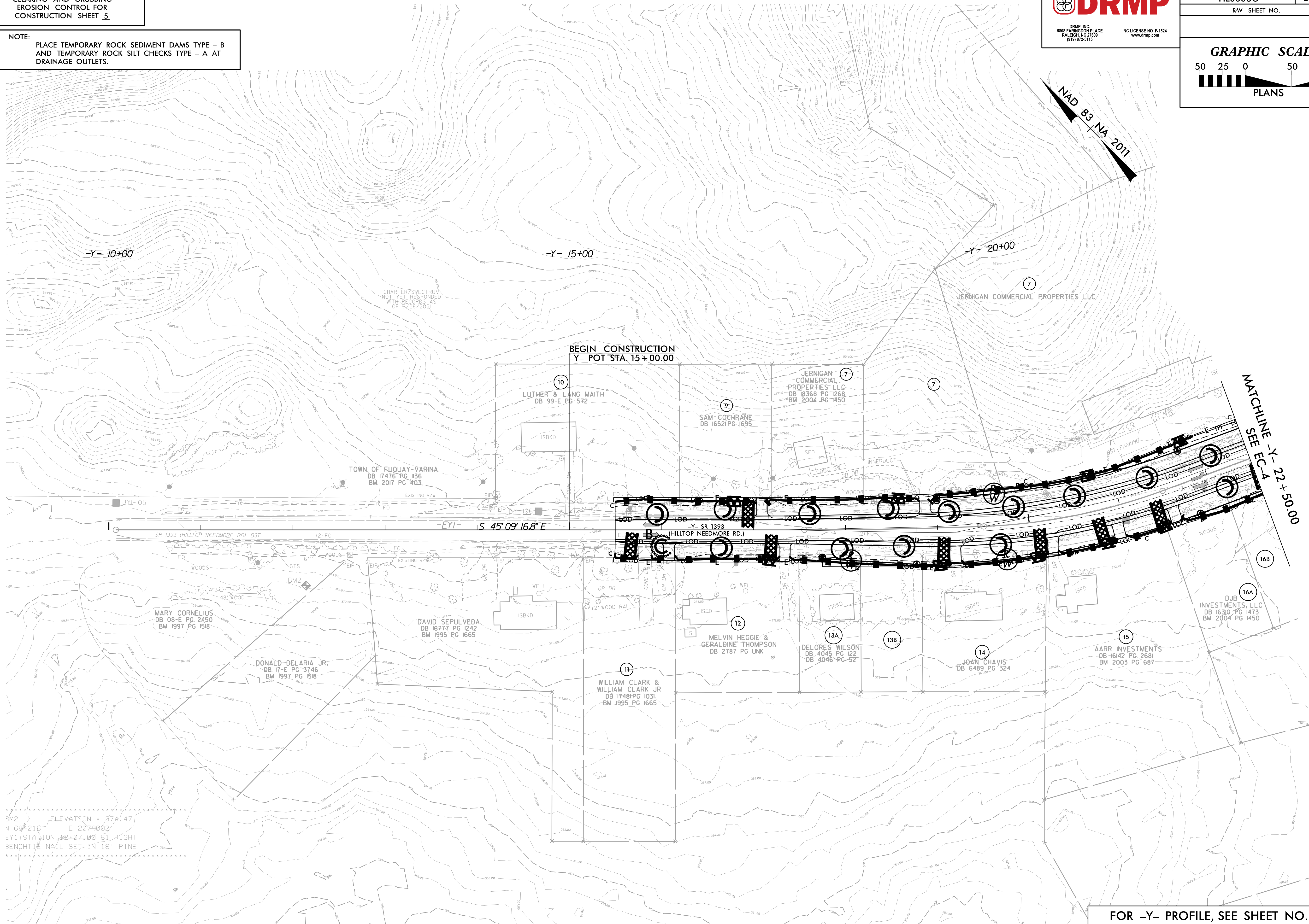
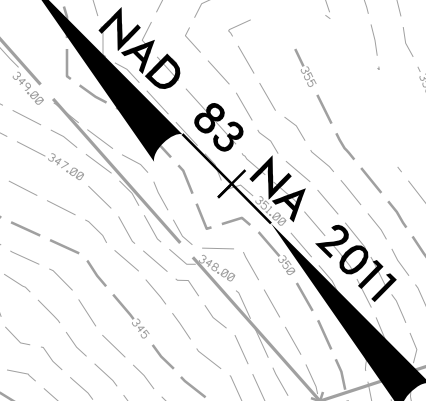
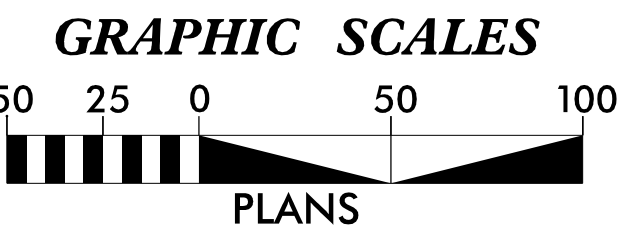
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

NOTE:

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



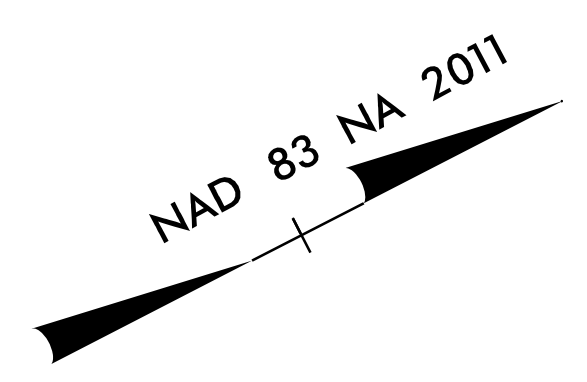
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HL0008G	EC- 5 /CONST.5
RW SHEET NO.	



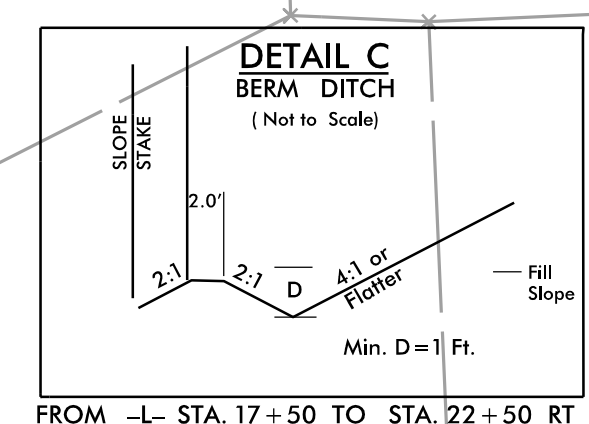
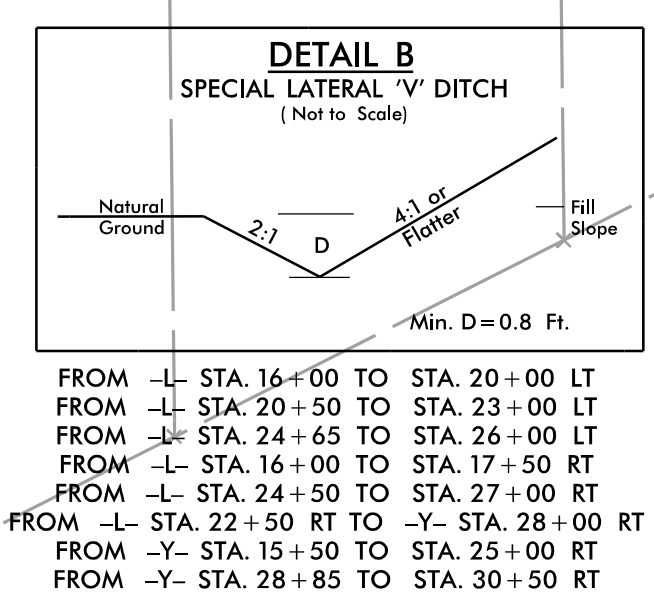
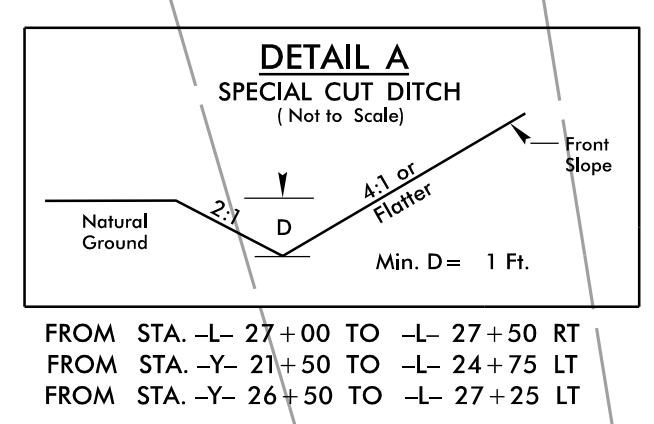
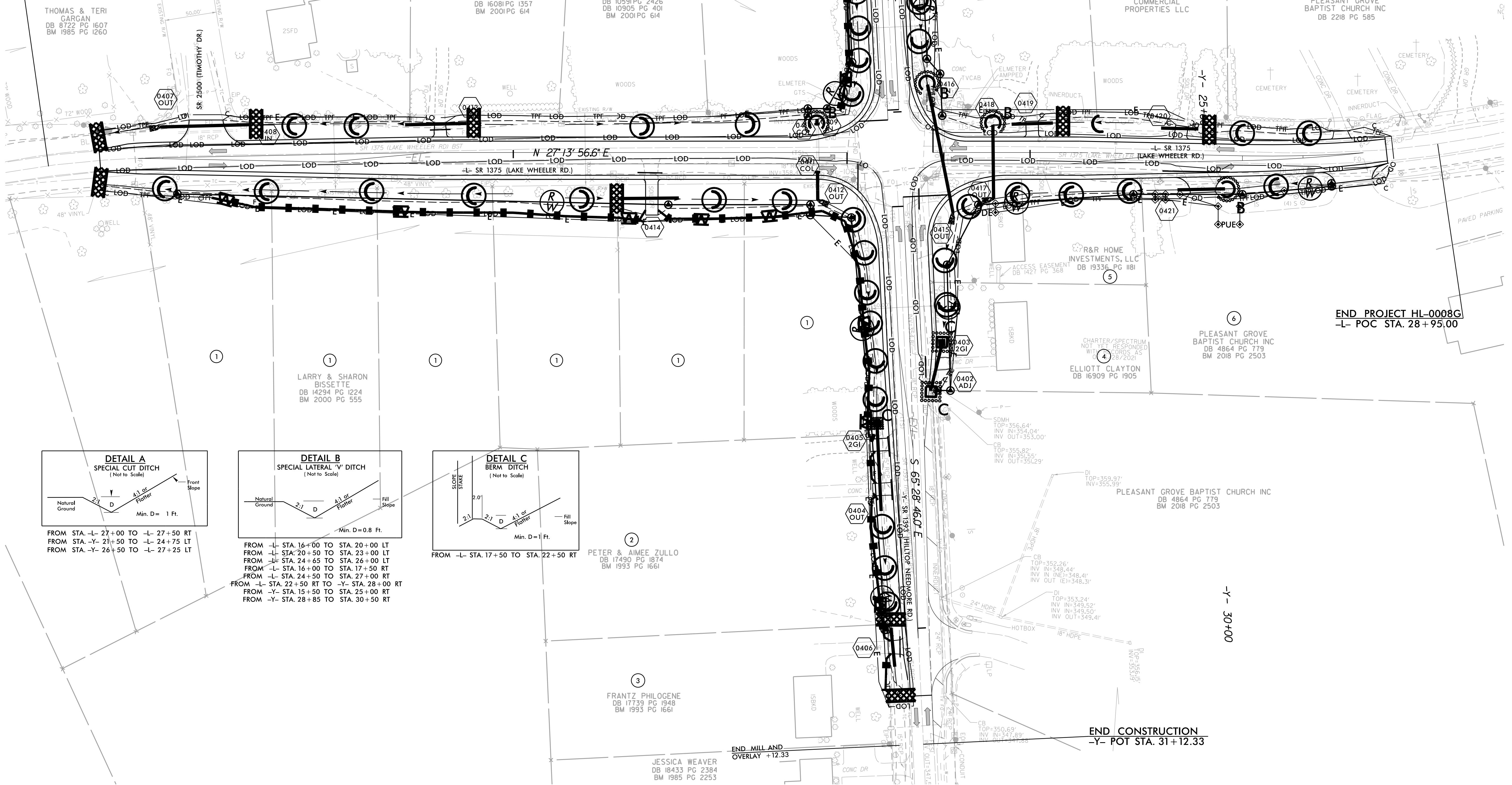
FOR -Y- PROFILE, SEE SHEET NO. 6

REVISIONS

3/13/2024
HL0008G_EC-ps05.dgn
User: mindsey



BEGIN PROJECT HL-0008G
L- POC STA. 15+50.00



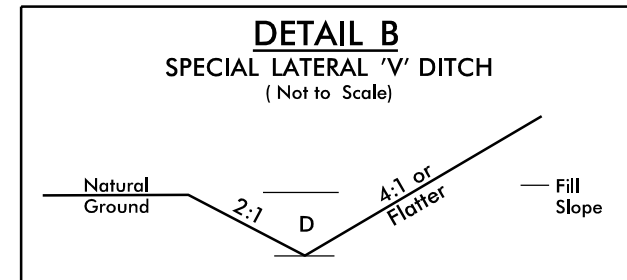
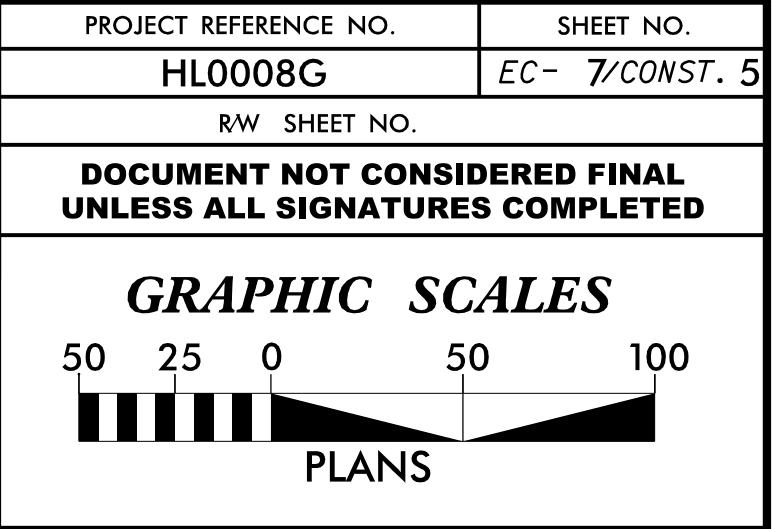
PETER & AIMEE ZULLO
DB 17490 PG 1874
BM 1993 PG 1661

FRANTZ PHILOGENE
DB 17739 PG 1948
BM 1993 PG 1661

JESSICA WEAVER
DB 18433 PG 2384
BM 1985 PG 2253

END MILL AND
OVERLAY +12.33

END CONSTRUCTION
-Y- POT STA. 31+12.33



FROM -Y- STA. 15+50 TO STA. 21+50 LT
FROM -Y- STA. 15+50 TO STA. 25+00 RT
FROM -Y- STA. 28+85 TO STA. 30+50 RT

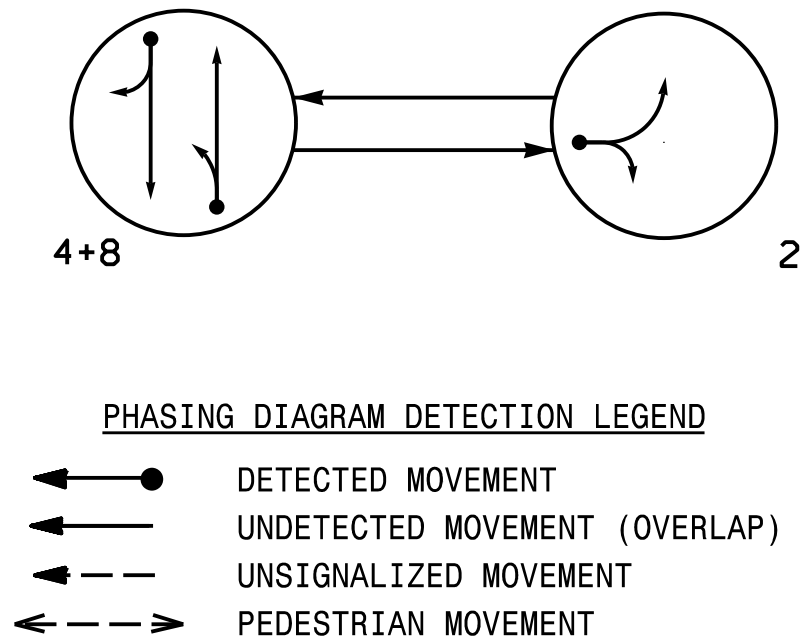
-Y- 20+00

NAD 83 NA 2011



3/13/2024
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User: mlindsey

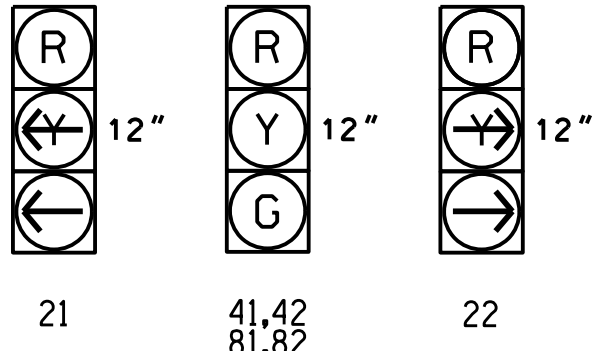
PHASING DIAGRAM



SIGNAL FACE	PHASE		
	4+8	2	FLASH
21	R	—	R
22	R	→	R
41, 42	G	R	R
81, 82	G	R	R

SIGNAL FACE I.D.

All Heads L.E.D.



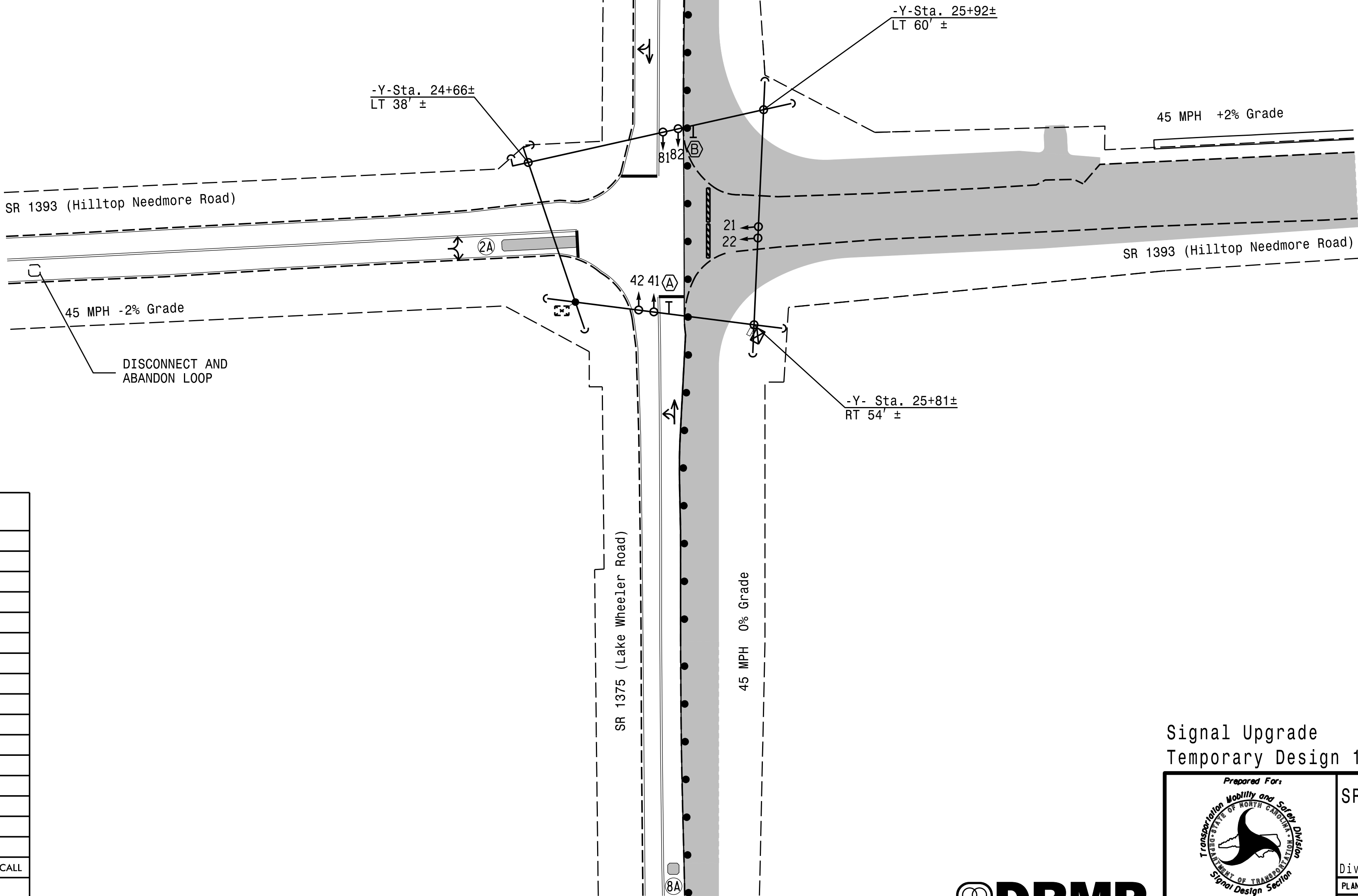
MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
ZONES	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	URNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
2A	6X40	0	*	*	2	5.0	-	X	-	X	*
4A	6X6	300	*	*	4	-	-	X	X	X	*
8A	6X6	300	*	*	8	-	-	X	X	X	*

* Video Detection

2 Phase
Fully Actuated
(Fuquay-Varina Signal System)

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.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



MAXTIME TIMING CHART				
FEATURE	PHASE			
	2	4	8	
Walk *	-	-	-	
Ped Clear	-	-	-	
Min Green*	7	12	12	
Passage *	2.0	6.0	6.0	
Max 1 *	40	90	90	
Yellow Change	3.0	4.8	4.8	
Red Clear	1.9	1.0	1.0	
Added Initial *	-	2.5	2.5	
Maximum Initial *	-	34	34	
Time Before Reduction *	-	15	15	
Time To Reduce *	-	30	30	
Minimum Gap	-	3.0	3.0	
Advance Walk	-	-	-	
Non Lock Detector	X	-	-	
Vehicle Recall	-	MIN RECALL	MIN RECALL	
Dual Entry	-	-	-	

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 4 and 8 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

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	⊠
⊠	Oversized Junction Box	⊠
⊠	2-in Underground Conduit	⊠
N/A	Right of Way	---
→	Directional Arrow	→
▬	Non-Intrusive Detection Zone	N/A
▬	Construction Zone	N/A
▬	Type III Barricade	N/A
▬	Construction Zone Drums	N/A
— PUE —	Permanent Utility Easement	N/A
(A)	No Left Turn Sign (R3-2)	(A)
(B)	No Right Turn Sign (R3-1)	(B)

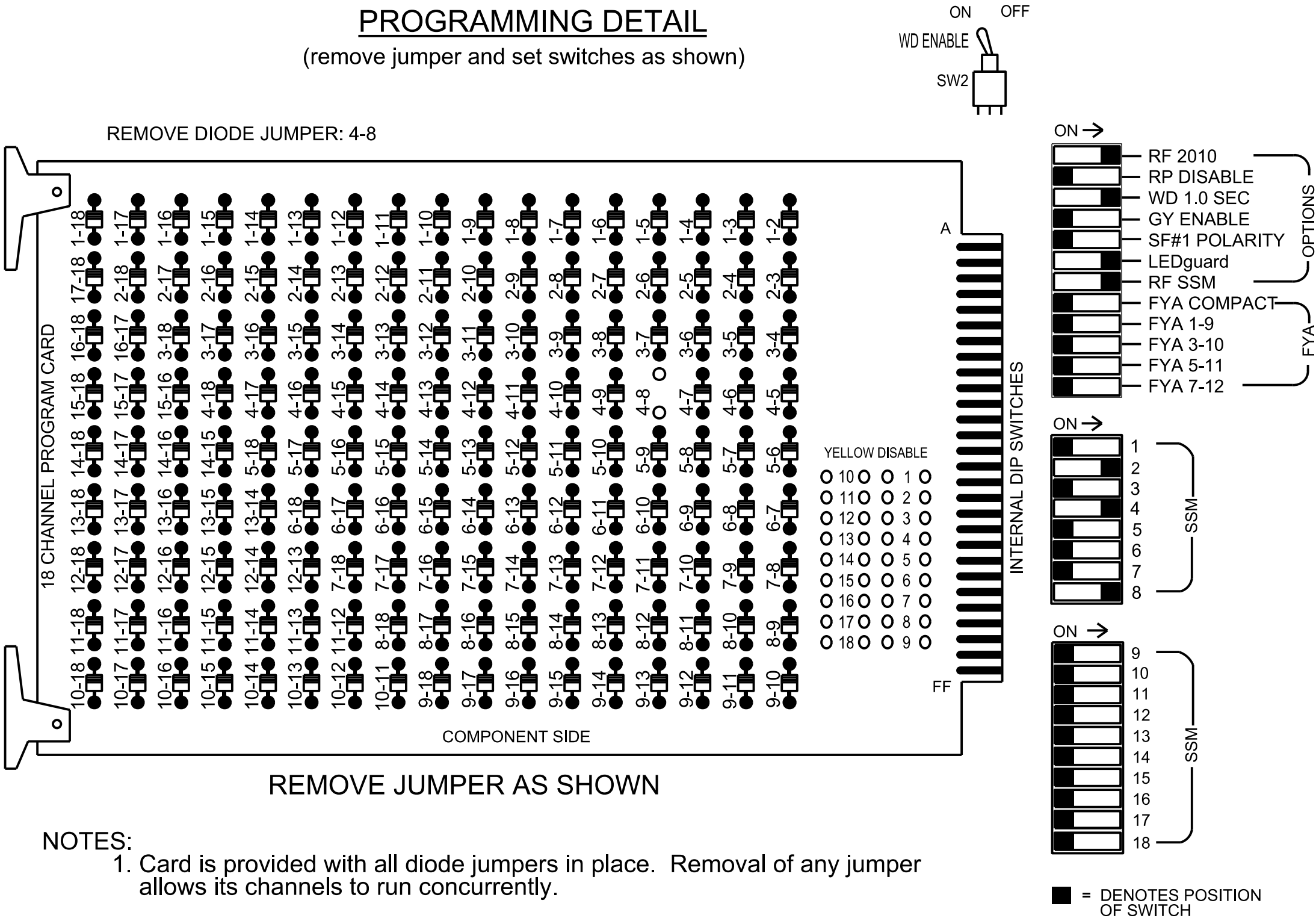
Signal Upgrade
Temporary Design 1 - (TMP Phase I)



 DRMP, INC. 8210 UNIVERSITY EXECUTIVE PARK DR. SUITE 220 CHARLOTTE, NC 28202 PHONE: 704-548-4260	Prepared For: Transportation Mobility and Safety Division NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Signal Design Section		SR 1393 (Hilltop Needmore Road) at SR 1375 (Lake Wheeler Road)		
	Division 5 Wake County Fuquay-Varina				
	PLAN DATE: December 2024 REVIEWED BY: ZM Esposito				
	PREPARED BY: DS Griffith DRMP PROJ. NO.: 21194(040)				
REVISIONS		INIT.	DATE	Signed by: Zachary M. Esposito 12/3/2024 DATE	
				SIGNATURE	
				SIC. INVENTORY NO. 05-155311	

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumper and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.

NOTES

- 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.
- Program controller to start up in phase 2 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Fuquay-Varina Signal System.

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.....S2, S5, S11
Phases Used.....2, 4, 8
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....NOT USED
Overlap "4".....NOT USED

SIGNAL HEAD HOOK-UP CHART

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	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	NU	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101						107							
YELLOW					102						108							
GREEN					103						109							
RED ARROW																		
YELLOW ARROW		129																
FLASHING YELLOW ARROW																		
GREEN ARROW		130																

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	FS
FILE "I" L	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	DC ISOLATOR
FILE "J" U	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	S O T	FS
FILE "J" L	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	E M P T Y	DC ISOLATOR

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

FS = FLASH SENSE
ST = STOP TIME

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu>Controller>Unit

Web Interface
Home>Controller>Unit

Start Up Parameters

Startup Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

SPECIAL DETECTOR NOTE

For all loops install a video detection system for 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: 05-1553T1
DESIGNED: Dec 2024
SEALED: 12/3/2024
REVISED: N/A

Electrical Detail
Temporary Design 1

ELECTRICAL AND PROGRAMMING
DETAILS FOR:



SR 1393 (Hilltop Needmore Road)
at
SR 1375 (Lake Wheeler Road)
Division 5 Wake County Fuquay-Varina
PLAN DATE: December 2024 REVIEWED BY: ZM Esposito
PREPARED BY: DS Griffith DRMP PROJ. NO: 21194 (040)

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



Signed by: *Zachary M. Esposito*
DATE: 12/3/2024
SIGNATURE
DATE
SIG. INVENTORY NO. 05-1553T1



DRMP, INC.
8210 UNIVERSITY EXECUTIVE PARK DR.
SUITE 220
CHARLOTTE, NC 28202
PHONE: 704-548-4260

NC LICENSE NO. F-1524
www.drmp.com

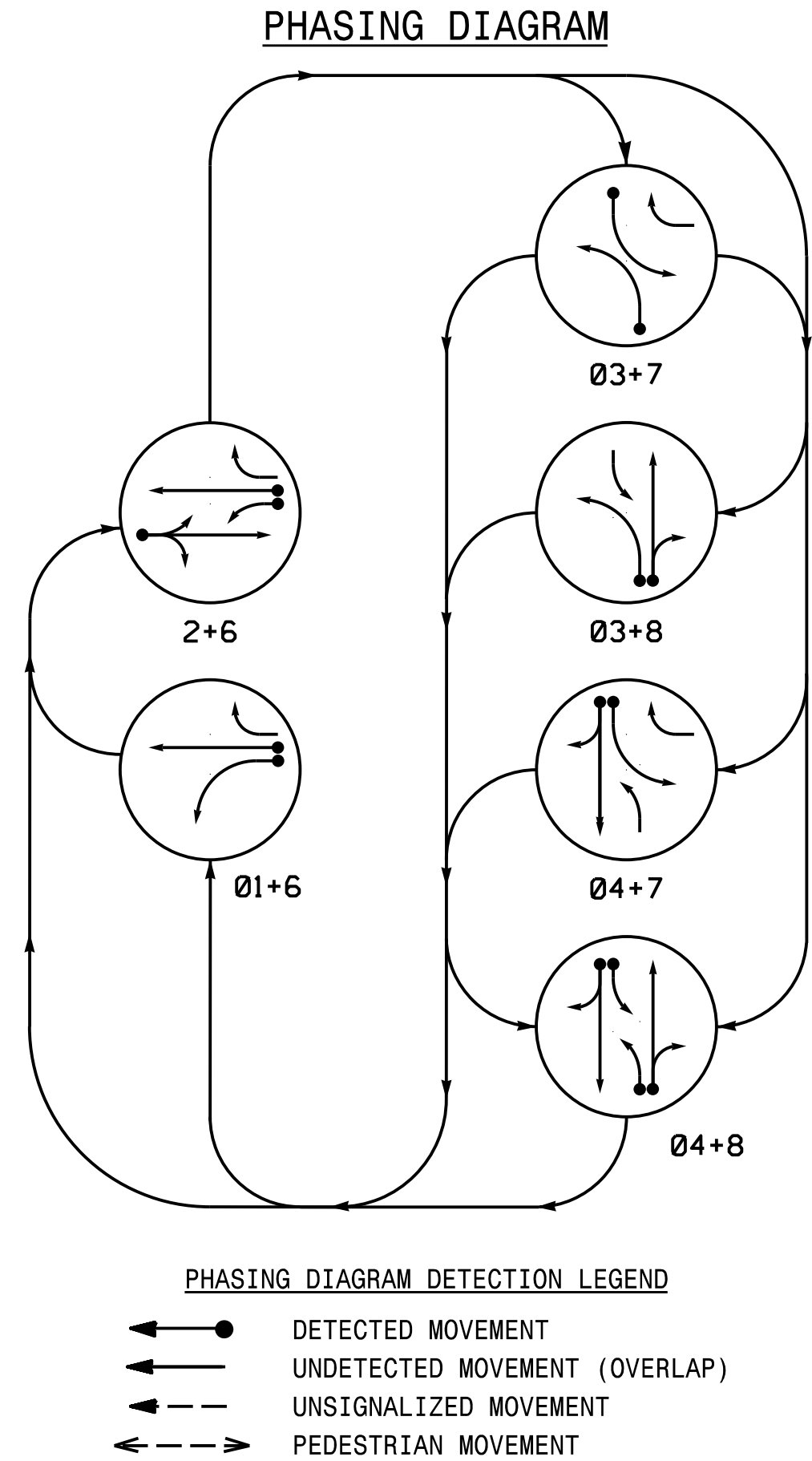
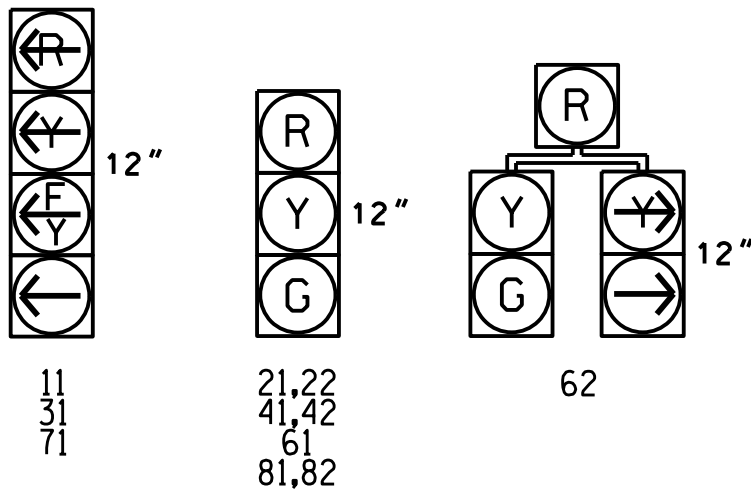


TABLE OF OPERATION								
SIGNAL FACE	PHASE						FLASH	
	1 + 6	2 + 6	3 + 7	3 + 8	4 + 7	4 + 8		
11	—	—	—	—	—	—	—	—
21, 22	R	G	R	R	R	R	R	R
31	—	—	—	—	—	—	—	—
41, 42	R	R	R	R	G	G	R	R
61	G	G	R	R	R	R	R	R
62	G	G	R	R	R	R	R	R
71	—	—	—	—	—	—	—	—
81, 82	R	R	R	G	R	G	R	R

SIGNAL FACE I.D.

All Heads L.E.D.



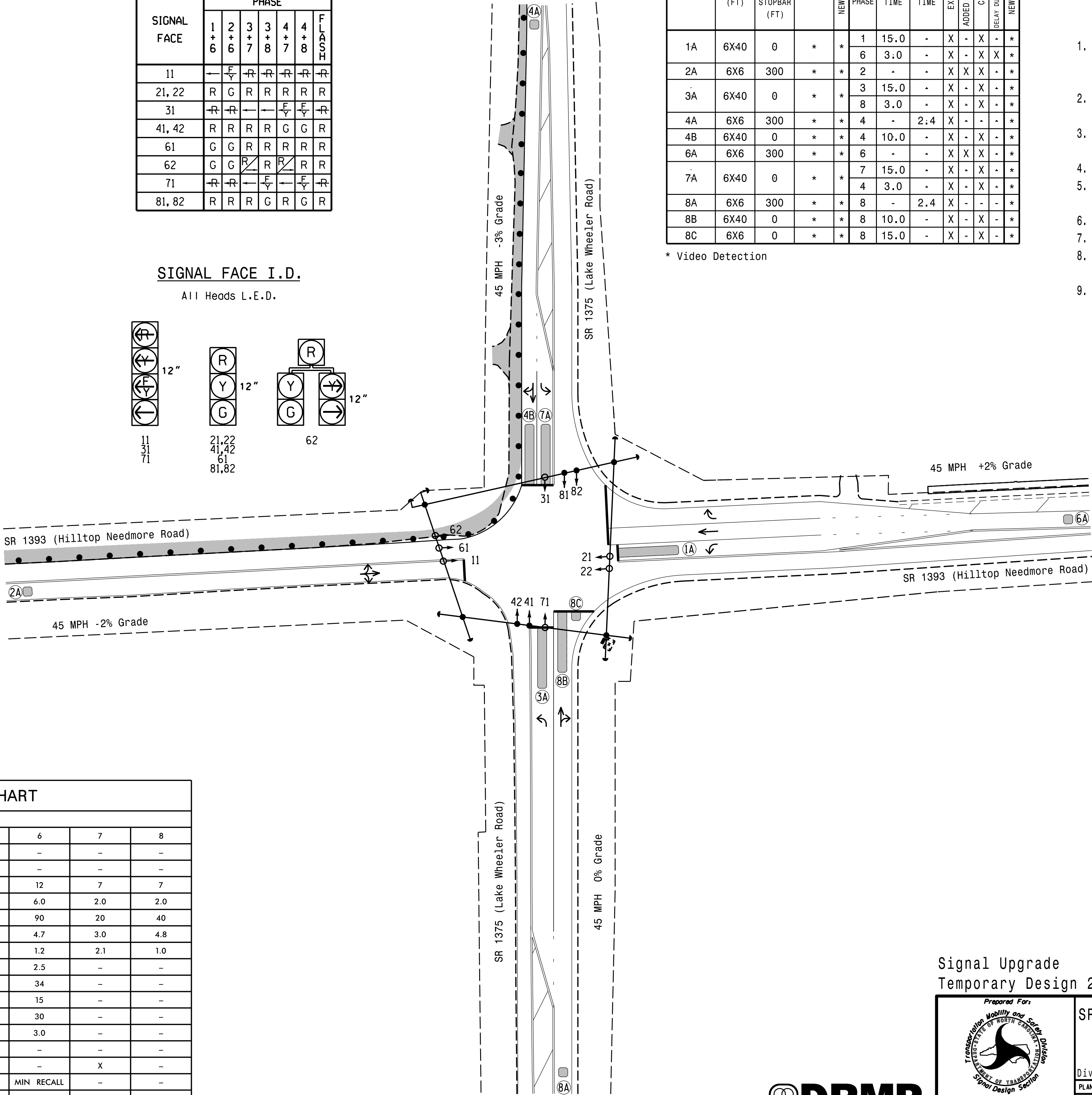
MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
ZONES	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
1A	6X40	0	*	*	1	15.0	-	X	-	X	-
2A	6X6	300	*	*	2	-	-	X	X	X	*
3A	6X40	0	*	*	3	15.0	-	X	-	X	-
4A	6X6	300	*	*	4	-	2.4	X	-	-	*
4B	6X40	0	*	*	4	10.0	-	X	-	X	-
6A	6X6	300	*	*	6	-	-	X	X	X	-
7A	6X40	0	*	*	7	15.0	-	X	-	X	-
8A	6X6	300	*	*	8	-	2.4	X	-	-	*
8B	6X40	0	*	*	8	10.0	-	X	-	X	-
8C	6X6	0	*	*	8	15.0	-	X	-	X	-

* Video Detection

6 Phase Fully Actuated (Fuquay-Varina Signal System)

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.
- Reposition existing signal heads numbered 41, 42, 81 and 82, respectively.
- Omit phase 1 during phase 2 on.
- Program controller to clear from phase 2+6 to phase 1+6 by progressing through phase 4+8 (see Electrical Details).
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



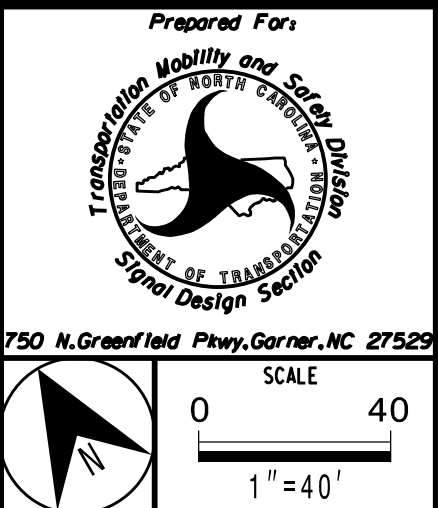
MAXTIME TIMING CHART								
FEATURE	PHASE							
	1	2	3	4	6	7	8	
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Min Green*	7	12	7	7	12	7	7	-
Passage *	2.0	6.0	2.0	2.0	6.0	2.0	2.0	-
Max I *	20	90	20	40	90	20	40	-
Yellow Change	3.0	4.7	3.0	4.8	4.7	3.0	4.8	-
Red Clear	2.1	1.2	1.9	1.0	1.2	2.1	1.0	-
Added Initial *	-	2.5	-	-	2.5	-	-	-
Maximum Initial *	-	34	-	-	34	-	-	-
Time Before Reduction *	-	15	-	-	15	-	-	-
Time To Reduce *	-	30	-	-	30	-	-	-
Minimum Gap	-	3.0	-	-	3.0	-	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	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 Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

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

Signal Upgrade Temporary Design 2 - (TMP Phase II)



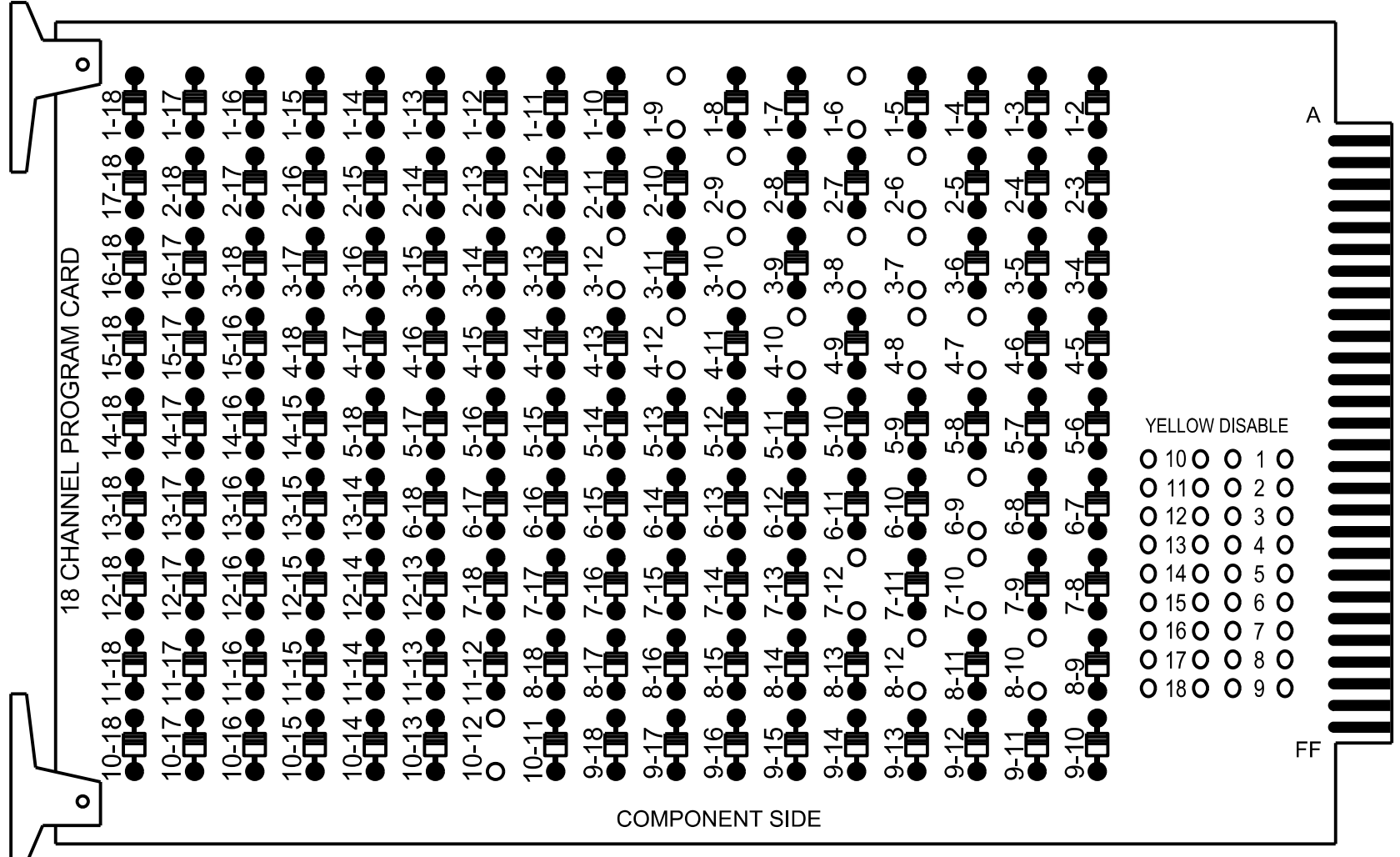
SR 1393 (Hilltop Needmore Road) at SR 1375 (Lake Wheeler Road)	
Division 5	Wake County
Fuquay-Varina	
PLAN DATE: December 2024	REVIEWED BY: ZM Esposito
PREPARED BY: DS Griffith	DRMP PROJ. NO.: 21194 (040)
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
SEAL	
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054155	
ZACHARY M. ESPOSITO	
SIGNATURE	DATE
12/3/2024	
SIG. INVENTORY NO. 05-1553T2	

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.

NOTES

- 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.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and phase 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Fuquay-Varina Signal System.

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, S10, S11,
AUX S1, AUX S2, AUX S5
Phases Used.....1, 2, 3, 4, 6, 7, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....*
*See overlap programming detail on this sheet

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

BACKUP PREVENTION PROGRAMMING

Front Panel

Main Menu >Controller >Sequence & Phs Config >Backup Prevention > Backup Protection Plan

Web Interface

Home >Controller> Backup Prevention >Backup Protection Plan

Sequence 1

No Backup Phase	1	2	3	4	5	6	7	8
Serve Phase 1	*	*	*	*	*	*	*	*
Serve Phase 2	X	*	*	*	*	*	*	*
Serve Phase 3	*	*	*	*	*	*	*	*
Serve Phase 4	*	*	*	*	*	*	*	*
Serve Phase 5	*	*	*	*	*	*	*	*
Serve Phase 6	*	*	*	*	*	*	*	*
Serve Phase 7	*	*	*	*	*	*	*	*
Serve Phase 8	*	*	*	*	*	*	*	*

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1553T2
DESIGNED: Dec 2024
SEALED: 12/3/2024
REVISED: N/A

MAXTIME STARTUP AND
SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel

Main Menu>Controller>Unit

Web Interface

Home>Controller>Unit

Start Up Parameters

Startup Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

BACKUP CALL PHASE
PROGRAMMING

Front Panel

Main Menu >Controller >Sequence & Phs Config>Backup Prevention > Backup Call Phase Plans

Web Interface

Home >Controller >Backup Prevention >Backup Calls Phase Plans >

Sequence 1

Serve Phase	Backup Call Phase
1	*
2	4
3	*
4	*
5	*
6	*
7	*
8	*

PROJECT REFERENCE NO.	SHEET NO.
HL-00086	Sig-2.1

SIGNAL HEAD HOOK-UP CHART

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	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	41,42	NU	NU	61,62	NU	62	71	81,82	NU	11	31	NU	NU	71
RED		128			101			134			*	107						
YELLOW	*	129		*	102			135				108						
GREEN		130			104			136				109						
RED ARROW													A121	A124			A101	
YELLOW ARROW										123			A122	A125			A102	
FLASHING YELLOW ARROW													A123	A126			A103	
GREEN ARROW	127			118						124	124							

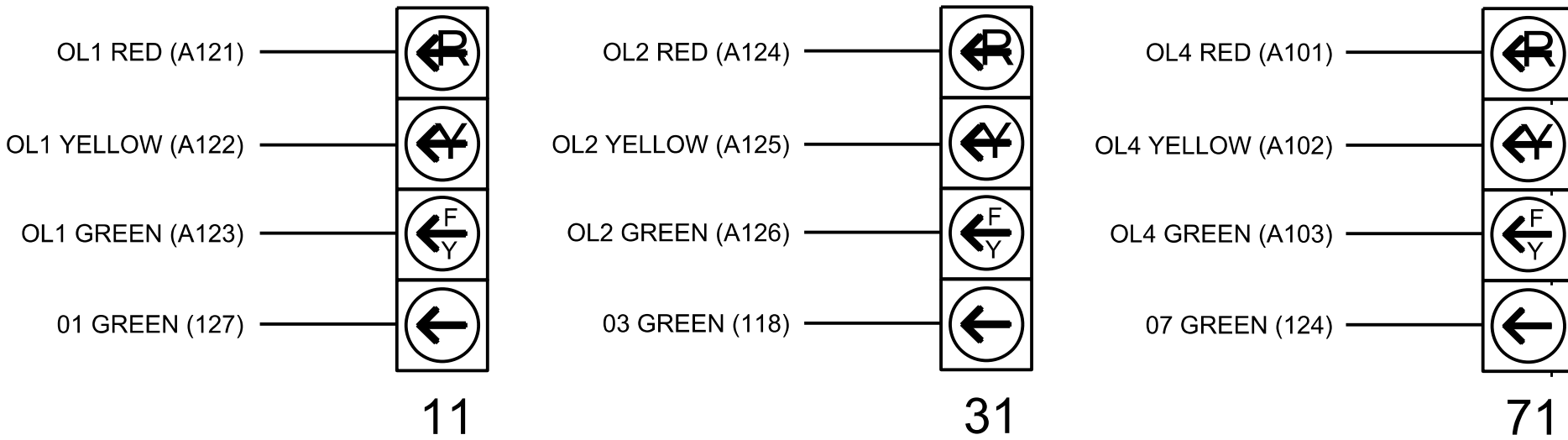
NU = Not Used

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

* See pictorial of head wiring in detail this sheet.

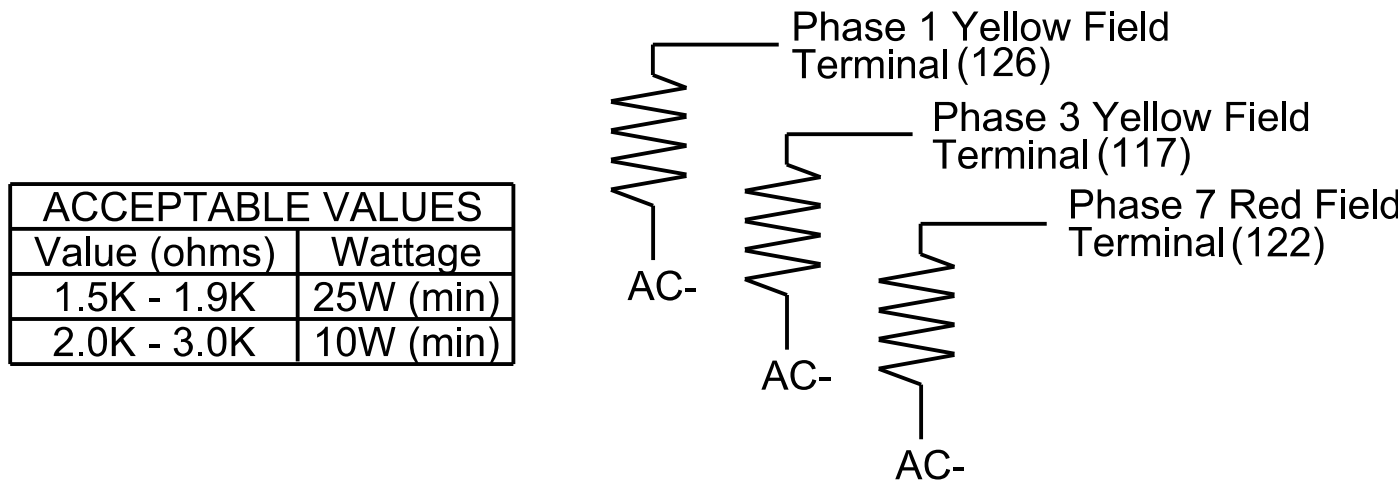
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



SPECIAL DETECTOR NOTE

For all loops, install a video detection system for 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.

FLASHER CIRCUIT MODIFICATION DETAIL

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

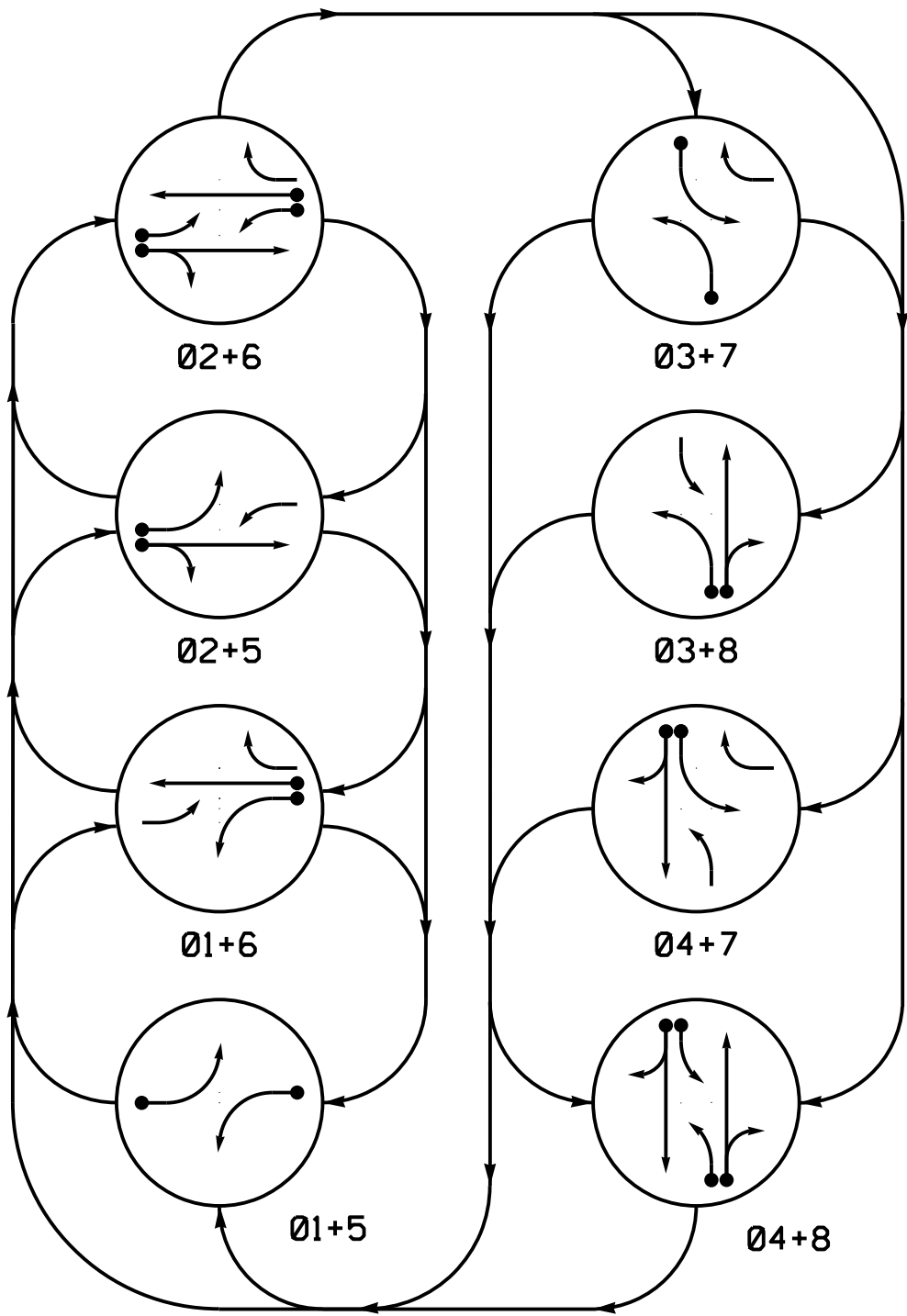
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

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

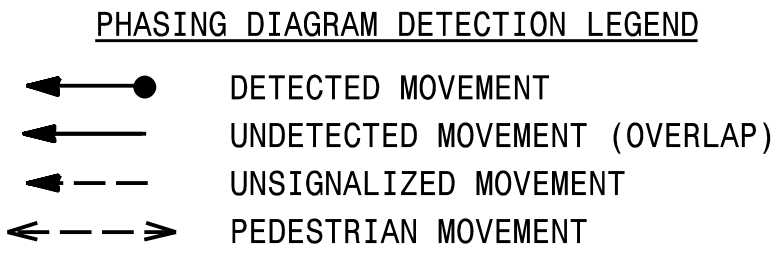
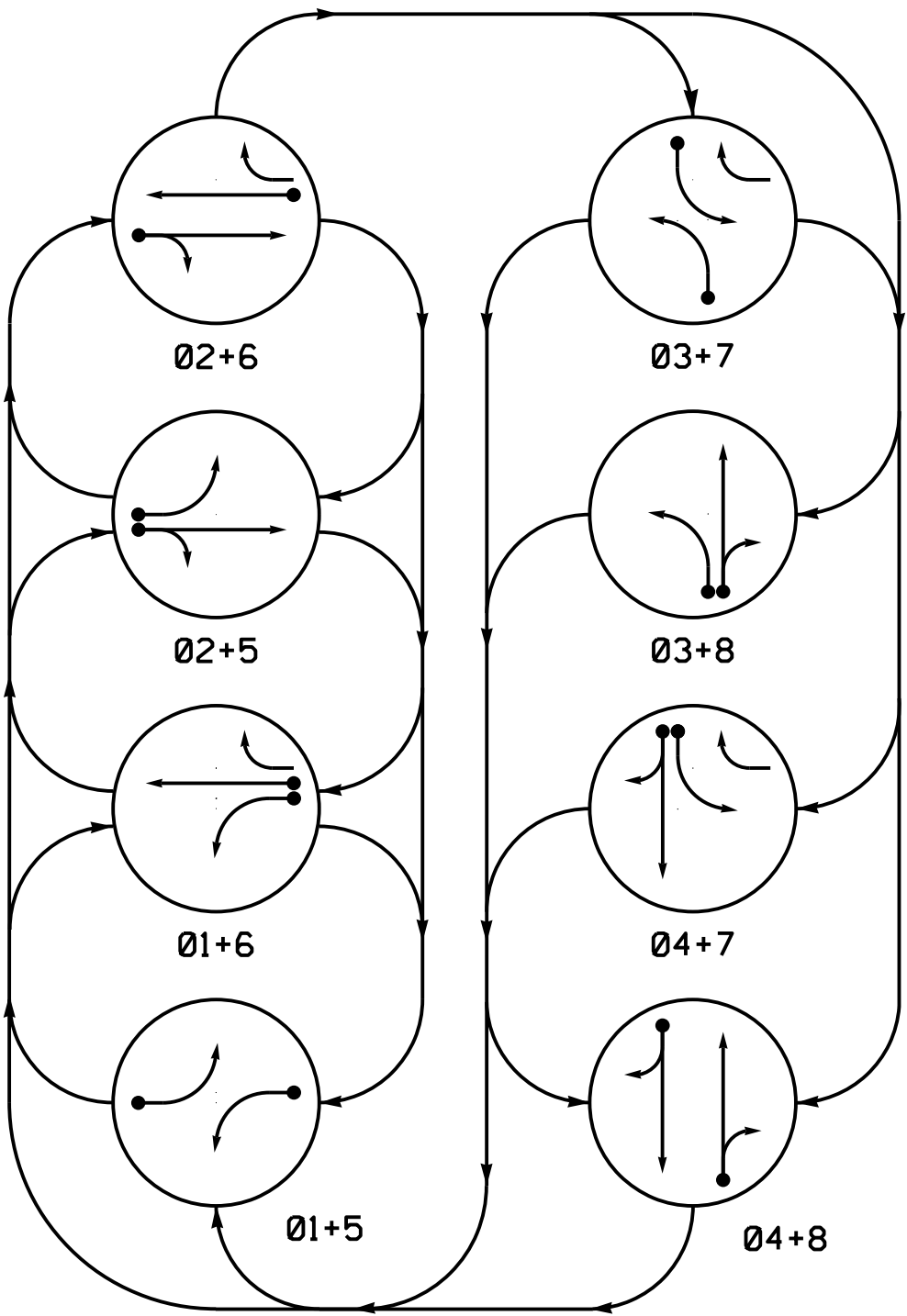
Electrical Detail Temporary Design 2 - (TMP Phase II)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1393 (Hilltop Needmore Road) at SR 1375 (Lake Wheeler Road)	
Division 5 Wake County Fuquay-Varina		Seal of North Carolina Professional Engineer ZM Esposito	
PLAN DATE: December 2024 REVIEWED BY: ZM Esposito		Prepared by: DS Griffith DRMP PROJ. NO: 21194 (040)	
REVISIONS		INIT.	DATE
750 N. Greenfield Pkwy, Corner, NC 27529			
DRMP, INC. 8210 UNIVERSITY EXECUTIVE PARK DR. SUITE 220 CHARLOTTE, NC 28202 PHONE: 704-548-4260		NC LICENSE NO. F-1524 www.drmp.com	

PROJECT REFERENCE NO.	SHEET NO.
HL-00086	Sig-3.0

DEFAULT PHASING DIAGRAM

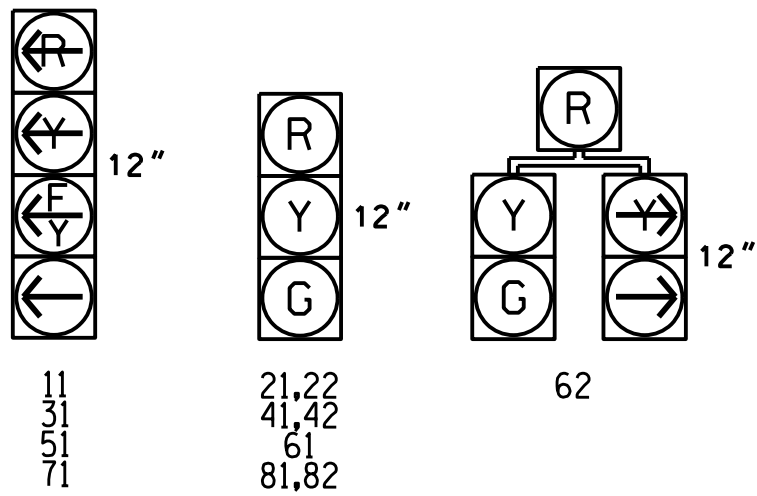


ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Min Green*	7	12	7	7	7	12	7	7
Passage *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	25	40	20	90	25	40
Yellow Change	3.0	4.7	3.0	4.8	3.0	4.7	3.0	4.8
Red Clear	2.1	1.0	2.1	1.0	2.3	1.0	2.1	1.0
Added Initial *	-	2.5	-	-	-	2.5	-	-
Maximum Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	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 Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
1A	6X40	0	2-4-2	X	1	15.0*	-	X	-	X	-
2A	6X6	300	5	X	2	3.0	-	X	-	X	-
3A	6X40	0	2-4-2	X	3	15.0*	-	X	-	X	-
4A	6X6	300	5	X	4	3.0	-	X	-	X	-
4B	6X40	0	2-4-2	X	4	10.0	-	X	-	X	-
5A	6X40	0	2-4-2	X	5	15.0*	-	X	-	X	-
6A	6X6	300	5	X	6	3.0	-	X	-	X	-
7A	6X40	0	2-4-2	X	7	15.0*	-	X	-	X	-
8A	6X6	300	5	X	8	3.0	-	X	-	X	-
8B	6X40	0	2-4-2	X	8	10.0	-	X	-	X	-
8C	6X6	0	5	X	8	15.0	-	X	-	X	-

* Reduce delay to 3.0 seconds during Alternate Phasing operation.
Disable phase call for loop during Alternate Phasing operation.

8 Phase
Fully Actuated
(Fuquay-Varina Signal System)

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 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

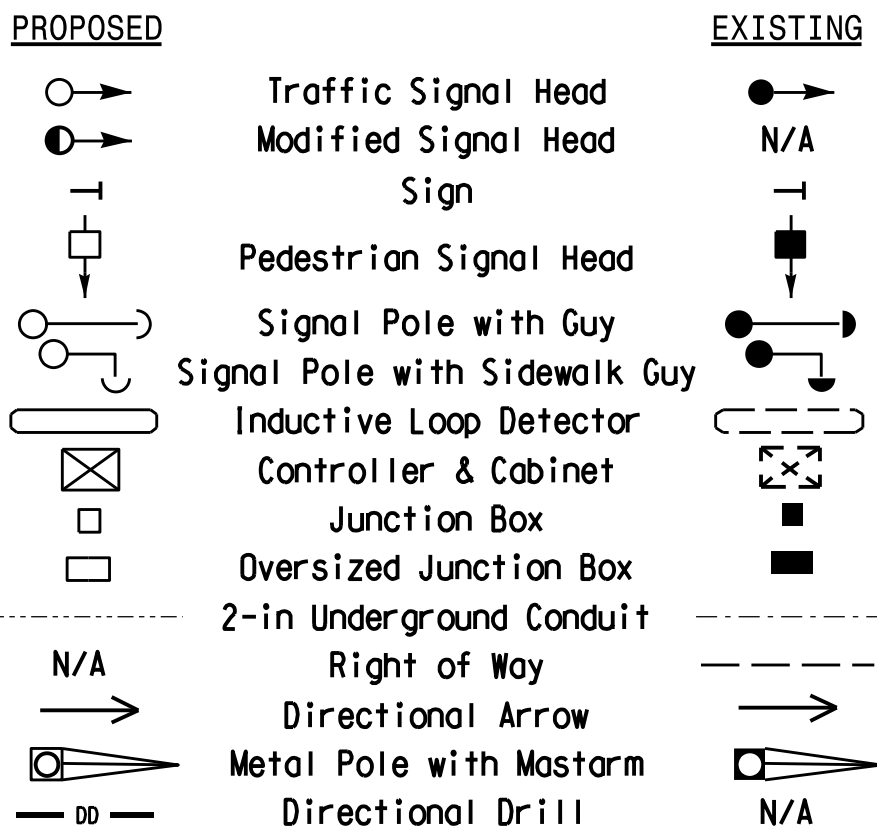
DEFAULT PHASING
TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	-	-	F	F	R	R	R	R
21,22	R	R	G	G	R	R	R	R
31	R	R	R	R	-	F	F	R
41,42	R	R	R	R	R	G	G	R
51	-	F	F	F	R	R	R	R
61	R	G	R	G	R	R	R	R
62	R	G	R	G	R	R	R	R
71	R	R	R	R	-	F	F	R
81,82	R	R	R	R	R	G	G	R

ALTERNATE PHASING
TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	-	-	R	R	R	R	R	R
21,22	R	R	G	G	R	R	R	R
31	R	R	R	R	-	R	R	R
41,42	R	R	R	R	R	G	G	R
51	-	-	-	-	R	R	R	R
61	R	G	R	G	R	R	R	R
62	R	G	R	G	R	R	R	R
71	R	R	R	R	-	R	R	R
81,82	R	R	R	R	R	G	G	R

LEGEND

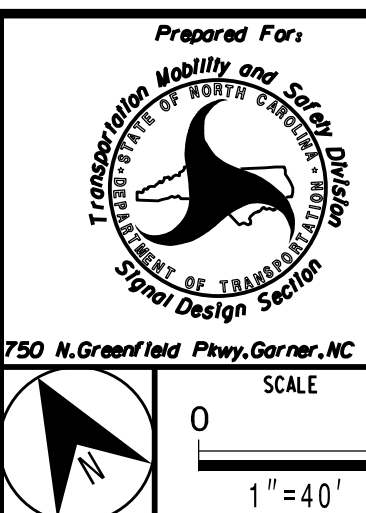


Signal Upgrade - Final Design



DRMP, INC.
2210 UNIVERSITY EXECUTIVE PARK DR.
SUITE 220
CHARLOTTE, NC 28202
PHONE: 704-548-4260

NC LICENSE NO. F-1524
www.drmp.com



SR 1393 (Hilltop Needmore Road)
at
SR 1375 (Lake Wheeler Road)

Division 5 Wake County Fuquay-Varina

PLAN DATE: December 2024 REVIEWED BY: ZM Esposito

PREPARED BY: DS Griffith DRMP PROJ. NO.: 21194 (040)

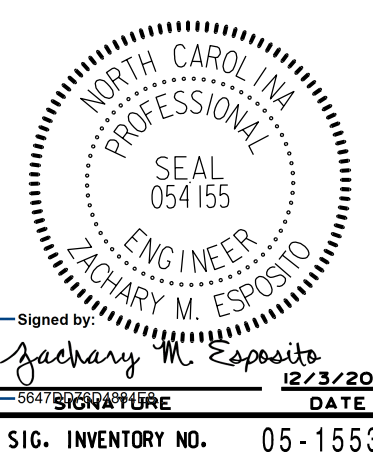
REVISIONS

INIT. DATE

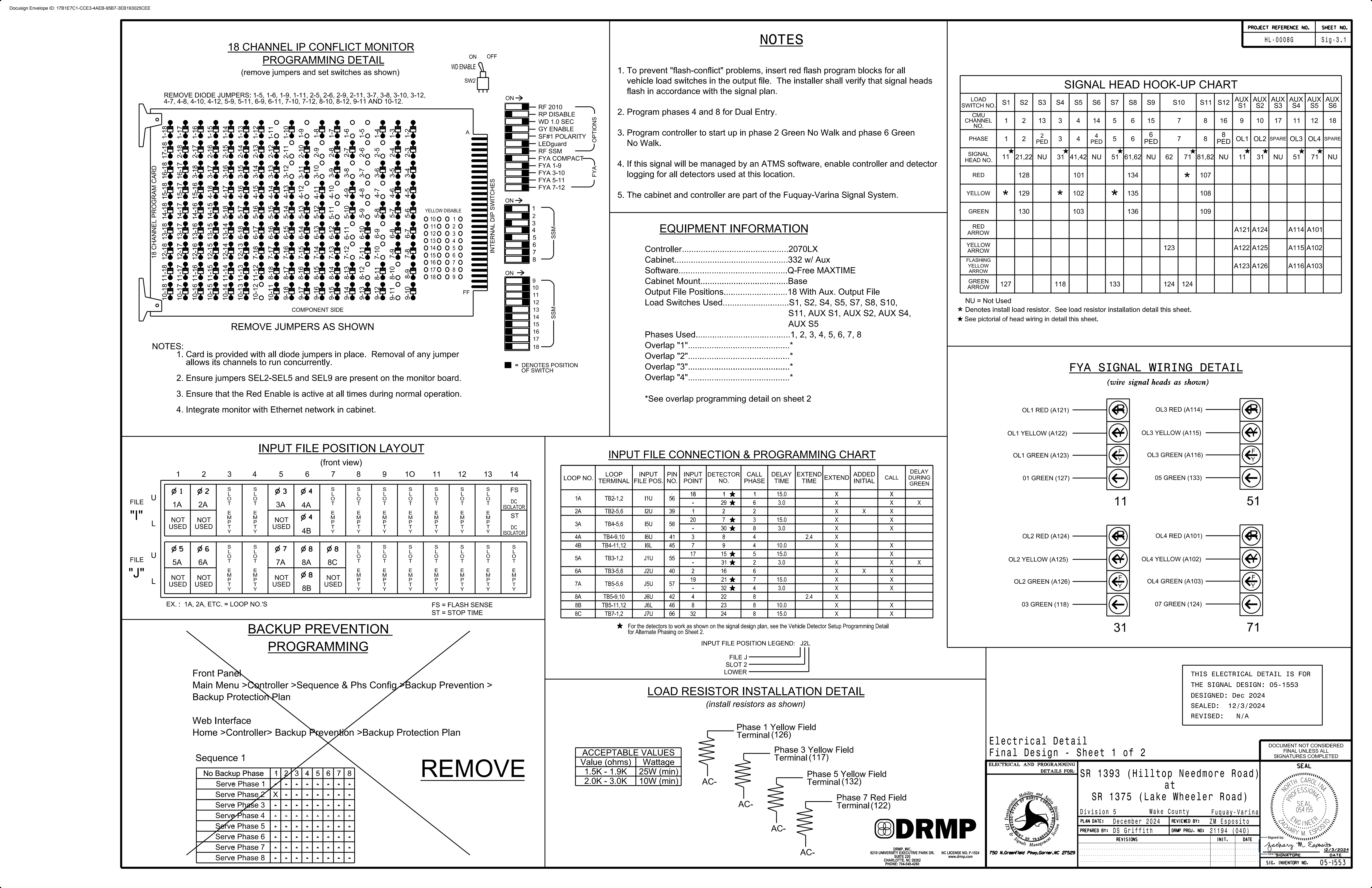
SIGNATURE DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



SIG. INVENTORY NO. 05-1553

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Docusign Envelope ID: 17B1E7C1-CCE3-4AEB-95B7-3EB193025CEE

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL
(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS: 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11 AND 10-12.

COMPONENT SIDE

INTERNAL DIP SWITCHES

WD ENABLE SW2

ON OFF

A

FF

YELLOW DISABLE

RF 2010

RP DISABLE

WD 1.0 SEC

GY ENABLE

SF#1 POLARITY

LEDguard

RF SSM

FYA COMPACT

FYA 1-9

FYA 3-10

FYA 5-11

FYA 7-12

SSM

SSM

■ = DENOTES POSITION OF SWITCH

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. Integrate monitor with Ethernet network in cabinet.

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 phases 4 and 8 for Dual Entry.

3. Program controller to start up in phase 2 Green No Walk and phase 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.

5. The cabinet and controller are part of the Fuquay-Varina Signal System.

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, S7, S8, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5

Phases Used.....1, 2, 3, 4, 5, 6, 7, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlap "4".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

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	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	31★	41,42	NU	51★	61,62	NU	62	71★	81,82	NU	11★	31★	NU	51★	71★
RED		128			101			134			*	107						
YELLOW	*	129		*	102		*	135				108						
GREEN		130			103			136				109						
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW									123				A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127			118			133			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.

FYA SIGNAL WIRING DETAIL
(wire signal heads as shown)

OL1 RED (A121) → 11

OL1 YELLOW (A122) → 11

OL1 GREEN (A123) → 11

01 GREEN (127) → 11

OL2 RED (A124) → 31

OL2 YELLOW (A125) → 31

OL2 GREEN (A126) → 31

03 GREEN (118) → 31

OL3 RED (A114) → 51

OL3 YELLOW (A115) → 51

OL3 GREEN (A116) → 51

05 GREEN (133) → 51

OL4 RED (A101) → 71

OL4 YELLOW (A102) → 71

OL4 GREEN (A103) → 71

07 GREEN (124) → 71

INPUT FILE POSITION LAYOUT
(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U	∅ 1	∅ 2	OT	OT	∅ 3	∅ 4	OT	OT	OT	OT	OT	OT	OT	FS
L	1A	2A	OT	OT	3A	4A	OT	OT	OT	OT	OT	OT	OT	DC ISOLATOR
FILE U	NOT USED	NOT USED	OT	OT	NOT USED	∅ 4	OT	OT	OT	OT	OT	OT	OT	ST
L	5A	6A	OT	OT	7A	8A	8C	OT	OT	OT	OT	OT	OT	DC ISOLATOR
	NOT USED	NOT USED	OT	OT	NOT USED	∅ 8	NOT USED	OT	OT	OT	OT	OT	OT	

EX.: 1A, 2A, ETC. = LOOP NO.'S
FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15.0		X		X	
2A	TB2-5,6	I2U	39	-	29 ★	6	3.0		X		X	X
3A	TB4-5,6	I5U	58	20	7 ★	3	15.0		X	X	X	
4A	TB4-9,10	I6U	41	3	8 ★	8	3.0		X		X	
4B	TB4-11,12	I6L	45	7	9	4	10.0	2.4	X		X	
5A	TB3-1,2	J1U	55	17	15 ★	5	15.0		X		X	
6A	TB3-5,6	J2U	40	-	31 ★	2	3.0		X		X	X
7A	TB5-5,6	J5U	57	19	21 ★	7	15.0		X	X	X	
8A	TB5-9,10	J6										

- [illegible]

[illegible]

- [illegible]

[illegible][illegible]

Docusign Envelope ID: 17B1E7C1-CCE3-4AEB-95B7-3EB193025CEE

PROJECT REFERENCE NO.
HL-00086

SHEET NO.
Sig-3.1

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS: 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 3-7, 3-8, 3-10, 3-12,
4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11 AND 10-12.

WD ENABLE

ON OFF

SW2

RF 2010

RP DISABLE

WD 1.0 SEC

GY ENABLE

SF#1 POLARITY

LEDguard

RF SSM

FYA COMPACT

FYA 1-9

FYA 3-10

FYA 5-11

FYA 7-12

OPTIONS

OPTIONAL

SSM

SSM

A

FF

INTERNAL DIP SWITCHES

YELLOW DISABLE

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

COMPONENT SIDE

REMOVE JUMPERS AS SHOWN

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. Integrate monitor with Ethernet network in cabinet.

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 phases 4 and 8 for Dual Entry.

3. Program controller to start up in phase 2 Green No Walk and phase 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.

5. The cabinet and controller are part of the Fuquay-Varina Signal System.

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, S7, S8, S10,
S11, AUX S1, AUX S2, AUX S4,
AUX S5

Phases Used.....1, 2, 3, 4, 5, 6, 7, 8

Overlap "1".....*

Overlap "2".....*

Overlap "3".....*

Overlap "4".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

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	OL1	OL2	SPARE	OL3	OL4	SPARE	
SIGNAL HEAD NO.	11★	21,22	NU	31★	41,42	NU	51★	61,62	NU	62	71★	81,82	NU	11★	31★	NU	51★	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									123				A122	A125		A115	A102		
FLASHING YELLOW ARROW													A123	A126		A116	A103		
GREEN ARROW	127			118			133			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.

FYA SIGNAL WIRING DETAIL

wire signal heads as shown

OL1 RED (A121) →

OL1 YELLOW (A122) →

OL1 GREEN (A123) →

01 GREEN (127) →

OL2 RED (A124) →

OL2 YELLOW (A125) →

OL2 GREEN (A126) →

03 GREEN (118) →

OL3 RED (A114) →

OL3 YELLOW (A115) →

OL3 GREEN (A116) →

05 GREEN (133) →

OL4 RED (A101) →

OL4 YELLOW (A102) →

OL4 GREEN (A103) →

07 GREEN (124) →

11

51

31

71

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U	∅ 1	∅ 2	O-T	O-T	∅ 3	∅ 4	O-T	O-T	O-T	O-T	O-T	O-T	O-T	FS
	1A	2A			3A	4A								DC ISOLATOR
FILE L	NOT USED	NOT USED	Y-T PZ E	Y-T PZ E	NOT USED	∅ 4	Y-T PZ E	Y-T PZ E	Y-T PZ E	Y-T PZ E	Y-T PZ E	Y-T PZ E	Y-T PZ E	ST
						4B								DC ISOLATOR
FILE U	∅ 5	∅ 6	S-O-T	S-O-T	∅ 7	∅ 8	∅ 8	S-O-T	S-O-T	S-O-T	S-O-T	S-O-T	S-O-T	S-O-T
	5A	6A			7A	8A	8C							
FILE L	NOT USED	NOT USED	E-M-P-T-Y	E-M-P-T-Y	NOT USED	∅ 8	NOT USED	E-M-P-T-Y	E-M-P-T-Y	E-M-P-T-Y	E-M-P-T-Y	E-M-P-T-Y	E-M-P-T-Y	E-M-P-T-Y

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

FS = FLASH SENSE

ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15.0		X		X	
			-	29	★	6	3.0		X		X	X
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
			20									

[illegible]

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS: 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11 AND 10-12.

COMPONENT SIDE

INTERNAL DIP SWITCHES

A

FF

YELLOW DISABLE

○ 10 ○ ○ ○ ○ ○ 1

○ 11 ○ ○ ○ ○ ○ 2

○ 12 ○ ○ ○ ○ ○ 3

○ 13 ○ ○ ○ ○ ○ 4

○ 14 ○ ○ ○ ○ ○ 5

○ 15 ○ ○ ○ ○ ○ 6

○ 16 ○ ○ ○ ○ ○ 7

○ 17 ○ ○ ○ ○ ○ 8

○ 18 ○ ○ ○ ○ ○ 9

ON →

RF 2010

RP DISABLE

WD 1.0 SEC

GY ENABLE

SF#1 POLARITY

LEDguard

RF SSM

FYA COMPACT

FYA 1-9

FYA 3-10

FYA 5-11

FYA 7-12

OPTIONS

FYA

ON →

1

2

3

4

5

6

7

8

SSM

ON →

9

10

11

12

13

14

15

16

17

18

SSM

■ = DENOTES POSITION OF SWITCH

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. Integrate monitor with Ethernet network in cabinet.

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 phases 4 and 8 for Dual Entry.

3. Program controller to start up in phase 2 Green No Walk and phase 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.

5. The cabinet and controller are part of the Fuquay-Varina Signal System.

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, S7, S8, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5

Phases Used.....1, 2, 3, 4, 5, 6, 7, 8

Overlap "1".....*

Overlap "2".....*

Overlap "3".....*

Overlap "4".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

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	OL1	OL2	SPARE	OL3	OL4	SPARE	
SIGNAL HEAD NO.	11★	21,22	NU	31★	41,42	NU	51★	61,62	NU	62	71★	81,82	NU	11★	31★	NU	51★	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									123				A122	A125		A115	A102		
FLASHING YELLOW ARROW													A123	A126		A116	A103		
GREEN ARROW	127			118			133			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.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

OL1 RED (A121)

OL1 YELLOW (A122)

OL1 GREEN (A123)

01 GREEN (127)

11

OL3 RED (A114)

OL3 YELLOW (A115)

OL3 GREEN (A116)

05 GREEN (133)

51

OL2 RED (A124)

OL2 YELLOW (A125)

OL2 GREEN (A126)

03 GREEN (118)

31

OL4 RED (A101)

OL4 YELLOW (A102)

OL4 GREEN (A103)

07 GREEN (124)

71

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U	∅ 1 1A	∅ 2 2A	∅ 3 3A	∅ 4 4A	∅ 5 5A	∅ 6 6A	∅ 7 7A	∅ 8 8A	∅ 8 8C	FS	ST	DC ISOLATOR	DC ISOLATOR	FS
FILE L	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15.0		X		X	
2A	TB2-5,6	I2U	39	-	29 ★	6	3.0		X		X	X
3A	TB4-5,6	I5U	58	20	7 ★	3	15.0		X		X	
4A	TB4-9,10	I6U	41	3	8	4		2.4	X		X	
4B	TB4-11,12	I6L	45	7	9	4	10.0		X		X	
5A	TB3-1,2	J1U	55	17	15 ★	5	15.0		X		X	
6A	TB3-5,6	J2U	40	-	31 ★	2	3.0		X		X	X
7A	TB5-5,6	J5U	57	19	21 ★	7	15.0		X		X	
8A	TB5-9,10	J6U	42	4	22	8		2.4	X			
8B	TB5-11,12	J6L	46	8	23	8	10.0		X		X	
8C	TB7-1,2	J7U	66	32	24	8	15.0		X		X	

★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on Sheet 2.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES

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

Phase 1 Yellow Field Terminal (126)

Phase 3 Yellow Field Terminal (117)

Phase 5 Yellow Field Terminal (132)

Phase 7 Red Field Terminal (122)

Electrical Detail

Final Design - Sheet 1 of 2

750 N. Greenfield Pkwy, Corner, NC 27259

DRMP INC.
8210 UNIVERSITY EXECUTIVE PARK DR.
SUITE 220
CHARLOTTE, NC 28202
PHONE: 704-548-4260

NC LICENSE NO. F-1524
www.drmp.com

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1553
DESIGNED: Dec 2024
SEALED: 12/3/2024
REVISED: N/A

Division 5

Wake County

Fuquay-Varina

PLAN DATE: December 2024

REVIEWED BY: ZM Esposito

PREPARED BY: DS Griffith

DRMP PROJ. NO: 21194 (040)

REVISIONS

INIT.

DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER

SEAL 054155

ZACHARY M. ESPOSITO

Signed by: Zachary M. Esposito

DATE: 12/3/2024

SIGNATURE

SIG. INVENTORY NO. 05-1553

Docusign Envelope ID: 17B1E7C1-CCE3-4AEB-95B7-3EB193025CEE

PROJECT REFERENCE NO.
HL-00086

SHEET NO.
Sig-3.1

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL
(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS: 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11 AND 10-12.

WD ENABLE ON OFF SW2

RF 2010 RP DISABLE WD 1.0 SEC GY ENABLE SF#1 POLARITY LEDguard RF SSM FYA COMPACT FYA 1-9 FYA 3-10 FYA 5-11 FYA 7-12

OPTIONS FYA

1 2 3 4 5 6 7 8

SSM

9 10 11 12 13 14 15 16 17 18

SSM

YELLOW DISABLE

10 11 12 13 14 15 16 17 18

1 2 3 4 5 6 7 8 9

INTERNAL DIP SWITCHES

A FF

REMOVE JUMPERS AS SHOWN

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. Integrate monitor with Ethernet network in cabinet.

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 phases 4 and 8 for Dual Entry.

3. Program controller to start up in phase 2 Green No Walk and phase 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.

5. The cabinet and controller are part of the Fuquay-Varina Signal System.

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, S7, S8, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5

Phases Used.....1, 2, 3, 4, 5, 6, 7, 8

Overlap "1".....*

Overlap "2".....*

Overlap "3".....*

Overlap "4".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

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	OL1	OL2	SPARE	OL3	OL4	SPARE	
SIGNAL HEAD NO.	11★	21,22	NU	31★	41,42	NU	51★	61,62	NU	62	71★	81,82	NU	11★	31★	NU	51★	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									123				A122	A125		A115	A102		
FLASHING YELLOW ARROW													A123	A126		A116	A103		
GREEN ARROW	127			118			133			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.

FYA SIGNAL WIRING DETAIL
(wire signal heads as shown)

OL1 RED (A121)

OL1 YELLOW (A122)

OL1 GREEN (A123)

01 GREEN (127)

11

OL3 RED (A114)

OL3 YELLOW (A115)

OL3 GREEN (A116)

05 GREEN (133)

51

OL2 RED (A124)

OL2 YELLOW (A125)

OL2 GREEN (A126)

03 GREEN (118)

31

OL4 RED (A101)

OL4 YELLOW (A102)

OL4 GREEN (A103)

07 GREEN (124)

71

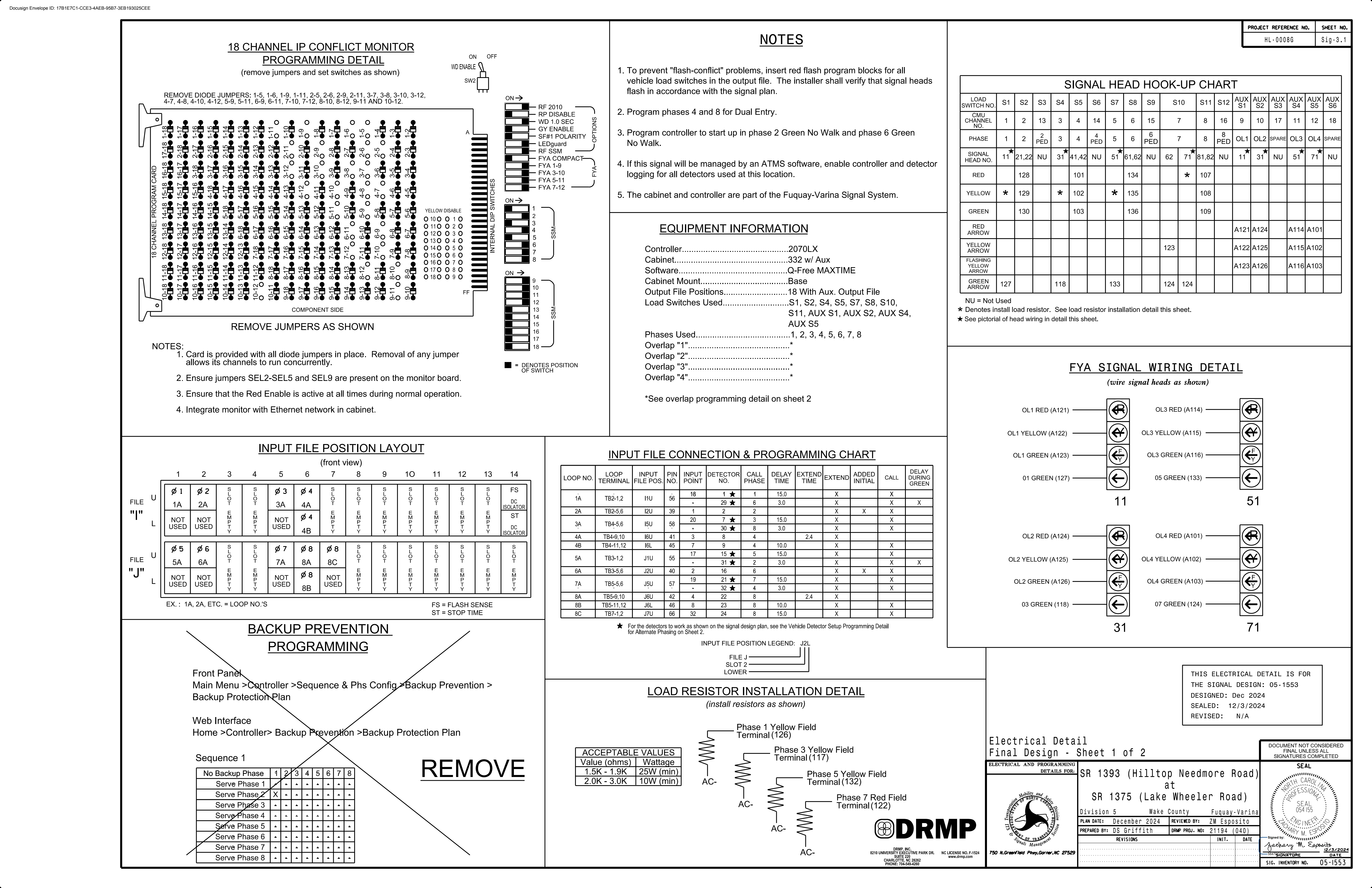
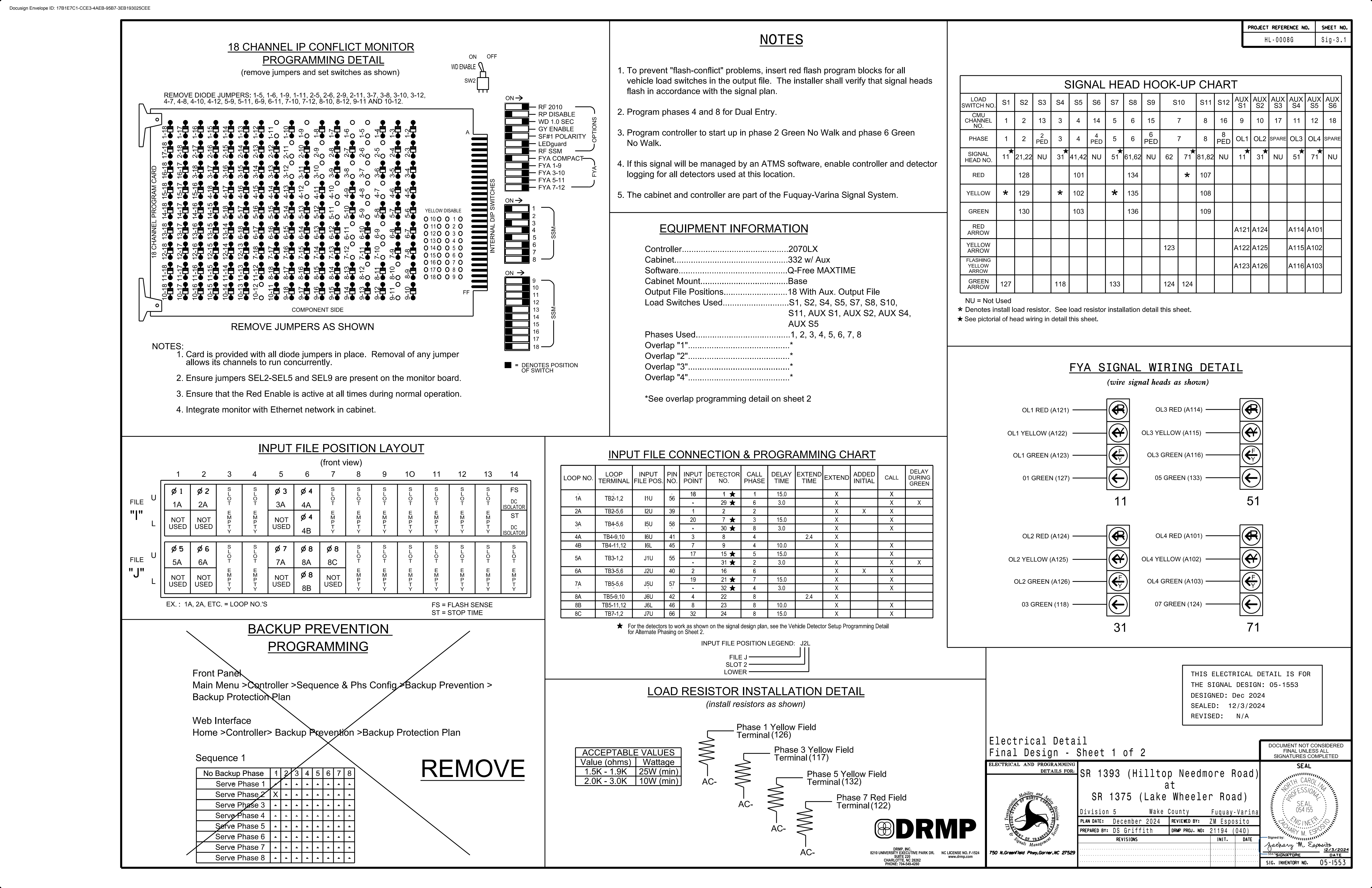
INPUT FILE POSITION LAYOUT
(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U	∅ 1	∅ 2	OT	OT	∅ 3	∅ 4	OT	OT	OT	OT	OT	OT	OT	FS
L	NOT USED	NOT USED	OT	OT	NOT USED	∅ 4	OT	OT	OT	OT	OT	OT	OT	DC ISOLATOR ST DC ISOLATOR
FILE U	∅ 5	∅ 6	OT	OT	∅ 7	∅ 8	∅ 8	OT	OT	OT	OT	OT	OT	OT
L	NOT USED	NOT USED	OT	OT	NOT USED	∅ 8	NOT USED	OT	OT	OT	OT	OT	OT	OT

EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1★	1	15.0		X		X	
2A	TB2-5,6	I2U	39	-	29★	6	3.0		X		X	X
3A	TB4-5,6	I5U	58	20	7★	3	15.0		X		X	
4A	TB4-9,10	I6U	41	3	8	4		2.4	X		X	
4B	TB4-11,12	I6L	45	7	9	4	10.0		X		X	
5A	TB3-1,2	J1U	55	17	15★	5	15.0		X		X	
6A	TB3-5,6	J2U	40	-	31★	2	3.0		X		X	X
7A	TB5-5,6	J5U	57	19	21★	7	15.0	</				

[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for heads 11, 31, 51 and 71 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

Disables phase 8 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 3 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

Disables phase 4 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
★	2	2

★ The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A, 3A, 5A & 7A

Front Panel
Main Menu >Controller >Detector >Veh Det Plans

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

1A	Plan 2		
	Detector	Call Phase	Delay
	1	1	3:0
3A			
	29	0	3:0
5A			
	7	3	3:0
	30	0	3:0
7A			
	15	5	3:0
	31	0	3:0
	21	7	3:0
	32	0	3:0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	-	-	-	-
Modifier Phases	1	3	5	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

NOTICE INCLUDED PHASE

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	5	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

Start Up Parameters
Startup Clearance Hold
6

Unit Flash Parameters
All Red Flash Exit Time
6

BACKUP CALL PHASE PROGRAMMING

Front Panel
Main Menu >Controller >Sequence & Phs Config>Backup Prevention > Backup Call Phase Plans

Web Interface
Home >Controller >Backup Prevention >Backup Calls Phase Plans >

Sequence 1	
Serve Phase	Backup Call Phase
1	-
2	4
3	-
4	-
5	-
6	-
7	-
8	-

REMOVE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1553
DESIGNED: Dec 2024
SEALED: 12/3/2024
REVISED: N/A

Electrical Detail
Final Design - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1393 (Hilltop Needmore Road)

at

SR 1375 (Lake Wheeler Road)

Division 5 Wake County Fuquay-Varina

PLAN DATE: December 2024 REVIEWED BY: ZM Esposito

PREPARED BY: DS Griffith DRMP PROJ. NO: 21194 (040)

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL



Signed by: Zachary M. Esposito

12/3/2024

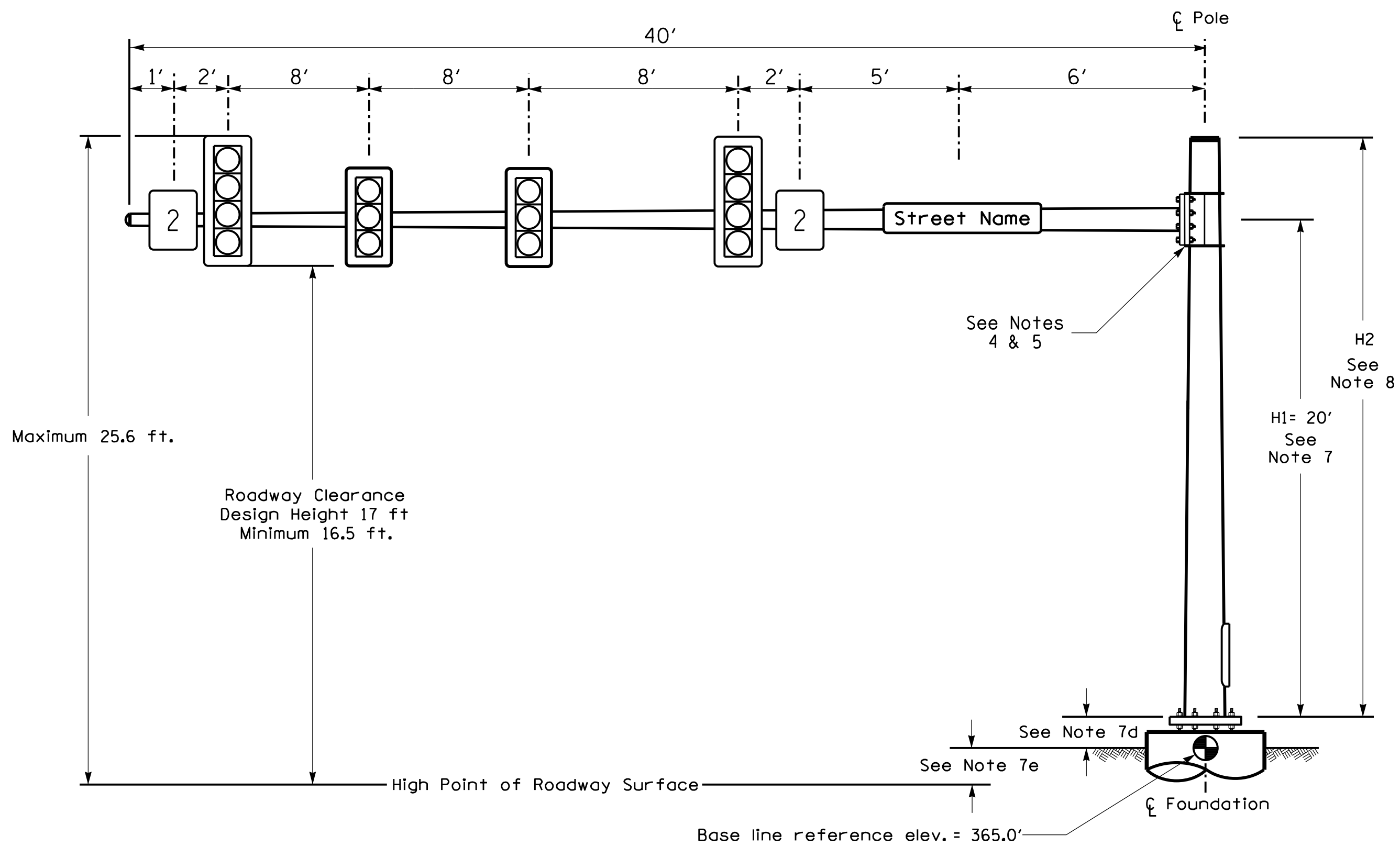
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SIG. INVENTORY NO. 05-1553



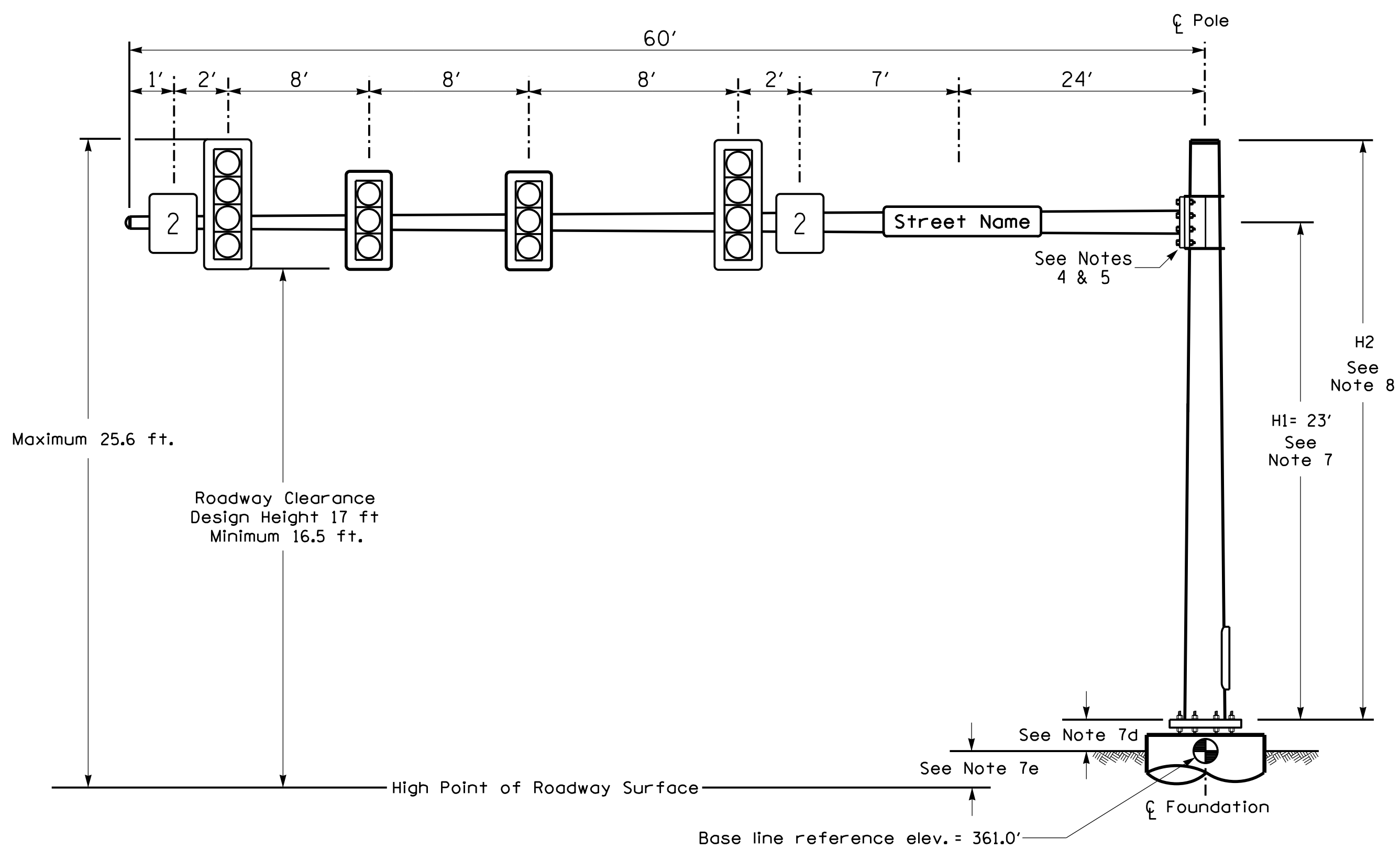
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Design Loading for METAL POLE NO. 1



Elevation View

Design Loading for METAL POLE NO. 2



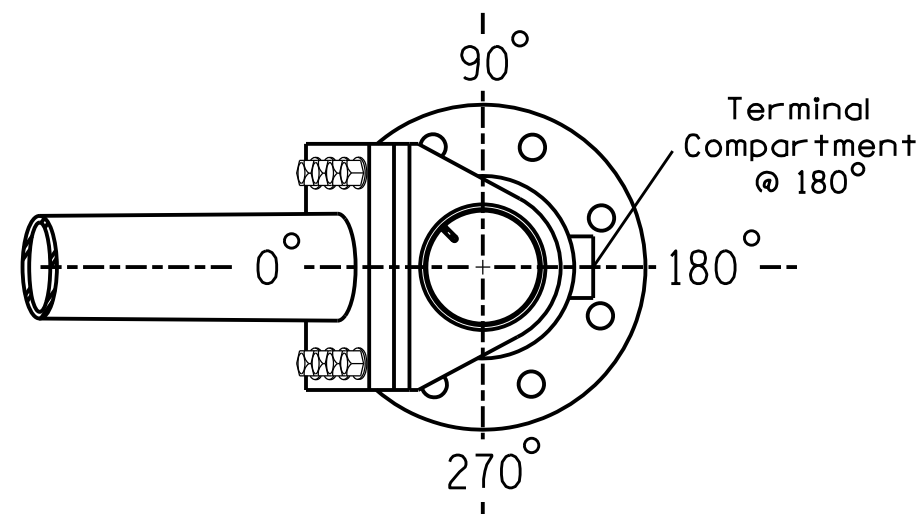
Elevation View

SPECIAL NOTE

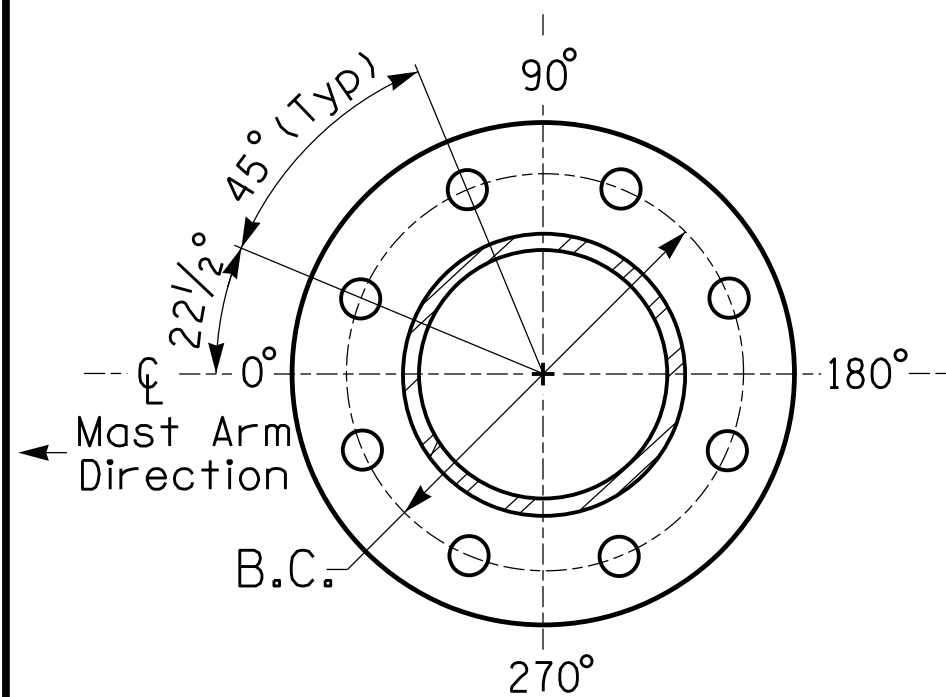
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at   Foundation @ ground level	365.0 ft.	361.0 ft.
Elevation difference at High point of roadway surface	+1.0 ft.	+4.0 ft.
Elevation difference at Edge of travelway or face of curb	-1.0 ft.	+3.0 ft.

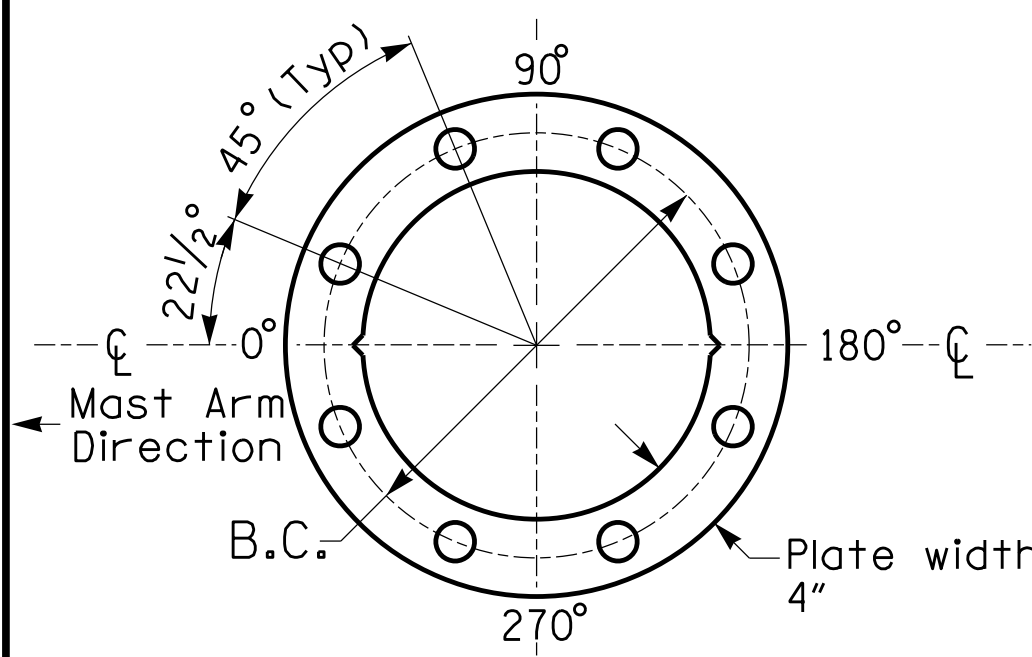


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT
LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLES No. 1 and 2

PROJECT REFERENCE NO.	SHEET NO.
HL-0008G	Sig-3.3

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12\"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5\" W X 66.0\" L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12\"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5\" W X 52.5\" L	60 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0\" W X 96.0\" L	36 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0\" W X 36.0\" L	14 LBS

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
 - The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2024 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website:
<https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

DESIGN REQUIREMENTS

3. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using force ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
 - a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - b. Signal heads are rigidly mounted and vertically centered on the mast arm.
 - c. The roadway clearance height for design is as shown in the elevation views.
 - d. The top of the pole base plate is 0.75 feet above the ground elevation.
 - e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.



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NCDOT Wind Zone 4 (120 mph)

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FINAL UNLESS ALL
SIGNATURES COMPLETED



SR 1393 (Hilltop Needmore Road)
at
SR 1375 (Lake Wheeler Road)

Division 5 Wake County Fuquay-Varina

PLAN DATE: December 2024	REVIEWED BY: ZM Esposito
--------------------------	--------------------------

PREPARED BY: DS Griffith	DRMP PROJ. NO.: 21194(040)
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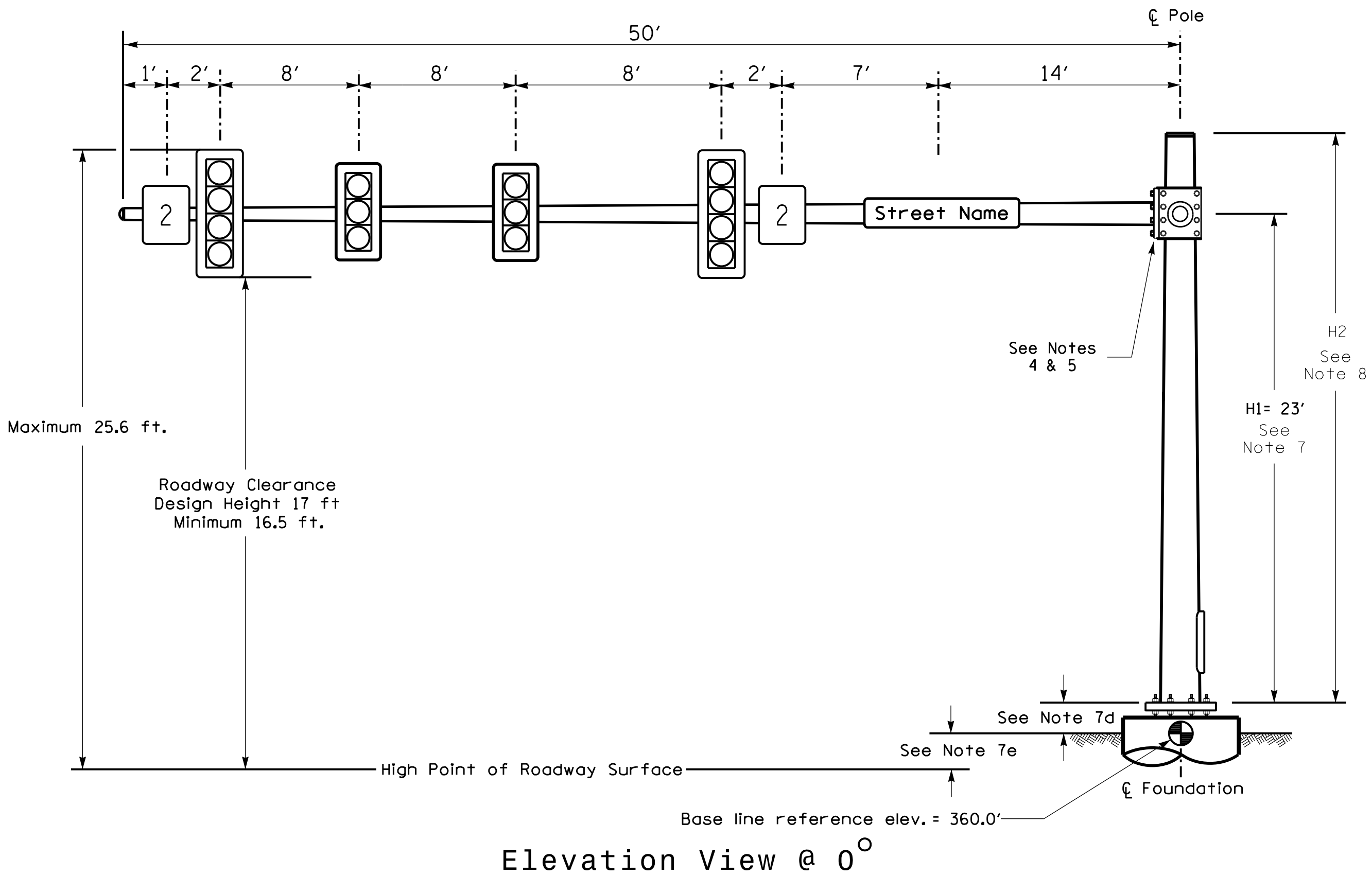
REVISIONS	INIT.	DATE

Professional Engineer Seal for North Carolina, State Seal 054155, Zachary M. Esposito.

Sachari M. Esposito

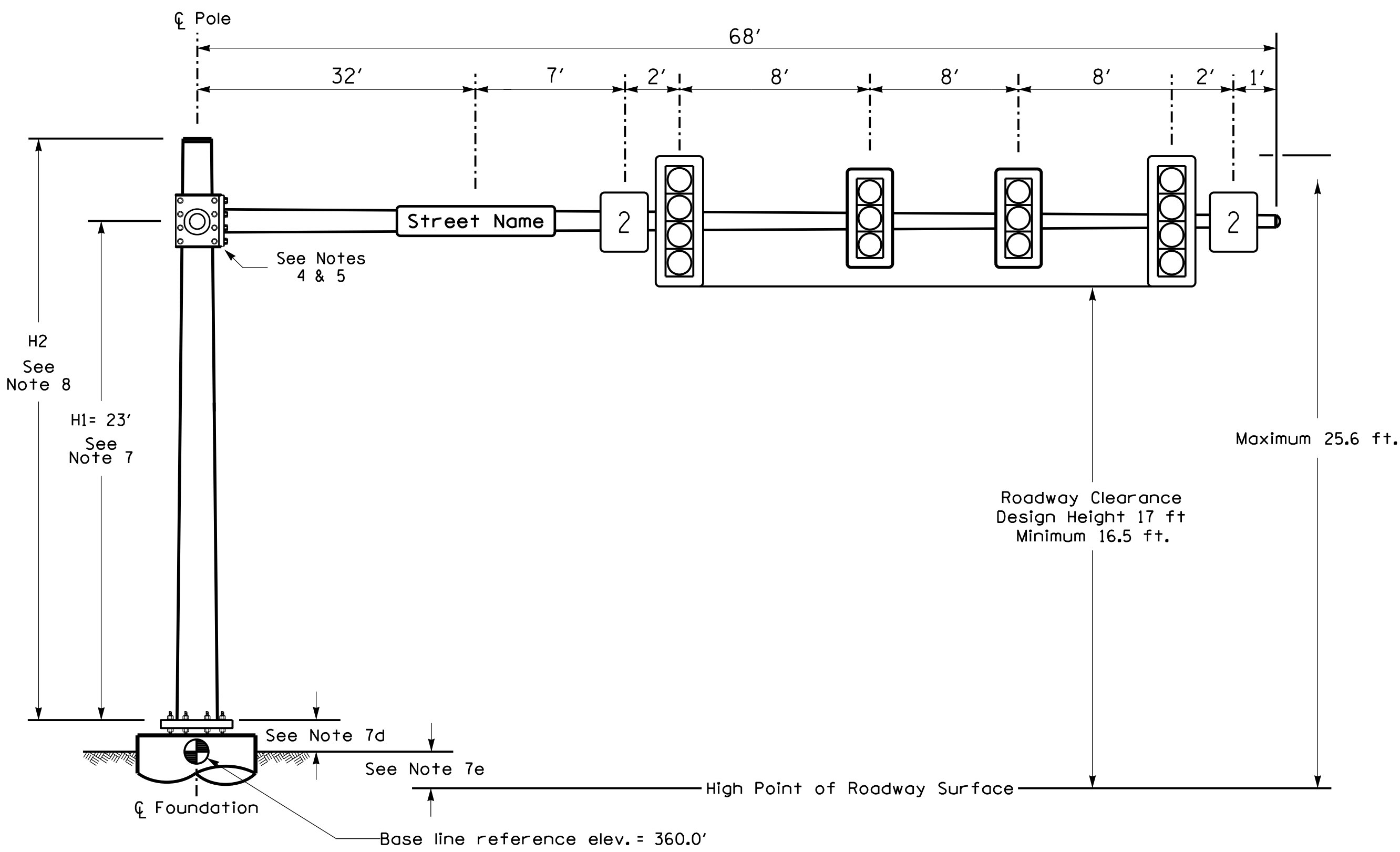
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Design Loading for METAL POLE NO.3, MAST ARM A



Elevation View @ 0°

Design Loading for METAL POLE NO.3, MAST ARM B



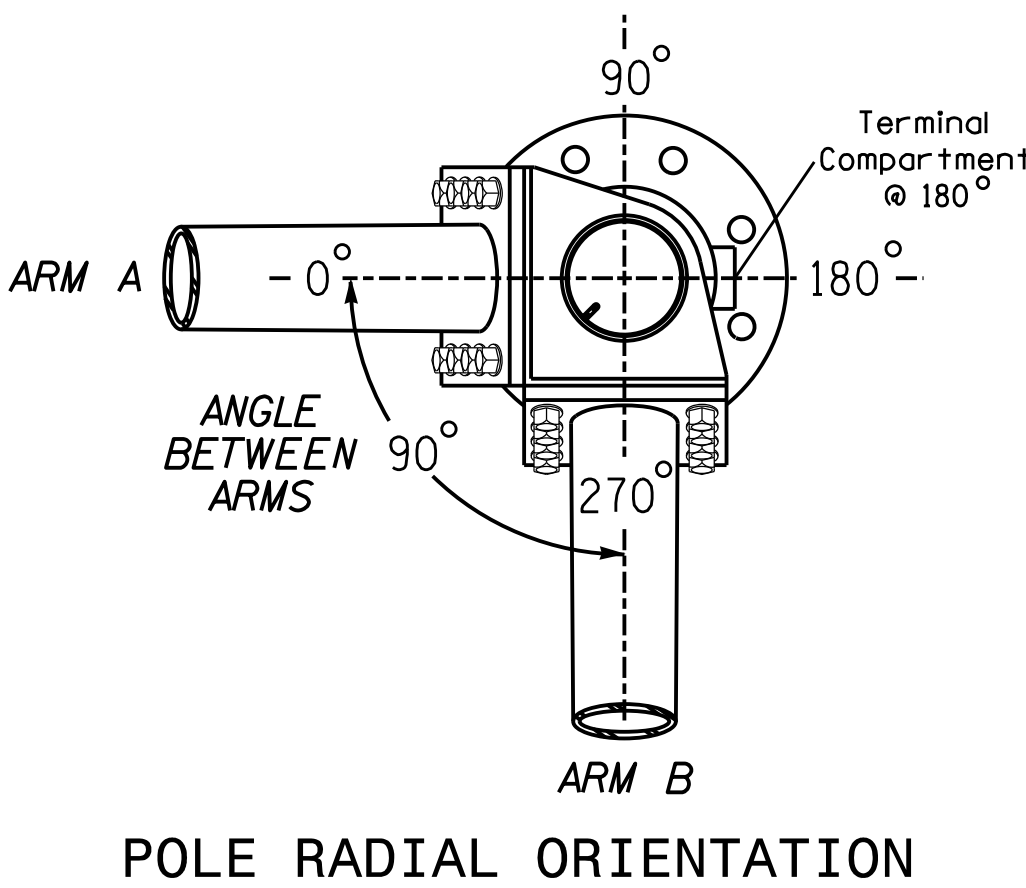
Elevation View @ 270°

SPECIAL NOTE

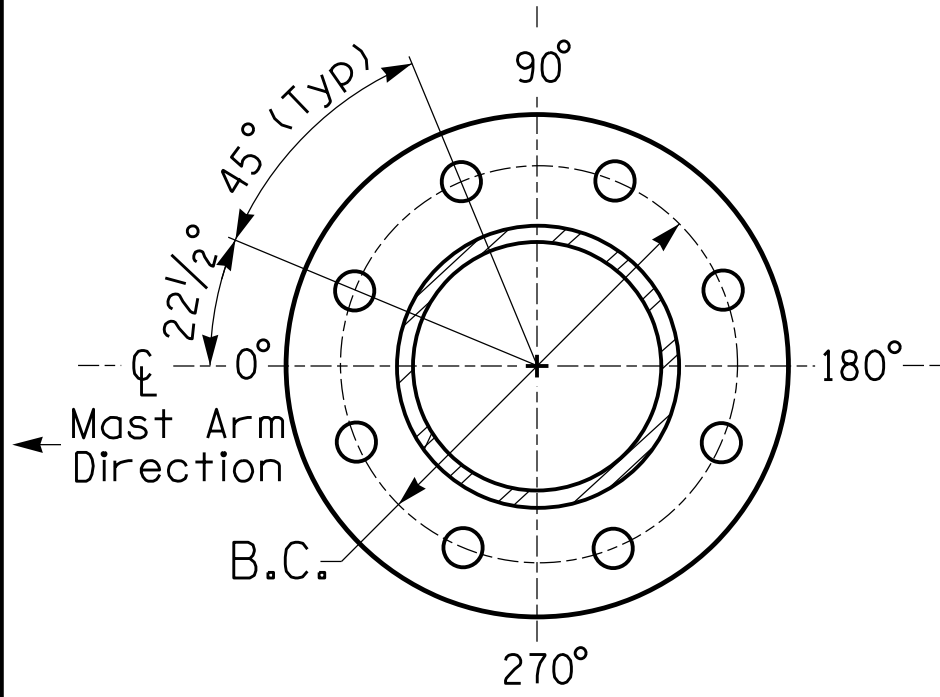
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at ϕ Foundation @ ground level	360.0 ft.	360.0 ft.
Elevation difference at High point of roadway surface	+3.0 ft.	+4.0 ft.
Elevation difference at Edge of travelway or face of curb	+3.0 ft.	+3.0 ft.

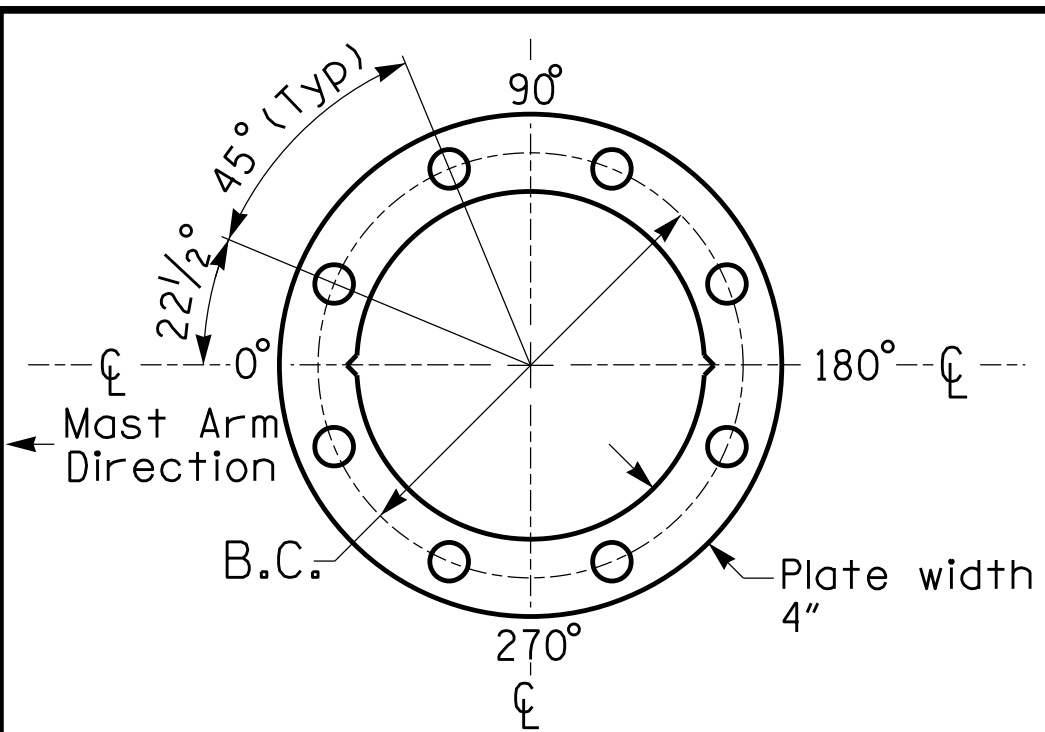


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLE No. 3

PROJECT REFERENCE NO.	SHEET NO.
HL-0008G	Sig-3.4

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5"W X 66.0"L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5"W X 52.5"L	60 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0"W X 36.0"L	14 LBS

NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure and foundation in accordance with:
 - The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
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 - The 2024 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

DESIGN REQUIREMENTS

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using force ratios that do not exceed 0.9.
- The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.



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NC LICENSE NO. F-1524
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NCDOT Wind Zone 4 (120 mph)

	SR 1393 (Hilltop Needmore Road) at SR 1375 (Lake Wheeler Road)	
	Division 5 Wake County Fuquay-Varina PLAN DATE: December 2024 REVIEWED BY: ZM Esposito PREPARED BY: DS Griffith DRMP PROJ. NO: 21194(040)	
750 N. Greenfield Phay Garner, NC 27529 SCALE 0 N/A	REVISIONS INIT. DATE	SIGNATURE DATE

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SIG. INVENTORY NO. 05-1553

- 1

INSTALL COAX CABLE
- 2

INSTALL ETHERNET CABLE
- 3

EXISTING ETHERNET (OR COAX) CABLE
- 4

INSTALL SMFO CABLE
- 5

EXISTING SMFO CABLE
- 6

INSTALL FIBER OPTIC DROP CABLE
- 7

INSTALL TRACER WIRE
- 8

TRENCH
- 9

INSTALL PVC CONDUIT
- 10

INSTALL RIGID, GALVANIZED STEEL CONDUIT
- 11

INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
- 12

INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
- 13

INSTALL OUTER-DUCT POLYETHYLENE CONDUIT
- 14

INSTALL POLYETHYLENE CONDUIT
- 15

DIRECTIONAL DRILL CONDUIT
- 16

BORE AND JACK CONDUIT
- 17

INSTALL CABLE(S) IN EXISTING CONDUIT
- 18

INSTALL CABLE(S) IN NEW CONDUIT
- 19

INSTALL CABLE(S) IN EXISTING RISER
- 20

INSTALL CABLE(S) IN NEW RISER
- 21

INSTALL CABLE(S) IN EXISTING CONDUIT STUB-OUTS
- 22

INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 23

INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 24

INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET
- 25

INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
- 26

INSTALL NEW ETHERNET EDGE SWITCH
- 27

INSTALL NEW FIBER OPTIC TRANSCEIVER
- 28

INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPlice CABLE IN CABINET
- 29

INSTALL UNDERGROUND SPlice ENCLOSURE
- 30

INSTALL AERIAL SPlice ENCLOSURE
- 31

MODIFY EXISTING INTERCONNECT CENTER /SPlice ENCLOSURE
- 32

INSTALL POLE MOUNTED SPlice CABINET
- 33

INSTALL BASE MOUNTED SPlice CABINET

- 34

INSTALL CABINET FOUNDATION
- 35

INSTALL CCTV CAMERA POLE MOUNTED CABINET
- 36

INSTALL CCTV CAMERA ASSEMBLY
- 37

INSTALL CCTV CAMERA WOOD POLE
- 38

INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39

INSTALL JUNCTION BOX
- 40A

INSTALL OVERSIZED JUNCTION BOX
- 40B

INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 24" x 24")
- 41

REMOVE EXISTING JUNCTION BOX
- 42

INSTALL WOOD POLE
- 43

REMOVE EXISTING WOOD POLE
- 44

INSTALL AERIAL GUY ASSEMBLY
- 45

INSTALL STANDARD GUY ASSEMBLY
- 46

INSTALL SIDEWALK GUY ASSEMBLY
- 47

INSTALL MESSENGER CABLE
- 48A

REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
- 48B

REMOVE EXISTING COMMUNICATIONS CABLE
- 49

BACK PULL EXISTING COMMUNICATIONS CABLE
- 50

INSTALL CELL MODEM AND ANTENNA
- 51

INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
- 52A

INSTALL DELINEATOR MARKER
- 52B

INSTALL JUNCTION BOX MARKER
- 53A

STORE 20 FEET OF COMMUNICATIONS CABLE
- 53B

STORE 50 FEET OF EACH COMMUNICATIONS CABLE
- 54

LASH CABLE(S) TO EXISTING COMMUNICATIONS CABLE
- 55

LASH CABLE(S) TO EXISTING MESSENGER CABLE
- 56

LASH CABLE(S) TO NEW MESSENGER CABLE
- 57

MODIFY EXISTING ELECTRICAL SERVICE
- 58

INSTALL NEW ELECTRICAL SERVICE
- 59

INSTALL NEW EQUIPMENT CABINET DISCONNECT
- 60

BOND TRACER WIRE TO EQUIPMENT GROUND BUS
DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS
- 61

BOND RISER AND MESSENGER CABLE TO POLE GROUND
- 62

BOND RISER TO POLE GROUND
- 63

BOND MESSENGER CABLE TO POLE GROUND
- 64

INSTALL HEAT SHRINK TUBING RETROFIT KIT
- 65

INSTALL MOLDABLE DUCT SEAL
- 66

SLACK SPAN
- 67

PROJECT REFERENCE NO.		SHEET NO.
HL-00086		SCP-1

FO

NEW FIBER OPTIC COMMUNICATIONS CABLE

EXI

EXISTING COMMUNICATIONS CABLE

REM

EXISTING COMMUNICATIONS CABLE TO BE REMOVED

NEW AERIAL GUY ASSEMBLY

NEW CONDUIT

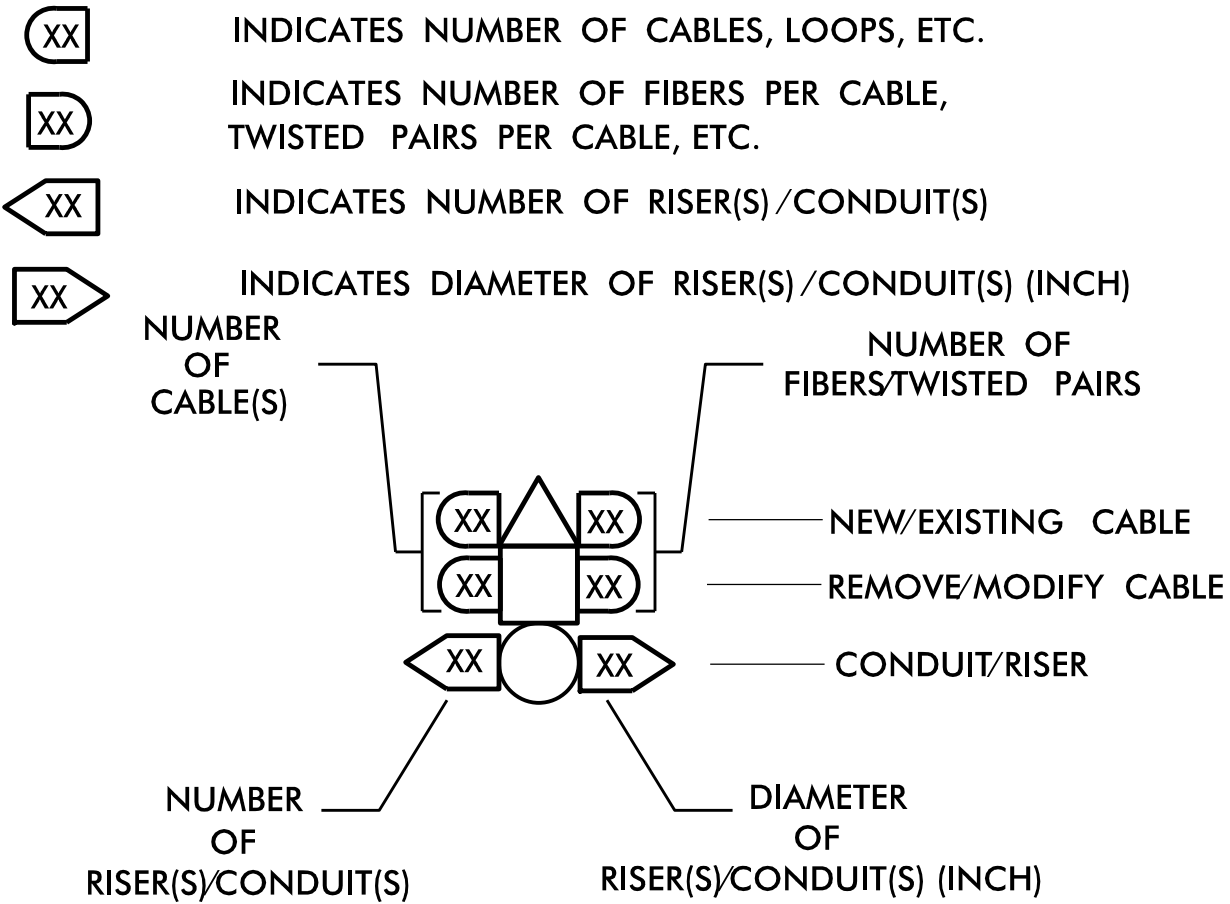
EXISTING CONDUIT

DD

NEW DIRECTIONAL DRILLED CONDUIT

NEW		EXISTING
	OVERSIZED JUNCTION BOX	
	WOOD POLE	
	AERIAL SPICE ENCLOSURE	
	UNDERGROUND SPICE ENCLOSURE	
	METAL POLE	
	CCTV ASSEMBLY	
	STANDARD GUY ASSEMBLY	
	SIDEWALK GUY ASSEMBLY	
	CABLE STORAGE RACKS (SNOW SHOES)	
	SIGNAL EQUIPMENT CABINET	
	SPICE CABINET	
	FLAT PANEL ANTENNA (SINGLE)	
	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION	
	YAGI ANTENNA (SINGLE)	
	OMNI ANTENNA	
SP	SIGNAL POLE	SP
XX-XXXX	SIGNAL INVENTORY NUMBER	XX-XXXX

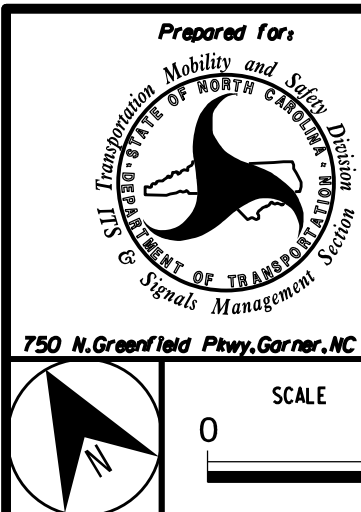
CONSTRUCTION NOTE SYMBOLOGY KEY



Prepared for: 750 N. Greenfield Pkwy, Garner, NC 27529	Construction Notes		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL Signed by: <i>Zachary M. Esposito</i> SIGNATURE DATE 12/3/2024
	Division 5 Wake County Fuquay-Varina		
	PLAN DATE: December 2024	REVIEWED BY: ZM Esposito	
	PREPARED BY: KA Jones	DRMP PROJ. NO.: 21194	
	REVISIONS	INIT. DATE	



4) RELOCATE AND REUSE EXISTING ETHERNET SWITCH AND INTERCONNECT CENTER AT NEW SIGNAL CABINET LOCATION.



Signed by: Zachary M. Esposito 12/3/2
 50470070P1001E0 SIGNATURE DAT

COLOR	CODE
TIA/EIA	598-B

(1) BLUE (7) RED
(2) ORANGE (8) BLACK
(3) GREEN (9) YELLOW
(4) BROWN (10) VIOLET
(5) SLATE (11) ROSE
(6) WHITE (12) AQUA

X = FUSION SPLICE INDIVIDUAL FIBER
C = CAP IN TRAY

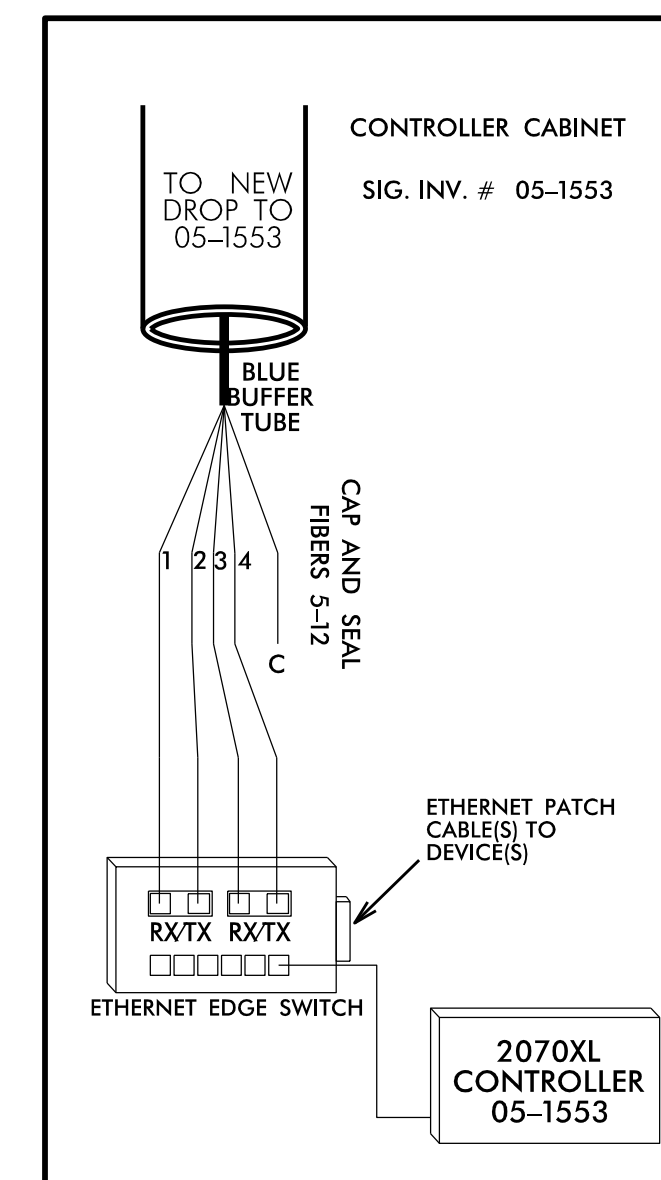
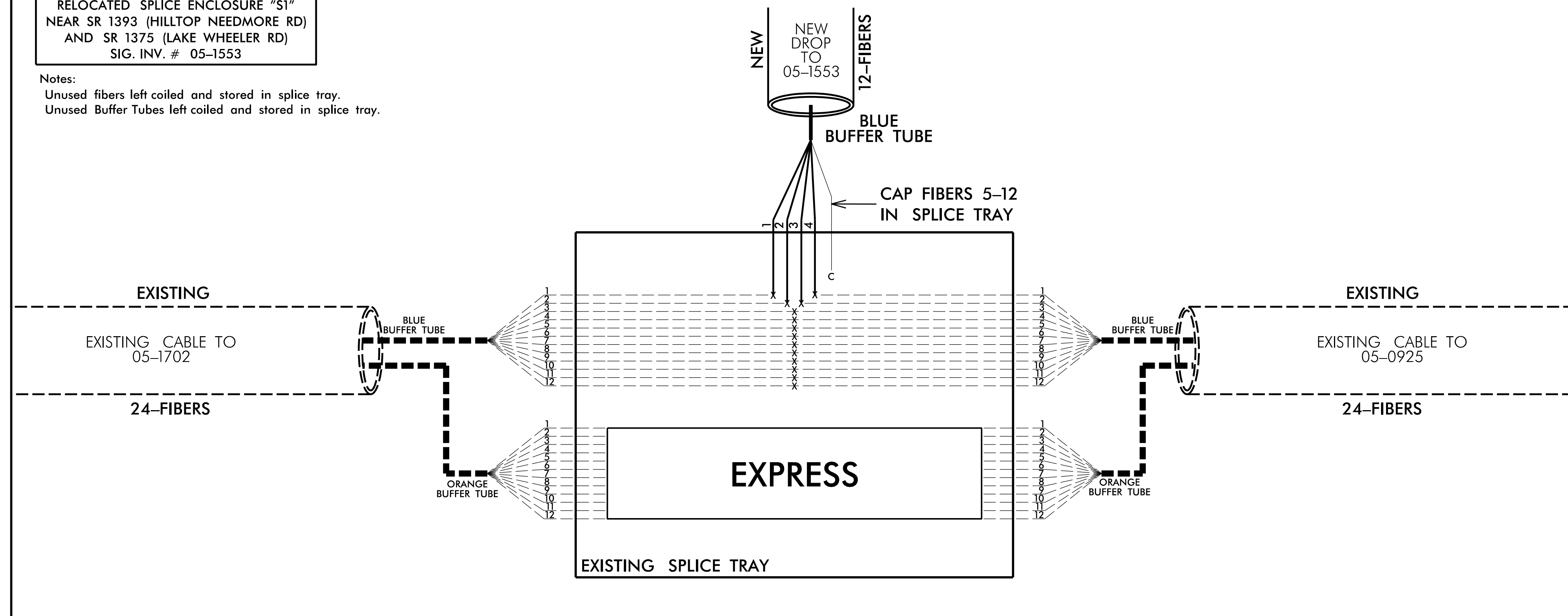
EXPRESS EXPRESS ENTIRE BUFFER TUBE /FIBERS THROUGH WITHOUT CUTTING

BUFFER SPLICE SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR

EXISTING EXISTING BUFFER TUBE /FIBERS. DO NOT MODIFY EXISTING SPLICES
OR EXPRESSED FIBERS.

RELOCATED SPLICE ENCLOSURE "S1"
NEAR SR 1393 (HILLTOP NEEDMORE RD)
AND SR 1375 (LAKE WHEELER RD)
SIG. INV. # 05-1553

Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



1) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE FIBER OPTIC CABLE, CONTACT THE DIVISION 5 TRAFFIC ENGINEER AT (919) 536-4000. NOTIFY THE DIVISION 5 TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3) ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING /ENSURING PROPER TERMINATIONS.

4) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING: REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

- 1) SPlice LOCATION
- 2) DATE
- 3) COMPANY NAME
- 4) NAME OF INDIVIDUAL PERFORMING THE SPlicing

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.



DRMP, INC.
8210 UNIVERSITY EXECUTIVE PARK DR.
SUITE 220
CHARLOTTE, NC 28262
PHONE: 704.549.4260

NC LICENSE NO. F-152
www.drmp.com

Prepared For:  Seal of the State of North Carolina	Fuquay-Varina Signal System Splice Details	SEAL 
Division 5 Wake County Fuquay-Varina		
PLAN DATE: December 2024		REVIEWED BY: ZM Esposito
PREPARED BY: KA Jones		DRAW PROJ. NO.: 21194
REVISIONS		INIT. DATE

750 N. Greenfield Pkwy, Corner, NC 27529

Signed by: Zachary M. Esposito

DATE: 12/13/2024

SIGNATURE DATE

09/08/99

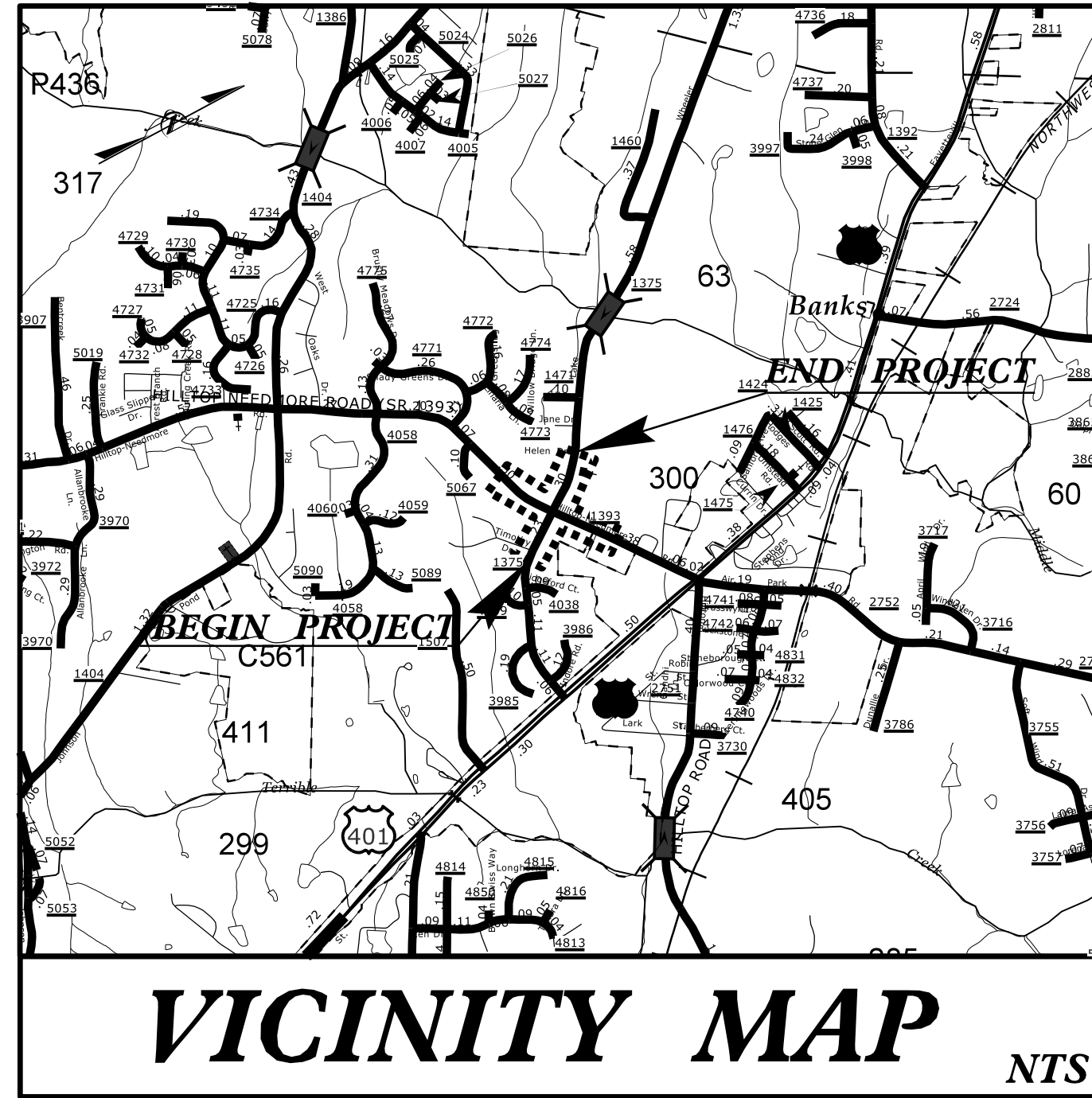
TIP PROJECT: HL-0008G

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Sheet: HL0008G_UC1.dgn
USER: tknecht

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

LOCATION: SR 1375 (LAKE WHEELER ROAD) & SR 1393 (HILLTOP NEEDMORE ROAD)
TYPE OF WORK: WATER RELOCATION



BEGIN TIP PROJECT HL-0008G
-L- STA. 15+50.00

END CONSTRUCTION
-Y- STA. 31+12.33

TO HOLLAND

-L- SR 1375 (LAKE WHEELER RD)

TIMOTHY DRIVE

UC-4

TO RALEIGH

END TIP PROJECT HL-0008G
-L- STA. 28+95.00

TO WILLOW SPRING

BEGIN CONSTRUCTION
-Y- STA. 15+00.00

TO HOLLY SPRINGS

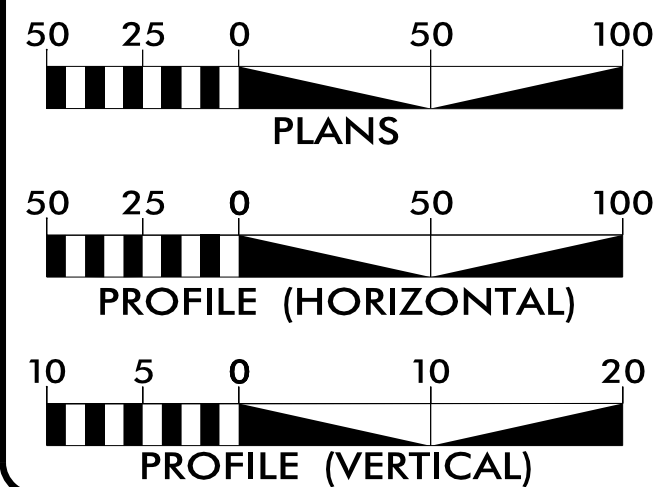
T.I.P. NO.

HL-0008G

SHEET NO.

UC-1

GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:

DESCRIPTION:

UC-1
UC-2
UC-3
UC-3A
UC-4

TITLE SHEET
UTILITY SYMBOLOGY
NOTES
DETAILS
UTILITY CONSTRUCTION SHEET

WATER OWNER ON PROJECT

(A) WATER TOWN OF FUQUAY VARINA

PREPARED IN THE OFFICE OF



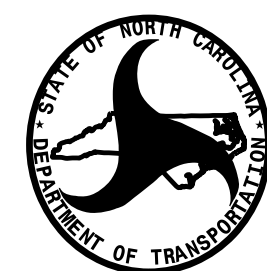
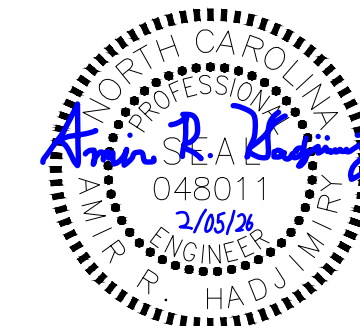
Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9929
NC COA No. F-0929

AMIR R. HADJIMIRY, PE
LEIGH-ANN DUDLEY, PE
TRAVIS KNECHT

CONSULTANT CONTACT #1
CONSULTANT CONTACT #2
CONSULTANT CONTACT #3

SEAL



DIVISION OF HIGHWAYS
DIVISION 5
PROJECT DELIVERY UNIT
2612 N. DUKE STREET
DURHAM, NC 27704
PHONE (919) 317-4700
FAX (919) 317-4710

Susan Lancaster, PE TEAM LEAD
Matthew Nolfo, PE DDC ENGINEER
Donald W. Proper DIVISION UTILITIES ENGINEER
James Swinson SENIOR UTILITIES ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED

5/14/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	12" WL
11¼ Degree Bend	+
22½ Degree Bend	+x
45 Degree Bend	+x
90 Degree Bend	+
Plug	■
Tee	+
Cross	+
Reducer	▶
Gate Valve	GV
Butterfly Valve	BV
Tapping Valve	TGV
Line Stop	LS
Line Stop with Bypass	LS/BP
Blow Off	BO
Fire Hydrant	PEH
Relocate Fire Hydrant	PEH
Remove Fire Hydrant	REM FH
Water Meter	PWM
Relocate Water Meter	PWM
Remove Water Meter	REM WM
Water Pump Station	PS(W)
RPZ Backflow Preventer	PRPZ
DCV Backflow Preventer	PBFP
Relocate RPZ Backflow Preventer	RRPZ
Relocate DCV Backflow Preventer	RBFP

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	12" SS
Force Main Sewer Line (Sized as Shown)	12" FSS
Manhole (Sized per Note)	•
Sewer Pump Station	PS(SS)

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

Power Pole	⦿
Telephone Pole	⦿
Joint Use Pole	⦿
Telephone Pedestal	TEL PED
Utility Line by Others (Type as Shown)	
Trenchless Installation	12" TL INSTALL
Encasement by Open Cut	24" ENCAS BY OC
Encasement	24" ENCASUREMENT

Thrust Block	■
Air Release Valve	AR
Utility Vault	UV
Concrete Pier	CP
Steel Pier	SP
Plan Note	NOTE
Pay Item Note	PAY ITEM

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	AATUR
End of Information	E.O.I.

*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	A/G Gas
*Underground Water Line	
Aboveground Water Line	A/G Water
*Underground Gravity Sanitary Sewer Line	
Aboveground Gravity Sanitary Sewer Line	A/G Sanitary Sewer
*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)

5/14/99
REV: 2/1/2012

5/14/99

\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DGN\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$

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 FUQUAY VARINA PUBLIC UTILITIES DEPARTMENT.
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.
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.

12. MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS.
13. ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER WITH 18" MIN. VERTICAL SEPARATION REQUIRED.
14. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE FUQUAY VARINA PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
15. CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE FUQUAY VARINA PUBLIC UTILITIES DEPARTMENT.
16. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
- PROJECT SPECIFIC NOTES:
1. PROPOSED WATER LINE SHALL BE RJ DIP OF THE SAME PRESSURE CLASS AND THICKNESS AS THE EXISTING WATER LINE.
2. ALL PIPE JOINTS AND FITTINGS SHALL BE RESTRAINED WITH RESTRAINED JOINTS.
3. CONTRACTOR SHALL ENSURE THAT THE CONNECTION BETWEEN EXISTING AND PROPOSED WATER LINE SHALL BE AT TIMES MOST CONVENIENT TO THE PUBLIC AND UTILITY OWNER.





DRMP, INC.
5801 FARMGROVE PLACE
RALEIGH, NC 27611
NC LICENSE NO. E-15261 (919) 872-8115

SITE: WITTEPPY ROAD
SHEETS: 415
DATE: 04/14/99
PHONE: (919) 881-9899
NC COA NO. F-40602

PROJECT REFERENCE NO.
HL-0008G

SHEET NO.
UC-3

DESIGNED BY: EPH

DRAWN BY: TLK

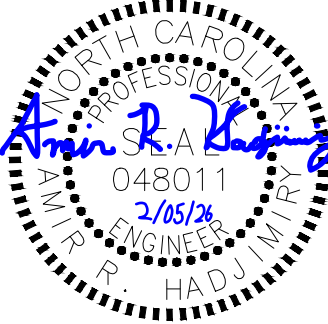
CHECKED BY: ARH

APPROVED BY: ARH

REVISED: 11/21/25

NORTH CAROLINA
DEPARTMENT OF
TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151



UTILITY CONSTRUCTION
PLANS ONLY

UTILITY CONSTRUCTION

4. CONTRACTOR SHALL COORDINATE WITH THE FUQUAY VARINA PUBLIC UTILITIES DEPARTMENT STAFF 72 HOURS PRIOR TO THE SHUTDOWN OF THE EXISTING WATER LINE.

5. CONTRACTOR SHALL REMOVE EXISTING 16" & 12" WATER LINE AS NECESSARY TO MAKE CONNECTION WITH THE NEW WATER LINE.

6. CONTRACTOR SHALL PLACE FOUNDATION CONDITIONING MATERIALS AND GEOTEXTILE IN ALL PROPOSED WATERLINE TRENCHES.

7. CONTRACTOR AND FUQUAY VARINA WATER WILL EXCHANGE ALL NECESSARY CONTACTS / PHONE NUMBERS AT THE PRE CONSTRUCTION CONFERENCE.

8. UPON EXPOSING ANY OF FUQUAY VARINA WATER'S ASSETS, CONTRACTOR SHALL IMMEDIATELY NOTIFY FUQUAY VARINA WATER ASSET MANAGEMENT TO PERFORM CONDITION ASSESSMENT OF THE ASSET WHILE EXPOSED.

9. CONTRACTOR SHALL PROVIDE A 2-DAY NOTIFICATION TO FUQUAY VARINA WATER PRIOR TO ANYTIME CONTRACTOR WILL EXCAVATE WITHIN 10 FEET OF ANY FUQUAY VARINA WATER MAIN.

10. ALL NEW WATER INFRASTRUCTURE SHALL BE IN COMPLIANCE WITH THE FUQUAY VARINA PUBLIC UTILITIES HANDBOOK.

5/14/99

PROJECT TYPICAL DETAILS

Dewberry

DRMP

DRMP, INC.
5000 FARMINGTON PLACE
RALEIGH, NC 27609
PHONE: 919.881.2909
NC LICENSE NO. F-0234 1/19/87/24115

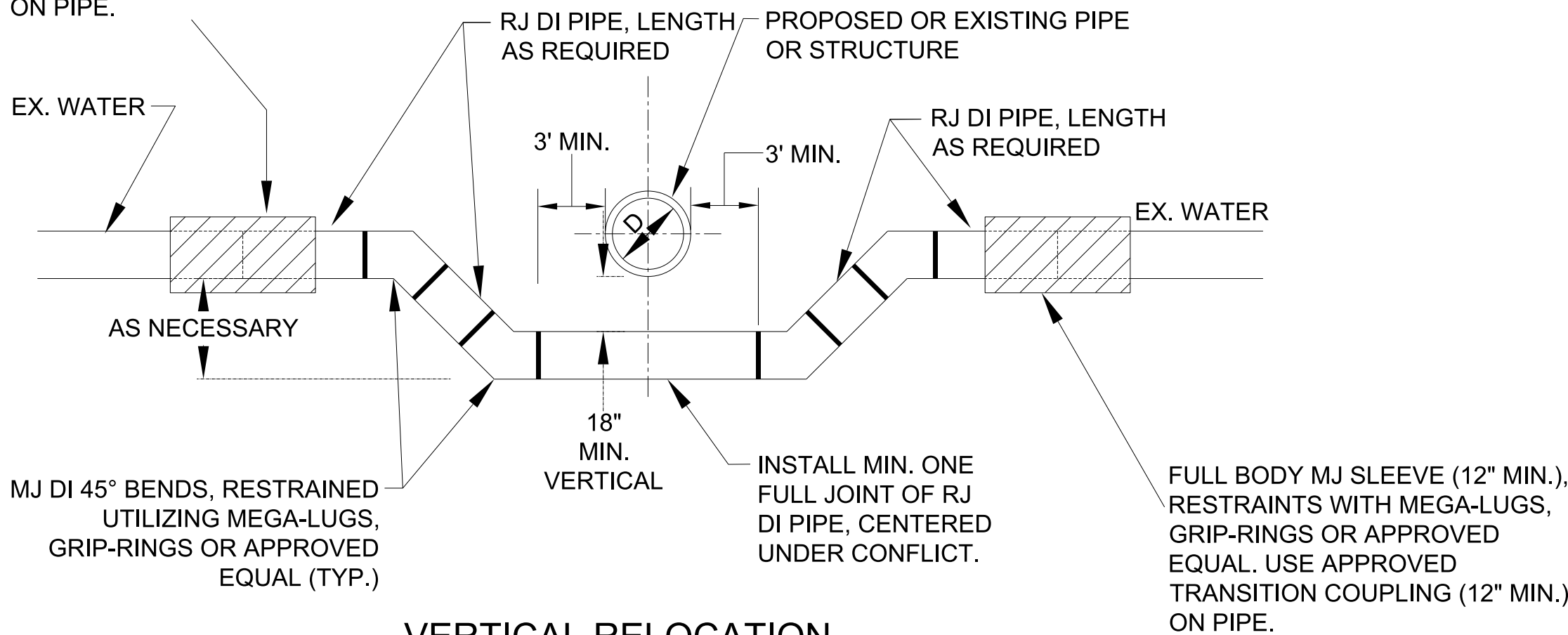
PROJECT REFERENCE NO.		SHEET NO.
HL-0008G		UC-3A
DESIGNED BY:	EPH	
DRAWN BY:	TLK	
CHECKED BY:	ARH	
APPROVED BY:	ARH	
REVISED:	11/21/25	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

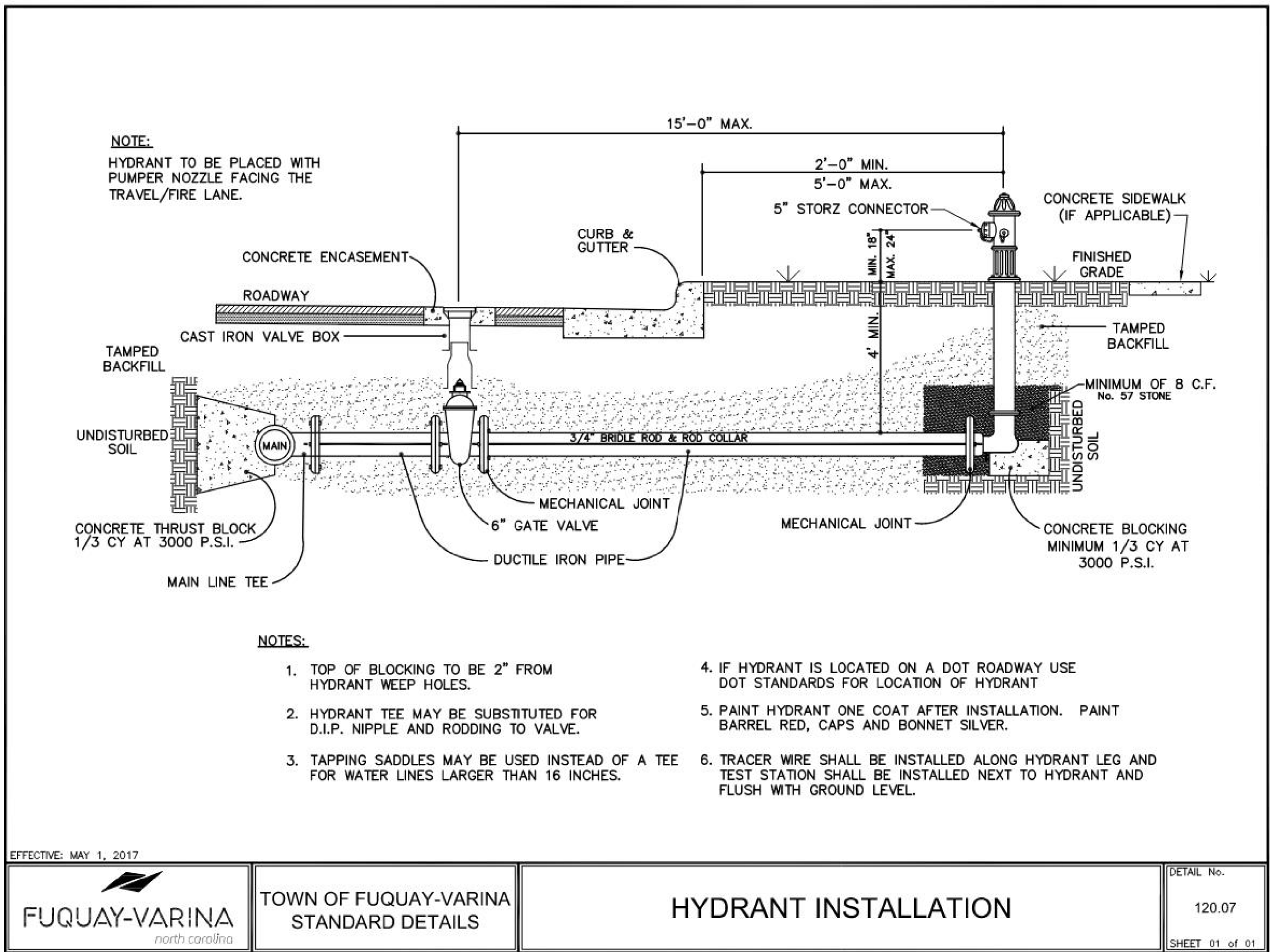
NOTES:

- ALL PIPE AND FITTINGS SHALL BE APPROVED BY NCDOT.
- CONTRACTOR TO COORDINATE NECESSARY OUTAGES WITH NCDOT AND AFFECTED CUSTOMERS. MINIMUM 48 HOUR NOTICE REQUIRED.
- NEW WATER MAIN TO BE SWABBED WITH A CHLORINE SOLUTION AND FLUSHED PRIOR TO PLACING INTO SERVICE.
- ALL NEW FITTINGS AND PIPE TO BE RESTRAINED UTILIZING MEGA-LUGS, GRIP-RINGS OR APPROVED EQUAL.
- ALL PIPE AND FITTINGS TO BE DUCTILE IRON.
- NCDOT PROJECT COORDINATOR TO BE PRESENT DURING WORK.
- BACKFILL AND COMPACT TO TOWN OF FUQUAY-VARINA AND NCDOT REQUIREMENTS.
- PROVIDE STONE BEDDING (NO. 5 OR NO. 57 STONE) TO SUPPORT RELOCATED WATER MAIN AND/OR NEW STORM DRAIN, AS APPROVED BY NCDOT PROJECT COORDINATOR.
- MJ RESTRAINTS NOT ALLOWED ON PVC PIPE.
- DIMENSIONS ARE GIVEN AS GENERAL GUIDANCE, EXACT DIMENSIONS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS AND AS DIRECTED BY NCDOT.

FULL BODY MJ SLEEVE (12" MIN.), RESTRAINTS WITH MEGA-LUGS, GRIP-RINGS OR APPROVED EQUAL. USE APPROVED TRANSITION COUPLING (12" MIN.) ON PIPE.



VERTICAL RELOCATION



NOTES:

- TOP OF BLOCKING TO BE 2" FROM HYDRANT WEEP HOLES.
- HYDRANT TEE MAY BE SUBSTITUTED FOR D.I.P. NIPPLE AND RODDING TO VALVE.
- TAPPING SADDLES MAY BE USED INSTEAD OF A TEE FOR WATER LINES LARGER THAN 16 INCHES.
- IF HYDRANT IS LOCATED ON A DOT ROADWAY USE DOT STANDARDS FOR LOCATION OF HYDRANT
- PAINT HYDRANT ONE COAT AFTER INSTALLATION. PAINT BARREL RED, CAPS AND BONNET SILVER.
- TRACER WIRE SHALL BE INSTALLED ALONG HYDRANT LEG AND TEST STATION SHALL BE INSTALLED NEXT TO HYDRANT AND FLUSH WITH GROUND LEVEL.

EFFECTIVE: MAY 1, 2017

FUQUAY-VARINA
north carolina

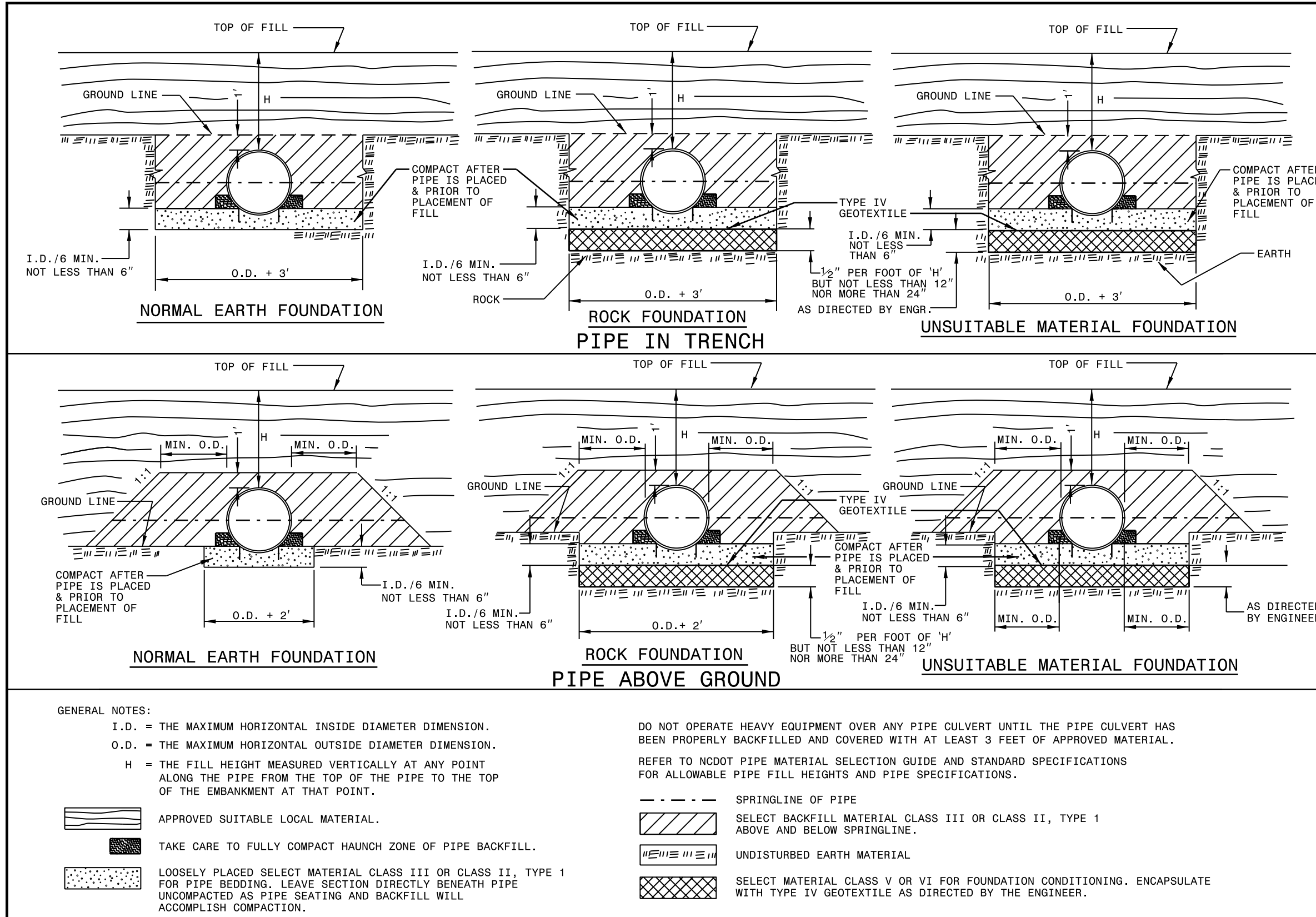
TOWN OF FUQUAY-VARINA
STANDARD DETAILS

HYDRANT INSTALLATION

DETAIL No.

120.07

SHEET 01 of 01



GENERAL NOTES:

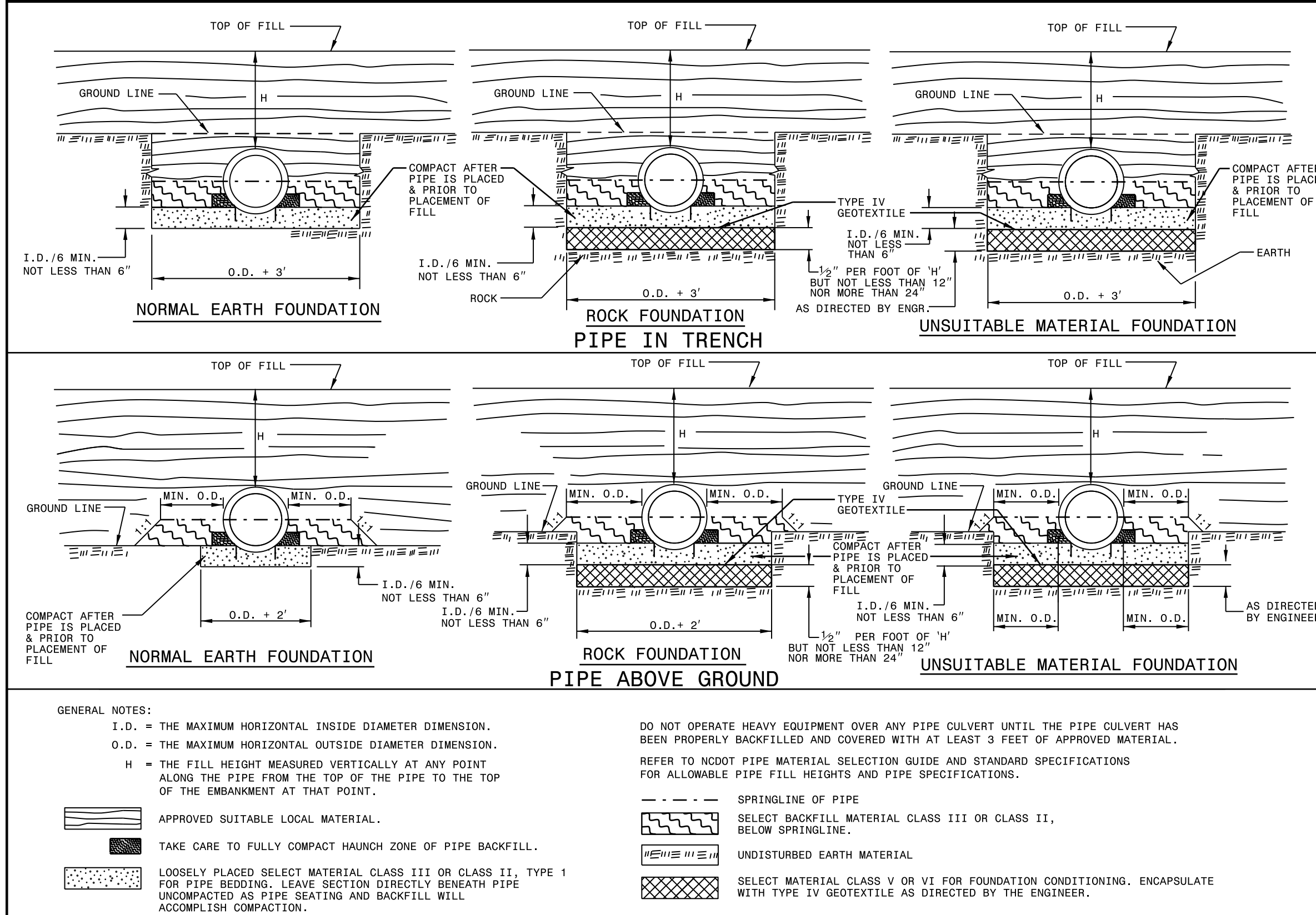
- I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
- APPROVED SUITABLE LOCAL MATERIAL.
- TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
- LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

- DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL. REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.
- SPRINGLINE OF PIPE
- SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.
- UNDISTURBED EARTH MATERIAL
- SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

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

ROADWAY STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 2
300.01



GENERAL NOTES:

- I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.
- APPROVED SUITABLE LOCAL MATERIAL.
- TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
- LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

- DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL. REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.
- SPRINGLINE OF PIPE
- SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.
- UNDISTURBED EARTH MATERIAL
- SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

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

ROADWAY STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE

SHEET 2 OF 2
300.01

5/14/99

NOTE:

1. SEE NCDOT STANDARD DETAIL 300.01 FOR RIGID PIPE FOR FOUNDATION CONDITIONING.
2. WL-1 IS TO REMAIN IN SERVICE USING INSERTION VALVE FOR THE ENTIRETY OF CONSTRUCTION.

NOTE:

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3125 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

Dewberry

DRMP

DRMP, INC.
5801 FARMGROVE PLACE
RALEIGH, NC 27611
PHONE: (919) 851-9999
FAX: (919) 851-9999
NC LICENSE NO. E-15201 (07/01/97) 0728115

PROJECT REFERENCE NO.		
HL-0008G		
DESIGNED BY:	EPH	
DRAWN BY:	TLK	
CHECKED BY:	TPBC	
APPROVED BY:	ARH	
REVISED:	07/28/26	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		

GRAPHIC SCALE

50 25 0 50 100

PLANS

50 25 0 50 100 5

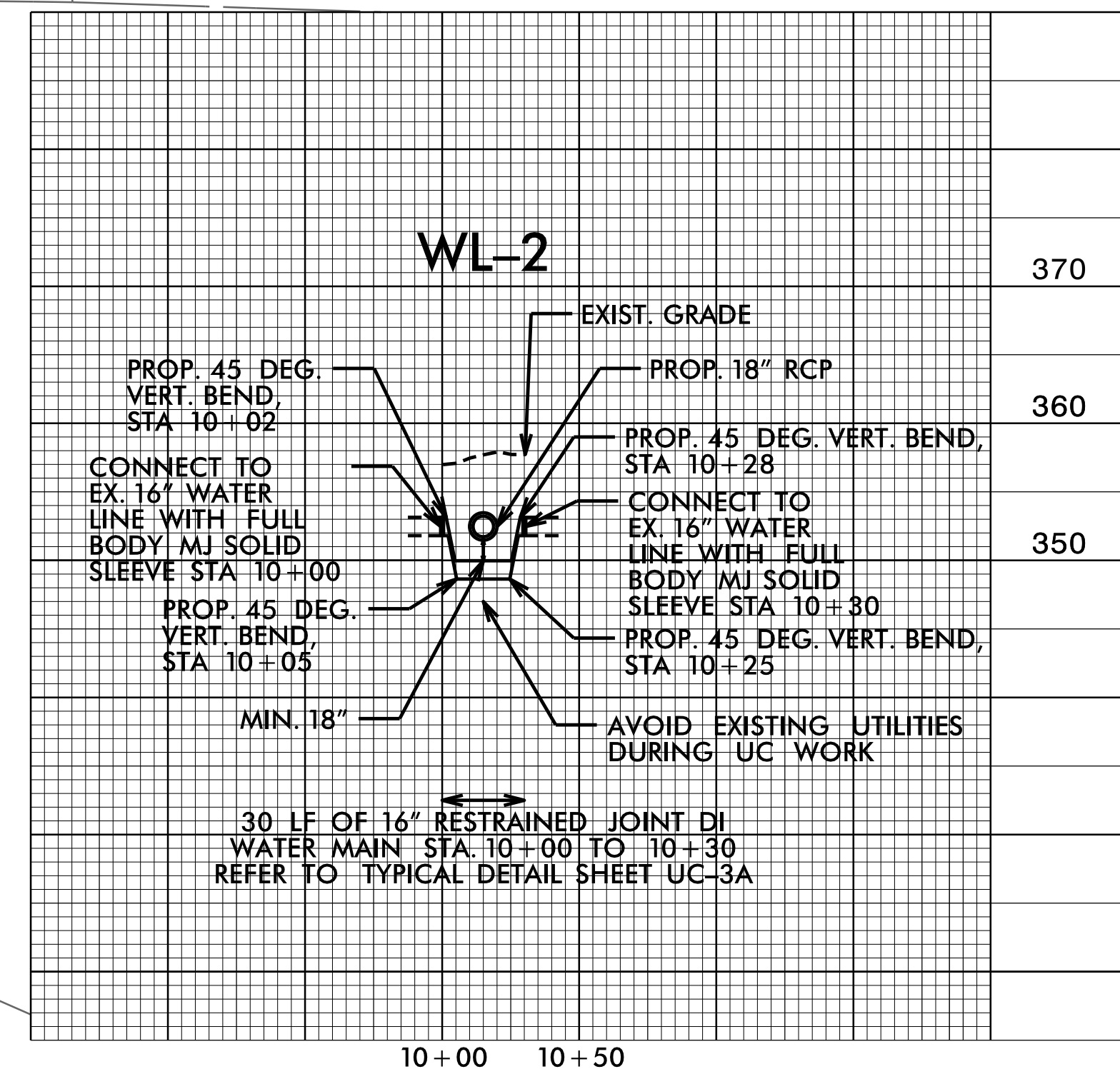
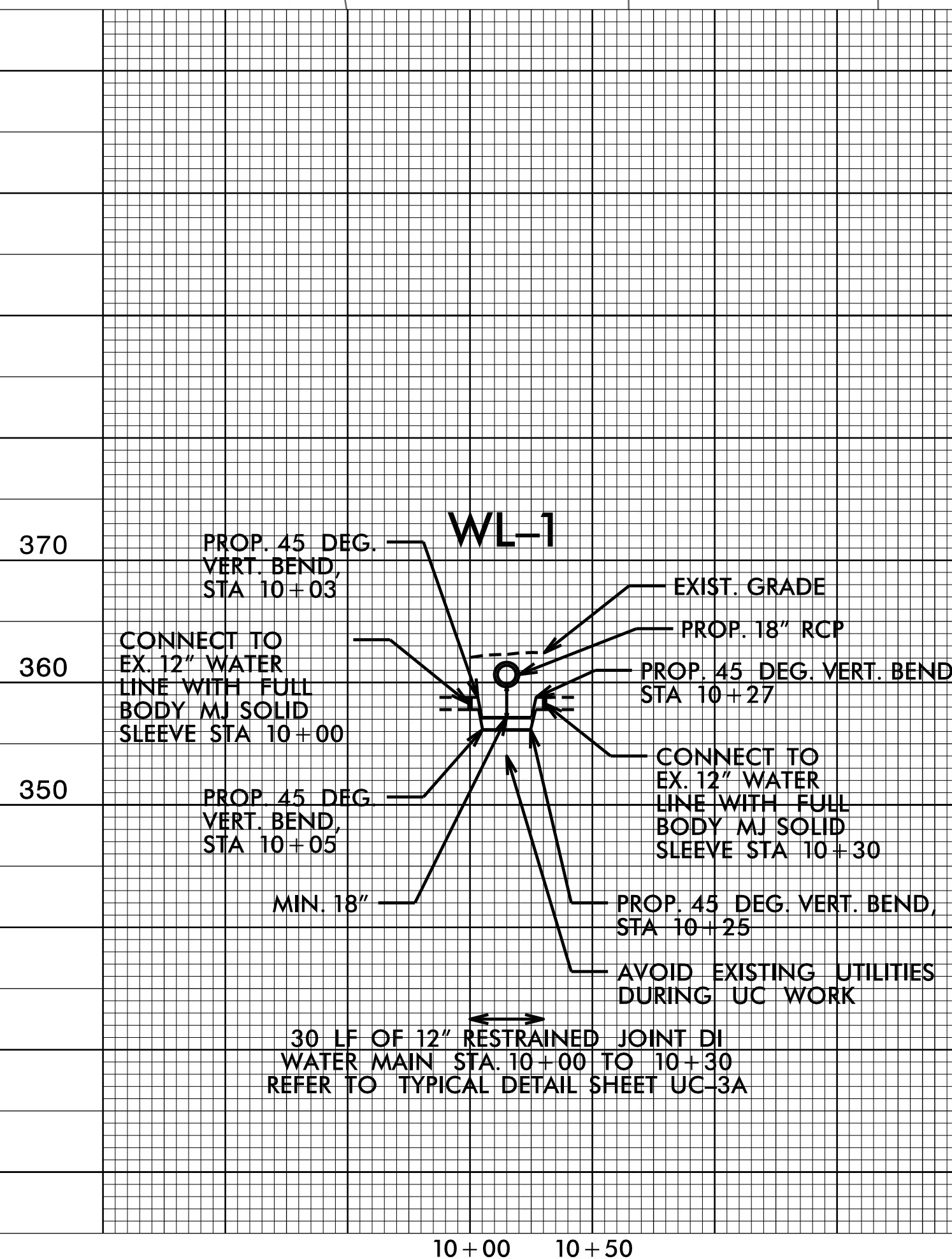
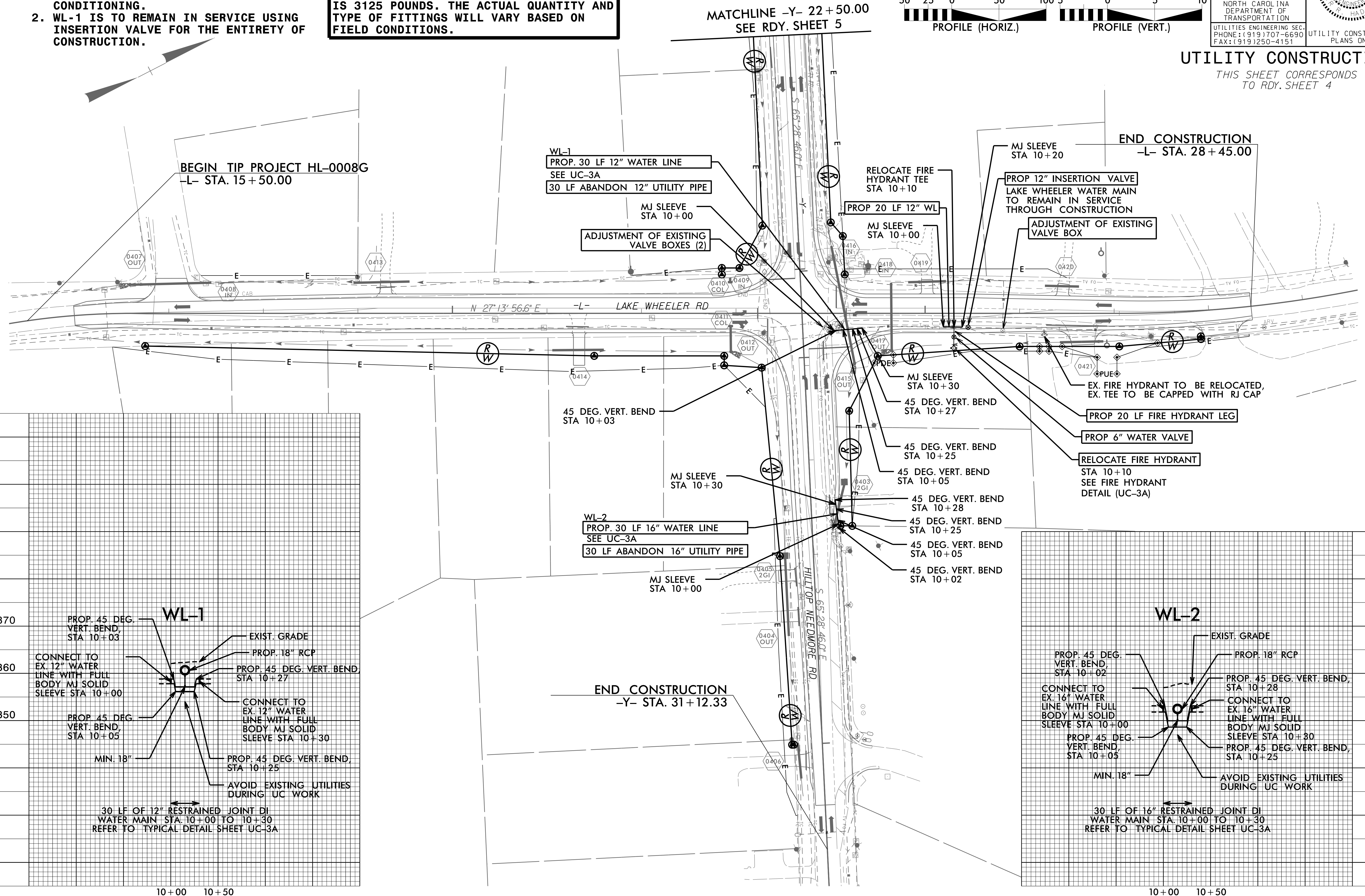
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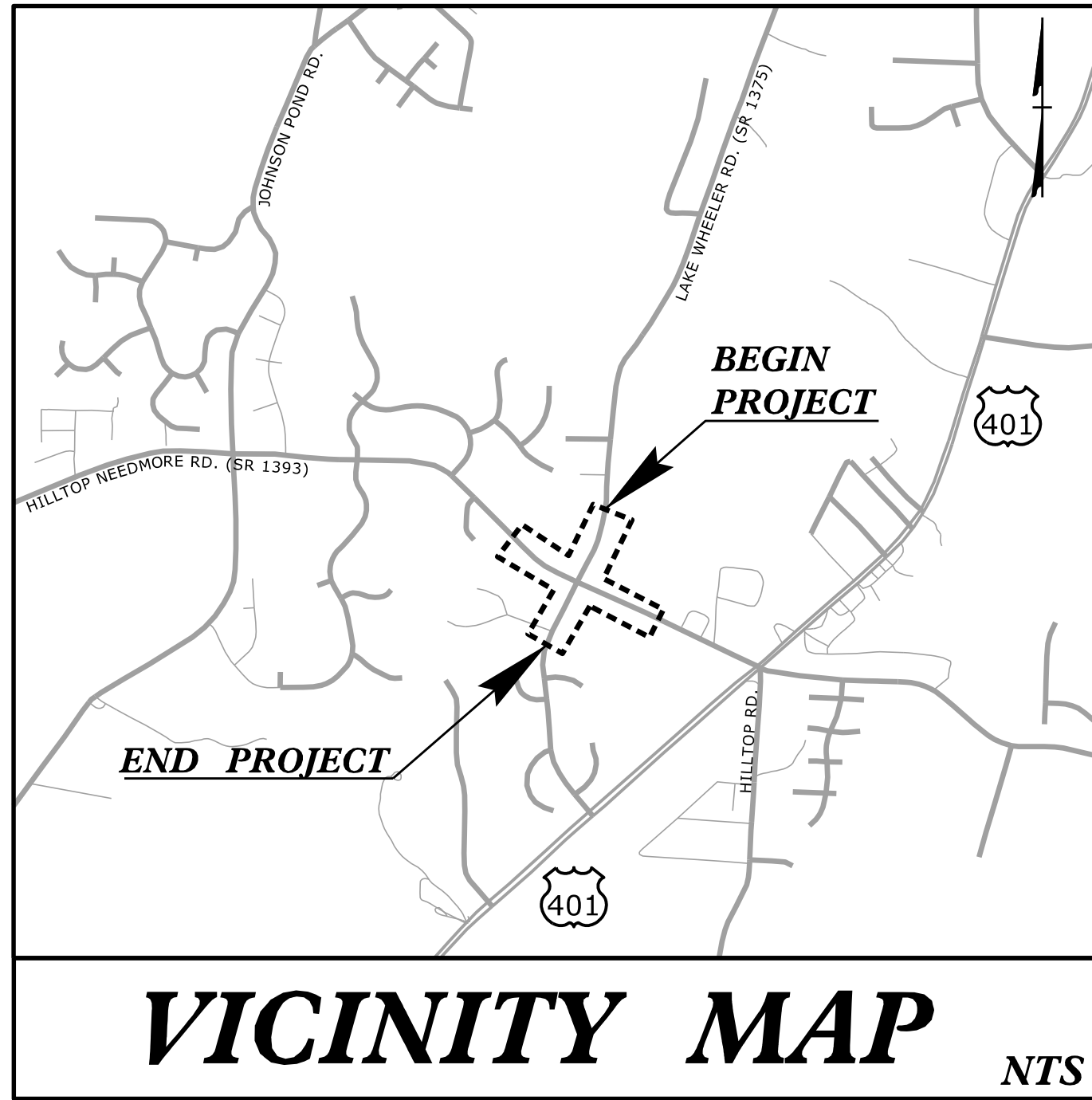
PROFILE (VERT.)

UTILITY CONSTRUCTION

THIS SHEET CORRESPONDS
TO RDY. SHEET 4



TIP PROJECT: HL-0008G

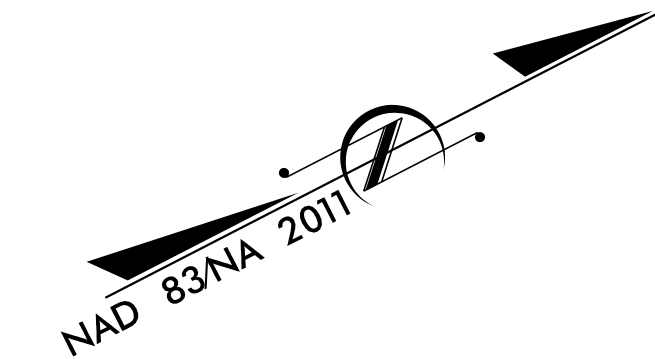
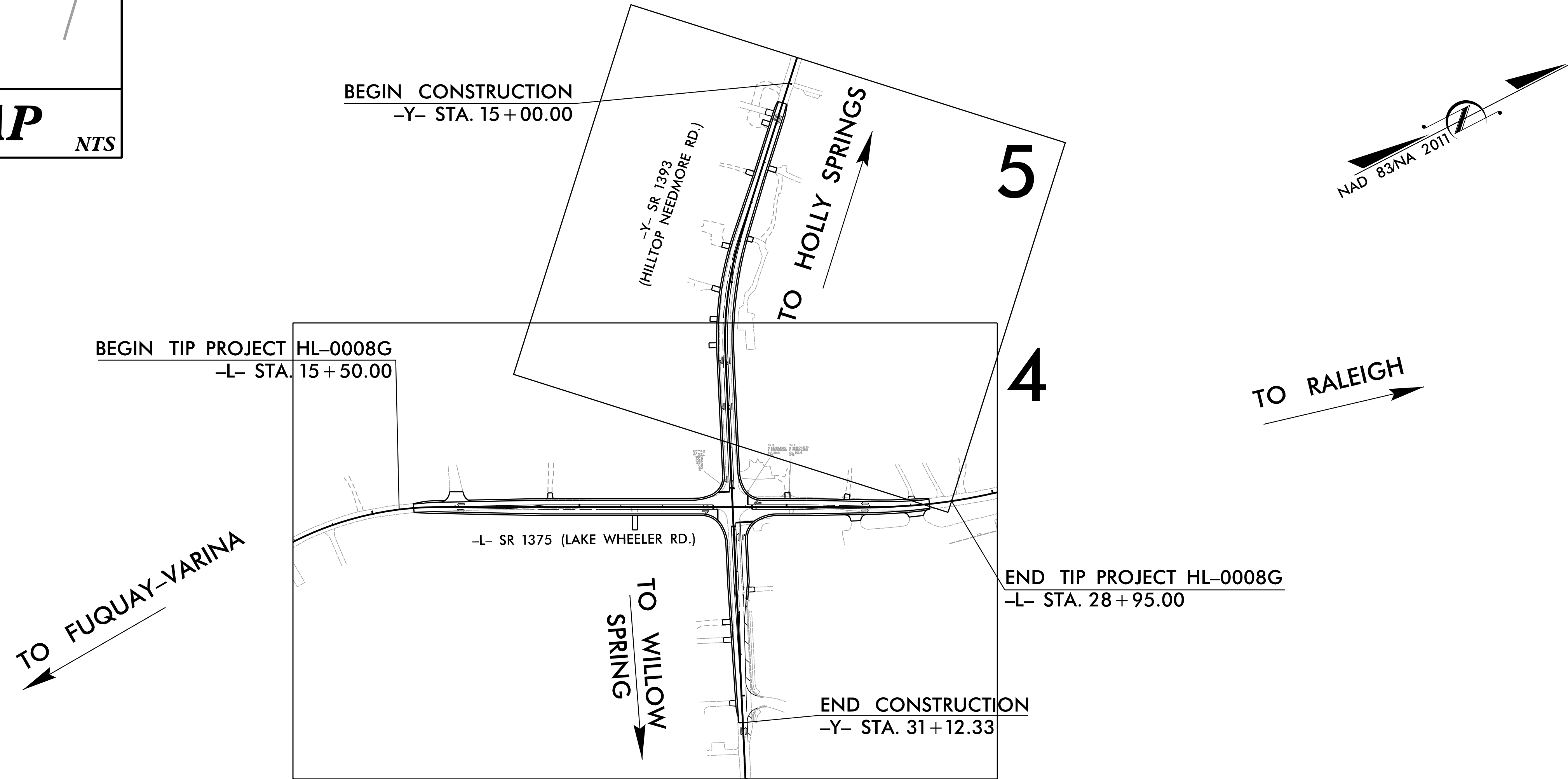


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

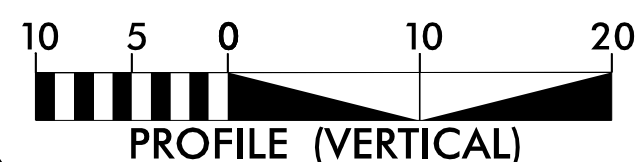
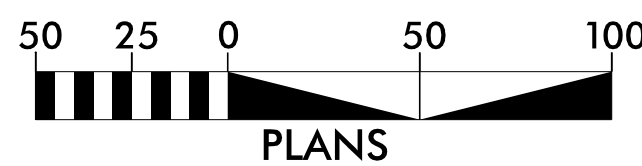
UTILITIES BY OTHERS PLANS WAKE COUNTY

LOCATION: SR 1375 (LAKE WHEELER ROAD) & SR 1393 (HILLTOP NEEDMORE ROAD)

TYPE OF WORK: UTILITY RELOCATION (GAS, POWER, COMMUNICATIONS)



GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-2 THRU UO-3	UBO PLAN SHEET

UTILITY OWNERS WITH CONFLICTS

- (A) POWER - DUKE ENERGY
- (B) COMMUNICATIONS - CHARTER
- (C) COMMUNICATIONS - BRIGHTSPEED
- (D) COMMUNICATIONS - SEGRA
- (E) SIGNAL COMMUNICATIONS - NCDOT
- (F) GAS - DOMINION

Prepared In the Office of:

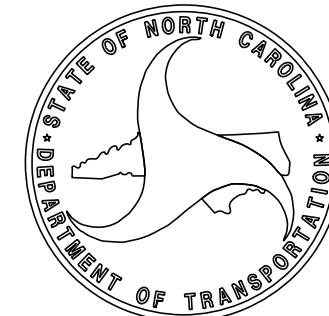


DRMP, INC.
5808 FARRINGTON PLACE
RALEIGH, NC 27609
PHONE: 919-872-5115
www.drmp.com | NC License No. F-1524

UTILITIES PROJECT ENGINEER:

KAYLA M. POULOS, PE

MIKAYLA M. LINDSEY, EI

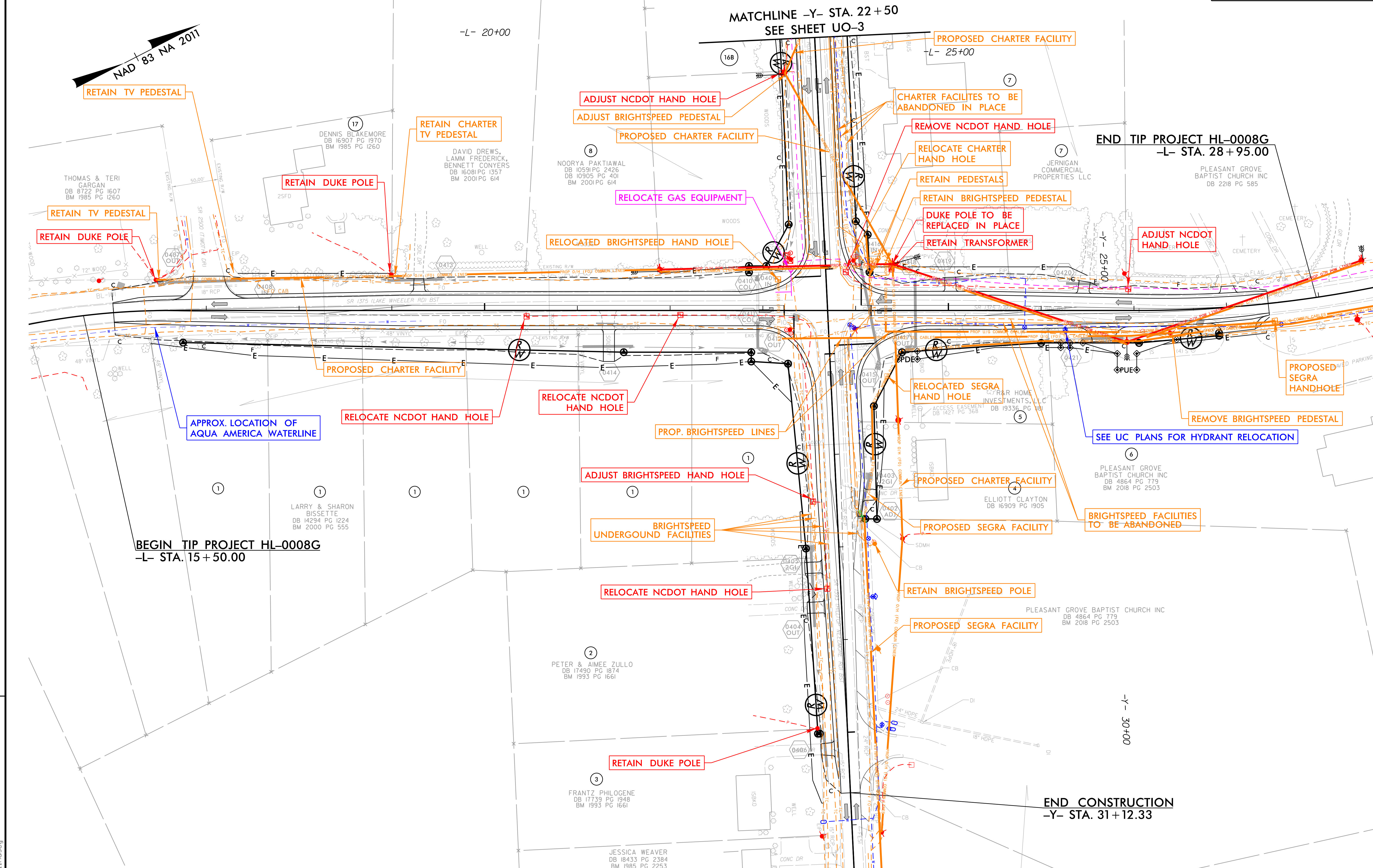


DIVISION OF HIGHWAYS - DIVISION 5

PROJECT DELIVERY UNIT
2612 N. DUKE STREET
DURHAM, NC 27704
PHONE 919-317-4700
FAX 919-317-4710

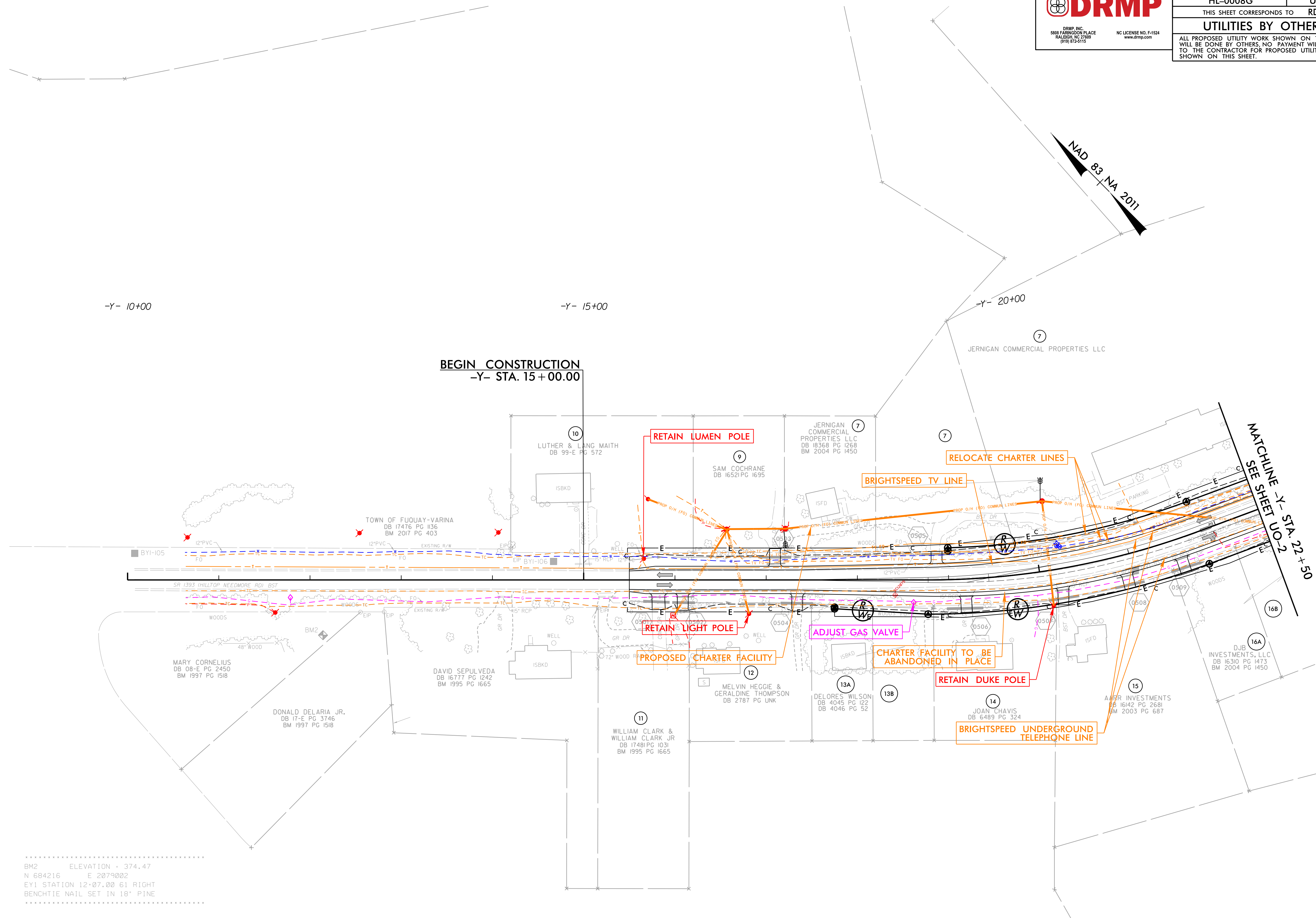
SUSAN LANCASTER, PE
MATTHEW W. NOLFO, PE
DONALD W. PROPER
JAMES E. SWINSON

TEAM LEAD
PROJECT MANAGER
DIV. 5 UTILITIES ENGINEER
DIV. 5 UTILITY ENGINEER



REVISIONS

3/27/2025
....\UBO\Proj\HL0008C-utl-ps04.dgn
User: mbindseu



```

BM2          ELEVATION = 374.47
N 684216     E 2079002
EY1 STATION 12+07.00 61 RIGHT
BENCHTIE NAIL SET IN 18" PINE
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

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INDEX OF CROSS SECTION SHEETS

-L- SR 1371 (LAKE WHEELER ROAD) X-2 THRU X-10
-Y- SR 1393 (HILLTOP NEEDMORE ROAD) X-11 THRU X-24

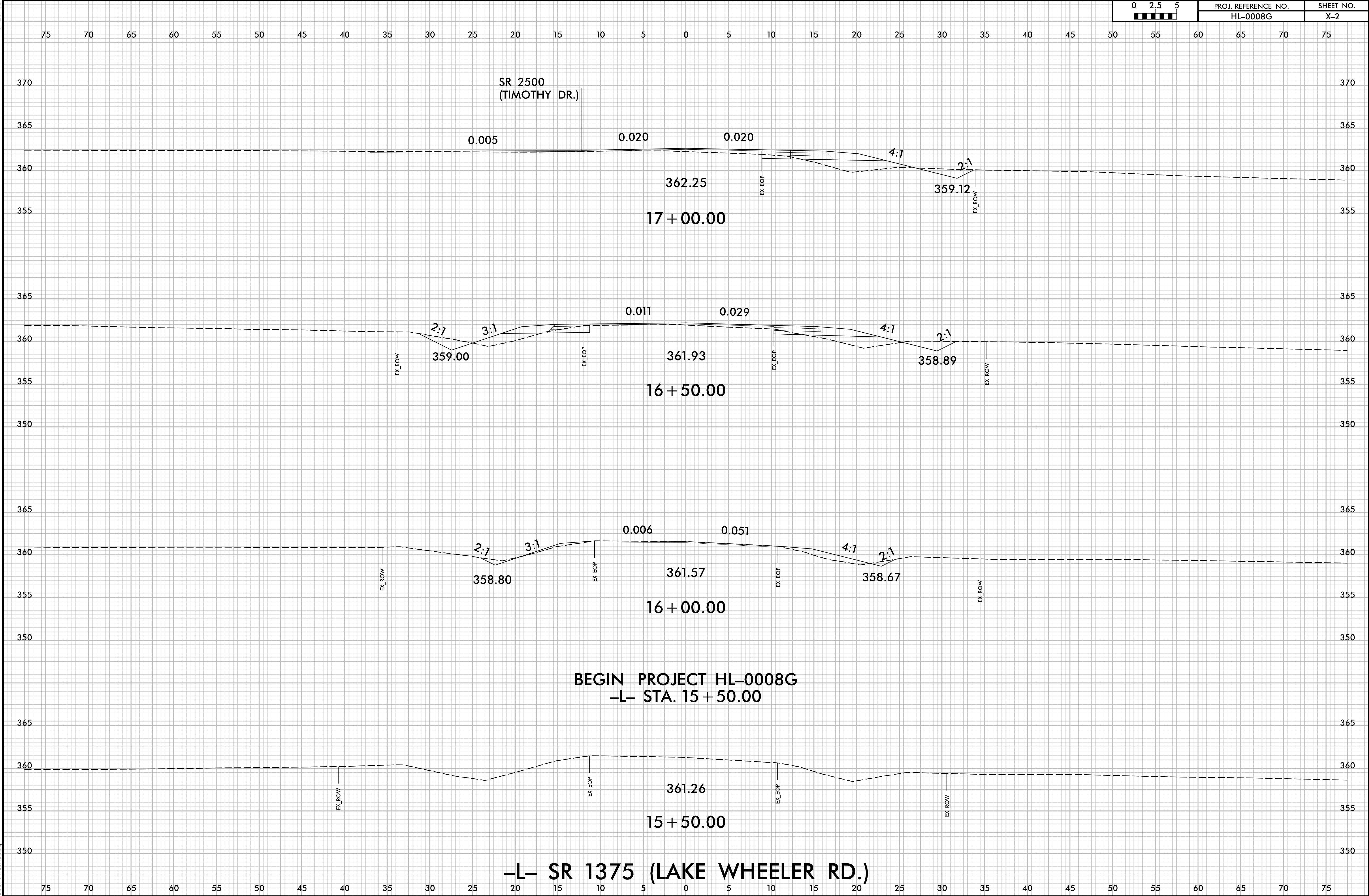
PROJECT NO.	SHEET NO.
HL-0008G	X-1



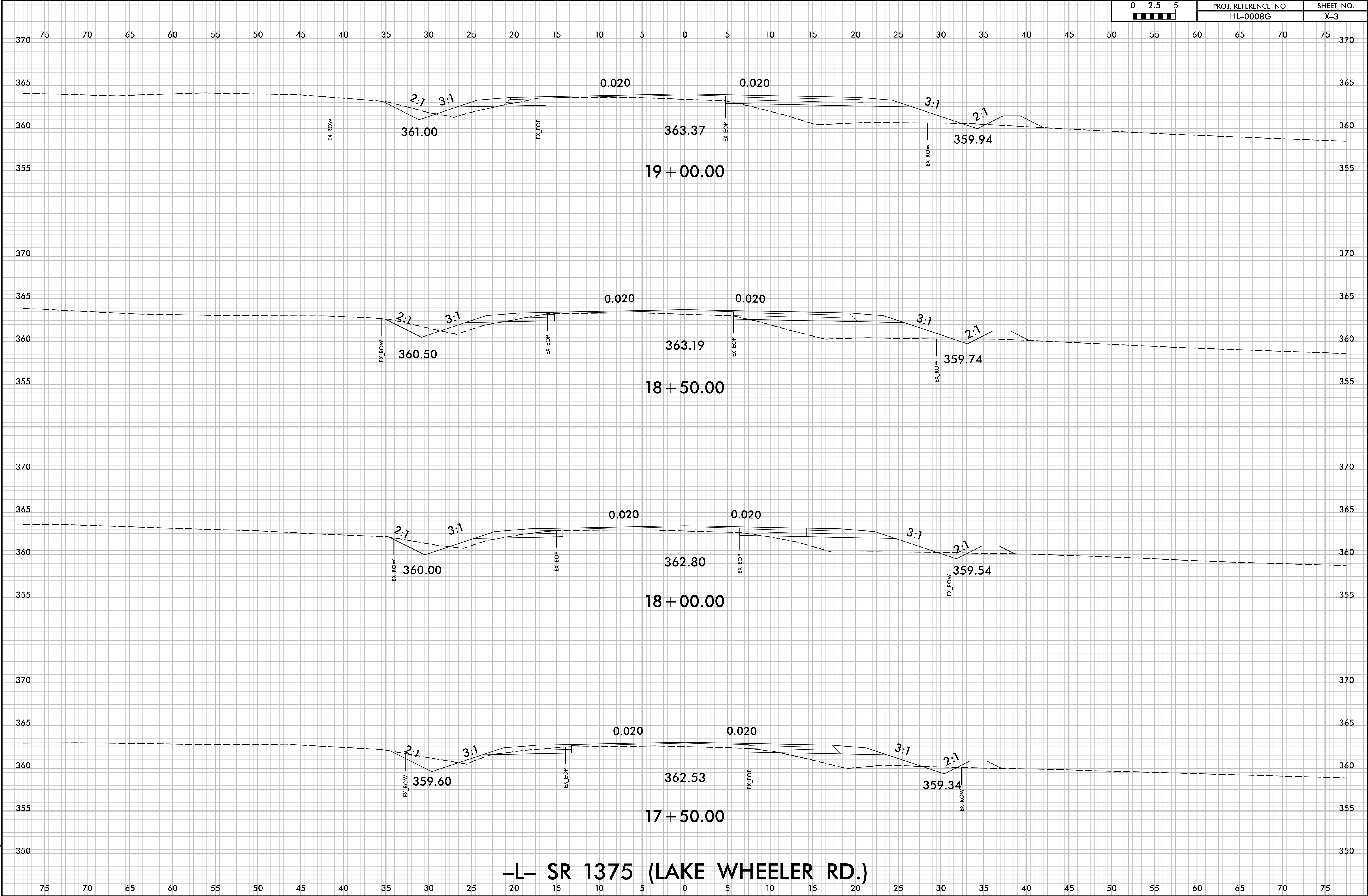
DRMP INC.
5808 FARINGDON PLACE
RALEIGH, NC 27609
(919) 872-5115

NC LICENSE NO. F-1524
www.drmp.com

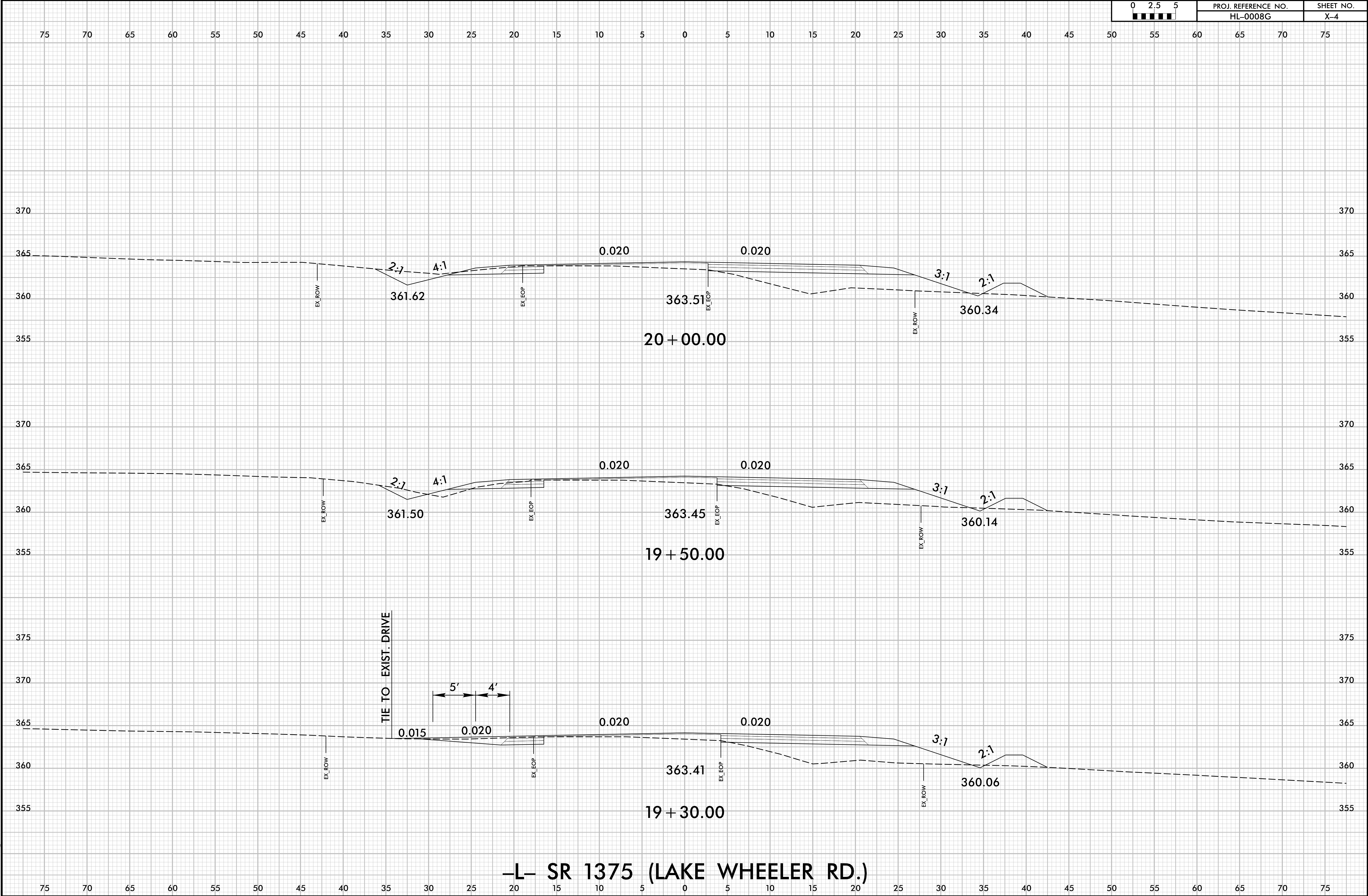
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS													PROJ. REFERENCE NO. HL-0008G		SHEET NO. X-1A	
CROSS-SECTION SUMMARY													 DRMP, INC. 5808 FARINGDON PLACE RALEIGH, NC 27609 (919) 872-5115 NC LICENSE NO. F-1524 www.drmp.com			
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT																
Station	Uncl. Exc.	Embt		Station	Uncl. Exc.	Embt		Station	Uncl. Exc.	Embt		Station	Uncl. Exc.	Embt		
L - RT	(cu. yd.)	(cu. yd.)		L - LT	(cu. yd.)	(cu. yd.)		Y - RT	(cu. yd.)	(cu. yd.)		Y - LT	(cu. yd.)	(cu. yd.)		
16+00.00	0	0		16+00.00	0	0		15+00.00	0	0		15+00.00	0	0		
16+50.00	5	12		16+50.00	7	6		15+50.00	3	5		15+50.00	6	3		
17+00.00	9	17		17+00.00	6	5		15+80.00	6	3		15+80.00	8	3		
17+50.00	7	27		17+50.00	9	1		16+00.00	4	1		16+00.00	5	2		
18+00.00	4	41		18+00.00	16	3		16+05.00	1	0		16+05.00	1	1		
18+50.00	2	58		18+50.00	13	6		16+50.00	6	2		16+50.00	5	7		
19+00.00	2	74		19+00.00	11	7		17+00.00	6	4		17+00.00	4	9		
19+30.00	1	50		19+30.00	6	2		17+10.00	1	1		17+10.00	1	2		
19+50.00	0	35		19+50.00	5	1		17+35.00	2	5		17+35.00	1	5		
20+00.00	1	87		20+00.00	18	2		17+50.00	1	3		17+50.00	2	3		
20+50.00	1	99		20+50.00	16	0		18+00.00	7	10		18+00.00	5	10		
21+00.00	1	137		21+00.00	9	1		18+50.00	10	15		18+50.00	6	9		
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								28+65.00	2	1		28+65.00	0	0		
								29+00.00	13	1		29+00.00	0	0		
								29+50.00	23	4		29+50.00	0	0		
								30+00.00	13	5		30+00.00	0	0		
								30+15.00	3	1		30+15.00	0	0		
								30+50.00	6	1		30+50.00	0	0		
								31+00.00	4	1		31+00.00	0	0		
								31+12.33	0	0		31+12.33	0	0		
Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, and clearing and grubbing will be paid for at the contract lump sum price for "Grading". Earthwork quantities are calculated by the roadway designer. These earthwork quantities are based in part on subsurface data from the Geotechnical Engineering Unit.																



6/23/16

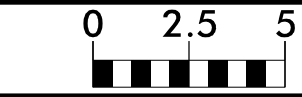


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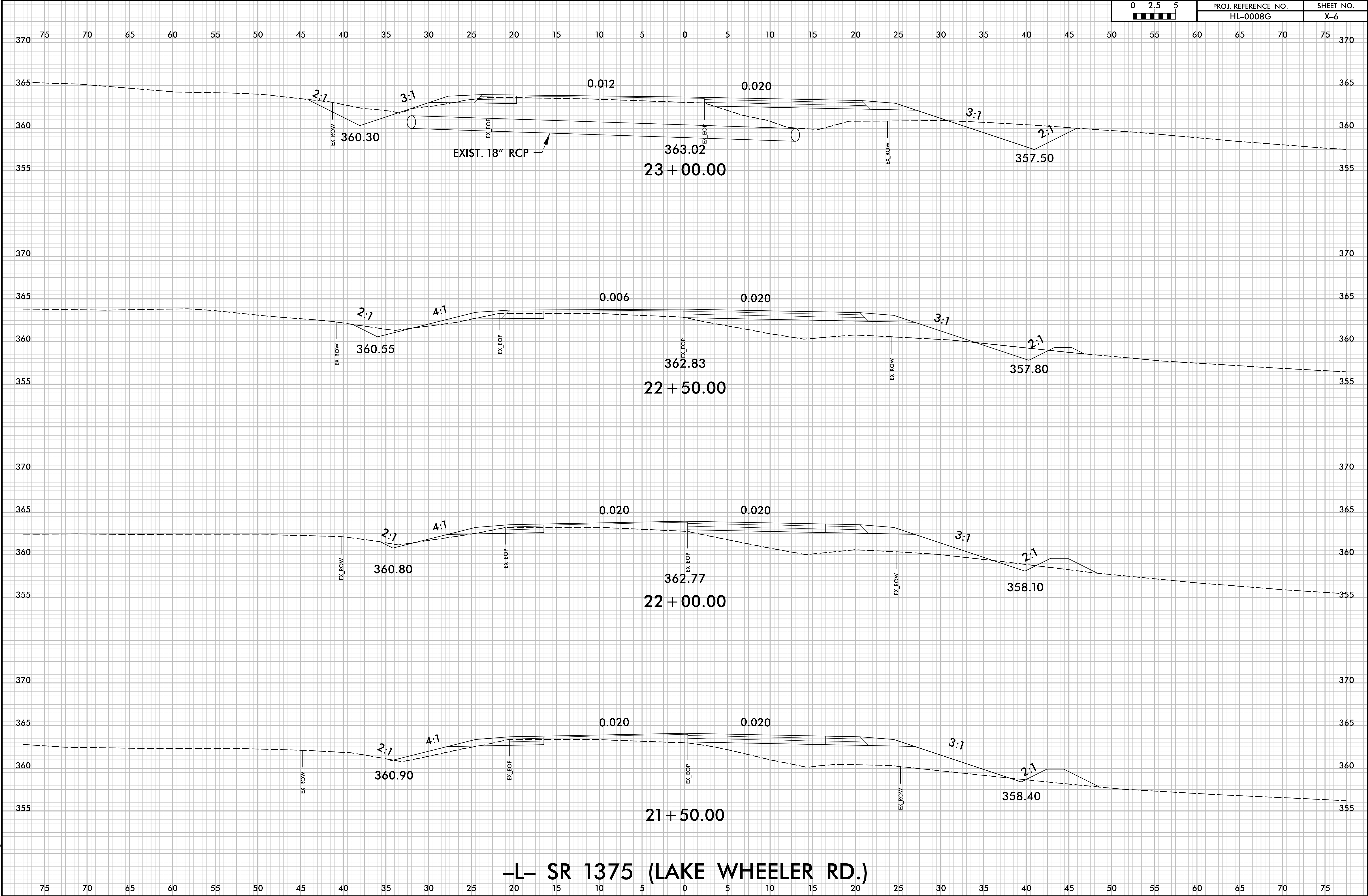




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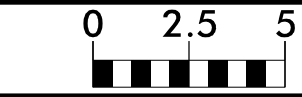


PROJ. REFERENCE NO.	SHEET NO.
HL-0008G	X-6

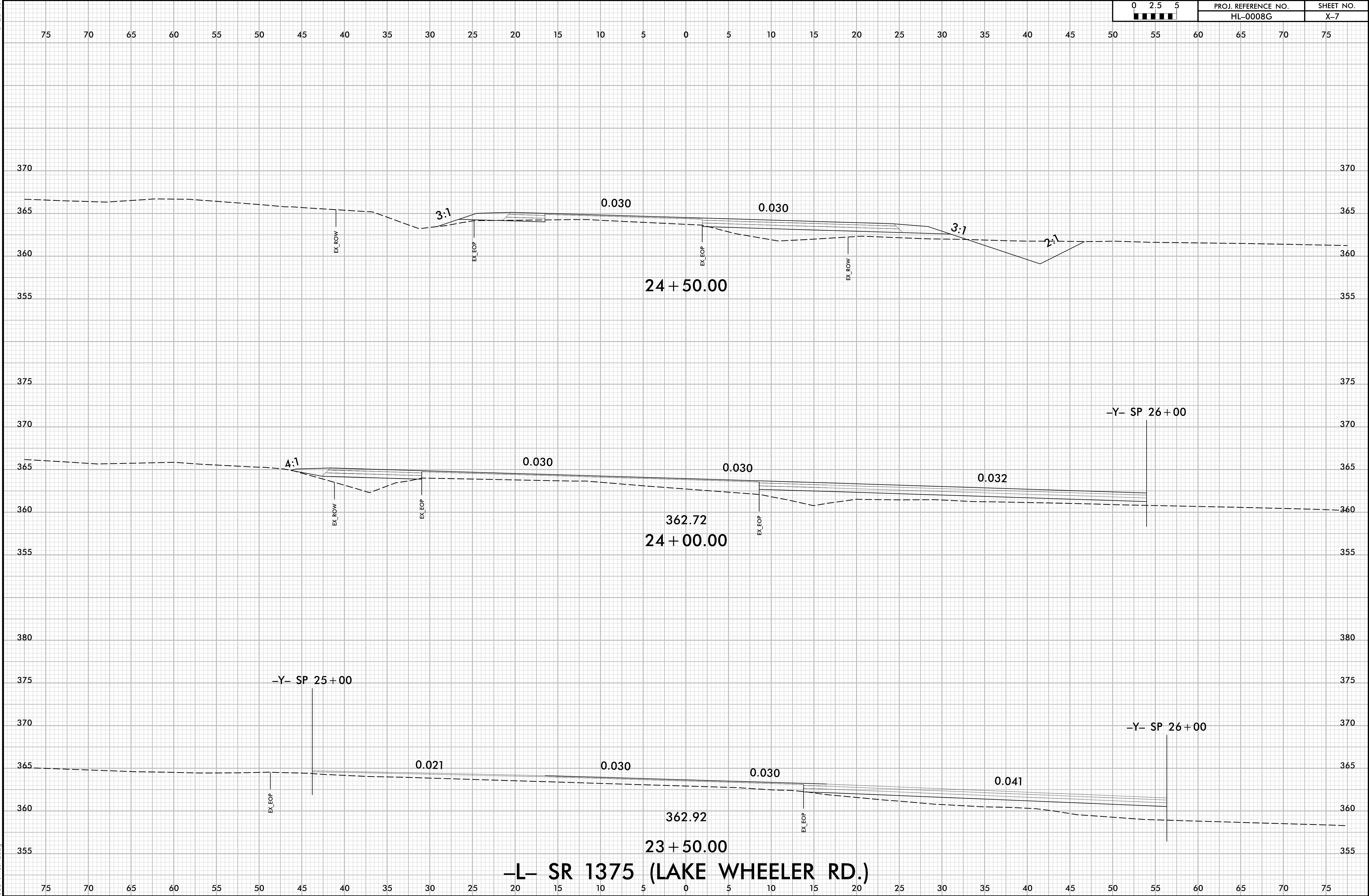


6/14/2024
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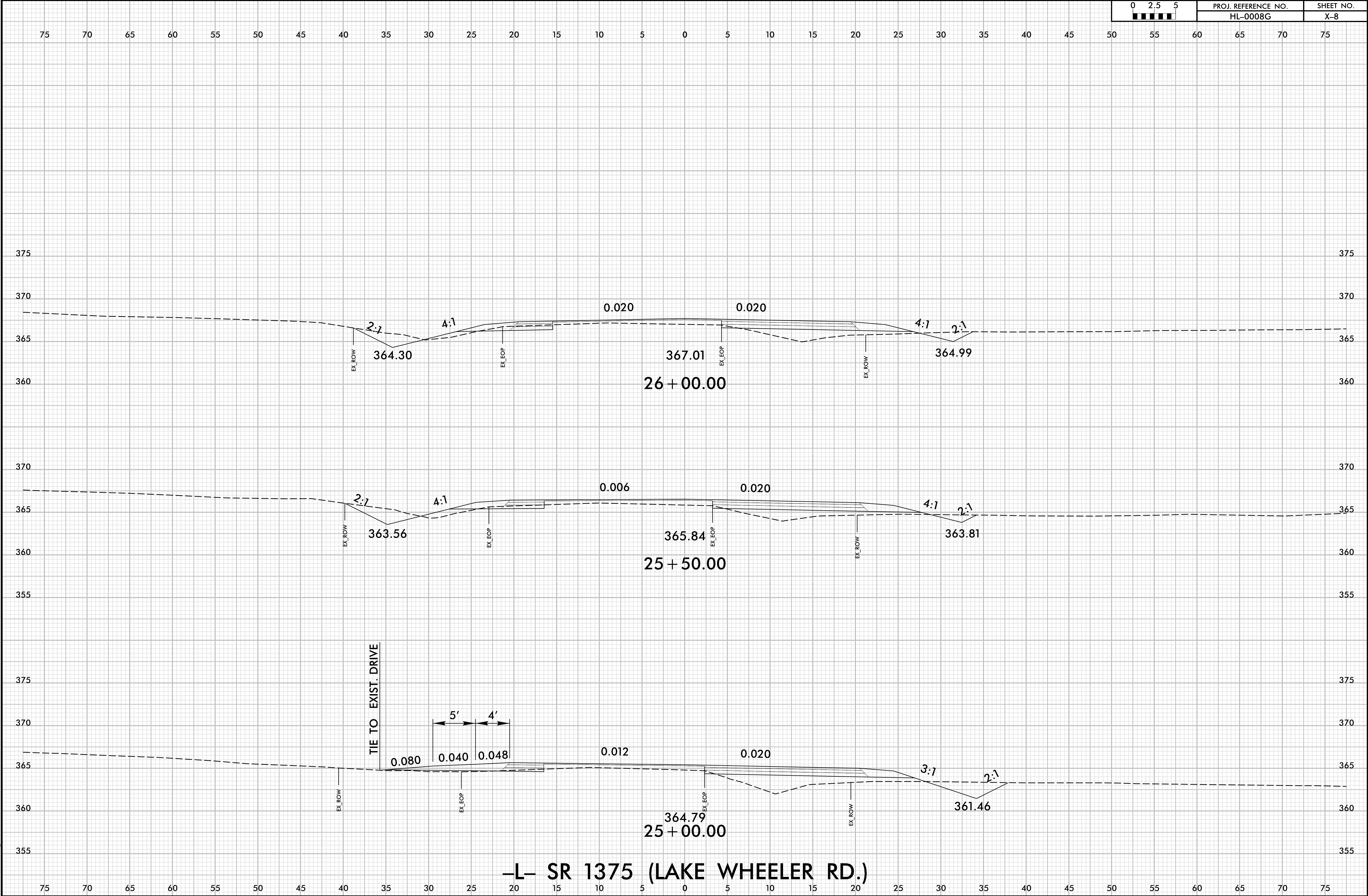
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HL-0008G	X-7



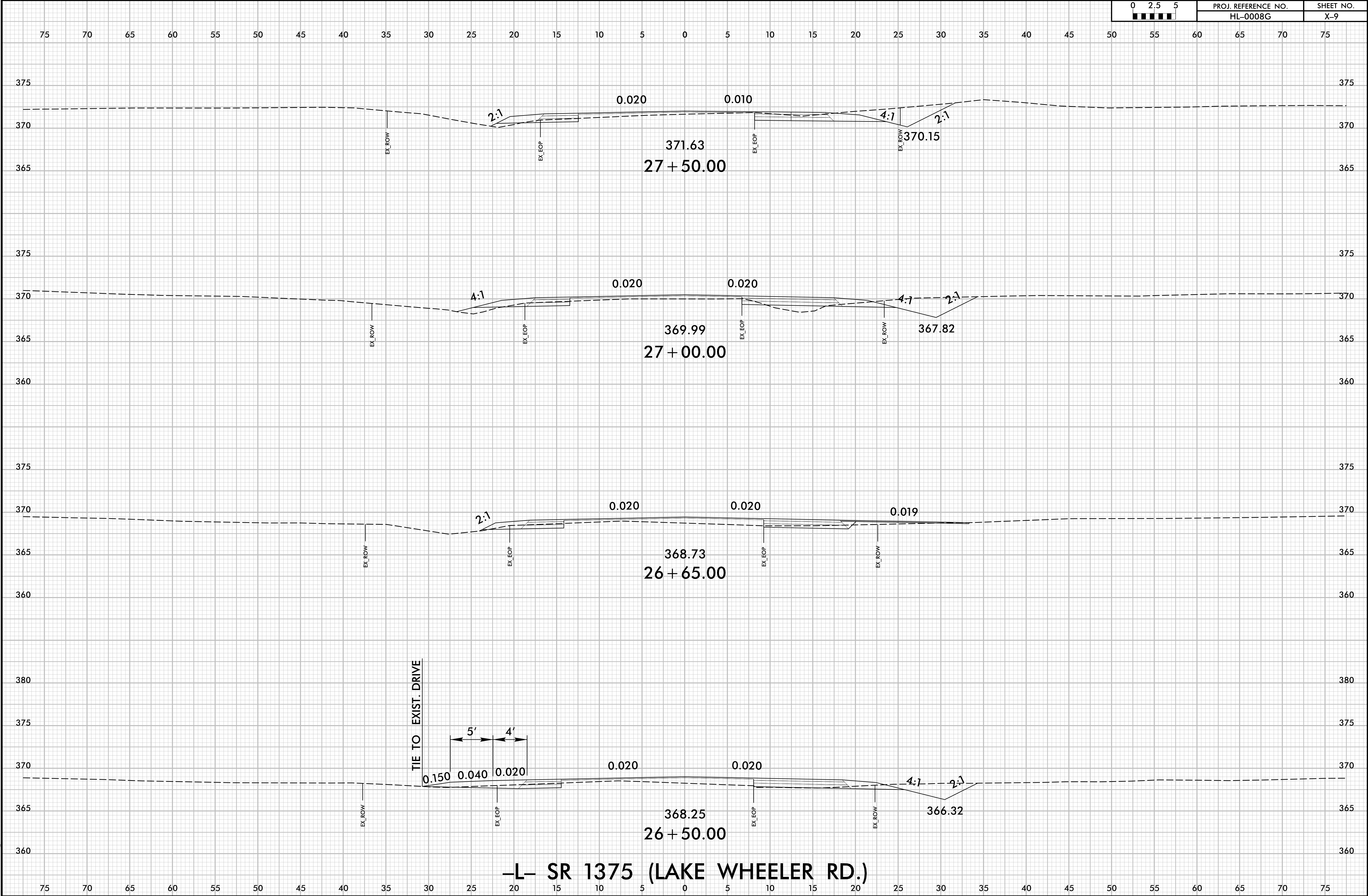
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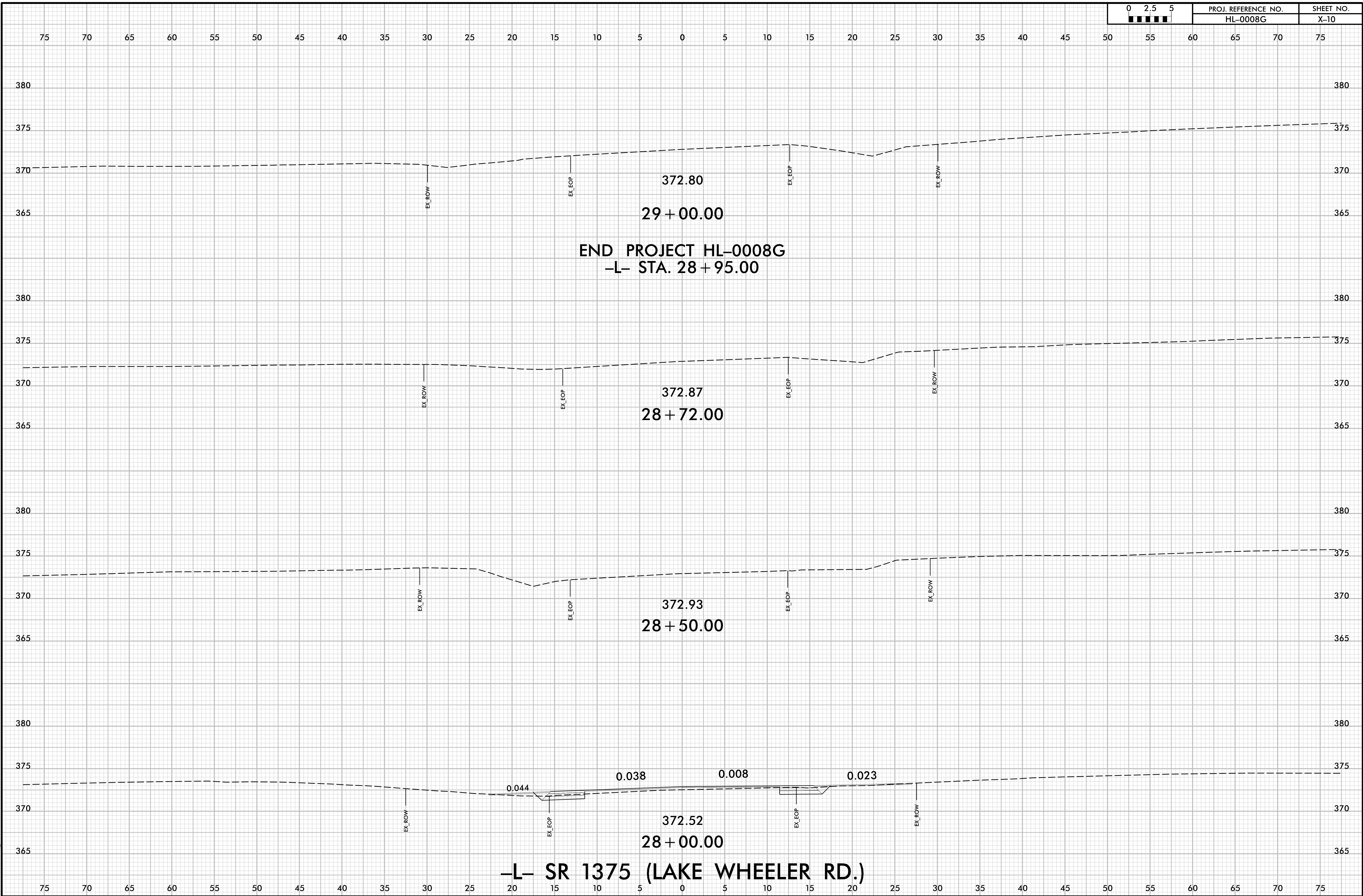


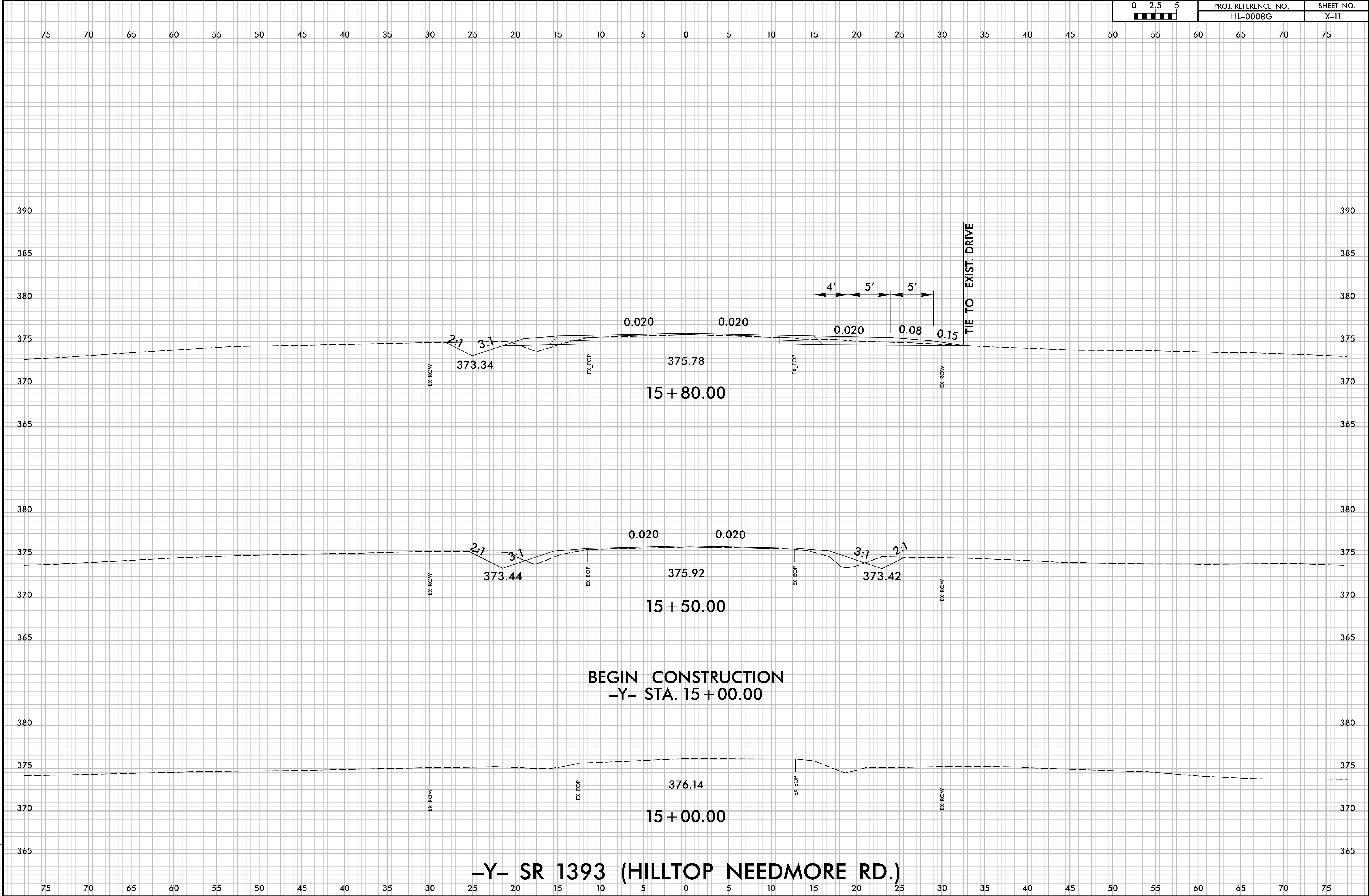
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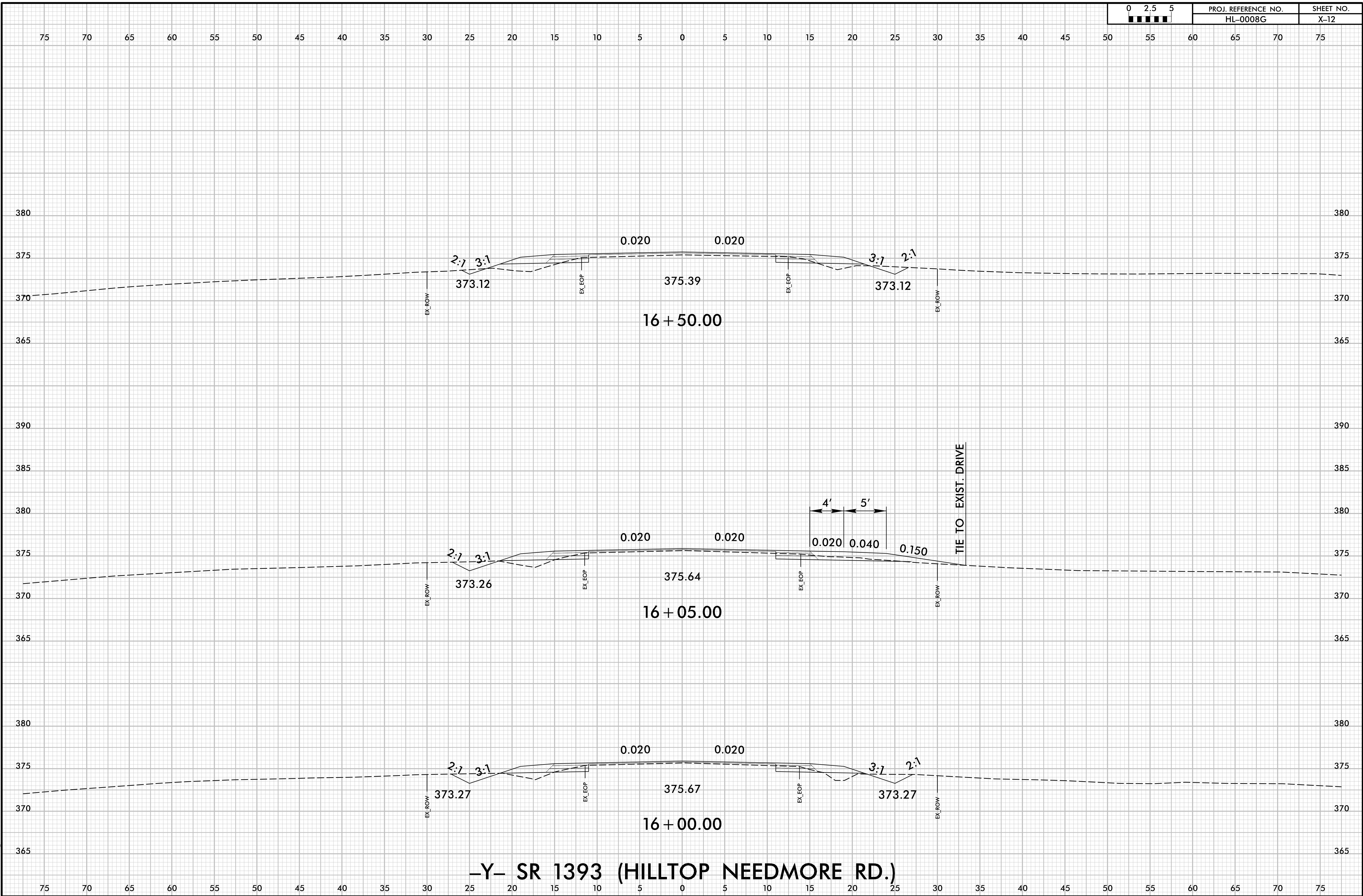


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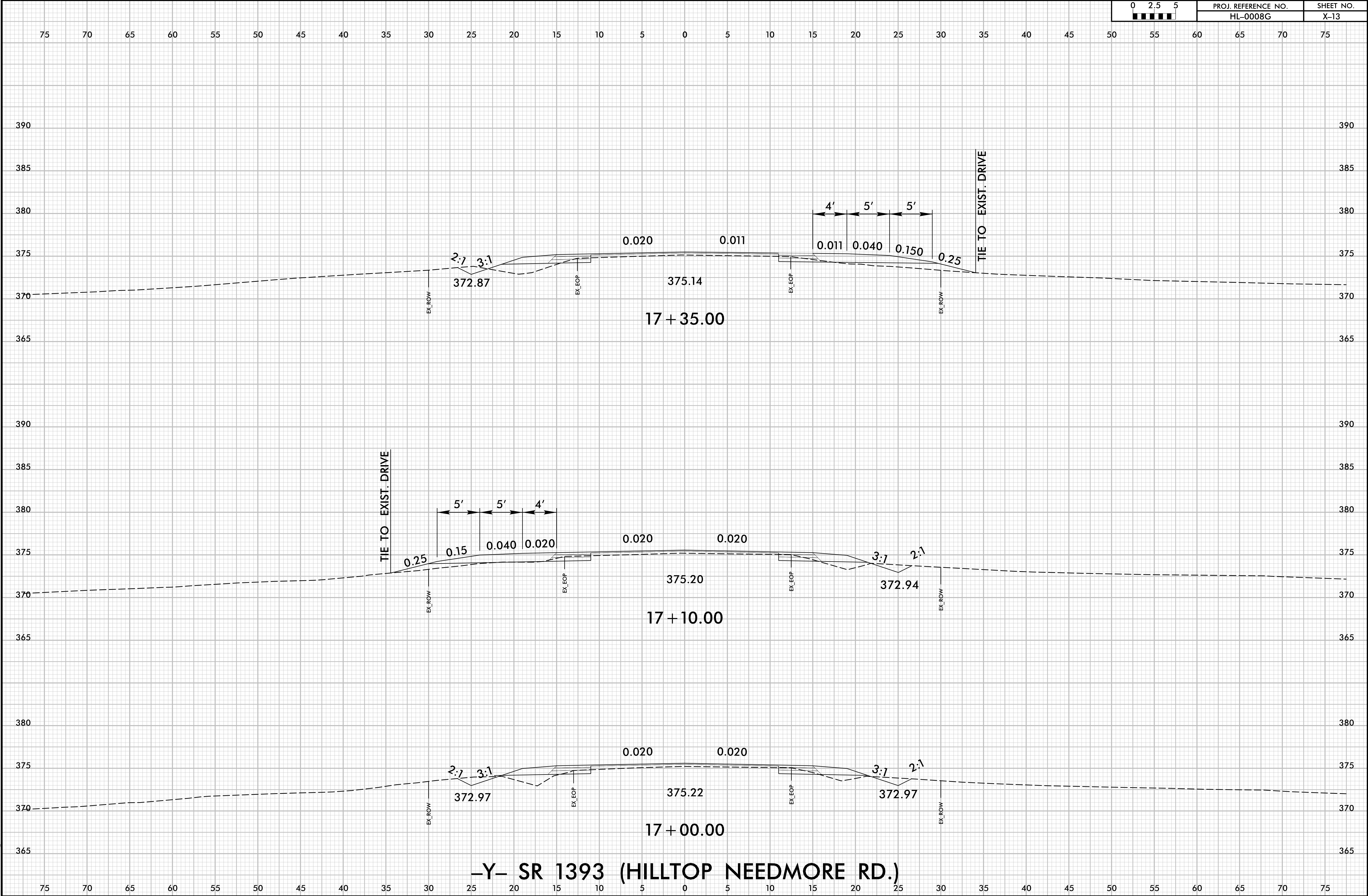




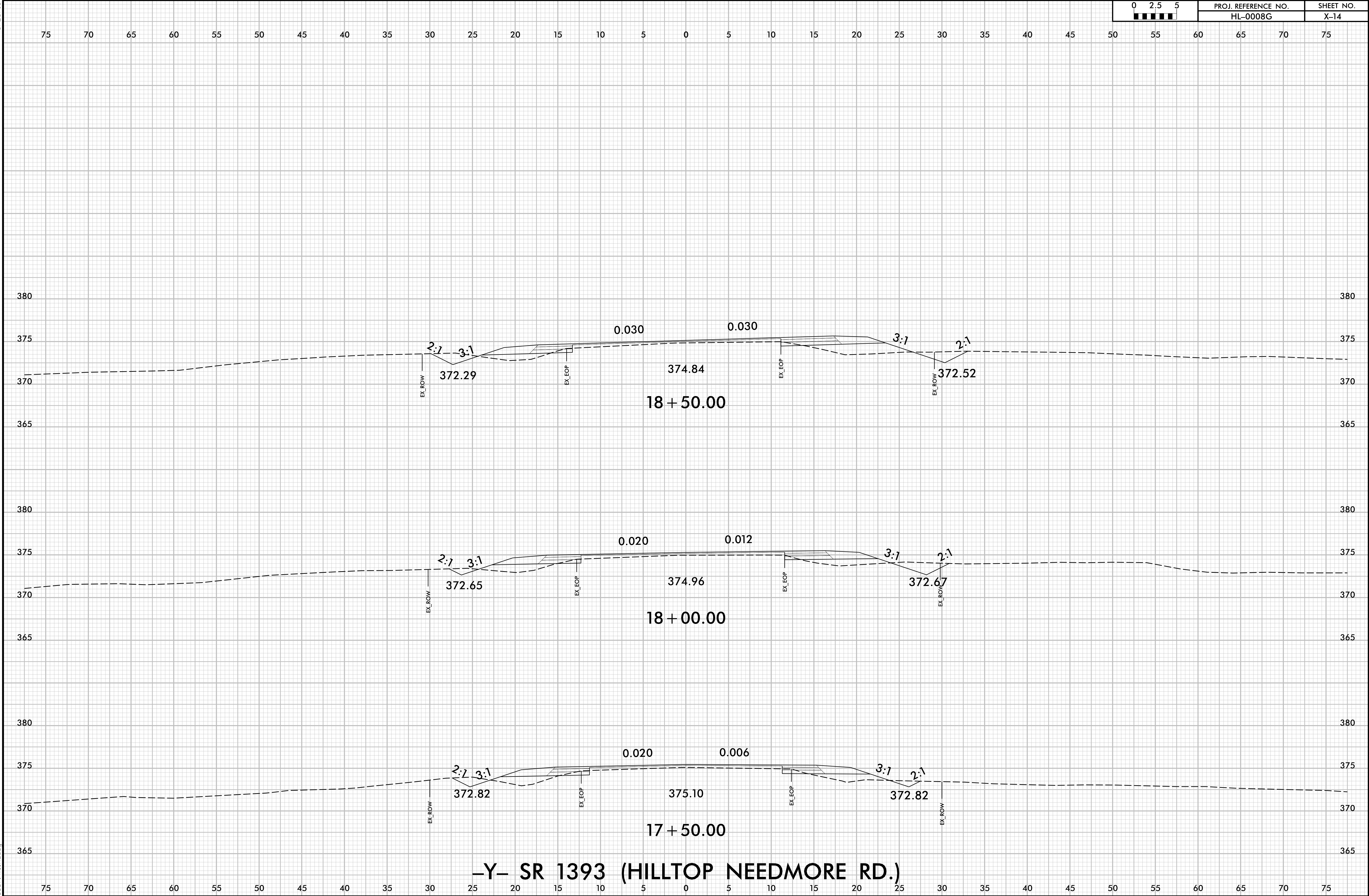


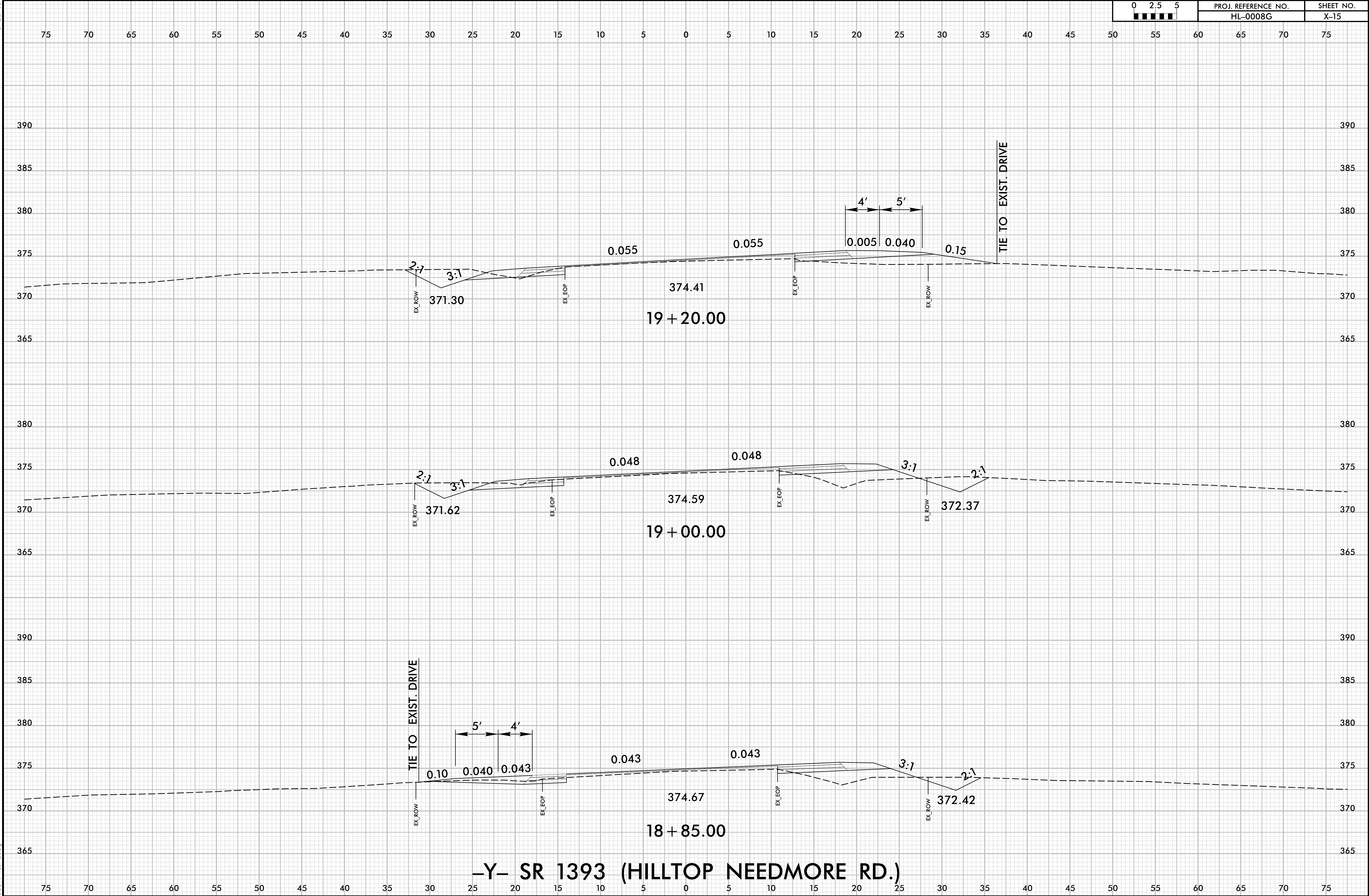


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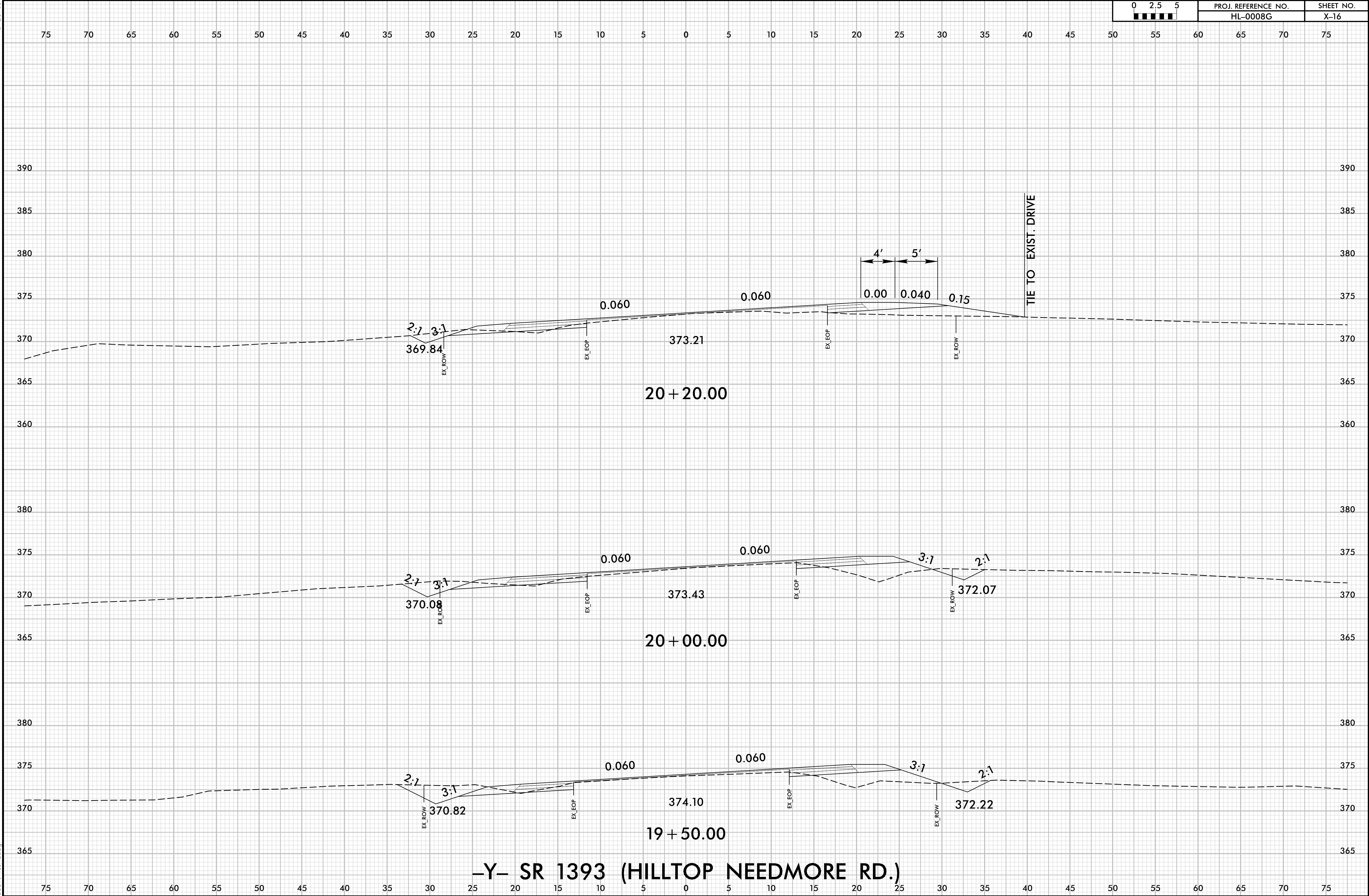


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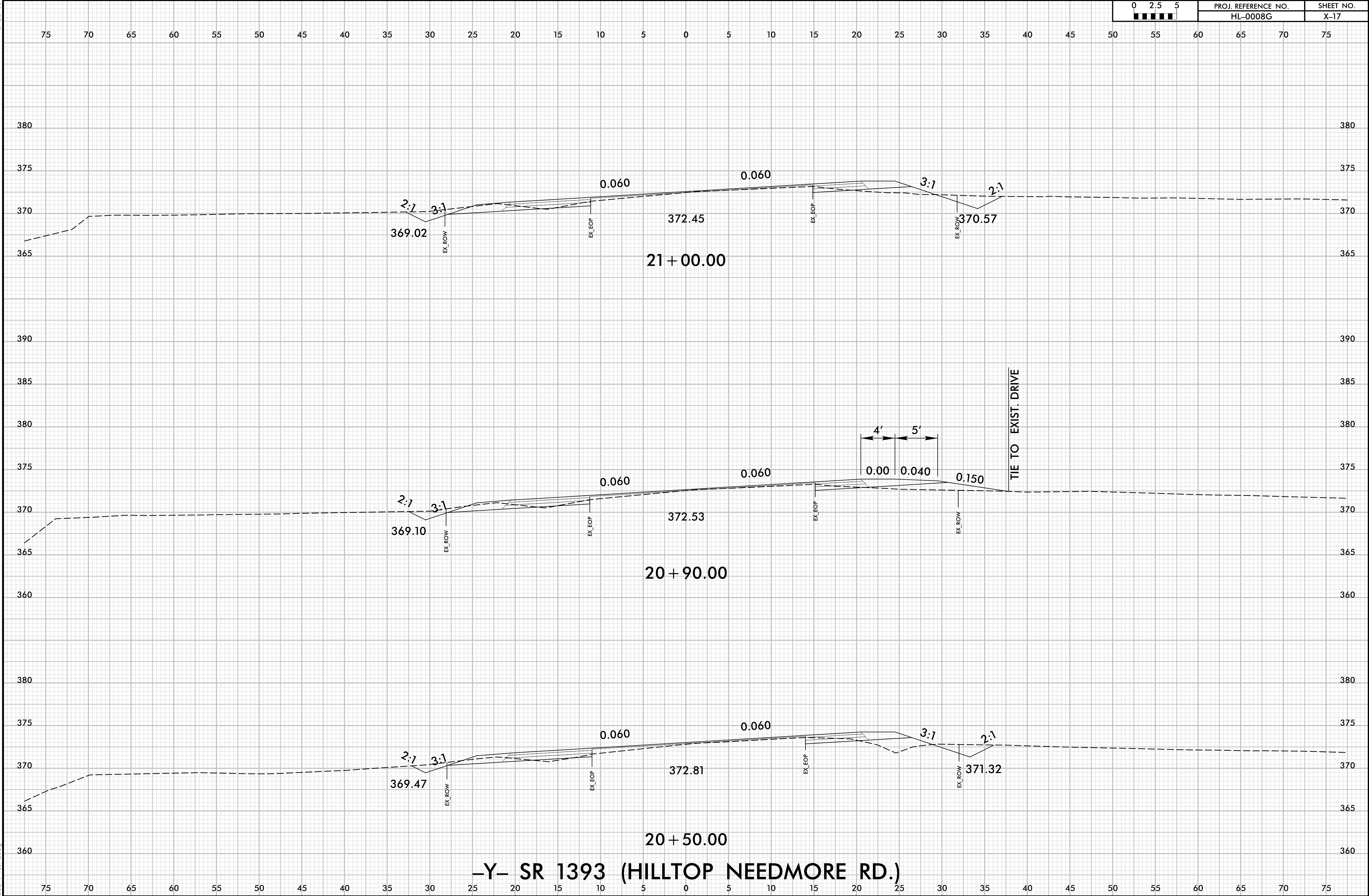




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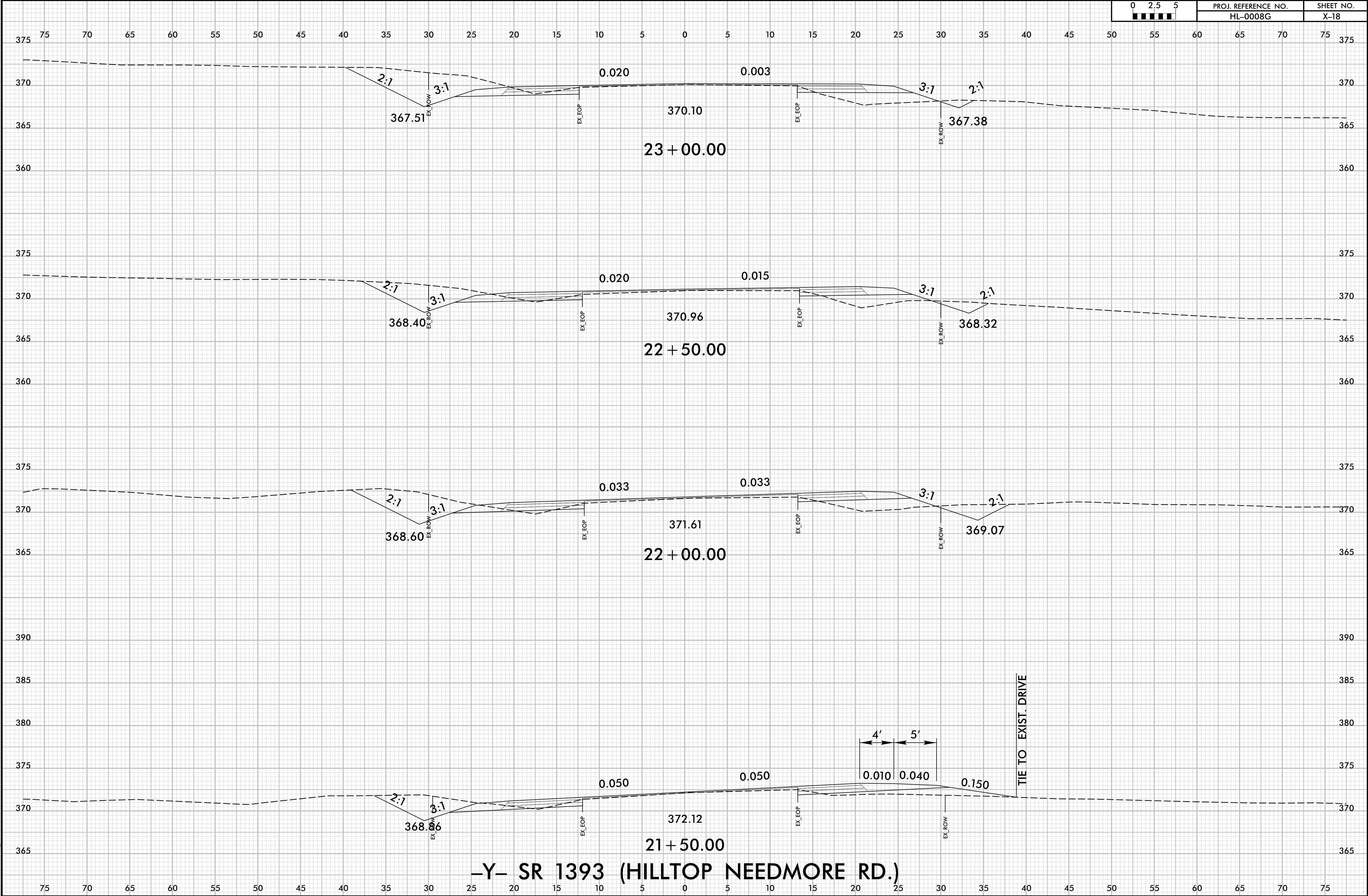


-Y- SR 1393 (HILLTOP NEEDMORE RD.)

6/23/16



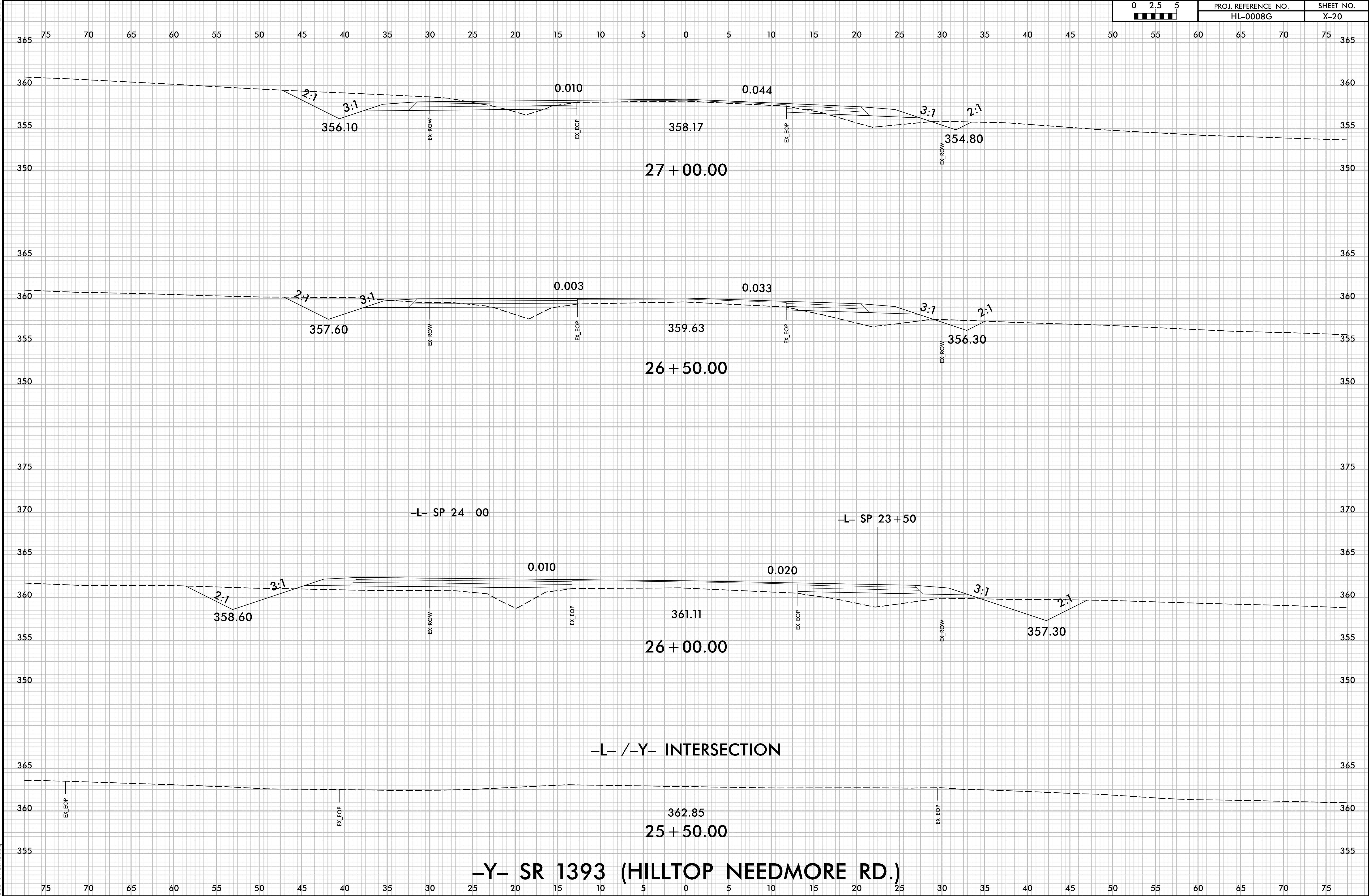
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HL-0008G	X-18



-Y- SR 1393 (HILLTOP NEEDMORE RD.)



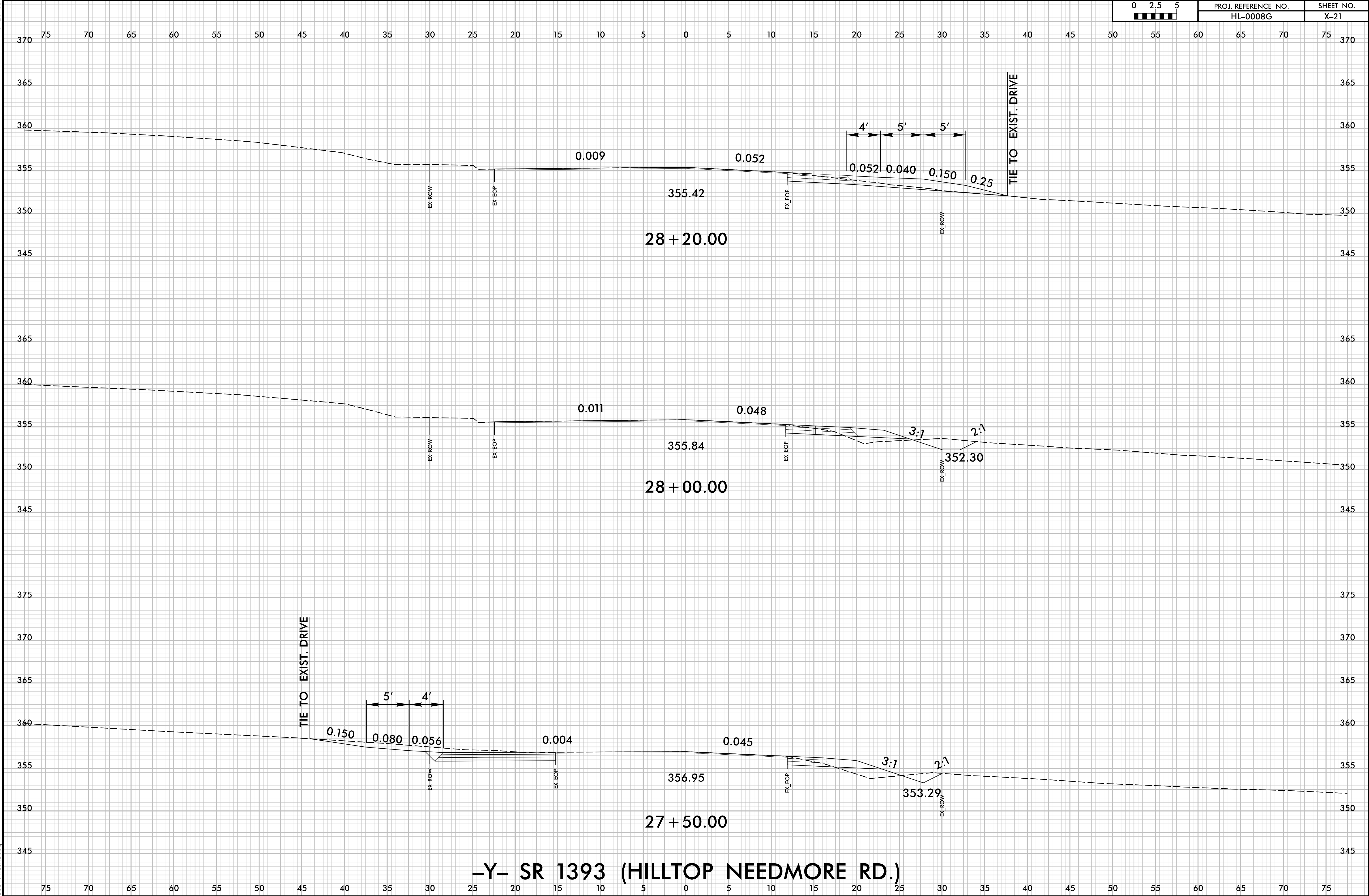
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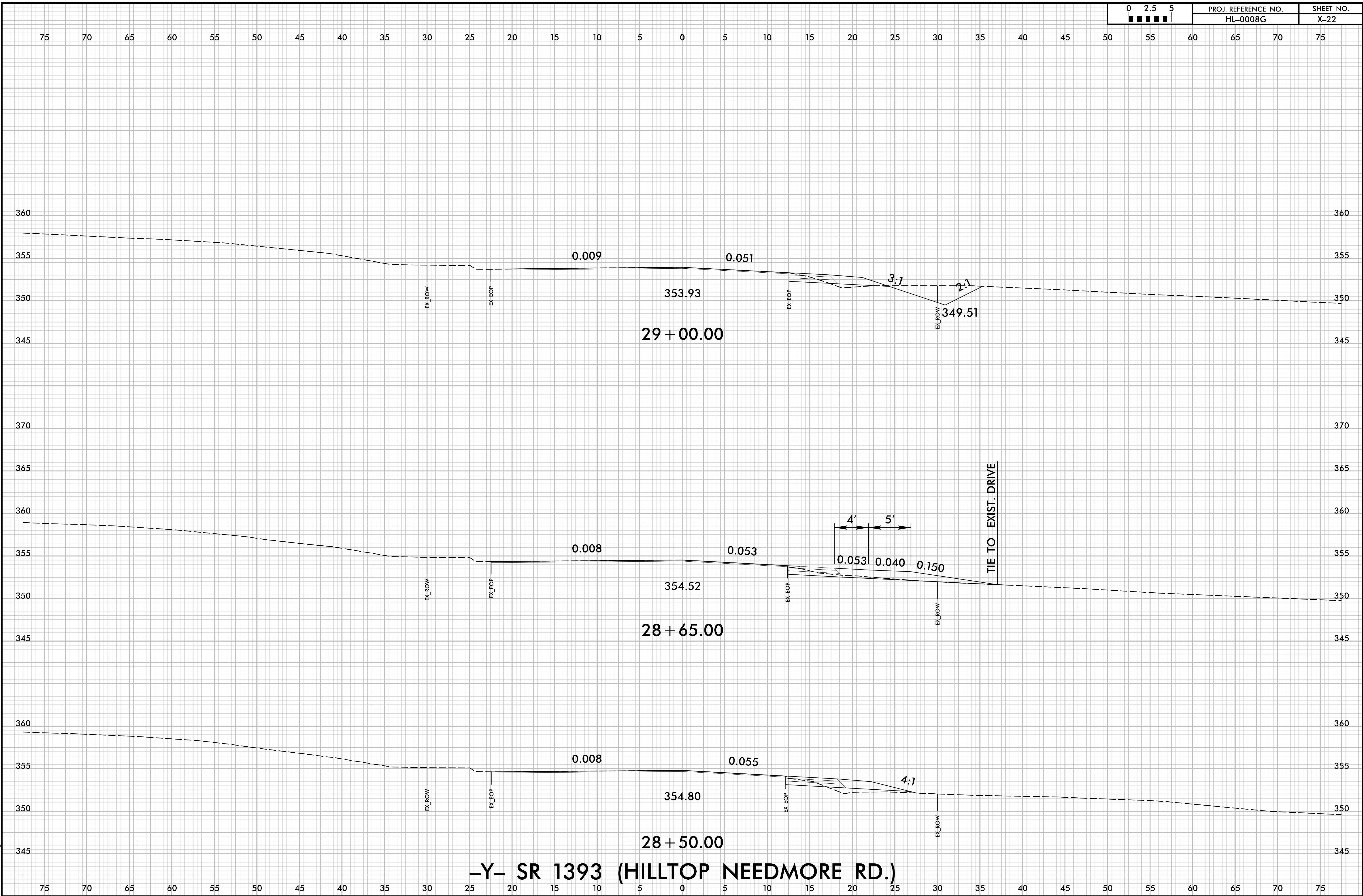


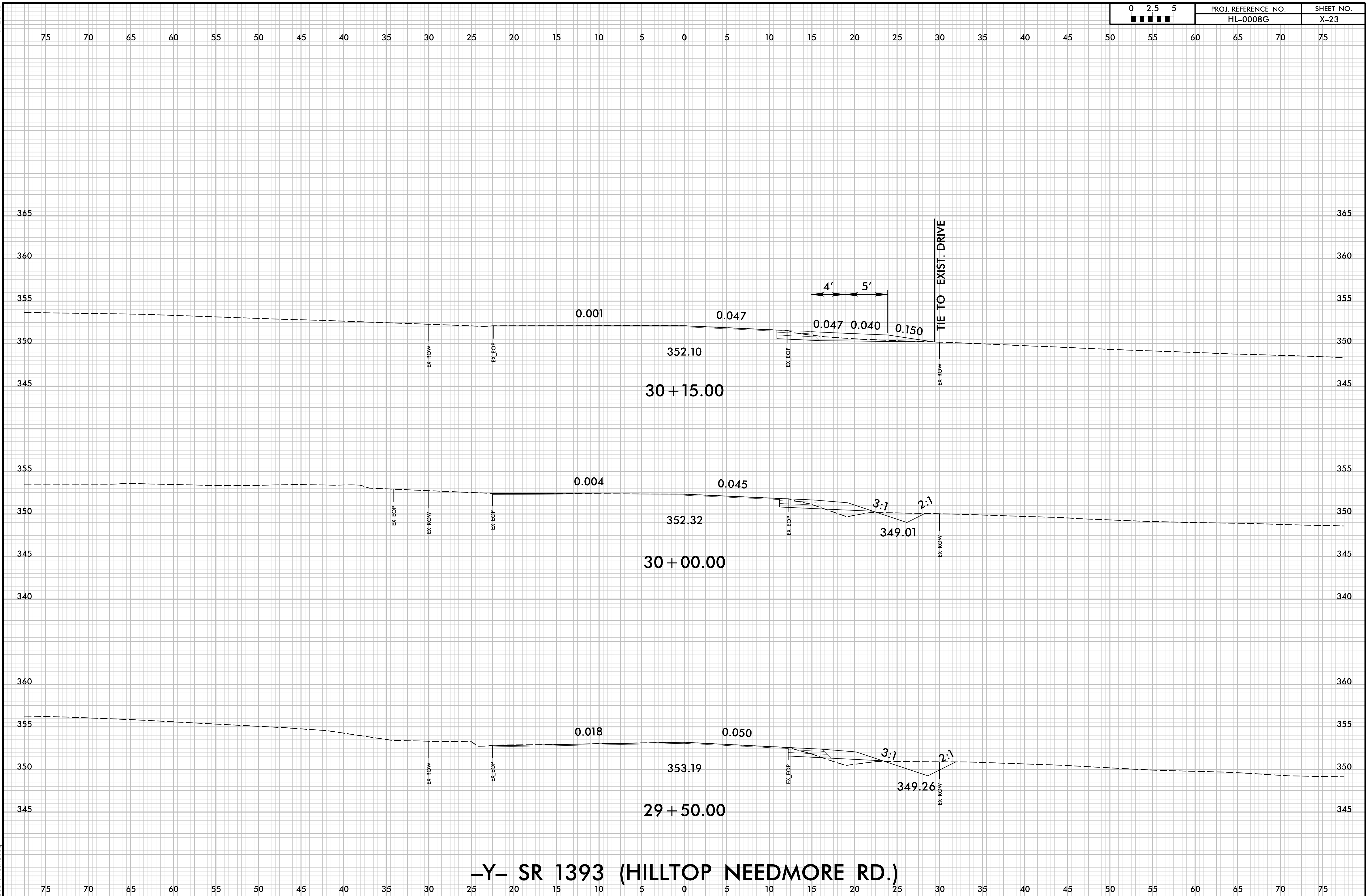
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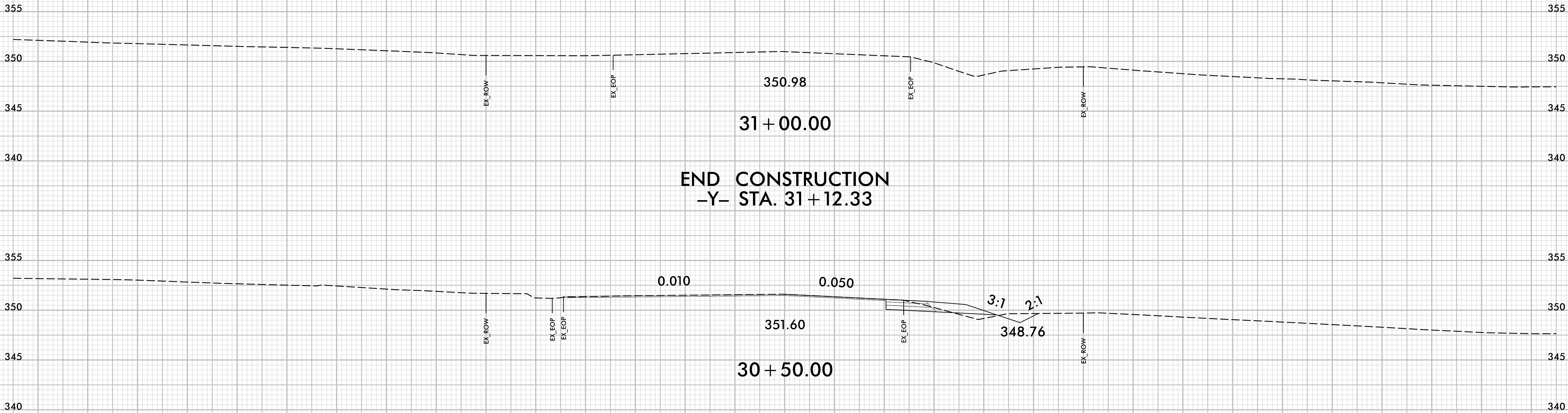
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HL-0008G	X-21







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